102AE-OM1310-00

OPERATION MANUAL

MINI-CRAWLER CRANE

MC285C-2

AUXILIARY WINCH

Serial No. P01043 and up

⚠ WARNING

Unsafe use of this machine may cause serious injury or death. Operators must read this manual before operating this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who will come into contact with it.

NOTICE

MAEDA has Operation Manual written in some other languages. If a foreign language manual is necessary, contact your local distributor for availability.

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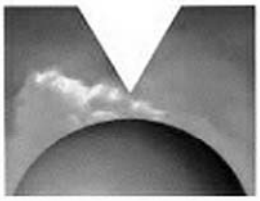

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CONTENTS

1. INTRODUCTION

This manual describes only for “MC285C-2 auxiliary winch”. For operation of MC285C-2 machine, please see “MC285C-2 Operation Manual”.

This manual is a guidebook for safe and effective use of this machine.

This manual describes the procedures for proper operation and maintenance of the machine. Warnings and precautions defined in this manual shall be observed for safety.

Many accidents are caused by the operation, inspection, or maintenance where basic precautions have not been observed.

Be sure to read this manual and understand the procedures for machine operation, inspection, and maintenance thoroughly before performing any operation of this machine.

Failure to observe the basic precautions defined in this manual may lead to hazardous accidents.

⚠ WARNING

Failure to use this machine properly can lead to serious personal injury or death.
Operators and maintenance personnel must always read this manual and “MC285C-2 Operation Manual” prior to operation or maintenance of this machine.
Store this manual at a designated place for reference when necessary. All personnel who work on this machine are to carry out periodic reference.

- **Only those who have a thorough understanding of the fundamental procedures provided in this manual and “MC285C-2 Operation Manual” are qualified to perform machine operation.**
- **Keep this manual and “MC285C-2 Operation Manual” handy for reference when necessary.**
- **Should you lose or damage this manual or “MC285C-2 Operation Manual”, contact Maeda or our sales service agency immediately for ordering a new manual.**
- **This manual and “MC285C-2 Operation Manual” should always accompany this machine upon transfer of the machine to the next owner.**
- **This manual has adopted data that was available at the time of the creation of the manual.**
  The contents of this manual, including maintenance specifications, tightening torque, pressure, measuring method, adjustment value, and illustrations, are subject to change due to refinement of the machine, without notice.
  Machine maintenance may be susceptible to revisions. Always obtain the latest information from Maeda or our sales service agency before performing maintenance of this machine.

For safety instructions, see “2. For Safe Use of Machine” on page 1-3 and “Safety” on page 2-1 in “MC285C-2 Operation Manual”.

2. FOR SAFE USE OF MACHINE

This manual classifies the risks into the following three categories to present the details of the safety labels in easy-to-understand manner.

⚠ DANGER

This denotes that there is an imminent hazard which will cause serious personal injury or death.
The method of hazard circumvention is stated.

⚠ WARNING

This denotes that there is a hazard which can cause serious personal injury or death.
The method of hazard circumvention is stated.

⚠ CAUTION

This denotes that there is a potential hazard which may cause minor or moderate personal injury or serious damage to this machine.
The method of hazard circumvention is stated.

Also following marks represent cautions for safe and efficient use of machine, and notes for convenient use.

CAUTION

This denotes that failure to handle the machine properly may damage the machine or shorten its life.

NOTES

This denotes helpful information.

Not only procedures for operation, inspection, and maintenance of this machine described in this manual and “MC285C-2 Operation Manual” but also safety precautions should pertain to the case where this machine is only used for specified tasks.
Every circumstance incidental to use of this machine is unforeseeable, and therefore, cautions given in this manual and on this machine do not necessarily cover every safety-related issue.
Necessary safety actions should be taken under your responsibility if operation, inspection, and maintenance in a situation that is not described in this manual or “MC285C-2 Operation Manual” are performed.
Even in the above case, never attempt work and operations that this manual or “MC285C-2 Operation Manual” prohibits you to do.

3. SAFETY OF AUXILIARY WINCH

3.1 CAUTIONS BEFORE OPERATION

INSPECTION BEFORE STARTING WORK

Do the following before starting work.

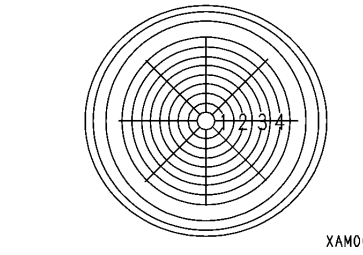
- Shift the select valve to auxiliary winch side.
- Shift the moment limiter to auxiliary winch mode.
- Check that the safety devices such as the moment limiter, outrigger safety device, and over hoist detector / automatic stop device activate properly.

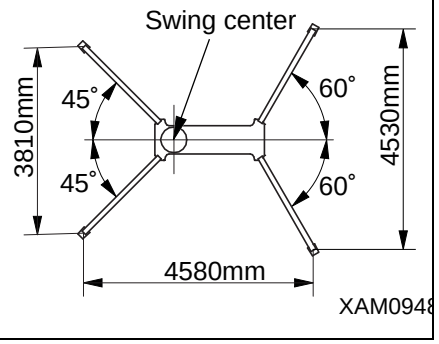
3.2 CAUTIONS DURING OPERATION

CHECK OUTRIGGER PLACEMENT CONDITION

Always observe followings to prevent serious injuries and death accidents when placing the outriggers.

- Always set the outrigger horizontally to the ground while looking at the level gauge.
- Always place the outriggers at maximum extension.
- When setting outriggers, insert lynch pins to secure position pins.





BE CAREFUL FOR TIPPING BY SWAYING LOAD

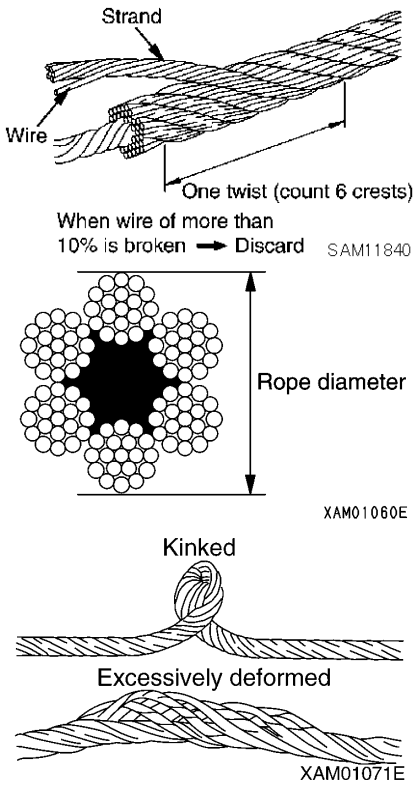
Underground lifting can be effected by swaying load more than it of above ground lifting.
Be careful of crane tipping by swaying load.

PAY ATTENTION TO WEATHER INFORMATION

If the maximum instantaneous wind speed is 10 m/s or greater, abort working with crane, immediately lower the load and contain the boom. When lifting underground or lifting large area load, stop operation even if wind speed is less than 10m/s depending on situation.

CAUTIONS WHEN HANDLING WIRE ROPE

- Wire ropes can wear out from constant use or old age, so be sure to inspect every time before work, and replace immediately if at or beyond the replacement standard.
  At the same time, inspect the sheave at the tip of the boom and the sheave of the hook block. Damaged sheaves accelerate the damage of the wire ropes.
- Use the wire ropes specified by us.
- Always put on leather gloves when handling the wire rope.
- Handling worn and damaged wire may cause injury from wire splinter.
- Do not use any wire rope of which any of the following applies:
  - 10% or more of the wires (except the filler wires) in one twist of the wire rope are snipped.
  - The wire rope diameter abrasion is beyond 7% of the nominal diameter.
  - Wire rope is kinked.
  - Wire rope is excessively deformed or corroded.
  - Affected by heat or sparks.



CAUTIONS HIGH TEMPERATURE OIL WHEN WORKING WITH CRANE

Hook raising and lowering operation at underground lifting can cause rapid raising of hydraulic oil temperature. If temperature of hydraulic oil exceeds 80 degrees, stop operation and wait until the oil cools down.

