

Dealer's Manual

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

Hydraulic Disc Brake/
DUAL CONTROL LEVER

ST-RS405
BR-RS405
BL-RS600

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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 (<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.
- After reading the dealer's manual thoroughly, keep it in a safe place for later reference.

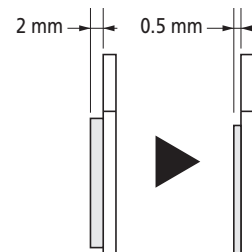
Be sure to also inform users of the following:

■ Brake

- 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 0.5 mm 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 1.5 mm 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; therefore, please refrain from doing this.

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.
- The lever should never be altered. 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.



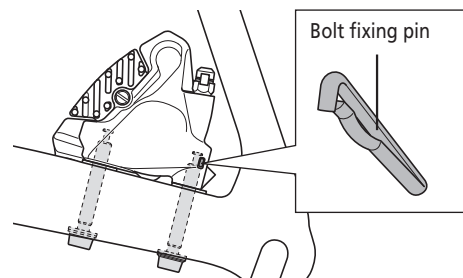
- If the disc brake rotor is worn, cracked or warped, it should be replaced.
- If the disc brake rotor becomes worn down to a thickness of 1.5 mm or so that the aluminum surface becomes visible, be sure to replace the disc brake rotor with a new one.
- Check that the brake components have cooled down 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 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 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, any air bubbles inside the reservoir tank may move in the direction of the calipers and if the bicycle is ridden in this condition, there is a danger that the brakes may not operate and a serious accident could 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, and 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 bleed section of 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.

If the brakes still operate sluggishly, bleed the air from the brake system (refer to "Adding Shimano genuine mineral oil and bleeding air").

- 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.
- When installing the brake caliper using bolt fixing pins, be sure to use mounting bolts of the appropriate length.
If not, the bolt fixing pins may not be securely fastened, and the bolts may fall out.

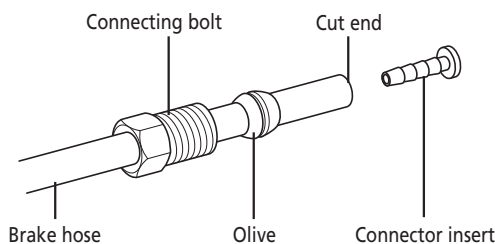


■ Brake hose

- 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-BH59-J-SS	13.2 mm	Gold

- 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.



**CAUTION**

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 vapor is inhaled, go immediately to an area with fresh air and cover up with a blanket. 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.

For Installation to the Bicycle, and Maintenance:

■ **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; therefore, 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.

NOTICE

Be sure to also inform users of the following:

- Be sure to keep turning the crank during gear shifting.
- Handle the product carefully, and avoid subjecting it to any strong shocks.
- Do not use thinners or similar substances to clean the products. Such substances may damage the surfaces.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- 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 cleaners or silencing agents, as they can cause damage to parts such as seals.
- 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:

- Use a brake hose/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.
- Use an OT-SP sealed outer casing and cable guide for smooth operation.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly. Do not let dust adhere to the inner cable. If the grease on the inner cable is wiped off, the application of SIS SP41 grease (Y04180000) is recommended.
- A special grease is used for the gear shifting cable. Do not use premium grease or other types of grease, otherwise they may cause deterioration in gear shifting performance.
- If gear shifting adjustments cannot be carried out, check that the rear fork ends are aligned. Check whether the cable is lubricated and clean, and if the outer casing is too long or short.
- Do not remove the lever unit.

■ Disc Brake

- If the brake caliper mounting boss and the fork end are not of standard dimensions, 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-tipped screwdriver or similar tool to push back the brake pads, while being careful not to damage the surfaces of the brake pads. (If the brake pads are not installed, use a flat-shaped tool to push the pistons straight back in, while being careful not to damage them.)
If it is difficult to push the brake pads or pistons back, remove the bleed screws and 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 cleaners 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.

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.

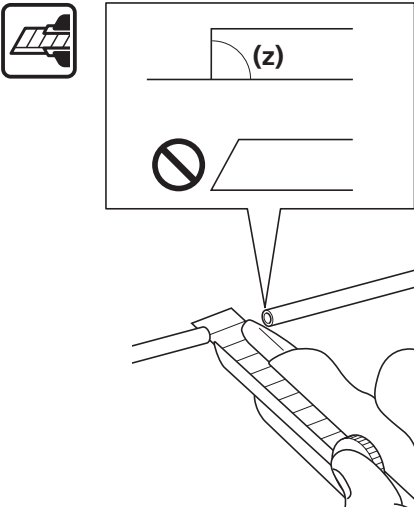
Tool		Tool		Tool	
	2 mm hexagon wrench		7 mm socket wrench		TL-CT12
	2.5 mm hexagon wrench		Screwdriver[#1]		SM-DISC (Oil funnel and oil stopper)
	4 mm hexagon wrench		Slotted screwdriver (nominal dia. 0.8 x 4)		TL-BT03/TL-BT03-S
	5 mm hexagon wrench		Utility knife		
	8 mm spanner		TL-BH61		

INSTALLATION

INSTALLATION

Installation of the brake hose

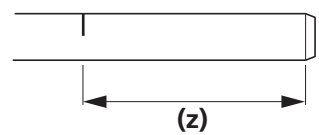
1



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

(z) 90°

2



Put a mark on the brake hose beforehand as shown in the illustration so that you can check if the ends of the brake hose are secured to the hose mounts of the brake caliper and the dual control lever.

(As a guide, the length **(z)** of the portion of the brake hose that is inside the mount is approximately 11 mm.)

NOTICE

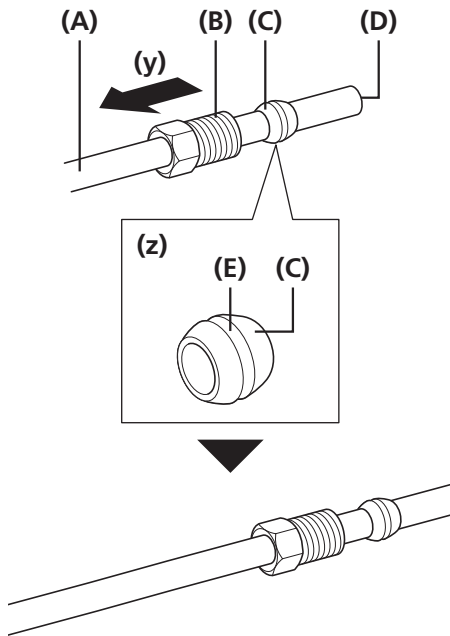
Use the utility knife safely and correctly in accordance with its instruction manual.



TECH TIPS

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

3



Pass the brake hose through the connecting bolt and olive.

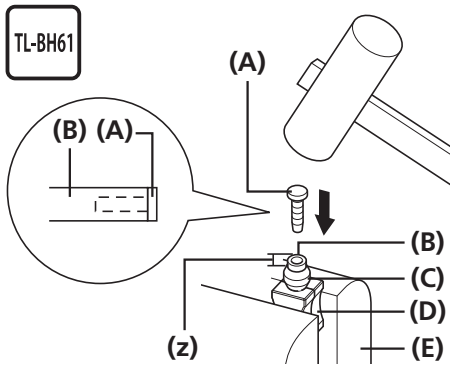
- (y) Direction of insertion
- (z) Grease the outside of the olive.

- (A) Brake hose
- (B) Connecting bolt
- (C) Olive
- (D) Cut end
- (E) Grease

NOTICE

For installation to the built-in type frame, first connect the end of the brake hose to which the banjo is not attached to the frame caliper.

4



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

Connect the brake hose to TL-BH61 and secure TL-BH61 in a vise.

Then, hammer down the connector insert until the connector insert mount comes into contact with the end of the brake hose.

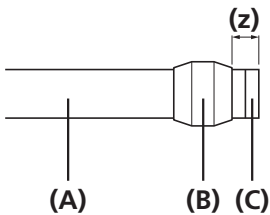
- (z) SM-BH59-J-SS : 1 mm

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

NOTICE

If the end of the brake hose is not in contact with the connector insert mount, the brake hose may be disconnected or cause fluid leaks.

5



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

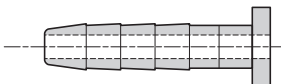
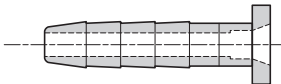
(z) 2 mm

Model No.	Length	Color
SM-BH59-J-SS	13.2 mm	Gold

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

NOTICE

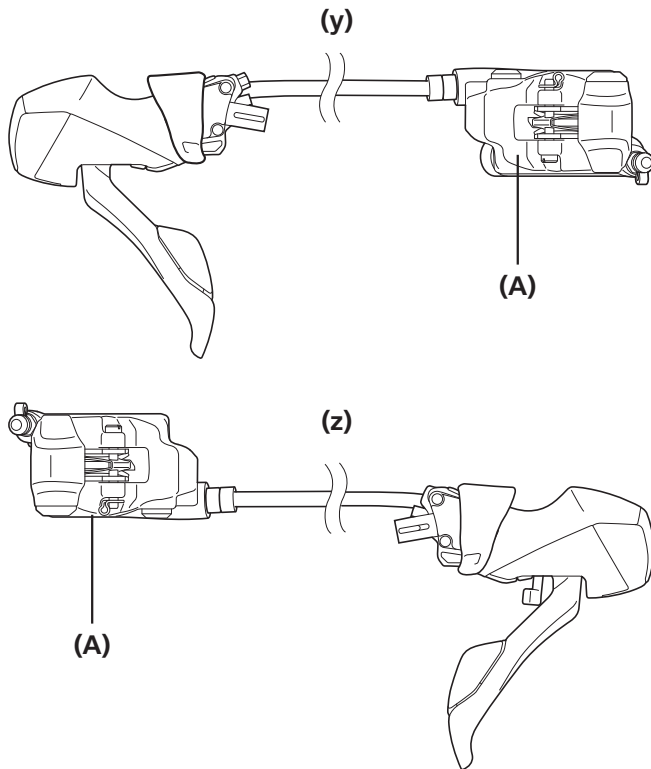
Use the dedicated connector insert supplied with SM-BH59-J-SS.
Use of any connector insert other than the one supplied may produce a loose assembly, leading to oil leaks or other problems.



6

Make sure that the brake hose is not twisted.

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

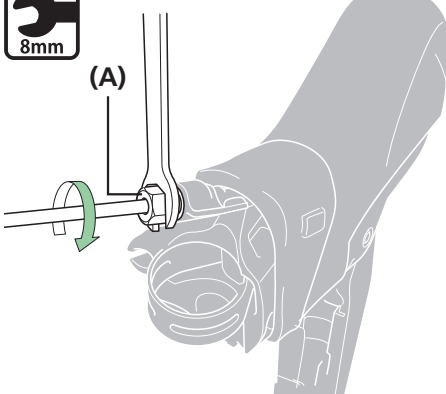


(y) Left lever

(z) Right lever

(A) Brake caliper

7



Secure the dual control lever to the handlebar or in a vise and insert the brake hose straight.

Tighten the connecting bolt with a spanner while pushing the brake hose.

(A) Connecting bolt

Tightening torque



5 - 7 N·m

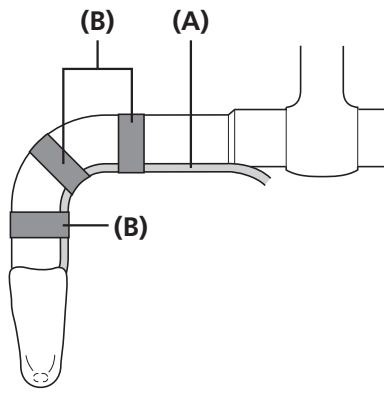
NOTICE

- At this point, make sure the brake hose is straight when pushing.
- When installing the brake hose with the dual control lever secured to the handlebar, adjust the angle of the bracket to make it easier to turn the spanner. At that time, be careful not to damage the handlebar and other parts.

INSTALLATION

Installation of the brake hose

8



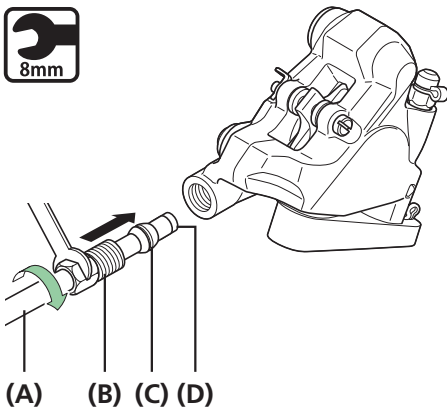
Temporarily secure the brake hose to the handlebar (by using tape or a similar material).

(A) Brake hose

(B) Tape

End of the brake hose on the brake caliper side

1



Attach the connector insert to the brake hose.

(A) Brake hose

(B) Connecting bolt

(C) Olive

(D) Connector insert

Tightening torque



5 - 7 N·m

2

While pushing the brake hose, tighten the connecting bolt.

