

Dealer's Manual

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

Hydraulic Disc Brake

ST-R785
BR-R785
BR-RS785
BR-RS805

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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

▶ Be sure to also inform users of the following:

TO ENSURE SAFETY

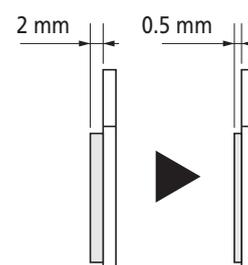
⚠ WARNING

- **When installing components, be sure to follow the instructions that are given in the instruction manuals.**
It is recommended that you use only genuine Shimano parts. If parts such as bolts and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.
In addition, if adjustments are not carried out correctly, problems may occur, and the bicycle may suddenly fall over, which may cause serious injury.
-  Be sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.
- This dealer's manual is for use with on road disc brake (electronic gear shifting system) only.
For information on products not explained in this manual, refer to the dealer's manuals provided with each product.
- 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

- It is important to completely understand the operation of your bicycle's brake system. Improper use of your bicycle's brake system may result in a loss of control or a fall, which could lead to severe injury. Because each bicycle may handle differently, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. This can be done by consulting your professional bicycle dealer and the bicycle's owners manual, and by practicing your riding and braking technique.
- Please use extra caution 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 within the openings of moving rotor.
- The calipers and disc brake rotor will become hot when the brakes are operated, so do not touch them while riding or immediately after dismounting from the bicycle, otherwise you may get burned.
- 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. There is the danger that the brakes may not work correctly.
- If noise occurs during brake operation, the brake pads may have been worn down to the usable limit. Check that the brake system temperature has been cooled down sufficiently, check the thickness of the brake pad. If the thickness is 0.5 mm or below, the brake pad needs to be replaced with a new one. Consult a dealer or an agency.



- 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. To relieve this condition, momentarily release the lever.

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

TO ENSURE SAFETY

►► For Installation to the Bicycle, and Maintenance:

- The disc brake is not designed to work with the bicycle 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 you ride 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. To avoid this, reduce your speed and apply the brakes early and gently.

■ For Installation to the Bicycle, and Maintenance:

- **When the shifting switch is operated, the motor which drives the front derailleur will operate to the shifting position without stopping, so be careful not to get your fingers caught.**

- Please use extra caution to keep your fingers away from the rotating disc brake rotor during installing or servicing the wheel.
The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught within the openings of moving disc brake rotor.



- If the disc brake rotor is cracked or warped, be sure to replace it with a new disc brake rotor.
- If the disc brake rotor becomes worn down to a thickness of 1.5 mm or so that the aluminum surface becomes visible, be sure to replace the disc brake rotor with a new one.
- 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 unuseable.
- 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 oil or already-used 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 the 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 the 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. 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

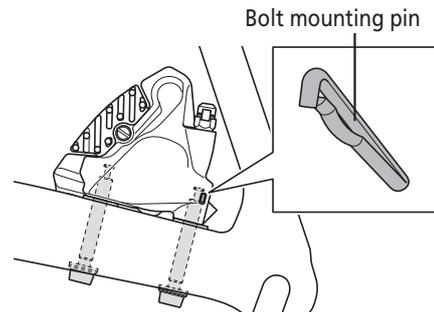
Set the bleed section of the brake lever so that it is parallel to the ground, and then gently depress the brake lever several times and wait for the bubbles to return to the reservoir tank.

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

TO ENSURE SAFETY

►► For Installation to the Bicycle, and Maintenance:

- If the quick release lever is on the same side as the disc brake rotor, there is the danger that it may interfere with the disc brake rotor, so check that it does not interfere.
- Shimano disc brake systems are not compatible with tandem bicycles. Because tandem bicycles have a high overall weight, the load 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, and this will cause 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.

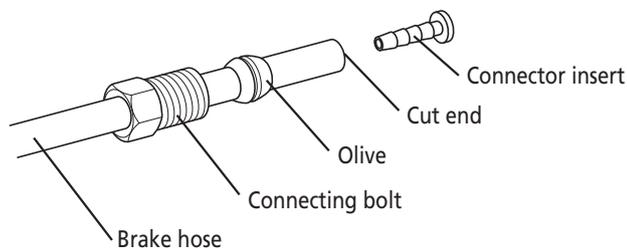


Brake hose

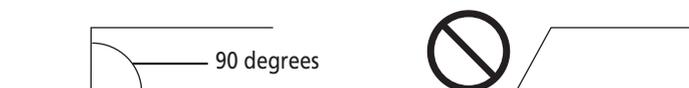
- After installing the brake hose to the brake unit, adding Shimano genuine mineral oil and bleeding air bubbles, depress the lever again several times to check that the brakes are operating normally and there are no fluid leaks from the hose or the system.
- The connector insert is for this brake hose 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-SB SM-BH59-JK-SS | 13.2 mm | Gold |

- Do not reuse the olive piece or the connector insert when reinstalling. A damaged or reused olive or the connector insert may not provide 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 the 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.



TO ENSURE SAFETY

▶ Be sure to also inform users of the following:



■ Be sure to also inform users of the following:

Cautions on the Shimano genuine mineral oil

- Contact with eyes may result in irritation. In the event of eye contact, flush with fresh water and seek medical assistance immediately.
- Contact with skin may cause a rash and discomfort. In the event of skin contact, 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, go immediately to an area with fresh air. Cover up with a blanket. Stay warm and stable 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:

Handling the 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 eye contact, flush with fresh water and seek medical assistance immediately.
- Contact with skin may cause a rash and discomfort. Use gloves when handling. In the event of skin contact, wash well with soap and water.
- Do not drink. May cause vomiting or diarrhea.
- Keep out of reach of children.
- Do not cut, 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.
- 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.

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.

TO ENSURE SAFETY

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

NOTE

■ Be sure to also inform users of the following:

- Be sure to rotate the crank when carrying out any switch operations which are related to gear shifting.
- This is a small waterproof connector. Do not repeat connecting and disconnecting it. It may impair the function.
- Be careful not to let water get into the terminal.
- The components are designed to be fully waterproofed to withstand wet weather riding conditions; however, do not deliberately place them into water.
- Do not clean the bicycle in a high-pressure car wash. If water gets into any of the components, operating problems or rusting may result.
- Handle the products carefully, and avoid subjecting them 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.
- Contact the place of purchase for updates of the product software. The most up-to-date information is available on the Shimano website.
- When the bicycle wheel has been removed, it is recommended that pad spacers should be 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 is normal. If that happens, consult a dealer.
- Use soapy water or a dry cloth when carrying out cleaning and maintenance of the brake system. Do not use commercially-available brake cleansers or silencing agents, as they can cause damage to parts such as seals.
- 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.

About system power reset

- When the system fails to operate, the system may be recovered by resetting the system power.
- After the battery is removed, about one minute is usually required for the system power to reset.

In the case of using SM-BTR1

- Remove the battery from the battery mount. After about one minute, install the battery.

In the case of using SM-BTR2

- Disconnect the plug from SM-BTR2. After about one minute, insert the plug.

Connection and communication with the PC

PC linkage devices can be used to connect a PC to the bicycle (system or components), and an E-TUBE PROJECT can be used to carry out tasks such as customizing single components or the whole system and updating their firmware.

- PC linkage device: SM-PCE1/SM-BCR2
- E-TUBE PROJECT: the PC application
- Firmware: the software inside each component

■ For Installation to the Bicycle, and Maintenance:

- Be sure to attach dummy plugs to any unused terminals.
- Always be sure to use the Shimano original tool TL-EW02 to remove the electric wires.
- Use a brake hose 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.

TO ENSURE SAFETY

►► For Installation to the Bicycle, and Maintenance:

Electric wires / Electric wire covers

- Secure the electric wires with zip tie so that they do not interfere with the chainrings, sprockets and tires.
- The strength of the adhesive is fairly weak, to prevent the paint on the frame from being peeled off at the same time when removing the electric wire cover for reasons such as replacing the electric wires. If the electric wire cover is peeled off, replace it with a new one. When removing the electric wire cover, do not peel it off too vigorously. If this is not observed, the paint on the frame will peel off too.
- Do not remove the wire holders which are attached to the built-in type electric wires (EW-SD50-I). The wire holders prevent the electric wires from moving inside the frame.
- When installing to the bicycle, do not forcibly bend the electric wire plug. It may result in a poor contact.

Disc brake

- If the brake caliper mounting boss and the dropout are not parallel, the disc brake rotor and caliper may touch.
- When the bicycle wheel has been removed, it is recommended that pad spacers should be 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 carrying out cleaning and maintenance of the brake system. Do not use commercially-available brake cleansers or silencing agents, as they can cause damage to parts such as seals.
- Do not remove the pistons when disassembling the calipers.
- If the disc brake rotor is worn, cracked or warped, it should be replaced.

Dual control lever

- Dummy plugs are installed at the time of shipment from the factory. Do not remove them except when necessary.
- When routing the electric wires, take care to ensure that they do not interfere with the brake levers.

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

Notes when reinstalling and replacing components

- When the product is reassembled or replaced, it is automatically recognized by the system to allow operation according to the settings.
- If the system does not operate after reassembly and replacement, follow the system power reset procedure to check the operation.
- If the component configuration changes or malfunction is observed, use the E-TUBE PROJECT software to update the firmware of each component to the latest version and perform a check again. Also make sure that the E-TUBE PROJECT software is the latest version. If the software is not the latest version, the component compatibility or the product functions may not be sufficiently available.

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 | |
|---|----------------------|--|---|---|---|
|  | 1.5mm hexagon wrench |  | Screwdriver[#2] |  | Hexalobular[#15] |
|  | 2.5mm hexagon wrench |  | Slotted screwdriver (nominal dia. 0.5 x 3) |  | TL-BH61 |
|  | 3mm hexagon wrench |  | Slotted screwdriver (nominal dia. 0.7 x 3) |  | TL-LR15 |
|  | 4mm hexagon wrench |  | Slotted screwdriver (nominal dia. 0.8 x 4) |  | SM-DISC (Oil funnel and oil stopper) |
|  | 5mm hexagon wrench |  | Utility knife |  | TL-BT03/TL-BT03-S |
|  | 8mm spanner |  | Plastic mallet | | |
|  | 7mm socket wrench |  | Hexalobular[#5] | | |

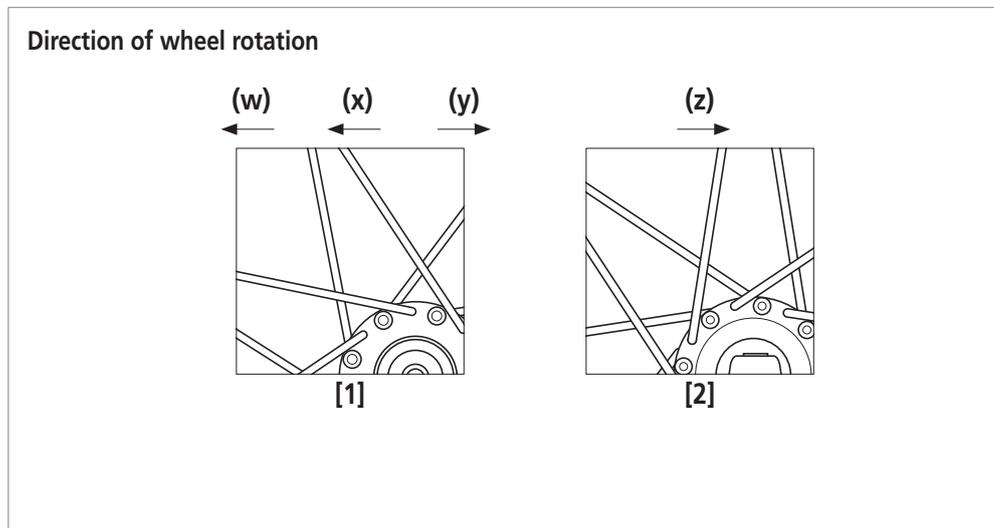
INSTALLATION

INSTALLATION

This dealer's manual describes how to install on road disc brake.

For information on how to install other products, refer to the appropriate dealer's manual for each product.

■ Wheel spoke assembly



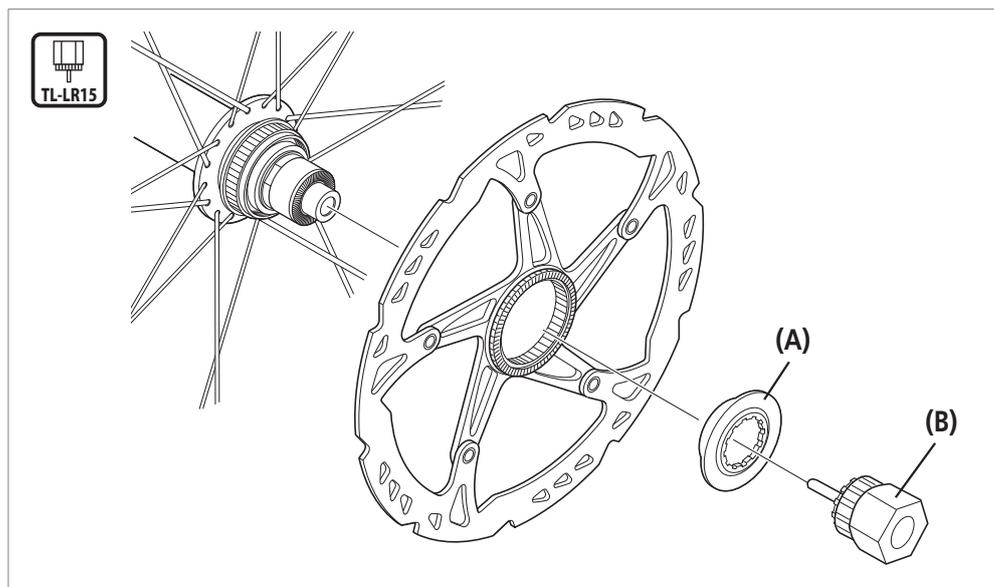
- (w) Front left
- (x) Rear left
- (y) Rear right
- (z) Front right

NOTE

Check that the spokes have been laced as shown in the illustration. A radial assembly cannot be used. Refer to [1] for the spoke patterns of the left side of the front wheel (disc brake rotor mounted side) and both sides of the rear wheel. Refer to [2] for the spoke pattern of the right side of the front wheel.