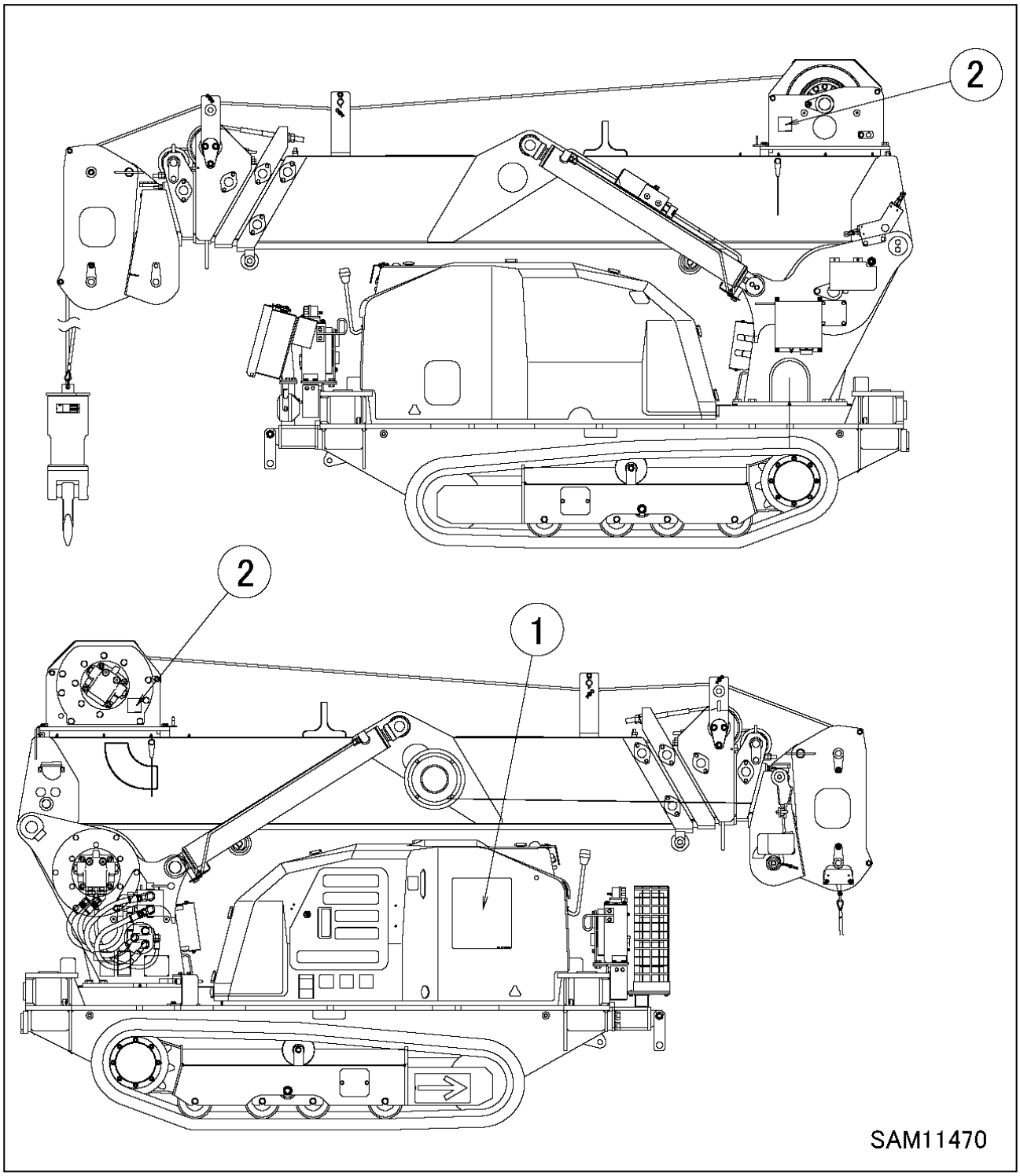
CAUTIONS WHEN OPERATING WINCH

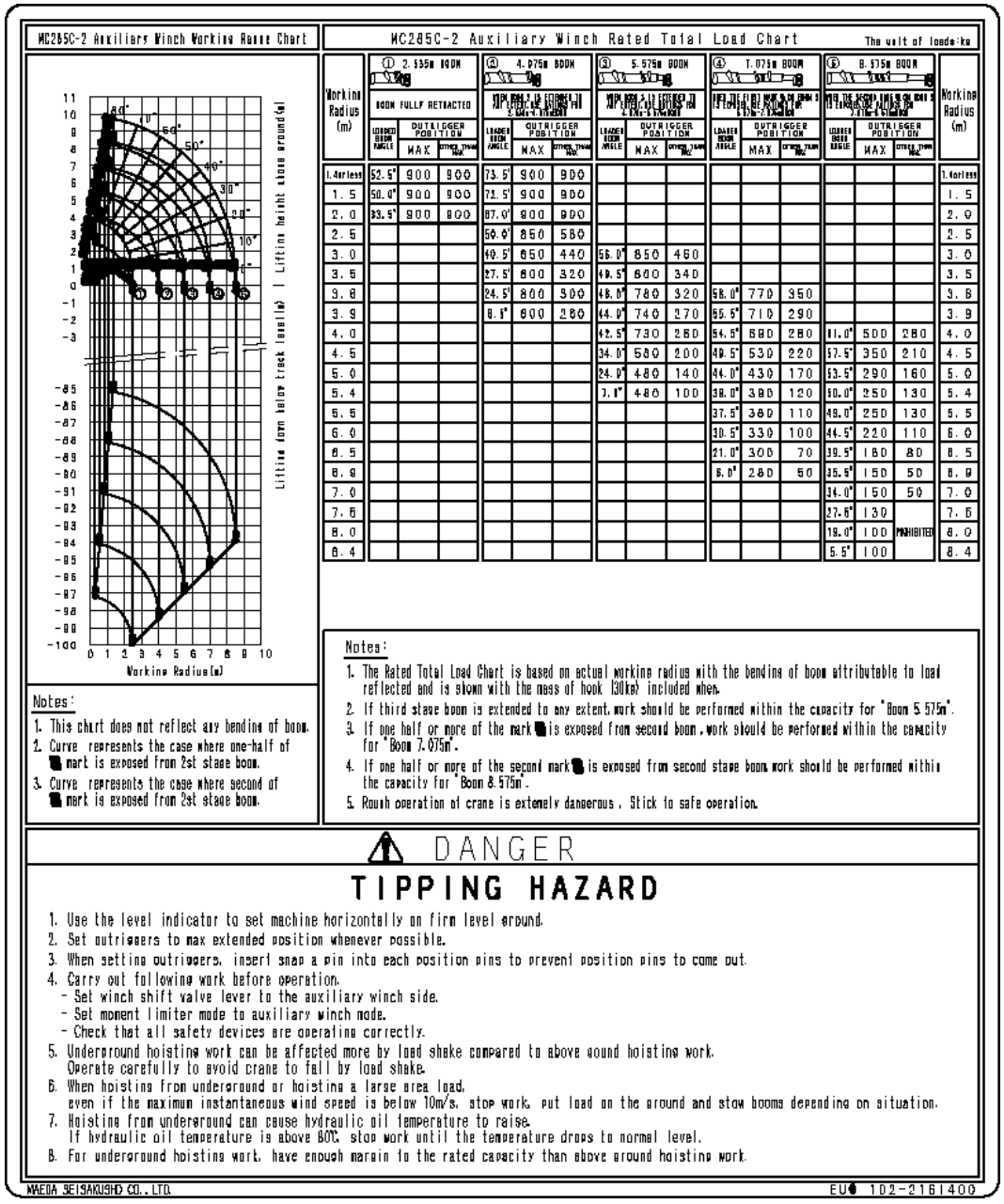
- Do not use the winch drum wire rope in random condition. If random, not only the wire rope suffers damage and shortens the lifetime, but the wire rope may snip and causes serious accidents.
  Observe following precautions to avoid wire rope from becoming random.
  - Do not let the hook block hit the ground.
  - Before leaving the hook block lowered for a long time for instance when working below ground, leave at least three loops of wire rope on the winch drum.

WORKING AT THE SITE WITH UNDERGROUND LIFTING

At the site with underground lifting, perform the operation by having bigger margin to crane capacity than above ground lifting work.

4. SAFETY DECAL LOCATIONS





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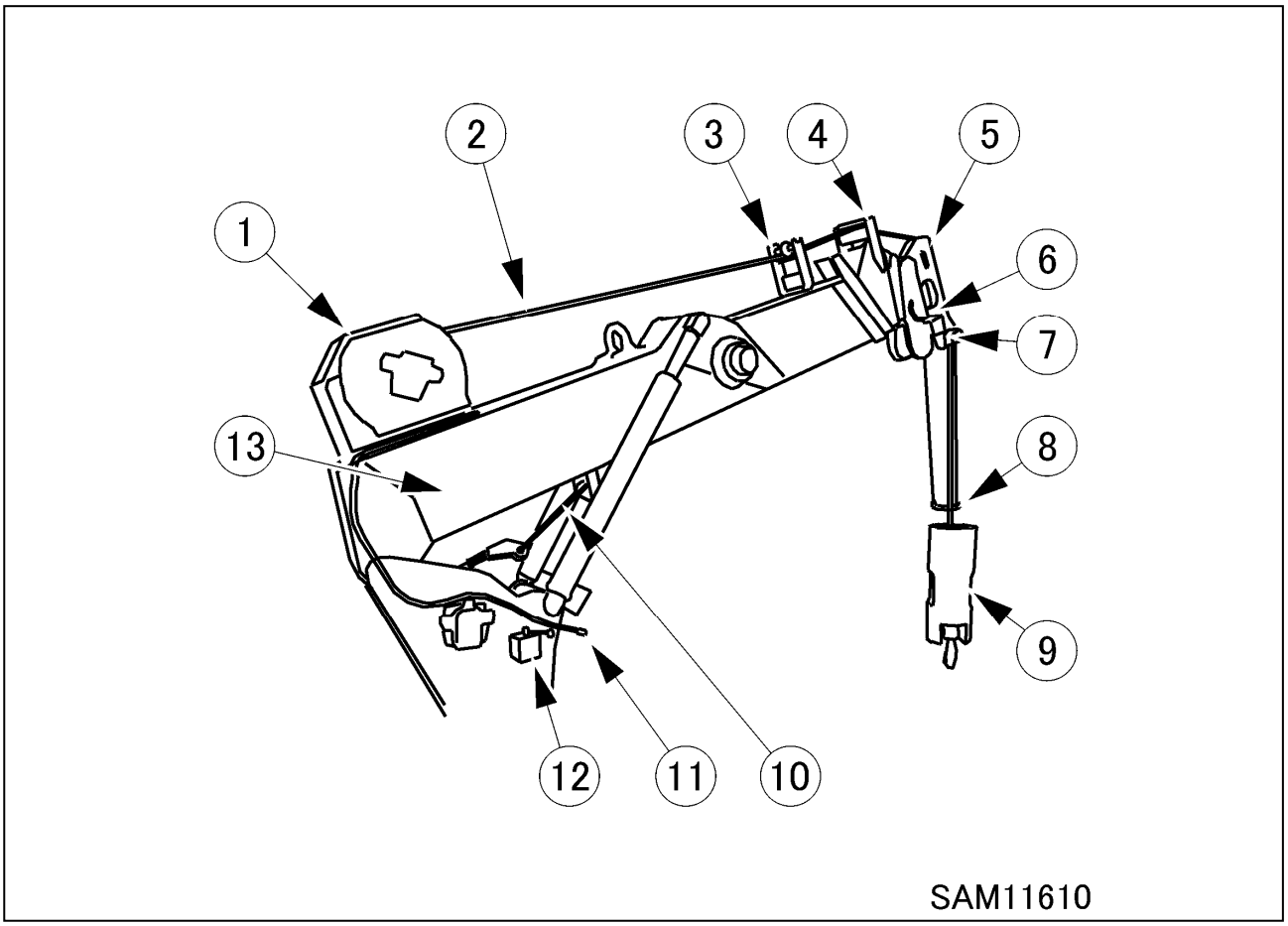
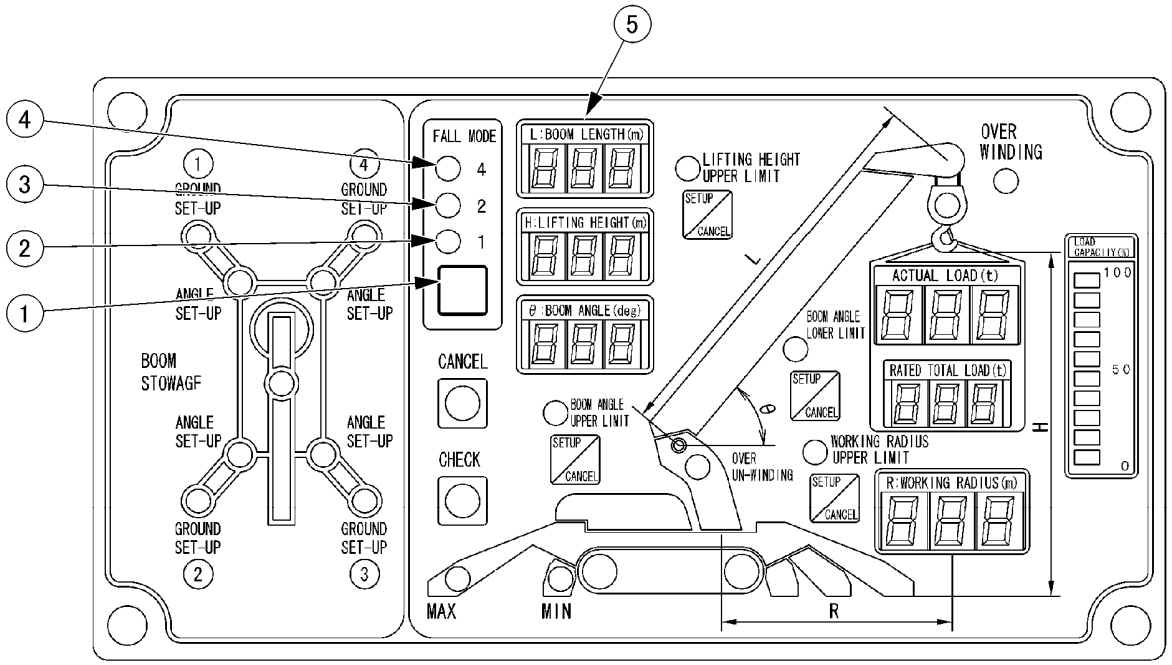
5. EACH SECTION



(1) Winch unit（Auxiliary winch）
(2) Wire rope（Auxiliary winch）
(3) Snap sheave bracket
(4) Idler bracket
(5) Boom head
(6) Bullet connector
(7) Over hoist detector（Auxiliary winch）
(8) Protect Weight（Auxiliary winch）
(9) Single fall hook block
(10) Rubber rope for stowage
(11) Hoist down stop harness
(12) Select valve
(13) Boom

6. MOMENT LIMITER DISPLAY UNIT



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(1) Fall mode / Option selector switch
(2) 1-fall LED (Blue)
(3) 2-fall LED (Blue)
(4) 4-fall LED (Blue)
(5) Boom length display

6.1 SETTING CHANGE OF SWITCHES MOMENT LIMITER DISPLAY UNIT

CAUTION

See "MC285C-2 Operation 1.5 Moment Limiter in Operation Manual" for how to operate the moment limiter.

