

Dealer's Manual

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

DURA-ACE

R9150 series

DURA-ACE

SW-R9150	SM-EWC2
SW-R9160	SM-JC40
SW-R610	SM-JC41
ST-R9150	SM-BTR1
ST-R9160	BT-DN110
ST-R9170	BT-DN110-A
ST-R9180	BM-DN100
FD-R9150	SM-BA01
RD-R9150	SM-BCR1
	SM-BCR2
BR-R9170	SM-BCC1
SM-EW90-A	SM-RT900
SM-EW90-B	
EW-RS910	
EW-WU111	
EW-SD50	
EW-SD50-I	
EW-JC130	

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IMPORTANT NOTICE

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

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

- Make sure to read all instruction manuals included with the product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All dealer's manuals and instruction manuals can be viewed on-line on our website (<http://si.shimano.com>).
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.
- The Bluetooth® word mark and logos are registered trademarks owned by the Bluetooth SIG, Inc. and any use of such marks by SHIMANO INC. is under license.
Other trademarks and trade names are those of their respective owners.

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

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

DANGER

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

WARNING

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

CAUTION

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

TO ENSURE SAFETY



Be sure to also inform users of the following:

■ Lithium ion battery

Be sure to observe the following instructions in order to avoid burns or other injury from fluid leakage, overheating, fire, or explosion.

- Use the designated charger to charge the battery. If any non-specified items are used, fire, overheating or leakage may occur.
- Do not heat the battery or throw it into fire. If this is not observed, fire or bursting may occur.
- Do not deform, modify, disassemble or apply solder directly to the battery. Do not leave the battery in places which may exceed 60°C in temperature, such as places which are exposed to direct sunlight inside vehicles on hot days or near stoves. If this is not observed, leakages, overheating or bursting may cause fire, burns, or other injuries.
- Do not connect the (+) and (-) terminals with metallic objects. Do not carry or store the battery together with metallic objects such as necklaces or hairpins. If this is not observed, short-circuits, overheating, burns or other injury may occur.
- If any liquid leaking from the battery gets into the eyes, immediately wash the affected area with clean water without rubbing the eyes, and then seek medical attention.

■ Battery charger/Battery charger cord

Be sure to observe the following instructions in order to avoid burns or other injury from fluid leakage, overheating, fire, or explosion.

- Do not get the charger wet or use it while it is wet, and do not touch or hold it with wet hands. If this is not observed, problems with operation or electric shocks may occur.
- Do not cover the charger with cloths while it is in use. If this is not observed, heat may build up and the case may become deformed, or fire or overheating may occur.
- Do not disassemble or modify the charger. If this is not observed, electric shocks or injury may occur.
- Use the charger at the specified power supply voltage only. If a power supply voltage other than that specified is used, fire, explosions, smoke, overheating, electric shocks or burns may occur.
- Do not touch metallic parts of the charger or the AC adapter if there is a lightning storm. If lightning strikes, electric shocks may occur.

■ SM-BCR2: Battery charger for SM-BTR2/BT-DN110/BT-DN110-A

- Use an AC adapter with a USB port with a voltage of 5.0Vdc and with a current equal to or higher than 1.0Adc. If the one with a current lower than 1.0A is used, the AC adapter may heat up, potentially causing a fire, smoke, overheating, destruction, electric shock, or burns.

**WARNING**

- **Be sure to follow the instructions provided in the manuals when installing the product.**

It is recommended to use genuine Shimano parts only. If parts such as bolts and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.

In addition, if adjustments are not carried out correctly, problems may occur, and the bicycle may suddenly fall over, which may cause serious injury.

-  Be sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.

- This dealer's manual is for use with the DURA-ACE R9150 series (electronic gear shifting system) only.

For information on products not covered in this manual, please look up the model on the website (<http://si.shimano.com>).

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

Be sure to also inform users of the following:

- *Intervals between maintenance depend on the use and riding circumstances. Clean the chain with an appropriate chain cleaner regularly. Never use alkali based or acid based solvents, such as rust cleaners. If those solvents are used the chain might break and cause serious injury.*
- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and serious injury may result.
- Check the chain for any damage (deformation or crack), skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency.
The chain may break, and you may fall.
- Be careful not to let the hemming of your clothes get caught in the chain while riding. Otherwise you may fall off the bicycle.

■ About the multi-shift function

- On this system, the multi-shift function can be configured using E-TUBE PROJECT. The gears will continue to shift when the shifting switch is pressed using the multi-shift function. Shifting speed setting for multi-shift can also be modified. When modifying the gear changing settings for multi-shift, carefully read "Settings customizable in E-TUBE PROJECT" in this dealer's manual.
- If crank revolutions are set to low under faster setting of the multi-shift shifting speed, the chain will be unable to follow the movement of the rear derailleur, possibly leading to issues such as the chain slipping over the tip of the cassette sprocket teeth, the cassette sprocket deforming, or the chain breaking.

Item	Multi-shift speed	Characteristics	Usage notes	Crank rotation speed when operating multi-shift
Very fast	High speed	Quick multi-shifting is possible - The crank rotation speed can be adjusted quickly depending on changes in riding conditions. - The speed can be adjusted quickly.	- Over-shifting occurs easily. - If the rotation speed of the crank is low, the chain will be unable to follow the movement of the rear derailleur. The chain may therefore slip over the tip of the cassette sprocket teeth.	High crank rotation speed
Fast				
Normal	Default setting			
Slow				
Very slow	Low speed	Accurate multi-shifting is possible	Multi-shifting takes some time	

By default it is set to **Normal**.
 Fully understand the features of the multi-shift speed, and choose a multi-shift gear shifting setting according to the riding conditions (terrain, riding method, etc.).

■ Lithium ion battery

- Do not place the battery into fresh water or sea water, and do not allow the battery terminals to get wet. If this is not observed, fire, bursting or overheating may occur.
- Do not use the battery if it has any noticeable scratches or other external damage. If this is not observed, bursting, overheating or problems with operation may occur.
- Do not throw or subject the battery to strong shock. If this is not observed, bursting, overheating or problems with operation may occur.
- Do not use the battery if leakages, discoloration, deformation or any other abnormalities occur. If this is not observed, bursting, overheating or problems with operation may occur.
- If any leaked fluid gets on your skin or clothes, wash it off immediately with clean water. The leaked fluid may damage your skin.
- The operating temperature ranges for the battery are given below. Do not use the battery in temperatures outside these ranges. If the battery is used or stored in temperatures which are outside these ranges, fire, injury or problems with operation may occur.
 1. During discharge: -10°C - 50°C
 2. During charging: 0°C - 45°C

SM-BTR1: Lithium ion battery (external type)

- If charging is not complete after 1.5 hours, stop charging. If this is not observed, fire, bursting or overheating may occur.

SM-BTR2/BT-DN110/BT-DN110-A: Lithium ion battery (built-in type)

- If the battery does not become fully charged after 4 hours, stop charging. If this is not observed, fire, bursting or overheating may occur.

■ Battery charger/Battery charger cord

SM-BCR1: Battery charger for SM-BTR1

- Hold the power plug when connecting or disconnecting the plug. Failure to do so may cause a fire or electric shock.
- If the following occurs, stop using the device and contact a dealer. A fire or electric shock may occur.
 - * If heat or acrid-smelling smoke is coming out from the power plug.
 - * There may be a bad connection inside the power plug.
- Do not overload the electrical outlet with appliances beyond its rated capacity, and use only a 100 - 240V AC electrical outlet. If the electrical outlet is overloaded by connecting too many appliances using adapters, overheating resulting in fire may occur.
- Do not damage the power cord or power plug. (Do not damage, process, let near hot objects, bend, twist or pull them; do not place heavy objects on top or bundle them tightly.) If they are used while damaged, fire, electric shocks or short-circuits may occur.
- Do not use the charger with commercially-available electrical transformers designed for overseas use, as they may damage the charger.
- Always be sure to insert the power plug as far as it will go. If this is not observed, fire may occur.

SM-BCR2: Battery charger for SM-BTR2/BT-DN110/BT-DN110-A

- Do not use any USB cable other than the USB cable which is supplied with the PC linkage device. This may cause a charging error, fire, or failure to connect to PC due to overheating.
- Do not connect the charger to PC when it is on standby. This may cause a PC failure depending on its specifications.
- When connecting or disconnecting the USB cable or the charger, be sure to hold the cable by the plug. Failure to do so may cause a fire or electric shock. If the following occurs, stop using the device and contact a dealer. A fire or electric shock may occur.
 - * If heat or acrid-smelling smoke is coming out from the power plug.
 - * There may be a bad connection inside the power plug.
- If it thunders while charging with an AC adapter with a USB port, do not touch the device, bicycle, or the AC adapter. If lightning strikes, electric shocks may occur.
- Use an AC adapter with a USB port with a voltage of 5.0Vdc and with a current equal to or higher than 1.0Adc. If the one with a current lower than 1.0Adc is used, a charge error may occur or the AC adapter may heat up, leading to a fire.
- Do not use a USB hub when connecting the cable to a computer USB port. This may cause a charging error or fire due to overheating.
- Be careful not to damage the charging cable. (Do not damage, process, let near hot objects, bend, twist or pull them; do not place heavy objects on top or bundle them tightly.) If they are used while damaged, fire, electric shocks or short-circuits may occur.

■ Brake

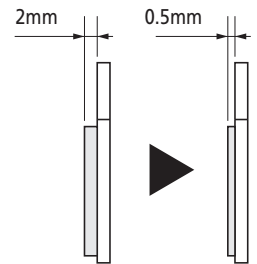
- Each bicycle may handle slightly differently depending on the model. Therefore, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. Improper use of your bicycle's brake system may result in a loss of control or a fall, which could lead to severe injury. For proper operation, consult a professional bicycle dealer or the bicycle's owner's manual. It is also important to practice riding and braking, etc.
- If the front brake is applied too strongly, the wheel may lock and the bicycle may fall forward, and serious injury may result.
- Always make sure that the front and rear brakes are working correctly before riding the bicycle.
- The required braking distance will be longer during wet weather. Reduce your speed and apply the brakes early and gently.
- If the road surface is wet, the tires will skid more easily. If the tires skid, you may fall off the bicycle; therefore, to avoid this, reduce your speed and apply the brakes early and gently.

■ Hydraulic disc brake

- Please make sure to keep your fingers away from the rotating disc brake rotor. The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught within the openings of moving disc brake rotor.



- The calipers and disc brake rotor will become hot when the brakes are operated; do not touch them while riding or immediately after dismounting from the bicycle. Otherwise you may get burned.
- Be careful not to allow any oil or grease to get onto the disc brake rotor and brake pads. There is the danger that the brakes may not work correctly.
- If any oil or grease does get on the brake pads, you should consult a dealer or an agency. There is the danger that the brakes may not work correctly.
- If noise occurs during brake operation, the brake pads may have been worn down to the usable limit. Check that the brake system temperature has been cooled down sufficiently, check the thickness of the brake pad. If the thickness is 0.5mm or below, the brake pad needs to be replaced with a new one. Consult a dealer or an agency.



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

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

- The disc brake is not designed to work when the bicycle is upside down. If the bicycle is turned upside down or on its side, the brake may not work correctly, and a serious accident could occur. Before riding the bicycle, be sure to operate the brake lever a few times to check that the brakes operate normally. If the brakes do not operate normally, stop using the brakes and consult a dealer or an agency.
- If you feel no resistance when depressing the brake lever, immediately stop using the brakes and consult a dealer or an agency.
- If fluid leaks occur, immediately stop using the brakes and consult a dealer or an agency.

■ Dual control lever

- Because of the characteristics of the carbon fiber material, the lever should never be altered. Otherwise, the lever may break preventing braking operation.
- Check before riding that there is no damage such as carbon peeling or cracking. If there is any damage, stop using the bicycle and consult a dealer or an agency. Otherwise, the lever may break preventing braking operation.

For Installation to the Bicycle, and Maintenance:

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

■ Hydraulic disc brake

- Please make sure to keep your fingers away from the rotating disc brake rotor during installation or maintenance of the wheel.

The disc brake rotor is sharp enough to inflict severe injury to your fingers if caught within the openings of moving disc brake rotor.



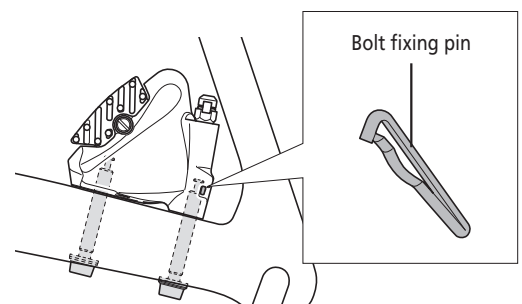
- If the disc brake rotor is worn, cracked or warped, it should be replaced.
- If the disc brake rotor becomes worn down to a thickness of 1.5mm or so that the aluminum surface becomes visible, be sure to replace the disc brake rotor with a new one.
- Check that the brake components have cooled down sufficiently before attempting to adjust the brakes.
- Use only Shimano genuine mineral oil. If other types of oil are used, it may cause problems with brake operation, and cause the system to be unuseable.
- Be sure to use only oil from a freshly-opened container, and do not re-use oil which has been drained from the bleed nipple. Old or reused oil may contain water, which could cause vapor lock in the brake system.
- Be careful not to let water or air bubbles get into the brake system. Otherwise, vapor lock may occur. Be particularly careful when removing the cover of the reservoir tank.
- If cutting the brake hose in order to adjust the length of the hose, or when changing over the brake hose from left to right or vice versa, be sure to bleed the air from the hose according to steps given in "Adding Shimano genuine mineral oil and bleeding air".
- When turning the bicycle upside down or on its side, the brake system may have some air bubbles inside the reservoir tank which are still there when the bleed nipple is closed, or which accumulate in various parts of the brake system when it is used for long periods. This disc brake system is not designed to work with the bicycle upside down. If the bicycle is turned upside down or on its side, the air bubbles inside the reservoir tank may move in the direction of the calipers. If the bicycle has been turned upside down or on its side, be sure to operate the brake lever a few times to check that the brakes operate normally before riding the bicycle. If the brakes do not operate normally, adjust them according to the following procedure.

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

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

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

- If the quick release lever on the hub is on the same side as the disc brake rotor, they may interfere with each other, which is dangerous, so check that they do not.
- Shimano disc brake systems are not compatible with tandem bicycles. Because tandem bicycles are heavier, the stress on the brake system increases during brake operation. If hydraulic disc brakes are used with tandem bicycles, the oil temperature will become too high and vapor locks or ruptures in the brake hoses may occur, and this will cause the brakes to fail.
- When installing the brake caliper using bolt fixing pins, be sure to use mounting bolts of the appropriate length.
If not, the bolt fixing pins may not be securely fastened, and the bolts may fall out.

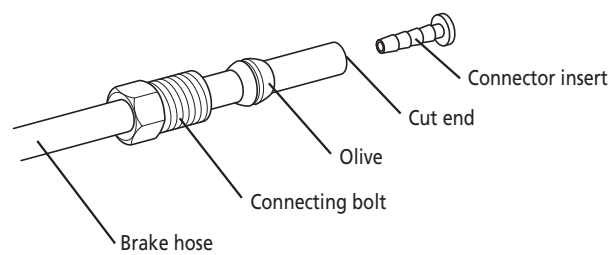


■ Brake hose

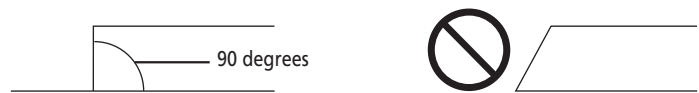
- After installing the brake hose to the brake unit, adding Shimano genuine mineral oil and bleeding air bubbles, depress the lever again several times to check that the brakes are operating normally and there are no fluid leaks from the hose or the system.
- The connector insert is for this brake hose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

Model No.	Length	Color
SM-BH90-JK-SSR	11.2mm	Silver

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



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



■ Points to note about the handlebars

ST-R9160/ST-R9180/SW-R9160

- Handle inner diameter: Ø19.0 - 22.5mm
- Handle outer diameter: Ø22.2 - 24.0mm
- Applicable handlebars: Carbon fiber handlebars (with aluminum inserts where the brake levers are installed) or aluminum handlebars.
 - * Carbon fiber handlebars without aluminum inserts, where the brake levers are installed, cannot be used.

EW-RS910 (Built-in bar end type)

- Handle inner diameter: Ø20.5 - 21.5mm
- Handle outer diameter: Ø23.8 - 24.2mm

**CAUTION**

Be sure to also inform users of the following:

■ **Lithium ion battery**

- Store the battery in a safe place away from the reach of infants and pets.

SM-BTR1: Lithium ion battery (external type)

- When you do not use the battery for a long period, remove and charge the battery before storage.

SM-BTR2/BT-DN110/BT-DN110-A: Lithium ion battery (built-in type)

- When you do not use the battery for a long period, charge the battery before storage.

■ **Battery charger/Battery charger cord**

SM-BCR1: Battery charger for SM-BTR1

- Disconnect the power plug from the electrical outlet before cleaning the charger.

SM-BCR2: Battery charger for SM-BTR2/BT-DN110/BT-DN110-A

- Disconnect the USB cable or the charging cable when performing maintenance.

■ **Hydraulic disc brake**

Cautions on the Shimano genuine mineral oil

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

Burn-in period

- Disc brakes have a burn-in period, and the braking force will gradually increase as the burn-in period progresses. Make sure that you are aware of any such increases in braking force when using the brakes during the burn-in period.

For Installation to the Bicycle, and Maintenance:

■ **Hydraulic disc brake**

Handling the Shimano genuine mineral oil

- Contact with eyes may result in irritation. Use safety glasses when handling, and avoid contact with eyes.
In the event of contact with eye, wash with water and seek medical attention immediately.
- Contact with skin may cause a rash and discomfort. Use gloves when handling.
In the event of contact with skin, wash well with soap and water.
- Do not drink. May cause vomiting or diarrhea.
- Keep out of reach of children.
- Do not cut, let near heat, weld or pressurize the oil container, as this may cause explosion or fire.
- Disposal of Used Oil: Follow local county and/or state codes for disposal.
- Directions: Keep the container sealed to prevent foreign objects and moisture from getting inside, and store it in a cool, dark area away from direct sunlight or heat.
Keep from heat or flame. Petroleum Class III, Danger level III

When cleaning with a compressor

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

Brake hose

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

NOTE

Be sure to also inform users of the following:

- Be sure to rotate the crank when carrying out any operations which are related to gear shifting.
- Do not keep connecting and disconnecting the small waterproof connector. It may impair the function.
- Be careful not to get water into the E-TUBE port.
- The components are designed to be fully waterproofed to withstand wet weather riding conditions; however, do not deliberately place them into water.
- Do not clean the bicycle with a high-pressure washer. If water gets into any of the components, operating problems or rusting may result.
- Be sure to keep turning the crank during the gear shifting.
- Handle the product carefully, and avoid subjecting it to any strong shocks.
- Do not use thinners or similar substances to clean the products. Such substances may damage the surfaces.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- Keep away from magnetized objects. If this is not observed, the product may be damaged.
For products that have magnets attached, make sure to install the product, using the attached magnet, in the location that is specified.
- Contact the place of purchase for updates of the component software. The most up-to-date information is available on the Shimano website.
- 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.

■ Lithium ion battery

- Lithium-ion batteries are recyclable, valuable resources.
For information on used batteries, contact the place of purchase or a bicycle dealer.
- Charging can be carried out at any time regardless of the amount of charge remaining. Always be sure to use the special battery charger to charge the battery until it is fully recharged.
- The battery is not fully charged at the time of purchase. Before riding, be sure to fully charge the battery.
- If the battery has become completely empty, charge it as soon as possible. If you leave the battery without charging it, it will cause the battery to deteriorate.
- The battery is an exhaustible item. The battery will gradually lose its capacity to charging after repeated use.
If the length of time that the battery can be used becomes extremely short, it has probably reached the end of its life, and so you will need to purchase a new battery.
- The life of the battery will vary depending on factors such as the storage method, the usage conditions, the surrounding environment and the characteristics of the individual battery pack.
- If storing the battery away for a long period, remove it when the battery level is 50% or higher or when the green indicator is illuminating in order to prolong its useful life; and it is recommended that you charge the battery about every six months.
- If the storage temperature is high, the performance of the battery is reduced, and its useable time will be shorter. When you use the battery after a long storage period, store the battery indoors where the battery will not be exposed to direct sunlight or rain.
- If the ambient temperature is low, the battery's usable time will be shorter.

SM-BTR1: Lithium ion battery (external type)

- When storing the battery away, remove the battery from the bicycle and install the terminal cover first.
- The charging time is approximately 1.5 hours. (Note that the actual time will vary depending on the remaining battery charge.)
- If the battery feels difficult to insert or remove, apply specified grease (premium grease) to the part that touches the O-ring at the side.

SM-BTR2/BT-DN110/BT-DN110-A: Lithium ion battery (built-in type)

- After removing the battery from the bicycle for storage, install a dummy plug.
- The charging time of an AC adapter with a USB port is about 1.5 hours, and that of computer USB port type about 3 hours. (Note that the actual time will vary depending on the amount of charge remaining in the battery. Depending on the specifications of the AC adapter, recharging via the AC adapter may require as much time (about 3 hours) as recharging via PC.)

■ Battery charger/Battery charger cord

- Use this instrument under the direction of a safety supervisor or the direction for use. Do not allow physically, sensory, or mentally impaired persons, inexperienced persons, or persons with no required knowledge, including children, to use this product.
- Do not allow children to play near the product.



Disposal information for countries outside the European Union

This symbol is only valid within the European Union.

Contact the place of purchase or your nearest Shimano agent for advice on disposing.

- Charge the battery indoors to avoid exposure to rain or wind.
- Do not use outdoors or in environments with high humidity.
- Do not place the battery charger on dusty floors when using it.
- Place the battery charger on a stable surface such as a table when using it.
- Do not place any objects on top of the battery charger or its cable.
- Do not bundle the cables.
- Do not hold the battery charger by the cables when carrying it.
- Do not apply excessive tension to the cables.
- Do not wash the battery charger or wipe it using detergents.

SM-BCR2: Battery charger/PC linkage device for SM-BTR2/BT-DN110/BT-DN110-A

- Connect the PC linkage device directly to a computer, without using an intermediate device such as a USB hub.
- Do not ride the bicycle while the PC linkage device and cable are still connected to it.
- Do not connect two or more of the same units to the same connection point. If this is not done, the units may not operate correctly.
- Do not connect or disconnect units again while unit recognition is in progress or after recognition is complete. If this is not done, the units may not operate correctly.
Check the procedures which are given in the user's manual for the E-TUBE PROJECT when connecting and disconnecting units.
- The tightness of the PC link cable will tend to drop after repeated connections and disconnections. If this happens, replace the cable.
- Do not connect two or more PC linkage device at the same time. If two or more PC linkage device units are connected, they will not operate correctly.
In addition, the PC may need to be restarted if operating errors occur.
- PC linkage devices cannot be used while the charger is connected.

■ Rear derailleur

- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- If the chain keeps skipping, ask the place of purchase to replace the chainrings, sprockets and/or the chain.
- If there is a large gap in the pulleys which causes a lot of noise, ask the place of purchase to replace the pulleys.
- The gears should be periodically washed with a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the life of the gears and the chain.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.

■ Hydraulic disc brake

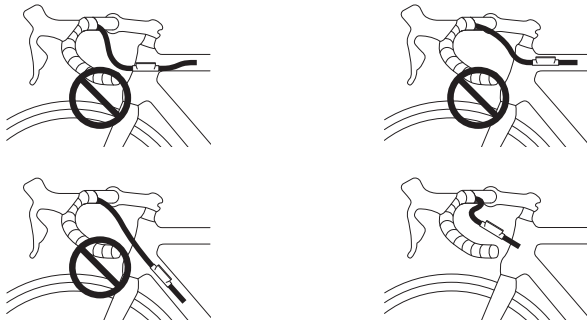
- When the bicycle wheel has been removed, it is recommended that pad spacers are installed. Do not depress the brake lever while the wheel is removed. If the brake lever is depressed without the pad spacers installed, the pistons will protrude further than normal. If that happens, consult a dealer.
- Use soapy water and a dry cloth when cleaning and carrying out maintenance of the brake system. Do not use commercially available brake cleansers or silencing agents, as they can cause damage to parts such as seals.

■ Dual control lever

- In the case of carbon levers, wash them with a soft cloth using a neutral detergent. Otherwise, the material may break down and be damaged.
- Avoid leaving the carbon levers in areas of high temperature. Also keep them well away from fire.

■ Wireless unit

- When using EW-WU111, combine it with one of the following units.
External type: BM-DN100, Built-in type: BT-DN110/BT-DN110-A
- Do not keep connecting and disconnecting the small waterproof connector. It may impair the function.
- Be careful not to get water into the E-TUBE port.
- The components are designed to be fully waterproofed to withstand wet weather riding conditions; however, do not deliberately place them into water.
- Do not clean the bicycle with a high-pressure wash. If water gets into any of the components, operating problems or rusting may result.
- Handle the product carefully, and avoid subjecting it to any strong shocks.
- Do not position the unit on the side of the bicycle frame, as in the illustrations.
If the bicycle collapses, damage to the unit may result if the unit is caught between the bicycle frame and curbstones etc.



- Do not use thinners or similar substances to clean the products. Such substances may damage the surfaces.
- Do not leave the product in an area exposed to strong sunlight for an extended period of time.
- Do not disassemble the product as it cannot be reassembled.
- When cleaning the product, use a cloth moistened with a diluted neutral detergent.
- Contact the place of purchase for updates of the component software. The most up-to-date information is available on the Shimano website.

