Dealer's Manual

ROAD	GRAVEL	MTB
E-BIKE	LIFESTYLE	GENERAL

Hub Set (Disc Brake)

Non-series

HB-TC500
FH-TC600
FH-TC500

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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

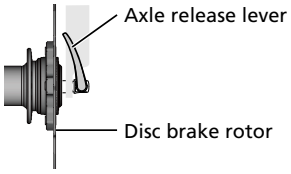
⚠ WARNING

- **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 axle release lever incorrectly may cause the wheel to fall off, etc. and lead to serious injury due to a fall or collision.
- Before riding the bicycle, you should carefully check your hubs to make sure that there are no cracks in the axles, and if you find any unusual conditions, DO NOT use the bicycle. These hubs are not designed for downhill bicycle riding or freeriding. Depending on the riding conditions, the hub axle could develop cracks that may result in the failure of the axle, which can lead to an accident resulting in serious injury or even death.
- The front hub can only be used in combination with a special front fork and through axle. If it is used in combination with any other front fork or through axle, it may cause the wheel to become detached from the bicycle during riding and result in serious injury.
- Use the freehub 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.
- Confirm that the axle release lever does not interfere with the disc brake rotor even when it is fully engaged. The axle release lever may interfere with the disc brake rotor if it is on the disc brake rotor side, which is unsafe. 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 axle release lever. Doing otherwise may cause a burn.

For installation to the bicycle and maintenance

- When installing the front wheel to the front fork, always be sure to follow the instructions given in the manual for the front fork. The securing method and tightening torque for the front wheel both vary depending on the type of front fork being used. If the instructions are not followed, the wheel may fall out and possibly result in serious injury. When the front 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 must always be followed.

- When installing the rear wheel to the frame, always be sure to follow the instructions given in the manual for the frame. The securing method and tightening torque for the rear wheel both vary depending on the type of frame being used. Improper handling may cause the rear wheel to fall off and lead to serious injury. When the rear wheel is secured in accordance with the tightening torque, the wheel's rotation may become stiff; however, the instructions in the manual for frame must always be followed.
- Read the disc brake manual carefully, and keep it in a safe place for later reference.

⚠ 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.
- 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.
- Use the TL-HB16 when attaching the front hub to the wheel truing stand.

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.

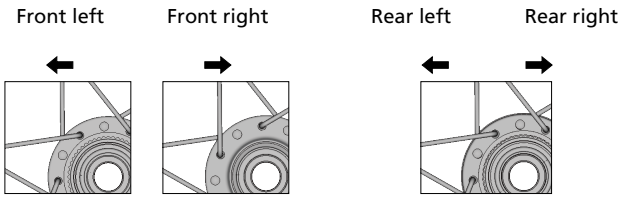
Tool	
	2.5 mm hexagon wrench
	4 mm hexagon wrench
	19 mm hexagon wrench
	17 mm hub spanner
	TL-FC36
	Slotted screwdriver
	Soft face mallet
	Bearing press tool

Installation/removal

Spoke lacing

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

   Radial lacing is not supported.

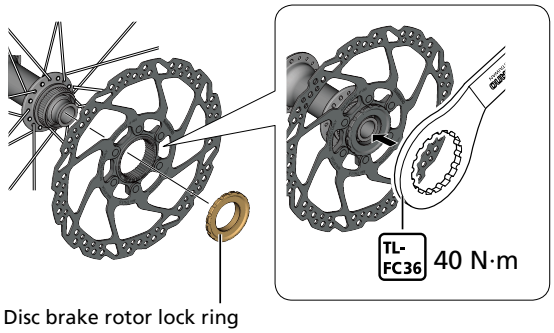


NOTICE

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

Installing the disc brake rotor

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



	External spline type
Disc brake rotor lock ring	
Lock ring tightening tool	TL-FC36

Removing the disc brake rotor

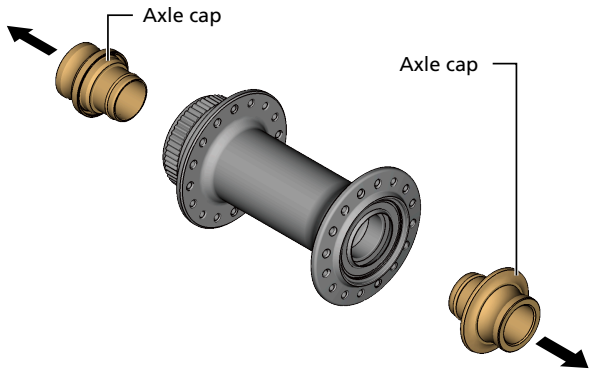
Perform the removal of the disc brake rotor in the reverse order from the installation procedure.

Maintenance

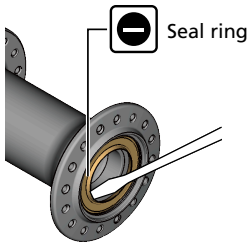
Front hub

Disassembly

1. **Remove the left and right axle caps by pulling them outwards off the end of the hub.**

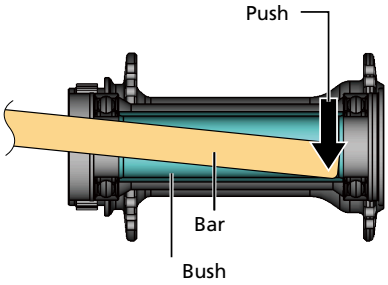


2. **Remove the left and right seal rings using a tool such as a slotted screwdriver.**



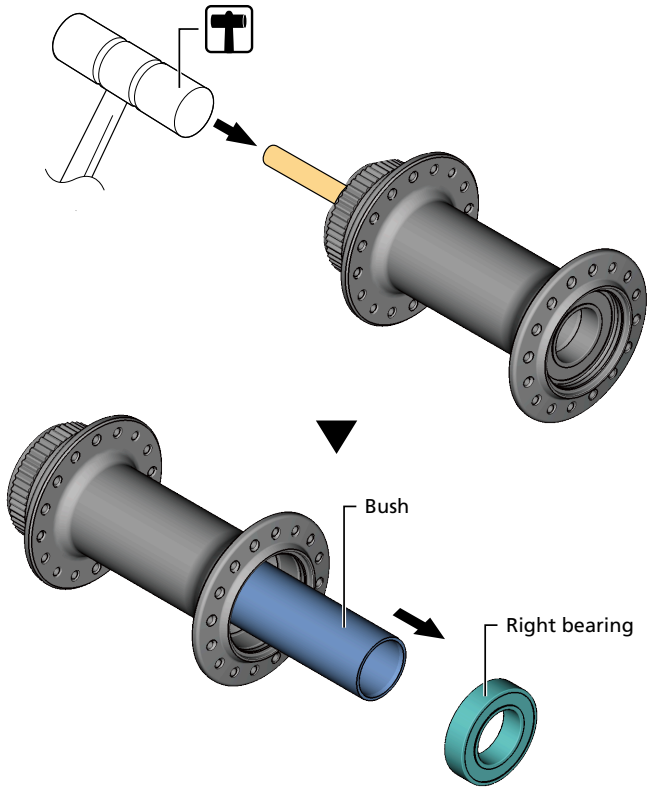
3. **Remove the bearings.**

   (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.

