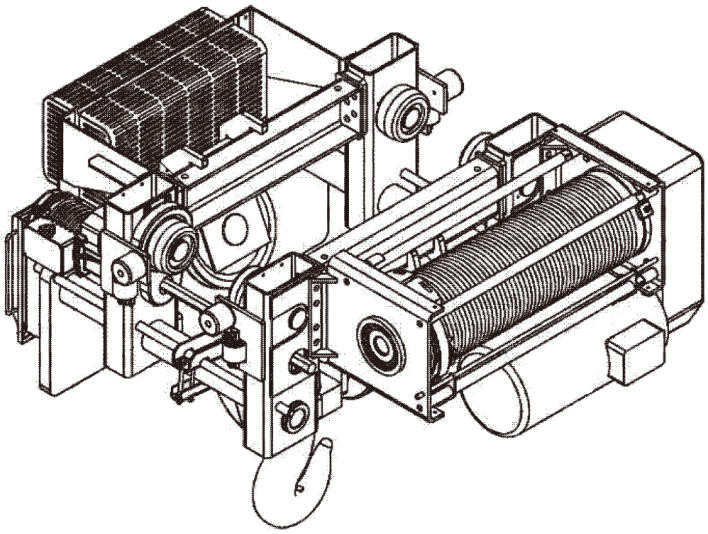
KITO

RY Series Wire Rope Hoist (10t)

Disassembly and Reassembly Manual

Low Headroom Type:RYL



Safety Precaution

This Disassembly and Reassembly Manual includes contents to prevent injury to any person performing Disassembly and reassembly, users, and other persons and damage to property, and to disassemble/reassemble the Wire rope hoist safely and correctly.

Disassembling and reassembling the rope hoist is an essential part of periodic inspections and repairs. Refer to the "RY Series Wire Rope Hoist (10t) Owner's Manual" (separate document) and carry out the procedures correctly.

Persons performing disassembly/reassembly

Disassembly/reassembly shall be performed by a competent person (a person duly authorized by the company as having expertise on the structure and device of the Wire rope hoist) or consult KITO.

Safety Precautions

Improper use of the hoist may cause serious accidents resulting in death or severe injury such as drop of lifted load.
Read this Disassembly and Reassembly Manual carefully before installation, operation and maintenance.
Use the product after understanding the product knowledge, safety information and precautions.
This Disassembly and Reassembly Manual classifies the safety information and precautions into three categories of "DANGER", "WARNING", and "CAUTION".
Also read the instruction manual of the device associated with the hoist (option, crane, etc.), and follow the described contents.

Description of Signal Words

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or severe injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or severe injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Further, the event described in CAUTION may result in serious accident depending on the situation. All of these items describe important matters. Please follow the instruction.
After reading, please keep this manual at hand for future use by the user.

Description of Safety Symbols

Prohibited

⃠ means "Prohibited" or "You must not do".
Prohibited action is shown in the circle or described near the circle with words and figures.
This Disassembly and Reassembly Manual uses ⃠ as the general prohibition.

Mandatory

❗ means "Mandatory Action" or "You must do".
Required action is shown in the circle or described near the circle with words and figures.
This Disassembly and Reassembly Manual uses ❗ as the general instruction.

■ Disassembly and reassembly (general)

⚠ DANGER

Prohibited

- **Only competent persons must disassemble/reassemble the rope hoist.**

Disassembly/reassembly by anyone other than competent persons may result in death or sever injury.

Prohibited

- **Do not use unauthorized parts for RY Series Wire Rope Hoist.**
  Even if the part is an authorized part, it may not be used for a different model.
  Use parts correctly in accordance with this manual.

Failure to follow this instruction may result in death or severe injury.

Prohibited

- **Do not disassemble/reassemble the rope hoist while it is being suspended.**
  When disassembling/reassembling the rope hoist, place it on the floor and perform them on the workbench.

Failure to follow this instruction may result in death or severe injury.

Prohibited

- **Do not perform disassembly/reassembly during conduction.**

Failure to follow this instruction may result in death or severe injury due to an electric shock or unexpected operation.

Prohibited

- **Do not use oil such as gear grease and lubricating oil in areas near a fire or spark.**

Failure to follow this instruction may result in fire or severe injury arising from ignition.

Mandatory

- **Carry out the installation or removal work of the rope hoist after securing the stable foothold.**

Failure to follow this instruction may result in death or severe injury due to falling or dropping.

Mandatory

- **Carry out the installation or removal work of the rope hoist after shutting down the power distribution panel.**

Failure to follow this instruction may result in death or severe injury due to an electric shock.

Mandatory

- **When reassembly is complete, perform a function check (preoperational check) to make sure it operates properly.**

Failure to follow this instruction may result in death or severe injury.

For details, refer to 'Periodic Inspection' in the separated Owner's Manual.

Mandatory

- **Tighten the bolts and nuts with the specified tightening torques.**

Failure to follow this instruction may result in death or severe injury.

⚠ CAUTION

Mandatory

- **When reassembling, follow the instructions below.**
  - Before reassembly, remove dust and oil on the part to be reused.
  - Insert snap rings completely in the groove.
  - Assemble the wire rope without torsion.
  - When closing the control box cover, be careful so that your finger won't get caught.

Failure to follow these instructions may cause loss of property arising from damaged product or dropped parts.

Mandatory

- **When reassembling, replace the following parts with new ones.**
  - Lubricating oil (The type and amount of oil required will vary depending on the specifications and size of the unit. Refer to "RY Series Wire Rope Hoist (10t) Owner's Manual" (separate document).)
  - Packing and the like
  - Oil seal
  - Snap ring
  - Split pin
  - O-ring
  - Spring pin

Failure to follow this instruction may cause bodily injury or loss of property.

■ Before disassembly and reassembly

⚠ DANGER

Mandatory

- **Disassembling/reassembling improperly causes death or severe injury. Only competent persons with expertise and experience must disassemble/reassemble the rope hoist. Alternatively, contact the nearest distributor or KITO.**
  (Refer to the back of this manual.)
  - Perform disassembly and reassembly in correct procedures as described in the manual.
  - Before reassembling the parts such as gear, clean and remove oil and dust on them.
    Especially when a plastic hammer is used, clean them thoroughly so that no chip of the hammer remains inside.
  - Prepare anti-loosening (screw lock) for bolts. Apply it to the specified locations.
  - Use only authorized parts for replacement.

Failure to follow these instructions may result in death or severe injury.

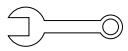
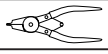
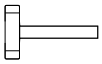
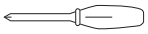
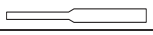
NOTE

The disassembly and reassembly procedures are described based on the representative model. Note that components may be slightly different for different capacities. In addition, the specifications may be changed without prior notice and may be different from the actual products.

Table of Contents

Disassembly and assembly tool

For disassembly and reassembly, prepare the following tools.

No.	Tool/jig name	Application	Icon
1	Wrench 8mm/10mm/13mm/16mm//17mm/18mm/19mm/24mm/30mm/36mm	Bolts and nuts	
2	Hexagon wrench 3mm/5mm/6mm/8mm/10mm/14mm	Socket bolts	
3	Snap ring pliers S	Snap rings (shaft)	
4	Snap ring pliers R	Snap rings (hole)	
5	Socket wrench 8mm/10mm/13mm/16mm/17mm/18mm/19mm/24mm/30mm/36mm	Bolts and nuts	
6	Combination pliers	Split pins	
7	Plastic hammer	Removing pinions	
8	Screwdrivers (+)(-)	Screws	
9	Puller	Ball bearings	
10	Monkey wrench	Bolts and nuts	
11	Torque wrench	Setting torque	
12	Pliers/Needle nose pliers	Set pins	
13	Nippers	Cutting INSULOK	
14	Brush	Applying lubricating oil	
15	Precision screwdriver (flathead)	Used for lead wire removal	
16	Wood block	Used as a sleeper	
17	Fiber sling	Used when lifting rope drum and the like	
18	Chain sling	Supporting control box unit and the like	
19	Eye type bolt M12	Supporting control box unit and the like	
20	Round bar	Pinions	
21	Pin punch	Spring pins	
22	Spatula	Used when removing lubricating oil	
23	Gas burner	For thread lock removal	
24	Socket bolt (complete thread) [M10x50]	Used for gear case removal	
25	T wrench	Socket bolts	

● Use the following types of grease.

- ENEOS: BONNOC M260
- ENEOS: Epinoc AP (N) 2
- MOLY PS Grease No.2 or equivalent (Molybdenum disulfide No. 3)
- Molybdenum disulfide lubricant Molytherm No. 2

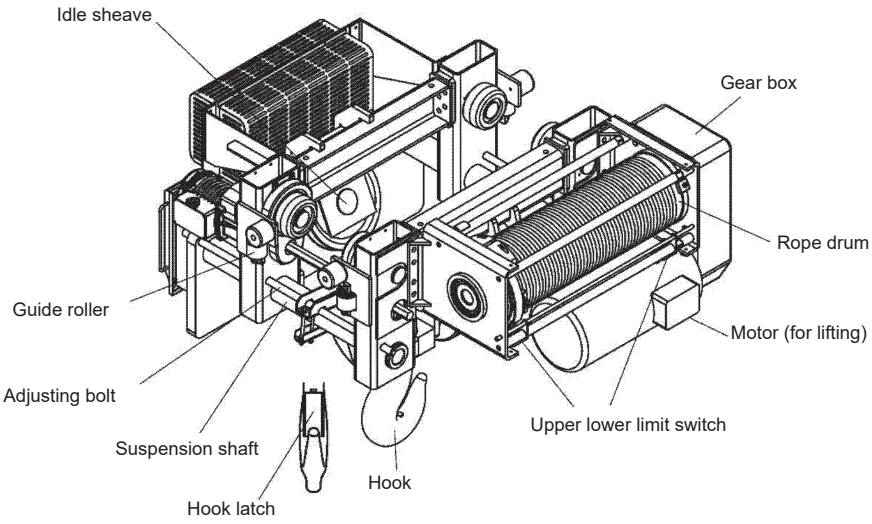
● Helpful tools

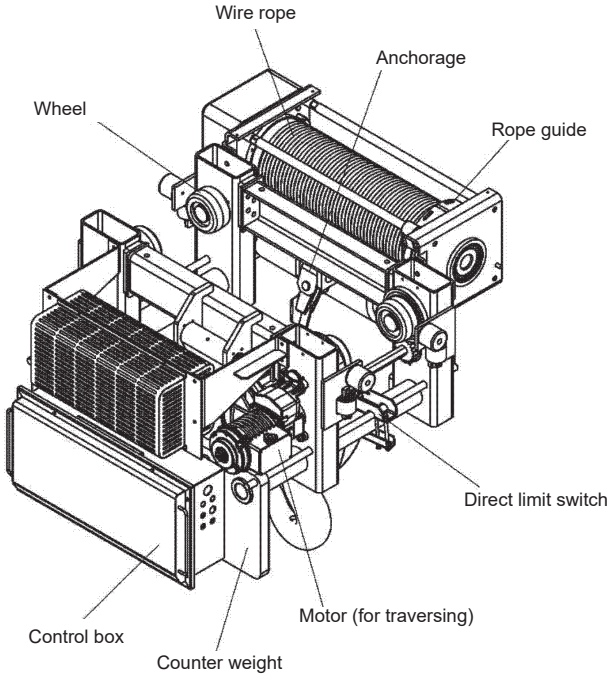
- Remover. Preparing remover for bearings (for inner race & outer race) or for oil seal allows easy operation.
- Preparing wire for guiding lead wires will be helpful.

Major parts in common

	10t				Difference
Rail width (mm)	150-350		351-500		
Lifting range (mm)	9	12	9	12	
Frame A, B, C, and D	a	←	←	←	
Suspension shaft	a	←	b	←	Length
Adjusting bolt	a	←	b	←	Length
Drive shaft	a	←	b	←	Length
Drum	a	b	a	b	Length
Support shaft	a	b	a	b	Length
Limit switch bolt	a	b	a	b	Length
Drum cover	a	b	a	b	Length
Counter weight	a	b	a	b	Length
Beam	a	b	a	b	Length
Traversing motor	a	←	←	←	
Hook block	a	←	←	←	
Wire rope	a	b	a	b	Structure and length

Name of parts





Disassembly procedure

⚠ DANGER

Prohibited

- **Do not disassemble the rope hoist while it is being suspended.**

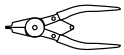
  Doing so may result in death or severe injury due to a falling part.
  Place it on the floor and perform maintenance on the workbench.

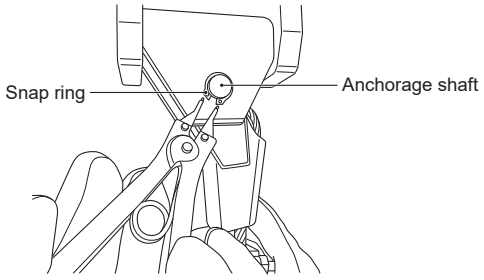
The overall disassembly procedure is shown below. Perform disassembly of only necessary parts.

1. Wire rope

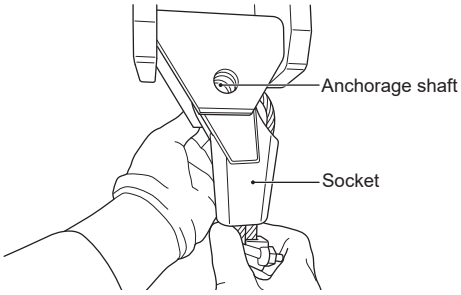
■ Removing Wire Rope

(1) Remove the snap ring from the anchorage shaft supporting the Rope End Fixing Part of the Main Unit.



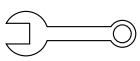


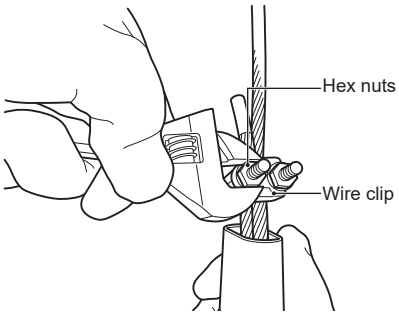
(2) Pull out the anchorage shaft from inside.



(3) Remove the socket.

(4) Remove the hex nuts (two locations), and then the Wire Clip at the rope end.


[19mm]



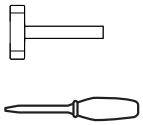
⚠ CAUTION

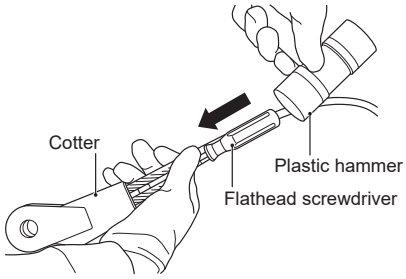
Mandatory

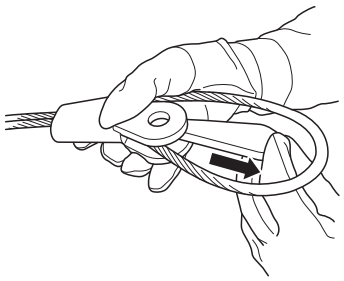
Your hands may be injured.
Wear gloves and the like. Be careful of fine splits of element wires at the rope end while working.

(5) Tap lightly the tip of the cotter, and pull out the cotter from the socket.

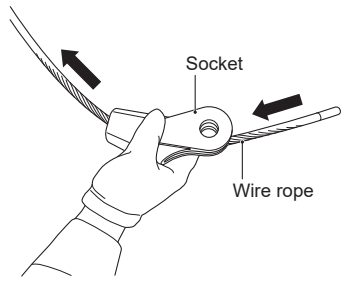
- If it is difficult to tap the tip of the cotter, put a flathead screwdriver on the cotter as shown in the figure and tap the screwdriver with a hammer.



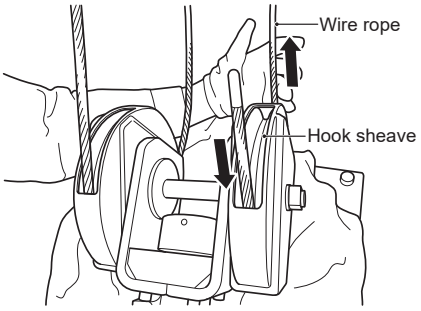




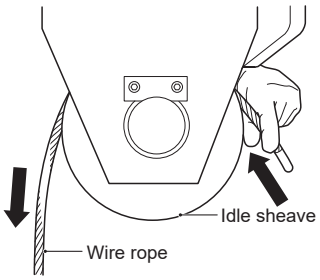
(6) Remove the Wire Rope from the socket.



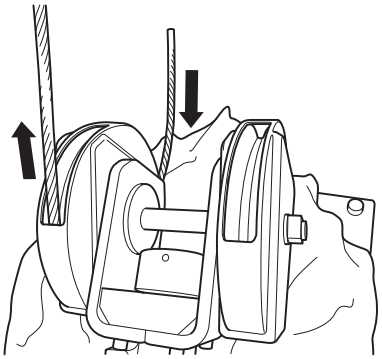
(7) Pull out slowly the Wire Rope from the Hook Sheave of the Hook Block.



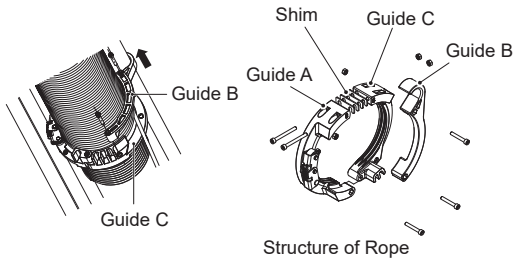
(8) Pull out slowly the Wire Rope from the Idle Sheave.



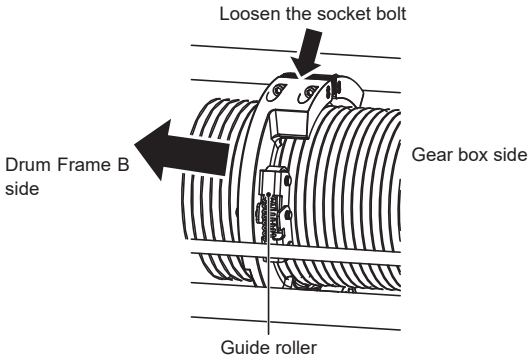
(9) Pull out slowly the Wire Rope from the other Hook Sheave of the Hook Block.



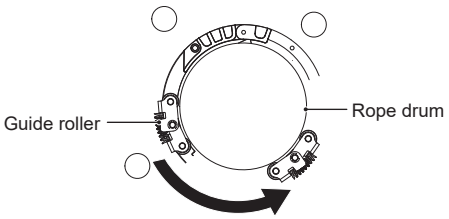
(10) Remove the bolt fixing Guide B, and remove Guide B from Guide C along the Support Shaft.



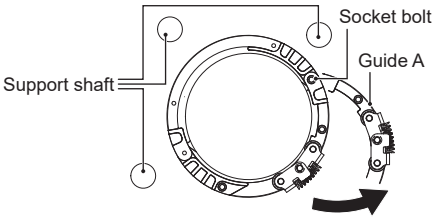
(11) Loosen the socket bolt indicated by the arrow in the figure below. Next, move Guide A toward the Drum Frame B side until its Guide Roller does not lie on the wire, and remove the socket bolt you loosened.



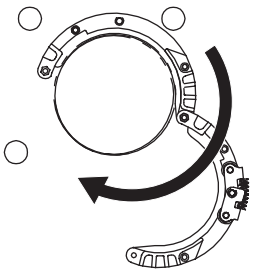
(12) As shown in the figure on the right, rotate Guide A and Guide C along the Rope Drum using the Guide Roller as a guide.



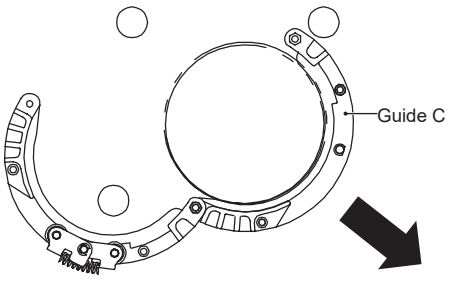
(13) Loosen the socket bolt connecting Guide A to Guide C, and remove Guide A from the Rope Drum at a position where Guide A has no interference with the Support Shaft.



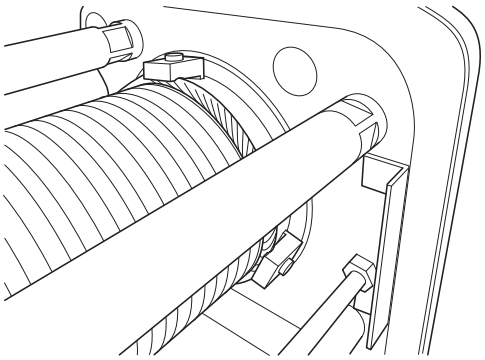
(14) As shown in the figure on the right, rotate Guide A and Guide C along the Rope Drum with Guide A removed from the Rope Drum.



(15) Remove Guide C from the Rope Drum at a position where Guide C has no interference with the Support Shaft.



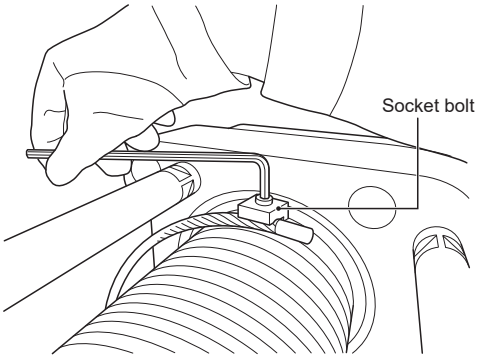
(16) Perform unwinding operation while pulling the Wire Rope by hand so that the Wire Rope does not float away from the Rope Drum. Remove in advance the Wire Rope to the position of the Rope Clamp as shown right.



(Fixed state)

(17) Loosen socket bolts and remove Wire Clamps at three locations to remove the Wire Rope from the Wire Drum. Remove the Wire Rope while holding it by hand so as to prevent the Wire Rope from being removed suddenly by tension of the Wire Rope.

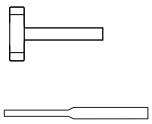
[6mm]

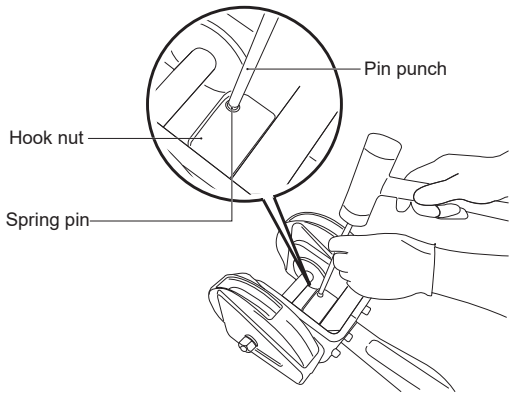


2. Hook block

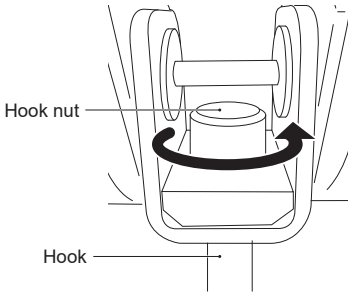
■ Removing the hook block

(1) Pull out the spring pin fixing the hook nut and hook.

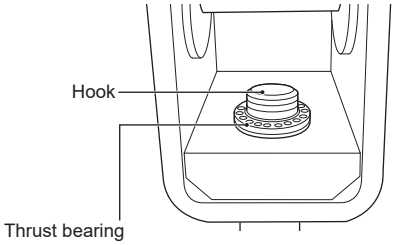




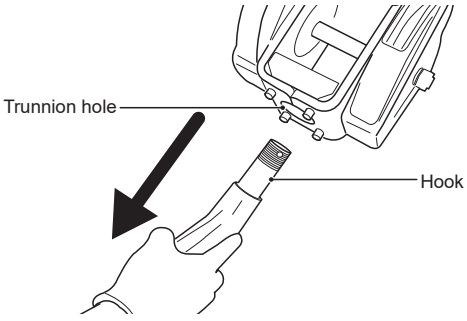
(2) Remove the hook nut fixing the hook.



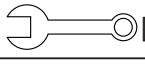
(3) Remove the thrust bearing from the hook.



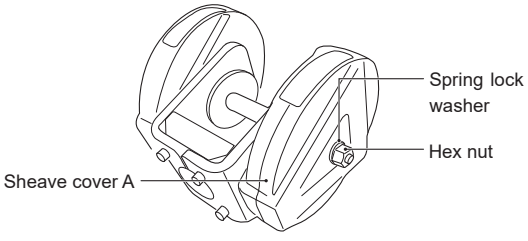
(4) Remove the hook from the trunnion hole.



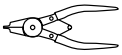
(5) Remove the hex nuts and spring lock washers fixing the sheave covers A and B.

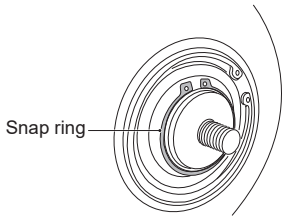


(6) Remove the sheave cover A.

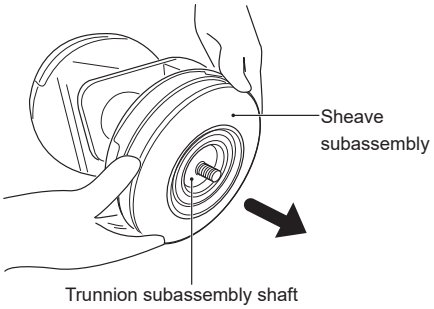


(7) Remove the snap ring fixing the sheave subassembly.

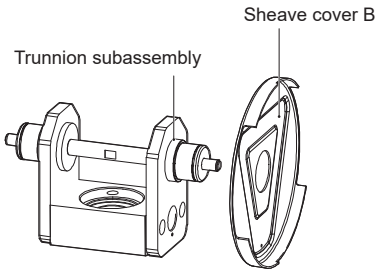




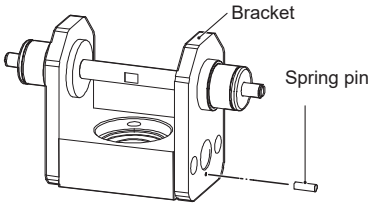
(8) Remove the sheave subassembly from the trunnion subassembly shaft.



(9) Remove the sheave cover B from the trunnion subassembly.



(10) Remove the spring pin from the bracket.



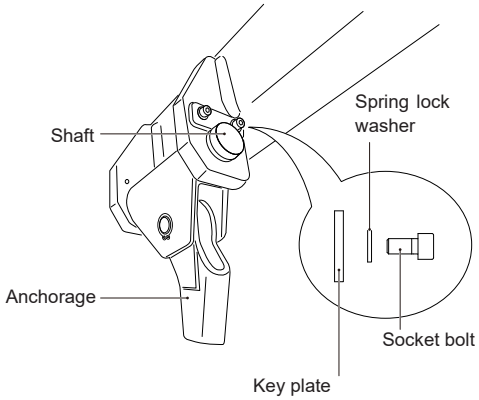
(11) Remove the parts on the opposite side in the same way.

