

Dealer's Manual

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

Hydraulic Disc Brake/ Dual Control Lever

SHIMANO 105

BR-R7170

ST-R7120

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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

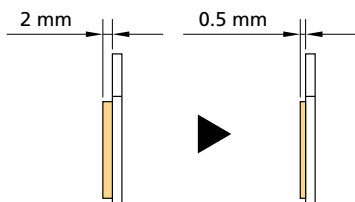
- Be sure to follow the instructions provided in the manuals when installing the product.
Only use SHIMANO genuine parts. If a component or replacement part is incorrectly assembled or adjusted, it can lead to component failure and cause the rider to lose control and crash.
-  Wear approved eye protection 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 rotating disc brake rotors. The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught within the openings of moving rotor.



- Do not touch the calipers or disc brake rotor while riding or immediately after dismounting from the bicycle. The calipers and disc brake 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 disc brake rotor and brake pads. Riding the bicycle with oil or grease on the disc brake rotor and brake pads may prevent the brakes from operating and result in serious injury due to a fall or collision.
- Check the thickness of the brake 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 disc brake rotor if it is cracked or deformed. The disc brake rotor may break, and result in serious injury due to a fall or collision.
- Do not use the disc brake rotor if its thickness is 1.5 mm or less. Also do not use it if the aluminum surface becomes visible. The disc brake 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,

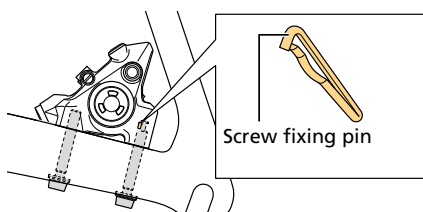
preventing the brakes from operating and resulting in serious injury due to a fall or collision.

- Do not use the brakes with fluid leaks. 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.
- Because the required braking distance will be longer during wet weather, reduce your speed and apply the brakes early and gently. You may fall or collide and be seriously injured.
- 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 disc brake rotor, confirm that it does not interfere with the disc brake 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 genuine 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.
- When installing the brake caliper using screw fixing pins, be sure to use caliper fixing screws of the appropriate length.

Failing to install caliper fixing screws of the correct length may cause the screws to fall out or lead to insufficient force for holding the brake caliper.



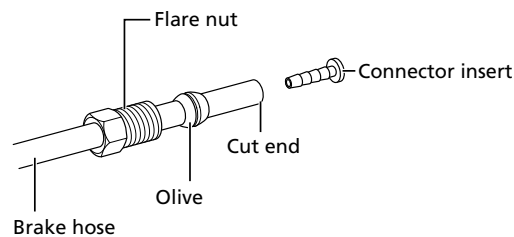
■ Brake hose

- 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.

TO ENSURE SAFETY

Brake hose	Connector insert	
	Length	Color
SM-BH90-JK-SSR	11.2 mm	Silver

- 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-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 genuine 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.
- Cover nose and mouth with a respirator type mask and use in a well ventilated area. Inhalation of mineral oil mist or vapors may cause nausea. If 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

- 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 brake pads or disc brake rotor are replaced.

For installation to the bicycle and maintenance

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

■ Handling SHIMANO genuine 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 genuine 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 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 plastic parts.

■ Brake hose

- When cutting the brake hose, handle the knife carefully so as not to cause injury.

TO ENSURE SAFETY

- 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.
- 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 fork 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 disc brake 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 brake pad, while being careful not to damage the surface 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 screw from the lever then try again. (Note that some oil may overflow from the reservoir tank at this time.)















TO ENSURE SAFETY

- 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, clamp screw, or clamp 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
	4 mm hexagon wrench
	5 mm hexagon wrench
	8 mm spanner
	Slotted screwdriver
	Cross head screwdriver [#1]
	Slotted screwdriver 0.8 x 4
	TL-BH62
	TL-BR001 (syringe and tube)
	TL-BR002 (oil funnel and oil stopper)
	TL-CT12
	Micrometer
	Hexalobular [#8]