For Installation to the Bicycle, and Maintenance:

- Be sure to attach dummy plugs to any unused E-TUBE ports.
- Be sure to use Shimano original tool TL-EW02 to remove the electric wires.
- The motors of the motor unit cannot be repaired.
- Contact Shimano for information regarding the shipment of the battery charger to South Korea and Malaysia.
- Use a brake hose/outer casing which still has some length to spare even when the handlebars are turned all the way to both sides.
Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- Use the specified cable for smooth operation.
- The clamp band, clamp bolt, and clamp nut are not compatible with other products. Do not use with components that are used in other products.

■ Electric wires/Electric wire covers

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

■ Rear derailleur

- Always be sure to adjust the top adjustment bolt and the low adjustment bolt according to the instructions given in the adjustment section. If these bolts are not adjusted, the chain may become clamped between the spokes and the largest sprocket and the wheel may lock, or the chain may slip onto a smaller sprocket.
- Periodically clean the derailleur and lubricate all moving parts (mechanism and pulleys).
- If gear shifting adjustments cannot be carried out, check the degree of parallel of the rear dropouts.
- The guide pulley and tension pulley are marked on one side with arrows to indicate the direction of rotation. When attaching the pulleys, make sure to orient them so that the sides marked with arrows face toward the bicycle.

■ Hydraulic disc brake

- If the brake caliper mounting boss and the dropout are not of standard dimensions, the disc brake rotor and caliper may touch.
- When the bicycle wheel has been removed, it is recommended that pad spacers are installed. The pad spacers will prevent the piston from coming out if the brake lever is depressed while the wheel is removed.
- If the brake lever is depressed without the pad spacers installed, the pistons will protrude further than is normal. Use a slotted screwdriver or similar tool to push back the brake pads, while being careful not to damage the surfaces of the brake pads. (If the brake pads are not installed, use a flat-shaped tool to push the pistons straight back in, while being careful not to damage them)
If it is difficult to push the brake pads or pistons back, remove the bleed screws and then try again. (Note that some oil may overflow from the reservoir tank at this time.)
- Use isopropyl alcohol, soapy water or a dry cloth when cleaning and carrying out maintenance of the brake system. Do not use commercially available brake cleansers or silencing agents. They can cause damage to parts such as seals.
- Do not remove the pistons when disassembling the brake calipers.
- If the disc brake rotor is worn, cracked or warped, it should be replaced.

■ Dual control lever

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

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

For Installation to the Bicycle:

■ Notes on reinstalling and replacing components

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

Be sure to also inform users of the following:

■ About used batteries

- Lithium-ion batteries are recyclable, valuable resources.
For information on used batteries, contact the place of purchase or a bicycle dealer.

■ About system power reset

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

In the case of using SM-BTR1

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

In the case of using SM-BTR2/BT-DN110/BT-DN110-A

- Disconnect the plug from SM-BTR2/BT-DN110/BT-DN110-A. After about one minute, insert the plug.

■ Connection and communication with PC

- PC linkage devices can be used to connect a PC to the bicycle (system or components), and an E-TUBE PROJECT can be used to carry out tasks such as customizing single components or the whole system and updating their firmware.
If your versions of E-TUBE PROJECT software and firmware for each component are not up to date there could be problems operating the bicycle.
Check the software version and update it to the latest one.

	PC linkage device	E-TUBE PROJECT	Firmware
SM-BMR2/SM-BTR2	SM-PCE1/SM-BCR2	Version 3.2.0 or later	Version 3.0.0 or later
BT-DN110/BT-DN110-A/ BM-DN100			Version 4.0.0 or later

■ Connection and communication with smartphone or tablet

- It is possible to customize single components or the system, and update firmware, using E-TUBE PROJECT for smartphones/tablets after connecting the bicycle (system or components) to a smartphone or tablet via Bluetooth LE.
 - E-TUBE PROJECT: app for smartphones/tablets
 - Firmware: software inside each component
- Disconnect Bluetooth LE when not using E-TUBE PROJECT for smartphones/tablets.
Using the wireless unit without disconnecting Bluetooth LE may result in high battery power consumption.

About compatibility with E-TUBE

- For details on the compatibility and functional limitations of units, refer to the following website.
(http://e-tubeproject.shimano.com/guide/#guide_list)

LIST OF TOOLS TO BE USED

LIST OF TOOLS TO BE USED

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

Tool		Tool		Tool	
	2mm hexagon wrench		Screwdriver[#2]		Plastic mallet
	2.5mm hexagon wrench		Slotted screwdriver Blade width: 4.0 - 5.0mm Blade thickness: 0.5 - 0.6mm		Utility knife
	3mm hexagon wrench		Hexalobular[#5]		Handlebar tape cutout tool
	4mm hexagon wrench		Hexalobular[#10]		TL-CT12
	5mm hexagon wrench		Snap ring pliers		Shimano original tool TL-EW02
	23mm hub spanner		Special E-ring removal tool		

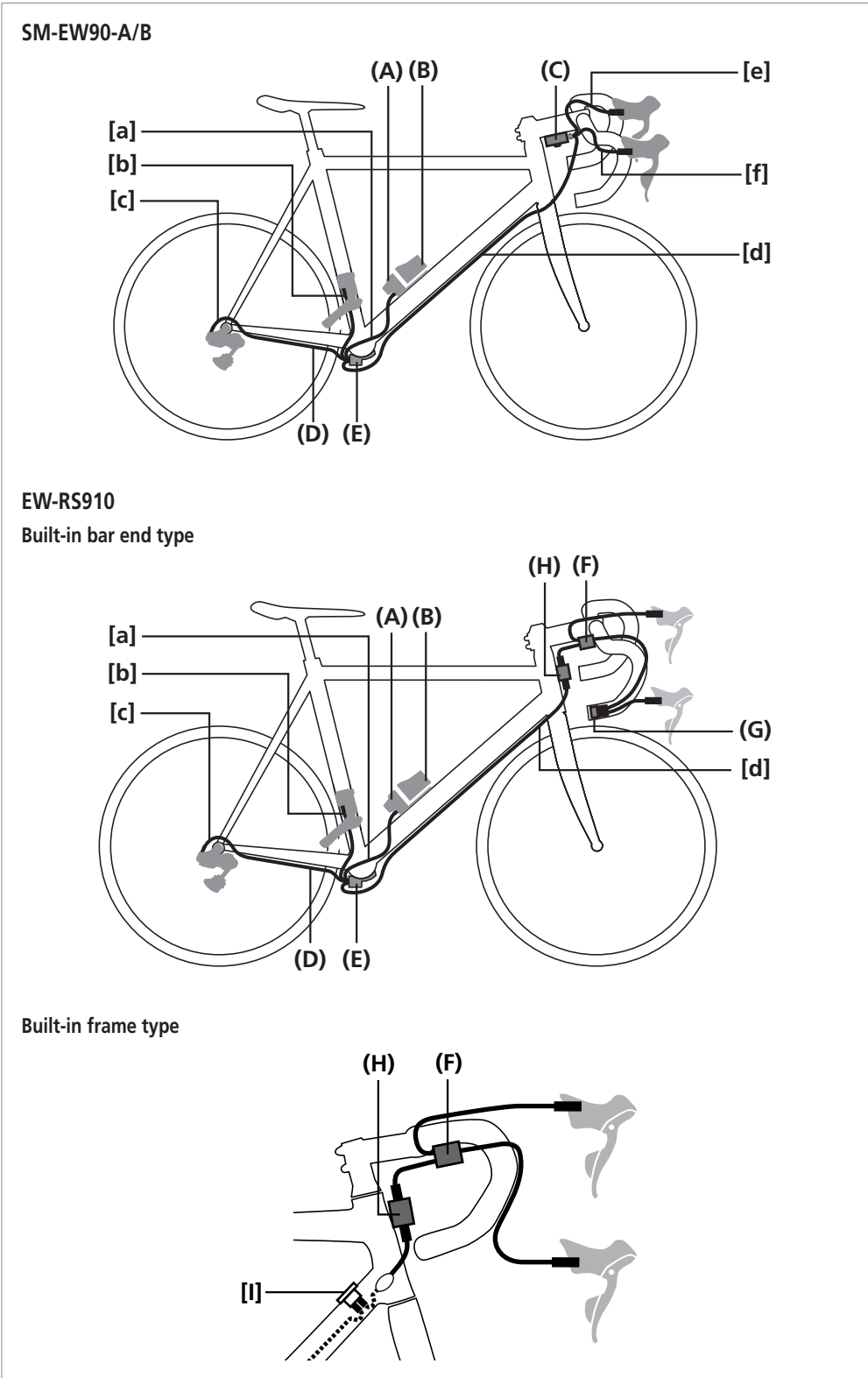
INSTALLATION

INSTALLATION

Electric wire wiring diagram (overall conceptual diagram)

Lithium ion battery (external type) SM-BTR1

External type (SM-JC40)



- (A) Battery mount SM-BMR2/ BM-DN100
- (B) Lithium ion battery (external type) SM-BTR1
- (C) Junction A SM-EW90-A/B
- (D) Electric wire EW-SD50
- (E) Junction B SM-JC40
- (F) EW-JC130
- (G) EW-RS910 (Built-in bar end type)
- (H) EW-WU111
- (I) EW-RS910 (Built-in frame type)

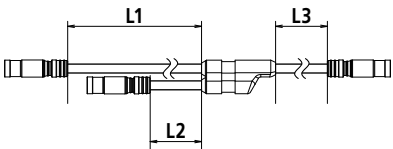


Cable length (EW-SD50)

- [a] + [b] ≤ 900mm
- [a] + [c] ≤ 1100mm
- [d] ≤ 1400mm
- [e], [f] ≤ 500mm

Cable length (EW-JC130)

EW-JC130 is available in three variations of differing length. Refer to the table and select the appropriate variation.

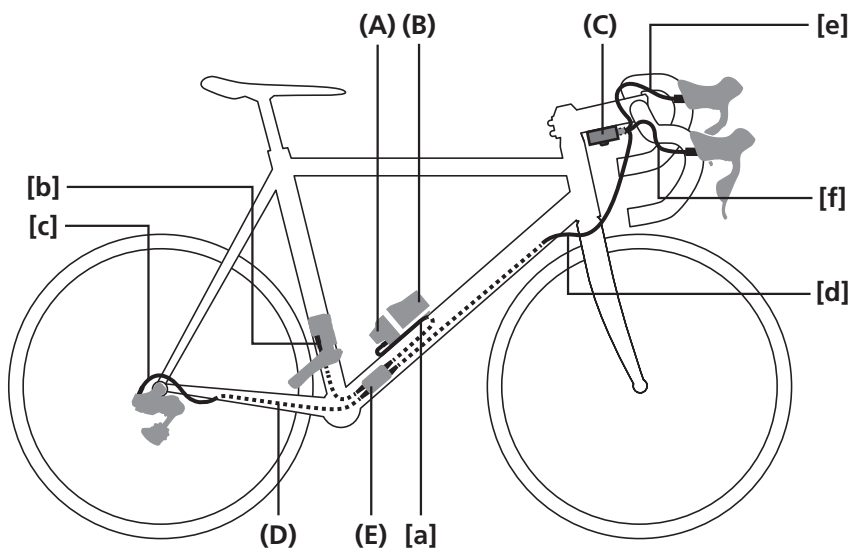


	L1 (mm)	L2 (mm)	L3 (mm)
EW-JC130-SS	350	50	250
EW-JC130-SM	350	50	450
EW-JC130-MM	550	50	550

- If using EW-WU111, use it in combination with BT-DN110, BT-DN110-A or BM-DN100.

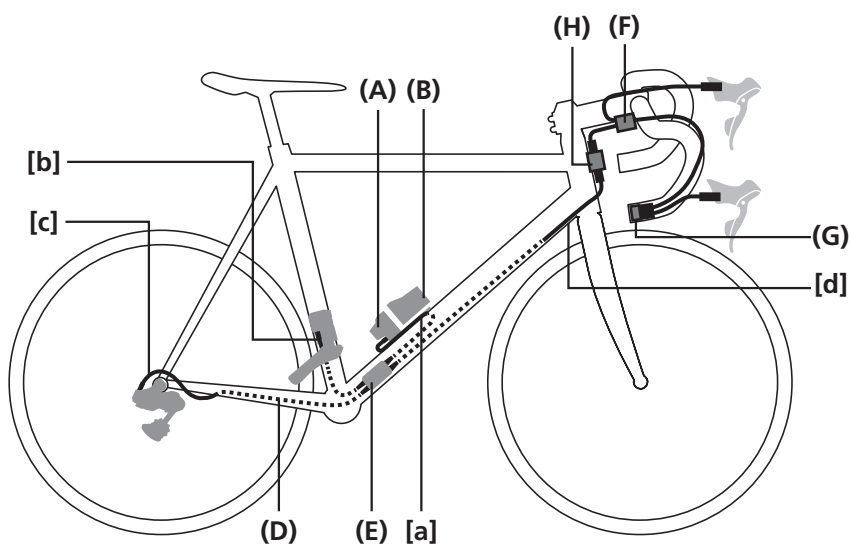
Built-in type (SM-JC41)

SM-EW90-A/B

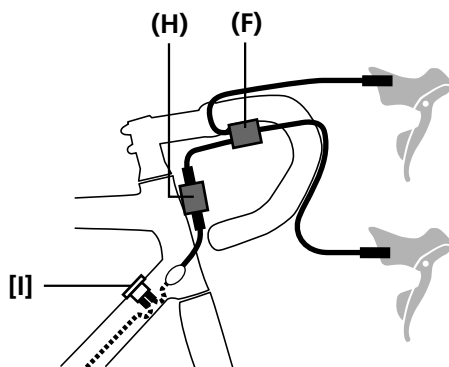


EW-RS910

Built-in bar end type



Built-in frame type



- (A) Battery mount SM-BMR2/ BM-DN100
- (B) Lithium ion battery (external type) SM-BTR1
- (C) Junction A SM-EW90-A/B
- (D) Electric wire EW-SD50-I
- (E) Junction B SM-JC41
- (F) EW-JC130
- (G) EW-RS910 (Built-in bar end type)
- (H) EW-WU111
- (I) EW-RS910 (Built-in frame type)



TECH TIPS

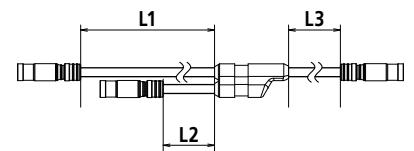
• Cable length (EW-SD50)

- [a] + [b] ≤ 1500mm
- [a] + [c] ≤ 1700mm
- [d] ≤ 1400mm
- [e], [f] ≤ 500mm

Cable length (EW-JC130)

EW-JC130 is available in three variations of differing length.

Refer to the table and select the appropriate variation.



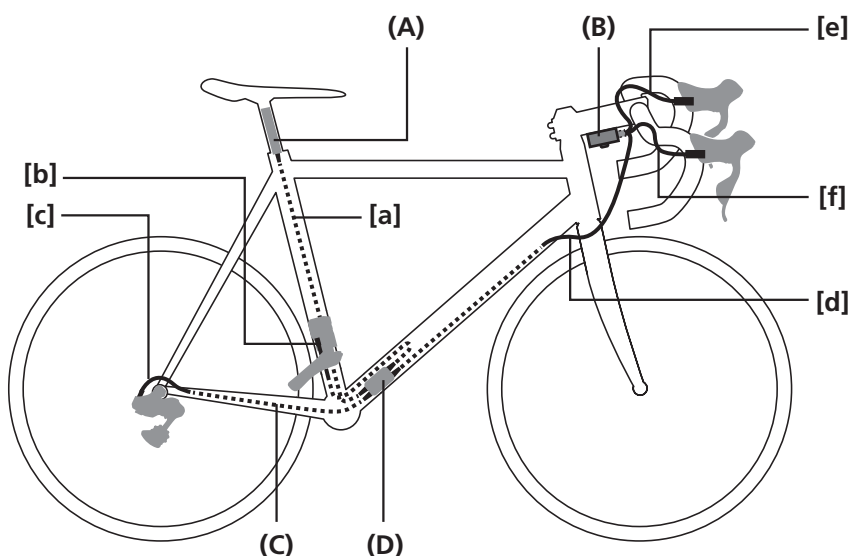
	L1 (mm)	L2 (mm)	L3 (mm)
EW-JC130-SS	350	50	250
EW-JC130-SM	350	50	450
EW-JC130-MM	550	50	550

- If using EW-WU111, use it in combination with BT-DN110, BT-DN110-A or BM-DN100.

Built-in battery type SM-BTR2/BT-DN110/BT-DN110-A

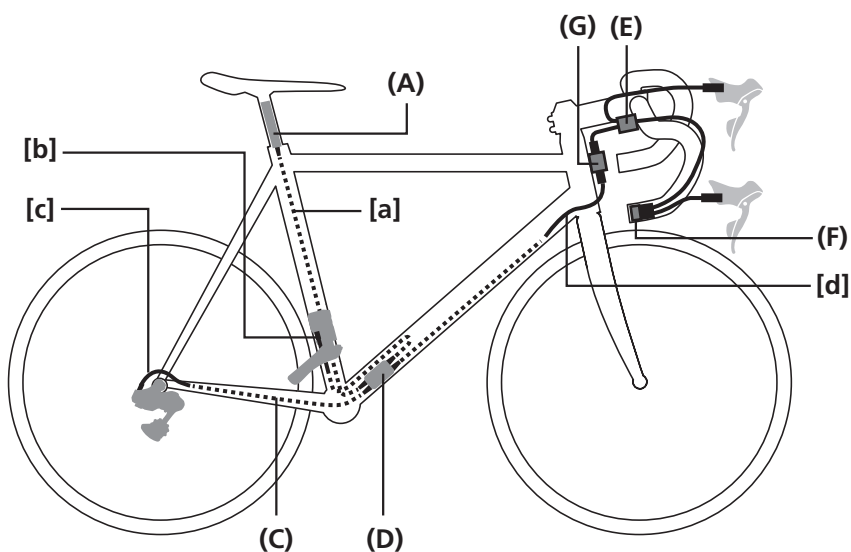
Built-in type (SM-JC41)

SM-EW90-A/B

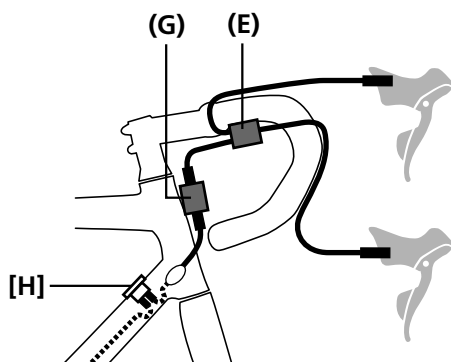


EW-RS910

Built-in bar end type



Built-in frame type



- (A) Lithium ion battery (built-in type)
SM-BTR2/BT-DN110/BT-DN110-A
- (B) Junction A SM-EW90-A/B
- (C) Electric wire EW-SD50-I
- (D) Junction B SM-JC41
- (E) EW-JC130
- (F) EW-RS910 (Built-in bar end type)
- (G) EW-WU111
- (H) EW-RS910 (Built-in frame type)



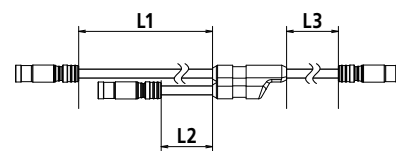
TECH TIPS

• Cable length (EW-SD50)

- [a] + [b] ≤ 1500mm
- [a] + [c] ≤ 1700mm
- [d] ≤ 1400mm
- [e], [f] ≤ 500mm

Cable length (EW-JC130)

EW-JC130 is available in three variations of differing length.
Refer to the table and select the appropriate variation.



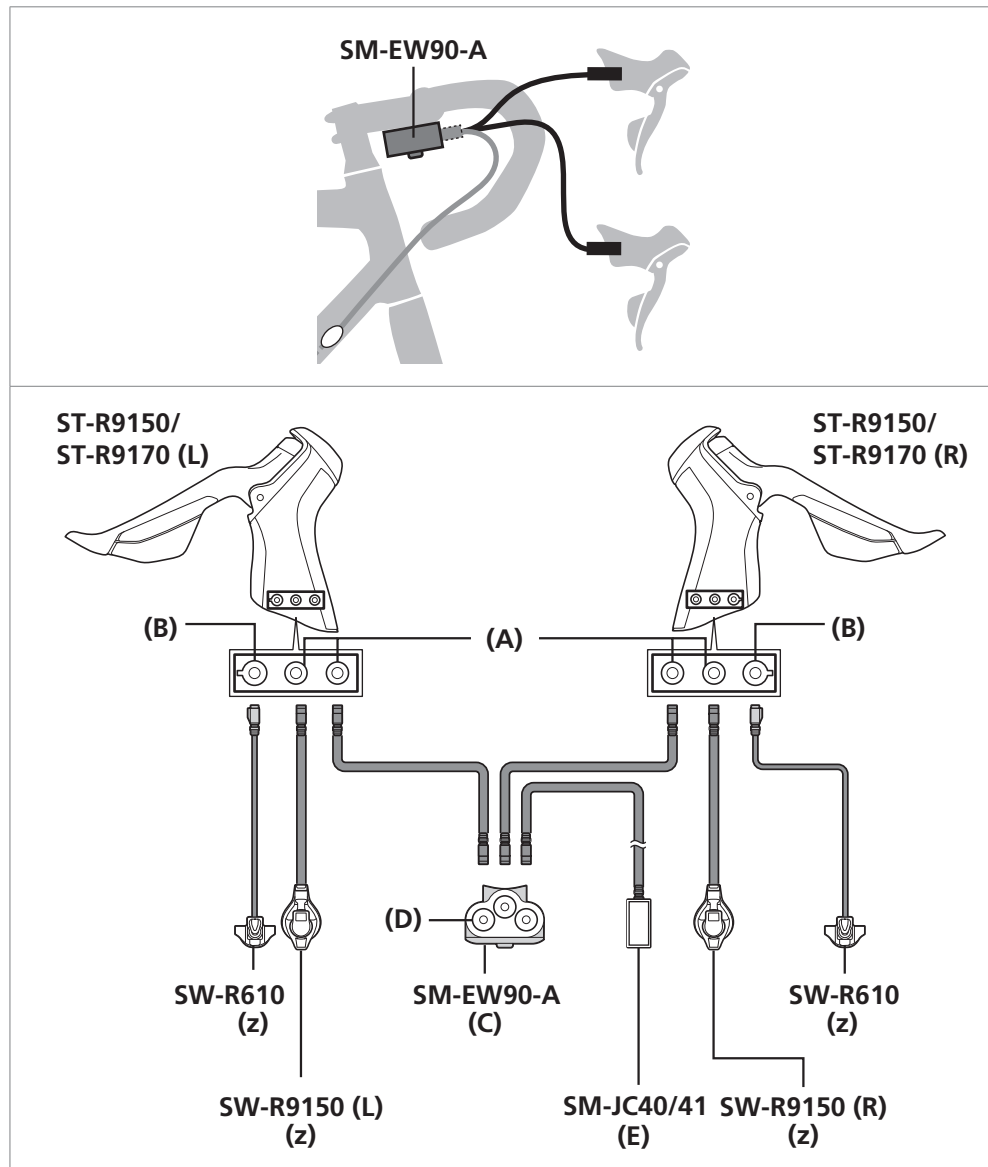
	L1 (mm)	L2 (mm)	L3 (mm)
EW-JC130-SS	350	50	250
EW-JC130-SM	350	50	450
EW-JC130-MM	550	50	550

- If using EW-WU111, use it in combination with BT-DN110, BT-DN110-A or BM-DN100.

