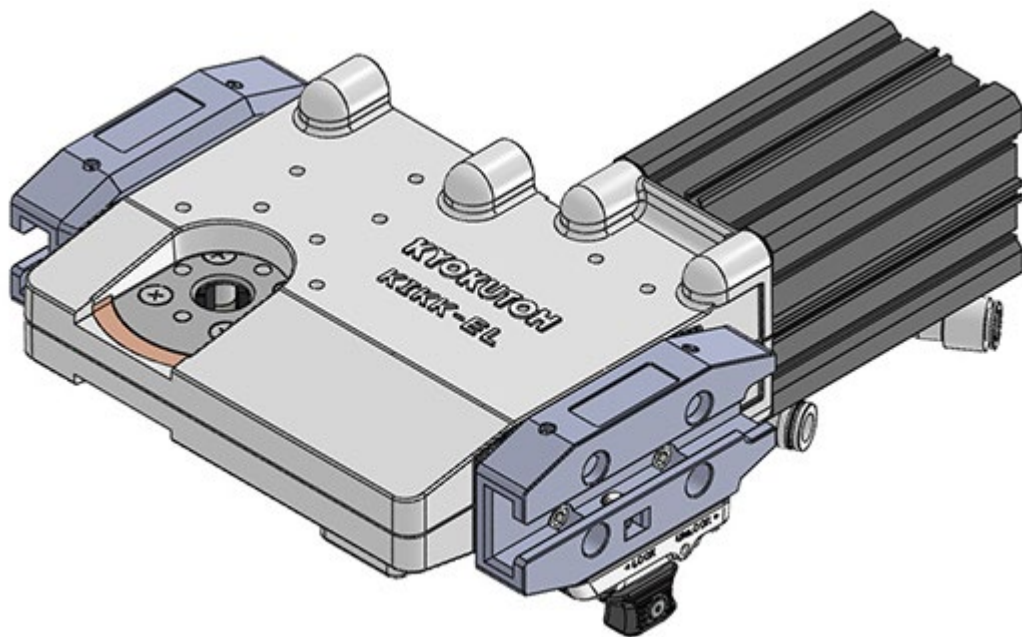


# Tip Changer (KIKK-EL\*\*X) Instruction Manual

Please read this instruction manual carefully  
before operating this unit and use our product correctly.  
After reading this instruction manual, be sure to keep it in a place where a person  
who uses or manages the equipment can check it at any time.



# REVISION

## Revision history

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Version	Date	Contents
First edition	03.06.2022	First edition issue
Revised edition	22.02.2023	Correction of required number of nails
Revised edition	28.03.2023	Correction of "Contact"
Revised edition	02.04.2024	Correction of "Mounting hole dimensions"
Revised edition	04.04.2024	Adapter block changed to sliding type

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# 1. Safety Precautions

## ■Introduction



This Tip Changer, KIKK-EL\*\*X series is designed to exchange damaged electrodes (hereinafter called cap tips) for new tips in car production line. Please do not use for any purpose other than described in this manual. We are not able to take a responsibility for any damage or injury caused by results other than specified in this manual.

After reading, please the manual to the place  
where you can check the manual.

## ■Regarding Signs

 Warning	It indicates contents informing possibilities of death or serious injury in case of incorrect handling.
 Caution	It indicates contents informing possibilities of injury due to handling error or occurrence of material damages.
	This symbol indicates operations that should not be done.
	This symbol indicates operation that should be done.

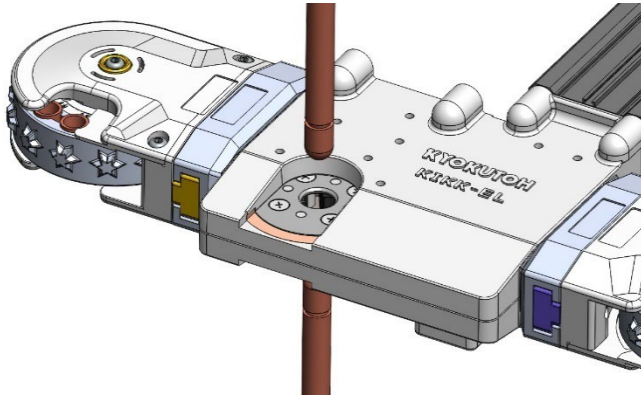
## ■ Handling precautions

	<ul style="list-style-type: none"><li>• <b>Never disassemble or modify.</b> →It may cause injury or operation failure.</li><li>• <b>Do not put this unit in liquid or spill too much liquid (over 70 ml/min, longer than 10 min) such as water.</b> →This could result in malfunction.</li><li>• <b>Do not insert anything other than the welding tip to the rotating part.</b> →Can be a cause of malfunction and injury.</li><li>• <b>Do not rotate in a way that is not described.</b> →Can be a cause of damage and injury.</li><li>• <b>Be sure to protect air pipe from any kinds of damages.</b> →Damaged pipe could result in malfunction.</li><li>• <b>Keep hands away from opening part during operation.</b> →May be a cause of injury.</li><li>• <b>Do not insert metallic articles such as a pins or needles in rotating part or opening part during operation.</b> →This could result in operation malfunction or electrical shock.</li><li>• <b>Do not tilt this machine more than 45 degree when installing or operating.</b> →This could result in operation malfunction and injury.</li><li>• <b>Please do not use chlorine-based or acidic cleaner for cleaning the main body.</b> →Toxic gas generated from the cleaner may harm your health.</li><li>• <b>Do not put undersigned tips in magazine.</b> →Incorrect tips type will cause malfunction and damage.</li><li>• <b>Stop air supply before "exchange cylinder, spring or nails" or "remove unit" or "robot teaching".</b> →This could result in serious injury.</li></ul>
	<ul style="list-style-type: none"><li>• <b>Firmly fix this unit to stand.</b> →Unstable installation causes imbalance tip setting or accident.</li><li>• <b>Remove alcohol or thinner properly after maintenance.</b> →The flying sparks can cause fires or explosions.</li><li>• <b>Protect air pipe from spatter.</b> →The flying spatter causes air leak due to melting pipe.</li><li>• <b>Remove spatter which covers tip remover periodically.</b> →Spatter build-up can cause operation malfunction.</li></ul>

## 2. Preparation

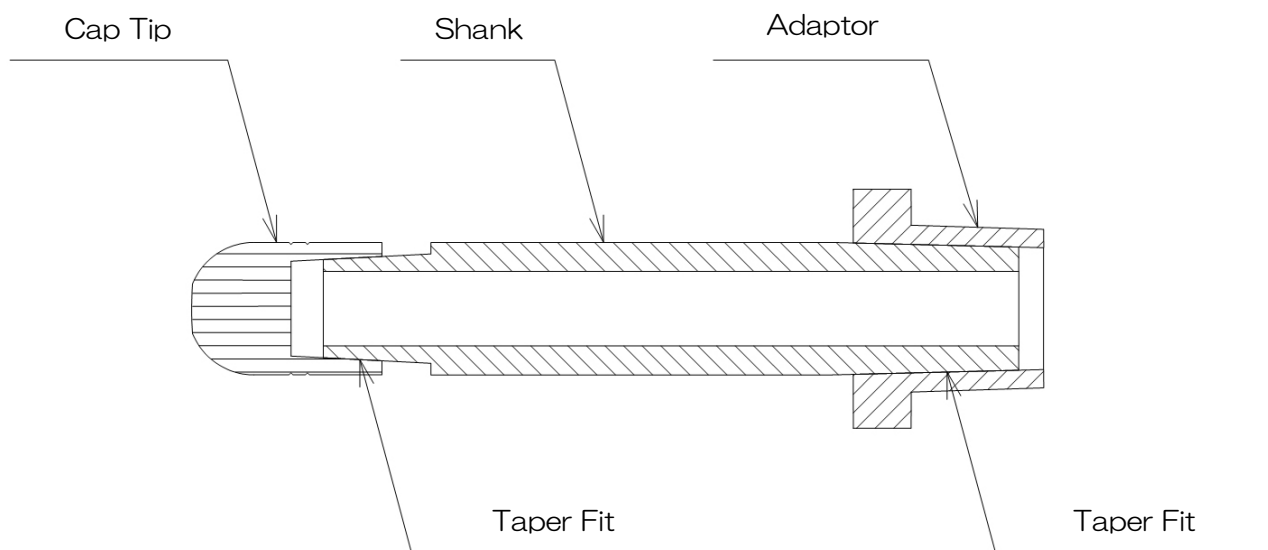
### ■Attention

This product is used when mounting and removing cap tip with robot gun.



### ■Mandatory fixing for a shank and an adaptor

Make sure a shank and an adaptor are fixed well before removing a cap to achieve a proper cap removing.



If it is hard to fix, take off an adaptor and a shank and hit the shank into the adaptor with paying attention not to hurt the taper then restore it on a gun.

If a taper on the shank or the adaptor is worn out or damaged, it is required to replace the shank or the adaptor.

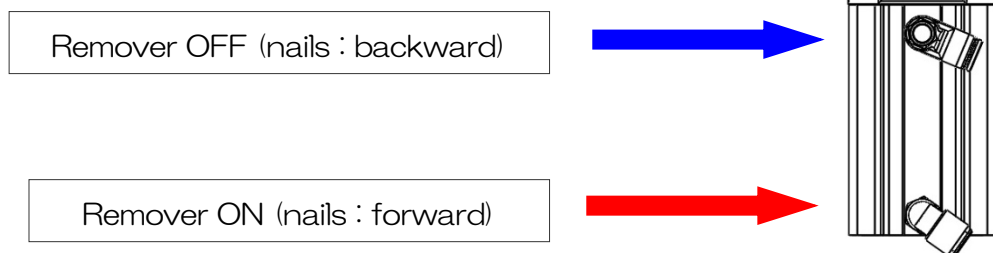
It may cause a tip remove failure if a process above is not completed properly.

## ■ How to install

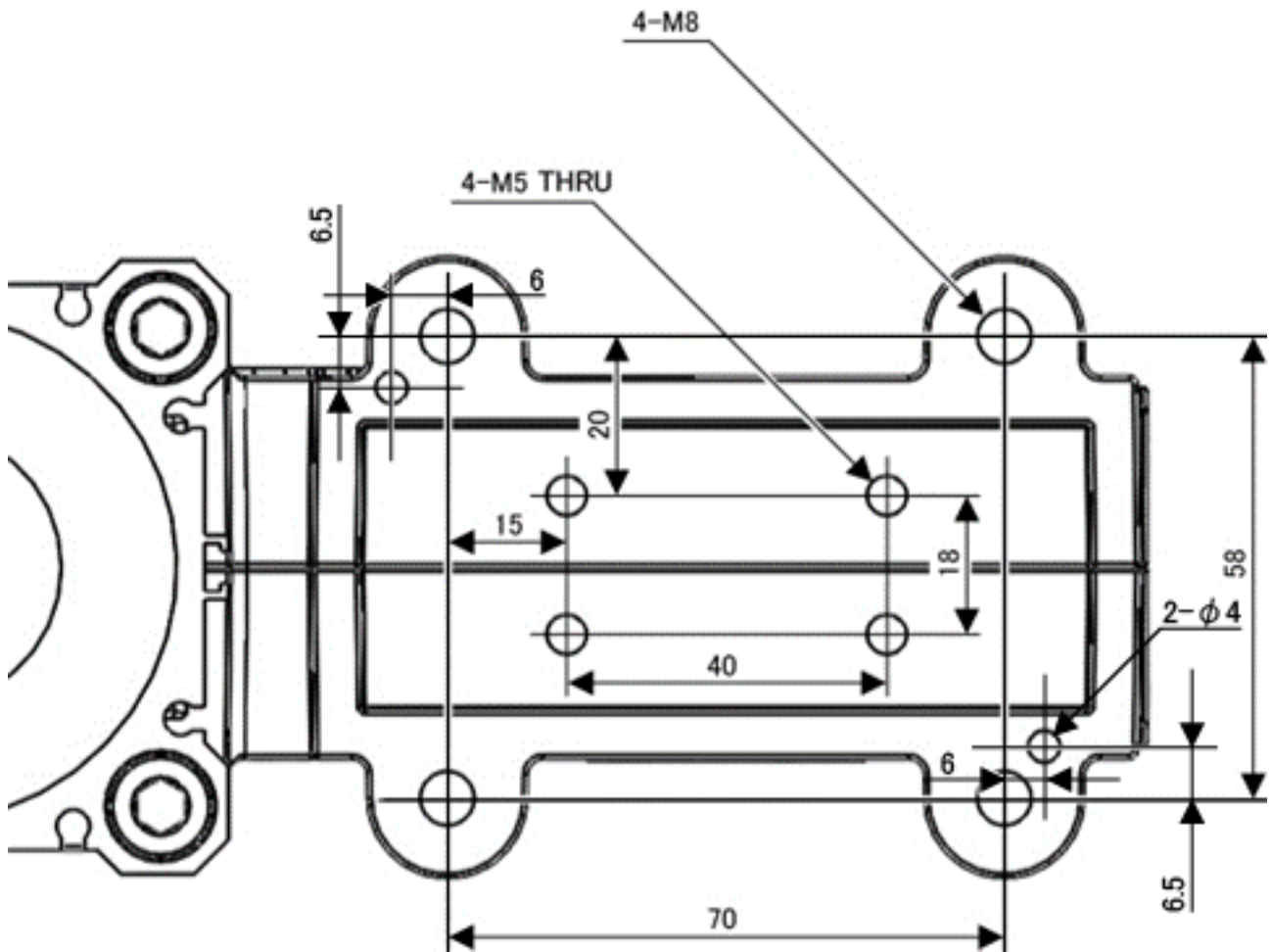
1. Install this machine in the area where welding robot can reach.  
(Please refer to the following drawing for the dimension of the installation plate.)
2. Firmly fix tip changer with four M8 cap bolts.  
(The stand must be solid and fixed.)
3. Set the air filter to the air supply circuit.
4. Connect air cylinder to air hose, and place the spatter collecting case ahead  
(Hose and hose band can be included as options).
5. Required Air Pressure more than 0.5 MPa.
6. Installation place must be where spatter and cooling water do not directly fall down as much as possible.
7. Remove dust or foreign substances from the body when they are caught in the body. When cleaning inside, please disassemble.
8. Please make sure that the magazine is securely fastened before use. Also, make sure that the magazine model being used is correct.
9. Please make sure that the cap tip is loaded in the magazine, or the cap tip is used correctly.

