

Dealer's Manual

General Operations

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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

- **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.

NOTE

- 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.

REAR DERAILLEUR

TO ENSURE SAFETY

⚠ WARNING

- **Obtain and read the dealer's manual carefully prior to installing the parts.**

Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. It is strongly recommended using only genuine Shimano replacement parts.

- **Obtain and read the dealer's manual carefully prior to installing the parts.**

If adjustments are not carried out correctly, the chain may come off. This may cause you to fall off the bicycle which could result in serious injury.

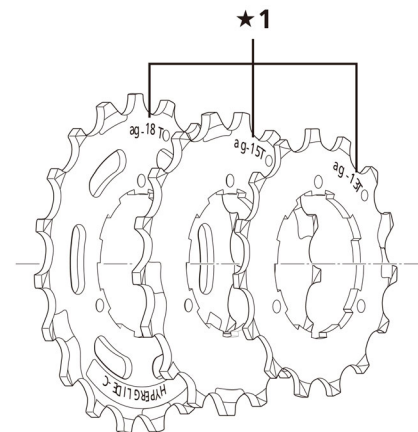
NOTE

- If gear shifting operations cannot be carried out smoothly, clean the derailleur and lubricate all moving parts.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.
- Periodically clean the derailleur and lubricate all moving parts (mechanism and pulleys).
- If gear shifting adjustment cannot be carried out, check the degree of parallelism at the rear end of the bicycle. Also, check if the cable is lubricated and if the outer casing is not too long or short.
- If you hear abnormal noise as a result of looseness in a pulley, you should replace the pulley.
- Using a frame with internal cable routing is strongly discouraged as it has tendencies to impair the SIS shifting function due to its high cable resistance.

For MTB/Trekking

- 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.

- Always be sure to use the sprocket set bearing the same group marks, and never use in combination with a sprocket bearing a different group mark.



★1 Group marks

- Use an outer casing which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- A special grease is used for the gear shifting cable. Do not use premium grease or other types of grease. These may cause deterioration in gear shifting performance.

For ROAD





- The end of the outer casing which has the aluminum cap should be at the derailleur side.



★1 Derailleur side

- (A) Aluminum cap
- (B) Cap (4mm)
- (C) Plastic cap or cap (4mm)

- When the chain is in any of the position combinations shown in the table, the chain and the cassette sprocket may come into contact and generate noise. If the noise is a problem, shift the chain to the next largest gear or the one after.

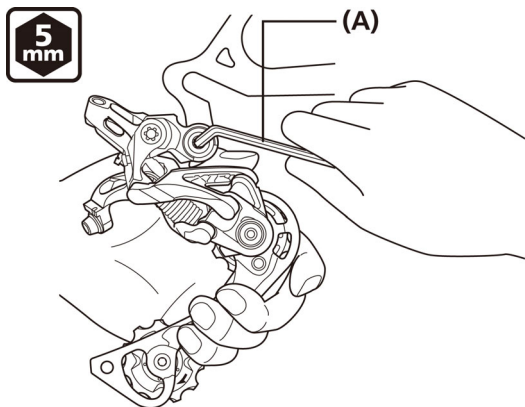
	Double	Triple
Front gear		
Rear gear		

REAR DERAILLEUR FOR MTB/TREKKING

Installation of the rear derailleur

■ Standard type

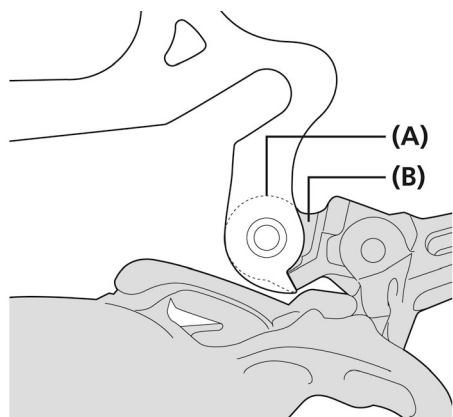
1. Install the rear derailleur.



(A) 5mm Allen key

Tightening torque

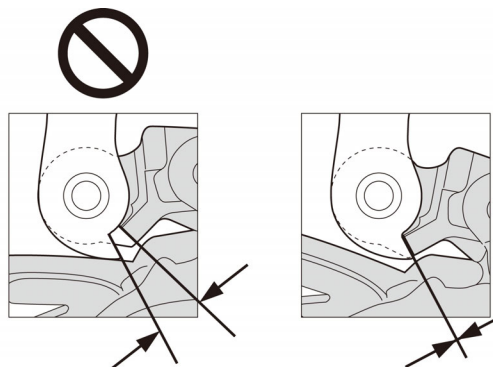
5mm Allen key
8 - 10 N·m
{70 - 87 in. lbs.}



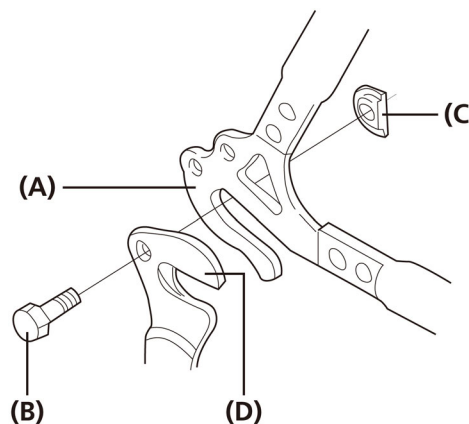
(A) Fork end
 (B) Bracket

NOTE

Periodically check that there is no gap between the fork end and the bracket as shown in the illustration. If there is a gap between these two parts, problems with gear shifting performance may occur.



■ Bracket type

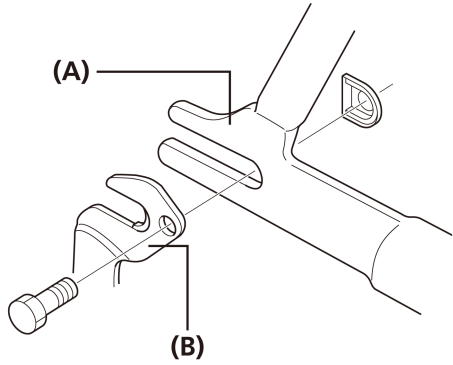


(A) Fork end
 (B) Bracket bolt
 (C) Bracket nut
 (D) Bracket

Tightening torque

3 - 4 N·m
{27 - 34 in. lbs.}

For BMX type



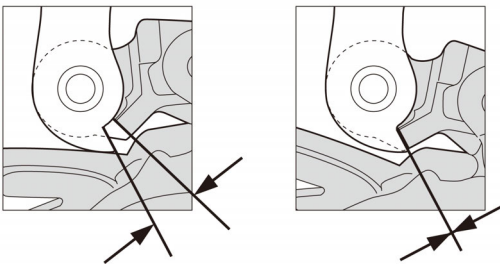
- (A) Fork end
- (B) Bracket

Tightening torque

3 - 4 N·m
{27 - 34 in. lbs.}

NOTE

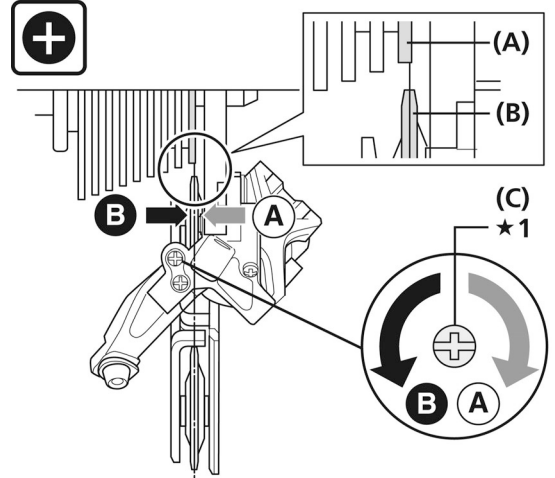
Periodically check that there is no gap between the fork end and the bracket as shown in the illustration. If there is a gap between these two parts, problems with gear shifting performance may occur.



Stroke adjustment

■ **Top adjustment**

1. Turn the top adjustment bolt to adjust so that the guide pulley is in line with the outer line of the smallest sprocket when looking from the rear.

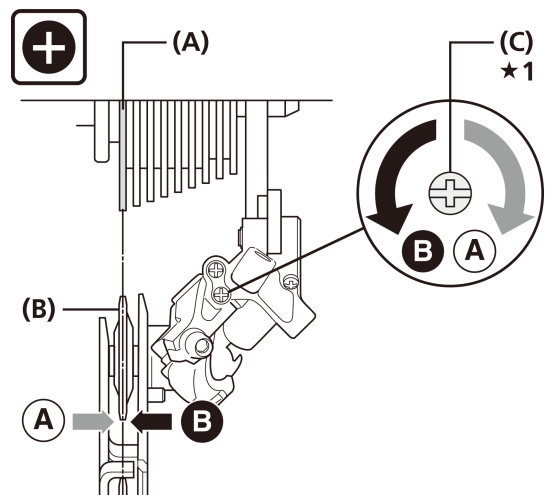


★1 Screwdriver

- (A) Outer line of smallest sprocket
- (B) Guide pulley
- (C) Top adjustment bolt

■ **Low adjustment**

1. Turn the low adjustment bolt so that the guide pulley moves to a position directly in line with the largest sprocket.

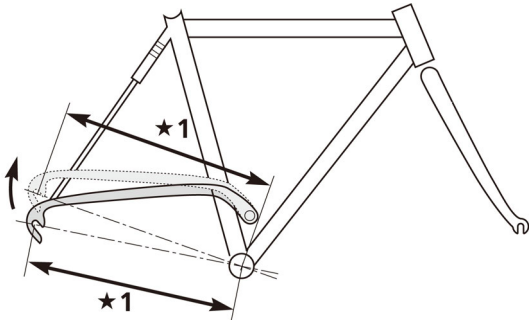


★1 Screwdriver

- (A) Largest sprocket
- (B) Guide pulley
- (C) Low adjustment bolt

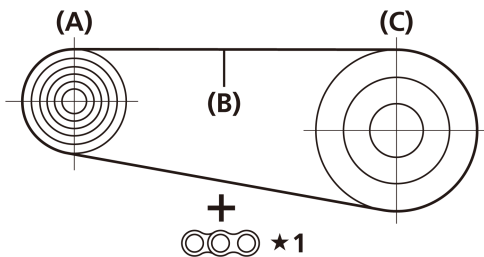
Chain length

1. The length of A will vary depending on the movement of the rear suspension. Consequently, an excessive load may be placed on the drive system if the chain length is too short. The rear suspension operates and stops when dimension A is at its greatest extension.



★1 A

2. Mount the chain on to the largest sprocket and the largest chainring. Next, add 2 links to set the length of the chain.

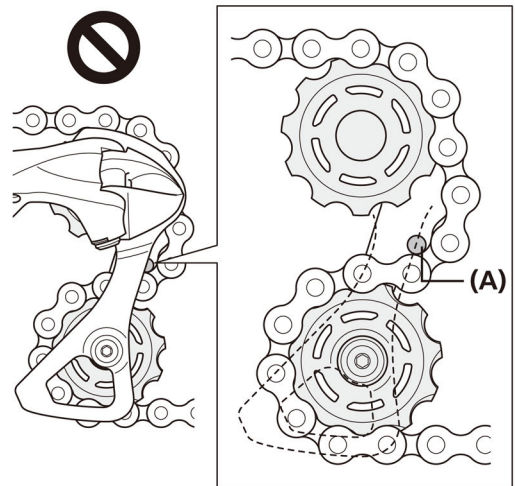
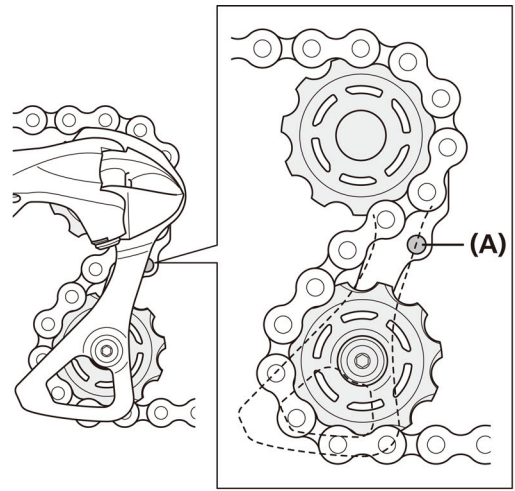


★1 +2 links

- | | |
|-----|-------------------|
| (A) | Largest sprocket |
| (B) | Chain |
| (C) | Largest chainring |

NOTE

- If there is a lot of movement in the rear suspension, the slack in the chain may not be taken up properly when the chain is on the smallest chainring and smallest sprocket.
- The rear derailleur plate assembly is equipped with a pin or plate that prevents the chain from derailing. When passing the chain through the rear derailleur, pass it to the rear derailleur body from the side of the pin/plate for preventing chain derailment as shown in the illustration.
If the chain is not passed through the correct position, damage may be caused to the chain or rear derailleur.



(A) Pin/plate for preventing chain derailment

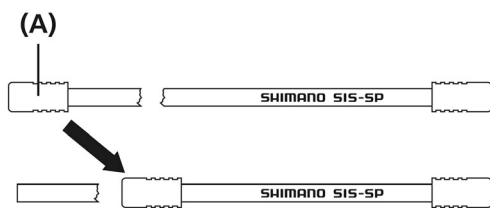
Securing the cable

■ Cutting the outer casing

1. When cutting the outer casing, cut the end opposite to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

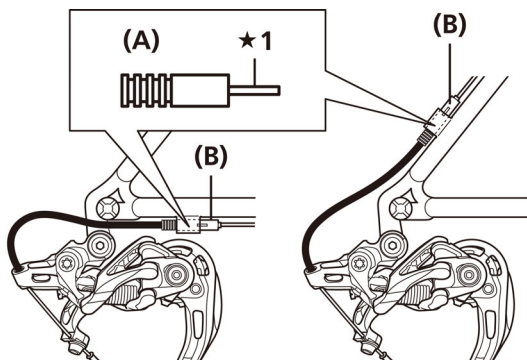


2. After cutting, attach the same sealed outer cap to the end.



(A) Outer cap

3. Install the sealed outer cap with tongue and the rubber shield onto the outer casing stopper of the frame.



★1 Be careful not to bend this section.

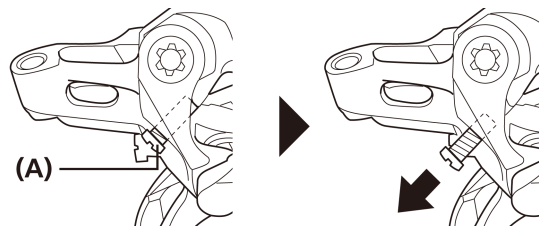
(A) Sealed outer cap with tongue
(B) Rubber shield

TECH TIPS

If the rear derailer moves to a large degree, such as in bicycles with rear suspension, it is recommended that you replace the cap with the accessory aluminum cap.

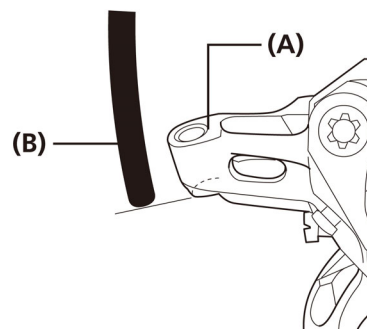
Outer casing length for SHADOW RD

1. Loosen the B-tension adjust bolt until it is in the position shown in the illustration.



(A) B-tension adjust bolt

2. Check that there is enough slack in the outer casing. Next, align the outer casing with the bottom edge of the holder on the rear derailer and then cut off any excess.



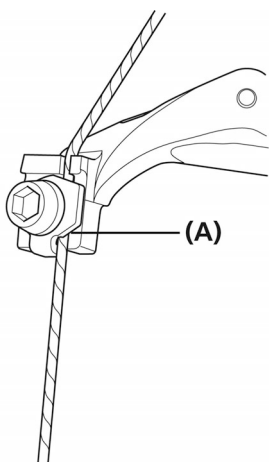
(A) Outer casing holder
(B) Outer casing

NOTE

The distance between the outer stopper to the outer casing holder of the rear derailer may change when the rear suspension moves, so determine the length of the outer casing at the point where this length is at its greatest.

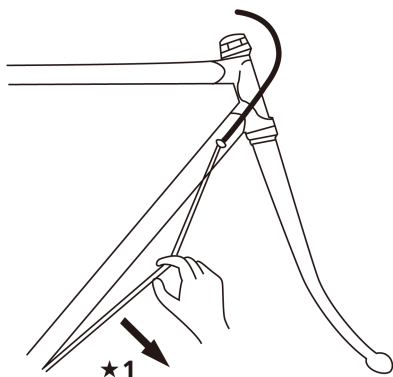
■ Connecting and securing of the cable

1. Connect the inner cable to the rear derailleur.



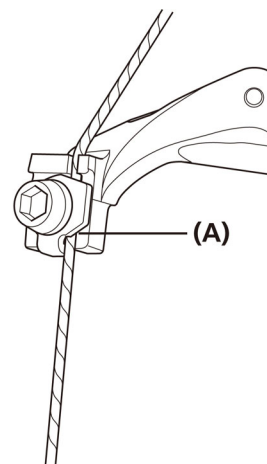
(A) Groove

2. Remove the initial slack from the cable as shown in the illustration.



★1 Pull

3. Reconnect the inner cable to the rear derailleur.



(A) Groove

Tightening torque

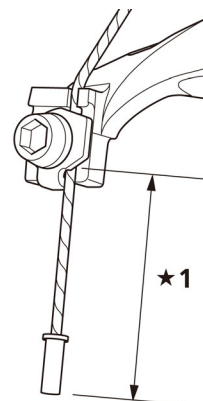
Allen key

6 - 7 N·m
{53 - 61 in. lbs.}

NOTE

Be sure that the cable is securely in the groove.

4. Set the inner cable so that the margin is approximately 30mm or less. Install the shift inner cap.



★1 30mm or less

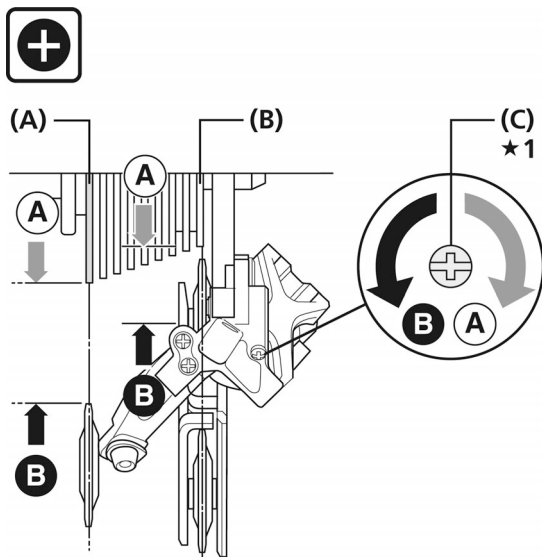
NOTE

Check that the inner cable does not interfere with the wheel spokes.
Stop the wheel from turning while carrying out this step.

■ Using the B-tension adjust bolt

1. Mount the chain on the smallest chainring and the largest sprocket, and turn the crank arm for shifting. Adjust the B-tension adjust bolt so that the guide pulley does not interfere with the sprocket but do not let the guide pulley come so close to the chain that they come into contact with each other.

Next, set the chain on the smallest sprocket. Repeat the above to make sure that the pulley does not touch the sprocket.

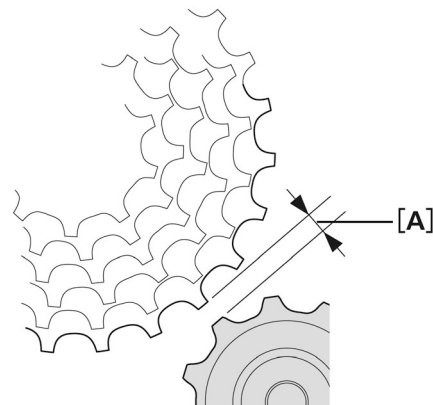


★1 Screwdriver

- | |
|---------------------------|
| (A) Largest sprocket |
| (B) Smallest sprocket |
| (C) B-tension adjust bolt |

Checking the distance between the largest sprocket and the guide pulley (SHADOW RD)

1. Set the rear derailleur to the largest sprocket and, with the wheel stopped, check that the distance between the tip of the guide pulley and the tip of the largest sprocket is within the range indicated in the table.



Gear combination	[A]
11-36T	5 - 6mm
11-34T	5 - 6mm
11-32T	9 - 10mm

TECH TIPS

- * When the lower gear uses the gear combination of 36T or 34T, set the distance to 5 to 6mm. When the lower gear uses the gear combination of 32T, set the distance to 9 to 10mm.

2. Turn the crank arm to shift gears and ensure that the shift is smooth.

NOTE

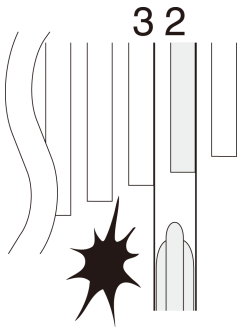
If the number of teeth for the cassette sprocket is changed, try setting it again.

■ SIS adjustment

1. Operate the shifting lever several times to move the chain to the 2nd sprocket counting from the smallest sprocket. Then, while operating the lever just enough to close the gap in the lever, turn the crank arm.
2. Adjust the positions of the gears by turning the cable adjustment barrel.

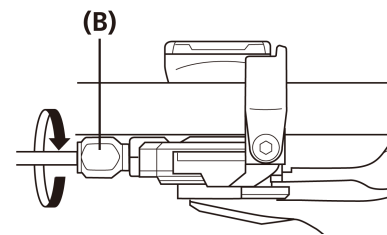
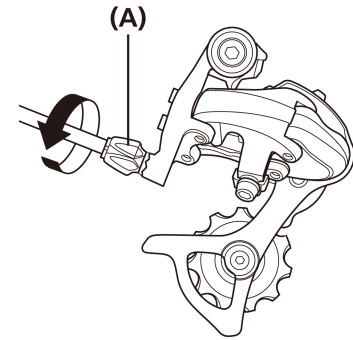
Best setting

The best setting is when the shifting lever is operated just enough to close the lever gap and the chain touches the 3rd sprocket counting from the smallest sprocket and makes noise.



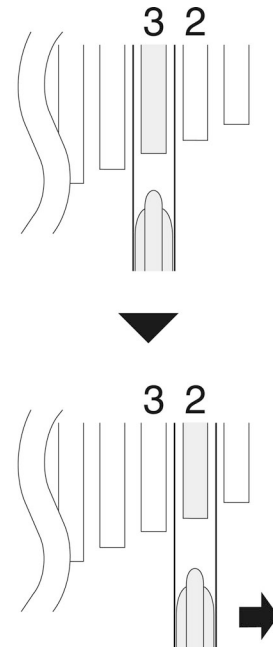
When shifting to the 3rd sprocket counting from the smallest sprocket

Tighten the cable adjustment barrel until the chain returns to the 2nd sprocket counting from the smallest sprocket. (Clockwise)



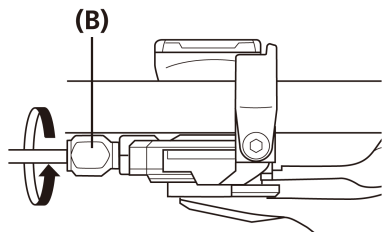
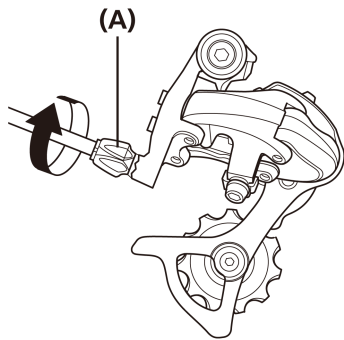
(A) Cable adjustment barrel

(B) Adjustment bolt

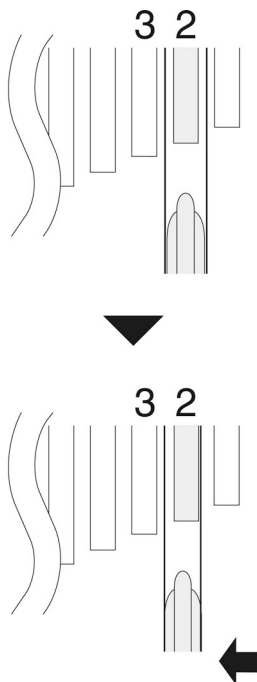


When no sound at all is generated

Loosen the cable adjustment barrel until the chain touches the 3rd sprocket counting from the smallest sprocket and makes a noise. (Counterclockwise)



(A) Cable adjustment barrel
(B) Adjustment bolt



- Return the lever to its original position (the position where the lever is at the 2nd sprocket setting counting from the smallest sprocket and it has been released) and then turn the crank arm clockwise. If the chain is touching the 3rd sprocket counting from the smallest sprocket and making a noise, turn the cable adjustment barrel clockwise slightly to tighten it until the noise stops and the chain runs smoothly. Stop turning at the point where the noise just stops.

- Operate lever to change gears, and check that no noise occurs in any of the gear positions.

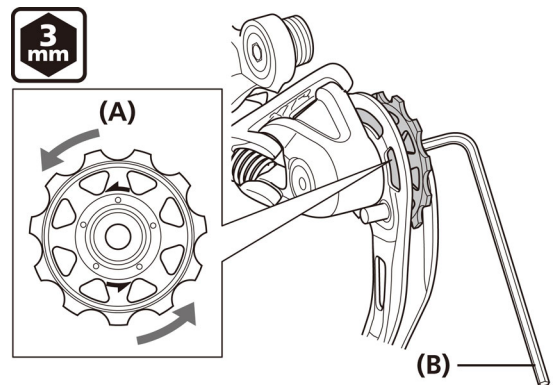
TECH TIPS

For the best SIS performance, periodically lubricate all power-transmission parts.

Replacing the pulley

Guide pulley

- Replace the guide pulley.



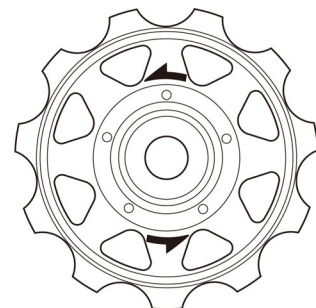
(A) Guide pulley
(B) 3mm Allen key

Tightening torque

3mm Allen key
2.5 - 5 N·m
{22 - 43 in. lbs.}

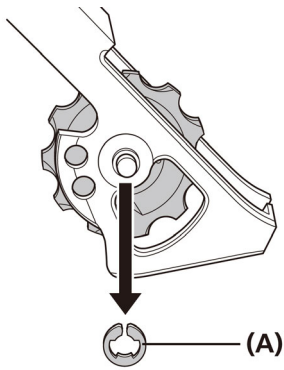
NOTE

Check the arrow direction on the pulley when installing it.



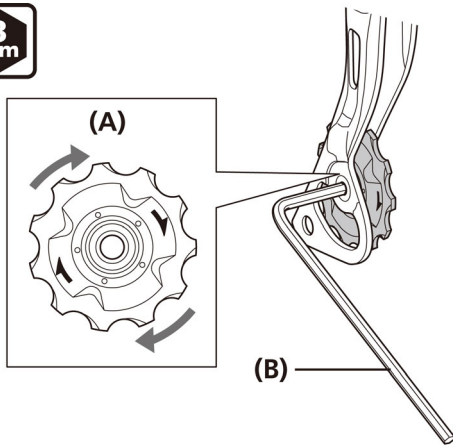
■ Tension pulley

1. Remove the E-ring first.



(A) E-ring

2. Replace the tension pulley.



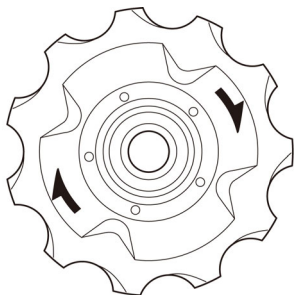
(A) Tension pulley
(B) 3mm Allen key

Tightening torque

3mm Allen key
2.5 - 5 N·m
{22 - 43 in. lbs.}

NOTE

Check the arrow direction on the pulley when installing it.



REAR DERAILLEUR FOR ROAD

Installation of the rear derailleur

When installing, be careful that deformation is not caused by the B-tension adjust bolt coming into contact with the fork end tab.

NOTE

- Make sure to insert the Allen key all the way to the end of the bracket axle tool hole when tightening.
- Do not use a ball point Allen key.

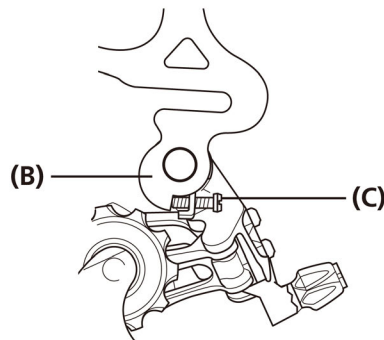
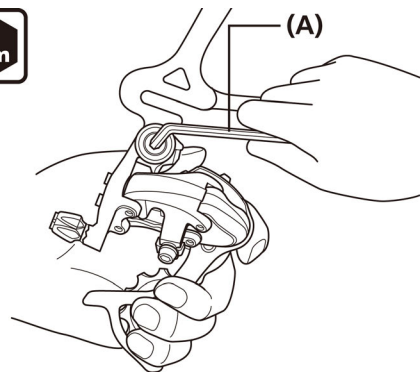


(A) Ball point Allen key

If tightening is performed incorrectly, the following phenomena may result:

- Deformation of the tool hole preventing installation or removal.
- Suboptimal gear shifting performance.

Standard type



- (A) 5mm Allen key
- (B) Fork end tab
- (C) B-tension adjust bolt

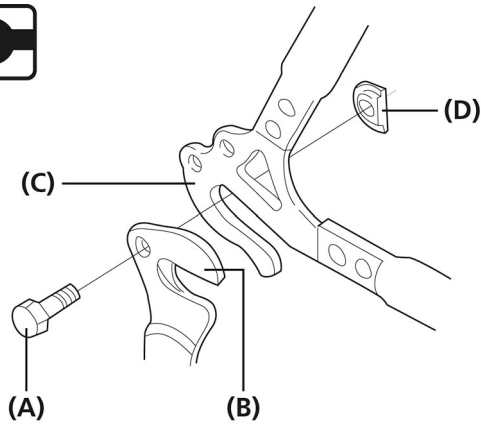
Tightening torque

5mm Allen key

8 - 10 N·m

{70 - 87 in. lbs.}

■ Bracket type



- (A) Bracket bolt
- (B) Bracket
- (C) Fork end
- (D) Bracket nut

Tightening torque

Spanner

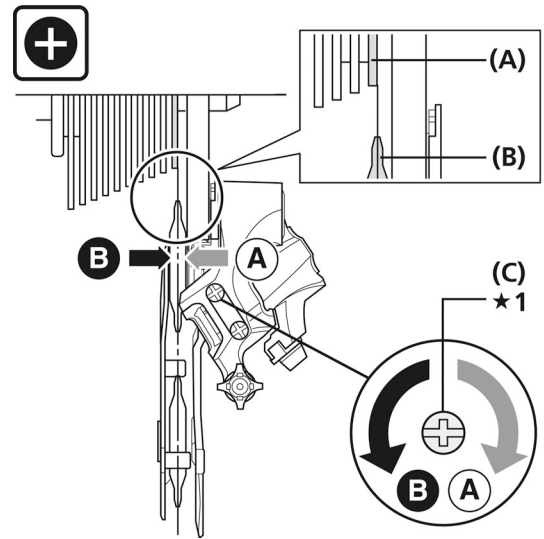
3 - 4 N·m

{27 - 34 in. lbs.}

Stroke adjustment

■ Top adjustment

1. Turn the top adjustment bolt to adjust so that the guide pulley is below the outer line of the smallest sprocket when viewed from the rear.

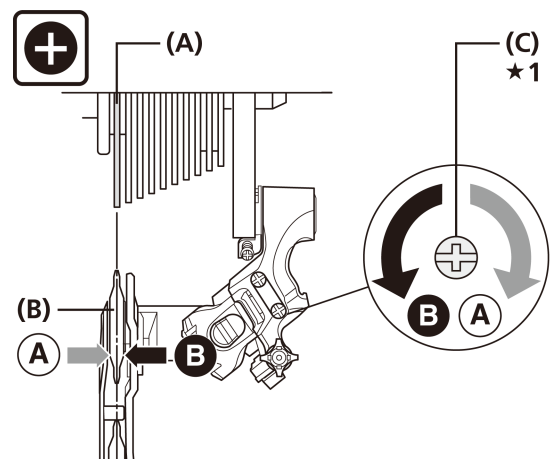


★1 Screwdriver

- (A) Outer line of smallest sprocket
- (B) Guide pulley
- (C) Top adjustment bolt

■ Low adjustment

1. Turn the low adjustment bolt so that the guide pulley moves to a position directly in line with the largest sprocket.

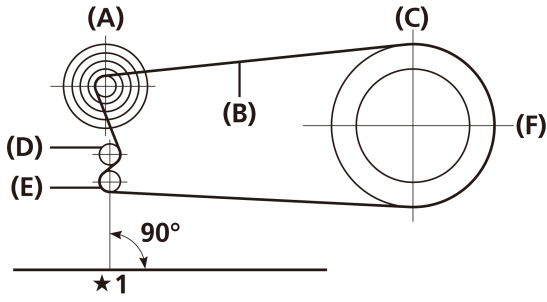


★1 Screwdriver

- (A) Largest sprocket
- (B) Guide pulley
- (C) Low adjustment bolt

■ Chain length

When largest sprocket is 27T or smaller

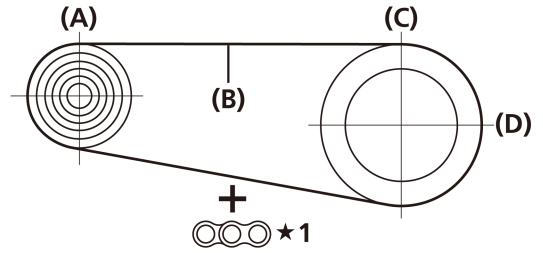


★1 Right angle to the ground

- (A) Smallest sprocket
- (B) Chain
- (C) Largest chainring
- (D) Guide pulley
- (E) Tension pulley
- (F) Front double

When largest sprocket is 28T or larger

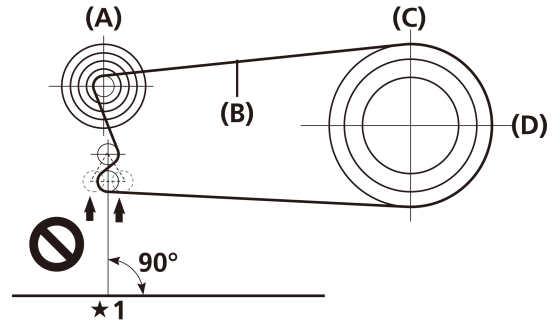
With the chain put on both the largest sprocket and the largest chainring, add 2 links to the "minimum number of links that can be connected".



★1 +2 links

- (A) Largest sprocket
- (B) Chain
- (C) Largest chainring
- (D) Front double

For front triple (when largest sprocket is 30T or smaller)



★1 Right angle to the ground

When installing chain using, place chain in largest chainring and smallest sprocket. Set so that the line drawn through the guide pulley and tension pulley is 90° or greater to the ground.

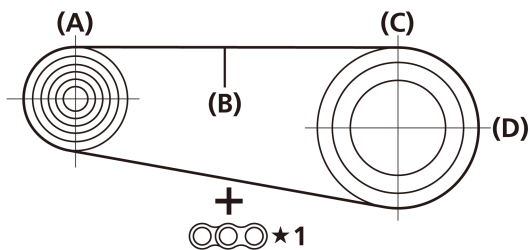
- (A) Smallest sprocket
- (B) Chain
- (C) Largest chainring
- (D) Front triple

NOTE

For RD-A070, follow the adjustment method in "For front triple (when largest sprocket is 32T or larger)" instead.

For front triple (when largest sprocket is 32T or larger)

With the chain put on both the largest sprocket and the largest chainring, add 2 links to the "minimum number of links that can be connected".



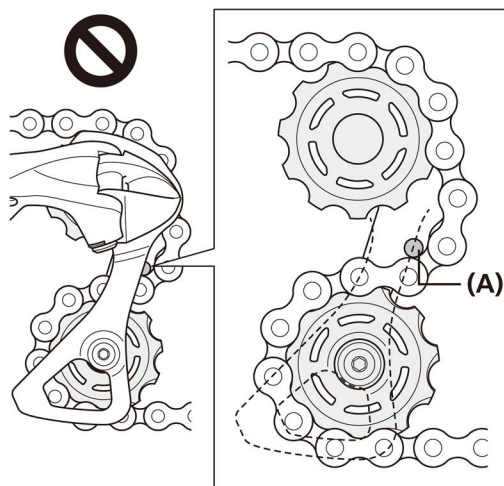
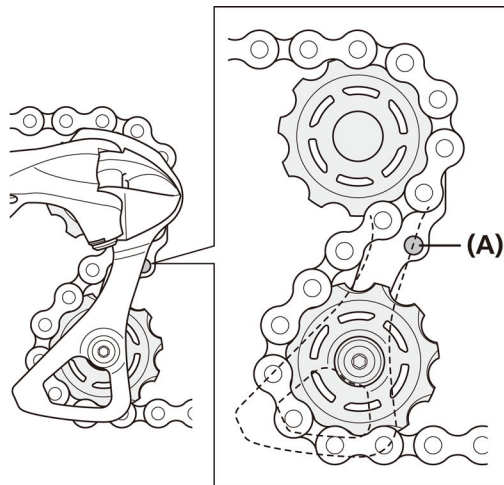
★1 +2 links

- (A) Largest sprocket
- (B) Chain
- (C) Largest chainring
- (D) Front triple

NOTE

The rear derailleur plate assembly is equipped with a pin or plate that prevents the chain from derailing. When passing the chain through the rear derailleur, pass it to the rear derailleur body from the side of the pin/plate for preventing chain derailment as shown in the illustration.

If the chain is not passed through the correct position, damage may be caused to the chain or rear derailleur.



(A) Pin/plate for preventing chain derailment

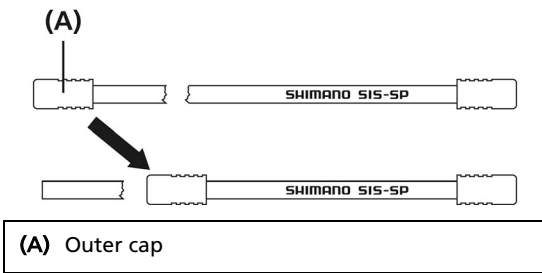
Securing the cable

■ Cutting the outer casing

1. When cutting the outer casing, cut the end opposite to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

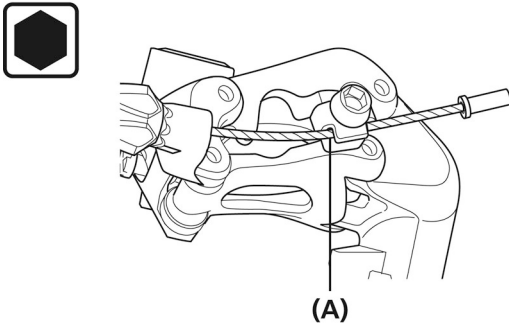


2. Attach the same outer cap to the cut end of the outer casing.



■ Connecting and securing of the cable

1. Connect the inner cable to the rear derailleur.

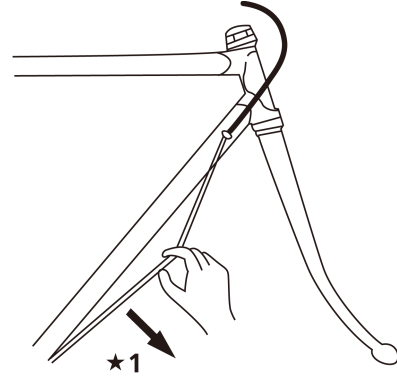


(A) Groove

Tightening torque

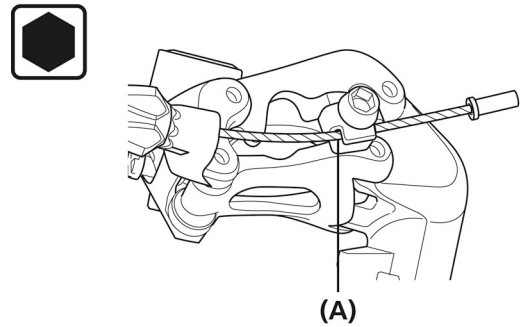
Allen key
6 - 7 N·m
{53 - 61 in. lbs.}

2. Remove the initial slack from the cable as shown in the illustration.



*1 Pull

3. Reconnect the inner cable to the rear derailleur.



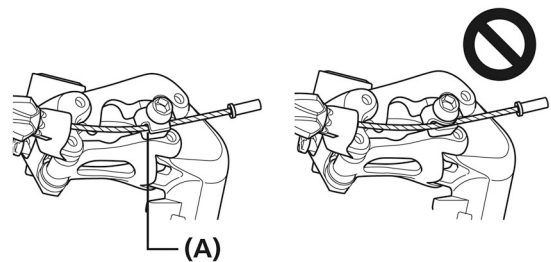
(A) Groove

Tightening torque

Allen key
6 - 7 N·m
{53 - 61 in. lbs.}

NOTE

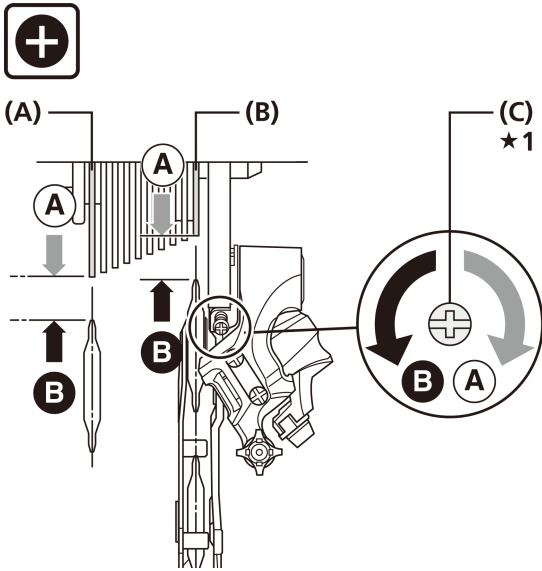
Be sure that the cable is securely in the groove.