Installation/removal

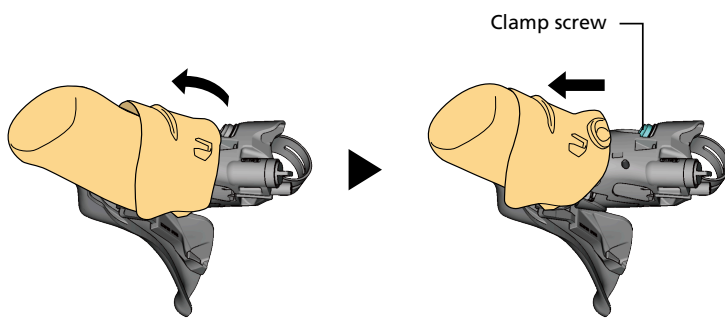
Installing the disc brake rotor

Refer to the Dealer's Manual for the Wheels to install and remove the disc brake 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.

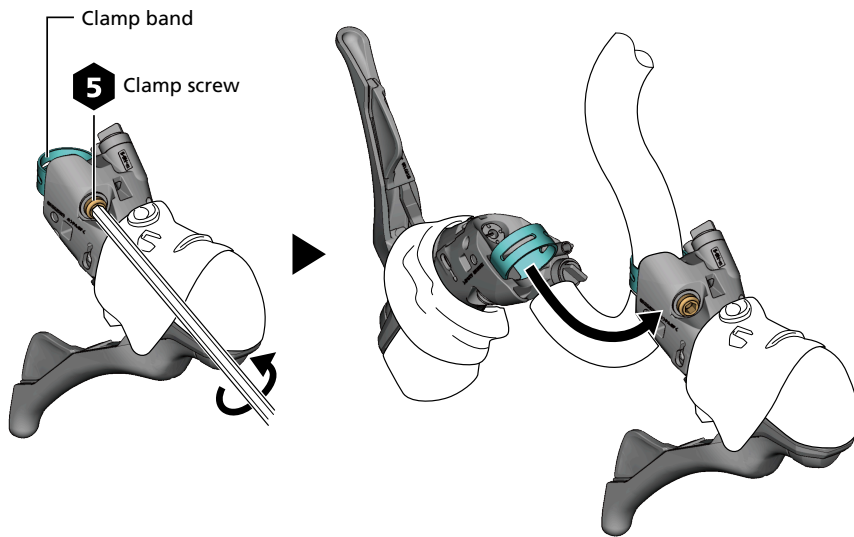


NOTICE

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

2. Loosen the clamp screw and pass the clamp band over the handlebar.

The clamp screw is found on top of the lever bracket when the bracket cover is turned over.

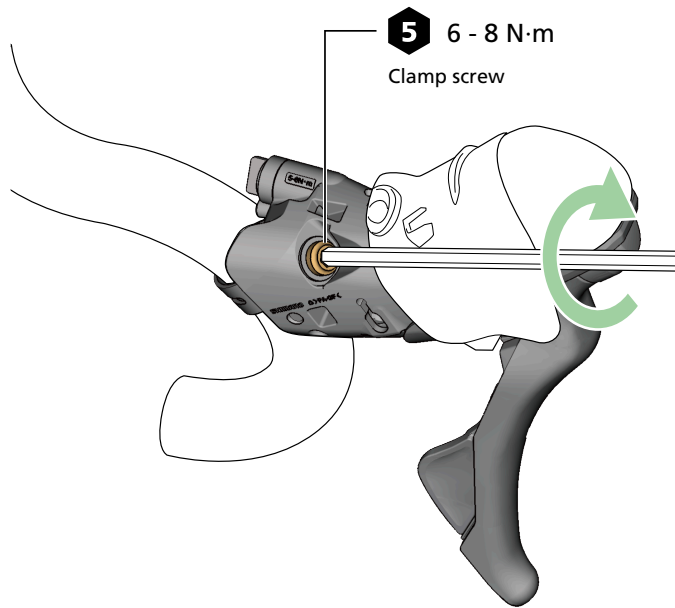


NOTICE

- Be sure to loosen the clamp screw 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 clamp screw.



NOTICE

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

Installing the brake hose (easy hose joint system)

Refer to the Hydraulic Disc Brake/Dual Control Lever (Di2) Dealer's Manual to find instructions on installing the

brake hose (easy hose joint system).