## ■ How to install the air hose

Refer to the figure on the right for connection.



## ■ Mounting hole dimensions



## ■ Specification

Model	KIKK-EL**X
Outer dimension (without magazine)	281W × 296D × 97H
Air pressure	0.5 (MPa)~
Weight (without magazine)	About 6.0 (kg)
Reference Weight (with magazine)	About 7.5 (kg)
Mounting hole	H70 × V58 (M8 × 4)
Mounting area	H100 × V78 (mm)
Remover unit thickness & depth	T24 (mm) D49 (mm)
Cylinder model	CDQ2B-63-75DCM-M9BA
Thrust	About 1560 (N)



## ■ Conditions for Spot Gun

### 1. For C gun

Conditions to use KIKK-EL\*\*X for C gun. (Straight x Straight)

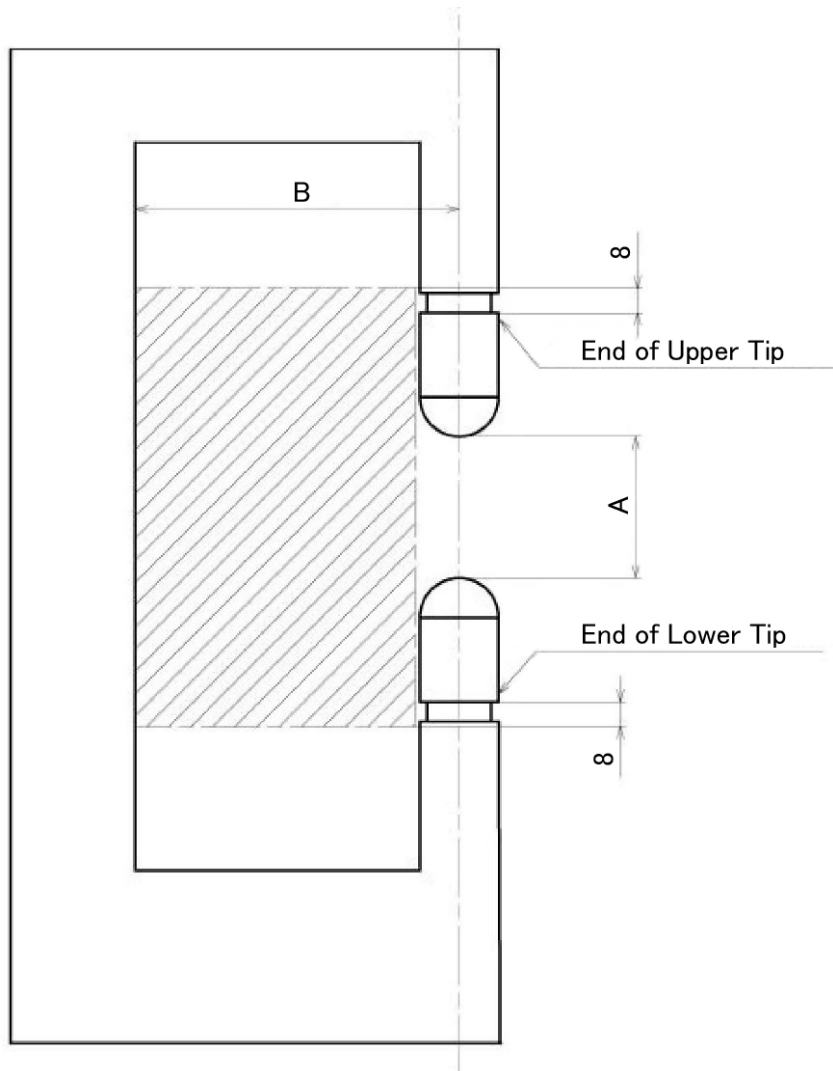
#### Dimension A should be

- To remove tip : 29mm or over
- To set tip : 30mm or over (for 1623)

#### Dimension B should be

- To remove tip : 54mm or over
- To set tip : 15mm or over (for 1623)

※Nothing should disturb in a shadow area in the figure above.



2. For X gun

Conditions to use KIKK-EL\*\*X for C gun. (Straight x Straight)

Dimension A should be

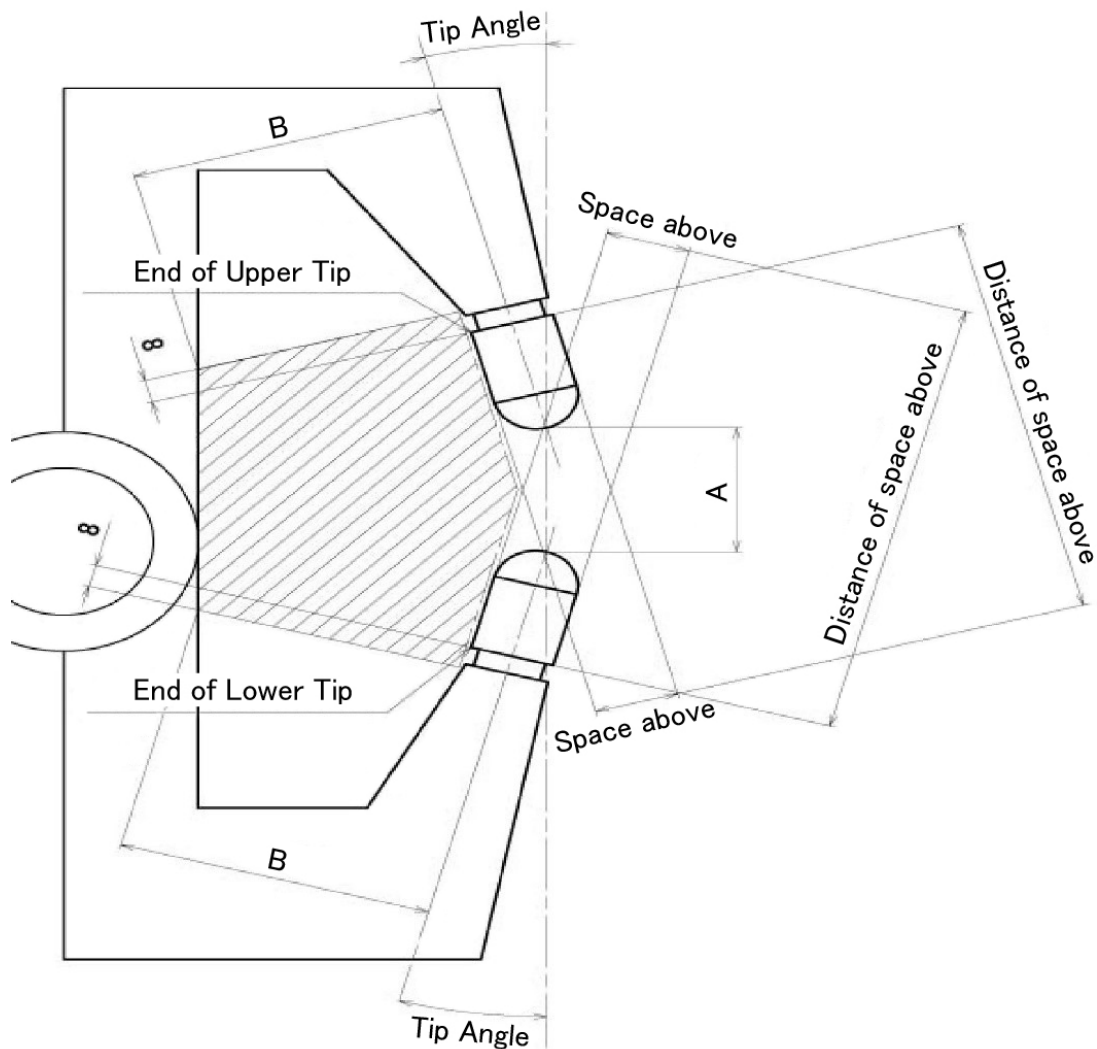
- To remove tip : 29mm or over
- To set tip : 30mm or over (for 1623)

Dimension B should be

- To remove tip : 54mm or over
- To set tip : 15mm or over (for 1623)

Tip angle should be less than 15 degrees.

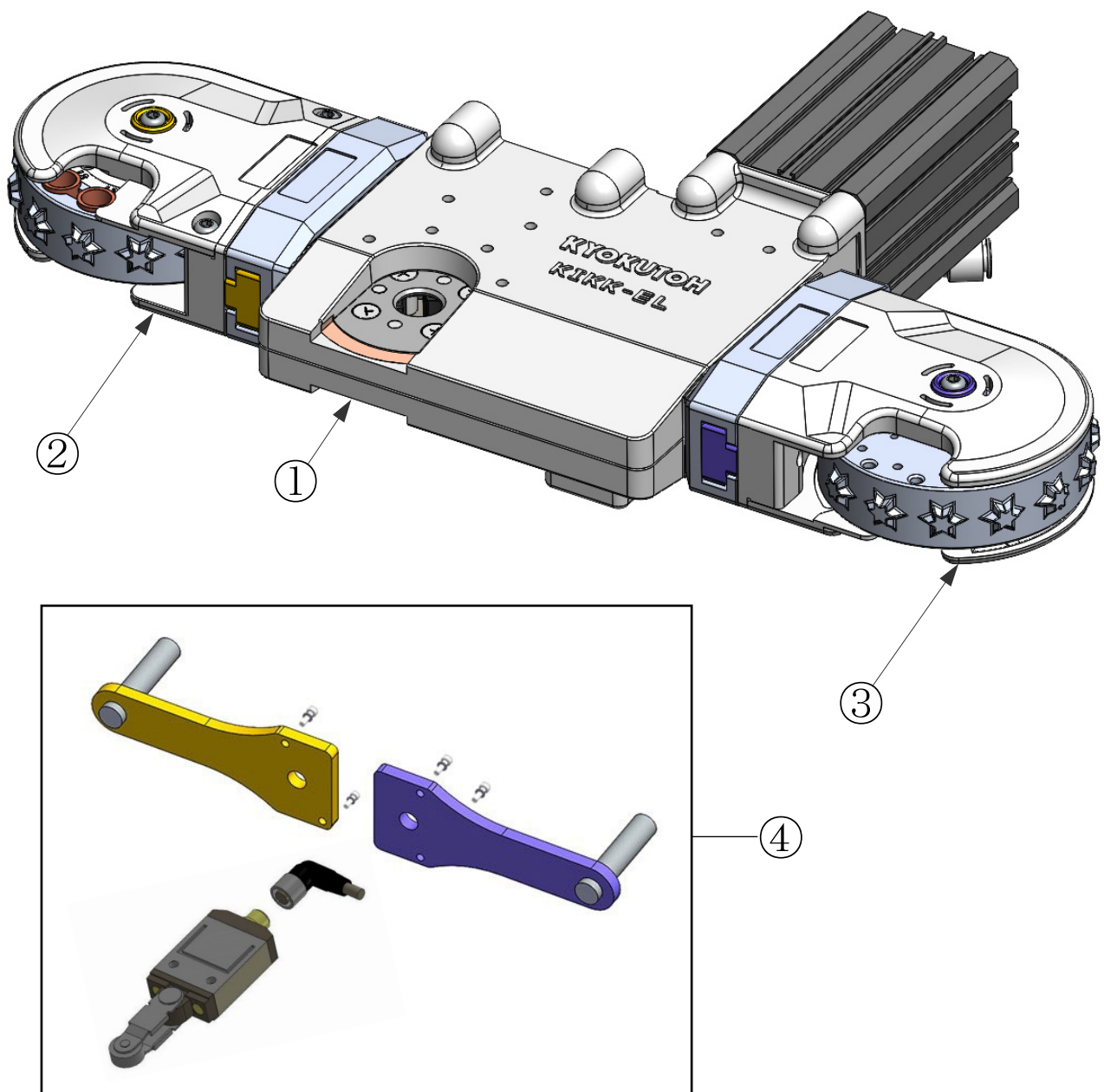
※Nothing should disturb in a shadow area in the figure above.



