

# Dealer's Manual

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

# Hydraulic Disc Brake

BR-M8000

BL-T8000

SM-MA-F180P/P2

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## IMPORTANT NOTICE

- **This dealer's manual is intended primarily for use by professional bicycle mechanics.**

Users who are not professionally trained for bicycle assembly should not attempt to install the components themselves using the dealer's manuals. If any part of the information on the manual is unclear to you, do not proceed with the installation. Instead, contact your place of purchase or a local bicycle dealer for their assistance.

- Make sure to read all instruction manuals included with the product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All dealer's manuals and instruction manuals can be viewed on-line on our website (<http://si.shimano.com>).
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.

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

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

 **DANGER**

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

 **WARNING**

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

 **CAUTION**

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

## TO ENSURE SAFETY

### WARNING

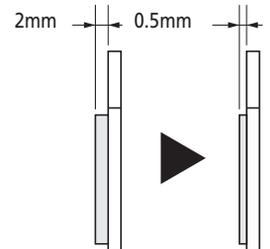
- **Be sure to follow the instructions provided in the manuals when installing the product.**  
It is recommended to use genuine Shimano parts only. If parts such as bolts and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.  
In addition, if adjustments are not carried out correctly, problems may occur, and the bicycle may suddenly fall over, which may cause serious injury.
-  Be sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.
- After reading the dealer's manual thoroughly, keep it in a safe place for later reference.

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

- The 203mm and 180mm disc brake rotors provide a higher braking force than the 160mm rotors. Make sure that you completely understand the braking characteristics before using the brakes.
- Each bicycle may handle slightly differently depending on the 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 a loss of control or a fall, which could 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.
- Please make sure to keep your fingers away from the rotating disc brake rotor. The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught in the openings of the disc brake rotor while it is moving.



- 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.
- 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.
- If any oil or grease does get on the brake pads, you should consult a dealer or an agency. 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 brake system temperature has cooled down sufficiently, check the thickness of the brake pad. If the thickness is 0.5mm or less, the brake pad needs to be replaced with a new one. Consult a dealer or an agency.



- If the disc brake rotor is cracked or deformed, immediately stop using the brakes and consult a dealer or an agency.
- If the disc brake rotor becomes worn down to a thickness of 1.5mm or less, or if the aluminum surface appears, immediately stop using the brakes and consult a dealer or an agency. The disc brake rotor may break, and you may fall off the bicycle.
- Vapor lock may occur if the brakes are applied continuously. To solve this problem, momentarily release the lever.

Vapor lock occurs when the oil inside the brake system becomes heated, which causes the water or air bubbles inside the brake system to expand. This can then result in a sudden increase in the brake lever stroke.

- 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 you feel no resistance when depressing the brake lever, immediately stop using the brakes and consult a dealer or an agency.
- If fluid leaks occur, immediately stop using the brakes and consult a dealer or an agency.
- If the front brake is applied too strongly, the wheel may lock and the bicycle may fall forward, and serious injury may result.
- Always make sure that the front and rear brakes are working correctly before riding the bicycle.
- The required braking distance will be longer during wet weather. Reduce your speed and apply the brakes early and gently.
- If the road surface is wet, the tires will skid more easily. If the tires skid, you may fall off the bicycle. Reduce your speed and apply the brakes early and gently.
- Because of the characteristics of the carbon fiber material, the lever should never be altered. Otherwise, the lever may break preventing braking operation.
- Check before riding that there is no damage such as carbon peeling or cracking. If there is any damage, stop using the bicycle and consult a dealer or an agency. Otherwise, the lever may break preventing braking operation.

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

- Please make sure to keep your fingers away from the rotating disc brake rotor during installation or maintenance of the wheel.  
The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught in the openings of the disc brake rotor while it is moving.



- If the disc brake rotor is worn, cracked or warped, it should be replaced.
- If the disc brake rotor becomes worn down to a thickness of 1.5mm or the aluminum surface becomes visible, be sure to replace the disc brake rotor with a new one.
- Check that the brake components have cooled down sufficiently before attempting to adjust the brakes.
- 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, and 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 to get into the brake system. Otherwise, vapor lock may occur. Be particularly careful when removing the cover of the reservoir tank.
- 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 according to steps given in "Adding Shimano genuine mineral oil and bleeding air".
- When turning the bicycle upside down or on its side, the brake system may have some air bubbles inside the reservoir tank which are still there when the bleed screw is closed, or which accumulate in various parts of the brake system when it is used for long periods. This disc brake system is not designed to work with the bicycle upside down. If the bicycle is turned upside down or on its side, the air bubbles inside the reservoir tank may move in the direction of the calipers. If the bicycle is ridden in this condition, there is danger that the brakes may not operate and a serious accident may occur. If the bicycle has been turned upside down or on its side, be sure to operate the brake lever a few times to check that the brakes operate normally before riding the bicycle. If the brakes do not operate normally, adjust them according to the following procedure.

#### **If brake does not seem to work (feels sluggish) when the lever is depressed**

Set the brake lever so that it is parallel to the ground, and then 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 reservoir tank cover and fill the reservoir tank with mineral oil until no bubbles remain.

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

## TO ENSURE SAFETY

- If the quick release lever on the hub is on the same side as the disc brake rotor, they may interfere with each other, which is dangerous, so check that they do not.
- 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.

### ■ SM-RTAD05 Disc brake rotor adapter

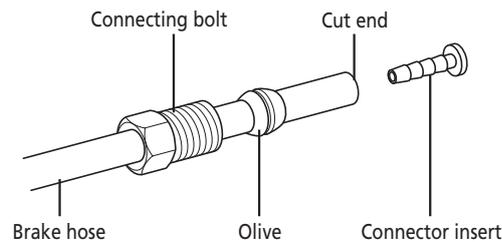
- Disc brake rotors with diameters of up to  $\text{Ø}203\text{mm}$  can be installed. If disc brake rotors with a larger diameter than this are installed, the braking force may damage the main unit.

