



# Repair Manual

## Tool Hose Balancer

**THB-15A**

**THB-25A**

**THB-35A**

**THB-50A**

**THB-65A**



For safe and correct operation of the product, please be sure to read this manual and fully understand its content before use.

After reading, keep the manual safe so that you can find and use it readily.

In case of resale or transfer of this product, make sure to transfer the manual to the new owner.



# Introduction

Thank you very much for purchasing the Tool Hose Balancer. To prevent any trouble and obtain the best performance, please be sure to read this manual and the separate Users Manual, and fully understand their content.

## Notation in this manual

### Hazard levels


This product is designed with ultimate priority on the safety of operators. However, due to the nature of the system, there are risks that cannot be removed. In this manual, the level of significance and risk is defined and indicated in three stages: "WARNING", "CAUTION", and "NOTICE". Thoroughly read and fully understand the indicated items before operating the product and performing maintenance procedures. The indications for "WARNING", "CAUTION", and "NOTICE" are in order of risk significance (WARNING > CAUTION > NOTICE). Their details are described below.

 <b>WARNING</b>	A situation that, if mishandled, may cause death or serious disability.
 <b>CAUTION</b>	A situation that, if mishandled, may cause minor or moderate injury.
<b>NOTICE</b>	A situation that, if mishandled, may cause property damage.

The extent of the problem described above (disability, injury, and property damage) is defined as follows.



- Serious disability:** Loss of eyesight, wound, burn (high-temperature or low-temperature), electric shock, bone fracture, poisoning, and other injuries that leave aftereffects and that require hospitalization or long-term outpatient treatment.
- Moderate injury:** Burn, electric shock, bone fracture, and other injuries that do not require hospitalization or long-term outpatient treatment.
- Minor injury:** Scratch, bruise, laceration, and other injuries that have a minor impact on health.
- Property damage:** Extended damage to buildings, household articles, and injury to domestic animals or pets.



Other than WARNING, CAUTION, and NOTICE described above, matters important to workers are indicated using the following format.

 <b>REMINDER</b> Describes important details to be remembered for the operation.
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## Symbols

This manual uses the following symbols to simply provide information in addition to the indications above.

	Indicates a PROHIBITED action that must not be performed.
	Indicates a REQUIRED action that must be performed.

	Indicates potential property damage or a danger that may inflict bodily injury.
	Indicates that it is necessary to thoroughly read this manual and the relevant documents.

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## Scope of warranty and liabilities for the equipment

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### Warranty and liabilities for the equipment

1. We will repair or replace the product free of charge if a failure due to manufacturing defects occurs under proper usage during the warranty period. For details, contact us or your dealer.
2. The warranty will be void in the following cases:
  - 1) Change in ownership.
  - 2) Repair or modification performed by a party other than the manufacturer, agents, or dealers.
3. The warranty period is one (1) year from the date of purchase.
4. Repairs applicable to any of the following shall be charged even during the warranty period:
  - 1) Failure/damage caused by incorrect use.
  - 2) Failure/damage caused by use of non-genuine parts.
  - 3) Failure/damage caused by fire, earthquake, natural disaster, or other unexpected incident.
  - 4) Incident caused by fall, shock, negligence, or by inadequate storage.
  - 5) Failure/damage caused by use of parts or other equipment that are not included in this product.
  - 6) Replacement of consumables.
  - 7) Usage in violation of dangers or cautions stipulated in this manual.
  - 8) Failure/damage caused by any reason that is not attributable to the manufacturer.
5. Warranty exclusions such as opportunity loss.

Either during or after the warranty period, opportunity loss, damage to anything other than our product(s), or other duties imposed on you/your customer as a result of the failure of our product(s) are outside the scope of the warranty.

### Copyright and liabilities

The copyright for this manual belongs to Endo Kogyo Co., Ltd.

The manual is provided for the limited purpose of supporting the safe and proper use of the product. It cannot be used for other purposes.

The customer may not use or make copies of this manual, in whole or in part, outside of this purpose without receiving prior consent from Endo Kogyo Co., Ltd.

The customer is also prohibited from translating or modifying the content of the manual, in whole or in part.

The content described in the manual is subject to change without advance notice. Please note this in advance.

## Definition of intended users for this manual

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This manual has been prepared to help all intended users involved with this product. From the point of view of safety, we have defined intended users according to their ability and experience and provided detailed descriptions for each group.

This manual defines four user levels.

### Operator

The operator is a user who engages in general operations. Maintenance and other operations that require special skills are excluded from the general operations.

The operator is therefore not permitted to disassemble the main equipment.

The operator should read the manual thoroughly and carry out their work with complete understanding of the operating procedures.

### Maintenance operator

In addition to the work of the operator described above, the maintenance operator is permitted to perform installation, simple troubleshooting, and periodic inspections.

The maintenance operator is required to develop sufficient knowledge and operating skill for this product. The maintenance operator should read the manual thoroughly and carry out their work with complete understanding of the equipment's characteristics and all work contents.

### Management supervisor

The management supervisor is required to have sufficient knowledge of the product and advanced operating skill for this product.

The management supervisor should manage not only the product itself but on-site operations that handle the product, comprehensively.

### Service engineer

The service engineer is a worker with special knowledge and skills for installing the product, investigating the causes of a failure or damage, and performing repairs and overhauls.

Service engineering (the work by the service engineer) is normally performed by our service technicians.

## Emergency contact in case of malfunctions

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If any problem with the product arises, contact us or your dealer.

## CONTENTS





<b>Introduction .....</b>	<b>1</b>
Notation in this manual .....	1
Scope of warranty and liabilities for the equipment .....	3
Definition of intended users for this manual .....	4
Emergency contact in case of malfunctions .....	4
<b>1. Warning Signs and Precautions for Handling.....</b>	<b>6</b>
1-1    Precautions for handling.....	6
<b>2. Maintenance.....</b>	<b>7</b>
2-1    Daily inspections.....	7
2-2    Periodical inspections.....	7
2-3    Replacement of the hose and O-rings.....	8
2-4    Replacement of the spring .....	19



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# 1. Warning Signs and Precautions for Handling

## 1-1 Precautions for handling

Incorrect handling of this product may cause damage to the product itself as well as a fire or injury. Thoroughly read the following precautions and be sure to heed the instructions when handling the machinery.

 <b>WARNING</b>	
	<ul style="list-style-type: none"><li>● Do not use in explosive, flammable gas, or dusty atmospheres, any place where water or oil may splash, and near combustibles. This may cause fire or injury.</li><li>● Do not perform any modification of the product.</li></ul>
	<ul style="list-style-type: none"><li>● The maintenance should be performed by a maintenance operator who has developed sufficient knowledge and operating skill for the balancer.</li></ul>
	<ul style="list-style-type: none"><li>● Incorrect usage of the product may cause an injury. Use the product correctly in accordance with the descriptions in this manual.</li><li>● Particularly, “WARNING”, “CAUTION”, and “NOTICE” described in this manual must be fully understood and always observed.</li><li>● Install the product correctly in accordance with the descriptions in this manual.</li></ul>

 <b>CAUTION</b>	
	<ul style="list-style-type: none"><li>● Be sure to perform daily and periodic inspections.</li><li>● Be sure to use the product within the capacity range that is described in “4-2-1 Specifications” of the Users Manual.</li></ul>

# 2. Maintenance

**⚠ WARNING**



The maintenance should be performed by a maintenance operator who has developed sufficient knowledge and operating skill for the balancer.

