Dealer's Manual

ROAD	GRAVEL	MTB
E-BIKE	LIFESTYLE	GENERAL

Hub Set (Disc Brake)

Non-series

HB-QB400
HB-QC400
HB-QC300
FH-QC500
FH-QB400
FH-QC400
FH-QC300

Contents

IMPORTANT NOTICE 3
TO ENSURE SAFETY 4
List of tools to be used 6
Installation/removal 7
Spoke lacing 7
Installing the disc brake rotor 8
- CENTER LOCK type 8
- 6-bolt type (with rotor lock washers) 8

Removing the disc brake rotor 10
Maintenance 11
Front hub disassembly (HB-QC400 / HB-QB400) 11
Front hub assembly (HB-QC400 / HB-QB400) 16
Front hub disassembly (HB-QC300) 20
Front hub assembly (HB-QC300) 22
Freehub disassembly (FH-QC500) 23
Freehub assembly (FH-QC500) 26
Freehub disassembly (FH-QC400 / FH-QB400) 31
Freehub assembly (FH-QC400 / FH-QB400) 36
Freehub disassembly (FH-QC300) 40
Freehub assembly (FH-QC300) 42
Replacing the freewheel body unit 43
- FH-QC500 43
- FH-QC400 / FH-QB400 / FH-QC300 43

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. Contact your place of purchase or a distributor for assistance.
- Make sure to read all manuals included with each product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All manuals and technical documents are accessible online at https://si.shimano.com .
- For consumers who do not have easy access to the internet, please contact a SHIMANO distributor or any of the SHIMANO offices to obtain a hardcopy 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.

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

TO ENSURE SAFETY

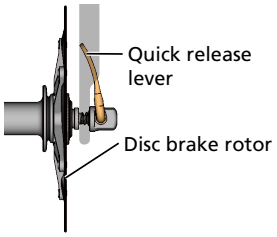
⚠ WARNING

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

  Only use SHIMANO genuine parts. If a component or replacement part is incorrectly assembled or adjusted, it can lead to component failure and cause the rider to lose control and crash.
- Wear approved eye protection while performing maintenance tasks such as replacing components.
- 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.
- Do not wash the freewheel body unit. The internal grease may flow out and cause the freewheel body unit to malfunction.

Be sure to also inform users of the following:

- Check that the wheels are fastened securely before riding the bicycle. Using the quick release lever incorrectly may cause the wheel to fall off, etc. and lead to serious injury due to a fall or collision.
- Make sure that, even if the quick release lever is tightened as much as possible, the quick release lever does not interfere with the disc brake rotor. If the quick release lever is on the same side as the disc brake rotor, it may interfere with the disc brake rotor. If the axle release lever interferes with the disc brake rotor, immediately stop use and contact the place of purchase or a distributor.



- Make sure that the disc brake rotor has cooled down before operating the quick release lever. Doing otherwise may cause a burn.
- Make sure to properly install the quick release hub onto the bicycle. Otherwise the wheel may detach from the bicycle while riding, resulting in serious injury.
- Read the quick release lever manual carefully, and keep it in a safe place for later reference.

For installation to the bicycle and maintenance

- When installing the wheel to the front fork/frame, always be sure to follow the instructions given in the manual for the front fork/frame. The securing method and tightening torque for the wheel both vary depending on the type of front fork/frame being used. If the instructions are not followed, the wheel may fall out and possibly result in serious injury. When the wheel is secured in accordance with the tightening torque, the wheel's rotation may become stiff; however, the instructions in the manual for front fork/frame must always be followed.
- Read the disc brake manual carefully, and keep it in a safe place for later reference.

Quick release type

- Use a front fork which is equipped with a wheel retention mechanism.

⚠ CAUTION

For installation to the bicycle and maintenance

- When installing or removing the disc brake rotor lock ring, be careful not to touch the outer edges 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 warrantied against damage caused by improper use, abuse, or issues resulting from a crash, unless the circumstance was caused by a manufacturing problem.
- If there are abnormal noises or if the freewheel body unit becomes difficult to engage, consult a place of purchase or a distributor.
- Use a neutral detergent when cleaning hubs. Other cleaners may damage the hubs. Do not clean any areas that have been instructed not to be cleaned.
- Do not clean the hub areas with a high-pressure wash. Water may get inside the hubs, which can degrade performance.
- 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, perform an inspection.
- Use only the lubricants specified by SHIMANO in this dealer's manual.
- Do not oil the internal parts of the hub. Otherwise, the grease will flow out.
- If the freehub is making abnormal noises when the pedal is pressed, the spacer may need more grease. Apply grease to the spacer.

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.

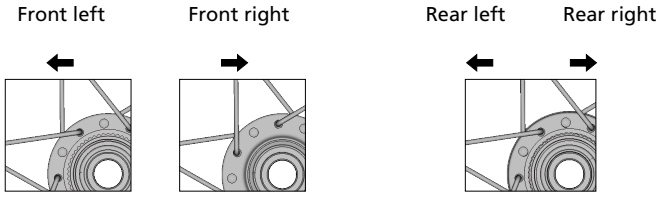
Tool	
	4 mm hexagon wrench
	5 mm hexagon wrench
	12 mm hexagon wrench
	19 mm hexagon wrench
	Hexalobular [#25]
	TL-FC36
	TL-HS35
	TL-HS37
	TL-LR15
	Adjustable wrench
	Soft face mallet
	Bearing press tool
	Slotted screwdriver

Installation/removal

Spoke lacing

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

   Radial lacing is not supported.



NOTICE

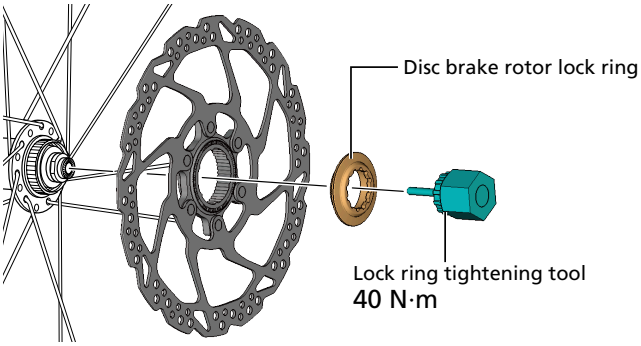
- Refer to "Specifications" on our website (https://productinfo.shimano.com) to obtain detailed specifications for each hub.

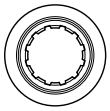
Installing the disc brake rotor

CENTER LOCK type

1. **Set the disc brake rotor on to the hub, then secure it with the disc brake rotor lock ring.**

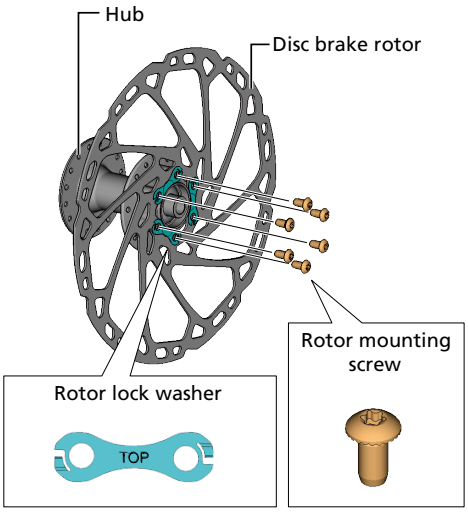
   Secure with TL-LR15 and an adjustable wrench or TL-FC36.



	Internal spline type	External spline type
Disc brake rotor lock ring		
Lock ring tightening tool	TL-LR15 and adjustable wrench	TL-FC36

6-bolt type (with rotor lock washers)

1. **Place the disc brake rotor and rotor lock washers on to the hub, then temporarily fix them in place by tightening the rotor mounting screws.**

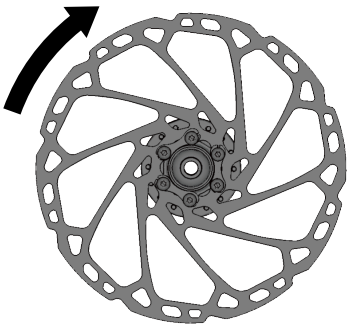


NOTICE

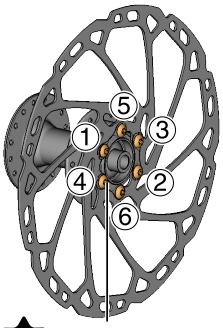
- Fit the rotor lock washers so that the marking “TOP” is visible.
- The rotor lock washers are not reusable. Always use new lock washers when installing the disc brake rotor.

- Use the dedicated rotor mounting screws.

2. **Wear gloves and turn the disc brake rotor clockwise with some force.**



3. **Tighten the rotor mounting screws in the order shown in the figure.**



25 2 - 4 N·m

Rotor mounting screw

Removing the disc brake rotor

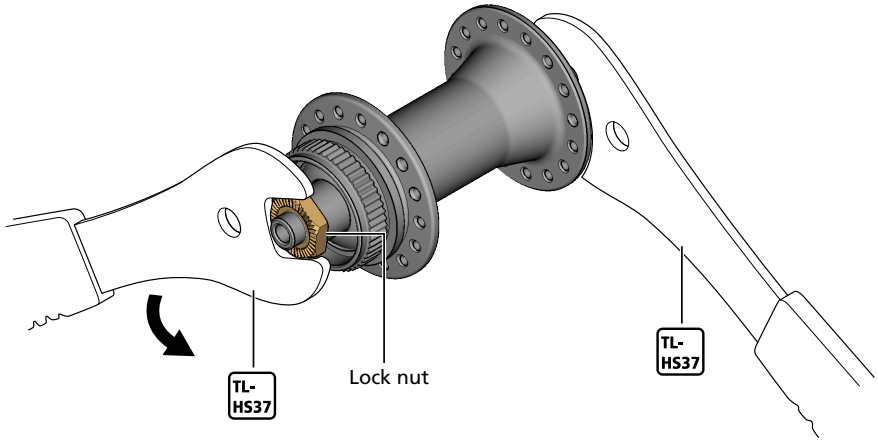
Perform the removal of the disc brake rotor in the reverse order from the installation procedure.

Maintenance

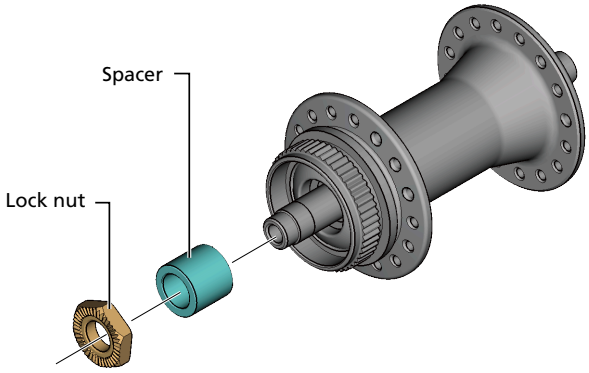
Front hub disassembly (HB-QC400 / HB-QB400)

1. **Loosen the lock nut on the left side of the hub body.**

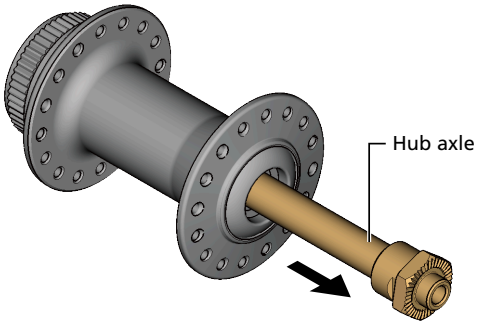
   Disassembly from the right side of the hub body is not possible.



