

## Dealer's Manual

ROAD	MTB	Trekking
City Touring/ Comfort Bike	URBAN SPORT	E-BIKE

# HUB SET (DISC BRAKE)

## XTR

HB-M9110  
FH-M9110  
FH-M9111

HB-MT900  
FH-MT900  
FH-MT901

## E-THRU Axle 12 mm

SM-AX75  
SM-AX76  
SM-AX76-B  
SM-AX78  
SM-AX78-B  
SM-AX65  
SM-AX55  
SM-AX56  
SM-AX56-B  
SM-AX58  
SM-AX58-B  
AX-MT700-142x12  
AX-MT700-148x12  
AX-MT500-142x12  
AX-MT500-148x12

# CONTENTS

---

<b>CONTENTS</b> .....	<b>2</b>
<b>IMPORTANT NOTICE</b> .....	<b>3</b>
<b>TO ENSURE SAFETY</b> .....	<b>4</b>
<b>LIST OF TOOLS TO BE USED</b> .....	<b>7</b>
<b>INSTALLATION/REMOVAL</b> .....	<b>8</b>
<b>Spoke lacing</b> .....	<b>8</b>
• Standard spoke type .....	8
• Straight spoke type .....	9
<b>Installing/removing the disc brake rotor</b> .....	<b>10</b>
<b>MAINTENANCE</b> .....	<b>11</b>
<b>Front hub</b> .....	<b>11</b>
• Disassembly .....	11
• Assembly .....	13
<b>Freehub</b> .....	<b>14</b>
• Pre-work cautions .....	14
• Disassembly .....	15
• Assembly .....	20

# IMPORTANT NOTICE

- **This dealer's manual is intended primarily for use by professional bicycle mechanics.**

Users who are not professionally trained for bicycle assembly should not attempt to install the components themselves using the dealer's manuals.

If any part of the information on the manual is unclear to you, do not proceed with the installation. Instead, consult a place of purchase or a bicycle dealer for their assistance.

- Make sure to read all owner's manuals included with the product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All owner's manuals and dealer's manuals can be viewed on-line on our website (<http://si.shimano.com>).
- Customers who do not use the internet may have to contact their place of purchase to receive a hard copy of the user's manual.  
You may print out a user's manual to hand to your customer or you may need to ask the nearest SHIMANO sales office for a hard copy of the user's manual.
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.

**For safety, be sure to read this dealer's manual thoroughly before use, and follow it for correct use.**

The following instructions must be observed at all times in order to prevent personal injury and physical damage to equipment and surroundings.

The instructions are classified according to the degree of danger or damage which may occur if the product is used incorrectly.

 <b>DANGER</b>	Failure to follow the instructions will result in death or serious injury.
 <b>WARNING</b>	Failure to follow the instructions could result in death or serious injury.
 <b>CAUTION</b>	Failure to follow the instructions could cause personal injury or physical damage to equipment and surroundings.

# TO ENSURE SAFETY

## ⚠ WARNING

- **Be sure to follow the instructions provided in the owner's manuals when installing the product.**

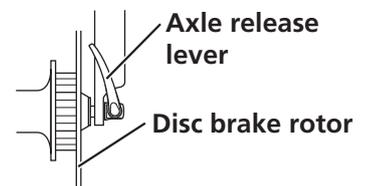
It is recommended to use SHIMANO genuine parts only. If parts such as bolts and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.

In addition, if adjustments are not carried out correctly, problems may occur, and the bicycle may suddenly fall over, which may cause serious injury.

-  Be sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.
- After reading the dealer's manual thoroughly, keep it in a safe place for later reference.
- When assembling the freewheel body unit, do not apply grease or oil outside of the designated areas. This may cause the freewheel body unit to malfunction or some other problem.
- Do not wash the freewheel body unit. The internal grease may flow out and cause the freewheel body unit to malfunction or some other problem.

## Be sure to also inform users of the following:

- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and cause serious injury.
- Use only in combination with a special frame and through axle. If used with any other type of frame, the wheel may come off while the bicycle is being ridden, and serious injury may occur as a result.
- If the axle release lever is on the same side as the disc brake rotor, there is a possibility they may interfere. Make sure that, even if the axle release lever is tightened as much as possible by hand, the axle release lever does not interfere with the disc brake rotor. If it interferes with the disc brake rotor, stop using it and consult a place of purchase or a distributor.



## For installation to the bicycle, and maintenance:

- The securing method and tightening torque for the front wheel both vary depending on the type of front suspension fork being used. When installing the front wheel to the front suspension fork, always be sure to follow the directions given in the owner's manual for the front suspension fork. If the instructions are not followed, the front wheel may fall out of the front suspension fork and serious injury may occur. When the front wheel is tightened onto the front suspension fork in accordance with the tightening torque in the owner's manual, the front wheel's rotation may become stiff; however, the instructions must always be followed.
- It is strongly recommended that only the hub axle that is shipped with the SHIMANO hub is used. If a different hub axle is used to secure the hub, it may not have sufficient strength to secure the freehub, or the axle may break because of insufficient strength, and this may cause the wheel to fall off, and serious injury may occur.

### CAUTION

## For installation to the bicycle, and maintenance:

- When using the SHIMANO original tool (TL-FC36) to remove and install the disc brake rotor fixing ring, be careful not to touch the outside of the disc brake rotor with your hands. Wear gloves to protect your hands from getting cut.

