

Dealer's Manual

Front Chainwheel

MTB

XTR

FC-M9000
FC-M9020

DEORE XT

FC-M780
FC-M782
FC-M785

SLX

FC-M670
FC-M672
FC-M675

ZEE

FC-M640
FC-M645

DEORE

FC-M610
FC-M612
FC-M615

ALIVIO

FC-M4000
FC-M4050
FC-M4060

Tourney

FC-TX801

Non-Series

FC-M371
FC-M522
FC-M523
FC-M552
FC-M622
FC-M625

Bottom bracket

SM-BB93
SM-BB94-41A
SM-BB72
SM-BBR60

Trekking

DEORE XT

FC-T780
FC-T781

DEORE LX

FC-T671

DEORE

FC-T611

ALIVIO

FC-T4010
FC-T4060

Non-Series

FC-T521

ROAD

SORA

FC-3503
FC-3550

Claris

FC-2403
FC-2450

Non-Series

FC-R350
FC-RS500

Tourney A070

FC-A070
FC-A073

Comfort

ALFINE

FC-S501

NEXUS

FC-C6000

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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. 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

- **When installing components, be sure to follow the instructions that are given in the instruction manuals.**
It is recommended that you use only genuine Shimano parts. 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:

- **Maintenance interval depends on the usage and riding circumstances. Clean regularly the chain with an appropriate chaincleaner. Never use alkali based or acid based solvents such as rust cleaners. If those solvent be used chain might break and cause serious injury.**
- Check that there are no cracks in the crank arms before riding the bicycle. 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 cuffs of your clothes get caught in the chain while riding, otherwise you may fall off the bicycle.

< SAINT / ZEE >

- **Downhill bicycle riding and freeriding are inherently dangerous activities. There is a risk of being involved in an accident that can result in a serious injury or even death. It is strongly recommended that riders wear protective head and body gear and perform thorough safety checks of their bicycles before riding. Please remember that you are riding at your own risk and that you have to consider your experience and your skills very carefully.**

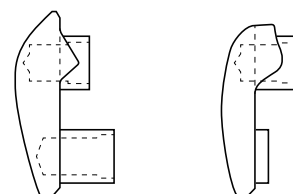
For Installation to the Bicycle, and Maintenance:

< HOLLOWTECH II type >

- 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 alternately in stages rather than each bolt being fully tightened all at once. Use a torque wrench to check that the final tightening torques are within the range of 12 - 14 N·m {105 - 122 in. lbs.}. Furthermore, after riding approximately 100 km (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.

< FC-M9000 / FC-M9020 >

Fixing nuts are available for use with single and double types. Each has a different shape.



<Double>

<Single >

⚠ CAUTION

Be sure to also inform users of the following:

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

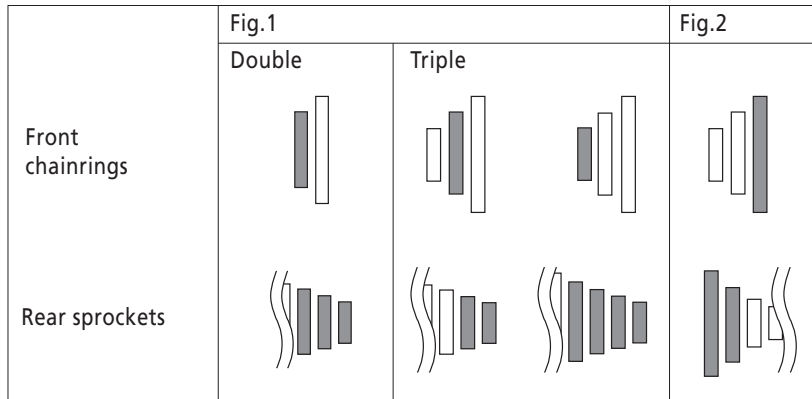
NOTE

Be sure to also inform users of the following:

- Before riding the bicycle, check that there is no play or looseness in the connection. Also, be sure to retighten the crank arms and pedals at periodic intervals.
- Be sure to keep turning the crank arm during the lever operation.

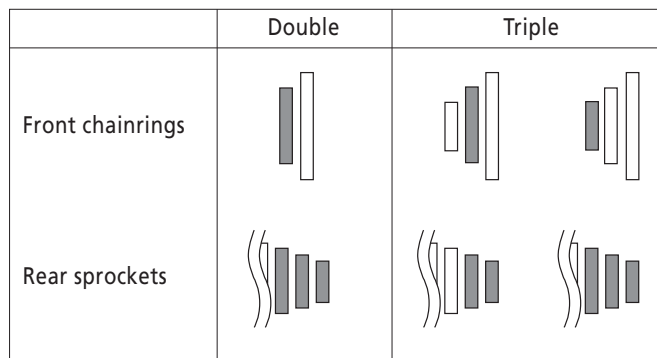
< MTB / Trekking >

- When the chain is in the position shown in the illustration, the chain may contact the front chainrings or front derailleur and generate noise. If noise is a problem, shift the chain onto the next larger rear sprocket or the one after if the chain is in the position shown in Figure 1. Shift the chain onto the next-smaller sprocket or the one after if it is in the position shown in Figure 2.



< ROAD >

- When the chain is in the position shown in the illustration, the chain may contact the front chainrings or front derailleur and generate noise. If noise is a problem, shift the chain onto the next larger rear sprocket or the one after.



- 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 this 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.

- You should periodically wash the chainrings in a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the useful life of the chainrings 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 {306 – 480 in. lbs.}. 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 chainrings during use, replace the chainrings and the chain.

< HOLLOWTECH II / 2 piece crank >

- When installing the left and right adapters, apply grease to them and be sure to install the inner cover. Otherwise the waterproofing performance will drop.
- 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 enter between the gears.

< OCTALINK type / SQUARE type >

- Be sure to use only the applicable chain and bottom bracket.
- Apply grease to the bottom bracket before installing it.
- If you feel any looseness in the bottom bracket axle, the bottom bracket should be replaced.


























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

INSTALLATION

INSTALLATION

■ List of tools to be used

The following tools are needed to assemble this product.