### ■ Brake hose

- After installing the brake hose to the brake unit, adding Shimano genuine mineral oil and bleeding air bubbles, depress the lever again several times to check that the brakes are operating normally and there are no fluid leaks from the hose or the system.
- The connector insert is for this brake hose only. Use an appropriate connector insert according to the following table. Use of a connector insert incompatible with the brake hose may cause fluid leaks.

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

- Do not reuse the olive piece or the connector insert when reinstalling. A damaged or reused olive, or connector insert, may not provide a secure brake hose connection, possibly causing the brake hose to disconnect from the calipers or brake lever. If the brake hose becomes disconnected, there is danger that the brakes may suddenly stop working.



- Cut the brake hose so that the cut end is perpendicular to the length of the hose. If the brake hose is cut at an angle, fluid leaks may result.





Be sure to also inform users of the following:

■ **Cautions on Shimano genuine mineral oil**

- Contact with eyes may result in irritation. In the event of contact with eye, wash with water and seek medical attention immediately.
- Contact with skin may cause a rash and discomfort. In the event of contact with skin, wash well with soap and water.
- Inhalation of Shimano genuine mineral oil mist or vapors may cause nausea. Cover nose and mouth with a respirator type mask and use in a well ventilated area. If Shimano genuine mineral oil mist or vapor is inhaled, cover up with a blanket and go immediately to an area with fresh air. Stay warm and calm, and seek professional medical advice.

■ **Burn-in period**

- Disc brakes have a burn-in period, and the braking force will gradually increase as the burn-in period progresses. Make sure that you are aware of any such increases in braking force when using the brakes during the burn-in period. The same thing will happen when the brake pads or disc brake rotor are replaced.

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

- When using the Shimano original tool (TL-FC36) to remove and install the disc brake rotor fixing ring, be careful not to touch the outside of the disc brake rotor with your hands. Wear gloves to protect your hands from getting cut.

■ **Handling Shimano genuine mineral oil**

- Contact with eyes may result in irritation. Use safety glasses when handling, and avoid contact with eyes. In the event of contact with eye, wash with water and seek medical attention immediately.
- Contact with skin may cause a rash and discomfort. Use gloves when handling. In the event of contact with skin, wash well with soap and water.
- 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. Keep from heat or flame, Petroleum Class III, Danger level III

■ **When cleaning with a compressor**

- If disassembling the caliper body to clean the internal parts using a compressor, note that moisture from the compressed air may remain on the caliper components. Let the caliper components dry sufficiently before reassembling the calipers.

■ **Brake hose**

- When cutting the brake hose, handle the knife carefully so as not to cause injury.
- Be careful to avoid injury from the olive.

## NOTE

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

- When the bicycle wheel has been removed, it is recommended that pad spacers are installed. Do not depress the brake lever while the wheel is removed. If the brake lever is depressed without the pad spacers installed, the pistons will protrude further than normal. If that happens, consult a dealer.
- Use soapy water and a dry cloth when cleaning and carrying out maintenance of the brake system. Do not use commercially available brake cleansers or silencing agents. Such substances can cause damage to parts such as seals.
- In the case of carbon levers, wash them with a soft cloth using a neutral detergent. Otherwise, the material may break down and be damaged.
- Avoid leaving the carbon levers in areas of high temperature. Also keep them well away from fire.
- Products are not guaranteed against natural wear and deterioration from normal use and aging.
- For maximum performance we highly recommend Shimano lubricants and maintenance products.

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

- The 203mm and 180mm disc brake rotors have a larger diameter than the 160mm rotor for cross-country bicycles, and so the flexing of these disc brake rotors is greater. As a result, they will interfere with the brake pads.
- If the brake caliper mounting boss and the fork end are not parallel, the disc brake rotor and caliper may touch.
- When the bicycle wheel has been removed, it is recommended that pad spacers are installed. The pad spacers will prevent the piston from coming out if the brake lever is depressed while the wheel is removed.
- 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. Such substances can cause damage to parts such as seals.
- Do not remove the pistons when disassembling the calipers.
- If the disc brake rotor is worn, cracked or warped, it should be replaced.

**■ SM-RTAD05 Disc brake rotor adapter**

- When using this disc brake rotor adapter to install disc brake rotors, the structure of the adapter means that there will be more play than normal in the disc brake rotor. Because of this, the disc brake rotor may interfere with the brake pads. Furthermore, it may also interfere with the calipers in the radial direction (upward).
- This product cannot be used with the 6-bolt disc brake rotor that is installed with an aluminum adapter (SM-RT86/RT76).

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

# LIST OF TOOLS TO BE USED

## LIST OF TOOLS TO BE USED

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

Tool		Tool		Tool	
	2.5mm hexagon wrench		8mm spanner		TL-BH61
	3mm hexagon wrench		7mm Socket Wrench		TL-FC36
	4mm hexagon wrench		Utility knife		
	5mm hexagon wrench		Hexalobular[#15]		

