

PART No. EM2CI - CR1 - 1

# Operator's Manual

# SCX1500-2

Hydraulic Crawler Crane  
Crane Edition

**HITACHI SUMITOMO**

Serial No. 7016 and up

<https://cranemanuals.com>



## INTRODUCTION

**Read this manual** carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or machine damage.

**This manual should be considered** a permanent part of your machine and should remain with the machine when you sell it.

**This machine is of metric design.** Measurements in this manual are metric. Use only metric hardware and tools as specified.

- SI Units (International System of Units) are used in this manual.  
For reference MKS system units and English units are also indicated in parentheses after the SI units.  
Example : 24.5 MPa (250 kgf/cm<sup>2</sup>, 3550 psi)

**Right-hand and left-hand** sides are determined by facing in the direction of forward travel.

**Write product identification numbers** in the Machine Numbers section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. If this manual is kept on the machine, also file the identification numbers in a secure place off the machine.

**Warranty** is provided as part of our support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from your dealer.

This warranty provides you the assurance that we will back its products where defects appear within the warranty period. In some circumstances, we also provide field improvements, often without charge to the customer, even if the product is out of warranty.

**Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied.** Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

The yellow pages in this operator's manual contain **IMPORTANT SAFETY INFORMATION**. Read these pages thoroughly and familiarize yourself with the safety standards and recommendations set forth in these yellow pages of the manual. Follow all safety instructions prior to and while operating the machine.

Only qualified, experienced operators officially licensed (according to local law) should be allowed to operate the machine. Moreover, only officially licensed personnel should be allowed to inspect/service the machine.

All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

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DALLAS ST. INC.  
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**MEMO**

# 1 INTRODUCTION

## 1 INTRODUCTION

This Operator's Manual is intended to provide safety instructions and correct operating procedures and practices.



### WARNING

- Improper operation of the machine may cause serious personal injury or damage to the machine. Go through this manual and instructions on caution plates on the machine before operating or servicing the machine. Keep the manual at hand in a convenient place for repeated reading by the operator and mechanics.
- The machine is designed and manufactured according to local standards and regulations in the country to which the machine is shipped. When the machine is purchased from another country or used in another country, the applied safety devices and specifications may differ. For detailed information, contact us or our service shop.

- Manual descriptions may differ from the delivered machine due to improvements after the publication of the manual. In this case, contact us or your nearest service shop for details.
- Standard and optional equipment described in the manual may differ from the delivered machine. In this case, refer to the specifications for the delivered machine, sales contract or others.
- For the engine and accessories, refer to the engine manufacturer's instruction manual.
- When transferring the machine to another party, the machine should be accompanied with the manual.
- If the manual is damaged or missed, acquire a new one from your nearest service shop.
- When ordering parts, refer to the Parts Catalog.
- For your convenience, our distributors and service shops are listed at the end of this manual.

## 2 MANUAL ORGANIZATION

The Operator's Manual consists of two volumes. This edition is the second volume (Crane edition).

Volumes	Common Edition	Crane Edition
Section 1 Introduction	●	●
Section 2 Safety	●	●
Section 3 Component Names and Functions		●
Section 4 Operation		●
Section 5 Assembly and Disassembly		●
Section 6 Transport		●
Section 7 Inspection and Maintenance	●	
Section 8 Specifications (Lifting Capacities)	●	

- Each section is contained in volume(s) marked with ●, as listed above.

# 1 INTRODUCTION

## 3 MACHINE SERIAL NUMBER

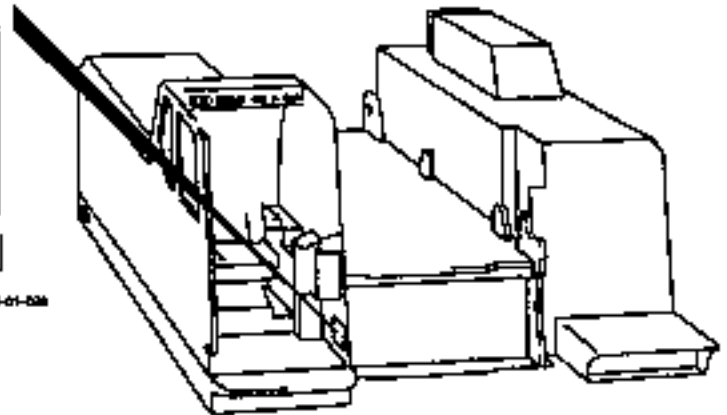
Machine serial number is stamped on the nameplate affixed inside the operator's cab.

On inquiry, please inform us of machine serial number.

Nameplate

Hitachi Sumitomo Heavy Industries Construction Crane Co., Ltd.	
製品型式名 Model / type	<input type="text"/> クローラクレーン Hydraulic Crawler Crane
つり上げ量 Capacity	<input type="text"/>
製品識別番号 Product Identification Number	<input type="text"/>
製造年月 Mfg. Date	<input type="text"/>
日立住友重機建機クレーン株式会社 Hitachi Sumitomo Heavy Industries Construction Crane Co., Ltd.	

MS91-01-028



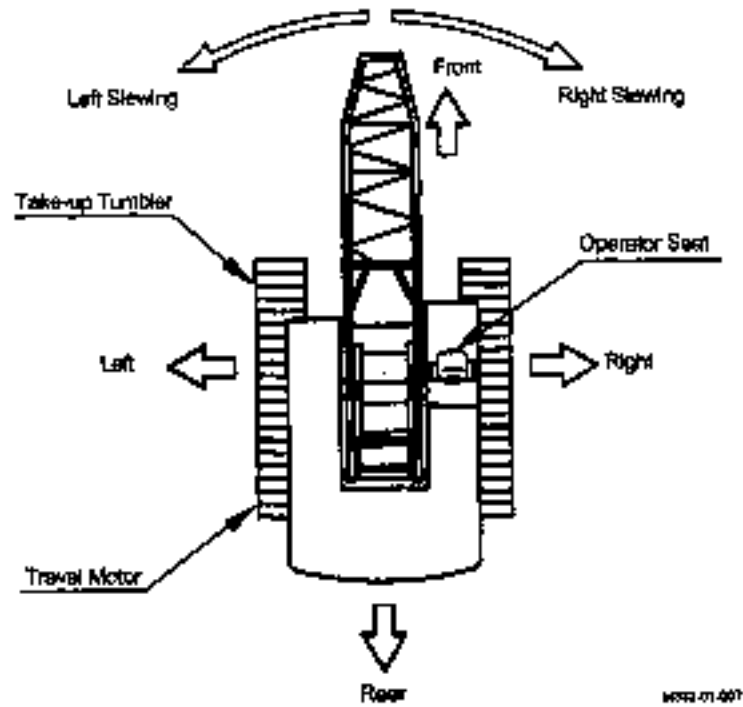
MS91-01-021

# 1 INTRODUCTION

## 4 MACHINE ORIENTATION

- Machine Orientation

- Front, rear, left and right are designated as viewed forward from the operator seat. Reference location is the take-up tumbler that is located at the "Front" side of the crawler.






# 1 INTRODUCTION

## 5 RECOGNIZE SAFETY INFORMATION

Before operation or servicing, go through the manual and caution plates to understand the machine and familiarize with operating procedures.

Make sure to follow the safety instructions in the manual and on caution plates for safe operation. Risk levels are rated as follows.

Caution Levels	Explanation
 <b>DANGER</b> ..... ..... .....	This signal word indicates a risk that could lead to death or serious bodily injury if operating procedures and practices are not followed correctly. Preventive measures are provided together to avoid possible risk.
 <b>WARNING</b> ..... ..... .....	This signal word indicates a potential risk that could lead to death or serious bodily injury if operating procedures and practices are not followed correctly. Preventive measures are provided together to avoid possible risk.
 <b>CAUTION</b> ..... ..... .....	This signal word indicates a risk that could lead to light to medium bodily injury or serious damage to the machine if operating procedures and practices are not followed correctly. Preventive measures are provided together to avoid possible risk.
<b>IMPORTANT:</b> ..... ..... .....	This message indicates a possibility that could lead to damage to the machine or cause adverse effect on performance and service life if operating procedures and practices are not followed correctly.
<b>NOTE:</b> ..... ..... .....	NOTE information is given.

Notice that our safety instructions cannot cover every possible risk. Always pay attention to avoiding personal injuries and machine damages by following correct operation procedures and practices, and maintenance instructions.

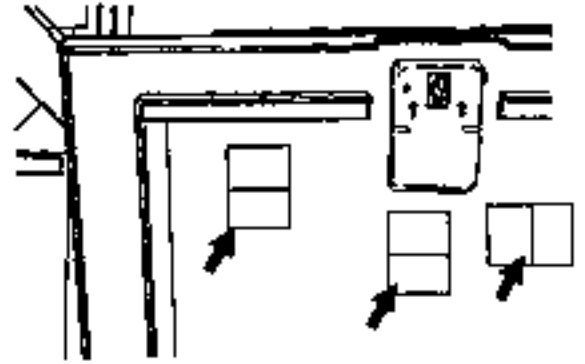
# 1 INTRODUCTION

## 6 SAFETY SIGNS



ES4460714

- Sign indicates an electrical hazard from handling the cable.  
Read manual for safe and proper handling.



MS-171



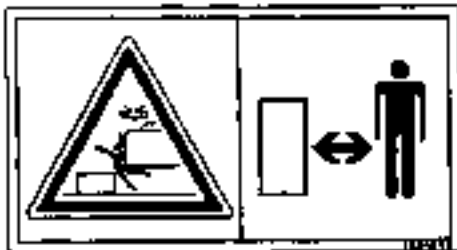
ES4460927

- Sign indicates an explosion hazard.  
Keep fire and open flames away from this area.



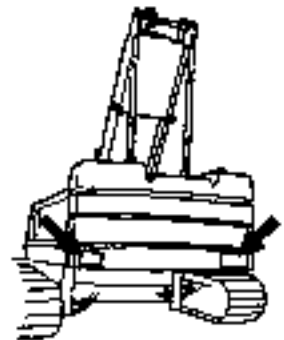
ES4460228

- Skin contact with electrolyte will cause burns. Splashed electrolyte into eyes will cause blindness. Take care not to touch electrolyte.



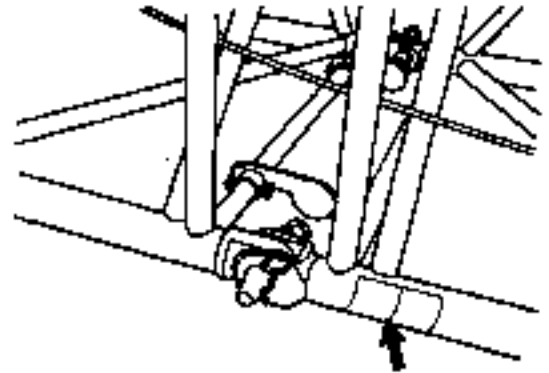
ES-1014

- Sign indicates a crush hazard by rotation of upper structure of the machine.  
Keep away from slewing area of machine.



MS-1075

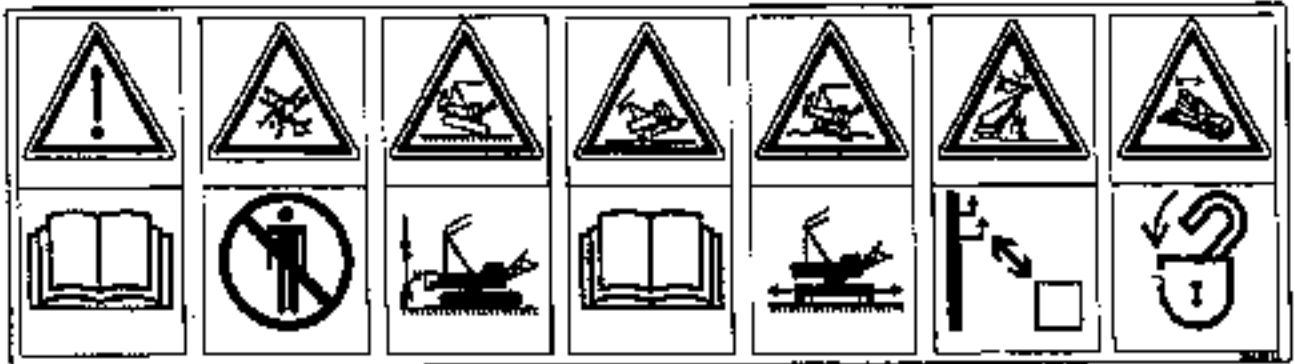
# 1 INTRODUCTION



60-1873

- Never stand or work under boom when disassembling or assembling boom. Boom may fall if disassembling/ assembling procedures are not followed. Disassemble/ assemble boom correctly, referring to Operator's Manual.

60-200971

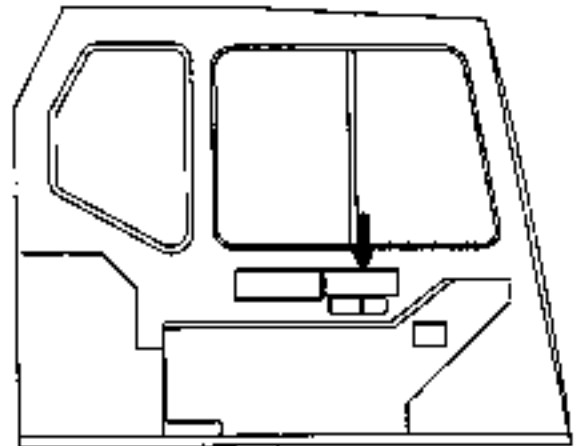


60-1890

- **WARNING**  
Make sure to read the Operator's Manual carefully prior to operation, maintenance, disassembly, reassembly, and transport of the machine.



60-1480



60-200-002

- Never stand or work under boom when disassembling or assembling boom. Boom may fall if disassembling/ assembling procedures are not followed. Disassemble/assemble boom correctly, referring to Operator's Manual.



60-1648

# 1 INTRODUCTION

- The crane may tip over under some operating conditions. Carry out crane operation in correct position with the specified counterweight mounted.



CS-180

- The crane may tip over rearward if slewing or disassembly/reassembly are carried out with the crawlers retracted. Make sure to go through Operator's Manual, and follow the instructions.



CS-181

- The crane may tip over under some ground or operating conditions during crane operation. Extend the crawlers on firm level ground, and carry out crane operation in correct position.



CS-182

- Serious injury or death can result from contact with electric lines or from work in close proximity to electric lines. Before working nearby electric lines, be sure to contact the utility company so as to take appropriate measures.



CS-183



# 1 INTRODUCTION

- Securely engage swing lock when transporting. Superstructure may accidentally rotate, possibly causing machine to fall off trailer bed.

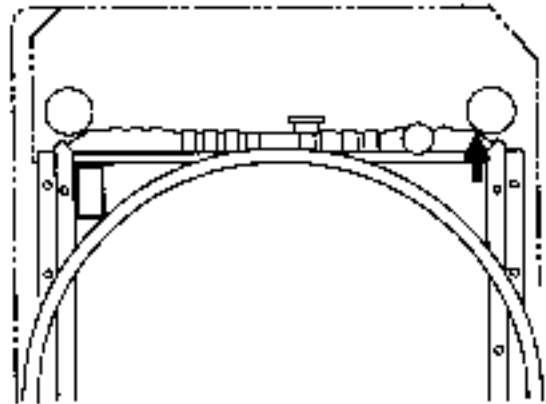


83-185A

- Do not approach rotating fan. Contact with rotating fan may cause serious personal injury. Always stop engine before working on or around fan.



83-186A



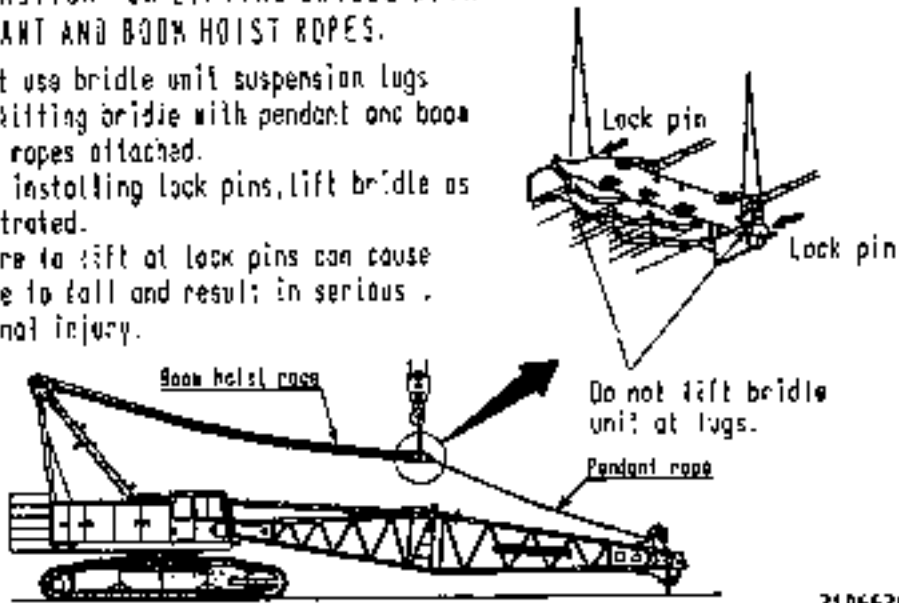
84-200-005

# 1 INTRODUCTION

**WARNING**

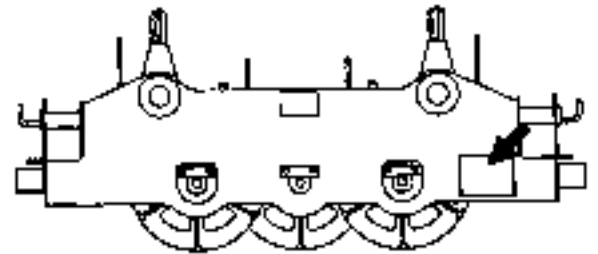
**PRECAUTION FOR LIFTING BRIDLE WITH PENDANT AND BOOM HOIST ROPES.**

Do not use bridle unit suspension lugs when lifting bridle with pendant and boom hoist ropes attached. After installing lock pins, lift bridle as illustrated. Failure to lift at lock pins can cause bridle to fall and result in serious personal injury.

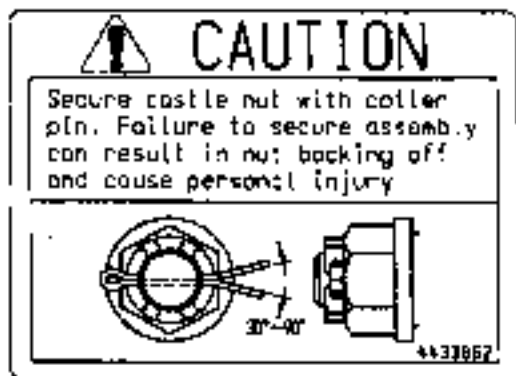


Do not lift bridle unit at lugs.

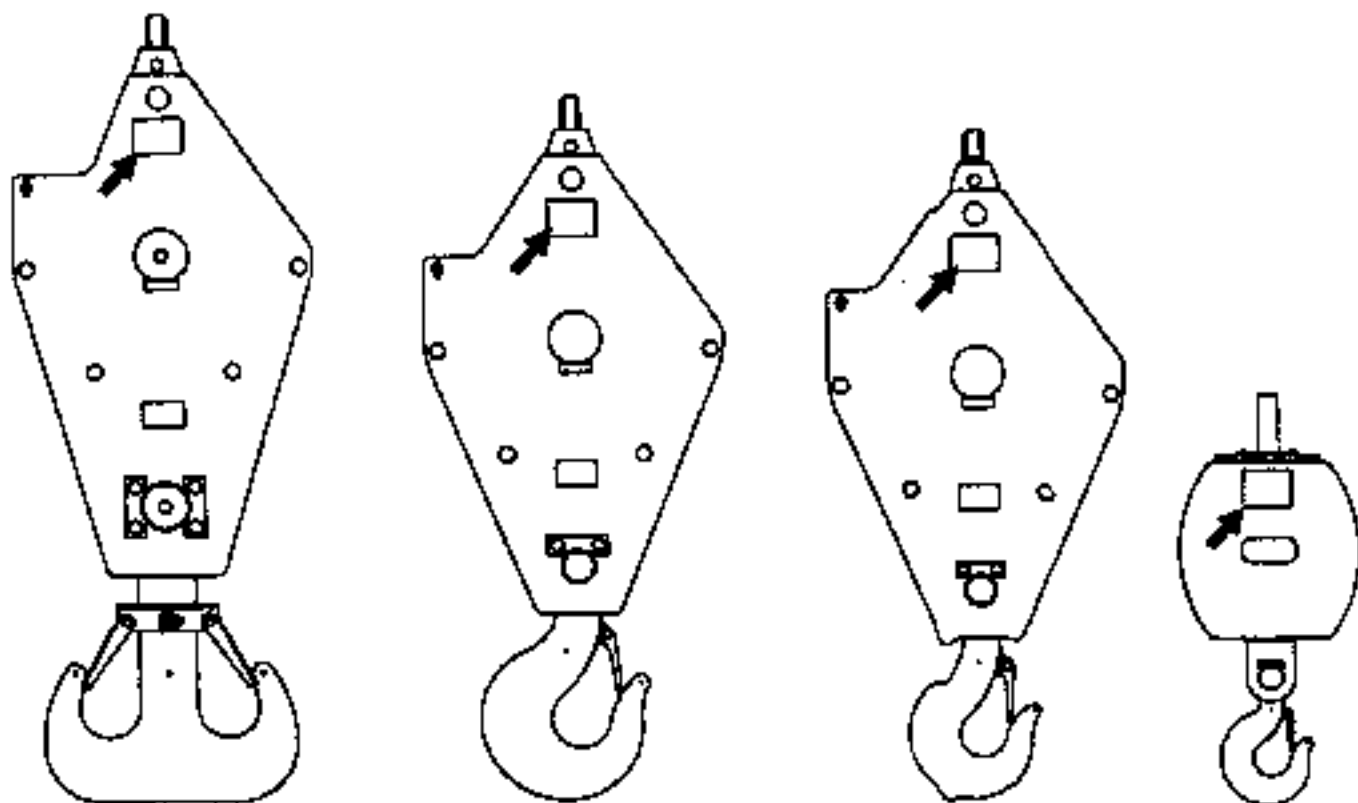
3106636



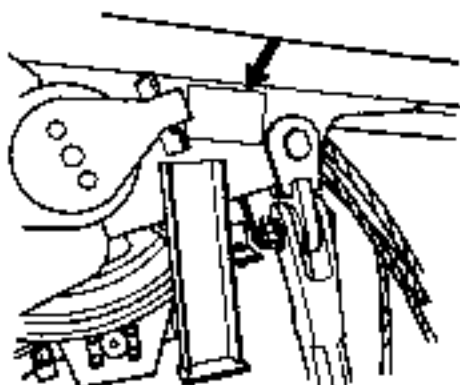
# 1 INTRODUCTION



584433862



34-187



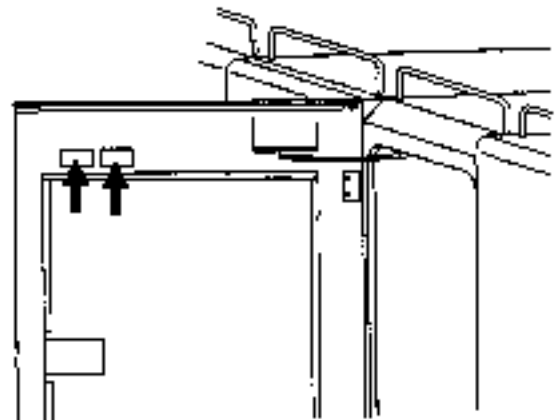
58-288

# 1 INTRODUCTION



08-02362

- Sign indicates a hazard of rotating parts, such as belt. Turn off before inspection and maintenance.



08-200-006



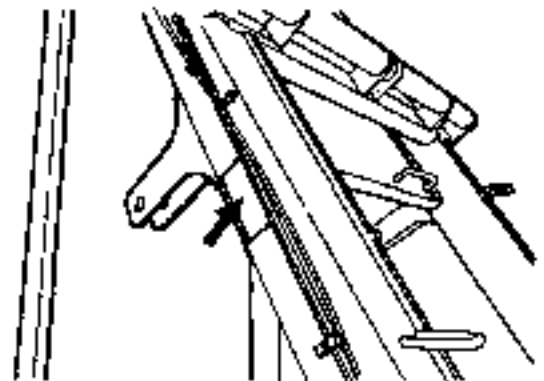
2302760

- Never touch the heated components. If touching the heated components such as engine, motor or muffler during operation or immediately after stopping, the operator may be scalded.

- Never enter under the A-frame during extending or retracting the A-frame. The A-frame (gantry frame) may lower unintentionally, catching the work crew.



05-1597



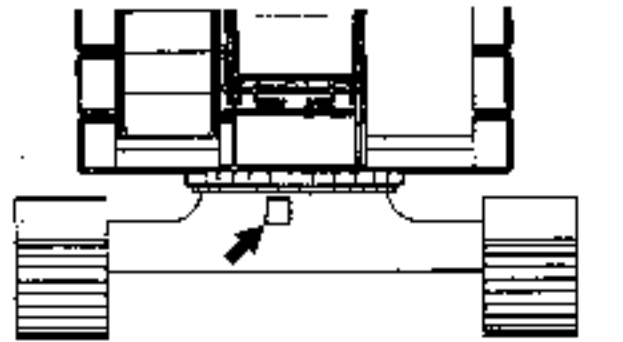
05-1601

# 1 INTRODUCTION

**⚠ WARNING**

- Use the attached floats under jack-up devices.
- Keep the machine base level.
- Check that travel motor pipelines, link pins, and all shims between crawler holding beams and track frame are removed before extending or retracting crawlers.
- Operate crawler extend/retract cylinders one at a time.
- When not in use turn pendant switch box power OFF.

3192275



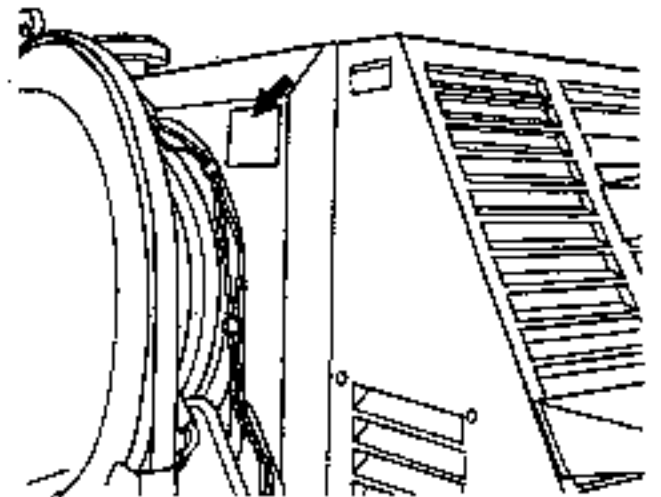
05-2617

**⚠ CAUTION**

Check the amount of the brake discs wear using the indicator. Normally, the indicator is projected from the end face of the drum when the engine is stopped. In case the projection is reduced to 0 mm or less, the risk of the lifted load falling may increase. Please contact your nearest authorized dealer.

The diagram shows a cross-section of a brake drum and disc assembly. A small rectangular indicator is mounted on the drum. A callout box labeled 'INDICATOR' shows a scale for 'Normal Projection' ranging from 0 to 5mm. The diagram is labeled '4624554' in the bottom right corner.

4624554



05-2617

# 1 INTRODUCTION

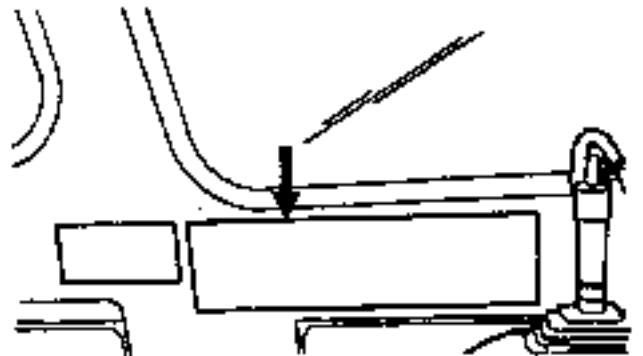


## CAUTION

1. Read and understand Operator's Manual prior to operating this machine.
2. Perform daily inspections.
3. A computer is used to control machine operations. When using a radio communication unit, install its antenna outside the operator's cab. If the antenna is installed inside the cab, machine malfunction may result.
4. Before operating machine, confirm that:
  - Crawlers are fully extended.
  - Required counterweights are in place.
  - "Gentry" is in "HIGH" position.
5. Sound horn to alert bystanders before operating. Ensure all persons are clear of area.
6. Confirm that all safety devices function correctly.
7. Operate in AUTOMATIC BRAKE MODE.  
In FREE MODE operation, suspended loads can fall if brake pedals are not engaged properly.
8. Never place any part of body beyond the left side cab window.
9. Do not impact or apply sudden inputs to machine or load.
10. Confirm that brake functions correctly and that machine is well-balanced.
11. Do not travel with a suspended load.
12. When leaving operator's seat:
  - Lower load to ground.
  - Apply hold brakes and bring parking brake.
  - Engage drum locks.
  - Return control levers to NEUTRAL.
  - Stop engine, remove key, and pull pilot control shut-off lever to LOCK position.
13. When transporting the machine, be sure to secure and lock the cab doors, the overhead window, and all other maintenance access covers.
14. Use correct combinations of rope sockets and wedge. (If size and taper angle combination are incorrect, wire rope can release, causing boom to fall.)
15. Never operate the basic boom with a single suspension line. Booms can move backward and cause machine to tip over.
16. Never drag load using swing or hoist function. Booms can be damaged.

3102114

980102 14

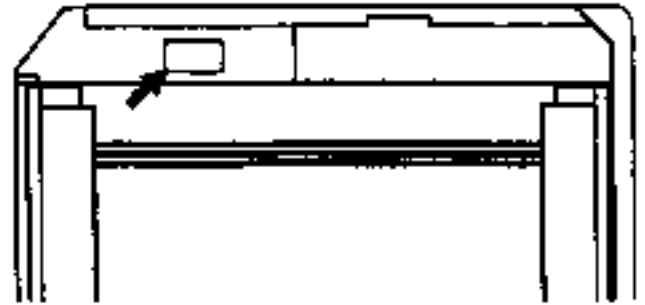


88-0388

# 1 INTRODUCTION

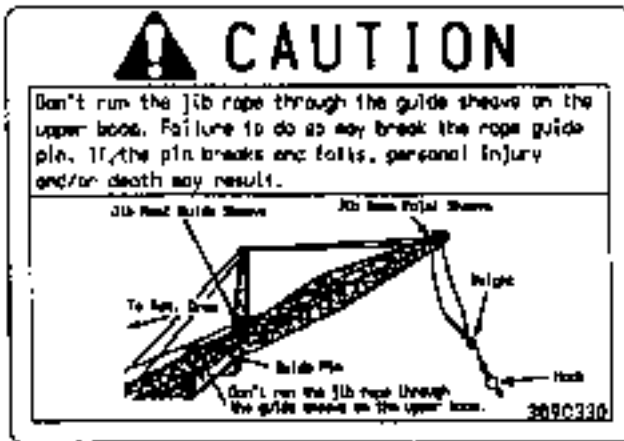


05-1808

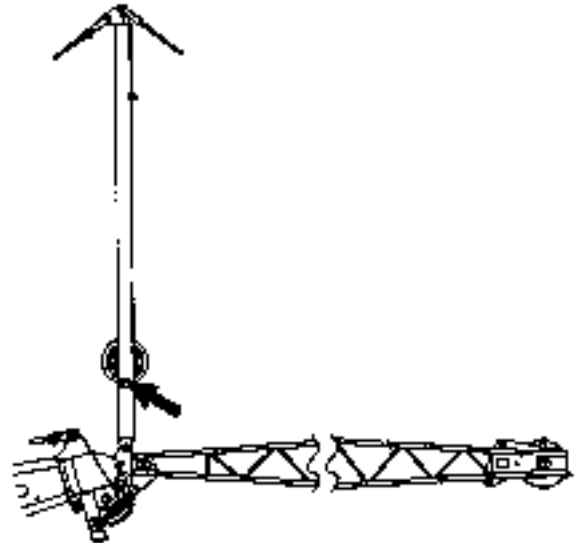


05-2641

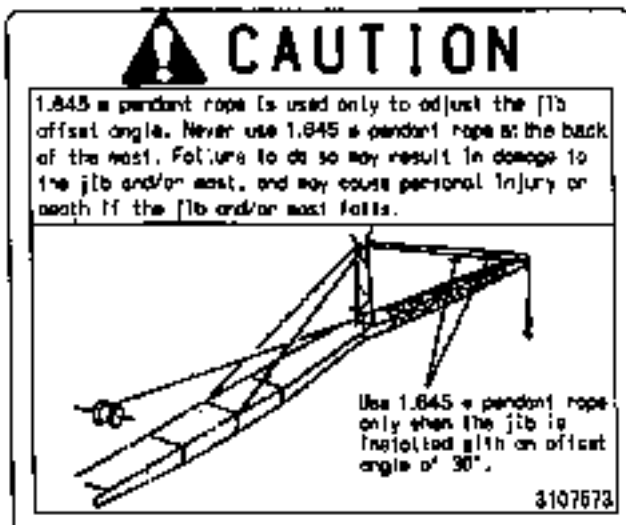
- Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot. Allow radiator or hydraulic tank to cool before removing cap.



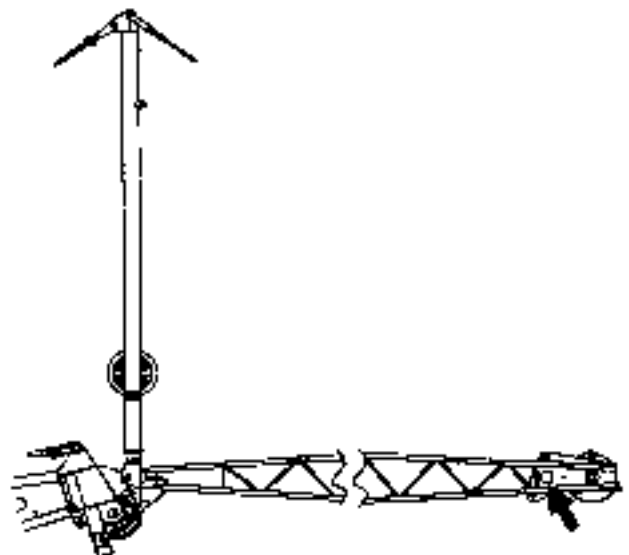
05-29200



06-1421

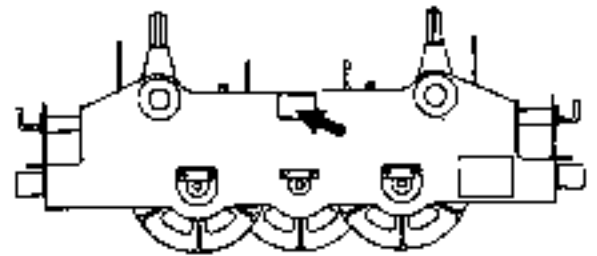
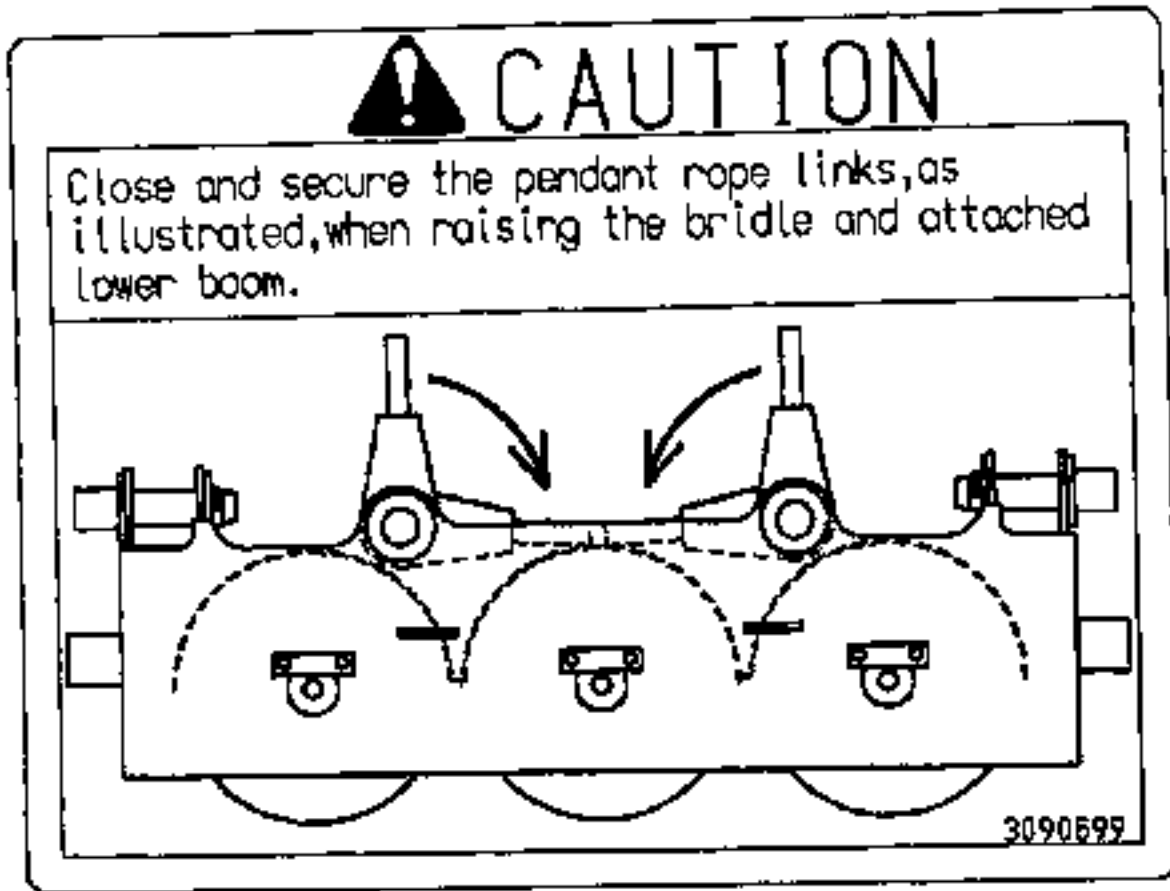


05-107673



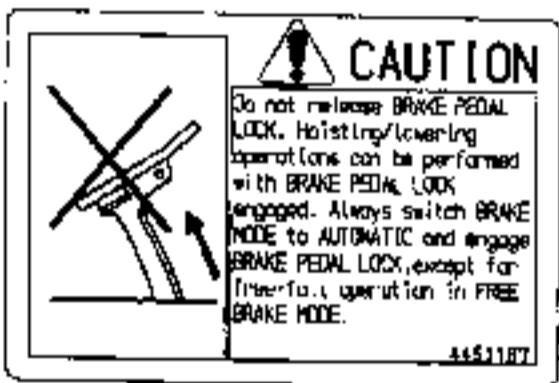
06-1423

# 1 INTRODUCTION

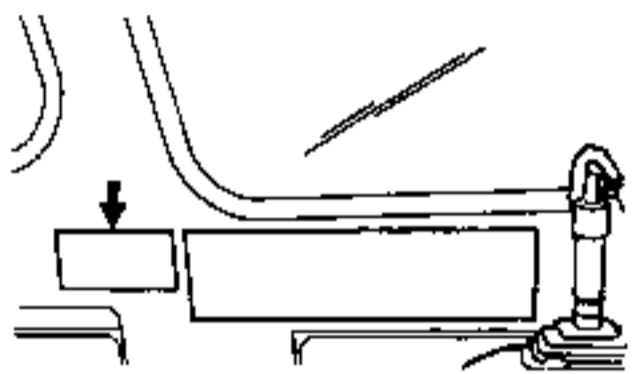




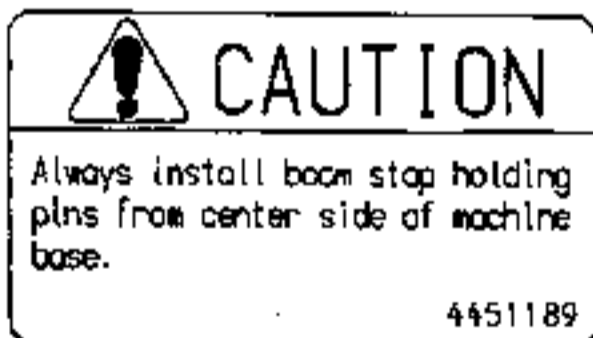
## 1 INTRODUCTION



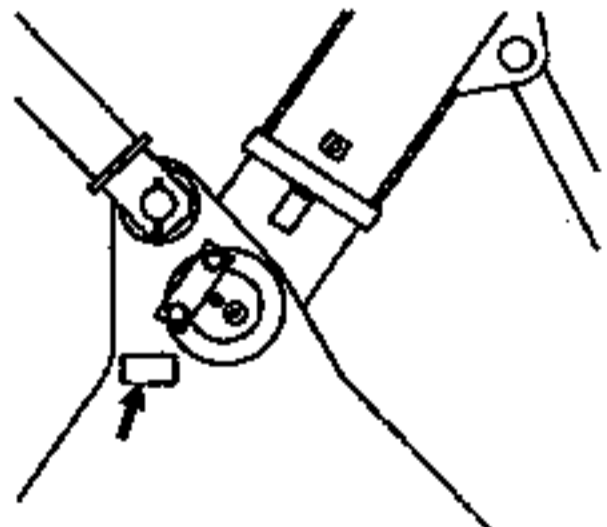
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29-2492



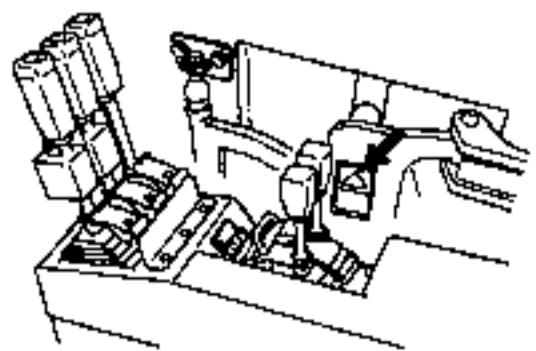
09A61148



05-10294-001



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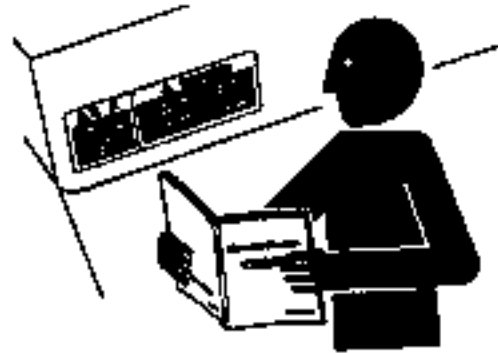
29-2492

## 2 SAFETY

### 1 BASIC PRECAUTIONS

#### 1.1 Follow safety instructions.

- Thoroughly read and understand all safety instructions in this manual and safety signs affixed to the machine to ensure proper and safe machine operation.
  - Always maintain the safety signs clean. In case a safety sign or this manual becomes damaged or missing, immediately order a replacement from your nearest Hitachi dealer. Reinstall the safety sign in its original position. Store the manual in the specified place to make it available as needed.
- Allow only trained, qualified, and authorized personnel to operate the machine.
- Learn the correct and safe operation, and service of the machine.
- Always keep your machine in proper working condition.
- Be sure to operate the machine within the specifications range.
- Never apply unauthorized modifications to the machine. A reduction in safety, function, and/or short lifetime of the machine may result and the warranty will be void.
- Descriptions indicated with mark  and the CAUTION cover safety instructions that need to be observed. Also, pay close attention to safety other than that which is described in this manual.



SA-000



EA-001

000-018-0003

#### 1.2 Wear protective items.

Loose jackets, shirt sleeves, rings, and other accessories should be removed to reduce the possibility of catching them on extruding parts or controls. Wear correct clothing for the job to be engaged. Do not wear oily clothing which may easily catch fire. Use necessary protective items as required. Be sure to check that the protective items can function correctly before using them.

- Protective items: Hard hats, Safety shoes, Safety glasses, Dust mask, Heavy gloves, Seat belt, etc.



PA-000

## 2 SAFETY

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### 1.3 Protect against noise.

- Loud ambient noise can cause impairment or loss of hearing.
- Wear earmuffs or ear plugs in case prolonged exposure to loud noise is unavoidable when engaging in works such as when servicing the engine.



SA-04

### 1.4 Do not operate machine in bad health.

Wandering attention can cause personal accidents. Do not operate the machine if it is impossible to correctly operate the machine due to overwork, sickness, or under the influence of drugs or alcohol.



NOH-42-002

### 1.5 Coordinate rules in job site with personnel concerned.

If job coordination with personnel concerned is omitted or insufficient, occurrence of unexpected accidents may result. Be sure to coordinate the following points with the personnel concerned beforehand.

- Appoint a conductor at the job site and decide the unified command channel.
- Appoint a signal person and coordinate the signs to be used in the job site.
- Appoint a responsible person in sling work and coordinate the sling method.
- Confirm the locations of other co-workers and working methods.
- Confirm the setup location of the crane and the ground condition. Reinforce the ground strength as needed.
- Confirm the lifting load weight and the crane lifting capacity.
- Confirm safety rules regarding prohibited practices or precautions have been publicized.
- Provide fences or ropes around the off-limit area.

## 2 SAFETY

### 1.6 Coordinate signal person's directions.

If signals to be used in the job site are not fully coordinated by all personnel concerned, the possibility of personal accident may increase.

The signal person must be in a clearly visible position so that signals and directions can be correctly transferred to all co-workers. The operator must operate the machine according to the signals from the signal person. In addition, it is requested for the operator to make certain safety around the machine before starting the engine by sounding the horn to alert bystanders.



34-431

### 1.7 Prepare for emergency.

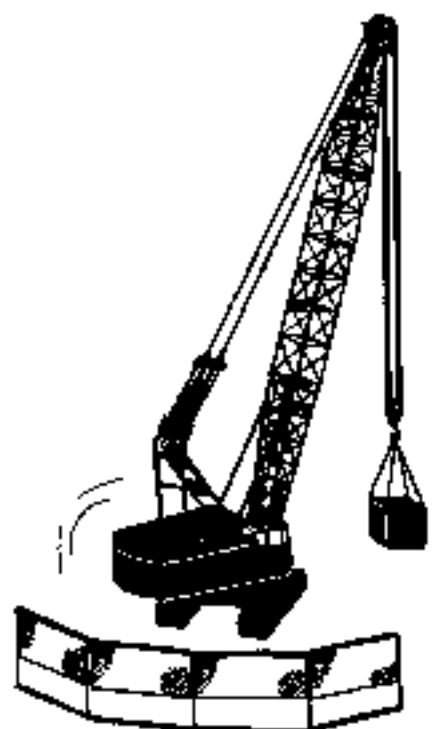
Establish emergency procedures and guidelines to cope with fires and accidents. Learn in advance how to use a fire extinguisher and first aid kit, and be informed where they are located.



34-431

### 1.8 Keep personnel clear of working area.

Serious injury or death may result if anyone enters the working area. Set up barriers around the working area to prevent anyone from entering the working area. Make it a rule for the operator to check that no personnel or obstructions are present around the machine before operating the machine.



34-431

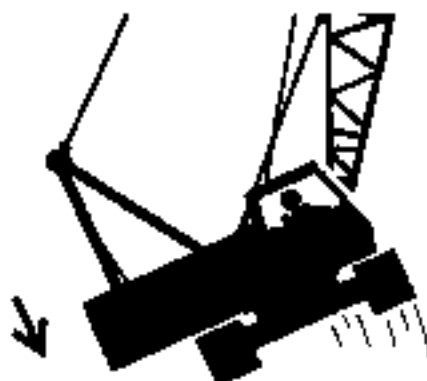
## 2 SAFETY

### 1.9 Operate the machine in the correct position.

Operation of the machine in an incorrect position or with an unauthorized machine modification may result in personal injury or death due to damage occurring to the machine or the machine tipping over. Always operate the machine in a position which conforms to the specification. Never attempt to modify the machine without first receiving authorization from Hitachi Sumitomo. In case any machine modification is required, contact your nearest Hitachi Sumitomo dealer in advance.

#### Check points related to the position of machine operation

- Mass of the counterweight
- Height of the A-Frame
- Make-up of the tower boom, boom and jib pendant
- Width of the extended crawler
- Locations to thread wire ropes (before raising the tower and jib/boom)
- Checking wire ropes for entanglement or detachment (after raising the tower and jib/boom)



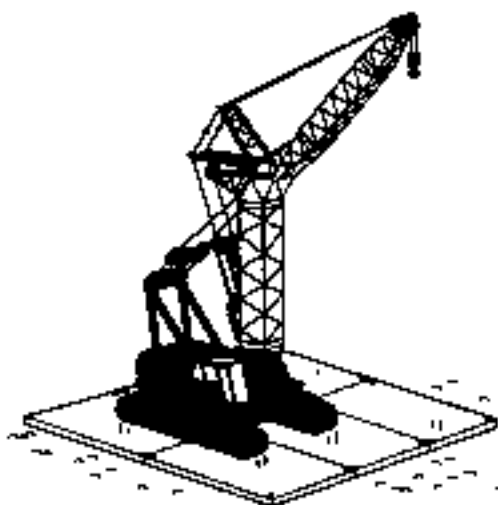
M23-01-05

### 1.10 Setting up of the machine.

If the machine is not set up vertically, personal injury or death may result due to machine tipping over. Check the ground strength. If the ground is not strong enough, reinforce the ground with planks being sufficiently strong. Set up the machine vertically. Extend the crawlers to the maximum.



M23-01-06



M23-01-07

## 2 SAFETY

### 1.11 Do not remove the safety devices.

Removal or incorrect operation of the safety device may result in personal injury or death. Do not remove the safety devices. Understand correct operation methods of all safety devices and always maintain them so that they can operate correctly. Check all guards and covers for incorrect installation, missing parts, or any damage. Repair or service the machine if discrepancy is found.

- **Safety Devices:** Refer to section 3 "Controls In Operator's Station" and "Safety Devices" for details of the overload prevention device, hook overhoist prevention device, tower or boom overhoist prevention device, secondary tower or boom overhoist prevention device, alarm buzzers, and brake and drum locks.

### 1.12 Mounting/Dismounting the machine.

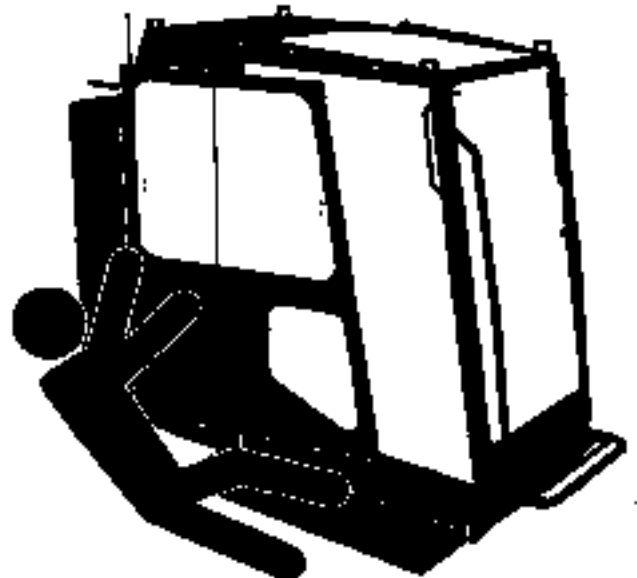
Always use handrails and steps when mounting/dismounting the machine. Never jump on or off the machine. Failure to do so may cause falling accidents. When mounting/dismounting the machine, always face the machine and maintain a three-point contact with the steps and handrails. Do not use any controls as handholds. Be careful of slippery conditions on steps and handrails when mounting/dismounting the machine.



EA-128

### 1.13 Opening/Closing the cab door with care.

When opening or closing the cab door, the door is extended forward. Be careful not to trip on the steps.



3P-127M-001

## 2 SAFETY

### 1.14 Operate machine only from the operator's seat.

Starting the engine or operating the machine from the outside of the operator's seat may introduce mis-operation, possibly resulting in personal injury or death. Be sure to start the engine or to operate the machine only from the operator's seat.



SA-444

### 1.15 Fasten your seat belt (if equipped).

◆ If the machine should overturn, the operator may be smashed in the cab, thrown from the machine, and/or crushed by the overturning machine, resulting in serious injury or death.

- Be sure to remain seated with the seat belt securely fastened at all times when the machine is in operation.
- Prior to operating the machine, thoroughly inspect the webbing, buckle, and attaching hardware for any damage. If any item is damaged, replace the seat belt or component. Make it a rule to replace the seat belt every three years regardless of its apparent condition.



SA-217

### 1.16 Keep riders off the machine.

Riders on the machine may obstruct operator's view and/or action, possibly causing mis-operation. In addition, riders may be thrown off the machine, or become subject to entanglement between the machine and obstructions. Never operate the machine with riders other than the operator.



LC504-02-008

## 2 SAFETY

### 1.17 Do not lift a person.

Lifting a person with a crane may cause falling accident. Do not lift a person. In case lifting a person is unavoidably required due to job site requirements, be sure to follow the instructions described below:

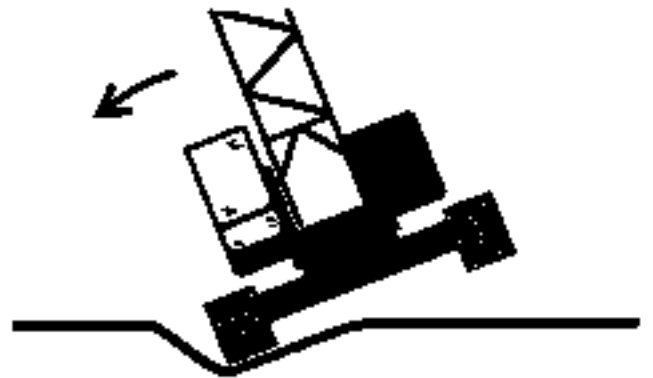
- Install a deck exclusively designed for personnel to ride on.
- Riders must use a safety belt.
- Lower the deck, on which personnel are riding, only by power lowering operation.
- The value obtained by the following formula must be lower than the rated load value.  
(Riding device weight + Rider's weight) x 1.3 + 500 kg
- Provide a safety device to prevent the attached personal riding deck from changing the position, or coming off the lifting tool.



SA-223

### 1.18 Prevent tipping over accidents.

Subsidence or collapse of the ground due to machine weight or vibration may cause the machine to tip over or to fall, possibly resulting in personal injury or death. Operate and/or travel the machine only on solid level ground strong enough to support the machine. Investigate the landform, geological condition, strength of bridges and structures in advance. Before operating the machine on soft ground, slopes or terrains where underground embedding exists, sufficiently reinforce and level such ground with steel planks of required size and strength.



SA-719

#### Typical grounds to be reinforced

- Inclined surface ground
- Areas close to a cliff, road shoulder, deep ditch, or hole
- Temporary asphalt or thin thickness concrete pavement
- Fill-up ground
- Swampy ground immediately after rain fall
- Frozen ground



## 2 SAFETY

### 1.19 Avoid power lines.

Never approach any part of the machine or a lifting load to power lines nearer than specified. Electrical shock may result.

#### Prevent Electrical Shock

Take the following protective measures against electrical shock before operating the machine in the vicinity of power lines.

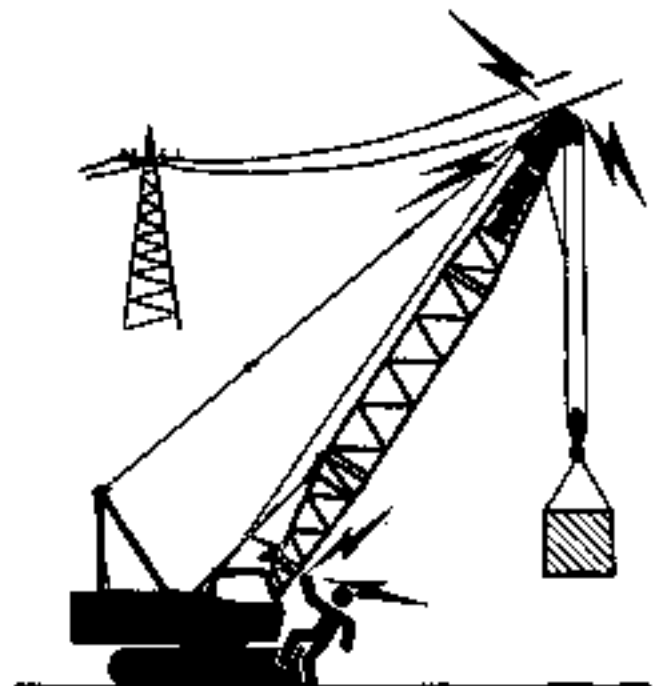
- Begin operation only after coordinating what specific precautions must be taken to insure safety with the nearest electric utility.
- Keep bystanders away from the machine or lifted load.
- Assign a signal person and obey his instructions when operating the machine.
- Operate the machine so that the machine and lifted load do not violate the minimum clearance from the power lines.
- According to number of the insulators used, the power line voltage can be estimated. However, be sure to know the correct voltage through the electric utility.
- Personnel relevant to the job must wear rubber or leather bottom shoes.
- If operation near power lines is unavoidably required, be sure to use proper electrical shock protective equipment. Contact the electric utility for installation and removal of the electrical shock protective equipment.

	Voltage	Safety Distance	Number of Insulators (Reference only)
Low voltage	Up to 6800 V	2 m	1 to 2
Specialty high voltage	22000 V	3 m	2 to 4
	68000 V	4 m	5 to 9
	154000 V	5 m	10 to 20
	275000 V	7 m	18 to 30
	500000 V	11 m	More than 31

#### Measures to take if machine becomes electrified:

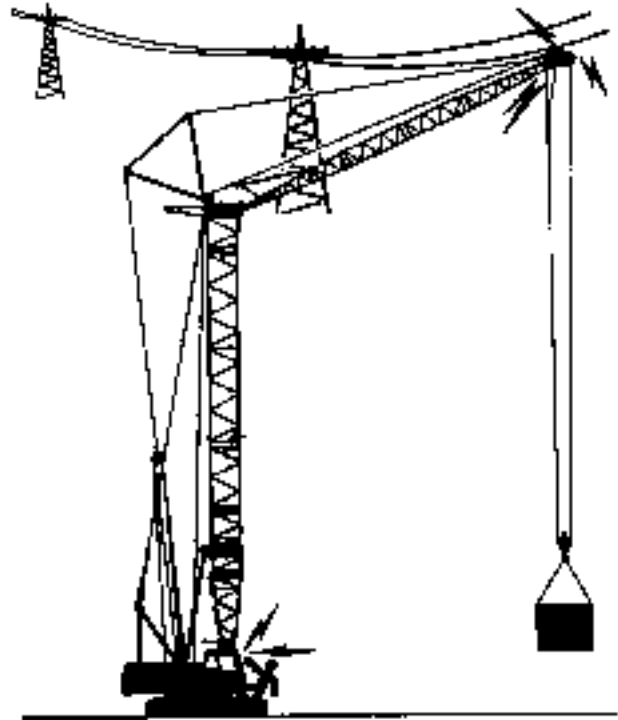
Take the following measures if machine becomes electrified.

- Immediately contact the electric utility to shut down the power supply and obtain instructions from them for emergency measures.
- Operate the machine so that the machine is moved away from the cause of electrification.
- Let the personnel concerned, to evacuate from the vicinity of the machine and keep the electrified machine and/or lifted loads away from the personnel to prevent the occurrence of accidents incident to electrification.
- If anyone becomes electrified, let the person evacuate by one's own effort. Evacuate the electrified person after confirming that the electricity has been completely discharged from the machine.



## 2 SAFETY

- The operator must stay in the operator's cab until the machine is discharged. In case the operator must unavoidably leave the machine, be sure to use a wooden ladder or jump off the machine to a position as far from the machine as possible.
- In case a metal ladder is used, lay a wooden board under the ladder. After descending the ladder, remove hands from the ladder. Then, move on to the ground from the wooden board.
- When attempting to jump off the machine, provide a cushion mat on which the operator can land. Take care not to allow any part of the body to come in contact with the machine when landing.



PC09-02008

### Check the machine after electrification

Check all parts of the machine for any abnormality before operating the machine. Contact your nearest Hitachi dealer for servicing the machine if any abnormality is found.

## 2 SAFETY

### 1.20 Be cautious about electrification induced by high voltage radio waves.

When the machine is operated in the vicinity of a radio or TV transmitting station, the hook and/or wire rope may become electrified, possibly causing co-worker(s) to be electrically shocked, or the safety devices to malfunction. Be sure to ground the hook to discharge electricity before starting slinging work.



BA-172

### 1.21 Stop operation when lightning strikes are expected.

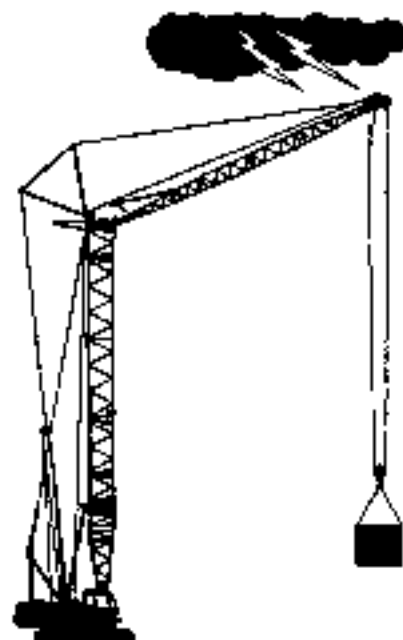
If the machine is struck by lightning, injury or death of the operator or personnel near or around the machine may result. In addition, the machine may become damaged. In the event of an electrical storm, immediately stop operation and lower the lifted load to the ground. Lay the boom or tower (after storing the jib) on the ground. Stop the engine. Evacuate to a safe place as far away from the machine as possible. After the electrical storm has passed, inspect the machine for any abnormalities before returning the machine to service. If any abnormality is found, contact your nearest Hitachi Sumitomo dealer for repair.



BA-173

#### Inspection Points:

- Presence of burnout and/or damage
- Malfunction of electrical parts
- Malfunction of all operation systems



BA-174

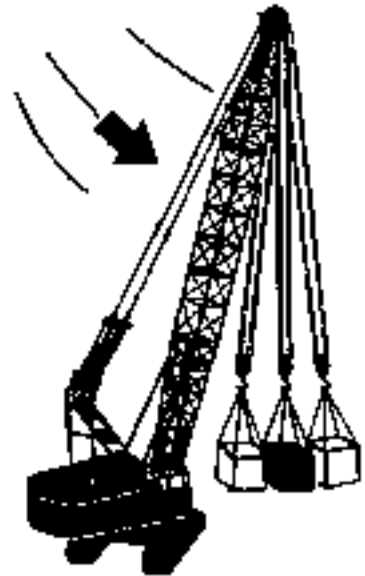
## 2 SAFETY

### 1.22 Precautions for wind.

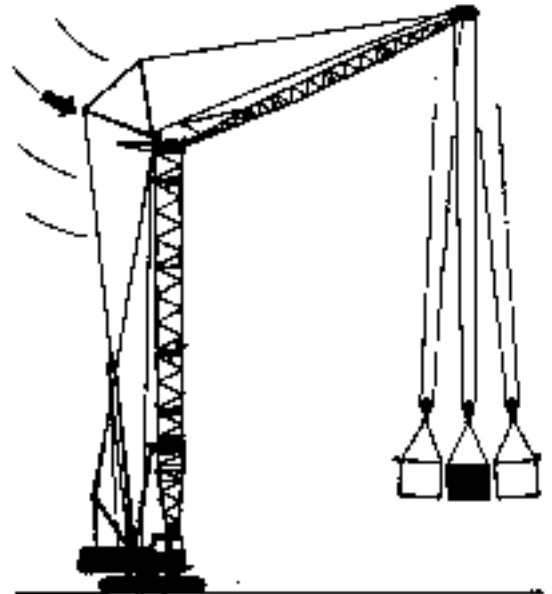
#### Effect of wind

If the machine is operated when a strong wind is blowing, the machine may tip over, possibly resulting in serious injury or death. In case the wind speed exceeds 10 m/s, stop operation. Take necessary measures depending on the wind velocity.

- The longer the tower boom, boom, or jib, the higher the lifted load position, and the wider the lifted load wind receiving area, the greater the effect of wind becomes.
- If strong wind blows from the front of the machine when the tower boom and jib, or the boom is raised to the maximum angle with no load lifting, the wind pressure acting on the tower boom and jib, or the boom may cause the machine to tip over backward.
- Wind power may vary depending on the landform or altitude.



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120742-015

## 2 SAFETY

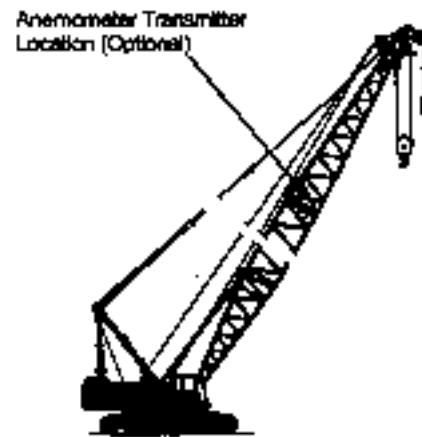
### Estimation of wind velocity

The information described on this page is a guide only to be referred to when using the machine in Japan.

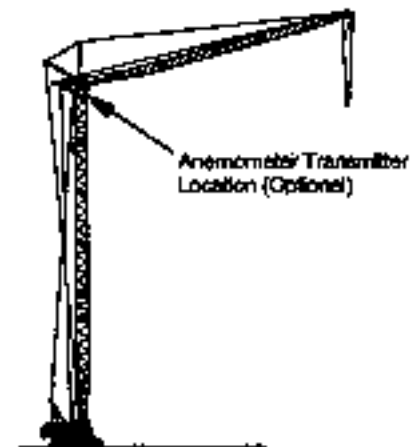
Determine the instantaneous velocity (to be measured at either the tip of the boom or the tip of the tower boom) of wind blowing against the crane in the following method. Measured wind velocity may fluctuate so as to use multiple measuring methods to avoid misjudgment by relying on one method.

The wind velocity described in this section corresponds to the instantaneous wind velocity measured at the tip of the tower boom or the boom. In case no anemometer is provided on the machine, estimate the instantaneous wind velocity by multiplying the coefficient of 1.5 to 1.7 to the value described in the wind velocity conversion table on the next page.

- When the wind velocity is measured with a mean wind speed meter provided at the job site office, convert the measured value to the corresponding mean wind speed at the tip of the tower boom or boom using the wind velocity conversion table. Then, obtain the instantaneous wind velocity by multiplying the coefficient of 1.5 to 1.7 to the mean wind speed value at the tip of the tower boom or boom.
- When using the mean wind speed according to the weather report which is based on the values measured at 10 m above the ground for 10 minutes, obtain the corresponding mean wind speed at the tip of the tower boom or boom referring to the mean wind values of the weather report in the wind velocity conversion table.



WZ14-02-018



WZ14-02-017

### Average Wind Velocity at the Tip of the Boom or Tower Boom

Unit: m/s

Height (m)	Above Sea	Above Level Ground	Above Rural Area	Above Urban Area
10	10.0	10.0	10.0	10.0
15	10.5	10.7	11.1	11.5
20	10.9	11.2	11.9	12.6
25	11.2	11.7	12.6	13.6
30	11.5	12.0	13.2	14.4
40	11.9	12.8	14.1	15.9
50	12.2	13.1	15.0	17.1
75	12.9	14.0	16.5	19.6
100	13.3	14.7	17.8	22.2
125	13.7	15.2	18.8	23.2
150	14.0	15.7	19.7	24.7
200	14.5	16.5	21.1	27.1

NOTE: 1. Wind velocity available from a meteorological agency is the average value measured at 10 m above the ground.

2. Obtain the approximate instantaneous wind velocity of 1.5 to 1.7 times value shown in the above chart.

## 2 SAFETY

### Wind Velocity Reference Guide

The information described on this page is a guideline for machines operated in Japan and shown for your reference only.

Table 1 Expected Wind Speed Changes in Various Surfaces in Relation to Height Change (Expected wind speeds in various heights, supposing wind blows 10 m/s at the height of 10 m)

Surface	Wind Speed (m/s)				
	Height from the ground (m)				
	10	20	30	40	50
Surface of Sea	10	10.7	11.2	11.5	11.8
Flat surface, such as a pastureland	10	11.4	12.1	12.7	13.1
Forests, residential areas, capes or uneven coast lines	10	11.9	13.2	14.1	15.0
Large downtown areas (High rise building districts)	10	14.1	17.3	20.0	22.4

Table 2 Standard Wind Speed, Wind Scale and Phenomena Observed

Wind Speed (m/s)	Name	Scale No.	Description
0 to 0.5	Calm	0	No wind; smoke rises vertically.
0.6 to 1.7	Light air	1	Direction air movement shown by smoke.
1.8 to 3.3	Light breeze	2	Wind felt on face; leaves rustle.
3.4 to 5.2	Gentle breeze	3	Leaves and small twigs in constant motion, flags wave.
5.3 to 7.4	Moderate breeze	4	Raises dust and loose paper.
7.5 to 9.8	Fresh breeze	5	Small trees begin to sway; small waves form on inland waters.
9.9 to 12.4	Strong breeze	6	Large branches in motion; telegraph wires whistle; umbrellas used with difficulty.
12.5 to 15.2	Moderate gale	7	Whole trees in motion; difficulty in walking against wind.
15.3 to 18.2	* Fresh gale	8	Breaks twigs off trees; generally impedes progress.
18.3 to 21.5	* Strong gale	9	Slight structural damage occurs; roof tiles blow off.
21.6 to 25.1	* Storm	10	Trees uprooted; considerable structural damage occurs.
25.2 to 29	* Violent storm	11	Widespread damage occurs.
29.1 or more	Typhoon/Hurricane	12	Widespread devastation occurs.

NOTE: If winds marked with an asterisk (\*) are generated by a tropical cyclon, they may commonly be referred to as "typhoon winds".

## 2 SAFETY

### Measures to be taken when strong wind blows

#### Tower Attachment

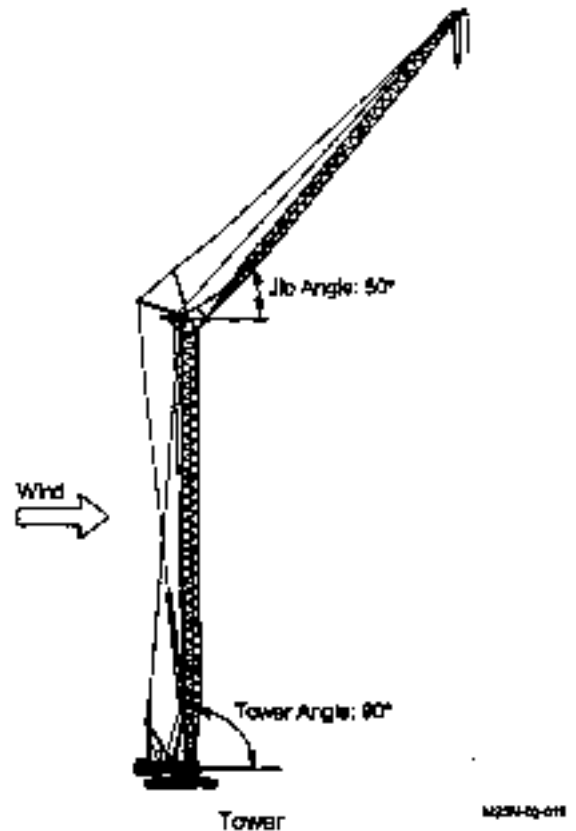
##### When wind velocity is lower than 10m/s:

Carefully operate the machine while taking the effect of wind on the machine into account as mentioned on the previous pages. The wind effect varies depending on conditions such as the boom and lifted load height, the wind blowing direction, the lay of the job site land or altitude. Therefore, stop operating the machine depending on the local working conditions.

##### When wind velocity is between 10 to 15 m/s:

Stop operation and take the following measures.

1. Position the counterweight so that the wind is blowing against the back of the counterweight.
2. Set the tower angle to 90 degrees.
3. Set the jib angle to 50 degrees.
4. Hoist the hook up to the position just before the overhoist prevention system becomes activated.
5. Engage the slewing lock and apply the slewing brake.
6. Return all control levers to neutral.
7. Move the lock lever forward (to the LOCK position).
8. Turn all drum lock switches ON. Turn other switches OFF or to neutral.
9. Stop the engine.



##### When wind velocity is between 15 to 30 m/s:

Stop all operations and take the following measures.

##### In case the tower can be lowered to the ground:

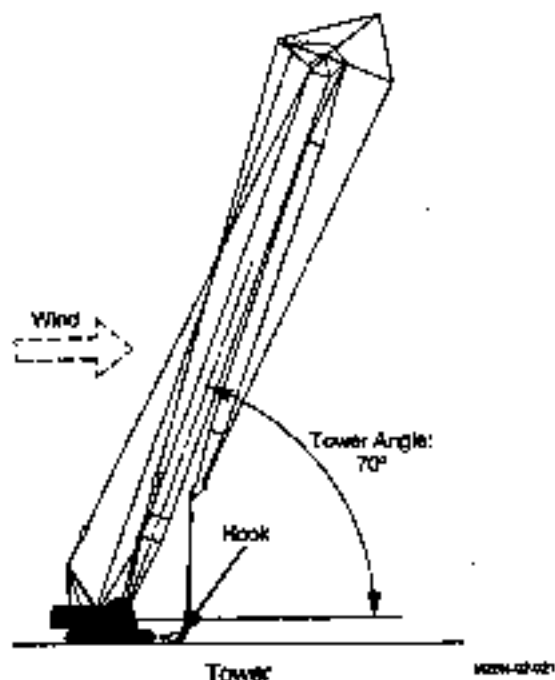
1. Secure the jib to the tower with the jib holder.
2. Lower the hook to the ground.
3. Lower the tower to the ground.
4. Engage the slewing lock and apply the slewing brake.
5. Return all control levers to neutral.
6. Move the lock lever forward (to the LOCK position).
7. Turn all drum lock switches ON. Turn other switches OFF or to neutral.
8. Stop the engine.



## 2 SAFETY

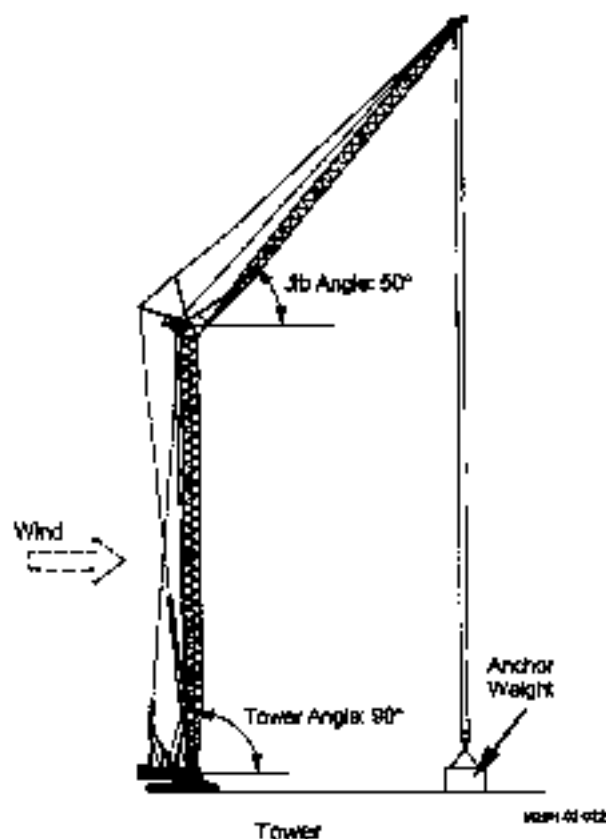
In case laying the tower to the ground is impossible although the jib can be secured to the tower with the tower jib coupler (Emergency measure 1):

1. Position the counterweight so that the wind is blowing against the back of the counterweight as straight as possible.
2. Secure the jib to the tower with the tower jib coupler.
3. Lower the hook to the ground.
4. Set the tower angle to 70 degrees.
5. Engage the slewing lock and apply the slewing brake.
6. Return all control levers to neutral.
7. Move the lock lever forward (to the LOCK position).
8. Turn all drum lock switches ON. Turn other switches OFF or to neutral.
9. Stop the engine.



In case laying the tower to the ground is impossible and the jib cannot be secured to the tower with the tower jib coupler (Emergency measure 2):

1. Position the counterweight so that the wind is blowing against the back of the counterweight as straight as possible.
2. Set the tower angle to 90 degrees.
3. Set the jib angle to 50 degrees.
4. Sling the anchor weight. Attach the hook to the anchor weight sling rope to lighten the hoist wire rope.
  - Refer to the Anchor Weight table on page 2-18 and arrange for the proper anchor weight to be available beforehand.
  - Pay attention not to lift the anchor weight off the ground when tightening the derricking wire rope.
5. Engage the slewing lock and apply the slewing brake.
6. Return all control levers to neutral.
7. Move the lock lever forward (to the LOCK position).
8. Turn all drum lock switches ON. Turn other switches OFF or to neutral.
9. Stop the engine.





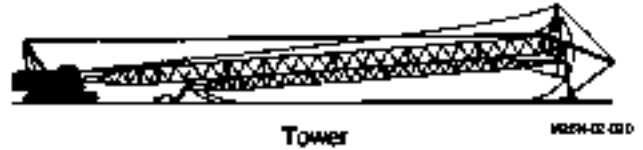
## 2 SAFETY

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### When wind velocity is over 30 m/s (stormy wind):

When the wind velocity is expected to become higher than 30 m/s such as during a storm, take the following measures in advance.

1. Correctly secure the jib to the tower with the tower jib coupler.
2. Lower the hook to the ground.
3. Lay the tower on the ground.
4. Engage the slewing lock and apply the slewing brake.
5. Return all control levers to neutral.
6. Move the lock lever forward (to the LOCK position).
7. Turn all drum lock switches ON. Turn other switches OFF or to neutral.
8. Stop the engine.



## 2 SAFETY

### Precautions for Wind

#### Crane Attachment

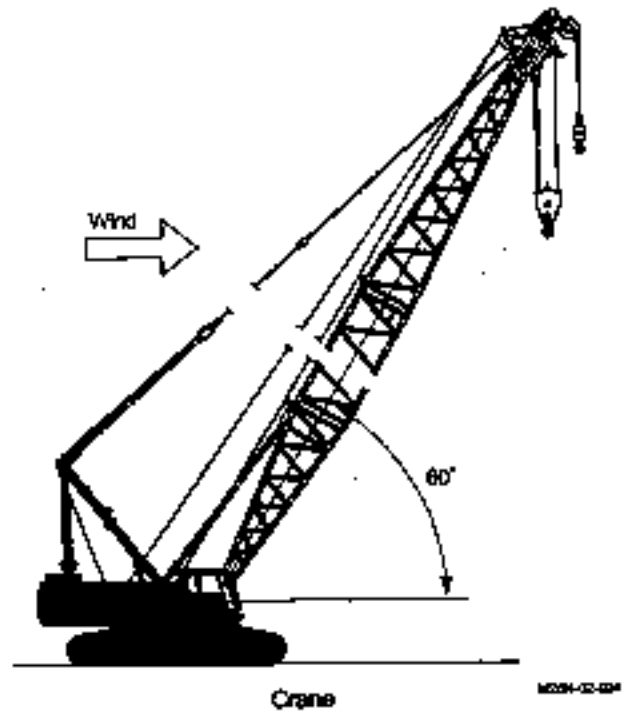
##### When wind velocity is lower than 10m/s:

Carefully operate the machine while taking the effect of wind on the machine into account as mentioned on the previous page. The wind effect varies depending on conditions such as the boom and lifted load height, the wind blowing direction, the lay of the job site land or altitude. Therefore, stop operating the machine depending on the local working conditions.

##### When wind velocity is between 10 to 15 m/s:

Stop operation and take the following measures.

1. Position the counterweight so that the wind is blowing against the back of the counterweight.
2. Set the boom angle to 60 degrees.
3. Hoist the hook up to the position just before the overhoist prevention system is activated.
4. Engage the slewing lock and apply the slewing brake.
5. Return all control levers to neutral.
6. Move the lock lever forward (to the LOCK position).
7. Turn all drum lock switches ON. Turn other switches OFF or to neutral.
8. Stop the engine.

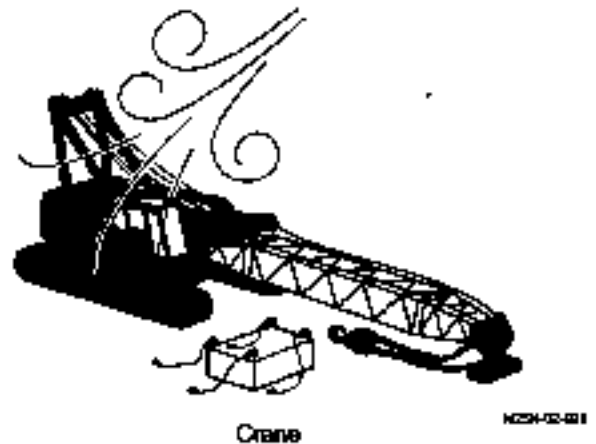


##### When wind velocity is between 15 to 30 m/s:

Stop operation and take the following measures.

In case the boom can be lowered to the ground:

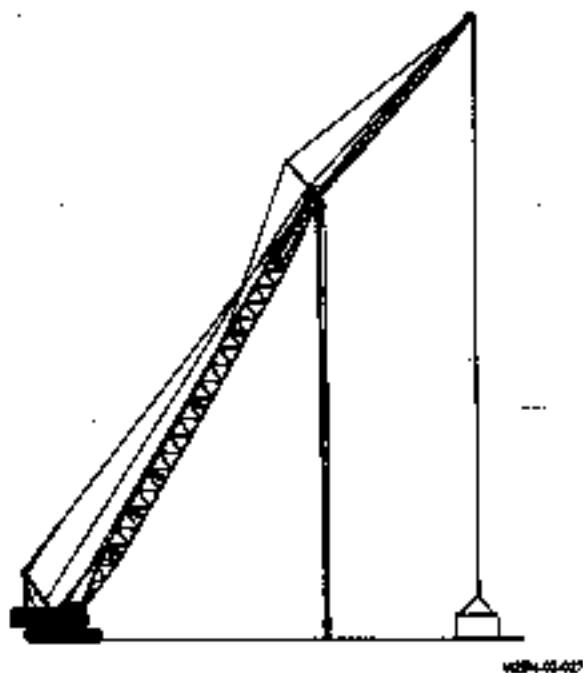
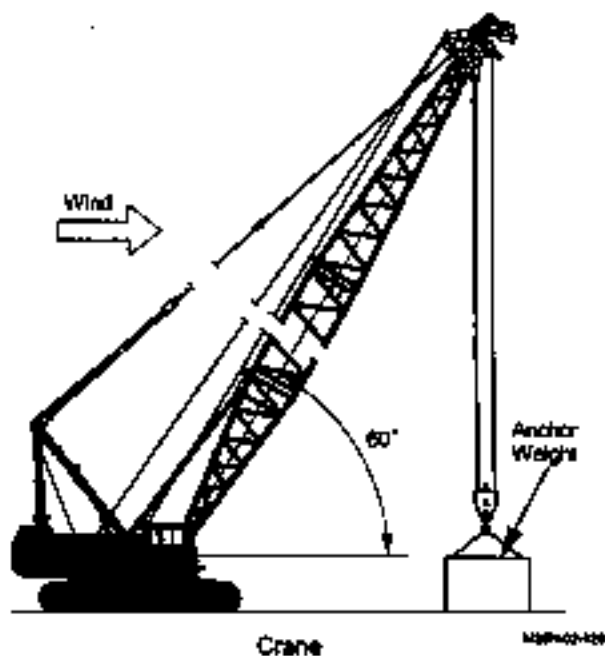
1. Lower the hook to the ground.
2. Lay the boom on the ground.
3. Engage the slewing lock and apply the slewing brake.
4. Return all control levers to neutral.
5. Move the lock lever forward (to the LOCK position).
6. Turn all drum lock switches ON. Turn other switches OFF or to neutral.
7. Stop the engine.



## 2 SAFETY

### In case laying the boom on the ground is impossible (Emergency measure):

1. Position the counterweight so that the wind is blowing against the back of the counterweight.
2. Set the boom angle to 60 degrees.
3. Sling the anchor weight. Attach the hook to the anchor weight sling rope to tighten the hoist wire rope.
  - Refer to the Anchor Weight table on page 2-19 and arrange the proper anchor weight beforehand.
  - Pay attention not to lift the anchor weight off the ground when lightening the derricking wire rope.
4. Engage the slewing lock and apply the slewing brake.
5. Return all control levers to neutral.
6. Move the lock lever forward (to the LOCK position).
7. Turn all drum lock switches ON, Turn other switches OFF or to neutral.
8. Stop the engine.



## 2 SAFETY

### When wind velocity is over 30 m/s (stormy wind):

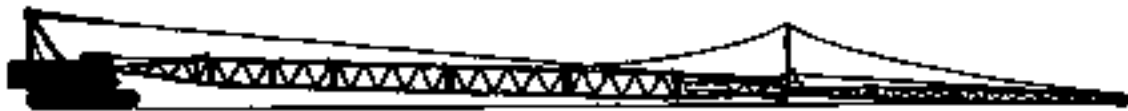
When the wind velocity is expected to become higher than 30 m/s such as during a storm, take the following measures in advance.

1. Lower the hook to the ground.
2. Lay the boom on the ground.
3. Engage the slewing lock and apply the slewing brake.
4. Return all control levers to neutral.
5. Move the pilot control shut-off lever forward (to the LOCK position).
6. Turn all drum lock switches ON. Turn other switches OFF or to neutral.
7. Stop the engine.



Crane

M234-02-025



M234-02-025

**Anchor Weight Table**

Model	Anchor Weight	
	Tower Specification Machine	Crane Specification Machine
35 t Class	—	1 t or more
40 t Class	—	1 t or more
50 t Class	5 t or more	1 t or more
55 t Class	—	1 t or more
65 t Class	7 t or more	2 t or more
80 t Class	7 t or more	2 t or more
90 t Class	7 t or more	2 t or more
100 t Class	10 t or more	2 t or more
120 t Class	10 t or more	2 t or more
150 t Class	10 t or more	3 t or more

Model	Anchor Weight		
	Tower Specification Machine		Crane Specification Machine
	When the tower and jib can be lowered to the ground.	When the tower cannot be lowered to the ground.	
250 t Class	8 t or more	15 t or more	3 t or more
350 t Class	10 t or more	10 t or more	3 t or more
500 t Class	6 t or more	17 t or more	6 t or more
650 t Class	6 t or more	15 t or more	7 t or more
800 t Class	8 t or more	24 t or more	6 t or more

### Measures to be taken after wind calms

Check all parts of the machine for any abnormality before operating the machine. Repair the machine if any abnormality is found.

## 2 SAFETY

### 1.23 Precautions for Earthquakes.

The information described on this page is usually used in Japan as a guideline.

According to past experience, earthquakes up to scale 4 usually will not cause severe disasters. However, no one can predict when and what scale of earthquake will happen. Always take the following safety measures to prepare for earthquakes.

- Conduct a work site geological survey beforehand. If the work site is considered to be unsafe should a large scale earthquake arise, protect and/or cure the ground condition.
- After a heavy rain fall, the ground will become unstable. Take any additional preventive measures as necessary.
- Prepare a level ground for setting up the machine. Reinforce the ground if the bearing capacity of soil is not strong enough to support the machine weight. Lay steel plates or planks on the machine moving area to ensure safer travel operation.
- If earthquake warning declaration or advisory is issued, take appropriate safety measures, such as laying the boom on the ground. It is recommended to make it a rule to lay the boom on the ground after completing the daily-work shift.

### Earthquake Intensity Scale

Intensity Scale		Acceleration (cm/s <sup>2</sup> )	Description
Scale	Designation		
1	Slight	0.8 to 2.5	Felt by people who are still or very sensitive.
2	Weak	2.5 to 8	Many people can feel. Partitions may slightly rattle.
3	Rather Strong	8 to 25	Houses shake, partitions rattling. Also, water in a washbasin ripples.
4	Strong	25 to 80	Houses shake violently. Unstable furniture falls. Also, people who are walking can feel.
5	Very Strong	80 to 250	Wall cracks. Tall structures may fall.
6	Disastrous	250 to 400	Many houses (less than 30 % of all houses) collapse. Landslides and cracks in the ground. Many people cannot stand.
7	Ruinous	Larger than 400	Many houses (more than 30 % of all houses) collapse. Landslides and cracks in the ground, and dislocations.

## 2 SAFETY

### 1.24 Precautions for Stopping Operation of Machine.

If the machine is not parked correctly after stopping operation of the machine, an unexpected accident may arise. When leaving the machine after completing work, take the following measures.

- Park the machine on solid and level ground.

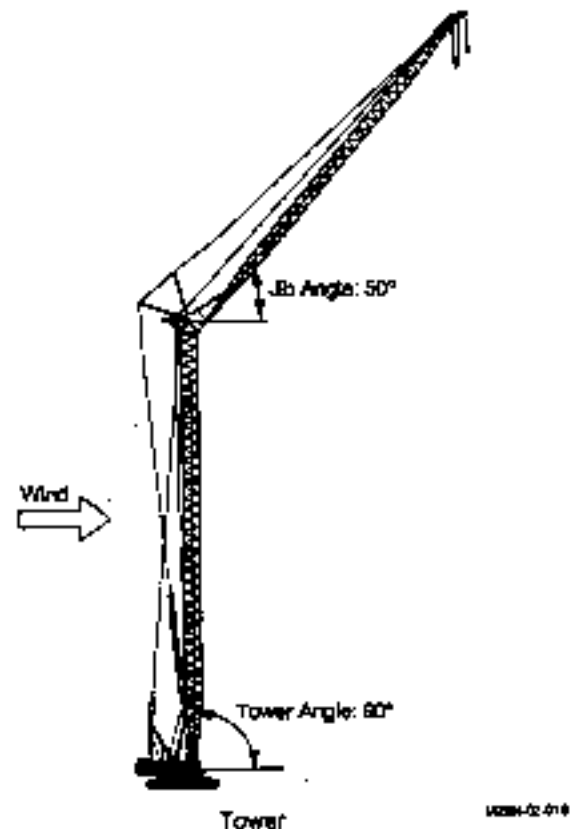
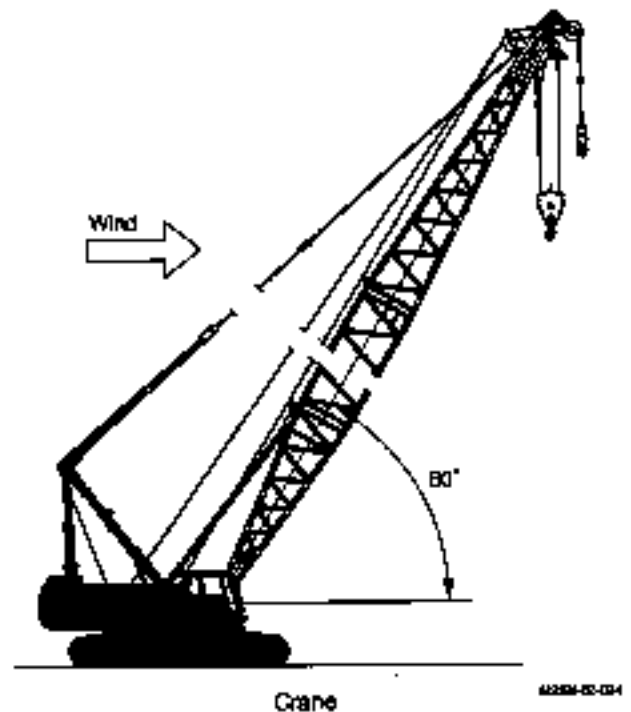
#### Machines with Tower Front Attachment

- Set the tower angle to  $90^\circ$ .
- Set the jib angle to  $50^\circ$ .
- Hoist the hook up to the position just before the overholst prevention device becomes activated.
- Move the pilot control shut-off lever forward (to the LOCK position).
- Apply all brakes and engage all locks. Return all control levers to neutral.
- Remove the engine key.
- Lock all doors and covers.

#### Machines with Crane Front Attachment

- Set the boom angle to  $60^\circ$ .
- Hoist the hook up to the position just before the overholst prevention device becomes activated.
- Move the pilot control shut-off lever forward (to the LOCK position).
- Apply all brakes and engage all locks. Return all control levers to neutral.
- Remove the engine key.
- Lock all doors and covers.

When it is anticipated that strong wind will blow during storage of the machine, take the necessary measures beforehand as described in group 1.22 Precautions for Wind depending on the anticipated instantaneous wind velocity.



## 2 SAFETY

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### 1.25 Precaution for swollen river and/or high tide in beach.

In case the machine is operated on river bed or near a beach, the machine may unexpectedly be submerged. Pay attention to sudden increases in water level.

### 1.26 Precautions for optionally and/or specially designed equipment.

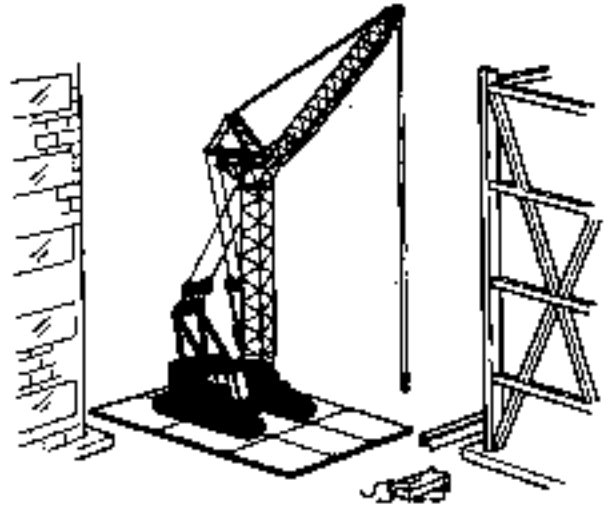
Among the optionally and/or specially designed equipment by Hitachi Sumitomo Heavy Industries Construction Crane Co., Ltd (HSC), some supply secondary operation manuals prepared by each professional manufacturer other than this manual. Thoroughly read and understand such manuals before operating the corresponding equipment. Failure to do so may result in an unexpected accident. Installation or use of specially designed equipment, which is not authorized by HSC, may introduce an unexpected accident. In case any specially designed equipment is required to be installed, contact your nearest Hitachi dealer beforehand. Hitachi product warranty is waived from the machine failures or personal accidents caused by installing or using any specially designed equipment without first requesting and receiving authorization by HSC.

## 2 SAFETY

### 2 PREPARATIONS FOR SAFETY OPERATION

#### 2.1 Ensure Safety Job Site.

Unless job site safety is ensured, personal accidents may result. Inspect the job site as to the layout of the land and geological conditions, location of machine operation, layout of traveling passages, whether any obstructions or obstacles are present or not, weight of loads to be lifted, and crane performance before operation. Then, employ the best operation method to ensure safety. In case operation is required to be made on a public road, appoint the signal person and set up barriers to ensure safety of other traffic.



#### 2.2 Check machine before operation.

##### Inspect all machine parts

Neglecting machine daily check prior to operation may result in an unexpected accident. Be sure to check all parts of the machine and repair any abnormality if found.

- Safety devices: Rated capacity limiter, hook hoisting limiter, tower and boom derricking limiter, secondary tower and boom derricking limiter, all alarm buzzers, and all the different kinds of locks
- Operation controls: Control levers, pedals, and all different kinds of switches
- Brake devices: Drum brakes, and slewing brakes
- Wire rope: Hook hoist ropes, boom derricking ropes, pendant ropes, and rope joint parts
- Lifting tools: Hooks
- Slings tools: Sling ropes, lifting chains, and shackles



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## 2 SAFETY

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### **Keep the vicinity around operator's hands and feet, and passages clean and in good order**

If the handrails, steps, levers, pedals, floors, and/or passages become contaminated with foreign matter such as oil, mud, water, and/or snow, or if parts and/or tools are scattered at random on the machine, sliding or stumbling, and falling off the machine may result. Completely remove the adhered foreign matter such as oil from the machine. Do not use the footings and/or passages as a storing place of parts and/or tools.



34-01

### **Clean the vicinity around the engine**

Accumulation of dead leaves and/or paper dirt, or oily spots around the engine may cause fires. Be sure to remove these fire hazards before operation.

### **Ensure visibility**

Poor visibility may disturb safe operation, possibly creating an unexpected accident. Always keep the windowpanes, lights, and mirrors clean. Adjust the mirror to the correct position and check that the head lights, and work lights operate correctly to ensure good visibility. Repair the damaged or abnormal equipment if any.

### **Clean caution plates**

If any caution plate affixed on the machine is difficult for the operator or the co-workers to read, the precautions described on it may not be properly understood, possibly creating a hazardous situation. Keep all caution plates clean. In case any caution plates become missing or damaged, install an identical new one in the same location.

## 2 SAFETY

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### 2.3 Adjust operator's seat position.

If the operator's seat is not adjusted in the correct position, unexpected accidents may result due to mis-operation. Adjust the operator's seat position so that all pedals and levers can be correctly operated.



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### 2.4 Ensure Safety Before Starting Engine.

Starting the engine without checking the position of the control levers and pedals, or safety around the machine may introduce personal injury and/or death. Before starting the engine, check the following points, and sound the horn to alert the personnel around the machine.

- ◆ Positions of the control levers, pedals, and switches
- ◆ Presence of any obstructions or personnel inside, outside, or under the machine
- ◆ Presence of any parts kept removed from the machine
- ◆ Attachment of a "Do not Operate" tag or notification

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### 2.5 Perform Warm Up Operation.

Neglecting warm up operation may reduce operational output, shorten the service life, or cause any number of malfunctions of the machine, possibly resulting in an unexpected accident. Be sure to perform warm up operation until the engine and hydraulic oil temperature sufficiently increases.

## 2 SAFETY

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### 2.6 Check after starting engine.

Neglecting machine check after starting the engine may delay detection of any failure in instruments, components and/or devices, possibly resulting in an unexpected accident. After starting the engine, check that all monitor panels and instruments display correctly. After performing warm up operation, check the safety around the machine. Then, operate the machine with no loads to check that all controls and safety devices operate correctly. If any abnormality is found, immediately repair it.

- Check the machine in a wide and safe place with no bystanders or obstructions being present.
- 

### 2.7 Do not deactivate safety device functions.

If the machine is operated with the safety device functions deactivated, personnel injury and/or death may result. Be sure to operate the machine with all safety devices such as the overload prevention device, and overhoist prevention device activated correctly. If any abnormality is found in a safety device, immediately repair it.

- Safety Devices: Over load prevention device, Hook overhoist prevention device, Tower or boom overhoist prevention device, Secondary tower or boom overhoist prevention device, Alarm buzzers, various kinds of locks, etc.

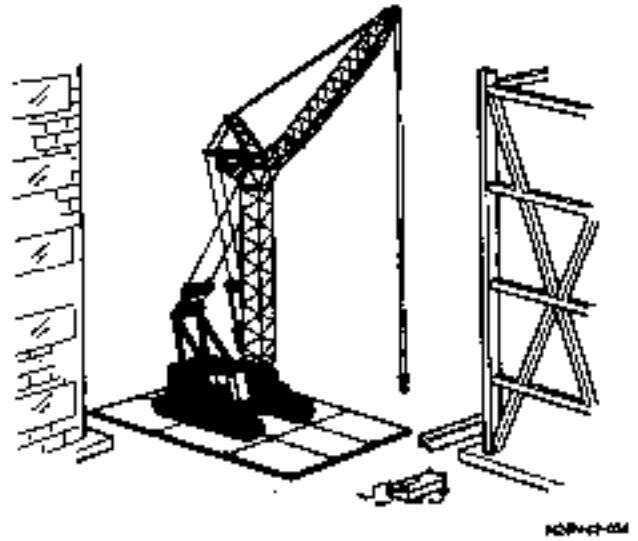
Refer to "Safety Devices" in Section 3 for the information on respective safety device.

## 2 SAFETY

### 3 PRECAUTIONS FOR OPERATION

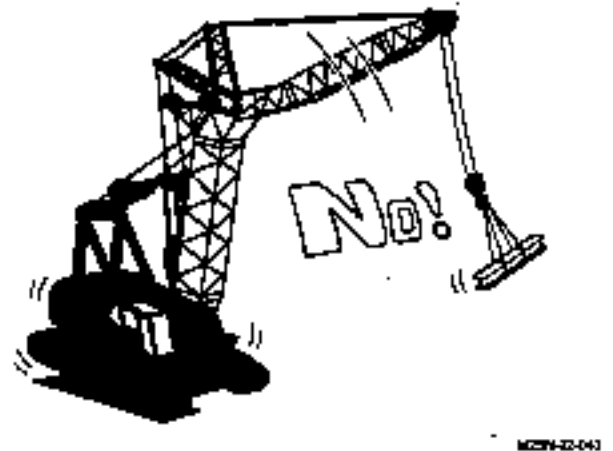
#### 3.1 Investigate Job Site Conditions.

Operating the machine without paying attention to the circumstances surrounding the machine may cause an unexpected accident. Before operating the machine, check the machine operating position, passage locations, presence of obstructions, and other machine locations in the job site. Always beware of changes in the circumstance surrounding the machine during operation.



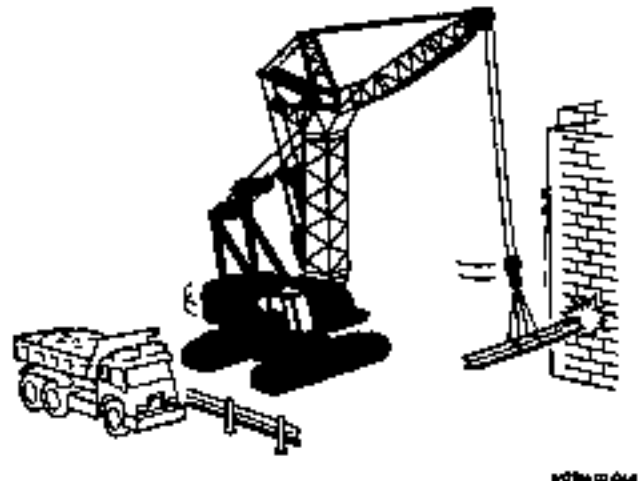
#### 3.2 Avoid abrupt operation.

Abrupt operation may cause the machine and/or lifted load to become unstable, possibly resulting in tipping over of the machine. Avoid abrupt operations such as sudden start, stop, or acceleration of actuators.



#### 3.3 Avoid diffusive operation.

Diffusive operation may create a hazardous condition. Do not look away from the signal person's instructions and/or the lifted load during operation.



## 2 SAFETY

### 3.4 Never attempt to leave operator's seat.

Do not leave the operator's seat without lowering the lifted load to the ground and stopping the engine. Failure to do so may create a hazardous situation. Always take the following measures before leaving the operator's seat.

1. Lower the lifted load to the ground.
2. Return all control levers to neutral.
3. Apply all brakes and engage all locks.
4. Move the lock lever forward (to the LOCK position).
5. Engage the drum lock, and turn all switches OFF or place them in the neutral position.
6. Stop the engine and remove the key.
7. Lock the cab door.



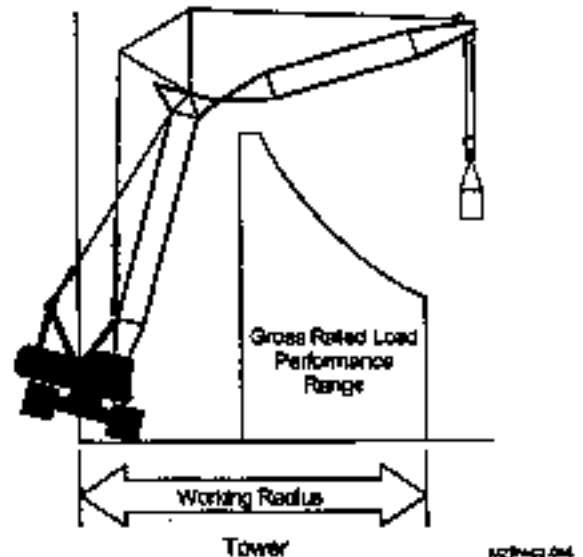
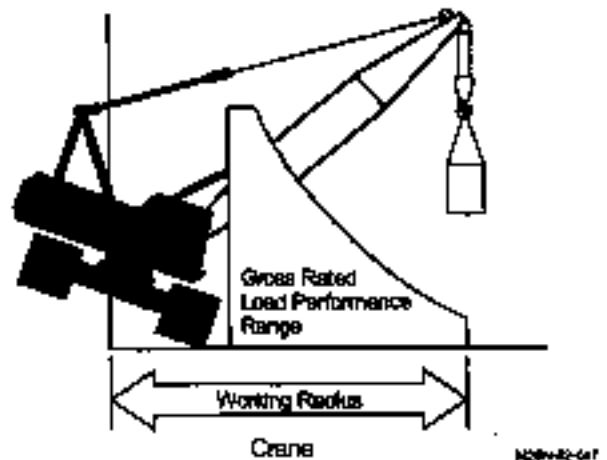
### 3.5 Operate machine within working range shown in gross rated load table.

#### Crane specification machines:

If the machine is operated outside the working range relative to the installed boom length, the machine output performance will exceed the allowable specification, tipping over of the machine or damage to the machine may result, introducing personal injury and/or death. Always check the boom length, working radius, and lifting load value while referring to the gross rated load table, and be sure to operate the machine within the specifications shown in the gross rated load table.

#### Tower specification machines:

If the machine is operated outside the working range relative to the installed jib length, the machine output performance will exceed the allowable specification, tipping over of the machine or damage of the machine may result, introducing personal injury and/or death. Always check the tower height, jib length, tower angle, working radius, and lifting load value while referring to the gross rated load table, and be sure to operate the machine within the specifications shown in the gross rated load table.



## 2 SAFETY

### 3.6 Prevent boom and jib from coming in contact with lifted load.

If the tower boom, crane boom, or jib come in contact with the lifted load, falling of the lifted load or damage to the tower or jib may result, possibly causing unexpected personal injury or death. Be cautious not to allow the tower boom, crane boom, or jib to come in contact with the lifted load. In case the tower boom, crane boom, or jib is damaged due to contact with the lifted load, immediately stop operation. Lower the lifted load to the ground. Contact your nearest Hitachi Sumitomo dealer for repair of the damaged part.

#### Tower specification machine:

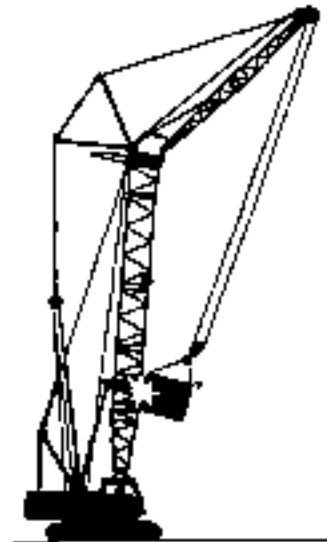
- After retracting the jib, lower the damaged tower to the ground while holding the tower with an assistant crane.

#### Crane specification machine:

- Lower the damaged boom to the ground with an assistant crane.



SA-428



SA-508

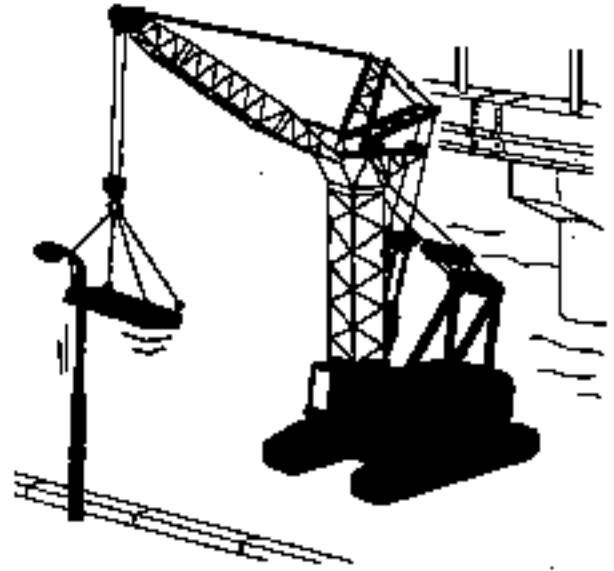
### 3.7 Precautions necessary to be taken when engine stalls.

If the engine stalls during operation, the lifted load may fall, possibly resulting in personal injury or death. If the engine stalls, immediately apply the drum brake and return the drum control lever to neutral.

## 2 SAFETY

### 3.8 Keep away from obstructions.

If the machine and/or lifted load come in contact with an obstruction, personal injury or death may result due to breakage of the machine and/or the obstruction, or falling of the lifted load. Be alert for obstructions in the surroundings or overhead of the machine. In case wire rope or the lifted load becomes entangled with an obstruction, unfasten the entangled wire rope or lifted load from the obstruction without forcibly hoisting the lifted load.



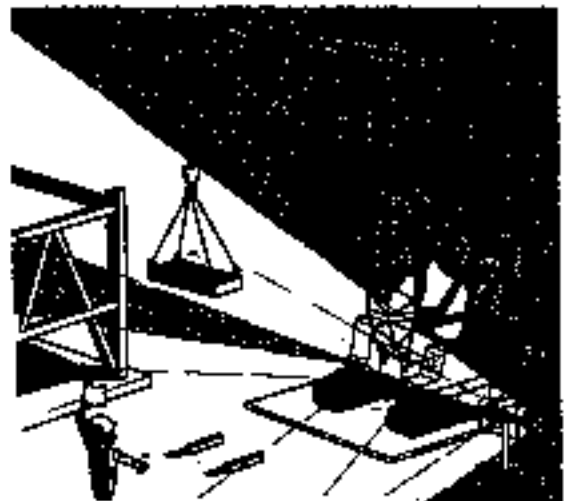
40204-02-01

### 3.9 Pay attention to any abnormality in machine operational condition.

If the machine is kept operated under any abnormal operational condition, an unexpected accident may result. If any abnormality in sound, vibration, smell, and/or indication/display of the instruments, or leakage of fuel, oil, and/or water is found, immediately stop operation of the machine. After parking the machine in a safety place, check and repair the cause of the problem.

### 3.10 Keep good visibility.

If the machine is operated with poor visibility, sufficient recognition of footings, people and obstructions nearby the machine may be difficult, possibly resulting in personal injury or death. When operating the machine in a dark place, turn the head lights and work lights ON. Use additional illumination as needed so that the machine and the overall operation in the job site can be clearly viewed. In case visibility is poor due to rain, snow, or fog, stop operation until good visibility is resumed.



40204-02-02

## 2 SAFETY

### 3.11 Precautions for operation in cold weather season.

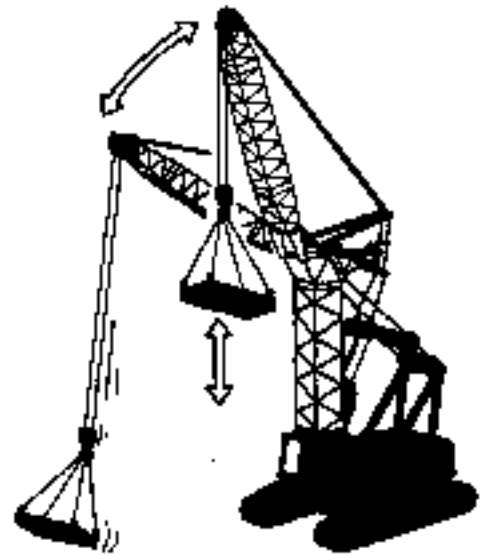
During cold weather season, perform sufficient warm up operation to prevent the lifted load from falling, or the machine collision during travel operation due to malfunctions of the machine systems. Then, obey the following instructions:

- Check that the safety devices, drums, and brakes function normally. Remove snow, then defrost or dry as needed.
- Before beginning regular operation, slowly operate the machine under a light duty conditions until lubricants are sufficiently circulated.
- After operation is finished, take necessary measure so that the crawlers and/or the lifted load do not freeze to the ground, or mud does not freeze the tracks.

### 3.12 Perform combined operations carefully.

Sway of the lifted load due to sudden changes in speed or mis-operation in combined operations may result in personal injury or death. Be sure to smoothly operate the machine and avoid sudden changes in speed. Do not attempt to perform combined operation before becoming accustomed to operation of the machine.

- Some combined operation speeds may become slower than the speed of each actuator single operation. When changing operation mode from combine operation to single operation, some operation speeds may become faster.



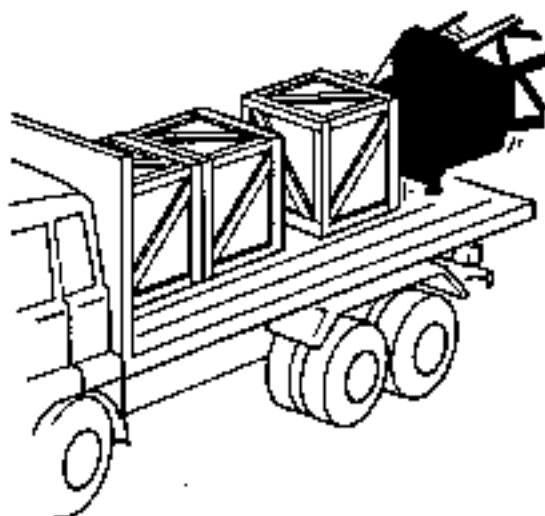
MC04-03-000



## 2 SAFETY

### 3.13 Do not use boom in push/pull-practices.

Pull/push-practices with the boom may cause the boom to become damaged, possibly resulting in personal injury or death. Whenever moving a heavy load, use a crane or hoist such as a fork lift. Never attempt to use the boom in applications other than those of crane front attachment.



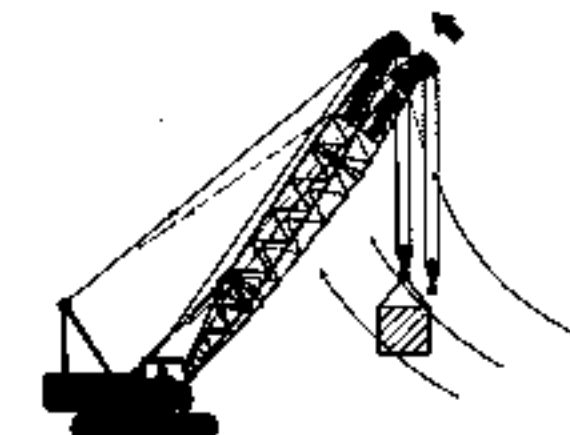
Crane

17284-02-007

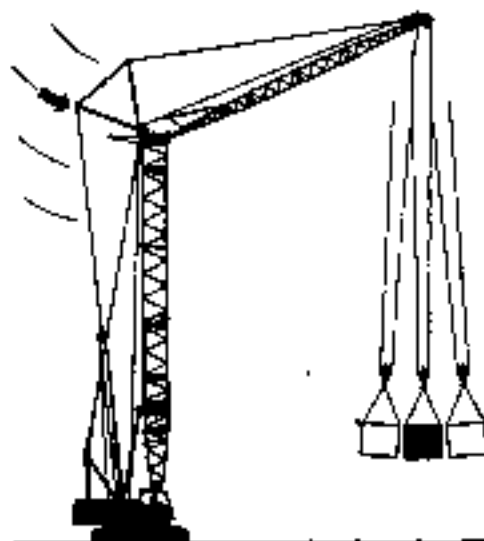
### 3.14 Do not rely only to safety devices.

This machine is equipped with safety devices such as the rated capacity limiter, boom derricking limiter, and hook hoisting limiter. However, these devices cannot discover malfunctions due to faulty assembly or adjustment, predict the collapse of the ground on which the machine is standing, or compensate for the effect of wind. Be noted that the ability of safety devices is not almighty. Thoroughly read and understand this Operator's Manual before operating the machine to prevent accidents from occurring in advance.

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## 2 SAFETY

### 3.15 Precautions for travel operation.

#### Ensure safety in surroundings

Pay attention to safety in the vicinity of the machine while travelling.

- Confirm the operation direction of the travel lever in relation to the machine travel direction before operating the travel lever.
- Do not approach precipices or weak road shoulders. If collapsed, tipping over of the machine may result.

#### Check the position of the base carrier in relation to the operator's position

If the machine is driven without checking which direction the base carrier is positioned, the machine may be driven in an unexpected direction, possibly resulting in personal injury or death. Be sure to check the position of the base carrier in relation to the operator's position.

- If the travel motors are located in front of the cab, the machine will move in reverse direction when travel levers are operated to the front.
- Normally, drive the machine with the travel motors located at the rear.

#### Precautions for the boom angle and hook position

If the machine is driven with the boom held in an excessively small or excessively large angle, or with the hook held at a low position, the boom may be damaged, or the boom and the hook may be moved severely by accelerated reaction force of impact loads in travel operation, possibly resulting in personal injury or death. Be sure to raise the boom to about  $60^\circ$  and hoist the hook up to a position close to the hook hoisting limiter before travelling the machine.



BA-207



MG24-02-099



Crane

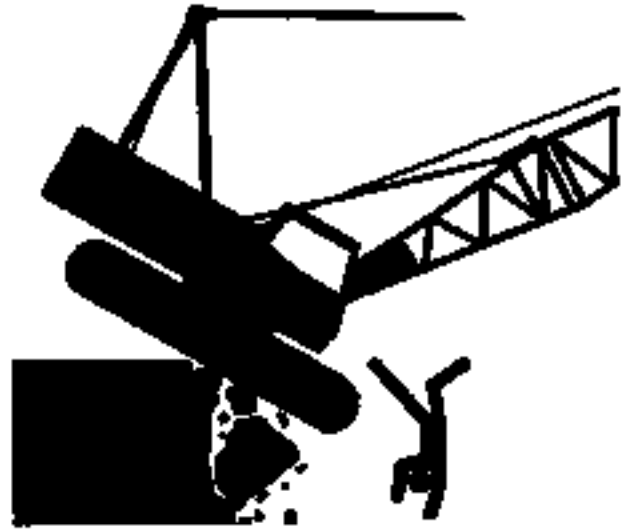
MG24-02-099

## 2 SAFETY

### Be cautious about ground conditions

If the machine is driven without paying attention to the ground conditions, the machine may tip over or fall, possibly resulting in serious injury or death due to hard contact or crushing. Always be cautious about the ground conditions while traveling. Observe the following points.

- Keep away from the edge of precipices or soft shoulder of roads.
- Select a flat ground surface for driving the machine.
- Investigate the ground strength. If the ground strength is insufficient to support the machine, reinforce the ground by laying steel plates having the necessary area and strength.
- When traveling the machine on slippery ground surfaces due to snow or freeze, take proper anti-slip measures.



M2014-07-001

### Precautions for crossing river

Crossing a river without paying attention may cause the machine to become immersed or tip over, possibly resulting in personal injury or death. When crossing a river is unavoidable, drive the machine carefully after checking the river bottom, water flow strength, and the depth of water.

- Do not allow the machine to enter water deeper than the lower face of the main frame.

## 2 SAFETY

### Precautions for traveling on slopes

#### (1) Crane Attachment: Using the crane exclusive boom

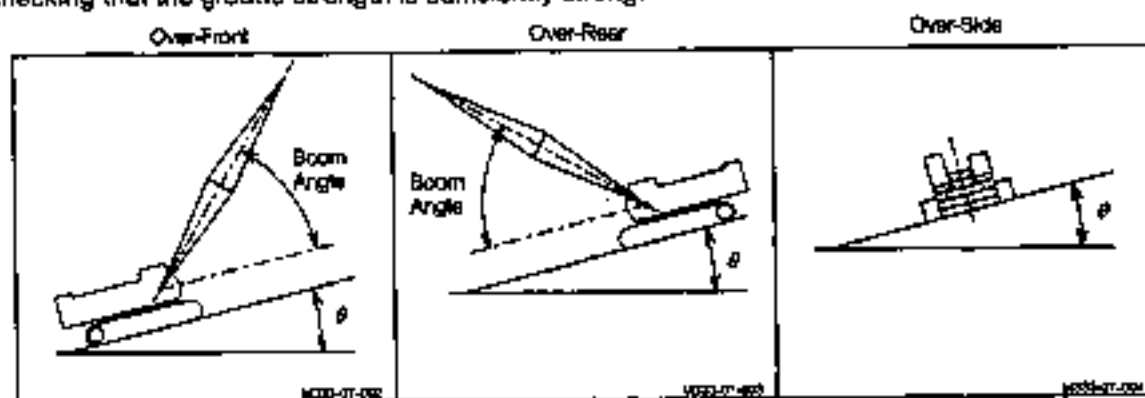


#### CAUTION

Do not travel the machine in the ranges shown with mark "X" in the table below. Failure to do so may cause the machine to tip over.

Use care about the following points when traveling the machine.

- Never attempt to travel with a load suspended.
- Slowly and carefully travel the machine.
- Travel the machine on a solid level surface.
- When traveling on slopes is unavoidable, allow the machine to travel within the angles shown in the tables below after checking that the ground strength is sufficiently strong.



Allowable Inclination of machine for traveling (with 7.5 m Top boom)

(Unit: Degree)

Status	Without short jib											
	Over-Front				Over-Rear				Over-Side			
	Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
Position Boom Length (m)	30	40	50	60	30	40	50	60	30	40	50	60
15	7	6	5	5	12	12	11	10	13	12	12	12
18	7	6	6	6	13	12	11	10	13	12	12	11
21	8	7	6	5	13	12	11	10	12	12	11	11
24	9	8	6	5	13	12	11	10	12	11	11	11
27	9	8	7	6	14	12	11	10	12	11	11	10
30	10	9	7	6	14	13	11	10	11	11	10	10
33	11	9	6	6	13	12	11	10	11	10	10	9
36	11	10	6	6	11	11	11	10	11	10	9	9
39	12	10	8	7	10	10	10	10	10	10	9	8
42	12	10	8	7	9	9	10	10	10	9	9	8
45	12	11	9	7	8	8	9	9	10	9	8	8
48	11	10	9	7	7	7	8	8	10	9	8	7
51	8	9	9	7	6	8	7	8	8	8	8	7
54	8	8	9	7	4	5	8	7	9	8	7	7
57	7	7	8	7	2	4	5	6	9	8	7	6
60	6	8	7	7	1	3	4	5	8	7	7	6
63	4	5	8	7	0	2	3	5	8	7	6	6
66	3	4	5	7	X	1	2	4	8	7	6	5
69	X	3	4	6	X	X	1	3	X	7	6	5
72	X	X	3	5	X	X	1	3	X	X	5	5
75	X	X	3	4	X	X	0	2	X	X	5	4

## 2 SAFETY

**Allowable Inclination of machine for traveling when equipped with main boom and short jib (Unit: Degree)**

Status Position Boom Length (m)	With Aux. short jib											
	Over-Front				Over-Rear				Over-Side			
	Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
	30	40	60	80	30	40	50	60	30	40	50	60
15	7	8	6	5	12	12	11	10	13	12	12	12
18	8	7	6	5	13	12	11	10	13	12	12	11
21	8	7	6	5	13	12	11	10	12	12	11	11
24	9	8	7	5	13	12	11	10	12	11	11	10
27	10	8	7	6	14	13	11	10	12	11	10	10
30	10	9	7	6	13	13	11	10	11	11	10	9
33	11	9	8	8	12	12	12	10	11	10	9	9
38	11	10	8	8	11	11	11	10	11	10	9	9
39	12	10	8	7	10	10	10	10	10	9	9	8
42	12	11	9	7	8	9	8	10	10	9	8	8
45	11	11	9	7	7	7	8	9	10	9	8	7
48	10	10	8	7	6	6	7	8	9	8	8	7
51	8	9	9	7	4	5	6	7	9	8	7	7
54	7	7	8	7	3	4	5	6	9	8	7	6
67	8	8	7	7	2	3	4	5	8	7	7	6
80	5	5	6	7	0	2	3	5	8	7	8	6
63	3	4	5	7	X	1	2	4	8	7	6	5
66	X	3	5	8	X	0	2	3	X	7	6	6
69	X	X	4	5	X	X	1	3	X	X	5	5

**10 m Fly Jib installed at 10°**

Fly Jib Length	10 m											
Off-set Angle	10°											
Position Boom Length (m)	Over-Front				Over-Rear				Over-Side			
	Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
	30	40	50	60	30	40	50	60	30	40	50	60
39	12	11	9	7	6	8	9	9	10	9	8	8
42	11	11	9	7	7	7	8	9	10	9	8	7
45	9	9	9	7	5	6	7	8	9	8	8	7
48	8	8	9	7	4	5	6	7	9	8	7	7
51	7	7	8	7	3	4	5	6	9	8	7	6
54	5	6	7	7	1	2	4	5	8	7	7	6
57	4	5	6	7	0	1	3	5	8	7	6	6
60	3	4	5	7	X	0	2	4	8	7	6	5
63	X	3	4	6	X	X	1	3	X	6	6	5

**10 m Fly Jib installed at 30°**

Fly Jib Length	10 m											
Off-set Angle	30°											
Position Boom Length (m)	Over-Front				Over-Rear				Over-Side			
	Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
	30	40	50	60	30	40	50	60	30	40	50	60
39	12	11	9	7	8	8	9	9	10	9	8	8
42	11	11	9	7	7	7	8	9	10	9	8	7
45	9	9	9	7	5	6	7	8	9	8	8	7
48	8	8	9	7	4	5	6	7	9	8	7	7
51	7	7	8	7	3	4	5	6	9	8	7	6
54	5	6	7	7	1	2	4	5	8	7	7	6
57	4	5	6	7	0	1	3	4	8	7	6	6
60	3	4	5	7	X	0	2	4	8	7	6	5
63	X	3	4	6	X	X	1	3	X	7	6	5

## 2 SAFETY

Allowable inclination of the machine for traveling when equipped with 16 m Fly Jib installed at 10°

(Unit: Degree)

Fly Jib Length		16 m											
Off-set Angle		10°											
Position		Over-Front				Over-Rear				Over-Side			
Boom Length		Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
(m)		30	40	50	60	30	40	50	60	30	40	50	60
39		11	11	9	7	7	8	8	8	10	9	8	8
42		10	10	9	7	6	6	7	8	9	8	8	7
45		9	9	9	7	5	6	6	7	9	8	7	7
48		7	8	8	7	3	4	5	6	9	8	7	7
51		6	7	7	7	2	3	4	6	9	8	7	8
54		5	5	6	7	0	2	3	5	8	7	6	6
57		3	4	5	7	X	1	2	4	8	7	6	5
60		X	3	5	6	X	0	2	3	X	7	6	5
63		X	X	4	5	X	X	1	3	X	X	5	5

16m Fly Jib Installed at 30°

Fly Jib Length		16 m											
Off-set Angle		30°											
Position		Over-Front				Over-Rear				Over-Side			
Boom Length		Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
(m)		30	40	50	60	30	40	50	60	30	40	50	60
39		11	11	9	7	7	8	8	9	10	9	8	8
42		10	10	9	7	8	6	7	8	10	9	8	7
45		9	9	9	8	5	5	6	7	9	8	7	7
48		7	8	8	8	3	4	5	6	9	8	7	7
51		6	7	7	8	2	3	4	6	9	8	7	8
54		5	5	6	7	0	2	3	5	8	7	6	6
57		3	4	5	7	X	1	2	4	8	7	6	5
60		X	3	5	6	X	0	2	3	X	7	6	5
63		X	X	4	5	X	X	1	3	X	X	5	5

22m Fly Jib Installed at 10°

Fly Jib Length		22 m											
Off-set Angle		10°											
Position		Over-Front				Over-Rear				Over-Side			
Boom Length		Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
(m)		30	40	50	60	30	40	50	60	30	40	50	60
39		11	10	9	7	7	7	8	8	10	9	8	7
42		9	9	9	7	5	6	7	8	9	8	8	7
45		8	8	9	7	4	4	6	7	9	8	7	7
48		7	7	8	7	2	3	5	6	9	8	7	8
51		6	6	7	7	1	2	4	5	8	7	7	8
54		4	5	6	7	X	1	3	4	8	7	6	6
57		X	4	5	8	X	0	2	4	X	7	6	5
60		X	3	4	6	X	X	1	3	X	6	6	5
63		X	X	3	5	X	X	0	2	X	X	5	5

22m Fly Jib installed at 30°

Fly Jib Length		22 m											
Off-set Angle		30°											
Position		Over-Front				Over-Rear				Over-Side			
Boom Length		Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
(m)		30	40	50	60	30	40	50	60	30	40	50	60
39		11	10	9	7	7	7	7	8	10	9	8	7
42		9	9	10	8	5	6	7	8	9	8	8	7
45		8	8	9	8	4	4	5	7	9	8	7	7
48		7	7	8	8	2	3	5	6	9	8	7	8
51		5	6	7	8	1	2	4	5	9	7	7	8
54		4	5	6	7	X	1	3	4	8	7	6	6
57		X	4	5	8	X	0	2	4	X	7	6	5
60		X	3	4	6	X	X	1	3	X	7	6	5
63		X	X	3	5	X	X	0	2	X	X	5	5

## 2 SAFETY

**Allowable inclination of the machine for traveling when equipped with 28 m Fly Jib installed at 10°**

(Unit: Degree)

Fly Jib Length	28 m											
Off-set Angle	10°											
Position	Over-Front				Over-Rear				Over-Side			
Boom Length (m)	Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
	30	40	50	60	30	40	50	60	30	40	50	60
39	10	10	9	7	6	6	7	8	9	8	8	7
42	9	8	9	7	4	5	6	7	9	8	7	7
45	7	7	8	8	3	4	5	6	9	8	7	6
48	6	6	7	8	2	3	4	5	9	8	7	6
51	4	5	6	7	0	2	3	5	8	7	6	6
54	3	4	5	7	×	1	2	4	8	7	6	5
57	×	3	4	6	×	×	1	3	×	7	6	5
60	×	×	4	5	×	×	1	3	×	×	5	5

**28m Fly Jib Installed at 30°**

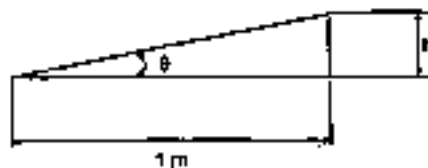
Fly Jib Length	28 m											
Off-set Angle	30°											
Position	Over-Front				Over-Rear				Over-Side			
Boom Length (m)	Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
	30	40	50	60	30	40	50	60	30	40	50	60
39	10	10	10	8	6	6	7	8	10	9	8	7
42	9	9	9	8	4	5	6	7	9	8	8	7
45	7	7	8	8	3	4	5	6	9	8	7	7
48	6	6	7	8	2	3	4	5	9	8	7	6
51	5	5	6	7	0	2	3	5	8	7	7	6
54	3	4	5	6	×	0	2	4	8	7	6	5
57	×	3	4	6	×	×	1	3	×	7	6	5
60	×	×	4	5	×	×	1	2	×	×	6	5

**Allowable inclination of machine for traveling (with 4.5m Heavy Top Boom)**

Status	Without Aux. Short Jib											
Position	Over-Front				Over-Rear				Over-Side			
Boom Length (m)	Boom Angle (°)				Boom Angle (°)				Boom Angle (°)			
	30	40	50	60	30	40	50	60	30	40	60	60
12	6	6	5	4	12	11	11	10	13	13	12	12
15	7	6	6	5	12	12	11	10	13	12	12	12
18	8	7	6	5	13	12	11	10	12	12	11	11
21	8	8	7	5	13	12	11	10	12	11	11	11

*NOTE: The inclination angles are converted to the gradient ratio as shown below:*

Angle θ	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
h (mm)	17.5	34.9	52.4	69.9	87.5	105	123	141	158	176	194	213	231	249	268

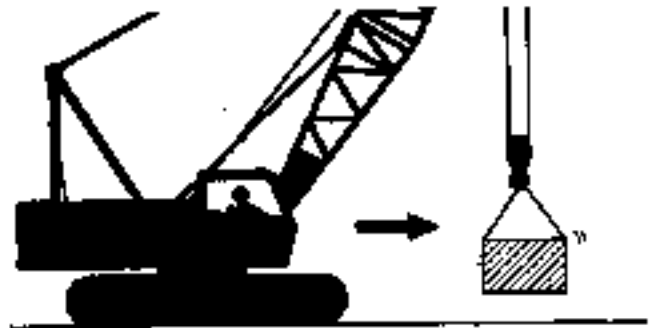


M224-M-016

## 2 SAFETY

### 3.16 Do not travel machine with a load lifted.

Traveling with a load lifted will cause the load to slew and increase impact reaction force, possibly resulting in personal injury or death due to damage and/or tipping over of the machine. Use another safer method to transport the load. In case traveling the machine with a load lifted is unavoidable, be sure to follow the instructions described below. Please feel free to contact your nearest Hitachi Sumitomo dealer for clarification as necessary.



MS20-05-177

- Appoint a signal person beforehand. Always travel the machine following all instructions from the signal person.
- Travel the machine on level ground. Avoid traveling on soft or uneven surface ground.
- Hold the lifted load at the lowest possible position to prevent the lifted load from swaying as much as possible.
  - Position the load lower than 300 mm (or as lower as possible) above the ground.
  - Travel the machine so that the hoist wire rope does not sway more than 3° if the lifted load is swung.
- Drive the machine at a slow speed to reduce machine vibration.
- Position the lifted load in front of the crawler while traveling forward.
- While traveling, never operate any other controls such as the hoist, slewing, or boom derricking.
- Never lift a load heavier than the rated load.
- Use a boom shorter than 1/2 length of the longest boom specified for this machine.
- Never lift a load exceeding 1/3 of the rated load when traveling the machine.
- Engage the slewing lock and apply the slewing brake.
- When traveling under power lines, keep the boom tip sufficiently away from the power lines.
- Always lower the load on the ground before changing travel direction. Pay out the hoist rope by the length necessary to loosen the rope tension so that the machine can change direction without being restricted by grounding the load.



