

# Dealer's Manual

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

# Front Chainwheel

## MTB

### XTR

FC-M9000

FC-M9020

## Bottom bracket

SM-BB93

SM-BB94-41A

# CONTENTS

- IMPORTANT NOTICE..... 3**
- TO ENSURE SAFETY..... 4**
- LIST OF TOOLS TO BE USED..... 8**
- INSTALLATION ..... 10**
  - List of tool combinations.....10
  - Installation.....11
- PRESS-FIT BB ..... 16**
  - Adapter .....16
  - Assembly example.....16
  - Installation.....17
  - Removal .....18
- MAINTENANCE ..... 20**
  - Replacing chainrings.....20

## IMPORTANT NOTICE

- **This dealer's manual is intended primarily for use by professional bicycle mechanics.**  
Users who are not professionally trained for bicycle assembly should not attempt to install the components themselves using the dealer's manuals. If any part of the information on the manual is unclear to you, do not proceed with the installation. Instead, 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>).
- 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:

- ***Intervals between maintenance depend on the use and riding circumstances. Clean the chain with an appropriate chain cleaner regularly. Never use alkali based or acid based solvents, such as rust cleaners. If those solvents are used the chain might break and cause serious injury.***
- Check that there are no cracks in the crank arms before riding the bicycle. If there are any cracks, the crank arm may break and you may fall off the bicycle.
- Check the chain for any damage (deformation or crack), skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency. The chain may break, and you may fall.
- Be careful not to let the hemming of your clothes get caught in the chain while riding. Otherwise you may fall off the bicycle.

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

- If the inner cover is not installed correctly, the axle may rust and become damaged, and the bicycle may fall over and serious injury may occur as a result.
- The two left crank arm mounting bolts should be tightened in stages rather than fully tightened at once. Use a torque wrench to check that the final tightening torques are within the range of 12 - 14 N·m. Furthermore, after riding approximately 100km (60 miles), use a torque wrench to re-check the tightening torques. It is also important to periodically check the tightening torques. If the tightening torques are too weak or if the mounting bolts are not tightened alternately in stages, the left crank arm may come off and the bicycle may fall over, and serious injury may occur as a result.

### CAUTION

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

- Be careful to keep body parts away from the sharp teeth of chainrings.

**NOTE**

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

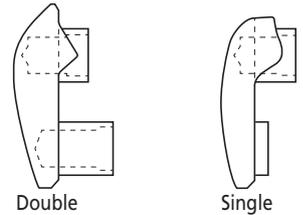
- Before riding the bicycle, check that there is no play or looseness between connecting parts. Also, be sure to retighten the crank and pedals at periodic intervals.
- Be sure to keep turning the crank arm during the lever operation.
- When the chain is in any of the positions shown in the illustration, the chain may come into contact with the front chainring or front derailleur and generate noise. If noise is a problem, shift the chain onto the next largest rear sprocket or the one after if the chain is in the position shown in Figure 1. Shift the chain onto the next smallest sprocket or the one after if it is in the position shown in Figure 2.

	Figure 1		Figure 2
	Double	Triple	
Front chainring		 	
Rear sprocket		 	

- Use a neutral detergent to clean the crank arm and the bottom bracket. Using alkaline or acidic detergents may cause discoloration.
- If pedaling performance does not feel normal, check the bicycle once more.
- Do not wash the bottom bracket with high-pressure jets of water. Water may enter the bearing section and cause noise or adhesion.
- The gears should be periodically washed with a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the life of the gears and the chain.
- The cuffs of your clothing may get dirty from the chain while riding.
- 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:**

- When installing the pedals, apply a small amount of grease to the threads to prevent the pedals from sticking. Use a torque wrench to securely tighten the pedals. Tightening torque: 35 - 55 N·m. The right-hand crank arm has a right-hand thread, and the left-hand crank arm has a left-hand thread.
- If the bottom bracket shell is not parallel, gear shifting performance will drop.
- If the chain keeps coming off the gears during use, replace the gears and the chain.
- When installing the left and right adapters, apply grease and be sure to install the inner cover. Otherwise the waterproofing performance will worsen.
- To ensure the best performance, be sure to use only the specified type of chain.
- If a squeaking noise is heard coming from the bottom bracket axle and the left crank arm connector, apply grease to the connector and then tighten it to the specified torque.
- If you feel any looseness in the bearings, the bottom bracket should be replaced.
- Be sure to use the specified gear tooth combination. If an unspecified gear is used, the dimension between the gears changes, and the chain may fall in between the gears.
- Decorative nuts are available for use with single and double types. Each has a different shape.



