DM-GN0001-28

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 manuals and technical documents are accessible online at https://si.shimano.com.
- For consumers who do not have easy access to the internet, please contact a SHIMANO distributor or any of the SHIMANO offices to obtain a hardcopy of the User's Manual.
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.

For safety, be sure to read this dealer's manual thoroughly before use, and follow it for correct use.

The following instructions must be observed at all times in order to prevent personal injury and physical damage to equipment and surroundings.
The instructions are classified according to the degree of danger or damage which may occur if the product is used incorrectly.

⚠ DANGER

Failure to follow the instructions will result in death or serious injury.

⚠ WARNING

Failure to follow the instructions could result in death or serious injury.

⚠ CAUTION

Failure to follow the instructions could cause personal injury or physical damage to equipment and surroundings.

TO ENSURE SAFETY

⚠ WARNING

- **Be sure to follow the instructions provided in the manuals when installing the product.**
  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.

NOTICE

- 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

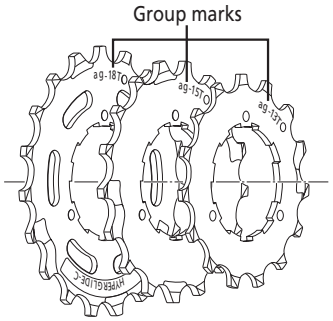
- **Obtain and read the dealer's manual carefully prior to installing the parts.**
  Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. It is strongly recommended using only genuine Shimano replacement parts.
- **Obtain and read the dealer's manual 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.

NOTICE

- 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.
- A high cable resistance on a frame with internal cable routing could impair the SIS shifting function.
  If some resistance is felt in the lever operation, SIS shifting does not function normally, or there is some other issue, check that there is no problem with the condition of the inner cable or the bending of the outer casing.

■ 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.



- 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.



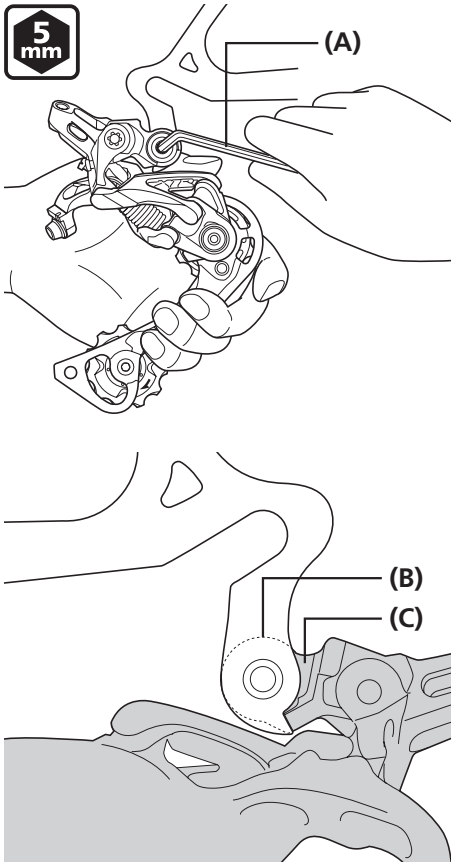
- When the chain is in any of the position combinations shown in the table, the chain and sprocket may come into contact and generate noise. If the noise is a problem, shift the chain onto the next largest sprocket or the one after.

	Double	Triple	
Chainring			
Sprocket			

REAR DERAILLEUR FOR MTB/TREKKING

■ Installation of the rear derailleur

Standard type



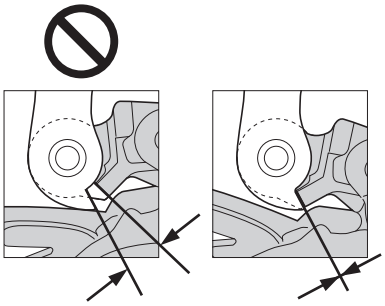
Install the rear derailleur.

(A) 5 mm hexagon wrench
(B) Dropout
(C) Bracket

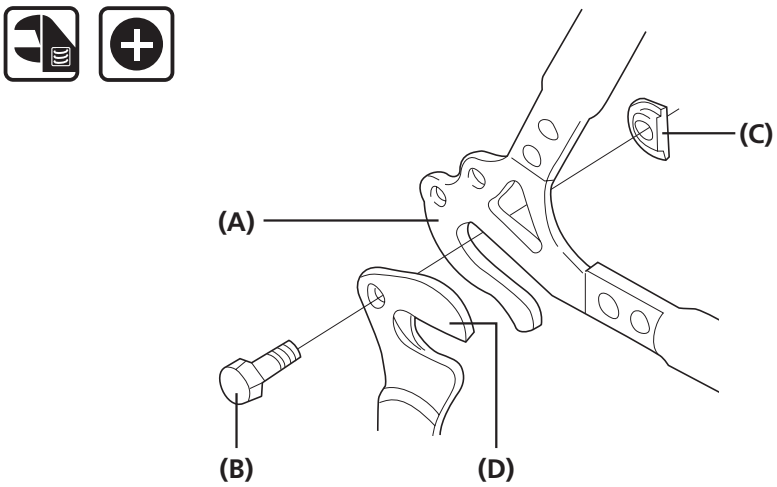
Tightening torque	
5 mm	8 - 10 N·m

NOTICE

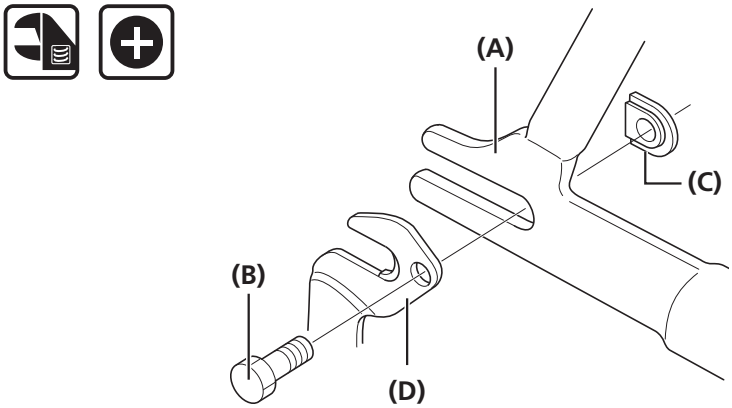
Periodically check that there is no gap between the derailleur hanger and the bracket as shown in the illustration. If there is a gap between these two parts, problems with gear shifting performance may occur.



Bracket type



For BMX type

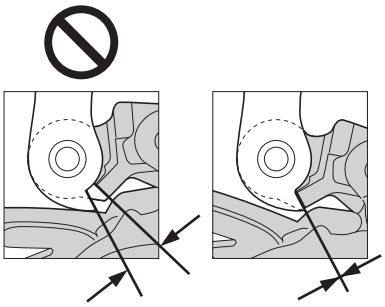


(A) Dropout
(B) Bracket bolt
(C) Bracket nut
(D) Bracket

Tightening torque
3 - 4 N·m

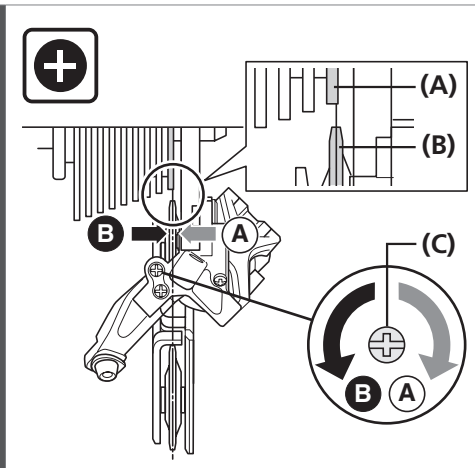
NOTICE

Periodically check that there is no gap between the derailleur hanger 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

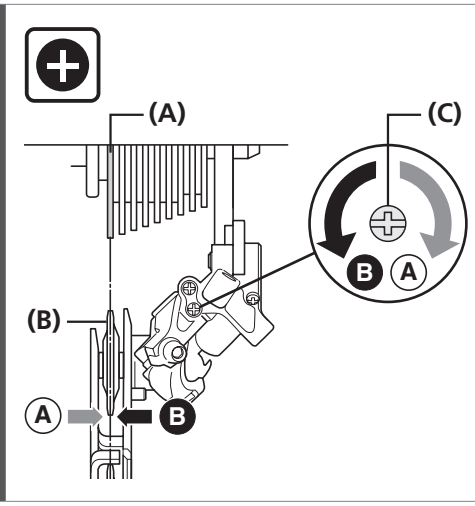
Top adjustment



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.

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

Low adjustment

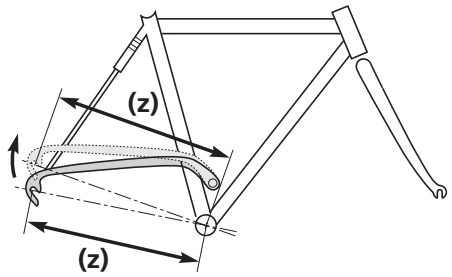


Turn the low adjustment bolt so that the guide pulley moves to a position directly in line with the largest sprocket.

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

Chain length

1



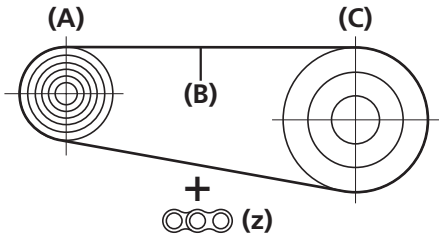
The length of A will vary depending on the movement of the rear suspension.

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.

(z) A

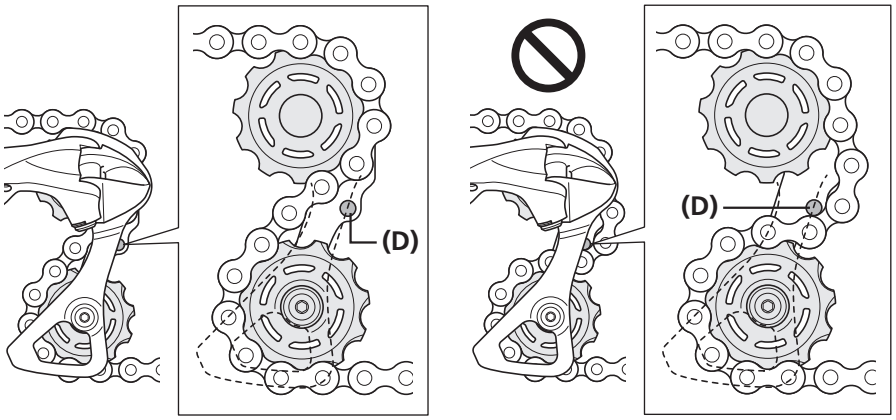
2



Mount the chain on to the largest sprocket and the largest chainring.

Next, add 2 links to set the length of the chain.

(z) +2 links



(A) Largest sprocket
(B) Chain
(C) Largest chainring
(D) Pin/plate for preventing chain derailment

NOTICE

- 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.

■ Securing the cable

Cutting the outer casing

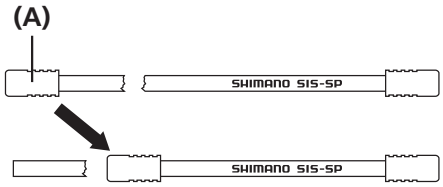
1



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

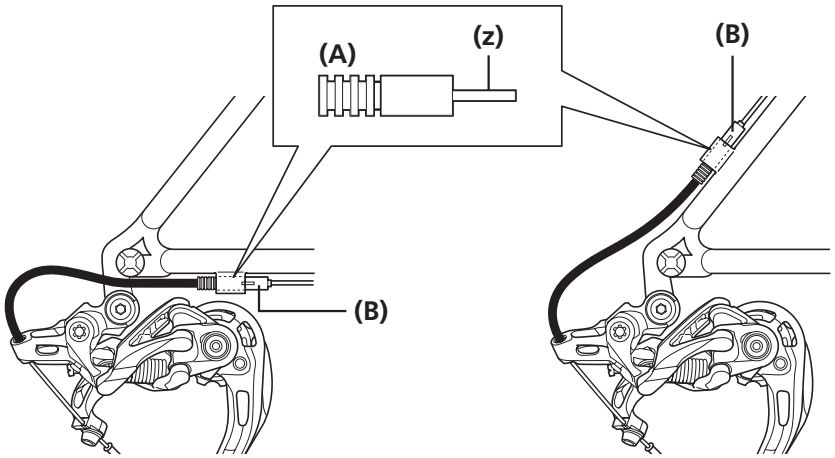


After cutting, attach the same sealed outer cap to the end.

(A) Outer cap

3

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



(z) Be careful not to bend this section.

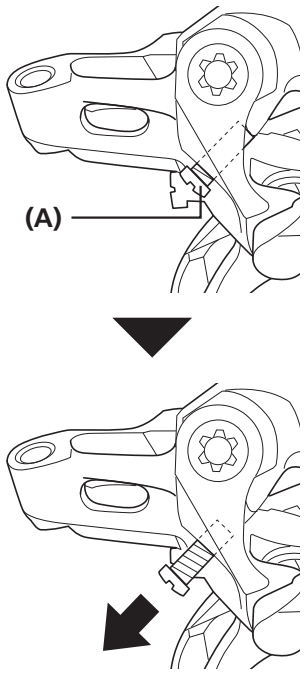
(A) Sealed outer cap with tongue
(B) Rubber shield

TECH TIPS

If the rear derailleur 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

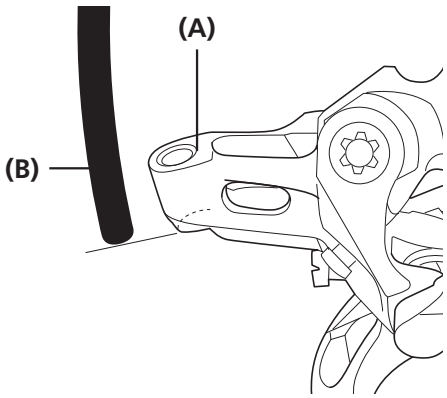
1



If there is a B-tension adjust bolt, loosen it 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 derailleur and then cut off any excess.

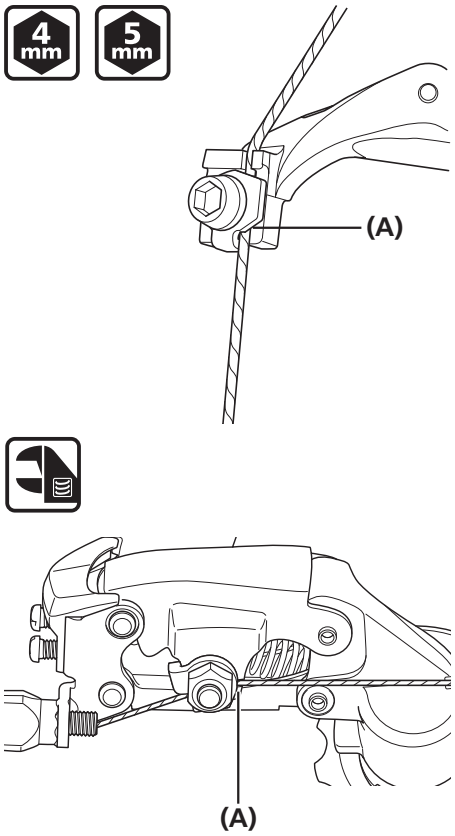
(A) Outer casing holder
(B) Outer casing

NOTICE

The distance between the outer stopper to the outer casing holder of the rear derailleur 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

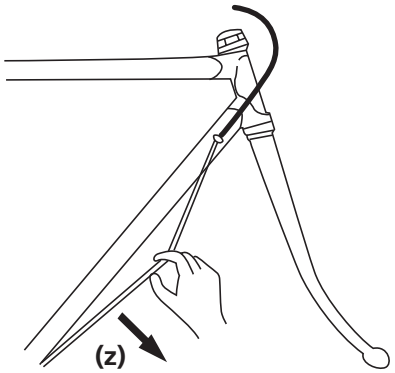
1



Connect the inner cable to the rear derailleur.

(A) Groove

2

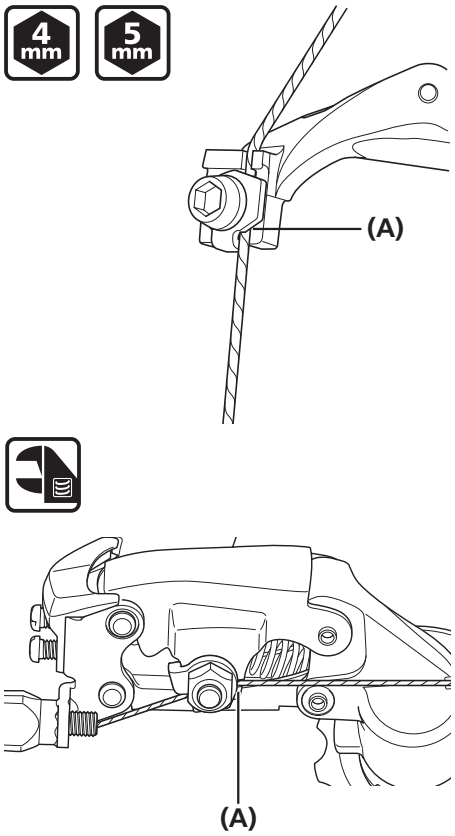


Remove the initial slack from the cable as shown in the illustration.

(z) Pull

To be continued on next page

3



Reconnect the inner cable to the rear derailleur.

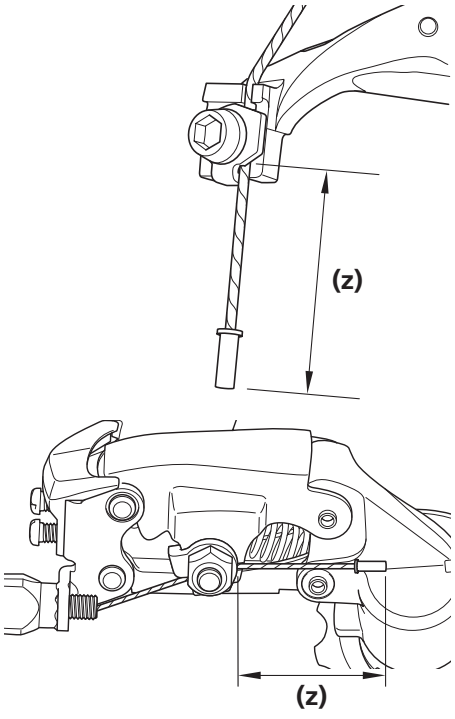
(A) Groove

Tightening torque	
4 mm 5 mm	6 - 7 N·m

NOTICE

Be sure that the cable is securely in the groove.

4



Set the inner cable so that the margin is approximately 30 mm or less.

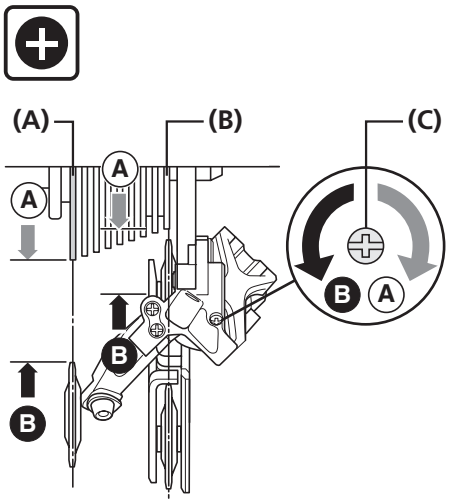
Install the shift inner cap.

(z) 30 mm or less

NOTICE

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



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.

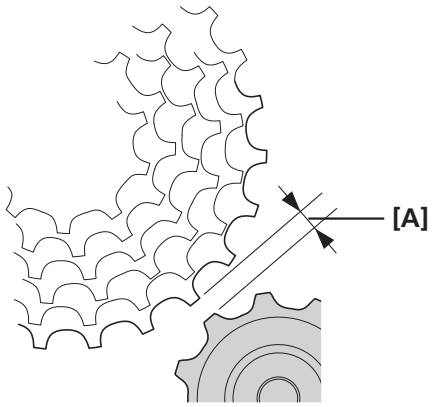
Next, set the chain on the smallest sprocket.

Repeat the above to make sure that the pulley does not touch the sprocket.

(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]
11-42T	5 – 6 mm
11-36T	5 – 6 mm
11-34T	5 – 6 mm
11-32T	9 – 10 mm

TECH TIPS

When the lower gear uses the gear combination of 42T, 36T, or 34T, set the distance to 5 to 6 mm.
When the lower gear uses the gear combination of 32T, set the distance to 9 to 10 mm.

2

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

NOTICE

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

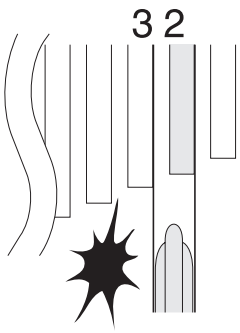
■ SIS adjustment

Confirming positioning on gear

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

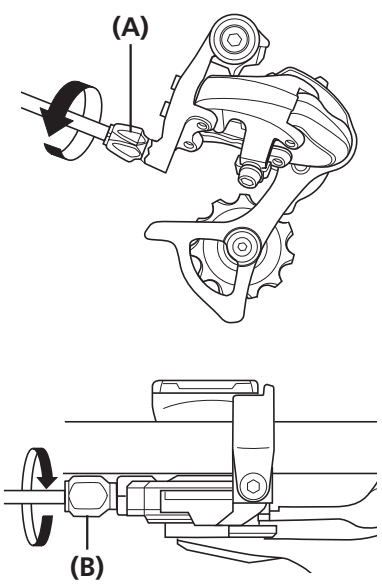


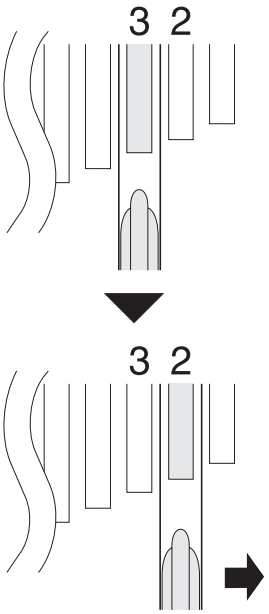
The best setting is when the shifting lever is operated just enough to close the lever gap and the chain touches the 3rd sprocket counting from the smallest sprocket and makes noise.

Adjusting SIS

When the chain shifts to the 3rd sprocket from the smallest sprocket

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



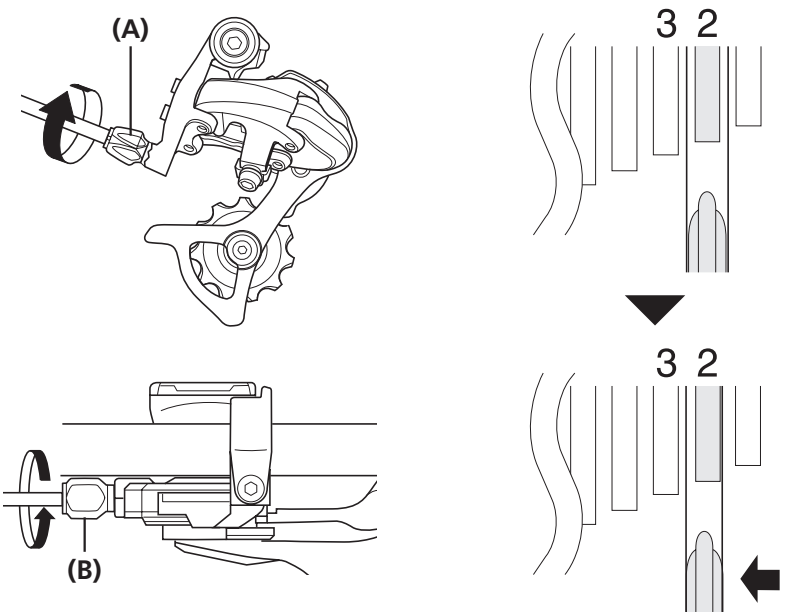


(A) Cable adjustment barrel
(B) Adjustment bolt

When no sound at all is generated

1

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

2

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.

3

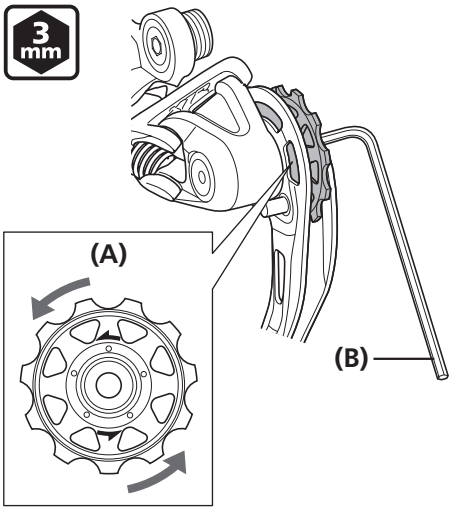
Operate lever to change gears, and check that no noise occurs in any of the gear positions.

TECH TIPS

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

■ Replacing the pulley

Guide pulley



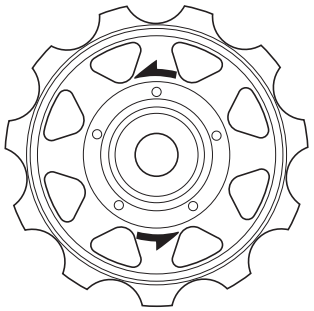
Replace the guide pulley.

(A) Guide pulley
(B) 3 mm hexagon wrench

Tightening torque	
3 mm	2.5 - 5 N·m

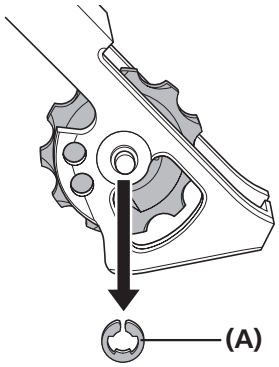
NOTICE

Check the arrow direction on the pulley when installing it.



Tension pulley

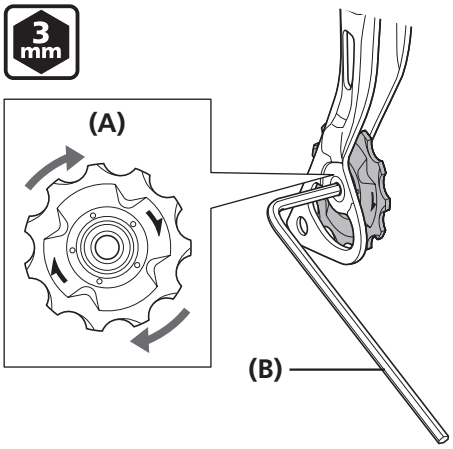
1



If an E-ring is attached, remove it first.

(A) E-ring

2



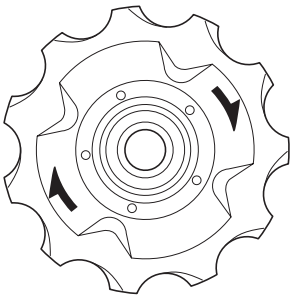
Replace the tension pulley.

(A) Tension pulley
(B) 3 mm hexagon wrench

Tightening torque	
3 mm	2.5 - 5 N·m

NOTICE

Check the arrow direction on the pulley when installing it.

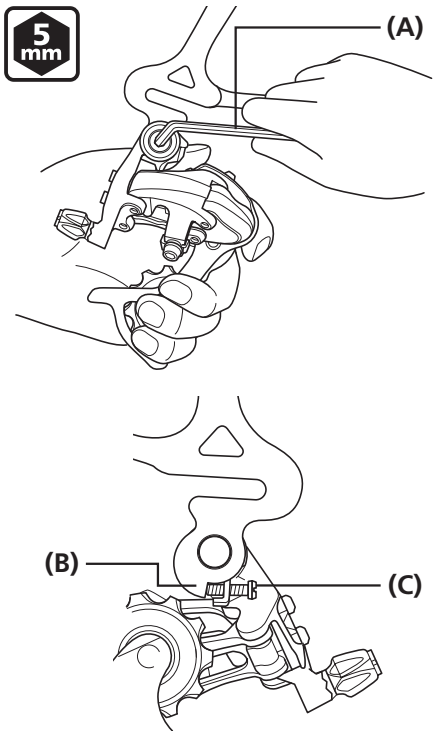


REAR DERAILLEUR FOR ROAD

■ 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 B-tension stop.

Standard type



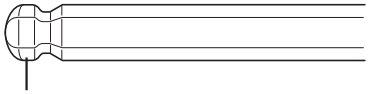
Install the rear derailleur.

(A) 5 mm hexagon wrench
(B) Hanger stop
(C) B-tension adjust bolt

Tightening torque	
5 mm	8 - 10 N·m

NOTICE

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

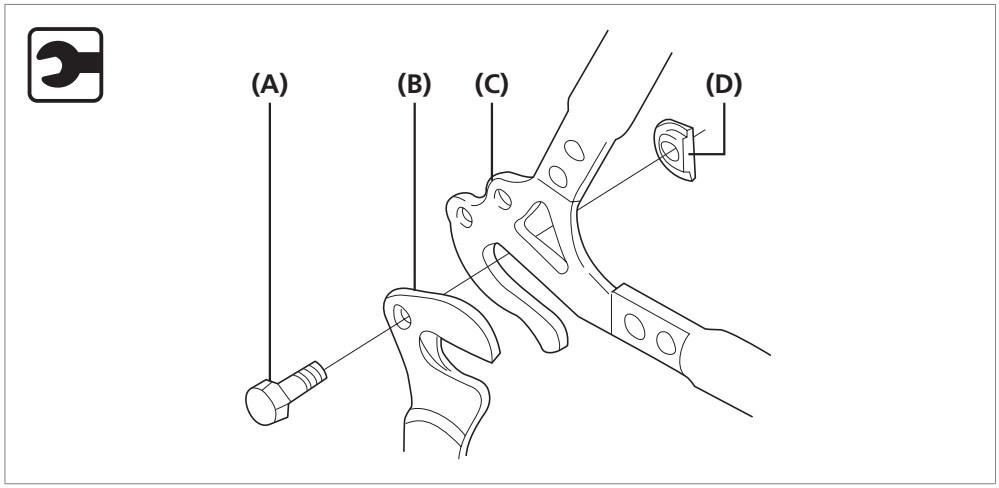


Ball point hexagon wrench

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

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

Bracket type

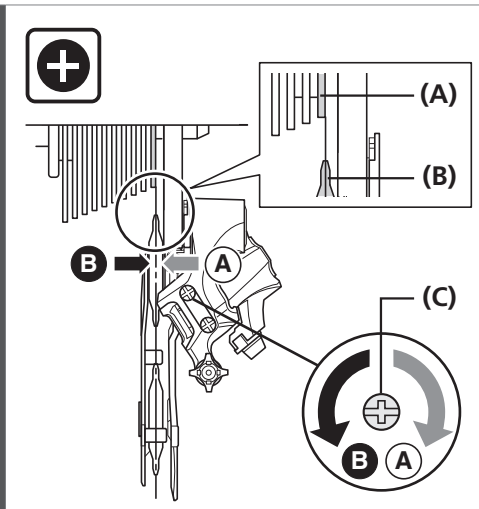


(A) Bracket bolt
(B) Bracket
(C) Dropout
(D) Bracket nut

Tightening torque
3 - 4 N·m

■ Stroke adjustment

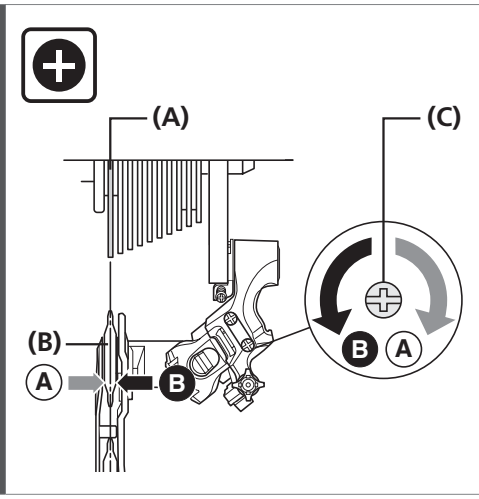
Top adjustment



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.

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

Low adjustment

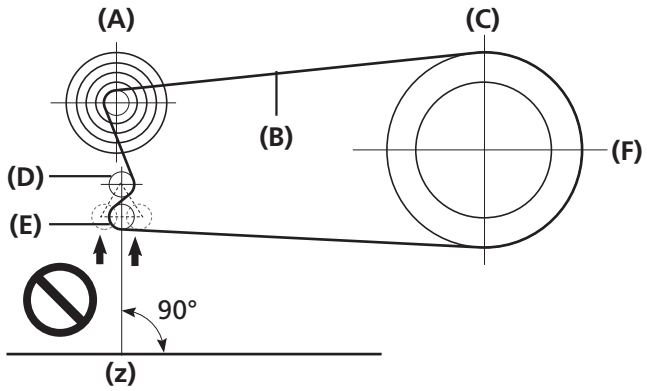


Turn the low adjustment bolt so that the guide pulley moves to a position directly in line with the largest sprocket.

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

Chain length

When largest sprocket is 27T or smaller



(z) Right angle to the ground

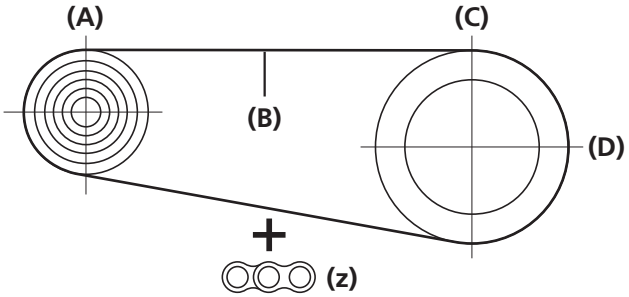
(A) Smallest sprocket
(B) Chain
(C) Largest chainring
(D) Guide pulley
(E) Tension pulley
(F) Front double

TECH TIPS

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.

When largest sprocket is 28T or larger

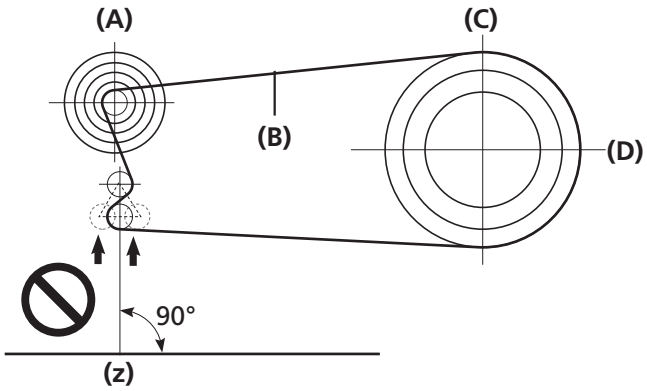
With the chain put on both the largest sprocket and the largest chainring, add 2 links to the "minimum number of links that can be connected".



(z) +2 links

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

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



(z) Right angle to the ground

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

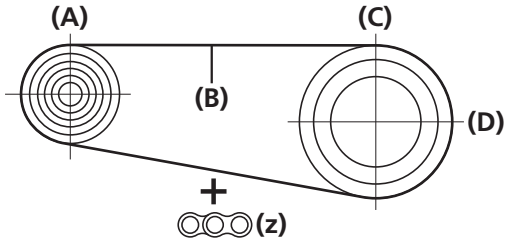
NOTICE

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

TECH TIPS

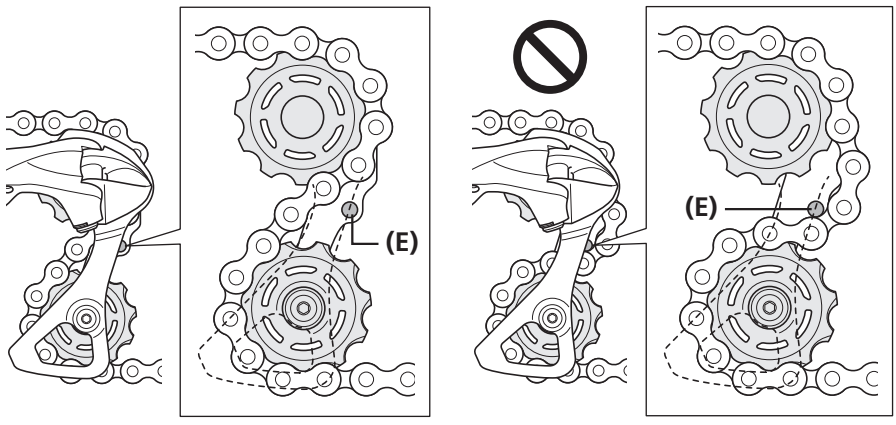
When installing chain using, place chain in largest chainring and smallest sprocket.
Set so that the line drawn through the guide pulley and tension pulley is 90° or greater to the ground.

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".

(z) +2 links



(A) Largest sprocket
(B) Chain
(C) Largest chainring
(D) Front triple
(E) Pin/plate for preventing chain derailment

TECH TIPS

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.

■ Securing the cable

Cutting the outer casing

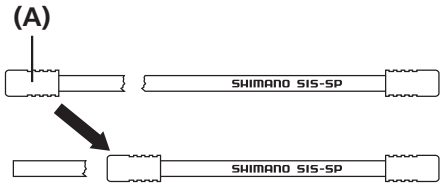
1



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

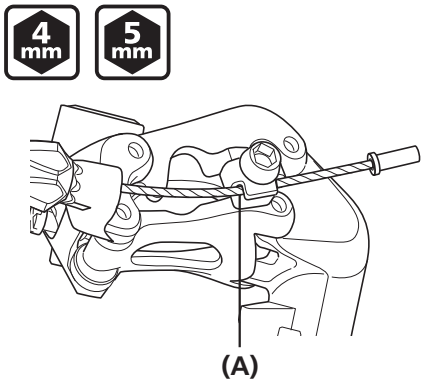


Attach the same outer cap to the cut end of the outer casing.

(A) Outer cap

Connecting and securing of the cable

1

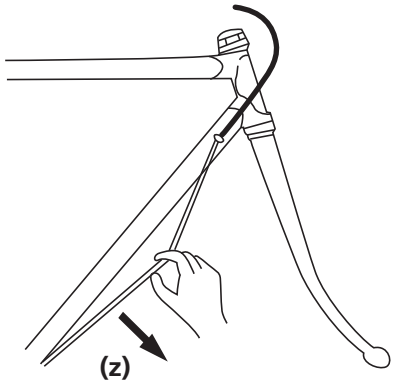


Connect the inner cable to the rear derailleur.

(A) Groove

Tightening torque	
4 mm 5 mm	6 - 7 N·m

2

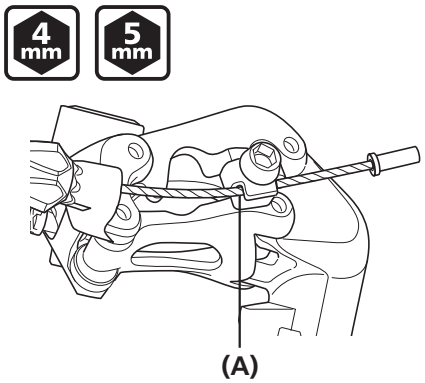


Remove the initial slack from the cable as shown in the illustration.

(z) Pull

To be continued on next page

3



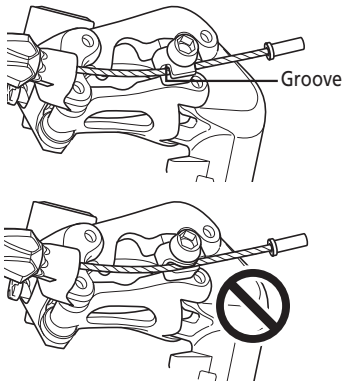
Reconnect the inner cable to the rear derailleur.