## 2 SAFETY

### 3.17 Avoid injury from traveling in reverse or slewing operation.

Visibility may be obstructed during slewing and/or reverse travel operation, possibly creating serious injury or death to anyone in close vicinity of the machine by hitting, pinching, or running over. Strictly follow the instructions below.

- Appoint a signal person beforehand. Always operate the machine following all instructions from the signal person.
- Check that no bystanders are present around the machine.
- Use the horn to alert bystanders not to enter the vicinity of the machine.



SA-363

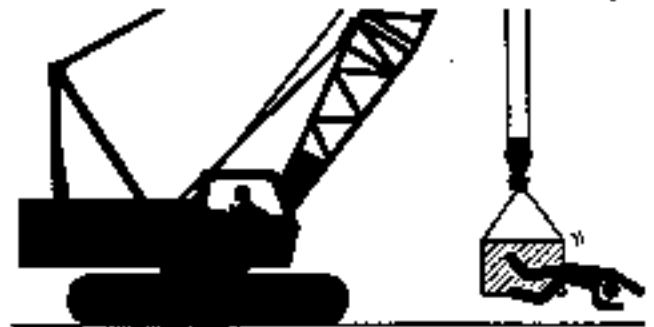


SA-364

### 3.18 Precautions for slewing operation.

#### Prevent the lifted load from swaying

Sudden start/stop or fast speed slewing operation may cause the lifted load to sway, possibly resulting in damage to the machine, tipping over of the machine, and/or personal injury or death due to falling of the lifted load. Slowly operate the slewing system (starting, operating, and stopping) so that the lifted load does not sway.



SA-473

#### Avoid using the slewing function to push/pull a load

Do not push/pull a load using the slewing function. Failure to do so may cause personal injury or death due to damage to the machine and/or tipping over of the machine.

## 2 SAFETY

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### Precautions for unexpected slewing

Unexpected slewing drift due to inclination of the machine or wind force may occur, possibly resulting in personal injury or death. Always apply the slewing brake when slewing operation is not required.

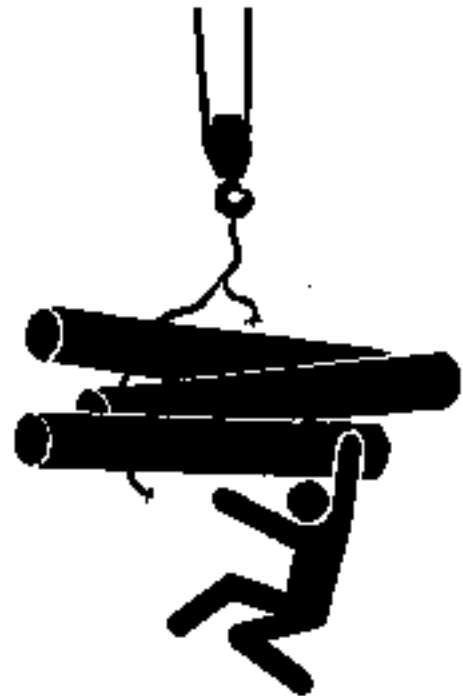


3A-34

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### 3.19 Never allow the lifted load to pass over a person.

Accidental falling loads may result in serious injury or death. Never move a lifted load over a person's head. Do not allow any person to enter below the lifted load.



3A-35

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### 3.20 Be cautious of sway of the unused hook.

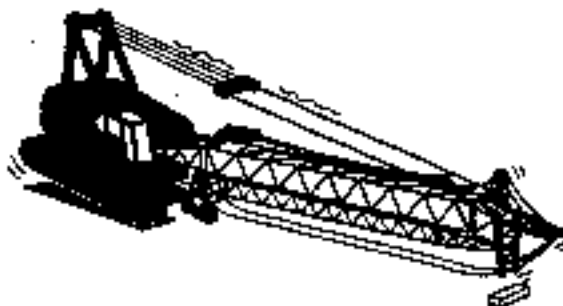
When the machine is operated with the jib attached, the unused hook may sway during slewing or boom hoist operation, possibly causing unexpected accidents if the swung hook comes in contact with the boom or obstructions around the machine. Hoist the unused hook up to a point close to the height where the overhoist prevention device becomes activated.

## 2 SAFETY

### 3.21 Precautions for erecting the boom.

#### Correctly hoist or lower the tower/boom

When hoisting the tower/boom or lowering the tower/boom to the ground, always face the tower/boom toward the correct direction relative to the base carrier, and place pads on the ground to support the tower/boom tip. Failure to do so may cause personal injury or death due to damage to the machine and/or tipping over of the machine.



M22N-C2-071



M22N-C2-072

#### Do not pull, erect, or lift a load off the ground by hoisting the tower jib or boom

Failure to follow the instructions below may result in personal injury or death due to damage to the machine or tipping over of the machine caused by overloading or sway of the lifted load.

#### Tower specification machines:

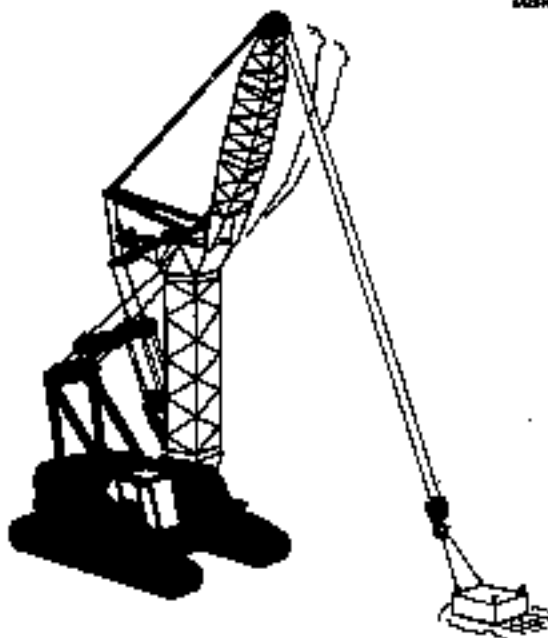
Never pull, raise, or lift a load off the ground by hoisting the tower jib.



M22N-C2-073

#### Crane specification machines:

Never pull, raise, or lift a load off the ground by hoisting the boom.



M22N-C2-074

## 2 SAFETY

### Avoid abrupt derricking operation

Avoid abrupt tower jib/boom derricking operation. Failure to do so may reduce stability of the machine and the lifted load, possibly resulting in personal injury or death.



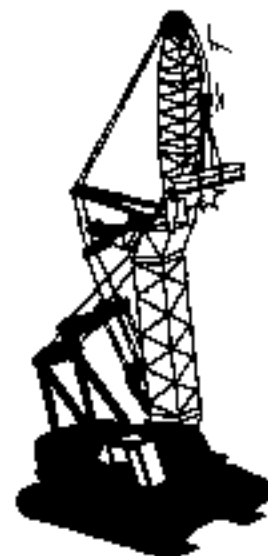
K024-02-071



K024-02-072

### Carefully operate the jib at a position close to the upper limit angle

If the jib is carelessly hoisted up to the position close to the upper limit angle, the jib may be moved backward by reaction force, or the lifted load may come in contact with the jib, possibly resulting in personal injury or death due to damage to the machine or tipping over of the machine. When the jib is hoisted up to a position near the upper limit angle, reduce the hoisting speed so that the jib is not hoisted beyond the upper limit angle. When lowering the load with the jib held at a position near the upper limit angle, slightly lower the jib from the upper limit angle position. Then, slowly lower the load in the power lowering mode.



K024-02-077

## 2 SAFETY

### Carefully operate the boom at a position close to the upper limit angle

If the boom is carelessly hoisted up to a position close to the upper limit angle, the boom may be moved backward by reaction force, or the lifted load may come in contact with the boom, possibly resulting in personal injury or death due to damage to the machine or tipping over of the machine. When the boom is hoisted up to a position near the upper limit angle, reduce the hoisting speed so that the boom is not hoisted beyond the upper limit angle. When lowering the load with the boom hoisted at a position near the upper limit angle, slightly lower the jib from the upper limit angle position. Then, slowly lower the load in the power lowering mode.



14204-03-018

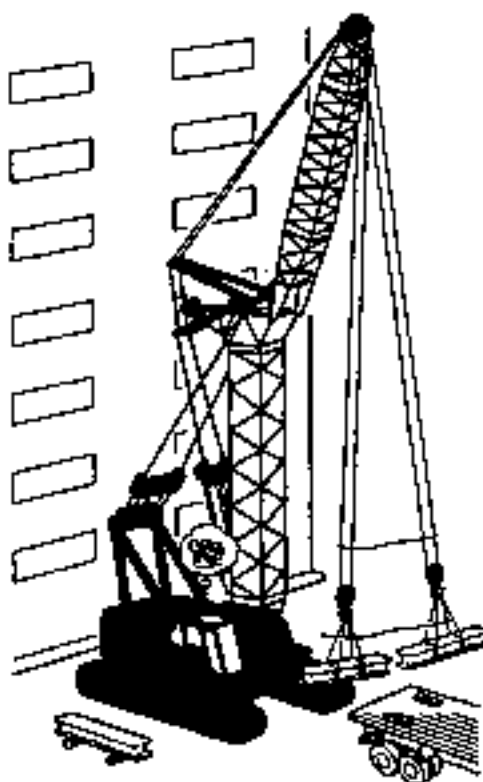
### 3.22 Do not use a boom/jib longer than necessary.

#### Tower specification machines:

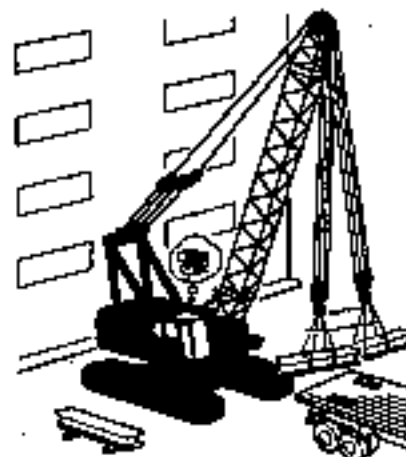
If a tower or jib longer than necessary is used, the balance of the lifted load will be reduced, possibly resulting in personal injury or death. Operate the machine with the shortest possible tower and/or jib as long as the job requirement is satisfied.

#### Crane specification machines:

If a boom longer than necessary is used, the balance of the lifted load will be reduced, possibly resulting in personal injury or death. Operate the machine with the shortest possible tower boom as long as the job requirement is satisfied.



14204-03-019



14204-03-020

## 2 SAFETY

### 3.23 Do not use both the front and rear drums at the same time.

If two separate loads, or one load is lifted with the main and auxiliary hooks at the same time, the rated capacity limiter does not operate correctly, possibly resulting in personal injury or death due to damage to the machine or tipping over of the machine. Use only either the front or the rear drum only in crane operation.

### 3.24 Do not lift more than one load.

If more than one load is lifted at the same time, it is difficult for the operator to equally pay attention to all of the lifted load conditions. Beside that, one lifting tool may come in contact with other lifted load, possibly creating an unexpected accident. Never lift more than one load at the same time.



MS24-02-002

### 3.25 Do not laterally pull or drag a load with the hook.

Pulling or dragging a load with the hook laterally may cause personal injury or death due to damage to the machine or tipping over of the machine. Move the machine as close to the load position as possible and lift the load vertically.



MS24-02-004

## 2 SAFETY

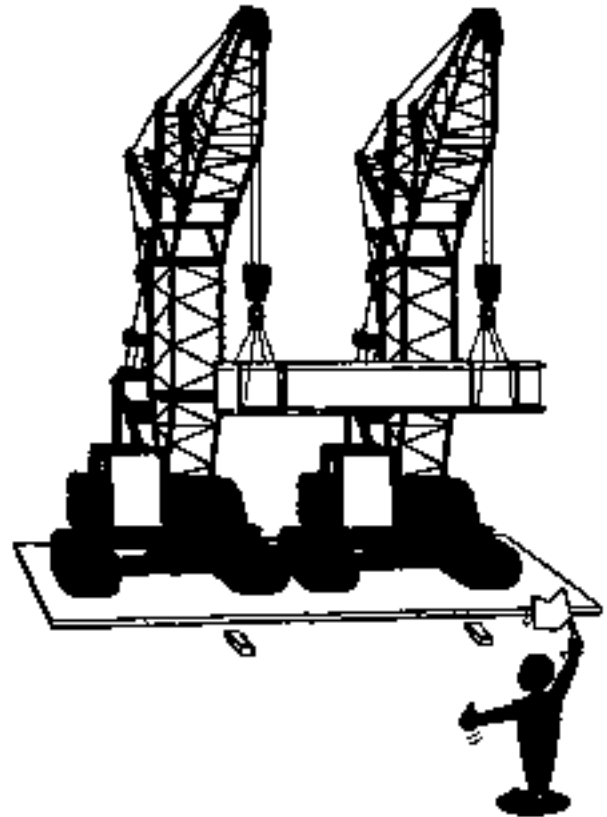
### 3.26 Do not lift one load with two or more machines.

The use of two or more machine to lift one heavy or unwieldy load may result in personal injury or death due to damage to the machine or tipping over of the machine. Avoid using two or more machine to lift one load. In case using two or more machine to lift one heavy or unwieldy load is unavoidable, strictly follow the instructions below.

- Set the machines on solid level ground.
- Use identical models with sufficient lifting capacity.

#### Tower specification machines

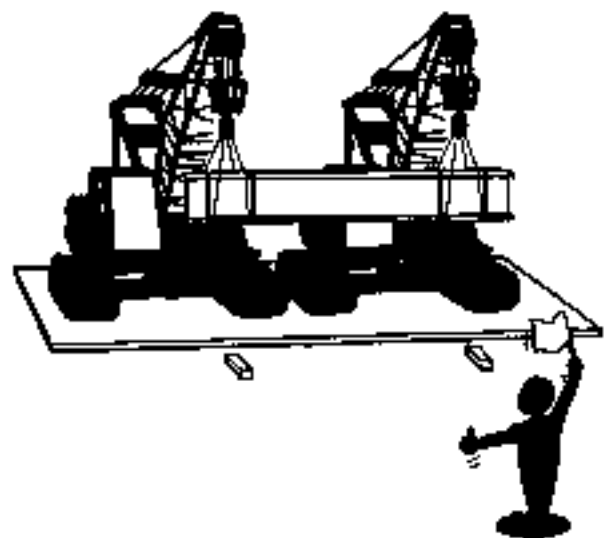
- Use the tower height, jib length, tower angle, and working radius identical to the respective machine.
- Operator on the respective machine must follow the direct directions from the job coordinator.
  - The job coordinator must coordinate lifting procedures with both machine operators in advance.
- Operate all machines in conjunction.
  - Operate both machines at slow speed.
  - Operate each machine in single operation. Never travel either machine.
  - Lift the load vertically.
  - Be cautious so that the lifted load can be evenly supported with both respective machines.
  - Always hold the lifted load in a horizontal position.



10274-02-08

#### Crane specification machines

- Use the boom length and working radius identical to the respective machine.
- Operator on the respective machine must follow the direct directions from the job coordinator.
  - The job coordinator must coordinate lifting procedures with both machine operators in advance.
- Operate all machines in conjunction.
  - Operate both machines at slow speed.
  - Operate each machine in single operation. Never travel either machine.
  - Lift the load vertically.
  - Be cautious so that the lifted load can be evenly supported with both respective machines.
  - Always hold the lifted load in a horizontal position.



10274-02-08

## 2 SAFETY

### 3.27 Know the lifting load weight beforehand.

Lifting unknown weight loads may introduce an overloading condition, possibly resulting in personal injury or death due to damage to the machine, tipping over of the machine, or falling of the load. Be sure to check the lifting load weight beforehand.

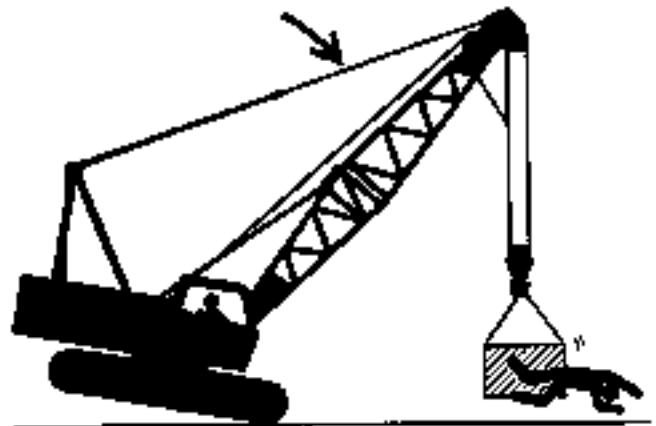


MS21-03-017

### 3.28 Do not overload the machine.

Overloading the machine may cause the machine to break or tip over, possibly introducing personal injury or death. Do not lift a load which will exceed the gross rated load. When lifting a load in water, avoid abruptly lifting the load out of water or pulling the load laterally to relieve the negative pressure developed under the load bottom.

- The load weight in water is reduced due to buoyancy. As soon as the load is lifted out of water, the load weight becomes heavier as the buoyancy dissipates and water weight contained in the load is applied. Slowly lift the load so that water can be drained as much as possible.



MS-100

### 3.29 Do not use the machine to extract loads.

Do not use the machine to extract buried or driven-in objects in the ground, or to hoist a load when wire rope or the lifted load is entangled in an obstruction without removing the obstruction. Failure to do so may cause the machine to break or tip over, possibly introducing personal injury or death. Never attempt to lift the object driven in the ground, or buried in mud or soil. In case the wire rope or the lifted load is entangled in any obstructions such as a tree, or steel structure, hoist the load only after removing or detaching the obstruction.



MS21-03-020

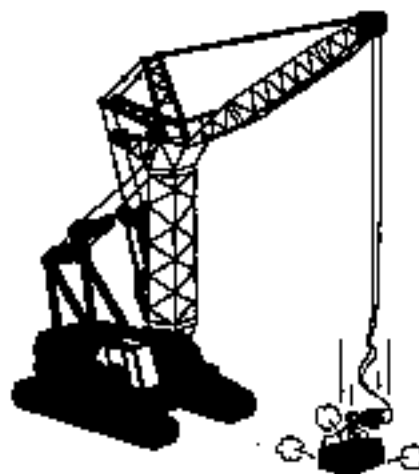


## 2 SAFETY

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### 3.30 Do not allow the lifted load to free-fall.

Free fall of a heavy load by operating the brake pedal may induce mis-operation, possibly resulting in personal injury or death due to the load falling. Use free fall operation mode only when lowering the hook with no load. When the lifted load is to be lowered, always select the auto-brake mode to lower the load in the power lowering mode.



14382-05-020

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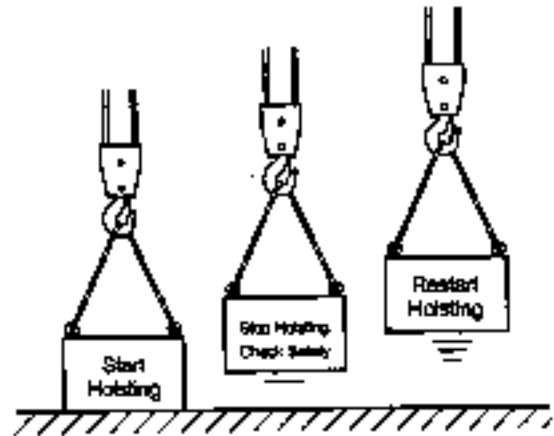
### 3.31 Prepare for steady braking operation.

Delayed braking operation may cause the hook to fall, possibly resulting in personal injury or death. Do not remove your foot from the brake pedal during free fall operation so that the brake can be quickly applied whenever needed.

## 2 SAFETY

### 3.32 Precautions for lifting the load off the ground.

If the load is carelessly lifted off the ground, falling of the lifted load or tipping over of the machine may result, possibly introducing personal injury or death. After lifting the load off the ground by several centimeters, stop lifting the load. Then, check the brake function, slinging condition, and machine stability for any abnormality.



UD04-02-08

### 3.33 Prevent the hook from being overhoisted.

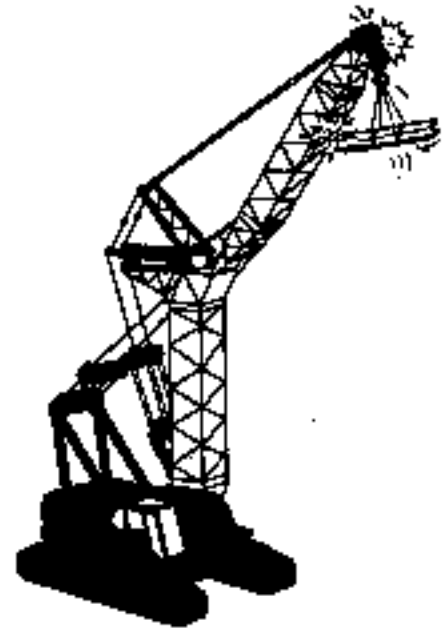
If the hook is overhoisted, the hook and the lifted load may come in contact with the boom or the jib, possibly resulting in personal injury or death due to damage to the boom or jib, or falling of the lifted load. Always pay attention to the position of the lifted load so that the hook is not overhoisted.

#### Tower specification machine:

- Depending on the jib angle or the size of the lifted load, the lifted load may come in contact with the jib creating a hazardous condition if the hook is overhoisted before the hook hoisting limiter is activated.

#### Crane specification machine:

- If the boom is lowered, the hook is moved upward so that overhoist status of the hook may occur even though the wire rope is not wound.
- Depending on the boom angle or the size of the lifted load, the lifted load may come in contact with the boom creating a hazardous condition if the hook is overhoisted before the hook hoisting limiter is activated.



UD04-03-081



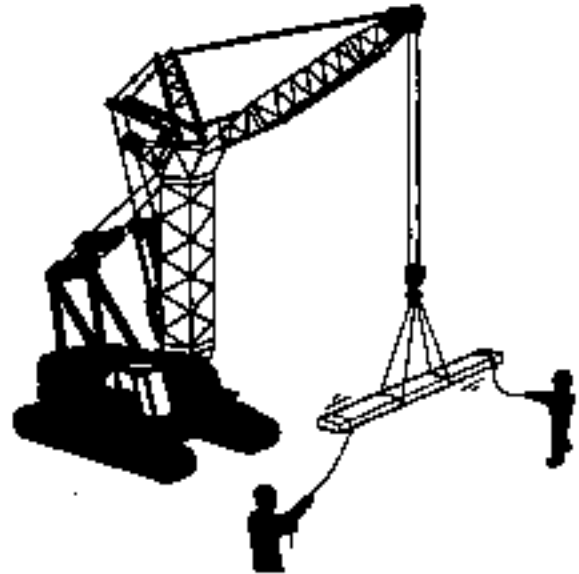
UD04-03-082

## 2 SAFETY

### 3.34 Lifting operation of a long-shape load.

Keeping stability of a long-shape lifted load is very difficult. Loss of balance may result in personal injury or death. Attach lag-lines to both ends of the lifted load to maintain the load stability.

- Be careful not to get dump with the lifted load.

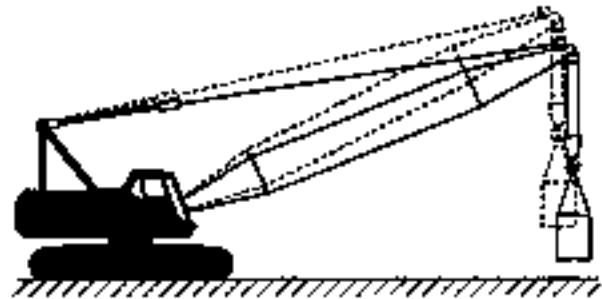


4-124-02-001

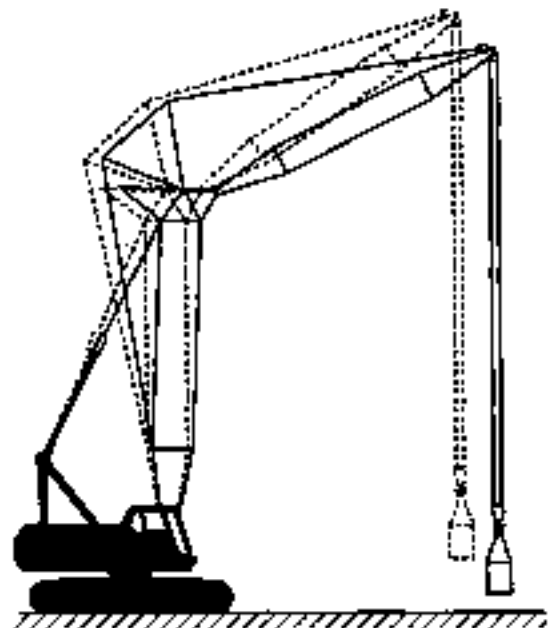
### 3.35 Precautions for extension in working radius.

As the lifted load is lowered, the working radius increases. Depending on the circumstances, the machine may become overloaded. Then, if the machine tips over, personal injury or death may result. Set the working radius or gross rated load with an appropriate allowance in advance so that even if the working radius is increased, the machine will not tip over.

- When the load is lifted off the ground, the working radius will increase due to the stretch of the hoist and pendant ropes. As the load becomes heavier, the working radius will further increase.



4-124-02-001

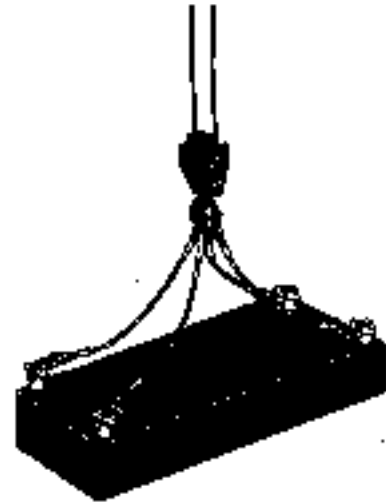


4-124-02-001

## 2 SAFETY

### 3.36 Select correct hook size and number of sling wire ropes.

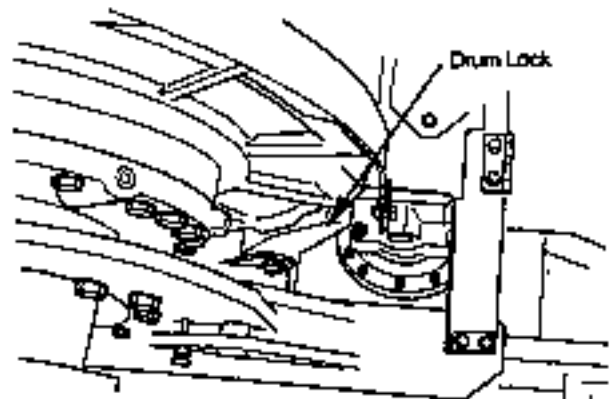
Select the proper hook size and number of sling wire ropes matching the lifted load weight and the tower and jib lengths. Failure to do so may result in personal injury or death due to breakage of wire rope.



M254-02-176

### 3.37 Use the drum lock to hold lifted load.

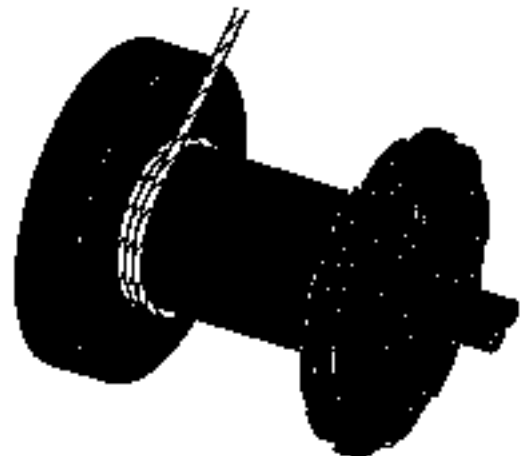
When holding the lifted load, apply not only the brake but also engage the drum lock to ensure safe operation. Holding the lifted load only with the brake is very hazardous. In the unlikely event of accidents such as falling of the lifted load, serious personal injury or death may result.



M224-07-026

### 3.38 Be careful not to excessively pay out wire rope.

If wire rope is excessively paid out of the drum, the rope may be disconnected from the drum or the rope may be broken, possibly introducing personal injury or death due to falling of the lifted load or hook. Be sure that at least 3 turns of the rope remains around the drum when paying out the rope.

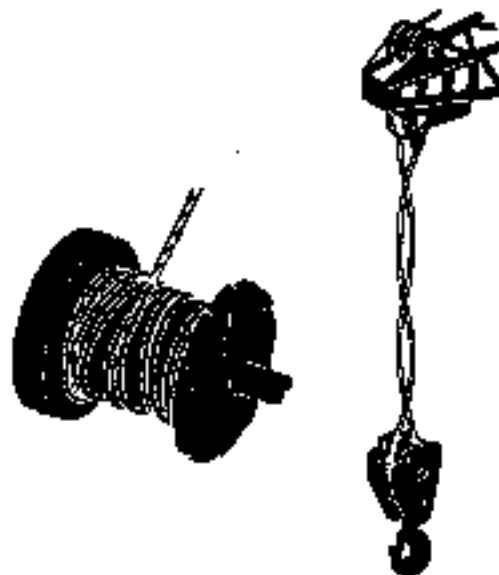


M224-02-007

## 2 SAFETY

### 3.39 Rectify irregular winding or twisting of wire rope.

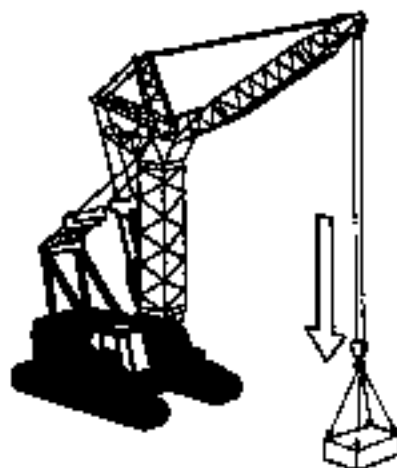
If irregular winding or twisting of wire rope is not rectified, the wire rope may be broken, possibly resulting in personal injury or death due to falling of the lifted load, rotation of the hook, or unthreading of wire rope from the sheave. In case irregular wire rope winding occurs, rewind the wire rope correctly. If wire rope is twisted, rectify the twisting before operating the machine.



M20V-52-058

### 3.40 Evacuate the machine safely if overloaded.

Lower the lifted load by lowering the hook if an overload situation occurs to the machine. Quick operation of the jib under an overloading condition may make the situation worse by causing the lifted load to sway, possibly resulting in personal injury or death due to tipping over of the machine.



M20V-52-058

## 2 SAFETY

### 3.41 Precautions for slinging.

#### Do not use improper sling tools

Using improper sling tools may cause the breakage or damage of the sling tools, possibly resulting in personal injury or death. Be sure to use proper size and strength of the intact sling wire rope, lifting chains, and shackles.



807942-1R

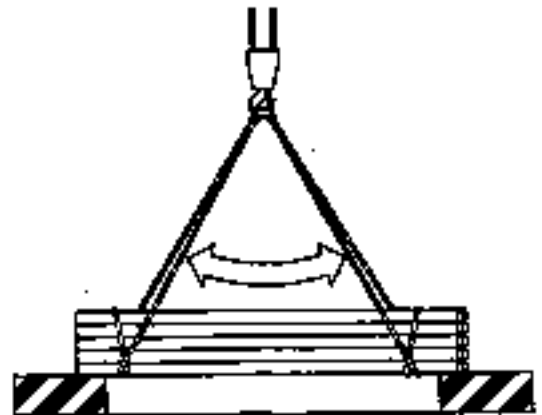
#### Set lifting angle between sling wire ropes as small as possible

Set the lifting angle between sling wire ropes to smaller than 60 degrees.

The larger the lifting angle between sling wire ropes is set, the more the force is applied to each sling wire rope so that breakage or skid of the wire rope may result, possibly resulting in personal injury or death due to falling of the lifted load.

#### Position the hook just above the center of the lifted load weight

Sling a load with the hook positioned just above the center of the lifted load weight. If a load is lifted without aligning the hook position with the center of the lifted load weight, tipping over or falling of the lifted load may result, possibly introducing personal injury or death.

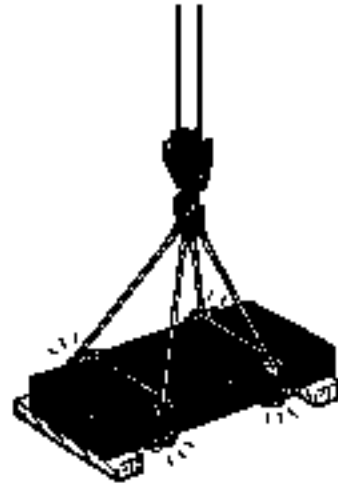


807942-1R

## 2 SAFETY

### Use soft material pads

When slinging sharp edges or slippery sections of a load, use soft material pads between the slinging ropes and the load to prevent the slinging rope from breaking, or coming off the load, possibly resulting in personal injury or death.



MS04-02-103

### Do not lift a load with one sling rope

Do not lift a load with one sling rope. Failure to do so may cause the lifted load to automatically rotate, possibly introducing an unexpected accident.



MS04-02-104

### Do not allow anyone to enter below the lifted load

Do not allow anyone to enter below the lifted load. Should the lifted load fall, personal injury or death may result.



MS04-02-105

## 2 SAFETY

### Use a latch to prevent wire rope from coming off the hook

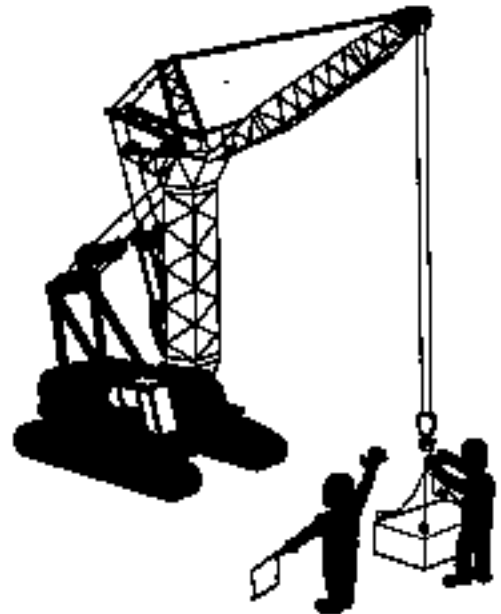
If the latch is not used, or the latch does not function properly, the sling rope may come off the hook so that the lifted load may fall, possibly resulting in personal injury or death. Be sure to use the hook latch when slinging a load. Check that the latch functions correctly in advance.



K029-02-124

### Arrange a signal person

Arrange a signal person when slinging a load. Then, always operate the machine according to the signal person's direction. If no signal person is used, or the signal person's direction is neglected during slinging a load, occurrence of an unexpected accident may result.



K029-02-124

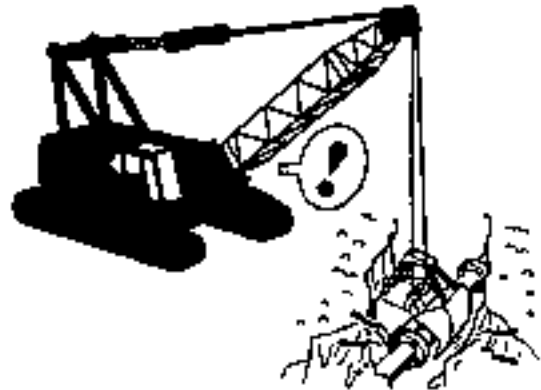


## 2 SAFETY

### 3.42 Precautions for Operating Clamshell Bucket.

#### Check locations of underground gas lines, water lines, and cables beforehand

Clearly locate all underground utilities such as gas lines, water lines, and cables before digging. Accidental severing of underground gas lines, water lines, or cables may result in personal injury or death.



M294-02-117

#### Arrange a signal person

Arrange a signal person and follow all direction from the signal person when operating a clamshell bucket. If the bucket is difficult to see from the operator's seat, the bucket may come in contact with sheetings, possibly introducing occurrence of an unexpected accident.



M294-02-108

#### Do not hit the ground with the bucket

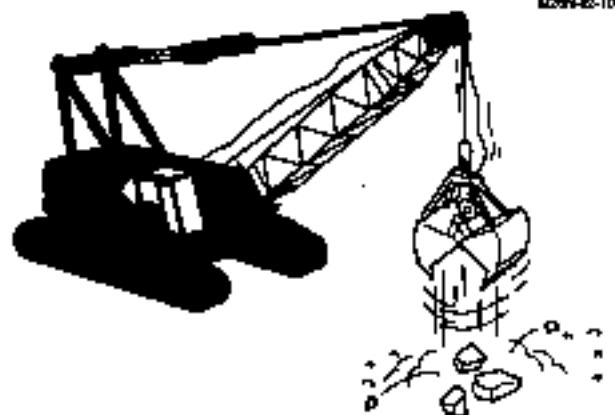
Do not use the bucket in lieu of a hammer to loosen the ground. The bucket may rebound so that an unexpected accident may result.



M294-02-109

#### Do not excessively tension the bucket holding rope

If the bucket holding rope is excessively tensioned while lifting the bucket, the bucket may be opened, causing the bucket load to fall, which may lead to personal injury or death. Whenever lifting the bucket, be sure to close the bucket by winging up the bucket open/close wire rope.



M294-02-110

## 2 SAFETY

### Do not allow the bucket to sway

If the swing operation is made at fast speed or is quickly stopped, the bucket may sway so that tipping over of the machine, damage to the machine, or falling of the bucket load may introduce personal injury or death. Always perform slewing operation slowly to prevent the bucket from swaying.

- Attach a tagline to prevent the bucket from swaying or rotating.



Crane

M25A-02-115

### Never move the bucket over the truck operator's cab or a person's head

If the bucket load falls, personal injury or death may result. Never move the bucket over the truck operator's cab or a person's head.



M25A-02-113

### Avoid irregular winding of wire rope

Wire rope may be broken due to irregular winding of wire rope, possibly resulting in personal injury or death if the bucket or a load falls. Beware not to excessively loosen wire rope during excavation with the bucket.



M25A-02-113

### Lower the bucket on the ground after operation

Lower the bucket on the ground with the teeth opened after operation. If the bucket is kept lifted above the ground, or if the bucket is lowered on the ground with the teeth closed, falling or overturning of the bucket may cause personal injury or death.



Crane

M25A-02-113

## 2 SAFETY

### 3.43 Precautions for Lifting Magnet Operation.

During lifting magnet operation, if electric power supply is cut off, falling of the lifted load may result, possibly introducing personal injury or death. Be sure to follow the instructions described below during lifting magnet operation.

- Start and stop the generator in the correct procedures.
- Before operating the lifting magnet, check that no personnel are present around the vicinity of the machine. Do not allow anyone to enter below the lifted load or to pass the lifted load over the personnel.
- Accurately attract or release the loads. Lower the lifted loads to the specified position.
- Before leaving the operator's seat, lower the magnet to the stored position. Turn the electric power OFF.
- Check the electric system at the regular intervals so that electrification does not occur.



Crane

10204-02-118

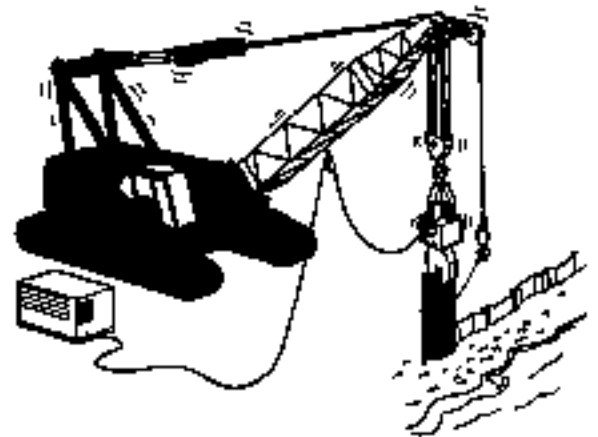
## 2 SAFETY

### 3.44 Precautions for Vibration Hammer Operation.

#### Be prepared for vibration and/or impacts

Vibration hammer operation will constantly create vibration and/or impacts which affect overall machine. Toppling of piles, falling of hook/vibration hammer, and/or damage to the machine may introduce personal injury or death in some cases. Be sure to follow the instructions described below.

- Accurately chuck a pile. Support the pile with an assistant rope.
  - Remove mud and/or rust adhered to the vibration hammer and the pile chucking areas. Always keep the vibration hammer and the pile chucking areas clean. If the pile head becomes excessively deformed, cut off the deformed area before chucking.
- When suspending a vibration hammer, use a hook equipped with a latch. Connect the vibration hammer to the hook with wire rope.
  - Use a hook and wire rope which matches the vibratory force.
- Gross lifting load in vibration hammer operation shall be less than the gross crane rated load at the working radius.
- $\text{Gross rated load} \geq \text{Hook weight} + \text{Sling rope weight} + \text{Vibration hammer weight} + \text{Pile weight} + \text{Vibration hammer vibratory force} \times 1/4$
- Set the boom length as short as possible.
- Loosen the hoist rope tension when starting to operate the vibration hammer.
- Do not allow the absorption spring to become tightly compressed during vibration hammer operation.
- Stop operating the vibration hammer after resting the hammer weight on the pile head.
- Check the boom and hook for any damage, and all fasteners for tightness before and after operation. If any, immediately repair or replace as necessary.



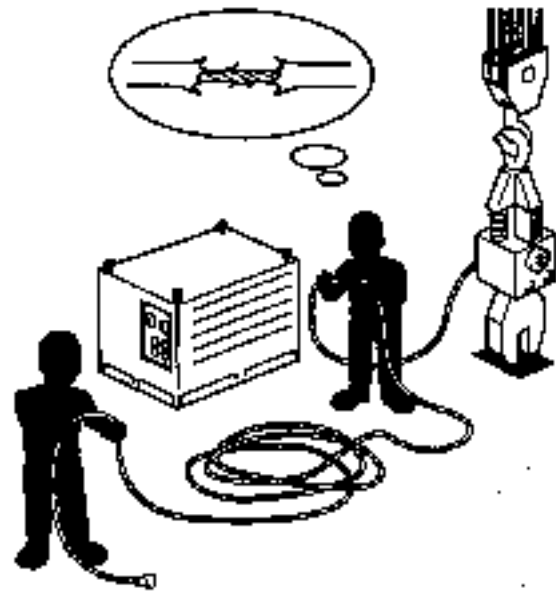
Crane

WJ81-02-117

## 2 SAFETY

### Precautions for handling Cab Tyre Cable

Damaged or broken cab tyre cable may cause rectification or short circuit, possibly resulting in personal injury or death. Before starting machine operation, check the cab tyre cable for any damage. If any damage is found, repair or replace the cab tyre cable. Be careful not to scratch the cab tyre cable during operation.

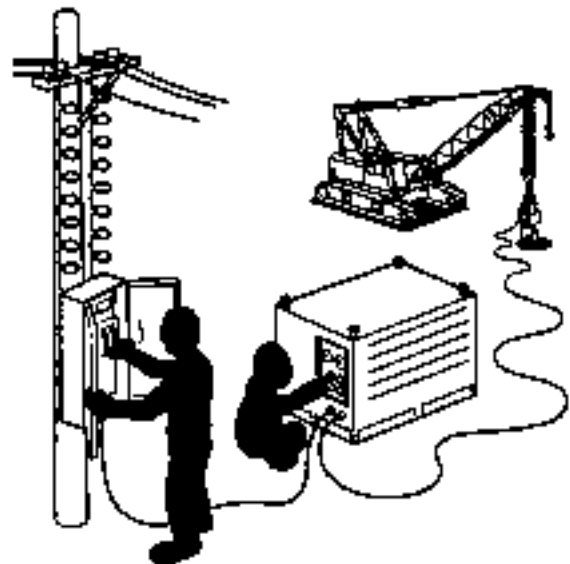


LS204-03-114

### Turn the power switch OFF after operation

After completing machine operation, turn all electrical switches such as the power switch and the earth leakage breaker OFF. Failure to do so may introduce an unexpected accident such as fires.

- When turning switches OFF, first turn off the switch located at the lowest-end of the circuit. Finally, turn off the main switch.



LS204-03-112

### 3.45 Lowering/Hoisting a load to/from the under ground level.

#### Pay attention to the wire rope length

If the wire rope length is not sufficient, the rope may be pulled out of the drum, or may be cut off, possibly causing personal injury or death due to falling of the lifted load and/or hook. Select the machine equipped with long wire rope enough to meet the working conditions. When the hook is lowered to the lowest position, minimum 2 turns of wire rope must remain around the drum.

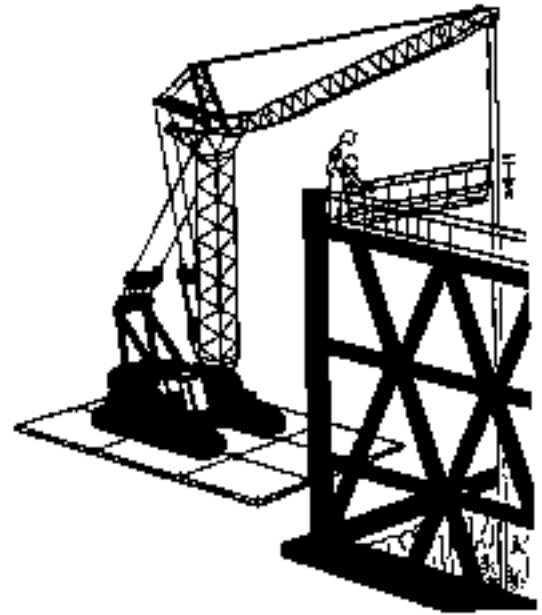


LS204-03-057

## 2 SAFETY

### Arrange a signal person

Arrange a signal person and follow the signal person's direction. If it is impossible for the operator to see how underground work, such as when slinging, from the operator's seat, occurrence of an unexpected accident may result.



NY284-02-125



NY284-02-126

### 3.48 Carefully pull out a buried object such as a pile.

If a buried object such as a pile is forcibly pulled out, overturning or damage to the machine may result, possibly introducing personal injury or death. When pulling out a buried object such as a pile, avoid abruptly pulling it out. In case pulling it out is difficult, use other equipment such as a vibration hammer to assist the work.

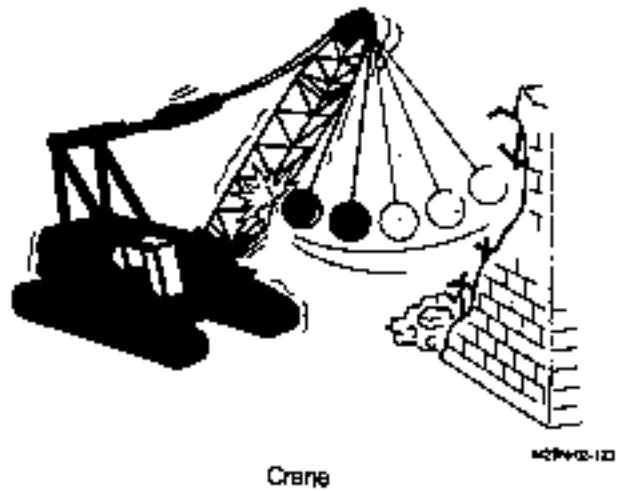


NY284-02-127

## 2 SAFETY

### 3.47 Precautions for using a breaking steel ball.

If a breaking steel ball is overweight for the machine, failure to crush an object, or coming in contact with the boom may result in personal injury or death due to overturning or damage to the machine. The breaking ball weight shall be less than the half value of either the hoist rope allowable line pull or the gross rated load at the working radius whichever is smaller. Swing the ball slowly toward the object from a diagonal direction. Be careful not to fail to crush an object, or not to allow the ball to come in contact with the boom.

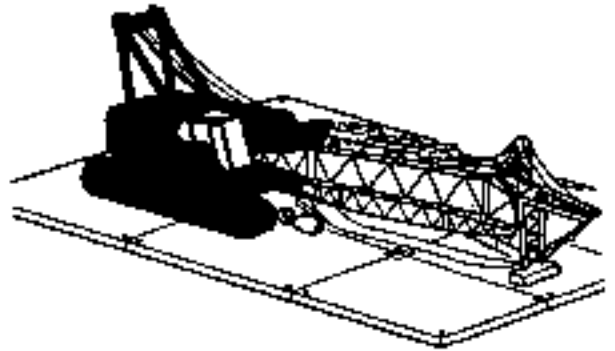


## 2 SAFETY

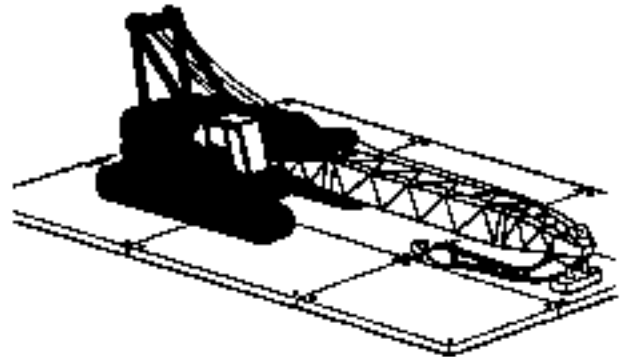
### 4 PRECAUTIONS FOR PREPARATION OF OPERATION AND TRANSPORTATION

#### 4.1 Setting machine.

If the machine is operated in an inclined position, personal injury or death may result. Check that the ground strength is strong enough to support the machine in advance. In case the ground is not strong enough, reinforce the ground using steel planks having sufficient strength and place the machine on the horizontal surface.



WJ 04-03-124



WJ 04-03-125

#### 4.2 Keep away from machine when giving signals.

Keep away from machine when giving signals. Stepping in the disassembling/ assembling work site of the machine will increase possibility of entanglement with the machine, resulting in personal injury or death.



WJ 04-03-126

#### 4.3 Never jump on or off the machine.

Jumping on or off the machine may introduce personal injury or death due to falling from the machine. Be sure to use the handrails, steps, or a footstool when mounting or dismounting the machine. Never jump on or off the machine.



SA-472



## 2 SAFETY

### 4.4 Assemble/Disassemble machine in correct procedures.

Incorrect assembling/disassembling procedures of the machine may introduce personal injury or death. Always follow the correct assembling/disassembling and/or removal/installation procedures.



SA-119

### 4.5 Do not put your fingers and/or hands into pin holes when aligning pin hole center.

When aligning the pin hole center, do not put your fingers and/or hands into pin holes. If the hole position becomes misaligned when your fingers and/or hands are inside the pin hole, personal injury or death may result. Align the pin hole center by visual inspection or with a tool such as a screw driver. Keep your fingers and/or hands away from the pin holes.



MSB-42-123

### 4.6 Use safety belt when working at high locations.

Working at a high location is very hazardous, possibly resulting in personal injury or death due to falling. Use safety belt when working at high locations.



SA-439

## 2 SAFETY

### 4.7 Use care when changing A-Frame height.

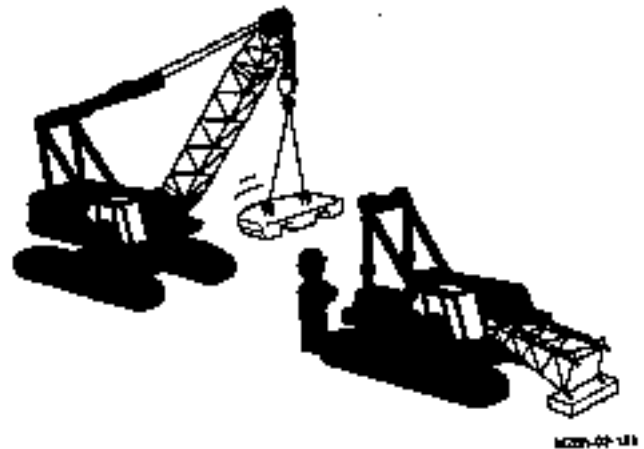
When changing the A-Frame height, the A-Frame may fall, possibly resulting in personal injury or death due to entanglement with the A-Frame. Follow the instructions below.

- Do not allow anyone to enter the area under or inside the A-Frame.
- Do not remove the right and left stay holding pins at the same time. When auxiliary pins are provided, use the auxiliary pins.

### 4.8 Precautions for removing /installing counterweight.

When removing or installing the counterweight, the machine may overturn or the counterweight may fall, possibly resulting in personal injury or death. Follow the instructions below.

- Set up the machine on a solid level ground. Engage the slewing lock.
- Do not allow anyone to enter the area under the counterweight.
- Hold the counterweight with an assistant crane until the counterweight is completely secured.
- Fully extend the width of the side frames.



### 4.9 Do not enter the inside of the boom/jib.

Do not enter the inside or the area under the tower, boom, or jib when assembling /disassembling /removing /installing them. If the tower, boom, or jib falls, personal injury or death may result.



## 2 SAFETY

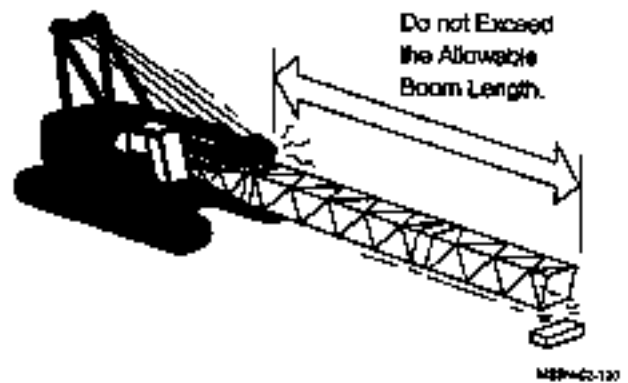
### 4.10 Ensure footings.

When working on the boom/ tower/jib, ensure the footings. Falling from the top of the boom/tower may result in personal injury or death.

### 4.11 Limit boom/tower length when raising boom/tower with wire rope supported by bridle.

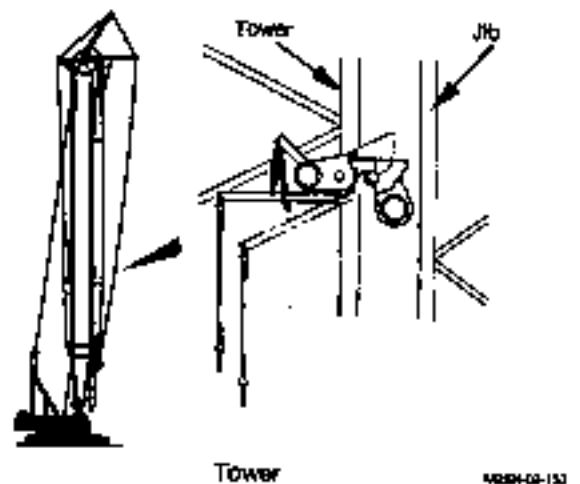
The maximum boom/tower length is limited when the boom/tower with the bridle installed on the top of the lower boom is raised. If the boom/tower longer than the limited length is raised, the boom/tower may fall, possibly resulting in personal injury or death. Never attempt to raise the boom/tower longer than the limited length.

- Refer to Section 5 "Conditions for raising tower" or "Conditions for raising boom/jib" for the tower/boom lengths when the bridle is installed on the top of the lower boom.



### 4.12 Use tower jib coupler.

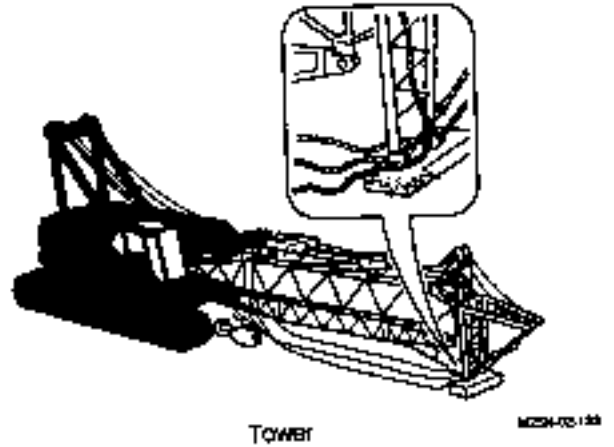
When raising or lowering the tower to the ground without securing the jib, the jib may sway forward from the tower, possibly introducing an unexpected accident. Secure the jib to the tower with the tower jib coupler.



## 2 SAFETY

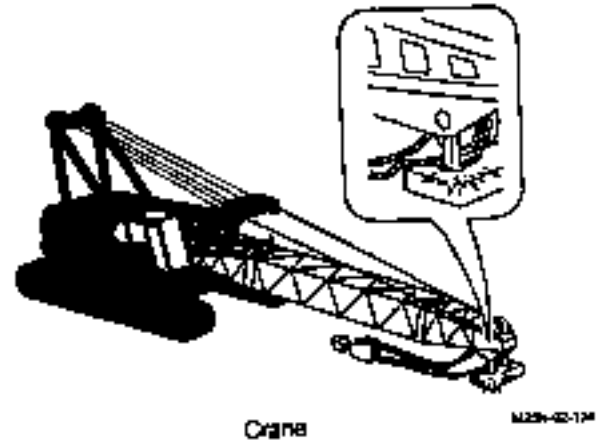
### 4.13 Lower tower carefully.

When lowering the tower to the ground, take care not to pinch the hook hoist rope between the tower tip and the ground. If the wire rope is broken, an unexpected accident may result.



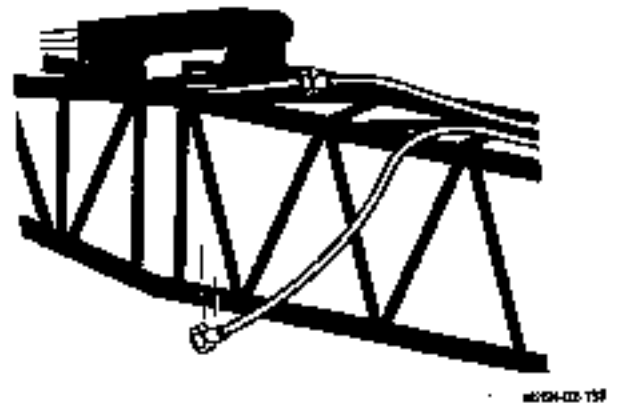
### 4.14 Lower boom carefully.

When lowering the boom to the ground, take care not to pinch the hook hoist rope between the boom tip and the ground. If the wire rope is broken, an unexpected accident may result.



### 4.15 Prevent pendant rope from falling.

When disconnecting the tower/boom/jib pendant rope from the bridle, if the pendant rope falls, an unexpected accident may result. Prevent the pendant rope from falling by securing the pendant rope to the tower/boom/jib with steel wires.



## 2 SAFETY

### 4.16 Securely support tower/boom/jib.

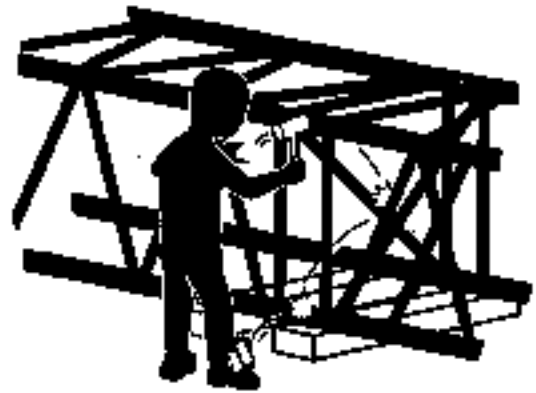
If the tower/boom/jib connection pins are removed without properly supporting the tower/boom such as when replacing or disassembling the tower/boom/jib, the tower/boom/jib may fall, possibly causing personal injury or death. Before removing the connection pins, securely support the entire length of the tower/boom/jib with an assistant crane or racks having sufficient strength.



SA-111

### 4.17 Carefully drive out pins.

When driving out the tower/boom/jib connection pins, the pins may fly out, possibly introducing an unexpected accident. Pay attention to the movement of the pins and avoid standing in front of the pin connections.

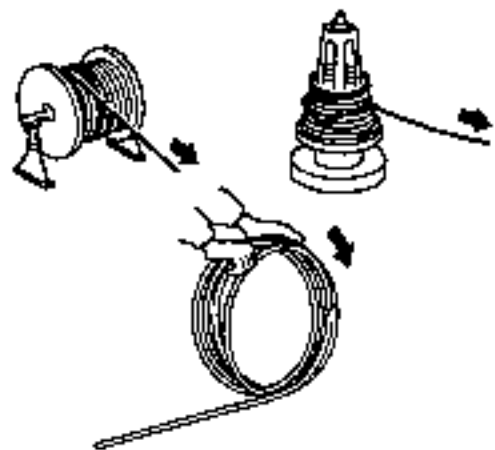


MSHA-2-126

### 4.18 Pay out wire rope in correct method.

Pay out wire rope while rotating a wood frame or coil. If wire rope is paid out following an incorrect method, deformations, kinks, warping, or untwisting of wire rope may result, possibly introducing an unexpected accident.

- Refer to Section 5 "Normal handling methods of wire rope" for the proper unwinding of wire rope method.



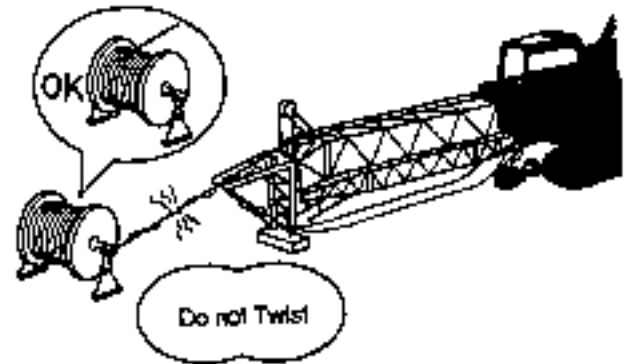
MSHA-2-127

## 2 SAFETY

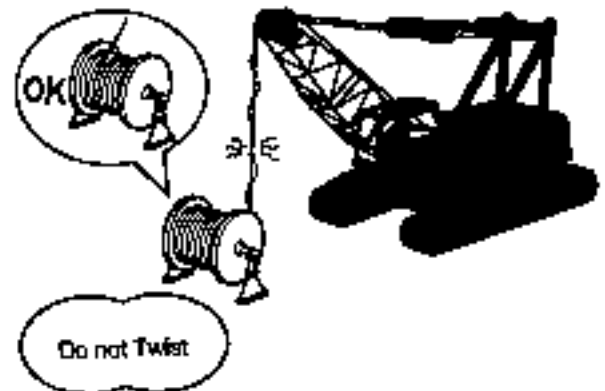
### 4.19 Wind wire rope in a regular alignment.

When winding wire rope around the drum, never allow wire rope to become twisted or loosely wound. Failure to do so may cause the premature damage or kinking of wire rope, possibly introducing an unexpected accident. Strictly observe the following instructions.

- Do not allow wire rope to become twisted.
- Securely wind wire rope in the first layer on the drum.
  - Apply tension force equivalent to 2 to 3 % of rope breaking load to the rope while winding the first layer of wire rope around the drum.
- Wind wire rope in a regular alignment around the drum.



16254-02-120

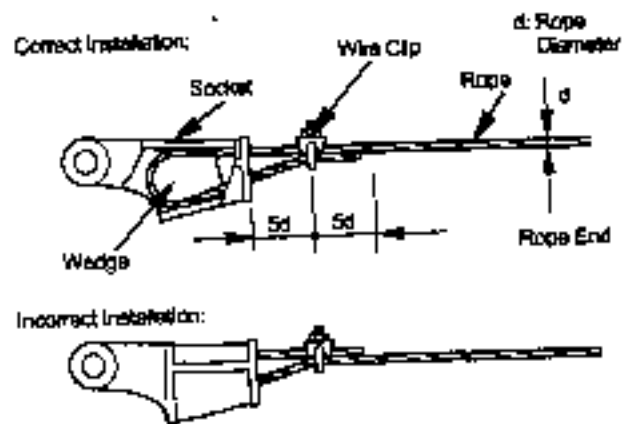


16254-02-120

### 4.20 Install wire rope correctly.

If the wire rope end is incorrectly installed in the drum or socket, wire rope may come off, possibly introducing an unexpected accident. Observe the following points to correctly install the rope ends.

- Use the sizes of sockets, wedges, and wire clips proper to the diameter of wire rope to be installed.
- Use the same taper sockets and wedges.
- Install wire rope in to the drum and socket in the correct direction.
- Install the wire clips in the correct direction.
- Install the wire clips at the correct interval distance.



16254-02-120

## 2 SAFETY

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### 4.21 Before electing the tower, check if there is a part and/or tool remaining behind on it.

After installing the tower attachment to the base machine, check that no parts or tools are remaining behind on the tower before raising the tower. If the tower is electing with any part and/or tool remaining behind on it, falling of the part and/or tool may cause personal injury or death.

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### 4.22 Before electing the boom, check if there is a part and/or tool remaining behind on it.

After installing the boom attachment to the base machine, check that no parts or tools are remaining behind on the tower before electing the boom. If the boom is electing with any part and/or tool remaining behind on it, falling of the part and/or tool may cause personal injury or death.

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### 4.23 Ensure safety operation.

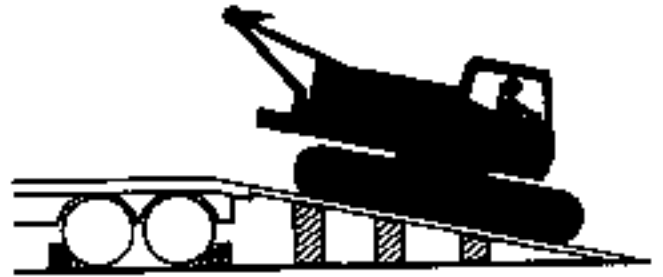
- Before operating the machine, recheck that all safety measures are taken. Failure to do so may cause personal injury or death. Recheck the following points.
- Check if the purposes and processes of work to be performed are fully understood.
  - Check if the signals to be used are fully understood.
  - Check if safety around the machine is ensured.
  - Check if the machine inspections have been completely and thoroughly conducted.
-

## 2 SAFETY

### 4.24 Loading/Unloading on trailer.

If the machine is loaded or unloaded on a trailer following incorrect methods, or if the machine is not sufficiently secured to the trailer, overturn of the trailer, and tipping over, falling, and collision of the machine may result, possibly causing personal injury or death. When loading/unloading the machine, strictly follow the instructions below.

- Load/unload the machine on a firm level surface.
- Select a trailer with specifications matching the machine weight to be transported.
- Apply the trailer parking brake. Wedge all trailer wheels.
- Remove the counterweight from the machine.
- Remove or store all projections from the machine.
- In case the machine is required to slewing on the trailer, securely support the trailer flatbed with jacks or blocks beforehand.
- Apply the slewing lock, slewing brake, drum locks and drum brakes.
- Close and lock all cab doors.
- Secure the machine with wire rope and chains to the trailer bed so that the machine does not move during transportation.
  - Use soft material pads at the sharp edged corners between the machine and wire rope or chains to prevent the machine, wire rope and/or chains from being damaged.



MOB-02-144

### 4.25 Avoid overloading trailer.

Overloading may cause the trailer to overturn or collide, possibly resulting in personal injury or death. Before transporting the machine, disassemble the machine into subassembly units so that each unit matches the correct transportation weight and dimensions. Then, select a trailer with specifications matching the correct transportation weight and dimensions.

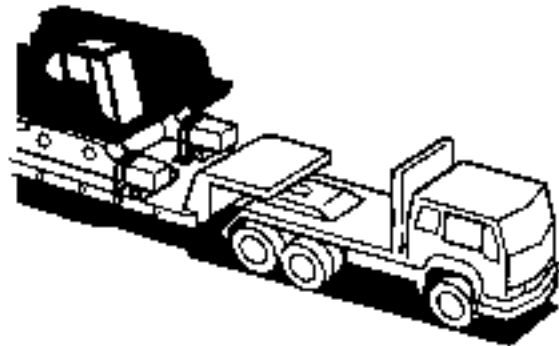


## 2 SAFETY

### 4.26 Obey associated local regulations.

If the machine is transported on public roads without obeying the associated local regulations such as the requirements of transportation or the arrangement of a pilot car, the trailer may overturn or collide, possibly resulting in personal injury or death. Investigate the traffic conditions up to the objective point beforehand, and transport the machine in a method conforming to the associated local regulations.

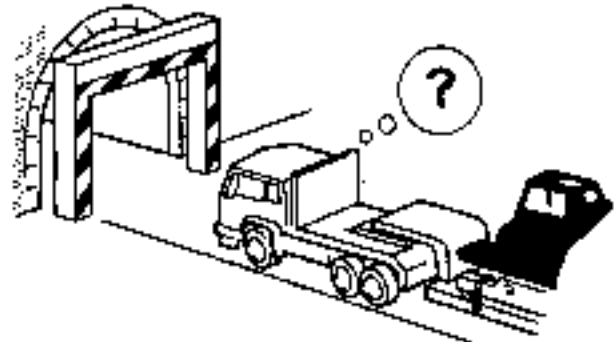
- In case the modification of regulations is required, apply to the authorities concerned for the modification of regulations and get the official right of way in advance.



K20V-02-147

### 4.27 Investigate local traffic regulation.

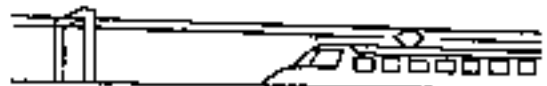
There may be local traffic restrictions in width, height, and weight. Neglecting such restrictions may introduce an unexpected accident. Investigate local traffic regulations beforehand to transport the machine on public roads. Select the safety routes.



K20V-02-148

### 4.28 Avoid letting the machine to come in contact or collide with obstructions.

Contact or collision of the machine with obstructions during transportation may cause personal injury or death. Before going through a tunnel or under the electric train overhead wires, overpasses, or girder bridges, investigate the height and width of them. Maintain proper clearances from their borders when passing through them.

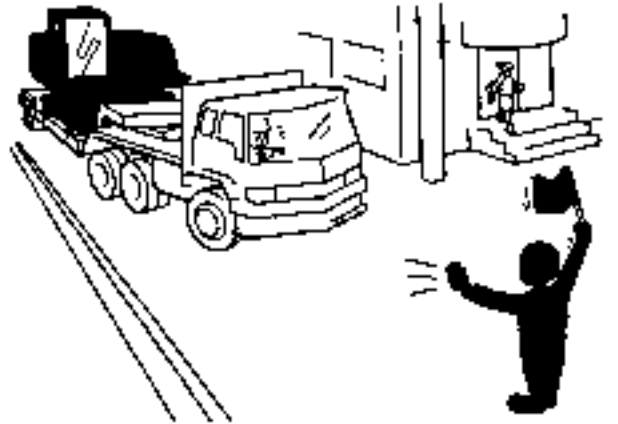


K20V-02-149

## 2 SAFETY

### 4.29 Arrange a signal person.

Arrange a signal person when passing through tight areas or going into an unclear passage. Be sure to follow the signal person's directions while checking safety along the path. If the trailer is driven without checking safety, contact or collision with a person or building may result, possibly causing personal injury or death.



M20H-02-183

### 4.30 Check transportation route surfaces.

Driving on a rough terrain may cause the trailer to skid or to steer seriously, possibly resulting in personal injury or death. When driving on snow covered roads, frozen roads, rough terrain, or slopes, always drive the trailer at slow speed while ensuring safety. Check the transportation route surfaces beforehand, and take necessary measures such as putting on tire chains.



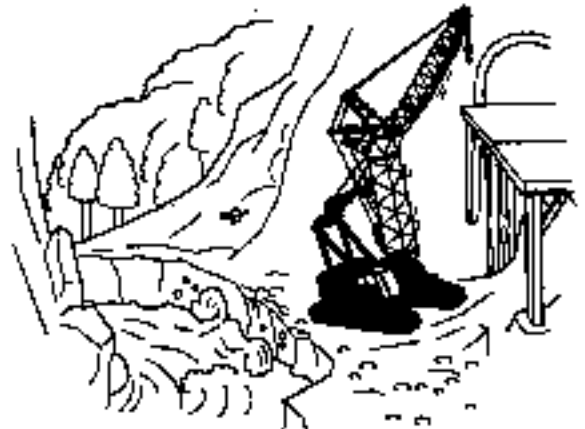
M20H-02-184

### 4.31 Park machine safely.

Leaving the machine in such spots as possibility of falling stones or ground collapse is expected, or in a low ground where flooding may occur, or parking the machine on a slope may cause an unexpected accident.

If parking the machine on a slope or public road is unavoidable, take the following measures.

- When parking the machine on a slope, face the machine parallel to the slope direction. Wedge both crawlers to prevent the machine from running away.
- When parking the machine on a public road, select a parking area so that traffic of other vehicles and pedestrians are not disturbed. Clearly discriminate the parking area using caution signs such as flags, barriers, or flashing signals.



M20H-02-185

## 2 SAFETY

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### 5 PRECAUTIONS FOR MAINTENANCE

#### 5.1 Use genuine Hitachi Sumitomo parts.

Be sure to use genuine Hitachi Sumitomo parts when replacing the machine parts during maintenance. Failure to do so may cause an unexpected accident due to defects in either safety or function of the replacement parts.

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#### 5.2 Replace crucial parts at regular intervals.

Crucial parts are requested to replace at regular intervals to ensure safe operation. Failure to do so may cause an unexpected accident due to deterioration and/or wear. Be sure to replace them at the specified intervals.

- Even if no failures are found, replace them with new parts at the specified intervals.
- In case any failures are found, immediately replace or repair the part regardless of the periodic replacement schedule.
- Refer to the Periodic replacement parts in Section 7 for details.

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#### 5.3 Carry out monthly inspection.

Neglecting inspection and/or repair of the machine may introduce an unexpected accident. Inspect the following points monthly. In case any abnormality is found by inspection, immediately repair, adjust, or replace the abnormal section.

- Inspect all the safety devices, alarm devices, brakes, and clutches for any malfunction.
- Inspect wire rope and sling chains for any damage.
- Inspect the lifting tools such as the hook and grab bucket for any damage.
- Inspect the controls for any malfunction.

## 2 SAFETY

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### 5.4 Carry out yearly inspection.

Neglecting inspection and/or repair of the machine may introduce an unexpected accident. Inspect the following points at the interval within one year after the machine is operated. In case any abnormality is found by inspection, immediately repair, adjust, or replace the abnormal section.

- Structural parts
- Mechanical parts
- Electrical parts
- Wire rope and sling chains
- Lifting tools
- Lifting load test

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### 5.5 Coordinate with personnel concerned.

Sufficiently coordinate with the personnel concerned about the scope and procedures of the maintenance work to be carried out beforehand. Failure to do so may cause personal injury or death.

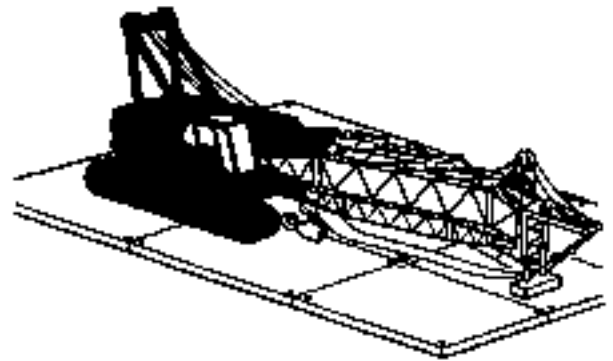


2-75

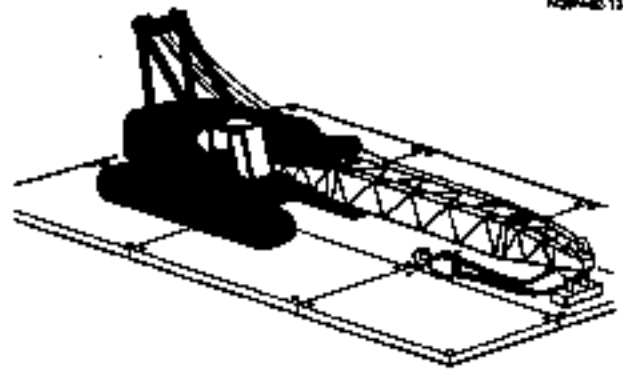
## 2 SAFETY

### 5.6 Carry out maintenance work on a solid level surface.

Carry out the maintenance work of the machine on a solid level surface. Failure to do so may cause the machine to tip over or to run away, possibly resulting in personal injury or death.



KQFM02-12A



KQFM02-12B

### 5.7 Beware of exhaust fumes.

When carrying out machine maintenance work indoors, sufficiently ventilate the work area by extending the exhaust pipe up to the outdoor, or opening the doors and windows. Install a ventilation fan as needed. Failure to do so may cause gas poisoning due to stagnation of gas produced from fuel, cleaning agents, paints, or engine exhaust.

## 2 SAFETY

### 5.8 Precautions for working at high position.

Inspection or maintenance at high positions on the machine may introduce personal injury or death due to a falling accident. Be sure to observe the following points.

- Clear off and clean the footings.
  - Remove any obstacles such as unnecessary tools and wipe off spilled oil.
- Beware not to slide or stumble when walking.
- Use footstools and/or handrails when mounting/dismounting to/from a high position. Be sure to maintain the body with hand and foot.
- Use a life belt.

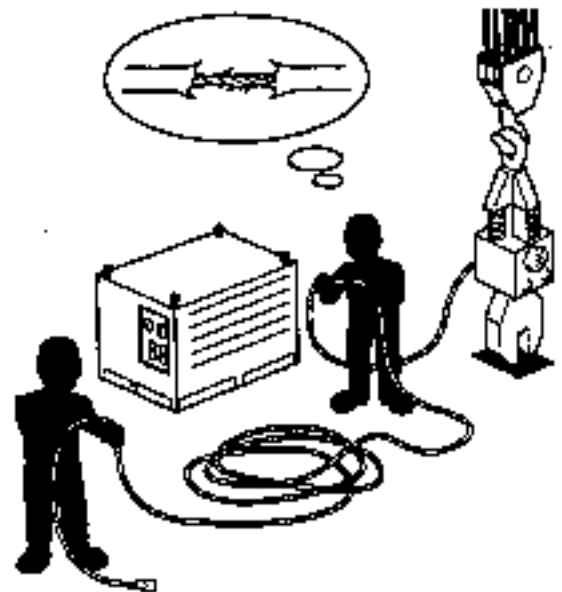


SA-432

### 5.9 Clear off and clean the vicinity around the machine.

Before servicing the machine, clear off and clean the working area around the machine. Failure to do so may result in overlooking of failed section, allowing dust to enter, getting dust/mud in worker's eye, inducing toppling/falling accidents, and/or occurrence of fires, possibly causing personal injury or death.

- After removing any objects, grease, oils, paints, and debris which may disturb the implementation of work from the machine, wash the machine so that the machine can be serviced safely.

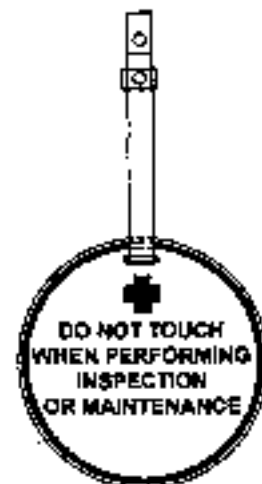


LSM-05-118

### 5.10 Attach a "DO NOT OPERATE" tag.

If the engine is started, or the machine is operated by an unauthorized person during service work, personal injury or death may result.

Attach a "DO NOT OPERATE" tag in an easy-to-see position such as on the cab door or on the control levers before beginning work such as inspection, adjustment, or replacement on the machine. If required, attach the same tags to the surroundings of the machine. Never attempt to operate the machine with a "DO NOT OPERATE" tag attached at your own discretion.

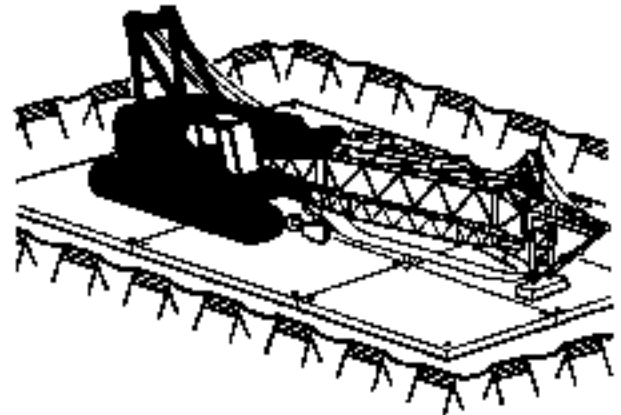


SA-442

## 2 SAFETY

### 5.11 Keep unauthorized personnel out of working area.

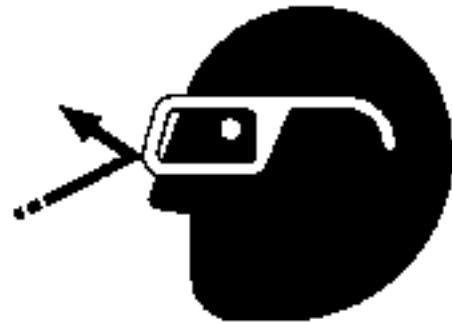
Allowing unauthorized personnel to enter the working area may result in an unexpected accident. Keep all unauthorized persons out of the vicinity around the machine when servicing the machine.



12289-02-102

### 5.12 Use protective items.

Use protective items suitable to the work. Working at a high position, and/or working under such hazardous circumstances as dust, soil, or metal pieces may scatter without using correct protective items may result in personal injury or death. Check that each protective item functions correctly beforehand.



12289-02-103

#### • Protective items:

A hard hat, Safety shoes, Safety glasses, Respirator or Filter mask, Heavy gloves, Safety belt, etc.

### 5.13 Protect against flying parts.

- Grease pressure in the track adjuster is very high. Failure to observe the following points may result in serious personal injury or death.
  - Do not remove the coupler assembly.
  - The parts may fly off. Do not position any part of your body in front of the coupler.
- The travel reduction gear device is pressurized.
  - The parts may fly off. Do not position any part of your body in front of the air breather plug.
  - Gear oil temperature is high. Wait for oil to become cool. Slowly loosen the air breather plug to release the pressure.



12289-02-104

## 2 SAFETY

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### 5.14 Appoint a job site conductor.

Before beginning work with multiple personnel, appoint a job site conductor and make sure that all personnel obey the conductor's directions. Poor communication among personnel concerned may introduce an unexpected accident.



BA-01

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### 5.15 Repair the machine as soon as any abnormality is found.

Repair the machine as soon as any abnormality is found. Failure to do so may cause personal injury or death.

---

### 5.16 Begin to work only after the engine is stopped.

Begin work only after the engine has stopped. Coming in contact with a moving part by mistake during maintenance of the machine may result in being caught or entangled in the machine, possibly causing personal injury or death. In case servicing the machine with the engine running or while operating the machine is unavoidable, conduct such work with more than one person by strictly obeying the following points while ensuring safety of mutual persons.

- Let one person take the operator's seat to stop the engine and the machine at any time as required. Do not touch all control levers other than necessary one.
  - The person, who engages in servicing the machine, must be careful not to allow any part of the body, clothing, or tools to come in contact with the rotating or moving machine parts. Avoid wearing loose items that can be easily caught in the machine.
-



## 2 SAFETY

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### 5.17 Maintain brakes in good order.

Poor maintenance of the brakes may create hazardous conditions. Be sure to maintain the brakes in good order.

- Wedge both crawlers to prevent the machine from running away.
  - Lower the boom/tower to the ground.
  - Engage the drum and swing locks.
- 

### 5.18 Precautions for handling batteries.

Battery electrolyte is diluted sulfuric acid which generates inflammable hydrogen gas. If the batteries are incorrectly handled, the battery may explode, possibly cause personal injury due to burns. Obey the following instructions when handling the batteries.

- Keep sparks and open flame away from the batteries.
- Never short-circuit between the posts.
  - Use a voltmeter or hydrometer when checking the battery voltage. Never check battery charge by placing a metal object across the posts.
  - Before checking the electrical circuits, disconnect the ground cable from the battery.
- When connecting the battery cable, securely connect the cable so that any malfunction in the electric system does not occur due to incomplete cable contact.
- Do not charge a frozen battery.
  - Warm the battery to more than 16°C if the battery becomes frozen.
- When servicing a battery, wear eye protection, rubber gloves, and long sleeved working clothes. If electrolyte spills on your cloth or skin, flush the cloth or skin with large amounts of water and seek medical attention as needed. If electrolyte splashes in your eyes, immediately flush eyes with water and get medical attention.
- Do not continue to use or charge the battery when electrolyte level is lower than specified (LOWER LEVEL). Explosion of the battery may result.



SA-02

## 2 SAFETY

### 5.19 Stay clear of moving parts.

"Pinch points" which result from relative motion between mechanical parts such as areas between the tower/boom and superstructure, hydraulic cylinders and brackets, and link mechanism sections will change its space when the machine operates, possibly causing personal injury or death as person in the pinch point may be caught or crushed by moving parts. Do not allow any person or any part of the body to enter the pinch points.



SA-020

### 5.20 Avoid high-pressure oil.

Spray of diesel fuel/hydraulic oil under pressure, or flying off of cap/plug from hydraulic lines may cause serious personal injury. Relieve oil pressure before servicing the hydraulic system. When searching for oil leaks, use a piece of cardboard or wooden plate and protect hands and body from high-pressure oil by wearing safety glasses and protective gloves. If an accident occurs, see a doctor familiar with this type of injury immediately.



SA-021



SA-022

## 2 SAFETY

### 5.21 Prevent fires.

Fuel, hydraulic oil and lubricant leaks can lead to fires, possibly resulting in personal injury or death. Retighten or replace any loose or damaged hoses and parts in the fluid lines.



SA-01



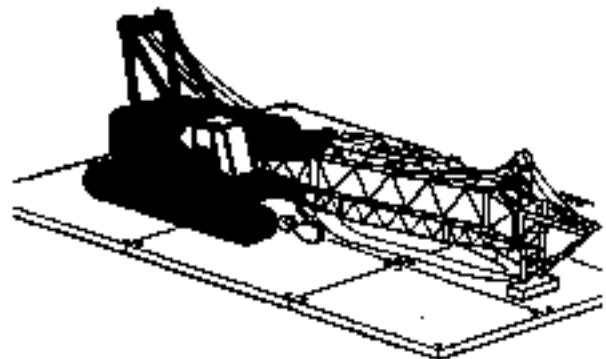
SA-02

### 5.22 Securely support raised machine.

Working under a raised machine without using proper supports may result in personal injury or death if the machine falls or tips over. Obey the following instructions before beginning to work.

#### Machines Equipped with Tower Attachment

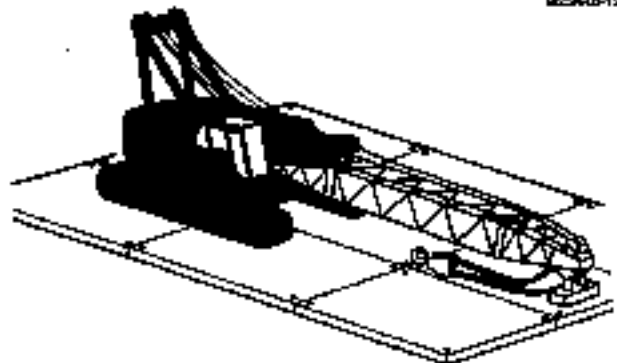
- Lower the tower to the ground.
  - In case the lowering the tower is impossible, securely support the tower with rigid stands.



MSM-05-15a

#### Machine Equipped with Crane Attachment

- Lower the boom to the ground.
  - In case the lowering the boom is impossible, securely support the tower with rigid stands.
- Wedge the crawlers.
- Use stays or stands strong enough to support the machine weight under the base carrier to securely support the machine.



MSM-05-15b

## 2 SAFETY

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### 5.23 Handle Fluid Safely.

All fuel and most lubricants are flammable. If fluid is spilled, the occurrence of fires, or slipping or falling accident may result, possibly introducing personal injury or death. Handle fluids by following the instructions below.

- Refill fluids in a well ventilated place.
- Stop the engine.
- Keep sparks and open flame away from fluids.
- Securely tighten the fuel and oil filler caps.
- Immediately wipe off any spilled fluids.



SA-018



SA-019

### 5.24 Prevent Burns.

Refill the coolant only after the engine and the radiator have cooled. Failure to do so may cause severe burns.



SA-020

### 5.25 Always use proper work light.

Using open flames such as a lighter to check the fluids instead of proper illumination may cause personal injury or death due to occurrence of fires or explosions. Always use a work light protected with a guard.



SA-021

## 2 SAFETY

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### 5.26 Precautions for maintenance of electric system.

Before maintaining the electric system, disconnect the negative side cable from the battery first. Failure to do so may cause fires, possibly resulting in severe injury.



84-182

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### 5.27 Lock opened doors and/or covers.

When the doors and/or covers are opened, be sure to lock them so that they do not close automatically. The doors and/or covers are suddenly closed by a gust of wind during maintenance, serious injury may result. Do not open the doors and/or covers when the wind is blowing.

### 5.28 Do not hang out of the cab window toward the tower/boom.

Body parts extended out of the cab window on the tower/boom side may become pinched between the cab and the tower/boom when the tower/boom is operated, possibly causing personal injury or death. Do not hang out of the cab window toward the tower/boom.

## 2 SAFETY

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### 5.29 Do not drop a tool and/or part.

Be careful not to drop a tool and/or part. If a tool and/or part is dropped by mistake, it may hit other person, or damage the machine, possibly causing an unexpected accident. In case any object is dropped in the machine, immediately pick it up.

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### 5.30 Watch out your step and head.

If maintenance work is carried out with distracted mind, falling accident due to losing your footing, or injury due to hitting the head on the hook, tower, boom, or jib may result. Watch your step and be careful of your head during maintenance work.

### 5.31 Precautions for washing the machine.

When washing the machine, wear safety glasses and be cautious not to allow the electrical components to become splashed with water. If highly pressurized steam is used to clean the machine, mud may be scattered and may enter your eyes.

If water permeates into the electrical system, a malfunction of the system may result, possibly causing an unexpected accident.

## 2 SAFETY

### 5.32 Precautions for welding.

When welding is conducted on painted surfaces, observe the following points.

- Conduct welding outdoor or in a well ventilated area. If welding is conducted in a poorly ventilated area, harmful fumes produced by heating paints may cause an unexpected accident.
- When removing paints using a grinder, removed paint powder and/or dust may enter your eyes and/or can be inhaled, possibly causing an unexpected accident. Wear safety glasses and a respirator.
- Before conducting welding after removing paints with a solvent, sufficiently wash the solvent away with soap and water. Solvents are flammable. Keep the solvent away from open flames to prevent fires.



SA-022

### 5.33 Do not heat hydraulic components and/or lines.

If hydraulic components and/or lines or their vicinity is excessively heated, fire breakout may result, possibly causing personal injury or death. Do not heat them excessively when welding or cutting with a gas torch.



SA-023

### 5.34 Do not modify any parts/components.

Do not modify any parts/components in the hydraulic and electrical systems, and electrical cables. Unauthorized adjustment and/or modification of machine parts/components may create hazardous situations, possibly causing an unexpected accident.



SA-018

## 2 SAFETY

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### 5.35 Repair the tower, boom, or jib on the ground.

When the tower, boom, or jib is required to be repaired, be sure to lower the tower, boom, or jib on the ground or on proper stands. Never attempt to repair the tower, boom, or jib while holding it in the air. If it falls, personal injury or death may result.

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### 5.36 Do not use damaged tower, boom, and/or jib.

If the tower, boom, and/or jib becomes damaged, replace it with a new one. Using a damaged tower, boom, and/or jib with a dent even if it is a small local one may cause a falling accident, possibly introducing personal injury or death.

- Repairing the tower, boom, or jib requires special tools and procedures. Please consult your nearest Hitachi Sumitomo dealer for repair of the tower, boom, or jib.

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### 5.37 Never weld another object to the tower, boom, or jib.

Never weld another object to the tower, boom, or jib. Welding on the tower, boom or jib will reduce the strength of the tower, boom, and/or jib, possibly causing personal injury or death.



SA-001

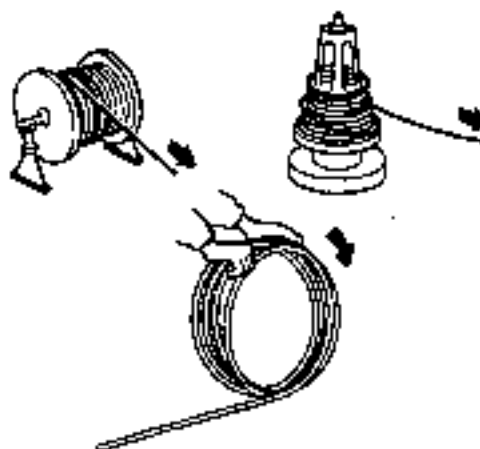


## 2 SAFETY

### 5.38 Precautions for handling wire rope.

Incorrect handling wire rope may cause personal injury and shorten the service life of the rope. When handling wire rope, follow the instructions below.

- When handling wire rope, be sure to wear heavy gloves. Especially be careful when handling broken strands of wire or kinked rope.
- When paying out new wire rope from a wooden reel, set the reel so that the reel can be rotated in the same direction as wire rope is paid out to prevent the wire rope from being kinked or untwisted.

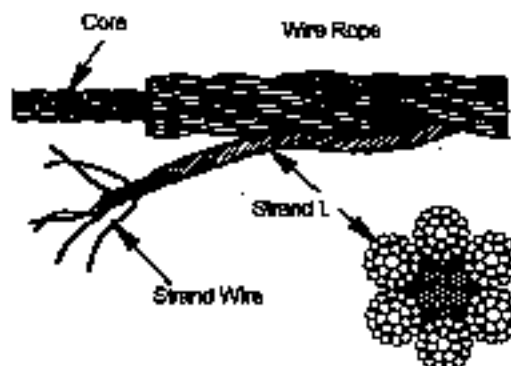


M224-02-132

### 5.39 Inspect wire rope correctly.

Neglecting inspection of wire rope may cause a breakage accident of wire rope. Check the following points. Replace wire rope if one of the failures described below is found.

- More than 10 % number of strands (except filler type) within one length of lay broken.
- Reduction in diameter exceeded more than 7% of the nominal diameter.
- Kinked wire rope.
- Remarkable deformation or corrosion is recognized.
- Wire rope affected by high heat or sparks (such as welding).

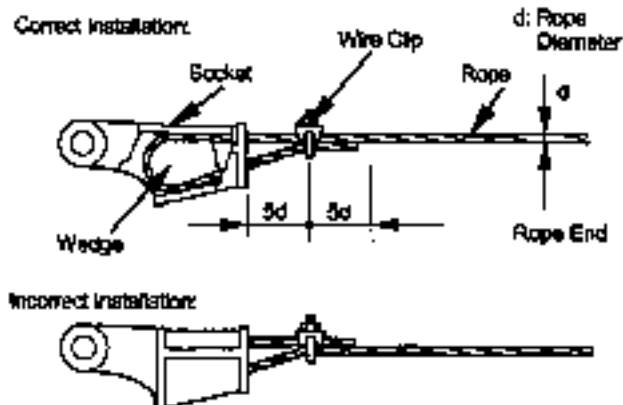


M224-02-098

### 5.40 Install rope socket correctly.

Incorrect installation of rope sockets may cause an unexpected accident due to pulling out of wire rope from the socket. Correctly install the wire rope sockets by observing the instructions below.

- Check that the sizes of sockets, wedges, and wire clips match the diameter of wire rope.
- Use the same taper sockets and wedges.
- Check that wire rope is correctly installed into the socket.
- Check that the wire clips are installed in the correct method.
- Check that the wire clips are installed at the correct intervals.



M224-02-143

## 2 SAFETY

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### 5.41 Use the tool appropriate to the work.

Using broken or deteriorated tools or using substitution tools may cause an unexpected accident. Be sure to use the tool appropriate to the work.



2A-092

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### 5.42 Do not adjust the hydraulic components.

The hydraulic components are strictly adjusted before the shipment from the factory. Incorrect adjustment of the hydraulic components may create unsafe safety situation or malfunction, possibly resulting in an unexpected accident. Consult your nearest Hitachi dealer when the adjustment of a hydraulic component is required.

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### 5.43 Precautions for using booster batteries.

Starting the engine with booster batteries following an incorrect method may cause the batteries to explode, possibly resulting in personal injury or death. Strictly observe the instructions shown below when starting the engine using booster batteries.

- Wear safety glasses.
- Connect the cable to the positive battery terminal first when connecting the cables to the batteries. Disconnect the cable from the negative battery terminal first when disconnecting the cables from the batteries.
- Use the booster batteries with a work team of two persons. Let the one person take the operator's seat. Be careful not to reverse the booster cable connections.
  - Do not connect the positive terminal to the negative terminal.
- Take care not to allow the positive battery terminal to come in contact with the vehicle frame through a metal piece such as a tool.



2A-092

## 2 SAFETY

### 5.44 Prevent fires.

Many kinds of flammable materials such as fuel and oils are handled in maintenance work. Neglecting care may cause personal injury or death due to fires. Extinguish fire hazards and keep flammable material away from the working area. Strictly follow the instructions shown below.

- Do not service the machine while smoking.
- Refill the fuel tank outdoors.
- Always stop the engine before refueling the machine.
- Keep fire hazards away during refueling the machine.
- Let the refill hose nozzle keep in contact with the fuel tank during refueling to prevent sparks from occurring due to electrostatic charge.
- When checking fuel, lubricants, and electrolyte, use an anti-explosion type flash light.
- Securely tighten the fuel, lubricant, and hydraulic oil filler caps.
- Before using a grinder and/or performing welding, keep flammable materials away from the working area.
- Check the fuel, lubricant, and hydraulic oil for leaking.
- In case any leaks are found, repair the cause of the leak. Wipe off the leaked fluid.
- Check the shield cover of electrical harnesses for any damage, and all harness connectors for any abnormality such as looseness. Keep all connectors clean.
- Store the flammable fluids in a place well away from fire hazards.
- Always maintain the machine and its surroundings clean.
  - Do not leave pieces of oily cloth scattered about.
  - Remove flammable material like spilled oils or oily dust from the machine.



SA-074



SA-075

## 2 SAFETY

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- Use nonflammable cleaning oil when cleaning the machine parts/components.
- Damaged or lost engine access covers may introduce fires.
- In case any of the engine access covers is lost or damaged, replace or repair it before operating the machine.
- Check where the fire extinguisher is located and understand how to operate it beforehand.

If fires break out, immediately stop the engine. Evacuate from the machine.

- Fires may spread unless the engine is not stopped if fire breaks out, possibly obstructing fire fighting.
    - Be sure to check the key switch function every day before operating the machine.
1. Start the engine. Run the engine at slow idle speed.
  2. Turn the key switch OFF. Check that the engine can be stopped.

In case any abnormality is noticed, be sure to repair the cause of the abnormality before operating the machine.

- If the fire is expected to be easily extinguished at the early stage, battle the fire while securing the evacuation way.

## 2 SAFETY

### 5.45 Prevent burns.

The machine components, coolant, lubricants, and hydraulic oil become hot during and immediately after operation of the machine. Wait for the fluids and components to cool before starting any maintenance work. Failure to do so may cause severe burns.

- The radiator is pressurized so that the hot coolant may escape if the cap is removed without releasing all pressure. Turn the cap slowly to release the remaining pressure only after the coolant temperature is cool. Then, remove the cap.



SA-224



SA-226

## 2 SAFETY

### 5.46 Handle hazardous chemicals safely.

- Direct contact to hazardous chemicals may cause serious injury. Potentially hazardous chemicals used in the machine include such items as lubricants, electrolyte, coolant, paints, and adhesives.
  - A Material Safety Data Sheet (MSDS) provides the following specific details on chemicals:
    - Type, properties, and extent of hazardous chemicals
    - Precautions for storing and handling
    - Emergency response techniques when hazardous situation occurs.
- Check the MSDS before handling the hazardous chemicals. Handle them in the correct method.
- Contact your nearest Hitachi dealer for the MSDS on hazardous chemicals.



SA-308

### 5.47 Dispose of waste properly.

Improperly disposing of waste can contaminate the environment and threaten the ecology. When disposing of machine waste oil or used filters, strictly follow the instructions shown below.

- When draining a waste fluid from the machine, be sure to receive it with a container.
- Do not let waste discharge onto the ground, or into rivers or marshy depressions.
- Dispose of hydraulic oil, fuel, coolant, brake oil, solvent, filters, batteries or other hazardous material in the correct way conforming to the laws and regulations concerned.



SA-308

## 2 SAFETY

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### 5.48 Service air conditioner safely.

- Should the refrigerant spill into eyes or onto skin, loss of sight or a cold injury may result.
  - Refer to the instructions described on the refrigerant container for handling the refrigerant.
  - Use a recovery and recycling system to avoid venting the refrigerant into the atmosphere.
  - Never let the refrigerant make contact with the skin.



21-40

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### 5.49 Be sure to recover freon.

Freon (R134a equivalent to type HFC) is used as the refrigerant for the air conditioner mounted on this machine. If the refrigerant is arbitrarily discharged into the atmosphere, depletion of ozone layer and global warming may be contributed. Do not discharge the refrigerant easily into the atmosphere to protect the global environment. Before disposing of the air conditioner, recover the refrigerant from the unit.

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### 5.50 Precautions to be taken after servicing the machine.

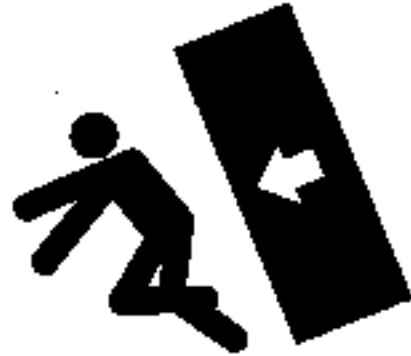
Neglecting operational checks of the machine after servicing the machine may disturb to find out machine failures such as oil leaks or any malfunction of a component and/or system in the initial stage of operation, possibly causing an unexpected accident. Be sure to check that all system operation is normal, no oil-leaks are present, and all fasteners are securely tightened. When checking each system function, slowly operate the respective system with the engine running at slow speed first. After confirming that no failure is found, recheck all systems with the engine speed increased. Remember that maintenance work is complete only after machine performance check is completed.

## 2 SAFETY

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### 5.51 Store the front attachment safely.

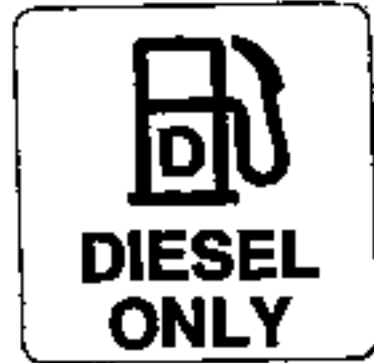
The attachments such as hooks or buckets removed from the machine can easily fall if it is left without being properly supported, possibly causing personal injury or death. Store the attachments such as hooks or buckets in their steady position. Keep all outsiders away from storage areas.



SA-024

### 5.52 Use diesel fuels and correct lubricants

Always use diesel fuels and correct lubricants. The engine is equipped with super high pressure common-rail type fuel injection system. The use of fuels other than diesel oil may cause serious breakdown such as fuel injection device seizing or wearing. Failure to do so will result in machine damage and loss of Hitachi Sumitomo product warranty.



YDSU 03-001



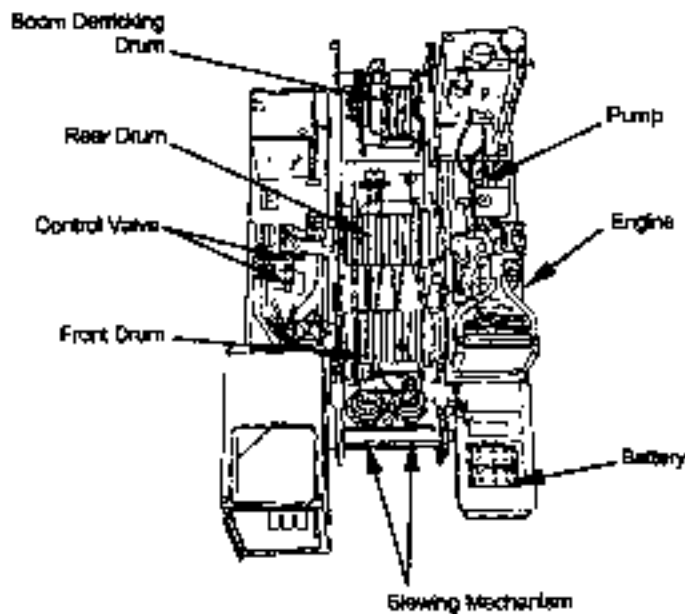
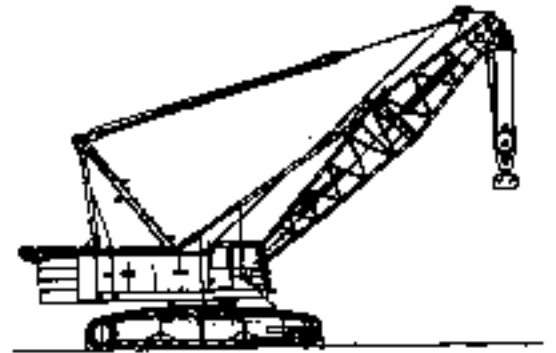
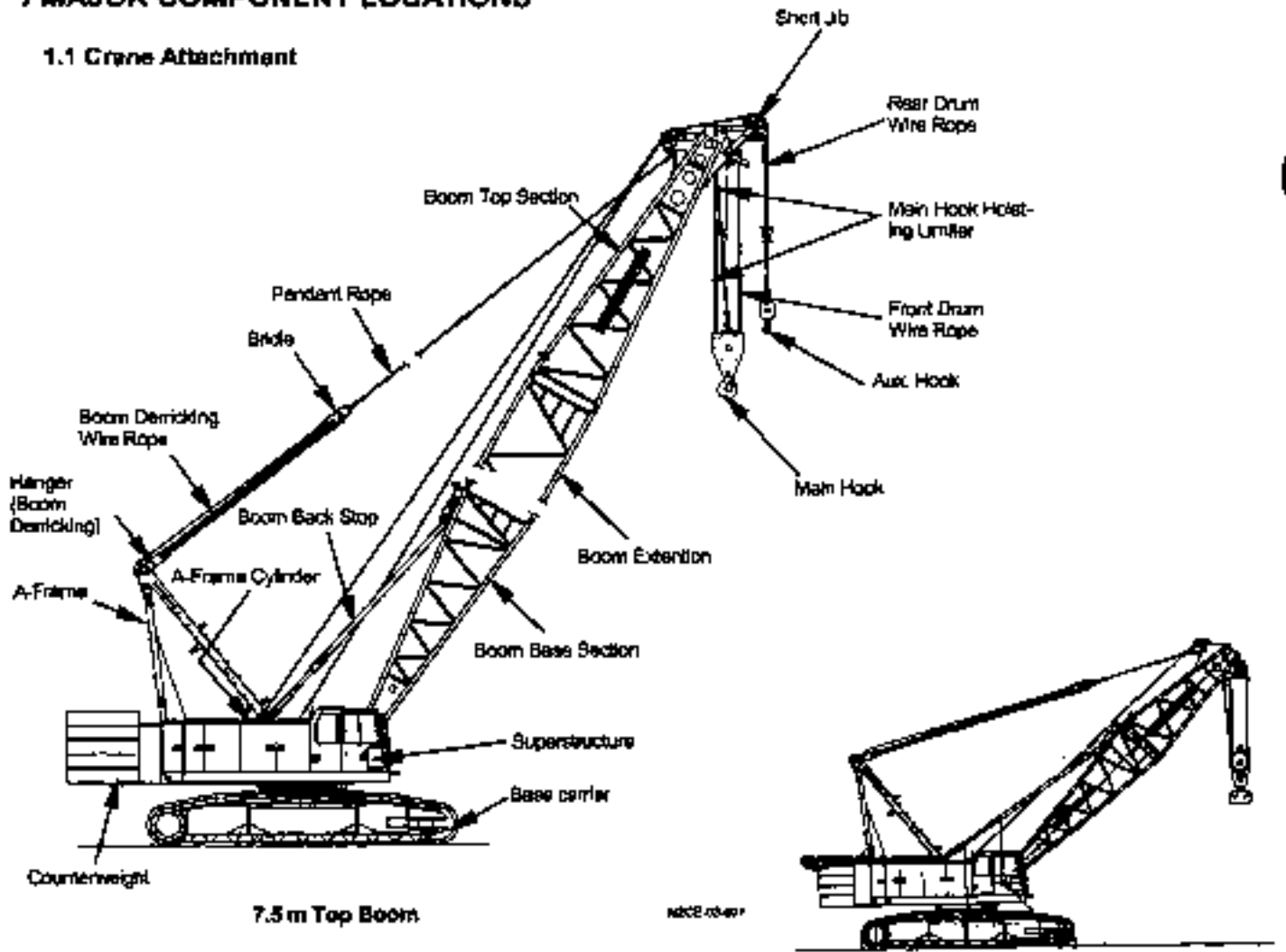
## 2 SAFETY

### MEMO

# 3 COMPONENTS NAME AND FUNCTION

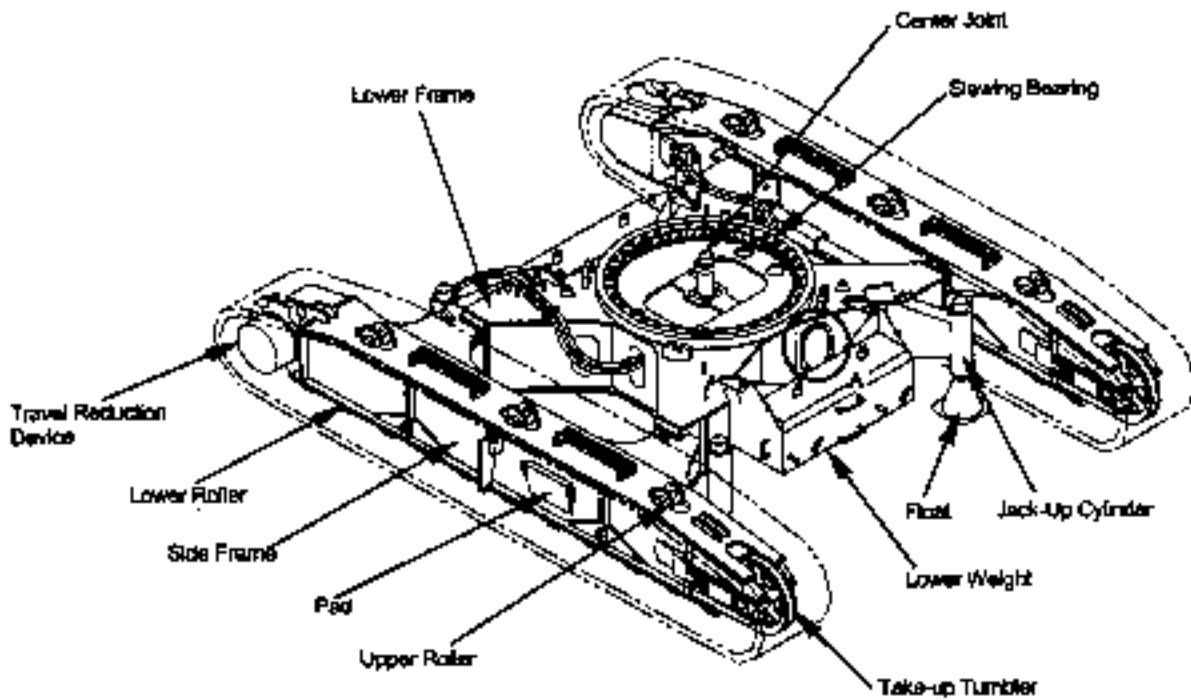
## 1 MAJOR COMPONENT LOCATIONS

### 1.1 Crane Attachment

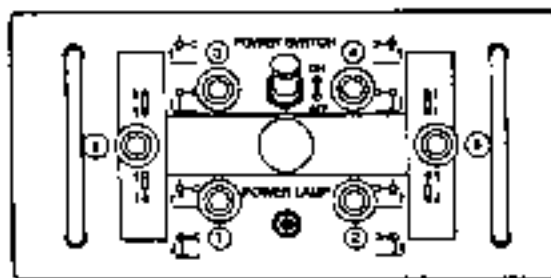


## 3 COMPONENTS NAME AND FUNCTION

### 1.2 Undercarriage



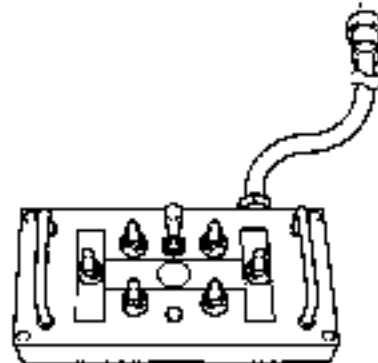
W028-03-000



Details of the Remote Control Panel



Detail A



Remote Control Box (Jack and Retraction Cylinder)

W028-03-000

\* : The metal power outlet is located at the rear side of the base machine.

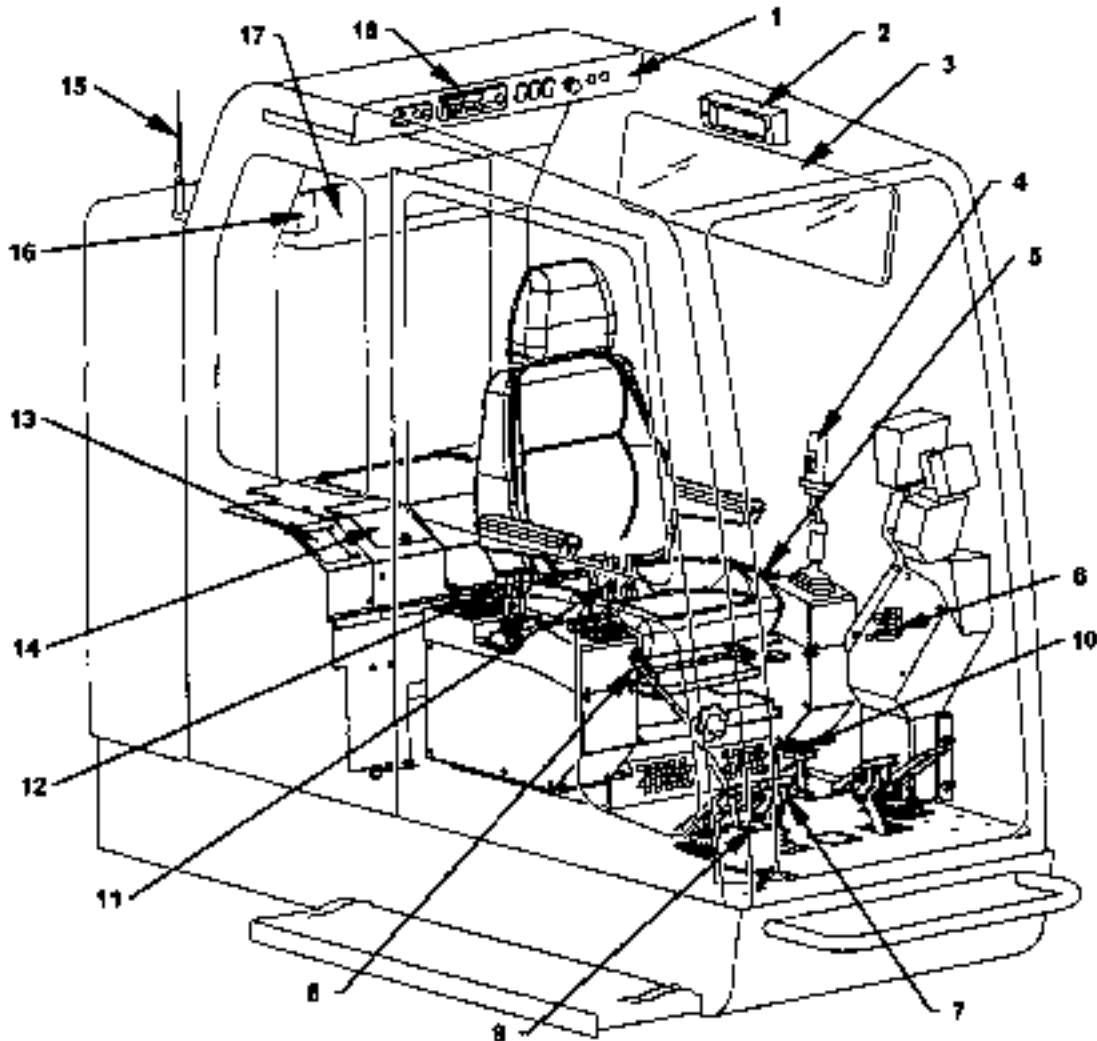
## 3 COMPONENTS NAME AND FUNCTION

### 2 OPERATOR'S STATION LAYOUT

#### 2.1 Locations and Component Names

##### 2.1.1 Overall View of Operator's Station

Refer to 4 OPERATION section for the details of operation.

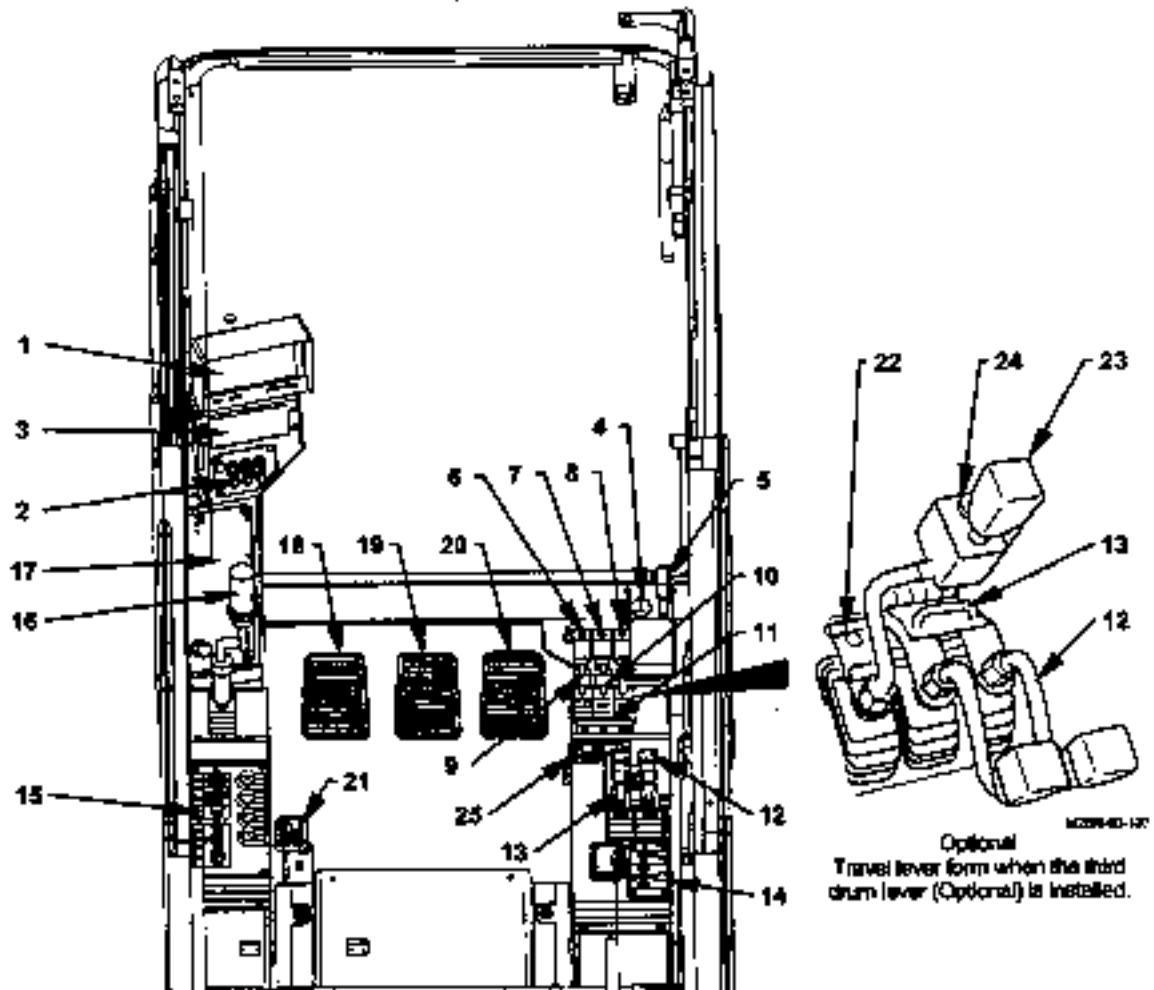


- |  |  |
|--|--|
| 1- Rear Overhead Panel (See Page 3-14) | 10- Slewing Lock Pedal (See Page 3-8)                    |
| 2- Side Overhead Panel (See Page 3-14) | 11- Drum Lever (See Page 3-8)                            |
| 3- Sun Visor                           | 12- Travel Levers (See Page 3-7)                         |
| 4- Slewing Lever (See Page 3-7)        | 13- Air Conditioner Control Panel (See Page 3-23)        |
| 5- Left Stand (See Page 3-9)           | 14- Fuse Box (See Page 3-28)                             |
| 6- Drink Holder                        | 15- Antenna  |
| 7- Drum Brake Pedal (See Page 3-8)     | 16- Alarm and Advance Notice Output Unit (See Page 3-30) |
| 8- Lock Lever (See Page 3-5)           | 17- Locker   |
| 9- Level (See Page 3-29)               | 18- FM/AM Radio (See Page 3-26)                          |

## 3 COMPONENTS NAME AND FUNCTION

### 2.1.2 Operator's Station

Refer to the Operation in Section 4 for the details of operation.



1029-03-127

- |   |   |
|---|---|
| 1- Rated Capacity Limiter (See Page 3-37)                         | 12- Travel Levers   |
| 2- Brake Mode Indicators (See Page 4-18)                          | 13- Travel Lever Lock (See Page 3-7)                                |
| 3- Rated Capacity Limiter Switch Panel (See Page 3-43)            | 14- Right Stand   |
| 4- Level  | 15- Left Stand  |
| 5- Lock Lever   | 16- Slewing Lever/Accelerator Grip/Slewing Brake Switch/Horn Switch |
| 6- Front Drum Lever/Drum Rotation Sensor (See Page 3-6)           | 17- Monitor Panel (See Page 3-16)                                   |
| 7- Rear Drum Lever/Drum Rotation Sensor (See Page 3-6)            | 18- Front Drum Brake Pedal  |
| 8- Boom Derricking Drum Lever/Drum Rotation Sensor (See Page 3-6) | 19- Third Drum Brake Pedal (Optional)                               |
| 9- Front Drum Brake Mode Switch (See Page 3-6)                    | 20- Rear Drum Brake Pedal   |
| 10- Rear Drum Brake Mode Switch (See Page 3-6)                    | 21- Slewing Lock Pedal  |
| 11- Drum Lever Lock (Front/Rear/Boom Derricking) (See Page 3-6)   | 22- Third Drum Lever Lock (Optional)                                |
|   | 23- Third Drum Lever (Optional)                                     |
|   | 24- Third Drum Brake Mode Switch (Optional)                         |
|   | 25- Accelerator Pedal (Optional)                                    |

## 3 COMPONENTS NAME AND FUNCTION

### 2.2 Levers And Pedals

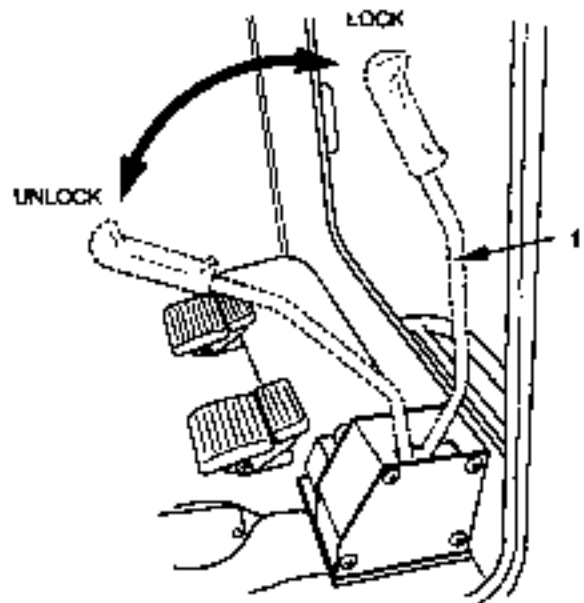
#### 2.2.1 Lock Lever

Lock lever (1) is a safety device to prevent the machine from being unintentionally operated even if the operator comes in contact with the control lever by mistake such as when mounting or dismounting the machine.



#### CAUTION:

- To deactivate all actuators, securely raise lock lever (1) to the LOCK position. Unless the lever is fully raised to the LOCK position, all actuators will not be deactivated, creating a hazardous condition. Before moving lock lever (1) to the UNLOCK position, be sure to check that all control levers are in neutral. Failure to do so may cause the machine to suddenly move, possibly resulting in personal injury or death.
- Before leaving the machine, be sure to stop the engine and move lock lever (1) to the LOCK position.
- After the work is complete or when transporting the machine, be sure to move lock lever (1) to the LOCK position.



MOOR-00-007

**LOCK Position:** Hook and boom derricking, slewing, and travel functions become inoperable.

**UNLOCK Position:** Hook and boom derricking, slewing, and travel functions are operable.

## 3 COMPONENTS NAME AND FUNCTION

### 2.2.2 Drum Levers

- 1- Front drum lever
- 2- Rear drum lever
- 3- Boom derricking drum lever

These levers are used to drive, brake, and stop the drums.

- The speed modes (first and second) of the front and rear drums can be selected by operating the levers. Both speed modes are maintained with the lever detent function.

- 4- Front drum rotation sensor
- 5- Rear drum rotation sensor
- 6- Boom derricking drum rotation sensor

When the drum speed feedback switch is turned ON, the drum speed feedback begins.

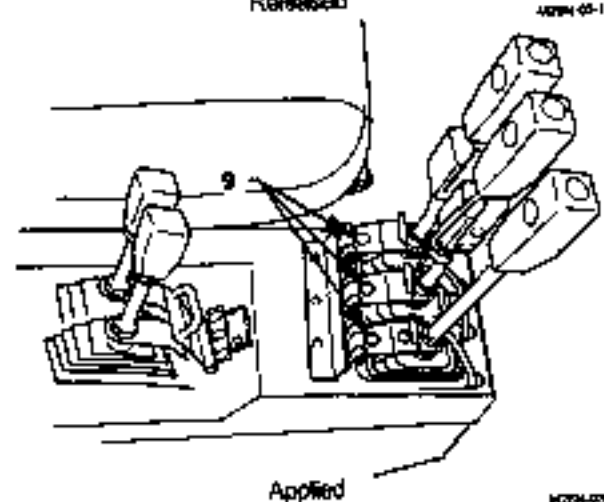
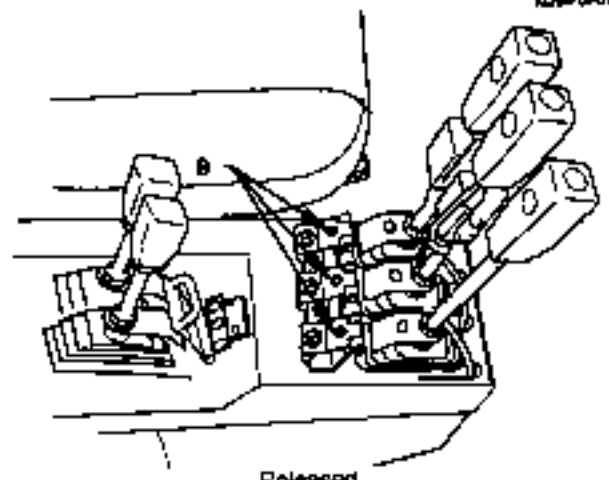
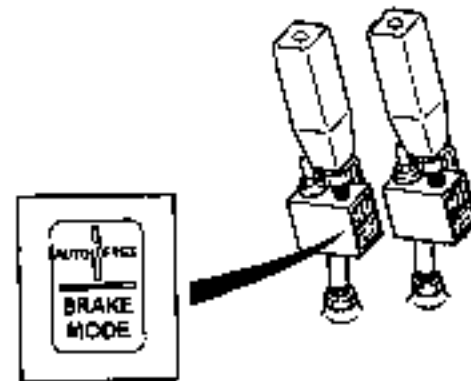
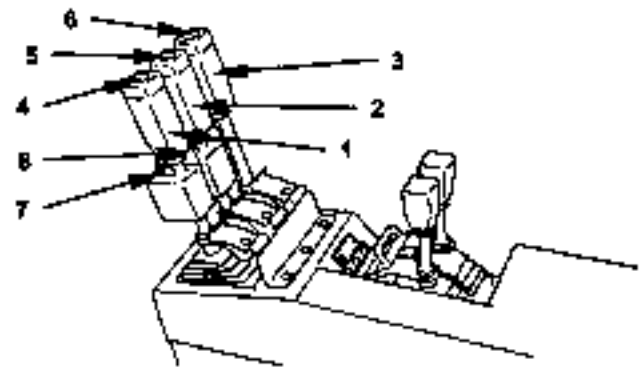
- 7- Front drum brake mode switch
- 8- Rear drum brake mode switch

- These switches are used to select the drum brake mode.

AUTO  : Auto brake  
 FREE  : Freefall

**NOTE:** The engine cannot be started unless drum brake mode switches (7 and 8) are in the Auto brake mode.

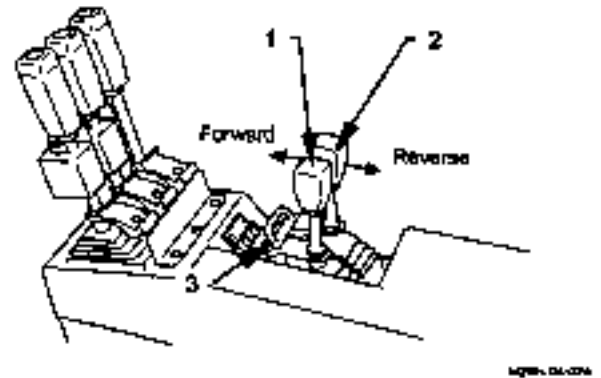
- 9- Apply the drum lever lock to the drum lever not required to operate to prevent mis-operation.



## 3 COMPONENTS NAME AND FUNCTION

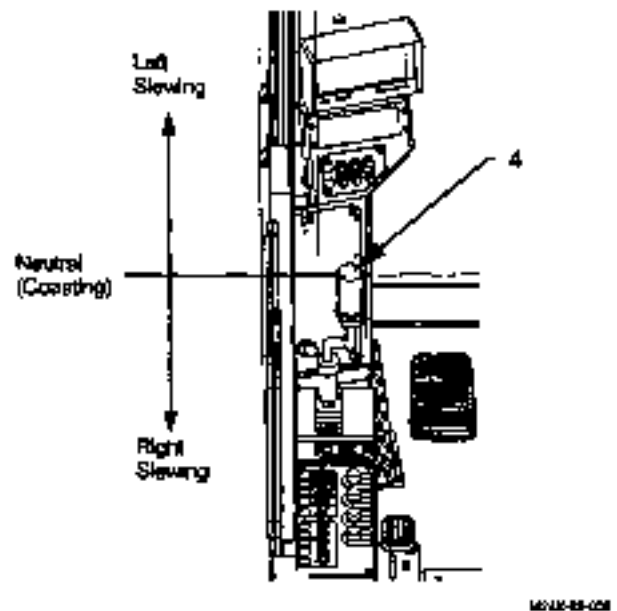
### 2.2.3 Travel Levers

- 1- Left travel lever
  - 2- Right travel lever
- These levers are used to drive, brake, and stop the travel system of the machine.
- In case the undercarriage is facing backward, the machine travel direction becomes opposite to the lever operation direction.
- 3- Travel lever lock
- When travel operation is not required, place travel levers (1 and 2) in neutral and apply travel lever lock (3) to prevent mis-operation.



### 2.2.4 Slewing Lever

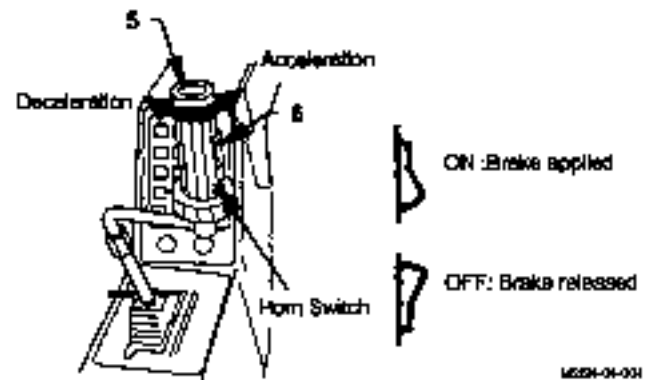
- 4- The slewing lever (4) leftward to rotate the upperstructure counterclockwise (Left Slewing).  
Slewing lever (4) rightward to rotate the upperstructure counterclockwise (Right Slewing).
  - 5- Accelerator grip
- The engine speed can be controlled by turning accelerator grip (5) on the left stand.
- Clockwise: Deceleration (to idle speed)  
Counterclockwise: Acceleration



- 6- Slewing brake switch
- The switch is used to hold the upperstructure so that the upperstructure does not rotate. Do not operate this switch to stop the upperstructure while slewing.

ON: The brake is applied.  
OFF: The brake is released.

**NOTE:** The engine can not be started when slewing brake (6) is OFF. Be sure to turn slewing brake switch (6) ON before attempting to start the engine.