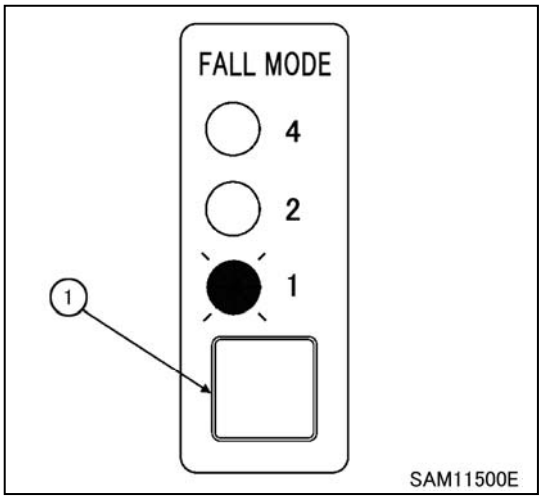
6.1.1 WIRE FALLS SELECTOR SWITCH AND WIRE FALLS DISPLAY LED (BLUE)

⚠ DANGER

When using auxiliary winch, fall mode and option mode must be set to "Auxiliary winch mode". Using auxiliary winch other than in auxiliary winch mode may prevent issuance of the pre-warnings and boom auto-stop even when the overload is near happening, and thus may result in crane damage or machine trip that may lead to serious accidents.

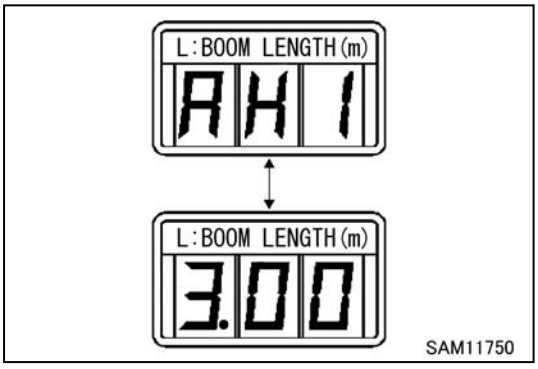
Use this switch to change the number of falls.

- Shift the fall mode/option selector switch (1) on moment limiter display unit to "Auxiliary winch mode" (**LED1: flash / Boom length window : "AH1" and "boom length" alternately**).
  Each time you press the switch for 2 seconds or more, the setting of the fall mode changes in the order of "4 falls ➔ searcher hook mode (all LED ON) ➔ 850kg searcher hook (all LED flashes) ➔ Auxiliary winch mode(**LED1: flash / Boom length window : "AH1" and "boom length" alternately**) ➔ single fall ➔ 2 falls ➔ 4 falls ・・・".



NOTES

When changing the setting, right after doing so, release your hand from the switch, and then press the switch again.



7. HOW TO INSTALL AND DETACH BOOM HEAD

⚠ WARNING

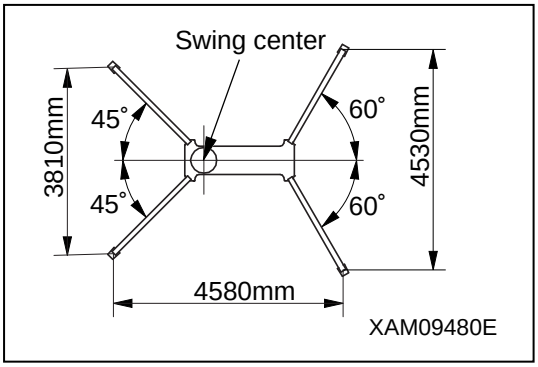
- **If installation or detaching work is carried out by two people, make sure of work detail each other and use designated signs for mutual communication during the work. If signs are not enough, it may cause serious accident, such as being hit by moving part.**
- **When installing or removing boom head, carry out the work on level and firm ground to avoid loosing balance during the work. Boom head may rotate by its own weight and it can lead to a serious accident.（Refer to page 13）**
- **When installing or detaching boom head, use stable work stand with enough height. Using unstable work stand can cause falling from high place, leading serious accident.**
- **When installing or detaching boom head, set main boom angle to "0 degree". If main boom angle is bigger than "0 degree", proper installing and detaching work may be interfered and it can cause serious accident.**
- **Boom head is fixed to boom by hitch part and position pin.**
  Surely set the hitch part to the boom.
  Insert position pin to correct position, and secure with lynch pin.
  If position pin comes off, it causes boom head to fall off, leading to a serious accident.
- **When boom head is installed, change electrical wiring from boom side of over winding detector to boom head side of over winding detector. If over winding detector doesn't work properly, it causes hook or load to fall and may result in a serious accident.**
- **When boom head is installed, always change electrical wiring from over un-winding detector of main winch to over un-winding detector of auxiliary winch. If over un-winding detector does not work properly, it may cause wire rope to fall off, which can result in a serious accident.**

7.1 INSTALLING BOOM HEAD

⚠ WARNING

Stop the engine during operating machine. If you operate crane without stopping engine, the machine will suddenly move to resort in a serious hazard.

1. See “MC285C-2 Operation 2.12 Outrigger Setting” and set the outrigger.



2. Remove wire rope from main winch on crane.

[REMOVAL WINCH WIRE ROPE]

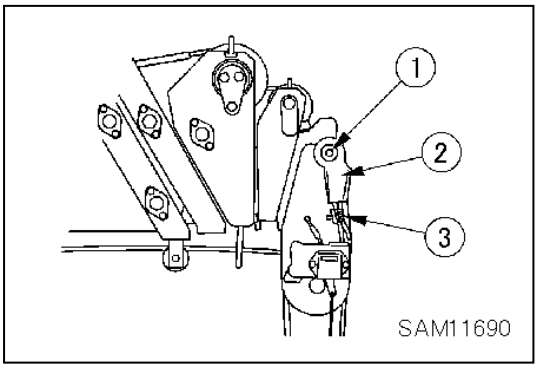
Use the following procedure to remove the wire rope.

(1) Place the boom telescoping lever in the “Extend” position (push it toward the front) to extend the boom slightly.

(2) Place the winch lever in the “Down” position (push it toward the front) to lower the hook block on the ground.

(3) Undo the wedge socket fixing bolt (1) and remove the wedge socket (2).

(4) Remove the wire clip (3).



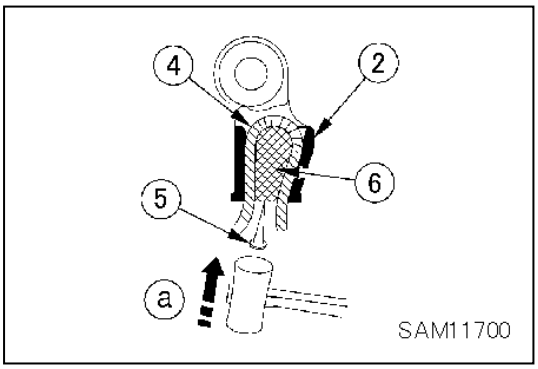
［Dismantling wedge socket］

(5) Pull the wire rope (4) out of the wedge socket (2), following the procedure provided below.

a. Bring a 4 to 6mm round bar (5) into contact with the rope wedge (6).

b. Remove the rope wedge (6), lightly tapping the round bar (5) with a hammer in the direction indicated by the arrow (a).

(6) Place the winch lever in the “Up” position (pull toward you) to wind up the wire rope (4) from the winch drum.



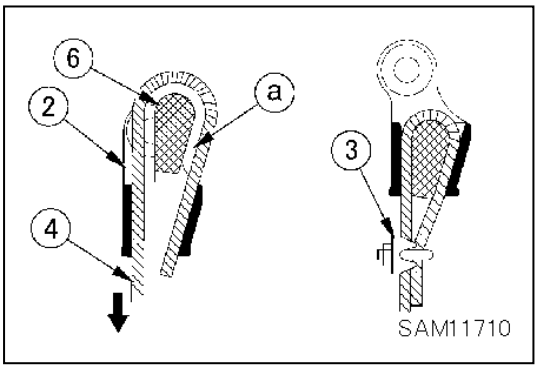
［Assembling wedge socket］

(7) Secure the end of the wire rope (4) to the wedge socket (2), following the procedure provided below.

a. Draw the wire rope (4) through the wedge socket (2) as shown in the diagram (right).

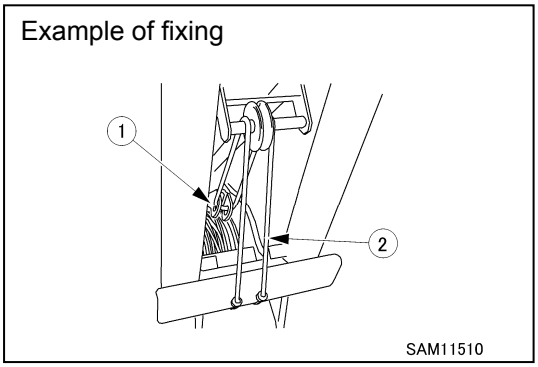
b. With the rope wedge (6) in position (a), pull the wire rope (4) in direction indicated by the arrow.

(8) Attach the rope clip (3) to the wire rope (4).



3. Fix the removed wedge socket (1) with stowage rubber band (2) for auxiliary winch.

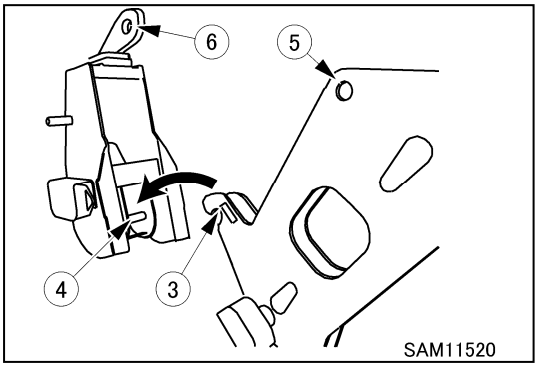
Example of fixing



4. Set the boom head hitch part (3) to point pin (4) at boom tip, and align hole (5) and bracket hole (6).

⚠ DANGER

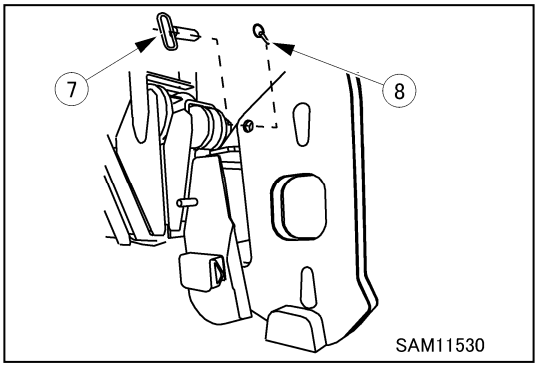
Securely hold boom head until position pin (7) is inserted. If hand is released, hitch part (3) may rotate, leading boom head to fall off, and may result in a serious accident.