Follow the steps from (5) to (10).

3. Anchorage

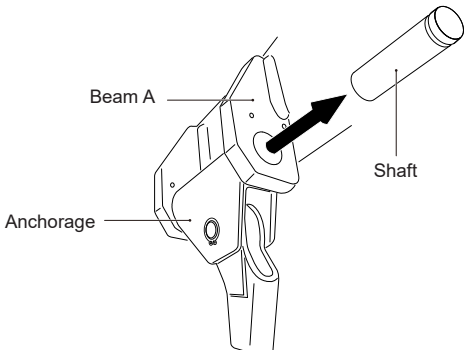
■ Removing the anchorage

(1) Remove the socket bolts and spring lock washers (two locations for each) of the key plate fixing the shaft of the anchorage, and remove the key plate.



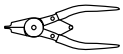
(2) Pull out the shaft of the anchorage from the hole of the beam A, and remove the anchorage.

- Make sure to support the anchorage by hand to prevent it from dropping.

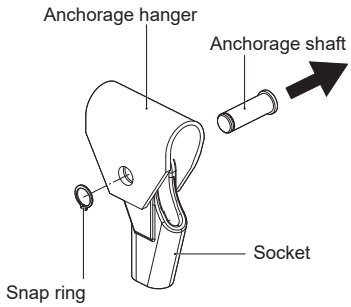


■ Disassembling the anchorage

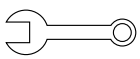
(1) Remove the snap ring fixing the anchorage shaft.



(2) Pull out the anchorage shaft from the anchorage hanger and socket.

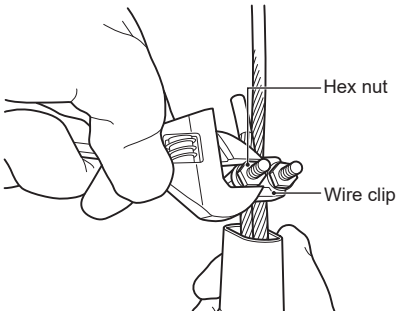


(3) Remove the hex nuts (two locations), and remove the wire clip at the rope end.



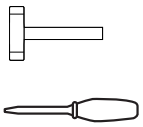
⚠ CAUTION

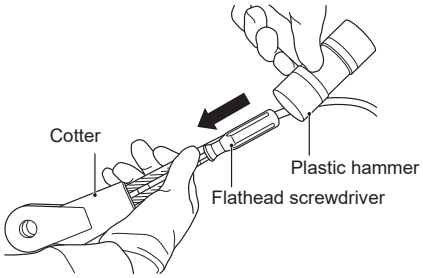
Mandatory Your hands may be injured. Wear gloves and the like. Be careful of fine splits of element wires at the rope end while working.

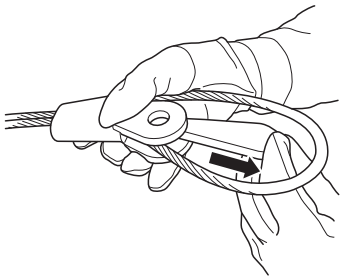


(4) Hammer the cotter tip gently, and pull out the cotter from the socket.

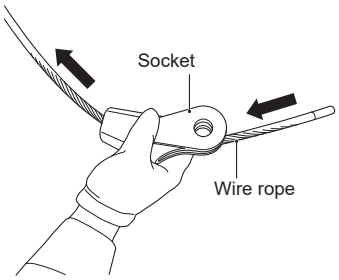
- If it is difficult to tap the tip of the cotter, put a flathead screwdriver on the cotter as shown in the figure and tap the screwdriver with a hammer.







(5) Remove the wire rope from the socket.

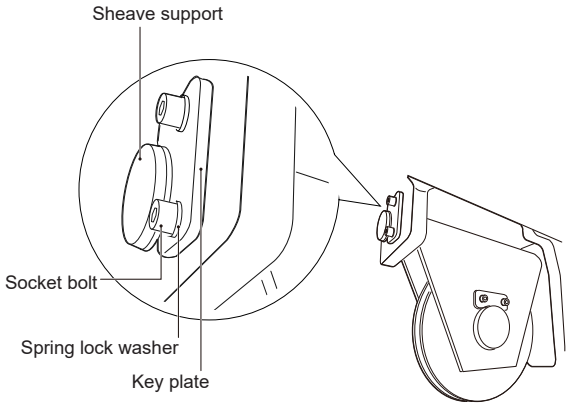


4. Idle sheave

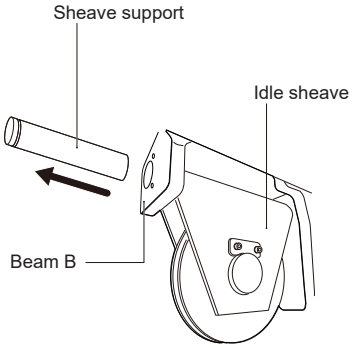
■ Removing the idle sheave

(1) Remove the socket bolts (two locations) of the key plate fixing the sheave support, and remove the key plate.

[5mm]



(2) While supporting the idle sheave to prevent it from falling, pull the sheave support out of the hole in beam B and remove the intermediate sheave.

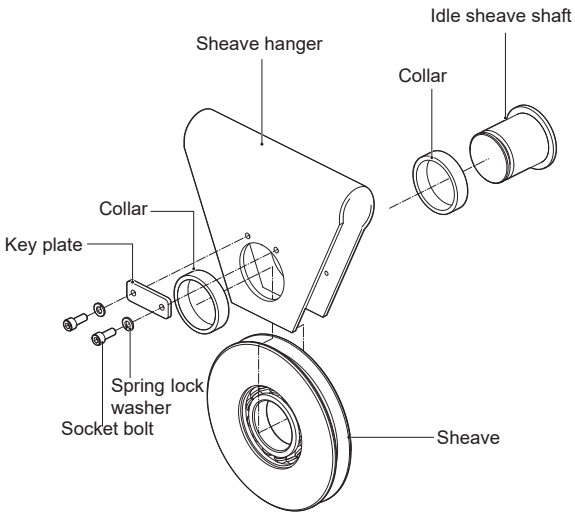


■ Disassembling the idle sheave

(1) Remove the socket bolts and spring lock washers (two locations for each) fixing the key plate, and remove the key plate.

[6mm]

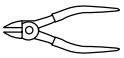
(2) Pull out the idle sheave shaft and remove the collar and sheave.

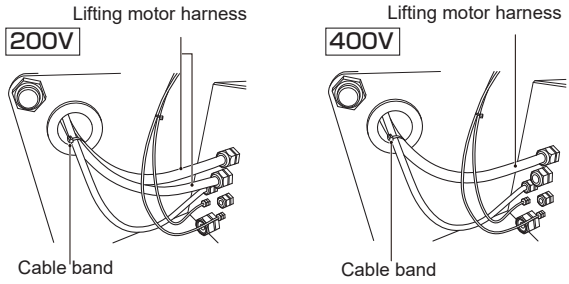


5. Rope drum

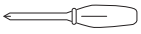
■ Removing the lifting motor harness (terminal box side)

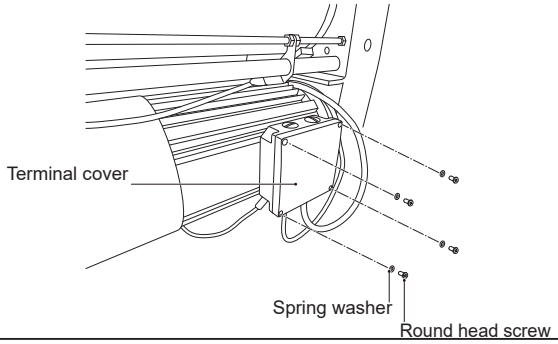
(1) Cut the tie that binds the lifting motor harness.





(2) Remove the round head screws (four locations each) securing the terminal cover, and then remove the terminal cover.





(3) Remove the lead wires of the lifting motor harness shown in Figure A (for 200 V: two each of red, white, and black; for 400V: one each of red, white, and black).


[10mm]

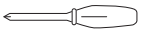
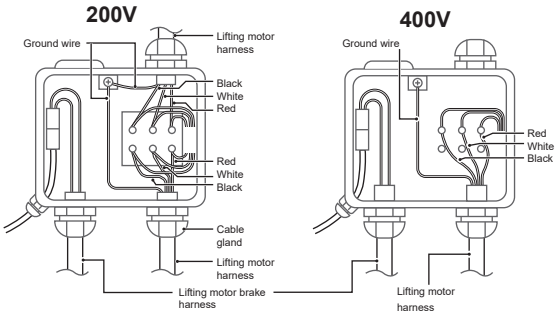


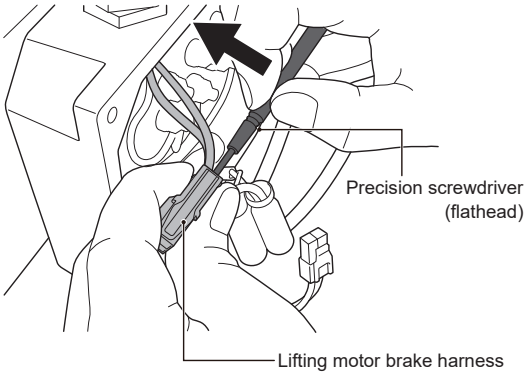
Figure A



(4) In addition, loosen the round head screw securing the ground wire (green/yellow) inside the terminal box, and remove the ground wire.

(5) Refer to Figure B.
- (1) Insert the precision screwdriver (flat-head) into the connector of the lifting motor brake harness.
- (2) Push the precision screwdriver in the direction of the arrow and remove the claw that holds the pin in place.
- (3) Pull out the lifting motor brake harness.

Figure B

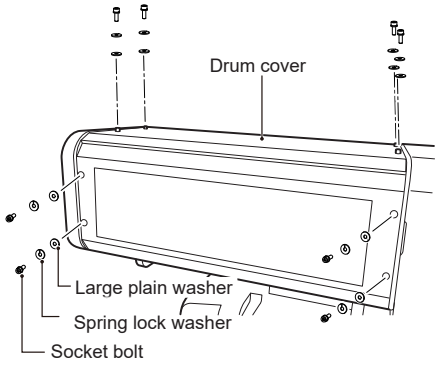


(6) Refer to Figure A.
- (1) Remove the cap from the cable gland.
- (2) Pull out the lifting motor harness / lifting motor brake harness.
- (3) Put the cap of the cable gland back on the cable gland itself.

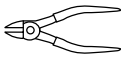
■ Removing the LS harness

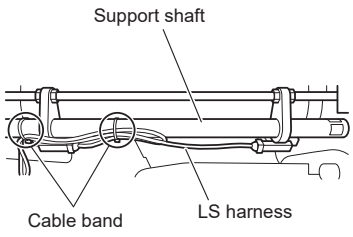
(1) Remove the socket bolts, spring lock washers, and large plain washers (eight locations for each) installing the drum cover.

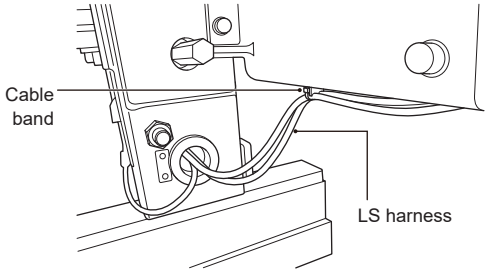

[3mm/5mm]



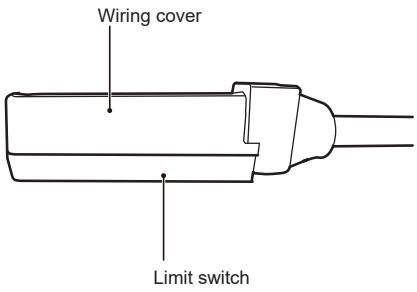
(2) Cut all the cable bands fixing the LS harness to the support shaft and mount base.



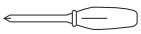


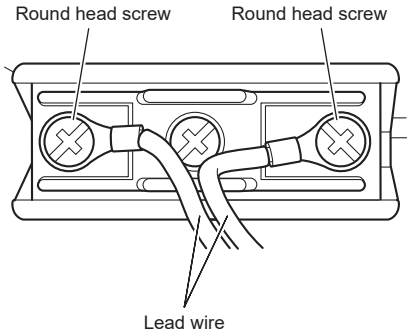


(3) Remove the wiring cover of the limit switch.

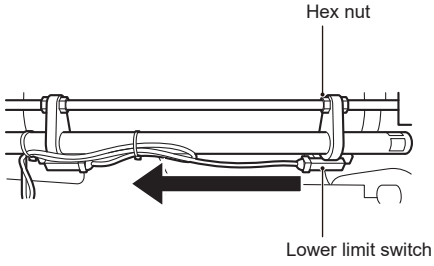


(4) Loosen the round head screws fixing the lead wire of the limit switch, and remove the lead wire from the limit switch.

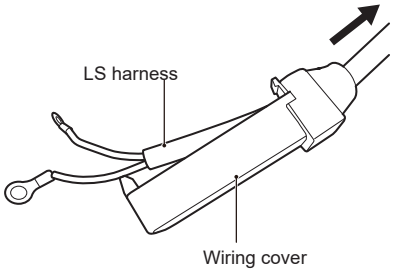




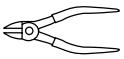
- When removing the lead wire of the Lower limit switch, if it cannot be removed due to interference by the lifting motor, loosen the hex nut fixing the LS fitting. Then shift the Lower limit switch to the position where no interference occurs, and remove the lead wire.

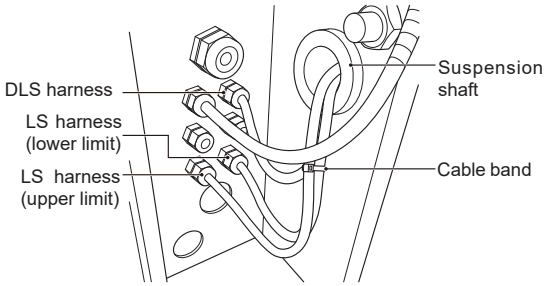


(5) Pull out the LS harness from the wiring cover, and return the wiring cover to the limit switch.



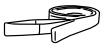
(6) Cut the cable band bundling the DLS harness and LS harness on the control box side, and pull out the LS harness from the suspension shaft.

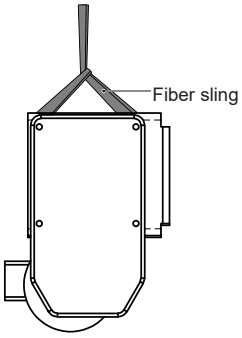




■ Removing the rope drum assembly

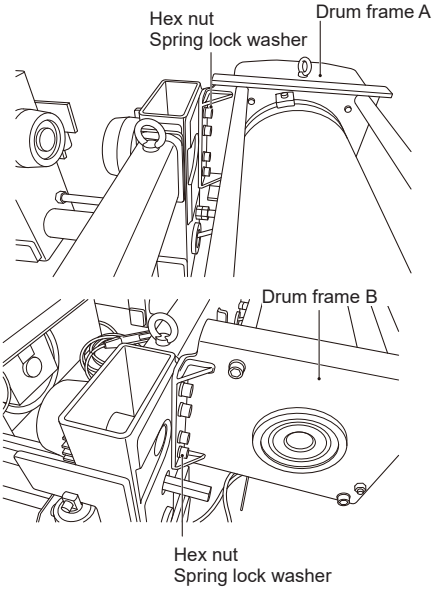
(1) Put fiber slings around the two support shafts located on the upper section of the rope drum assembly, and lift the rope drum assembly with the crane to the extent that it will not fall even if the hex bolts are removed, and then apply tension.



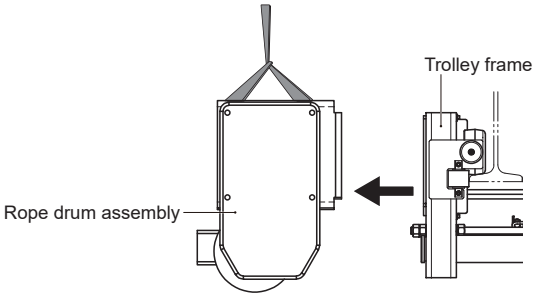


(2) Remove the hex bolts and spring lock washers from each of the four locations on drum frame A and drum frame B.


[24mm]

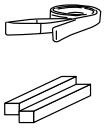


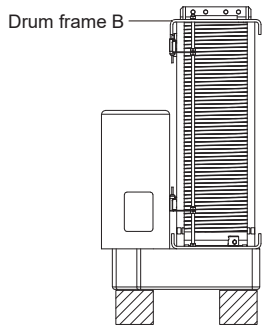
(3) Remove the rope drum assembly from the trolley frame.



■ Disassembling the rope drum

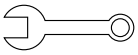
(1) Place the rope drum assembly on sleepers with drum frame B facing up as shown in the figure.

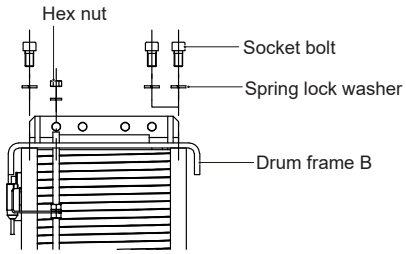




(2) Remove the three socket bolts and spring lock washers and the one hex nut and spring lock washer from drum frame B.

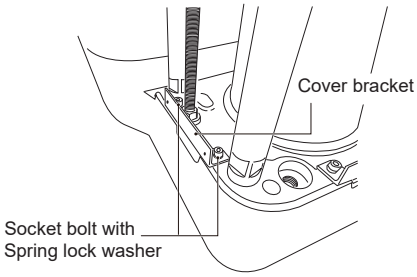

[14mm]


[18mm (19mm)]

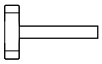


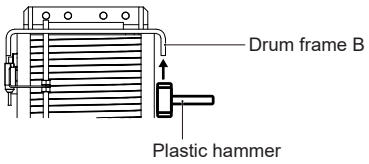
(3) Remove the socket bolts and spring lock washers (two locations for each) of the cover bracket on the gear box side, and remove the cover bracket.


[5mm]

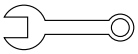


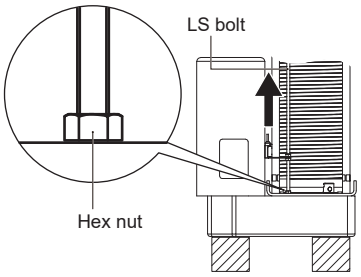
(4) Remove drum frame B by tapping it with a plastic hammer from the back side of drum frame B.





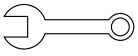
(5) Loosen the hex nut (one location) of the LS bolt, and remove the LS bolt from the gear box.

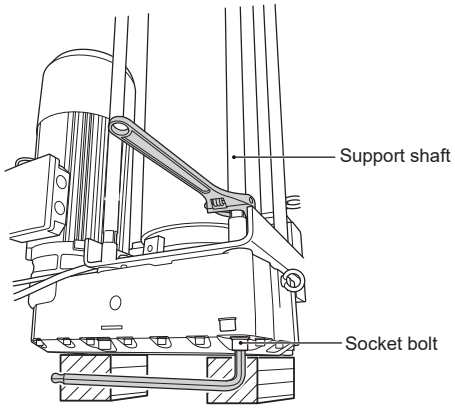

[18mm (19mm)]



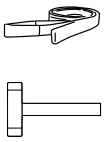
(6) Use a hex wrench and wrench to remove the support shaft and socket bolts (three locations).

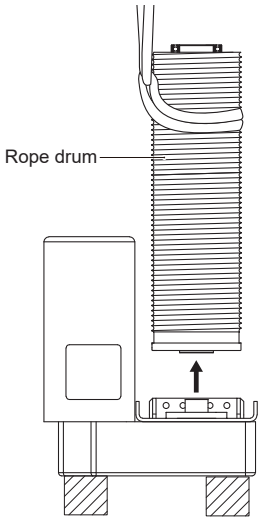

[14mm]


[24mm]

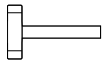


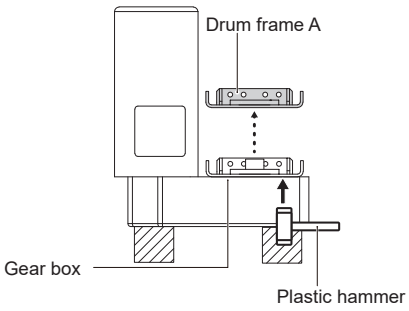
(7) Wind the fiber sling around the rope drum. While lifting the rope drum with a crane gradually, pull it out straight.





(8) Remove drum frame A by tapping it with a plastic hammer from the back side of drum frame A.

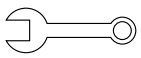


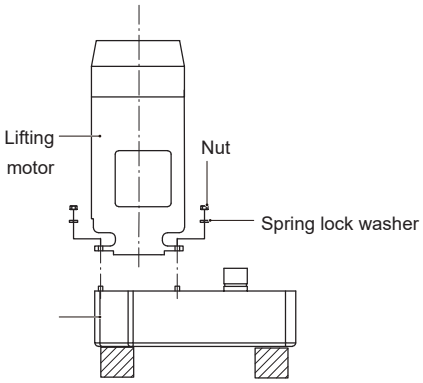


6. Lifting motor

■ Removing the lifting motor

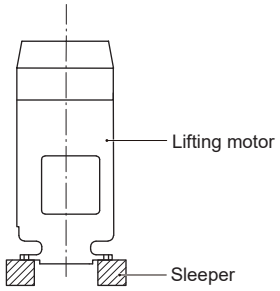
(1) Remove the nuts and spring lock washers (eight locations) securing the lifting motor, and remove the lifting motor from the gear box.



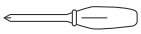


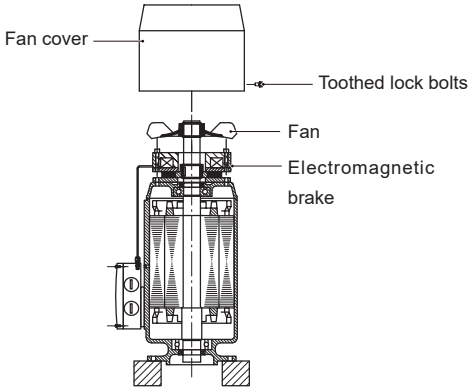
■ Disassembling the lifting motor

(1) Place the removed lifting motor upright on the sleeper.

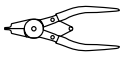


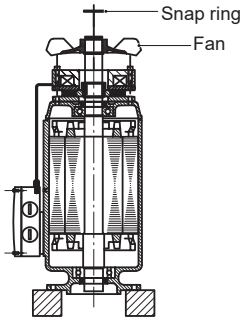
(2) Remove the toothed lock bolts (four locations) securing the fan cover, and then remove the fan cover.



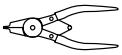


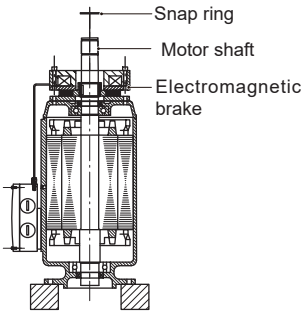
(3) Remove the snap ring securing the fan and remove the fan.





(4) Remove the snap ring that is attached to the motor shaft.

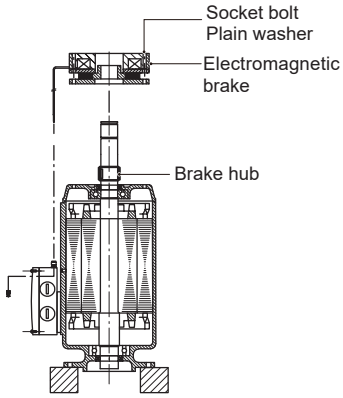




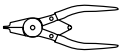
(5) Loosen the socket bolts securing the electromagnetic brake (four locations), and then remove the electromagnetic brake.

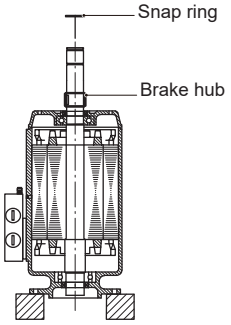

[6mm]

- The socket bolts cannot be removed from the electromagnetic brake.

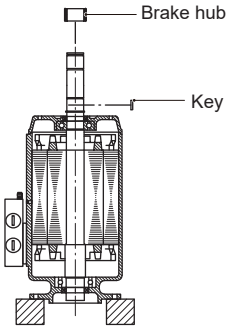


(6) Remove the snap ring.

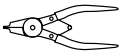


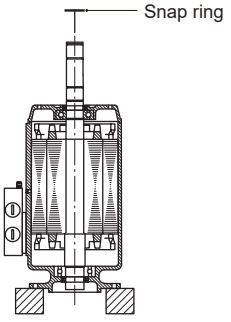


(7) Remove the brake hub and key.

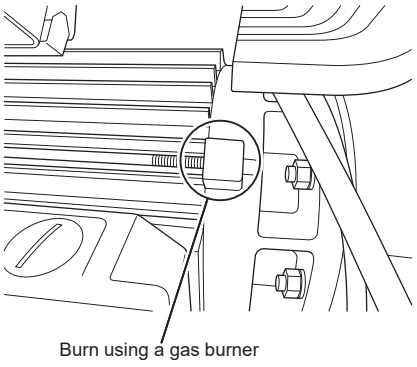


(8) Remove the snap ring.

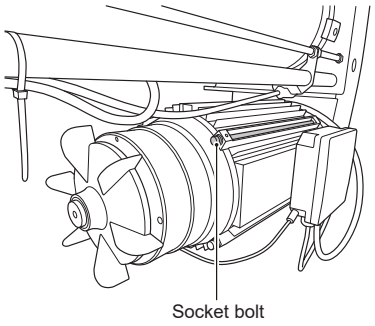


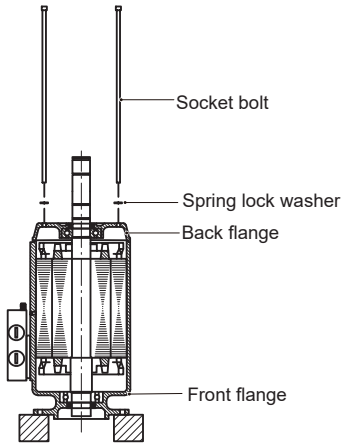


(9) Burn the screw section as shown in the figure with a gas burner to melt the thread lock.

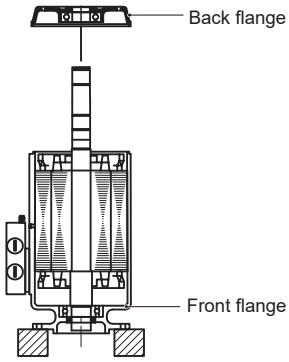


(10) Remove the socket bolts and spring lock washers (four locations each).

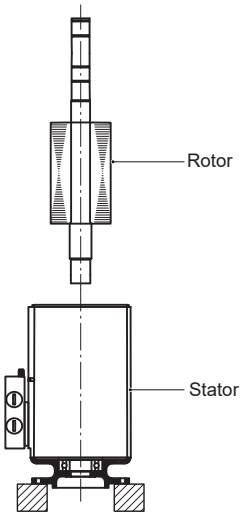




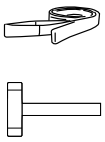
(11) Remove the back flange.