■ Electric wire wiring diagram (junction A side)

SM-EW90-A (3 port type)

Drop handlebar type

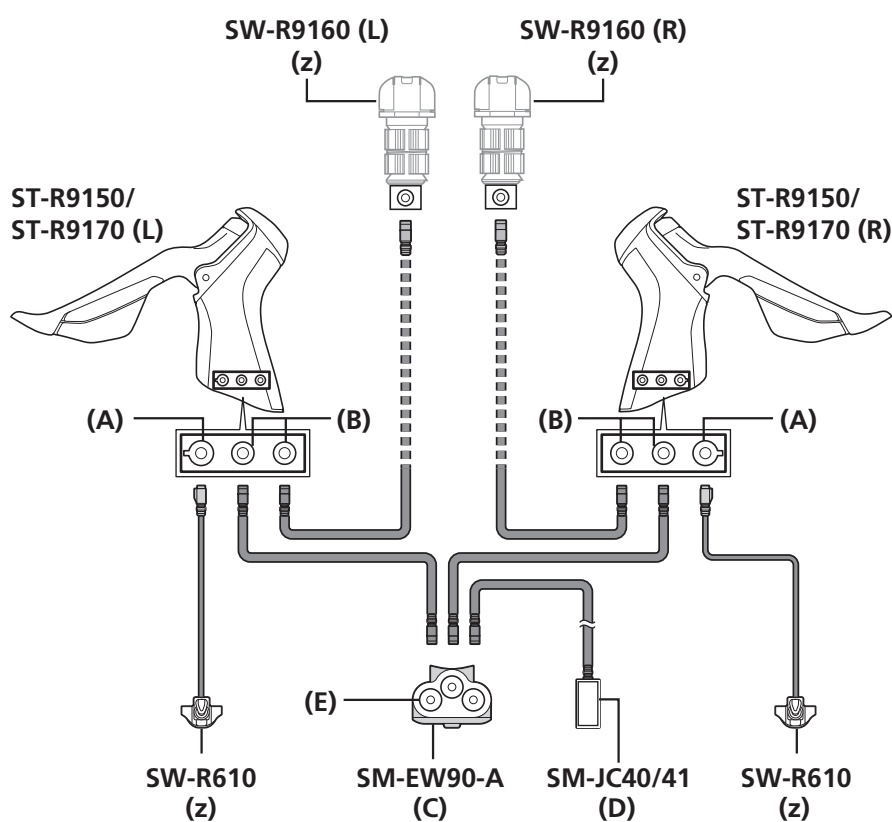
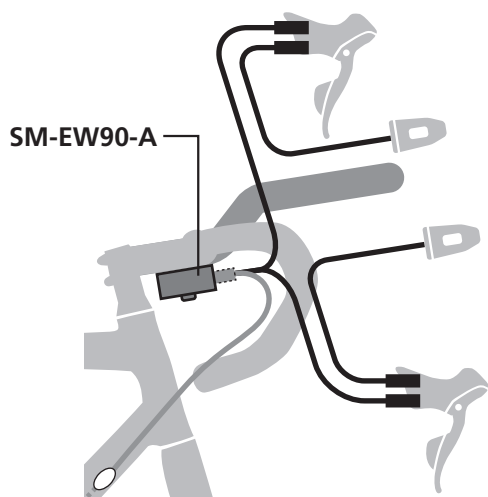


-  E-TUBE connector
-  Connector for remote sprinter shifter

(z) Option

- (A)** E-TUBE port x2
- (B)** Port for remote sprinter shifter (ST-R9170 does not have this port.)
- (C)** Junction A
- (D)** E-TUBE port x3
- (E)** Junction B

Clip-on bar type

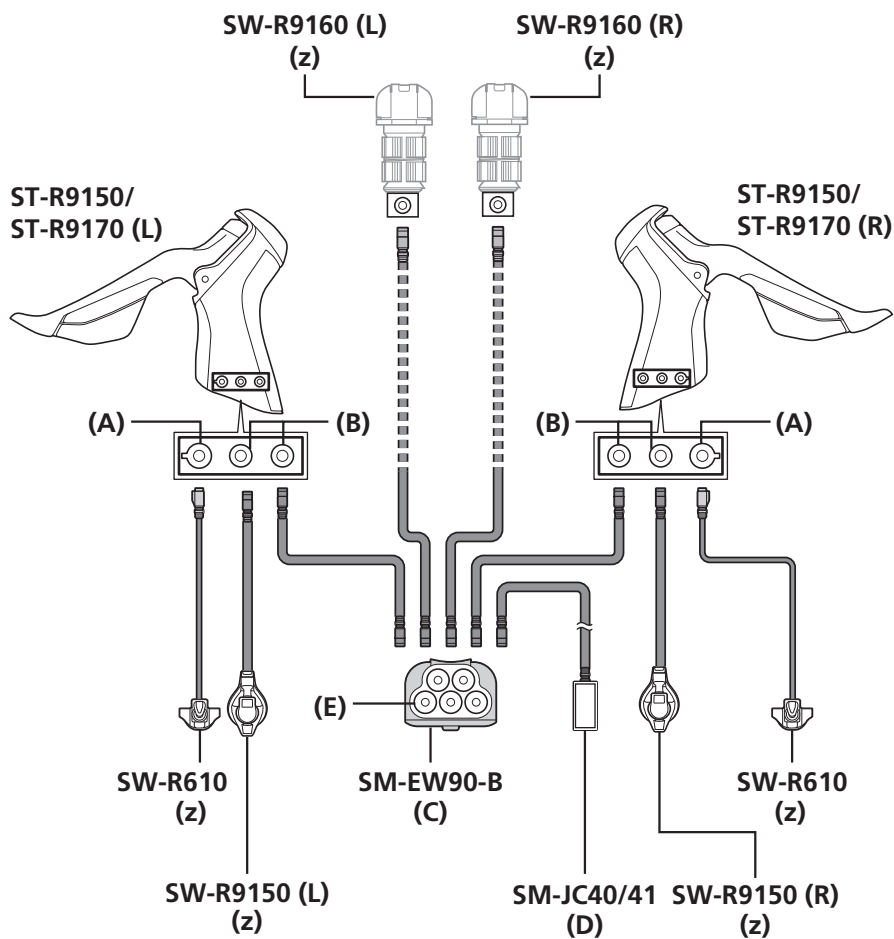
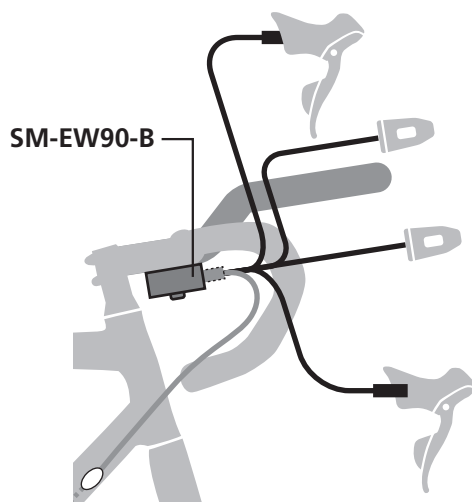


- E-TUBE connector
- Connector for remote sprinter shifter

(z) Option

- (A)** Port for remote sprinter shifter (ST-R9170 does not have this port.)
- (B)** E-TUBE port x2
- (C)** Junction A
- (D)** Junction B
- (E)** E-TUBE port x3

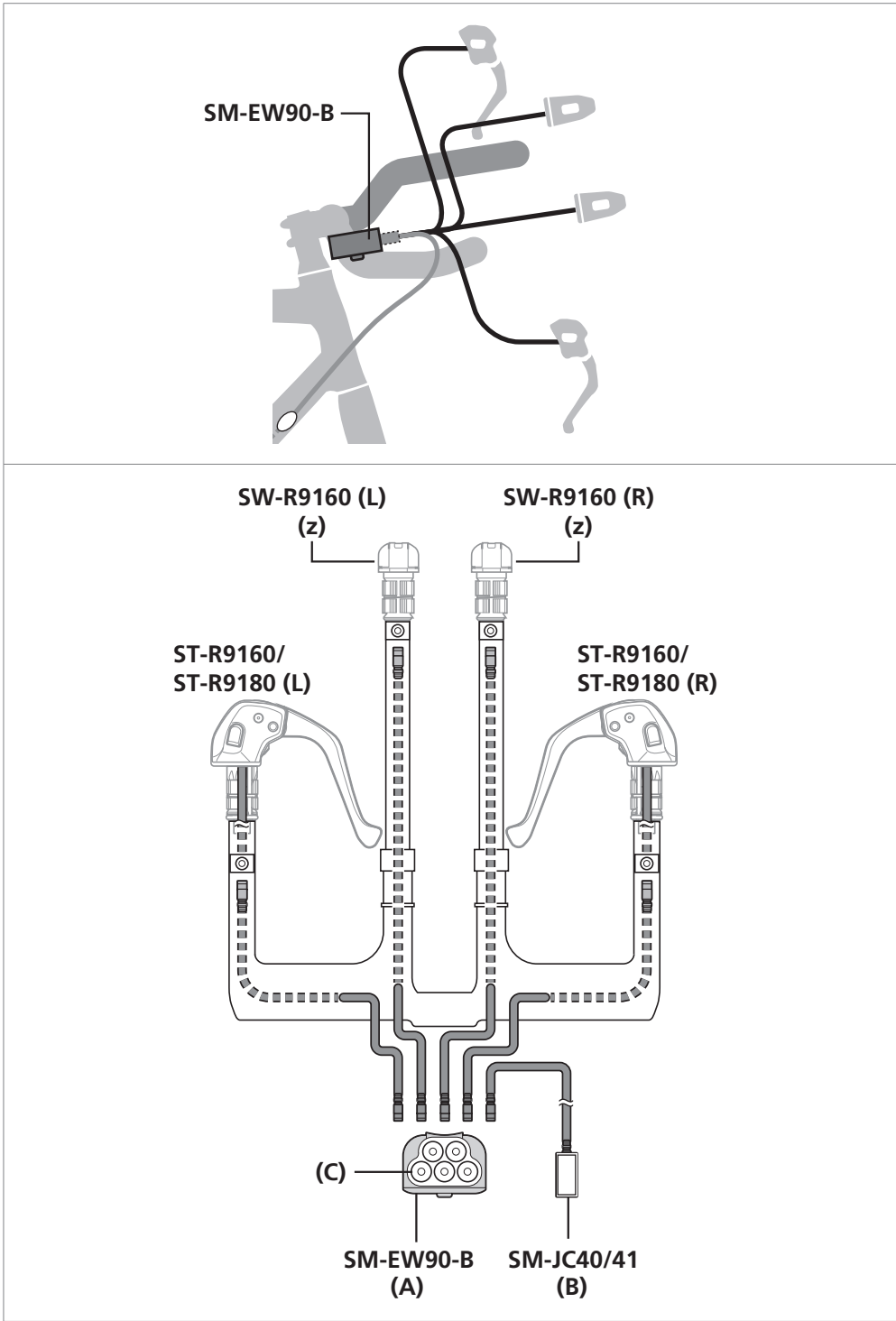
Clip-on bar type

 Connector for remote sprinter shifter

(z) Option

(E) E-TUBE port x5

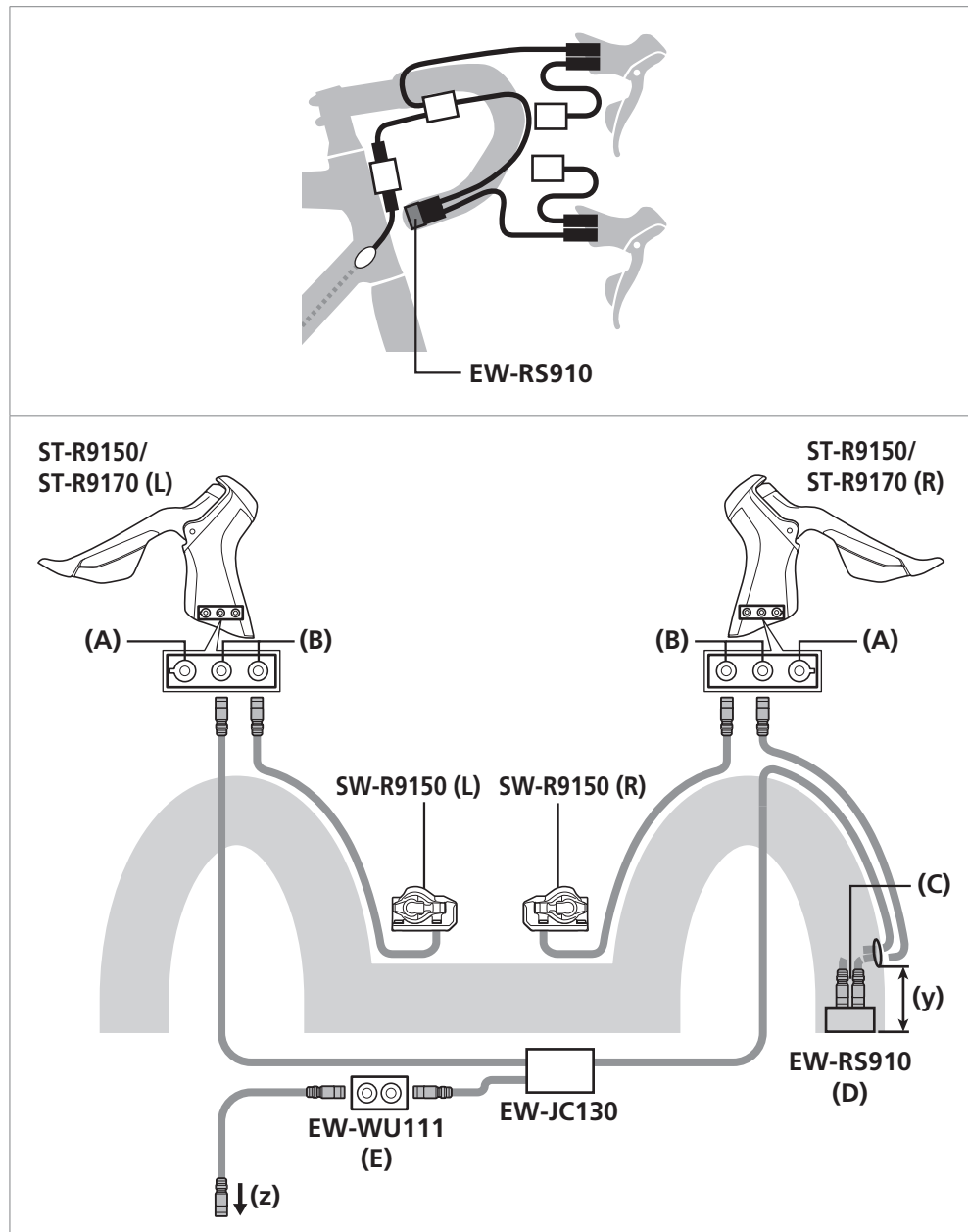
Time trial/triathlon handle type



-  E-TUBE connector
-  Connector for remote sprinter shifter
- (z)** Option
- (A)** Junction A
- (B)** Junction B
- (C)** E-TUBE port x5

EW-RS910 (Built-in bar end type)

Drop handlebar type



 E-TUBE connector

(y) At least 40mm

(z) To frame (Junction B)

(A) Port for remote sprinter shifter
(ST-R9170 does not have this
port.)

(B) E-TUBE port x2

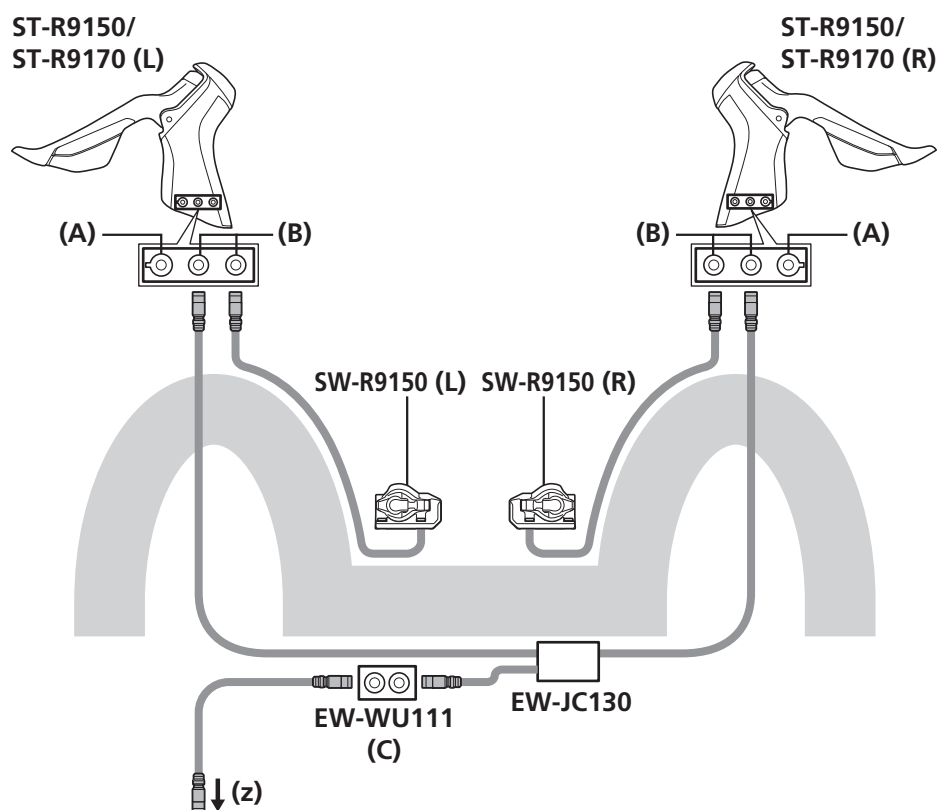
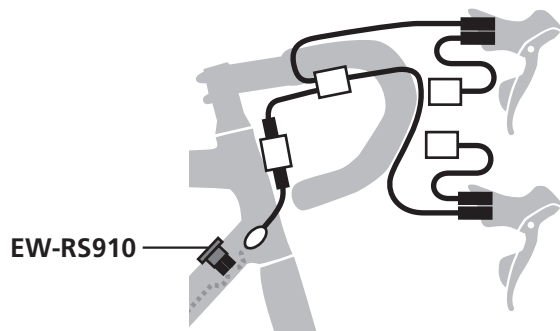
(C) E-TUBE port x2

(D) Junction A
(2 port bar end type junction)

(E) Wireless unit

►► Electric wire wiring diagram (junction A side)

Drop handlebar type



(z) To frame (EW-RS910)

(A) Port for remote sprinter shifter (ST-R9170 does not have this port.)

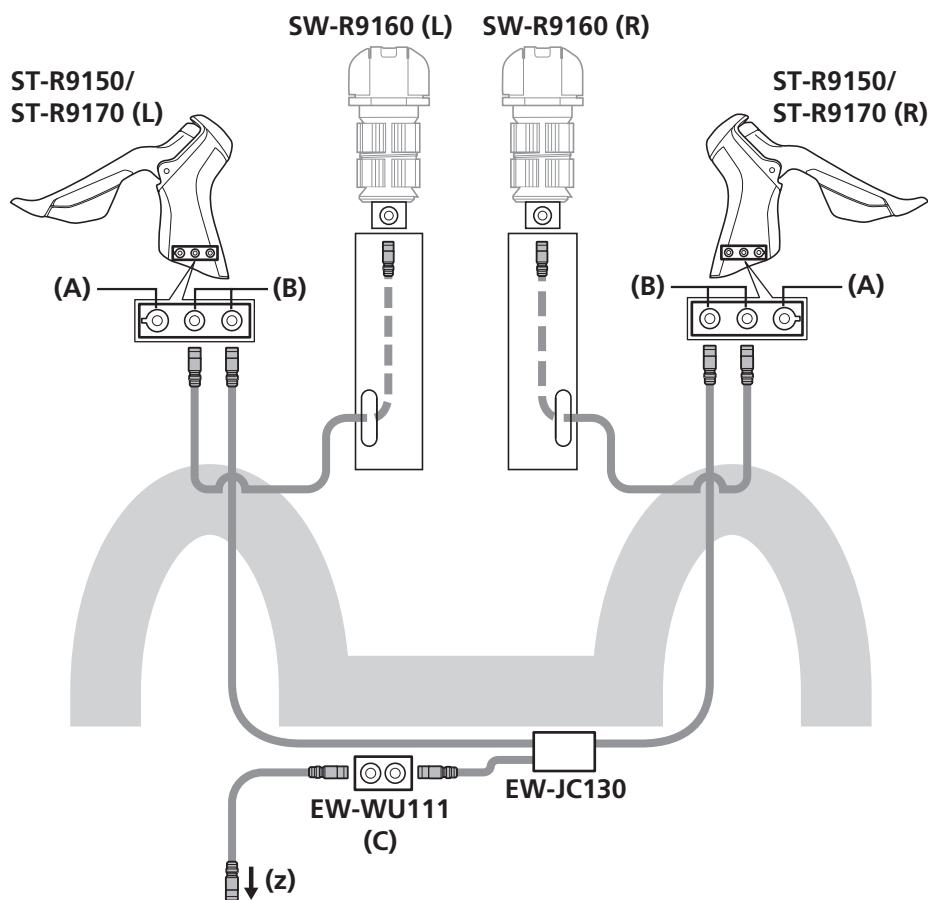
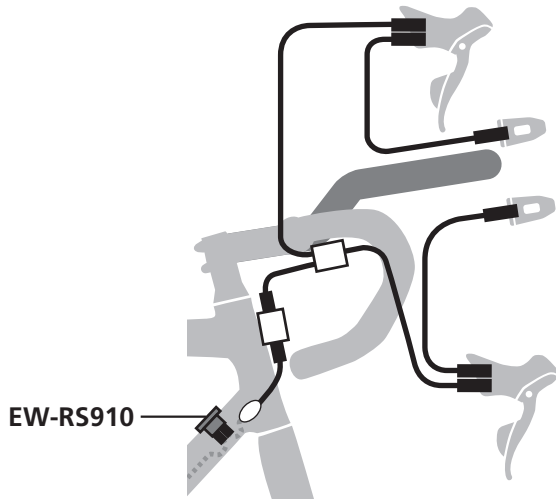
(B) E-TUBE port x2

(C) Wireless unit

INSTALLATION

Electric wire wiring diagram (junction A side)

Clip-on bar type



 E-TUBE connector

(z) To frame (EW-RS910)

(A) Port for remote sprinter shifter
(ST-R9170 does not have this
port.)

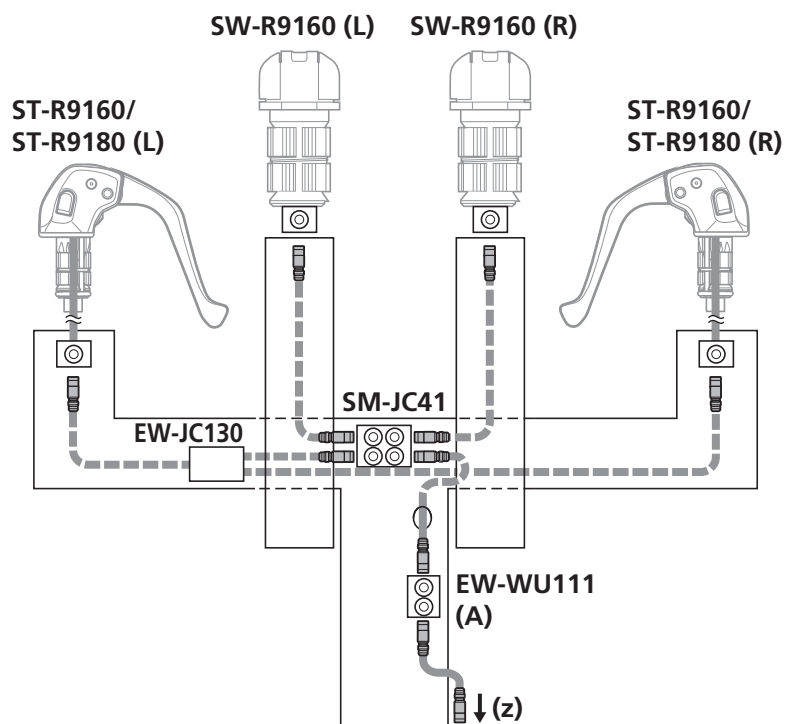
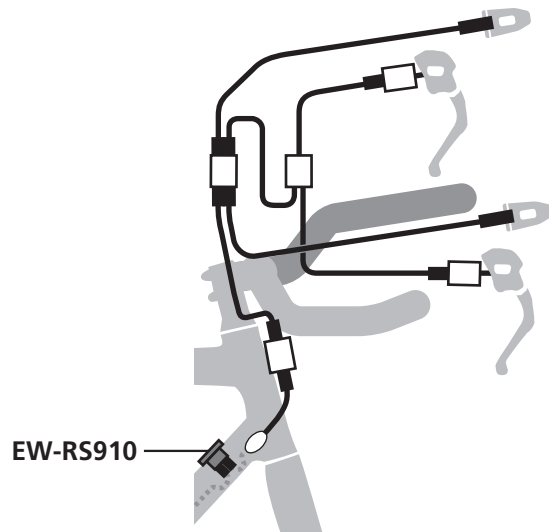
(B) E-TUBE port x2

(C) Wireless unit

INSTALLATION

►► Electric wire wiring diagram (junction A side)

Time trial/triathlon handle type



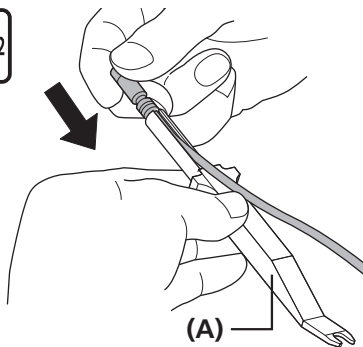
 E-TUBE connector

(z) To frame (EW-RS910)

(A) Wireless unit

■ Using the Shimano original tool TL-EW02

TL-EW02



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

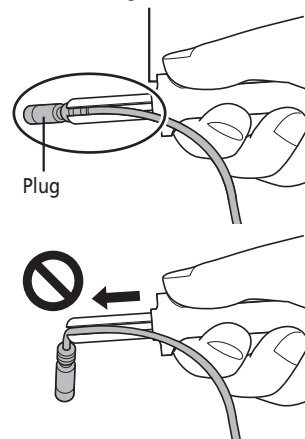
(A) Shimano original tool TL-EW02

NOTE

Use the Shimano original tool when connecting/disconnecting the electric wires. When installing the electric wire, do not forcibly bend the plug. It may result in a poor connection. When connecting electric wires, push them in until you feel and hear a click.

Shimano original tool TL-EW02

TL-EW02



■ Installation of the dual control lever and brake cable

 WARNING

- Do not apply grease or other lubricants to the inner cable.
- Be sure to wipe off with a cloth any grease that adheres to the inner fixing section. After wiping off the grease, pass the inner cable through the outer casing. If grease adheres to the fixing section, the holding force of the brake cable may not be sufficient. If the holding force is insufficient, the brake cable will slacken resulting in a loss of brake control and possibly severe injury.

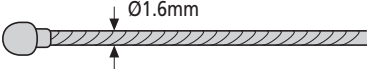
NOTE

- Be careful not let the BC-9000/R680 inner cable come into contact with the brake lever or the metal section (adjustment section) of the caliper brake. Fuzz may be generated when the inner cable is installed or when the coating is damaged during use, but this will not affect its functions.
- Use cables which are long enough that they still have some looseness even when the handlebars are turned all the way to both sides.

 TECH TIPS

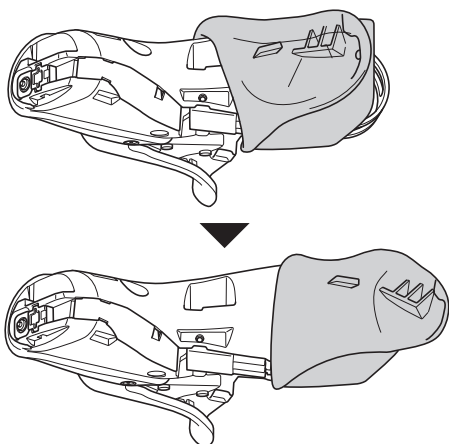
For information on how to install the brake cable, refer to the dealer's manual for BR-R9100.

