

Dealer's Manual

ROAD	GRAVEL	MTB
E-BIKE	LIFESTYLE	GENERAL

Hydraulic Disc Brake/ Dual Control Lever (SHIMANO Hydraulic Mineral Oil)

TIAGRA
ST-R4020

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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 distributor for assistance.

- Make sure to read all manuals included with each product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All manuals and technical documents are accessible online at <https://si.shimano.com>.
- For consumers who do not have easy access to the internet, please contact a SHIMANO distributor or any of the SHIMANO offices to obtain a hardcopy of the user's manual.
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.

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

The following instructions must be observed at all times in order to prevent personal injury and physical damage to equipment and surroundings.

The instructions are classified according to the degree of danger or damage which may occur if the product is used incorrectly.

	DANGER	Failure to follow the instructions will result in death or serious injury.
	WARNING	Failure to follow the instructions could result in death or serious injury.
	CAUTION	Failure to follow the instructions could cause personal injury or physical damage to equipment and surroundings.

TO ENSURE SAFETY

⚠ WARNING

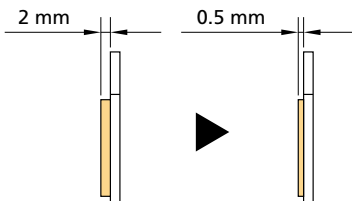
- **Be sure to follow the instructions provided in the manuals when installing the product.**
Only use SHIMANO genuine parts. If a component or replacement part is incorrectly assembled or adjusted, it can lead to component failure and cause the rider to lose control and crash.
-  Wear approved eye protection while performing maintenance tasks such as replacing components.

Be sure to also inform users of the following:

- Because each bicycle may handle slightly differently depending on the model, 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, which could lead to serious injury due to a fall or collision.
- Keep your fingers away from the rotating rotor. The rotor is sharp enough to inflict severe injury to your fingers if caught.



- Do not touch the calipers or rotor while riding or immediately after dismounting from the bicycle. The calipers and rotor will become hot when the brakes are operated, so you may get burned if you touch them.
- Do not allow any oil or grease to get onto the rotor or pads. Riding the bicycle with oil or grease on the rotor or pads may prevent the brakes from operating and result in serious injury due to a fall or collision.
- Check the thickness of the pads and do not use them if they have a thickness of 0.5 mm or less. Doing so may prevent the brakes from operating and result in serious injury due to a fall or collision.



- Do not use the rotor if it is cracked or deformed. The rotor may break, and result in serious injury due to a fall or collision.
- Do not use the rotor if its thickness is 1.5 mm or less. Also do not use it if the aluminum surface becomes visible. The rotor may break, and result in serious injury due to a fall or collision.
- Do not continuously apply the brakes. Doing so may cause a sudden increase in the brake lever stroke, preventing the brakes from operating and resulting in serious injury due to a fall or collision.
- Check the information on the [supported models for each oil type](#), and use the correct oil for the product. Doing otherwise may prevent the brakes from operating and result in serious injury.
- Do not mix SHIMANO hydraulic mineral oil with SHIMANO low viscosity oil. Doing so may prevent the brakes from operating and result in serious injury.
- Do not use the brakes with fluid leaking. Doing so may prevent the brakes from operating and result in serious injury due to a fall or collision.
- Do not apply the front brake too strongly. If you do so, the front wheel may lock and the bicycle may fall forward, and serious injury may result.

TO ENSURE SAFETY

- Because the required braking distance will be longer during wet weather, reduce your speed and apply the brakes early and gently. Failure to do so may result in serious injury due to a fall or collision.
- A wet road surface may cause tires to lose traction; therefore, to avoid this, reduce your speed and apply the brakes early and gently. If the tires lose traction, you may fall and be seriously injured.
- If the quick release lever is on the same side as the rotor, confirm that it does not interfere with the rotor. Otherwise, the bicycle may fall forward, and serious injury may result.

For installation to the bicycle and maintenance

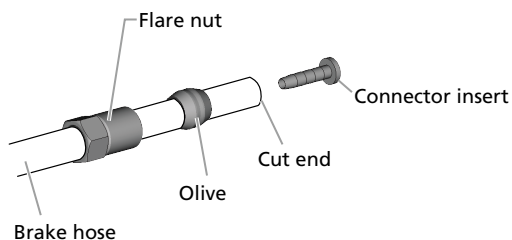
- Do not use oil other than SHIMANO hydraulic mineral oil. Doing so may prevent the brakes from operating and result in serious injury due to a fall or collision.
- Use only mineral oil from a container that has been stored in a clean and sealed state. Doing otherwise may prevent the brakes from operating and result in serious injury due to a fall or collision.
- Do not let water or air bubbles get into the brake system. Doing so may prevent the brakes from operating and result in serious injury due to a fall or collision.
- Do not use with a tandem bicycle. Doing so may prevent the brakes from operating and result in serious injury due to a fall or collision.

■ Brake hose

- Refer to the table below, and do not use an incorrect connector insert. Doing so may prevent the brakes from operating and result in serious injury due to a fall or collision.

Brake hose	Connector insert	
	Length	Color
SM-BH59-JK-SSR	13.2 mm	Gold

- Do not reuse the olive piece or the connector insert when reinstalling. Doing so may prevent the brakes from operating and result in serious injury due to a fall or collision.



- 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. Fluid leaks may prevent the brakes from operating and result in serious injury due to a fall or collision.



■ When using TL-CT12:

- Be careful not to get injured by the blade or needle while working.
- Be careful not to get your fingers pinched by the tool while working.
- Keep the tool out of the reach of small children.

■ When using TL-BH62

- Read the TL-BH62 manual carefully, and keep it in a safe place for later reference.

CAUTION

Be sure to also inform users of the following:

■ Cautions on SHIMANO hydraulic mineral oil

- Use appropriate eye protection when handling, and avoid contact with eyes. In the event of eye contact, flush with fresh water and seek medical assistance immediately. Contact with eyes may result in irritation.
- Use gloves when handling. In the event of skin contact, wash well with soapy water. Contact with skin may cause a rash and discomfort.
- When using SHIMANO hydraulic mineral oil, cover your nose and mouth with a respirator type mask and ensure that the area is well-ventilated. Inhalation of mineral oil mist or vapors may cause nausea.
- If SHIMANO hydraulic 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.

■ Bed-in period

- When using resin pads, perform bed-in for a longer period of time than metal pads. Resin pads are designed to reduce the amount of noise generated between the pads and the rotor when the brakes are operated. A longer bed-in period is required than for metal pads. Refer to "[Replacing the pads](#)." for information on how to perform bed-in.
- Disc brakes have a bed-in period, and the braking force will gradually increase as the bed-in period progresses. You may lose control of the bicycle, which can result in serious injury due to a fall or collision.
(The same thing will happen when the pads or rotor are replaced.)

For installation to the bicycle and maintenance

- When using the SHIMANO original tool (TL-FC36, etc.) to remove and install the rotor lock ring, wear gloves and be careful not to touch the outer edges of the rotor with your hands. Failure to do so may result in cuts to your hands.

■ Handling SHIMANO hydraulic mineral oil

- Do not drink. May cause vomiting or diarrhea.
- Keep out of reach of children.
- Do not cut, let near heat, weld or pressurize the SHIMANO hydraulic mineral oil container. Doing so may cause an 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.
- For cleaning brake hoses exposed to SHIMANO hydraulic mineral oil, or cleaning and maintaining tools, use isopropyl alcohol or a dry cloth. Do not use commercially available brake cleaners. Doing so may cause damage to resin parts.

■ 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.

■ When using TL-BH62

- When cutting the brake hose, handle the blade carefully so as not to cause injury.
- Be careful to avoid pinching your fingers between the lever and the tool during operations.
- When replacing the knife blade, handle the knife carefully so as not to cause injury.

TO ENSURE SAFETY

- Keep the tool and the blades out of reach of children.

Notice

Be sure to also inform users of the following:

- When the bicycle wheel has been removed, it is recommended that pad spacers are installed. Do not depress the brake lever while the wheel is removed. If the brake lever is depressed without the pad spacers installed, the pistons will protrude further than normal. If that happens, consult a place of purchase.
- When conducting maintenance, do not use commercially available brake cleaners or silencing agents, as they can cause damage to parts such as the seals.
- Be sure to keep rotating the crank arm during gear shifting operations.
- Handle the components carefully, and avoid subjecting them to strong shock.
- Do not use the thinners or harsh solvents to clean the products. Such solvents may damage the surface.
- 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 either side. Furthermore, check that the dual control levers do not touch the bicycle frame when the handlebars are turned all the way.
- Use an OT-SP sealed cable and cable guide for smooth operation.
- Grease with SIS SP41 Grease (Y04180000) the inner cable and the sliding portions 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 dropouts are aligned. Check if the cable is lubricated or if the outer casing is too long or too short.
- Do not remove the lever unit from the bracket body.
- If the brake caliper mounting boss and the dropout are not of standard dimensions, the rotor and caliper may touch. If this occurs, contact the manufacturer of the bicycle frame or fork for assistance.
- 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 normal. Use a flat-shaped tool to push back the pads, while being careful not to damage the surface of the pads. (If the pads are not installed, use a flat-shaped tool to push the pistons straight back in, while being careful not to damage them.) When pushing back the pads or pistons, do so with an oil funnel attached to the dual control lever. Otherwise, the diaphragm of the dual control lever may be damaged by the oil pressure.
- Do not remove the pistons when cleaning the calipers.
- Use the parts indicated in the exploded view of the dual control levers when you replace the clamp band, mounting screw, or mounting nut.
- Even with the recommended tightening torque, there is a possibility that the carbon handlebars may become damaged and insufficiently tightened. Confirm the appropriate torque value with the bicycle manufacturer or the handlebar manufacturer.

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

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

Tool	
	2.5 mm hexagon wrench
	3 mm hexagon wrench
	5 mm hexagon wrench
	7 mm box wrench
	8 mm spanner
	Slotted screwdriver
	Cross head screwdriver [#1]
	TL-BH62
	TL-BR001 (syringe and tube)
	TL-BR002 (oil funnel and oil stopper)
	TL-CT12
	Micrometer
	Hexalobular [#8]

Installation / removal

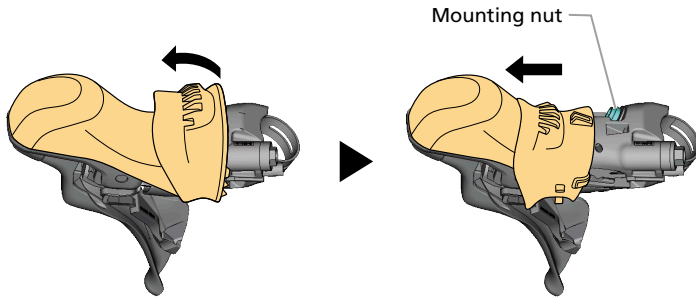
Installing the rotor

Refer to the [dealer's manual for the hub set \(disc brake\)](#) to install and remove the rotor.