# INSTALLATION

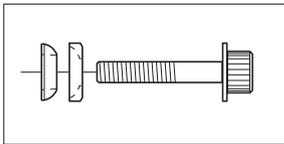
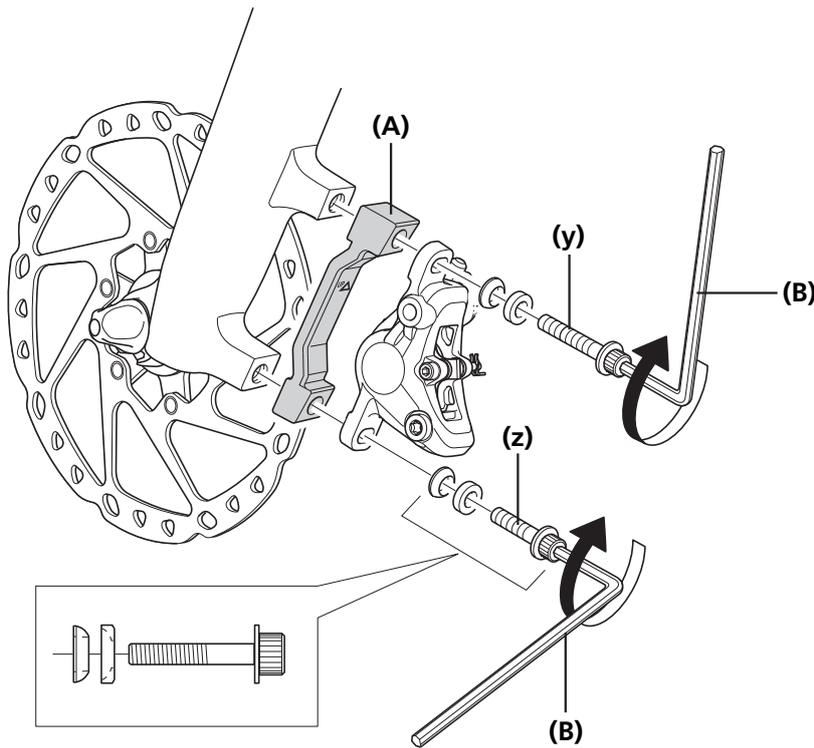
# INSTALLATION

\* Refer to the Disc Brake section of General Operations for how to install the brake caliper, brake lever, and disc brake rotor.

## ■ Disc brake mount adapter (for 180mm disc brake rotors)

**SM-MA-F180P/P2**

Place the adapter onto the brake caliper, and then install the adapter to the frame.



**(y)** Long

**(z)** Short

**(A)** Mount adapter

**(B)** 5mm hexagon wrench

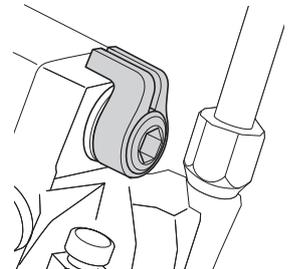
**Tightening torque**



**6 - 8 N·m**

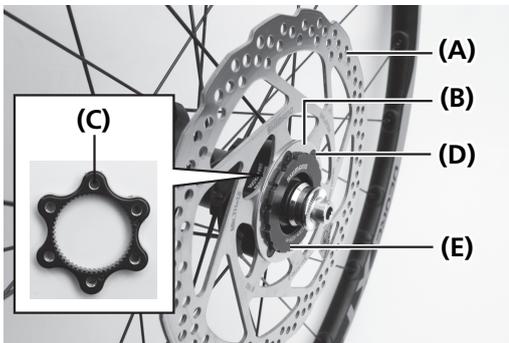
**NOTE**

Be sure to attach the caps when attaching the brake caliper fixing bolts.



■ Disc brake rotor adapter

SM-RTAD05



This product is an adapter used for installing 6 bolt type disc brake rotors to center lock system hubs/wheels.

- (A) Disc brake rotor
- (B) Washer
- (C) Disc brake rotor adapter
- (D) Disc brake rotor fixing bolt
- (E) Disc brake rotor fixing lock ring



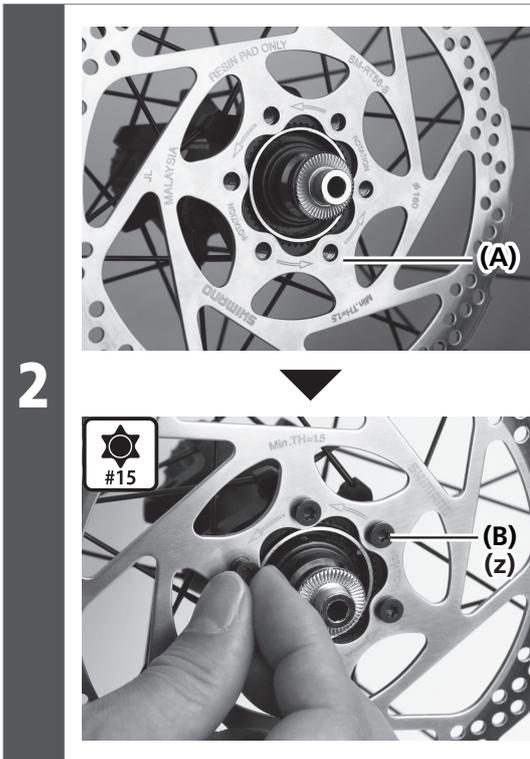
Place the disc brake rotor adapter on to the hub.

1



**INSTALLATION**

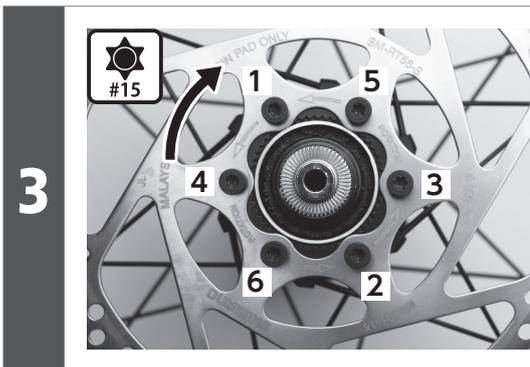
▶▶ Disc brake rotor adapter



Place the disc brake rotor on to the hub, and then temporarily fix it in place by tightening the disc brake rotor fixing bolts.