(A) Groove

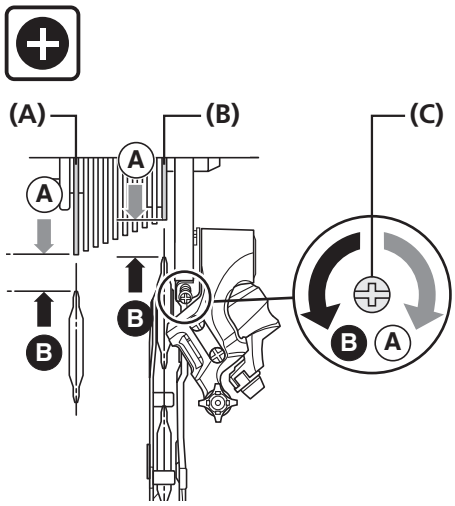
Tightening torque	
4 mm 5 mm	6 - 7 N·m

NOTICE

Be sure that the cable is securely in the groove.



Using the B-tension adjust bolt



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.

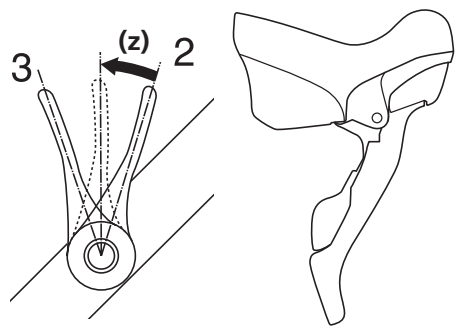
Next, set the chain on the smallest sprocket and repeat the above procedure to make sure that the pulley does not come into contact with the sprockets.

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

■ SIS adjustment

Confirming positioning on gear

1

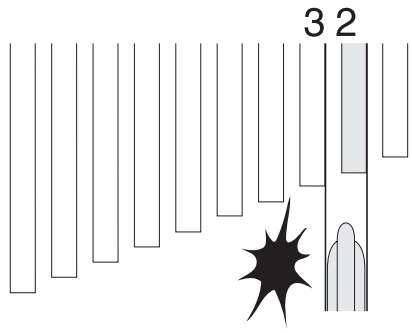


Operate the shifting lever several times to move the chain to the 2nd sprocket counting from the smallest sprocket.

Then, while operating the lever just enough to close the gap in the lever, turn the crank arm.

(z) Gap

2

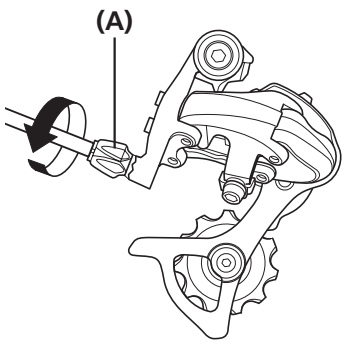


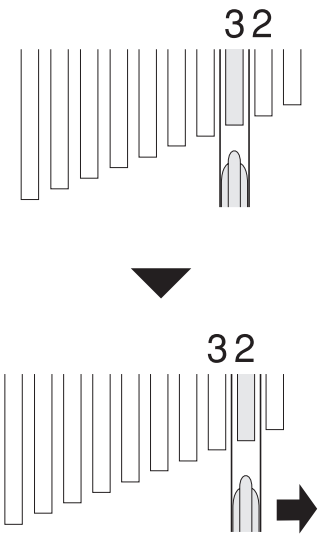
The best setting is when the shifting lever is operated just enough to close the lever gap and the chain touches the 3rd sprocket counting from the smallest sprocket and makes noise.

Adjusting SIS

When the chain shifts to the 3rd sprocket from the smallest sprocket

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

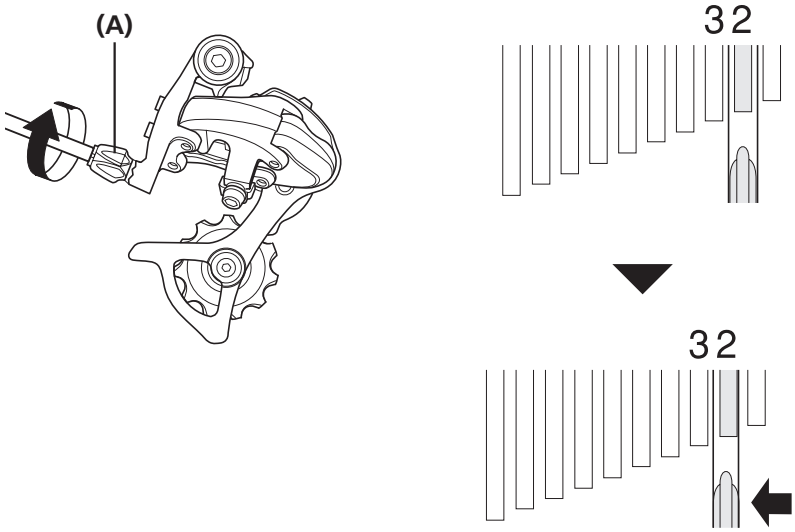




(A) Cable adjustment barrel

When no sound at all is generated

1 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

2 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.

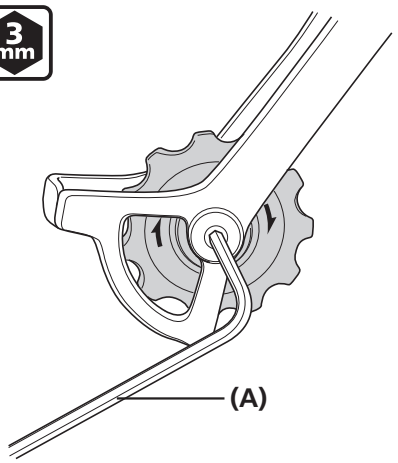
Stop turning at the point where the noise just stops.

3 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



Replace the pulley using a 3 mm hexagon wrench.

(A) 3 mm hexagon wrench

Tightening torque	
3 mm	2.5 - 5 N·m

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.

NOTICE

- 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 chainrings or front derailleur and generate noise. If the noise is a problem, shift the chain onto the next-larger sprocket or the one after.

	Figure 1			Figure 2
	Double	Triple		
Chainring				
Sprocket				

- For frames with suspension, the chainstay angle will vary depending on whether the bicycle is being ridden or not.
- When the bicycle is not being ridden and the chain is positioned on the largest chainring at the front and on the smallest sprocket at the rear, the chain may come into contact with the chain guide outer plate of the front derailleur.

■For ROAD

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

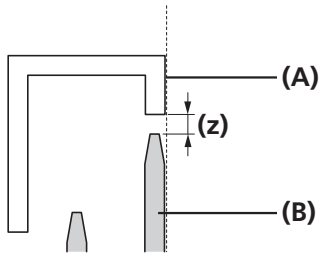
	Double	Triple	
Chainring			
Sprocket			

FRONT DERAILLEUR FOR MTB/TREKKING

NOTICE

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



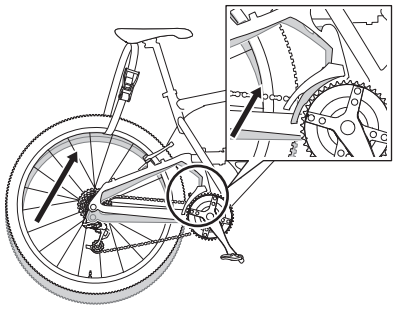
Adjust so that there is a clearance of 1 – 3 mm between the chain guide outer plate and the largest chainring. (Common to all types)

(z) 1 – 3 mm

(A) Chain guide
(B) Largest chainring

TECH TIPS

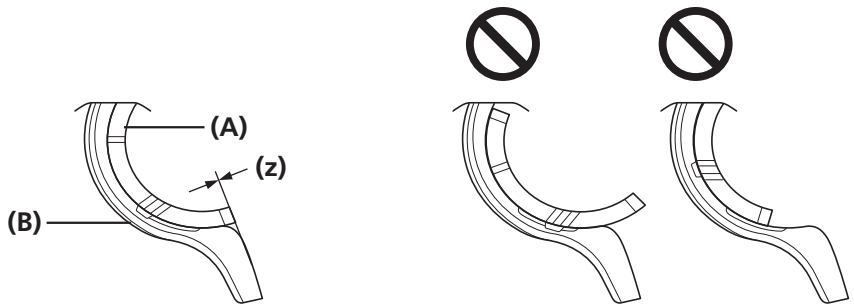
Bicycles with suspensions are positioned differently between when a rider is off the bicycle and on the bicycle. By referring to the illustration, perform installation and SIS adjustment while seated on the bicycle.



Band type

1

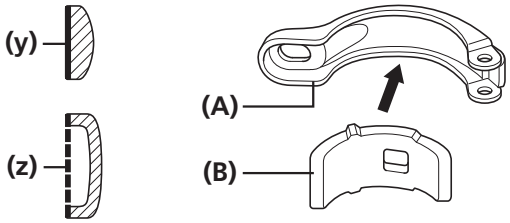
When using the adapter, install it in the position shown in the illustration, relative to the front band or the rear band.



(z) Align

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

When using a non-planar front band

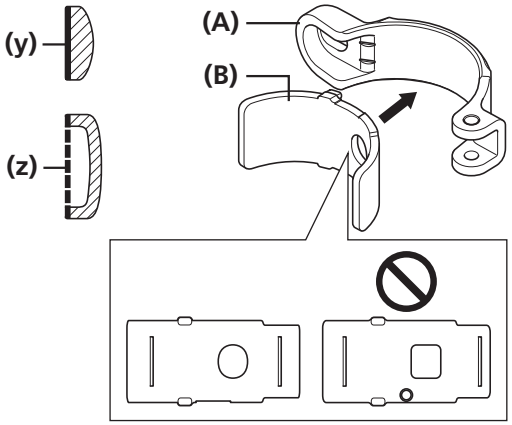


Be sure to use a metallic adapter for a front band which has a non-planar shape.

(y) Planar shape
(z) Non-planar shape

(A) Front band
(B) Metallic adapter

When using a planar front band



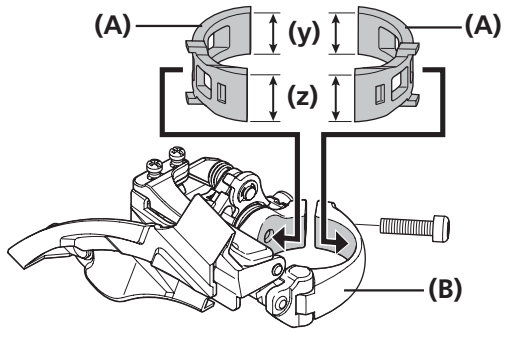
Be sure to use a round-type plastic adapter when using a front band with a planar shape.

Square-type plastic adapters are not compatible.

(y) Planar shape
(z) Non-planar shape

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

For the SM-AD16/SM-AD17



Peel off the double-sided tape from the band adapters (front and rear are interchangeable), and then secure the band adapters by press-fitting them to the fixing bands with the wider ends oriented toward the hinge, as shown in the illustration.

(y) Narrower
(z) Wider

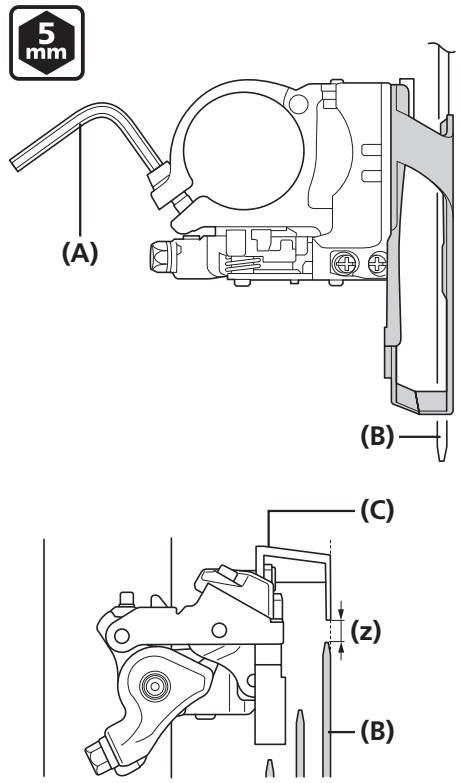
(A) Band adapter
(B) Fixing band

NOTICE

These band adapters are available in two sizes: S size (SM-AD16S/AD17S/28.6 mm diameter) and M size (SM-AD16M/AD17M/31.8 mm diameter).

To be continued on next page

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.

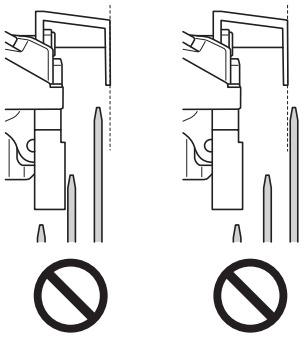
(z) 1 – 3 mm

(A) 5 mm hexagon wrench
(B) Largest chainring
(C) Chain guide outer plate

Tightening torque	
5 mm	5 - 7 N·m

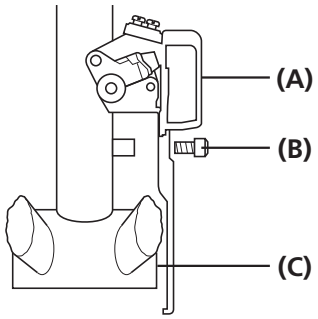
NOTICE

Do not position the chain guide as shown in the below illustrations.



E-type

1



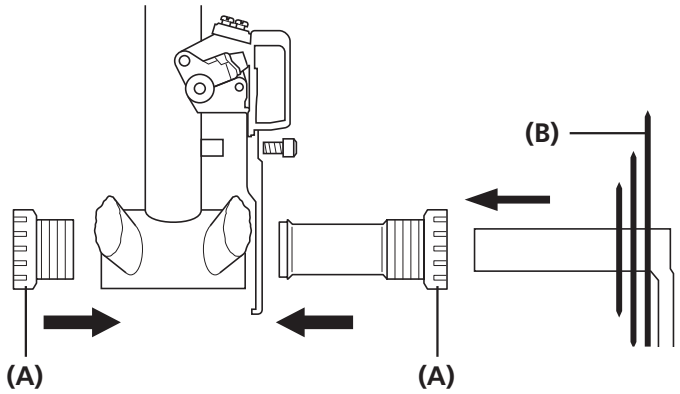
Align the bracket of the front derailleur with the position of the bottom bracket and secure it with a bolt.

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

Tightening torque
5 - 7 N·m

2

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



(A) Adapter
(B) Front chainwheel

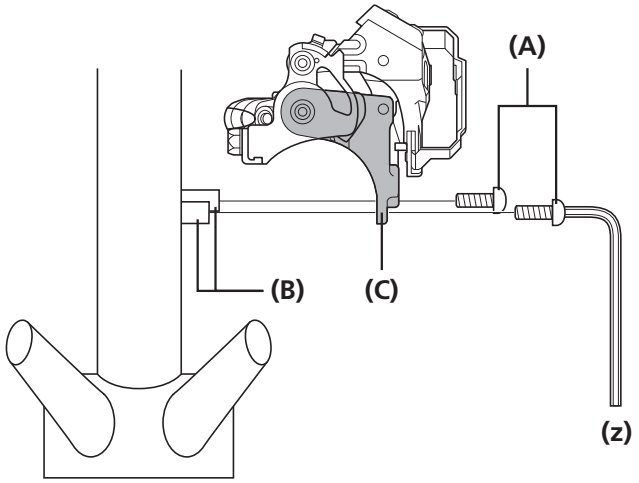
Tightening torque
35 - 50 N·m

E-type (models without BB plate)

Secure with bottom bracket mount fixing bolts.

Positioning varies depending on number of gear teeth.

Refer to the illustration for correct positioning.



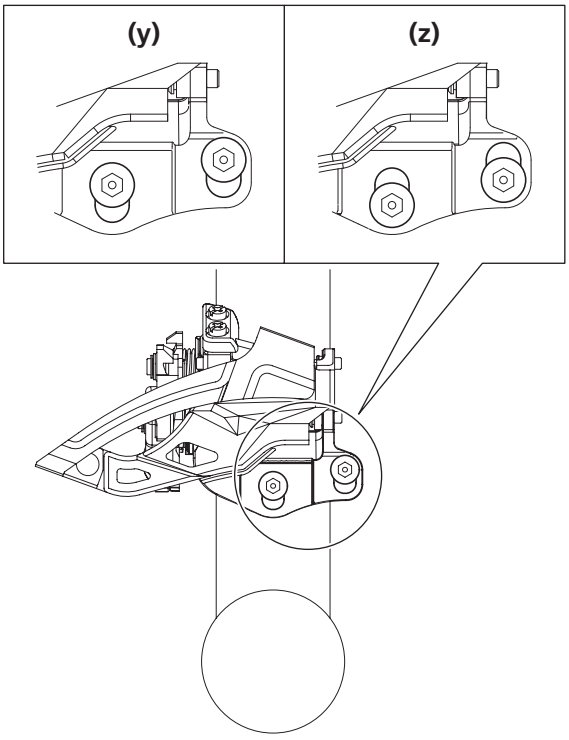
(z) Example: When using a hexagon wrench

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

NOTICE

Shimano does not provide the bottom bracket mount fixing bolts.

Securing position



(y) Double:
Largest chainring 38T
Triple:
Largest chainring 40T

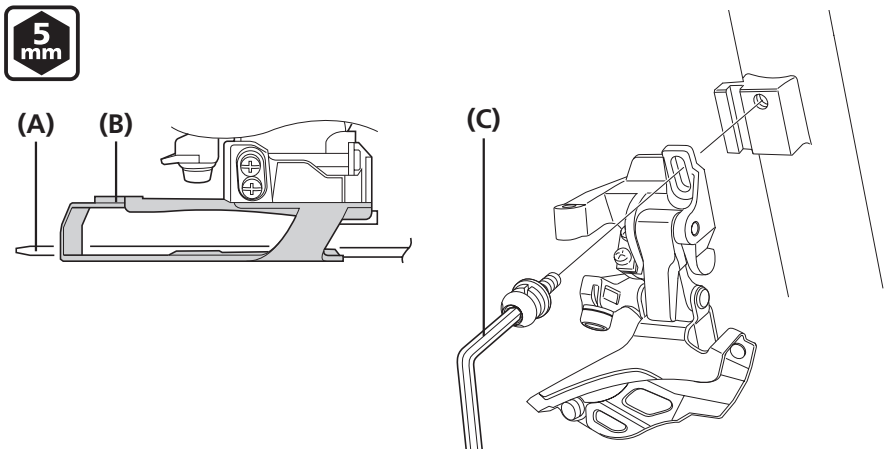
(z) Double:
Largest chainring 40T
Triple:
Largest chainring 42T

Direct mount type

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.

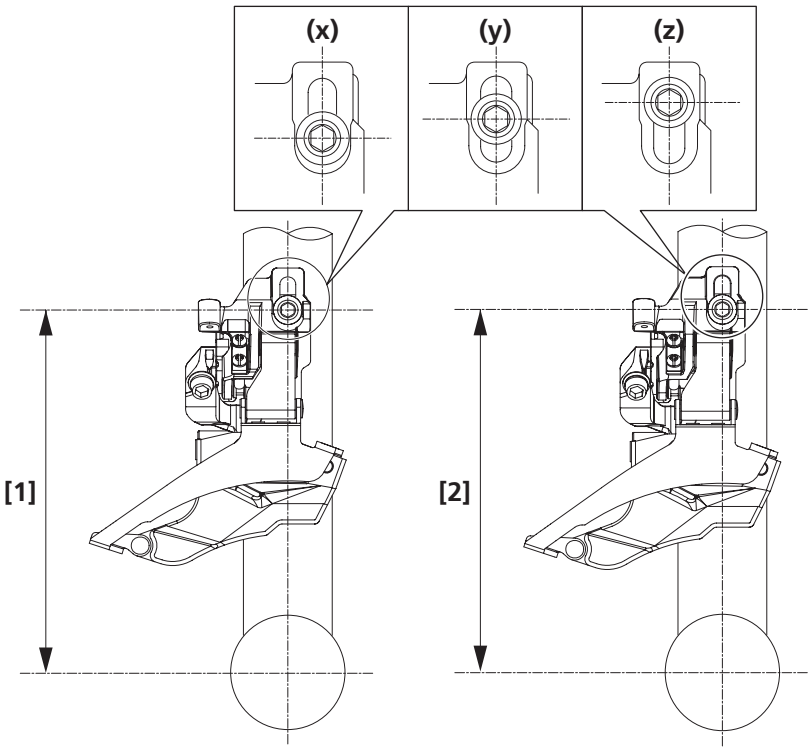
Secure with a hexagon wrench (5 mm).



(A) Chainwheel (largest chainring)
(B) Chain guide
(C) 5 mm hexagon wrench

Tightening torque	
5 mm	5 - 7 N·m

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



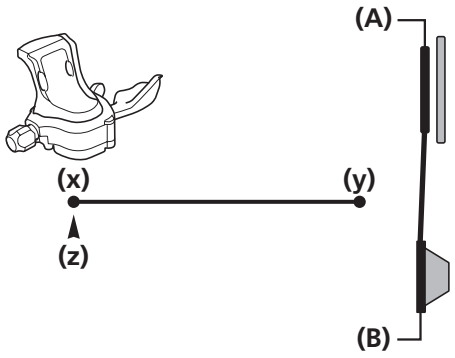
[1] 155.5 mm (From bottom bracket center)
(x) Double: 42T
(y) Double: 40T
Triple: 42T
(z) Double: 38T

[2] 159.5 mm (From bottom bracket center)
(x) Double: 44T
(y) Double: 42T
(z) Double: 40T
Triple: 42T

■ Fixing the cable and adjusting the SIS (Front double)

Low adjustment

1

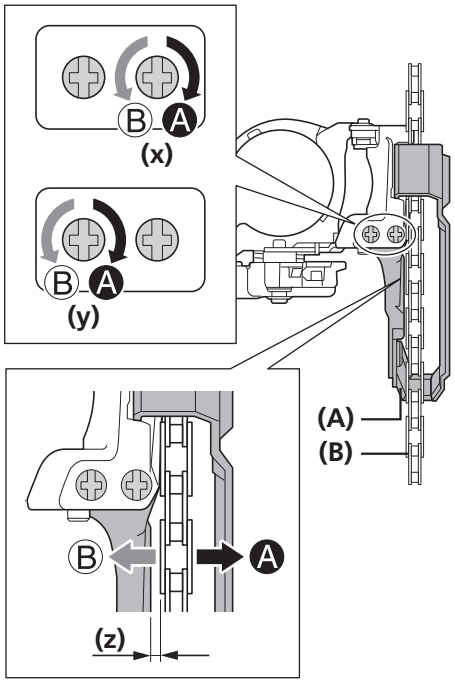


Set the chain on the smallest chainring at the front and the largest sprocket at the rear.

(x) Low
(y) Top
(z) 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 – 0.5 mm.

(x) Top swing
(y) Down swing
(z) 0 – 0.5 mm

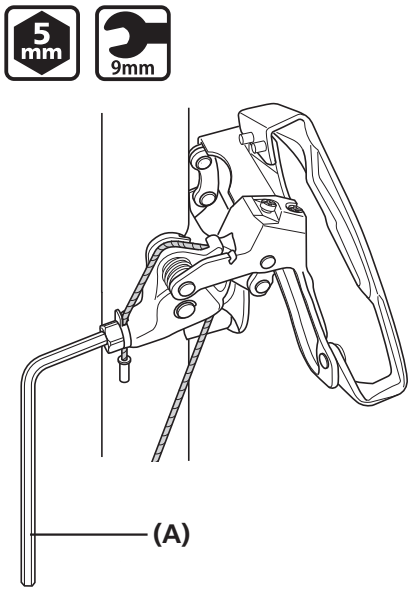
(A) Chain guide inner plate
(B) Chain

Securing the cable

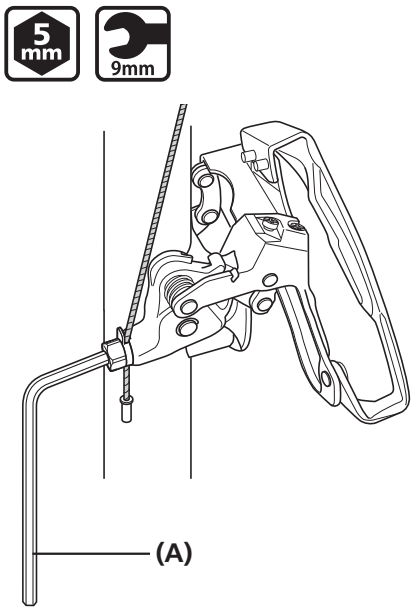
Use the shifting lever with a mode converter in x2 mode. To shift from x3 to x2, refer to the maintenance section of the dealer's manual for the shifting lever RAPIDFIRE Plus.

Top Swing (Common to E-type and band type)

Down pull



Top pull



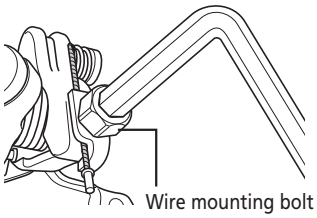
Use a spanner or a hexagon wrench to tighten the wire mounting bolt.

(A) 5 mm hexagon wrench/
9 mm spanner

Tightening torque	
5 mm 9mm	5 - 7 N·m

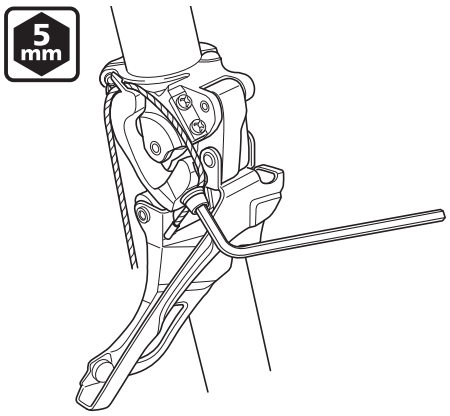
NOTICE

Run the cable through as shown in the illustration.



Down swing (Band type)

Down pull

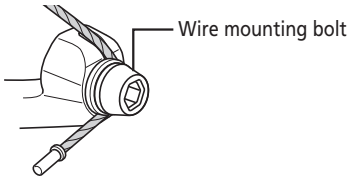


Use a hexagon wrench to tighten the wire mounting bolt.

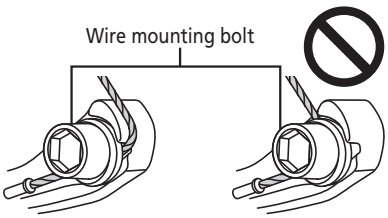
Tightening torque	
5 mm	5 - 7 N·m

NOTICE

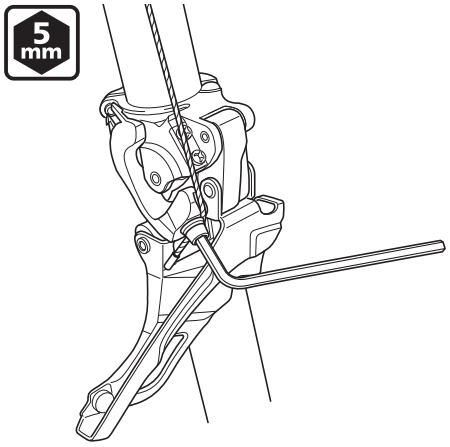
Run the cable through as shown in the illustration.



Different shaped type



Top pull



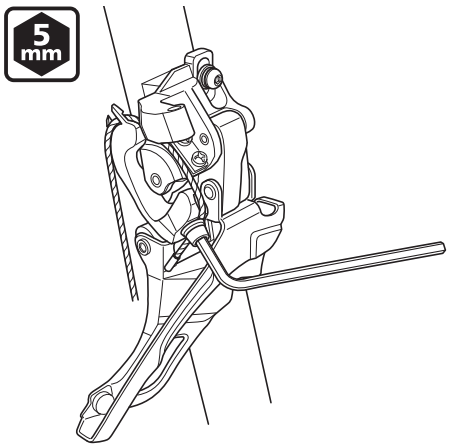
Use a hexagon wrench to tighten the wire mounting bolt.

Tightening torque	
5 mm	5 - 7 N·m

Down swing (Direct mount type)

1

Down pull

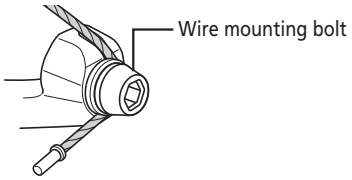


Use a hexagon wrench to tighten the wire mounting bolt.

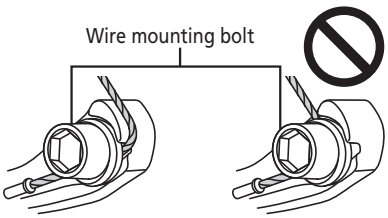
Tightening torque	
5 mm	5 - 7 N·m

NOTICE

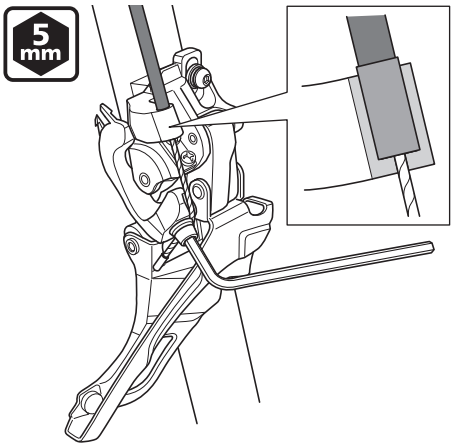
Run the cable through as shown in the illustration.



Different shaped type



Top pull



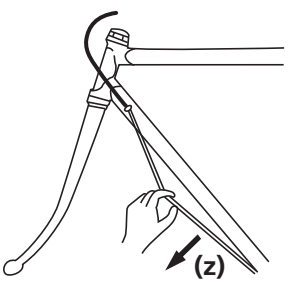
Use a hexagon wrench to tighten the wire mounting bolt.

Tightening torque	
5 mm	5 - 7 N·m

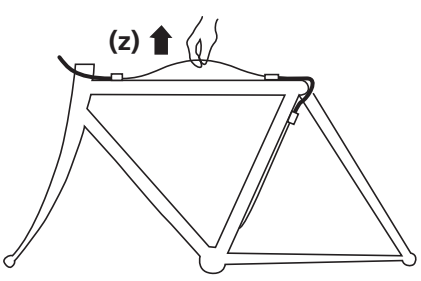
2

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

Down pull



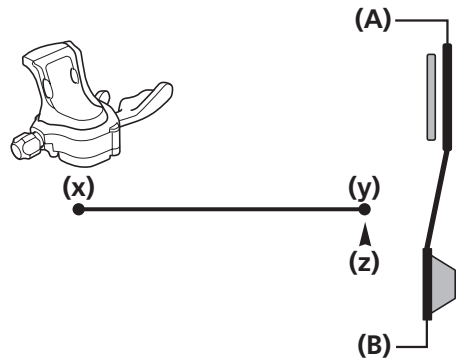
Top pull



(z) Pull

Adjustment of the cable tension

1

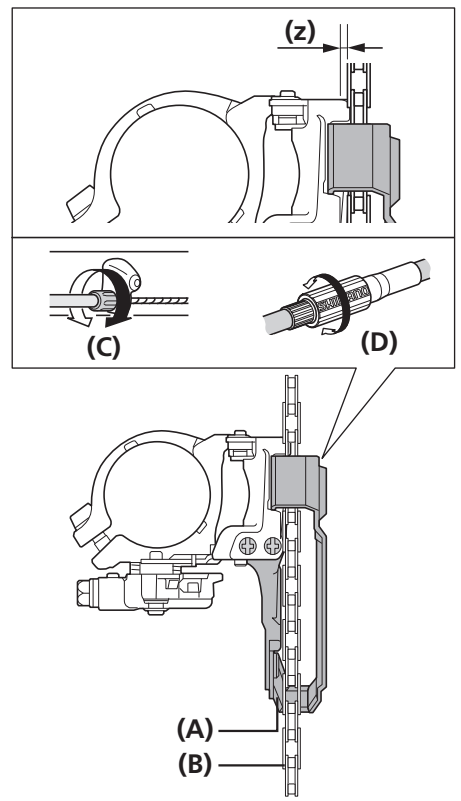


Set the chain onto the largest chainring and the largest sprocket.

(x) Low
(y) Top
(z) Cable index point

(A) Largest chainring
(B) Largest sprocket

2



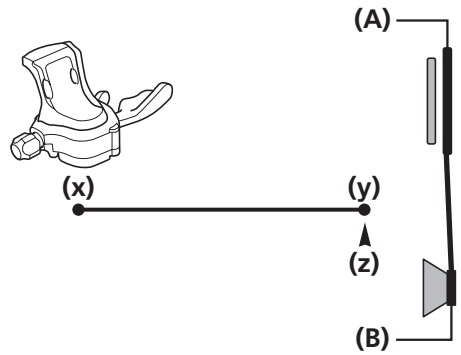
Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5 mm.

(z) 0 – 0.5 mm

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

Top adjustment

1

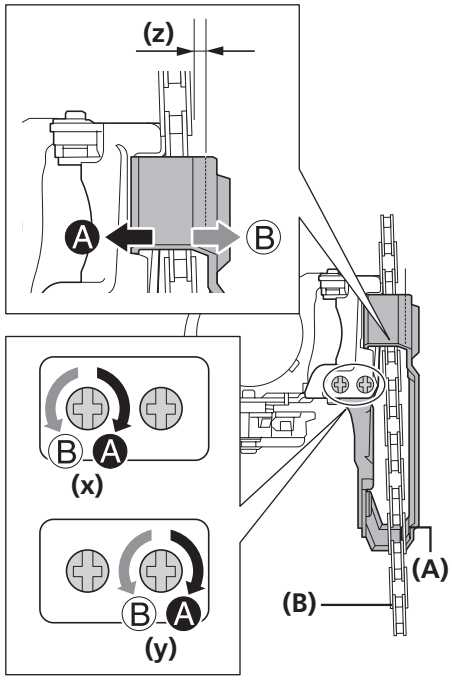


Set the chain on the largest chainring at the front and the smallest sprocket at the rear.

(x) Low
(y) Top
(z) 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 – 0.5 mm.

(x) Top swing
(y) Down swing
(z) 0 – 0.5 mm

(A) Chain guide outer plate
(B) Chain

Troubleshooting chart

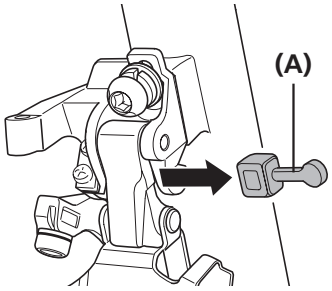
After low adjustment, fixing the cable, cable tension adjustment and top adjustment, operate the shifting lever to check the shifting.
(This also applies if shifting becomes difficult during use.)
* Turn the bolt by 1/8th turn for each adjustment.

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 this does not improve the situation, loosen the cable.
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

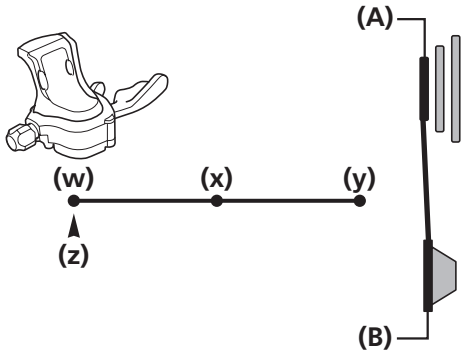
1



Remove the Pro-Set alignment block.

(A) Pro-Set alignment block

2

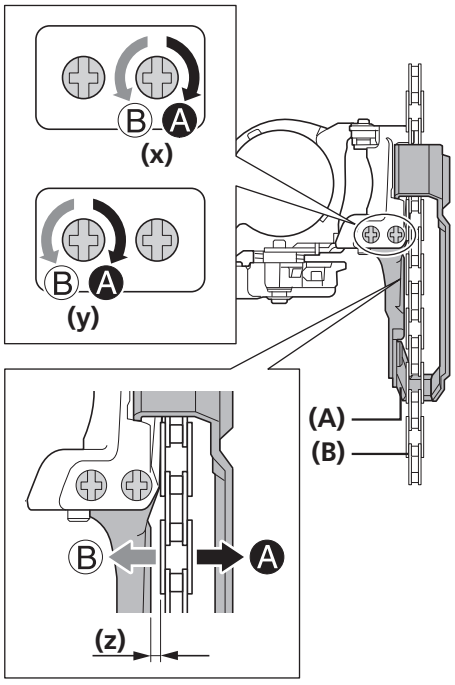


Set the chain on the smallest chainring at the front and the largest sprocket at the rear.

(w) Low
(x) Middle
(y) Top
(z) 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 – 0.5 mm.

(x) Top swing
(y) Down swing
(z) 0 – 0.5 mm

(A) Chain guide inner plate
(B) Chain

Securing the cable

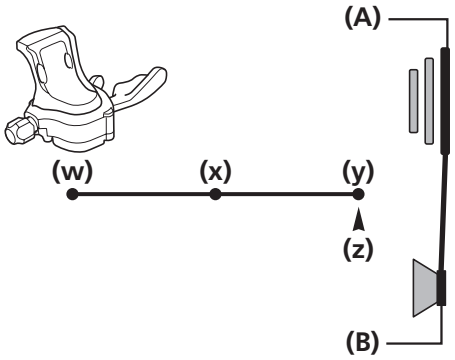
Use the shifting lever with a mode converter in x3 mode. To shift from x2 to x3, refer to the maintenance section of the dealer's manual for the shifting lever RAPIDFIRE Plus.

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

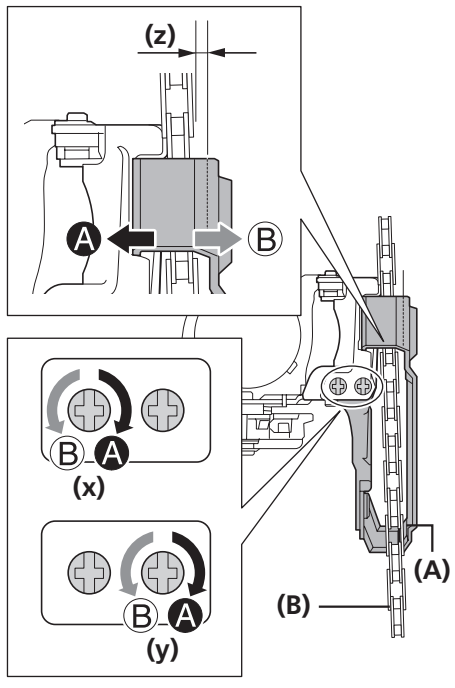


Set the chain on the largest chainring at the front and the smallest sprocket at the rear.

(w) Low
(x) Middle
(y) Top
(z) Cable index point

(A) Largest chainring
(B) Smallest sprocket

2



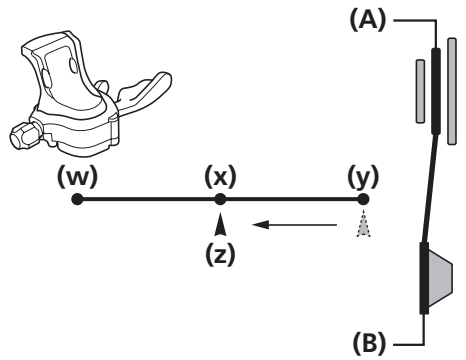
Set so that the clearance between the chain guide outer plate and the chain is 0 – 0.5 mm.

(x) Top swing
(y) Down swing
(z) 0 – 0.5 mm

(A) Chain guide outer plate
(B) Chain

Adjustment of the cable tension

1



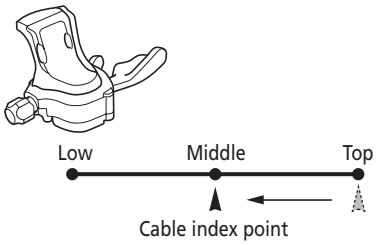
Set the chain onto the middle chainring and the largest sprocket.