# 3. Name of Each Part

## ■Name list

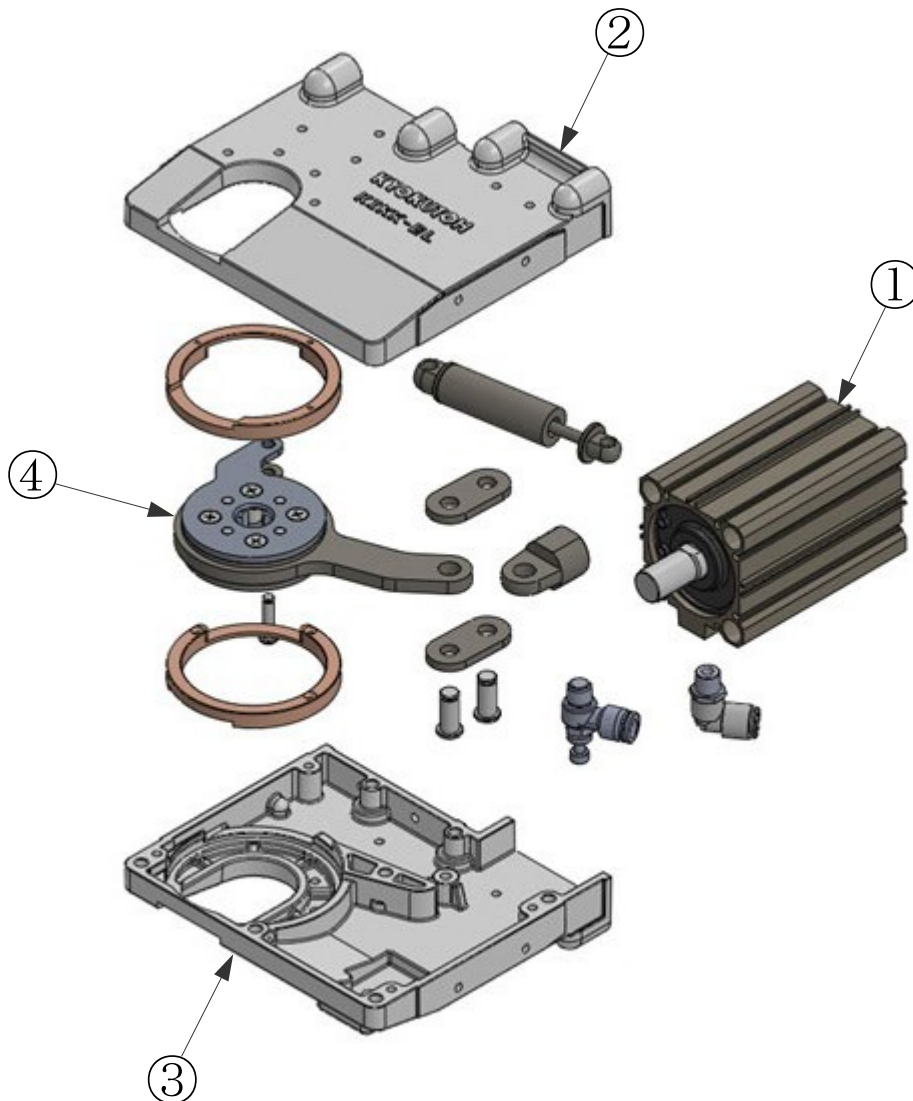
No.	Name	Model	QTY
1	KIKK-EL**X Body	KIKK-EL**X	1
2	Upper side Magazine	XR-****-U <i>(Refer to the manual of XR)</i>	1
3	Lower side Magazine	XR-****-L <i>(Refer to the manual of XR)</i>	1
4	Sensor Pac (Option)	KIKK-ELX-SE-Pac	1



## 4. Parts List

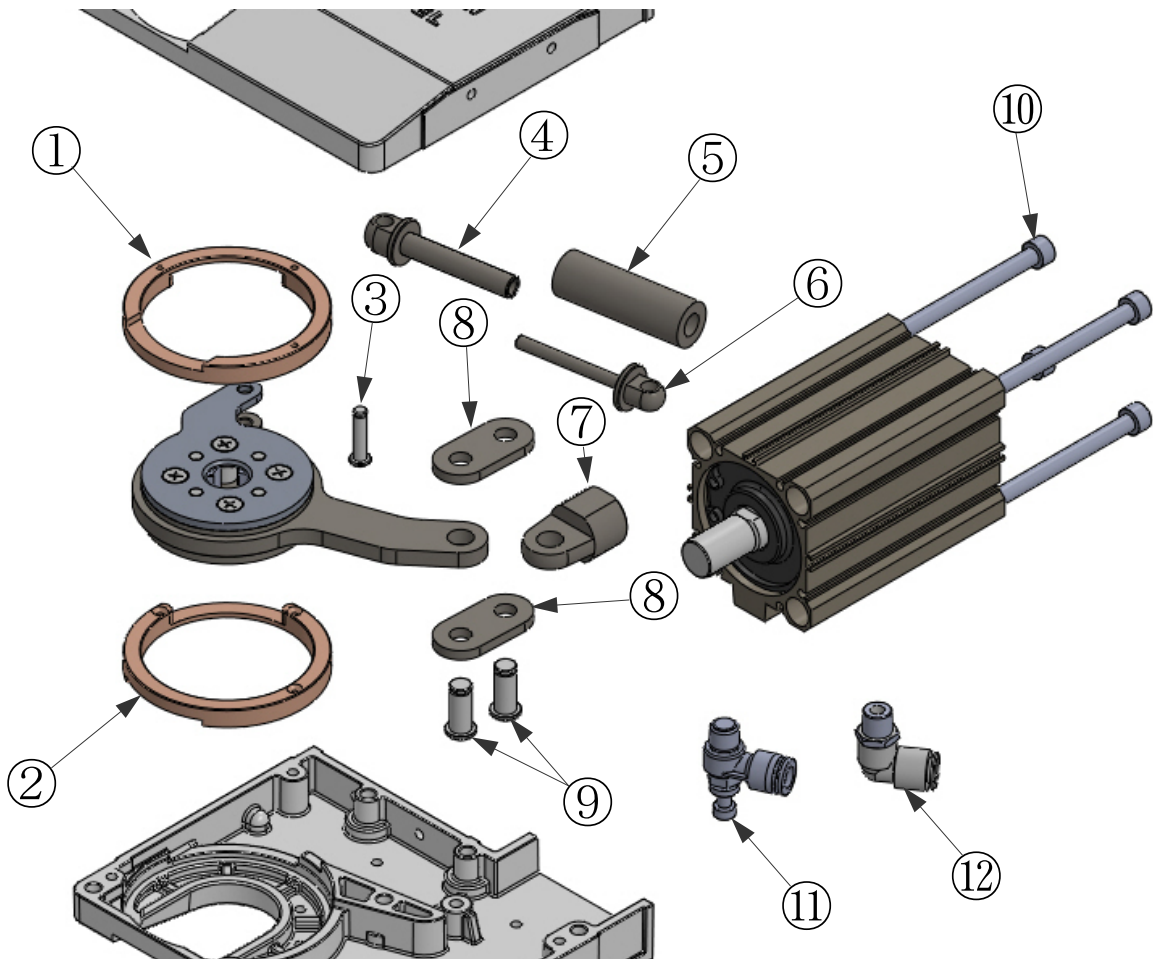
### ■ KIKK-EL\*\*X Appearance

No.	Name	Model	QTY
1	Cylinder	CDQ2B-63-75DCMZ-M9BA	1
2	Upper body	KIKK-EL20-P-013-DC	1
3	Lower body	KIKK-EL20-P-014-DC	1
4	Remover unit	KIKK-EL-ReU-TYPE-13 (for $\phi 13$ )	1
		KIKK-EL-ReU-TYPE-16 (for $\phi 16$ )	1
		KIKK-EL-ReU-TYPE-19 (for $\phi 19$ )	1
		KIKK-EL-ReU-TYPE-20 (for $\phi 20$ )	1



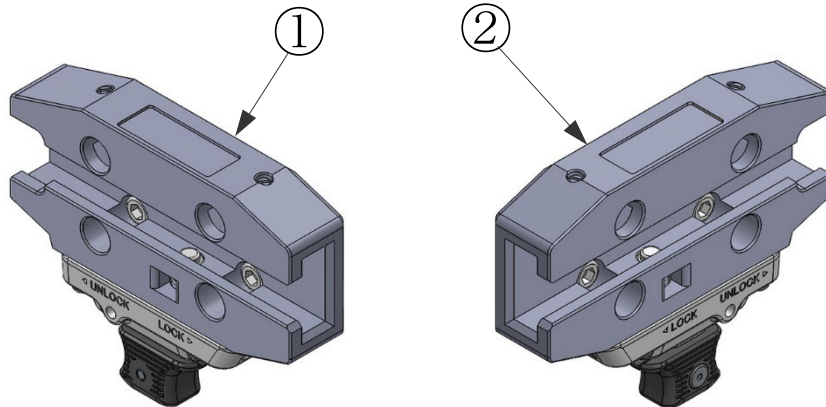
■KIKK-EL\*\*X Internal

No.	Name	Model	QTY
1	Upper bush	KIKK-EL20-P-006U	1
2	Lower bush	KIKK-EL20-P-006L	1
3	Remove shaft 3	KIKK-EL20-P-009	1
4	Spring guide A	KIKK-EL20-P-007	1
5	Spring	51-22100	1
6	Spring guide B	KIKK-EL20-P-008	1
7	Knuckle joint	KIKK-EL20-P-012	1
8	Arm ring plate	KIKK-EL20-P-011	2
9	Remove shaft 4	KIKK-EL20-P-010	1
10	Cylinder fixing bolt	CQ2B-M8*125L	4
11	Speed controller	AS2201F-02-10SA	1
12	Tubing	KQ2L10-02AS	1



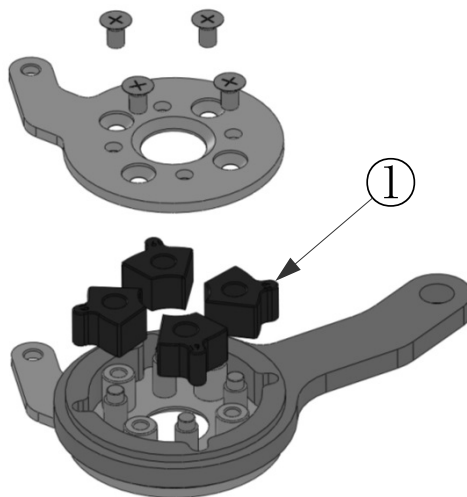
### ■ Adapter block

No.	Name	Model	QTY
1	Upper side adapter block	XR-ADB-SLIDE-YL	1
2	Lower side adapter block	XR-ADB-SLIDE-BL	1

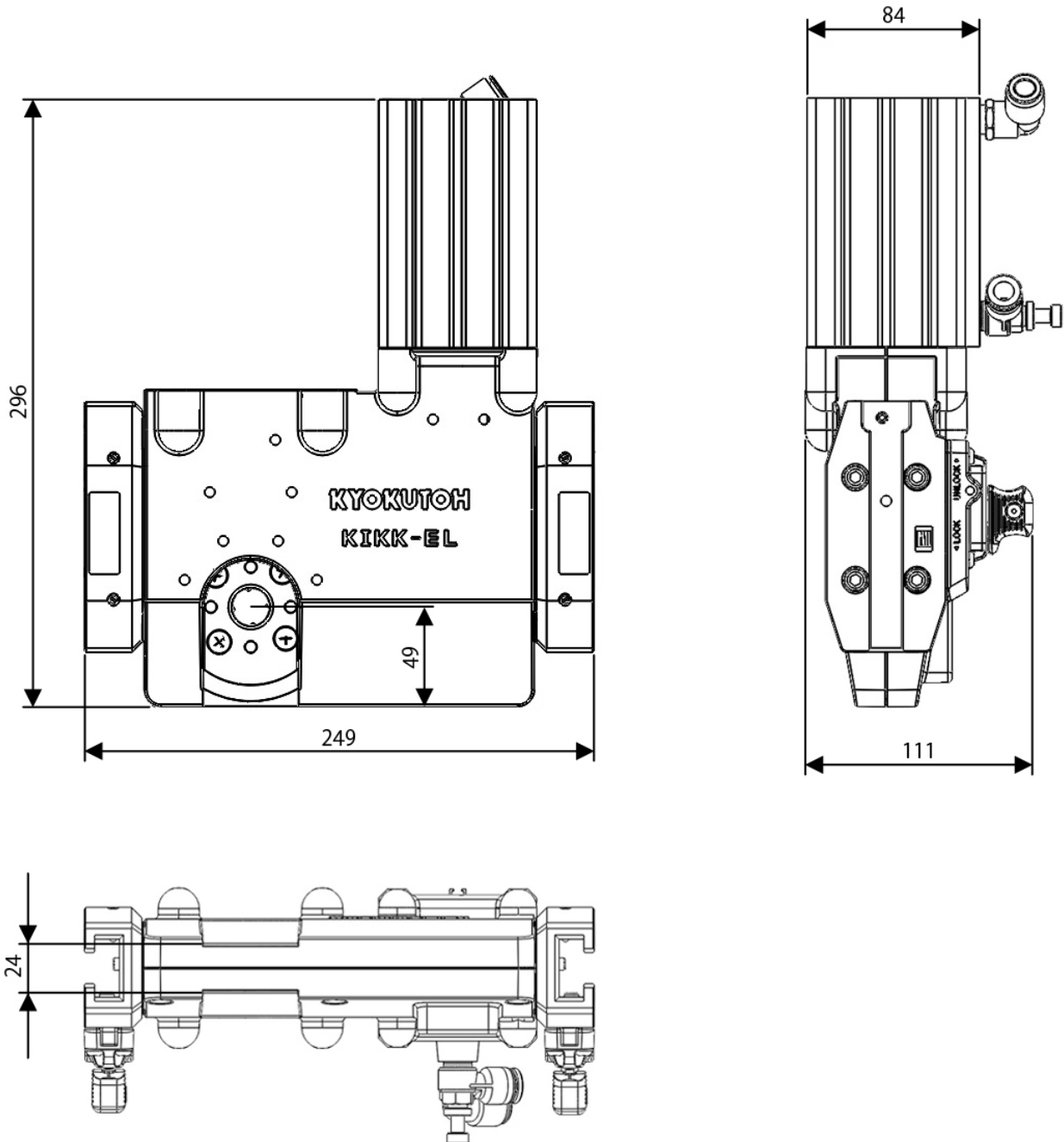


### ■ Remover unit

No.	Name	Model	QTY
1	Nails	KIKK-EL13-P-001-13 (for $\phi 13$ )	1
		KIKK-EL16-P-001-16 (for $\phi 16$ )	1
		KIKK-EL19-P-001-19 (for $\phi 19$ )	1
		KIKK-EL20-P-001-20 (for $\phi 20$ )	1



