

# Dealer's Manual

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

## Wheel Set

### DURA-ACE

- WH-R9100-C40-CL
- WH-R9100-C40-TU
- WH-R9100-C60-CL
- WH-R9100-C60-TU

# CONTENTS

<b>IMPORTANT NOTICE.....</b>	<b>3</b>
<b>TO ENSURE SAFETY.....</b>	<b>4</b>
<b>LIST OF TOOLS TO BE USED.....</b>	<b>8</b>
<b>INSTALLATION .....</b>	<b>10</b>
Tire size .....	10
Installation of cassette sprocket.....	10
Brake shoe installation position.....	12
Brake shoe and rim combinations.....	12
<b>MAINTENANCE .....</b>	<b>14</b>
Spoke lacing .....	14
Replacing the spokes .....	15
Replacement of the freewheel body .....	22
Cautions on the use of rims for tubular tires .....	24

## 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, contact your place of purchase or a local bicycle dealer for their assistance.
- Make sure to read all instruction 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 dealer's manuals and instruction manuals can be viewed on-line on our website (<http://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.**

It is recommended to use genuine SHIMANO 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.

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

- Before use, check the wheels to make sure that there are no bent or loose spokes, dents, scratches or cracks on the rim surface. Do not use the wheel if any of these problems are found. The wheel may break, and you may fall. In the case of carbon wheels, check also that there is no carbon peeling or cracking.
- If the quick release mechanism is not used correctly, the wheel may come off the bicycle and serious injury could result. Read the Service Instructions for the quick release mechanism thoroughly before use.
- If the wheels are used in harsh conditions such as on unpaved surfaces, they may become bent or damaged, which may then result in accidents.
- 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.

#### ■ CL: Clincher wheel

- The hollow on the opposite side to the valve hole is an indicator for the amount of rim wear. If this hollow can no longer be seen, stop using the rim. If you continue using the rim, it may break, and the bicycle may fall over and an accident may result.

#### ■ TU: Tubular wheel

- Before riding, check that the tires are securely glued to the rims. If the tires come off while riding, you may fall and get severely injured.
- If the braking surfaces of the carbon fiber rims become extremely worn and the rims appear to have become deformed, stop riding the bicycle. If you continue using the rim, it may break, and the bicycle may fall over and an accident may result.

#### For Installation to the Bicycle, and Maintenance:

- Do not use in combination with bottom link-type suspension forks. With these types of forks, when the brakes are applied, the clearance between the hub axle and the brake shoes can change due to the operation of the suspension and the brake shoes may touch the spokes.

**CAUTION****Be sure to also inform users of the following:**

- The tires should be inflated to the pressure indicated on the tires before use.
- Note that a higher rim is more affected the wind and makes riding unstable.

**■ CL: Clincher wheel**

- Use a high-pressure-resistant rim tape for the rim. Otherwise, a sudden puncture may occur, and you may fall off the bicycle.
- When you replace the rim tape, use the one that matches the rim size. If you use a rim tape that does not match the rim size, a sudden puncture may occur, and you may fall off the bicycle.

**■ TU: Tubular wheel**

- Carbon fiber rims become worn due to friction from the brake shoes, and there may be a "run-in" period before the full performance of the rims can be obtained. As the run-in period progresses, the braking force will become stronger. Take this increase in braking force into account for safety purposes.

**NOTICE****Be sure to also inform users of the following:**

- Before use, check that there are no pieces of metal or other foreign objects sticking to the brake shoes. If any such items are present, they may cause damage to the rim when the brakes are applied.
- Do not lubricate the internal parts of the hub. Otherwise, grease will flow out.
- It is recommended that you ask a bicycle dealer to adjust the spoke tensions if there is any deviation in the spokes and after the first 1,000 km of riding.
- Optional reflector and spoke protector sets are available. Check the model number on the website specifications, and ensure you are using the appropriate parts.
- 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.

**■ CL: Clincher wheel**

- The SHIMANO R55HC (high performance) brake shoes use an aggressive compound designed with an emphasis on maximum performance in wet conditions, however they will cause accelerated rim wear.  
SHIMANO accepts no responsibility for reduced rim life which might occur from using R55HC brake shoes.

**■ TU: Tubular wheel**

- For tubular specifications, use brake shoes for carbon rims such as R55C3 and R55C4. If you use any brake shoes other than those for carbon rims, they may provide insufficient braking force or wear quickly.
- Do not use an R55C3, R55C4 carbon rim brake shoe if it has been used with an aluminum rim. Using the shoe on an aluminum rim will cause aluminum wear powder to be stuck on the brake shoe, which will damage the brake friction surface of the carbon rim.