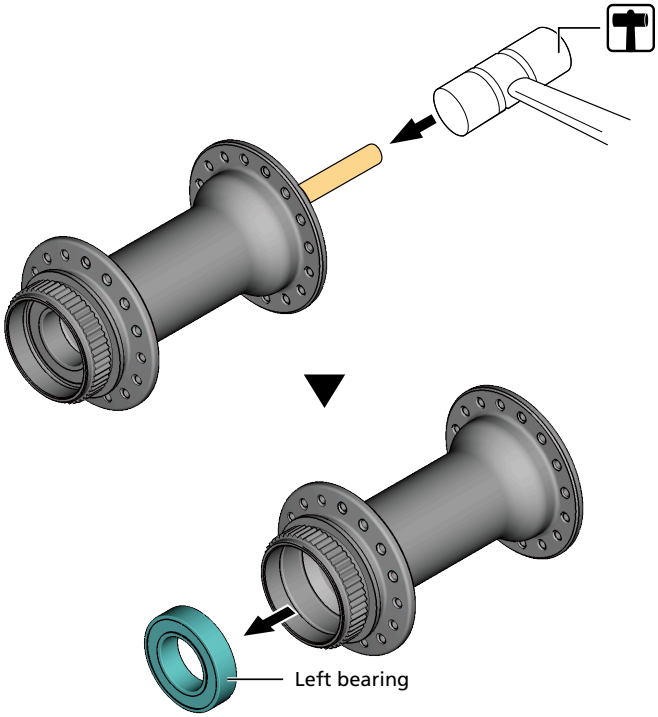


   (2) Touch the part of the right bearing that was exposed when the bush was shifted with the bar, and tap it with the soft face mallet to push out the right bearing.

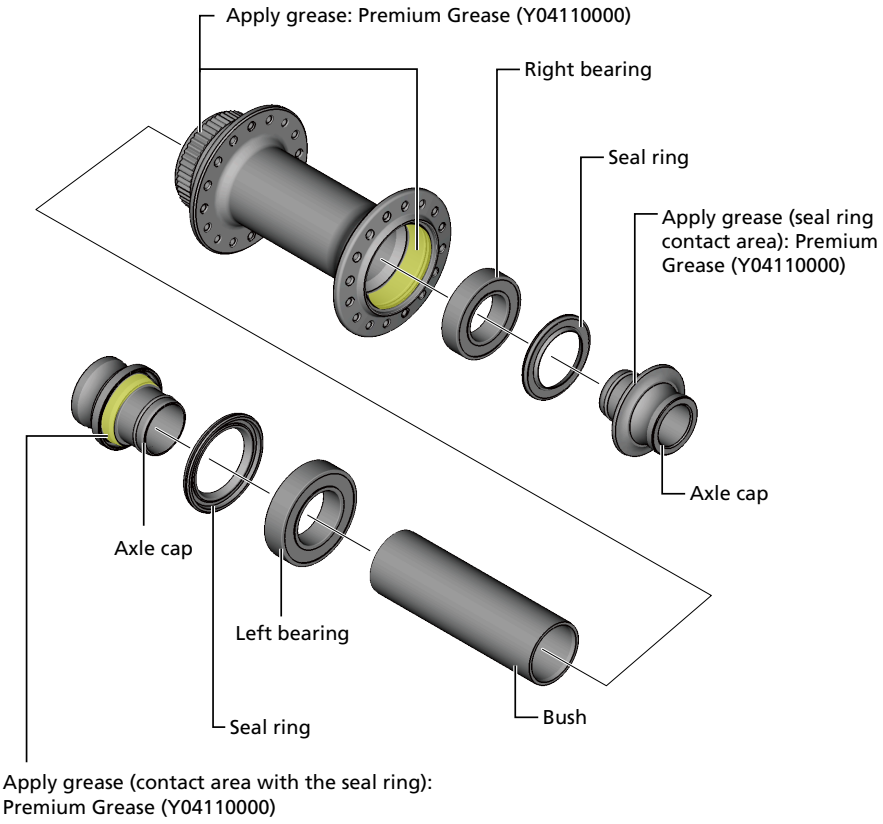
   – The bush can be removed at the same time too.



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

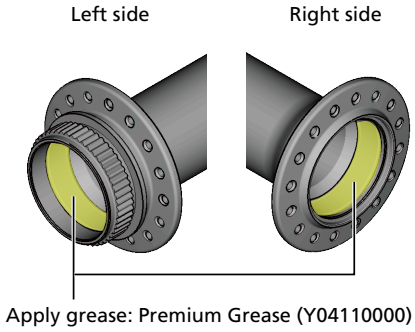


4. The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic intervals.



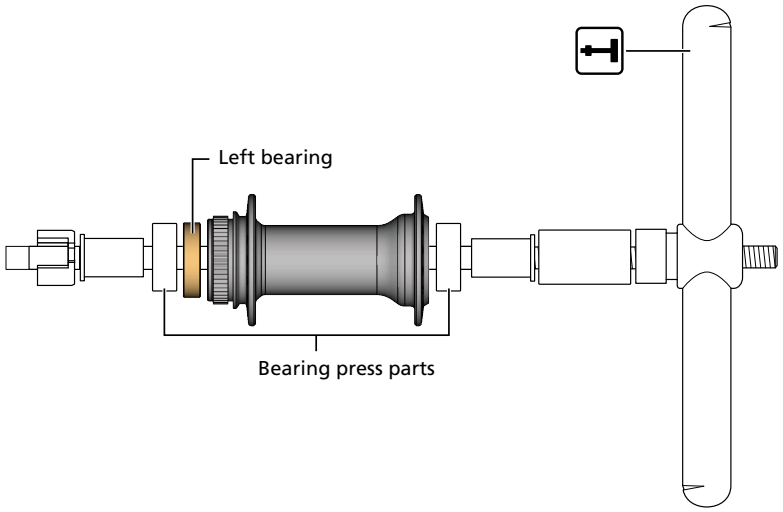
Assembly

1. Apply grease to the hub shell.

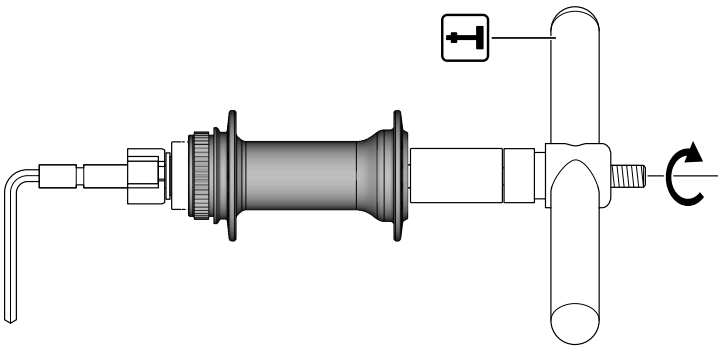


2. Install the left bearing.

(1) Install the left bearing and bearing press parts (inner diameter 17 mm, outer diameter 30 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.



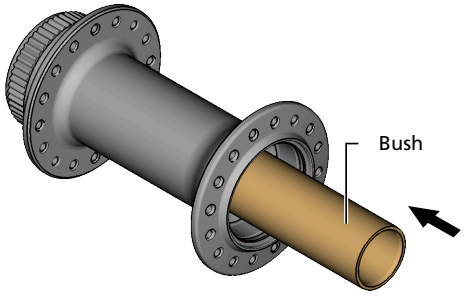
NOTICE

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

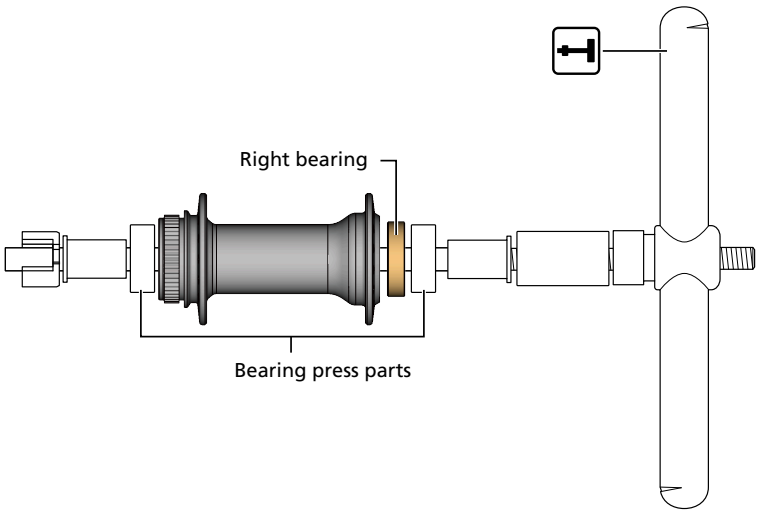
3. Install the right bearing.