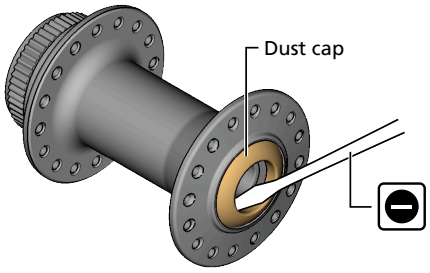
2. **Remove the lock nut and spacer.**



3. **Remove the hub axle, lock nut and spacer from the right side of the hub body.**

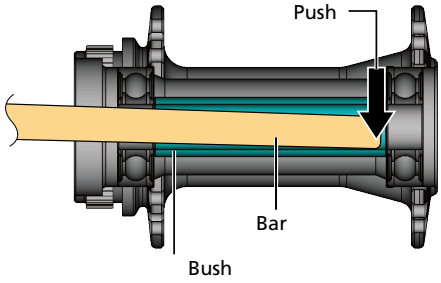


4. **Remove the left and right dust caps.**



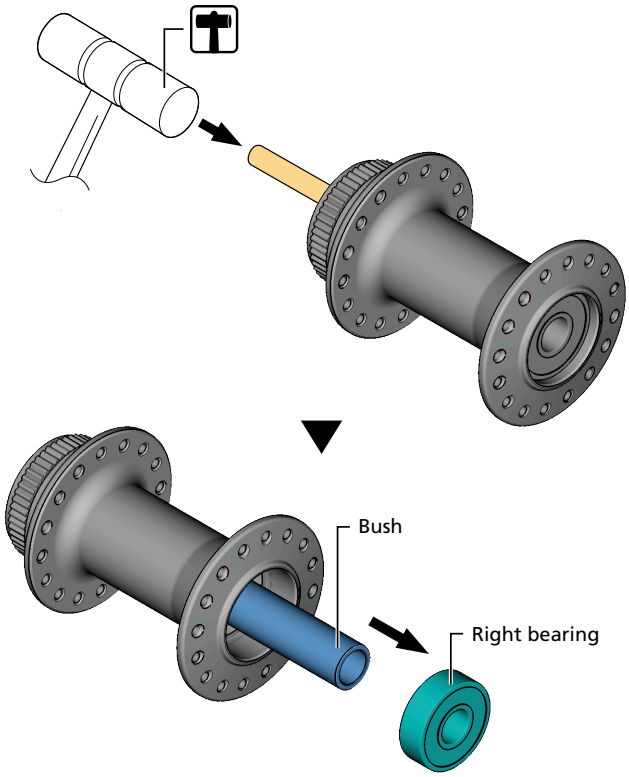
5. Remove the bearings.

(1) Use a bar (recommended: diameter 10 - 15 mm, length 120 - 150 mm) to push the right side of the bush to tilt it as shown in the figure.

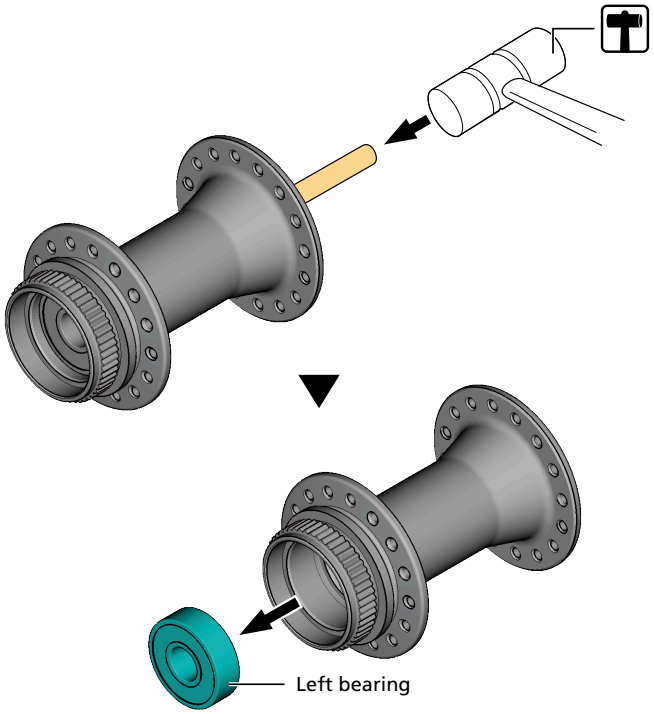


(2) Touch the part of the right bearing that was exposed when the bush was shifted with the bar, and tap it with the soft face mallet to push out the right bearing.

- The bush can be removed at the same time too.

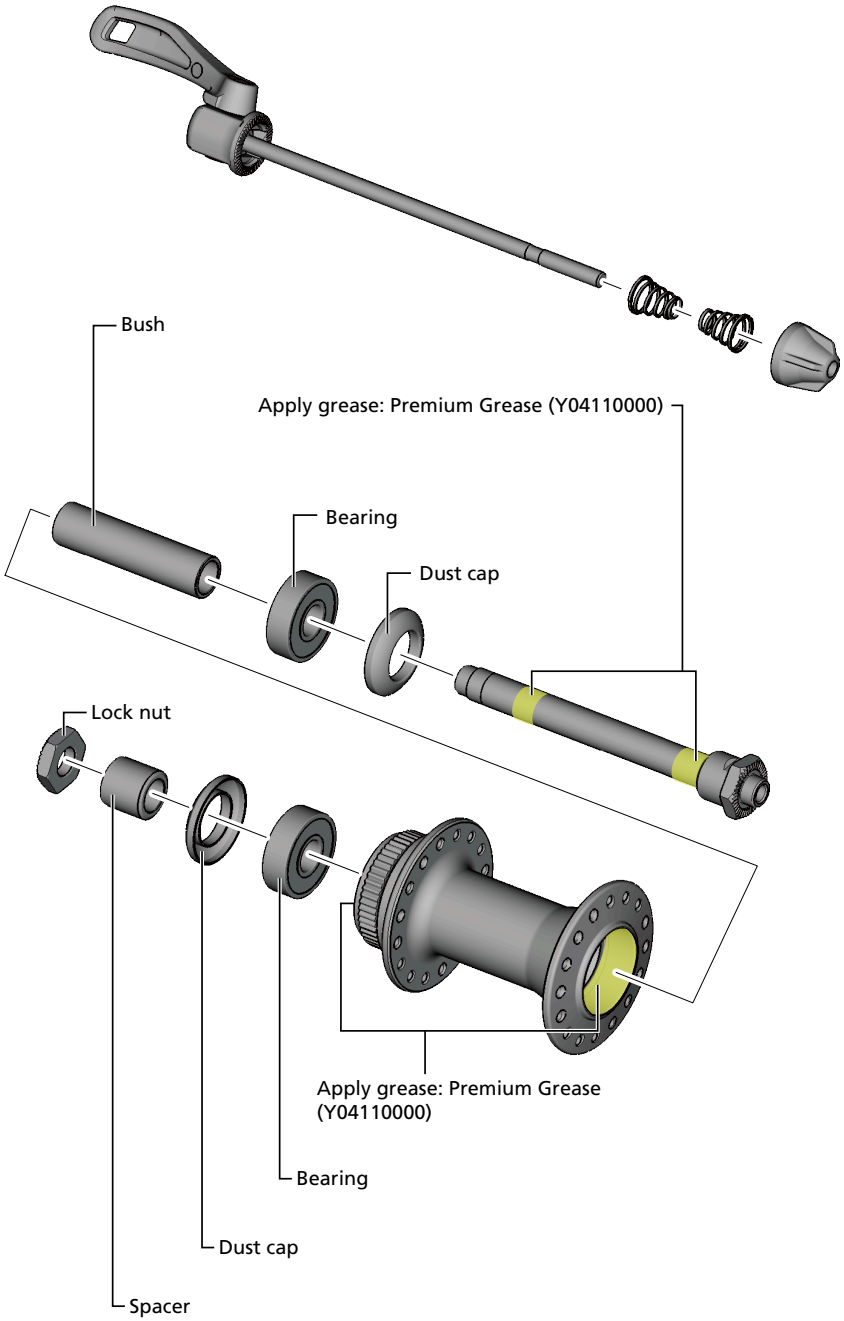


(3) Also push out the left bearing from the other side in the same manner.

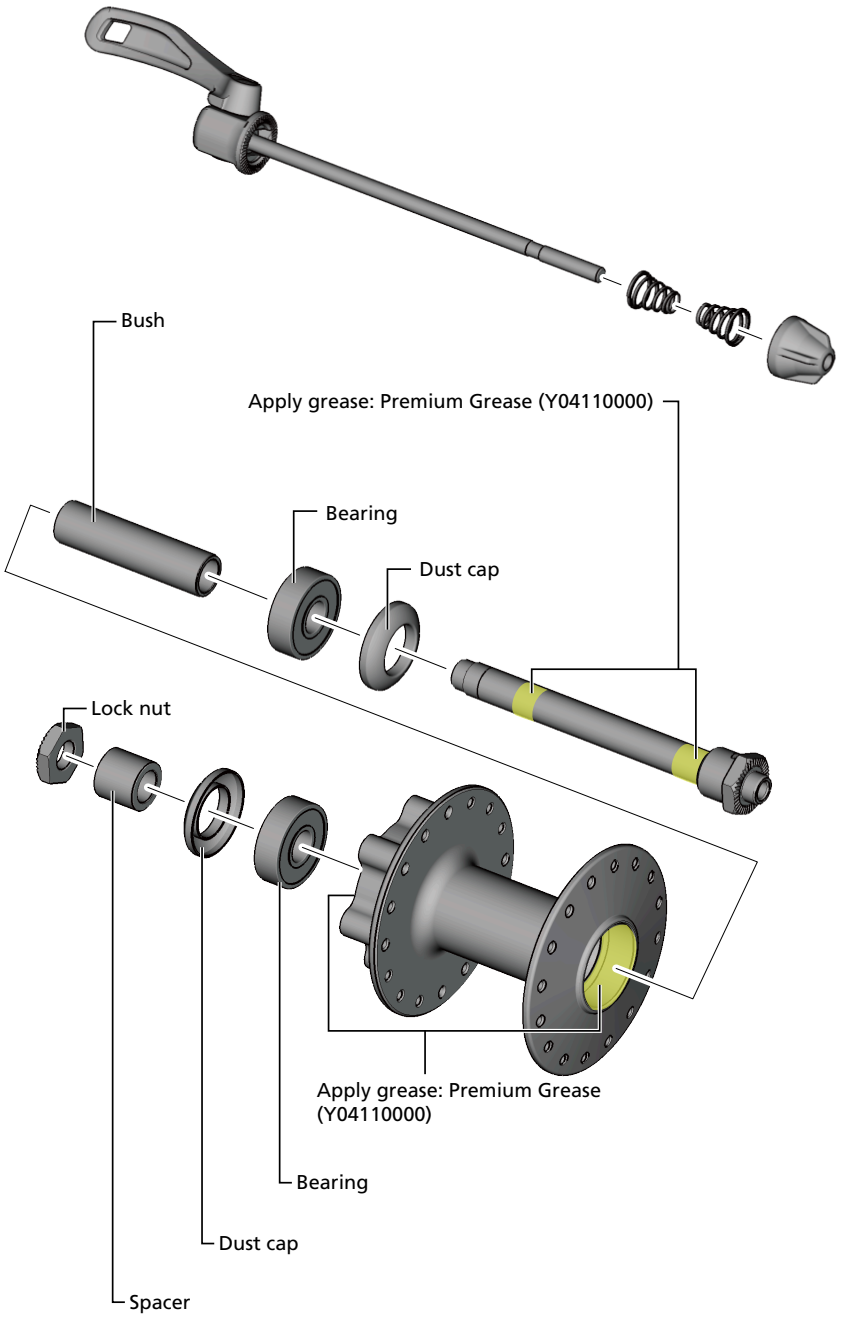


6. The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic intervals.

HB-QC400

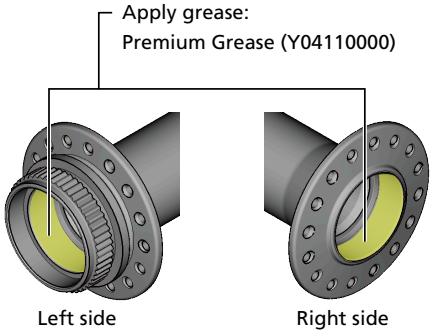

Bush
Apply grease: Premium Grease (Y04110000)
Bearing
Dust cap
Lock nut
Apply grease: Premium Grease
(Y04110000)
Bearing
Dust cap
Spacer

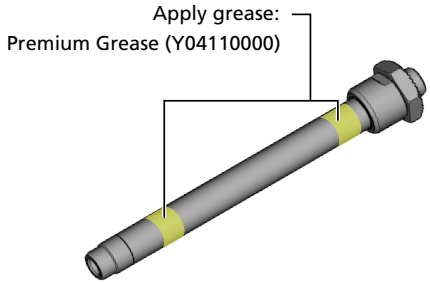
HB-QB400


Bush
Apply grease: Premium Grease (Y04110000)
Bearing
Dust cap
Lock nut
Apply grease: Premium Grease
(Y04110000)
Bearing
Dust cap
Spacer

Front hub assembly (HB-QC400 / HB-QB400)

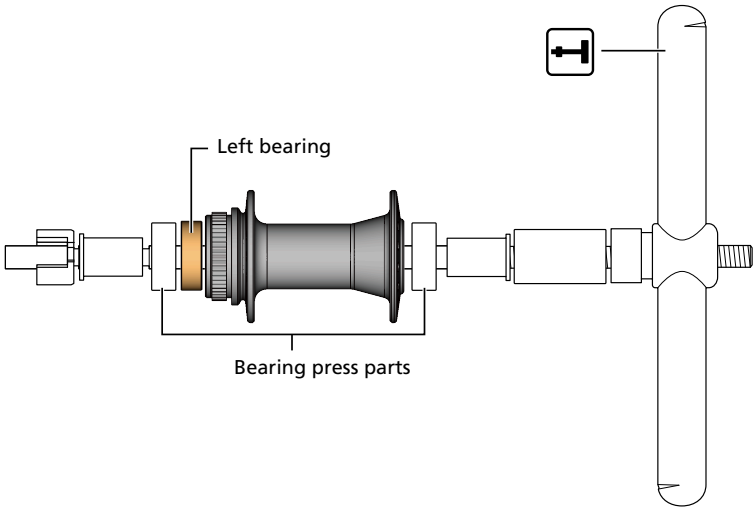
1. Apply grease to the hub shell and hub axle.