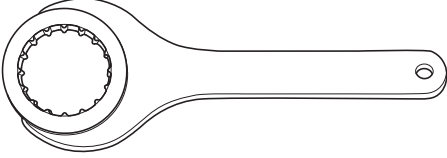
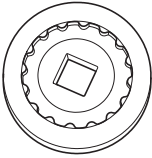
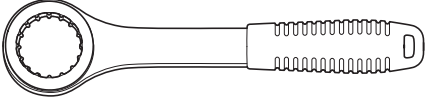

Tool		Tool	
	5 mm Allen key		TL-FC31
	8 mm Allen key		TL-FC32
	10 mm Allen key		TL-FC33
	Adjustable wrench		TL-FC34
	15mm spanner		TL-FC36
	17mm spanner		TL-BB12
	19mm spanner		TL-BB13
	32mm spanner		TL-UN66
	TL-FC10		TL-UN74-S
	TL-FC11		Hexalobular #27
	TL-FC16		Hexalobular #30
	TL-FC18		Plastic mallet
	TL-FC24		

INSTALLATION

►► List of tool combinations

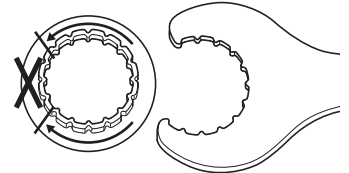
■ List of tool combinations

Use the tools in combination when performing work.

TL-FC24 & TL-FC32	TL-FC24 & TL-FC33
 A line drawing of a circular tool with a serrated outer edge and a smooth inner ring, attached to a long handle with a small hole at the end.	 A line drawing of a circular tool with a serrated outer edge and a square-shaped inner ring.
TL-FC24 & TL-FC36	TL-FC34
 A line drawing of a circular tool with a serrated outer edge and a smooth inner ring, attached to a long handle with a textured grip and a small hole at the end.	 A line drawing of a circular tool with a serrated outer edge and a square-shaped inner ring.

NOTE

- For an impact wrench, use TL-FC34 for SM-BB9000 and TL-FC37 for SM-BBR60. Using other tools causes the tool to be damaged.
- When setting TL-FC24/25 to TL-FC32, check the installable position.
- TL-FC33/36 can be installed at any position.

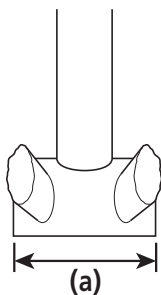


When setting to TL-FC32, check the installable position.

HOLLOWTECH II / 2 piece crankset

Spacer installation method

1



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

(a) Bottom bracket shell width

2

Install the adapter. See the illustrations for the normal type or chain case type, depending on the type of your front chainwheel.

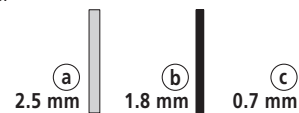
< Normal type >

	68 mm	73 mm
(I)		
(II)		

- (A) BB mount-type bracket
- (I) Band Type
- (II) Bracket Type

TECH TIPS

Spacer

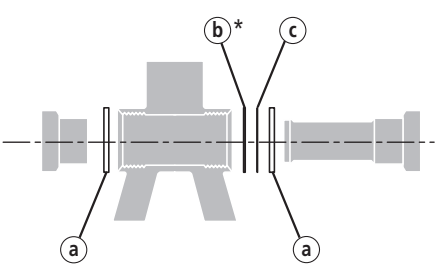
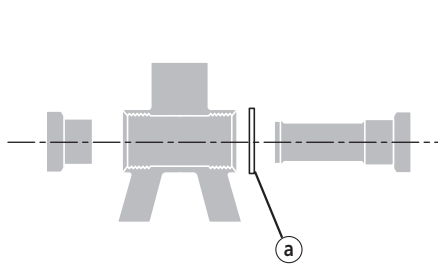
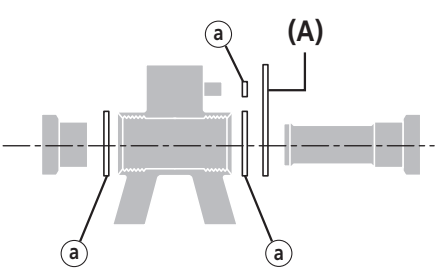
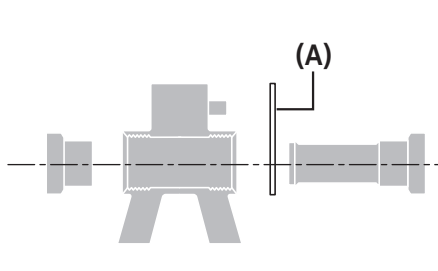
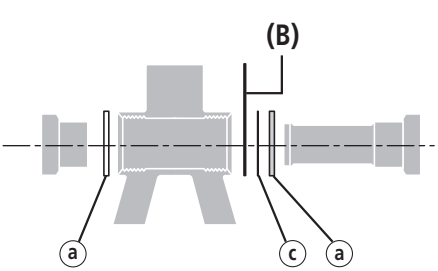
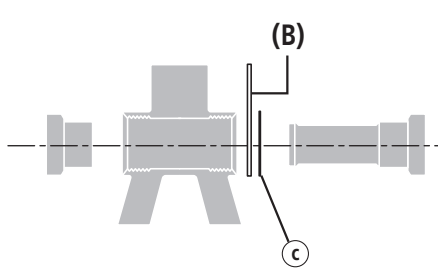


If using three 2.5 mm spacers with a band type and a bottom bracket shell having a width of 68 mm, install the three spacers so that there are two on the right and one on the left.

INSTALLATION

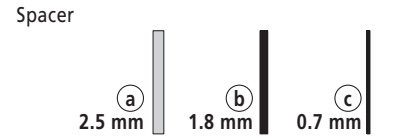
▶▶ HOLLOWTECH II / 2 piece crankset

< Chain case specifications >

	68 mm	73 mm
(I)		
(II)		
(III)		

- (A) BB mount-type bracket
- (B) Chaincase stay
- (I) Band Type
- (II) Bracket Type
- (III) Chaincase Stay Type