(z) Hexalobular[#15]

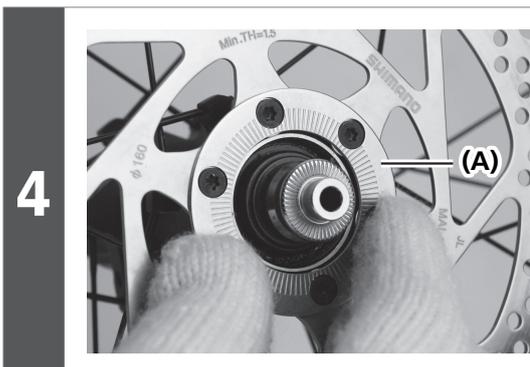
- (A) Disc brake rotor
- (B) Disc brake rotor fixing bolt



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

Then, tighten the disc brake rotor fixing bolts in the order shown in the illustration.

Tightening torque	
	2 - 4 N·m



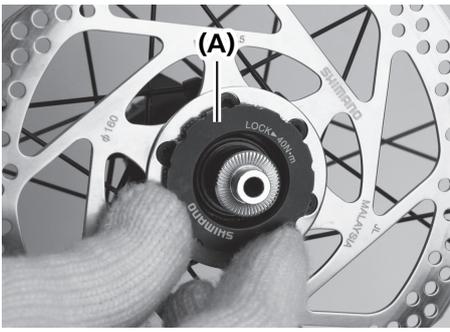
Fit the washer.

- (A) Washer

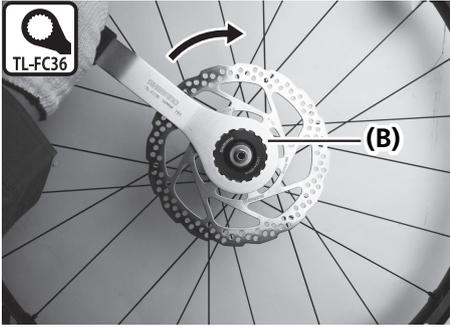
## INSTALLATION

### ▶▶ Disc brake rotor adapter

5



Tighten the disc brake rotor fixing lock ring.



- (A) Disc brake rotor fixing lock ring
- (B) TL-FC36

#### Tightening torque

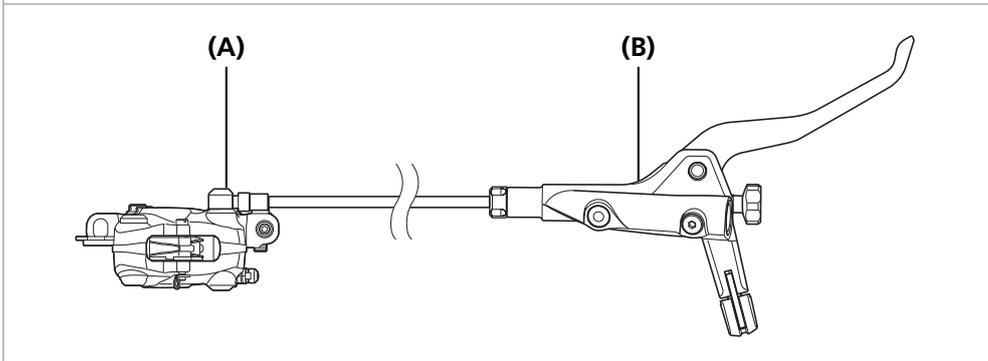


40 N·m

**■ Brake hose**

For information on installing the brake hose, refer to the brake section of General Operations.

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



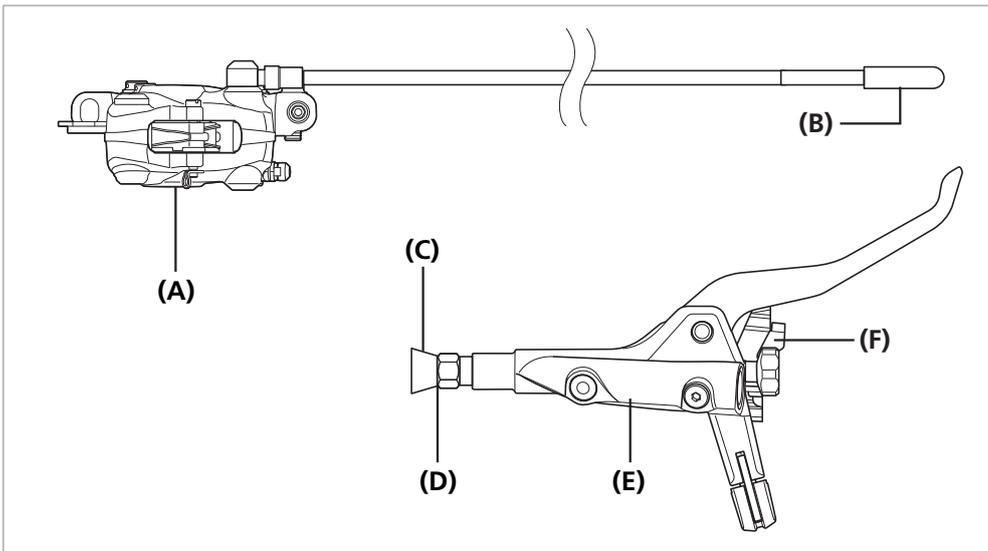
- (A)** Brake caliper
- (B)** Brake lever

**NOTE**

- The installation position of the brake hose differs depending on the model.
- Do not let the brake hose become twisted when installing it.

**Overview of the easy hose joint system**

For information on how to install and replace the brake hose, refer to the brake section of General Operations.