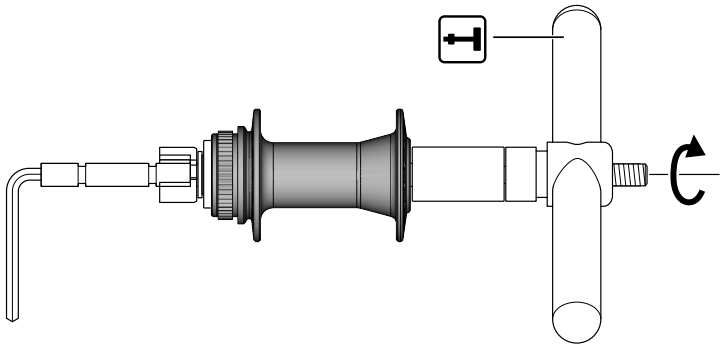


2. Install the left bearing.

(1) Install the left bearing and bearing press parts (inner diameter 10 mm, outer diameter 26 mm) to the hub body, and set the bearing press tool.



(2) Turn the handle of the bearing press tool, and securely press-fit the left bearing as far as it will go.



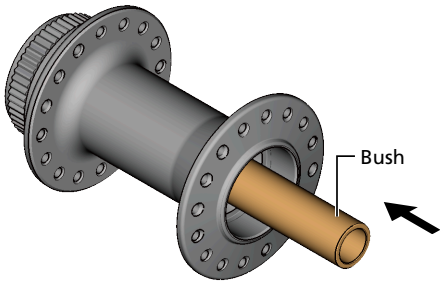
NOTICE

- Be sure to install the left bearing first.
- The bearing press parts should touch both the outer ring and inner ring of the bearing.

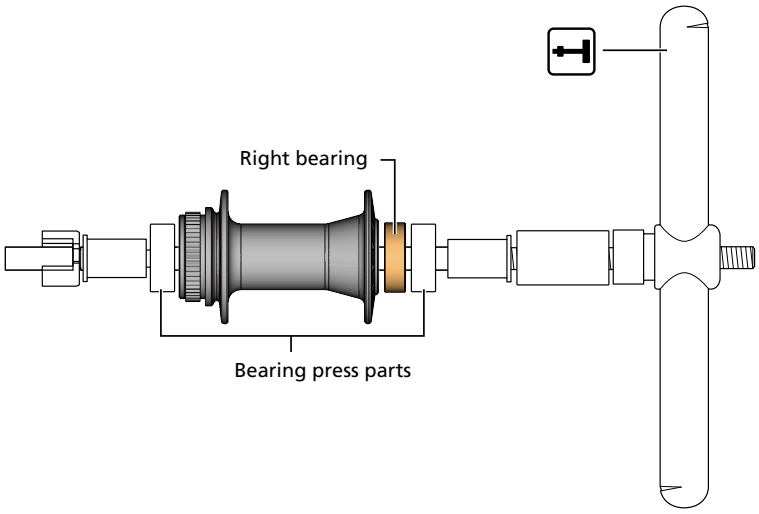
3. Install the right bearing.

(1) Remove the bearing press tool and bearing press parts, and insert the bush from the right side of the hub body.

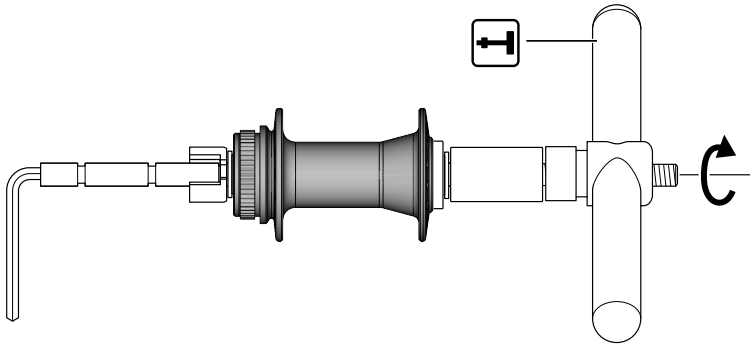
- Make sure that the bush is in the center of the hub body.



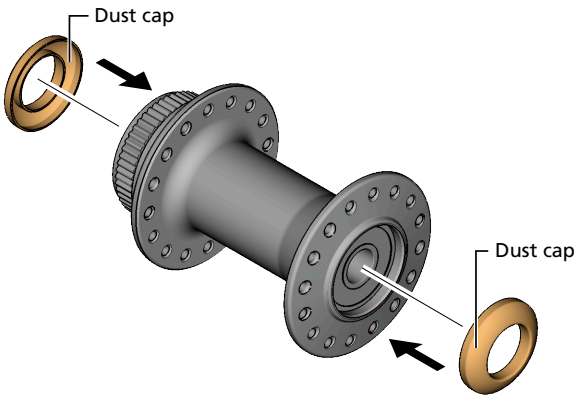
(2) Install the right bearing and bearing press parts to the hub body, and set the bearing press tool.



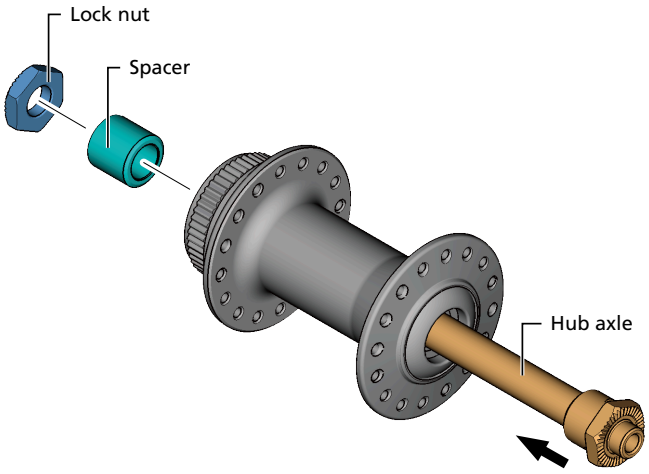
(3) Turn the handle of the bearing press tool, and securely press-fit the right bearing as far as it will go.



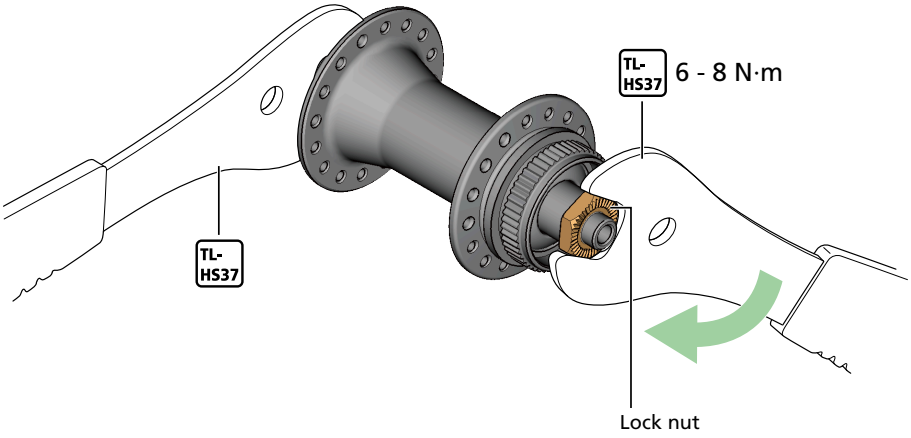
4. **Install the left and right dust caps.**



5. **Insert the hub axle from the right side of the hub body, then install the spacer and the lock nut.**



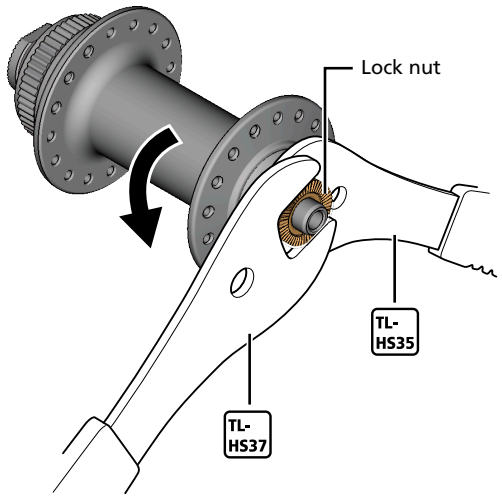
6. **Make sure that the bearings are completely installed.**
   (1) Hold the hub axle and move the hub body in the axle direction to confirm that there is no play. If there is play, perform step 3 . If there is still play, perform step 2 .
   (2) Hold the hub axle and rotate the hub body to confirm that it rotates smoothly. If it is not smooth, gently tap the bearing with a bar from inside to loosen it as when performing disassembly. When loosening, loosen the right bearing first.
7. **Tighten the lock nut.**


TL-HS37
6 - 8 N·m
TL-HS37
Lock nut

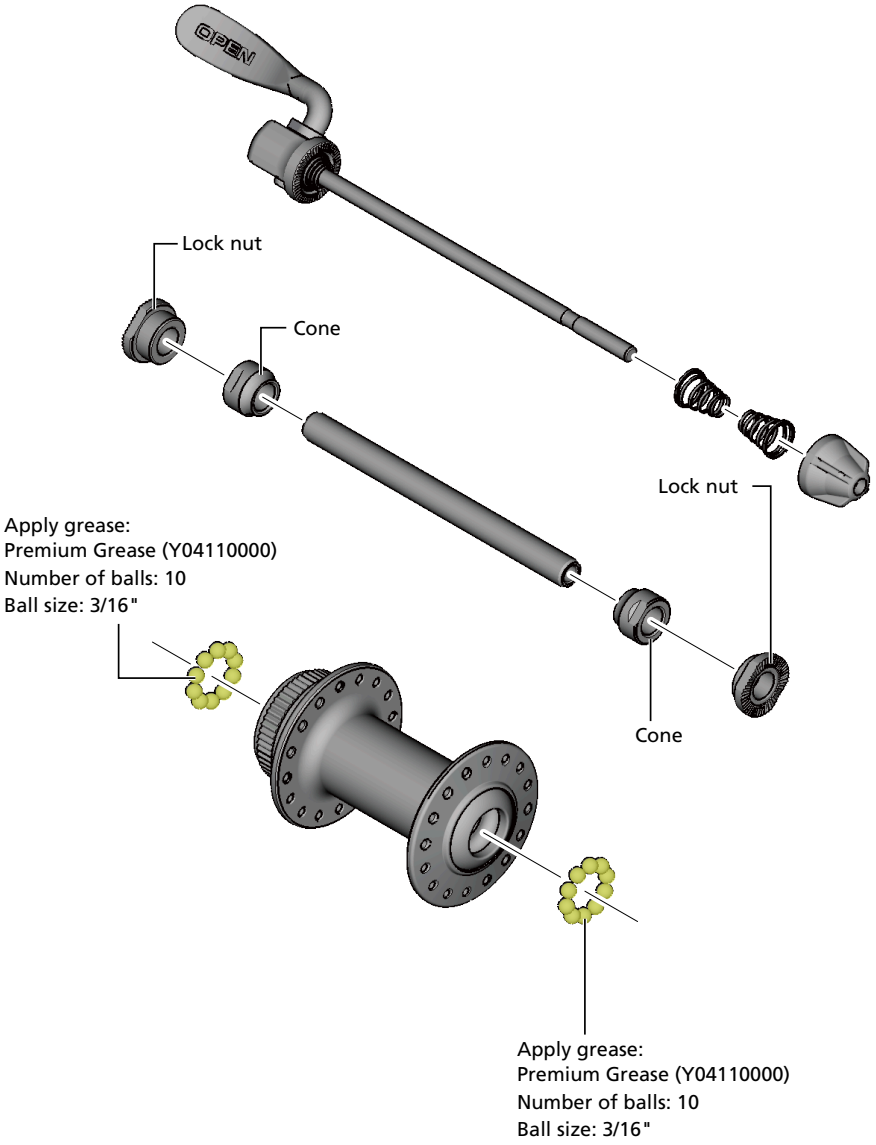
Front hub disassembly (HB-QC300)