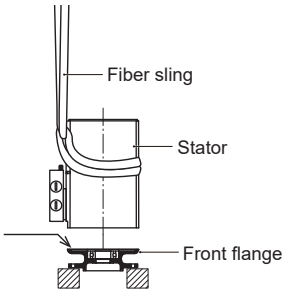


(12) Removing the rotor from the stator.



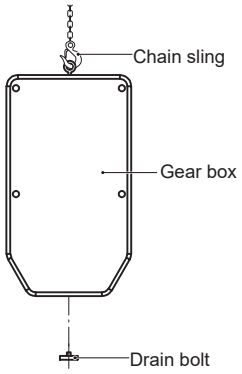
(13) Wrap a fiber sling around the stator and pull it straight out while gradually lifting the stator with a crane.



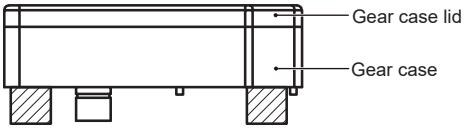


■ Disassembling the gear box

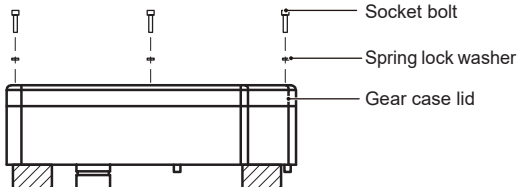
(1) Suspend the gear box, remove the drain bolt on the bottom side, and drain the oil.



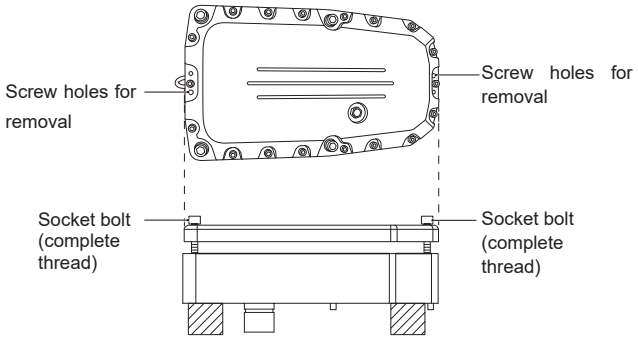
(2) Place on the sleepers with the gear case lid side facing up.



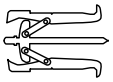
(3) Remove the socket bolts and spring lock washers (18 locations each) securing the gear case lid.

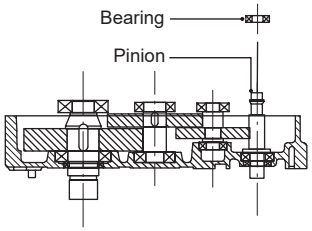


(4) Screw the socket bolt (complete thread) into the screw hole for removing the gear case lid, and lift the gear case lid off of the gear case to remove it.

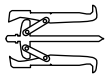


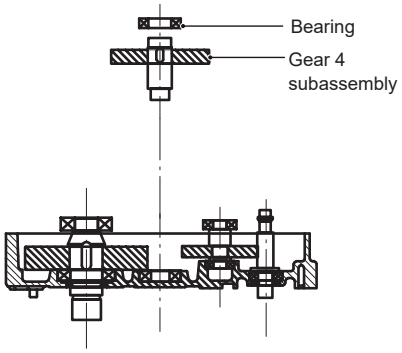
(5) Remove the bearing at the end of the pinion.



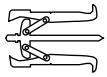


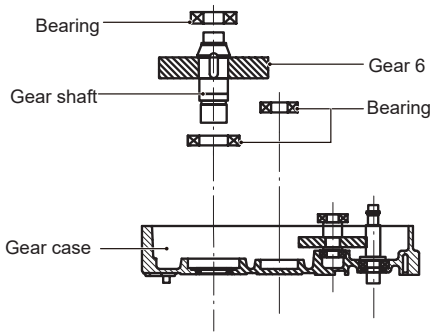
(6) Remove the bearing at the end of the gear 4 subassembly, and then remove the gear 4 subassembly.



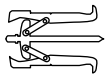


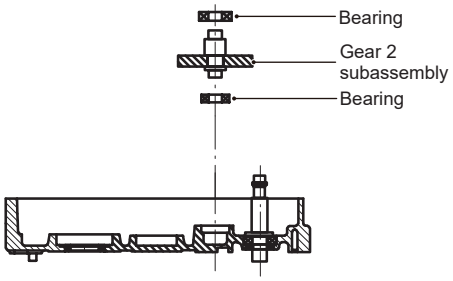
(7) Remove the bearing at the end of the gear 6 subassembly, and then remove gear 6, the gear shaft, and the bearing (gear case side).



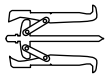


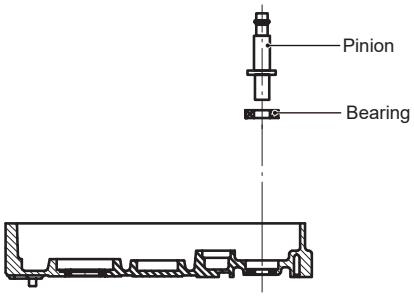
(8) Remove the bearing at the end of the gear 2 subassembly, and then remove the gear 2 subassembly and bearing (gear case side).



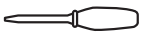


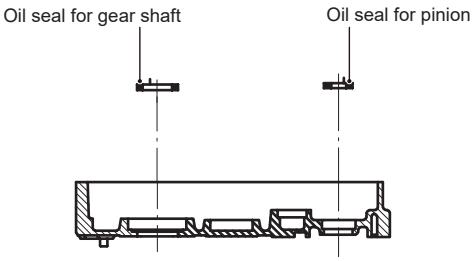
(9) Remove the pinion and bearing (gear case side).





(10) Use a screwdriver (flathead) or the like to remove the oil seal for the gear shaft and the oil seal for the pinion.

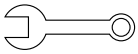


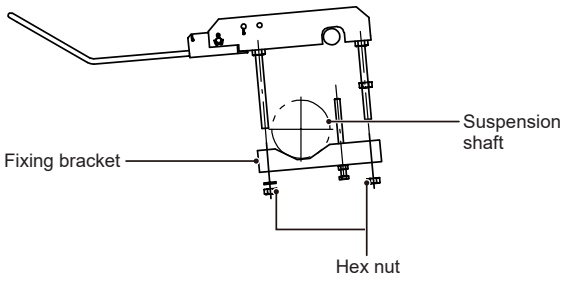


7. Direct limit switch

■ Removing the direct limit switch

(1) Remove the hex nut fixing the fixing bracket of the direct limit switch, and remove the direct limit switch from the suspension shaft.

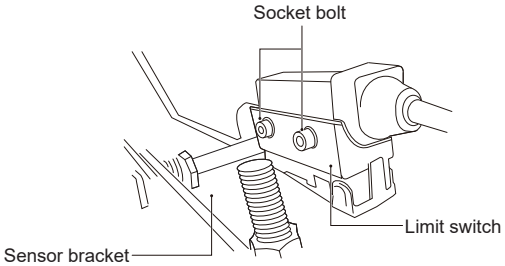

[16mm (17mm)]



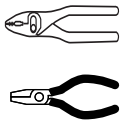
■ Disassembling the direct limit switch

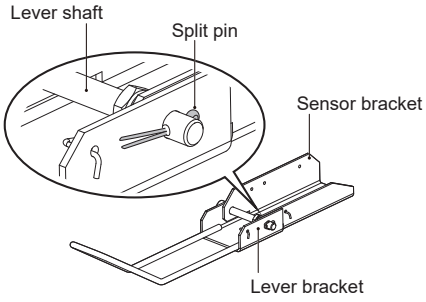
(1) Remove the socket bolts (two locations) fixing the limit switch, and remove the limit switch from the sensor bracket.


[3mm]

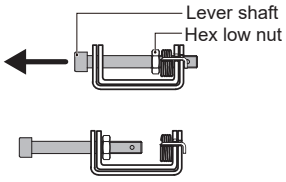


(2) Remove the split pin at the tip of the lever shaft.

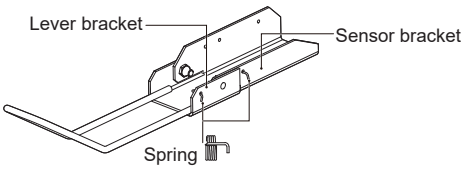




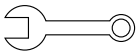
(3) Pull out the lever shaft to the position of the hex low nut.



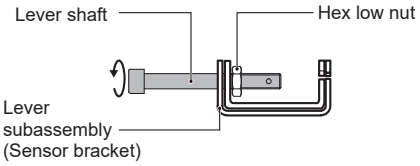
(4) Remove the spring from the lever bracket and sensor bracket.



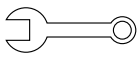
(5) Remove the hex low nut from the lever shaft, and pull out the lever shaft from the sensor bracket and lever bracket.

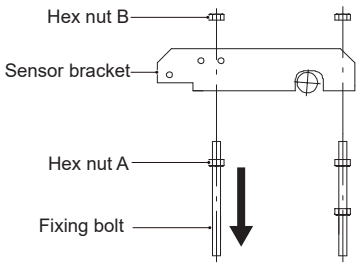

[16mm (17mm)]


[8mm]



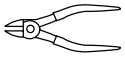
(6) Loosen hex nut B, pull out the fixing bolt, and remove the sensor bracket.

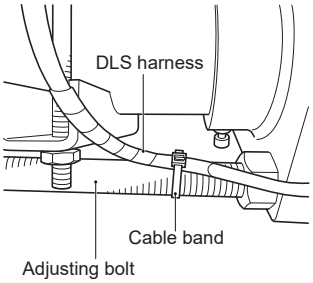

[16mm (17mm)]



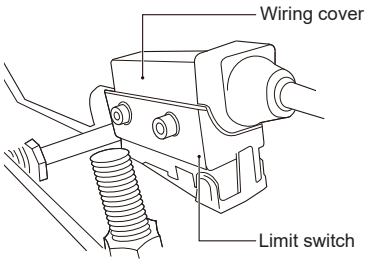
■ Removing the DLS harness

(1) Cut the cable band fixing the DLS harness to the adjusting bolt.

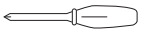


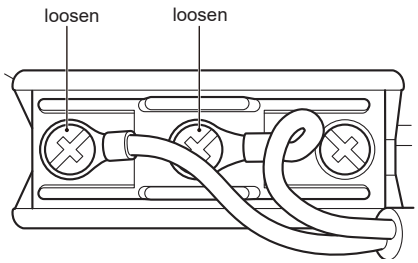


(2) Remove the wiring cover of the limit switch of the direct limit switch.

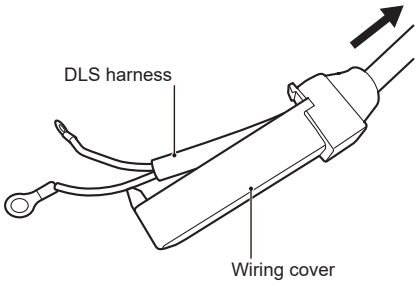


(3) Loosen the screw fixing the DLS harness, and remove the DLS harness.

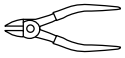


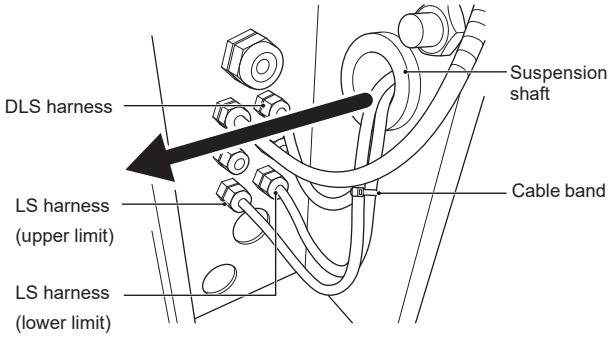


(4) Pull out the DLS harness from the wiring cover, and return the wiring cover to the limit switch.



(5) Cut the cable band bundling the DLS harness and 2 LS harnesses on the control box side, and pull out the DLS harness from the suspension shaft.

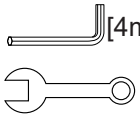


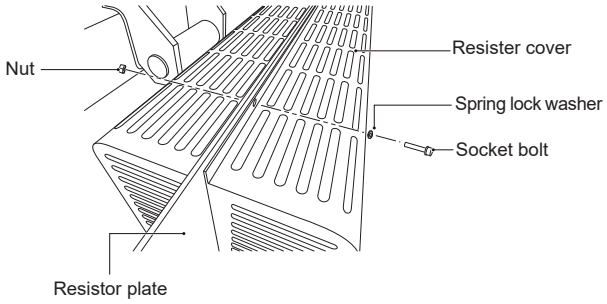


8. Control box

■ Removing the resistor harness

(1) Remove the socket bolts, spring lock washers, and nuts (four locations each), and then remove the resistor cover from the resistor plate.



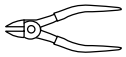


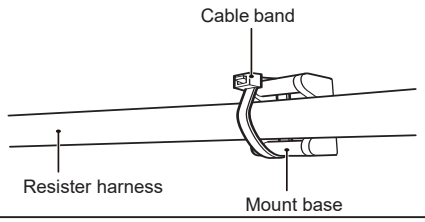
⚠ CAUTION

Prohibited

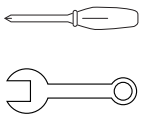
The resistor cover is hot after the rope hoist is operated. Do not touch the cover until it cools down.
Otherwise, you may get burned.

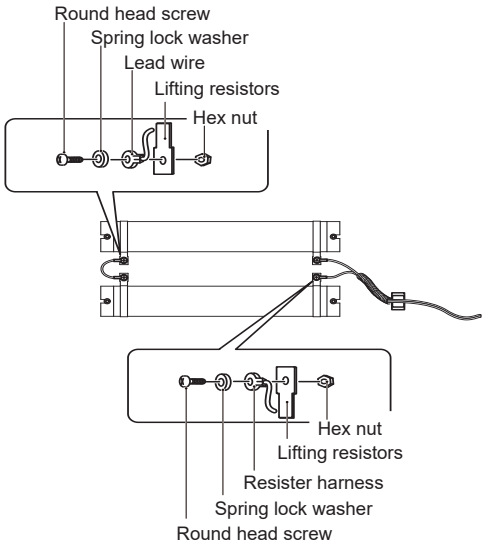
(2) Cut the cable band fixing the resistor harness to the mount base.





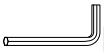
(3) Remove the round head screw, spring lock washer, and hex nut each connecting the lifting resistor to the resistor harness, and remove the resistor harness and lead wire.

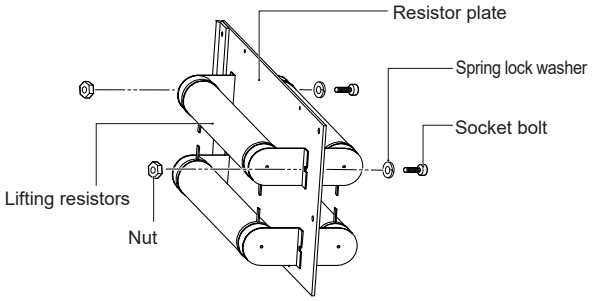




■ Removing the lifting resistor

(1) Remove the socket bolts, spring lock washers, and nuts (two locations each), and then remove the lifting resistor.

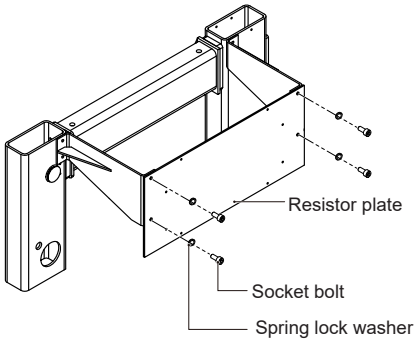




■ Removing the resistor plate and resistor support bracket L/R

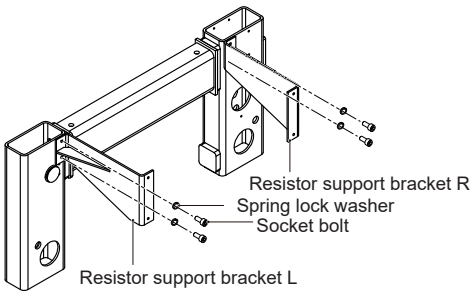
(1) Remove the socket bolts and spring lock washers (four locations each), and then remove the resistor plate.


[6mm]



(2) Remove the socket bolts and spring lock washers (two locations each), and then remove the resistor support bracket L/R.

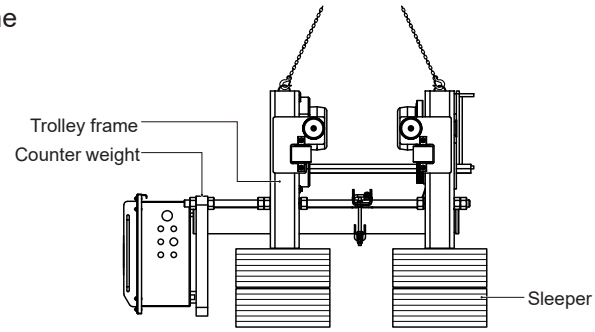

[6mm]



■ Removing the control box unit

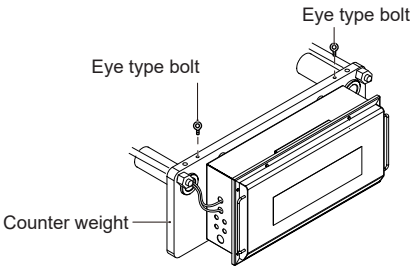
(1) Suspend the trolley frame and place it on the sleepers.

・ Raise the counterweight.

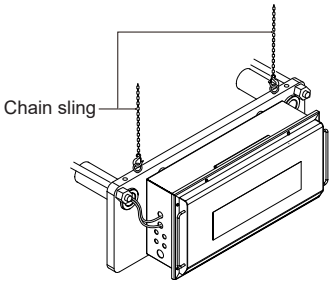


(2) Install M12 eye type bolts to the screw holes (two locations) located on the upper side of the counter weight.

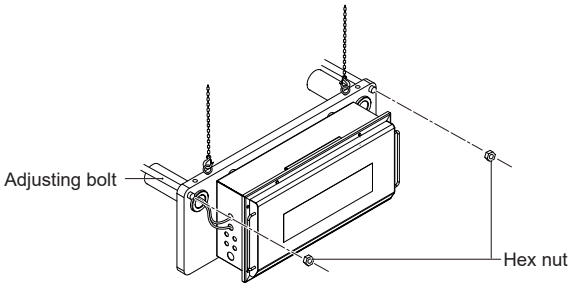

(Ring internal diameter 30 mm)



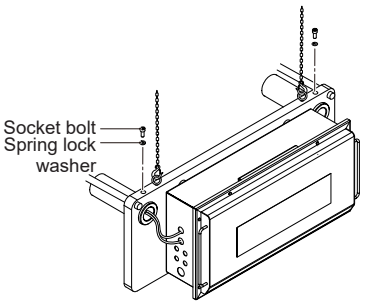
(3) Pass the chain sling through the eye type bolts (two locations). Suspend it with the crane, and apply a tension to the chain sling.



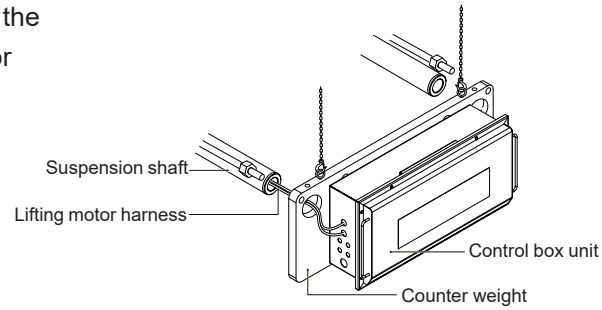
(4) Remove the hex nuts (two locations) of the adjusting bolt outside of the counter weight.



(5) Remove the socket bolts and spring lock washers (two locations each).

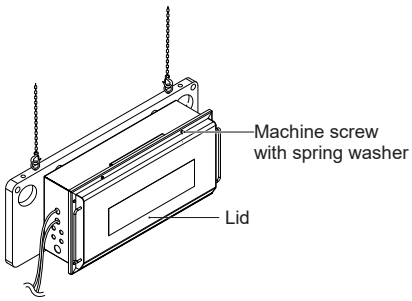


(6) Remove the control box unit together with the counterweight while pulling the lifting motor harness out of the suspension shaft.

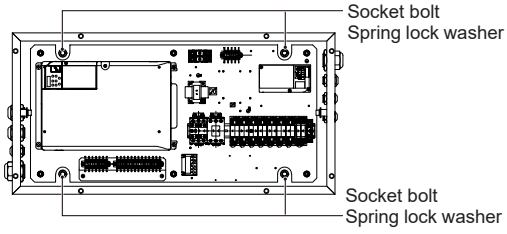


■ Removing the control box

(1) Loosen the machine screw with spring washers (8 locations) fixing the lid of the control box, and open the lid.

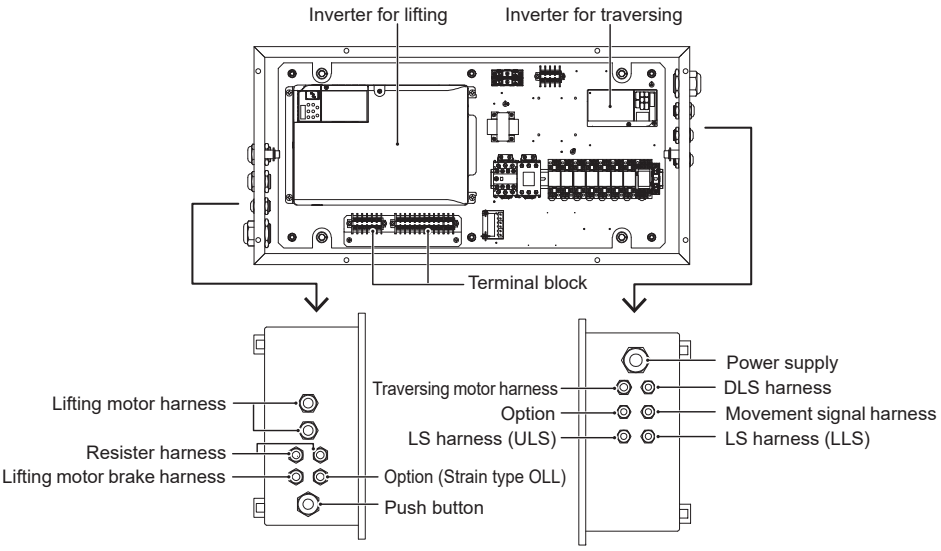


(2) Remove the socket bolts and spring lock washers (four locations for each) fixing the control box, and remove the control box from the counter weight.



■ Disassembling the control box

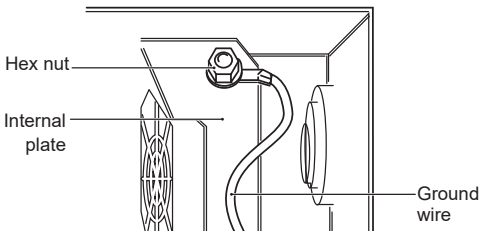
Positions of the harness and the like are shown below.



● Removing the ground wire

(1) Remove the hex nut fixing the ground wire, and remove the ground wire from the internal plate.

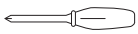
[13mm]

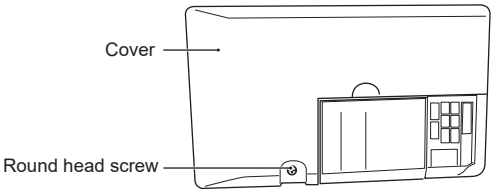


■ Removing the internal wiring and electrical components

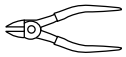
● Removing the lifting inverter

(1) Remove the cover of the lifting inverter.

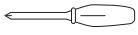




(2) Cut the cable band bundling the harness (lead wire) as necessary.

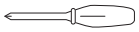


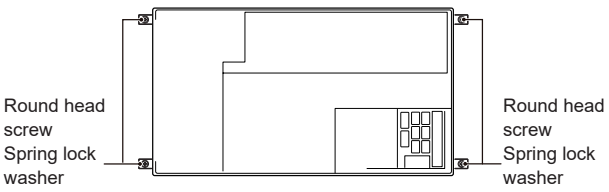
(3) Pull the harness out from the lifting inverter. Loosen the screw of the lead wire screwed to the lifting inverter and remove the lead wire.



- For details, see the wiring diagram provided in the "RY Series Wire Rope Hoist (10t) Owner's Manual".

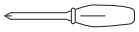
(4) Remove the round head screws and spring lock washers (four locations for each) fixing the lifting inverter, and remove the lifting inverter.

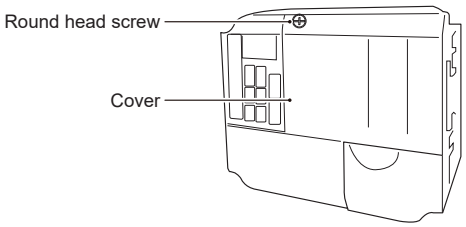




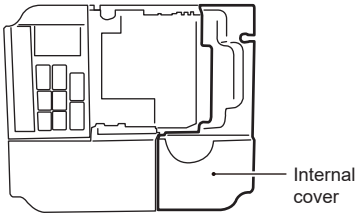
● Removing the traversing inverter

(1) Remove the cover of the traversing inverter.

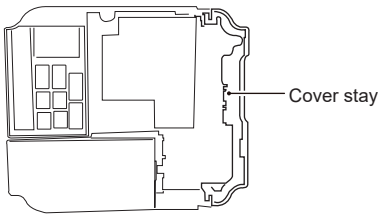




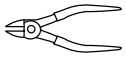
(2) Remove the internal cover of the traversing inverter.



(3) Remove the cover stay of the traversing inverter.



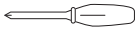
(4) Cut the cable band bundling the harness (lead wire) as necessary.

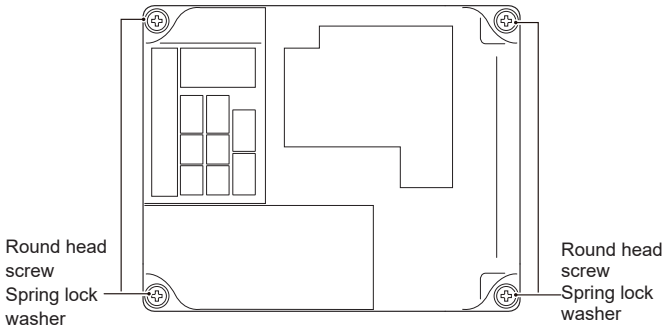


(5) Pull the harness out of the traversing inverter. Loosen the screw of the lead wire screwed to the traversing inverter and remove the lead wire.

- For details, see the wiring diagram provided in the "RY Series Wire Rope Hoist (10t) Owner's Manual".