M224-01-001  
M224-01-001



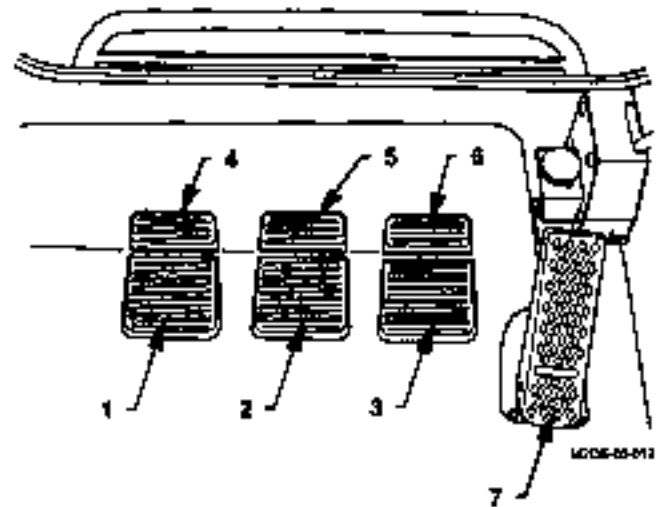
## 3 COMPONENTS NAME AND FUNCTION

### 2.2.5 Pedals

- 1- Front drum brake pedal
- 2- Third drum brake pedal (Optional)
- 3- Rear drum brake pedal

**Auto Brake mode:** Both hoist and lower operations can be performed regardless if the pedal lock is in either the engaged or disengaged position. Perform both operations with the pedal lock engaged to ensure safety operation.

**Freefall mode:** When the hoist lever is in neutral, freefall operation can be made with the pedal lock disengaged and the brake pedal released. Braking operation is controlled in proportion to how much the brake pedal is stroked. Both hoist and lower operations can be performed regardless if the pedal lock is in either the engaged or disengaged position. Perform both operations with the pedal lock engaged to ensure safety operation, or with the brake pedal stepped on.

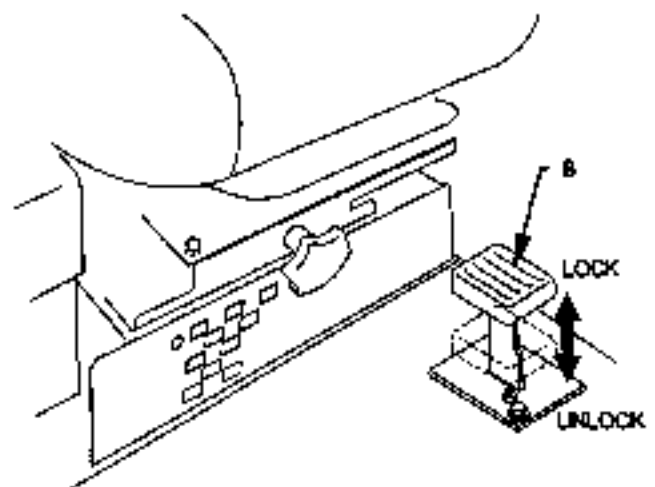


- 4- Front drum brake pedal lock
  - 5- Third drum brake pedal lock (Optional)
  - 6- Rear drum brake pedal lock
- Drum brake pedals (1, 2, and 3) are locked with these pedals.

- Fully step on drum brake pedals (1, 2, and 3) to lock all of them. When releasing the locks, step on drum brake pedal locks (4, 5, and 6) with the toe of your foot.

- 7- Accelerator pedal (Optional)

- 8- Slewing lock pedal  
After aligning the lock pin on the superstructure side with the notch on the undercarriage side, move slewing lock pedal (7) to the LOCK position to engage the slewing lock pin in the lock groove on the track frame. Move slewing lock pedal (7) to the UNLOCK position to disengage the swing lock pin.

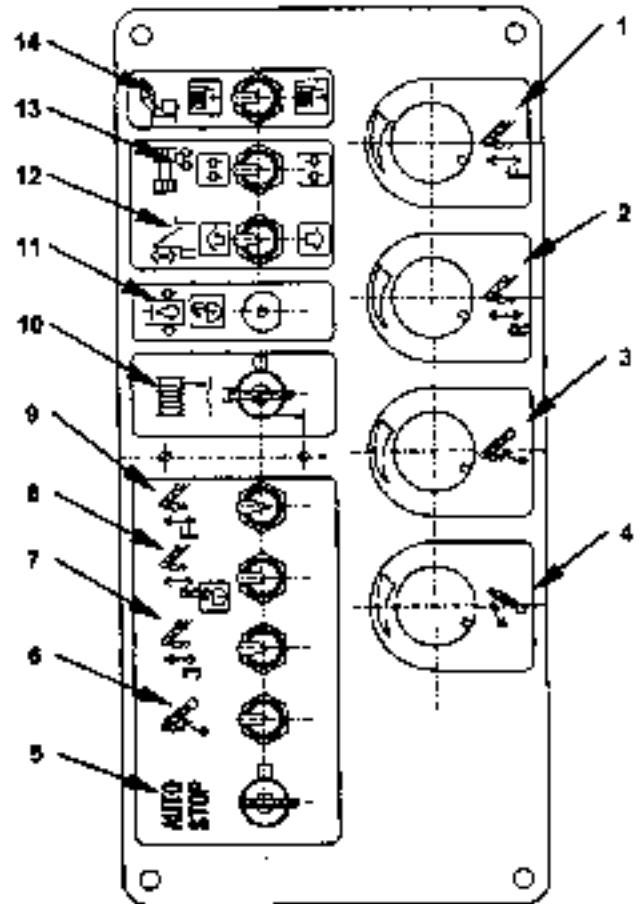


## 3 COMPONENTS NAME AND FUNCTION

### 2.3 Left Stand

#### 2.3.1 Location and Names of Switches and Dials

- 1- Front Drum Speed Control Dial
- 2- Rear Drum Speed Control Dial
- 3- Boom Derricking Drum Speed Control Dial
- 4- Stewing Speed Control Dial
- 5- Auto Stop Override Select Key Switch
- 6- Boom Derricking Drum Auto Stop Override Switch
- 7- Third Drum Auto Stop Override Switch
- 8- Rear Drum Auto Stop Override Switch
- 9- Front Drum Auto Stop Override Switch
- 10- Brake Mode Select Key Switch
- 11- Pilot Control Oil Pressure Recovery Switch
- 12- A-Frame Raise/Lower Switch
- 13- Retraction Switch
- 14- Reeving Winch (Pay out/Wind) Switch

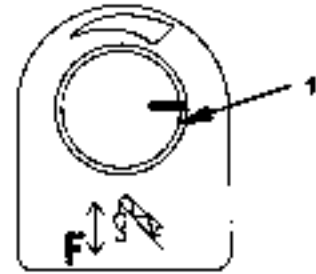


14291-03-006

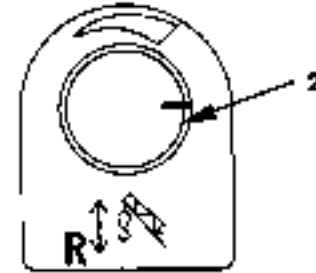
### 3 COMPONENTS NAME AND FUNCTION

#### 2.3.2 Switches and Dials

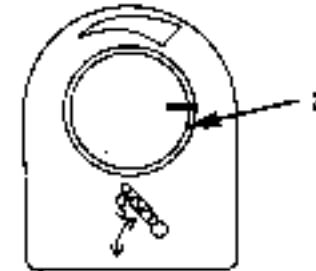
- |  |  |
|--|--|
| 1- Front Drum Speed Control Dial           | } The maximum speeds of the front, rear, and boom derricking drums, and slewing can be adjusted to match the job conditions. |
| 2- Rear Drum Speed Control Dial            |  |
| 3- Boom Derricking Drum Speed Control Dial |  |
| 4- Slewing Speed Control Dial              |  |



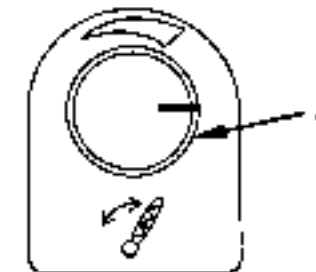
W32H-05-078



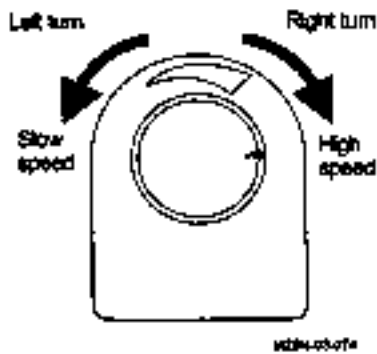
W32H-05-078



W32H-05-080



W32H-05-081



Right turn: The drum and slewing speed increases.

Left turn: The drum and slewing speed decreases.

**NOTE:** In case no speed control is required, rotate the dial fully to the maximum speed side (right turn).

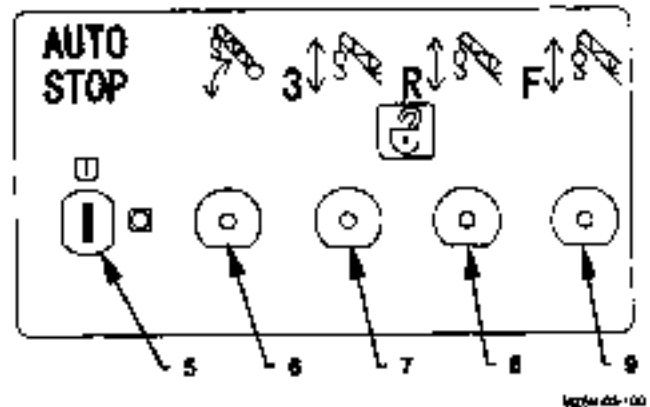
### 3 COMPONENTS NAME AND FUNCTION

#### 5- Auto Stop Override Select Key Switch.

**IMPORTANT:** When the machine is in operation, turn the monitor key to the  position and remove the key. Consign the key to the job-site manager.

This key deactivates the auto stop functions of switches (6, 7, 8, and 9).

- : The auto stop function can be deactivated.
- : The auto stop function can be activated.



- 6- Boom Derricking Drum Auto Stop Override Switch
- 7- Third Drum Auto Stop Override Switch
- 8- Rear Drum Auto Stop Override Switch
- 9- Front Drum Auto Stop Override Switch

The auto stop function can be deactivated only when the switch is tilted toward the  UNLOCK position. When the switch is released, the corresponding auto stop function is recovered.

**NOTE:** When auto stop override monitor key switch (5) is in the  (LOCK) position, the auto stop function cannot be deactivated even if switches (6, 7, 8, and 9) is tilted toward the  UNLOCK position.

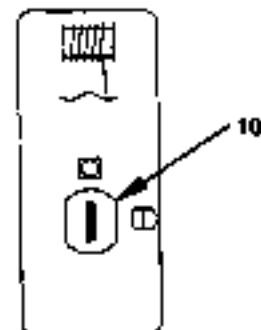
#### 10- Brake Mode Select Key Switch

**IMPORTANT:** When the machine is operated in the auto brake mode, turn the brake mode change key switch to the  position. Then, remove the key and consign the key to the job-site manager.

The free brake mode of the front/rear/ third drum (optional) can be activated with this key switch.


- position:
  - Freefall: Inoperable
  - Free brake mode cannot be selected.
  - Drums can be operated only in the auto brake mode.
- position:
  - Freefall: Operable
  - Free brake mode can be selected.

**NOTE:** The key can only be removed when it is in the  (LOCK) position.

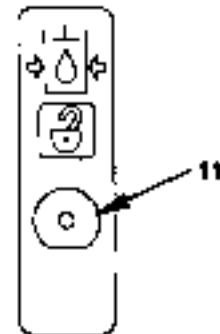


### 3 COMPONENTS NAME AND FUNCTION

#### 11- Pilot Control Oil Pressure Recovery Switch

After the secondary boom overhaul is activated, as long as switch (11) is kept in the  UNLOCK position, the pilot control oil pressure is recovered, making the boom and hook tower system become operable.

- When switch (11) is released, it is returned to its original position.

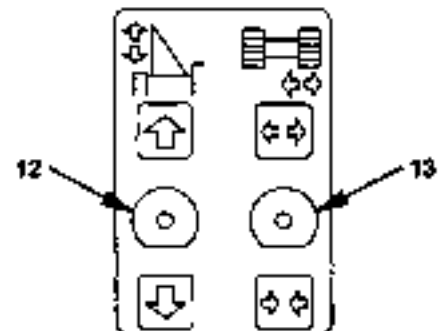


MGR-05-101

#### 12- A-Frame Extend/Retract Switch

This switch is used to raise the A-Frame for operation and to lower for transportation.

- Switch (16) is an auto-return momentary type. When switch (16) is released, it is returned to its original position.



MGR-05-102



#### 13- Retraction Switch

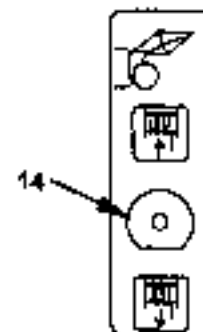
This switch is used to activate the retract device. Normally the switch is placed in the neutral position.

  : The crawler is extended.

  : The crawler is retracted.

#### 14- Reeving Winch (pay out/wind) Switch (Optional)

This winch is used to install the hoist wire rope along the sheaves. Shift the switch to either the  PAY OUT side or the  WIND side to operate the winch.



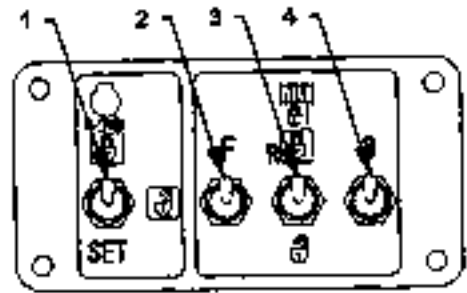
MGR-05-090

### 3 COMPONENTS NAME AND FUNCTION

#### 2.4 Right Stand

##### 2.4.1 Location and Names of Switches

- 1- Accelerator Holding Switch
- 2- Front Drum Lock Switch
- 3- Rear Drum Lock Switch
- 4- Third Drum Lock Switch





MC24-01-00-020

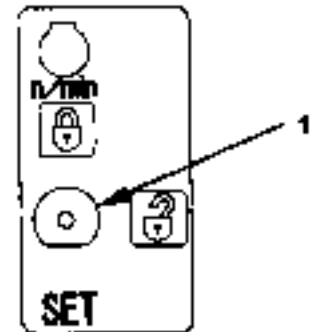
- 1- Accelerator Holding Switch

The engine speed is held at the desired speed.

**SET** : The desired speed set by the slewing lever accelerator dial can be stored in the memory.

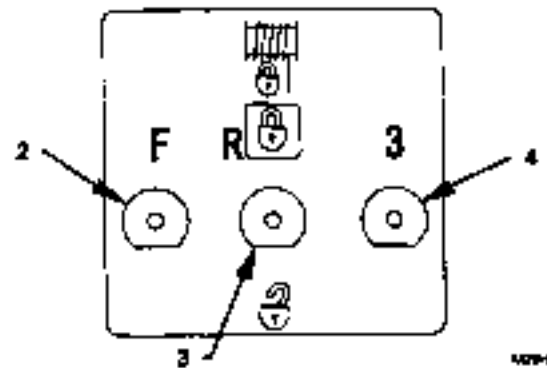
 : The engine runs at the set speed

 : The engine speed can be adjusted by the accelerator dial regardless of the set engine speed.



MC24-03-004

- |  |   |   |
|--|---|---|
| <ol style="list-style-type: none"> <li>2- Front Drum Lock Switch</li> <li>3- Rear Drum Lock Switch</li> <li>4- Third Drum Lock Switch</li> </ol> | } | These switches are used to lock the drums to ensure safety. |
|--|---|---|



MC24-03-004

## 3 COMPONENTS NAME AND FUNCTION

### 2.5 Side Overhead Panel

#### 1- Side Overhead Panel Switch

#### 2- Travel Mode Switch

This switch is used to change the travel mode.

-  : Fast Travel Mode
-  : Slow Travel Mode



#### 3- Drum Speed Feedback Mechanism Switch

Tilt the drum speed feedback mechanism switch toward the ON side to feel the drum speed. When the front, rear, and/or boom hoist drum rotates, the knob on the each drum lever grip vibrates, transmitting the drum speed to your palm.

**NOTE:** The knob does not vibrate if the drum speed rotates faster than  $5 \text{ min}^{-1}$  (rpm).

#### 4- Auxiliary Switches

##### • Hydraulic Tagline Switch (Optional)

The constant hydraulic tagline rope tension is due to a hydraulic motor, which slightly pulls the bucket with the rope so that the bucket doesn't swing or rotate. The tagline rotation mode is selected to either  FREE or  POWER ROTATION (wind) by operating switch.

##### • Slow Speed Holding Switch (Optional)

The front and/or rear drum speed is maintained at slow speed.

 : Slow speed holding system is activated.

 : Slow speed holding system is deactivated.

#### 5- Emergency engine stop Switch.

### 2.6 Rear Overhead Panel

#### 6- Rear Overhead Panel Switch

#### 7- Front Wiper/Washer Switch

#### 8- Roof Wiper/Washer Switch

The front and roof windowpane wiper and washer switches are provided.

**IMPORTANT:** If washer fluid motor is continuously used for more than 20 seconds, or if the motor is operated with no washer fluid in the fluid tank, damage to the motor in the washer fluid tank may result. Do not continuously spray the washer fluid for longer than 20 seconds and monitor that the washer fluid is being properly sprayed.

• Rotate the switch clockwise to select the switch position.

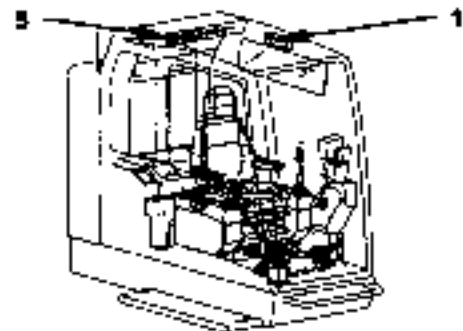
OFF: Stop

INT: Intermittent operation (Interval: about 4 to 5 seconds)

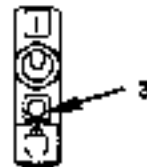
CONT: Continuous operation

PUSH: To Inject washer fluid

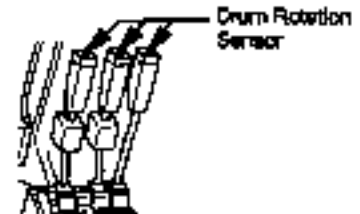
Press the washer switch center.



MS29-03-074



MS29-03-042



MS29-03-103



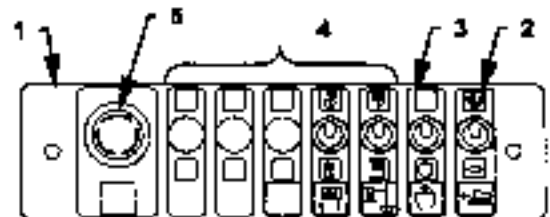
Hydraulic Tagline Switch (Optional)

MS29-03-102



Slow Speed Holding Switch (Optional)

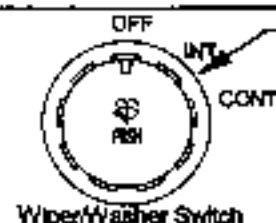
MS29-03-101



MS29-03-066



MS29-03-099



Wiper/Washer Switch

MS29-03-122

### 3 COMPONENTS NAME AND FUNCTION

9- Electric Power Socket  
DC 24 V is available.

10- Auxiliary Switch

11- Drum Light Switch (Optional)

A drum light can be installed on this machine. Adjust the light direction so that the winding status of wire rope around the drum can be checked.

12- Working Light Switch

13- FM/AM Radio

14- Amplifier for microphone and loud speaker  
A loud speaker is installed on this machine.

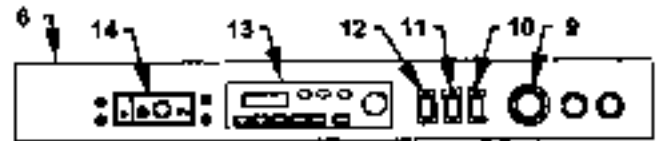
15- Electric Power Switch

16- Electric Power Indicator

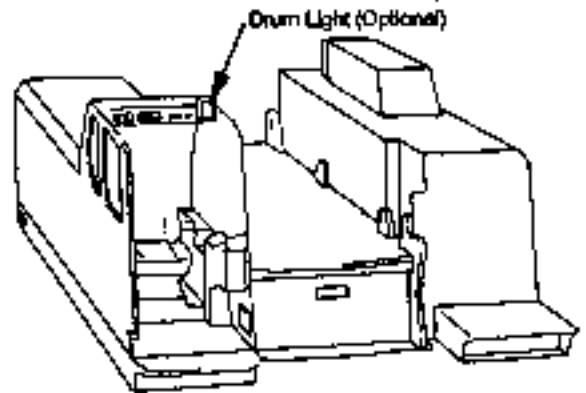
17- Volume Control Switch

18- Microphone Jack 2

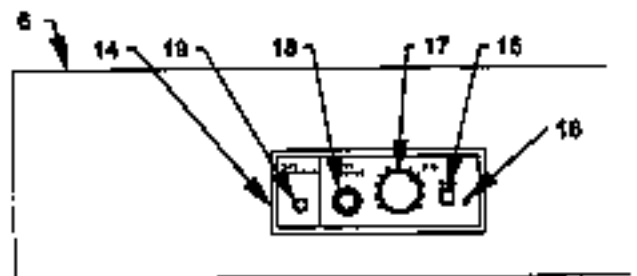
19- Microphone Jack 1



400-12-00



400-12-01



400-12-12

#### Operation

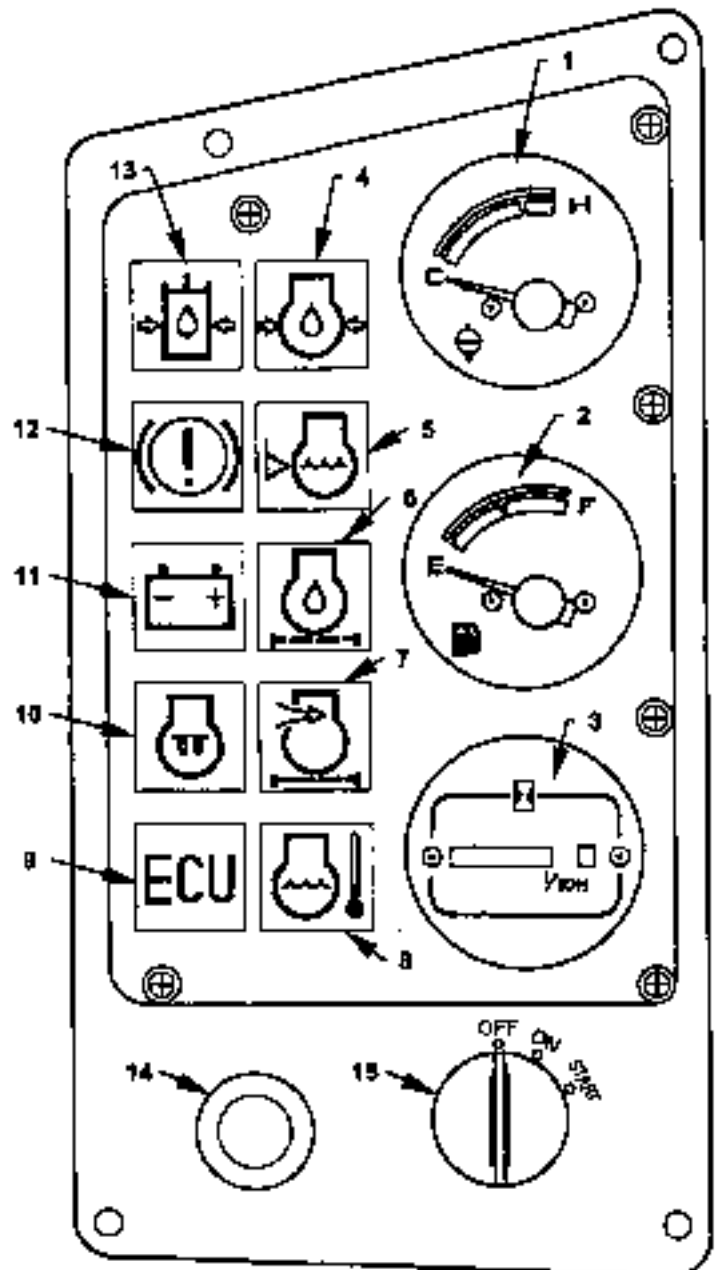
1. Turn amplifier electric power switch (15) ON. (The electric power indicator (16) comes ON.)
2. When using an electret microphone, connect it to microphone jack 1 (19).
3. When using a dynamic microphone, connect it to microphone jack 2 (18).
4. Adjust the sound level with volume control switch (17).



### 3 COMPONENTS NAME AND FUNCTION

#### 2.7 Monitor Panel

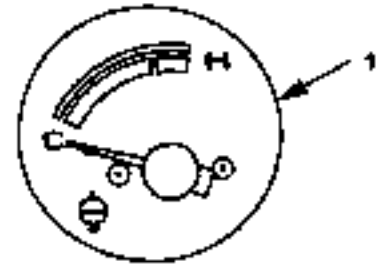
- 1- Coolant Temperature Gauge
- 2- Fuel Gauge
- 3- Hour Meter
- 4- Engine Oil Pressure Indicator
- 5- Coolant Level Indicator
- 6- Engine Oil Filter Restriction Indicator  
(does not light as this system is not used on this machine.)
- 7- Air Filter Restriction Indicator
- 8- Overheat Indicator
- 9- Abnormal Controller Indicator
- 10- Preheat Indicator
- 11- Alternator Indicator
- 12- Brake Unapplied Indicator
- 13- Pilot Oil Pressure Indicator
- 14- Cigar Lighter
- 15- Key Switch



## 3 COMPONENTS NAME AND FUNCTION

### 1- Coolant Temperature Gauge

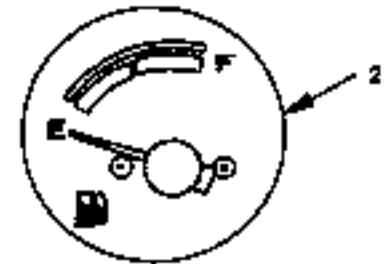
The gauge needle indicates the engine coolant temperature. Normally the needle is within the green range during operation. If the needle enters the red range, reduce the engine speed to the slow idle range to lower the coolant temperature.



16204-02-087

### 2- Fuel Gauge

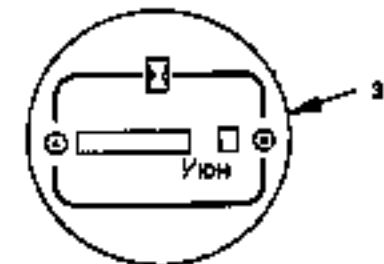
The gauge needle indicates the fuel amount in the fuel tank. Refuel before the needle reaches "E". When the needle reaches "E", the remaining fuel amount in the fuel tank is approx. 14 liters.



16204-02-090

### 3- Hour Meter

The total accumulated machine operation hours are indicated with this meter. The right hand number indicates tenths of an hour (six minutes).

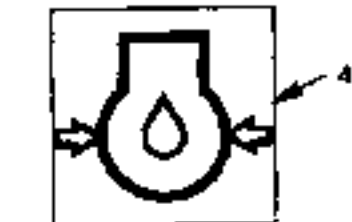


16204-02-090

### 4- Engine Oil Pressure Indicator

**NOTE:** In case the engine oil pressure does not increase within 20 seconds after the engine is started, the emergency relay is activated, causing the engine to stop.

Reduction in the engine oil pressure is displayed with this indicator. If the red indicator lights up, immediately stop the engine. Check the engine hydraulic system and oil level for any abnormality.



16204-02-088

### 5- Coolant Level Indicator

If the coolant level is too low for inadequate level for operation, the red indicator lights up.



16204-02-087

### 3 COMPONENTS NAME AND FUNCTION

- 6- Engine Oil Filter Restriction Indicator  
(does not light as this system is not used on this machine.)



10784-01-002

- 7- Air Filter Restriction Indicator  
If the air cleaner element is clogged, this indicator lights up. If the red indicator comes ON, clean or replace the element.



10784-01-004

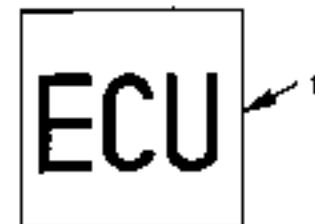
- 8- Overheat Indicator  
If the coolant temperature increases abnormally, the indicator comes ON. If the red indicator lights, stop operating the machine. Then, reduce the engine speed to the slow idle range to lower the coolant temperature.



10784-01-005

- 9- Abnormal Controller Indicator

**IMPORTANT:** If this abnormal controller indicator lights, and if both the hoist/lower speeds of the rear drum and the boom hoist/lower speeds are reduced to the minimum fine speed range, refer to the descriptions for "in case the safety device falls."



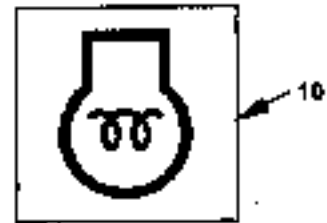
10784-01-006

In case the controller falls, this indicator lights up. If the red indicator comes ON, stop operating the machine. Consult your nearest Hitachi dealer.

### 3 COMPONENTS NAME AND FUNCTION

#### 10-Preheat Indicator

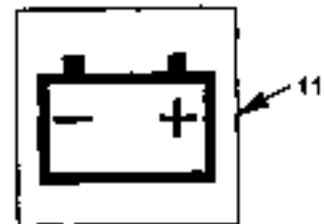
The indicator will stay ON when the engine is being preheated. The indicator will go off when preheating is completed.



1229-05-001

#### 11-Alternator Indicator

The indicator shows the occurrence of any abnormality in the electrical system during engine operation. The red indicator will light when low alternator output is present. Check the alternator and battery systems for any abnormality.



1229-05-001

#### 12-Brake Unapplied Indicator

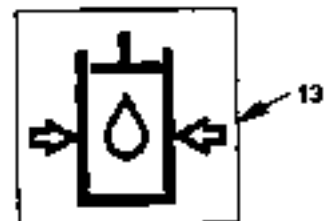
The brake unapplied indicator will light if the key switch is turned to the START position with the swing brake switch OFF and the brake mode switch is in the FREE mode. In case the swing brake switch is turned OFF, the engine will not start. If the brake unapplied red indicator comes ON, return the key switch to the ON position, and turn the swing brake switch ON. Then, check that the swing brake mode switch is turned to the auto brake mode position (the green brake mode indicator lights on the display).



1229-05-001

#### 13-Pilot Oil Pressure Indicator

If the pilot oil pressure is reduced to 3 MPa (29 kgf/cm<sup>2</sup>) or lower, the indicator lights up.



1229-05-001

### 3 COMPONENTS NAME AND FUNCTION

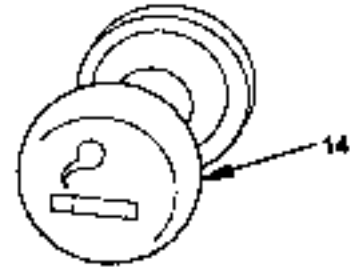
#### 14-Cigar Lighter



#### CAUTION:

If the lighter does not come out in 30 seconds, pull it out. If left in the pressed position, damage to the harness may result, possibly causing fires.

When the lighter is pushed in, the lighter will be held in that position and will pop out after it becomes red-hot. Pull it out to use it.



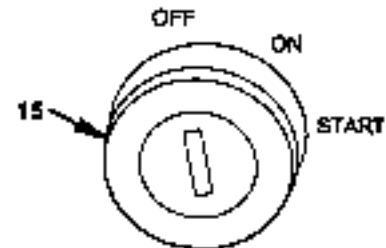
1408-02-129

#### 15-Key Switch

OFF: Engine OFF (key installation and removal position)

ON: Engine Running (Electrical system is activated.)

START: Engine Start



1408-02-113

## 3 COMPONENTS NAME AND FUNCTION

### 2.6 Operator's Seat



#### CAUTION:

If the seat back is tilted forward carelessly, the travel control levers may come in contact with the arm rest. As a result, the drums may suddenly be operated, possibly resulting in an unexpected accident. Be sure to move the pilot control shut-off lever to the LOCK position and apply the lever locks to the control levers before tilting the seat back forward.

#### 2.6.1 Seat Adjustment

Adjust the seat position so that all drum control levers and switches can be operated from the most suitable position.

##### 1. Seat fore-aft adjustment

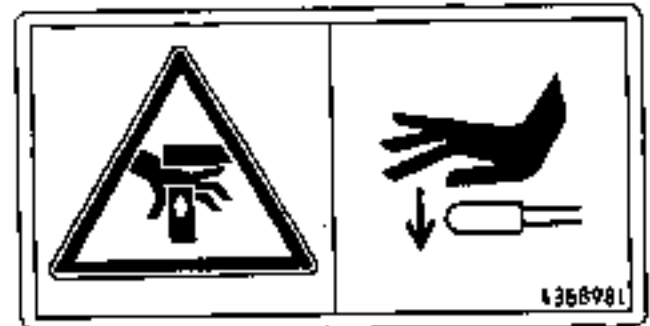
Pull up lever (1) to adjust the seat fore-aft position. Release the lever after adjustment. The seat will be automatically locked in the adjusted position.

##### 2. Backrest adjustment

Pull up and hold lever (2) (located under the seat right side) to adjust the backrest angle. Release the lever after adjustment. The seat will be automatically locked in the adjusted position.

##### 3. Headrest height adjustment

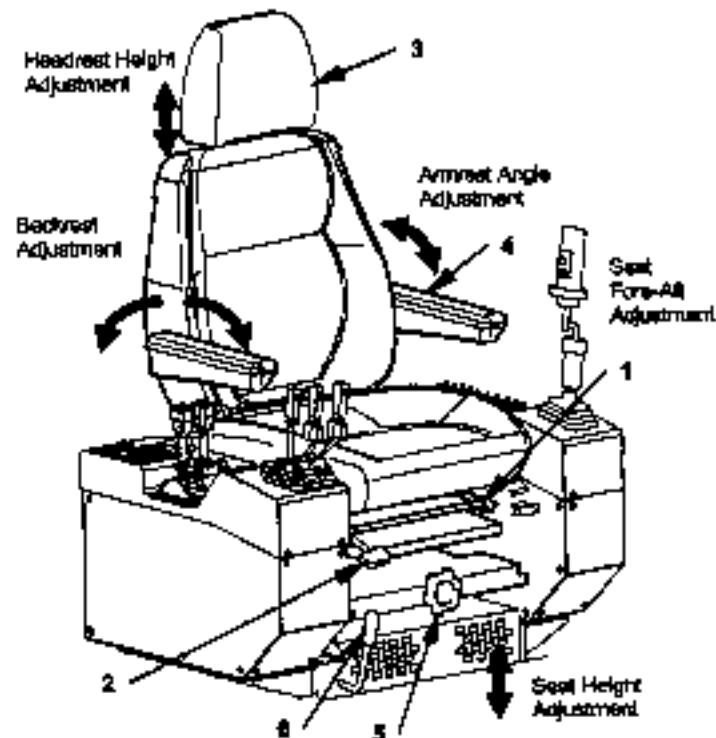
When raising the headrest, directly pull headrest (3) upward. When lowering the headrest, push headrest (3) downward while pressing the projection to release the lock.



Caution: Possibility of pinched fingers

Push down with the palm.

55-147



NO29-43-244

### 3 COMPONENTS NAME AND FUNCTION

4. Armrest angle adjustment

The armrest angle can be adjusted by turning dial (4) located on the bottom of the armrest. When required to raise the entire armrest backward, pull the armrest upright by hand.

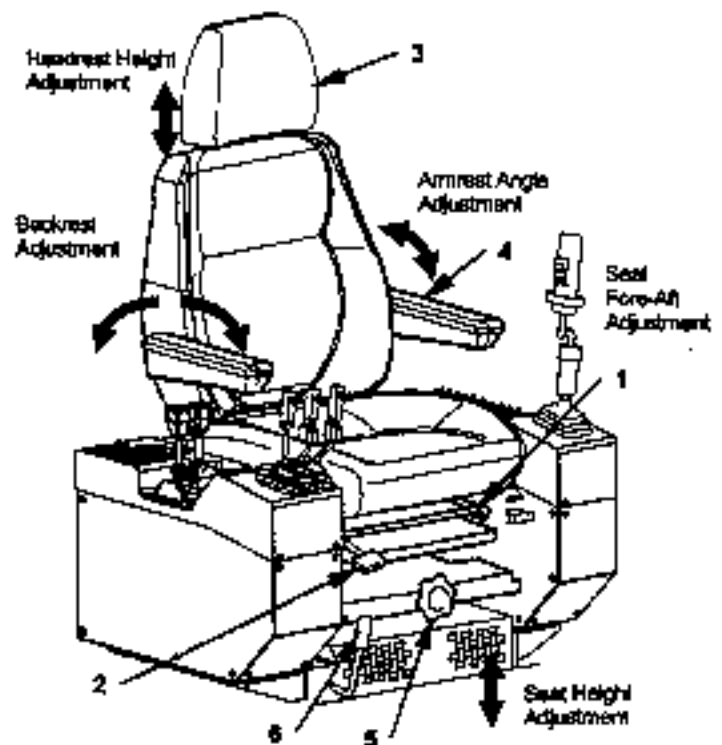
5. Seat height adjustment

Rotate seat bracket knob (5) to adjust the seat to the desired height position.

6. Stand and Seat Fore-aft Adjustment

Pull lever (6) to the right to adjust the seat and both right and left stand to desired distance from the travel pedals and levers. Release lever to lock seat and consoles into position.

**NOTE:** Seat and console fore-aft adjustment range is 120 mm (4.7 in) with steps every 20 mm (0.8 in)



M29-03-344

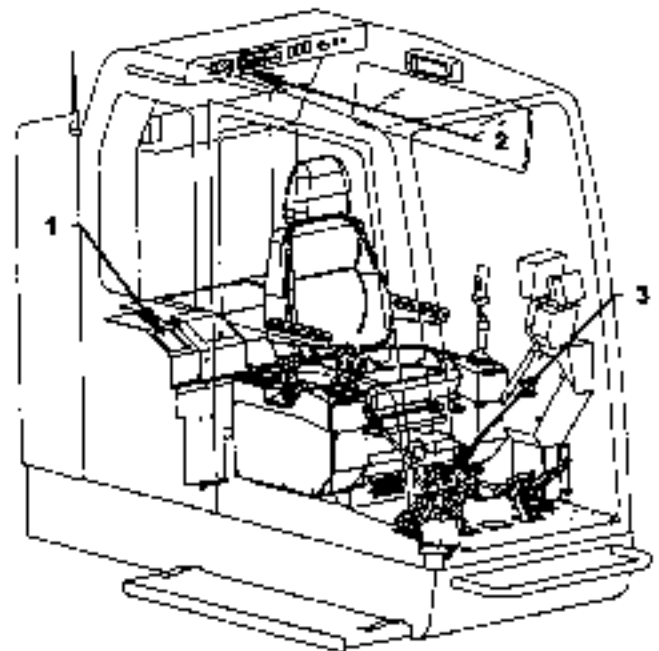
## 3 COMPONENTS NAME AND FUNCTION

### 2.9 Air Conditioner

#### 2.9.1 Part Name

- 1- Control Panel
- 2- Upper Air Flow Vent
- 3- Lower Air Flow Vent




**NOTE:** Air flow direction from upper air flow vent (2) on both the right and left sides can be adjusted by moving the louvers



lightbulb 300

#### 2.9.2 Names and Functions of Switches and Indicators on Controller

##### 4- Fresh/ Circulation Air Mode Switch


Each time  switch (4) is pressed, the fresh  or circulation air  indicator lights alternately so that the air flow mode is automatically selected.

 : Circulation air

 : Fresh air

When the fresh air is inducted, the cab inside is pressurized, preventing dust from entering the cab.

##### 5- Air Conditioner Switch

Each time  (5) is pressed, the air conditioner is turned ON or OFF.

##### 6- Air Conditioner Indicator

When the air conditioner is turned ON, indicator (6) comes ON. When the air conditioner is turned OFF, indicator (6) goes OFF.

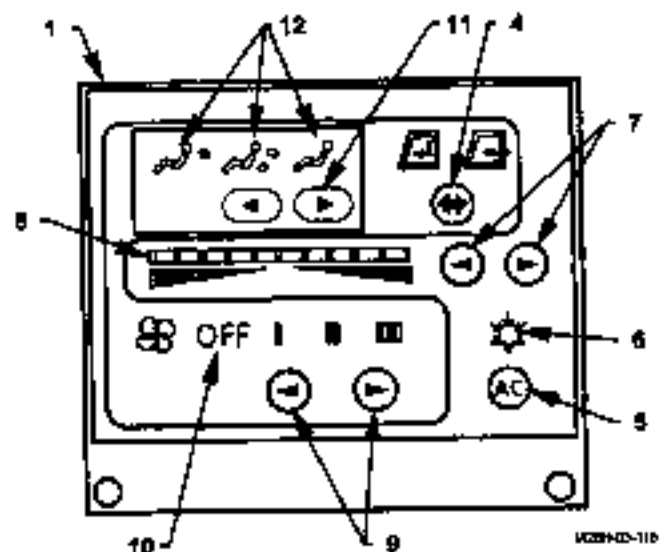
##### 7- Air Temperature Control Switch (7)

Press  to increase the flowing-in air temperature.

Press  to decrease the flowing-in air temperature.

##### 8- Air Temperature Indicator

Air temperature indicator (8) lights in proportion to the output air temperature. When the air temperature is set to the lowest, only the left end indicator comes ON. When the air temperature is set to the maximum, all indicators come ON.





UC29ND-110



### 3 COMPONENTS NAME AND FUNCTION

#### 9- Blower Switch (9)


Each time button  is pressed, the blower speed mode is controlled from OFF, Slow, Medium, and Fast in that order.


Each time button  is pressed, the blower speed mode is controlled from Fast, Medium, Slow and OFF in that order.

#### 10- Blower Indicator

The blower operating status is indicated with blower indicator (10).

When the OFF indicator is ON, the blower is OFF.

When the  indicator is ON, the blower speed is low.

When the  indicator is ON, the blower speed is medium.




When the  indicator is ON, the blower speed is high.

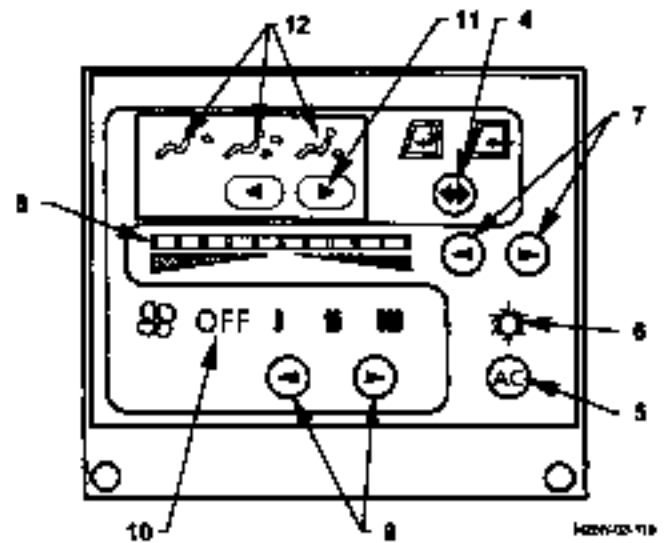
#### 11- Air Vent Mode Switch (11)

Cool or warm air vent position (rear head, foot, or both rear head and foot) can be selected by operating this switch.

#### 12- Air Vent Indicator

The selected air vent position is indicated with air vent indicator (12).

-  : Rear head air vent
-  : Rear head and foot air vents
-  : Foot air vent



#### 2.9.3 Cooling Operation

Set the air temperature to the lowest with air temperature control switch (7). The most left end indicator of air temperature indicator (8) lights. Press blower switch (9). When air conditioner switch (5) is turned ON, cool air blows out of the vent. Adjust the cab temperature by operating air temperature control switch (7) and blower switch (9).

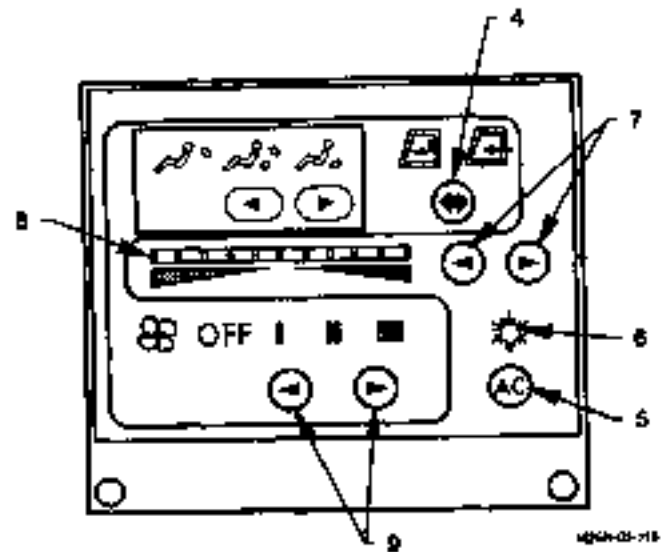
#### 2.9.4 Heating Operation

Set the air temperature to the highest level with air temperature control switch (7). All indicators of air temperature indicator (8) light up. Press blower switch (9) to blow warm air out of the vent. Adjust the cab temperature by operating air temperature control switch (7) and blower switch (9).

## 3 COMPONENTS NAME AND FUNCTION

### 2.9.5 Dehumidification and Heating Operation

Set the air temperature to the highest level with air temperature control switch (7). All indicators of air temperature indicator (8) light up at this time. Press blower switch (9) and turn air conditioner switch (5) ON, warm air will blow out of the vent. Adjust the cab temperature by operating air temperature control switch (7) and blower switch (9).




### 2.9.6 Air Blowing

Set the air temperature to the lowest level with air temperature control switch (7). The most left end indicator of air temperature indicator (8) lights at this time. Press blower switch (9) to blow air out of the vent.

*NOTE: Air is not heated or cooled in this operation.*

### 2.9.7 Ventilation

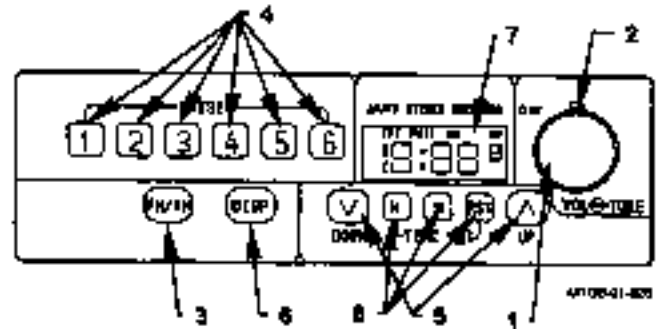
Induce fresh air into the cab by operating fresh/ circulation air mode switch (4).  indicator comes ON at this time. Set the air temperature to the lowest level with air temperature control switch (7). The most left end indicator of air temperature indicator (8) lights. Press blower switch (9) to blow air out of the vent.

## 3 COMPONENTS NAME AND FUNCTION

### 2.10 FM/AM Radio

#### 2.10.1 Controls and Switches

- 1- Power/Volume Control Switch
- 2- Volume Control Knob
- 3- FM/AM Selector  
Each time the selector is pressed, FM and AM can be selected alternately.
- 4- Station Presets
- 5- Tuning Controls
- 6- Display Button  
Each time the button is pressed, indicator (7) displays "Clock" or "Received Frequency" alternately.
- 7- Indicator
- 8- Time Adjustment Button



#### 2.10.2 Tuning

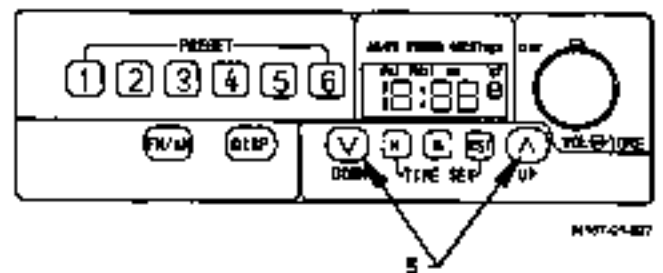
- Manual Tuning  
Press tuning control (5) in short intervals (less than 0.5 seconds) until the desired frequency is selected. Each time the control is pressed, the frequency changes gradually.

Press the mark (^) side to increase the frequency.  
Press the mark (v) side to decrease the frequency.

- Automatic Search Tuning  
Press and hold tuning control (5) for longer than 0.5 seconds until a beep is heard, then release the control. After a station is tuned, the search function stops automatically.

Press the mark (^) side to increase the frequency.  
Press the mark (v) side to decrease the frequency.

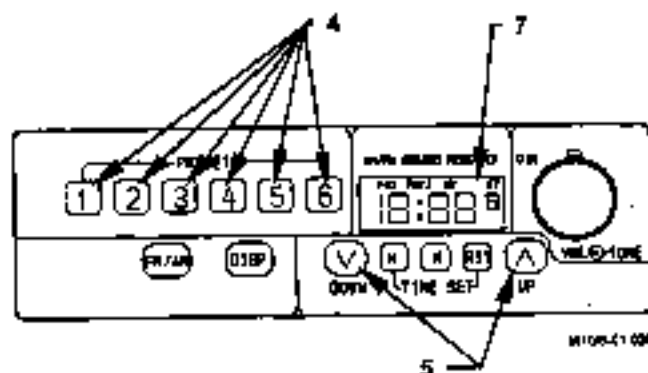
When deactivating the automatic search function, press tuning control (5) once more. In case the radio waves are not strong enough to be received such as when working close to high buildings, use the manual tuning function.



## 3 COMPONENTS NAME AND FUNCTION

### 2.10.3 Presetting Stations

1. Tune to the desired frequency using tuning control (5). Refer to 2.10.2 for tuning.
2. After tuning, press and hold one station presets (4) button for more than 1 second until a beep is heard to memorize the selected station frequency. After pre-setting has been completed, indicator (7) displays the preset button No. Once a station preset has been completed, press station preset (4) for less than 1 second to tune in the preset station. To reset the station after a station preset has been completed, repeat the same procedure in the above steps.



#### • Presetting Deletion

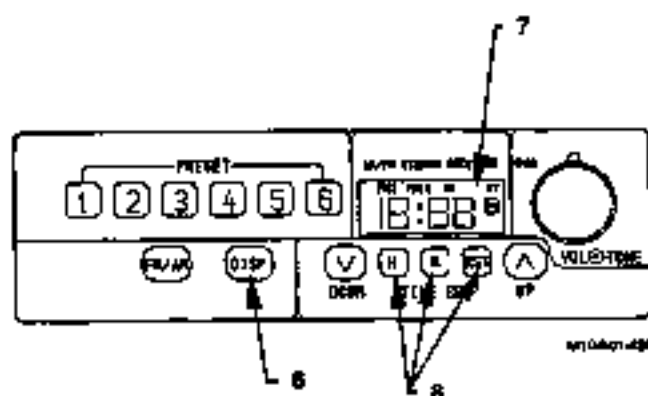
When the radio is removed for maintenance of the machine, or if the batteries are disconnected, the station presets (4) memory is deleted. Resetting is required in these cases.

### 2.10.4 Setting Clock

The clock can be set when time is displayed on indicator (7).

#### (1) Time Adjustment

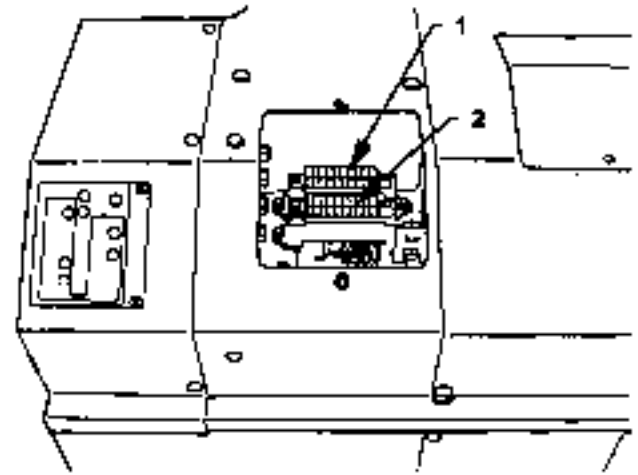
1. Press display button (6) to display the current time on indicator (7).
2. Press and hold the RST button of time adjustment button (8) for longer than 1 second to flash the displayed time, by which the time setting mode is selected.
3. Press time adjustment button (8) to set time. Each time, time adjustment button (8) is pressed, the displayed time changes gradually. When time adjustment button (8) is kept pressed, the displayed time changes continuously.
  - Press the H button to adjust HOURS.
  - Press the M button to adjust MINUTES.The time is displayed in 12 hour standard.
4. When the H button is pressed while 12 is displayed, the hour display is returned to 1. When the M button is pressed while 59 is displayed, the minute display is returned to 00. However, the time display remains unchanged at this time.
5. Press the RST button of time adjustment button (8) again for longer than 1 second or turn power/volume control switch (1) OFF to end time setting. Then, The displayed time changes from flashing to 11.



## 3 COMPONENTS NAME AND FUNCTION

### 2.11 Fuse Box

Fuse boxes (1 and 2) are located in the rear stand. Arrangement, function, and capacity of each fuse are shown below.



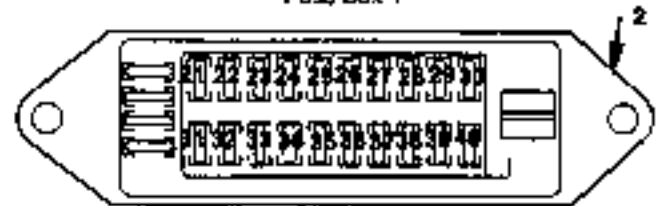
42294-01-077

#### 2.11.1 Fuse Box 1

10- Fuel pump (Engine) ..... 10A	20- Battery relay..... 10A
9- Backup power ..... 3A	19- Monitor panel ..... 5A
8- Horn..... 10A	18- Controller key switch .... 5A
7- MCA..... 5A	17- ECU..... 10A
6- MCB..... 5A	16- Glow timer..... 5A
5- IDU..... 5A	15- Lock lever..... 5A
4- Dome light..... 5A	14- Radio..... 5A
3- Right stand slide power... 3A	13- Audio alarm power..... 5A
2- Rear drum lock switch power ..... 10A	12- Slewing alarm power... 10A
1- Fuel supply pump power ..... 10A	11- Air conditioner main power..... 15A



Fuse Box 1



Fuse Box 2

42294-01-077

#### 2.11.2 Fuse Box 2

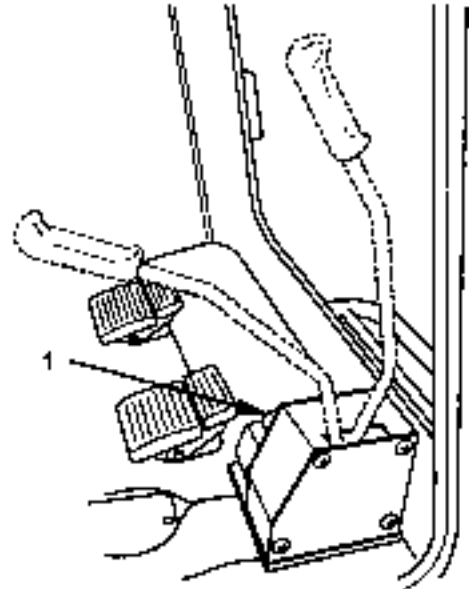
30- PWM(MCA) ..... 15A	40- Third drum lock switch.. 10A
29- PWM(MCB) ..... 15A	39- Retract/Jack/A-Frame switch ..... 5A
28- Solenoid (MCA) ..... 15A	38- Cigar Lighter ..... 20A
27- Solenoid (MCB) ..... 15A	37- Front wiper..... 5A
26- Side light (Optional) ..... 10A	36- Swing brake..... 5A
25- Work light..... 20A	35- Roof wiper..... 5A
24- Air conditioner..... 3A	34- Motor output restriction 5A
23- Travel mode/Hydraulic tag line/Raising winch ..... 5A	33- Microphone/Speaker amplifier/anemometer .5A
22- Front drum lock switch.. 10A	32- Rear view camera..... 10A
21- Engine start signal ..... 10A	31- Air conditioner ..... 3A

### 3 COMPONENTS NAME AND FUNCTION

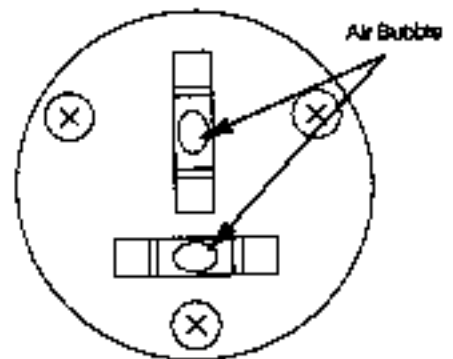
#### 2.12 Level

##### 1- Level

The level indicates the machine inclination. When the air bubble is in the center, the machine is horizontal.



4822-03-01



459-03-17

## 3 COMPONENTS NAME AND FUNCTION

### 2.13 Alarm and Advance Notice Output Unit

#### 1- Electric Power Indicator

This unit does not have its own power switch so that when the key switch is turned ON, electric power indicator (1) comes ON and is illuminated in red.



#### CAUTION:

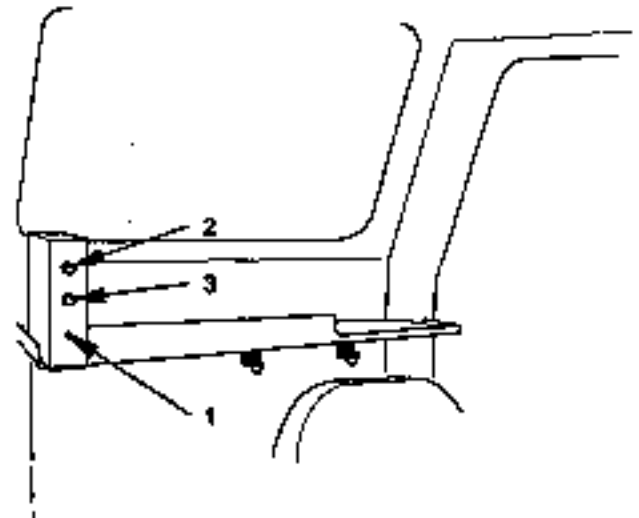
Adjust the interior and exterior speaker volume so that the announcements from speakers are audible over the machine noises such as an engine noise or ambient noise.

#### 2- Interior speaker alarm sound level adjustment knob

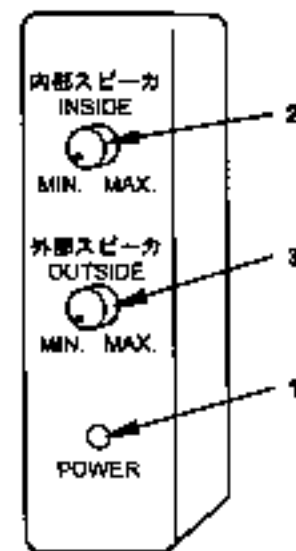
- Turn the knob to the MIN side to reduce the volume.
- Turn the knob to the MAX side to increase the volume. Even though the knob is fully turned to the MIN side, the speaker volume is not completely cut off. The interior speaker is commonly used as the radio speaker, adjust the radio volume by turning the radio volume adjustment switch.

#### 3- Exterior speaker alarm sound level adjustment knob

- Turn the knob to the MIN side to reduce the volume.
- Turn the knob to the MAX side to increase the volume. When knob (3) is fully turned to the MIN side, the speaker volume is cut off.



42294-03-114



Panel

42294-03-113

### 3 COMPONENTS NAME AND FUNCTION

#### 3 SAFETY DEVICES

There are various types of safety devices provided on this machine for the operator to safely operate the machine. Many limit switches and sensors monitor the machine operating conditions and is displayed to the controller, by which the display, alarm, auto-deceleration, and auto-stop functions are activated according to the machine operating conditions.

Safety Device Output List (Cranes/Clamshells/Dragline)	Drum Output										Display Output				On Screen Display	Audio Alarm
	Main Hoist Drum		Front Drum		Riser Drum		Third Drum		Work Mode		Anemometer	Overhaul	Emergency Stop	Control		
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Crane	Clamshell						
Overload	Advance overload notice	△	△			△							X	X		Buzzer (Intermittent)
	Stop at overload	○	○			○							X	X		Buzzer (Cont. noise)
	Advance max. working radius notice	△	△			△							X	X		Buzzer (Intermittent)
	Stop at max. working radius	○	○			○							X	X		Buzzer (Cont. noise)
	Stop operation in operational specification	○	○	○	○	○	○	○	○	○	○	○				
Overhaul/Load restriction	Advance boom over-hoist notice	△											X	X		Buzzer (Intermittent)
	Stop boom at max. boom angle	○											X	X		Buzzer (Cont. noise)
	Stop boom at overhoist (Link Switch)	○											○	○		
	Stop boom hook at secondary overhoist	○											○	○		
	Stop boom hook at overhoist (Limit Switch)	○											○	○		Bell
Abnormal Monitor	Warning hoist (Rise) alarm of rope on the drum															Buzzer (Cont. noise)
	Stop at min. boom hoist rope tension	○	○			○							X	X		Buzzer (Cont. noise)
Working Range Restriction	Abnormal sensor notice	○	○			○							△	△		Buzzer (Cont. noise)
	Advance max. working radius restriction notice		△										○	○		Buzzer (Intermittent)
	Stop at max. working radius restriction		○										○	○		Buzzer (Cont. noise)
	Advance working height restriction												○	○		Buzzer (Intermittent)
	Stop at working height restriction												○	○		Buzzer (Cont. noise)
Note	Advance load restriction notice												○	○		Buzzer (Intermittent)
	Stop at load restriction												○	○		Buzzer (Cont. noise)

○ : Start of deceleration  
 △ : Operable by recovered pilot control oil pressure  
 ○ : Stop (impossible to override)  
 △ : Stop (impossible to override)  
 ○ : Monitor \* Not monitored  
 △ : Not monitored (without auto-stop function)



## 3 COMPONENTS NAME AND FUNCTION

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### 3.1 Precautions for Safety Device Operation



#### **CAUTION:**

- The safety devices are very important to ensure safe crane operation. Always check that safety devices operate correctly and be sure to use them during operation. Wrong-operation, intentional deactivation, and insufficient check and/or maintenance of the safety devices may cause serious accidents such as damage to, or tipping-over of the machine. If a safety device fails, immediately repair it. Operate the machine only after repairing.
- The safety devices are auxiliary devices to ensure safe operation. Even though the safety device functions are normal, tipping-over of the machine may occur due to collapse of the ground, wind, incorrect adjustment of the safety devices, and/or lateral pull of a lifting load. Therefore, do not rely only to the safety devices. You must assume responsibility for safety operation. Stop operation when strong wind is blowing, when an earthquake has occurred, or when a threat of lightning is expected. Operate the machine with caution to prevent electrocution or interference of strong radio wave noise.
- Never attempt to adjust the wire rope length, striker, and limit switch of the boom derricking limiter and/or hook hoisting limiter as they have been adjusted to specifications when shipping the machine. If failed or any abnormality occurs, contact your nearest Hitachi Sumitomo dealer.

#### **Precautions For Safety Device Operation**

- The following safety devices are provided on this machine.
  - Hook Hoisting Limiter
  - Boom Derricking Limiter
  - Secondary Boom Overhaul Device
  - Rated Capacity Limiter (Overload Prevention Device)
- To always correctly operate the safety devices, check them at regular intervals according to the instructions described in this Operator's Manual.

### 3 COMPONENTS NAME AND FUNCTION

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- Never attempt to modify the safety devices.
- In case a safety device does not operate correctly, stop the machine and contact your nearest Hitachi Sumitomo dealer for repairs.
- Do not operate the machine with the safety devices deactivated. If intentionally deactivated, the machine may be overloaded or the hook or the boom may be overhoisted without noticing, resulting in a serious accident such as machine breakdown or tipping over.
- Observe the following points to accurately operate the moment limiter.
  - Correctly install the boom derricking drum wire rope and the hook derricking wire ropes while referring to the respective pages for Install Boom Derricking Drum Wire Rope in 1.8, and Install Hook and Wire Rope in 1.21 in section 5 with the title of Assembly and Disassembly.
  - The maximum load ratings are designated depending on the length of the boom and the job to be used. Be sure to use the number of wire rope reeved lines and the hook size corresponding to the maximum load rating.
  - Grease the boom foot-pin and A-Frame hanger at regular intervals referring to the Greasing pages in the Check/Maintenance section. Sufficiently grease before storing or re-using the machine.
  - Before operating the machine, be sure to extend the crawler and the A-Frame.

## 3 COMPONENTS NAME AND FUNCTION

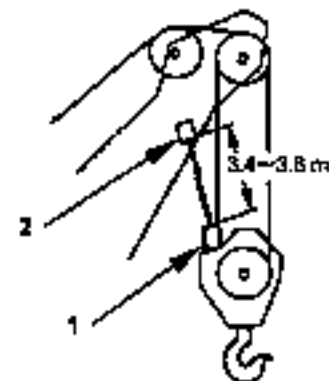
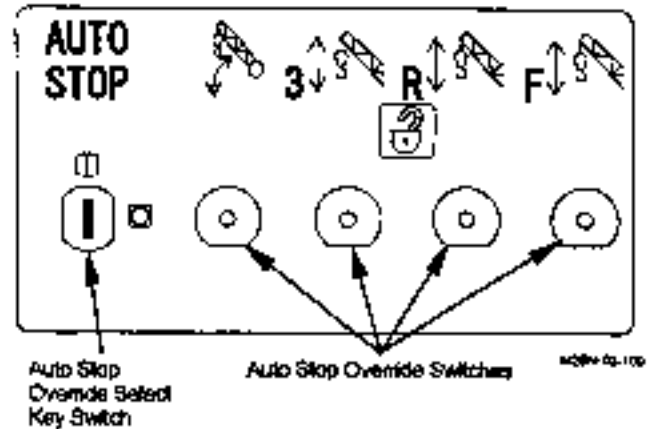
### 3.2 Safety Device Operation

#### 3.2.1 Hook Hoisting Limiter



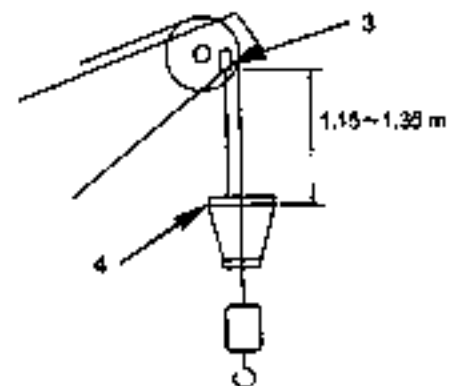
#### CAUTION:

- Never operate the machine with any of the auto stop override switches ON and with the auto stop override monitor key switch deactivated. Do not use the auto stop override switches (auto-return type) except for when evacuating from an emergency status caused by a failure or damage to the safety devices, or when required to use for inspection/maintenance of the machine. During operation, turn the auto stop override switches to the activation position and remove the key. Then, consign the key to the job-site manager.
- This device is very important to ensure safe crane operation. Always check that this device operates correctly and use this device during operation. If this device fails, immediately repair it. Operate the machine only after repairing the failure. Never attempt to modify this device. If failed or any abnormality occurs, contact your nearest Hitachi Sumitomo dealer.
- The hook hoisting limiter does not operate in case the information display controller displays the disassembly configuration (with the boom angle at 10 degrees or less).



Boom Hook Hoisting Limiter

W02-01-008



Jib Hook Hoisting Limiter

W02-01-025

#### IMPORTANT:

- Do not adjust the distance between boom hook overhoist prevention limit switch (2) and weight (1). It has been adjusted to 2.4 to 2.6 m when shipping the machine from the factory.
- Do not adjust the distance between jib hook overhoist prevention limit switch (3) and weight (4). It has been adjusted to 1.15 to 1.35 m when shipping the machine from the factory.

The hook hoisting limiter prevents two blocking between the hook and the boom or jib boom (short jib) when the hook is overhoisted. When hook overhoist prevention limit switch (2 or 3) located at the tip of the boom or jib boom (short jib) detects hook overhoist, the controller stops hook hoisting and boom lowering, and activates the buzzer at the same time. Hook lowering and boom hoisting are both operable at this time.

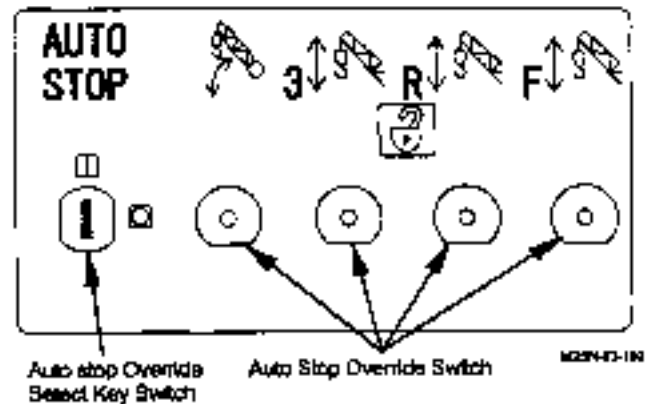
## 3 COMPONENTS NAME AND FUNCTION

### 3.2.2 Boom Derrick Limiter

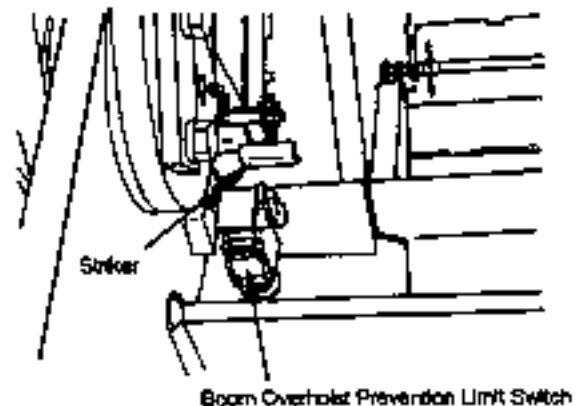


#### CAUTION:

- Never operate the machine with any of the auto stop override switches ON and with the auto stop override monitor key switch deactivated. Do not use the auto stop override switches (auto-return type) except for when evacuating from an emergency status caused by a failure or damage to the safety devices, or when required to use for inspection/maintenance of the machine. During operation, turn the auto stop override switches to the activation position and remove the key. Then consign the key to the job-site manager.
- This device is very important to ensure safe crane operation. Always check that this device operates correctly and use this device during operation. If this device fails, immediately repair it. Operate the machine only after repairing the failure. Never attempt to modify this device. If failed or any abnormality occurs, contact your nearest Hitachi Sumitomo dealer.



**IMPORTANT:** The striker has been adjusted to come in contact with the boom overhoist prevention limit switch when the boom angle becomes to 80 to 80.5 degrees prior to shipping the machine from the factory. Do not adjust the positions of the striker and/or the limit switch.



The boom derricking limiter is a safety device which prevents damage to the boom, or backward movement or tipping over of the machine due to boom overhoisting.

When the boom angle exceeds 80°, the boom overhoist prevention limit switch provided at the boom foot is activated so that the controller stops the boom hoisting and sounds the buzzer. The buffer stop function operates slightly before the boom is automatically stopped to ensure safety operation, reducing the boom hoisting speed and activating the advance notice buzzer.

## 3 COMPONENTS NAME AND FUNCTION

### 3.2.3 Secondary Boom Overhoist Prevention Device



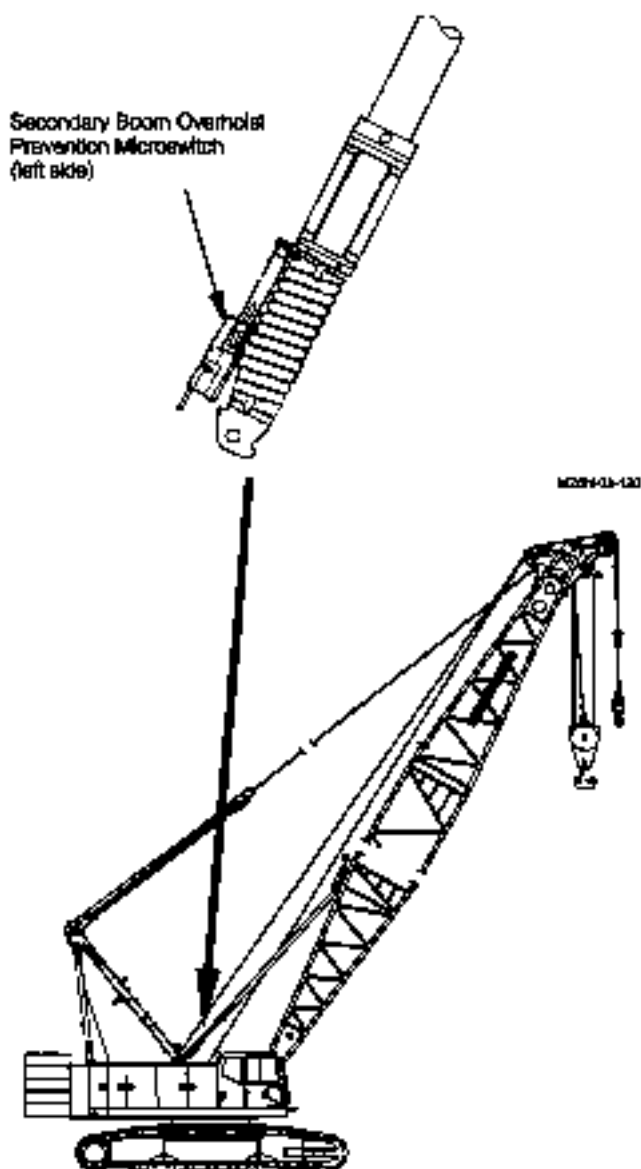
**CAUTION:** This device is very important to ensure safe crane operation. Always check that this device operates correctly and use this device during operation. If this device fails, immediately repair it. Operate the machine only after repairing the failure. Never attempt to modify this device. If failed or any abnormality occurs, contact your nearest Hitachi dealer.

#### IMPORTANT:

- The secondary boom overhoist prevention device cannot be overridden.
- The striker has been adjusted to contact at the boom angle of 81.5 to 82.0 degrees prior to factory shipping. Do not adjust the striker and the limit switch.
- In case the secondary boom overhoist prevention device is activated due to overhoist of the boom or jib hook, lower the boom or jib hook to deactivate the auto-stop function.
- This device does not operate as long as the machine is normal. If this device operates, perform the troubleshooting and repair the abnormality through the proper corrective action.

The secondary boom overhoist prevention device is a redundant safety device which is activated if the hook or boom overhoist prevention device fails, preventing the backward movement of the boom.

When the boom angle exceeds more than 81.5 degrees, the boom secondary overhoist prevention limit switch on the boom backstop sends a signal to the controller. Then, the controller deactivates the boom hoist, front, rear, and third drum operation systems and sounds the buzzer. However, when the pilot control oil pressure recovery switch is operated, only unwinding system of each drum becomes operable.



MO21-01-002

## 3 COMPONENTS NAME AND FUNCTION

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### 3.3 Rated Capacity Limiter

(Overload Prevention Device)



#### **CAUTION:**

- This device is very important to ensure safe crane operation. Always check that this device operates correctly and use this device during operation. If this device fails, immediately repair it. Operate the machine only after repairing the failure. Never attempt to modify this device. If failed or any abnormality occurs, contact your nearest Hitachi dealer.
- This device is auxiliary device to ensure safe operation. Even though the safety device function is normal, tipping-over of the machine may occur due to collapse of the ground, wind, incorrect adjustment of the safety devices, and/or lateral pull of a lifting load. Therefore, do not rely only to the safety devices. You must assume responsibility for safety operation.

#### **IMPORTANT:**

- When the specifications of the front attachment are changed, be sure to operate the machine only after resetting the machine specification such as the boom length, jib length, etc. on the rated capacity limiter.
- Sufficiently grease the boom foot pin and the A-Frame hanger during operation, or before storing the machine, or re-operating the machine. Unless the boom foot pin and/or the A-Frame hanger can rotate smoothly, the rated capacity limiter does not operate accurately.
- If the machine is operated without removing heavy weight parts such as stanchions or buffers from the boom, the boom weight will increase so that the net load possible to hoist will decrease by the added part weight.

## 3 COMPONENTS NAME AND FUNCTION

---

### 3.3.1 Main Functions of Rated Capacity Limiter and Precautions for Rated Capacity Limiter Operation

#### (1) Main Functions

##### 1- Overloading Prevention System

While continuously sensing the boom angle and boom hoist rope tension, the rated capacity limiter performs computations based on the sensor data and the stored machine specifications. Then, it indicates the actual load value, gross rated load value, load factor, working radius, and boom angle on the display. When the current working condition becomes close to the gross rated load, or the maximum working radius, the moment limiter alerts the operator by sounding the alarm buzzer. In addition, when the actual load value and working radius reach the gross rated load value and maximum working radius, the rated capacity limiter sounds the alarm buzzer and stops machine operation.

##### 2- Limiting Boom Angle

When the boom angle approaches the maximum or minimum angle set in the rated capacity limiter, the rated capacity limiter alerts the operator by emitting the advance notice. When the boom angle reaches the maximum or minimum angle, the rated capacity limiter sounds the alarm buzzer and stops machine operation.

##### 3- Alarm Buzzer

##### 4- Buffer Stop

Before the auto-stop system operates, the machine operating speed is reduced so that the machine can be smoothly stopped.

##### 5- Working Range Restriction

When the machine operating conditions approach the previously set lifting load value, hook height, working radius, or tip height, the machine operation is automatically stopped.

##### 6- Abnormality Monitoring System

If the boom hoist wire rope tension is extraordinarily reduced because the boom is hoisted with the hook wire rope by mistake, the machine operation is automatically stopped.

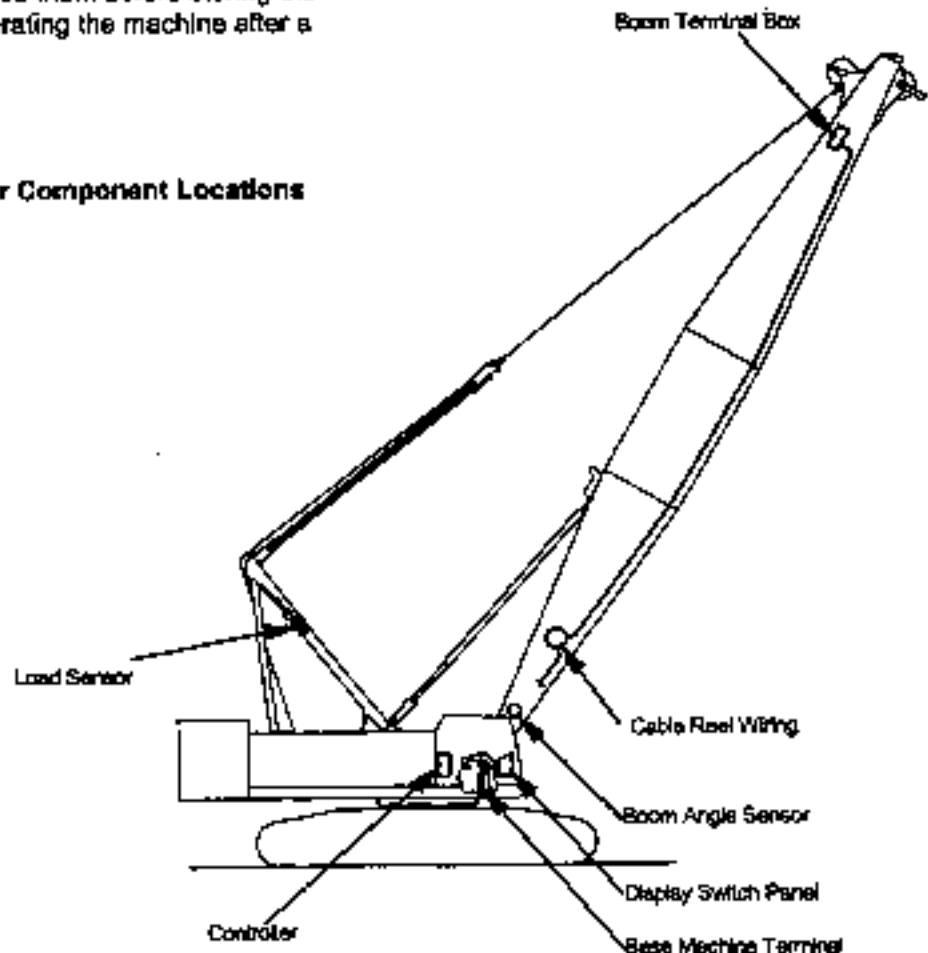
## 3 COMPONENTS NAME AND FUNCTION

### (2) Precautions for Rated capacity limiter Operation

The rated capacity limiter functions are installed in the information display controller. Observe the following points to accurately utilize the rated capacity limiter functions.

- Correctly run the boom demicking wire rope and hook hoist wire rope while referring to 1.8 Wind Boom Demicking Drum Wire Rope and 1.20 Installing Hook and Wire Rope in Section 5 Assembling/ Disassembling.
- Before operating the machine, be sure to check that the boom and jib lengths set in the rated capacity limiter match the actual machine specifications. If not, reset the data in the rated capacity limiter.
- In case the specifications of the attachment, number of hoist rope falls, and/or type of the hook in use is changed, carry out the operational specification setting in the rated capacity limiter.
- Referring to the descriptions for greasing in the Inspection/Maintenance section, grease the boom foot pin and the A-Frame hanger at regular intervals. In addition, sufficiently grease them before storing the machine, or when re-operating the machine after a period of storage.

### (3) Rated Capacity Limiter Component Locations



W03E-83-001

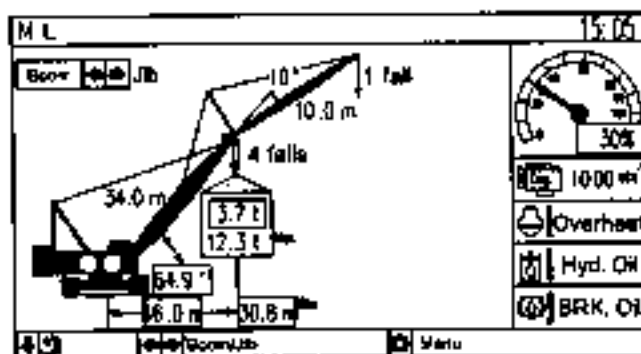


## 3 COMPONENTS NAME AND FUNCTION

### 3.3.2 Information Display Controller Function

#### (1) Display Organization

- 1 - Title/Abnormal Guidance Column  
Screen title, or guidance for corrective actions to be taken when an abnormality occurs is displayed.
- 2 - Main Screen  
Function or operation method corresponding to the screen title is displayed.
- 3 - Key Operation Guidance Column  
Key switches shown in 3.3.3 are displayed in this column. Function of each key switch differs depending on the screen displayed.



ML04-05-277

#### (2) Introduction of Each Screen

##### Machine Specification Screen

The set specifications of the base machine, and types of attachments are checked on this screen. In case the specifications displayed on the screen differ from those on the actual machine, reset the specifications on this screen.

Machine Specifications		load ratio	30%
Undercarriage	Crawler	Boom length	34 m
Attachment	Crane (Shit)	Jib	10 m
Boom Mast	None	Boom angle	10°
Lifting Tool	Hook	EM hook capacity	45 t
Counterweight	Standard	# of falls - BM	4 falls
Crawler Width	Standard	Jib hook capacity	11 t
Boom Hook Drum	Front	# of falls - Jib	1 fall
Jib Hook Drum	Rear	Stowwalk	Attached

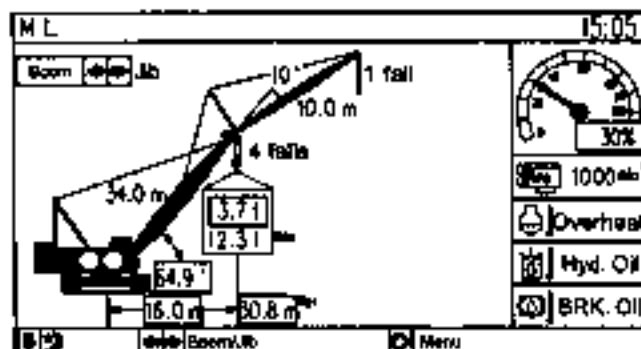
In case setting change is required, move the cursor to the item to be changed with the <SELECT> key. Press the <CHANGE> key.

Select Next Reset

ML04-05-278

##### ML (Rated capacity limiter) Screen

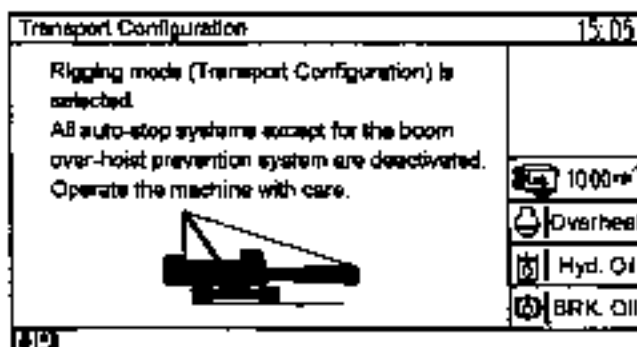
This screen is displayed during normal crane operation. Depending on whether the short or crane jib is equipped, the screen displays differently.



ML04-05-277

##### Transport Configuration Screen

When the boom angle becomes 10° or less, or if the boom angle sensor and/or the cable reel wiring is removed, this screen is displayed. Depending on whether the cable reel wiring is removed or not, the screen will display differently.

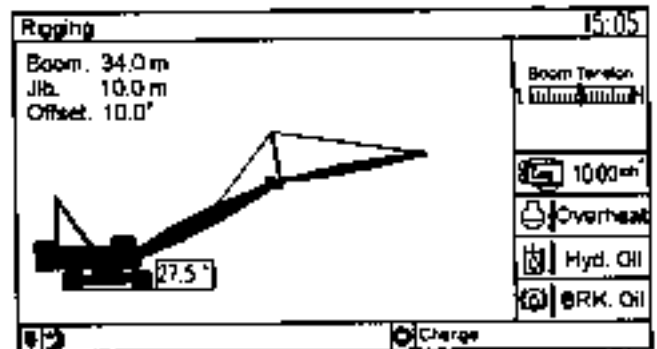


ML04-05-276

### 3 COMPONENTS NAME AND FUNCTION

#### Rigging Screen

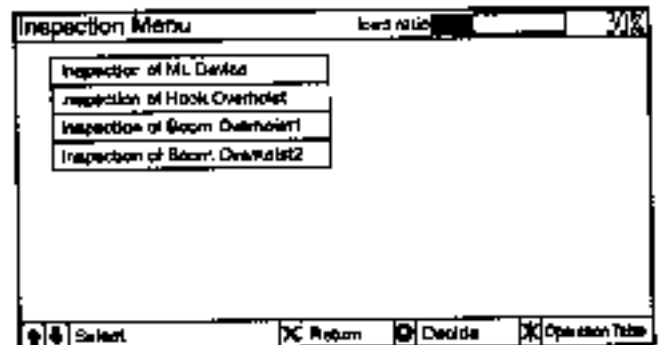
When the boom is rigged, if the boom is moved to the maximum working radius position or lower, this screen is displayed.



M224-03-014

#### Inspection Screen

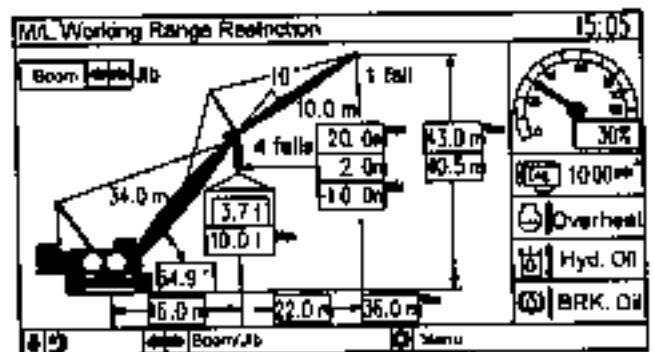
This screen is displayed when checking if the safety devices such as overload, or hook hoisting limiter are normally operating.



M224-03-020

#### M/L Working Range Restriction

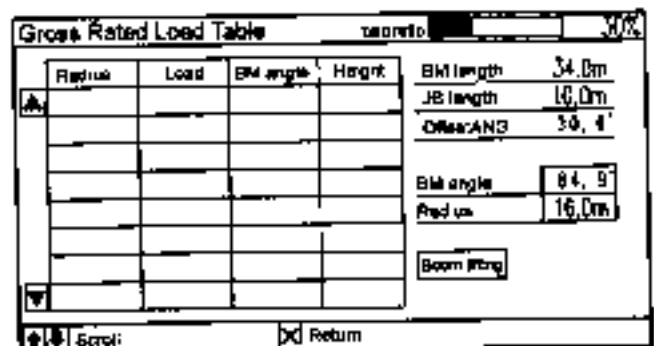
This screen is displayed when operating the crane with the working range restriction system activated. The lifting load, maximum working radius, and jib tip height are restricted.



M224-03-014

#### Gross Rated Load Table Screen

The set crane performance table and working range are checked on this screen.



M224-03-014

### 3 COMPONENTS NAME AND FUNCTION

#### Clock Confirmation Screen

Date and time display adjustment are made on this screen.

The screenshot shows a window titled "Clock Confirmation" with a "load ratio" indicator at 30%. The date is set to 2003 Year 2 Month 28 Day, and the time is 15 Hour 10 Minute. A message at the bottom says "Press < ADJUST > key to change the set-value." At the bottom of the window are "Return" and "Adjust" buttons.

KG94-05-040

#### Operation Instructions Screen

This screen is displayed to confirm ML operations and settings.

The screenshot shows a window titled "Operation Instructions" with a "load ratio" indicator at 30%. It contains a list of seven items: 1. Introduction, 2. Shifting Method of Displayed Screen, 3. Display of Machine Specifications, 4. Display of Abnormalities, 5. Adjustment of Screen Brightness, 6. Confirmation of Machine Specifications, and 7. Setting of Machine Specifications. Item 7 is selected with a cursor. Below the list, it says "Move the cursor to the item to be displayed by operating <SELECT> key. Press <DECIDE> key." At the bottom are "Select", "Return", and "Decide" buttons.

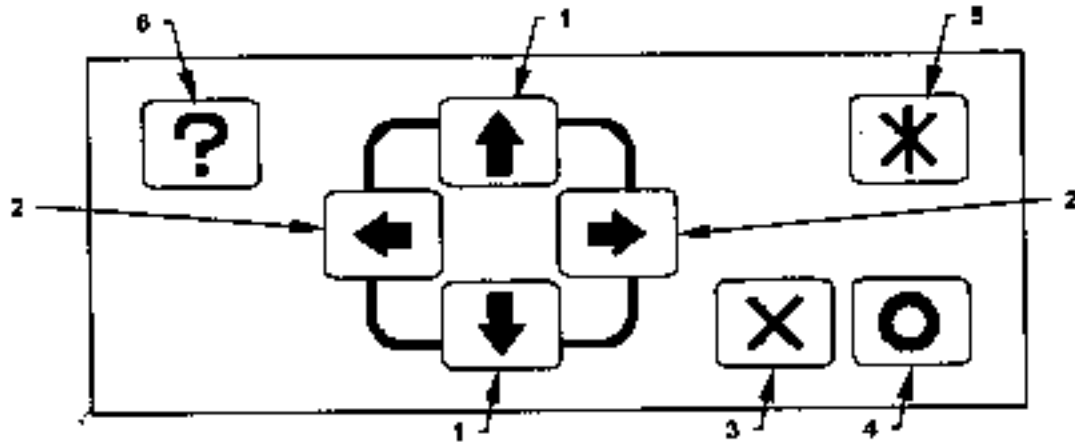
KG94-05-100

## 3 COMPONENTS NAME AND FUNCTION







### 3.3.3 Switch Panel Operation

Operate the keys on the switch panel when shifting the displayed screen or select the menu.

One key has multi-functions so that the function of the same key differs each time a different screen is displayed.



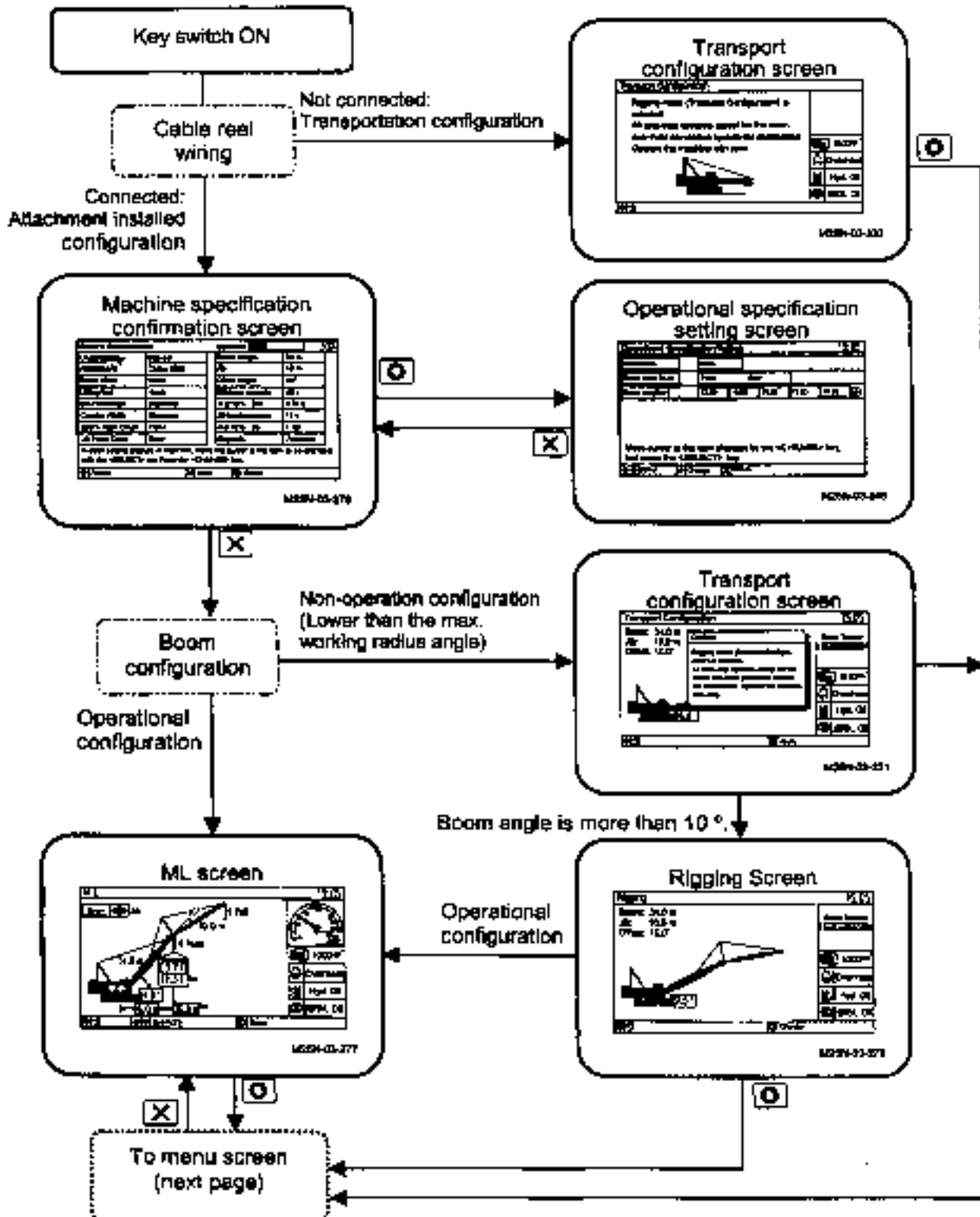
4921-03-010

- 1-  key  
Press these keys to move the cursor up and down or to select the item.
- 2-  key  
Press these keys to move page (screen) or change the numerical value.
- 3-  key  
Press this key when passing (next, stop setting, return) the function.
- 4-  key  
Press to execute (start, change, and menu display) the function.
- 5-  key  
Press this key to activate or deactivate the working range restriction function.
- 6-  key  
Press this key to display the M/L operation screen.

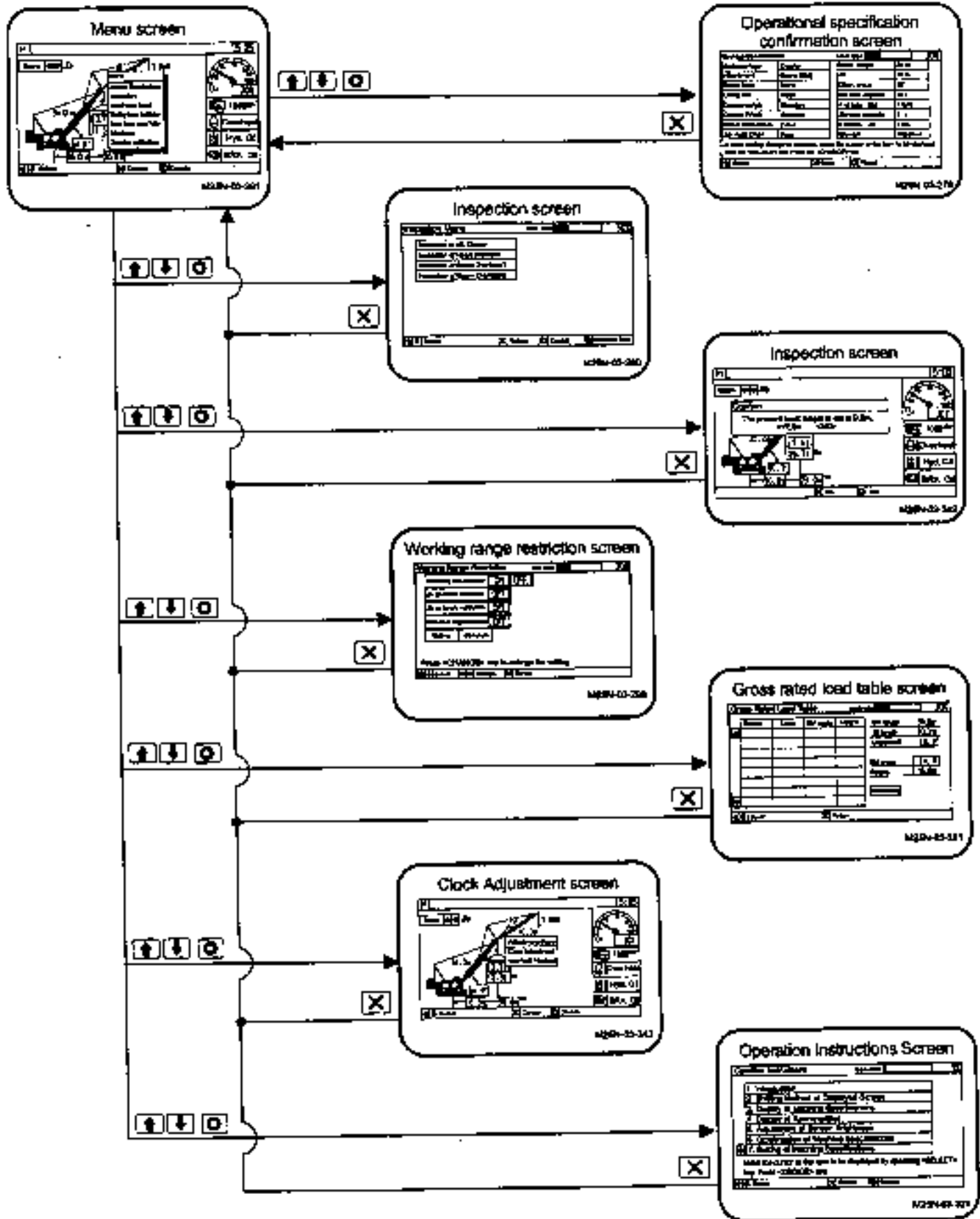
## 3 COMPONENTS NAME AND FUNCTION

### 3.3.4 Display Screen Shift Order

Shift order of the entire M/L screen is illustrated below. The line with an arrow mark (→) indicates the screen shift direction. Illustration of (○) key indicates the operation key to shift the screen.



### 3 COMPONENTS NAME AND FUNCTION



## 3 COMPONENTS NAME AND FUNCTION

### 3.3.5 Operation of Machine Specification Screen

**CAUTION:** If rated capacity limiter setting at this stage is not correctly performed, the rated capacity limiter functions may not work properly, possibly resulting in tipping over or damage to the machine. Be sure to check or set the following points.

This screen is used to confirm the set crane base machine and front attachment specifications. All screens shown below are sample screen forms to explain how to operate them. Therefore, some of them may differ from those actually displayed.

#### (1) Displaying Machine Specification Screen

When the key switch is turned ON, this screen will be displayed. In addition, when an machine specification item is selected on the menu screen, this screen is displayed. (Refer to the ML screen operation for displaying the menu screen.)

*NOTE: When the key switch is turned ON, if the boom angle is 10° or less, or if no boom or cable reel winchs are installed, the transport configuration screen is displayed. Refer to the descriptions in 3.3.15 Operation of Boom Storage, and 3.3.17 Display Screens of Transportation Position, etc.*

Machine Specifications		load ratio	
Undercarriage	Crawler	Boom length	34 m
Attachment	Crane (Std)	Jib	10 m
Boom Mast	None	Offset angle	10°
Lifting Tool	Hook	BM hook capacity	45 t
Counterweight	Standard	# of falls : BM	4 falls
Crawler Width	Standard	JIB hook capacity	11 t
Boom Hook Drum	Front	# of falls : Jib	1 fall
Jib Hook Drum	Rear	Outward	Attached
If a data setting change is required, move the cursor to the item to be changed with the <SELECT> key. Press the <CHANGE> key.			
<input type="button" value="Select"/>		<input checked="" type="button" value="Next"/> <input type="button" value="Reset"/>	

KCN-0-278




#### (2) Confirmation of Machine Specifications

1. Press  key when the actual crane specifications coincide with the displayed specifications. The screen moves to the ML screen.
2. In case the crane specifications do not coincide with the displayed ones, perform the machine specification setting.

## 3 COMPONENTS NAME AND FUNCTION

### (3) Machine Specification Setting

In case the crane specifications do not coincide with the displayed ones, perform the following operation. During this operation, all machine operations are automatically stopped.




1. After moving the blue cursor to the first item to be changed by operating   keys, press  key. Machine specification setting screen will be displayed.

- NOTE:**
- Items which are possible to set, differ depending on the customer's order specifications.
  - Items shown in light gray background can be set.
  - Items shown in deep gray background cannot be set (out of specification).



Setting order Blue cursor

Machine Specification		load ratio	30%
Unimountage	Crawler	Boom length	34 m
Attachment	Crane (3rd)	Jib	40 m
Boom Main	None	Offset angle	10°
Lifting Table	Hook	W of hook capacity	45 t
Counterweight	Standard	W of table : BM	4 tafe
Crane Width	Standard	Jib hook capacity	11 t
Boom Hook Drop	Left	W of table : JB	1 tafe
Jib Hook Drum	Rear	Stowage	Attached

If basic setting change is required, move the cursor to the item to be changed with the <SELECT> key. Press the <CHANGE> key.

 Select
  Change
 Return




K204-03-204

2. Move the blue cursor to the item to be changed by operating   keys.




Blue cursor

Operational Specification Setting				15:05
Attachment	Crane	Tower		
Boom Hook Drum	Front	Rear		

Move cursor to the item changed by the <CHANGE> key, and press the <SELECT> key.

 Select
  Change
 Return




K204-03-205

3. After selection is complete, press  key. The blue cursor moves to the next item below so that new item will be consequently displayed. Move the blue cursor to the item to be changed by operating   keys. After this, repeat this operation until "Complete" is displayed on the screen.

Blue cursor

Operational Specification Setting					15:05
Attachment	Crane	Tower			
Boom Hook Drum	Front	Rear			
Boom length (m)	12.00	13.00	15.00	18.00	18.00

Move cursor to the item changed by the <CHANGE> key, and press the <SELECT> key.

 Select
  Change
 Return

K204-03-206



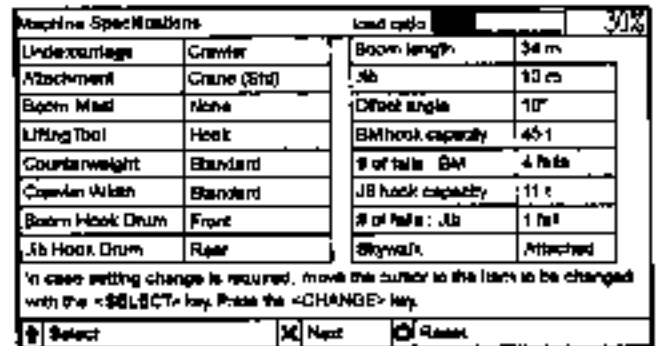
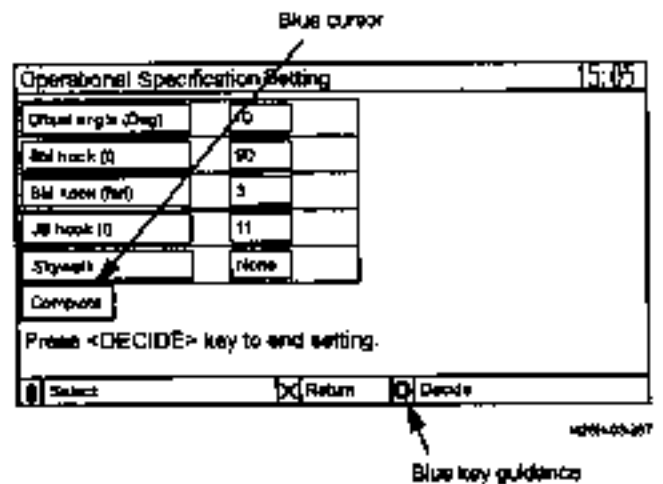
### 3 COMPONENTS NAME AND FUNCTION

4. After selecting all items, when the blue cursor reaches the "Complete" column, **[O]** mark and "DECIDE" are displayed in the key guidance column at the screen bottom.

Press **[O]** key. The screen moves to the operational specification confirmation screen.

- NOTE:**
- Press **[X]** key to cancel operational specification setting operation. The screen is moved to the operational specification confirmation screen.
  - Press **[?]** key to refer to the explanation screen. It is possible for you to check the setting method of operational specification setting screen.

5. When the operational specification confirmation screen is displayed, recheck the displayed specifications. Then, press **[X]** key to display the ML screen before starting to operate the machine.



## 3 COMPONENTS NAME AND FUNCTION

### 3.3.6 Operation of ML Screen

This screen is used during normal crane operation. When the crane attachment is installed, depending on whether the short jib or the fly jib is installed, a different screen is displayed.

#### (1) Displaying ML screen

1. Turn the key switch ON. When the machine specification screen is displayed, check that the displayed specifications match the actual machine specifications. Then, press **X** key.

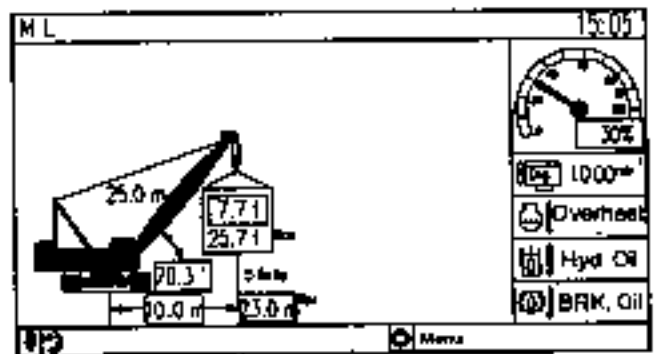
Machine Specifications		load ratio	30%
Undercarriage	Crawler	Boom length	34 m
Attachment	Crane (Std)	Jib	7.3 m
Boom Mast	None	Offset angle	10°
Lifting Tool	Hook	BM hook capacity	45 t
Counterweight	Standard	# of falls : BM	4 falls
Crawler Width	Standard	Jib hook capacity	11 t
Boom Hook Drum	Front	# of falls : Jib	1 fall
Jib Hook Drum	Rear	Skywork	Attached

In case setting change is required, move the cursor to the item to be changed with the <SELECT> key. Press the <CHANGE> key.

WZM-03-276

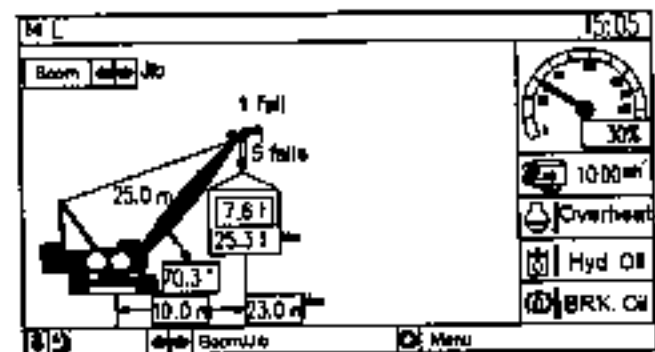
**NOTE:** When the key switch is turned ON, if the boom angle is lower than 10 degrees or no boom or cable reel wiring is installed, the screen displays a disassembly configuration. Refer to 3.3.15 Boom Storage Operation, 3.3.16 Boom Erection Operation, and 3.3.17 Display screens of Transportation Position, etc.

2. ML screen is displayed. Depending on whether the short jib or the fly jib is installed, a different screen is displayed.



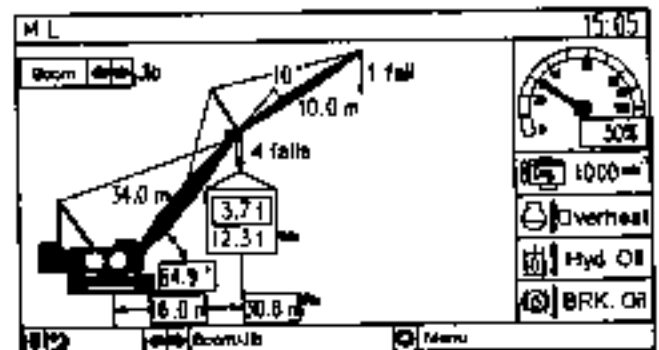
Display of only main boom

WZM-03-286



Display of short jib equipped machine  
(boom lifting)

WZM-03-296

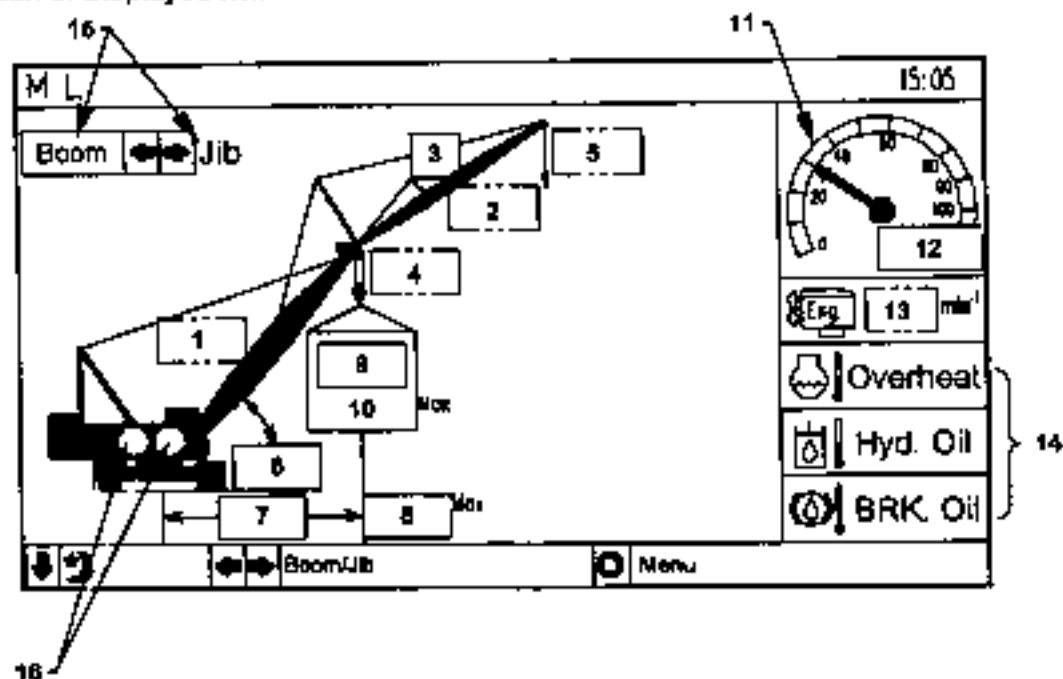


Display of crane jib equipped machine  
(boom lifting)

WZM-03-377

## 3 COMPONENTS NAME AND FUNCTION

### (2) Explanation of Displayed Items



MOON-02-200

- 1- The set boom length is displayed.
- 2- The set fly jib length is displayed.  
(In case no jib is set, nothing is displayed.)
- 3- The set fly jib off-set angle is displayed.  
(In case no jib is set, nothing is displayed.)
- 4- The set number of reeved lines for boom lifting is displayed.
- 5- The set number of reeved lines for jib lifting is displayed.
- 6- The actual boom angle is displayed.
- 7- The actual working radius is displayed.
- 8- The rated working radius for the present machine position or for the present actual lifting load is displayed.
- 9- The actual load including the hook weight in the selected work mode (boom or jib lifting) is displayed.
- 10- The gross rated load for the present machine configuration is displayed.
- 11- The load factor (actual load value/Limited load value) is displayed in % by means of the gauge panel.
- 12- The load factor (actual load value/Limited load value) is displayed in % by means of the numerical value.
- 13- The engine speed is displayed.
- 14- If a sensor detects an abnormal temperature, the background color changes to red.
- 15- The selected lifting mode (boom or jib lifting) is displayed in orange color frame.
- 16- The selected drum is displayed in orange color.

## 3 COMPONENTS NAME AND FUNCTION

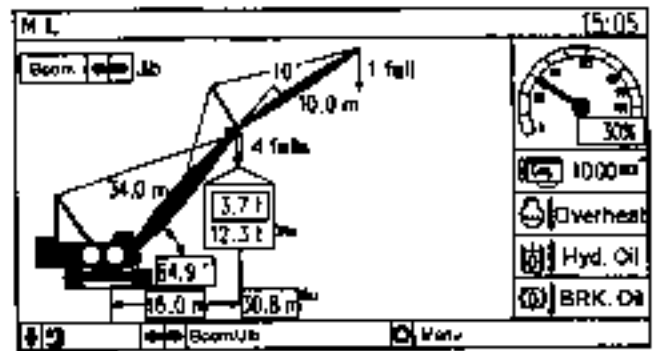
### (3) Operation

1. When operating the machine in the boom lifting or jib lifting mode, press or key respectively.

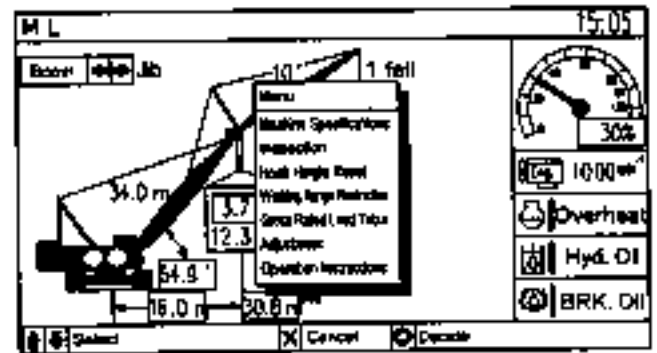
**NOTE:** In case either the short jib or fly jib is not installed, lifting mode selection is not achieved.

2. In case the screen is too bright during operation at night, press key. The entire screen background dims. To return the original brightness, press key.

3. Press key to display the menu. The menu screen pops on the ML screen.



M284-03-27

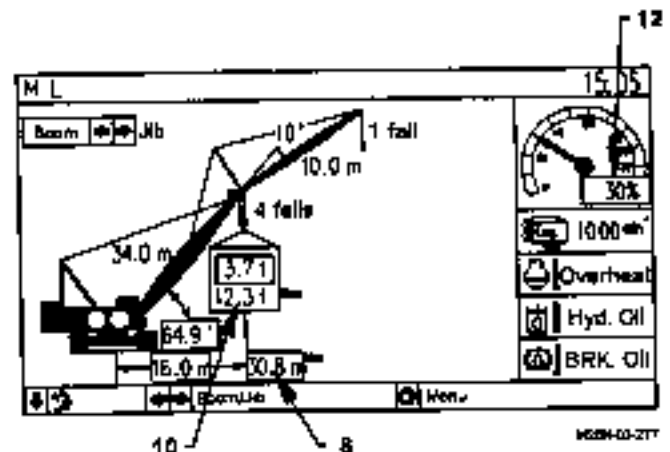


M284-03-27

### (4) ML Operation

**CAUTION:** If any alarm situation arises, immediately lower the load or retract the working radius up to the safety range.

When the load factor exceeds 90%, the green display columns of load factor (12), gross rated load (10), and rated working radius (8) start flashing in yellow, and the buzzer sounds at the same time. Then, if the load factor reaches 100%, these display columns change to red, the buzzer sounds, and the hook hoisting and boom lowering operation are automatically stopped. In case the load factor is more than 100%, the display of load factor (12) flashes "100."



M284-03-27


## 3 COMPONENTS NAME AND FUNCTION

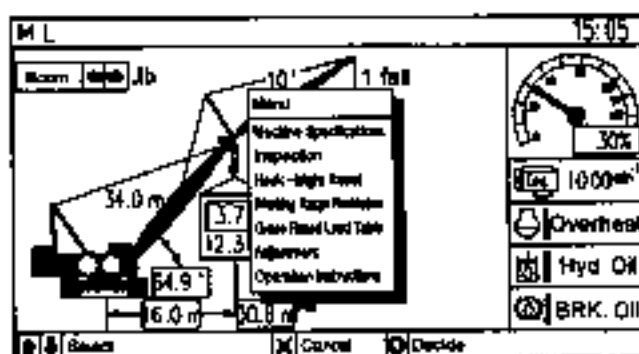
### 3.3.7 Operation of Menu Screen

7 types of the screens as shown below can be displayed from the menu screen.

- Machine specifications
- Inspection
- Hook Height Reset
- Working range restriction
- Gross rated load table
- Adjustment
- Operation Instructions





#### (1) Shifting method to Menu Screen

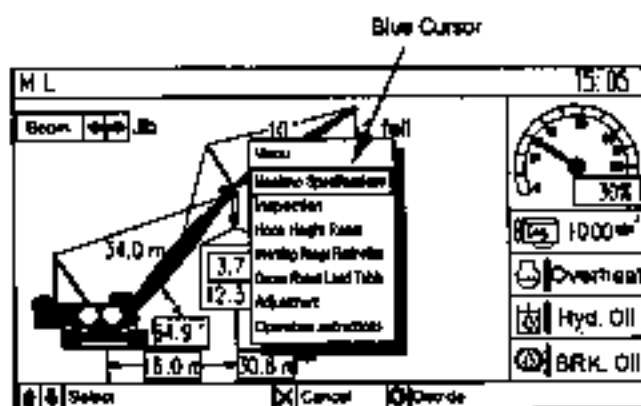
After displaying the ML screen, press  key. The menu pops on the screen. Refer to 3.3.6 Operation of ML Screen for displaying the ML screen.



MG24-05-201

#### (2) Operation

1. After moving the blue cursor to the item to be displayed by operating   keys, press  key. Refer to the descriptions in 3.3.8 Operation of Machine Specification Screen to 3.3.14 Operations of Operation Instructions for the details of each individual menu item.
2. Press  key to close the menu screen. The screen is returned to the ML screen.



MG24-05-202

## 3 COMPONENTS NAME AND FUNCTION


### 3.3.8 Operation of Machine Specification Screen

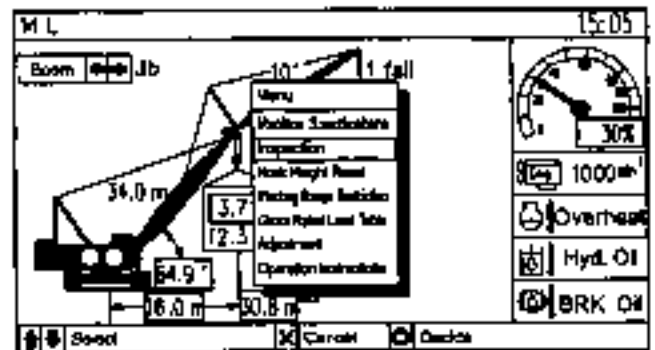
Refer to the explanation in 3.3.5 Operation of Machine Specification Screen.

### 3.3.9 Operation of Inspection Screen

On this screen, all safety device operation (auto-stop and buzzer) is checked. Use this screen when conducting inspection before operating the machine.

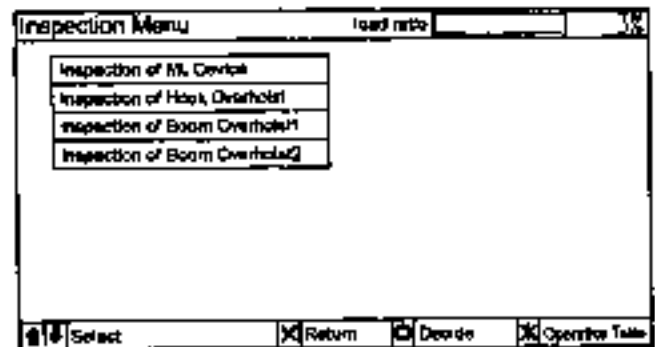
#### (1) Shifting method to Inspection Screen

1. Select the Inspection item on the menu screen. Press  key. (Refer to 3.3.6 Operation of ML Screen for displaying the menu screen.)



M2294-01-004

2. The inspection screen is displayed.






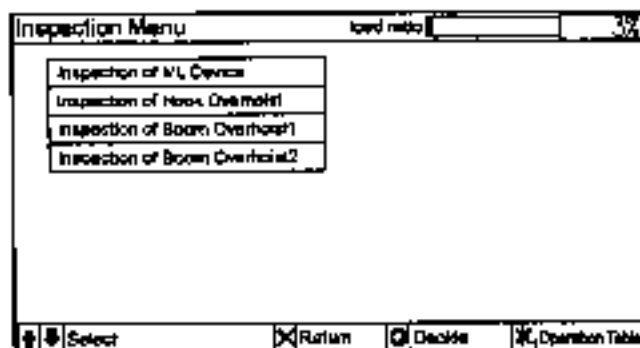
M2294-01-004

### 3 COMPONENTS NAME AND FUNCTION


#### (2) Inspection Procedures

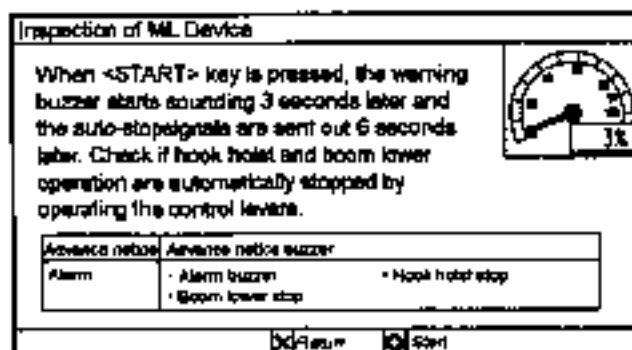
##### Inspection of Overload Prevention Device

1. Select the overload prevention device on the inspection menu screen by operating   keys. Press  key. The inspection screen for the overload prevention device will be displayed.



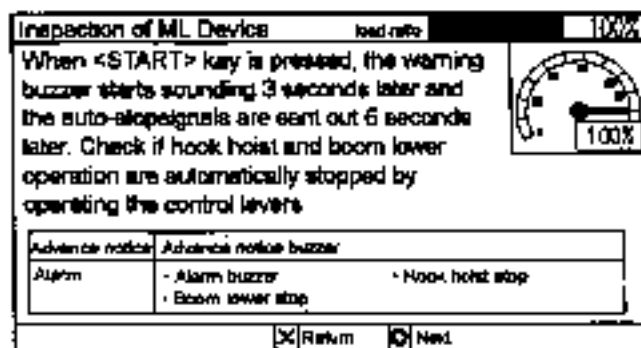
WZ04-03-26

2. Press  key. The ML device inspection system is activated.



WZ04-03-26



3. During inspection, the current status of the buzzer and the auto-stop system (whether signals are output or not) are displayed at the bottom of the screen. When the load factor shown at the right corner of the screen reaches 90%, the buzzer sounds. Further more, when the load factor reaches 100%, as soon as the buzzer sounds, the hook hoist and the boom lower operation are automatically stopped. Make sure that the hook hoist (boom/lb) system and the boom lower system are inoperable by actually operating the machine.

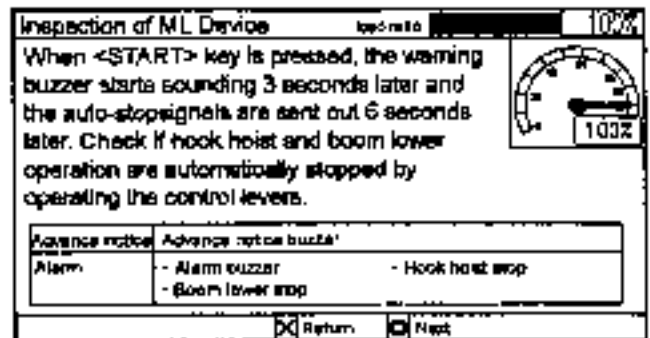


WZ04-03-26

**NOTE:** Press  key to cancel inspection operation.

### 3 COMPONENTS NAME AND FUNCTION

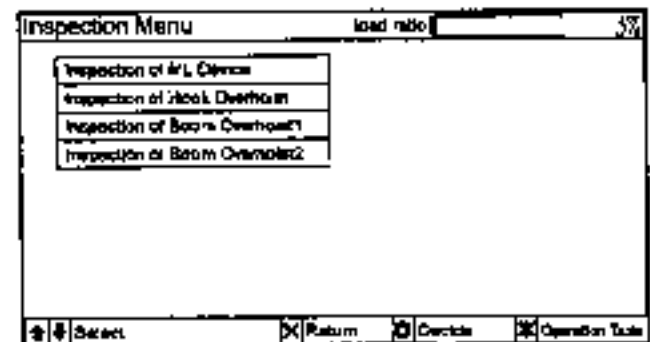
- Press  key to inspect the next item. The hook overhoist inspection screen will be displayed. In case no other inspections are required press  key. The screen is returned to the inspection menu screen.



M254-02-293

#### Inspection of Hook Overhoist

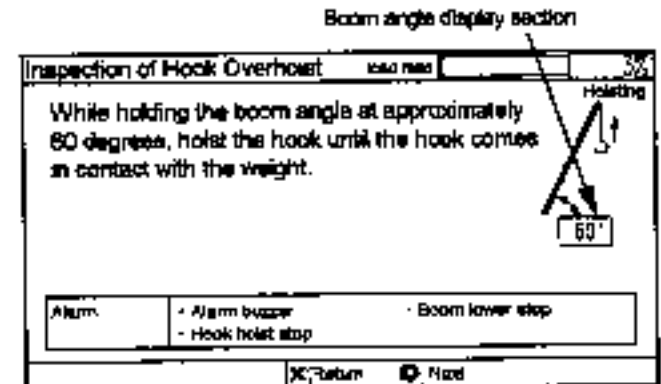
- Select the hook hoisting limiter on the Inspection menu screen by operating   keys. Press  key.



M254-02-294

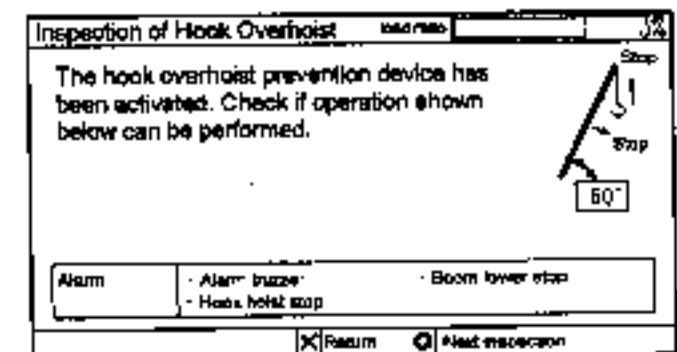
**NOTE:** In case the hook overhoist inspection screen is displayed, after displaying the overload prevention device inspection screen, this operation is unnecessary.

- While checking the boom angle displayed on the right side of the screen, set the boom angle to approx. 60 degrees.
- Raise the hook hoisting limiter weight by slowly hoisting the hook with the front drum lever.



M254-02-304



- When the hook hoisting limiter is activated, the screen display is automatically shifted. Check that the hook hoist and the boom lower system become inoperable and the alarm buzzer sounds at this time.

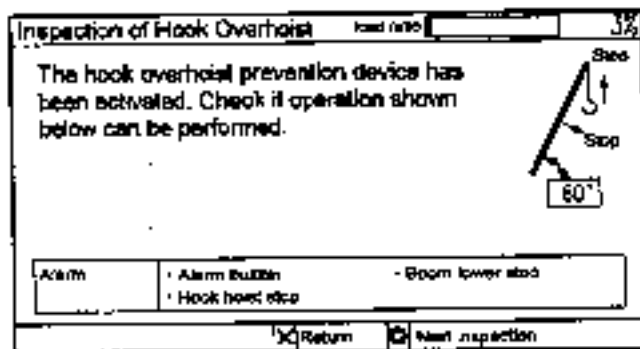


M254-02-302






### 3 COMPONENTS NAME AND FUNCTION

- Press  key to inspect the next item. The boom overhoist1 inspection screen will be displayed. In case no other inspections are required press  key. The screen is returned to the inspection menu screen.

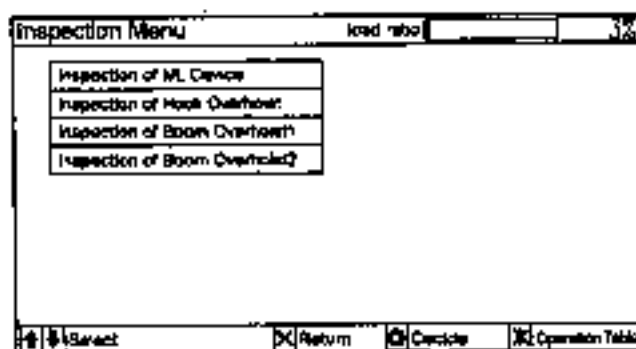


MSM-02-302

#### Inspection of Boom Overhoist1 Prevention Device

- Select the boom overhoist1 device on the inspection menu screen by operating   keys. Press  key.

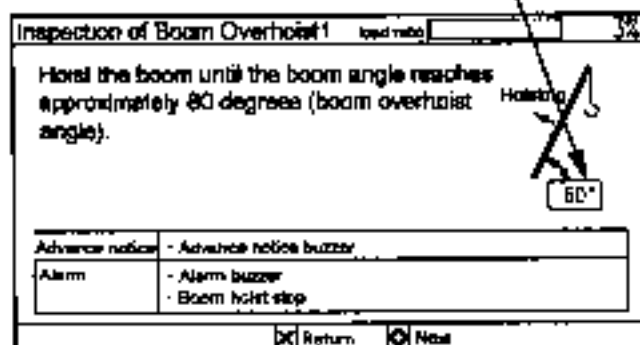
*NOTE: In case the boom overhoist1 inspection screen is displayed after displaying the hook hoisting limiter inspection screen, this operation is unnecessary.*



MSM-02-294

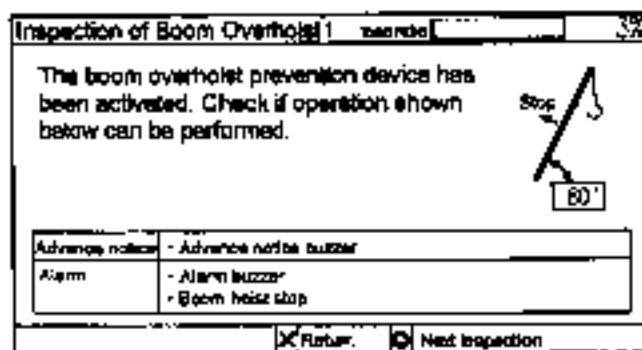
- While checking the boom angle displayed on the right side of the screen, slowly hoist the boom until the boom derrick limiter is activated (boom angle: 60°).

Boom angle display section





MSM-02-328

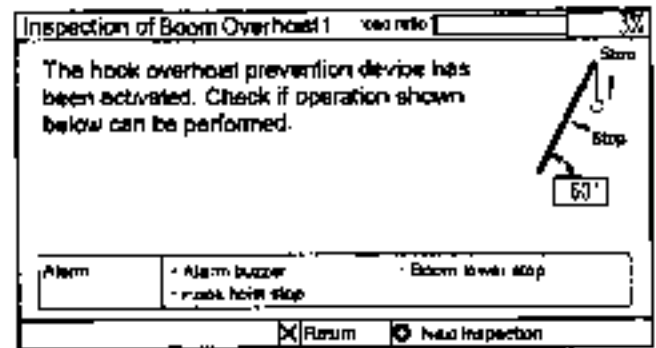
- When the boom derricking limiter is activated, the screen display is automatically shifted. Check that the boom hoist system becomes inoperable and the alarm buzzer sounds at this time.