**For Installation to the Bicycle, and Maintenance:**

- Be careful not to overtighten the nipples when adjusting the spoke tensions. If overtightened, damage to the rim may result.
- If the wheel becomes stiff and difficult to turn, lubricate it with grease.
- Special nipple wrenches are available as optional accessories.
- For compatible reflectors and spoke protectors, check the specifications table (<http://si.shimano.com>).

■ **CL: Clincher wheel/TU: Tubular wheel**






- Use of genuine SHIMANO spokes and nipples is strongly recommended. Otherwise, the area where the spokes fit into the hub body may become damaged.

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**

LIST OF TOOLS TO BE USED

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

Tool		Tool		Tool	
	5 mm hexagon wrench		Adjustable wrench		TL-SR23
	14 mm hexagon wrench		TL-LR15		



# INSTALLATION

# INSTALLATION

## Tire size

The recommended tire sizes for installation to each wheel are as follows.

	Model No.	Tire size
DURA-ACE	WH-R9100-C40-CL	23C - 28C
	WH-R9100-C40-TU	23 mm - 28 mm
	WH-R9100-C60-CL	23C - 32C
	WH-R9100-C60-TU	23 mm - 28 mm

## Installation of cassette sprocket

1

Place each sprocket with the marked side facing outward.

Install them so that the wide groove in the freewheel is aligned with the wide protrusion on each sprocket.

(A)

Wide groove (freewheel)

(B)

Wide protrusion (sprocket)

(C)

Sprocket spacers

(D)

Lock ring

To be continued on next page

10

## INSTALLATION

### Installation of cassette sprocket

#### Installing HG sprockets:

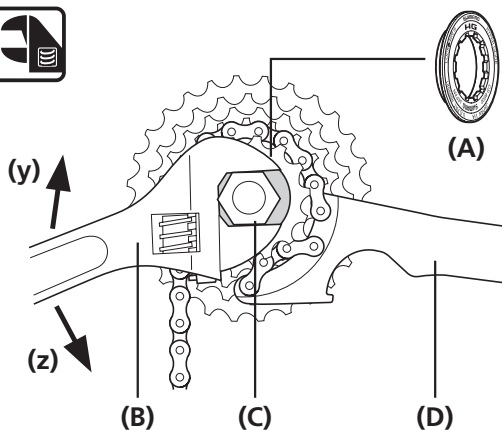
Tighten the lock ring with the SHIMANO original tool TL-LR15.

#### Replacing HG sprockets:

Remove the lock ring with the SHIMANO original tools TL-LR15 and TL-SR23.



2



- (y) Assembly
- (z) Disassembly

- (A) Lock ring
- (B) Adjustable wrench
- (C) TL-LR15
- (D) TL-SR23

#### Tightening torque



30 - 50 N·m

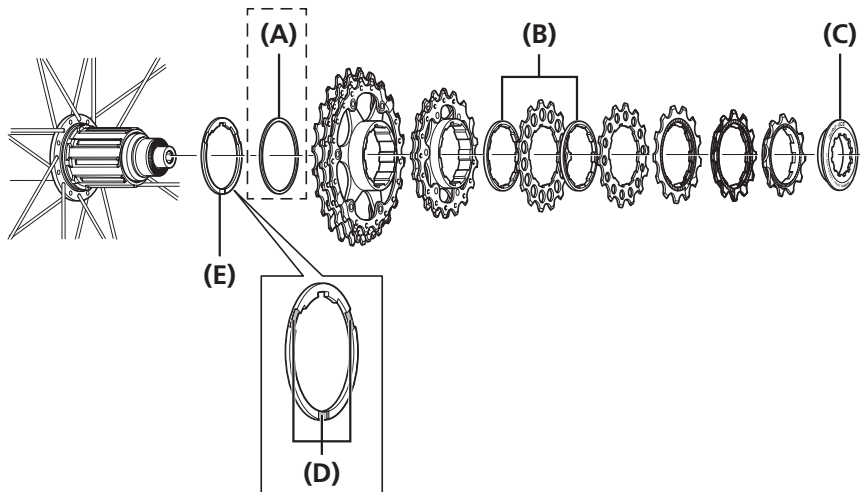
### Cautions when installing

When installing a 10-speed cassette:

Install the included 1.85 mm low spacer at the position indicated in the figure.