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

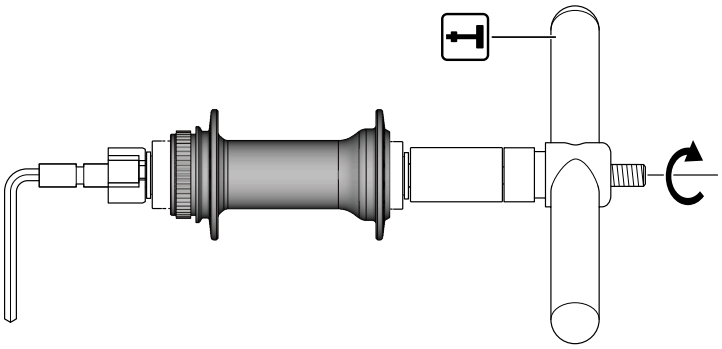
- Make sure that the bush is in the center of the hub body.



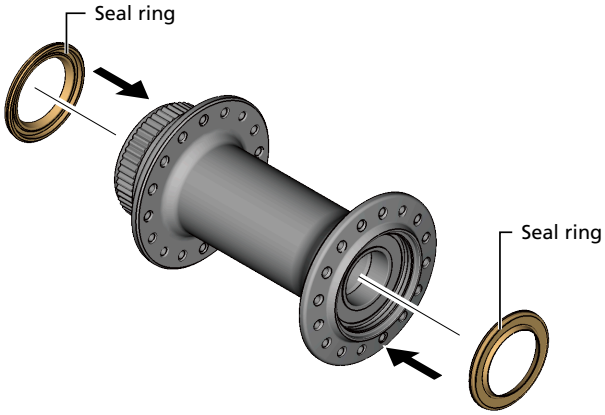
(2) Install the right bearing and bearing press parts to the hub body, and set the bearing press tool.



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

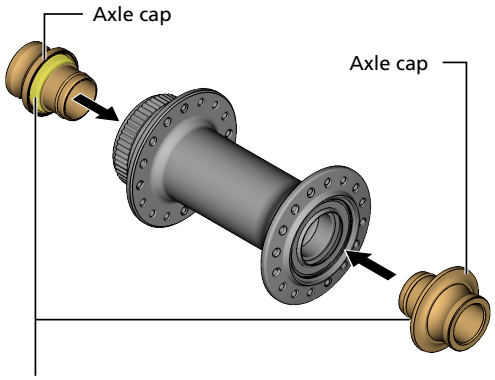


4. Install the left and right seal rings.



5. Install the left and right axle caps.

Be sure to push the axle caps until they click.



Apply grease (seal ring contact area): Premium Grease (Y04110000)

6. Make sure that the bearings are completely installed.

(1) Hold the left and right axle caps 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 left and right axle caps 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.

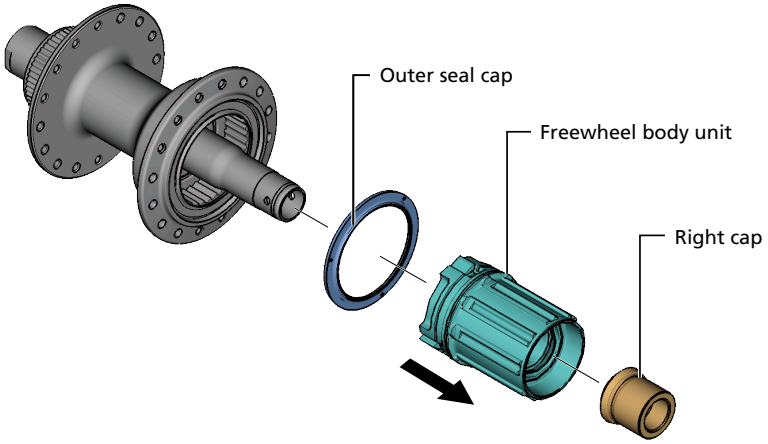
Freehub (FH-TC600)

NOTICE

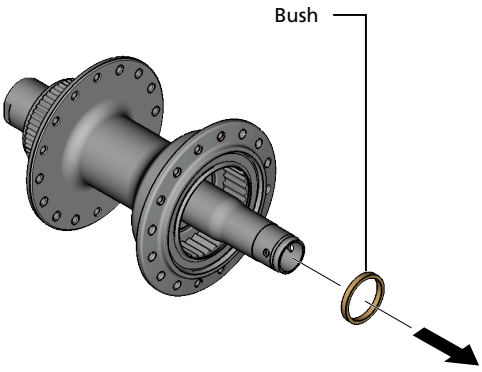
- Conduct the removal and installation of the seal very carefully so that it does not become deformed. When reinstalling the seal, check that it is facing the right way and insert it as far as it will go.
- Do not attempt to disassemble the dust cover which is crimped onto the right cap.
- Do not attempt 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.

Disassembly

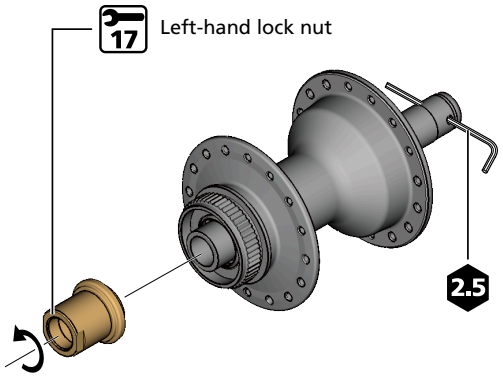
1. **Remove the right cap and freewheel body unit by pulling them outwards off the end of the hub axle.**
   Remove the outer seal cap at the same time.



2. **Remove the bush.**

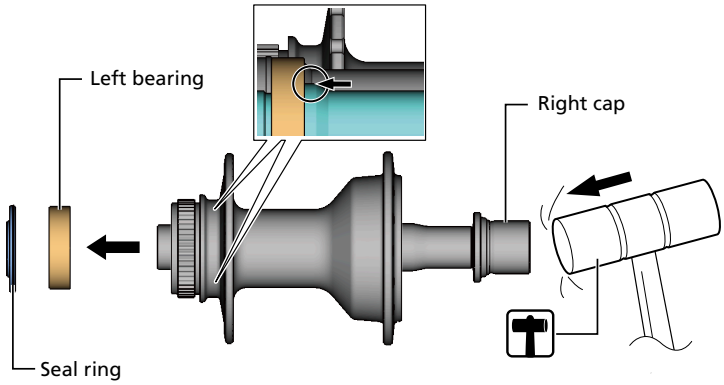


3. **Secure the hub axle with a hexagon wrench, and remove the left-hand lock nut.**

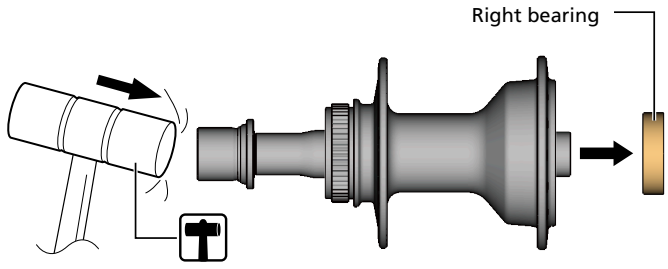


4. Remove the bearing and seal ring.

(1) 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.