(A) Groove

Using the B-tension adjust bolt

1. Mount the chain on the smallest chainring and the largest sprocket, and turn the crank arm for shifting. Then turn the B-tension adjust bolt to adjust so that the guide pulley does not interfere with the sprocket but not so close that it touches the chain. Next, set the chain on the smallest sprocket and repeat the above procedure to make sure that the pulley does not come into contact with the sprockets.

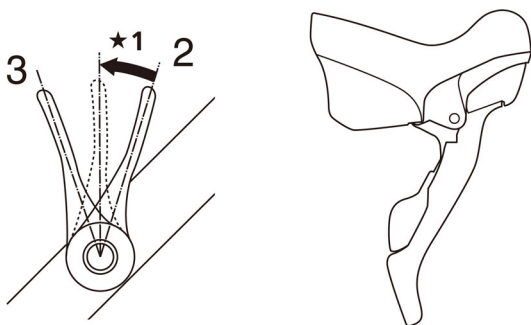


★1 Screwdriver

- | | |
|-----|-----------------------|
| (A) | Largest sprocket |
| (B) | Smallest sprocket |
| (C) | B-tension adjust bolt |

SIS adjustment

1. Operate the shifting lever several times to move the chain to the 2nd sprocket counting from the smallest sprocket. Then, while operating the lever just enough to close the gap in the lever, turn the crank arm.

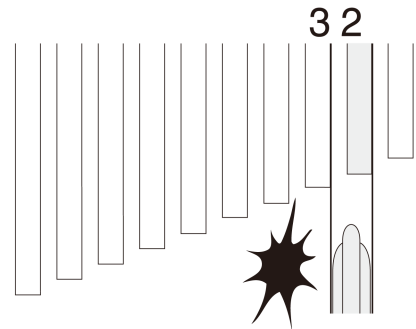


★1 Gap

2. Adjust the positions of the gears by turning the cable adjustment barrel.

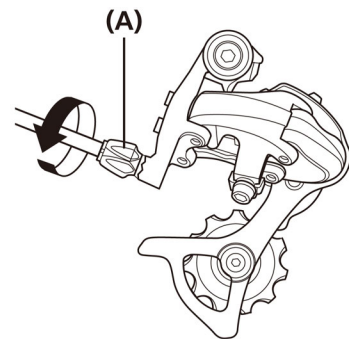
Best setting

The best setting is when the shifting lever is operated just enough to close the lever gap and the chain touches the 3rd sprocket counting from the smallest sprocket and makes noise.

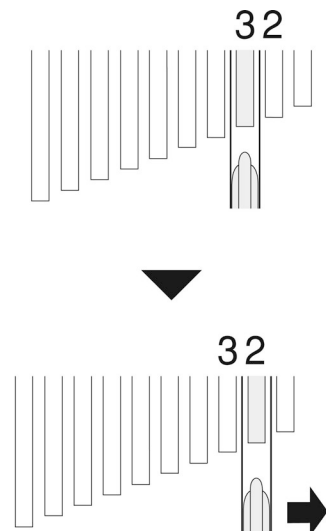


When shifting to the 3rd sprocket counting from the smallest sprocket

Tighten the cable adjustment barrel until the chain returns to the 2nd sprocket counting from the smallest sprocket. (Clockwise)

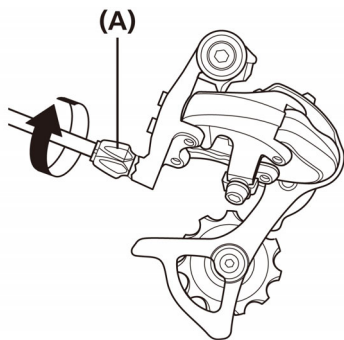


(A) Cable adjustment barrel

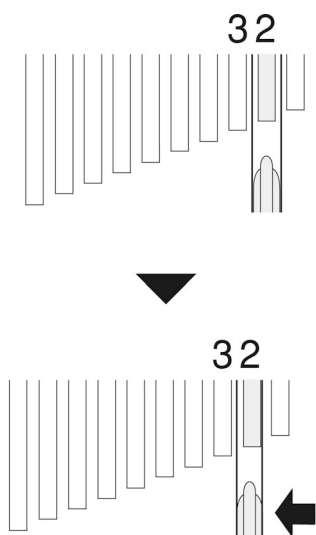


When no sound at all is generated

Loosen the cable adjustment barrel until the chain touches the 3rd sprocket counting from the smallest sprocket and makes a noise. (Counterclockwise)



(A) Cable adjustment barrel



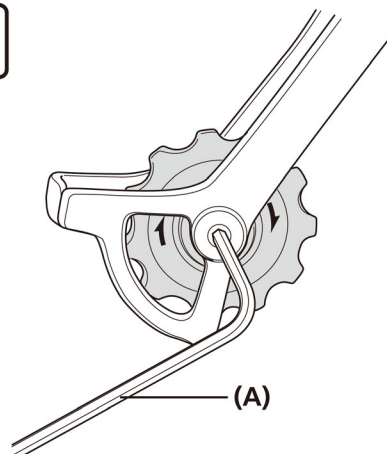
3. Return the lever to its original position (the position where the lever is at the 2nd sprocket setting counting from the smallest sprocket and it has been released) and then turn the crank arm clockwise. If the chain is touching the 3rd sprocket counting from the smallest sprocket and making a noise, turn the cable adjustment barrel clockwise slightly to tighten it until the noise stops and the chain runs smoothly. Stop turning at the point where the noise just stops.
4. Operate lever to change gears, and check that no noise occurs in any of the gear positions.

TECH TIPS

For the best SIS performance, periodically lubricate all power-transmission parts.

Replacing the pulley

1. Replace pulleys using a 3mm Allen key.



(A) 3mm Allen key

Tightening torque

3mm Allen key

2.5 - 5 N·m

{22 - 43 in. lbs.}

FRONT DERAILLEUR

TO ENSURE SAFETY

WARNING

- **Obtain and read the dealer's manual carefully prior to installing the parts.**

Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. It is strongly recommended using only genuine Shimano replacement parts.

- **Obtain and read the dealer's manual carefully prior to installing the parts.**







If adjustments are not carried out correctly, the chain may come off. This may cause you to fall off the bicycle which could result in serious injury.

NOTE

- If gear shifting operations cannot be carried out smoothly, clean the derailleur and lubricate all moving parts.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.

For 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 the noise is a problem, shift the chain onto the next-larger rear sprocket or the one after.

	Figure 1		Figure 2
	Double	Triple	
Front chain-ring			
Rear sprocket			

- For frames with suspension, the chain stay angle will vary depending on whether the bicycle is being ridden or not being ridden. When the bicycle is not being ridden and the chain is positioned on the largest/larger chainring and on the smallest sprocket, the chain guide outer plate of the front derailleur may touch the chain.

For 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 the noise is a problem, shift the chain onto the next-larger rear sprocket or the one after.

	Double	Triple
Front chain-ring		
Rear sprocket		

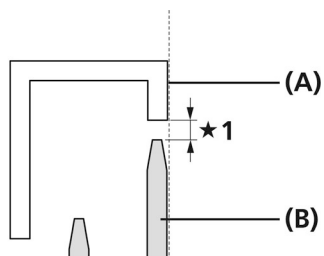
FRONT DERAILLEUR FOR MTB/TREKKING

NOTE

When installing components to a carbon frame/handlebar, check the tightening torque recommended by the carbon frame or component manufacturer to avoid carbon material damage due to excessive tightening or insufficient component holding force resulting from insufficient tightening torque.

Installation

Adjust so that there is a clearance of 1 – 3mm between the chain guide outer plate and the largest chainring. (Common to all types)

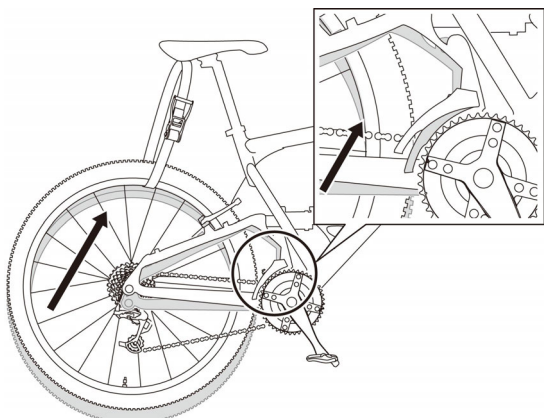


★1 1 – 3mm

- (A) Chain guide
- (B) Largest chainring

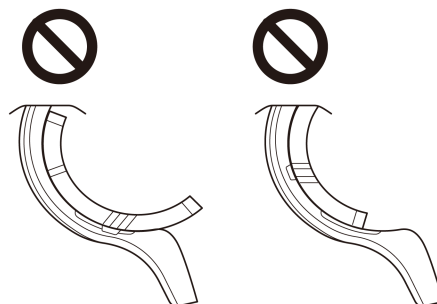
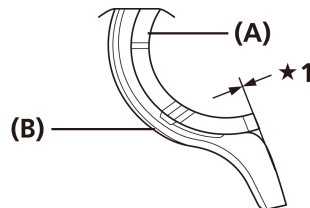
TECH TIPS

Bicycles with suspensions are positioned differently between when a rider is off the bicycle and on the bicycle. By referring to the illustration, perform installation and SIS adjustment while seated on the bicycle.



■ Band type

- When using the adapter, install it in the position shown in the illustration, relative to the front band or the rear band.

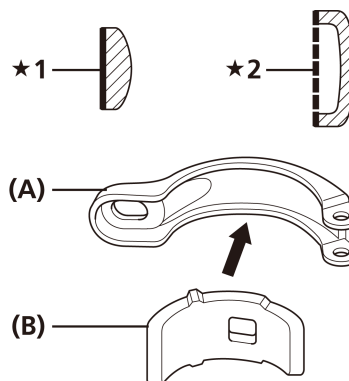


★1 Align

- (A) Adapter
- (B) Front band/Rear band

When using a non-planar front band

Be sure to use a metallic adapter for a front band which has a non-planar shape.

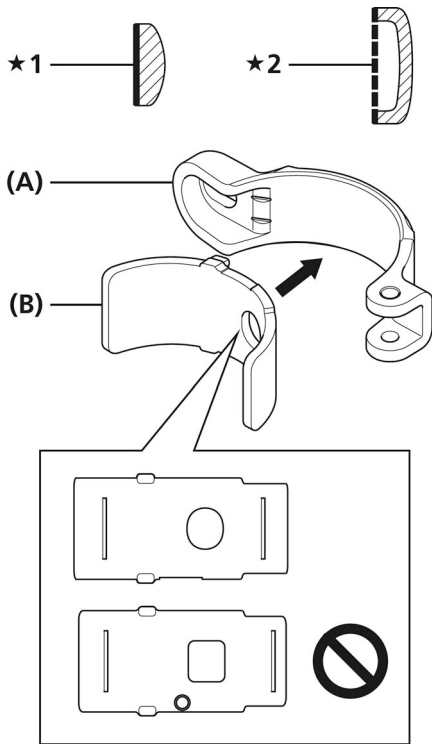


- ★1 Planar shape
- ★2 Non-planar shape

- (A) Front band
- (B) Metallic adapter

When using a planar front band

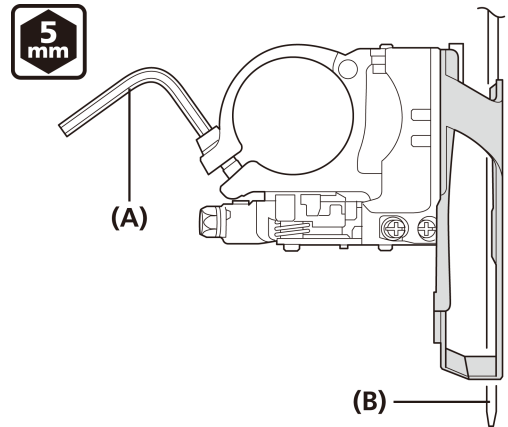
Be sure to use a round-type plastic adapter when using a front band with a planar shape. Square-type plastic adapters are not compatible.



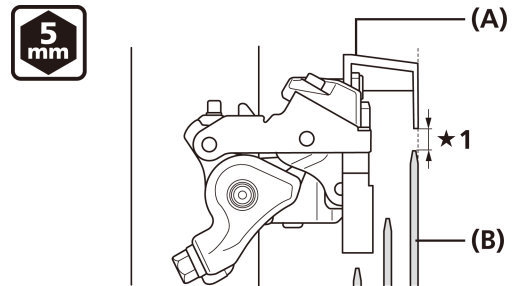
- ★1 Planar shape
- ★2 Non-planar shape

(A) Front band
 (B) Round-type plastic adapter

2. After tentatively tightening the clamp bolt, align the flat portion of the outer plate of the chain guide in parallel with the flat surface of the largest chainring. When the adjustment is complete, tighten the clamp bolt.

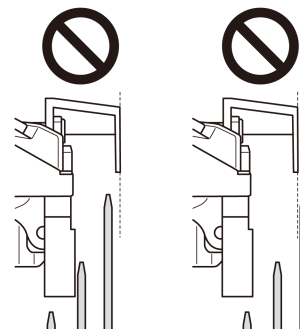


- (A) 5mm Allen key
- (B) Largest chainring



★1 1 – 3mm

- (A) Chain guide outer plate
- (B) Largest chainring



Tightening torque

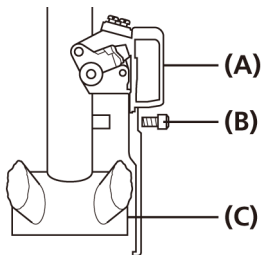
5mm Allen key

5 - 7 N·m

{44 - 61 in. lbs.}

■ Type E

1. Align the bracket of the front derailleur with the position of the bottom bracket and secure it with a bolt.

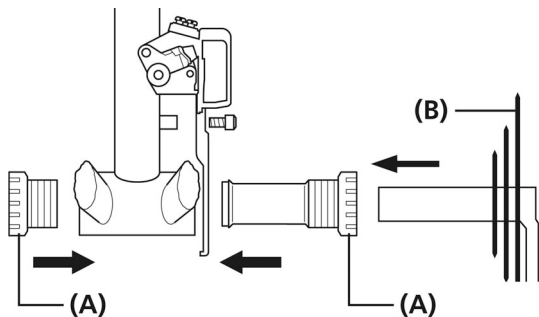


- (A) Front derailleur
- (B) Bolt
- (C) Bottom bracket position

Tightening torque

5 - 7 N·m
{44 - 61 in. lbs.}

2. Insert the bottom bracket adapter as in the illustration and tighten it.

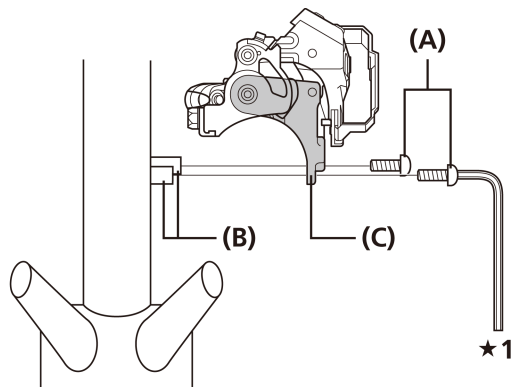


- (A) Adapter
- (B) Front chainwheel

Tightening torque

35 - 50 N·m
{306 - 437 in. lbs.}

■ Type E (models without BB plate)

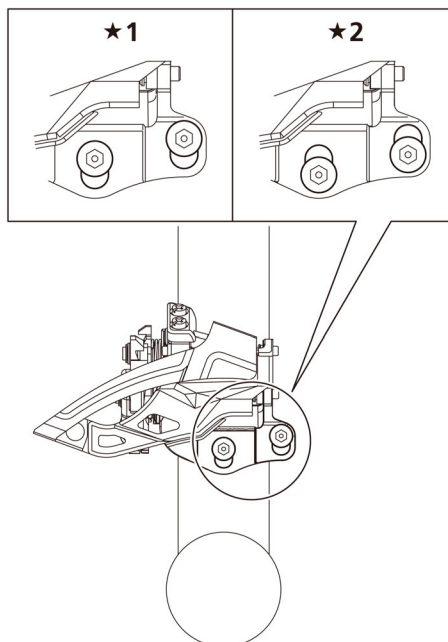


★1 Example: When using an Allen key

- (A) Bottom bracket mount fixing bolt
- (B) Bottom bracket mount
- (C) Bracket

NOTE

Shimano does not provide the bottom bracket mount fixing bolts.

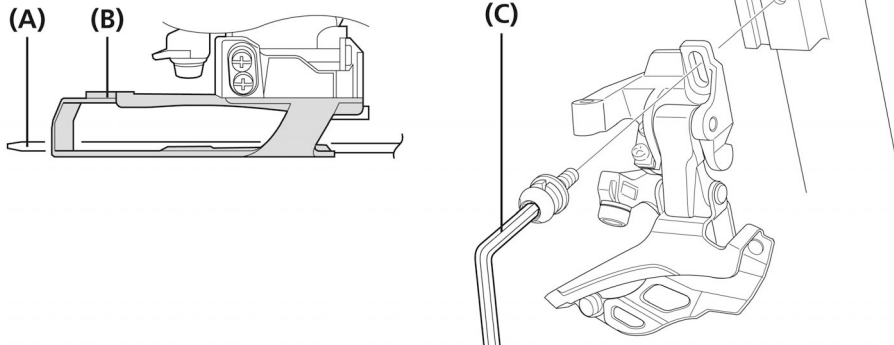


★1 Double: Largest chainring 38T
Triple: Largest chainring 40T

★2 Double: Largest chainring 40T
Triple: Largest chainring 42T

■ Direct mount type

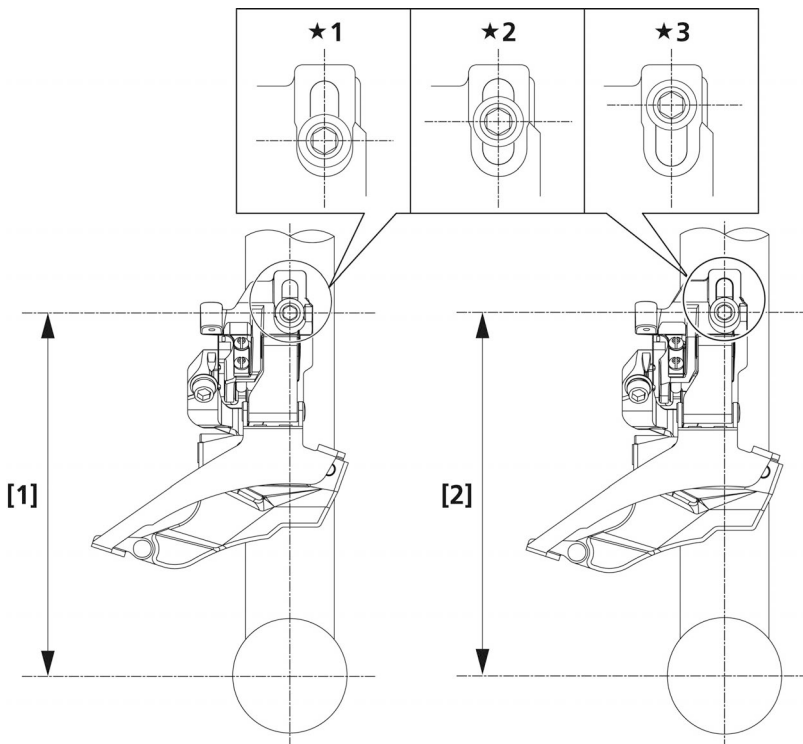
1. Adjust the height of the front derailleur. The flat section of the chain guide outer plate should be directly above and parallel to the largest chainring. Secure with an Allen key (5mm).



- (A) Chainwheel (largest chainring)
- (B) Chain guide
- (C) 5mm Allen key

Tightening torque
5mm Allen key
5 - 7 N·m
{44 - 61 in. lbs.}

The mounting height varies depending on the position of the base on the frame.



[1] 155.5mm
(From bottom bracket center)

- ★1 Double: 42T
- ★2 Double: 40T
Triple: 42T
- ★3 Double: 38T

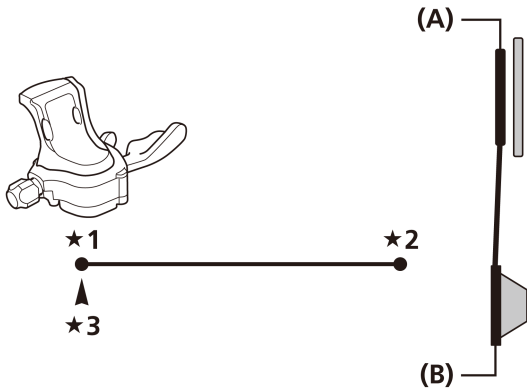
[2] 159.5mm
(From bottom bracket center)

- ★1 Double: 44T
- ★2 Double: 42T
- ★3 Double: 40T
Triple: 42T

Fixing the cable and adjusting the SIS (Front double)

Low adjustment

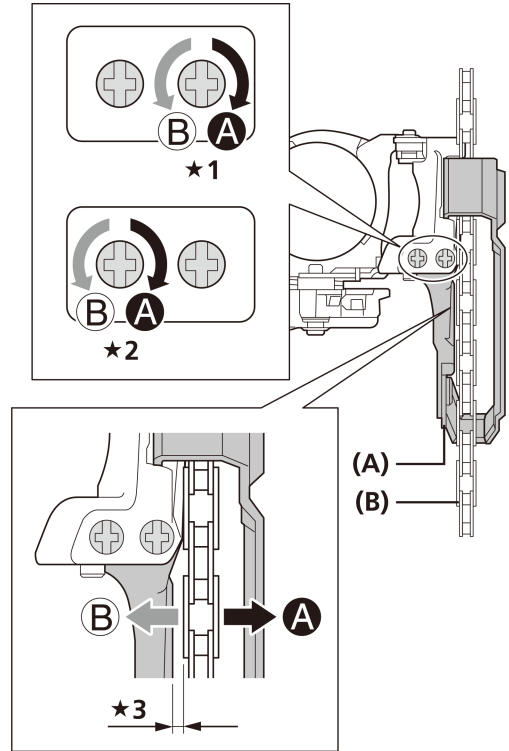
1. Set the chain on the smallest chainring at the front and the largest sprocket at the rear.



- ★1 Low
- ★2 Top
- ★3 Cable index point

- (A) Smallest chainring
- (B) Largest sprocket

2. Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5mm.



- ★1 Top swing
- ★2 Down swing
- ★3 0 - 0.5mm

- (A) Chain guide inner plate
- (B) Chain

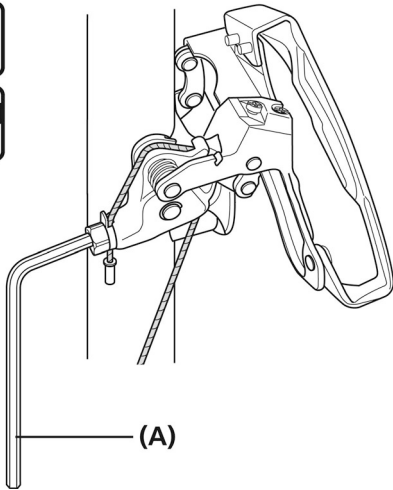
■ Securing the cable

Use the shifting lever with a mode converter in exes mode. To shift from x3 to x2, refer to the maintenance section of the dealer's manual for the shifting lever RAPIDFIRE Plus.

Top swing (Common to E type and band type)

1. Use a spanner or an Allen key to tighten the wire mounting bolt.

Down pull



(A) 5mm Allen key/9mm spanner

Tightening torque

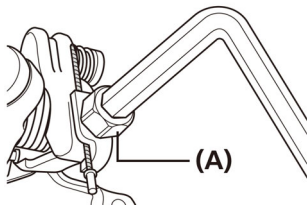
5mm Allen key/9mm spanner

5 - 7 N·m

{44 - 61 in. lbs.}

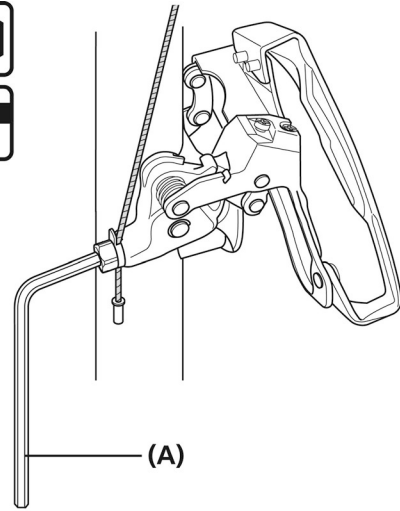
NOTE

Run the cable through as shown in the illustration.



(A) Wire mounting bolt

Top pull



(A) 5mm Allen key/9mm spanner

Tightening torque

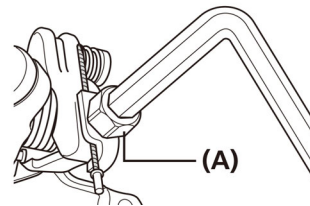
5mm Allen key/9mm spanner

5 - 7 N·m

{44 - 61 in. lbs.}

NOTE

Run the cable through as shown in the illustration.

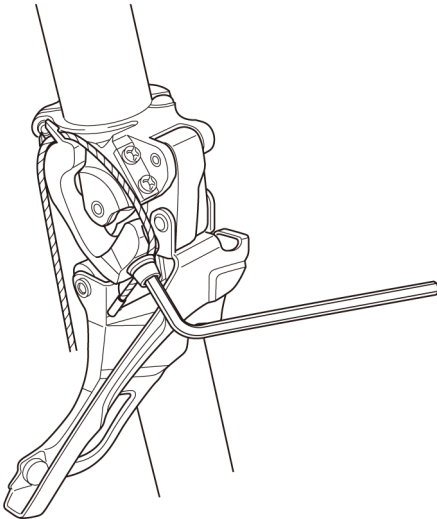


(A) Wire mounting bolt

Down swing (Band type)

1. Use an Allen key to tighten the wire mounting bolt.

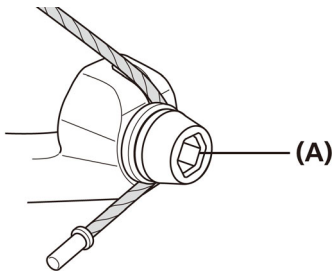
Down pull



Tightening torque
5mm Allen key 5 - 7 N·m {44 - 61 in. lbs.}

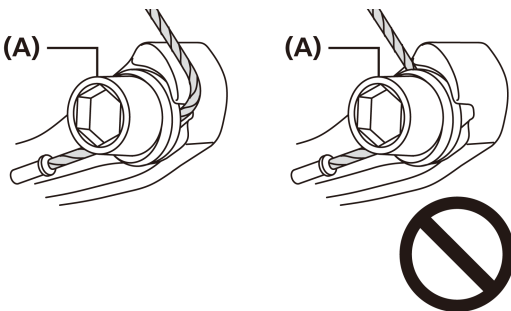
NOTE

Run the cable through as shown in the illustration.



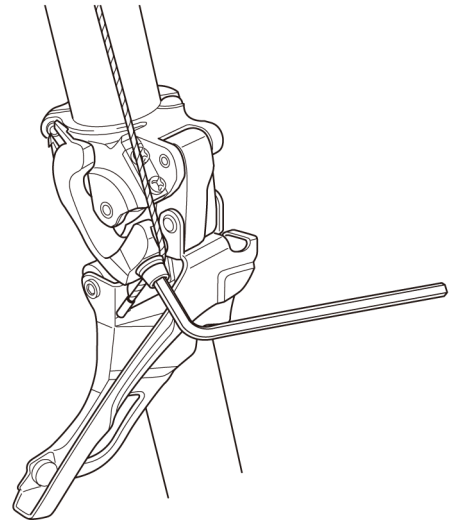
(A) Wire mounting bolt

Different shaped type



(A) Wire mounting bolt

Top pull

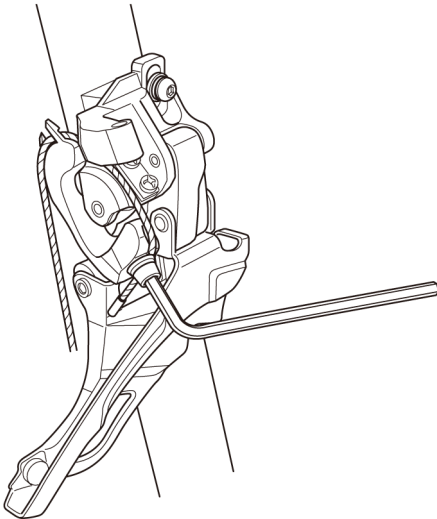


Tightening torque
5mm Allen key 5 - 7 N·m {44 - 61 in. lbs.}

Down swing (Direct mount type)

1. Use an Allen key to tighten the wire mounting bolt.

Down pull

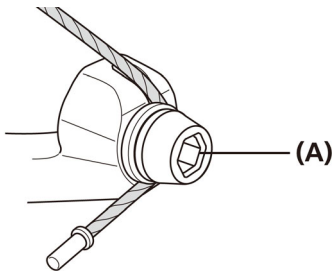


Tightening torque

5mm Allen key
5 - 7 N·m
{44 - 61 in. lbs.}

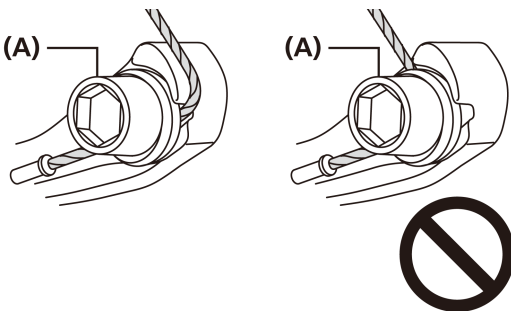
NOTE

Run the cable through as shown in the illustration.



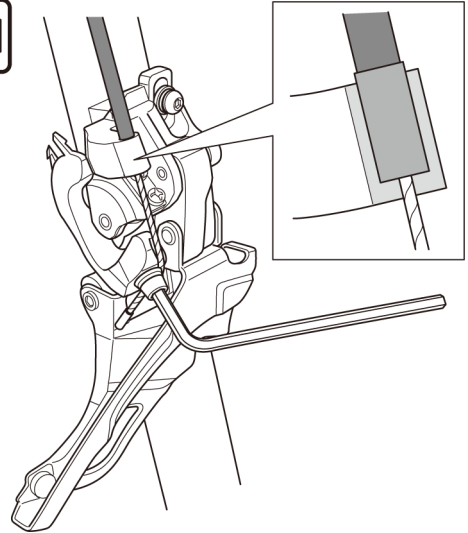
(A) Wire mounting bolt

Different shaped type



(A) Wire mounting bolt

Top pull

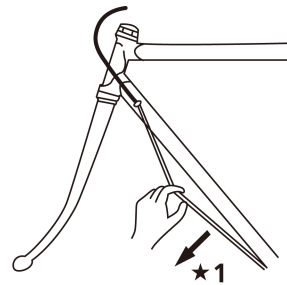


Tightening torque

5mm Allen key
5 - 7 N·m
{44 - 61 in. lbs.}

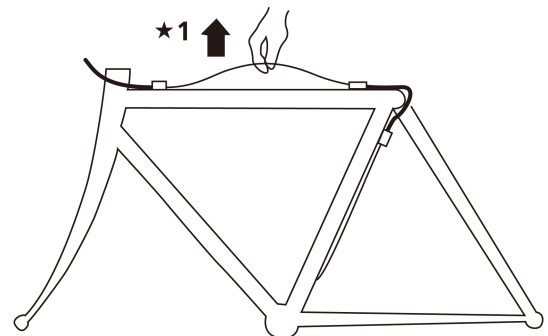
2. After taking up the initial slack in the cable, re-secure to the front derailleur as shown in the illustration.

Down pull



*1 Pull

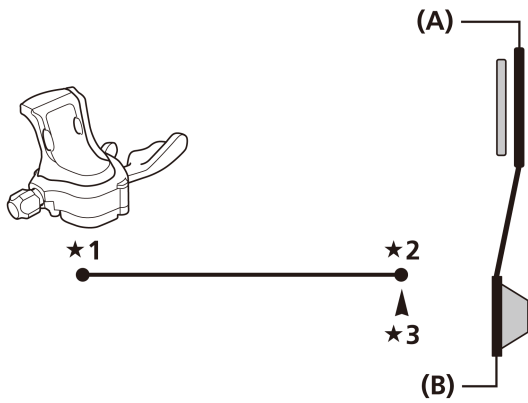
Top pull



*1 Pull

■ Adjustment of the cable tension

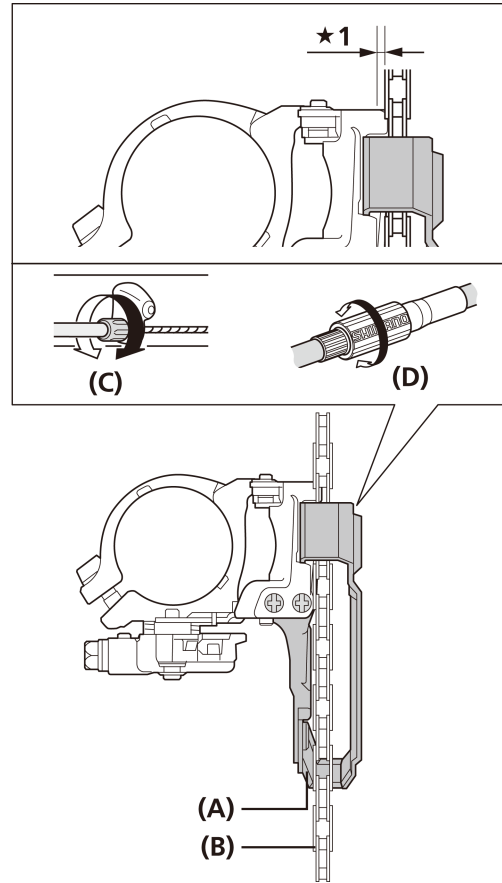
1. Set the chain onto the largest chainring and the largest sprocket.



- ★1 Low
- ★2 Top
- ★3 Cable index point

- (A) Largest chainring
- (B) Largest sprocket

2. Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5mm.

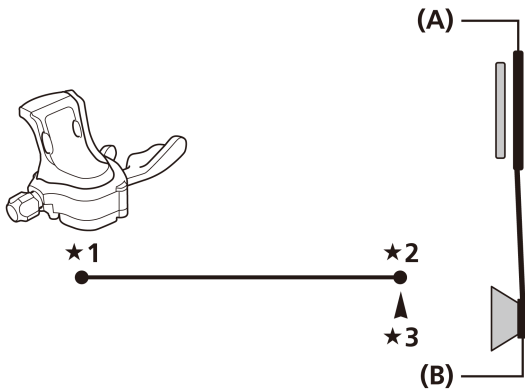


★1 0 - 0.5mm

- (A) Chain guide inner plate
- (B) Chain
- (C) Cable adjustment barrel
- (D) Cable adjuster

■ Top adjustment

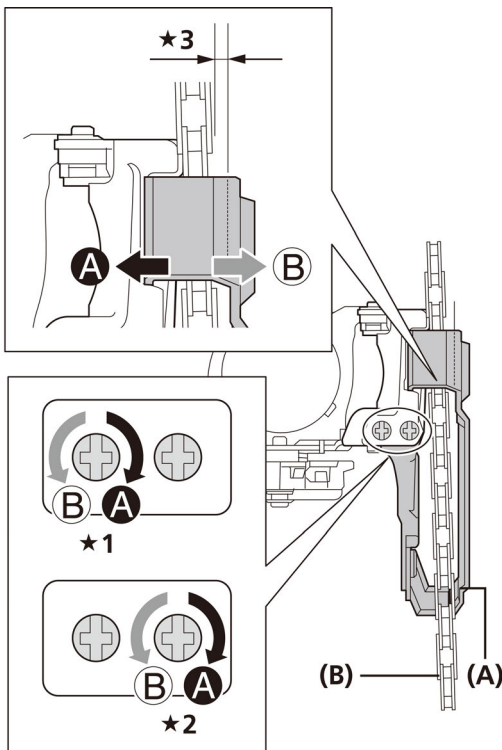
1. Set the chain on the largest chainring at the front and the smallest sprocket at the rear.



- ★1 Low
- ★2 Top
- ★3 Cable index point

(A) Largest chainring
(B) Smallest sprocket

2. Set so that the clearance between the chain guide outer plate and the chain is 0 – 0.5mm.



- ★1 Top swing
- ★2 Down swing
- ★3 0 - 0.5mm

(A) Chain guide outer plate
(B) Chain

■ Troubleshooting chart

After low adjustment, fixing the cable, cable tension adjustment and top adjustment, operate the shifting lever to check the shifting.

(This also applies if shifting becomes difficult during use.)

* Turn the bolt by 1/8th turn for each adjustment.

If the chain falls to the crank side.

Turn the top adjustment bolt clockwise.

If shifting is difficult from the smallest chainring to the largest chainring.

Tighten the cable. If this does not improve the situation, turn the top adjustment bolt counterclockwise.

If shifting is difficult from the largest chainring to the smallest chainring.

Turn the low adjustment bolt counterclockwise.

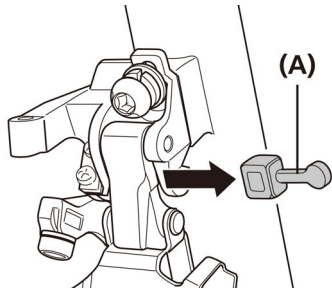
If the chain falls to the bottom bracket side.

Turn the low adjustment bolt clockwise.

Fixing the cable and adjusting the SIS (Front triple)

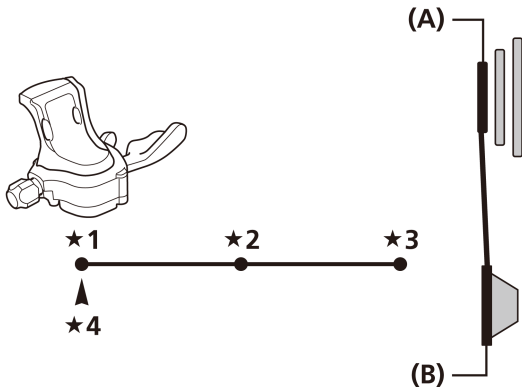
Low adjustment

1. Remove the Pro-Set alignment block.



(A) Pro-Set alignment block

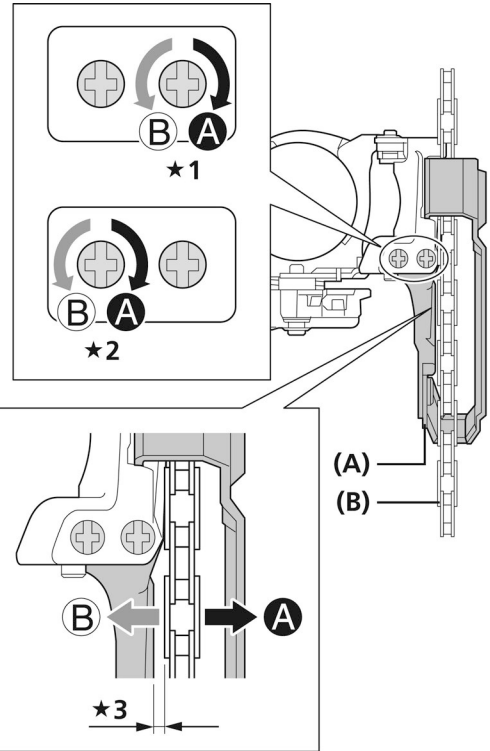
2. Set the chain on the smallest chainring at the front and the largest sprocket at the rear.



- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 Cable index point

(A) Smallest chainring
(B) Largest sprocket

3. Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5mm.



- ★1 Top swing
- ★2 Down swing
- ★3 0 - 0.5mm

(A) Chain guide inner plate
(B) Chain

Securing the cable

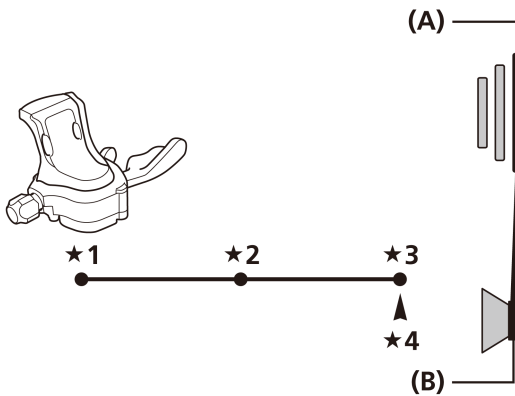
Use the shifting lever with a mode converter in x3 mode. To shift from x2 to x3, refer to the maintenance section of the dealer's manual for the shifting lever RAPIDFIRE Plus.

TECH TIPS

The cable can be secured on each FD type in the same way as the double. Refer to Fixing the cable and adjusting the SIS (Front double).

■ Top adjustment

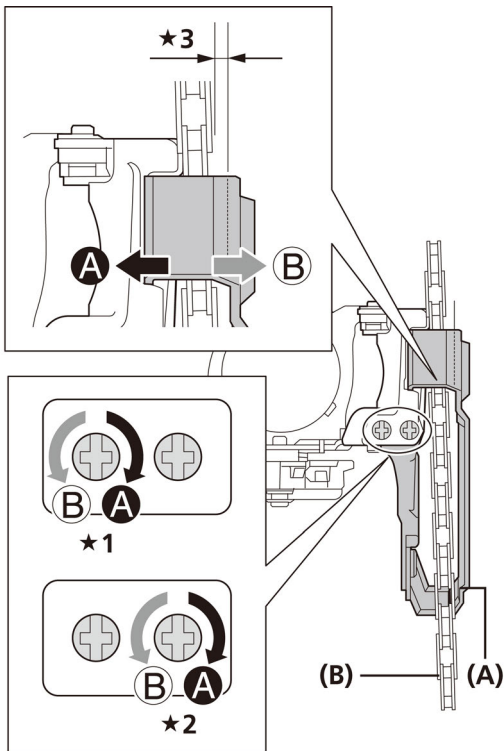
1. Set the chain on the largest chainring at the front and the smallest sprocket at the rear.



- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 Cable index point

(A) Largest chainring
(B) Smallest sprocket

2. Set so that the clearance between the chain guide outer plate and the chain is 0 – 0.5mm.

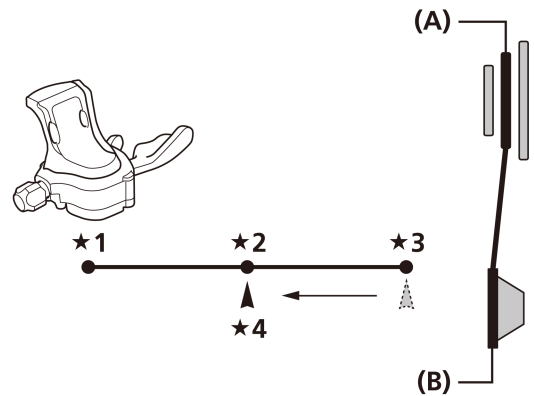


- ★1 Top swing
- ★2 Down swing
- ★3 0 - 0.5mm

(A) Chain guide outer plate
(B) Chain

■ Adjustment of the cable tension

1. Set the chain onto the middle chainring and the largest sprocket.

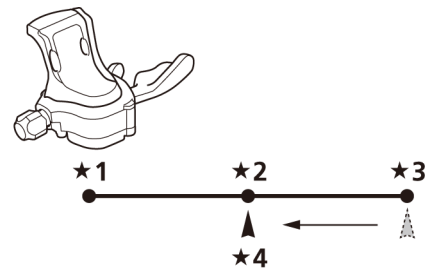


- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 Cable index point

(A) Middle chainring
(B) Largest sprocket

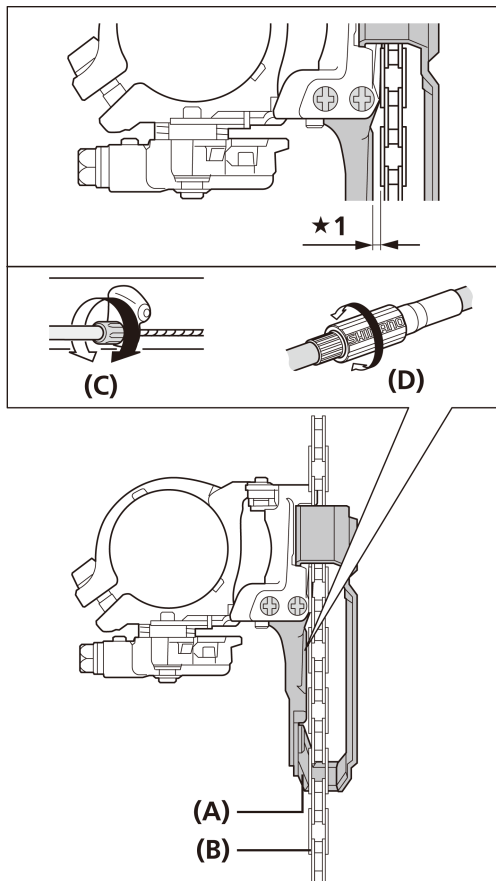
NOTE

Adjust the lever after operating it from top to middle, not low to middle.



- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 Cable index point

2. Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5mm.



★1 0 - 0.5mm

- (A) Chain guide inner plate
 (B) Chain
 (C) Cable adjustment barrel
 (D) Cable adjuster

■ Troubleshooting chart

After low adjustment, fixing the cable, cable tension adjustment and top adjustment, operate the shifting lever to check the shifting.

(This also applies if shifting becomes difficult during use.)

* Turn the bolt by 1/8th turn for each adjustment.

If the chain falls to the crank side.

Turn the top adjustment bolt clockwise.

If shifting is difficult from the middle chainring to the largest chainring.

Tighten the cable. If this does not improve the situation, turn the top adjustment bolt counterclockwise.

If shifting is difficult from the largest chainring to the middle chainring.

Loosen the cable.

If the chain falls to the bottom bracket side.

Turn the low adjustment bolt clockwise.

If the middle chainring is skipped when shifting from the largest chainring.

Tighten the cable.

If shifting is difficult from the middle chainring to the smallest chainring.

Turn the low adjustment bolt counterclockwise.

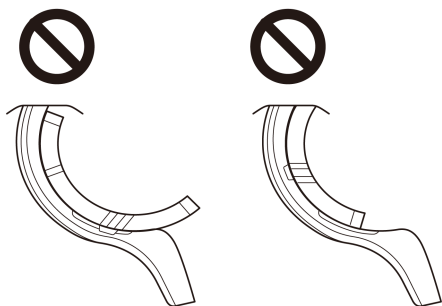
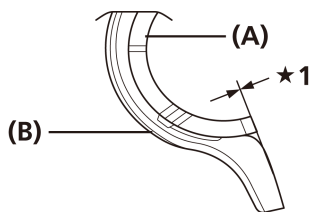
FRONT DERAILLEUR FOR ROAD

NOTE

When installing components to a carbon frame/handlebar, check the tightening torque recommended by the carbon frame or component manufacturer to avoid carbon material damage due to excessive tightening or insufficient component holding force resulting from insufficient tightening torque.

Installation

1. When using the adapter, install it in the position shown in the illustration, relative to the front band or the rear band.

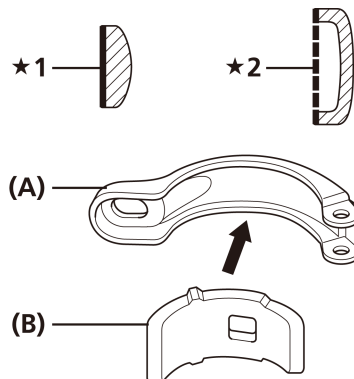


★1 Align

- | |
|--------------------------|
| (A) Adapter |
| (B) Front band/Rear band |

NOTE

Be sure to use a metallic adapter for a front band which has a non-planar shape.

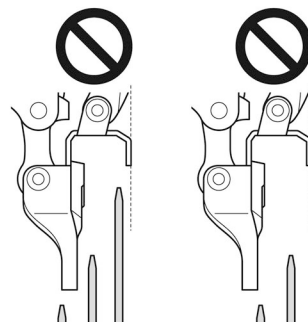
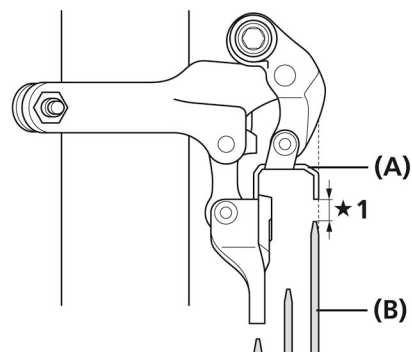


★1 Planar shape

★2 Non-planar shape

- | |
|----------------------|
| (A) Front band |
| (B) Metallic adapter |

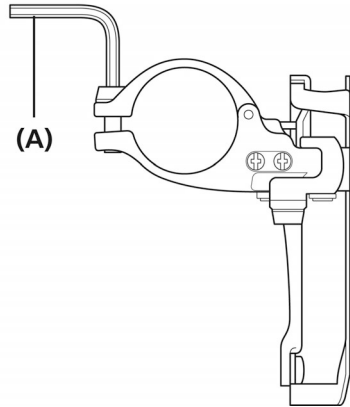
2. Adjust so that there is a clearance of 1 – 3mm between the chain guide outer plate and the largest chainring. After tentatively tightening the clamp bolt, align the flat portion of the outer plate of the chain guide in parallel with the flat surface of the largest chainring.



★1 1 – 3mm

- | |
|-----------------------------|
| (A) Chain guide outer plate |
| (B) Largest chainring |

3. When the adjustment is complete, tighten the clamp bolt.



(A) 5mm Allen key/9mm spanner

Tightening torque

5mm Allen key/9mm spanner

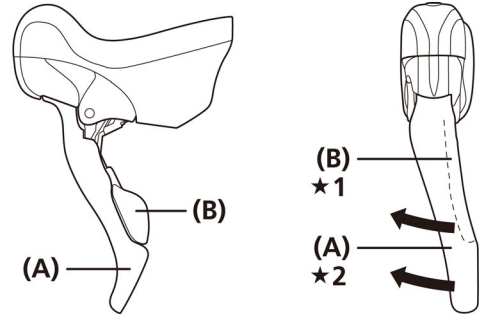
5 - 7 N·m

{44 - 61 in. lbs.}

Fixing the cable and adjusting the SIS (Front double)

■ Lever operation and cable index point

Front shifting (Standard type)



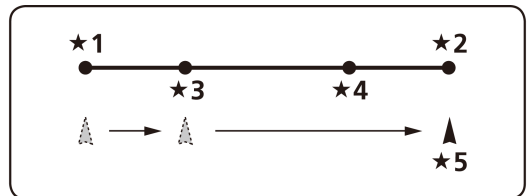
★1 From largest chainring to smallest chainring

★2 From smallest chainring to largest chainring

(A) Lever [a]

(B) Lever [b]

When the lever [a] is operated



★1 Low

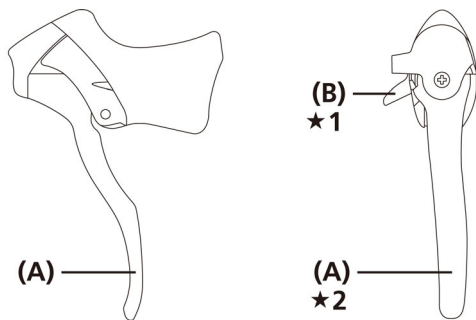
★2 Top

★3 L-trim

★4 T-trim

★5 Cable index point

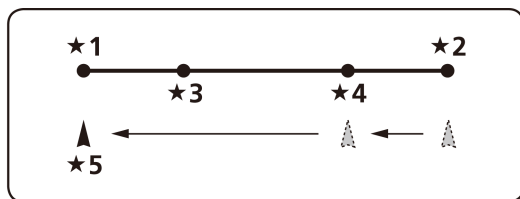
Front shifting (Thumb release type)



- ★1 From largest chainring to smallest chainring
- ★2 From smallest chainring to largest chainring

(A) Lever [a]
 (B) Lever [b]

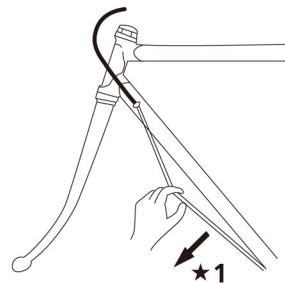
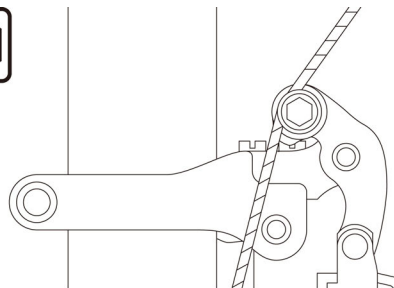
When the lever [b] is operated



- ★1 Low
- ★2 Top
- ★3 L-trim
- ★4 T-trim
- ★5 Cable index point

■ Securing the cable

1. Check that the lever [b] is released to the low position by operating it 2 or more times before fixing the inner cable.
2. After fixing the cable, remove the initial extension from the cable as shown in the illustration. After that, fix the cable again on the front derailleur.

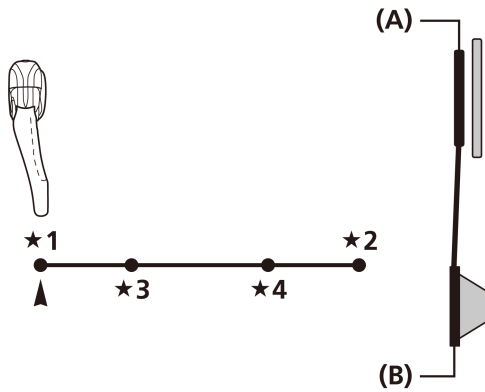


★1 Pull

Tightening torque
5mm Allen key
6 - 7 N·m
{53 - 61 in. lbs.}

Low adjustment

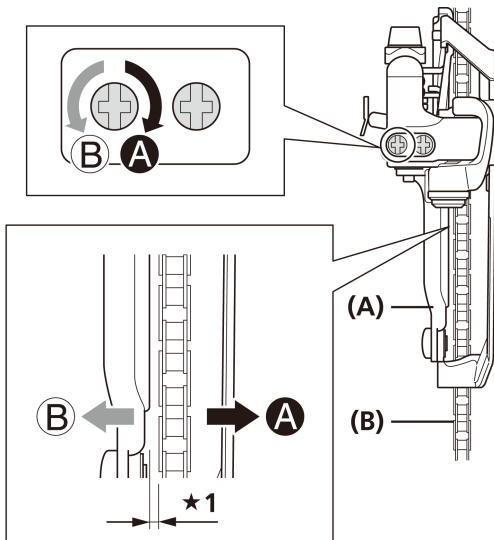
1. Set the chain on the smallest chainring at the front and the largest sprocket at the rear.



- ★1 Low
- ★2 Top
- ★3 L-trim
- ★4 T-trim

(A) Smallest chainring
(B) Largest sprocket

2. Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5mm.

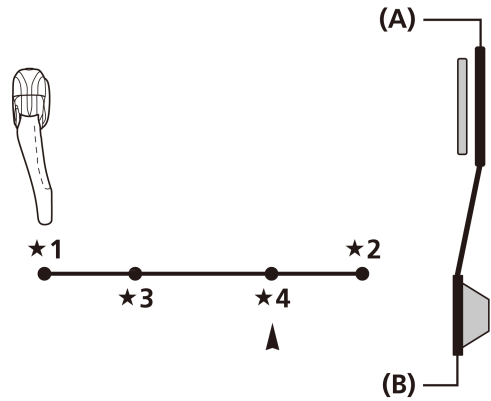


- ★1 0 - 0.5mm

(A) Chain guide inner plate
(B) Chain

Adjustment of the cable tension

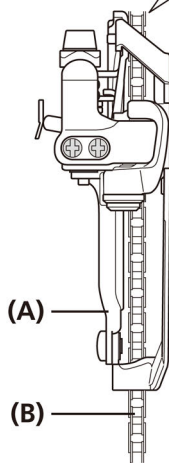
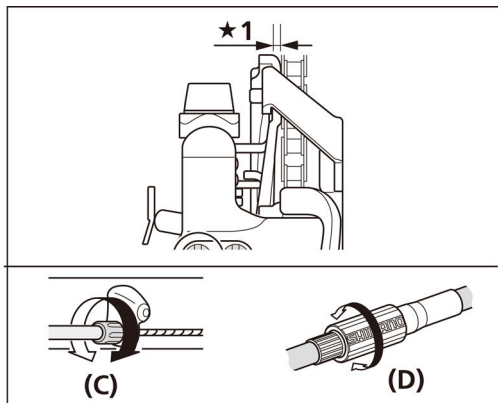
1. Set the chain onto the largest chainring and the largest sprocket.



- ★1 Low
- ★2 Top
- ★3 L-trim
- ★4 T-trim

(A) Largest chainring
(B) Largest sprocket

2. Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5mm.

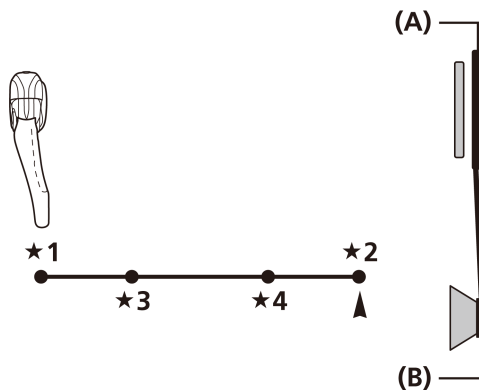


★1 0 - 0.5mm

- (A) Chain guide inner plate
- (B) Chain
- (C) Cable adjustment barrel
- (D) Cable adjuster

■ Top adjustment

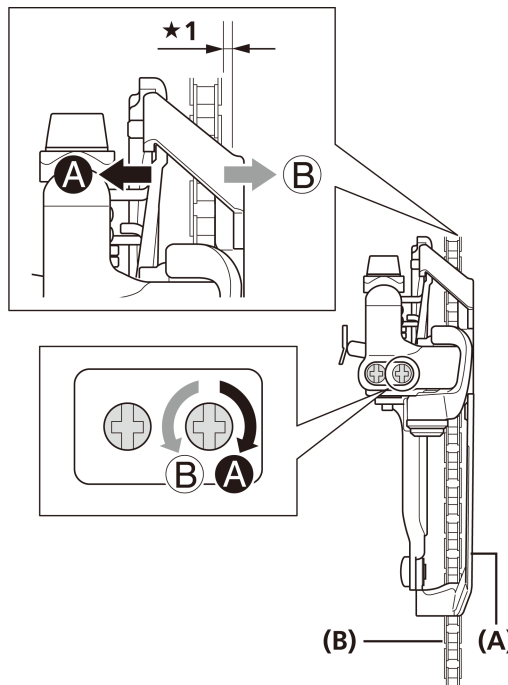
1. Set the chain on the largest chainring at the front and the smallest sprocket at the rear.



- ★1 Low
- ★2 Top
- ★3 L-trim
- ★4 T-trim

- (A) Largest chainring
- (B) Smallest sprocket

2. Set so that the clearance between the chain guide outer plate and the chain is 0 – 0.5mm.



★1 0 - 0.5mm

- (A) Chain guide outer plate
- (B) Chain

■ Troubleshooting chart

After low adjustment, fixing the cable, cable tension adjustment and top adjustment, operate the shifting lever to check the shifting.

(This also applies if shifting becomes difficult during use.)

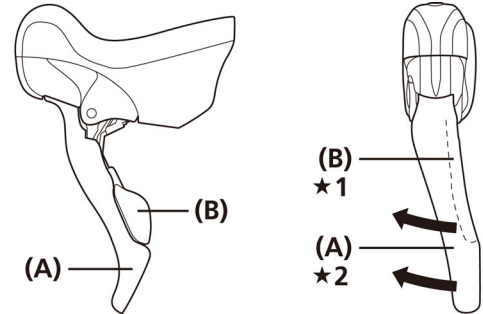
* Turn the bolt by 1/8th turn for each adjustment.

If the chain falls to the crank side.
Turn the top adjustment bolt clockwise.
If shifting is difficult from the smallest chainring to the largest chainring.
Tighten the cable. If this does not improve the situation, turn the top adjustment bolt counterclockwise.
If shifting is difficult from the largest chainring to the smallest chainring.
Turn the low adjustment bolt counterclockwise.
If the chain falls to the bottom bracket side.
Turn the low adjustment bolt clockwise.

Fixing the cable and adjusting the SIS (Front triple)

■ Lever operation and cable index point

Front shifting (Standard type)



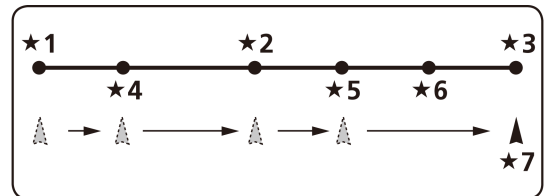
★1 From largest chainring to smallest chainring

★2 From smallest chainring to largest chainring

(A) Lever [a]

(B) Lever [b]

When the lever [a] is operated



★1 Low

★2 Middle

★3 Top

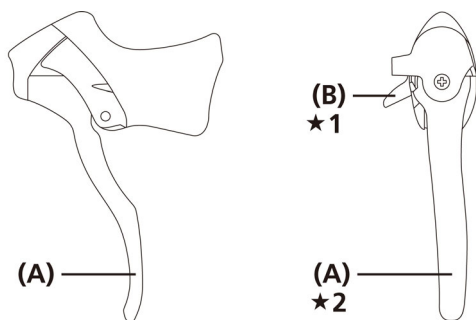
★4 L-trim

★5 M-trim

★6 T-trim

★7 Cable index point

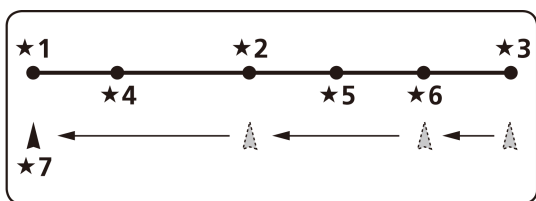
Front shifting (Thumb release type)



- ★1 From largest chainring to smallest chainring
- ★2 From smallest chainring to largest chainring

(A) Lever [a]
(B) Lever [b]

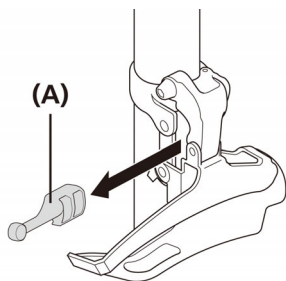
When the lever [b] is operated



- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 L-trim
- ★5 M-trim
- ★6 T-trim
- ★7 Cable index point

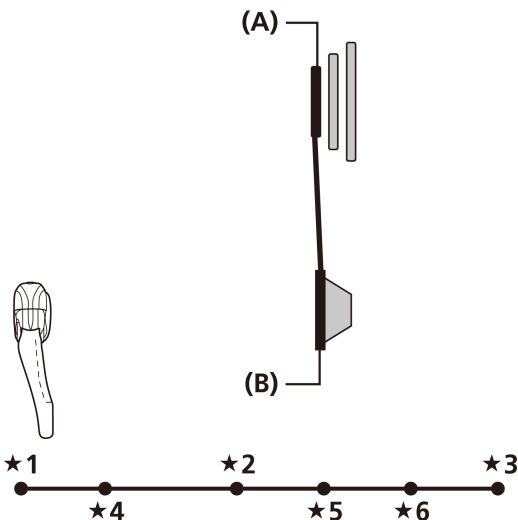
Low adjustment

1. Remove the Pro-Set alignment block.



(A) Pro-Set alignment block

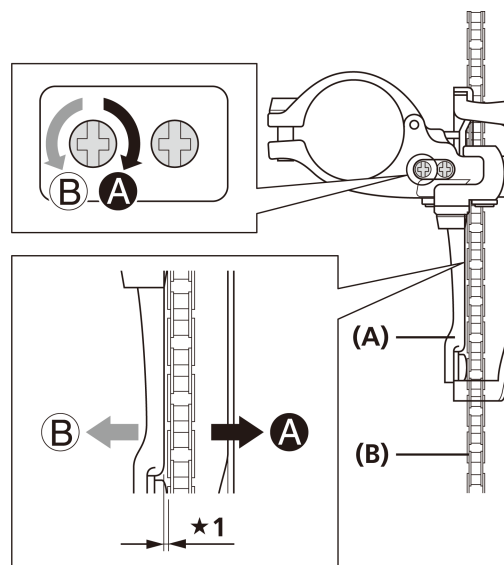
2. Set the chain on the smallest chainring at the front and the largest sprocket at the rear.



- ★7
- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 L-trim
- ★5 M-trim
- ★6 T-trim
- ★7 Cable index point

(A) Smallest chainring
(B) Largest sprocket

3. Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5mm.

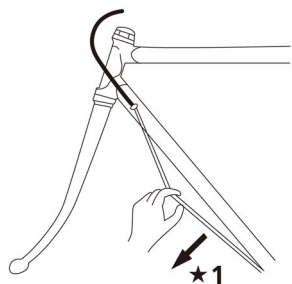
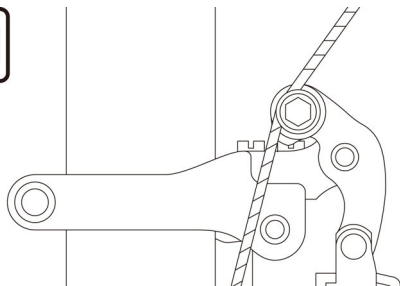


★1 0 – 0.5mm

(A) Chain guide inner plate
(B) Chain

■ Securing the cable

1. Check that the lever [b] is released to the low position by operating it 3 or more times before fixing the inner cable.
2. After fixing the cable, remove the initial extension from the cable as shown in the illustration. After that, fix the cable again on the front derailleur.



★1 Pull

Tightening torque

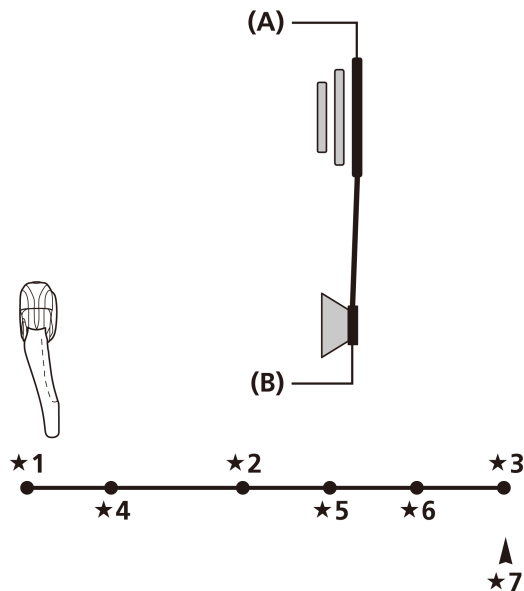
5mm Allen key

6 - 7 N·m

{53 - 61 in. lbs.}

■ Top adjustment

1. Set the chain on the largest chainring at the front and the smallest sprocket at the rear.

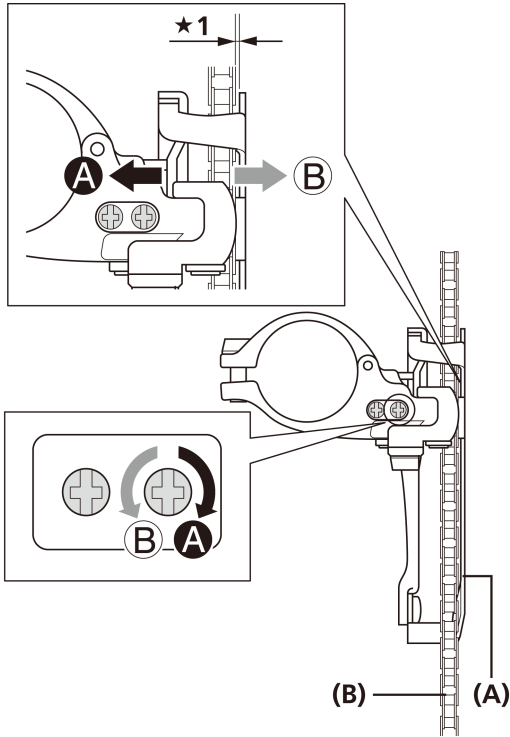


- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 L-trim
- ★5 M-trim
- ★6 T-trim
- ★7 Cable index point

(A) Largest chainring

(B) Smallest sprocket

2. Set so that the clearance between the chain guide outer plate and the chain is 0 – 0.5mm.

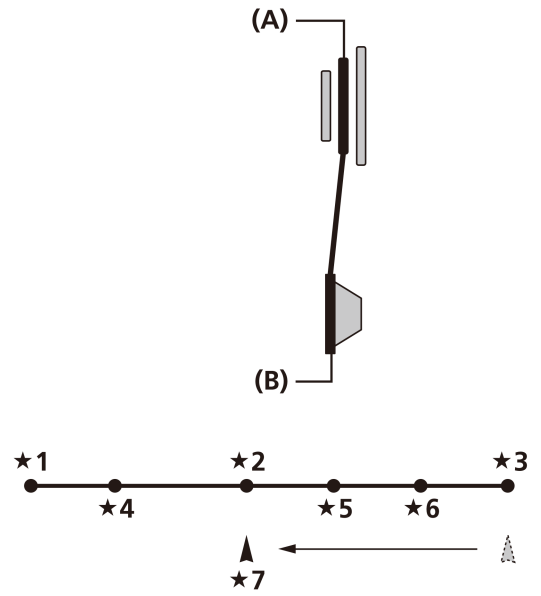


★1 0 - 0.5mm

(A) Chain guide outer plate
(B) Chain

■ Adjustment of the cable tension

1. Set the chain onto the middle chainring and the largest sprocket.

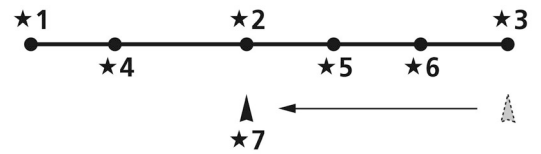


- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 L-trim
- ★5 M-trim
- ★6 T-trim
- ★7 Cable index point

(A) Middle chainring
(B) Largest sprocket

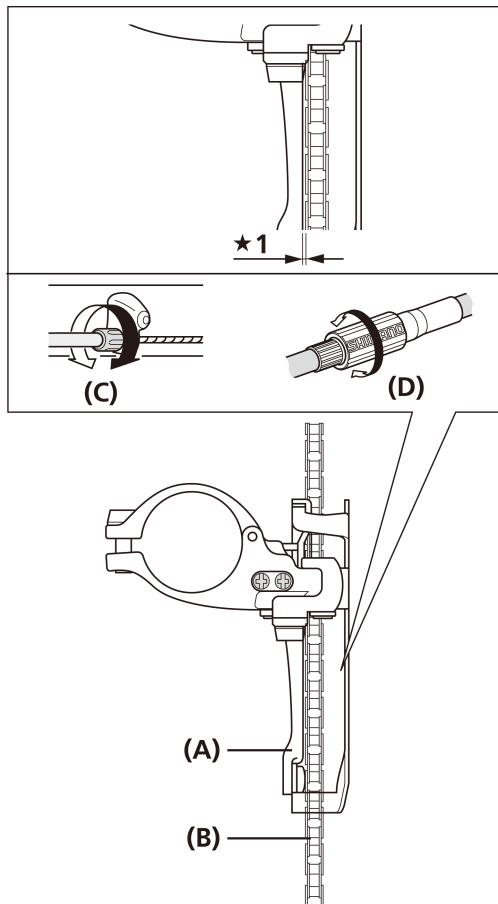
NOTE

Adjust the lever after operating it from top to middle, not low to middle.



- ★1 Low
- ★2 Middle
- ★3 Top
- ★4 L-trim
- ★5 M-trim
- ★6 T-trim
- ★7 Cable index point

2. Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5mm.



★1 0 - 0.5mm

- (A) Chain guide inner plate
 (B) Chain
 (C) Cable adjustment barrel
 (D) Cable adjuster

■ Troubleshooting chart

After low adjustment, fixing the cable, cable tension adjustment and top adjustment, operate the shifting lever to check the shifting.

(This also applies if shifting becomes difficult during use.)

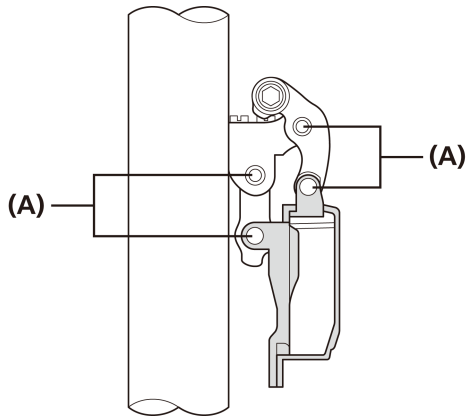
* Turn the bolt by 1/8th turn for each adjustment.

If the chain falls to the crank side.
Turn the top adjustment bolt clockwise.
If shifting is difficult from the middle chainring to the largest chainring.
Tighten the cable. If this does not improve the situation, turn the top adjustment bolt counterclockwise.
If shifting is difficult from the largest chainring to the middle chainring.
Loosen the cable.
If the chain falls to the bottom bracket side.
Turn the low adjustment bolt clockwise.
If the middle chainring is skipped when shifting from the largest chainring.
Tighten the cable.
If shifting is difficult from the middle chainring to the smallest chainring.
Turn the low adjustment bolt counterclockwise.

MAINTENANCE

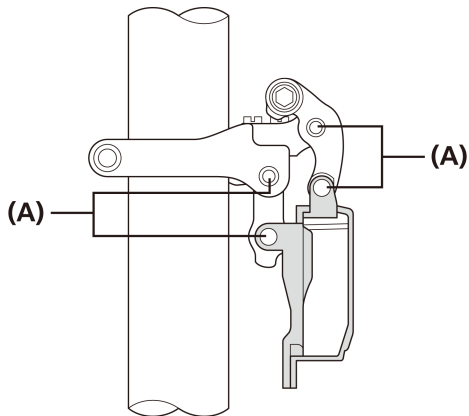
If shifting operation becomes less smooth, clean the front derailleur and lubricate the link sections shown in the illustration.

Brazed-on type



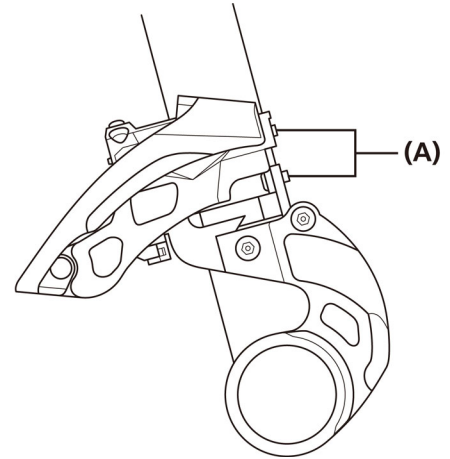
(A) Link

Band type



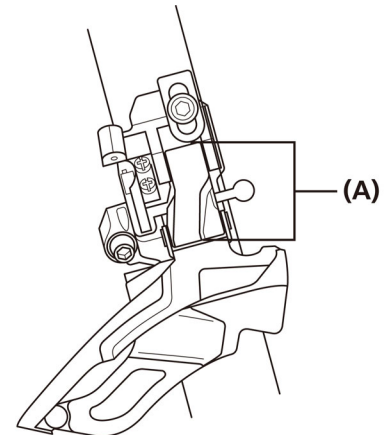
(A) Link

Type E



(A) Link

Direct mount type



(A) Link

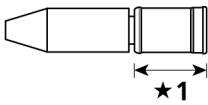
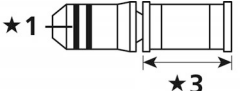
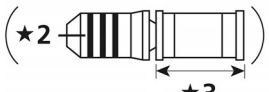
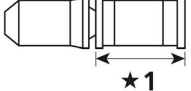

CHAIN

TO ENSURE SAFETY

⚠ WARNING

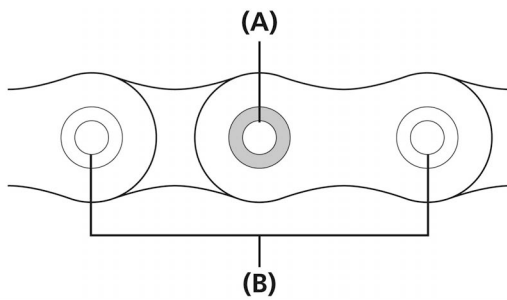
“Intervals between maintenance depend on the use and riding circumstances. Clean the chain with an appropriate chain cleaner regularly. Never use alkali based or acid based solvents, such as rust cleaners. If those solvent be used chain might break and cause serious injury.”

- In order to obtain good gear shifting performance, CN-HG900-11/HG700-11/HG600-11, CN-M981/HG95/HG75/HG54, CN-7901/6701/5701/4601, CN-E6090-10 have a forward side and a reverse side, and the sides are marked so that the chain will face the correct way when installed. For best chain performance make sure it is installed to face the correct way. If it is installed so that it faces the opposite way, the chain may come off and the bicycle may fall over and serious injury may occur as a result.
- Check the chain for any damage (deformation, cracks, or corrosion), elongation due to wear, skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency. If you continue to ride the bicycle in such a condition, the chain may break causing the bicycle to fall, and serious injury may result.
- Only use the tool and connecting pin models specified in the table to connect the chain. If unsuitable connecting pins or tools are used to connect the chain, the connecting pin force may not be sufficient, which could cause the chain to break or fall off.

Chain	Connecting pin	Tool
11-speed CN-9000/6800 CN-HG900-11/HG700-11/HG600-11	 ★1 5.8mm	TL-CN34 TL-CN28
For MTB/Trekking/E-BIKE 10-speed super narrow chain CN-M981/HG95/HG75/HG54/ E6090-10 (CN-M980/HG94/HG74 EOL)	 ★1 with groove [2]	TL-CN34 TL-CN33 TL-CN32 TL-CN28 TL-CN27
For ROAD double crank 10-speed super narrow chain Such as CN-7901/6701/5701/4601	 ★2 with groove [3]	
For ROAD triple crank 10-speed super narrow chain Such as CN-7801/6600/5600	★3 5.85mm	
9-speed super narrow chain Such as CN-YM81/7701/HG93/E6070-9	 ★1 6.5mm	Silver
8/7/6-speed narrow chain Such as CN-HG50/HG40	 ★1 7.1mm	Black

TO ENSURE SAFETY

- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut in a place other than where the chain has been joined using a reinforced connecting pin. The chain will be damaged if it is cut at a place where it is joined with a reinforced connecting pin.

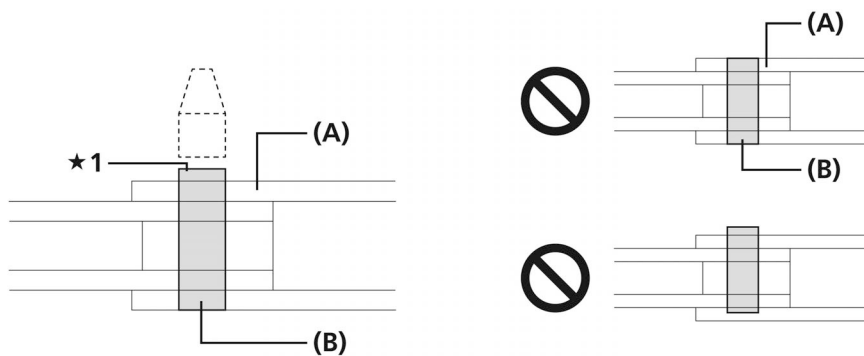


(A) Reinforced connecting pin
(B) Link pin

- When readjusting the length of the chain, be sure to insert the reinforced connecting pin from the same side as the chain cutter was inserted (the same direction as when the chain was cut).

11/10-speed chain (ampoule pin type)

- Make sure that the connecting pin is as shown in the illustrations after adjustment. (The pin will protrude slightly after the break off pin is removed)

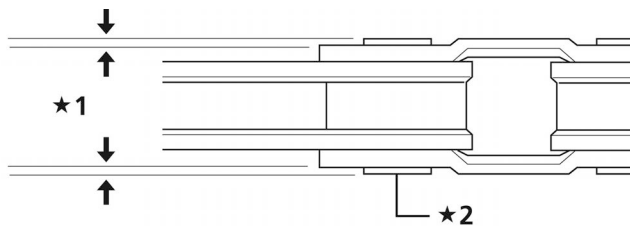


★1 Slightly protruding

(A) Link surface
(B) Connecting pin

9/8/7/6-speed chain

- Be sure to check that the connecting pin protrudes equally from both sides of the chain after it has been joined.



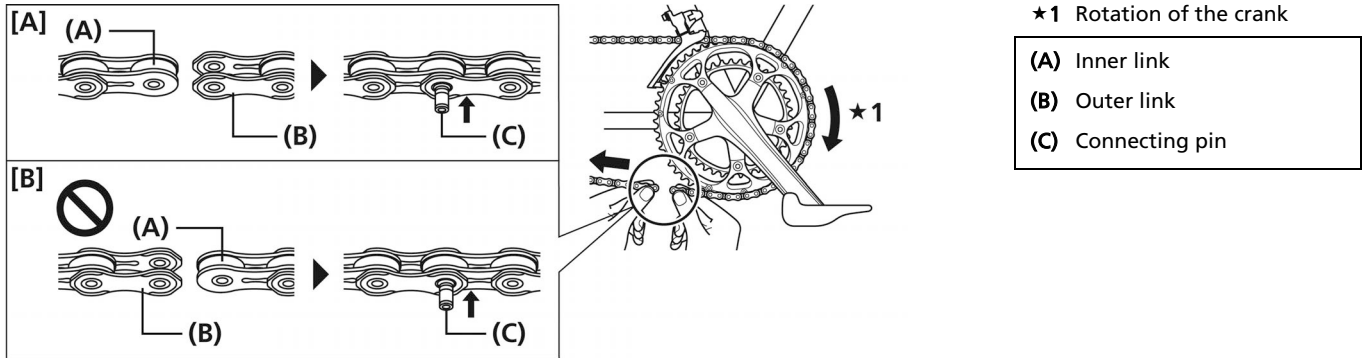
★1 Should be uniform

★2 Connection location

NOTE

- CN-E6090-10/CN-E6070-9 can be used only in combination with single front chainrings.
- As illustrated in Fig. [A], we strongly recommend to set the connecting pin in the hole of the outer link on the front side in the direction of travel.

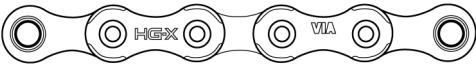
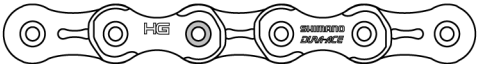
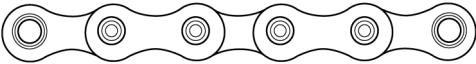

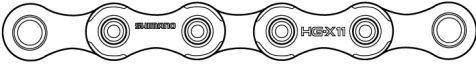
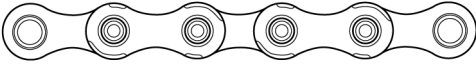
The chain's level of strength is enhanced compared to the method in Fig. [B].



- 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.

For the CN-HG900-11/HG700-11/HG600-11, CN-M981/HG95/HG75/HG54, CN-7901/6701/5701/4601, CN-E6090-10

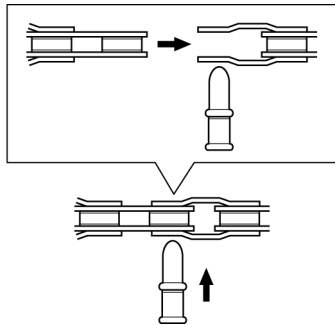
- In order to achieve good gear shifting performance, these have a forward side and a reverse side and must be fitted in the correct orientation.
- * The side with the mark shown in the illustration is the forward side (outer side).