**CS-7900/CS-7800/CS-6700/CS-6600/CS-5700/CS-5600:**

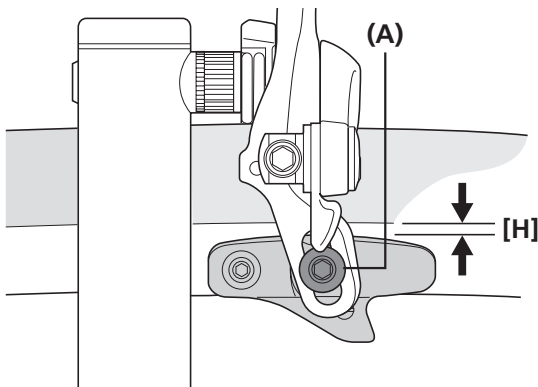
A 1.0 mm spacer is included with the cassette. Install it.



- (A) 1.0 mm spacer
- (B) Sprocket spacers
- (C) Lock ring
- (D) Grooves: Sprocket side  
(Some 1.85 mm low spacers do not have grooves.)
- (E) 1.85 mm low spacer

■ Brake shoe installation position

Position the brake shoes as in the illustration.



(A) Shoe fixing bolt



TECH TIPS

Adjust the distance of the brake shoe from the edge of the rim [H] while referring to the table.

	Distance [H]
C40-TU C60-TU	4 mm or more
C40-CL C60-CL	1 mm or more

■ Brake shoe and rim combinations

Refer to the Dealer's Manual for the dual pivot caliper brake for details on brake shoe and rim combinations.

NOTICE

Use brake shoes that are appropriate for the rim type and rim width.

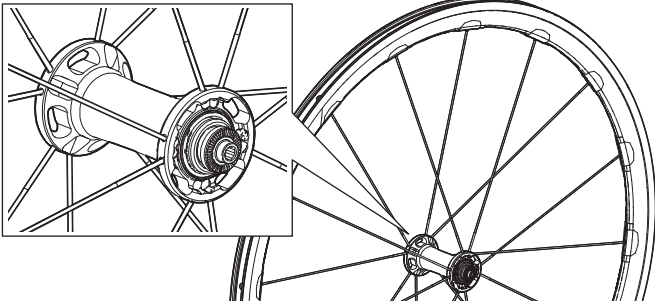
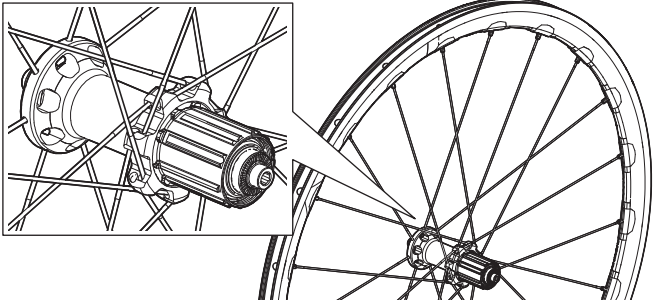
# MAINTENANCE

## MAINTENANCE

### ■ Spoke lacing

Lace the spokes as shown in the illustration.

\*The spoke tension values should be used as a guide only.

Front	Rear
<p>Radial lacing is used on both the left and right.</p> 	<p>Right (sprocket) side: tangent lacing Left side: radial lacing</p> 

Spoke tension value			
Front		Rear	
		Right (sprocket) side	Left side
C60	600 - 1000 N (135 - 225 lbf)	1100 - 1400 N (247 - 315 lbf)	600 - 900 N (135 - 202 lbf)
C40TU	800 - 1200N (180 - 270 lbf)	900 - 1300N (202 - 292 lbf)	
C40CL	1000 - 1400 N (225 - 315 lbf)	1200 - 1500 N (270 - 337 lbf)	

## ■ Replacing the spokes

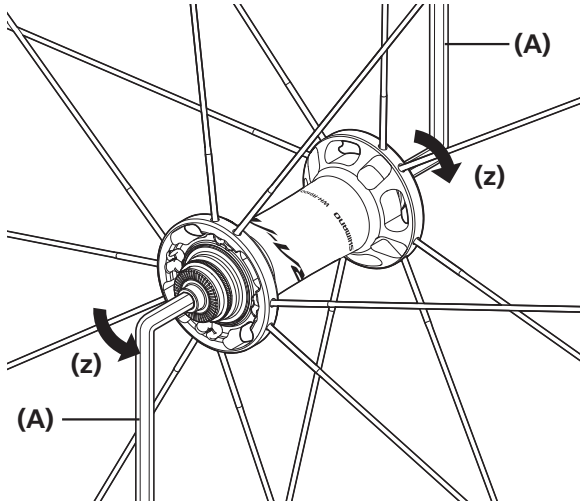
### NOTICE

When replacing the left-side spokes on the front and rear hubs, pull out the hub axle first.