## 5. External Dimension Diagram





## 6. Example of Operation

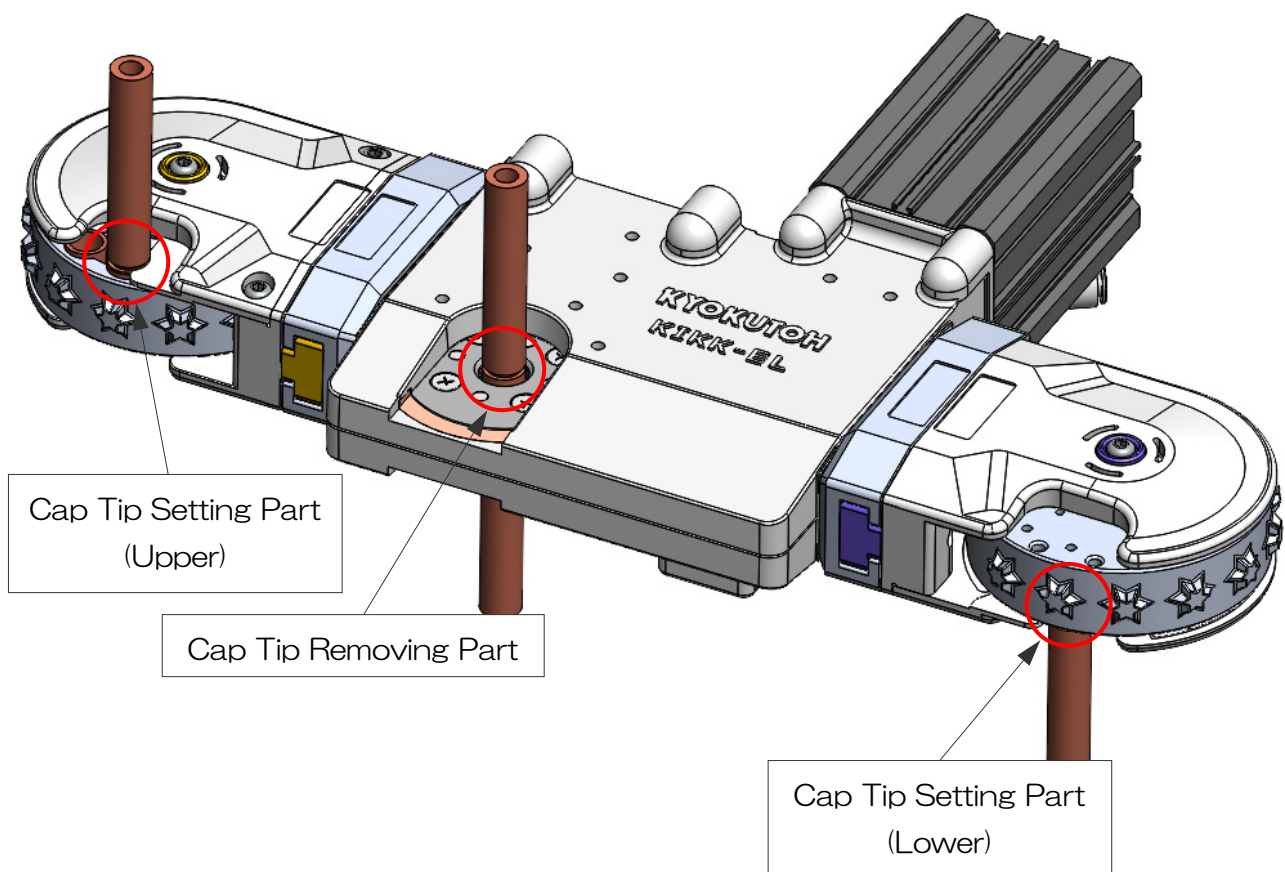
### ■Cautions and preparation before operating

- Make sure that the machine is fixed on stand tightly.
- Confirm the shank is joined tightly to the gun arm.  
Please refer to 「P4. Mandatory fixing for a shank and an adaptor」
- Confirm the connection of the air supply.
- Check air cylinder operation and checking rotation movement.

※Test driving also possible.

※Test driving is dangerous, so please do not touch it.

### ■Tip position for setting and removing





## ■ Example of operation

※Please start from the welding power supply OFF/stopped cooling water.

※This is an example of operation when used with the switchboard of our company.

1. Start tip exchange • insertion operation.



2. Confirm the presence of the upper and lower magazines • the presence of the cap tip with "proximity sensor".

※The proximity sensor is assembled in the adapter block on Tip Changer.



3. Move a lower side of robot gun to cap tip removal position.



4. Remove the lower side cap tip. ※Be sure to remove the cap tip from the lower side.



5. Check the removal of the lower side cap tip with sensor (Option) on the Tip Changer.



6. Move the lower side of the robot gun to cap tip insertion position.



7. Insert the lower side cap tip. ※Recommended Pressure: 150kgf



8. Move the robot gun back to pull out a cap tip.



9. Check the insertion of the lower side cap tip with sensor (Option) on the Tip Changer.



10. Move the upper side of the robot gun to removal position.



11. Remove the upper side cap tip. ※Be sure to remove the cap tip from the lower side.



12. Check the removal of the upper side cap tip with sensor (Option) on the Tip Changer.



13. Move the upper side of robot gun to removal position.



14. Insert the upper side cap tip. ※Recommended Pressure: 150kgf



15. Move the robot gun back to pull out a cap tip.



16. Check the insertion of the upper side cap tip with sensor (Option) on the Tip Changer.



17. Complete the cap tip exchange • insertion operation.

## 7. Robot Teaching

### ■Items to be confirmed before robot teaching

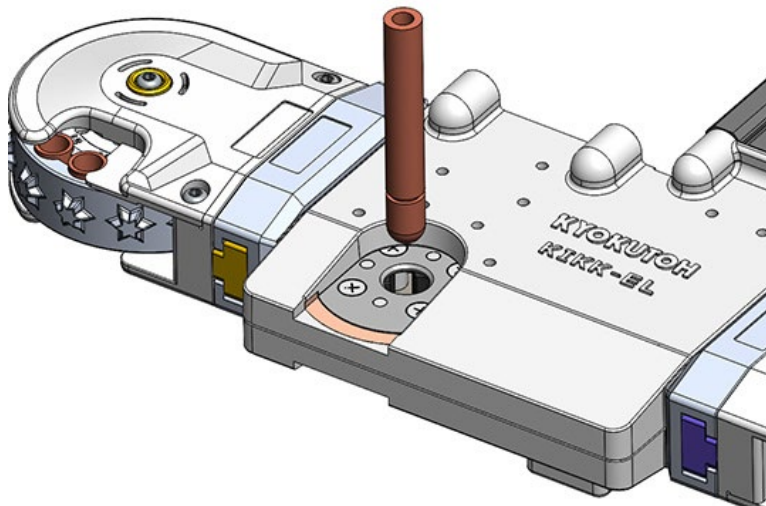
- Is the horizontal and the vertical of the robot gun correct?
- Are the shapes of the magazine and cap tip appropriate?
- Is the tip loaded in the magazine?
- Is the magazine firmly fixed and does not move?
- Is the shank joined tightly to the gun arm?

Please refer to 「P4. Mandatory fixing for a shank and an adaptor」

### ■Removing cap tip

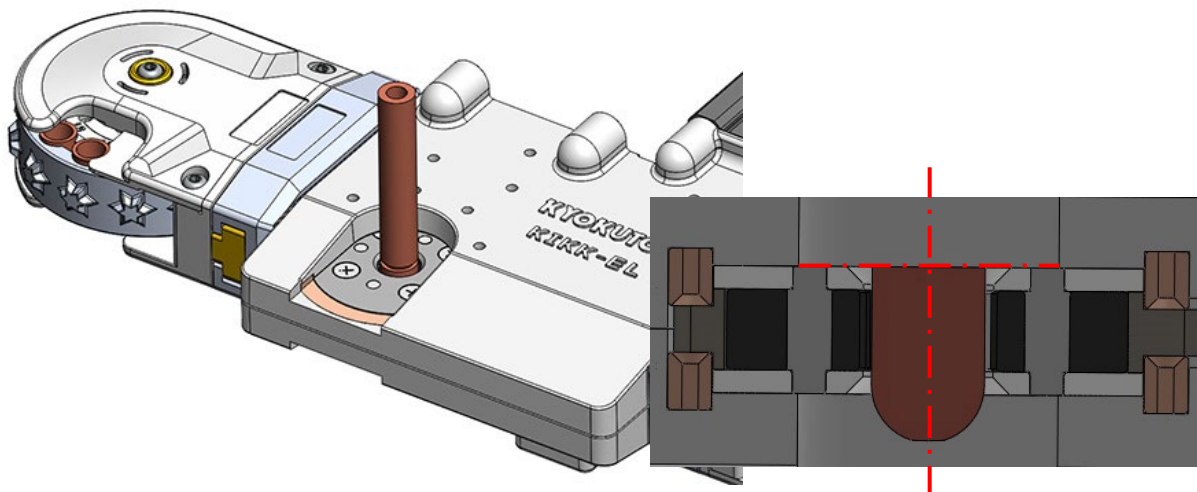
※This operation is for the upper side, but it can also be applied for the lower side.

1. Position cap tips to the center of the remover unit by teaching the robot.

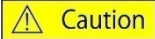


2. Check that the cap tip is located at the center of nails, then move to the remove position.

(Position where rear end of cap tip will be hidden by remover.)



- Lift up 3 mm to Z axis direction in 0.7 sec after a cylinder start moving.  
(For lower-side shank, pull down 3mm.)



Caution

※Adjust cylinder speed. Adjust speed controller to keep 1.5 sec to 2 sec from forward end to back end on a cylinder.

※Remover starts rotation in 0.7 sec.

A robot have to be lifted up during the rotation.

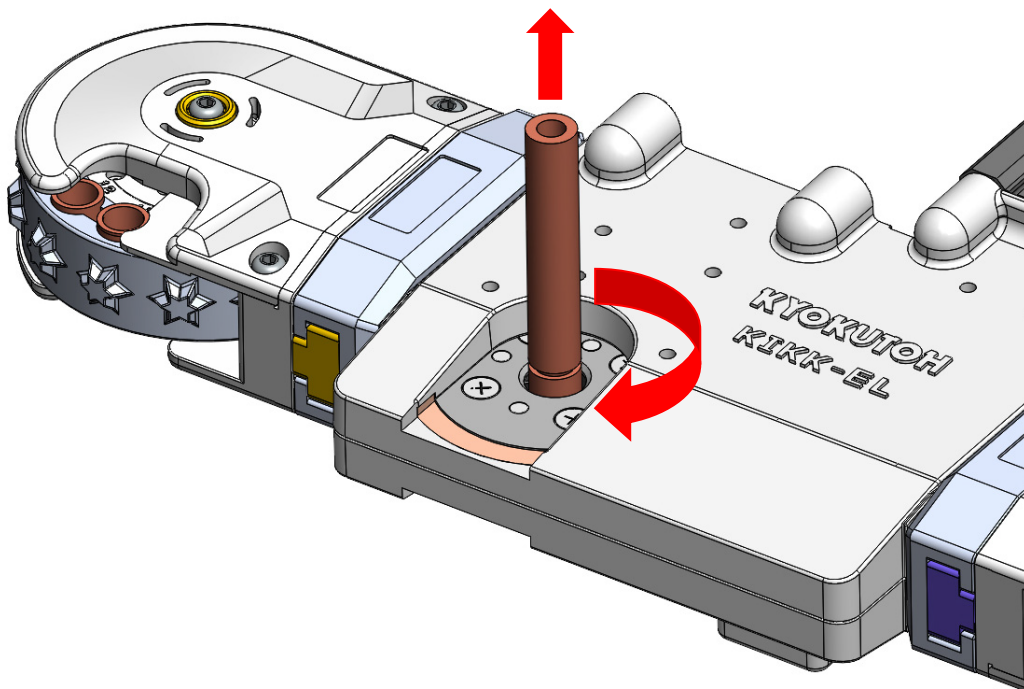
※Please do the below action, since the cap tip cannot be removed by only the rotation of the remover.

(Upper → Raise about 3mm, Lower → Lower about 3mm)

This action also prevents the robot gun and the KIKK from being damaged.

※The position of the cylinder switch needs to be re-adjusted when confirming the operation of the KIKK.

※Recommended lift up speed is about 100mm/sec.



- After the robot has escaped and is not close to KIKK-EL\*\*X, return the cylinder and release the tip.



Caution

※If the cap tip is released with the robot being close to KIKK-EL\*\*X, the tip may hit the parts such as gun arm and scatter in an unexpected area.

- Check the cap tip fell off.