<p>CN-M981/HG95/HG75/HG54/E6090-10 (CN-M980/HG94/HG74 EOL)</p>	<p>CN-7901/6701/5701/4601</p>
<p>Forward (outer side)</p> 	<p>Forward (outer side)</p> 
<p>Reverse (inner side)</p> 	<p>Reverse (inner side)</p> 
<p>CN-HG900-11/HG700-11/HG600-11</p>	
<p>Forward (outer side)</p> 	
<p>Reverse (inner side)</p> 	

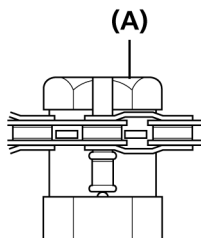
CHAIN CONNECTING PIN

Method of use

1. Insert

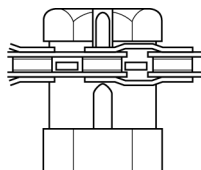


2. Press

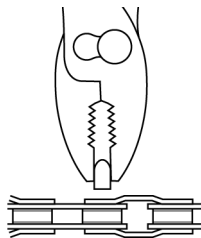


(A) Chain tool

3. After pressing

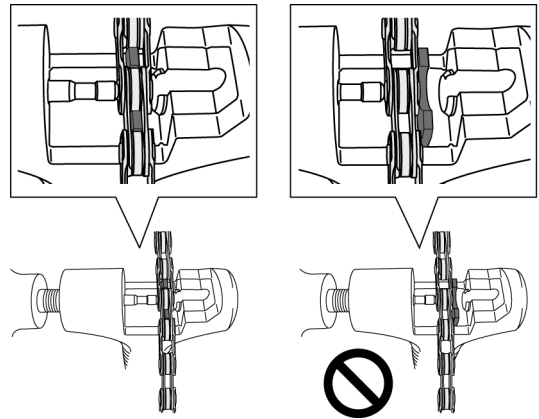


4. Break off the excess portion



NOTE

Set the chain on the chain cutting tool as shown in the illustration when using the chain cutting tool. If the tool is used with the chain set incorrectly, the positioning plate will get damaged.



QUICK-LINK

⚠ WARNING

- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut at some other place than the place where the chain has been joined using a QUICK-LINK. The chain cutter will be damaged if the chain is cut at a place where it has been joined with a QUICK-LINK.
- If an already-used QUICK-LINK is used again, the chain may break and serious injury due to accidents may result, so always be sure to use a brand-new QUICK-LINK.
- **Be sure to follow the instructions provided in the manuals when installing the product.**
It is recommended to use genuine Shimano parts only. If adjustments are not carried out correctly, the chain may come off and this may cause you to fall off the bicycle which could result in serious injury.

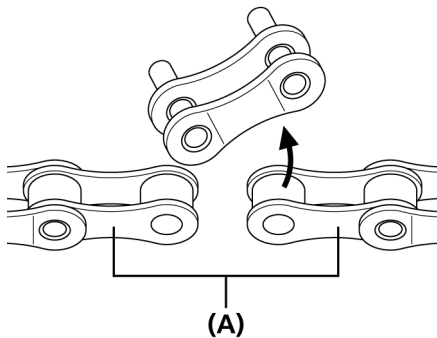
Compatible chains: Shimano 6/7/8-speed

Model No.	
QUICK-LINK	Chain
SM-UG51	CN-HG91
	CN-HG71
	CN-HG50
	CN-HG40
	CN-UG51

- Read these instructions carefully, and keep them in a safe place for later reference.

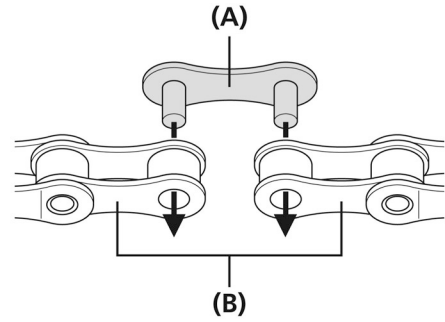
Installing QUICK-LINK

1. Remove the outer link at the connection location so that both ends of the chain finish at an inner link.



(A) Inner link

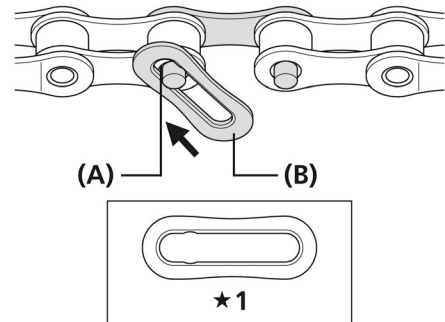
2. Insert the connecting link with pins section of the QUICK-LINK as shown in the illustration.



(A) Connecting link with pins

(B) Inner link

3. Place the connecting link with hole onto one of the pins, and then slide the connecting link so that the pin is at the other end from the hole. (The side of the link plate with the depression should be facing toward the outside at this time.)

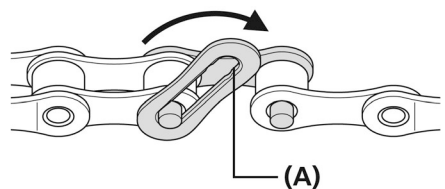


★1 Depression should be on the outside

(A) Hole

(B) Connecting link with hole

4. Turn the connecting link with hole until it overlaps the other pin.

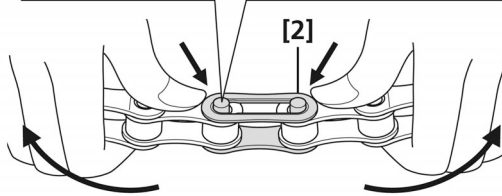
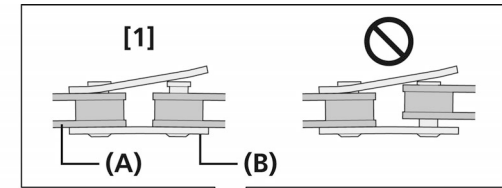


(A) Hole

- 5.** Loosen the chain and insert the pin securely into the hole.

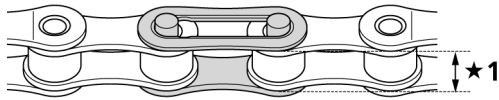
There should be no gap between the connecting link with pins and the inner link **[1]**.

Insert the pins into the hole while pushing the connecting link with hole **[2]**.



(A) Inner link
(B) Connecting link with pins

- 6.** Set both pins securely into the slot of the connecting link with hole, and check that both plates are parallel.



★1 Parallel

BRAKE

TO ENSURE SAFETY



WARNING

- **Obtain and read the dealer's manual carefully prior to installing the parts.**

Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. It is strongly recommended using only genuine Shimano replacement parts.

For Disc Brake

- If the disc brake rotor is cracked or warped, be sure to replace it with a new disc brake rotor.
- If the disc brake rotor becomes worn down to a thickness of 1.5mm or so that the aluminum surface becomes visible, be sure to replace the disc brake rotor with a new one.
- If any oil or grease gets on the pads, replace the pads. If any oil or grease gets on the disc brake rotor, wipe clean the disc brake rotor. Otherwise, the brakes may not work correctly.

For Hydraulic Disc Brake

- Use only Shimano genuine mineral oil. If other types of oil are used, it may cause problems with brake operation, and cause the system to be unusable.
- Be sure to use only oil from a freshly-opened container. Do not re-use oil which has been drained from the bleed nipple. Old or reused oil may contain water, which could cause vapor lock in the brake system.
- Be careful not to let water or air bubbles get into the brake system. Otherwise vapor locks may occur. Be particularly careful when removing the bleed screws.
- If cutting the brake hose in order to adjust the length of the hose, or when changing over the brake hose from left to right or vice versa, be sure to bleed the air from the hose by carrying out steps (4), (8) to (12) given in "Adding mineral oil and bleeding air".

- The disc brake is not designed to work when the bicycle is upside down. If the bicycle is turned upside down or on its side, the brake may not work correctly, and a serious accident could occur. Before riding the bicycle, be sure to operate the brake lever a few times to check that the brakes operate normally. If the brakes do not operate normally, stop using the brakes and consult a dealer or an agency.

If brake operation is sluggish when the lever is depressed

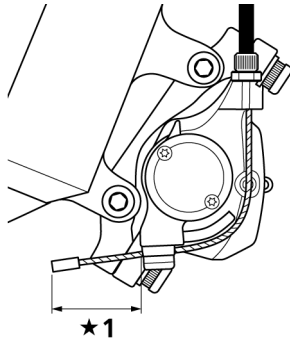
Gently depress the brake lever several times and wait for the bubbles to return to the reservoir tank. It is recommended that you then remove the bleed screws and fill the reservoir tank with mineral oil until no air bubbles remain.

If the brakes are still sluggish, bleed the air from the brake system. (Refer to "Adding mineral oil and bleeding air".)

- If the quick release lever is on the same side as the disc brake rotor, there is the danger that it may interfere with the disc brake rotor, so check that it does not interfere.
- Shimano disc brake systems are not compatible with tandem bicycles. Because tandem bicycles are heavier, the stress on the brake system increases during brake operation. If hydraulic disc brakes are used with tandem bicycles, the oil temperature will become too high and vapor locks or ruptures in the brake hoses may occur, causing the brakes to fail.
- If fluid leaks occur, immediately stop using the brakes and carry out the appropriate repairs. If you continue riding the bicycle while fluid is leaking, there is the danger that the brakes may suddenly stop working.

For Mechanical Disc Brake

- Adjust the inner cable so that the protruding length is less than 20mm (3/4 inch). If the protruding length is any longer, the end of the inner cable may become stuck in the disc brake rotor, which could cause the wheel to lock and the bicycle could fall forward causing serious injuries.



★1 Less than 20mm

- Be careful not to allow any oil or grease to get onto the disc brake rotor and brake pads. Otherwise the brakes may not work correctly.

For V-BRAKE/Caliper Brake

- Brakes designed for use as rear brakes should not be used as front brakes.
- Be careful not to allow any oil or grease to get onto the brake shoes. If any oil or grease do get on the shoes, you should replace the shoes. Otherwise the brakes may not work correctly.

For caliper brakes

- Securely tighten the caliper brake mounting nuts to the specified tightening torque.
 - Use lock nuts with nylon inserts (self-locking nuts) for nut-type brakes.
 - For sunken nut type brakes, use sunken nuts of the appropriate length which can be turned six times or more. When re-installing, apply sealant (locking adhesive) to the nut threads.

If the nuts become loose and the brakes fall off, they may get caught up in the bicycle and the bicycle may fall over.

Particularly if this happens with the front wheel, the bicycle may be thrown forward and serious injury could result.

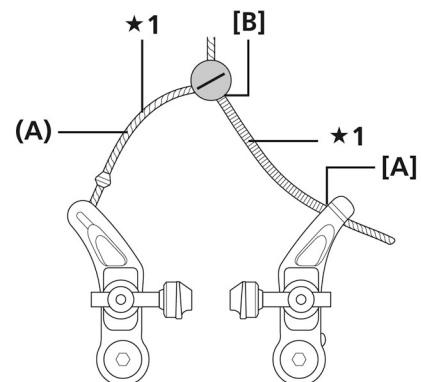
- Check the brake cable for rust and fraying, and replace the cable immediately if any such problems are found. Otherwise, the brakes may not work correctly.

For Canti Brake

- Brake handling may vary slightly by model. Therefore, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. Improper use of your bicycle's brake system may result in loss of control or an accident, which could also lead to severe injury. For proper operation, consult a professional bicycle dealer or the bicycle's owner's manual. It is also important to practice riding and braking, etc.

- For the unit link type of cantilever brake, the brake performance that the brake was designed to produce can be obtained if the mark in the center of the cable carrier is directly in line with the link wire. However, if the cable is bent with excessive force, it will hinder the smooth transmission of braking force, or it might make the cable rub against the frame or cause sharp bends in the cable, which will in turn cause the cable to break easily.

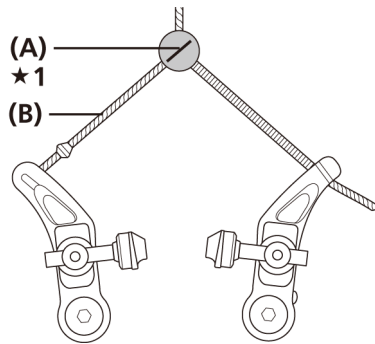
In addition, if the unit link is forcibly set to the condition shown in the illustration, sufficient braking force will not be obtained and excessive force will be applied at points [A] and [B], which will also cause the cable to break easily.



★1 Unit link is curved

[A] Link wire

Accordingly, always make sure that the mark in the center of the cable carrier is directly in line with the link wire as shown in the illustration when the brake cable is being installed.



★1 Mark and link wire should be directly in line

(A) Mark

(B) Link wire

CAUTION

For Hydraulic Disc Brake

- Resin pads are designed to reduce the amount of noise generated between the pads and the disc brake rotor when the brakes are operated. A longer run-in period is required than for metal pads.

Handling the mineral oil

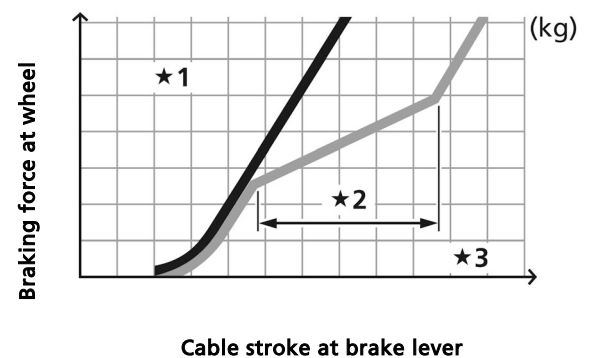
- Use safety glasses when handling, and avoid contact with eyes. Contact with eyes may result in irritation. In the event of eye contact, flush with fresh water and seek medical assistance immediately.
- Use gloves when handling. Contact with skin may cause a rash and discomfort. In the event of contact with skin, wash well with soap and water.
- Inhalation of oil mist or vapors may cause nausea. Cover nose and mouth with a respirator type mask and use in a well ventilated area. If mist or vapor is inhaled, go immediately to an area with fresh air, cover up with a blanket, stay warm and stable and seek professional medical advice.
- Do not drink. May cause vomiting or diarrhea.
- Keep out of reach of children.
- Do not cut, let near heat, weld or pressurize the oil container, as this may cause explosion or fire.
- Disposal of Used Oil : Follow local county and/or state codes for disposal. Use caution when preparing the oil for disposal.

- Directions: Keep the container sealed to prevent foreign objects and moisture from getting inside, and store it in a cool, dark area away from direct sunlight or heat.

For V-BRAKE brakes

- The power modulator is a device that makes it easier to control braking by increasing the brake lever's cable stroke within a certain range of braking force. If the effective operating range of the power modulator is exceeded, the lever stroke and the brake will operate as V-BRAKE (responsive and powerful). In that case, the brakes may operate more powerfully than intended and may cause the wheel to lock up. Therefore it is essential that you fully understand and test the performance of the power modulator before use. **The power modulator is not equipped with a function to prevent the wheel from locking up.**

Braking Performance Comparison



★1 w/o power modulator

★2 Effective operating range of the power modulator

★3 w/ power modulator

NOTE

For Hydraulic Disc Brake

- If the brake lever is depressed without the pad spacers installed, the pistons will protrude further than normal. Use a flat-tipped screwdriver or similar tool to push back the brake pads, while being careful not to damage the surfaces of the brake pads. (If the brake pads are not installed, use a flat-shaped tool to push the pistons straight back in, while being careful not to damage them.) If it is difficult to push the brake pads or pistons back, remove the bleed screws and try again. (Note that some oil may overflow from the reservoir tank at this time.)
- Use isopropyl alcohol, soapy water or a dry cloth when cleaning and carrying out maintenance of the brake system. Do not use commercially-available brake cleansers or silencing agents, as they can cause damage to parts such as seals.
- Do not remove the pistons when disassembling the calipers.

For Mechanical Disc Brake

- If the brake caliper mounting boss and the fork end are not parallel, the disc brake rotor and caliper may touch.

For V-BRAKE brakes

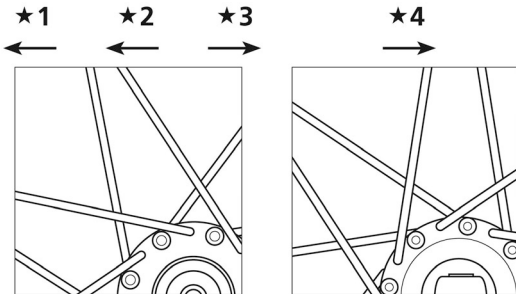
- The Multi-Condition Brake System can reach maximum efficiency if the brakes and brake levers are used in the recommended combinations.
- If the brake shoes have worn down to where the grooves are no longer visible, they should be replaced.

DISC BRAKE

Wheel spoke lacing

1. Check that the spokes have been laced as shown in the illustration.

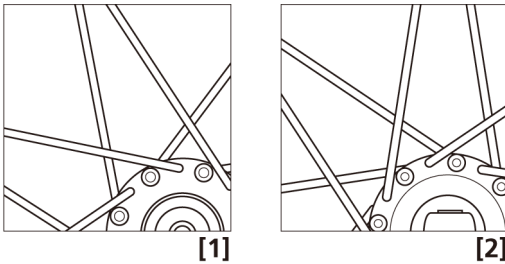
Rotating direction of wheel



- ★1 Front left
- ★2 Rear left
- ★3 Rear right
- ★4 Front right

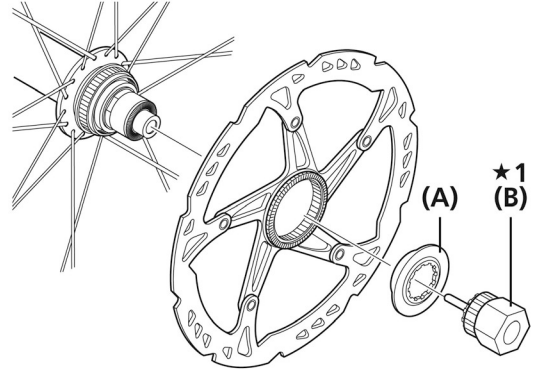
NOTE

A radial assembly cannot be used.
 Refer to [1] for spoke arrangement of the left side of the front wheel (disc brake rotor mounted side) and both sides of the rear wheel; refer to [2] for spoke arrangement of the right side of the front wheel.



Installation of the disc brake rotor

■ For center lock type



★1 Adjustable wrench

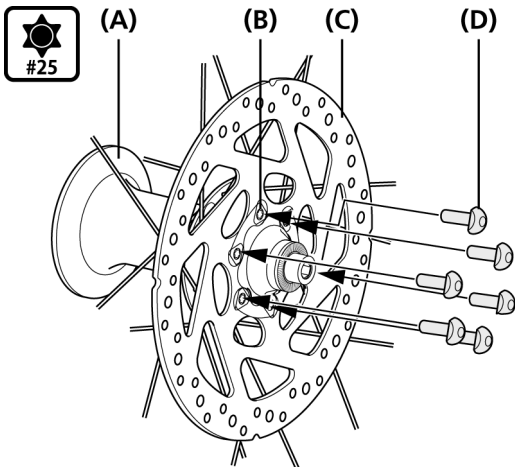
- (A) Rotor fixing lock ring
- (B) TL-LR15

Tightening torque

TL-LR15
 Adjustable wrench
40 - 50 N·m
{350 - 437 in. lbs.}

■ For 6-bolt type

1. Install the disc brake rotor and the disc brake rotor tightening plate to the hub, and then install and tighten the bolts.

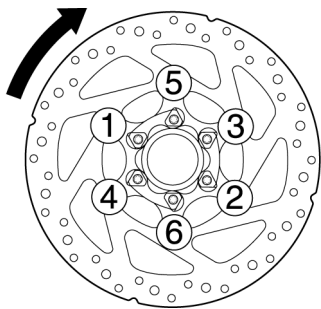


- (A) Hub
- (B) Tightening plate
- (C) Disc brake rotor
- (D) Rotor fixing bolt

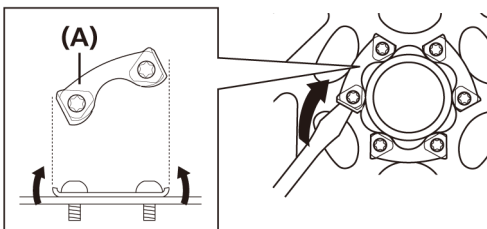
Tightening torque

Hexalobular[#25]
2 - 4 N·m
{18 - 34 in. lbs.}

2. Wear gloves and turn the disc brake rotor clockwise with some force. While doing this, tighten the rotor fixing bolts in the order shown in the illustration.



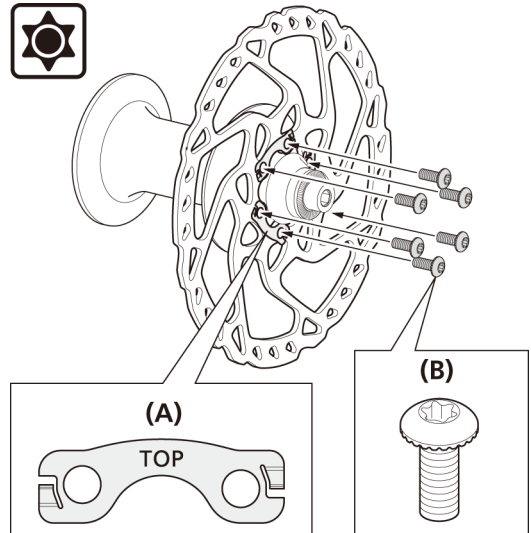
3. Use a slotted screwdriver or similar tool to bend the edges of the tightening plate over the heads of the bolts.



- (A) Tightening plate

■ For 6-bolt type (with lock washer)

1. Install the disc brake rotor and rotor lock washers to the hub and tighten the bolts.



- (A) Lock washer
- (B) Rotor fixing bolt

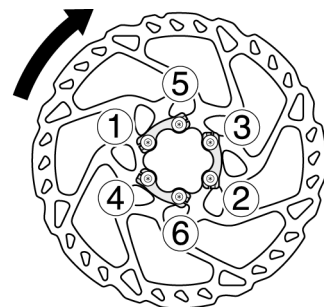
Tightening torque

Hexalobular
2 - 4 N·m
{18 - 34 in. lbs.}

NOTE

- Fit the lock washers so that the marking "TOP" is visible.
- The lock washers are not reusable. Always use new lock washers when installing/re-installing the disc brake rotor.
- Use the dedicated rotor fixing bolts.

2. Wear gloves and turn the disc brake rotor clockwise with some force. While doing this, tighten the rotor fixing bolts in the order shown in the illustration.



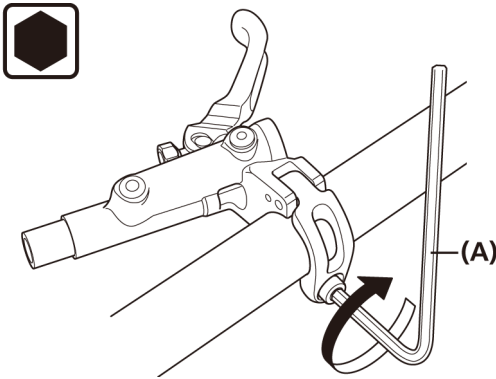
INSTALLATION (HYDRAULIC DISC BRAKES)

Installation of the brake lever

NOTE

When installing components to a carbon frame/handlebar, check the tightening torque recommended by the carbon frame or component manufacturer to avoid carbon material damage due to excessive tightening or insufficient component holding force resulting from insufficient tightening torque.

1. Secure the brake lever as shown in the illustration.



(A) Allen key

Tightening torque

Allen key
6 - 8 N·m
{53 - 69 in. lbs.}

BL-M987/BL-M9000/BL-M9020

Tightening torque

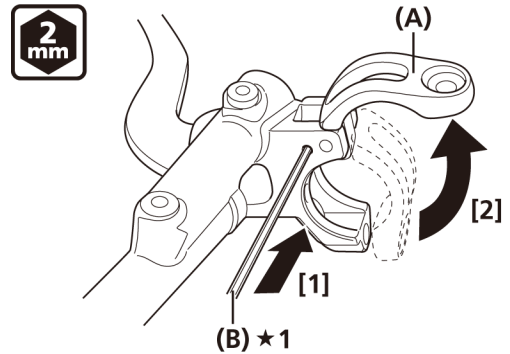
Allen key
4 - 6 N·m
{35 - 52 in. lbs.}

NOTE

Check that the brake lever does not interfere with the shifting lever during operation. Some types might require the shifting lever to be installed first, due to the position of the shifting lever fixing bolts.

For open clamp band type

Use a 2mm Allen key to open the clamp band of the brake lever as shown in the illustration.



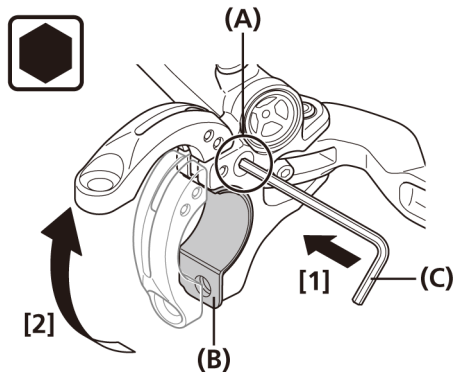
★1 Push

- (A) Clamp band
- (B) 2mm Allen key

NOTE

For models with the clamp band lock release hole on the outer side of the bracket body

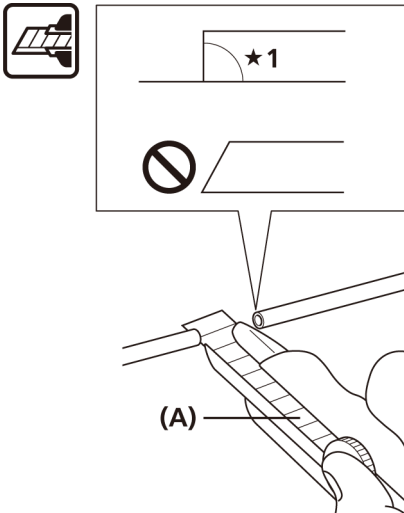
- When installing the brake lever, be sure to use a spacer.
- The spacer should only be removed when combining with an I-Spec II type shifting lever. For information on the combining procedure, refer to "shifting lever RAPIDFIRE Plus 11-speed" in the dealer's manual.



- (A) Lock release hole
- (B) Spacer
- (C) Allen key

Installation of the brake hose

1. Use a utility knife or similar tool to cut the hose.



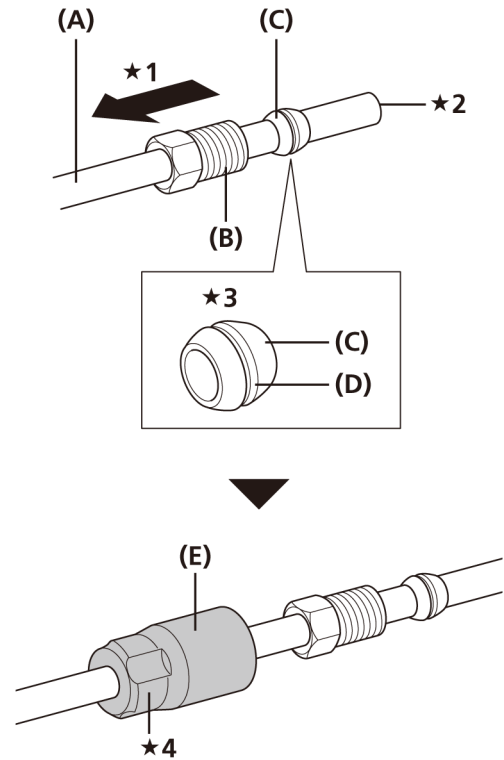
★1 90°

(A) Utility knife

NOTE

- Use the utility knife safely and correctly in accordance with its instruction manual.
- If you are using TL-BH62, refer to the manual accompanying the product.

2. Pass the brake hose through the connecting bolt and the olive as shown in the illustration.



★1 Direction of insertion

★2 Cut end

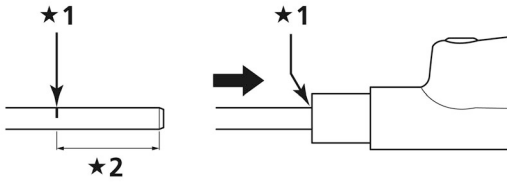
★3 Grease the outside of the olive.

★4 Attach the cover to the connecting bolt for the brake lever.

- (A) Hose
 (B) Connecting bolt
 (C) Olive
 (D) Premium grease
 (E) Cover

3. In order to check that the end of the brake hose are fitted securely into the base of the hose mounts of the calipers and brake lever, make marks on the hose beforehand as shown in the illustration.
(As a guide, the length of hose inside the mounts should be approximately 11 or 14mm, measured from the cut end of the hose.)

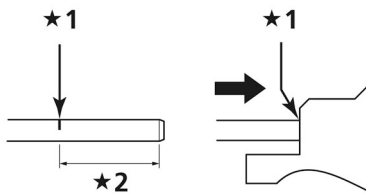
At brake lever end



- ★1 Mark
- ★2 Length

Model No.	Length	Type
SM-BH90-SB	11mm	Banjo type
SM-BH90-SS	11mm	Straight type
SM-BH59	14mm	Straight type
SM-BH59-A	11mm	Straight type
SM-BH80	14mm	Banjo type

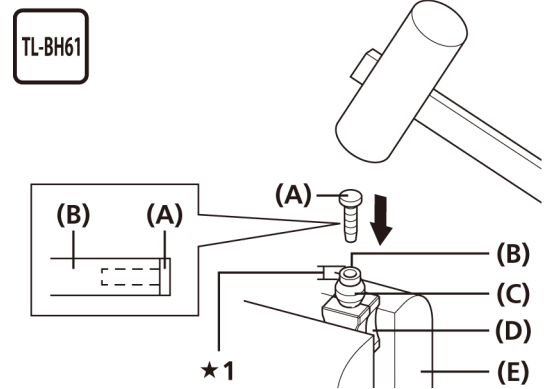
At caliper end



- ★1 Mark
- ★2 Length

Model No.	Length	Type
SM-BH90-SS	11mm	Straight type
SM-BH59	14mm	Straight type
SM-BH59-A	11mm	Straight type

4. Use an object such as a needle to smooth the inside of the cut end of the hose, and then install the connector insert. Attach the hose to the TL-BH61, as shown in the illustration, and secure the TL-BH61 in a vise. Then use a hammer or similar tool to knock the connector insert in firmly until the base of the connector insert touches the end of the hose. If the end of the hose is not touching the base of the connector insert, the hose may become disconnected or fluid leaks may occur.

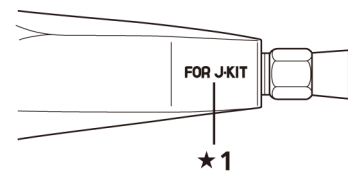


- ★1 SM-BH90: 1mm
- SM-BH59/BH80 (YM-BH81): 4mm

(A)	Connector insert
(B)	Hose
(C)	Olive
(D)	TL-BH61
(E)	Vise

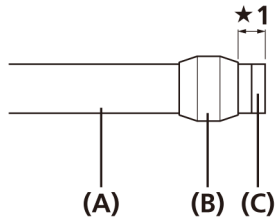
NOTE

If there is a marking as shown in the illustration, refer to the section "Replacing the brake hose (easy hose joint system)".



- ★1 Mark

5. After checking that the olive is positioned as shown in the illustration, apply premium grease to the threads of the connecting bolts and attach the hose to the brake lever as shown in the illustration.



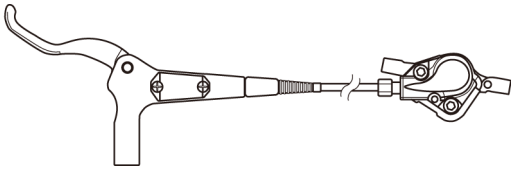
★1 SM-BH90: 2mm
SM-BH59/BH80 (YM-BH81): 5mm

(A) Hose
(B) Olive
(C) Connector insert

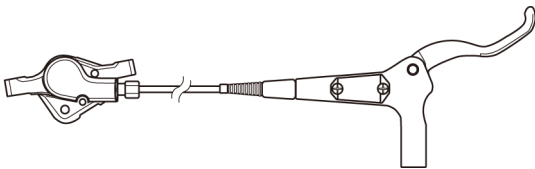
Model No.	Length	Color
SM-BH90	11.2mm	Silver
SM-BH59/80	13.2mm	Gold
YM-BH81	13.2mm	Silver

6. Make sure that the brake hose is not twisted. Make sure that the calipers and levers are in the positions shown in the illustrations.

Left lever

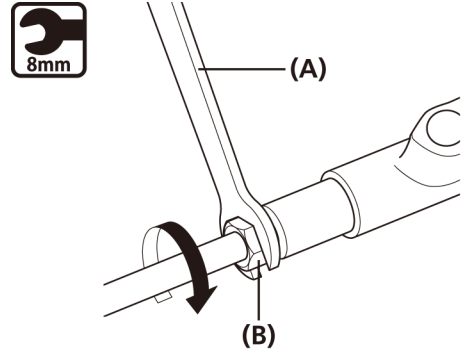


Right lever



7. While pushing the brake hose, tighten the connecting bolt.

At brake lever end

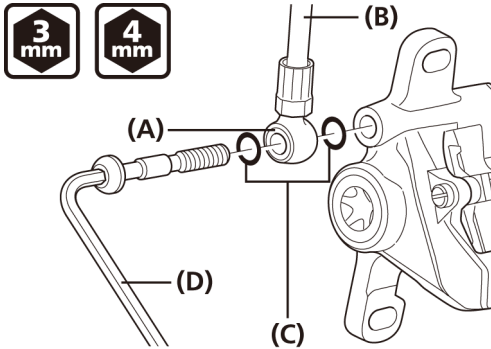


(A) 8mm spanner
(B) Connecting bolt

Tightening torque
8mm spanner
5 - 7 N·m
{44 - 61 in. lbs.}

■ At caliper end (Banjo type)

After checking that both O-rings are fitted in the top groove and bottom groove of the banjo, secure the banjo to the caliper as shown in the illustration. At this point, check that the O-rings are in the grooves. The O-rings are greased.



- (A) Banjo
- (B) Hose
- (C) O-ring
- (D) 3mm Allen key/4mm Allen key

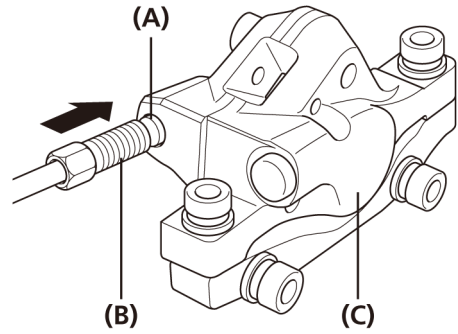
For 3mm Allen key

Tightening torque
3mm Allen key 5 - 7 N·m {44 - 61 in. lbs.}

For 4mm Allen key

Tightening torque
4mm Allen key 8 - 10 N·m {70 - 87 in. lbs.}

■ At caliper end (Straight type)



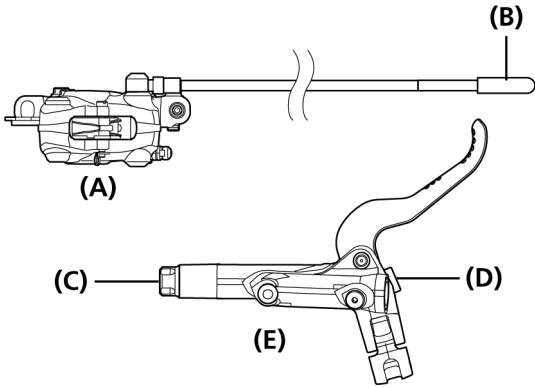
- (A) Olive
- (B) Connecting bolt
- (C) Caliper

Tightening torque
5 - 7 N·m {44 - 61 in. lbs.}

Installation of the brake hose (easy hose joint system)

This procedure for installation of the brake hose is directed at bicycle OEMs.

■ Overview of the easy hose joint system (For MTB)



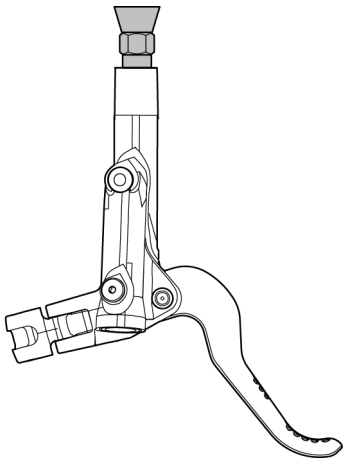
- (A) Brake caliper
- (B) Hose cap
- (C) Brake hose connection port
- (D) Lever stopper
- (E) Brake lever

1. Pass the brake hose through each hole in the built-in frame.

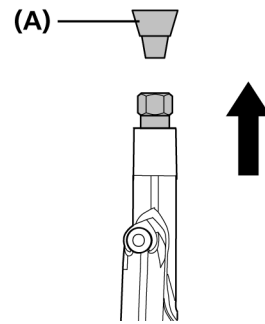
2. Remove the hose cap.



3. Secure the brake lever in a vise or another similar device. Face the hose connection port upward when securing the brake lever.

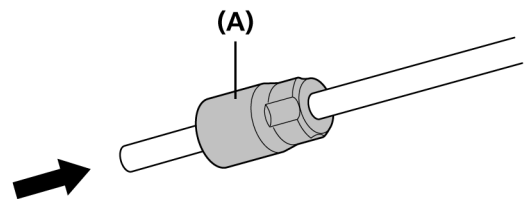


4. Remove the seal plug. Cover the seal plug with a waste cloth as the oil applied to the seal plug may leak.



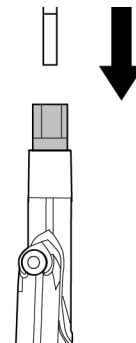
(A) Seal plug

5. Pass the brake hose through the hose cover.



(A) Hose cover

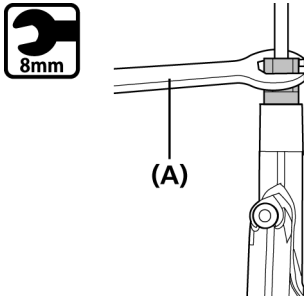
6. Insert the brake hose into the joint component. It comes with a built-in olive. Insert it while making sure that it will not get snagged on the olive. Check that the brake hose is inserted up to the line printed on the hose.



TECH TIPS

Use a waste cloth when inserting the brake hose as some oil inside may leak.

7. Tighten the connecting bolt with an 8mm spanner.

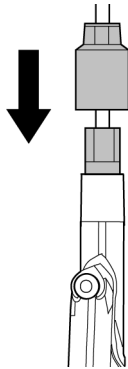


(A) 8mm spanner

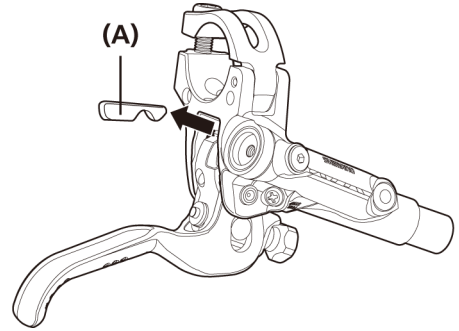
Tightening torque

8mm spanner
5 - 7 N·m
{44 - 61 in. lbs.}

8. Clean any oil residue and attach the hose cover.



9. Remove the brake lever stopper.



(A) Lever stopper

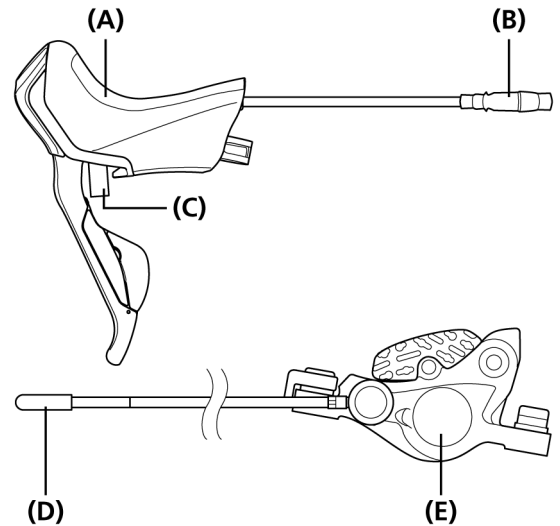
NOTE

After removing the lever stopper, check that the pad spacer is installed on the caliper side or that the caliper is installed to the bicycle and the disc brake rotor is between the two sides of the caliper, before depressing the lever. After installation to the bicycle, make sure to check that the lever stopper is removed.

TECH TIPS

Move and pull on the lever stopper to remove it while being careful not to depress the lever.

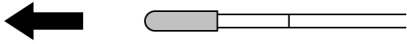
■ Overview of the easy hose joint system (For ROAD)



(A) Dual control lever
 (B) Joint sleeve
 (C) Lever stopper
 (D) Hose cap
 (E) Brake caliper

1. Pass the brake hose through each hole in the built-in frame.

2. Remove the hose cap.



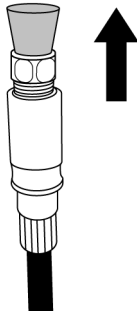
3. Secure the joint component in a vise or another similar device.

Face the hose connection port upward as shown in the illustration.

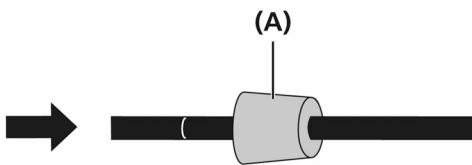


4. Remove the seal plug.

Cover the seal plug with a waste cloth as the oil applied to the seal plug may leak.