### Pulling out the hub axle (Front)

When assembling the spokes, reverse the procedure.

Use a hexagon wrench to loosen the lock nut as shown in the illustration.



(z) Disassembly

(A) 5 mm hexagon wrench

#### Tightening torque



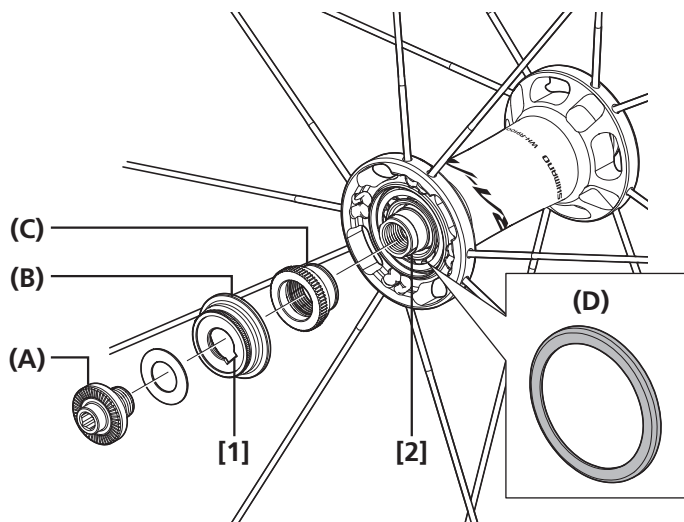
15 - 17 N·m

### NOTICE

Disassembly from the right side is not possible.

2

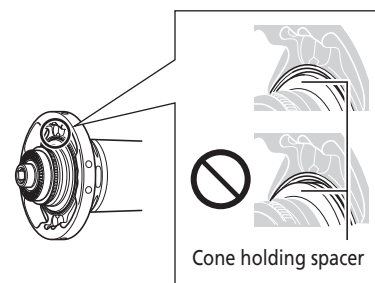
Remove the lock nut, the cone holding spacer and the cone.



- (A) Lock nut
- (B) Cone holding spacer
- (C) Cone
- (D) Seal (Lip is on the outside)

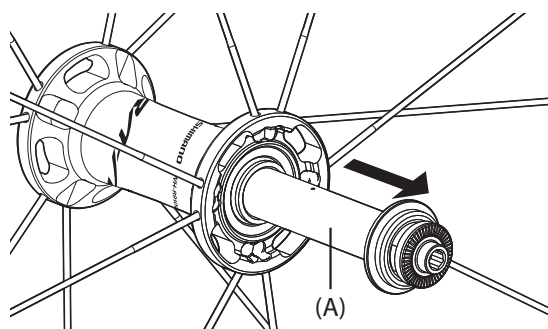
#### NOTICE

- When removing and installing the seal, do so very carefully so that the seal does not become bent. When reinstalling the seal, make sure that it is facing the right way, and insert it as far as it will go.
- Tighten the cone onto the hub axle until it has no looseness. While aligning the knurls of the cone and the knurls of the cone holding spacer, align section [1] of the cone holding spacer with section [2] on the hub axle.
- Check that the cone holding spacer is embedded as far as it will go.



3

Pull out the hub axle.



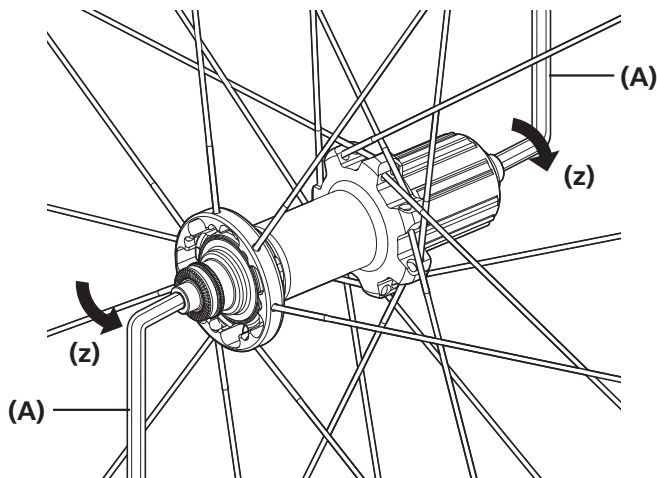
- (A) Hub axle



## Pulling out the hub axle (Rear)

When assembling the spokes, reverse the procedure.