MSM-02-317




### 3 COMPONENTS NAME AND FUNCTION

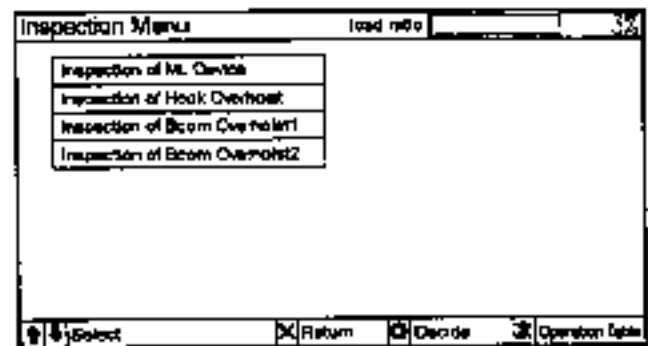
- Press  key to inspect the next item. The boom overhoist2 inspection screen will be displayed. In case no other inspections are required press  key. The screen is returned to the inspection menu screen.



MS20-03-33

#### Inspection of Boom Overhoist2 Prevention Device

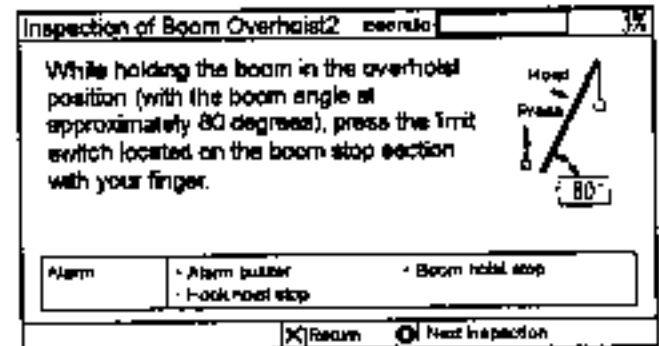
- Select the secondary boom overhoist2 prevention device on the inspection menu screen by operating   keys. Press  key.



MS20-03-29

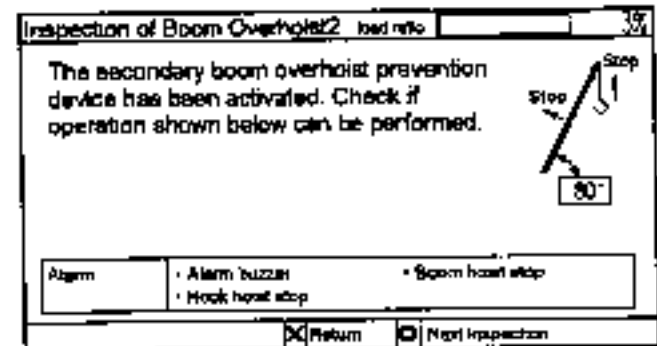
*NOTE: In case the boom overhoist2 prevention inspection screen is displayed after displaying the boom derrick limiter inspection screen, this operation is unnecessary.*

- Press the secondary boom overhoist prevention limit switch located on the boom back stop section with your finger.



MS20-03-32

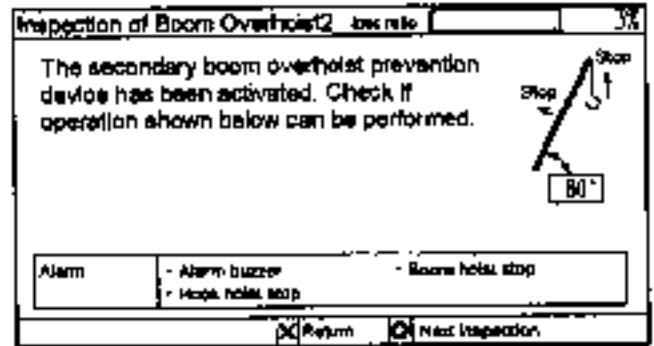
- When the secondary boom overhoist prevention device is activated, the screen display is automatically shifted. Check that the boom hoist system becomes inoperable and the alarm buzzer sounds at this time.



MS20-03-30

## 3 COMPONENTS NAME AND FUNCTION

4. Press **[O]** key to inspect the next item. The inspection of ML device screen will be displayed. In case no other inspections are required press **[X]** key. The screen is returned to the inspection menu screen.



M22H-03-138

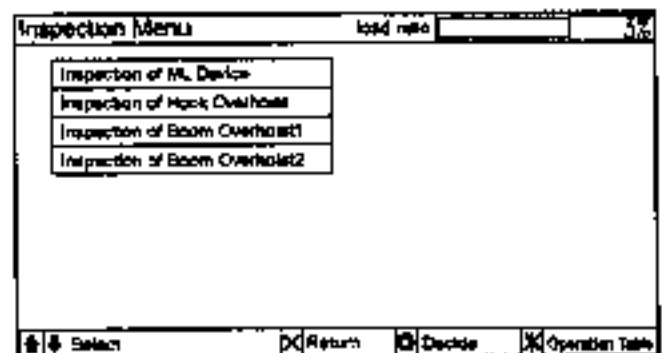
### Other Operations

1. When checking the operation table, press **[\*]** key on the inspection menu screen. When returning to the inspection menu screen, press **[X]** key.

Safety Device	Hose		Boom		Sound
	Hold	Lower	Hold	Lower	
ML	Stop			Stop	ON
Hook overhault	Stop			Stop	ON
Boom overhault 1			Stop		ON
Boom overhault 2	Stop		Stop		ON

M22H-05-140

2. Press **[?]** key to refer to the explanation screen. Inspection methods described on the inspection screen can be checked.
3. To complete inspection, press **[X]** key on the inspection menu screen. The screen is returned to the ML screen.



M22H-02-224

## 3 COMPONENTS NAME AND FUNCTION

### 3.3.10 Operation of Working Range Restriction Screen

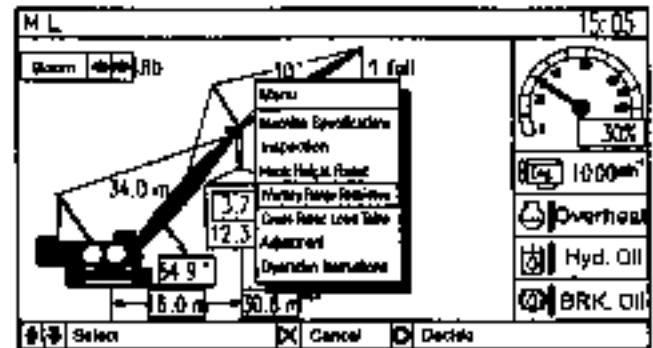
**CAUTION:** If the working range restriction system is set at a location close to an obstruction, the machine may come in contact with the obstruction. Set the system allowing sufficient distance away from the obstruction.

Desired restriction values for four items of lifting load, maximum working radius, and working height and hook height can be set on the working range restriction screen. The set restriction value becomes invalid when the operational specification setting is changed. Reset the restriction value as needed. When the actual load/working position becomes close to the set value, the advance notice buzzer operates. When the load or working position exceeds the set value, the operation system is automatically stopped and the alarm buzzer sounds.

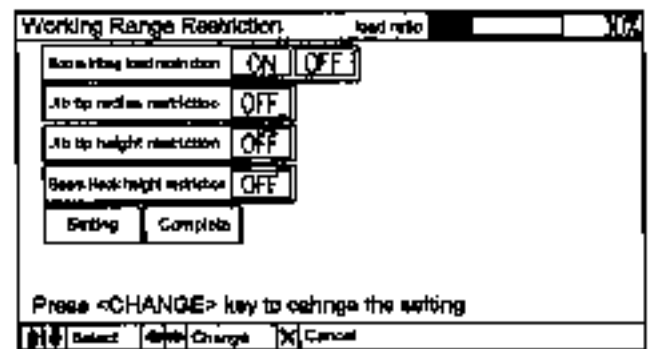
#### (1) Display of Working Range Restriction Screen

1. Select the working range restriction on the inspection menu screen by operating  $\uparrow$   $\downarrow$  keys. Press  $\odot$  key. (Refer to 3.3.6 Operation of ML screen for displaying method of the menu screen.)
2. The working range restriction setting screen is displayed.

**NOTE:** The item titles to be displayed on the working range restriction screen differ depending on whether the short jib or the fly jib is installed and whether boom lifting or jib lifting is selected on the ML screen.

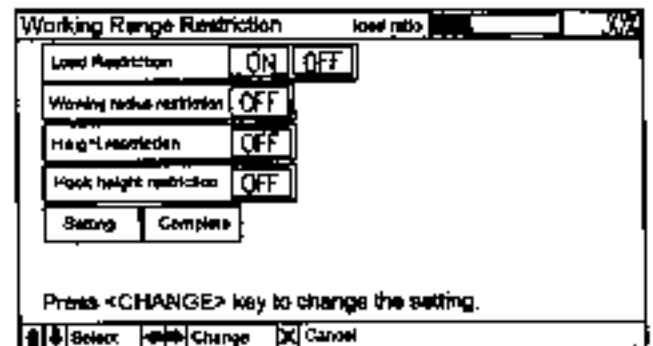


41204-05-007



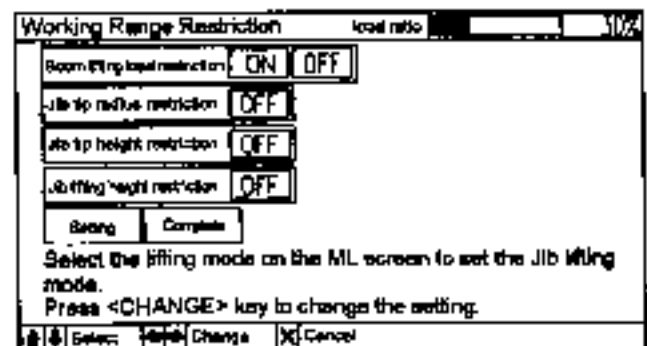
When boom lifting is selected with the short jib or fly jib installed:

41204-05-008



When both the short jib and fly jib are not installed:

41204-05-009





When jib lifting is selected with the short jib or fly jib installed:


41204-05-010



## 3 COMPONENTS NAME AND FUNCTION

### (2) Setting Method

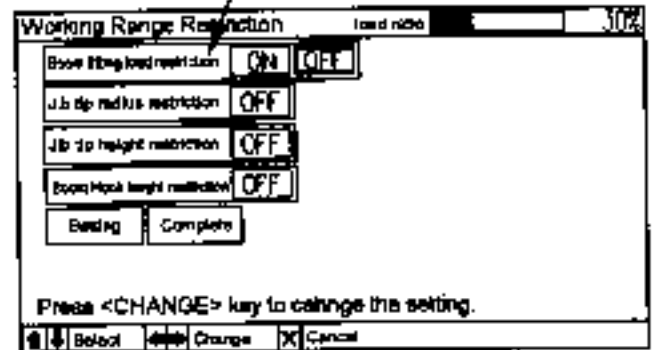
#### Setting of Load Restriction

1. Select the item for the load restriction by operating   keys.



**NOTE:** • When the boom lifting mode is selected on the ML screen, "Boom lifting load restriction" is displayed. When the jib lifting mode is selected on the ML screen, "Jib lifting load restriction" is displayed. To set the jib lifting mode, return to the ML screen by pressing  key. Then, execute this setting procedure. The menu displayed on the screen is changed to the jib lifting load restriction. In case no short jib or crane jib is set, "Load restriction" is displayed.

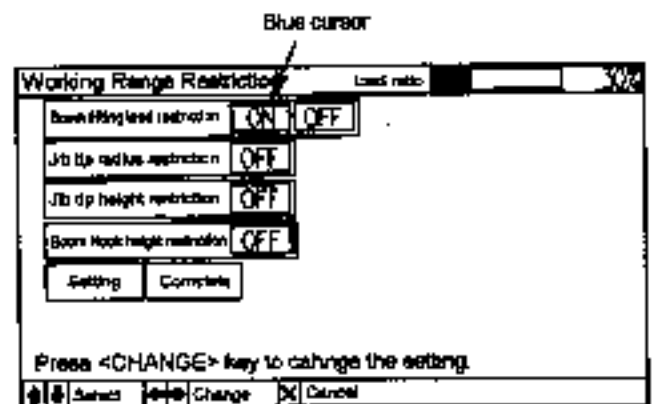
- Press  key to stop setting operation. The screen is returned to the ML screen.
- Press  key to refer to the explanation screen. The working range restriction setting method can be referred to.

In the jib lifting mode, the description "Jib lifting load restriction" is displayed. When no jib setting is made, the description "Load restriction" is displayed.








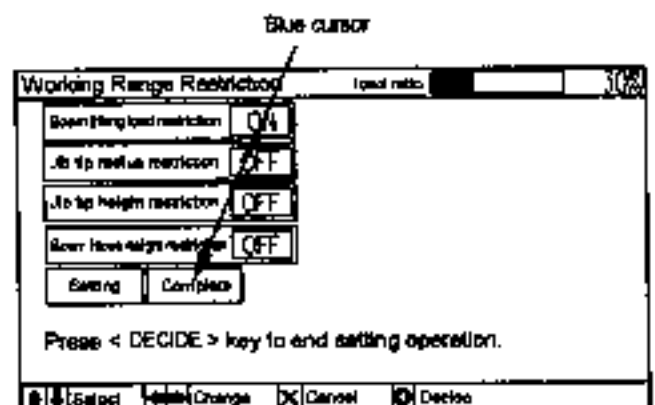
M28V-03-001

2. Move the blue cursor to the ON position by operating   keys. When no other setting is required, move to numerical value setting operation.



M28V-03-002

3. When using the restriction value, which has already been set, move the blue cursor to "Complete" by operating     keys. Then, press  key. The ML working range restriction screen is displayed.



M28V-03-003

## 3 COMPONENTS NAME AND FUNCTION

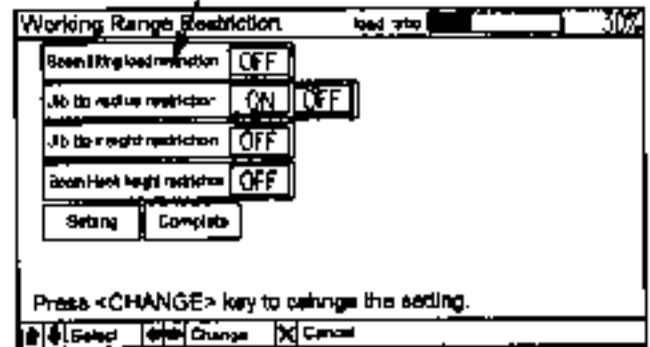
### Setting of Working Range Restriction

1. Select the item for the working range restriction by operating keys.

**NOTE:** • When the jib lifting mode (short jib or crane jib) is selected on the ML screen, jib lifting working radius restriction is activated. In case no short jib or fly jib is set, boom lifting working radius restriction is activated. The title of "Working radius restriction" is displayed in this case.

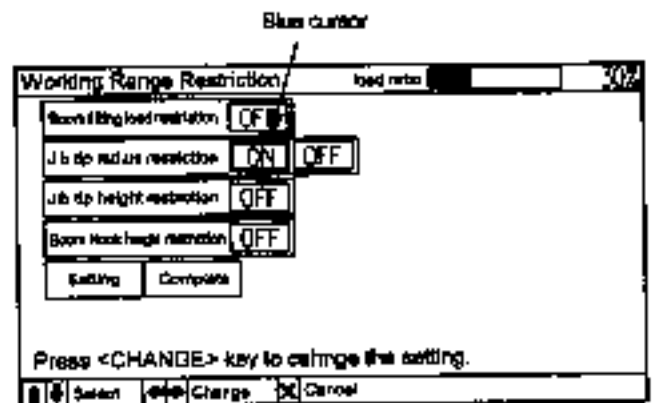
- Press key to stop setting operation. The screen is returned to the ML screen.
- Press key to refer to the explanation screen. The working range restriction setting method can be referred to.

In case no short jib or fly jib is set, "Working radius restriction" is displayed.



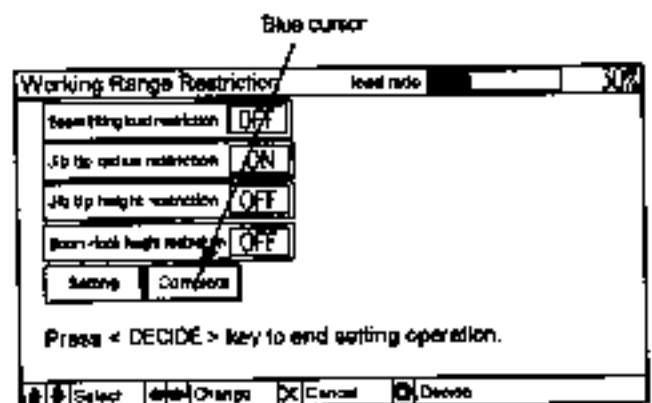
M229-02-304

2. Move the blue cursor to the ON position by operating keys. When no other setting is required, move to numerical value setting operation.



M229-02-305

3. When using the restriction value which has already been set, move the blue cursor to "Complete" by operating keys. Then, press key. The ML working range restriction screen is displayed.



M229-02-306

## 3 COMPONENTS NAME AND FUNCTION

### Setting of Working Height Restriction

1. Select the item for the working height restriction by operating keys.
  - The working height is the distance from the ground surface to the center of the boom or jib point sheave.

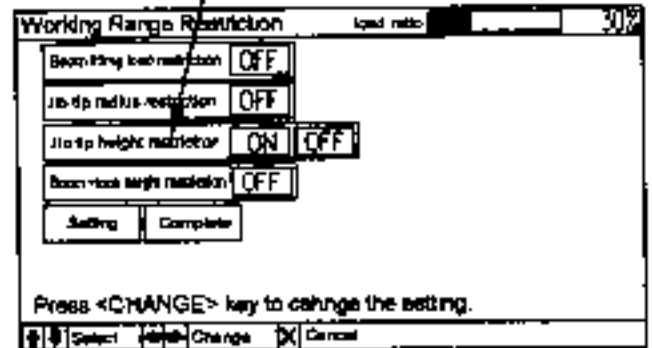
**NOTE:** • When the jib lifting mode (short jib or fly jib) is selected on the ML screen, jib tip radius restriction is activated. In case no short jib or fly jib is set, boom tip radius restriction is activated. The title of "Height restriction" is displayed in this case.

- Press key to stop setting operation. The screen is returned to the ML screen.
- Press key to refer to the explanation screen. The working range restriction setting method can be referred to.

2. Move the blue cursor to the ON position by operating keys. When no other setting is required, move to numerical value setting operation.

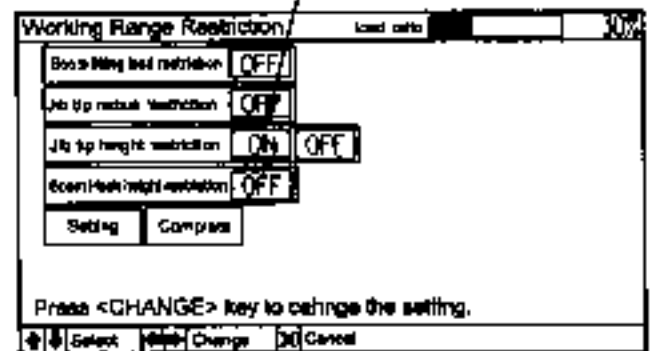
3. When using the restriction value which has already been set, move the blue cursor to "Complete" by operating keys. Then, press key. The ML working range restriction screen is displayed.

In case no short jib or fly jib is set, "Working height restriction" is displayed.



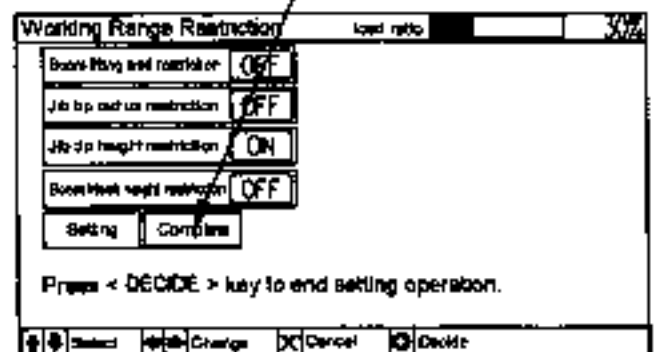
MOB-0-307

Blue cursor



MOB-0-308

Blue cursor



MOB-0-309

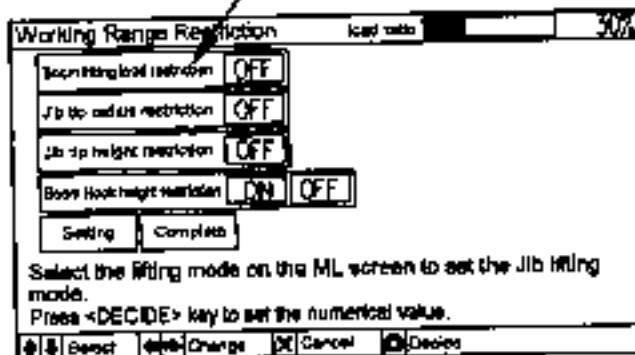
### 3 COMPONENTS NAME AND FUNCTION

#### Setting of Working Height Restriction

1. Select the item for the working height restriction by operating   keys.

When the jib lifting mode is selected "Jib lifting load restriction" is displayed. When no jib is used, "Load restriction" is displayed

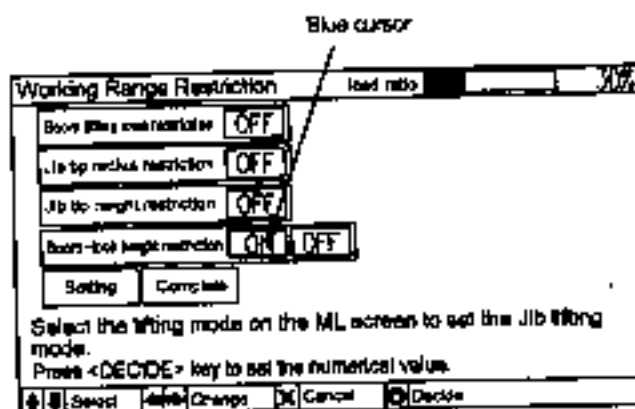
**NOTE:** • When the boom lifting mode is selected on the ML screen, the working height restriction for boom lifting is set. When the jib lifting mode is selected, the working height restriction for jib lifting is set. When setting the jib lifting mode, return to the ML screen by pressing  key. Then, select the jib lifting mode on the ML screen and perform the setting procedure on this screen. The item for the Boom Lifting Working Height Restriction display is shifted to the Jib Lifting Working Height Restriction display. When the operation mode without using the short or fly jib is set, the item for Boom Lifting Working Height Restriction display is shifted to the Working Height Restriction display.



WJ201-03-3-17

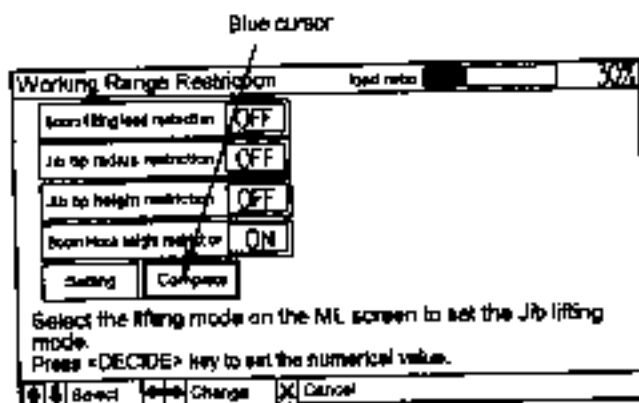
- Press  key to stop setting operation. The screen is returned to the ML screen.
- When required to refer to the explanation screen, press  key. The working range restriction screen setting method can be referred to.

2. Move the blue cursor to the ON position by operating   keys. When no other setting is required, move to numerical value setting operation.



WJ201-03-3-17

3. When using the restriction value, which has already been set, move the blue cursor to the Complete position by operating     keys. Then, press  key. The ML working range restriction screen is displayed.



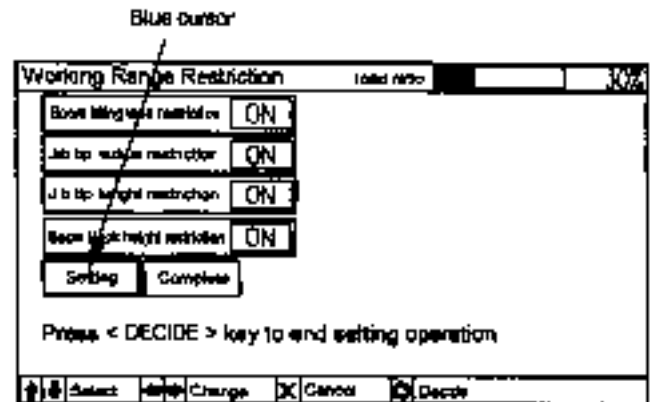
WJ201-03-3-17



## 3 COMPONENTS NAME AND FUNCTION

### Numerical Value Setting

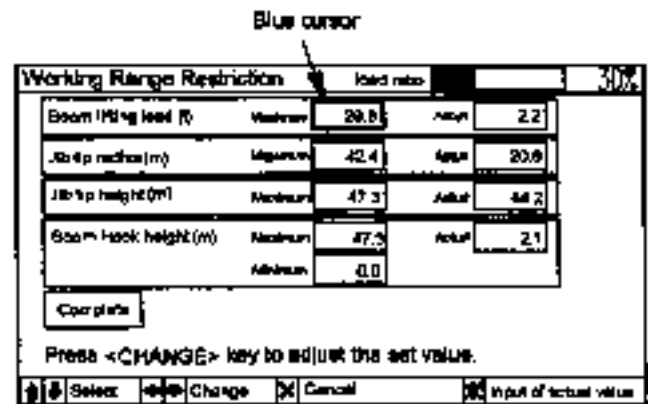
1. Move the blue cursor to the Setting position.



M229-03-010

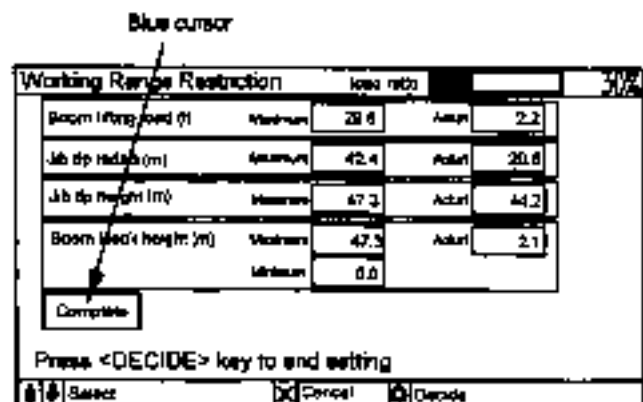
2. Press key. The numerical value setting screen is displayed.

- NOTE:**
- The illustration shown to the right indicates a screen pattern in which all item numerical value settings have been completed. In actual practice, only the item set ON in the previous setting screen is displayed.
  - The current value means the actual load, working radius, or working height.



M229-03-010

3. Move the blue cursor to the item to be set by operating keys.
4. Change the restriction value in the following method. When setting the restriction value with the current value, press key. When changing the restriction value, increase or decrease the restriction value by operating keys.
5. In case more than one item is set, repeat the above steps 3 and 4.
6. When completing the numerical setting operation, after moving the blue cursor to "Complete", press key. The ML working range restriction screen is displayed.



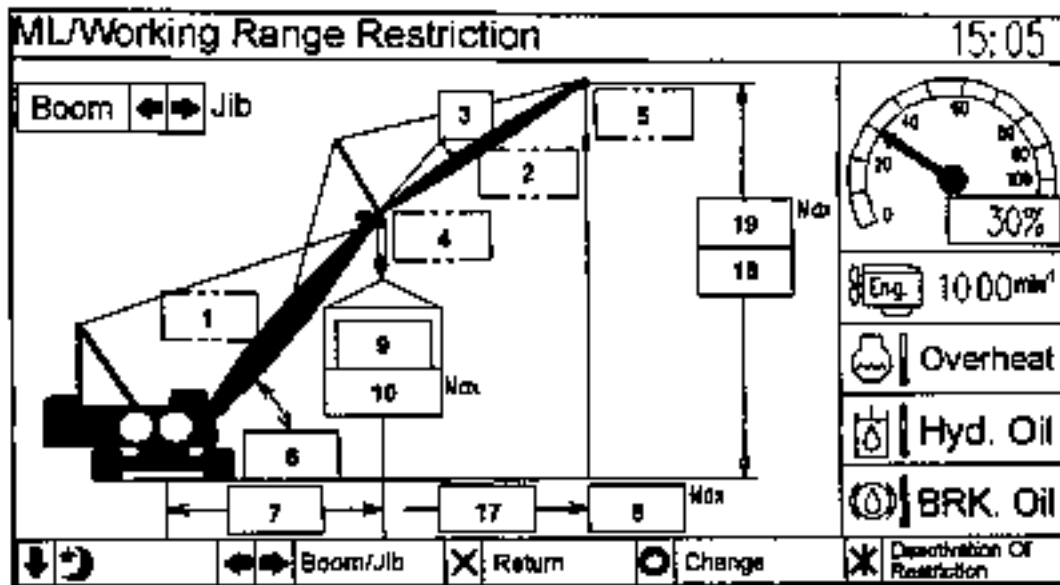
M229-03-010

### 3 COMPONENTS NAME AND FUNCTION

#### ML/ Working Range Restriction Screen

The ML working range restriction screen displays the restriction values on the ML screen introduced in 3.3.6. This screen can be used for normal crane work as well as the ML screen. In case any restrictions are not required, all restriction systems are deactivated at a time. (Refer to the next page for the deactivation method.) Once the all restriction systems are deactivated, the screen displays the identical pattern as the ML screen. (Only the different screen title is displayed.)

- Display pattern



10294-02-013

- 1- Displays the set boom length.
- 2- Displays the set fly jib length. (In case no jib is set, nothing is displayed.)
- 3- Displays the offset angle of the set fly jib. (In case no jib is set, nothing is displayed.)
- 4- Displays the number of boom derricking rope falls.
- 5- Displays the number of jib derricking rope falls.
- 6- Displays the actual boom angle.
- 7- Displays the actual working radius.
- 8- Displays the maximum restriction limit of the set working radius.
- 9- Displays actual load value.

The following items are added or changed while setting the working range restrictions.

- 10- Displays the maximum limit of the set load.
- 17- Displays the actual jib tip working radius. (In case no jib is set, nothing is displayed.)
- 18- Displays the actual boom or jib tip working height.
- 19- Displays the maximum restriction value of the set boom or jib tip working height.

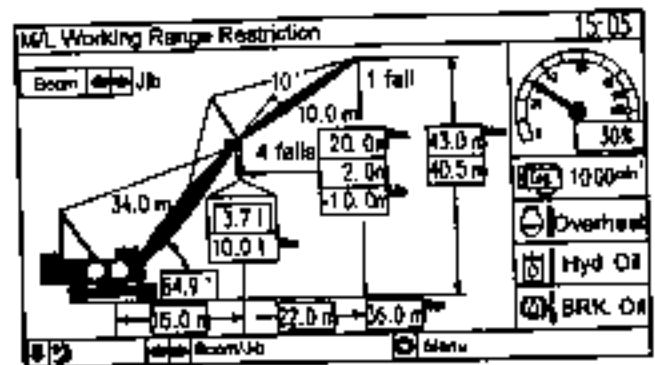
### 3 COMPONENTS NAME AND FUNCTION

• Operation

1. When the boom lifting mode is set, press key.  
When Jib lifting mode is set, press key.

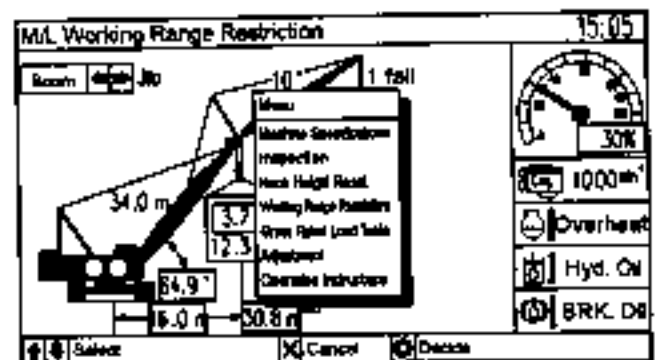
*NOTE: In case no jib is set, selection of the lifting mode cannot be made.*

2. When the screen is too bright in night operation, press key to dim the entire background of the screen. Press key to return to the original brightness.



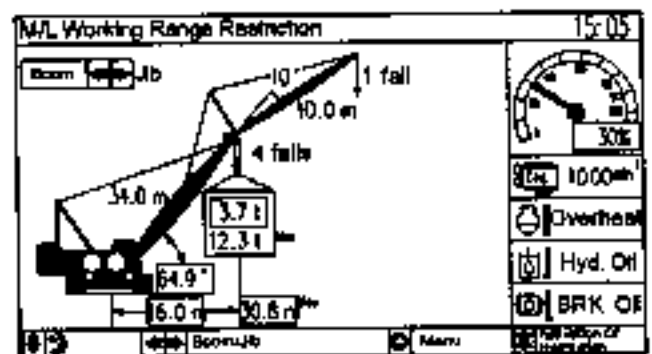
K0294-03-211

3. Press key to display the menu. The menu list is displayed on the screen.



K0294-03

4. In case all restriction systems are temporarily deactivated, press key. All set restriction values are deleted. (The screen becomes equal to the ML screen.) When resetting the restriction values, press key again.





K0294-03-118

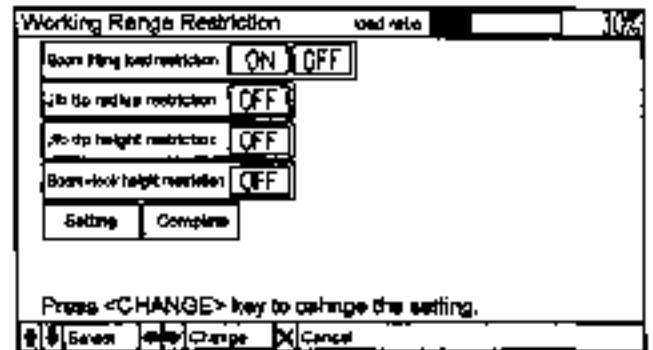
5. Press key to refer to the explanation screen. The display on the working range restriction screen can be referred to.

### 3 COMPONENTS NAME AND FUNCTION



#### Deactivation of Working Range Restriction Value

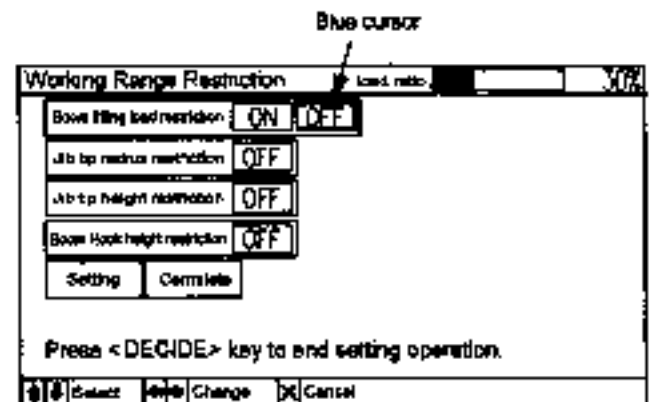
Use this deactivation function when deactivating the restriction of single item, or when deactivating all restrictions of the working range completely not by temporal deactivation on the ML working range restriction screen.

1. Select the item to be deactivated by operating   keys.







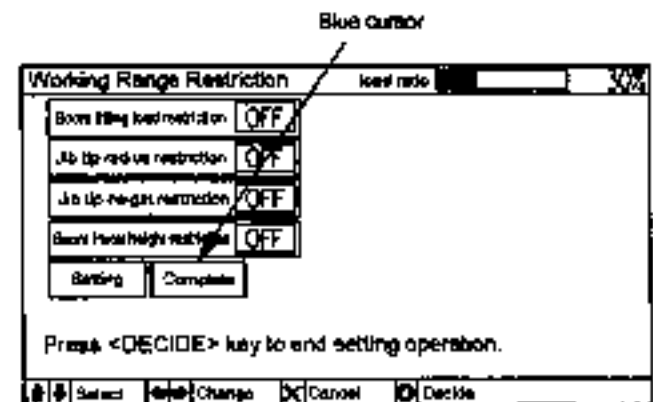
MS04-03-17

2. Move the blue cursor to the OFF position by operating   keys.



MS04-03-18

3. Move the blue cursor to the numerical value setting position by operating   keys.
4. After moving the blue cursor to the Complete position by pressing  key further, press  key. The screen is moved to either the ML screen or the ML working range restriction screen.



MS04-03-19

**NOTE:** In case only when all items are set OFF, the screen is moved to the ML screen. In case one of the restriction items is set ON, the screen is moved to the ML working range restriction screen.

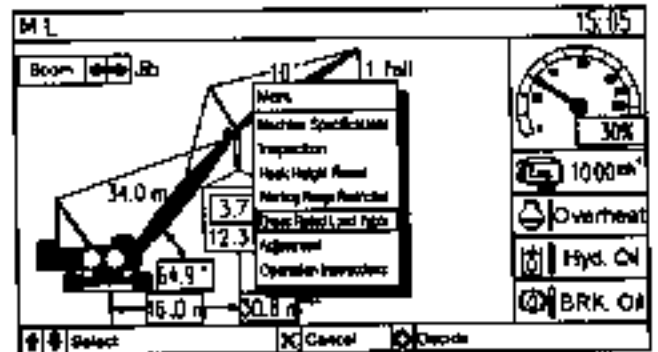
## 3 COMPONENTS NAME AND FUNCTION

### 3.3.11 Operation of Gross Rated Load Table Screen

The crane performance (working radius, gross rated load, boom angle, and working height) of the machine with the front attachment set on the operational specification setting screen can be confirmed on the gross rated load table screen.

#### (1) Shifting method to gross rated load table screen

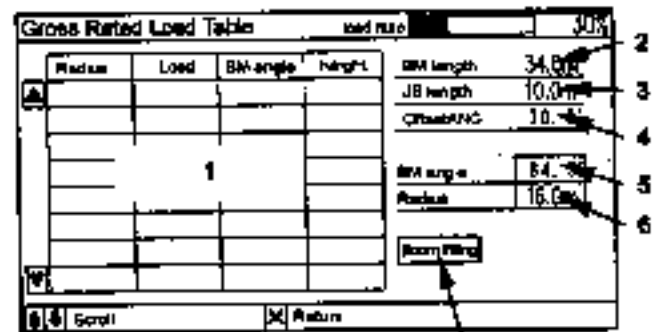
1. Select the menu of Gross rated load table on the menu screen by operating  $\uparrow$   $\downarrow$  keys. Then, press  $\odot$  key. (Refer to 3.3.5 Operation of ML Screen for displaying method of the menu screen.)
2. The gross rated load table screen is displayed.



MS24-03-09

#### (2) Displays on the screen

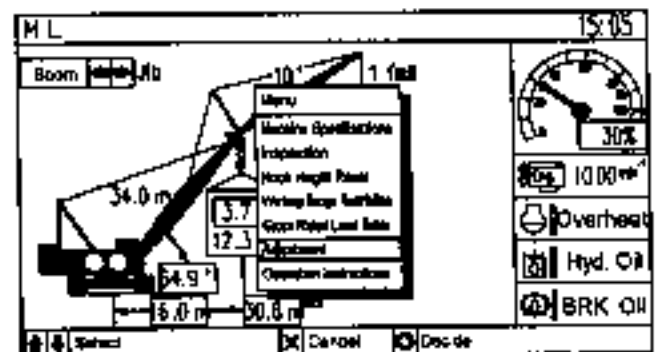
- 1- Displays the performances of the set attachment specifications in 8 lines per page.
- 2- Displays the set boom length.
- 3- Displays the set short jib or fly jib length.
- 4- Displays the set fly jib offset angle.
- 5- Displays the actual boom angle.
- 6- Displays the actual working radius.
- 7- Displays the lifting mode (either boom or jib lifting mode) set on the ML screen.



MS24-03-10

#### (3) Operation

1. Press  $\uparrow$   $\downarrow$  keys to scroll the table. The table is moved up and down by one line.
2. Press  $\times$  key to return to the ML screen.
3. Press  $?$  key to refer to the explanation screen. The display on the gross rated load table screen and operation methods can be confirmed.



MS24-03-11

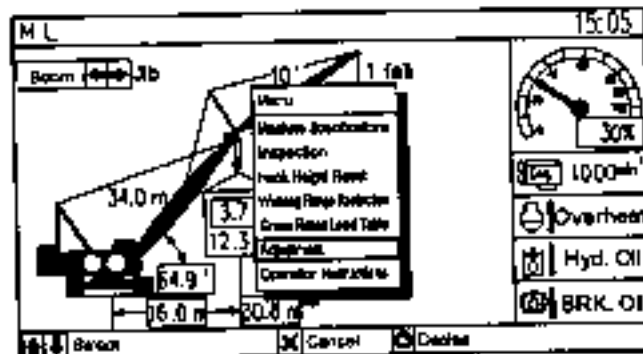
## 3 COMPONENTS NAME AND FUNCTION

### 3.3.12 Operation of Adjustment Screen

Display the clock adjustment screen when adjusting the date and/or the clock.

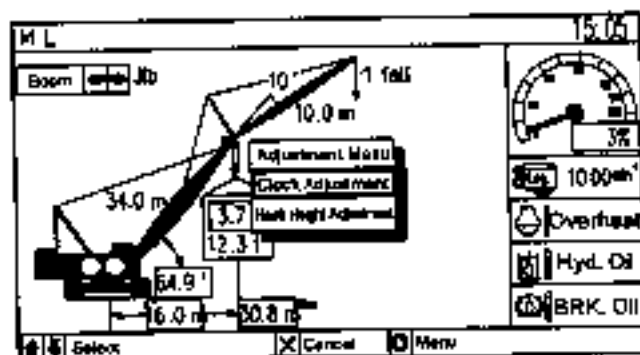
#### (1) Shifting method to adjustment screen

1. Select the menu of the Adjustment on the menu screen by operating keys. Then, press key. (Refer to 3.3.6 Operation of ML Screen for displaying method of the menu screen.)



WCM-03-321

2. The adjustment menu screen is displayed. Select the Clock adjustment menu by operating keys. Then, press key.

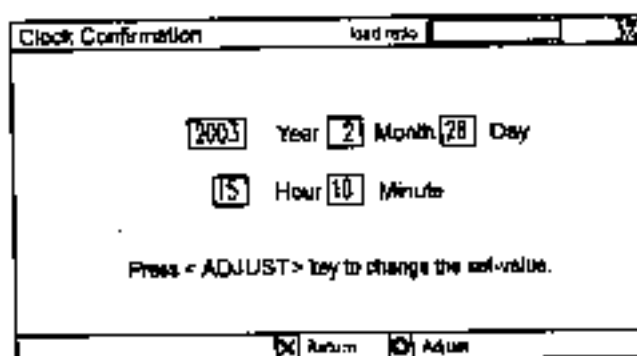


WCM-03-322

3. The clock confirmation screen is displayed.

**NOTE:** • If clock adjustment is not required, press key. The screen is returned to the ML screen.  
• Press key to refer to the explanation screen. Setting method of the clock adjustment screen can be referred to.





4. Press key to adjust the clock. The clock adjustment screen is displayed.

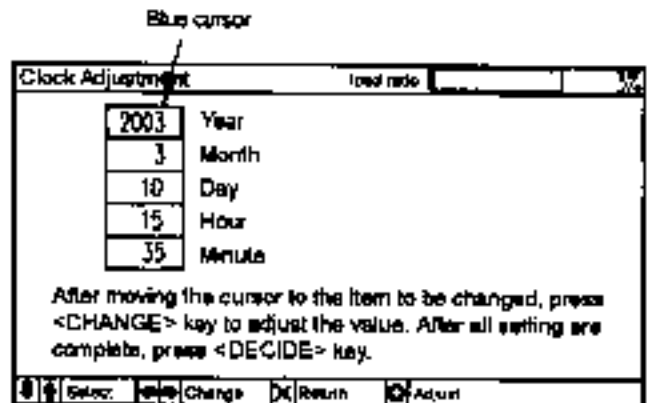


WCM-03-323


### 3 COMPONENTS NAME AND FUNCTION

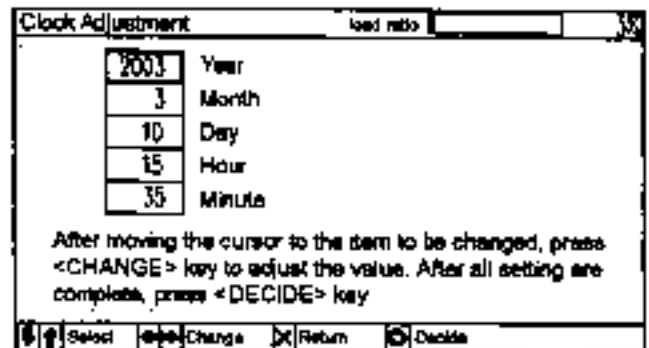
#### (2) Clock Adjustment

1. Move the blue cursor to the Item (one of Year, Month, Day, Hour, or Minute) to be changed by operating   keys.
2. After moving the blue cursor to the item to be changed, change the value by operating   keys.
3. When other values are required to change, repeat the above procedures 1 and 2.



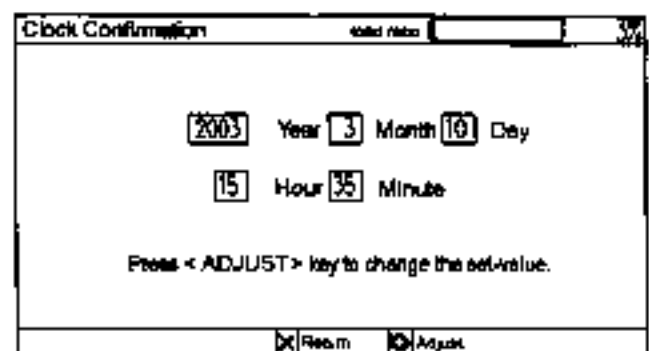
MS24-03-304

4. Press  key to end adjustment operation. The clock check screen is displayed.



MS24-03-305

5. After checking the changed item, press  key. The screen is returned to the ML screen.









MS24-03-306

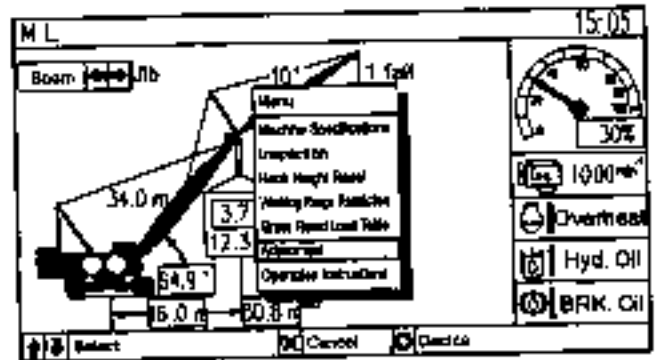
## 3 COMPONENTS NAME AND FUNCTION

### 3.3.13 Operation of Hook Height Adjustment Screen

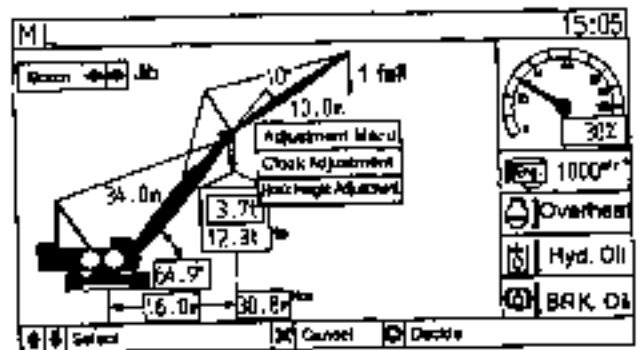
Set the ply and lane numbers of wire rope on the front and rear drums.

#### (1) Shifting operation to the hook height adjustment screen

1. Select "ADJUST" by operating   keys. Press  key. (Refer to 3.3.6 Operation of ML screen for displaying the MENU screen.)
2. The adjustment menu screen is displayed. Select "Hook Height ADJUST" by operating   keys. Press  key.








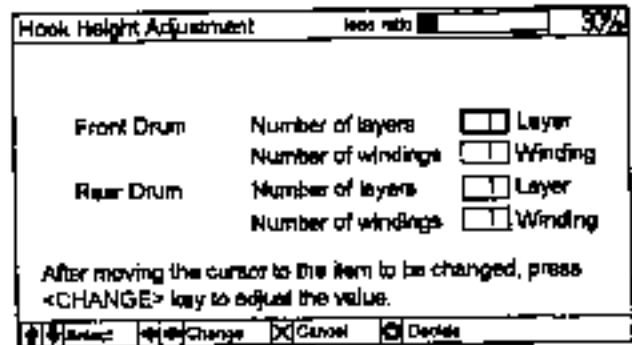
W094-03-321



W094-03-349

#### 3. Adjustment of Hook Height

- In case using both front and rear drums are set on the operation mode screen, both mode-setting screens are displayed. Move the blue cursor to the menu to be changed by operating   keys.
- After moving the blue cursor to the menu to be changed, change the value by operating   keys. Count the ply and lane numbers of wire rope from the wire rope winding start position on the bare drum.
- When ending adjustment operation, press  key.



W094-03-350






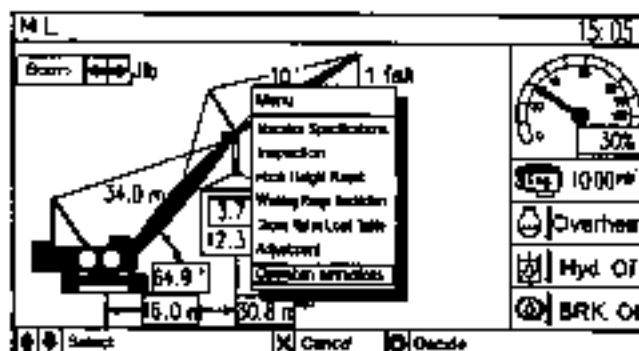
## 3 COMPONENTS NAME AND FUNCTION

### 3.3.14 Operation of Operation Instructions Screen

The operation explanation screen introduces operation and setting methods of each screen, and the displayed details.

#### (1) Shifting method to Operation Instructions screen

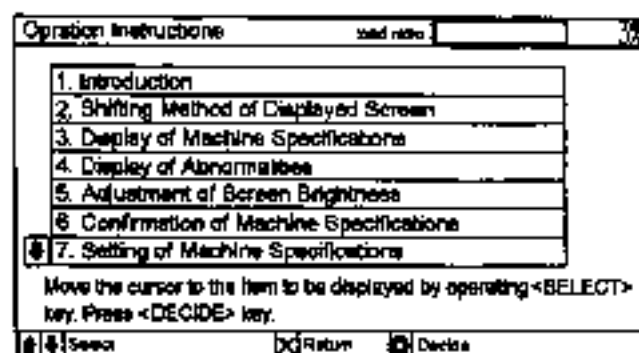
1. Select the menu of the operation instructions on the menu screen by operating   keys. Then, press  key. (Refer to 3.3.6 Operation of ML Screen for displaying method of the menu screen.)
2. The Contents of the operation instructions screen is displayed.








MS24-05-147

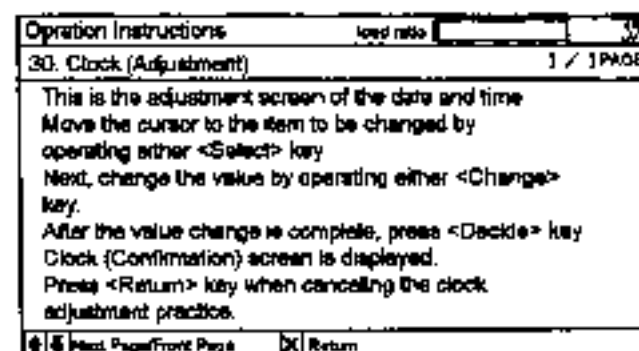
#### (2) Operation

1. Select the item to be referred by operating   keys.



MS24-05-148

2. Then, press  key. The explanation screen for the selected item is displayed.
3. Press   keys to turn the page.
4. When finishing operation, press  key to return to the Contents screen. Then, press  key again. The screen is returned to the ML screen.



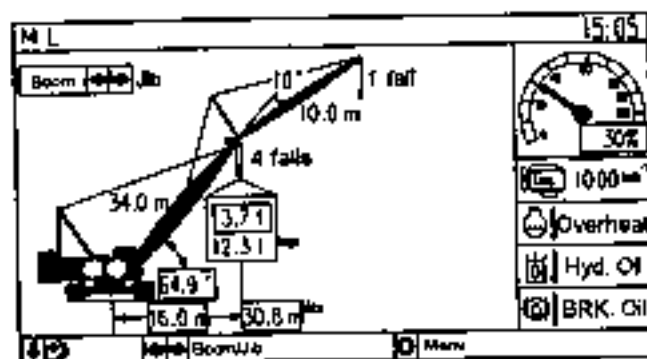
MS24-05-149

## 3 COMPONENTS NAME AND FUNCTION

### 3.3.15 Operation of Boom Storage

1. Ground the lifting load. Lower the boom until the working radius reaches the maximum.

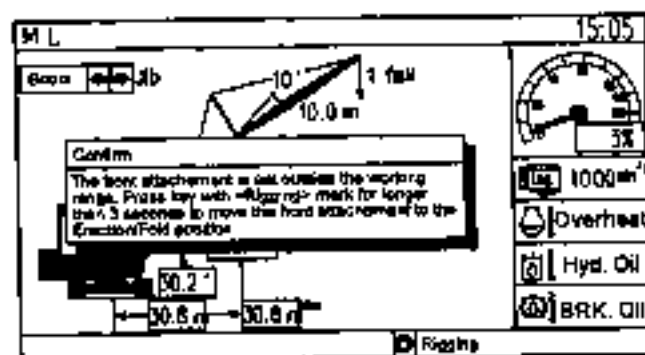
**NOTE:** Display either the ML screen or the ML working range restriction screen.




MO204-02-177

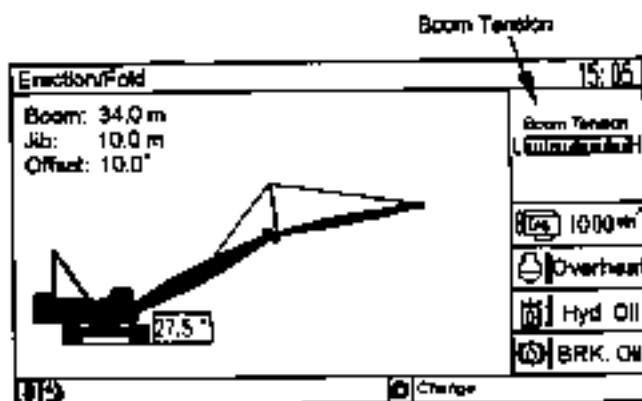
2. When the working radius reaches the maximum, the guidance for erection storage confirmation is displayed on the screen.

**NOTE:** When the load factor is more than 30%, this guidance will not be displayed. In this case, the guidance for "The front attachment is outside the maximum working range. Retract the working radius or ground the load." is displayed so that shifting to the erection storage screen is not achieved.



MO204-02-180

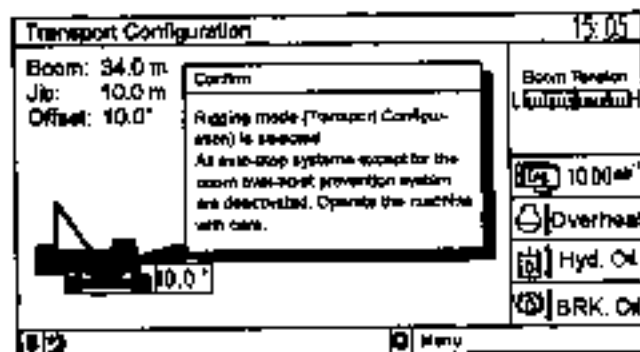
3. Press  key until the Erection/Fold screen is displayed. The boom length and the boom angle set on the machine specification screen are displayed on the rigging screen. (Load value, working radius, and load factors are not displayed.) In addition, the boom hoist rope tension is indicated in the form of a bar graph on the upper right corner of the screen.



MO204-02-127

4. When the boom is lowered further until the boom angle becomes lower than 10 degrees, the screen is shifted to the transport configuration screen.

**NOTE:** The safety devices (the overload and hook overhaul prevention devices) other than the boom overhaul prevention device will be deactivated on the transport configuration screen. Pay sufficient attention when operating the machine.



MO204-02-201

## 3 COMPONENTS NAME AND FUNCTION

### 3.3.16 Operation of Boom Erection

Operation of the boom erection required in case the boom is laid on the ground after finishing the work, or after replacing the front attachment (the boom angle is lower than 10 degrees in both cases) is explained below.

1. When the key switch is turned ON, the machine specification screen is displayed.

Machine Specification		Load info	30%
Undercarriage	Standard	Boom length	34 m
Attachment	Crane (Std)	Jib	10 m
Boom limit	None	Offset angle	0°
Lifting Tools	Hook	BM hook capacity	45 t
Counterweight	Standard	# of falls : BM	4 falls
Crane Winding	Standard	JIB hook capacity	11 t
Boom Hook Drum	Front	# of falls : Jib	1 fall
Jib Hook Drum	Rear	Skywalk	Attached

In case setting change is required, move the cursor to the item to be changed with the <SELECT> key. Press the <CHANGE> key.

Select      X Next      R Reset

MS04-03-270


**NOTE:** In case only the base section boom is displayed on the transport configuration screen, check if the cable reel wiring is connected.

Transport Configuration 15:05

Rigging mode (Transport Configuration) is selected.

All auto-stop systems except for the boom over-hoist prevention system are deactivated.

Operate the machine with care.



1000 m<sup>3</sup>

Overheat

Hyd. Oil

BRK. Oil

MS04-03-270

MS04-03-270

2. After checking that the actual machine specifications correspond with the displayed specifications, press  (NEXT) key. The screen is moved to the Transport configuration screen.

**NOTE:** • In case the actual crane specifications do not correspond with the displayed specifications, reset the setting.

- All safety systems (overload and hook overhoist prevention systems) except the boom overhoist prevention system are deactivated. Carefully operate the machine.


Transport Configuration 15:05

Boom: 34.0 m  
Jib: 10.0 m  
Offset: 10.0°

Confirm

Rigging mode (Transport Configuration) is selected.

All auto-stop systems except for the boom over-hoist prevention system are deactivated. Operate the machine with care.



Boom Tension

1000 m<sup>3</sup>

Overheat

Hyd. Oil

BRK. Oil

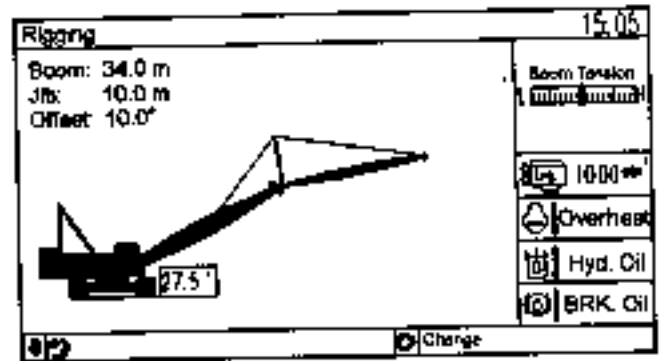
Menu

MS04-03-271

MS04-03-271

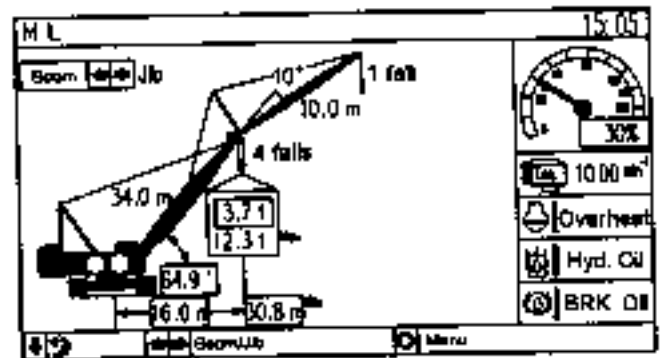
## 3 COMPONENTS NAME AND FUNCTION

- 3 Hoist the boom. When the boom angle becomes more than 10 degrees, the screen is moved to the rigging screen.



162A-03-270

4. Hoist the boom further. When the boom angle enters the working range, the screen is moved to the ML screen.

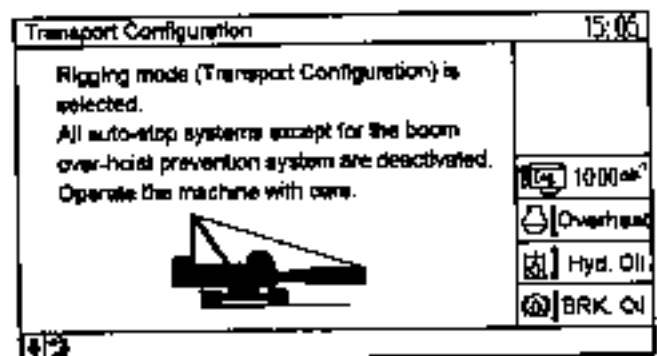


162B-03-277

### 3.3.17 Display Screens of Transportation Position, etc.

After storing the boom, when the key switch is turned ON to replace the front attachment or set the machine to the transportation position, etc without connecting the cable reel wiring [Refer to 3.3.1 (3) Rated Capacity Limiter Component Locations.], the transport configuration screen (the machine equipped with only the boom base section) is displayed.


**NOTE:** The machine is equipped with the boom base section. Therefore, when the boom angle sensor is provided and the boom angle becomes more than 30 degrees, the screen is shifted to the machine specification screen so that the derricking (hook hoisting) system is automatically stopped. Then, error code W 47 is displayed at the same time.



162B-03-302

## 3 COMPONENTS NAME AND FUNCTION

### 3.4 Display of Error Codes

If the ML is incorrectly operated, or any abnormality occurs in the ML, error codes and messages are displayed in the title column at the upper section of the screen. The error code starting with "E" indicates an alarm state (sounding the buzzer and activating the auto-stop system). The error code starting with "W" indicates a warning state (error guidance only). Press  key to check the abnormal state.

Alarm Error Code (sounding the buzzer and activating the auto-stop system) List

Error code	Error message to be displayed in the title column at the upper section of the screen	Failure in operation, setting, or wiring		Malfunction
		Check point	Solution	
E20	Abnormal boom angle	Broken or short-circuited boom angle sensor harness	Repair the harness.	Faulty boom angle sensor
E21	Abnormal boom angle	Disconnected boom angle sensor, Broken or short-circuited boom angle sensor harness	Connect correctly. Repair the harness.	Faulty boom angle sensor
E22	Abnormal tower angle	Broken or short-circuited tower angle sensor harness	Repair the harness.	Faulty tower angle sensor
E26	Abnormal tower angle	Disconnected lower angle sensor, Broken or short-circuited tower angle sensor harness	Connect correctly. Repair the harness.	
E30	Abnormal jib angle	Broken or short-circuited jib angle sensor harness	Repair the harness.	Faulty jib angle sensor
E31	Abnormal jib angle	Disconnected jib angle sensor, Broken or short-circuited jib angle sensor harness	Connect correctly. Repair the harness.	Faulty jib angle sensor
E40	No data is input.	Incorrect machine specification setting	Reset.	
E43	Select tower	Incorrect machine specification setting	Select the tower.	
E44	Select crane	Incorrect machine specification setting	Select the crane.	
E45	Short-circuited cable reel wiring	Short-circuited cable reel wiring	Repair the harness.	
E50	Abnormal load cell	Broken or short-circuited load cell harness	Repair the harness	Faulty load cell
E51	Abnormal rope tension	Incorrectly set boom length and/or jib length, Lifted boom or jib with hook	Set the correct length. Lower the hook.	Faulty load cell
E52	Abnormal load cell	Disconnected load cell, Broken or short-circuited load cell harness	Connect correctly. Repair the harness.	Faulty load cell
E53	Abnormal load cell electric power source			Faulty electric power to load cell
E54	Reduced load cell electric power source			Faulty electric power to load cell
E55	Short-circuited load cell electric power source	Short-circuited load cell harness	Repair the harness	Faulty electric power to load cell

### 3 COMPONENTS NAME AND FUNCTION

Warning State (error guidance only) List

Error code	Error message to be displayed in the title column at the upper section of the screen	Failure in operation, setting, or wiring		Malfunction
		Check point	Solution	
W10	Abnormal electric source voltage			Faulty alternator
W11	Reduced electric source voltage	Reduced battery voltage	Replace the batteries.	Faulty alternator
W14	Short-circuited sensor electric source voltage (24V)	Short-circuited IDU sensor 24V electric source harness	Repair the harness.	Faulty IDU sensor 24V output
W47	Broken cable reel wiring	Disconnected cable reel wiring	Connect correctly.	
W48	Abnormal counterweight sensing data	Broken or short-circuited counterweight sensor harness	Repair the harness.	
W49	Abnormal hook overhoist prevention device circuit	Connected short circuit connector in the upper boom relay box	Connect correctly.	Faulty relay box
W90	Abnormal communication A	Broken harness between IDU and MC2/A	Repair the harness.	Faulty IDU or MC2/A
W91	Abnormal communication B	Broken harness between IDU and MC2/B	Repair the harness.	Faulty IDU or MC2/B
WA1	Short-circuited sensor electric source (24V1A)	Short-circuited MC2/A sensor 24V electric source harness	Repair the harness.	Faulty MC2/A sensor 24V output
WA2	Short-circuited sensor electric source (24V2A)	Short-circuited MC2/A sensor 24V electric source harness	Repair the harness.	Faulty MC2/A sensor 24V output
WA3	Short-circuited sensor electric source (24V3A)	Short-circuited MC2/A sensor 24V electric source harness	Repair the harness.	Faulty MC2/A sensor 24V output
WA5	Short-circuited sensor electric source (5VA)	Short-circuited MC2/A sensor 5V electric source harness	Repair the harness.	Faulty MC2/A sensor 5V output
WB1	Short-circuited sensor electric source (24V1B)	Short-circuited MC2/B sensor 24V electric source harness	Repair the harness.	Faulty MC2/B sensor 24V output
WB2	Short-circuited sensor electric source (24V2B)	Short-circuited MC2/B sensor 24V electric source harness	Repair the harness.	Faulty MC2/B sensor 24V output
WB3	Short-circuited sensor electric source (24V3B)	Short-circuited MC2/B sensor 24V electric source harness	Repair the harness.	Faulty MC2/B sensor 24V output
WB5	Short-circuited sensor electric source (5VB)	Short-circuited MC2/B sensor 5V electric source harness	Repair the harness.	Faulty MC2/B sensor 5V output

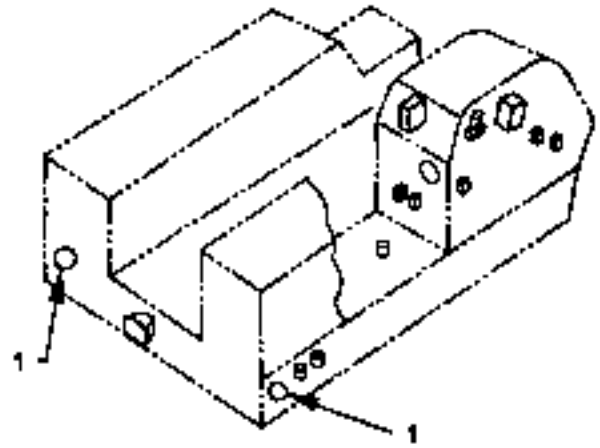
IDU: Information display controller, MC2/A: Controller A, MC2/B: Controller B

## 3 COMPONENTS NAME AND FUNCTION

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### 3.5 Slewing Alarm Light

When the slewing lever is operated, the signal from the sensor flashes slewing alarm light (1) located on the back of the superstructure. In this case, the buzzer sounds at the same time. (Refer to the next page for information on the alarm buzzer.)



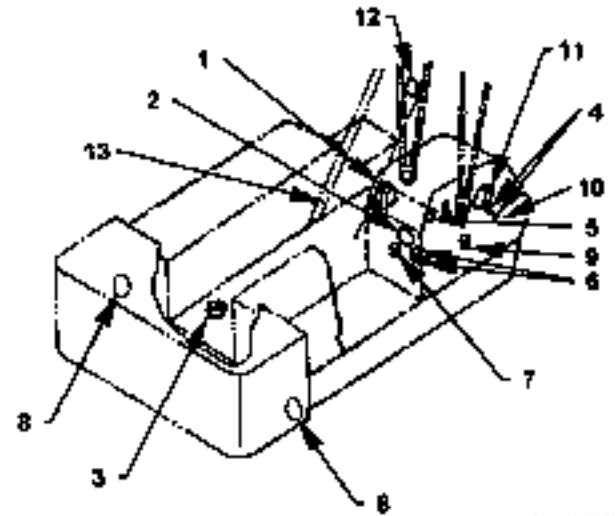
MOB-13-4-T

## 3 COMPONENTS NAME AND FUNCTION

### 3.6 Alarm and Advance Notice Device

The interior speaker (commonly used for the radio) provided inside the cab or the exterior speaker provided on the rear of the superstructure deliver various kinds of alarms based on the signals sent from sensors installed at many places on the machine.

- Alarm output unit (1) sounds the alarms.
- The alarm is sounded when machine operation state matches the corresponding alarm output conditions, as shown on the next page
- As long as machine operation state is kept in the corresponding alarm output conditions, the alarm is continuously sounded.



The major components in the alarm and advance notice system are as follows:

- 1- Output unit
- 2- Interior speaker (for the operator)
- 3- Exterior speaker (for the personnel working outside the machine)
- 4- Front/Rear drum brake selectors
- 5- Slewing brake switch
- 6- Front/Rear drum brake relays
- 7- Slewing alarm relay
- 8- Slewing alarm light
- 9- Travel remote control switch
- 10- Front/Rear drum brake pressure switch
- 11- Rated capacity limiter (Moment limiter)
- 12- Boom angle gauge
- 13- Secondary boom overhoist prevention switch



### 3 COMPONENTS NAME AND FUNCTION

#### ALARM OUTPUT CONDITIONS

	Corresponding Buzzer	Output Speaker	Display on ML Screen	Output Conditions
1	Buzzer A	Interior	E45: Short-circuited cable reel W91: Abnormal communication B	Continuously sounds when the front attachment sensor short-circuits or the communication cable between the information display and the controller B is abnormal.
			E21: Abnormal boom angle ...	Continuously sounds when the front attachment sensor short-circuits or the angle sensor is abnormal
2	Buzzer C	Interior		Continuously sounds when the key switch is turned to the START position with one of the front, rear, or third drum brake mode switch in the FREE position.
3	Buzzer C	Interior		Continuously sounds when the key switch is turned to the START position with the slowing brake switch OFF.
4	Buzzer A	Interior	Boom angle display comes ON in red.	Continuously sounds when the secondary overhoist limit switch is activated.
5	Buzzer A	Interior	E52: Abnormal load cell	Continuously sounds when the boom hoist rope tension or the load cell output is reduced.
6	Buzzer C	Interior		Sounds once when the free hoist brake mode is selected.
7	Buzzer C	Interior		Sounds once when the hoist lever is operated with the hoist brake in the free mode. (In crane operation only)
8	Buzzer A	Interior	Boom angle display comes ON in red.	Continuously sounds when the boom overhoist limit switch is activated or the boom angle reaches 80°.
9	Buzzer B	Interior	Lifting height display comes ON in red.	Continuously sounds when hook hoist or boom lower operation is made in a crane operation position with the hook overhoist switch activated. (Excl. in a dragline operation position.)
10	Buzzer A	Interior	Lifting load and working radius displays come ON in red.	Continuously sounds when the overload override system is operated.
11	Buzzer A	Interior	Working radius display comes ON in red.	Continuously sounds when the maximum working radius is reached. (Excl. when the machine is operated with the clamshell or dragline attachment.)
12	Buzzer A	Interior	Working radius display comes ON in red.	Continuously sounds when boom raise operation is made with the working radius restriction (maximum side) override system activated.
13	Buzzer A	Interior	Lifting height display comes ON in red.	Continuously sounds when boom raise operation is made with the working height restriction (maximum side) override system activated.
14	Buzzer B	Interior	Lifting load display comes ON in red.	Continuously sounds when hookhoist operation is made with the load restriction (maximum side) override system activated
15	Buzzer B	Interior	Lifting height display comes ON in red.	When lifting height restriction (maximum side) override system is activated.
			Lifting height display comes ON in red.	When lifting height restriction (minimum side) override system is activated.
16	No sound		Boom angle display flashes in yellow.	Sounds twice when boom hoist operation is made after the boom angle is 3° lower than the boom's limit angle.
17	No sound		Lifting height restriction flashes in yellow.	When the hook is hoisted up to the height of the working height restriction (maximum side) plus 1 m.

### 3 COMPONENTS NAME AND FUNCTION

	Corresponding Buzzer	Output Speaker	Display on ML Screen	Output Conditions
18	Buzzer a	Interior	Lifting load and working radius displays flash in yellow.	Sounds twice when hook hoist or boom lower operation is made with the load factor more than 90 % of the maximum load.
19	Buzzer a	Interior	Working radius display flashes in yellow.	Sounds twice when boom lower operation is made after the boom is lowered to the working radius corresponding to an angle of 3° higher than that of the maximum working radius.
20	No sound		Working radius display flashes in yellow.	Sounds twice when boom raise operation is made after the boom is lowered to the boom's working radius corresponding to an angle of 3° higher than that of the maximum boom working restriction radius.
21	No sound		Lifting height display flashes in yellow.	Sounds twice when boom lower operation is made after the boom is hoisted to the boom height corresponding to an angle of 3° lower than that of the maximum boom working restriction height.
22	No sound		Lifting load and working radius displays flash in yellow.	Sounds twice when hook hoisting operation is made with the load factor more than 90 % of the maximum load restriction value.
23	No sound		Erection/Fold	Sounds once when the boom is set beyond the working range to store the boom.
24	No sound		Erection/Fold Transport configuration	Sounds once when the boom angle is reduced to lower than 10° or when only the base machine is positioned for transportation.
25	No sound		W47: Broken cable reel	Continuously sounds when the cable reel wiring is discontinued with the machine in the operating position.
26	Buzzer D	Exterior		Continuously sounds during slewing operation.
27	Buzzer D	Exterior		Continuously sounds during travel operation

Buzzer A: Buzz,

Buzzer a: Intermittent Buzz

Buzzer B: Tinkling

Buzzer C: Peep

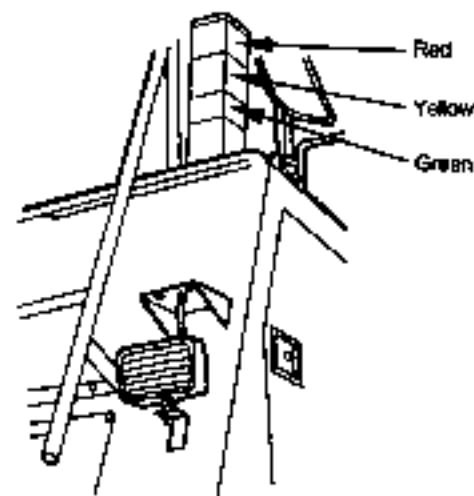
Buzzer D: Beep: Slewing/Travel Alarm

## 3 COMPONENTS NAME AND FUNCTION

### 3.7 3 Color Percentage Indicator Light (Optional)



**CAUTION:** Do not operate the machine with the red light ON.



The 3 color percentage indicator light alerts personnel outside the machine when the disassembly or boom erection storage configuration screen is displayed, or when any of the auto-stop system override switch such as the rear drum auto stop override switch is turned ON. During normal operation, this light indicates the rated capacity limiter load factor by three colors. The 3 color percentage indicator light consists of a three color (red, yellow, and green) rotary lights. When the engine is turned ON, one of them lights depending on operating status of the machine as described below:

**Green:** Indicates that the machine is lifting the load less than 90 % of the rated load.

**Yellow:** Indicates that the machine is lifting the load between 90% and 100% of the rated load, or the boom is lowered close to the maximum working radius.

**Red:** Indicates one of the following status:

- The machine is lifting a load more than 100% of the gross rated load so that the machine is overloaded. (In this case, the front and rear drum winding and the boom lowering systems are automatically deactivated.)
- The screen displays the disassembly or boom erection configuration. (The boom is extended beyond the specified working radius when the front attachment is replaced.)
- An auto stop override switch on the left console rear is operated.

**Inspect the 3 color percentage indicator limiter warning light before operation.**

Be sure to inspect the 3 color percentage indicator light before operation while referring to (2) inspection Procedures: Inspection of Rated Capacity Limiter in 3.3.9 Operation of Inspection Screen.

Check that the 3 color percentage indicator light normally operates in proportion to the increase of the load factor displayed on the screen.

- The green light comes ON when the load factor is lower than 90%.
- The yellow light comes ON when the load factor is between 90 and 100%.
- The red light comes ON when load factor is higher than 100%.

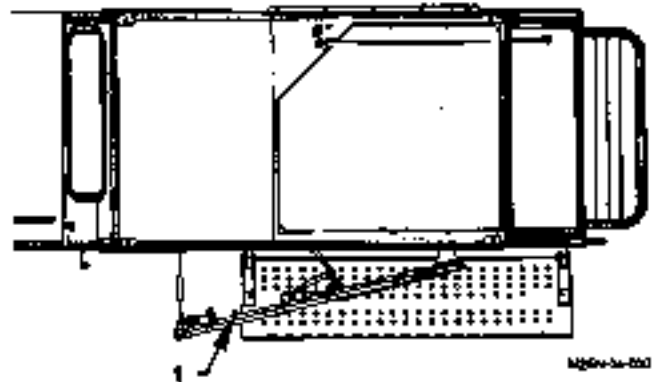
If malfunction of the lights occurs, contact your nearest Hitachi Sumitomo dealer. Operate the machine only after repairs are complete.

## 4 OPERATION

### 1 MOUNTING/DISMOUNTING OPERATOR'S CAB



**CAUTION:** When opening/closing the cab door, the cabin door swings toward the outside. Pay attention not to fall off the step when mounting/dismounting the operator's cab.



### 2 INSPECT MACHINE DAILY BEFORE OPERATION

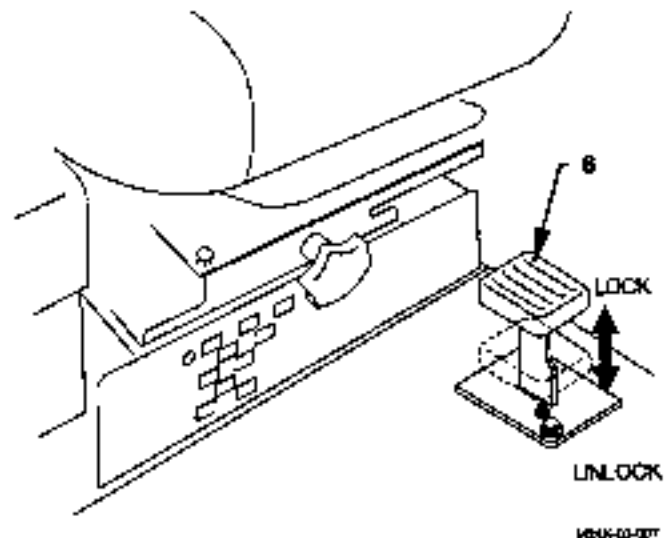
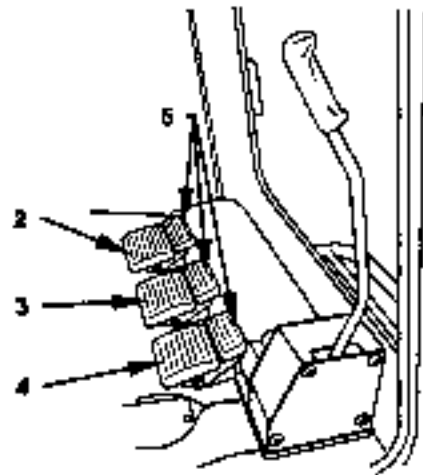
- Inspect the machine in accordance with the inspection procedures as described in section 7 Inspection/Maintenance before operation.

### 3 INSPECT MACHINE BEFORE STARTING ENGINE

#### 3.1 Check Levers and Switches

##### 3.1.1 Check the brake and slewing lock pedals

- Check that front drum brake pedal (2), third drum brake pedal (optional) (3) and rear drum brake pedal (4) are fully depressed and locked. If not, step on the pedals to engage locks (5).
- Check that slewing lock pedal (6) is locked.



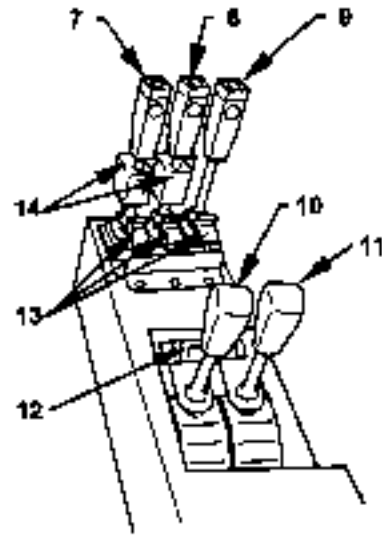
## 4 OPERATION

### 3.1.2 Check Levers

#### 1. Check all control lever positions.

- Drum levers [Front drum (7), rear drum (8), and boom derricking drum (9)]: Neutral
- Travel Levers [Right (11) and Left (10)]: Neutral
- Travel Lever Lock (12): Lock
- Slewing Lever (15): Neutral
- Drum Lever Lock (13): Lock
- Lock Lever (17) : Lock


In case any lever is not in the above position, move the lever to the specified position.



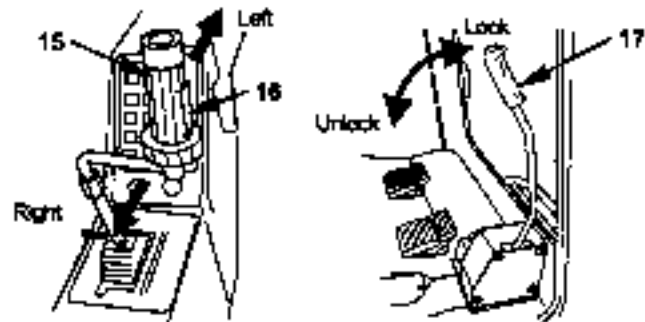
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### 3.1.3 Check Switches

#### 1. Check the lever switch positions.

- Drum Brake Mode Switch (14): Auto 
- Slewing Brake Switch (16): ON

In case any switch is not in the above position, shift the switch to the specified position before starting the engine.





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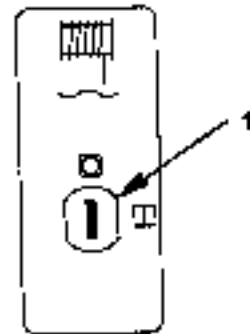
MS02-01-005

## 4 OPERATION

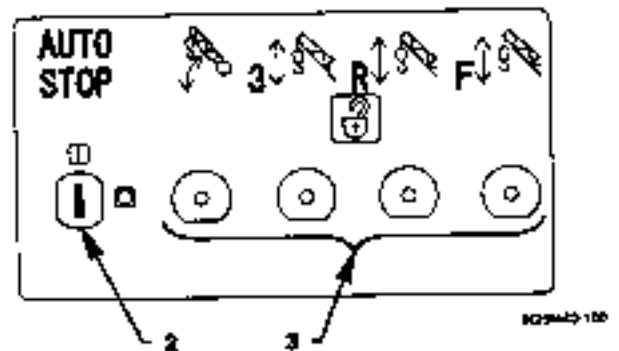
### 2. Check Switch Positions on Left Stand

- 1- Brake Mode Key Switch:  Lock
- 2- Auto-Stop Override Monitor Key Switch:  Lock
- 3- Drum Auto Stop Override Switch (Boom demicking, Third, Rear, and Front Drums): Neutral
- 4- A-Frame Raise/Lower Switch: Neutral
- 5- Retraction Switch: Neutral
- 6- Reaving Winch Switch: Neutral

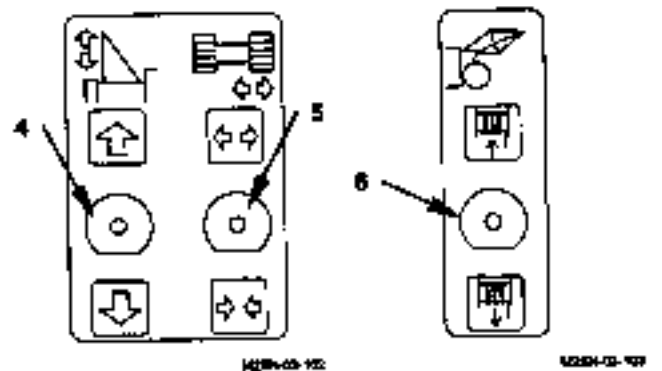
In case any switch is not in the above position, shift the switch to the specified position. Check that other switches are in the proper positions for their functions before starting the engine.



42284-03-107



42284-03-108



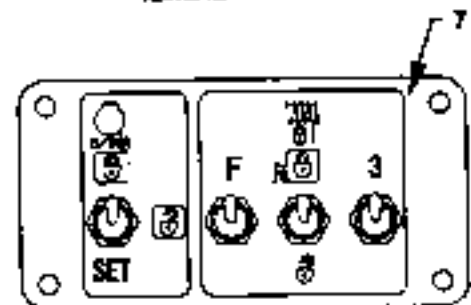
42284-03-102

42284-03-103

### 3. Check Switch Positions on Right Stand

- 7- Drum Lock Switch (Front, Rear, and Third Drums):  Lock

In case any switch is not in the above position, shift the switch to the specified position. Check that other switches are in the proper positions for their functions before starting the engine.



Right Stand

42284-03-204

## 4 OPERATION

### 4 START ENGINE

**CAUTION:** Start the engine only after checking that no personnel are present in the machine compartment or in the immediate vicinity of the machine, and after sounding the horn.

#### 4.1 Starting the engine

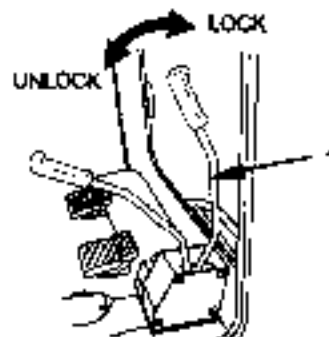
1. Check that Lock lever (1) is in the LOCK position
2. Turn accelerator dial (3) to the LOW IDLE position.
3. Insert key (2) into the Engine key switch. Turn the key ON. Check that preheat indicator (4) on the monitor panel stays OFF at this time.

**NOTE:** When pre-heating is required, preheat indicator (4) automatically lights.

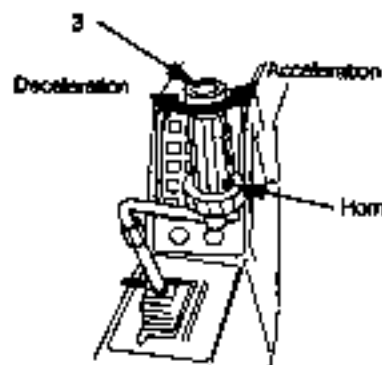
4. Sound the horn to alert any surrounding personnel.
5. Turn Engine key (2) to the START position. The starter will rotate and the engine will start.

**IMPORTANT:** Do not rotate the starter for more than 10 seconds at a time. In case the engine fails to start, return the key switch to OFF. Wait for more than 30 seconds, then try again. Failure to do so may result in damage to the starter and/or discharge of the batteries.

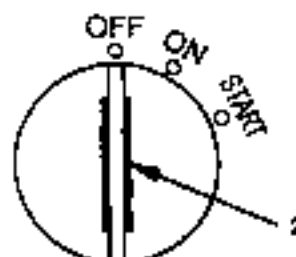
6. As soon as the engine starts, release the key (2). The key will automatically return to the ON position.



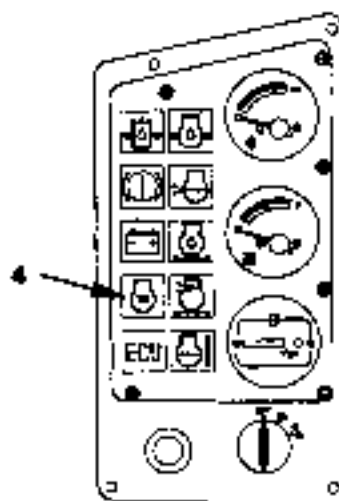
MDR-23-07



MDR-04-04



MDR-04-05



MDR-03-10

## 4 OPERATION

### 4.2 Starting in cold weather

#### Preheating

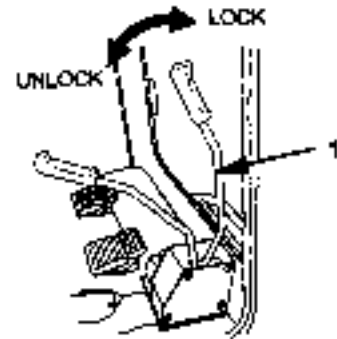
1. Check that Lock lever (1) is in the LOCK position.
2. Insert key (2) into the Engine key switch. Turn the key ON.
3. The machine automatically judges whether pre-heating is required or not. In case pre-heating is required, pre-heat indicator (4) comes ON.

**NOTE:** When pre-heating is required, preheat indicator (4) automatically lights.

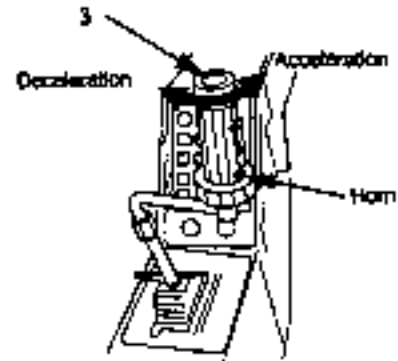
4. Sound the horn to alert any surrounding personnel.
5. As soon as preheat indicator goes OFF, turn key (2) to the START position to rotate the starter.

**IMPORTANT:** Do not rotate the starter for more than 10 seconds at a time. In case the engine fails to start, return the key switch to OFF. Wait for more than 30 seconds, then try again. Failure to do so may result in damage to the starter and/or discharge of the batteries.

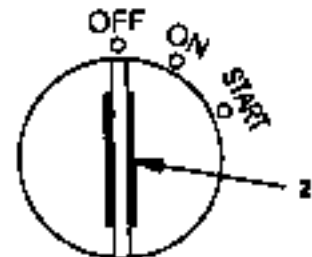
6. As soon as the engine starts, release the key (2). The key will automatically return to the ON position.



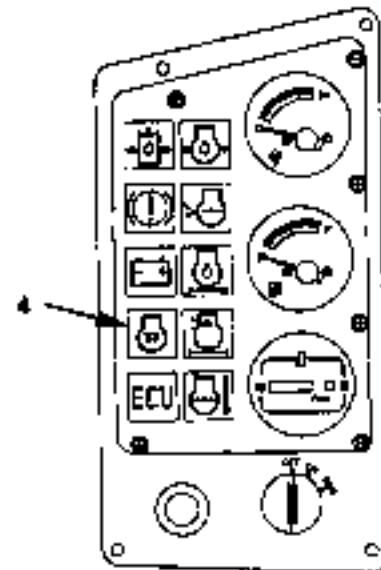
1022-00-01



1023-00-01



1024-01-01



1024-02-01



## 4 OPERATION

### 4.3 Using booster batteries

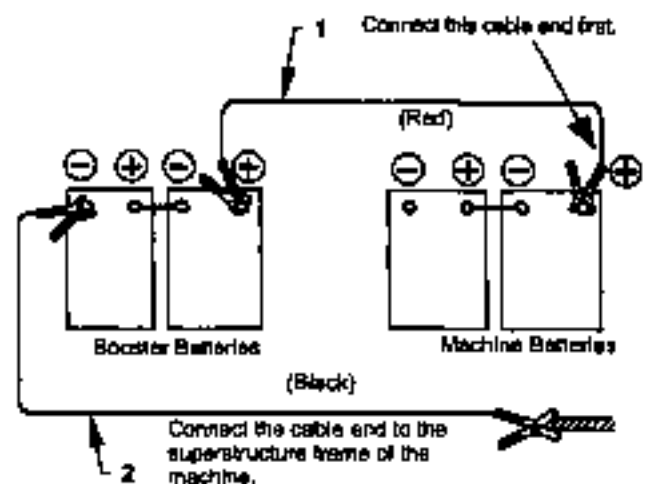
**CAUTION:** Batteries produce a gas which is explosive. Keep flames and sparks away from the batteries. Do not continue to use or charge the batteries when the electrolyte level is lower than specified. Explosion of the battery may result. Park the machine and the machine with the booster batteries on a dry soil or concrete surface. If the machines are parked on steel plates, the machines are kept grounded, unexpected sparks may be created. Never connect a positive (+) terminal to a negative (-) terminal, causing a dangerous short circuit.

**IMPORTANT:** The machine electrical system is a DC 24 volt negative (-) ground. Use only the machine with DC 24 volt booster batteries having sufficient capacity to start the engine on this machine.

When the machine batteries are discharged, start the engine using booster batteries as shown below.

#### 4.3.1 Connecting booster batteries

1. Stop the engine of the machine with the booster batteries mounted.
2. Connect one end of booster cable (1) (red) to the positive (+) terminal of the machine batteries, and the other end to the positive (+) terminal of the booster batteries.
3. Connect one end of booster cable (2) (black) to the negative (-) terminal of the booster batteries, and other end to the superstructure frame of the machine. Sparks may be created at this last connection to the frame. Be sure to connect the cable in a position as far away from the machine batteries as possible.
4. After connecting cables (1 and 2) securely, start the engine of the machine with booster batteries mounted.
5. Start the engine on the machine.
6. After the engine starts, disconnect cables (1 and 2) following the procedure below.



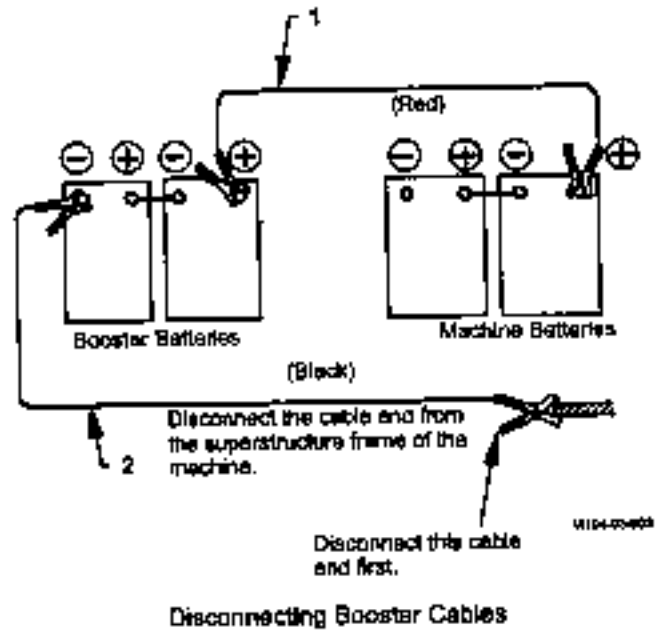
Connecting Booster Cables

M-24-23-027

## 4 OPERATION

### 4.3.2 Disconnecting booster batteries

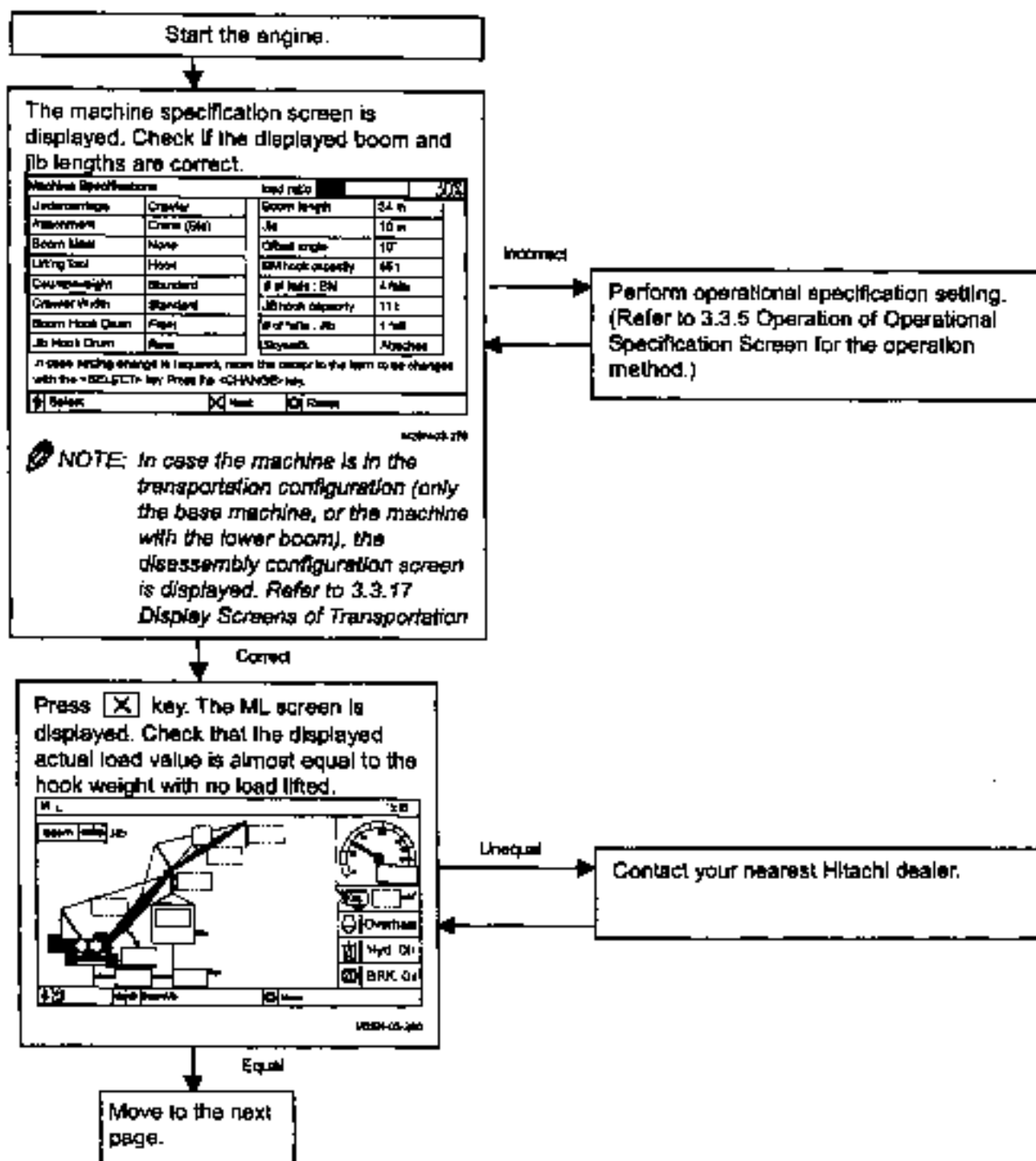
1. Disconnect booster cable (2) (black) from the superstructure frame of the machine.
2. Disconnect booster cable (2) (black) from negative (-) terminal of the booster batteries.
3. Disconnect booster cable (1) (red) from the positive (+) terminal of the booster batteries.
4. Disconnect booster cable (1) (red) from the positive (+) terminal of the machine batteries.



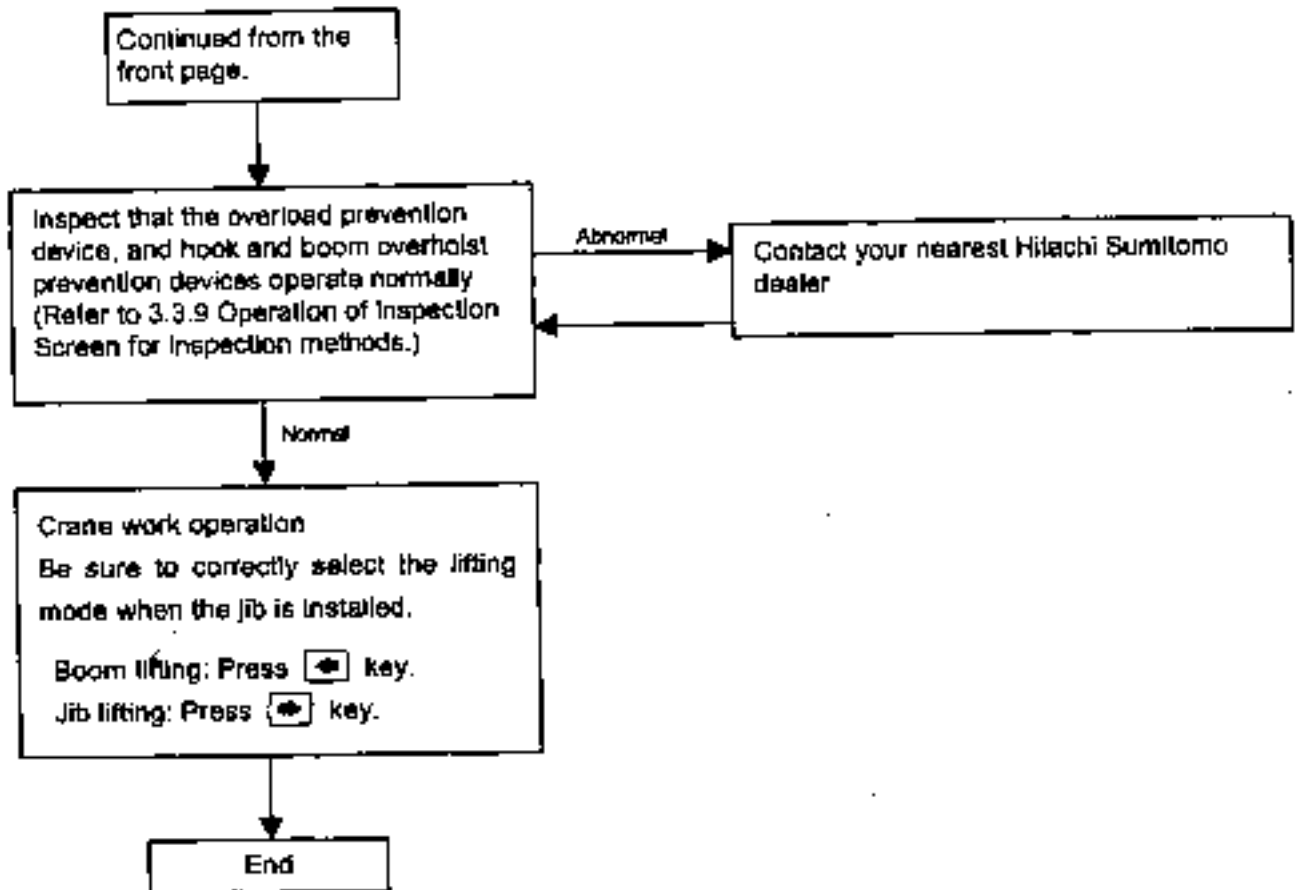
## 4 OPERATION

### 6 INSPECTION, SETTING, AND CONFIRMATION OF RATED CAPACITY LIMITER (OVERLOAD PREVENTION DEVICE)

#### 6.1 Inspection and Operation before Starting Machine Operation



## 4 OPERATION



### 6.2 Setting and Confirmation of Overload Prevention Device

- Refer to Section 3 Component Name and Function: Safety Devices for function and setting of the overload prevention device.
- Refer to Section 7 Inspection and Maintenance for inspection and maintenance of the overload prevention device.

## 4 OPERATION

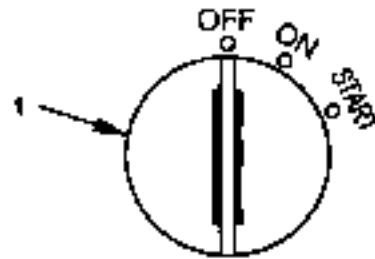
### 7 STOPPING ENGINE

Stop the engine by following the procedures below.

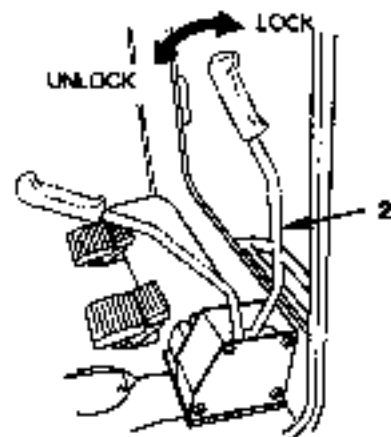
1. Except for a special case, lower the lifting load or the bucket to the ground before stopping the engine. In addition, lock the brake pedal lock.
2. Reduce the engine speed to idle speed and run it for approximately 3 minutes to cool the engine.

**IMPORTANT:** The engine is equipped with a turbocharger. If the engine stopped without cooling down operation, the sections, which require lubrication, will become dry due to the high engine oil temperature, possibly resulting in damage to the turbocharger.

3. Turn key switch (1) OFF to stop the engine.
4. Raise lock lever (2) to the LOCK position.



4444-01-002



4444-01-007


## 4 OPERATION

### 8 ENGINE SPEED CONTROL

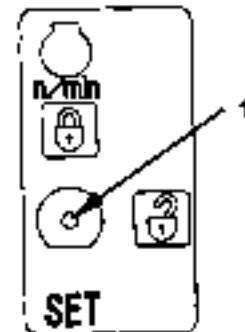
#### 8.1 Control by Accelerator Grip

**CAUTION:** The drum speed and travel speed can change very quickly by operating the accelerator grip. Carefully operate the grip when precise operation is required.

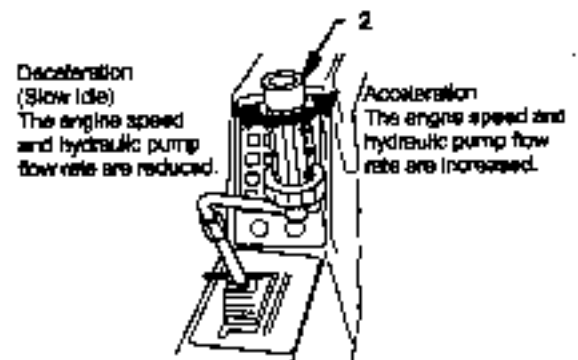
The engine speed and the hydraulic pump flow rate are controlled by the accelerator grip (2). The actuator speed is controlled from the minimum to the maximum speed.

1. Override the accelerator holding switch (1): Tilt the knob to the  (UNLOCK) side.
2. When accelerating the engine speed: Slowly turn grip (2) counterclockwise.
3. When decelerating the engine speed: Slowly turn grip (2) clockwise.

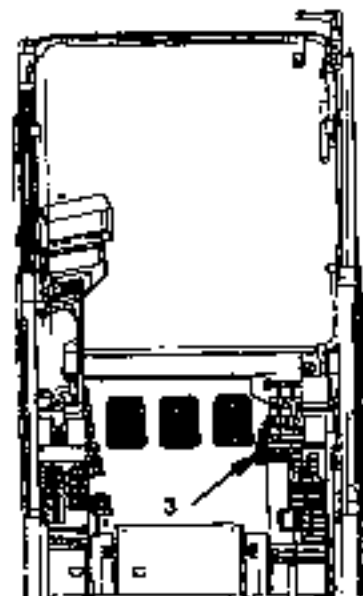
**NOTE:** The engine speed can be controlled with accelerator pedal (3) regardless of the position where accelerator lock switch (1) is placed.



4274-01-004



4274-01-004





4274-01-004



## 4 OPERATION

### B.2 Constant Engine Speed Control

While running the engine at the most optimum constant speed, the machine operation speed is controlled by changing the hydraulic pump flow rate with the accelerator grip (2). This operation method is used when increasing the work volume in bucket or lifting magnet operation with the engine speed running at a constant speed.

#### IMPORTANT:

- Stop the engine only after running the engine at slow idle speed.
- If the engine is stopped with the accelerator holding switch tilted towards the  (LOCK) position, when the engine is started next time, the engine starts at the set speed regardless of the grip (2) position. Whenever the engine is stopped, tilt the accelerator holding switch towards the  (UNLOCK) position and turn the grip (2) towards the deceleration direction.

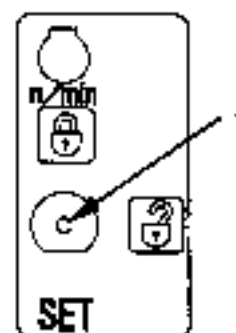
1. Tilt accelerator holding switch (1) towards the  (UNLOCK) position.
2. Turn the grip counterclockwise to run the engine at the desired speed.
3. Tilt accelerator holding switch (1) towards the SET position. (The switch will automatically return to the original position.)
  - The engine speed is set.
4. Tilt accelerator holding switch (1) towards the  (LOCK) position. The engine operates at the set speed.

**(1) When Increasing the machine operation speed:**

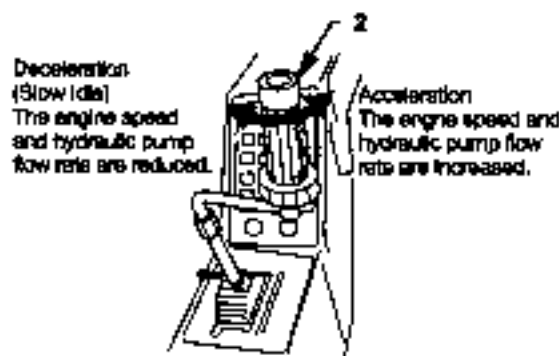
1. Slowly turn accelerator grip (2) counterclockwise.
- Machine operating speed increases due to increase in the hydraulic pump flow rate.
2. Slowly step on accelerator pedal (3) (optional).

**(2) When decreasing the machine operation speed:**

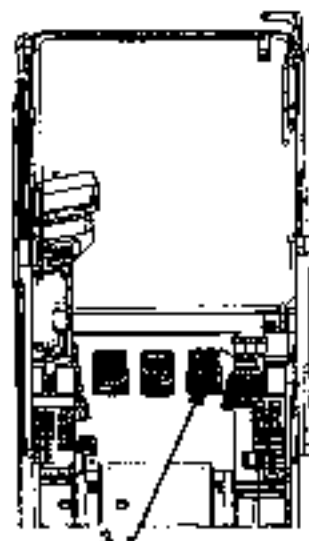
1. Slowly turn accelerator grip (2) clockwise.
- Machine operating speed increases due to decrease in the hydraulic pump flow rate.
2. Slowly step off accelerator pedal (3) (optional).
3. When resetting the engine speed, repeat steps 1 to 3 described above.



4074-02-001




4074-02-001

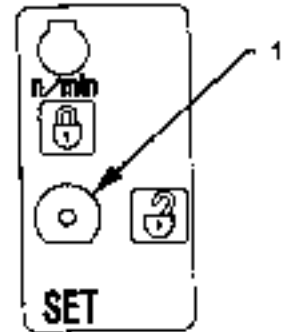


4074-02-001

## 4 OPERATION

### (3) When deactivating the engine constant speed setting:

1. Tilt accelerator holding switch (1) towards the  (UNLOCK) position. The set engine speed is deactivated so that the engine speed can be controlled with the accelerator dial.




KCN-03-08





## 4 OPERATION

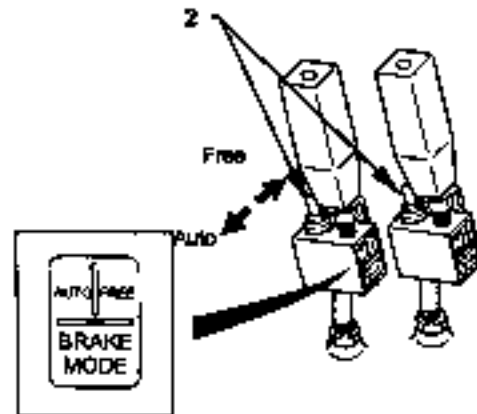
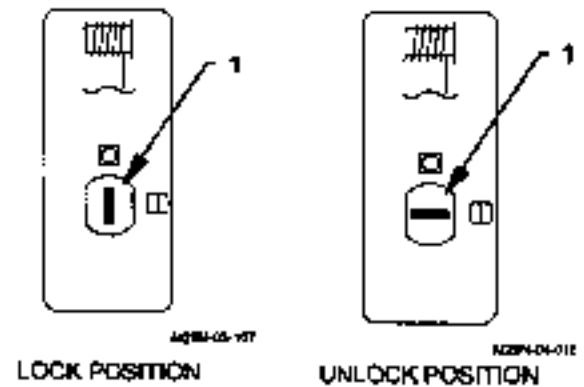
### 9 OPERATING FRONT AND REAR DRUM

**CAUTION:** Be sure to operate the machine in the auto-brake mode when hoisting or lowering the hook in crane work. Turn brake mode select key switch (1) to the LOCK  position. Remove the key before starting operation. Consign the key to the job site manager.

Two drum brake modes are available. In the auto-brake mode, the drum brake is automatically applied when the drum lever is returned to neutral. In the free-brake mode, the brake pedal must be stepped on to hold the lifted load in position when the drum lever is returned to neutral.





#### 9.1 Selecting Drum Brake Mode

Either the auto-brake or free-brake mode can be selected by operating brake mode select key switch (1). When selecting the free-brake mode, turn brake mode select key switch (1) to the UNLOCK  position. Unless brake mode select key switch (1) is in the UNLOCK  position, the free-brake mode cannot be selected even if brake mode select switch (2) is tilted towards the FREE side. In the auto-brake mode, the drum brake is automatically applied when the drum control lever is in the neutral position. This operation mode is a suitable operation method in safe crane work. In the free-brake mode, free-fall operation can be performed by releasing the stepped on brake pedal with the drum control lever in neutral so that this operation is suitable to bucket operation work.



MO204-04-017

#### Brake Operation with Drum Control Lever In Neutral

Brake Mode Select Key Switch (1)	Brake Mode Switch (2)	
	AUTO  Side	FREE  Side
LOCK :  Position	Auto-Brake	Auto-Brake
UNLOCK :  Position	Auto-Brake	Free (Step on the pedal to apply the brake.)

## 4 OPERATION

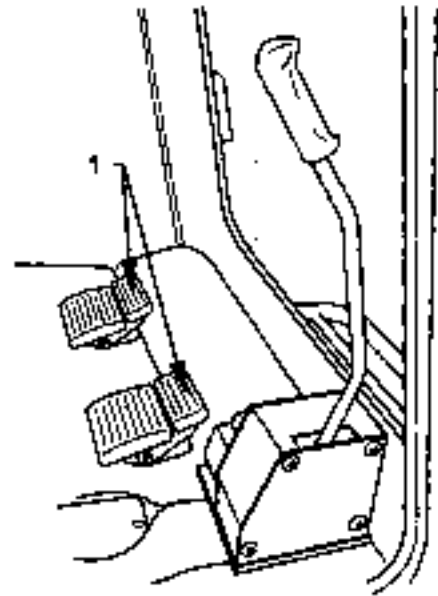
### 9.2 Operating Brake Mode Switch



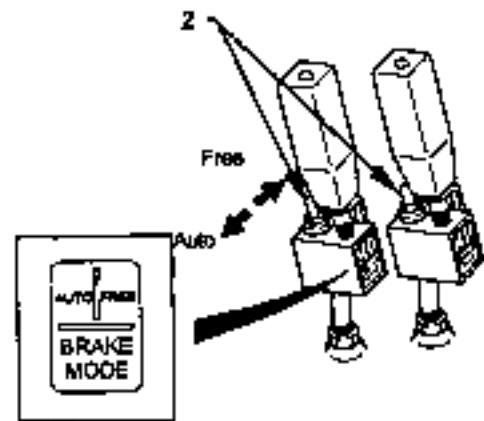
**CAUTION:** Be sure to change the brake mode under no load condition.

#### IMPORTANT:

- Be sure to operate brake mode switch (2) only after returning the drum lever to neutral and engaging brake pedal lock (1). If brake pedal lock (1) is not engaged, shifting the auto-brake mode to the free brake mode cannot be achieved.
- In the auto-brake mode, the drum can be wound or unwound with brake pedal lock (1) engaged. Even though brake pedal lock (1) is disengaged, when the stepped on brake pedal is released, winding or unwinding the drum can be achieved. However, perform winding and unwinding operation with brake pedal lock (1) engaged to ensure safe operation.
- In the free-brake mode, when the drum control lever is operated with brake pedal lock (1) engaged, the same operation as the auto-brake mode can be made. However, if brake pedal lock (1) is intentionally or unexpectedly disengaged when the drum control lever is neutral, falling of the lifted load may result. Be sure to operate the machine in the auto-brake mode during crane work.



MCCE-03-058



MCCE-04-017

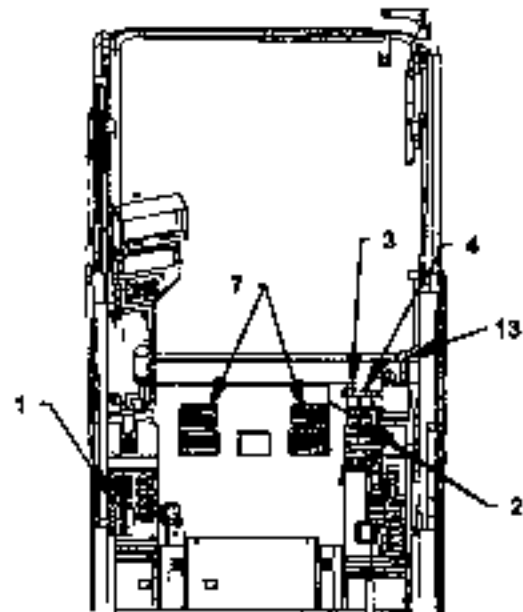
## 4 OPERATION

### 9.2.1 Shifting Auto-Brake Mode to Free-Brake Mode

#### IMPORTANT:

- In the free-brake mode, when lock lever (13) is raised to the LOCK position, red brake mode light (9) comes OFF. (The green brake mode light stays OFF.) Under this condition, the brake mode is in the auto-brake mode.
- Unless the brake pedal is stepped on, the free-brake mode is not activated.

1. Place lock lever (13) in the UNLOCK position, drum control levers (3 and 4) in neutral, and brake pedal locks (7) in the engage position.
2. Turn brake mode select key switch (1) to the  position and tilt brake mode switch (2) towards the FREE position to shift to the free-brake mode. Green brake mode indicator (10) will go OFF and red brake mode indicator (9) will light at this time.



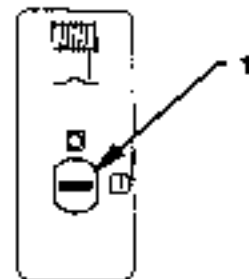
K0294-03-011

### 9.2.2 Shifting Free-Brake Mode to Auto-Brake Mode

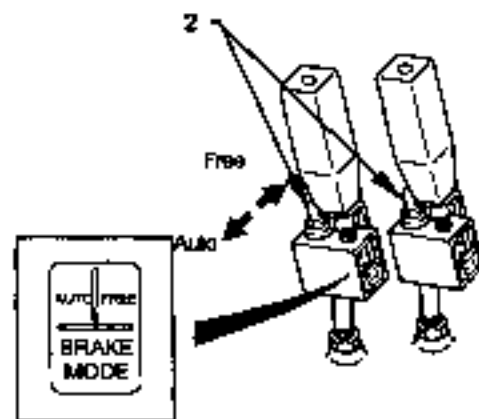


**CAUTION:** In case green brake mode light (10) does not come ON even if brake mode switch (2) is shifted, the auto-brake mode is not selected. There may be some failure in the system. Contact your nearest Hitachi Sumitomo dealer.

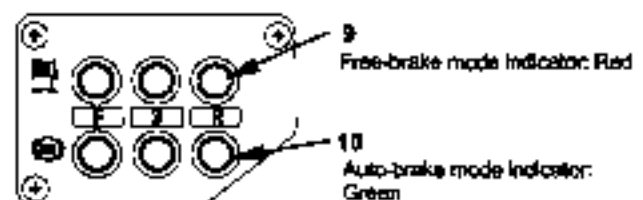
1. Place lock lever (13) in the LOCK position, drum control levers (3 and 4) in neutral, and brake pedal locks (7) in the engage position.
2. Turn drum brake mode key switch (1) towards the LOCK  position.
3. Tilt brake mode switches (2) towards the auto-brake side. Red brake mode indicator (9) will go OFF and green brake mode indicator (10) will light at this time.



K0294-04-016



K0294-04-017



Brake Mode Indicators

K0294-04-020

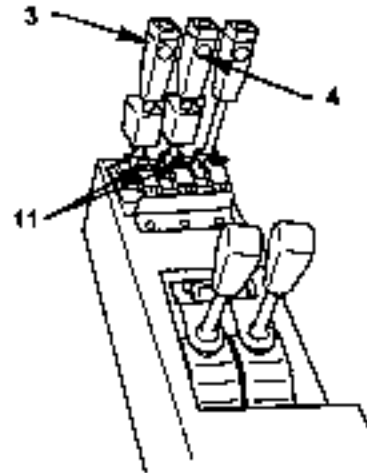
## 4 OPERATION

### 9.3 Hoist/Lower Operation



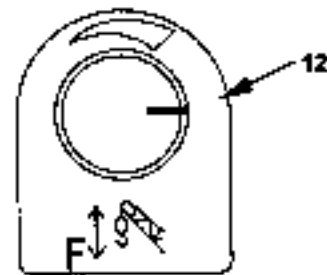
#### CAUTION:

- If the drum control lever is returned quickly to neutral, lifting load speed will be rapidly changed so that a dangerous impact may be created. In addition, irregular winding of wire rope may result.
- When returning the drum control lever to neutral, make sure that the lever is correctly returned to the neutral position.
- When the drum control lever is not operated, drum lever lock (11) to the LOCK position.

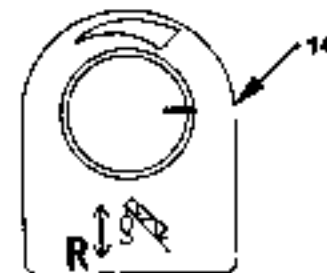


**IMPORTANT:** When the front drum is operated at the first speed and the rear drum is operated at the second speed at the same time, both winding and unwinding operation of the front drum at the first speed will become inoperable. Operate both front and rear drums at the same speed, either first or second speed.

Front/rear drum control levers (3 and 4) are stopped at the first and second speed detent position in both winding and unwinding operation. Control the drum speed in both winding and unwinding operation by moving the drum control lever to the first or second speed position as well as by turning the accelerator grip. The maximum drum speed in both winding and unwinding operation can be adjusted by operating front drum speed control dial (12) and rear drum speed control dial (14).

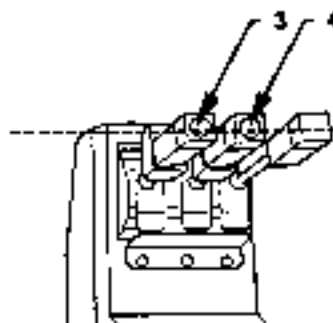


K22H-04-070



K22H-03-770

K22H-03-070



#### Drum unwinding

↑ Second Speed

•

↑ First Speed

• Neutral Position

↓ First Speed

•

↓ Second Speed

#### Drum winding



K22H-04-080

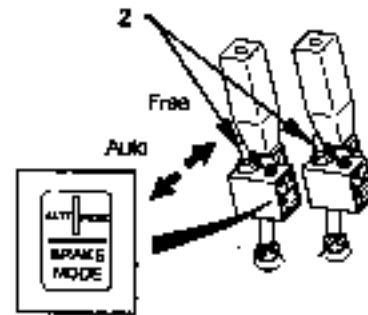
K22H-04-010

K22H-04-020

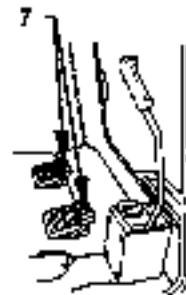
## 4 OPERATION

### 9.3.1 When Brake Mode Switch is Placed in the Auto-Brake Position:

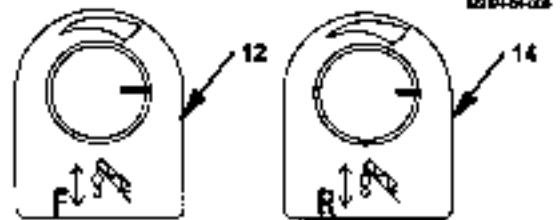
**IMPORTANT:** In the auto-brake mode the drum can be wound or unwound with brake pedal lock (7) engaged. Even though brake pedal lock (7) is disengaged, when the brake pedal is stepped off, winding or unwinding the drum can be achieved. However, perform winding and unwinding operation with brake pedal lock (7) engaged to ensure safe operation.



MS24-04-117



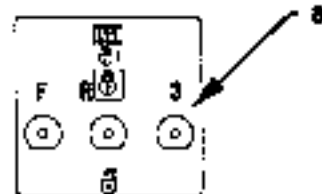
1. Check that brake mode switches (2) are in the AUTO position, brake pedal locks (7) are engaged.
2. Adjust the maximum drum speed with drum speed control dials (12 and 14) as needed.
3. **Winding**  
Slowly pull drum control lever (3 or 4) to rotate the drum in the winding direction.
4. **Unwinding**
  1. Override drum lock switch (8): Tilt the switch knob towards the unlock side to override the drum lock.
  2. Slowly push drum control lever (3 or 4) to rotate the drum in the unwinding direction.
5. **Stop**  
Slowly return drum control lever (3 or 4) to neutral.  
The lifted load is held in position and the brake is automatically applied.



MS24-04-026

MS24-03-279

MS24-03-278



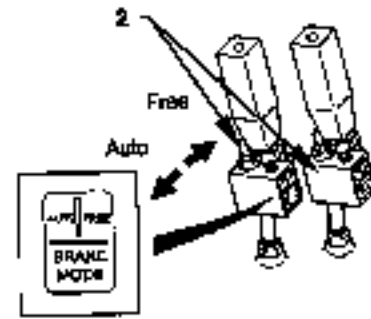
MS24-01-282

Brake mode switch and indicators	Drum control lever position	Free pedal brake	Movement of lifted load
<p>MS24-04-016 MS24-04-013</p>	<p>MS24-04-025</p>	Unwinding	Step on the brake pedal. (The pedal lock is engaged.) Lowering
		Neutral	Stop
		Winding	Hoisting

## 4 OPERATION

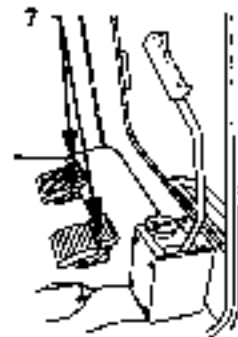
### 9.3.2 When Brake Mode Switch is Placed in the Free-Brake Position:

**CAUTION:** In case the drum is automatically stopped in the free-brake mode, while stepping on the brake pedal, return the drum control lever to neutral. If the drum control lever is returned to neutral before stepping on the brake pedal, the hook and lifted load will freefall.




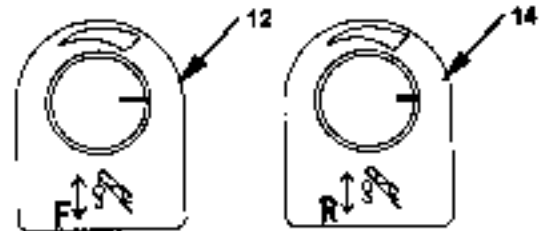
M229-04-017

**IMPORTANT:** In the free-brake mode, when the drum control lever is operated with brake pedal lock (7) engaged, the same operation as the auto-brake mode can be made. However, if brake pedal lock (7) is intentionally or unexpectedly disengaged when the drum control lever is neutral, falling of the lifting load may result. Be sure to operate the machine in the auto-brake mode during crane works.



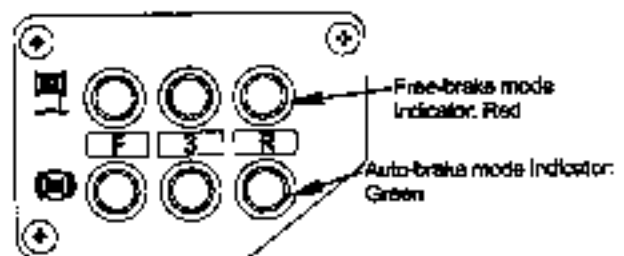
M229-04-026

1. Check that brake mode switches (2) are in the FREE position (Red free mode indicator: ON), brake pedal locks (7) are engaged.
2. Adjust the maximum drum speed with drum speed control dials (12 and 14) as needed.
3. Winding  
Slowly pull drum lever (3 or 4) to rotate the drum in the winding direction.
4. Unwinding
  1. Override drum lock switch (8): Tilt the switch knob towards the unlock side  to override the drum lock.
  2. Slowly push drum lever (3 or 4) to rotate the drum in the unwinding direction.
5. Stop  
Slowly return drum lever (3 or 4) to neutral. The lifted load is held in position with the foot brake.

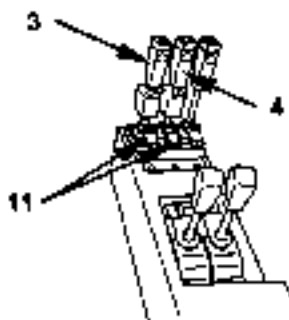


M229-04-011

M229-04-076

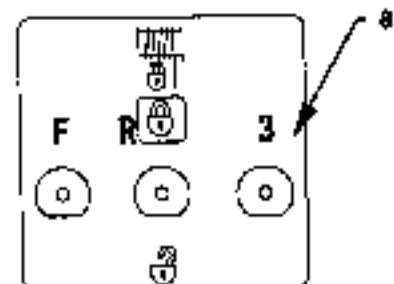


M229-04-075



M229-04-032


Brake Mode Indicator

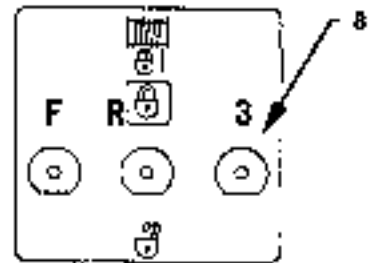


M229-07-192

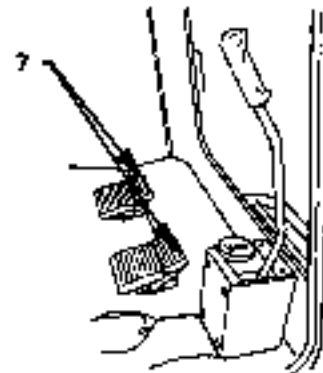
## 4 OPERATION

### 6. Free-Fall

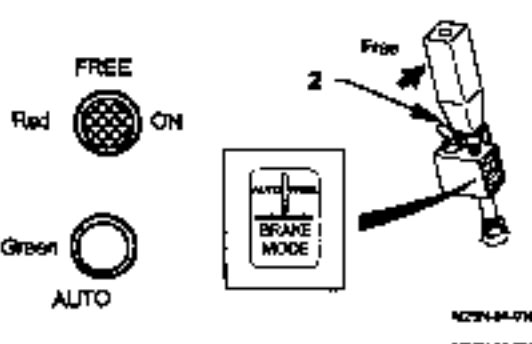
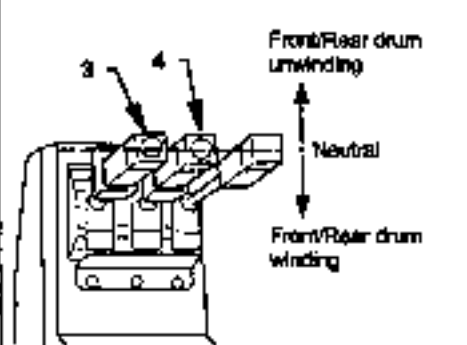
1. Override drum lock switch (8): Tilt the switch knob towards the  (unlock) side to override the drum lock.
2. Disengage brake pedal locks (7). Slowly step off the brake pedal. The hook will start freefalling. Control the freefall speed with the brake pedal.
7. Stop Press on the brake pedal. Engage brake pedal lock (7).



10284-01-143



10284-01-204


Brake mode switch and indicators	Drum control lever position	Foot pedal brake	Movement of lifted load
 <p>FREE Red ON</p> <p>Green AUTO</p> <p>10284-04-076 10284-04-073</p>	 <p>3 4</p> <p>Front/Rear drum unwinding</p> <p>Neutral</p> <p>Front/Rear drum winding</p> <p>10284-04-038</p>	Unwinding Engage the pedal lock or step on the brake pedal	Lowering
		Neutral Step off the brake pedal	Freefalling
		Neutral Step on the brake pedal	Stop
		Winding Engage the pedal lock or step on the brake pedal	Holting

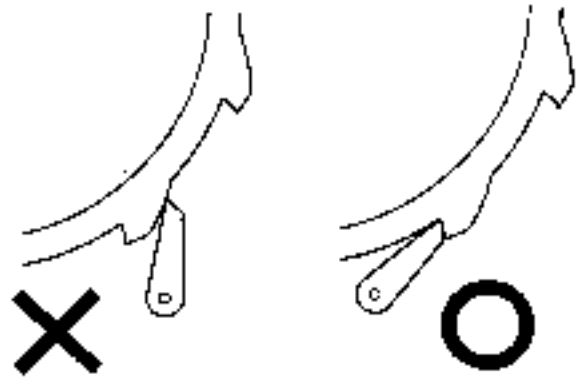
## 4 OPERATION

### 10 DRUM LOCK OPERATION (FRONT, REAR AND THIRD DRUMS)




#### CAUTION:

- When required to lift a load above the ground for a long time or when leaving the operator's seat, engage all drum locks.
- After tilting drum lock switch (1) toward the  LOCK position, operate the drum control lever toward the unwind side to engage the lock tooth into the drum. Then, check that the drum does not rotate.