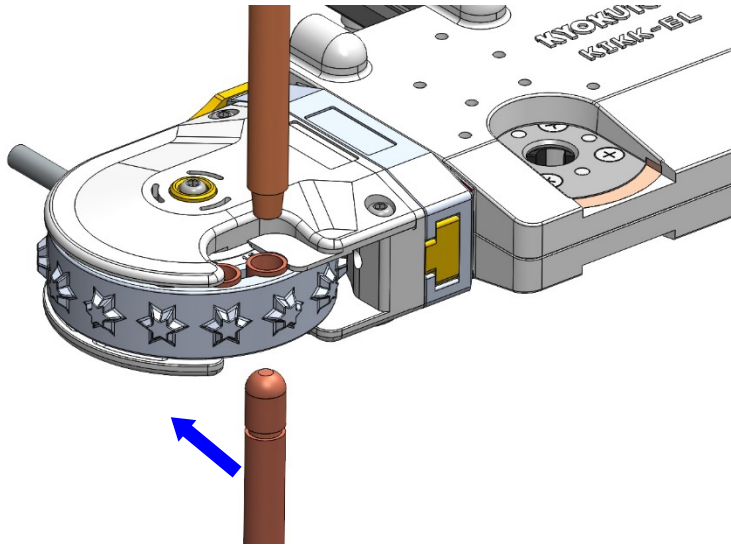
※If the tip does not come off from the shank or does not fall properly, review steps 1 to 4.

## ■ Inserting upper side tip

1. Move the robot gun from the front of the magazine.

※Fit as much as possible to the center position of the loaded cap tip and the shank.


If each center position is out of position, the insertion operation may fail.



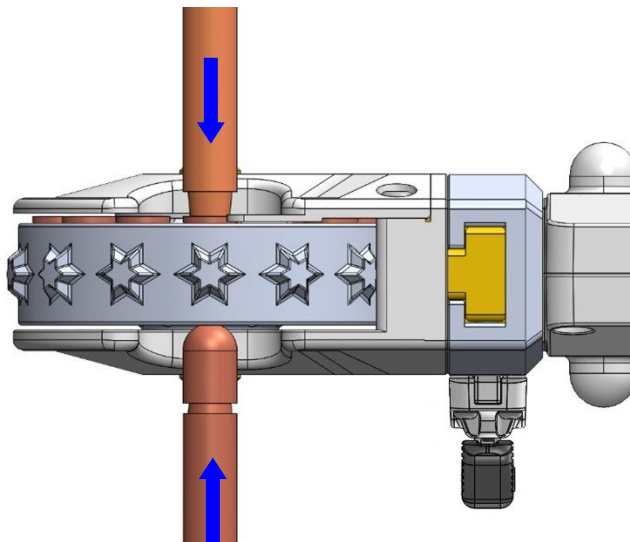
2. Move to Press-Ready position. Insert upper shank into the tip in a range of 3~5mm.

Move lower cap tip to the lower surface of the revolver.


Do not lift more than 1mm from the surface of the revolver.

 Caution

※Excessive lifting may cause improper tip fitting or other mechanical failures.



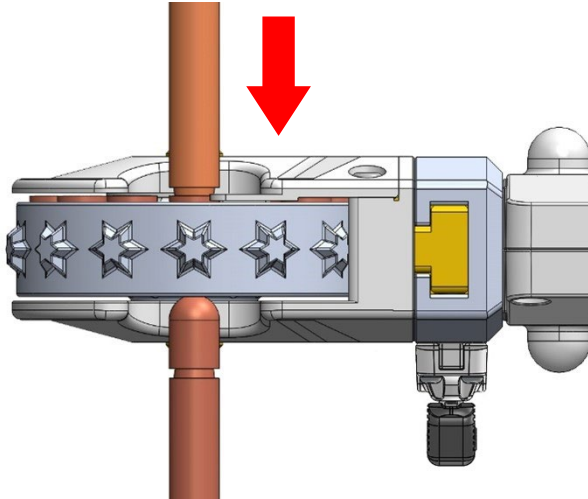
3. Insert the cap tip by applying pressure. (150kgf recommended)

 Caution

※If used at higher pressure, the product may be damaged.

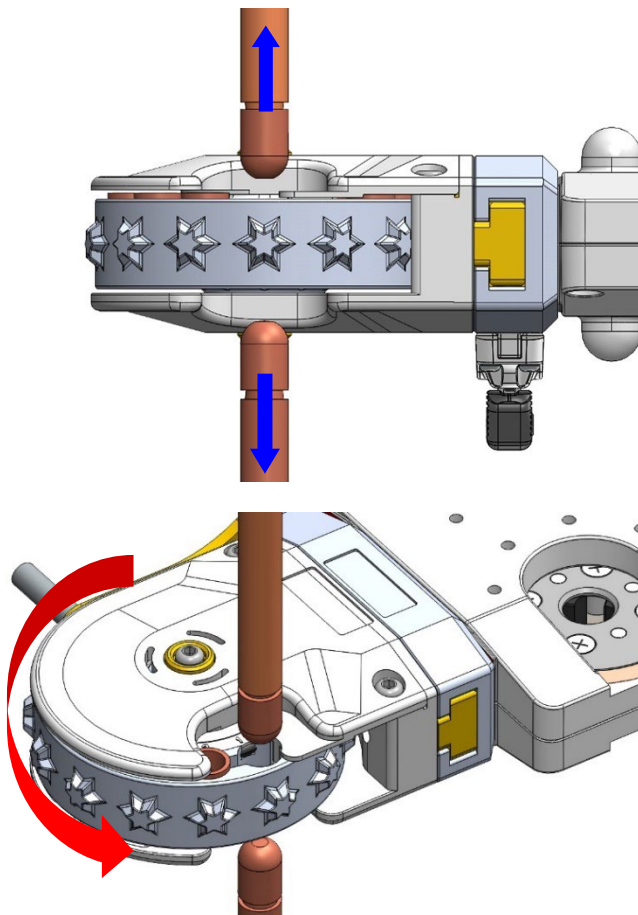
※If used at 100kgf or less, the tip may not be inserted.

※When using robots that require thickness setting when pressing, select 9mm (for 1623).



Release gun pressing. Check that the revolver rotates automatically, and the following cap tip comes to the front.

※Be sure that the tip release distance is enough not to interfere the revolver (both upper and lower side).

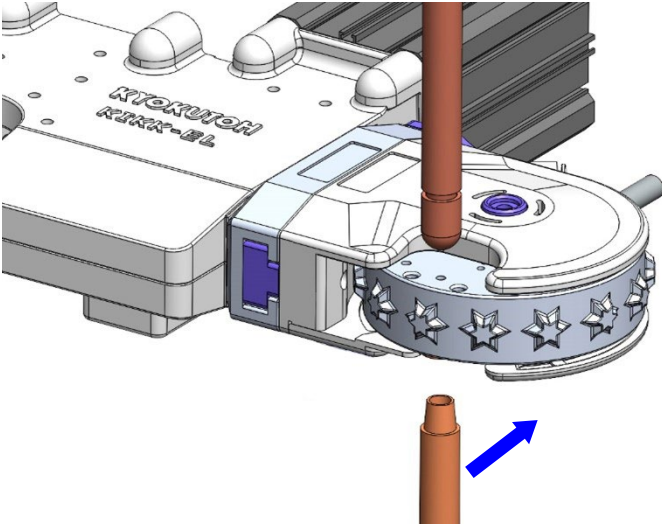


## ■ Inserting lower side tip

1. Move the robot gun from the front of the magazine.

※Fit as much as possible to the center position of the loaded cap tip and the shank.

If each center position is out of position, the insertion operation may fail.



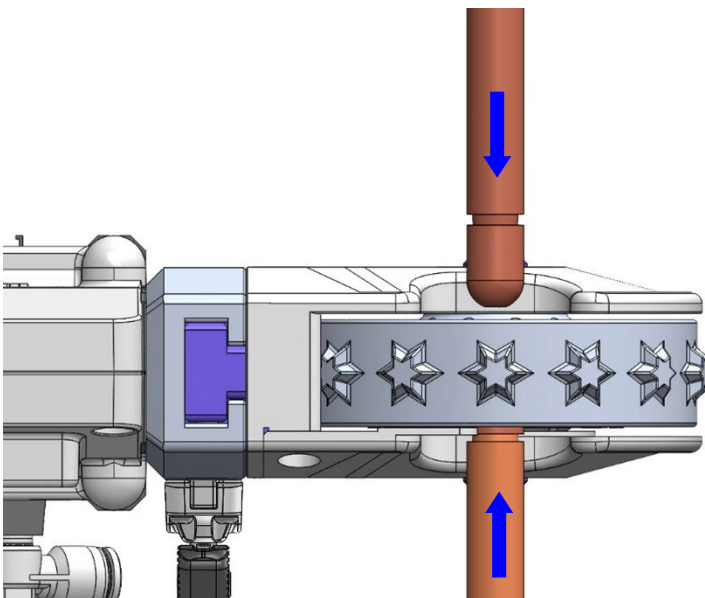
2. Move to Press-Ready position.

Insert upper shank into the tip fully by lifting no more than 1mm from the surface of the revolver.

Move the upper tip to the position where tip surface will be about 5mm from the revolver.

 Caution

※Excessive lifting may cause improper tip fitting or other mechanical failures.



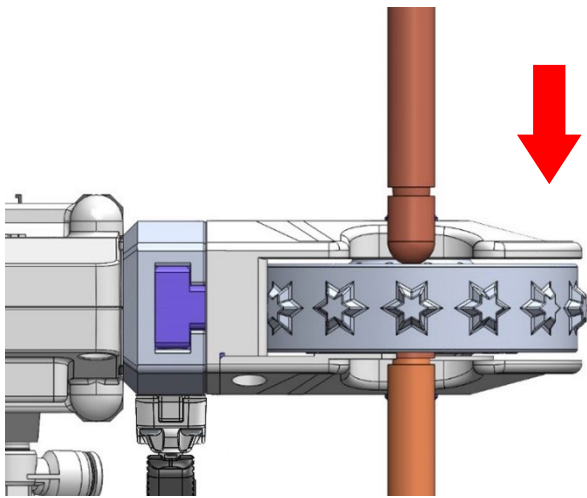


3. Insert the cap tip by applying pressure. (150kgf recommended)

 Caution

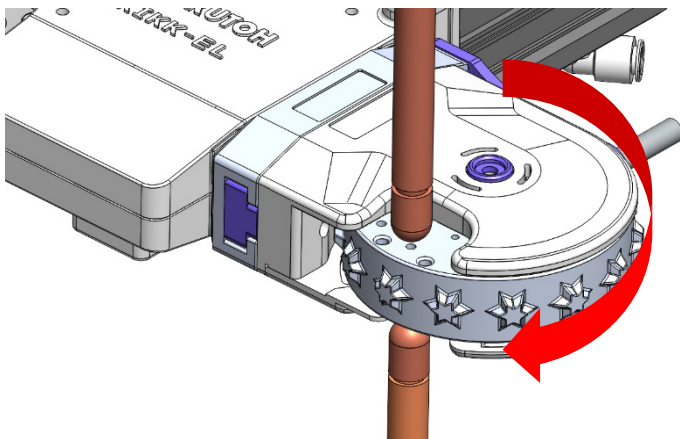
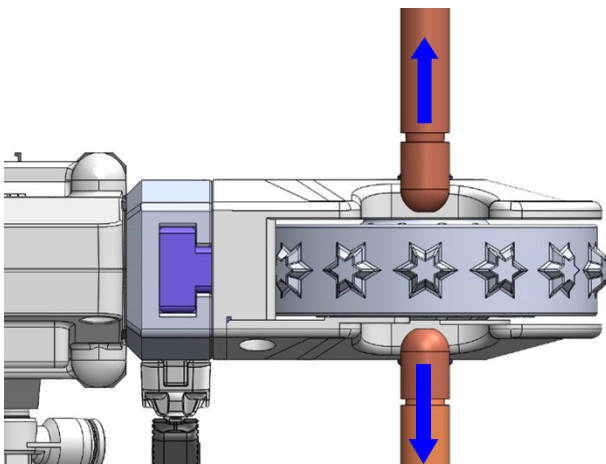
※If used at higher pressure, the product may be damaged.

※If used at 100kgf or less, the tip may not be inserted.



Release gun pressing. Check that the revolver rotates automatically, and the following cap tip comes to the front.

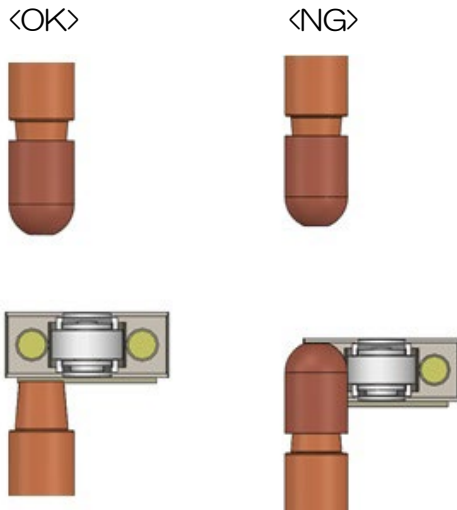
※Be sure that the tip release distance is enough not to interfere the revolver (both upper and lower side).



## ■ Sensor (Option)

### Check cap tip removal (LS)

※The image below shows an example of using the lower cap tip.

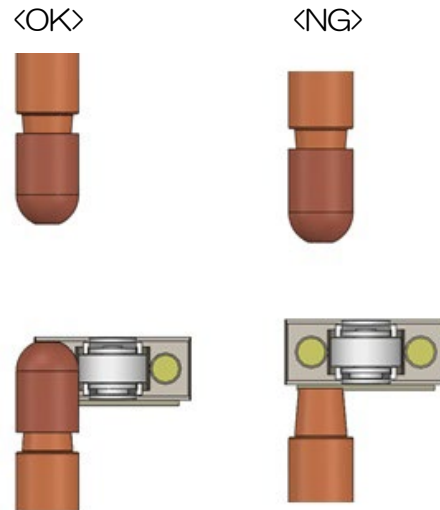


◆ For checking the cap tip removal, set as follows.