Installing the dual control levers

1. Turn over the bracket cover from the back side.

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

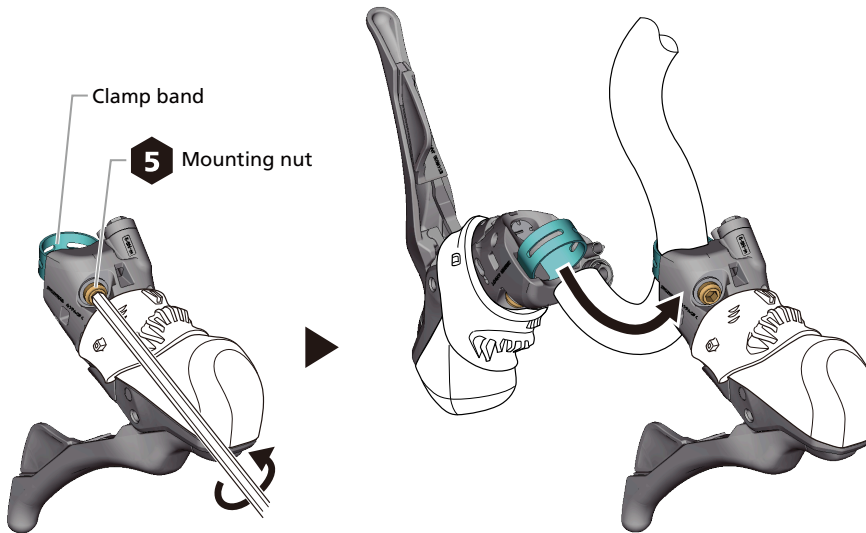


NOTICE

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

2. Loosen the mounting nut and pass the clamp band over the handlebar.

The mounting nut is found on top of the lever bracket when the bracket cover is turned over.

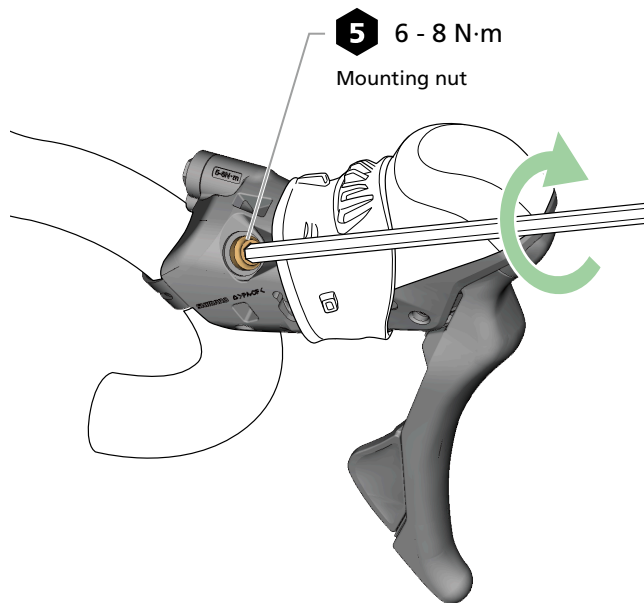


NOTICE

- Be sure to loosen the mounting nut sufficiently. Otherwise the handlebar may be damaged when passing the clamp band over the drop handlebar.

3. Install the lever to the handlebar.

Tighten the mounting nut.

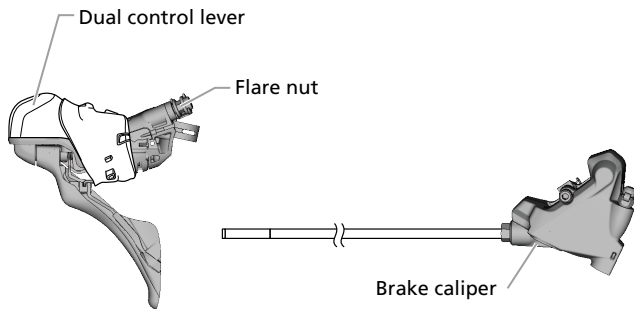


NOTICE

- Use the parts indicated in the exploded view of the dual control levers when you replace the clamp band, mounting screw, or mounting nut.

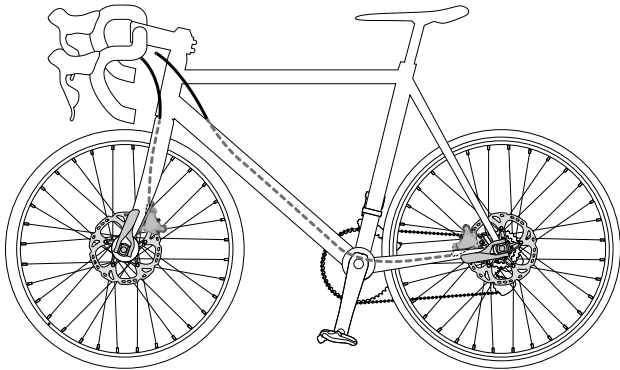
Installing the brake hose (easy hose joint system)

Overview of the easy hose joint system



Checking the length of the hose

1. Route the brake hose into the final installation position.



NOTICE

- This figure is only for explanatory purposes. For details on how to route the brake hoses, consult the manufacturer of the bicycle or refer to the bicycle's manual.

2. Check the appropriate length of the brake hose.

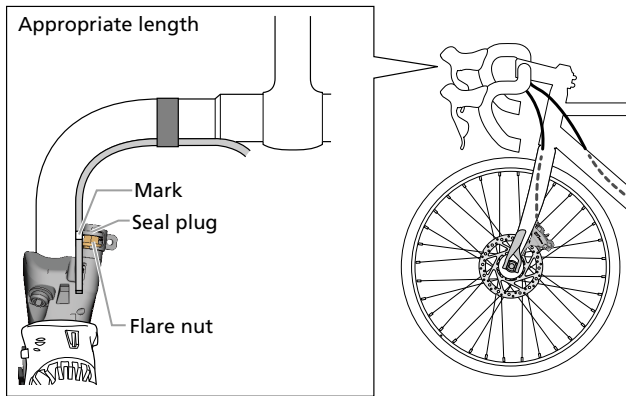
Secure the lever in the position used when riding.

Check the mark on the brake hose with the edge of the dual control lever flare nut.

* If the hose is at the appropriate length, it is not necessary to cut the hose. Proceed to " [Connecting the hose](#) " in "Installing the brake hose (easy hose joint system)."

* If the hose needs to be shortened, proceed to " [Cutting the hose](#) " in "Installing the brake hose (easy hose joint system)" to shorten the hose.

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

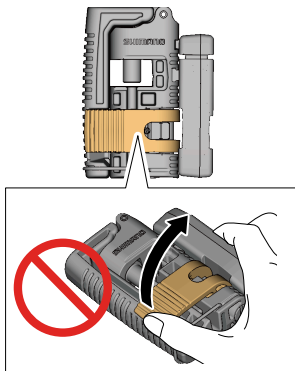


Cutting the hose

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

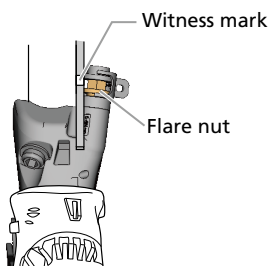
NOTICE

- Make sure to also refer to the manual for SHIMANO original tool TL-BH62.
- Do not move the lever indicated in the figure before disassembling TL-BH62.



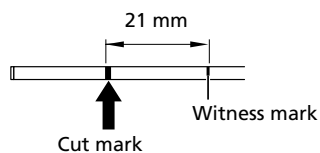
1. Determine the appropriate length and add a witness mark on the brake hose.

Add the mark so it is aligned with the edge of the flare nut.



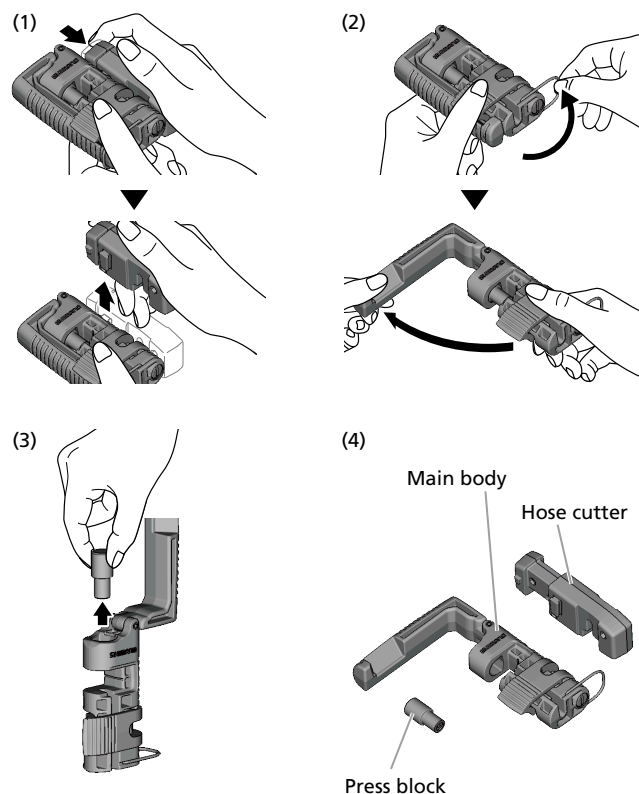
2. Add a cut mark.

Mark the hose at a position 21 mm from the witness mark towards the end of the hose.



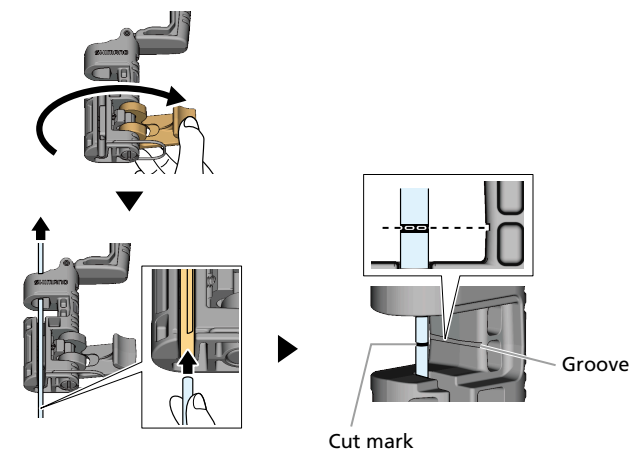
3. Prepare tool TL-BH62 for the cutting of the brake hose.

Disassemble the tool as shown in the figures.

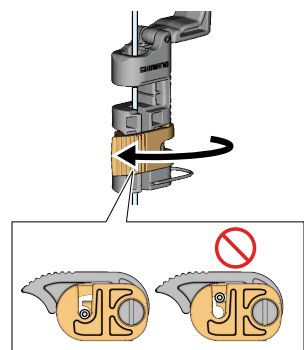


4. Insert the brake hose into the TL-BH62.

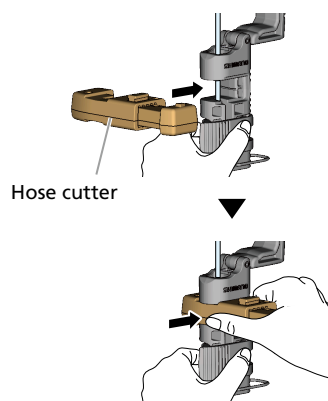
When placing the brake hose, make sure that the cut mark is parallel with the alignment groove in the tool.



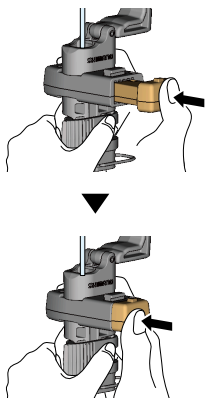
5. Check the cut location and secure the brake hose in place.



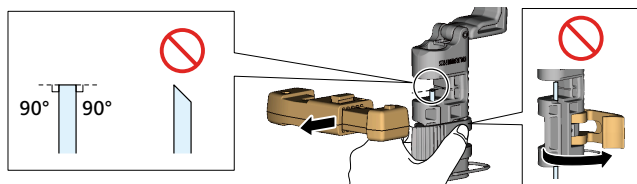
6. Check that the hose is secure, then install the hose cutter.