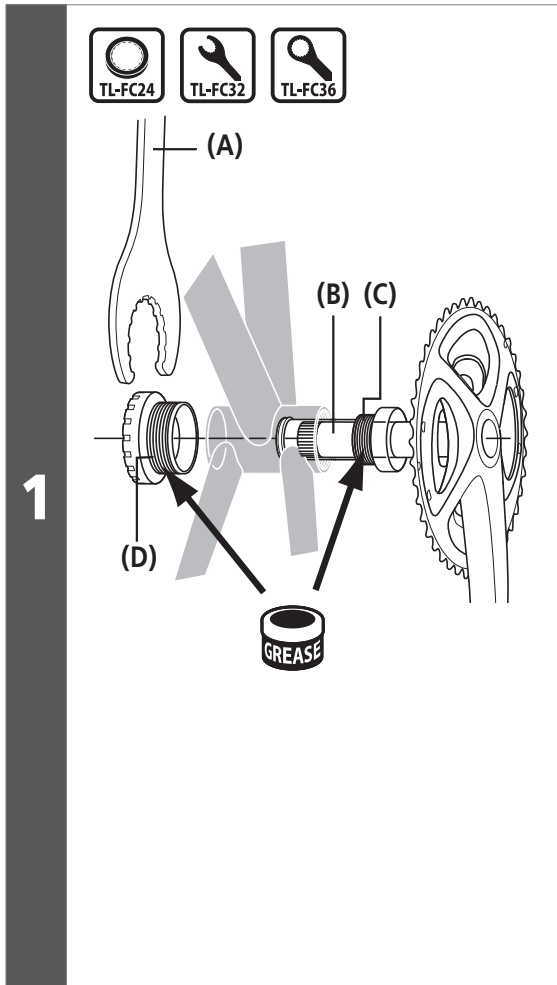
 **TECH TIPS**



If using three 2.5 mm spacers with a band type and a bottom bracket shell having a width of 68 mm, install the three spacers so that there are two on the right and one on the left.




* 1.8 mm corresponds to the thickness of the chain case.

Installation of the crank




Grease the left and right adapters and use the Shimano original tool (A) to install the right hand adapter (C) of the bottom bracket, the inner cover (B) and the left hand adapter (D) of the bottom bracket.

- (A) TL-FC32
- (B) Inner cover
- (C) Right hand adapter (counterclockwise thread)
- (D) Left hand adapter (clockwise thread)

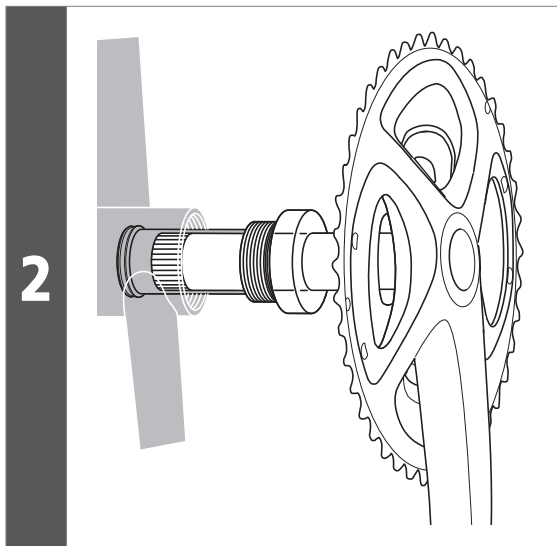
Tightening torque:	
 TL-FC24	35 - 50 N·m {306 - 437 in. lbs.}
 TL-FC32	
 TL-FC36	

NOTE

TL-FC24 can be tightened by combining it with TL-FC32/36.

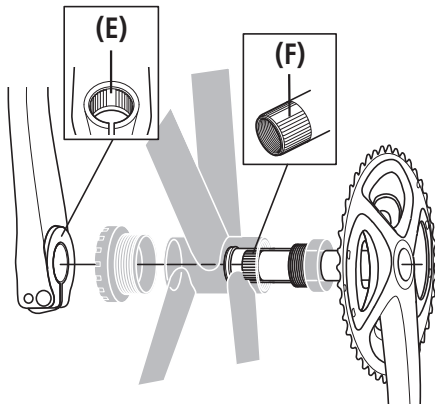
 **TECH TIPS**

Turn the right adapter clockwise when the 70 mm [M36] bottom bracket is used. (Clockwise thread)



Insert the right crank arm unit.

3



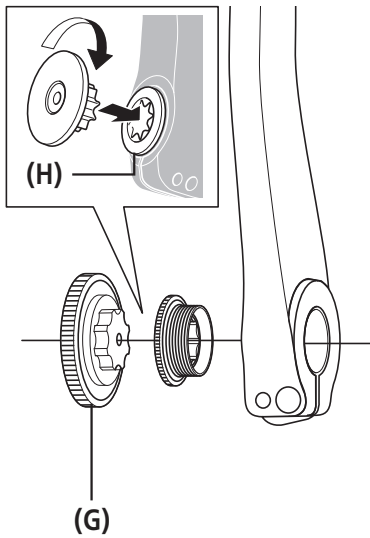
Set the wide groove area of the crank arm **(E)** into the axle of the right crank arm unit where the groove is wide **(F)**.

- (E)** Wide groove area on the left crank arm
- (F)** Wide groove area on the axle

NOTE

Insert a spacer for the triple specification of road bikes and the double guard specification of comfort bikes.

4



Use the Shimano original tool **(G)** to tighten the cap **(H)**.

- (G)** TL-FC16
- (H)** Cap

Tightening torque:

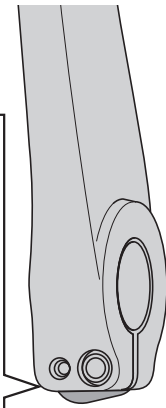
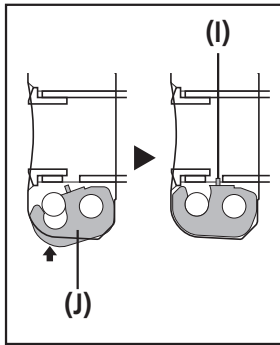


0.7 - 1.5 N·m
{6.2 - 13 in. lbs.}

INSTALLATION

▶▶ HOLLOWTECH II / 2 piece crankset

5



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

- (I) Plate pin
- (J) Stopper plate

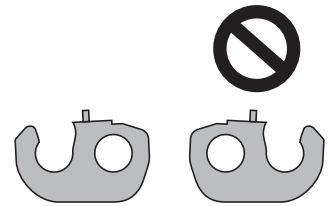
Tightening torque:



35 - 50 N·m
{306 - 437 in. lbs.}

NOTE

- For MTB/Trekking
Spacers may be necessary depending on the bottom bracket shell width. For details, refer to "Spacer installation method".
- Set the stopper plate in the right direction as shown in figure.