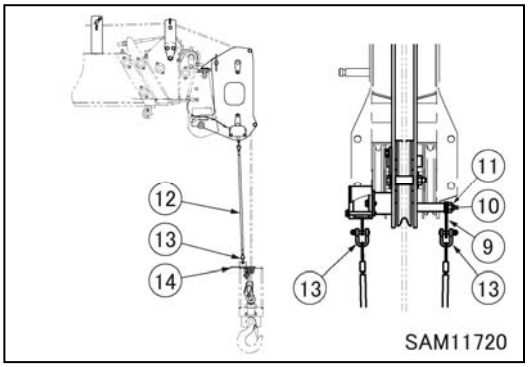
5. Insert position pin (7) to the aligned holes, and secure it with lynch pin (8).

⚠ DANGER

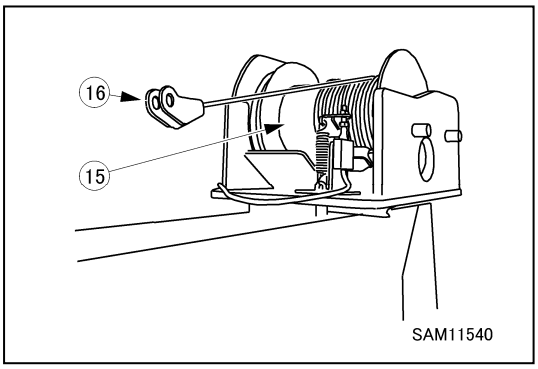
Position pin (7) must be secured with lynch pin (8). If position pin comes off during work, it may cause a serious accident.



6. Fix plate (9) to boom head with plain washer (10) and U nut (11). Then connect plate (9), protective rope (12) and protect weight (14) using shackle (13).



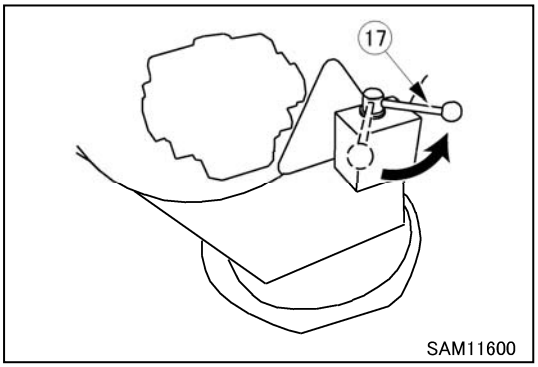
7. Take out wedge socket (16) for wire rope for auxiliary winch unit (15).
   Refer to “Dismantling wedge socket” (P.12) and dismantle wedge socket (16).



8. Shift the manual shift valve (17) from regular side to auxiliary winch side.

NOTES

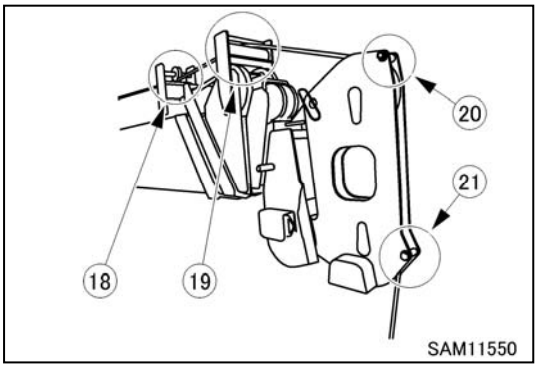
If valve is not shifted, main winch activates causing random winding.



9. Hold wire rope end and operate hook lowering. Holding with hand, pass the running rope through snap sheave bracket (18) of No.1 boom, idler bracket (19) of No.3 boom, (20) and (21) of boom head.

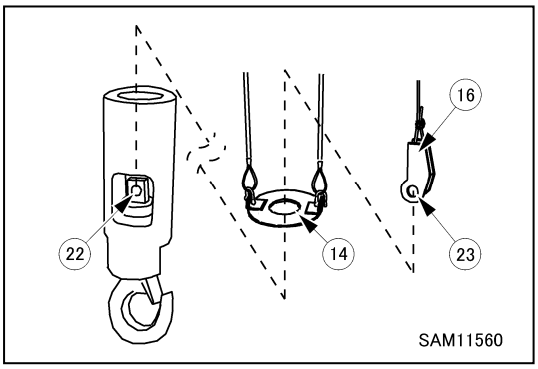
NOTES

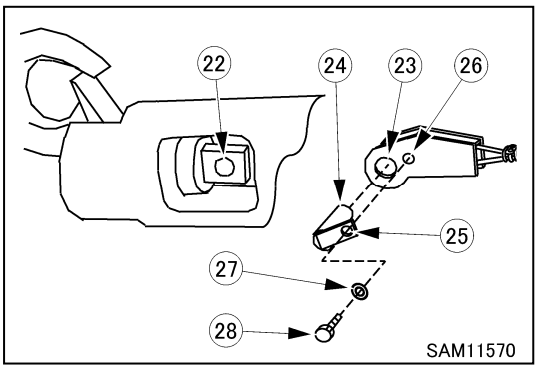
Before passing the wire rope through above mentioned parts, run the wire rope out for about the length necessary for passing through those parts.
Pulling by hand, run out the wire rope to keep tension and avoid random winding.



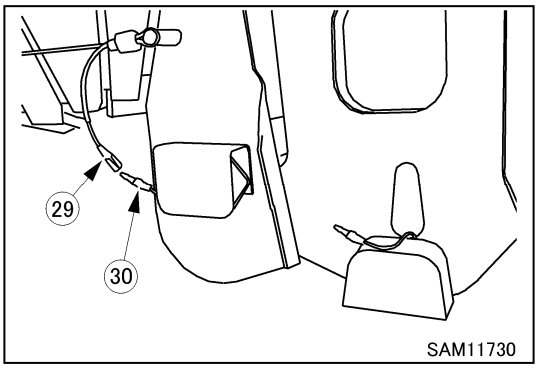
10. Refer to “Assembling wedge socket” (P.13), and fix the wedge socket (16) to the wire rope.

11. Hold the wedge socket (16) and put it through protect weight (14) and then insert to hook to align holes of connection base (22) and wedge socket (23).
Insert wedge socket pin (24) to the aligned holes, and align hole of wedge socket pin (25) and hole of wedge socket (26), then secure with spring washer (27) and bolt (28).

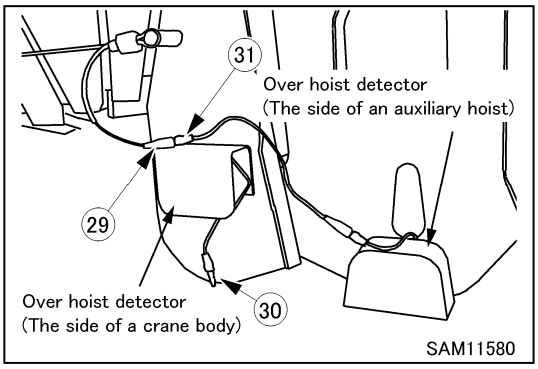




12. Separate length sensor bullet connector (29) and bullet connector (30) on machine side.

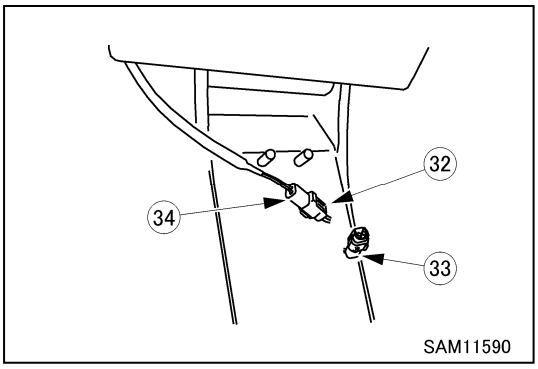


13. Connect the length sensor bullet connector (29) to bullet connector (relay harness) (31) on boom head side.



14. Disconnect hook lowering stop harness (32) from harness (33) on machine body side and connect to harness (34) for auxiliary winch.

NOTES
Put dummy plug to the disconnected harness.



15. Raise hook block by operating boom derricking lever to raise boom (pull) or boom telescoping lever to extend boom (push forward).

NOTES
Winch operation is allowed only after the hook block is raised.

16. Fully extend and fully raise boom, and operate hook lowering (push winch lever forward) to run out wire rope on auxiliary winch unit (15) as close as to the ground.

NOTES
Do not let hook block to touch the ground.

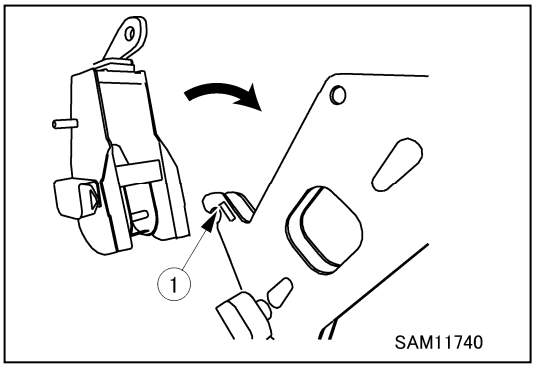
17. Keep wire rope at tension and operate hook raising (pull winch lever) to wind wire rope on auxiliary winch unit (15).

7.2 DETACHING BOOM HEAD

1. Take off boom head in reverse order of installation process.

⚠ DANGER

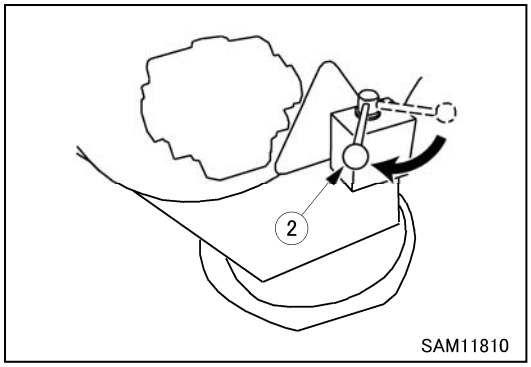
Securely hold the boom head, when pulling out position pin from boom head. When position pin is pulled out, hitch part (1) may rotate and boom head falls off, resulting in a serious accident.



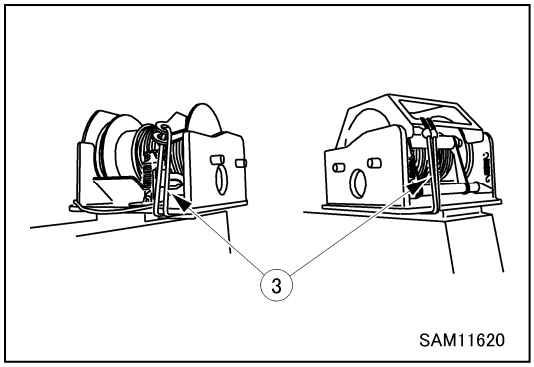
2. Shift the manual shift valve (2) from auxiliary winch side to regular side.

NOTES

If valve is not shifted, auxiliary winch activates causing random winding.