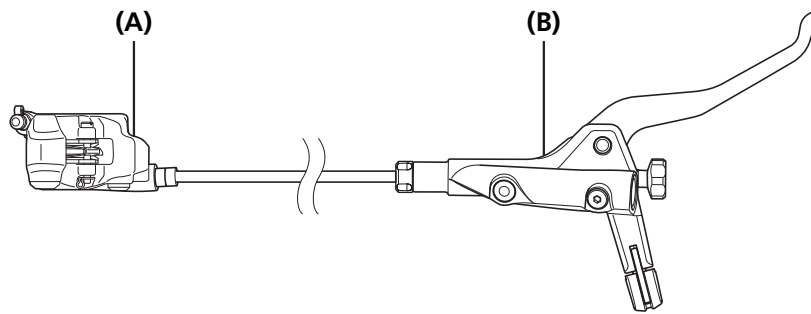
INSTALLATION

Installation of the brake hose (Flat handlebar type)

Installation of the brake hose (Flat handlebar type)

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

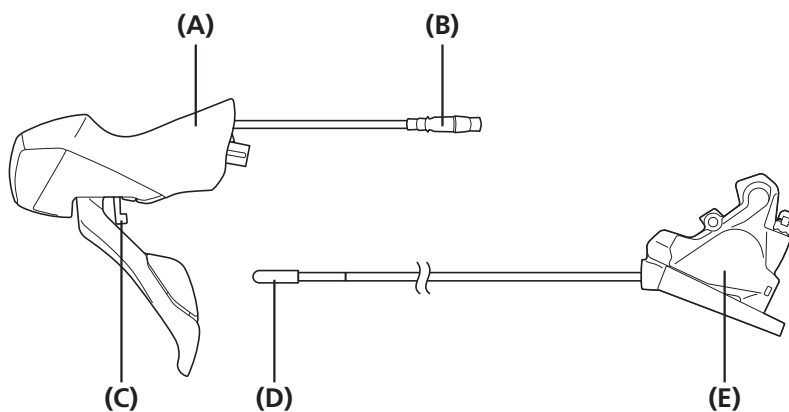
(B) Brake lever

NOTICE

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

Installation of the brake hose (easy hose joint system)

Overview of the easy hose joint system



(A) Dual control lever

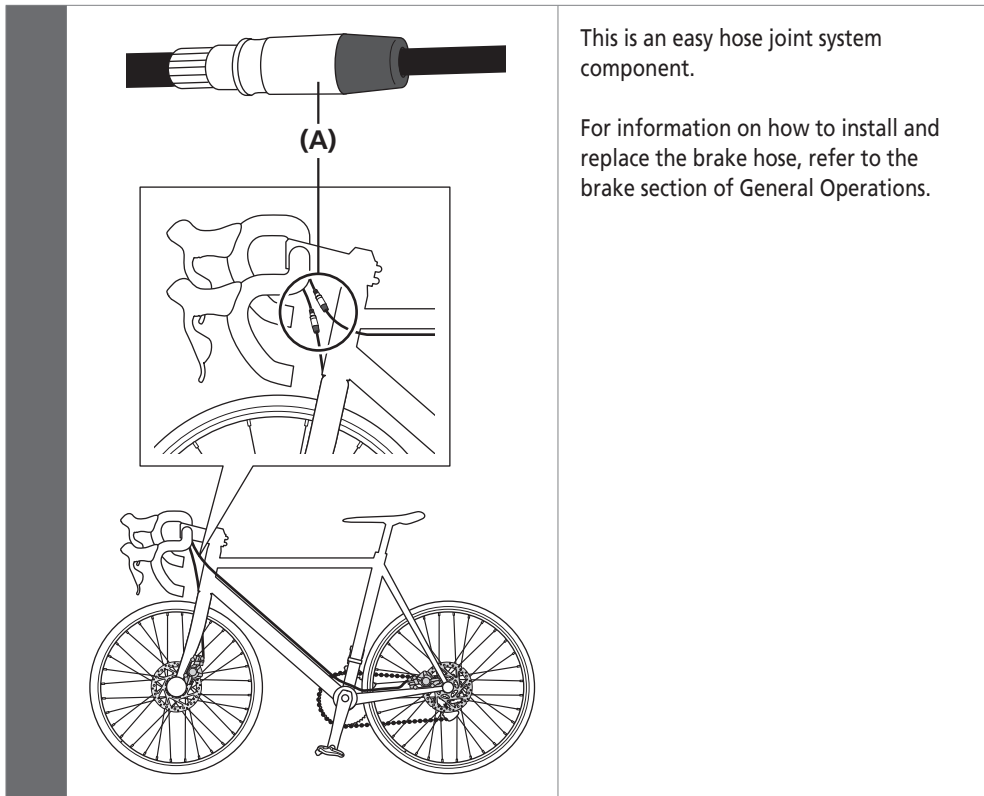
(B) Joint sleeve

(C) Lever stopper

(D) Hose cap

(E) Brake caliper

About the easy hose joint system

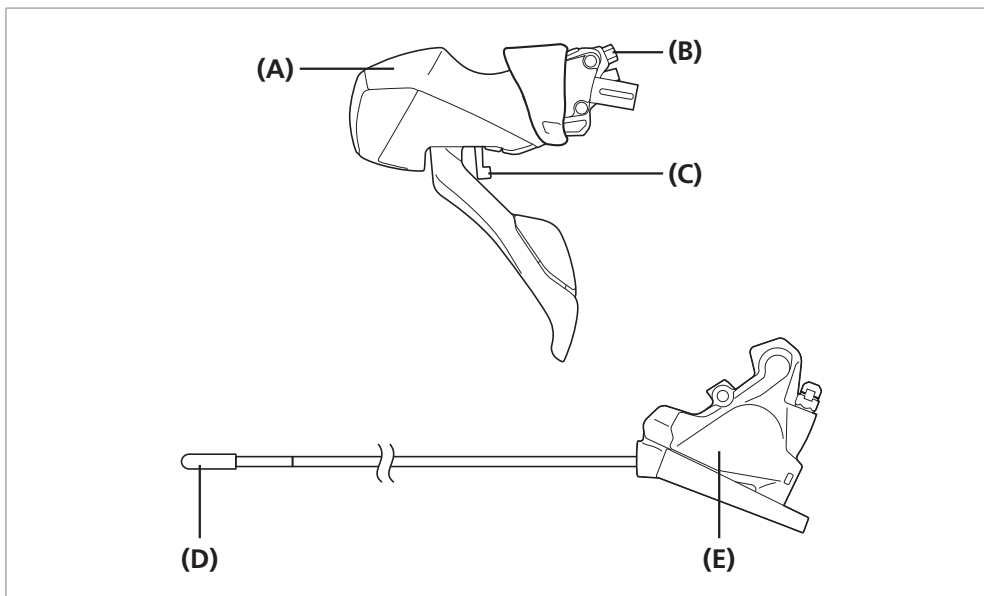


This is an easy hose joint system component.

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

(A) Joint sleeve

About the easy hose joint system (Direct)



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

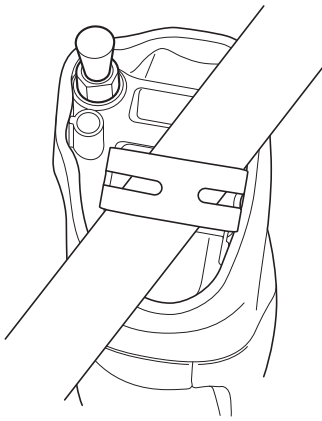
1 Pass the brake hose through each hole in the built-in frame.

2 Remove the hose cap.

INSTALLATION

Installation of the brake hose (easy hose joint system)

3



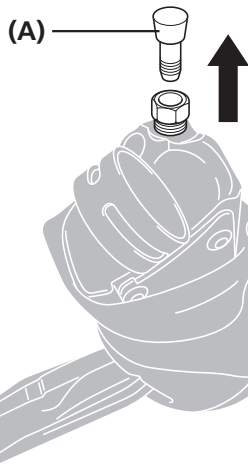
Secure the dual control lever to the handlebar or in a vise.

Orient the brake hose connection port of the dual control lever upward when securing.

NOTICE

When installing the brake hose with the dual control lever secured to the handlebar, adjust the angle of the bracket to make it easier to turn the spanner.
At that time, be careful not to damage the handlebar and other parts.

4



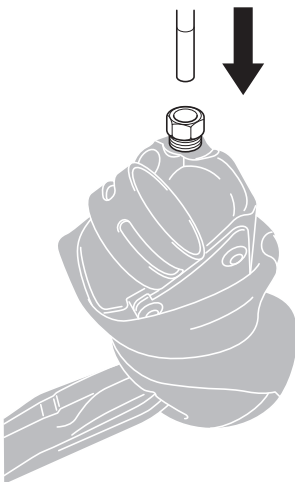
Remove the seal plug.

(A) Seal plug

NOTICE

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

5



Insert the brake hose into the joint component.

TECH TIPS

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

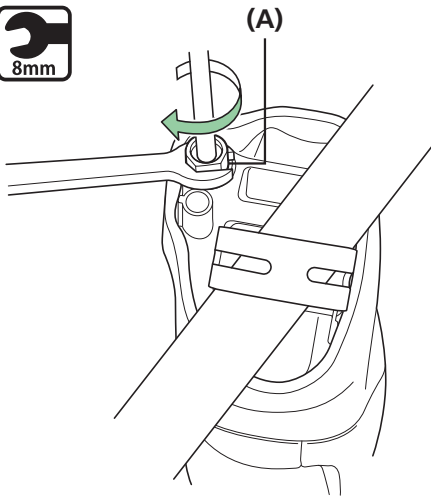
Check that the brake hose is inserted up to the line printed on the hose.

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

INSTALLATION

Installation of the brake hose (easy hose joint system)

6



Tighten the connecting bolt with an 8 mm spanner.

Then, wipe off any oil residue.

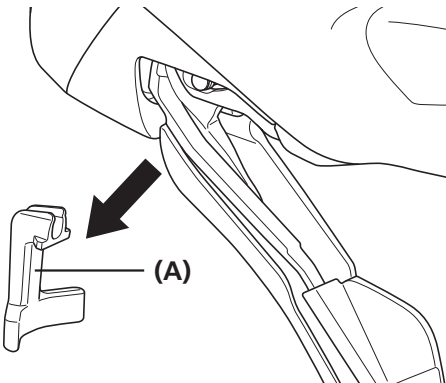
(A) Connecting bolt

Tightening torque



5 - 7 N·m

7



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.

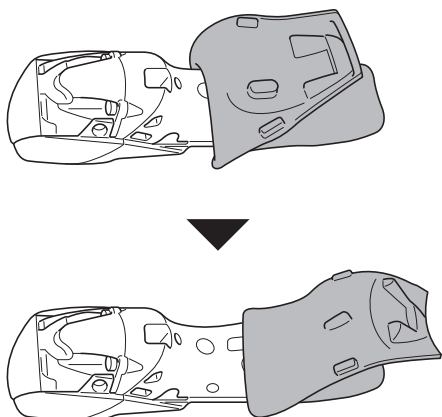


TECH TIPS

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

Installation to the handlebar

1



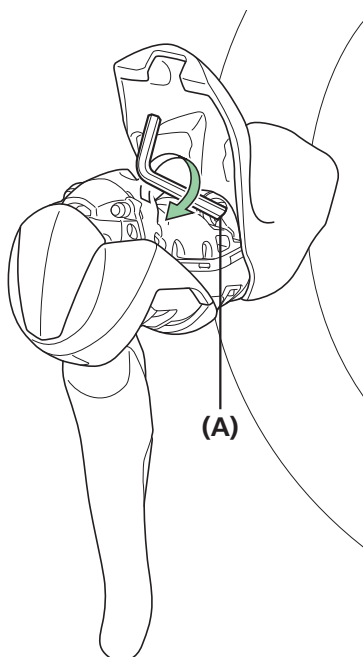
Turn over the bracket cover from the front side.

Gently turn over the ends of the bracket cover with both hands and slowly push them down.

NOTICE

Forcibly pulling it may cause damage to the bracket cover because of its material properties.

2



Use a 5 mm hexagon wrench to loosen the clamp bolt at the upper section of the bracket then tighten it after setting it on the handlebar.

(A) Clamp bolt

Tightening torque



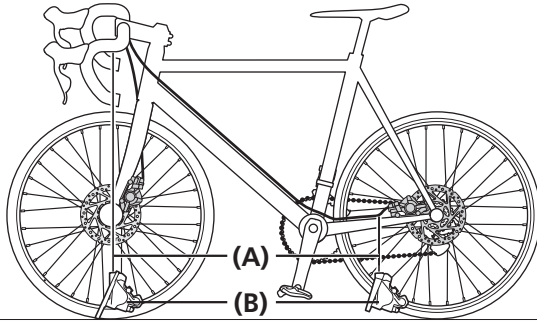
6 - 8 N·m

NOTICE

When mounting the shifting lever to a drop handlebar, loosen the clamp bolt sufficiently. Otherwise, the handlebar may be damaged.

■ Adding Shimano genuine mineral oil and bleeding air

With the bleed spacer (yellow) attached to the brake caliper, place the bicycle in the work stand as shown in the illustration.



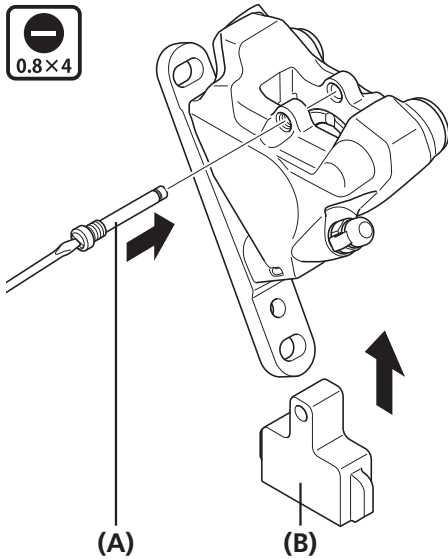
- (A) Brake hose
- (B) Brake caliper

NOTICE

When bleeding the brake caliper, you need SM-DISC (oil funnel and oil stopper).



1



Mount the bleed spacer (yellow).