■ Installation of the disc brake rotor

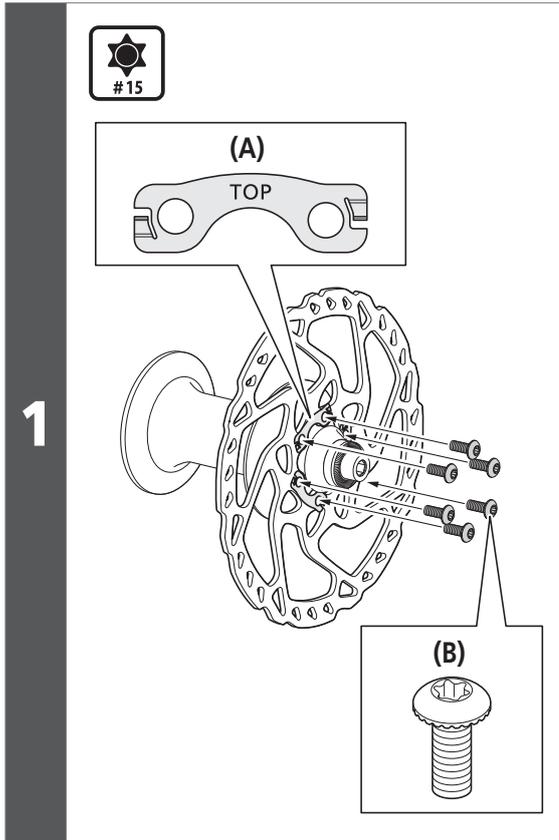
Center lock type



- (A) Disc brake rotor fixing lock ring
- (B) TL-LR15

| Tightening torque | |
|---|-------------|
|  | 40 - 50 N·m |

6-bolt mounting type (with lock washers)

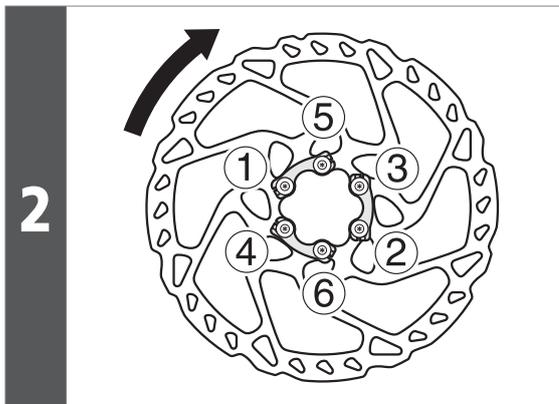


Install the disc brake rotor and rotor lock washers to the hub and tighten the bolts.

- (A) Lock washer
- (B) Disc brake rotor mounting bolt

| Tightening torque | |
|---|------------------|
|  | 2 - 4 N·m |

| NOTE |
|---|
| <ul style="list-style-type: none"> • Install the lock washers so that the side labeled "TOP" faces toward you. • Do not reuse old lock washers. Use new lock washers when installing a disc brake rotor. • Use the dedicated disc brake rotor mounting bolts for installation. |



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

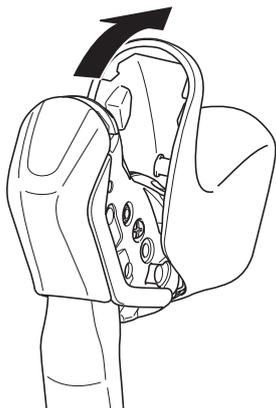
Then, tighten the disc brake rotor mounting bolts in the order shown in the illustration.

INSTALLATION

► Installation of the dual control lever

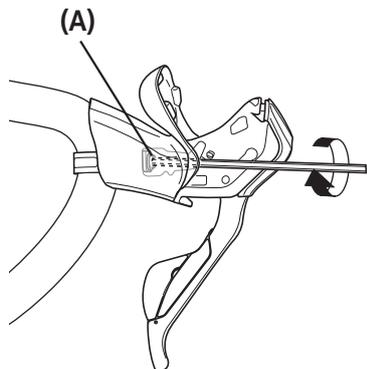
■ Installation of the dual control lever

1



Unhook both the right and left tabs of the bracket cover and open up the bracket cover as shown in the illustration.

2



Install the dual control lever to the handlebar and tighten the clamp nut with an hexagon wrench.

(A) Clamp nut

Tightening torque



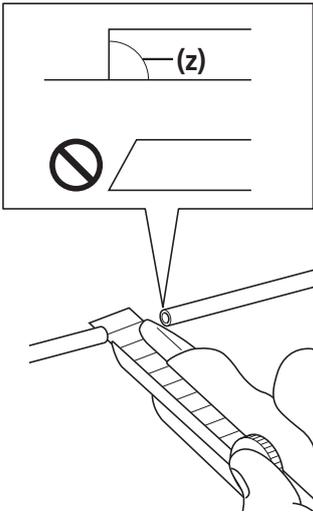
6 - 8 N·m

NOTE

- With a carbon handle, even the recommended tightening torque may cause damage to the handle or insufficient fixation of the handle. For the appropriate torque value, consult with the manufacturer of the completed bicycle or the manufacturer of the handle.
- The clamp band, clamp nut, and clamp bolt of ST-R785 have no compatibility with other products. Do not use components that are used in other products together.

Installation of the brake hose

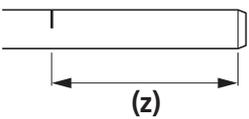
1



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

(z) 90 degrees

2

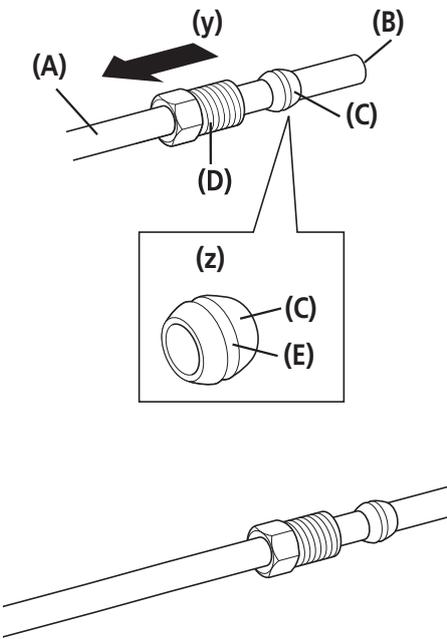


Put a mark on the brake hose beforehand as shown in the illustration so that you can check if the ends of the brake hose are secured to the hose mounts of the brake caliper and the dual control lever.

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

(z) 11 mm

3



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

(y) Direction of insertion

(z) Grease the outside of the olive.

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.

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

NOTE

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

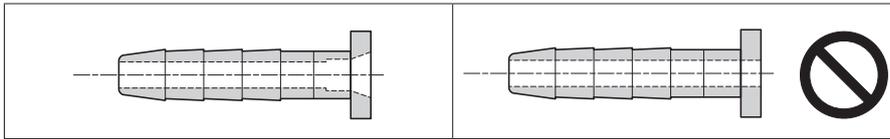
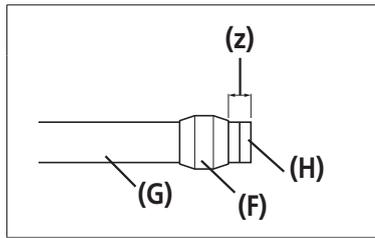
INSTALLATION

► Installation of the brake hose

4

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

| Model No. | Length | Color |
|-----------------------------|---------|-------|
| SM-BH59-SB SM-BH59-JK-SS | 13.2 mm | Gold |



(z) 2 mm

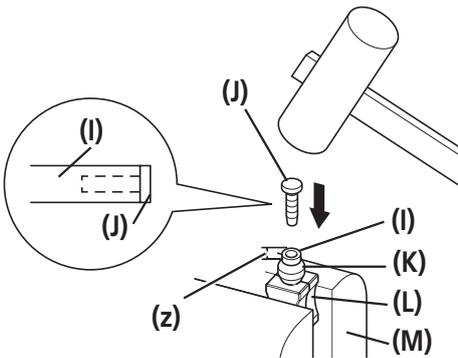
- (F)** Olive
- (G)** Brake hose
- (H)** Connector insert

NOTE

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

5

TL-BH61



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, as shown in the illustration.

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

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.

(z) 1 mm

- (I)** Brake hose
- (J)** Connector insert
- (K)** Olive
- (L)** TL-BH61
- (M)** Vise

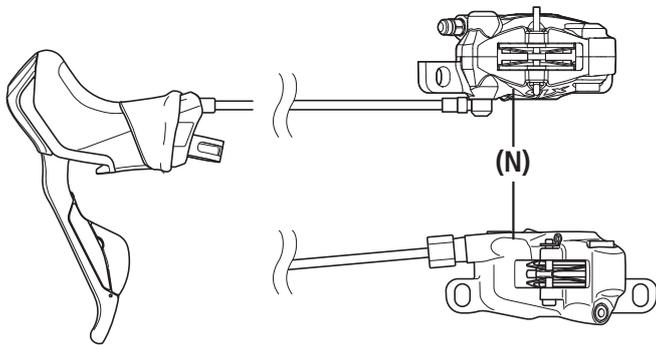
INSTALLATION

► Installation of the brake hose

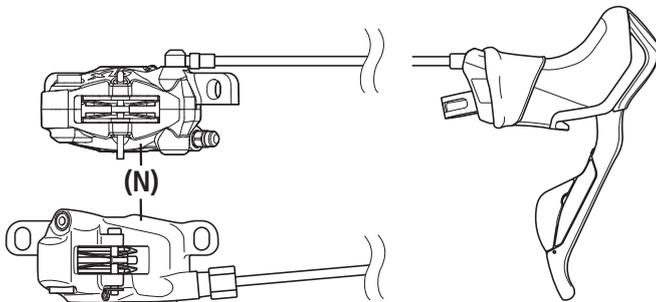
Make sure that the brake hose is not twisted.

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

Left lever

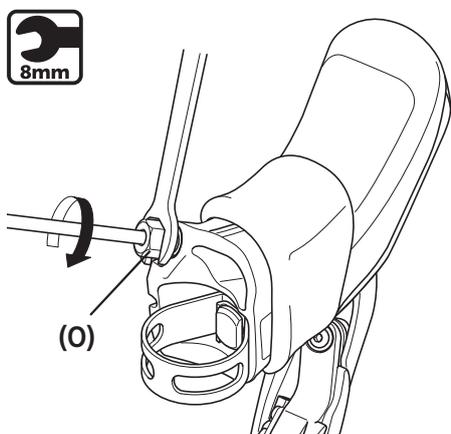


Right lever



(N) Brake caliper

6



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.

At this point, make sure that you are pushing the brake hose straight.

(O) Connecting bolt

Tightening torque



5 - 7 N·m

NOTE

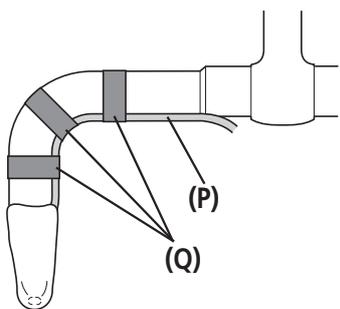
To install the handle bar, adjust the angle of the bracket by tilting the bracket from the handlebar so that you can turn the spanner. At that time, be careful not to damage the handlebar and other parts.

7

INSTALLATION

► Installation of the brake hose

8



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

(P) Brake hose

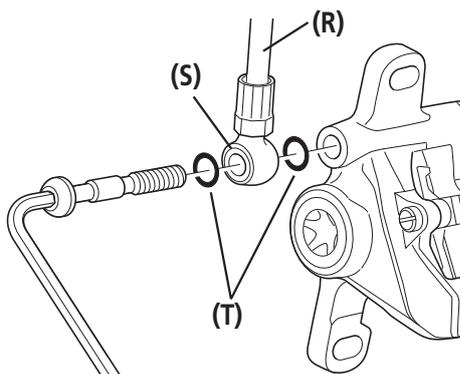
(Q) Tape

End of the brake hose on the brake caliper side

Banjo type

After checking that both O-rings are fitted in the top groove and bottom groove of the banjo, secure the banjo to the caliper as shown in the illustration.

At this point, check that the O-rings are in the grooves.



(R) Brake hose

(S) Banjo

(T) O-rings

Tightening torque



8 - 10 N·m



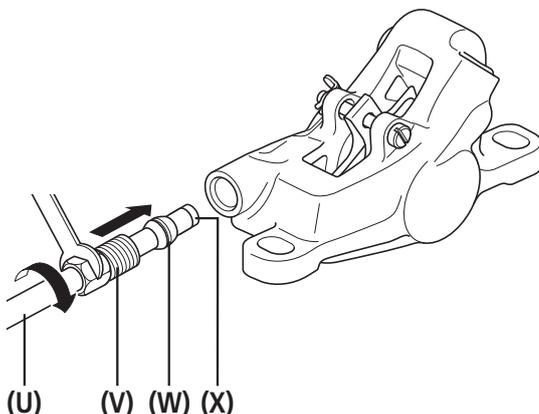
TECH TIPS

The O-rings are greased.

Straight type

Attach the connector insert to the brake hose.

After that, while pushing the brake hose, tighten the connecting bolt.