(w) Low
(x) Middle
(y) Top
(z) Cable index point

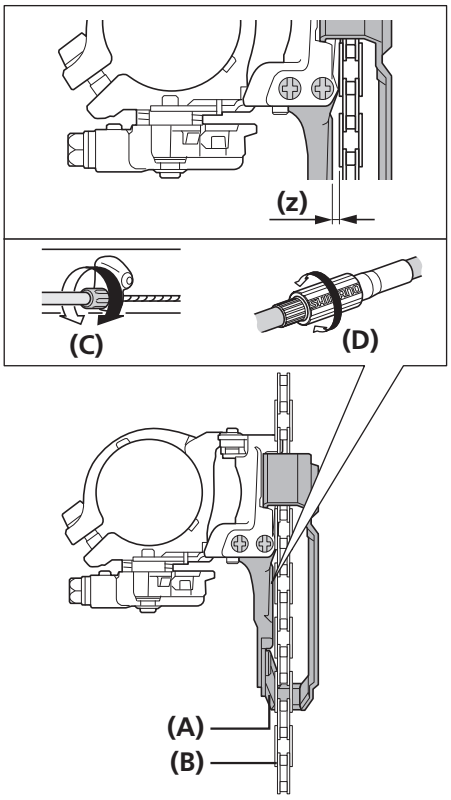
(A) Middle chainring
(B) Largest sprocket

NOTICE

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



2



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

(z) 0 – 0.5 mm

(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

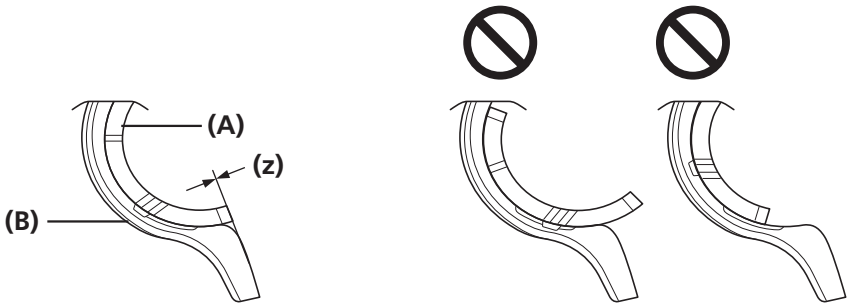
NOTICE

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

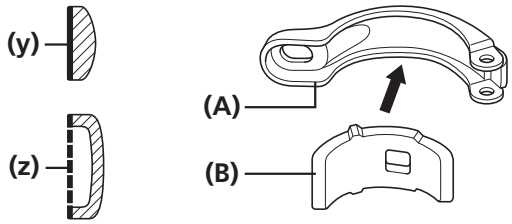
When using the adapter, install it in the position shown in the illustration, relative to the front band or the rear band.



(z) Align

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

When using a non-planar front band

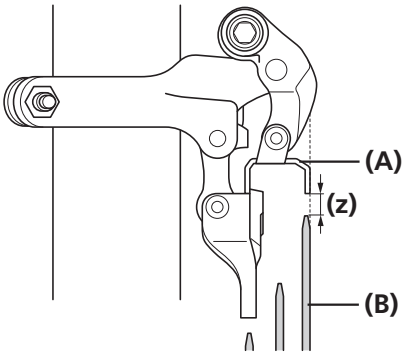


Be sure to use a metallic adapter for a front band which has a non-planar shape.

(y) Planar shape
(z) Non-planar shape

(A) Front band
(B) Metallic adapter

2



Adjust so that there is a clearance of 1 – 3 mm between the chain guide outer plate and the largest chainring.

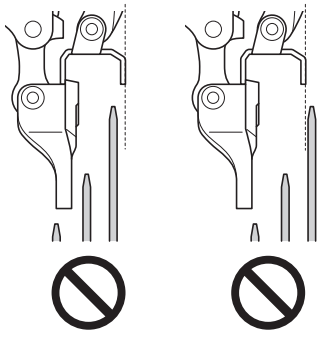
After tentatively tightening the clamp bolt, align the flat portion of the outer plate of the chain guide in parallel with the flat surface of the largest chainring.

(z) 1 – 3 mm

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

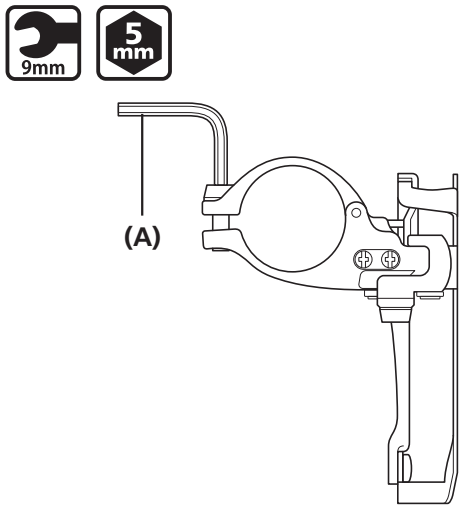
NOTICE

Do not position the chain guide as shown in the below illustrations.



To be continued on next page

3



When the adjustment is complete, tighten the clamp bolt.

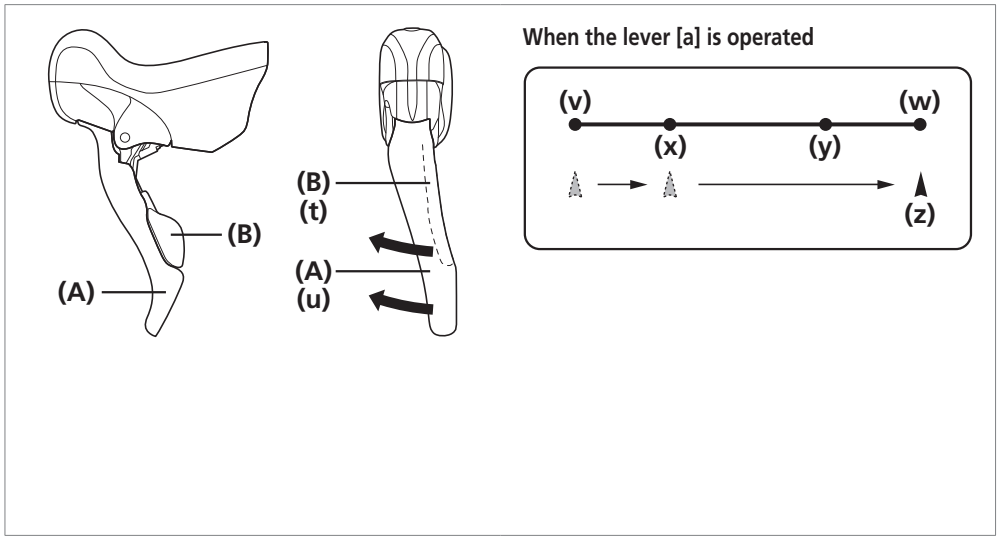
(A) 5 mm hexagon wrench/ 9 mm spanner

Tightening torque	
5 mm 9mm	5 - 7 N·m

■ Fixing the cable and adjusting the SIS (Front double)

Lever operation and cable index point

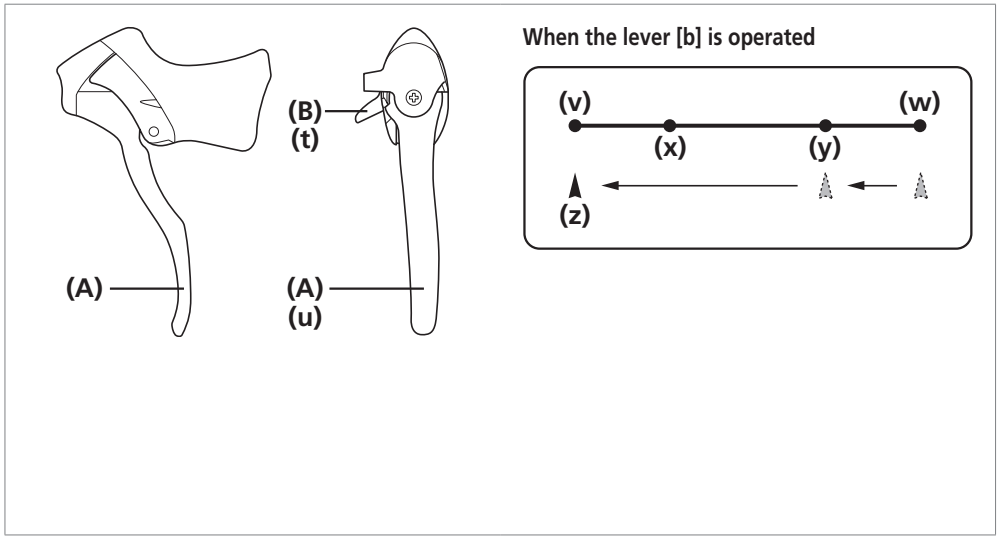
Front shifting (Standard type)



(t) From largest chainring to smallest chainring
(u) From smallest chainring to largest chainring
(v) Low
(w) Top
(x) L-trim
(y) T-trim
(z) Cable index point

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

Font shifting (Thumb release type)



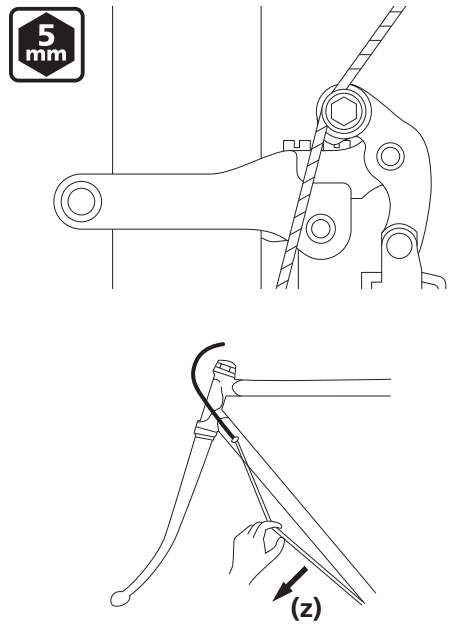
(t) From largest chainring to smallest chainring
(u) From smallest chainring to largest chainring
(v) Low
(w) Top
(x) L-trim
(y) T-trim
(z) Cable index point

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

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.

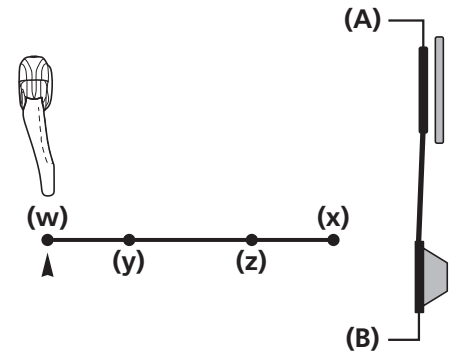
After that, fix the cable again on the front derailleur.

(z) Pull

Tightening torque	
5 mm	6 - 7 N·m

Low adjustment

1

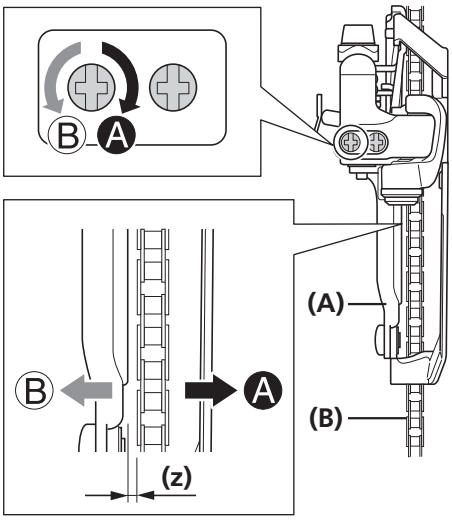


Set the chain on the smallest chainring at the front and the largest sprocket at the rear.

(w) Low
(x) Top
(y) L-trim
(z) T-trim

(A) Smallest chainring
(B) Largest sprocket

2



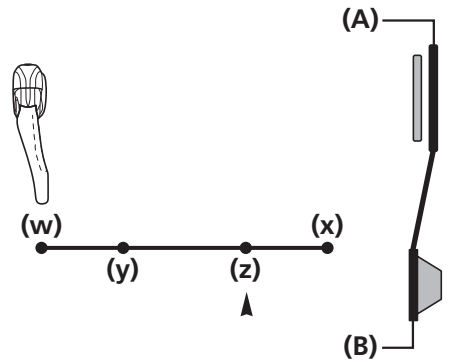
Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5 mm.

(z) 0 – 0.5 mm

(A) Chain guide inner plate
(B) Chain

Adjustment of the cable tension

1

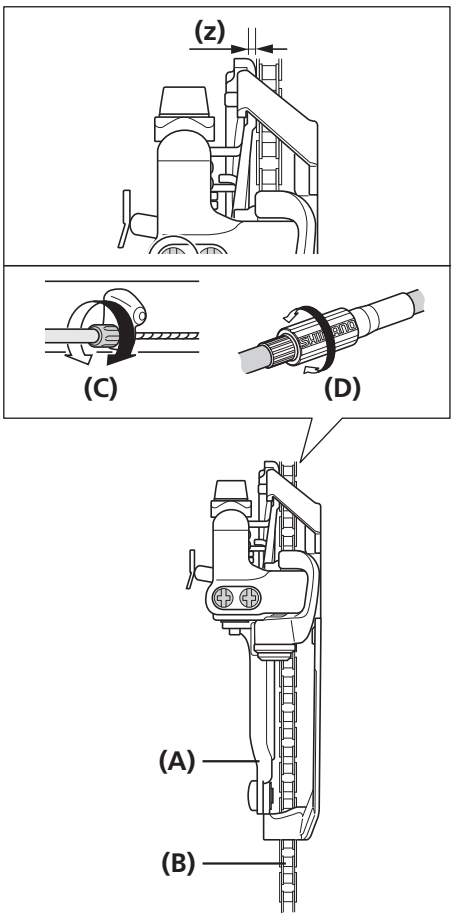


Set the chain onto the largest chainring and the largest sprocket.

(w) Low
(x) Top
(y) L-trim
(z) T-trim

(A) Largest chainring
(B) Largest sprocket

2



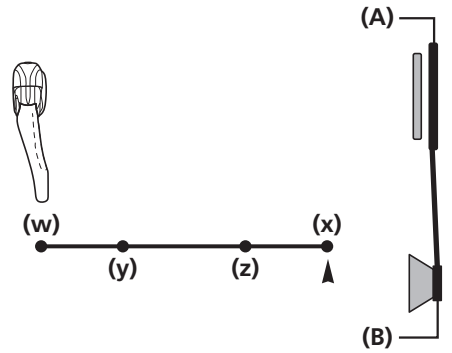
Set so that the clearance between the chain guide inner plate and the chain is 0 – 0.5 mm.

(z) 0 – 0.5 mm

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

Top adjustment

1

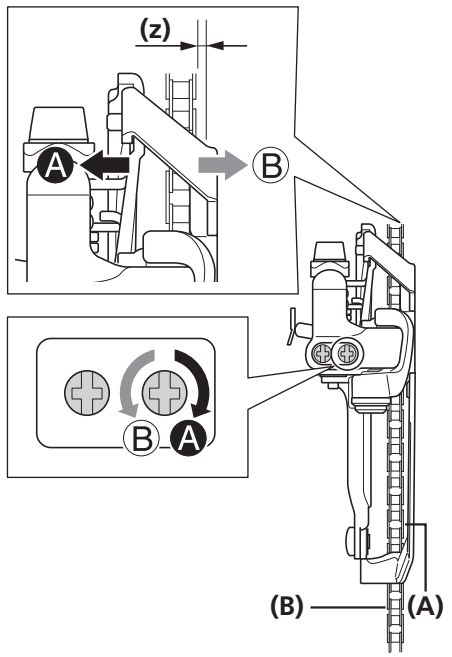


Set the chain on the largest chainring at the front and the smallest sprocket at the rear.

(w) Low
(x) Top
(y) L-trim
(z) 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 – 0.5 mm.

(z) 0 – 0.5 mm

(A) Chain guide outer plate
(B) Chain

Troubleshooting chart

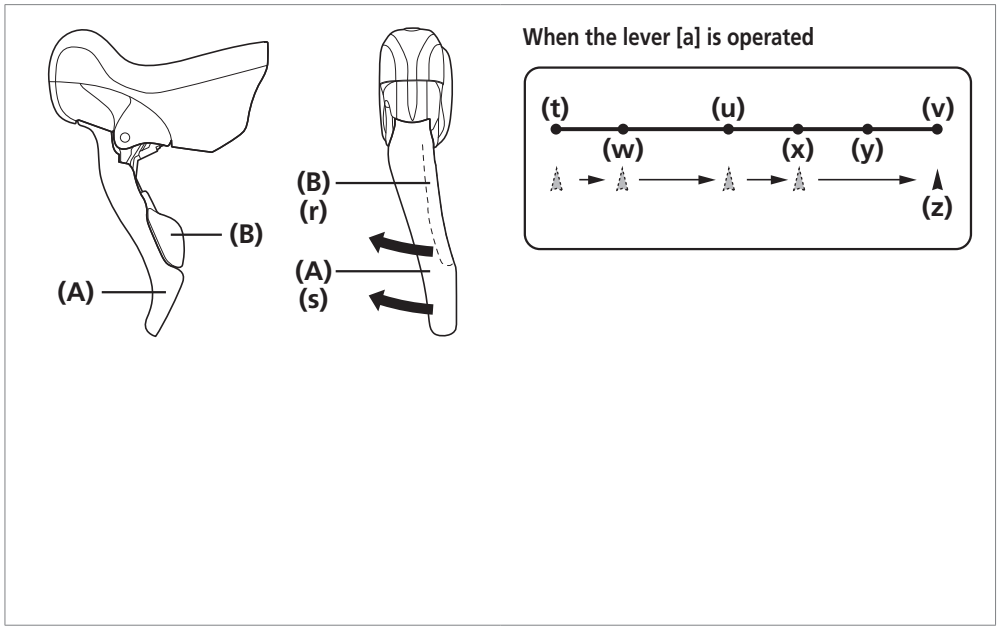
After low adjustment, fixing the cable, cable tension adjustment and top adjustment, operate the shifting lever to check the shifting.
(This also applies if shifting becomes difficult during use.)
* Turn the bolt by 1/8th turn for each adjustment.

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

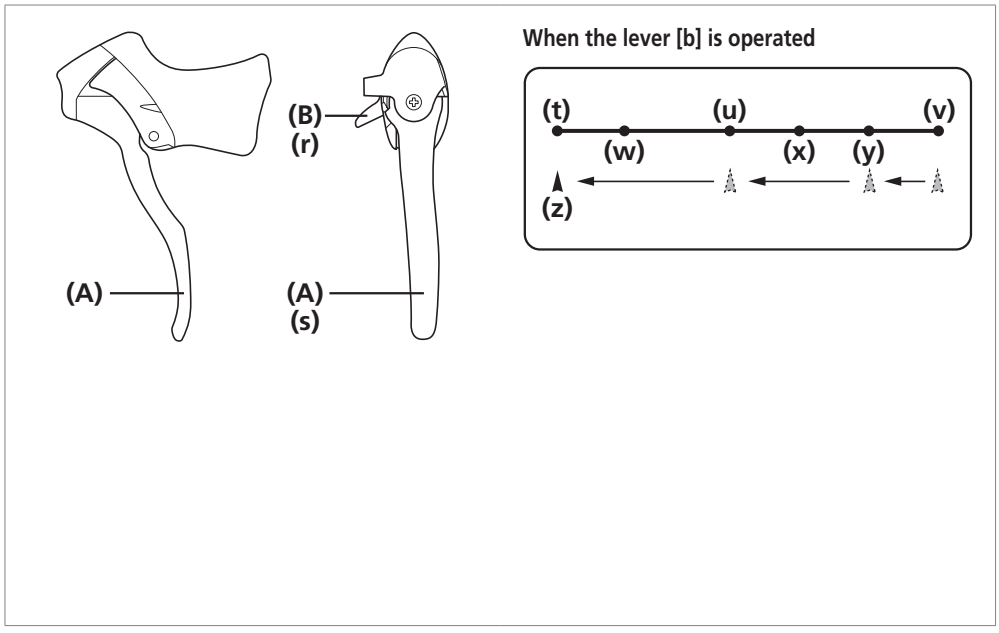
Front shifting (Standard type)



(r) From largest chainring to smallest chainring
(s) From smallest chainring to largest chainring
(t) Low
(u) Middle
(v) Top
(w) L-trim
(x) M-trim
(y) T-trim
(z) Cable index point

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

Front shifting (Thumb release type)

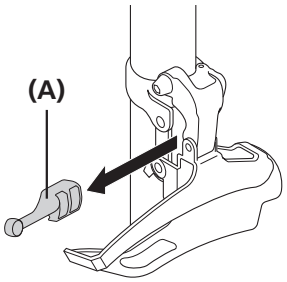


(r) From largest chainring to smallest chainring
(s) From smallest chainring to largest chainring
(t) Low
(u) Middle
(v) Top
(w) L-trim
(x) M-trim
(y) T-trim
(z) Cable index point

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

Low adjustment

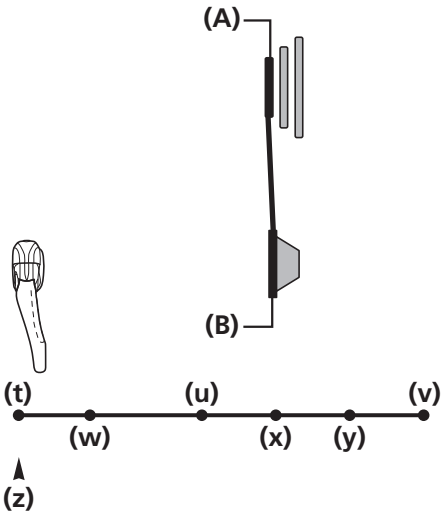
1



Remove the Pro-Set alignment block.

(A) Pro-Set alignment block

2

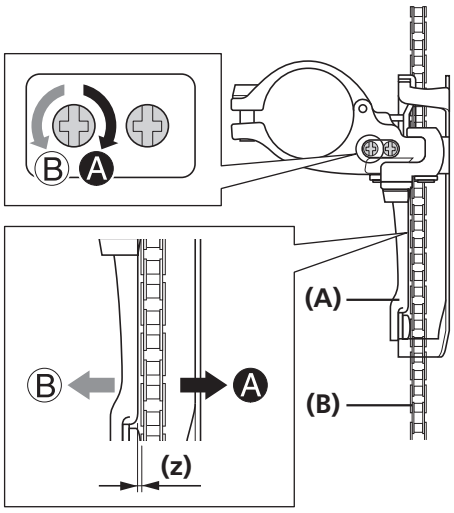


Set the chain on the smallest chainring at the front and the largest sprocket at the rear.

(t) Low
(u) Middle
(v) Top
(w) L-trim
(x) M-trim
(y) T-trim
(z) 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 – 0.5 mm.

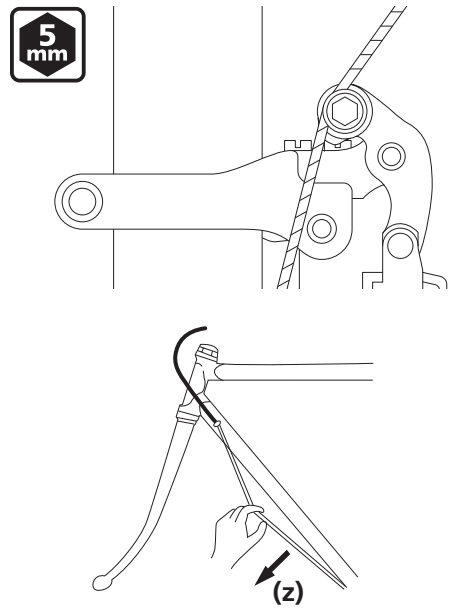
(z) 0 – 0.5 mm

(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.

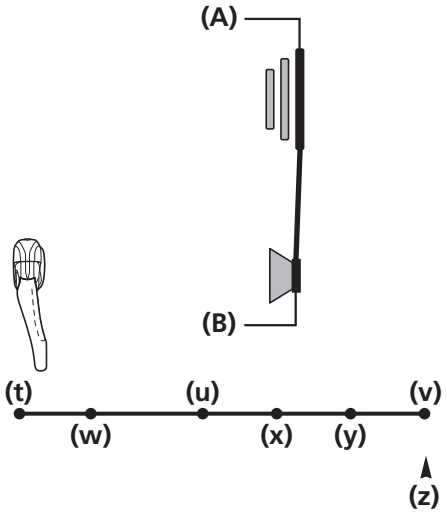
After that, fix the cable again on the front derailleur.

(z) Pull

Tightening torque	
5 mm	6 - 7 N·m

Top adjustment

1

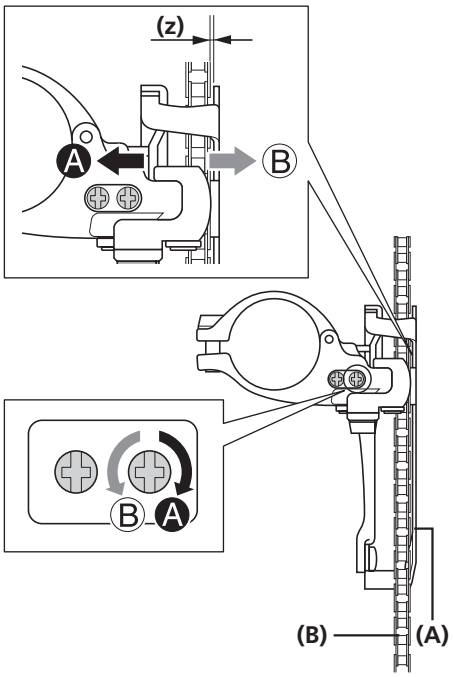


Set the chain on the largest chainring at the front and the smallest sprocket at the rear.

(t) Low
(u) Middle
(v) Top
(w) L-trim
(x) M-trim
(y) T-trim
(z) Cable index point

(A) Largest chainring
(B) Smallest sprocket

2



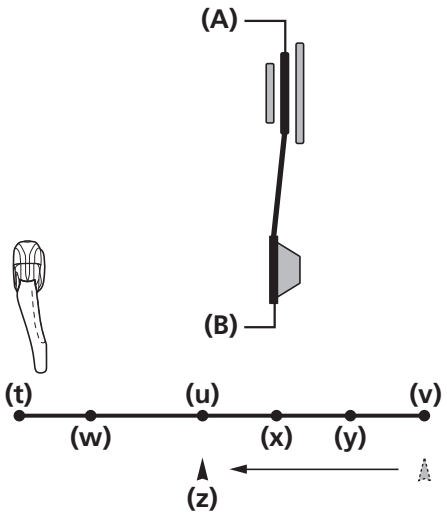
Set so that the clearance between the chain guide outer plate and the chain is 0 – 0.5 mm.

(z) 0 – 0.5 mm

(A) Chain guide outer plate
(B) Chain

Adjustment of the cable tension

1



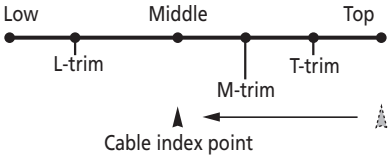
Set the chain onto the middle chainring and the largest sprocket.

- **(t)** Low
- **(u)** Middle
- **(v)** Top
- **(w)** L-trim
- **(x)** M-trim
- **(y)** T-trim
- **(z)** Cable index point

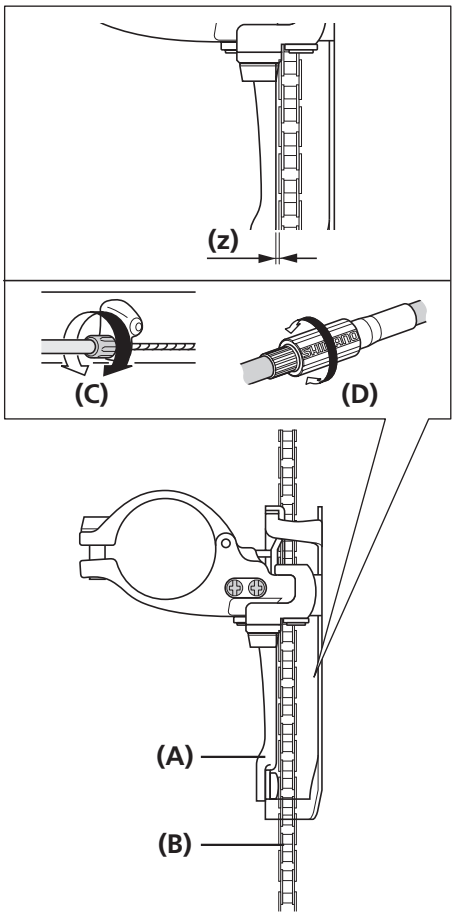
- **(A)** Middle chainring
- **(B)** Largest sprocket

NOTICE

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



2



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

- **(z)** 0 – 0.5 mm

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

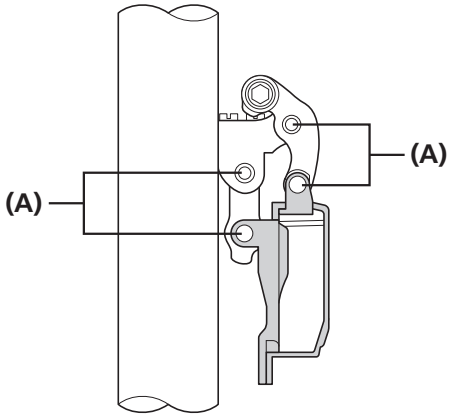
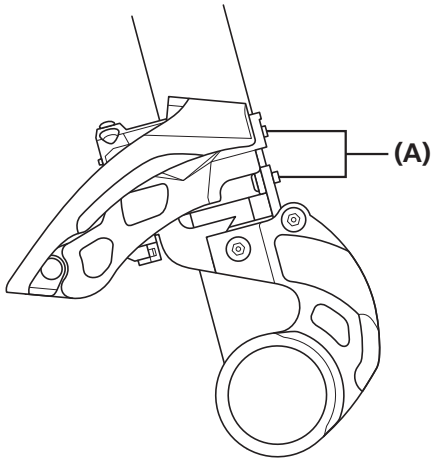
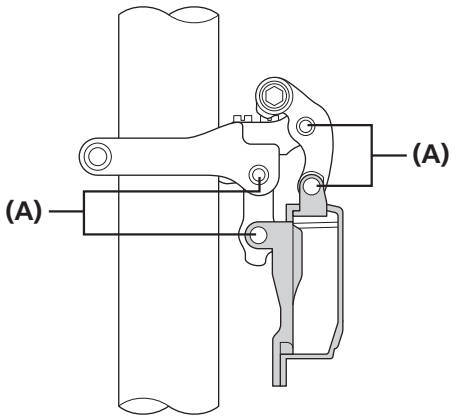
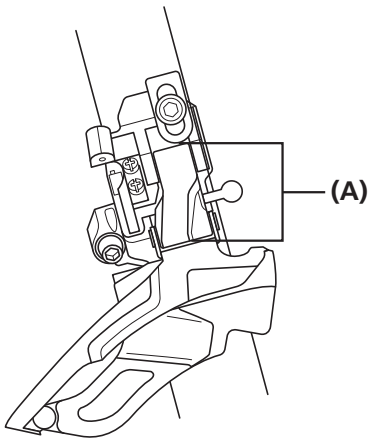
Troubleshooting chart

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	E-type
	
Band type	**Direct mount type**
	

(A) Links

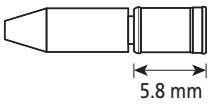
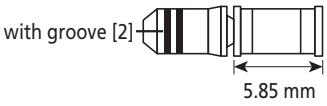
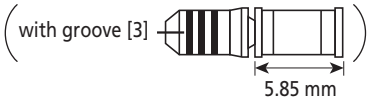
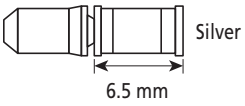
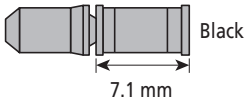
CHAIN

TO ENSURE SAFETY

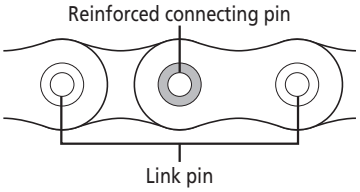
⚠ WARNING

"Intervals between maintenance depend on the use and riding circumstances. Clean the chain and QUICK-LINK regularly with an appropriate chain cleaner. Never use alkali based or acid based solvents, such as rust cleaners. If any of these are used, the chain or QUICK-LINK might break resulting in 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 and QUICK-LINK for any damage (deformations or cracks), chain skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency. There is a risk of the chain breaking or the QUICK-LINK disengaging, which may cause the bicycle to collapse.
- 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. If using a QUICK-LINK to connect the chain, refer to the section "QUICK-LINK".

Chain	Reinforced connecting pin / QUICK-LINK	Tool
11-speed CN-9000/6800 CN-HG900-11/HG700-11/HG600-11		TL-CN34 TL-CN28
All 11-speed chains		TL-CN10
For MTB/Trekking/E-BIKE 10-speed super narrow chain CN-M981/HG95/HG75/HG54/E6090-10 etc. (CN-M980/HG94/HG74 EOL)		TL-CN34 TL-CN33 TL-CN32 TL-CN28 TL-CN27
For ROAD double crank 10-speed super narrow chain CN-7901/6701/5701/4601 etc.		
For ROAD triple crank 10-speed super narrow chain CN-7801/6600/5600 etc.		
9-speed super narrow chain CN-YM81/7701/HG93/E6070-9 etc.		
8/7/6-speed narrow chain CN-HG50/HG40 etc.		

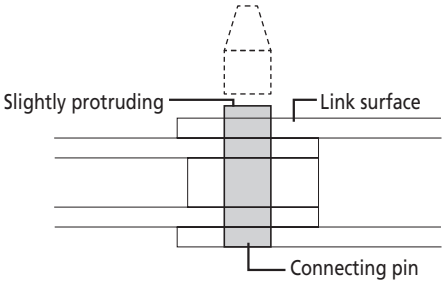
- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut in a place other than where the chain has been joined using a reinforced connecting pin. The chain will be damaged if it is cut at a place where it is joined with a reinforced connecting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

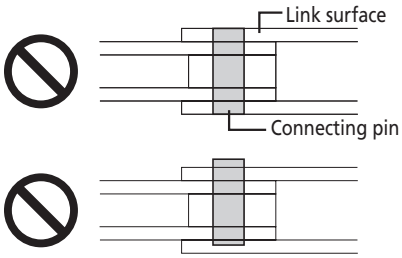


- When readjusting the length of the chain, be sure to insert the reinforced connecting pin from the same side as the chain cutter was inserted (the same direction as when the chain was cut).

■11/10-speed chain (ampoule pin type)

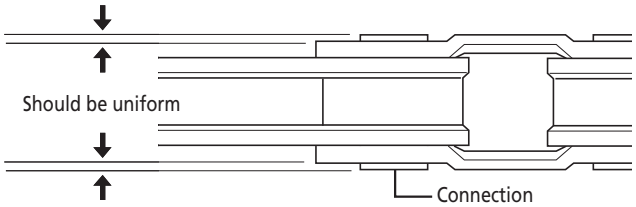
- After adjustment, make sure that the connecting pin is as shown in the illustration by running your finger over it. (The pin will protrude slightly after the break off pin is removed)





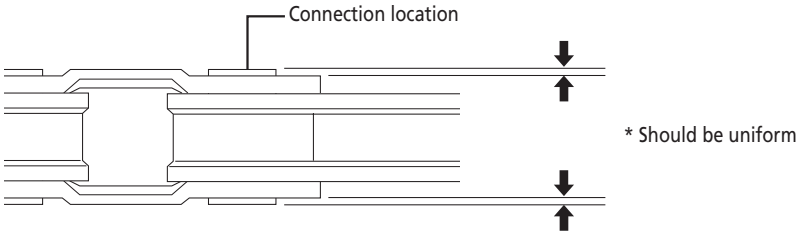
■9/8/7/6-speed chain

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



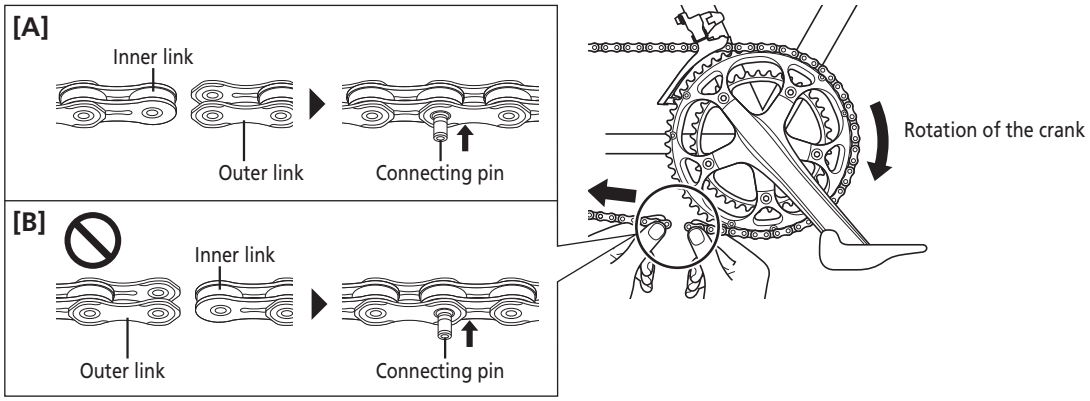
■CN-NX10

- Be sure to check that the connecting pin protrudes equally from both sides of the chain after it has been joined. Twist the connection area so that the chain moves smoothly.



NOTICE

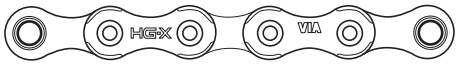
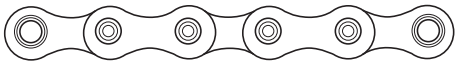
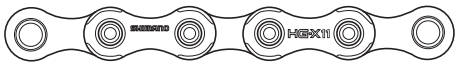
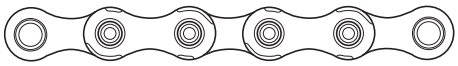
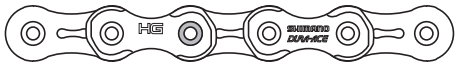
- CN-E6090-10/CN-E6070-9 can be used only in combination with single front chainrings.
- As illustrated in Fig. **[A]**, we strongly recommend to set the connecting pin in the hole of the outer link on the front side in the direction of travel. The chain's level of strength is enhanced compared to the method in Fig. **[B]**.



- You should periodically wash the chainrings/sprockets in a neutral detergent and then lubricate them again. In addition, cleaning the chain and QUICK-LINK with a neutral detergent and lubricating it can be an effective way of extending its useful life.

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

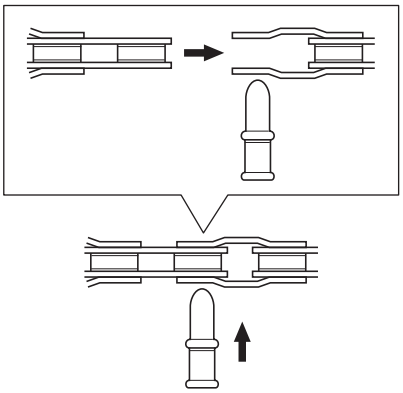
- In order to achieve good gear shifting performance, these have a forward side and a reverse side and must be fitted in the correct orientation.
  * The side with the mark shown in the illustration is the forward side (outer side).

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

CHAIN CONNECTING PIN

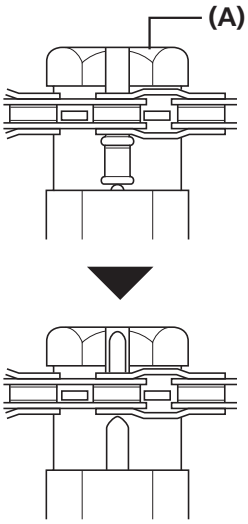
■ Method of use

1



Insert the connecting pin.

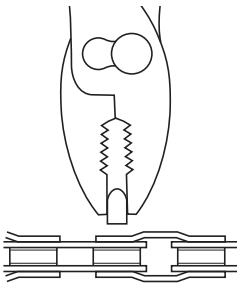
2



Press in the connecting pin using a chain tool.

(A) Chain tool

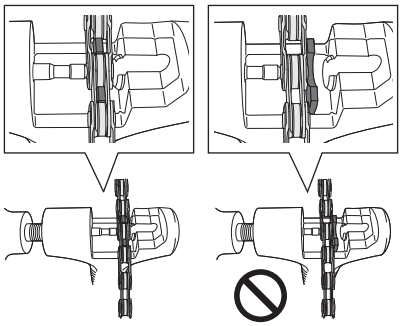
3



Break off the excess portion of the connecting pin.