### NOTICE

## Be sure to also inform users of the following:

- This product is not warranted against damage resulting from improper use, such as jumping while riding or if the bicycle falls over, except if such malfunctions are caused by manufacturing methods.
- If there are abnormal noises or if the free body becomes difficult to engage, consult a place of purchase or a distributor.
- Products are not guaranteed against natural wear and deterioration from normal use and aging.
- For maximum performance we highly recommend SHIMANO lubricants and maintenance products.

## For installation to the bicycle, and maintenance:

- If the wheel becomes stiff and difficult to turn, lubricate it with grease.
- Do not add oil to the internal parts of the hub. Otherwise, grease will flow out.

- When replacing the E-THRU Axle, make sure that the replacement E-THRU Axle is of the same model as the current E-THRU Axle attached to the frame. A different model may not be mounted properly onto the frame due to differences in axle length, screw size, housing diameter, etc.
- Aluminum is used in the outer material of the freewheel body unit. Use an aluminum lock ring for the cassette sprocket. Refer to "Specifications" on our website (<http://si.shimano.com>) for aluminum lock ring models.
- FH-M9110/FH-MT900: A ratchet sound may occur during free rotation of the hub at low speeds or free rotation of the hub while the bicycle is inclined. This is caused by the internal configuration of the hub and is not a malfunction.
- When attaching the hubs to a wheel truing tool, use TL-HB16 for the front hub and TL-FH12 for the freehub.
- The E-THRU models listed on the cover page of this dealer's manual are not designed for downhill bicycle riding or freeriding.

The actual product may differ from the illustration because this manual is intended mainly to explain the procedures for using the product.

# LIST OF TOOLS TO BE USED

The following tools are needed for installation/removal, adjustment, and maintenance purposes.

Tool	
	17 mm hub spanner
	18 mm hub spanner
	22 mm hub spanner
	TL-FH12
	TL-HB16
	TL-FC36
	Snap ring remover

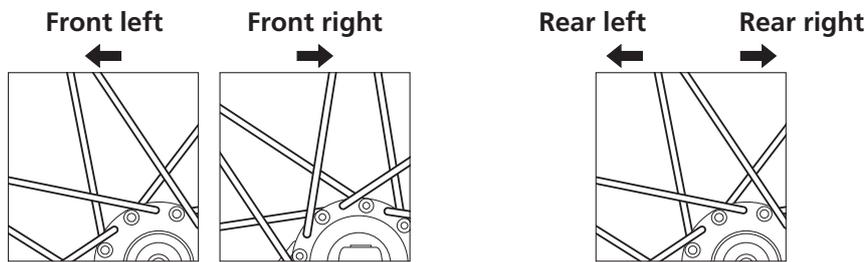
# INSTALLATION/REMOVAL

## Spoke lacing

### Standard spoke type

#### 1. Lace the spokes as shown in the figure.

Radial lacing is not supported.



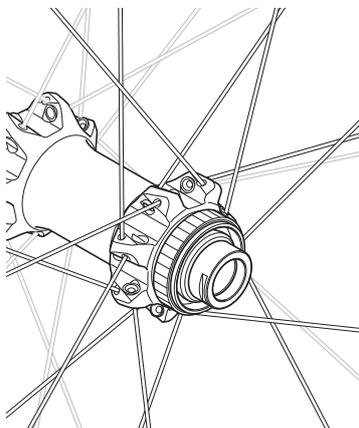
#### **NOTICE**

- Use SHIMANO original tools (for the front: TL-HB16, for the rear: TL-FH12) when assembling the wheel.
- Refer to "Specifications" on our website (<http://si.shimano.com>) to obtain detailed specifications for each hub.

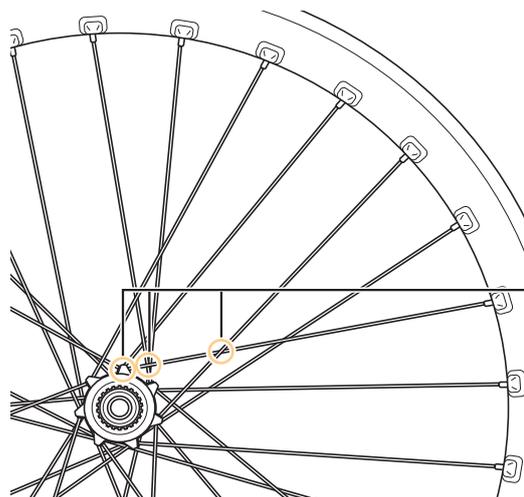
## Straight spoke type

### 1. Lace the spokes as shown in the figure.

Only three-cross lacing can be used.



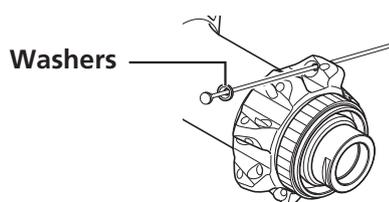
ERD (Effective Rim Diameter): 550 - 610 mm  
Rim offset: 0 - 3 mm



Including the flange portion, the spokes will intersect at the three locations shown in the figure.

#### NOTICE

- Use the attached washers when installing the spokes. Install the spokes so that the spherical portion of the washers are facing a direction in which they will fit into the indents in the flange.



- Use SHIMANO original tools (for the front: TL-HB16, for the rear: TL-FH12) when assembling the wheel.
- Refer to "Specifications" on our website (<http://si.shimano.com>) to obtain detailed specifications for each hub.

# Installing/removing the disc brake rotor

Refer to the dealer's manual for the brakes to install and remove the disc brake rotor.

**NOTICE**

- The lock ring of the disc brake rotor to be used in FH-M9110/M9111/MT900/MT901 must be an outer serration type. Other types of lock rings cannot be used.