- Use FC-M9020-B1/FC-M9020-B2 with a specially designed frame.

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	
	5mm hexagon wrench		TL-FC18		TL-FC36
	8mm hexagon wrench		TL-FC24		TL-BB12
	17mm spanner		TL-FC32		TL-BB13
	Plastic mallet		TL-FC33		Hexalobular[#27]
	TL-FC16		TL-FC34		

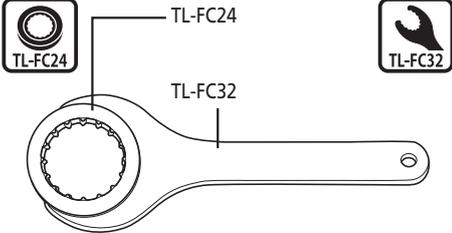
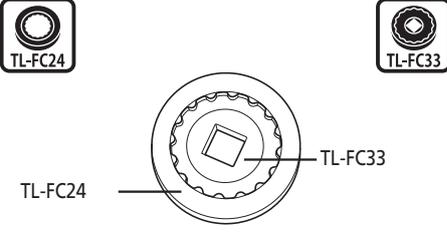
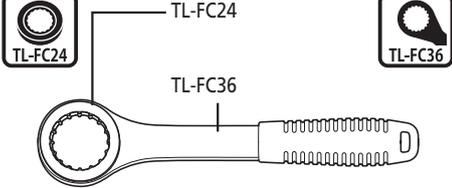
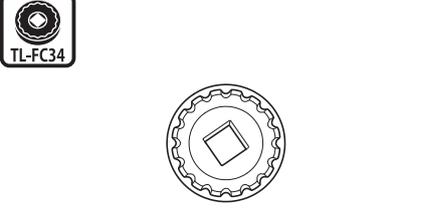
# INSTALLATION

# INSTALLATION

## List of tool combinations

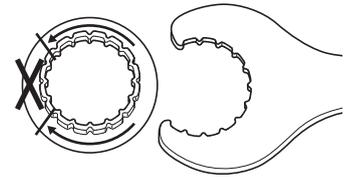
Use the tools in the correct combination.

### SM-BB93

TL-FC24 & TL-FC32	TL-FC24 & TL-FC33
	
TL-FC24 & TL-FC36	TL-FC34
	

### NOTE

- For an impact wrench, use TL-FC34 for SM-BB93. Using other tools may damage the tool.
- When setting TL-FC24 in TL-FC32, check the possible setting position.



When setting in TL-FC32, check the possible setting position.

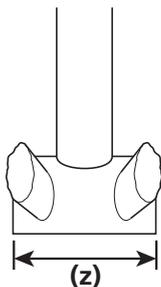
- Any position is possible when setting to TL-FC33/FC36.

# INSTALLATION

## ► Installation

### ■ Installation

1

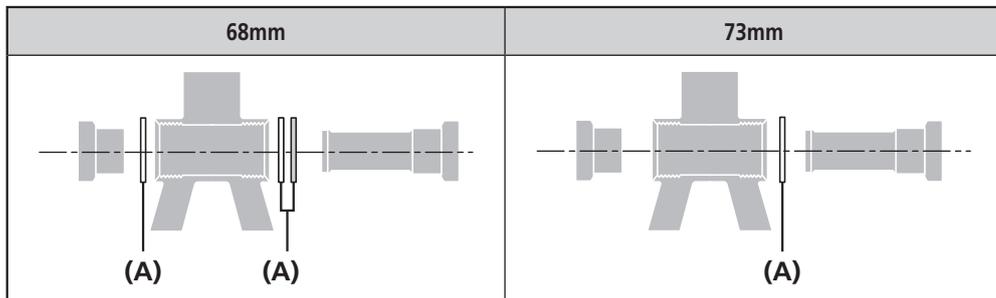


Check whether the width of the bottom bracket shell is 68mm or 73mm.