**⚠ CAUTION**



Replace any parts using genuine parts only.

Daily and periodic inspections are required for the product to be used safely and properly. If any failure is found in the inspections, the relevant parts must be replaced. For details, contact us or your dealer.

## 2-1 Daily inspections

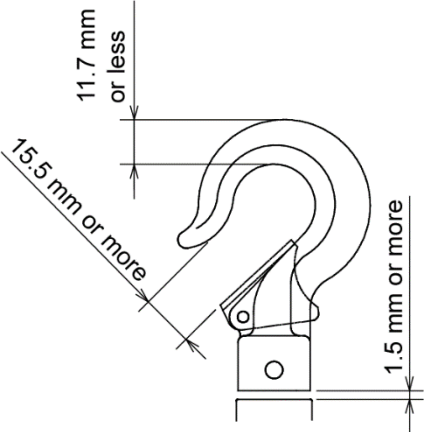
Before starting the operation, refer to “6-1 Pre-operation inspections and checks” of the separate Users Manual and perform the inspections and checks daily.

## 2-2 Periodical inspections

Perform an inspection at least once per month. If the product is used in an unfavorable environment or used frequently, reduce the interval between the inspections.

### ■ Inspection of the hook

See the figure on the right, measure the relevant dimensions of the hook, and check the measured dimensions against the operating limits. The hook must be replaced when any dimensions have reached the limiting dimensions. Stop using the balancer, and contact us or your dealer.



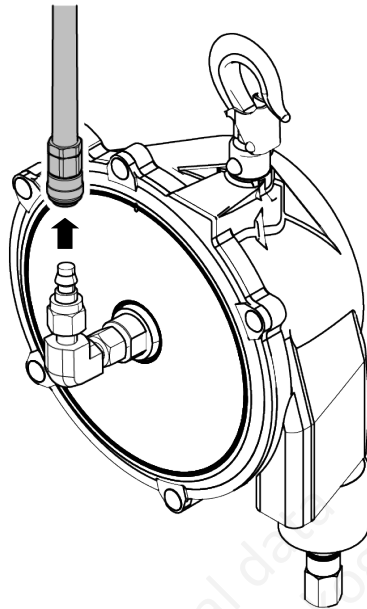
Operating limit of the hook



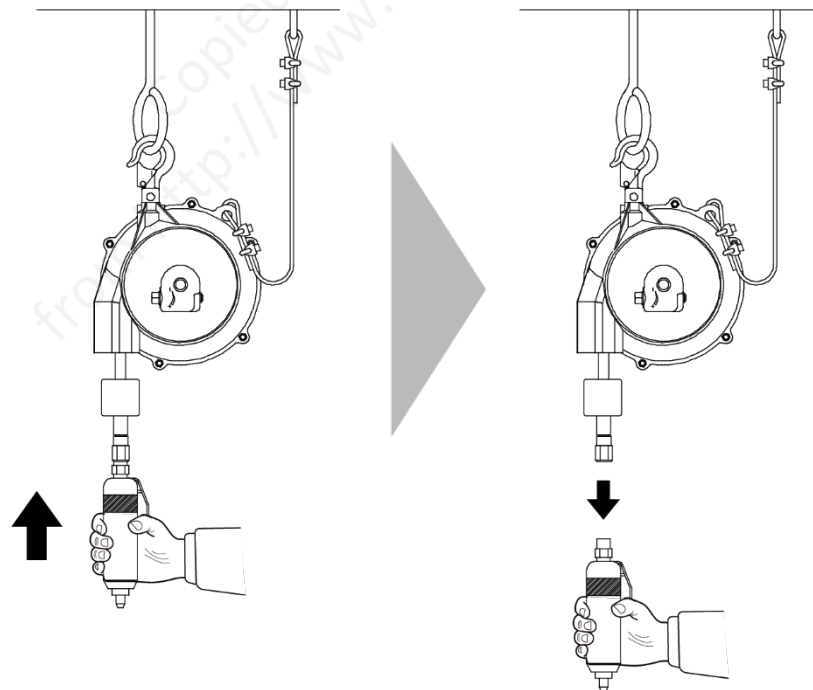
## 2-3 Replacement of the hose and O-rings

### 2-3-1 Disassembly

- 1 Remove the supply hose.

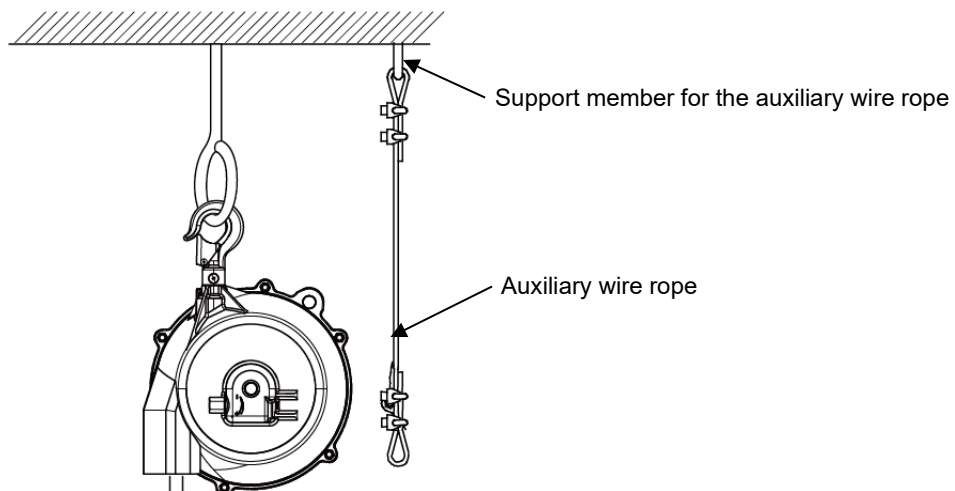


- 2 Remove the tool (equipment) from the swivel joint while lifting it and with the hose completely wound inside the drum.



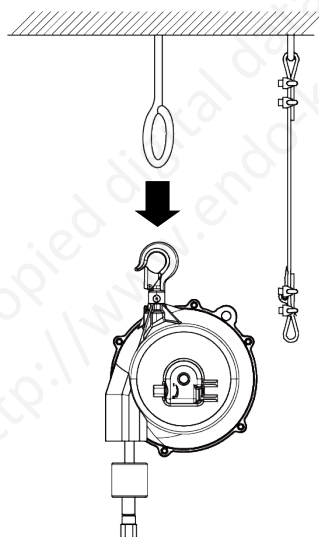
Note: The auxiliary wire rope, the support member, and the tool (equipment) in the figure are indicated for reference.