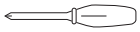
(6) Remove the round head screws and spring lock washers (four locations for each) fixing the traversing inverter, and remove the traversing inverter.





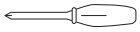
● Removing the terminal block

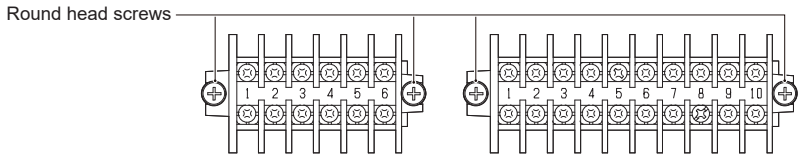
(1) Loosen the screw of the lead wire screwed to the terminal block, and remove the lead wire.



- For details, see the wiring diagram provided in the "RY Series Wire Rope Hoist (10t) Owner's Manual".

(2) Remove the round head screws (two locations for each: four locations in total) fixing the terminal blocks (two locations), and remove the terminal blocks.

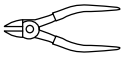


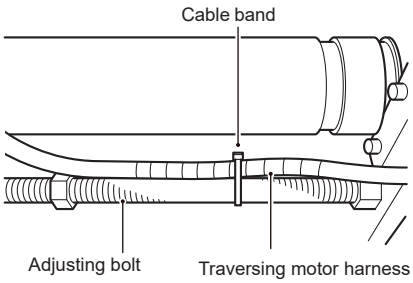


9. Traversing motor

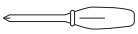
■ Removing the traversing motor harness (terminal box side)

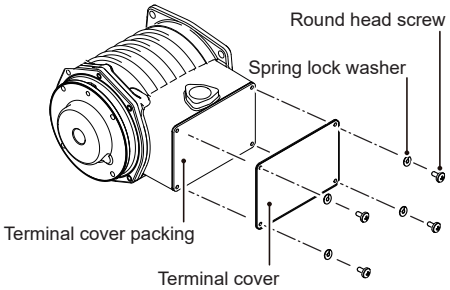
(1) Cut the cable band fixing the traversing motor harness to the adjusting bolt.



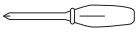


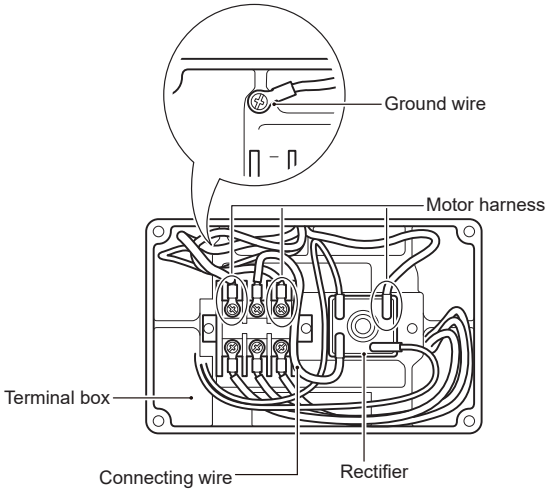
(2) Remove the round head screws and spring lock washers (four locations for each), and remove the terminal cover and terminal packing.



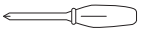


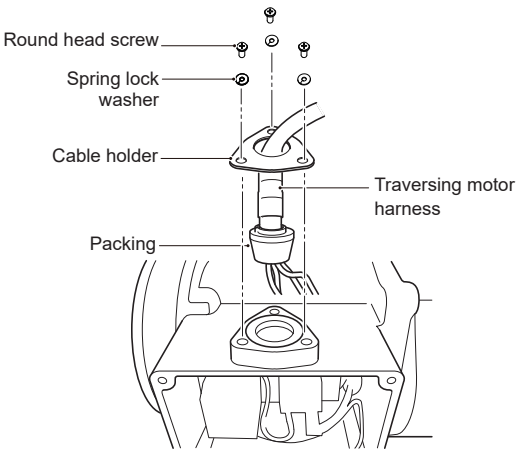
(3) Remove the lead wires (red, white, and black) and ground wire (green/yellow) of the traversing motor harness shown in the figure. Then remove the connecting wire connecting the rectifier to the terminal block.





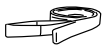
(4) Remove the round head screws and spring lock washers (three locations for each) fixing the cable packing and cable holder. Make sure not to let the lead wire get caught and remove the traversing motor harness from the terminal box.

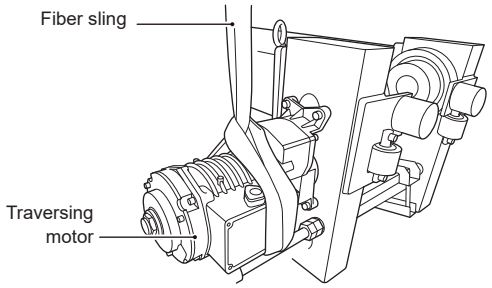




■ Removing the traversing motor

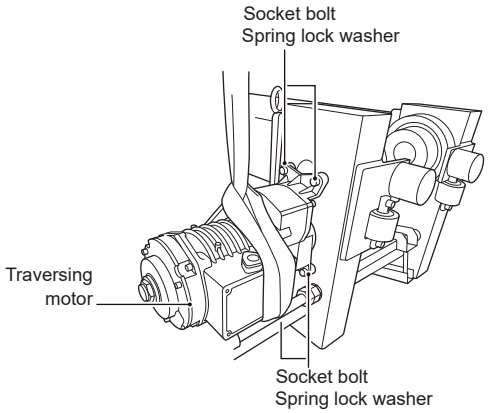
(1) Wrap a fiber sling around the traversing motor to support the traversing motor.





(2) Remove the socket bolts and spring lock washers (four locations for each), and remove the traversing motor.

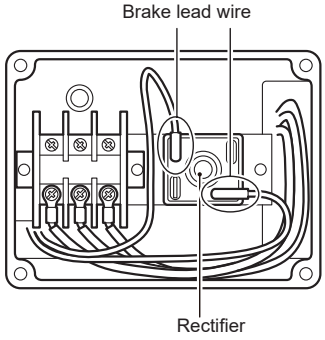

[8mm]



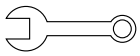
■ Disassembling the traversing motor

● Disassembling the brake

(1) Remove the lead wires (two locations) inserted into the rectifier.

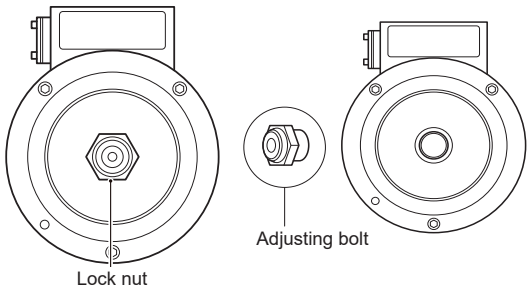


(2) Loosen the lock nut, and remove the adjusting bolt.

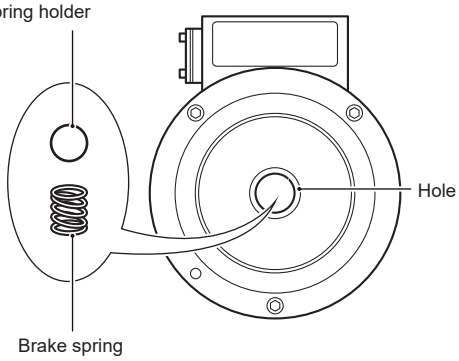

[35mm]

(Monkey wrench recommended)


[10mm]

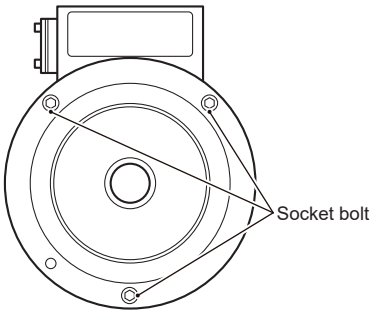


(3) Remove the spring holder and brake spring from the hole where the adjusting bolt was screwed.

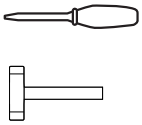


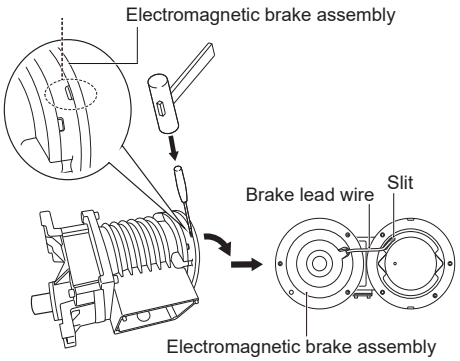
(4) Remove the socket bolts (three locations).


[5mm]

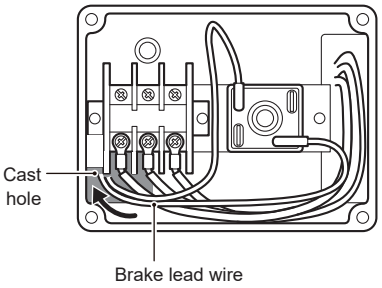


(5) Apply the flat screwdriver (-) to the insertion positions (two locations). Hammer it gently with the plastic hammer, and remove the electromagnetic brake assembly.

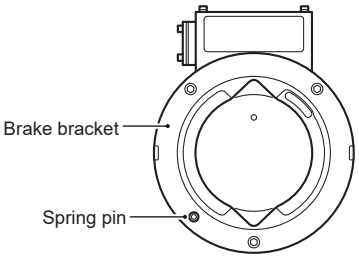




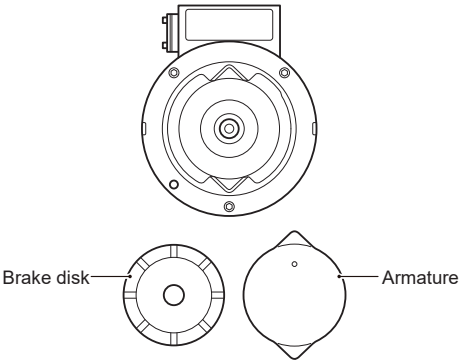
(6) Make sure not to let the brake lead wire get caught in the cast hole in the terminal box. Pull out the brake lead wire from the slit, and remove the electromagnetic brake assembly.



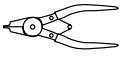
(7) Remove the spring pin fitted into the brake bracket.

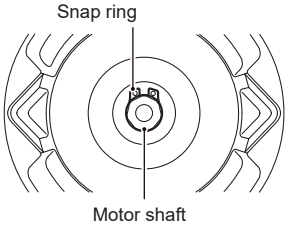


(8) Remove the armature and brake disk fitted into the brake bracket.



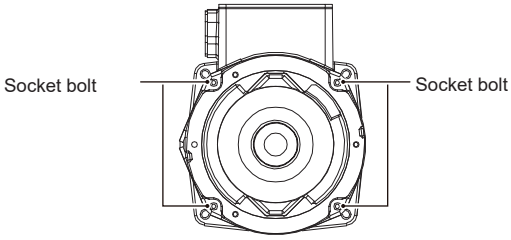
(9) Remove the snap ring at the end of the motor shaft.



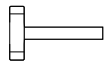


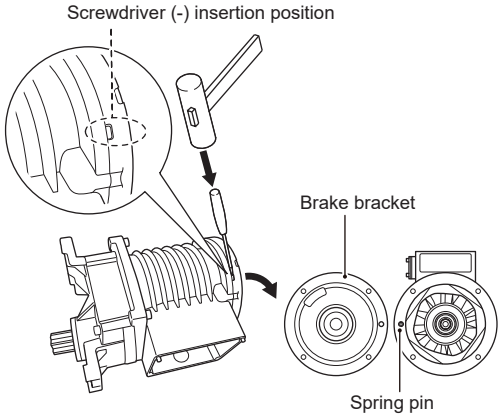
(10) Remove the socket bolts (four locations) securing the brake bracket.


[5mm]



(11) Apply the screwdriver (-) to the insertion position. Hammer the screwdriver gently with the plastic hammer, and remove the brake bracket.

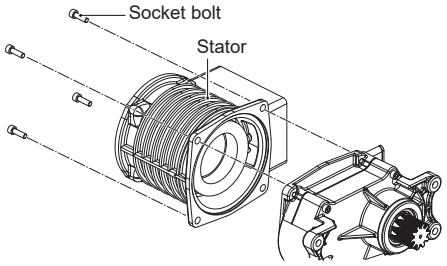




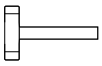
● Removing the stator and rotor

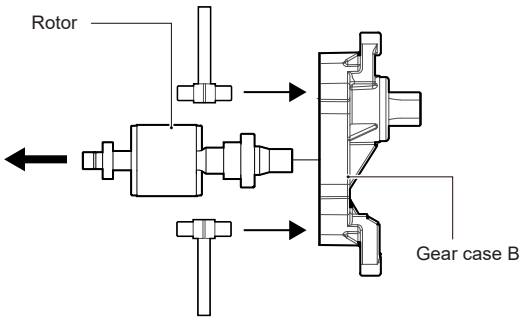
(1) Remove the socket bolts (four locations), and remove the stator.


[6mm]



(2) Hold the rotor. While hammering the gear case B gently with the plastic hammer, remove the rotor.



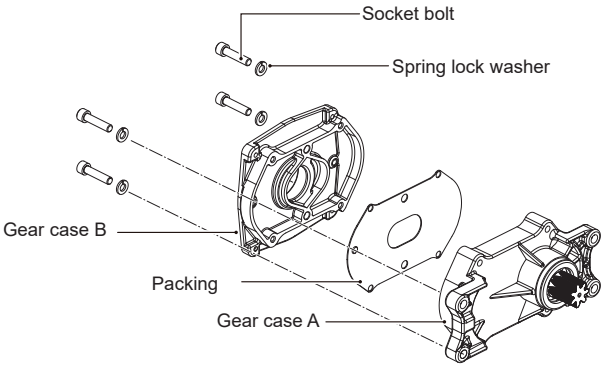


Hammer gently with the plastic hammer the position indicated with arrows.

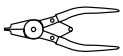
● Disassembling the gear box

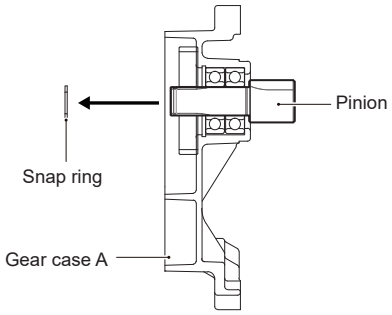
(1) Remove the socket bolts and spring lock washers (four locations for each) fixing the gear case B, and remove the gear case B and packing.


[6mm]

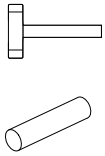


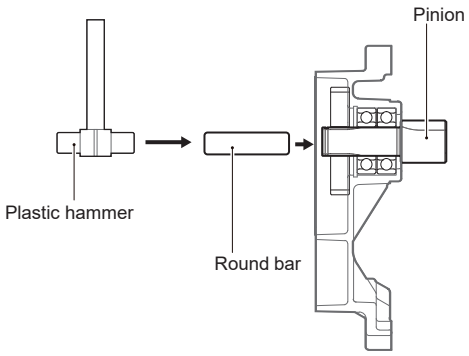
(2) Remove the snap ring of the pinion.



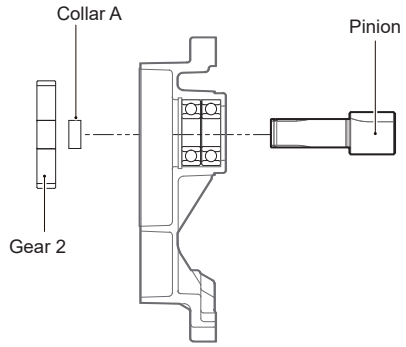


(3) Apply the round bar to the pinion. Hammer the round bar gently with the plastic hammer, and remove the pinion from the gear case A.

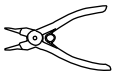


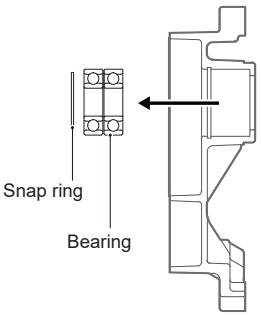


(4) Remove the gear 2 and collar A.



(5) Remove the snap ring fixing the bearing, and remove the bearing.



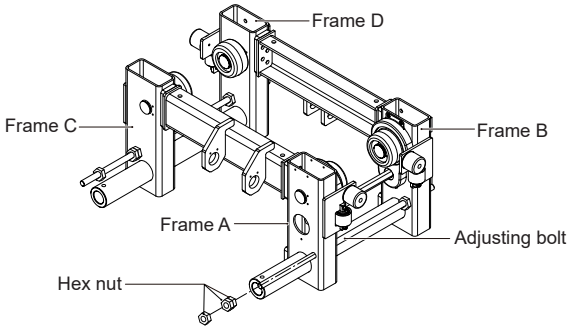


10. Trolley frame

■ Removing the frame A/B/C/D

(1) Remove the hex nuts (three locations) on the frame A exterior.

- Remove the hex nuts on the exterior of frame C in the same way.



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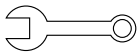
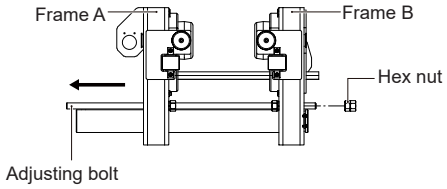
(2) Remove the hex nuts (two locations) on the frame B exterior, and while pulling out the adjusting bolt, remove the remaining hex nut and spring lock washer.



- Pull out the adjusting bolt on the frame C/D side in the same way.



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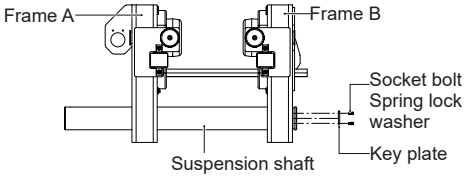
(3) Remove the socket bolts and spring lock washers (two locations each) on the frame B exterior, and then remove the key plate.

- Remove the key plate on the frame D side in the same way.



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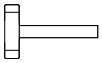
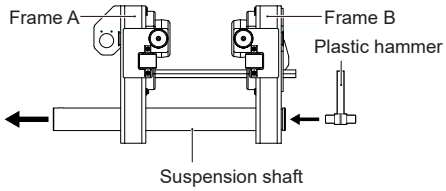
(4) Tap the suspension shaft with a plastic hammer out of frame A and frame B.



- Pull out the suspension shaft on the frame C/D side in the same way.



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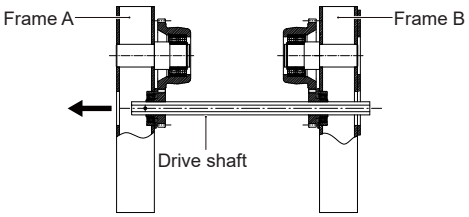
(5) Pull the drive shaft out of frame A and frame B.



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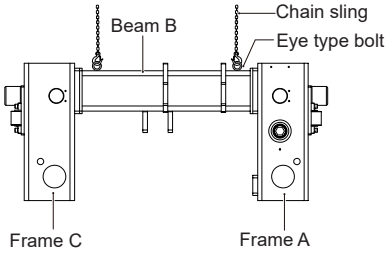
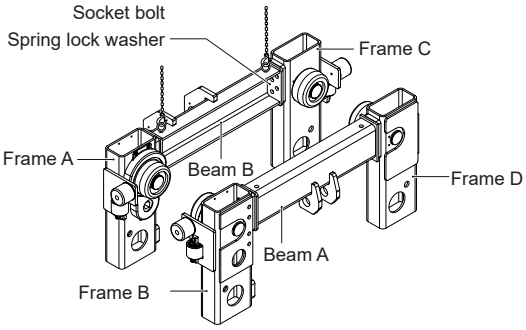
(6) Install the M12 eye type bolts in the screw holes (two locations) on the top of the beam, and suspend with a crane through the chain sling so that tension is applied to the chain sling.


(Inside diameter of the ring: 30 mm)



(7) Remove the socket bolts and spring lock washers from the inside of frame A and frame C (four locations each, 8 locations in total), and remove beam B.
- Remove beam A on the frame B/D side in the same way, replacing the eye type bolts and chain sling.



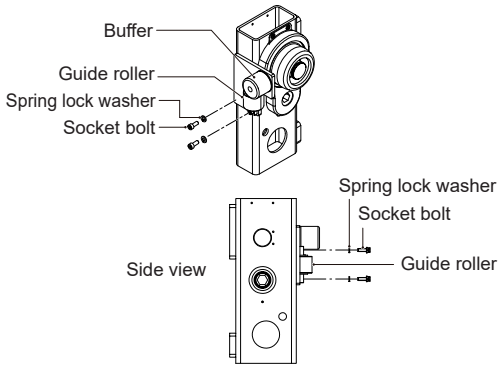
■ Disassembling the frame A (frame B)

- The disassembly procedure for frame B is the same as for frame A.

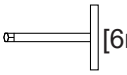
● Removing the rubber buffer/guide roller

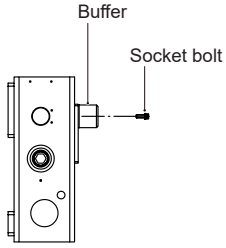
(1) Remove the socket bolts and spring lock washers (two locations) fixing the guide roller, and remove the guide roller from the frame A.


[8mm]

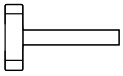


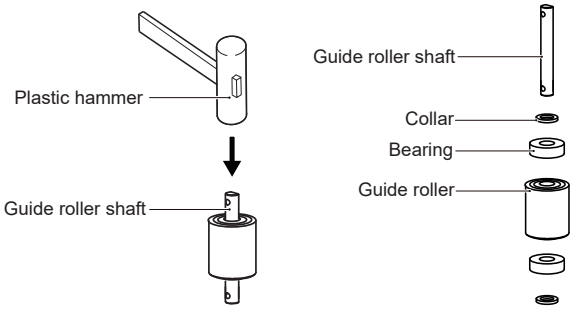
(2) Remove the socket bolt securing the rubber buffer and remove the rubber buffer from frame A.


[6mm]



(3) Hammer the shaft tip of the guide roller gently with the plastic hammer, and disassemble as shown in the figure.

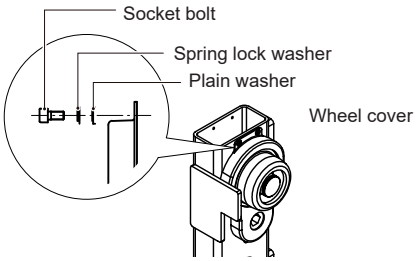




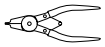
● Removing the wheel A

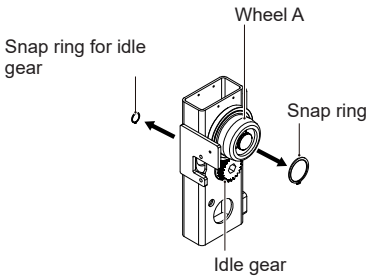
(1) Remove the socket bolts, spring lock washers, and plain washers (three locations each) securing the wheel cover, and then remove the wheel cover.

[5mm]

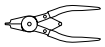


(2) Remove the snap ring fixing the wheel A, and remove the wheel A from the axle.

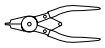


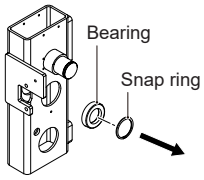


(3) Remove the snap ring for idle gear, and pull out the idle gear.



(4) Remove the snap ring fixing the bearing, and remove the bearing.





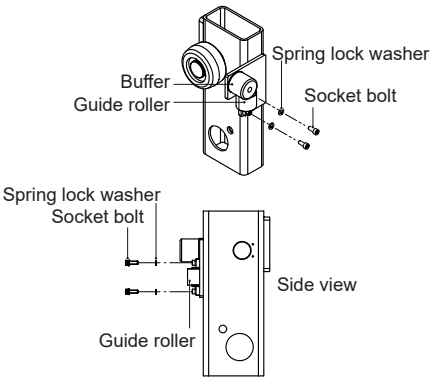
■ Disassembling the frame C (frame D)

- The disassembly procedure for frame D is the same as for frame C.

● Removing the rubber buffer/guide roller

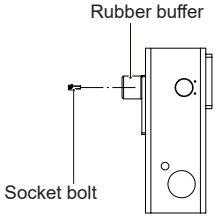
(1) Remove the socket bolts and spring lock washers (two locations each) securing the guide roller, and then remove the guide roller from frame C.

[8mm]

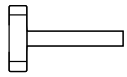


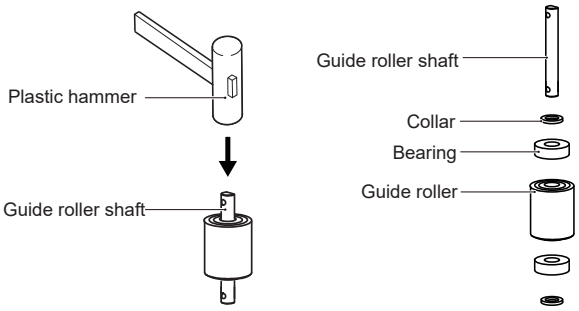
(2) Remove the socket bolt securing the rubber buffer and remove the rubber buffer from frame C.

[6mm]



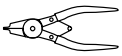
(3) Lightly tap the tip of the guide roller jig with a plastic hammer to disassemble it as shown in the figure.

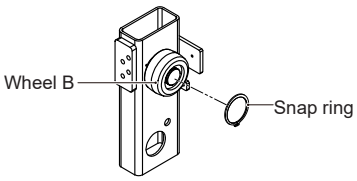




● Removing the wheel B

(1) Remove the snap ring fixing the wheel B, and remove the wheel B from the axle.





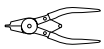
1. Trolley frame

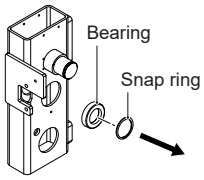
■ Reassembling Frame A (Frame B)

- The reassembly procedure for frame B is the same as for frame A.

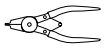
● Installing wheel A

(1) Install the bearing into frame A and secure it with the snap ring.

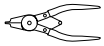


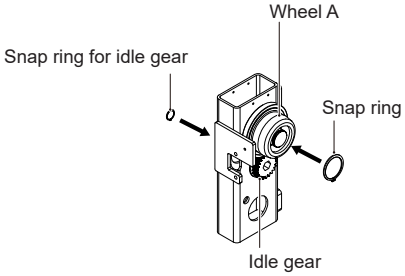


(2) Secure the idle gear with the snap ring for idle gear.

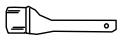


(3) Secure wheel A to the axle using the snap ring.





(4) Apply lubricant to the teeth of both the idle gear and Wheel A subassembly.



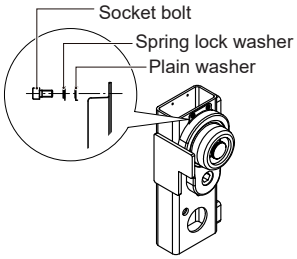
- Lubricant: EPNOC AP (N) No. 2
- The lubricant must be applied to the entire circumference of both Wheel A and the gear.