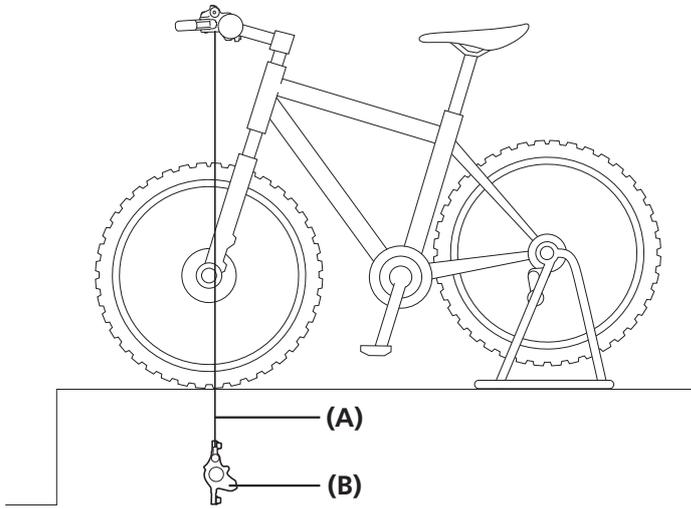
- (A)** Brake caliper
- (B)** Hose cap
- (C)** Seal plug
- (D)** Hose connection port
- (E)** Brake lever
- (F)** Stopper

# MAINTENANCE

# MAINTENANCE

## ■ Adding Shimano genuine mineral oil and bleeding air

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

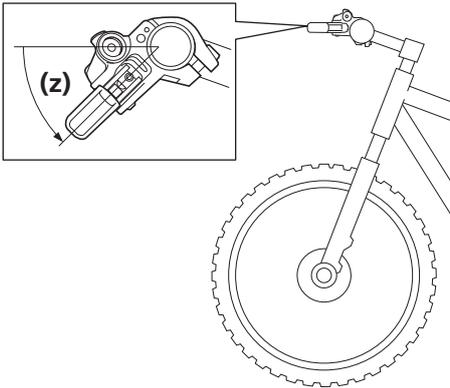


- (A) Hose
- (B) Caliper

**NOTE**

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

**1**

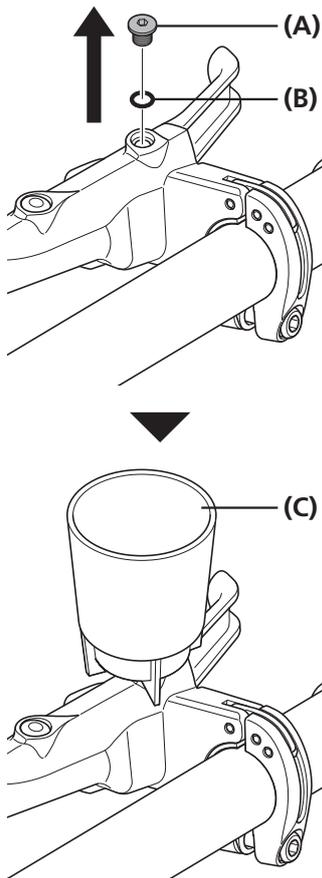


Set the brake lever so that it is in riding position at 45° angle from the ground.

(z) 45°

▶▶ Adding Shimano genuine mineral oil and bleeding air

**2**



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

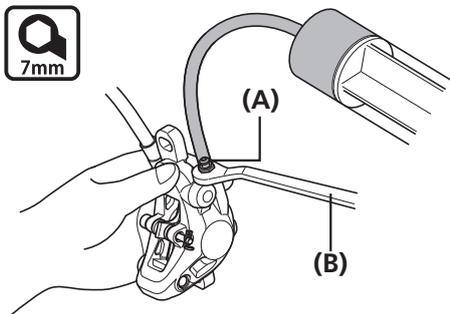
- (A)** Bleed screw
- (B)** O-ring
- (C)** Oil funnel



**TECH TIPS**

Do not insert the oil stopper at this time.

**3**



Set a 7mm socket wrench in place, fill the syringe with oil, connect a tube to the bleed nipple, and then loosen the bleed nipple by 1/8 of a turn to open it.

Push the piston of the syringe to add oil.

The oil will start coming out from the oil funnel.

Continue adding oil until there are no more air bubbles in the oil that is coming out.

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

**4**

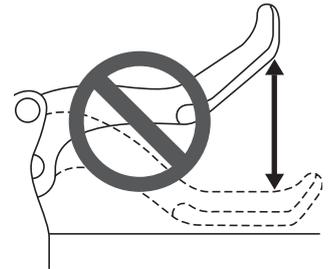
Once there are no more air bubbles mixed in with the oil, temporarily close the bleed nipple.

**NOTE**

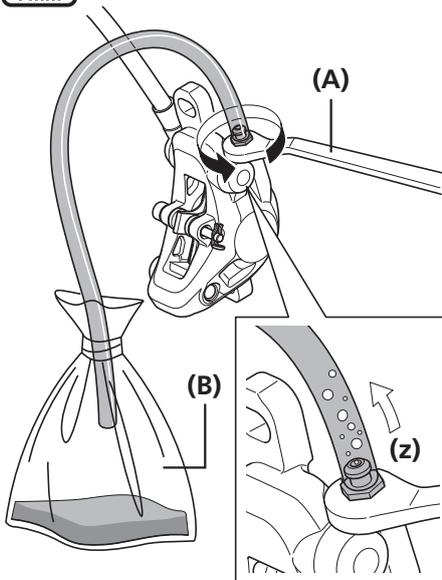
Secure the brake caliper in a vise to prevent the tube from being accidentally disconnected.

Do not depress and release the lever repeatedly.

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



**5**



Set a 7mm socket wrench in place as shown in the illustration, and then attach the bag to the tube.

Connect the tube to the bleed nipple and loosen the bleed nipple.

After a little while, the oil and air bubbles will flow naturally from the bleed nipple into the tube.