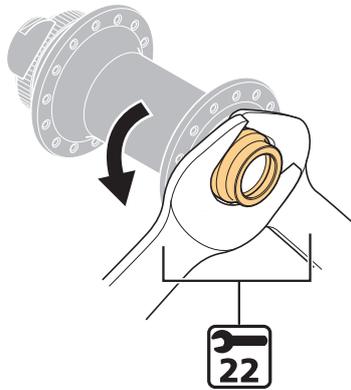
# MAINTENANCE

## Front hub

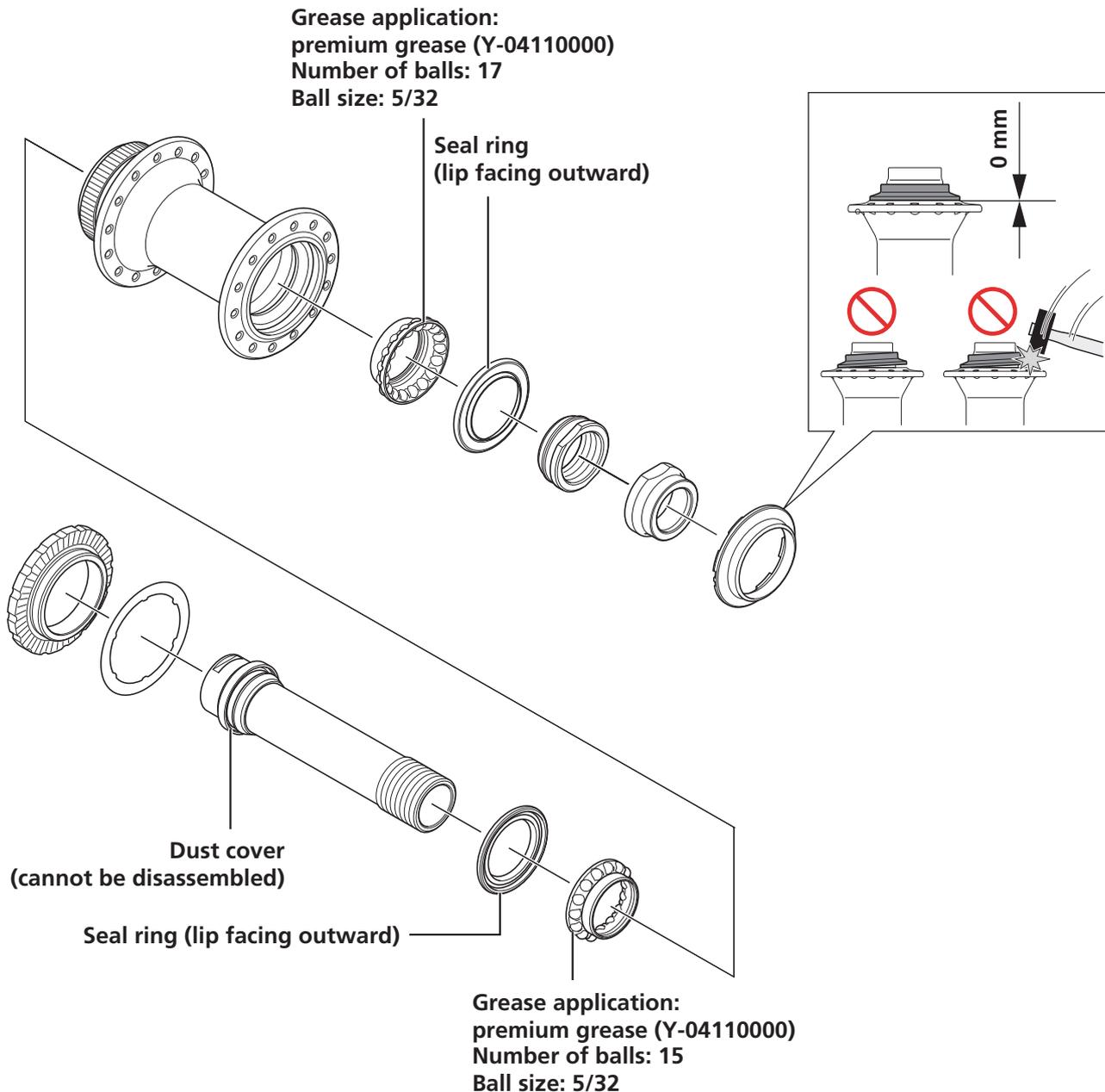
### Disassembly

- 1. Loosen the lock nut of the double-lock section on the right side of the hub body.**

The unit cannot be disassembled from the left side of the hub body (the disc brake rotor fixing serration side).



**2.** The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic intervals.

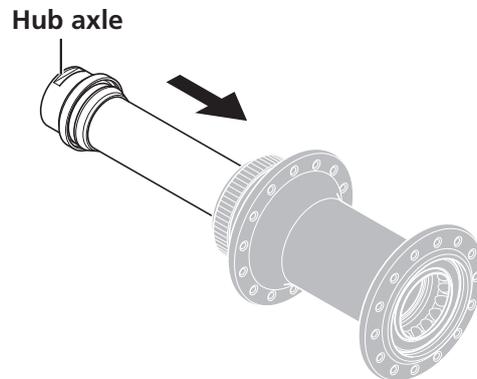


**NOTICE**

- Conduct the removal and installation of the seal very carefully so that it does not become deformed. When reinstalling the seal, check that it is facing the right way and insert it as far as it will go.