Installing the brake hose

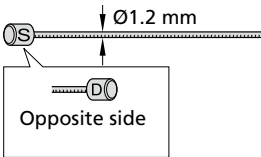
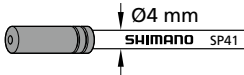
Refer to the Hydraulic Disc Brake/Dual Control Lever (Di2) Dealer's Manual to install the brake hose.

Installing the brake calipers

Refer to the Hydraulic Disc Brake/Dual Control Lever (Di2) Dealer's Manual to install the brake caliper.

Installation of the shifting cable

Cable to be used

Designated inner cable		Recommended outer casing
ST-R7120		Normal outer cap/SP41 outer casing 

NOTICE

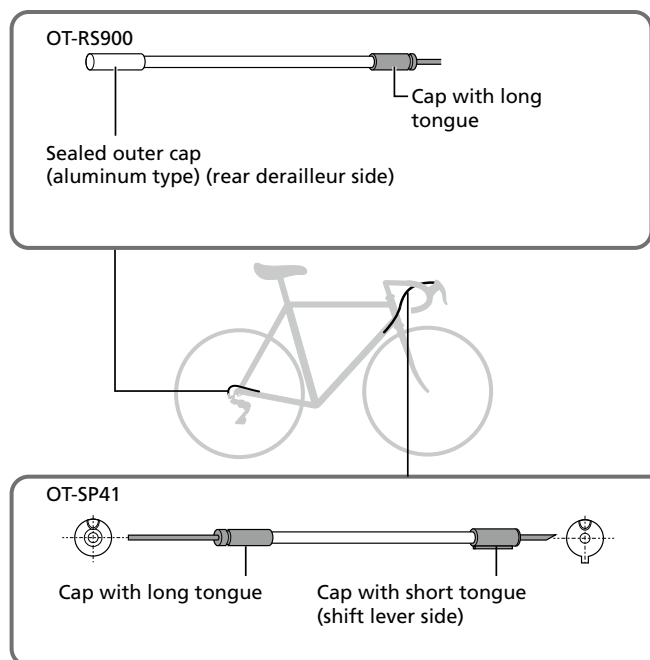
- Do not let dust adhere to the inner cable.
- If the grease on the inner cable is wiped off, the application of SIS SP41 Grease (Y04180000) is recommended.

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.

Installation/removal

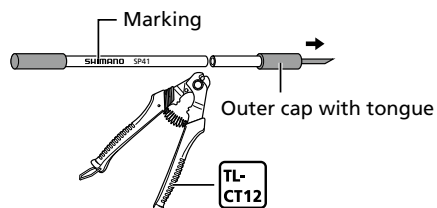
Installation of the shifting cable



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

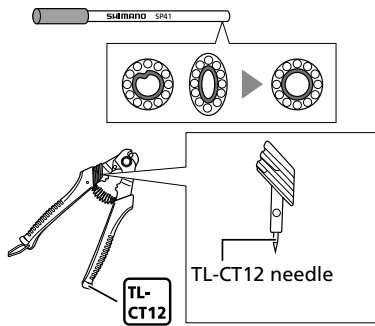
- Cut the outer casing so it still has some length to spare even when the handlebars are turned all the way to either side.

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.

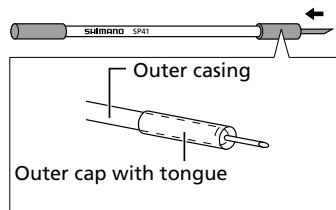


NOTICE

- 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

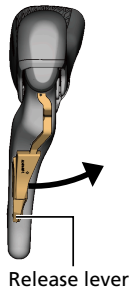
- When inserting the outer casing, take care to ensure that the tip of the outer cap with tongue is not damaged.

Installing the inner cable

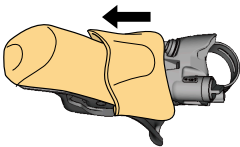
The illustration shows the right-hand lever.

1. Set the lever position to the top.

Operate the release lever 10 times or more.