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

**(z)** Air bubbles

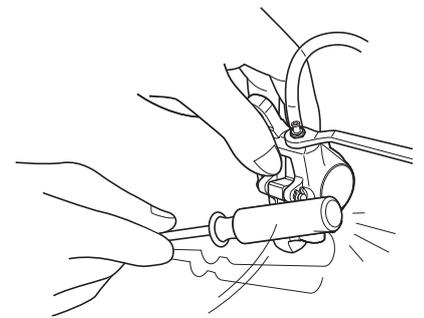
**(A)** 7mm socket wrench

**(B)** Bag



**TECH TIPS**

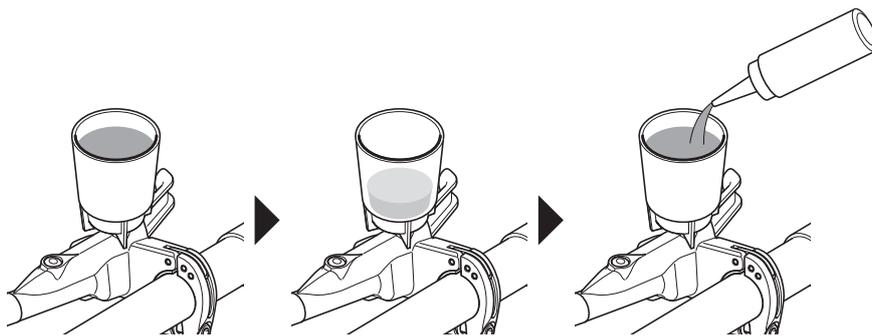
It may help to shake the hose gently or to tap the reservoir tank or caliper gently with a screwdriver or move the position of the caliper at this time.



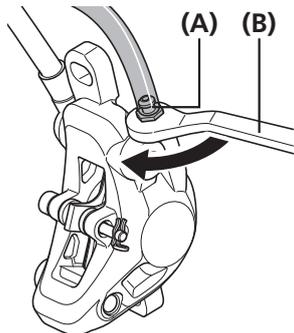
▶▶ Adding Shimano genuine mineral oil and bleeding air

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).

**6**



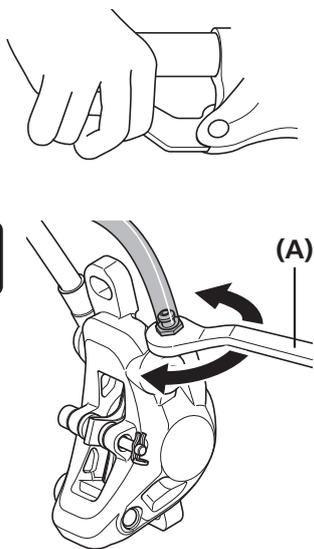
**7**



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

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

**8**



With the brake lever depressed, open and close the bleed nipple in rapid succession (for approximately 0.5 seconds each time) to release any air bubbles which may be in the calipers.

Repeat this procedure about 2 to 3 times.

Then tighten the bleed nipple.

- (A)** 7mm socket wrench

**Tightening torque**



**4 - 6 N·m**

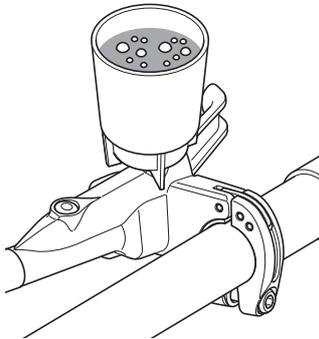
▶▶ Adding Shimano genuine mineral oil and bleeding air

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

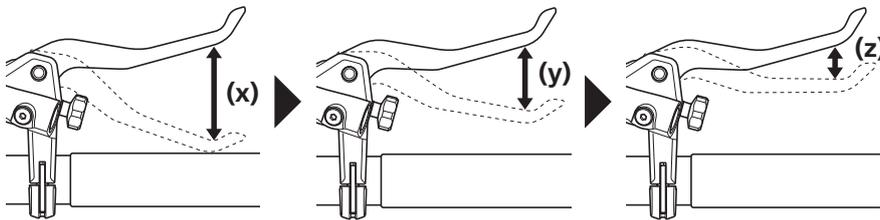
Once the bubbles stop appearing, depress the brake lever as far as it will go.

It is normal for the lever to be stiff at this point.

**9**



**Lever operation**

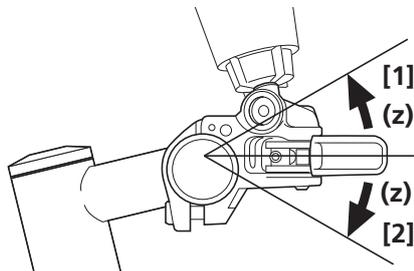


- (x)** Loose
- (y)** Slightly stiff
- (z)** Stiff

**NOTE**

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

**10**



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

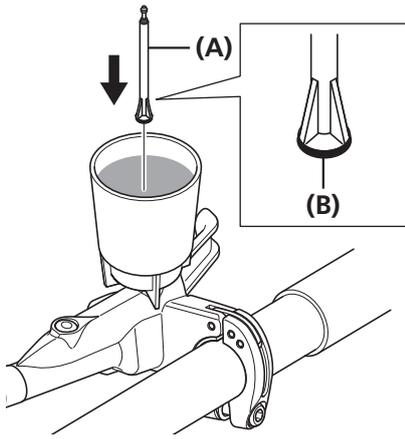
Next, tilt the lever unit 30° in the direction of **[2]**, and carry out step 9 again to check that there is no air remaining.

If any air bubbles appear, repeat the above procedure until they stop appearing.