NOTICE

Set the chain on the chain cutter 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

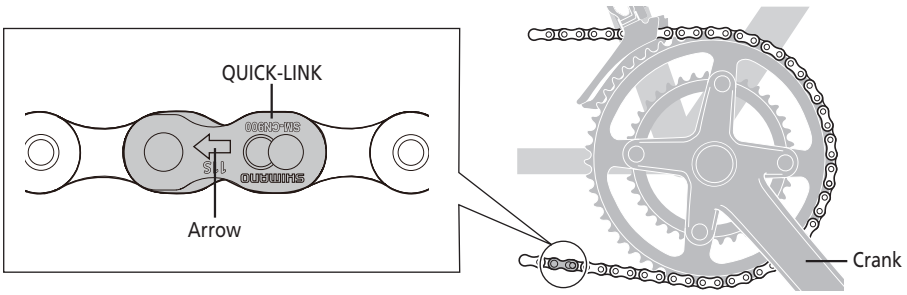
Do not reuse a QUICK-LINK that has been removed. If the QUICK-LINK is reused, there is a risk that it will loosen and become detached, causing the bicycle to fall over, which may cause serious injury.
"Intervals between maintenance depend on the use and riding circumstances. Clean the chain and QUICK-LINK regularly with an appropriate chain cleaner. Never use alkali based or acid based solvents, such as rust cleaners. If any of these are used, the chain or QUICK-LINK might break resulting in serious injury."

- 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.
- Check the chain and QUICK-LINK for any damage (deformations or cracks), chain skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency. There is a risk of the chain breaking or the QUICK-LINK disengaging, which may cause the bicycle to collapse.
- When replacing the chain with a new one, be sure to also replace the QUICK-LINK with a new one. If you do not replace it, the QUICK-LINK may break and you may fall.
- When attaching the QUICK-LINK, make sure that the pins on the link plates are pushed all the way in and securely planted in the link holes.
- **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.

■ QUICK-LINK compatible chains

Model No.	
QUICK-LINK	**Compatible chains**
SM-UG51	All 6, 7, and 8-speed chains
SM-CN900-11	All 11-speed chains

- When attaching SM-CN900-11, be sure to attach it so that the arrow on the surface faces in the direction of rotation of the crank when viewed from the front.
  If not attached correctly, SM-CN900-11 could detach causing the bicycle to collapse.



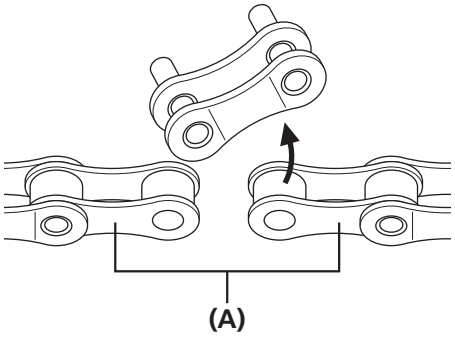
- Read these instructions carefully, and keep them in a safe place for later reference.

NOTICE

- You should periodically wash the chainrings/sprockets in a neutral detergent and then lubricate them again. In addition, cleaning the chain and QUICK-LINK with a neutral detergent and lubricating it can be an effective way of extending its useful life.
- Shimano original tool is required to remove the QUICK-LINK. Consult a dealer or an agency.

■ Installing a QUICK-LINK (SM-UG51)

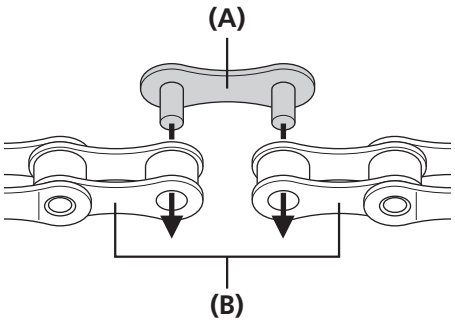
1



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

(A) Inner link

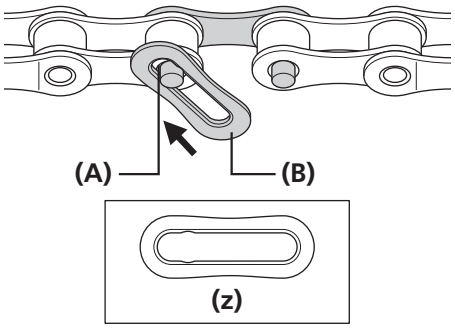
2



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

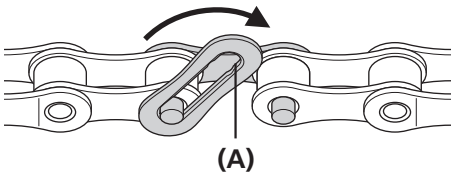


Place the connecting link with hole onto one of the pins, and then slide the connecting link so that the pin is at the other end from the hole.
(The side of the link plate with the depression should be facing toward the outside at this time.)

(z) Depression should be on the outside

(A) Hole
(B) Connecting link with hole

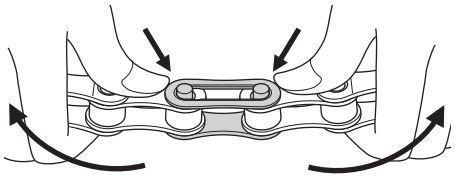
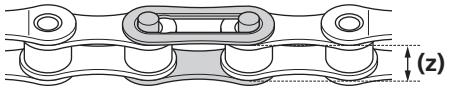
4



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

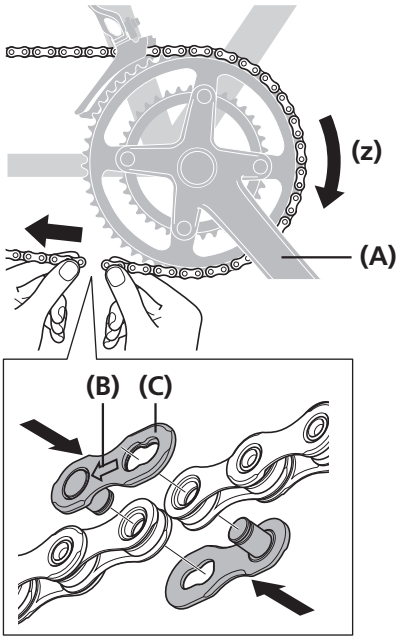
(A) Hole

To be continued on next page

5		Loosen the chain and insert the pin securely into the hole.
6		Set both pins securely into the slot of the connecting link with hole, and check that both plates are parallel. **(z)** Parallel

■ Installing a QUICK-LINK (SM-CN900-11)

1



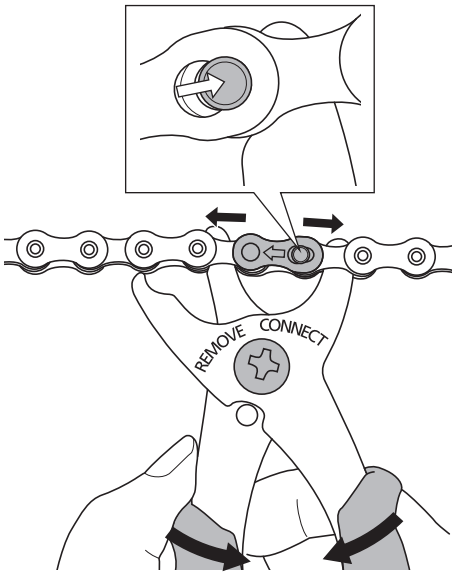
Insert the pins of the QUICK-LINK into the spaces in the inner link from both sides as shown in the illustration.

When using SM-CN900-11, be sure to install it so that the arrow on the surface faces in the direction of rotation of the crank when viewed from the front.

(z) Rotation of the crank

(A) Crank
(B) Arrow
(C) QUICK-LINK

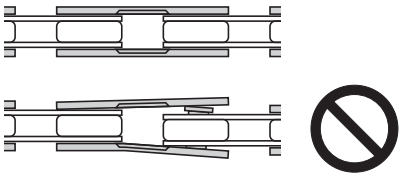
2



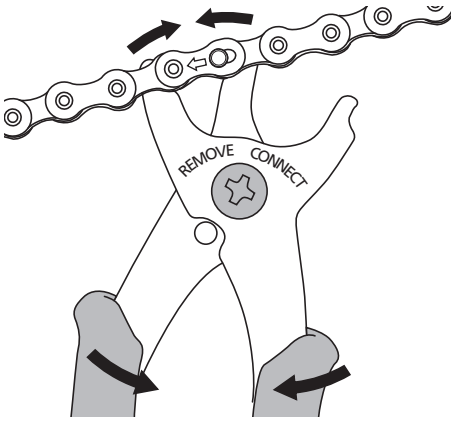
Use Shimano original tool TL-CN10 to slide the pins and insert them firmly.

NOTICE

Check that both QUICK-LINK plates are firmly fastened in position as shown in the illustration.



■ Removing a QUICK-LINK (SM-CN900-11)



Set Shimano original tool TL-CN10 as shown in the illustration, slide the pins and remove the QUICK-LINK.

BRAKE

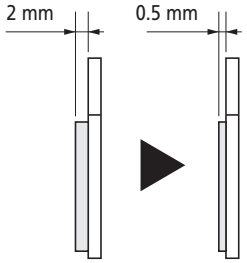
TO ENSURE SAFETY

⚠ 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 1.5 mm 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.
- If noise occurs during brake operation, the brake pads may have been worn down to the usable limit. Check that the brake system temperature has been cooled down sufficiently, check the thickness of the brake pad. If the thickness is 0.5 mm or below, the brake pad needs to be replaced with a new one. Consult a dealer or an agency.



- The calipers and disc brake rotor will become hot when the brakes are operated; do not touch them while riding or immediately after dismounting from the bicycle. Otherwise, you may get burned. Check that the brake components have cooled down sufficiently before attempting to adjust the brakes.

■ 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.

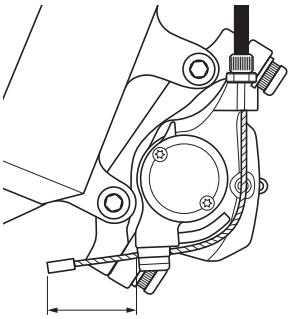
If brake operation is sluggish when the lever is depressed

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 20 mm (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.



- 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.

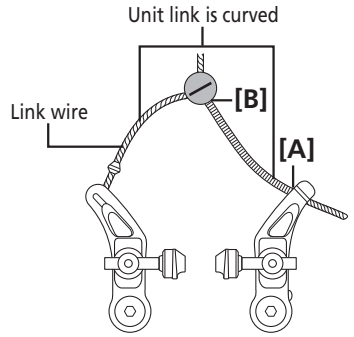
■ For caliper brakes

- 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 five times or more. When re-installing, apply sealant (locking adhesive) to the nut threads.

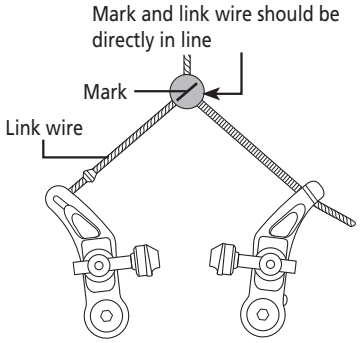
  If the nuts become loose and the brakes fall off, they may get caught up in the bicycle and the bicycle may fall over.
  Particularly if this happens with the front wheel, the bicycle may be thrown forward and serious injury could result.
- Check the brake cable for rust and fraying, and replace the cable immediately if any such problems are found. Otherwise, the brakes may not work correctly.

■ For cantilever brakes

- 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.



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.



⚠ 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.

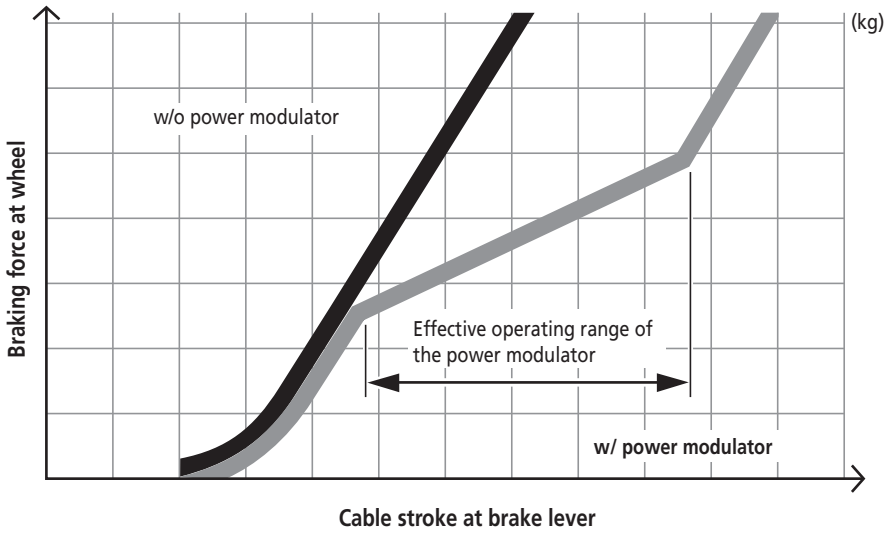
Handling the mineral oil

- 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



NOTICE

■For Hydraulic Disc Brake

- If the brake lever is depressed without the pad spacers installed, the pistons will protrude further than is normal. Use a flat-shaped 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 then 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 dropout are not parallel, the disc brake rotor and caliper may touch.

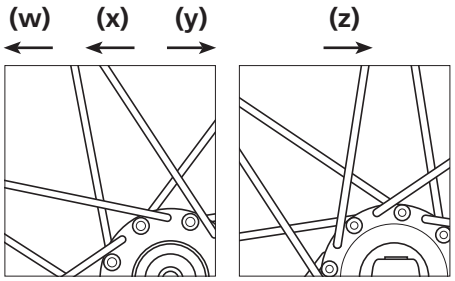
■For V-BRAKE brakes

- 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

Rotating direction of wheel



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

(w) Front left
(x) Rear left
(y) Rear right
(z) Front right

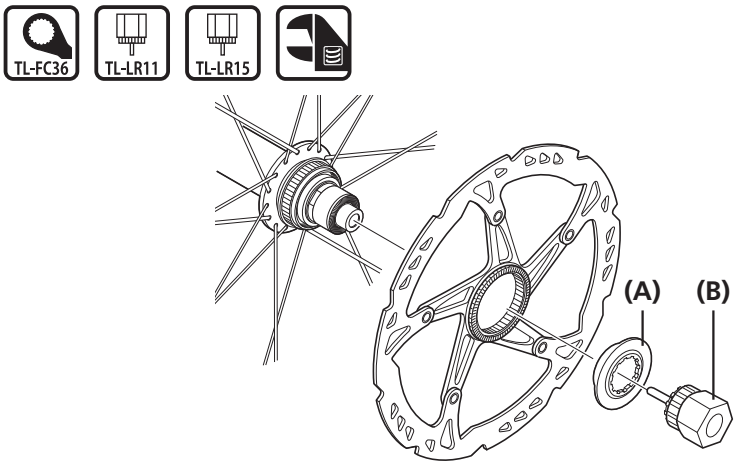
NOTICE

A radial assembly cannot be used.

■ Installation of the disc brake rotor

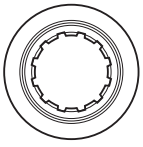
Center lock type

For quick release type

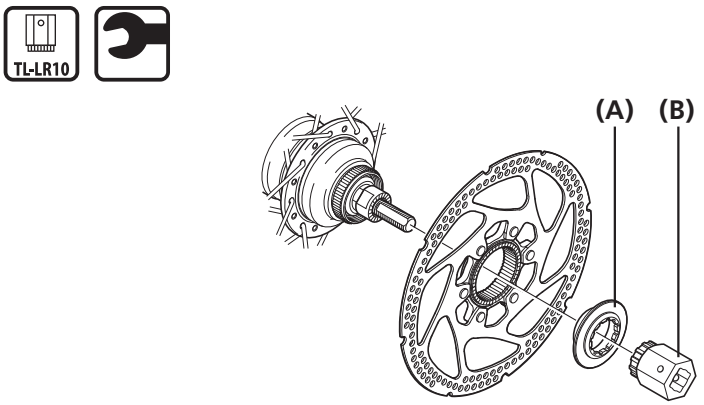


(A) Disc brake rotor fixing lock ring
(B) Lock ring tightening tool

Tightening torque	
TL-LR15 TL-FC36 TL-LR11	40 - 50 N·m

	Internally serrated type	Externally serrated type	Internally and externally serrated type
Disc brake rotor fixing lock ring			
Lock ring tightening tool	TL-LR15 Adjustable wrench	TL-FC36	TL-FC36/TL-LR11 Adjustable wrench

For nut type

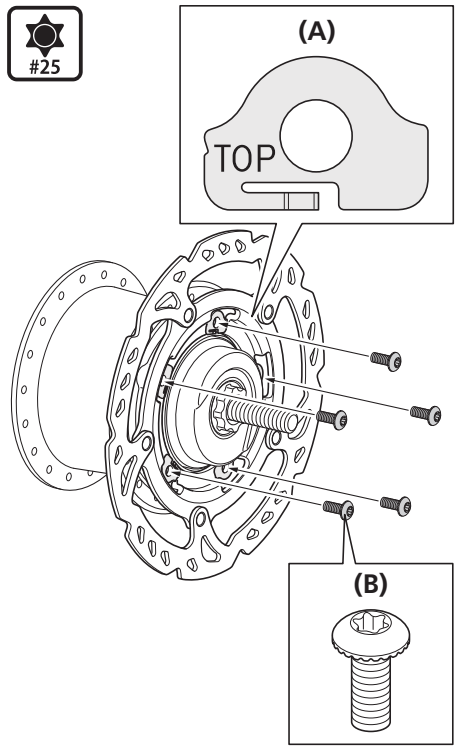


(A) Disc brake rotor fixing lock ring
(B) TL-LR10

Tightening torque:	
TL-LR10	40 - 50 N·m

5 bolt type (with lock washers)

1



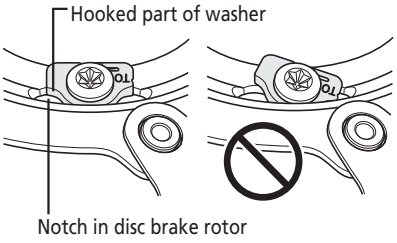
Attach the disc brake rotor and the disc brake rotor lock washers to the hub, and then tighten them on with bolts.

(A) Lock washer
(B) Disc brake rotor fixing bolt

Tightening torque	
#25	2 - 4 N·m

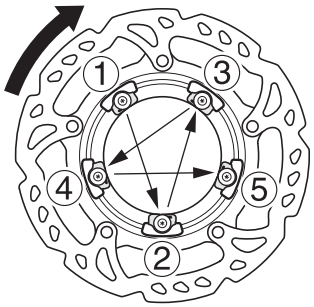
NOTICE

- Fit the lock washers so that the marking "TOP" is visible.
- Ensure that the hooked parts of the lock washer are securely caught on the notches in the disc brake rotor and then tighten on the lock washer with the disc brake rotor fixing bolt. If tightened while the hooked parts are against the surface of the disc brake rotor, the washer and its hooked parts will become deformed.



- The lock washers are not reusable. Always use new lock washers when installing/re-installing the disc brake rotor.
- Use the dedicated disc brake rotor fixing bolts.

2

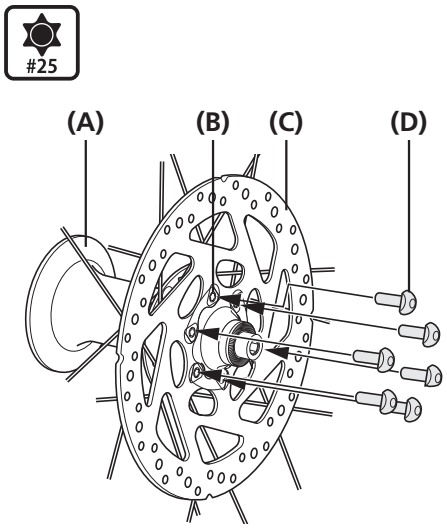


Wear gloves and turn the disc brake rotor clockwise with some force.

At this time, tighten on the disc brake rotor fixing bolts in the order indicated in the illustration.

6 bolt type

1

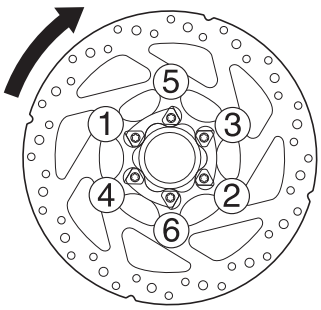


Install the disc brake rotor and the disc brake rotor tightening plate to the hub, and then install and tighten the bolts.

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

Tightening torque	
#25	2 - 4 N·m

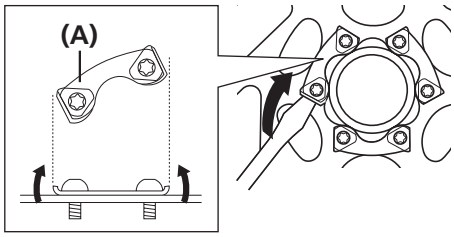
2



Wear gloves and turn the disc brake rotor clockwise with some force.

While doing this, tighten the disc brake rotor fixing bolts in the order shown in the illustration.

3

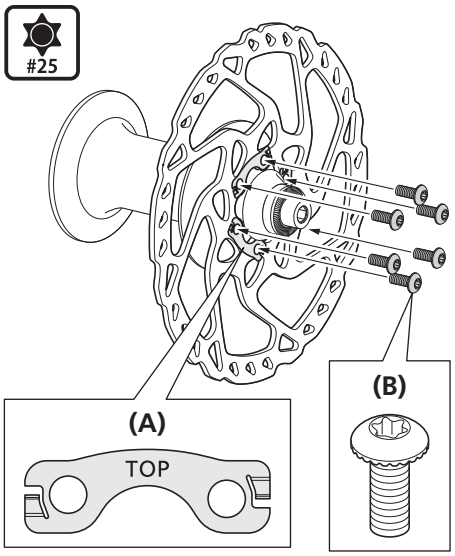


Use a slotted screwdriver or similar tool to bend the edges of the tightening plate over the heads of the bolts.

(A) Tightening plate

6 bolt type (with lock washers)

1



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

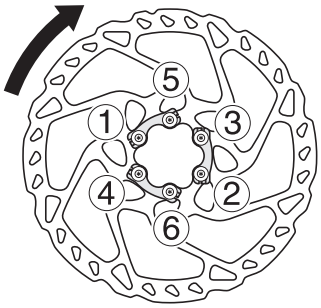
(A) Lock washer
(B) Disc brake rotor fixing bolt

Tightening torque	
#25	2 - 4 N·m

NOTICE

- 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 disc brake rotor fixing bolts.

2



Wear gloves and turn the disc brake rotor clockwise with some force.

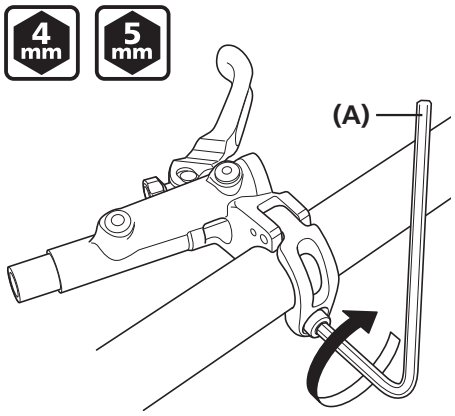
While doing this, tighten the disc brake rotor fixing bolts in the order shown in the illustration.

INSTALLATION (HYDRAULIC DISC BRAKES)

■ Installation of the brake lever

NOTICE

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.



Secure the brake lever as shown in the illustration.

(A) 4 mm hexagon wrench/
5 mm hexagon wrench

Tightening torque	
4 mm 5 mm	6 - 8 N·m

BL-M987/BL-M9000/BL-M9020

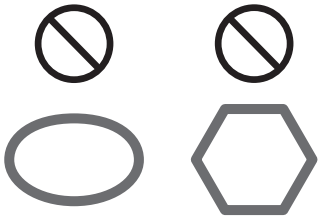
Tightening torque	
4 mm	4 - 6 N·m

BL-MT200/BL-MT201/BL-MT401/BL-MT402-3A

Tightening torque	
5 mm	4 - 6 N·m

NOTICE

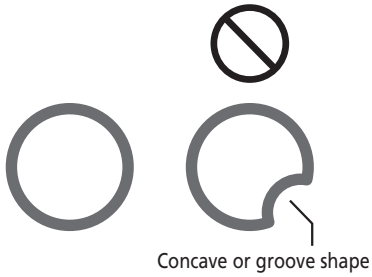
- Check that the brake lever does not interfere with the shifting lever during operation. Some types might require the shifting lever to be installed first, due to the position of the shifting lever fixing bolts.
- All parts mounted on a flat handlebar are designed to be fixed with a round section shape and a diameter of 22.2 mm (±0.2 mm).
  Avoid using handlebars as shown in the illustration.



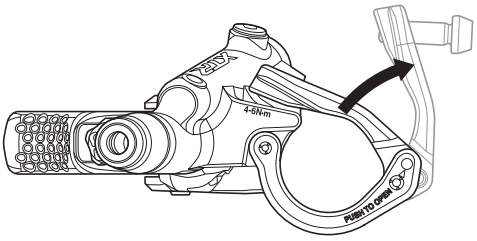
Cross-section view of a handlebar where the part is fixed

NOTICE

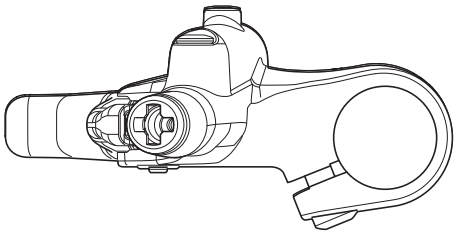
If the flat handlebar has groove as the illustration, it may lead to stress concentration on the clamp band, potentially lead to damage. Please choose an open clamp band type brake lever instead.



Cross-section view of a handlebar where the clamp band is fixed

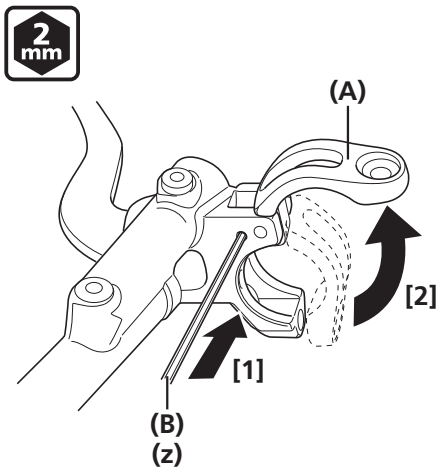


Brake lever with open clamp band



Brake lever with conventional clamp band (Non-open clamp band type brake lever)

For open clamp band type



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

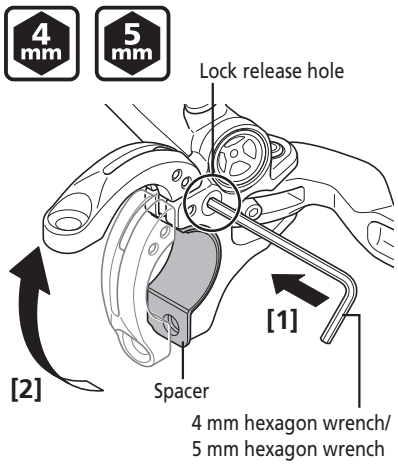
(z) Push

(A) Clamp band
(B) 2 mm hexagon wrench

NOTICE

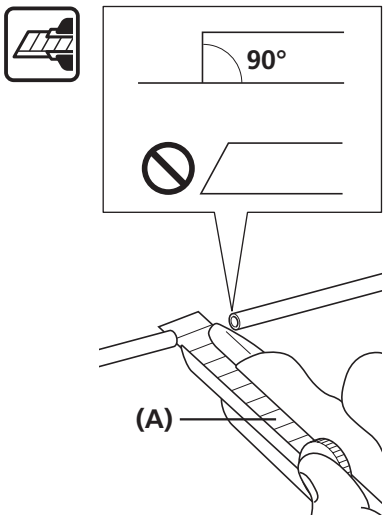
For models with the clamp band lock release hole on the outer side of the bracket body

- 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.



■ Installation of the brake hose

1



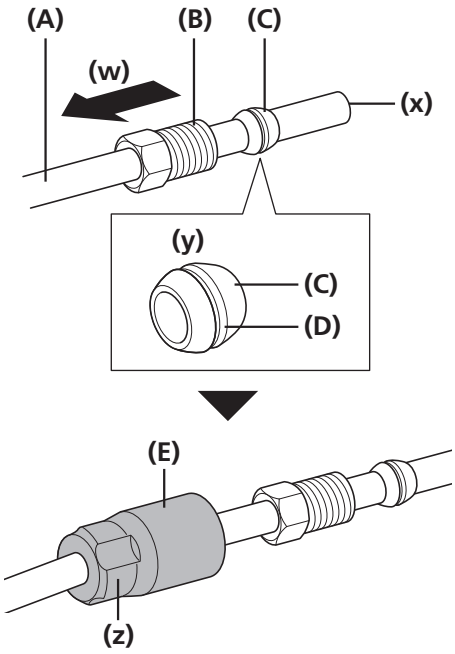
Use a utility knife or similar tool to cut the hose.

(A) Utility knife

NOTICE

- 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.

(w) Direction of insertion
(x) Cut end
(y) Grease the outside of the olive.
(z) Attach the cover to the connecting bolt for the brake lever.

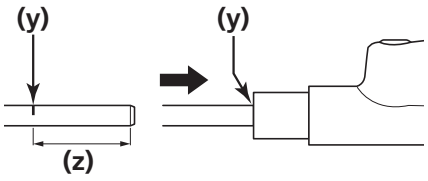
(A) Hose
(B) Connecting bolt
(C) Olive
(D) Premium grease
(E) Cover

To be continued on next page

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.

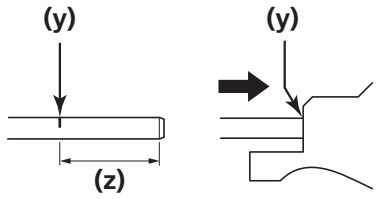
At brake lever end



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

* 14 mm for BL-T675/T615/M445/T445.

At caliper end



Model No.	Length	Type
SM-BH90-SS	11 mm*	Banjo type
SM-BH59-JK-SS	11 mm*	Straight type

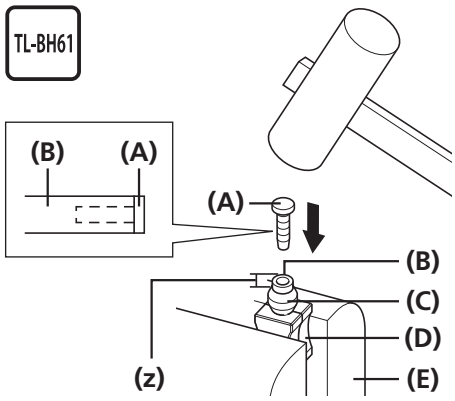
* 14 mm for BR-T675/T615/M446.

(y) Mark
(z) Length

TECH TIPS

As a guide, the length of hose inside the mounts should be approximately 11 or 14 mm, measured from the cut end of the hose.

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.

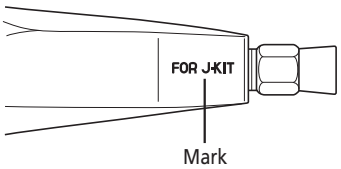
If the end of the hose is not touching the base of the connector insert, the hose may become disconnected or fluid leaks may occur.

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

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

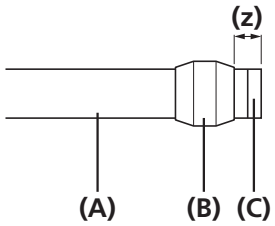
NOTICE

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



To be continued on next page

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.

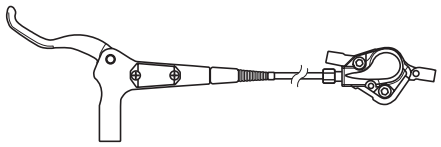
(z) SM-BH90: 2 mm
SM-BH59/BH80
(YM-BH81): 5 mm

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

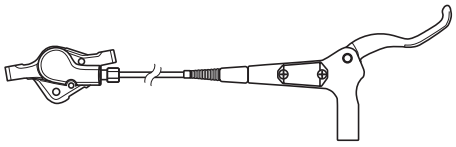
Model No.	Length	Color
SM-BH90	11.2 mm	Silver
SM-BH59/80	13.2 mm	Gold
YM-BH81	13.2 mm	Silver

6

Left lever



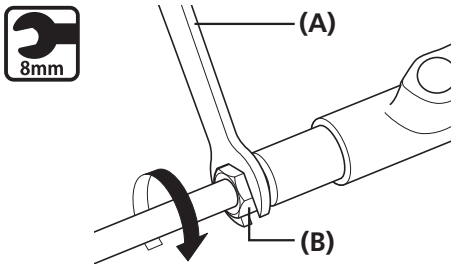
Right lever



Make sure that the brake hose is not twisted.

Make sure that the calipers and levers are in the positions shown in the illustrations.

7

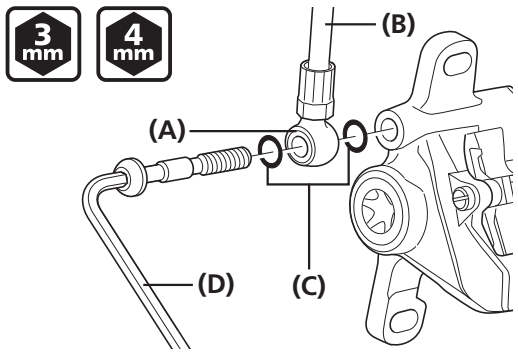


While pushing the brake hose, tighten the connecting bolt.

(A) 8 mm spanner
(B) Connecting bolt

Tightening torque	
8mm	5 - 7 N·m

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) 3 mm hexagon wrench/ 4 mm hexagon wrench

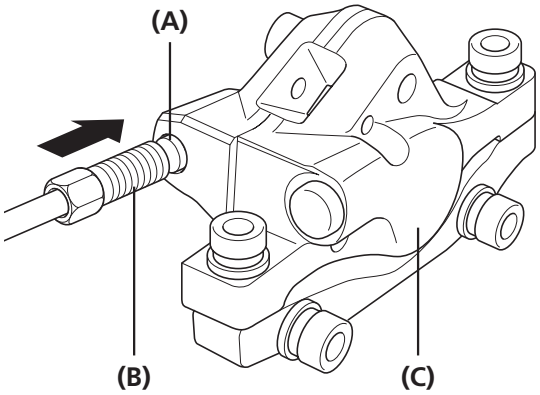
For 3 mm hexagon wrench

Tightening torque
5 - 7 N·m

For 4 mm hexagon wrench

Tightening torque
8 - 10 N·m

At caliper end (Straight type)

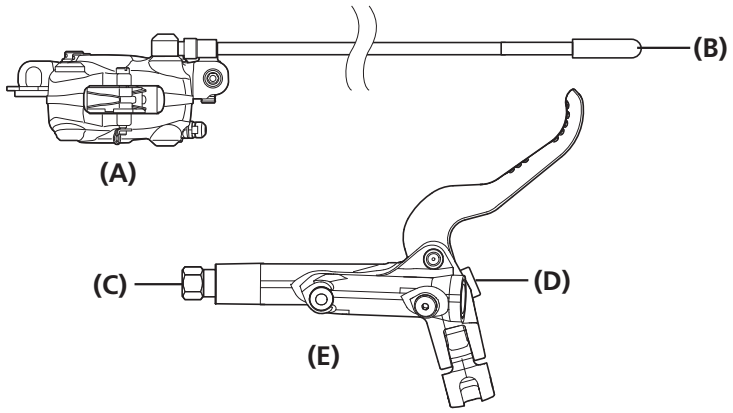


(A) Olive
(B) Connecting bolt
(C) Caliper

Tightening torque
5 - 7 N·m

■ Installation of the brake hose (easy hose joint system)

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 Route the brake hose into the final installation position.

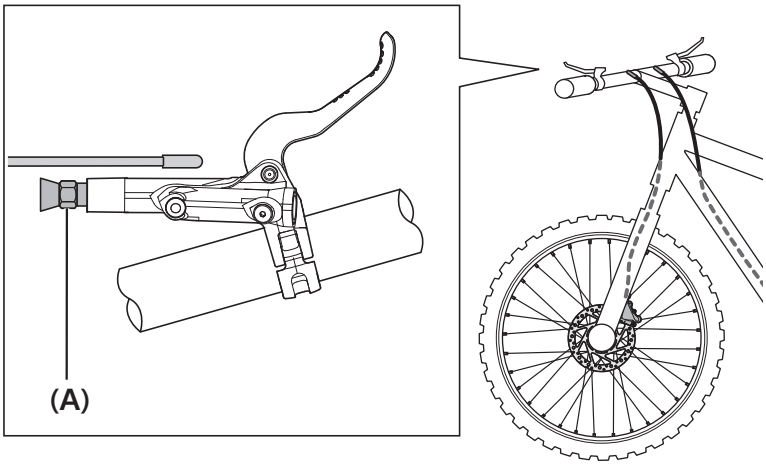
NOTICE

Do not remove the hose caps from the ends of the brake hoses.

2 Check the appropriate length of the brake hose.

Secure the brake lever in the position used when riding.

If the hose needs to be shortened, refer to "Cutting the hose" in "Installation of the brake hose" and cut the hose.



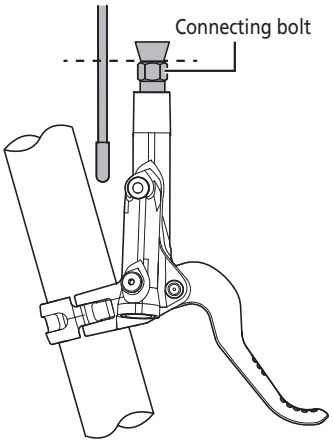
(A) Connecting bolt

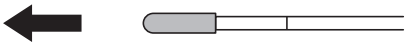
NOTICE

If the hose length is insufficient, replace with a hose that has an appropriate length.

TECH TIPS

When checking the appropriate length of the brake hose, the end of the brake lever's connecting bolt should be the standard.



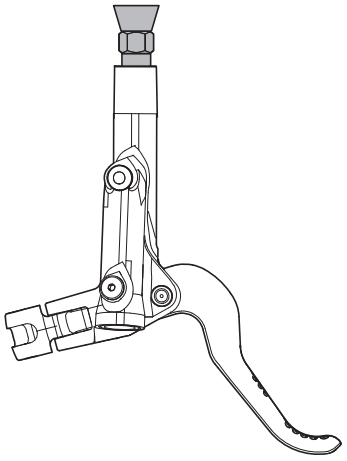
3 

Remove the hose cap.

If the brake hose was cut, it is not necessary to remove the hose cap.

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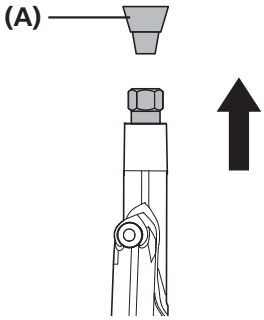
4



Secure the brake lever in a vise or another similar device.

Face the hose connection port upward when securing the brake lever.

5

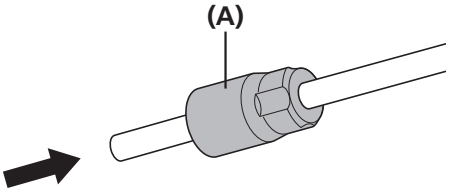


Remove the seal plug.

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

(A) Seal plug

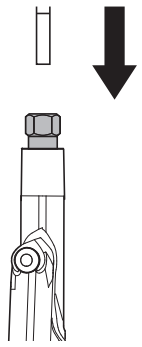
6



Pass the brake hose through the hose cover.

(A) Hose cover

7



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.

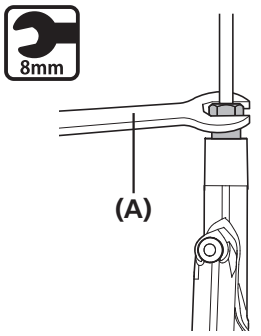
Check that the brake hose is inserted up to the line printed on the hose.