4226-04-010

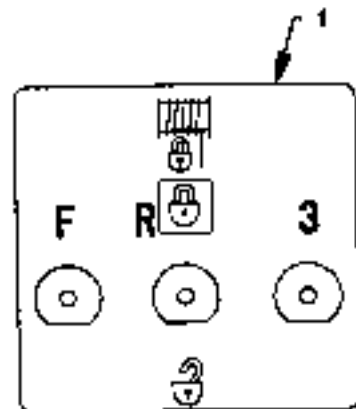
When drum lock switch (1) is operated with the key switch ON, the electric motor operates so that the drum lock pawl are moved. When disengaging the drum lock, tilt drum lock switch (1) towards the  (UNLOCK) side. Precisely move the drum control lever towards the winding side to disengage the lock from the drum.



LOCK position: Lock pawl are engaged.



UNLOCK position: Lock pawl are disengaged.



4226-07-142



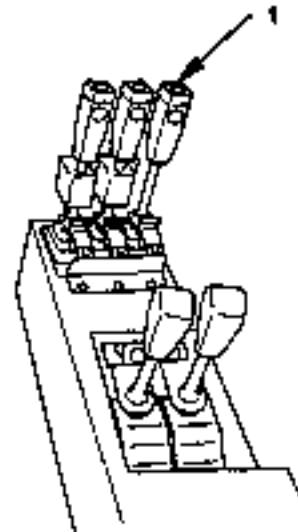
## 4 OPERATION

### 11 BOOM DERRICKING OPERATION

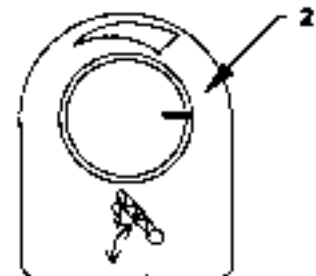


#### CAUTION:

- In crane work, operate the boom slowly. If quickly operated, the lifted load may sway, extending the working radius so that the machine stability may be reduced. Especially be cautious when operating a long boom.
- When returning the drum lever to neutral, make sure that the lever is correctly returned to the neutral position.
- When the drum lever is not operated, lock the lever with the lever lock to prevent mis-operation.
- While the boom operating speed is reduced as the buffer-stop device operates, when the boom derricking drum lever is returned to neutral, be sure to return other drum levers to neutral at the same time. Failure to do so will allow the auto speed reduction system to deactivate so that other drum speeds increase to the original speeds.



W284-04-092



W284-03-097

#### IMPORTANT:

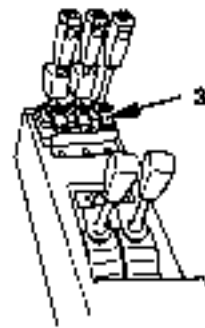
- When boom derricking drum lever (1) is in neutral, the drum lock is automatically engaged. When boom derricking drum lever (1) is operated, the drum lock is automatically disengaged.
- When the boom angle comes close to the upper or lower limit, the boom operating speed is automatically reduced and the buzzer intermittently sounds. When the boom angle reaches the upper and lower limit, the boom is automatically stopped and the buzzer sounds continuously.

Boom derricking drum lever (1) stops at the first and second speed detent positions in both winding and unwinding operation. Control the drum speed in both winding and unwinding operation by moving the drum lever to the first or second speed position as well as by turning the accelerator dial. The maximum drum speed in both winding and unwinding operation can be adjusted by operating boom derricking drum speed control dial (2).

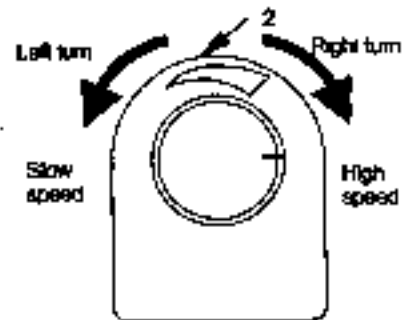
## 4 OPERATION

### 11.1 Derricking Operation

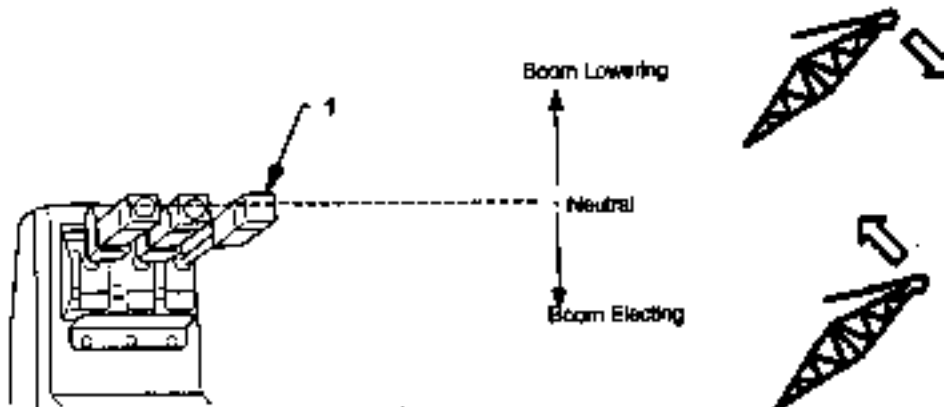
1. Check that drum lever lock (3) is released.
2. Adjust the maximum operation speed by operating speed control dial (2) as needed.
3. **Electing**  
Slowly pull drum lever (1) leftward. The boom derricking drum starts winding the boom derricking wire rope.
4. **Lowering**  
Slowly push drum lever (1) rightward. The boom derricking drum starts unwinding the boom derricking wire rope.
5. **Stopping**  
Slowly return drum lever (1) to neutral. The boom derricking drum stops and the drum lock is engaged.



MS2H-01-002



MS2H-05-074



MS2H-04-088

MS2H-01-018

MS2H-04-020


## 4 OPERATION

### 11.2 Operation Method to be Applied to a Machine that has Automatically Stopped




#### 11.2.1 When the Boom Derricking Limiter is Activated:

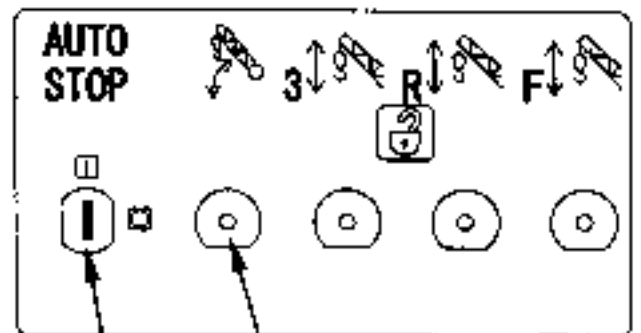


#### CAUTION:

- When evacuating from the emergency situation, operate the boom at the minimum speed. Do not hoist the boom more than necessary.
- After evacuating from the emergency situation (after lowering the boom), turn the auto-stop override select key switch (3) to the  position. Remove the key. Consign the key to the job site manager.

The boom cannot be hoisted further. Only boom lowering system is operable. If the drum lock is difficult to disengage when the boom overhoist prevention device is activated, lower the boom by taking the following procedures to evacuate the emergency situation.

1. Return all drum levers to neutral.
2. Fully turn the accelerator grip (5) clockwise to set the drum speed to the minimum.
3. Insert the key into override select key switch (3). Turn the key towards the  LOCK position.
4. Tilt and hold hoist auto-stop override switch (4) towards the  (UNLOCK) side to deactivate the derricking limiter.
5. Slowly pull boom derricking drum lever (1) to slightly wind the boom derricking drum to disengage the drum lock.
6. Release boom derricking drum auto-stop override switch (4). The knob will return to the original position.
7. After returning boom derricking drum lever (1) to neutral, slowly push the lever forward to lower the boom angle to the desired position.
8. Turn override select key switch (3) towards the  position. Remove the key from the switch.



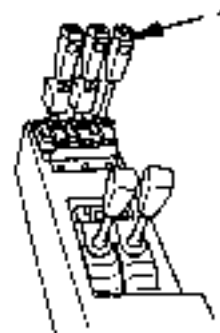
KG2042-102

Deceleration  
(Slow idle)  
The engine speed  
and hydraulic pump  
flow rate are reduced.

Acceleration  
The engine speed and  
hydraulic pump flow  
rate are increased



KZ20-24-024



KZ20-01-022

## 4 OPERATION

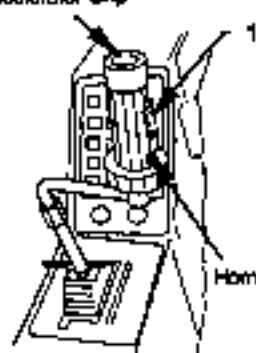
### 12 SLEWING OPERATION (INCLUDING OPERATIONS OF THE SLEWING BRAKE AND LOCK)



#### CAUTION:

- Slowly operate the slewing system in crane work. If quickly operated, the lifted load may sway, extending the working radius so that a hazardous condition may be created.
- Stop slewing of the upperstructure by operating the slewing control lever in the reverse direction. Slowly operate the control lever so that the lifted load does not sway.
- Do not use the slewing brake to stop slewing operation. Failure to do so may cause the lifted load to sway, the slewing brake, boom, or tower attachment to become damaged, and the machine to tip over due to large impacts created by sudden stop of slewing.
- During slewing operation, do not engage the slewing lock pedal. Failure to do so may cause the lifted load to sway, the slewing lock, boom, or tower attachment to become damaged, and the machine to tip over due to large impacts created by sudden stop of slewing.
- Leave the operator's seat only after conducting the following operation to ensure safety.
  - Turn slewing brake switch (1) ON. (The brake is applied.)
  - Move the slewing lock pedal (2) to the LOCK position.
  - Stop the engine.

Accelerator Grip

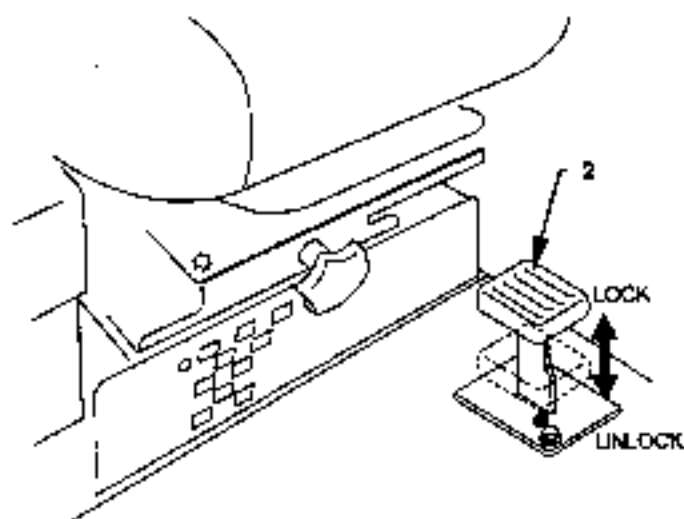


Slewing Brake Switch

ON: The Brake is applied

OFF: The Brake is released

M200-06-004  
M200-06-001



M200-06-005

#### IMPORTANT:

- When slewing brake switch (1) is OFF. (The brake is released.), the engine will not start. Before starting the engine, be sure to turn slewing brake switch (1) ON.
- Use the slewing brake as the slewing parking brake.
- When the engine is stopped, the slewing brake is automatically applied.
- In case the slewing lock is difficult to disengage, while operating the slewing system at extra-fine speed, move slewing lock pedal (2) towards the UNLOCK position.

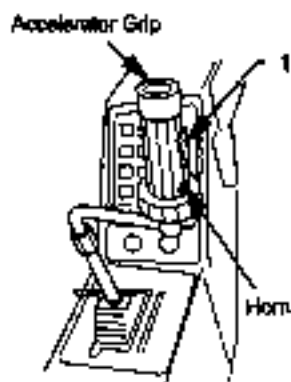
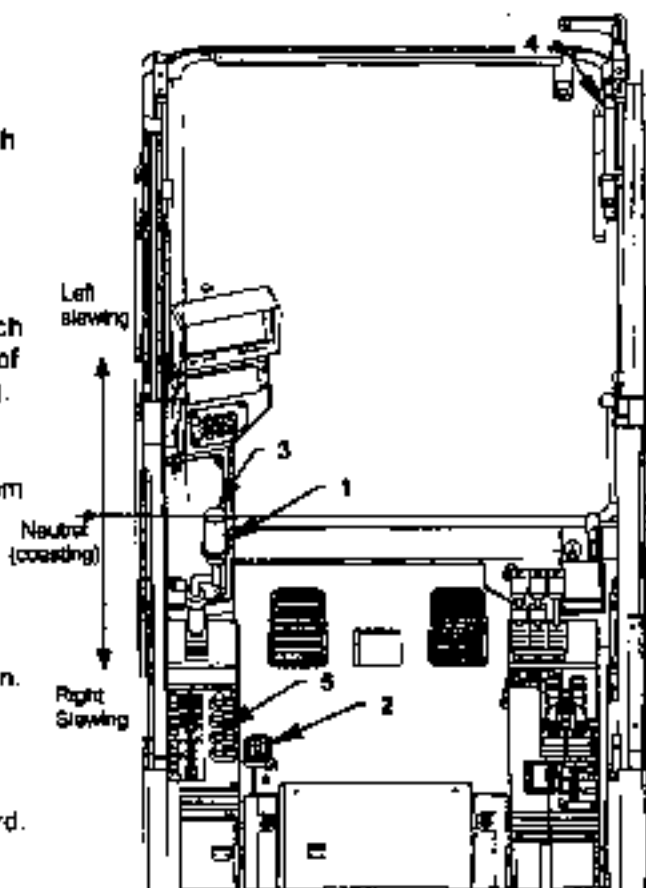
## 4 OPERATION

**IMPORTANT:** When slewing lever (3) is in neutral, slewing drift may occur, allowing the machine to automatically slewing on a slope or at a windy job site. When the machine is stopped with slewing lever (3) in neutral, push slewing brake switch (1) ON.

### 12.1 Slewing Operation

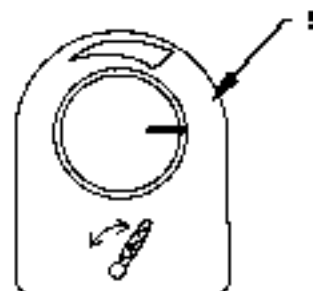
Slewing operation is controlled by operating slewing lever (3), slewing lock pedal (2) and slewing brake switch (1). When controlling slewing speed, adjust the stroke of slewing lever (3) and rotation of the accelerator grip (6). The maximum slewing speed can be adjusted by operating slewing speed control dial (5). Even though lock lever (4) is in the LOCK position, the slewing system is operable.

1. Adjust the maximum slewing speed with slewing speed control dial (5) as needed.
2. Move slewing lock pedal (2) to the UNLOCK position.
3. Turn slewing brake switch (1) OFF.
4. Slewing operation:
  1. Left slewing: Slowly push slewing lever (3) forward.
  2. Right slewing: Slowly pull slewing lever (3) backward.
5. Stop
  1. Slowly move slewing lever (3) to the reverse slewing direction.
  2. After slewing has completely stopped, turn slewing brake switch (1) ON.



Slewing Brake Switch  
ON: The Brake is applied

OFF: The Brake is released



## 4 OPERATION

### 13 TRAVEL OPERATION



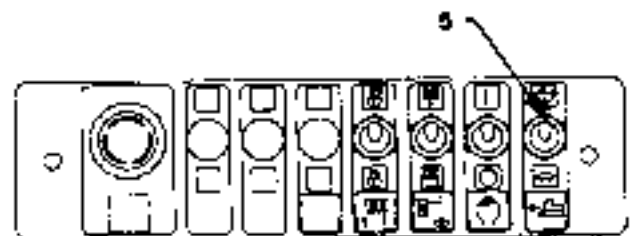
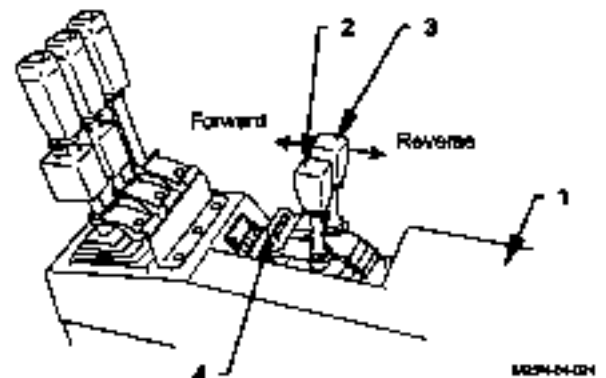
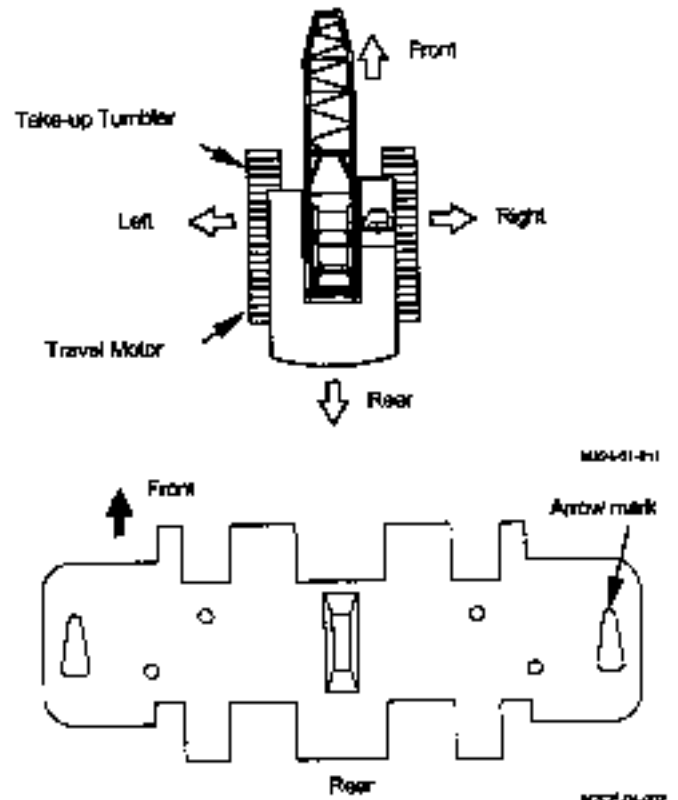
#### CAUTION:

- When the travel control levers are operated in the directions as illustrated on the control lever operation pattern decal with the travel motors positioned at the front of the base machine, beware that the machine will travel in the reverse direction. The machine travels in the normal direction only when the travel motors are positioned at the rear and the take-up tumblers are positioned at the front of the base machine. Each shoe has marks "Δ" on its surface to indicate the take-up tumbler position.
- When travel operation is not needed, apply lever lock (4) to travel levers (2 and 3) to avoid mis-operation.
- Do not operate any hoist drums simultaneously while traveling the machine.
- Do not operate travel mode switch (5) on the side overhead panel while traveling the machine.

**IMPORTANT:** Always slowly travel the machine. Failure to do so may cause the hook or the bucket to sway, possibly resulting in damage to the boom and the tower attachment.

Travel operation is made by operating travel levers (2 and 3) located in right stand (1). The maximum strokes of travel levers (2 and 3) are limited by the detent positions in both forward and rearward directions. Control the travel speed by adjusting the travel lever stroke and the accelerator grip.

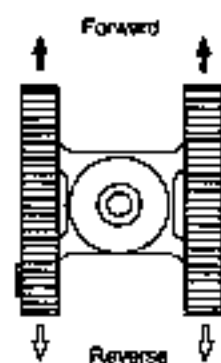
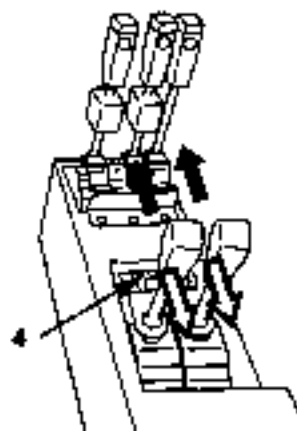
- **Travel mode selection**  
When changing the travel mode, park the machine. Then, operate travel mode switch (5) on the side overhead panel.



## 4 OPERATION

### • Forward/Reverse Travel

When travelling forward, push travel levers (2 and 3) forward at the same time. When traveling in reverse, pull travel levers (2 and 3) in reverse at the same time. The machine drives at the speed in proportion to the engine speed and the travel lever stroke. When travel operation is not needed, apply the lever lock (4) to travel levers (2 and 3).



M114-01-003  
U134-01-003

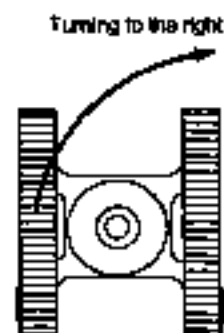
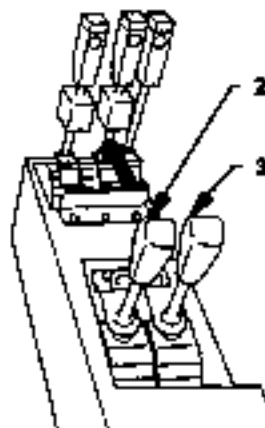
### • Travel Direction Change

#### Pivot Turn

Drive only one side crawler to change the travel direction. Operate either one of travel levers (2 and 3).

Left turn: Operate right travel lever (3)

Right turn: Operate left travel lever (2).



M224-01-003  
U134-01-003

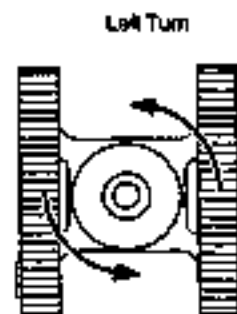
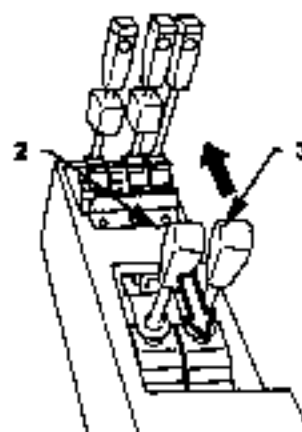
Pivot Turn

### • Spin Turn

Drive the right and left crawlers inversely each other to change the travel direction in the same position. Simultaneously move either travel levers (2 and 3) forward and the other travel lever backward.

Left turn: Move right travel lever (3) forward and left travel lever (2) backward.

Right turn: Move right travel lever (3) backward and left travel lever (2) forward.



M224-01-003  
U134-01-003

Spin Turn

## 4 OPERATION

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### 14 CLAMSHELL OPERATION

#### 14.1 Precautions for Clamshell Work



**CAUTION:**

- Machine failures such as damage to the boom and the bucket, pin wear, missing pins, and looseness of bolts are liable to occur due to repeating loads and vibration created in bucket operation work. Thoroughly check and service the machine before and after operation every day. Operate the machine only after repairing faulty sections if any.



**IMPORTANT:**

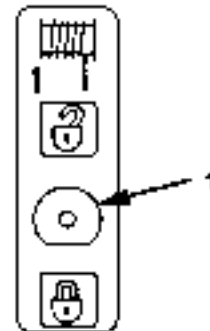
- After operation is complete, lower the bucket on the ground. Step on the brake pedal to engage the lock. Be sure to set the brake to the auto-brake mode. Engage the drum lock. After installing the tagline rotation stopper pin, stop the engine.



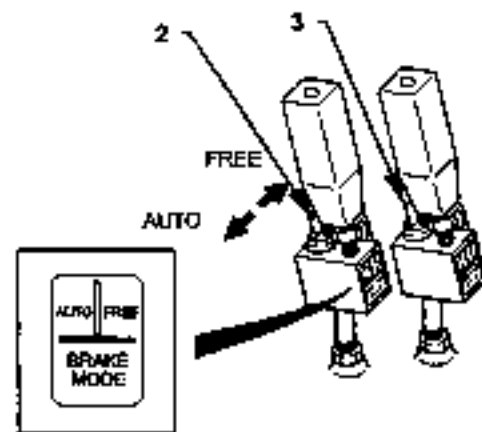
## 4 OPERATION

### 14.2 Preparation

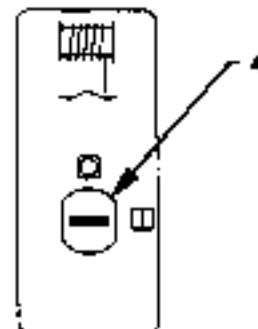
1. Arrange a bucket which matches the machine specification.
2. Check that the tagline connected to the bucket is properly tensioned by operating the hydraulic tag line. When the hydraulic tagline is used, the maximum bucket digging depth is 36 m.
3. Tilt slow speed holding switch (1) towards the  (LOCK) side.
4. Insert the key into brake mode select key switch (4) at the rear side of on the left stand and turn the switch towards the  position.
5. Step on the brake pedal to lock the pedal. Tilt the knobs of front and rear drum brake mode switches (2 and 3) towards the FREE mode side.
6. Set the engine speed with accelerator grip (5).



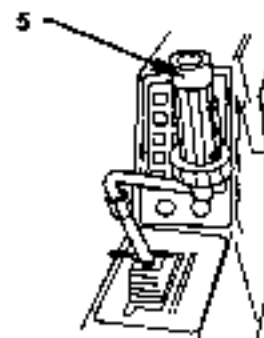
M22V-63-863



M22V-66-817



M22V-64-613



M22V-04-004

## 4 OPERATION

### 14.3 Excavation Work

During excavation with the clamshell, operate the drum levers and brake pedals as shown in the following table.

No.	Work Process	Open/Close Wire Rope		Tagline Wire Rope		Operation method and precautions.
		Front drum lever	Front drum brake pedal	Rear drum lever	Rear drum brake pedal	
1.	Dig	ON (Hoist)	*Step off	Neutral (Free)	Half braking	While controlling the tagline wire rope with the rear drum brake, adjust the bucket penetration.
2.	Derricking	ON (Hoist)	*Step off	ON (Hoist)	*Step off	Simultaneously wind the open/close wire rope and the tagline wire rope so that either of them does not slack.
3.	Stop	Neutral	Step on	Neutral	Step on	Stop hoisting the bucket.
4.	Slewing					
5.	Discharge	Neutral	Step off	Neutral	Step on	
6.	Slewing					Slewing the bucket to the excavation point.
7.	Lower (Preparation for digging)	Neutral	Step on the brake pedal half stroke, or step off	Neutral	Step on the brake pedal half stroke, or step off	Lower the bucket in half braking. Beware not to slacken the rope at this moment.

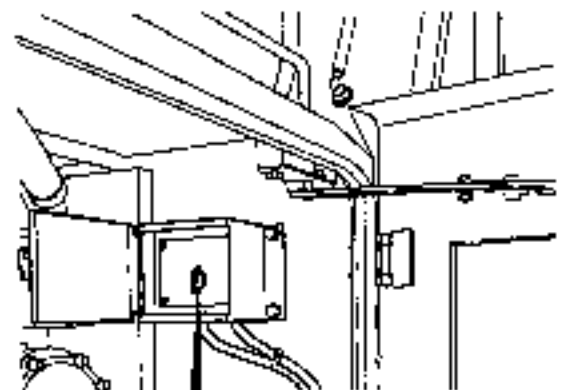
\*: The brake pedal is allowed to be stepped on in this stage.

The above description is a sample excavation operation method with a clamshell bucket. Combined operations of slewing, hoist, and discharging can be performed in response to the working situation.

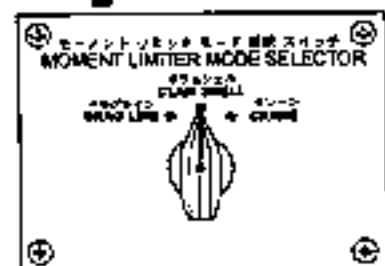
#### (1) Moment Limiter mode Selector (Optional)

**CAUTION:** When either the clamshell or dragline operation mode is selected, the safety system is deactivated. If the machine becomes overloaded, or is operated in the incorrect machine operation mode, damage to the machine and/or overturning of the machine may result, possibly causing a serious accident. When operating the machine in either the clamshell or dragline mode, be careful not to allow the machine to become overloaded. When engaging the machine in crane work, be sure to select the crane mode.

When the machine is engaged in excavation work using a clamshell or a dragline attachment, select either the clamshell or dragline operation mode by operating the moment limiter (ML) mode selector which is located in the access covers behind the operator's cab. When clamshell operation mode is selected, the lifted load value in the clamshell is displayed on the ML screen. However, the machine operation is not automatically stopped even if the machine becomes overloaded. When dragline operation mode is selected, both bucket load display and overload auto-stop systems are deactivated. (Refer to 3. Safety Device Output List). Be careful not to overload the machine. When the machine is engaged in crane work (material handling) using a clamshell bucket or lifting magnet, select the crane operation mode. At this time, set the lifting tool mode for the bucket or lifting magnet on the ML operational specification-setting screen. (Refer to 3.3.5 Operation of Operational Specification Screen)



MO24-04-011




MO24-04-002

## 4 OPERATION




### 14.4 Hydraulic Tagline (Sway Prevention Device) (Optional)

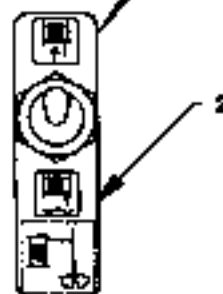
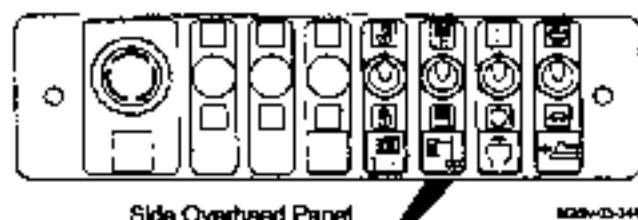
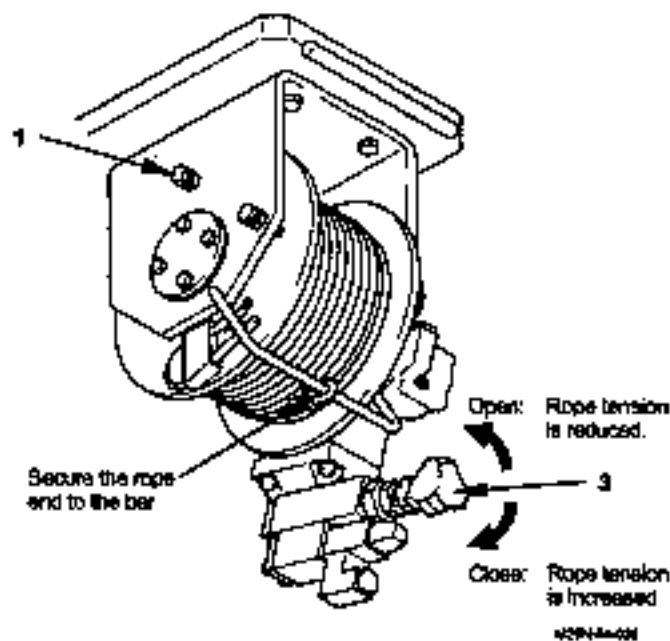


#### CAUTION:

- When paying out wire rope from the winding drum, never allow the engine to start. If the engine is started, even though the tagline switch is tilted to the  (FREE) side, the rope is wound, creating a dangerous condition.

#### IMPORTANT:

- Before using the tagline, be sure to sufficiently loosen rotation stopper (1). Failure to do so may damage the tagline device.
- When stopping the engine while the tagline is in use, tighten rotation stopper (1) before the engine is stopped. Unless rotation stopper (1) is sufficiently tightened, the tagline wire rope will be paid out by the weight of wire rope when the engine is stopped or tagline switch (2) is tilted towards the  (FREE) side, causing the tagline wire rope to slacken. Then, if the engine is started or tagline switch (2) is tilted towards the  (POWER DRIVE) side with the tagline wire rope slackened, wire rope may be wound irregularly or may come off the drum.
- The tagline wire rope length is adjusted to 55 m when the machine is shipped from the factory regardless of whether the machine is applied to deep or shallow excavation task. In case the machine is applied to a specified deep excavation, it is possible to use the length (shorter than 55 m) of wire rope meeting the working condition.
- When the tag line is not used, wind the wire rope with the drum and secure the end of the wire rope to the drum with a shackle. Fully open relief valve (3) and tilt tagline switch (2) towards the  (FREE) side.





## 4 OPERATION

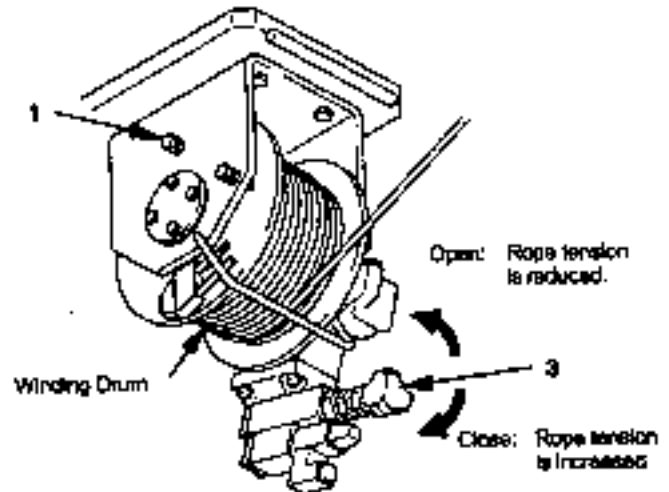
### (1) Specifications

Driving Method	: Hydraulic
Wire Rope Type	: 6 × Fi (28) 2 lay, Class B
Breaking Force	: 6.01 tf or more
Rope Dia.	: 10 mm
Rope Length	: 55 m
Rope Tension	: Max. approx. 1177N (120 kgf)
Max. Underground Lifting Height (Excavation Depth)	: 36 m

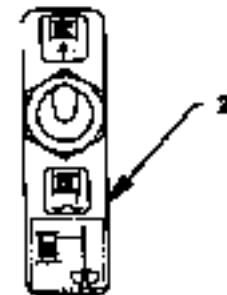
### (2) Installing Wire Rope to the Bucket

**CAUTION:** When paying out wire rope from the winding drum, never allow the engine to be started. If the engine is started, even though the tagline switch is tilted to the FREE  side, the rope is wound, creating a dangerous condition.

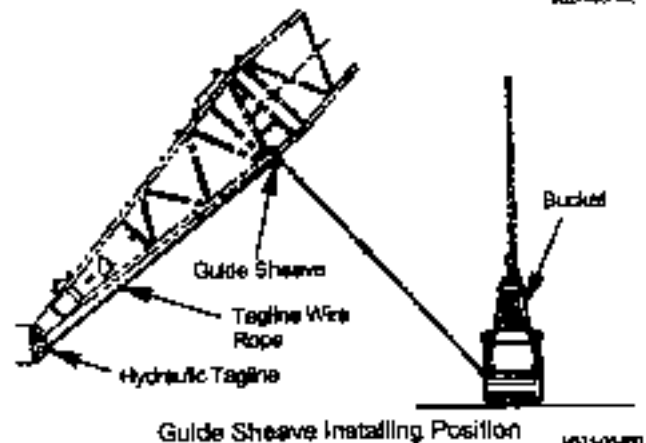
1. Fully open relief valve (3).
2. Turn the key switch ON.
3. Tilt tagline switch (2) towards the FREE  side.
4. Pay out wire rope from the drum and install the wire rope to the bucket.
  - Loosen drum rotation stopper (1) to allow the drum to rotate.
  - Pay out the necessary length of the rope from the drum. Thread the rope through the sheave on the boom. Secure the rope end to the bucket with a wire clip.
5. Wind the excess rope length around the drum.
  - While holding the bucket, rotate the drum by hand to wind the excess rope length around the drum.



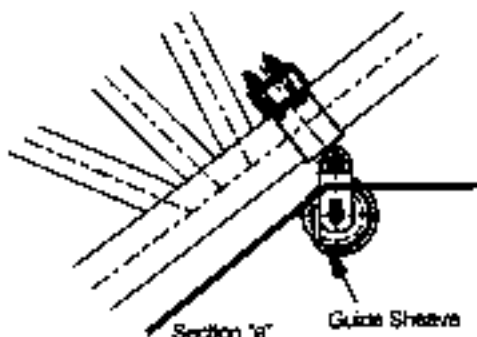
U621-04-002



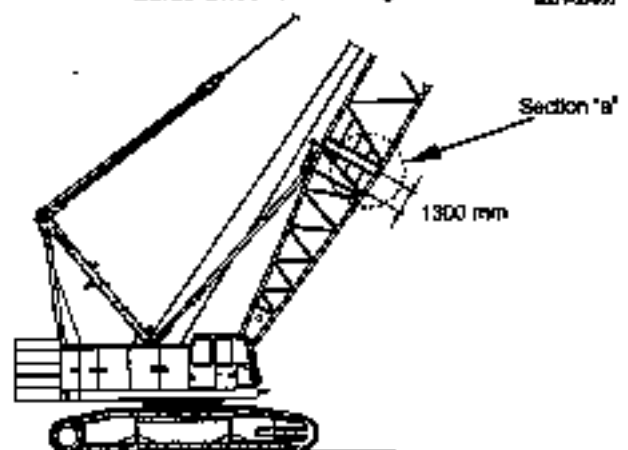
U621-05-002



U621-05-003



U621-05-004




U721-04-001

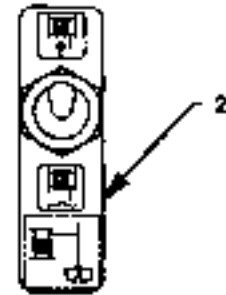
## 4 OPERATION

### (3) Hydraulic Tagline Operation

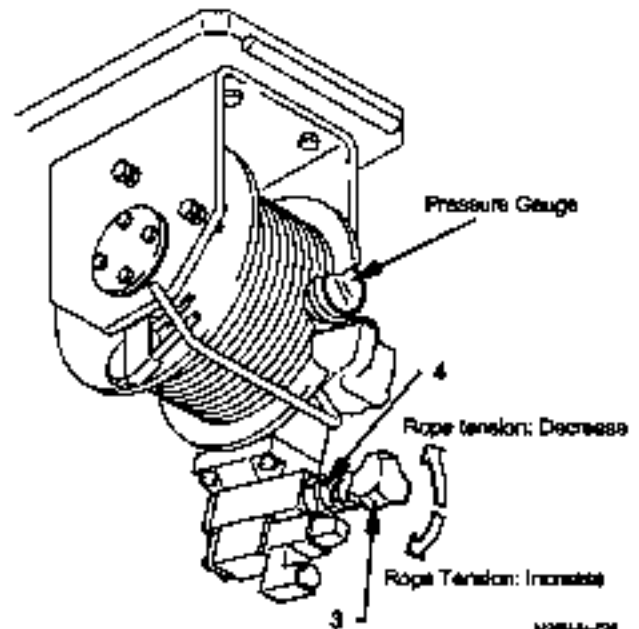
Operate hydraulic tagline using tagline switch (2) and relief valve (3).

**IMPORTANT:** Adjust the hydraulic oil pressure so that the pressure gauge does not indicate more than 9.8 MPa (100 kgf/cm<sup>2</sup>).

1. Start the engine. Turn tagline switch (2) towards the POWER DRIVE  side.
2. Increase the engine speed to the rated speed. Adjust the tagline wire rope tension by turning the relief valve handle while checking the oil pressure through the pressure gauge on the front of the swing frame.
  - Adjust the rope tension in response to the working conditions.
  - Loosen lock nut (4) of the relief valve handle. Turn the handle to the right to increase the rope tension. Turn the handle to the left to reduce the rope tension.
3. After adjustment is complete, secure lock nut (4) of the relief valve handle.



4251-02-01




4251-02-02



## 4 OPERATION

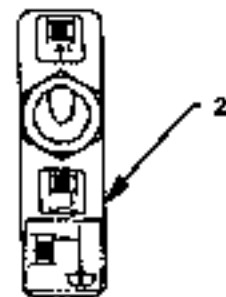
### 14.5 Replacement and Winding Procedure of Wire Rope



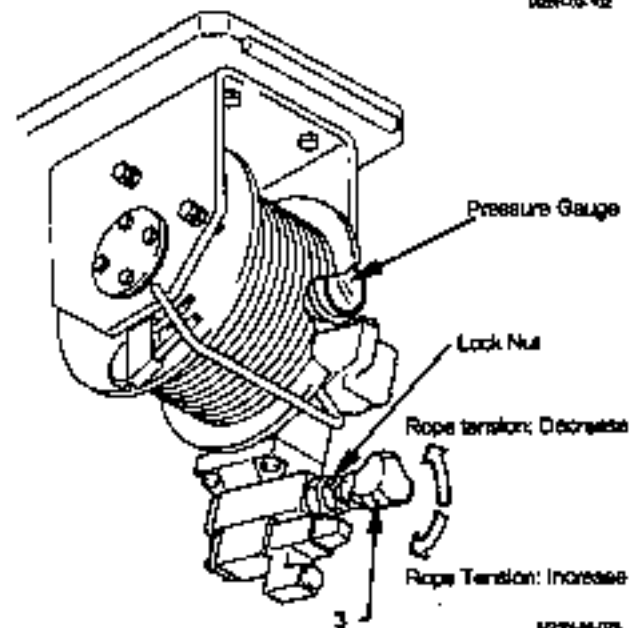
#### CAUTION:

- Use protective items such as heavy gloves when handling wire rope.
- In case no wire rope is wound around the drum, if the engine speed is increased with tagline switch (2) tilted towards the POWER DRIVE  side, the drum may rotate even if relief valve (3) is fully opened. Pay sufficient attention on this point when replacing wire rope.
- When winding wire rope, take care to ensure that hands pulling the rope do not get entangled in the drum.

1. Fully open relief valve (3) (Turn the handle counter-clockwise to the stop end.)
2. Start the engine.
3. Tilt tagline switch (2) towards the FREE  side.
4. Pay out wire rope from the drum. Remove the cotter to separate wire rope from the drum.
5. Secure the one end of the replacement wire rope to the drum with the cotter.
6. Tilt tagline switch (2) towards the POWER DRIVE  side.
7. While pulling wire rope, slowly close relief valve (3). Wind wire rope at a proper speed so that wire rope can be safely and regularly wound around the drum.



4229-03-102



4229-04-026

## 4 OPERATION

### 15. REEVING WINCH CUM HYDRAULIC TAGLINE (OPTIONAL)



#### CAUTION

- Do not use the reeving winch cum hydraulic tagline for applications other than described below.
- To wind the hoist rope around the drum when assembling or disassembling the front attachment
- To stop swaying of the bucket (such as clamshell) or lifting magnet
- Even though the needle valve is completely opened, when no wire rope is wound on the drum with the tagline switch ON, the drum may turn as the engine speed increases. When replacing wire rope, use extra care.

This winch is used as a reeving winch which assists paying out of wire rope wound on a drum or as a hydraulic tagline device to prevent a clamshell bucket or a lifting magnet from swaying.

#### IMPORTANT:

- The relief valve set pressure for the reeving winch is different from that for the hydraulic tagline. (When the machine is shipped from the factory, the relief valve set pressure is adjusted to match the reeving winch.) Unless the relief valve set pressure is appropriately adjusted, damage to the hydraulic components may result. Whenever the application of the winch is changed, be sure to readjust the relief valve set pressure.
- The wire rope length for the reeving winch is different from that for the tagline. According to the types of application, install the wire rope appropriate to the application. Refer to the description on "Replacement and Reeving Wire Rope" for the replacement procedures.

#### Specifications

	Reeving Winch	Hydraulic Tagline
Relief pressure MPa (kgf/cm <sup>2</sup> )	11.3 (115)	5.9 (60)
Type of Wire Rope	6 x Fi (29) Z Lay	6 x Fi (29) Z Lay
Breaking Force kN (tf)	59.1 (6.03) or more	59.1 (6.03) or more
Rope Dia. (mm)	φ 10	φ 10
Wire Rope Length (m)	220	55
Wire Rope Weight (kg)	87	22
Wire Rope Tension kN (kgf)	2.94 (300) (first layer on drum)	1.47 (150) (first layer on drum)
Max. Underground Lift (Digging Depth) (m)	-	36

## 4 OPERATION

### 15.1 Location

#### 15.1.1 Control Switch

##### 1. Winch Selector

Shifts winch operation mode between the reeving winch and the tagline winch. When adjusting pressure of the reeving and tagline winches, use the tagline side.

##### 2. Reeving Winch Wind / Unwind Switch

This device is used to reeve the hoist wire rope into the sheave. Tilt switch (2) to either the "Pay out" side or the "Wind" side depending on winch operation required.

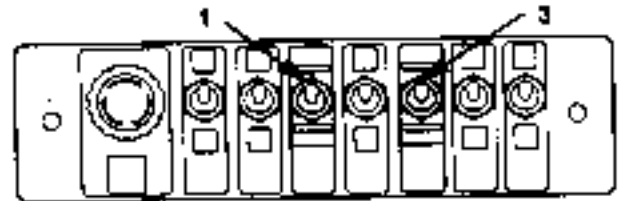
##### 3. Tagline Switch

To prevent the bucket from swaying or turning, the hydraulic motor is driven to give the wire rope a constant tension so that the bucket is slightly kept pulled. Either "FREE" or "POWER (Winding)" operation of the tagline can be selected by tilting switch (3).

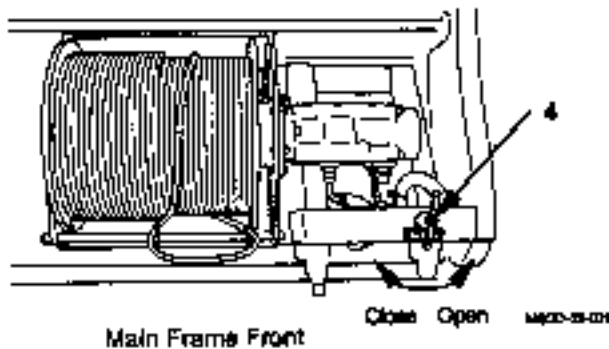
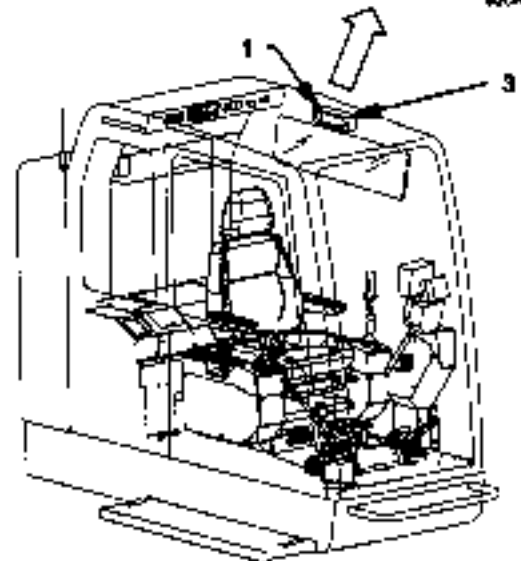
##### 4. Needle Valve (Stop Valve)

The wire rope speed of the reeving winch and the hydraulic tagline is adjusted by closing or opening needle valve (4).

Open (Counterclockwise): Speed reduction  
Close (Clockwise): Speed Increase



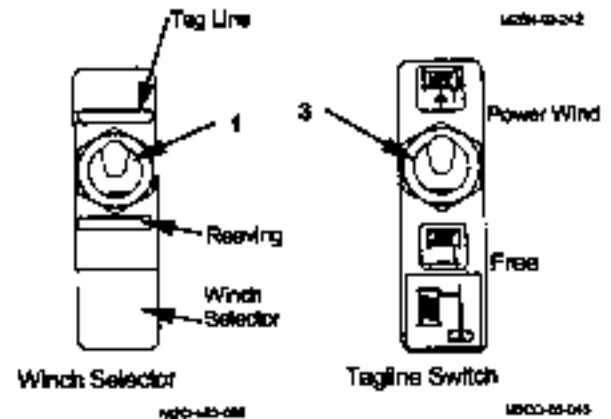
1420-05-001



Main Frame Front

Close Open

1420-05-001

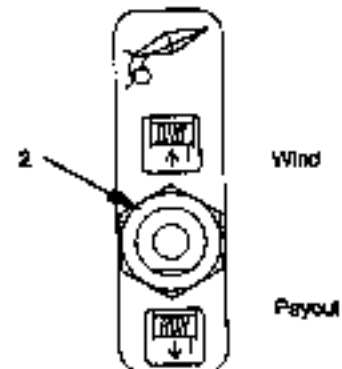


Winch Selector

Tagline Switch

1420-05-001

1420-05-003



2

Wind

Payout

1420-03-001





## 4 OPERATION

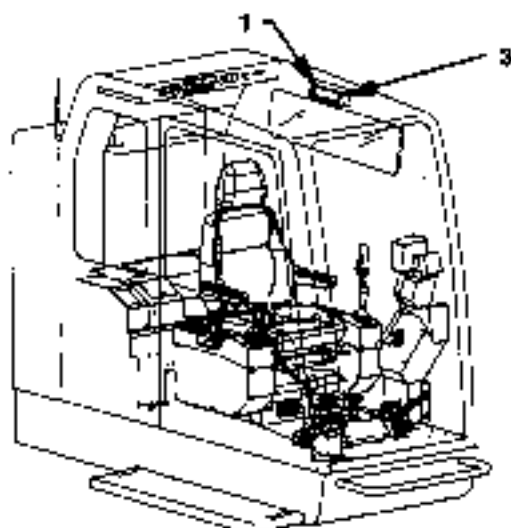
### 15.1.2 Relief Valve Pressure Adjustment

#### IMPORTANT:

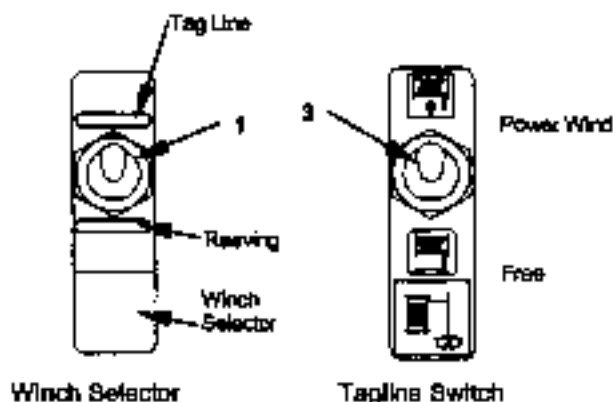
- The drum may be rotated at the same time when the engine is started. Be sure to fully open the needle valve before starting the engine.
- Check that the pressure gauge indicates 0 MPa before starting the engine.
- Do not set the relief valve pressure to a value higher than specification. Failure to do so may damage the hydraulic components.

Perform pressure adjustment of the tagline winch and the reeving winches with winch selector (1) tilted to the tagline side and tagline switch (3) tilted to  side.

1. Fully open needle valve (4). (Fully rotate the handle counterclockwise.)
2. Start the engine.
3. Lower the lifted load and/or the bucket to the ground. Apply the brake pedal lock and the drum lock. Place the lock lever in the LOCK position.
4. Tilt tagline switch (3) to  side. Tilt the winch selector to the tagline side.
5. While manually rotating the winch drum, align the pin hole. Install the drum lock bolt into the drum lock position.

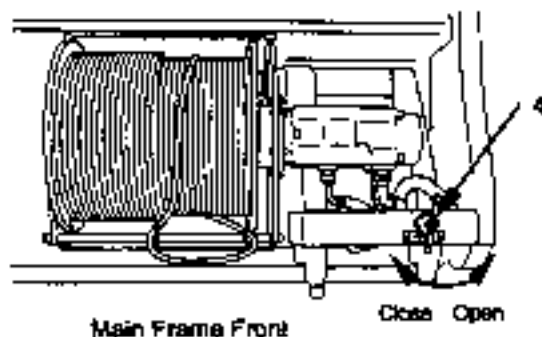


MCD-03-011



MCD-03-012

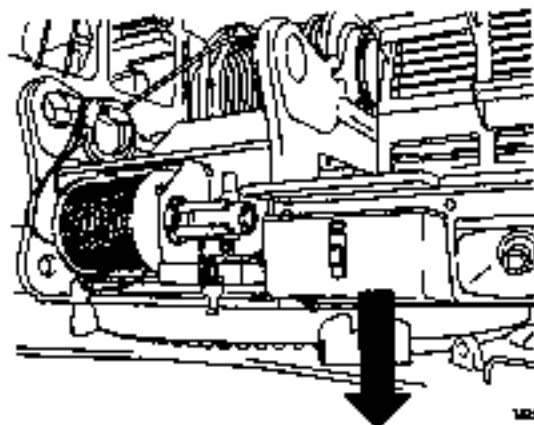
MCD-03-013



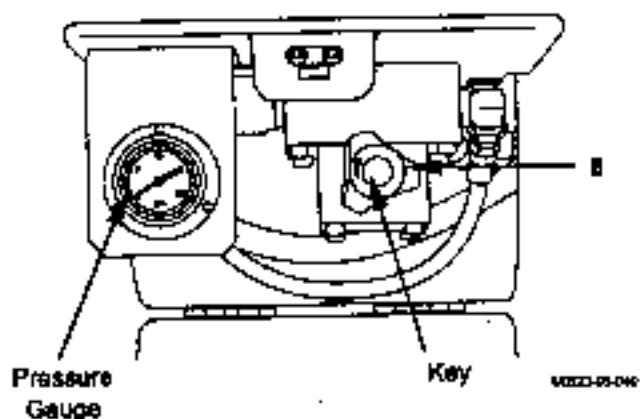
MCD-03-014

## 4 OPERATION

6. Relief valve (6) is located behind the front left cover. Insert the key into the knob of relief valve (6). Rotate the knob counterclockwise until the knob comes to stop.

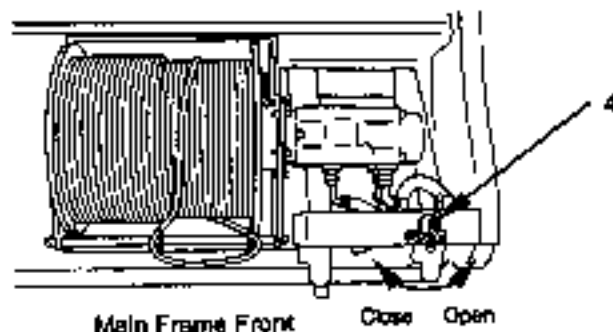


18277-01-044



18277-01-046

7. Fully close needle valve (4). (Fully rotate the handle clockwise.)

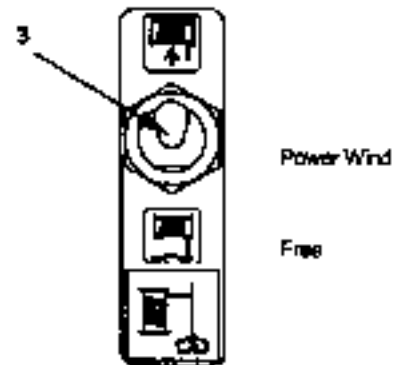


18277-01-048

## 4 OPERATION

8. Adjust the engine speed to the specifications. Tilt tagline switch (3) to  side.

	Specified Engine Speed
Reeving winch operation	800min <sup>-1</sup> (800rpm) (Slow idle speed)
Tagline operation	2000min <sup>-1</sup> (2000rpm) (Rated speed)



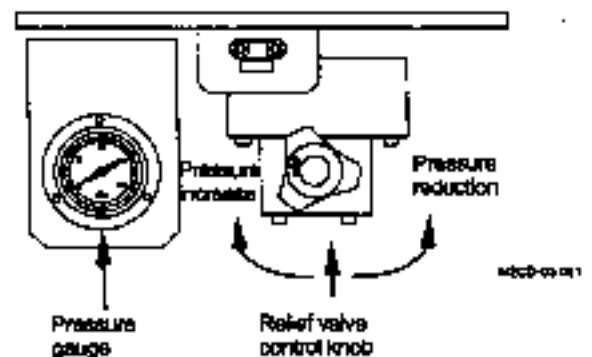
Tagline Switch

MCCO-03-049


9. While viewing the pressure gauge, rotate the adjusting knob of relief valve (6) to set the pressure to the values shown below.

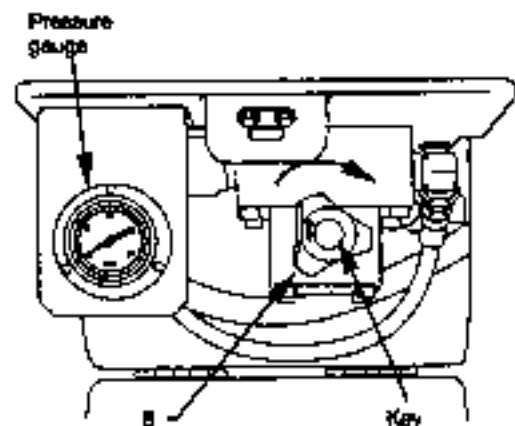
Clockwise: Increase  
Counterclockwise: Reduction

	Relief valve set pressure	Note
Reeving winch operation	11.3MPa (115kgf/cm <sup>2</sup> )	Set pressure at shipping
Tagline operation	5.8MPa (60kgf/cm <sup>2</sup> )	

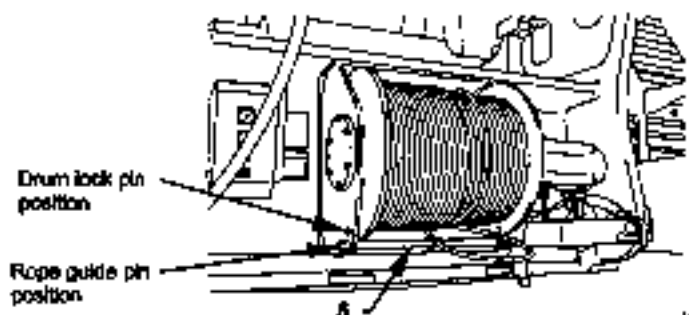


MCCO-03-051

10. Tilt tagline switch (3) to  side and fully open the needle valve. (Turn the handle counterclockwise.)
11. Turn the key clockwise and remove the key from relief valve (6). Stow the removed key in position.
12. Remove pin (5) from the drum lock position. Install pin (5) in rope guide position.
13. Stop the engine.



MCCO-03-048



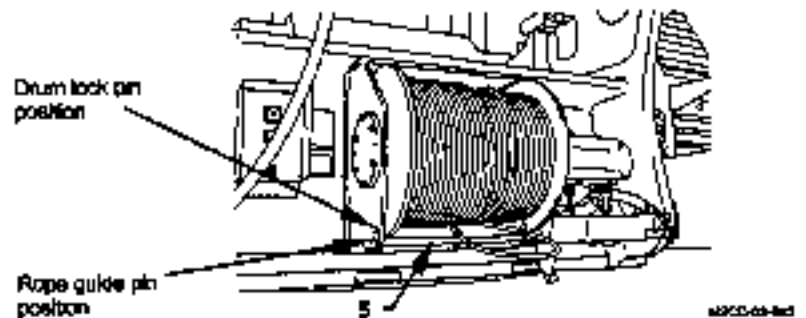
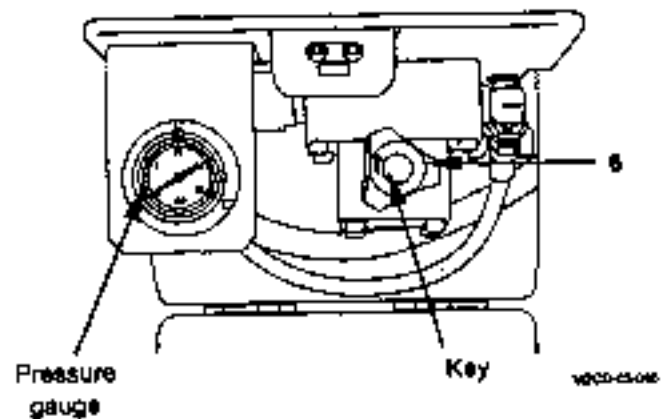
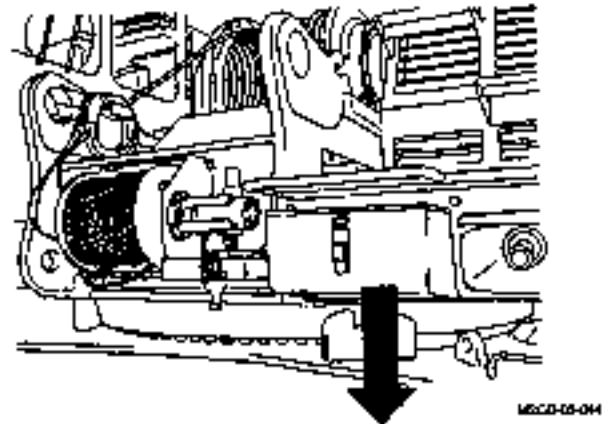
MCCO-03-046

## 4 OPERATION

### 15.2 Reeving Winch Operation

#### IMPORTANT:

- Before operating the reeving winch, check that set pressure of relief valve (6) is 11.3 MPa (115 kgf/cm<sup>2</sup>). In case the set pressure is incorrect, adjust the pressure while referring to the description on "Relief valve Pressure Adjustment" in Group for "Reeving Winch cum Hydraulic Tagline."
- Before using the reeving winch, always remove the bolt from the drum lock pin hole. Failure to do so may result in damage to the reeving winch.
- When reeving the wire rope, reduce the engine speed to slow idle. Then, while adjusting the opening of the needle valve, carefully thread the wire rope through the sheaves so that the wire rope is not entangled.



## 4 OPERATION

### 15.2.1 Operation



#### CAUTION:

- When handling wire rope, use protection items such as heavy gloves.
- When aligning pin holes, never insert your finger into the hole.
- Take care to ensure that your fingers are not entangle into sheaves and/or wire rope.

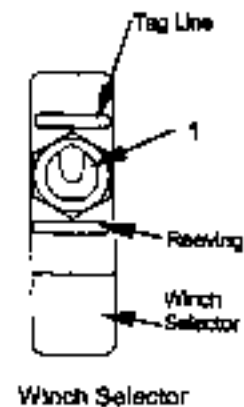
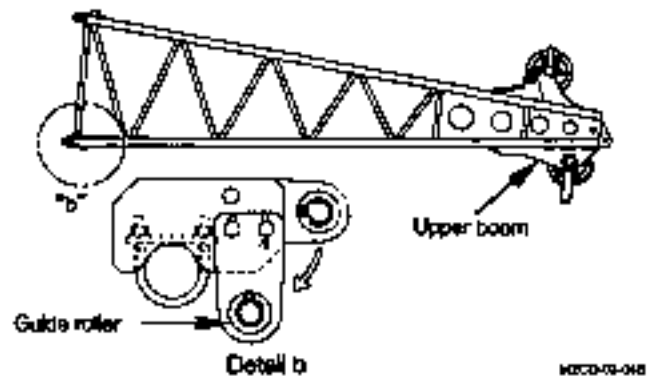
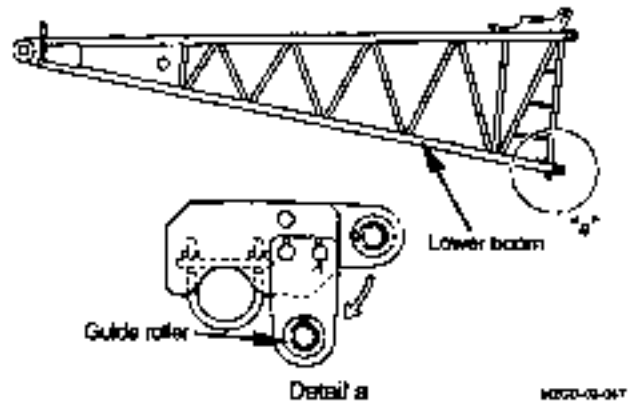
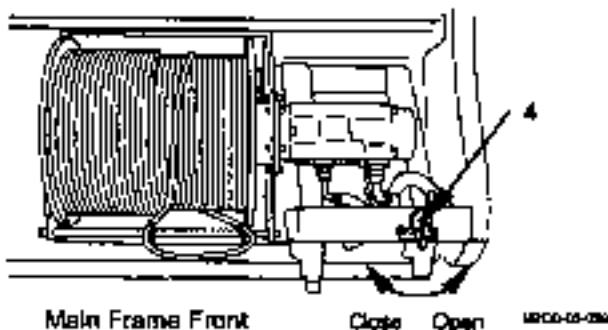
1. Set the guide rollers for the lower boom and the upper boom in the position as illustrated.



#### CAUTION:

- Before operating the winch, be sure to fully open needle valve (4). (Fully turn the handle counterclockwise.) If needle valve (4) is not completely opened, the drum may unexpectedly start to rotate, possibly causing personal injury or death.

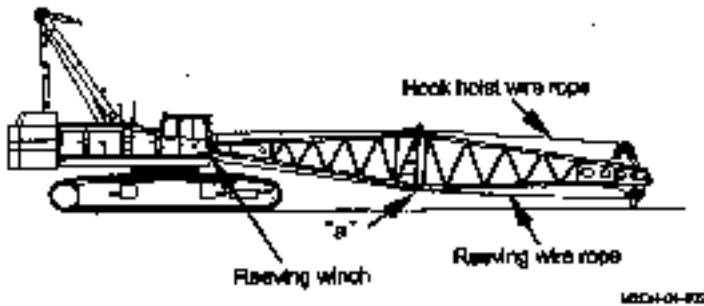
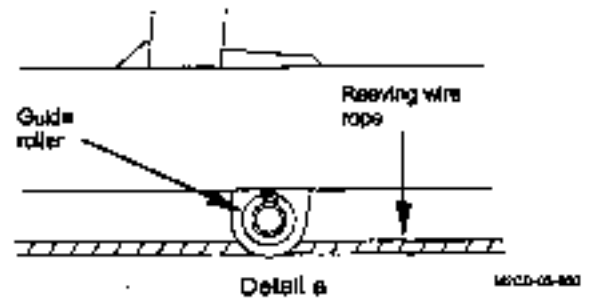
2. Completely open needle valve (4). (Fully turn the handle counterclockwise.)
3. Start the engine. Run the engine at slow idle speed.
4. Tilt winch selector (1) to the reaving side




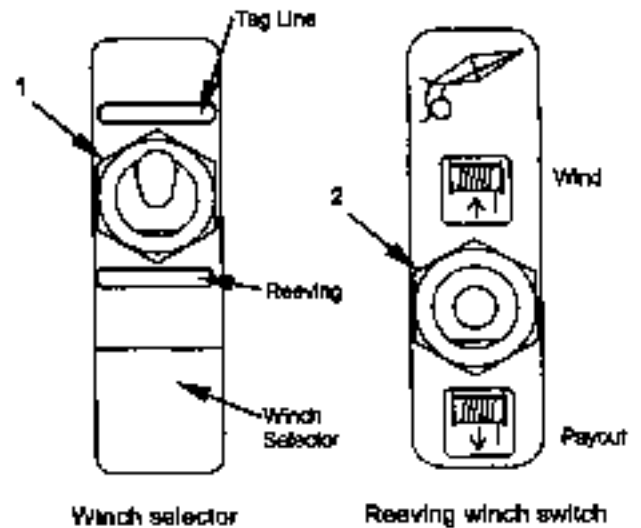
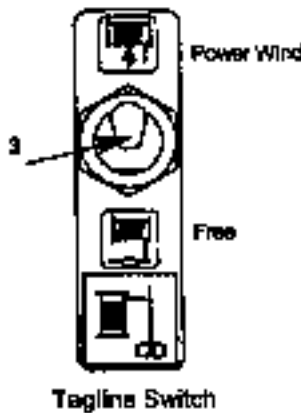
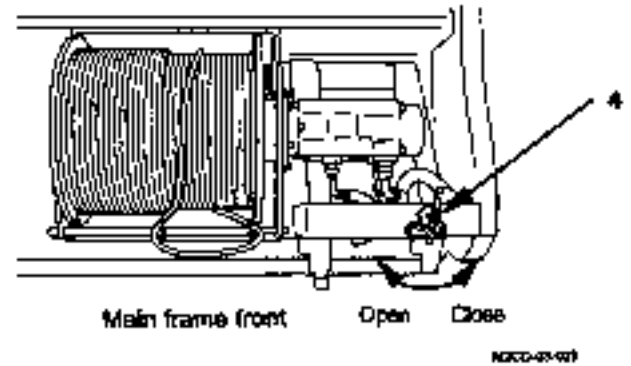
## 4 OPERATION


**IMPORTANT:**

- When installing wire rope to the reeving winch, thread the wire rope into sheave from the opposite installation direction of the hook hoist wire rope. Thread the reeving wire rope under the guide roller on the lower and upper booms.



- When manually paying out the reeving wire rope, fully open needle valve (4). Tilt tagline switch (3) to  side and winch selector (1) to the tagline side. As the drum becomes free to move, wire rope can be manually paid out. Decide paying out method taking the job site conditions into account.



5. Tilt reeving winch switch (2) to  side to pay out the reeving wire rope. Adjust the paying out speed by slowly closing (turning the handle clockwise) needle valve (4).

## 4 OPERATION



### CAUTION:

- If wire rope is not fully inserted into the rope joint, the wire ropes may be disconnected. Be sure to fully insert the wire rope into the rope joint.


**IMPORTANT:** Be sure to use genuine Hitachi rope joint.

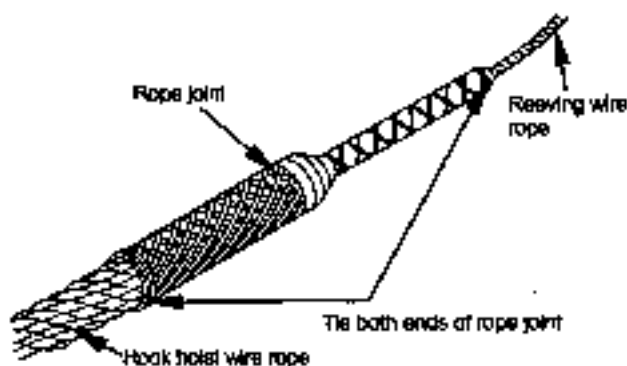
6. Fully insert both hook hoist and reeving wire ropes into the rope joint. Stretch the joint section while rubbing the joint surface along the wire ropes. Using wire cables, tie the both ends of the rope joint to connect the hook hoist wire rope and the reeving wire rope.
7. Fully open needle valve (4).



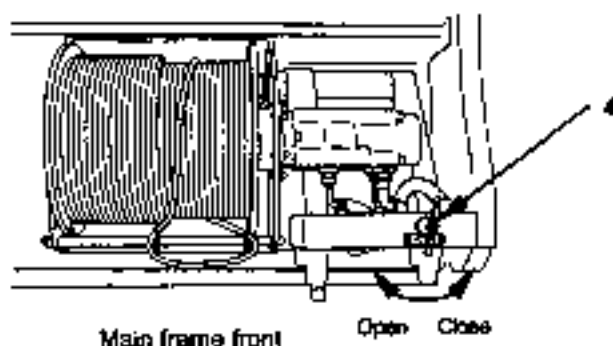
### CAUTION:

- Keep personnel away from wire rope.

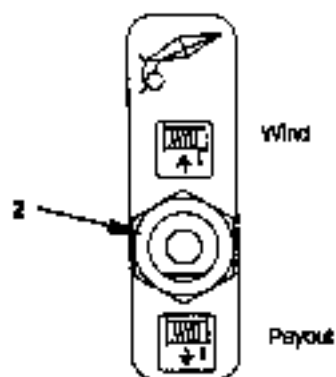
8. Tilt the hoist brake mode selector to the FREE position. Step off the brake pedal to set the hook hoist drum free.
9. Tilt reeving winch switch (2) to  side to wind the reeving wire rope. Adjust the winding speed while slowly closing needle valve (4).
10. Disconnect the rope joint. Wind all surplus reeving wire rope on the drum. Securely hold wire rope with wire cable so that it does not come loose.



W200-03-024



W200-03-025



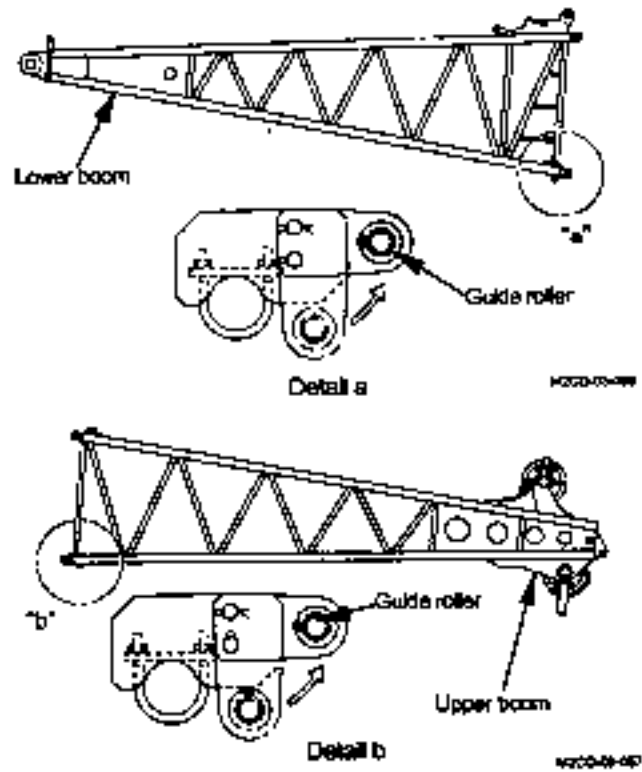
Reeving winch switch

W200-03-021

## 4 OPERATION

**IMPORTANT:** If the boom is lowered to the ground without stowing the guide roller, damage to the guide roller may result.

11. Stow the guide rollers on the lower and upper booms in the position as illustrated.



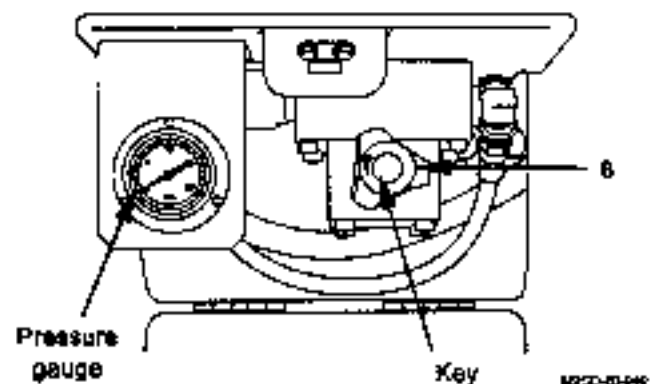
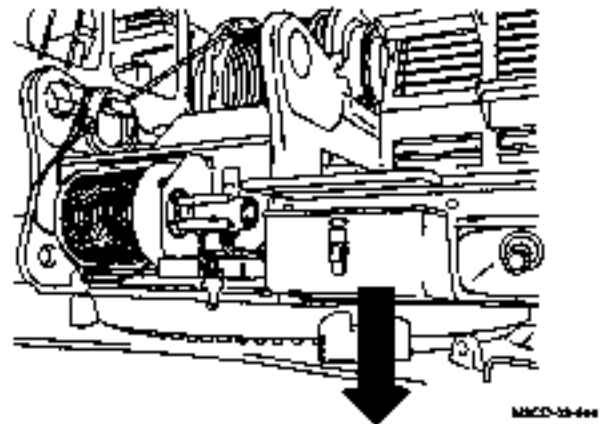


## 4 OPERATION

### 15.3 Hydraulic Tagline (Sway Prevention Device)

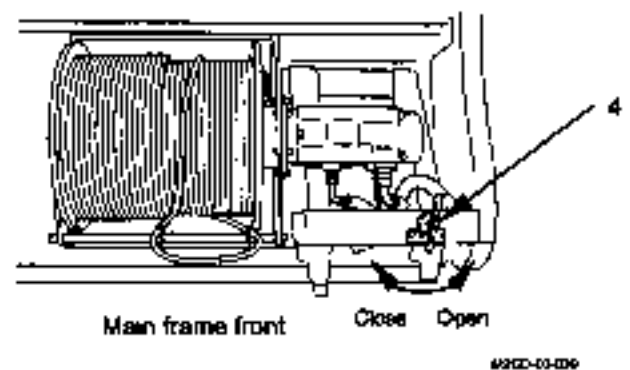
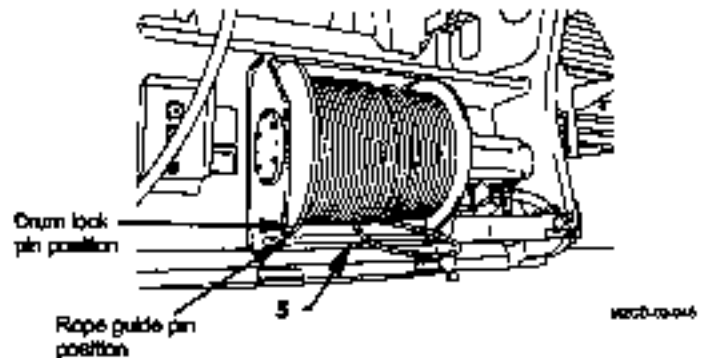
#### IMPORTANT:

- Before operating the tagline, check that set pressure of relief valve (5) is 5.9 MPa (60 kgf/cm<sup>2</sup>). In case the set pressure is incorrect, adjust the pressure while referring to the description on "Relief valve Pressure Adjustment" in Group for "Reeving Winch cum Hydraulic Tagline."
- Do not use the tagline with the relief valve pressure set at 11.3 MPa (115 kgf/cm<sup>2</sup>). Failure to do so may damage the hydraulic components.
- Before using the reeving winch, always remove the bolt from the drum lock pin hole. Failure to do so may result in damage to the reeving winch.
- The tagline wire rope length is 55 m regardless of digging depth either shallow or deep. In case the digging depth is unspecified, do not use wire rope of length other than 55 m to ensure safety of the device. In case the digging depth is specified, the wire rope length matching the digging depth is allowed to use (shorter than 55 m).




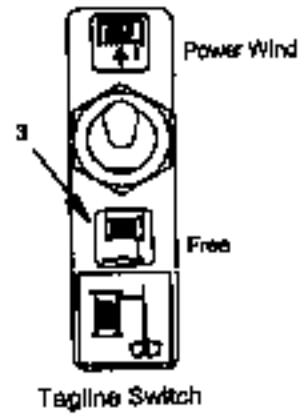
#### Attaching Wire Rope to Bucket

1. Fully open needle valve (4).
2. Start the engine.

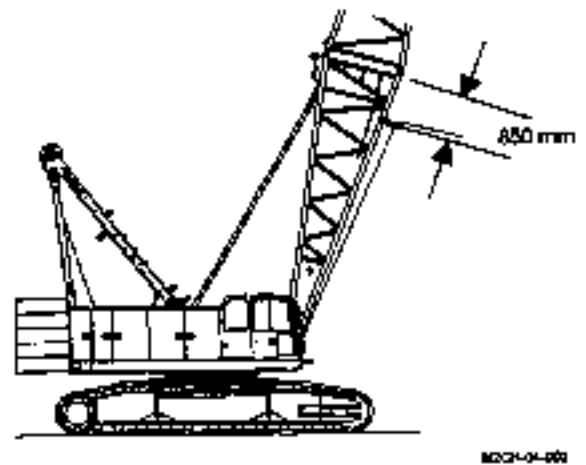
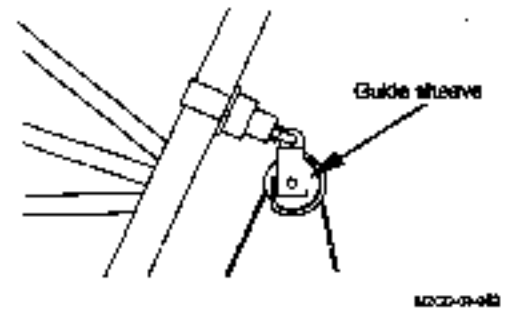
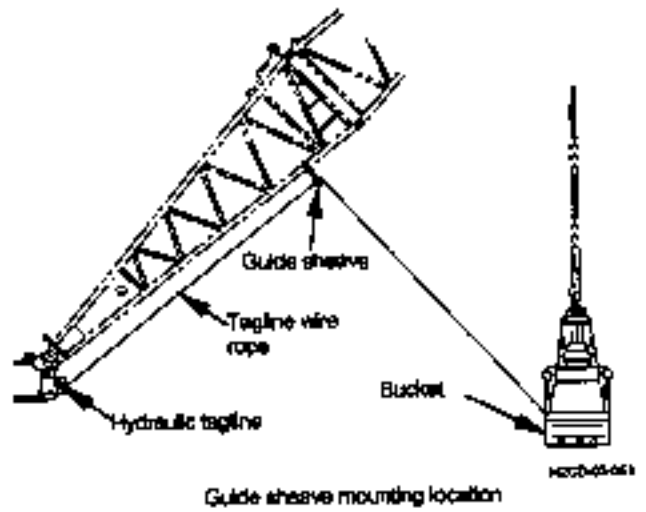


## 4 OPERATION

3. Tilt tagline switch (3) to  side. Tilt winch selector (1) to the tagline side.




4. Pay out the tagline wire rope from the drum. Thread the wire rope end through the guide sheave on the lower boom and connect to the bucket.

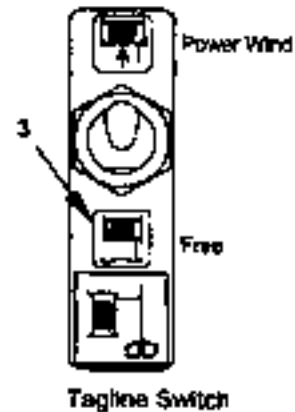


## 4 OPERATION

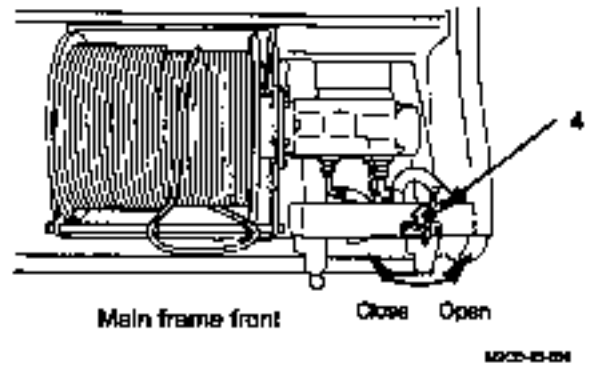
### 15.3.1 Hydraulic Tagline Operation

Control the hydraulic tagline by operating tagline switch (3) and needle valve (4).

1. Close needle valve (4) and lift tagline switch (3) to  side.



2. Slightly open needle valve (4) to adjust the tagline wire rope speed.
  - When using the tagline in normal bucket work, fully close needle valve (4).
  - In case the bucket away speed does not match the tagline speed, adjust the speed by slightly opening needle valve (4).




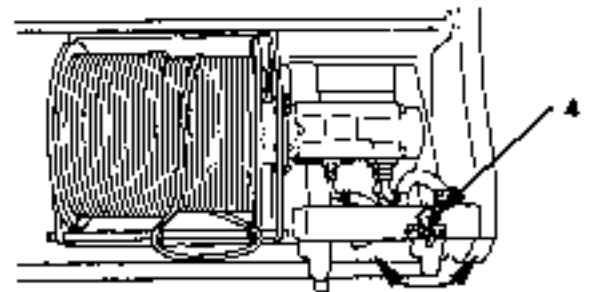
## 4 OPERATION

### 15.4 Replacement and Winding of Wire Rope



#### CAUTION:


- When handling wire rope, use protection items such as heavy gloves.
- Even though the needle valve is completely opened, when no wire rope is wound on the drum with the tagline switch in  position, the drum may turn as the engine speed increases. When replacing wire rope, use extra care.

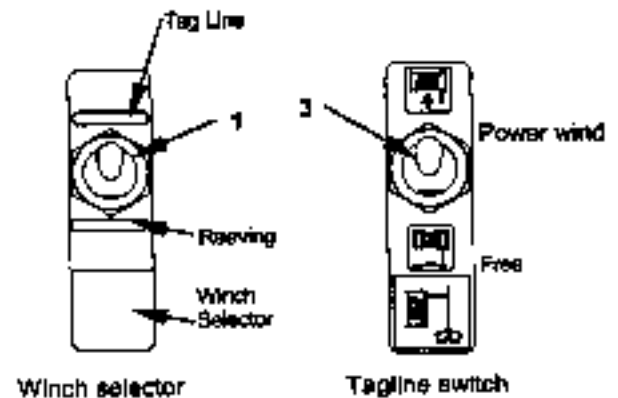


Main frame front Close Open 1422-03-132

#### IMPORTANT:

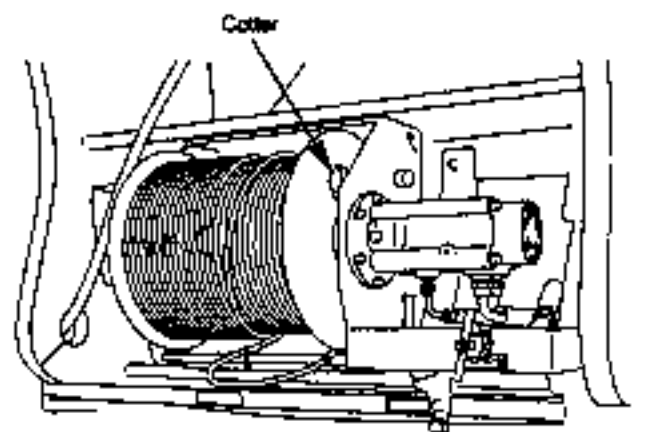
- Depending on applications of the winch, the length of wire rope to be employed differs. Refer to the specification table.
- Before replacing the wire rope, tilt the winch selector to the hydraulic tagline side.

1. Fully open needle valve (4) (fully rotate the handle counterclockwise).
2. Start the engine.
3. Tilt tagline switch to  side and winch selector (1) to the tagline side.
4. Pay out wire rope from the drum. Remove the cotter to disconnect wire rope from the drum.
5. Secure the one end of the replacement wire rope to the drum with the cotter.



1422-03-132

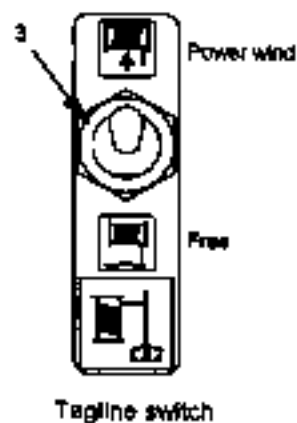
1422-03-015



1422-03-142

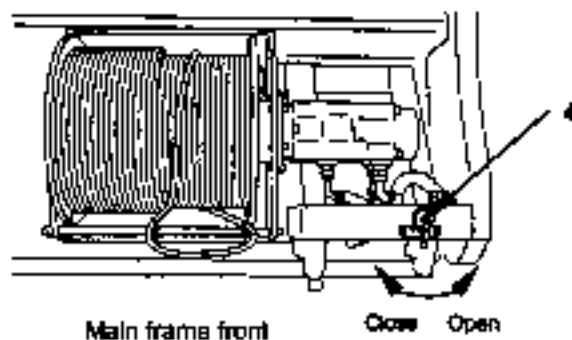
## 4 OPERATION

6. Tilt tagline switch (3) to  side.



WCC-03-004

7. While pulling out the wire rope, slowly close needle valve (4) so that the wire rope is completely wound on the drum without entanglement.



WCC-03-004

## 4 OPERATION

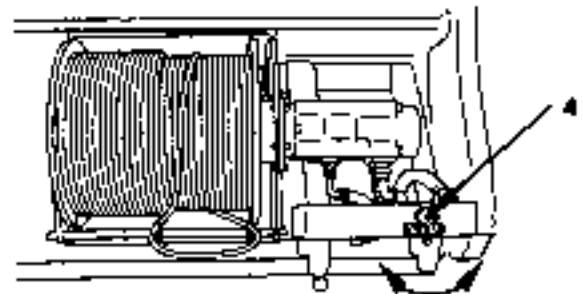
### 15.5 Procedures to be Taken after Reeving Winch and/or Hydraulic Tagline is Used



**CAUTION:**

- When handling wire rope, use protection items such as heavy gloves.
- When aligning pin holes, never insert your finger into the hole.

1. Fully open needle valve (4).



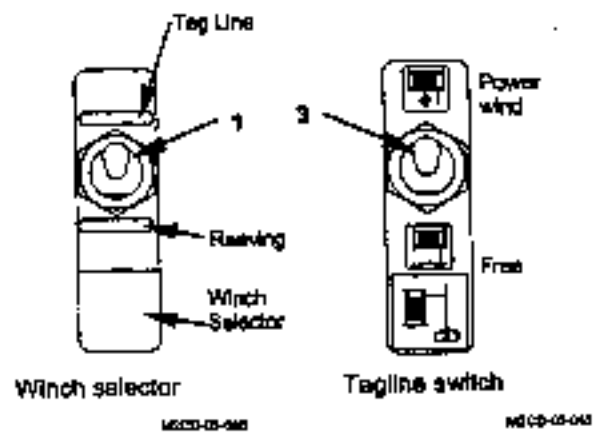
Main frame front

Close Open

MOCD-28-029

2. Start the engine. Wind all wire rope on drum.

3. Tilt winch selector (1) to the tagline side.



Winch selector

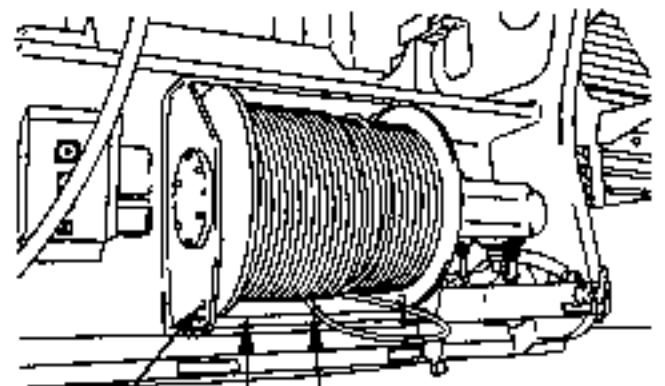
Tagline switch

MOCD-05-040

MOCD-05-041

4. Tilt tagline switch (3) to  side.

5. Manually rotate the winch to align the pin holes. Install bolt (5) in the drum lock position.



Drum lock pin position

5

Tie wire rope with wire cable.

MOCD-05-044

6. Secure the wound wire rope with wire cables in position.

## 4 OPERATION

### 16 VIBRATORY HAMMER OPERATION

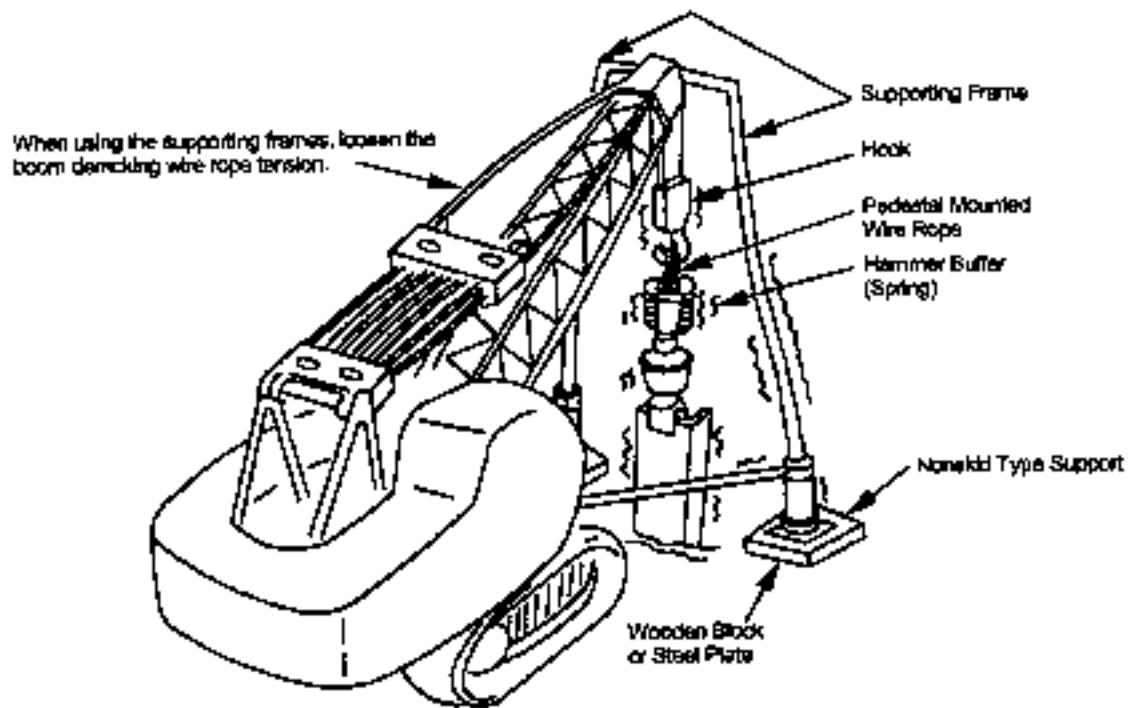


#### CAUTION:

- Vibrator hammer operation may develop unexpectedly large loads on the machine. Take care not to allow the weight of a vibrator hammer and sheet piles to exceed the machine lifting capacity.
- Machine failures such as damage to the boom and the bucket, pin wear, missing pins, and looseness of bolts are liable to occur due to repeating loads and vibration created in vibrator hammer operation work. Thoroughly check and service the machine before and after operation every day. Operate the machine only after repairing faulty sections if any.
- After winding wire rope until the rear end of the base machine is raised off the ground, when the base machine is allowed to quickly lower, extraordinary large rope tension is created by the reaction force of the quickly lowered base machine. Utilization of this large rope tension to pull out piles may cause every part of the machine to receive large impacts, possibly resulting in damage to the machine or a serious personal accident. Never attempt to operate the machine under any overloading conditions.
- Hitachi Sumitomo product warranty is waived from the machine failures or personal accidents caused by neglecting the precautionary rules or operating the failed machine without repairing.

1. Use supporting frames so that extraction force is only applied vertically.
2. Connect the hook to the hammer buffer (spring) with a pedestal mounted wire rope.
3. A vibratory hammer is a machine used to drive piles into the ground using vibration energy. When the vibratory hammer is used to extract piles, reaction force to the machine becomes larger than with any other work, possibly resulting in damage to the boom and/or hook. Before operating the machine, thoroughly read and understand the precautionary instructions to ensure safety. Two supporting frames illustrated on the next page are used to receive extremely large reaction force instead of the machine boom so that the boom will not be damaged. When using the supporting frames, loosen the boom hoist wire rope tension. Lay wooden blocks or steel plates on the ground under the supporting frame bottoms to prevent the ground from settling. Use nonskid type supports at the bottoms of the supporting frames.

## 4 OPERATION



Example of Using Vibratory Hammer Supporting Frame

4247-07-003



## 4 OPERATION

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### 1B.1 Selection of Crane for Vibratory Hammer Work

Check the lifting power, working radius, and lifting height when selecting the crane for vibratory hammer work.

- **Lifting Power**

Check the gross crane rated load using the following formula:

$$\begin{aligned} \text{Gross crane rated load} &\geq \text{Lifting power required in} \\ &\quad \text{vibratory hammer work} \\ &\geq \text{Hook weight} + \text{Pile Weight} \\ &\quad + \text{Gross vibratory hammer} \\ &\quad \text{load} + \text{Vibratory force of} \\ &\quad \text{vibratory hammer} \times 1/4 \end{aligned}$$

- **Working Radius**

The necessary working radius will be restricted depending on the job site conditions. Make the maximum value of the necessary working radius as the selection standard.

- **Lifting Height**

Check the lifting height necessary for vibratory hammer work using the following formula:

$$\text{Lifting height} \geq \text{Pile length} + \text{Vibratory hammer length}$$

## 4 OPERATION

---

### 16.2 Precautions for Using Vibratory Hammer (including a case of work performed unavoidably without using a supporting frame.)

- Select the minimum necessary boom length to protect the crane boom from being damaged.
- Never allow the buffer spring to become tightly compressed.
- Always keep the chucks of the vibratory hammer and the chucking areas of piles clean. Failure to do so may result in a pile falling accident.
- During the initial stages of starting vibration, a sympathetic vibration may develop, so that a large vibration will be applied to the front attachment. Slightly slacken the boom hoist rope tension to prevent vibration from being directly transmitting to the boom. Be aware that the hook does not come off wire rope at this time.
- The buffer spring and/or boom may sympathetically vibrate in some frequency range of vibration when the vibratory hammer is stopped. Tense the boom hoist wire rope when stopping the vibratory hammer after extracting a pile. Slacken the boom hoist wire rope when stopping the vibratory hammer after driving a pile in the ground. Then, after vibration is completely stopped, take the next action.
- Be sure to check the chucking pressure before beginning operation.
- Use a hook most closely matching the specifications of the vibratory hammer and the base machine for lifting the vibratory hammer.
- Check all bolts on the machine such as the swing bearing mounting bolts for missing, looseness, and/or cracks. Especially, strictly check the swing bearing mounting bolts at regular intervals for missing and/or looseness. In case the bolts receive the reaction force from external loads under a high stress condition, check the bolts for cracks by means of color-check inspection method. Replace all bolts in the same group even if only one of them is found to be abnormal.

## 4 OPERATION

MEMO

## 5 ASSEMBLING/DISASSEMBLING

### 1. ASSEMBLING

#### 1.1 Preparation and Precautions



##### WARNING

- If the machine is assembled in following incorrect procedures, personal injury or death may result.
- Before beginning work, sufficiently coordinate with all personnel concerned to ensure safety during work.



##### CAUTION

- The attachment mounted side crawlers support a heavier load than the other side crawlers. Place steel plates with enough strength on the ground under the crawlers.
- Use an assistant crane, sling ropes, and shackles with enough strength to provide a sufficient margin when lifting loads.
- Refer to Section 6 "3.Approx. Weights and Dimensions of subassembly units" for the contour dimensions and weight of each subassembly unit.

#### 1.1.1 Practices before Beginning Work

1. Have all coordination handled by the job site conductor to ensure safety prior to beginning any work.
2. Thoroughly inform all workers so they understand the types of work, procedures, and signals to be used at the job site, etc.
3. Check all instruments and materials for any abnormality.

#### 1.1.2 Selection of Work Area

1. Select a solid level surface wide enough to assemble the machine.

##### NOTE:

- Remove all obstacles from the area in which the crane will be moved.
- Provide a space wide enough for an assistant crane to move around.
- Flatten indented surface areas. Horizontally reinforce any soft ground by placing high strength planks beforehand.
- Depending on the configuration of the front attachment to be installed, the raising direction of the front attachment is restricted. Refer to 1.14 "Conditions to Erect Boom and Jib."

## **5 ASSEMBLING/DISASSEMBLING**

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### **1.1.3 Equipment and Items to be Prepared**

- **Assistant crane**  
The specifications of the assistant crane shall be decided according of the job site conditions and types of work the machine is engaged in. Arrange a crane having sufficient lifting capacity.
- **Arrange protection items, sling tools, base machine attachments, and tools necessary for the disassembly/assembly work.**

### **1.1.4 Necessary Number of Personnel**

- **Practice the work with more than four personnel present. (Crane operator, Assistant crane operator, Sling worker, and Signal person)**

### **1.1.5 Keep all Unauthorized Persons Clear from Working Area.**

- **Take all measures necessary to keep all unauthorized persons clear from the working area during work.**

## 5 ASSEMBLING/DISASSEMBLING

### 1.2 Unloading Base Machine from Trailer.

The unloading procedures differ depending on whether the upperstructure and the crawlers are united or separated. In case the upperstructure and the crawlers are united, unload the machine according to the procedures described in 1.2.2 "Unloading machine with crawlers." In case the superstructure and the crawlers are separated, unload the machine according to the procedures described below.

#### 1.2.1 When the Crawlers are not Mounted:

##### WARNING

- When the jack-up units are projected, install the holding pins. If the jacks and/or crawler extension/retraction system is operated without installing the holding pins, the jacks may be rotated, possibly causing the machine to move or tip over.
- If the superstructure is rotated without projecting the jacks, the machine may tip over. Never rotate the superstructure before extending the jacks.

#### (1) Set the trailer.

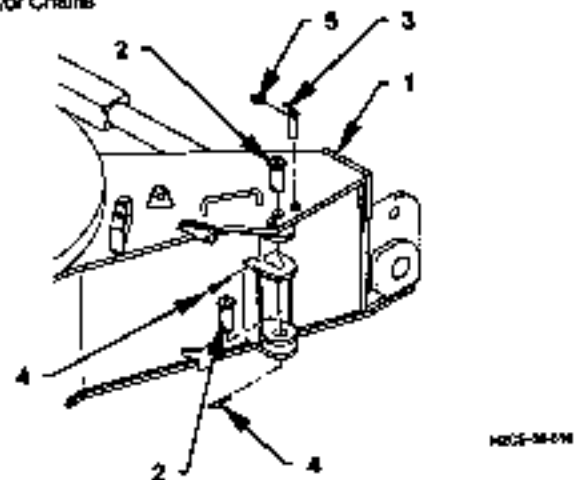
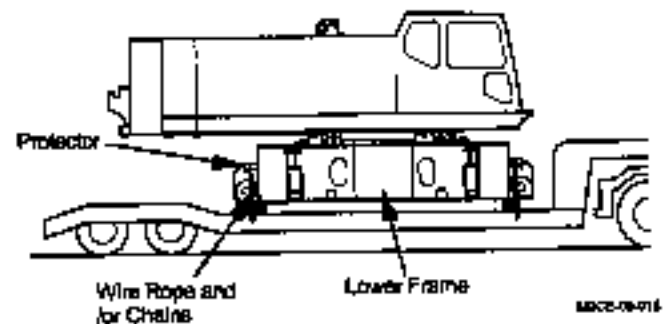
1. Park the trailer on solid level ground.
2. Unfasten wire rope and/or chains from the machine.

#### (2) Installing Jack-Up Device

1. Remove upper and lower two supporting pins (2) and lock pin (3) from lower frame (1).

#### NOTE:

- Remove cotter pins (4) from supporting pins (2).
- Remove ring pin (5) from lock pin (3).



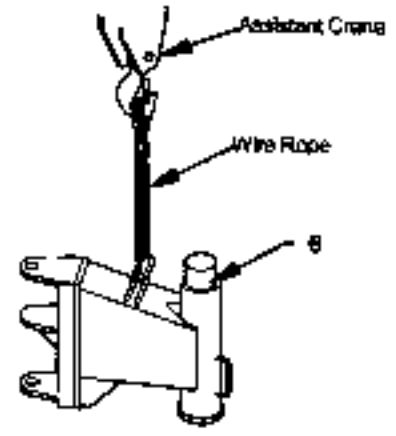
## 5 ASSEMBLING/DISASSEMBLING

- Attach sling wire ropes to the suspension lugs of jack-up unit (6).

**NOTE:** Jack-Up Unit Weight: 370 kg

**IMPORTANT:** Lift jack-up unit (6) so that the jack-up device is maintained in the horizontal position.

- Using an assistant crane, lift jack-up unit (6).

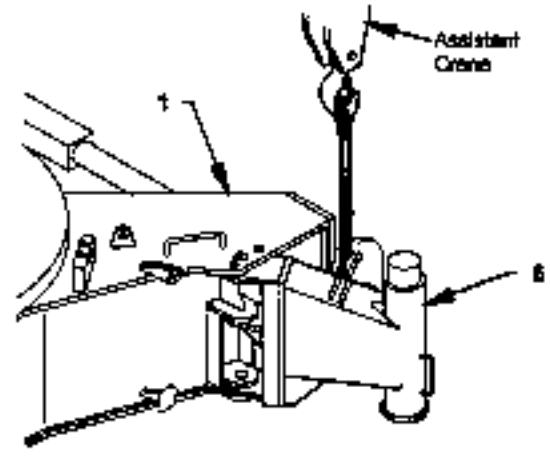


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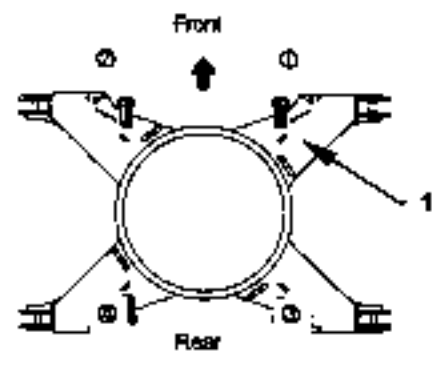
- Align jack-up unit (6) with pin holes on lower frame (1).

**NOTE:**

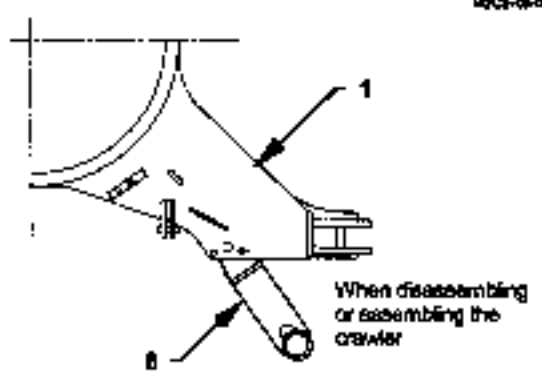
- Figure numbers (1 to 4) are marked on the joint sections of jack-up units (6) and lower frame (1). Joint the jack-up units to the lower frame so that the same figure numbers marked on both parts meet each other.
- Jack-up unit (6) can be locked in positions. One position is used when disassembling or assembling the crawler.



MCCB-08-018



MCCB-08-019



MCCB-08-020

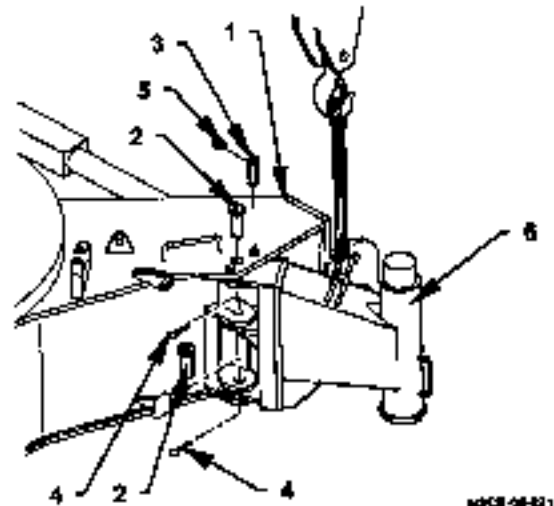
## 5 ASSEMBLING/DISASSEMBLING

5. Secure jack-up units (6) to lower frame (1) with upper and lower two supporting pins (2).

**NOTE:** Install cotter pins (4) into supporting pins (2) to prevent the supporting pins from coming off.

6. Extend jack-up units (6) to the crawler disassembly/assembly position. Then, secure jack-up units (6) in that position with lock pins (3).

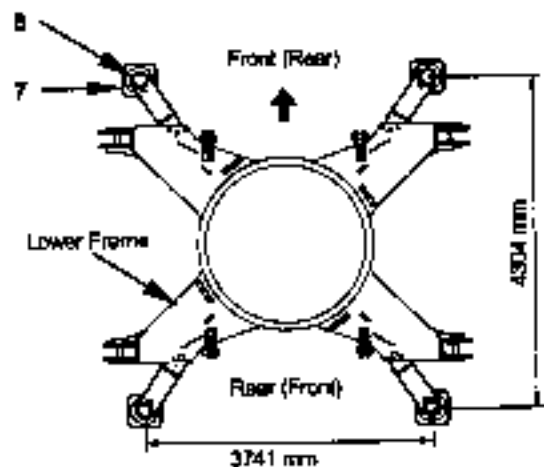
**NOTE:** Install ring pin (5) into lock pin (3).



- IMPORTANT:**
- Be sure to use floats (7) supplied in the attached accessory parts.
  - Level the ground surface under the floats so that the float bottom comes in contact with the ground horizontally.
  - Accurately align the centers of jack cylinder (8) and float (7).
  - Depending on the direction taken when the superstructure is loaded on the trailer, the forward and backward direction of the lower frame may differ.

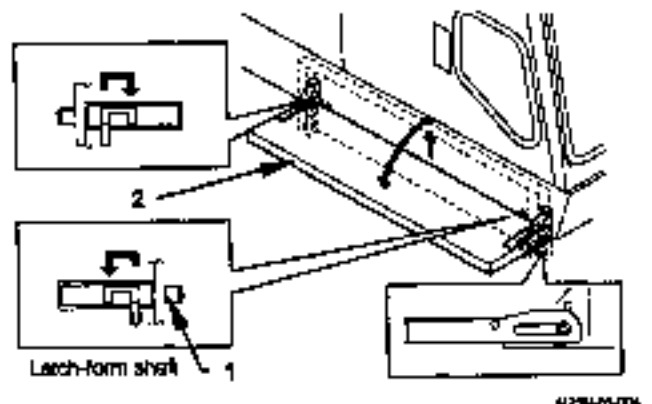
7. Place floats (7) just under all jack cylinders (8).

**NOTE:** Float Weight: 27 kg



### (3) Setting Footstep to Cab

1. Fully pull in latch shaft (1).
2. While lifting step (2), rotate the footstep outward.





## 5 ASSEMBLING/DISASSEMBLING

### (4) Jack Operation



#### WARNING

- Never enter under the superstructure while operating the jacks.
- Operate the jack cylinders so that the base machine is not inclined more than 1 degree. Failure to do so may result in damage to the jack cylinder and/or tipping over of the machine.



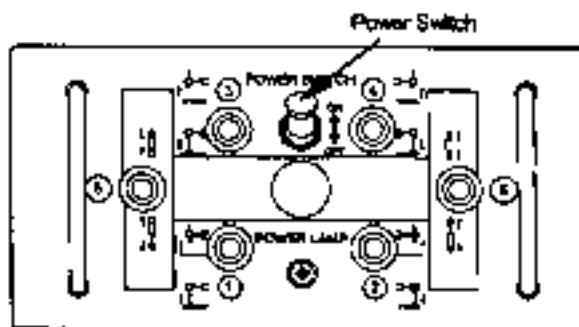
#### CAUTION

- When aligning the pin hole centers, keep your fingers well clear of the pin holes.
- The jack cylinder may receive a reaction force of up to 29 tons. Be sure to check the ground strength before using the jack cylinder. In case the ground strength is not strong enough, reinforce the ground by laying steel plates under the floats.
- Place the float on solid level ground. The float may be deformed if it is placed on a slope.
- Slewing the superstructure only after the jack cylinder rod comes in contact with the float, and the lower frame touches slightly to the wooden blocks on the trailer bed.

1. Connect the remote control box.

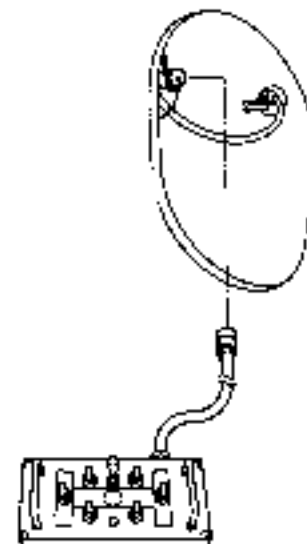
#### NOTE:

- The remote control box hose connectors are located at two locations in the front and rear of the lower frame. Depending on the job site circumstances, select either one which is in the easiest-to-see position to safely connect the hose.
- Check that the power switch on the remote control box is OFF. In case the power switch is in the ON position, tilt the knob to the OFF position.



Details of Remote Control Panel

- 1- Right front jack switch
- 2- Left front jack switch
- 3- Right rear jack switch
- 4- Left rear jack switch
- 5- Right crawler connecting cylinder switch
- 6- Left crawler connecting cylinder switch



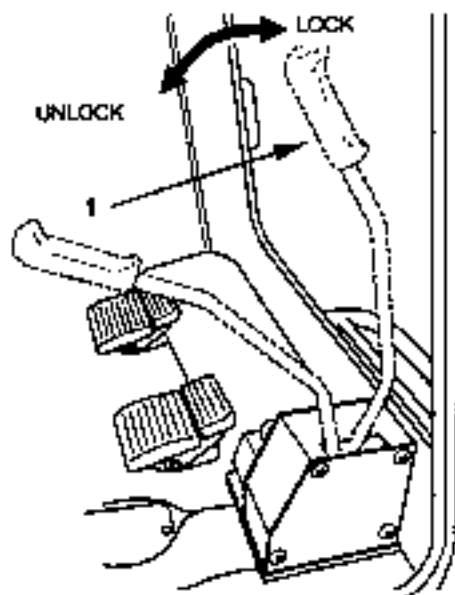
Remote Control Box

300-08-004  
300-09-005

## 5 ASSEMBLING/DISASSEMBLING

2. Move lock lever (1) to the LOCK position.

**NOTE:** If lock lever (1) is in the UNLOCK position, the jack cylinders and the retraction cylinders cannot be operated.



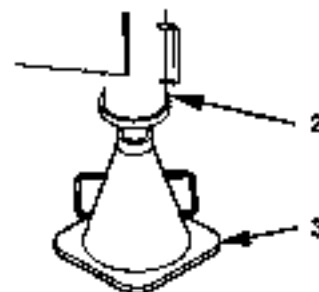
M3C5 09007

3. Start the engine.

**NOTE:** Increase the engine speed to approx. 1000min<sup>-1</sup> (rpm).

**IMPORTANT:** Operate the remote control box in a safe and easy-to-see place.

4. Turn the power switch on the remote control box ON. Extend jack cylinder (2) onto float (3) by operating the jack switch.



ZCD-05411

## 5 ASSEMBLING/DISASSEMBLING

### IMPORTANT:

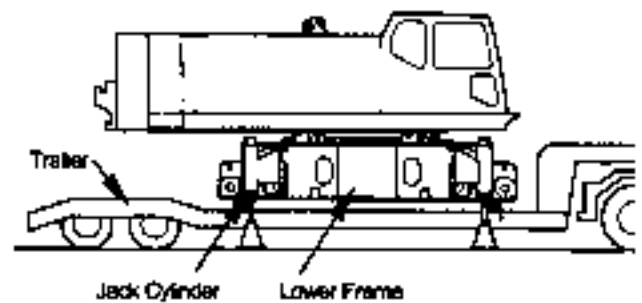
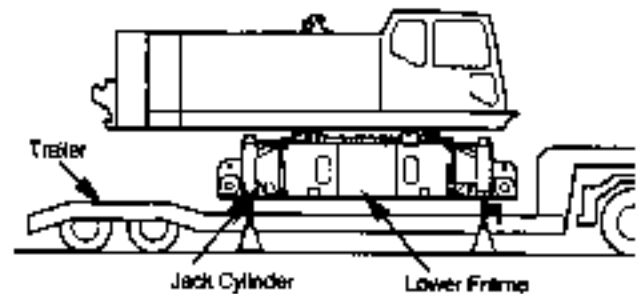
- Operate the remote control box in an easy-to-see place.
  - Do not raise the superstructure higher than necessary.
5. Operate the jack switch to raise the superstructure until the superstructure is slightly separated from the trailer deck.

**NOTE:** To prevent the superstructure from being inclined more than 1 degree, operate the switch to slightly raise the rear side of the superstructure first. Then, raise the front side of the superstructure so that the superstructure becomes level. Repeat this procedure in sequence. Check the ground strength under the floats under this circumstance.

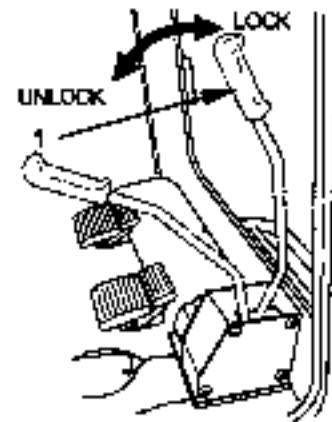
6. Operate the jack switch to retract the jacks so that the lower frame bottoms come in contact with the wooden blocks laid on the trailer deck.

### NOTE:

- Keep the jack cylinders in contact with the floats at this time.
  - To prevent the superstructure from being inclined more than 1 degree, operate the switch to slightly lower the front side of the upperstructure first. Then, lower the rear side of the upperstructure so that the superstructure becomes level. Repeat this procedure in sequence as necessary.
7. Move lock lever (1) to the UNLOCK position.
8. Step on slewing lock pedal (2) to release the swing lock.
9. Turn slewing brake switch (3) OFF.

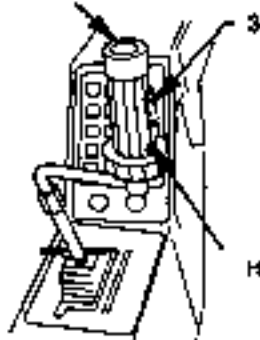


MOCE-85-02



MOCE-85-03

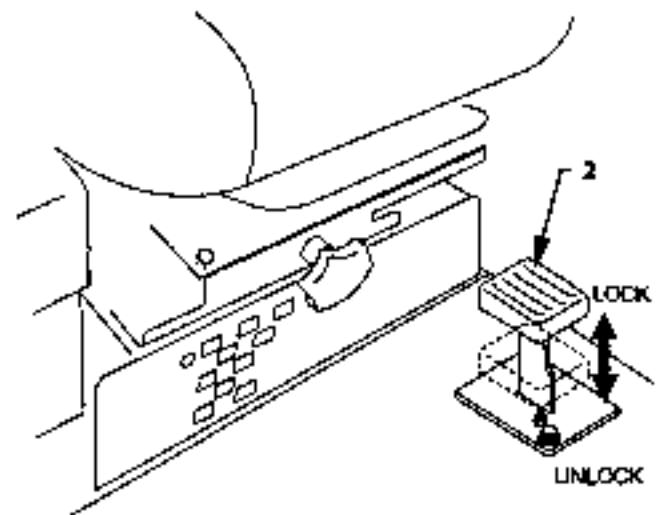
Accelerator Grip



Slewing Brake Switch  
ON :The Brake is applied

OFF: The Brake is released

MOZH-01-83h  
MOZH-01-83f

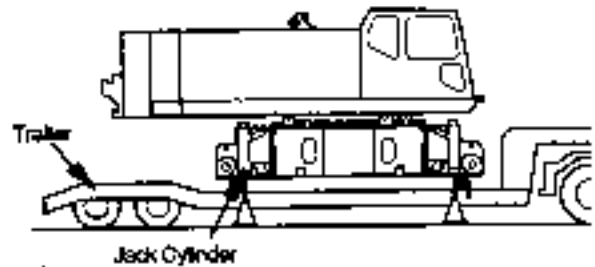


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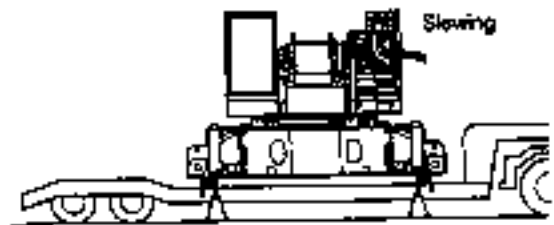
## 5 ASSEMBLING/DISASSEMBLING

### IMPORTANT:

- Slowly slewing the upperstructure so that impacts are not developed.
- Properly secure the front attachment electrical harnesses so that they are not suspended from the upperstructure.



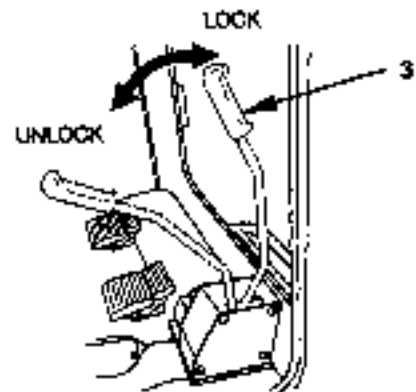
10. Slewing the upperstructure 90 degrees.



11. Move lock lever (3) to the LOCK position.

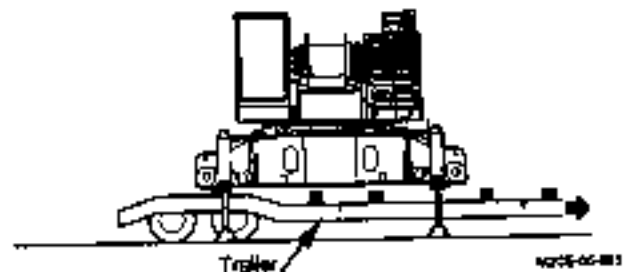
### IMPORTANT:

- Operate the remote control box in an easy-to-see place.
- Do not raise the superstructure higher than necessary.
- Hold the travel device hydraulic hoses on the lower frames to prevent the hoses from being damaged.
- Carefully move the trailer so that the trailer deck does not come in contact with the jack cylinders and/or the lower frames.



12. Raise the superstructure so that the superstructure level is kept maintained by operating the remote control box. Move the trailer.

**NOTE:** To prevent the superstructure from being inclined more than 1 degree, operate the remote control to slightly raise the rear side of the superstructure first. Then, raise the front side of the superstructure so that the superstructure becomes level. Repeat this procedure in sequence as necessary.



## 5 ASSEMBLING/DISASSEMBLING

### 1.3 Install Crawlers



#### WARNING

- Never enter under the superstructure while operating the Jacks.
- Operate the jack cylinders so that the base machine is not inclined more than 1 degree. Failure to do so may result in tipping over of the machine.
- Never slewing the superstructure when only one side crawler is installed. Tipping over of the machine may result.
- The space between the superstructure and the crawlers is a pinch point. Keep away from this space.
- While connecting or disconnecting the hydraulic hoses to the travel devices, never slewing the superstructure. A serious accident due to entanglement may result.



#### CAUTION

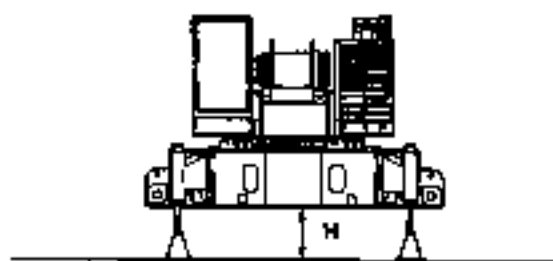
- Carefully install the crawlers following the signal person's directions.
- When aligning the pin hole centers, keep your fingers away from the pin holes.
- Use protective items such as heavy gloves when handling wire rope.

**IMPORTANT:** When required to leave the superstructure supported with the jack cylinders for a long time, retract all jack cylinders to the minimum.

1. Retract the jack cylinders to lower the superstructure so that the superstructure level is maintained by operating the control box switches.

#### NOTE:

- Retract the jack cylinders until the clearance between the lower frame bottom surface and the ground surface comes to approx. 550 mm.
- To prevent the superstructure from being inclined more than 1 degree, operate the remote control to slightly lower the front side of the superstructure first. Then, lower the rear side of the superstructure so that the superstructure becomes level. Repeat this procedure in sequence as necessary.



Ht. Approx. 550 mm

MACB-08-003

## 5 ASSEMBLING/DISASSEMBLING

2. Decide which side frame, right or left, is installed first.
3. Extend suspension link (1) out of the side frame.

**NOTE:** After removing lock pin (2) from suspension link (1), extend suspension link (1). Then, secure the suspension link in position with the removed lock pin.

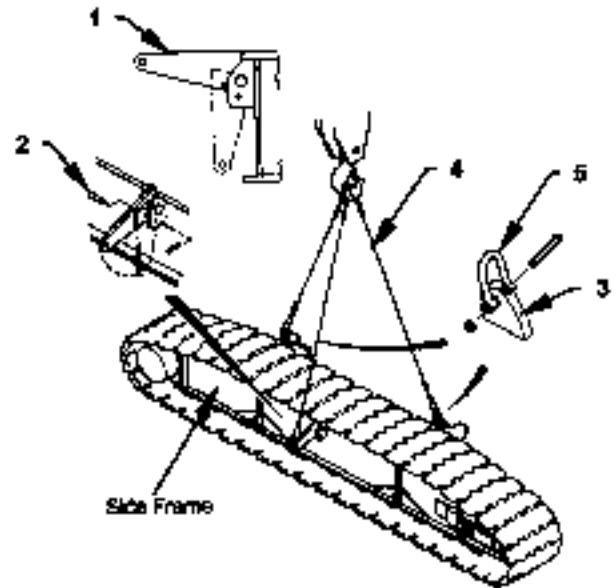
4. Attach sling wire ropes (4) to side frame suspension lugs (3) and suspension links (1).

**NOTE:** Wire ropes (4) and shackles (5) for slinging the side frame are arranged.

Wire Rope: Dia. 28 mm x 2.85 m - 3 pieces

Shackle: Light weight type shackle for 10 t x 3 pieces

Crawler Weight: 14400 kg



W02E-01-028

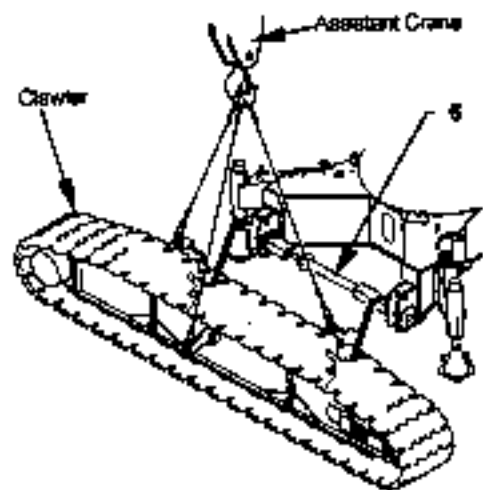
**IMPORTANT:** Lift the crawler so that the crawler is maintained in the horizontal position.

5. Lift the crawler using an assistant crane.

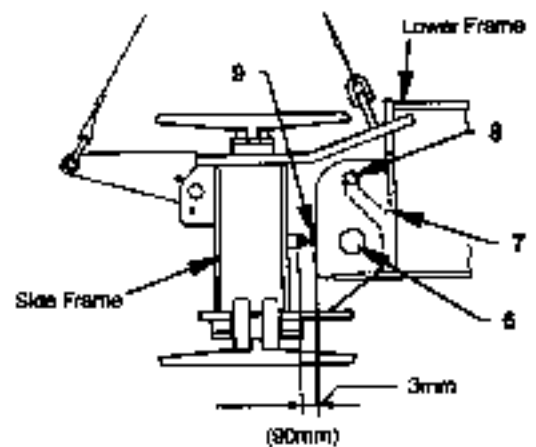
**NOTE:** Check that crawler connecting cylinder (6) pin is not projecting.

6. After hanging side frame hook (7) to lower frame pin (8), slowly lower the crawler.

**NOTE:** When side frame adjusting bolt (9) comes in contact with the lower frame, crawler connecting cylinder (6) pin center aligns with the crawler frame hole center.



W02E-01-027



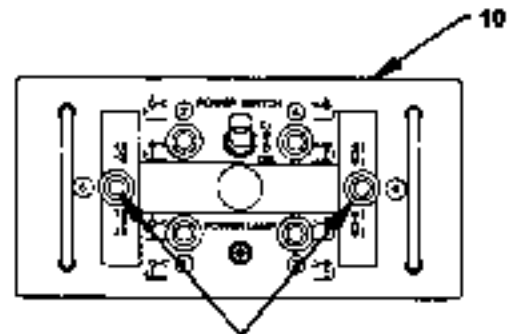
W02E-01-029

## 5 ASSEMBLING/DISASSEMBLING

7. Operate the crawler connecting cylinder switch on control box (10) toward "EXTEND" side to secure the crawler.

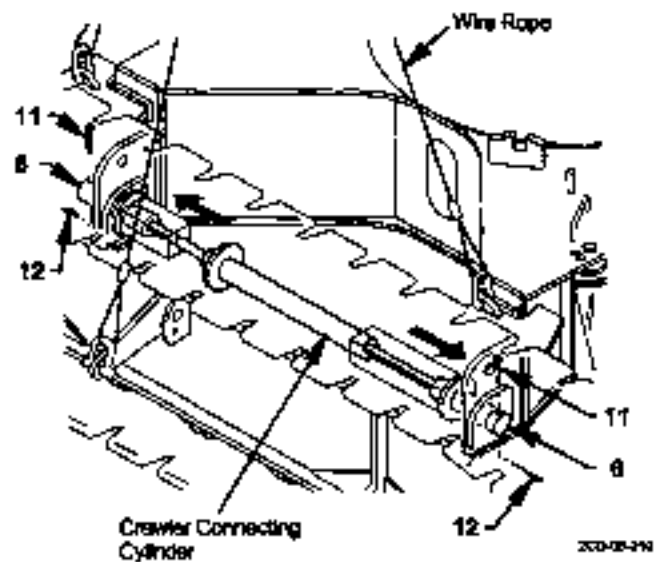
**NOTE:**

- Install headed pin (11) into crawler connecting cylinder (6) pin. Install lock pin (12) to prevent head pin (11) from coming off.
- Coat the crawler connecting cylinder pin sliding section with grease beforehand.



Crawler Connecting Cylinder Switch

200-06-204

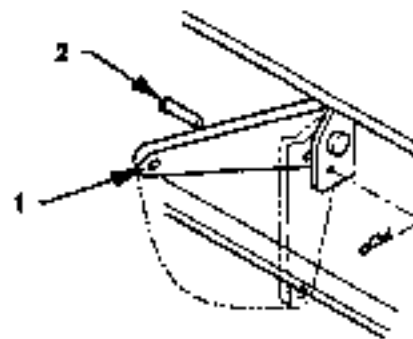


Crawler Connecting Cylinder

200-06-204

8. Pay out the assistant crane hoisting rope to detach the slinging wire ropes from the crawler.
9. Retract suspension link (1) of the side frame back to the storing position.

**NOTE:** Remove lock pin (2) from suspension link (1). After pushing suspension link (1) back to the storing position, secure suspension link (1) to the crawler frame with the removed lock pin (2).



10. Install the opposite side crawler.

**NOTE:** Follow the same procedures in step 2 to 9 described above.

200-06-204

## 5 ASSEMBLING/DISASSEMBLING

Operate the jack cylinder switches on control box (10) to retract jack cylinders (13) until the base machine is lowered on the ground while maintaining the base machine in the horizontal position.

**NOTE:** Two jack cylinders (each one on both right and left sides) are provided in the front and rear of the superstructure.

Alternately operate the switches for the front and rear jack cylinders so that both the right and left cylinders can be simultaneously retracted.

12. Fully retract jack cylinders (13).

13. Installing lower weight

### **WARNING**

Do not allow workers to enter the space between the lower frame and the lower weight.

### **CAUTION**

Before installing the lower weight, slide the mounting/dismounting step from the stored position upward and secure it in the temporary storing hole.

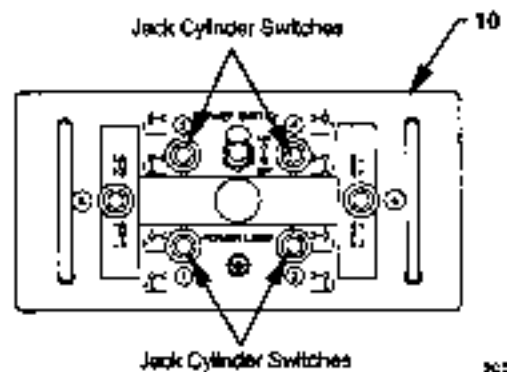
- 1) Slew the superstructure 90° so that the superstructure aligns with the side frames in parallel.
- 2) Apply the slew lock. Stop the engine.
- 3) Attach sling wire ropes to the lower weight. Using an assistant crane, lift the lower weight.
  - Weight of Lower Weight: 4750 kg/unit

**IMPORTANT:** Lift the lower weight with two pieces of sling wire ropes.

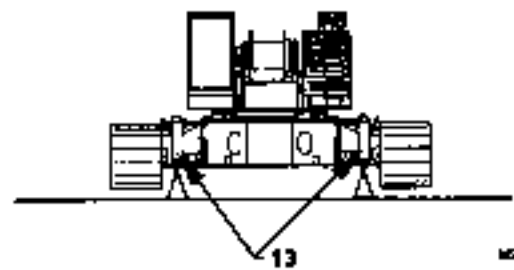
- 4) While aligning the lower weight pins with the hooks on the lower frame, install the lower weight onto the lower frame.

**IMPORTANT:** Take care not to allow the lower weight to hit the lower frame.

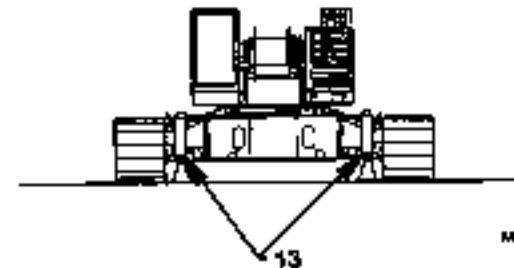
- 5) Install the opposite side lower weight by following the same procedures in steps 3) and 4).