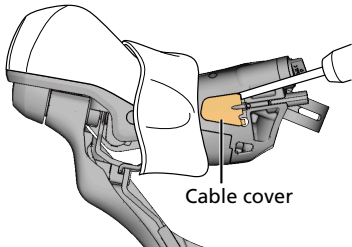


2. Turn over the bracket cover from the back side.

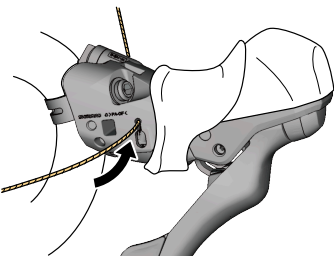


3. Remove the cable cover from the bracket.

Remove it using a screwdriver, etc.



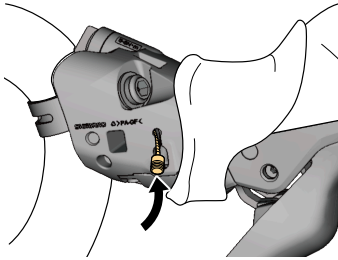
4. Install the inner cable through the lever bracket as shown in the figure.



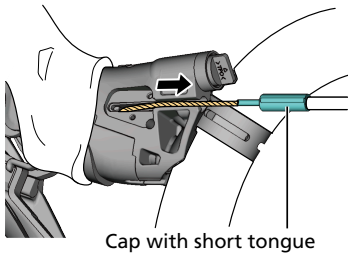
NOTICE

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

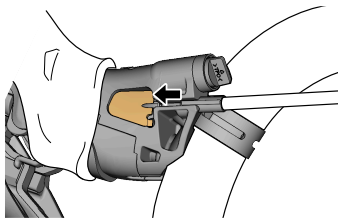
5. Insert the cable in such a manner that the inner end is attached to the unit.



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



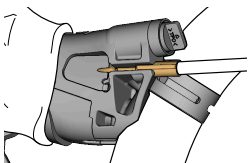
7. Install the cable cover to the bracket.



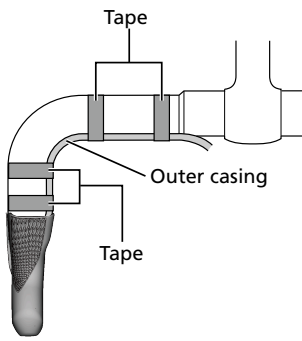
TECH TIPS

- 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).



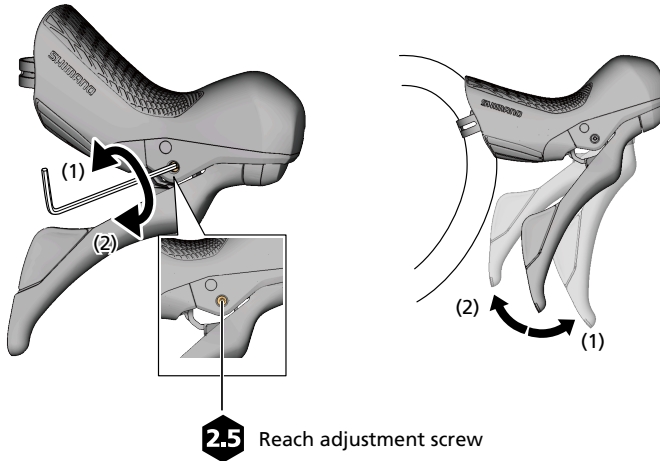
10. Wrap the handlebar with handlebar tape.

Adjustment

Adjusting the reach

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

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



Maintenance

Replacing the brake pads

Refer to the Hydraulic Disc Brake/Dual Control Lever (Di2) Dealer's Manual to replace the brake pads.

SHIMANO genuine mineral oil replacement

Refer to the Hydraulic Disc Brake/Dual Control Lever (Di2) Dealer's Manual to replace SHIMANO genuine mineral oil.

Caliper piston maintenance

Refer to the Hydraulic Disc Brake/Dual Control Lever (Di2) Dealer's Manual for caliper piston maintenance.