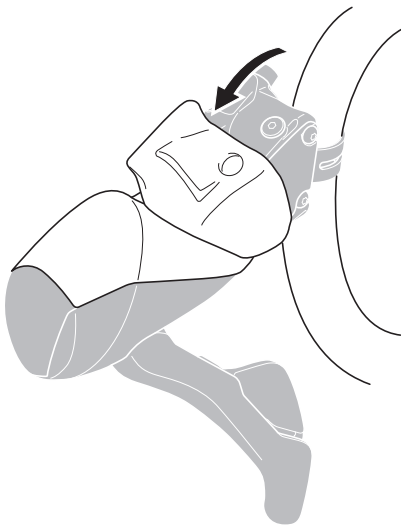
- (A) Pad axle
- (B) Bleed spacer

Tightening torque



0.1 - 0.3 N·m

2

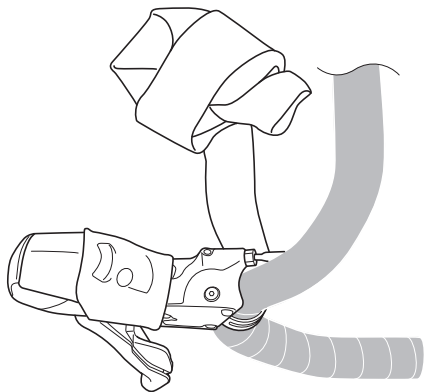


Turn over the bracket cover from the back side.

INSTALLATION

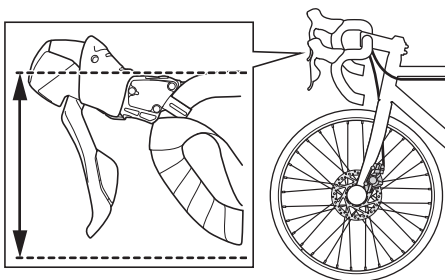
▶▶ Adding Shimano genuine mineral oil and bleeding air

3



Remove the handlebar tape.

4

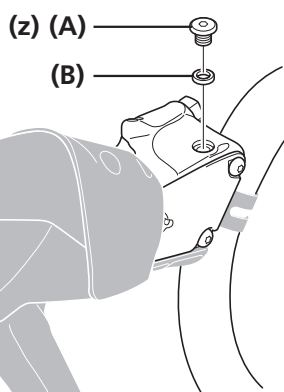


Adjust the position of the bleed screw so that its surface is parallel to the ground.

NOTICE

When tilting, be careful not to forcibly pull on the brake hose or shifting cable.

5



Remove the bleed screw and O-ring.

(z) 2.5 mm hexagon wrench

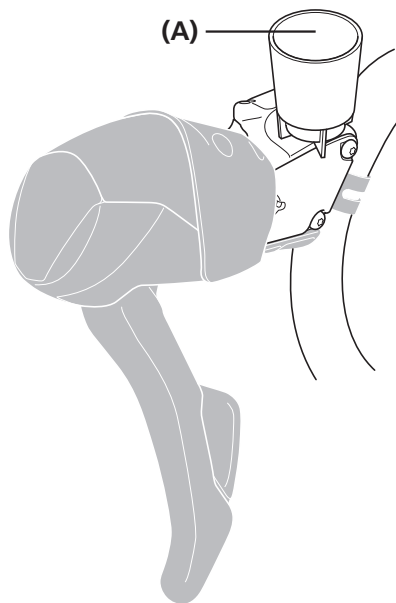
(A) Bleed screw

(B) O-ring

NOTICE

Be careful not to drop the bleed screw or O-ring.

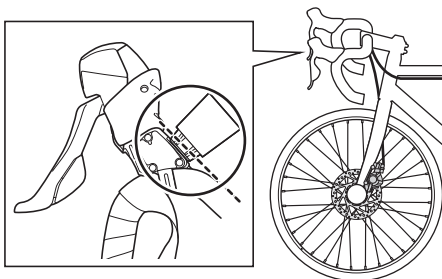
6



Mount the oil funnel.

(A) Oil funnel

7



As shown in the illustration, tilt the handlebar so that the top of the bracket bleed screw is at a 45° angle to the ground.

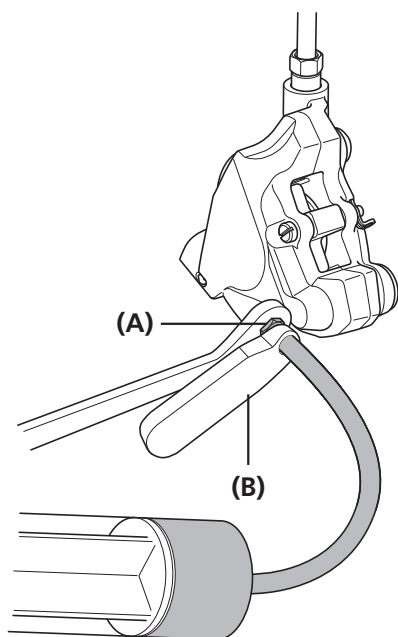
NOTICE

When tilting, be careful not to forcibly pull on the brake hose or shifting cable.

8

Secure the brake caliper in a vise while bleeding.

9



Set a 7 mm socket wrench in place.

Fill the syringe with sufficient oil, connect the syringe tube to the bleed nipple, and fasten it with the tube holder so that the tube will not be disconnected.

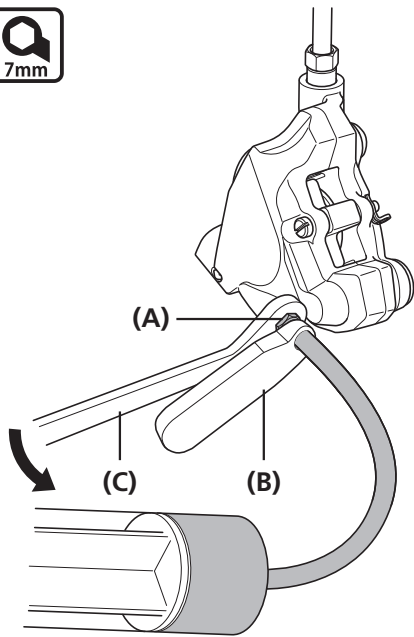
(A) Bleed nipple

(B) Tube holder

NOTICE

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

10



Loosen the bleed nipple by a 1/8 of a turn to open it.

Push the piston of the syringe to add oil.

The oil then starts coming out from the oil funnel.

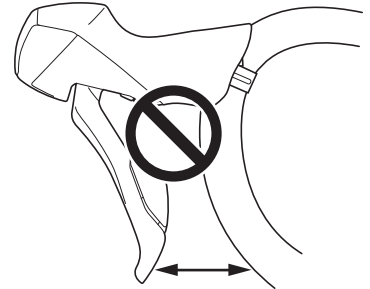
Continue adding oil until there are no more air bubbles in the oil that is coming out.

- (A) Bleed nipple
- (B) Tube holder
- (C) 7 mm socket wrench

NOTICE

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.)



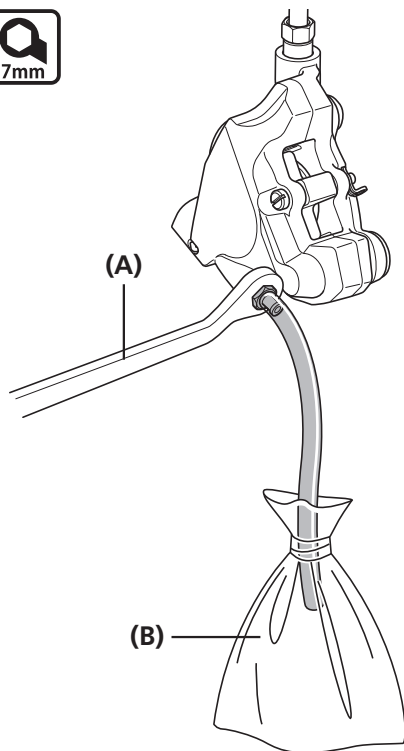
11



Once there are no more air bubbles in the oil in the funnel, temporarily close the bleed screw.

Remove the syringe while covering the end of the syringe tube with a waste cloth to prevent oil from spattering.

12



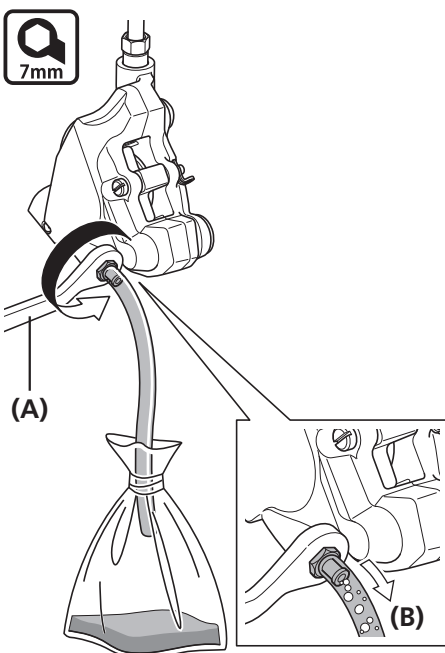
Tie the supplied tube and bag with rubber bands.

Set a 7 mm socket wrench as shown in the illustration, and connect the tube to the bleed nipple.

(A) 7 mm socket wrench

(B) Bag

13



Loosen the bleed nipple.

At this point, make sure that the tube is secured to 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.

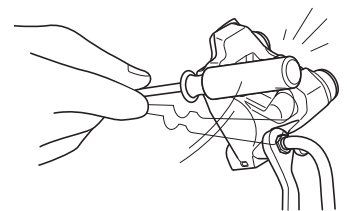
(A) 7 mm socket wrench

(B) Air bubble



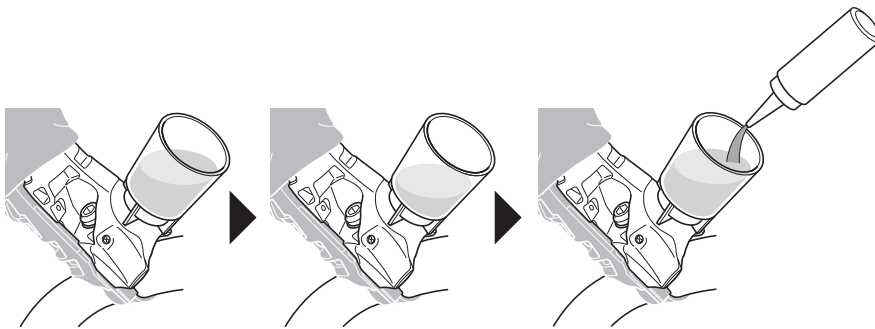
TECH TIPS

It may be effective to shake the brake hose gently, tap the lever bracket or brake calipers gently with a screwdriver, or move the position of the calipers at this time.

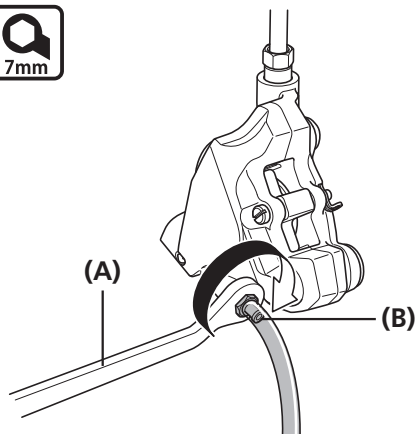


14

The level of liquid inside the oil funnel drops at this time, so keep filling the funnel with oil to maintain the level of liquid so that air is not drawn in.



15

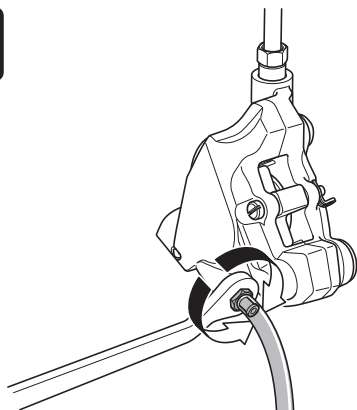
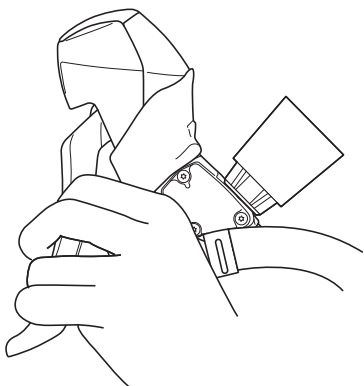


Once no more air bubbles come from the bleed nipple, temporarily close the bleed nipple.

(A) 7 mm socket wrench

(B) Bleed nipple

16



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 brake calipers.

Repeat this procedure about 2 to 3 times.

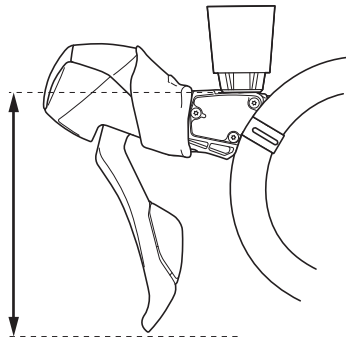
Then tighten the bleed nipple.

Tightening torque



4 - 7 N·m

17



By raising the handlebar, adjust the position of the bleed screw so that its surface is parallel to the ground and check that no air bubbles remain.

WARNING

Make sure to set the lever to the specified position before bleeding air. If you bleed air without setting the lever to the specified position, air bubbles may remain in the brake system. Air bubbles remaining in the brake system may prevent the brakes from operating and result in serious injury due to a fall or collision.

NOTICE

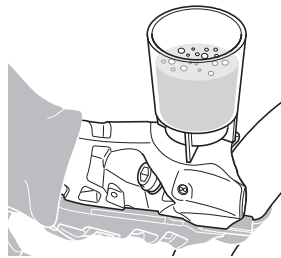
Secure the handlebar when conducting the check.

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

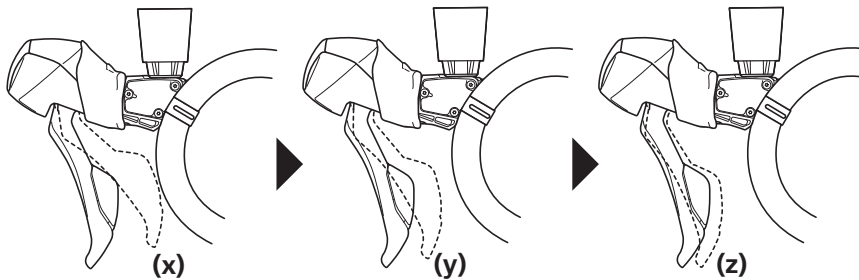
Once the bubbles stop appearing, depress the brake lever as far as it will go.