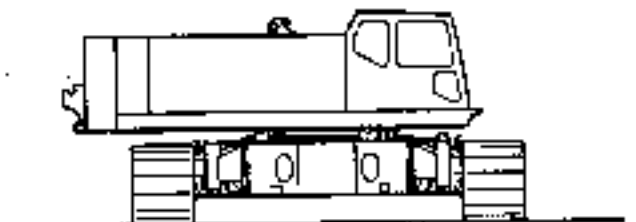
905-88-00a



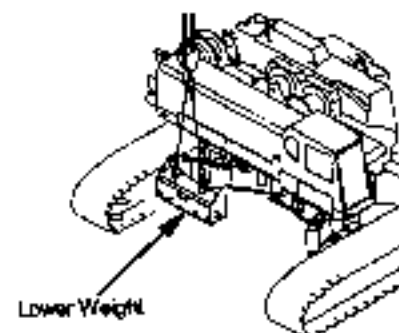
902E-88-030



902E-88-031



902E-88-032

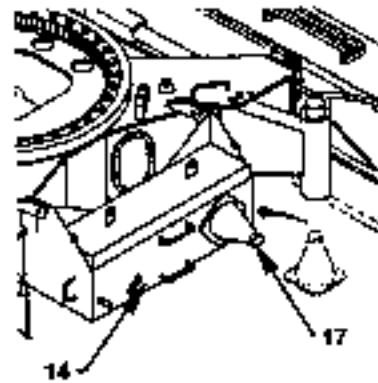


902E-88-034



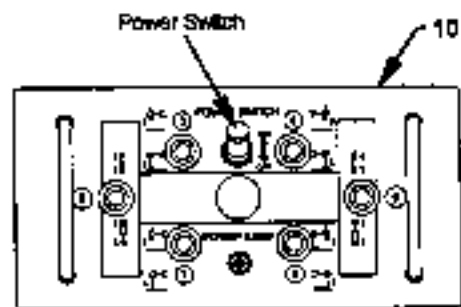
## 5 ASSEMBLING/DISASSEMBLING

14. Store float (17) on lower weights (14).  
Float Weight: 27 kg



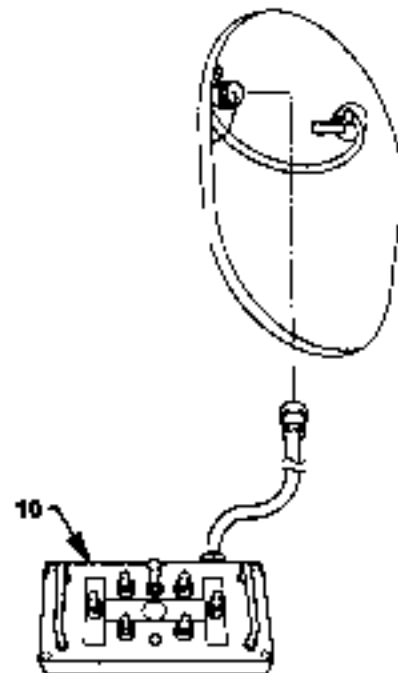
90CE-09489

15. Turn the power switch on the remote control box (10)  
OFF.  
16. Stop the engine.



90D-05-006

17. Disconnect the remote control box (10). Store it in the  
specified place.



90D-05-006

## 5 ASSEMBLING/DISASSEMBLING

### IMPORTANT:

- Disconnect/connect quick-couplers only after stopping the engine. Failure to do so may make the connection of the coupler difficult, or damage to the O-ring may result due to pressure in the hydraulic circuit.
- Wipe off dust or foreign matter from the couplers before connecting.
- Be careful not to let the quick couplers come in contact with other objects. Damage to the couplers may result.
- Securely connect the hydraulic hoses. Failure to do so may cause damage to the travel device.

18. Open travel motor cover (18).

19. Connect hydraulic hoses (20) (4 hoses on the one side) to the travel motor section.

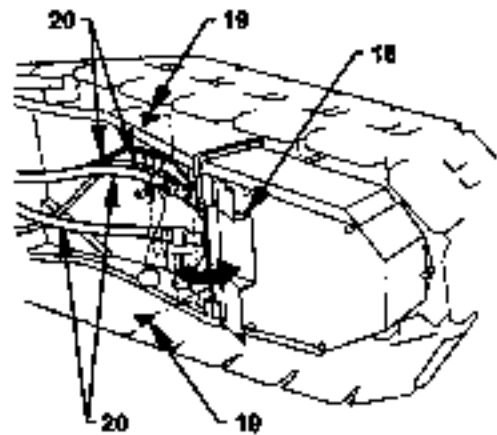
*NOTE:* Remove the cap and/or plug from each connection port.

20. Close travel motor cover (18).

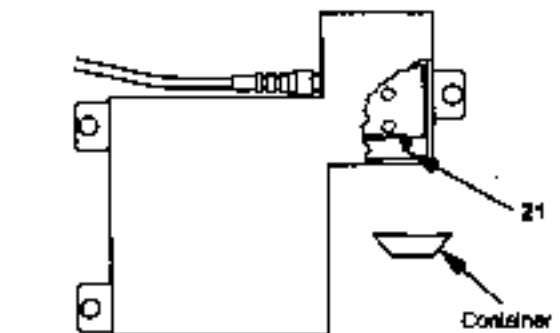
21. Connect the hydraulic hose to the take-up tumbler section.

### NOTE:

- When the standard jack/shim type crawler belt tension adjuster is equipped, this procedure is not required. When the optional hydraulic cylinder type adjuster is equipped, connect the hydraulic hose (one hose on each side).
- Remove a cap and/or a plug from each connection port.
- In case the hose is difficult to be connected due to residual oil pressure, bleed the pressure by loosening plug (21) by approximately 1/2 turn. Prepare a container to receive the drain oil at this time. After connecting the hydraulic hose, tighten oil drain plug (21).



122-05-003



Connection of Hydraulic Hose to Take-up Tumbler

V214-06-001

## 5 ASSEMBLING/DISASSEMBLING

### 1.4 Install Side walkway (Optional)

The side walkway is a footing used for when walking along the cab. Normally, it is hung horizontally and stored vertically as needed.

**IMPORTANT:** Do not use side walkway (1) as a rack.

#### 1.5.1 Installation

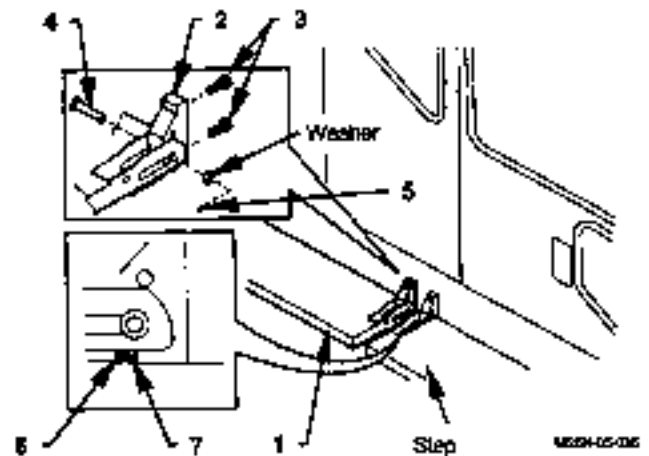
1. Install brackets (2) on the side of the right and left platforms with bolts (3).  
Wrench size: 19 mm
2. Install side walkway (1) onto brackets (2) with pins (4)

#### NOTE:

- Install pins (4) from the inside of side walkway (1) toward the outside.
- Lock the pins with lock pins (5).

3. Set side walkway (1) horizontally with adjustment bolt (6).

**NOTE:** After setting the side walkway, tighten lock nuts (7).  
Wrench size: 19 mm

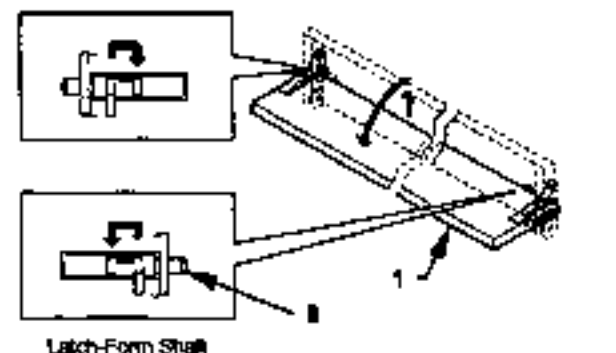
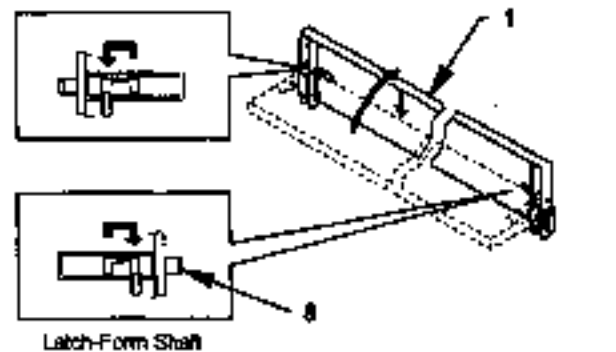


#### 1.5.2 Storing

1. When lifting the outside of side walkway (1) rotate the side walkway toward the cab side. Then slide the side walkway downward.
2. Install latch-form shafts (8).

#### 1.5.3 Overhang

1. Pull in latch-form shaft (8).
2. When lifting the outside of side walkway (1) rotate the side walkway outwardly from the cab side.



## 5 ASSEMBLING/DISASSEMBLING

### 1.5 Installing A-Frame

**WARNING:** Do not enter under and/or inside A-Frame.

**CAUTION**

- When aligning pin holes, never insert your finger into the hole.
- Take care not to fall on the machine.

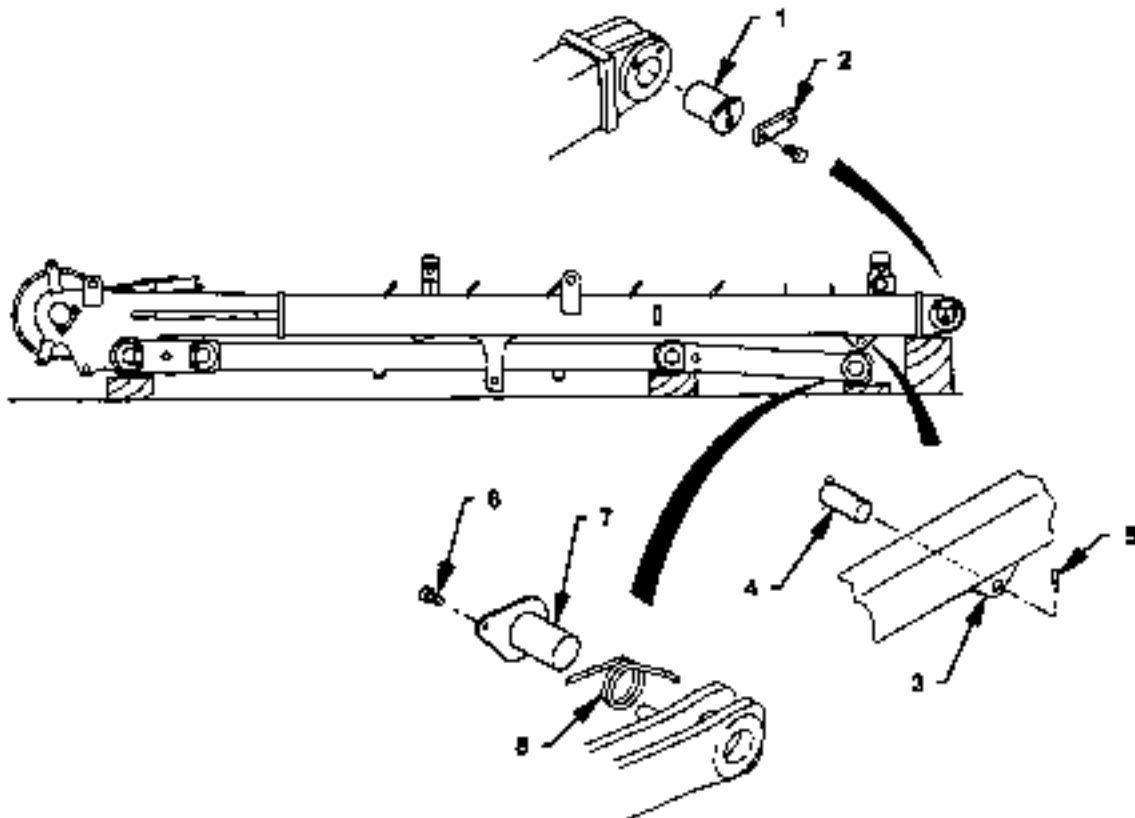
1. Remove pin (1) from the strut tip end.

*NOTE: Remove key plate (2) to remove pin (1).  
Wrench Size: 30 mm*

2. Remove pin (4) from lug (3) located on the strut bottom.

*NOTE: Remove cotter pin (5) to remove pin (4).*

3. Remove bolt (6) from the lower stay tip end. Remove pin (7) and spring (8).
- Wrench size: 19 mm*



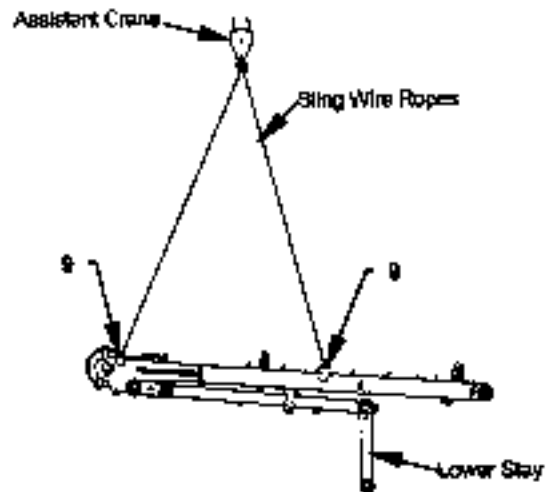
20p-08-082

## 5 ASSEMBLING/DISASSEMBLING

4. Attach sling wire ropes to A-Frame suspension lugs (9). Using an assistant crane, lift the A-Frame.

Wire Rope: Diameter, 28 mm x 6 m – 4 pieces  
Shackle: Light weight type shackle for 10 t x 4 pieces  
A-Frame Weight: 1900 kg

**IMPORTANT:** Take care not to drag the lower stay end edge on the ground when lifting the A-Frame off the ground.

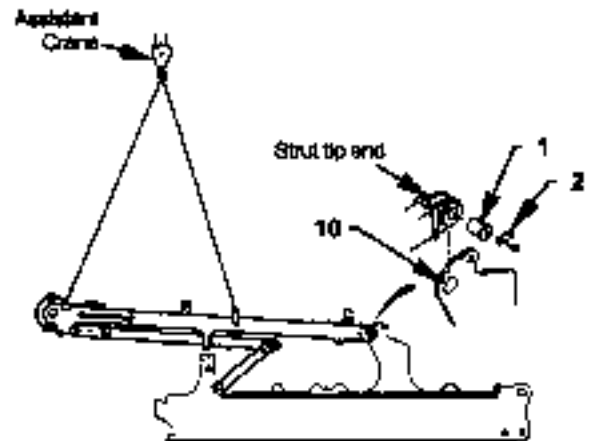


4000-06-050

5. Align the strut tip end hole with platform center lug hole (10). Install the A-Frame to the main frame with pin (1).

**NOTE:** Install key plate (2) to prevent pin (1) from coming off.

Wrench Size: 30 mm

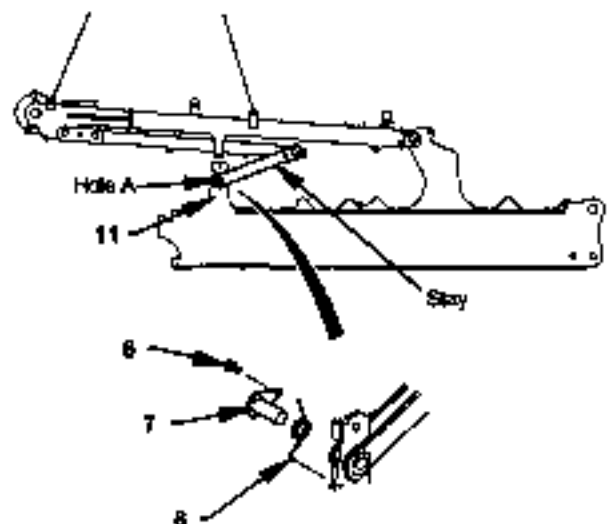


4000-06-054

6. Align the lower stay tip end hole with hole (A) on main frame rear lug (11). Install the lower stay to the platform with spring (8), and pin (7). Lock pin (7) with bolt (6).

Wrench Size: 19 mm

**IMPORTANT:** Do not allow the lower stay to come in contact with the cab or drums.

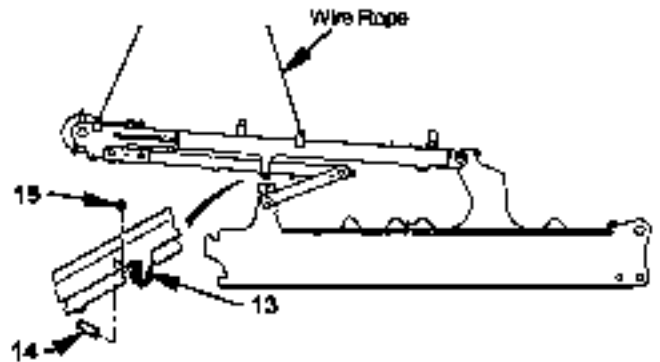


4000-06-056

## 5 ASSEMBLING/DISASSEMBLING

7. Remove pin (14) from lug (13) located at the center of the strut.

**NOTE:** Remove ring pin (15) to remove pin (14).

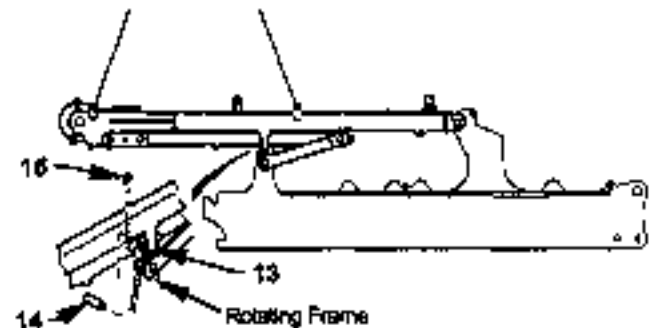


MOCE-05-136

8. While lowering the A-Frames, align strut center lug (13) with the rotating frame hole.

9. Install pin (14) into strut center lug (13).

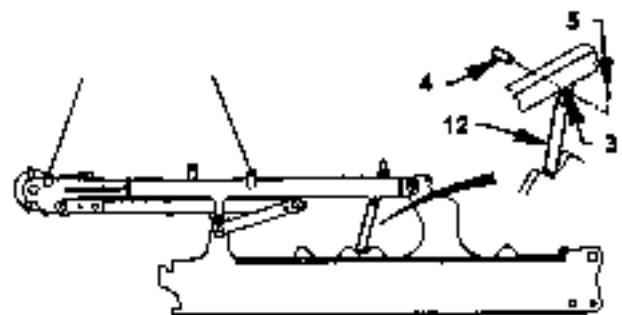
**NOTE:** Install ring pin (15) to prevent pin (14) from coming off.



MOCE-05-137

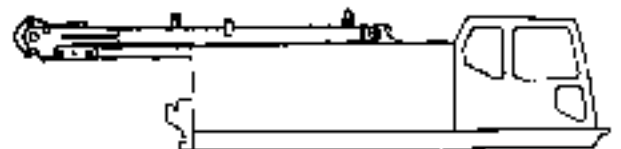
10. Align A-Frame control cylinder (12) with the hole on strut tip lower side lug (3). Joint A-Frame control cylinder (12) to the strut with pin (4).

**NOTE:** Install cotter pin (5) to prevent pin (4) from coming off.



MOCE-05-138

11. Detach the sling wire ropes.



MOCE-05-139

## 5 ASSEMBLING/DISASSEMBLING

### 1.6 Install Boom Base Section



#### WARNING

Never enter under the boom.



#### CAUTION

- Do not put your fingers into pin holes when aligning pin hole centers.
- When handling wire rope, be sure to use protective items such as heavy gloves.

1. Remove boom foot pin (2) from boom base section (1).

*NOTE: After removing the lock plate, remove boom foot pin (2).*

*Wrench size: 30 mm*

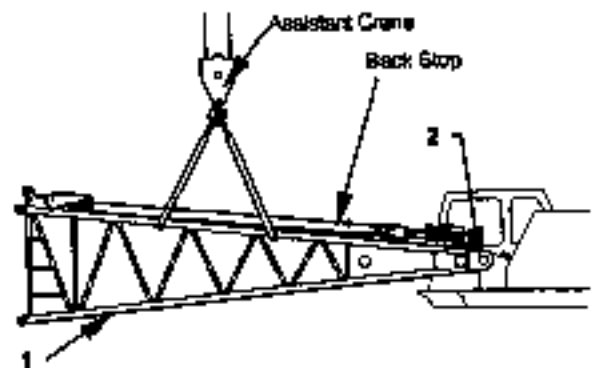
2. Clean boom foot pin (2) holes on boom base section (1). Coat the hole surfaces with grease.
3. Clean boom foot pin holes (2) on the the superstructure. Coat the hole surfaces with grease.

**IMPORTANT:** Lift boom base section (1) horizontally.

4. Attach sling wire ropes to boom base section (1). Lift boom base section (1) with an assistant crane.

**IMPORTANT:** Be careful not allow the boom base section to come in contact with the cab.

5. Align the superstructure boom foot pin holes (2) with the pin holes on boom base section (1).



When installing the crane exclusive boom:

200-88-096

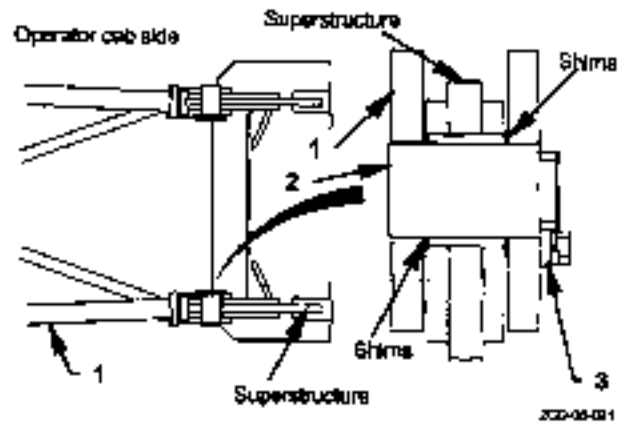
## 5 ASSEMBLING/DISASSEMBLING

**IMPORTANT:** Use only genuine Hitachi Sumitomo shims. Adjust the thickness of shims so that the clearance  $A + B$  becomes to less than 3 mm.

6. Install boom foot pins (2)

**NOTE:**

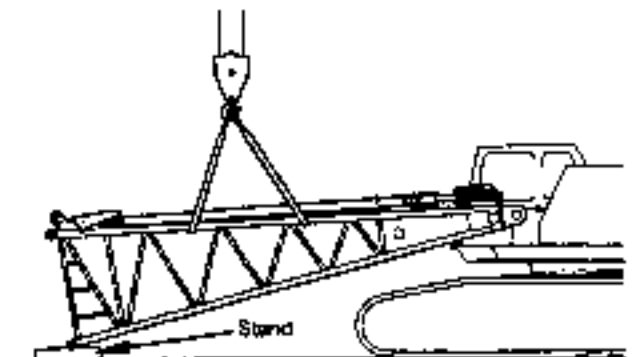
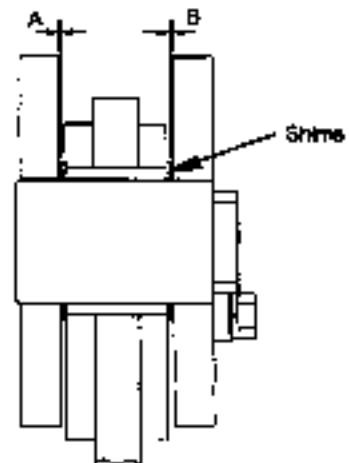
- Coat boom foot pin (2) with
- Install the pin located on the cab side first.
- Install lock plate (3) to lock boom foot pin (2).  
Wrench size: 30 mm



7. While lowering the assistant crane hook, lower the boom base section tip onto the ground.

**NOTE:** Support the boom tip with a stand.

8. Detach the sling wire ropes from the boom base section.



When installing the crane exclusive boom:



## 5 ASSEMBLING/DISASSEMBLING

### 1.7 Install Back Stop



#### CAUTION:

- Do not put your fingers into pin holes when aligning pin hole centers.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- Be careful not to fall off the base machine or the boom.

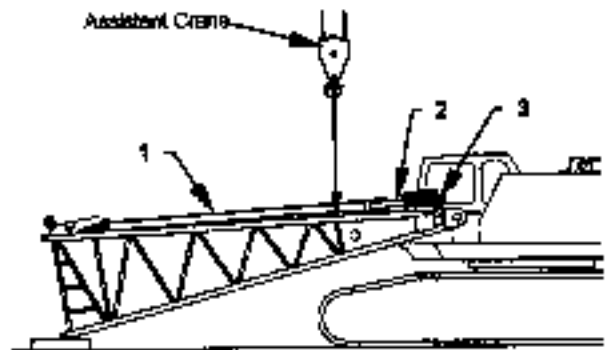
1. Attach sling wire ropes to outer member (1) of the left side back stop. Hold it with the assistant crane.
2. Remove holding pin (3) on the boom foot side.

NOTE: Remove a cotter pin.

3. While lifting the back stop, extend inner member (2).
4. Align the inner member end pin hole with strut (A-Frame) foot front lug hole. Then, install holding pin (3) to secure the inner member to the strut.

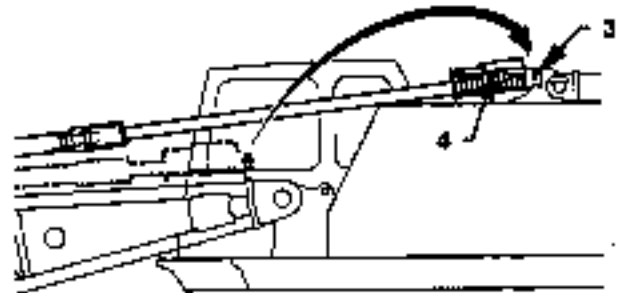
#### NOTE:

- Install limit switch (4) so that it is positioned on the topside.
- Install holding pin (3) from the inside of the machine.
- Lock pin (3) with the cotter pin.
- Open the cotter pin ends 30 to 90°.

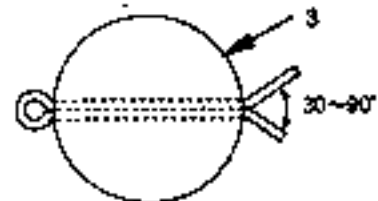


When the crane exclusive

KCP-08-004



KCP-08-005



KCP-08-006

## 5 ASSEMBLING/DISASSEMBLING

5. Remove the sling wire ropes from the back stop.

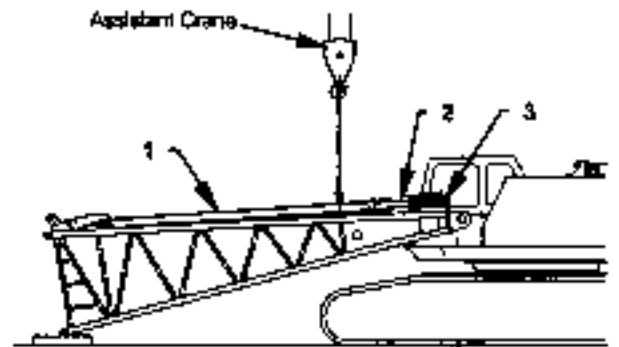
**IMPORTANT:** Be careful not to allow the back stop to come in contact with the cab.

6. Install the right side back stop.

**NOTE:** Attach sling wire ropes to outer member (1). While holding the back stop with the assistant crane, install the right side back stop in the same procedures as described in steps 2 to 5. No limit switch is provided on the right side back stop.

**IMPORTANT:** Securely connect the electrical harness connectors so that rain does not permeate into the connectors.

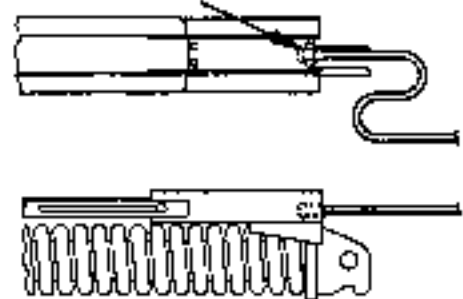
7. Connect the secondary boom overhaul prevention device cable.
8. Coat a thin film of grease to the exposed sections on right and left back stop inner members (2).



When the crane exclusive

21-0-05-004

Secondary boom hoist prevention device electrical cable.



M254-06-011

## 5 ASSEMBLING/DISASSEMBLING

### 1.8 Wind Boom Derricking Drum Wire Rope



#### DANGER

- When lifting the bridle and pendant rope with the assistant crane, always lift the bridle as illustrated below.



#### WARNING

- Winding wire rope around the boom derricking drum, or threading wire rope through the hanger/bridle may cause the personnel to become entangled into the drum or sheaves. Be sure to keep your body away from any rotating machine parts.
- Do not make an incorrect combination of a rope socket and wedge. Incorrect combination of a rope socket and wedge in size and/or taper angle may cause the wire rope to come off, possibly resulting in falling of the boom. Be sure to check the imprinted wedge size.
- If the rope end is not securely clipped, the wire rope may come off, possibly resulting in falling of the boom. Be sure to securely clip the rope end.
- Be sure that at least 3 turns of the rope remains around the drum even if the wire rope is fully paid out. Failure to do so may result in falling of the boom.

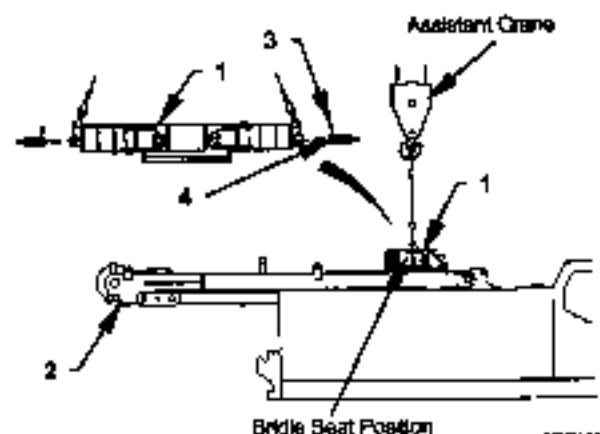


#### CAUTION

- Be cautious not to fall off the base machine or the boom.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- Wire rope end may come off an installation hole and bounce up. Be careful not to let the rope end be beaten.
- When driving in a part with a hammer, pieces of metal may fly off, possibly causing serious injury. Use protective items such as safety glasses and a hard hat.

1. Attach sling wire ropes to bridle (1). Lift the bridle with an assistant crane and lower the bridle to the bridle seat position in front of A-Frame (2).

**NOTE:** Remove lock pin (3) from bridle (1). Then, remove bridle holding pin (4).



5024-05-040

## 5 ASSEMBLING/DISASSEMBLING

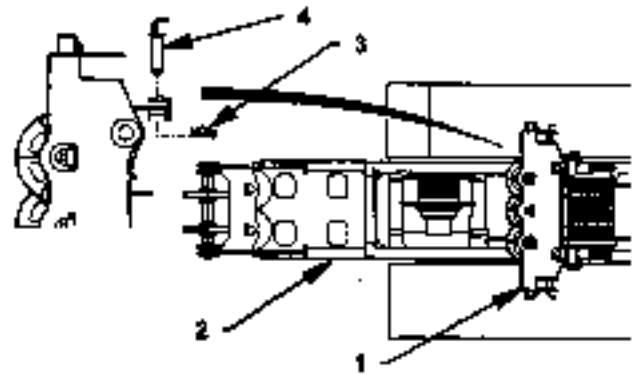
2. Install bridle (1) to A-Frame (2) with bridle holding pins (4).

*NOTE: Lock bridle holding pin (4) with lock pin (3).*

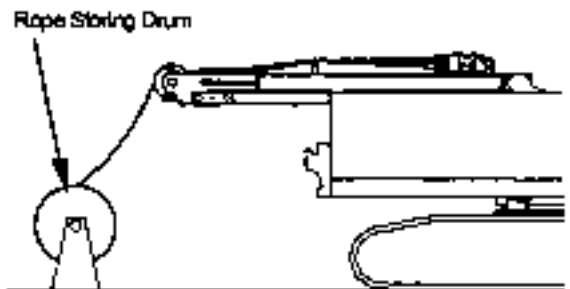
3. Remove the sling ropes bridle (1).
4. Lift the rope storing drum with the assistant crane. Place the drum behind the base machine.

**IMPORTANT:**

- Be careful not to twist the boom derricking drum wire rope.
  - Pay attention not to mistake the upper and lower positions of the boom derricking drum wire rope at its intersections.
5. Pay out the wire rope from the rope storing drum. Thread the wire rope through the sheaves on the A-Frame, bridle, and hanger.

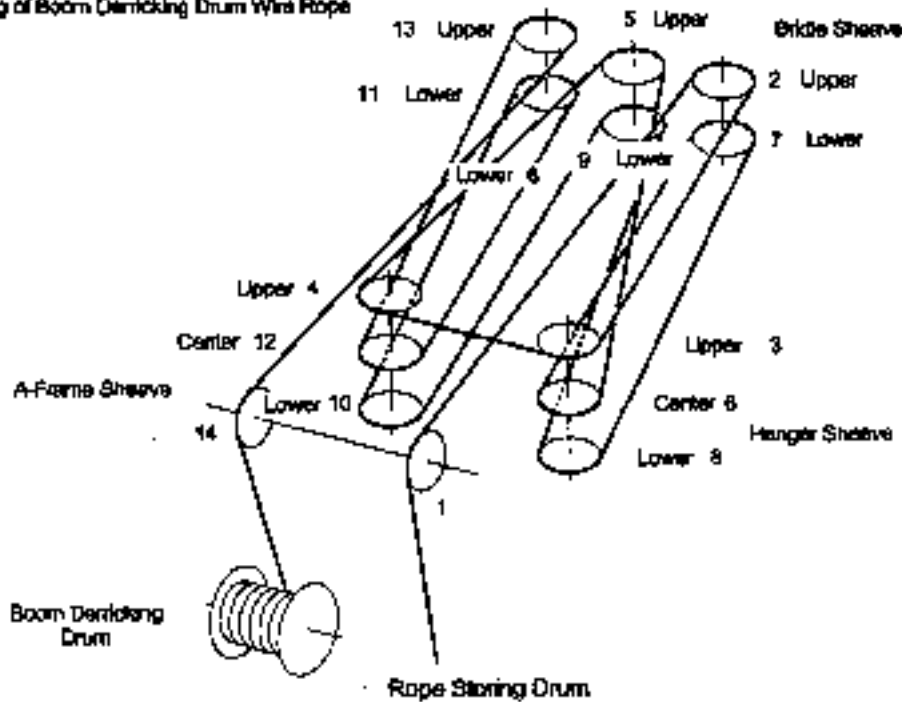


200-05-285



1000-05-041

Threading of Boom Derricking Drum Wire Rope



1000-05-056

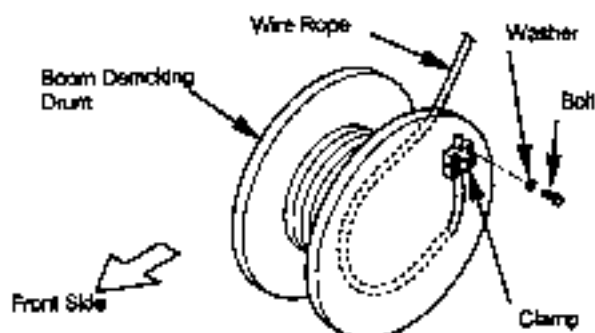
## 5 ASSEMBLING/DISASSEMBLING

6. Route the wire rope tip end around the boom derricking drum from the top to the bottom via the drum front side. Then, thread the rope tip end through the hole on the left flange from the inside to the outside.

7. Secure the wire rope tip end to the boom derricking drum with a clamp.

**NOTE:** Secure the wire rope so that the tip end is extended from the clamp by 10 to 20 mm.

Wrench size: 24 mm



U284-08-004

### IMPORTANT:

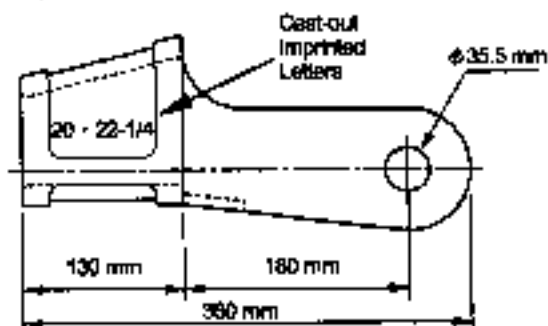
- Be careful not to twist the boom derricking drum wire rope.
- Carefully handle wire rope so that irregular rope winding does not occur.

8. Start the engine. Move the lock lever to the UNLOCK position.

9. Move the boom derricking drum lever to the winding side to wind the wire rope around the boom derricking drum.

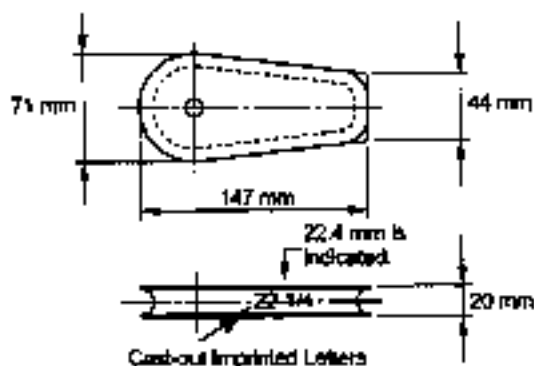
**NOTE:** Wind the wire rope around the boom derricking drum until the overall wire rope is paid out the rope storing drum.

Rope Socket Size for  
Boom Derricking Drum  
Wire Rope 22.4 mm



U284-08-004

Wedge Size for  
Boom Derricking Drum  
Wire Rope 22.4 mm



U284-08-004

## 5 ASSEMBLING/DISASSEMBLING

10. Connect wedge (7) and rope socket (6) to the wire rope end.  
 Rope Socket (6) with cast-out imprinted letters of 20-22.4-1/4  
 Wedge (7) with cast-out imprinted letters of 22.4-1/4

**IMPORTANT:** Be aware of the installation position of a wire clip. If the wire rope end is incorrectly installed, wire rope may come off, possibly introducing an unexpected accident.

11. Install wire clip (6).

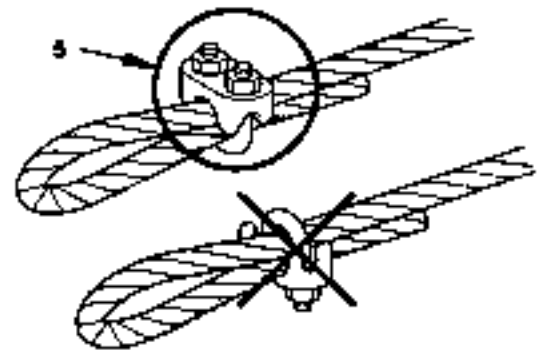
Wrench size: 27 mm

**IMPORTANT:** Connect rope socket (6) in the direction as illustrated. While taking care not to twist the boom derricking drum wire rope, connect the rope socket to rope tension sensor (9).

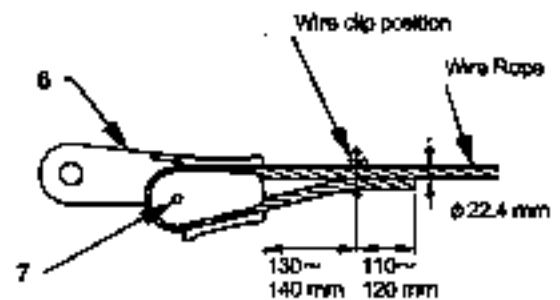
12. Connect rope socket (6) to rope tension sensor (9) located on the bottom side of strut (8).

**NOTE:**

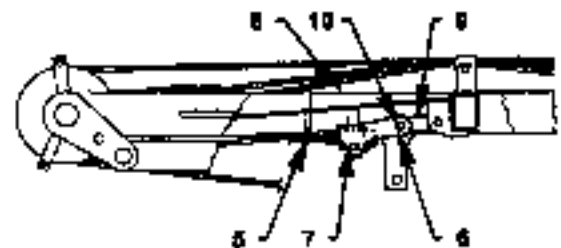
- Coat pin (10) with grease.
- Secure pin (10) with cotter pin (11).
- Open the cotter pin ends 30 to 90°.



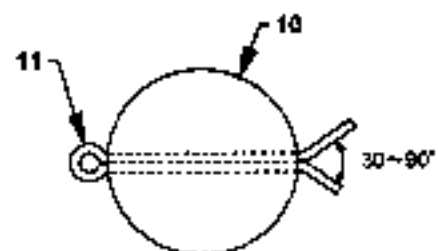
W02H-05-007



W02H-05-008



W02H-05-009



W02H-05-010

## 5 ASSEMBLING/DISASSEMBLING

### 1.9 Install Bridle to Boom Base Section



#### DANGER

- When lifting the bridle and pendant rope with the assistant crane, always lift the bridle as illustrated below.
- The suspension lugs (steel) provided on bridle are to be used when only the bridle is lifted. If the bridle with the boom dericking wire rope connected is lifted using the suspension lugs (steel) provided on the bridle, the suspension lugs will be broken, causing bridle (6) to fall, possibly resulting in a serious accident.

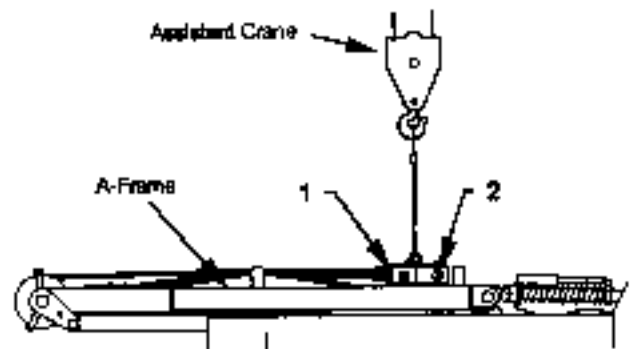


#### CAUTION

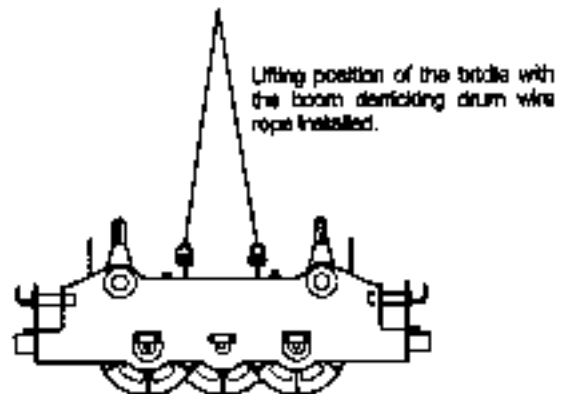
- Do not put your fingers into pin holes when aligning pin hole centers.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- Be careful not to fall off the base machine or the boom.

1. Attach sling wire ropes to bridle (1). Hold bridle (1) with an assistant crane.
2. Pay out the boom dericking drum wire rope to the extent so that bridle holding pin (2) can be removed.
3. Remove bridle holding pin (2).

*NOTE: Remove the lock pin.*



16294-02-000



16294-06-100

## 5 ASSEMBLING/DISASSEMBLING

### IMPORTANT:

- Check that the bridle guide is in the stored position. If the bridle guide is not in the stored position, damage to the bridle and the bridle guide may result.
- Carefully pay out the boom derricking drum wire rope so that the wire rope is not wound irregularly on the boom derricking drum.

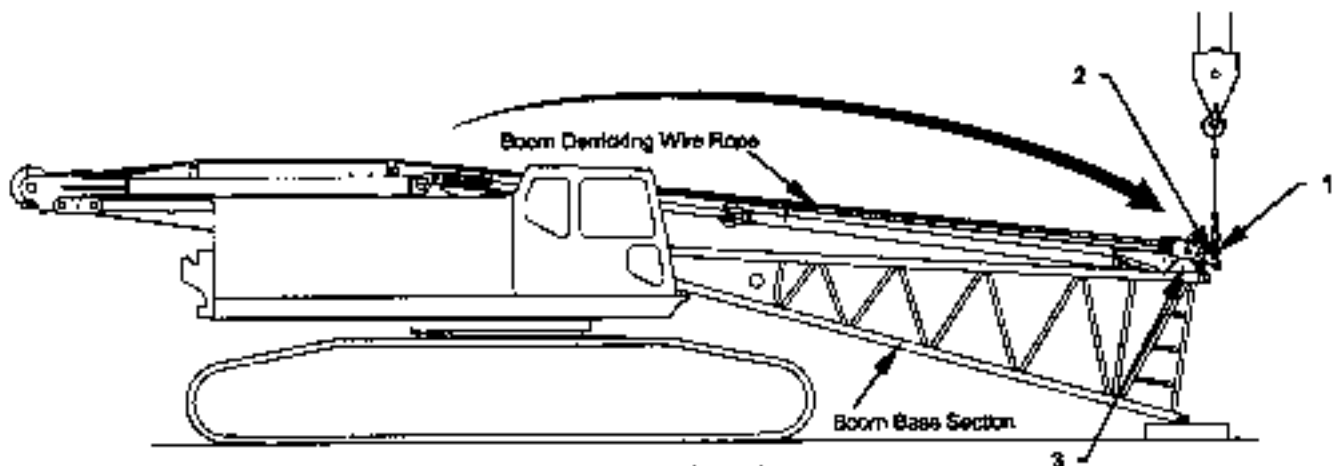
4. Lift bridle (1) with an assistant crane. While paying out the boom derricking drum wire rope, align bridle (1) with bridle holding lug (3) hole on the lower boom tip end.

*NOTE: Adjust the wire rope paying out amount and speed from the boom derricking drum in accordance with the movement of bridle (1).*

5. Install bridle (1) to bridle holding lug (3) with holding pin (2).

*NOTE: Install bridle holding pin (2) from the outside of the base machine toward the inside. Secure it with the lock pin.*

6. Remove the sling wire ropes from the bridle.



W02E-05-04C



## 5 ASSEMBLING/DISASSEMBLING

### 1.10 Extend A-Frame



#### WARNING

- Never enter the space under the A-Frame or the boom.
- Keep your hands away from the sheaves and/or wire rope during winding the boom derricking drum wire rope around the drum.



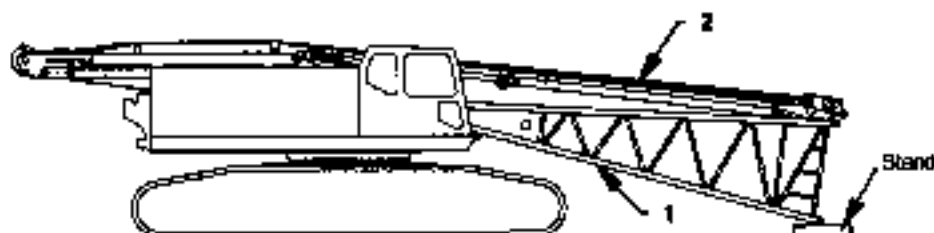
#### CAUTION

- Do not lift the boom base section off the ground with the A-Frame retracted. Failure to do so may cause the damage to the boom derricking drum wire rope.
- Do not touch the stay while raising the A-Frame.
- After extending the A-Frame, keep the A-Frame extend/retract switch in the RAISE position until the intermediate stay holding pin is installed.
- When winding the boom derricking drum wire rope around the drum while raising the A-Frame, never allow the boom base section tip end to be lifted off the ground.
- Do not put your fingers into pin holes when aligning pin hole centers.
- Be careful not to fall off the base machine or the boom.

1. Check that the tip end of boom base section (1) stays on a stand.
2. Check that the engine speed is approx.  $1000 \text{ min}^{-1}$  (rpm).

#### IMPORTANT:

- Avoid tangling wire rope in boom base section (1).
  - Wind wire rope so that wire rope is not wound irregularly.
3. Wind the boom derricking drum wire rope (2) up to the point just before the boom base section is lifted off the ground.



When installing the crane exclusive:

LC65-05-015

## 5 ASSEMBLING/DISASSEMBLING

- Remove holding pin (3) from its stored position.

**NOTE:**

- Remove ring pin (4.)
- When holding pin (3) is difficult to remove, slightly operate A-Frame extend/retract switch (5).

**IMPORTANT:** If the A-Frame is raised too quickly when operating switch (5), the wire rope will not be wound tightly, possibly causing irregular winding of wire rope during operation.

- Tilt A-Frame extend/retract switch (5) in the cabin toward the RAISE position. While raising the A-Frame, wind the boom derricking wire rope.

- When the A-Frame is fully raised, stop winding the boom derricking wire rope.

- Install holding pins (3) into intermediate stay (6).

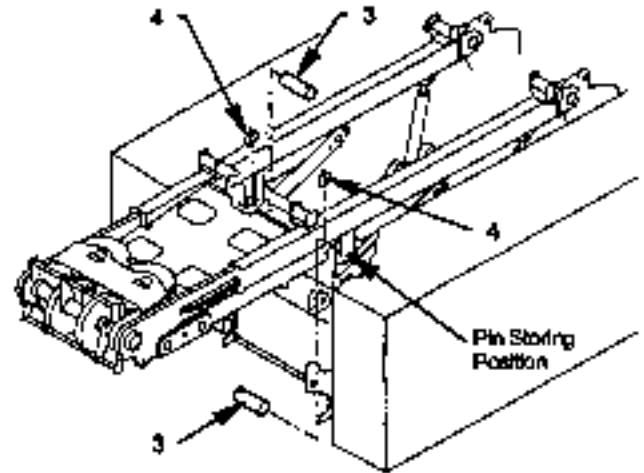
**NOTE:** Install holding pins (3) into intermediate stay (6) from the center side of the base machine toward the outer side. Lock holding pins (3) with ring pins (4).

- Return A-Frame extend/retract switch (5) to neutral.

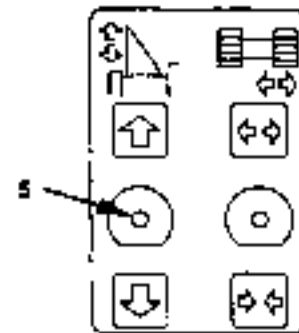
**NOTE:** Switch (5) is released, it will automatically return to neutral.

- Move the lock lever to the LOCK position.

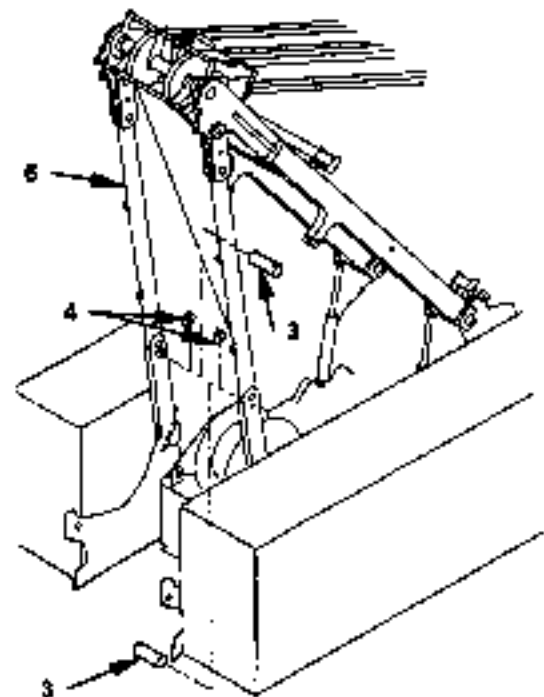
- Stop the engine.



M202-08-044



M202-08-100



M202-08-043

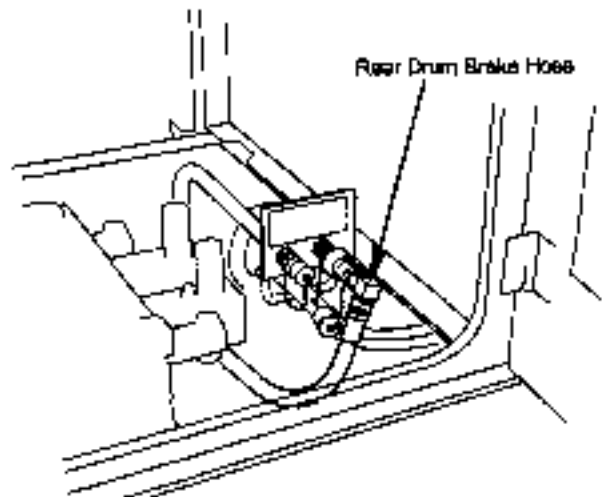
## 5 ASSEMBLING/DISASSEMBLING

### 1.11 Change Rear Drum Brake Hose Connection

In case the machine is exclusively arranged for crane operations, the procedures described below will not be required. Move to the step for 1.12 Install Counterweights

In case the machine is arranged for a crane and tower common use, depending on whether the crane or tower attachment is installed, the rear drum brake hose connection position must be changed.

**NOTE:** The quick couplers to change the connection of the rear drum brake hose are provided in the lower section behind the cab.



When the machine is used as a crane:

1220-04-10

## 5 ASSEMBLING/DISASSEMBLING

### 1.12 Install Counterweights



#### WARNING

- Never allow the workers enter the space under the superstructure and the counterweights.
- Hold the counterweight with an assistant crane until the counterweight is completely secured.
- If the superstructure with the counterweights is rotated without extending the width of the crawlers, the machine will turn over. Refer to 2.2 Operational Conditions on Partially Disassembled Machines in Section 6 for the information regarding slewing operation of the machine with the counterweights.



#### CAUTION

- Do not lift counterweights A, B, and C as a unit. The sling lugs may be broken, possibly resulting in falling of the counterweights.
- Be careful not to allow the sling wire ropes to come in contact with the hanger rope guide bar.

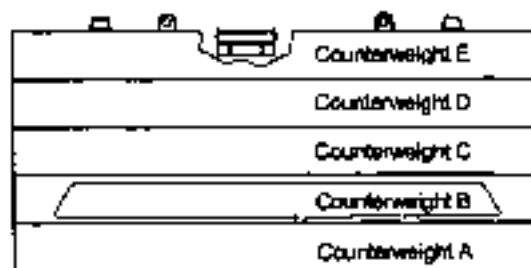
The counterweight sling wire ropes and shackles are provided as follows (Optional):

Wire ropes:  $\phi$  28 mm  $\times$  6 m – 2 ropes

Shackle: Lightweight shackle (10t) – 2 pieces

1. Check that the width of the crawlers is fully extended.
2. Check that the A-Frame is extended.
3. Check that the boom base section tip and sits on a stand.

Counterweight	Weight (t)
Counterweight A	10.4 t
Counterweight B	8.9 t
Counterweight C	8.9 t
Counterweight D	8.9 t
Counterweight E	8.9 t
Total	46 t



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## 5 ASSEMBLING/DISASSEMBLING

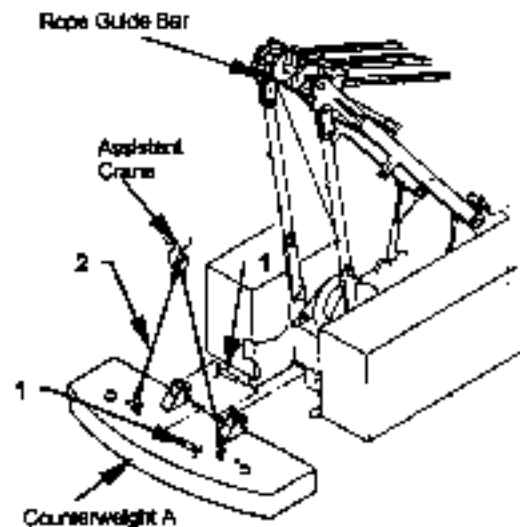
4. Attach sling wire ropes to counterweight A. Lift counterweight A with an assistant crane.
5. Install counterweight A on the superstructure so that the pin holes on counterweight A aligns with the hooks on the superstructure.
6. Secure counterweight A to the superstructure with holding pins (1). Turn the knob of holding pin (1) downward to prevent the pin from coming off.

**NOTE:** Install holding pin (1) from the center side of the machine.

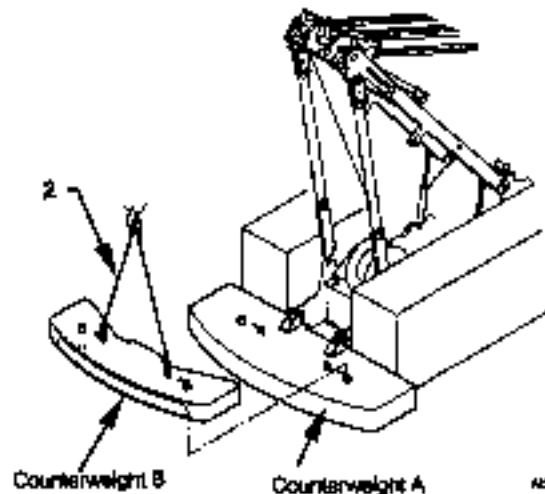
7. Detach the sling wire ropes (2) from the counterweight.
8. Attach sling wire ropes to counterweight B. Lift counterweight B with the assistant crane.
9. Mount counterweight B on counterweight A so that the concave section on counterweight B aligns with convex section on counterweight A.

**NOTE:** Check that mounting bolt (3) holes are aligned with each other.

10. Detach the sling wire ropes (2) from the counterweight.
11. Mount counterweights C and D in the same procedures shown in step 8, 9 and 10.



4022-05-048



4022-05-047

## 5 ASSEMBLING/DISASSEMBLING

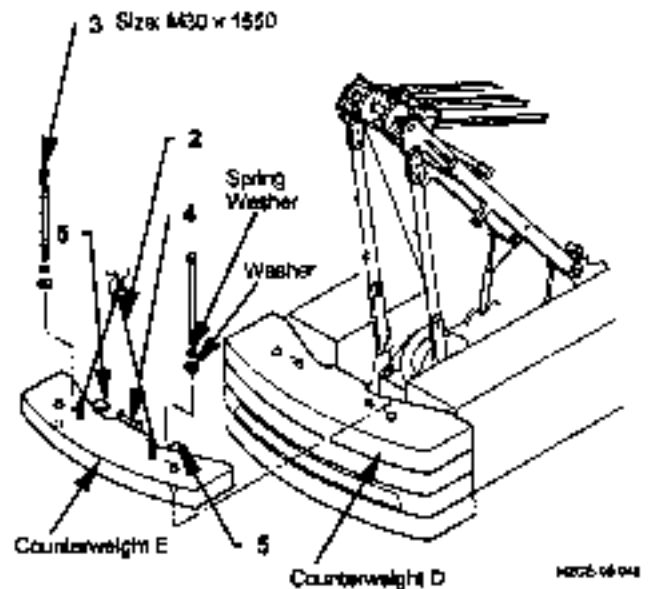
12. Attach sling wire ropes to counterweight E. Lift counterweight E with the assistant crane.

**IMPORTANT:** Be careful not to allow rope guide (4) and step (5) on counterweight E to come in contact with the A-Frame.

13. Mount counterweight E on counterweight D so that the concave section on counterweight E aligns with convex section on counterweight D.
14. Install two bolts (3) from the top of counterweight E. Tighten bolts (3).

Wrench size: 48 mm

15. Detach the sling wire ropes (2) from the counterweight.

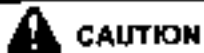


## 5 ASSEMBLING/DISASSEMBLING

### 1.13 Configurations of Boom/Jib and Pendant Rope

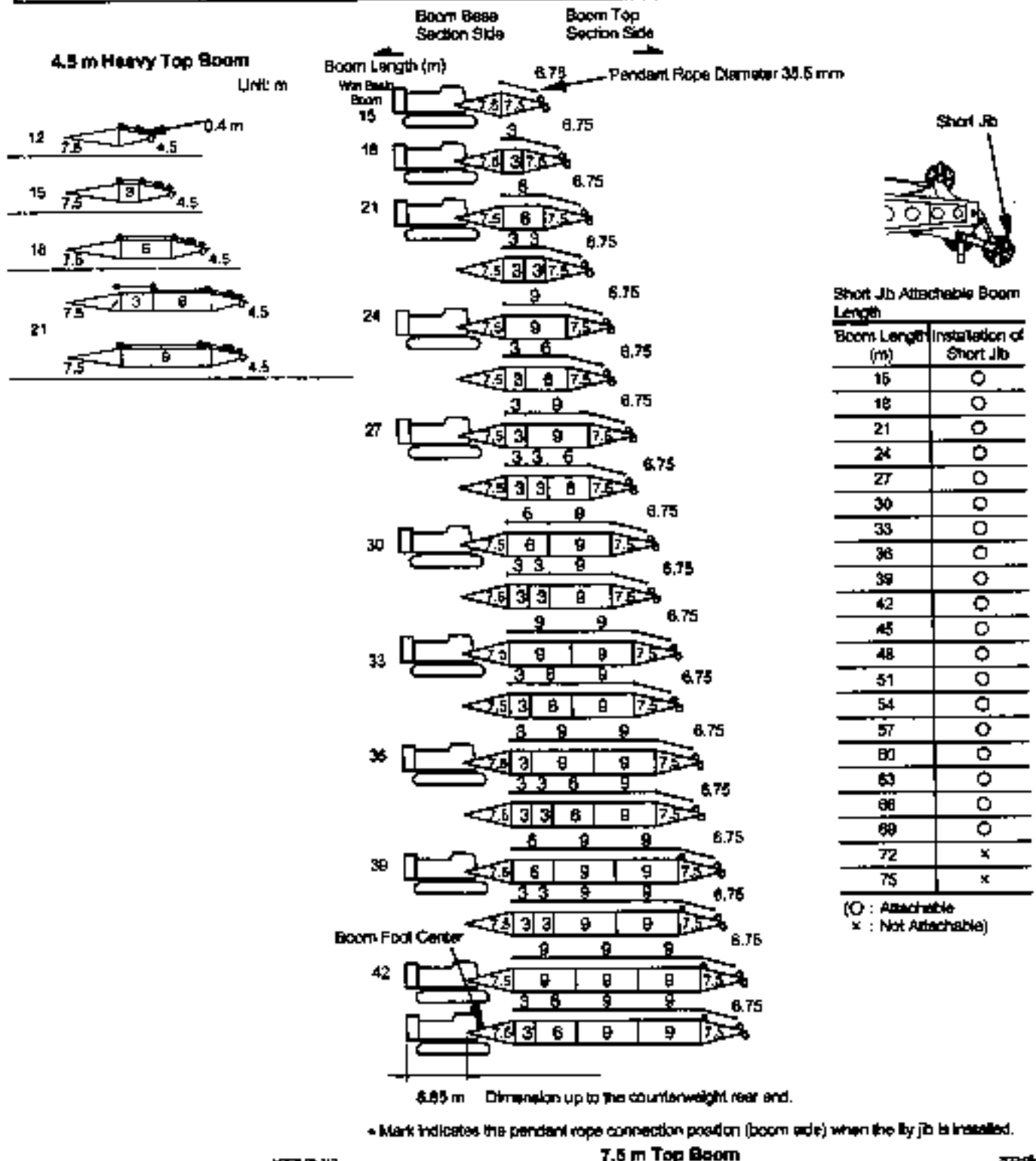
#### 1.13.1 When crane exclusive boom is used:

##### (1) Boom

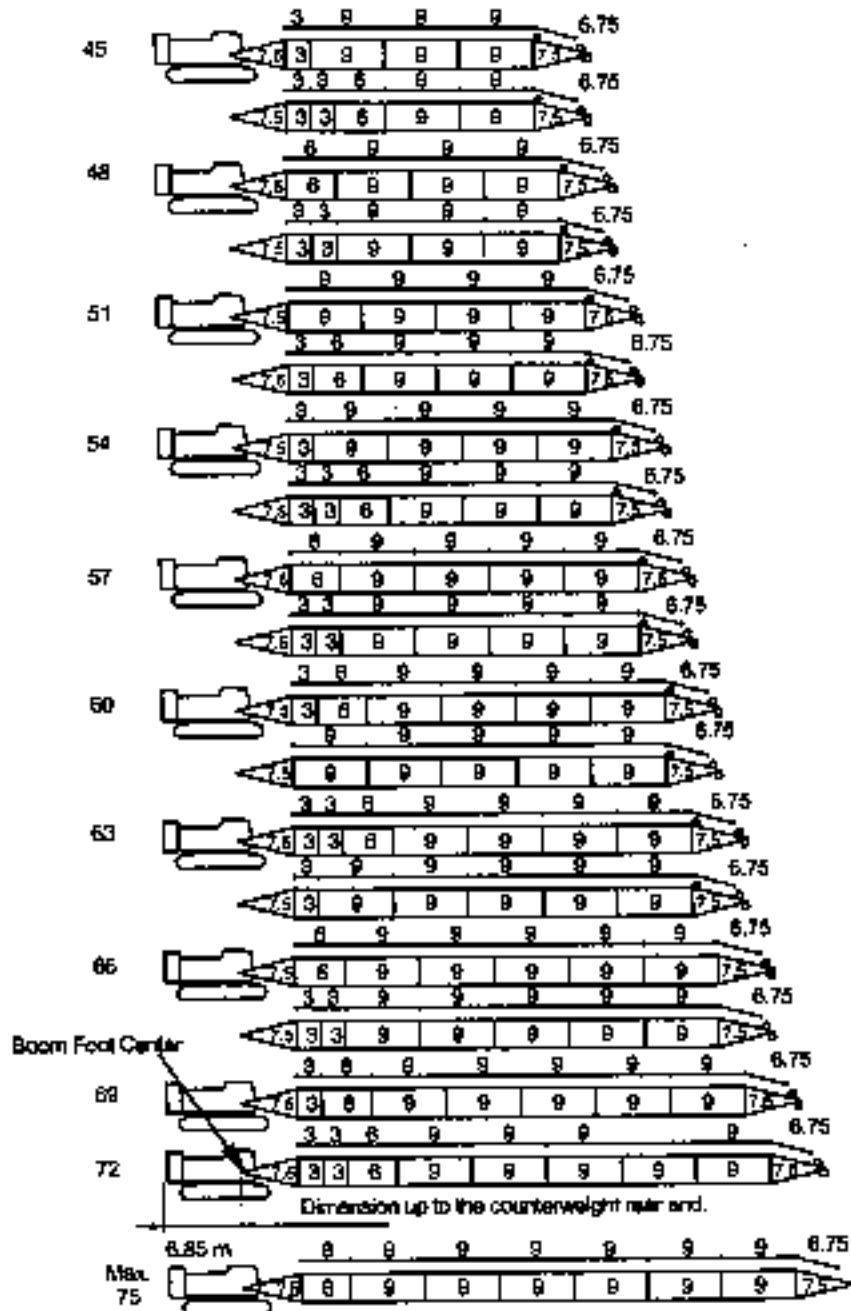


**CAUTION**

Use a pendant rope matching the boom length.



## 5 ASSEMBLING/DISASSEMBLING



ver:08-013

**NOTE:** Check the rope diameter and length by referring to the imprints on the rope end.

Length (m)	Rope Diameter (mm)	Imprint	Imprint Position
3.00	40	□ · △ · 40 · 3 · C	<p style="text-align: center;">Imprint</p>
6.00	40	□ · △ · 40 · 6 · C	
6.75	40	□ · △ · 40 · 6.6 · C	
9.00	40	□ · △ · 40 · 9 · C	

ver:08-013



## 5 ASSEMBLING/DISASSEMBLING

### (2) Fly Jib



#### CAUTION

If the pendant ropes are incorrectly connected, the jib mast may be broken, possibly creating a serious accident. Connect the pendant ropes as described in the following table.

#### Combination of Boom and Fly Jib

Boom Length (m)	Fly Jib Length (m)							
	10		15		22		28	
	Offset Angle 10°	Offset Angle 30°	Offset Angle 10°	Offset Angle 30°	Offset Angle 10°	Offset Angle 30°	Offset Angle 10°	Offset Angle 30°
15	x	x	x	x	x	x	x	x
18	x	x	x	x	x	x	x	x
21	x	x	x	x	x	x	x	x
24	x	x	x	x	x	x	x	x
27	x	x	x	x	x	x	x	x
30	x	x	x	x	x	x	x	x
33	x	x	x	x	x	x	x	x
36	x	x	x	x	x	x	x	x
39	○	○	○	○	○	○	○	○
42	○	○	○	○	○	○	○	○
45	○	○	○	○	○	○	○	○
48	○	○	○	○	○	○	○	○
51	○	○	○	○	○	○	○	○
54	○	○	○	○	○	○	○	○
57	○	○	○	○	○	○	○	○
60	○	○	○	○	○	○	○	○
63	○	○	○	○	○	○	x	x
66	x	x	x	x	x	x	x	x
69	x	x	x	x	x	x	x	x
72	x	x	x	x	x	x	x	x
75	x	x	x	x	x	x	x	x

(○ : Attachable x : Not Attachable)

Fly Jib Length (m)	Offset Angle	Fly Jib Configuration
10	10°	<p>Jib Pendant Rope (Boom Side) Dia. 26 mm 9.56</p> <p>Jib Pendant Rope (Jib Side) Dia. 24 mm 9.62</p>
	30°	<p>8.58</p> <p>9.62</p> <p>1.845</p>

142-04-01-210

## 5 ASSEMBLING/DISASSEMBLING

Fly Jib Length (m)	Offset Angle	Fly Jib Configuration
18	10°	
	30°	
22	10°	
	30°	
28	10°	
	30°	

WSPH-05-227

**NOTE:** Check the rope diameter and length by referring to the imprints on the rope end.

Length (m)	Rope Diameter (mm)	Imprint	Imprint Position
1.645	24	□ · △ · 24 · 1.6 · S	
5.678	24	□ · △ · 24 · 5.7 · S	
9.56	26	□ · △ · 26 · 9.6 · S	
9.62	24	□ · △ · 24 · 9.6 · S	

WSPH-05-276

## 5 ASSEMBLING/DISASSEMBLING

### 1.14 Conditions to Erect Boom and Jib



#### WARNING

- Before erecting the boom or lowering the boom, reinforce the ground by laying planks such as steel plates on the ground so that the machine level can be maintained.
- If the boom is erected/lowered in the boom raise-prohibited direction, the machine may tip over. Be sure to place pads underneath the front or the rear side of the crawlers before raising/lowering the boom under the condition marked with ▲ in the following tables.



#### CAUTION

- When erecting the boom, never lift the hook off the ground until the boom angle enters the working range.

#### 1.14.1 When a crane exclusive boom is installed

- (1) Conditions required to erect boom depending on types of jib to be attached (with the bridle connected to the pendant rope)

Over Front Erecting

(with the take-up tumblers positioned in the front)

Over Rear Erecting

(with the travel motors positioned in the front)

x: Prohibited to erect the boom

●: Possible to erect the boom without using pads.

▲: Possible to erect the boom using pads

#### 1. Only Boom

Boom Length (m)	Over Front Erecting	Over Rear Erecting	Overside Erecting
15	●	●	●
18	●	●	●
21	●	●	●
24	●	●	●
27	●	●	●
30	●	●	●
33	●	●	●
36	●	●	●
39	●	●	●
42	●	●	●
45	●	●	●
48	●	●	●
51	●	●	●
54	●	●	●
57	●	●	●
60	●	●	●
63	●	●	●
66	●	●	●
69	●	●	●
72	●	●	●
75	●	●	●

#### 2. Boom + Short Jib

Boom Length (m)	Over Front Erecting	Over Rear Erecting	Overside Erecting
15	●	●	●
18	●	●	●
21	●	●	●
24	●	●	●
27	●	●	●
30	●	●	●
33	●	●	●
36	●	●	●
39	●	●	●
42	●	●	●
45	●	●	●
48	●	●	●
51	●	●	●
54	●	●	●
57	●	●	●
60	●	●	●
63	●	●	●
66	●	●	●
69	●	●	●

## 5 ASSEMBLING/DISASSEMBLING

Over Front Electing  
(with the take-up tumblers positioned in the front)

×: Prohibited to elect the boom

Over Rear Electing  
(with the travel motors positioned in the front)

●: Possible to elect the boom without using pads.

▲: Possible to elect the boom using pads

### 3. Boom + Fly Jib

#### 3.1 Over Front Electing (with the take-up tumblers positioned in the front)

Boom Length (m)	Fly Jib Length (m)			
	10	16	22	28
39	●	●	●	●
42	●	●	●	●
45	●	●	●	●
48	●	●	●	●
51	●	●	●	●
54	●	●	●	●
57	●	●	●	●
60	●	●	●	●
63	●	●	●	—

#### 3.2 Over Rear Electing (with the travel motors positioned in the front)

Boom Length (m)	Fly Jib Length (m)			
	10	16	22	28
39	●	●	●	●
42	●	●	●	●
45	●	●	●	●
48	●	●	●	●
51	●	●	●	●
54	●	●	●	●
57	●	●	●	●
60	●	●	●	●
63	●	●	●	—

#### 3.3 Overside Electing

Boom Length (m)	Fly Jib Length (m)			
	10	16	22	28
39	●	●	●	●
42	●	●	●	●
45	●	●	●	●
48	●	●	●	●
51	●	●	●	●
54	●	●	●	●
57	●	●	●	●
60	●	●	●	●
63	●	●	●	—

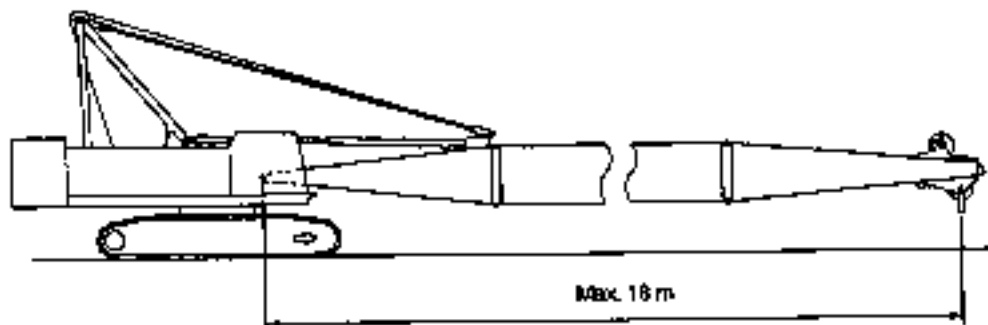
## 5 ASSEMBLING/DISASSEMBLING

(2) When the bridle is installed on the boom base section:

### CAUTION

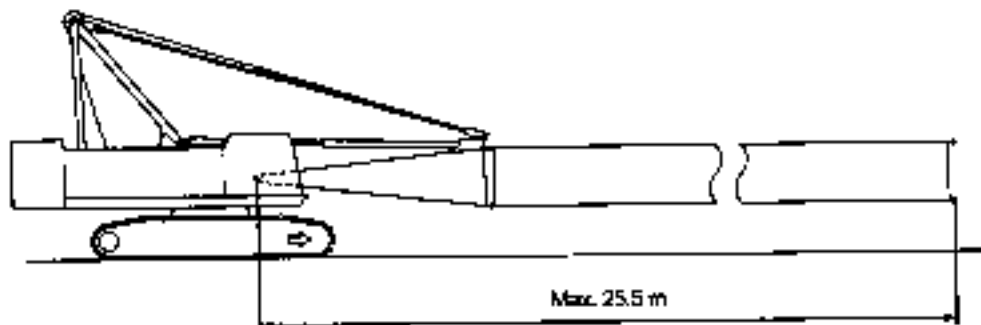
When the bridle is installed on the boom base section, do not raise the boom longer than the length illustrated below. The boom may be broken.

When the boom top section is installed:



M022-05-001

When the boom top section is not installed:



M022-08-002

## 5 ASSEMBLING/DISASSEMBLING

### 1.15 Install Boom Top Section



#### WARNING

- When installing connection pins (both side tapered or flanged pins), never enter inside the boom. Always remain outside the boom and install the pins from outside of the boom.
- Support the boom base section with wire stands strong and stable enough to support the boom when assembling the boom. Be sure to take all necessary measures to prevent personal injury or death from occurring in advance.



#### CAUTION

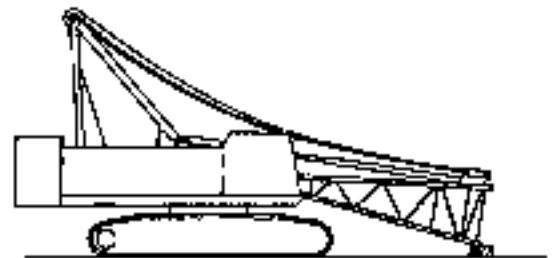
- Do not put your fingers into pin holes when aligning pin hole centers.
- Be careful not to fall off the boom.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- When driving in a part with a hammer, pieces of metal may fly off, possibly causing serious injury. Use protective items such as safety glasses and a hard hat.

**IMPORTANT:** Clean the connection pin holes and coat the pin hole surfaces with grease.

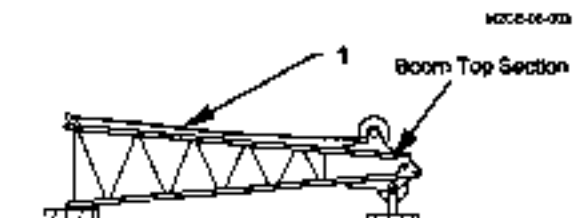
Before installing the boom top section, check the following points.

- The boom base section is seated on a stand.
  - The bridle is mounted on the boom base section.
  - The A-Frame is raised.
  - All counterweights are installed.
1. Check that pendant rope (1) is mounted on the boom top section.

**NOTE:** Connect one end of pendant rope (1) to the lug at the tip of the boom top section. Then, secure the other end of the pendant rope to the boom top section so that the rope does not fall off the boom top section.



When installing the crane exclusive boom:



W02E-06-03

1P3-04-026

## 5 ASSEMBLING/DISASSEMBLING

**IMPORTANT:** When operating the machine with more than 9 falls of wire ropes installed, install side sheaves (3) on both sides of boom top head shaft (2).

2. Remove pins (4) from both sides of boom top section head shaft (2) to remove covers (5).

*NOTE:* After removing cotter pins (6), remove pins (4).

3. Using an assistant crane, lift and install side sheaves (3) onto both sides of the boom top section head shaft with pins (4).  
Install cotter pins (6) to pins (4).
4. Attach a sling rope to the boom top section. Lift the boom top section with an assistant crane.

*NOTE:* Lift the boom top section so that connect pin (2) side is positioned slightly lower than the level.

5. Align the connection lug holes on the boom top section and boom base section with each other.

**IMPORTANT:** Install connection pin (7) so that lock pin (8) hole is positioned upright.

6. Install connection pin (7) (flanged pin) from the outside of the boom.

*NOTE:* Secure the connection pin with lock pin (8).

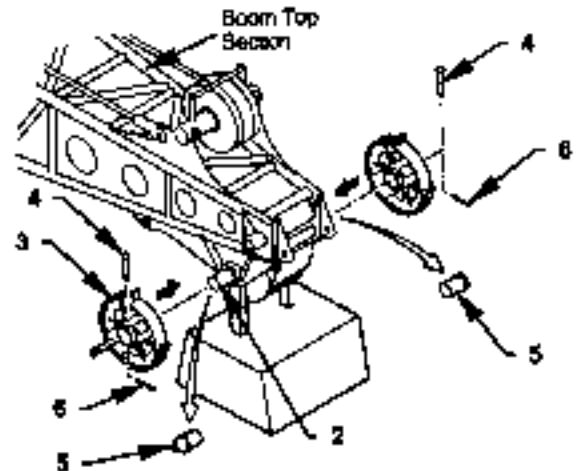
7. Lower the boom top section tip to the ground by operating the assistant crane.

*NOTE:* Support the boom tip with a stand.

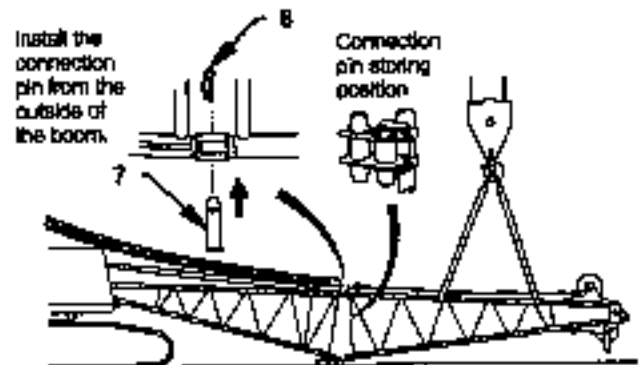
8. Detach the sling rope from the boom top section.
9. Start the engine.

*NOTE:* Run the engine at approx.  $1000\text{min}^{-1}$  (rpm).

10. Move the lock lever to the UNLOCK position.



200-05-183



When installing the crane exclusive boom:

200-05-027



When installing the crane exclusive boom:

200-05-028

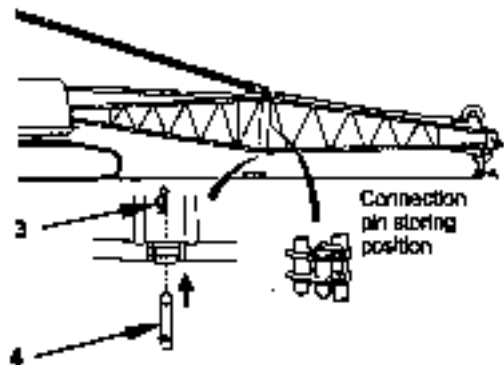
## 5 ASSEMBLING/DISASSEMBLING

11. While raising the boom, align the connection lug holes at the bottom on the boom top section and boom base section with each other.

**IMPORTANT:** Install connection pin (9) so that lock pin (8) hole is positioned upright.

12. Install connection pin (9) (both side tapered pin) from the outside of the boom.

**NOTE:** Secure the connection pin (9) with lock pin (8).



When installing the crane exclusive boom: 320-08-099

13. Remove lock pin (10). Extend link (12) out of bridle (11).

**NOTE:** After extending link (2), reinstall lock pin (10) in the original position.

14. When assembling the crane exclusive boom, connect pendant rope (1) to link (12) on bridle (11) with connect pin (13). When assembling the lower/crane common boom, connection link (15) to link (12) on bridle (11) with connection pin (13). Then, connect pendant rope (1) to link (15) with connection pin (13).

**NOTE:**

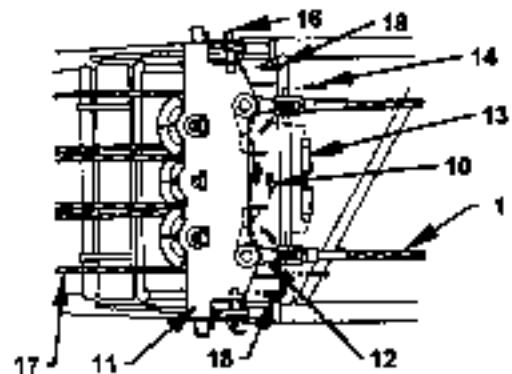
- Install connect pin (13) from the boom inside out. Then, install cotter pin (14) to lock connect pin (13).
- Open the end of cotter pin (14) 30 to 90°.

15. Pay out boom derricking drum wire rope (17) so that bridle holding pin (16) can be removed.

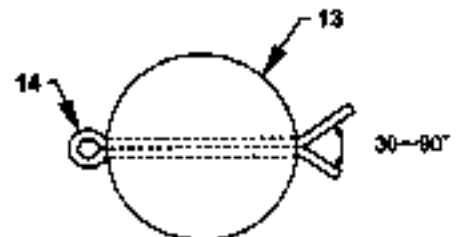
**IMPORTANT:** When bridle holding pin (16) is removed, bridle (11) may be moved toward the direction of the base machine by the tension force of boom derricking drum wire rope (17). Stay only on the boom top side while working.

16. Remove bridle holding pin (16).

**NOTE:** Remove lock pin (18).



When installing the crane exclusive boom: 320-05-043



320-05-043



## 5 ASSEMBLING/DISASSEMBLING

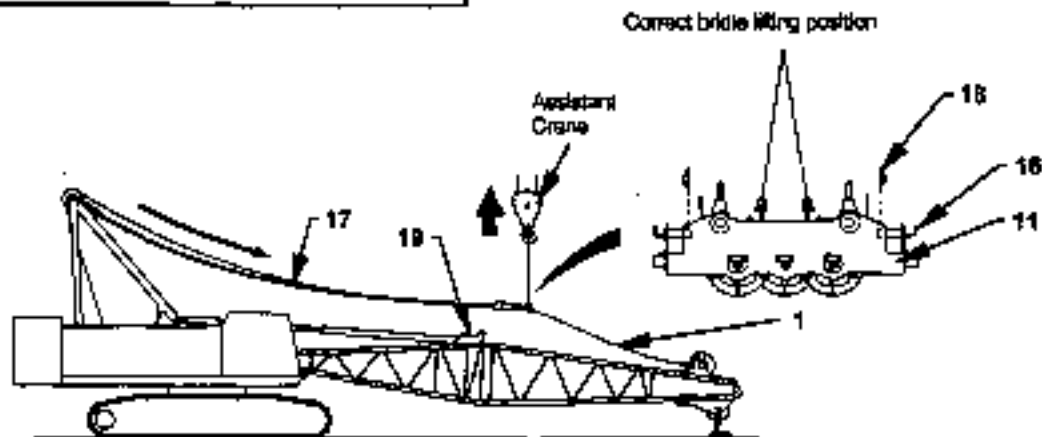
17. Wind boom derricking drum wire rope (17) until bridle (11) is separated from bridle holding lug (19) at the lower boom tip.
18. Re-install bridle holding pin (16) in the original position on bridle (11).

*NOTE: Secure bridle holding pin (16) with lock pin (18).*

19. While lifting bridle (11) with the assistant crane, pay out boom derricking drum wire rope (17) until two to three turns of the wire rope remains on the drum.

### DANGER

- When lifting the bridle and pendant rope (1) with the assistant crane, always lift the bridle as illustrated below.
- The suspension lugs (steel) provided on bridle (11) are to be used when only the bridle is lifted. If the bridle with the boom derricking wire rope (17) connected is lifted using the suspension lugs (steel) provided on the bridle, the suspension lugs will be broken, causing bridle (11) to fall, possibly resulting in a serious accident.



When installing the crane exclusive boom:

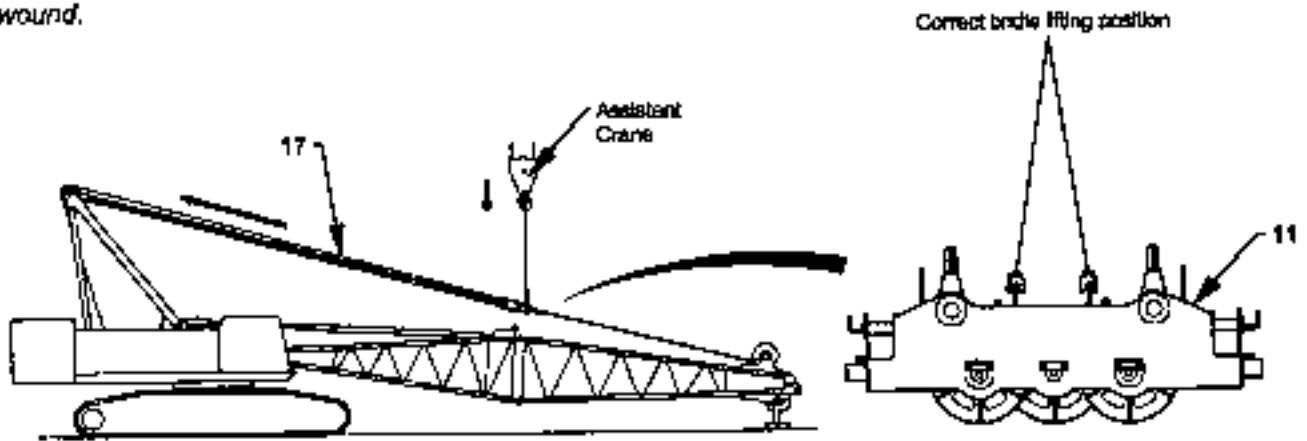
UACR-00-000

## 5 ASSEMBLING/DISASSEMBLING

20. While applying tension to boom derricking drum wire rope (17), wind rope (17) onto the boom derricking drum so that irregular winding does not occur.

**NOTE:**

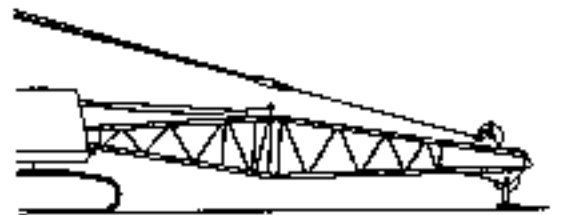
- Apply tension to boom derricking drum wire rope (17) so that the boom top section is not lifted off the ground.
- Move bridle (11) with the assistant crane at the same speed as boom derricking drum wire rope (17) is wound.



When installing the crane exclusive boom:

40CC-40-004

21. Move the lock lever to the LOCK position.  
22. Stop the engine.



When installing the crane exclusive boom:

40CC-40-004

## 5 ASSEMBLING/DISASSEMBLING

### 1.16 Install Stanchions and Support Wire Ropes (Optional)

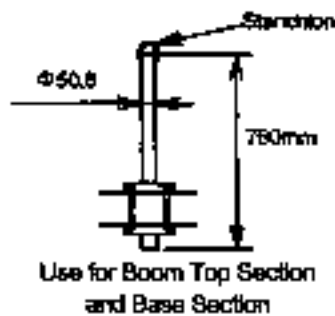


#### WARNING

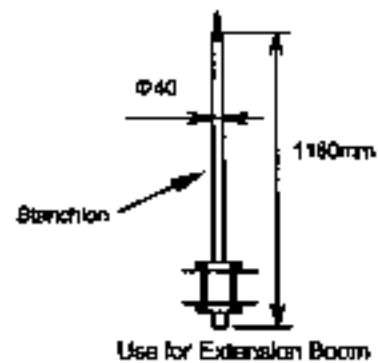
Be careful not to fall off the base machine or the boom.

**IMPORTANT:** Use the support wire ropes and stanchions at the only time when assembling or disassembling the boom. Be sure to remove the support wire ropes and stanchions during crane operation. If the machine is operated without removing the stanchions, as the boom weight is increased, the net lifting load weight is reduced by the increased boom weight.

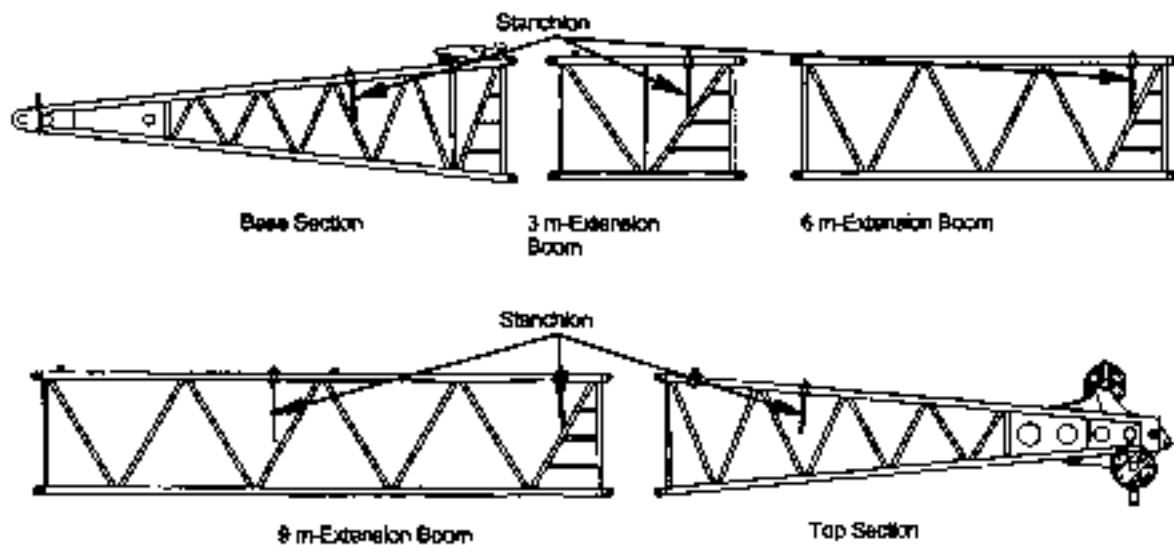
The stanchions purchased together with the machine are installed in the positions illustrated below.



W001-07-208



W001-07-209

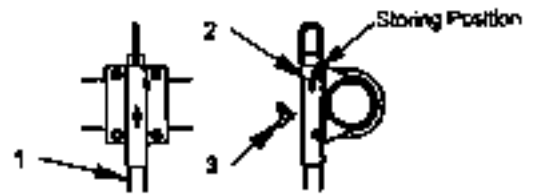


SCD-04-108

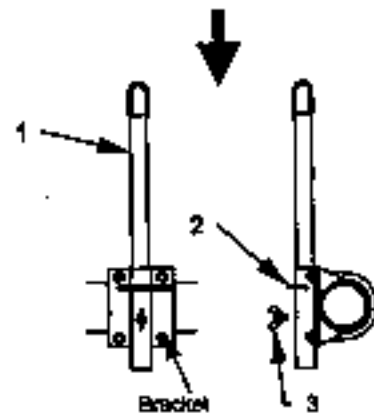
## 5 ASSEMBLING/DISASSEMBLING

1. Remove stanchion lock pin (2) and lock bolt (3). Remove stanchion (1) from the stored position. Reinstall the stanchion in the specified position with lock pin (2) and lock bolt (3).

Stanchion: 5 kg for the Extension Boom  
 4 kg for the Boom Top Section and Base Section  
 Wrench Size: 19 mm

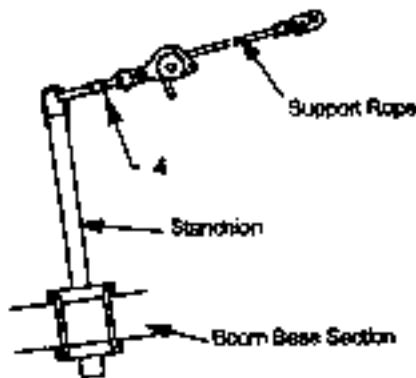


MS1-07-282

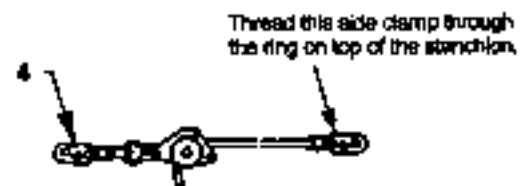


MS1-07-284

2. Attach one end clamp (4) of the support rope to the stanchion on the boom base section.

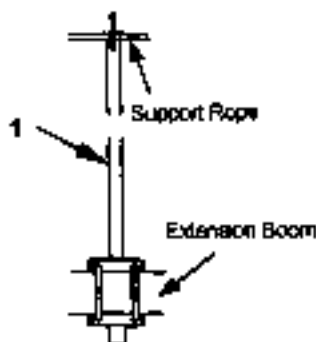


MS1-07-285

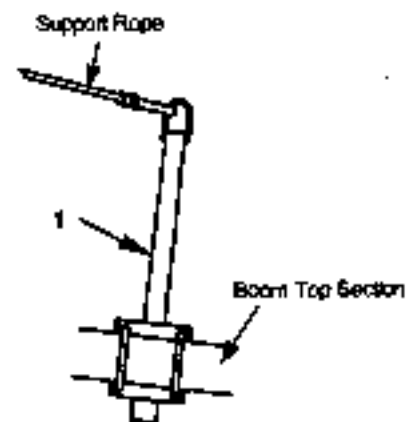


MS1-07-286

3. Thread the other end of the support wire rope through the ring on top of the stanchion on the extension booms. Connect the other end clamp of the support wire rope to the stanchion on the upper boom. Tighten the rope.



MS1-07-287

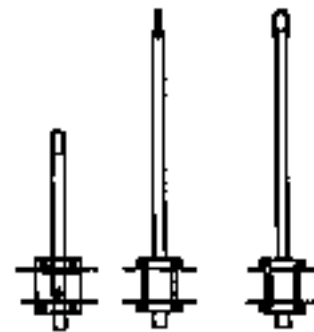


MS1-07-288

## 5 ASSEMBLING/DISASSEMBLING

**NOTE:** The length of the support rope is 30 m. In case the boom length is longer than 30 m, connect the wire in the following procedures:

4. After removing stanchion lock pin (2) and loosening lock bolt (3), rotate the stanchion 90° as illustrated. Then, reinstall lock pin (2) and tighten lock bolt (3).
5. Attach clamp (5) of the support rope to stanchion (1) as illustrated to the right below. Tighten the rope.



Bracket

M321-07-021

When the stanchions and related parts are purchased separately, secure stanchion mounting brackets (6) with U-bolts (7) and nuts (8) in the locations as illustrated below. Then, install stanchions with the direction as illustrated below.

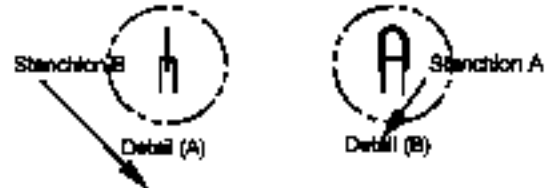


M321-07-030

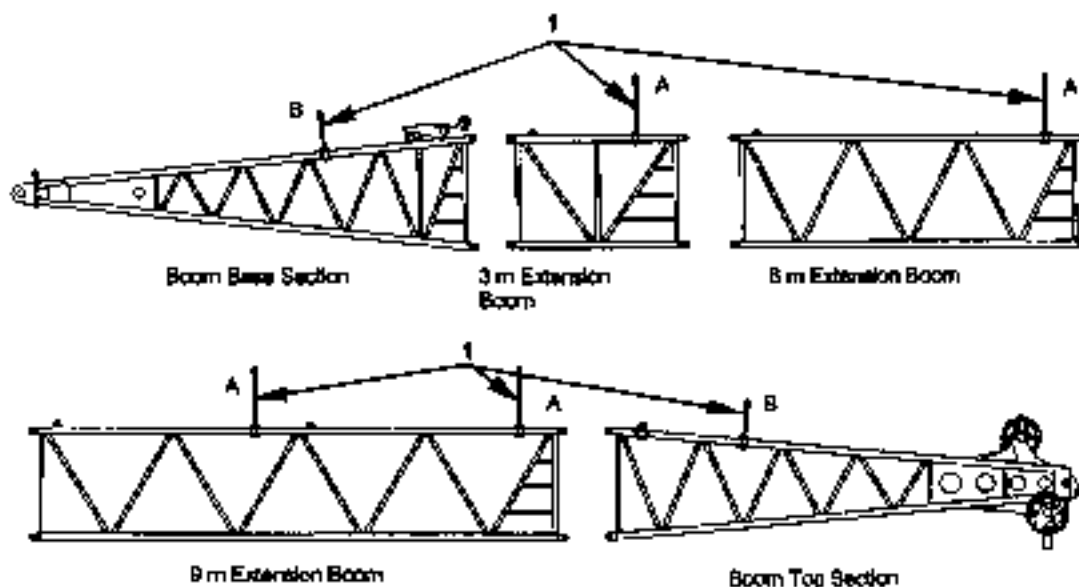
- Wrench Size: 24mm  
 Stanchion Length: 760 mm for the boom top section  
 and base section  
 1160 mm for the extension boom



M321-07-043



M321-07-044



M321-08-107

## 5 ASSEMBLING/DISASSEMBLING

### 1.17 Install Extension Boom

Check the boom length to be assembled by referring to 1.13 Configurations of Boom/Jib and Pendant Rope.

**NOTE:**

- Connect the extension booms from the boom base section side in order. Then, finally connect the boom top section.
- Position an extension boom with the female connection lug toward the boom top section.



**WARNING:**

- When installing connection pins (both side tapered or flanged pins), never enter the inside of the boom. Always remain outside the boom and install the pins from the outside of the boom.
- Support the boom base section with wire stands strong and stable enough to support the boom base section when assembling the boom. Be sure to take all necessary measures to prevent personal injury or death from occurring in advance.

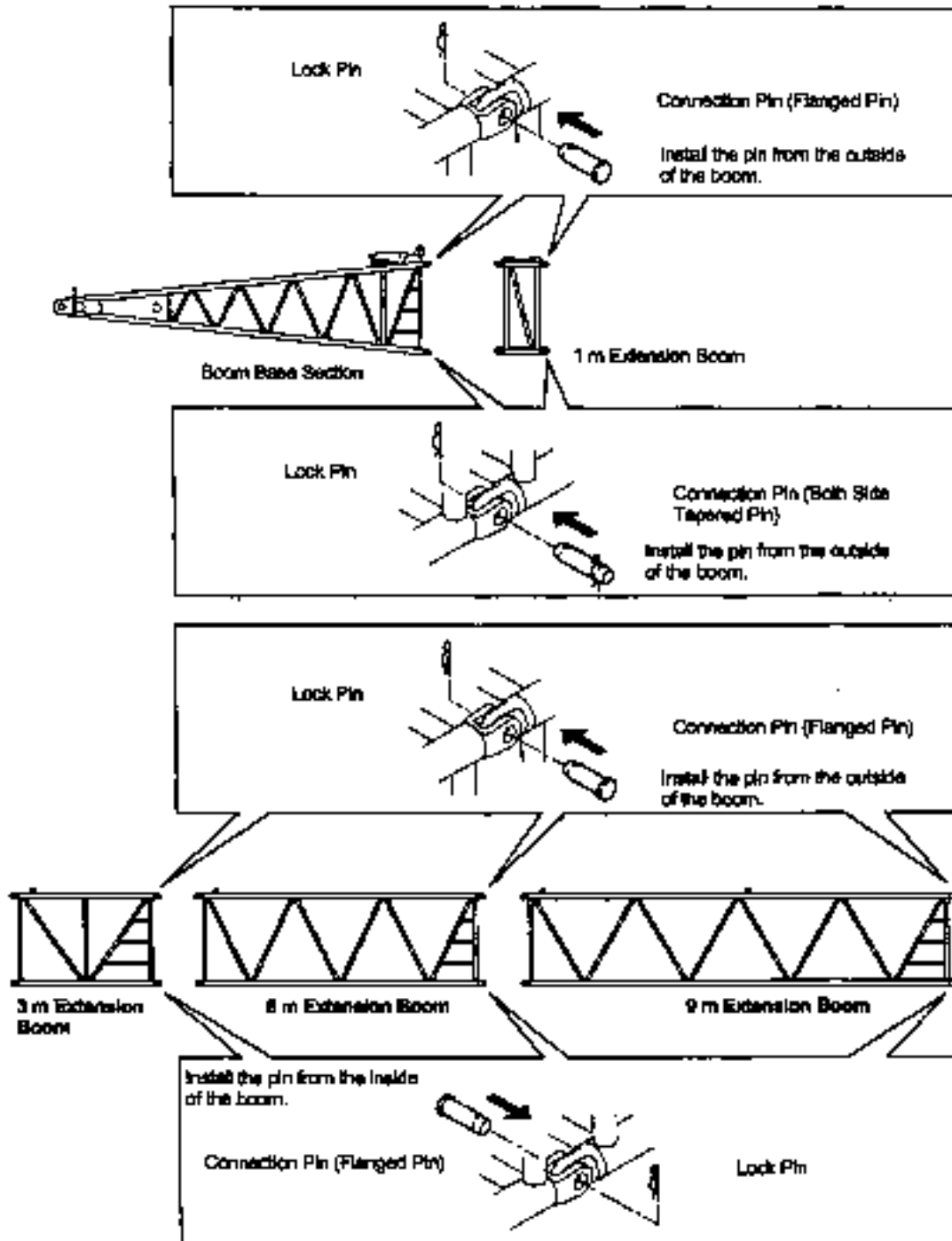


**CAUTION:**

- Do not put your fingers into pin holes when aligning pin hole centers.
- Connect the pendant rope to the bridle. Then, do not lift the boom top section tip off the ground until the bridle is separated from the boom base section.
- Be careful not to fall off the boom.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- When driving in a part with a hammer, pieces of metal may fly off, possibly causing serious injury. Use protective items such as safety glasses and a hard hat.

## 5 ASSEMBLING/DISASSEMBLING

Types and Installation Direction of Connection Pins to be Used at Each Boom Tip End  
(Concave Connection Lug)



200-05-082

## 5 ASSEMBLING/DISASSEMBLING

**IMPORTANT:** Clean the connection pins and holes, and coat the pins and hole surfaces with grease.

Before installing an extension boom, check the following points.

- The boom base section is seated on a stand.
- The bridle is mounted on the lower boom.
- The A-Frame is raised.
- All counterweights are installed.

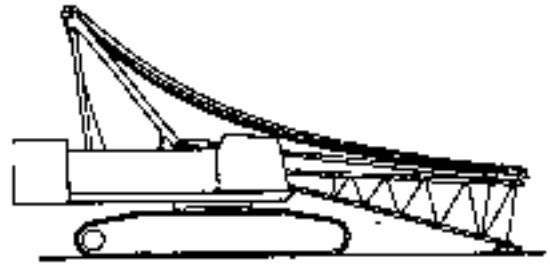
1. Check that the working area is large enough to assemble the required length boom and the jib.
2. Check that the corresponding pendant ropes are laid on the boom top section and the extension booms.

**NOTE:** To prevent the pendant ropes from falling off the boom when the boom is raised, connect the one tip end of the boom top section pendant rope to the lug at the tip of the boom top section and secure the opposite side tip end of the boom top section pendant rope to the boom top section. Then, secure both ends of the extension boom pendant rope to the respective extension boom.

3. Attach sling ropes to the extension boom to be installed and lift it with an assistant crane.

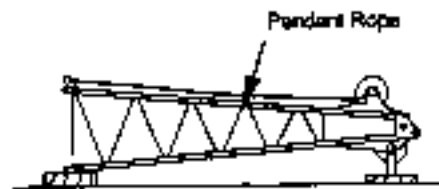
**NOTE:** Lift the extension boom so that the boom base section connection side is positioned slightly lower than level.

4. Align the top side connection lug holes on the boom base section with the lug holes on the extension boom.

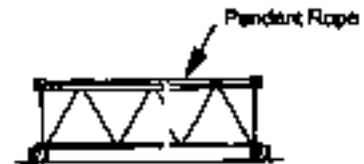


When installing the crane exclusive boom:

10022-05-008



1020-05-008



1020-05-120



## 5 ASSEMBLING/DISASSEMBLING

**IMPORTANT:** Install connection pin (2) so that lock pin (1) hole is positioned upright.

5. Install connection pin (2) (flanged pin) from the outside.

**NOTE:**

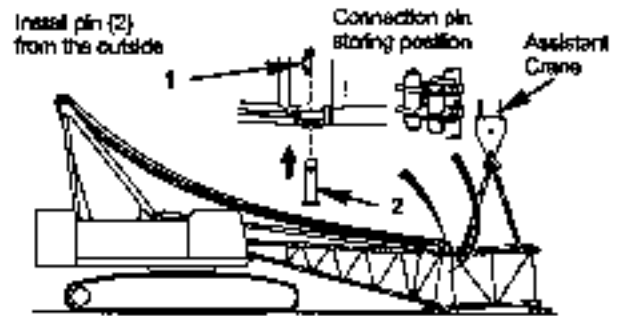
- Secure the connection pin with lock pin (1).
- Do not install bottom side connection pins (3).

6. Lower the extension boom to the ground with the assistant crane.

**NOTE:** Lay the extension boom on stands.

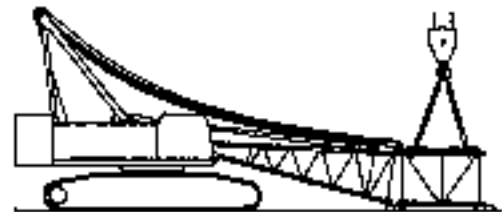
7. Detach the sling wire ropes from the extension boom.

**IMPORTANT:** Install connection pin (2) so that lock pin (1) hole is positioned upright.



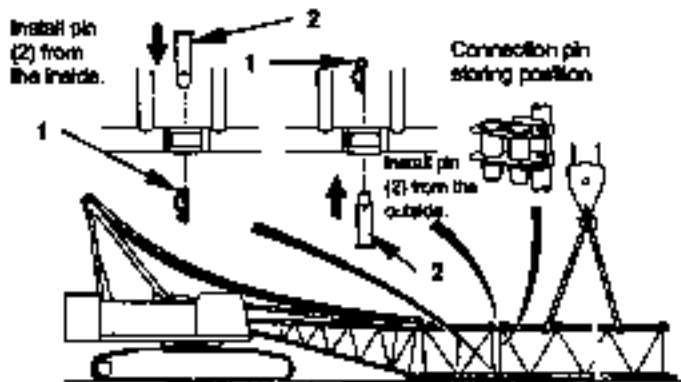
When installing the crane exclusive boom:

200-08-061



When installing the crane exclusive boom:

200-08-061



When installing the crane exclusive boom:

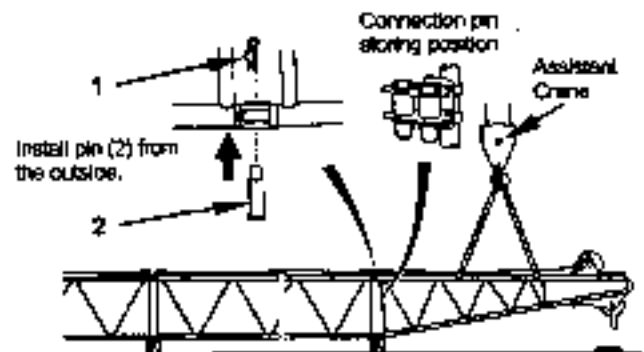
200-08-065

## 5 ASSEMBLING/DISASSEMBLING

8. Connect all extension booms required to configure the boom in sequence.

**NOTE:**

- Install all lower connection pins (2) (flanged pins) except the pins on the bottom side.
- Install connection pin (2) (flanged pin) on the top side from the outside of the boom and on the bottom side from the inside of the boom respectively. Then, secure all pins with lock pins (1).



MC 84-08-302

9. Attach the sling wire ropes to the boom top section. Lift the boom top section with the assistant crane.

**NOTE:** Lift the boom top section so that the boom top section connection side is positioned slightly lower than the level.

10. Align the topside connection lug holes on the boom top section with the tip side lug holes on the extension boom which has already been connected.

**IMPORTANT:** Install connection pin (2) so that lock pin (1) hole is positioned upright.

11. Install connection pin (2) (flanged pin) from the outside.

**NOTE:** Secure pin (2) with lock pin (1).

12. Lower the tip of the boom top section to the ground with the assistant crane.

**NOTE:** Lay the tip of the boom top section on a stand.

13. Detach the sling wire ropes from the boom top section.

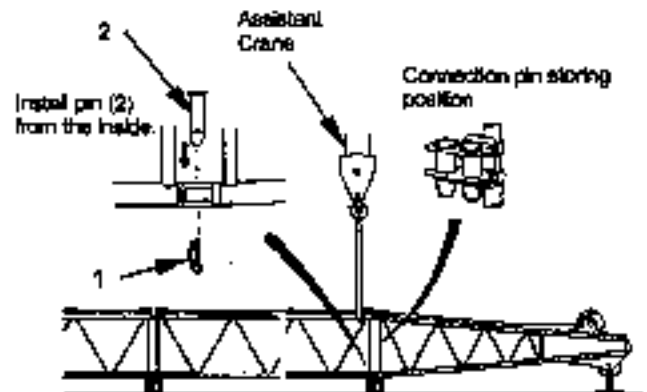
## 5 ASSEMBLING/DISASSEMBLING

**IMPORTANT:** Install connection pin (2) so that lock pin (1) hole is positioned upright.

14. Install connection pin (2) (flanged pin) into the bottom connection lug from the outside.

**NOTE:**

- Secure pin (2) with lock pin (1).
- If it is difficult for the pin holes to align with each other, attach a sling wire rope to a section close to the connection end of the extension boom. Then, slightly lift the extension boom with the assistant crane.



15. Attach a sling wire rope to a section close to the connection end of the extension boom. Slightly lift the extension boom with the assistant crane.

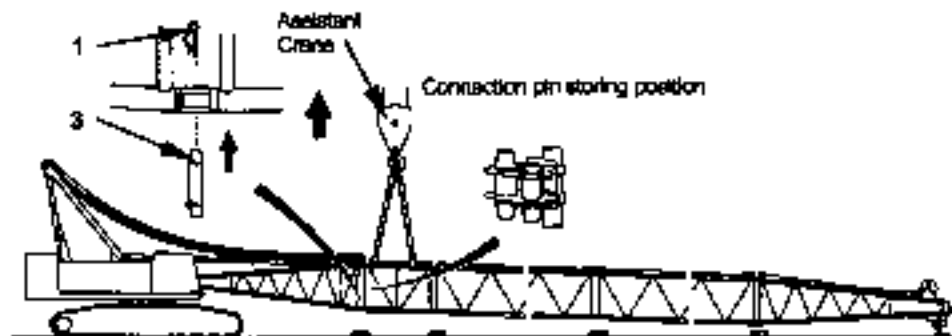
**NOTE:** Do not lift the tip of the boom base section off the stand.

16. Align the bottom side connection lug holes on the extension boom and the boom base section.

**IMPORTANT:** Install connection pin (3) so that lock pin (1) hole is positioned upright.

17. Install connection pin (3) (both side tapered pin) from the outside.

**NOTE:** Secure connection pin (3) with lock pin (1).



When installing the crane exclusive boom:

ACD-05-098

## 5 ASSEMBLING/DISASSEMBLING

18. Remove lock pin (4). Pull link (6) out of bridle (5).

**NOTE:** After pulling out link (6), install lock pin (4) in the original position.

19. Connect pendant ropes (7) from the boom top section side to the lower boom side with connection pin (8) in sequence.

**NOTE:**

- Install connection pin (8) from the inside of the boom. Lock connection pin (8) with cotter pin (9).
- Open cotter pin (9) end 30 to 90°.

20. Connect pendant rope (7) to link (6) on bridle (5) with connection pin (8).

**NOTE:**

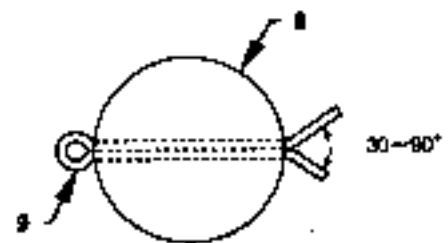
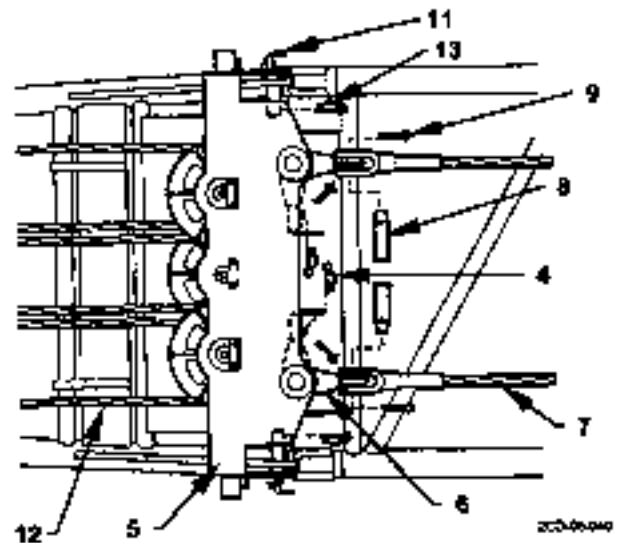
- Install connection pin (8) from the inside of the boom. Lock connection pin (8) with cotter pin (9).
- Open cotter pin (9) end 30 to 90°.

21. Pay out boom democking drum wire (12) so that bridle holding pin (11) can be removed.

**IMPORTANT:** When bridle holding pin (11) is removed, bridle (5) may suddenly be moved toward the base machine by the tension force of wire rope (12). Always stay on the boom top section while working on the bridle.

22. Remove bridle holding pin (11).

**NOTE:** Remove lock pin (13).



## 5 ASSEMBLING/DISASSEMBLING

23. Wind boom derricking drum wire rope (12) until bridle (5) is separated from bridle holding lug (14) at the boom base section tip.
24. Re-install bridle holding pin (11) in the original position on bridle (5).

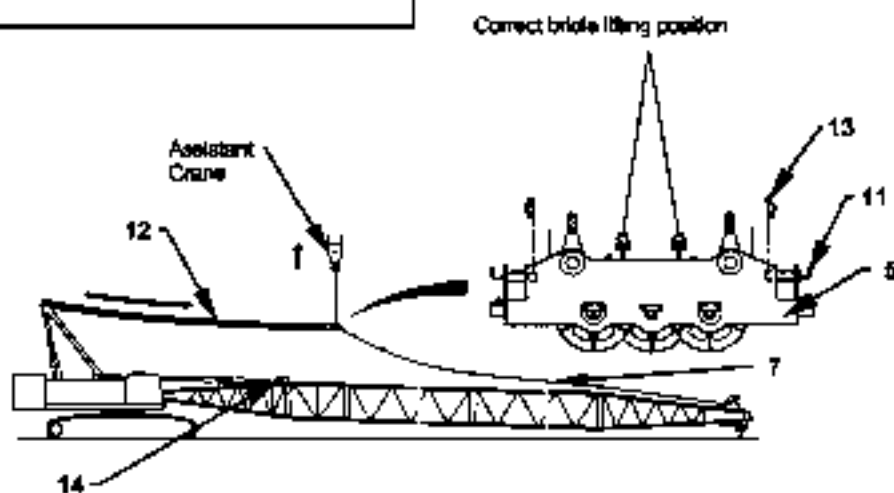
*NOTE: Secure bridle holding pin (11) with lock pin (13).*

25. While lifting bridle (5) with the assistant crane, pay out boom derricking drum wire rope (12) until the wire rope remains two to three turns on the drum.



### DANGER

- When lifting the bridle (5) and pendant rope (7) with the assistant crane, always lift the bridle (5) as illustrated below. The suspension lugs (steel) provided on bridle (5) are to be used when only the bridle is lifted.
- If the bridle with the boom derricking drum wire rope (12) connected is lifted using the suspension lugs (steel) provided on the bridle, the suspension lugs will be broken, causing bridle (5) to fall, possibly resulting in a serious accident.



When installing the crane exclusive boom:

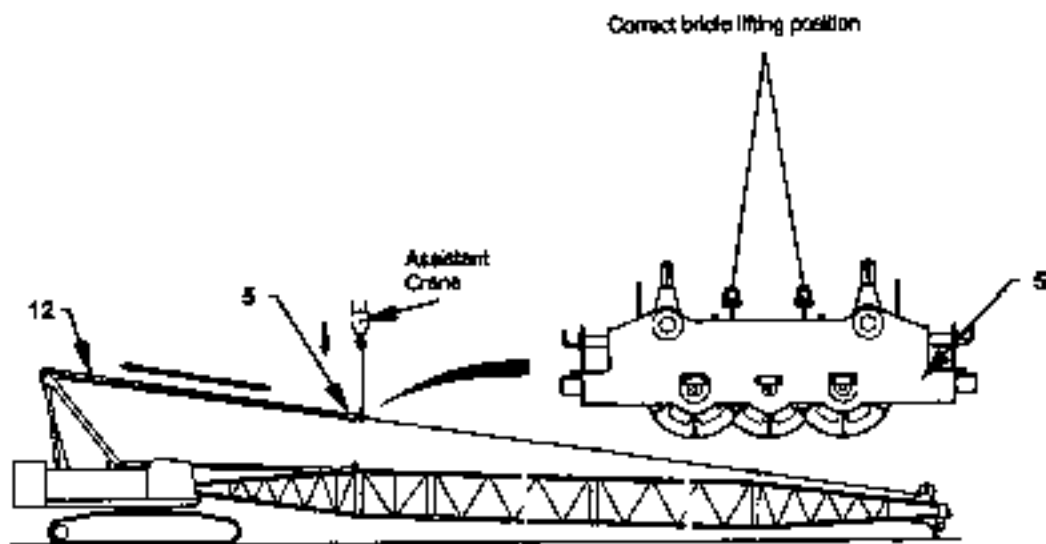
MOCE 06-007

## 5 ASSEMBLING/DISASSEMBLING

26. While applying tension to boom derricking drum wire rope (12), wind rope (12) onto the boom derricking drum so that irregular winding does not occur.

**NOTE:**

- Apply tension to boom derricking drum wire rope (12) so that the boom top section is not lifted off the ground.
- Move bridle (5) with the assistant crane at the same speed as boom derricking drum wire rope (12) is wound.



When installing the crane exclusive boom:

WCE-05-004

## 5 ASSEMBLING/DISASSEMBLING

### 1.18 Install Fly Jib

Refer to 1.13 Configurations of Boom/Jib and Pendant Rope for the attachable boom/fly jib length and the combination of the jib pendant ropes. The fly jib can be installed to the boom with the offset angle of 10 to 30°.

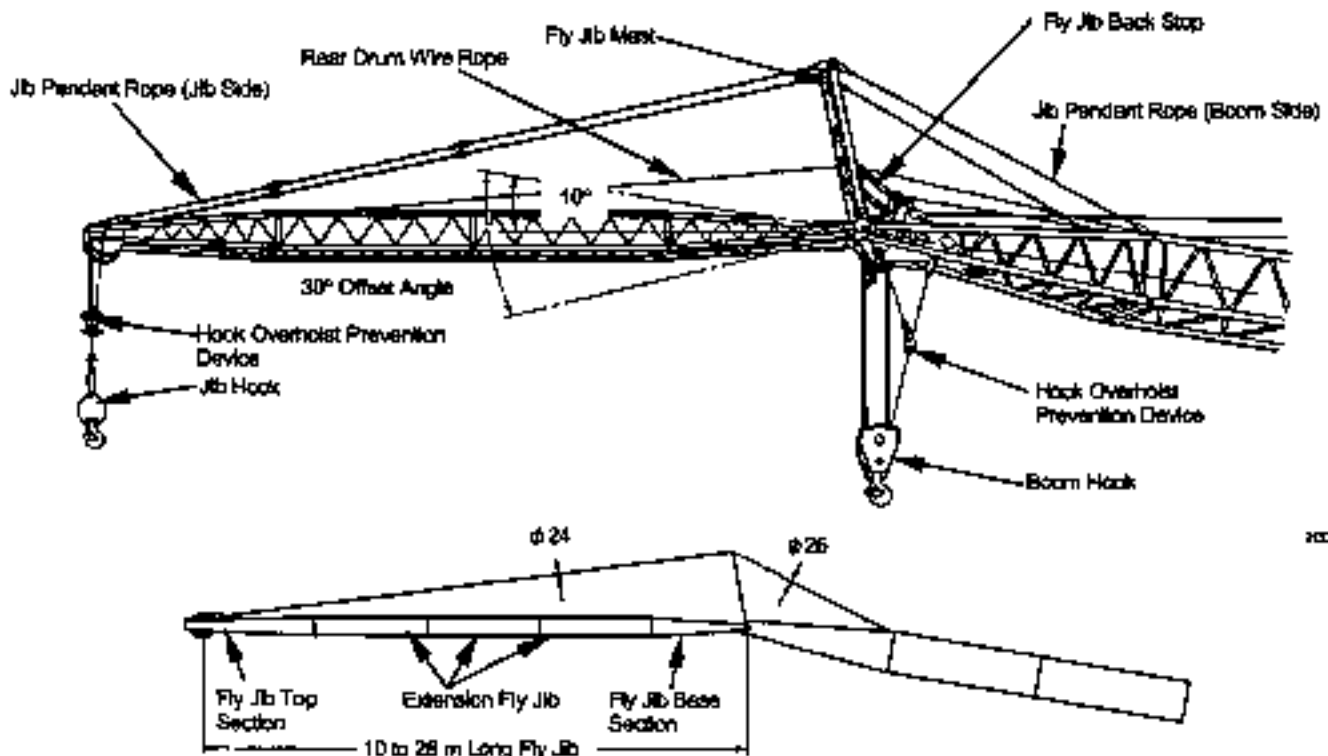
#### **⚠ DANGER**

- When removing connection pins (both side tapered or flanged pins), never enter the inside of the boom. Always stay outside the boom and remove the pins from the outside of the boom.
- Support the boom and fly jib with stands strong and stable enough to support the boom and fly jib when assembling the fly jib. Be sure to take all necessary measures to prevent personal injury or death from occurring in advance.

#### **⚠ CAUTION**

Do not put your fingers into pin holes when aligning pin hole center.

**IMPORTANT:** Clean the connection pin holes and coat the pin hole surfaces with grease.



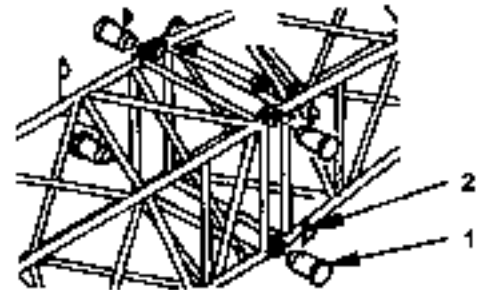
## 5 ASSEMBLING/DISASSEMBLING

1. Assemble as much as necessary of the fly jib on the ground.

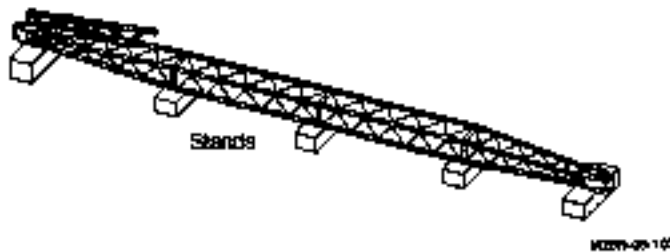
**NOTE:**

- Assemble the fly jib on stands.
- Install connection pin (1) from the outside of the jib.
- Install lock pin (2) upright.

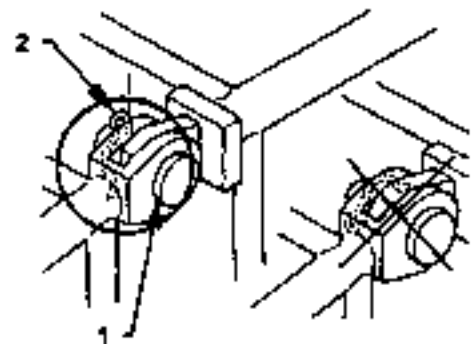
Fly Jib Base Section Weight: 580 kg (with the jib mast)  
Fly Jib Top Section: 290 kg  
6 m- Extension Fly Jib: 190 kg



M504-07-018



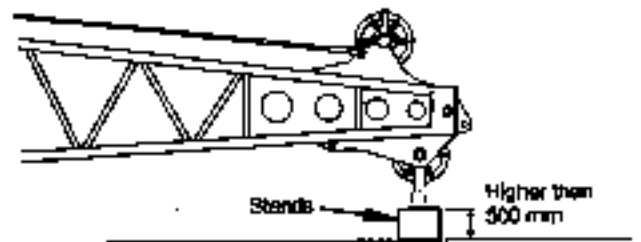
M504-07-107



M504-07-048

2. Lower the boom to the stand.

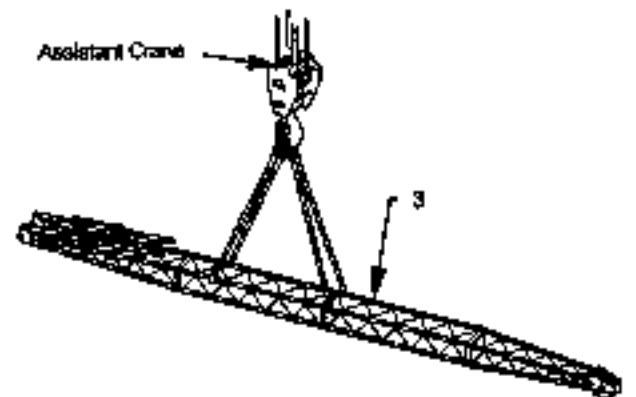
**NOTE:** Use a stand higher than 500 mm.



M504-07-048

3. Lift assembled fly jib (3) with an assistant crane.

**NOTE:** Attach sling wire ropes so that the fly jib can be held in a level position.



M504-07-124



## 5 ASSEMBLING/DISASSEMBLING

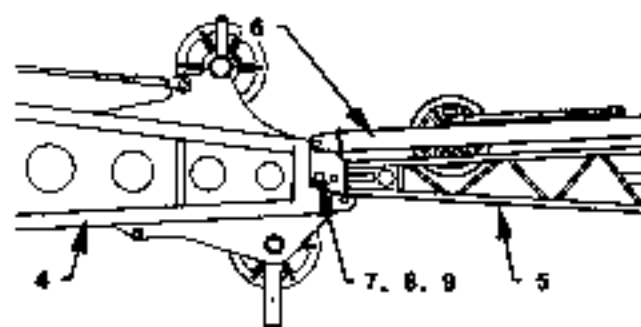
4. Align pin holes on boom top section (4) and fly jib base section (5). Install pin (7).

**NOTE:** Secure pin (7) with lock plate (8) and bolts (9).

Wrench size: 24 mm

5. Connect jib pendant ropes (10 and 14).

- (1) Connect one end of jib pendant rope (10) (jib side) to link (11) on fly jib mast (8).



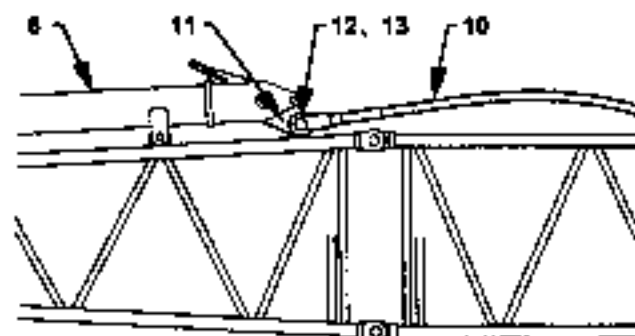
**NOTE:**

- Install pin (12) from the outside of the fly jib mast.
- Open the end of cotter pin (13) 30 to 90°.
- (2) Connect the other end of jib pendant rope (10) (jib side) to the fly jib.

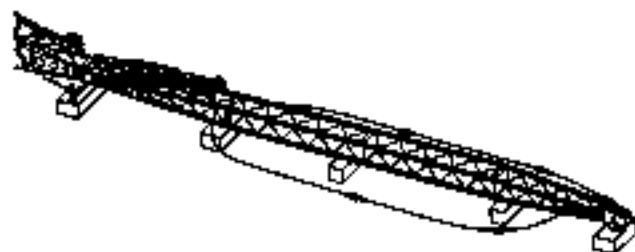
2CD-05-281

**NOTE:**

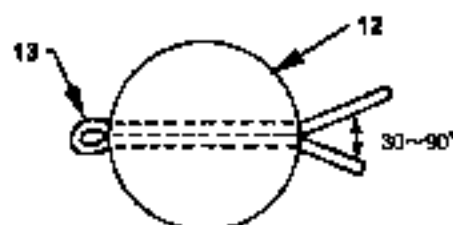
- Install pin (12) from the outside of the fly jib mast.
- Open the end of cotter pin (13) 30 to 90°.



2CD-05-110



2CD-05-111

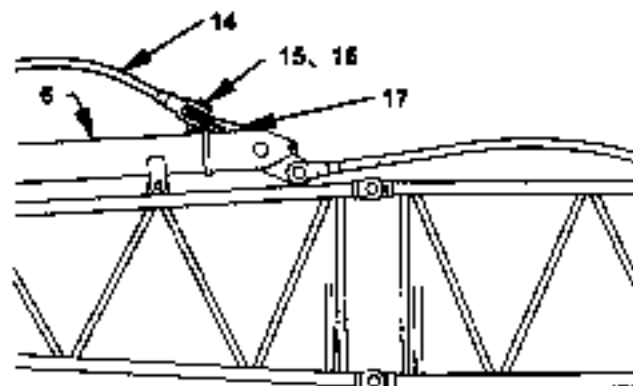


1624-07-128

- (3) Connect one end of jib pendant rope (14) (boom side) to link (17) on fly jib mast (8).

**NOTE:**

- Install pin (15) from the top side of the boom.
- Open the end of cotter pin (13) 30 to 90°.

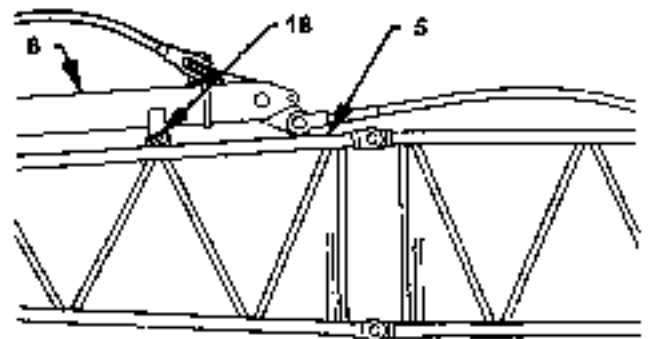


2CD-05-112

## 5 ASSEMBLING/DISASSEMBLING

6. While holding fly jib mast (6) with the assistant crane, remove pin (18) which is used to hold fly jib mast (6) and fly jib base section (5) during transportation.

**NOTE:** After raising jib mast (6) slightly, re-install pin (18) to jib mast (6).

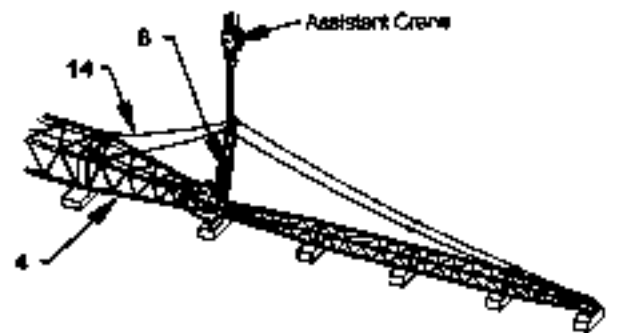


200-08-110

7. Raise fly jib mast (6) with the assistant crane. Connect the other end of jib pendant rope (14) (boom side) to boom top section (4).