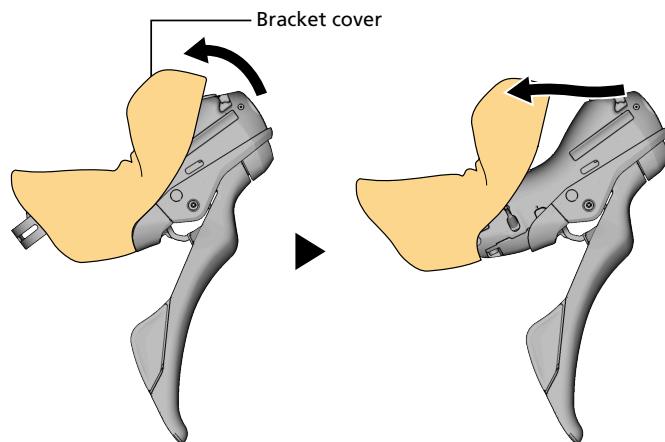
Replacing the bracket cover

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.**

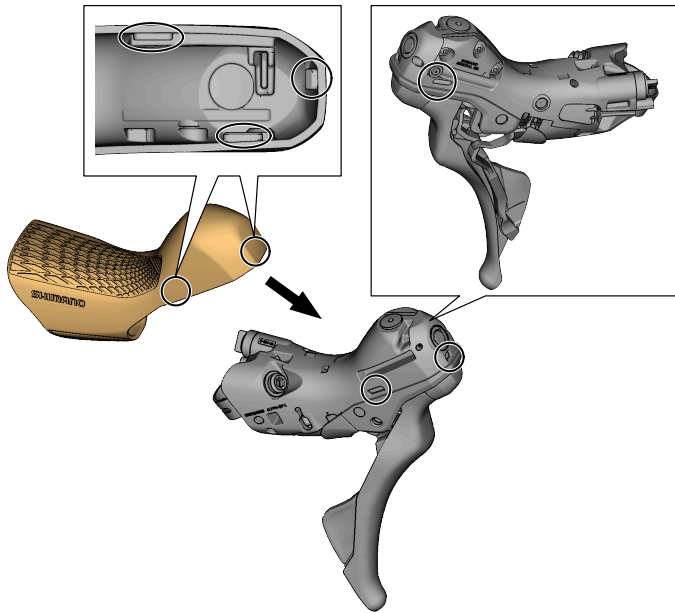
3. **Remove the bracket cover.**



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.

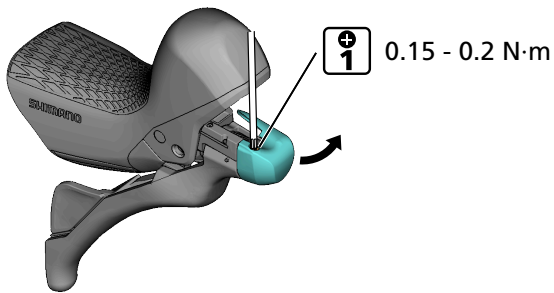
NOTICE

- A new olive and connector insert are required to reinstall the brake hose.
- Make sure to add the mineral oil and bleed the air. Refer to the Hydraulic Disc Brake/Dual Control Lever (Di2) Dealer's Manual to add the mineral oil and bleed the air.

Replacing the name plate

1. Simultaneously perform a braking motion and shifting motion with the lever to expose the screw.

2. Remove the screw, and replace the name plate.

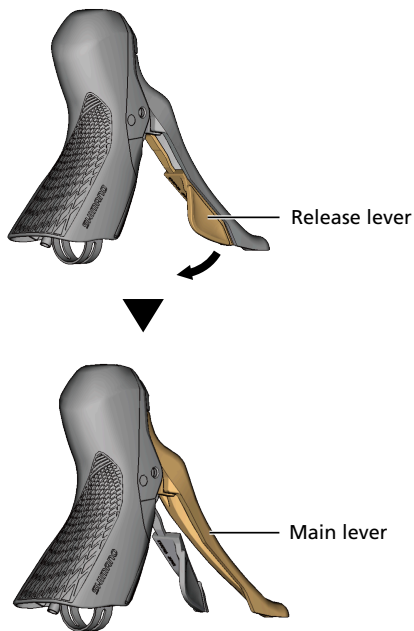


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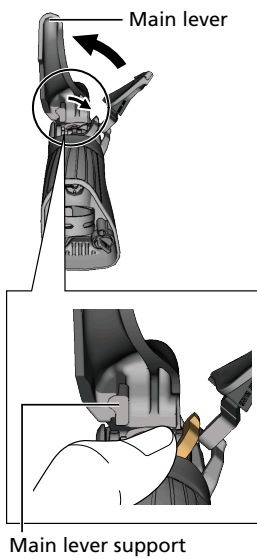
- As the screw is small, be careful not to drop it.