7. Press the hose cutter as shown in the figure to cut the brake hose.

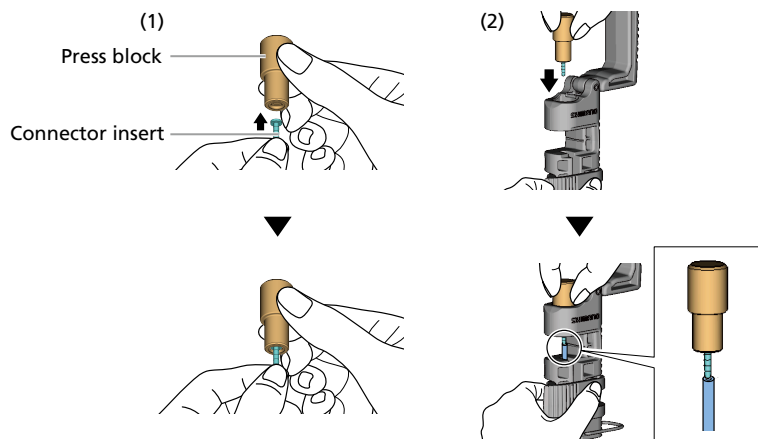


8. Remove the hose cutter and check that the cut end is even.



9. Install the connector insert in the press block, then set the press block in the TL-BH62.

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

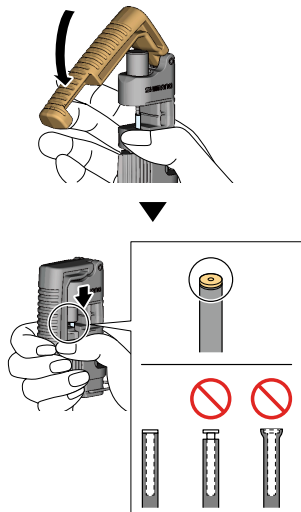


NOTICE

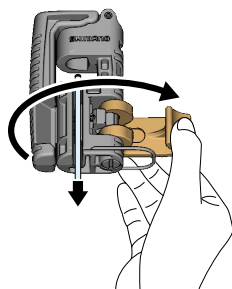
- When connecting with an easy hose joint system, a specific Connector Insert (SHIMANO CODE No.: Y8H298040 / color: gold) must be used. Use of any connector insert other than the specified one may lead to oil leakage and other malfunctions.

10. Depress the lever on the TL-BH62 to install the connector insert in the brake hose.

Check that the connector insert is installed correctly.



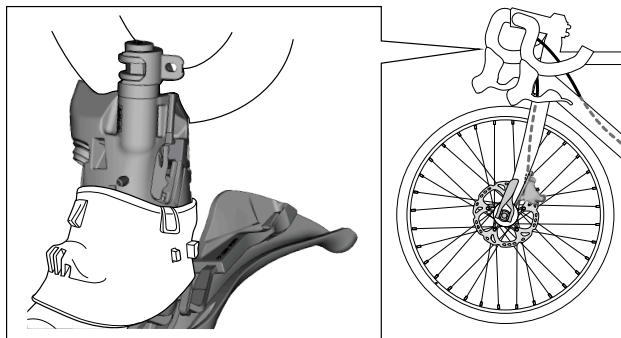
11. Remove the brake hose from the TL-BH62.



Connecting the hose

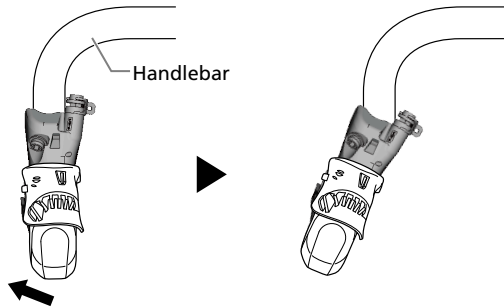
1. Secure the lever with the hose connection port facing up by changing the angle of the handlebar, etc.

Perform this task with the brake caliper removed from the frame as needed.

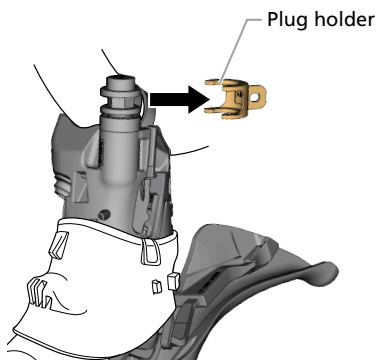


NOTICE

- You may need to adjust the angle of the lever outward in order to gain clearance for the spanner. Be careful not to damage the handlebar and other parts when doing so.

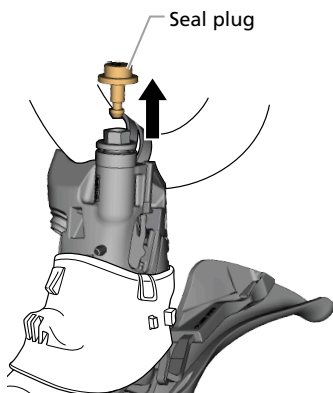


2. Remove the plug holder.



3. Remove the seal plug.

Use a clean rag to keep oil from dripping off the seal plug.

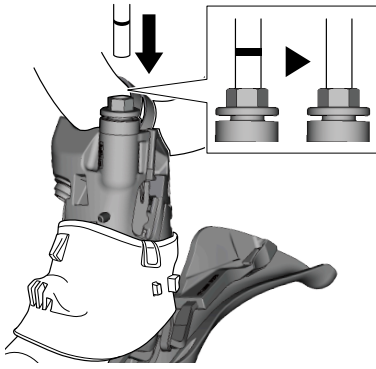


4. Insert the brake hose into the brake hose connection port.

The lever comes with a pre-installed olive. When inserting the hose, ensure it does not snag on the olive.

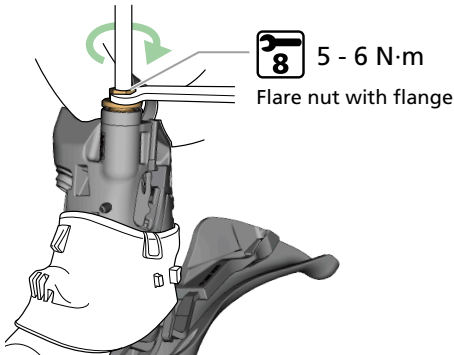
Insert the hose until the witness marks added beforehand on the surface of the hose are covered.

Cover with a clean rag while conducting this procedure as some of the internal oil may leak.



5. Tighten the flare nut with flange.

Tighten the flare nut with flange while pushing the brake hose in.



NOTICE

- Make sure to fully insert the brake hose and tighten the flare nut. Otherwise, oil leaks or insufficient braking force may occur.

- 6. Wipe away any excess oil.**
- 7. Check that the pad spacer is installed in the caliper.**
- 8. Operate the brake lever several times. Check that the pads grip the pad spacer and that the lever becomes stiff.**

If the lever does not become stiff, refer to " [Adding SHIMANO hydraulic mineral oil and bleeding air](#) " and bleed the air from the system.

Installing the brake hose

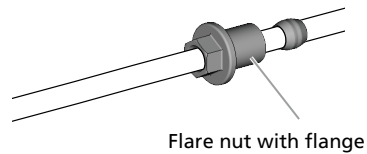
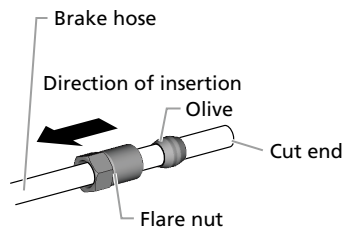
Connecting the hose

1. Cut the brake hose and install the connector insert.

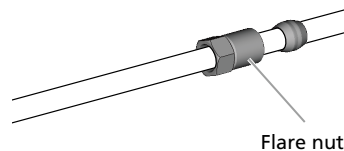
Refer to " [Cutting the hose](#) " in "Installing the brake hose (easy hose joint system)."

2. Pass the brake hose through the flare nut and olive as shown in the figure.

Dual control lever side



Brake caliper side

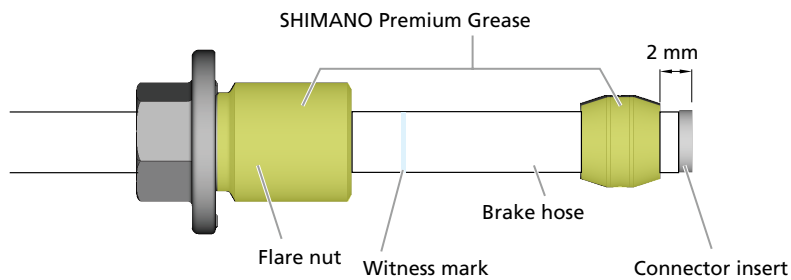


NOTICE

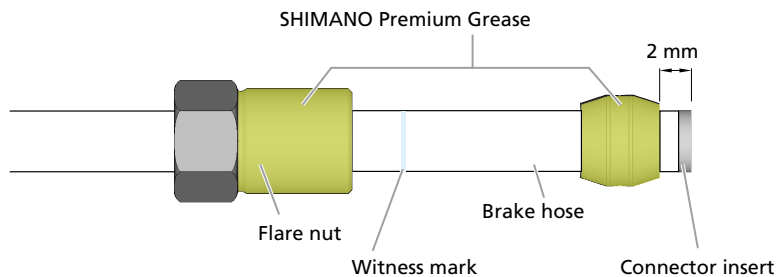
- Use a flare nut with flange on the dual control lever side.

3. Check that the olive is in the position shown in the figure, then apply SHIMANO Premium Grease to the threads of the flare nut and outer surface of the olive.

Dual control lever side



Brake caliper side



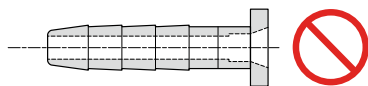
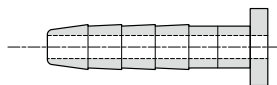
⚠ WARNING

- Use the dedicated connector insert supplied with SM-BH59-JK-SS. Use of any connector insert other than the one supplied may produce a loose assembly, which may prevent the brakes from operating and result in serious injury due to a fall or collision.

Model number: SM-BH59-JK-SSR

Length: 13.2 mm

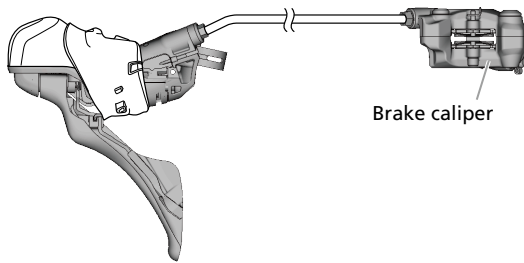
Color: gold



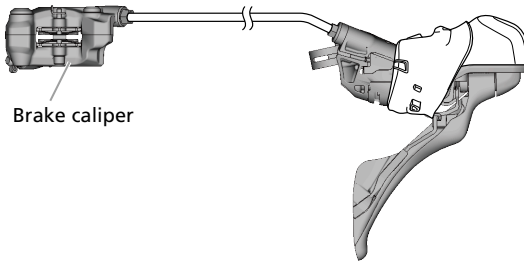
4. Insert the brake hose.

Insert the hose until the witness marks added beforehand on the surface of the hose are covered.
Make sure that the brake hose is not twisted.