**NOTE:**

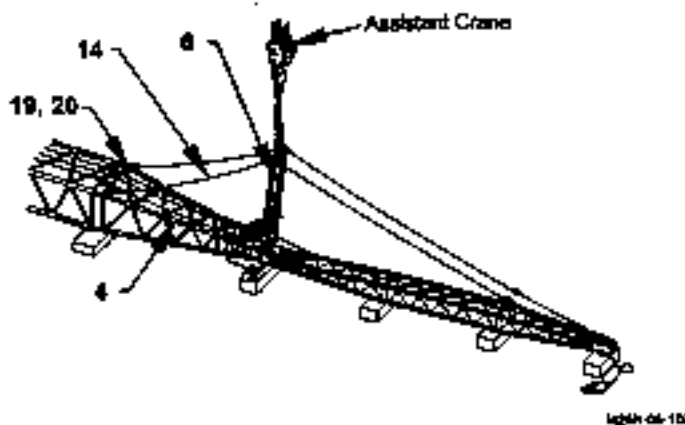
- Install pin (19) from outside of the top section.
- Open the end of cotter pin (20) 30 to 90°.



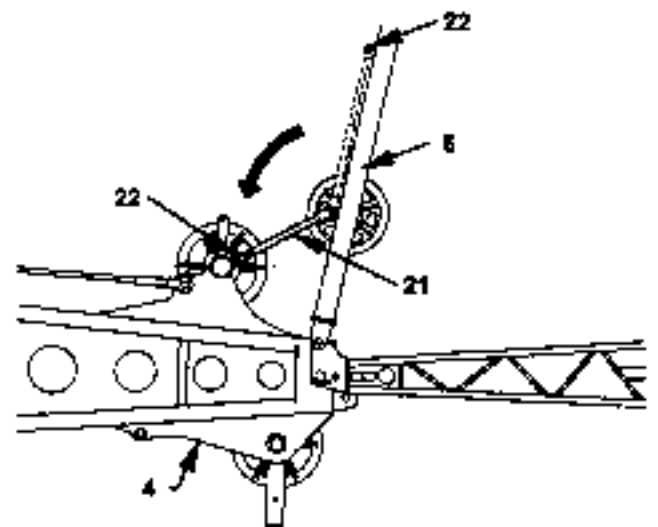
200-08-113

8. Install fly jib mast back stop (21).

**NOTE:** After removing pin (22), which is used to hold the fly jib mast back stop (21) to the fly jib mast (6) during transportation, from fly jib mast (6), rotate fly jib mast back stop (21) downward. Then, secure fly jib mast back stop (21) to boom top section (4) with removed pin (22).



1000-08-109



200-08-102

## 5 ASSEMBLING/DISASSEMBLING

### 1.19 Install Short Jib

Refer to 1.13 Configurations of Boom/Jib and Pendant Rope for the attachable boom/short jib length and the combination of the jib pendant ropes.

There are two types of short jibs available, Sheave 1 type and Sheave 2 type. However, installation of both types is identical. Sheave 1 type is illustrated in this group.

#### IMPORTANT:

- Clean the connection pin holes and coat the pin hole surfaces with grease.
- The side sheave can not be used at the same time.

1. Lower the boom to a stand.

**NOTE:** Use a stand higher than 500 mm.

2. Remove cotter pin (1), pin A (2), and plate (5) from the short jib foot.
3. Remove cotter pin (3) and pin B (4) from link (8).
4. Remove lock pin (6) and rope guide pin (7) from the short jib. Rotate link (8) toward the short jib sheave side.

**NOTE:** Lay link (8) on rope guide (9).

5. Move bracket (12), which is installed on boom top point sheave pin (10), outward.

**NOTE:** Remove cotter pin (13) and pin (14) to move bracket (12) outward.

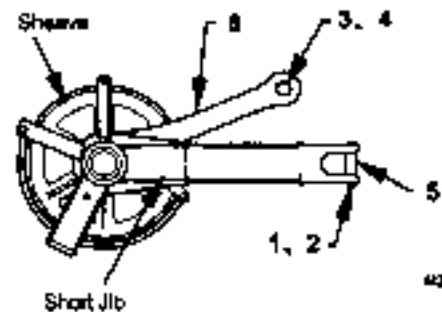
6. Using an assistant crane, lift the short jib so that the both short jib ends align with point sheave pin (10). Install plate (5), pin A (2), and cotter pin (1).

Short Jib Weight: 400kg

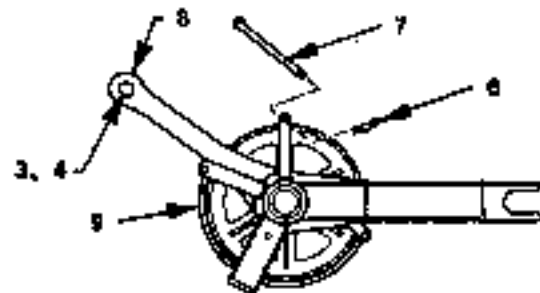
7. Rotate link (8) toward the boom top section. Align the pin holes on link (8) and boom top section mounting lug (11) with each other. Secure link (8) with pin B (4) and cotter pin (3).

#### NOTE:

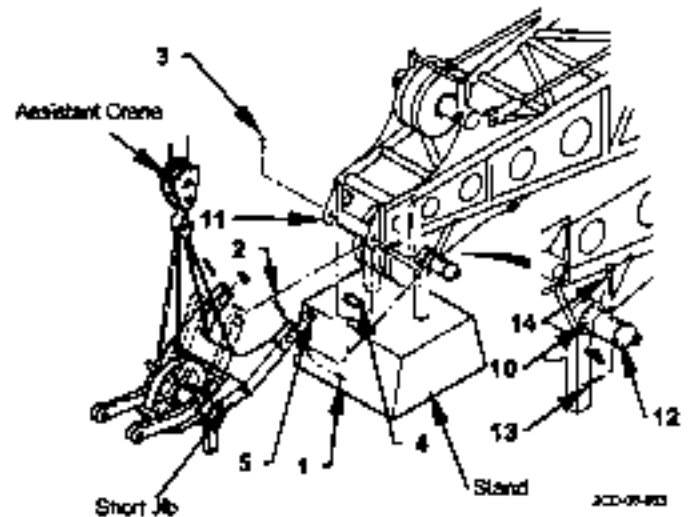
- Install pin B (4) from the boom inside out.
  - Open the end of cotter pin (3) 30 to 90°.
8. Install rope guide pin (7) and lock pin (6).



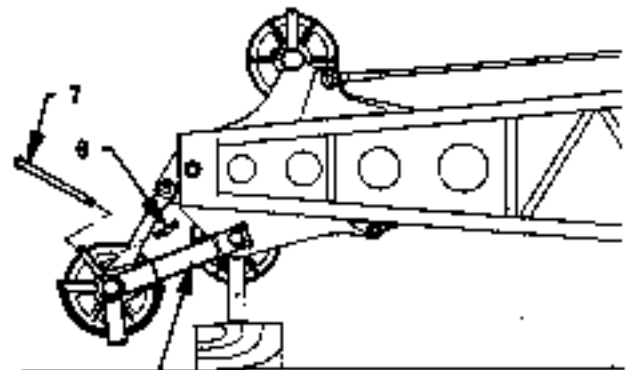
42284-08-110



42284-08-111



42284-08-112



42284-08-113

## 5 ASSEMBLING/DISASSEMBLING

### 1.20 Install Hook and Wire Rope



#### WARNING

- Do not raise the boom more than 30° without connecting the hook. The wire rope may fall by its own weight.
- Wire rope will be twisted by the curvature on the sheave or loads during operation. Therefore, when the socket pin is removed to replace or reinstall the wire rope, the wire rope may unexpectedly be untwisted, possibly creating a hazardous situation. Especially, when working in high places, use a safety belt or take necessary safety measures before removing the wire rope.

Rated Gross Load According to Type and No. of Reeved Lines  
Rope Diameter: 26 mm

(Unit: t)

Hook (t)	Weight (t)	Maximum rated loads (t)/No. of Reeved Lines												
		14 falls	12 falls	11 falls	10 falls	9 falls	8 falls	7 falls	6 falls	5 falls	4 falls	3 falls	2 falls	1 falls
150	2.04	150.0	135.0	120.0	110.0	99.0	88.0	77.0	66.0	56.0	—	—	—	—
135	1.88	—	135.0	120.0	110.0	99.0	88.0	77.0	66.0	56.0	—	—	—	—
50	0.90	—	—	—	—	—	—	—	—	50.0	44.0	—	—	—
30	0.73	—	—	—	—	—	—	—	—	—	—	30.0	22.0	—
11	0.37	—	—	—	—	—	—	—	—	—	—	—	—	11.0

#### IMPORTANT:

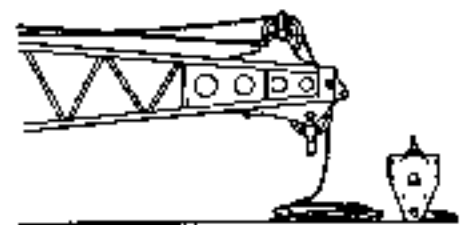
- Do not use a hook without the maximum gross rated load clearly marked.
- Decide the No. of reeved lines according to the load value to be lifted. Refer to the Gross Rated Load Table.
- It is impossible for the machine to be operated with only one reeved line except for operating the shot jib using the third drum (optional) wire rope.

#### 1.20.1 Install Wire Rope to Front Drum

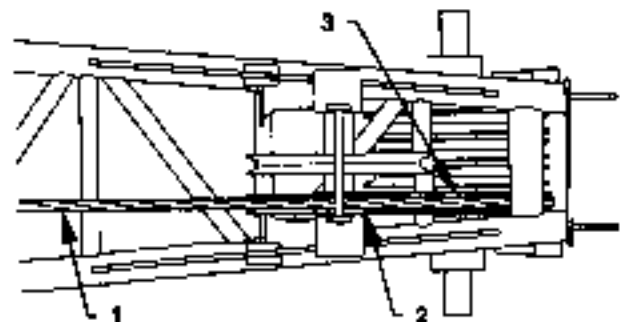
1. Place the hook to be used in front of the boom.
2. Pay out front drum wire rope (1). Thread the wire rope through right side guide sheave (2) and point sheave (3) on the boom top section.

#### NOTE:

- Pay out the wire rope by the length corresponding to the No. of reeved lines on the hook.
- Be careful not to allow the rope on the front drum to become overly loose.



720-05-063

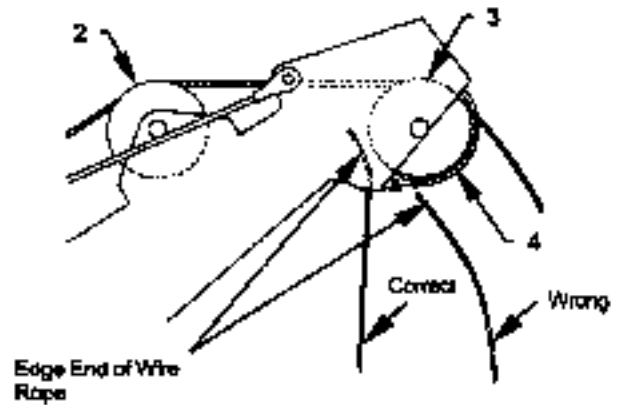


720-05-067

## 5 ASSEMBLING/DISASSEMBLING

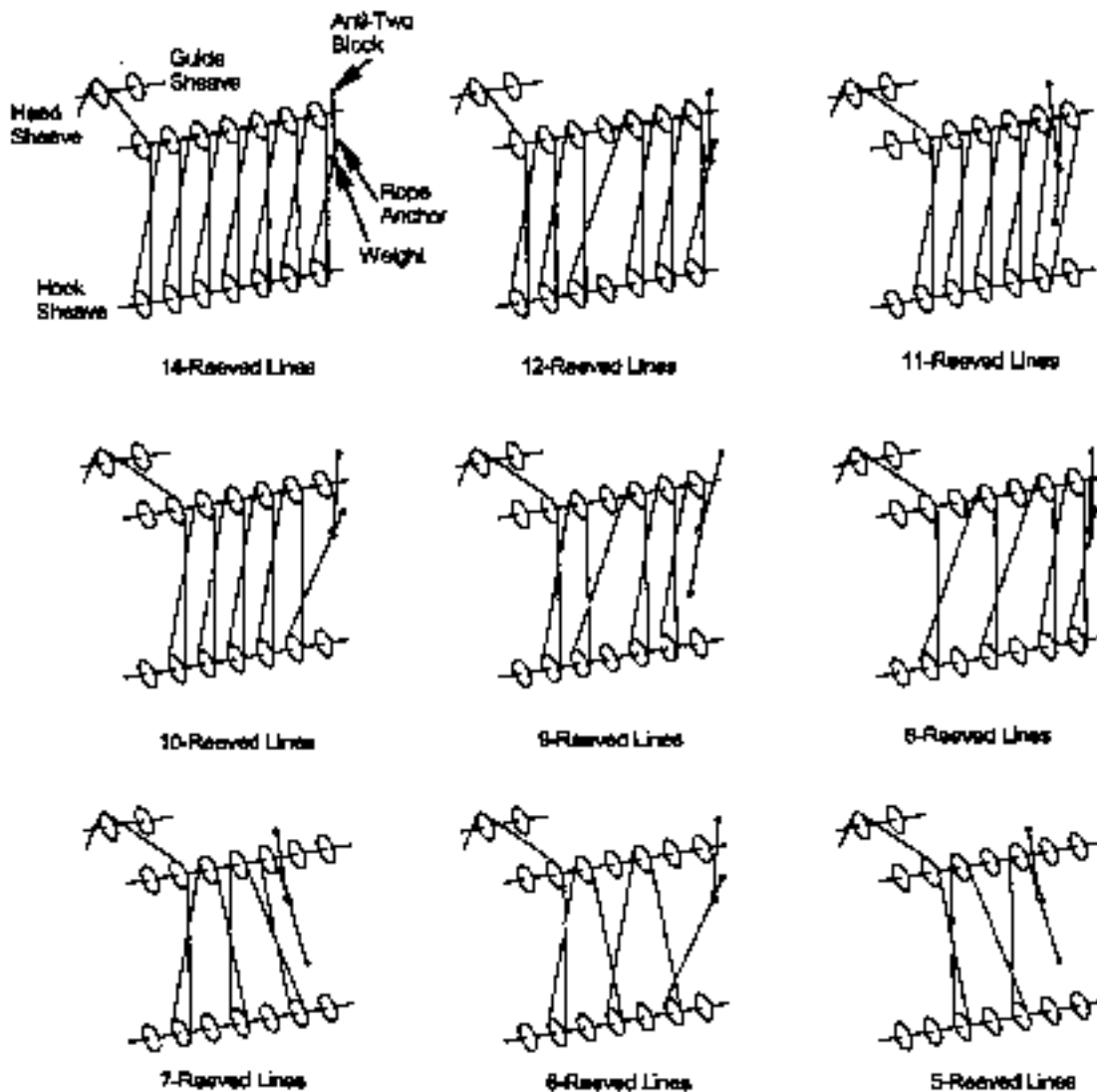
3. While referring to the illustrations for the wire rope threading method, install the wire rope into the hook and point sheaves.

**NOTE:** When threading the wire rope around point sheave (3) from the underside, install the wire rope from the outside of rope guide (4).



W824-07-103

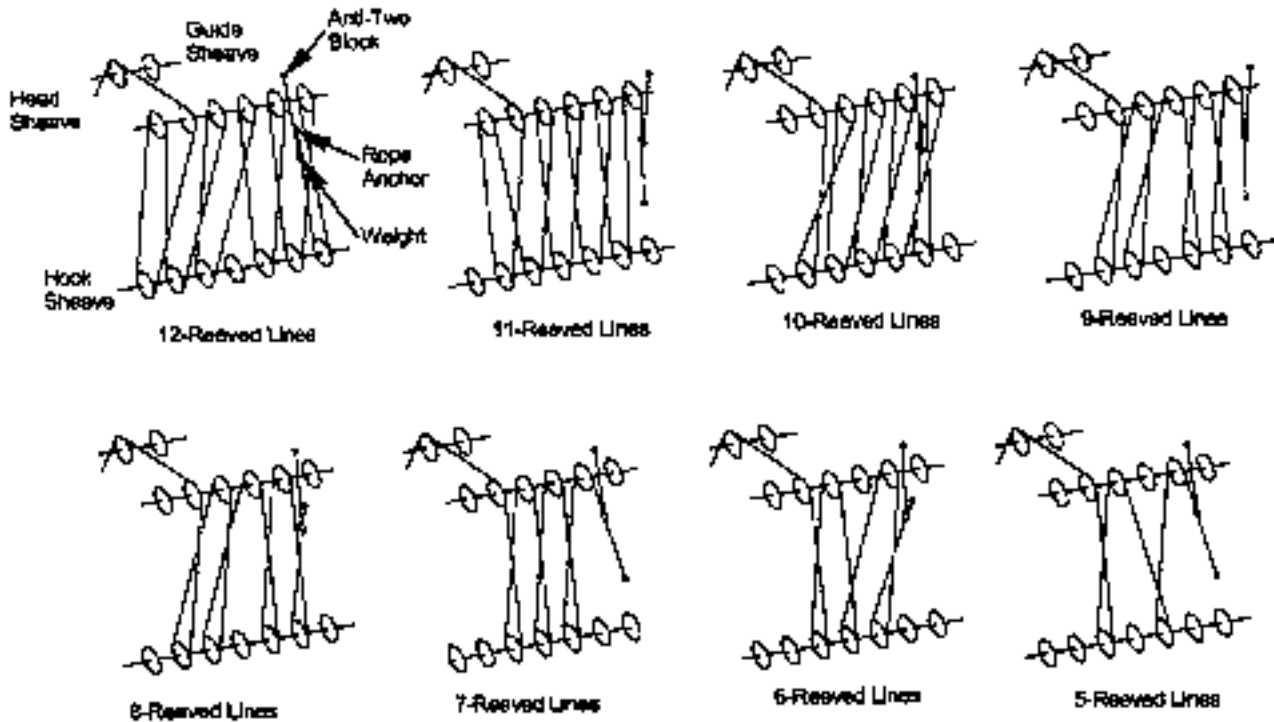
### (1) Wire Rope Threading Methods for 150t-Hook 4.5 m Heavy Top Boom



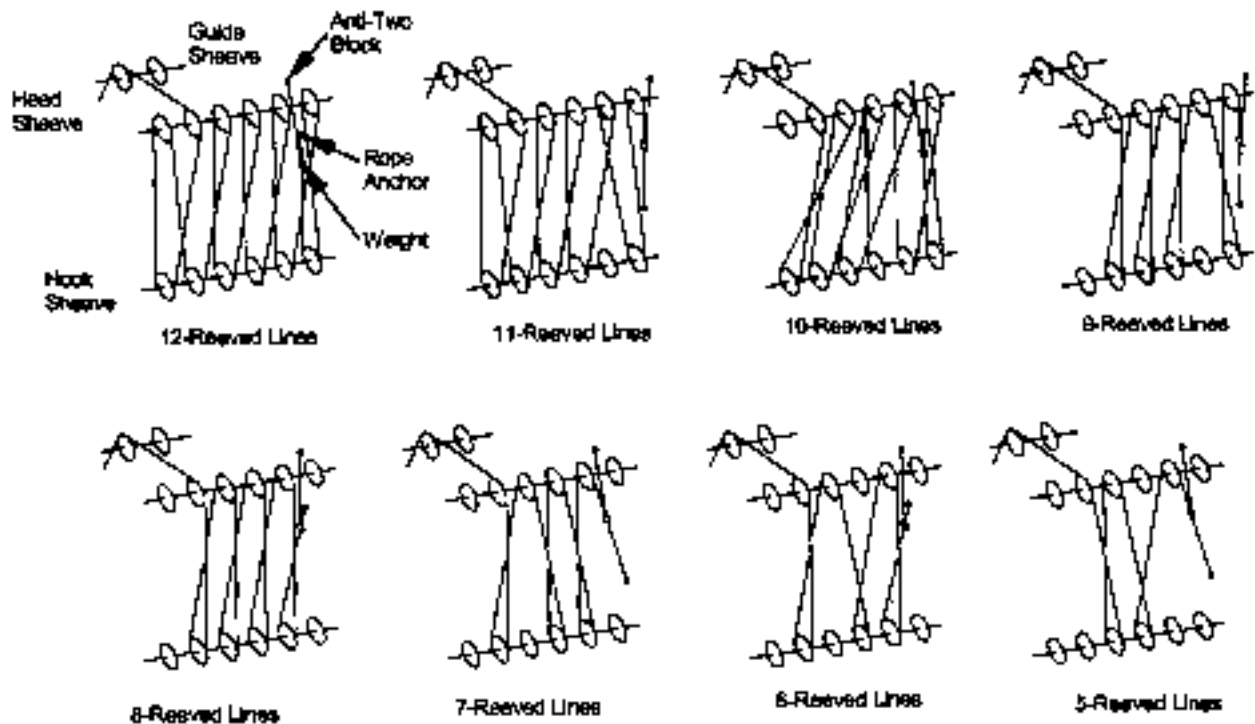
W822-04-099

## 5 ASSEMBLING/DISASSEMBLING

### (2) Wire Rope Threading Methods for 150t-Hook 7.5 m Top Boom

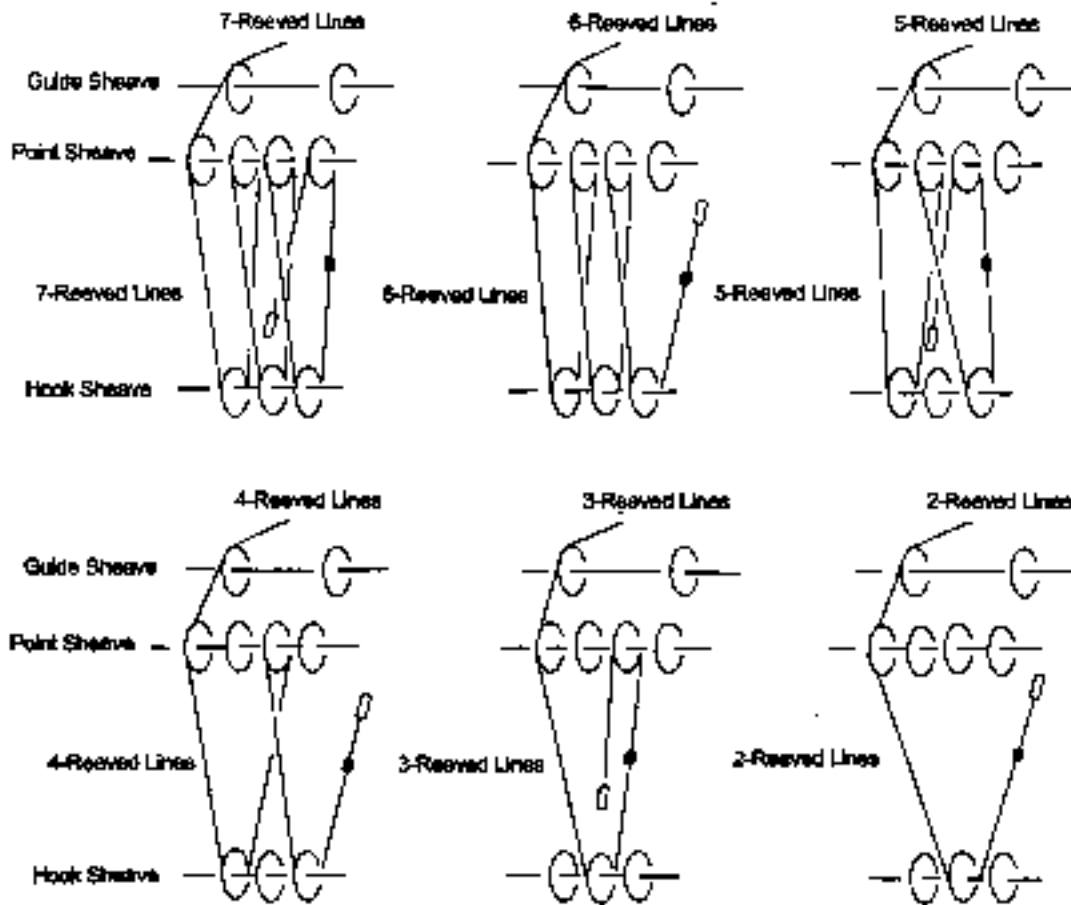


### (3) Wire Rope Threading Methods for 135t-Hook (Option) 7.5 m Top Boom



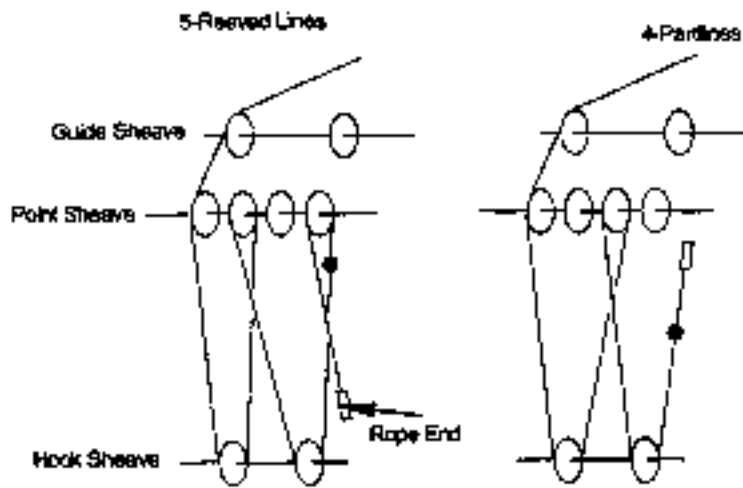
## 5 ASSEMBLING/DISASSEMBLING

### (4) Wire Rope Threading Methods for 70t-Hook (Optional)



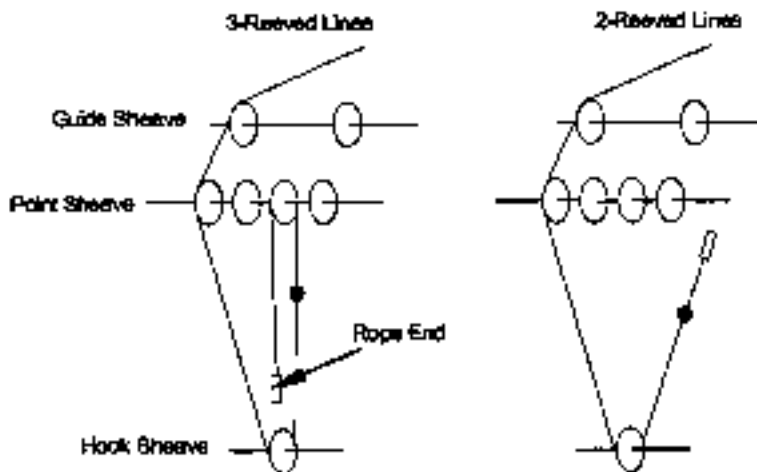
## 5 ASSEMBLING/DISASSEMBLING

**(5) Wire Rope Threading Methods for 50t-Hook (Optional)  
7.5 m Top Boom**



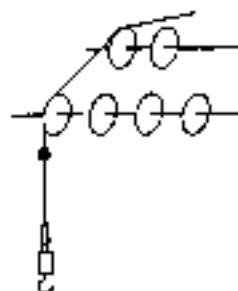
100-05288

**(6) Wire Rope Threading Methods for 30t-Hook (Optional)  
7.5 m Top Boom**



100-05142

**(7) Wire Rope Threading Methods for 11t-Hook (Optional)  
7.5 m Top Boom**



□ Mark: Rope Socket Installation Position  
● Mark: Weight position for hook hoisting limiter

100-05142

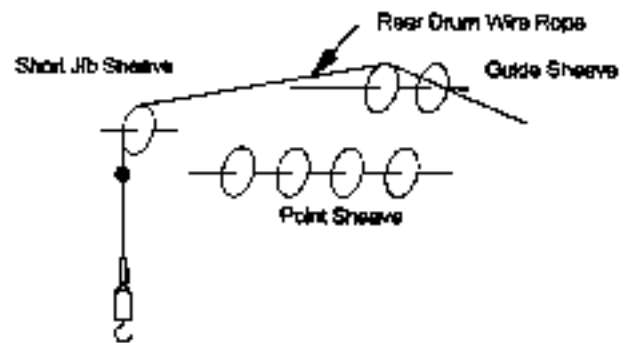


## 5 ASSEMBLING/DISASSEMBLING

### 1.20.2 Install Wire Rope to Rear Drum

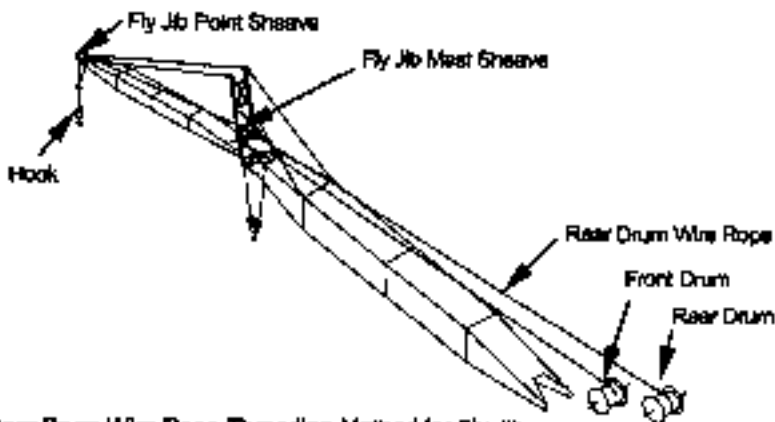
1. Place the hook to be used in front of the boom, fly jib, or short jib.
2. Pay out rear drum wire rope. Thread the wire rope by referring to the methods illustrated below.

**NOTE:** Install wire rope while referring to the wire rope installing method illustration.



Rear Drum Wire Rope Threading Method for Short Jib

MC24-05-148



Rear Drum Wire Rope Threading Method for Fly Jib

MC24-05-149

## 5 ASSEMBLING/DISASSEMBLING

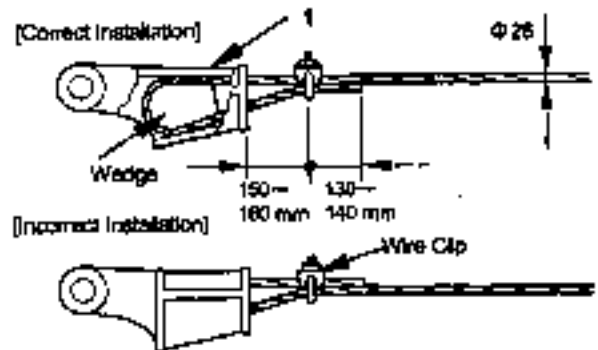
### 1.21 Install Rope Socket

#### 1.21.1 Installation of Front Drum Wire Rope Socket

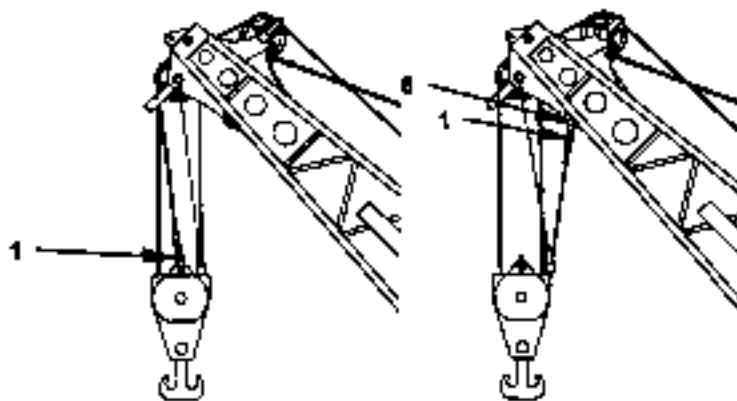
- 1 After attaching rope socket (1) to the wire rope end, connect rope socket (1) to the boom top section or hook (2) with pin (3), castle nut (4) and cotter pin (5).

**NOTE:**

- Correct installation method of wire rope into rope socket (1) is illustrated to the right.
- When lifting the hook with even No. of falls, install the rope socket (1) to the boom using link (6). When lifting the hook with odd No. of falls, install rope socket (1) directly to the hook block.

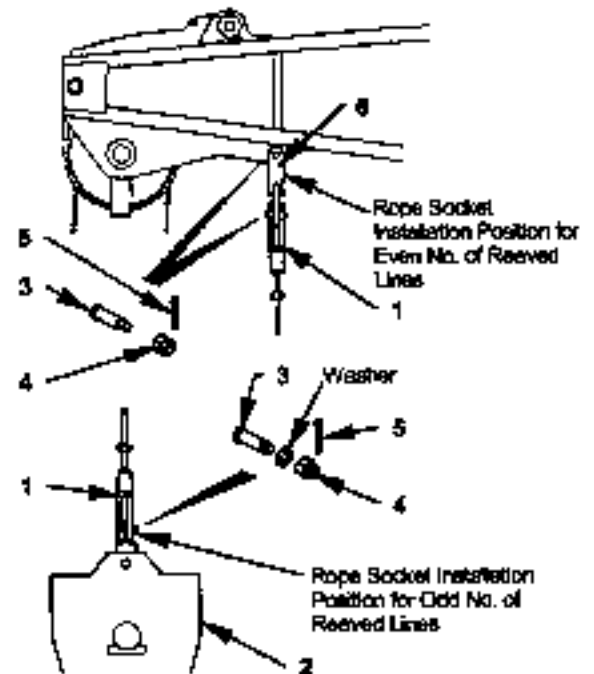


AC204-02-114



Lifting Boom Hook with Even No. of Reeved Lines

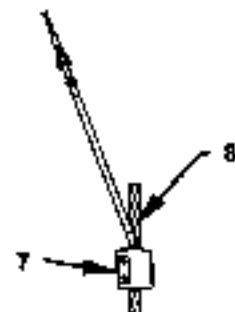
Lifting Boom Hook with Odd No. of Reeved Lines



verce-08-078

2. Install hook hoisting limiter weight (7) on wire rope (8).

**NOTE:** Refer to the illustrations of Wire Rope Threading Methods for the weight position.



YCS-08-115

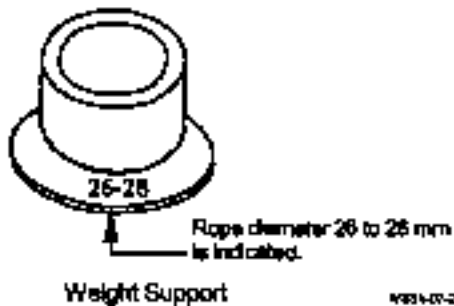
## 5 ASSEMBLING/DISASSEMBLING

### 1.21.2 Installation of Rear Drum Wire Rope Socket

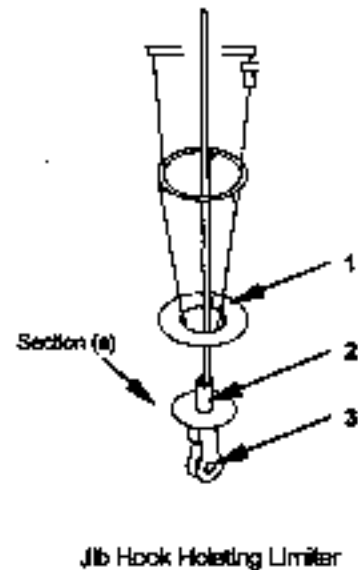
1. Thread the wire rope through crane or short jib hook hoisting limiter weight (1).

**NOTE:**

- The hook hoisting limiter may not operate unless weight support (2) is installed.
- Always check and use the correct weight support (2) matching the wire rope diameter stamped on it.



M225-07-020

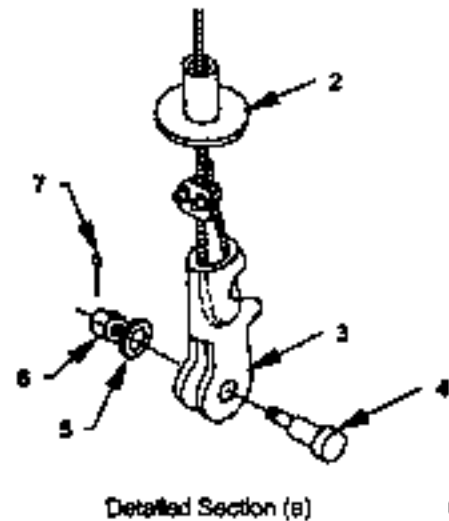


M225-07-020

2. In case the hook is lifted with 1-reeved line, install weight (1), weight support (2) and rope socket (3) to the wire rope end. Securely install jib hook (111) to rope socket (3) with pin (4), washer (5), castle nut (6), and cotter pin (7).

**NOTE:**

- Open cotter pin (7) ends 30 to 90°.
- Be sure to install the wire rope end into rope socket (3) in the correct securing method.



M225-07-100



M225-07-021

## 5 ASSEMBLING/DISASSEMBLING

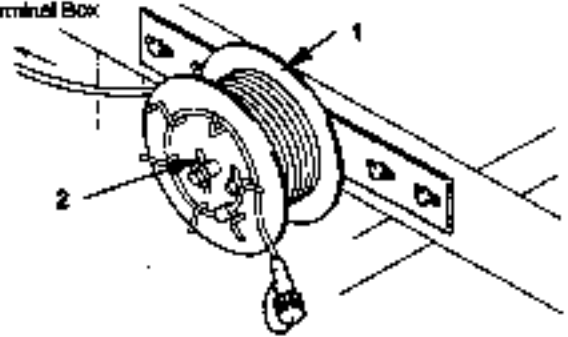
### 1.22 Wiring

**IMPORTANT:** Securely tighten wiring connectors so that rain does not permeate.

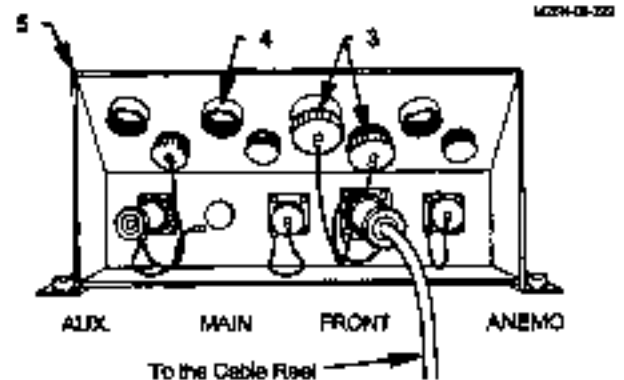
#### 1.22.1 Wiring on Boom

1. Remove lock pin (2) from cable reel (1) on the boom base section. Pull the cable out of reel (1). Connect the cable to the FRONT terminal on boom top section terminal box (5).

To the FRONT  
Terminal on the  
Terminal Box

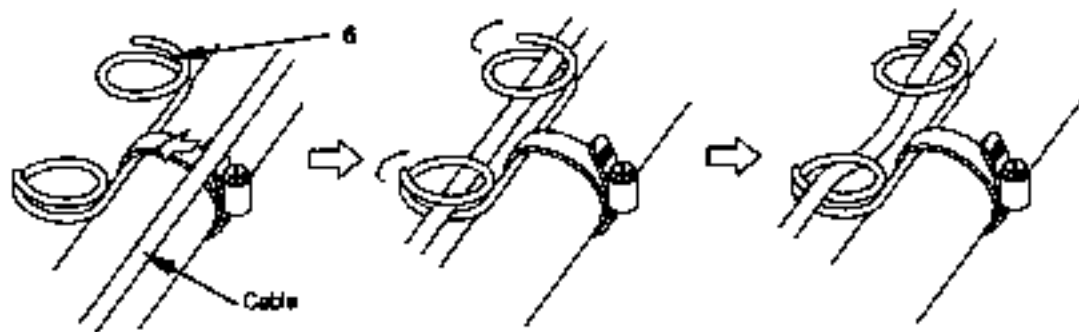
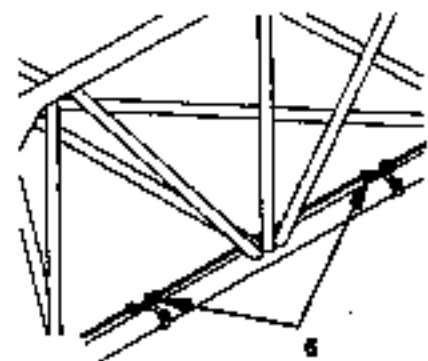


**NOTE:** Connect cap (3) to plug (4).



2. Clamp the cable between cable reel (1) and terminal box (5) to the boom with clips (6) in order from terminal box (5).

**NOTE:** Thread the cable in clips (6) as illustrated below.



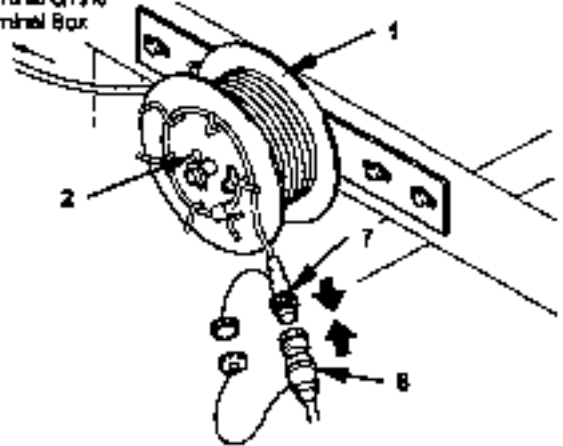
4024-08-121

## 5 ASSEMBLING/DISASSEMBLING

3. Connect connector (7) on cable reel (1) to base machine side cable and connector (8) on the boom base section.

**NOTE:** Connect the removed caps each other.

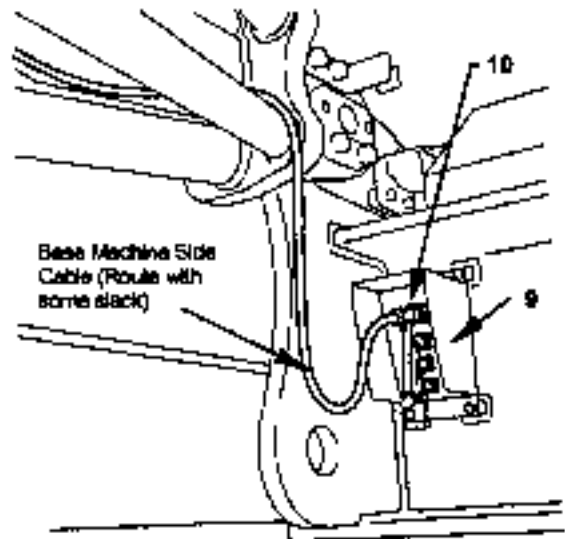
To the FRONT  
Terminal on the  
Terminal Box



42281-06-101

4. Connect base machine side cable and connector (10) on the boom base section to base machine side terminal box (9).

**NOTE:** Route the cable with some slack around the boom foot so that the cable is not tightened when and/or after the boom is elected.



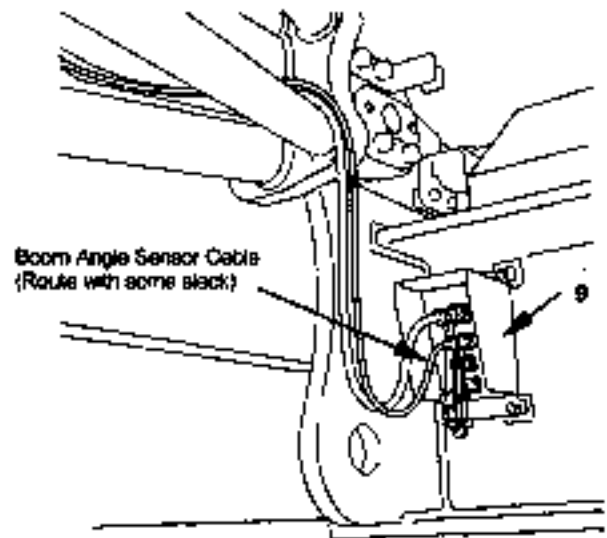
42281-06-206

## 5 ASSEMBLING/DISASSEMBLING

### 1.22.2 Connect Boom Angle Sensor Cable

1. Connect the boom angle sensor cable routed on the boom base section to base machine side terminal box (9).

*NOTE: Route the cable with some slack around the boom foot so that the cable is not tightened when and/or after the boom is raised.*



4284-06-24

## 5 ASSEMBLING/DISASSEMBLING

### 1.22.3 Connect Hook Hoisting Limiter Cable

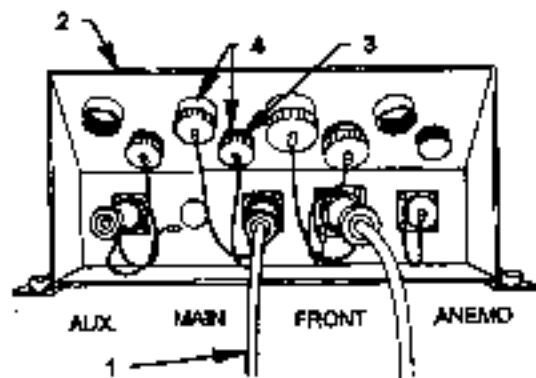
#### (1) Boom Hook Hoisting Limiter Cable

1. Connect one end of boom hook hoisting limiter cable (1) to the MAIN terminal on boom top section terminal box (2).

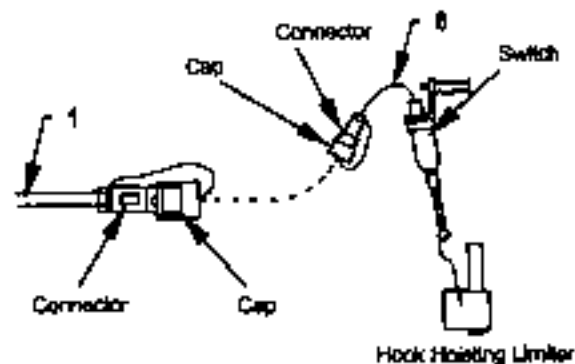
*NOTE: Connect removed cap (3) to plug (4).*

2. Connect the other end of boom hook hoisting limiter cable (1) to switch cable (6).

*NOTE: Connect the removed caps each other.*



1224-05-10



1224-05-14

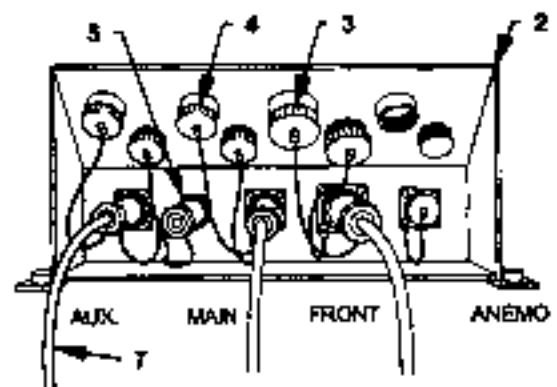
#### (2) Short Jib Hook Hoisting Limiter Cable (Optional)

1. Connect one end of short jib hook hoisting limiter cable (7) to the AUX terminal on boom top section terminal box (2).

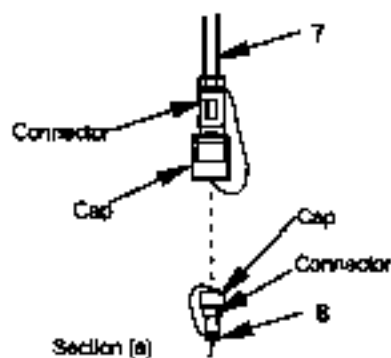
*NOTE: Connect removed short circuit connector (5) to plug (4).*

2. Connect the other end of short jib hook hoisting limiter cable (7) to switch cable (8).

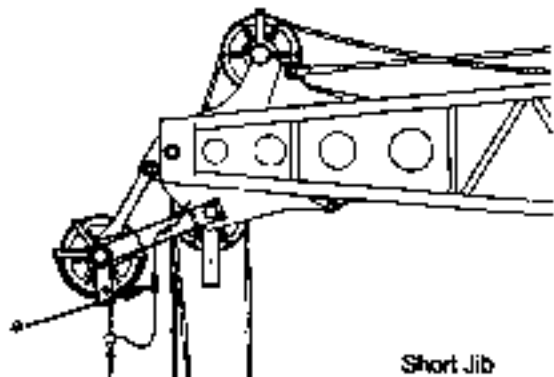
*NOTE: Connect the removed caps with each other.*



1224-05-17



1224-05-24



Short Jib

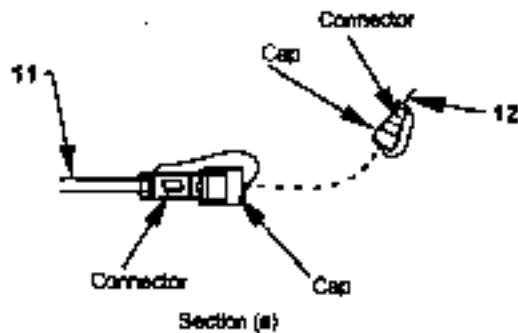
1224-05-24

## 5 ASSEMBLING/DISASSEMBLING

### (3) Fly Jib Hook Hoisting Limiter Cable

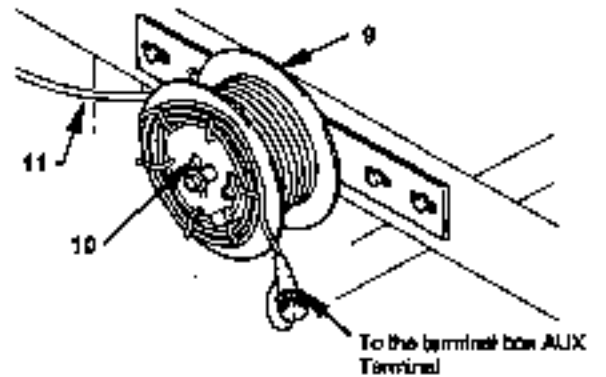
1. Remove lock pin (10) from cable reel (9) on the fly jib base section. Pull the cable out of reel (9). Connect jib hook hoisting limiter cable (11) to switch cable (12).

**NOTE:** Connect the removed caps with each other.

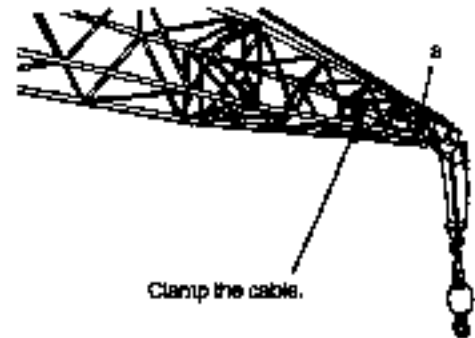


W029-05-146

2. Clamp the cable from cable reel (9) to the fly jib with clips (13) in order from the switch side.

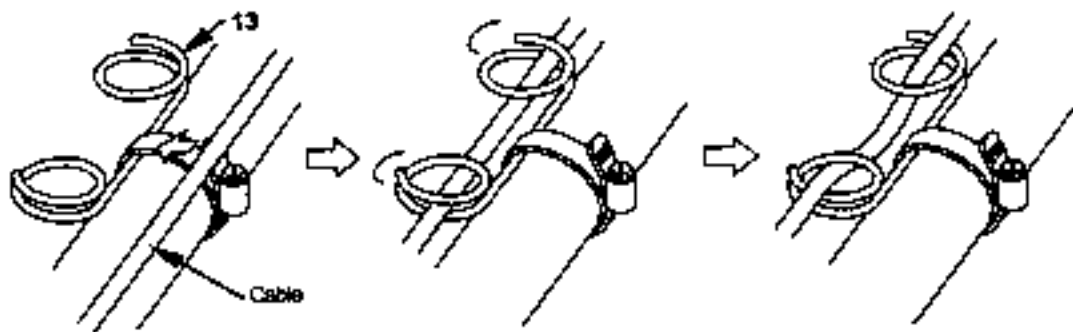


W029-05-147



W029-07-148

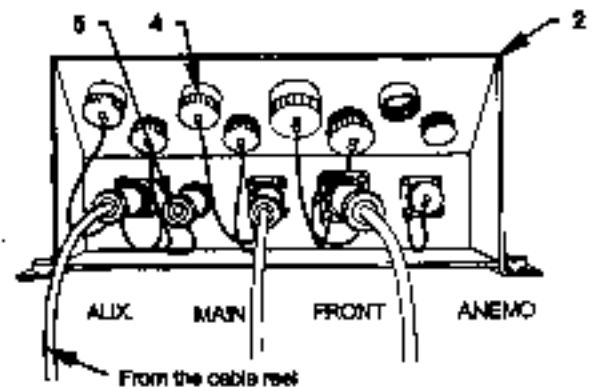
**NOTE:** Thread the cable in clips (13) as illustrated below.



W029-08-149

3. Secure cable reel (9) with lock pin (10).
4. Pay out the cable reel outside cable and connect the cable end to the AUX terminal on boom top section terminal box (2).

**NOTE:** Connect removed short circuit connector (5) to plug (4).



W029-09-150



## 5 ASSEMBLING/DISASSEMBLING

### 1.23 Remove Stanchions and Support Rope (Optional)



#### WARNING

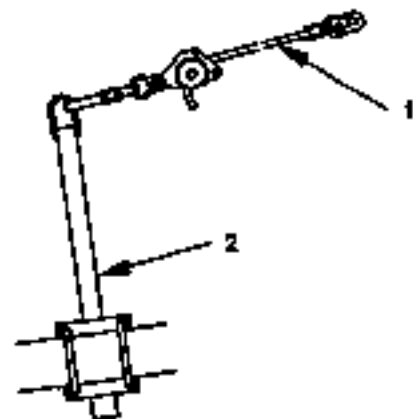
Be careful not to fall off the boom.

1. Remove support rope (1) from stanchions (2).

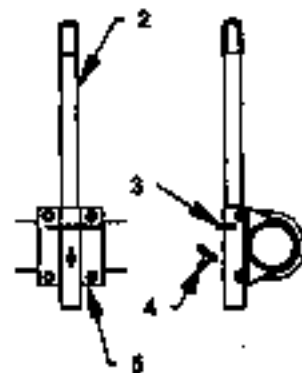


MO01-07-267

2. Remove stanchion lock pin (3) and lock bolt (4).  
Remove stanchion (2) from stanchion mounting  
bracket (5).



MO01-07-248



MO01-07-244

## 5 ASSEMBLING/DISASSEMBLING

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### 1.24 Boom Erection

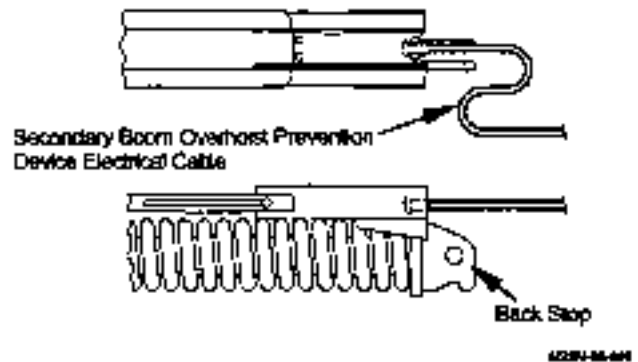
#### 1.24.1 Check Machine After Assembling

After assembling the machine, recheck that all parts are correctly installed or connected. If any fault is found, reassemble the faulty section according to the correct procedures.

1. Check that the cotter pins for all connection pins are correctly installed.
  - Boom Connection Pin
  - Fly Jib Connection Pin
  - Short Jib Connection
  - Fly Jib Mast Connection Pin
  - Back Stop Connection Pin
  - Pendant Rope Connection Pin
  - Fly Jib Pendant Rope Connection Pin
  - Wire Rope Socket Connection Pin
2. Check that the rope socket wire clips are correctly installed.
  - Front Drum Wire Rope Clip
  - Rear Drum Wire Rope Clip
  - Boom Derricking Drum Wire Rope Clip
3. Check that all bolts are securely tightened.
  - Drum and Wire Rope Connection
  - Boom Foot Pin
  - Guide Roller Mounting Section
  - Short Jib Connection
  - Fly Jib Foot Pin
  - Hook Overhoist Prevention Device Switch and Weight Connection
  - Sheave Mounting Pins

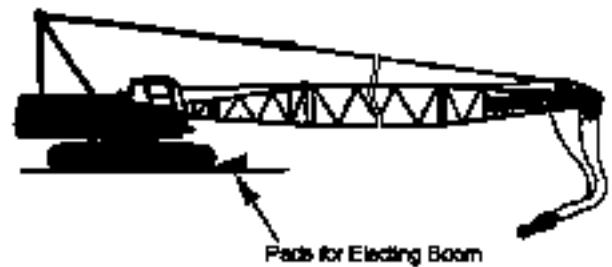
## 5 ASSEMBLING/DISASSEMBLING

4. Check that all cable connections are correctly connected.
  - Hook Hoisting Limiter Cable
  - Boom Angle Sensor Cable
  - Secondary Boom Overhoist Prevention Device Cable
  - Other Front Attachment Cables
5. Check that the lengths of the pendant rope, fly jib pendant are correct.
6. Check that wire ropes are correctly installed and threaded.
7. Check that all wire ropes are laying on top of the boom without being restricted.
8. Check that no tools are left behind.

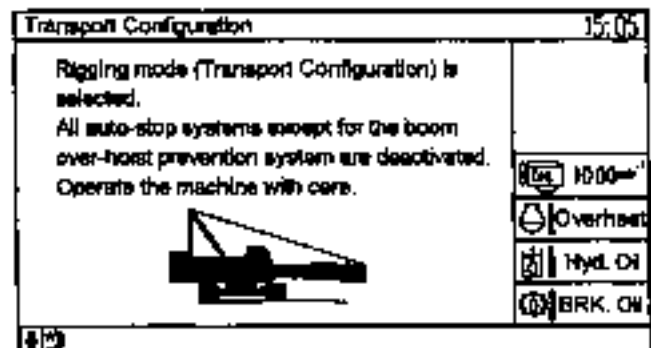


### 1.24.2 Check Before Boom Erection

Check the following points before elect the boom. If any improper or abnormal status is found, correct it before electing the boom.



1. Recheck that all conditions to raise the boom have been met.
  - The ground surface on which the machine setup is done is level and solid.
  - No obstructions such as power lines are present in the area in which the boom is to be elected.
  - Check that wind will not work against boom electing operation.
2. Check that the boom electing pads are correctly laid.
  - Refer to the group titled with "1.14 Conditions to Erect Boom and Jib" for the boom lengths which require the pads.
3. Check operation of the safety devices while referring to Section 7 Inspection and Maintenance.
  - Boom Hook Hoisting Limiter
  - Jib Hook Hoisting Limiter
  - Boom Derrick Limiter
  - Secondary Boom Overhoist Prevention Device
4. Check that the moment limiter displays the transport configuration.



## 5 ASSEMBLING/DISASSEMBLING

### 1.24.3 Boom Erection



#### WARNING

- Practice the boom erecting work with a team of two personnel (operator and signal person/observer). The signal person/observer shall be in a position to be able to predict a potential hazard and inform the operator of the presence of such potentially well in advance.
- When the rated capacity limiter displays the transport configuration, all auto-stop systems except the boom derrick limiter are deactivated. Operate the machine with care.



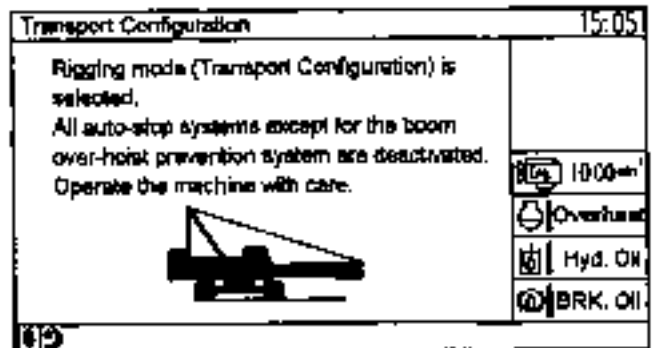
#### CAUTION

- Slowly wind the boom derricking drum wire rope while taking care not to allow the wire rope to come off and/or become entangled with the sheaves until slack on the wire rope is removed.
- Do not lift the hook off the ground until the boom angle enters the operation range (the rated capacity limiter displays the ML screen).

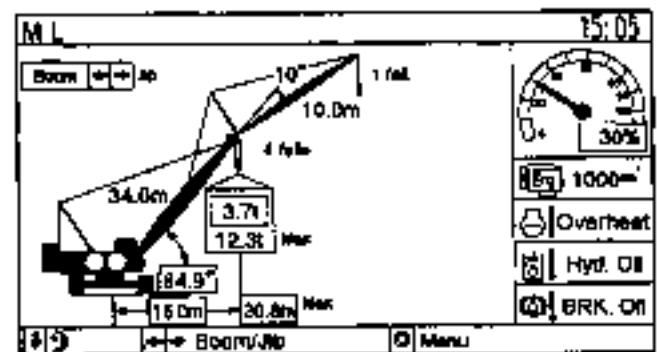
- Turn the accelerator grip clockwise full stroke to reduce the pump delivery flow rate to the minimum.
- Run the engine at 1000 to 1200 min<sup>-1</sup> (rpm). Move the boom derricking drum lever to the HOIST position.
- Slowly wind the boom derricking drum wire rope with the hook kept on the ground until the boom angle enters the operation range (the rated capacity limiter displays the ML screen).

#### NOTE:

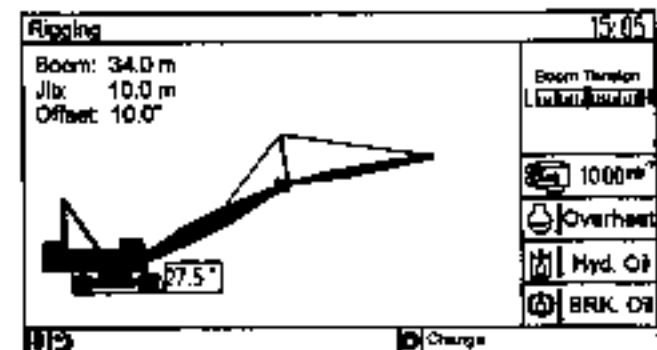
- The screen on the rated capacity limiter displays the Disassembly Configuration screen, the Rigging screen, and the ML screen in sequence.
- Before the hook is lifted off the ground, pay out the front or rear drum wire rope.
- Return the boom derricking drum lever to neutral. Hoist the hook.
- Slowly travel the machine backward. Remove the pads.



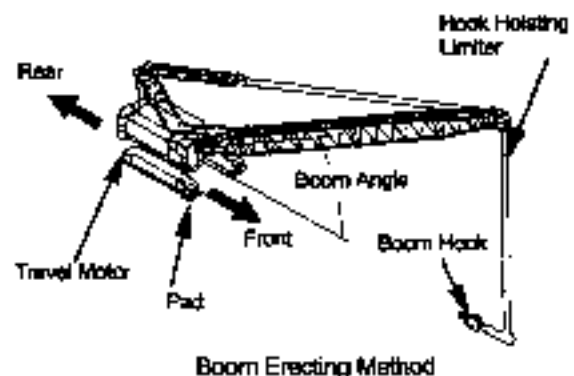
M22N-06-128



M22N-05-128



M22N-06-127



M22N-06-128

## 5 ASSEMBLING/DISASSEMBLING

### 2. DISASSEMBLE MACHINE FOR TRANSPORTATION

#### 2.1 Preparation and Precautions for Disassembling



##### WARNING

- If the machine is disassembled by following incorrect procedures, personal injury or death may result.
- Before beginning work, sufficiently coordinate with all personnel concerned to ensure safety during work.



##### CAUTION

- The attachment mounted side crawlers support a heavier load than the other side crawlers. Place steel plates with enough strength on the ground under the crawlers.
- Use an assistant crane, sling ropes, and shackles with enough strength to provide a sufficient margin when lifting loads.

Refer to Section 6 "3. Approx. Weights and Dimensions of Subassembly Units" for the contour dimensions and weight of each subassembly unit.

#### 2.1.1 Practices before beginning work

1. Have all coordination handled by the job site conductor to ensure safety prior to beginning any work.
2. Thoroughly inform all workers so they understand the types of work, procedures, and signals to be used at the job site, etc.
3. Check all instruments and materials for any abnormality.

#### 2.1.2 Selection of work area

Select a solid level surface wide enough to assemble the machine.

##### NOTE:

- Remove all obstacles from the area in which the crane will be moved.
- Provide a space wide enough for an assistant crane to move around
- Flatten indented surface areas. Horizontally reinforce any soft ground by placing high strength planks beforehand.
- Depending on the configuration of the front attachment, the laying direction of the front attachment is restricted. Refer to 1.14 "Conditions to Erect Boom and Jib."

#### 2.1.3 Equipment and Items to be prepared

- Assistant crane  
The specifications of the assistant crane shall be decided according of the job site conditions and types of work the machine is engaged in. Arrange a crane having sufficient lifting capacity.
- Arrange protection items, sling tools, base machine attachments, and tools necessary for the disassembly/assembly work.

## **5 ASSEMBLING/DISASSEMBLING**

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### **2.1.4 Necessary number of personnel**

Practice the work with more than four personnel present. (Crane operator, Assistant crane operator, Sling worker, and Signal person)

### **2.1.5 Keep all unauthorized persons clear from working area**

Take all measures necessary to keep all unauthorized persons clear from the working area during work.

## 5 ASSEMBLING/DISASSEMBLING

### 2.2 Check Before Lowering Boom

Check the following points before lowering the boom. If any improper or abnormal status is found, correct it before lowering the boom.

1. Recheck that all conditions to lower the boom have been met.

**NOTE:**

- The ground surface on which the machine is setup is level and solid.
  - No obstructions such as power lines are present in the area in which the boom is lowered.
2. Check that the boom lowering pads are correctly laid.

**NOTE:** Refer to the group titled with 1.14 "Conditions to Erect Boom and Jib" for the boom lengths which require the pads.

3. Check that the rated capacity limiter is correctly set.



1051-00-005

## 5 ASSEMBLING/DISASSEMBLING

### 2.2.1 Lower Boom



#### WARNING

- Practice the boom lowering work with a team of two personnel (operator and signal person/observer). The signal person/observer shall be in a position to be able to predict a potential hazard and inform the operator of the presence of such potentiality in advance.
- Never allow the workers, and/or signal person/observer to enter under the boom.
- When the rated capacity limiter displays the transport configuration, all auto-stop systems except the boom derricking limiter are deactivated. Operate the machine with care.



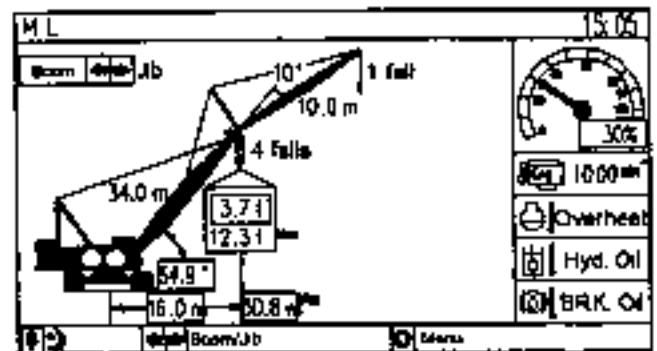
#### CAUTION

- Carefully lower the boom at slow speed so that impact loads are not created.
- After the boom angle reaches the maximum working radius (the rated capacity limiter displays the Rigging screen), lower the hook to the ground.

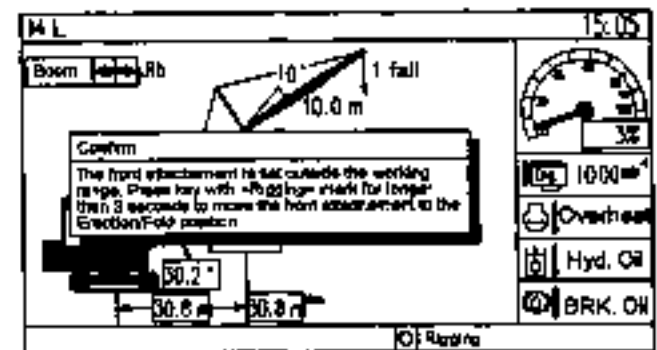
1. Check that the rated capacity limiter displays the ML screen or the ML Working Range Restriction screen.
2. Turn the accelerator grip clockwise full stroke to reduce the pump delivery flow rate to the minimum.
3. Run the engine at 1000 to 1200  $\text{min}^{-1}$  (rpm). Move the boom derricking drum lever to the LOWER position.
4. Slowly lower the boom until the boom angle reaches the maximum working radius range (the machine automatically stops as the moment limiter operates).

#### NOTE:

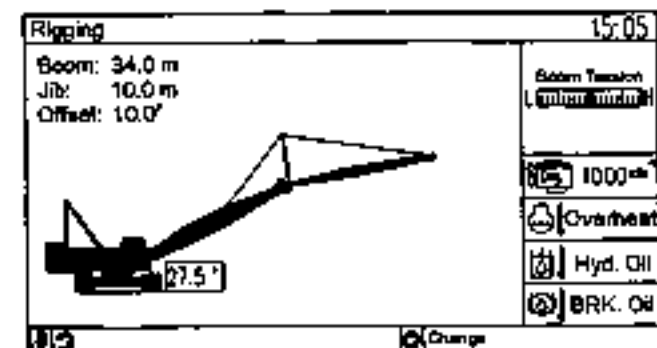
- Slightly before the machine automatically stops, the boom lowering speed is reduced.
- The rated capacity limiter displays the guidance for Rigging Confirmation.



10234-05-077




10234-05-078



10234-05-079



## 5 ASSEMBLING/DISASSEMBLING

5. Return the boom derricking drum lever to neutral. Press  key on the rated capacity limiter until the rated capacity limiter displays the Election Storage screen.

**NOTE:** The rated capacity limiter screen will shift in approx. 3 seconds. The auto-stop systems and the alarm buzzer systems are deactivated.

6. Lower the boom hook and the jib hook on the ground.

**NOTE:** Lower the hook in a position so that the hook does not obstruct the boom when the boom is lowered.

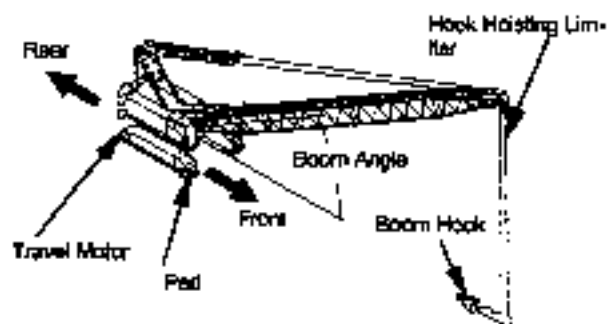
7. Move the boom derricking drum lever to the LOWER position again. Slowly lower the boom.

**NOTE:** When the boom angle comes close to 10°, the rated capacity limiter display shifts the Election Storage screen to the Disassembly Configuration screen.

8. Support the boom and the jib with stands.

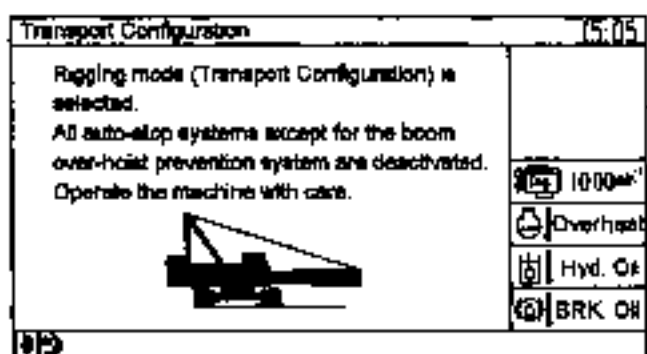
**NOTE:**

- Use a stand with the height of approx. 1 m.
- Take care not to damage the hook hoisting limiter.

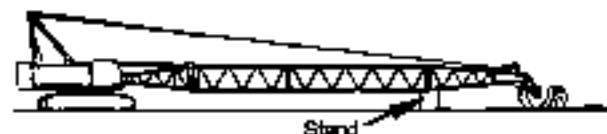


Boom erecting Method

MOB-05-100



MOB-05-123



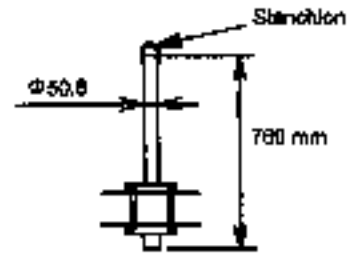
MOB-05-100

## 5 ASSEMBLING/DISASSEMBLING

### 2.3 Install Stanchions and Support Ropes (Optional)

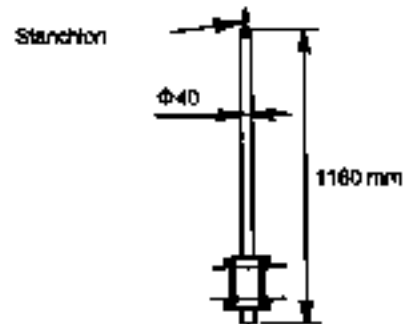
**⚠ WARNING**  
 Be careful not to fall off the base machine or the boom.

**IMPORTANT:** The lengths of the support rope stanchions for the boom top section, boom base section, and extension booms are different respectively. Take care not to mistake the length of them.



Use for boom top section and boom base section Booms

M331-07-238



Use for Extension Boom

M331-07-238

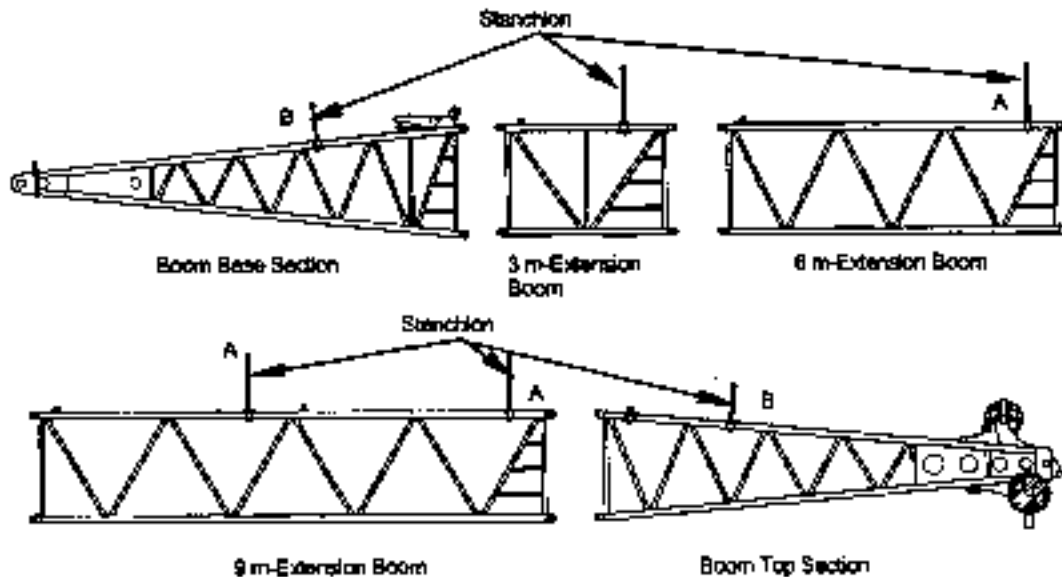


Detail (Section A)



Detail (Section B)

M331-07-240



2C-D-05-907

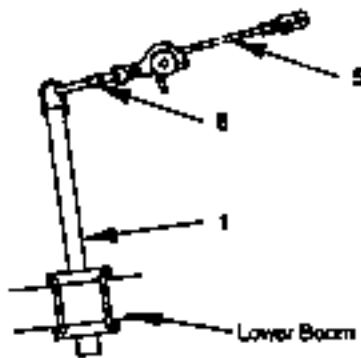
## 5 ASSEMBLING/DISASSEMBLING

1. Install stanchion (1) into bracket (2). Secure the stanchion in the specified position with lock pin (3) and lock bolt (4).

Stanchion: 5 kg for the Extension Boom  
4 kg for the boom top section  
and boom base section

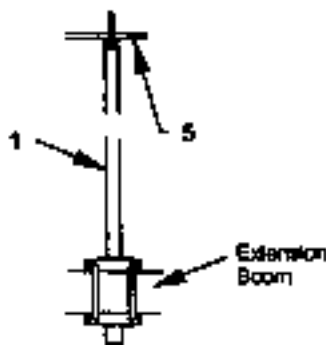
Wrench Size: 19 mm

2. Attach one end clamp (6) of support rope (5) to stanchion (1) on the boom base section.



M31-07-244

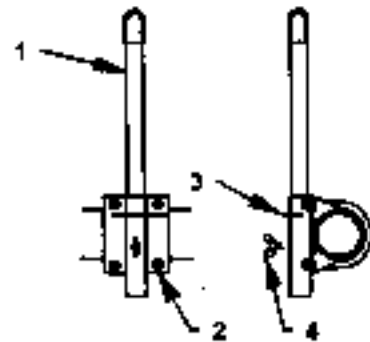
3. Thread the other end of support rope (5) through the ring on top of stanchion (1) on the extension boom. Connect the other end clamp of the support rope to the stanchion on the boom top section. Tighten the rope.



M31-07-247

**NOTE:** The length of the support rope is 30 m. In case the boom length is longer than 30 m, connect the wire in the following procedures:

4. After removing stanchion lock pin (3) and loosening lock bolt (4), rotate the stanchion 90° as illustrated. Then, reinstall lock pin (3) and tighten lock bolt (4).
5. Attach clamp (6) of support rope (5) to stanchion (1) as illustrated below. Tighten the rope.

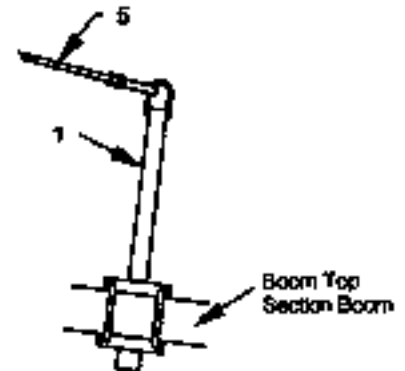


M31-07-244

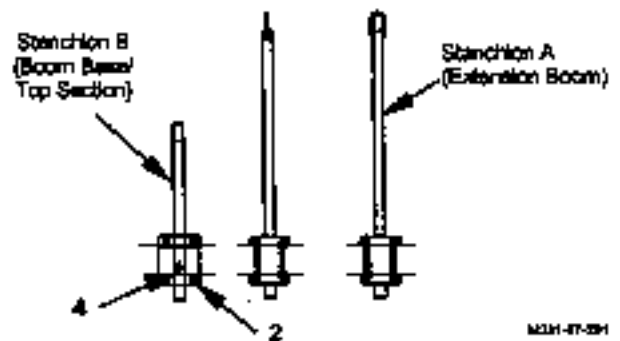
Thread this side clamp through the ring on top of the stanchion.



M31-07-244



M31-07-248



M31-07-249



M31-07-250

## 5 ASSEMBLING/DISASSEMBLING

### 2.4 Wind Front/Rear Drum Wire Rope



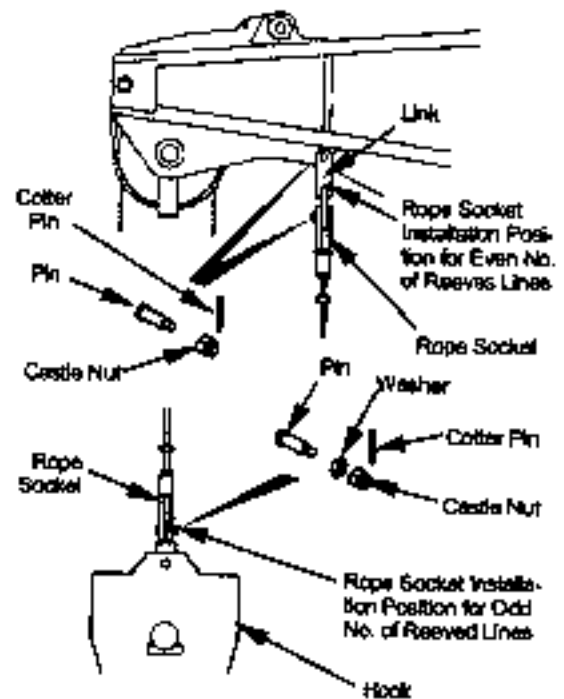
#### WARNING

- Do not raise the boom more than 30° without first connecting the hook. The wire rope may fall by its own weight.
- Wire rope will be twisted by the curvature on the sheave or loads during operation. Therefore, when the socket pin is removed to replace or reinstall the wire rope, the wire rope may unexpectedly untwist, possibly creating a hazardous situation. Especially, when working at high place, use a safety belt and take all necessary safety measures before removing the wire rope.
- When wire rope is wound, wire rope may fall off the boom. Keep away from the boom when winding the wire rope.

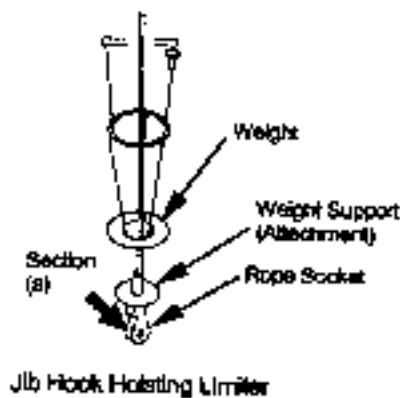
1. Remove the pin from the boom hook or the boom top section to remove the rope socket.
2. Remove the wire clip. Remove the wedge from the rope socket.
3. Remove the wire rope from the boom hook and point sheaves. Wind the wire rope on the front drum.

**NOTE:** Wind the wire rope so that the wire rope does not wind on the drum irregularly.

4. Following the same procedures, wind the wire rope on the rear drum.

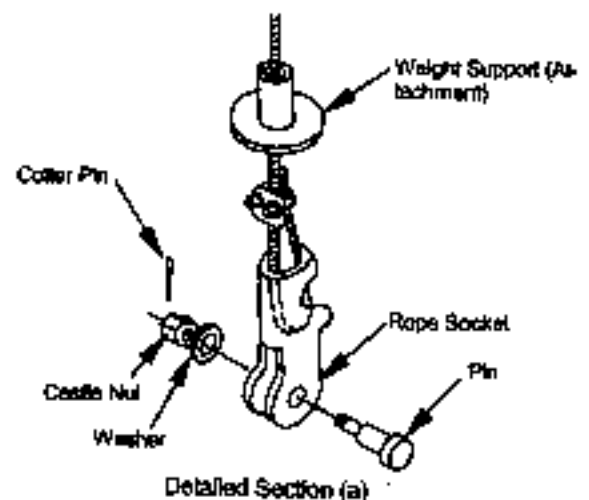


W025-01-020



Jib Hook Hoisting Limiter

W025-01-020



Detailed Section (a)

W025-01-100

## 5 ASSEMBLING/DISASSEMBLING

### 2.5 Disconnect Electrical Cables

#### 2.5.1 Wind Boom Cable

1. Disconnect connector (3) from the FRONT terminal on boom top section terminal box (1).

**NOTE:** Install caps (4 and 5) on relay box (1) and connector (3).

2. Remove the cable routed to boom top section terminal box (1) from clips.
3. Disconnect base machine side cable connector (6) from cable reel (2).

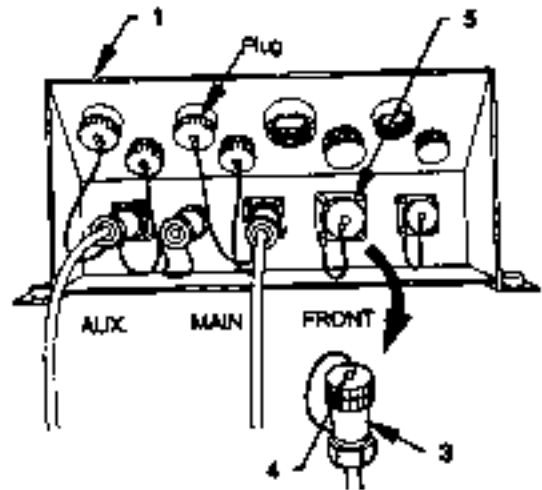
**NOTE:** Install caps (8 and 9) on connectors (6 and 7).

4. Remove lock pin (10) from cable reel (2). Wind the cable.
5. Lock cable reel (2) with lock pin (10). Secure the cable ends to cable reel (2) with cable fasteners.
6. Disconnect base machine side cable end connector (12) from base machine terminal box (11).

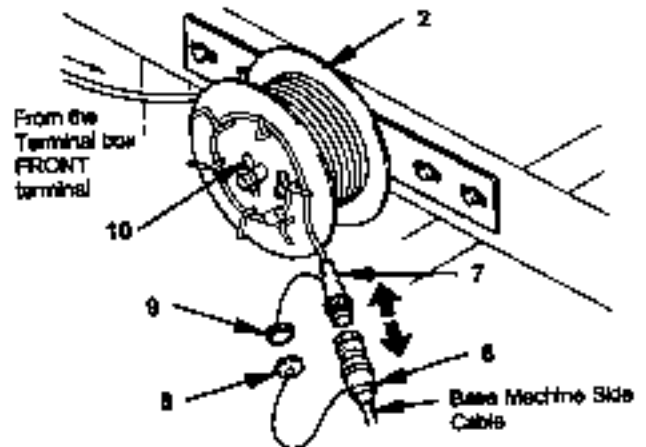
**NOTE:** Install caps (13 and 14) on terminal box (11) and connector (12).

7. Disconnect the boom angle sensor cable from base machine terminal box (11).

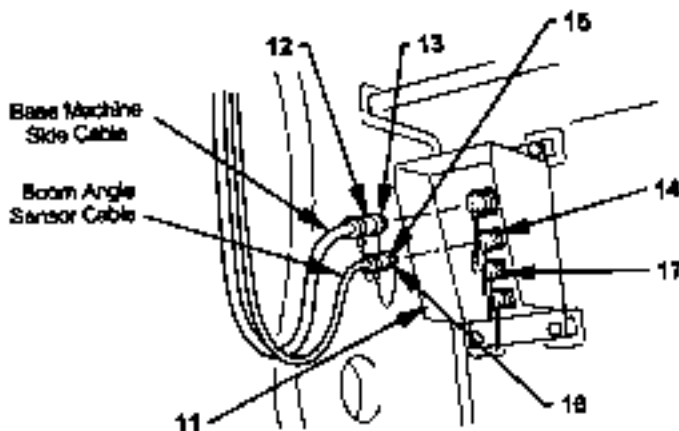
**NOTE:** Install caps (16 and 17) on terminal box (11) connector end cable end connector (15).



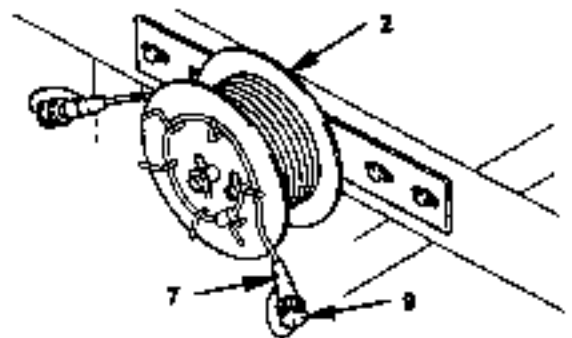
MOB-05-199



MOB-05-201



MOB-05-201



MOB-05-199

## 5 ASSEMBLING/DISASSEMBLING

### 2.5.2 Wind Fly Jib Cable

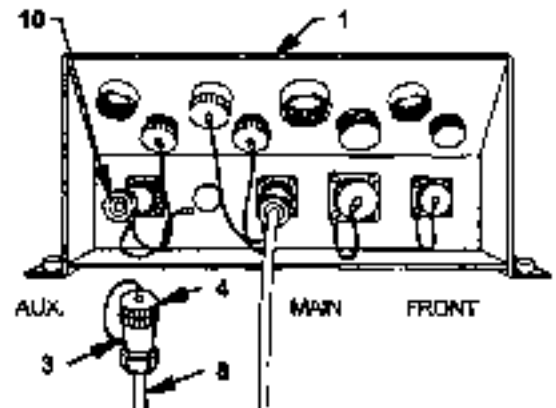
1. Disconnect cable connector (3) from the AUX terminal on boom top section terminal box (1).

**NOTE:**

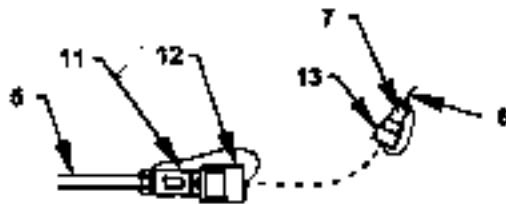
- Install cap (4) on connector (3).
- Connect short circuit connector (10) to the AUX terminal.

2. Disconnect connector (11) of jib hook hoisting limiter cable (5) from connector (7) of switch cable (6).

**NOTE:** Install caps (12 and 13) on connectors (11 and 7) respectively.



MS24-05-200



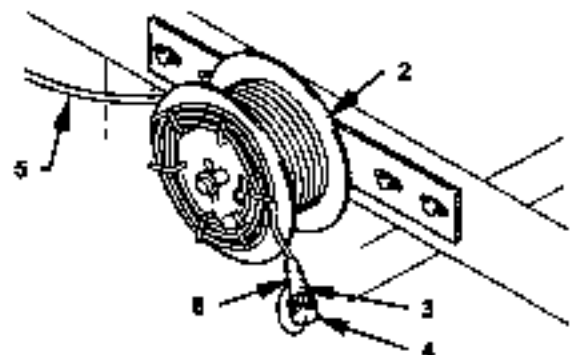
Section (a)

MS24-05-148

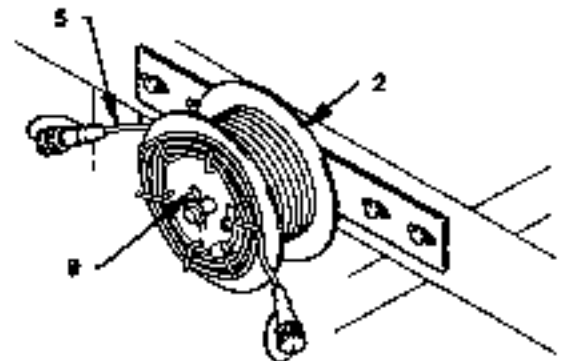


MS31-07-188

3. Remove cable (8) up to boom top section terminal box (1) and jib hook hoisting limiter cable (5) from the clips.
4. Wind cable (8) up to boom top section boom terminal box (1) on cable reel (2).
5. Remove lock pin (9) from cable reel (2). Wind jib hook hoisting limiter cable (5) on cable reel (2).
6. Lock the cable reel (2) with lock pin (9). Secure the cable ends to cable reel (2) with cable fasteners.



MS24-05-177



MS24-05-188

## 5 ASSEMBLING/DISASSEMBLING

### 2.6 Remove Short Jib

There are 2 types of short jib available, 1-sheave type and 2-sheave type. However, the same removal method can be applied to both of them. Illustrations in this group are shown with the 1-sheave type.

1. Lower the boom to a stand.

**NOTE:** Use a stand higher than 500 mm.

2. Remove rope guide pin (1) and lock pin (2).
3. Hold the short jib with an assistant crane.
4. Remove cotter pin (3) and pin B (9). Remove link (6) from upper boom mounting lugs (7).

**NOTE:** Rotate link (6) toward the sheave side to lay it on the rope guide.

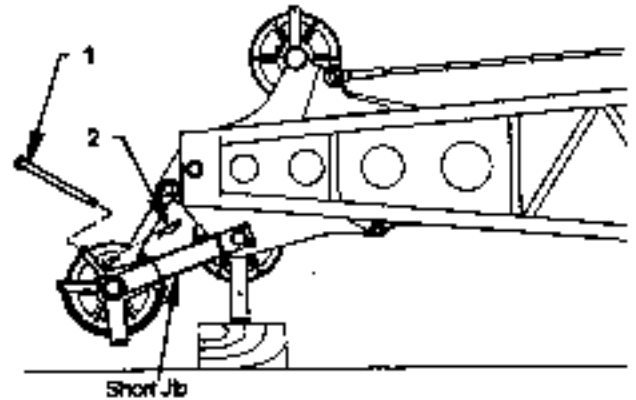
5. Remove pin A (4), cotter pin (10), and plate (5). Remove the short jib from point sheave pin (8).

Short Jib Weight: 400 kg

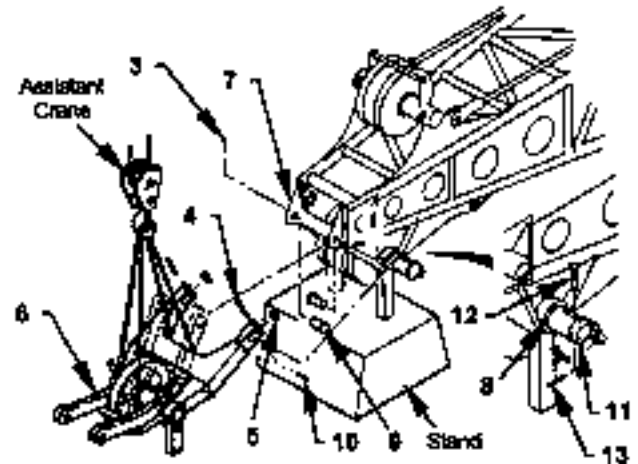
6. Move bracket (11) inward along boom top head shaft (8).

**NOTE:** Remove pin (12) and cotter pin (13) before moving the bracket.

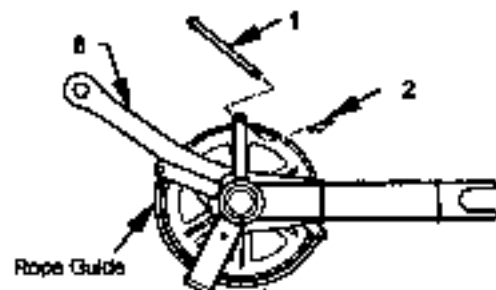
7. Rotate link (6) toward the short jib foot. Install rope guide pin (1) and lock pin (2).
8. Reinstall pin A (4), cotter pin (10), and plate (5) to the short jib foot. Install pin B (9), and cotter pin (3) to link (6).



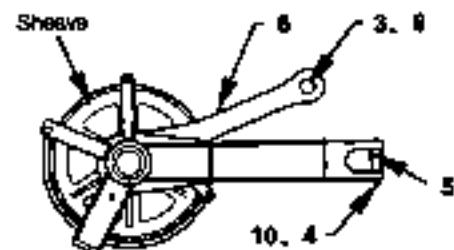
202-05-004



202-05-007



1024-05-111



1024-05-110

## 5 ASSEMBLING/DISASSEMBLING

### 2.7 Disassemble Fly Jib



#### DANGER

- Always stay outside the fly jib when removing the connection pins. Never enter inside or underneath of the fly jib.
- When disassembling the fly jib, use stands strong enough to stably support the boom and the fly jib. Be sure to take all necessary measures to prevent personal injury or death from occurring in advance.



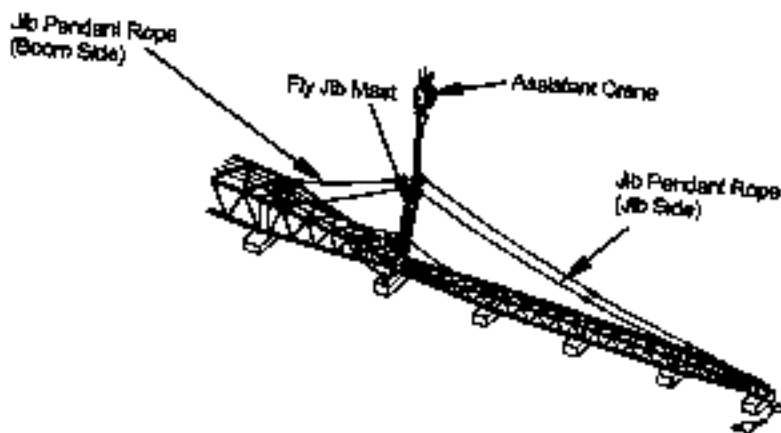
#### CAUTION

Do not put your fingers into pin holes when aligning pin hole centers.

1. Lower the boom and the fly jib to stands.

*NOTE: Set the height of the stands at more than 500 mm.*

2. Hold the jib mast with an assistant crane.



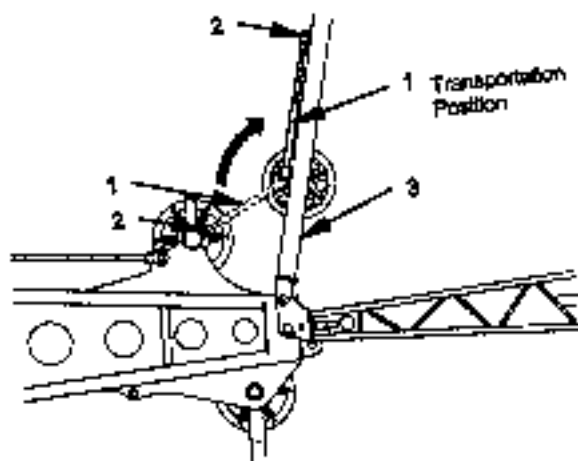
2025-08-1-14



## 5 ASSEMBLING/DISASSEMBLING

3. Move fly jib mast back stop (1) to the transportation position.

**NOTE:** Remove holding pin (2) from the top section. Rotate fly jib mast back stop (1) upward. Secure fly jib mast (3) to the fly jib mast with removed holding pin (2).



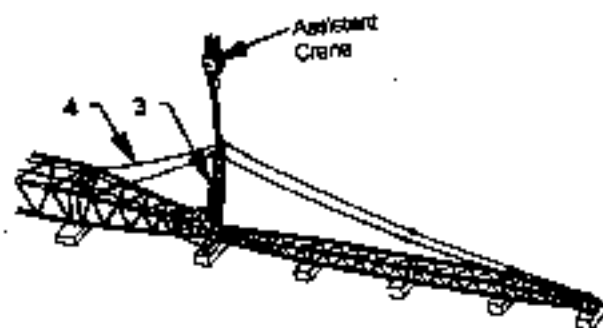
4. Remove the connection pin to disconnect jib pendant rope (4) (boom side) from the boom top section.

202-08-170

5. Lower fly jib mast (3) toward the fly jib side with the assistant crane.

6. Secure fly jib mast (3) to transportation holding lug (5) on the fly jib base section with holding pin (6).

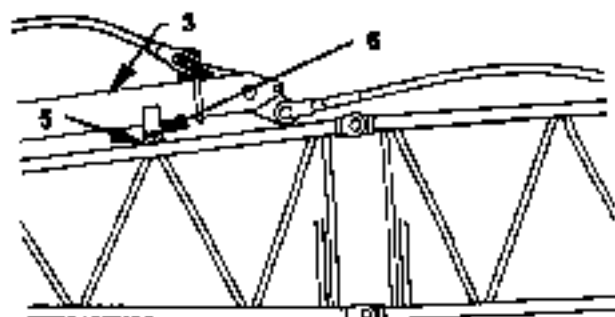
**NOTE:** Holding pin (6) is provided on fly jib mast (3).



202-08-171



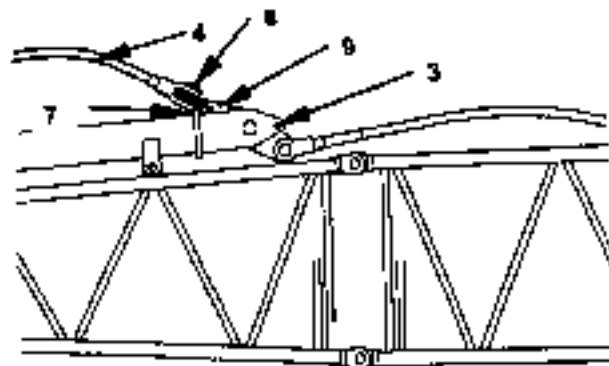
202-08-171



202-08-172

7. Disconnect jib pendant rope (4) (boom side) from the fly jib mast.

**NOTE:** Remove connection pin (8) and cotter pin (7) from link (9) on fly jib mast (3).

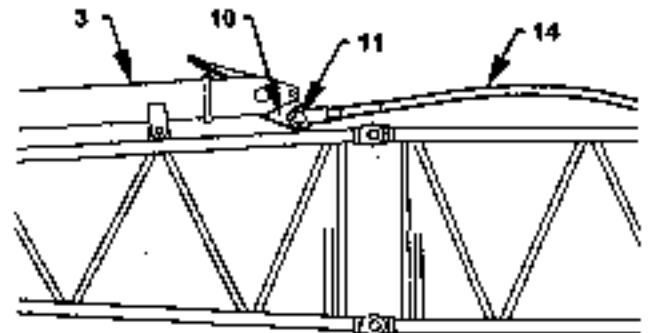


202-08-173

## 5 ASSEMBLING/DISASSEMBLING

8. Disconnect jib pendant rope (14) (jib side) from the fly jib mast.

**NOTE:** Remove connection pins (11) between pendant rope (14) (jib side) and link (10) on fly jib mast (3), and pendant rope (14) (jib side) and the fly jib top section.

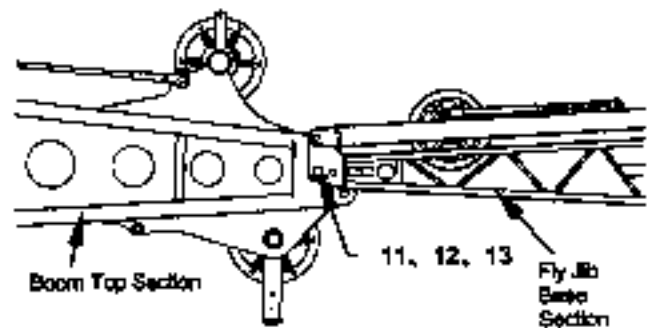


900-05-110

9. While holding the fly jib base section with the assistant crane, remove pin (13) between the fly jib and the boom top section.

**NOTE:** After removing bolts (11) and lock plate (12), remove pin (13).

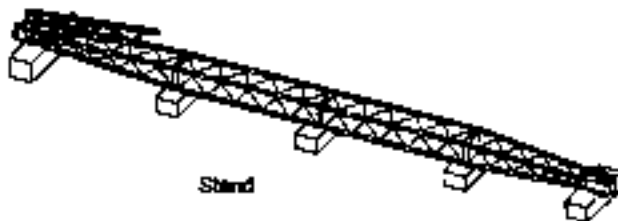
**Wrench size: 24 mm**



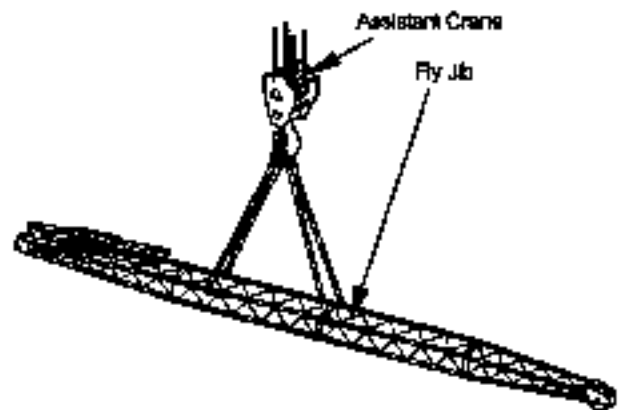
200-05-001

10. Lift the crane jib with the assistant crane. Lower the fly jib to stands. Disassemble the fly jib.

Fly Jib Base Section Jib Weight:	580 kg
	(with the jib mast)
Fly Jib Top Section Weight:	290 kg
6 m-extension Fly Jib Weight:	190 kg



100-05-007



900-05-108

## 5 ASSEMBLING/DISASSEMBLING

### 2.9 Disassemble Boom

#### 2.9.1 Disassemble Basic Boom



#### WARNING

- When removing connection pins (both side tapered or flanged pins), never enter inside and/or underneath of the boom. Always stay outside the boom.
- When disassembling the boom, use stands strong enough to stably support the boom. Be sure to take all necessary measures to prevent personal injury or death from occurring in advance.



#### CAUTION

- Support the boom so that when the connection pins (flanged pins) are removed, the boom does not spring up.
- Do not put your fingers into pin holes when aligning pin hole centers.
- Be careful not to fall off the boom.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- When storing the bridle guide, be careful not to entangle hands and/or fingers into the bridle guide.
- When driving in a part with a hammer, pieces of metal may fly off, possibly causing serious injury. Use protective items such as safety glasses and a hard hat.

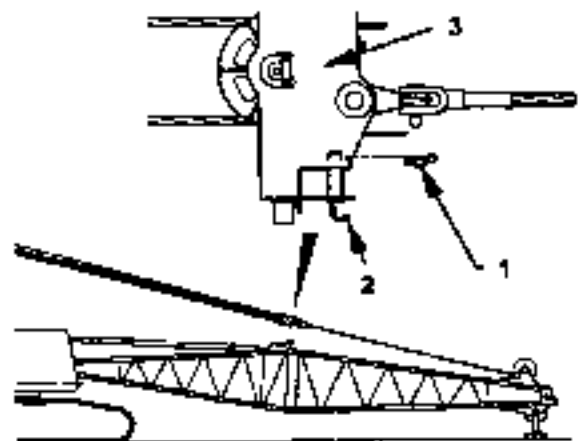
1. Start the engine.

*NOTE:* Run the engine at approx.  $800 \text{ min}^{-1}$  (rpm).

2. Move the lock lever to the UNLOCK position.
3. Remove bridle holding pin (2).

#### NOTE:

- Remove lock pin (1).
- When the bridle (3) is in a high position, rewind the boom derricking drum wire rope to lower bridle (3).



When disassembling the crane exclusive boom:

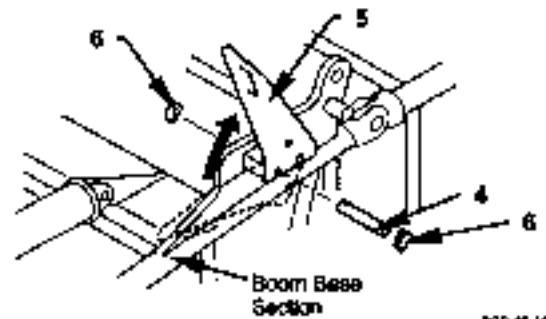
202-05-121

## 5 ASSEMBLING/DISASSEMBLING

4. Remove bridle guide holding pin (4). Raise bridle guide (5).

**NOTE:**

- Remove ring pin (6) before removing bridle guide holding pin (4).
- Secure bridle guide (5) in the raised position with removed bridle guide holding pin (4).
- Install ring pin (6) to lock bridle guide holding pin (4).

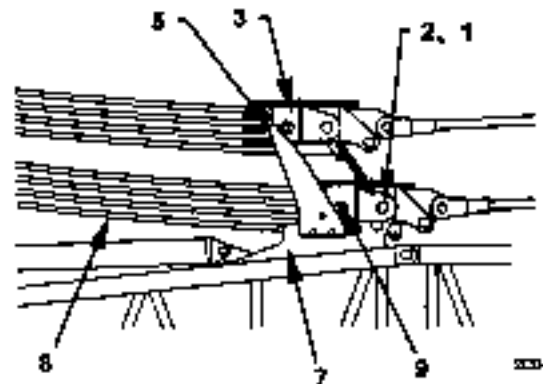


When disassembling the crane exclusive boom:

303-08-124

5. Rewind boom derricking drum wire rope (8) to lower the bridle until bridle roller (9) comes in contact with bridle guide (5).
6. Rewind boom derricking drum wire rope (8) further to lower bridle (3) on bridle holding lug (7) along the bridle guide (5).

**NOTE:** When boom derricking drum wire rope (8) is re-wound, bridle (3) is lowered along the slope of bridle guide (5) so the pin holes on bridle (3) and bridle holding lug (7) align with each other.



When disassembling the crane exclusive boom:

303-08-124

7. Install bridle holding pin (2) to connect bridle (3) to bridle holding lug (7).

**NOTE:** Lock bridle holding pin (2) with lock pin (1).

## 5 ASSEMBLING/DISASSEMBLING

**IMPORTANT:** After connecting bridle (3) to bridle holding lug (7), store bridle guide (5) in the original position. If the A-Frame is retracted without storing bridle guide (5), damage to bridle guide (5) may result.

8. Remove guide holding pin (4). Store bridle guide (5) in the original position.

**NOTE:**

- Remove ring pin (6) before removing bridle guide holding pin (4).
- Secure bridle guide (5) in the original position with removed bridle guide holding pin (4).
- Install ring pin (6) to lock bridle guide holding pin (4).

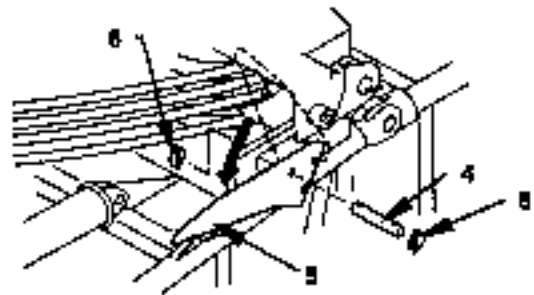
9. Remove connection pin (10) to disconnect pendant rope (12) from bridle link (11).

**NOTE:**

- Remove cotter pin (13).
- Secure pendant rope (12) to the boom so that the pendant rope does not fall off the boom when the boom is lifted.

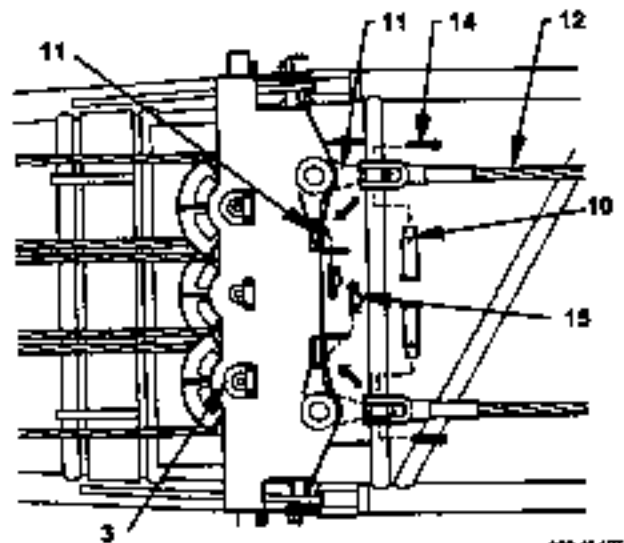
10. Remove lock pin (15). Store link (11) in bridle (3).

**NOTE:** After storing link (11) in bridle (3), install lock pin (15) in the original position.



When disassembling the crane exclusive boom:

200-06-176

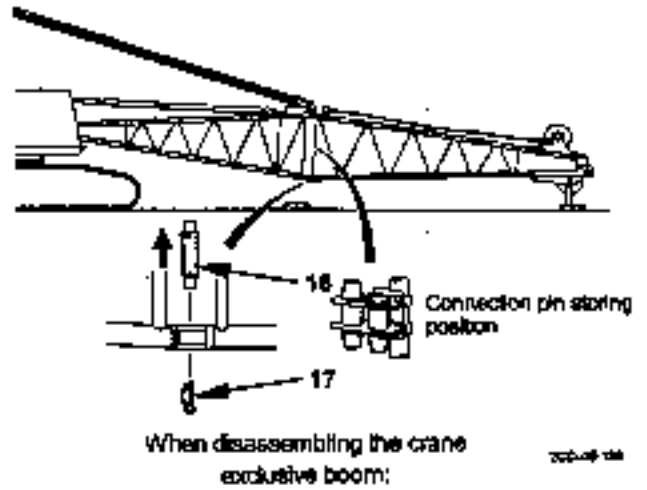


200-06-177

## 5 ASSEMBLING/DISASSEMBLING

11. Remove boom bottom connection pin (16) (both side tapered pins).

*NOTE: After removing lock pin (17), drive connection pin (16) out from the outside to the inside of the boom.*



12. Rewind the boom derricking drum wire rope. Lower the tip of the lower boom on the ground.

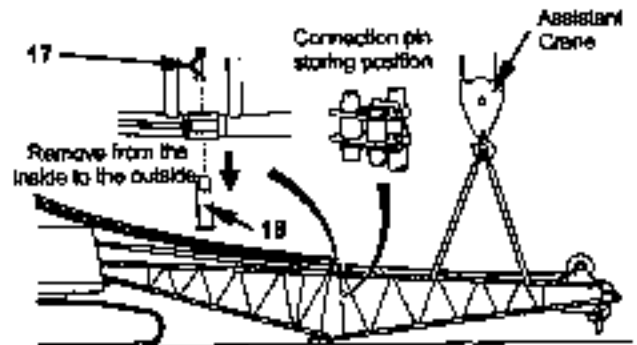
*NOTE: Place a stand under the tip.*



## 5 ASSEMBLING/DISASSEMBLING

13. Remove boom top connection pin (18) (flanged pin).

**NOTE:** After removing lock pin (17), drive connection pin (18) out from the inside to the outside of the boom.



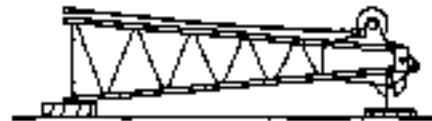
14. Attach sling wire ropes to the boom top section. Lift and move the boom top section with an assistant crane to a proper place so that the removed boom will not disturb the process of disassembly work hereafter.

**NOTE:** Support the boom with stands.

When disassembling the crane exclusive boom:

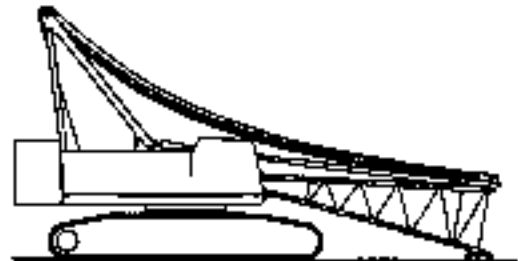
7CB-08-017

15. Detach the sling ropes from the boom.



16. Move the lock lever to the LOCK position.

17. Stop the engine.



When disassembling the crane exclusive boom:

7CB-08-020

## 5 ASSEMBLING/DISASSEMBLING

### 2.8.2 Disassemble Extension Boom



#### WARNING

- When removing connection pins (both side tapered and flanged pins), never enter inside and/or underneath of the boom. Always stay outside the boom.
- When disassembling the boom, use stands strong enough to stably support the boom. Be sure to take all necessary measures to prevent personal injury or death from occurring in advance.



#### CAUTION

- When the bridle is connected to the boom base section, never lift the boom top section off the ground. The boom may be damaged. Refer to 1.14 Conditions to Erect Boom and Jib for the boom length which can be erected.
- Support the boom so that when the connection pins (flanged pins) are removed, the boom does not spring up.
- Do not put your fingers into pin holes when aligning pin hole centers.
- Be careful not to fall off the boom.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- When storing the bridle guide, be careful not to entangle hands and/or fingers into the bridle guide.
- When driving in a part with a hammer, pieces of metal may fly off, possibly causing serious injury. Use protective items such as safety glasses and a hard hat.

1. Start the engine.

*NOTE: Run the engine at approx. 900 min<sup>-1</sup> (rpm).*

2. Move the lock lever to the UNLOCK position.

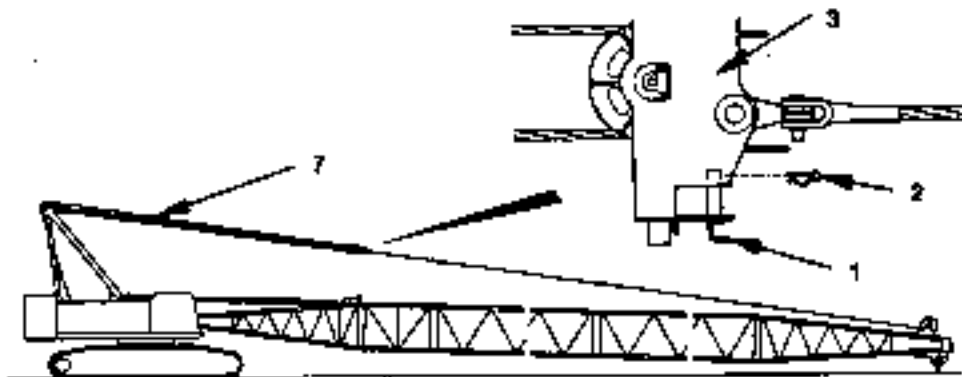


## 5 ASSEMBLING/DISASSEMBLING

3. Remove bridle holding pin (1).

**NOTE:**

- Remove lock pin (2).
- When the bridle (3) is in a high position, rewind boom derricking drum wire rope (7) to lower bridle (3).



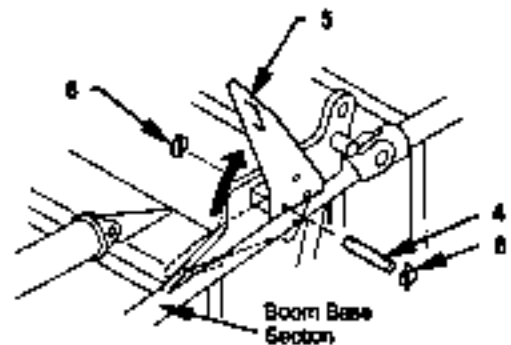
When disassembling the crane exclusive boom:

200-08-108

4. Remove bridle guide holding pin (4). Raise bridle guide (5).

**NOTE:**

- Remove ring pin (6) before removing bridle guide holding pin (4).
- Secure bridle guide (5) in the raised position with removed bridle guide holding pin (4).
- Install ring pin (6) to lock bridle guide holding pin (4).



When disassembling the crane exclusive boom:

200-08-120

## 5 ASSEMBLING/DISASSEMBLING

5. Rewind boom derricking drum wire rope (7) to lower bridle (3) until bridle roller (9) comes in contact with bridle guide (5).
6. Rewind boom derricking drum wire rope (7) further to lower bridle (3) to bridle holding lug (8) along the bridle guide (5).

**NOTE:** When boom derricking drum wire rope (7) is rewound, bridle (3) is lowered along the slope of bridle guide (5) so the pin holes on bridle (3) and bridle holding lug (8) align with each other.

7. Install bridle holding pin (1) to connect bridle (3) to bridle holding lug (8).

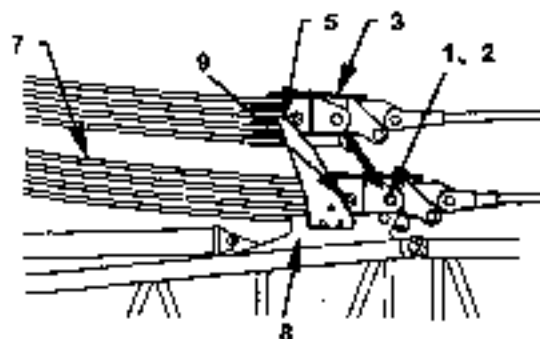
**NOTE:** Lock bridle holding pin (1) with lock pin (2).

**IMPORTANT:** After connecting bridle (3) to bridle holding lug (8), store bridle guide (5) in the original position. If the A-Frame is retracted without storing bridle guide (5), damage to bridle guide (5) may result.

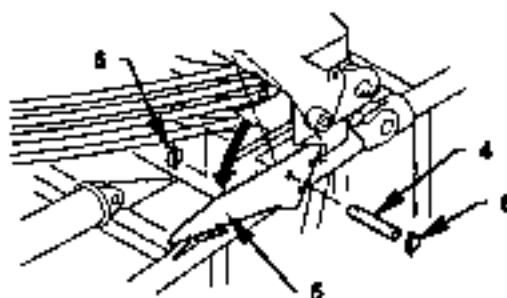
8. Remove guide holding pin (4). Store bridle guide (5) in the original position.

**NOTE:**

- Remove ring pin (6) before removing bridle guide holding pin (4).
- Secure bridle guide (5) in the original position with removed bridle guide holding pin (4).
- Install ring pin (6) to lock bridle guide holding pin (4).



300-35-124



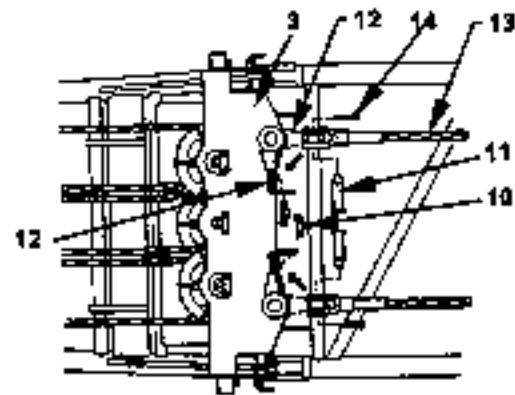
300-44-134

## 5 ASSEMBLING/DISASSEMBLING

9. Remove connection pin (11) to disconnect pendant rope (12) from bridle link (12).

**NOTE:**

- Remove cotter pin (14).
- Secure pendant rope (13) to the boom so that the pendant rope does not fall off the boom when the boom is lifted.



920-05-127

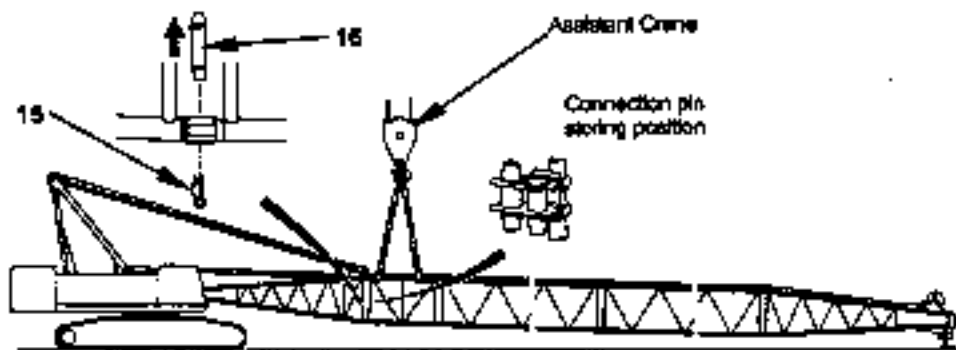
10. Remove lock pin (10). Store link (12) in bridle (3).

**NOTE:** After storing link (12) in bridle (3), install lock pin (10) in the original position.

11. Attach sling wire ropes close to the extension boom connection. Then, hold the extension boom with an assistant crane.

12. Remove boom base section bottom connection pin (16) (both side tapered pins).

**NOTE:** After removing lock pin (15), drive connection pin (16) out from the outside to the inside of the boom.



When disassembling the crane exclusive boom:

920-05-009

## 5 ASSEMBLING/DISASSEMBLING

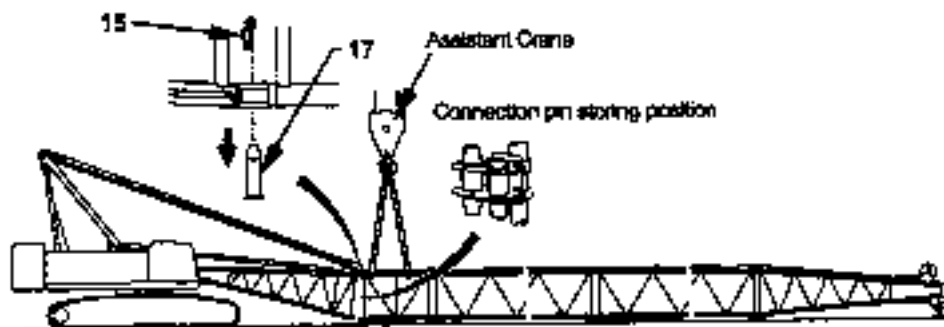
13. Rewind the boom derricking drum wire rope. Lower all connections of the extension booms on the stands.

*NOTE: While lowering the assistant crane hook, pay out the boom derricking drum wire rope so that the boom derricking drum wire rope becomes slack.*

14. Remove boom base section or 1 m-extension boom top connection pin (17) (flanged pin).

*NOTE: After removing lock pin (15), drive connection pin (17) out from the inside to the outside of the boom.*

15. Detach the sling wire ropes from the extension boom.



When disassembling the crane exclusive boom:

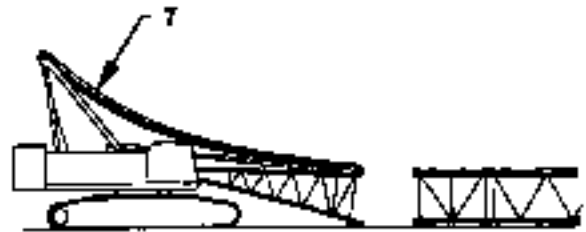
1405-04-04

## 5 ASSEMBLING/DISASSEMBLING

16. Move the base machine backward so that the boom disassembly work will not be interrupted.
17. Pay boom derricking drum wire rope (7) out to lower the tip of the boom base section to the ground.

**NOTE:** Support the tip of boom base section or extension boom with stands.

18. Move the lock lever to the LOCK position.
19. Stop the engine.



When disassembling the crane exclusive boom: KCC2-08-011

20. Disconnect each pendant rope.

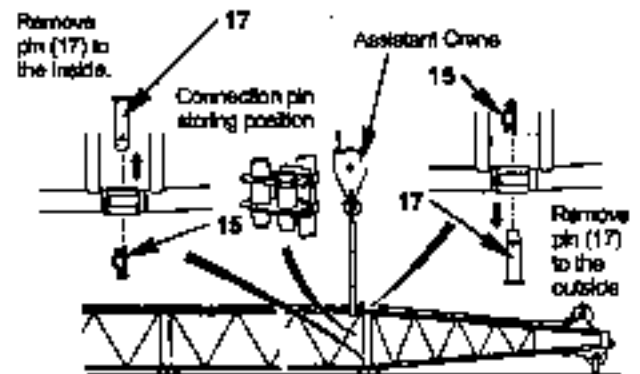
**NOTE:** Keep the boom top section tip side rope end connected to the boom top section tip and secure the opposite side rope end to the boom. As to the pendant rope for each extension boom, secure both ends of the rope to each extension boom to prevent the pendant ropes fall off the boom/extension booms when the boom/extension booms are lifted.

21. Attach sling wire ropes close to the connection between the boom top section and the extension boom. Hold the boom top section and the extension boom with an assistant crane.
22. Remove boom top section and extension boom bottom connection pin (17) (flanged pin).

**NOTE:** After removing lock pin (15), drive connection pin (17) out from the outside to the inside of the boom.

23. Using the assistant crane, place the extension boom and the boom top section on the stands.
24. Remove boom top section and extension boom top connection pin (17) (flanged pin).

**NOTE:** After removing lock pin (15), drive connection pin (17) out from the inside to the outside of the boom.

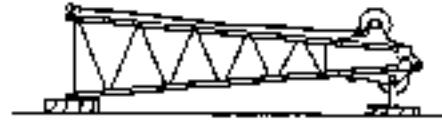


KCC2-08-141

## 5 ASSEMBLING/DISASSEMBLING

25. Attach sling wire ropes to the top section. Lift and move the top section with an assistant crane to a proper place so that the removed boom will not disturb the process of disassembly work hereafter.

*NOTE: Support the boom with stands.*

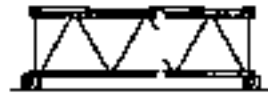


SCD-05-008

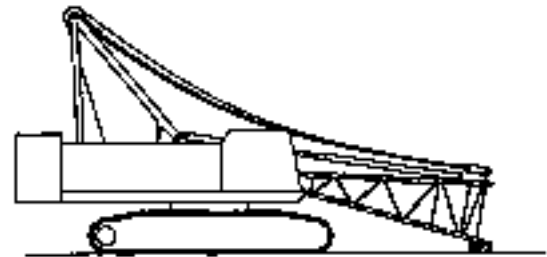
26. Detach the sling ropes from the boom.

27. Using the assistant crane, remove connection pins (17) (flanged pin) from the top side in sequence to separate each extension boom.

*NOTE: After removing lock pin (15), drive top side connection pins (17) out from the inside to the outside, and bottom side connection pins (17) out from the outside to the inside of the boom respectively.*



MOB-05-123



When disassembling the crane exclusive boom:

ARG-05-003

## 5 ASSEMBLING/DISASSEMBLING

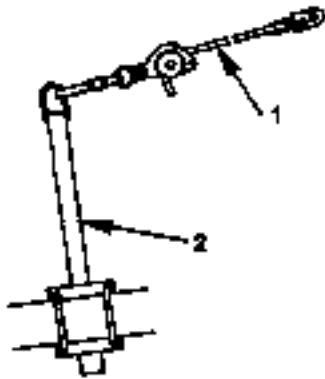
### 2.9 Remove Stanchions and Support Ropes (Optional)



#### WARNING

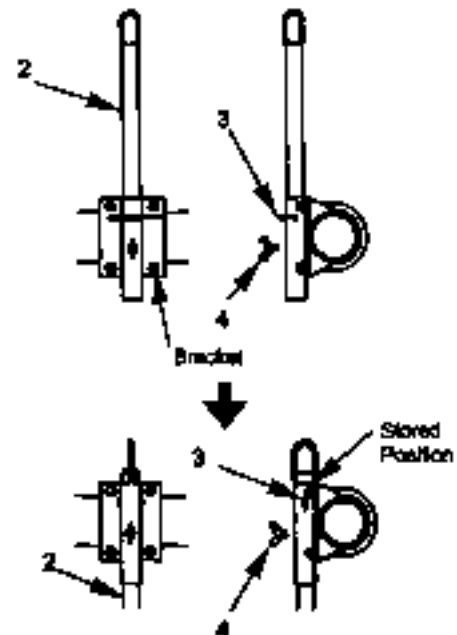
Be careful not to fall off the base machine or the boom.

1. Remove support rope (1) from stanchion (2).



M031-07-247

2. Remove stanchion lock pin (3) and holding bolt (4). Lower stanchion (2) to the stored position for transportation. Secure stanchion (2) with the holding bolt.



## 5 ASSEMBLING/DISASSEMBLING

### 2.10 Remove Counterweights



#### WARNING

- Never allow the workers enter under the superstructure and/or the counterweights.
- If the superstructure with the counterweights is rotated without extending the width of the crawlers, the machine will turn over. Refer to 2.2 Operational Conditions on Partially Disassembled Machines in Section 6 for the information regarding slewing operation of the machine with the counterweights.



#### CAUTION

- Do not lift counterweights A, B, C, D and E as a unit. The sling lugs may be broken, possibly resulting in falling of the counterweights.
- Be careful not to allow the sling wire ropes to come in contact with the hanger rope guide bar.

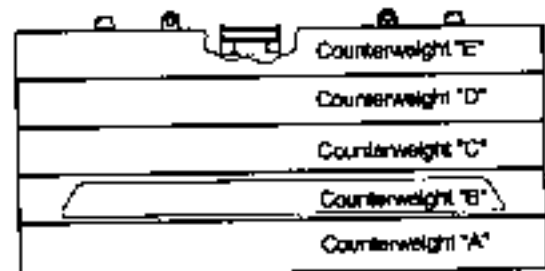
The counterweight sling wire ropes and shackles are provided as follows (Optional):

Wire ropes:  $\phi$ . 28 mm x 6 m – 2 ropes

Shackle: Lightweight shackle (10t) – 2 pieces

1. Check that the crawler's widths are fully extended.
2. Check that the gantry is extended.
3. Check that the lower boom tip end is resting on a stand.

Counterweight	
Counterweight A	10.4 t
Counterweight B	8.9 t
Counterweight C	8.9 t
Counterweight D	8.8 t
Counterweight E	8.9 t
<b>Total</b>	<b>46 t</b>



200-06-01



## 5 ASSEMBLING/DISASSEMBLING

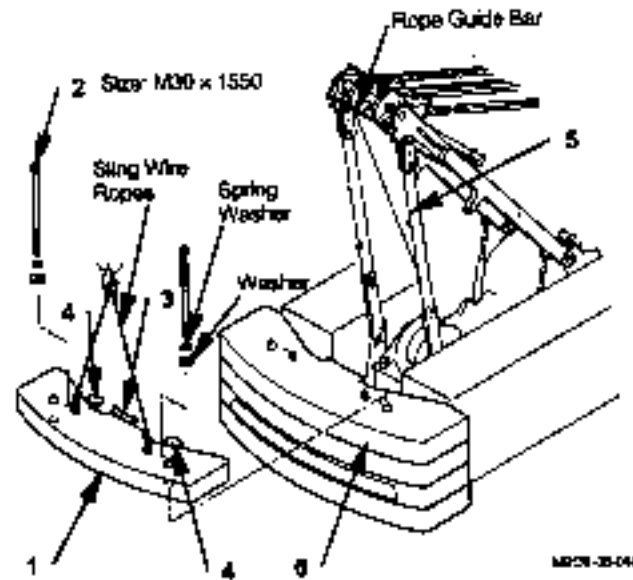
4. Attach sling wire ropes to counterweight E (1). Hold counterweight E with an assistant crane.

**NOTE:** Pull the sling wire ropes so that slack on the sling wire ropes is removed.

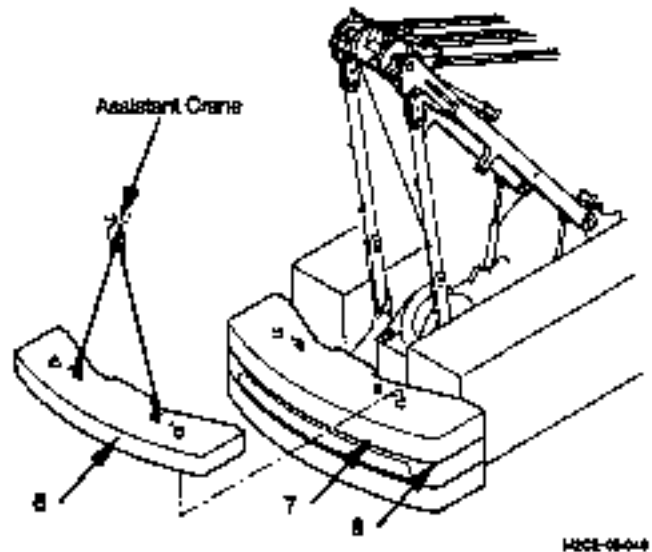
5. Remove 2 mounting bolts (2) from the top of counterweight E (1).