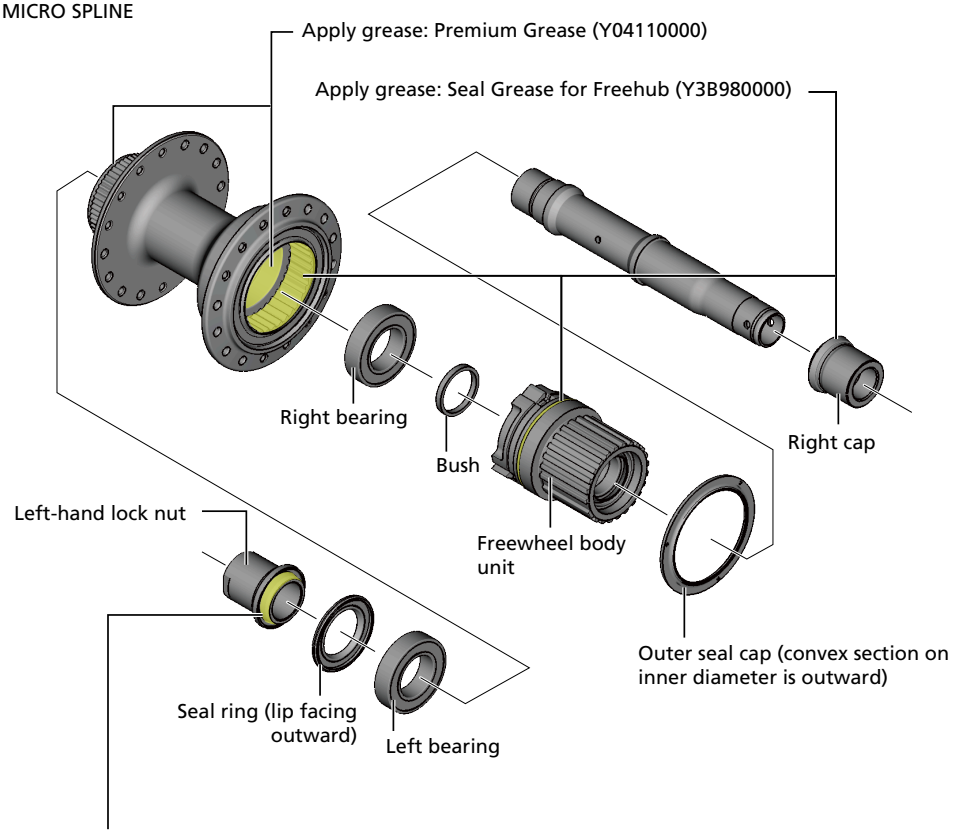


(2) Insert the hub axle covered by the right cap into the left side of the hub body, and tap the right cap from the left side to remove the right bearing.

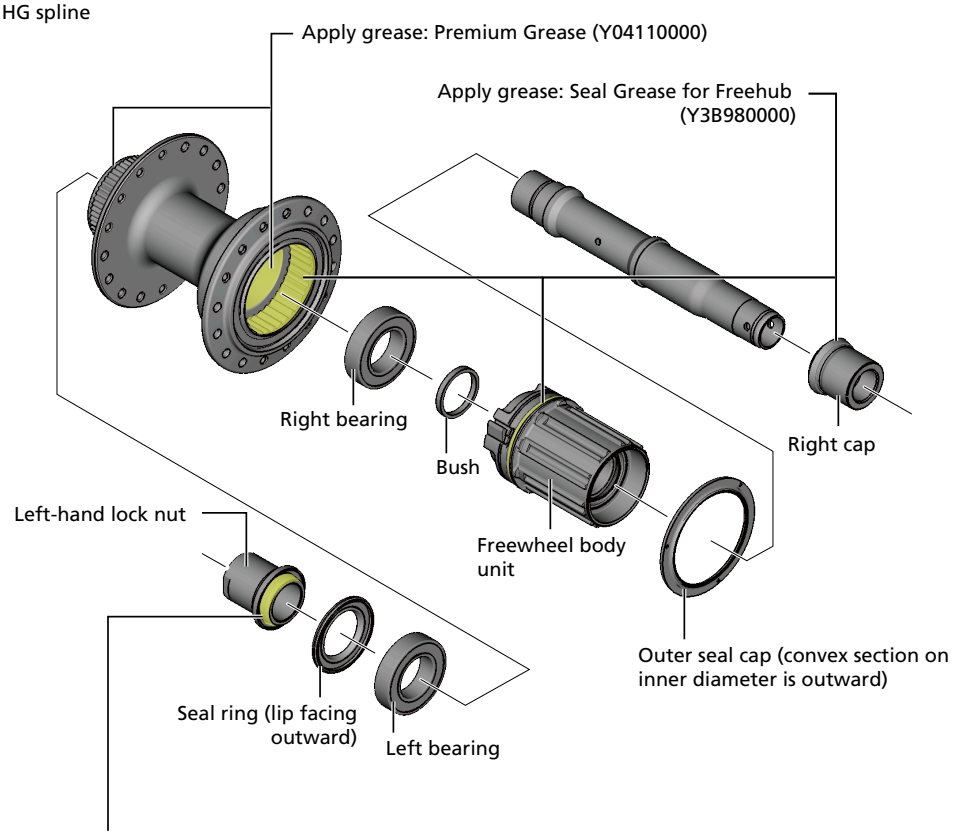


5. The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic intervals.

MICRO SPLINE

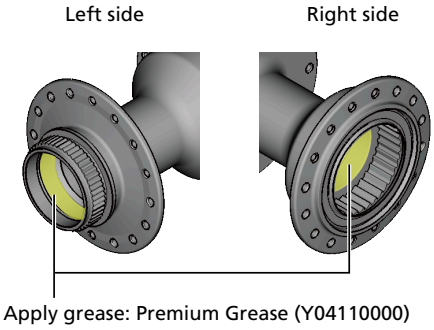


HG spline



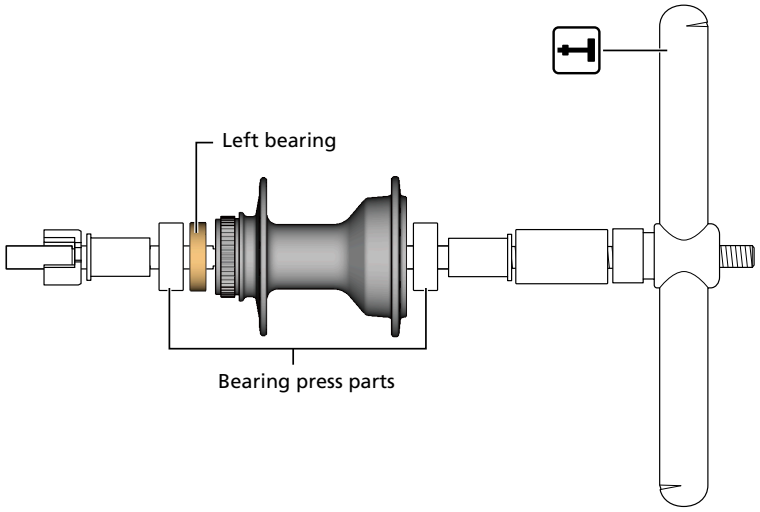
Assembly

1. Apply grease to the hub shell.

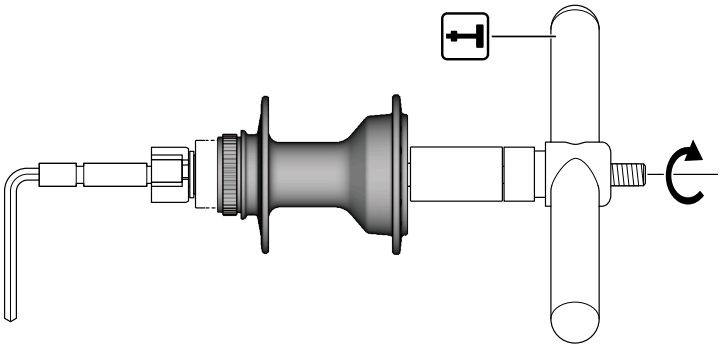


2. Install the left bearing.

(1) Install the left bearing and bearing press parts (inner diameter 17 mm, outer diameter 30 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.