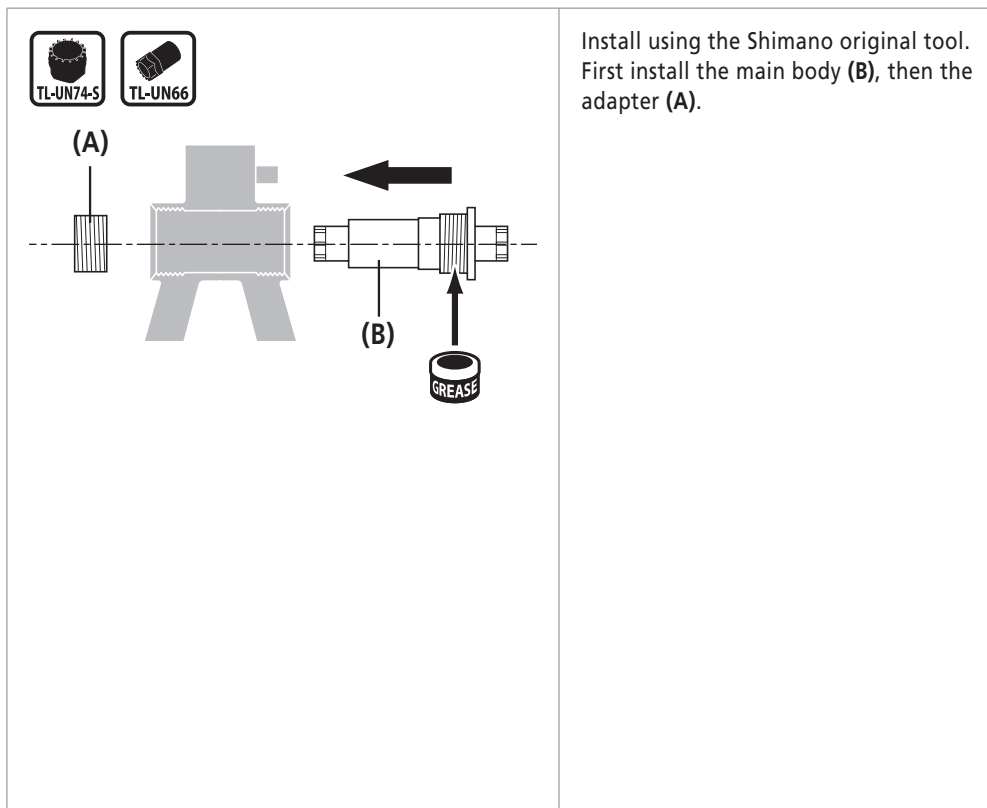


INSTALLATION

▶ OCTALINK TYPE

■ OCTALINK TYPE

Installation of the Bottom Bracket



- (A) Adapter
- (B) Main body

Tightening torque:



TL-UN74-S



TL-UN66

50 - 70 N·m
{437 - 611 in. lbs.}

NOTE

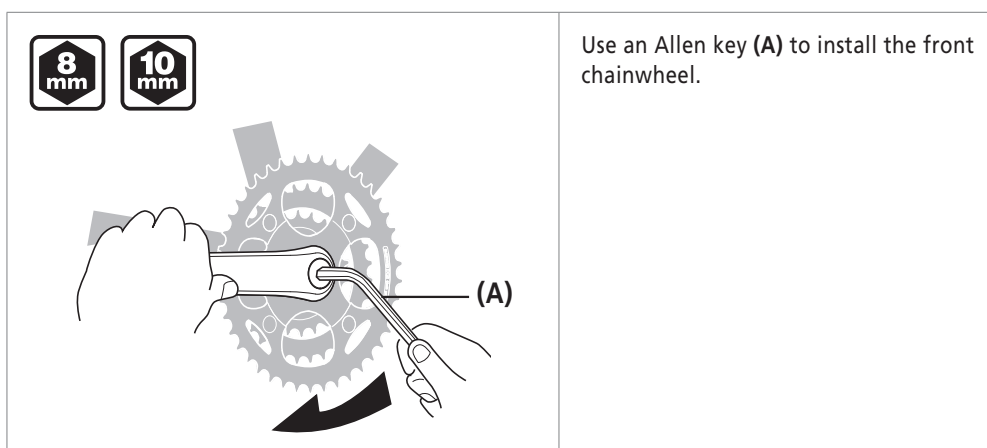


If the adapter is made of aluminum or steel
Apply grease to the adapter.



If the adapter is made of plastic
Do not apply grease to the adapter.

Installation of the front chainwheel



- (A) 8 mm / 10 mm Allen key

Tightening torque:



8 mm

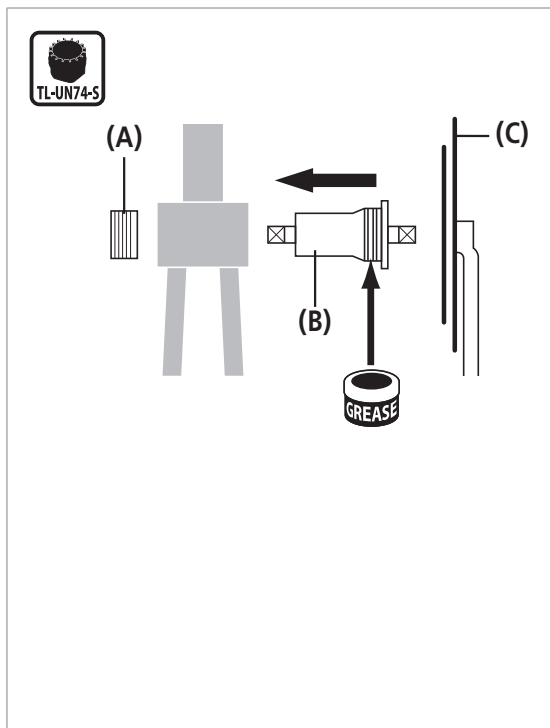


10 mm

35 - 50 N·m
{306 - 437 in. lbs.}


■ SQUARE TYPE

Installation of the Bottom Bracket



Install using the Shimano original tool. First install the main body (B), then the adapter (A).

- (A) Adapter
- (B) Main body
- (C) Front Chainwheel

Tightening torque:	
	50 - 70 N·m {437 - 611 in. lbs.}

NOTE

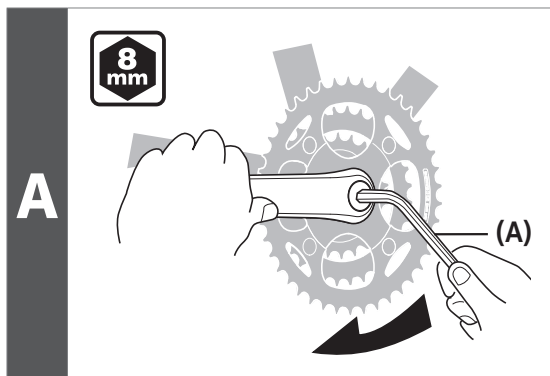


If the adapter is made of aluminum or steel
Apply grease to the adapter.