Under normal conditions, lever action should feel stiff at this point.

18

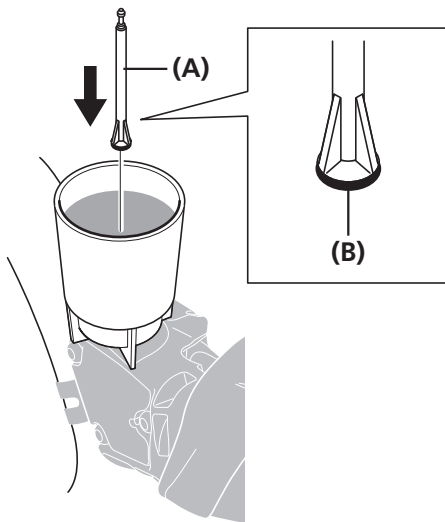


Lever operation



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

19

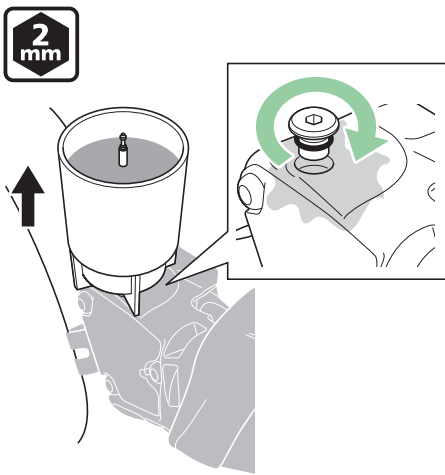


Plug the oil funnel with the oil stopper so that the O-ring mounted side is facing downward.

(A) Oil stopper

(B) O-ring

20



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

At this point, use a waste cloth to prevent oil from flowing out to the surrounding areas.

Tightening torque

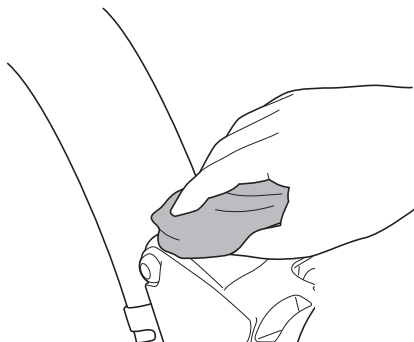


0.5 - 1 N·m

NOTICE

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

21

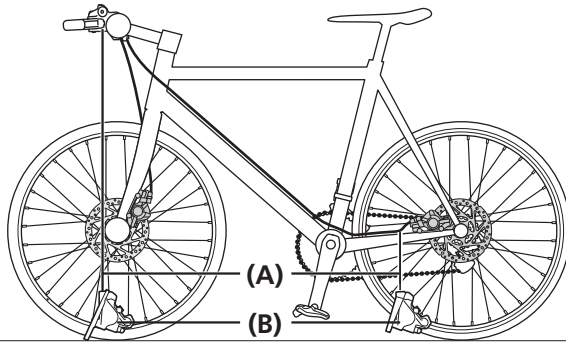


Wipe away any oil which may have leaked out.

▶▶ Adding Shimano genuine mineral oil and bleeding air (Flat handlebar type)

■ Adding Shimano genuine mineral oil and bleeding air (Flat handlebar type)

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.



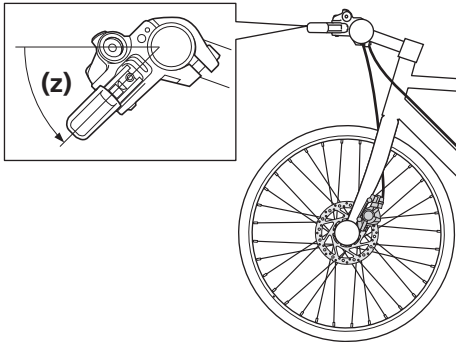
(A) Hose

(B) Caliper

NOTICE

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

1

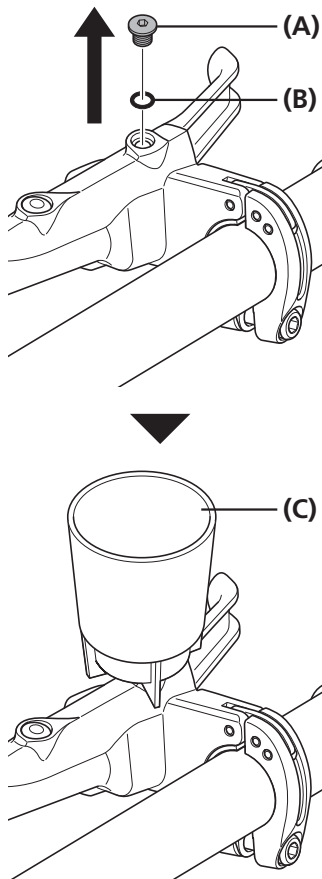


Set the brake lever so that it is in riding position at 45° angle from the ground.

(z) 45°

▶▶ Adding Shimano genuine mineral oil and bleeding air (Flat handlebar type)

2



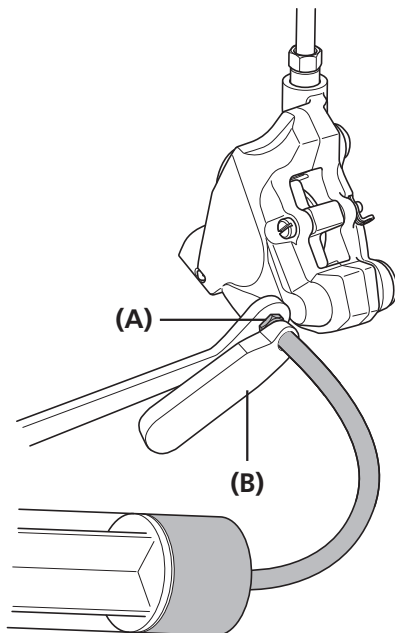
Remove the upper bleed screw and O-ring and insert the oil funnel.

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



Do not insert the oil stopper at this time.

3



Set a 7 mm socket wrench in place.

Fill the syringe with sufficient oil, connect the syringe tube to the bleed nipple, and fasten it with the tube holder so that the tube will not be disconnected.

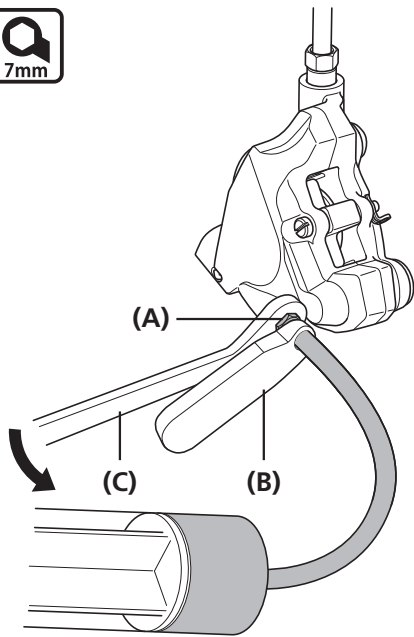
- (A) Bleed nipple
- (B) Tube holder

NOTICE

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

▶ Adding Shimano genuine mineral oil and bleeding air (Flat handlebar type)

4



Loosen the bleed nipple by a 1/8 of a turn to open it.

Push the piston of the syringe to add oil.

The oil then starts 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) Tube holder
- (C) 7 mm socket wrench

5

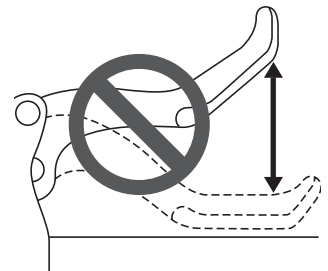
Once there are no more air bubbles mixed in with the oil, temporarily close the bleed nipple.

NOTICE

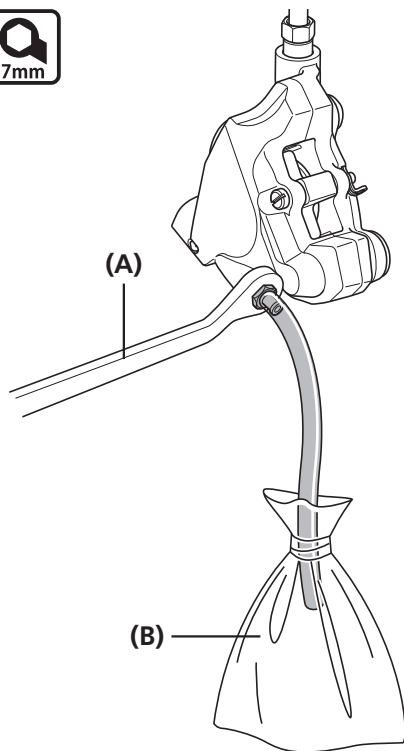
Secure the brake caliper in a vise to prevent the tube from being accidentally disconnected.

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.)



6



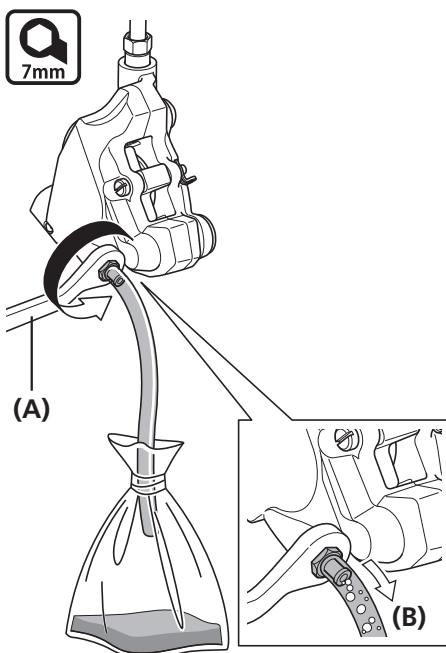
Tie the supplied tube and bag with rubber bands.

Set a 7 mm socket wrench as shown in the illustration, and connect the tube to the bleed nipple.

(A) 7 mm socket wrench

(B) Bag

7



Loosen the bleed nipple.

At this point, make sure that the tube is secured to 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.

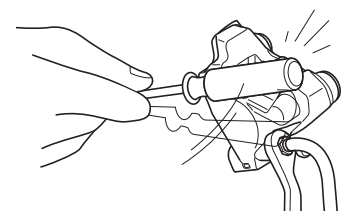
(A) 7 mm socket wrench

(B) Air bubble



TECH TIPS

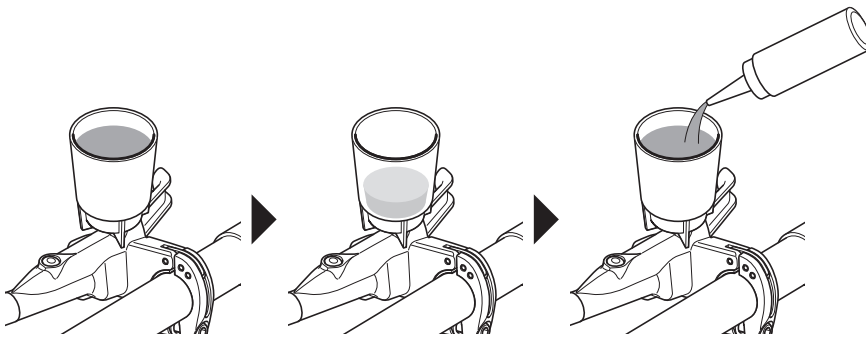
It may be effective to shake the brake hose gently, tap the lever bracket or brake calipers gently with a screwdriver, or move the position of the calipers at this time.



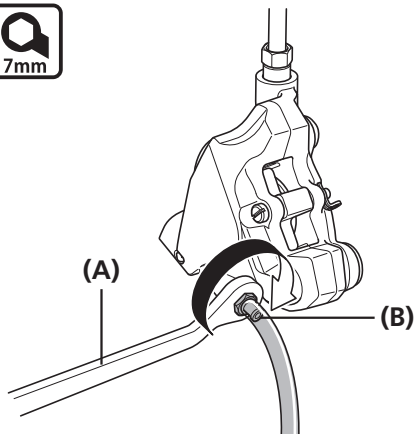
▶ Adding Shimano genuine mineral oil and bleeding air (Flat handlebar type)

8

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).



9

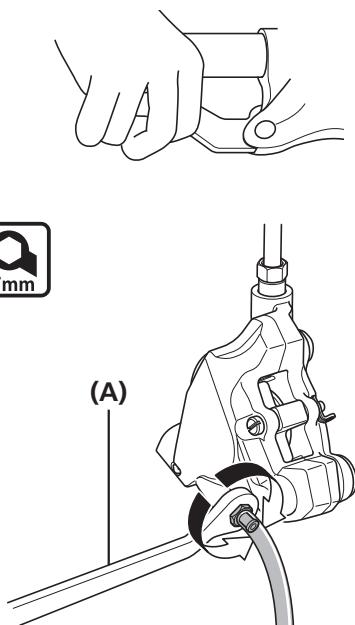


Once no more air bubbles come from the bleed nipple, temporarily close the bleed nipple.