**(z)** Bottom bracket shell width

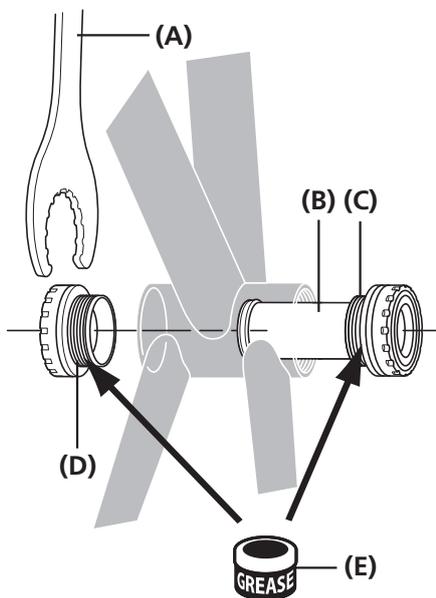
2

Install the adapter.



**(A)** 2.5mm spacer

3



Grease the left and right hand adapters and use the Shimano original tool to install the right hand adapter of the bottom bracket, the inner cover and the left hand adapter of the bottom bracket.

- (A)** TL-FC32
- (B)** Inner cover
- (C)** Right hand adapter (counterclockwise thread)
- (D)** Left hand adapter (clockwise thread)
- (E)** Apply grease: Premium grease (Y-04110000)

#### Tightening torque



TL-FC24



TL-FC32



TL-FC36

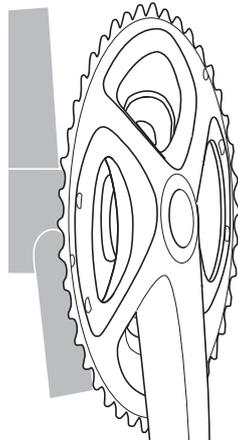
35 - 50 N·m

#### NOTE

TL-FC24 is tightened by combining with TL-FC32/FC36.

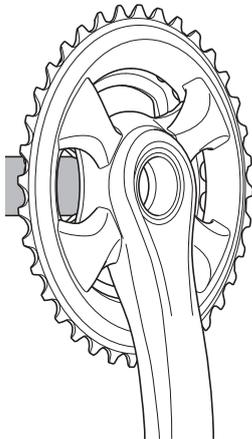
Insert the right crank arm unit.

Triple gear type

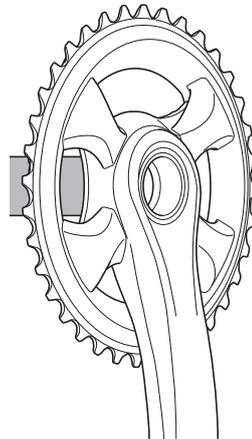


4

Double gear type

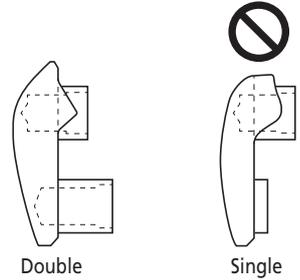


Single gear type



**WARNING**

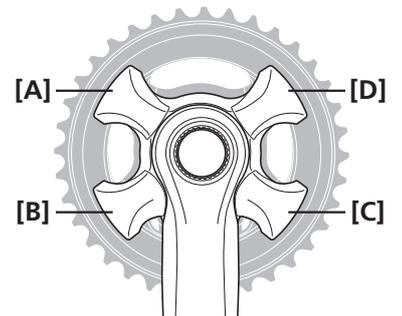
Decorative nuts are available for use with single and double types. Each has a different shape. Use the decorative nuts designed for use with double types.



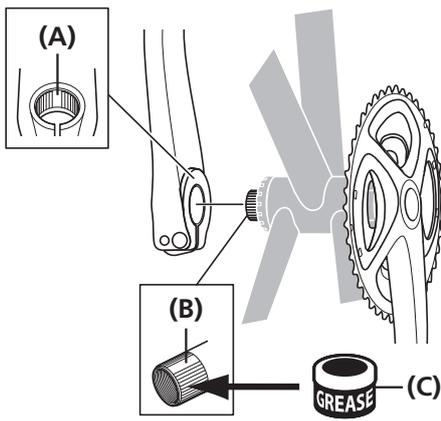
**NOTE**

**Double gear type/Single gear type**

Each decorative nut has a different shape. Be sure to check the shape and attachment position of each nut before removal. If the attachment position is incorrect, the nut cannot be installed. If the decorative nut has a mark on the back, check the positioning mark ([A] [B] [C] [D]) and attach it according to the illustration.