- If passing without contacting LS, OK
- If passing by hitting LS, NG

### Check cap tip insertion (LS)

※The image below shows an example of using the lower cap tip.



◆ For checking the cap tip removal, set as follows.

- If passing by hitting LS, OK
- If passing without contacting LS, NG



## 8. Maintenance

### ■Precautions before work

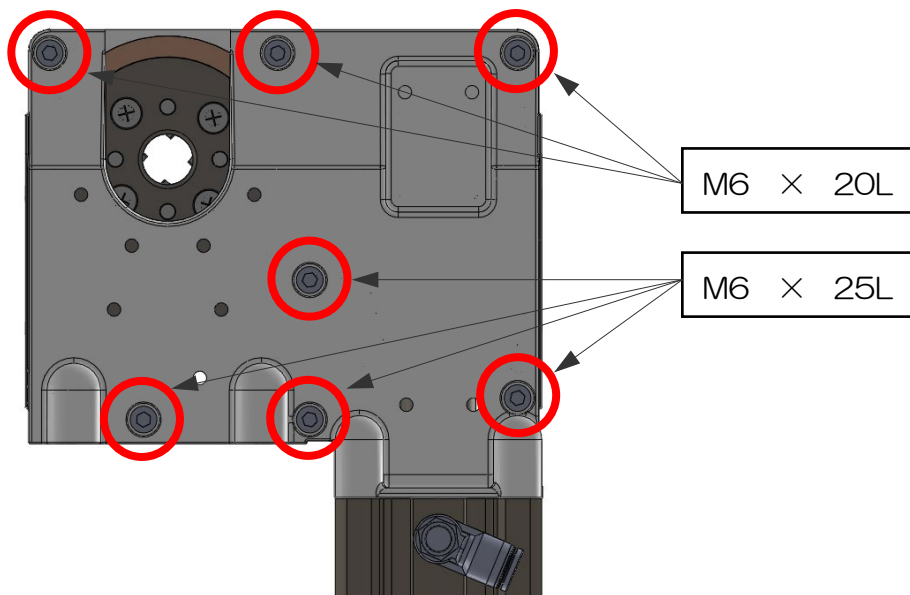
- Protect your body sufficiently with protective goggles, gloves, etc. before starting operation.
- Make sure that the machine is fixed on stand tightly.
- Confirm the connection of the air supply.
- Make sure that there are no foreign substances or dust accumulated in the magazine.
- Unless otherwise specified 「Medium Strength Loctite」 is recommended as a slack preventing agent.

### 8-1. Procedure for changing remover unit

1. Cut off the air supply.

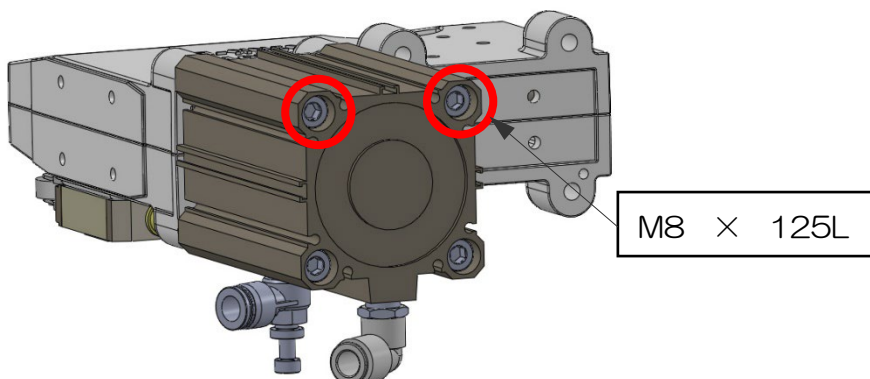
2. Remove the bolt referring to the figure below. (M6 x 7pcs)

※The screwing torque when assembling must be 7.6N • m with loctite.

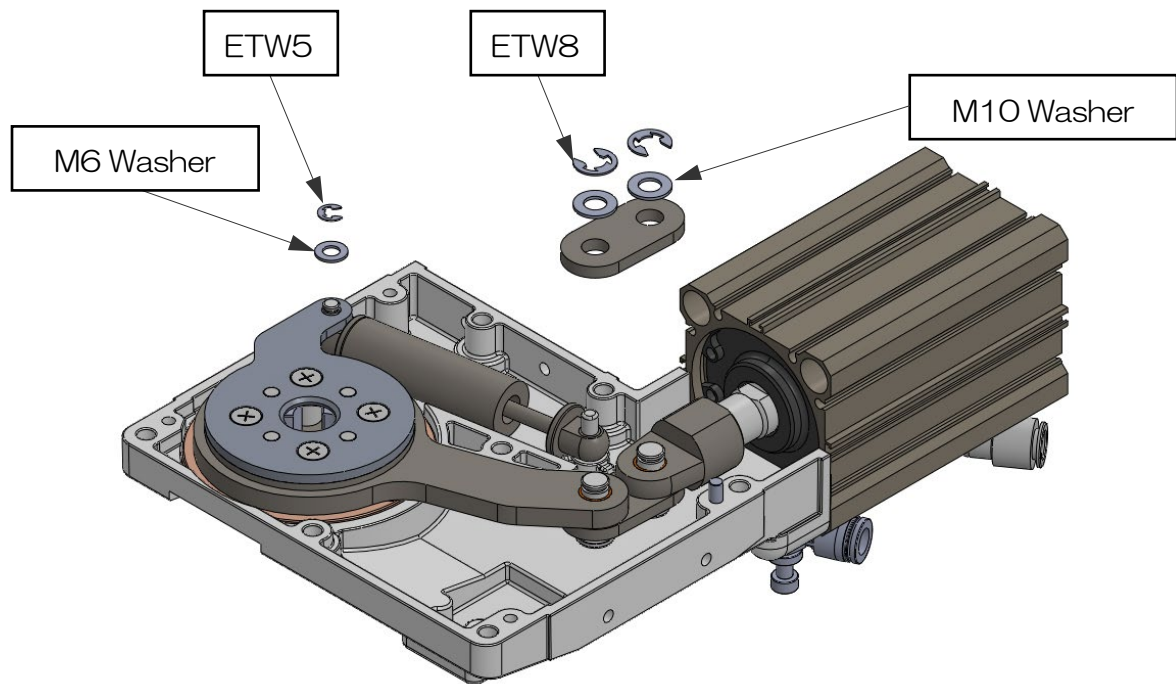


3. Take off the upper gear case by unscrewing the cap bolts of the cylinder.

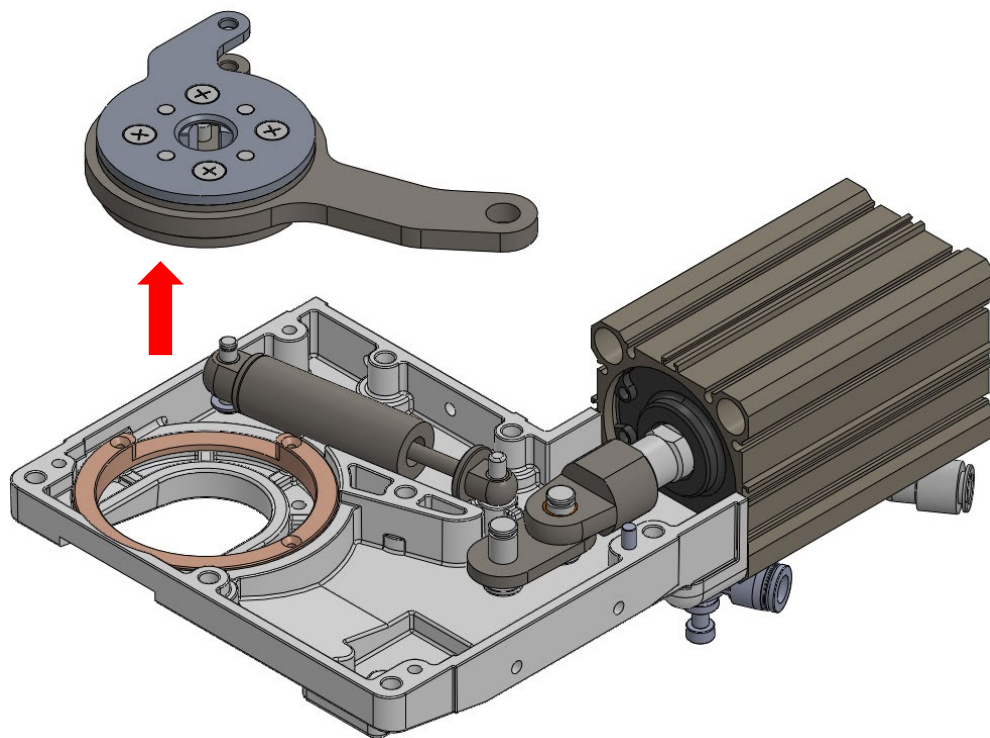
※The screwing torque when assembling must be 18.5N • m with loctite.



4. Remove the arm ring plate and the remove shaft from the remover unit.



5. Take off the remover unit.



6. Do 1 to 5 in reverse order to exchange new one.

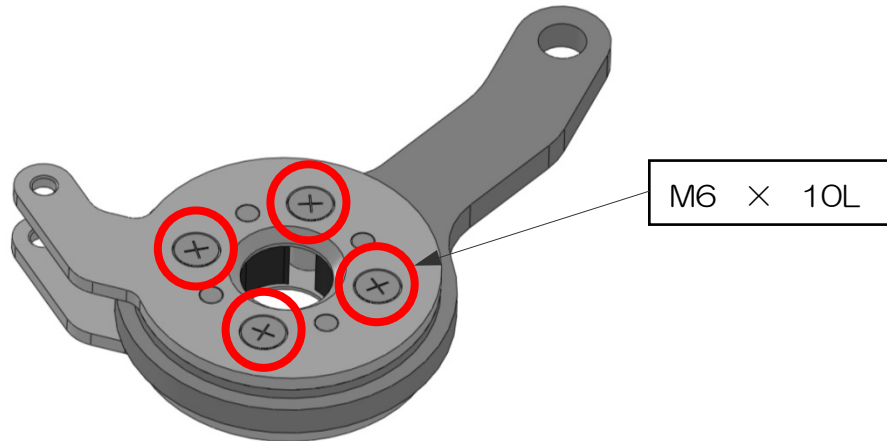
7. Check the operation of the remover unit by test-driving.

## 8-2. Procedure for changing nails

1. Remove bolts (M6 x 4pcs) of upper cover and lift the upper cover of the remover unit.

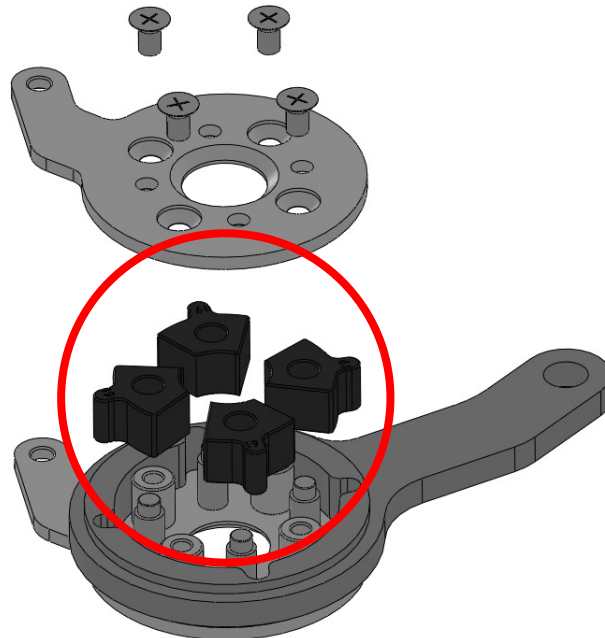
※The screwing torque when assembling must be 7.6N • m with loctite.

※If screws are being stubborn, use heat gun and heat the screws.



2. Remove each nail fixed to lower cover.

※Please assemble the nails with printed side up.

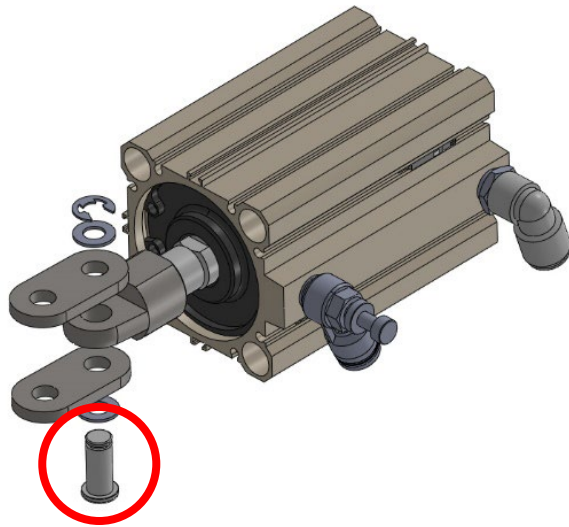


3. Do 1 and 2 in reverse order with new nails.

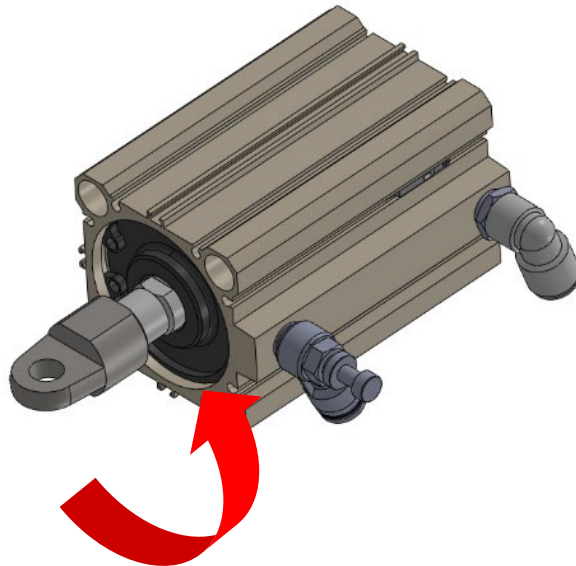
4. Check the nails direction properly.