3. Secure the winded wire rope with stowage rubber band (3).



8. MACHINE TRAVELLING POSTURE AND HOISTING METHOD

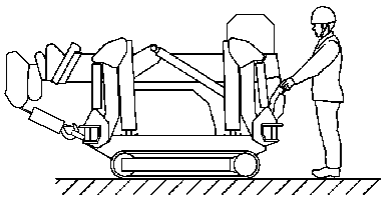
8.1 MACHINE TRAVELLING POSTURE (AUXILIARY WINCH)

⚠ WARNING

- **When moving this machine self-propelled, take the "travelling posture" with which the boom, hook block, and outriggers are stowed.**
- **Travelling or travelling hoist with the boom extended is essentially prohibited. This will overturn the machine, causing serious injury and accidents.**
- **Do not use this machine for any other purpose except the major purpose such as using it for carrying the load on the machine.**
- **Follow the local laws and regulations if driving the machine on public roads.**

Take the travelling posture shown on the right when moving the machine.

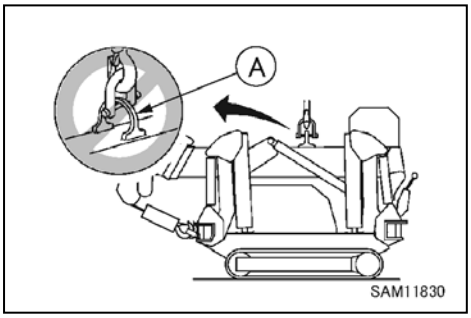
1. See "Operation 2.21 Crane Stowing Operation" to stow the crane. Stow the hook block in the specified position.
2. See "MC285C-2 Operation 2.22 Outrigger Stowing Operation" to stow the outriggers.

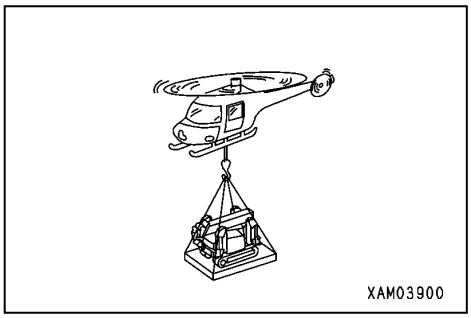


8.2 HOISTING MACHINE (AUXILIARY WINCH)

⚠ DANGER

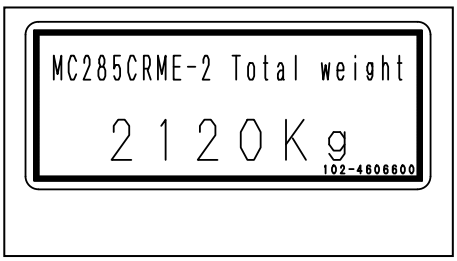
- **Never use the hoisting bracket (A) to lift machine if single fall hook block is still equipped. Using the bracket (A) to lift the machine with single fall hook block equipped can cause breakage of wire rope for lack of strength, thus leading serious accident.**
  When lifting machine, always replace to 4 falls hook block and make machine into stowage position.
- **The hoisting attachments such as wire ropes and shackles used in hoisting should be sufficiently strong enough for the weight of this machine.**
- **Crane stowed position when it is hoisted means its "Travelling position" where 4 of outrigger position pins are securely inserted in the outrigger rotary. The centre of the balance of the machine is specified subject to the machine being in its travelling position. In addition, to set it into that position correctly, secure the hook block (4) to its stowing position, also tension the wire rope tight, this will prevent the boom derricking cylinder form extending. Refer to "8.1 Machine Travelling Position(Auxiliary Winch)" for details of travelling position.**
- **Hoisting the machine for a long time will cause the boom derricking cylinder to extend, shifting the centre of gravity and the machine to lose balance.**
  Hoisting should be limited to a max of 10 minutes.
- **Where it is required to hoist the machine for a longer time (exceeding 10 minutes), or when it is carried by a helicopter, use a proper carriage deck as shown in the diagram on the right, for safe transportation.**





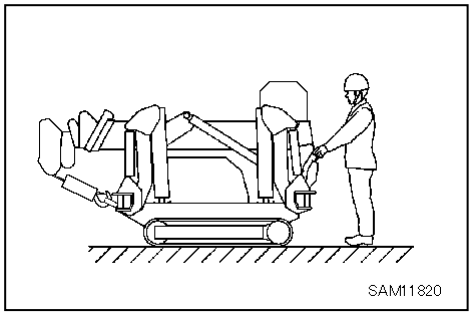
CAUTION

- **When the local laws and regulations are applicable, the person who uses the crane to perform hoisting operation must be qualified to do so. If not, the operator must be well trained and skilled.**
- **See the Dimension or the nameplate attached to the machine for the weight of the machine.**
- **The dimensions are for standard specifications. The hoisting method varies depending on the attachments and options mounted. In that case, contact us or our sales service agency.**



Hoist the machine on solid and flat ground using the following procedure.

1. See “8.1 Machine Travelling Position(Auxiliary Winch)” and put the machine in the “Travelling position”.

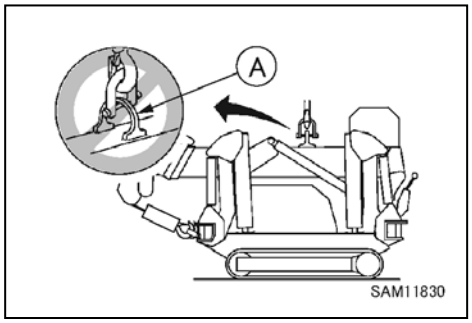


2. Change single fall hook block to 4 falls hook block.

⚠ DANGER

Never use the hoisting bracket (A) to lift machine if single fall hook block is still equipped. Using the bracket (A) to lift the machine with single fall hook block equipped can cause breakage of wire rope for lack of strength, thus leading serious accident.

When lifting machine, always replace to 4 falls hook block and make machine into stowage position.

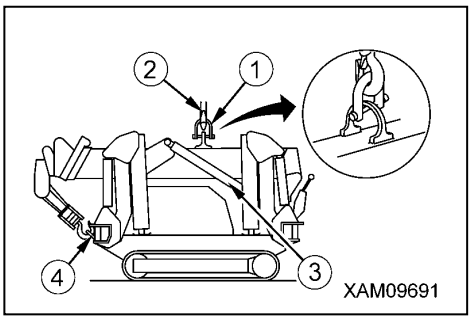


3. Hang the hook (2) directly to the bracket (A) on the top of the boom, or use a shackle (1) to hang the hook (2).

NOTES

With auxiliary winch wire rope equipped, machine cannot be lifted at bracket (A) because of interfering of hook (2) and auxiliary winch wire rope.
Before lifting at hoisting bracket (A), dismantle wedge socket of auxiliary winch and take up the wire rope, then place standard winch wire rope to designated position, and change to 4 falls hook block.

4. As soon as the machine leaves the ground, stop and wait until the machine is stabilized. Then slowly hoist the machine.
5. Check the changes in the position due to the leakage from the hydraulic circuit on the head side of the derricking cylinder (4) when the machine is hoisted.



9. INSPECTION AND MAINTENANCE

9.1 LEGAL INSPECTION

If periodic inspection for machine safety assurance is stipulated by laws and regulations of your country, perform inspection complying with the inspection items listed below.

1. Verify that all safety devices are operating properly.
2. Check the hoist accessories, including the hook block, for problems or damage.
3. Check the structural parts of the machine, including the frame and boom, for cracks, deformation and damage.
4. Check for loose or missing mounting bolts and joints.
5. Verify that the boom operates properly by stopping, extending, retracting, raising, lowering and slewing the boom.

Contact Maeda or a Maeda sales service agency to request inspection and repair service as needed.

9.2 CONSUMABLES

Wire ropes is consumables. Replace them at periodic inspection or before they reach abrasion limits. Replace consumable items regularly, which will produce economical use of this machine. Always replace with a Maeda genuine item. Check parts catalogue for correct part number for parts request.

[CONSUMABLES LIST]

Part	Replacement cycle
Winch wire rope IWRC 6×Ws (26) 0/0 ϕ8×108mm	Every 3 years

Items include a halt period. Contact Maeda or a Maeda sales service agency for part replacement information.

9.3 INSPECTION AND MAINTENANCE LIST

This document only covers auxiliary winch kit. For crane body, please refer to “MC285C-2 Inspection and Maintenance” and follow its precautions.

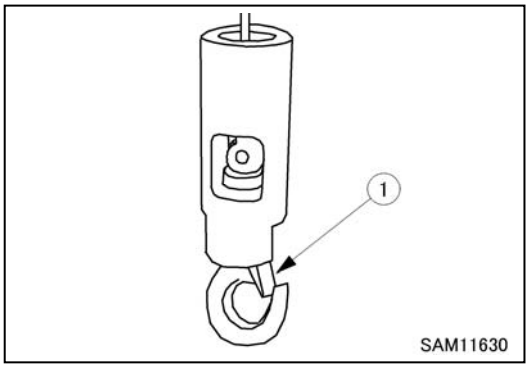
9.4 MAINTENANCE PROCEDURES
9.4.1 INSPECTION BEFORE OPERATION

[**CHECKING BEFORE STARTING ENGINE**]

Check the following in this section without starting the engine and before starting work every day.

[1] CHECKING BOOM HEAD, FRAME AND HOOK

Check each part of the boom head, frame and hook for cracks, excessive deformation and contamination etc. In addition, check bolts nuts and pins for any looseness, drop and damage etc. If you find any abnormality, repair. Check hook for deformation, abnormal noise from bearing and correct function of wire rope latch (1).



[2] INSTALLATION CHECK OF POSITION PIN AND LYNCH PIN

Check if position pin of boom head is surely secured with lynch pin.

[3] INSPECTION OF WIRE ROPE

Check for damage, deformation, wear, twists, kinks and corrosion and replace where necessary.

[4] INSPECTION OF OVER-HOIST PREVENTIVE DEVICE

Check the wire rope of over-hoist weight for damage etc, and replace it as necessary.

[5] INSPECTION OF WINCH MOTOR

Check for loose pipe connections, oil leakage or loose mounting bolts, and repair as necessary.

[6] INSPECTION OF WINCH DRUM

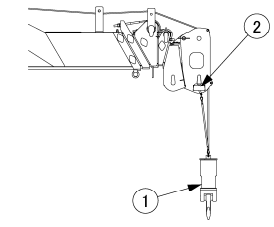
Check the drum for cracks, bending or damage and repair it as necessary. Check hoisting wire rope for disorderly winding and repair it as necessary

[**CHECKING AFTER STARTING ENGINE**]

⚠ CAUTION

The checkups described in this section should be carried out after starting the machine.
See "MC285C-2 Operation manual Operation 2.2 Starting Engine" and later to execute the engine startup, travelling operations, outrigger operations and crane operations.

[1]CHECKING OVER HOIST DETECTOR FOR OPERATION



Over hoist the hook block (1), and raise the hook with winch and extend the boom, and verify that the buzzer sounds and an audible message saying "Over hoisted" is spoken, the hook raising operation and boom extending operation stop.
If these events do not happen, the over hoist detector (2) may be faulty.
If the alarm does not stop, the over hoist detector (2) may be faulty or the circuit may be open.
Ask us or our sales service agency for repair.

[2]INSPECTION OF OVER-UNWINDING STOP DEVICE

Before carrying out underground lifting work, with three loops of wire ropes left on winch drum (1), operate hook lowering to test if alarm buzzer sounds and hook lowering operation stops.
If these are not happening, over-unwinding stop device (3) may be broken.
If the alarm buzzer does not stop sounding, over-unwinding device (3) may have failure or may have cut wiring.
Contact Maeda or a Maeda sales service agency to request repair service.