**5**

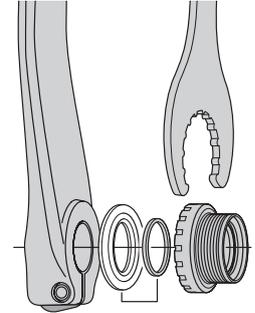


Set the wide groove area of the left crank arm into the axle of the right crank arm unit where the groove is wide.

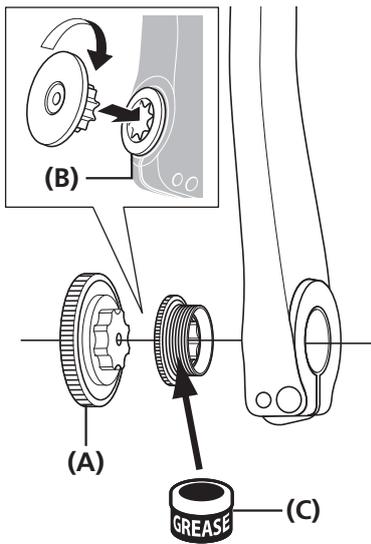
- (A)** Wide groove area (left crank arm)
- (B)** Wide groove area (axle)
- (C)** Apply grease:  
Premium grease (Y-04110000)

**NOTE**

Insert a spacer when installing FC-M9020-B2/FC-M9020-B1.



**6**



Use the Shimano original tool to tighten the cap.

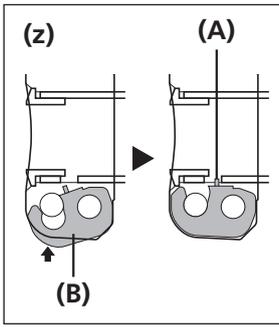
- (A)** TL-FC16
- (B)** Cap
- (C)** Apply grease:  
Premium grease (Y-04110000)

**Tightening torque**

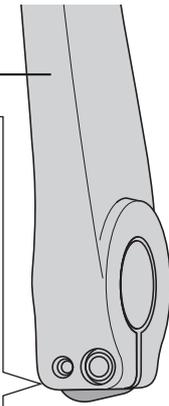


**0.7 - 1.5 N·m**

7



(C)



Push in the stopper plate and check that the plate pin is securely in place, and then tighten the bolt of the left crank arm.

(z) The illustration is of the left crank arm (cross-section)

- (A) Plate pin
- (B) Stopper plate
- (C) Left crank arm

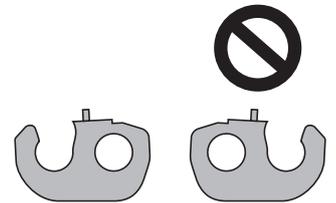
**Tightening torque**



**12 - 14 N·m**

**NOTE**

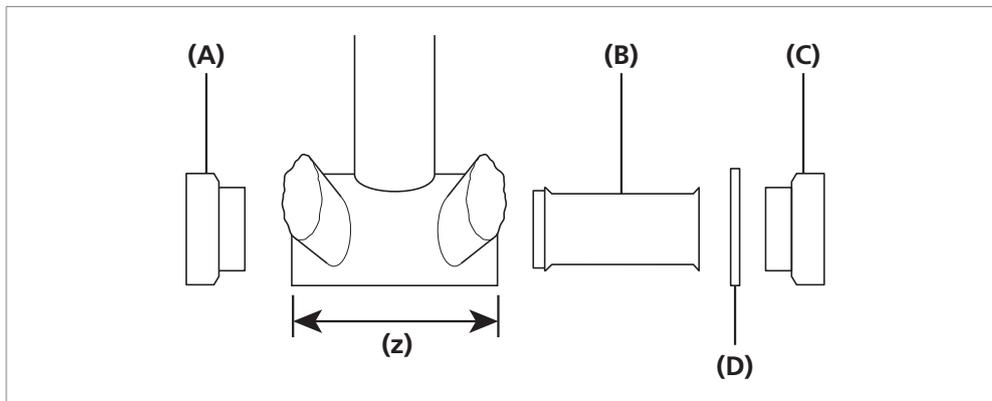
- Spacers used vary according to the width of the bottom bracket shell. For details, refer to steps 1 and 2.
- Set the stopper plate in the correct direction as shown in illustration.