(A) 7 mm socket wrench

(B) Bleed nipple

10



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



4 - 6 N·m

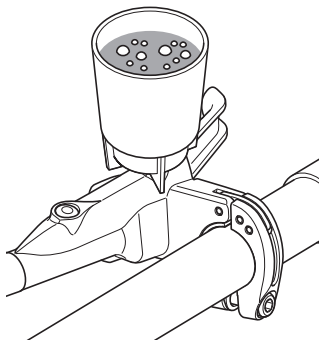
▶▶ Adding Shimano genuine mineral oil and bleeding air (Flat handlebar type)

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

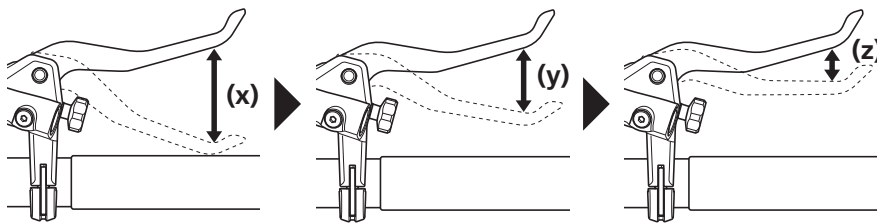
Once the bubbles stop appearing, depress the brake lever as far as it will go.

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

11



Lever operation



(x) Loose

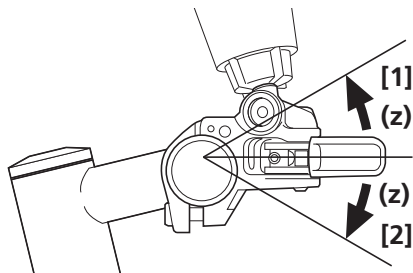
(y) Slightly stiff

(z) Stiff

NOTICE

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

12



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 11 to check that there is no air remaining.

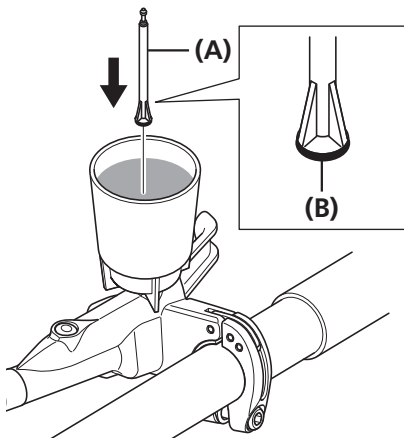
Next, tilt the lever unit 30° in the direction of [2], and carry out step 11 again to check that there is no air remaining.

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

(z) 30°

▶▶ Adding Shimano genuine mineral oil and bleeding air (Flat handlebar type)

13

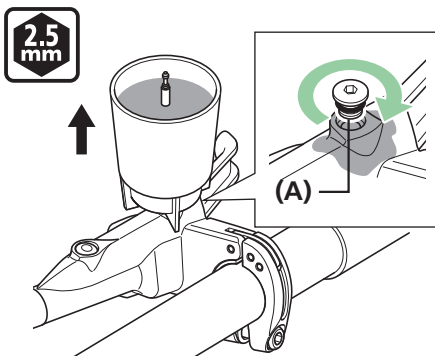


Plug the oil funnel with the oil stopper so that the side with the O-ring attached is facing downward.

(A) Oil stopper

(B) O-ring

14



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

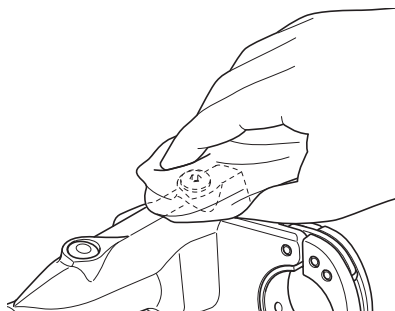


0.3 - 0.5 N·m

NOTICE

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

15

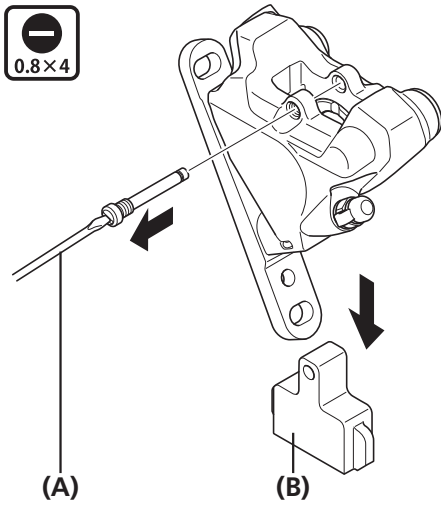


Wipe away any oil that has overflowed.

■ Installation of brake calipers

Installing the brake pads

1

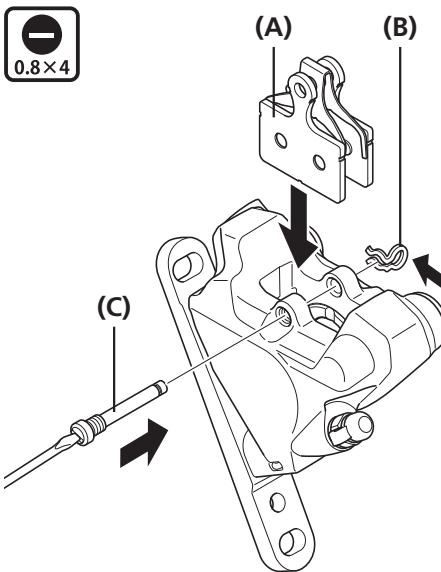


Remove the bleed spacer (yellow).

(A) Slotted screwdriver
(nominal dia. 0.8 x 4)

(B) Bleed spacer

2



Install the new brake pads and bolts.

Make sure to use a snap retainer at this time.

Install the pads as shown in the illustration.

(A) Brake pad

(B) Snap retainer

(C) Pad axle

Tightening torque



0.1 - 0.3 N·m

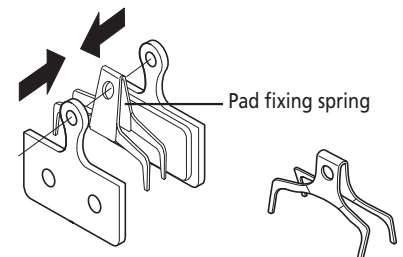
NOTICE

When using a pad with fins, take note of the left (L) and right (R) markings to set it.



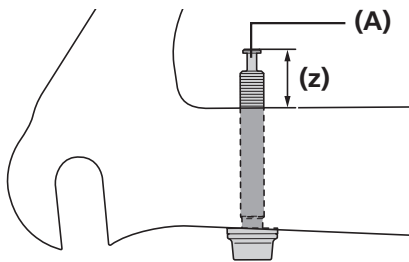
TECH TIPS

Install the pad fixing spring as shown in the illustration.



Checking the length of converter fixing bolts

Same for 140 mm and 160 mm

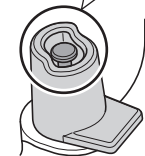
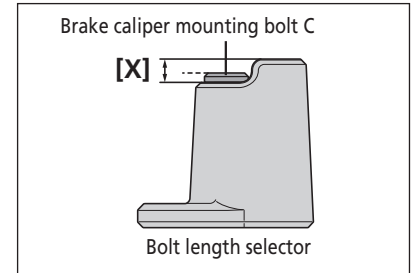


Insert brake caliper mounting bolts C into the frame mount area, and check that the length (z) of the protruding portion of each brake caliper mounting bolt C is 13 mm.

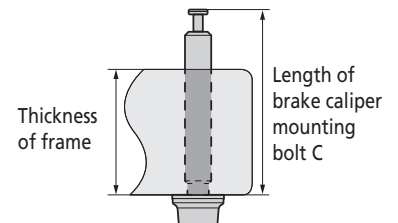
(A) Brake caliper mounting bolt C

NOTICE

- When using a bolt length selector, check whether the tip of the brake caliper mounting bolt C is within the range [X].



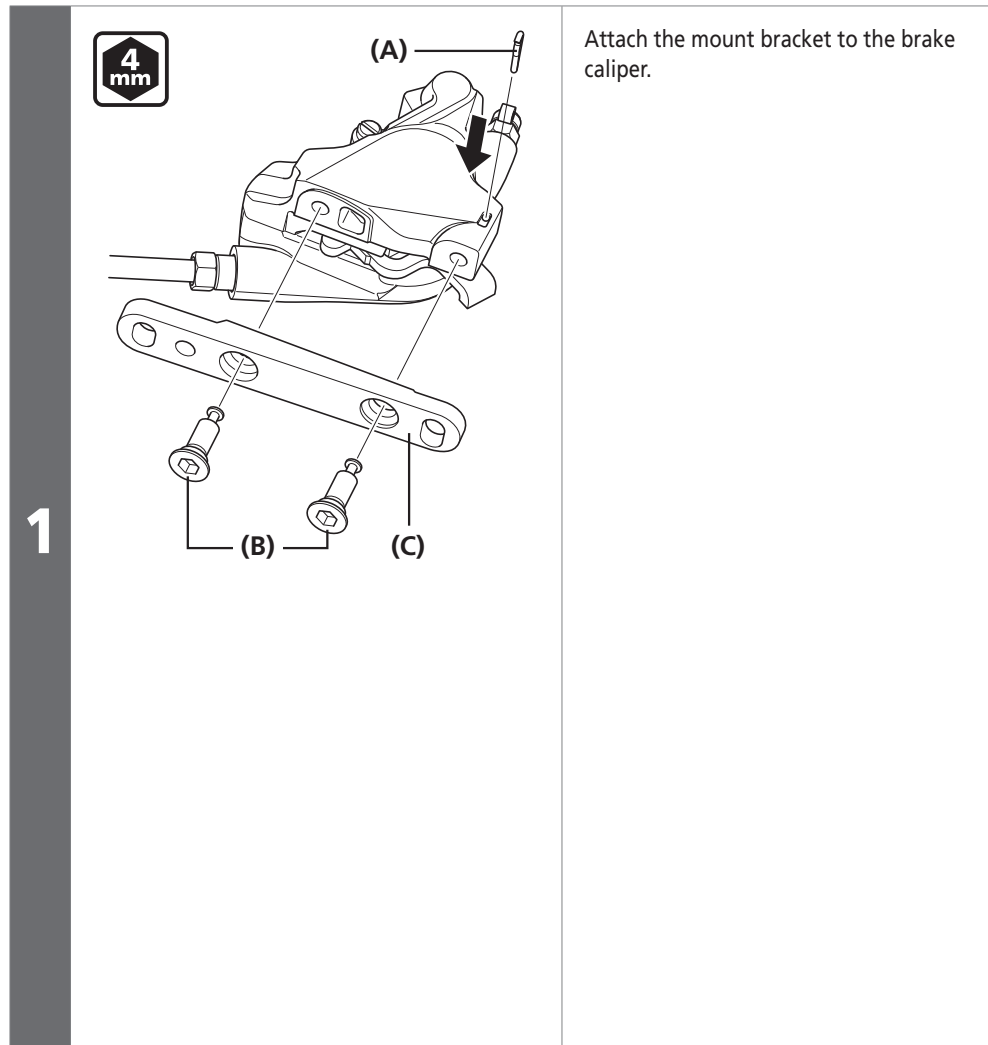
- Do not use a washer when checking the length of brake caliper mounting bolt C.
- The length of brake caliper mounting bolts C to be used vary depending on the thickness of the frame. Use brake caliper mounting bolts C that are appropriate for the thickness of the frame.



Thickness of frame	Length of brake caliper mounting bolt C	Y-part
10 mm	23 mm	Y8N208000
15 mm	28 mm	Y8N208050
20 mm	33 mm	Y8N208010
25 mm	38 mm	Y8N208020
30 mm	43 mm	Y8N208030
35 mm	48 mm	Y8N208040

Installation to the frame

When using a mount bracket (140 mm disc brake rotor)



- (A) Bolt fixing pin
- (B) Brake caliper mounting bolt B
- (C) Mount bracket

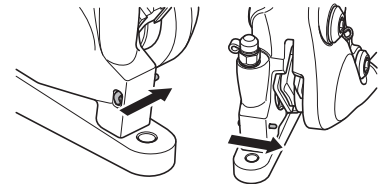
Tightening torque



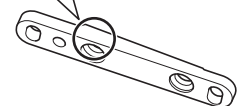
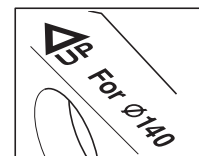
6 - 8 N·m

NOTICE

- Be sure to attach the bolt fixing pin. Check that the bolt fixing pin is fully inserted all the way to the rear.



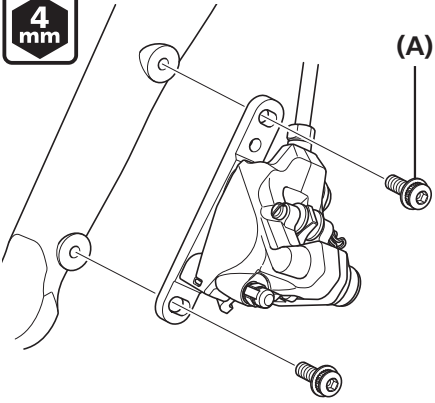
- Observe the direction indicated on the mount bracket when installing it.



INSTALLATION

Installation of brake calipers

2



Temporarily attach the mount bracket to the frame.

Depress the brake lever, and tighten the brake caliper mounting bolts A while the brake pads are pressed against the disc brake rotor.