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

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

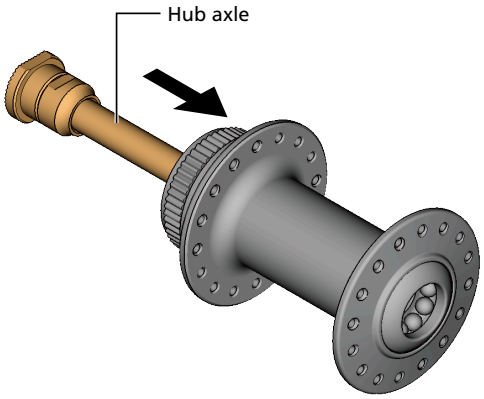


2. **The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic intervals.**

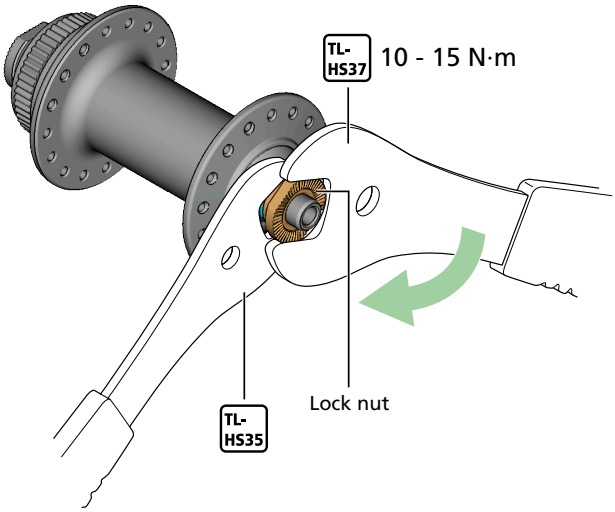

OPEN
Lock nut
Cone
Lock nut
Apply grease:
Premium Grease (Y04110000)
Number of balls: 10
Ball size: 3/16"
Cone
Apply grease:
Premium Grease (Y04110000)
Number of balls: 10
Ball size: 3/16"

Front hub assembly (HB-QC300)

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



2. **After assembling the necessary parts and adjusting the bearing preload, tighten the lock nut to double-lock the assembly.**

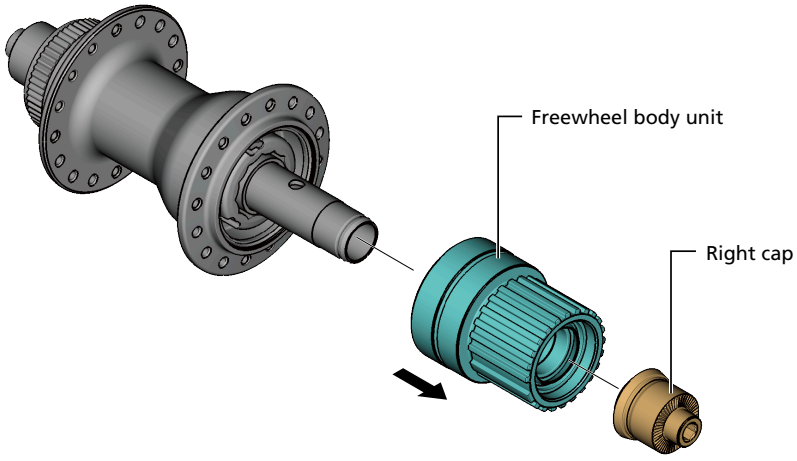


Freehub disassembly (FH-QC500)

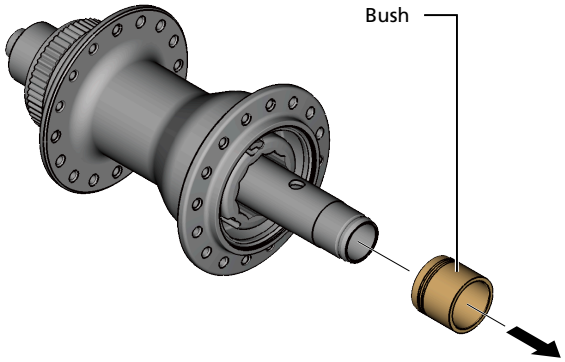
NOTICE

- 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.
- Do not attempt to disassemble the dust cover which is crimped onto the right cap.
- Do not attempt to disassemble the freewheel body unit, because it may result in a malfunction.
- Perform the assembly according to the assembly procedures when the freewheel body unit has been removed.
- Do not mix the special grease applied to the freewheel body unit with other grease. Doing so may cause the clutch of the freewheel to malfunction.

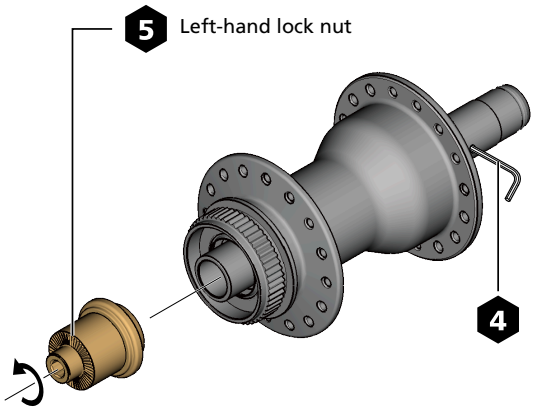
1. **Remove the right cap and freewheel body unit by pulling them outwards off the end of the hub axle.**



2. **Remove the bush.**

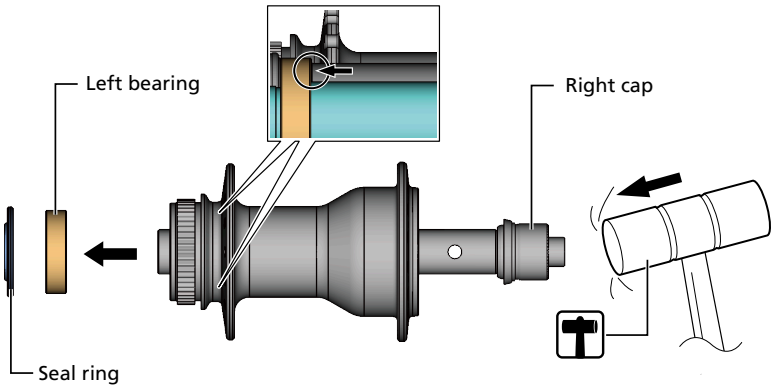


3. **Secure the hub axle with a hexagon wrench, and remove the left-hand lock nut.**

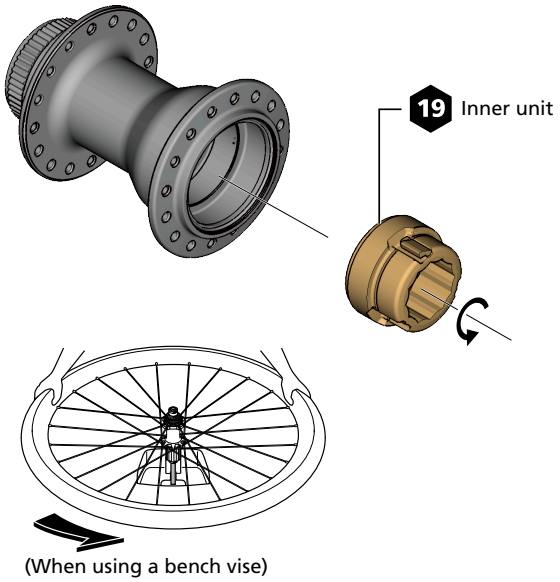


4. Remove the left bearing and seal ring.

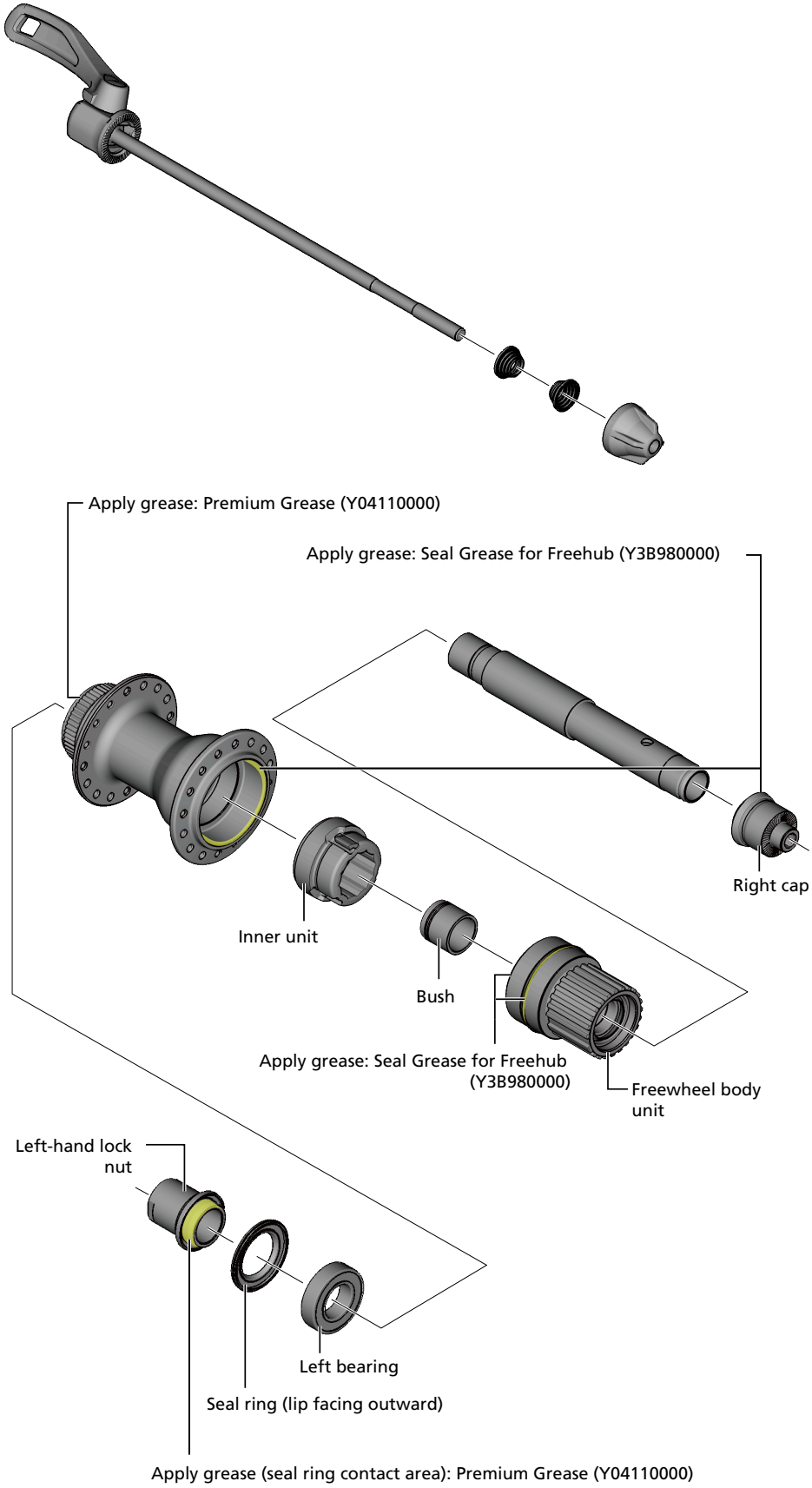
Place the right cap over the right side of the hub axle, and tap the right cap from the right side with a soft face mallet to remove the left bearing and seal ring.