## Assembly

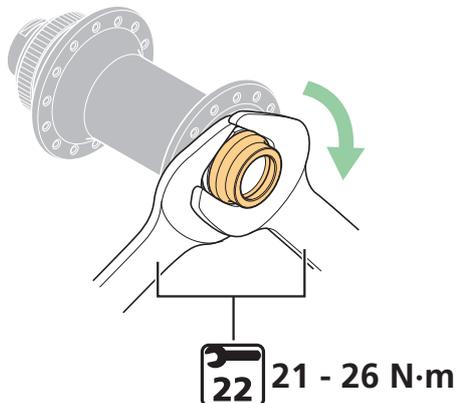
### 1. Install the hub axle from the left side of the hub body.



#### **NOTICE**

- If using a hub spanner on the beveled part of the hub body left side, be careful not to apply excessive torque. Doing so may cause damage.

### 2. After assembling the necessary parts and adjusting the rotation, tighten the lock nut to double-lock the assembly.

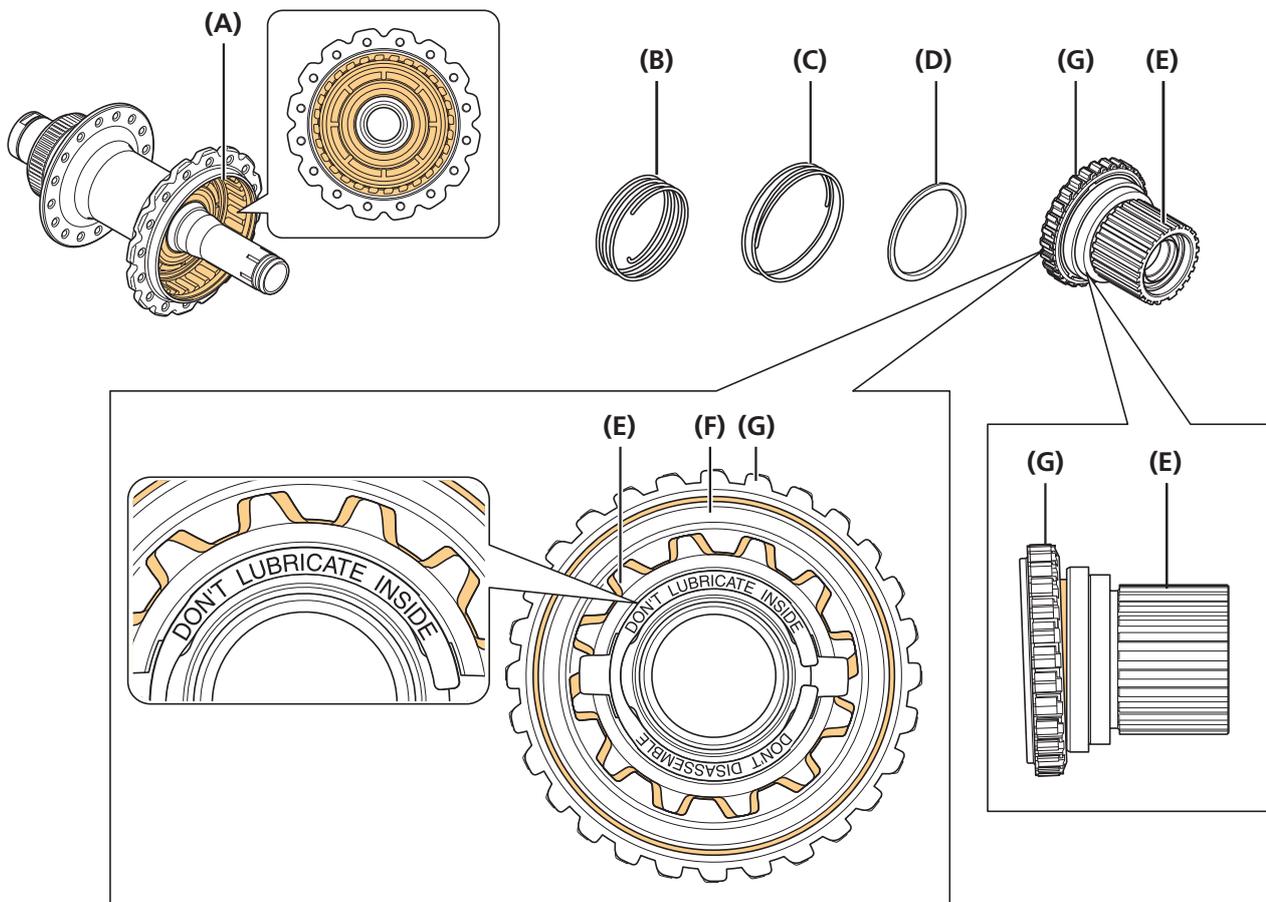


# Freehub

## Pre-work cautions

### ⚠ WARNING

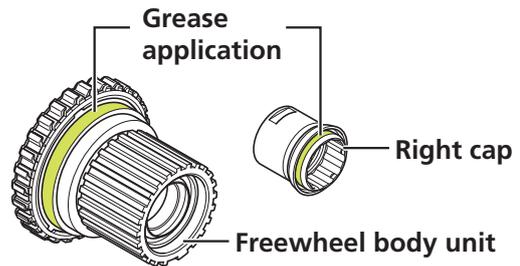
- Except for the seal portion of (E), do not apply grease or oil to parts (A) through (G) and to the colored parts shown in the figure. This may lead to a malfunction in the freewheel body unit.



- The three parts (E), (F) and (G) form one unit (the freewheel body unit). Do not disassemble. This may lead to a malfunction in the freewheel body unit.
- Make sure that the freewheel body unit is operating correctly before riding the bicycle by checking it several times following parts replacement or maintenance. If the freewheel body unit appears to be malfunctioning, replace it.