(A) Brake caliper mounting bolt A

Tightening torque

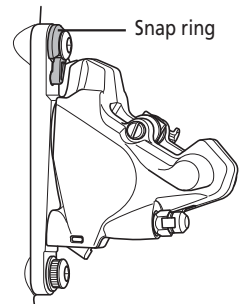


6 - 8 N·m

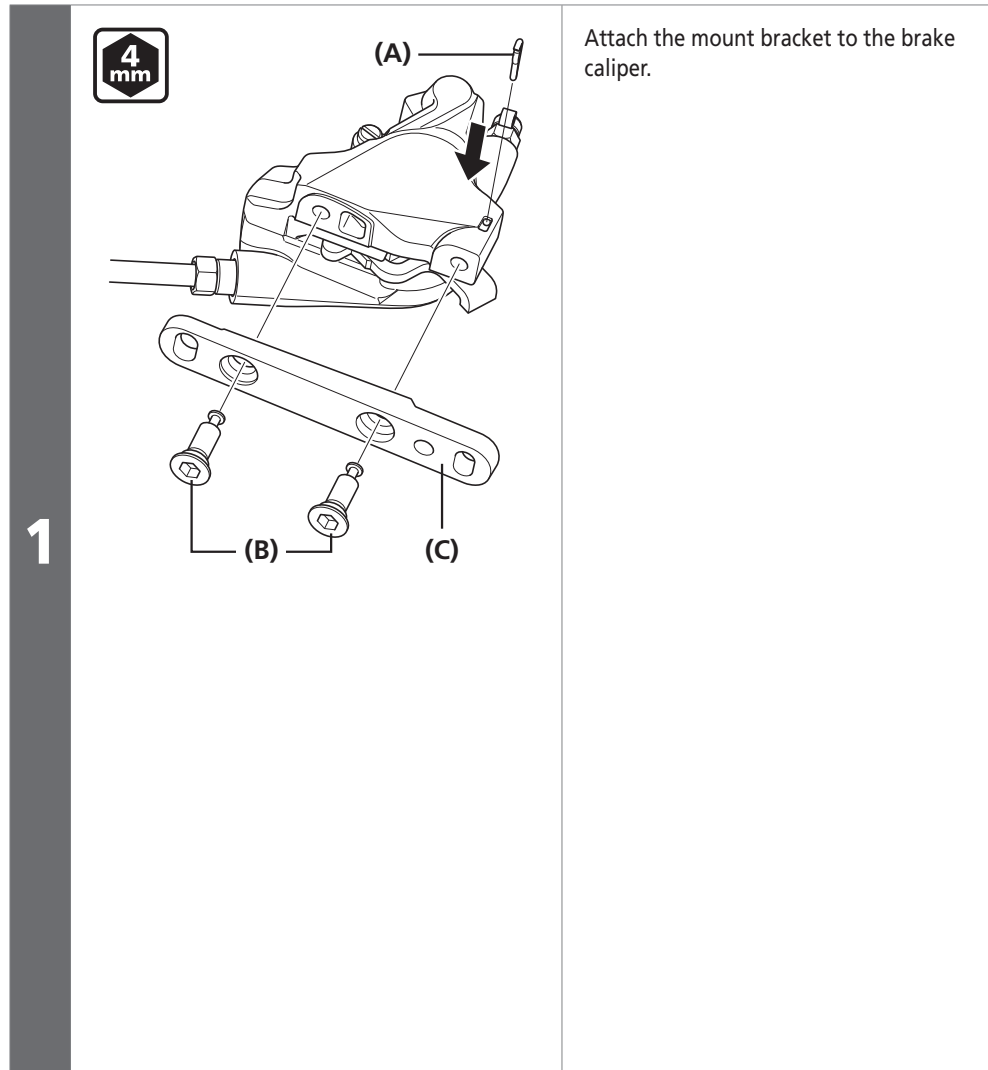
NOTICE

When tightening the brake caliper mounting bolts A, make sure to attach snap rings.

* Positions for attaching snap rings are different for 140 mm and 160 mm. (Illustration shows 140 mm)



When using a mount bracket (160 mm disc brake rotor)

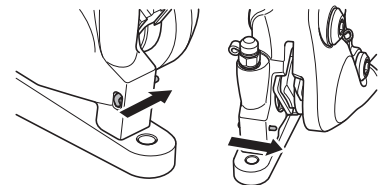


- (A)** Bolt fixing pin
- (B)** Brake caliper mounting bolt B
- (C)** Mount bracket

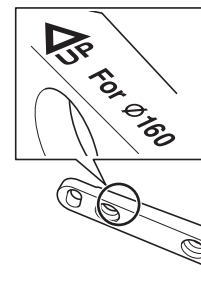
Tightening torque	
	6 - 8 N·m

NOTICE

- Be sure to attach the bolt fixing pin. Check that the bolt fixing pin is fully inserted all the way to the rear.



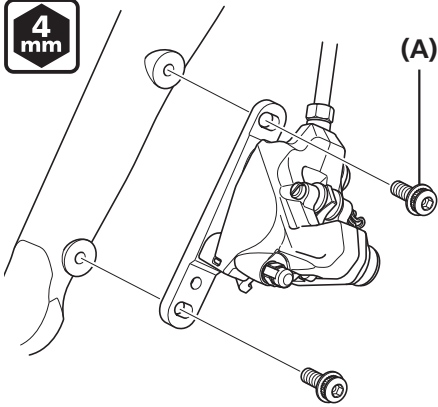
- Observe the direction indicated on the mount bracket when installing it.



INSTALLATION

Installation of brake calipers

2



Temporarily attach the mount bracket to the frame.

Depress the brake lever, and tighten the brake caliper mounting bolts A while the brake pads are pressed against the disc brake rotor.

(A) Brake caliper mounting bolt A

Tightening torque

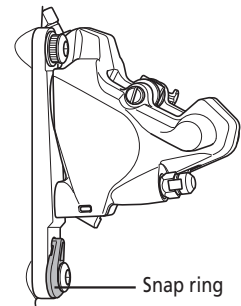


6 - 8 N·m

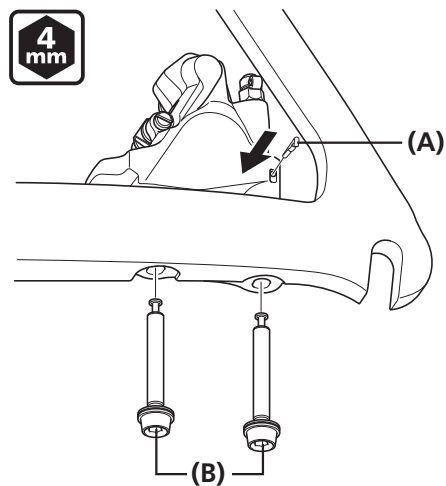
NOTICE

When tightening the brake caliper mounting bolts A, make sure to attach snap rings.

* Positions for attaching snap rings are different for 140 mm and 160 mm. (Illustration shows 160 mm)



When using a brake caliper mounting bolt C
(140 mm disc brake rotor)



Attach the brake caliper to the frame.

(A) Bolt fixing pin

(B) Brake caliper mounting bolt C

Tightening torque

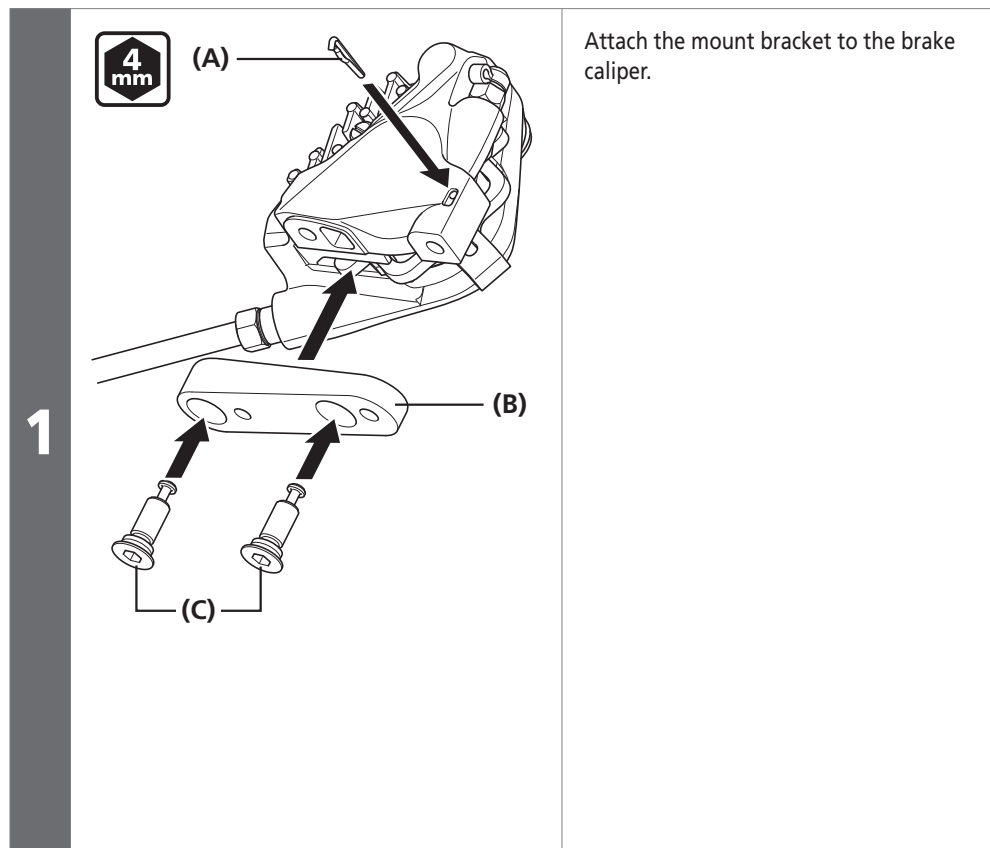


6 - 8 N·m

NOTICE

Be sure to attach the bolt fixing pin.

When using a brake caliper mounting bolt C
(160 mm disc brake rotor)



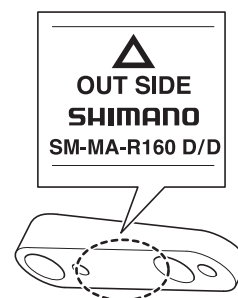
- (A) Bolt fixing pin
- (B) Mount bracket
- (C) Brake caliper mounting bolt B

Tightening torque

4 mm	6 - 8 N·m
------	-----------

NOTICE

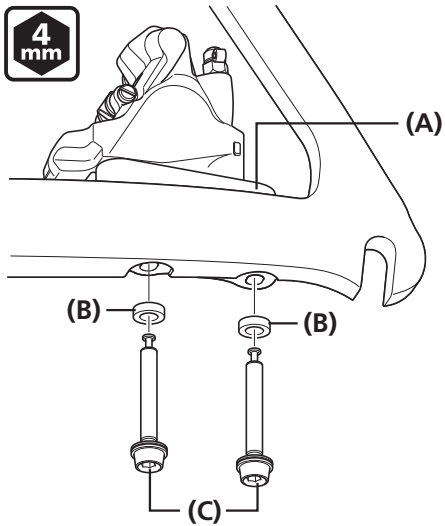
- Be sure to attach the bolt fixing pin.
- Observe the direction indicated on the mount bracket when installing it.



INSTALLATION

Installation of brake calipers

2



Attach the mount bracket to the frame.

- (A) Mount bracket
- (B) Washer
- (C) Brake caliper mounting bolt C

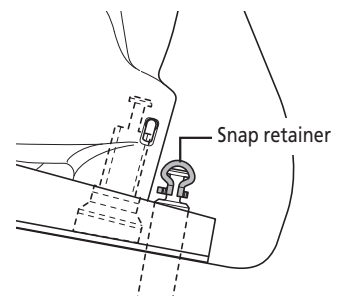
Tightening torque



6 - 8 N·m

NOTICE

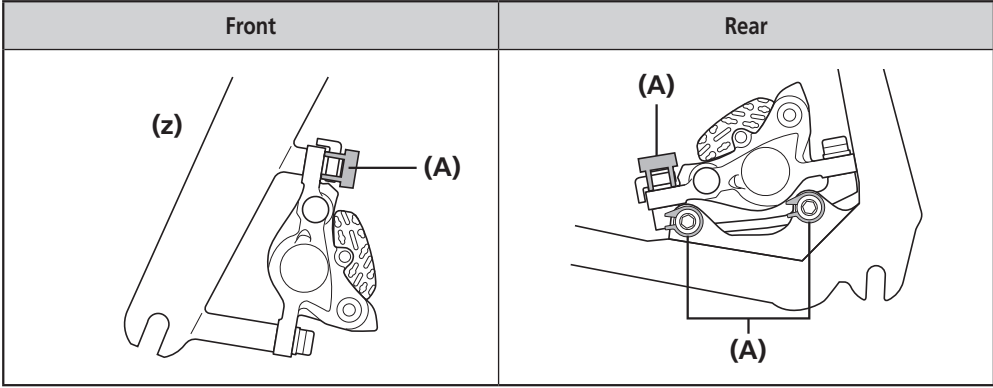
- Be sure to use the washers when installing the mount bracket.
- When tightening the brake caliper mounting bolts C, make sure to attach snap retainers.



■ Preventing loosening of frame fixing bolts

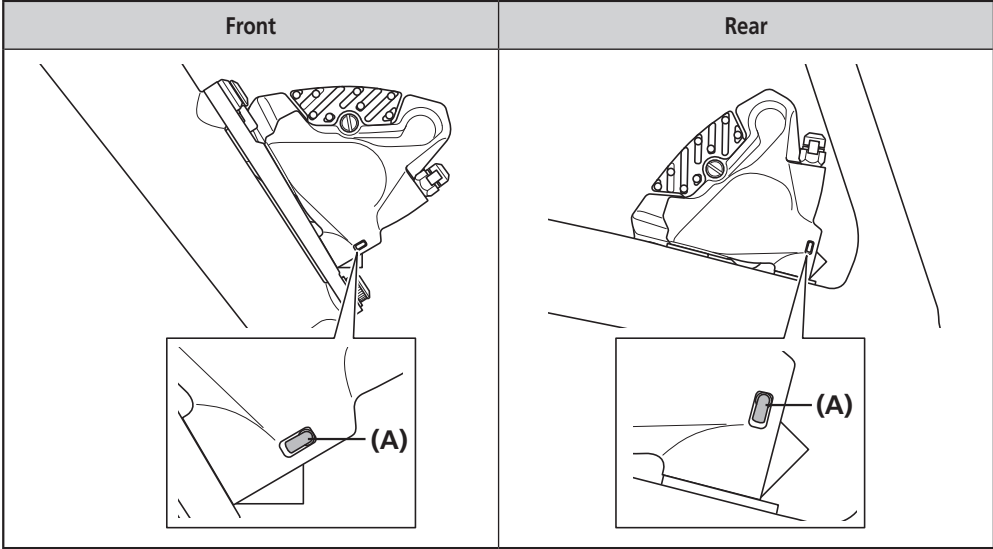
The snap ring method, the fixing pin insertion method, or the wiring method can be used to prevent the loosening of the bolts. Choose whichever method is suitable for the model, front fork and frame.