### 8-3. Procedure for changing the cylinder

1. Cut off the air supply.
2. Remove the remover unit (Please refer to 8-1).
3. Remove the remove shaft and the arm ring plates.



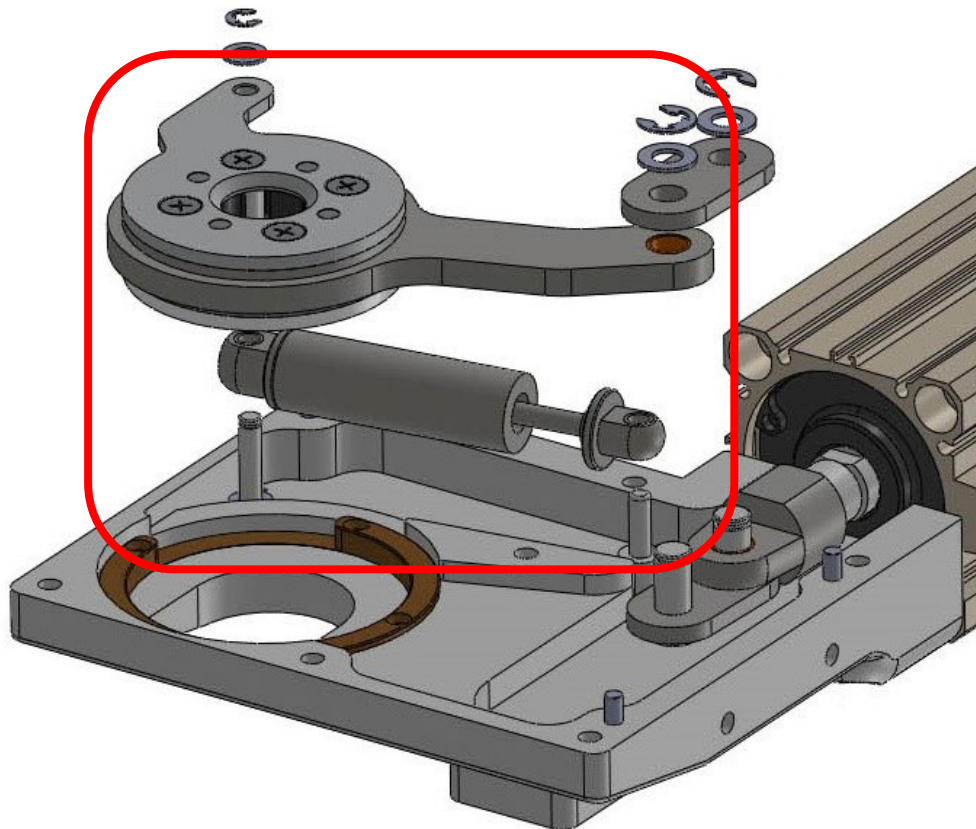
4. Please turn a knuckle joint counterclockwise and remove from a cylinder rod.  
※The screwing torque when assembling must be  $45.0\text{N} \cdot \text{m}$  with Low Strength Loctite.



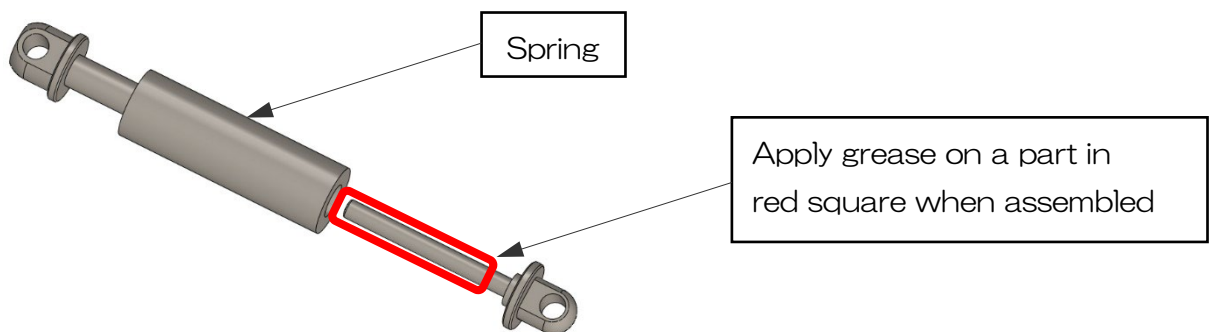
5. Cylinder exchange is completed in reverse order 1 to 4.
6. Check the operation of the cylinder by test-driving.

## 8-4. Procedure for changing the spring

1. Cut off the air supply.
2. Remove the remover unit (Please refer to 8-1).
3. Separate remover unit while bringing up the spring and spring guide.



4. Take spring guide B out to exchange the spring inside with new one.

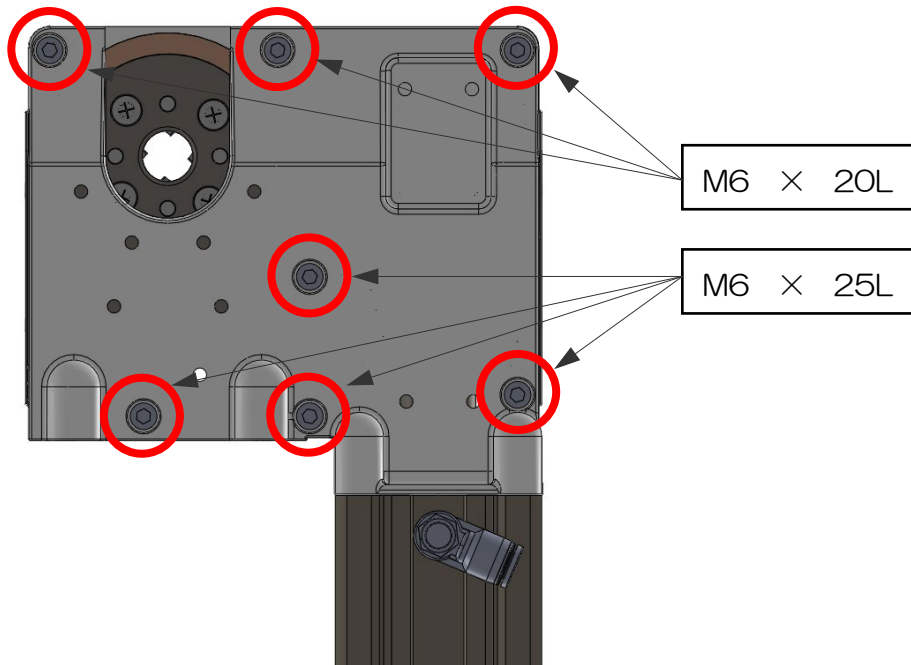


5. Spring exchange is completed in reverse order 1 to 4.

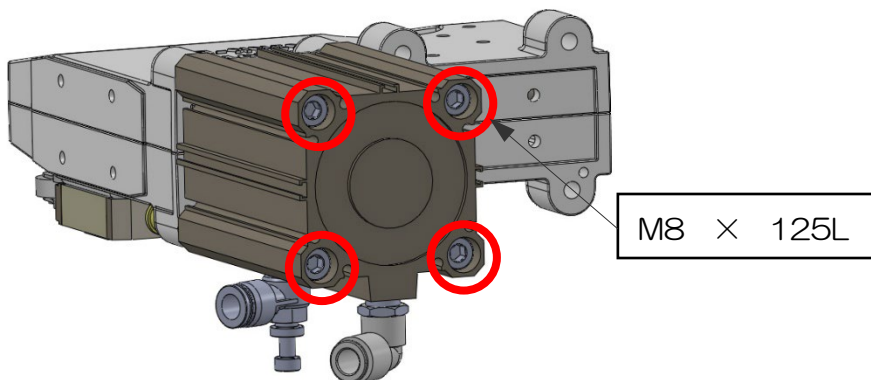


## 8-5. Procedure for grease up

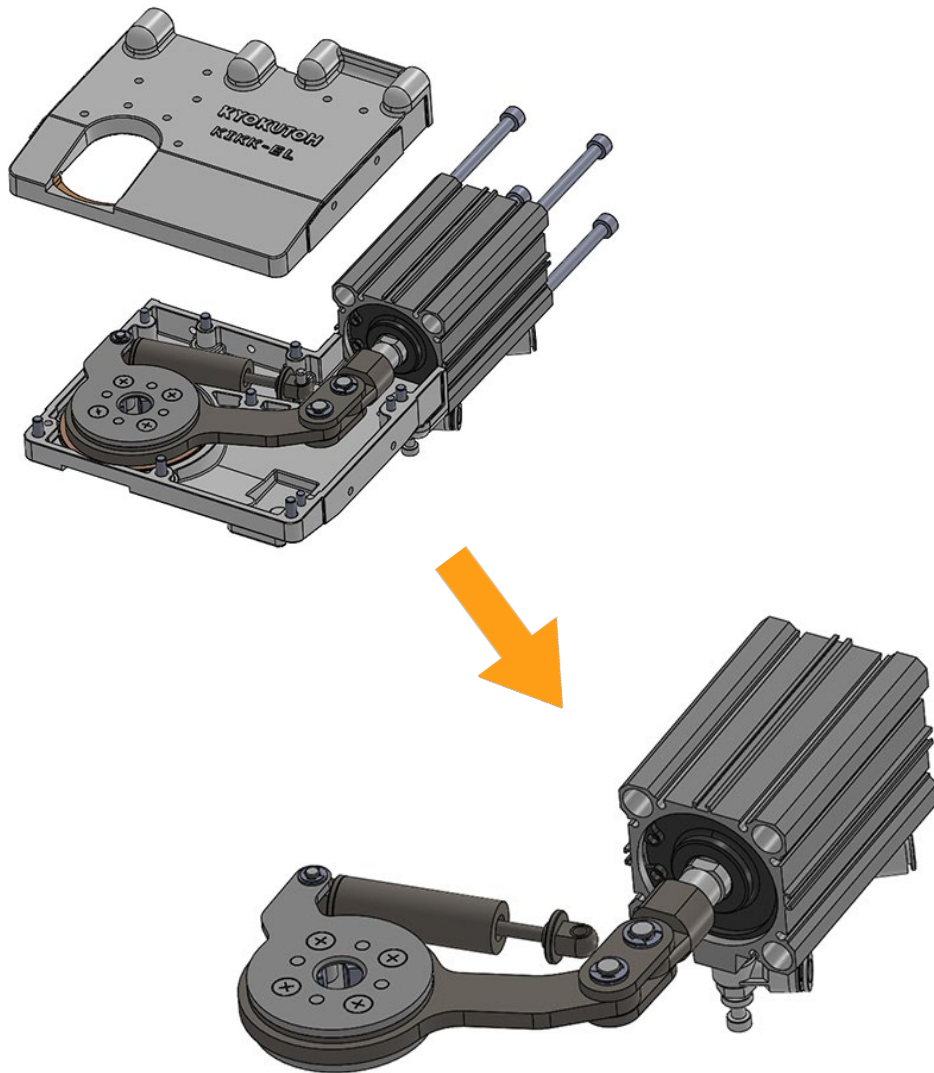
1. Cut off the air supply.
2. Remove the bolt referring to the figure below. (M6 x 7pcs)  
※The screwing torque when assembling must be 7.6N • m with loctite.



3. Take off the gear case by unscrewing the cap bolts of the cylinder.  
※The screwing torque when assembling must be 18.5N • m with loctite.

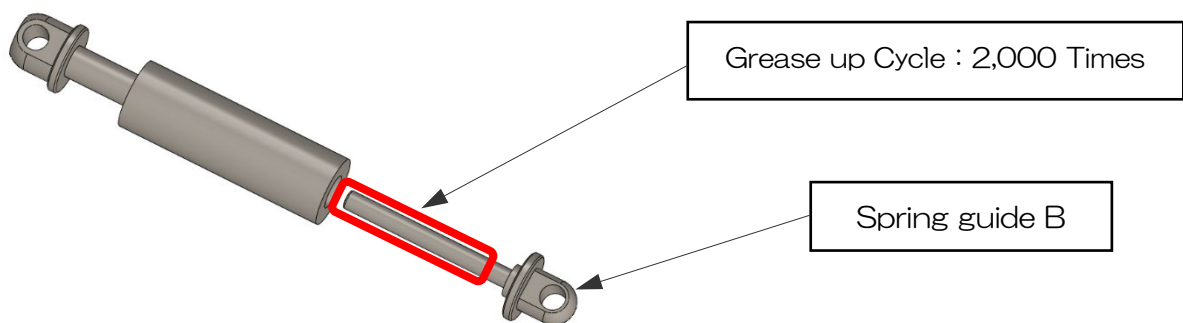


4. Take off the gear case and remove the remove unit with cylinder.



5. Take spring guide B and grease up.

※Recommended grease are Water-resistant industrial grease, NLGI No.1 or equivalent.