TECH TIPS

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

To be continued on next page

8

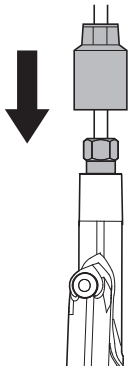


Tighten the connecting bolt with an 8 mm spanner while pushing the brake hose.

(A) 8 mm spanner

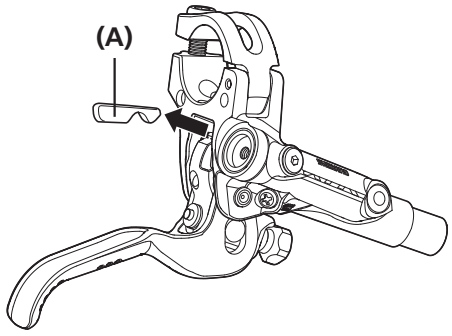
Tightening torque	
8mm	5 - 7 N·m

9



Clean any oil residue and attach the hose cover.

10



Remove the brake lever stopper.

(A) Lever stopper

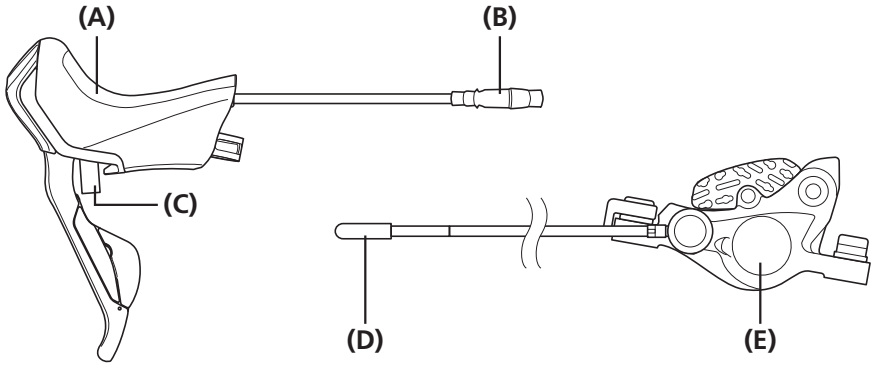
NOTICE

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 Route the brake hose into the final installation position.

NOTICE

Do not remove the hose caps from the ends of the brake hoses.

2 Check the appropriate length of the brake hose.

Secure the dual control lever in the position used when riding.

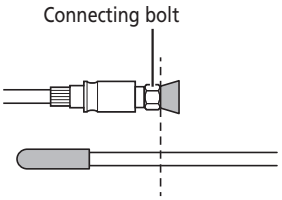
If the hose needs to be shortened, refer to "Cutting the hose" in "Installation of the brake hose" and cut the hose.

NOTICE

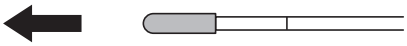
If the hose length is insufficient, replace with a hose that has an appropriate length.

TECH TIPS

When checking the appropriate length of the brake hose, the end of the dual control lever's connecting bolt should be the standard.



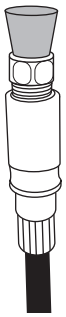
3



Remove the hose cap.

If the brake hose was cut, it is not necessary to remove the hose cap.

4

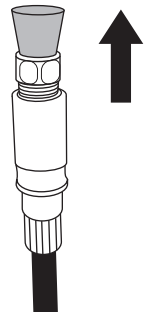


Secure the joint component in a vise or another similar device.

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

To be continued on next page

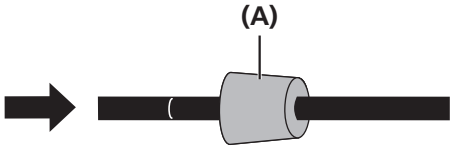
5



Remove the seal plug.

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

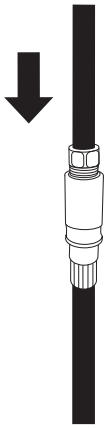
6



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

(A) Hose cover

7



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

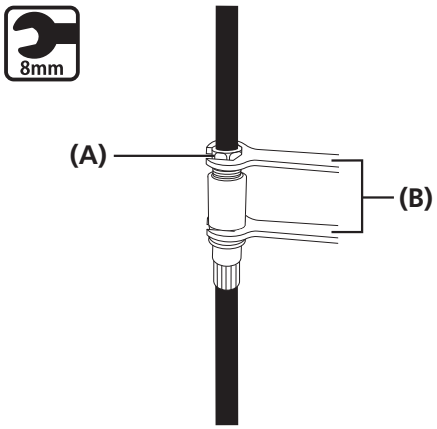
It comes with a built-in olive. Insert it while making sure that it will not get snagged on the olive.

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.

8

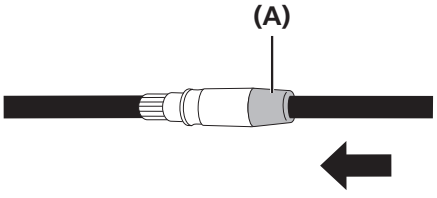


Tighten the connecting bolt with two 8 mm spanners while pushing the brake hose.

(A) Connecting bolt
(B) 8 mm spanner

Tightening torque	
8mm	5 - 7 N·m

9



Clean any oil residue and attach the hose cover.

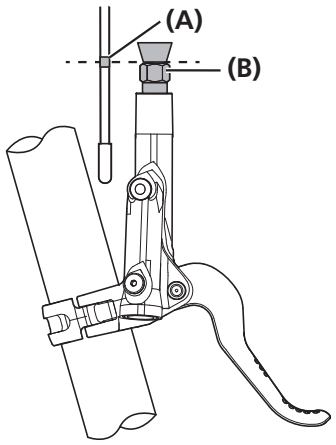
(A) Hose cover

Cutting the hose

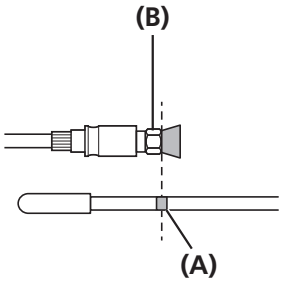
Use care when cutting the hose, as oil may leak when the hose is cut.

1

For MTB



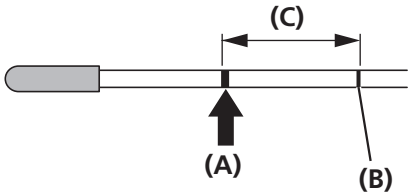
For ROAD



Determine the appropriate length and add a check mark on the brake hose. Add the mark so it is aligned with the edge of the connecting bolt.

(A) Check mark
(B) Connecting bolt

2



Add a cut mark.

Mark the hose at a position 18 mm from the check mark on the end side of the hose if it is a MTB and 21 mm if it is a ROAD.

(A) Cut mark
(B) Check mark
(C) MTB: 18 mm
ROAD: 21 mm

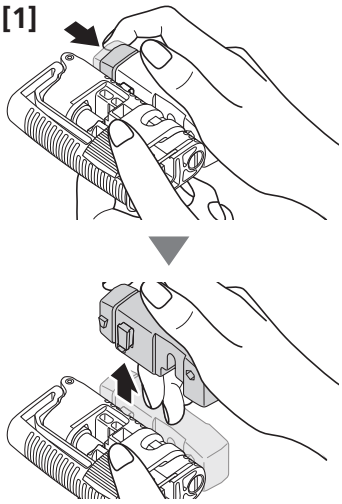
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3

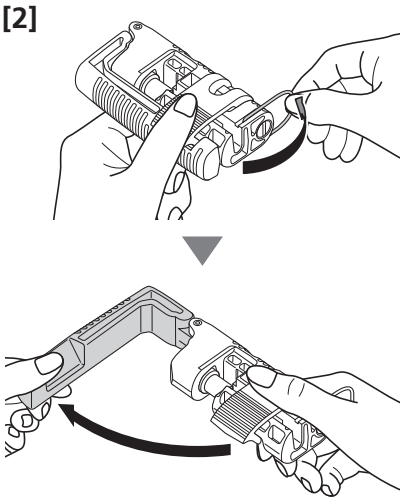
Prepare the Shimano original tool TL-BH62 for cutting the brake hose as follows.

Disassemble the Shimano original tool TL-BH62 as shown in the illustrations.

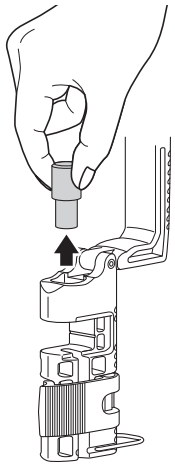
[1]



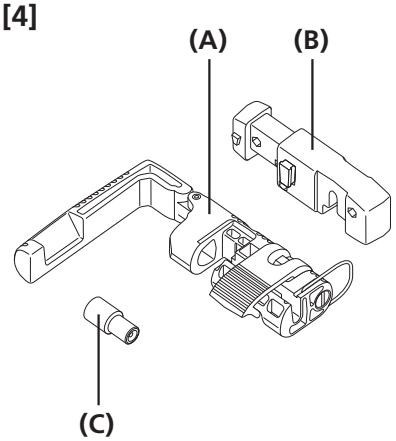
[2]



[3]



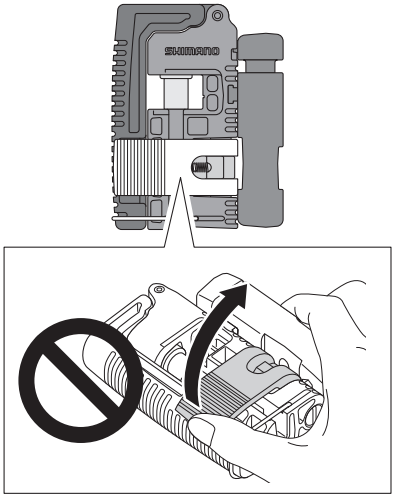
[4]



(A) Body of tool
(B) Hose cutter
(C) Press block

NOTICE

- Do not move the lever indicated in the illustration before disassembling the Shimano original tool TL-BH62.



- Make sure to also read the instruction manual for the Shimano original tool TL-BH62.

TECH TIPS

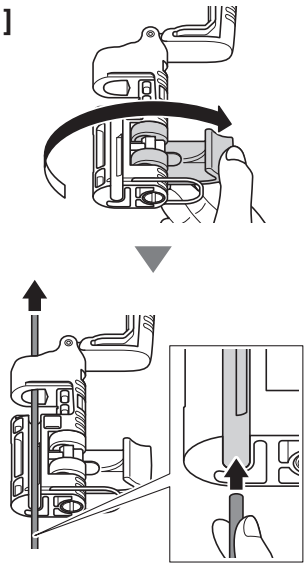
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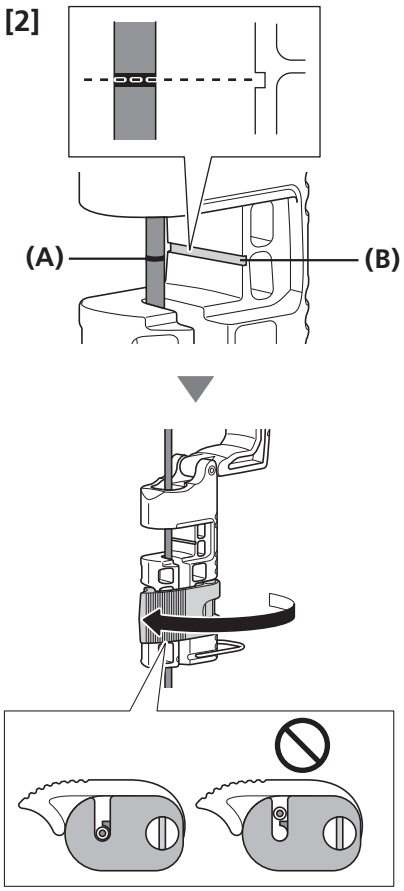
Insert the brake hose into the tool as shown in the illustration.

Next, check that the cut mark is level with the groove on the tool, and then secure the brake hose in place.

[1]



[2]



(A) Cut mark
(B) Groove

NOTICE

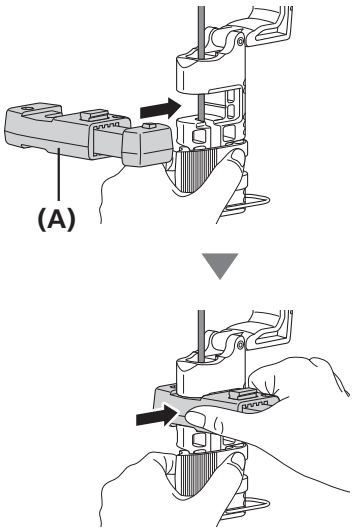
When inserting the brake hose into the tool, align the mark for cutting with the groove in the tool.

5

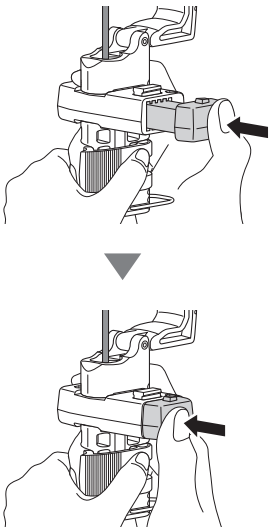
Check that the hose is secure and then attach the hose cutter.

Press the hose cutter as shown in illustration [2] to cut the brake hose.

[1]



[2]

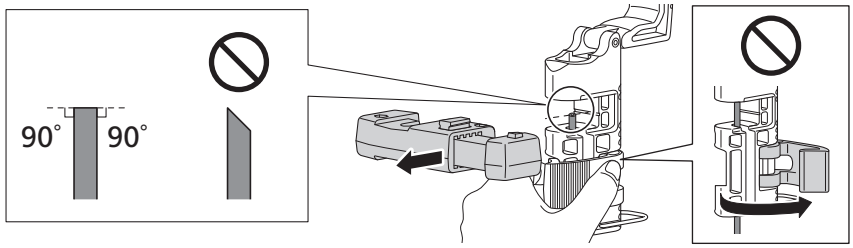


(A) Hose cutter

To be continued on next page

6

Detach the hose cutter and check that the cut end is horizontal.

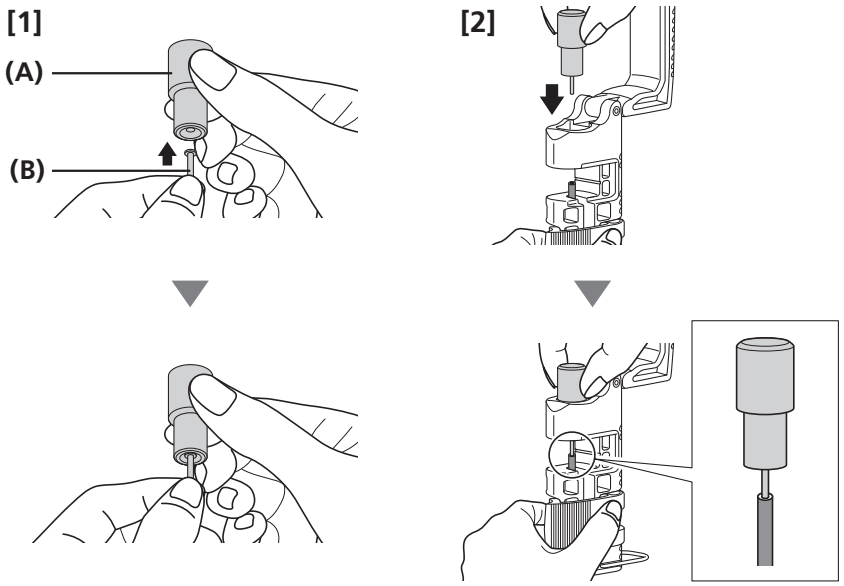


7

Prepare the connector insert for insertion into the brake hose as follows.

Attach the connector insert to the press block and then set the press block in the tool.

Make sure that the tip of the connector insert is correctly positioned inside the opening of the brake hose.



(A) Press block
(A) Connector insert

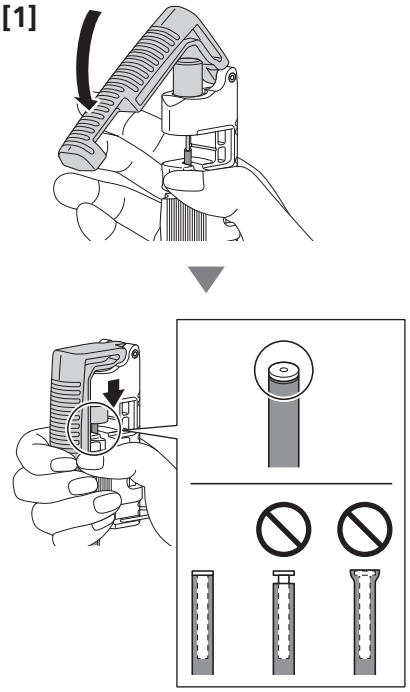
To be continued on next page

8

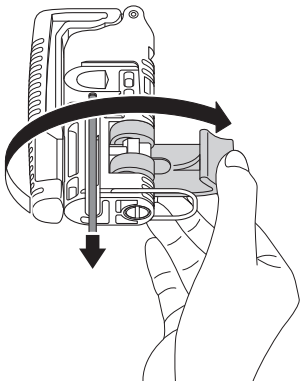
Grip the lever on the tool to insert the connector insert into the brake hose, as shown in the illustrations.

Check that the connector insert has been inserted correctly, and then remove the brake hose from the tool.

[1]



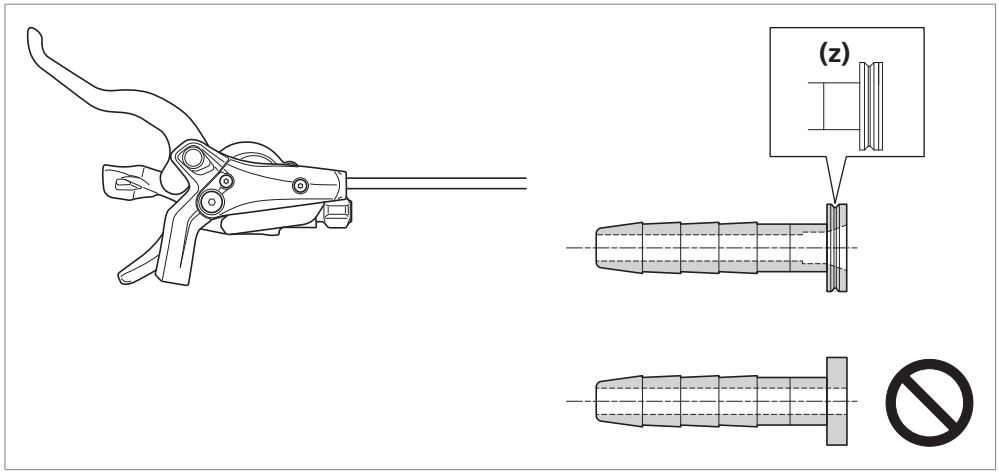
[2]



■ Replacing the brake hose (easy hose joint system)

For MTB BH59

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



(z) SHIMANO CODE No.: Y8H298040
There is a groove in the head shaped part.

NOTICE

- 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.

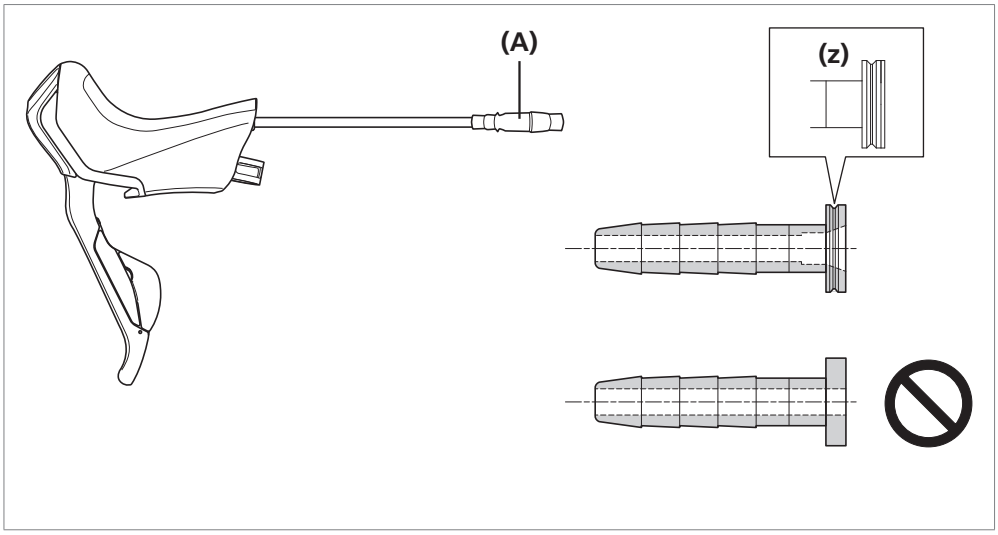
For ROAD

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

When connecting to the joint sleeve

NOTICE

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



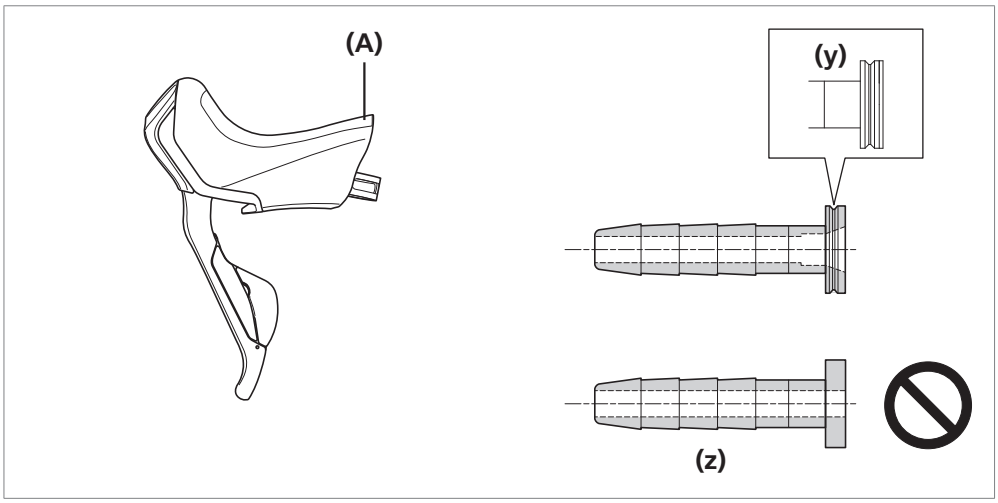
(z) SHIMANO CODE No.: Y8H298040
There is a groove in the head shaped part.

(A) Joint sleeve

NOTICE

- 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



(y) SHIMANO CODE No.: Y8H298040
There is a groove in the head shaped part.

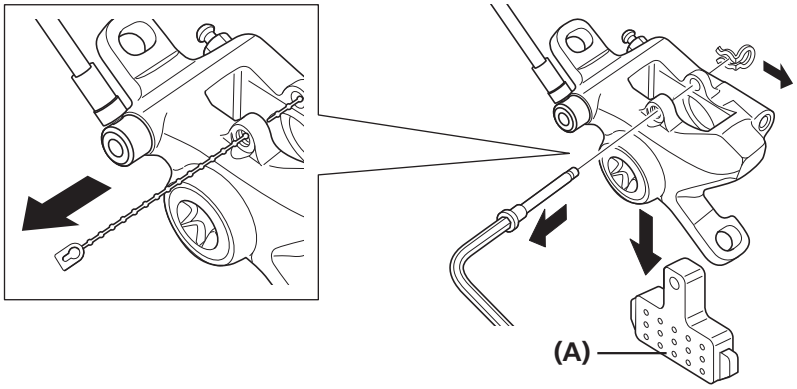
(z) For a connector insert of this shape, only ST-R785 can be used.

(A) Brake hose connection port

Installation of the calipers and securing the hose

1

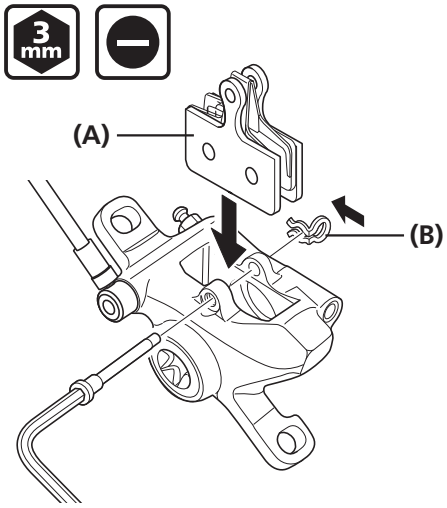
Remove the spacer for bleeding (yellow), and then set the wheel which has the disc brake rotor onto the frame.



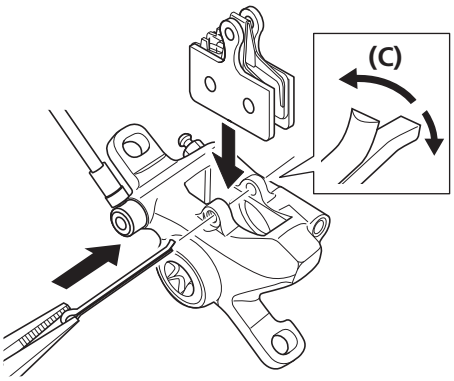
(A) Bleed spacer

2

Install the brake pads.



For split pin

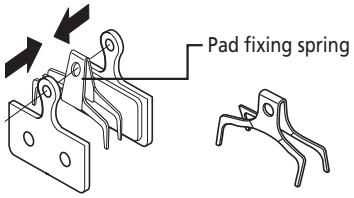


(A) Brake pad
(B) Snap ring
(C) Split pin

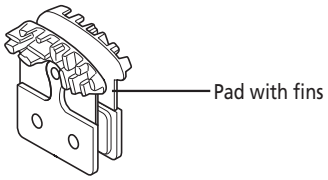
Tightening torque	
3 mm	2 - 4 N·m

TECH TIPS

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



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



International standard mounting type

NOTICE

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

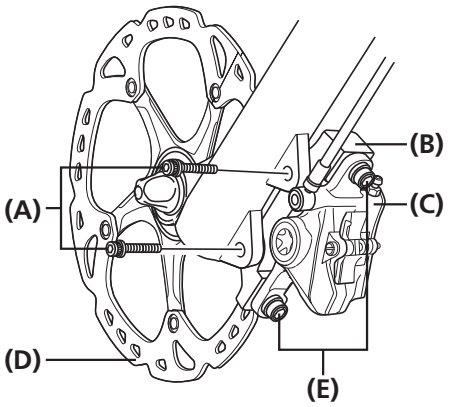
1 First install the adapter, and then provisionally secure the calipers to the frame.

TECH TIPS

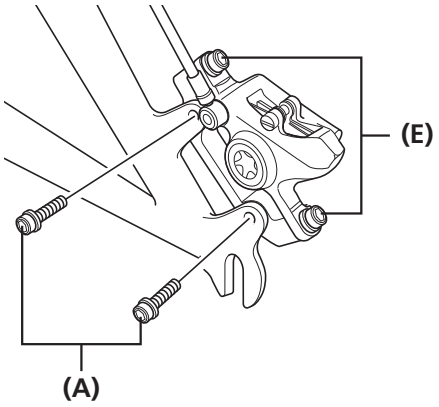
The calipers should be able to move sideways.

2

Front



Rear



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

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

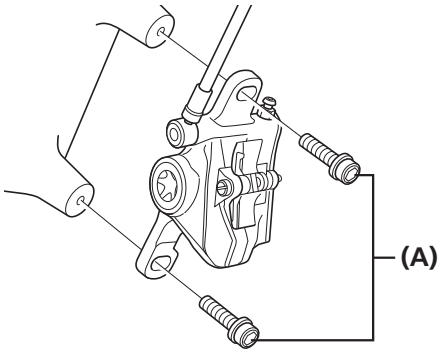
Tightening torque
6 - 8 N·m

Post mounting type

1 Provisionally install the caliper to the frame (so that the caliper can move sideways).

2

Front



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

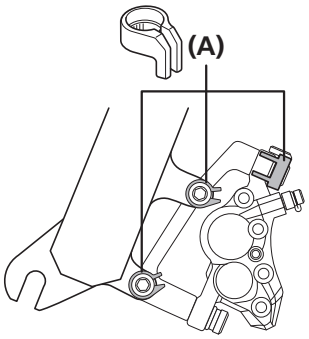
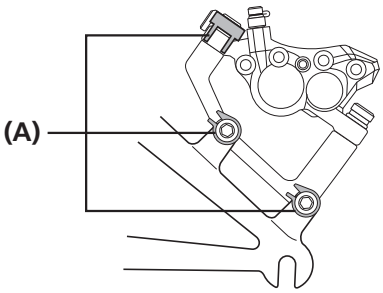
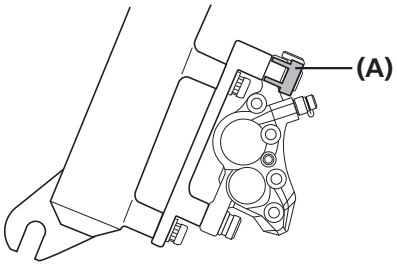
(A) Caliper fixing bolt

Tightening torque
6 - 8 N·m

■ Preventing loosening of frame fixing bolts

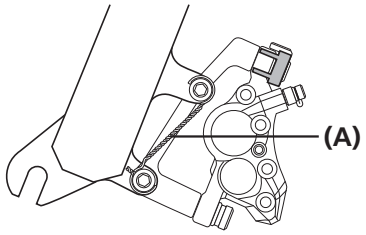
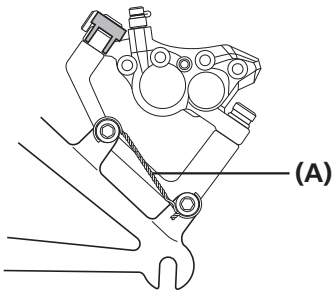
Either a cap method or a wiring method can be used to stop the bolts from falling out.
Use whichever method is suitable for the front fork and frame.

Cap method

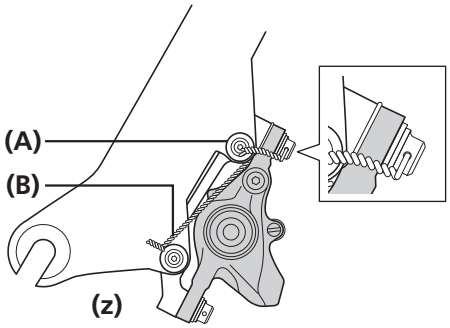
Front	Rear
	
Post type 	

(A) Cap

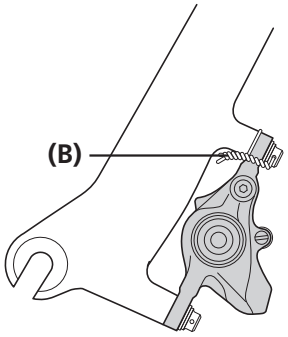
Wiring method

Front	Rear
	

(A) Wire



Post type



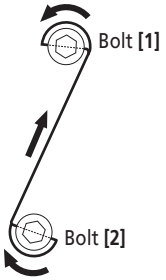
Secure the two bolts with a wire as shown in the illustration in order to prevent the bolts from coming loose.

(z) Wind a wire around the fixing bolt between the adapter and the frame as shown in the illustration.

(A) Bolt
(B) Wire

TECH TIPS

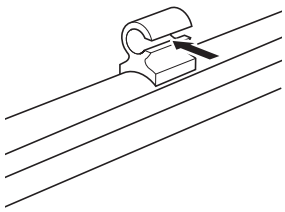
If bolt **[1]** loosens (turns counterclockwise), force is applied via the wire to turn bolt **[2]** in the tightening direction (clockwise). However, bolt **[2]** cannot turn any further in the tightening direction.
Accordingly, this prevents bolt **[1]** from turning in the loosening direction because 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.



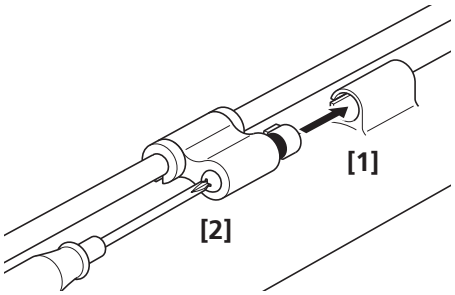
Securing the cable

1

C-shaped guide



Usual type of cable stopper



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.

Tightening torque
0.3 - 0.5 N·m

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

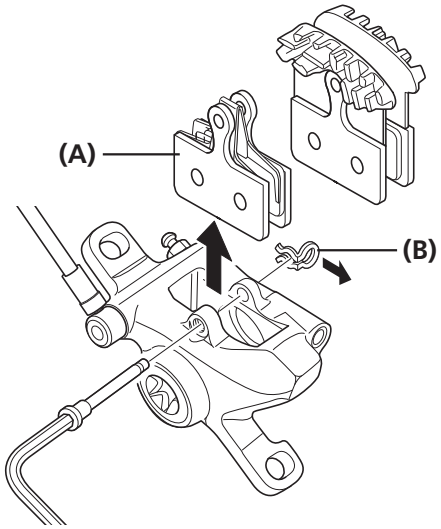
NOTICE

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.

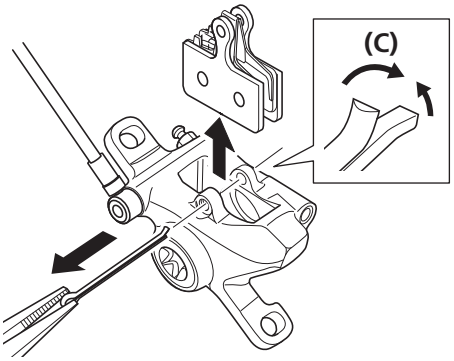
TECH TIPS

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

1



For split pin



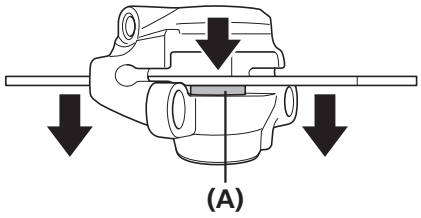
Remove the wheel from the frame, and remove the brake pads as shown in the illustration.

(A) Brake pad
(B) Snap ring
(C) Split pin

2 Clean the pistons and surrounding area.

To be continued on next page

3



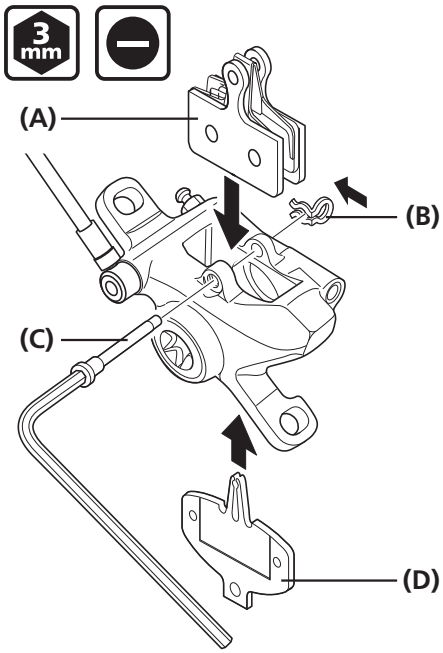
Use a flat-shaped tool to push the pistons straight back in as far as they will go, while being careful not to twist the pistons.

(A) Piston

NOTICE

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).

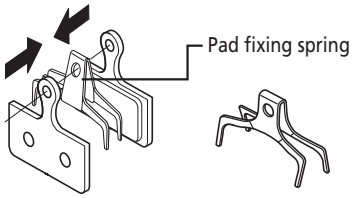
At this point, make sure to install the snap ring as well.

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

Tightening torque	
3 mm	2 - 4 N·m

TECH TIPS

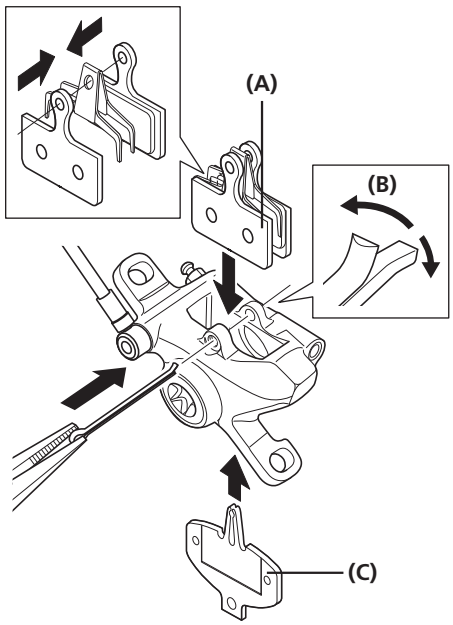
Install the pad fixing spring as shown in the illustration. (There are left (L) and right (R) marks on the spring.)



To be continued on next page

For split pin types

4



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).

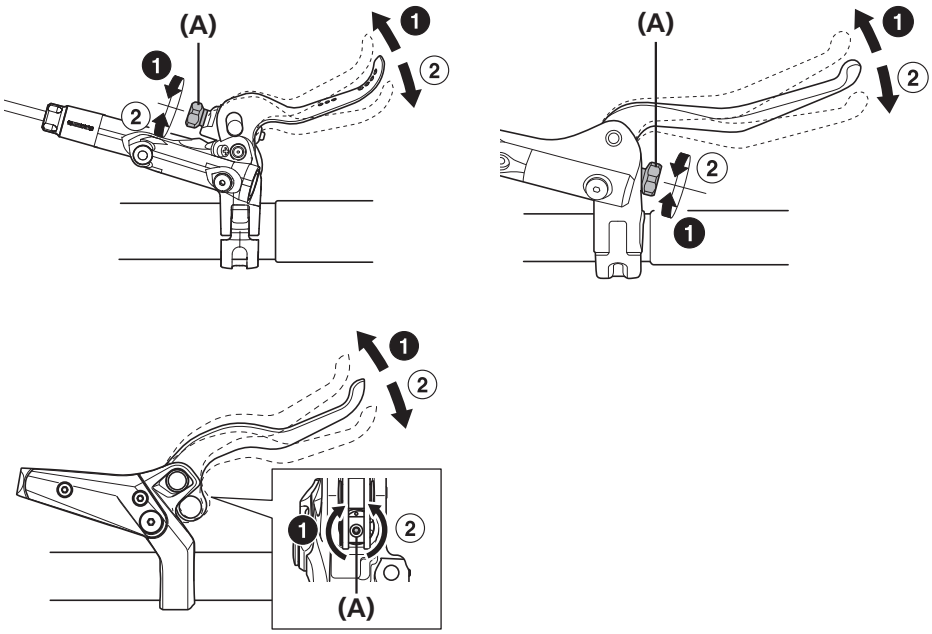
4 Depress the brake lever as far as it will go, and then operate it several more times so that the two pistons move to their initial positions.

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

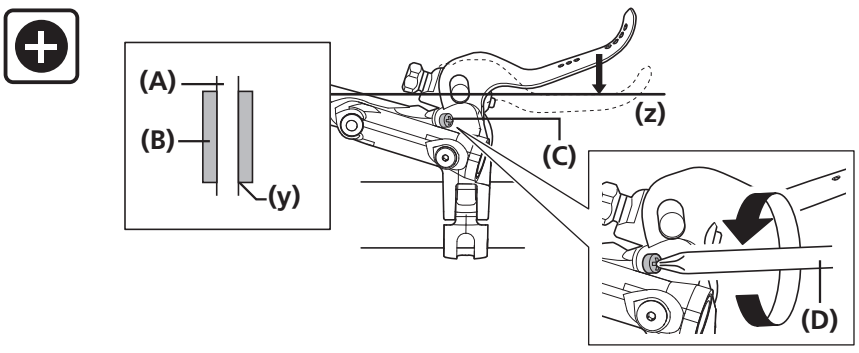
Tighten the adjust bolt (clockwise) to increase the stroke, and loosen it (counterclockwise) to decrease the stroke.



(A) Reach adjustment bolt

■ 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.