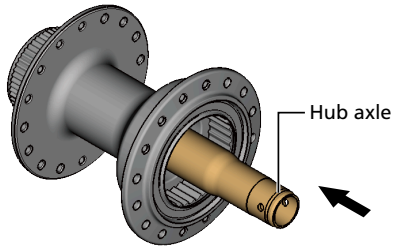


NOTICE

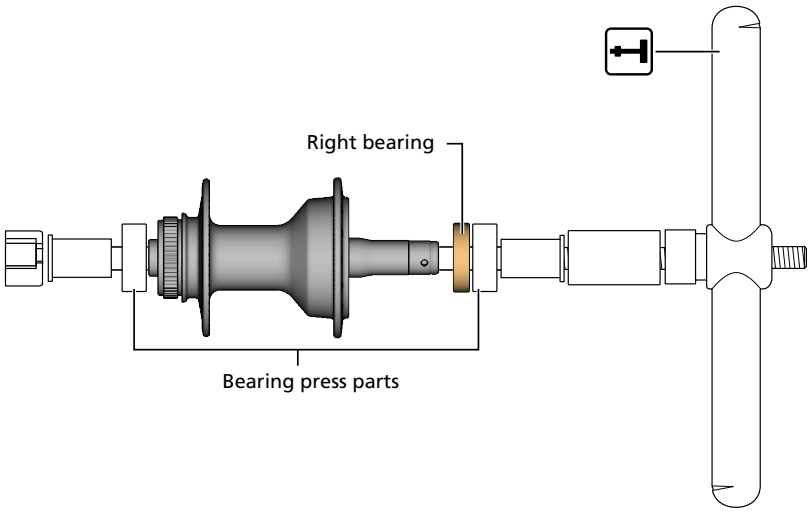
- Be sure to install the left bearing first.
- The bearing press parts should touch both the outer ring and inner ring of the bearing.

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

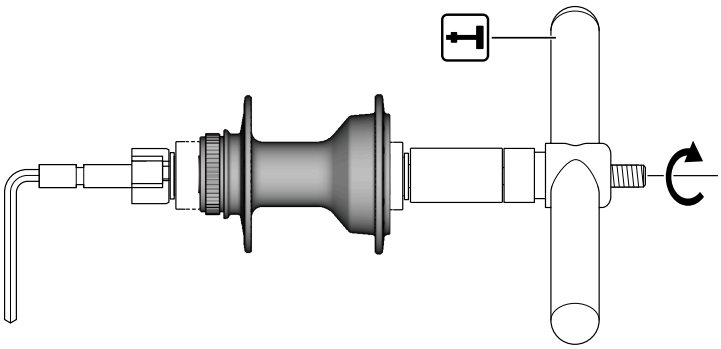
(1) Remove the bearing press tool and bearing press parts, and insert the hub axle from the right side of the hub body.



(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.



NOTICE

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

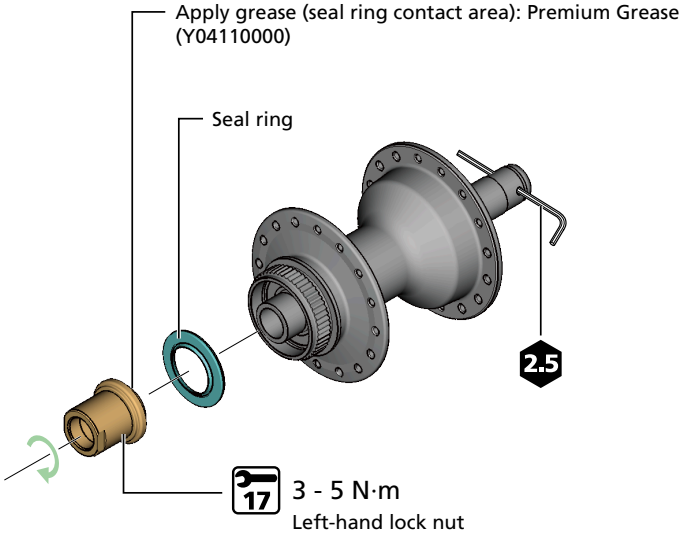
4. Make sure that the bearings are completely installed.

(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 2 . If there is still play, perform step 3 .

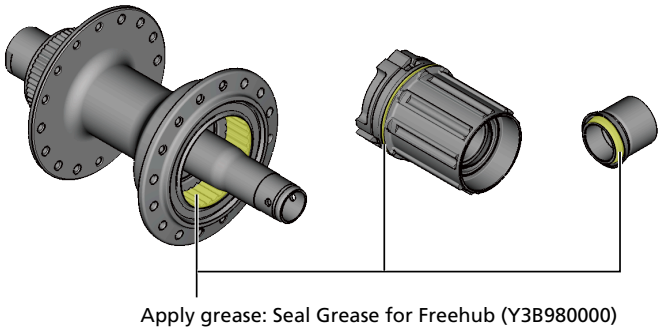
(2) Hold both sides of the hub axle and rotate the hub body to confirm that it rotates smoothly. If it is not smooth, tap the bearing with a bar from inside to loosen it as when performing disassembly. When loosening, loosen the right bearing first.

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.



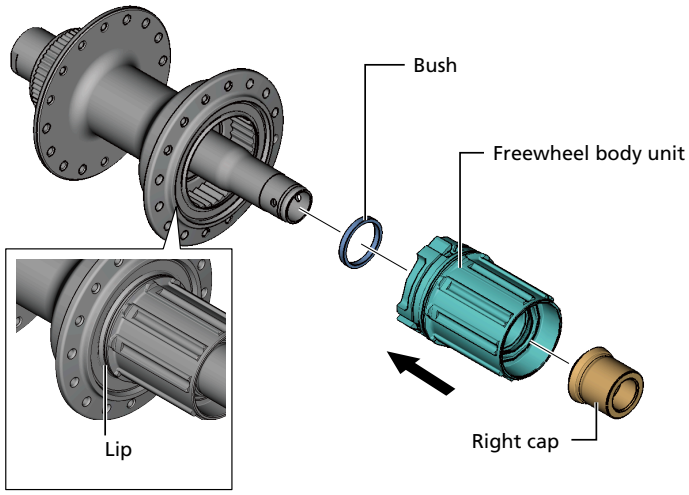
6. Apply grease to the ratchet part, freewheel body unit, and right cap.



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

Be sure to push the right cap until it clicks.

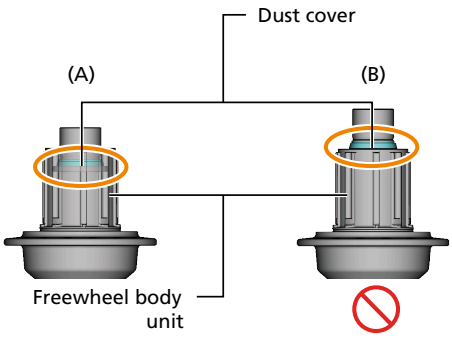
After installing the freewheel body unit, check that the lip of the seal ring is not facing the wrong way.



NOTICE

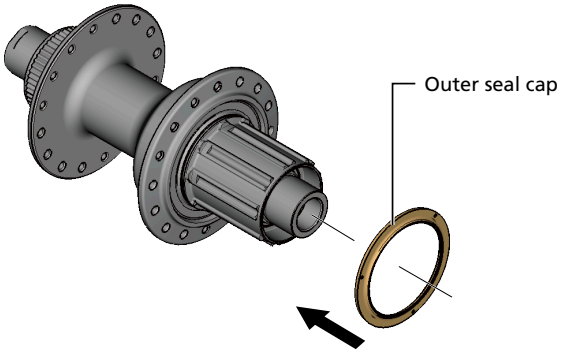
- The correct position for the dust cover is where it is hidden in the freewheel body unit, as shown in illustration (A).

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



8. Install the outer seal cap.

Make sure that the outer seal cap is installed in the correct direction.