**PRESS-FIT BB**

# PRESS-FIT BB

## ■ Adapter



(z) Bottom bracket shell width

(A) Left-hand adapter

(B) Inner cover

(C) Right hand adapter

(D) 2.5mm spacer

## ■ Assembly example

Bottom bracket shell with 92mm width	Bottom bracket shell with 89.5mm width
<ul style="list-style-type: none"> <li>• The 2.5mm spacer is not needed for a bottom bracket shell width of 92mm.</li> <li>• Use the inner cover.</li> </ul>	<ul style="list-style-type: none"> <li>• For a bottom bracket shell width of 89.5mm, insert the 2.5mm spacer into the right hand side (between the frame and the right hand adapter).</li> <li>• Use the inner cover.</li> </ul>

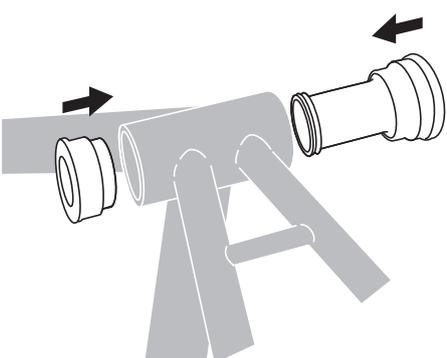
(A) 2.5mm spacer

### NOTE

- If the frame has openings inside the bottom bracket shell, install an inner cover to prevent possible contamination.
- If the frame has no openings inside the bottom bracket shell, it can be installed without an inner cover.

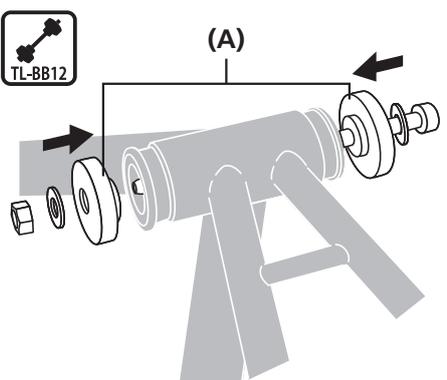
■ Installation

**1**



Insert the bottom bracket into the bottom bracket shell.

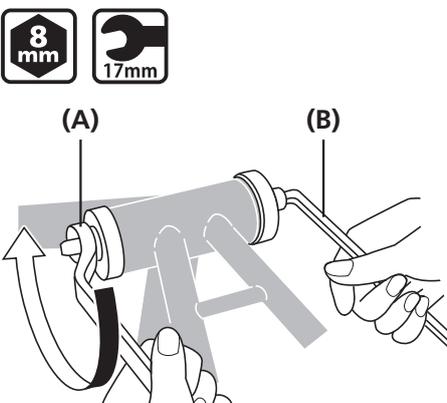
**2**



Insert the Shimano original tool into the bottom bracket.

**(A)** TL-BB12

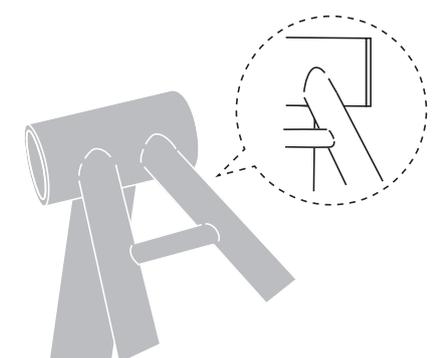
**3**



Press fit the bottom bracket by tightening with a spanner while making sure that the contact surface of the bottom bracket stays parallel to the contact surface of the bottom bracket shell.

**(A)** 17mm spanner  
**(B)** 8mm hexagon wrench

**4**



Check to confirm that there is no gap between the bottom bracket and the bottom bracket shell.

■ Removal

**1**

Insert the Shimano original tool into the bottom bracket.

(A) TL-BB13

**NOTE**

Do not reuse the adapters as they can be damaged during removal.

**2**

As shown in the illustration, hold down the flap with your fingers and push it in from the opposite side. (When pushed in, the flap opens.)

 **TECH TIPS**

While holding down the end of the removal tool, push the tool in from the other side until it locks in place.

**3**

Tap the Shimano original tool with a plastic mallet until the end of the bottom bracket is ejected.

(A) Plastic mallet

**4**

Tap the opposite end of the bottom bracket in the same way and remove it.