Use a hexagon wrench to loosen the lock nut as shown in the illustration.



(z) Disassembly

(A) 5 mm hexagon wrench

### Tightening torque

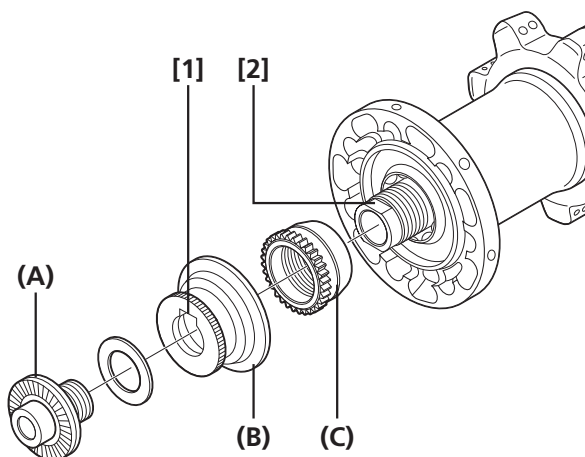


15 - 17 N·m

### NOTICE

Disassembly from the freewheel side is not possible.

Remove the lock nut, the cone holding spacer and the cone.



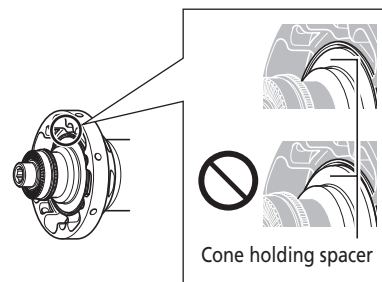
(A) Lock nut

(B) Cone holding spacer

(C) Cone

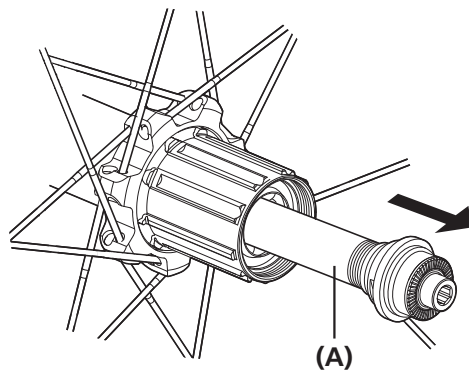
### NOTICE

- When removing and installing the seal, do it very carefully so that the seal does not become bent. When reinstalling the seal, make sure that it is facing the right way, and insert it as far as it will go.
- Tighten the cone onto the hub axle until it has no looseness. While aligning the knurls of the cone and the knurls of the cone holding spacer, align section [1] of the cone holding spacer with section [2] on the hub axle.
- Check that the cone holding spacer is embedded as far as it will go.



3

Pull out the hub axle.

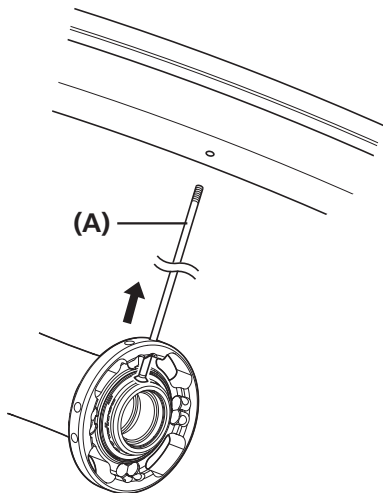


(A) Hub axle

## Replacing front spokes

### Right side

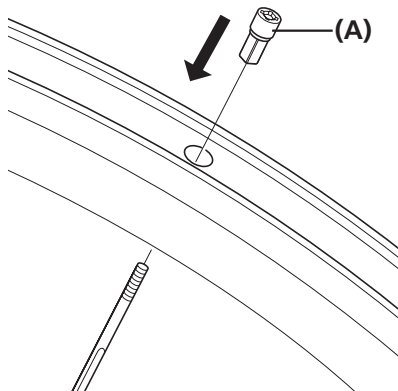
1



Insert the spokes into the holes in the hub flange as shown in the illustration.