- 3** Remove the auxiliary wire rope or chain from the main equipment of the balancer.

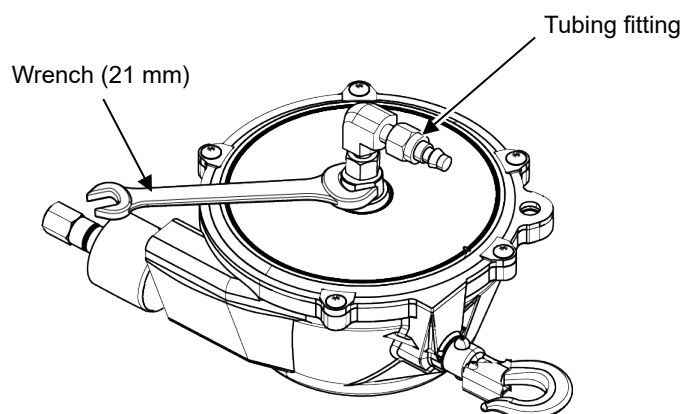


Note: The auxiliary wire rope and the support member in the figure are indicated for reference.

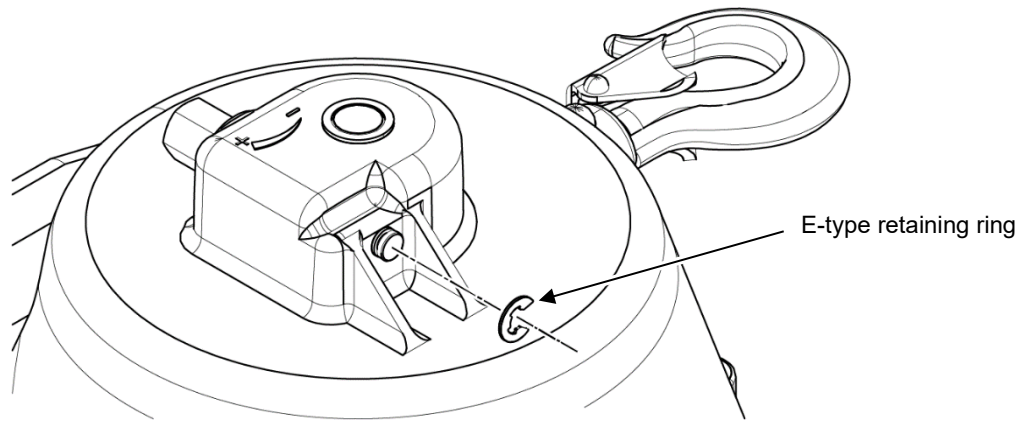
- 4** Remove the balancer from the support member (metal hanger) and place it on the ground or on a workbench.



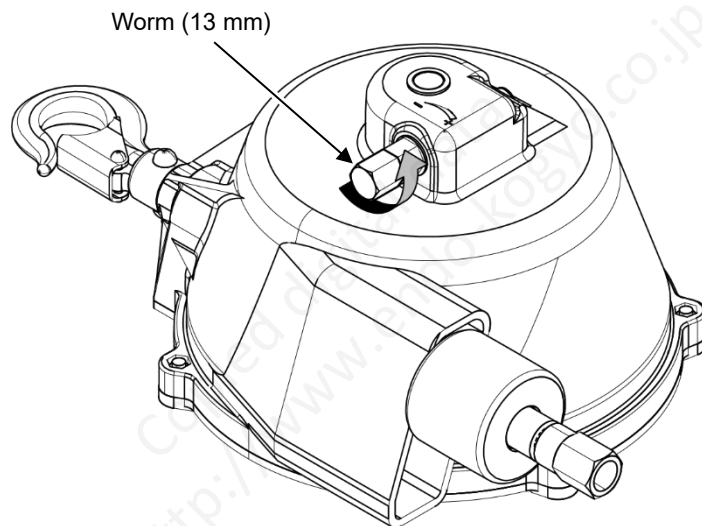
- 5** Secure the shaft with a wrench and remove the tubing fitting.



- 6 Remove the E-type retaining ring from the end of the worm.

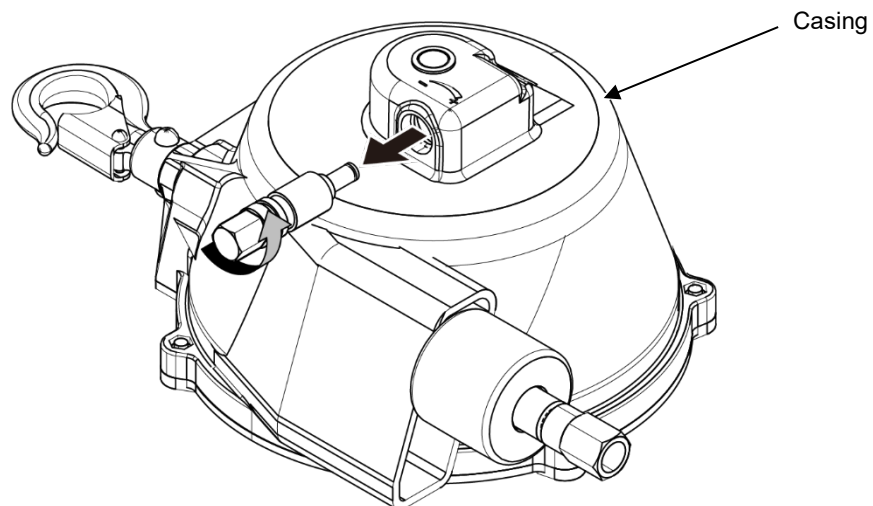


- 7 Turn the worm in the “-” direction (counterclockwise) until the worm starts coming off and release the spring tension.

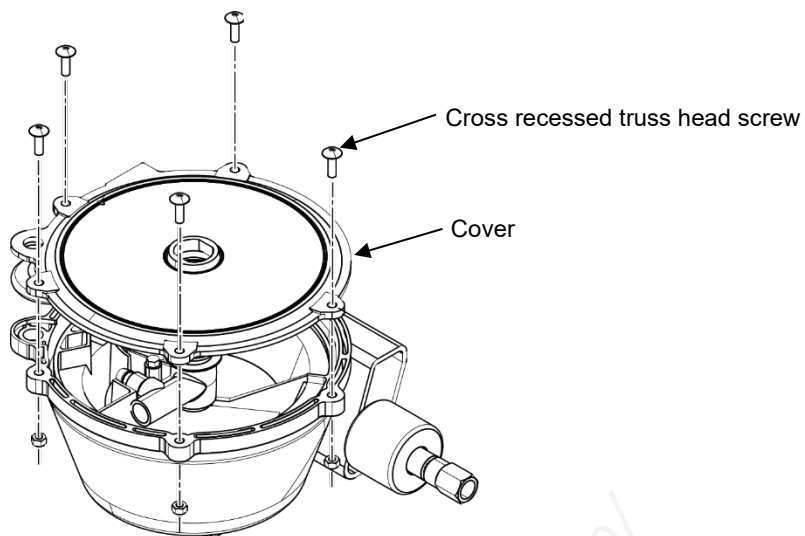


- 8 Pull the hose to confirm that no spring tension remains.