**(z)** 30°

▶▶ Adding Shimano genuine mineral oil and bleeding air

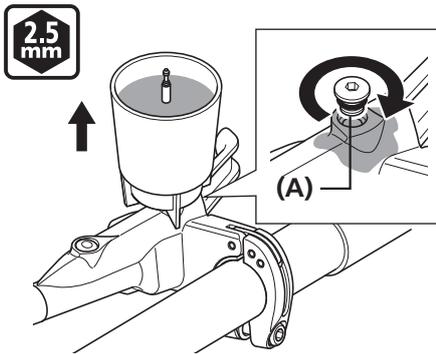
11



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

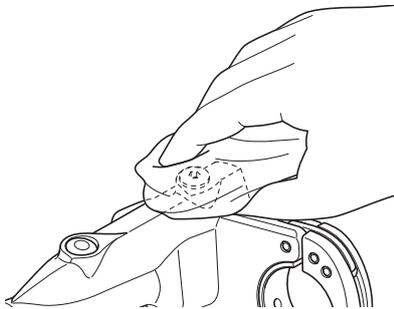


0.3 - 0.5 N·m

**NOTE**

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

13



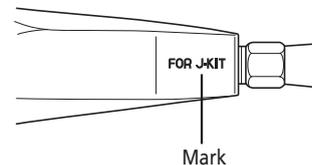
Wipe away any oil that has overflowed.

# ■ Replacing the brake hose

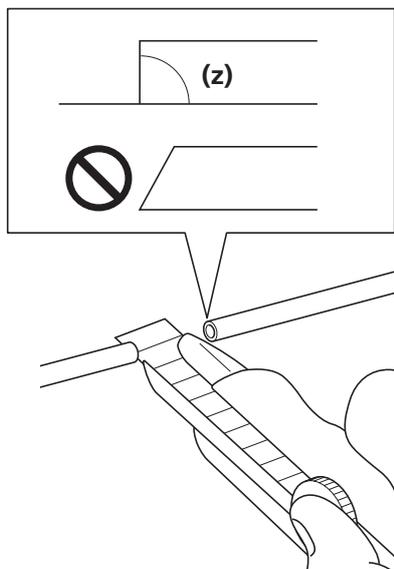
## Brake lever side

### NOTE

If there is a marking as shown in the illustration, refer to the "How to replace the brake hose (easy hose joint system)" section of General Operations.



**1**



Use a utility knife or other cutting tool to cut the brake hose.

**(z)** 90°

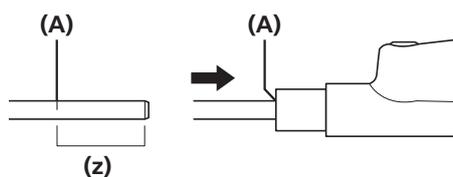
### NOTE

Use the utility knife safely and correctly in accordance with its instruction manual.



If you are using TL-BH62, refer to the manual accompanying the product.

**2**



In order to check that the ends of the brake hose are fitted securely into the base of the brake hose mounts of the brake calipers and brake lever, make marks on the brake hose beforehand as shown in the illustration.

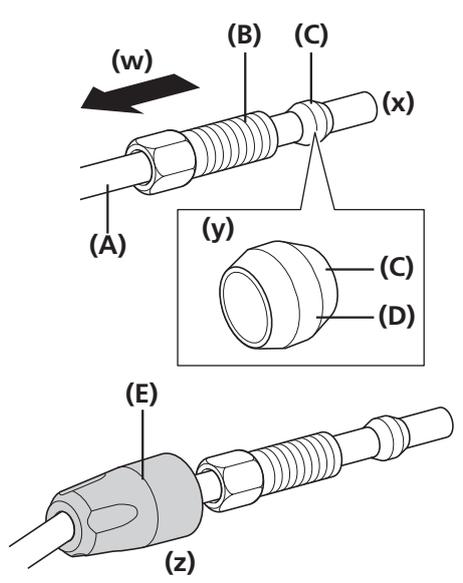
(As a guide, the length of brake hose inside the mount should be approximately 11mm, measured from the cut end of the brake hose.)

**(z)** Approx. 11mm

**(A)** Mark

▶▶ Replacing the brake hose

**3**

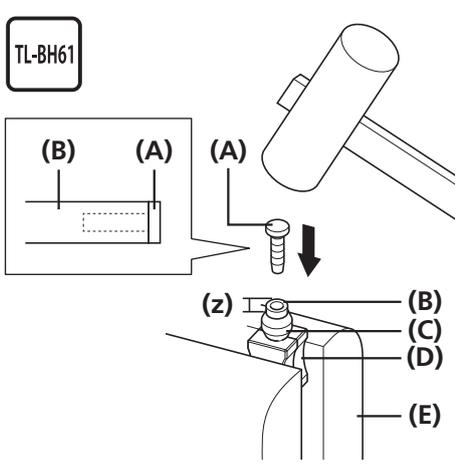


Pass the brake hose through the connecting bolt and olive.

**(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)** Brake hose
- (B)** Connecting bolt
- (C)** Olive
- (D)** Premium grease
- (E)** Cover

**4**



Use a tapered tool to smooth out the inside of the cut end of the brake hose, and mount the connector insert.

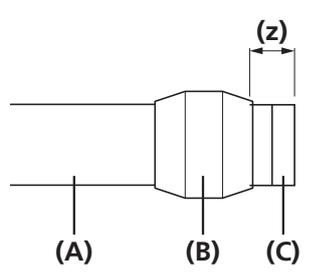
Attach the brake hose to the TL-BH61 as shown in the illustration, secure the TL-BH61 in a vise, and then use a hammer or similar tool to knock the connector insert in firmly until the base of the connector insert touches the end of the brake hose.