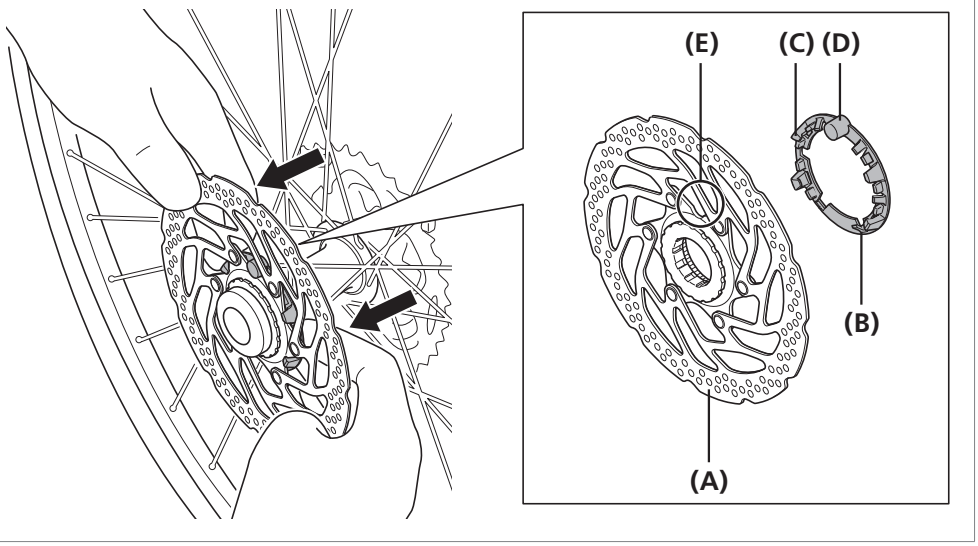
(y) Contact
(z) Pad contact point

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

■ Installation of the magnet holder

If the magnet holder included with the disc brake rotor is separated, re-install it.

Insert the magnet holder's claw into the disc brake rotor and install it.
Align the cylinder part of the magnet holder with the one recessed area of the disc brake rotor and then install the magnet holder.



⚠ WARNING

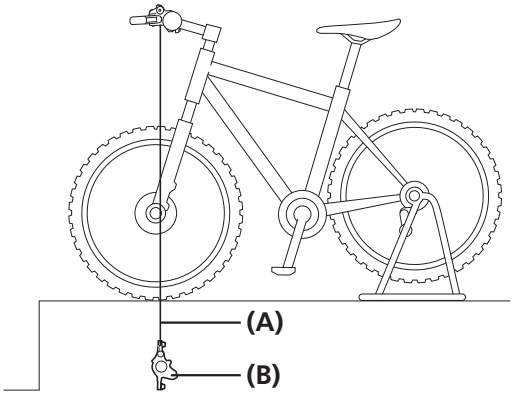
The calipers and disc brake rotor will become hot when the brakes are operated; do not touch them while riding or immediately after dismounting from the bicycle. Otherwise, you may get burned. Check that the calipers and disc brake rotor have cooled down sufficiently before attempting to re-install the magnet holder.

(A) Disc brake rotor
(B) Magnet holder
(C) Claw
(D) Cylinder part
(E) Recessed area

■ 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 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



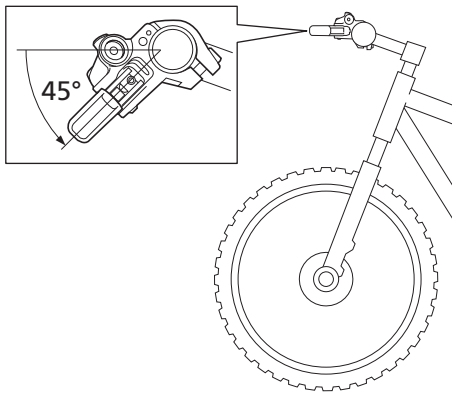
With the spacer for bleeding (yellow) still attached to the calipers, place the bicycle into a bicycle stand, or the like, as shown in the illustration.

(A) Hose
(B) Caliper

NOTICE

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

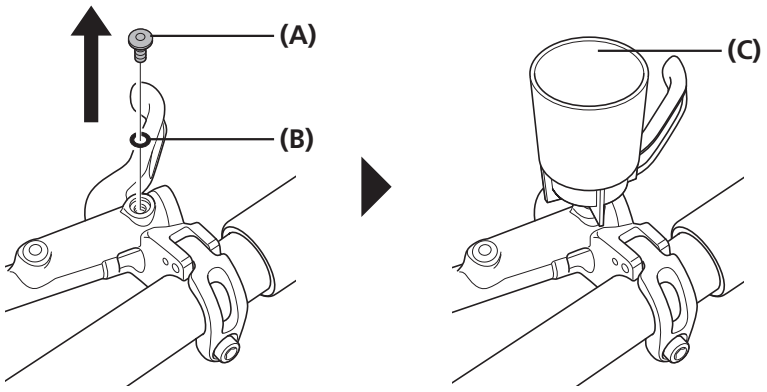
1



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

2

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



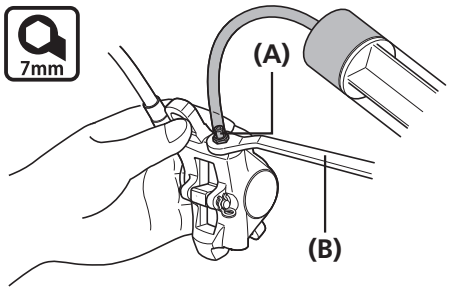
(A) Bleed screw
(B) O-ring
(C) Oil funnel

TECH TIPS

Do not insert the oil stopper at this time.

To be continued on next page

3



Set a 7 mm 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) 7 mm socket wrench

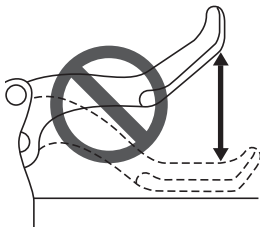
4

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

NOTICE

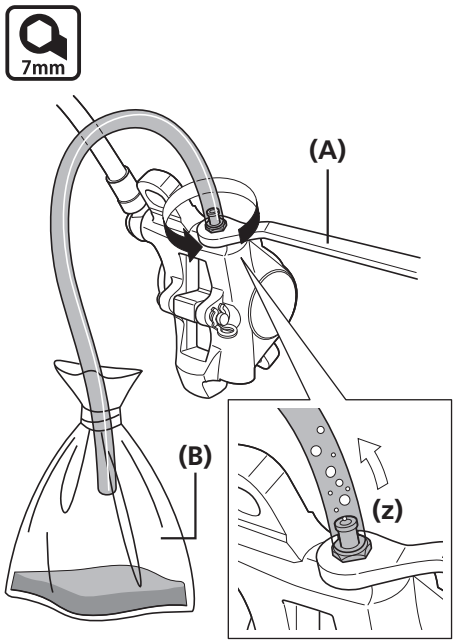
Secure the brake caliper in a vise to prevent the tube from being accidentally disconnected.
Do not depress and release the lever repeatedly.

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.)



To be continued on next page

5



Set a 7 mm 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.

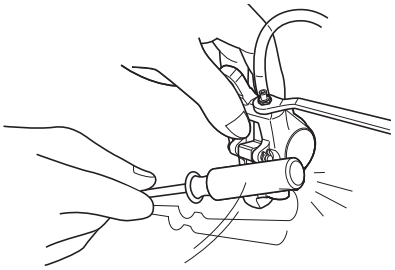
This way it will be possible to easily extract the greater part of the air bubbles remaining inside the brake system.

(z) Air bubbles

(A) 7 mm socket wrench
(B) Bag

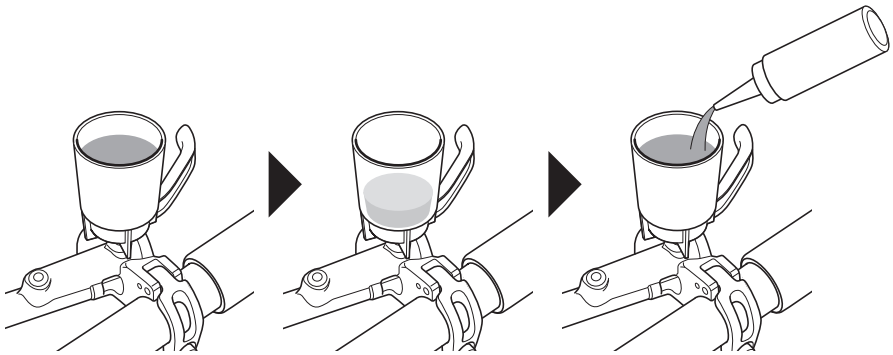
TECH TIPS

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.

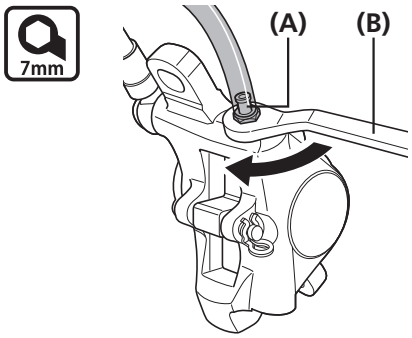


6

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

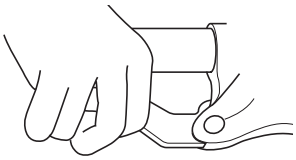


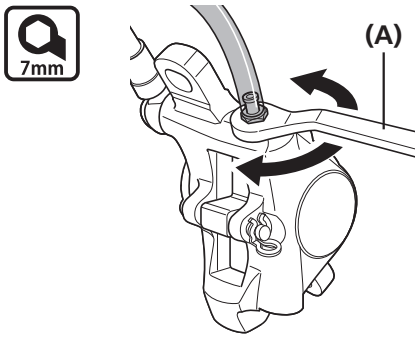
Once no more air bubbles come from the bleed nipple, temporarily close the bleed nipple.

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

To be continued on next page

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) 7 mm socket wrench

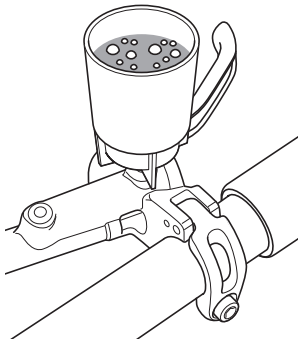
Tightening torque	
7mm	4 - 6 N·m

9

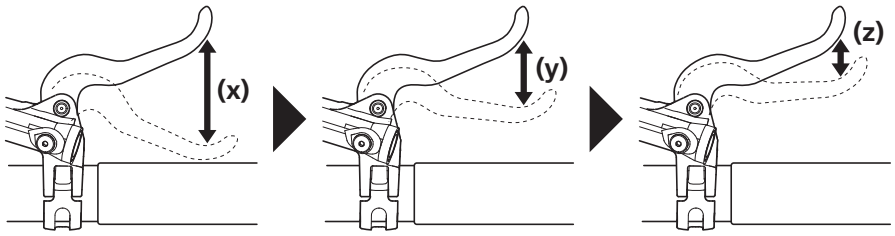
If the brake lever is then operated, air bubbles in the system will rise up through the port into the oil funnel.

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



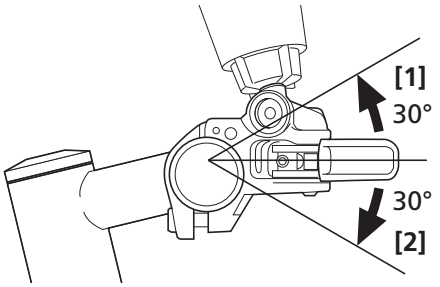
(x) Loose
(y) Slightly stiff
(z) Stiff

NOTICE

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

To be continued on next page

10

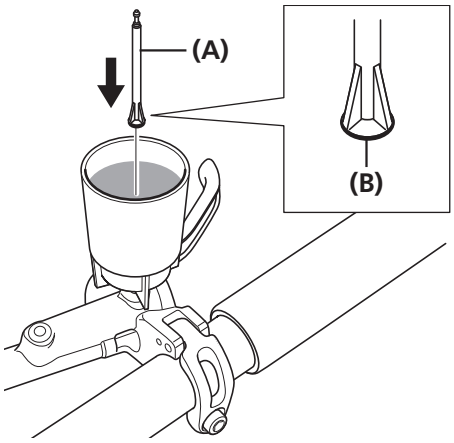


Set the lever unit to the horizontal position as shown in the illustration and tilt it in the direction of **[1]** by 30°, and then carry out step 9 to check that there is no air remaining.

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.

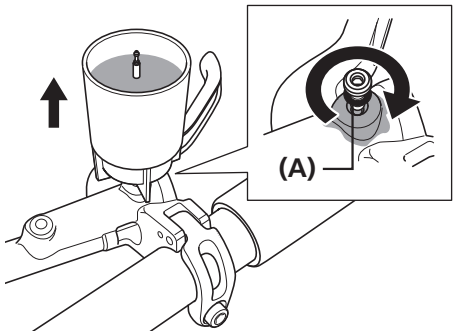
11



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.

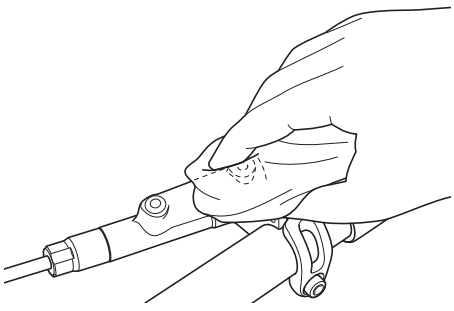
(A) O-ring

Tightening torque
0.3 - 0.5 N·m

NOTICE

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

13

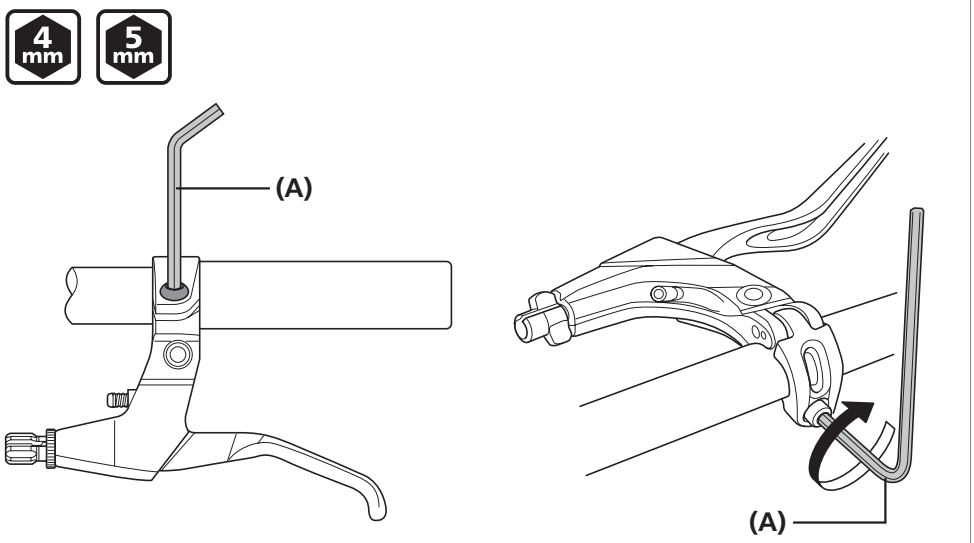


Wipe away any oil that has overflowed.

INSTALLATION (V-BRAKE BRAKES)

■ Installation of the brake lever

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



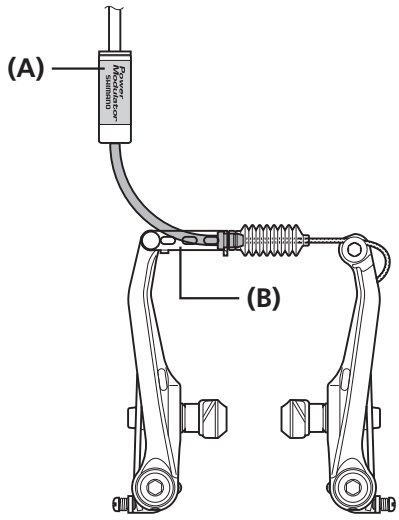
(A) 4 mm hexagon wrench/
5 mm hexagon wrench

Tightening torque	
4 mm 5 mm	6 - 8 N·m

NOTICE

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



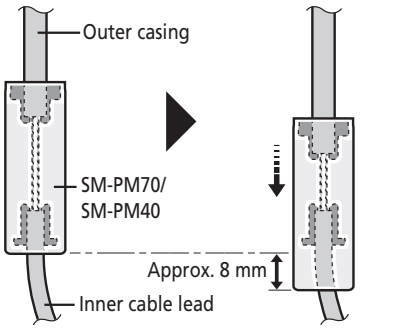
Install the power modulator to the V-BRAKE brake as shown in the illustration.

(A) Power modulator
(B) V-BRAKE brake

NOTICE

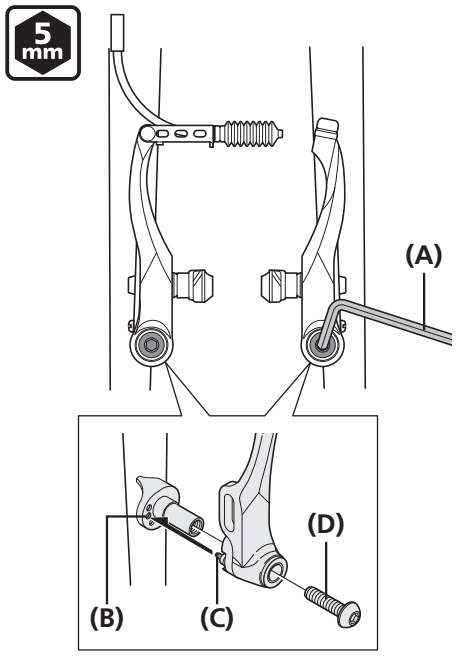
When the brakes are applied, the power modulator will move about 8 mm toward the inner cable lead; make sure that there is enough excess length in the outer casing for that.

When brakes are applied



■ Installation of V-BRAKE brakes

1



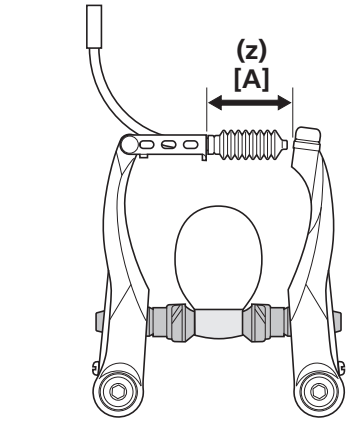
Insert the stopper pin of the brake caliper into the center spring hole in the frame mounting boss, and then secure the brake caliper to the frame with the link fixing bolt.

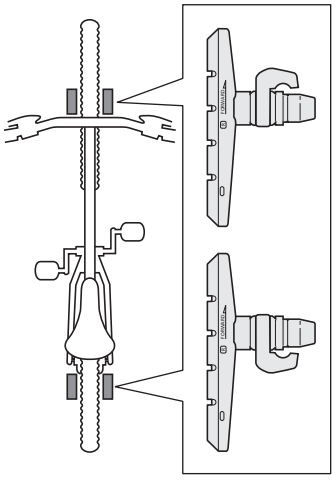
(A) 5 mm hexagon wrench
(B) Spring hole
(C) Stopper pin
(D) Link fixing bolt

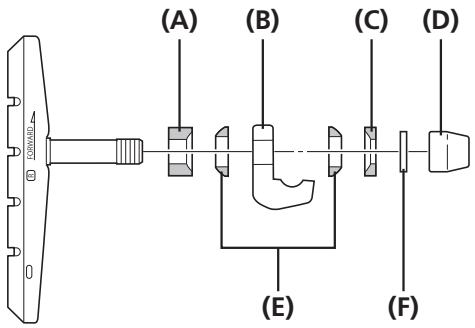
Tightening torque	
5 mm	5 - 7 N·m

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 32 mm or more.





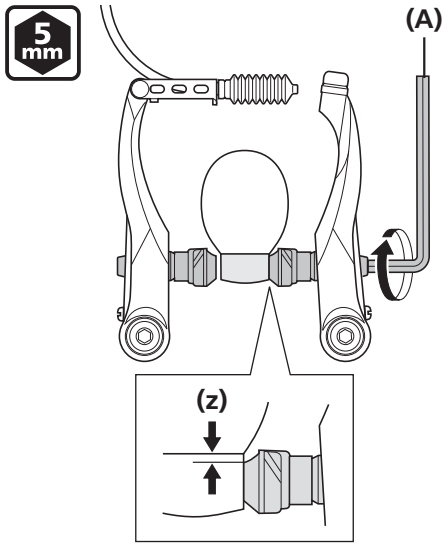


(z) 32 mm or more

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

To be continued on next page

3



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

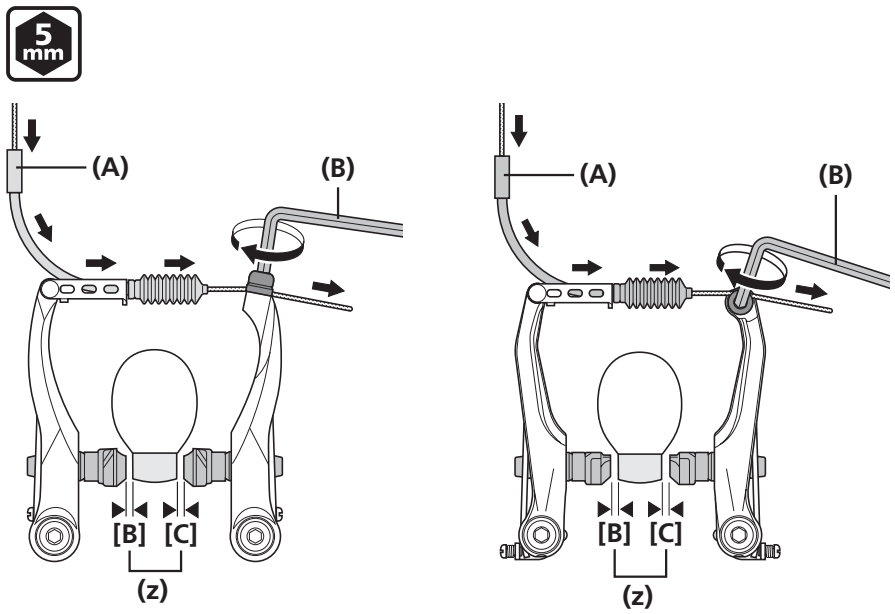
(z) 1 mm

(A) 5 mm hexagon wrench

Tightening torque	
5 mm	6 - 8 N·m

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 2 mm, tighten the cable fixing bolt.



(z) [B] + [C] = 2 mm

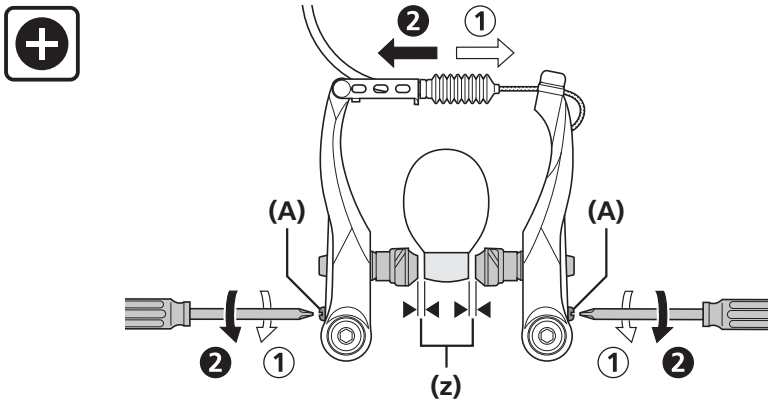
(A) Inner cable lead
(B) 5 mm hexagon wrench

Tightening torque	
5 mm	6 - 8 N·m

To be continued on next page

5

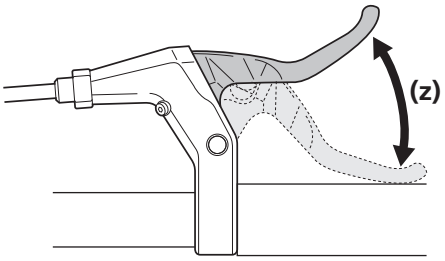
Adjust the balance with the spring adjustment bolts.



(z) 1 mm

(A) Spring adjustment bolt

6



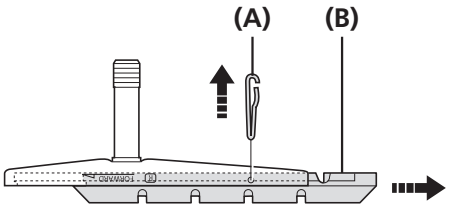
Depress the brake lever about 10 times until it touches the grip and check that everything is operating correctly and that the shoe clearance is correct before using the brakes.

(z) 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.

(A) Shoe fixing pin
(B) Shoe

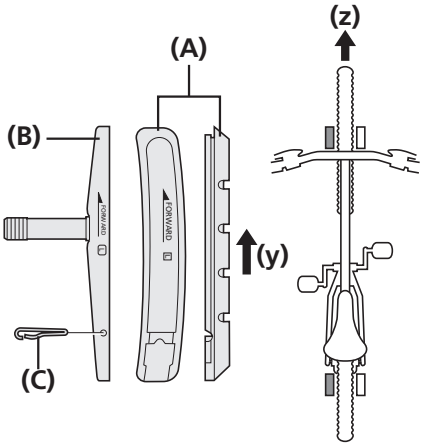
2

There are two different types of shoes and shoe holders for the left and right positions respectively.

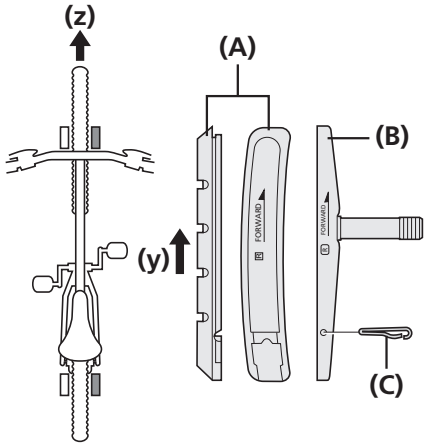
Slide the new shoes into the grooves on the shoe holders while taking note of the correct directions and pin hole positions.

Insert the shoe fixing pins.

For left (same for front and rear)



For right (same for front and rear)



(y) Shoe insertion direction
(z) Front

(A) Shoe
(B) Shoe holder
(C) Shoe fixing pin

NOTICE

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

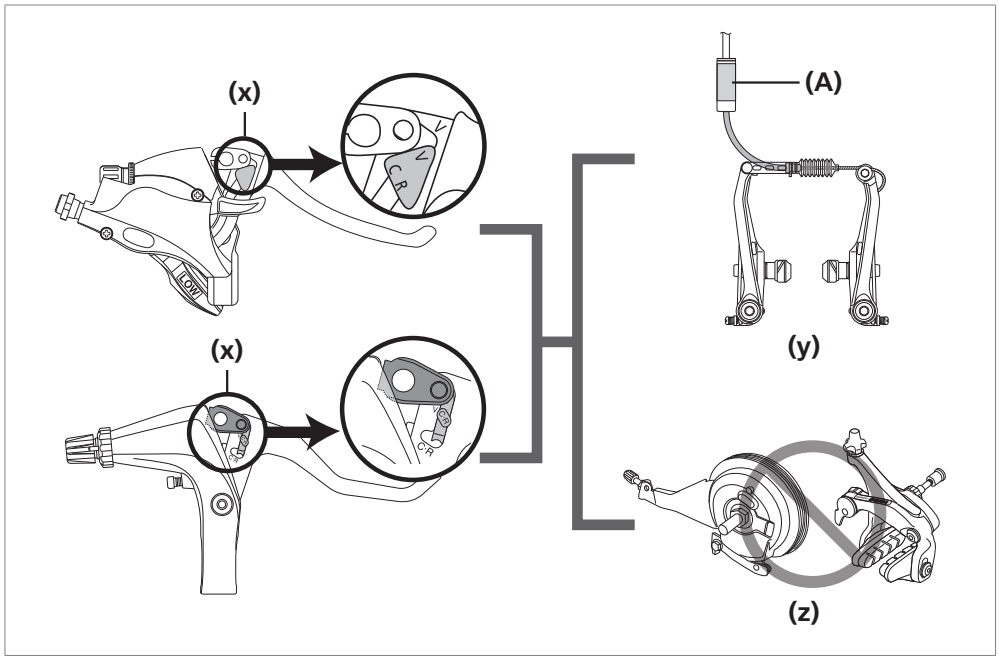
BRAKE LEVER WITH SWITCH INTERCHANGEABILITY (V-BRAKE AND HUB ROLLER BRAKES)

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



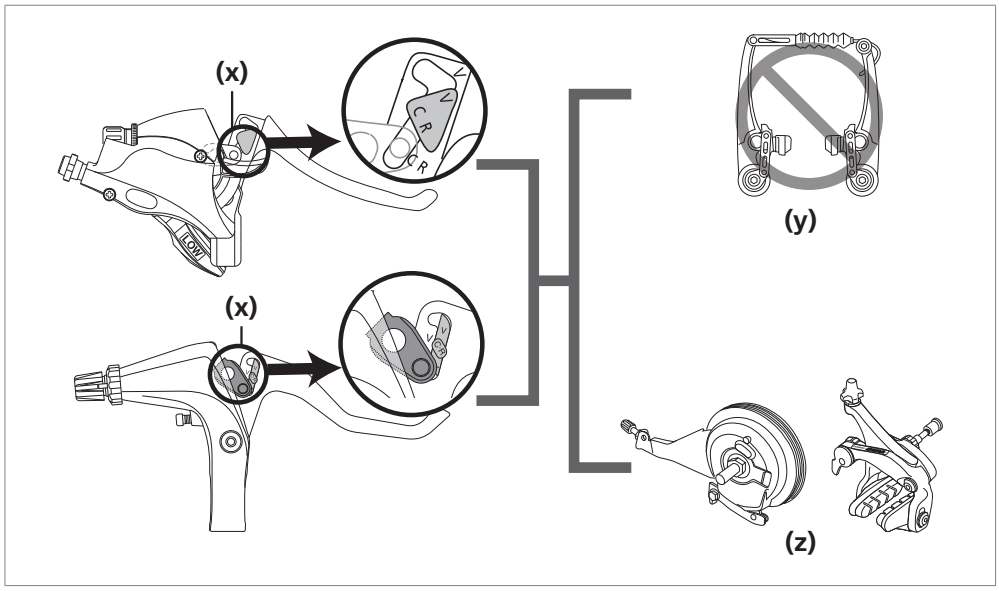
(x) V-position

(y) V-BRAKE brakes with power modulator

(z) Roller brake/Caliper brakes

(A) Power modulator

■ For Caliper brake/Roller brake



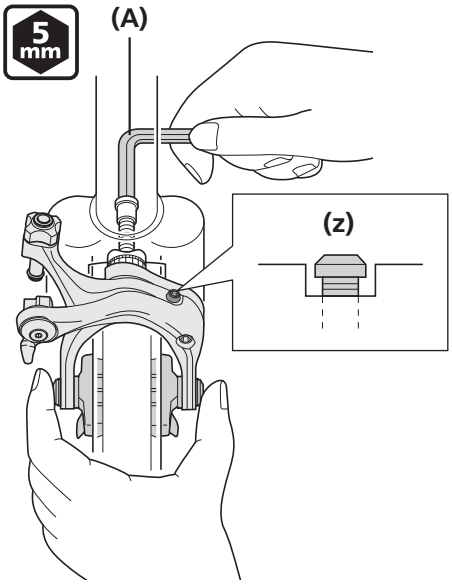
(x) Caliper/Roller (CR) brake position

(y) V-BRAKE brakes

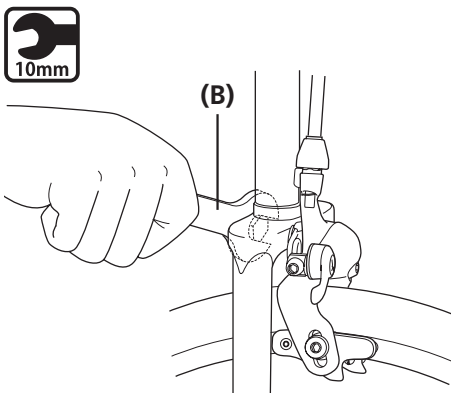
(z) Roller brake/Caliper brakes

INSTALLATION (DUAL PIVOT CALIPER BRAKES)

1



For nut type



Install the brake caliper.

Compress the arch and set while the shoe is in firm contact with the rim.

(z) The usual position during installation is when the head of the centering adjustment bolt is as shown in the illustration.

(A) 5 mm hexagon wrench
(B) 10 mm spanner

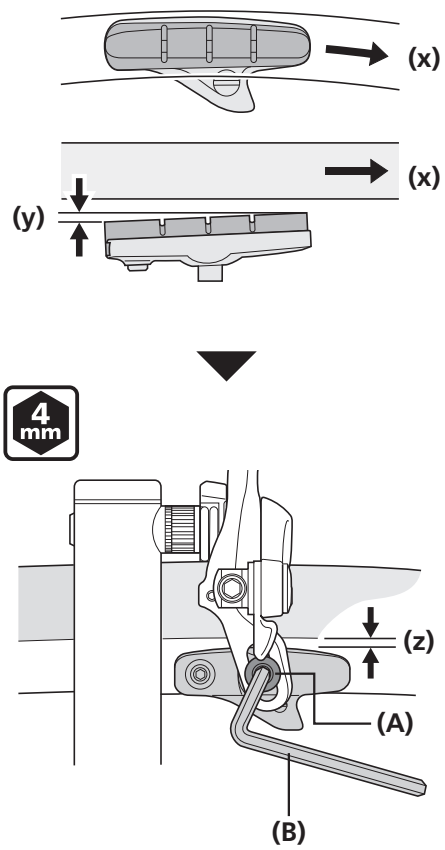
Tightening torque	
5 mm 10mm	8 - 1 0 N·m

NOTICE

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

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2



Adjust the brake shoe position and then secure in place the brake shoe.

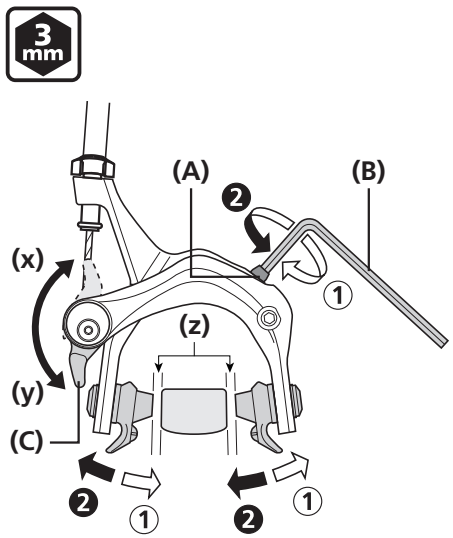
After adjusting the brake shoe position so that the shoe surface and the rim surface are as shown in the illustration, tighten the shoe fixing bolt.

(x) Direction of rim rotation
(y) Toe-in 0.5 mm
(z) 1 mm or more

(A) Shoe fixing bolt
(B) 4 mm hexagon wrench

Tightening torque	
4 mm	5 - 7 N·m

3

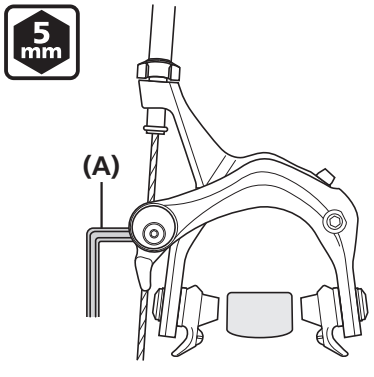


Move the quick release lever to the closed position and adjust shoe clearance as shown in the illustration.

(x) Open
(y) Close
(z) 1.5 – 2 mm
(Adjust so that the shoe clearances on the left and right are the same)

(A) Centering adjustment bolt
(B) 3 mm hexagon wrench
(C) Quick release lever

4



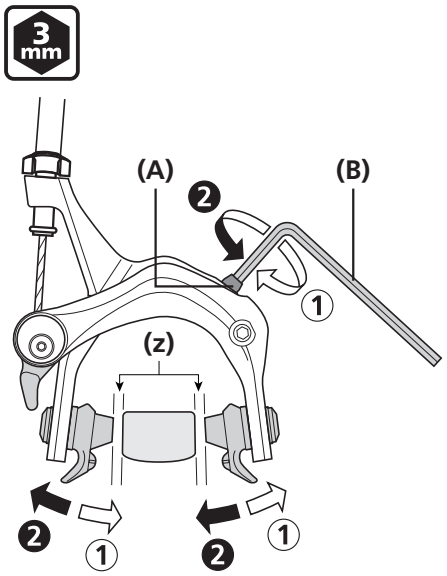
Secure the brake cable.

(A) 5 mm hexagon wrench

Tightening torque	
5 mm	6 - 8 N·m

To be continued on next page

5

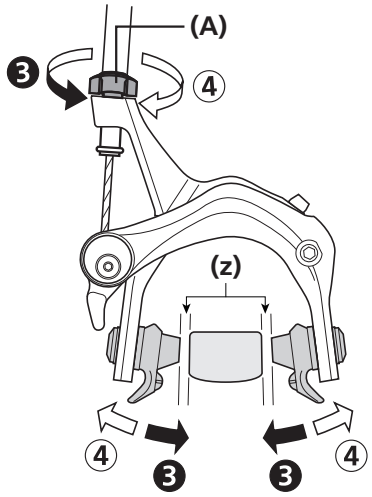


Fine adjust the centering of the brake shoe using the centering adjustment bolt.

(z) 1.5 – 2 mm
(Adjust so that the shoe clearances on the left and right are the same)

(A) Centering adjustment bolt
(B) 3 mm hexagon wrench

6



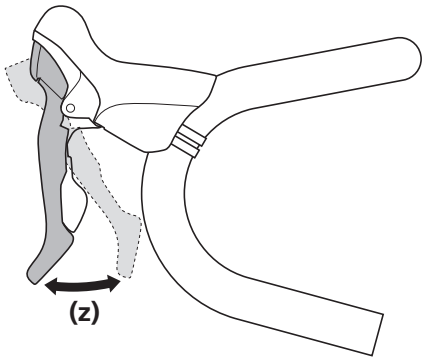
Readjust shoe clearance.

Turn the cable adjustment nut to readjust shoe clearance.

(z) 1.5 – 2 mm
(Adjust so that the shoe clearances on the left and right are the same)

(A) Cable adjustment nut

7



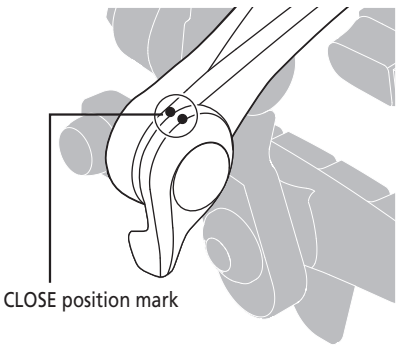
Check the brakes.

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.

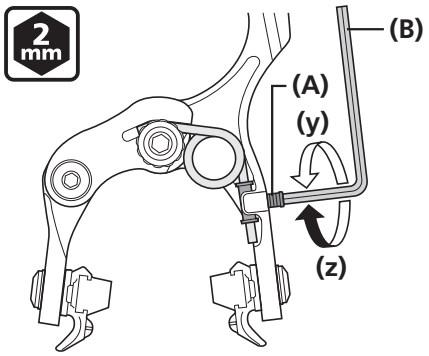
(z) Depress about 10 times

TECH TIPS

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



■ Arch spring tension adjustment



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

(y) Reduce spring force

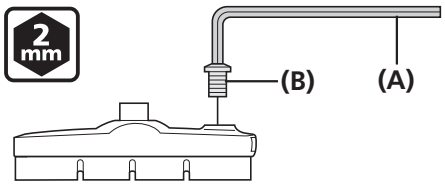
(z) Increase spring force

(A) Spring adjustment bolt
(B) 2 mm hexagon wrench

MAINTENANCE (DUAL PIVOT CALIPER BRAKES)

■ Replacement of the cartridge shoe

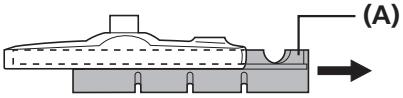
1



Remove the mounting bolt.