5. Remove the inner unit.

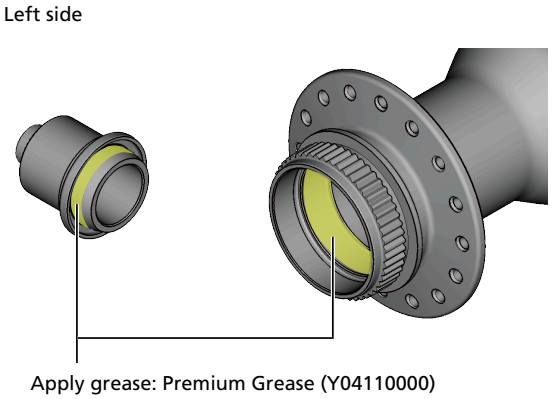


6. The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic intervals.

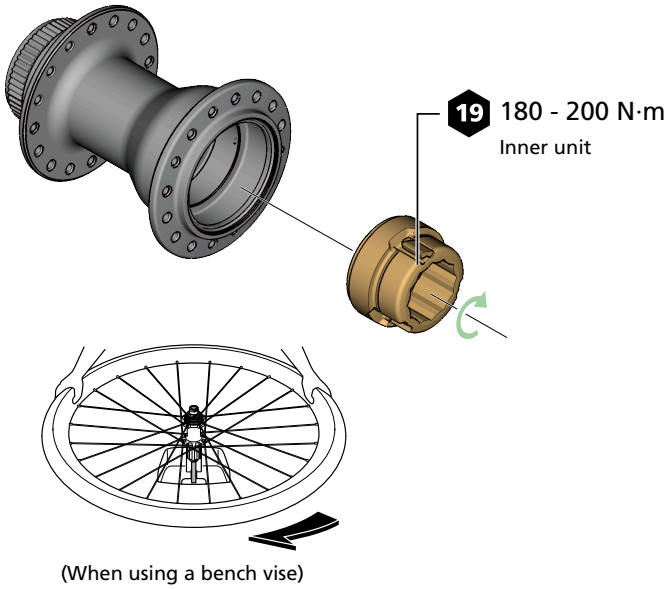

Apply grease: Premium Grease (Y04110000)
Apply grease: Seal Grease for Freehub (Y3B980000)
Right cap
Inner unit
Bush
Apply grease: Seal Grease for Freehub (Y3B980000)
Freewheel body unit
Left-hand lock nut
Left bearing
Seal ring (lip facing outward)
Apply grease (seal ring contact area): Premium Grease (Y04110000)

Freehub assembly (FH-QC500)

1. **Apply grease to the left-hand lock nut (contact area with the seal ring) and hub shell.**

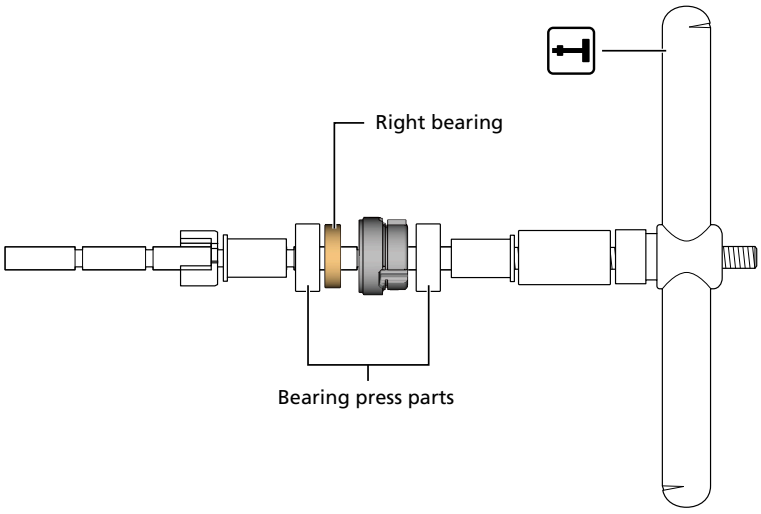


2. **Install the inner unit to the hub body.**

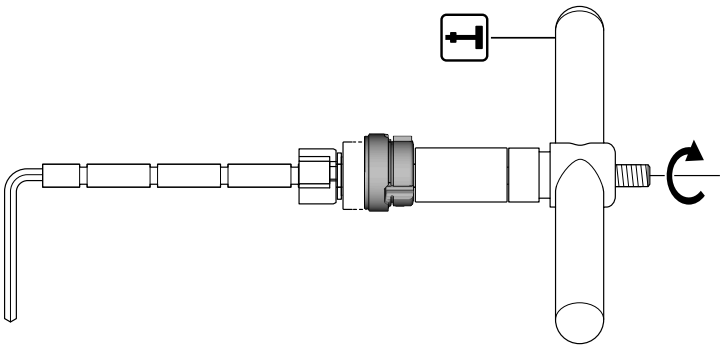


If the right bearing has come off the inner unit

(1) Install the right bearing and bearing press parts (inner diameter 15 mm, outer diameter 28 mm) to the inner unit, and set the bearing press tool.



(2) Turn the handle of the bearing press tool, and securely press-fit the right bearing as far as it will go.

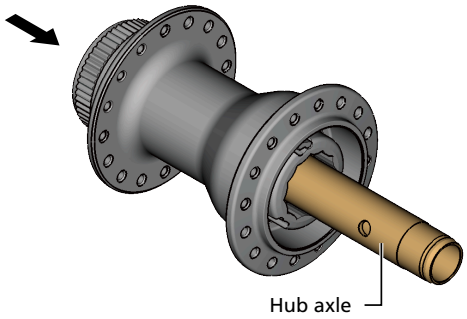


NOTICE

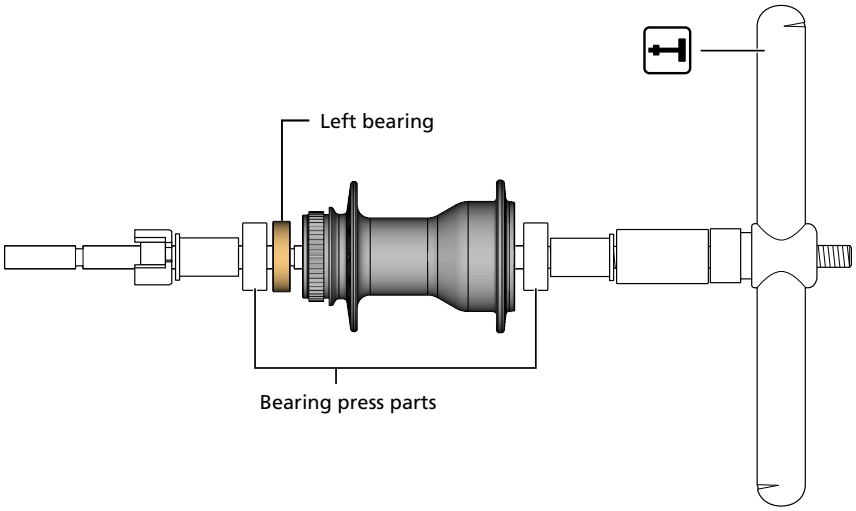
- Be sure to install the right bearing first. (If the right bearing has come off the inner unit)
- The bearing press parts should touch both the outer ring and inner ring of the bearing.

3. Install the left bearing and hub axle to the hub body.

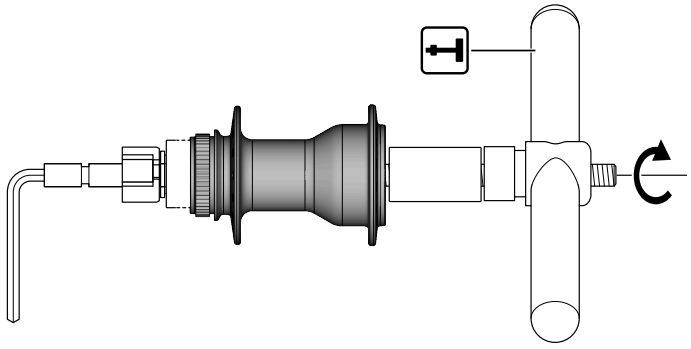
(1) Insert the hub axle and left bearing from the left side of the hub body.



(2) Install the bearing press parts (inner diameter 15 mm, outer diameter 28 mm) to the hub body, and set the bearing press tool.



(3) Turn the handle of the bearing press tool, and securely press-fit the left bearing as far as it will go.



NOTICE

- The bearing press parts should touch both the outer ring and inner ring of the bearing.

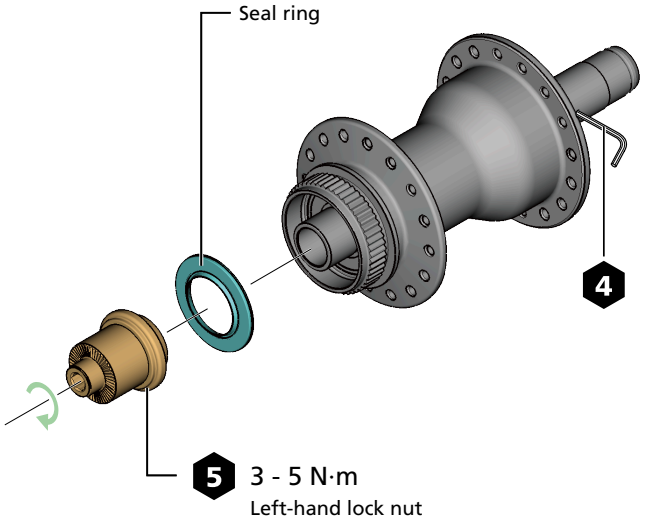
4. Make sure that the bearings are completely installed.

(1) Hold both sides of the hub axle and move the hub body in the axle direction to confirm that there is no play. If there is play, perform step 3 .

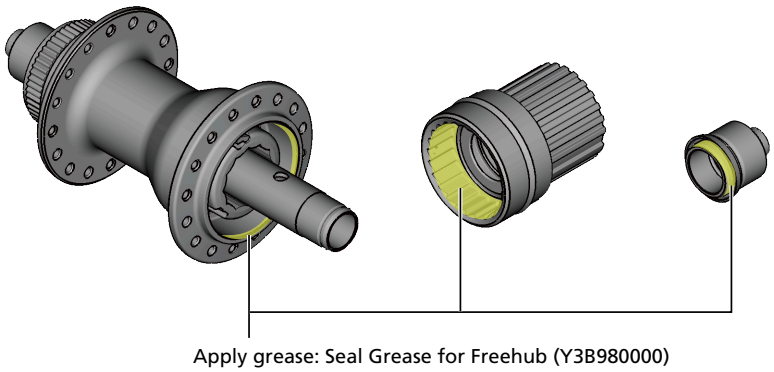
(2) Hold both sides of the hub axle and rotate the hub body to confirm that it rotates smoothly. If it is not smooth, gently tap the bearing with a soft face mallet to loosen it as when performing disassembly.

5. Install the seal ring and left-hand lock nut.

Secure the hub axle with a hexagon wrench, then install the left-hand lock nut.

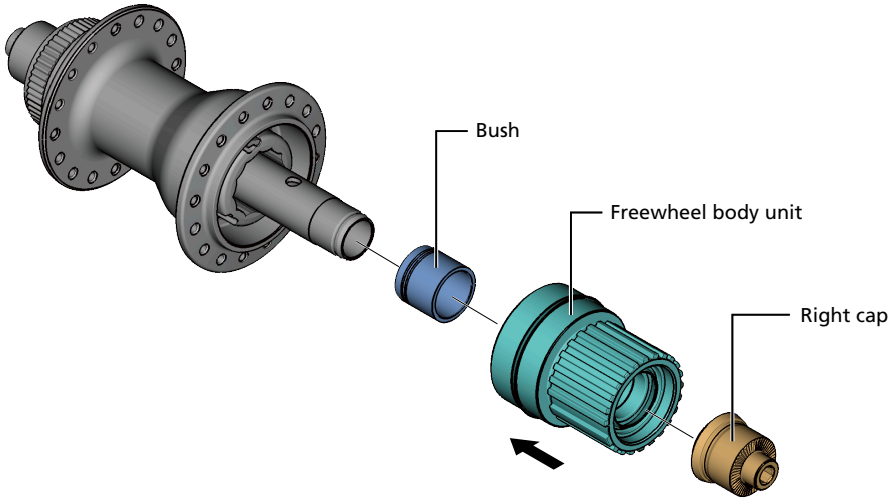


6. **Apply grease to the hub body (contact area with the seal ring), ratchet part, freewheel body unit, and right cap.**



7. **Install the bush, freewheel body unit, and right cap to the hub body.**

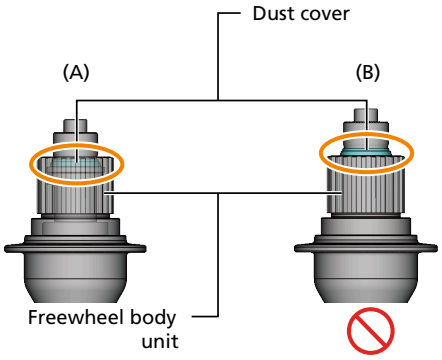
   Be sure to push the right cap until it clicks.



NOTICE

- The correct position for the dust cover is where it is hidden in the freewheel body unit, as shown in illustration (A).

  If the dust cover is in the position shown in illustration (B), repeat the assembly process from the beginning.