If the adapter is made of plastic
Do not apply grease to the adapter.

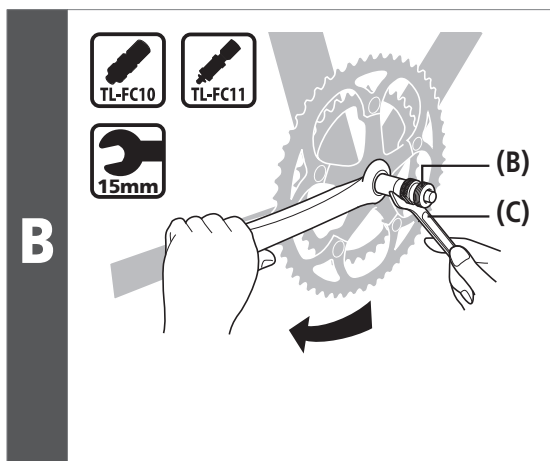
Installation of the front chainwheel



Use an Allen key (A) to install the front chainwheel.




- (A) 8 mm Allen key

Tightening torque:	
	35 - 50 N·m {306 - 437 in. lbs.}



Use the Shimano original tool (B) to install the front chainwheel.

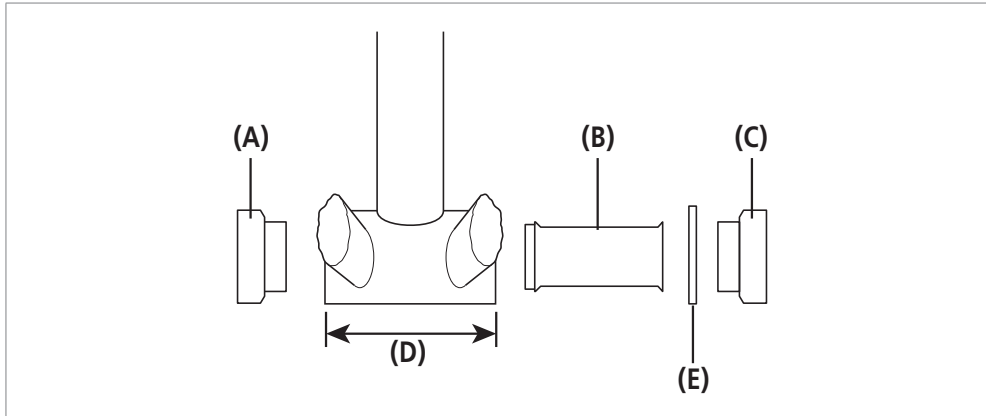
- (B) TL-FC10/TL-FC11
- (C) 15mm spanner

Tightening torque:	
	35 - 50 N·m {306 - 437 in. lbs.}
	
	

PRESS-FIT BB

PRESS-FIT BB

■ Adapter



- (A) Left hand adapter
- (B) Inner cover
- (C) Right hand adapter
- (D) Bottom bracket shell width
- (E) 2.5 mm spacer

NOTE

For SM-BB91-42A, the inner cover is not required.
 * Some models do not need spacers.

■ Assembly example

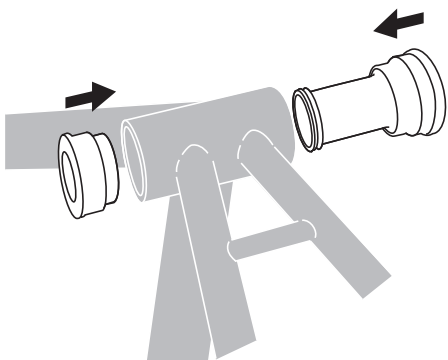
Adapter type		
ROAD	<ul style="list-style-type: none"> If the frame has openings inside the bottom bracket shell, it should be installed with the inner cover sleeve to prevent possible contamination. 	
ROAD	<ul style="list-style-type: none"> Use for a bottom bracket shell width of 86.5 mm. The 2.5 mm spacer is not needed. Use the inner cover. 	
MTB	<ul style="list-style-type: none"> The 2.5 mm spacer is not needed for a bottom bracket shell width of 92 mm. Use the inner cover. 	
	<ul style="list-style-type: none"> For a bottom bracket shell width of 89.5 mm, insert the 2.5 mm spacer into the right hand side (between the frame and the right hand adapter). Use the inner cover. 	

NOTE

- If the frame has no openings inside the bottom bracket shell, it can be installed without the inner cover sleeve.
- Use for a bottom bracket shell width of 86.5 mm.

■ Installation

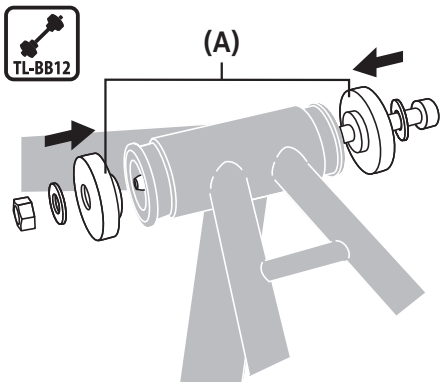
1



Insert the bottom bracket (BB) into the hanger.

The diagram shows a bicycle hanger with a bottom bracket being inserted into it. Arrows indicate the direction of insertion.

2

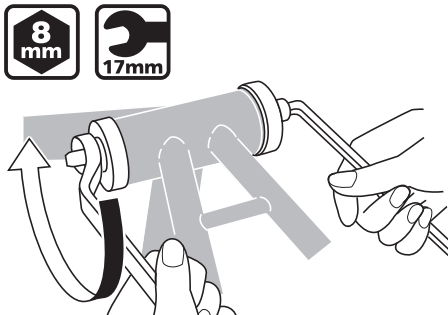


Insert the Shimano original tool (A) into the BB.

The diagram shows the Shimano TL-BB12 tool being inserted into the bottom bracket. A callout box labeled (A) points to the tool. A small icon of the tool is also shown.

(A) TL-BB12

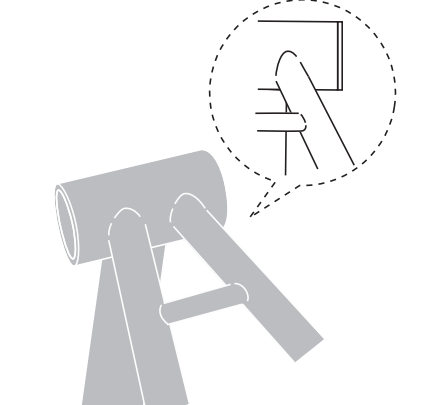
3



Press fit the BB by tightening with a wrench while making sure that the contact surface of the BB stays parallel to the contact surface of the hanger.