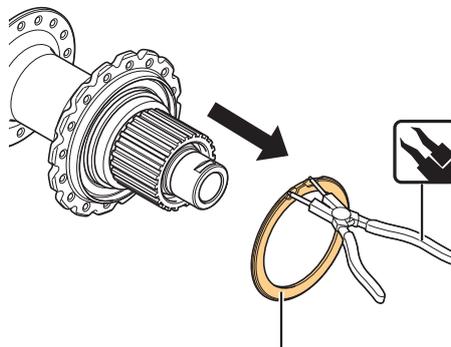
**⚠ WARNING**

- Apply special grease (Seal Grease for Freehub) to the outer seal portion and on the seal portion of the right cap. Do not mix in any other type of grease. As a guide, use just enough grease to apply lightly by hand. Using the wrong type of grease or applying it in excessive amounts may cause the freewheel body unit to malfunction or some other problem. In addition, the freewheel body unit may malfunction if grease or oil is applied outside of these areas and the bearing section. (Refer to the steps in Freehub "Disassembly".)



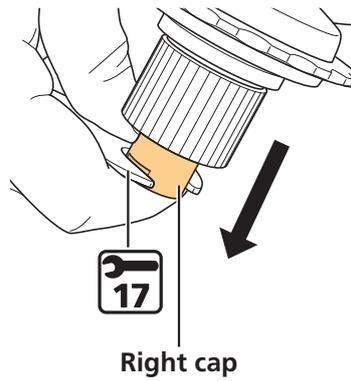
## Disassembly

### 1. Remove the C-ring with outer dust cover.



C-ring with outer dust cover

## 2. Remove the right cap.

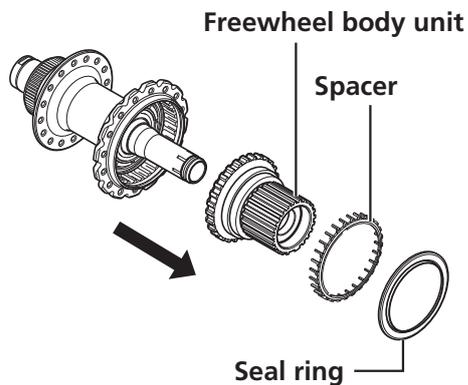


### NOTICE

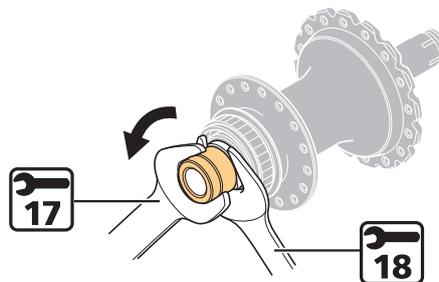
- Position the right cap so it is facing downward and support it with your thumb, etc. to prevent the cap from falling as it is removed.

## 3. Remove the freewheel body unit.

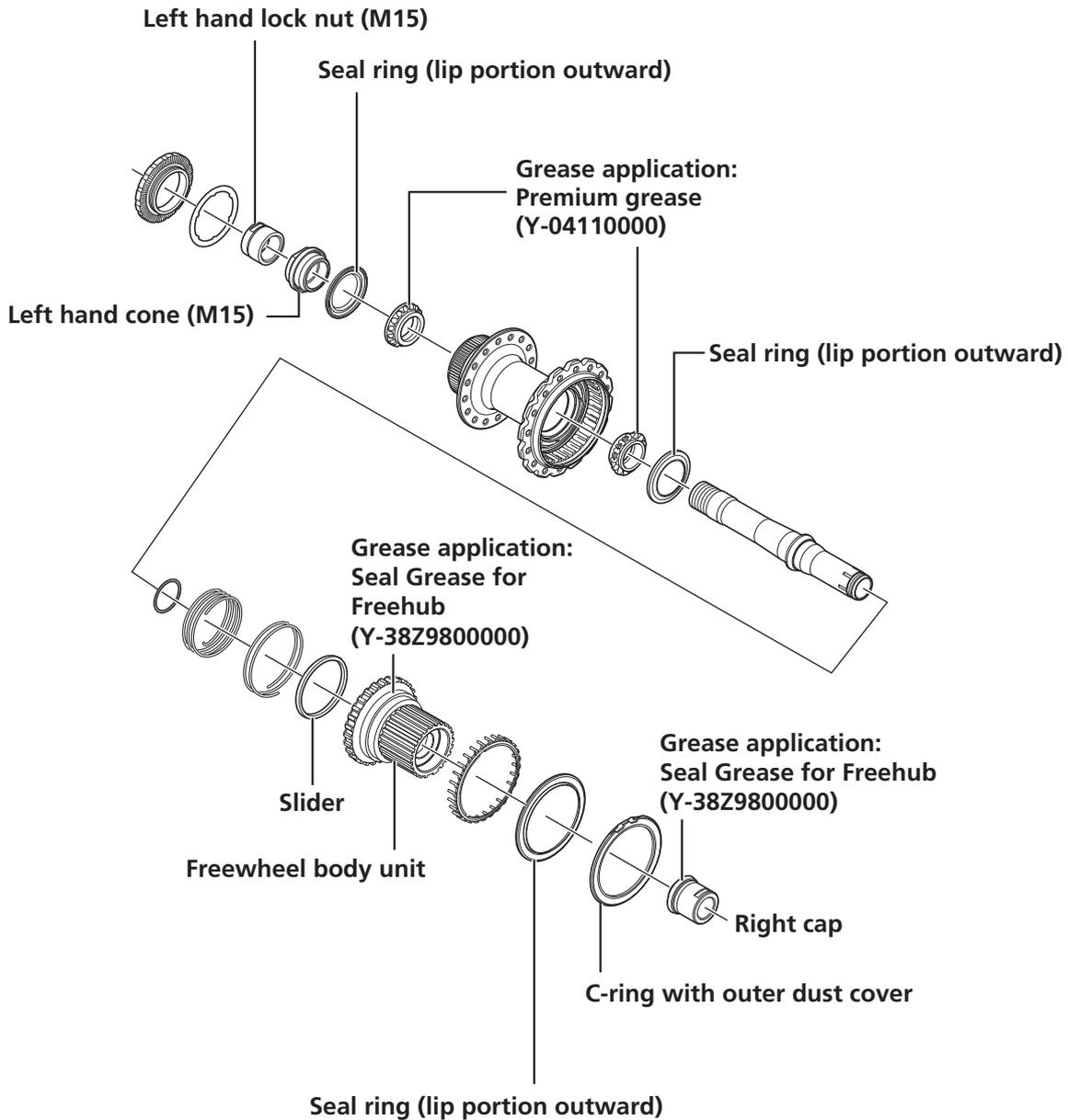
The seal ring and the spacer can be removed at the same time.