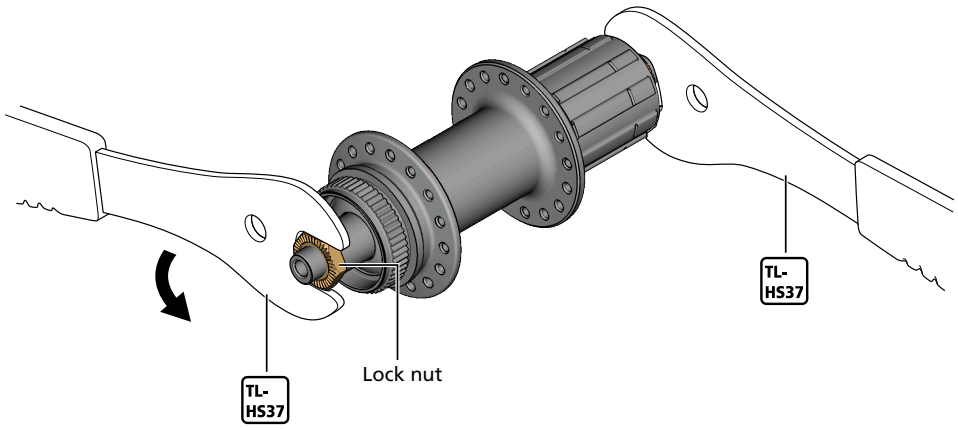
Freehub disassembly (FH-QC400 / FH-QB400)

NOTICE

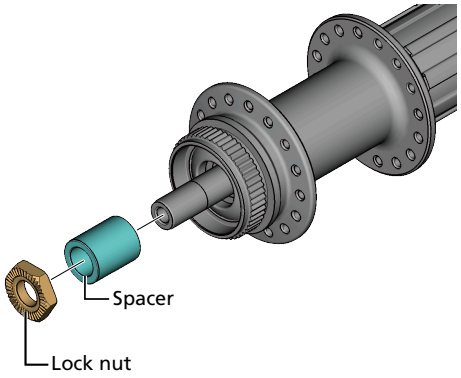
- Do not attempt to disassemble the freewheel body unit, because it may result in a malfunction.
- Perform the assembly according to the assembly procedures when the freewheel body unit has been removed.

1. **Loosen the lock nut on the left side of the hub body.**

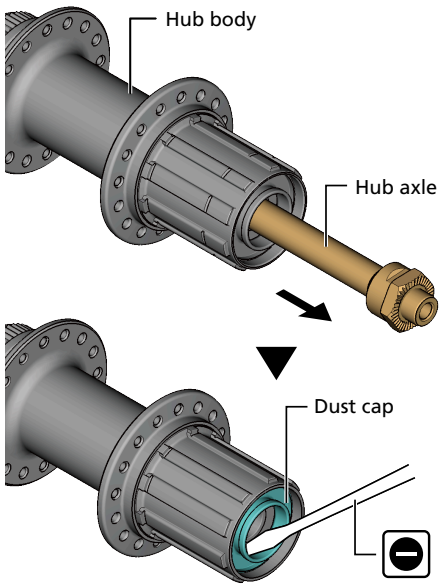
   Disassembly from the right side of the hub body is not possible.



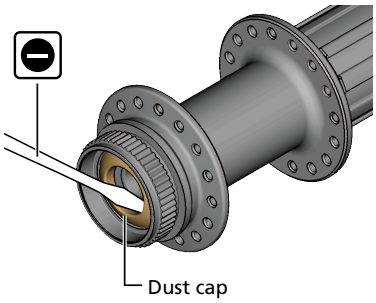
2. **Remove the lock nut and spacer.**



3. **Pull out the hub axle, lock nut, and spacer from the right side of the hub body, then remove the dust cap.**

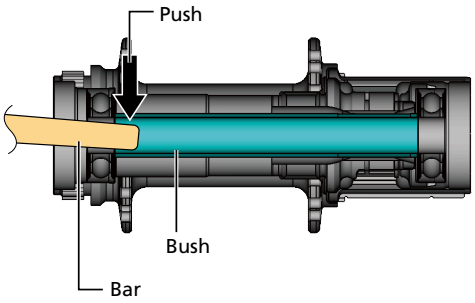


4. Remove the left dust cap.



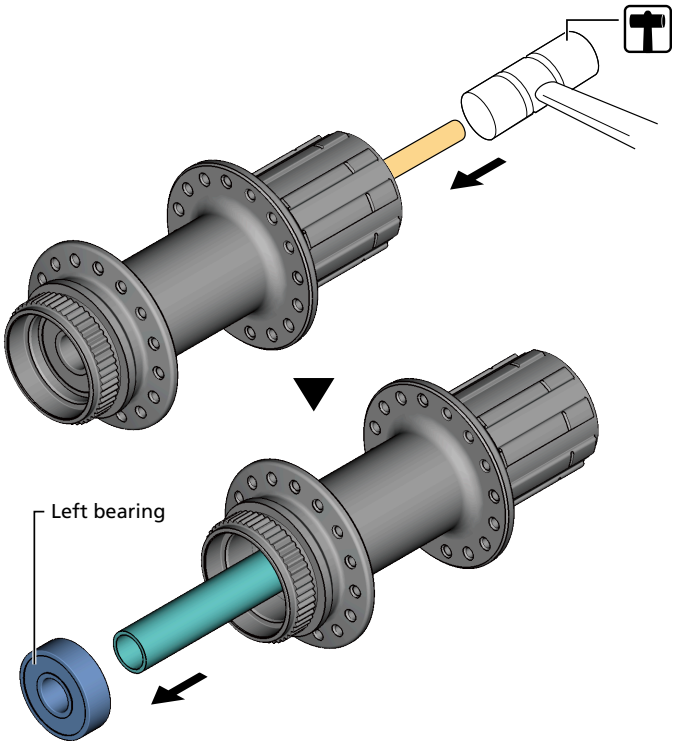
5. Remove the bearings.

(1) Use a bar (recommended: diameter 10 - 15 mm, length 120 - 150 mm) to push the left side of the bush to tilt it as shown in the figure.

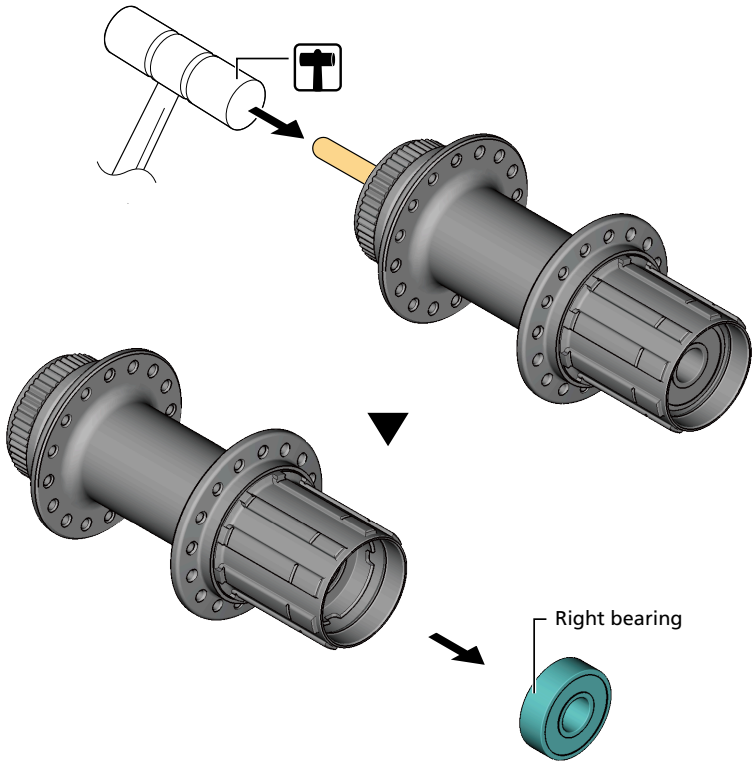


(2) Touch the part of the left bearing that was exposed when the bush was shifted with the bar, and tap it with the soft face mallet to push out the left bearing.

- The bush can be removed at the same time too.



(3) Also push out the right bearing from the other side in the same manner.



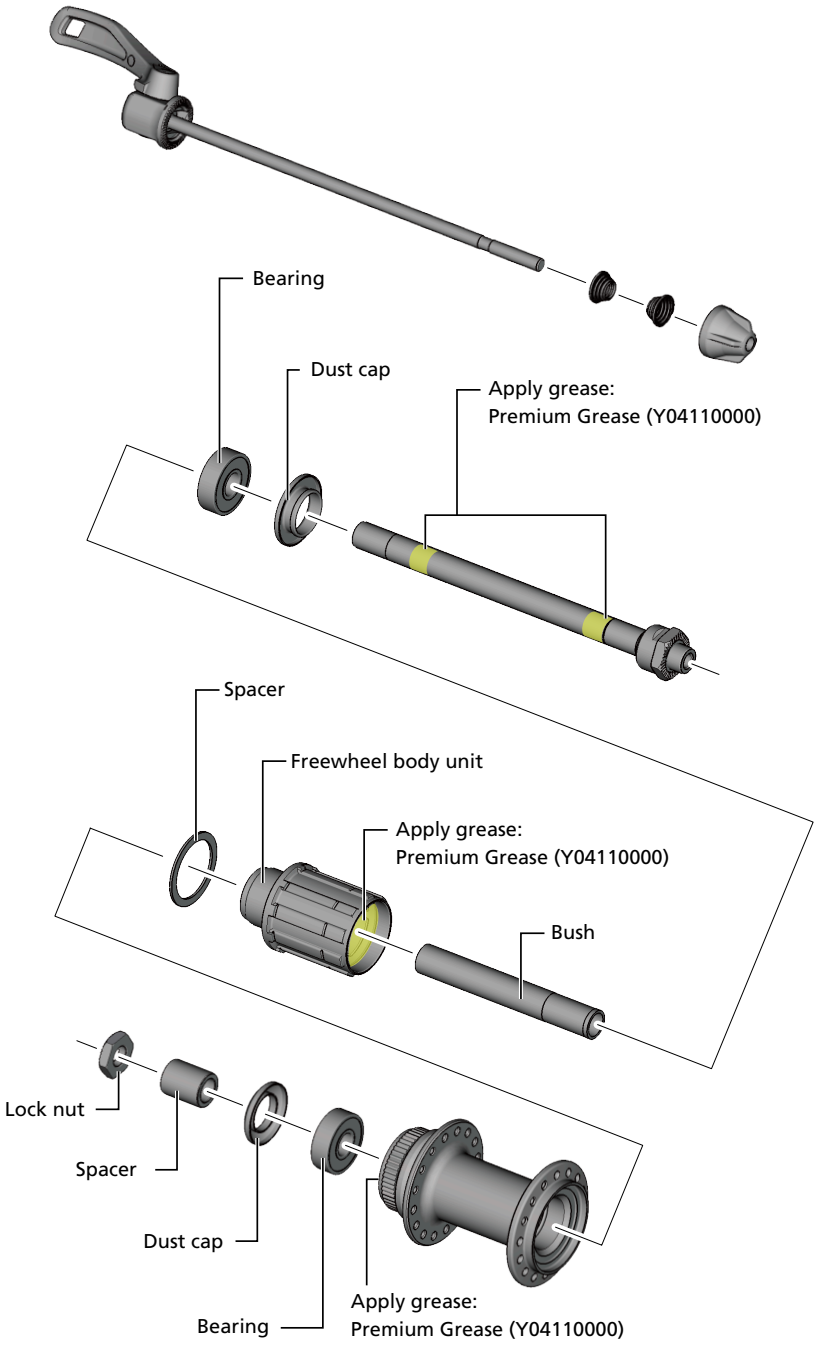
6. Remove the freewheel body unit.

Refer to " FH-QC400 / FH-QB400 / FH-QC300 " in "Replacing the freewheel body unit" when replacing the freewheel body unit.