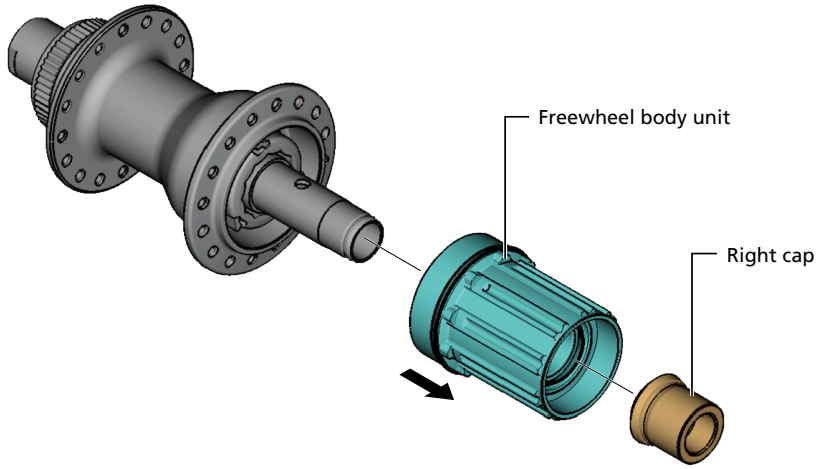
Freehub (FH-TC500)

NOTICE

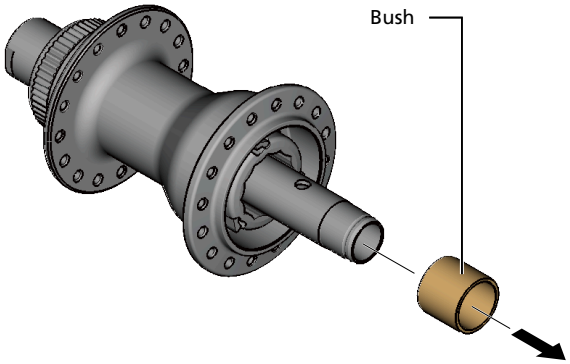
- Conduct the removal and installation of the seal very carefully so that it does not become deformed. When reinstalling the seal, check that it is facing the right way and insert it as far as it will go.
- Do not attempt to disassemble the dust cover which is crimped onto the right cap.
- Do not attempt 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.

Disassembly

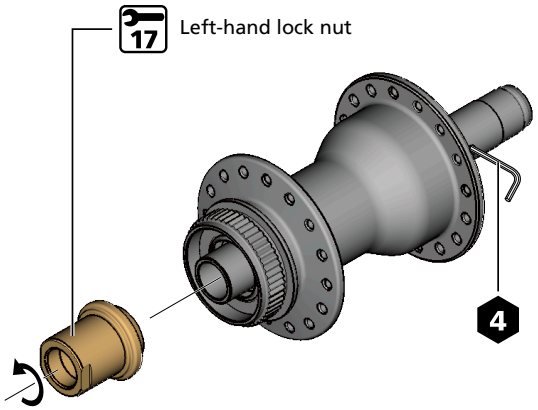
1. **Remove the right cap and freewheel body unit by pulling them outwards off the end of the hub axle.**



2. **Remove the bush.**

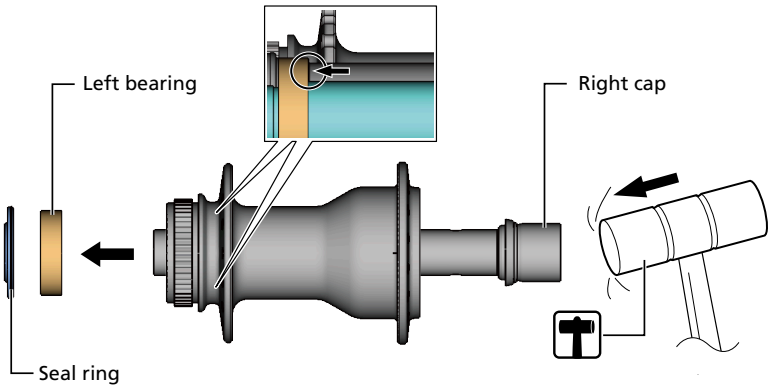


3. **Secure the hub axle with a hexagon wrench, and remove the left-hand lock nut.**

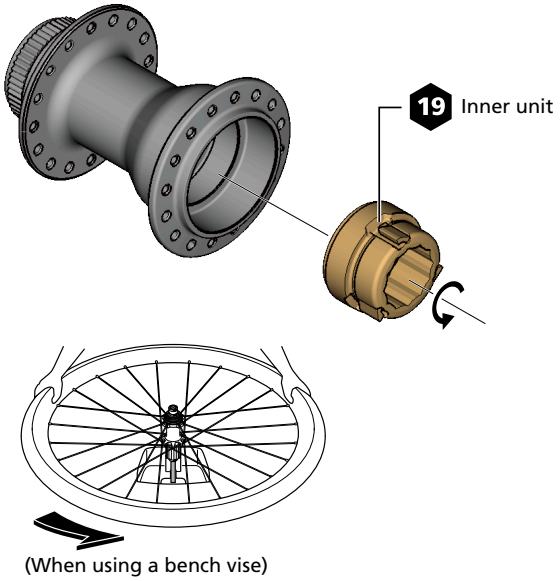


4. **Remove the left bearing and seal ring.**

   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.