(U) Brake hose

(V) Connecting bolt

(W) Olive

(X) Connector insert

Tightening torque



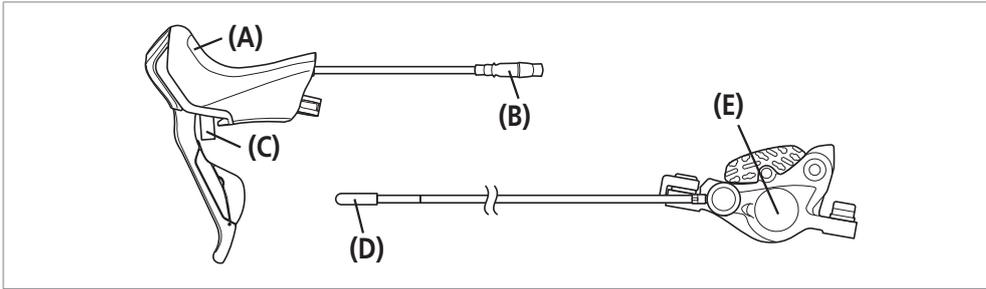
5 - 7 N·m

INSTALLATION

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

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

Overview of the easy hose joint system

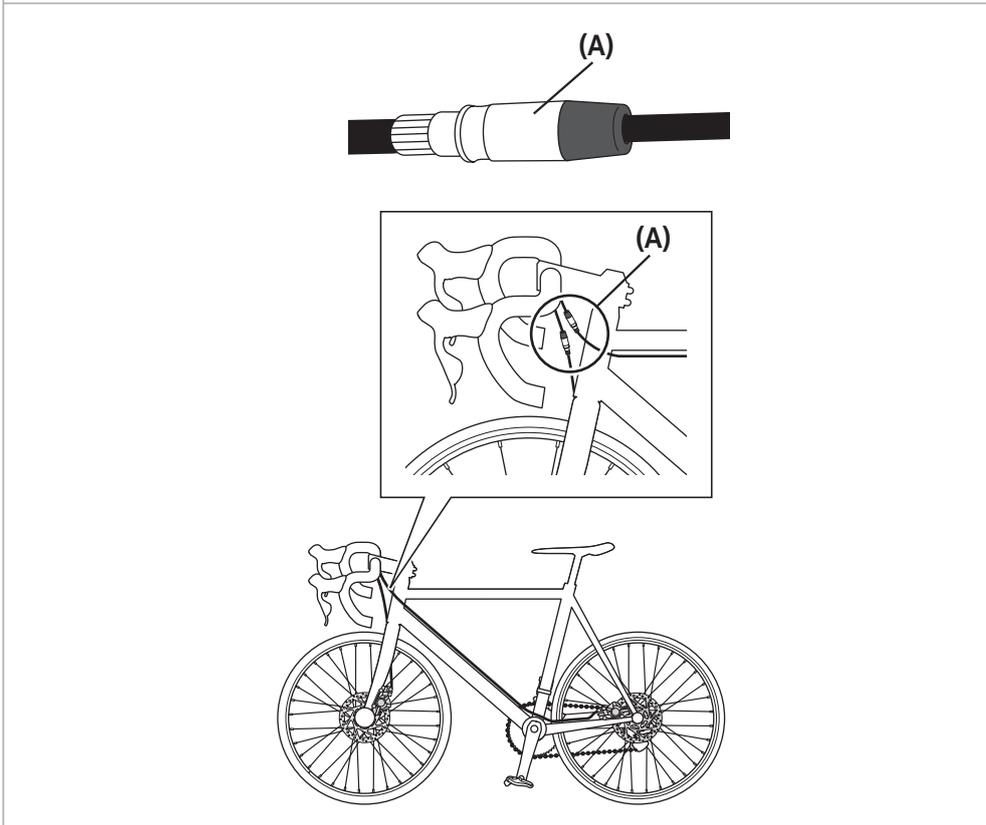


- (A) Dual control lever
- (B) Joint sleeve
- (C) Lever stopper
- (D) Hose cap
- (E) Brake caliper

About the easy hose joint system

This is a list of components comprising the easy hose joint system.

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



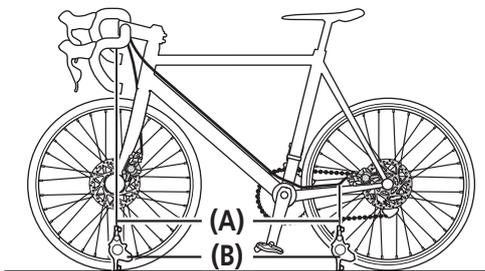
- (A) Joint sleeve

INSTALLATION

▶▶ Adding Shimano genuine mineral oil and bleeding air

■ Adding Shimano genuine mineral oil and bleeding air

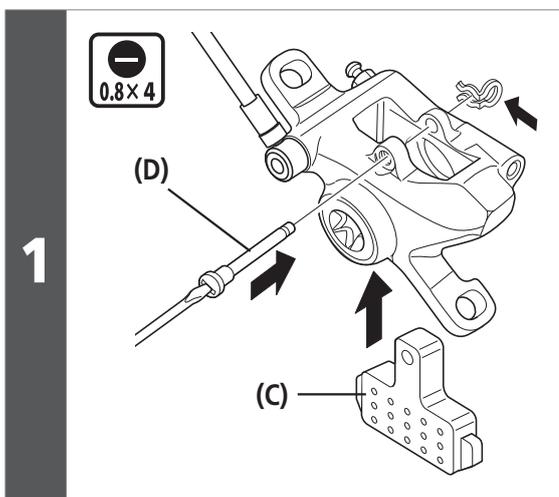
With the bleed spacer (yellow) attached to the brake caliper, place the bicycle in the work stand as shown in the illustration.



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

NOTE

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

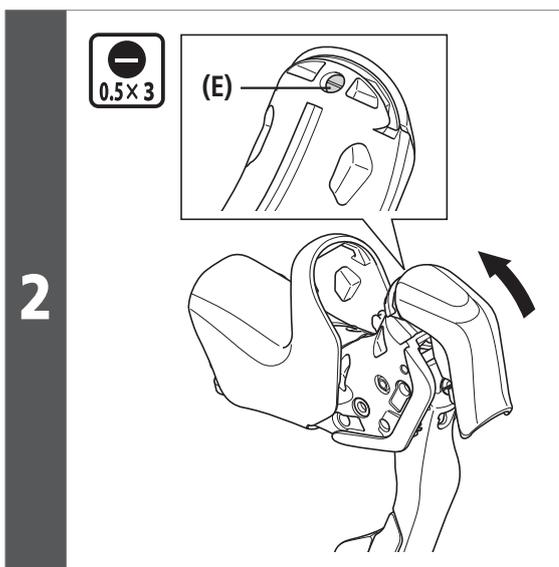


Mount the bleed spacer (yellow).

- (C) Bleed spacer
- (D) Pad axle

Tightening torque

| | |
|--|----------------------|
| | 0.1 - 0.3 N·m |
|--|----------------------|



Open up the bracket cover and remove the name plate fixing screw.

Hold the lower part of the name plate while gripping the lever, and pull up the name plate to remove it as shown in the illustration.

- (E) Name plate fixing screw

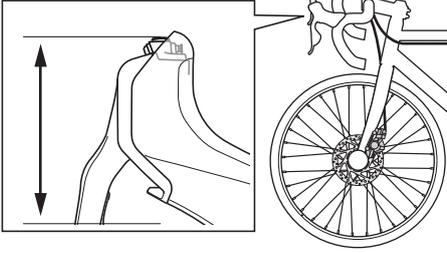
NOTE

The name plate fixing screw is very small. Be careful not to lose the screw while removing it.

INSTALLATION

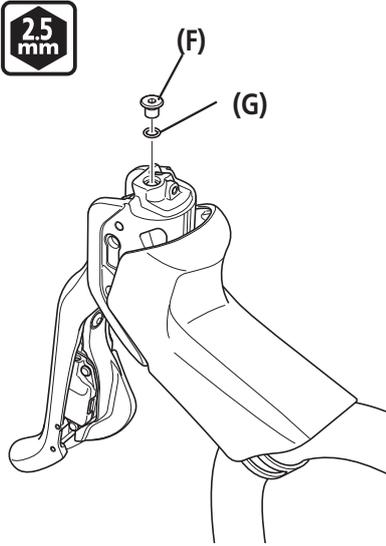
▶ Adding Shimano genuine mineral oil and bleeding air

3



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

4

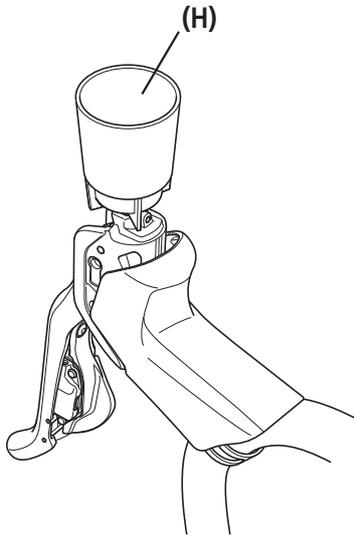


Remove the bleed screw.

(F) Bleed screw

(G) O-rings

5

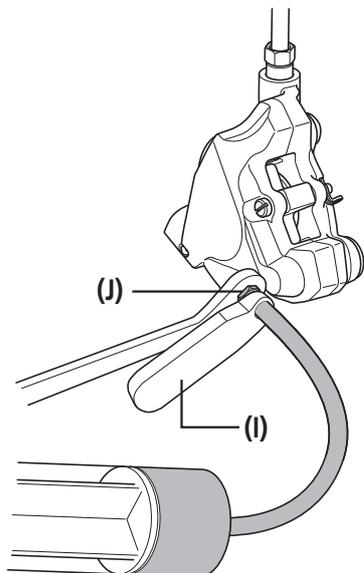
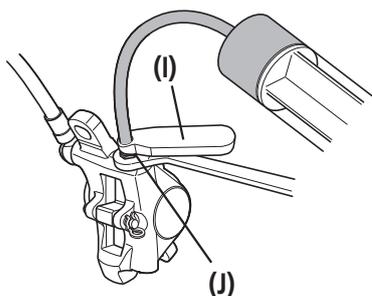


Mount the oil funnel.

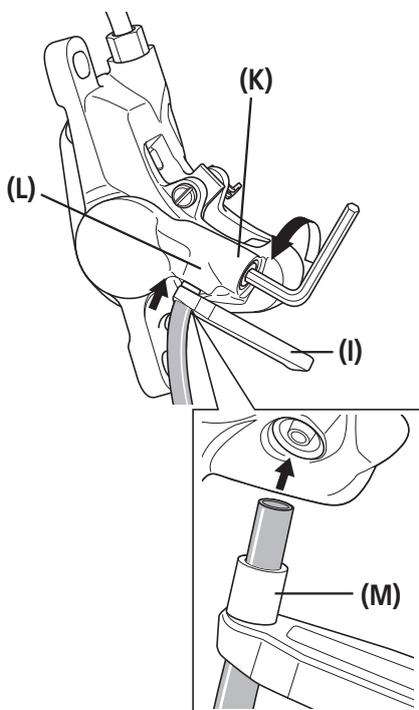
(H) Oil funnel

6

Secure the brake caliper in a vise while bleeding.



7



BR-R785/RS805

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.

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

BR-RS785

Fill the syringe with sufficient oil.

Attach the adapter provided with this product or Shimano original tool to the end of the tube, connect the tube to the bleed boss, and fasten it with the tube holder so that the tube will not be disconnected.

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

Push the plunger of the syringe to add oil.

The oil then starts coming out from the oil funnel.

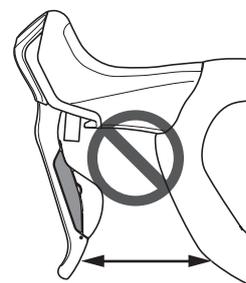
Continue adding oil until there are no more air bubbles mixed in with the oil that is coming out.

- (I) Tube holder
- (J) Bleed nipple
- (K) Bleed screw
- (L) Bleed boss
- (M) Adapter

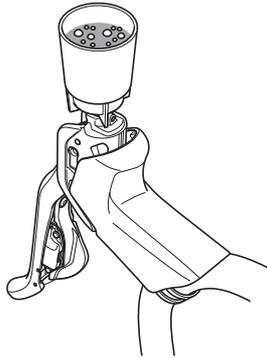
NOTE

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.)



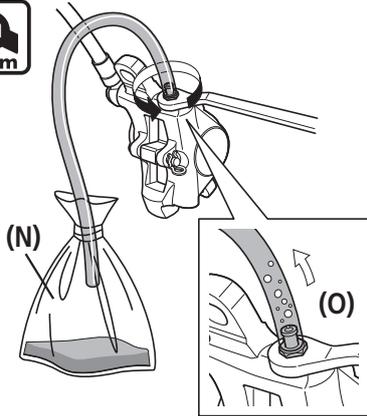
8



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

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

9



Tie the supplied tube and bag with rubber bands.

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

At this point, make sure that the tube is secured to the bleed nipple / screw.

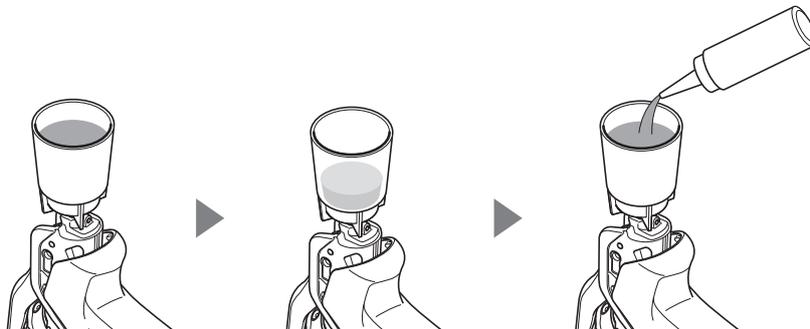
After a little while, the oil and air bubbles will flow naturally from the bleed nipple/boss into the tube.