Right-hand lever

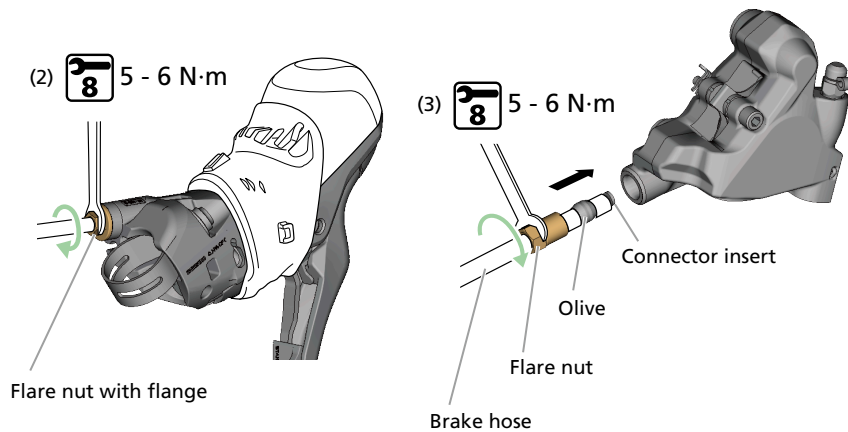


Left-hand lever



5. Secure the brake hose.

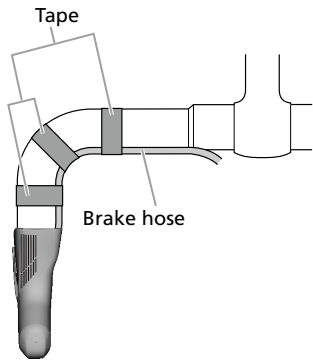
- (1) Secure the dual control levers to the handlebar.
- (2) Tighten the flare nut with flange to the lever while pushing the brake hose.
- (3) Tighten the flare nut to the caliper while pushing the brake hose.



NOTICE

- Make sure the brake hose is straight when pushing.
- You may need to adjust the angle of the lever outward in order to gain clearance for the spanner. Be careful not to damage the handlebar and other parts when doing so.

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

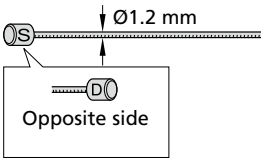
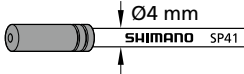


Installing the brake calipers

Refer to the " [Hydraulic Disc Brake/Dual Control Lever Dealer's Manual](#) " to install the brake caliper.

Installation of the shifting cable

Cable to be used

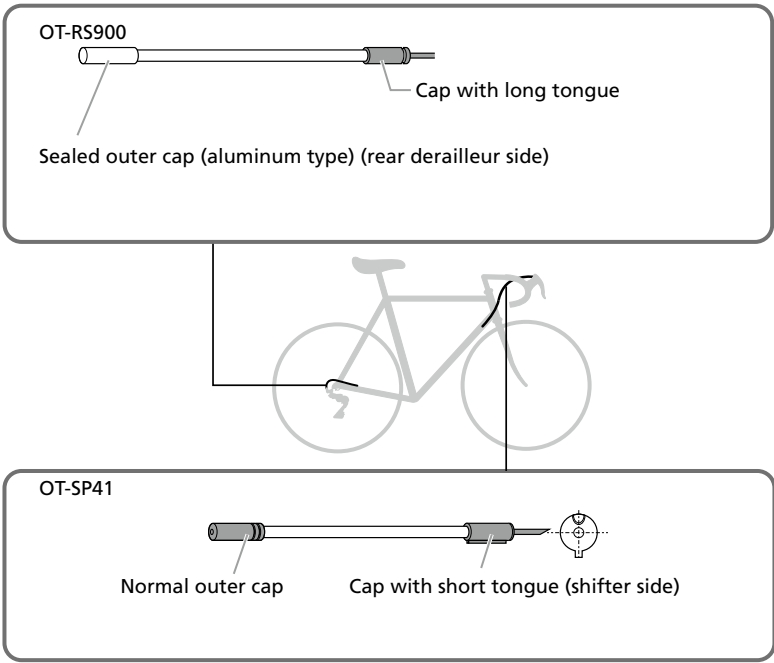
Designated inner cable		Recommended outer casing
ST-R4020		Normal outer cap/SP41 outer casing 

NOTICE

- 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.

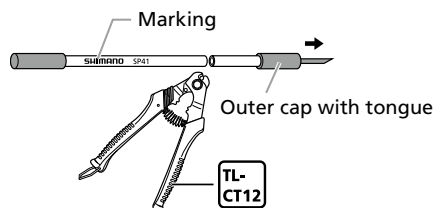
Outer cap with tongue installation position

If outer casing longer than 240 mm is required on the rear derailleur side, use OT-SP41 outer casing rather than OT-RS900.



Cutting the outer casing

1. Cut the outer casing using a cable cutter (TL-CT12), etc.
Cut the end of the outer casing that is opposite to the marking.



NOTICE

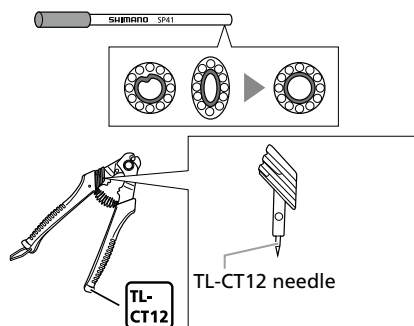
- Cut the outer casing so it still has some length to spare even when the handlebars are turned all the way to either side.

2. Remove the outer cap with tongue from the cut outer casing.



3. Spread out the tip of the liner (Ø2.2 or more) using a thin tool such as a TL-CT12 needle.

Arrange the cut end into a perfect circle.

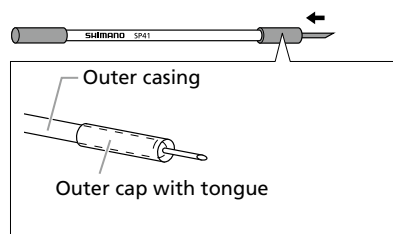


NOTICE

- Be careful not to hurt your hands with the TL-CT12 needle.

4. Install the outer cap with tongue.

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



NOTICE

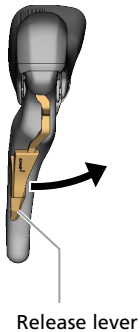
- When inserting the outer casing, take care to ensure that the tip of the outer cap with tongue is not damaged.

Installing the inner cable

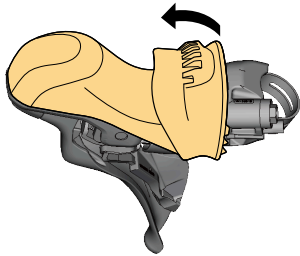
The illustration shows the right-hand lever.

1. Set the lever position to the top.

Operate the release lever 10 times or more.

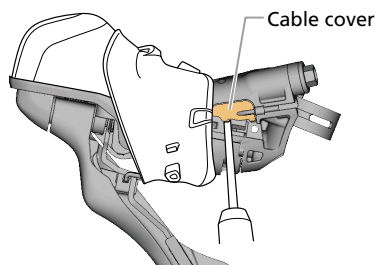


2. Turn over the bracket cover from the back side.

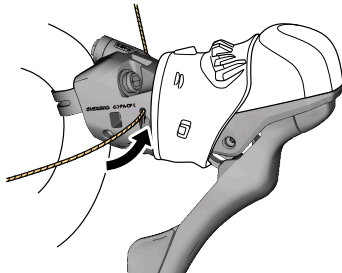


3. Remove the cable cover from the bracket.

Remove it using a screwdriver, etc.



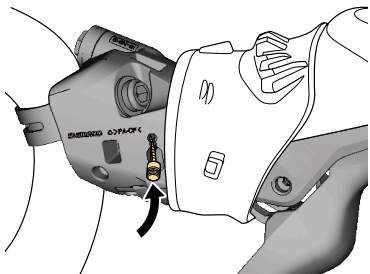
4. Install the inner cable through the lever bracket as shown in the figure.



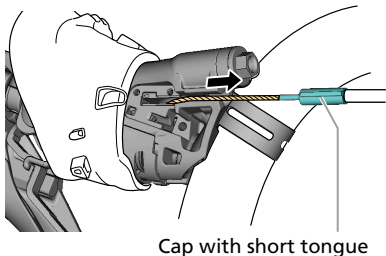
NOTICE

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

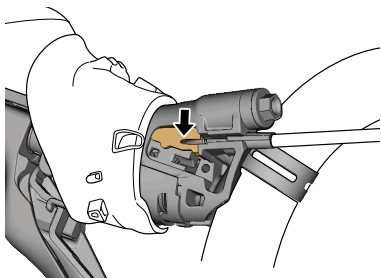
5. Insert the cable in such a manner that the inner end is attached to the unit.



6. Install the inner cable through the lever bracket as shown in the figure.



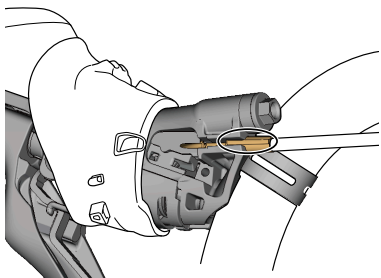
7. Install the cable cover to the bracket.



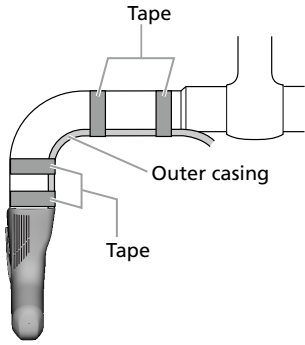
TECH TIPS

- If the coating is damaged when the inner cable is installed, the coating may become fluffy; however, function will not be affected.

8. Insert the alignment tab of the cap with short tongue into the indicator groove on the lever bracket.



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



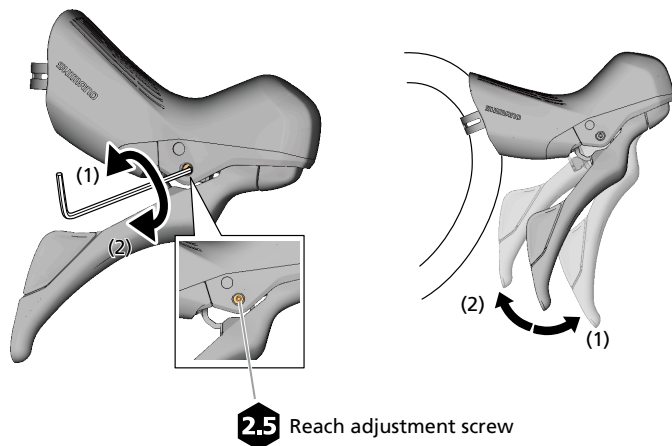
10. Wrap the handlebar with handlebar tape.

Adjustment

Adjusting the reach

1. Turn the reach adjustment screw to adjust the reach.

Tightening the reach adjustment screw (clockwise) narrows the distance between the position of the brake lever and the handlebar, while loosening the screw (counterclockwise) widens it.



Maintenance

Replacing the pads

Refer to the " [Hydraulic Disc Brake/Dual Control Lever Dealer's Manual](#) " to install the brake caliper.

NOTICE

- To optimize the performance of the pads and rotor after replacing the pads, perform the bed-in procedure as explained in the steps below:
 - (1) Ride your bicycle in a flat and safe area without obstacles and depress the brake lever an amount that enables pedaling.

Do this only with one brake lever at a time. For your bicycle with gear shifting capability, shifting the chain to the largest sprocket and the smallest chainring makes pedaling easier. If it has the assist function, perform bed-in with the function OFF. Performing bed-in with the function ON may overheat the rotor and cause discoloration and noise.
 - (2) With the brake lever depressed, ride your bicycle for 20 m.
 - (3) Repeat steps [1](#) and [2](#) at least 10 times for both the front and rear brakes.