## 4. Loosen the lock nut of the double-lock section on the left side of the hub body.



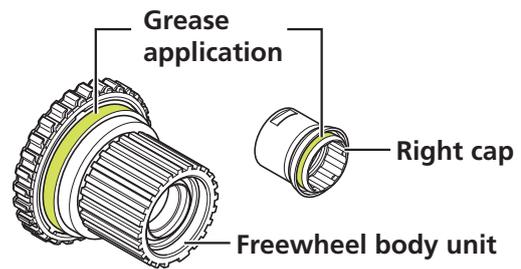
**5.** The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic intervals.



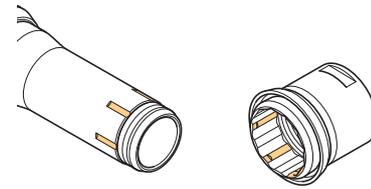
Conduct the removal and installation of the seal very carefully so that it does not become deformed.

**NOTICE**

- Apply special grease (Seal Grease for Freehub) to the parts indicated in the figure.



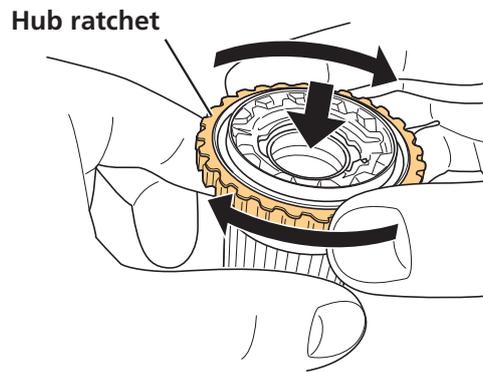
- When attaching the right cap to the hub axle, align the groove of the hub axle and the protrusion part of the right cap.



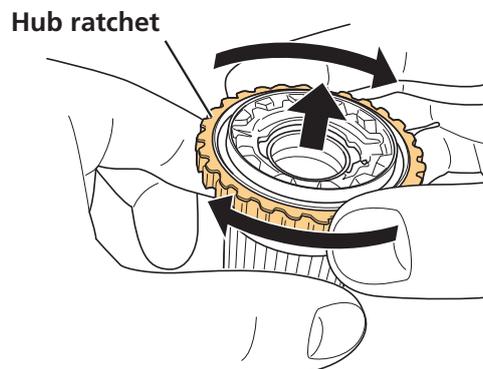
- When replacing the freewheel body unit, hub axle or right cap, make sure to remove any shim rings from inside the parts in advance. Some shim rings may still be inside the hub axle and freewheel body unit.
- If only conducting maintenance, the shim rings already inside the parts can be used as they are. When replacing the freewheel body unit, hub axle or right cap, refer to "Adjusting the number of shim rings" to adjust the number of shim rings.
- Do not attempt to disassemble the freewheel body unit, because it may result in a malfunction.
- Do not apply grease or oil outside of the designated areas.
- Conduct the removal and installation of the seal very carefully so that it does not become deformed. When reinstalling the seal, check that it is facing the right way and insert it as far as it will go.
- Do not attempt to disassemble the dust cover which is crimped onto the right cap and cone.

**NOTICE**

- After removing the freewheel body unit, make sure that the hub ratchet does not spin out of control when you are turning it clockwise, while pressing it in the direction of the arrow (downward) as shown in the figure. If the hub ratchet is spinning out of control, it may lead to a malfunction in the freewheel body unit.



When the hub ratchet spins out of control, return it to the proper position by turning it clockwise while pulling it in the direction of the arrow (upward) as shown in the figure. After this, perform the above checks again to make sure that the hub ratchet does not spin out of control.



## Assembly

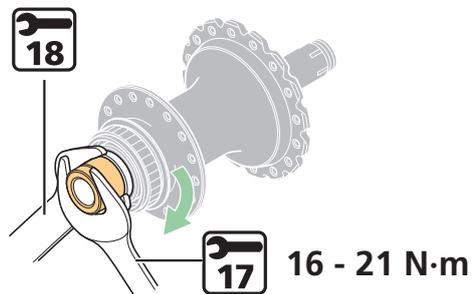
Perform the tasks listed below to assemble the hub.