[3] CHECKING MOMENT LIMITER FOR OPERATION (AUXILIARY WINCH MODE)

⚠ WARNING

If you find any abnormality with the moment limiter, immediately contact us or our sales service agency.

1. Turn the starter switch to the “ON” position.
2. Check with the working status lamp. The red lamps up for 2 seconds, then the green lamps up.
3. Check the moment limiter display unit.
   Verify that no error code is displayed at the “RATED TOTAL LOAD” display on the display panel.
   Check if moment limiter is set as auxiliary winch mode.
4. Start the engine and operate the crane as follows to verify if the moment limiter properly displays the value.

Crane Operation and Displayed Parameter	Value Displayed on Moment Limiter
Displayed “boom length” with the boom length at minimum	2.5m
Displayed “boom length” with the boom length at maximum	8.6m
Displayed “working radius” with the boom length of “4.4 m” and boom angle of “29.2 °“	3.7± 0.1m

5. Check if displayed actual load value is equal to the total weight of the load + the hoisting accessory, when the weight of the known load is hoisted. There may be slight error in accuracy depending on boom condition.
6. Operate the crane until the moment limiter display indicates the boom length is "4.4 m" and boom angle is "29.2 degrees", then measure the "boom angle" and "working radius.
   If the measured value(s) differ from the moment limiter display value, contact MAEDA or MAEDA sales agency.
7. Lift up load and check if boom extending or boom lowering operation is auto-stopped when overloaded. If the operation is not auto-stopped in overloaded condition, please contact us or our sales service agency and do not use the machine.
   This checking operation must be operated slowly, and if machine does not auto-stop by overloading, immediately stop the operation, and perform recovery operation caused by overloading.

NOTES

When measuring actual working radius, measure from hook offset position.

9.4.2 IRREGULAR MAINTENANCE

[1] REPLACEMENT OF WINCH WIRE ROPE

⚠ WARNING

Always wear leather work gloves when replacing the wire rope.

CAUTION

- **The diameter of the wire rope is measured at points where the wire repeatedly runs through the sheave. A mean value needs to be determined through three-way measurement. (A measurement should be performed at several points, spacing between the points.)**
- **Do not use old wire rope regardless of the frequency of use.**
- **Always use Maeda genuine wire rope.**

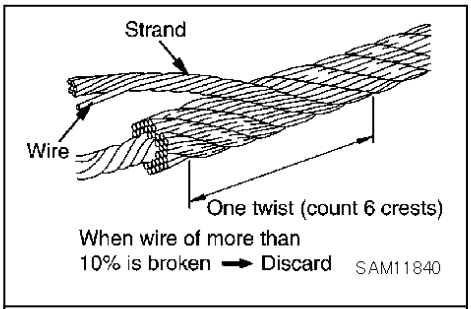
[CRITERIA FOR WINCH WIRE ROPE REPLACEMENT]

A wire rope undergoes wear and tear over time.
Prompt replacement is required if any of the following appears in the wire rope.

- 10% or more of strands (except a filler wire) in a twist of the wire rope (6 crests) are broken.

NOTES

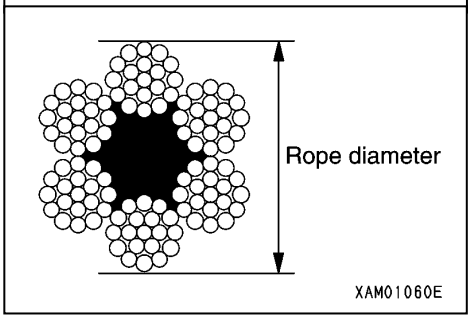
For auxiliary winch, replace when more than 13 wires are cut.



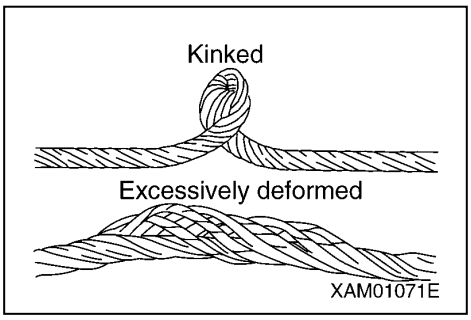
- Wear equivalent to 7% or more of a nominal diameter occurs in the wire rope diameter.

NOTES

• Change the 8-mm diameter wire rope when reduced to 7.5 mm.



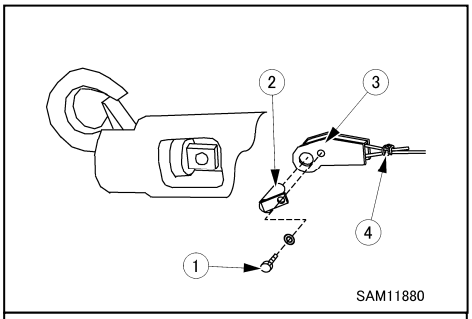
- A kink is formed.
- Considerable deformation or corrosion is developed.
- A faulty end socket is used.



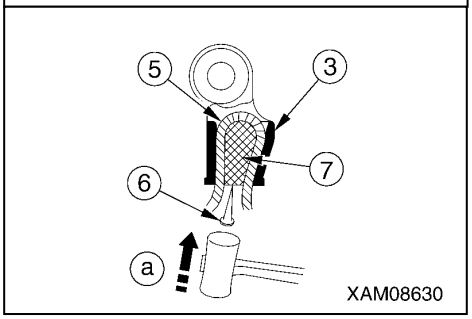
[REMOVAL OF WINCH WIRE ROPE]

Use the following procedure to remove the wire rope.

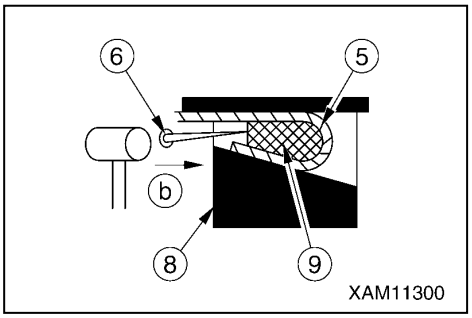
1. Place the machine on a level and firm surface.
2. Place the boom telescoping lever in the “Extend” position (push it toward the front) to extend the boom slightly.
3. Place the winch lever in the “Down” position (push it toward the front) to lower the hook block on the ground.
4. Remove wedge socket fixing bolt (1), wedge socket pin (2), and then take off wedge socket (3).
5. Remove the wire clip (4).



6. Pull the wire rope (5) out of the wedge socket (3), following the procedure provided below.
   (1) Bring a 4 to 6mm round bar (6) into contact with the rope wedge (7).
   (2) Remove the rope wedge (7), lightly tapping the round bar (6) with a hammer in the direction indicated by the arrow (a).
7. Place the winch lever in the “Down” position (push it toward the front) to wind up the wire rope (5) from the winch drum.



8. With the wire rope wound off from the winch drum, detach the end of the wire rope (5) from the winch drum (8) by following the procedure provided below.
   (1) Bring a 4 to 6mm round bar (6) into contact with the rope wedge (9).
   (2) Remove the rope wedge (9), lightly tapping the round bar (6) with a hammer in the direction indicated by the arrow (b).
9. Wind up the remaining wire rope (5) completely.



Removal of the winch wire rope is completed.

[INSTALATION OF WINCH WIRE ROPE]

⚠ WARNING

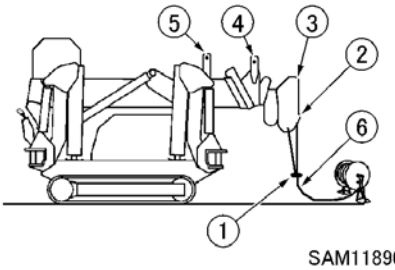
Be sure to attach the rope wedge properly to secure the wire rope. Serious accidents may occur if the wire rope is detached during crane operations.

CAUTION

- **Avoid irregular winding of the wire rope on the winch drum.**
- **Always hoist an object (2.9 to 4.9KN {300 to 500kg}) with the boom extended and raised fully immediately after attaching a new rope. Repeat raising and lowering the hook several times until the new rope conforms.**
- **The wire rope is coiled. Exercise caution not to form a kink in the rope when winding it up. Be sure to unravel by rotating the rope to pull it out of the winch drum.**

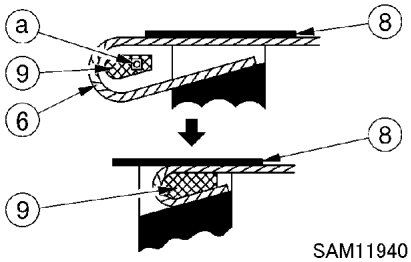
Use the following procedure to attach the wire rope.

1. With the end of the wire rope held, draw the wire rope (6) through the weight of the over hoist detector (1), the load sheave (2) at the boom end, the wire guide (3) of No. 2 boom, the guide sheave (4) of No.1 boom, and also the idler sheave (5) of No.1 boom.



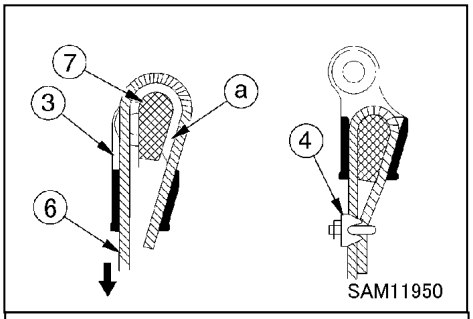
SAM11890

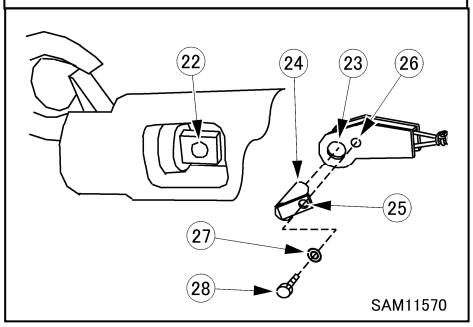
2. Draw the wire rope (6) through the attachment hole of the winch drum (8). Secure the wire rope (6) to the winch drum (8), following the procedure provided below.
   (1) Draw the slackened wire rope (6) through the winch drum (8).
   (2) The rope wedge (9) should be in position (a). Pass the wire rope (6) around the rope wedge and pull the rope in the direction indicated by the arrow.
   Adjust the length of the wire rope (6) to keep the end of the wire rope from protruding from the narrow hole in the winch drum (8).
3. Place the winch lever in the “Up” position (pull toward you) slowly to wind up the wire rope (6) on to the winch drum (8).



SAM11940

4. Secure the end of the wire rope (6) to the wedge socket (3), following the procedure provided below.
   (1) Draw the wire rope (6) through the wedge socket (3) as shown in the diagram (right).
   (2) With the rope wedge (7) in position (a), pull the wire rope (6) in the direction indicated by the arrow.
5. Attach the rope clip (4) to the wire rope (6).
6. Insert to hook to align holes of connection base (22) and wedge socket (23).
   Insert wedge socket pin (24) to the aligned holes, and align hole of wedge socket pin (25) and hole of wedge socket (26), then secure with spring washer (27) and bolt (28).





7. Place the boom derricking lever in the “Raise” position (pull it toward you) or the boom telescoping lever in the “Extend” position (pull it toward you) to raise the hook block.