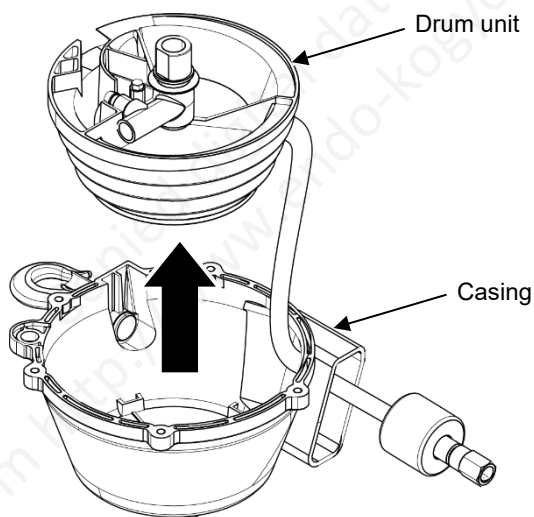
- 9 Further turn the worm in the “-” direction (counterclockwise) and pull the worm from the casing.



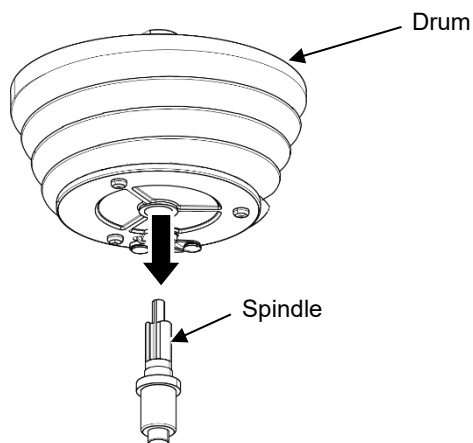
**10** Remove the cross recessed truss head screws (5 pieces) and remove the cover.



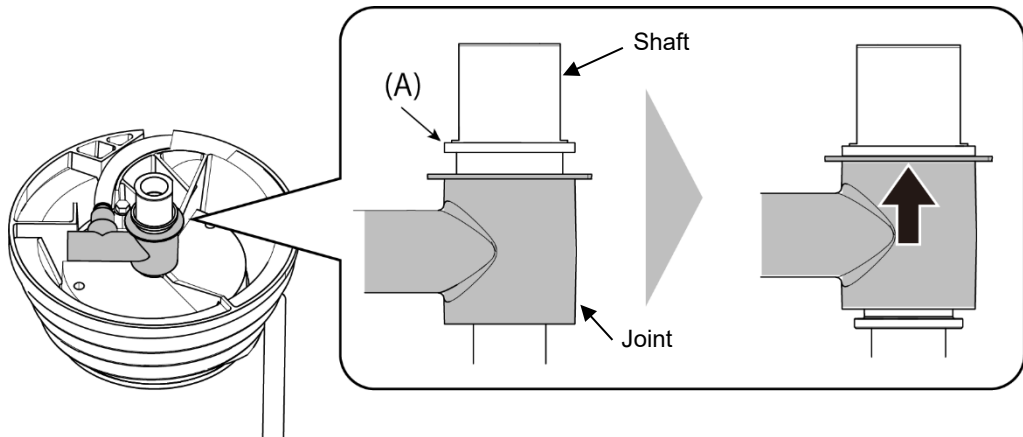
**11** Remove the whole drum unit (drum, shaft, joint, hose, and spindle) from the casing.



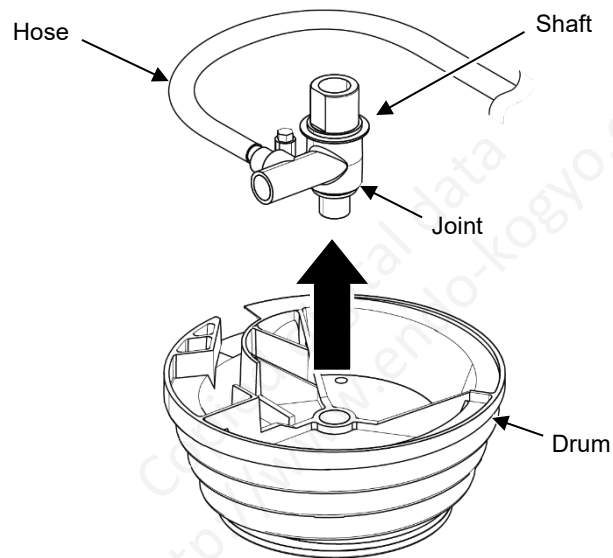
**12** Pull the spindle from the drum.



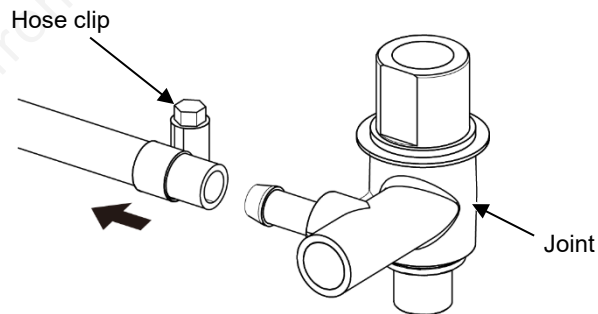
**13** Move the joint until it touches (A) of the shaft as shown in the figure below.