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

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

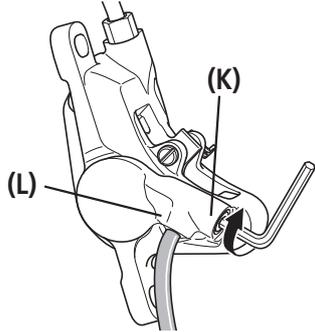
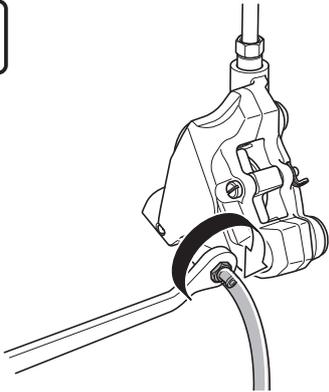
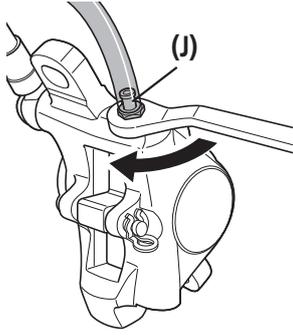
- (N) Bag
- (O) Air bubbles

10



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.

11



BR-R785/RS805

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

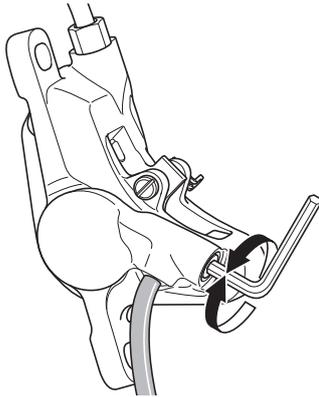
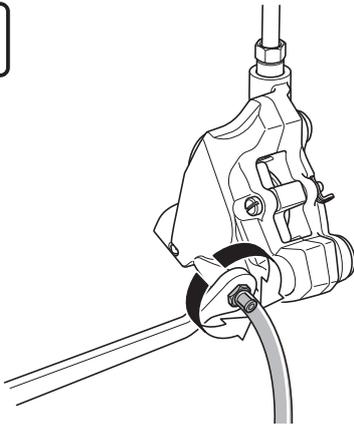
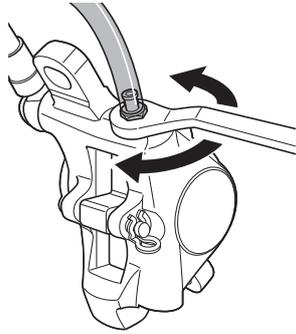
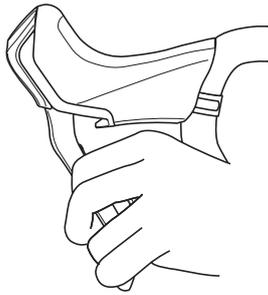
BR-RS785

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

(J) Bleed nipple

(K) Bleed screw

(L) Bleed boss



BR-R785/RS805

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.

BR-RS785

With the brake lever depressed, open and close the bleed screw 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 screw again.

Tightening torque



4 - 6 N·m

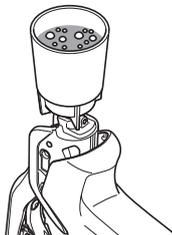
INSTALLATION

▶▶ Adding Shimano genuine mineral oil and bleeding air

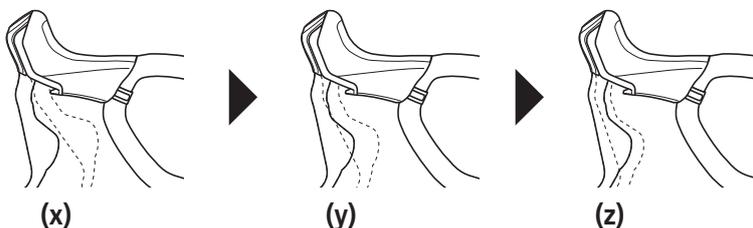
If the brake lever is then operated, air bubbles in the system will rise up through the port into the oil funnel.

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

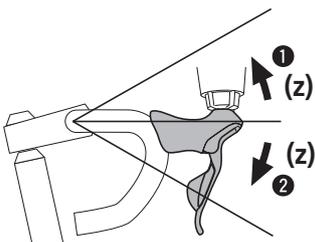
Under the normal condition, the lever action should feel stiff at this point.

13

Lever operation



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

14

Tilt the handlebar in the up/down directions by 30 degrees as shown in the illustration, and then perform step 13 to check that there is no air bubble remaining.

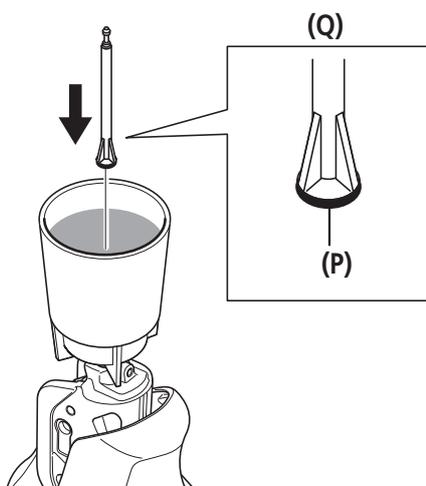
If any air bubbles appear, repeat steps 9 to 13 until they stop appearing.

(z) 30°

NOTE

Tilt the handlebar in the up/down directions as shown in the illustration, and then secure the handlebar and stem.

For information on how to secure the handlebar and stem, refer to the installation procedures provided with those parts.

15

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

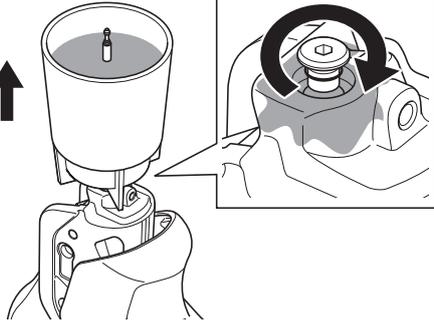
- (P) O-ring
- (Q) Oil stopper

INSTALLATION

▶▶ Adding Shimano genuine mineral oil and bleeding air

16

25
mm



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 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

25
mm

0.5 - 1 N·m

NOTE

Do not operate the brake lever. Otherwise, air bubbles may enter the cylinder.

17

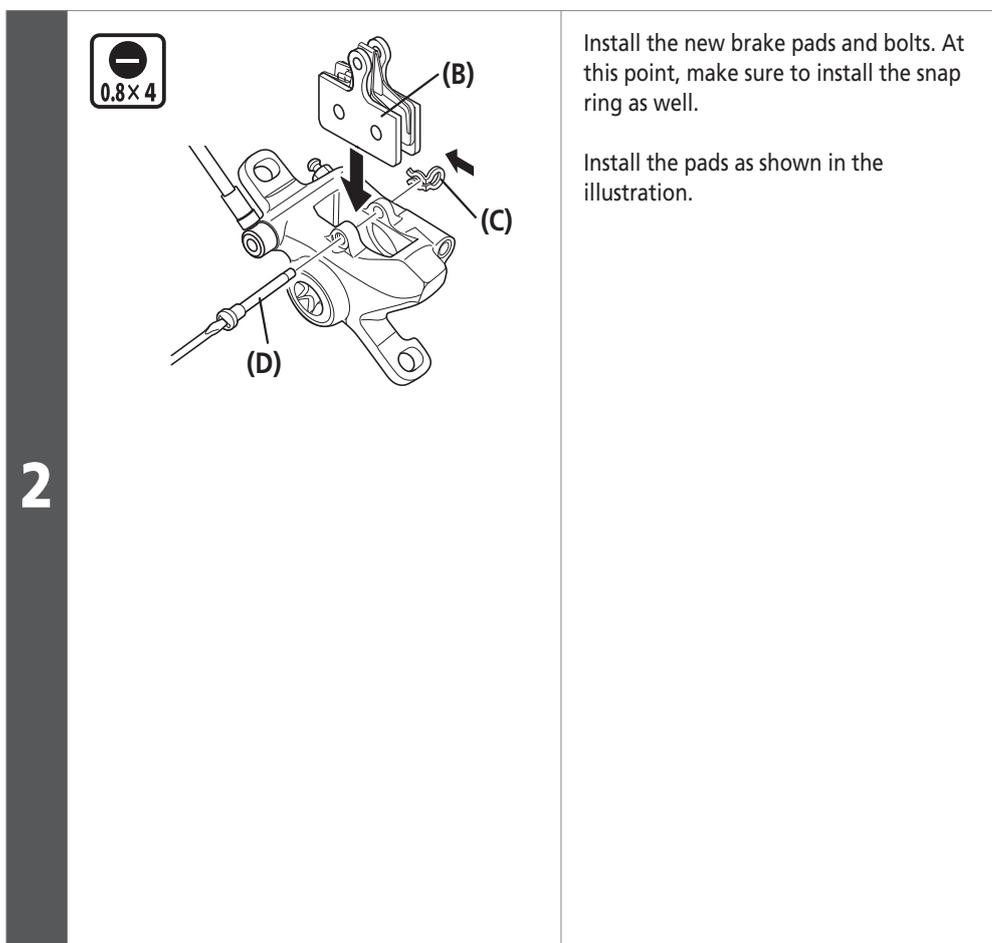
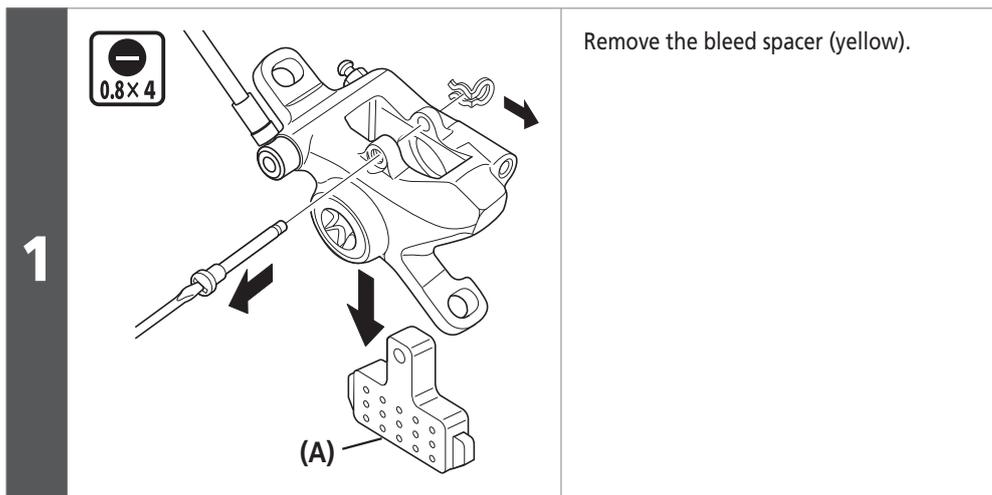


Wipe away any oil which has flowed out.

INSTALLATION

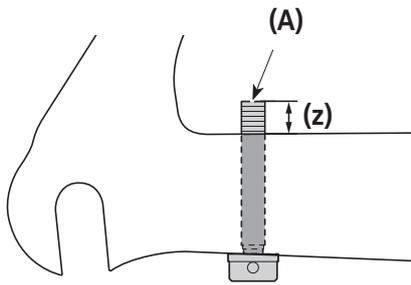
▶▶ Installing the brake caliper and securing the brake hose

■ Installing the brake caliper and securing the brake hose



Check the length of converter fixing bolt (BR-R785/RS785)

Rear (same for both 140 mm and 160 mm)



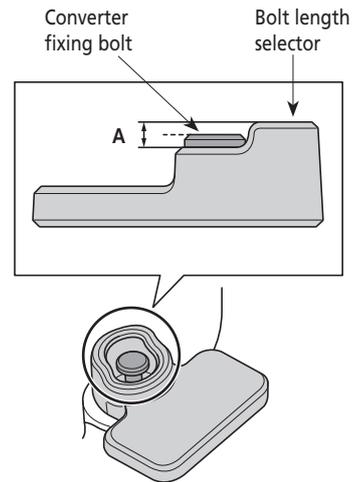
Insert the converter fixing bolts into the frame mount area, and check that the lengths of the protruding sections of the converter fixing bolts are 13 mm.

(z) 13mm

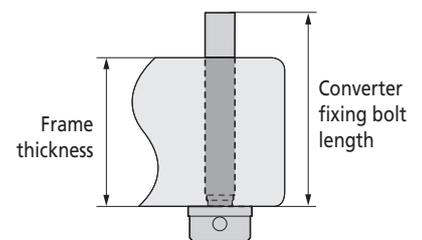
(A) Converter fixing bolt

NOTE

- When using a bolt length selector, check whether the tip of the converter fixing bolt is within the range A.