NOTES
Winch operation is allowed only after the hook block is raised.

8. Fully extend and fully raise boom, and operate hook lowering (push winch lever forward) to run out wire rope on auxiliary winch unit (15) as close as to the ground.

NOTES
Do not let hook block to touch the ground.

9. With the wire rope (6) held under tension, place the winch lever in the “Up” position (pull it toward you) to wind up the wire rope (6) to the winch drum (8).

9.4.3 MAINTENANCE EVERY 50 HOURS

[1] GREASING MACHINE UNITS

CAUTION

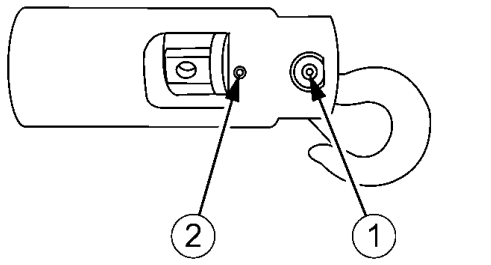
- **Grease type varies with greasing points. Failure to grease properly may cause the machine to shorten its useful life. See the following table for grease types.**
- **Greasing a new machine is required once every 10 hours until the machine attains the first 100 hours of operation that initial fit emerges.**

• Use proper grease specified below according to the greasing points.

№	Greasing point		Grease type
1	Greasing of the hook block	2 places ((1),(2))	Lithium grease
2	Greasing of the winch wire rope	1 piece ((3))	Rope grease

1. With the use of the grease gun, grease the grease plugs.
2. Wipe off old grease squeezed out after greasing.
3. Apply wire rope grease to prevent wear and rust of the wire rope.
   Before applying, remove dirt from the rope surface.

No.1



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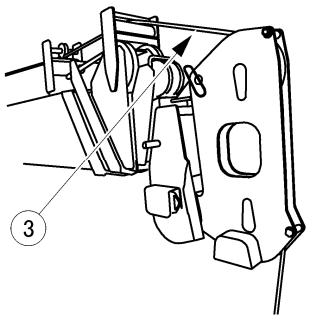
No.2



SAM11650

9.4.4 MAINTENANCE EVERY 100 HOURS

[1] CHECK OIL LEVEL IN WINCH REDUCTION GEAR CASE, AND ADD OIL

⚠ WARNING

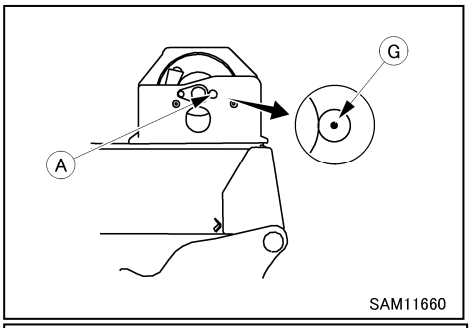
- **Oil is extremely hot immediately after operation of engine. Wait until oil cools down before removing inspection port plug after operation.**
- **For inspection and replenishment of oil, be sure to stop engine.**

CAUTION

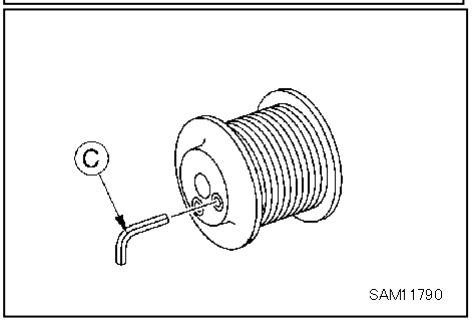
- **Be sure to use oil specified in section 5.1 "Use of Lubricating Oil according to Temperatures" in MC285C-2 Inspection and Maintenance. Failure to use proper oil may cause the engine life to shorten. Always use the specified oil for replenishment.**
- **After the inspection and replenishment of oil, prevent leakage from the threaded part of oil inspection plug with sealer tape and securely tighten it.**

・ Plug removal Allen key: 8mm

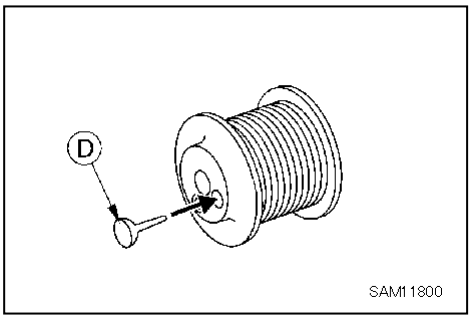
1. Place the machine on a level surface.
2. See "MC285C-2 Operation 2.12 Outrigger Setting Operation" to rotate the rotary of the "outrigger [4]" outward.
3. Rotate the winch slowly until the oil inspection plug (G) reaches a point where it can be seen through the post side inspection hole (A).



4. Use the hexagonal wrench (C) to loosen the oil inspection plug (G). Check if the gear oil exudes from the oil inspection plug (G).



5. If no exudation of the gear oil is found, rotate the oil inspection plug (G) slowly to remove it. Replenish gear oil with the use of an oil pump (D).



NOTES

Wipe off the oil completely if spilled.

6. Put in the oil inspection plug (G) and secure it upon completion of oil replenishment.
7. See "MC285C-2 Operation 2.22 Outrigger Stowing Operation" to stow the outriggers.

9.4.5 MAINTENANCE EVERY 1000 HOURS

[1] OIL REPLACEMENT IN WINCH REDUCTION GEAR CASE

⚠ WARNING

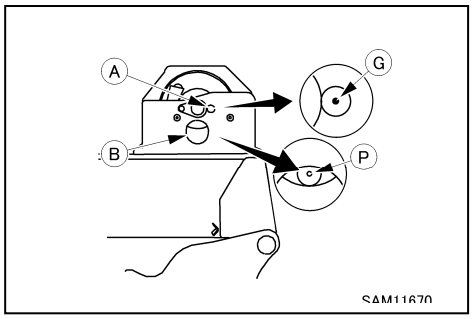
Oil temperature will be elevated immediately after engine operation. Do not unplug the inspection port and drain port until the oil becomes cold.

CAUTION

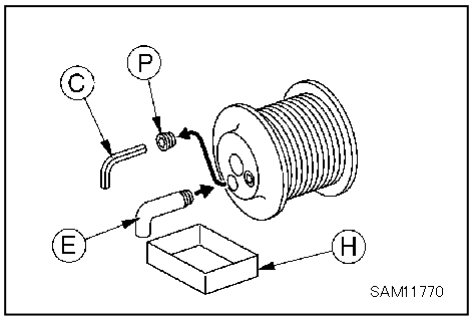
- **See "MC285C-2 Maintenance 5.1 Use of Lubricating Oil According to Temperature" for which oil to be used.**
- **Use seal tape, etc. at the thread of the filler plug to stop the oil leak and securely tighten the plug after refilling with the oil.**

- Oil drain pan: A 1-litre container
- Hexagonal wrench for plug removal: 8mm
- Quantity of oil for replacement: 0.5L
- Oil drain elbow : NPT1/16

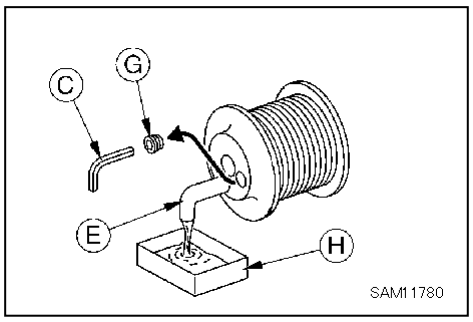
1. Place the machine on a level surface.
2. See "MC285C-2 Operation 2.12 Outrigger Setting Operation" to rotate the rotary of the "outrigger [4]" outward.
3. Rotate the winch slowly to a point where the oil inspection plug (G) and drain plug (P) come in sight.
   (1) Stop the winch at a point where the oil inspection plug (G) can be seen through the post side inspection hole (A).
   (2) Stop the winch at a point where the drain plug (P) of the winch reduction gear case can be seen above the inspection hole (B).



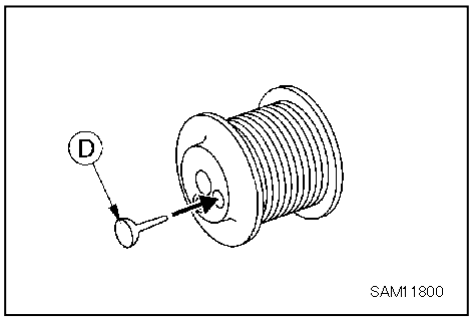
4. Use the hexagonal wrench (C) to remove the drain plug (P).
5. Install the elbow (E) to the screw hole of the drain plug (P) for draining oil.
6. Place a drain pan (H) directly under the elbow (E) to receive drained oil.



7. Use the hexagonal wrench (C) to remove the oil inspection plug (G). The gear oil is drained from the winch reduction gear case upon plug removal.
8. Remove the elbow (E) after the gear oil is completely drained from the winch reduction gear case. Put in the drain plug (P) and secure it.



9. Pump the gear oil through the oil inspection plug (G) with the use of the oil pump (D).



NOTES
Pump the gear oil until it exudes from the oil inspection plug.

10. Put in the oil inspection plug (G) and secure it upon completion of oil replenishment.

NOTES
• Perform a proper break-in with no object hoisted for 5 minutes after oil replacement. • Wipe off the oil completely if spilled.