Snap ring method



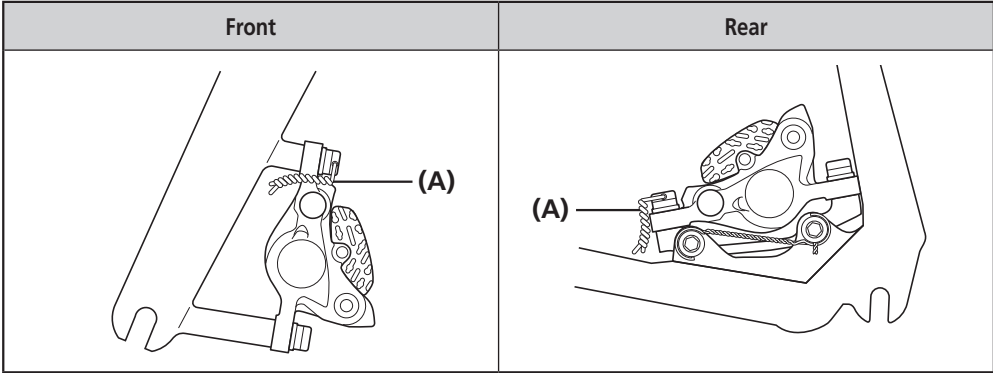
- (z) Post type
- (A) Snap ring

Fixing pin insertion method



- (A) Bolt fixing pin

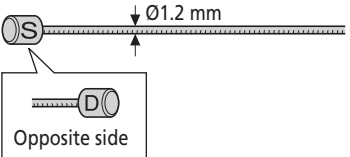
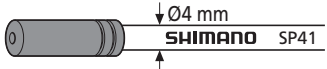
Wiring method



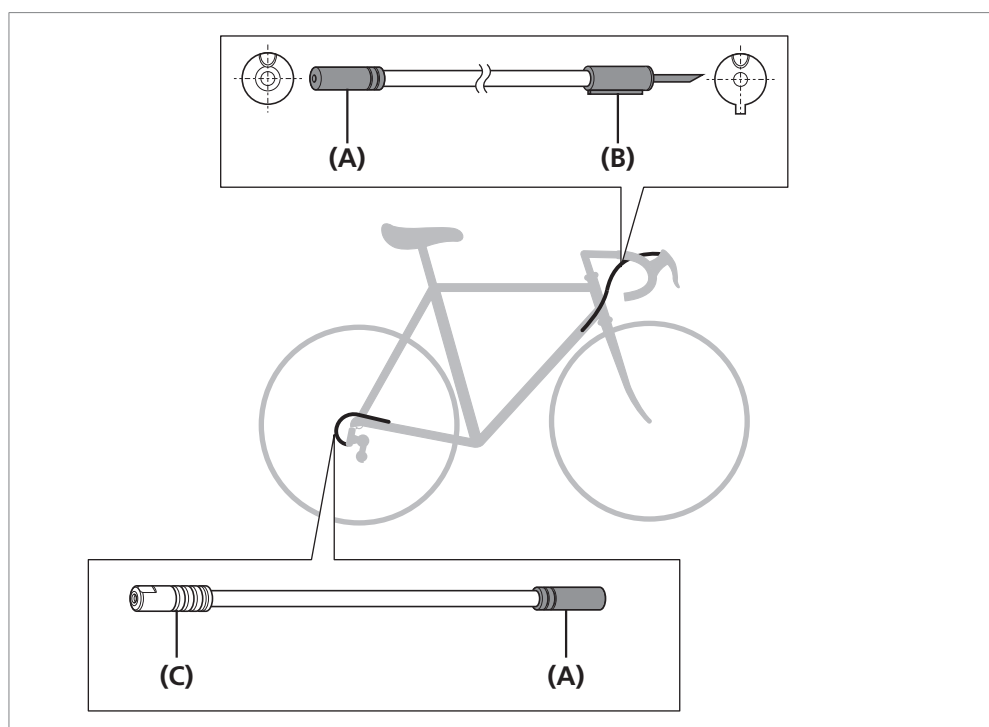
- (A) Wire

■ Installing the shifting cable

Cable used

Dedicated inner cable	Normal outer cap/SP41 outer casing
 Ø1.2 mm S D Opposite side	 Ø4 mm SHIMANO SP41

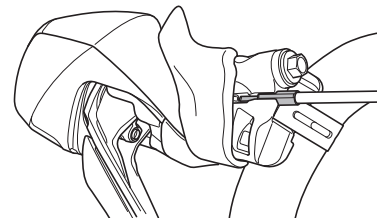
Outer cap with tongue installation position



- (A) Normal outer cap
- (B) Cap with short tongue
- (C) Sealed outer cap (resin type)

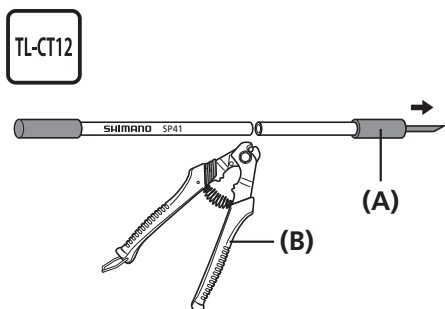
TECH TIPS

Be sure to insert the convex shape on the cap with short tongue into the groove in the bracket.



Cutting the outer casing

1



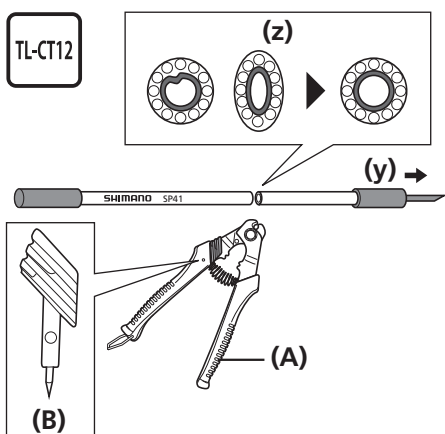
Use the cable cutter (TL-CT12) or an equivalent tool to cut the side opposite of the inscription.

- (A) Outer cap with tongue
(B) TL-CT12

NOTICE

- Use a cable which still has some length to spare even when the handlebars are turned all the way to both sides.
- Be careful not to injure your hand with the TL-CT12 needle section.

2

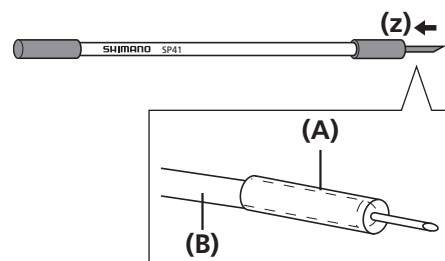


After cutting, expand the tip of the liner (Ø2.2 mm or more) with TL-CT12 or another narrow tool.

- (y) Remove the outer cap with tongue
(z) Arrange the cut end into a perfect circle

- (A) TL-CT12
(B) TL-CT12 needle

3



Insert the outer casing until it closely contacts with the seating surface of the outer cap with tongue.

- (z) Attach the outer cap with tongue

- (A) Outer cap with tongue
(B) Outer casing

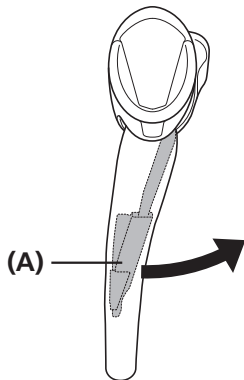
NOTICE

Be careful not to crush the tip of the convex part of the outer cap with tongue when inserting the outer casing.

Passing through the shifting inner cable

The illustration is of the rear lever.

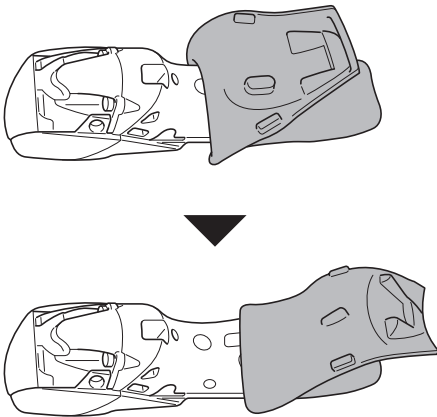
1



Operate the release lever 9 or more times and set the lever to the top position.

(A) Release lever

2



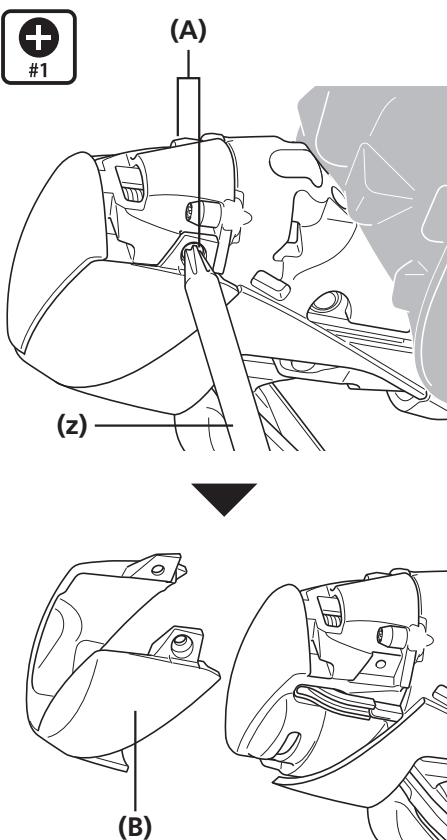
Turn over the bracket cover from the front side.

Gently turn over the ends of the bracket cover with both hands and slowly push them down.

NOTICE

Forcibly pulling it may cause damage to the bracket cover because of its material properties.

3



Loosen the screws (2 places) and remove the nameplate.

(z) Screwdriver[#1]

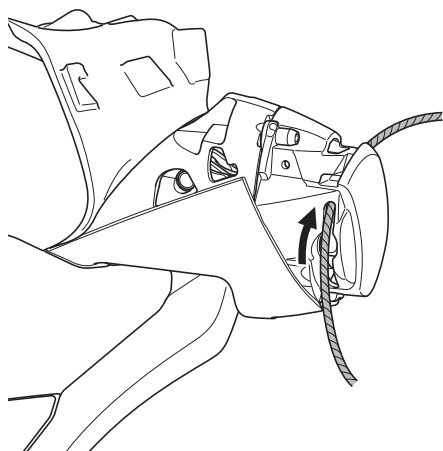
(A) Screw

(B) Name plate

NOTICE

As the screw is small, be careful not to drop it.

4

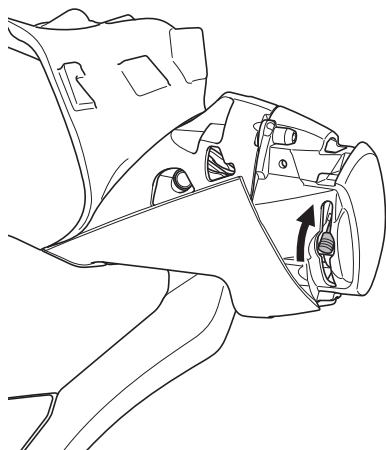


Put the inner cable through as shown in illustration.

NOTICE

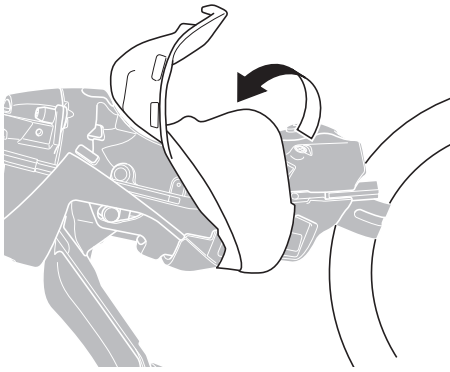
Insert the cable while being careful not to damage the coating.

5



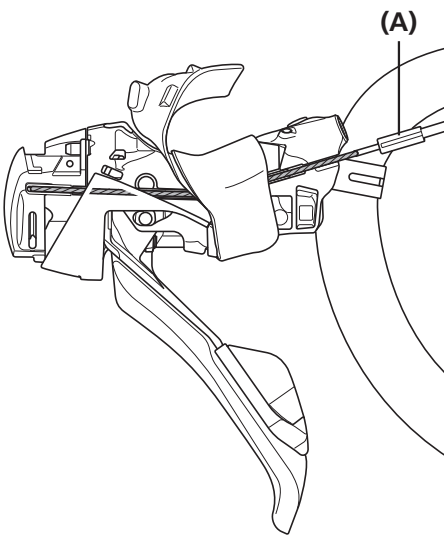
Insert the cable in such a manner that the inner end is attached to the unit.

6



Turn over the bracket cover from the back side.

7

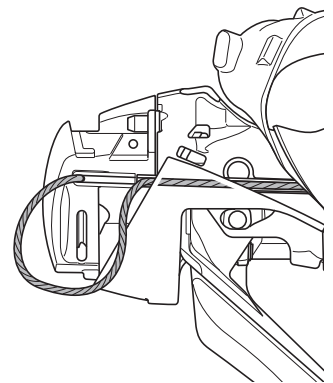


Put the inner cable through as shown in illustration.