The diagram shows a hand using a wrench to tighten the bottom bracket. A callout box shows an 8mm hex key and a 17mm wrench. An arrow indicates the direction of tightening.

4

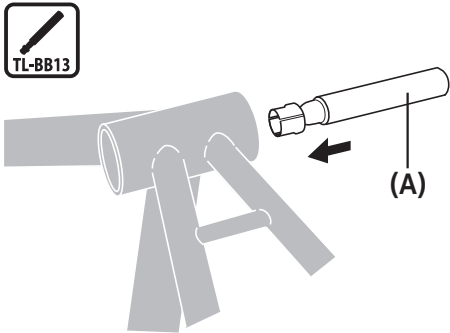


Check to confirm that there is no gap between the BB and the hanger.

The diagram shows the bottom bracket installed in the hanger. A callout box shows a close-up of the contact surface between the BB and the hanger, with a dashed line indicating the area to be checked for a gap.

■ Removal

1



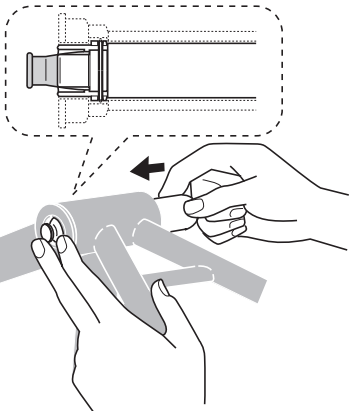
Insert the Shimano original tool (A) into the bottom bracket (BB).

(A) TL-BB13

NOTE

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

2

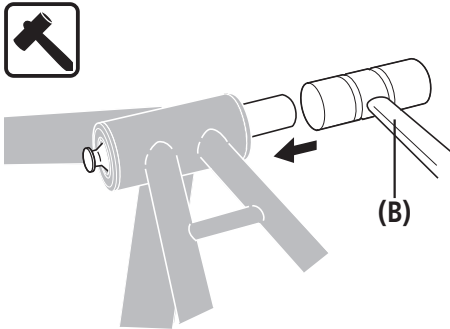


As shown in the illustration, hold down the flap with your fingers and push it in from the opposite side. (When pushed in, the flap opens.)

TECH TIPS

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

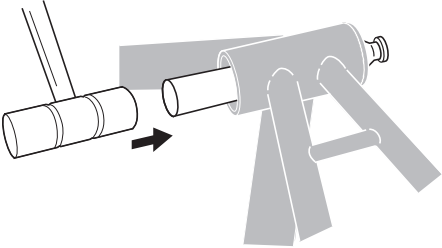
3



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

(B) Plastic mallet

4



Tap out the other end of the bottom bracket (BB) in the same way.

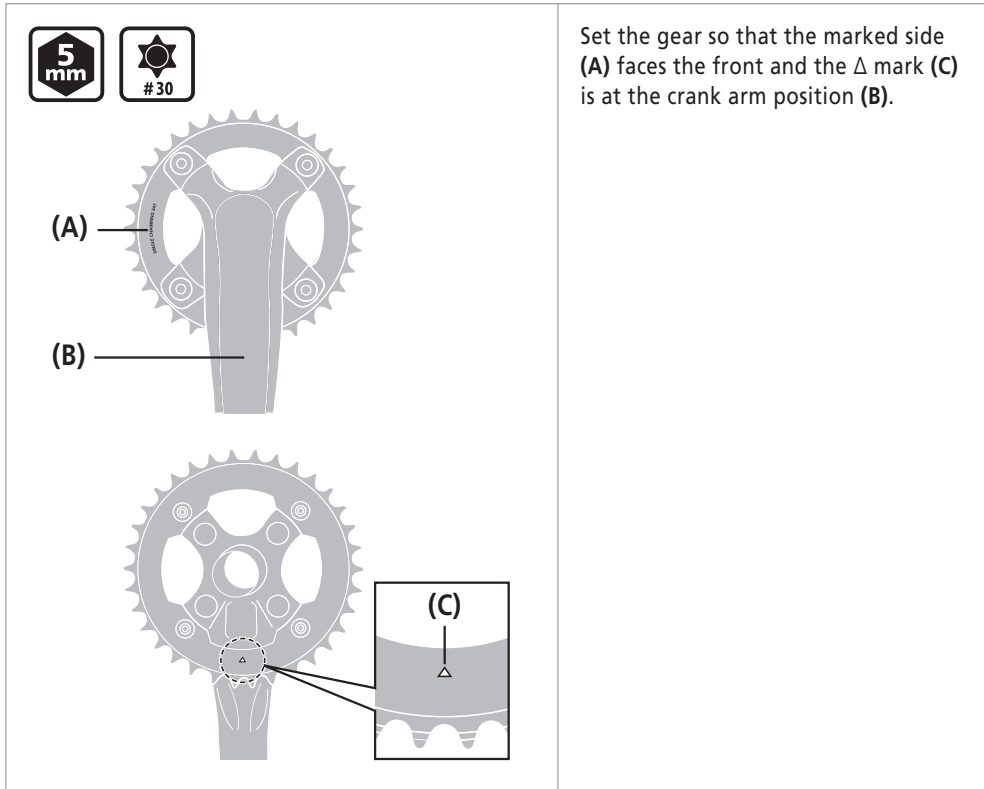
MAINTENANCE

MAINTENANCE

■ Replacing chainrings



* For models that are not described here, refer to the chainrings installation section of General Operations.

Single gear type



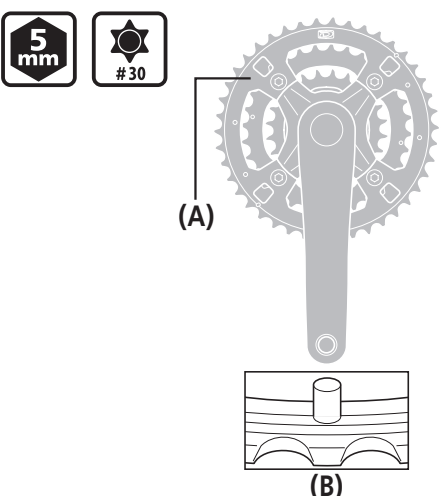
Set the gear so that the marked side (A) faces the front and the Δ mark (C) is at the crank arm position (B).