**14** Remove the shaft, joint, and hose as one from the drum.

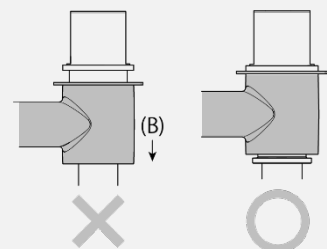


**15** Loosen the hose clip and remove the hose from the joint.

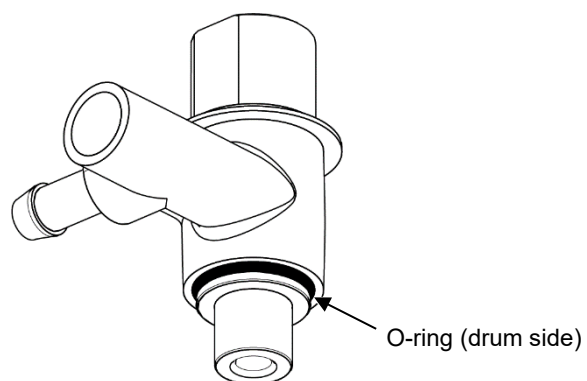


**! REMINDER**

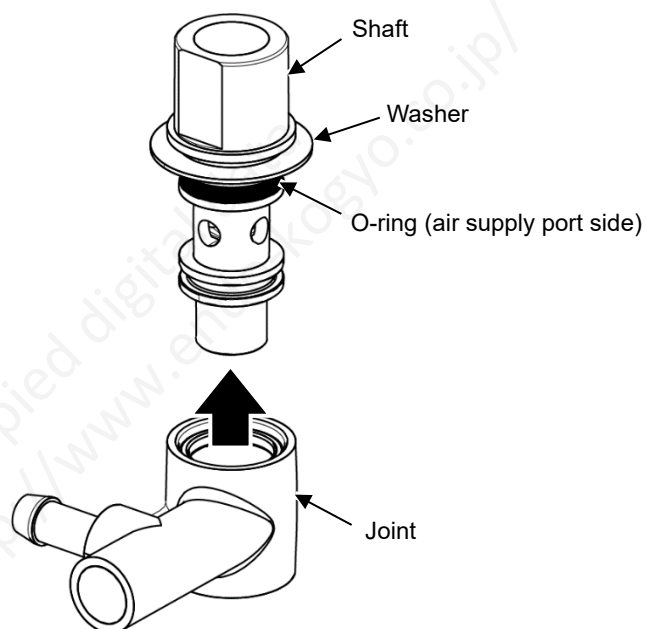
Prevent the joint from moving in the direction toward (B).



**16** Remove the O-ring (drum side) on the joint.

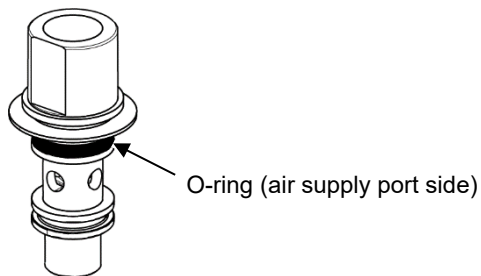


**17** Remove the joint from the shaft and remove the other O-ring (air supply port side). At this time, do not remove the washer from the shaft.



## 2-3-2 Installation

- 1 Install the O-ring into the groove on the air supply port side and apply grease.

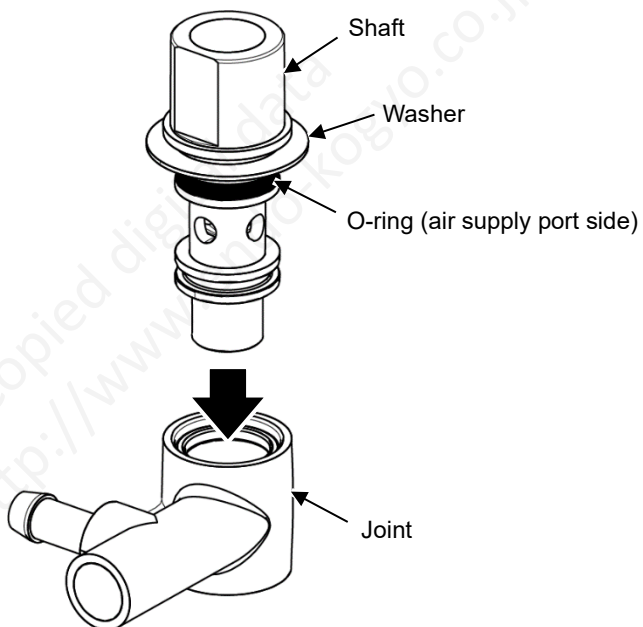


### NOTICE

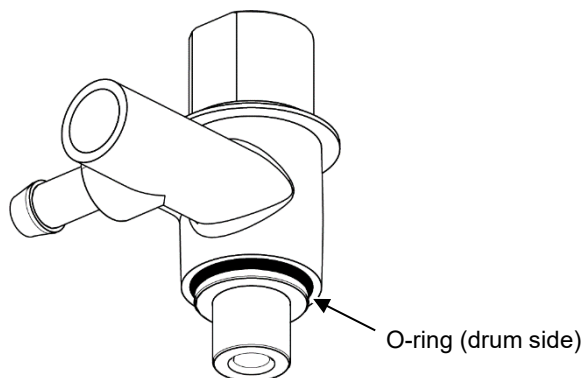


Use lithium soap-based silicone grease corresponding to the NLGI (National Lubrication Grease Institute) No.2 classification.

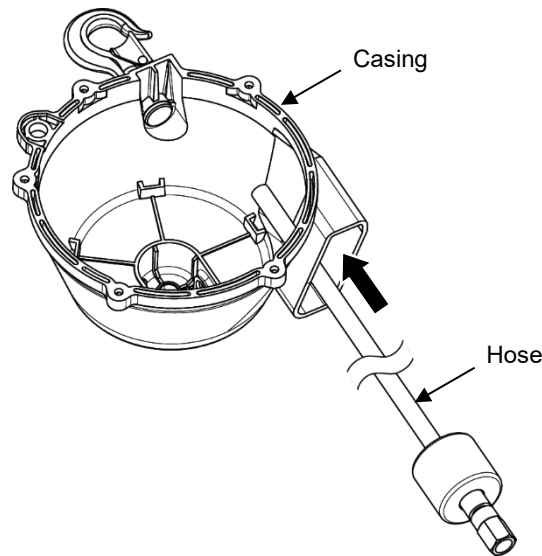
- 2 Insert the shaft into the joint until the washer touches the joint.



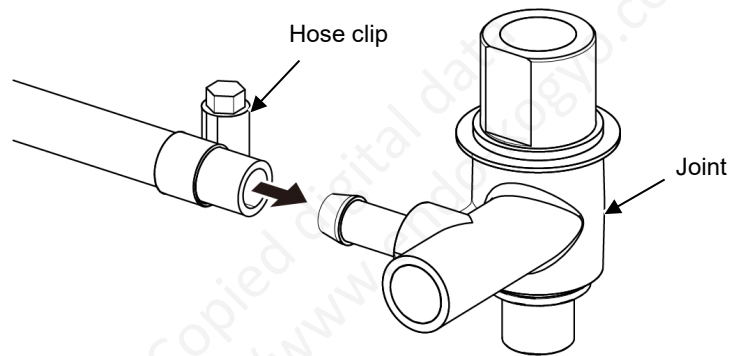
- 3 Install the O-ring (drum side) into the other groove and apply grease.



- 4 Thread the hose into the casing.

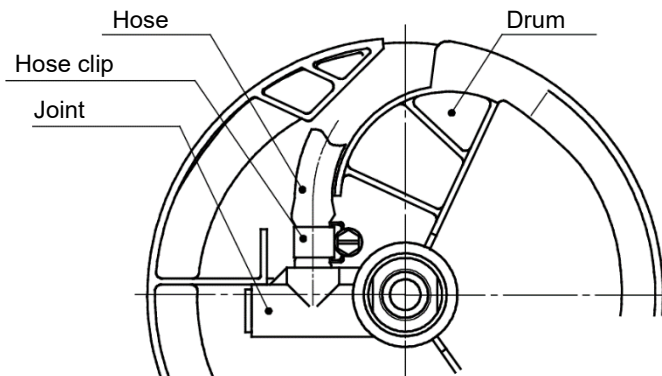


- 5 Install the hose on the joint and tighten the hose clip.