Cable to be used

BC-9000/BC-R680 inner cable	Outer casing
	

ST-R9150

1



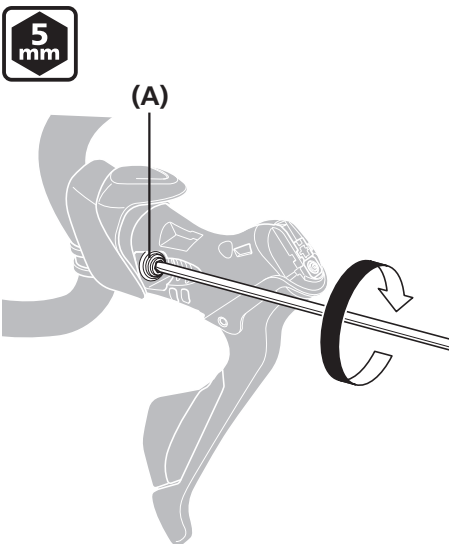
Turn over the bracket cover from the front side.

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

NOTE

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

2



Use a 5mm hexagon wrench to tighten the clamp bolt at the top of the bracket.

(A) Clamp bolt

Tightening torque



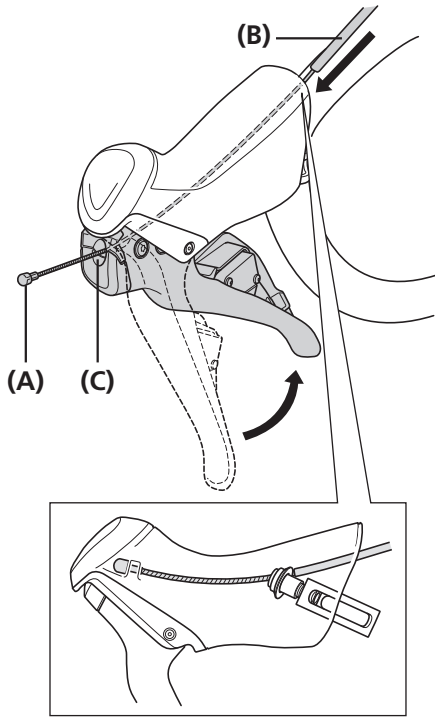
6 - 8 N·m

NOTE

- With a carbon handle, even the recommended tightening torque may be too tight and cause damage to the handle, or too loose and not sufficiently attached. For the appropriate torque value, consult with the manufacturer of the completed bicycle or the manufacturer of the handle.
- The clamp band, clamp bolt, and clamp nut are not compatible with other products. Do not use with components that are used in other products.

►► Installation of the dual control lever and brake cable

3

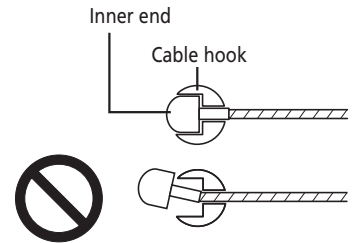


Depress the lever as if to brake and pass the brake cable through.

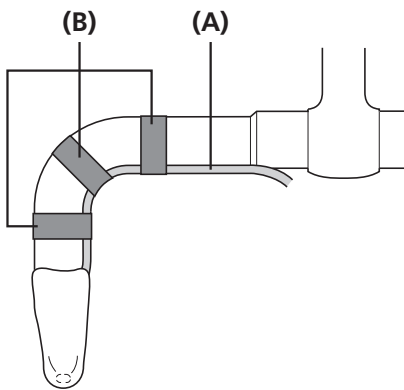
- (A) Inner end
- (B) Outer casing
- (C) Cable hook

NOTE

Make sure that the inner end is firmly set in the cable hook.



4



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

- (A) Outer casing
- (B) Tape

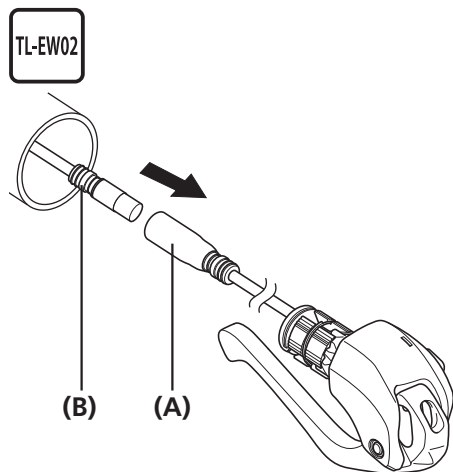
ST-R9160

1

Route the outer casing and electric wire through the handlebar.

When installing the lever, adjust the length of the outer casing so that it can fit securely into the outer casing holder.

2

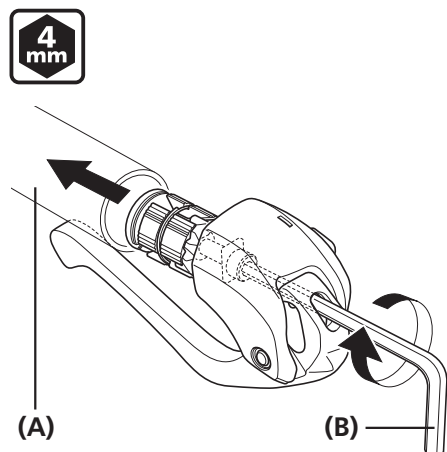


Connect the electric wire to the connector (female) extending from the lever.

(A) Connector (female)

(B) Electric wire

3



Install the brake lever to the handlebar by tightening clockwise with a hexagon wrench.

(A) Handlebar

(B) 4mm hexagon wrench

Tightening torque



6 - 8 N·m

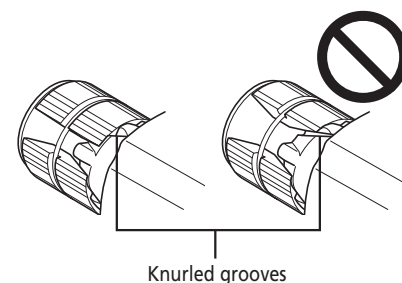


TECH TIPS

The illustration is of the right brake lever.

NOTE

The knurled grooves should be aligned.

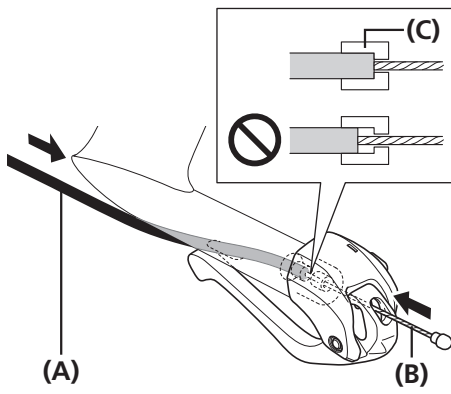


Knurled grooves

INSTALLATION

►► Installation of the dual control lever and brake cable

4



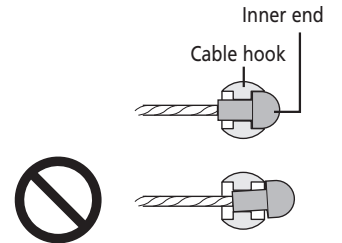
Pass the inner cable through.

- (A) Outer casing
- (B) Inner cable
- (C) Outer casing holder

NOTE

Inner end

Make sure that the inner end is firmly set in the cable hook.



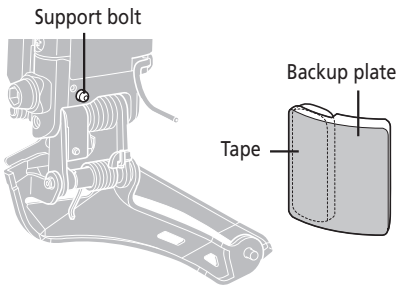
■ Installation of the front derailleur

Check if the frame to which the front derailleur will be installed is a direct mount type or band type.

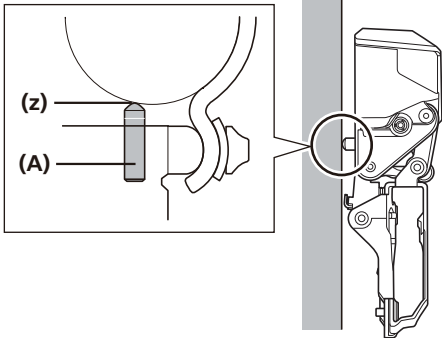
Installation of the front derailleur (direct mount type frame)

NOTE

- With a carbon frame, even the recommended tightening torque may be too tight and cause damage to the frame, or too loose and not sufficiently attached to the frame. For the appropriate torque value, consult with the manufacturer of the completed bicycle or the manufacturer of the frame.
- When installing the front derailleur to a direct mount type frame, it is recommended to attach a support bolt to ensure optimum performance of the front derailleur. When a support bolt is attached, there is a risk that it will cause to damage the frame; therefore, be sure to attach a backup plate. (However, in some cases a support bolt and backup plate cannot be attached.)



1



Check where the support bolt makes contact with the seat tube when adjusting the front derailleur support bolt.

(z) Location where support bolt touches seat tube

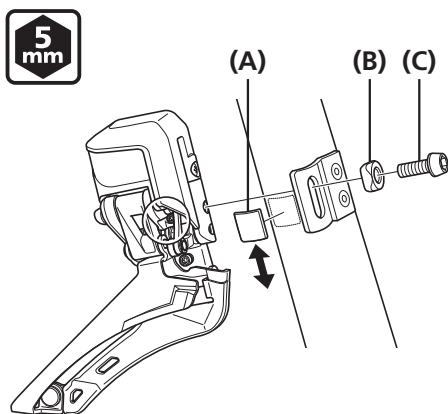
(A) Support bolt



TECH TIPS

After the checking the position, loosen the support bolt and return it to its original position.

2



Attach the backup plate where the support bolt touches the seat tube.

After that install the front derailleur to the frame.

- (A) Backup plate
- (B) Mounting washer
- (C) Fixing bolt

Tightening torque

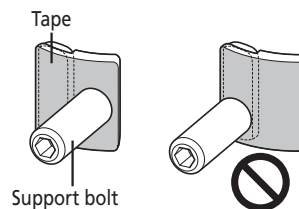


5 - 7 N·m

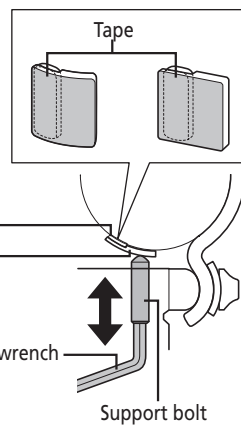


TECH TIPS

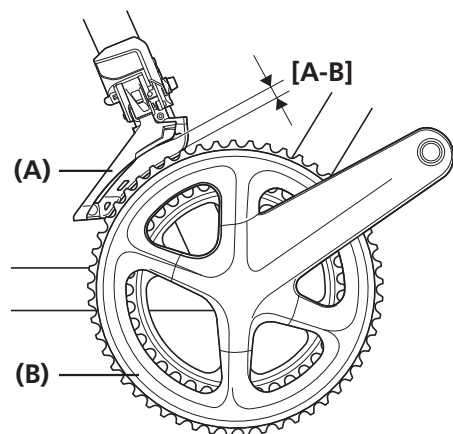
- Position the backup plate tape so that the tape does not come into direct contact with the support bolt.



- There is a backup plate with a curved adhesion surface and one with a flat adhesion surface, as shown in the illustration; use whichever type matches the shape of the frame.



3



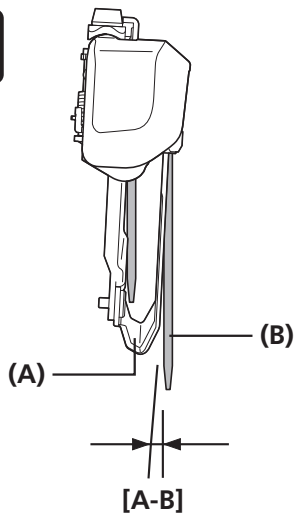
Adjust so that there is a clearance of 1 – 3mm between the chain guide outer plate and the largest chainring.

[A-B] Clearance: 1 – 3mm

- (A) Chain guide outer plate
- (B) Largest chainring

►► Installation of the front derailleur

4



Use a 5mm hexagon wrench to secure the chain guide outer plate so that the flat part of the plate is directly above the largest chainring and so that the rear edge of the chain guide is within 0.5 – 1mm from the front edge.

[A-B] 0.5 – 1mm

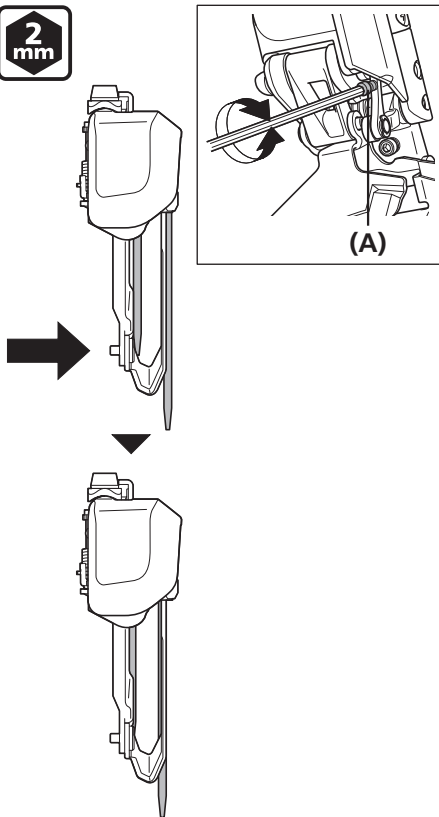
- (A)** Chain guide
- (B)** Front chainwheel (largest chainring)

Tightening torque



5 - 7 N·m

5



Adjust the position of the front derailleur.

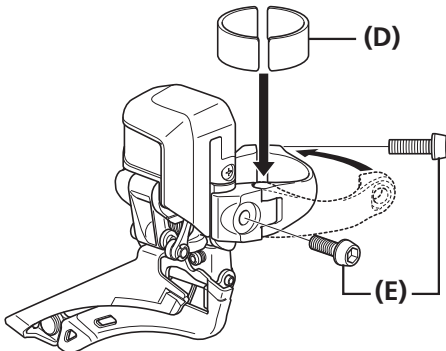
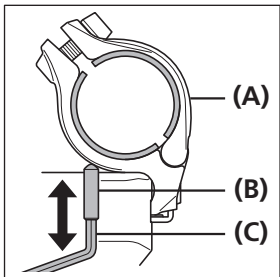
Position the front derailleur so that the flat part of the chain guide outer plate is directly above and parallel to the largest chainring.

Turn the support bolt with a 2mm hexagon wrench to adjust.

- (A)** Support bolt

When installing the front derailleur using a clamp band (SM-AD91)

1



Install the clamp band to the front derailleur.

Depending on the frame, mount a band adapter to the clamp band.

After that install the front derailleur to the frame.

- (A) Clamp band
- (B) Support bolt
- (C) 2mm hexagon wrench
- (D) Band adapter (for Ø28.6)
- (E) Fixing bolt

Tightening torque

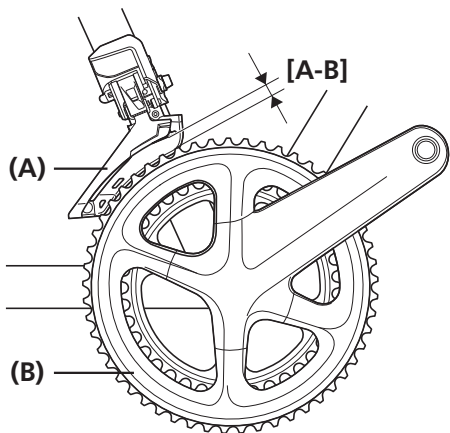


5 - 7 N·m

NOTE

- Use a support bolt and backup plate even when installing the front derailleur using a clamp band (SM-AD91). Refer to "Installation of the front derailleur (direct mount type frame)" for details on use.
- SM-AD11/15 cannot be mounted.

2



Adjust so that there is a clearance of 1 – 3mm between the chain guide outer plate and the largest chainring.

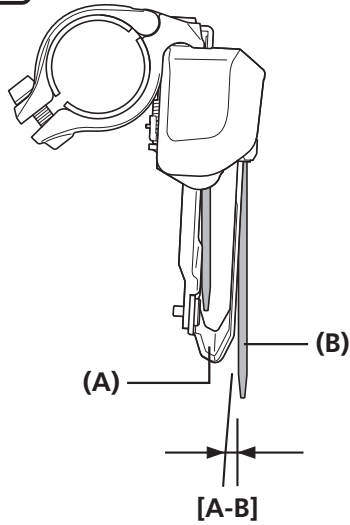
[A-B] Clearance: 1 – 3mm

- (A) Chain guide outer plate
- (B) Largest chainring

INSTALLATION

►► Installation of the front derailleur

3



Use a 5mm hexagon wrench to secure the chain guide outer plate so that the flat part of the plate is directly above the largest chainring and so that the rear edge of the chain guide is within 0.5 – 1mm from the front edge.

[A-B] 0.5 – 1mm

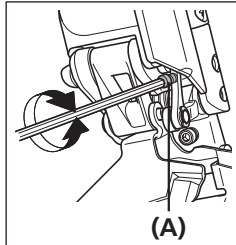
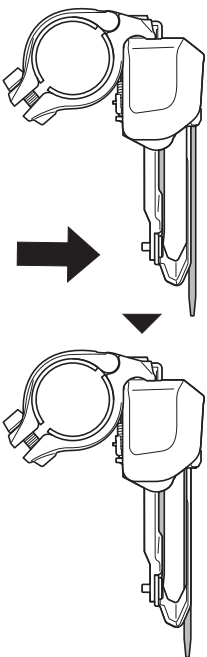
- (A)** Chain guide
- (B)** Front chainwheel (largest chainring)

Tightening torque



5 - 7 N·m

4



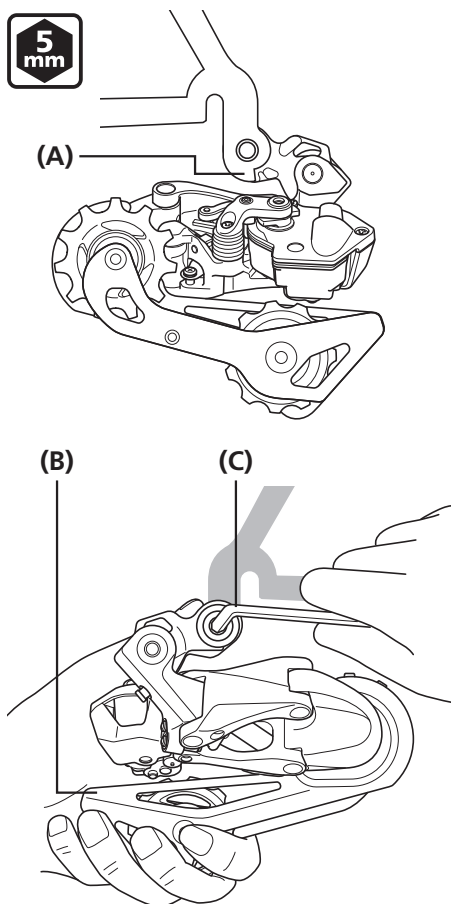
Adjust the position of the front derailleur.

Position the front derailleur so that the flat part of the chain guide outer plate is directly above and parallel to the largest chainring.

Turn the support bolt with a 2mm hexagon wrench to adjust.

- (A)** Support bolt

■ Installation of the rear derailleur



Install the rear derailleur to the frame.

- (A) B-tension stop
- (B) Pulley cage
- (C) 5mm hexagon wrench

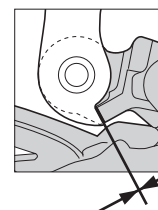
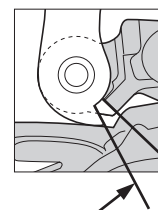
Tightening torque

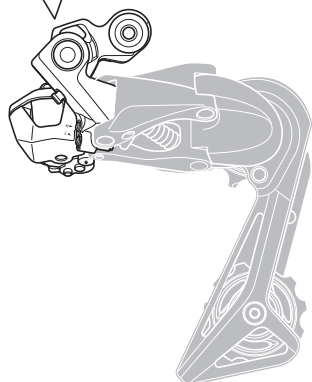
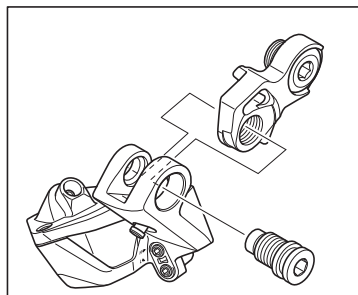


8 - 10 N·m

NOTE

Periodically check that there is no gap between the derailleur hanger and the bracket as shown in the illustration. If there is a gap between these two parts, problems with gear shifting performance may occur.



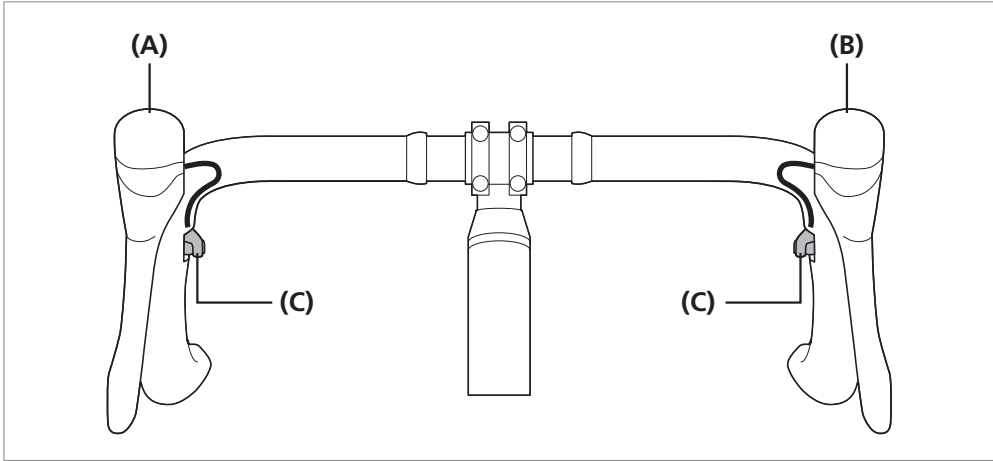
■ Direct mount type**Replacing with direct mount type**

Remove the bracket axle.

■ Installing the shifting switch

SW-R610 (Sprinter switch)

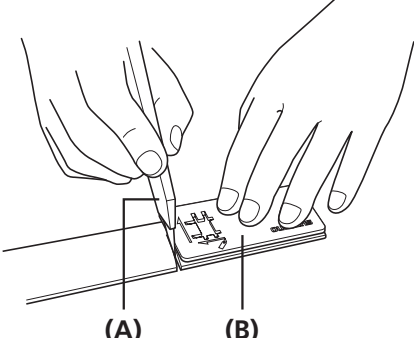
Routing map



- (A) ST-R9150 (R)
- (B) ST-R9150 (L)
- (C) SW-R610

Installation

1

(A) (B)

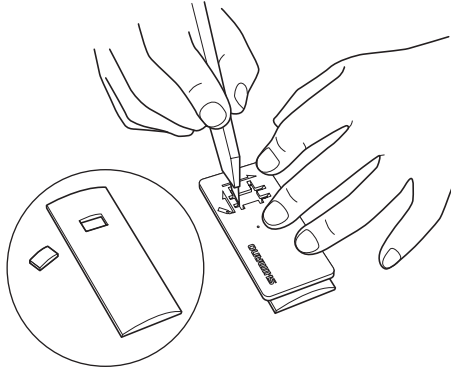
Use a utility knife or similar tool to cut the handlebar tape to the length shown in the illustration.

- (A) Utility knife
- (B) Handlebar tape cutout tool



Make sure that you handle the utility knife safely and correctly in accordance with the instructions which are provided with the utility knife.

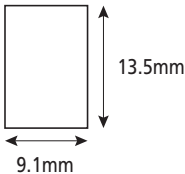
2

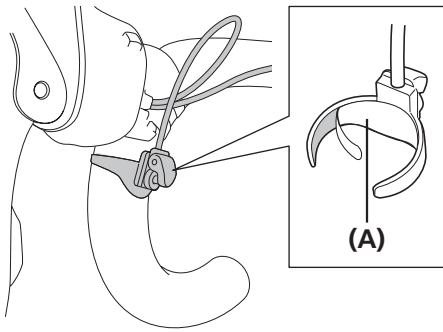
Hold the cut handlebar tape against the tool, and then cut out the holes for the switches while following the directions of the arrows on the tool.



Depending on the material used for the handlebar tape, it may be difficult to cut the tape using the tape cutting tool. If this happens, make a hole of the size shown in the illustration.



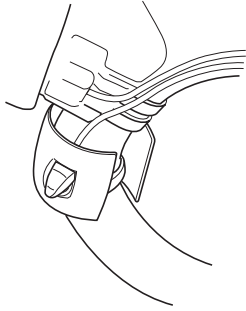
3



Make guide marks on the handlebars at the switch installation positions, and secure the switches with double-sided tape.

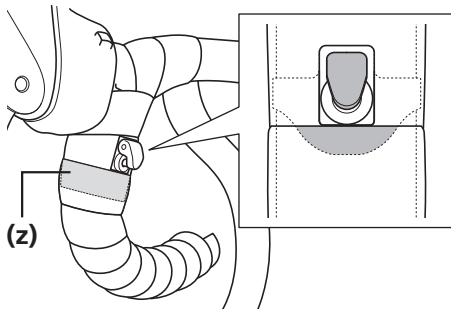
(A) Double-sided tape

4



Align the hole in the handlebar tape which was cut with the switch.