Replacing the main lever support

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

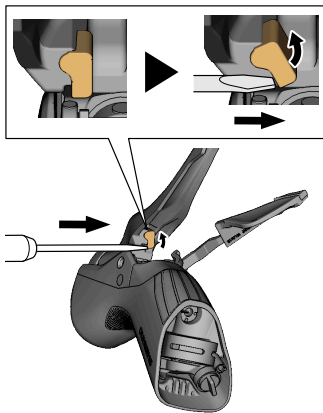


2. Hold the base of the main lever with your fingers, and return only the main lever to the original position.

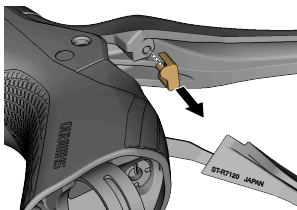


3. Remove the stopper.

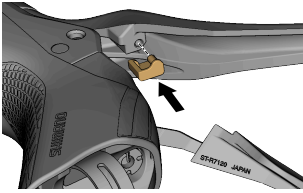
Rotate the main lever support in the direction of the arrow with a slotted screwdriver or similar tool.



4. Pull out the main lever support.

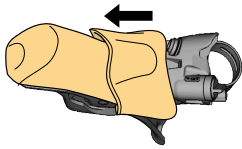


5. Insert a new main lever support.



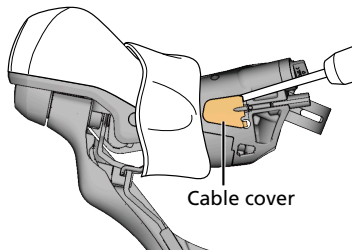
Replacing the cable cover

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



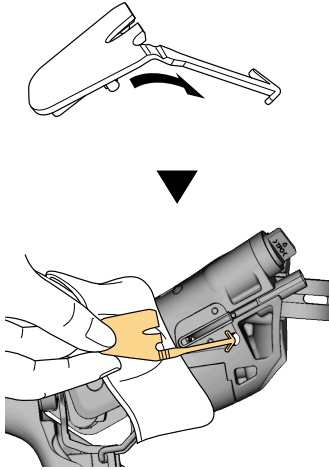
2. Remove the cable cover from the bracket.

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.

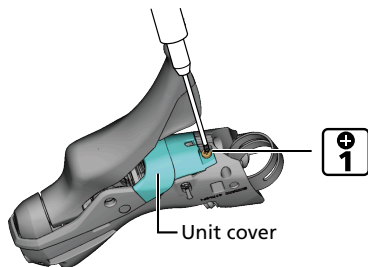
1. Remove the lever from the handlebar, then remove the bracket cover.

TECH TIPS

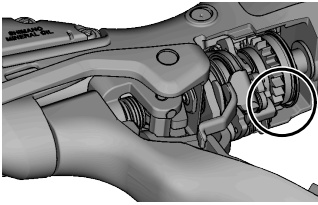
- In order to maintain smooth shifting, it is suggested that a new shift lever cable guide be installed when replacing a separated inner cable.

2. Remove the unit cover.

Remove the screws located at the bottom of the bracket.



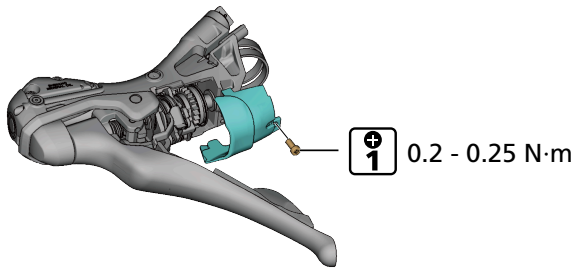
3. Pull out the stuck inner end out of the seat of the shift mechanism.



NOTICE

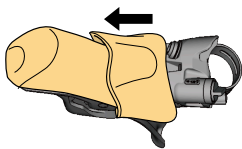
- Be careful not to touch the spring accidentally. Doing so could cause a malfunction.