Wrench size: 46 mm

**IMPORTANT:** Be careful not to allow rope guide (3) and step (4) on counterweight E (1) to come in contact with A-Frame (5).



6. Lift counterweight E (1) to dismount from counterweight D (6).
7. Detach the sling wire ropes.
8. Attach sling wire ropes to counterweight D (8). Lift and dismount counterweight D (8) from counterweight C (7) with an assistant crane.
9. Detach the sling wire ropes.
10. Dismount counterweights C (7) and B (8) in the same procedures shown in steps 8 and 9.

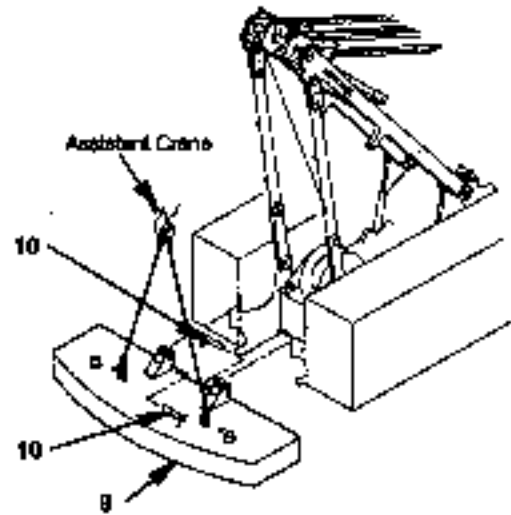


## 5 ASSEMBLING/DISASSEMBLING

11. Attach sling wire ropes to counterweight A (9) and hold counterweight A (9) with the assistant crane.

**NOTE:**

- Lift counterweight A (9) with suspension lugs.
  - Pull the sling wire ropes so that slack on the sling wire ropes is removed.
12. Remove holding pin (10) from counterweight A (9).
  13. Lift to dismount counterweight A (9) from the hook section at the rear of the superstructure.
  14. Detach the sling wire ropes.



MOZE 02-040

## 5 ASSEMBLING/DISASSEMBLING

### 2.11 Retract A-Frame



#### WARNING

- Never enter the space under and/or inside the A-Frame or the boom.
- Keep your hands away from the sheaves and/or wire rope during winding the boom derricking wire rope around the drum.



#### CAUTION

- Do not lift the boom base section off the ground with the A-Frame retracted. Failure to do so may cause the damage to the boom derricking wire rope.
- Do not touch the stay while lowering the A-Frame.
- Do not put your fingers into pin holes when aligning pin hole centers.
- Be careful not to fall off the base machine or the boom.

1. Check that the tip end of the lower on a stand.
2. Start the engine.

*NOTE: Run the engine at approx. 1000 min<sup>-1</sup> (rpm).*

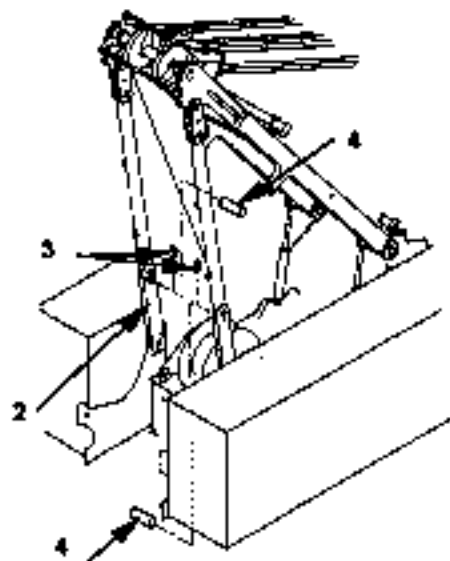
3. Move the lock lever to the UNLOCK position.
4. Tilt A-Frame extend/retraction switch (1) in the cab toward the RAISE position. While holding the switch in that position, remove holding pins (4) from both right and left intermediate stays (2).

#### NOTE:

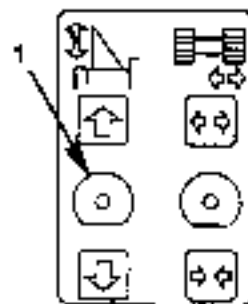
- Remove ring pin (3.)
- When holding pin (4) is difficult to remove, slightly operate A-Frame extend/retraction switch (1).

5. Return A-Frame extend/retraction switch (1) to neutral.

*NOTE: When switch (1) is released, it will automatically return to neutral.*



MCS-0604



MCS-15-112

## 5 ASSEMBLING/DISASSEMBLING

6. Tilt A-Frame extend/retraction switch (1) toward the LOWER position. While lowering the A-Frame, pay out the boom derricking drum wire rope.

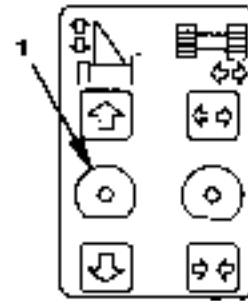
*NOTE: Lower A-Frame (5) while applying tension to the wire rope so that the tip of the lower is not lifted off the ground.*

7. When A-Frame (5) is fully lowered, stop paying out the boom derricking wire rope. Return A-Frame extend/retraction switch (1) to neutral.

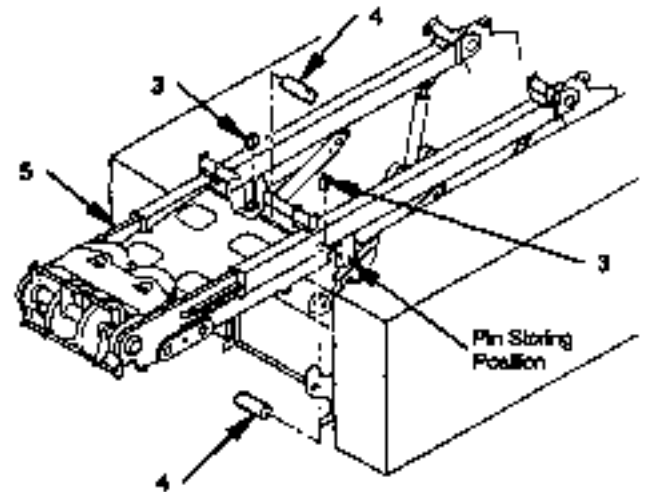
*NOTE: When switch (5) is released, it will automatically return to neutral.*

8. Move the lock lever to the LOCK position.  
9. Stop the engine.  
10. Install holding pin (4) in the stored position to secure the A-Frame to the superstructure.

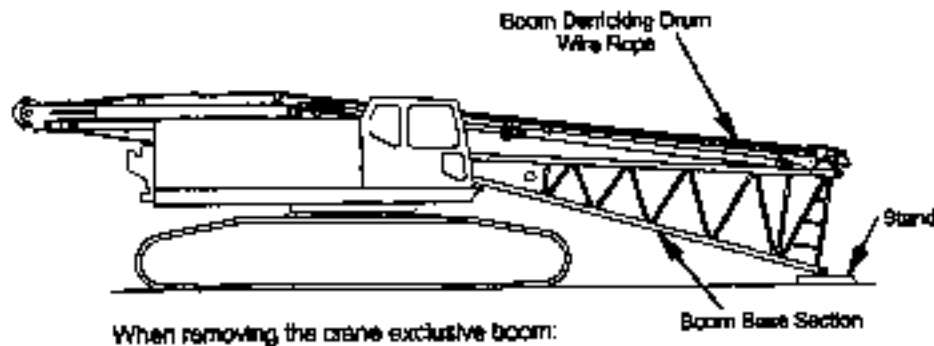
*NOTE: Install holding pins (4) into intermediate stay (2) from the center side of the base machine toward the outer side. Lock holding pins (4) with ring pins (3).*



K2284-03-102



K222-05-044



K222-05-047

## 5 ASSEMBLING/DISASSEMBLING

### 2.12 Install Bridle to A-Frame



#### CAUTION

- Do not put your fingers into pin holes when aligning pin hole centers.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- Be careful not to fall off the base machine or the boom.

1. Start the engine.

*NOTE: Run the engine at approx. 1000 min<sup>-1</sup> (rpm).*

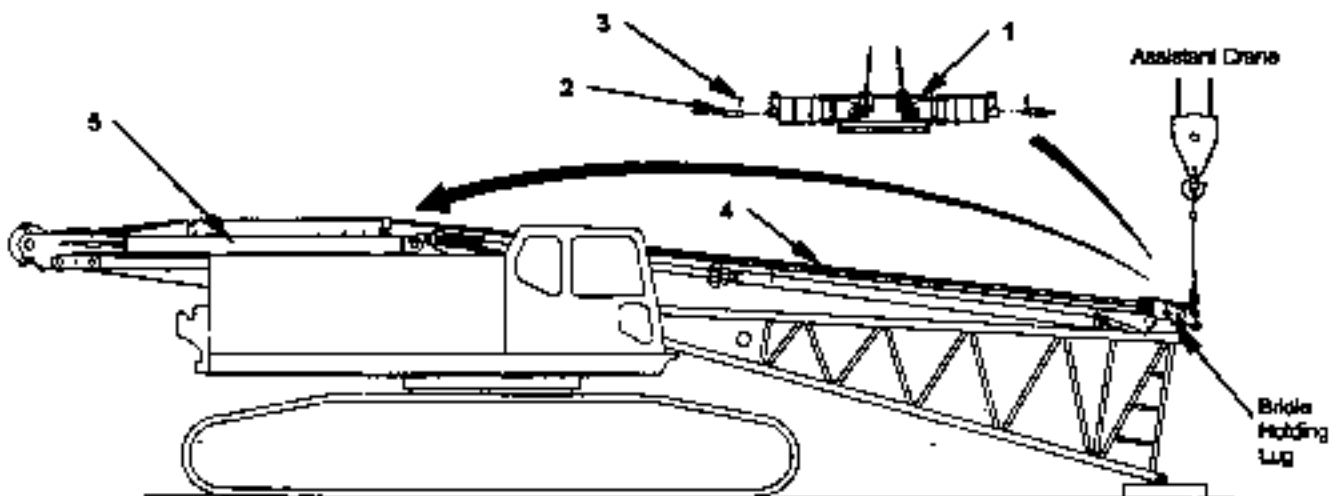
2. Move the lock lever to the UNLOCK position.
3. Attach sling wire ropes to bridle (1). Hold bridle (1) with an assistant crane.
4. Pay out boom derricking drum wire rope (4) to the extent so that bridle holding pin (2) can be removed.
5. Remove bridle holding pin (2).

*NOTE: Remove the lock pin (3).*

**IMPORTANT:** Carefully pay out boom derricking drum wire rope (4) so that the wire rope is not wound irregularly on the boom derricking drum.

6. Lift bridle (1) with an assistant crane. While winding boom derricking drum wire rope (4), lower bridle (1) onto the bridle seat in front of A-Frame (5).

*NOTE: Adjust the wire rope winding amount and speed on the boom derricking drum in accordance with the movement of bridle (1).*



When disassembling the crane exclusive boom:

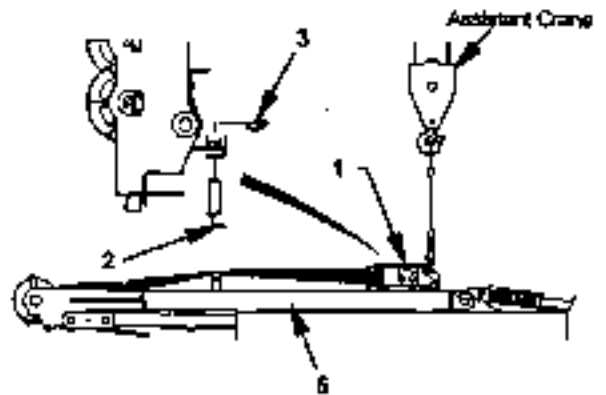
MOCC-04-020

## 5 ASSEMBLING/DISASSEMBLING

7. Install bridle (1) to A-Frame (5) with bridle holding pins (2).

*NOTE: Install bridle holding pin (2) from the outside of the bridle toward the center. Secure it with the lock pin (3).*

8. Remove the sling wire ropes from the bridle.



722-95-1-10

## 5 ASSEMBLING/DISASSEMBLING

### 2.13 Unwind Boom Derricking Drum Wire Rope

#### DANGER

When lifting the bridle and the pendant rope using an assistant crane, pay attention to the lifting position. The suspension lugs (made of steel plates) located on the bridle are to be used when lifting only the bridle.

#### WARNING

Winding wire rope from the boom derricking drum, or the hanger/bridle may cause the personnel to become entangled into the drum or sheaves. Be sure to keep your body away from any rotating machine parts.

#### CAUTION

- Be careful not to fall off the base machine.
- When handling wire rope, be sure to use protective items such as heavy gloves.
- Wire rope end may come off an installation hole and bounce up. Be careful not to be hit with the rope end.
- When driving in a part with a hammer, pieces of metal may fly off, possibly causing serious injury. Use protective items such as safety glasses and a hard hat.

1. Remove rope socket (1) from rope tension sensor (3) located on the bottom side of strut (A-Frame)(2).
2. Remove rope socket (1) from rope tension sensor (3) located on the bottom of A-Frame strut (2).

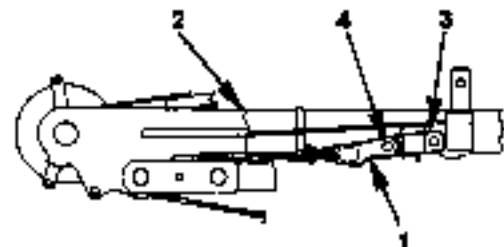
**NOTE:** Remove the cotter pin to remove pin (4).

3. Remove wire clip (5).  
Wrench size: 27 mm
4. Remove wedge (6) and rope socket (1) from the wire rope end.

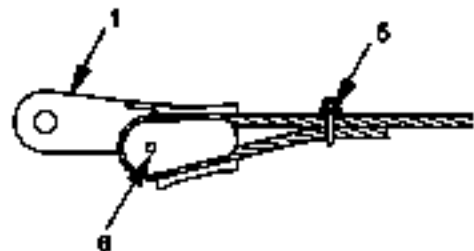
#### **IMPORTANT:**

- Carefully wind wire rope so that wire rope does not bounce, or fall off the A-Frame or irregular rope winding occur.
  - Be careful not to twist the wire rope.
5. Move the boom derricking drum lever to the winding side to wind the wire rope around the boom derricking drum.

**NOTE:** Wind the wire rope around the boom derricking drum until the overall wire rope is paid out of the A-Frame, bridle and hanger sheaves.



2020-05-018



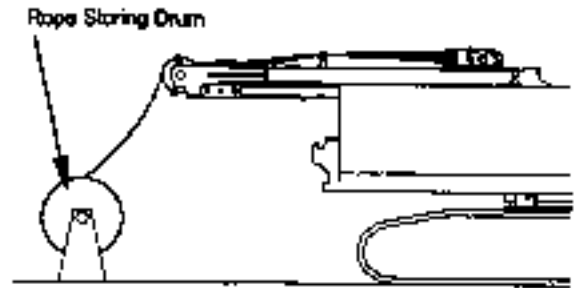
14294-06-204

## 5 ASSEMBLING/DISASSEMBLING

5. Lift the rope storing drum with the assistant crane. Place the drum behind the base machine.
6. Wind the boom derricking drum wire rope around the rope storage drum.

**NOTE:**

- Adjust the wire rope paying out speed from boom derricking drum (7) in accordance with the winding speed on the rope storing drum.
- Wind the wire rope on the rope storing drum to the extent that only the rope end section remains on boom derricking drum (7).

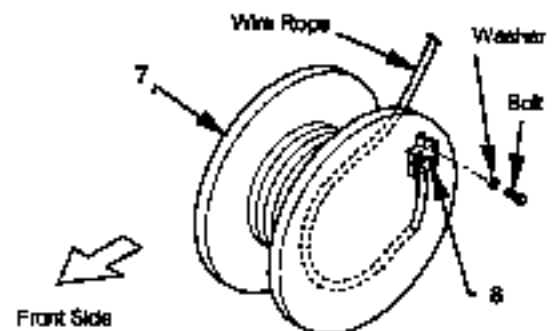


MS21-03-01

7. Remove rope end clamp (8) from boom derricking drum (7).

Wrench size: 24 mm

8. Take out the rope end through the flange hole. Wind the rope end on the rope storing drum.



MS21-03-02



## 5 ASSEMBLING/DISASSEMBLING

### 2.14 Remove Back Stop



#### CAUTION

- Do not put your fingers into pin holes when aligning pin hole centers.
- When handling wire ropes, be sure to use protective items such as heavy gloves.
- Be careful not to fall off the base machine or the boom.

1. Disconnect the secondary boom overhoist prevention device electrical cable from the left side back stop.

Secondary boom overhoist prevention device electrical cable



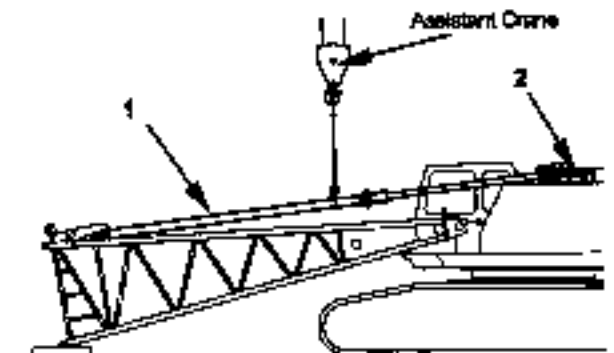
Back Stop

U20K-04-04

2. Attach sling wire ropes to outer member (1) of the left side back stop. Hold it with an assistant crane.

3. Remove holding pin (2) from the strut (A-Frame) foot lug.

**NOTE:** Remove the cotter pin.



When the crane exclusive boom is used:

U20K-05-01

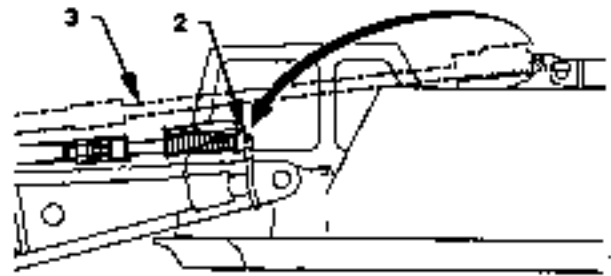
## 5 ASSEMBLING/DISASSEMBLING

**IMPORTANT:** Be careful not to allow the back stop to come in contact with the cab.

4. While lifting the back stop, retract inner member (3).
5. Hold inner member (3) to the boom base section boom foot side lug with holding pin (2).

**NOTE:**

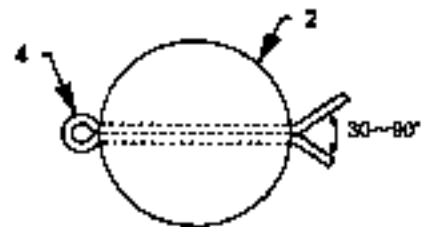
- Install holding pin (2) from the center side of the base machine. Lock holding pin (2) with cotter pin (4).
- Open the cotter pin ends 30 to 90°.



WCS-06-05

6. Remove the sling wire ropes from the back stop.
7. Remove the right side back stop.

**NOTE:** Attach sling wire ropes to the outer member. While holding the back stop with the assistant crane, remove the right side back stop in the same procedure as described in steps 3 to 6. No limit switch is provided on the right side back stop.



WCS-05-06

## 5 ASSEMBLING/DISASSEMBLING

### 2.15 Remove Boom Base Section



#### WARNING

Never enter under the boom.

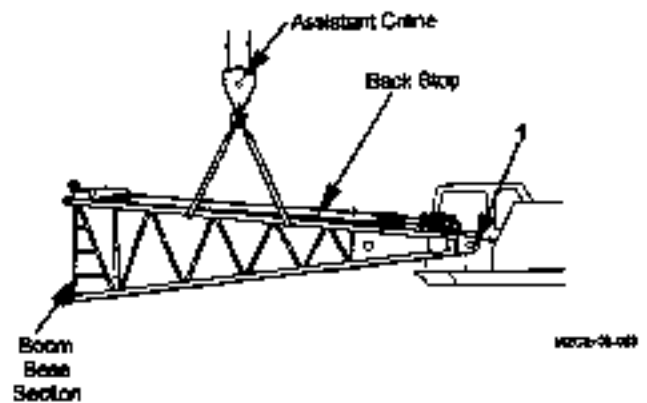


#### CAUTION

When handling wire rope, be sure to use protective items such as heavy gloves.

1. Attach sling wire ropes to the boom base section. Lift the boom base section with an assistant crane.

**NOTE:** Lift the boom base section horizontally.



When removing the crane exclusive boom:

#### IMPORTANT:

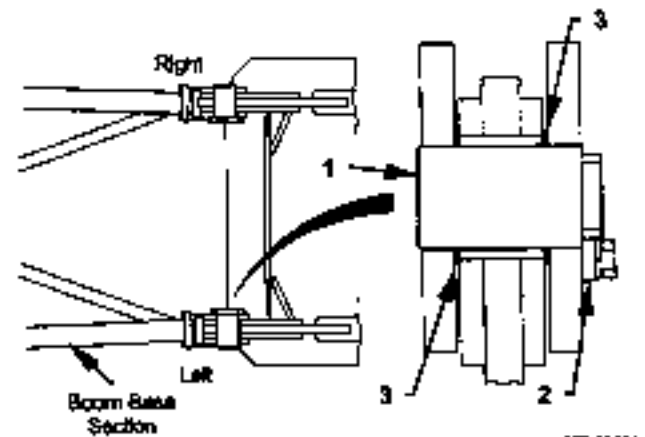
- Take care not to allow the boom foot to move up and down.
- Take care not to hit the cab with the boom base section.

2. Remove boom foot pins (1).

#### NOTE:

- Remove the left side pin first.
- After removing lock plate (2), remove boom foot pin (1) and shim (3).

Wrench size: 30 mm



3. Lift to move the boom base section to a proper place so that the boom base section does not disturb the base machine disassembly work.
4. Remove the sling wire ropes.
5. Install boom foot pins (1) into the boom base section.

#### NOTE:

- Install shim (3) together with boom foot pins (1).
- Lock boom foot pins (1) with lock plates (2).

Wrench size: 30 mm

## 5 ASSEMBLING/DISASSEMBLING

### 2.16 Removing A-Frame



#### CAUTION

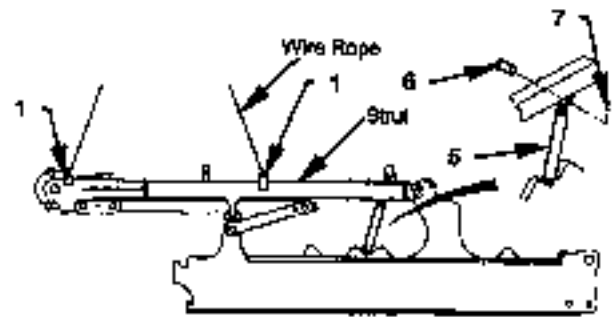
Do not enter under and/or inside the A-Frame.



#### CAUTION

• When aligning pin holes, never insert your finger into the hole.

• Take care not to fall on the machine.



MOCC-05-006

1. Attach sling wire ropes to suspension lugs (1) of the A-Frame. Hold the A-Frame using an assistant crane.

Wire Rope: Diameter: 26 mm x 6 m - 4 pieces

Shackle: Light weight type shackle for 10 t x 4 pieces

A-Frame Weight: 1900 kg

2. Remove pin (6) of A-Frame control cylinder (5) from the strut.

*NOTE: Remove catter pin (7) to remove pin (6).*

3. Remove pin (3) from strut center lug (2).

*NOTE: Remove ring pin (4) to remove pin (3).*

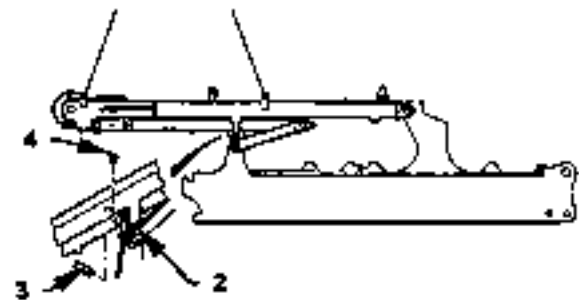
4. Lift the A-Frame using the assistant crane until lug (2) comes off the rotating platform.

5. Install pin (3) into the strut center lug (2) hole.

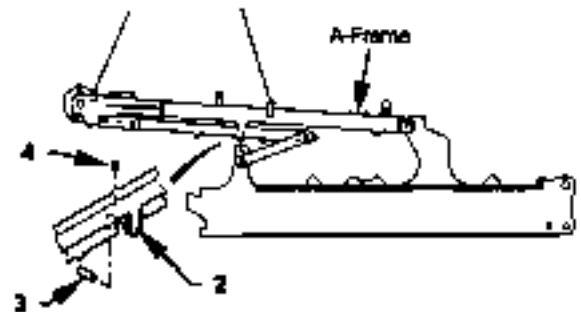
*NOTE: Install ring pin (4) to prevent pin (3) from coming off.*

6. Remove bolt (8) from the lower stay tip end. Remove pin (9) and spring (10).

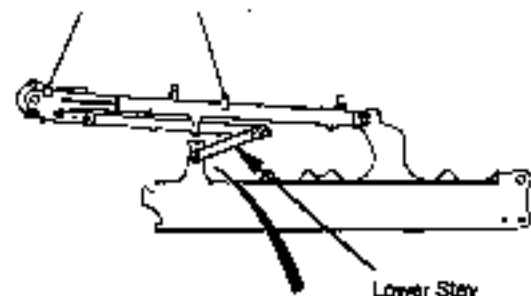
Wrench Size: 19 mm



MOCC-05-007



MOCC-05-008



MOCC-05-009



MOCC-05-010

## 5 ASSEMBLING/DISASSEMBLING

7. Remove pin (11) from the strut tip end.

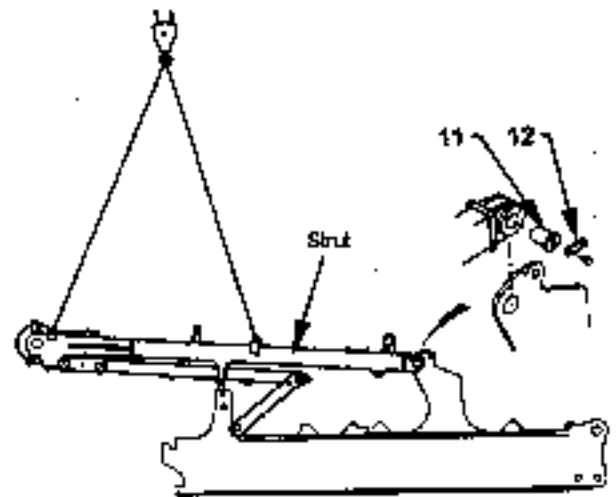
**NOTE:** Remove key plate (12) to remove pin (11).  
Wrench Size: 30 mm

**IMPORTANT:** Do not allow the stay to come in contact with the cab or drums.

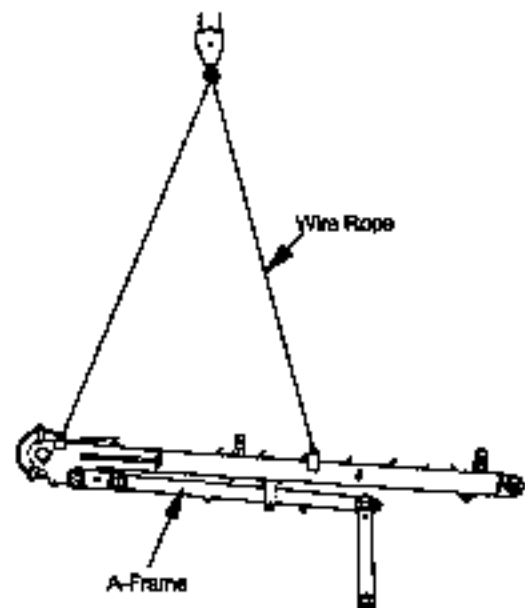
8. Lift and move the gantry to a place where the A-Frame will not disturb other disassembly work process.

**NOTE:** Fold end store the stay as illustrated.

9. Detach the sling wire ropes.



MOCE-04-034



200-04-000



200-04-000

## 5 ASSEMBLING/DISASSEMBLING

10. Install pin (11) into the strut tip end hole.

*NOTE: Install key plate (12) to prevent pin (11) from coming off.*

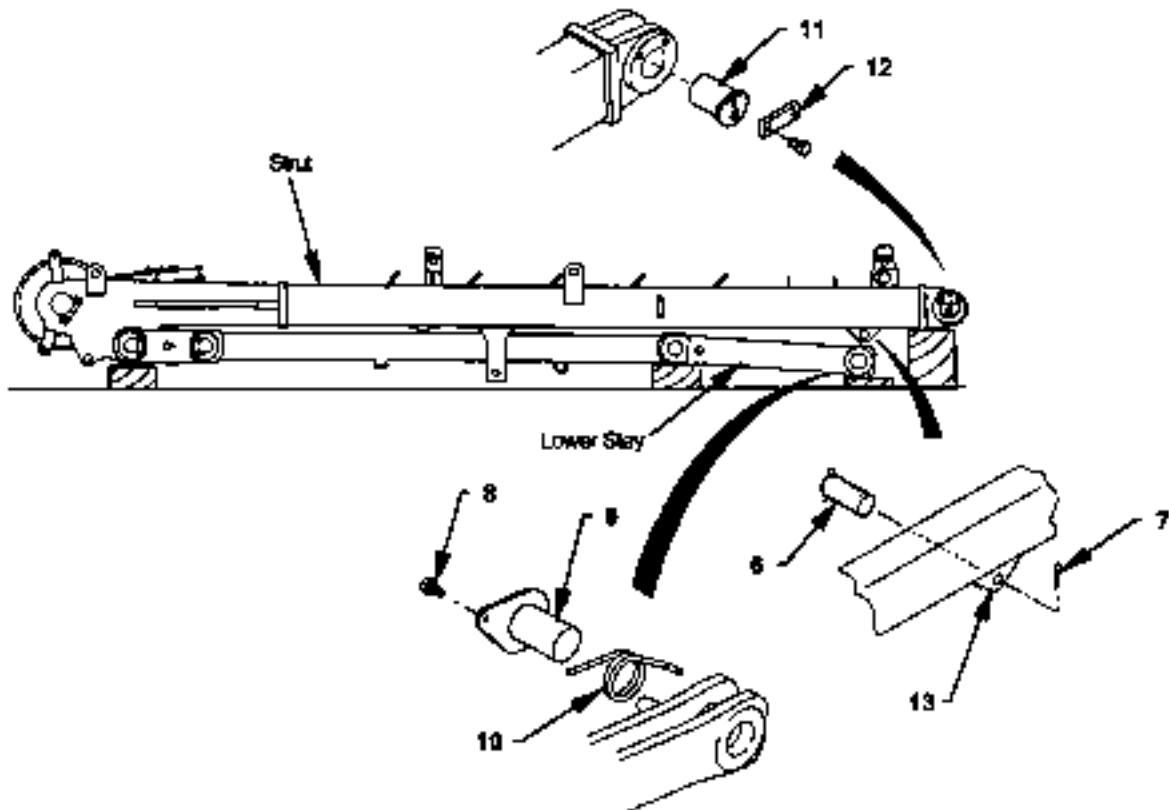
*Wrench Size: 30 mm*

11. Install spring (10) and pin (9) into the lower stay tip end hole. Install bolt (8).

*Wrench Size: 19 mm*

12. Install pin (6) into the strut tip bottom lug (13) hole.

*NOTE: Install cotter pin (7) to prevent pin (6) from coming off.*



700-05-000

## 5 ASSEMBLING/DISASSEMBLING

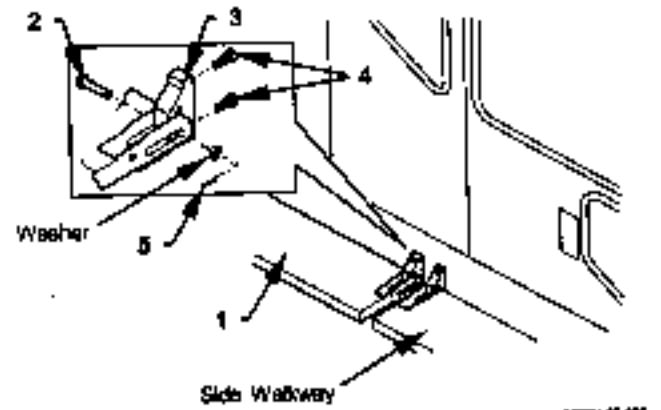
### 2.17 Remove Side Walkway (Optional)

1. Remove pin (2) to remove side walkway (1) from bracket (3).

*NOTE: Remove lock pin (5).*

2. Remove bolts (4) to remove bracket (3).

Wrench size: 19 mm



## 5 ASSEMBLING/DISASSEMBLING

### 2.18 Remove Crawlers



#### WARNING

- Never enter under the superstructure while operating the Jacks.
- Operate the jack cylinders so that the base machine is not inclined more than 1 degree. Failure to do so may result in tipping over of the machine.
- Never slewing the superstructure when only one side crawler is installed. Tipping over of the machine may result.
- The space between the superstructure and the crawlers is a pinch point. Keep away from this space.
- While connecting or disconnecting the hydraulic hoses to the travel devices, never slewing the superstructure. A serious accident due to entanglement may result.



#### CAUTION

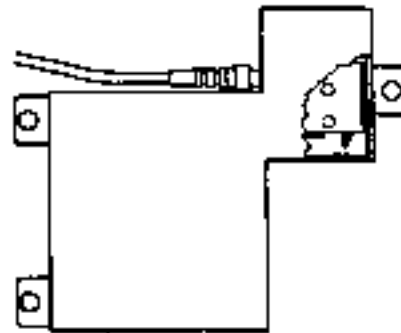
- Carefully install the crawlers following the signal person's directions.
- When aligning the pin hole centers, keep your fingers away from the pin holes.
- Use protective items such as heavy gloves when handling wire rope.

**IMPORTANT:** Be careful not to let the quick couplers come in contact with other objects. Damage to the couplers may result.

1. Disconnect the hydraulic hose from the take-up tumbler section.

#### NOTE:

- When the standard jack/shim type crawler belt tension adjuster is equipped, this procedure is not required. When the optional hydraulic cylinder type adjuster is equipped, disconnect the hydraulic hose (one hose on each side).
- Protect the disconnected sections with caps or plugs.



Disconnection of Hydraulic Hose from Take-up Tumbler

420444-113



## 5 ASSEMBLING/DISASSEMBLING

2. Open travel motor cover (1).

**IMPORTANT:** Be careful not to let the quick couplers come in contact with other objects. Damage to the couplers may result.

3. Disconnect hydraulic hoses (2) from the travel motor (4 hoses on each side).

**NOTE:** Protect the disconnected sections with caps or plugs.

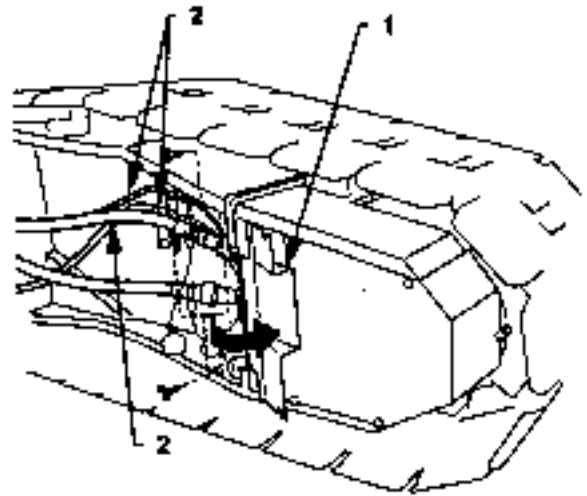
4. Close travel motor cover (1).

5. Start the engine.

**NOTE:** Run the engine at approx. 1000 min<sup>-1</sup> (rpm).

6. Check that the cab side of the superstructure faces the front side of the undercarriage.

**NOTE:** In case the cab side of the superstructure does not face the front side of the base carrier, move the lock lever to the UNLOCK position to release the slewing lock and brake. Then, after slewing the superstructure face the cab side of the superstructure toward the front side of the undercarriage, apply the slewing lock, and the slewing brake. Move the lock lever to the LOCK position.



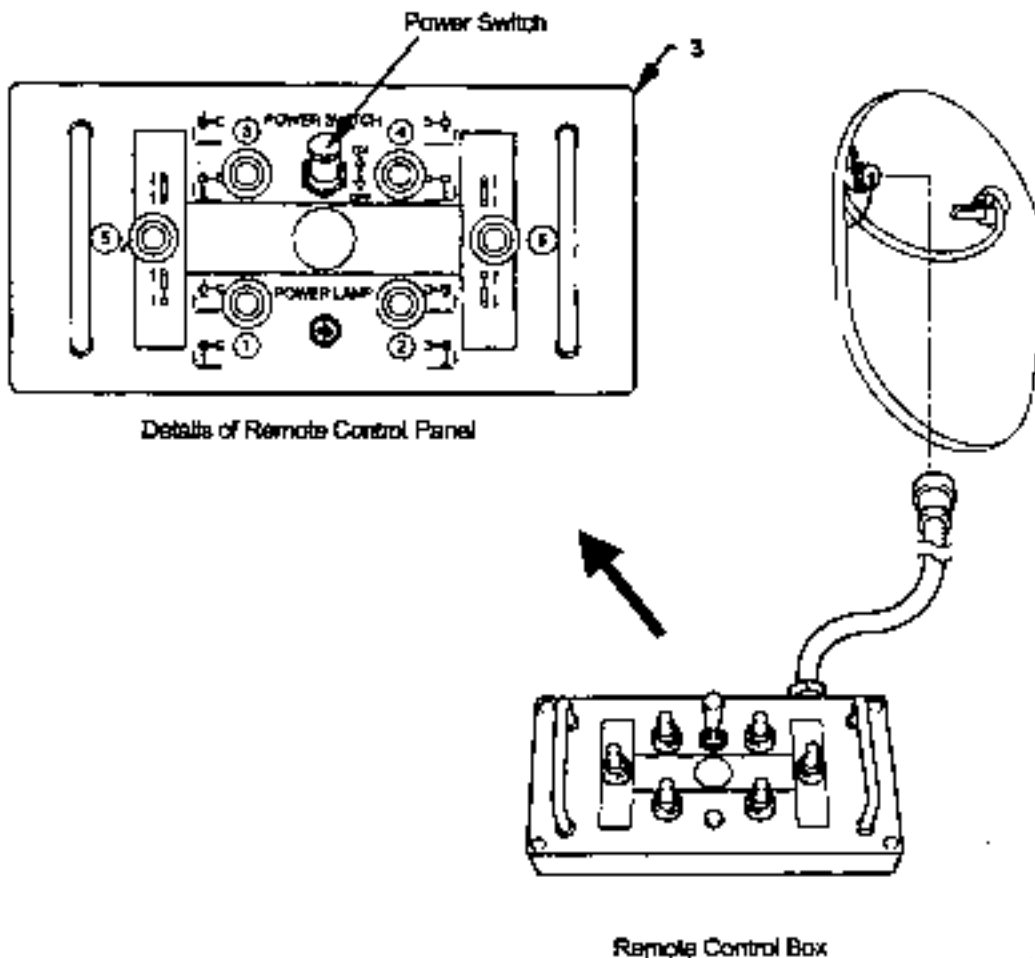
8CD-08-280

## 5 ASSEMBLING/DISASSEMBLING

7. Connect remote control box (3) to the connector on the lower frame.

### NOTE:

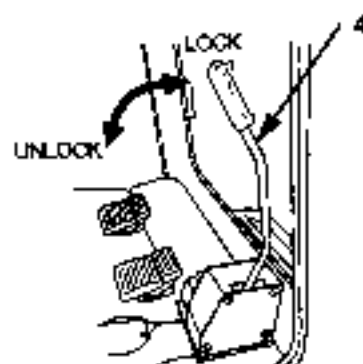
- Check that the power switch on the remote control box (3) is OFF. In case the power switch is in the ON position, tilt the knob to the OFF position.
- The remote control box (3) hose connectors are located at two locations in the front and rear of the lower frame. Depending on the job site circumstances, select either one which is in the easiest-to-see position to safely connect the hose.



100-99-001

## 5 ASSEMBLING/DISASSEMBLING

8. Move lock lever (4) to the LOCK position.



9. Store mounting/dismounting step (11).

**NOTE:** While raising step (11), rotate step toward the cab. Install latch-form shaft (12).

### IMPORTANT:

- Be sure to use floats (5) which are attached to the machine.
- Arrange the ground surface flat so that overall float bottom face can come in contact with the ground.
- Correctly align the centers of jack-up cylinders (8) and floats (5).

10. Remove floats (5) from lower weight. Position each float (5) just under the respective jack-up cylinder (8).

Float weight: 27 kg

11. Removing lower weight

### WARNING

Do not allow workers to enter the space between the lower frame and the lower weight.

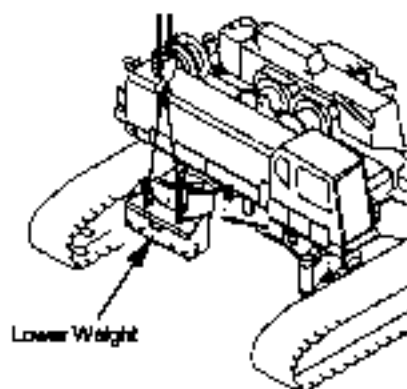
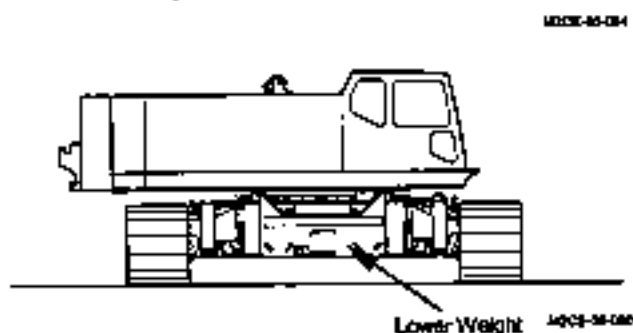
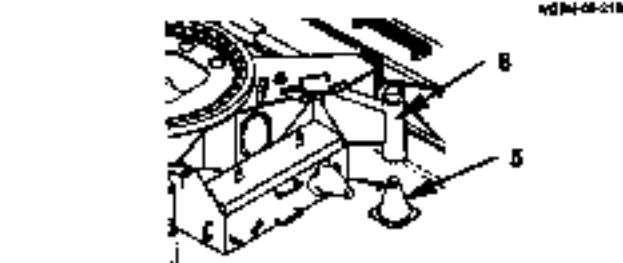
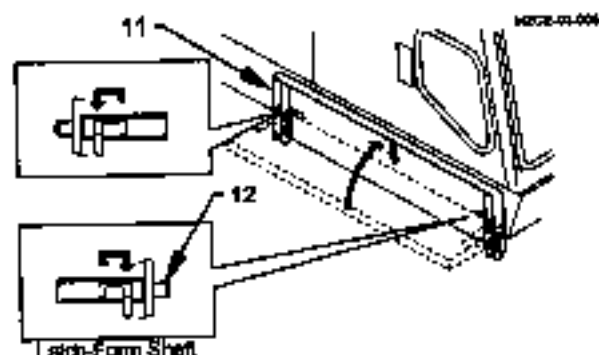
### CAUTION

Before removing the lower weight, store mounting/dismounting step (11) in the cab. After rotating step (11) inward while lifting the outside edge of the step, secure the step into the temporal storing hole without allowing the step to slide downward.

- 1) Slew the superstructure 90° so that the superstructure aligns with the side frames in parallel.
- 2) Apply the slew lock. Stop the engine.
- 3) Attach sling wire ropes to the lower weight. Using an assistant crane, lift the lower weight so that the lower weight comes off the hooks on the lower frame.
  - Weight of Lower Weight: 4750 kg/unit

**IMPORTANT:** Lift the lower weight with two pieces of sling wire ropes.

- 4) Remove the opposite side lower weight by following the same procedure in steps 3).



## 5 ASSEMBLING/DISASSEMBLING

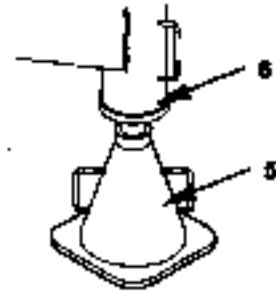
12. Tilt the power switch on remote control box (3) toward the ON position.

**IMPORTANT:** Operate the remote control box (3) in a safe and easy-to-see place.

13. Extend jack cylinder (6) onto float (5) by operating jack switches (10).

**IMPORTANT:**

- Operate jack switches (10) in an easy-to-see place.
- Do not raise the superstructure higher than necessary.

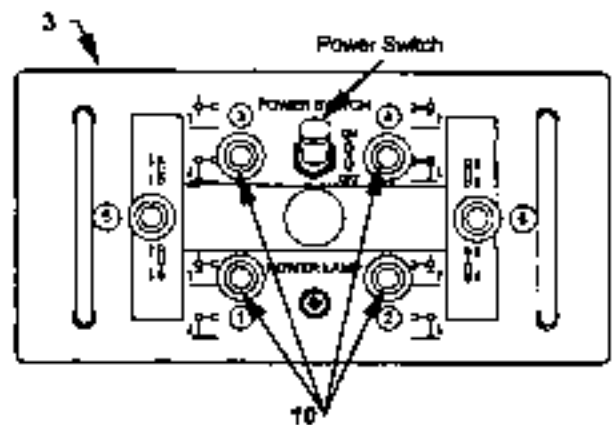


3CD-06-018

14. Operate jack switches (10) so that the machine can be horizontally raised.

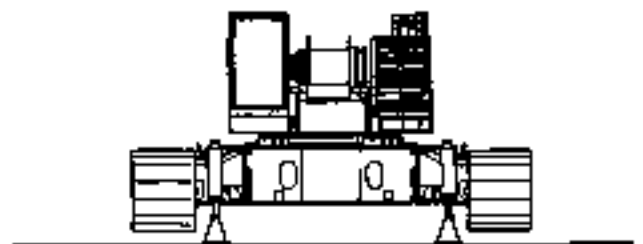
**NOTE:**

- To prevent the superstructure from being inclined more than 1 degree, operate jack switches (10) to slightly raise the rear side of the superstructure first. Then, raise the front side of the superstructure so that the superstructure becomes level. Repeat this procedure in sequence as necessary.
- Extend the jack cylinders until the crawlers are raised off the ground.



3CD-06-024

15. Choose one side crawler to be removed first.



M2C-E-06-020

## 5 ASSEMBLING/DISASSEMBLING

16. Extend side frame suspension link (13).

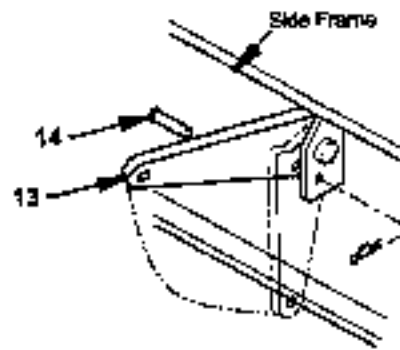
**NOTE:** After removing holding pin (14) of suspension link (13), extend suspension link (13). Then, lock suspension link (13) in position using removed holding pin (14).

17. Attach sling wire ropes (16) to side frame suspension lugs (15) and suspension link (13). Hold the crawler using an assistant crane.

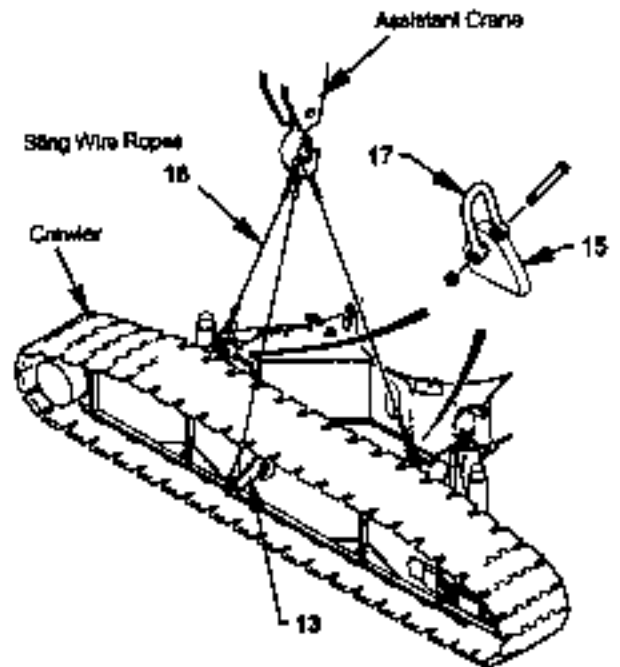
**NOTE:** Crawler sling wire ropes (16) and shackles (17) are included in the optional parts:  
Wire Rope: Diameter: 28 mm x 2.85 m - 3 pieces  
Shackle: Light weight type shackle for 10 t x 3 pieces  
Crawler Weight: 14400 kg

18. Remove headed pins (19) from crawler connecting cylinder (18).

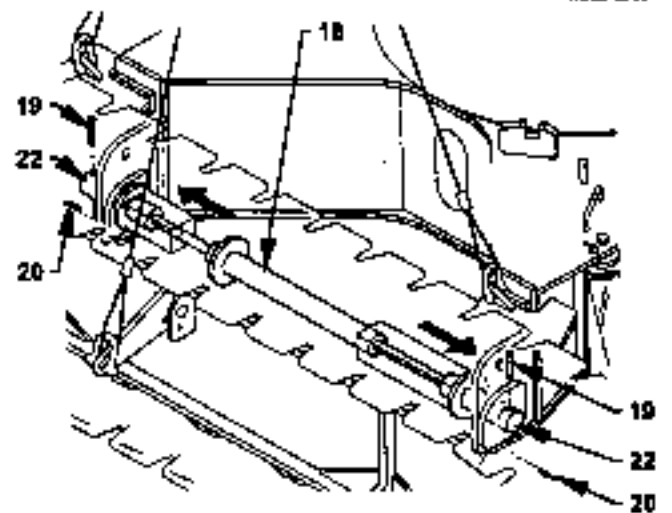
**NOTE:** Remove lock pin (20) to remove headed pin (19) on cylinder pin (22).



1402-08-028



1402-08-029



1402-08-102

## 5 ASSEMBLING/DISASSEMBLING

19. Operate crawler connecting cylinder switch (21) on control box (3) to the RETRACT side to remove cylinder pins (22) from the side frame.

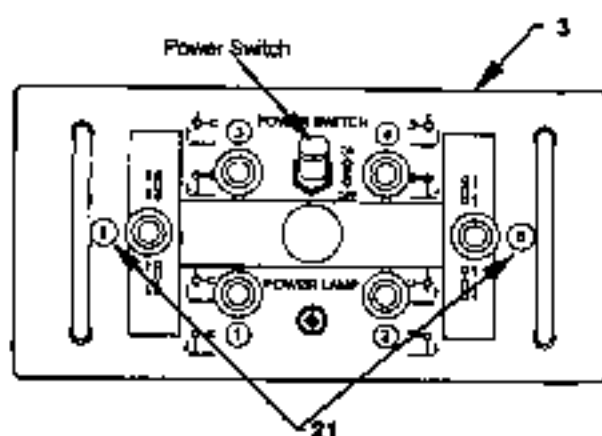
**NOTE:** After the crawler is separated from the lower frame, coat the pin sliding sections on crawler connecting cylinder (18) with grease.

20. Operating the assistant crane, slowly separate side frame hooks (23) from lower frame pins (24).
21. Lower the crawler in a position where the crawler will not disturb other disassembly work process.
22. Retract side frame suspension link (13) back to the storing position.

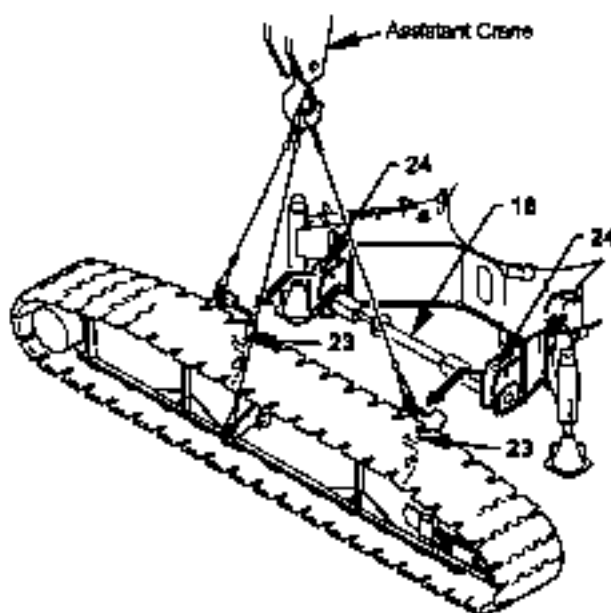
**NOTE:** Remove holding pin (14) of suspension link (13) to retract suspension link (13) back to the storing position. Then, reinstall holding pin (14) to secure suspension link (13) in position.

23. Remove the opposite side crawler.

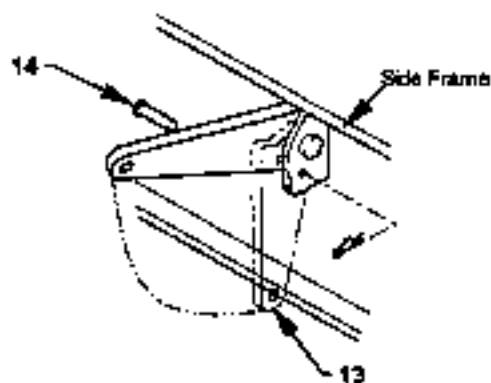
**NOTE:** Remove the opposite side crawler by following the same procedures described in steps 18 to 21.



MOSE-06-024



MOSE-06-025



MOSE-06-026

## 5 ASSEMBLING/DISASSEMBLING

### 2.19 Loading Base Machine onto Trailer

#### 2.19.1 When the crawlers are not mounted:



#### WARNING

- Never enter under the superstructure while operating the Jacks.
- Operate the Jack cylinders so that the base machine is not inclined more than 1 degree. Failure to do so may result in tipping over of the machine.
- If the superstructure is slewed without extending the Jack cylinders, the machine will turnover. Never rotate the superstructure without extending the Jack cylinders.

1. Move lock lever (1) to the LOCK position.

#### IMPORTANT:

- Operate the switch box in an easy-to-see place.
- Do not raise the superstructure higher than necessary.
- Place the crawler hoses on the lower frame so that the hoses are not damaged.

2. Raise the base machine so that the machine level is maintained by operating the Jack switch.

**NOTE:** To prevent the superstructure from being inclined more than 1 degree, operate the switch to slightly raise the rear side of the superstructure first. Then, raise the front side of the superstructure so that the superstructure becomes level. Repeat this procedure in sequence.

**IMPORTANT:** Carefully move the trailer by following the directions from the signal person so that the trailer deck does not come in contact with the Jack cylinders, the lower frame and/or the floats.

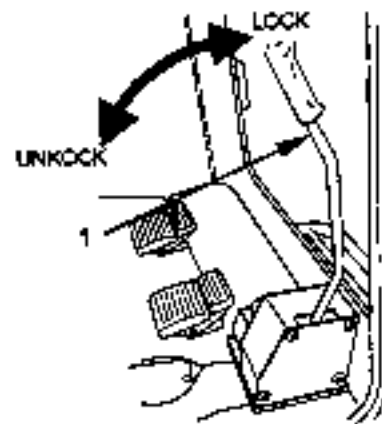
3. Move the trailer in reverse.

**NOTE:** Move the trailer so that both right and left side clearances between the trailer deck side and the Jack cylinders become equal.

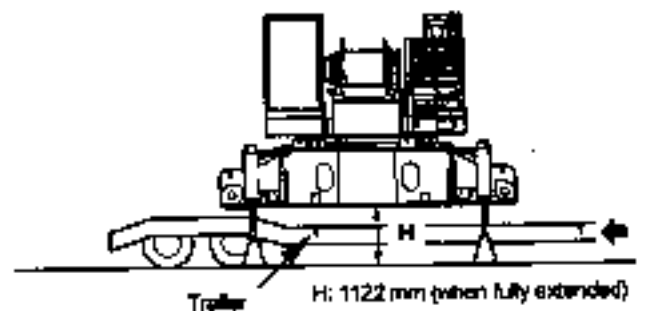
4. Let the lower frame bottom surface come in contact with the wooden blocks laid on the trailer deck by operating the Jack switches.

#### NOTE:

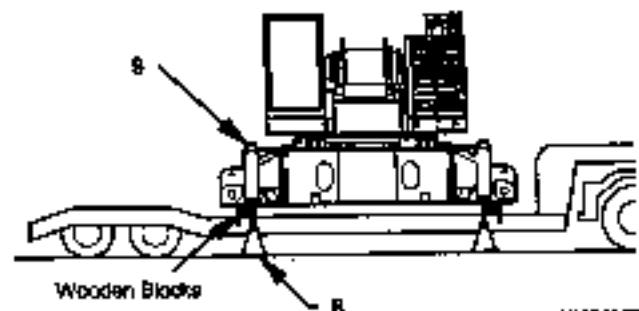
- Keep the Jack cylinders (9) in contact with the floats (8) at this time.
- To prevent the superstructure from being inclined more than 1 degree, operate the switch to slightly lower the front side of the superstructure first. Then, lower the rear side of the superstructure so that the superstructure becomes level. Repeat this procedure in sequence as necessary.



WCCB-03-008



WCCB-04-008



WCCB-05-007

## 5 ASSEMBLING/DISASSEMBLING

5. Move lock lever (1) to the UNLOCK position.
6. Step on slewing lock pedal (2) to release the slewing lock.
7. Turn slewing brake switch (3) OFF.

**IMPORTANT:** Slowly slew the superstructure so that impacts are not developed.

8. Slew the upper structure 90 degrees.

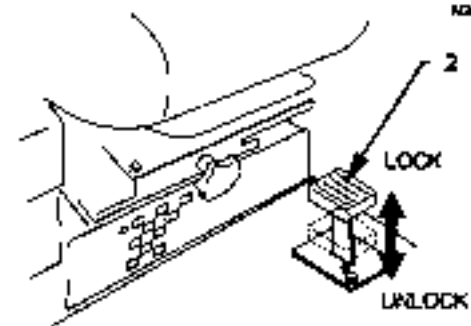
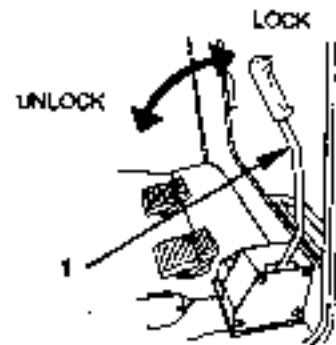
**NOTE:** Position the lower frame parallel to the axle beam.

9. Step off the slewing lock pedal (2).
10. Turn the slewing brake switch (3) ON.
11. Move lock lever (1) to the LOCK position.
12. Fully retract the jack cylinders (9) by operating the jack switches.

**IMPORTANT:** Do not leave the floats attached to the jack up unit when transporting the machine by a trailer. The floats will be extended beyond the trailer deck width.

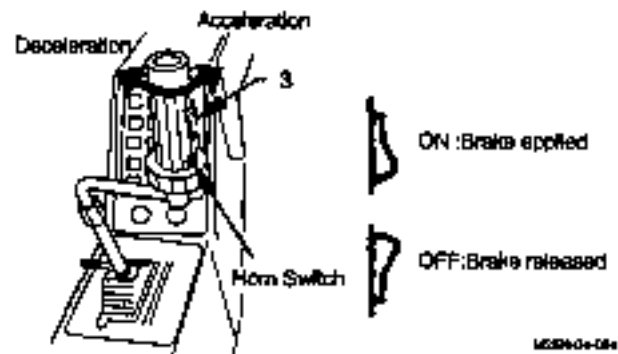
13. Store the float (8) in the specified position.

Float weight: 27 kg



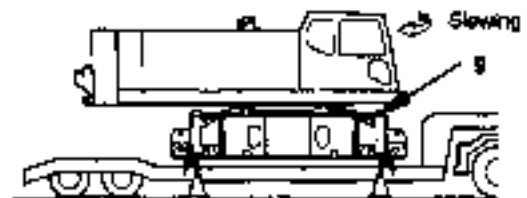
MOB-23-024

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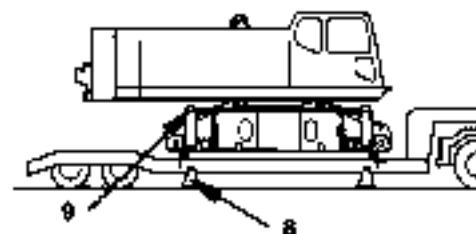


MOB-04-024

MOB-04-027



MOB-05-024

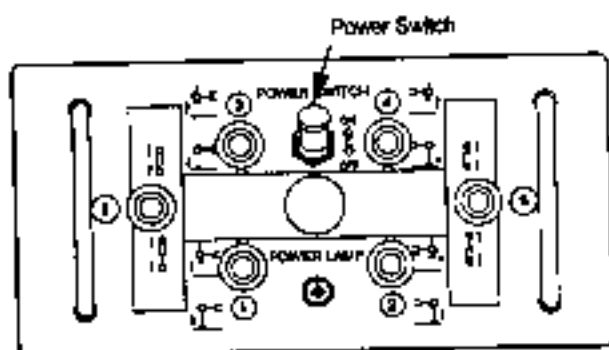


MOB-04-025



## 5 ASSEMBLING/DISASSEMBLING

14. Turn the power switch on the remote control box OFF.



300-85-33H

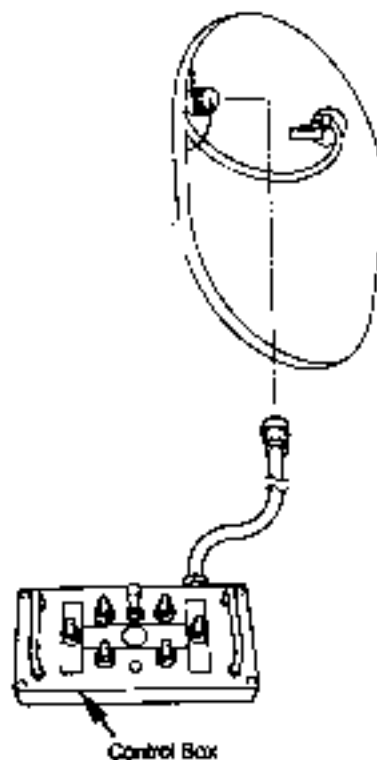
15. Stop the engine.  
16. Remove the switch box. Store the switch box in the specified location.  
17. Attach sling wire ropes to the suspension lugs on jack-up unit (2). Hold jack-up unit (2) using an assistant crane.

**NOTE:** Jack-up Unit Weight: 370 kg

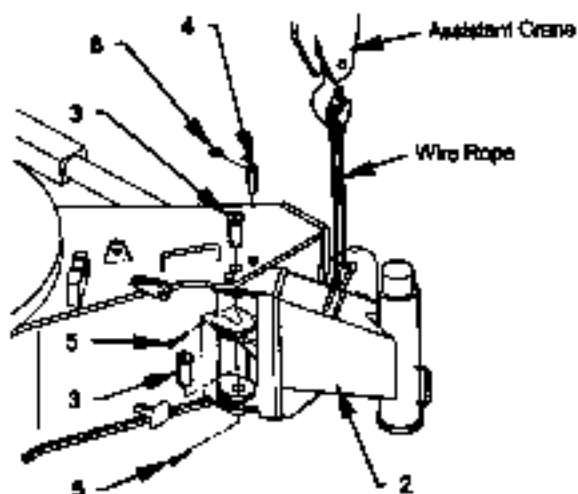
18. Remove upper and lower two supporting pins (3) and holding pin (4) from jack-up unit (2).

**NOTE:**

- Remove cotter pin (5) from supporting pin (3).
- Remove ring pin (6) from holding pin (4).



200-86-114



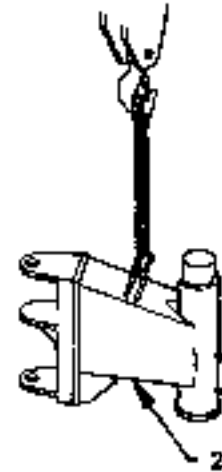
300-85-021

## 5 ASSEMBLING/DISASSEMBLING

- Using the assistant crane, lift and move jack-up unit (2) to a position where the jack-up unit will not disturb the transportation work process.
- Install upper and lower two supporting pins (3) and holding pin (4) into holes on lower frame (7).

**NOTE:**

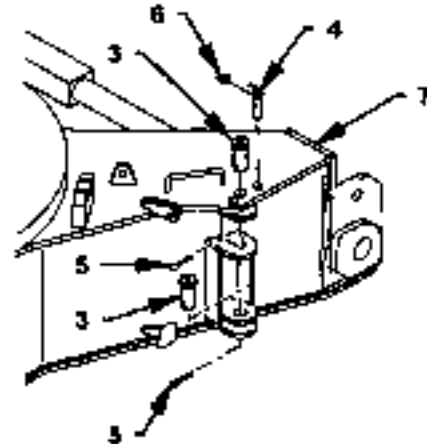
- Install cotter pin (5) to prevent supporting pin (3) from coming off.
- Install ring pin (6) to prevent holding pin (4) from coming off.



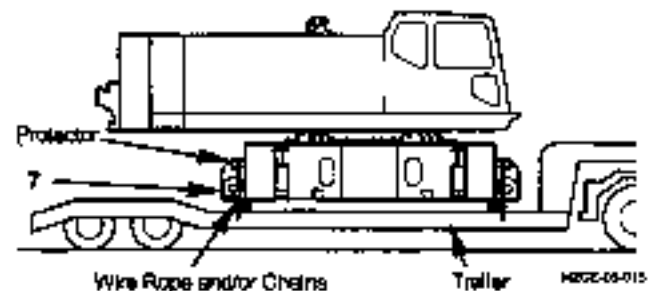
MOB-05-014

- Remove other three units of the jack-up units from the lower frame by following the same procedures described in steps 17 to 20.
- Secure the front and rear of lower frame to a trailer deck with wire ropes or chains.

**NOTE:** Install protectors (soft material) between lower frame (7) and wire ropes (chains).



MOB-05-015



MOB-05-015

## 5 ASSEMBLING/DISASSEMBLING

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### 2.20 Maintenance after Disassembly

Perform the following maintenance.

- Coat all pin holes with grease.
- After cleaning, coat all pins with grease. Install them into their respective pin holes.
- Put caps or plugs to all cable ends.
- Wind wire ropes around wooden box and fasten them with wire to prevent them from kinking
- Take necessary measures to protect lifting tools, shackles, forcing screws, etc from rusting. Store them in a specified location such as a tool box for easy retrieval.

## 5 ASSEMBLING/DISASSEMBLING

### 3 HANDLING WIRE ROPE

#### 3.1 Wire Rope Specifications and Lengths

**IMPORTANT:** The standard length wire rope is installed to the front drum on a new crane or crane/tower combined specification machine. However, when a crane specification machine is operated with a short boom and less number of the hook lifting reeved lines, or when a tower specification machine is operated with a hook lifted by one reeved line, the length of wire rope remaining on the drum will increase, causing the rope tension on the drum to become loose. Therefore, irregular winding of the rope on the drum may occur so that short service life of wire rope may result. Operate the machine with the length of wire rope appropriate to the machine specifications. (Refer to 3.1.5 Required Wire Rope Lengths.)

#### 3.1.1 Crane Wire Ropes

Part Name		Rope Construction Shipped from Factory	Breaking Force (kN)	Diameter (mm)	Length (m)
Boom Derricking Drum Wire Rope		XP IWRC6xWS (31) Ordinary Z lay	367	22.4	195
Front Drum	Crane exclusive boom (Use either one.)	EP 3x(40) Ordinary Z lay	569	26	300
		P-S(19)+39xP-7 Ordinary Z lay	593	26	300
Rear Drum	Crane exclusive boom (Use either one.)	EP 3x(40) Ordinary Z lay	569	26	200
		P-S(19)+39xP-7 Ordinary Z lay	593	26	200

**IMPORTANT:**

- Be sure to only use the wire rope as specified by Hitachi Sumitomo for the boom derricking drum wire rope.
- Use a wire rope with the diameter tolerance of + 2 % to +4 %. If a wire rope with the diameter tolerance beyond the specified range is used, irregular winding of wire rope on the drum may result.
- Take the records of date and the hour meter reading when wire rope is replaced.

## 5 ASSEMBLING/DISASSEMBLING

### 3.1.2 Clamshell Wire Ropes (Optional)

Part Name	Rope Construction Shipped from Factory	Breaking Force (kN)	Diameter (mm)	Length (m)
Boom Derricking Drum	XP IWRC6xWS (31) Ordinary Z lay	367	22.4	195
Front Drum (Open/Close Wire Rope)	XP IWRC6xWS (31) Ordinary Z lay	500	26	82
Rear Drum (Bucket Support Wire Rope)	XP IWRC6xWS (31) Ordinary Z lay	500	26	70

#### IMPORTANT:

- Be sure to only use the wire rope as specified by Hitachi Sumitomo for the boom derricking drum rope.
- Use a wire rope with the diameter tolerance of + 2 % to +4 %. If a wire rope with the diameter tolerance beyond the specified range is used, irregular winding of wire rope on the drum may result.
- When the digging depth becomes deeper, the wire rope from the front drum (bucket open/close) may get intertwined with the wire rope from rear drum (bucket support). If this case occurs, use an S-lay wire rope on the rear drum.
- The Open/Close and Bucket Support wire rope lengths shown in the above table are decided based on the conditions that the machine excavates 12 mm below the ground surface with a boom which length is 21 to 22 m. If required to excavate deeper than 12 m, arrange a wire rope length meeting the operation conditions.

### 3.1.3 Hydraulic Tag Line Wire Rope (Optional)

Rope Construction Shipped from Factory	Breaking Force (kN)	Diameter (mm)	Length (m)
6x37 Ordinary Z lay	59.2	10	55

### 3.1.4 Reaving Winch Wire Rope

Rope Construction Shipped from Factory	Breaking Force (kN)	Diameter (mm)	Length (m)
A4xF (30) Ordinary Z lay	35.5	8	250

### 3.1.5 Reaving Winch Wire Rope (Optional) (Specification for Hydraulic Tagline cum Reaving Winch)

Rope Specification Shipped from Factory	Breaking Force (kN)	Diameter (mm)	Length (m)
6xFI (29) Ordinary Z lay	59.1	10	220

## 5 ASSEMBLING/DISASSEMBLING

### 3.1.8 Required Wire Rope Length

#### (1) Wire Rope for Front Drum and Short Jib (with Crane Exclusive Boom)

Boom Length (m)	Number of Reeved Lines											
	Front Drum											Short Jib
	1	2	3	4	5	6	7	8	9	10	11	1
15	37	51	66	81	95	110	124	139	154	168	183	40
18	43	60	78	95	113	131	148	166	183	201	-	46
21	49	69	90	110	131	151	172	192	213	-	-	52
24	55	78	102	125	149	172	198	219	-	-	-	58
27	61	87	113	140	166	193	219	-	-	-	-	63
30	67	96	125	155	184	213	-	-	-	-	-	69
33	72	105	137	170	202	234	-	-	-	-	-	75
36	78	114	149	184	220	-	-	-	-	-	-	81
39	84	123	161	199	237	-	-	-	-	-	-	87
42	90	132	173	214	-	-	-	-	-	-	-	93
45	96	140	185	229	-	-	-	-	-	-	-	99
48	102	149	198	-	-	-	-	-	-	-	-	105
51	108	158	208	-	-	-	-	-	-	-	-	111
54	114	167	220	-	-	-	-	-	-	-	-	117
57	120	176	232	-	-	-	-	-	-	-	-	123
60	126	185	-	-	-	-	-	-	-	-	-	129
63	132	194	-	-	-	-	-	-	-	-	-	135
66	138	203	-	-	-	-	-	-	-	-	-	141
69	144	212	-	-	-	-	-	-	-	-	-	147
72	150	221	-	-	-	-	-	-	-	-	-	-
75	150	230	-	-	-	-	-	-	-	-	-	-

- The wire rope length for the front drum and short jib shown in the above table corresponds to the wire rope length required when the hook is lifted 1m above the ground at the minimum working radius with 3 turns of the wire rope remaining on the front drum. In case any underground lifting is required, decide the wire rope length so that 3 turns of the wire rope can remain on the drum when the hook is lowered to the required underground lift.

## 5 ASSEMBLING/DISASSEMBLING

### (2) Fly Jib Wire Rope (with Crane Exclusive Boom)

Boom Length (m)	Fly Jib Length (m)			
	10	16	22	28
39	107	119	131	143
42	113	125	137	149
45	119	131	143	155
48	125	137	149	161
51	131	143	155	167
54	137	149	161	173
57	143	155	167	179
60	149	161	173	185
63	155	167	179	-

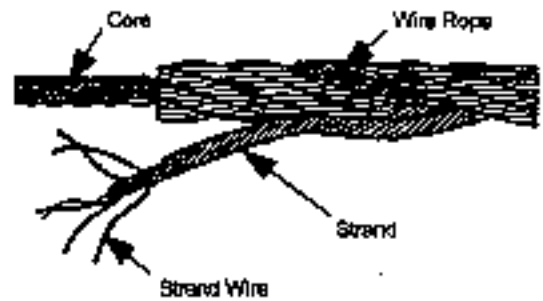
- The wire rope length for the front drum and fly jib shown in the above table corresponds to the wire rope length required when the hook is lifted 1m above the ground at the minimum working radius with 3 turns of the wire rope remaining on the front drum. In case any underground lifting is required, decide the wire rope length so that 3 turns of the wire rope can remain 3 turns on the drum when the hook is lowered to the required underground lift.

## 5 ASSEMBLING/DISASSEMBLING

### 3.2 Outline of Wire Ropes

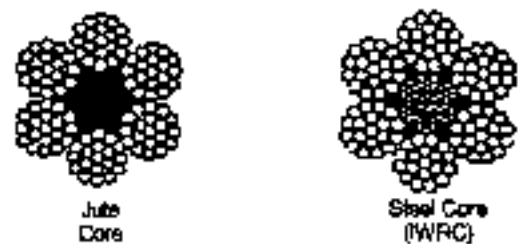
#### 3.2.1 Construction of Wire Rope

Many different kinds of wire ropes are available. Therefore, it is important to select wire ropes which are best suited to the required work considering wire structure, twist type, angle of lay, diameter, material, used, etc. Wire rope construction is generally specified by the number of strands and the number of strand wires. For example, in case there are six strands and each strand has 29 wires, the rope is called (6x29) rope. Jute and steel core (IWRC) are used as rope core. On construction machines, high tensile IWRC is commonly used.



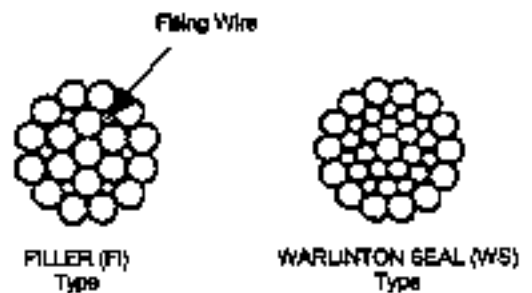
W124-08-012

Two types of parallel lay wire rope strands are available, FILLER and WARLINTON seal (WS) types. The FILLER type is most commonly used as it has a good combination of flexibility, bending fatigue resistance and wear resistance. The WARLINTON type has very good bending fatigue resistance. Moreover, flexibility and wear resistance are also good.



Wire Rope Construction

W124-08-013



Cross Section of Strand

W124-08-014

Among the flat type rope strands, there is an oval shape strand which cross section forms the oval shape. This type of wire rope typically consists of three or four strands. As the rope surface is smooth, increased wear resistance and self-rotation-resistant characteristics are prominent features of this rope.



Oval Shape Strand Mono-Rope

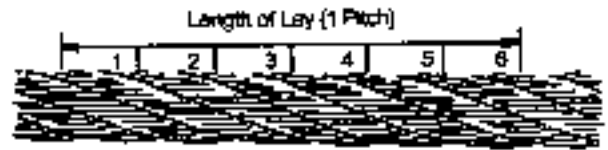
W124-08-015



## 5 ASSEMBLING/DISASSEMBLING

### (1) Length of Lay

Length of lay is the pitch made of the strands. Two types of pitch are available: Normal Pitch and Special Pitch. A special pitch is longer than normal pitch so that self-rotation-resistant characteristics and fatigue resistance are improved, and the strands are less likely to be loosened.



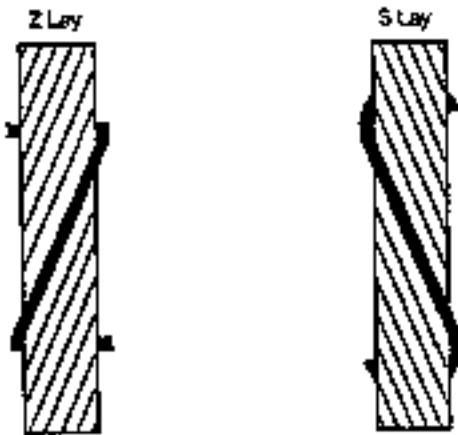
The numbers 1 to 6 mean the strand numbers.

Length of Wire Rope Lay

W06-06-01

### (2) Direction of Lay

Two directions of lay for ropes and strands are available: Z lay and S lay.



Direction of Lay

W04-02-01

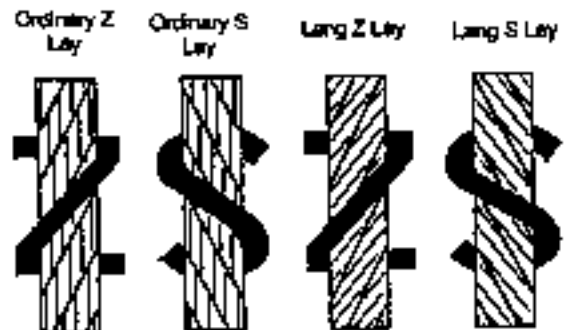
### (3) Laying Method

#### • Rope Lay

Depending on the combination of rope and strand laying directions, ordinary lay and lang lay are available. In ordinary lay, the lay direction of the rope is opposite to that of the strand. In lang lay, the lay direction of the rope is the same as that of the strand.

#### • Strand Lay

Depending on the combination of strand wires in each ply, cross lay (strand wires in each ply makes point contact), parallel lay (strand wires in each ply makes line contact) and flat lay (strands are rearranged so that wire rope periphery becomes flat) are available. On construction machinery, parallel lay strand wire ropes are generally used. Occasionally, flat lay strand wire rope is used as a hoist wire rope with self-rotation-resistant characteristics.



Wire Rope Laying Method






W06-06-02

## 5 ASSEMBLING/DISASSEMBLING

### 3.2.2 Types of Wire Ropes and Their Characteristics

Types of wire ropes and their characteristics are compared in the following table, in which wire ropes made by TOKYO SEIKO are described as the samples.

Types of Wire Ropes and Their Characteristics

Item	Description	Ordinary Pitch IWRC6xFi (29)	Long Pitch LPWRC6xFi (29)	Ordinary Pitch Profile Wire IWRC6xFi (29)	Ordinary Pitch IWRC6x WS (31)	Special Pitch XP IWRC6x WS (31)
Cross Section		 M324-06-03C	 M324-06-03E	 M324-06-03J	 M324-06-03G	 M324-06-03A
Fatigue-Resistance	Life time comparison with IWRC6xFi (29) (Test conditions: D/d=20, SF=8)	1	1.2~1.3	1.0~1.1	1.1~1.2	2.0~2.5
Self-Rotation-Resistance	Guide value to prevent wire rope from entangling * Rope torque efficient $k$ ( $10^{-3}$ )	$\frac{H}{D} < 40$ 80~100	$\frac{H}{D} < 40\sim70$ 50~70	$\frac{H}{D} < 40$ 80~100	$\frac{H}{D} < 40$ 80~100	$\frac{H}{D} < 50\sim80$ 50~70
Loosening Resistance	Resistance to loosening at rope crossover points and at sheave contact points. Wear resistance between wire ropes. Resistance to rope strand loosening	Good	Good	Very good	Good	Excellent
Handling Ease	Evaluation by flexibility and handling easiness	Easy to wind on drum. Excellent durability against loosening	Easy to wind on drum. Excellent durability against loosening	Easy to wind on drum. Excellent durability against loosening	Easy to wind on drum. Excellent durability against loosening	Easy to wind on drum. Excellent durability against loosening
Note		Generally used on crane operations	Improved self-rotation resistance rope	IWRC6xFi (29) with strands organized by profile wires	Fatigue resistance is slightly better than IWRC6x Fi (29). Other characteristics are almost equal to IWRC6x Fi (29).	Self-rotation resistance, loosening resistance, and fatigue resistance are much improved than IWRC6x Fi (29)

**NOTE:**

\* Using wire ropes described in 3.1.1 Crane Wire Ropes is recommended. Refer to 3.2.3 Standard Wire Ropes to select appropriate wire ropes suited for working conditions.

\* Acronyms used in the above table:

D : Sheave pitch circle diameter (mm)

d : Rope diameter (mm)

SF : Safety factor for rope breaking force







H : Lifting height (mm)

W : Rope tension (kgf)

T : Torque generated by tension W (kgf-m)

## 5 ASSEMBLING/DISASSEMBLING

Types of Wire Ropes and Their Characteristics (Self-Rotation-Resistant Rope)

Item	Description	Mono-Rope SP 4×F (40)	Mono-Rope EP 3×F (40)	Hercules Type 19×7	Nuflex Type 35×7	Tough- Nuflex Type P S(19)+30×P-7
Cross Section		 <small>M324-06-005</small>	 <small>M324-06-006</small>	 <small>M324-06-007</small>	 <small>M324-06-008</small>	 <small>M324-06-009</small>
Fatigue-Resistance	Life time comparison with IWRC6×F1 (29)	0.7~0.8	0.5~0.6	0.8~0.9	0.8~0.9	0.8~0.9
Self-Rotation-Resistance	Guide value to prevent wire rope from entangling	$\frac{H}{D} < 60 \sim 150$	$\frac{H}{D} < 100 \sim 180$	$\frac{H}{D} < 100 \sim 140$	$\frac{H}{D} < 100 \sim 140$	$\frac{H}{D} < 100 \sim 180$
	* Rope torque efficient k (10 <sup>-3</sup> )	10~20	5~15	20~25	20~25	10~20
Handling Easiness	Evaluation by flexibility and handling easiness	<ul style="list-style-type: none"> <li>• Possible to handle like general rope. Drum winding flexibility is slightly reduced.</li> <li>• Excellent durability against loosening</li> </ul>	<ul style="list-style-type: none"> <li>• Less flexibility than mono-rope SP</li> <li>• Excellent durability against loosening</li> </ul>	Flexible but care must be taken as the strands are easy to loosen as illustrated below.	Flexible but care must be taken as the strands are easy to loosen as illustrated below.	<ul style="list-style-type: none"> <li>• Flexible</li> <li>• Resistance to loosening is stronger than Hercules and Nuflex Type</li> <li>• Take care not to kink.</li> </ul>
Note		Fatigue resistance is slightly reduced but wear resistance is increased as the rope surface is smooth.	Although fatigue resistance is less than Mono-Rope SP, the breaking load is increased as the effective cross-section area is increased. The strand wire diameter in the top stratum is thick so that the wire rope surface becomes smooth, increasing wear resistance.	Round shape cross section strands are laid in two stratum. As each strand lay direction is opposite to each other, Resistance to crushing load is reduced if high tension is applied. Take care not to kink.	Round shape cross section strands are laid in three stratum. Resistance to crushing load is slightly reduced if high tension is applied. Take care not to kink.	The core strand is a seal type. The second and third stratum strands are WARLINTON seal type. Resistance to crushing load and wear is increased. the breaking load is increased as the effective cross-section area is increased.
				(Looseness)  <small>M324-07-004</small>		

## 5 ASSEMBLING/DISASSEMBLING

### 3.2.3 Standard Wire Ropes

**IMPORTANT:** The standard wire ropes installed to machines shipped from the factory do not meet all possible working requirements. Select appropriate wire rope by referring to the table below.

#### Wire Rope Types

Depending on the types of wire rope, characteristics of wire ropes differ. Referring to the table below, select the type of wire rope appropriated to the working requirements. Refer to 3.2.2 Types of Wire Ropes and Their Characteristics for their make-up and characteristics of each wire rope

Main Work Types vs. Recommended Hoist Wire Rope Types

Work Type	Wire Rope Types	Note
High Lift Work • Tower Crane • Work with wire rope which number of falls is 2 to 3. • Lifting with a Jib or auxiliary jib	<b>Self-Rotation-Resistant Rope</b> • Single rope 3xF (40) • Mono-Rope EP 3xF (40) • Tough-Nuflex P-S (19)→39xP-7	Even though self-rotation-resistant rope is used, self rotation of rope may be unavoidable.
General Lifting Work • Less frequency work with a boom shorter than an intermediate boom. • Multi-crane lift work such as foundation construction site work • Clamshell work	6-strand rope • XP rope (XP) IWRC 6xWS (31) • Filler rope IWRC 6xFi (28) IWRC 6xFi (25)	
Heavy load, high frequency work • Tetrapod lifting work • Harbor loading and unloading work (Grab bucket work) • Dragline work	6-strand rope • XP rope (XP) IWRC 6xWS (31) • Tough super rope IWRC 6xP-Fi (29)	
Heavy load, high lift work • Underground reservoir excavation (Vessel bucket work)	<b>Self-rotation-resistant rope</b> • Single rope 3xF (40) • Mono-rope EP 3xF (40) • Mono-rope SP 3xF (40) • Tough-Nuflex P-S (19)→39xP-7	Even though self-rotation-resistant rope is used, self rotation of rope may be unavoidable.
Underground diaphragm wall bucket excavation work	6-strand rope or self-rotation-resistant rope • XP rope (XP) IWRC 6xWS (31) • Mono-rope SP 4xF (40)	Even though self-rotation-resistant rope is used, self rotation of rope may be unavoidable.
Light load, high frequency work • Lifting magnet work	6-strand rope XP rope (XP) IWRC 6xWS (31)	

**NOTE:** Be sure to use recommended wire ropes for replacement. Before changing or replacing, consult your authorized dealer.

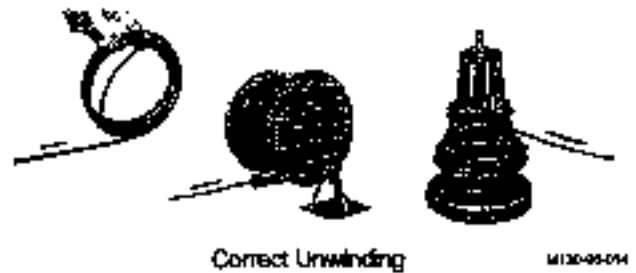
## 5 ASSEMBLING/DISASSEMBLING

### 3.3 General Wire Rope Handling

#### 3.3.1 Precautions for Handling

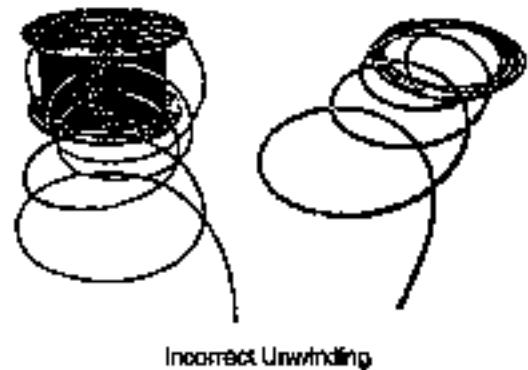
##### (1) Unloading and/or Transportation

- Take care not to allow wire rope to fall off a carrier.
- When rolling wire rope wound around a wooden reel with a lever, do not allow the lever to come in contact with the wire rope. Be sure to push the side frame edges of the reel.
- Do not roll coiled rope on ground surface covered with pieces of crushed rocks and/or metals.



##### (2) Storing

- Store wire rope indoors, in a moisture free location. In case storing outdoors is unavoidable, be sure to seal wire rope in a water proof cover.
- Avoid storing wire rope directly on ground. Lay wooden blocks with height of 200 to 300 mm above the ground, and store the wire rope on the wooden blocks.



##### (3) Unwinding

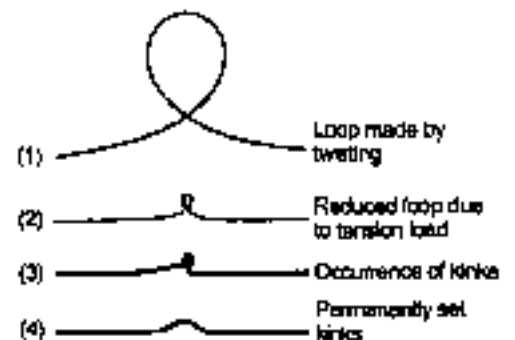
1. Both correct and incorrect unwinding methods of wire rope are illustrated to the right.
2. When unwinding a coiled rope to wind it on a drum, follow the correct handling method.

If unwound following an incorrect method, the rope lay may become twisted as illustrated to the right, causing the rope to make a loop. If the wire rope is tensed without removing any twisting, kinks will result.



Fouled Rope Due to Incorrect Unwinding

M024-06-003



Occurrence of Kinks

M024-06-004

## 5 ASSEMBLING/DISASSEMBLING

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### 3.3.2 Rope Winding on Drum

- Select a wire rope length appropriate to the working conditions (boom length, number of reeved lines, and lifting height) to prevent the wire rope in the upper layer from thrusting into the clearance between the ropes in the lower layer when a load is lifted.
- When rewinding the wire rope in the first layer on drum, continuously apply a line pull.

When the machine was shipped from the factory, the wire rope is installed on the drum without applying a line pull tension. Therefore, if a large load is lifted, the wire rope in the upper layer may be thrust into the clearance between the ropes in the lower layer, possibly resulting in the wire rope lay looseness, irregular winding, and/or premature strand wire breakage. Before using the wire rope on the drum, be sure to pay out wire rope to its full length. Then, rewind the wire rope in the first layer on drum while applying a line pull tension corresponding to the type of the work in which the machine will be engaged.

#### (1) Proper Line Pull for Winding Wire Rope in First Layer

When a 6-strand wire rope is used, proper line pull tension for winding wire rope corresponds to 10 to 15 % of the load to be lifted per a reeved lines. When self-rotation-resistant rope (mono-rope EP, mono-rope SP, or single rope) is used, proper line pull tension for winding wire rope shall correspond to 15 to 20 % of the load to be lifted per a reeved lines. For example, when rewinding wire rope with which the load of 196 kN (20 tf) is lifted by 4 falls, lift the load of 19.6 to 29.4 kN (2.0 to 3.0 tf) apply the proper line pull tension to the wire rope in the first layer on the drum according to the following calculation.

Load per one reeved lines:  $196\text{kN (20 tf)} / 4 = 49\text{ kN (5tf)}$ .

Necessary rope line pull tension for winding wire rope in the first layer:

$49\text{ kN (5tf)} \times (0.1\text{ to }0.15) = 4.9\text{ to }7.35\text{ kN (0.5 to 0.75 tf)}$

Necessary load to obtain proper rope line pull tension:

$[4.9\text{ to }7.35\text{ kN (0.5 to 0.75 tf)}] \times 4$   
 $= 19.6\text{ to }29.4\text{ kN (2.0 to 3.0 tf)}$

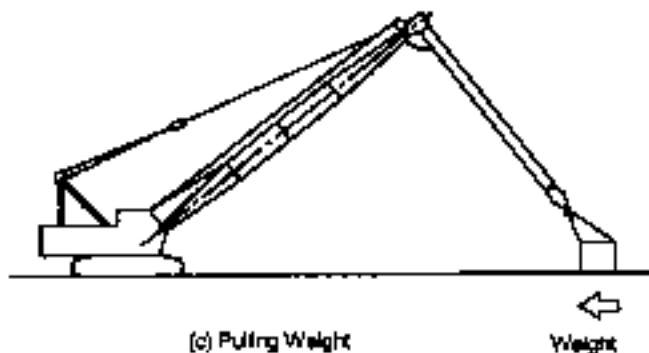
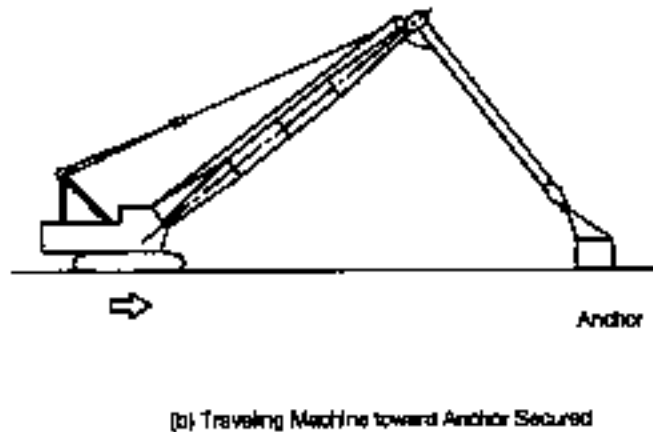
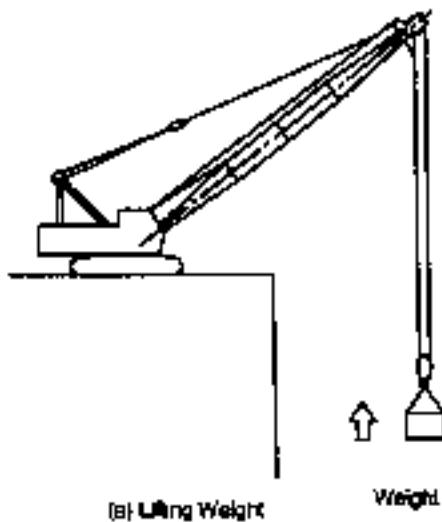
- If wire rope other than the standard type is used, irregular winding on the drum may result. Use only the standard wire rope as specified by Hitachi Sumitomo.
- When high lift work operation is made, use self-rotation-resistant rope to prevent wire rope from tangling.
- When paying wire rope out of the drum, be sure to follow the correct method. Take care not to allow the wire rope to change the lay direction or to form kinks.

## 5 ASSEMBLING/DISASSEMBLING

### (2) Line Pull Application Method (Examples)

**IMPORTANT:** When lowering a load from a high place to a lower place (e.g. disassembling work) or from the ground surface to a surface below the ground level, only the hook weight is applied to the wire rope until the hook is moved to the load position, causing the rope tautness on the drum to become loose. Therefore, when a load is suspended with the hook, the wire rope in the upper layer on the drum may be thrust into the clearance between the wire ropes in the lower layer, possibly resulting in irregular winding of wire rope or deformation of the wire rope cross section. When the machine is engaged in this type of work, apply an appropriate line pull in the methods as illustrated (a) to (c) below as needed.

Apply necessary line pull by means of one of methods (a to c) illustrated below.



M224-08-013

## 5 ASSEMBLING/DISASSEMBLING

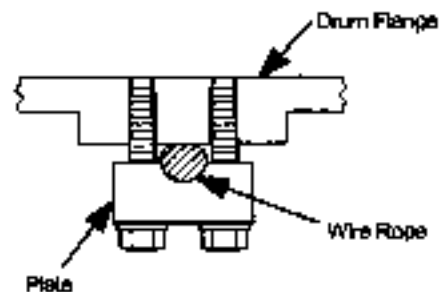
### 3.3.3 Wire Rope Winding Method

The winding method explained in this section can be commonly applied to all drums (front, rear, and boom derricking drums).



#### WARNING:

- If the rope end is not sufficiently fastened, the rope may come off, possibly causing the lifted load to fall. Be sure to securely fasten the rope end.
- If the remaining wire rope on the drum is less than 3 turns, the rope may come off, possibly causing the lifted load to fall. Be sure that more than 3 turns of wire rope remain on the drum.



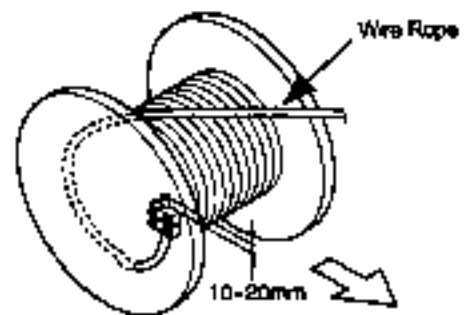
UG21-05-14

1. Thread the wire rope end through the drum flange from the drum flange inside. Extend the rope end 10 to 20 mm from the drum flange outside and secure the rope end with the plate. Tighten bolts to the specified torque so that the clearance between the plate and the projected face on the flange becomes parallel.

Wrench size (Boom hoist): 24 mm

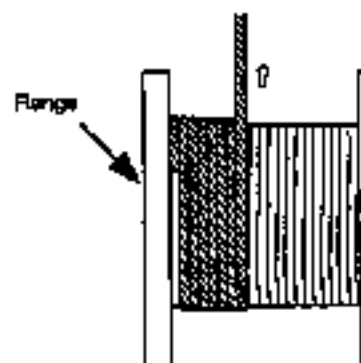
Wrench size (Front, Rear, and Third): 30 mm

**NOTE:** Bolt tightening torque (front, and rear drums):  
Approx. 400 N·m (40 kgf·m)  
(Boom derricking drum): Approx. 210 N·m (21 kgf·m)



UG21-05-14

2. While pulling the wire rope by hand, wind the wire rope along the rope groove on the drum by two to three turns.
3. Then, while applying the required line pull tension, wind the wire rope in the rest of the first layer on the drum. Refer to the illustrations in the "Line Pull Application Method (Examples)."

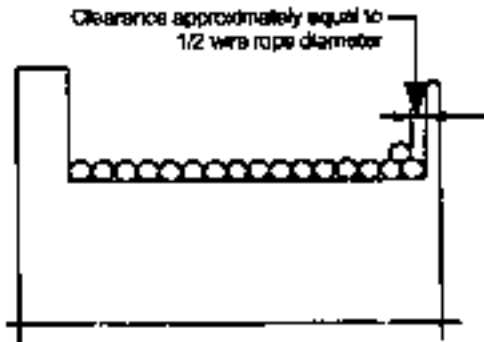


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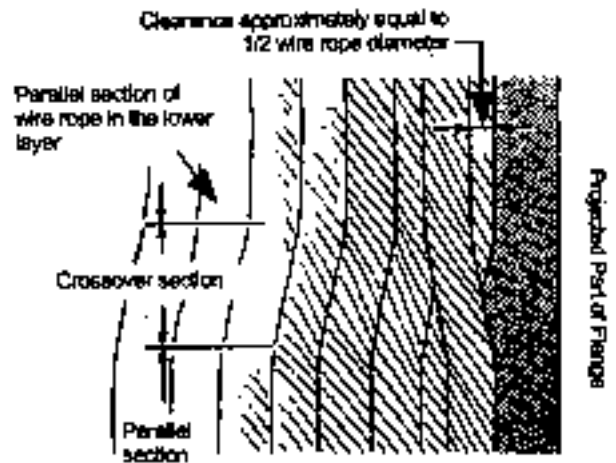


## 5 ASSEMBLING/DISASSEMBLING

4. When the wire rope is wound up to the projected part on the drum flange side face, the wire rope winding layer will be shifted by the projected part to the next upper layer, leaving a clearance between the wire rope and the drum flange side face by approx.  $1/2$  wire rope diameter.

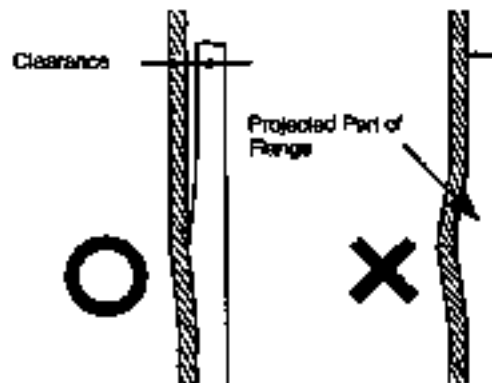


M23-08-041



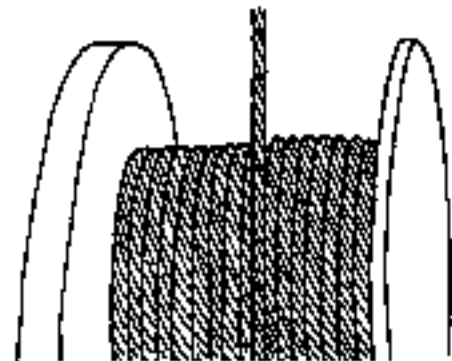
M23-08-042

**IMPORTANT:** If the wire rope is forcibly wound along the drum flange without leaving a clearance at the projected part of the flange, irregular winding of the wire rope may result. Be sure to provide a clearance at the projected part as illustrated to the right.



M23-08-043

5. Even though the wire rope is wound on the drum in multi-layers, rope winding transition section between layers is basically made in the same pattern as the first layer is made to the second layer. However, the transition position may be changed as the number of layers increase due to deviation in the rope and drum manufacturing dimensions. (The transition may not always be made at the projected part of the flange.)



Rope winding transition from the second layer to the third layer

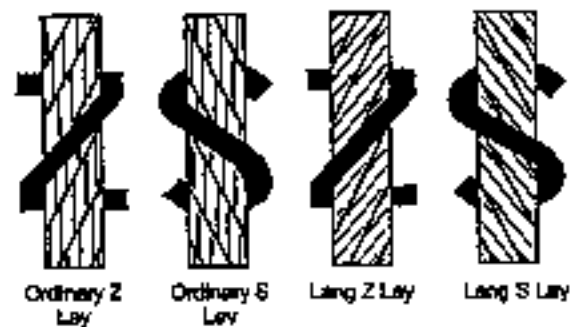
## 5 ASSEMBLING/DISASSEMBLING

### 3.3.4 Correction Method of Rope Entanglement

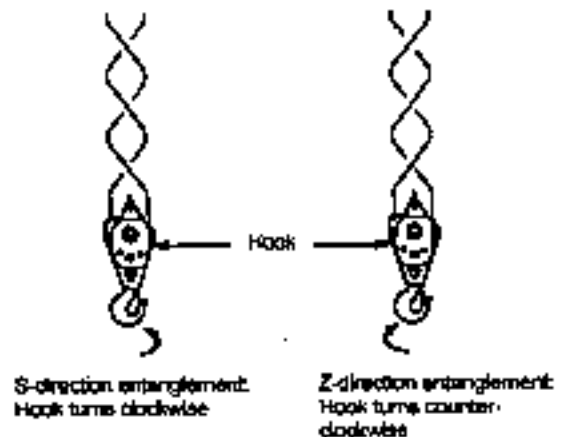
According to wire rope inherent construction, when a load is applied to wire rope, the wire rope rotates in the direction as the lay is unwound. This property is called "self-rotation." In high lift operation or the hook is suspended with 2 to 3 falls, wire ropes may tangle each other due to the self-rotation property, possibly causing the lifted load to spin so that a safety hazard is created and/or work efficiency may be reduced. Although self-rotation-resistant rope which can reduce rope self-rotation property is available, the occurrence of self-rotation cannot completely be prevented. If rope entanglement occurs due to self-rotation property, correct the entanglement by the following methods.

#### (1) Kinds of Rope Lay

Refer to the illustrations shown to the right.



MS24-08-002



MS24-08-011

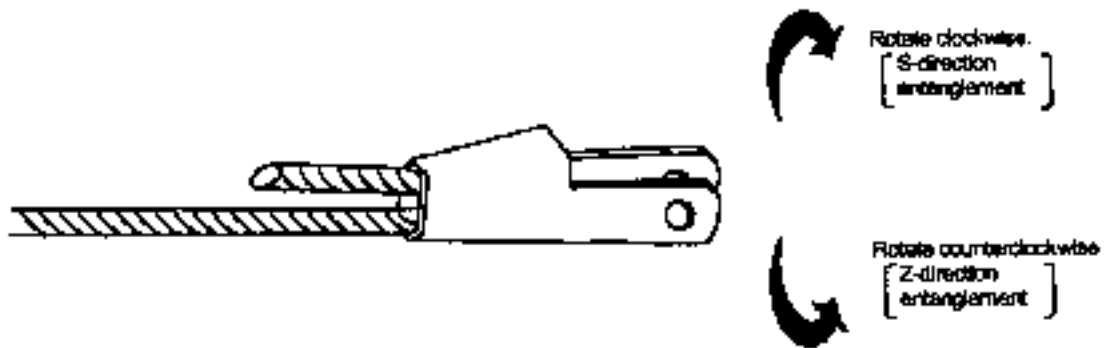
Direction of entanglement (In case Z-lay rope is used) indicates normal examples which may occur when a load is applied to unloaded ropes suspended in parallel.

## 5 ASSEMBLING/DISASSEMBLING

### (2) Correction Method

After completely releasing rope tension, detach the rope socket and rotate the rope end (rope socket) by hands so that rope entanglement is corrected toward the drum side in sequence by repeating to hoist and lower the hook.

Rotation Direction of Rope Socket: Example of Z-lay Rope



In short, rotate the rope socket in the same direction as the hook is rotated by rope entanglement.

MOX-06-016

### (3) Precautions for Correcting Entanglement

- **Number of Rotations to Correct Rope Entanglement**  
Number of Entanglements (\* Number of Hook Turns) x Number of Reeved Line = Number of Rotations to Correct Rope Entanglement
- \*: Required number to slowly rotate the hook until ropes become parallel after the ropes cease entangling.
- If the rope is rotated many turns at one time, the rope ray will become loose. In addition, as it is difficult to correct the entanglement overall length at a time, limit the number of rope rotations up to 4 to 5 turns at a time. Repeat rotations as required.

## 5 ASSEMBLING/DISASSEMBLING

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- The cause of entanglement depends on the time when entanglement occurs. If entanglement occurs during test operation soon after the rope is installed, correct entanglement according to the method mentioned above.

In case entanglement occurs after the machine has been operated for a certain period of time, the following items may be a possible cause of entanglement. Be sure to trace the exact causes. The following are check points to be referred to when troubleshooting. If required, contact your nearest Hitachi Sumitomo dealer.

- After the rope was excessively drawn along the sheave grooves, the rope lay length became uneven.
- Too small sheave diameter
- Worn sheave groove
- Too large fleet angle between the sheave center and the wire rope center



**CAUTION:**

Rope socket may rotate when the rope socket is removed.

- Restoring of Boom Derricking Drum Wire Rope  
The boom derricking drum rope may occasionally wave when the rope lay is unwound. If this occurs, remove the rope socket to restore the rope lay. Also, check that the sheaves can rotate smoothly at the same time.

## 5 ASSEMBLING/DISASSEMBLING

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### MEMO

## 6 TRANSPORTATION

### 1 TRANSPORTATION ON PUBLIC ROADS

When transporting the machine on public roads with a trailer, combinations in transportation weight and dimensions will vary, depending on the trailer model and type used. Check the weight and dimensions to be arranged before transporting. Then, observe the following point.

#### IMPORTANT:

- The maximum weight, width, and height are limited when transporting the machine on public roads. Get permission beforehand from the authorized office. Refer to all local regulations for details.
- Investigate beforehand the conditions of the route to be traveled, such as dimensional limits, weight limits, and traffic regulations.
- Refer to 3. Approx. Weight and Dimensions of Subassembly Units in this section for the weight and dimension specifications. In addition, refer to 2.2 Operational Conditions on Partially Disassembled Machines for operational conditions of the partially disassembled machine.

#### 1.1 Precautions for Transportation

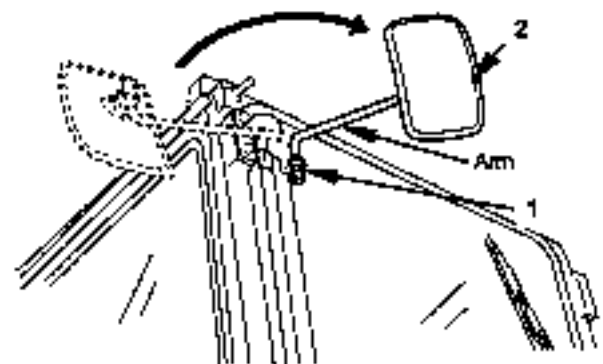


#### WARNING

- Check that the slewing lock, boom derricking drum lock, and brakes are engaged in the LOCK position.
- Check that the control levers and switches are in neutral or OFF position.
- Close and lock all doors with the key.
- Check that any protruding parts are removed or retracted.
- Secure the machine to the trailer deck with wire rope and/or chain so that the machine does not move.
- Store the jack up units in the transportation position. Secure them in the specified position with lock pins. Failure to do so may cause the jack up unit to extend beyond the trailer width, possibly resulting in a serious accident.

#### Retracting the rear view mirror

1. Loosen mirror arm holding nut (1). Rotate rear view mirror (2) in the direction on the arrow.
- Rotate rear view mirror (2) to the position until the mirror is retracted inside the cab width.
2. Retighten mirror arm holding nut (1).  
Wrench size: 18 mm



MS246-001

## 6 TRANSPORTATION

### 2 TRANSPORTATION AT JOB SITE

When transporting the machine with a trailer, refer to 3. approx. weights and dimensions of subassembly units in this section for the weight and dimension specifications. When operating the partially-disassembled machine, observe the rules described in 2.2 Operational Conditions on Partially Disassembled Machines.

#### 2.1 Precautions for Transportation at Job Site



##### WARNING

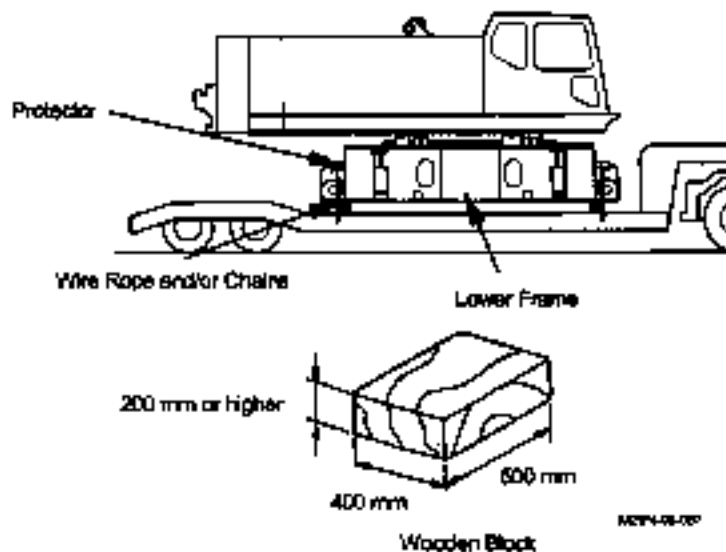
- Check that the slewing lock, boom derricking drum lock, and brakes are engaged in the LOCK position.
- Check that the control levers and switches are in neutral or OFF position.
- Close and lock all doors with the key.
- Check that any protruding parts are removed or retracted.
- Secure the machine to the trailer deck with wire rope and/or chain so that the machine does not move.
- Store the jack up units in the transportation position. Secure them in the specified position with lock pins. Failure to do so may cause the jack up units to extend beyond the trailer width, possibly resulting in a serious accident.

#### Securing Method of Base Machine

1. Secure the front and rear sections of the lower frame with wire ropes and/or chains.

##### IMPORTANT:

- Attach soft materials at sharp corner edges to protect wire ropes or chains.
- Do not secure the beams. Be sure to secure the lower frame with wire ropes and/or chains.



## 6 TRANSPORTATION

### 2.2 Operational Conditions on Partially Disassembled Machines

The machine stability will widely vary depending on how many counterweights are installed (weight), and/or whether the boom is installed. Refer to the descriptions in the tables shown on the following pages for operational conditions on partially disassembled machines.

#### WARNING

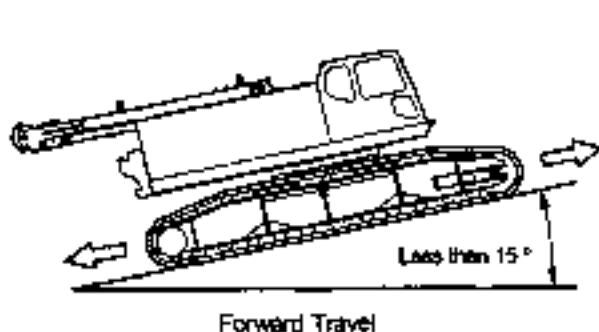
If the machine is operated under the conditions shown with "X" marks, the machine may turnover. Never attempt to operate the machine under the conditions shown with "X" marks.

#### CAUTIONS

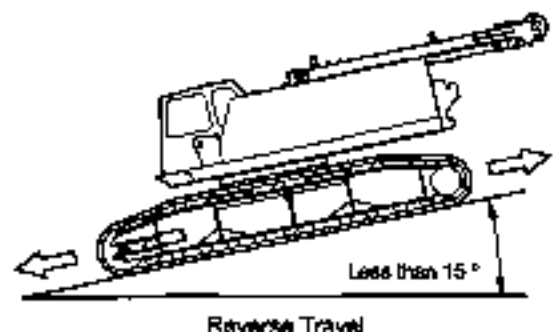
If the boom angle is increased to more than 30 ° with the A-Frame retracted and the lower boom installed, the boom may become easy to wiggle by inertia forces. Do not position the boom angle outside the range of 0 to 30 °.

#### 2.2.1 Supplementary explanations for the terminologies and conditions described in the following tables

- When the machine is equipped with the boom, hold the boom angle at 0 °.
- The maximum slope angle the machine can ascend or descend is 15 °. Never travel the machine on the slope with the slope angle of more than 15 °.
- Traveling forward in ascending operation means that the cab is faced toward the uphill side.
- Traveling in reverse in descending operation means that the cab is faced toward the downhill side.
- Slewing operation is allowed only on solid level ground.



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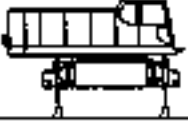
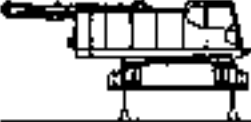
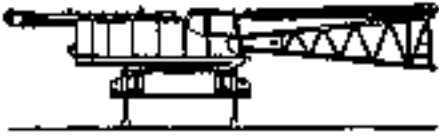

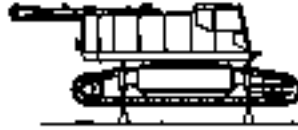
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## 6 TRANSPORTATION

### 2.2.2 Slewing Operation with Base Machine Jacked Up







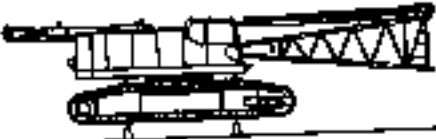

- : Operable  
 △: Operable under Certain Conditions  
 ×: Inoperable

Machine Status		Total Weight (kg)	Slewing
	Base machine without crawlers, A-Frame and lower weights  7CD-08-02F	33000	○
	Base machine with A-Frame without crawlers and lower weights  7CD-08-02E	35800	○
	Base machine with crane exclusive boom base section and without crawlers and lower weights  7CD-08-027	39600	○
	Base machine without one side crawler and lower weights  7CD-08-029	47400	×
	Base machine with A-Frame without one side crawler and lower weights  7CD-08-028	50000	×

**NOTE:**

- When the boom is attached, hold the boom horizontally. Slewing can be performed only on solid and level ground.
- The machine weight value includes 1/4 (105 L, 90 kg) of the total fuel volume and specified hydraulic and gear oil volumes.
- When the boom is attached, wire ropes on the front and boom derricking drums are included.

## 5 TRANSPORTATION

Machine Status	Total Weight (kg)	Slewing
  <p style="text-align: center; font-size: small;">2CD-05-011</p>	54000	X
  <p style="text-align: center; font-size: small;">2CD-05-009 12CD-05-008</p>	61800	O
  <p style="text-align: center; font-size: small;">2CD-05-009</p>	64400	X
  <p style="text-align: center; font-size: small;">2CD-05-004</p>	68400	O









**NOTE:**

- When the boom is attached, hold the boom horizontally. Slewing can be performed only on solid and level ground.
- The machine weight value includes 1/4 (105 L, 90 kg) of the total fuel volume and specified hydraulic and gear oil volumes.
- When the boom is attached, wire ropes on the front and boom derricking drums are included.

## 6 TRANSPORTATION

### 2.2.3 Operational Conditions on Partially Disassembled Machines (With only boom base section attached)

○: Operable  
 △: Operable under Certain Conditions  
 ×: Inoperable

Machine Status	Weight (kg)	Travel on Level Surface	Travel on Slope		Stewing	Jack Up
			Forward	Reverse		
 Only base machine with counterweight A, B, C, D, E and lower weights <small>700-05-005</small>	119900	×	×	×	×	×
 Only base machine with counterweight A and lower weights <small>700-06-007</small>	84300	○	△ Possible to travel when slope angle is 10° or less.	○	○	×
 Only base machine with lower weights and without counterweights <small>700-08-008</small>	73800	○	○	○	○	×
 Only base machine without counterweights and lower weights <small>700-08-008</small>	64600	○	△ Possible to travel when slope angle is 14° or less.	○	○	○ (Blowing: ×)
 Base machine with crane exclusive boom base section and counterweights A, B, C, D, E and lower weights <small>7020-04-010</small>	123900	○	×	△ Possible to travel when slope angle is 8° or less.	○	×
 Base machine with crane exclusive boom base section, counterweight A and lower weights <small>7020-04-010</small>	88300	○	△ Possible to travel when slope angle is 12° or less.	○	○	×
 Base machine with crane exclusive boom base section, lower weights and without counterweights <small>7020-04-010</small>	77800	○	○	○	○	×
 Base machine with crane exclusive boom base section and without counterweights and lower weights <small>7020-04-010</small>	68400	○	○	○	○	○ (Blowing: ×)





**NOTE:**

- When the boom is attached, hold the boom horizontally. Stewing can be performed only on solid and level ground.
- The machine weight value includes 1/4 (105 L, 90 kg) of the total fuel volume and specified hydraulic and gear oil volumes.
- When the boom is attached, wire ropes on the front and boom derricking drums are included.

## 6 TRANSPORTATION

### 2.2.4 Operational Conditions on Partially Disassembled Machines (With 15 m basic boom attached)

○ Operable  
 △: Operable under Certain Conditions  
 X: Inoperable

Machine Status	Weight (kg)	Travel on Level Surface	Travel on Slope		Slewing	Jack Up
			Forward	Reverse		
 <p>With 15 m basic boom and with counterweights A, B, C, D, E and lower weights</p>	126300	○	△ Possible to travel when slope angle is 2° or less.	△ Possible to travel when slope angle is 11° or less.	○	X
 <p>With 15 m basic boom and with counterweights A and lower weights</p>	90700	○	○	○	○	X
 <p>With 15 m basic boom and lower weights and without counterweights</p>	80300	○	○	○	○	X
 <p>With 15 m basic boom and without counterweights and lower weights</p>	70800	○	○	○	○	○





**NOTE:**

- When the boom is attached, hold the boom horizontally. Slewing can be performed only on solid and level ground.
- The machine weight value includes 1/4 (105 L, 90 kg) of the total fuel volume and specified hydraulic and gear oil volumes.
- When the boom is attached, wire ropes on the front and boom derricking drums are included.

## 6 TRANSPORTATION

### 2.2.5 Operational Conditions on Partially Disassembled Machines (With 12 m basic boom attached, Included optional 4.5 m Heavy Top Boom)

- : Operable  
 △: Operable under Certain Conditions  
 ×: Inoperable

Machine Status	Weight (kg)	Travel on Level Surface	Travel on Slope		Slewing	Jack Up
			Forward	Reverse		
 <small>NR25-25-00</small> With 12 m basic boom and with counterweights A, B, C, D, E and lower weights	126600	○	△ Possible to travel when slope angle is 2° or less.	△ Possible to travel when slope angle is 10° or less.	○	×
 <small>NR25-25-50</small> With 12 m basic boom and with counterweights A and lower weights	91000	○	△ Possible to travel when slope angle is 14° or less.	○	○	×
 <small>NR25-25-100</small> With 12 m basic boom and lower weights and without counterweights	80800	○	○	○	○	×
 <small>NR25-25-200</small> With 12 m basic boom and without counterweights and lower weights	71100	○	○	○	○	○

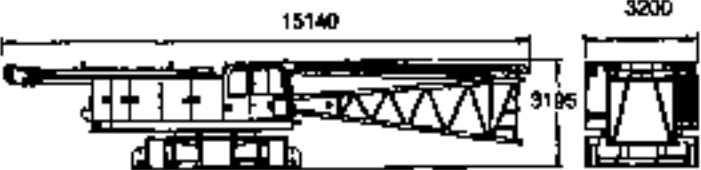
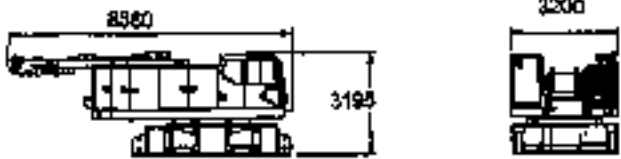
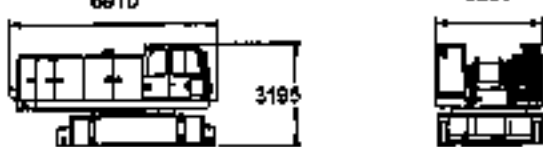
**NOTE:**

- When the boom is attached, hold the boom horizontally. Slewing can be performed only on solid and level ground.
- The machine weight value includes 1/4 (105 L, 90 kg) of the total fuel volume and specified hydraulic and gear oil volumes.
- When the boom is attached, wire ropes on the front and boom derricking drums are included.

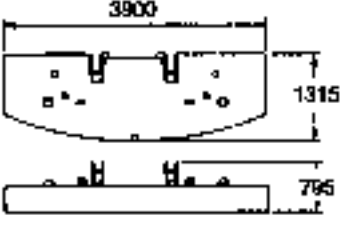



## 6 TRANSPORTATION

### 3 APPROX. WEIGHTS AND DIMENSIONS OF SUBASSEMBLY UNITS

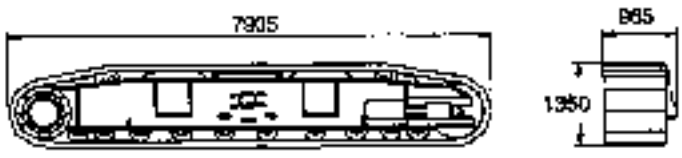
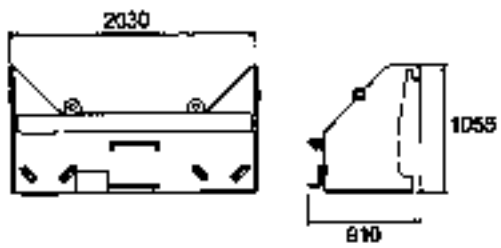
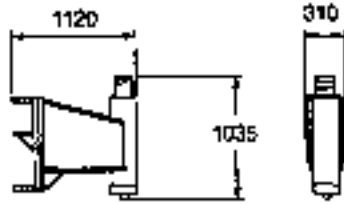
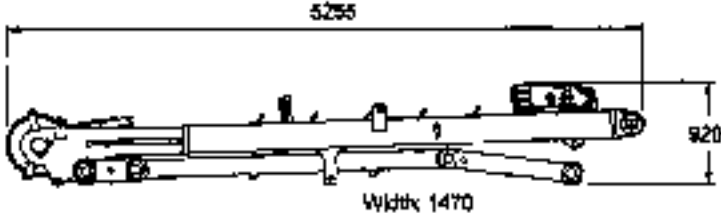
#### 3.1 Base Machine and Counterweights

Subassembly Unit	Quantity	Weight (kg)	Approx. and Dimensions (Height x Length x Width) (mm)
Base machine with crane exclusive boom base section, front drum wire rope, jack-up units, 1.7 t aux. weight and without floats	1	39400	$3195 \times 15140 \times 3200$ 
Base machine with front drum wire rope, A-Frame and jack-up units, 1.7 t aux. weight and without floats	1	36700	$3195 \times 8580 \times 3200$ 
Base machine without A-Frame, front drum wire rope, jack-up units, 1.7 t aux. weight and without floats	1	32300	$3195 \times 6910 \times 3200$ 

## 6 TRANSPORTATION

Subassembly Unit	Quantity	Weight (kg)	Approx. and Dimensions (Height × Length × Width) (mm)
Counterweight A	1	10400	<p>770 × 1315 × 3900</p>  <p style="text-align: right;">200-08-00</p>
Counterweight B	1	8900	<p>495 × 1315 × 3900</p>  <p style="text-align: right;">200-08-00</p>
Counterweight C, D	2	8900	<p>495 × 1315 × 3900</p>  <p style="text-align: right;">200-08-00</p>
Counterweight E	1	8900	<p>495 × 1315 × 3900</p>  <p style="text-align: right;">200-08-00</p>

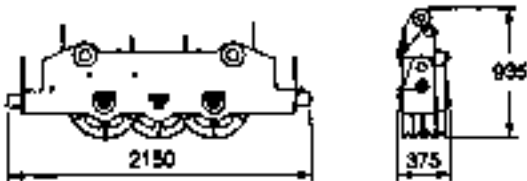
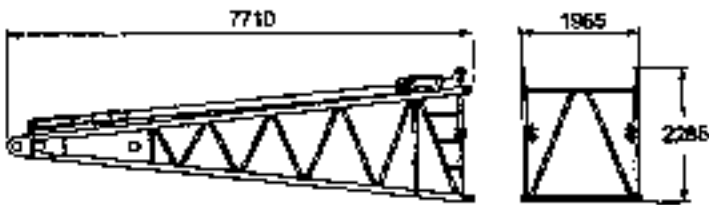
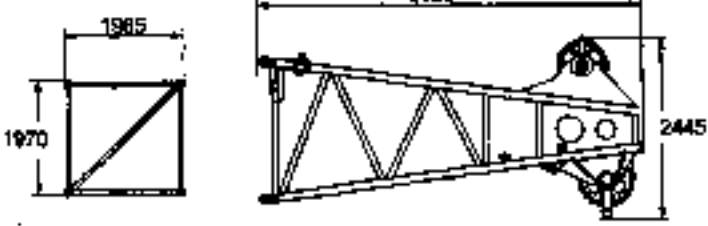

## 6 TRANSPORTATION

Subassembly Unit	Quantity	Weight (kg)	Approx. and Dimensions (Height x Length x Width) (mm)
Crawler	2	14400	<p style="text-align: center;">1350 x 7905 x 985</p> 
Lower Weight	2	4750	<p style="text-align: center;">1055 x 2030 x 810</p> 
Jack-up unit	4	340	<p style="text-align: center;">1035 x 1120 x 310</p> 
A-Frame (with Bridle)	1	2800	<p style="text-align: center;">1770 x 5255 x 1660</p> 

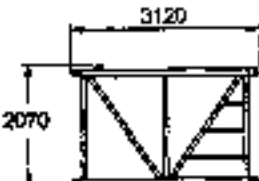
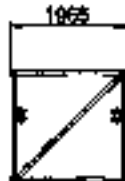
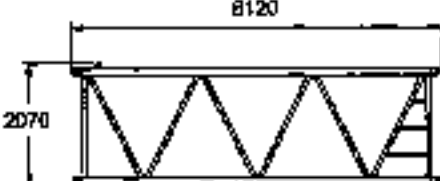

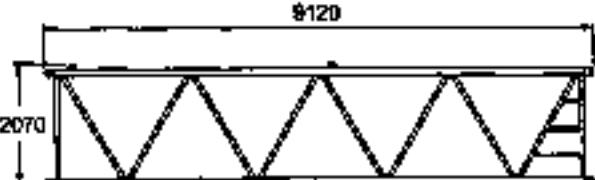
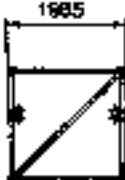


## 6 TRANSPORTATION

### 3.2 Boom

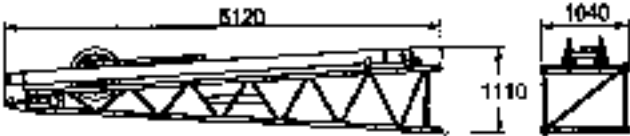
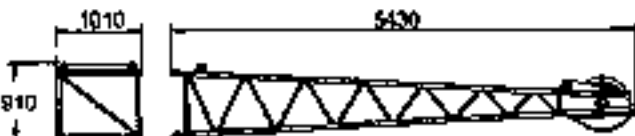
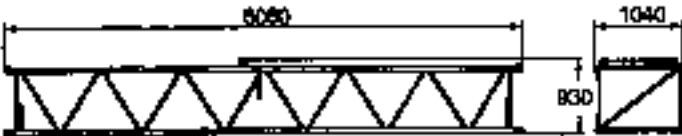
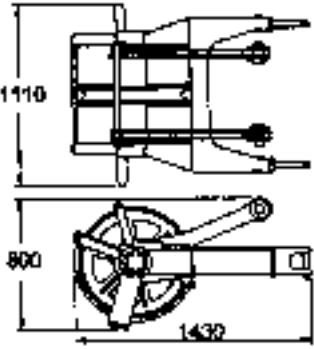
Subassembly Unit	Quantity	Weight (kg)	Approx. and Dimensions (Height × Length × Width) (mm)
Bridle	1	430	$375 \times 2150 \times 935$ 
Crane exclusive boom base section with four connection pins and two back stops	1 4 2	2800	$2285 \times 7710 \times 1965$ 
4.5 m Heavy top boom section without two pendant ropes	2	2600	$2445 \times 5025 \times 1965$ 
7.5 m Boom top section without two pendant ropes	1 2	2200	$2315 \times 8145 \times 1965$ 

## 6 TRANSPORTATION

Subassembly Unit	Quantity	Weight (kg)	Approx. and Dimensions (Height x Length x Width) (mm)
3 m-extension boom with four connection pins and without pendant rope	1 4	460	<p style="text-align: center;">2070 x 3120 x 1985</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: right; font-size: small;">200-08-016</p>
6 m-extension boom with four connection pins and without pendant rope	1 4	770	<p style="text-align: center;">2070 x 6120 x 1985</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: right; font-size: small;">200-08-018</p>
9 m-extension boom with four connection pins and without pendant rope	1 4	1100	<p style="text-align: center;">2070 x 9120 x 1985</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: right; font-size: small;">200-08-017</p>

## 6 TRANSPORTATION

### 3.3 Jib

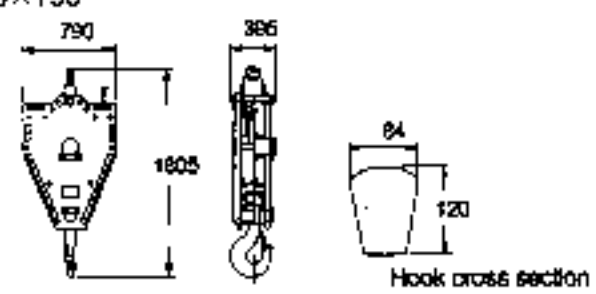
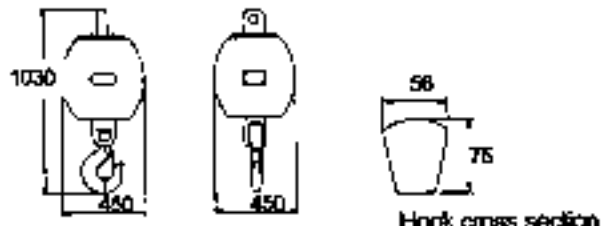
Subassembly Unit	Quantity	Weight (kg)	Approx. and Dimensions (Height × Length × Width) (mm)
Fly jib base section with four connection pins and one fly jib mast and without pendant ropes	1 4 1	580	<p style="text-align: center;"><math>1110 \times 5120 \times 1040</math></p>  <p style="text-align: right; font-size: small;">#278-08-04</p>
Fly jib top section and without pendant ropes	1	290	<p style="text-align: center;"><math>910 \times 5430 \times 1010</math></p>  <p style="text-align: right; font-size: small;">#278-08-05</p>
6 m-extension fly jib with four connection pins and without pendant ropes	1 4	190	<p style="text-align: center;"><math>930 \times 6080 \times 1040</math></p>  <p style="text-align: right; font-size: small;">#278-08-06</p>
Short jib with two connection pins	1 2	400	<p style="text-align: center;"><math>800 \times 1430 \times 1110</math></p>  <p style="text-align: right; font-size: small;">#278-08-07</p>

## 6 TRANSPORTATION

### 3.4 Hook

Subassembly Unit	Quantity	Weight (kg)	Approx. and Dimensions (Height x Length x Width) (mm)
150 t Hook	1	2040	<p style="text-align: center;">1015 x 2280 x 780</p> <p style="text-align: right;"><small>MSZ-2-02</small></p>
135 t Hook	1	1980	<p style="text-align: center;">1015 x 2280 x 780</p> <p style="text-align: right;"><small>MSZ-2-02</small></p>
70 t Hook	1	1010	<p style="text-align: center;">480 x 2105 x 620</p> <p style="text-align: right;"><small>MSZ-2-02</small></p>
50 t Hook	1	900	<p style="text-align: center;">465 x 1930 x 780</p> <p style="text-align: right;"><small>MSZ-2-02</small></p>

## 6 TRANSPORTATION

Subassembly Unit	Quantity	Weight (kg)	Approx. and Dimensions (Height × Length × Width) (mm)
30t Hook	1	730	<p style="text-align: center;">385 × 1805 × 790</p>  <p style="text-align: right;">Hook cross section 205-09-071</p>
11 t Hook	1	370	<p style="text-align: center;">450 × 1030 × 450</p>  <p style="text-align: right;">Hook cross section 125H-09-058</p>



Hook cross section

The hook cross section is indicated with the dimensions corresponding to those at the cross section located at the broken line shown in each hook illustration.

125H-09-058

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## MEMO

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