5



Wind on the handlebar tape.

At this time, be sure to overlap the tape below the switches.

(z) Overlap

NOTE

In order to protect the cable, use handlebar tape to secure the cable. Do not secure the cable with the zip tie or the bracket for the cycle computer.

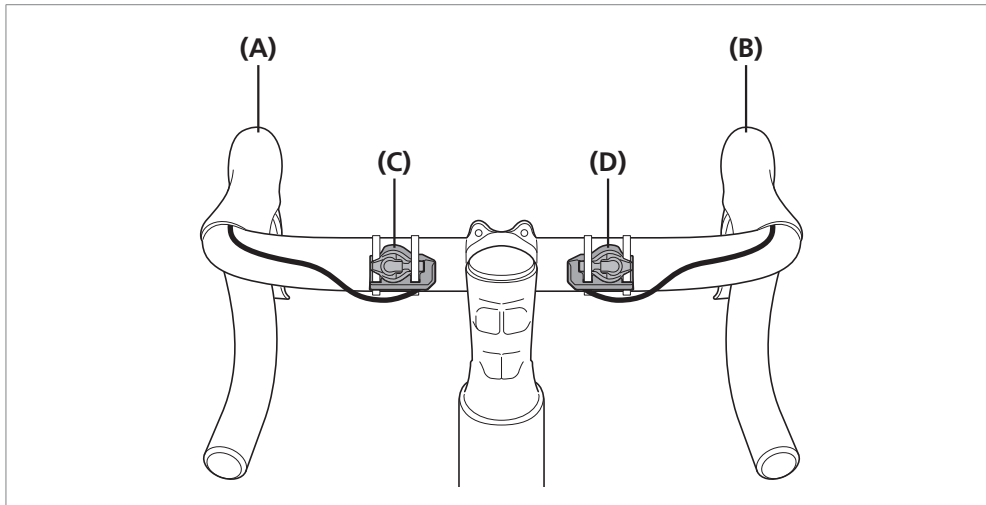


TECH TIPS

The illustration shows an example of how to wind the handlebar tape. Wind the handlebar tape on securely so that the switches do not move.

SW-R9150

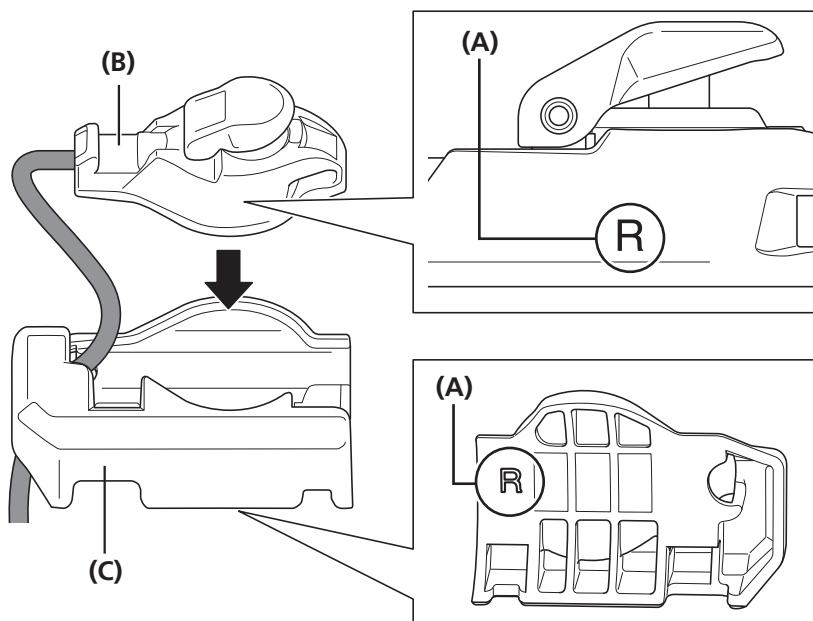
Routing map



- (A) ST-R9150/ST-R9170 (L)
- (B) ST-R9150/ST-R9170 (R)
- (C) SW-R9150 (L)
- (D) SW-R9150 (R)

Installation

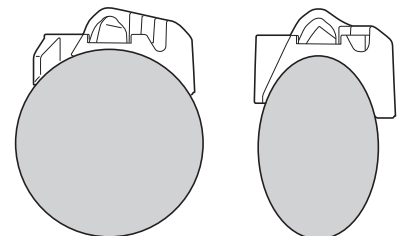
Check the markings (R or L) on the shifting switch and adapter, and then attach the shifting switch to the adapter.



- (A) Markings (R: for right, L: for left)
- (B) Shifting switch
- (C) Adapter

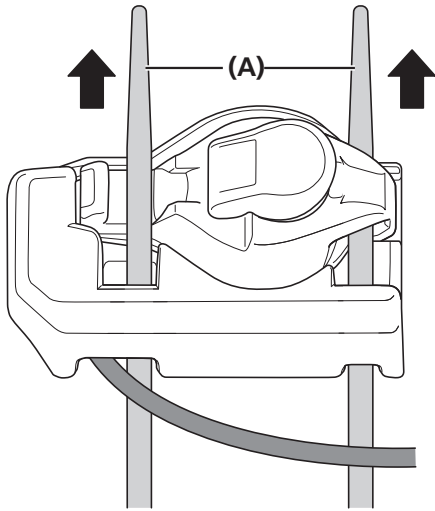


- Note that one shifting switch is for the left and one is for the right. (For details on operating the shifting switches, refer to the user's manual.)
- The illustration is of the right shifting switch.
- The adapter is available in two variations. Use the variation that matches the shape of the handlebar.



1

2



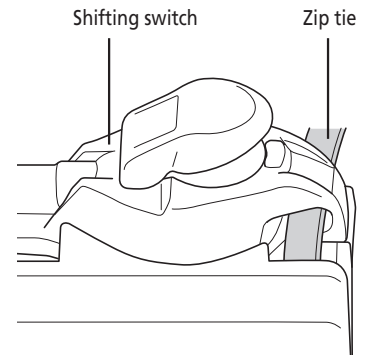
Pass zip ties through the adapter and shifting switch as shown in the illustration.

(A) Zip tie

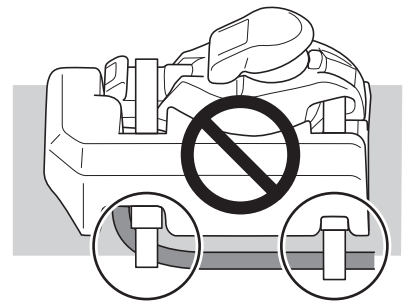


TECH TIPS

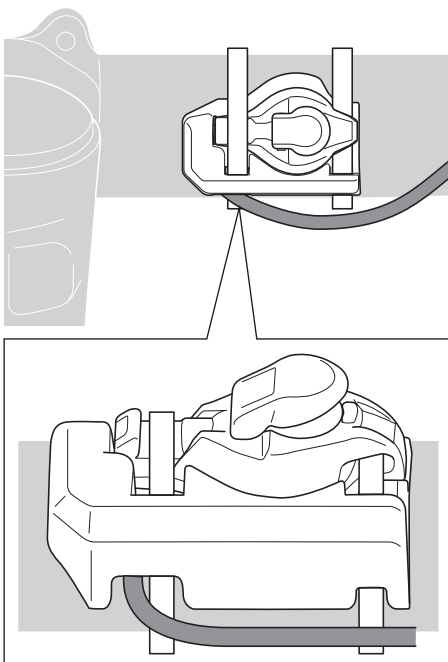
- Make sure that the zip tie passes through the hole in the shifting switch as shown in the illustration.



- When attaching the zip ties, make sure not to tie up the electric wire too.



3

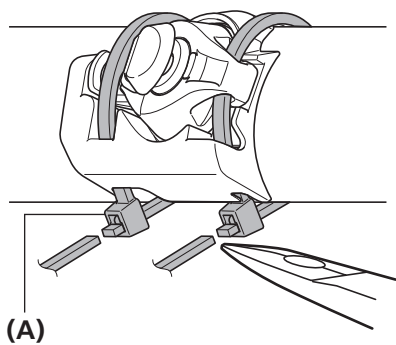


Secure to the handlebar.

INSTALLATION

▶▶ Installing the shifting switch

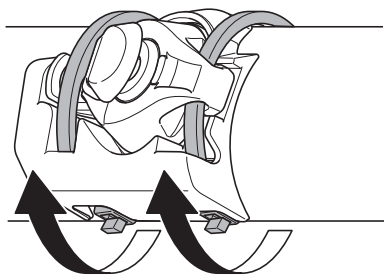
4



Cut off any excess zip tie with a pair of nippers or similar.

(A) Zip tie

5

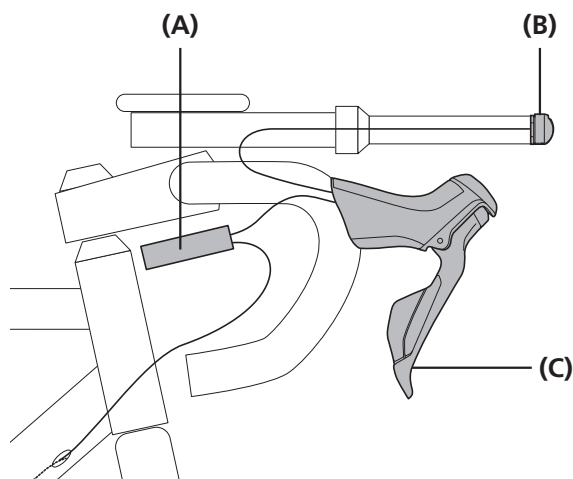


Rotate the zip tie until the square head on the zip tie fits into the notch in the adapter.

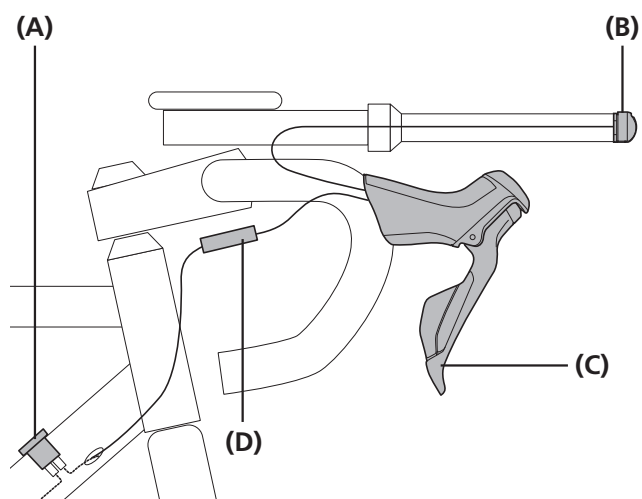
SW-R9160 (Shifting switch for aero bar)

Routing map

SM-EW90-A/B



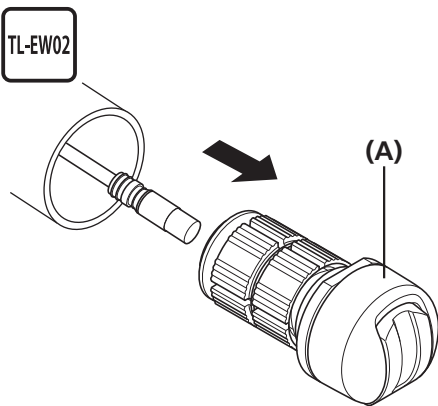
EW-RS910



- (A) Junction A
- (B) SW-R9160
- (C) ST-R9150/ST-R9170
- (D) EW-JC130

Installation

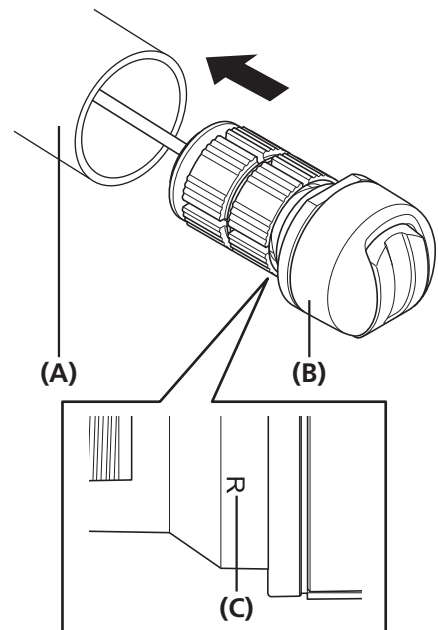
1



Connect the electric wire to the shifting switch.

(A) Shifting switch

2



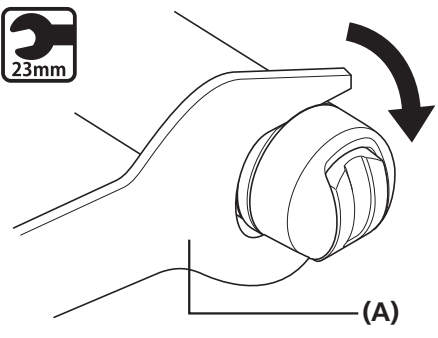
Check the marking (R or L) on the shifting switch and insert it into the end of the aero bar.

- (A)** Aero bar
- (B)** Shifting switch
- (C)** Markings (R: for right, L: for left)



Note that one shifting switch is designed for the left and one is for the right. (For details on operating the shifting switches, refer to the user's manual.)

3



Hold the end of the shifting switch and tighten the nut part with a hub spanner.

(A) 23mm hub spanner

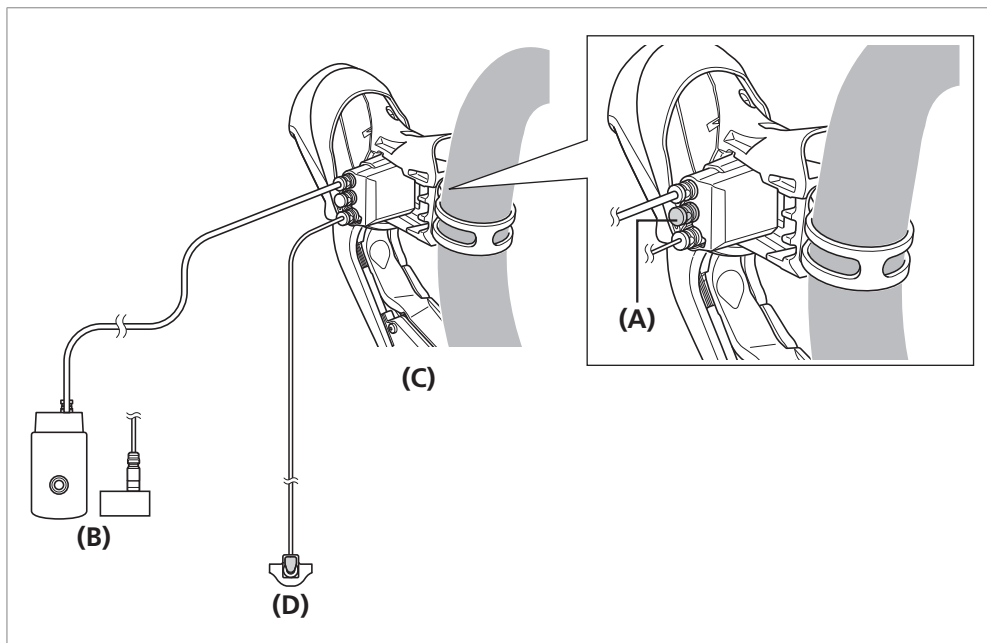
Tightening torque	
	1.5 N·m

NOTE

When securing the shifting switch, make sure to tighten the nut part using a tool. Rotating the end of the shifting switch in an attempt to tighten it will result in damage to the switch.

Example of routing the electric wire

* The illustration takes ST-R9150/SW-R610 as an example.

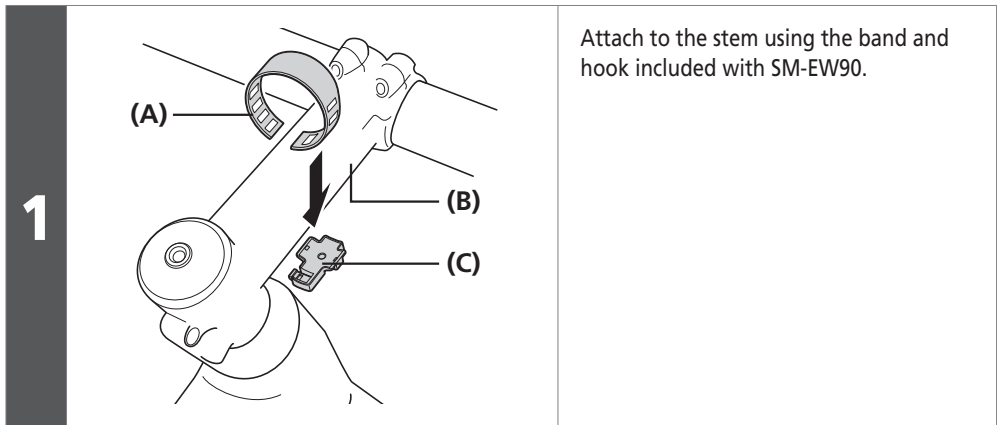


- (A) Dummy plug
- (B) SM-EW90/EW-RS910
- (C) ST-R9150 (R)
- (D) SW-R610

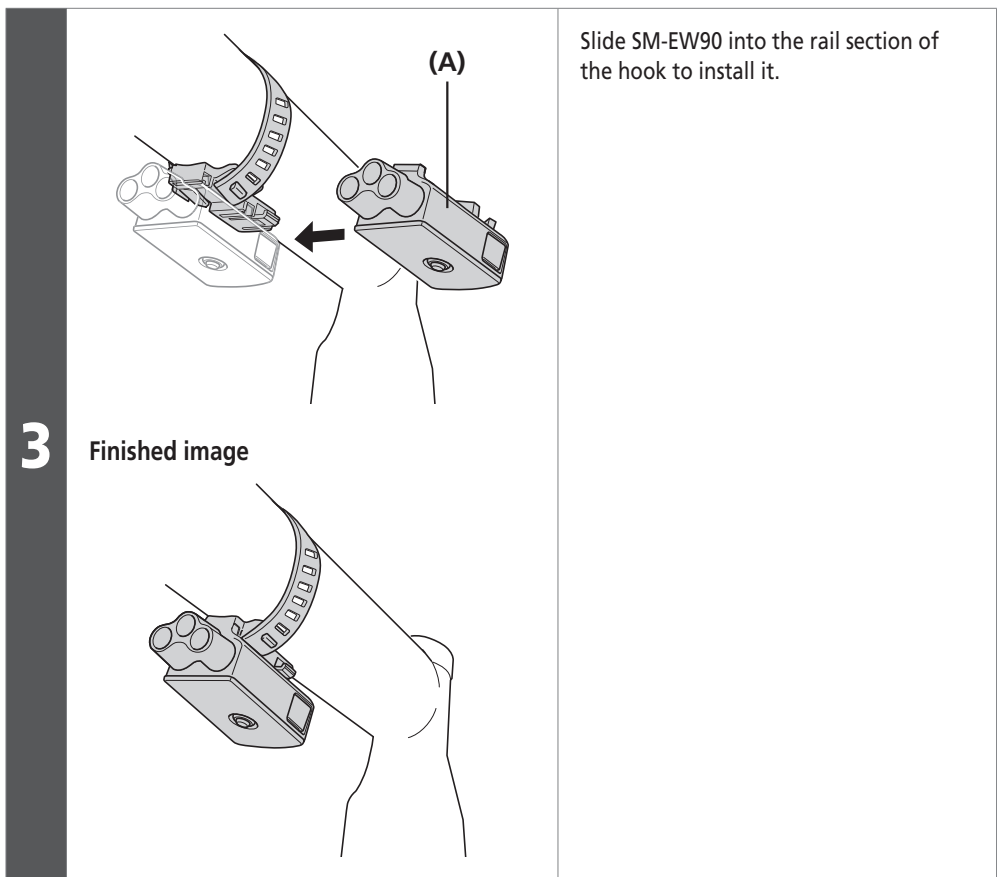
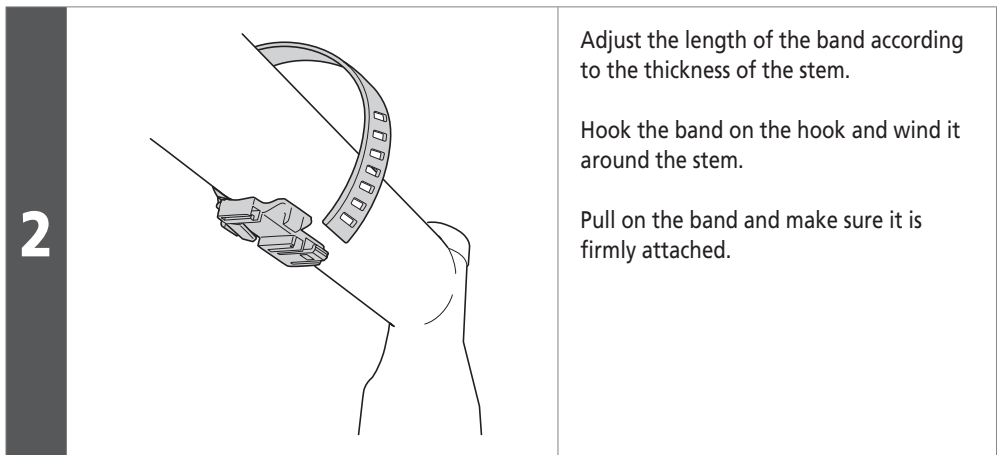
TECH TIPS

- This varies depending on the combination of the dual control lever and the gear-shifting switch. For details, refer to the electric wire wiring diagram (junction A).
- For waterproof purposes, use Shimano original tool TL-EW02 on unused ports and install dummy plugs.

■ Installation of junction A (SM-EW90-A/B)



- (A) Band
- (B) Stem
- (C) Hook

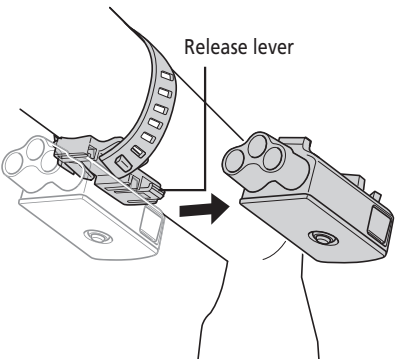


(A) SM-EW90 Junction A



TECH TIPS

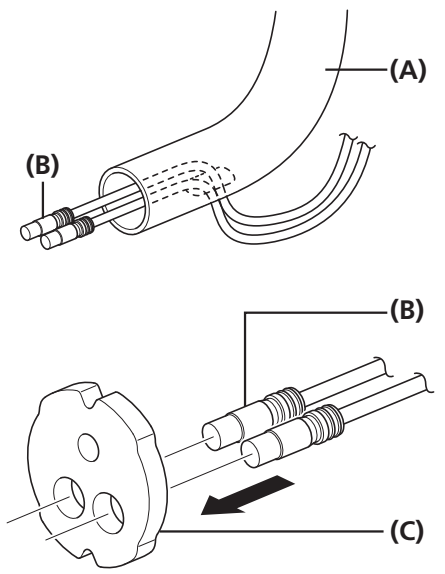
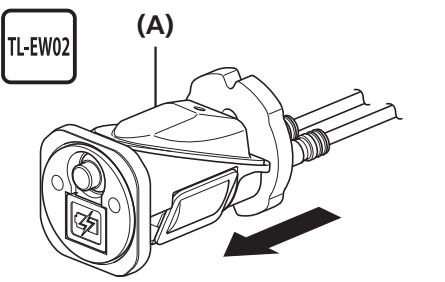
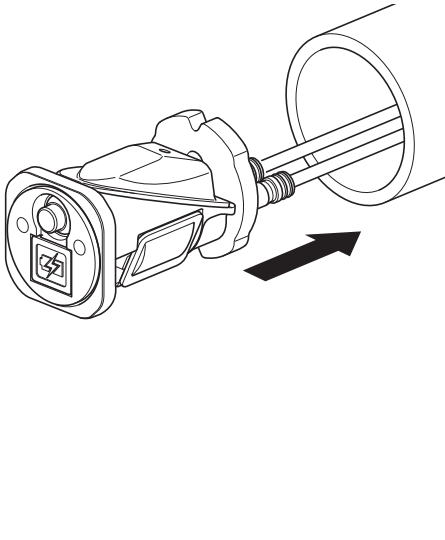
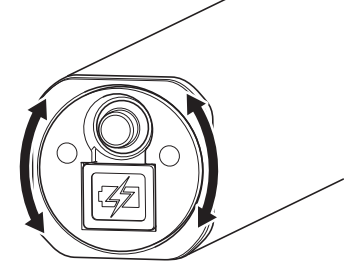
Removal
Pull up the release lever to slide junction A in the direction of the arrow for removal. Forcibly pulling up the release lever may break the lever.