5. Pass the brake hose on the brake caliper side through the hose cover.



(A) Hose cover

6. Insert the brake hose on the brake caliper side into the joint component.

It comes with a built-in olive. Insert it while making sure that it will not get snagged on the olive.

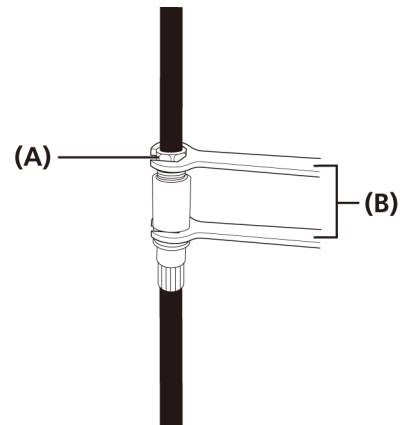
Check that the brake hose is inserted up to the line printed on the hose.



TECH TIPS

Use a waste cloth when inserting the brake hose as some oil inside may leak.

7. Tighten the connecting bolt with two 8mm spanners.



(A) Connecting bolt

(B) 8mm spanner

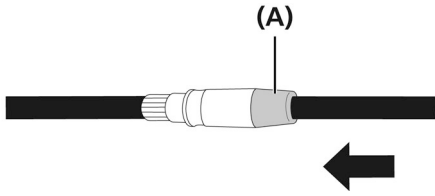
Tightening torque

8mm spanner

5 - 7 N·m

{44 - 61 in. lbs.}

8. Clean any oil residue and attach the hose cover.

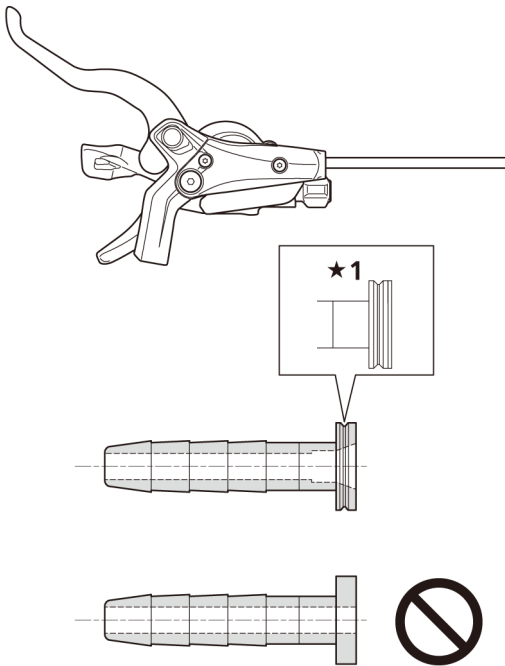


(A) Hose cover

Replacing the brake hose (easy hose joint system)

■ For MTB BH59

Check the shape of the connector insert. Incorrect combinations may cause oil leakage.



★1 SHIMANO CODE No.: Y8H298040
There is a groove in the head shaped part.

NOTE

- Each connector insert has a differently shaped hole.
- Be sure to use a dedicated connector insert. Use of any connector insert other than the specified one may produce a loose assembly, leading to oil leaks or other problems.

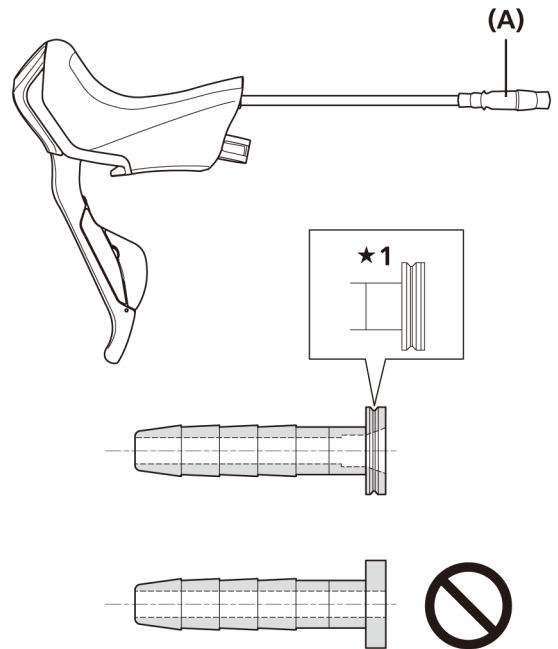
■ For ROAD

Check the shape of the connector insert. Incorrect combinations may cause oil leakage.

When connecting to the joint sleeve

NOTE

When reconnecting the brake hose to the joint sleeve, make sure to use the designated connector insert supplied with SM-BH59-5B.



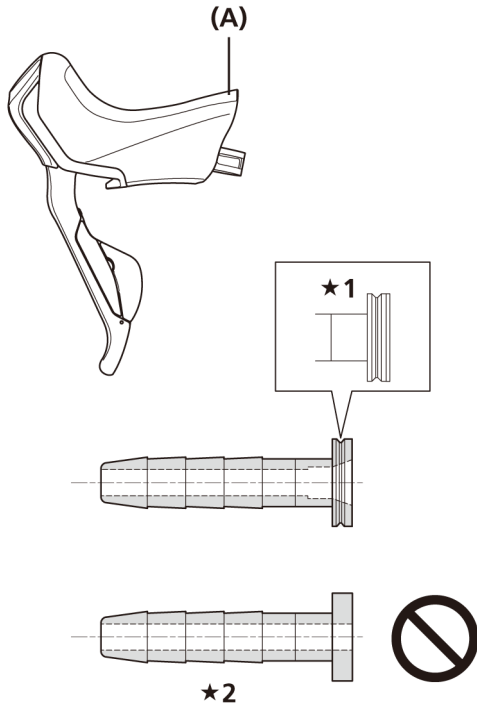
★1 SHIMANO CODE No.: Y8H298040
There is a groove in the head shaped part.

(A) Joint sleeve

NOTE

- Each connector insert has a differently shaped hole.
- Be sure to use a dedicated connector insert. Use of any connector insert other than the specified one may produce a loose assembly, leading to oil leaks or other problems.

When connecting on the lever side

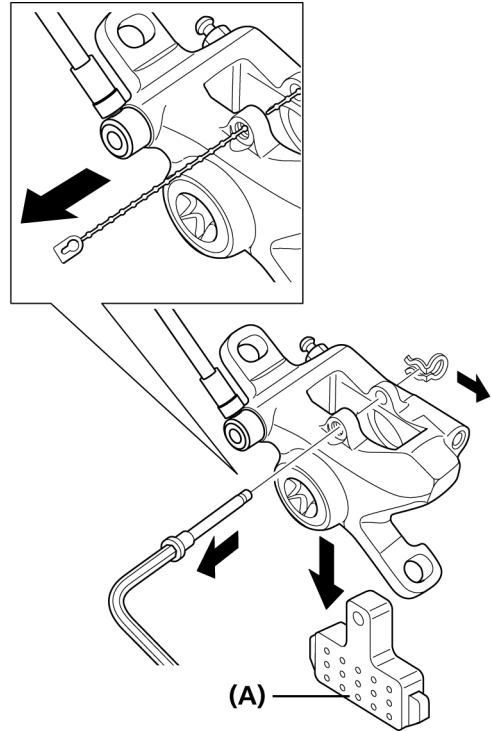


- ★1 SHIMANO CODE No.: Y8H298040
There is a groove in the head shaped part.
- ★2 For a connector insert of this shape, only ST-R785 can be used.

(A) Brake hose connection port

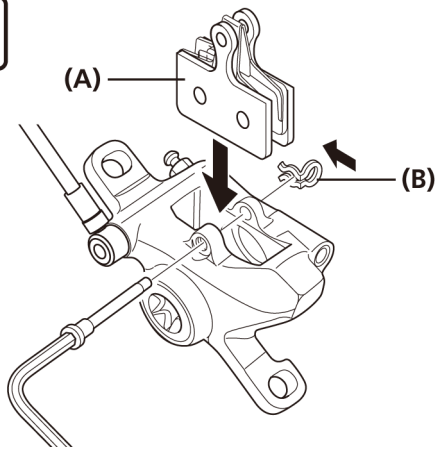
Installation of the calipers and securing the hose

1. Remove the spacer for bleeding (yellow), and then set the wheel which has the disc brake rotor onto the frame.



(A) Bleed spacer

2. Install the brake pads.



- (A) Brake pad
- (B) Snap ring

Tightening torque

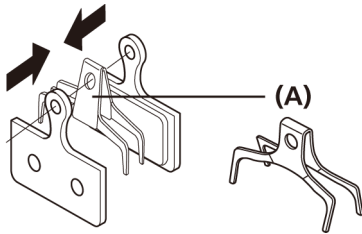
Allen key

2 - 4 N·m

{18 - 34 in. lbs.}

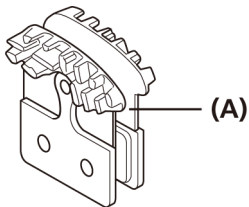
TECH TIPS

- Install the pad fixing spring as shown in the illustration. (There are left (L) and right (R) marks on the spring.)



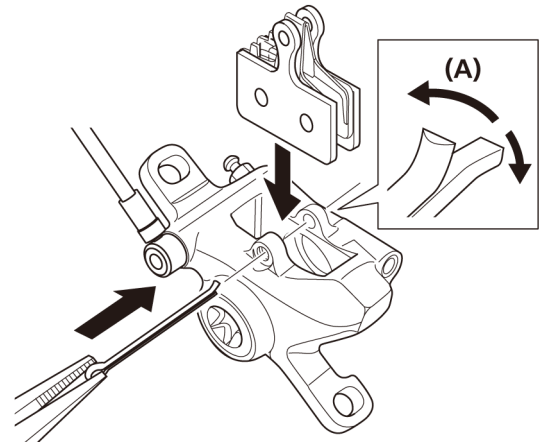
- (A) Pad fixing spring

- The pads with fins have fins at the front and back, so install them as shown in the illustration.



- (A) Pad with fins

For split pin



- (A) Split pin

■ International standard mounting type

NOTE

For international-standard mounts, attach adapters to calipers for post-type mounts. (Separate front and rear adapters are available.)

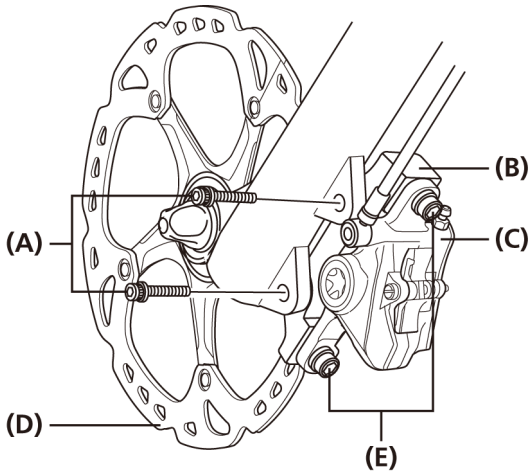
1. First install the adapter, and then provisionally secure the calipers to the frame.

TECH TIPS

The calipers should be able to move sideways.

2. Depress the brake lever so that the disc brake rotor is being clamped by the pads, and then tighten the caliper fixing bolts.

Front

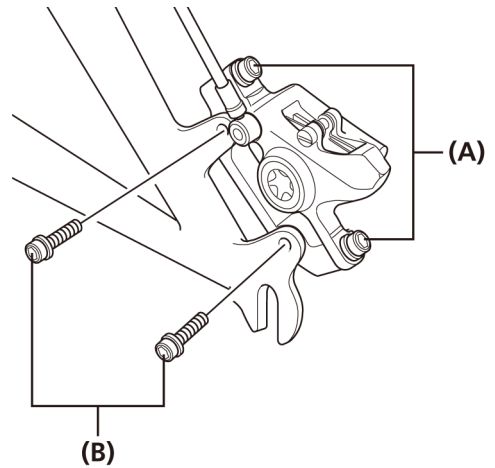


- (A) Adapter fixing bolt
- (B) Adapter
- (C) Caliper
- (D) Disc brake rotor
- (E) Caliper fixing bolt

Tightening torque

6 - 8 N·m
{53 - 69 in. lbs.}

Rear



- (A) Caliper fixing bolt
- (B) Adapter fixing bolt

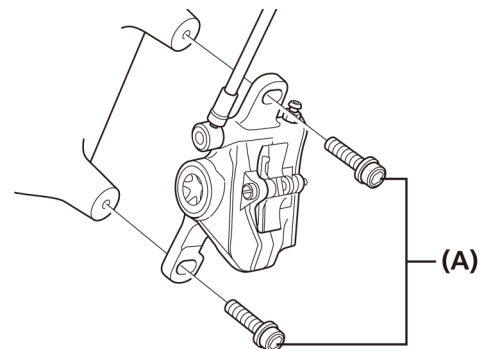
Tightening torque

6 - 8 N·m
{53 - 69 in. lbs.}

■ Post mounting type

1. Provisionally install the caliper to the frame (so that the caliper can move sideways).
2. Depress the brake lever so that the disc brake rotor is being clamped by the pads, and then tighten the caliper fixing bolts.

Front



- (A) Caliper fixing bolt

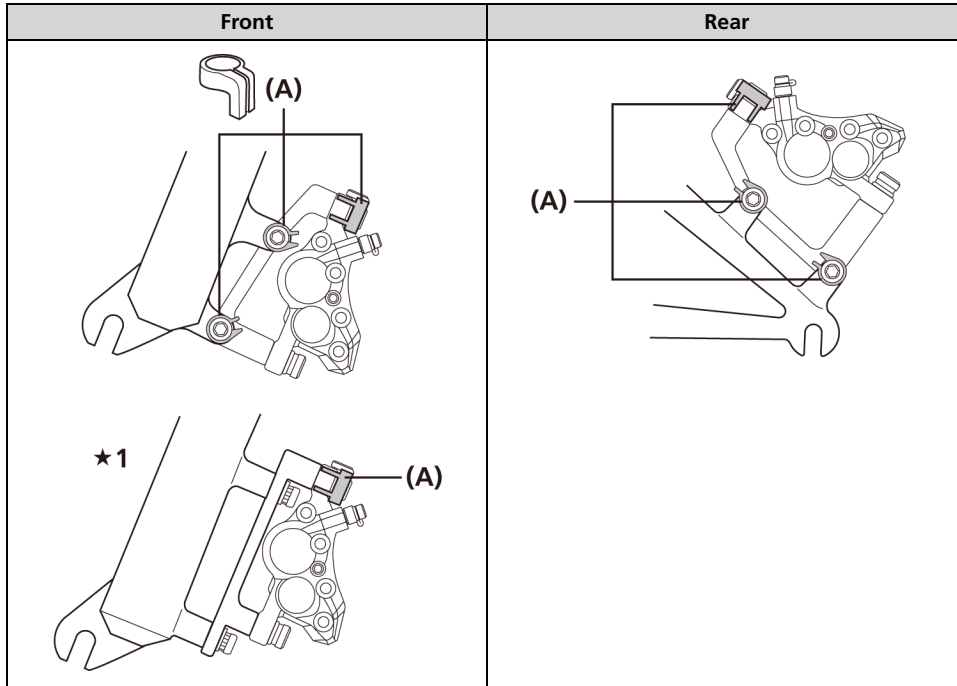
Tightening torque

6 - 8 N·m
{53 - 69 in. lbs.}

Preventing loosening of frame fixing bolts

Either a cap method or a wiring method can be used to stop the bolts from falling out. Use whichever method is suitable for the front fork and frame.

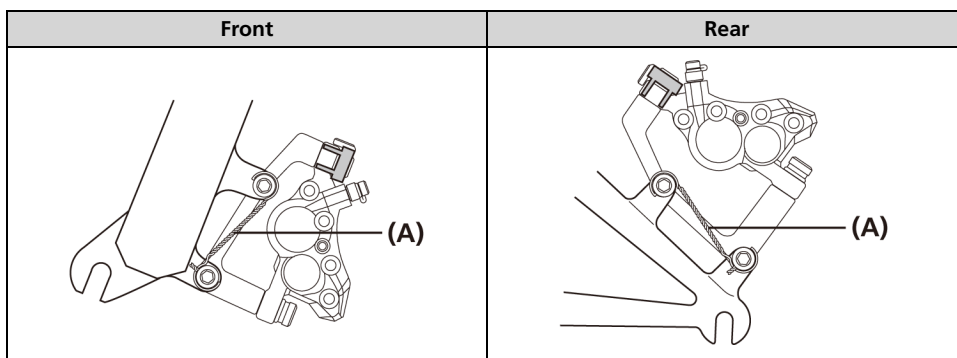
■ Cap method



★1 Post type

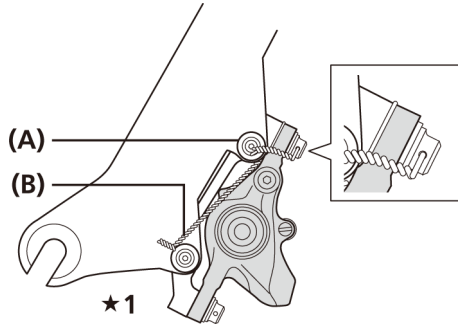
(A) Cap

■ Wiring method



(A) Wire

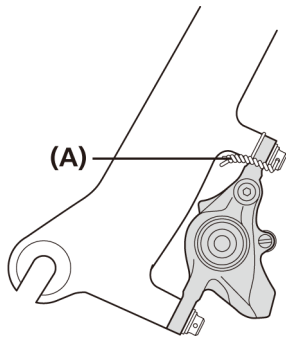
1. Secure the two bolts with a wire as shown in the illustration in order to prevent the bolts from coming loose.



★1 Wind a wire around the fixing bolt between the adapter and the frame as shown in the illustration.

- | |
|----------|
| (A) Bolt |
| (B) Wire |

Post type



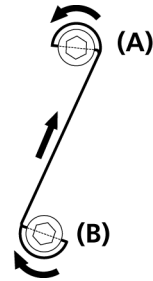
- | |
|----------|
| (A) Wire |
|----------|

TECH TIPS

If bolt [1] loosens (turns counterclockwise), force is applied via the wire to turn bolt [2] in the tightening direction (clockwise). However, bolt [2] cannot turn any further in the tightening direction.

Accordingly, this prevents bolt [1] from turning in the loosening direction because it is also connected via the wire.

If either one of the bolts tries to loosen, this causes a force to be applied to the other bolt that turns it in the tightening direction. In other words, this system prevents the bolts from loosening.

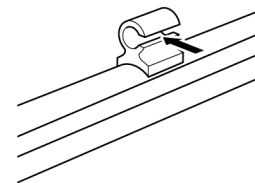


- | |
|--------------|
| (A) Bolt [1] |
| (B) Bolt [2] |

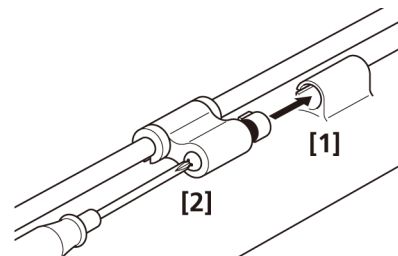
■ Securing the cable

1. For C-shaped guides and the usual type of cable stoppers, use the special Shimano cable supporter (sold separately) to secure as shown in the illustration.

C-shaped guide



Usual type of cable stopper



- | |
|-----------------------------|
| Tightening torque |
| 0.3 - 0.5 N·m |
| {2.7 - 4.3 in. lbs.} |

2. Operate the brake lever several times and check whether the brakes operate normally or not. Also check that there are no oil leaks.

MAINTENANCE (HYDRAULIC DISC BRAKES)

Brake pad replacement

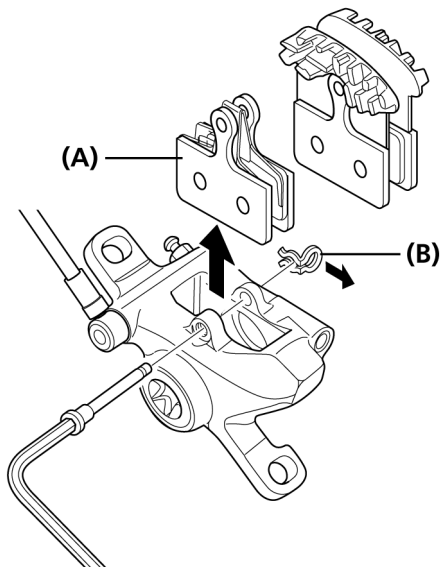
NOTE

This brake system is designed to automatically adjust the clearance between the disc brake rotor and the brake pads by the piston gradually protruding according to the wear of the brake pads; therefore, when you replace the brake pads, you need to push back the piston.

TECH TIPS

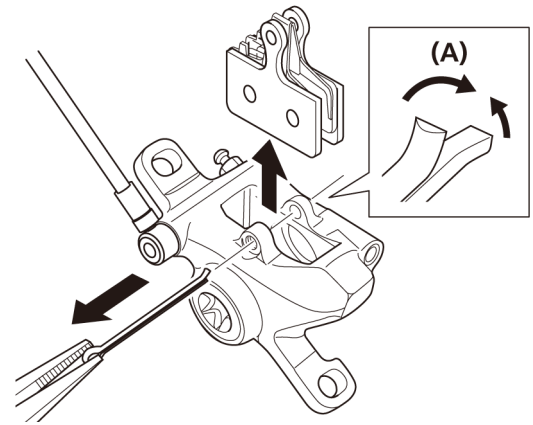
If oil adheres to the brake pads, if the brake pads are worn down to a thickness of 0.5mm, or if the brake pad presser springs are interfering with the disc brake rotor, replace the brake pads.

1. Remove the wheel from the frame, and remove the brake pads as shown in the illustration.



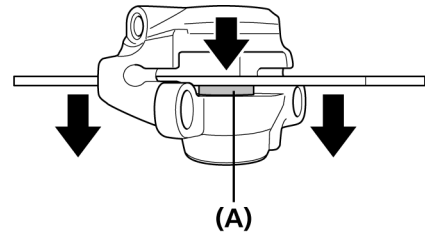
(A) Brake pad
(B) Snap ring

For split pin



(A) Split pin

2. Clean the pistons and surrounding area.
3. Use a flat-shaped tool to push the pistons straight back in as far as they will go, while being careful not to twist the pistons.

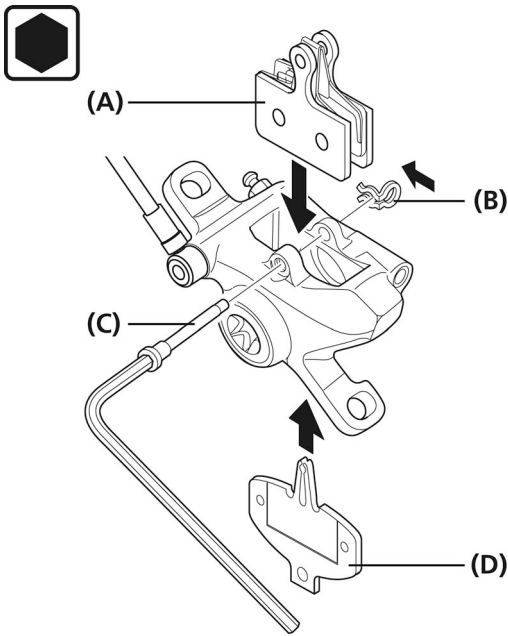


(A) Piston

NOTE

Do not push the pistons with a sharp tool.
The pistons may be damaged.

- 4.** Install the new brake pads, the bolt, and the pad spacer (red). At this point, make sure to install the snap ring as well.



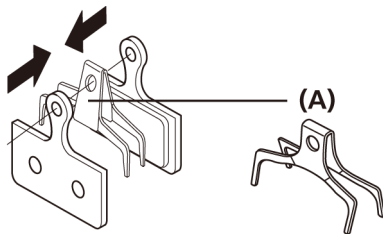
- (A) Brake pad
- (B) Snap ring
- (C) Bolt
- (D) Pad spacer (red)

Tightening torque

Allen key
2 - 4 N·m
{18 - 34 in. lbs.}

TECH TIPS

Install the pad fixing spring as shown in the illustration. (There are left (L) and right (R) marks on the spring.)

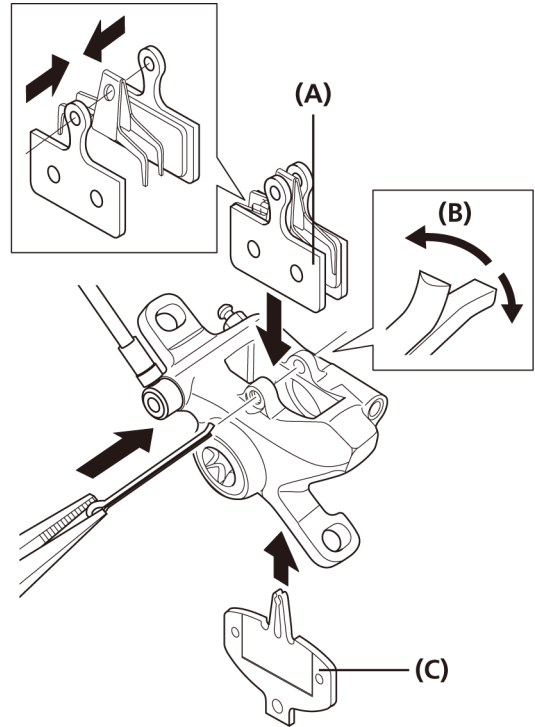


- (A) Pad fixing spring

For split pin types

Install the new brake pads the split pin, and then install the pad spacers (red).

After this, bend open the split pin.



- (A) Brake pad
- (B) Split pin
- (C) Pad spacer (red)

- 5.** Depress the brake lever several times to check that the operation becomes stiff.
- 6.** Remove the pad spacer, install the wheel, and then check that there is no interference between the disc brake rotor and caliper. If they are touching, adjust while referring to "Installation of the calipers and securing the hose".

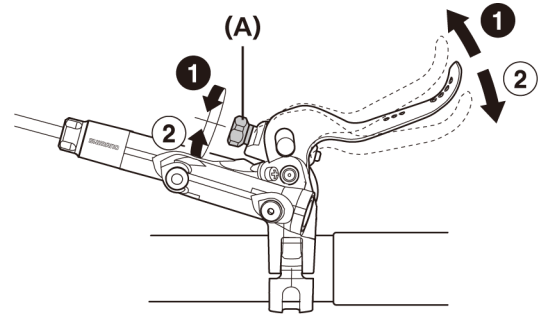
Adjustment when the pistons are not operating correctly

The caliper mechanism includes two pistons; if these pistons do not operate properly or if they protrude unevenly, or if the brake pads remain in contact with the disc brake rotor, adjust the pistons by the following procedure.

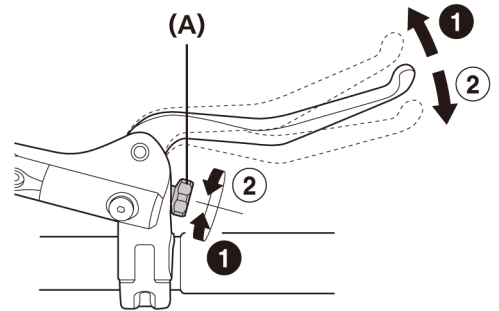
1. Remove the wheel and brake pads. Clean the pistons and surrounding area.
2. Use a flat-shaped tool to push the pistons straight back in as far as they will go, while being careful not to twist the pistons. Do not push the pistons with a sharp tool. The pistons may be damaged.
3. Install the brake pads and the pad spacer (red).
4. Depress the brake lever as far as it will go, and then operate it several more times so that the two pistons move to their initial positions.
5. Remove the pad spacer, install the wheel, and then check that there is no interference between the disc brake rotor and brake pads. If they are touching, loosen the mounting bolts and adjust so that they are no longer touching.

Lever stroke adjustment

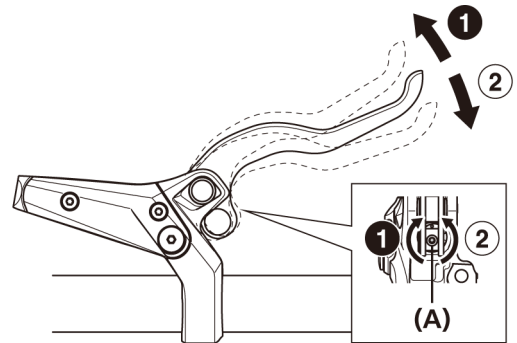
Tighten the adjust bolt (clockwise) to increase the stroke, and loosen it (counterclockwise) to decrease the stroke.



(A) Reach adjustment bolt



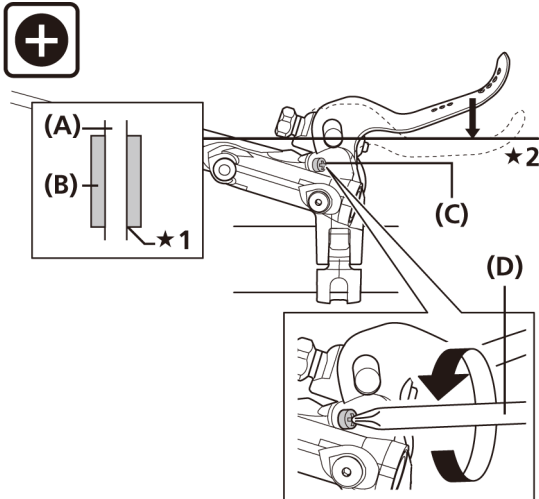
(A) Reach adjustment bolt



(A) Reach adjustment bolt

Free stroke adjustment

When the free stroke adjustment screw is loosened, the free stroke of the brake lever will increase, so that you can adjust it to the desired setting.



- ★1 Contact
- ★2 Pad contact point

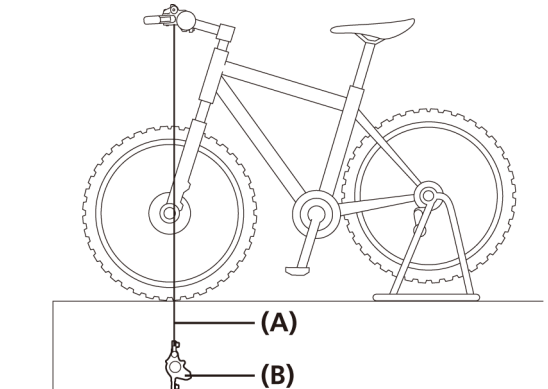
- (A) Disc brake rotor
- (B) Pad
- (C) Free stroke adjustment screw
- (D) Screwdriver

Mineral oil replacement

It is recommended that you replace the oil inside the reservoir tank if it becomes severely discolored. Attach a tube with a bag to the bleed nipple, and then open the bleed nipple to drain out the oil. The brake lever can be operated at this time to help the oil drain out. After draining the fluid, pour in fresh brake fluid while referring to the "Adding the mineral oil and bleeding air" section. Use only Shimano genuine mineral oil. Dispose of the waste oil according to proper country and/or state disposal regulations.

Adding mineral oil and bleeding air

With the spacer for bleeding (yellow) still attached to the calipers, place the bicycle into a bicycle stand, or the like, as shown in the illustration.

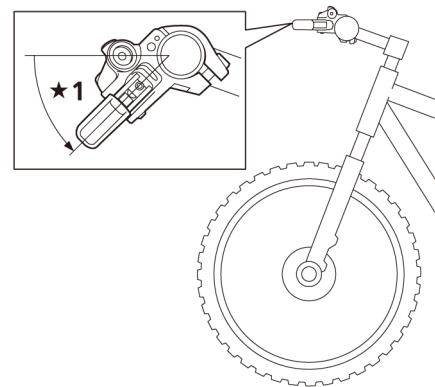


- (A) Hose
- (B) Caliper

NOTE

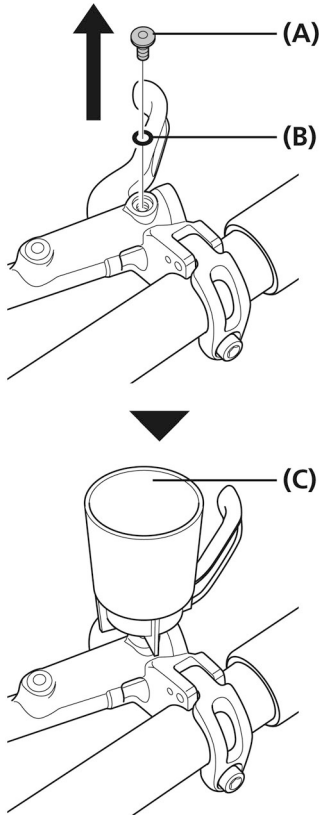
When bleeding the air out of the caliper, you will need the SM-DISC (oil funnel and oil stopper).

1. Set the brake lever so that it is in riding position at 45° angle from the ground.



- ★1 45°

2. Remove the upper bleed screw and O-ring and insert the oil funnel.

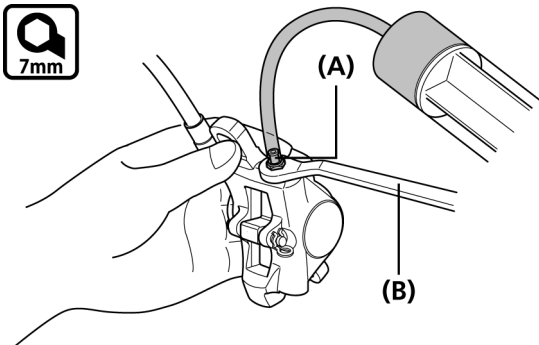


- (A) Bleed screw
(B) O-ring
(C) Oil funnel

TECH TIPS

Do not insert the oil stopper at this time.

3. Set a 7mm socket wrench in place, fill the syringe with oil, connect a tube to the bleed nipple, and then loosen the bleed nipple by 1/8 of a turn to open it. Push the piston of the syringe to add oil. The oil will start coming out from the oil funnel. Continue adding oil until there are no more air bubbles in the oil that is coming out.



- (A) Bleed nipple
(B) 7mm socket wrench

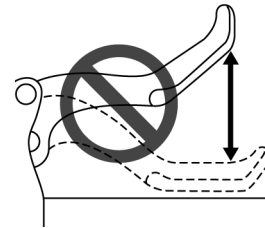
4. Once there are no more air bubbles mixed in with the oil, temporarily close the bleed nipple.

NOTE

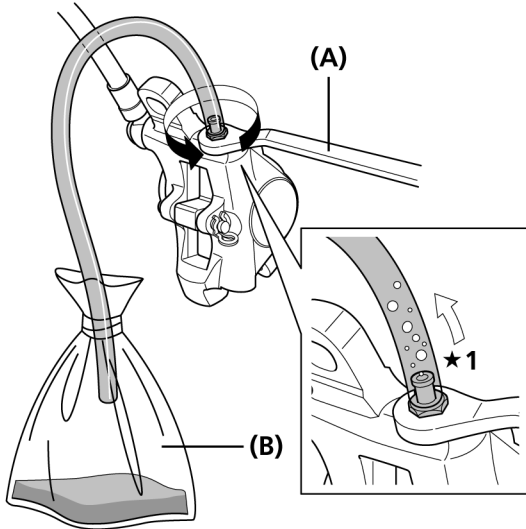
Secure the brake caliper in a vise to prevent the tube from being accidentally disconnected.

Do not depress and release the lever repeatedly.

Oil without air bubbles may come out as a result of such operation, but air bubbles may remain in the oil inside the brake caliper, and it will take longer to bleed the air. (If you have depressed and released the lever repeatedly, drain out all of the oil and then add oil again.)



5. Set a 7mm socket wrench in place as shown in the illustration, and then attach the bag to the tube. Connect the tube to the bleed nipple and loosen the bleed nipple. After a little while, the oil and air bubbles will flow naturally from the bleed nipple into the tube. This way it will be possible to easily extract the greater part of the air bubbles remaining inside the brake system.



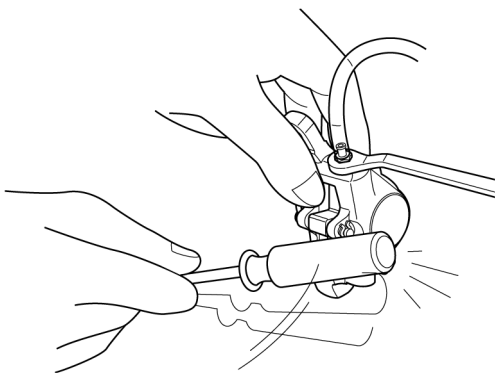
★1 Air bubbles

(A) 7mm socket wrench

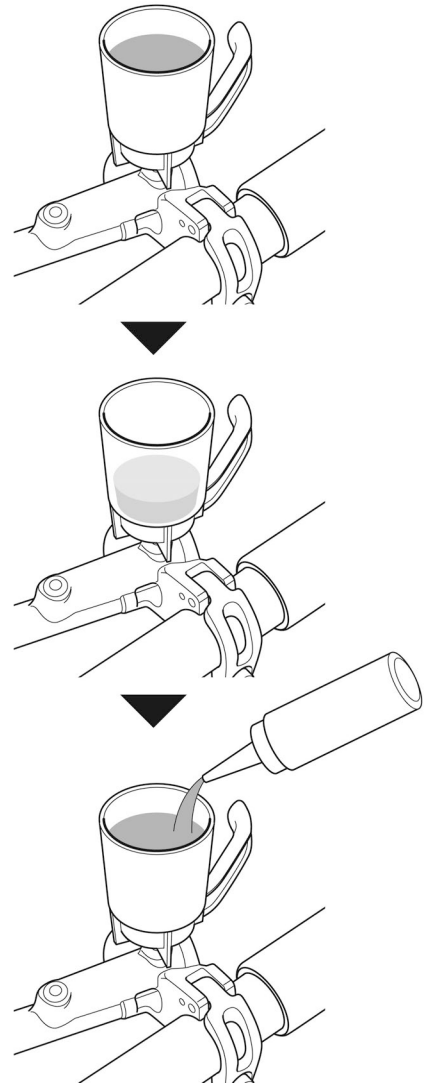
(B) Bag

TECH TIPS

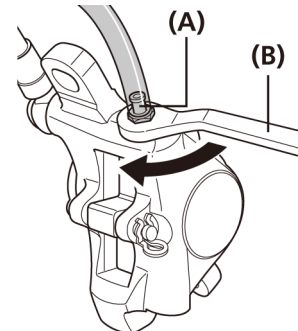
It may help to shake the hose gently or to tap the reservoir tank or caliper gently with a screwdriver or move the position of the caliper at this time.



6. The level of liquid inside the funnel will drop at this time, so keep filling the funnel with oil to maintain the level of liquid so that air is not drawn in (air does not get inside).



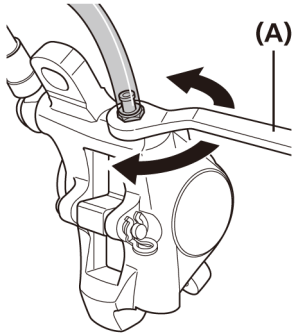
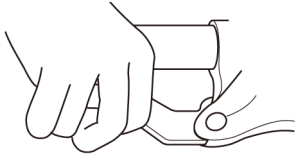
7. Once no more air bubbles come from the bleed nipple, temporarily close the bleed nipple.



(A) Bleed nipple

(B) 7mm socket wrench

8. With the brake lever depressed, open and close the bleed nipple in rapid succession (for approximately 0.5 seconds each time) to release any air bubbles which may be in the calipers. Repeat this procedure about 2 to 3 times. Then tighten the bleed nipple.



(A) 7mm socket wrench

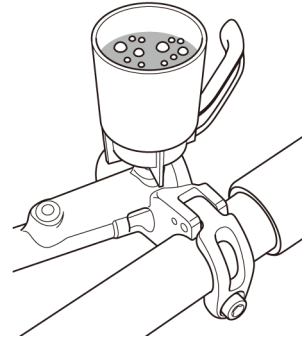
Tightening torque

7mm socket wrench

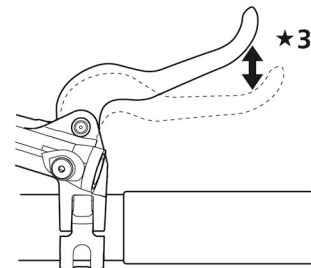
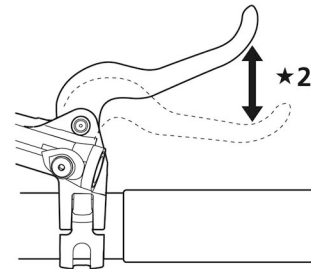
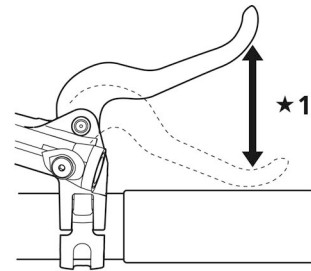
4 - 6 N·m

{35 - 52 in. lbs.}

9. If the brake lever is then operated, air bubbles in the system will rise up through the port into the oil funnel. Once the bubbles stop appearing, depress the brake lever as far as it will go. It is normal for the lever to be stiff at this point.



Lever operation



★1 Loose

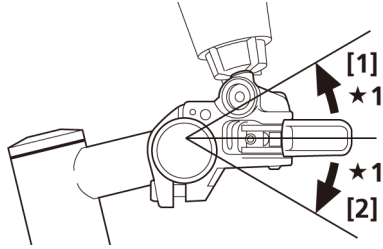
★2 Slightly stiff

★3 Stiff

NOTE

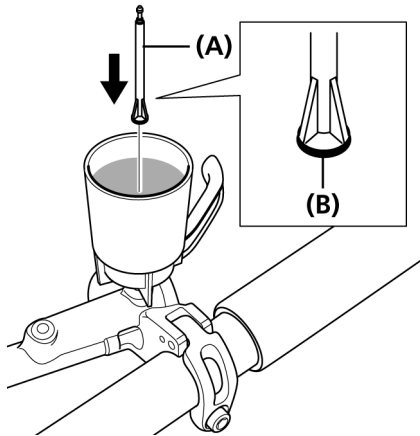
If the lever does not become stiff, repeat the procedures from step 5.

10. Set the lever unit to the horizontal position as shown in the illustration and tilt it in the direction of [1] by 30°, and then carry out step 9 to check that there is no air remaining. Next, tilt the lever unit 30° in the direction of [2], and carry out step 9 again to check that there is no air remaining. If any air bubbles appear, repeat the above procedure until they stop appearing.