4. Install the unit cover.



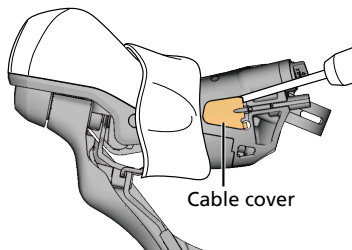
Replacing the SL cable guide

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



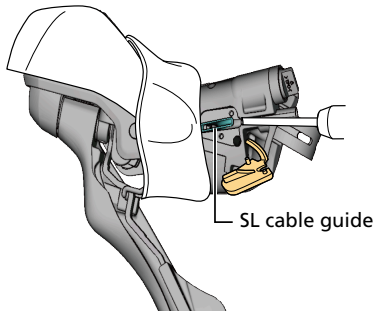
2. Open the cable cover.

Open it using a screwdriver, etc.

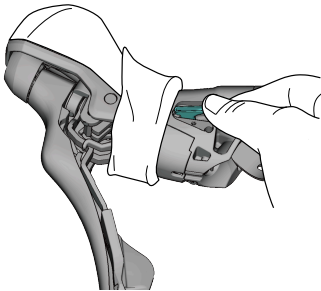


3. Pull out the SL cable guide.

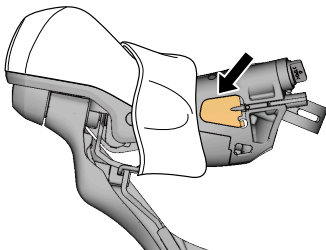
Use a pointed tool to pry it out.



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



5. Close the cable cover.

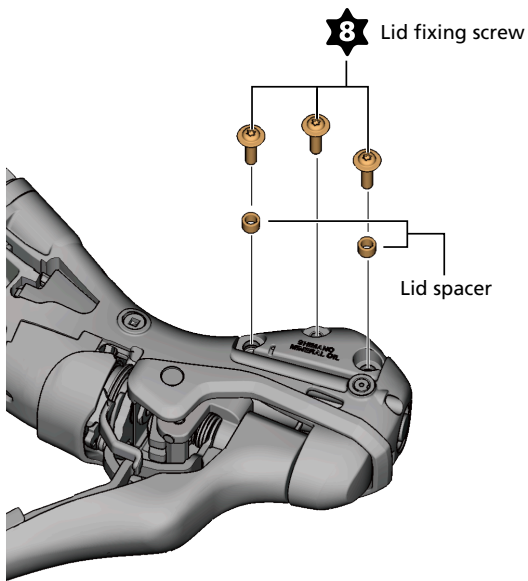


Replacing the diaphragm

1. Remove the bracket cover.

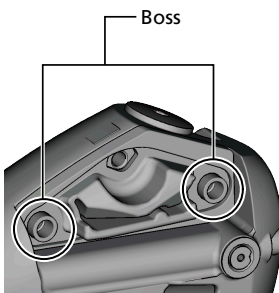
Refer to "Replacing the bracket cover" to proceed.

2. Remove the lid fixing screws.

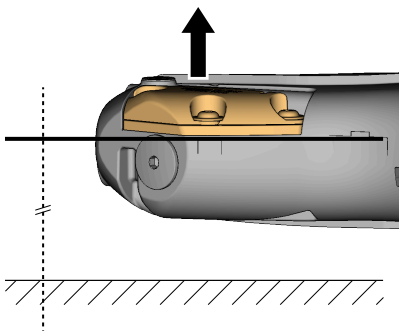


NOTICE

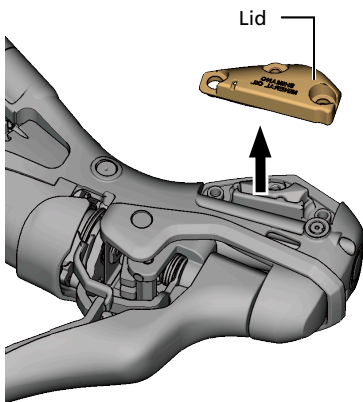
- If the bracket has bosses, the lid spacers are not installed.