(A) 2 mm hexagon wrench
(B) Mounting bolt

2



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

(A) Shoe

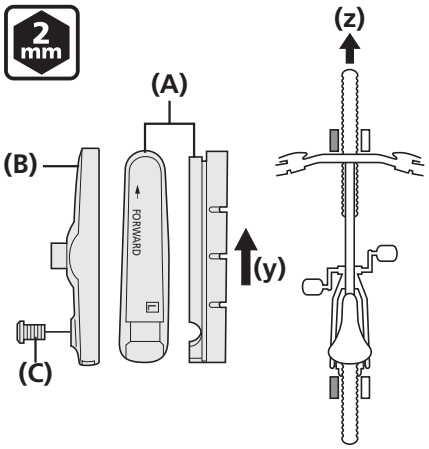
3

There are two different types of shoes and shoe holders for the left and right positions respectively.

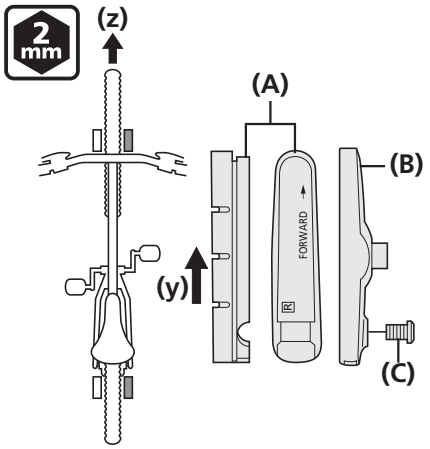
Slide the new shoes into the grooves on the shoe holders while taking note of the correct directions and bolt hole positions.

Tighten the mounting bolt.

For left (same for front and rear)



For right (same for front and rear)



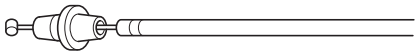
(y) Shoe insertion direction
(z) Front

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

Tightening torque	
2 mm	1 - 1.5 N·m

SPECIFICATIONS (CANTILEVER BRAKES)

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 brakes

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	22.2 mm

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)

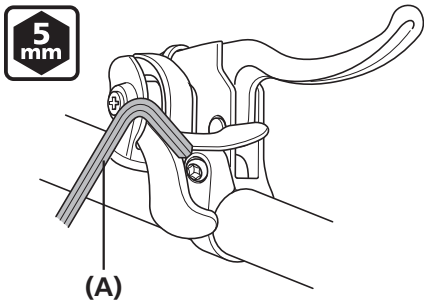
■ Installation of the brake lever

TECH TIPS

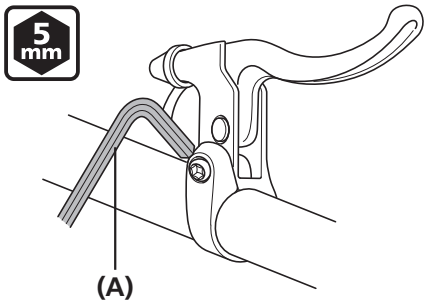
Use a handlebar grip with an outer diameter of Ø32 mm or less.

1 Install the brake lever.

ST-CT90/ST-CT95

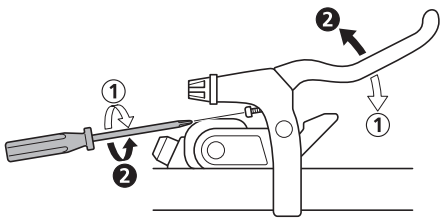


SB-CT90/SB-CT91



2 Connect the brake cable.

3



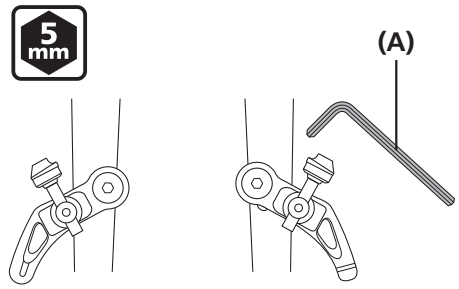
Adjust the lever stroke.
(only for ST-CT95)

(A) 5 mm hexagon wrench

Tightening torque	
5 mm	6 - 8 N·m

■ Installation of the brake caliper

1

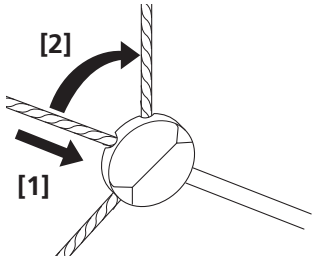


Install the brake caliper to the frame.

(A) 5 mm hexagon wrench

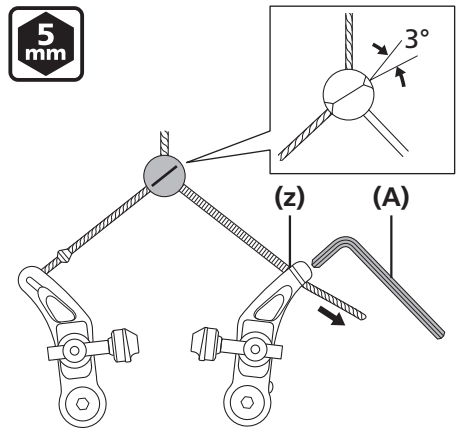
Tightening torque	
5 mm	5 - 7 N·m

2



Set the cable onto the cable carrier.

3



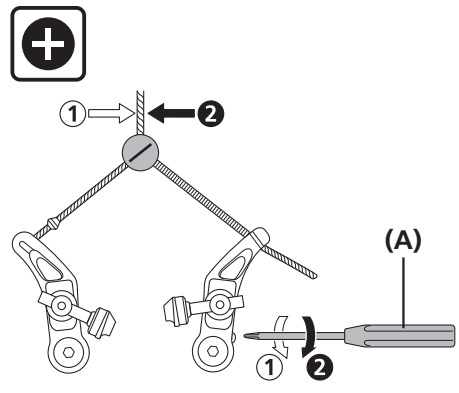
Temporarily tighten the cable so that the cable carrier is at the position in the illustration.

(z) Touching

(A) 5 mm hexagon wrench

Temporary tightening torque	
5 mm	0.5 - 1 N·m

4

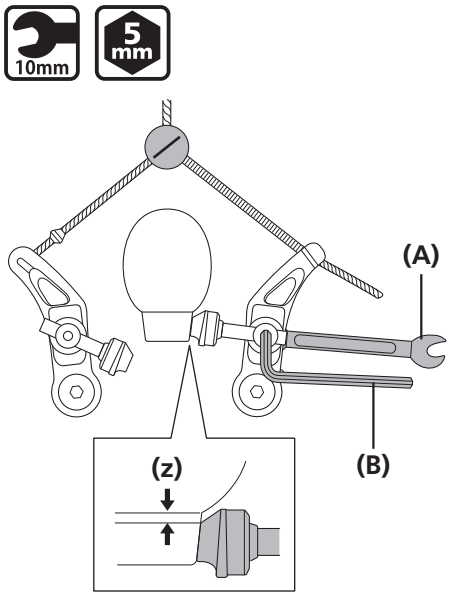


Turn the spring adjustment bolt so that the cable carrier comes to a position directly below the outer casing holder.

(A) Screwdriver

To be continued on next page

5



Secure one of the shoes at a time.

Adjustment of shoe clearance is not necessary at this time.

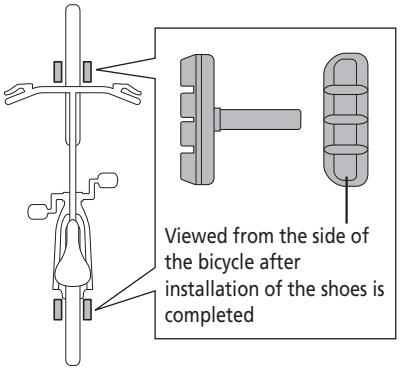
(z) 1 mm

(A) 10 mm spanner
(B) 5 mm hexagon wrench

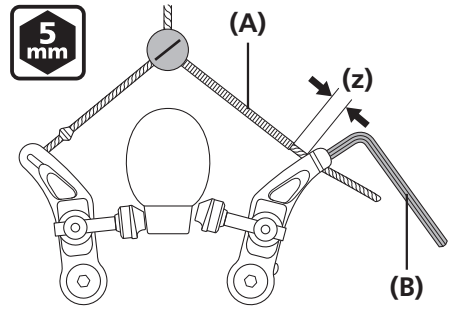
Tightening torque	
10mm / 5 mm	8 - 9 N·m

NOTICE

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



6



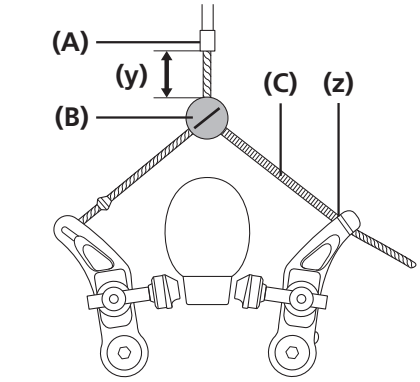
Loosen the cable fixing bolt, move the brake caliper so that the clearance of the flexible pipe is 2 – 3 mm, and then secure the inner cable.

(z) 2 – 3 mm

(A) Flexible pipe
(B) 5 mm hexagon wrench

Tightening torque	
5 mm	6 - 8 N·m

7



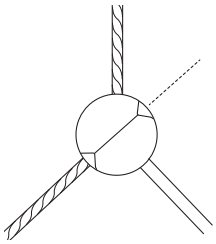
Adjust so that the flexible pipe touches the brake caliper.

(y) 20 mm or more
(z) Touches

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

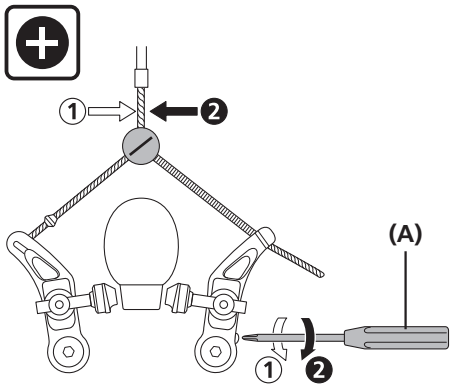
To be continued on next page

8



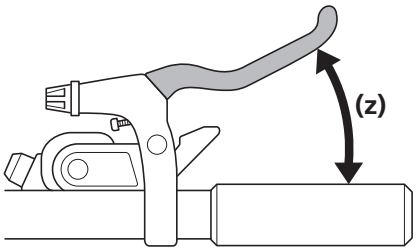
If the cable carrier is in the position in the illustration, then setting is complete.

9



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

10



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

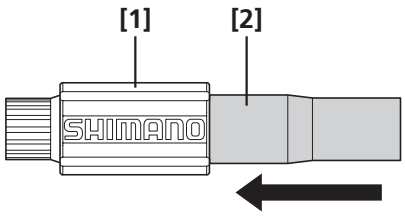
(z) Depress about 10 times

TECH TIPS

Check to be sure that there is a clearance of 20 mm 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.

(A) Screwdriver

■ Installing SM-CB70

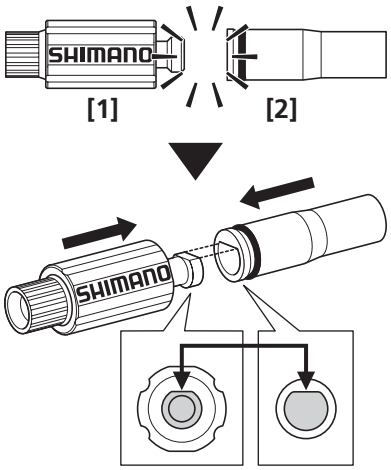


First, push **[2]** in the direction of the arrow as shown in the illustration, and then install to the cable.

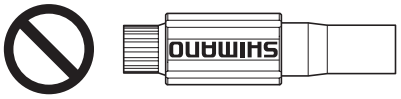
TECH TIPS

Recommended outer casing combination: SHIMANO SLR

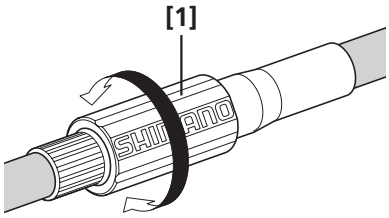
If **[1]** and **[2]** are separated



Make sure the **[1]** logo is facing the right way.



Adjustment method



Turn part **[1]** to adjust.

FRONT CHAINWHEEL

TO ENSURE SAFETY

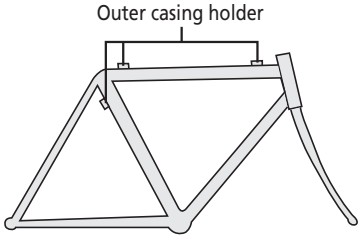
⚠ WARNING

"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 corrosions. 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.
- 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.

NOTICE

- If pedaling performance does not feel normal, contact your place of purchase.
- 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. 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 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 chainstay angle will vary depending on whether the bicycle is being ridden or not.
- When the bicycle is not being ridden and the chain is positioned on the largest chainring at the front and on the smallest sprocket at the rear, the chain may come into contact with the chain guide outer plate of the front derailleur.
- 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)

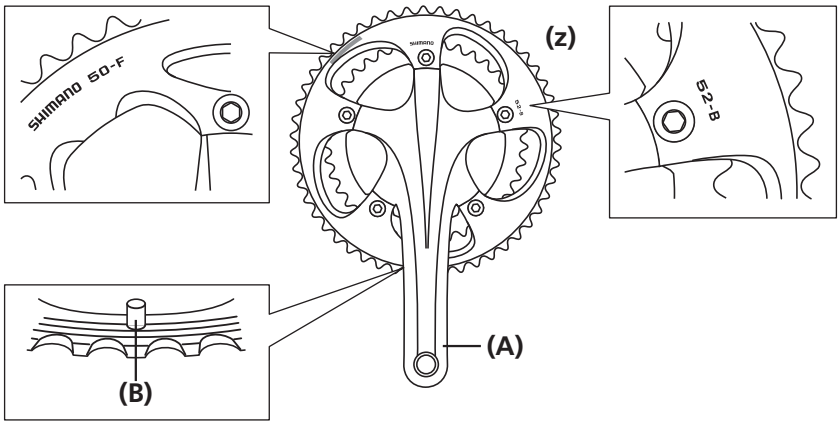
Smooth shifting will not be possible if the chainrings are incorrectly installed. Therefore, be sure to install the chainrings in the correct positions.

■ 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.



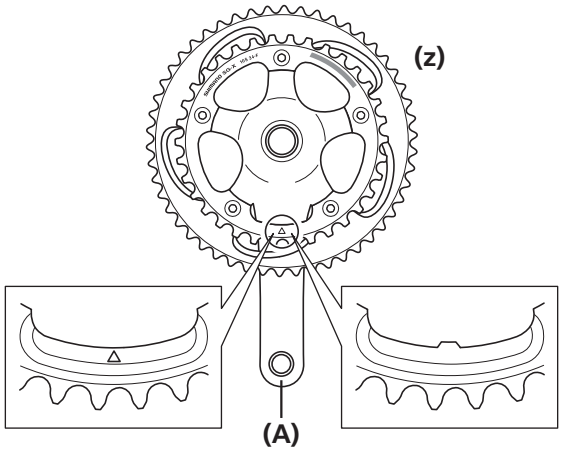
(z) Outer side

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

Tightening torque
12 - 14 N·m

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.

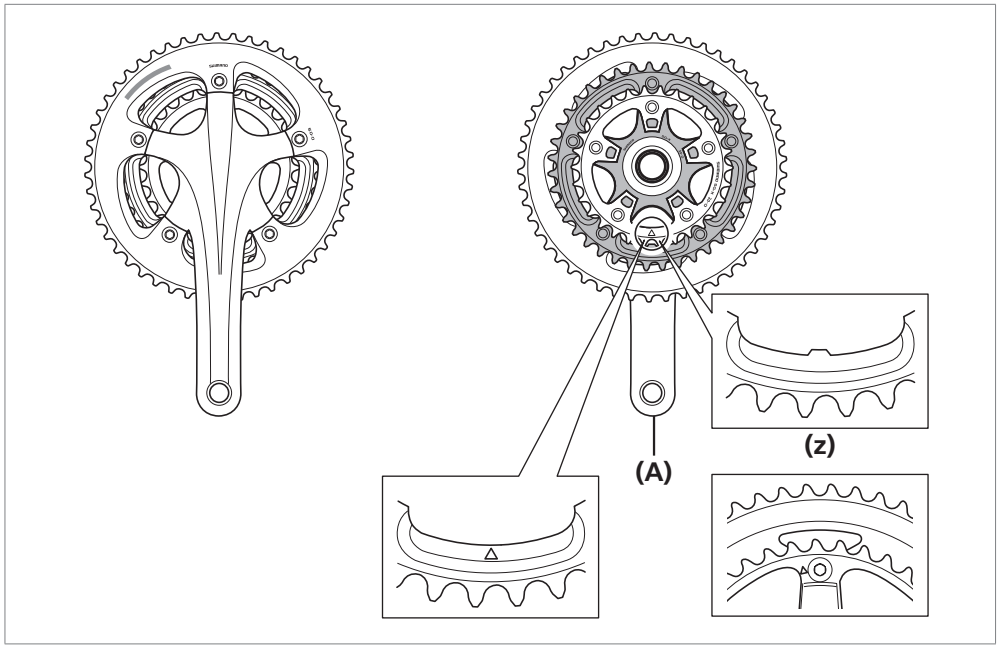


(z) Inner side

(A) Crank arm

Tightening torque
12 - 14 N·m

Triple chainwheel set



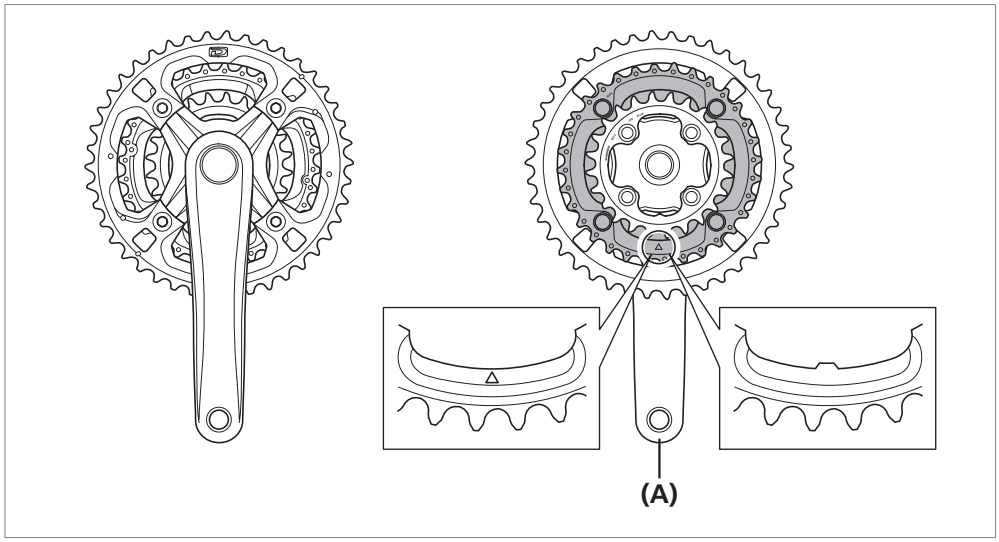
(z) FC-5703 (39T)

(A) Crank arm

Tightening torque
12 - 14 N·m

■ For MTB/Trekking

Triple chainwheel set



(A) Crank arm

Largest chainring/middle chainring

Tightening torque
14 - 16 N·m

Smallest chainring

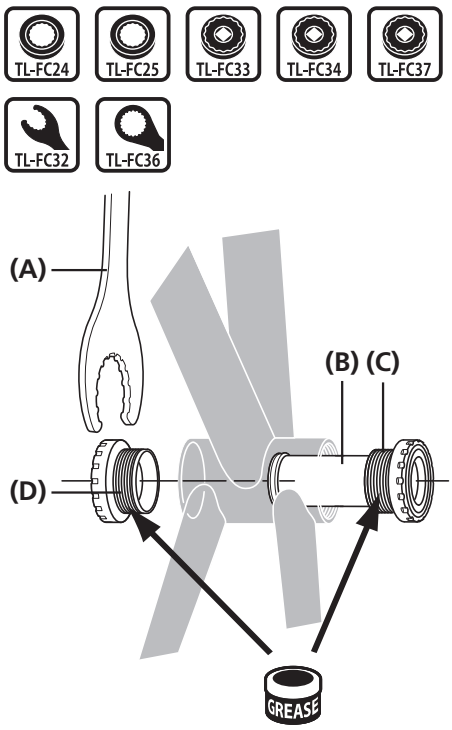
Tightening torque
16 - 17 N·m

INSTALLATION (FRONT CHAINWHEEL)

■ HOLLOWTECH II / 2 piece crankset

Installation of crank

1



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-FC24, TL-FC25, TL-FC33, TL-FC34, TL-FC37, TL-FC32, TL-FC36	35 - 50 N·m

NOTICE

- Tighten TL-FC24/TL-FC25 by combining with TL-FC32/TL-FC33/TL-FC36.
- TL-FC24/FC25 may become damaged and unusable after repeated use.

NOTICE

For MTB/Trekking

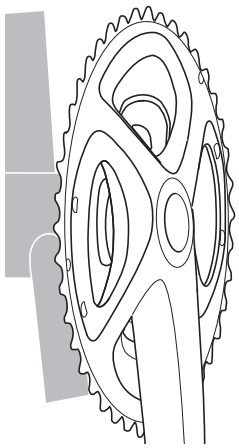
Spacers used vary according to the width of the bottom bracket shell. For details, refer to "Spacer installation method (For MTB/Trekking)".

TECH TIPS

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

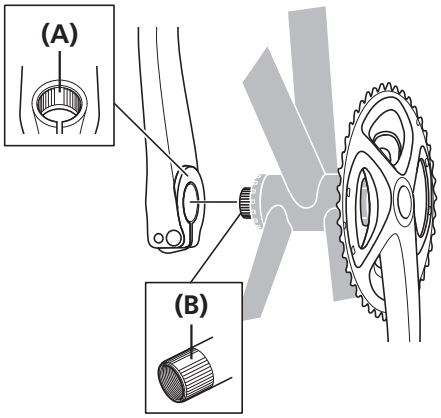
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2



Fully insert the right crank arm unit until it touches the bottom bracket.

3



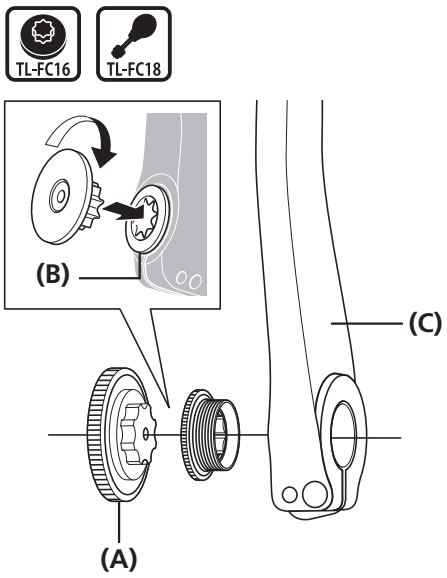
Set the wide groove area of the left crank arm into the axle of the right crank arm unit where the groove is wide.

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

NOTICE

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

4



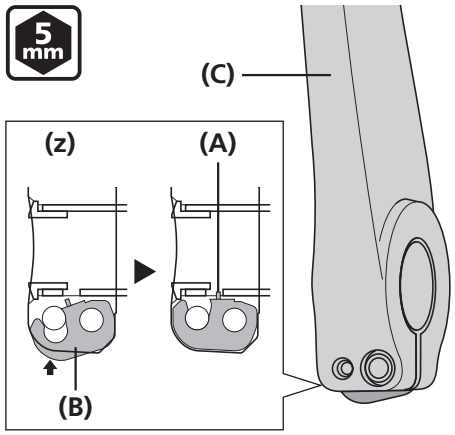
Use the Shimano original tool to tighten the cap.

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

Tightening torque	
TL-FC16 TL-FC18	0.7 - 1.5 N·m

To be continued on next page

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.

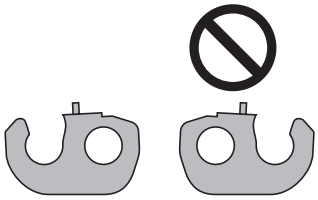
(z) The illustration is of the left crank arm (cross-section)

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

Tightening torque	
5 mm	12 - 14 N·m

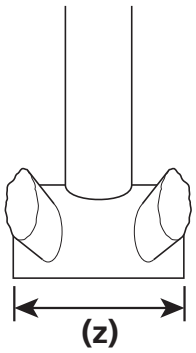
NOTICE

- 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



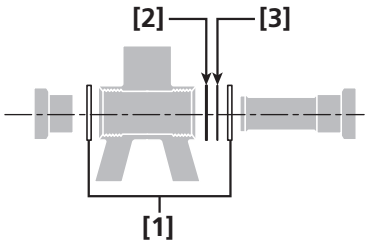
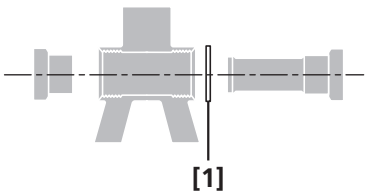
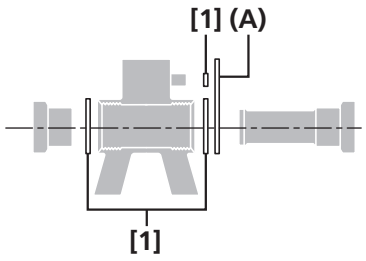
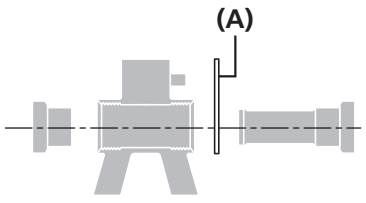
Check whether the width of the bottom bracket shell is 68 mm or 73 mm.

(z) Bottom bracket shell width

2

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

Normal type

	68 mm	73 mm
Band type		
Bracket type		

[1] 2.5 mm spacer
[2] 1.8 mm spacer
[3] 0.7 mm spacer

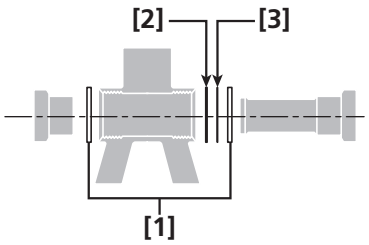
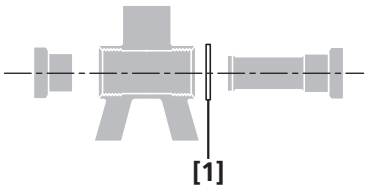
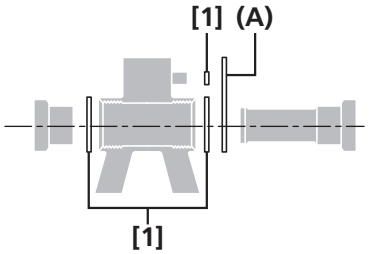
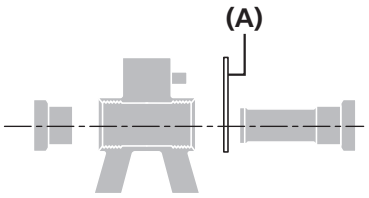
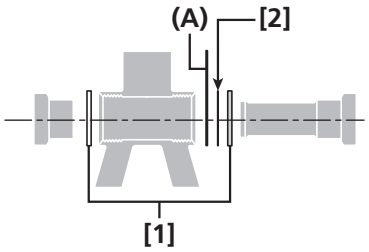
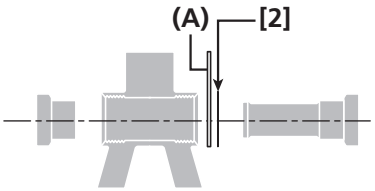
TECH TIPS

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

[1] 2.5 mm spacer

(A) BB mount-type bracket

Chain case specifications

	68 mm	73 mm
Band type		
Bracket type		
Chain case stay type		

[1] 2.5 mm spacer

[2] 1.8 mm spacer
* 1.8 mm corresponds to the thickness of the chain case.

[3] 0.7 mm spacer

TECH TIPS

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

[1] 2.5 mm spacer

(A) BB mount-type bracket

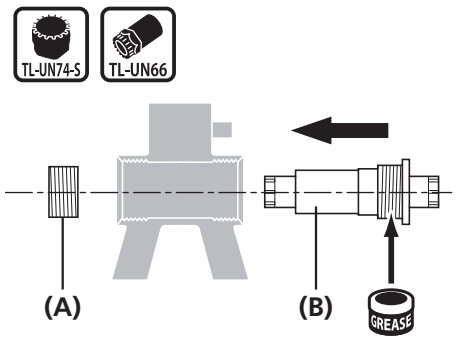
[1] 2.5 mm spacer

[2] 0.7 mm spacer

(A) Chain case stay

■ OCTALINK TYPE

Installation of the bottom bracket



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

NOTICE

If the adapter is made of aluminum or steel

Apply grease to the adapter.

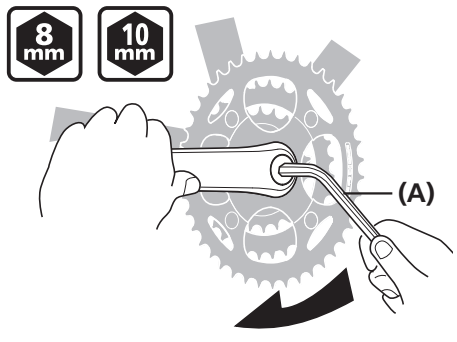


If the adapter is made of plastic

Do not apply grease to the adapter.



Installation of the front chainwheel



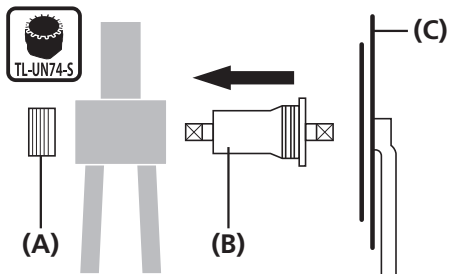
Use a hexagon wrench to install the front chainwheel.

(A) 8 mm hexagon wrench/
10 mm hexagon wrench

Tightening torque	
8 mm 10 mm	35 - 50 N·m

■ SQUARE TYPE

Installation of the bottom bracket



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

NOTICE

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

Apply grease to the main body and adapter.



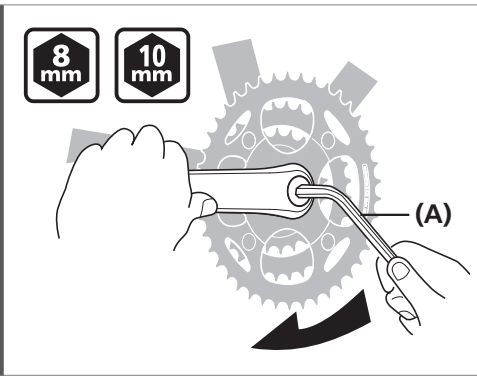
If the main body and adapter are made of plastic

Do not apply grease to the main body or adapter.



Installation of the front chainwheel

If using a hexagon wrench

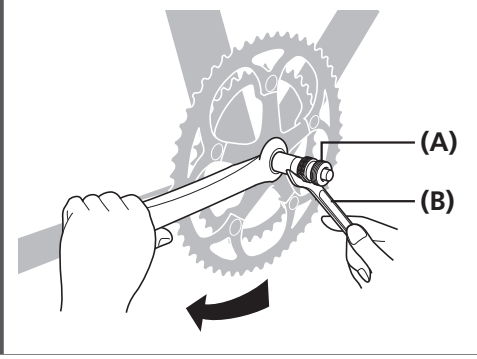


Use a hexagon wrench to install the front chainwheel.

(A) 8 mm hexagon wrench/ 10 mm hexagon wrench

Tightening torque	
8 mm 10 mm	35 - 50 N·m

If using a Shimano original tool



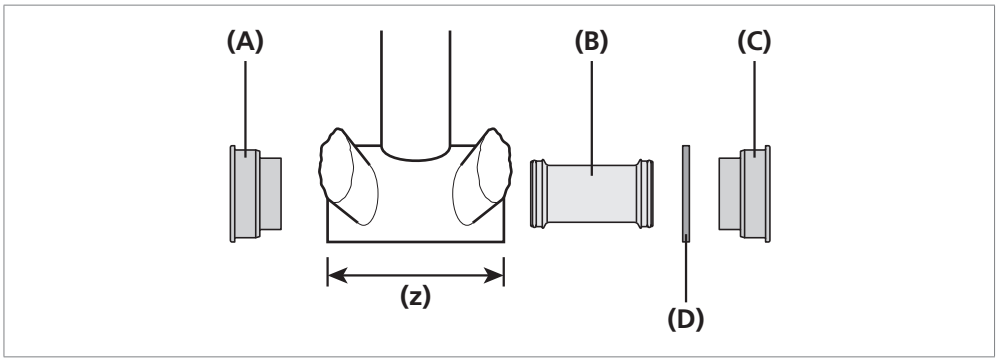
Use the Shimano original tool to install the front chainwheel.

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

Tightening torque	
TL-FC10 TL-FC11 15mm	35 - 50 N·m

INSTALLATION (PRESS-FIT BOTTOM BRACKET)

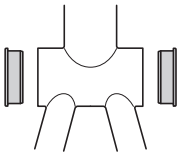
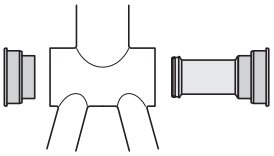
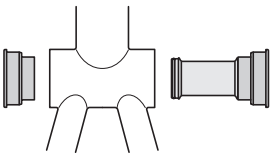
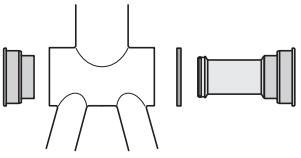
■ Adapter



(z) Bottom bracket shell width

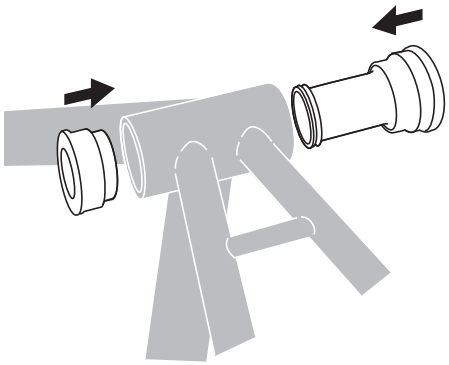
(A) Left hand adapter
(B) Inner cover
(C) Right hand adapter
(D) 2.5 mm spacer

■ Assembly example

<table>
<tr><th colspan="2">Adapter type</th><th>ROAD</th><th>MTB</th></tr>
<tr><td>Inner cover cannot be installed</td><td>If the frame has no openings inside the bottom bracket shell, it can be installed without the inner cover sleeve.</td><td>• Use for a bottom bracket shell width of 86.5 mm.
</td><td>-</td></tr>
<tr><td rowspan="2">Inner cover can be installed</td><td rowspan="2">If the frame has openings inside the bottom bracket shell, it should be installed with the inner cover sleeve to prevent possible contamination.</td><td rowspan="2">• Use for a bottom bracket shell width of 86.5 mm. The 2.5 mm spacer is not necessary.
• Use the inner cover.
</td><td>• The 2.5 mm spacer is not needed for a bottom bracket shell width of 92 mm.
• Use the inner cover.
</td></tr>
<tr><td>• For a bottom bracket shell width of 89.5 mm, insert the 2.5 mm spacer into the right hand side (between the frame and the right hand adapter).
• Use the inner cover.
</td></tr>
</table>

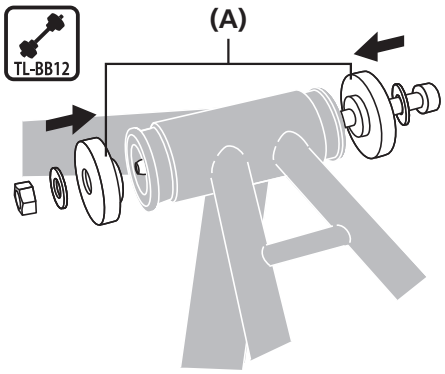
■ Installation

1



Insert the bottom bracket into the bottom bracket shell.

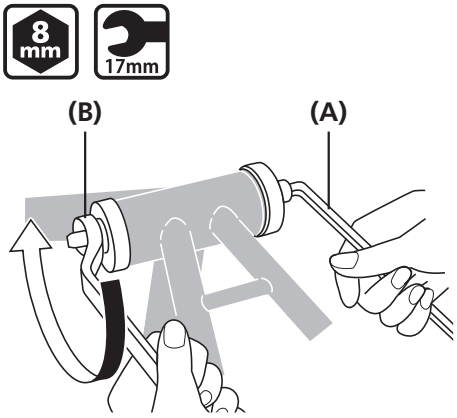
2



Insert the Shimano original tool into the bottom bracket.

(A) TL-BB12

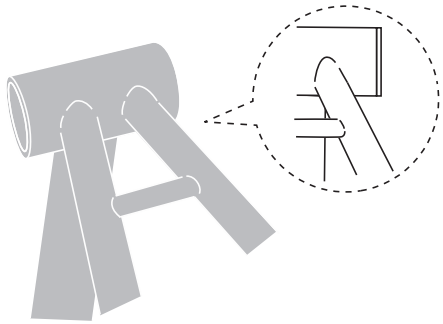
3



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) 8 mm hexagon wrench
(B) 17 mm spanner

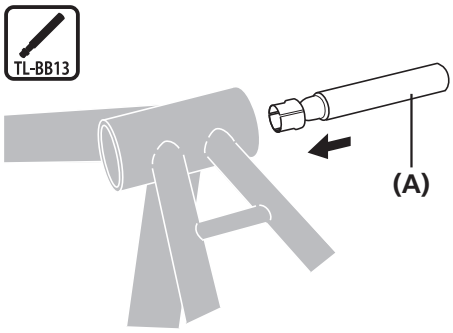
4



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

■ Removal

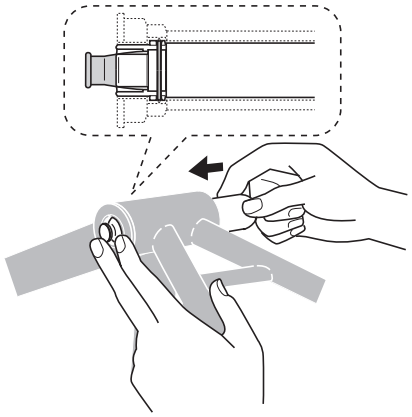
1



Insert the Shimano original tool into the bottom bracket.

(A) TL-BB13

2

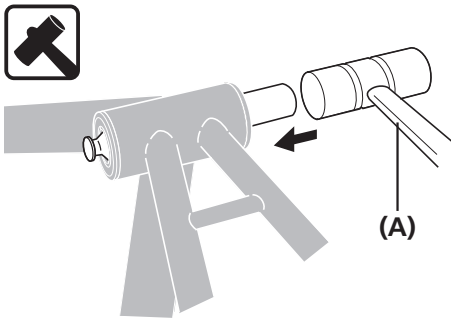


As shown in the illustration, hold down the flap with your fingers and push it in from the opposite side.
(When pushed in, the flap opens.)

TECH TIPS

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

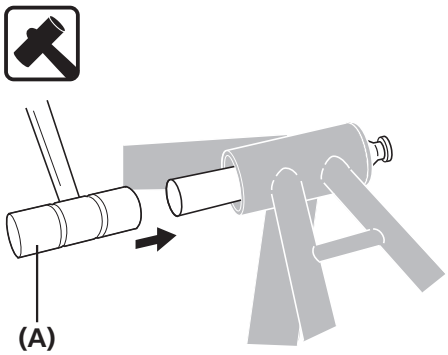
3



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

NOTICE

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.
- Reflectors have to be mounted to the bike at any time as soon as traveling on public roads. 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.