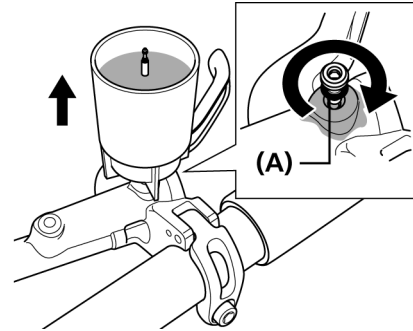
★1 30°

11. Plug the oil funnel with the oil stopper so that the side with the O-ring attached is facing downward.



- (A) Oil stopper
(B) O-ring

12. Remove the oil funnel while it is still being plugged with the oil stopper, and then attach the O-ring to the bleed screw and tighten it until oil flows out to make sure that there are no air bubbles remaining inside the reservoir tank.



(A) O-ring

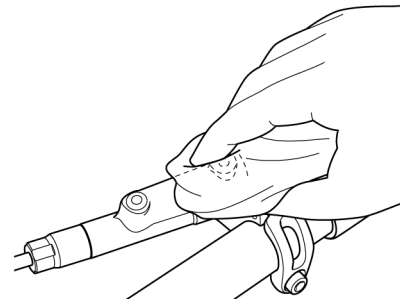
Tightening torque

0.3 - 0.5 N·m
{2.7 - 4.3 in. lbs.}

NOTE

Do not operate the brake lever. If operated, there is a risk of air bubbles entering the cylinder.

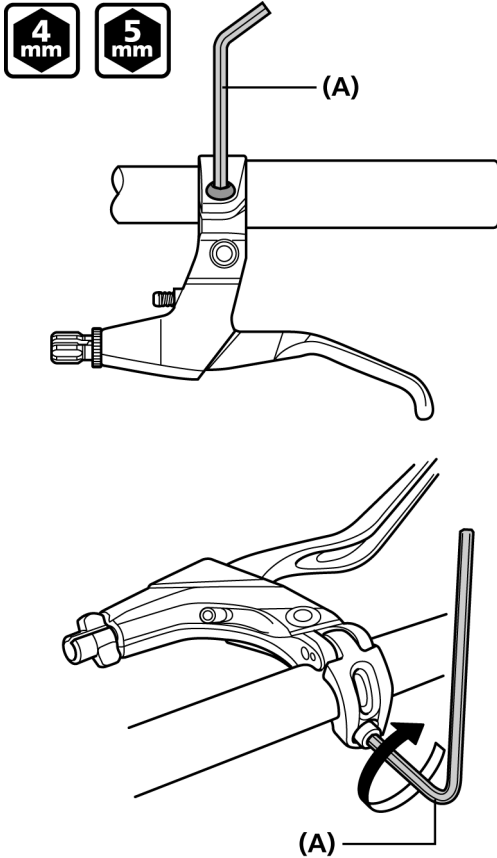
13. Wipe away any oil that has overflowed.



INSTALLATION (V-BRAKE BRAKES)

Installation of the brake lever

Use a handlebar grip with a maximum outer diameter of 32mm.



(A) 4mm Allen key/5mm Allen key

Tightening torque

4mm Allen key/5mm Allen key

6 - 8 N·m

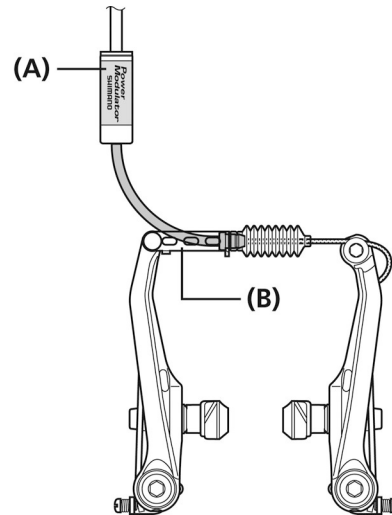
{53 - 69 in. lbs.}

NOTE

In the case of carbon handlebars, it may be necessary to lower the tightening torque in order to prevent damage to the handlebar. Please consult the bicycle or handlebar manufacturer regarding the appropriate level of tightening torque for carbon handlebars.

Installing the power modulator

1. Install the power modulator to the V-BRAKE brake as shown in the illustration.

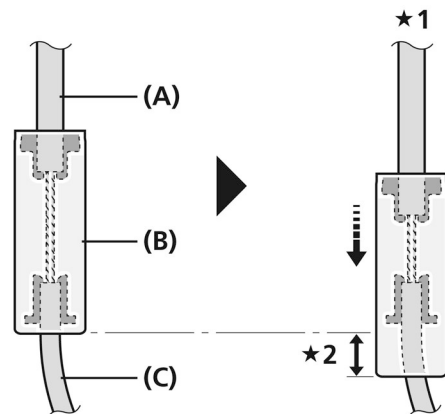


(A) Power modulator

(B) V-brake

NOTE

When the brakes are applied, the power modulator will move about 8mm toward the inner cable lead; make sure that there is enough excess length in the outer casing for that.



*1 When brakes are applied

*2 Approx. 8mm

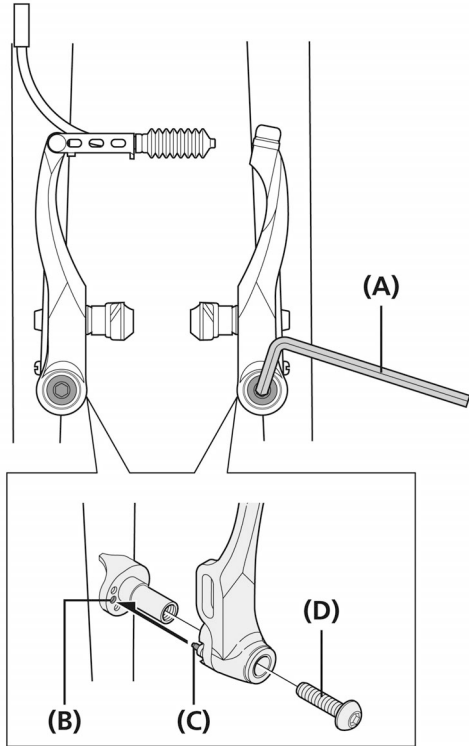
(A) Outer casing

(B) SM-PM70/SM-PM40

(C) Inner cable lead

Installation of V-BRAKE brakes

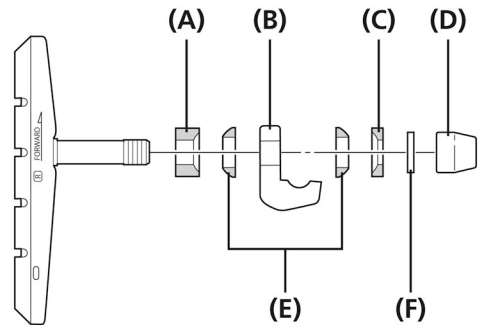
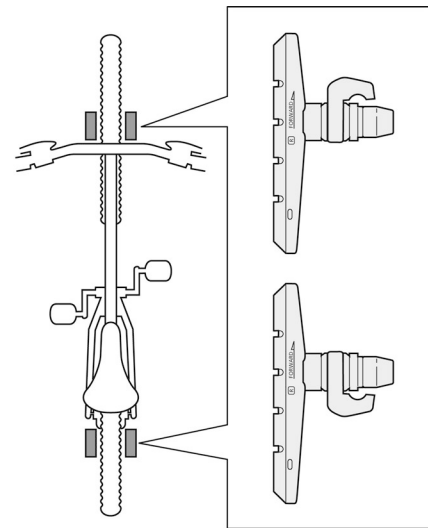
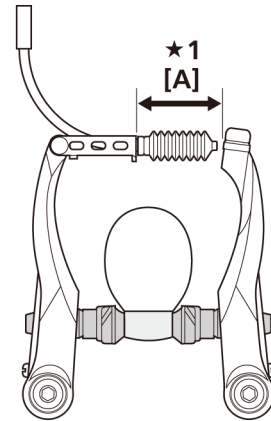
1. Insert the stopper pin of the brake caliper into the center spring hole in the frame mounting boss, and then secure the brake caliper to the frame with the link fixing bolt.



- (A) 5mm Allen key
- (B) Spring hole
- (C) Stopper pin
- (D) Link fixing bolt

Tightening torque
5mm Allen key
5 - 7 N·m
{44 - 61 in. lbs.}

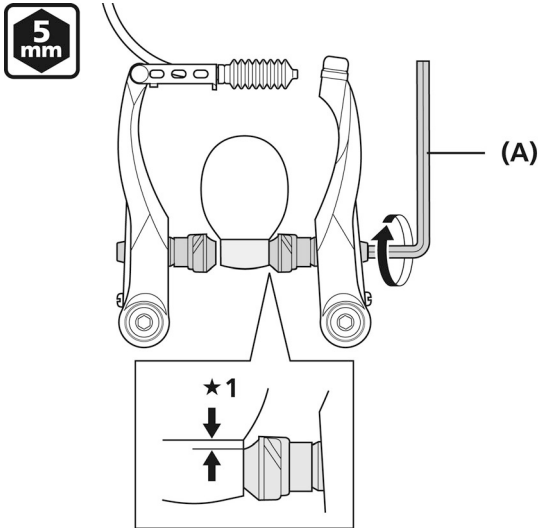
2. While pressing the shoe against the rim, adjust the amount of shoe protrusion by interchanging the washer B (thick or thin) so that dimension [A] is at 32mm or more.



★1 A: 32mm or more

- (A) Washer B (thick)
- (B) Shoe fixing link
- (C) Washer B (thin)
- (D) Shoe fixing nut
- (E) Washer A
- (F) Washer

3. While holding the shoe against the rim, tighten the shoe fixing nut.



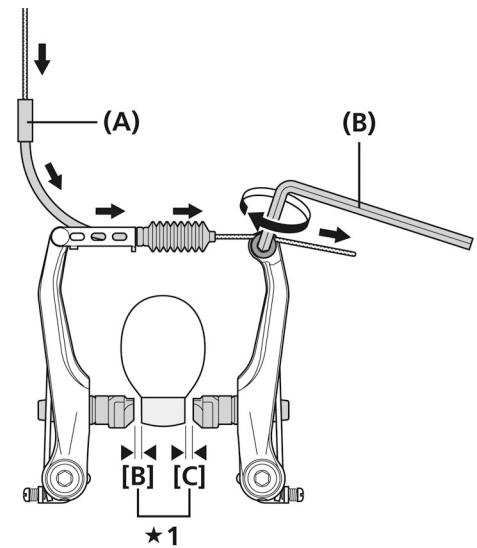
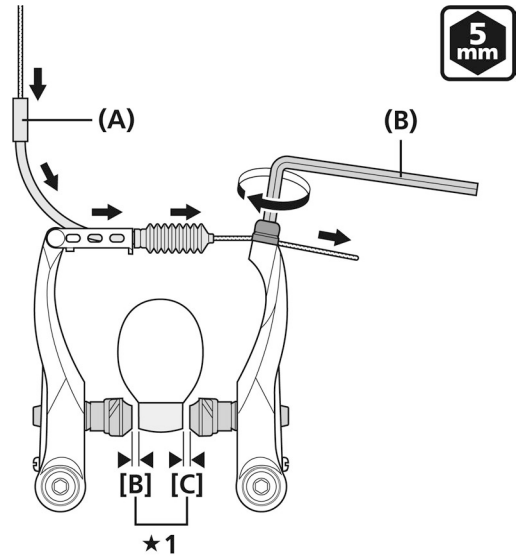
★1 1mm

(A) 5mm Allen key

Tightening torque

5mm Allen key
6 - 8 N·m
{53 - 69 in. lbs.}

4. Pass the inner cable through the inner cable lead, and after making sure the combined clearance between the left and right shoes and the rim is a total of 2mm, tighten the cable fixing bolt.



★1 [B] + [C] = 2mm

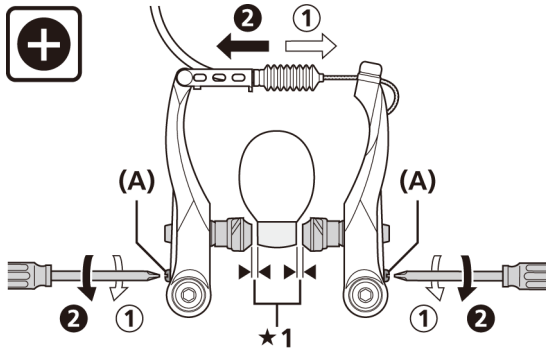
(A) Inner cable lead

(B) 5mm Allen key

Tightening torque

5mm Allen key
6 - 8 N·m
{53 - 69 in. lbs.}

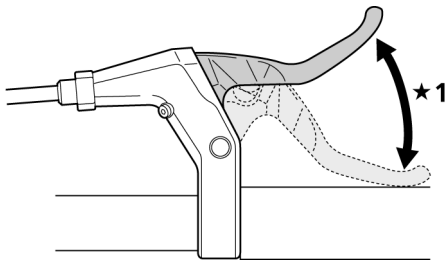
5. Adjust the balance with the spring adjustment bolts.



★1 1mm

(A) Spring adjustment bolt

6. Depress the brake lever about 10 times until it touches the grip and check that everything is operating correctly and that the shoe clearance is correct before using the brakes.

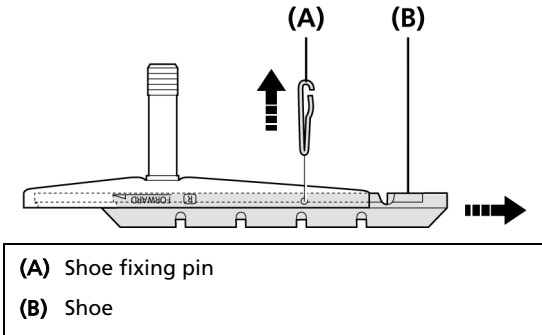


★1 Depress about 10 times

MAINTENANCE (V-BRAKE BRAKES)

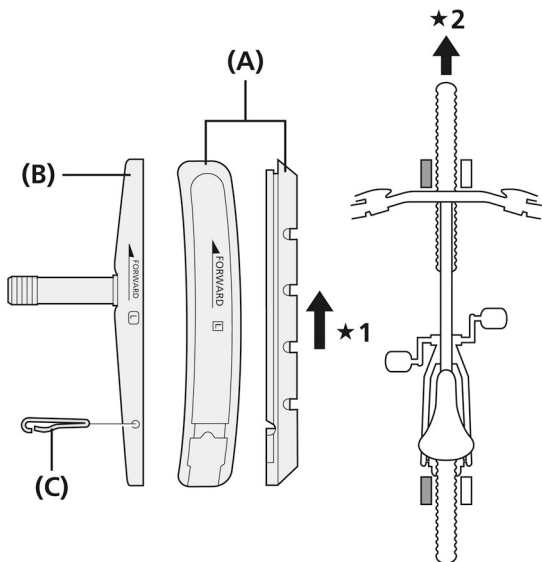
Replacement of the cartridge shoe

1. Remove the shoe fixing pin, and then slide the shoe along the groove to remove it from the shoe holder.

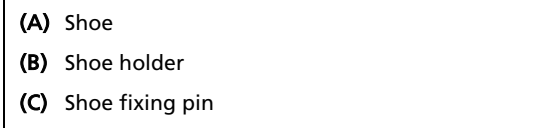


2. There are two different types of shoes and shoe holders for the left and right positions respectively. Slide the new shoes into the grooves on the shoe holders while taking note of the correct directions and pin hole positions.

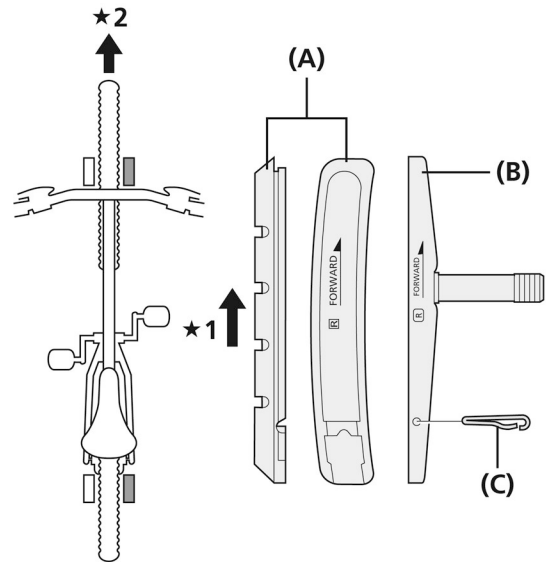
For left (same for front and rear)



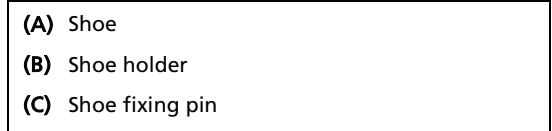
- ★1 Shoe insertion direction
- ★2 Front



For right (same for front and rear)



- ★1 Shoe insertion direction
- ★2 Front



3. It is very critical to insert the shoe fixing pin to keep the shoe properly fixed in place.

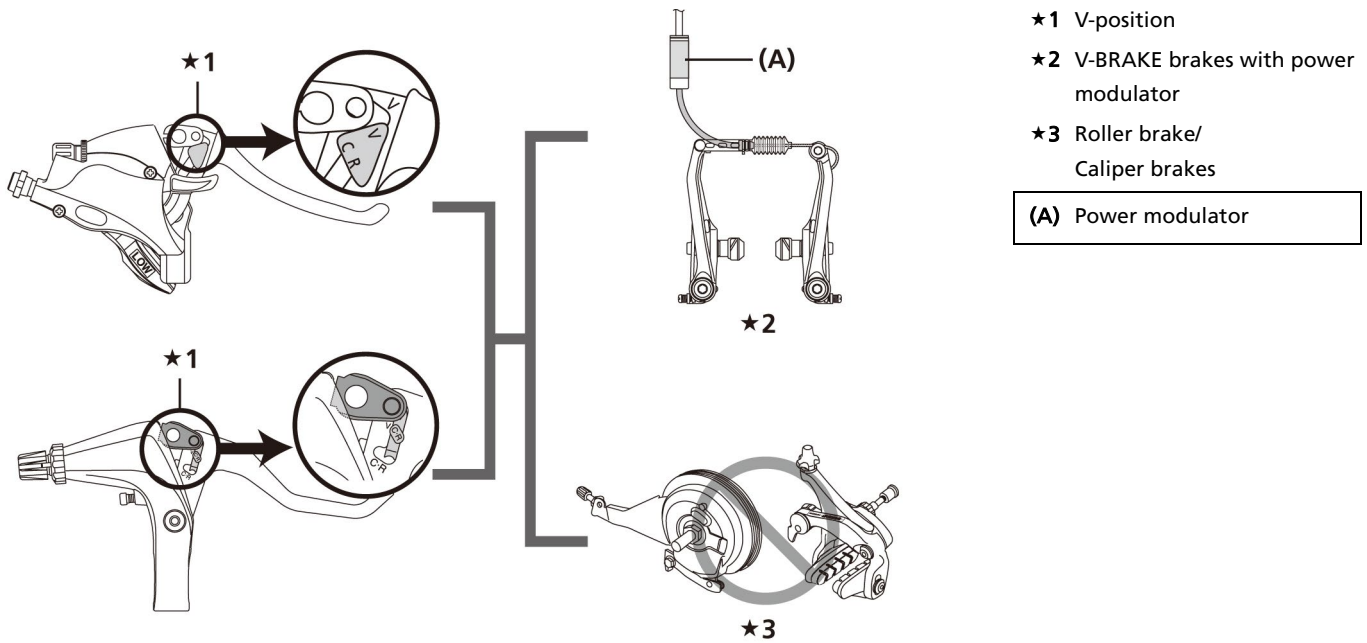
BRAKE LEVER WITH SWITCH INTERCHANGEABILITY (V-BRAKE and Hub roller brake)

Four finger brake levers are equipped with a switch to change between the V-BRAKE with modulator mode and the caliper or roller brake modes.

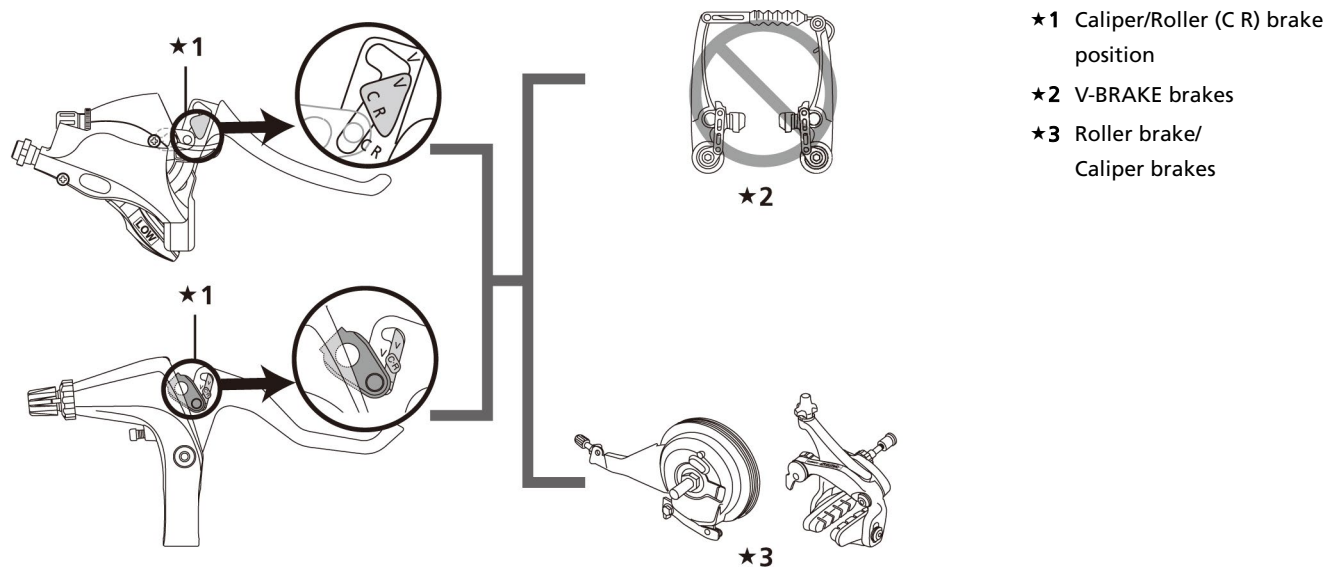
! WARNING

If the mode is not matched to the type of brake being used, this could result in inadequate or excessive braking power. Please proceed with caution when selecting the correct mode for the corresponding brake.

For V-BRAKE (with power modulator) mode

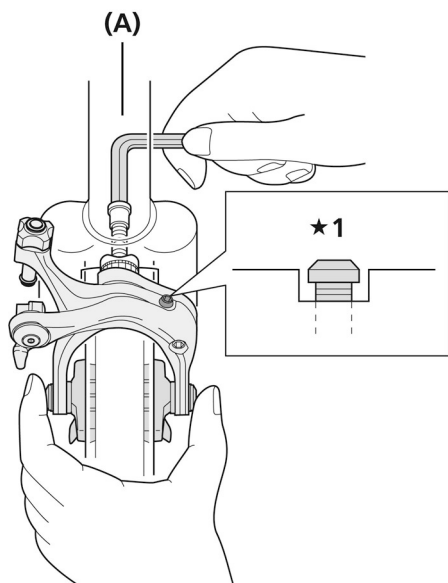


For Caliper brake/Roller brake



INSTALLATION (DUAL PIVOT CALIPER BRAKES)

1. Install the brake caliper. Compress the arch, and set while the shoe is in firm contact with the rim.



★1 The usual position during installation is when the head of the centering adjustment bolt is as shown in the illustration.

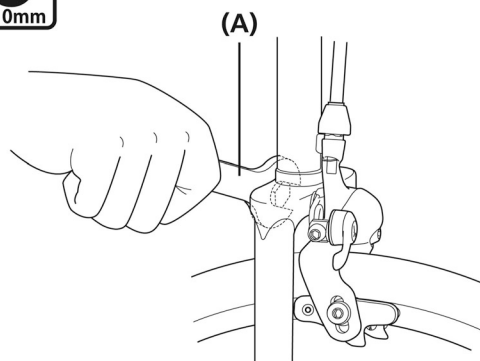
(A) 5mm Allen key

Tightening torque
5mm Allen key
8 - 10 N·m
{70 - 87 in. lbs.}

NOTE

If the brake arm touches the frame when the handlebar is turned, attach the included frame protection sticker to the frame.

For nut type



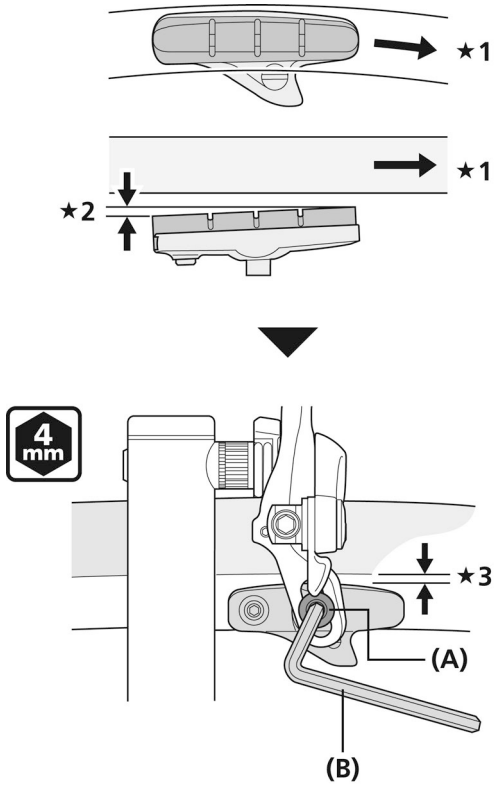
(A) 10mm spanner

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

NOTE

If the brake arm touches the frame when the handlebar is turned, attach the included frame protection sticker to the frame.

2. Adjust the brake shoe position and then secure in place the brake shoe. After adjusting the brake shoe position so that the shoe surface and the rim surface are as shown in the illustration, tighten the shoe fixing bolt.



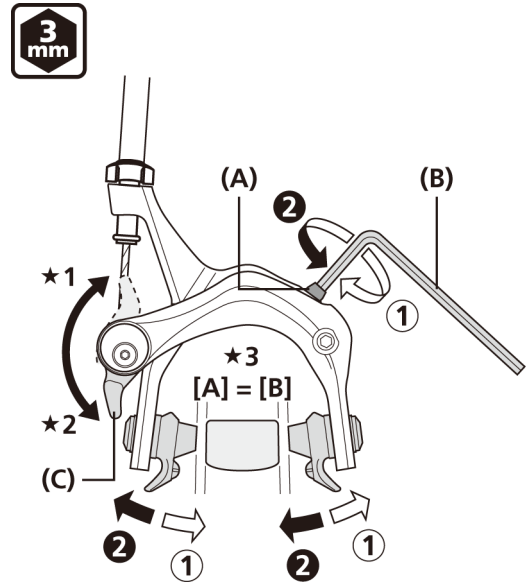
- $\star 1$ Direction of rim rotation
- $\star 2$ Toe-in 0.5mm
- $\star 3$ 1mm or more

- (A) Shoe fixing bolt
- (B) 4mm Allen key

Tightening torque

4mm Allen key
5 - 7 N·m
{44 - 61 in. lbs.}

3. Install the brake cable. Set the quick release lever to the closed position; then adjust the shoe clearance (as shown in the illustration) and secure the cable.



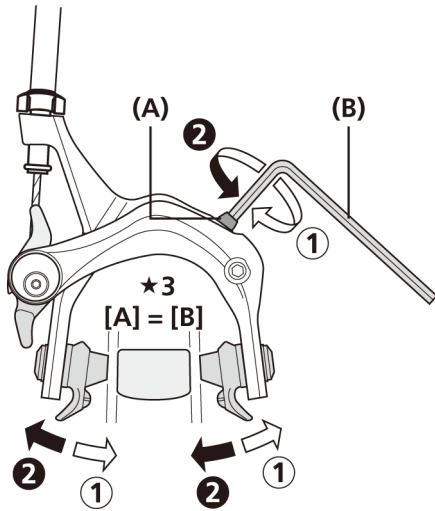
- $\star 1$ Open
- $\star 2$ Close
- $\star 3$ $[A] + [B] = 3 - 4\text{mm}$

- (A) Centering adjustment bolt
- (B) 3mm Allen key
- (C) Quick release lever

Tightening torque

3mm Allen key
6 - 8 N·m
{53 - 69 in. lbs.}

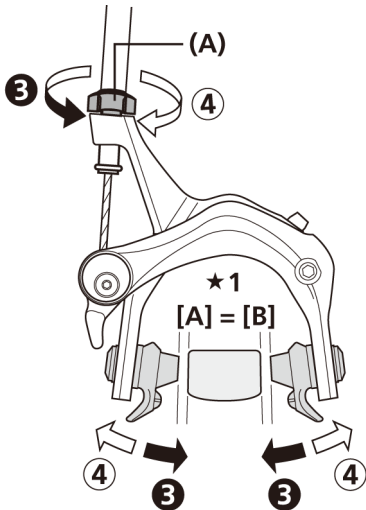
4. Fine adjust the centering of the brake shoe using the centering adjustment bolt.



- ★1 Open
- ★2 Close
- ★3 [A] + [B] = 3 – 4mm

(A) Centering adjustment bolt
(B) 3mm Allen key

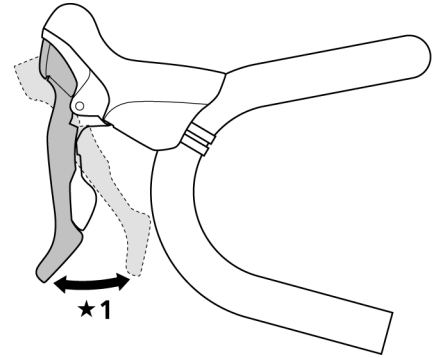
5. Readjust shoe clearance. Turn the cable adjustment nut to readjust shoe clearance.



- ★1 [A] + [B] = 3 – 4mm

(A) Cable adjustment nut

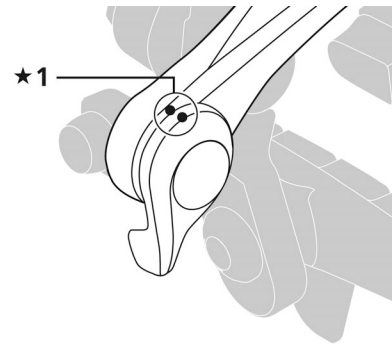
6. Check the brakes. Depress the brake lever about 10 times until it touches the grip and check that everything is operating correctly and that the shoe clearance is correct before using the brakes.



- ★1 Depress about 10 times

TECH TIPS

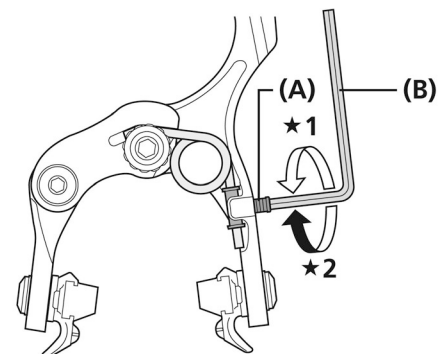
For models with a CLOSE position mark on the quick release lever and brake body side, align the marks. At this time, check for a click.



- ★1 CLOSE position mark

■ Arch spring tension adjustment

The spring adjustment bolt can be used to adjust the spring tension of the arch.



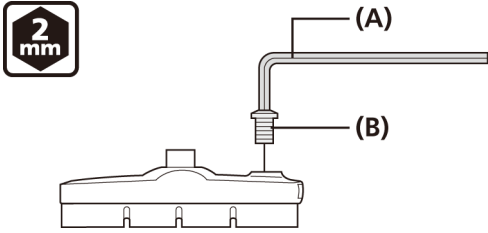
- ★1 Weak
- ★2 Strong

(A) Spring adjustment bolt
(B) 2mm Allen key

MAINTENANCE (DUAL PIVOT CALIPER BRAKES)

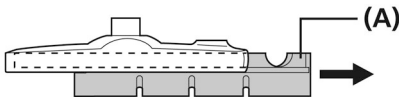
Replacement of the cartridge shoe

1. Remove the fixing bolt.



- (A) 2mm Allen key
- (B) Mounting bolt

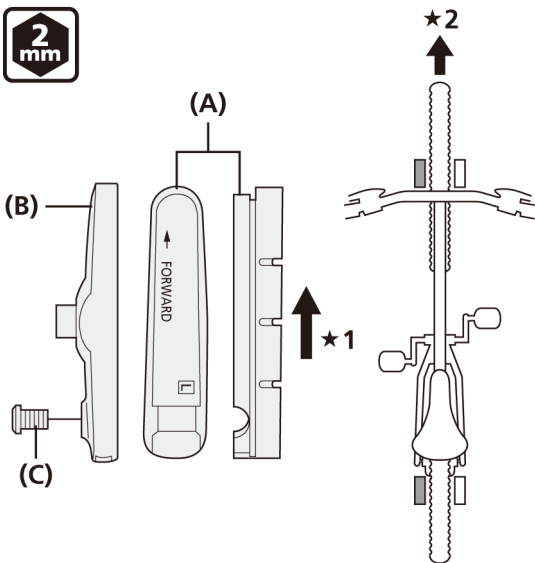
2. Remove the shoe by sliding it along the groove of the shoe holder.



- (A) Shoe

3. There are two different types of shoes and shoe holders for the left and right positions respectively. Slide the new shoes into the grooves on the shoe holders while taking note of the correct directions and bolt hole positions.

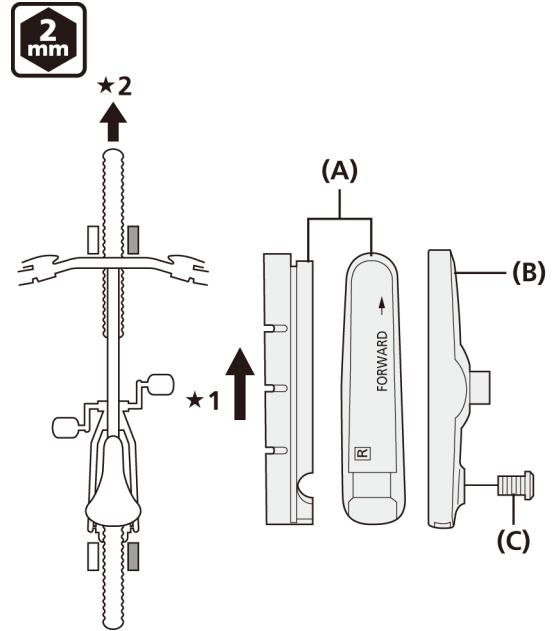
For left (same for front and rear)



- *1 Shoe insertion direction
- *2 Front

- (A) Shoe
- (B) Shoe holder
- (C) Mounting bolt

For right (same for front and rear)



- *1 Shoe insertion direction

- *2 Front

- (A) Shoe
- (B) Shoe holder
- (C) Mounting bolt

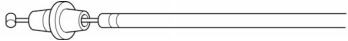
Tightening torque

2mm Allen key
1 - 1.5 N·m
{9 - 13 in. lbs.}

4. Tighten the fixing bolt.

SPECIFICATIONS (Cantilever Brake)

In order to realize the best performance, we recommend that the following combination be used.

Series	CT90
Brake lever	ST-CT90/ST-CT95 SB-CT90/SB-CT91
Cantilever brakes	BR-CT91
Cable	

Cantilever brake

Model No.	BR-CT91	
Arch size	M	L
Link type	Unit link (alignment type)	
Link wire length	A/73	A/73
	B/82	B/82
	-	C/106
	-	D/93

Brake lever

Model No.	ST-CT90/ST-CT95/SB-CT90/SB-CT91
Clamp diameter	22.2mm

TECH TIPS

- If the link length is the same, any link wire can be used even if the type is different.
- If you have any questions about the use and maintenance of the product, consult the place of purchase.

INSTALLATION (CANTILEVER BRAKES)

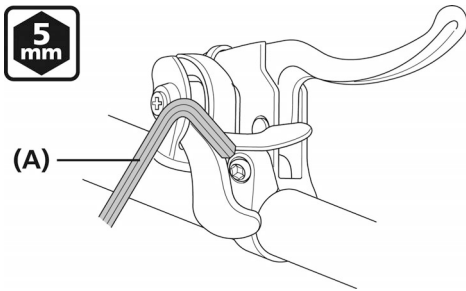
Installation of the brake lever

TECH TIPS

Use a handlebar grip with an outer diameter of $\varnothing 32\text{mm}$ or less.

1. Install the brake lever.

ST-CT90/ST-CT95

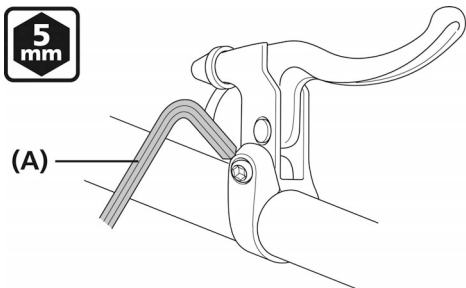


(A) 5mm Allen key

Tightening torque

5mm Allen key
6 - 8 N·m
{53 - 69 in. lbs.}

SB-CT90/SB-CT91



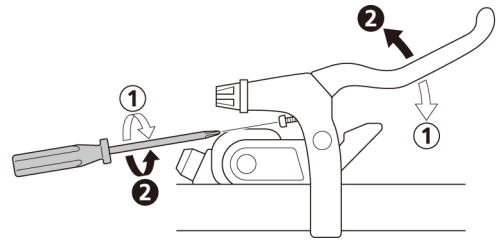
(A) 5mm Allen key

Tightening torque

5mm Allen key
6 - 8 N·m
{53 - 69 in. lbs.}

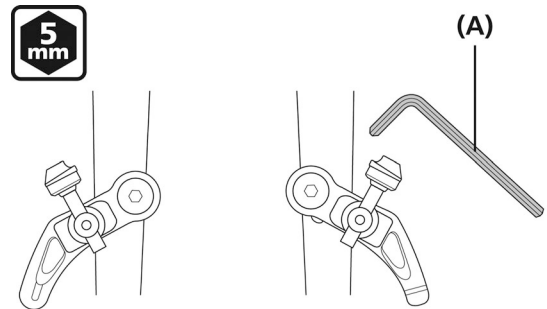
2. Connect the brake cable.

3. Adjust the lever stroke. (only for ST-CT95)



Installation of the brake caliper

1. Install the brake caliper to the frame.

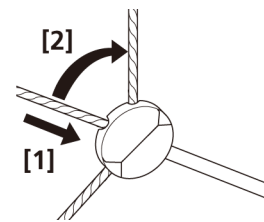


(A) 5mm Allen key

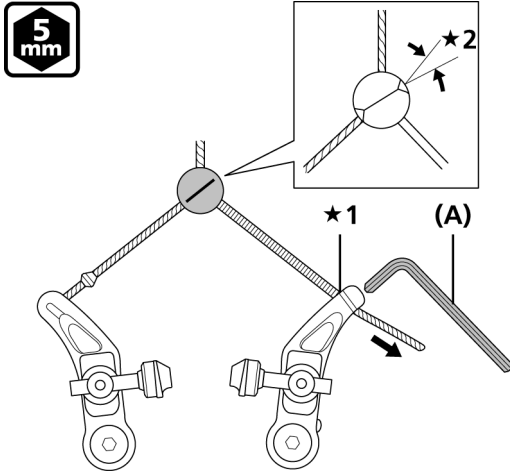
Tightening torque

5mm Allen key
5 - 7 N·m
{44 - 61 in. lbs.}

2. Set the cable onto the cable carrier.



3. Temporarily tighten the cable so that the cable carrier is at the position in the illustration.



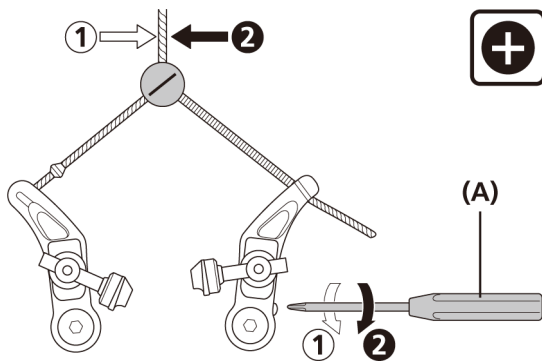
- ★1 Touching
- ★2 3°

(A) 5mm Allen key

Temporary tightening torque

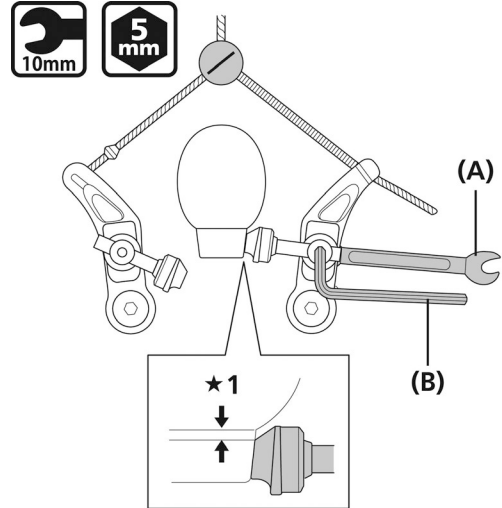
5mm Allen key
0.5 - 1 N·m
{4.4 - 8 in. lbs.}

4. Turn the spring adjustment bolt so that the cable carrier comes to a position directly below the outer casing holder.



(A) Screwdriver

5. Secure one of the shoes at a time. Adjustment of shoe clearance is not necessary at this time.



- ★1 1mm

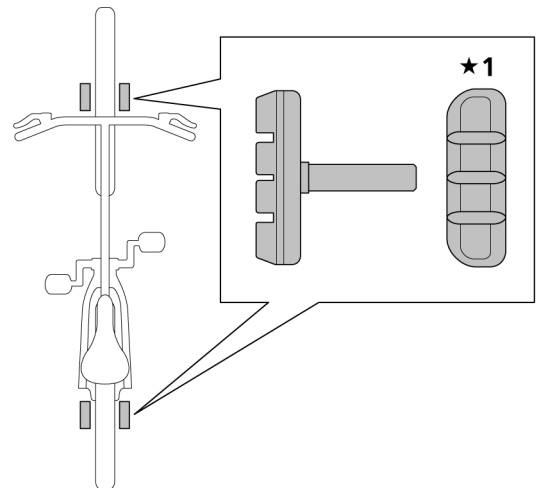
(A) 10mm spanner
 (B) 5mm Allen key

Tightening torque

10mm spanner
 5mm Allen key
8 - 9 N·m
{70 - 78 in. lbs.}

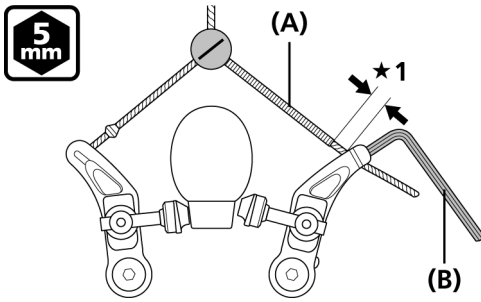
NOTE

When installing the shoes, make sure that they are facing the right way and are not back to front.