(A) Spoke

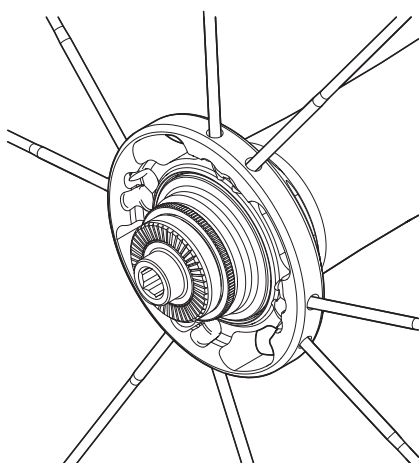
2



Attach the nipples and tighten the spokes to the specified tension.

(A) Nipple

### Left side



Replacement procedures are the same as for the right side.

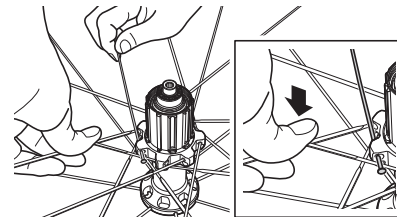
## Replacing rear spokes (C40-CL/C40-TU/C60-CL/C60-TU)

The right-side spokes can be replaced without removing the hub axle.

### NOTICE

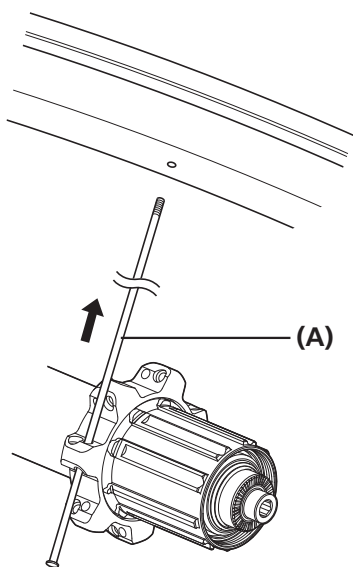
#### Cautions when replacing right-side spokes

When replacing a right-side spoke on the rear hub, slightly push the adjacent spokes before removal. Do the same when you put a spoke through.



### Right side

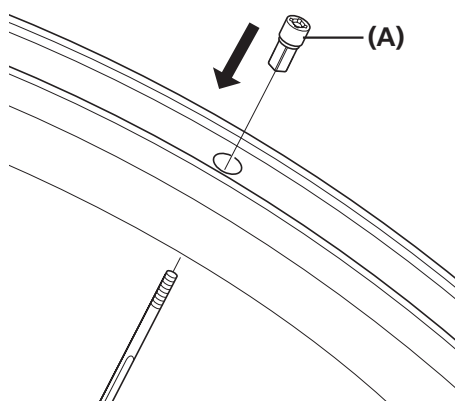
1



Pass the spoke through the hole in the hub flange as shown in the illustration.

(A) Spoke

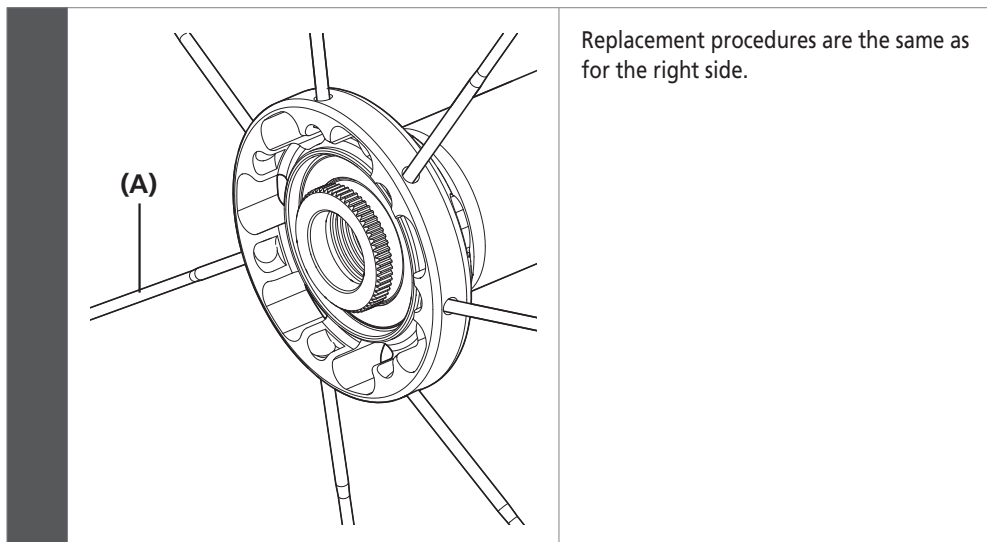
2



Attach the nipples and tighten the spokes to the specified tension.