(5) Fix Wheel Cover with three socket bolts, three spring lock washers, and three plain washers.


[5mm]

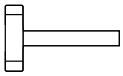
M6 torque setting: 3 N•m

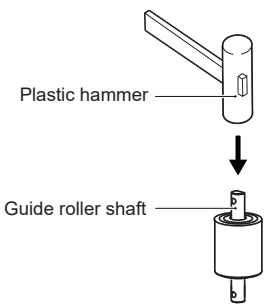
- Do not overtighten the bolts and washers. Doing so can cause Wheel Cover to crack.

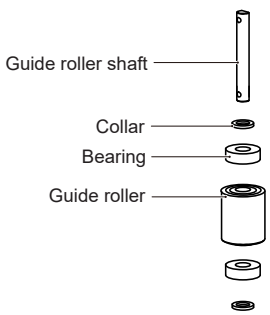


● Installing the buffer/guide roller

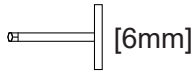
(1) Using a plastic hammer, secure a collar, a bearing, and then a guide roller to the guide roller shaft.



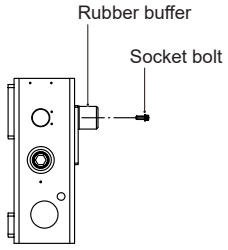




(2) Secure the rubber buffer to the frame A with a socket bolt.

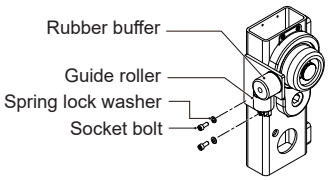


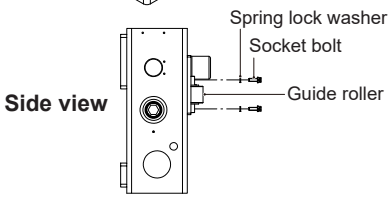
M8 torque setting: 18N•m



(3) Secure the guide roller to the frame A by using socket bolts and spring lock washers (two locations).

M10 torque setting: 35N•m



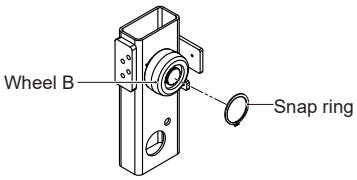


■ Reassembling Frame C (Frame D)

・ The reassembly procedure for frame D is the same as for frame C.

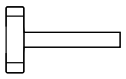
● Installing wheel B

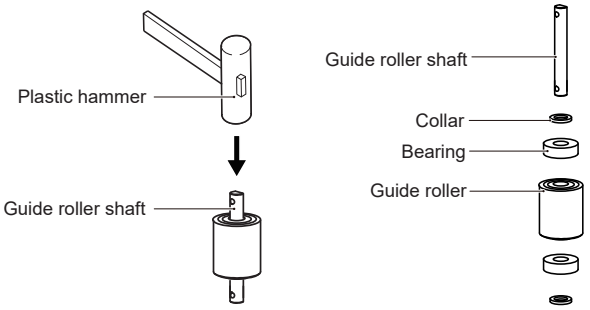
(1) Secure wheel B using the snap ring.



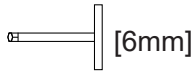
● Installing the buffer/guide roller

(1) Using a plastic hammer, secure a collar, a bearing, and then a guide roller to the guide roller shaft.

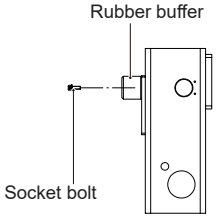




(2) Secure the rubber buffer to the frame C with a socket bolt.



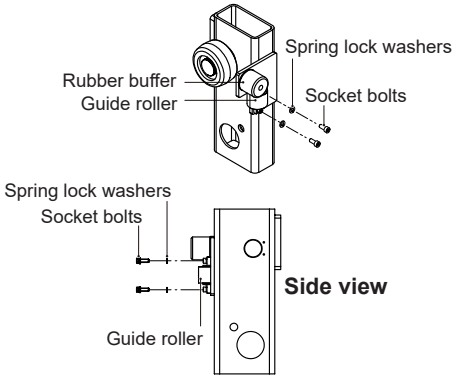
M8 torque setting: 18N•m



(3) Secure the guide roller to the frame A by using socket bolts and spring lock washers (two locations).


[8mm]

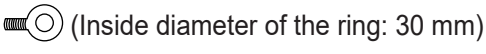
M10 torque setting: 35N•m

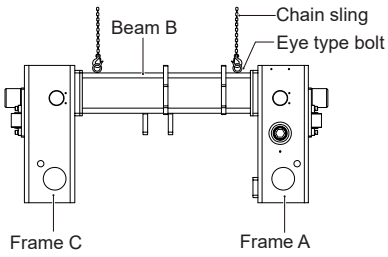


■ Installing frame A/C (B/D)

- The installation procedure for frames B/D is the same as for frames A/C.

(1) Install the M12 eye type bolts in the screw holes (two locations) on the top of beam B, and suspend with a crane through the chain sling, aligning the installation positions of frame A and frame C.

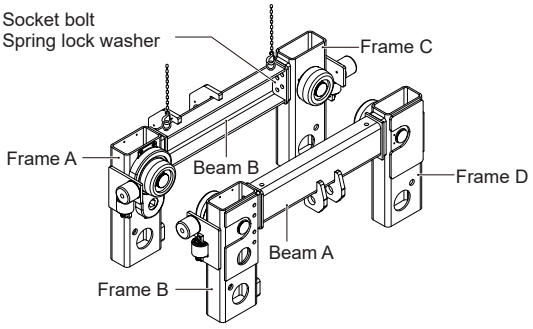

(Inside diameter of the ring: 30 mm)



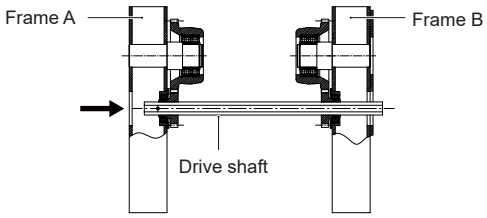
(2) Secure beam B using the socket bolts and spring lock washers from the inside of frame A and frame C (four locations each, 8 locations in total).


[14mm]

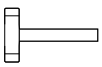
M16 torque setting: 120N•m

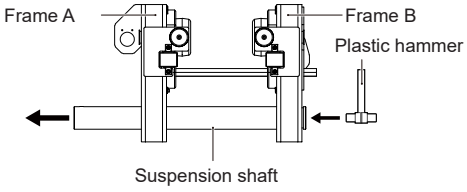


(3) Insert the drive shaft into frame A and frame B.

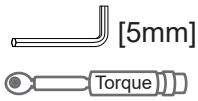


(4) Tap the suspension shaft with a plastic hammer to insert it into frame A and frame B.

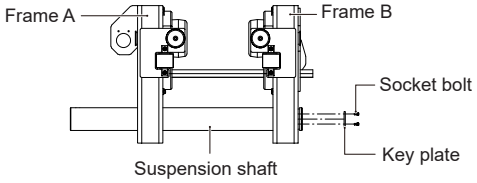




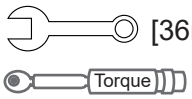
(5) Secure the key plate to frame B by using the socket bolts and spring lock washers (two locations).



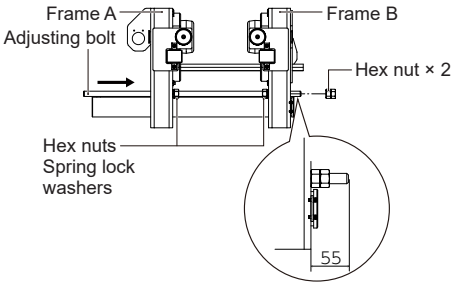
M6 torque setting: 8N•m



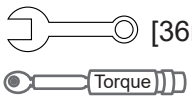
(6) Insert the adjusting bolt into frame A and frame B, and then secure it using the outer side hex nuts (two locations) and the remaining hex nut and spring lock washer.



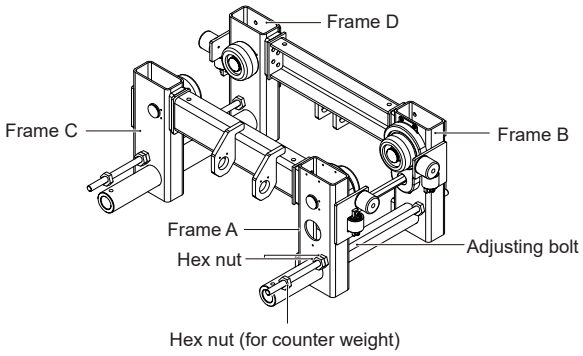
M24 torque setting: 300N•m



(7) Secure the frame A using the exterior hex nuts (three locations).

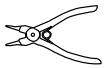


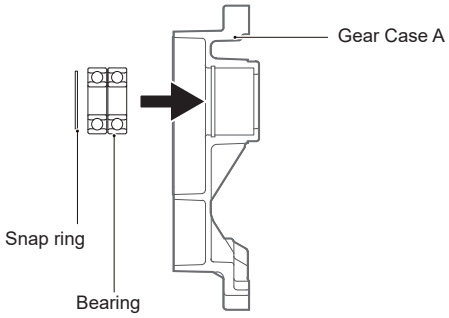
M24 torque setting: 300N•m
(excluding counter weight)



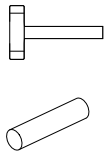
2. Traversing motor

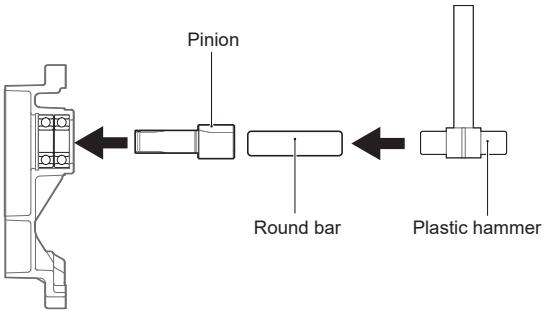
(1) Insert two bearings into Gear Case A, and then fix them in place with a snap ring.



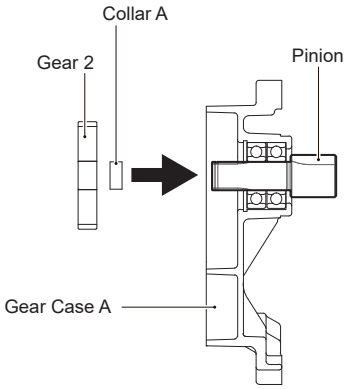


(2) Hold a round bar against a pinion, and then with a plastic hammer, lightly tap on the round bar to insert the pinion.

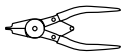


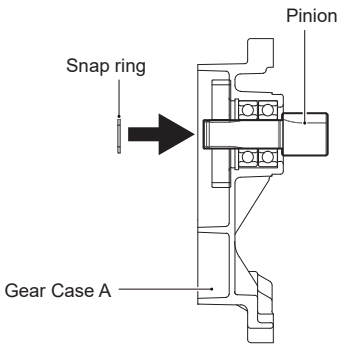


(3) Slide Collar A and Gear 2 onto the pinion.

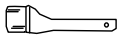


(4) Install a snap ring to the pinion.



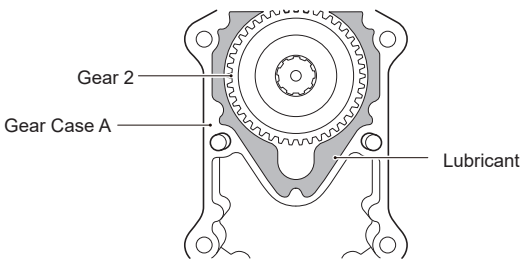


(5) Apply lubricant to Gear Case A and Gear 2.

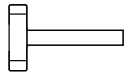


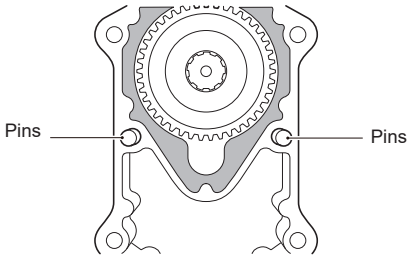
- Lubricant: EPNOC AP (N) No. 2

  (For details about the amount of lubricant to be used, see the owners' manual.)

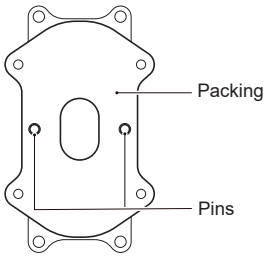


(6) With a plastic hammer, drive two pins into the gear case.

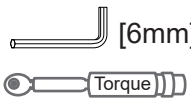




(7) Install a packing, making sure that the pins are aligned with the holes on the packing.

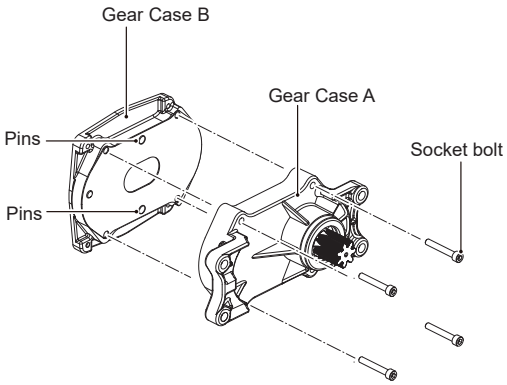


(8) Install Gear Case B by screwing in four socket bolts from the pinion side, making sure that the pins are aligned with the holes on the gear case.

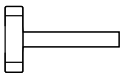


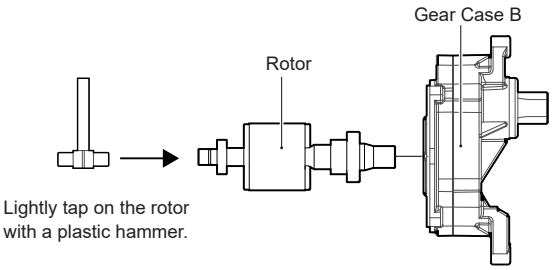
M8 torque setting: 18N•m

- Apply a threadlocker to the socket bolts.

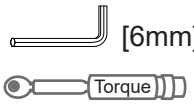


(9) With a plastic hammer, lightly tap on a rotor to drive it into Gear Case B.



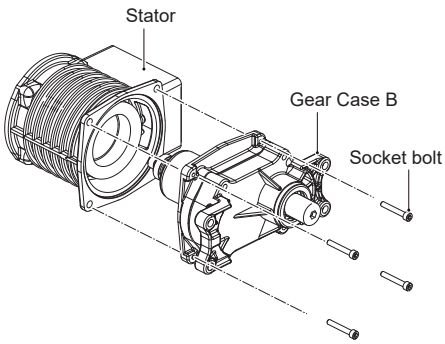


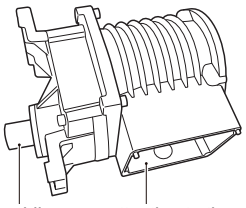
(10) Fix a stator to Gear Case B by using four socket bolts.



M8 torque setting: 18N•m

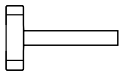
- Ensure that the stator is properly positioned before attaching it to the gear case.
- Apply a threadlocker to the socket bolts before screwing them in.

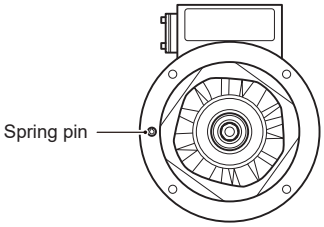




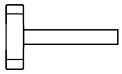
When assembling, pay attention to the position of the terminal box relative to the position of the pinion.

(11) Install a spring pin to the stator by lightly tapping on it with a plastic hammer.

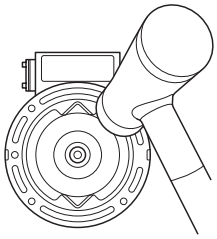


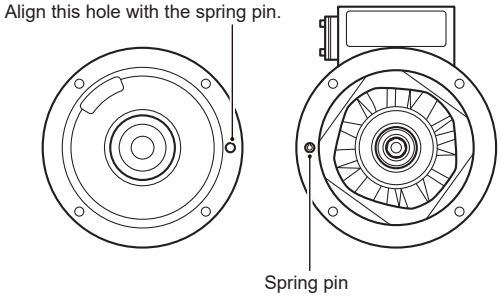


(12) Install a brake bracket, making sure that the spring pin is aligned with the hole on the brake bracket.



- With a plastic hammer, lightly tap on the brake bracket to make it engage with the stator.

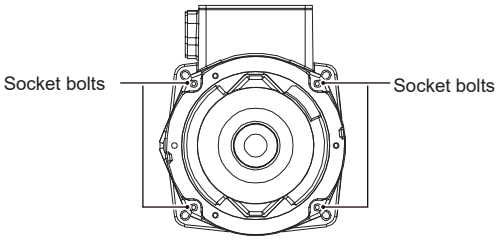




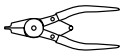
(13) Install the brake bracket on the stator with the socket bolts (four locations).

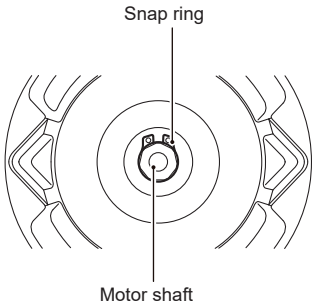

[5mm]

M6 torque setting: 8N•m

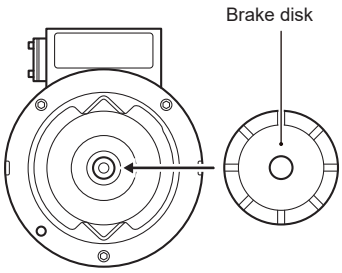


(14) Install a snap ring to the motor shaft.

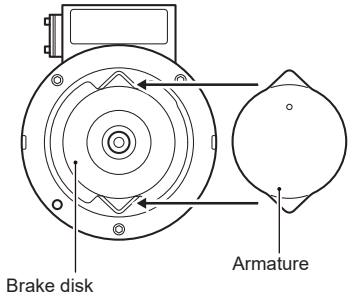




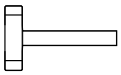
(15) Install a brake disk.

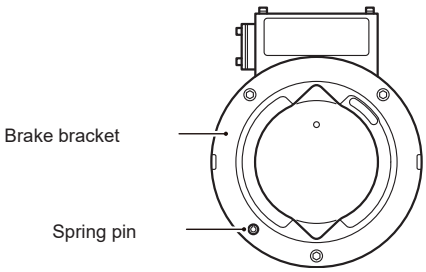


(16) Install an armature.

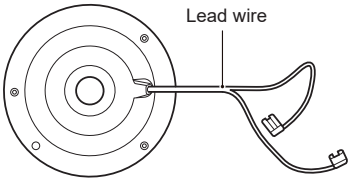


(17) Install a spring pin to the brake bracket by lightly tapping on it with a plastic hammer.

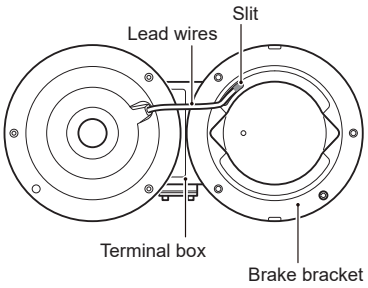




(18) Pass the lead wire extending from the electromagnetic brake assembly through a slit on the brake bracket and route it to the terminal box.



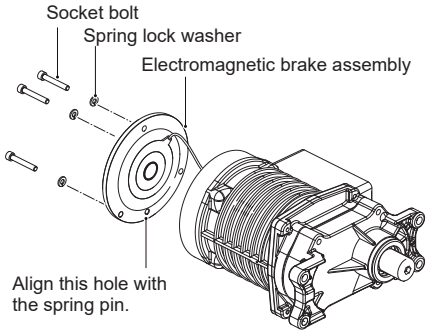
Electromagnetic brake assembly



(19) Install the electromagnetic brake assembly to the brake bracket making sure that the spring pin is aligned with the hole on the electromagnetic brake assembly, and then fix it in place by using three socket bolts and three spring lock washers.

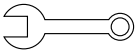

[5mm]

M6 torque setting: 8N•m



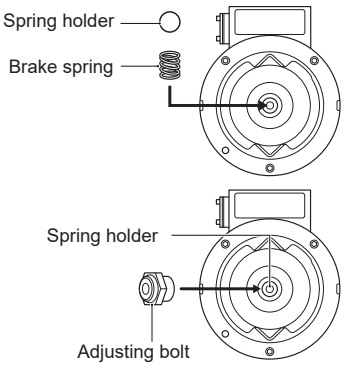
(20) Insert a brake spring, and then a spring holder in the position indicated in the figure to the right, and then from the opening on the spring holder, screw in an adjusting bolt.


[10mm]


[35mm]

(Monkey wrench recommended)

- For details about how to adjust the brake, see the "RY Series Wire Rope Hoist (10t) Owner's Manual".

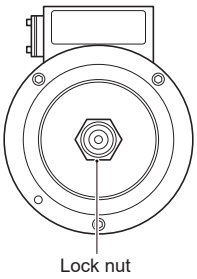


(21) After tightening the adjusting bolt to the designated brake torque, screw in a lock nut to prevent the adjusting bolt from becoming loose.

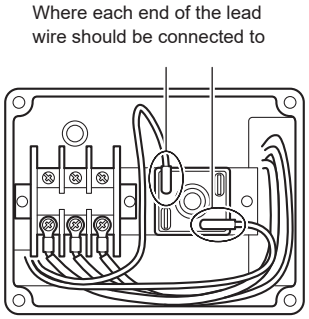
[10mm]

[35mm]

(Monkey wrench recommended)



(22) Lay the lead wire routed to the terminal box as shown in the figure to the right.



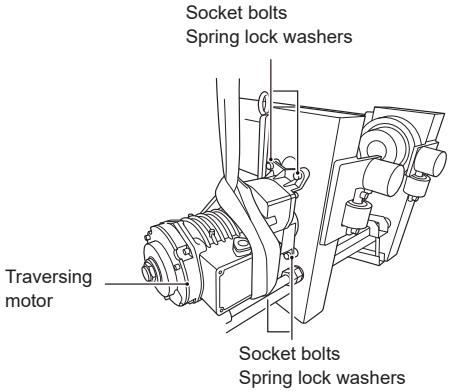
■ Installing the traversing motor

(1) Use a fiber sling to support the traversing motor and then secure the traversing motor to the frame A using socket bolts and spring lock washers (four locations).

[8mm]

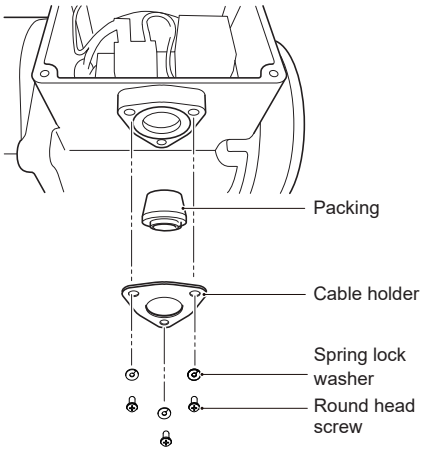
Torque

M10 torque setting: 35N•m



■ Installing the traversing motor harness

(1) Remove the three round head screws and three spring lock washers fixing the cable holder in place.



(2) Wrap black plastic tape around the traversing motor harness about four times, and then pass the traversing motor harness through the cable holder and the packing.

For details, see the following illustration that shows where tape should be wrapped around.

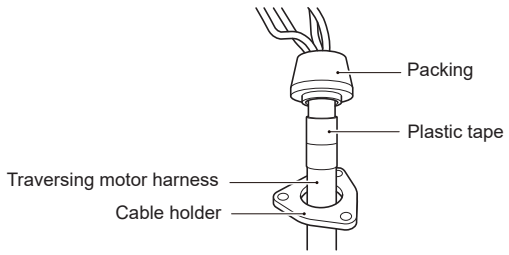
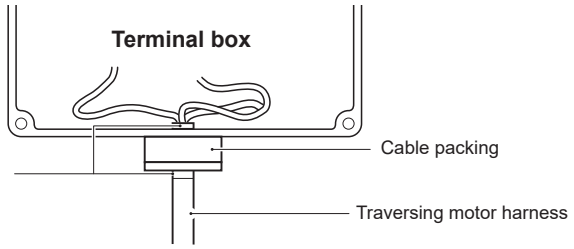
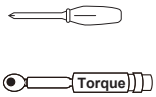


Illustration of where tape should be wrapped around

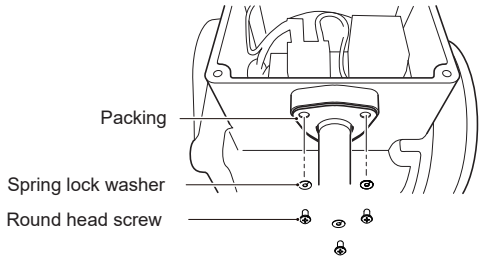


Wrap plastic tape around the traversing motor harness, making sure that 3-5 mm of plastic tape is visible from the upper and lower ends of the cable packing.

(3) Insert the traversing motor harness into the terminal box, and fix the cable packing and the cable holder in place with screws.

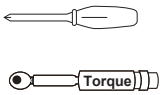


M4 torque setting: 1N•m

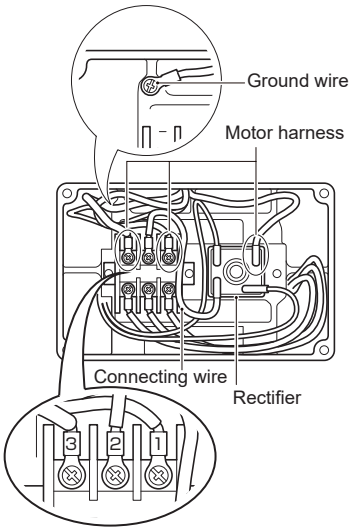


(4) Secure the ground wire (green/yellow) from the traversing motor harness to the inside of the terminal box by using a screw.
Connect the remaining three lead wires (red, white, and black wires) to Terminal 1, Rectifier, and Terminal 3, respectively.

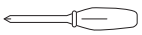
(5) Connect the rectifier with the connecting wire from Terminal Block 2.



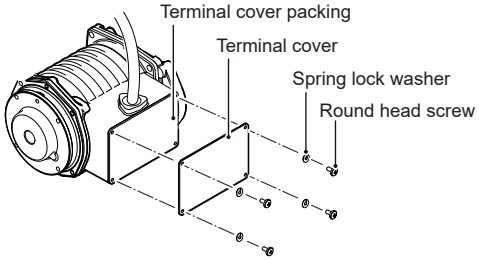
M3.5 torque setting: 0.75N•m



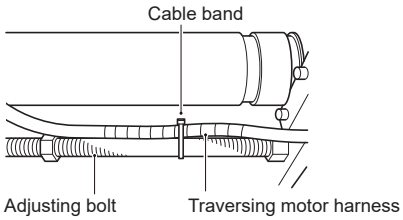
(6) Fix the terminal cover and the terminal cover packing to the traversing motor by using four round head screws and four spring lock washers.