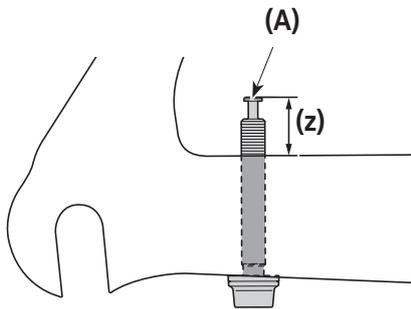
- Do not use a washer when checking the length of the converter fixing bolt.
- The length of the converter fixing bolt used vary depending on thickness of the frame. Use converter fixing bolt that are suitable for the thickness of the frame.



| Frame thickness | Converter fixing bolt length | Y-part |
|-----------------|------------------------------|-----------|
| 10 mm | 16.8 mm | Y81743100 |
| 15 mm | 21.8 mm | Y81743150 |
| 20 mm | 26.8 mm | Y81743200 |
| 25 mm | 31.8 mm | Y81743250 |
| 30 mm | 36.8 mm | Y81743300 |
| 35 mm | 41.8 mm | Y81743350 |

Check the length of brake caliper mounting bolt C (BR-RS805)

Rear (same for both 140 mm and 160 mm)



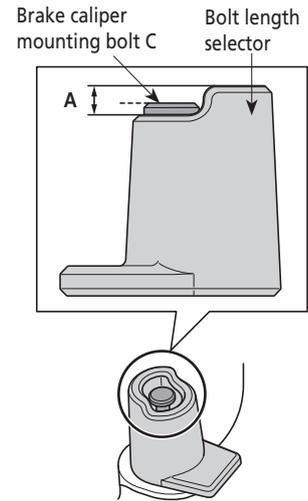
Insert the brake caliper mounting bolts C into the frame mount area, and check that the lengths of the protruding sections of the brake caliper mounting bolts C are 13 mm.

(z) 13mm

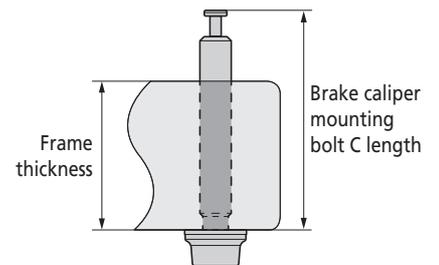
(A) Brake caliper mounting bolt C

NOTE

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



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



| Frame thickness | Brake caliper mounting bolt C length | 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

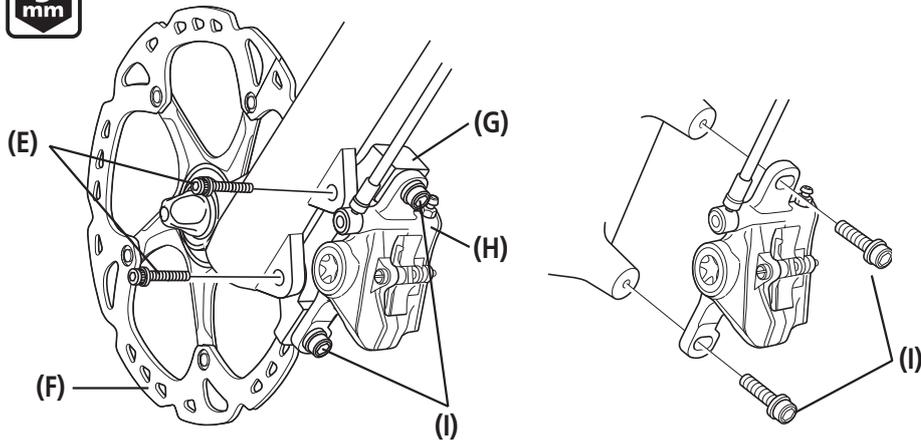
► Installing the brake caliper and securing the brake hose

BR-R785/RS785

Temporarily install the brake caliper to the frame.

Depress the brake lever, and tighten the brake caliper fixing bolts while pressing the brake pads against the disc brake rotor.

Front



- (E) Adapter fixing bolts
- (F) Disc brake rotor
- (G) Adapter
- (H) Caliper
- (I) Brake caliper fixing bolts

Tightening torque



6 - 8 N·m

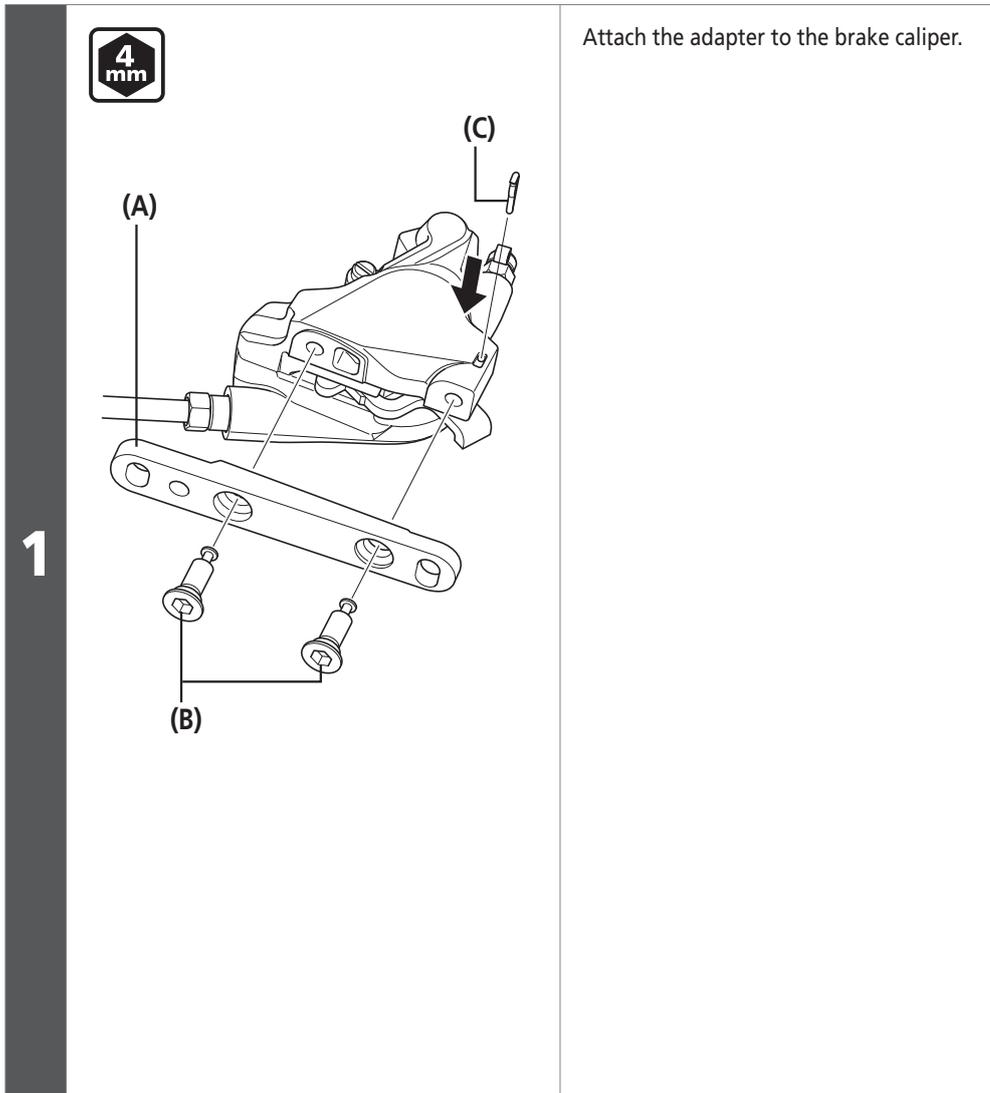


TECH TIPS

Make sure that the brake caliper can move sideways before installing it.

BR-RS805

In the case of a disc brake rotor for a 140 mm front wheel



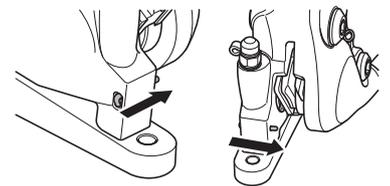
Attach the adapter to the brake caliper.

- (A) Adapter
- (B) Brake caliper mounting bolts B
- (C) Bolt fixing pin

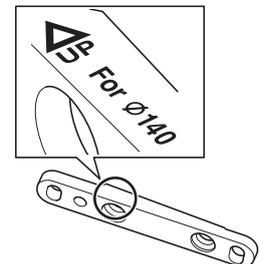
| Tightening torque | |
|---|-----------|
|  | 6 - 8 N·m |

NOTE

- 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 adapter when installing it.

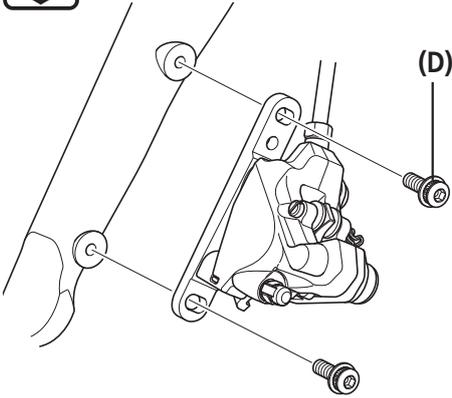


1

INSTALLATION

▶▶ Installing the brake caliper and securing the brake hose

2



Attach the adapter temporarily to the frame.

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

(D) Brake caliper mounting bolts A

Tightening torque

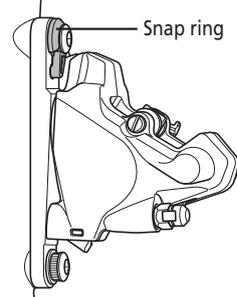


6 - 8 N·m

NOTE

Be sure to attach a snap ring when installing the brake caliper mounting bolts A.

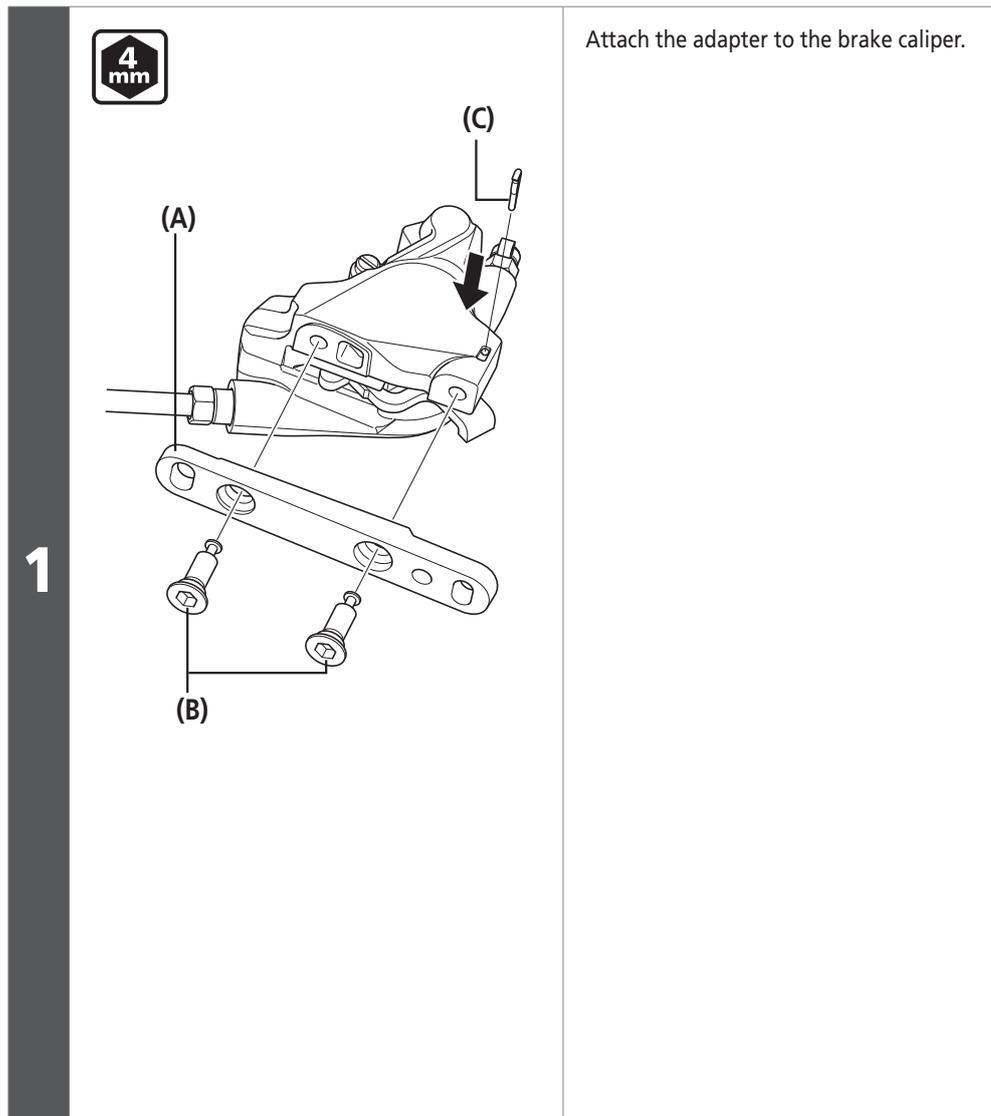
* The snap ring installation positions is different for 140 mm and 160 mm.
(Drawing shows 140 mm)



INSTALLATION

►► Installing the brake caliper and securing the brake hose

In the case of a disc brake rotor for a 160 mm front wheel



- (A) Adapter
- (B) Brake caliper mounting bolts B
- (C) Bolt fixing pin

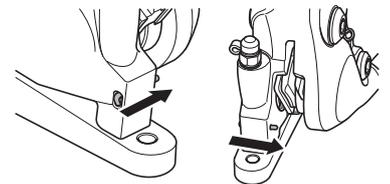
Tightening torque



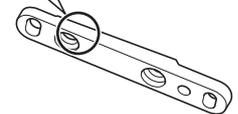
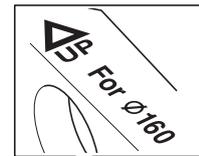
6 - 8 N·m

NOTE

- 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 adapter when installing it.