While repeating the process, the braking force will increase.

Replacing SHIMANO hydraulic mineral oil

It is recommended to change the oil when it becomes noticeably discolored.

Refer to the " [Draining SHIMANO hydraulic mineral oil](#) " and " [Adding SHIMANO hydraulic mineral oil and bleeding air](#) " sections to perform the replacement procedure.

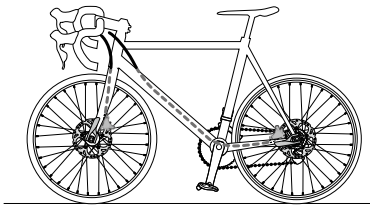
Draining SHIMANO hydraulic mineral oil

⚠ CAUTION

Note the following cautions when handling SHIMANO hydraulic mineral oil:

- Do not drink. May cause vomiting or diarrhea.
- Keep out of reach of children.
- Do not cut, let near heat, weld or pressurize the SHIMANO hydraulic mineral oil container. Doing so may cause an 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. Keep from heat or flame.
- For cleaning brake hoses exposed to SHIMANO hydraulic mineral oil, or cleaning and maintaining tools, use isopropyl alcohol or a dry cloth. Do not use commercially available brake cleaners. Doing so may cause damage to resin parts.

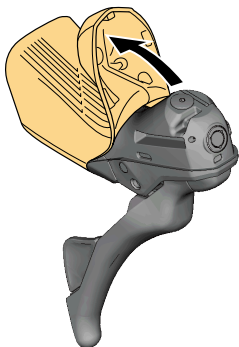
1. **Secure the bicycle so that it is parallel to the ground using a stand, etc.**



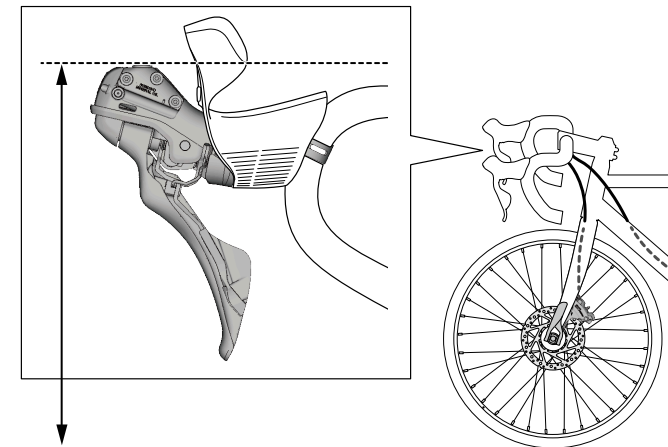
2. **Remove the pads from the calipers, and install the bleed spacer.**

Refer to the "[Hydraulic Disc Brake/Dual Control Lever Dealer's Manual](#)."

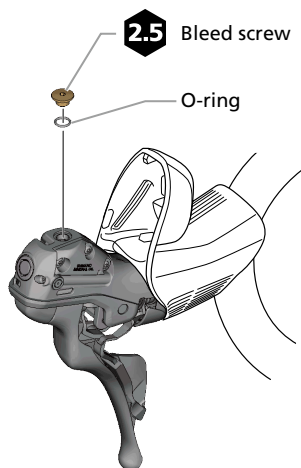
3. **Turn over the bracket cover from the front side.**



4. **Set the lever in a position where the top surface of the bleed screw is parallel with the ground.**

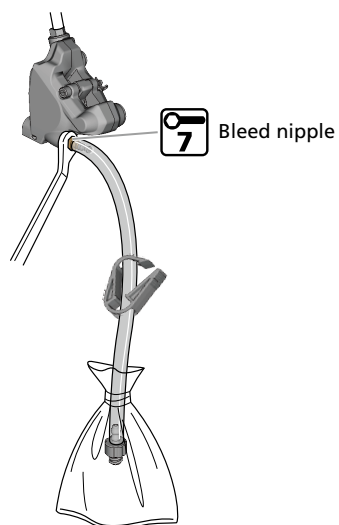


5. Remove the bleed screw and O-ring.



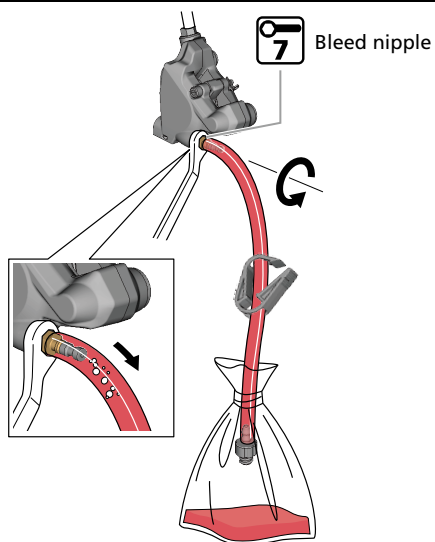
6. Install a bag and tube on the bleed nipple.

- (1) Remove the bleed nipple cap.
- (2) Place a 7 mm box wrench in the position shown in the figure.
- (3) Connect the tube with bag attached to the bleed nipple.



7. Loosen the bleed nipple.

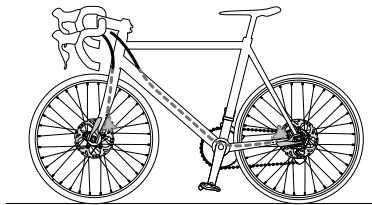
The oil will begin to drain. Operating the brake lever while the oil drains will allow the oil to drain more quickly.



Adding SHIMANO hydraulic mineral oil and bleeding air

When adding oil, use only SHIMANO hydraulic mineral oil.

1. Secure the bicycle so that it is parallel to the ground using a stand, etc.



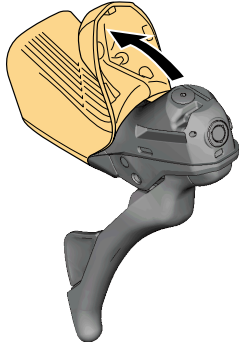
NOTICE

- When bleeding air, you will need the TL-BR001 and TL-BR002 SHIMANO original bleed tools.

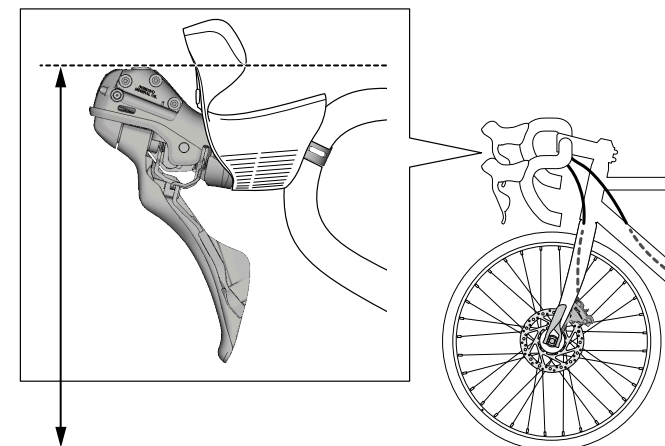
2. Remove the pads from the calipers, and install the bleed spacer.

Refer to the "[Hydraulic Disc Brake/Dual Control Lever Dealer's Manual](#)."

3. Turn over the bracket cover from the front side.



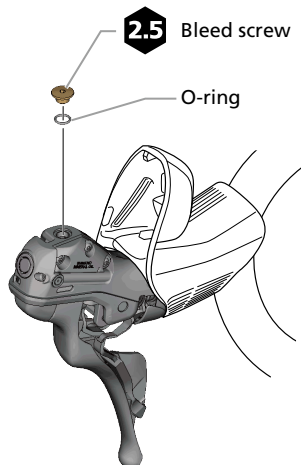
4. Set the lever in a position where the top surface of the bleed screw is parallel with the ground.



NOTICE

- When adjusting the angle of the brake lever, be careful not to strain the brake hose or shift cable to avoid damage.

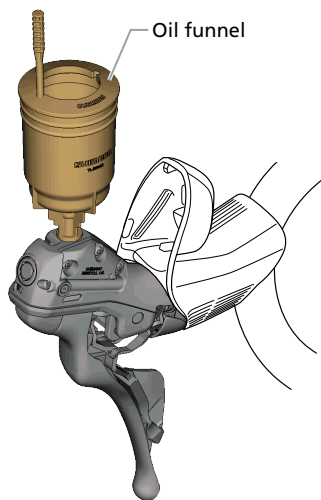
5. Remove the bleed screw and O-ring.



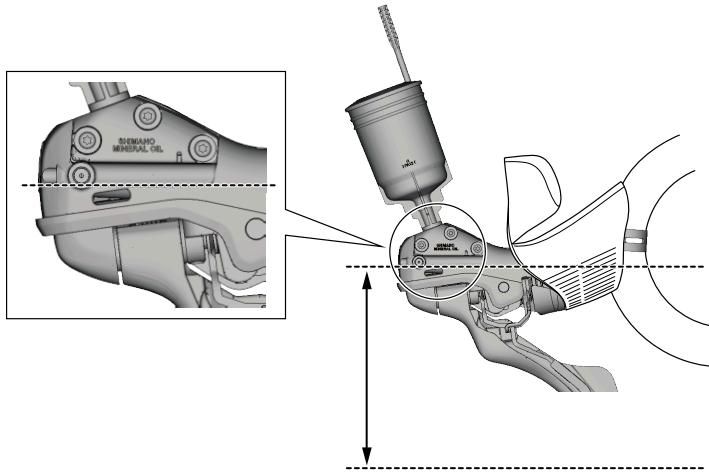
NOTICE

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

6. Mount the oil funnel.



7. Set the lever in a position where the bracket surface indicated in the figure is parallel with the ground. Perform adjustment by changing the angle of the handle, etc.



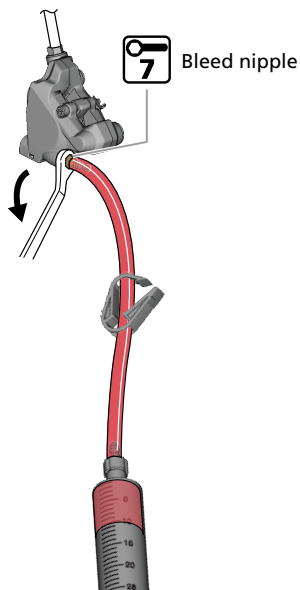
NOTICE

- When adjusting the angle of the brake lever, be careful not to strain the brake hose or shift cable to avoid damage.

8. Add the oil through the bleed nipple.

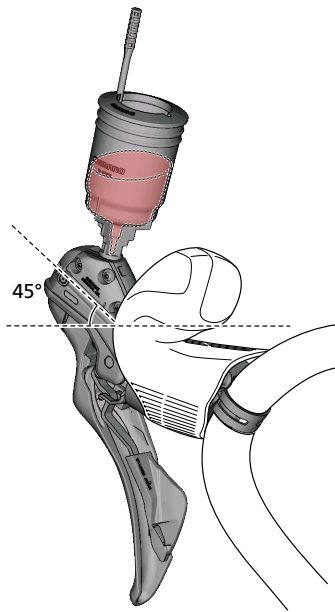
Do not depress the brake lever while adding oil. Doing so may introduce air bubbles into the system. If the lever was depressed, drain the oil and re-start the process.

- (1) Remove the bleed nipple cap.
- (2) Place a 7 mm box wrench in the position shown in the figure.
- (3) Fill a syringe with oil, then connect the tube to the bleed nipple.
- (4) Loosen the bleed nipple by 1/2 of a turn.
- (5) Push the piston of the syringe to add the oil.
- (6) Oil will start to come out from the oil funnel. Continue adding the oil until there are no more air bubbles in the oil that is coming out.