M4 torque setting: 1N•m



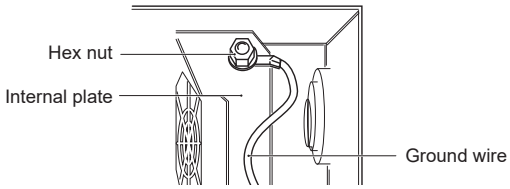
(7) Fix the traversing motor harness to the adjusting bolt by using a cable band.



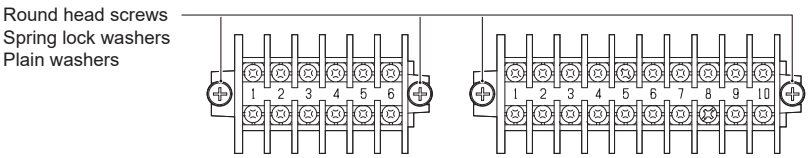
3. Control box

(1) Lay the ground wire over the internal plate and route it to the control box.

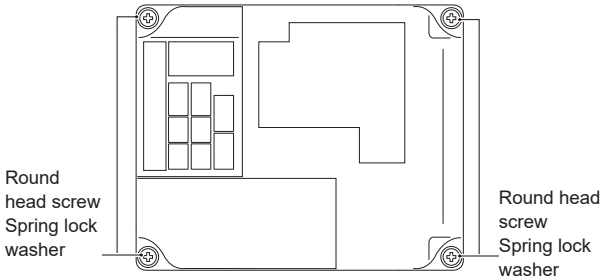
[13mm]



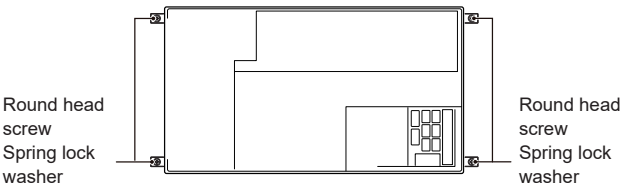
(2) Fix each of the two terminals in place by using two round head screws, two plain washers, and two spring lock washers.



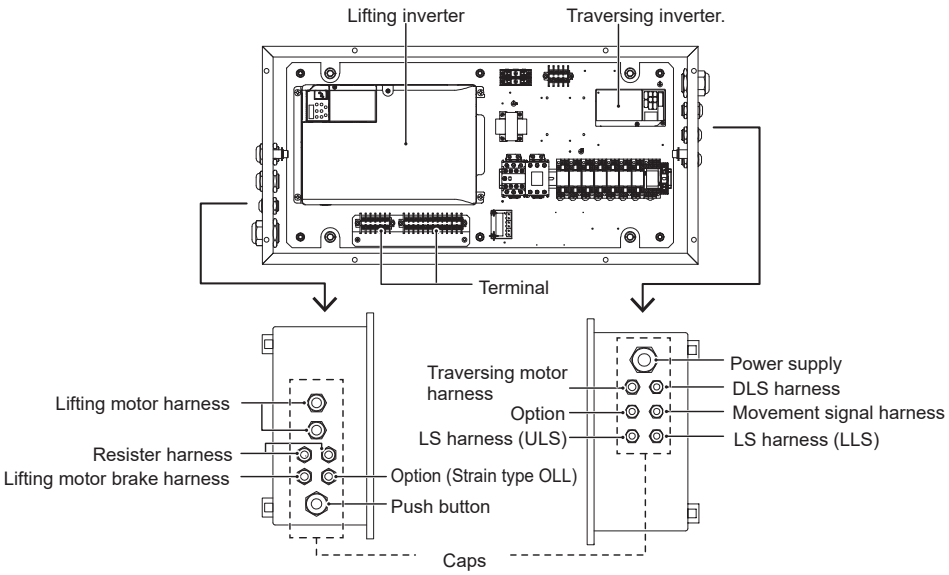
(3) Fix the fixing plate on the traversing resistor in place by using two round head screws and two spring lock washers.



(4) Fix the traversing inverter in place by using four round head screws and four spring lock washers.



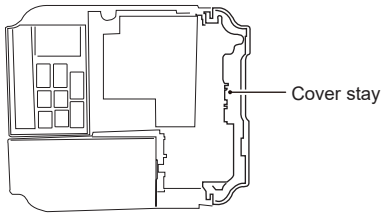
(5) Insert each harness into the corresponding cable gland, and fix it in place by tightening a cap.



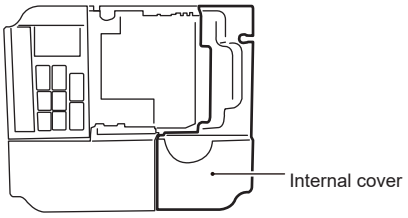
(6) Connect each harness to an inverter or a terminal.
- For details, see the wiring diagram provided in the "RY Series Wire Rope Hoist (10t) Owner's Manual".

(7) Tie harnesses together with a cable band.
- Do not tie the resister line and the power line together with other harnesses.

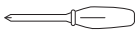
(8) Install a cover stay to the traversing inverter.



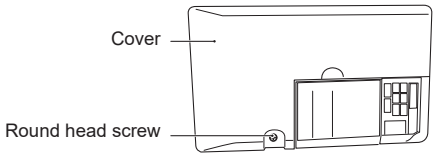
(9) Install an internal cover to the traversing inverter.



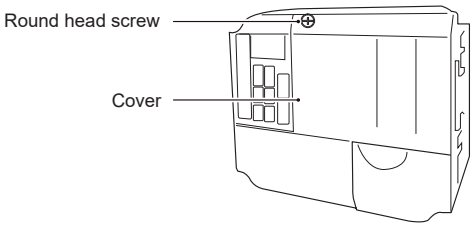
(10) Install covers to the lifting inverter and the traversing inverter.



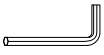
Lifting inverter



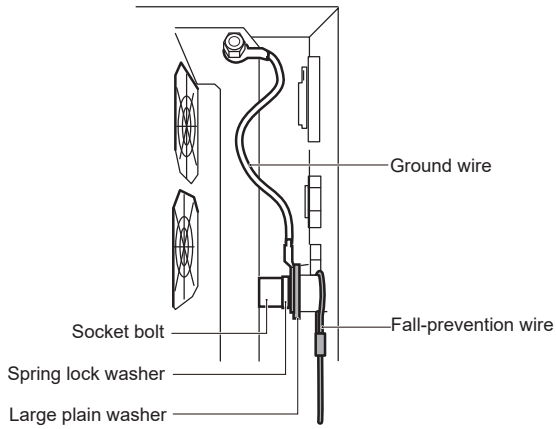
Traversing motor



(11) Let a small loop at the end of two fall-prevention wires hang at the bosses inside the control box and the control box cover, and then install two socket bolts, two spring lock washers, and two large plain washers to prevent the wires from coming off loose.

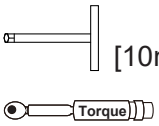

[6mm]

M8 torque setting: 18N•m
- Remember to connect the ground wire.

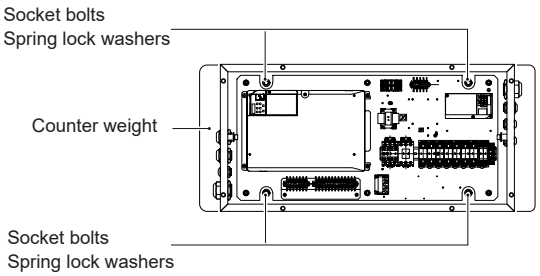


■ Installing the control box

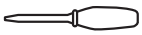
(1) Fix the control box to the counter weight by using four socket bolts and four spring lock washers.

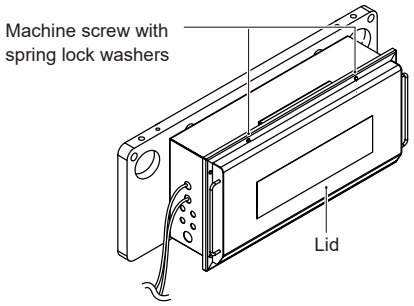


M12 torque setting: 60N•m



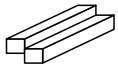
(2) Close the lid on the control box by using eight machine screw with spring lock washers.

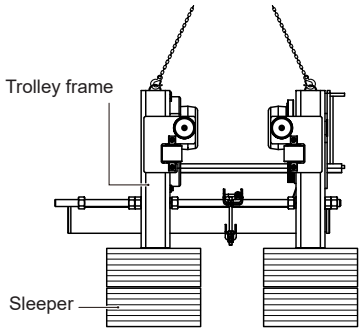




■ Installing the control box unit

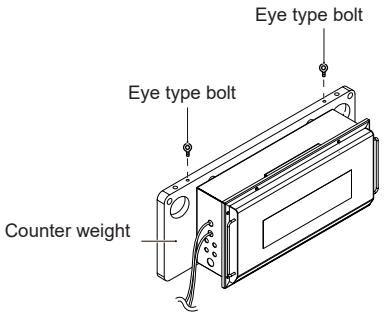
(1) Suspend the trolley frame and place it on the sleepers.



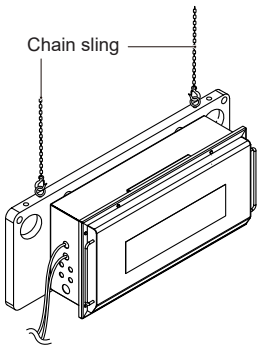


(2) Install two M12 eye type bolts to the screw holes located on both sides of the counter weight.

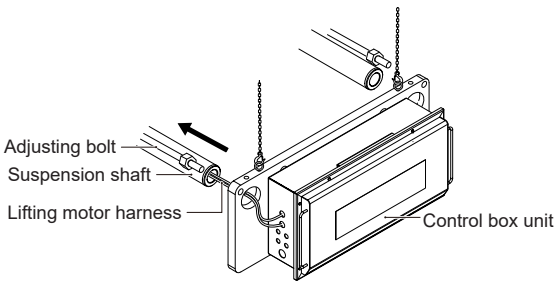
(Inside diameter of the ring: 30 mm)



(3) Pass the chain sling through the eye type bolts (two locations). Suspend it with the crane, and apply a tension to the chain sling.



(4) While inserting the lifting motor harness into the suspension shaft, install the control box unit to both the suspension shaft and the adjusting bolt.

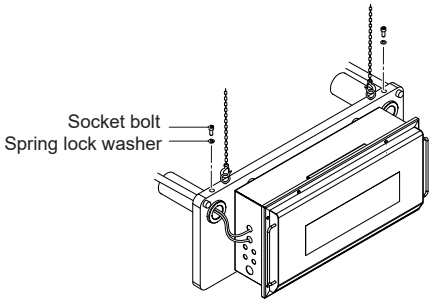


(5) Put through the counter weight and install socket bolts and spring lock washers (two locations) to the suspension shaft.

[14mm]

Torque

M16 torque setting: 120N•m



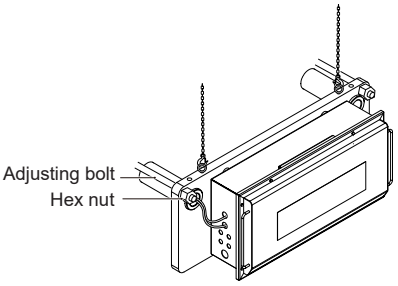
(6) On the outer surface of the counter weight, install the two hex nuts on the adjusting bolts.

[36mm]

Torque

M24 torque setting: 300N•m

- After installing the hex nuts, confirm that the counter weight is positioned perpendicular to the suspension shaft.



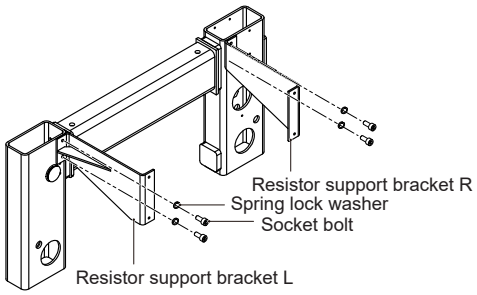
■ Installing the resistor plate and resistor support bracket L/R

(1) Install the socket bolts and spring lock washers (two locations for each) and install the resistor support bracket L/R.

[6mm]

Torque

M8 torque setting: 18N•m

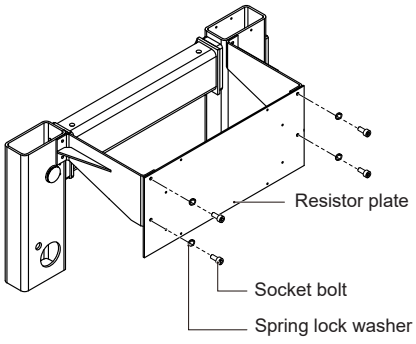


(2) Install the socket bolts and spring lock washers (four locations each), and then install the resistor plate.

[6mm]

Torque

M8 torque setting: 18N•m



■ Installing lifting resistors

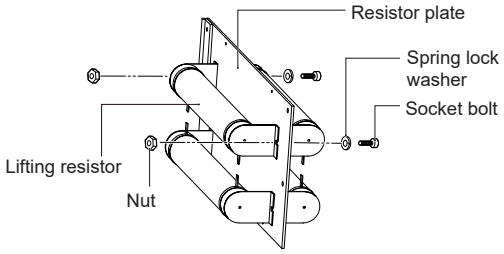
(1) Secure the lifting resistors to the resistor plate using socket bolts and spring lock washers (two locations each).

[5mm]

[10mm]

Torque

M6 torque setting: 8N•m



(2) Connect a resister harness to each lifting resister.

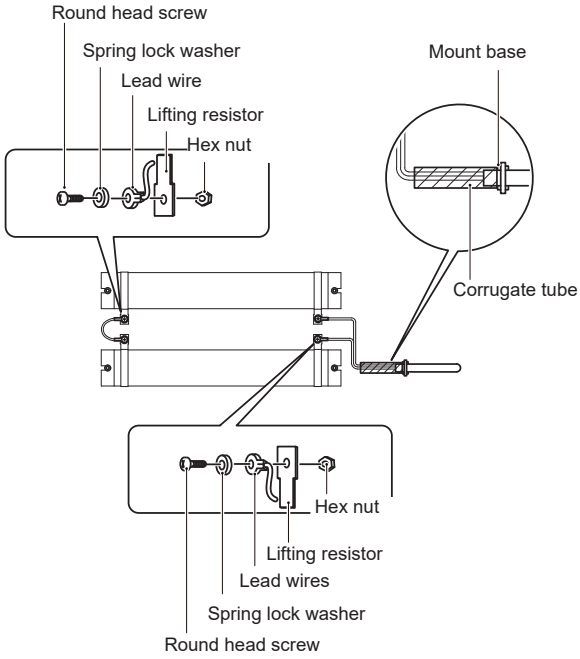
[8mm]

Torque

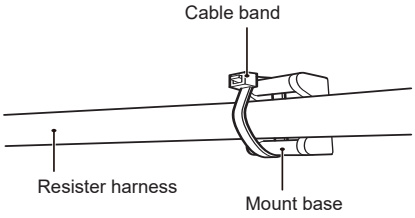
M5 torque setting: 2.5N•m

(3) Fix the mount base to the counter weight by using a round head screw and spring lock washer.

(4) Wrap corrugate tube around the stripped potion of the resister harness.



(5) Fix the resister harness to the mount base by using a cable band.



(6) Fix the four socket bolts and four spring lock washers, and then insatll the resistor cover to the counter weight.

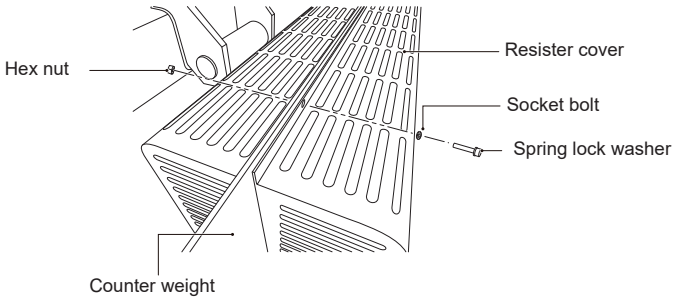
[4mm]

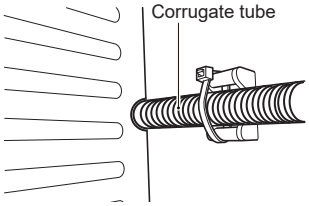
[8mm]

Torque

M5 torque setting: 4N•m

- Adjust the position of the corrugate tube so that the portion wrapped by the corrugate tube comes in contact with the edge of the resister cover.

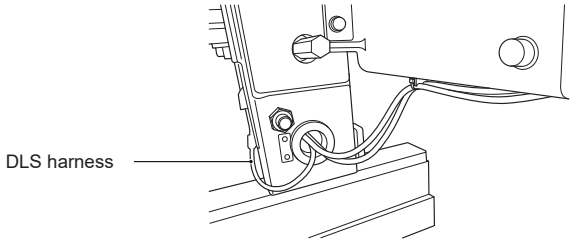




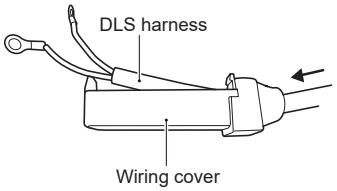
4. Direct Limit Switch

■ Installing the DLS harness

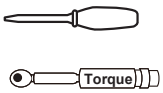
(1) Pass a DLS harness through the suspension shaft located on the right of the control box, and pull it out from the rope-drum side.



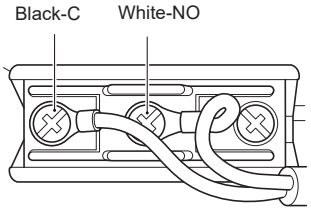
(2) Insert the DLS harness into the wiring cover of the limit switch of the direct limit switch.



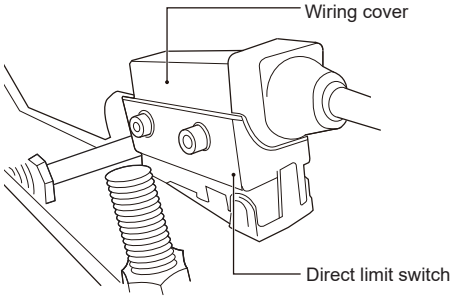
(3) Connect the DLS harness to the limit switches.
Connect the black lead wire to C and the white lead wire to NO.



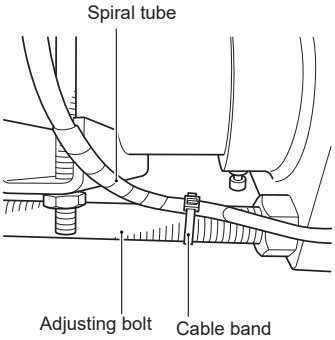
M3 torque setting: 0.5N•m



(4) Attach the wiring cover to the direct limit switch.

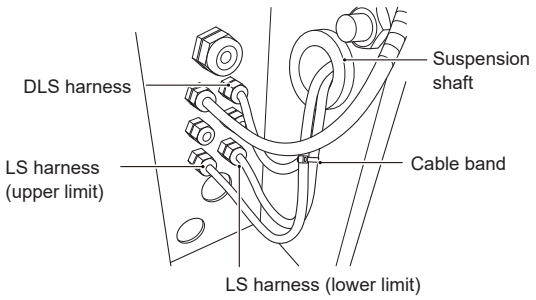


(5) Wrap a spiral tube around 100 mm of the DLS harness, and fix the DLS harness to the adjusting bolt with a cable band.



(6) With a cable band, tie the inserted DLS harness and the two LS harnesses together at the entry point to the suspension shaft.

- Tie the harnesses together making sure that they are aligned according to the positions of the cable glands that accept them.



■ Installing the direct limit switch

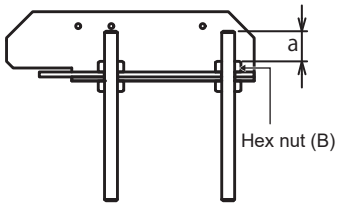
(1) Insert the fixing bolt into the sensor bracket and secure it with a hex nut (B).

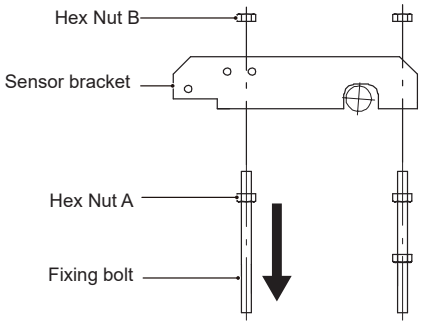
[16mm(17mm)]

Torque

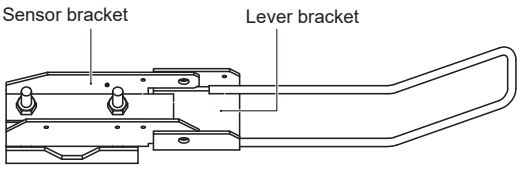
M10 torque setting: 35N•m

- Distance "a" between the upper surface of Hex Nut B and the tip of the fixing bolt must be 18 mm:

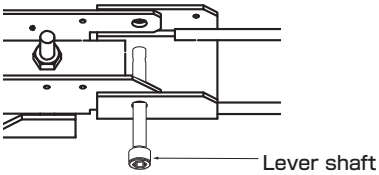




(2) Engage the lever bracket with the sensor bracket.

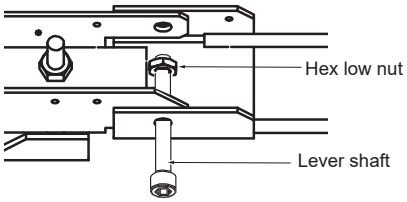


(3) Insert the lever shaft halfway in.

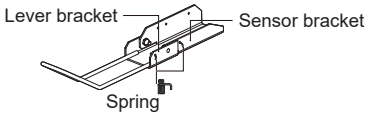


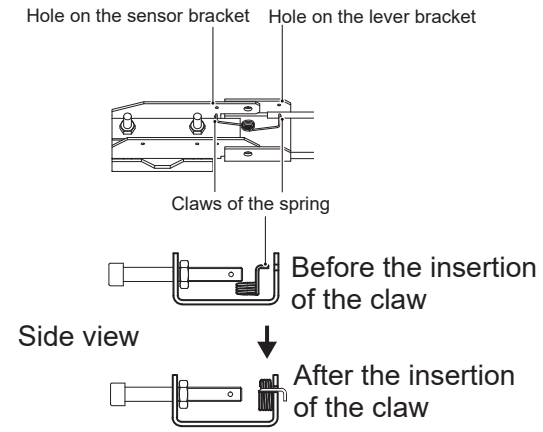
(4) Install a hex low nut onto the lever shaft and tighten it.

[16mm(17mm)]

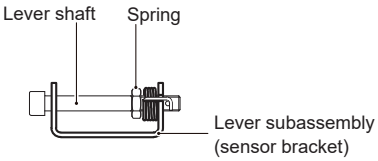


(5) As shown in the figure to the right, insert the claws of the spring into the holes on the sensor bracket and the lever bracket.

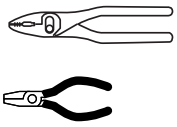




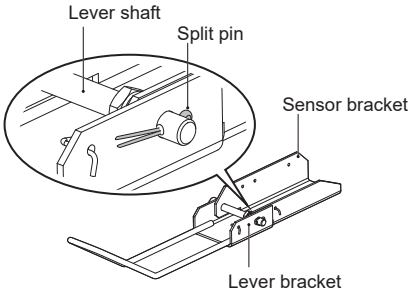
(6) Holding down the spring, pass the lever shaft through the spring and through the sensor bracket and the lever subassembly.



(7) Insert a split pin into the hole on the tip of the lever shaft.



- Bend the split pin to fix the lever shaft in place.

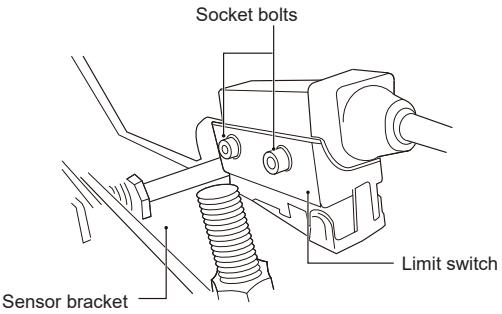


(8) Fix the limit switch to the sensor bracket by using two socket bolts.

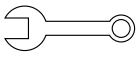

[3mm]

M4 torque setting: 2N•m

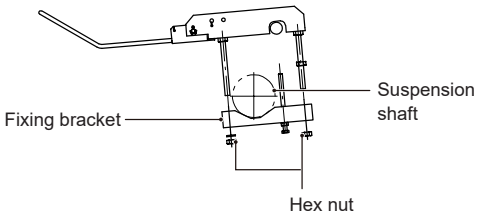
- After assembly, confirm that the limit switch functions properly when the lever is moved.



(9) By using two hex nuts and two spring lock washers, fix the direct limit switch to the fixing bracket, with the suspension shaft placed between them. Mount the direct limit switch to the suspension shaft located between Frame A and Frame B.


[16mm(17mm)]

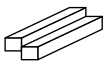
M10 torque setting: 35N•m

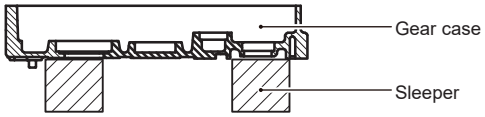


5. Lifting motor

■ Assembling the gear box

(1) Place the gear case on the sleepers with the gear case lid side facing up.





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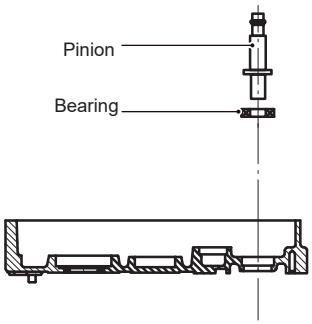
(2) Install the bearing.
- Use a press-fitting jig.
- Apply lubricant to the outer circumference. BONNOC M260



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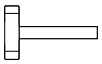
(3) Insert the pinion.



- Use a press-fitting jig.