■ Installation of junction A (EW-RS910)

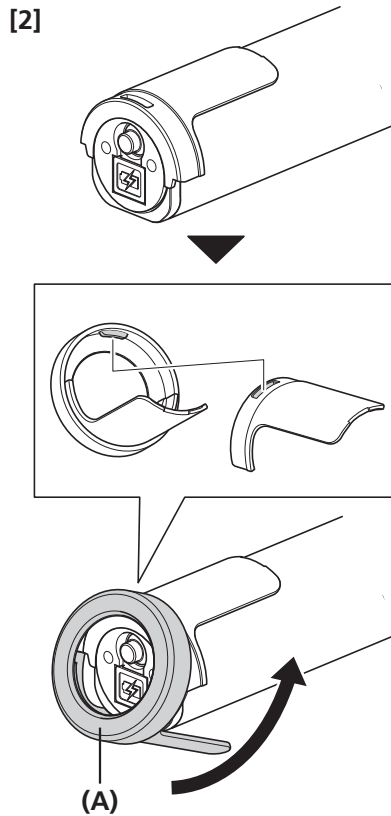
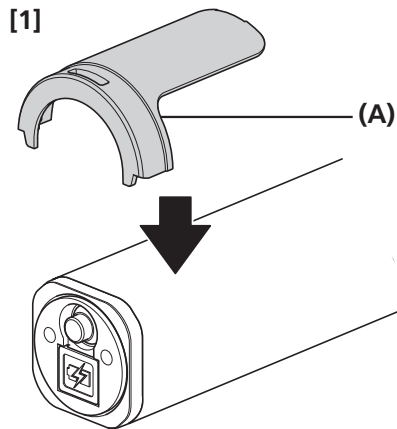
Built-in bar end type

If installing a built-in bar end type junction A, make sure to use a compatible handlebar.

1		Route the electric wires through the hole in the handlebar as shown in the illustration. Attach the wire holder to the electric wires.	(A) Handlebar (B) Electric wire (C) Wire holder
2		Connect the electric wires to junction A.	(A) Junction A
3		Insert junction A into the handlebar.	 TECH TIPS - Using a gentle twisting motion when inserting junction A prevents the wire holder from becoming arched outward and allows it to be inserted fully and securely.  - Do not tap junction A with a plastic mallet or similar tool when inserting it.

Remove the release back sheet from the handle holders, and then install them to the handlebar.

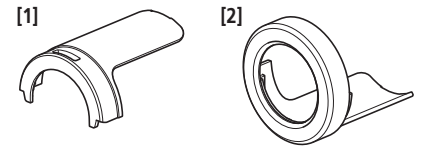
4



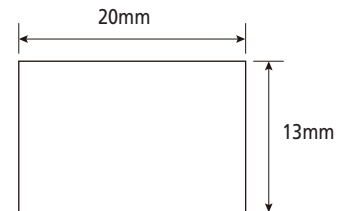
(A) Handle holder



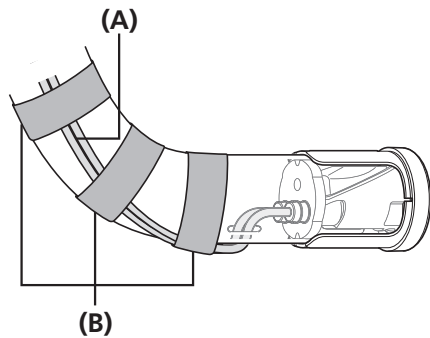
- There are two handle holders which differ in shape.
Attach [1] first and then [2].



- After attaching them to the handlebar, hold down the handle holders with your finger for 1 minute.
- If the double-sided tapes have diminished in adhesive strength after replacing the handle holders etc., cut some store-bought double-sided tape and replace them.



5



Secure the electric wires to the handlebar using tape or a similar material.

(A) Electric wire

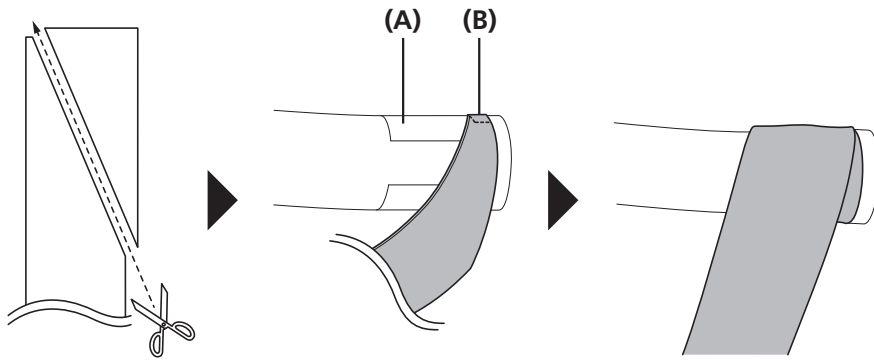
(B) Tape



When securing the electric wires, make length adjustments by tucking any excess length into the handlebar etc.

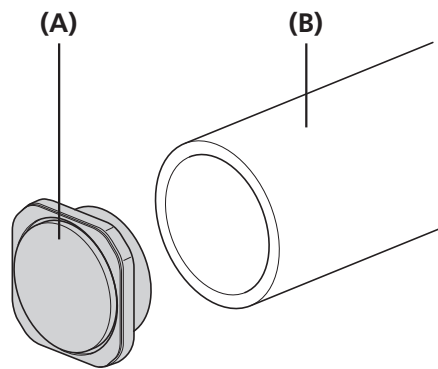
6

Cut the end of the handlebar tape diagonally and wrap it over the handle holders as shown in the illustrations.



(A) Handle holder
(B) Handlebar tape

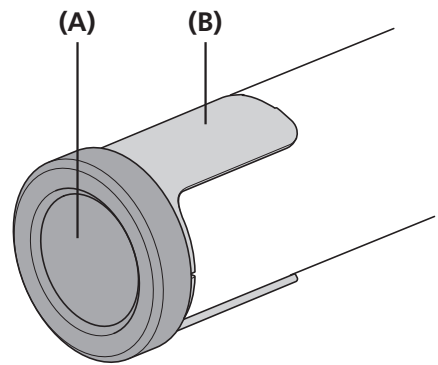
7



Insert the end cap into the handlebar end not fitted with junction A.

(A) End cap
(B) Handlebar

8



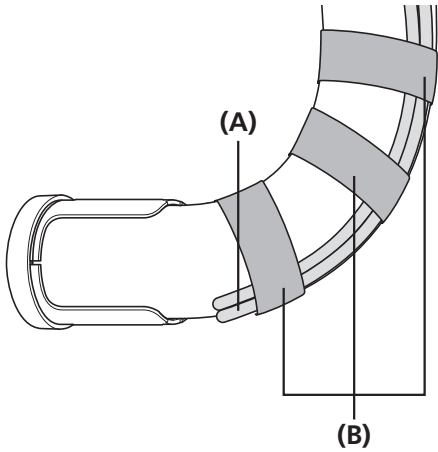
Attach the handle holders following the same steps as for the handlebar end fitted with junction A.

(A) End cap
(B) Handle holder

INSTALLATION

►► Installation of junction A (EW-RS910)

9



Secure the dummy wires to the handlebar using tape or a similar material.

(A) Dummy wires

(B) Tape



TECH TIPS

What are dummy wires?

Dummy wires are attached to ensure that both the handlebar end fitted with junction A and the opposing handlebar end are of the same thickness when wrapped so that discomfort is not caused to the rider when gripping the handlebars.

When securing them to the handlebar, route them in the same manner as the electric wires.

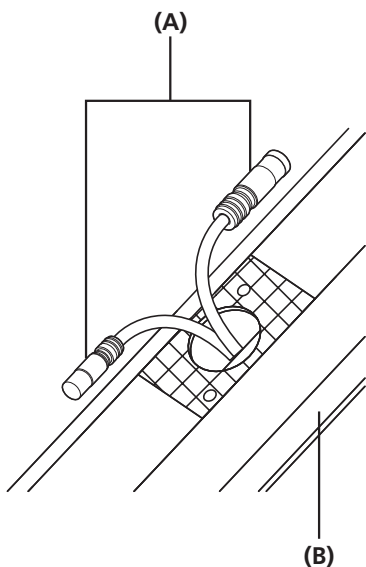
10

Affix handlebar tape following the same steps as for the handlebar end fitted with junction A.

Built-in frame type

If installing a built-in frame type junction A, make sure to use a compatible frame.

1

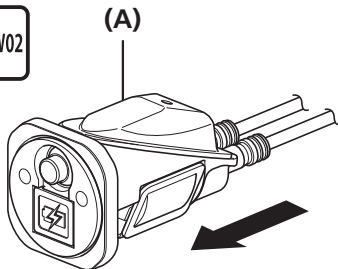


Pull out the electric wires through the hole in the frame as shown in the illustration.

- (A) Electric wire
- (B) Frame

2

TL-EW02

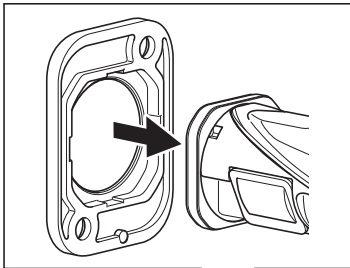


Connect the electric wires to junction A.

- (A) Junction A

3

2 mm



Insert junction A into the frame and attach the holder plate.

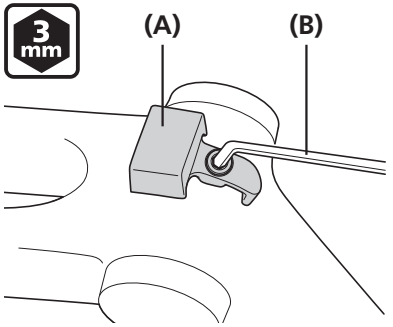
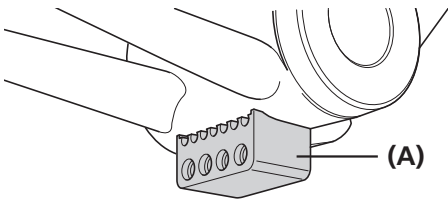
- (A) Fixing bolt
- (B) Holder plate

Tightening torque

2 mm

0.26 - 0.4 N·m

■ Installation of junction B

1		Remove the wire guide from the frame, if attached.	(A) Wire guide (B) 3mm hexagon wrench
2	Finished image 	Attach junction B using the wire guide mounting hole.	(A) Junction B

▶▶ Points to check before attaching the wireless unit (EW-WU111)

■ Points to check before attaching the wireless unit (EW-WU111)

Before installing components, please take note of the following.

Compatible cycle computers

A D-FLY compatible cycle computer is required to use EW-WU111.
For details, refer to the manual for the cycle computer.



TECH TIPS

The types of information displayed vary by product. Refer to the manual for your cycle computer.

About wireless functions

ANT connection

ANT connection facilitates the transmission of the following three types of information to compatible cycle computers or receivers.

(1)	Gear position (front, rear)
(2)	DI2 battery level information
(3)	Adjustment mode information

For information on which of the above types of information are displayed, refer to the manual for your cycle computer or receiver.



TECH TIPS

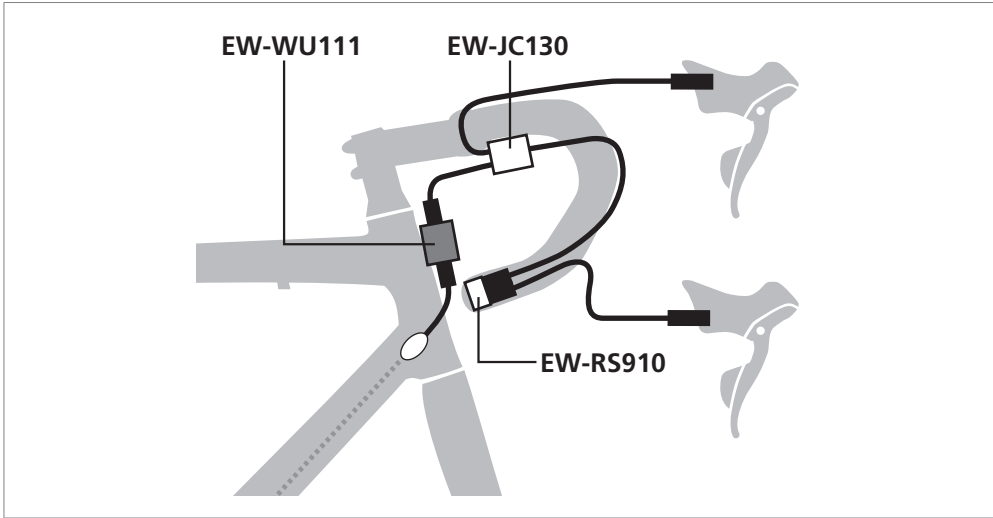
The latest functions can be checked by updating the software via E-TUBE PROJECT. For details, consult the place of purchase.

Bluetooth® LE Connection

E-TUBE PROJECT for smartphones/tablets may be used if a Bluetooth LE connection is established with a smartphone/tablet.

■ Attaching the wireless unit (EW-WU111)

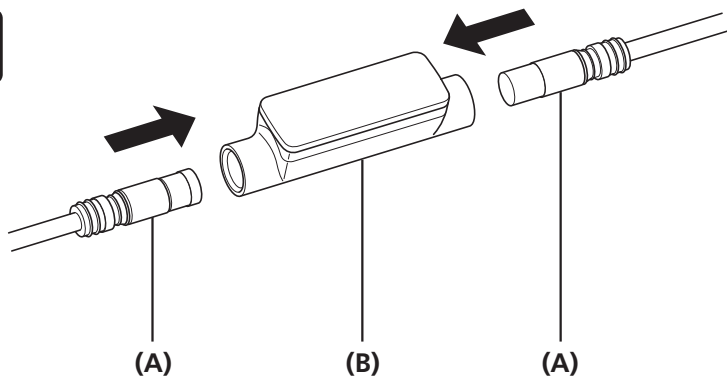
Routing map



Connect the electric wires to the wireless unit.

TL-EW02

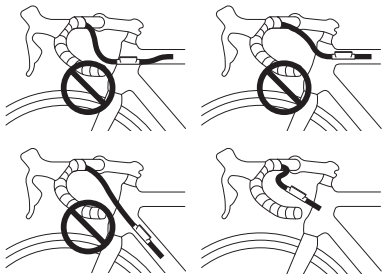
1



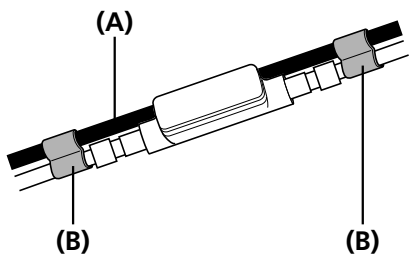
- (A) Electric wire
- (B) Wireless unit (EW-WU111)

NOTE

Do not position the unit on the side of the bicycle frame, as in the illustrations. If the bicycle collapses, damage to the unit may result if the unit is caught between the bicycle frame and curbstones etc.



2



Secure the electric wires to the outer casing using the clips.

- (A) Outer casing
- (B) Clips

How to make connections

ANT connection

To make a connection, the cycle computer needs to be in connection mode. For information on how to put the cycle computer into connection mode, refer to the manual for the cycle computer.

1

Put the cycle computer into connection mode.

2

When using an external battery

Check that the electric wires are connected to the wireless unit, and then remove and remount the external battery.

When using a built-in battery

Check that the electric wires are connected to the wireless unit, and then remove the electric wires (two wires) from the wireless unit and reconnect them.

3

This completes the connection process.



TECH TIPS

Connection transmission begins a few seconds after the battery is remounted or the electric wires are reconnected to the wireless unit.



TECH TIPS

- Check on the cycle computer to see if connection was successful.
- If a connection cannot be made in the way described above, refer to the manual for your cycle computer.
- For information on how to show the number of gears or the DI2 battery level, refer to the manual for the cycle computer.

▶▶ Attaching the wireless unit (EW-WU111)

Bluetooth® LE connection

Before setting up a connection, turn on Bluetooth LE on the smartphone/tablet.

- 1

Open E-TUBE PROJECT and set it to listen for Bluetooth LE signals.
- 2

- Setting up via system information display**
 Press the mode switch on the system information display until "C" appears on the display.
 The unit on the bicycle will begin signal transmission. The unit name displays in E-TUBE PROJECT.
 - Setting up via junction A**
 Press the button on junction (A) until the green LED and red LED begin to blink alternately. The unit on the bicycle will begin signal transmission. The unit name displays in E-TUBE PROJECT.
- 3

Select the unit name displayed on screen.



TECH TIPS

- To disconnect, cancel the Bluetooth LE connection from the smartphone/tablet. (The cycle computer will exit connection mode and return to regular operation mode.)

Compatibility with dual control lever (ST-R9150/ST-R9170) built-in remote switch

- Using the dual control lever built-in remote switch in combination with EW-WU111 enables control of the D-FLY compatible cycle computer and related components.
- The dual control lever built-in remote switch sends a switch signal via wireless through EW-WU111. Please check the instruction manuals for compatible components as functions vary depending on the component.

- (z)** E-TUBE port section
- (A)** Remote switch (ST-R9150/ST-R9170)
- (B)** Brake lever
- (C)** Shifting switch

■ Installing the battery

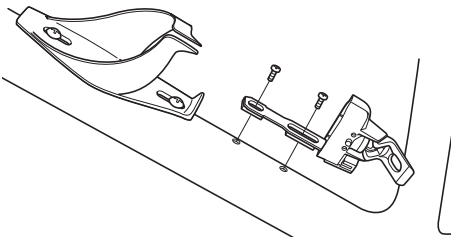
In the case of an external battery (battery: SM-BTR1 battery mount: SM-BMR1/2, BM-DN100)

Installing the battery mount

Set the battery mount into position.

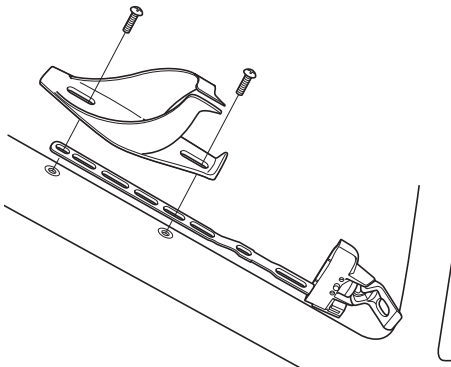
Use the bottle cage fixing bolt to temporarily install the battery mount onto the bottom of the bottle cage.

Short type



Use the included M4 bolts to secure the short type.

Long type



For the long type, secure it with the bolts supplied with the frame or the bottle cage.

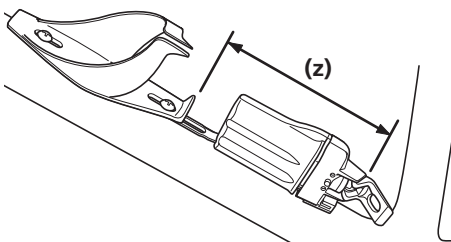
Refer to the Service Instructions for the bottle cage for details on the tightening torques.

Short type Tightening torque



1.2 - 1.5 N·m

2

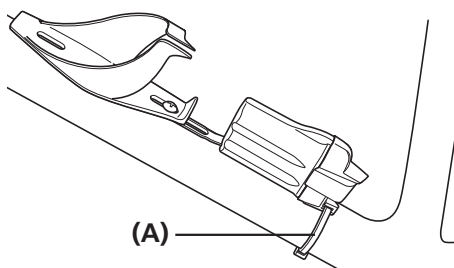


Leave a space of 108mm or more at the end of the battery mount.

Check that the battery can be inserted and removed while the bottle cage is installed.

(z) 108mm

3



Tighten the bolt of the bottle cage to secure the battery mount.

For the long type, use the accessory zip tie to secure the battery mount to the frame.

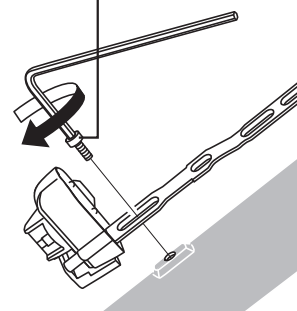
(A) Zip tie



If there is a mounting boss on the frame
If there is a mounting boss on the frame, the battery mount can be secured to the frame with a bolt.



Battery mount mounting bolt (M4x15mm)



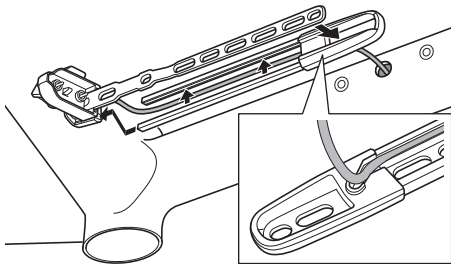
Tightening torque



1.2 - 1.5 N·m

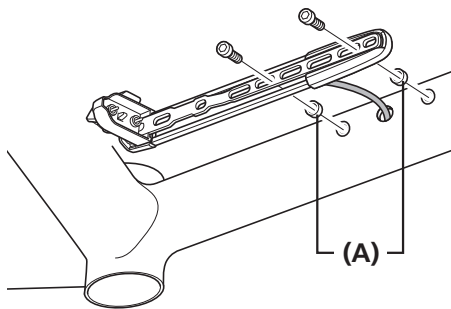
Installation of the electric wire covers

1



Set the electric wire for the battery mount into the groove in the electric wire cover for the battery mount.

2



Place the accessory spacers in between the battery mount and the frame and then secure them by tightening the bolts.

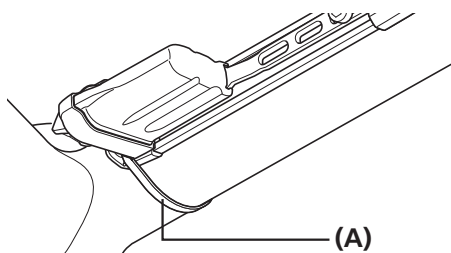
(A) Spacer



TECH TIPS

- If installing the bottle cage, it is easier to install it at this stage.
- Refer to the Service Instructions for the bottle cage for details on the tightening torques.

3



Use the accessory zip tie to secure the battery mount to the frame.

(A) Zip tie

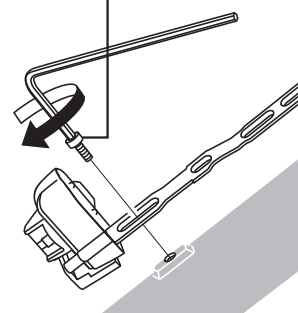


TECH TIPS

If there is a mounting boss on the frame
If there is a mounting boss on the frame, the battery mount can be secured to the frame with a bolt.



Battery mount mounting bolt (M4×15mm)



Tightening torque



1.2 - 1.5 N·m

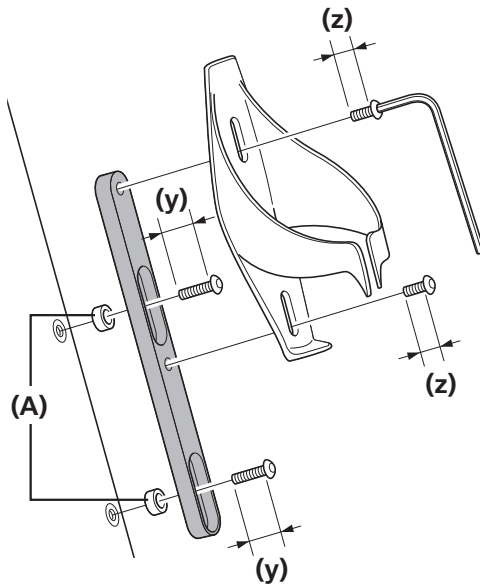
INSTALLATION

►► Installing the battery

Installation of the bottle cage adapter

If the bottle cage which is installed to the seat tube interferes with the battery, move the position of the bottle cage upward.

The installation position for the bottle cage can be moved upward by a minimum of 32mm and a maximum of 50mm from the original installation position.



(y) 15mm

(z) 10mm

(A) Spacer

Tightening torque



3 N·m



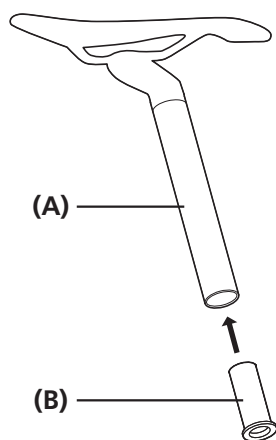
TECH TIPS

- If it interferes with the mounting boss for the front derailleur, use the included spacer.
- Refer to the Service Instructions for the bottle cage for details on the tightening torques.

Built-in battery (SM-BTR2/BT-DN110/BT-DN110-A)

Installing the battery

1



Insert the seat post collar into the seat post.

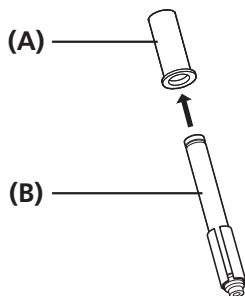
- (A) Seat post
- (B) Seat post collar



TECH TIPS

- Depending on the type of frame, the way the lithium ion battery (built-in type) is installed may differ. For details, contact a manufacturer of completed bicycles.
- Prepare a seat post that is compatible with DI2 (SM-BTR2/BT-DN110/BT-DN110-A).
- * If you have any questions, consult with the manufacturer of seat post.

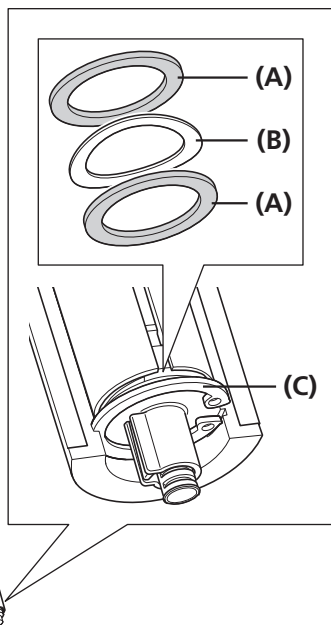
2



Insert internal battery into the collar from the bottom of seat post.

- (A) Seat post collar
- (B) Built-in battery (SM-BTR2/BT-DN110/BT-DN110-A)

3



Mount a wave washer between two washers to the groove of the battery adapter, and fix them in place with a snap ring.

- (A) Washer
- (B) Wave washer
- (C) Snap ring
- (D) Battery adapter



TECH TIPS

- This procedure is for when installing the battery into the seat post. Depending on the frame, the way the battery is installed may differ. For details, consult with the manufacturer of completed bicycles.
- Use snap ring pliers (with a claw diameter of 2.0mm or less) to mount the snap ring.

INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM

ST-R9170

ST-R9180

BR-R9170

SM-RT900

INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM

This section covers details relating to the installation of the hydraulic disc brake system only.
For details on the connection and adjustment of electric wires, refer to the relevant sections.

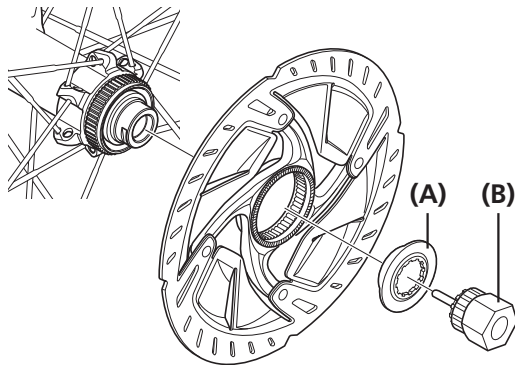
■ List of tools to be used when installing hydraulic disc brake system

Tools listed here are required when installing the hydraulic disc brake system.
Other tools are listed in the section "LIST OF TOOLS TO BE USED".

Tool		Tool		Tool	
	1.5mm hexagon wrench		7mm socket wrench		Funnel adapter
	2mm hexagon wrench		Slotted screwdriver (nominal dia. 0.8 × 4)		TL-BT03/TL-BT03-S
	5mm hexagon wrench		Adjustable wrench		TL-BH62
	8mm spanner		Utility knife		TL-LR15
	12mm spanner		TL-BH61		

■ Installation of the disc brake rotor

Center lock type



- (A) Rotor fixing lock ring
- (B) Lock ring tightening tool

Tightening torque

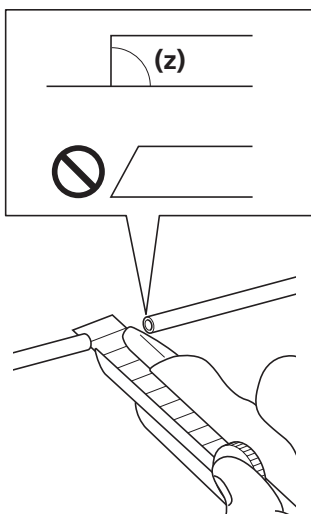


40 - 50 N·m



	Internally serrated type
Rotor fixing lock ring	
Lock ring tightening tool	TL-LR15 Adjustable wrench

■ Installation of the brake hose



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

(z) 90 degrees

NOTE

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

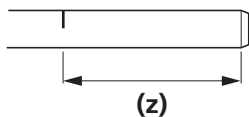


TECH TIPS

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

Installation of the brake hose

2

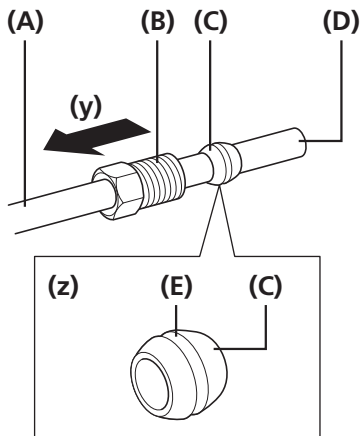


Put a mark on the brake hose beforehand as shown in the illustration so that you can check if the ends of the brake hose are secured to the hose mounts of the brake caliper and the dual control lever.

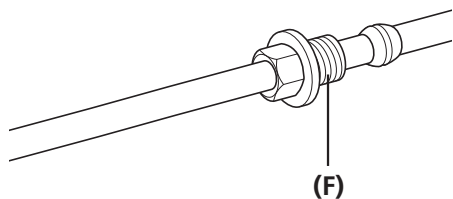
(As a guide, the length of the portion of the brake hose that is inside the mount is approximately 15mm.)

(z) 15mm

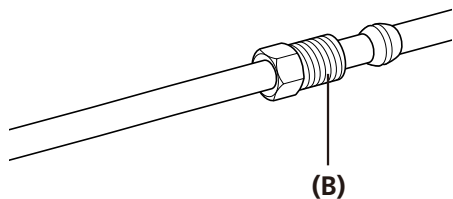
3



ST-R9170



ST-R9180/BR-R9170



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

(y) Direction of insertion

(z) Grease the outside of the olive.

(A) Brake hose

(B) Connecting bolt

(C) Olive

(D) Cut end

(E) Grease

(F) Flanged connecting bolt

NOTE

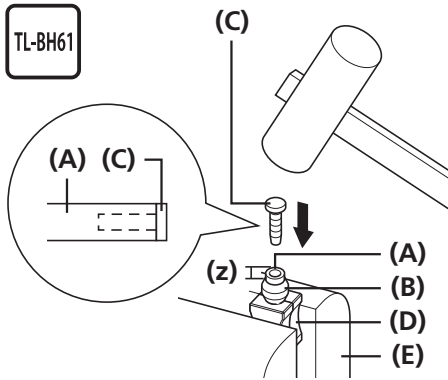
- When installing to a built-in type frame, make sure to first pass the lever end of the brake hose through the caliper end of the frame.
- For ST-R9170, use a flanged connecting bolt.
- The connecting bolts for BR-R9170 and ST-R9180 differ in length. Be careful not to mix them up during installation.

BR-R9170: 13.8mm

ST-R9180: 16.8mm

►► Installation of the brake hose

4



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

Connect the brake hose to TL-BH61 and secure TL-BH61 in a vise, as shown in the illustration.

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

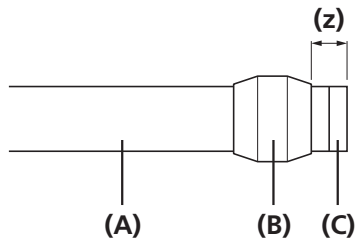
(z) SM-BH90-JK-SSR: 1mm

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

NOTE

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

5



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

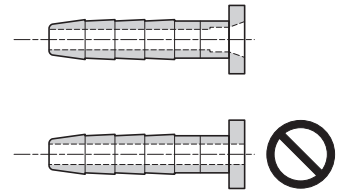
(z) 2mm

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

NOTE

Use the dedicated connector insert supplied with SM-BH90-JK-SS.

Use of any connector insert other than the one supplied may produce a loose assembly, leading to oil leaks or other problems.

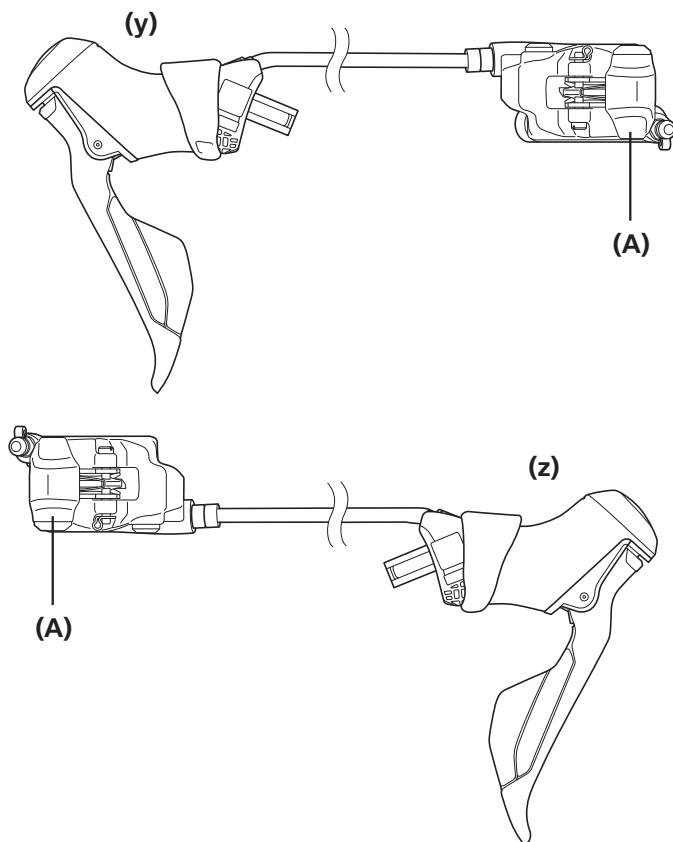


Model No.	Length	Color
SM-BH90-JK-SSR	11.2mm	Silver

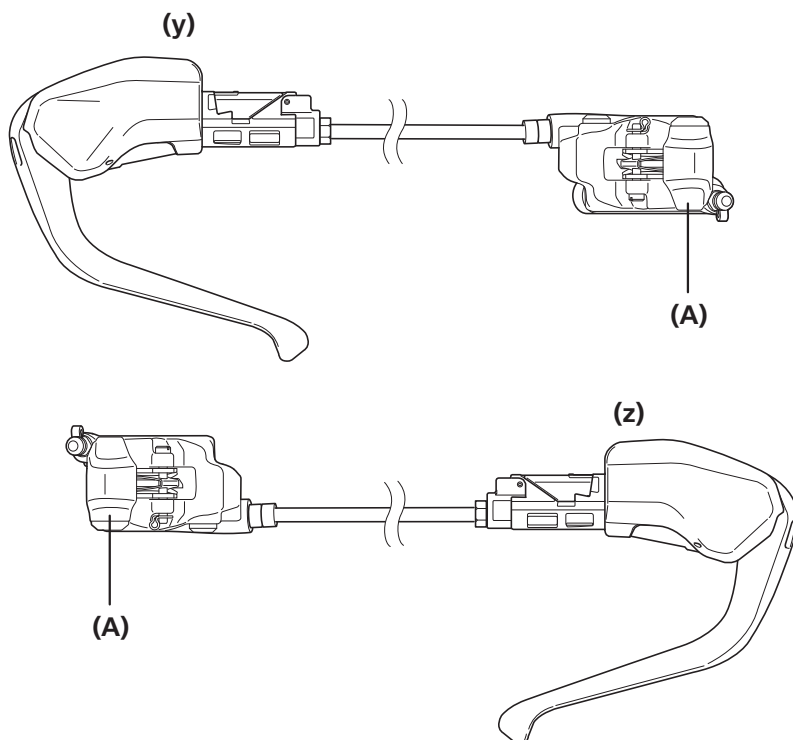
Make sure that the brake hose is not twisted.

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

ST-R9170/BR-R9170



ST-R9180/BR-R9170

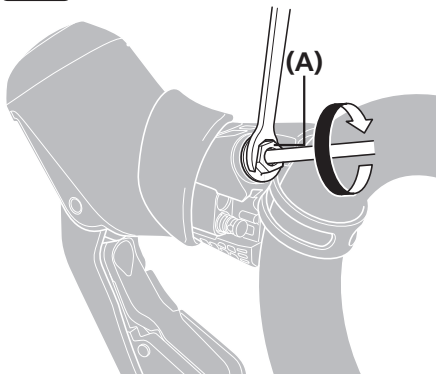


(y) Left lever

(z) Right lever

(A) Brake caliper

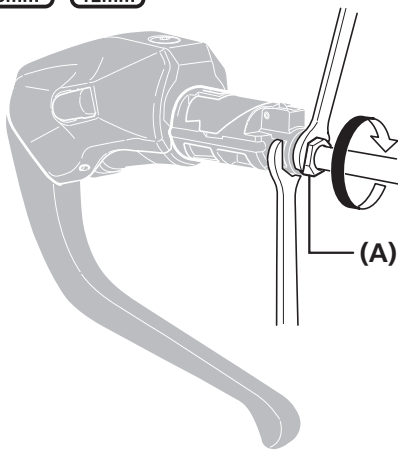
ST-R9170



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

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

ST-R9180



Insert the brake hose straight.

Tighten the connecting bolt with spanners while pushing the brake hose.

(A) Connecting bolt
(For ST-R9170 use a flanged connecting bolt)

Tightening torque



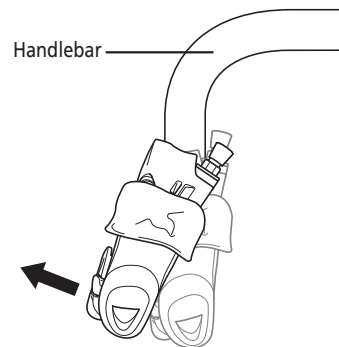
5 - 6 N·m

NOTE

- At this point, make sure the brake hose is straight when pushing.

ST-R9170

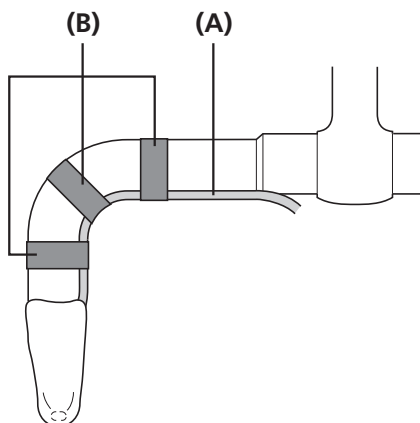
- To install the handlebar, adjust the angle of the bracket by tilting the bracket from the handlebar so that you can turn the spanner.
At that time, be careful not to damage the handlebar and other parts.



ST-R9180

- Pass the brake hose through the handlebar before attaching the brake hose to the dual control lever.

8



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

(A) Brake hose
(B) Tape



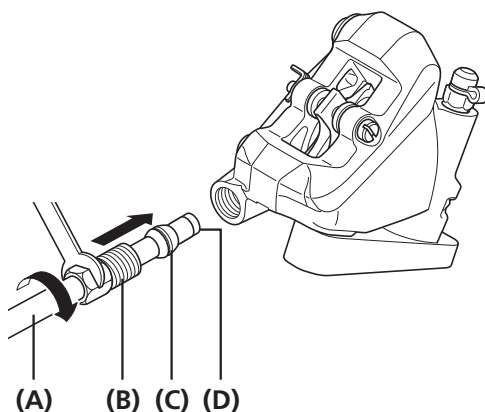
This step is not required for ST-R9180.

Installation of the brake hose

End of the brake hose on the brake caliper side

Attach the connector insert to the brake hose.

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



- (A) Brake hose
- (B) Connecting bolt
- (C) Olive
- (D) Connector insert

Tightening torque



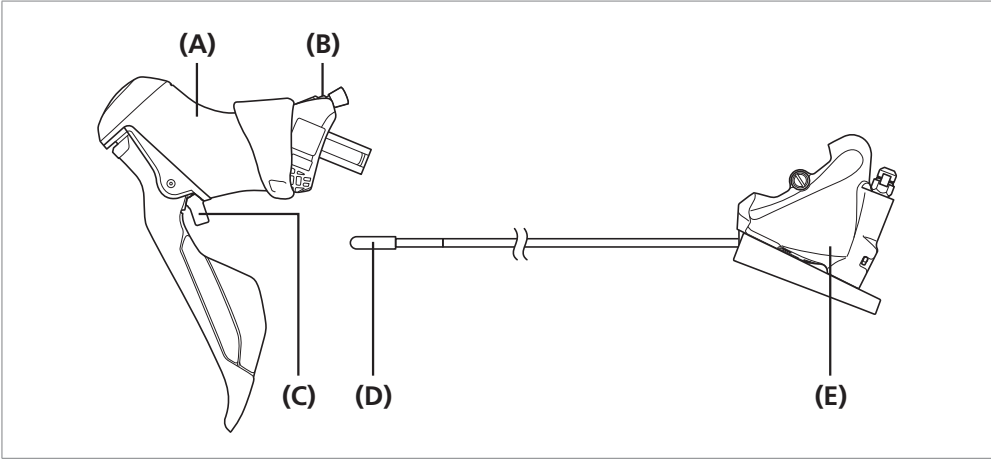
5 - 7 N·m

Installation of the brake hose (easy hose joint system)

Installation of the brake hose (easy hose joint system)

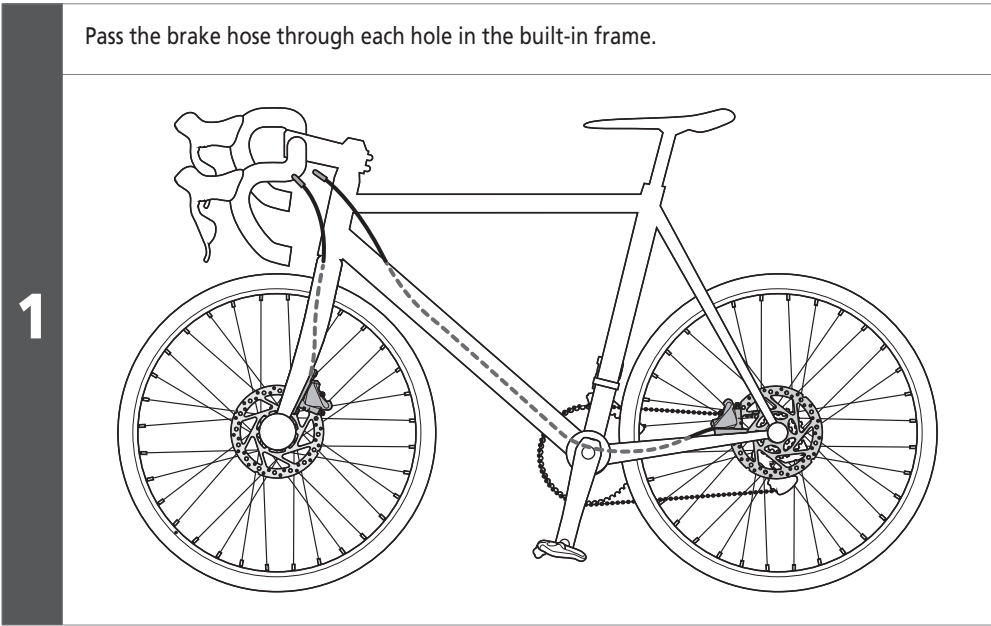
This section covers procedures for cutting and adjusting the lengths of easy hose joint system brake hoses.
If length adjustment of a brake hose is not necessary, it is not necessary to follow procedures relating to cutting the brake hose.

ST-R9170



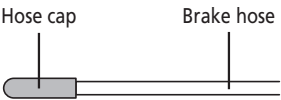
- (A) Dual control lever
- (B) Joint sleeve
- (C) Lever stopper
- (D) Hose cap
- (E) Brake caliper

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



NOTE

- The illustration is a rough image.
For details on routing the brake hoses, consult the manufacturer of the completed bicycle or refer to the instruction manual for the bicycle.
- Do not remove the hose caps attached to the ends of the brake hoses.



- When bleeding the brake caliper, SM-DISC (oil funnel and oil stopper) and the funnel adapter are required.

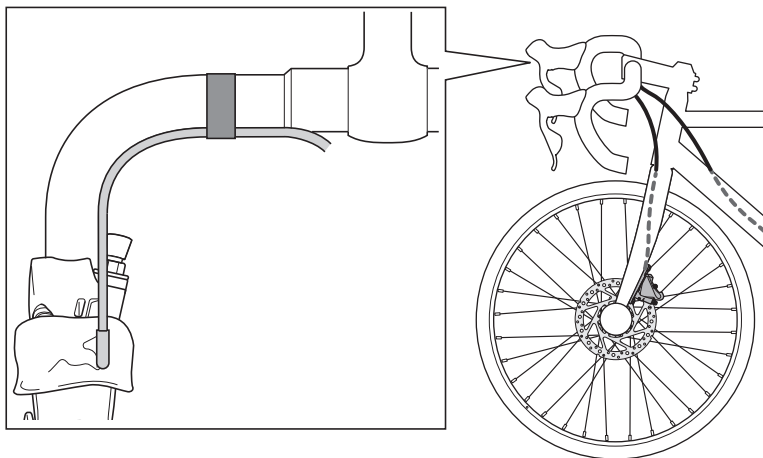
INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM

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

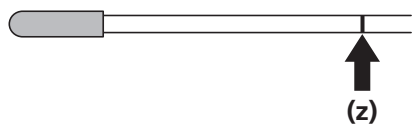
Secure the dual control levers in the installation positions to be used when riding.

Check the appropriate length for each brake hose by running the brake hose along the handlebar as in the following illustration.

2



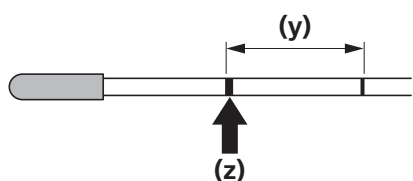
3



When the appropriate length has been determined, mark the brake hose.

(z) Mark

4



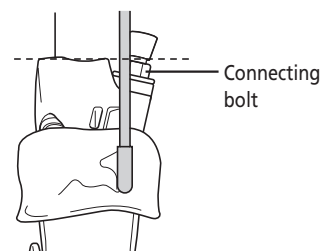
Mark the brake hose again 21mm away from the first mark to indicate where the brake hose should be cut.

(y) 21mm

(z) Mark for cutting

TECH TIPS

When checking the appropriate lengths for the brake hoses, use the head of the connecting bolt on the dual control lever as a guideline.

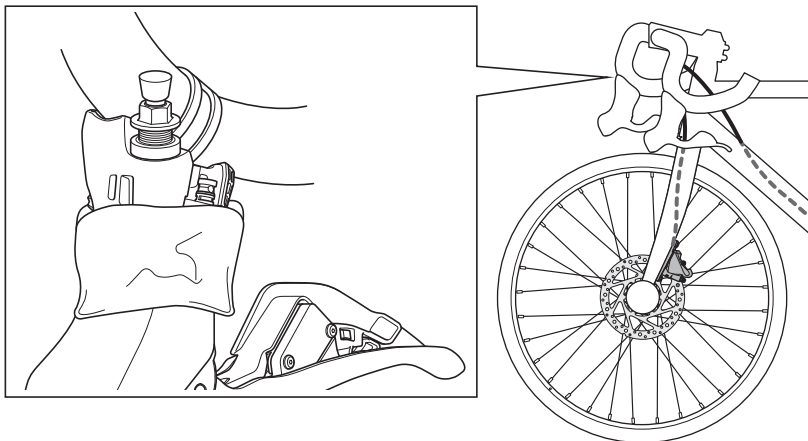


NOTE

Easy hose joint system brake hoses are pre-marked.
If it is not necessary to cut the brake hose in order to adjust its length, it is not necessary to mark the hose.

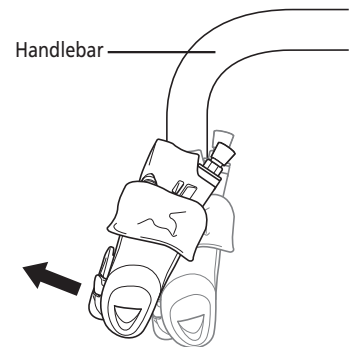
►► Installation of the brake hose (easy hose joint system)

Orient the brake hose connection port of the dual control lever securely upward by changing the angle of the handlebars or another means.



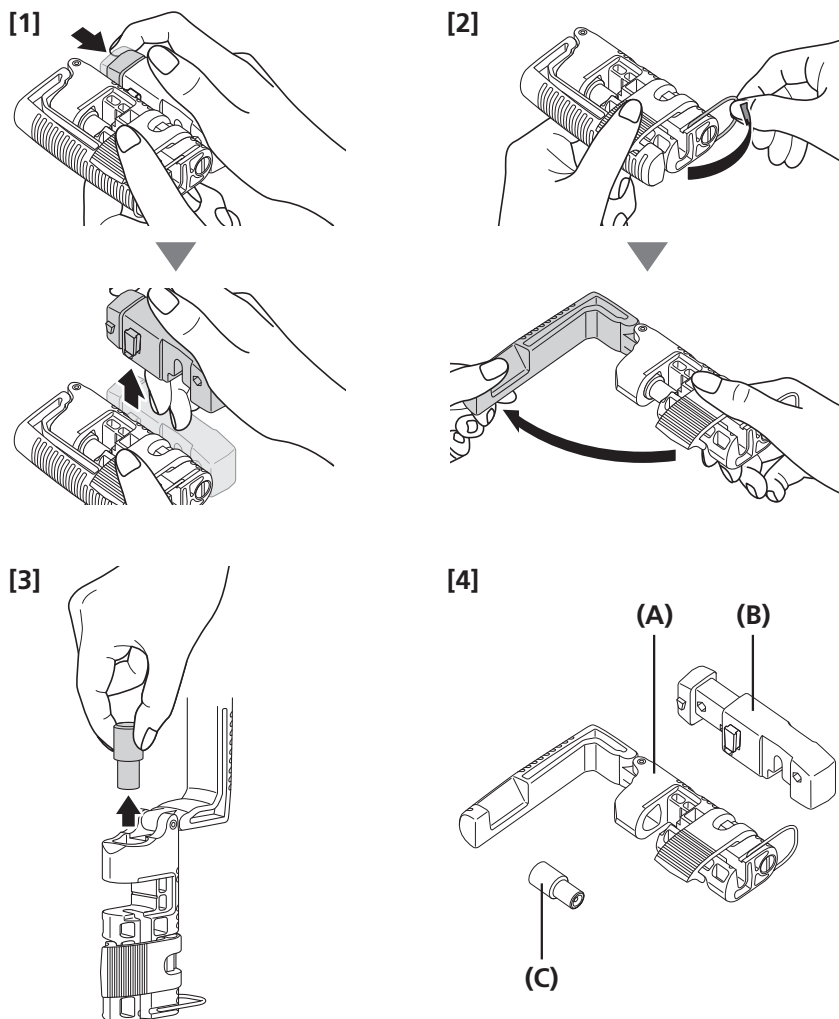
NOTE

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



Prepare the Shimano original tool TL-BH62 for cutting the brake hose as follows.

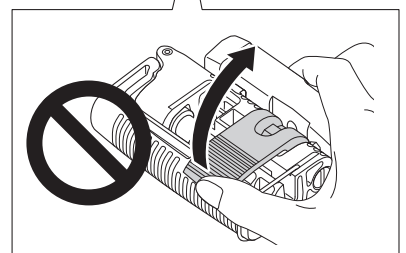
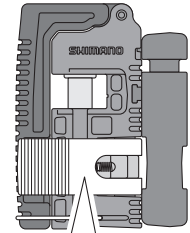
Disassemble the Shimano original tool TL-BH62 as shown in the illustrations.