- ★1 Viewed from the side of the bicycle after installation of the shoes is completed

6. Loosen the cable fixing bolt, move the brake caliper so that the clearance of the flexible pipe is 2 – 3mm, and then secure the inner cable.



★1 2 - 3mm

- (A) Flexible pipe
(B) 5mm Allen key

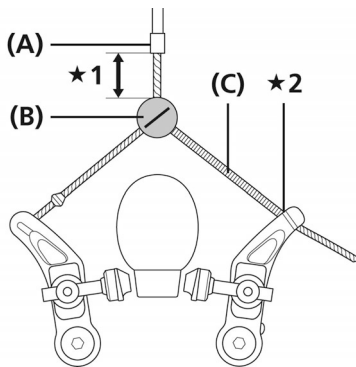
Tightening torque

5mm Allen key

6 - 8 N·m

{53 - 69 in. lbs.}

7. Adjust so that the flexible pipe touches the brake caliper.

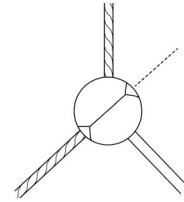


★1 20mm or more

★2 Touches

- (A) Outer casing holder
(B) Cable carrier
(C) Flexible pipe

8. If the cable carrier is in the position in the illustration, then setting is complete.

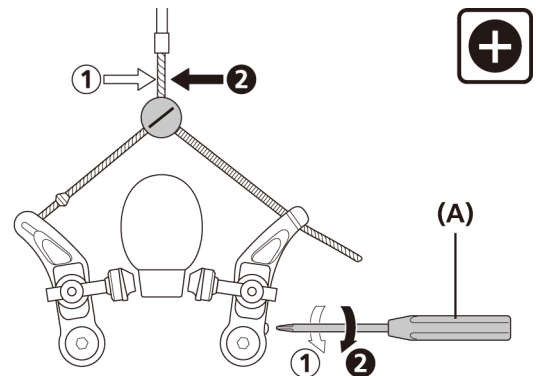


TECH TIPS

Check to be sure that there is a clearance of 20mm or more between the outer casing holder and the cable carrier as shown in the illustration in step 7.

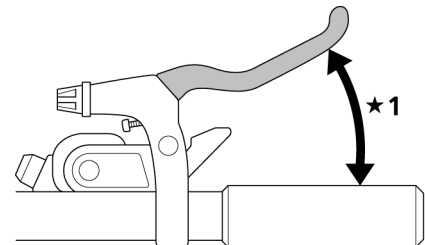
This is to ensure that the cable carrier does not touch the outer casing holder as if it does touch, the brakes will not work.

9. If balance adjustment is necessary, adjust with the spring adjustment bolt.



- (A) Screwdriver

10. Depress the brake lever about 10 times as far as the grip and check that everything is operation correctly before using the brakes.



★1 Depress about 10 times

FRONT CHAINWHEEL

TO ENSURE SAFETY

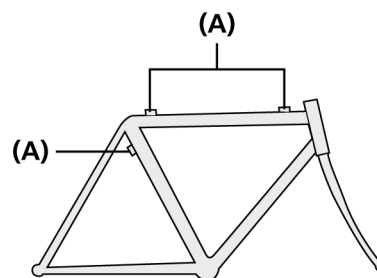
WARNING

“Intervals between maintenance depend on the use and riding circumstances. Clean regularly the chain with an appropriate chain cleaner. Never use alkali based or acid based solvents, such as rust cleaners. If those solvent be used chain might break and cause serious injury.”

- 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 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.
- If the inner cover is not installed correctly, the axle may rust. This may result in damage to the axle, the bicycle falling over and serious injury.
- Inspect the chain for possible deformity and abnormalities such as cracks or corruptions. If damage is detected, replace the chain immediately. If you continue to ride the bicycle in such a condition, the chain may break causing the bicycle to fall, and serious injury may result.
- **Obtain and read the dealer’s manual carefully prior to installing the parts.**
Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. It is strongly recommended using only genuine Shimano replacement parts.
- **Obtain and read the dealer’s manual carefully prior to installing the parts.**
If adjustments are not carried out correctly, the chain may come off. This may cause you to fall off the bicycle which could result in serious injury.

NOTE

- In addition, if pedaling performance does not feel normal, check this once more.
- Before riding the bicycle, check that there is gap or looseness in the connection. Also, be sure to retighten the crank arms and pedals at periodic intervals.
- 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.
- Do not wash the bottom bracket with high-pressure jets of water.
- If you feel any looseness in the bearings, the bottom bracket should be replaced.
- 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.
- Use a neutral detergent to clean the crank arm and the bottom bracket. Using alkaline or acidic detergents may cause discoloration.
- If gear shifting operations cannot be carried out smoothly, clean the derailleur and lubricate all moving parts.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.
- Use an outer casing which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.



(A) Outer casing holder

- A special grease is used for the gear shifting cable. Do not use premium grease or other types of grease. These may cause deterioration in gear shifting performance.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- Operate the gear shifting levers only while turning the crankset.
- Do not disassemble the shifting lever unit, as this may damage it or cause mis-operation.

For MTB/Trekking

- For frames with suspension, the chain stay angle will vary depending on whether the bicycle is being ridden or not being ridden. When the bicycle is not being ridden and the chain is positioned on the largest/larger chainring and on the smallest sprocket, the chain guide outer plate of the front derailleur may touch the chain.
- When installing the top route type, choose a frame that has three outer casing holders as shown in the illustration at right.
- If the brake fluid used in the oil disc brakes is of a type which tends to adhere to the plastic parts of the shifting lever, this may cause the plastic parts to crack or become discolored. Therefore, make sure that the brake fluid does not stick to these plastic parts. The Shimano genuine mineral oil which is used in SHIMANO disc brakes does not cause cracking or discoloration if it adheres to plastic parts, but such parts should be cleaned with alcohol beforehand to prevent foreign particles from adhering.

For ROAD

- If the bottom bracket shell is not parallel, gear shifting performance will drop.
- When installing the left and right adapters, be sure to install the inner cover. Otherwise the waterproofing performance will worsen.
- 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.
- If you feel any looseness in the bottom bracket axle, the bottom bracket should be replaced.

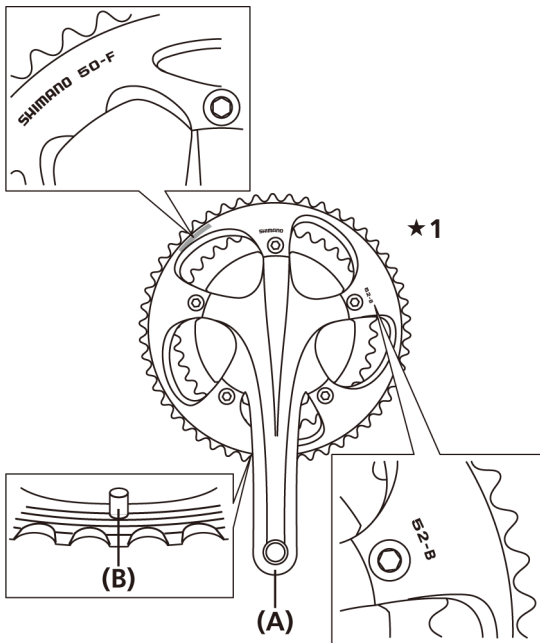
INSTALLATION (CHAINRINGS)

Smooth shifting will not be possible if the chainrings are incorrectly installed. Therefore, be sure to install the chainrings in the correct positions.

For ROAD

■ Double chainwheel set

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



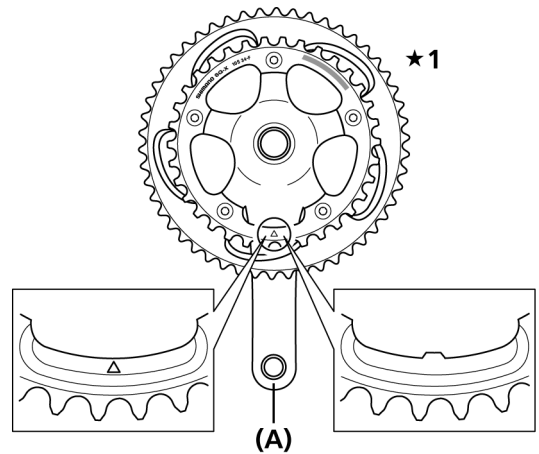
★1 Outer side

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

Tightening torque

12 - 14 N·m
{105 - 122 in. lbs.}

2. With the marked surface of the smallest chainring facing away from the crank arm, set the chainring so that the Δ mark is lined up with the crank arm position.



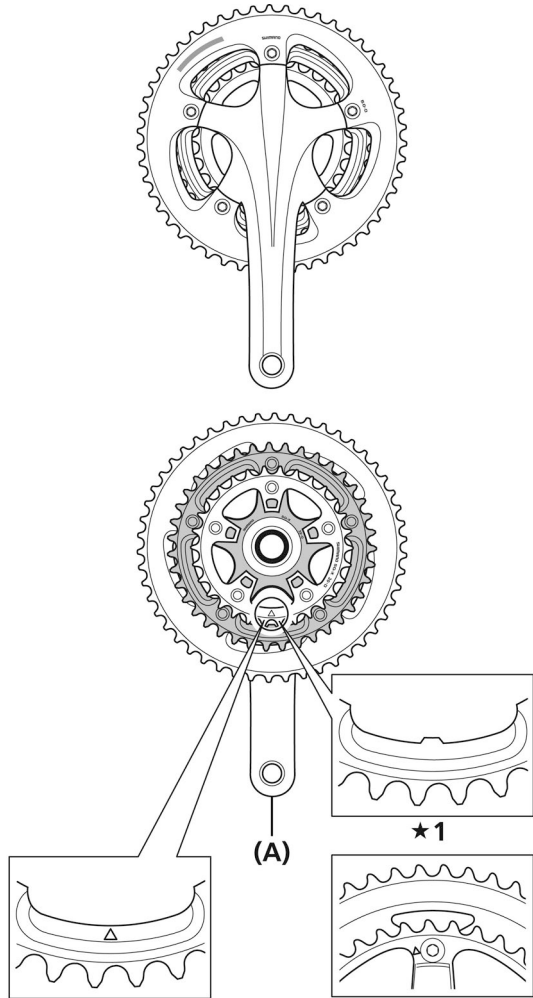
★1 Inner side

- (A) Crank arm

Tightening torque

12 - 14 N·m
{105 - 122 in. lbs.}

■ Triple chainwheel set



★1 FC-5703 (39T)

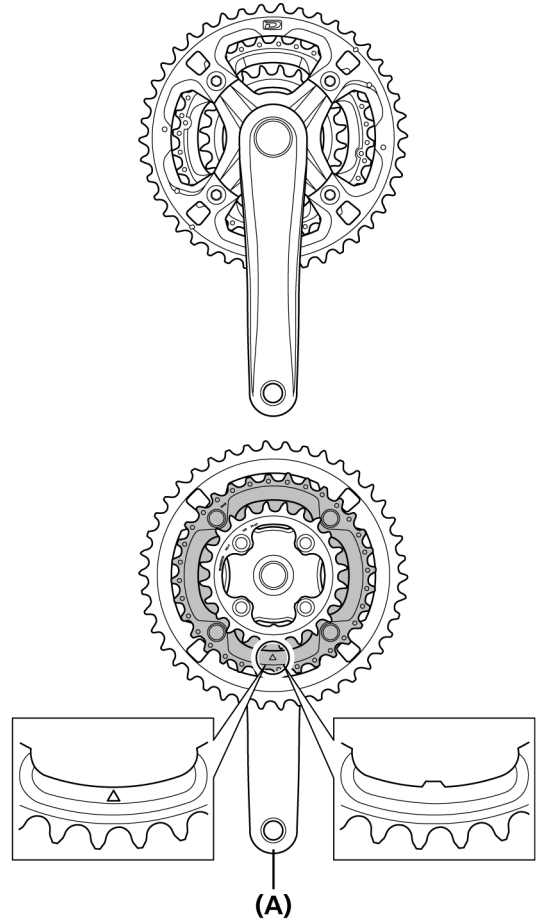
(A) Crank arm

Tightening torque

12 - 14 N·m
{105 - 122 in. lbs.}

For MTB/Trekking

■ Triple chainwheel set



(A) Crank arm

Largest chainring/middle chainring

Tightening torque

14 - 16 N·m
{123 - 139 in. lbs.}

Smallest chainring

Tightening torque

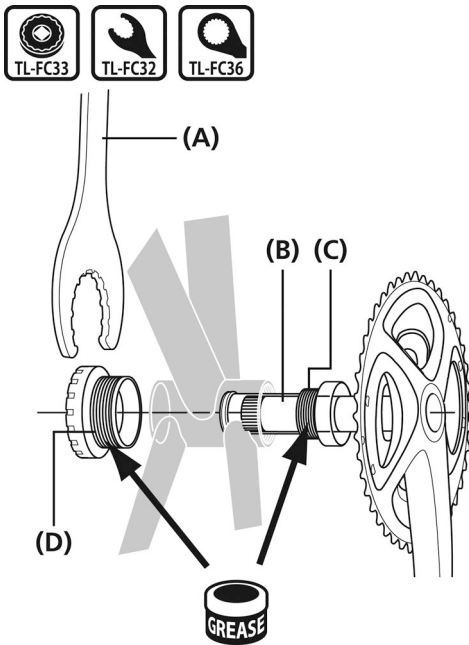
16 - 17 N·m
{140 - 148 in. lbs.}

INSTALLATION (FRONT CHAINWHEEL)

HOLLOWTECH II/2 piece crankset

■ Installation of crank

- 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)

Tightening torque

TL-FC33
 TL-FC32/TL-FC36
35 - 50 N·m
{306 - 437 in. lbs.}

NOTE

Tighten TL-FC33 using TL-FC32/FC36 in combination.

NOTE

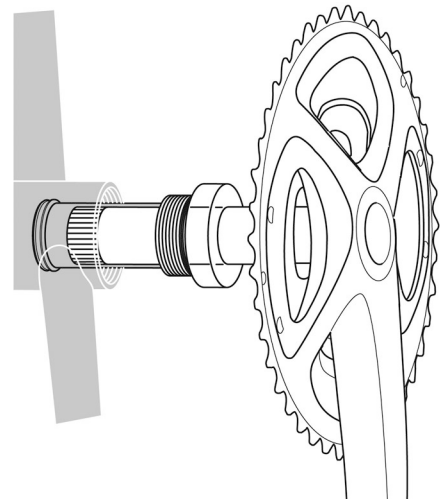
For MTB/Trekking

Spacers used vary according to the width of the bottom bracket shell. For details, refer to "Spacer installation method (For MTB/Trekking)".

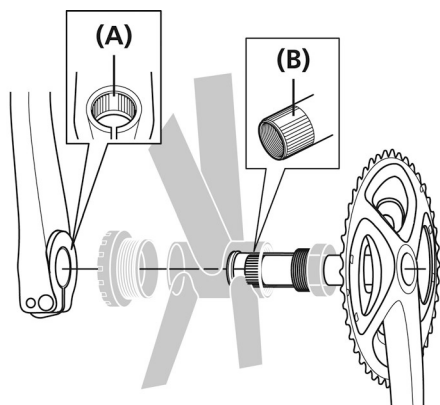
TECH TIPS

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

- Insert the right crank arm unit.



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

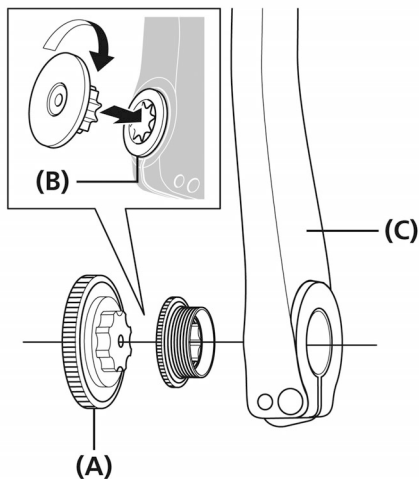


- (A) Wide groove area (left crank arm)
 (B) Wide groove area (axle)

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 to tighten the cap.



- (A) TL-FC16
 (B) Cap
 (C) Left crank arm

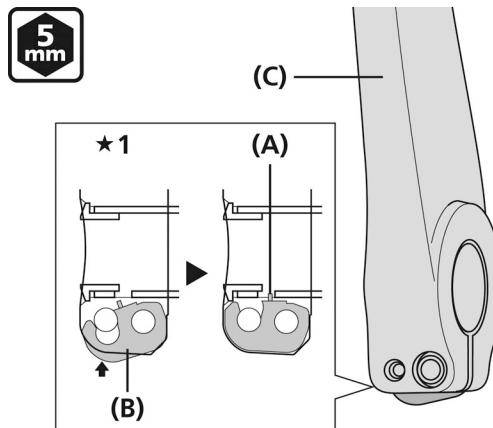
Tightening torque

TL-FC16/TL-FC18

0.7 - 1.5 N·m

{6.2 - 13 in. lbs.}

5. 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.



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

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

Tightening torque

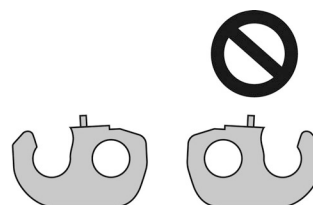
5mm Allen key

12 - 14 N·m

{105 - 122 in. lbs.}

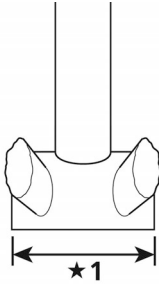
NOTE

- Each of the bolts should be evenly and equally tightened.
- Set the stopper plate in the correct direction as shown in illustration.



■ **Spacer installation method (For MTB/Trekking)**

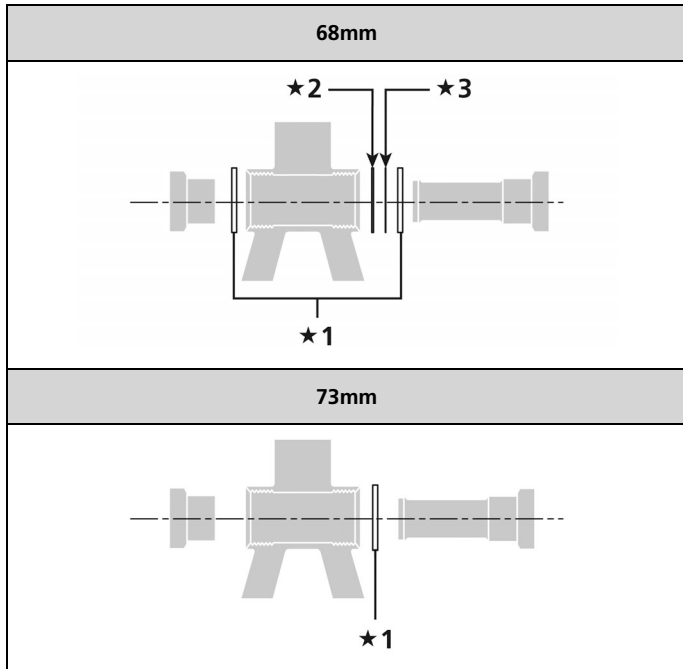
1. Check whether the width of the bottom bracket shell is 68mm or 73mm.



★1 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 (Band type)

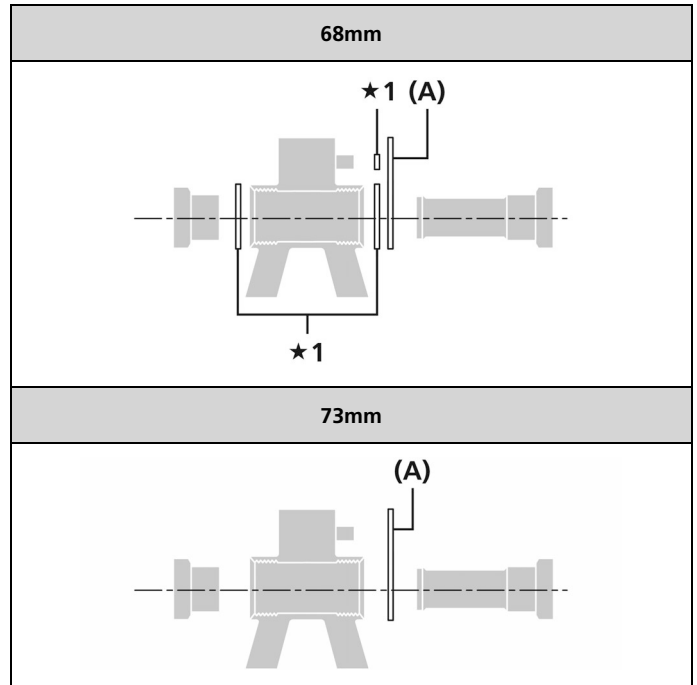


- ★1 2.5mm spacer
- ★2 1.8mm spacer
- ★3 0.7mm spacer

TECH TIPS

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

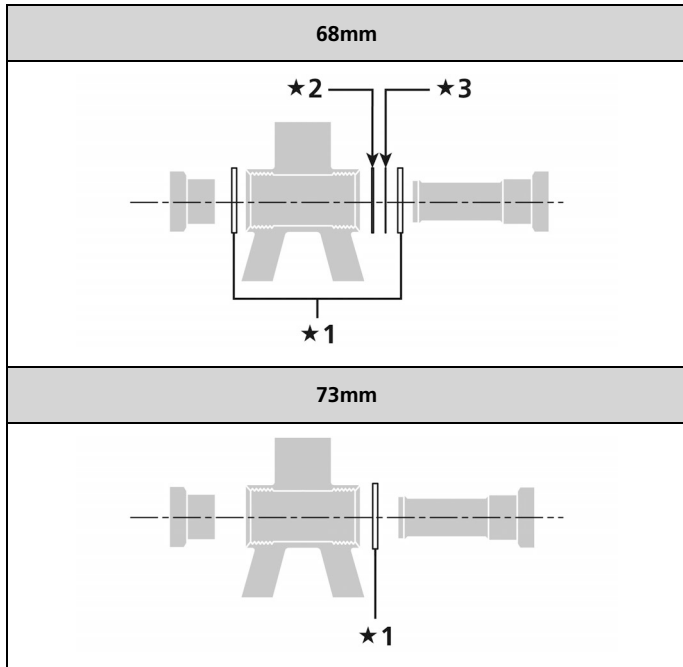
Normal type (Bracket type)



★1 2.5mm spacer

(A) BB mount-type bracket

Chain case specification (Band type)

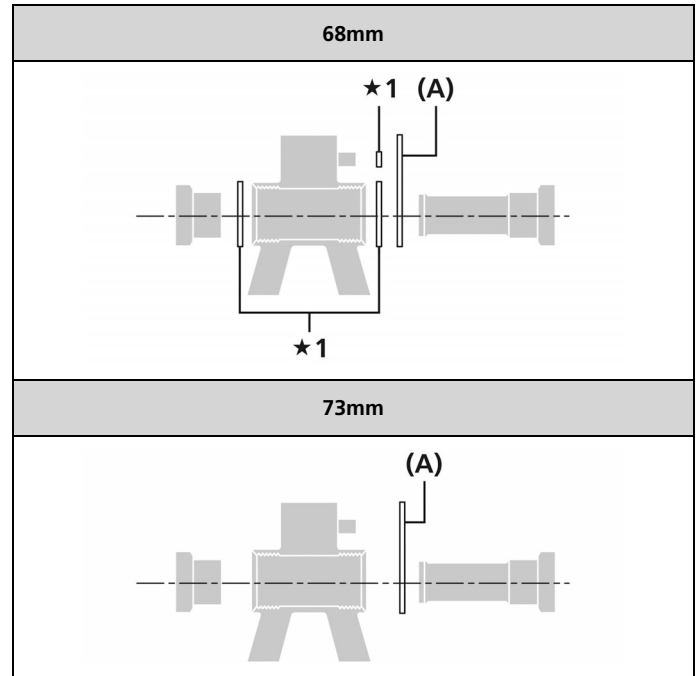


- ★1 2.5mm spacer
- ★2 1.8mm spacer
*1.8mm corresponds to the thickness of the chain case.
- ★3 0.7mm spacer

TECH TIPS

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

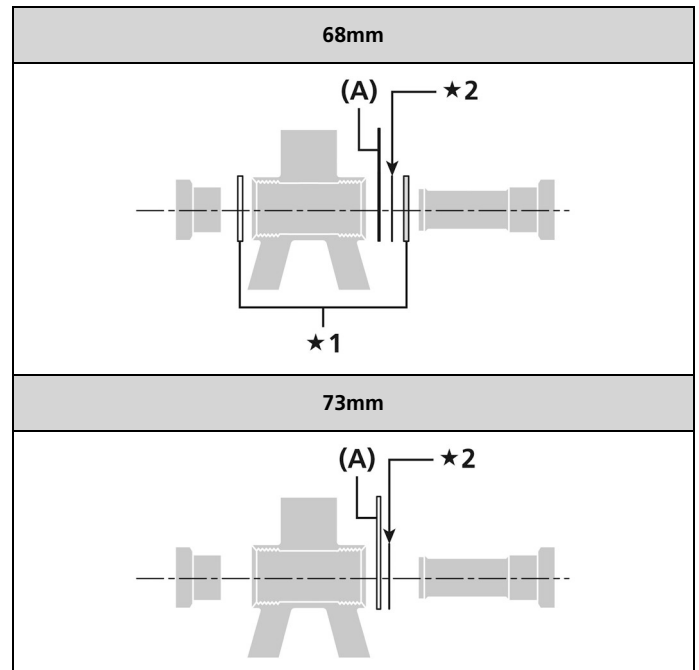
Chain case specification (Bracket type)



- ★1 2.5mm spacer

(A) BB mount-type bracket

Chain case specification (Chain case stay type)



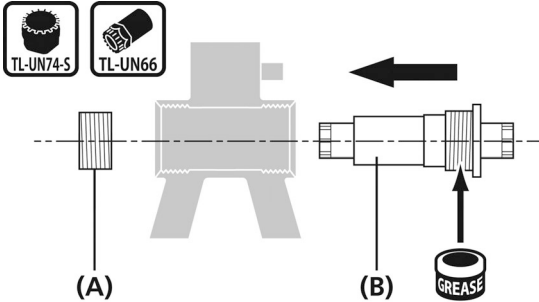
- ★1 2.5mm spacer
- ★2 0.7mm spacer

(A) Chaincase stay

OCTALINK TYPE

■ Installation of the bottom bracket

1. Apply grease to the main body, and install using the Shimano original tool. First install the main body, then the adapter.



(A) Adapter
(B) 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.

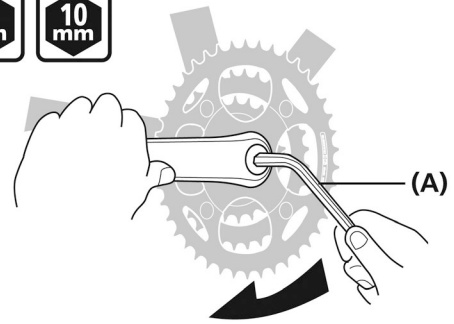


If the adapter is made of plastic
Do not apply grease to the adapter.



■ Installation of the front chainwheel

1. Use an Allen key to install the front chainwheel.



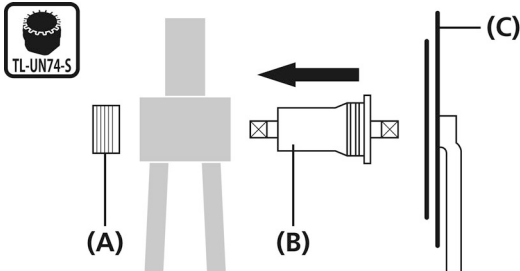
(A) 8mm Allen key/10mm Allen key

Tightening torque
8mm Allen key/10mm Allen key
35 - 50 N·m
{306 - 437 in. lbs.}

SQUARE TYPE

■ Installation of the bottom bracket

1. Install using the Shimano original tool. First install the main body, then the adapter.



- (A) Adapter
- (B) Body
- (C) Front chainwheel

Tightening torque

TL-UN74-S
50 - 70 N·m
{437 - 611 in. lbs.}

NOTE

If the main body and adapter are made of aluminum or steel

Apply grease to the main body and adapter.



If the main body and adapter are made of plastic

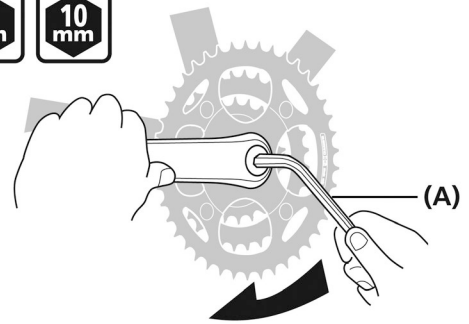
Do not apply grease to the main body or adapter.



■ Installation of the front chainwheel

If using an Allen key

1. Use an Allen key to install the front chainwheel.



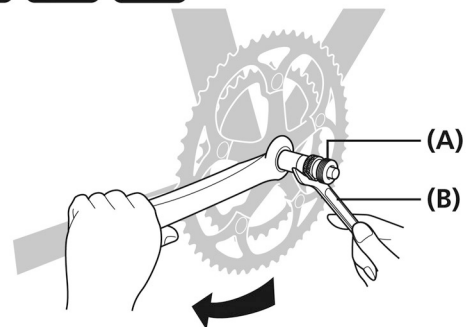
- (A) 8mm Allen key/10mm Allen key

Tightening torque

8mm Allen key/10mm Allen key
35 - 50 N·m
{306 - 437 in. lbs.}

If using a Shimano original tool

1. Use the Shimano original tool to install the front chainwheel.



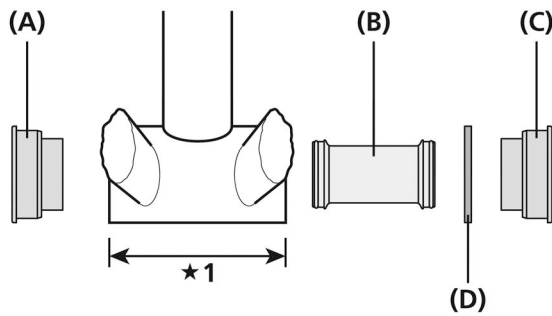
- (A) TL-FC10/TL-FC11
- (B) 15mm spanner

Tightening torque

TL-FC10/TL-FC11
 15mm spanner
35 - 50 N·m
{306 - 437 in. lbs.}

INSTALLATION (PRESS-FIT BOTTOM BRACKET)

Adapter



★1 Bottom bracket shell width

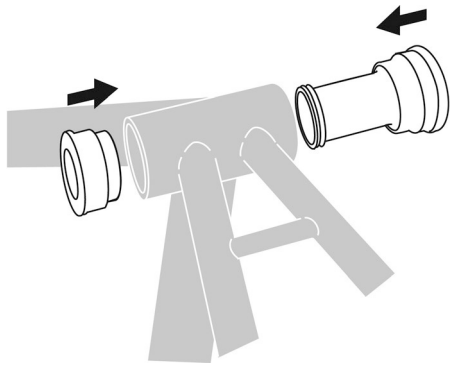
- (A) Left-hand adapter
- (B) Inner cover
- (C) Right hand adapter
- (D) 2.5mm spacer

Assembly example

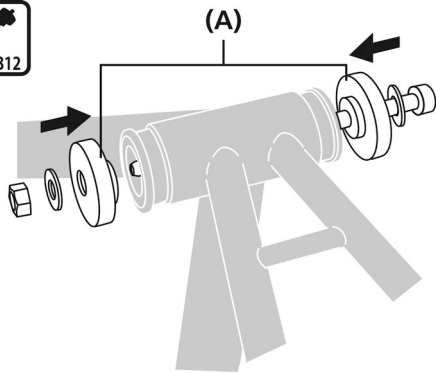
Adapter type		ROAD	MTB
Inner cover cannot be installed	If the frame has no openings inside the bottom bracket shell, it can be installed without the inner cover sleeve.	<ul style="list-style-type: none"> Use for a bottom bracket shell width of 86.5mm. 	-
Inner cover can be installed	If the frame has openings inside the bottom bracket shell, it should be installed with the inner cover sleeve to prevent possible contamination.	<ul style="list-style-type: none"> Use for a bottom bracket shell width of 86.5mm. The 2.5mm spacer is not necessary. Use the inner cover. 	<ul style="list-style-type: none"> The 2.5mm spacer is not needed for a bottom bracket shell width of 92mm. Use the inner cover.
		<ul style="list-style-type: none"> 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). Use the inner cover. 	

Installation

1. Insert the bottom bracket into the bottom bracket shell.

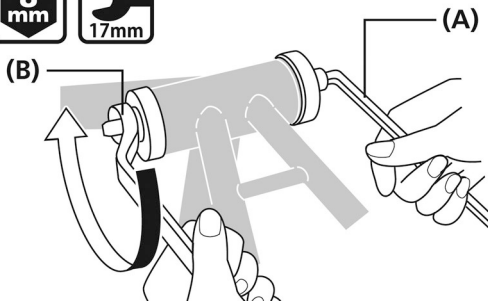


2. Insert the Shimano original tool into the bottom bracket.



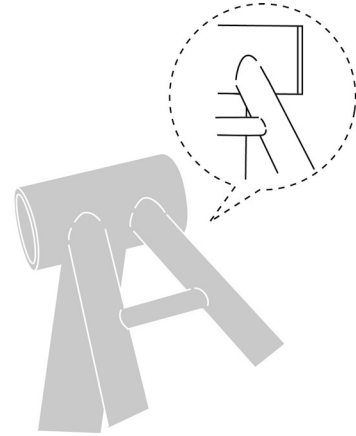
(A) TL-BB12

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.



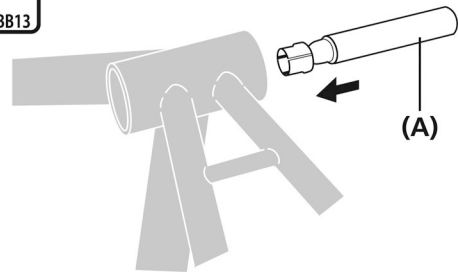
(A) 8mm Allen key
(B) 17mm spanner

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



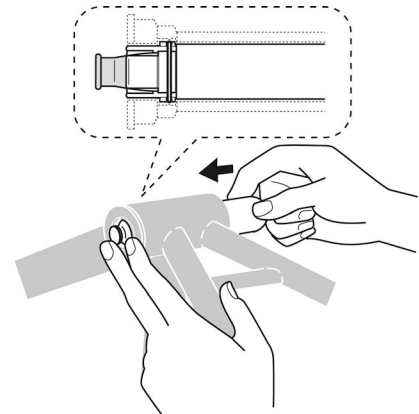
Removal

1. Insert the Shimano original tool into the bottom bracket.



(A) TL-BB13

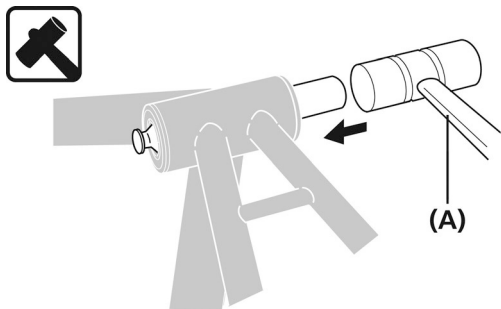
2. As shown in the illustration, hold down the flap with your fingers and push it in from the opposite side. (When pushed in, the flap opens.)



TECH TIPS

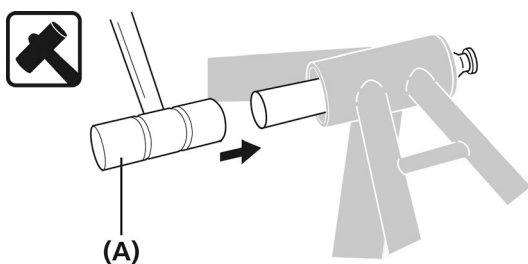
While holding down the end of the removal tool, push the tool in from the other side until it locks in place.

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

NOTE

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

PEDALS (SPD-SL PEDALS/SPD PEDALS)

TO ENSURE SAFETY

For information on the Click'R pedals and the flat pedals, refer to the dealer's manual for each product.

WARNING TO PARENT/GUARDIAN

To avoid serious injuries:

USE OF THIS PRODUCT IN ACCORDANCE WITH THESE DEALER'S MANUAL IS ESSENTIAL FOR YOUR CHILD'S SAFETY. MAKE SURE YOU AND YOUR CHILD UNDERSTAND THESE DEALER'S MANUALS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY.

WARNING

Be sure to also inform users of the following:

If the warnings below are not followed, your shoes may not come out of the pedals when you intend or they may come out unexpectedly or accidentally, and severe injury may result.

Common descriptions regarding SPD-SL/SPD pedals

- SPD-SL/SPD pedals are designed to be released only when intended. They are not designed to be released automatically when you have fallen off the bicycle.
- Before attempting to ride with these pedals and shoes, make sure you understand the operation of the engagement/release mechanism for the pedals and cleats (shoes).
- Before you attempt to ride with these pedals and shoes, apply the brakes, then place one foot on the ground and practice engaging and releasing each shoe from its pedal until you can do so naturally and with minimal effort.
- Ride on level ground first until you become accustomed to engaging and releasing your shoes from the pedals.
- Before riding, adjust the spring tension of the pedals to your liking. If the spring tension of the pedals is low, the cleats may become accidentally released and you may lose balance and fall off the bicycle. If the spring tension of the pedals is high, the cleats cannot be easily released.
- When riding at low speed or when there is a possibility that you might need to stop riding, (for example, when doing a U-turn, nearing an intersection, riding uphill or turning a blind curve), release your shoes from the pedal beforehand so that you can quickly put your feet onto the ground at any time.

- Use a lighter spring tension for attaching the pedal cleats when riding in adverse conditions.
- Keep cleats and bindings out of dirt and debris to ensure proper engagement and release.
- Remember to check the cleats periodically for wear. When the cleats are worn, replace them, and always check the spring tension before riding and after replacing the pedal cleats.
- Be sure to attach reflectors to the bicycle when riding at night. Do not continue riding the bicycle if the reflectors are dirty or damaged. Otherwise, it becomes more difficult for others to see you.
- Use only Shimano cleats and make sure that the mounting bolts are tightened securely to the shoes. Refer to the dealer's manual for each product for applicable cleats.

Descriptions regarding SPD-SL pedals

- Use only SPD-SL shoes with this product. Other types of shoe may not release from the pedals, or may release unexpectedly.

Descriptions regarding SPD pedals

- Use only SPD shoes with this product. Other types of shoe may not release from the pedals, or may release unexpectedly.

CAUTION

To avoid serious injuries:

SPD PEDALS

PD-M324 can be fitted with toe clips, but the toe clips should be removed when using the pedals as SPD pedals.

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.
- Check that there is no looseness in cleat or spacer before riding the bicycle.
- If pedaling performance does not feel normal, check the bicycle once more.
- If you experience any trouble with the rotating parts of the pedal, the pedal may require adjustment. Consult a dealer or an agency.
- Be sure to retighten the crank arms and pedals at periodic intervals at the place of purchase or a bicycle dealer.

TO ENSURE SAFETY

- Optional reflector sets are available. Reflector sets vary depending on the model of the pedals, therefore, consult a dealer or an agency.
- Products are not guaranteed against natural wear and deterioration from normal use and aging.

INSTALLATION (SPD PEDALS)

NOTE

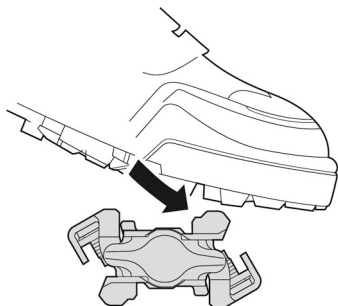
Single release mode cleats (SM-SH51) and multiple release mode cleats (SM-SH56) are available for use with these pedals.

Each type of cleat has its own distinctive features, so be sure to follow these instructions carefully and select whichever type of cleat best suits your riding style and the terrain and riding conditions which you will encounter.

Other types of cleats, such as single release mode cleats (SM-SH52) and multiple release mode cleats (SM-SH55), cannot be used as they do not provide stable enough step-out performance or sufficient holding force.

Engaging the cleats with the pedals

1. Press the cleats into the pedals with a forward and downward motion.



Releasing the cleats from the pedals

The method of release varies according to the type of cleats you are using.

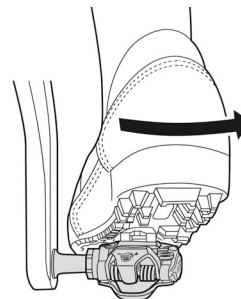
(Check the model number and color of your cleats to determine the proper method of release.)