(A) Plastic mallet

# MAINTENANCE

# MAINTENANCE

## ■ Replacing chainrings

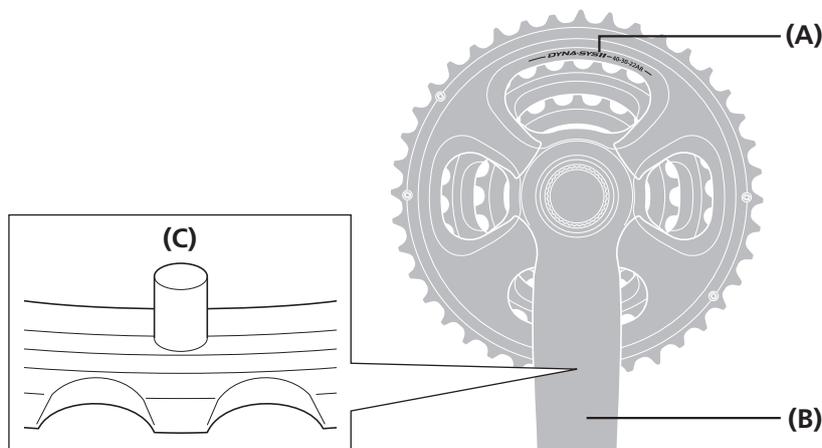
### Triple gear type

#### NOTE

- FC-M9000 does not support triple gear types.
- Always use the gear in combinations of 40T-AR, 30T-AR and 22T-AR. If an unspecified gear is used, the chain may fall in between the gears, damaging them.

1

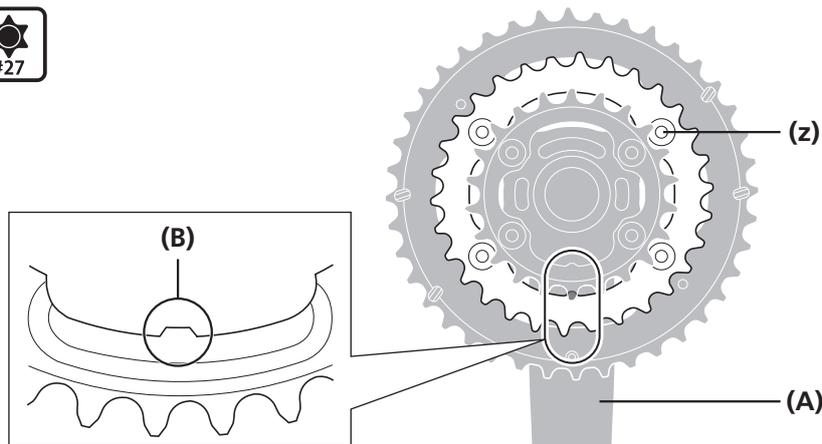
With the marked side of the largest chainring facing outward, set the largest chainring so that the chain drop prevention pin is positioned under the crank arm.



- (A) Mark
- (B) Crank arm
- (C) Chain drop prevention pin

2

Set the middle chainring and the smallest chainring so that the marked sides face inward and the convex section on each chainring is positioned under the crank arm.



- (z) Hexalobular[#27]

- (A) Crank arm
- (B) Convex section

#### Tightening torque



8 - 10 N·m

**Double gear type**

Be sure to use the specified gear tooth combination. If an unspecified gear is used, the chain may fall in between the gears, damaging them.

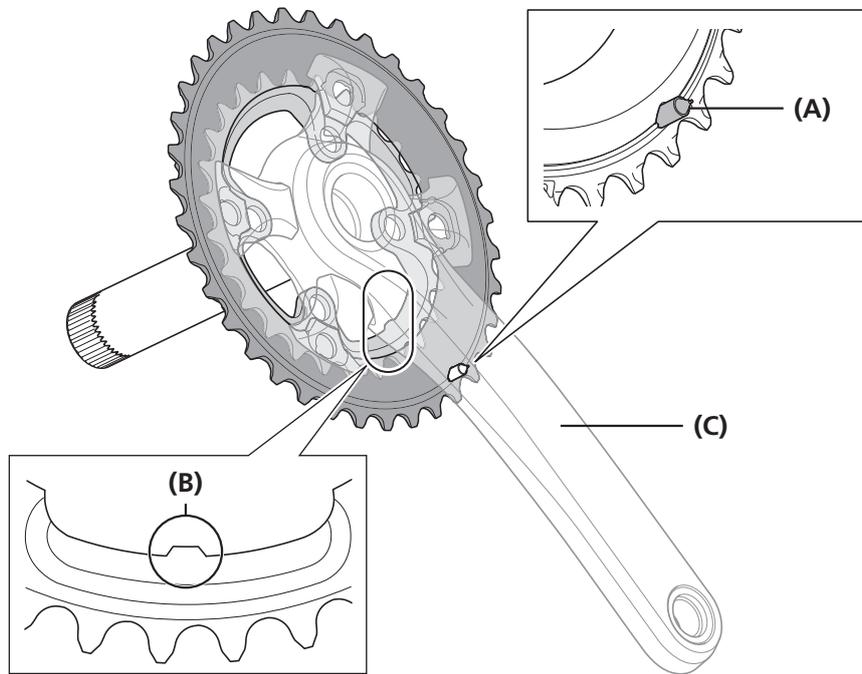
		Top		
		34T-AS	36T-AT	38T-AW
Low	24T-AS	X	-	-
	26T-AT	-	X	-
	28T-AW	-	-	X