NOTICE

Be sure to also inform users of the following:

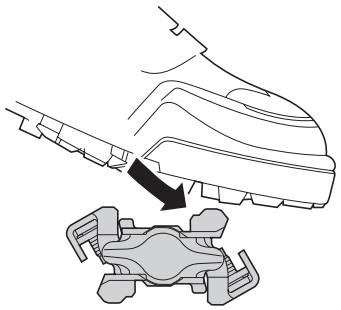
• Before riding the bicycle, check that there is no play or looseness between connecting parts.
• Check that there is no looseness in cleat or spacer before riding the bicycle.
• If pedaling performance does not feel normal, check the bicycle once more.
• If you experience any trouble with the rotating 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.
• 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.
• For maximum performance we highly recommend Shimano lubricants and maintenance products.

INSTALLATION (SPD PEDALS)

NOTICE

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



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

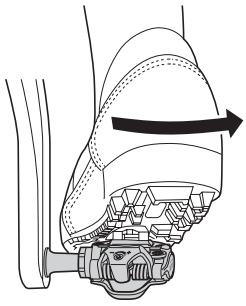
■ Releasing the cleats from the pedals

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. 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.

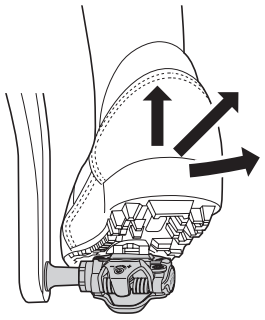
NOTICE

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. 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.

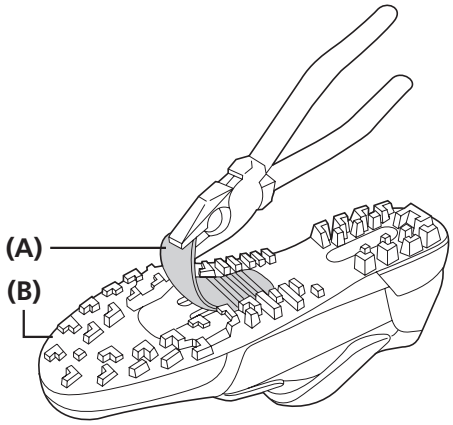
NOTICE

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



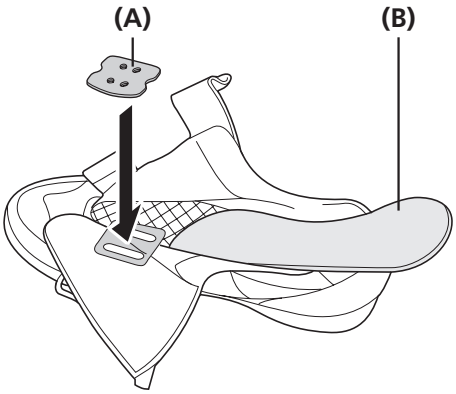
With a pair of pliers or a similar tool, pull off the rubber cover to expose the cleat mounting holes.

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

NOTICE

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

2



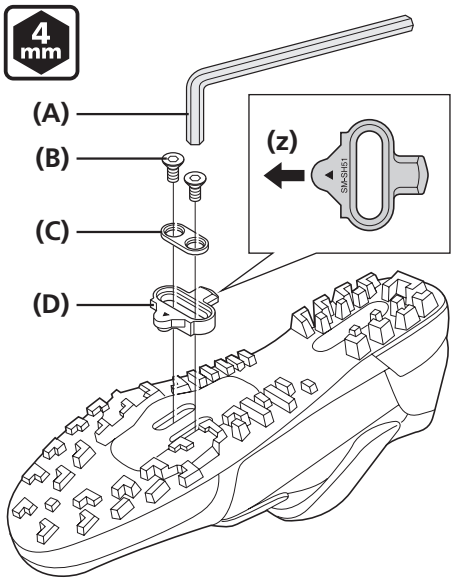
Remove the sockliner and position a cleat nut over the oval holes.

(A) Cleat nut
(B) Sockliner

NOTICE

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

3



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.

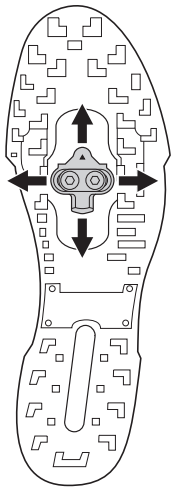
(z) Position the triangular portion of the cleat toward the front of the shoe.

(A) 4 mm hexagon wrench
(B) Cleat mounting bolt
(C) Cleat adapter
(D) Cleat

Provisional tightening torque for cleat mounting bolts	
4 mm	2.5 N·m

Adjustment of cleat position

1



The cleat has an adjustment range of 20 mm front to back and 5 mm right to left.

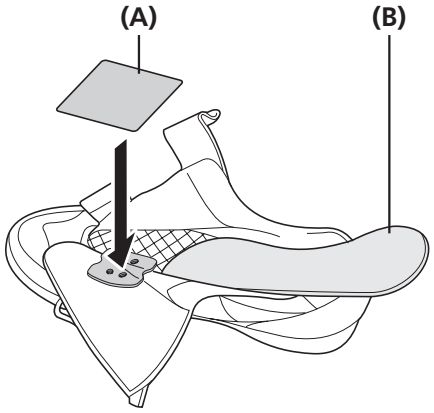
After temporarily fixing the cleats, adjust them by repeatedly engaging and releasing the cleats, one by one, to determine the optimal necessary cleat positions.

2

After you have determined the best cleat position, firmly tighten the cleat mounting bolts with a 4 mm hexagon wrench.

Tightening torque	
4 mm	5 - 6 N·m

Waterproof seal



Remove the sockliner and attach the waterproof seal.

(A) Waterproof seal
(B) Sockliner

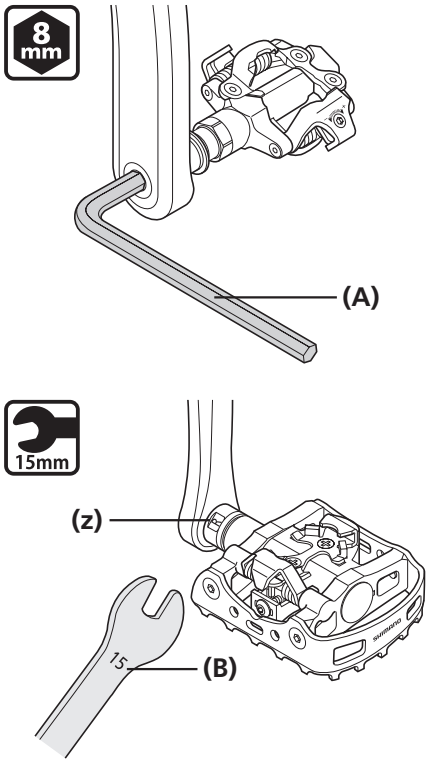
NOTICE

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

■ Mounting the pedals on the crank arms

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

2



Use an 8 mm hexagon wrench or a 15 mm spanner to install the pedals to the cranks.

(z) Note the markings
R: Right pedal, L: Left pedal

(A) 8 mm hexagon wrench
(B) 15 mm spanner

Tightening torque	
8 mm 15mm	35 - 55 N·m

NOTICE

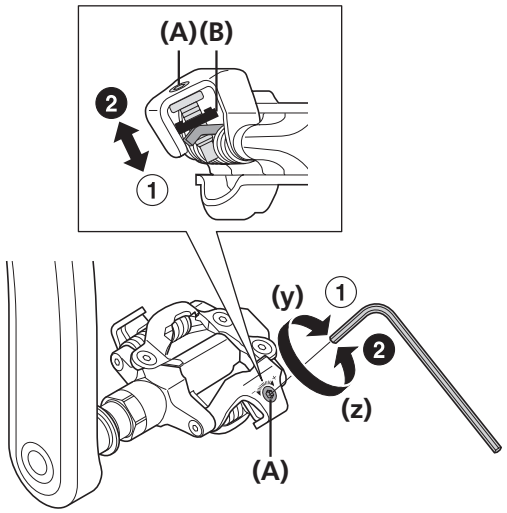
A 6 mm hexagon wrench cannot provide a sufficient tightening torque.
Always be sure to use a 15 mm spanner.

TECH TIPS

The right pedal has a right-hand thread; the left pedal has a left-hand thread.

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.

(y) Increase
(z) Decrease

(A) Adjustment bolt
(B) Adjustment plate

TECH TIPS

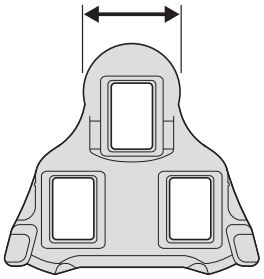
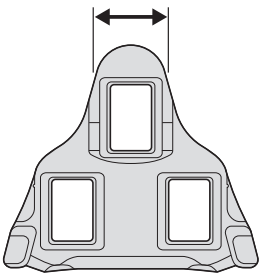
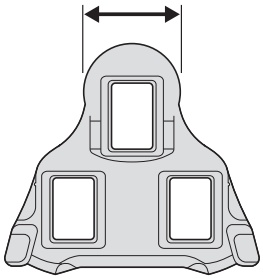
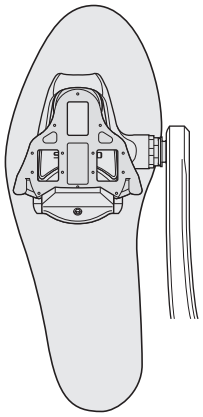
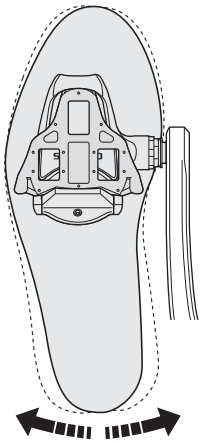
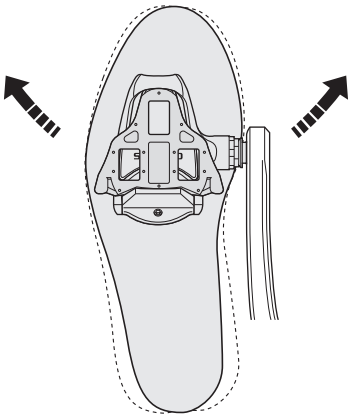
When the adjustment bolt is turned clockwise, the spring tension increases, and when it is turned counterclockwise, the spring tension decreases.

■ Cleat replacement

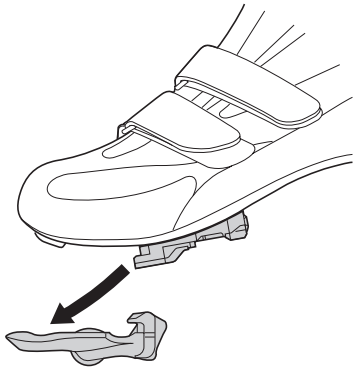
Cleats wear out over time and should be replaced periodically. Cleats should be replaced when it becomes difficult to release, or it starts to release with much less effort than the when it was in new condition.

INSTALLATION (SPD-SL PEDALS)

■ Cleat types

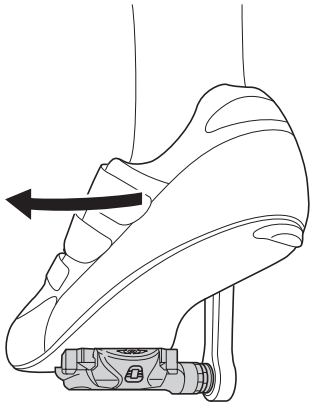
SM-SH10	SM-SH11 (PD-R540-LA: standard)	SM-SH12 (PD-9000: standard)
Red	Yellow	Blue
Wide 	Narrow 	Wide 
Fixed mode There is no looseness when the shoes are firmly engaged with the pedals. There is no looseness. 	**Self-aligning mode** There is some sideways looseness when the shoes are engaged with the pedals. 	**Front center pivot mode** There is some sideways looseness centered on the front of the shoes. 

■ Engaging the cleats with the pedals



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

■ Releasing the cleats from the pedals

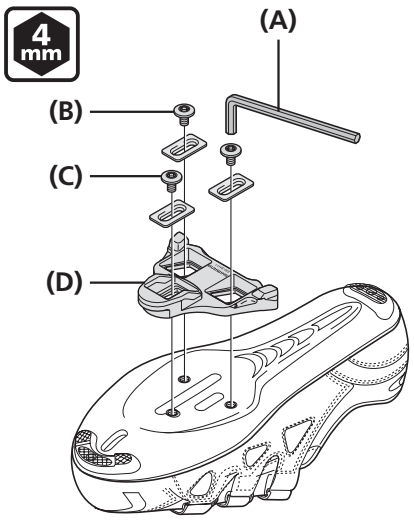


These cleats only release when the heel is moved outward.

NOTICE

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



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) 4 mm hexagon wrench
(B) Cleat mounting bolt
(C) Cleat washer
(D) Cleat

NOTICE

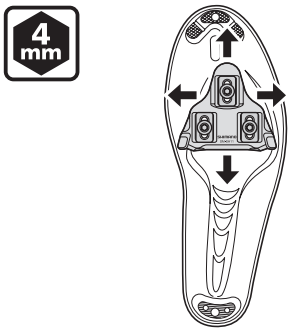
When installing the cleats, use the provided cleat mounting bolts and washers. If you use any other cleat mounting bolts, it may damage the cleats and cause problems with installation.

Adjustment of cleat position

1 The cleat has an adjustment range of 15 mm front to back and 5 mm right to left.

After provisionally tightening the cleat, practice engaging and releasing, one shoe at a time.

2



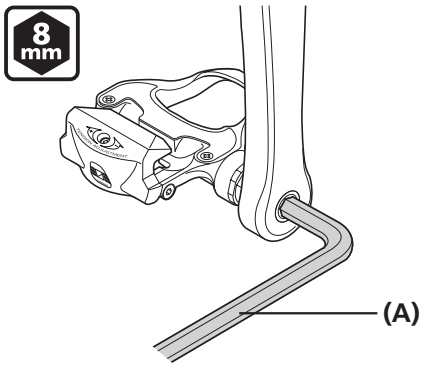
After you have determined the best cleat position, firmly tighten the cleat mounting bolts with a 4 mm hexagon wrench.

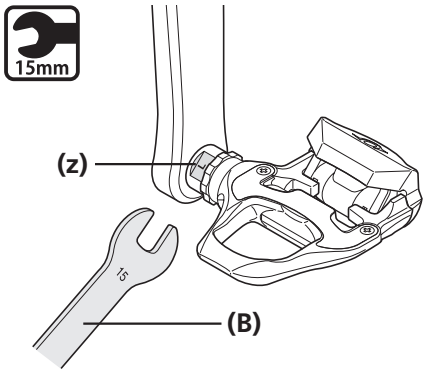
Tightening torque	
4 mm	5 - 6 N·m

■ Mounting the pedals on the crank arms

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

2





Use an 8 mm hexagon wrench or a 15 mm spanner to install the pedals to the cranks.

(z) Note the markings
R: Right pedal, L: Left pedal

(A) 8 mm hexagon wrench
(B) 15 mm spanner

Tightening torque	
8 mm 15mm	35 - 55 N·m

NOTICE

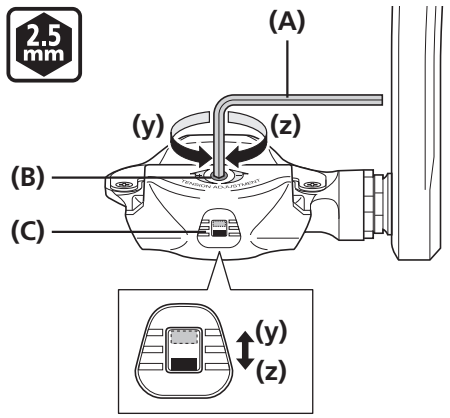
A 6 mm hexagon wrench cannot provide a sufficient tightening torque. Always be sure to use a 15 mm spanner.

TECH TIPS

The right pedal has a right-hand thread; the left pedal has a left-hand thread.

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.

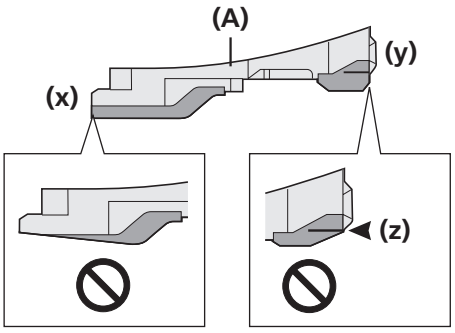
(y) Decrease
(z) Increase

(A) 2.5 mm hexagon wrench
(B) Adjustment bolt
(C) Indicator

NOTICE

- 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.

(x) Front
(y) Rear
(z) A

(A) Cleat

NOTICE

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

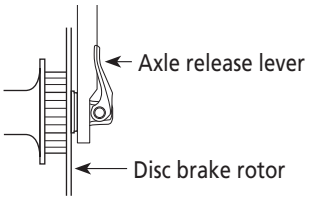
⚠ WARNING

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 cause serious injury.**
- 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.
- If the axle release lever is on the same side as the disc brake rotor, there is a possibility they may interfere. Make sure that even if the axle release lever is tightened with your palm with all your strength, the axle release lever does not interfere with the disc brake rotor. If the lever interferes with the disc brake rotor, stop using the wheel and consult a dealer or an agency.



- The disc brake calipers and disc brake rotor will become hot when the brakes are operated, so do not touch them while riding or immediately after dismounting from the bicycle. Otherwise you may get burned. Check that the brake components have cooled down sufficiently before attempting to adjust the brakes.
- Be sure to also carefully read the Service Instructions for the disc brakes.
- If the axle release lever is not used correctly, the wheel may come off the bicycle and serious injury could result.
- For details on the E-THRU Axle, refer to the E-THRU Axle user's manual.
- The E-THRU hub dynamo can be used in combination with the special front fork/frame and the through axle only. If it is used in combination with any other front fork/frame or through axle, it may cause the wheel to become detached from the bicycle while you are riding and result in serious bodily injury.

⚠ 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.

NOTICE

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 dropout is aligned. If the front dropout 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

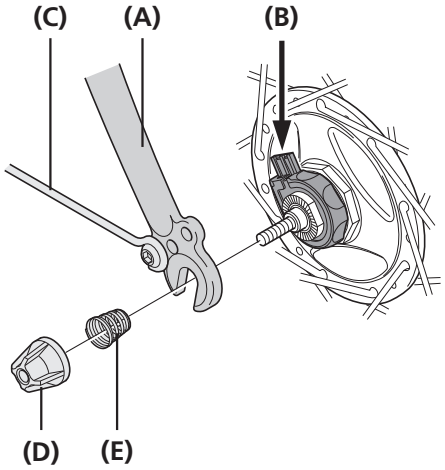
Please refer to the DISC BRAKE section.

■ Installation of the front wheel

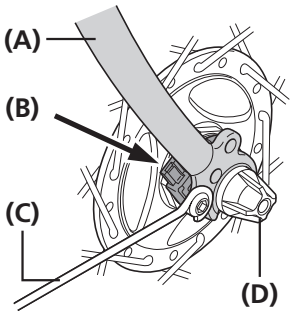
Install the wheel so that the side with the hub dynamo connection terminal is on the right side when looking toward the front of the bicycle, and so that the hub connection terminal is aligned with the front fork or with the basket stay. Then install following the procedure shown in the illustration so that the connection terminal is facing up.
Do not force the connection terminal to turn after the quick release lever, hub nut, or E-THRU lever 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



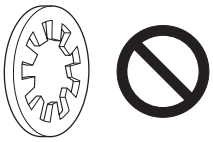
After installing



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

NOTICE

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

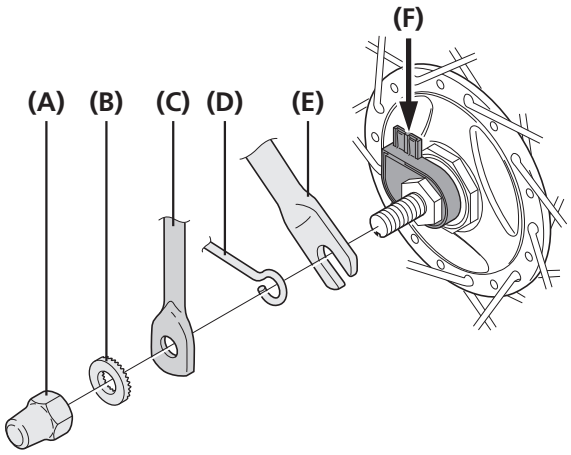


- Connect the two wires to ensure that the current flows smoothly.

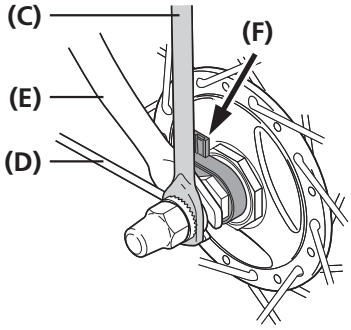
For nut type

For E2 type

Before installing



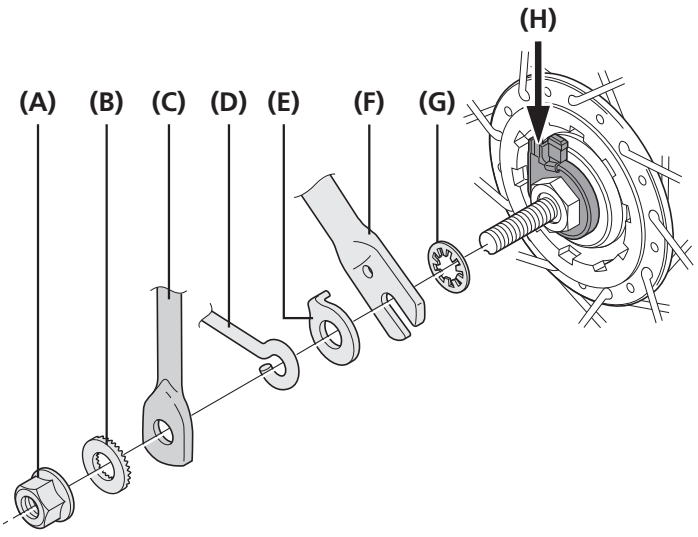
After installing



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

Tightening torque
20 - 25 N·m

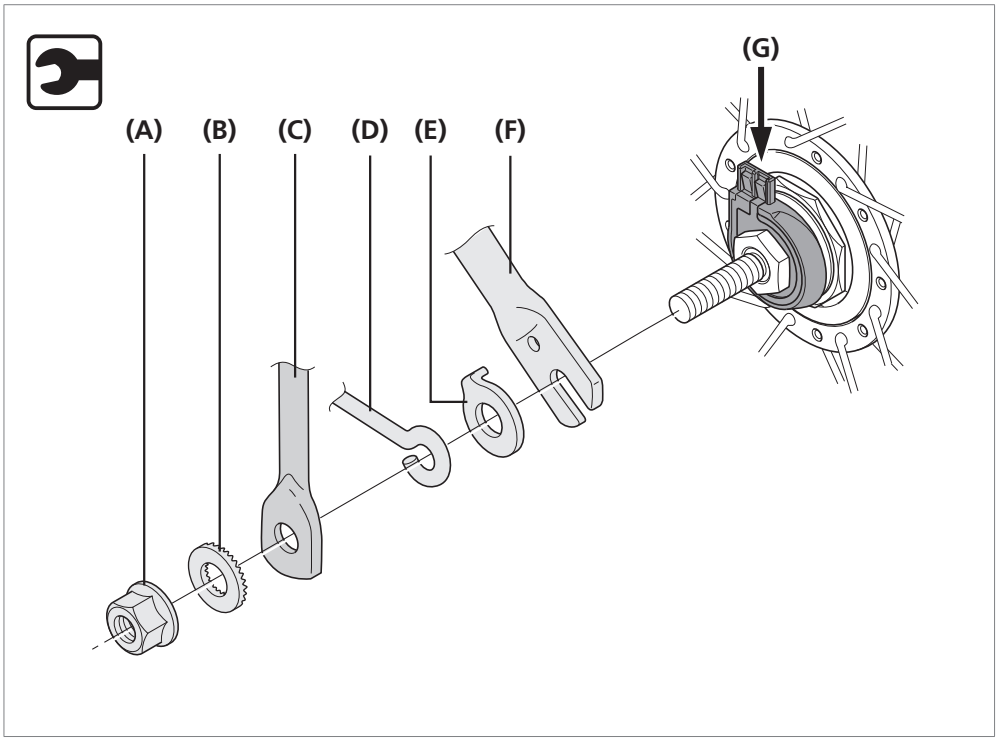
For J2 type



(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
20 N·m

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

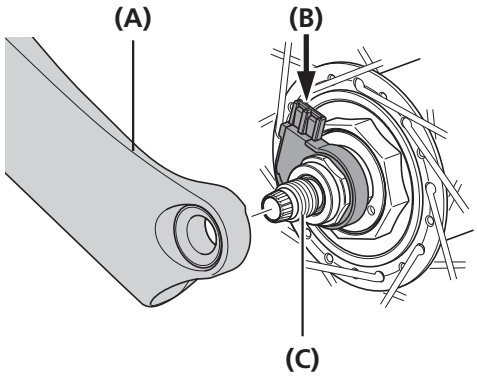
Tightening torque
20 N·m

NOTICE

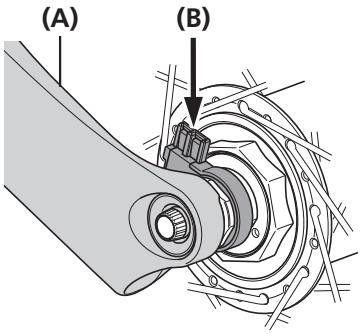
When tightening the hub nuts or flange nuts, tightening the hub nut only on one side excessively may force the hub axle to turn, tightening or loosening the lock nut excessively; therefore, tighten both nuts alternately.

For E-THRU type

Before installing



After installing



(A) Front fork
(B) Connection terminal
(C) E-THRU axle

NOTICE

For information on installing the E-THRU lever, refer to the instruction manual included with the E-THRU lever.

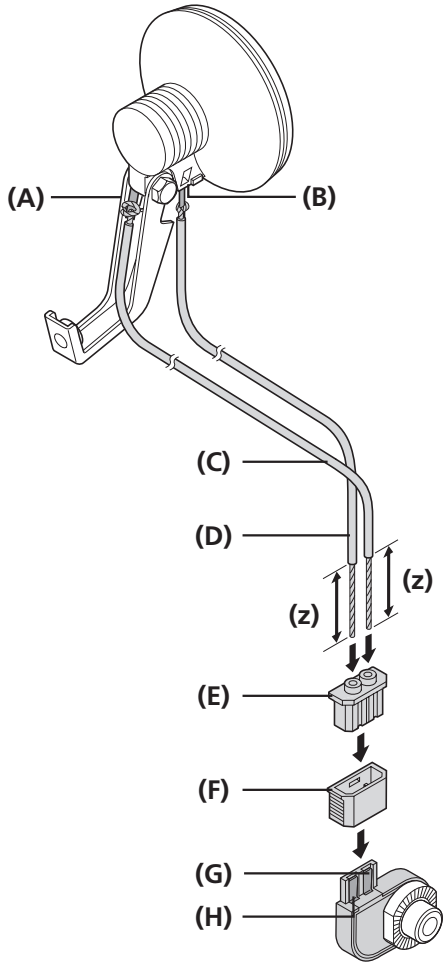
CONNECTION OF THE CABLES

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

■ For E2 type

1

Hub dynamo connection terminal



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

(z) Approx. 16 mm

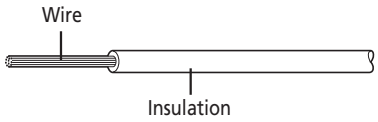
(A) Frame connection terminal
(B) Light connection terminal
(C) Frame cable
(D) Light cable
(E) Connector cap (gray)
(F) Connector cover (black)
(G) Frame connection terminal
(H) Light connection terminal

NOTICE

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

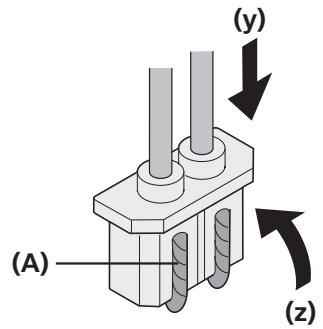
Recommended wire specification



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

To be continued on next page

2



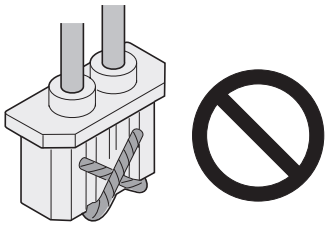
Bend the cable wires and run them along the grooves.

(y) Insert
(z) Bend

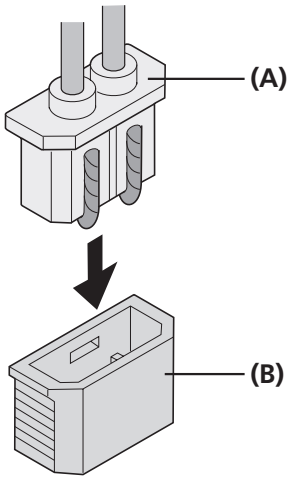
(A) Groove

NOTICE

Do not allow the cable wires to touch each other.



3

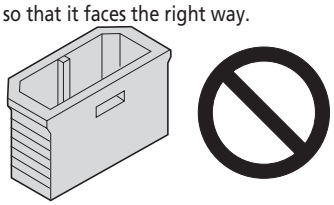


Press in until you hear a click.

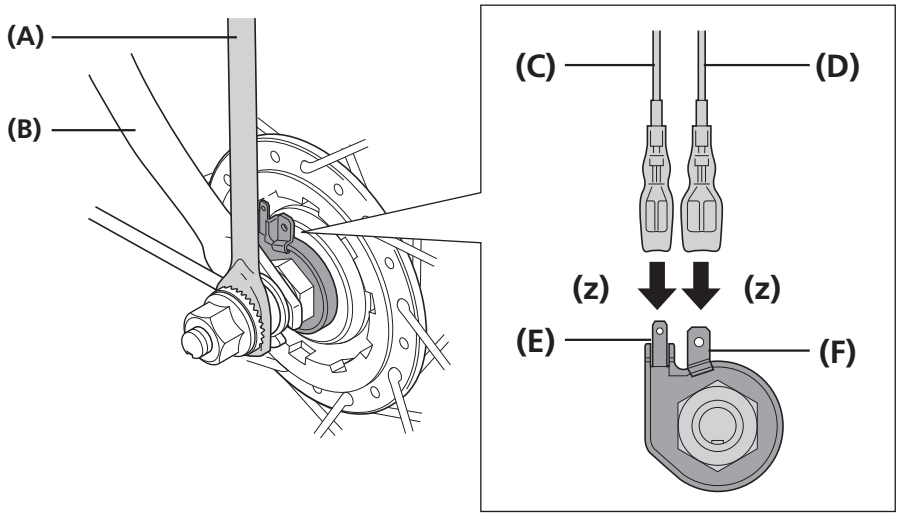
(A) Connector cap (gray)
(B) Connector cover (black)

NOTICE

Set so that it faces the right way.



■ For J2 type



(z) Connect

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

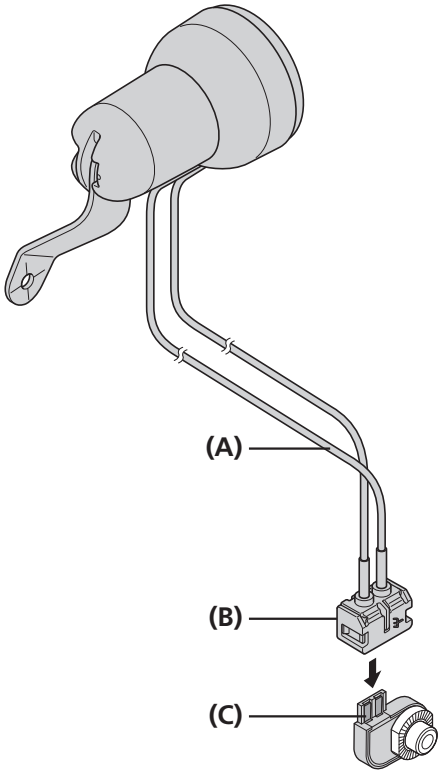
TECH TIPS

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

■ For J2-A type

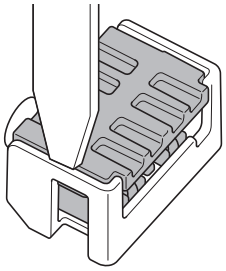
1

Hub dynamo connection terminal



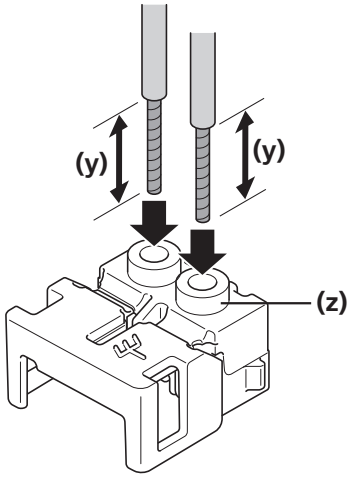
Twist the conducting wires of the cable together before connecting them so that they stay together.

2



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

3



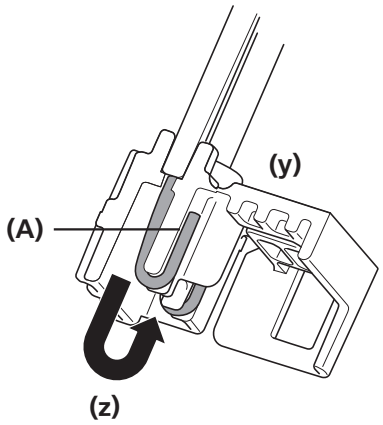
Insert the cable with the marking into the ground side of the connector.

(y) Approx. 16 mm
(z) Ground side

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

To be continued on next page

4



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

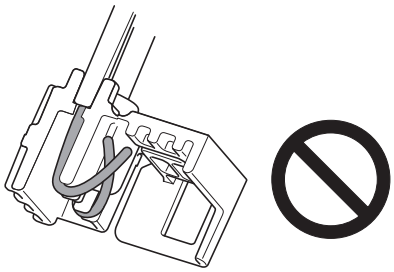
(y) Insert

(z) Bend

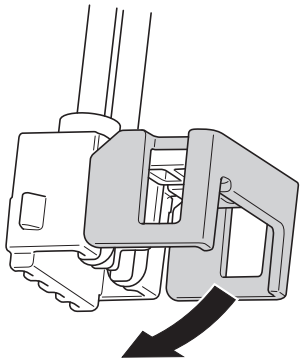
(A) Groove

NOTICE

Do not allow the cable wires to touch each other.



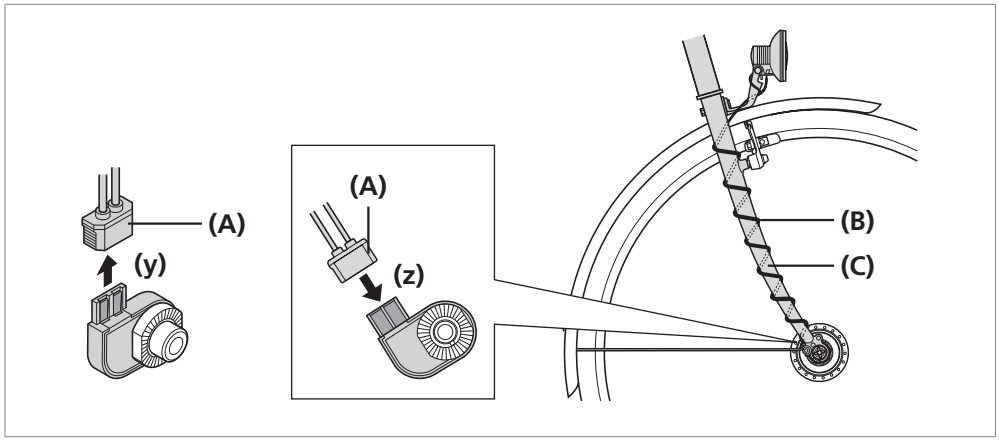
5



Close the connector until you hear a click.

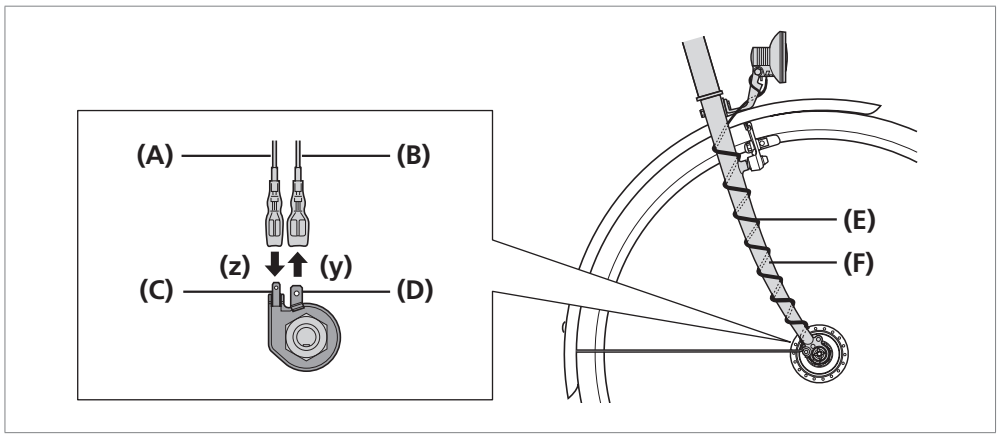
■ Note on the connection of the cables

- 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.



(y) Remove
(z) Connect

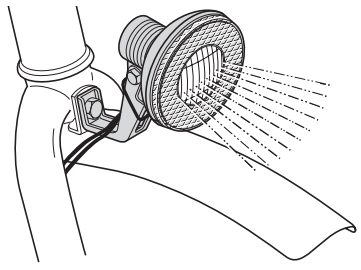
(A) Connector cover
(B) Cord
(C) Front fork



(y) Remove
(z) 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

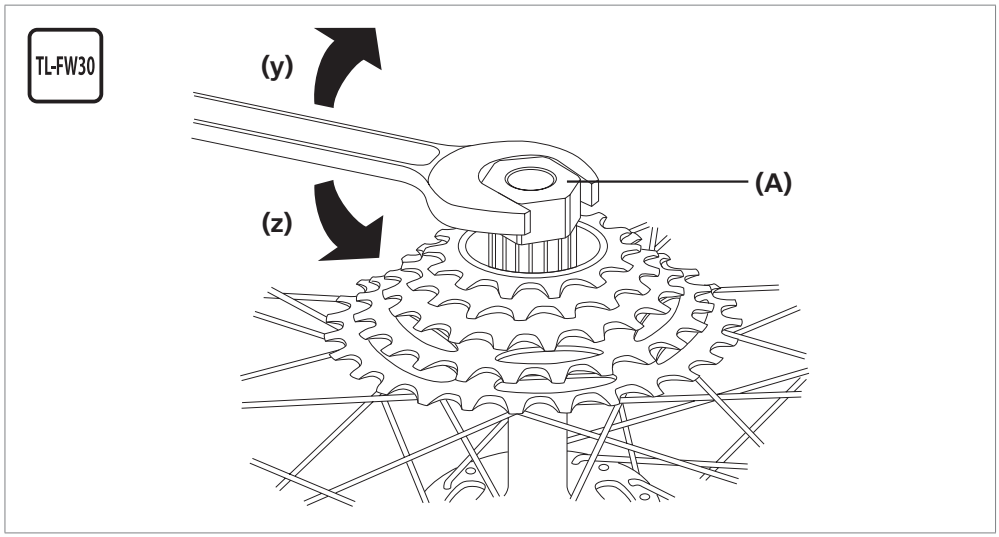


Rotate the front wheel and check that the light illuminates.

MULTIPLE FREEWHEEL

INSTALLATION (MULTIPLE FREEWHEEL)

■ Installation of the freewheel



(y) Installation
(z) Removal

(A) Freewheel removal tool (TL-FW30)

Tightening torque	
TL-FW30	30 N·m

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