- 6 Install the shaft, joint, and hose as one into the drum.  
Pay attention to the following points.

- For the hose clip, the installation direction and the positional relation to the joint are specified.  
Be sure to install the hose clip so that the position as shown in the figure below is achieved.

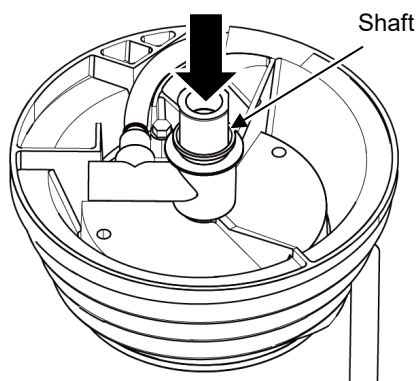


**! REMINDER**

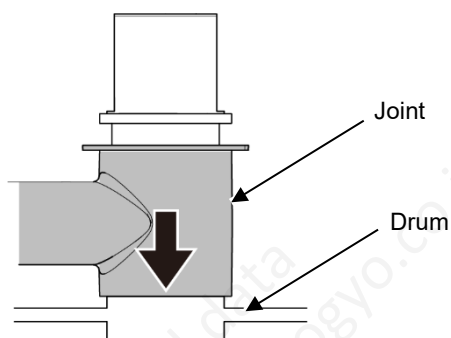
If the beam of the drum prevents the installation of the hose clip, slightly rotate the hose clip.



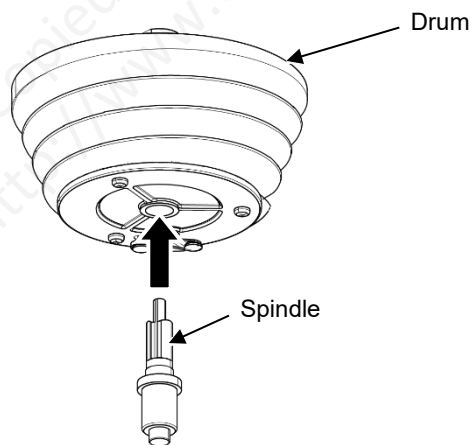
- 7 Push in the shaft until it touches the drum.



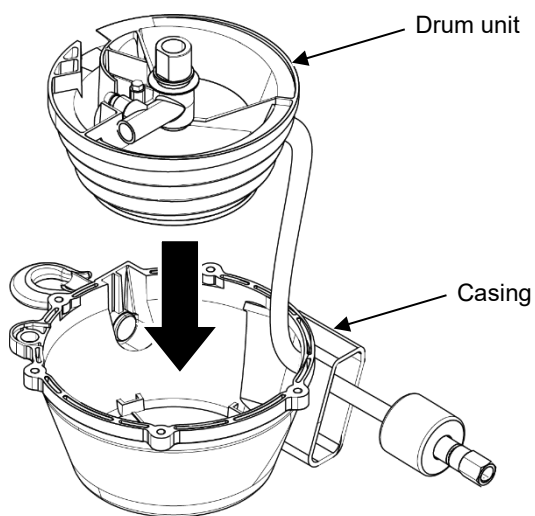
- 8 Move the joint until it touches the drum.



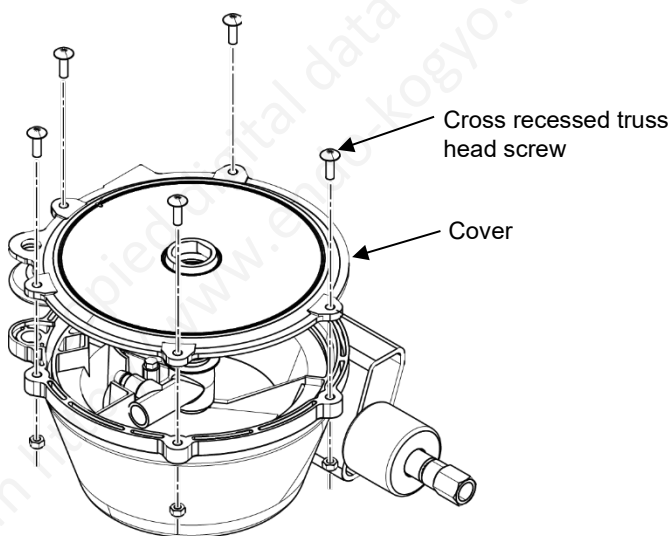
- 9 Install the spindle on the drum.



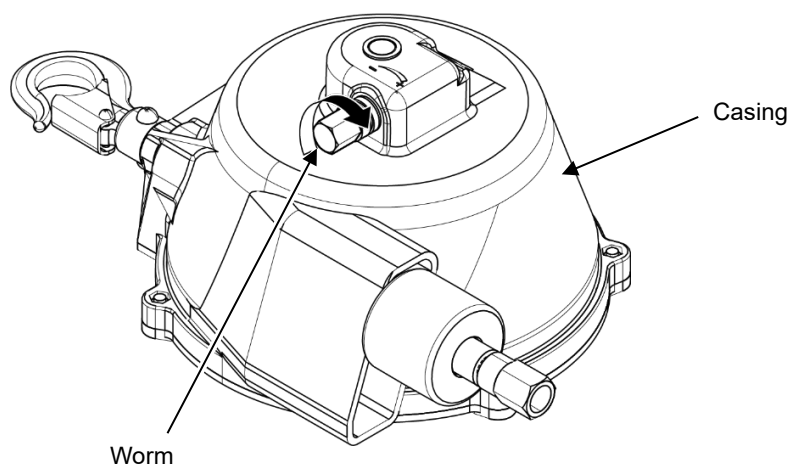
**10** Install the drum unit (drum, shaft, joint, hose, and spindle) on the casing.



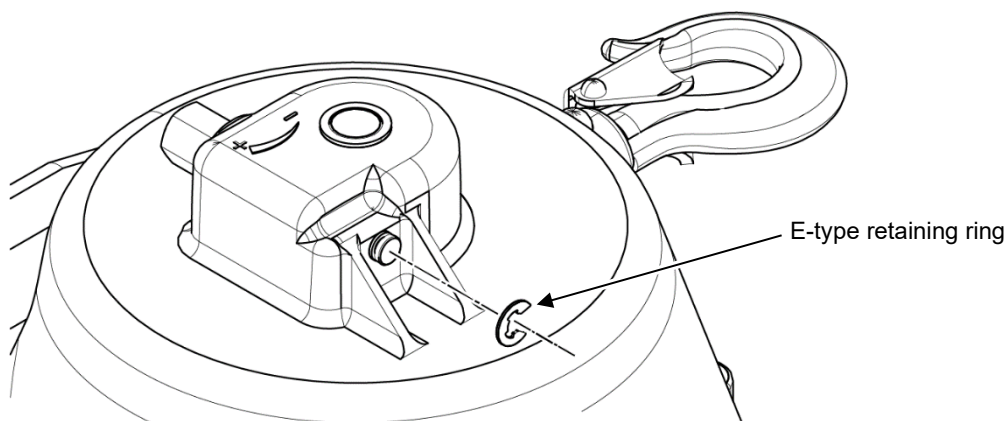
**11** Install the cover on the casing and tighten it with the cross recessed truss head screws (5 pieces).