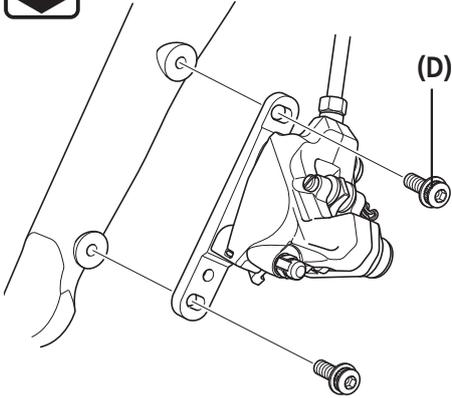


INSTALLATION

▶▶ Installing the brake caliper and securing the brake hose

2

4
mm



Attach the adapter temporarily to the frame.

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

(D) Brake caliper mounting bolts A

Tightening torque

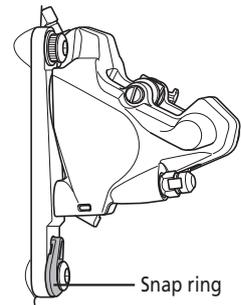
4
mm

6 - 8 N·m

NOTE

Be sure to attach a snap ring when installing the brake caliper mounting bolts A.

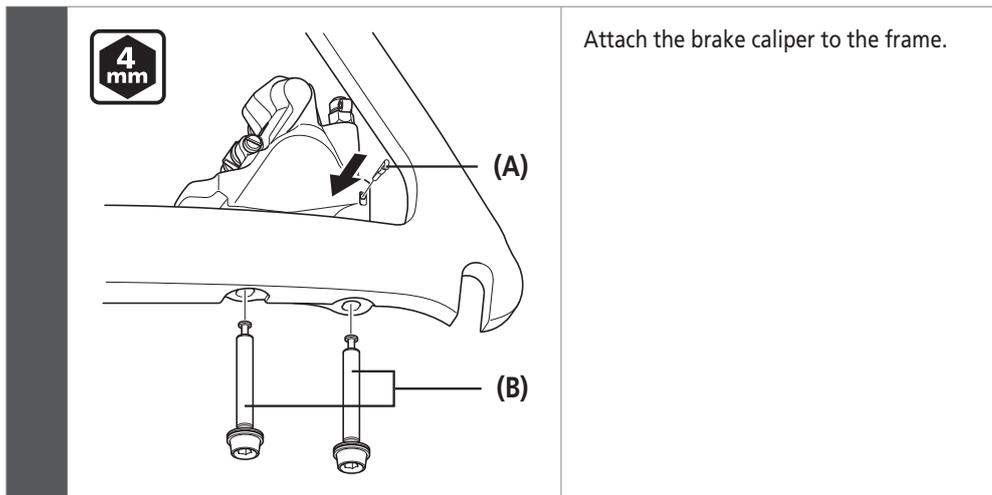
* The snap ring installation positions is different for 140 mm and 160 mm. (Drawing shows 160 mm)



INSTALLATION

▶▶ Installing the brake caliper and securing the brake hose

In the case of a disc brake rotor for a 140 mm rear wheel



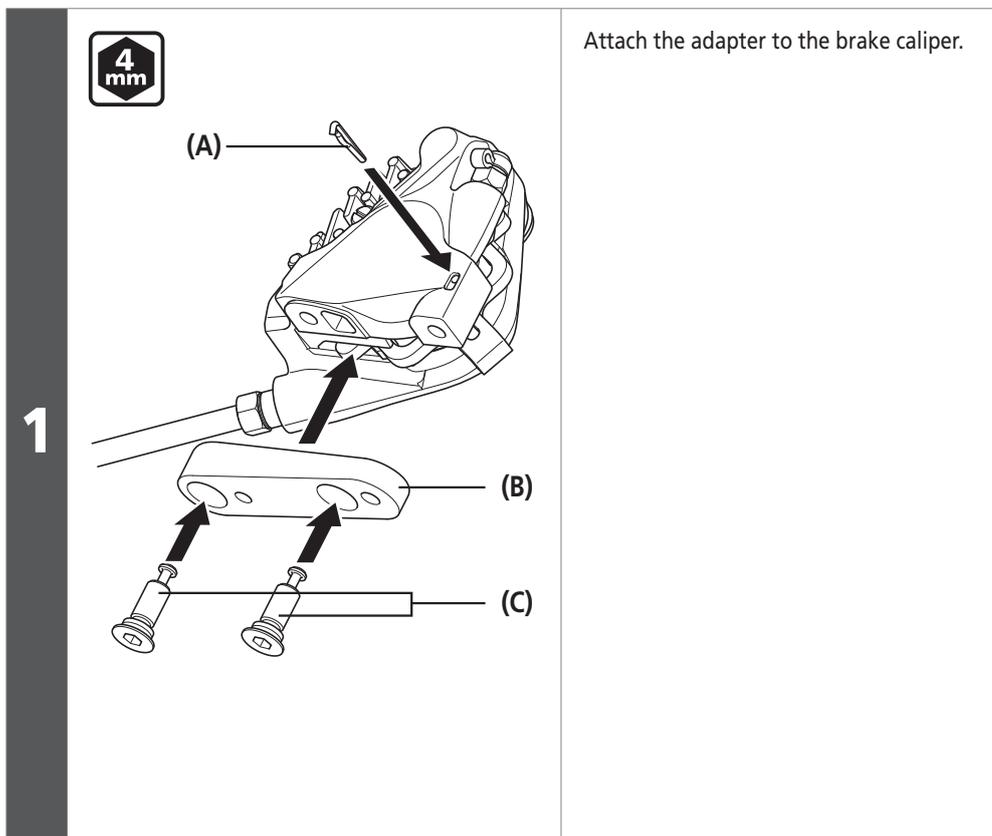
- (A) Bolt fixing pin
- (B) Brake caliper mounting bolts C

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

NOTE

Be sure to attach the bolt fixing pin.

In the case of a disc brake rotor for a 160 mm rear wheel



- (A) Bolt fixing pin
- (B) Adapter
- (C) Brake caliper mounting bolts B

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

NOTE

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

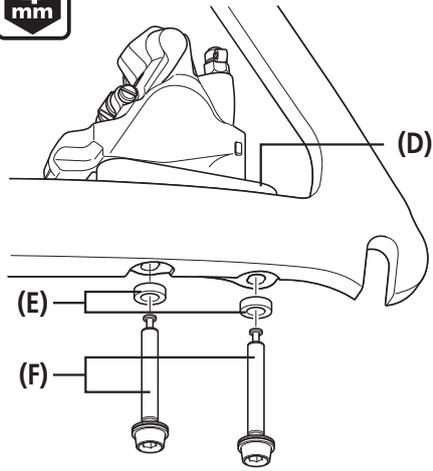


INSTALLATION

▶▶ Installing the brake caliper and securing the brake hose

2

4
mm



Attach the adapter to the frame.

- (D) Adapter
- (E) Washers
- (F) Brake caliper mounting bolts C

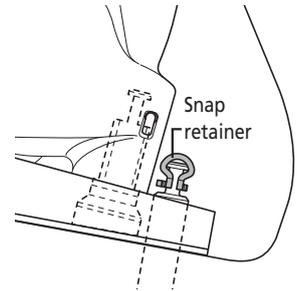
Tightening torque

4
mm

6 - 8 N·m

NOTE

- Be sure to use the washers when installing the adapter.
- Be sure to attach a snap retainer when installing the brake caliper mounting bolts C.



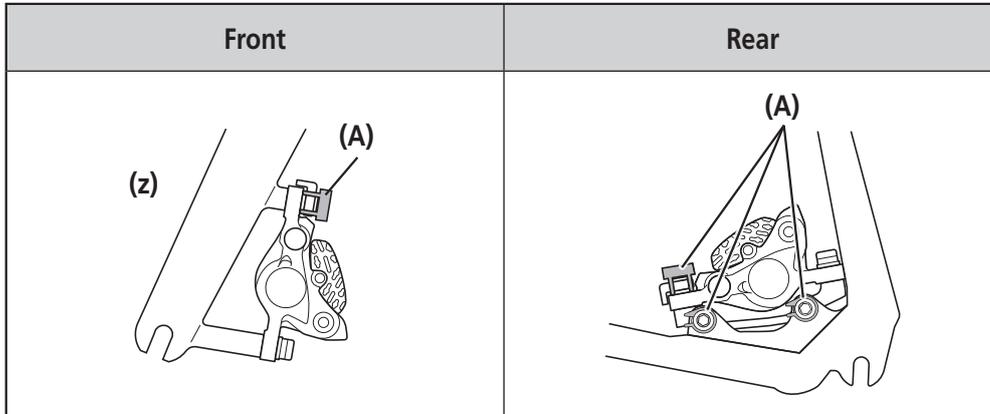
INSTALLATION

▶▶ Temporary tightening of the frame fixing bolts

■ Temporary tightening of the frame fixing bolts

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

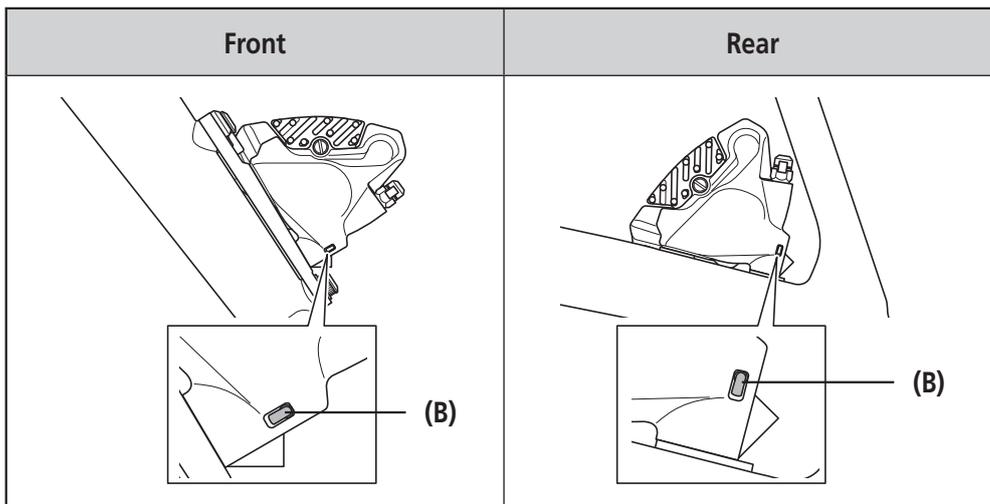
Snap ring method



(z) Post type

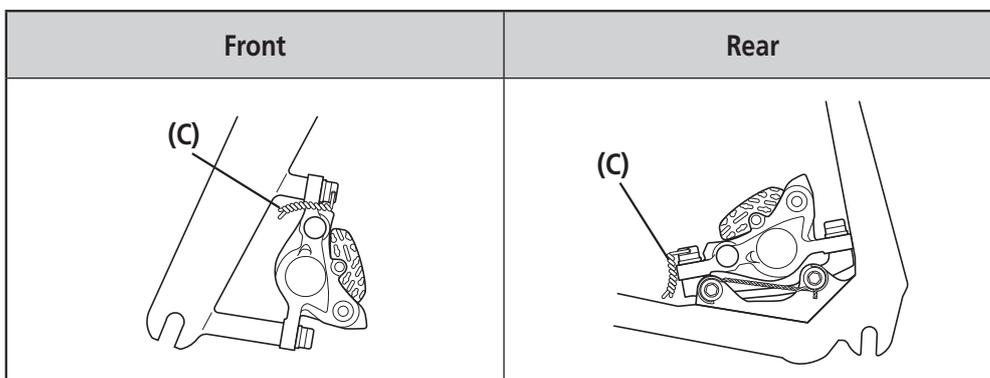
(A) Snap rings

Fixing pin insertion method



(B) Bolt fixing pin

Wiring method



(C) Wire

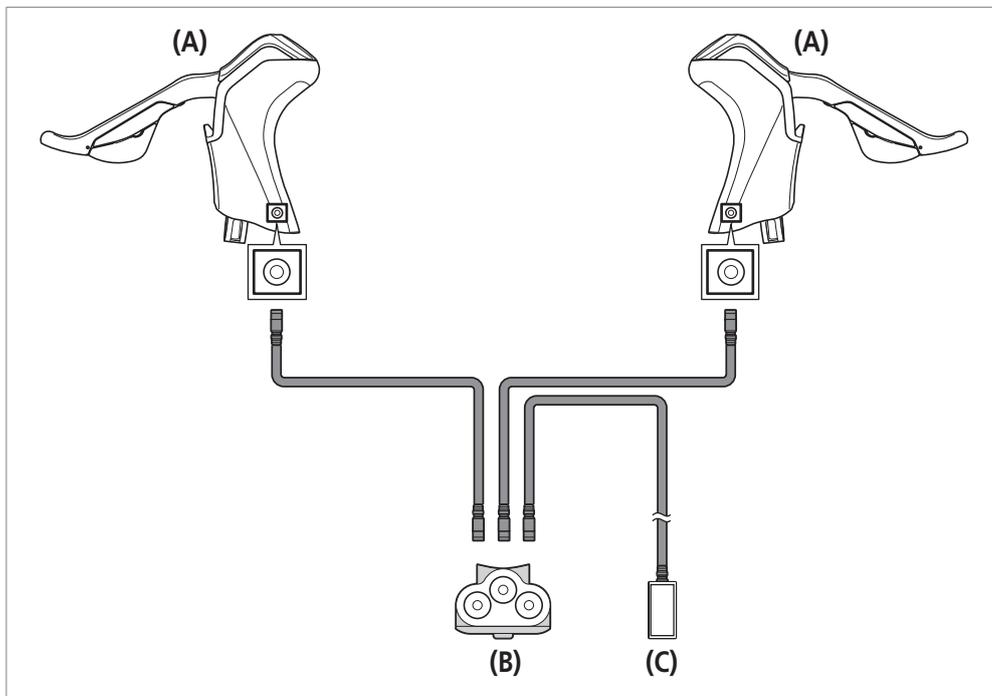
CONNECTION OF THE ELECTRIC WIRES

CONNECTION OF THE ELECTRIC WIRES

■ Connection of the Junction (A)