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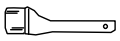
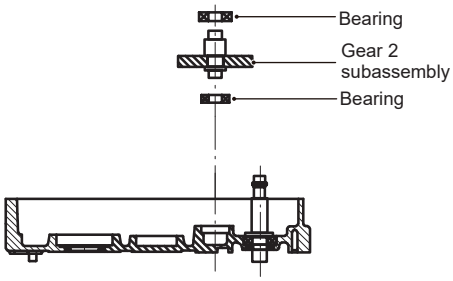
(4) Apply lubricant to the bearing outer surface and then insert the gear 2 subassembly and bearing into the gear case.
- Use a press-fitting jig.
- Lubricant: BONNOC M260





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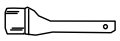
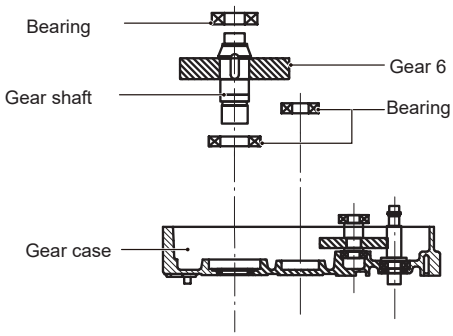
(5) Apply lubricant to the bearing outer surface and then insert gear 6, the gear shaft, and the bearing into the gear case.
- Lubricant: BONNOC M260





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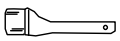
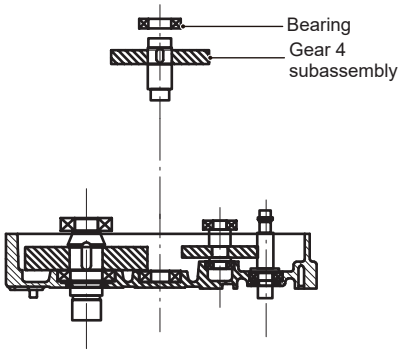
(6) Apply lubricant to the bearing outer surface and then insert the gear 4 subassembly, making sure that its teeth engage with the gears.
- Lubricant: BONNOC M260





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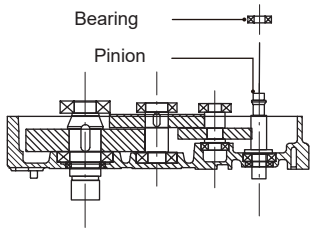
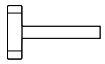
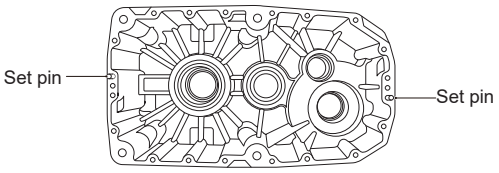
(7) Apply lubricant to the outer surface of the bearing for pinion, and insert it onto the pinion.



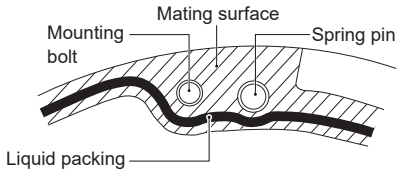
(8) Install the set pins (two locations) and apply the liquid gasket to the gear case lid mating surface.



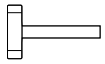
- Liquid packing: 1222C made by ThreeBond
- When applying liquid packing to the mating surface of parts, pay attention to the points below:
  (1) The mating surface must be degreased sufficiently.
  (2) Apply around the entire circumference with no breaks.
  (The minimum width for applying liquid packing is 3 mm or more, confirmed visually.)
  (3) After aligning the parts, wipe off any protruding liquid packing.
  (4) Refer to the "Liquid Packing Application Figure" on the right and apply the liquid packing to the inside of the screw holes and pins.



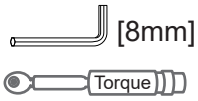
Liquid Packing Application Figure



(9) Install the gear case lid to the gear case, making sure that the set pins are aligned.

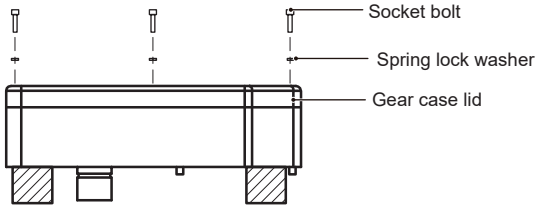


(10) Lock the gear case lid in place by tightening the socket bolts and spring lock washers (18 locations for each).

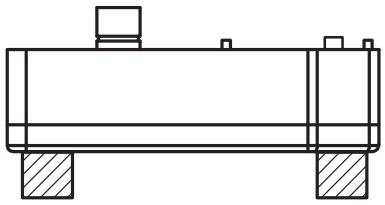


M10 torque setting: 42N•m

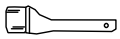
- Apply a threadlocker to the threaded part.



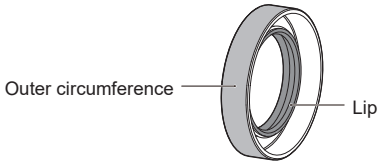
(11) Turn the gear box on the sleepers upside down and place it on the sleepers again.



(12) Apply lubricant (grease) to the lip and outer circumference of the oil seal for pinion and for gear shaft.

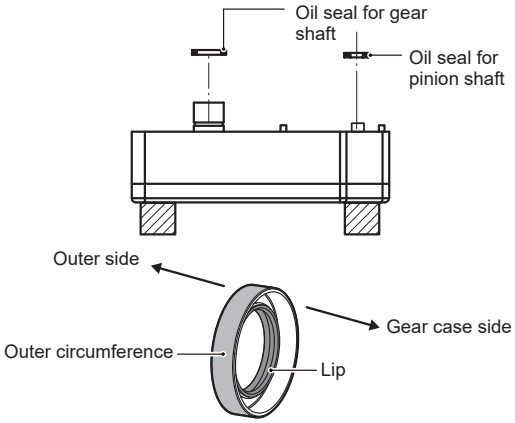


- Oil seal: AE2085A0
- Lubricant: EPNOC AP (N) No. 2

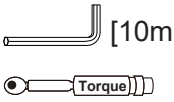


(13) Use a press-fitting jig to press the oil seal for pinion into place.

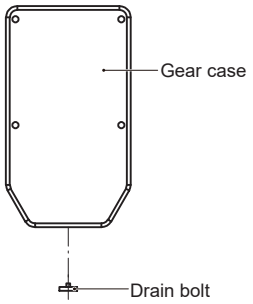
- Use a press-fitting jig.



(14) Install the drain bolt and tighten it to the gear case.

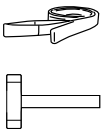


M12 torque setting: 8N•m

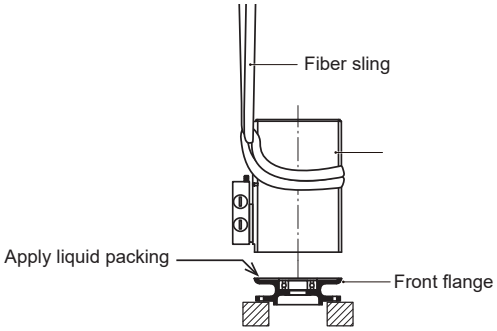


■ Assembling a lifting motor

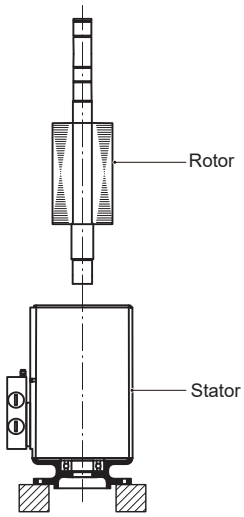
(1) Place the front flange on the sleepers, wrap a fiber sling around the stator, suspend it, and insert it onto the front flange.



- Liquid packing: 1222C made by ThreeBond
- When applying liquid packing to the mating surface of parts, pay attention to the points below:
  - (1) The mating surface must be degreased sufficiently.
  - (2) Apply around the entire circumference with no breaks.
    (The minimum width for applying liquid packing is 3 mm or more, confirmed visually.)
  - (3) After aligning the parts, wipe off any protruding liquid packing.
  - (4) Refer to the "Liquid Packing Application Figure" on Page 64page and apply the liquid packing to the inside of the screw holes and pins.

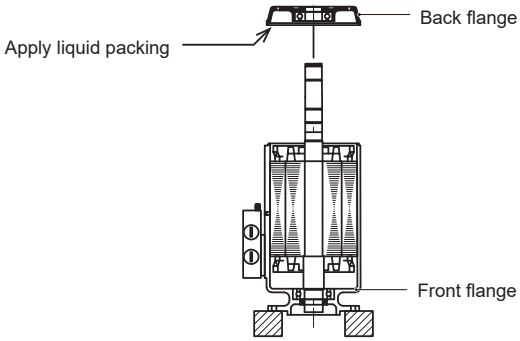


(2) Insert the rotor onto the stator.

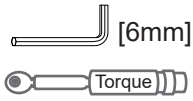


(3) Install the back flange.

- Liquid packing: 1222C made by ThreeBond
- When applying liquid packing to the mating surface of parts, pay attention to the points below:
  (1) The mating surface must be degreased sufficiently.
  (2) Apply around the entire circumference with no breaks.
  (The minimum width for applying liquid packing is 3 mm or more, confirmed visually.)
  (3) After aligning the parts, wipe off any protruding liquid packing.
  (4) Refer to the "Liquid Packing Application Figure" on Page 64page and apply the liquid packing to the inside of the screw holes and pins.

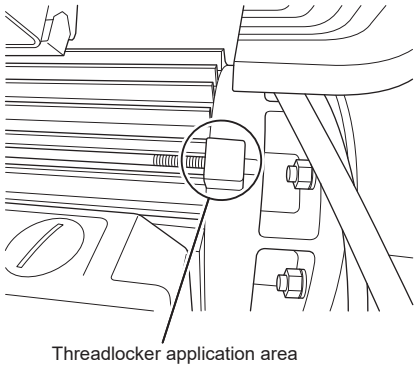


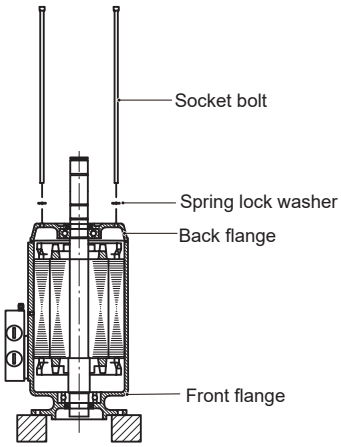
(4) Install the socket bolts and spring lock washers (four locations for each).

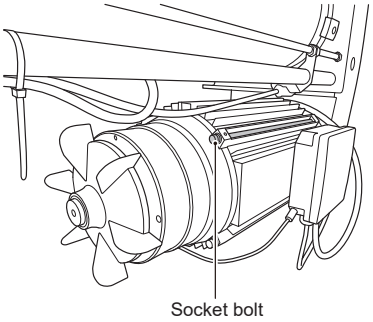


M8 torque setting: 25N•m

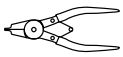
- Apply a threadlocker to the threaded part.

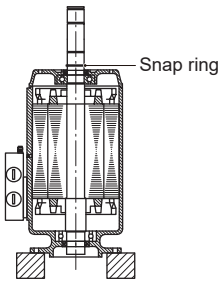




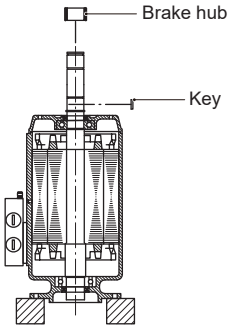


(5) Install a snap ring.

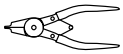


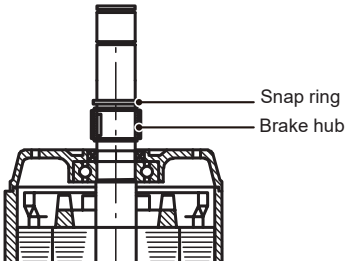


(6) Install the brake hub and key.



(7) Install a snap ring.



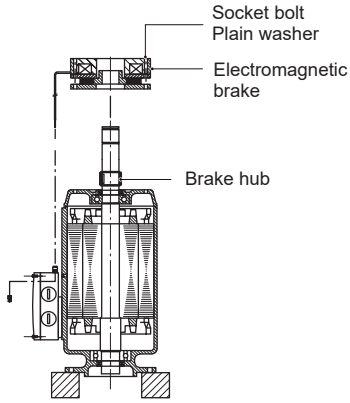


(8) Secure the electromagnetic brake using socket bolts (four locations).

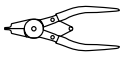

[8mm]

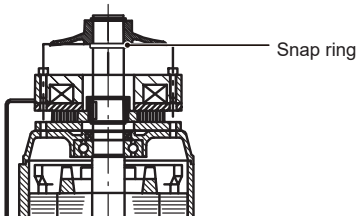
M8 torque setting: 25N•m

- Apply a threadlocker to the threaded part.

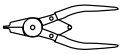


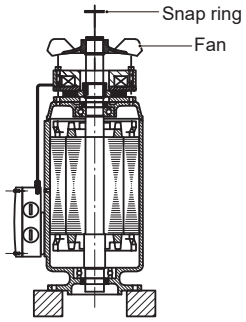
(9) Install a snap ring.



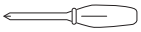


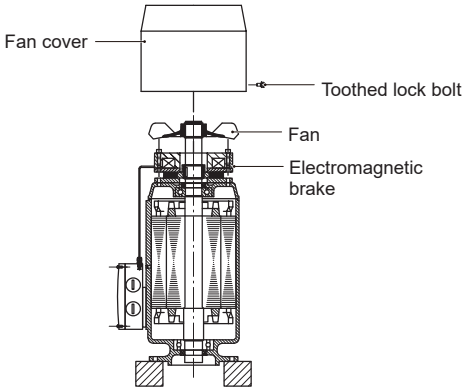
(10) Install the fan using a snap ring.





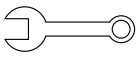
(11) Secure the fan cover using toothed lock bolts (four locations).





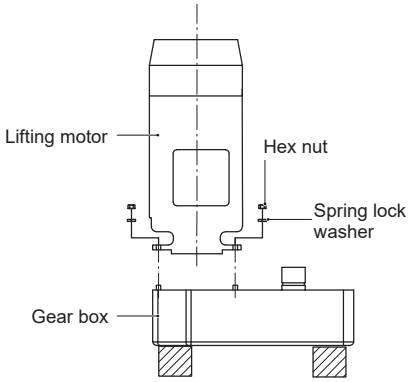
■ Installing the lifting motor

(1) Secure the lifting motor to the gear box with nuts and spring lock washers (8 locations).


[17mm]

M10 torque setting: 44N•m

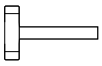
- Apply a threadlocker to the threaded part.

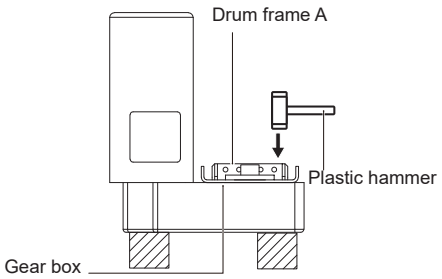


6. Rope drum

■ Assembling the rope drum

(1) Install drum frame A to the gear box by tapping it with a plastic hammer.





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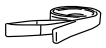
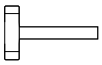
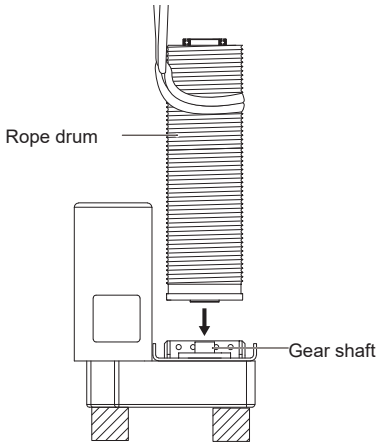
(2) Wrap a fiber sling around the rope drum and lift the rope drum to insert it onto the gear shaft.







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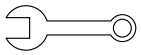
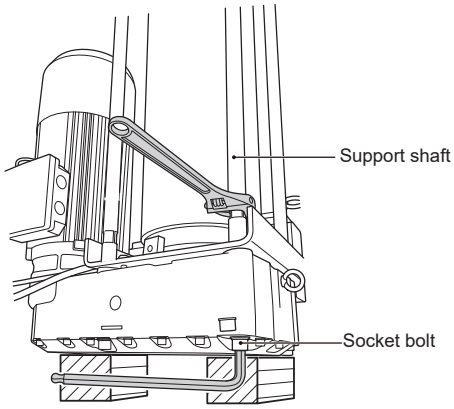
(3) Use a hex wrench and wrench to secure the support shaft using socket bolts (three locations).


[14mm]


[24mm]

M16 torque setting: 120N•m



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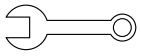
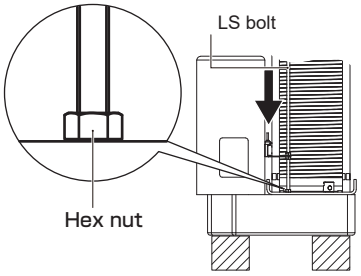
(4) Secure the LS bolt using a hex nut (one location) and install it to the gear box.


[18mm(19mm)]

M12 torque setting: 60N•m



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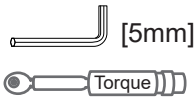
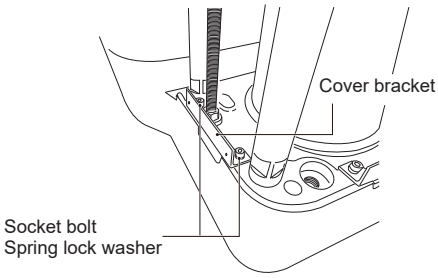
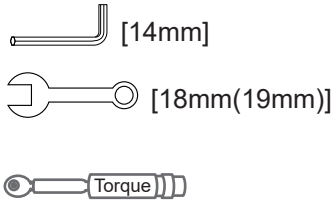
(5) Secure the gear box side cover bracket using socket bolts and spring lock washers (two locations for each).



M6 torque setting: 8N•m

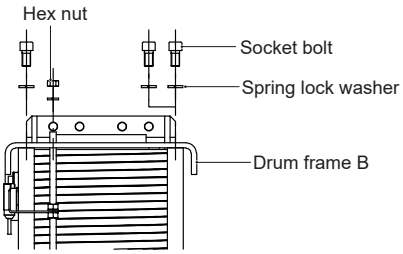


(6) Secure the drum frame B using three socket bolts and spring lock washers and the one hex nut and spring lock washer.



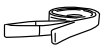
M16 torque setting: 120N•m (socket bolt)

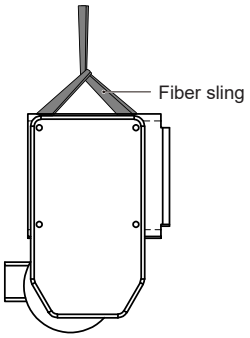
M12 torque setting: 60N•m (hex nut)



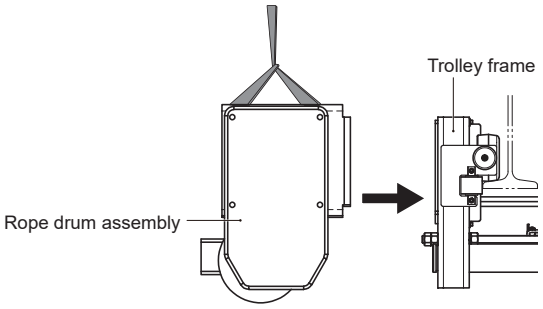
■ Installing the rope drum assembly

(1) Put fiber slings around the two support shafts located on the upper section of the rope drum assembly, and lift the rope drum assembly.





(2) Align the rope drum assembly with the trolley frame coupling.

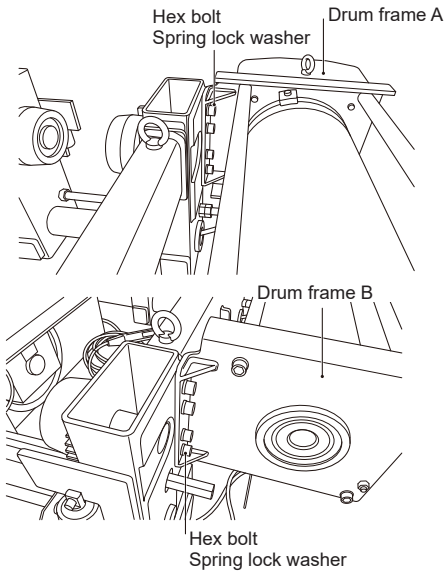


(3) Secure drum frame A and drum frame B using the hex bolts and spring lock washers at each of the four locations.

[24mm]

Torque

M16 torque setting: 120N•m



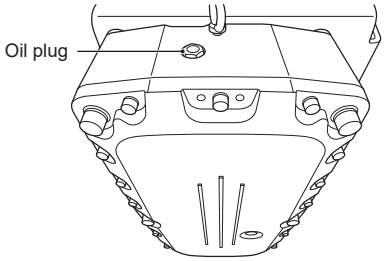
(4) Open the oil plug (air breather) and put lubricant (oil) into the gear box.
After supplying oil, close the oil plug.

[22mm]

Torque

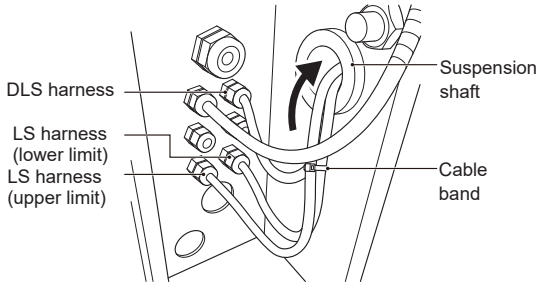
M14 torque setting: 8N•m

- Lubricant: BONNOC M260 5L

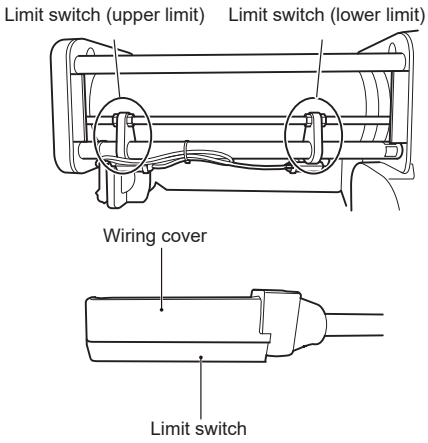


■ Installing the LS harnesses

(1) Tie up the DLS harness and LS harness of the control box side using cable band, and then pass the suspension shaft through.

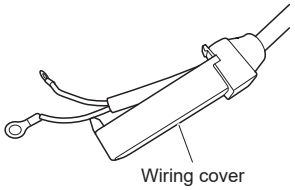


(2) Remove the wiring covers from the two limit switches (one for the upper limit and the other for the lower limit).

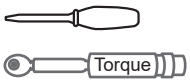


(3) After confirming which one of the two LS harnesses is for the upper limit and which is for the lower limit, insert them into the corresponding wiring covers.

- A tube with marking on each LS harness tells you which one is for the upper limit and which is for the lower limit.
- ULS: upper-limit side, LLS: lower-limit side

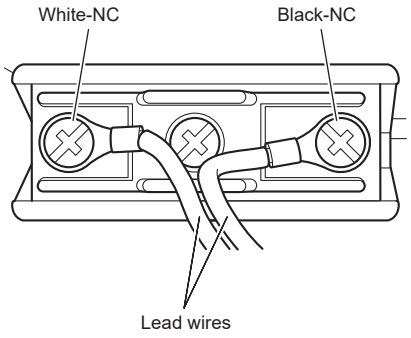


(4) Connect one LS harness to the upper-limit-side limit switch and the other to the lower-limit-side limit switch.
Connect the black lead wire to C and the white lead wire to NC.

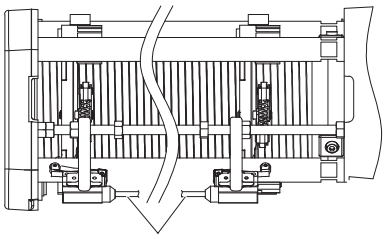


M3 torque setting: 0.5N•m

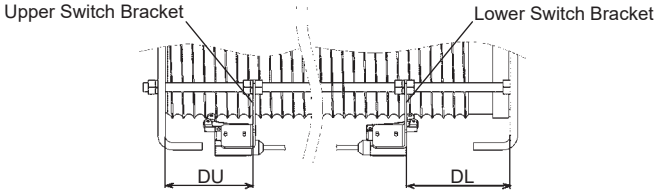
- When the lifting motor interfering with the screwdriver impedes wiring work for the lower-limit side, shift the lower-limit-side limit switch to the position where this interference can be avoided, and then perform wiring for the lower-limit side.



(5) Attach the wiring covers to the limit switches. Fix them in place after confirming that the openings on these covers, from which the upper-limit-side and lower-limit-side LS harnesses come out, are facing each other.



(6) Position Upper Switch Bracket and Lower Switch Bracket as shown in the following figure, and fix them in place by tightening the nuts.

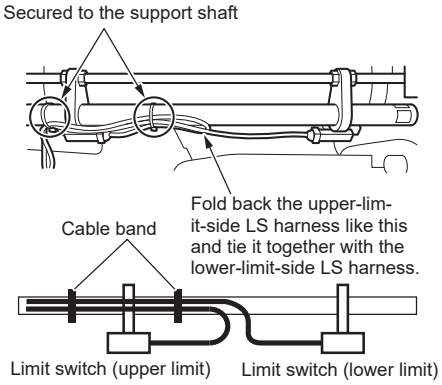


For the Limit Switch Brackets, perform adjustments so that the dimensions DU and DL in the figure above match the values in the table below.
Do not set the upper limit position (DU) of the Upper/Lower Limit Stop Device to the upper-limit side beyond the Upper Limit Emergency Stop Device.

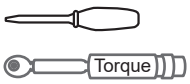
Destination	Wire rope diameter	Default setting postion	
		Upper limit	Lower limit
		DU	**DL**
For Australia	ϕ 9	139±3	107±3
Other than Australia	ϕ 8	135±3	114±3

For details on how to adjust the stop position, refer to "RY Series Wire Rope Hoist (10t) Owner's Manual".

(7) As shown in the figure to the right, lay the LS harnesses such that the upper-limit-side harness and the lower-limit-side harness are of the same length, and then fix the harnesses to the support shaft by using a cable band.

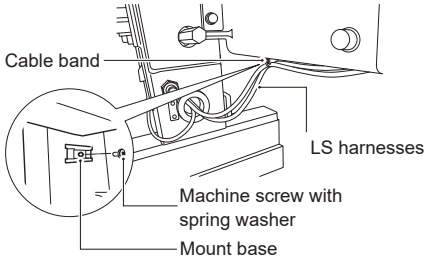


(8) Secure the LS harness to the support shaft and mount base using cable bands.



M6 torque setting: 4N•m

- When the harnesses are too long, you can adjust their length by loosening the cable gland on the control box and tucking part of the harnesses into the control box.



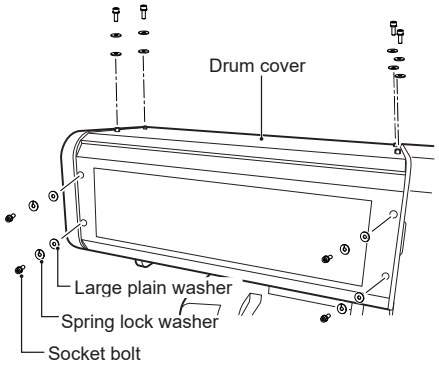
(9) Secure the drum cover using socket bolts, spring lock washers, and large plain washers (8 locations for each).

[3mm/5mm]

Torque

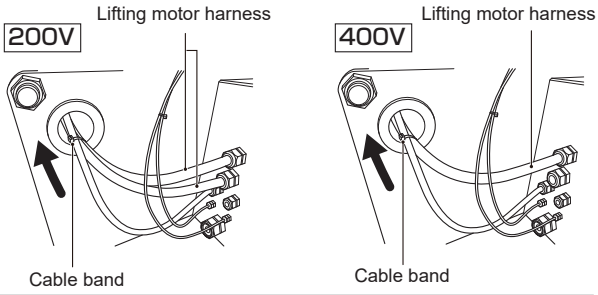
M4 torque setting: 2N•m

M6 torque setting: 8N•m



■ Installing the lifting motor harness

(1) Tie together the lifting motor harness on the control box side using a cable band and then put through the suspension shaft.