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

**(z)** 1mm

- (A)** Connector insert
- (B)** Brake hose
- (C)** Olive
- (D)** TL-BH61
- (E)** Vise

**5**



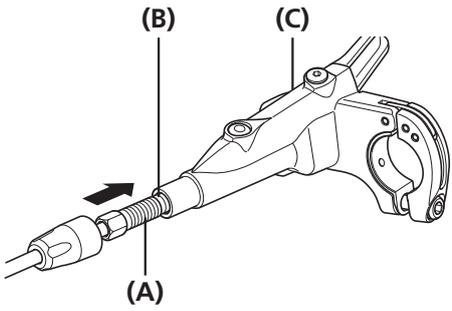
After checking that the olive is positioned as shown in the illustration, apply premium grease to the threads of the connecting bolt.

**(z)** 2mm

- (A)** Brake hose
- (B)** Olive
- (C)** Connector insert

▶▶ Replacing the brake hose

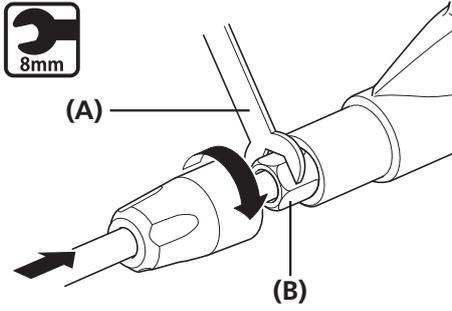
**6**



Attach the brake hose to the brake lever as shown in the illustration.

(A) Connecting bolt  
(B) Olive  
(C) Brake lever

**7**



While pushing the brake hose, tighten the connecting bolt.

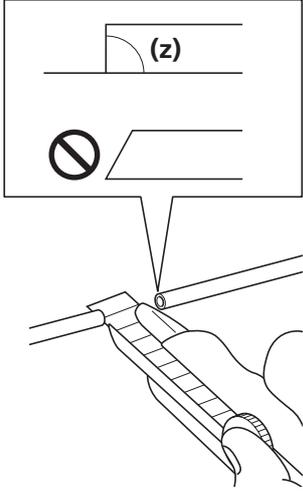
(A) 8mm spanner  
(B) Connecting bolt

Tightening torque	
	5 - 7 N·m

**Caliper side**

Mount the connecting bolt, the olive, and the connector insert by following the same procedure as for the brake lever.  
Use an 8mm spanner to secure the connecting bolt.

**1**



Use a utility knife or other cutting tool to cut the brake hose.

**(z)** 90°

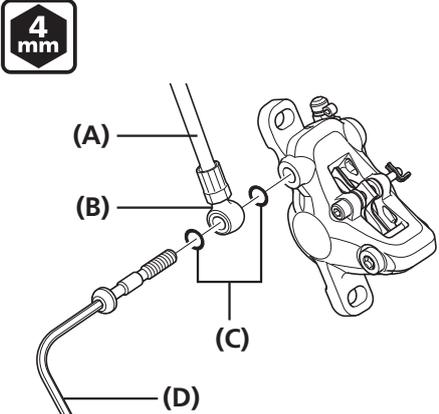
**NOTE**

Use the utility knife safely and correctly in accordance with its instruction manual.

**TECH TIPS**

If you are using TL-BH62, refer to the manual accompanying the product.

**2**



While pushing the brake hose, tighten the connecting bolt.

- (A)** Brake hose
- (B)** Banjo
- (C)** O-ring
- (D)** 4mm hexagon wrench

Tightening torque	
	<b>5 - 7 N·m</b>

## ■ Replacing the brake pads

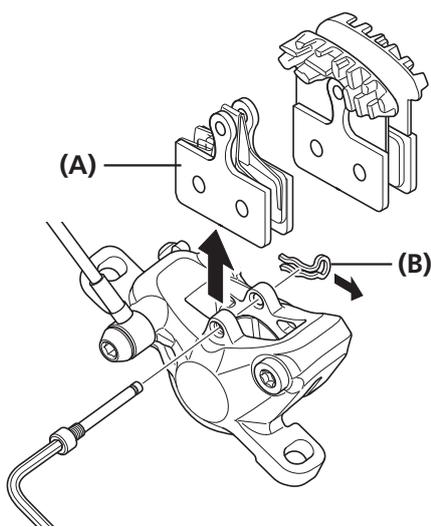
### NOTE

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

### TECH TIPS

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

1



The diagram shows a brake caliper assembly. A brake pad, labeled (A), is being removed from the caliper. A snap ring, labeled (B), is also shown being removed from the assembly. Arrows indicate the direction of removal for both components.

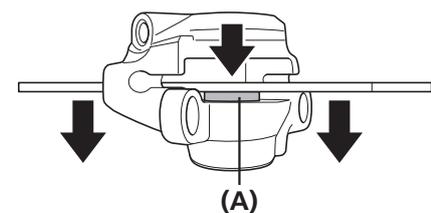
Remove the wheel from the frame, and remove the brake pads as shown in the illustration.

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

2

Clean the pistons and surrounding area.

3



The diagram shows a cross-section of the brake caliper piston. A flat-shaped tool is being used to push the piston back into the caliper housing. Arrows indicate the direction of the tool and the piston's movement.

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

- (A)** Piston

### NOTE

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

▶▶ Replacing the brake pads

4

Install the new brake pads, the bolt, and the pad spacer (red).

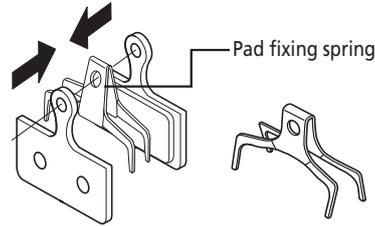
At this point, make sure to install the snap ring as well.

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

Tightening torque	
	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.)



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".

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

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