With the marked side of the largest chainring facing outward, set the largest chainring so that the chain drop prevention pin is positioned under the crank arm.

With the marked side of the smallest chainring facing inward, set the smallest chainring so that the convex section is positioned under the crank arm.

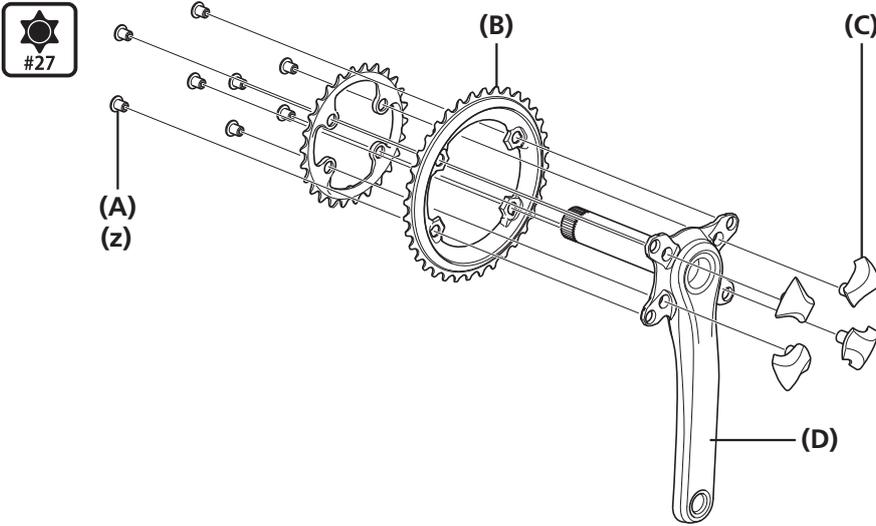
- (A)** Chain drop prevention pin
- (B)** Convex section
- (C)** Crank arm

**1**



Attach the decorative nuts in the correct positions.

For details, refer to the "INSTALLATION" section.



**2**

**(z)** Hexalobular[#27]

- (A)** Fixing bolt
- (B)** Chainring
- (C)** Decorative nut
- (D)** Crank arm

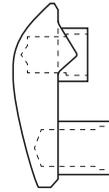
**Tightening torque**



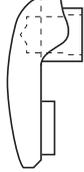
**8 - 10 N·m**

**! WARNING**

Decorative nuts are available for use with single and double types. Each has a different shape. Use the decorative nuts designed for use with double types.



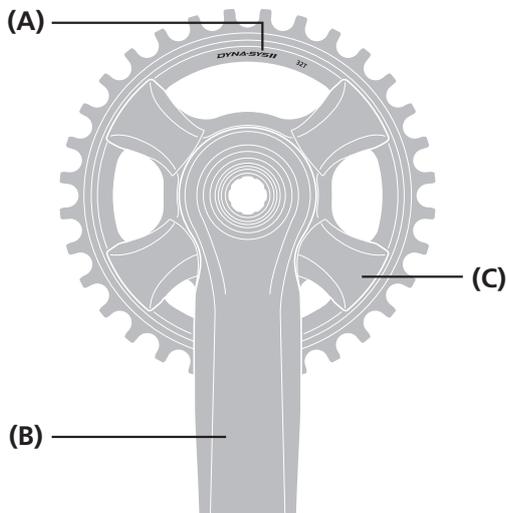
Double



Single

**Single gear type**

Set the chainring so that the marked side faces outward as shown in the illustration.