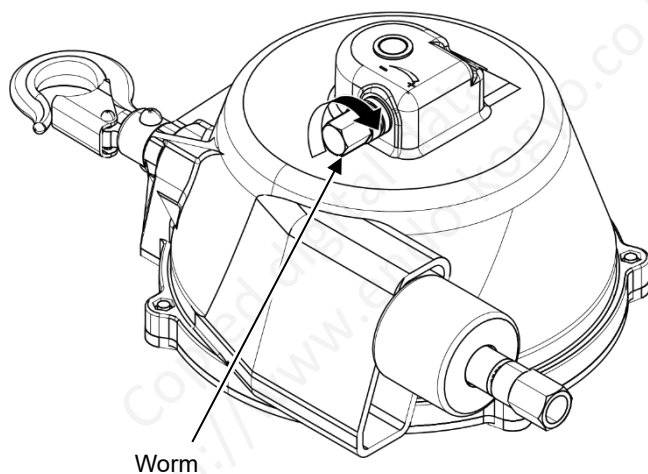
**12** Install the worm on the casing and turn it in the "+" direction (clockwise).



**13** Install the E-type retaining ring on the end of the worm.



**14** Turn the worm in the “+” direction (clockwise) and wind the spring.



**15** After the hose is completely wound inside the drum, further turn the worm by the number of times described in the table below.

Model	THB-15A	THB-25A	THB-35A	THB-50A	THB-65A
Worm Number of turns	Approx. 120	Approx. 75	Approx. 70	Approx. 65	Approx. 85

**16** Hereafter, install the balancer according to the procedure in “5-2-1 Installation of the Tool Hose Balancer” of the Users Manual.

## 2-4 Replacement of the spring

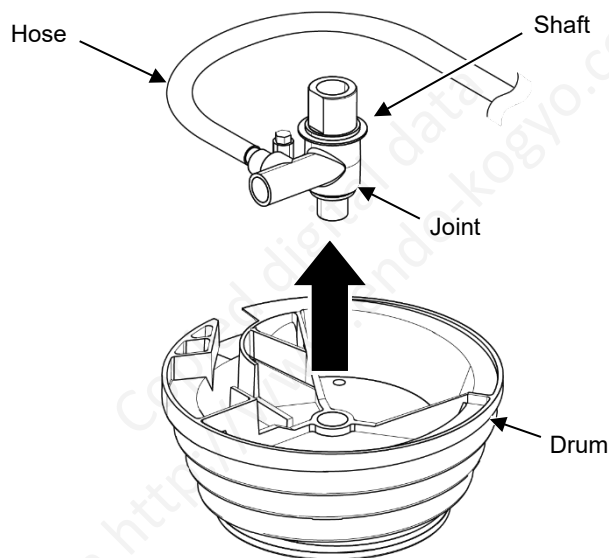
### **WARNING**



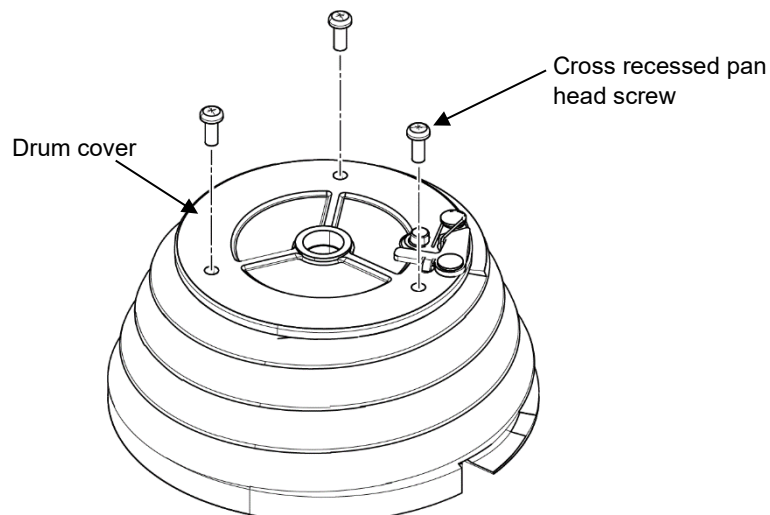
- The spring should be replaced by a maintenance operator who has developed sufficient knowledge and operating skill for the balancer.
- The spring of the product is highly dangerous. Handle the spring with great caution.
- When removing the spring from the drum, never pull out the center part of the spring. The spring may rapidly extend, causing an injury.

### 2-4-1 Removal of the spring

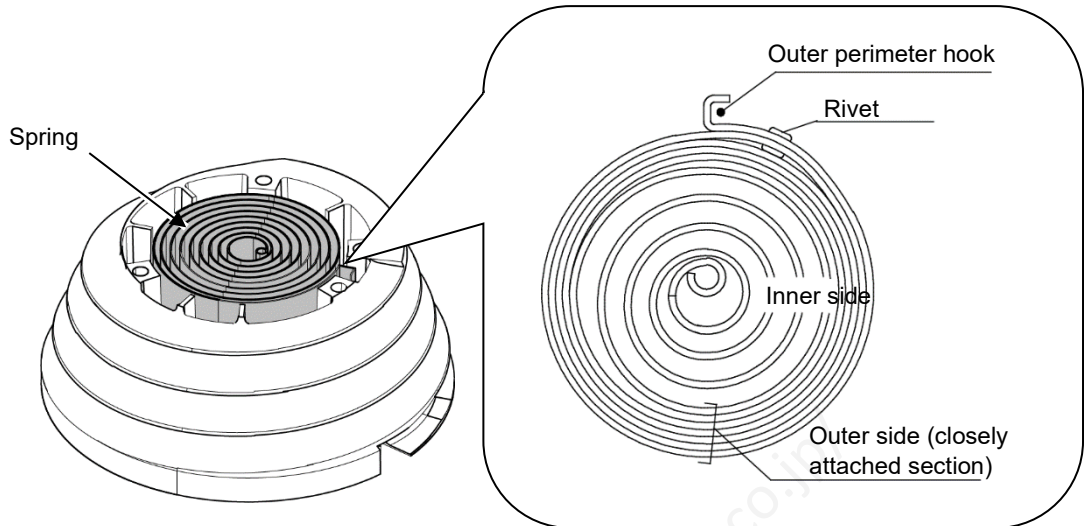
- 1 Remove the casing from the drum according to steps 1 to 15 in “2-3-1 Disassembly”.



- 2 Remove the cross recessed pan head screws (3 pieces) on the back of the drum and remove the drum cover.



- 3 Check the position where the spring is ruptured and the state of the rivet.  
If the spring is ruptured in the closely attached section on the outer side, or if the rivet is damaged, install the cover again and consult with your dealer.