### ▶ Installing the hub axle

#### 1. Install the necessary parts such as the hub axle.

Install it in the reverse order from the disassembly.

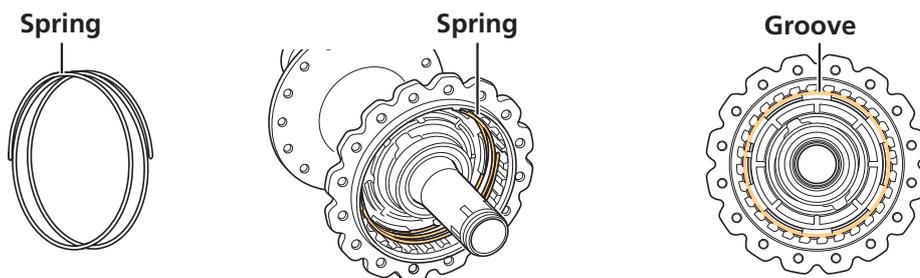
#### 2. Tighten the lock nut on the left side of the hub body to double-lock the assembly.



### ▶ Installing the spring

#### 1. Fit the spring into the slot in the hub.

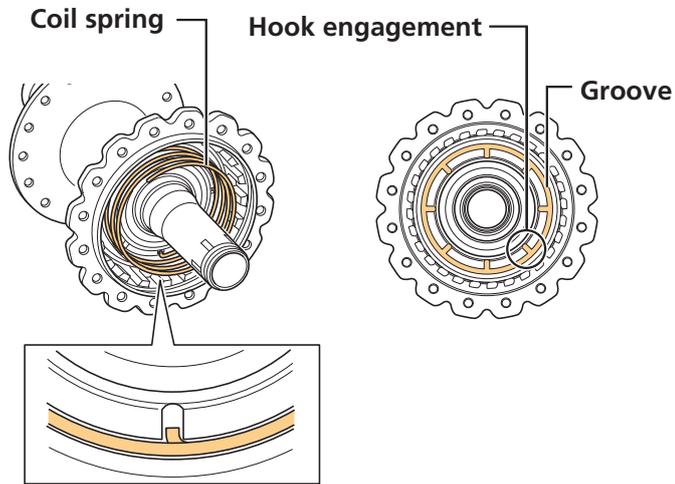
Insert the spring into the groove specified in the figure.



## ▶ Installing the coil spring

### 1. Fit the coil spring into the slot in the hub.

Fit the stopper hook into the hook engagement. There are eight hook engagements in total, and any of them can be used for the installation.



#### **NOTICE**

- The coil spring and spring have different shapes.

Coil spring

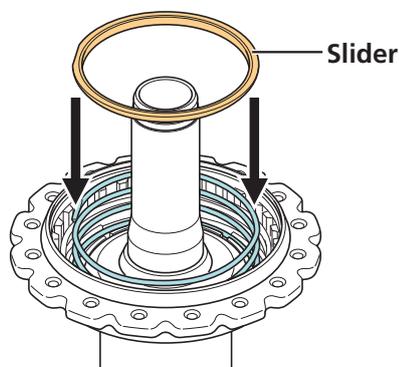


Spring



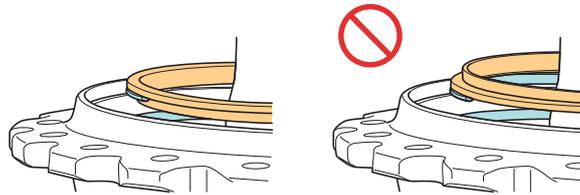
## ▶ Installing the slider

### 1. Set the slider on top of the coil spring.



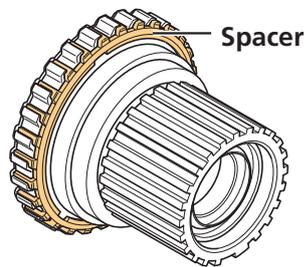
**NOTICE**

- Note the direction (up and down) of the slider.



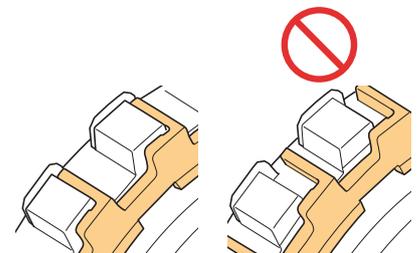
► **Installing the spacer**

1. Install the spacer as shown in the figure.



**NOTICE**

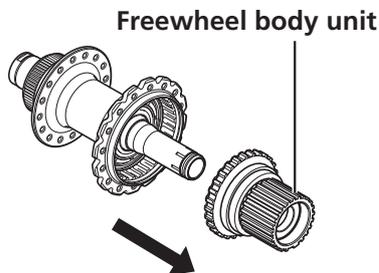
- Pay attention to the position of the spacer.



## ► Adjusting the number of shim rings

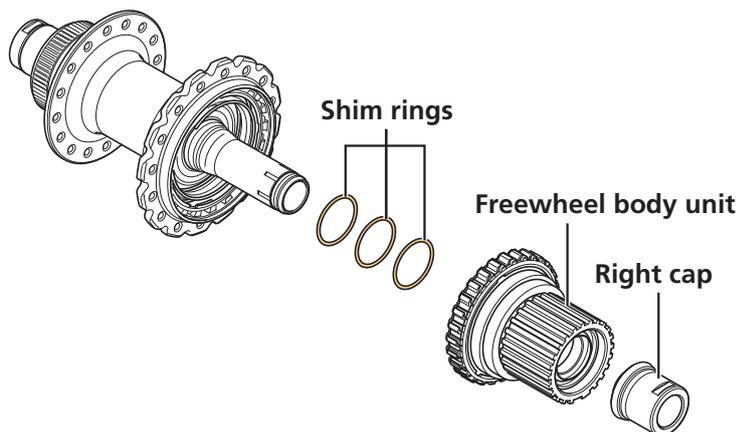
When replacing the freewheel body unit, hub axle or right cap, adjust the number of shim rings.