- (A) Mark
- (B) Crank arm
- (C) Δ mark

Tightening torque:	
	<p>12 - 14 N·m {105 - 122 in. lbs.}</p>
	

Triple gear type

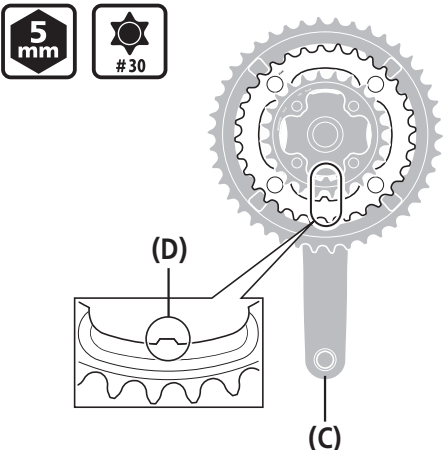
1



With the marked surface (A) of the largest chainring facing out, set the largest chainring so that the chain drop prevention pin (B) is lined up with the crank arm position.

- (A) Mark
- (B) Chain drop prevention pin



2





Set the middle chainring and the smallest chainring so that the convex sections (D) are at the crank arm (C) position.

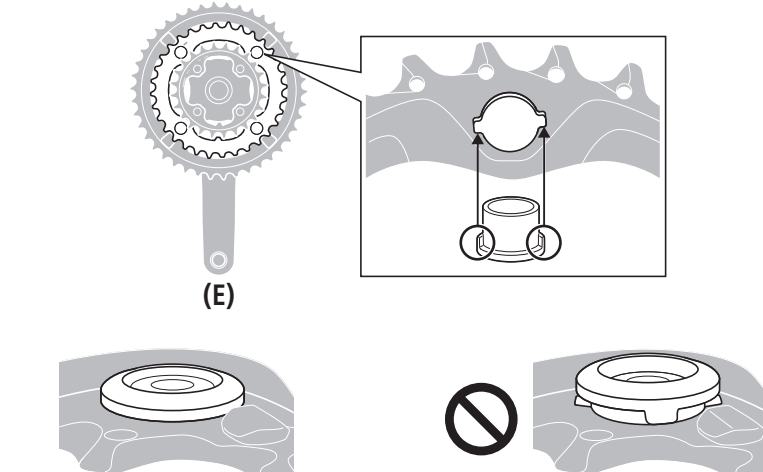
- (C) Crank arm
- (D) Convex section

< Smallest chainring >

Tightening torque:	
	16 - 17 N·m {140 - 148 in. lbs.}
	

< Largest chainring / Middle chainring >

Tightening torque:	
	12 - 14 N·m {105 - 122 in. lbs.}
	



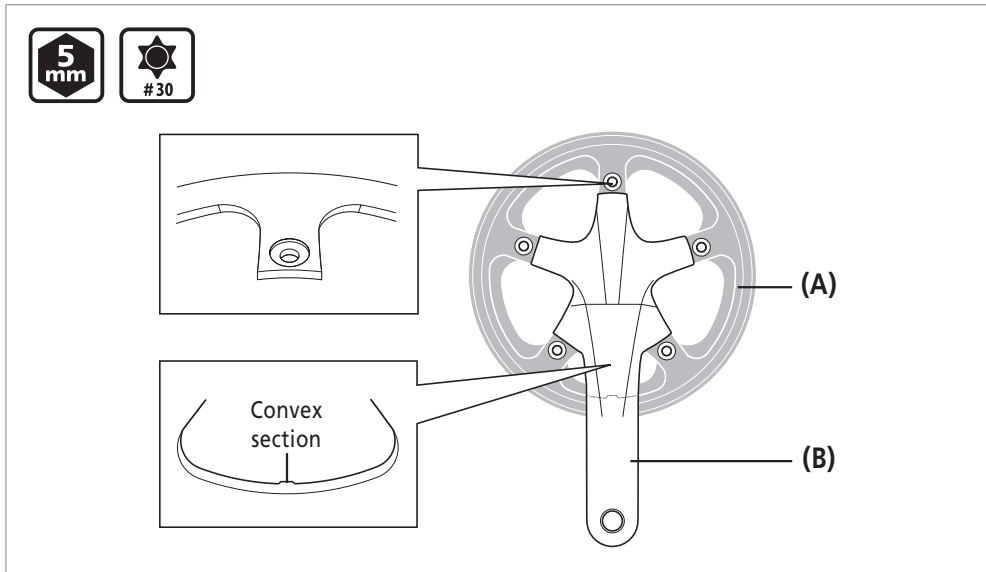
(E) Inner side

- (E) Inner side

NOTE

Set the largest chainring and the middle chainring of FC-M782/M672/M622/M612 so that the convex sections of the nuts fit the concave in the holes of the chainring.

Chain guide type

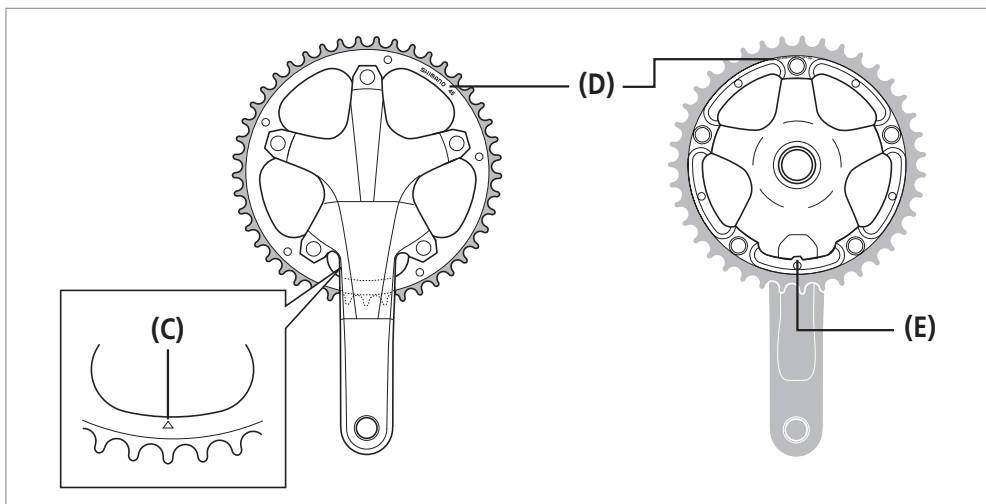


- (A) Top guard
- (B) Crank arm

NOTE

Set the top guard so that the surface of the top guard with the raised section around the hole faces outside, and so that the inside convex section is at the crank arm position.