■ Single release mode cleats: SM-SH51 (black)

- These cleats only release when the heel is moved outward. They will not release if the heel is twisted in any other direction.
- Upward force may be applied to the pedal, since they will not release unless the foot is twisted outward.
- The cleats will not necessarily release if you lose your balance. Accordingly, for places and conditions where it looks as though you may lose balance, make sure that you have sufficient time to release the cleats beforehand.
- When you are pedaling vigorously, your heel may inadvertently twist outward and this may cause the cleat to release accidentally. If the cleat releases by accident, you may fall off the bicycle and serious injury may result. You can help to prevent this by adjusting the amount of force required to release the cleats in any direction. You should practice until you are accustomed to the amount of force and the angle required to release the cleats.

Single release mode

These cleats only release when the heel is moved outward.



NOTE

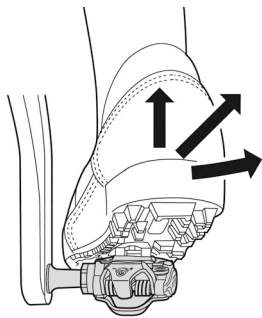
It is necessary to practice releasing until you become accustomed to the technique.

Multiple release mode cleats: SM-SH56 (silver, gold)

- The cleats can be released by twisting in any direction.
- Because the cleats can also be released by lifting your heel, they may become accidentally released when applying upward force on the pedals. These cleats should not be used for riding style which may involve pulling up on the pedals or for activities, such as jumping. In such riding styles, pulling forces are applied to the pedals causing possible release from the pedals.
- Although the cleats can be released by twisting your heels in any direction, or by lifting, they will not necessarily release if you lose your balance. Accordingly, for places and conditions where it looks as though you may lose balance, make sure that you have sufficient time to release the cleats beforehand.
- If the cleat releases by accident, you may fall off the bicycle and serious injury may result. If the use of the multiple release mode cleats are not sufficiently understood or used correctly, they may release accidentally more frequently than single release mode cleats. You can help to prevent this by adjusting the amount of force required to release the cleats in any direction. You should practice until you are accustomed to the amount of force and the angle required to release.

Multiple release mode

Release the cleats from the pedals by twisting your heels in any direction.



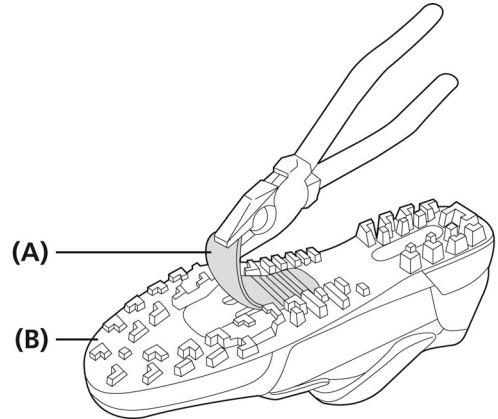
NOTE

It is necessary to practice releasing until you become accustomed to the technique.
Releasing by lifting your heel requires particular practice.

Attaching the cleats

Set the cleat on the bottom of each shoe as shown in the illustration, and then tighten the cleat mounting bolts, temporarily.

1. With a pair of pliers or a similar tool, pull off the rubber cover to expose the cleat mounting holes.

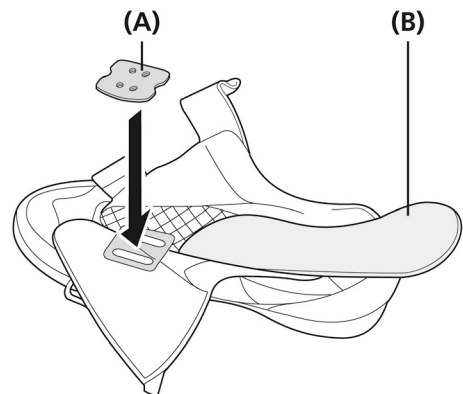


- (A) Rubber cover for cleat mounting holes
(B) SPD shoe

NOTE

This step may not be necessary depending on the type of shoe.

2. Remove the sockliner and position a cleat nut over the oval holes.



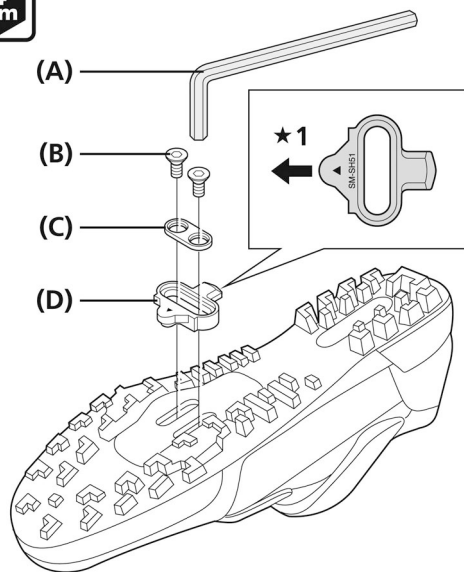
- (A) Cleat nut
(B) Sockliner

NOTE

This step may not be necessary depending on the type of shoe.

- Position the cleat then the cleat adapter on to the bottom of the shoe and then tighten with the cleat mounting bolts.

The cleats are compatible with both left and right pedals.



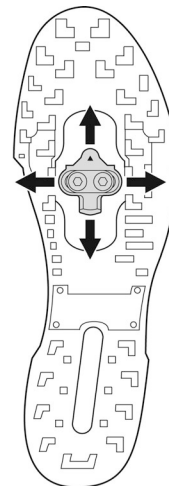
★1 Position the triangular portion of the cleat toward the front of the shoe.

- (A) 4mm Allen key
- (B) Cleat mounting bolt
- (C) Cleat adapter
- (D) Cleat

Provisional tightening torque for cleat mounting bolts
4mm Allen key
2.5 N·m
{22 in. lbs.}

■ Adjustment of cleat position

- The cleat has an adjustment range of 20mm front to back and 5mm right to left. After temporarily fixing the cleats, adjust them by repeatedly engaging and releasing the cleats, one by one, to determine the optimal necessary cleat positions.

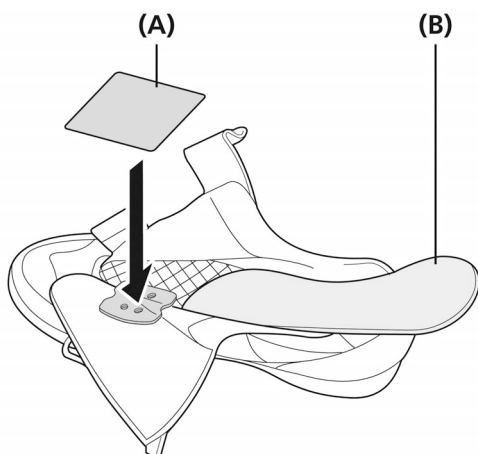


- After you have determined the best cleat position, firmly tighten the cleat mounting bolts with a 4mm Allen key.

Tightening torque
4mm Allen key
5 - 6 N·m
{44 - 52 in. lbs.}

Waterproof seal

1. Remove the sockliner and attach the waterproof seal.



- (A) Waterproof seal
(B) Sockliner

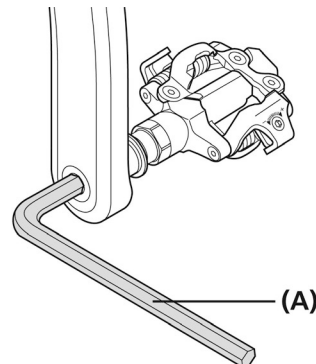
NOTE

The waterproof seal is supplied with Shimano shoes that require this step to be carried out.

Installation to crank

1. Apply a small amount of grease to the thread to prevent sticking.

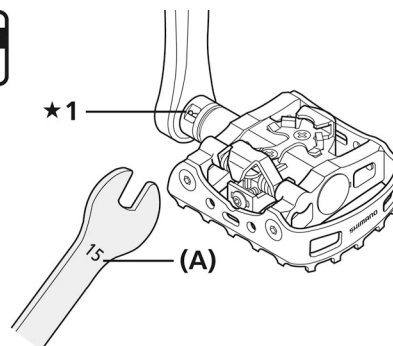
2. Use an 8mm Allen key or a 15mm spanner to install the pedals to the cranks.
 - The right pedal has a right-hand thread; the left pedal has a left-hand thread.



- (A) 8mm Allen key

Tightening torque

8mm Allen key
35 - 55 N·m
{306 - 480 in. lbs.}



- ★1 Note the markings
R: Right pedal, L: Left pedal

- (A) 15mm spanner

Tightening torque

15mm spanner
35 - 55 N·m
{306 - 480 in. lbs.}

NOTE

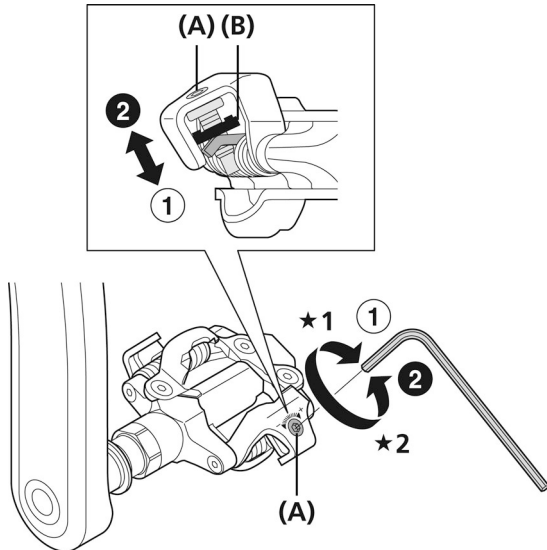
A 6mm Allen key cannot provide sufficient tightening torque.

Always be sure to use a 15mm spanner.

3. Remove any roughness or bumps on the joint, if detected.

Adjusting the spring tension of the binding

The spring force is adjusted by means of adjustment bolts. The adjustment bolts are located behind each of the bindings, and there are two adjustment bolts on each pedal. Equalize the tensions by referring to the adjustment plates and by counting the number of turns of the adjustment bolts. The spring tension can be adjusted by four steps each turn of the adjustment bolt.



★1 Increase

★2 Decrease

(A) Adjustment bolt

(B) Adjustment plate

TECH TIPS

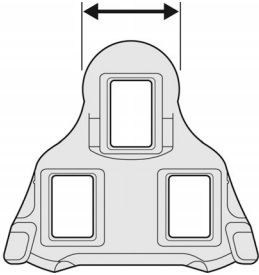
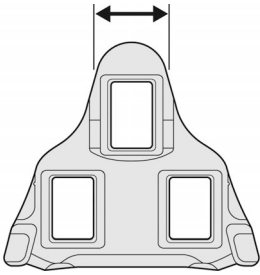
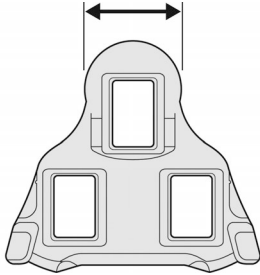
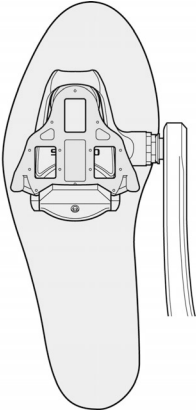
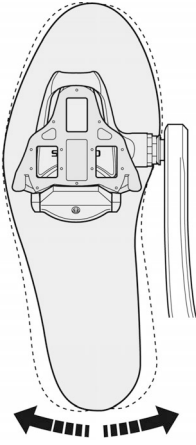
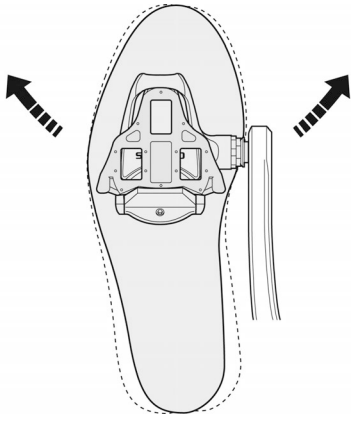
When the adjustment bolt is turned clockwise, the spring tension increases, and when it is turned counterclockwise, the spring tension decreases.

Cleat replacement

Cleats wear out over time and should be replaced periodically. Cleats should be replaced when it becomes difficult to release, or it starts to release with much less effort than the when it was in new condition.

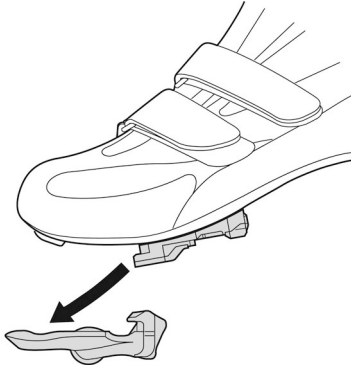
INSTALLATION (SPD-SL PEDALS)

Cleat types

SM-SH10	SM-SH11 (R540-LA: standard)	SM-SH12 (PD-9000: standard)
Red	Yellow	Blue
<p data-bbox="277 510 335 537">Wide</p> 	<p data-bbox="756 510 829 537">Narrow</p> 	<p data-bbox="1257 510 1315 537">Wide</p> 
<p data-bbox="70 931 193 958">Fixed mode</p> <p data-bbox="70 963 536 1048">There is no looseness when the shoes are firmly engaged with the pedals. There is no looseness.</p> 	<p data-bbox="561 931 762 958">Self-aligning mode</p> <p data-bbox="561 963 992 1016">There is some sideways looseness when the shoes are engaged with the pedals.</p> 	<p data-bbox="1050 949 1310 976">Front center pivot mode</p> <p data-bbox="1050 981 1509 1034">There is some sideways looseness centered on the front of the shoes.</p> 

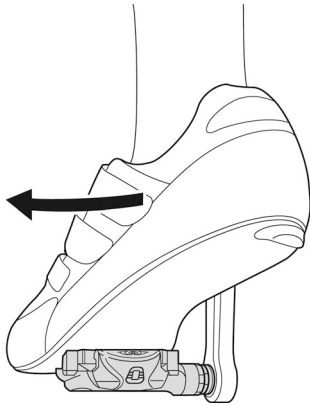
Engaging the cleats with the pedals

1. Press the cleats into the pedals with a forward and downward motion.



Releasing the cleats from the pedals

These cleats only release when the heel is moved outward.



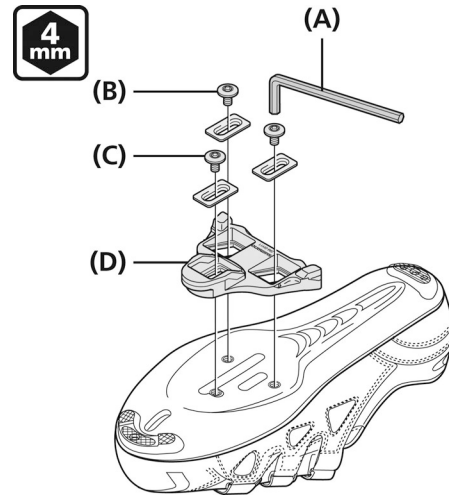
NOTE

Place one foot on the ground and practice engaging and releasing the cleat from the pedal several times. Set the spring tension to the tension you prefer when releasing the cleat.

Attaching the cleats

1. Set the cleat on the bottom of each shoe as shown in the illustration, and then tighten the cleat mounting bolts.

Refer to the Service Instructions provided with your shoes for further details.



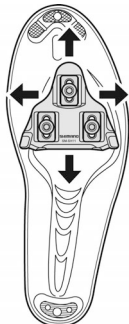
- (A) 4mm Allen key
- (B) Cleat mounting bolt
- (C) Cleat washer
- (D) Cleat

NOTE

When installing the cleats, use the provided cleat mounting bolts and washers. If you use any other cleat mounting bolts, it may damage the cleats and cause problems with installation.

Adjustment of cleat position

1. The cleat has an adjustment range of 15mm front to back and 5mm right to left. After provisionally tightening the cleat, practice engaging and releasing, one shoe at a time.
2. After you have determined the best cleat position, firmly tighten the cleat mounting bolts with a 4mm Allen key.



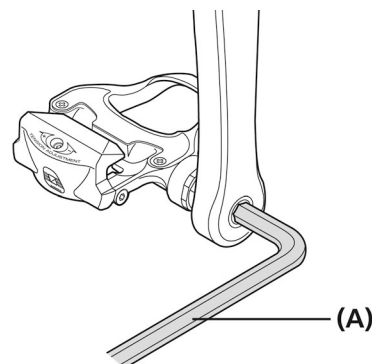
Tightening torque

4mm Allen key
5 - 6 N·m
{44 - 52 in. lbs.}

Mounting the pedals on the crank arms

1. Apply a small amount of grease to the thread to prevent sticking.

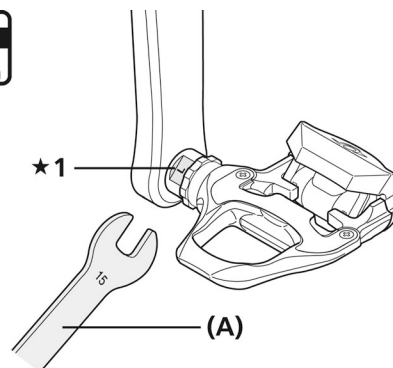
2. Use an 8mm Allen key or a 15mm spanner to install the pedals to the cranks.
 - The right pedal has a right-hand thread; the left pedal has a left-hand thread.



(A) 8mm Allen key

Tightening torque

8mm Allen key
35 - 55 N·m
{306 - 480 in. lbs.}



★1 Note the markings
 R: Right pedal, L: Left pedal

(A) 15mm spanner

Tightening torque

15mm spanner
35 - 55 N·m
{306 - 480 in. lbs.}

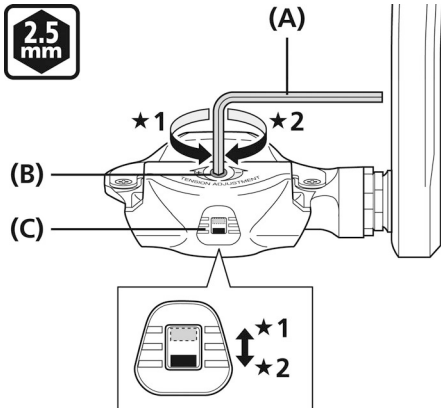
NOTE

A 6mm Allen key cannot provide a sufficient tightening torque. Always be sure to use a 15mm spanner.

3. Remove any roughness or bumps on the joint, if detected.

Adjusting the spring tension of the binding

- The spring force is adjusted with the adjustment bolts. Adjust the spring force to the optimal cleat holding force when releasing the cleats from the bindings. Equalize the spring tensions for both pedals by referring to the tension indicators and by counting the number of turns of the adjustment bolts. The spring tension can be adjusted by four steps each turn of the adjustment bolts; each adjustment bolt can be turned up to three full turns.



★1 Decrease

★2 Increase

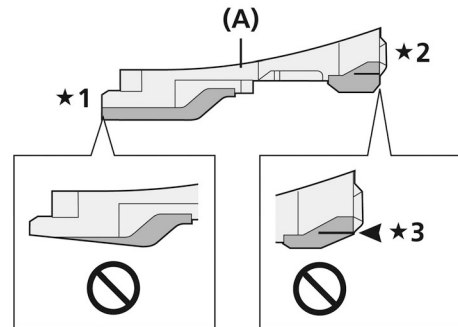
- (A) 2.5mm Allen key
 (B) Adjustment bolt
 (C) Indicator

NOTE

- In order to prevent accidental release, make sure all the spring tensions are properly adjusted.
- The spring tensions for the right and left pedals should be adjusted so they are equal. If the cleats are not adjusted equally, it can cause the rider difficulty in engaging or releasing the pedals.
- If the adjustment bolt is completely withdrawn from the spring plate, disassembly and reassembly will be required. If this occurs, ask a professional dealer for assistance.
- Do not turn the bolt past the point at which the indicator shows the maximum or minimum tension.

Cleat replacement

- Cleats wear out over time and should be replaced periodically. Cleats should be replaced when it becomes difficult to release, or it starts to release with much less effort than the when it was in new condition.



★1 Front

★2 Rear

★3 A

(A) Cleat

NOTE

If the yellow (SM-SH11) or red (SM-SH10) or blue (SM-SH12) portions of the cleats become worn, replace the cleats with new ones.

Front: Replace the cleats when the base layer underneath the cleats starts to be visible.

Rear: Replace when section A in the illustration becomes worn.

Replacement of the body cover

For information on how to replace the body cover, refer to the dealer's manual for each product.

Maintenance of the axle units

If you experience any trouble with the rotating parts of the pedal, the pedal may require adjustment.

Mounting the reflectors (optional)

Use a reflector (separately sold) designed for each pedal. For information on installation, refer to the included manual.

HUB DYNAMO

TO ENSURE SAFETY

WARNING

Be sure to also inform users of the following:

- 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 serious injury may result.
- Check that the light illuminates normally when riding at nighttime.

For Installation to the Bicycle, and Maintenance:

- Depending on the hub dynamo, the tire diameter of the compatible wheel may differ. Be sure to check the compatible size. If an incompatible size is used, the wheels may lock and you may lose balance and fall off the bicycle.
- If the total weight of the bicycle (bicycle + rider + luggage) is indicated on the hub body, the power modulator that controls an excessive braking effect is built in. Use the compatible brake lever together. If the total weight of the bicycle is heavier than the recommended range, braking may be insufficient; if lighter, braking will be too effective and the wheel may be locked, which may cause you to fall off the bicycle. The power modulator is not an anti-locking device of the wheel.

CAUTION

Be sure to also inform users of the following:

- The hub dynamo generates an extremely high voltage. Never touch the connection terminal of the hub dynamo directly while riding the bicycle or while the wheel is spinning. Touching the dynamo terminal may cause an electric shock.

NOTE

Be sure to also inform users of the following:

- Be sure to install the hub dynamo to the front fork so that the side with the connection terminal is on the right when facing toward the front of the bicycle. If the side with the connection terminal is facing toward the left, the hub dynamo may not turn properly while riding.
- Check that the hub dynamo connection terminal is securely connected before using the hub dynamo.

- If the bulb of either the front light or tail light burns out, excessive voltage will be applied to the remaining light and shorten the operating life of the bulb, so any burned out bulbs should be replaced as soon as possible.
- If the light is frequently turned on when riding at high speed ranges, it will shorten the operating life of the bulbs.
- Lights with electrical circuits such as automatic lights may become damaged if the bicycle is ridden at high speeds.
- The hub dynamo will cause the turning of the wheel to become slightly heavier because of the magnet inside the hub.

For Installation to the Bicycle, and Maintenance:

- According to German regulations (StVZO), a hub dynamo in Germany requires overvoltage protection. This hub dynamo (3.0W) does not have overvoltage protection inside the hub itself. Use an external overvoltage protector with a symbol to show that it complies with the German regulations (overvoltage protector product).
- Check that the front fork end is aligned. If the front fork end is severely misaligned, deformation of the hub axle may cause noise from an obstruction inside the hub dynamo.
- Do not lubricate the internal parts of the hub. Otherwise the grease will come out and it may cause problems with conductivity.
- Compatible lights

3.0W hub dynamo

Front light	Tail light
6.0V/2.4W	6.0V/0.6W
6.0V/3.0W	-
9.6V/5.0W	-

2.4W hub dynamo

Front light	Tail light
6.0V/2.4W	-

1.5W hub dynamo

Use LED light only.

0.9W hub dynamo

Front light	Tail light
6.0V/0.9W	-

INSTALLATION (HUB DYNAMO)

Installation of the disc brake rotor

* Please refer to the DISC BRAKE section.

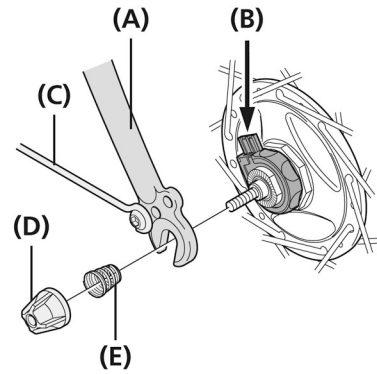
Installation of the front wheel

Install the wheel so that the side with the hub dynamo connection terminal is on the right side when looking toward the front of the bicycle, and so that the hub connection terminal is aligned with the front fork or with the basket stay. Then install following the procedure shown in the illustration so that the connection terminal is facing up.

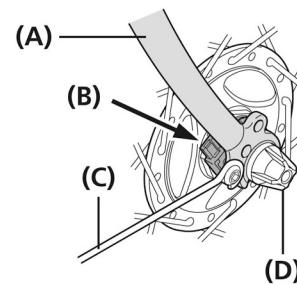
Do not force the connection terminal to turn after the quick release lever or the hub nut has been secured. If you force the connection terminal to turn, it may become damaged, or the wire inside the connection terminal may break.

■ For quick release type

Before installing



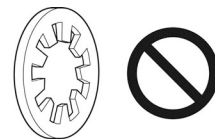
After installing



- (A) Front fork
- (B) Connection terminal
- (C) Mudguard stay
- (D) Quick release nut
- (E) Volute spring

NOTE

- Do not use the toothed axle washer with a quick release type.

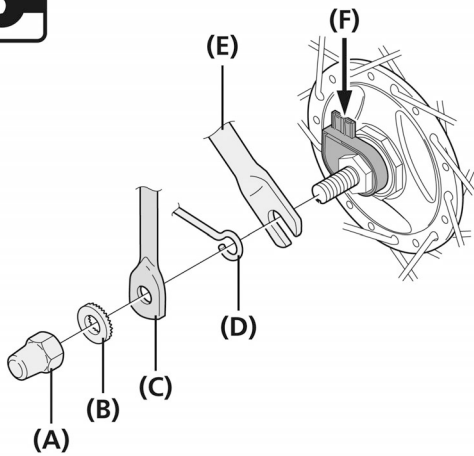


- Connect the two wires to ensure that the current flows smoothly.

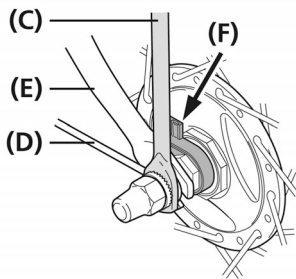
■ For nut type

For E2 type

Before installing



After installing



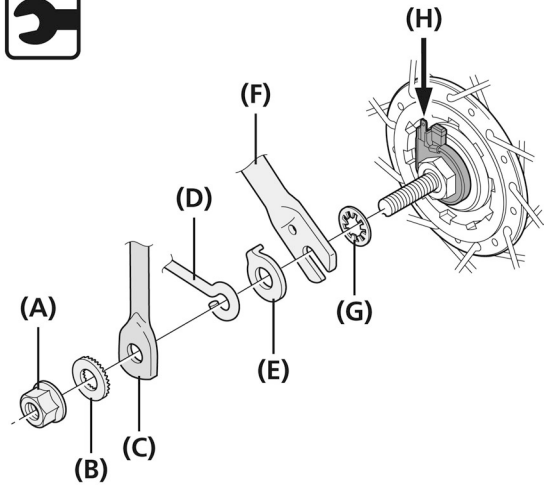
- (A) Hub nut (M9)
- (B) Washer
- (C) Basket stay
- (D) Mudguard stay
- (E) Front fork
- (F) Connection terminal

Tightening torque

Spanner

20 - 25 N·m
{175 - 218 in. lbs.}

For J2 type



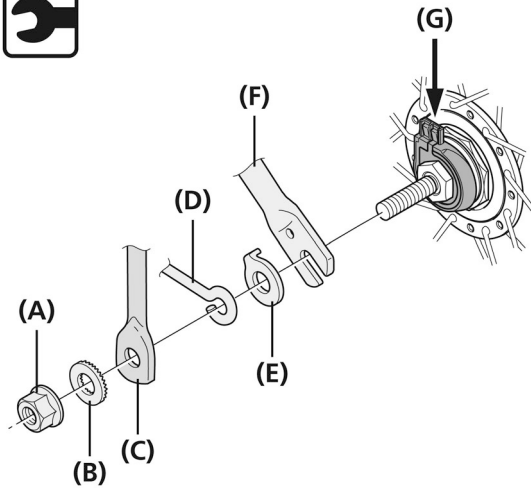
- (A) Flange nut
- (B) Washer
- (C) Basket stay
- (D) Mudguard stay
- (E) Front-wheel anti-falloff fitting
- (F) Front fork
- (G) Toothed washer for axles
- (H) Connection terminal

Tightening torque

Spanner

20 N·m
{175 in. lbs.}

For J2-A type



- (A) Flange nut
- (B) Washer
- (C) Basket stay
- (D) Mudguard stay
- (E) Front-wheel anti-falloff fitting
- (F) Front fork
- (G) Connection terminal

Tightening torque

Spanner

20 N·m

{175 in. lbs.}

NOTE

When tightening the hub nuts or flange nuts, tightening the hub nut only on one side excessively may force the hub axle to turn, tightening or loosening the lock nut excessively; therefore, tighten both nuts alternately.

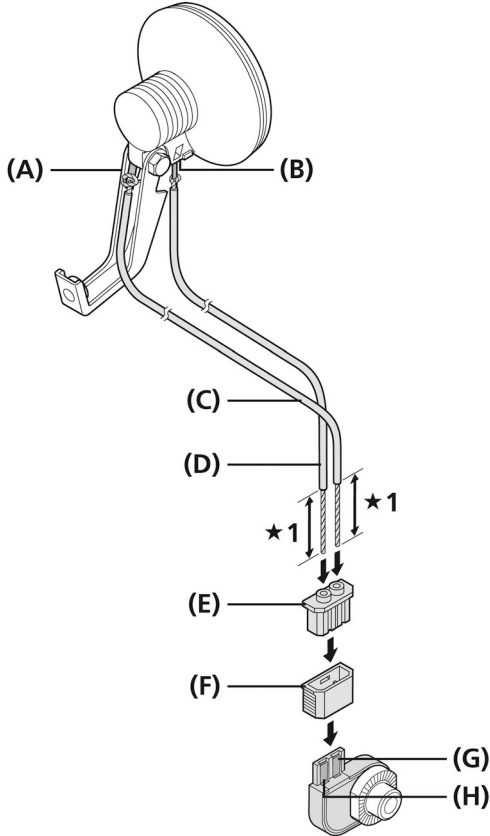
CONNECTION OF THE CABLES

If you wish to replace the connector or change the length of the cable, perform the following procedure.

For E2 type

1. Twist the conducting wires of the cable together before connecting them so that they stay together.

Hub dynamo connection terminal



★1 Approx. 16mm

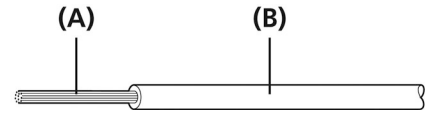
- (A) Frame connection terminal
- (B) Light connection terminal
- (C) Frame cable
- (D) Light cable
- (E) Connector cap (gray)
- (F) Connector cover (black)
- (G) Frame connection terminal
- (H) Light connection terminal

NOTE

Do not mix up the frame cable and the light cable by mistake. If the cables are connected incorrectly, the light will not turn on.

TECH TIPS

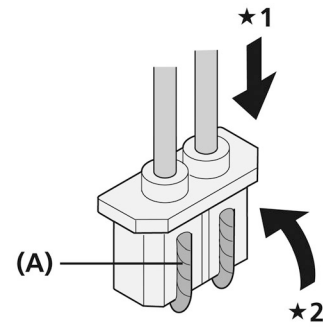
Recommended wire specification



- (A) Wire
- (B) Insulation

Type	Stranded
Wire	Size (AWG) 22 Diameter: approx. 0.8mm
Insulation	Diameter: 1.8 - 2mm

2. Bend the cable wires and run them along the grooves.

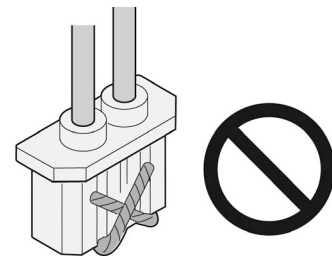


- ★1 Insert
- ★2 Bend

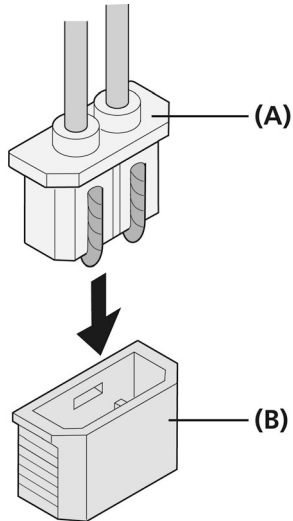
- (A) Groove

NOTE

Do not allow the cable wires to touch each other.



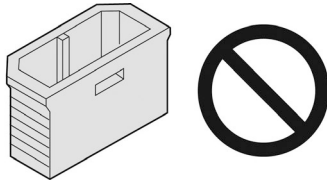
3. Press in until you hear a click.



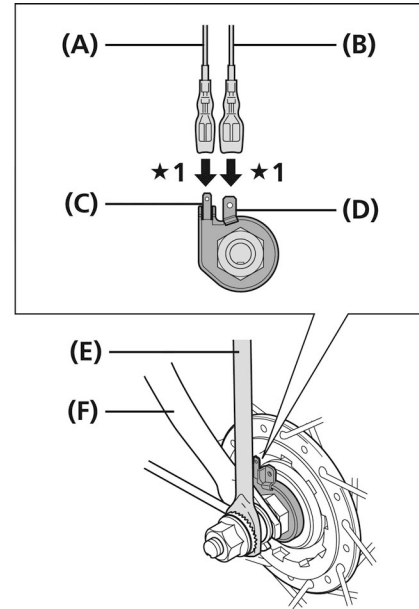
- (A) Connector cap (gray)
- (B) Connector cover (black)

NOTE

Set so that it faces the right way.



For J2 type



★1 Connect

- (A) Light cable
- (B) Frame (grounding) cord
- (C) Light connection terminal (small)
- (D) Frame (grounding) connection terminal (large)
- (E) Basket stay
- (F) Front fork

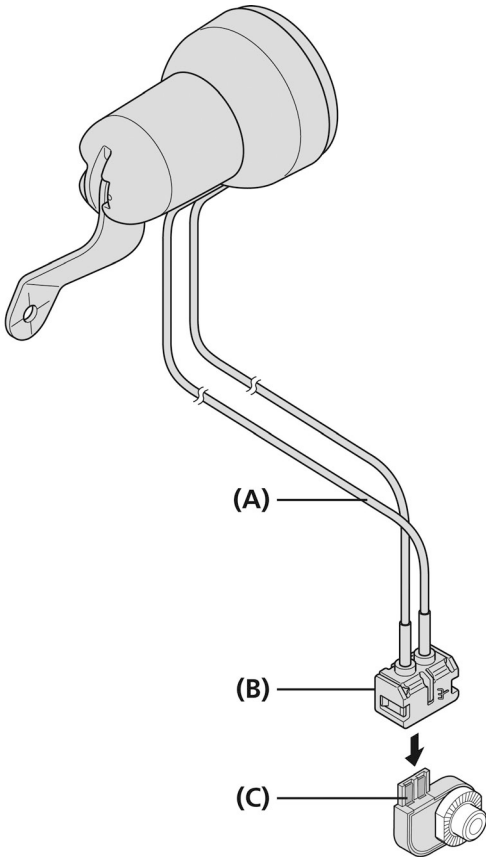
TECH TIPS

If the frame (grounding) connection terminal is fitted with a cover, remove it before connection.

For J2-A type

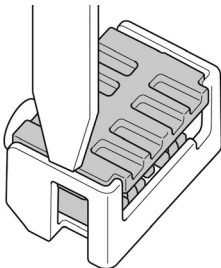
1. Twist the conducting wires of the cable together before connecting them so that they stay together.

Hub dynamo connection terminal

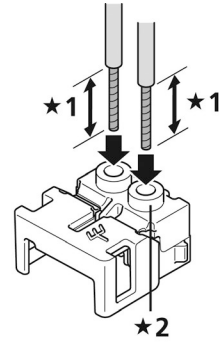


- (A) Mark
- (B) Connector
- (C) Connection terminal

2. Open the connector using a slotted screwdriver or similar tool as shown in the illustration.

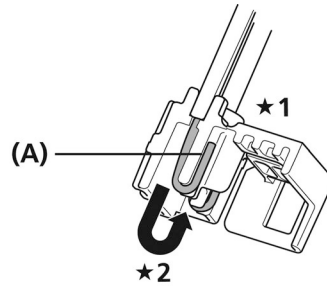


3. Insert the cable with the marking into the ground side of the connector.



- *1 Approx. 16mm
- *2 Ground side

4. Twist the cable wires, pass them through the connector, bend them, and run them along the grooves.

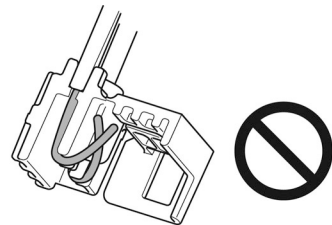


- *1 Insert
- *2 Bend

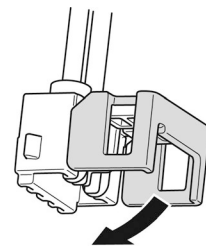
(A) Groove

NOTE

Do not allow the cable wires to touch each other.

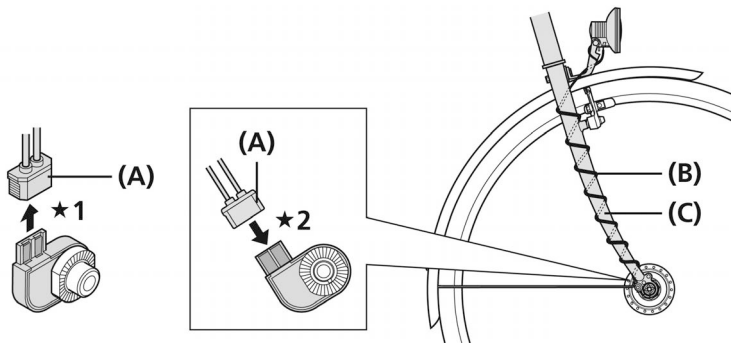


5. Close the connector until you hear a click.



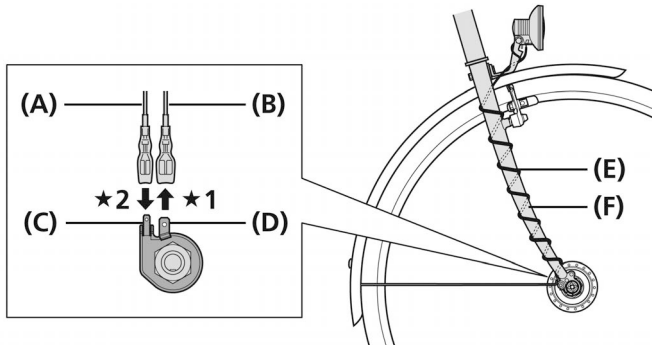
Note on the connection of the cables

- Secure the cable to the front fork or the basket stay so that it will not get caught in the spokes or any other parts while riding. If the position of the hub dynamo changes with respect to the light while riding, for example when using a suspension fork, make sure that the cable is connected so that it will not be too loose or too tight at any point.
- Connect so that the current from the hub dynamo flows through the cable from the light connection terminal to the frame connection terminal.
- To disconnect the light from the hub dynamo, remove the connector cover/light cord and frame (grounding) cord.
- Do not ride the bicycle with the connector cover, light cord or frame (grounding) cord removed. The cord may be entangled in the wheel.
- Remove the connector cover/light cord and frame (grounding) cord before removing the wheel. If the cables are pulled strongly, it may break the cable wires or cause poor connection. Furthermore, when installing the wheel, first secure the wheel to the front forks and then connect the connector cover/light cord and frame (grounding) cord.



- ★1 Remove
- ★2 Connect

- (A) Connector cover
- (B) Cord
- (C) Front fork

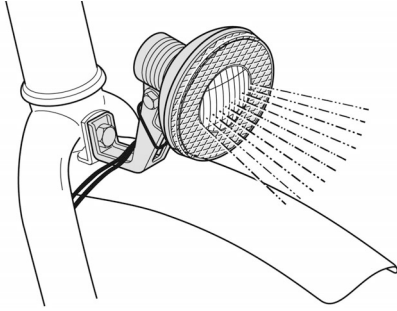


- ★1 Remove
- ★2 Connect

- (A) Light cable
- (B) Frame (grounding) cord
- (C) Light connection terminal (small)
- (D) Frame (grounding) connection terminal (large)
- (E) Cord
- (F) Front fork

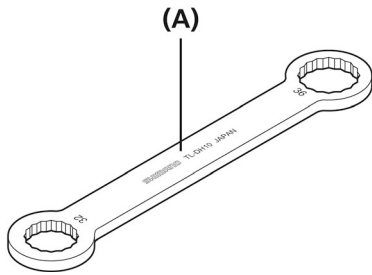
Checking the light illumination

1. Rotate the front wheel and check that the light illuminates.



MAINTENANCE (HUB DYNAMO)

When replacing the internal parts of a hub dynamo, it is recommended to use a genuine Shimano tool TL-DH10 (Y-12009000).



(A) TL-DH10 (Y-12009000)

Tightening torque

TL-DH10

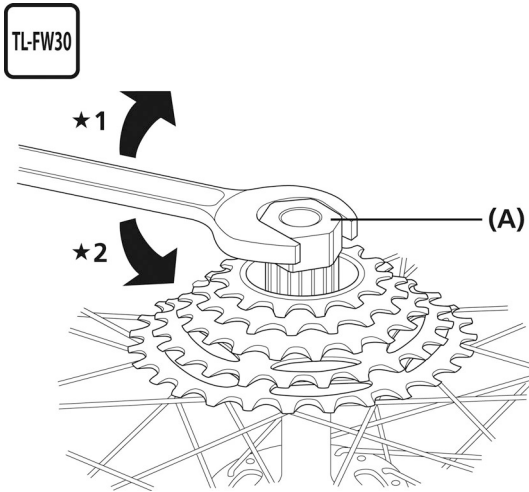
54 N·m

{472 in. lbs.}

MULTIPLE FREEWHEEL

INSTALLATION (MULTIPLE FREEWHEEL)

Installation of the freewheel



★1 Installation

★2 Removal

(A) Freewheel removal tool (TL-FW30)

Tightening torque

TL-FW30

30 N·m

{263 in. lbs.}

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