11. See “MC285C-2 Operation 2.22 Outrigger Stowing Operation” to stow the “outrigger [4]”.

10. SPECIFICATIONS

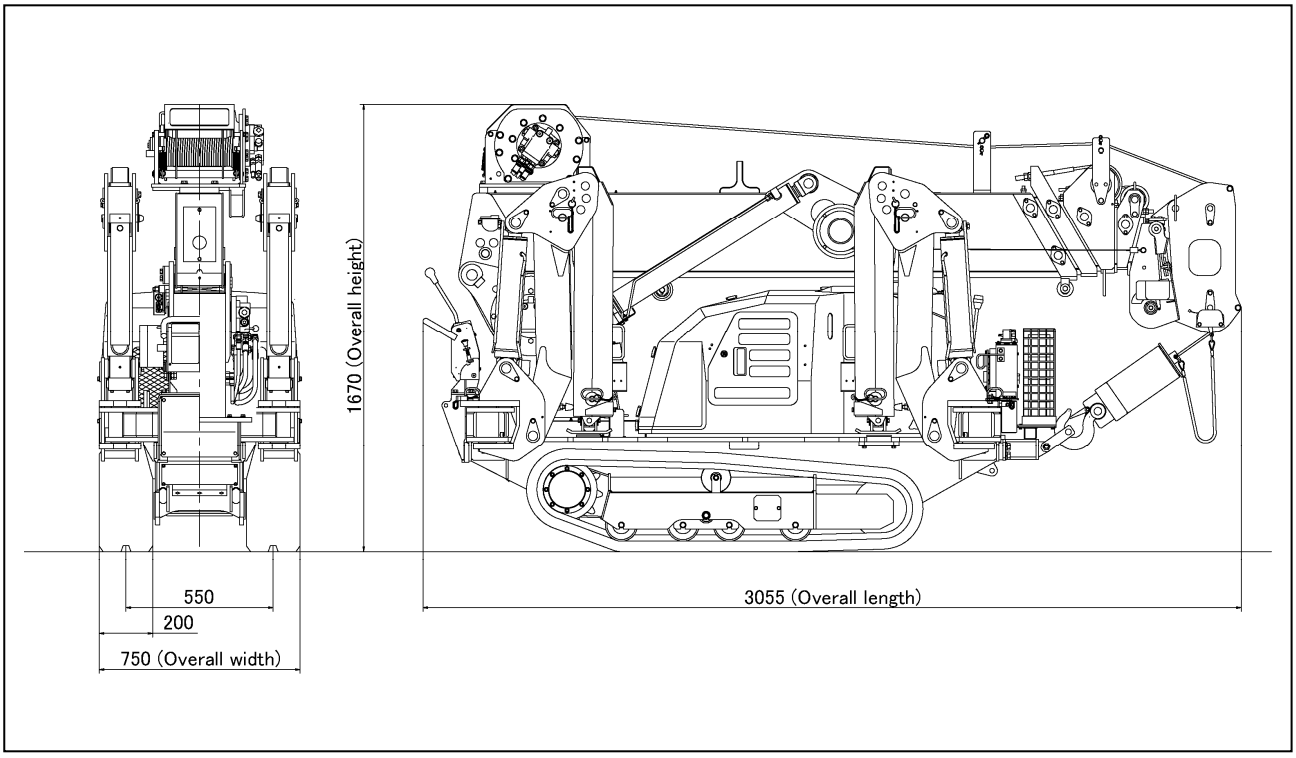
10.1 SPECIFICATIONS

Model		MC285CRM-2	MC285CRME-2
Weight and dimensions	Machine weight※1	2130kg	2290kg
	Overall length × width × height※1	3055mm × 750mm × 1670mm	3620mm × 750mm × 1670mm
	Distance between centre idler and sprocket	975mm	
	Track gauge	550mm	
	Width of crawler	200mm	
	Minimum ground clearance	133mm	
Performance	Crane capacity	2.82t × 1.4mm	
	Maximum working radius	8.2m	
	Maximum lifting height above ground	8.7m	
Winch system	Type	Hydraulic motor driven with brake, differential planetary gear type, with counter balance valve(within drum type)	
	Hook hoist speed	30.0mm / min(4 layers, 1 line fall)	
	Hoist wire rope	IWRC 6 × Ws (26) 0/0 φ8 × 108mm	
Telescoping system	Type	Sequential hydraulic cylinders × 2 + wire rope telescoping systems × 2	
	Type of boom	Fully automatic 5-section pentagonal telescopic (3 to 5 stage: simultaneous telescoping)	
	Boom length	2.535mm - 4.075mm - 5.575mm - 7.075mm - 8.575mm	
	Boom telescoping stroke/ time	6.04mm / 22 sec	
Boom hoist system	Type	Hydraulic double acting cylinder,direct acting type × 2	
	Derricking angle/ time	0 to 80° / 14 sec	
Slewing system	Type	Slew bearing support, hydraulic motor drive, worm and spur gears, worm self-lock	
	Slewing angle/ speed	360° (continuous) / 60 sec (1.0 RPM)	
Outrigger system	Type	1st stage with flexible stay damper, 2nd stage manual pullout, hydraulic cylinder direct acting type	
	Max extended width	(Right / left) 4580mm × (Front) 4530mm × (Rear) 3810mm	
Travel system	Type	Hydraulic motor driven, Step-less speed changer	
	Travel speed	Forward/backward: 0 – 2.2 km/h	
	Grade ability	20°	
	Ground pressure※1	53.7kPa(0.547kgf/cm^2)	57.6kPa(0.587kgf/c m^2)
Hydraulic system	Hydraulic pump	Variable piston pump	
	Rated pressure	20.6MPa(210kgf/c m^2)	
	Hydraulic oil tank capacity	20L	
Engine	Model	Yanmar 2TNV70-NMBA	
	Type	In-line 2-cylinder, water cooled, 4-cycle diesel	

	Displacement	0.569L(569 cc)
	Rated output (continuous)	7.4kW / 2500min^{-1}(10.1 PS / 2500rpm)
	Fuel tank capacity	Diesel 12L
Battery	Model	55B24R (DC12V x 1 piece)
Safety device	Over hoist detector, over un-winding detector, angle indicator, hydraulic safety valve, wire rope latch, level, machine body inclination alarm, EMO Switch, crane outrigger interlock device, moment limiter, outrigger setting lamp, working status lamp	

※1 Value is with auxiliary winch

10.2 SPECIFICATION DIMENSIONAL DRAWING



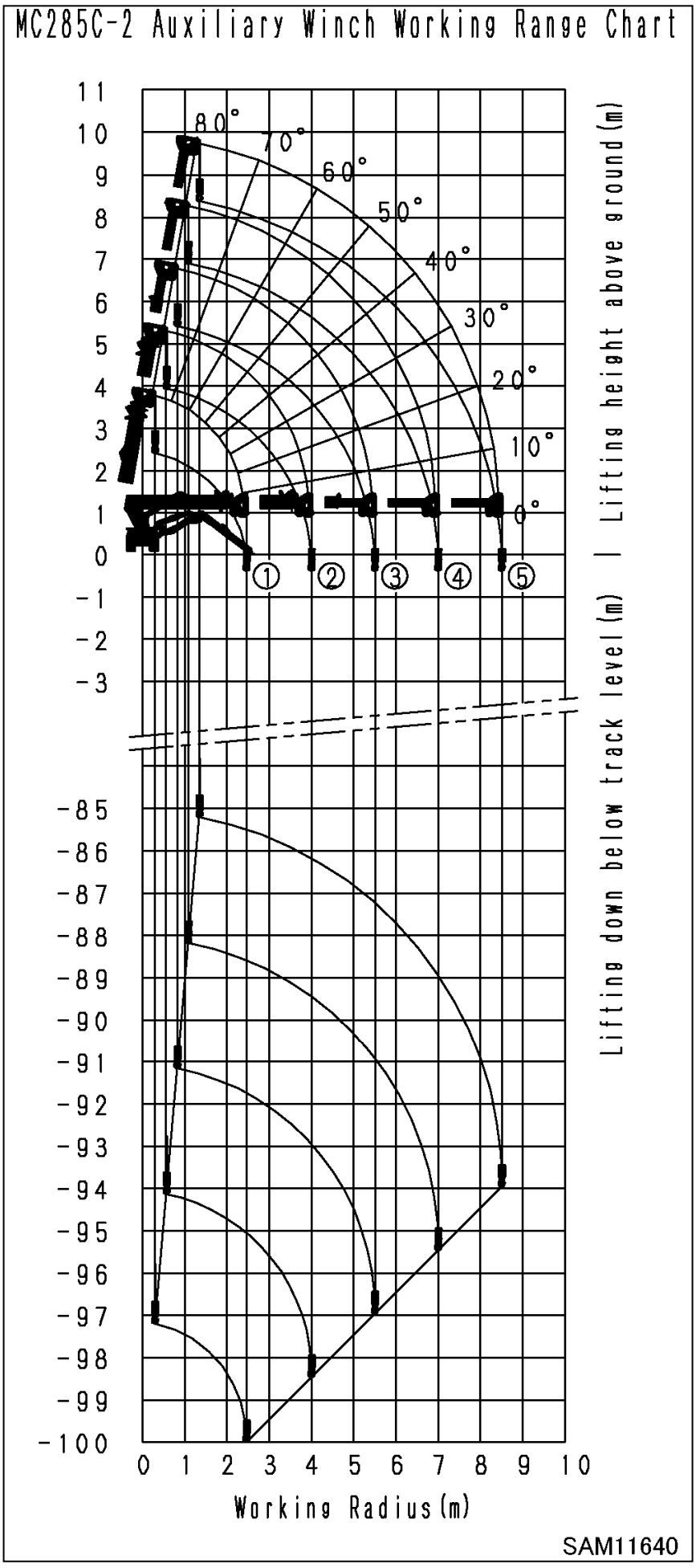
The above figure represents the travelling lever stand upright.

10.3 WORKING RANGE DIAGRAM AND RATED TOTAL LOAD CHART

⚠ DANGER

- **The working range diagram shows the relationship between the working radius of this machine, boom angle and lifting height above the ground with no object hoisted. Deflection in the boom is not indicated.**
- **When using auxiliary winch, always set moment limiter to auxiliary winch mode.**
- **Do not use single fall hook block and crane hook block at the same time.**
- **Use of crane hook block is prohibited in auxiliary winch mode.**

10.3.1 WORKING RANGE DIAGRAM FOR AUXILIARY WINCH



10.3.2 RATED TOTAL LOAD CHART FOR AUXILIARY WINCH

1. The diagram of working radius and lifting height has been made allowing for no deflection in the boom.
2. Rated total load chart is based on working radius with boom deflection and raised load taken into consideration.
3. Rated total load is shown with the mass of single fall hook (30kg) included.
4. If boom (3) is extended to any extent, work should be performed within the capacity for “5.575m Boom”.

5. When more than one half of the first ◣ mark is exposed from the boom (2), work should be carried out within the performance for the “7.075m Boom”.
6. When more than one half of the second ◣ mark is exposed from boom (2), work should be carried out within the performance for the “8.575m Boom”.
7. Rough operation of crane is very dangerous. Always try to operate safely.
8. In some working condition, moment limiter displays bigger load value than actual load.

Working Radius (m)	2.535m BOOM			4.075m BOOM			5.575m BOOM			7.075m BOOM			8.575m BOOM			Working Radius (m)
	BOOM FULLY RETRACTED			BOOM FULLY RETRACTED			BOOM FULLY RETRACTED			BOOM FULLY RETRACTED			BOOM FULLY RETRACTED			
	LOADED BOOM ANGLE	OUTRIGGER POSITION		LOADED BOOM ANGLE	OUTRIGGER POSITION		LOADED BOOM ANGLE	OUTRIGGER POSITION		LOADED BOOM ANGLE	OUTRIGGER POSITION		LOADED BOOM ANGLE	OUTRIGGER POSITION		
		MAX	OTHER THAN MAX		MAX	OTHER THAN MAX		MAX	OTHER THAN MAX		MAX	OTHER THAN MAX		MAX	OTHER THAN MAX	
1.4 or less	52.5	**900**	**900**	73.5	**900**	**900**										1.4 or less
1.5	50.0	**900**	**900**	72.5	**900**	**900**										1.5
2.0	33.5	**900**	**900**	67.0	**900**	**900**										2.0
2.5				50.0	850	580										2.5
3.0				40.5	850	440	56.0	850	460							3.0
3.5				27.5	800	320	49.5	800	340							3.5
3.6				24.5	800	300	48.0	780	320	58.0	770	350				3.6
3.9				8.5	800	260	44.0	740	270	55.5	710	290				3.9
4.0							42.5	730	260	54.5	690	280	61.0	500	280	4.0
4.5							34.0	580	200	49.5	530	220	57.5	350	210	4.5
5.0							24.0	480	140	44.0	430	170	53.5	290	160	5.0
5.4							7.0	480	100	39.0	390	120	50.0	250	130	5.4
5.5										37.5	380	110	49.0	250	130	5.5
6.0										30.5	330	100	44.5	220	110	6.0
6.5										21.0	300	70	39.5	180	80	6.5
6.9										6.0	280	50	35.5	150	50	6.9
7.0													34.0	150	50	7.0
7.5													27.5	130		7.5
8.0													19.0	100	PROHIBITED	8.0
8.4													5.5	100		8.4

MAEDA MINI-CRAWLER CRANE MC285C-2

AUXILIARY WINCH OPERATION MANUAL

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