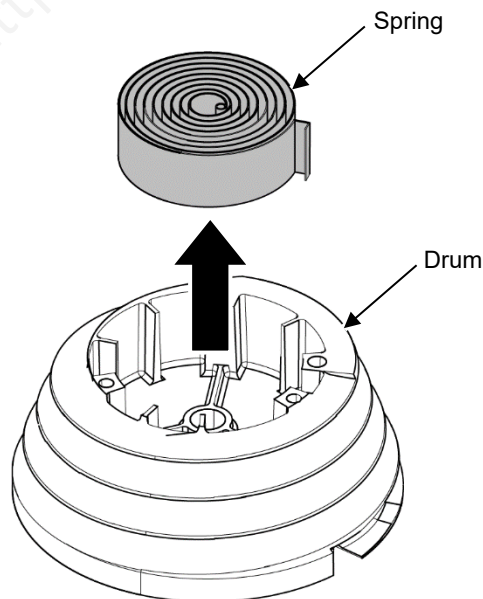


**! WARNING**



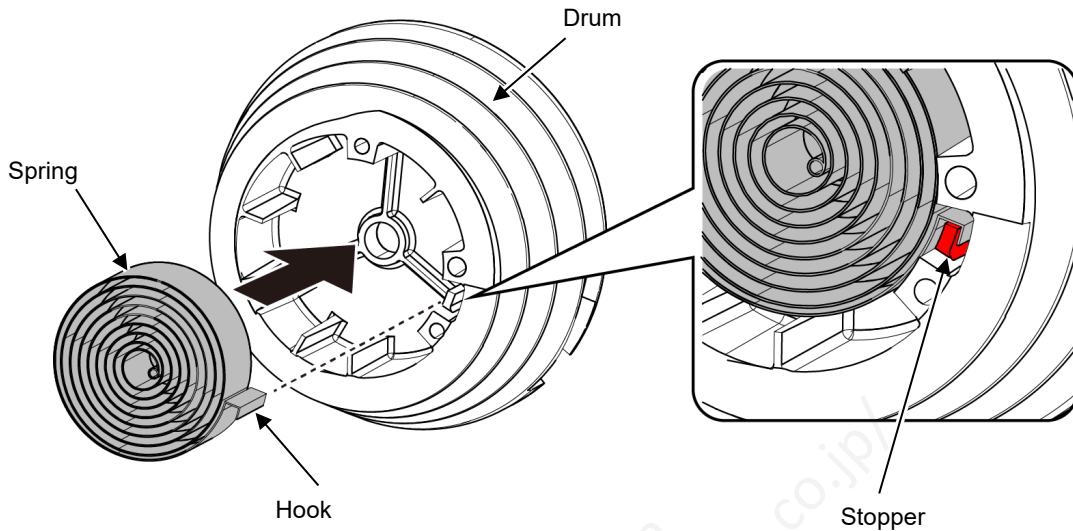
If the spring is ruptured in the closely attached section on the outer perimeter, or if the rivet on the spring is damaged, never remove the spring from the drum. If the spring is removed in such a case, the spring may rapidly extend, causing an injury.

- 4 Remove the spring from the drum.



## 2-4-2 Installation of the spring

- 1 Insert the spring into the drum so that the hook of the spring is caught on the stopper of the cover.



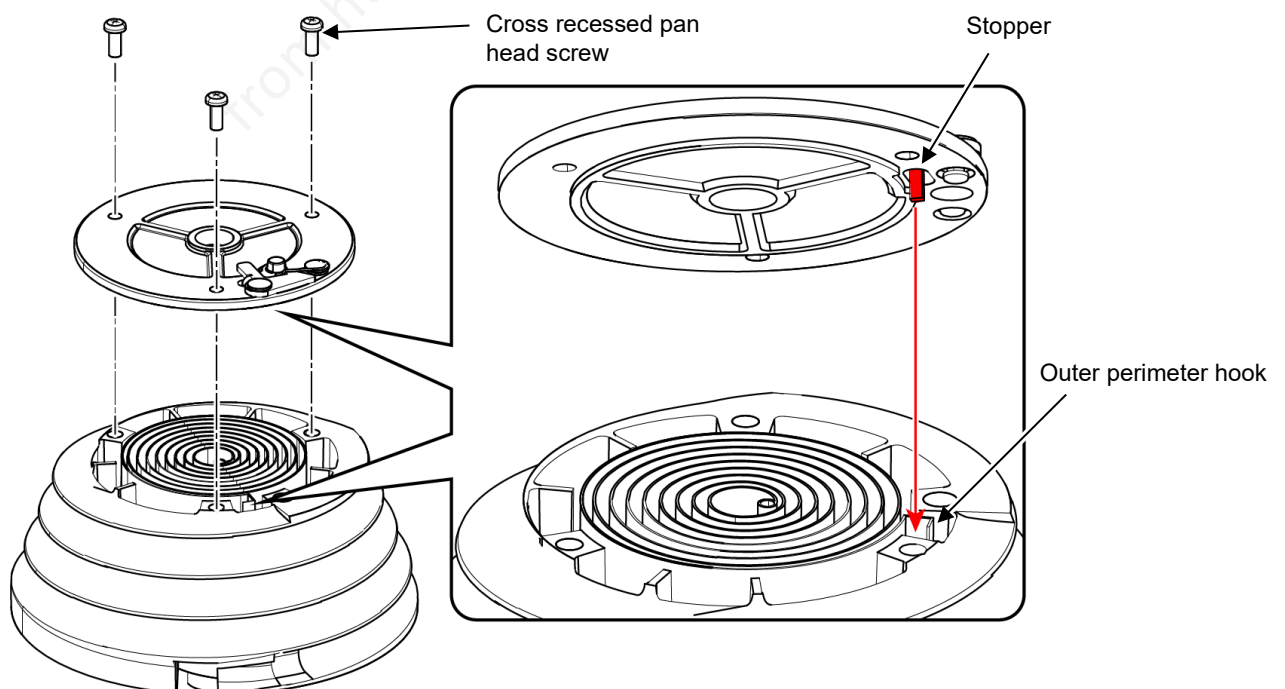
- 2 Apply grease over the top surface of the spring.

### NOTICE



Use One Luber MP-2 grease.

- 3 Install the cover on the drum so that the stopper is inserted into the outer perimeter hook of the spring. Tighten the cross recessed pan head screws (3 pieces).



- 4** After installing the spring and the cover, confirm that the stopper can move smoothly.
- 5** Install the drum on the main equipment of the balancer according to steps 1 to 15 in “2-3-2 Installation”.
- 6** After installing the drum, install the balancer according to “5-2-1 Installation of the Tool Hose Balancer” of the Users Manual.
- 7** Adjust the spring according to “5-2-2 Installation of tools and equipment and adjustment of the spring tension” of the Users Manual.
- 8** Ensure that work can be performed within the range of the stroke according to the “5-3-1 Checking the working range (stroke)” of the Users Manual.

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