9. Once there are no more air bubbles mixed in with the oil, set the lever in the position where the bracket is at 45°, as shown in the figure.

Perform adjustment by changing the angle of the handle, etc.



10. Fill the oil funnel with oil until there are no more air bubbles mixed in with the oil, and temporarily close the bleed nipple.

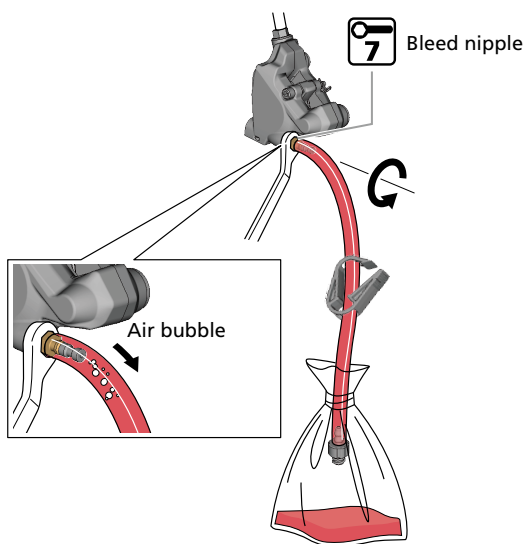
11. Remove the syringe.

Cover the end of the syringe with a clean rag to prevent spilling any oil.

12. Bleed the remaining air.

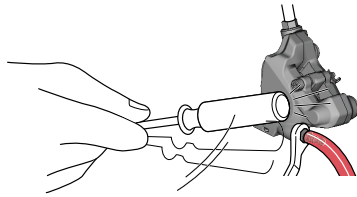
Most of the air bubbles remaining inside the brake system can be bled by performing the following operation:

- (1) Place a 7 mm box wrench in the position shown in the figure.
- (2) After attaching a bag to the tube, connect the tube to the bleed nipple.
- (3) Loosen the bleed nipple.
- (4) After a little while, the oil and air bubbles will flow naturally from the bleed nipple into the tube.

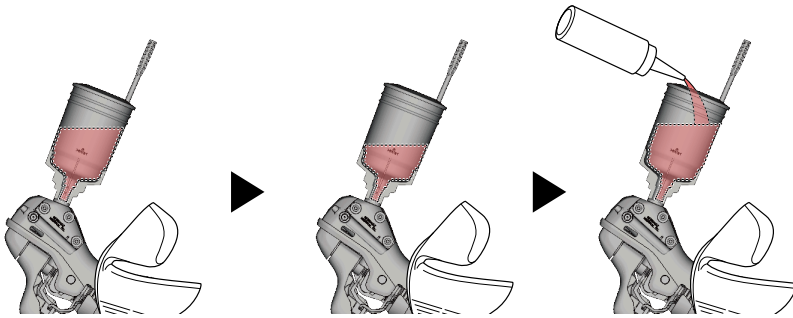


TECH TIPS

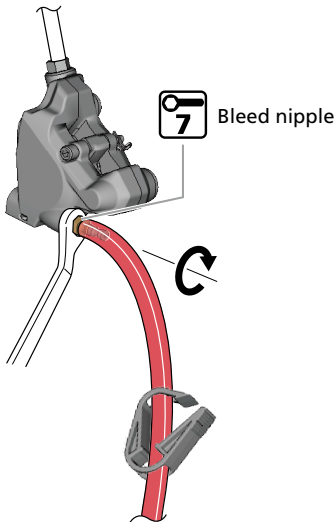
- It may be effective to shake the brake hose gently, to tap the lever bracket or caliper gently with a non-marring screwdriver handle, or to move the position of the calipers.



- 13. As the oil level drops in the oil funnel, add oil to maintain the oil level and prevent air from getting into the system.**

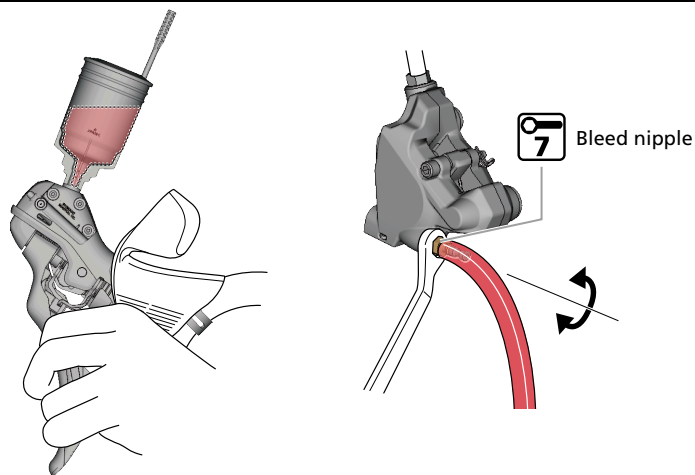


- 14. Once no more air bubbles come out from the bleed nipple, temporarily tighten the bleed nipple.**

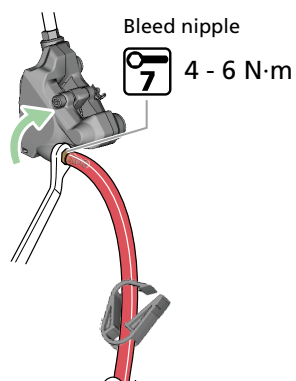


- 15. With the lever depressed, loosen and tighten the bleed nipple in rapid succession.**

Loosen and tighten for approximately 0.5 seconds each time to release any air bubbles inside the caliper.



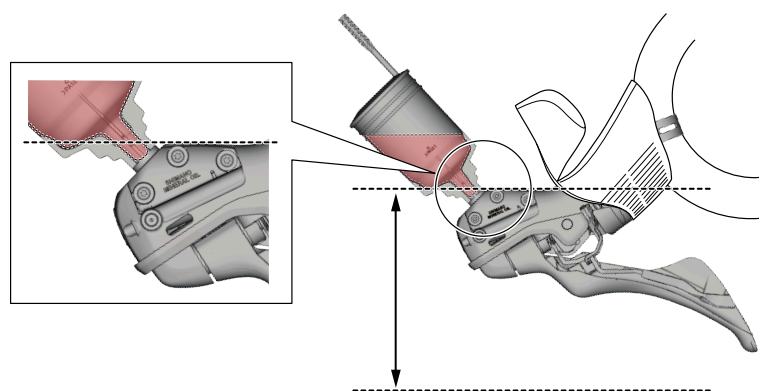
16. Repeat step 15 two to three times, then tighten the bleed nipple.



17. Remove the tube and wipe away any excess oil on the caliper.

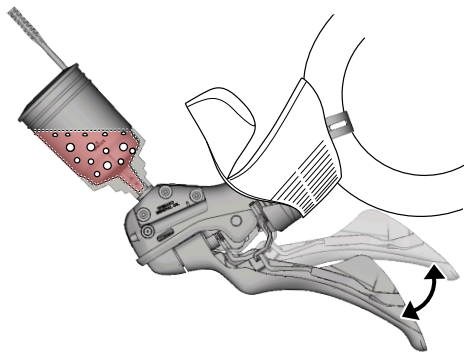
18. Install the bleed nipple cap.

19. Set the lever in a position where the bracket surface indicated in the figure is parallel with the ground.
Perform adjustment by changing the angle of the handlebar, etc.



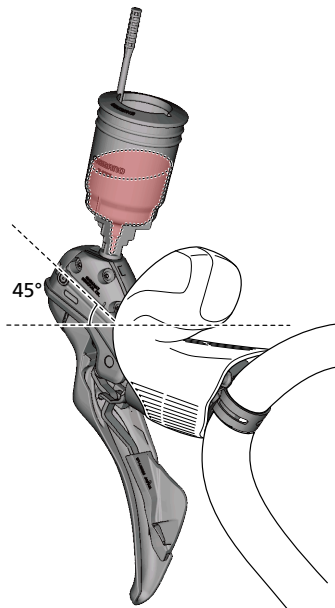
20. Operate the lever.

Slowly repeat until no more air bubbles appear.



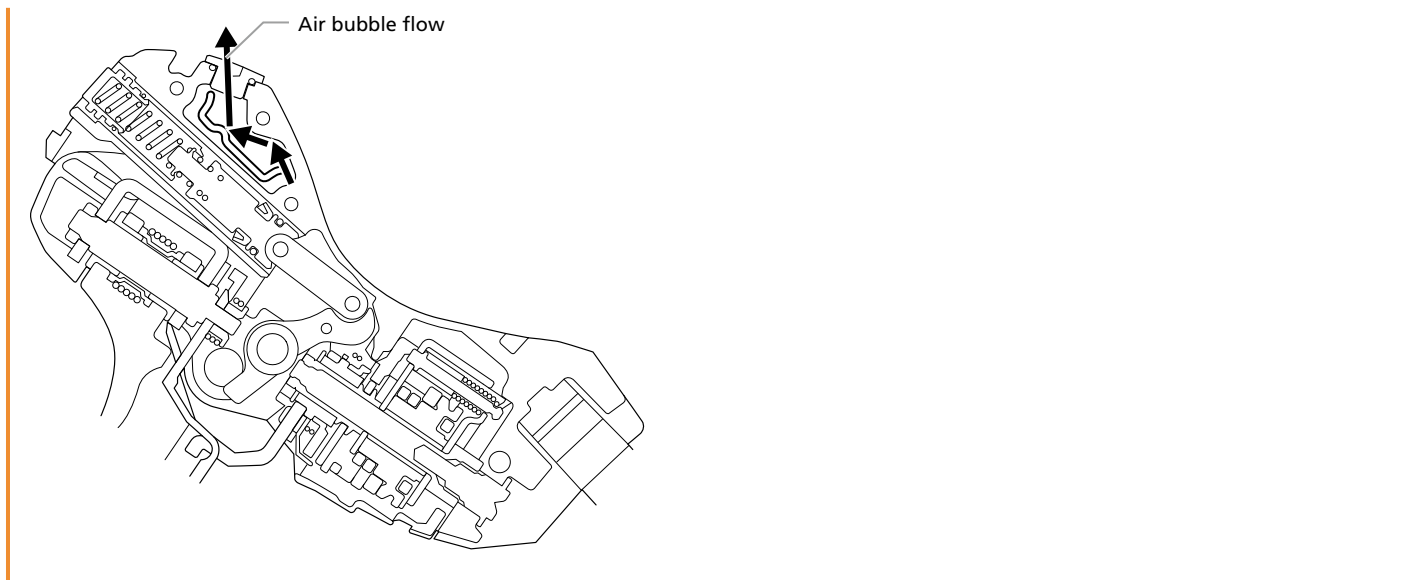
21. Set the lever in a position where the bracket surface indicated in the figure is at 45° to the ground.

Perform adjustment by changing the angle of the handle, etc.



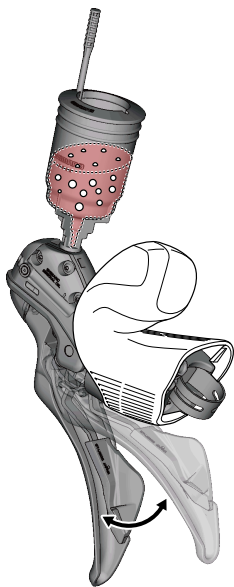
⚠ WARNING

- 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.