ST-R785 with SM-EW90 routing map

3 port

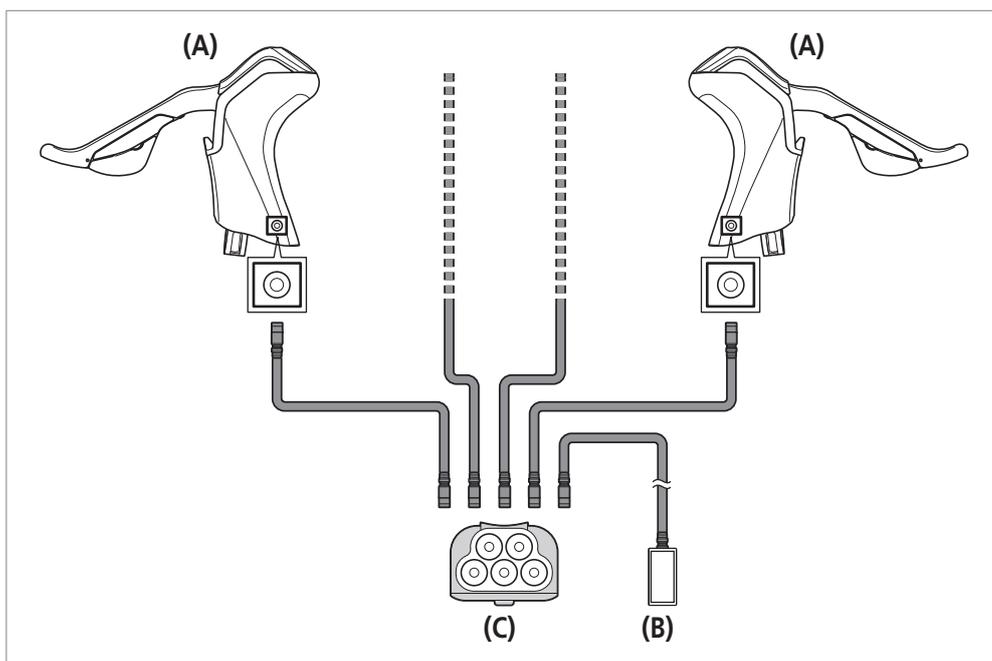


- (A) ST-R785
- (B) SM-EW90-A
(E-TUBE port x3)
- (C) SM-JC40/41
Junction (B)



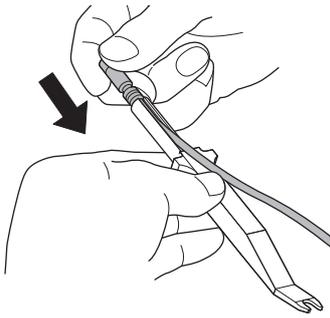
- The electric wire can be wound around the handle when the bar tape is wrapped.
- Wire SM-EW90 with a sufficient margin to allow the positioning of ST-R785 and the full turning of the handle.

5 port

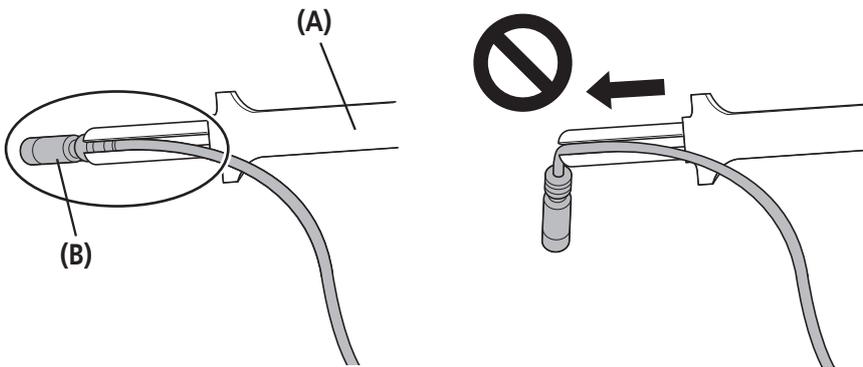


- (A) ST-R785
- (B) SM-JC40/41
Junction (B)
- (C) SM-EW90-B
(E-TUBE port x5)

Installation of the electric wires



Set so that the projection on the connector is aligned with the groove on the narrow end.



(A) TL-EW02

(B) Plug

NOTE

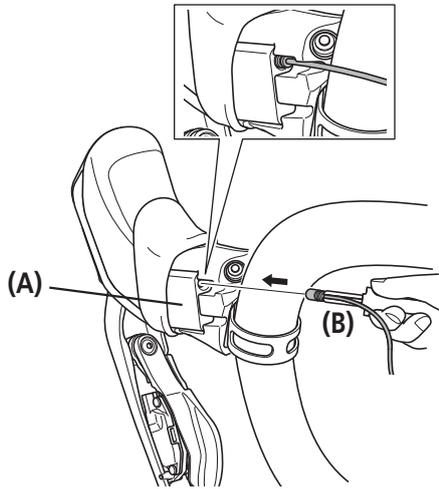
Use the Shimano original tool for installation and removal of the electric wire. When installing the electric wire, do not forcibly bend the plug. It may result in a poor contact. When connecting the electric wire, push it in until it clicks in place.

■ Connection to the dual control lever

ST-R785

1 Open up the bracket cover and lift up the connector cover.

2



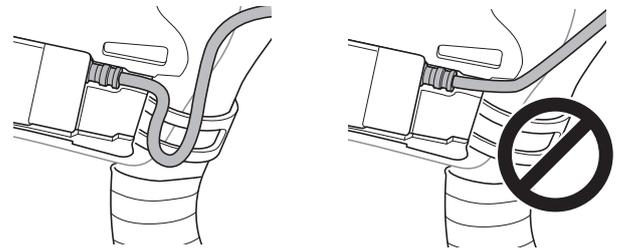
Use the TL-EW02 to connect the connector of the electric wire to the terminal on the lever side.

Be sure to push them together until they connect with a click.

(A) Connector
(B) TL-EW02

NOTE

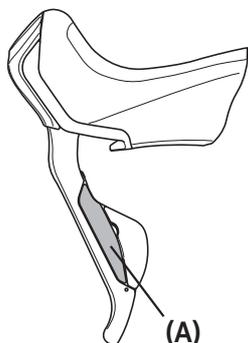
When the handle is gripped or the bar tape is wound, the electric wires may be pulled out. By allowing sufficient wire length, accidental connector disconnection can be prevented after winding the bar tape.



■ Checking connections

1 After connecting the electric wires to all of the components, install the battery and check the operation.

2



Operate the shifting switches and check that the front derailleur and rear derailleur both operate.

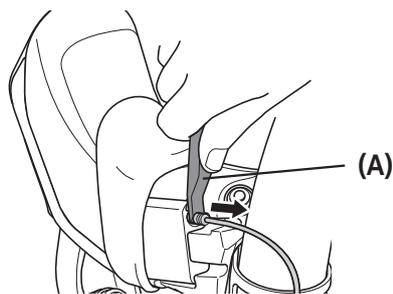
(A) Shifting switch (X)

NOTE

To prepare for chain installation, if none is installed, be sure to operate the shifting switch (X) of the left lever one or more times to set the front derailleur to the largest chainring. After that, be sure to remove the battery.

■ Disconnection of the electric wires

ST-R785



(A) TL-EW02

NOTE

- This is a small waterproof connector. Do not repeat connecting and disconnecting it. The waterproof section or the connecting section may become worn or deformed, and the function may be affected.
- When removing the electric wire, use the wider end of the Shimano original tool TL-EW02 as shown in the illustration. If you pull too firmly on the connectors, problems with operation may occur.

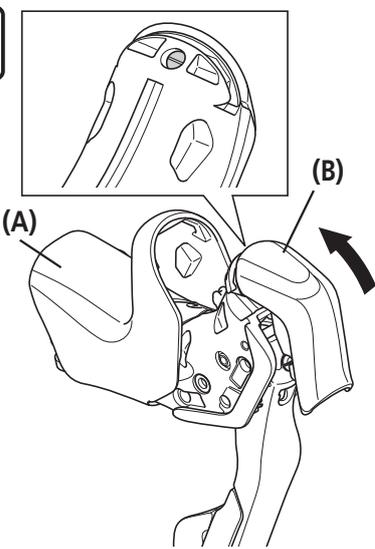
ADJUSTMENT

ADJUSTMENT

■ Free stroke and reach adjustment

1

-
0.5x3



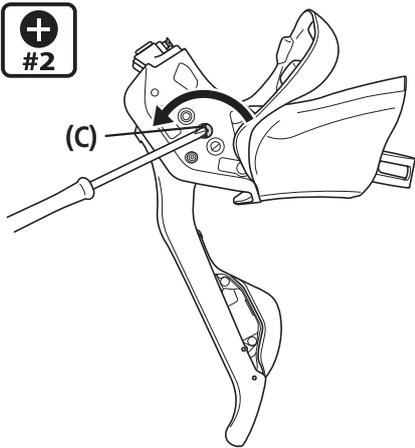
Open up the bracket cover and remove the name plate.

When adjusting only the reach, perform step 3.

- (A) Bracket cover
- (B) Name plate

2

+
#2



Turn the free stroke adjustment screw to adjust the stroke.

Turning in the direction shown in the illustration increases the free stroke.

- (C) Free stroke adjustment screw

NOTE

Stop loosening the free stroke adjustment screw when the free stroke stops increasing. Loosening the free stroke adjustment screw excessively may cause the screw to be removed from the bracket unit.



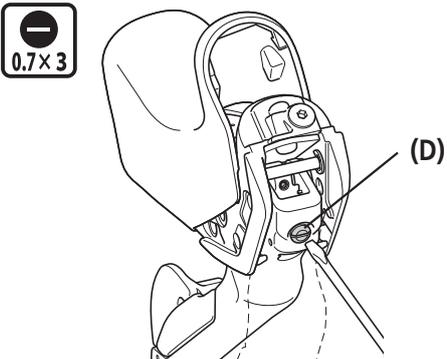
TECH TIPS

If you want to increase the free stroke, perform free stroke adjustment. The free stroke is factory-adjusted to the minimum level.

ADJUSTMENT

▶ Adjustment when the pistons are not operating correctly

3



Turn the reach adjustment screw to position the lever unit.

(D) Reach adjustment screw

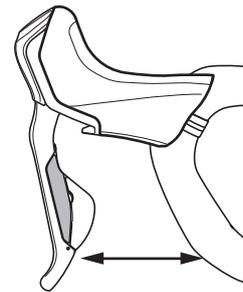
NOTE

Make sure that the braking operates after the adjustment.



TECH TIPS

Clockwise: The grip width becomes wider
Counterclockwise: The grip width becomes narrower



■ Adjustment when the pistons are not operating correctly

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

1

Remove the wheel and brake pads.

Clean the pistons and surrounding area.

2

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

Do not push the pistons with a sharp tool.

The pistons may be damaged.

3

Install the brake pads and the pad spacer (red).

4

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

5

Remove the pad spacer, install the wheel, and then check that there is no interference between the disc brake rotor and brake pads.

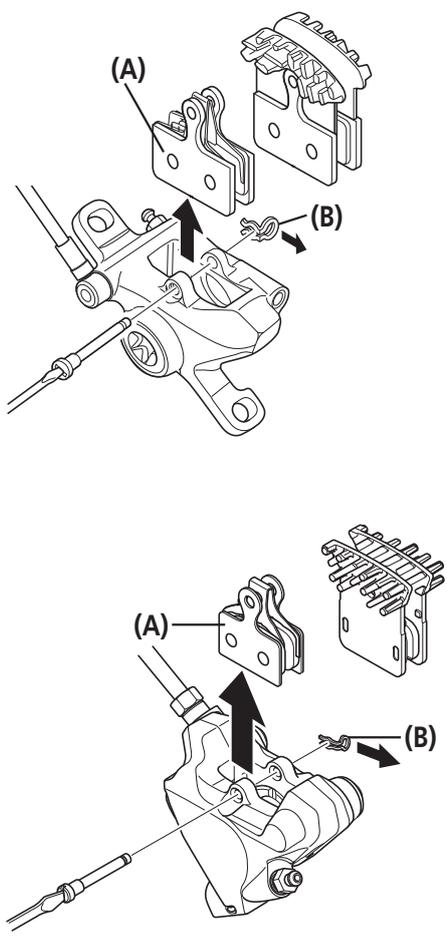
If they are touching, loosen the mounting bolts and adjust so that they are no longer touching.

MAINTENANCE

MAINTENANCE

■ Replacing the brake pads

1



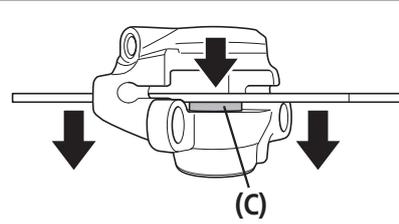
BR-R785/RS785
Remove the wheel from the frame, and remove the brake pads as shown in the illustration.

BR-RS805
Remove the wheel from the frame, and remove the brake pads as shown in the illustration.

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.

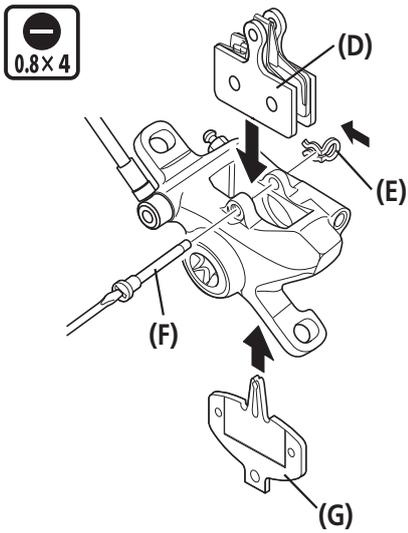
- (A) Brake pad
- (B) Snap ring

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. When you replace the brake pads, you need to push back the piston.
- If oil adheres to the brake pads after oil is added, or 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.
- The brake pads in the BR-R785/RS785 and BR-RS805 are not compatible. 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.