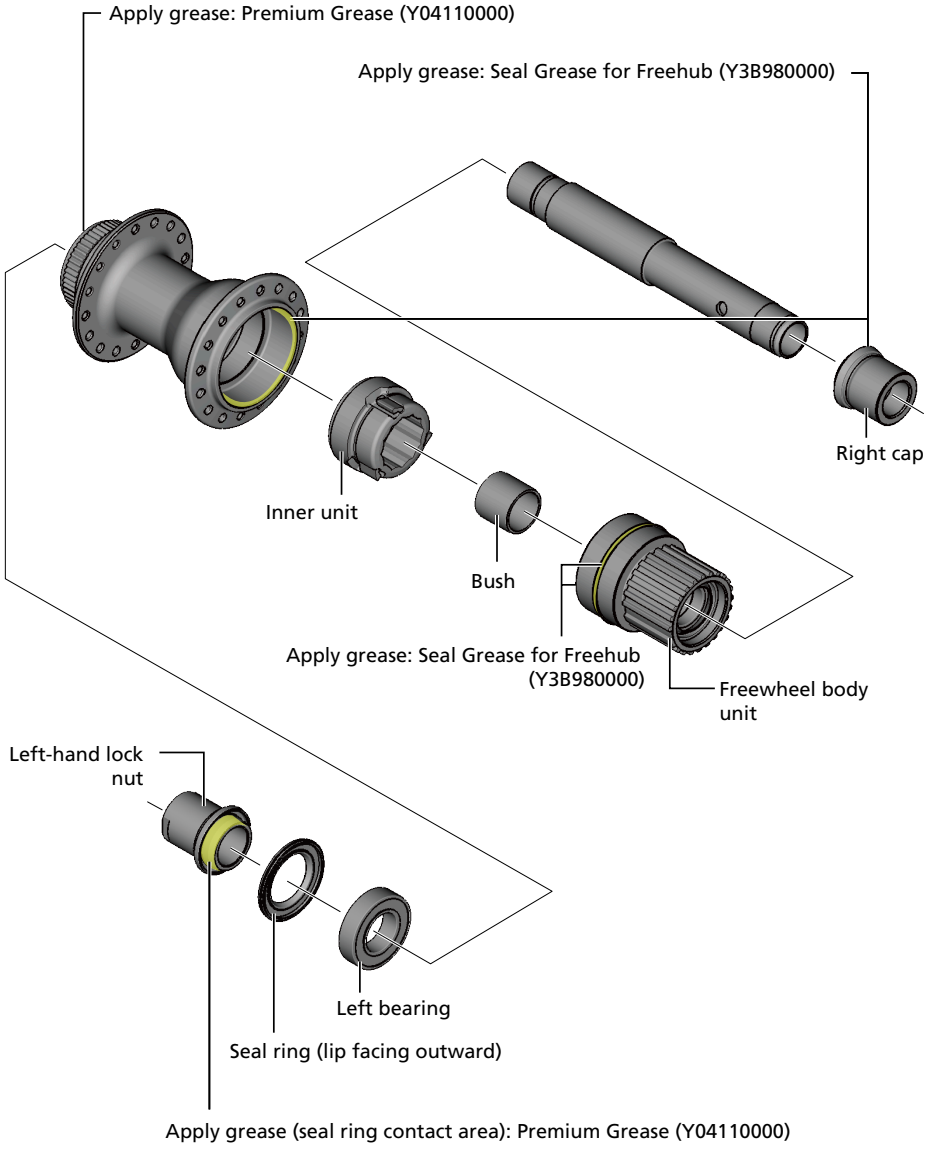


5. **Remove the inner unit.**

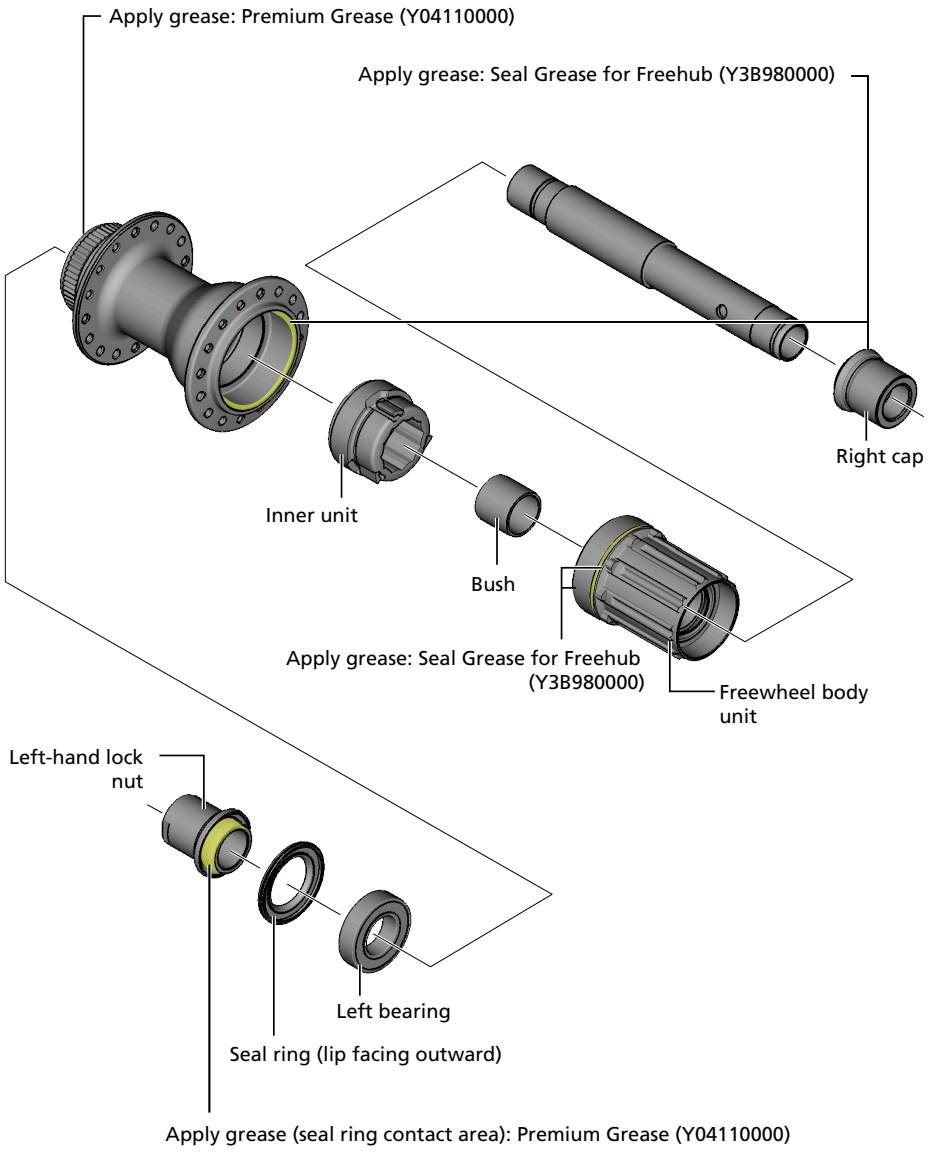


6. **The unit can be disassembled as shown in the figure. Apply grease to the indicated parts at periodic intervals.**

MICRO SPLINE



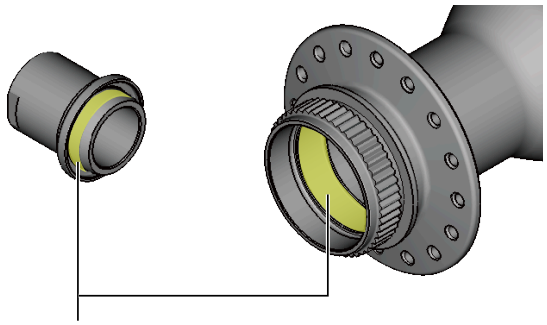
HG spline



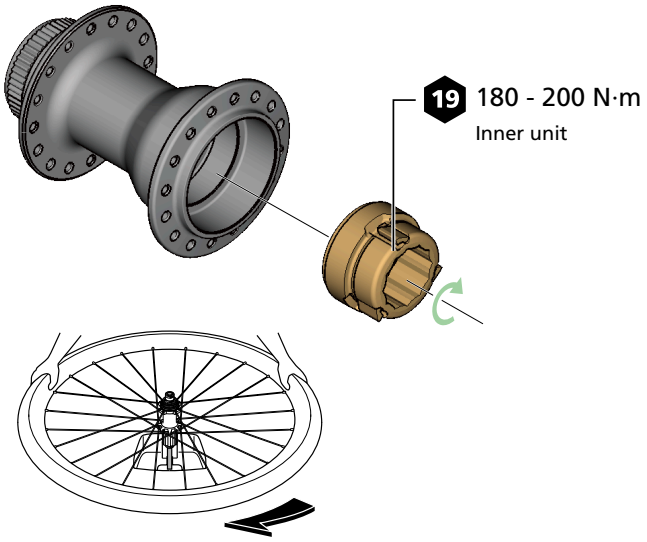
Assembly

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

Left side

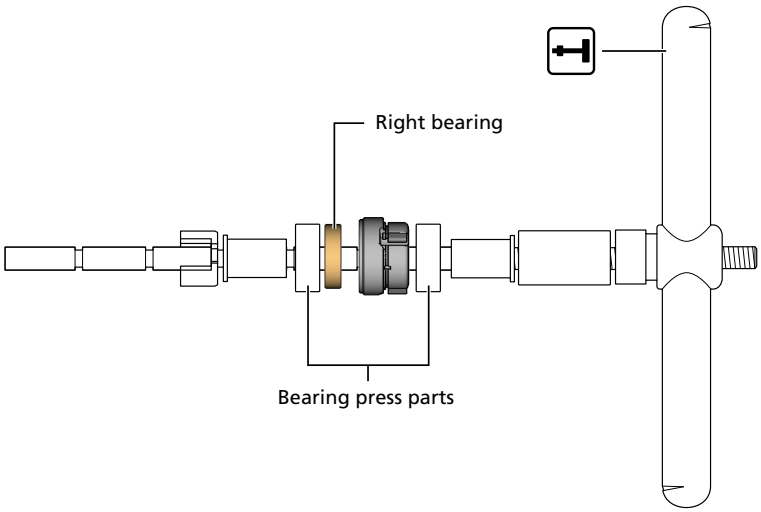


2. Install the inner unit to the hub body.

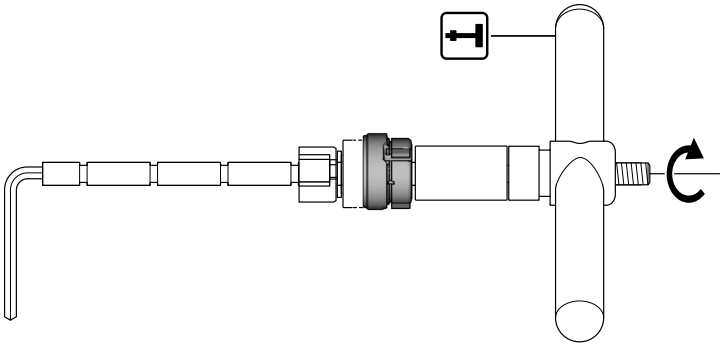


If the right bearing has come off the inner unit

(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.