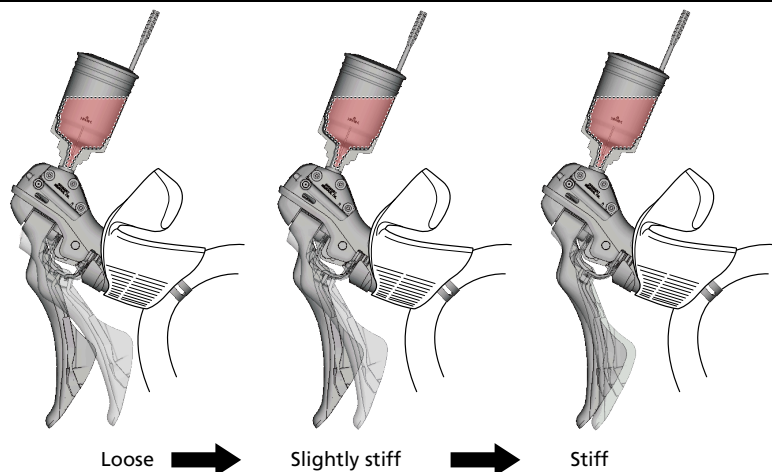
22. Operate the lever.

Air bubbles in the system rise up through the port into the oil funnel. Slowly repeat until no more air bubbles appear.



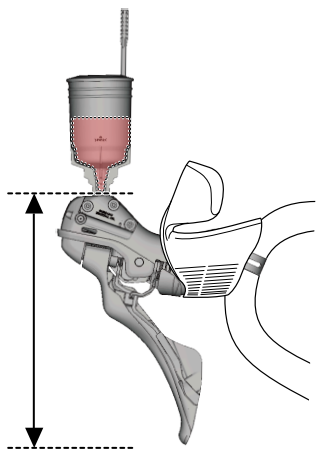
23. Operate the brake lever several times and check that the pads grip the rotor and that the lever becomes stiff.

If the lever does not become stiff, repeat the procedures from step [12](#).



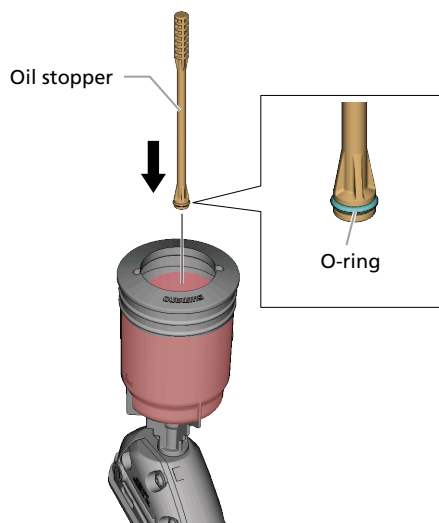
24. Set the lever in a position where the top surface of the bleed screw is parallel with the ground.

Perform adjustment by changing the angle of the handlebar, etc.



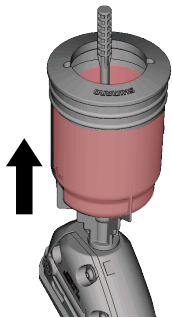
25. Plug the oil funnel with the oil stopper.

Make sure that the side of the oil stopper with the O-ring attached is facing downward.



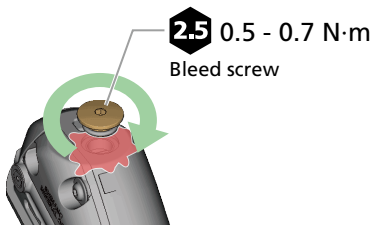
26. Remove the oil funnel with the oil stopper still in place.

Cover the bleed port with a clean rag when removing the funnel to absorb any excess oil that may drip out.



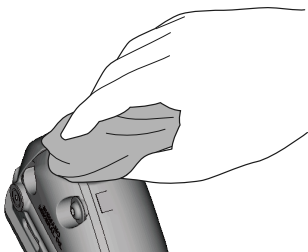
27. Install a bleed screw with O-ring.

Tighten until oil overflows to make sure that no air bubbles remain inside the reservoir.
Do not operate the lever. If operated, there is a risk of air bubbles entering the cylinder.



28. Wipe away any oil that has overflowed.

Use isopropyl alcohol to clean any oil that has overflowed.



29. Remove the bleed spacer (yellow), and install the pads.

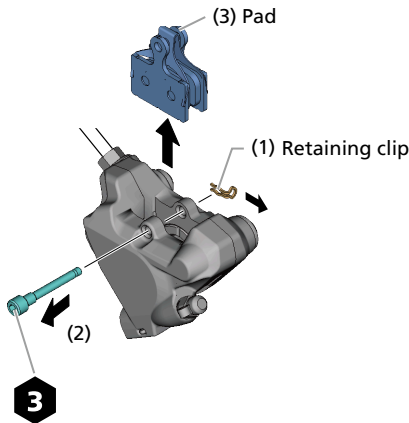
Refer to the " [Hydraulic Disc Brake/Dual Control Lever Dealer's Manual](#) " to install the pads.

Caliper piston adjustment

The caliper includes two pistons. Adjust the pistons with the following procedure if these pistons do not operate properly, if they protrude unevenly, or if the pads remain in contact with the rotor.

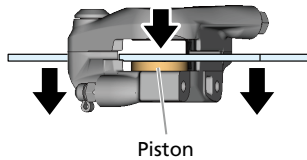
1. **Remove the wheel from the frame.**
2. **Remove the pads from the caliper.**

Remove the retaining clip, then remove the pad axle.



3. **Clean the pistons and the surrounding area.**
4. **Push the pistons straight back as far as they will go.**

Use a flat-shaped tool to push the pistons back while being careful not to twist them.



NOTICE

- Do not push the pistons with a sharp tool. Doing so may damage the pistons.
- When pushing the pistons back, do so with the oil funnel attached to the dual control lever. Otherwise, the diaphragm of the dual control lever may be damaged by the oil pressure. After pushing the pistons back, remove the oil funnel. For instructions on installing / removing the oil funnel, refer to "[Adding SHIMANO hydraulic mineral oil and bleeding air](#)."

5. **Install the pads and pad spacer (red) in the caliper.**
6. **Depress the lever a few times and make sure pistons protrude evenly.**

If the pistons do not protrude evenly, repeat steps [2](#) to [6](#).

7. **Remove the pad spacer and install the wheel.**
8. **Check that the rotor does not interfere with the pads.**

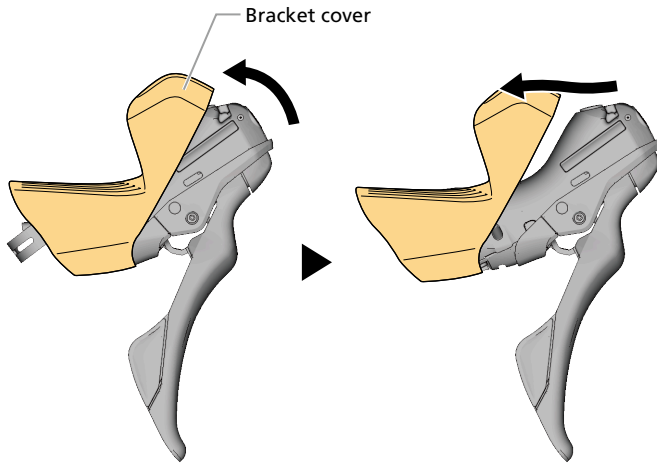
If there is interference, loosen the mounting screw and adjust until there is no more interference.

Replacing the bracket cover

1. Remove the brake hose and shifting cable from the dual control lever.

Be careful so that oil does not spill from the dual control levers or removed brake hose.

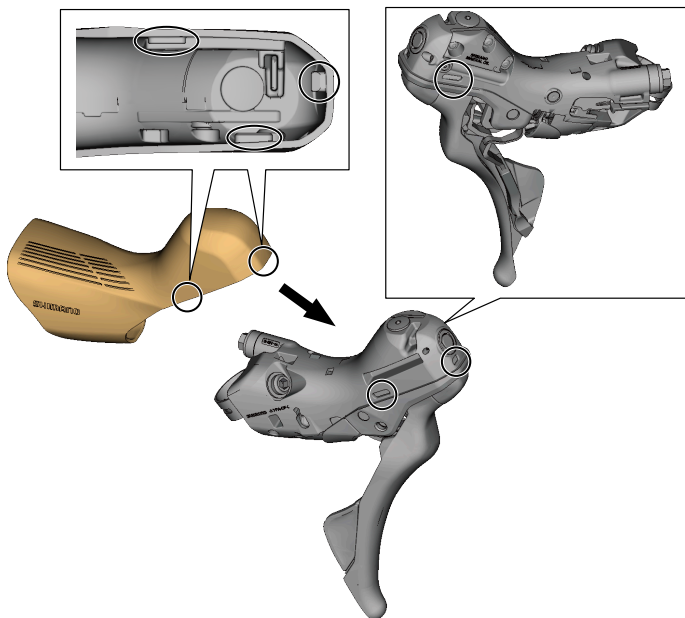
2. Remove the dual control levers from the handlebar.
3. Remove the bracket cover.



4. Install a new bracket cover.

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

The inside of the bracket cover has a marking indicating the left side or right side.



TECH TIPS

- It is easier to perform installation if isopropyl alcohol is applied to the inside of the bracket cover.

5. Reinstall the dual control levers.

(1) Install the dual control levers to the handlebar.

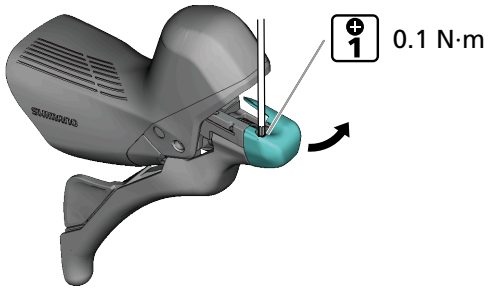
- (2) Install the shifting cable and brake hose to the dual control lever.

NOTICE

- A new olive and connector insert are required to reinstall the brake hose.
- Make sure to perform the procedure in " [Adding SHIMANO hydraulic mineral oil and bleeding air](#)."

Replacing the name plate

1. Perform a brake operation with the lever to expose the screw.
2. Remove the screw, and replace the name plate.

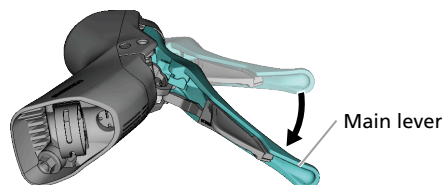
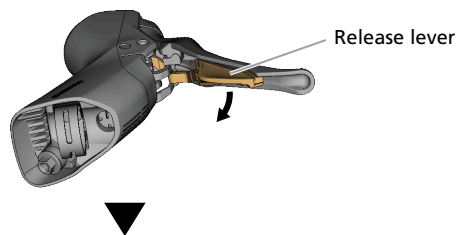


NOTICE

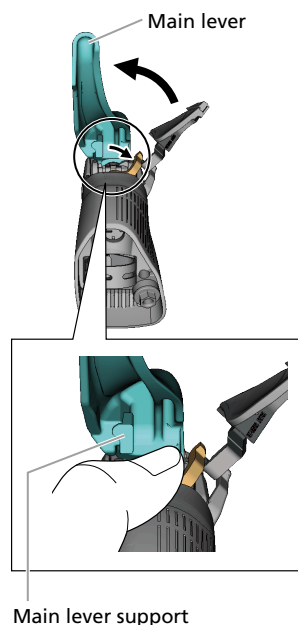
- As the screw is small, be careful not to drop it.