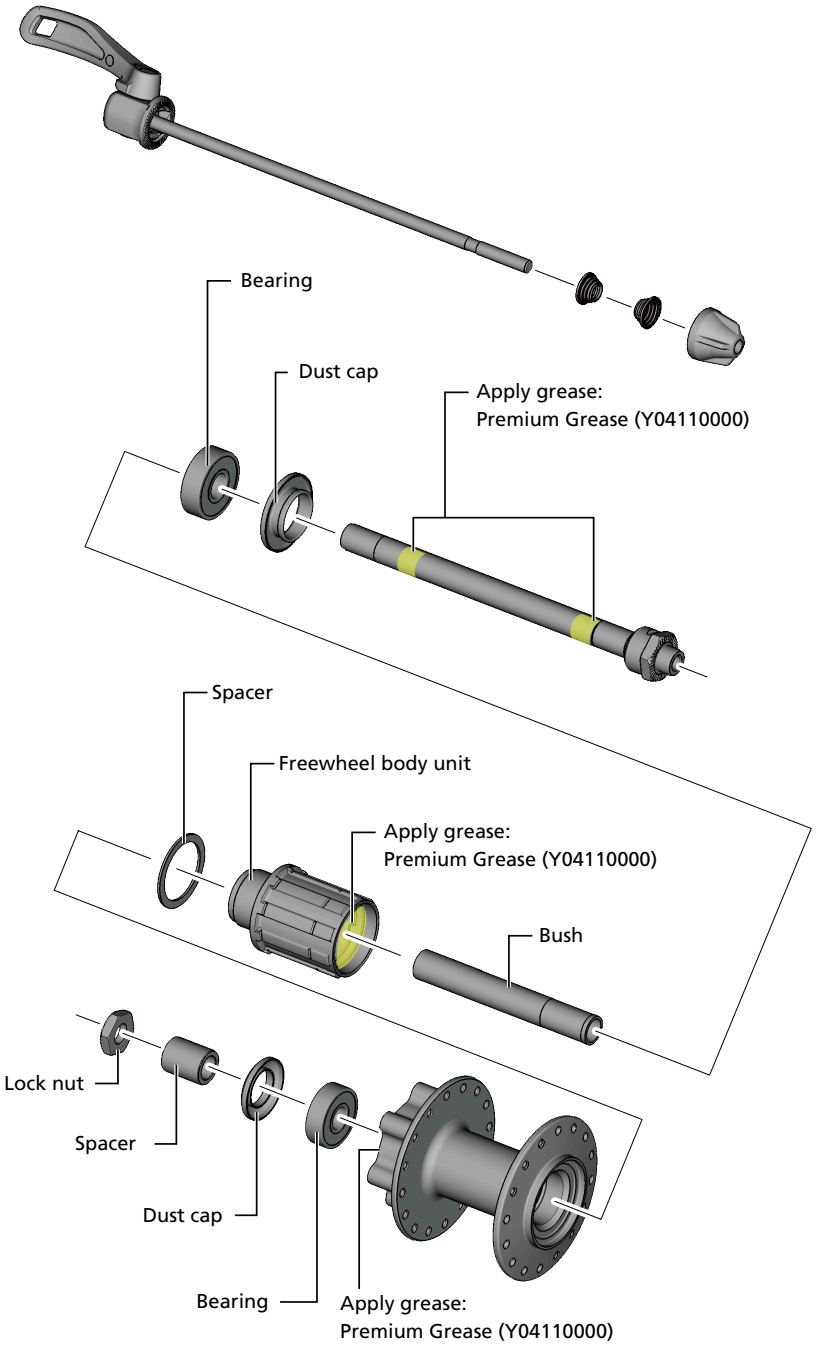
7. The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic

intervals.

FH-QC400

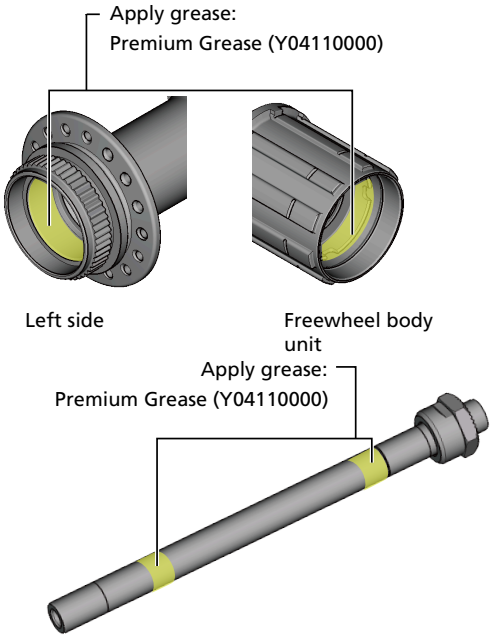


FH-QB400

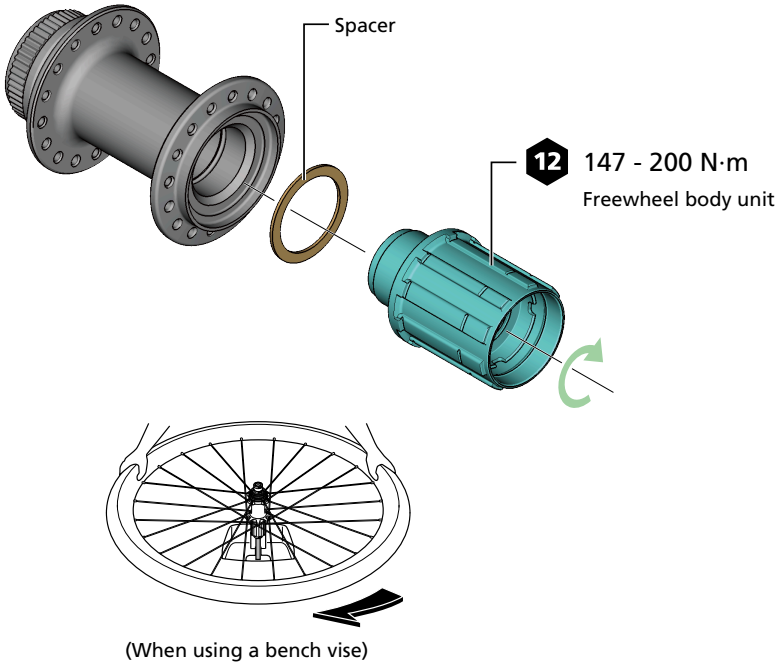

Bearing
Dust cap
Apply grease:
Premium Grease (Y04110000)
Spacer
Freewheel body unit
Apply grease:
Premium Grease (Y04110000)
Bush
Lock nut
Spacer
Dust cap
Bearing
Apply grease:
Premium Grease (Y04110000)

Freehub assembly (FH-QC400 / FH-QB400)

1. Apply grease to the hub shell, freewheel body unit and hub axle.

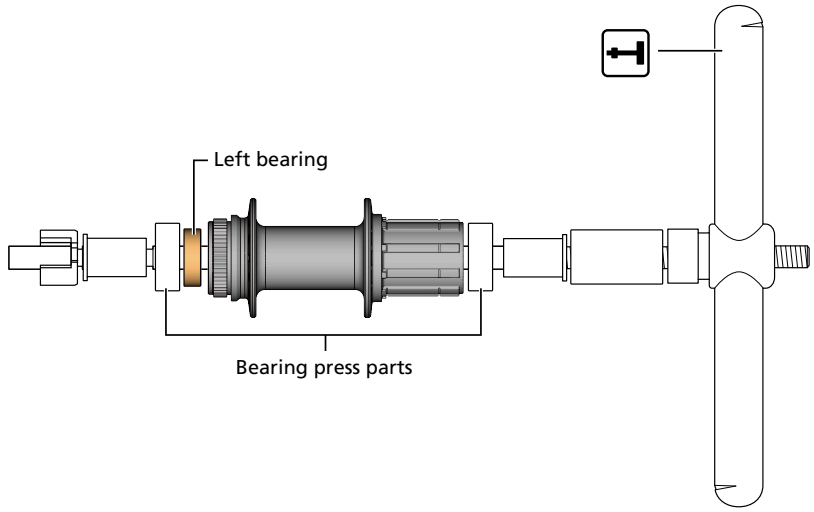


2. Install the spacer and freewheel body unit to the hub body.

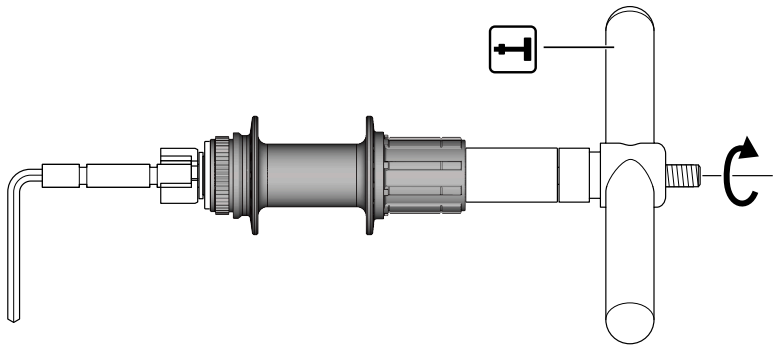


3. Install the left bearing.

(1) Install the left bearing and bearing press parts (inner diameter 10 mm, outer diameter 26 mm) to the hub body, and set the bearing press tool.



(2) Turn the handle of the bearing press tool, and securely press-fit the left bearing as far as it will go.

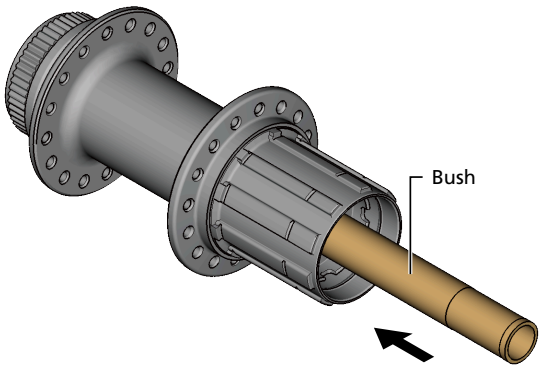


NOTICE

- Be sure to install the left bearing first.
- The bearing press parts should touch both the outer ring and inner ring of the bearing.

4. Install the right bearing.

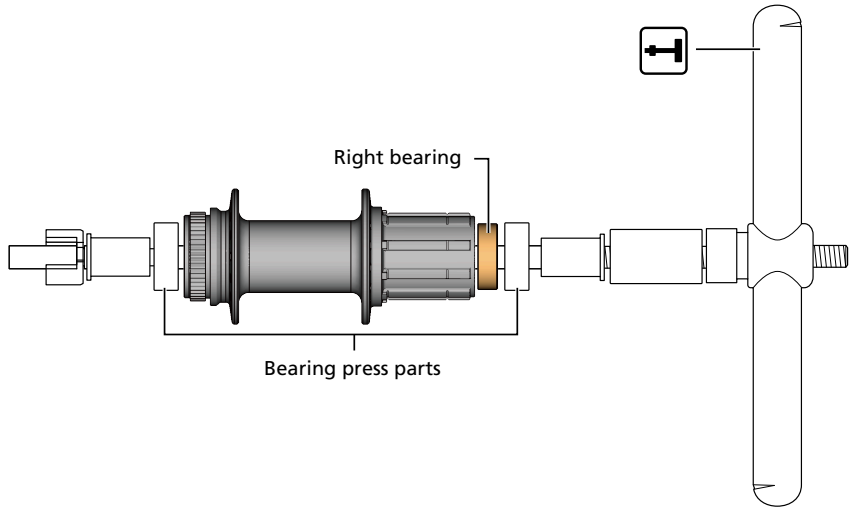
(1) Remove the bearing press tool and bearing press parts, and insert the bush from the right side of the hub body.



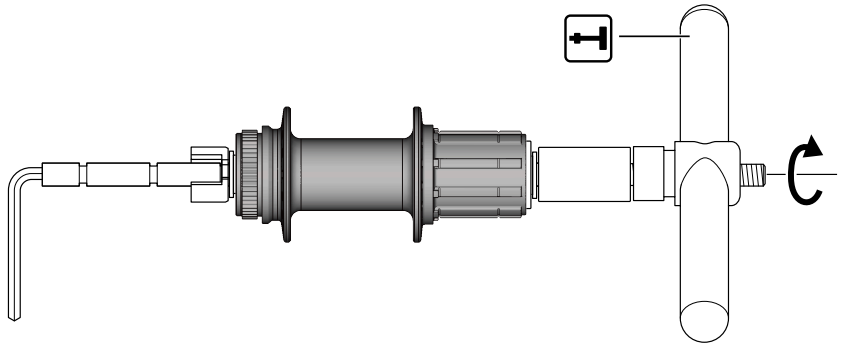
NOTICE

- Make sure that the bush is in the center of the hub body.
- When inserting the bush, make sure that there is a notch on the right side of the bush.

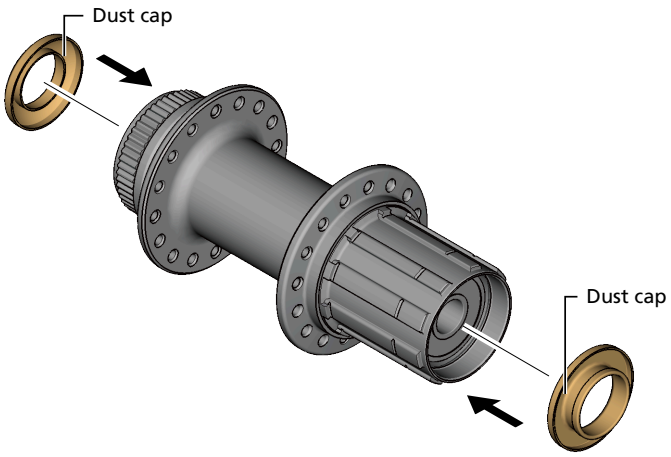
(2) Install the right bearing and bearing press parts to the hub body, and set the bearing press tool.