(2) Referring to Figure A, put the lifting motor harness / lifting motor brake harness through the cap of the cable gland and install the cable gland to the main unit.

(3) Referring to Figure B, insert the connector pin into the connector of the lifting motor brake.

(4) Referring to Figure A, install the lead wires of the lifting motor harness (for 200 V: two each of red, white, and black; for 400V: one each of red, white, and black).

[10mm]

Torque

M6 torque setting: 5.5N•m

(5) Referring to Figure A, secure the ground wire (green/yellow) inside the terminal box using a round head screw and spring lock washer.

Torque

M5 torque setting: 2.5N•m

Figure A

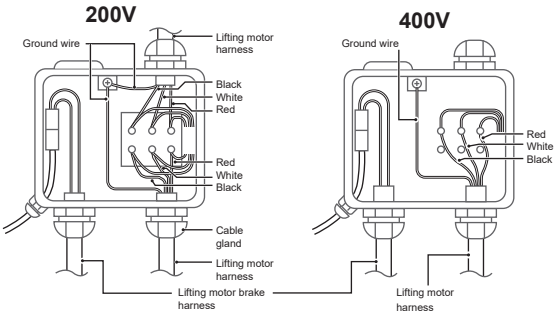
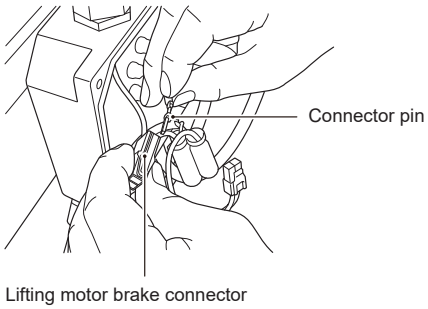


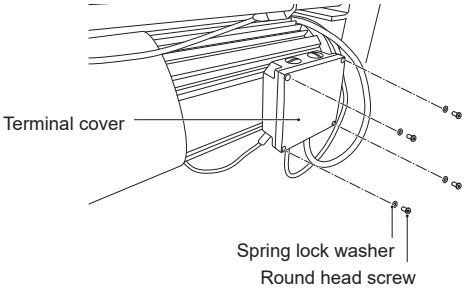
Figure B



(6) Secure the terminal cover using round head screws and spring lock washers (four locations for each).

Torque

M5 torque setting: 2.5N•m

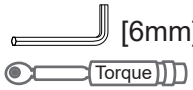


7. Idle Sheave

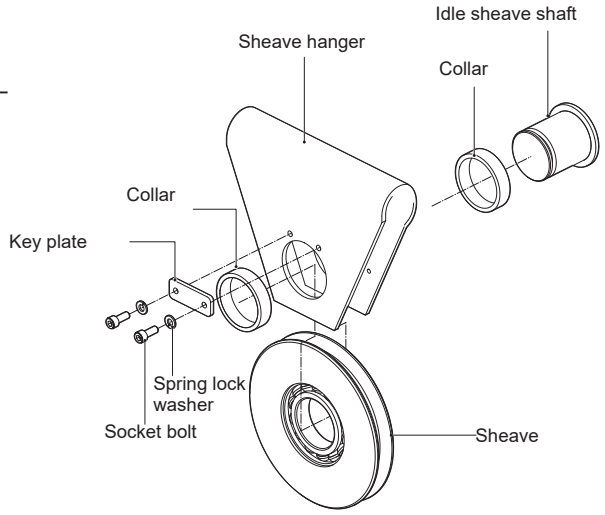
■ Assembling the idle sheave

(1) Slide a collar, a sheave hanger, and then a sheave onto the sheave shaft, in that order.

(2) Align the key plate to the groove on the sheave shaft, and then secure using socket bolts and spring lock washers (two locations for each).

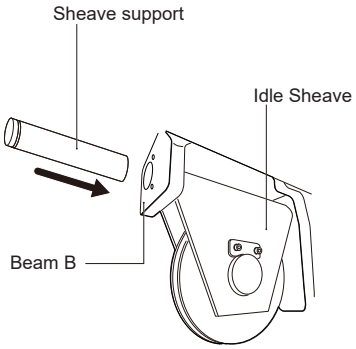


M8 torque setting: 18N•m

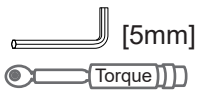


■ Assembling the idle sheave

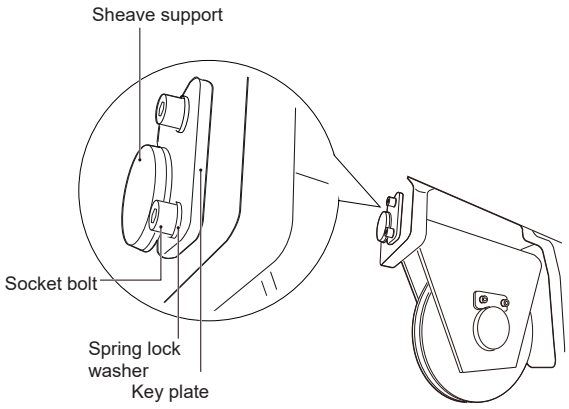
(1) While supporting the idle sheave to prevent it from falling, insert the sheave support into the hole in beam B and install the idle sheave.



(2) Align a key plate to the groove on the sheave support, and then fix it in place by using two socket bolts.



M6 torque setting: 8N•m

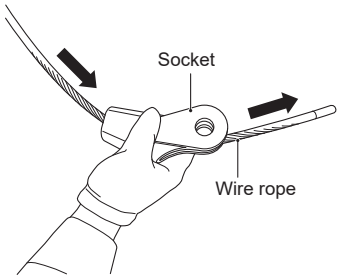


8. Anchorage

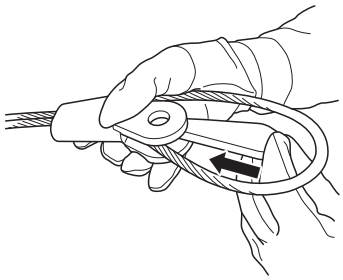
■ Assembling the anchorage

(1) Draw a wire rope through a sheave hanger. Pay attention to the position of the socket (remember to draw a wire rope through the side that has no R attached to it).

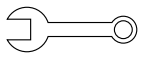
(2) Insert a cotter.



(3) Draw a wire rope through a gap between the cotter and the socket.

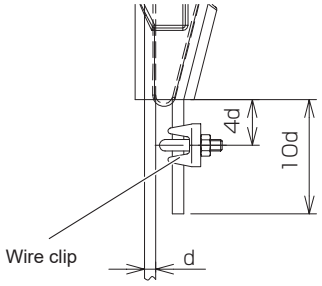


(4) Secure a wire clip to the rope end.


[19mm]

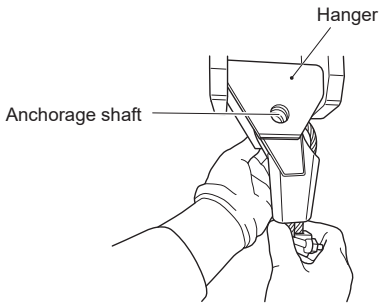
M14 torque setting: 13N•m

- The distance between the lower end of the sheave hanger and the position of the secured wire clip must be four times the wire rope diameter. Furthermore, the length of the wire rope extending beyond the wire clip must also be four times the wire rope diameter. Pull hard on the rope to prevent the cotter from coming loose.

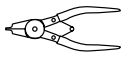


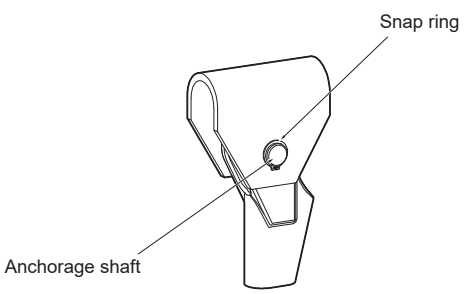
(5) From the inner side, insert an anchorage shaft into the part fixing the rope end in place on the main unit.

- Remove kinks from the wire rope, and then with the sheave hanger positioned as shown in the figure to the right, insert it into the hanger.



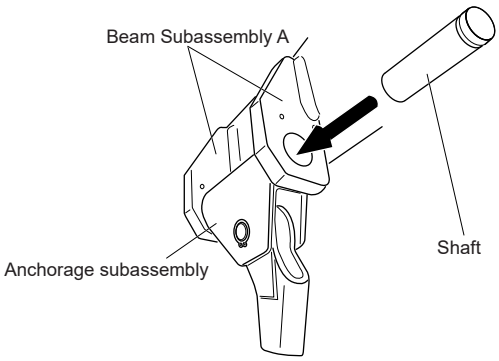
(6) Install a snap ring to the anchorage shaft.



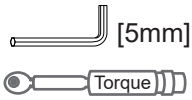


■ Installing the anchorage

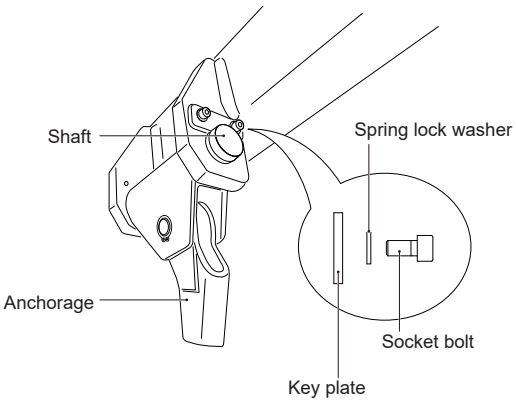
(1) Install the shaft of the anchorage to Beam Subassembly A and the anchorage subassembly.



(2) Align a key plate to the groove on the shaft of the anchorage, and then fix it in place by using two socket bolts and two spring lock washers.



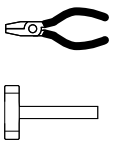
M6 torque setting: 8N•m

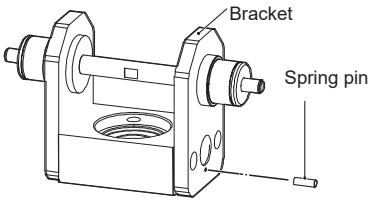


9. Hook Block

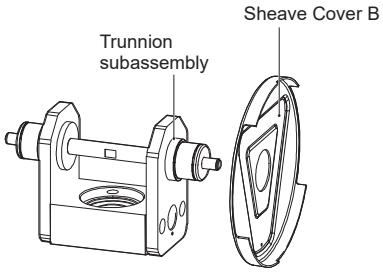
■ Assembling the hook block

(1) Press the spring pin into the bracket.

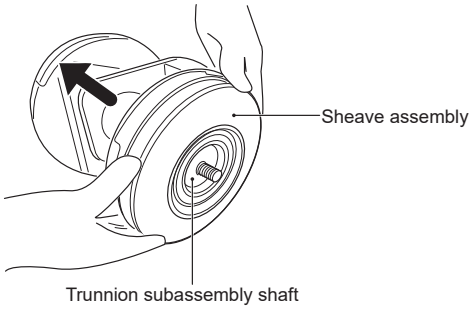




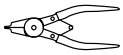
(2) Install the sheave cover B onto the trunnion subassembly.

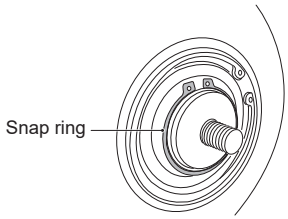


(3) Install the sheave assembly on the trunnion subassembly shaft.



(4) Secure the sheave assembly with a snap ring.



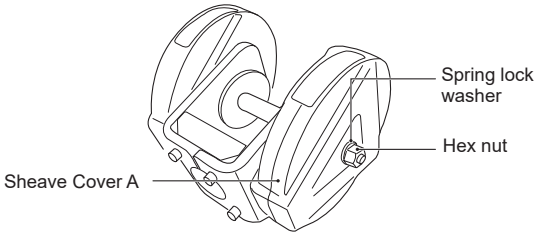


(5) Install the sheave cover A.

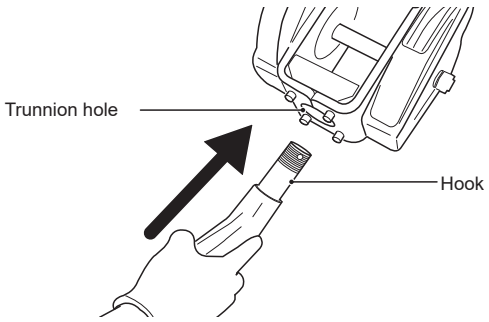
(6) Secure the sheave cover A using a hex nut and spring lock washer.


[30mm]

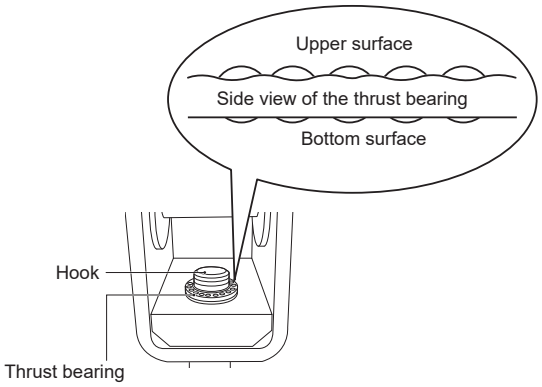
M20 torque setting: 300N•m



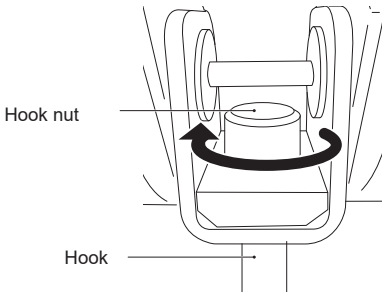
(7) Insert the hook into the trunnion hole.



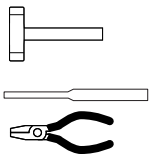
(8) Install the thrust bearing on the hook.
- Make sure that the bearing is correctly positioned when you fit it onto the hook.

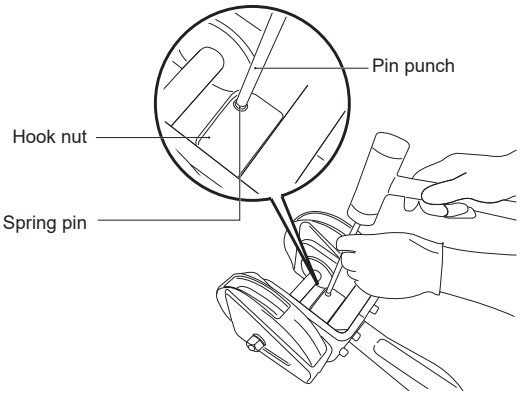


(9) Secure the hook with the hook nut.
- Confirm that the hook turns.



(10) Align the hole on the hook nut with the hole on the hook, and secure them with a spring pin.





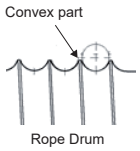
(11) Install all the parts on the opposite side as well by following the same procedure.
- Follow steps (5) through (10).

10. Installing the Wire Rope

⚠ WARNING

Mandatory

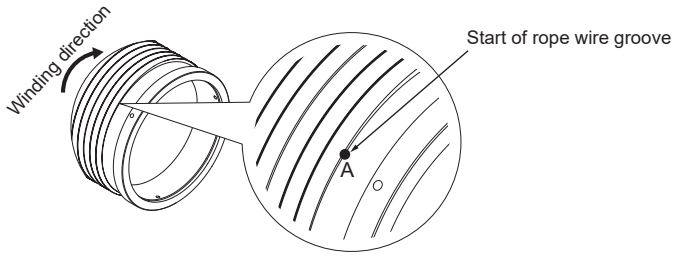
- **Wind the Wire Rope following the wire rope groove on the Rope Drum.**
  Winding the Wire Rope over the convex part of the wire rope groove (refer to the figure on the right) will not only impair the proper functionality and performance of the Wire Rope Hoist, but could also cause the Wire Rope Hoist to malfunction, resulting in a serious accident.



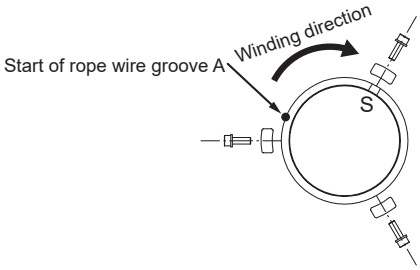
(1) Unpack the Replacement Wire Rope. Straighten the Replacement Wire Rope into a straight untwisted line in a wide space.
- Note: Replace the Wire Rope in a straightened state. If the Wire Rope is installed in a twisted state, it moves violently or floats away from the Rope Drum when wound on it.

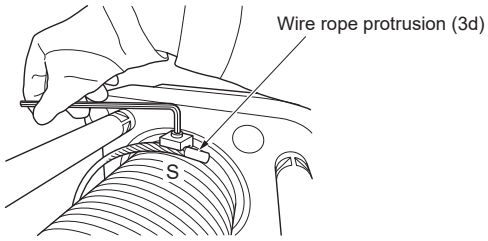
(2) Fix the end of the Wire Rope to the Rope Drum with the socket bolt and Wire Clamp.

2-1. Check the position where you will first fix the Wire Rope.
- Check the location where the rope wire groove begins. (Refer to the figure below.)



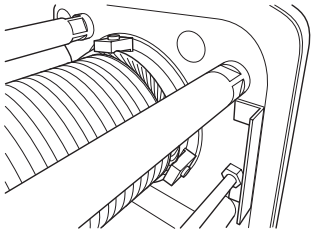
- The tapped hole closest to the start of the wire rope groove (A) in the winding direction is the position where you will first fix the Wire Rope (S). (Refer to the figure below on the left.)





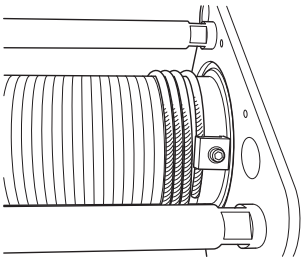
2-2. Use the Wire Clamp to fix the Wire Rope in the position (S) you checked in Step 2-1. (Refer to the figure above on the right.)
The amount that the Wire Rope protrudes from the Wire Clamp must be approximately three times the wire rope diameter.
Tightening torque: 18 N-m (in all three locations)

(3) Perform the lifting operation to rotate the Rope Drum slowly by approximately 120 degrees, and then fix the Wire Rope at the next position.



(4) In the same manner as (3), fix the Wire Rope to the remaining position. (The Wire Rope must be fixed to three positions in total.)

(5) After fixing the Wire Rope, rotate the Rope Drum slowly, and place the Wire Rope in the Rope Drum's groove from the groove's start point. When doing so, lightly pull on the Wire Rope while rotating the Rope Drum in the lifting direction to prevent the Wire Rope from floating as you place the Wire Rope in the groove of the Rope Drum.



(6) Wind the Wire Rope around the Rope Drum to some extent, and then apply grease to the locations below.

Grease:

Wirol R or Wirol Aerosol R (TOKYO ROPE MFG. CO., LTD.)

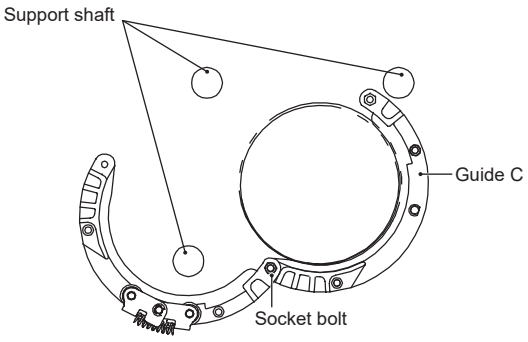
Applied locations:

- Roller part of the Rope Guide
- Convex part engaged with the Rope Drum
- Rope Drum groove

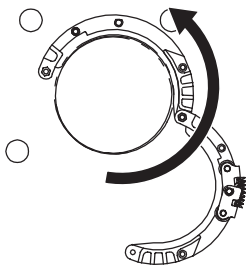
For details about the Rope Guide structure, refer to page 11.

(7) Attach the Rope Guide to the Rope Drum by following the procedure described below.

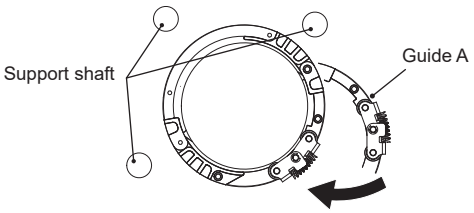
7-1. Loosely connect Guide A to Guide C with a socket bolt, and place Guide C along the Rope Drum as shown in the figure on the right.



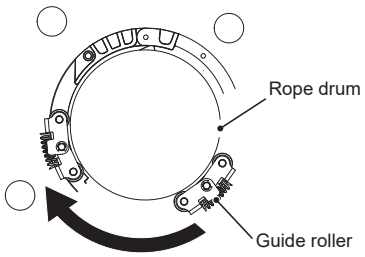
7-2. As shown in the figure on the right, rotate Guide A and Guide C along the Rope Drum with Guide C placed along the Rope Drum.



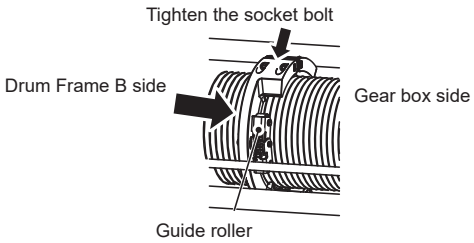
7-3. Remove Guide C from the Rope Drum at a position where Guide C has no interference with the Support Shaft.



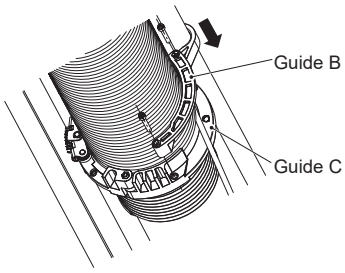
7-4. As shown in the figure on the right, rotate Guide A and Guide C along the Rope Drum using the Guide Roller as a guide.



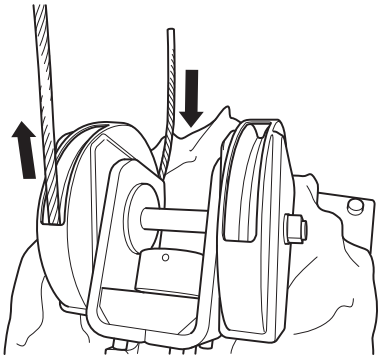
(8) Move Guide A toward the Reduction Gear side until its Guide Roller lies on the Wire Rope on the Rope Drum, and tighten the socket bolt.
Next, retighten the socket bolt you loosely connected Guide A to Guide C in Step 7-1.
(Tightening Torque : 6 N•m)



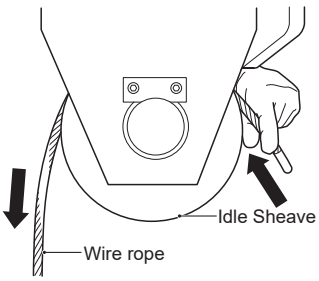
(9) Hook the Guide B on the Support Shaft as shown in the figure and fasten the Guide B with socket bolts.
(Tightening Torque : 6 N•m)
Pay attention to attach the Guide B so that the Wire Rope comes out from the gap between the Guide C and Guide B.



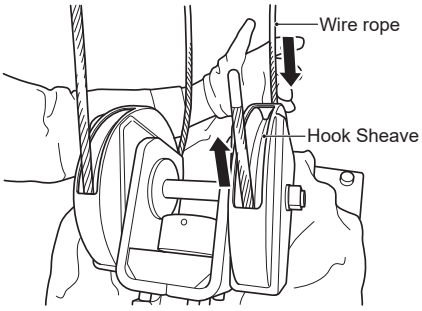
(10) Paying attention to a passing position, pass the rope end through the Hook Sheave.



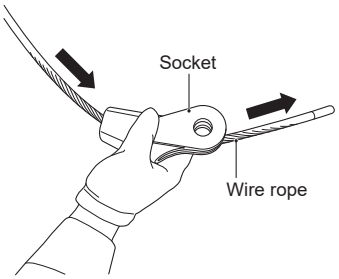
(11) Paying attention to a passing position, pass the Wire Rope through the Idle Sheave.



(12) Pass the Wire Rope through the other Hook Sheave of the Hook Block.

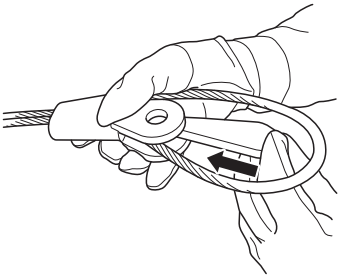


(13) Draw a wire rope through a socket. Pay attention to the position of the sheave hanger (remember to draw a wire rope through the side that has no R attached to it).

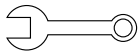


(14) Insert a cotter.

(15) Pass the Wire Rope from the gap between the cotter and the socket.

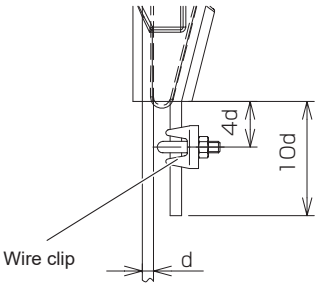


(16) Secure a wire clip to the rope end.



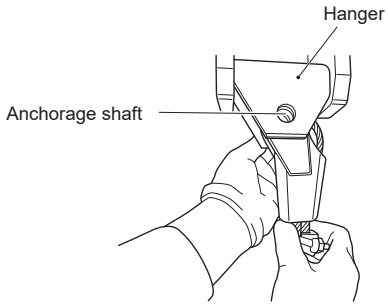
M14 torque setting: 13N•m

- The distance between the lower end of the sheave hanger and the position of the secured wire clip must be four times the wire rope diameter. Furthermore, the length of the wire rope extending beyond the wire clip must also be four times the wire rope diameter. Pull hard on the rope to prevent the cotter from coming loose.

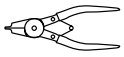


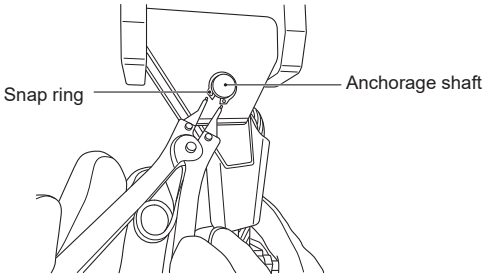
(17) From the inner side, insert an anchorage shaft into the part fixing the rope end in place on the main unit.

- Remove kinks from the wire rope, and then with the sheave hanger positioned as shown in the figure to the right, insert it into the hanger.



(18) Firmly fix the tip of the fixed end shaft with the snap ring.





⚠ WARNING

Mandatory

- **After replacing the Wire Rope, check that the Rope Guide moves smoothly under no load, and the Wire Rope moves without obstruction.**

  Failure to comply with this instruction may not only result in failure to obtain normal function and performance of the hoist, but may also cause failure of the hoist and may lead to serious accidents.

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