Replacing the main lever support

1. Operate the release lever two or more times, then shift the main lever by two gears.

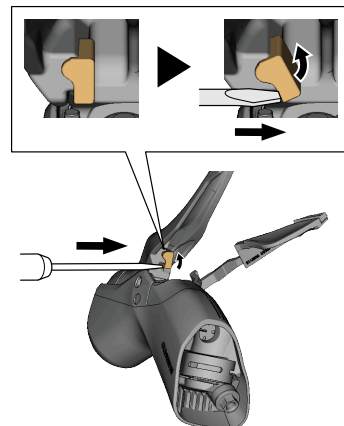


2. Hold the base of the main lever with your fingers, and return only the main lever to the original position.

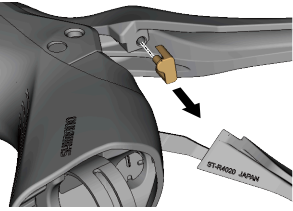


3. Remove the stopper.

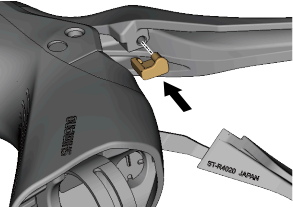
Rotate the main lever support in the direction of the arrow with a slotted screwdriver or similar tool.



4. Pull out the main lever support.

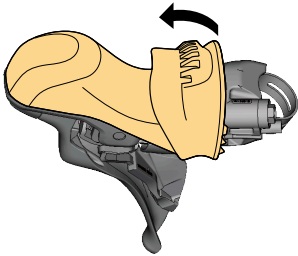


5. Insert a new main lever support.



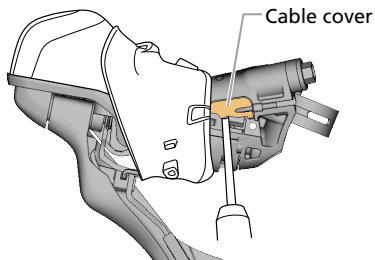
Replacing the cable cover

1. Turn over the bracket cover from the back side.



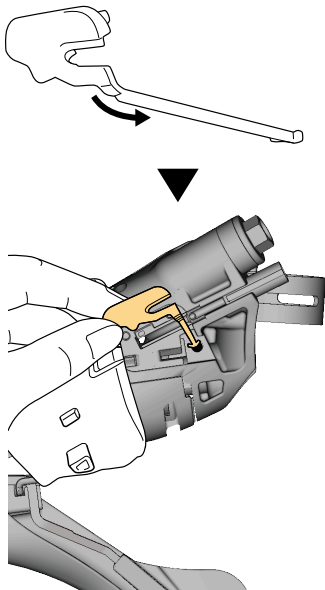
2. Remove the cable cover from the bracket.

Remove it using a screwdriver, etc.



3. Insert a new cable cover into the hole of the bracket.

Before installation, make light folding marks on the cable cover.



Removing a separated inner end (shifting cable)

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

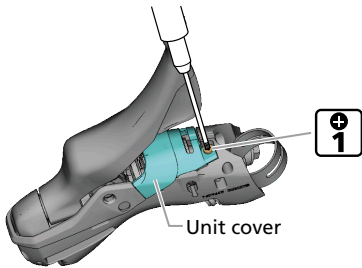
1. Remove the lever from the handlebar, then remove the bracket cover.

TECH TIPS

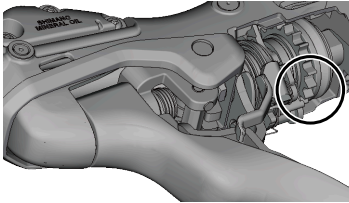
- In order to maintain smooth shifting, it is suggested that a new shift lever cable guide be installed when replacing a separated inner cable.

2. Remove the unit cover.

Remove the screws located at the bottom of the bracket.



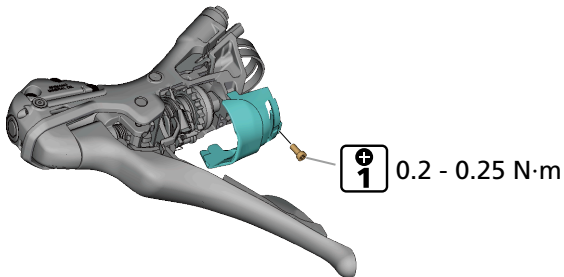
3. Pull out the stuck inner end out of the seat of the shift mechanism.



NOTICE

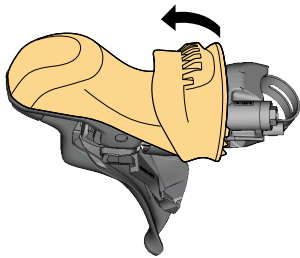
- Be careful not to touch the spring accidentally. Doing so could cause a malfunction.

4. Install the unit cover.



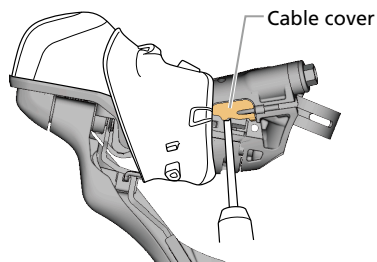
Replacing the SL cable guide

1. Turn over the bracket cover from the back side.



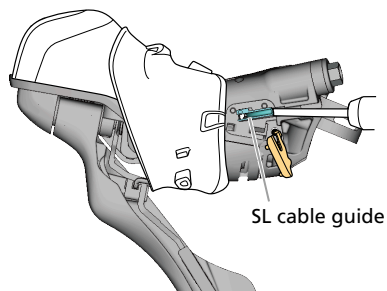
2. Open the cable cover.

Open it using a screwdriver, etc.

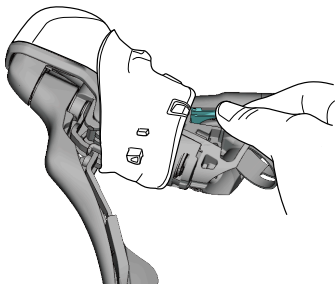


3. Pull out the SL cable guide.

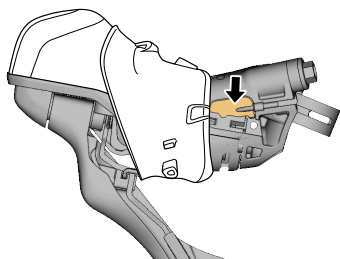
Use a pointed tool to pry it out.



4. Push in the new SL cable guide with your hands.



5. Close the cable cover.

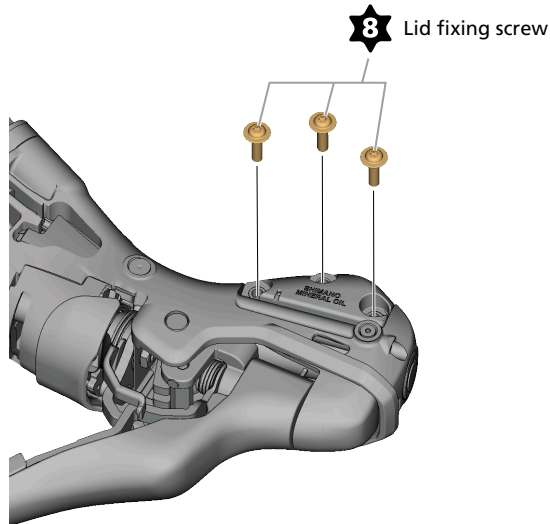


Replacing the diaphragm

1. Remove the bracket cover.

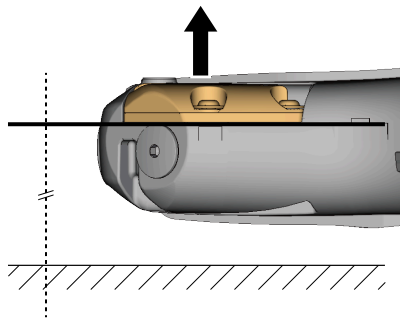
Refer to " [Replacing the bracket cover](#) " to proceed.

2. Remove the lid fixing screws.

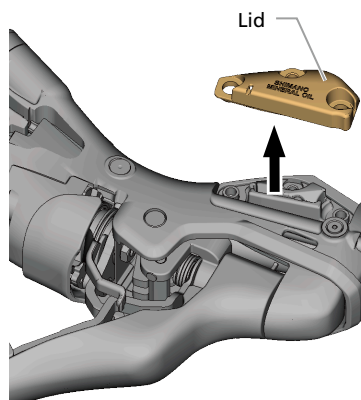


NOTICE

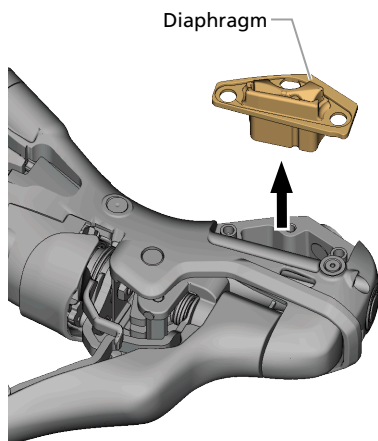
- Perform the replacement procedure with the lever facing the direction in which the lid fixing screws and lid, etc. can be removed straight up. Another direction will cause the oil to spill.



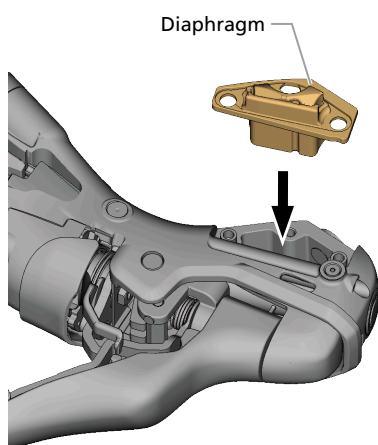
3. Remove the lid.



4. Remove the diaphragm.

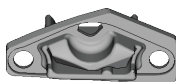


5. Set the new diaphragm.

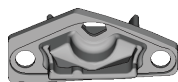


NOTICE

- Before setting the diaphragm, check that there is no dirt or dust on the mounting surface of the diaphragm. If there is any dirt or dust, remove it with a clean rag sprayed with parts cleaner.
- Note that the left and right diaphragms are different.



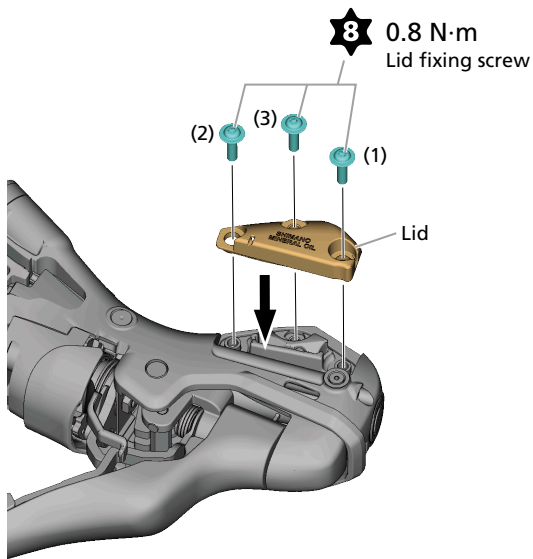
Left diaphragm



Right diaphragm

6. Install the lid.

Tighten the lid fixing screws in the order (1) to (3).



NOTICE

- Before installing the lid, check that there is no dirt or dust on the mounting surface of the lid. If there is any dirt or dust, remove it with a clean rag sprayed with parts cleaner.
- After replacing the diaphragm, perform the procedure in " [Adding SHIMANO hydraulic mineral oil and bleeding air.](#) "

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