### 1. Remove the freewheel body unit.



### 2. Place three shim rings.

Install the freewheel body unit and right cap.

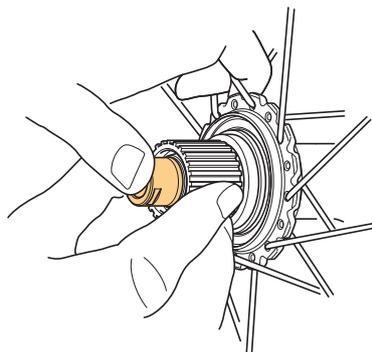


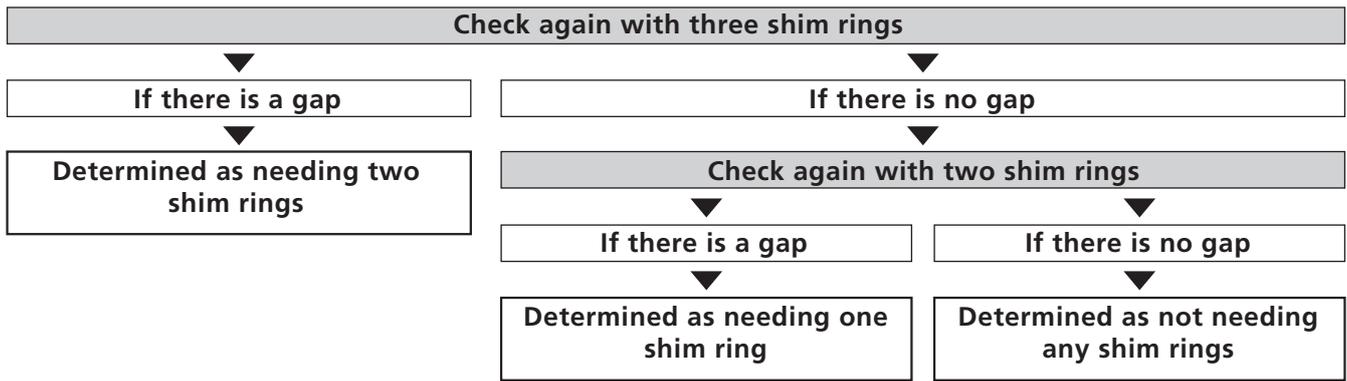
### 3. Check if there is a gap with the freewheel body unit.

An appropriate gap is necessary between the freewheel body unit and the hub body.

Support the right cap with your thumb as shown in the figure while conducting the check.

Check the gap by feeling the three shim rings, then follow the table and continue your check. Now determine the necessary number of shim rings.





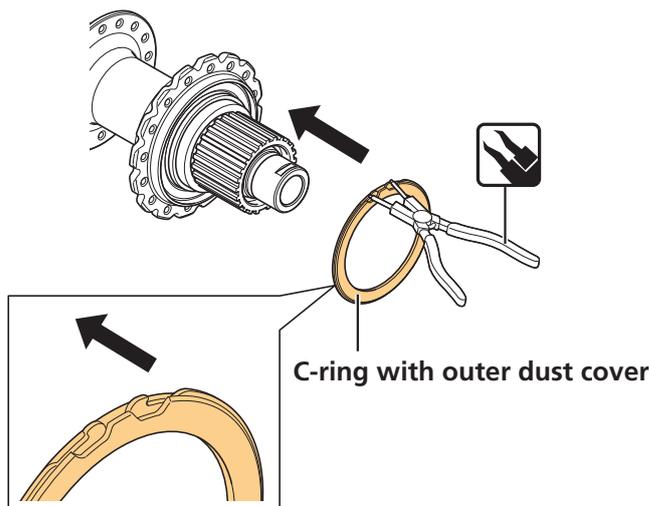
**4. Place the necessary number of shim rings and then install the freewheel body unit.**

**NOTICE**

- Do not use with three shim rings installed.

**▶ Installing the C-ring with outer dust cover**

- 1. Install the freewheel body unit and right cap.**
- 2. Install the seal ring.**  
Face the lip towards the outside.
- 3. Install the C-ring with outer dust cover.**



**NOTICE**

- Pay attention to the orientation of the C-ring with outer dust cover.
- Push the C-ring with outer dust cover into the groove along the entire circumference.

## ▶ Replacing the freewheel body unit

Refer to "Pre-work cautions", "Disassembly", and "Assembly" when replacing the freewheel body unit.

The procedure from step 4 in "Disassembly" is unnecessary, since the hub axle does not need to be removed.

# SHIMANO

**SHIMANO NORTH AMERICA BICYCLE, INC.**

One Holland, Irvine, California 92618, U.S.A. Phone: +1-949-951-5003

**SHIMANO EUROPE B.V.**

High Tech Campus 92, 5656 AG Eindhoven, The Netherlands Phone: +31-402-612222

**SHIMANO INC.**

3-77 Oimatsu-cho, Sakai-ku, Sakai-shi, Osaka 590-8577, Japan

Please note: specifications are subject to change for improvement without notice. (English)

© Jan. 2019 by SHIMANO INC. ITP