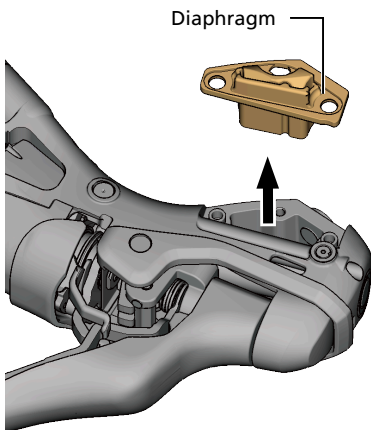
- Perform the replacement procedure with the lever facing the direction in which the lid fixing screws and lid, etc. can be removed straight up. Another direction will cause the oil to spill.



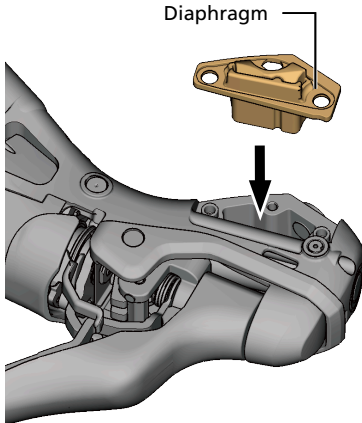
3. Remove the lid.



4. Remove the diaphragm.

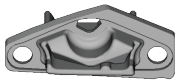


5. Set the new diaphragm.

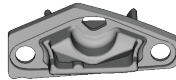


NOTICE

- 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

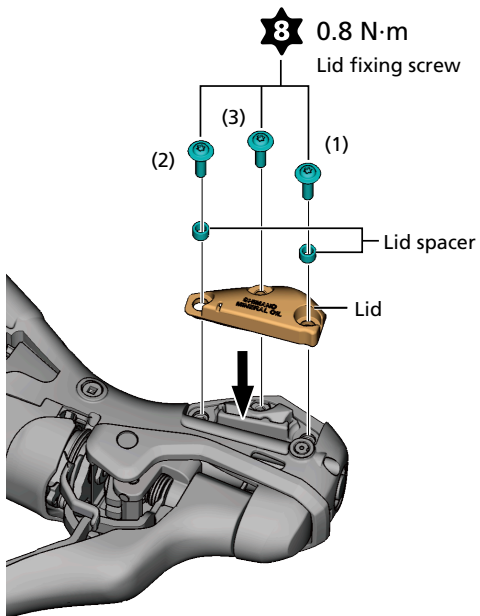


Right diaphragm

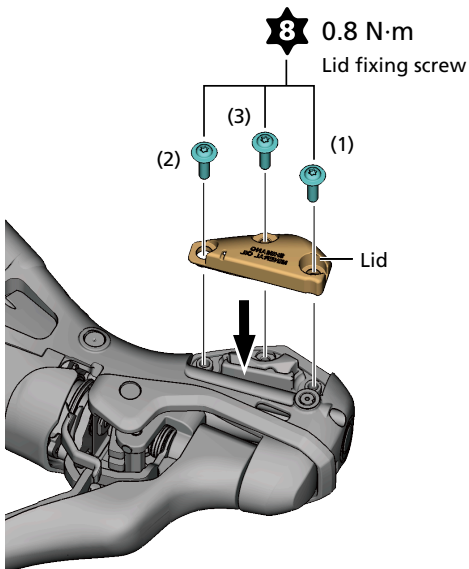
6. Install the lid.

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

Bracket without bosses

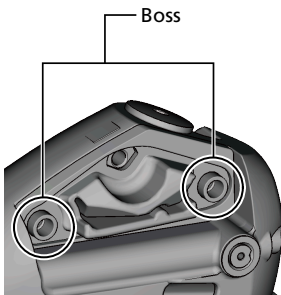


Bracket with bosses



NOTICE

- If the bracket has bosses, the lid spacers are not installed.



- 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.
- If the bracket does not have bosses, ensure that the diaphragm is not caught between the lid spacer and bracket when tightening the lid fixing screws. The diaphragm may be torn.
- A lid spacer is not required for the lid fixing screw indicated by (3).
- After replacing the diaphragm, inject the mineral oil and bleed the air from the system. Refer to the Hydraulic Disc Brake/Dual Control Lever (Di2) Dealer's Manual to add the mineral oil and bleed the air.

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