- (C) Piston

4



BR-R785/RS785

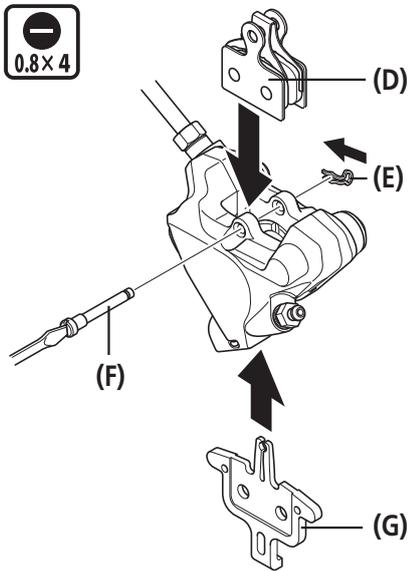
Install the new brake pads, the bolt, and the pad spacer (red).

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

BR-RS805

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

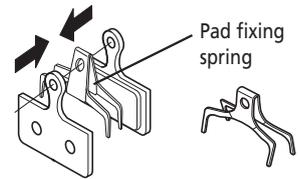
At this point, make sure to install the snap ring as well.



- (D) Brake pad
- (E) Snap ring
- (F) Pad axle
- (G) Pad spacer (red)

| Tightening torque | |
|---|----------------------|
|  0.8x4 | 0.1 - 0.3 N·m |

 **TECH TIPS**



Install the pad fixing spring as shown in the illustration.
 (The spring of the BR-R785/RS785 has markings on the left side (L) and the right side (R).)

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 section "Installing the brake caliper and securing the brake hose".

■ Shimano genuine mineral oil replacement

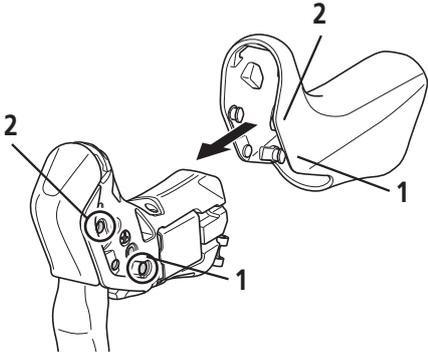
It is recommended that you replace the oil inside the reservoir tank if it becomes severely discolored.

Attach a tube with a bag to the bleed nipple, and then open the bleed nipple to drain out the oil. You can operate the dual control lever at this time to help the oil to drain out. After draining the oil, pour in fresh brake oil in accordance with "Adding Shimano genuine mineral oil and bleeding air". Use only Shimano genuine mineral oil.

Dispose of the waste oil according to proper country and/or state disposal regulations.

■ Installation of the bracket cover

1



Insert the protrusions of the bracket cover as shown in the illustration.

Do the same with the protrusions on the other side.

NOTE

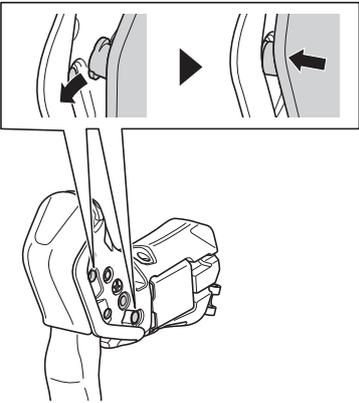
Note the markings
R: for right
L: for left

The markings can be found on the inner surface of the bracket cover. Always replace the bracket cover with the dual control lever and brake hose removed from the bicycle as shown in the illustration.

 **TECH TIPS**

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

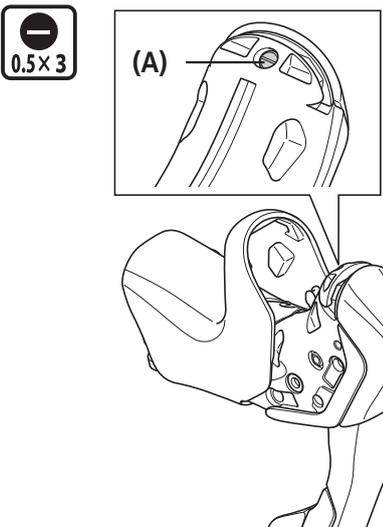
2



Insert the lower protrusion into the appropriate hole of the bracket unit, and then insert the upper protrusion.

■ Replacement of the name plate

1



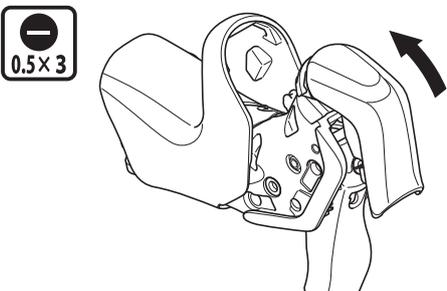
Open up the bracket cover and remove the name plate fixing screw.

(A) Name plate fixing screw

NOTE

The name plate fixing screw is very small. Be careful not to lose the screw while removing it.

2



Hold the lower part of the name plate while gripping the lever, and pull up the name plate to remove it as shown in the illustration.

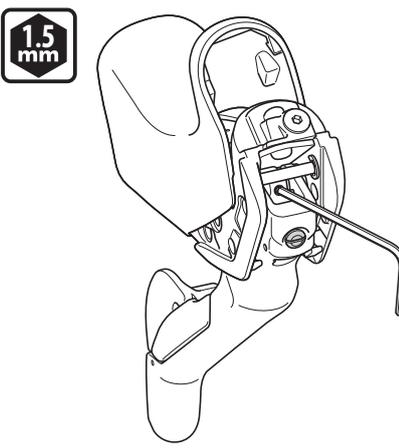
3

Replace the name plate and fix the new name plate with the name plate fixing screw.

| Tightening torque | |
|---|----------------|
|  0.5x3 | 0.15 - 0.2 N·m |

■ Disassembly of the bracket unit and lever unit

1



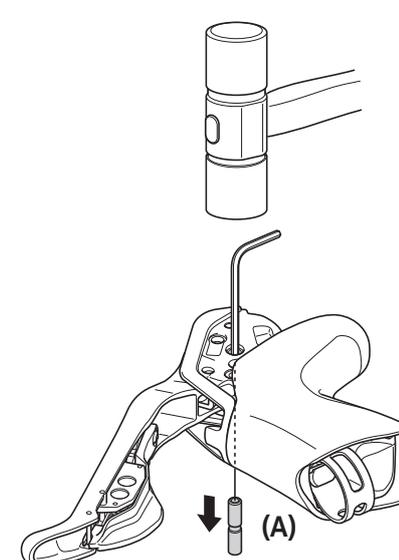
1.5 mm

Remove the name plate.

Remove the switch unit.

Grip the lever and loosen the lever mounting bolt with an hexagon wrench.

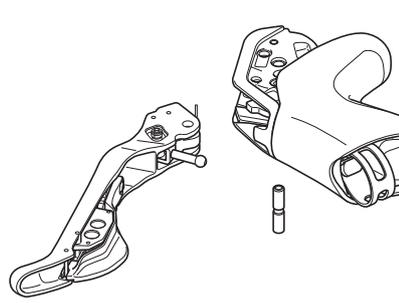
2



Insert an hexagon wrench or a similar tool into the hole in the lever stud, and then tap it with a plastic mallet to push out the lever stud.

(A) Lever stud

3



Remove the lever unit from the bracket unit.

■ Assembly of the bracket unit and lever unit

1

Mount the fixing spring (R) and fixing spring (L) to the cam, and mount the cam to the lever unit.

- (A) Cam
- (B) Fixing spring (R)
- (C) Fixing spring (L)
- (D) Lever unit

2

Temporarily assemble the cam and lever unit by TL-ST04.

- (E) TL-ST04

TECH TIPS

TL-ST04 (Y07T27000) :
Included in main lever assembly of service parts.

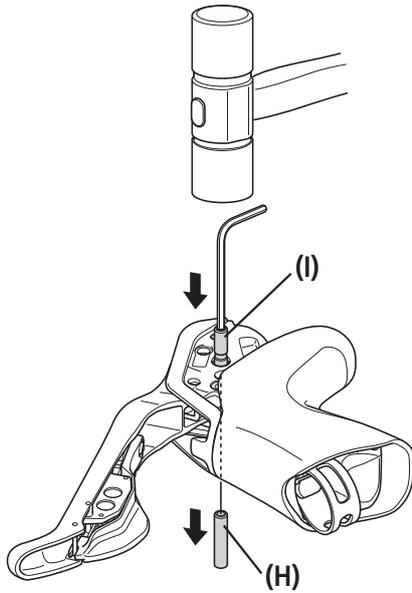
3

Set the lever unit to the bracket unit in place.

At this point, make sure that the push rod is fitted into the groove in the master piston.

- (F) Push rod
- (G) Master piston

4

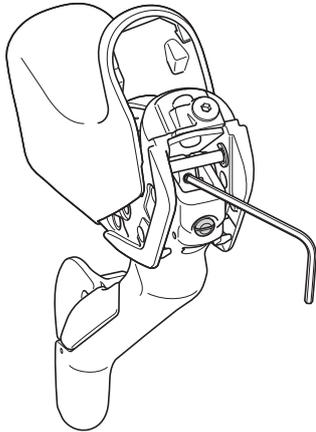


Use an hexagon wrench to install the lever stud.

Tap the hexagon wrench with a plastic mallet to push out the temporary assembly lever stud and install the lever stud.

- (H) Mounting the temporary assembly lever stud
- (I) Lever stud

5

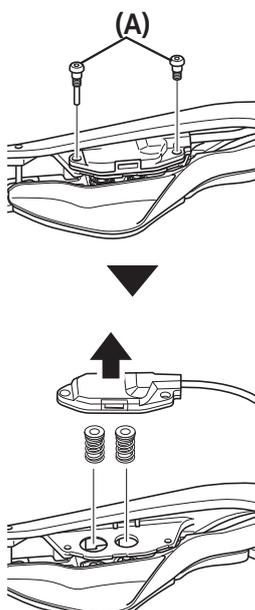


Tighten the lever mounting bolt with an hexagon wrench.

| Tightening torque | |
|-------------------|----------|
| | 0.15 N·m |

■ Removing the switch unit

1

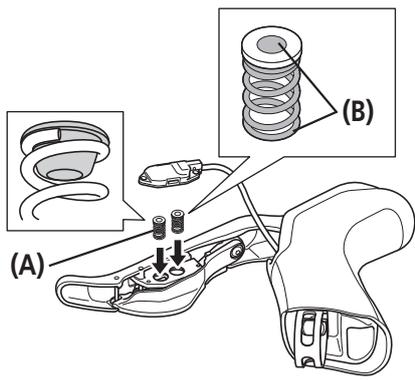


Remove the two switch unit fixing screws, and then remove the switches and the switch springs.

- (A) Switch unit fixing screws (Hexalobular #5)

■ Assembly of the switch unit

1

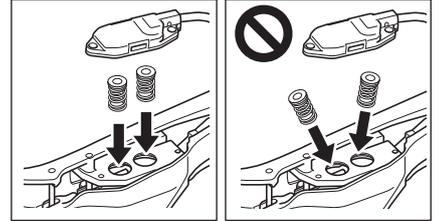


Check that the buttons are attached to the springs, and then place the switch springs into the holes in the switch unit setting plate.

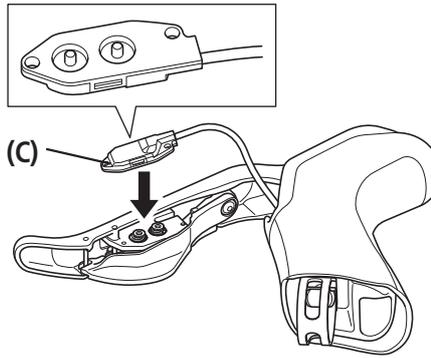
- (A) Switch spring
- (B) Apply grease
Premium grease
(Y-04110000)

NOTE

Do not compress switch springs as this will deform them. When placing the switch springs, place them perpendicular to the setting plate.



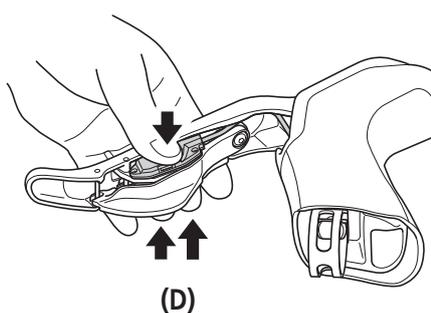
2



Place the switch unit against the mounting surface of the switch unit setting plate.

- (C) Switch unit

3



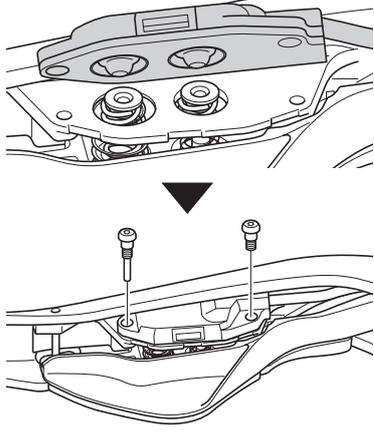
Press the switch unit by hand so that the switch springs go into the grooves in the buttons, and then push the shifting switches (X / Y) in as far as they will go.

- (D) Shifting switch (X / Y)

MAINTENANCE

▶▶ Assembly of the switch unit

4



Make a gap between the switch unit and the switch unit setting plate and check that the end of the rubber on the switch unit is on the button.

Tightening torque



0.18 N·m

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

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