Without chain guide type



- (C) Δ mark
- (D) Mark
- (E) Convex section



TECH TIPS

- For 45T/42T gear, install so that the marked surface faces outside, and so that the Δ mark is at the crank arm position.
- For 39T gear, install so that the marked surface faces inside, and so that the inside convex section is at the crank arm position.

Triple gear type FC-M9020

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 enter between the gears, damaging them.

1

With the marked surface **(A)** of the largest chainring facing out, set the largest chainring so that the chain drop prevention pin **(B)** is lined up with the crank arm position.

- (A)** Mark
- (B)** Chain drop prevention pin

2

Set the middle chainring and the smallest chainring so that the convex sections **(D)** are at the crank arm **(C)** position.

- (C)** Crank arm
- (D)** Convex section

Tightening torque:	
	<p>8 - 10 N·m {70 - 87 in. lbs.}</p>

Double gear FC-M9000 / M9020

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

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

1

With the marked surface of the largest chainring facing the front, set the largest chainring so that the chain drop prevention pin (A) is lined up with the crank arm position.

Set the smallest chainring so that the convex sections (B) are at the crank arm position.

- (A) Chain drop prevention pin
- (B) Convex section

2

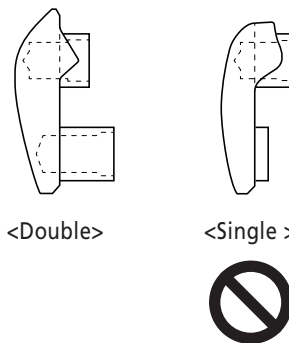
- Each fixing nuts (E) has a different shape. Be sure to check the shape and attachment position of the fixing nuts before removing them.
- Attach the fixing nut (E) carefully in the correct position. If the attachment position of the fixing nut is incorrect, they cannot be installed.
- If the fixing nut (E) have a positioning marks (A, B, C, D) on their back, attach them according to the positioning mark as shown in the diagram.

- (C) Fixing bolt
- (D) Chainring
- (E) Fixing nut
- (F) Crank arm

Tightening torque:	
	8 - 10 N·m {70 - 87 in. lbs.}

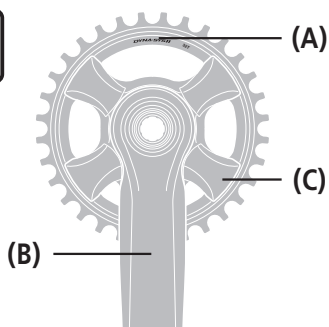
⚠ WARNING

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



Single gear FC-M9000 / M9020

1



Set the gear so that the marked side (A) faces the front, as shown in the illustration.

- (A) Mark
- (B) Crank arm
- (C) Fixing nut

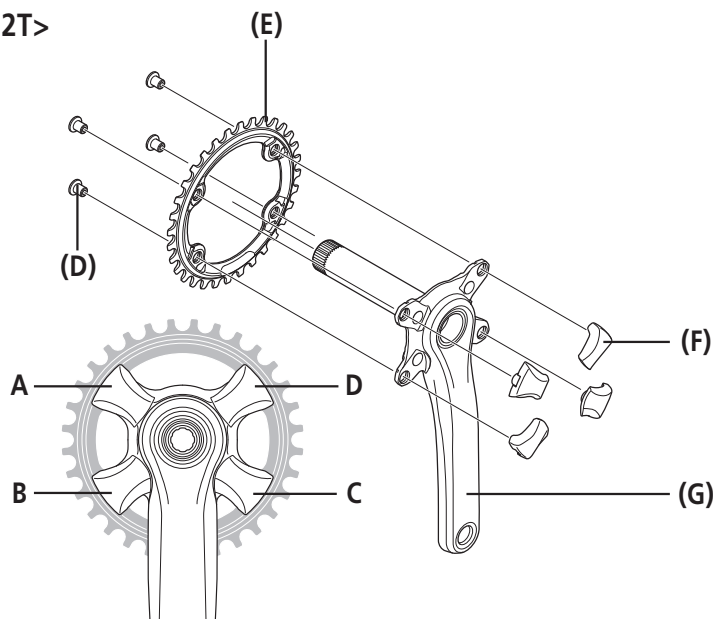
Tightening torque:



8 - 10 N·m
{70 - 87 in. lbs.}

2

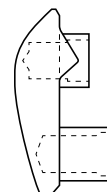
<30T/32T>



- (D) Fixing bolt
- (E) Chainring
- (F) Fixing nut
- (G) Crank arm
- (H) Spacer

⚠ WARNING

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

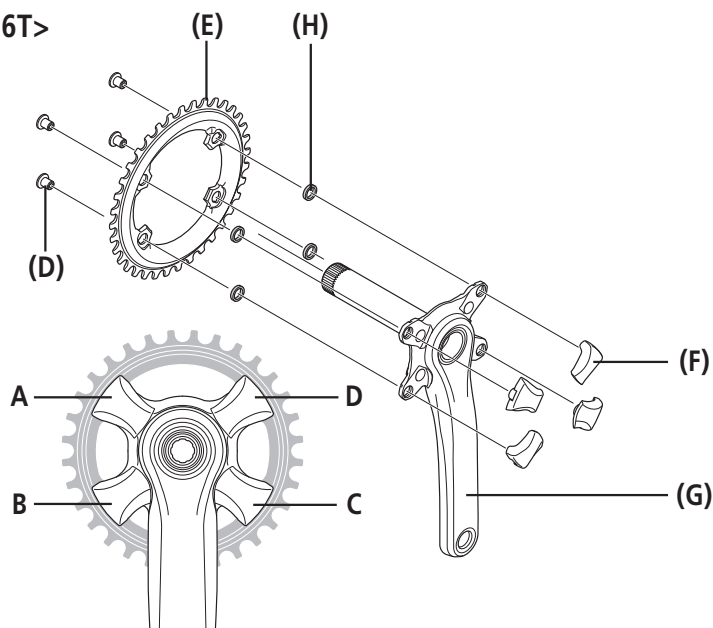


<Double>

<Single >



<34T/36T>



NOTE

For 34T/36T, install the spacer between the gear and the crank.

All 4 fixing nuts (F) have different shapes so please check the back side for positioning marks (A, B, C, D) when attaching them according to the positions in the diagram.

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

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