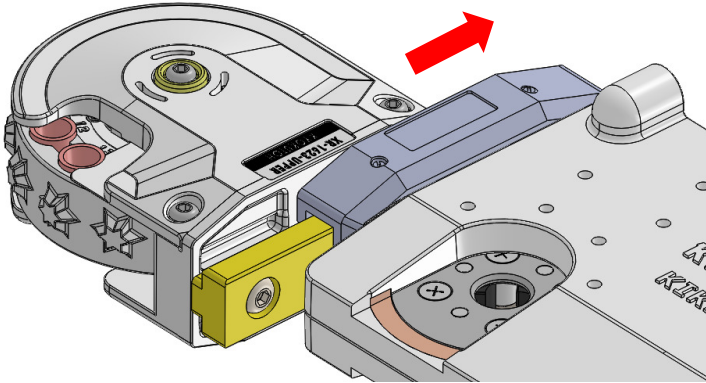


6. Grease up is completed in reverse order 1 to 5.

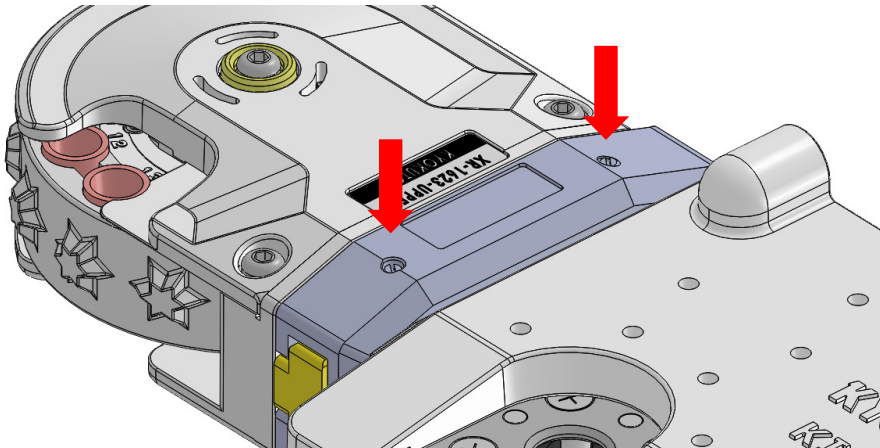
## 8-6. Adjustment of magazine mounting position

※Only work on a magazine if it has a large rattling when installed.

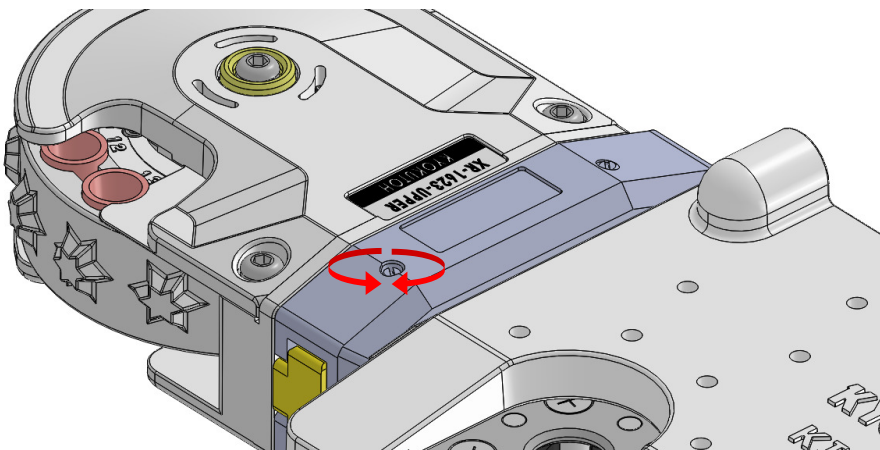
1. attach the magazine.



2. Tighten the adjustment screw fully while installing.



3. Loosen about 90° from the tightened position.



※Adjustments that do not allow the magazine to move at all (no rattling) may damage the equipment.

Please be careful.

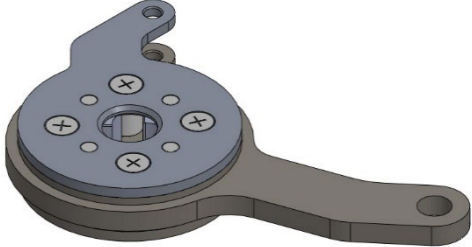
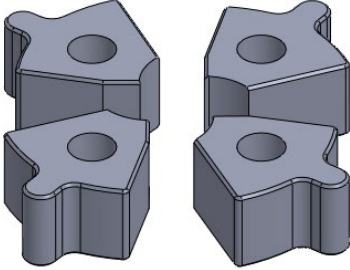
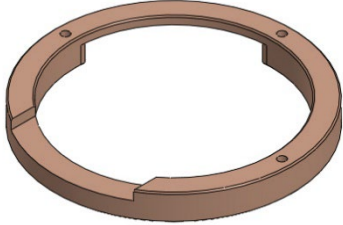
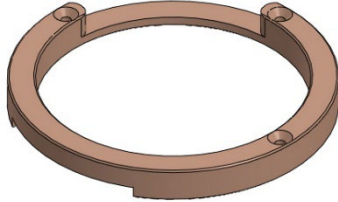
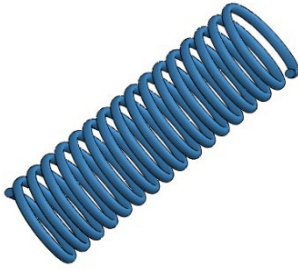


## 9. Problems and Solutions

Abnormal Condition	Causes and Solution
Cap tip is not removed.	<ul style="list-style-type: none"> <li>*Breakdown of a remover unit               <ul style="list-style-type: none"> <li>→Check the nails and exchange for new one if necessary and change it for new one.</li> </ul> </li> <li>*Breakdown of a cylinder.               <ul style="list-style-type: none"> <li>→Check the air cylinder and exchange for new one if necessary.</li> </ul> </li> <li>*Tip does not fit in magazine.               <ul style="list-style-type: none"> <li>→Check the cap tip size.</li> </ul> </li> <li>*The motion when removing is not proper.               <ul style="list-style-type: none"> <li>→Confirm the robot teaching.</li> </ul> </li> <li>*The air pressure is too low, or it is not supplied.               <ul style="list-style-type: none"> <li>→Check the air supply.</li> <li>→Check the air pressure and adjust it. (Recommended:0.5MPa)</li> </ul> </li> </ul>
Removed cap tip does not fall.	<ul style="list-style-type: none"> <li>*The nail might be clumping the tip.               <ul style="list-style-type: none"> <li>→Rotate the nail to retract the nail.</li> </ul> </li> <li>*A cylinder is not returned.               <ul style="list-style-type: none"> <li>→Check the air pressure and adjust it. (Recommended:0.5MPa)</li> <li>→Check the operation of a cylinder and adjust it.</li> </ul> </li> <li>*Remover nails not match a cap tip.               <ul style="list-style-type: none"> <li>→Check the cap tip size and use proper cap tip.</li> </ul> </li> </ul>
Cap tip cannot be inserted.	<ul style="list-style-type: none"> <li>*Robot teaching is correct.               <ul style="list-style-type: none"> <li>→Adjust the horizontal • vertical of the robot gun. Perform the insertion operation at the cap tip center location.</li> </ul> </li> <li>*Loading cannot be performed in the correct position of the tip magazine.               <ul style="list-style-type: none"> <li>→Adjust the position so that the grooves of the cap tip and picker are aligned.</li> </ul> </li> <li>*Applied pressure is low.               <ul style="list-style-type: none"> <li>→Set it the recommended applied pressure (150kgf).</li> </ul> </li> </ul>

# 10. Consumption Parts List

## ■Name list

	<p>Product Name : Remover unit            Model            (for <math>\phi 13</math>) : KIKK-EL-ReU-TYPE-13            (for <math>\phi 16</math>) : KIKK-EL-ReU-TYPE-16            (for <math>\phi 19</math>) : KIKK-EL-ReU-TYPE-19            (for <math>\phi 20</math>) : KIKK-EL-ReU-TYPE-20            ◆Required Quantity : 1            ◆Exchange Cycle : 4,000 Times</p>
	<p>Product Name : Nails            Model            (for <math>\phi 13</math>) : KIKK-EL13-P-001-13            (for <math>\phi 16</math>) : KIKK-EL16-P-001-16            (for <math>\phi 19</math>) : KIKK-EL19-P-001-19            (for <math>\phi 20</math>) : KIKK-EL20-P-001-20            ◆Required Quantity : 4            ◆Exchange Cycle : 2,000 Times</p>
	<p>Product Name : Upper bush            Model            KIKK-EL20-P-006U            ◆Required Quantity : 1            ◆Exchange Cycle : 2,000 Times</p>
	<p>Product Name : Lower bush            Model            KIKK-EL20-P-006L            ◆Required Quantity : 1            ◆Exchange Cycle : 2,000 Times</p>
	<p>Product Name : Spring            Model            51-22100            ◆Required Quantity : 1            ◆Exchange Cycle : 4,000 Times</p>

# 11. Order Model

## ■Standard Model

Tip diameter	Model
φ 13	KIKK-EL13X
φ 16	KIKK-EL16X
φ 19	KIKK-EL19X
φ 20	KIKK-EL20X

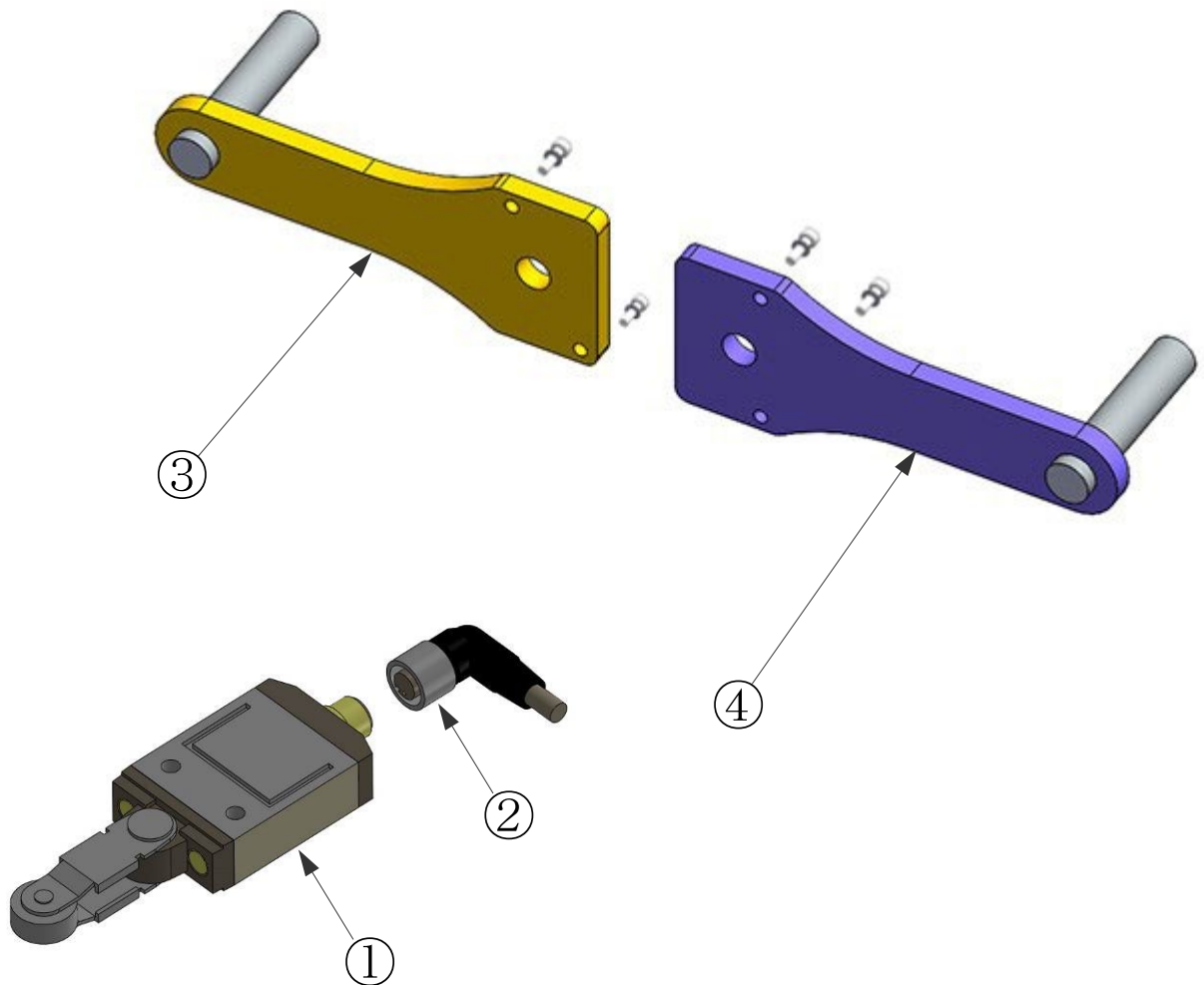
## ■Attention

- 1) Model other than the above shapes is "KIKK-EL\*\*X-SP".
- 2) KIKK-EL\*\*X cannot accept off set cap tips.
- 3) Please send us drawings of guns and tips if you are not sure whether correspondence by a standard specification is available when ordering its configuration option.  
We give you specific details of tip changer model and propriety of the correspondence.

## 12. Option List

### ■ KIKK-ELX-SE-Pac

No.	Name	Model	QTY
1	Limit Switch	D4CC-4060 (DC30V)	1
2	Plug	XS2F-D421-D-80F (2m)	1
3	XR Sensor Plate Set Yellow	XR-SPL-PS-YL-SET	1
4	XR Sensor Plate Set Blue	XR-SPL-PS-BL-SET	1



MEMO

# Contact

Contact us if there is any damage or machine defects in our products.



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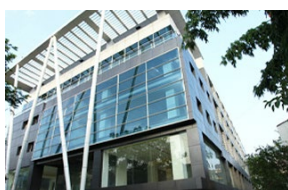


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