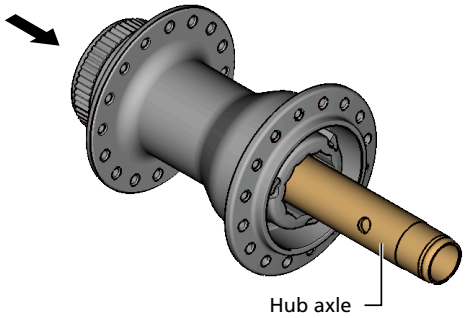


NOTICE

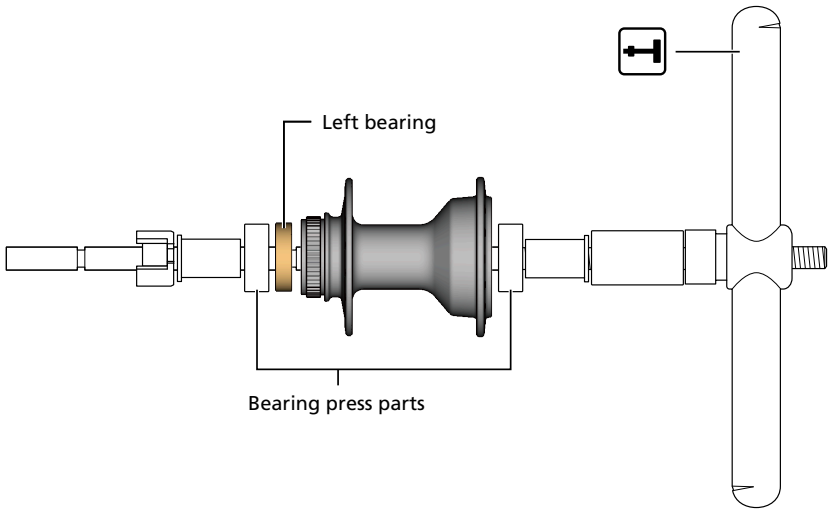
- Be sure to install the right bearing first. (If the right bearing has come off the inner unit)
- The bearing press parts should touch both the outer ring and inner ring of the bearing.

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

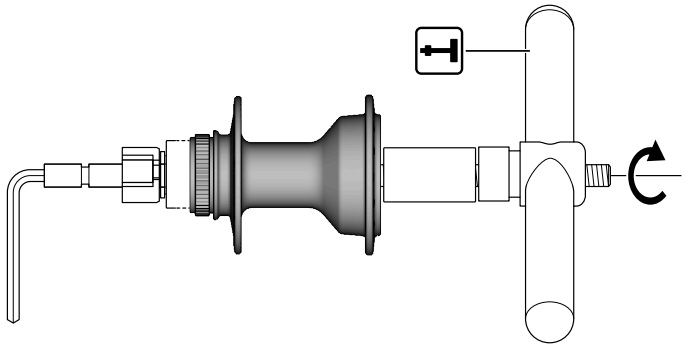
(1) Insert the hub axle and left bearing from the left side of the hub body.



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



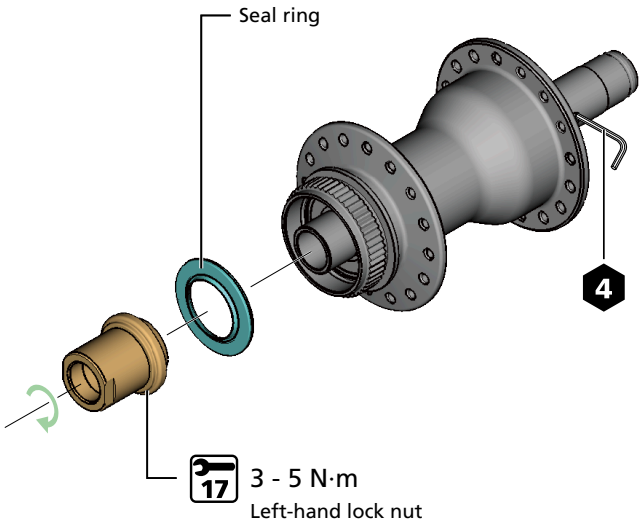
(3) Turn the handle of the bearing press tool, and securely press-fit the left bearing as far as it will go.



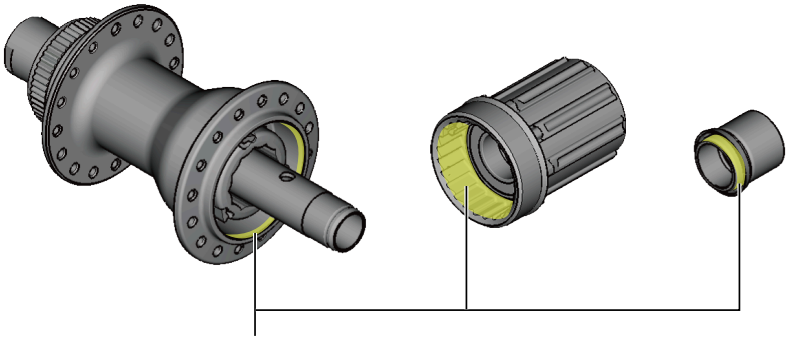
NOTICE

- 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.



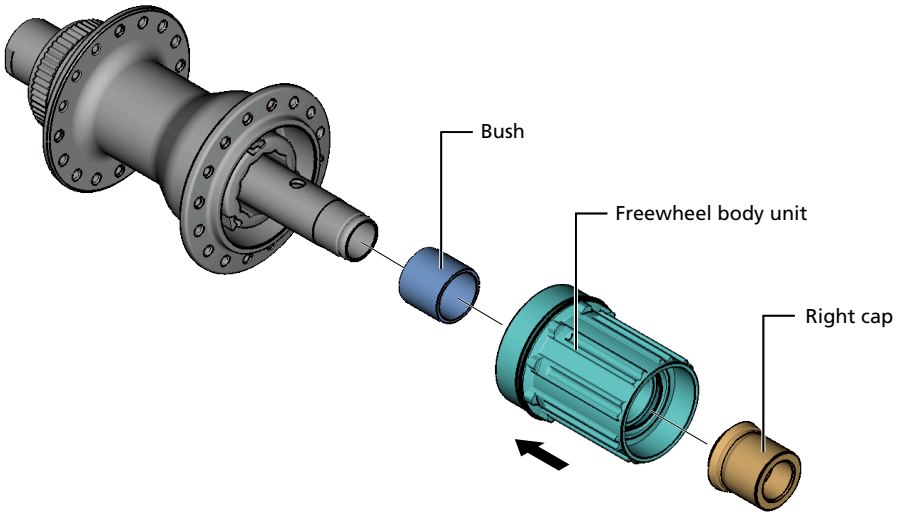
6. **Apply grease to the hub body (contact area with the seal ring), ratchet part, freewheel body unit, and right cap.**



Apply grease: Seal Grease for Freehub (Y3B980000)

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

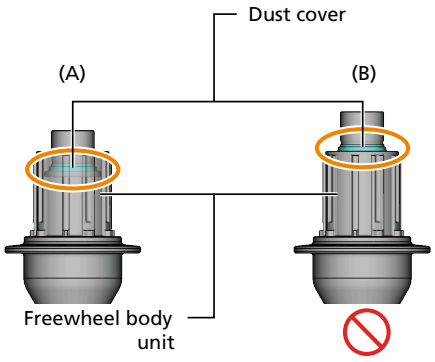
Be sure to push the right cap until it clicks.



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.



Replacing the freewheel body unit

Refer to “Disassembly” and “Assembly” when replacing the freewheel body unit.

- For FH-TC600: “ Disassembly ” / “ Assembly ”
- For FH-TC500: “ Disassembly ” / “ Assembly ”

The procedure from step 2 in “Disassembly” is unnecessary, since the hub axle does not need to be removed.

- For FH-TC600: Click here
- For FH-TC500: Click here

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