(A) Nipple

**Left side**



Replacement procedures are the same as for the right side.

**(A)** Spoke

## ■ Replacement of the freewheel body

### NOTICE

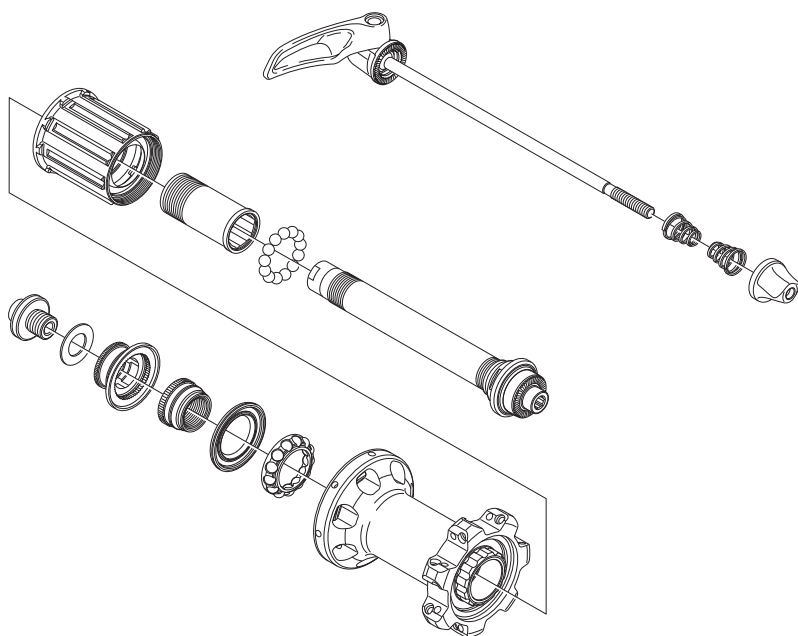
The freehub can be disassembled as shown in the illustration, however, do not disassemble it any further than this. If it is disassembled any further, it will not be possible to reassemble it.



### TECH TIPS

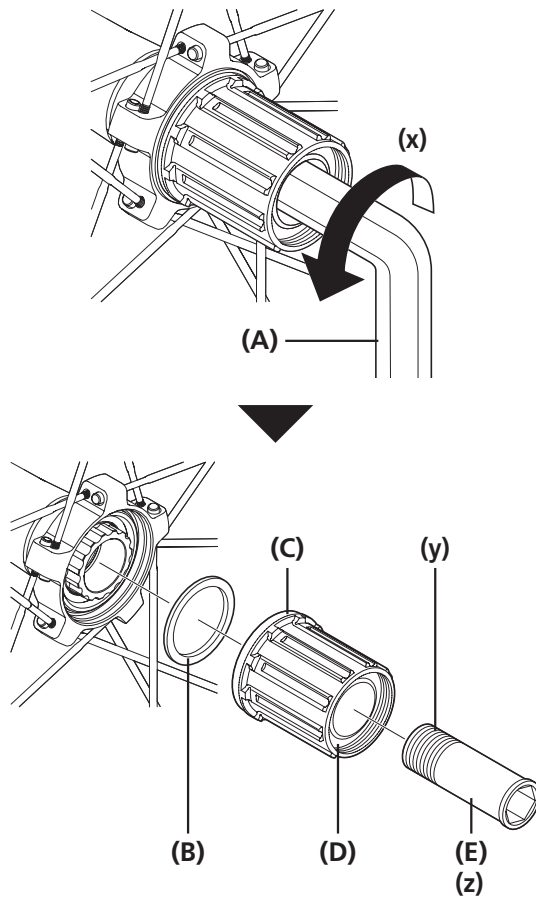
For information on how to pull out the hub axle, refer to the section "Replacing the spokes".

#### C40-CL/C40-TU/C60-CL/C60-TU



## Replacing the freewheel body

Remove the freewheel body fixing bolt (inside the freewheel body), and then replace the freewheel body.



- (x) Disassembly
- (y) Apply grease:  
Premium grease (Y-04110000)
- (z) Not reusable

- (A) 14 mm hexagon wrench
- (B) Freewheel body washer
- (C) Freewheel body
- (D) Seal (Cannot be removed)
- (E) Freewheel body fixing bolt

### Tightening torque



45 - 50 N·m

### NOTICE

- When replacing the freewheel body, replace the freewheel body fixing bolt at the same time.
- Be sure to apply grease to the threads of the freewheel body fixing bolt, otherwise looseness or sticking may occur. Do not disassemble the freewheel or apply oil or grease to it, otherwise problems with operation may occur.