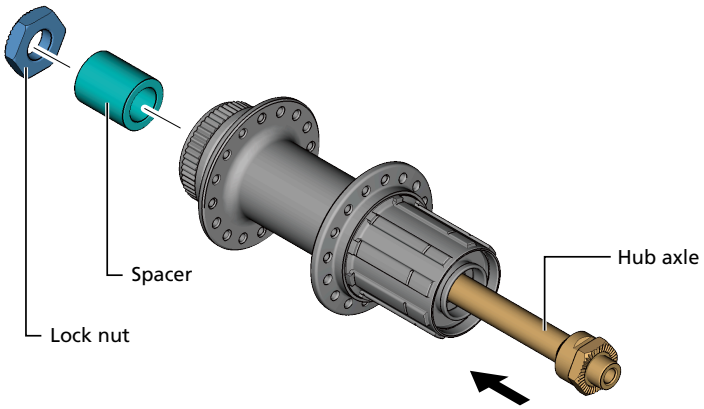
(3) Turn the handle of the bearing press tool, and securely press-fit the right bearing as far as it will go.



5. Install the left and right dust caps.



6. Insert the hub axle from the right side of the hub body, then install the spacer and the lock nut.

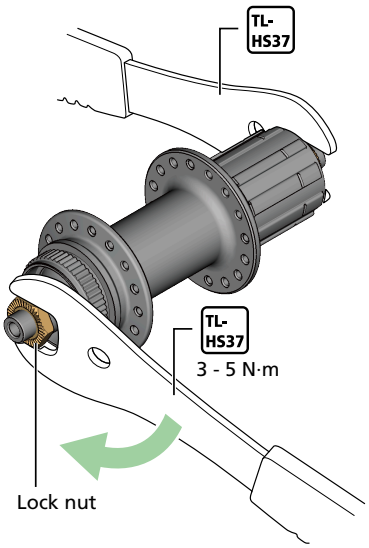


7. Make sure that the bearings are completely installed.

(1) Hold the hub axle and move the hub body in the axle direction to confirm that there is no play. If there is play, perform step 4 . If there is still play, perform step 3 .

(2) Hold the hub axle and rotate the hub body to confirm that it rotates smoothly. If it is not smooth, gently tap the bearing with a bar from inside to loosen it as when performing disassembly. When loosening, loosen the right bearing first.

8. Tighten the lock nut.

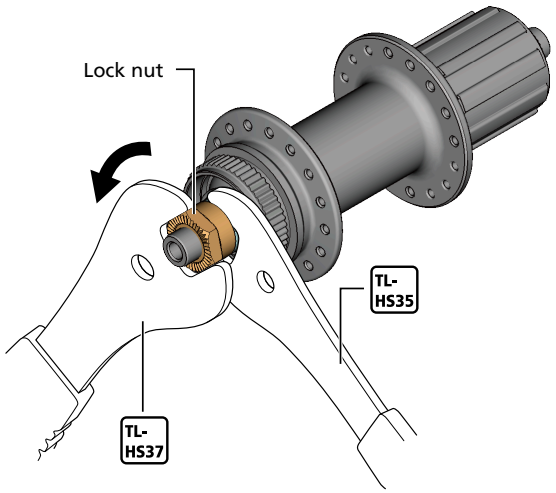


Freehub disassembly (FH-QC300)

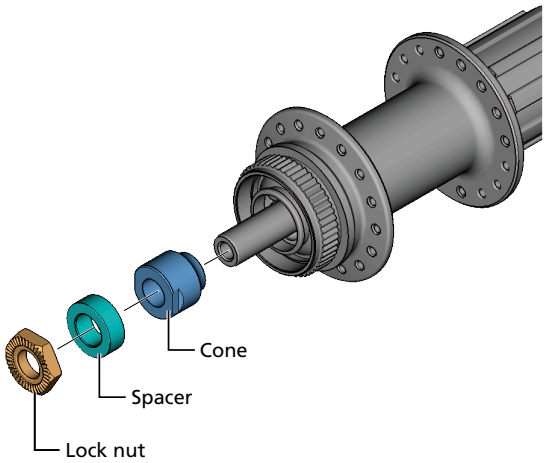
NOTICE

- Do not attempt to disassemble the freewheel body unit, because it may result in a malfunction.
- Perform the assembly according to the assembly procedures when the freewheel body unit has been removed.

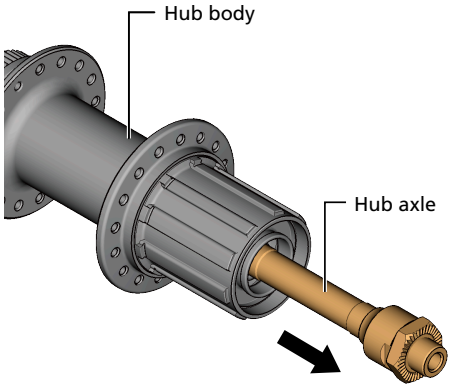
1. **Loosen the lock nut on the double-lock section on the left side of the hub body.**
   Disassembly from the right side of the hub body is not possible.



2. **Remove the lock nut, spacer, and cone.**



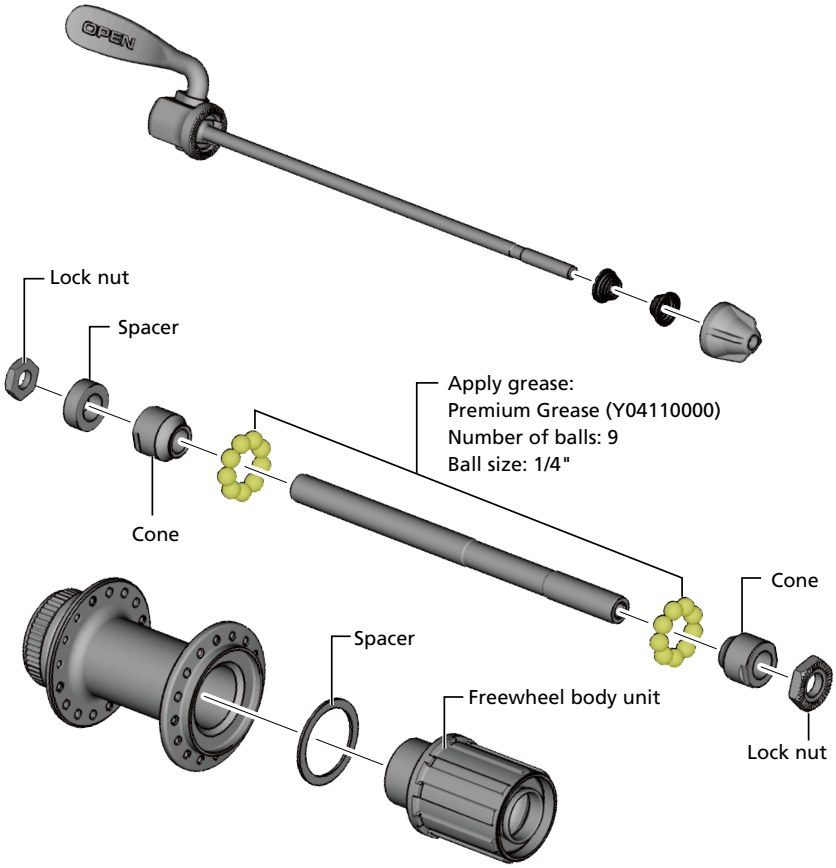
3. **Pull out the hub axle from the right side of the hub body.**



4. **Remove the freewheel body unit.**

   Refer to " FH-QC400 / FH-QB400 / FH-QC300 " in "Replacing the freewheel body unit" when replacing the freewheel body unit.

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



Freehub assembly (FH-QC300)

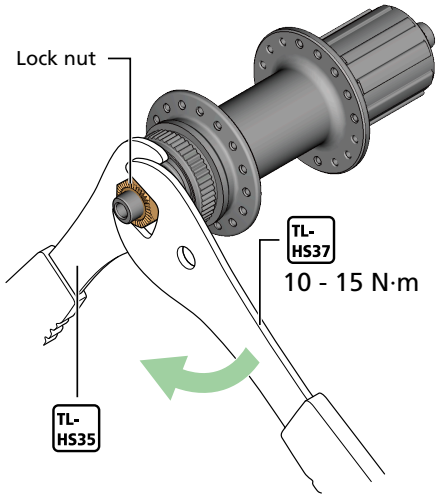
1. **Install the necessary parts such as the hub axle.**

   Perform the installation in the reverse order from “ Freehub disassembly (FH-QC300) .”

2. **Install the freewheel body unit.**

   Refer to “ FH-QC400 / FH-QB400 / FH-QC300 ” in “Replacing the freewheel body unit” when installing the freewheel body unit.

3. **After adjusting the bearing preload, tighten the lock nut on the left side of the hub body and double-lock the assembly.**



Replacing the freewheel body unit

FH-QC500

Refer to " Freehub disassembly (FH-QC500) " and " Freehub assembly (FH-QC500) " when replacing the freewheel body unit.

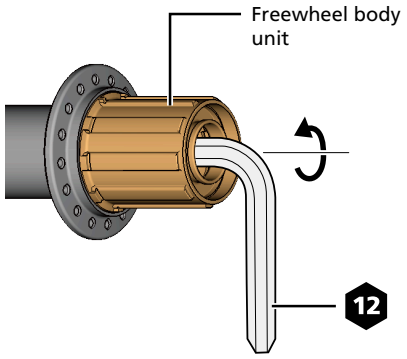
The procedures from step 2 in " Freehub disassembly (FH-QC500) " are unnecessary, since the hub axle does not need to be removed.

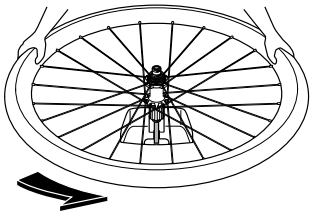
FH-QC400 / FH-QB400 / FH-QC300

For information on how to pull out the hub axle, refer to "Freehub disassembly."

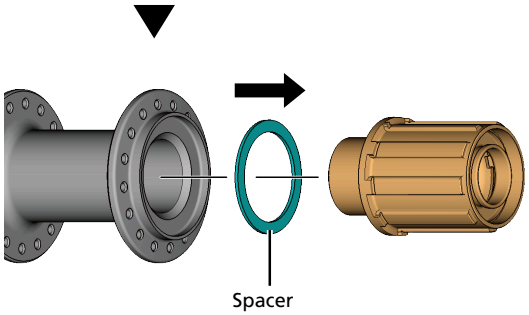
- For FH-QC400 / FH-QB400: Click here
- For FH-QC300: Click here

1. **Remove the freewheel body unit.**

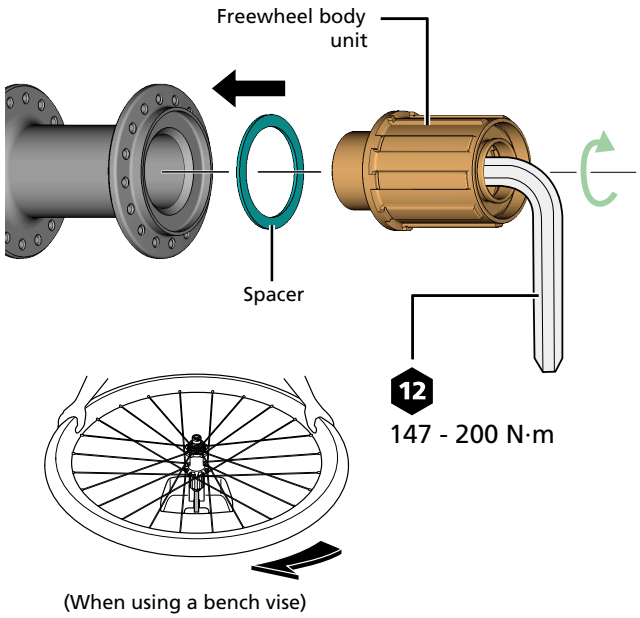




(When using a bench vise)



2. **Install the new freewheel body unit.**


Freewheel body unit
Spacer
12
147 - 200 N·m
(When using a bench vise)

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
Only EU General Contact : contactshimano@shimano-eu.com

SHIMANO INC.
3-77 Oimatsu-cho, Sakai-ku, Sakai City, Osaka 590-8577, Japan

Please note: specifications are subject to change for improvement without notice. (English)
© Dec. 2023 by SHIMANO INC. ITP