**1**

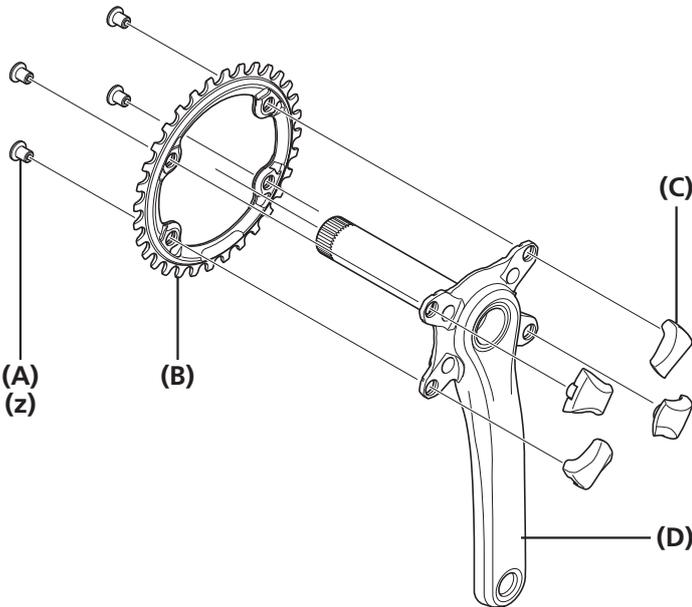
- (A)** Mark
- (B)** Crank arm
- (C)** Decorative nut

Attach the decorative nuts in the correct positions.

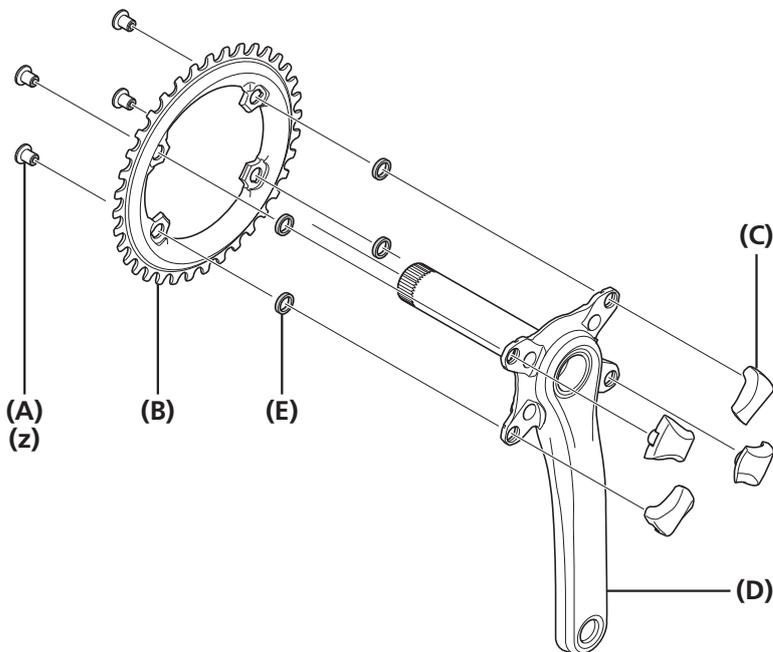
For details, refer to the "INSTALLATION" section.

Some chainrings may require spacers to be inserted between the crank and the chainring when installing the decorative nuts.

SM-CRM90 30T/32T  
SM-CRM91 30T/32T/34T/36T



SM-CRM90 34T/36T



**(z)** Hexalobular[#27]

**(A)** Fixing bolt

**(B)** Chainring

**(C)** Decorative nut

**(D)** Crank arm

**(E)** Spacer

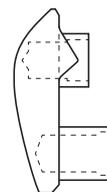
**Tightening torque**



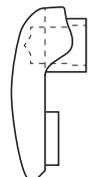
**8 - 10 N·m**

**! WARNING**

Decorative nuts are available for use with single and double types. Each has a different shape. Use the decorative nuts designed for use with single types.



Double



Single

# SHIMANO

## **SHIMANO AMERICAN CORPORATION**

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

## **SHIMANO EUROPE B.V.**

Industrieweg 24, 8071 CT Nunspeet, The Netherlands Phone: +31-341-272222

## **SHIMANO INC.**

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

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

© Jul. 2016 by Shimano Inc. HTR