## ■ Cautions on the use of rims for tubular tires

### General Safety Information.

### WARNING

Tubular tires are widely used in racing bicycles as they are lightweight and have smooth cornering performance. However, compared to clincher-type tires, greater expertise is required when handling them. Additionally, greater care is required in their maintenance. In addition, always inspect the wheels prior to use. These precautions must be observed in order for the optimum performance features of this product to be obtained; if they are not observed, the tires may come off the rims or damage to the tires may occur resulting in severe injury to the rider. Make sure that you read and fully understand the following points on using tubular tires. Furthermore, if you are not confident that you have enough knowledge and experience in installing and removing the tires or carrying out maintenance, ask an authorized bicycle dealer or a professional bicycle technician for assistance.

**Do not use these tubular tires if you are not confident that they have been installed by someone with an adequate level of knowledge and experience.**

- A special adhesive designed exclusively for tubular tires is used to secure the tires to the wheel rims. If any other type of adhesive is used, it might not secure the tires in place with sufficient force, and it may also cause deterioration of the rim material.
- When cleaning the rim surfaces, use only a cleaning agent which is exclusively designed for tubular tires. If any other type of cleaning agent is used, it may cause deterioration of the rim material. If using carbon fiber rims, do not rub the surfaces of the rims vigorously with sandpaper or anything similar. Otherwise, the carbon fiber layer of the rims may peel off when replacing the tires.
- If the adhesive is not applied correctly to the rim surfaces, it may not hold the tires securely in place, and the tires may easily come off the rims. Particularly when using the rims for the first time, always be sure to clean the rim surfaces thoroughly with the correct cleaning agent to remove any traces of grease and other foreign materials, and then apply a thin layer of adhesive to the rim surface to create a secure bond between the rim and the wheel. When this has been done, apply more adhesive evenly to the rim at a thickness which is just sufficient to cover the roughness of the tire and no more, and then install the tire. When using rims which contain carbon fiber material, if the tires are not attached properly, or if the wrong type of adhesive or cleaning agent is used, it may be impossible to obtain the same adhesion force between the rim and the tire as for aluminum rims; this it may also reduce the strength of the carbon fiber rims.
- Depending on the type of adhesive used, there may be large differences in factors such as adhesion force, the time it takes to dry, durability, and the sensitivity to conditions such as temperature and humidity. Therefore, you should pay particular attention to the adhesion force when using the wheels.
- Always check the tires before use by applying force to the tires to make sure they are properly attached to the rims.
- The adhesion force of the tires may deteriorate after long periods of use, therefore it is best to re-apply the adhesive periodically. If using carbon fiber rims, use a rim cement cleaner or similar when replacing the tires to assist in peeling the tires off gently in order to avoid pulling away the carbon fiber layer.
- If you do not apply any adhesive to the adhesion surface of the tire when installing the tire to the rim, the adhesion force between the tire and the rim will be weaker.  
If you want the tires to adhere to the rims with greater force (such as when riding in criterium competition races and track races where hard turning and acceleration are required) you can use adhesive to adhere them more firmly.
- If the rims become hot as a result of continuous use of the brakes when riding down long declines, sudden loss of tire adhesion force may occur. If you think that this might happen at some stage, pay particular attention to selecting and re-applying the adhesive at some point. Loss of adhesion force can still occur even if measures are taken to prevent it, so if it still occurs, replace the wheels and discontinue using the tubular type of tires.
- Also check the tires before use. If there are large cracks in the tires, they may burst during use, and so they should be replaced beforehand. In addition, the seam covers may come off the tires after long periods of use, and so check the tires before use.
- If you feel that there are any malfunctions or problems with the system, stop riding the bicycle and contact an authorized bicycle dealer or a professional bicycle technician for advice.
- For any questions regarding methods of installation, adjustment, maintenance or operation, please contact an authorized bicycle dealer.

### NOTICE

- If any glue gets on the painting surface of the rim, use a cloth to wipe it off before it dries. Do not use cleaning solvents or chemicals, such as rim cement removers, as they may remove the paint.



# 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 City, Osaka 590-8577, Japan

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

© Mar. 2019 by SHIMANO INC. ITP