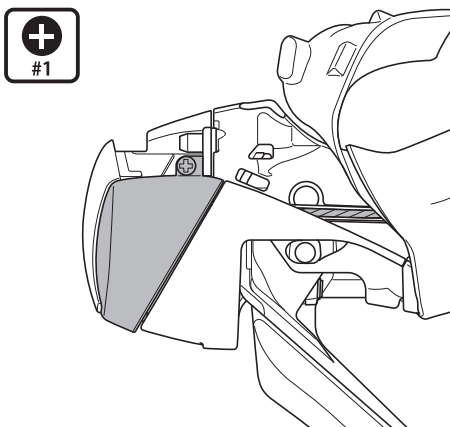
(A) Cap with short tongue

NOTICE

- Make sure not to leave a crease by bending the inner cable.



8



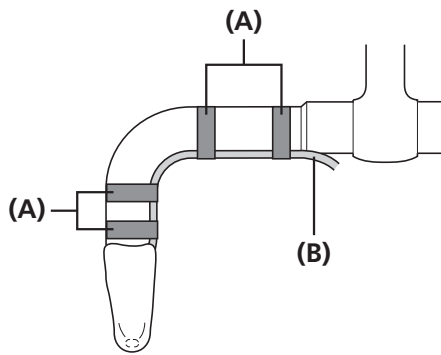
Lastly, install the nameplate.

Tightening torque



0.1 - 0.15 N·m

9



Temporarily secure the outer casing to the handlebar (by using tape or a similar material).

- (A) Tape
- (B) Outer casing

10

Lastly, return the bracket cover to its original position.



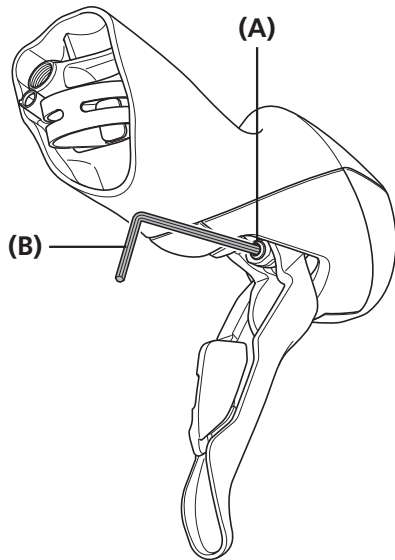
TECH TIPS

For details on installing the bracket cover, refer to "Replacing the bracket cover".

ADJUSTMENT

ADJUSTMENT

■ Reach adjustment



Turn the reach adjustment screw to position the lever unit.

- (A) Reach adjustment screw
(B) 2 mm hexagon wrench

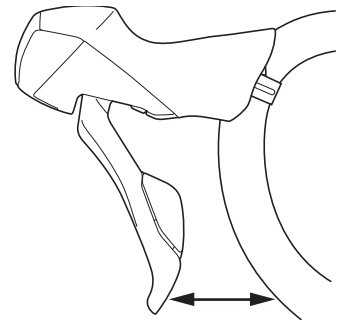
NOTICE

- Make sure that the braking operates after the adjustment.
- Observe the tightening torque upper limit (0.8N·m).
The adjustable area may be damaged.



TECH TIPS

Clockwise: Increases the lever stroke
Counterclockwise: Decreases the lever stroke

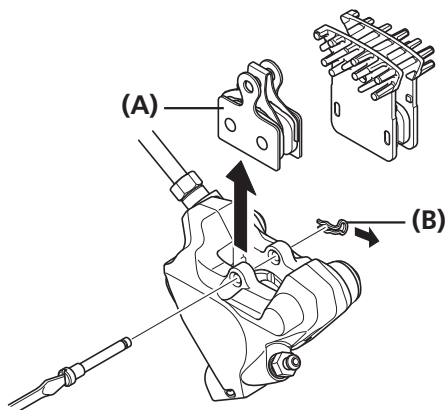


MAINTENANCE

MAINTENANCE

■ Replacement of brake pads

1



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

(A) Brake pad

(B) Snap ring

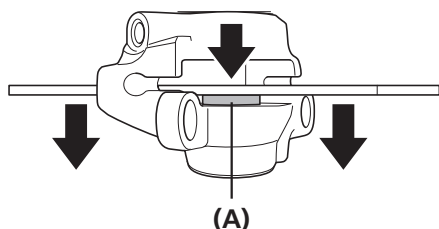
NOTICE

- 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.
- 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.
- Use a compatible brake pad when replacing it.
- When using a pad with fins, take note of the left (L) and right (R) markings to set it.

2

Clean the pistons and surrounding area.

3



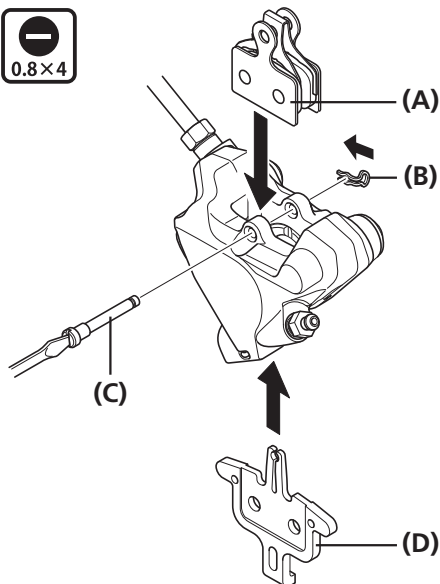
Use a flat-shaped tool to push the pistons straight back in as far as they will go, while being careful not to twist the pistons.

Do not push the pistons with a sharp tool.

The pistons may be damaged.

(A) Piston

4



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

Make sure to use a snap retainer at this time.

- (A) Brake pad
- (B) Snap retainer
- (C) Pad axle
- (D) Pad spacer (red)

Tightening torque

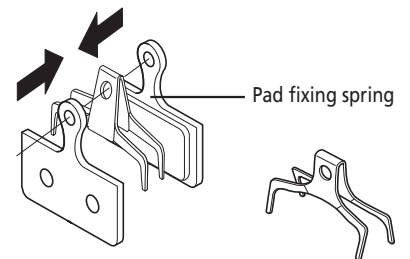


0.1 - 0.3 N·m



TECH TIPS

Install the pad fixing spring as shown in the illustration.



5

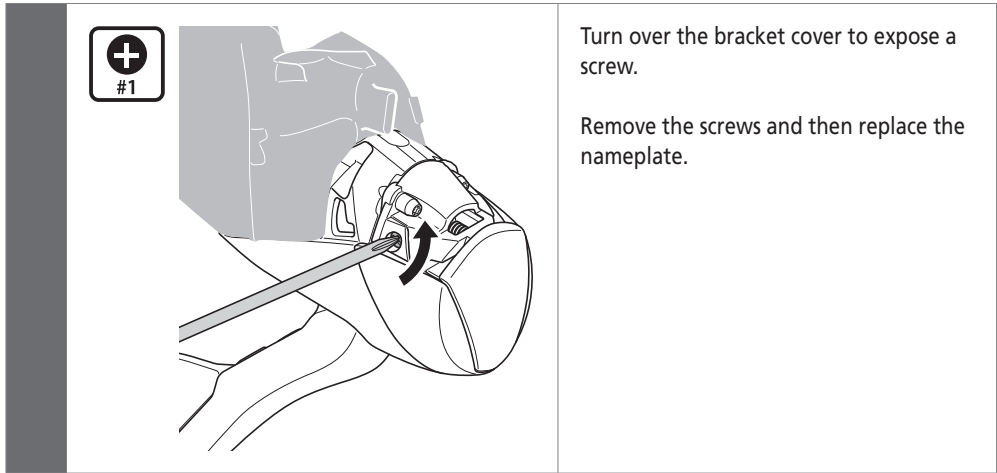
Depress the brake lever several times to check that the operation becomes stiff.

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 in accordance with the section "Installation of brake calipers".

■ Replacement of the nameplate



Tightening torque	
	0.1 - 0.15 N·m

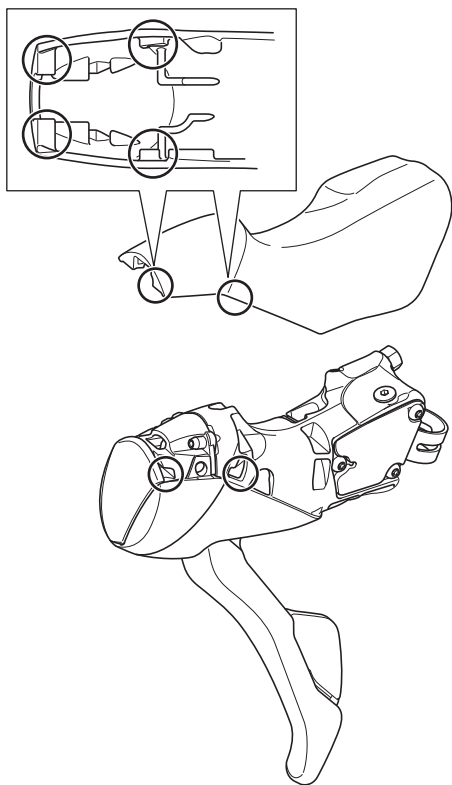
NOTICE	
As the screw is small, be careful not to drop it.	

■ Replacing Shimano genuine mineral oil

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 dual control lever can be operated at this time to help the oil drain out. After draining the oil, pour in fresh brake oil in accordance with the "Adding Shimano genuine 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.

■ Replacing the bracket cover



Insert the protrusions on the bracket cover into the hollows in the bracket body when fitting on the bracket cover.

NOTICE

Note the markings

R: for right

L: for left

- A label is engraved in the bracket cover.
- Replace the bracket cover with the dual control lever and brake hose removed from the bicycle as shown in the illustration.
- Perform bleeding after removing the brake hose.
- Be careful not to let oil adhere to the bracket cover.



TECH TIPS

- Wipe a little rubbing alcohol inside the bracket cover to make installation easier.
- The tabs on the bracket cover each fit to a matching slot on the bracket.

Pulling out a disconnected inner end (shifting cable)

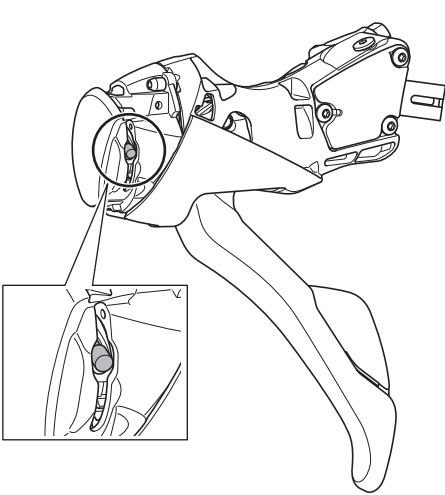
Pulling out a disconnected inner end (shifting cable)

If it is hard to pull out the inner end, follow the procedure below.

1

Turn over the bracket cover from the front side and remove the nameplate.

2



Pull out the inner end on the cable hook of the winding body.

3

Install the nameplate and return the bracket cover to its original position.



TECH TIPS

Should the inner cable break, it is recommended that you also replace the cable guide together with the inner cable in order to maintain smooth shifting.

Tightening torque



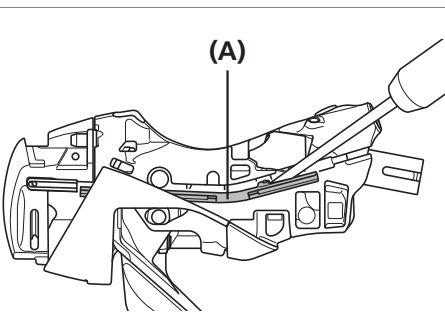
0.1 - 0.15 N·m

Replacement of the SL cable guide

1

Remove the lever from the handlebar, and then remove the bracket cover and nameplate.

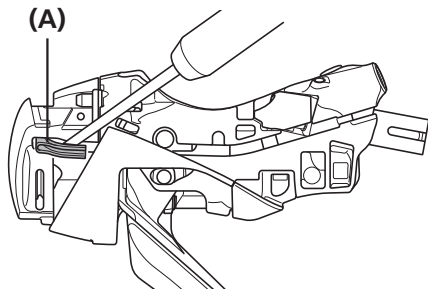
2



Remove cable guide B using a screwdriver.

(A) Cable guide B

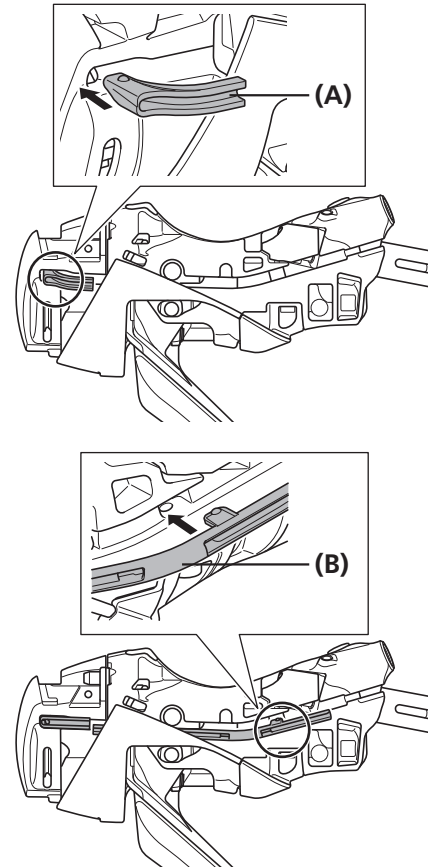
3



Remove cable guide A using a screwdriver.

(A) Cable guide A

4



Push in the new cable guides A and B by hand.

(A) Cable guide A

(B) Cable guide B

5

Install the nameplate and bracket cover.



For details on installing the bracket cover, refer to "Replacing the bracket cover".



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