- (A) Body of tool
- (B) Hose cutter
- (C) Press block

NOTE

- Do not move the lever indicated in the illustration before disassembling the Shimano original tool TL-BH62.



- Make sure to also read the instruction manual for the Shimano original tool TL-BH62.

6

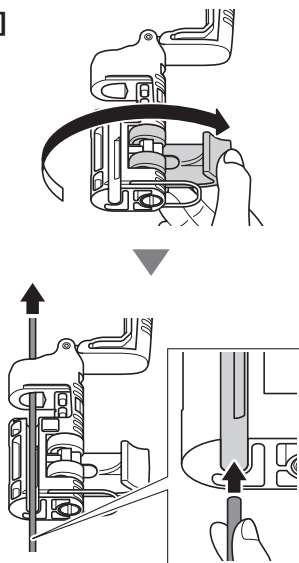
5

Installation of the brake hose (easy hose joint system)

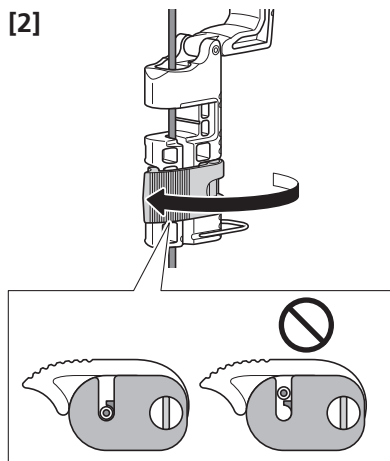
Insert the brake hose into the tool as shown in the illustration.

Check the location of the mark for cutting and secure the brake hose in place.

[1]

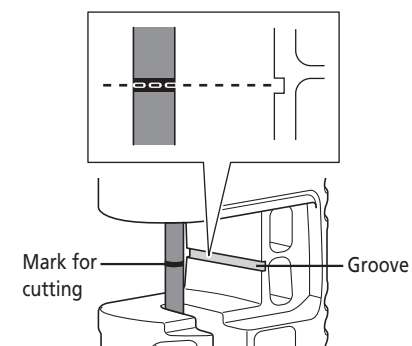


[2]



NOTE

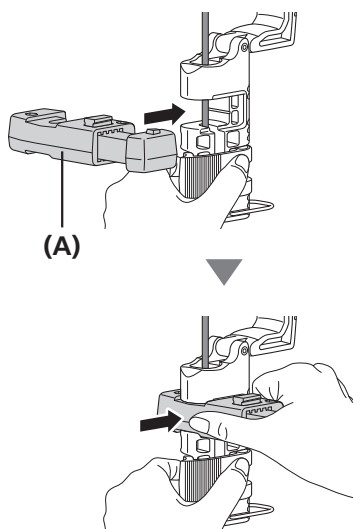
When inserting the brake hose into the tool, align the mark for cutting with the groove in the tool.



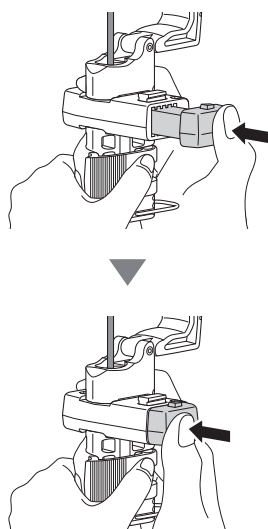
Check that the hose is secure and then attach the hose cutter.

Press the hose cutter as shown in illustration [2] to cut the brake hose.

[1]

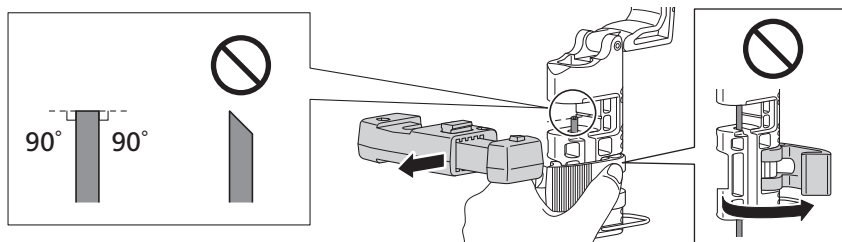


[2]



(A) Hose cutter

Detach the hose cutter and check that the cut end is horizontal.



9

Prepare the connector insert for insertion into the brake hose as follows.

Attach the connector insert to the press block and then set the press block in the tool.

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

(A) Press block

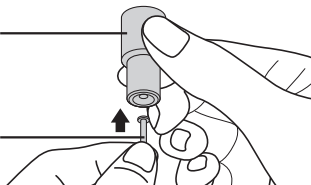
(B) Connector insert

10

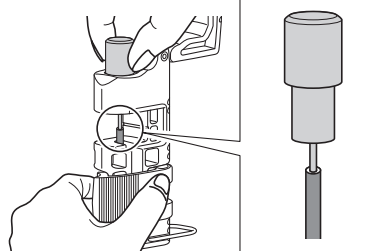
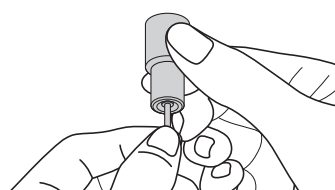
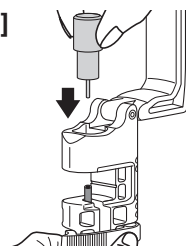
[1]

(A)

(B)



[2]

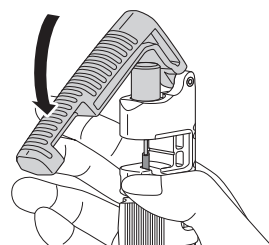


Grip the lever on the tool to insert the connector insert into the brake hose, as shown in the illustrations.

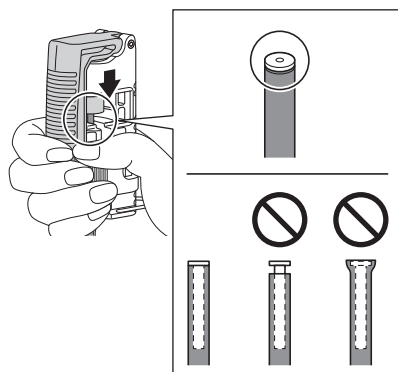
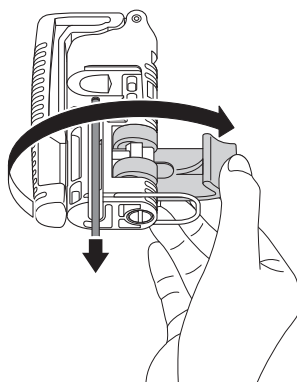
Check that the connector insert has been inserted correctly, and then remove the brake hose from the tool.

11

[1]

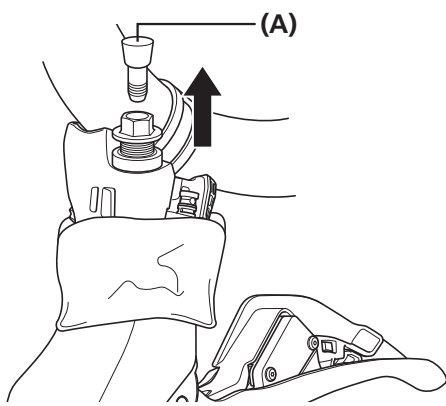


[2]



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

12



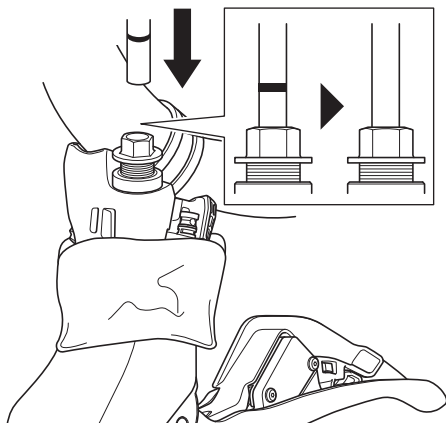
Remove the seal plug.

(A) Seal plug

NOTE

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

13

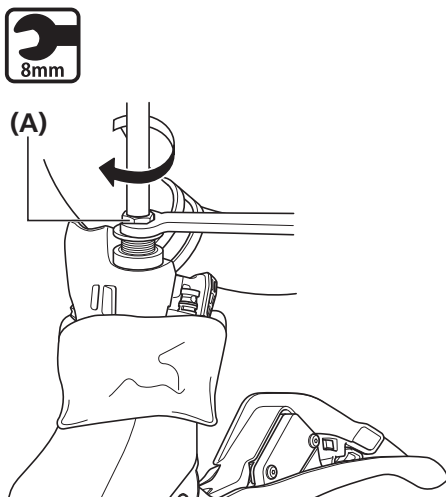


Insert the brake hose into the joint component until the mark on the hose is hidden.

TECH TIPS

- It comes with a built-in olive. Insert it while making sure that it will not get snagged on the olive.
- Check that the brake hose is inserted until the line printed on it or the mark made previously are hidden.
- Use a waste cloth when inserting the brake hose as some oil inside may leak.

14



Tighten the flanged connecting bolt with an 8mm spanner while pushing in the brake hose.

Then, wipe off any oil residue.

(A) Flanged connecting bolt

Tightening torque

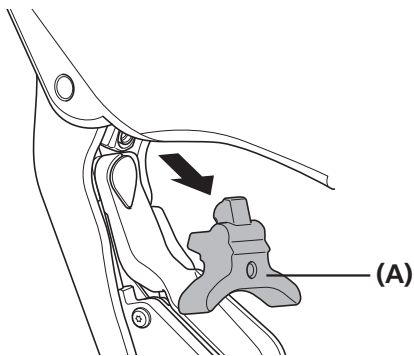


5 - 6 N·m

NOTE

Make sure that the brake hose is inserted properly and the connecting bolt is tightened correctly.
Oil leakage or inadequate braking power may result.

15



Remove the brake lever stopper.

(A) Lever stopper

NOTE

After removing the lever stopper, check that the pad spacer is installed on the caliper side or that the caliper is installed to the bicycle and the disc brake rotor is between the two sides of the caliper, before depressing the lever.

After installation to the bicycle, make sure to check that the lever stopper is removed.



TECH TIPS

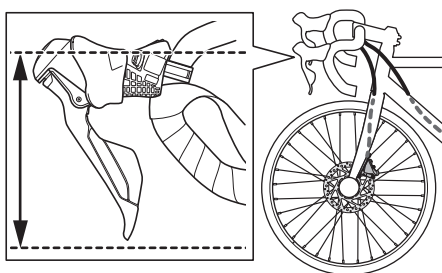
Move and pull on the lever stopper to remove it while being careful not to depress the lever.

16



Turn over the bracket cover from the back side.

17



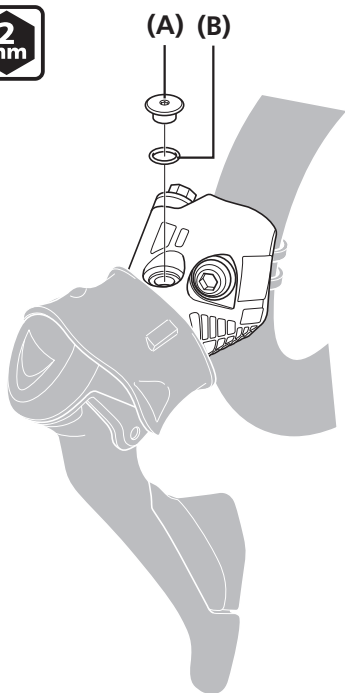
Adjust the position of the bleed screw so that its surface is parallel to the ground.

NOTE

When tilting, be careful not to forcibly pull on the brake hose or electric wires.

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

18



Remove the bleed screw and O-ring.

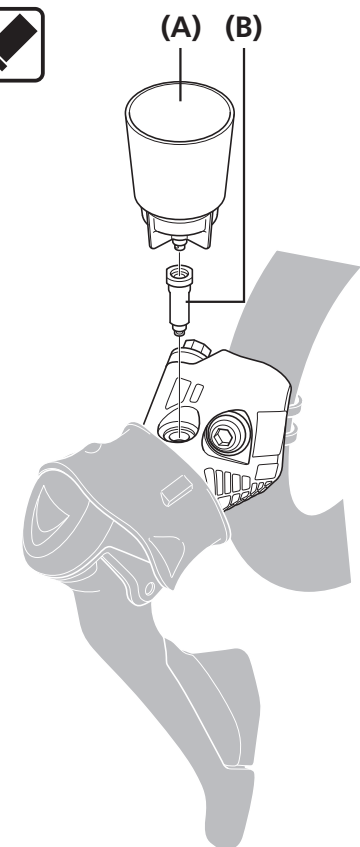
(A) Bleed screw

(B) O-ring

NOTE

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

19



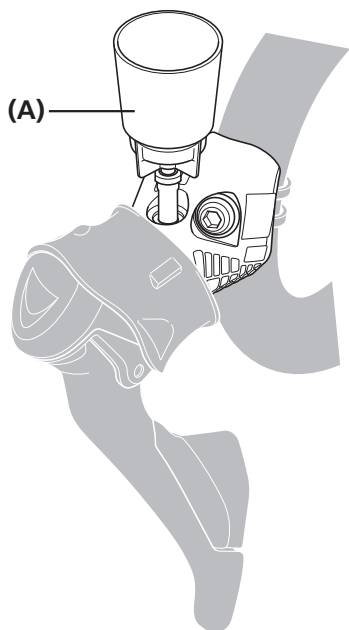
Attach the funnel adapter to the oil funnel.

(A) Oil funnel

(B) Funnel adapter

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

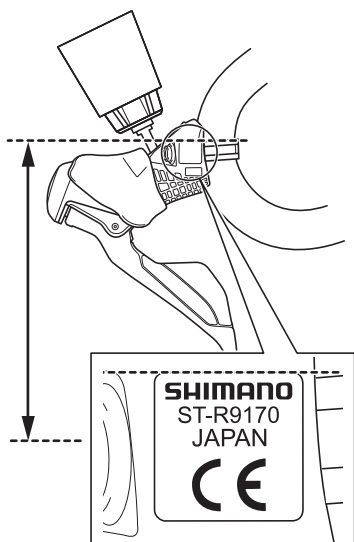
20



Mount the oil funnel.

(A) Oil funnel

21



Make adjustments, such as changing the angle of the handlebar, so that the side of the bracket indicated in the illustration is parallel to the ground.

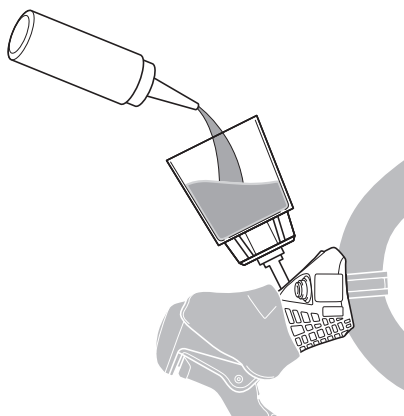
NOTE

When tilting, be careful not to forcibly pull on the brake hose or electric wires.

22

Secure the brake caliper in a vise while bleeding.

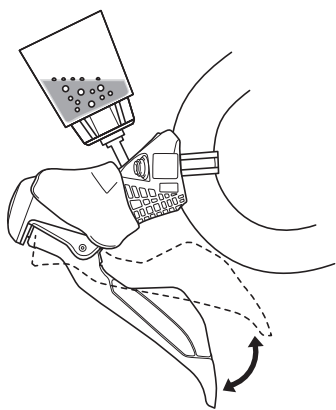
23



Fill the oil funnel with oil.

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

24



Slowly apply and release the lever until no more air bubbles are emitted.

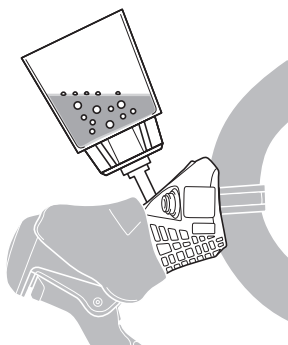
If the brake lever is then operated, air bubbles in the system will rise up through the port into the oil funnel.

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

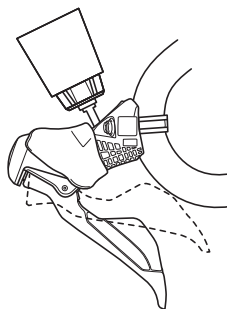
Under the normal condition, the lever action should feel stiff at this point.

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

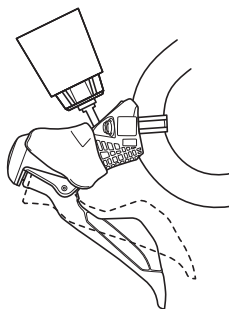
25



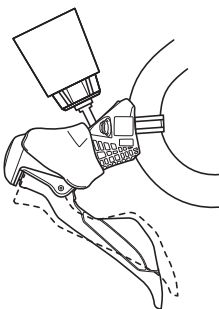
Lever operation



(x)



(y)

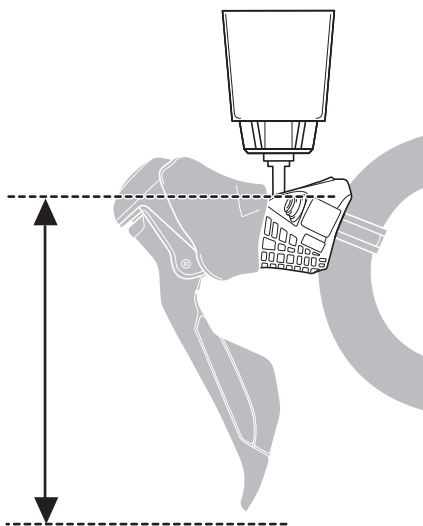


(z)



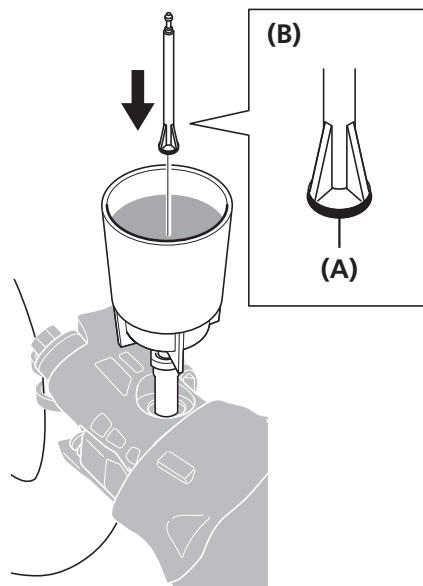
►► Installation of the brake hose (easy hose joint system)

26



Make adjustments, such as changing the angle of the handlebar, so that the head of the bleed screw is parallel to the ground.

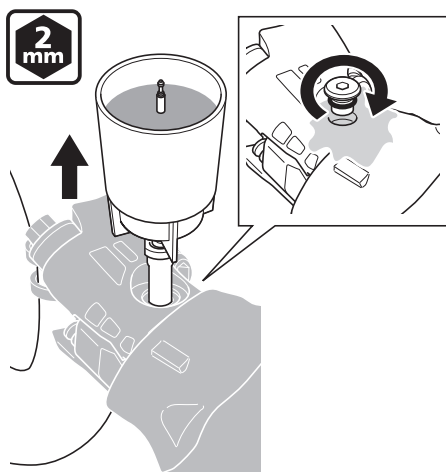
27



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

- (A) O-ring
- (B) Oil stopper

28



Remove the oil funnel and funnel adapter while still plugged with the oil stopper.

Attach the O-ring to the bleed screw and tighten it while letting oil flow out so as to make sure that no air bubbles remain inside the reservoir tank.

Tightening torque



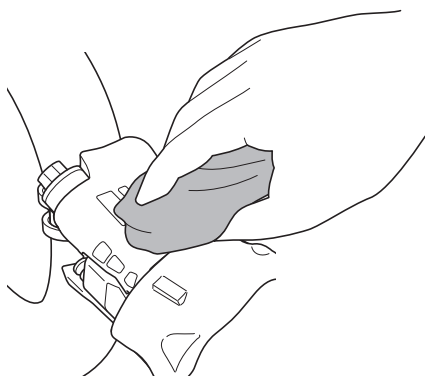
0.5 - 0.7 N·m

NOTE

- Do not operate the brake lever. Otherwise, air bubbles may enter the cylinder.
- Use a waste cloth to prevent the oil from flowing to surrounding areas.

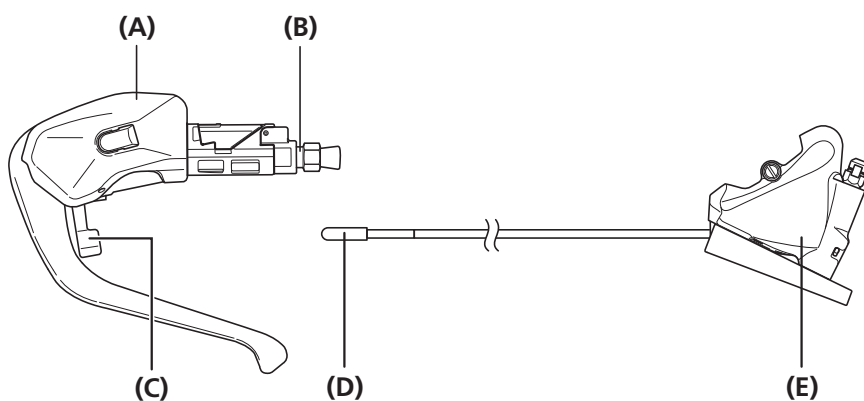
▶▶ Installation of the brake hose (easy hose joint system)

29

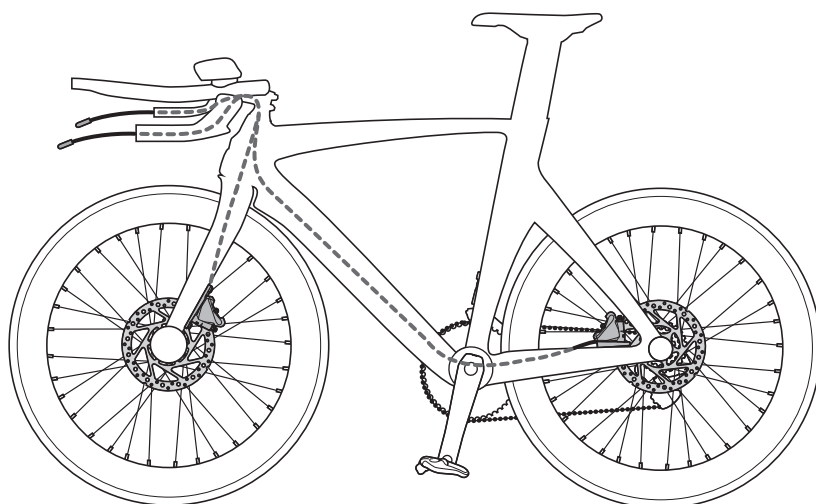


Wipe away any oil which has flowed out.

ST-R9180



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



NOTE

- The illustration is a rough image. For details on routing the brake hoses, consult the manufacturer of the completed bicycle or refer to the instruction manual for the bicycle.

- Do not remove the hose caps attached to the ends of the brake hoses.



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

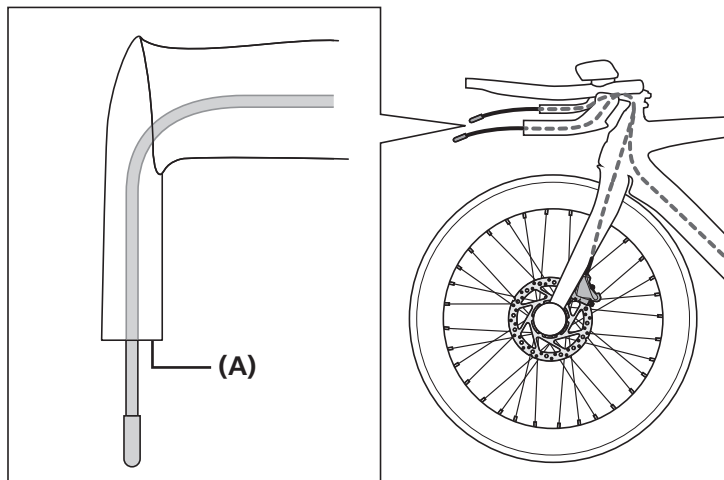
1

Installation of the brake hose (easy hose joint system)

Secure the handlebars at the angle to be used when riding.

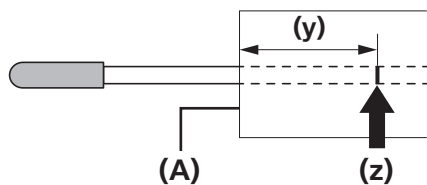
Pass the brake hoses through the handlebars as in the following illustration, and adjust the brake hoses to the appropriate length using the end surface of the handlebars as a guide.

2



(A) End surface of handlebar

3



Pull out the brake hose and mark it at a point 30mm inward from the end surface of the handlebar.

- (y) 30mm
- (z) Mark

(A) End surface of handlebar

NOTE

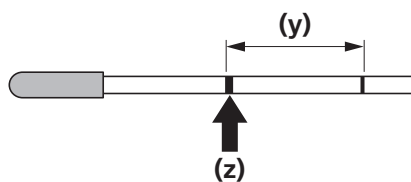
- Easy hose joint system brake hoses are pre-marked.
If it is not necessary to cut the brake hose in order to adjust its length, it is not necessary to mark the hose.
- Be careful not to forcibly pull on the hose.



TECH TIPS

To ensure that later steps are easier to perform, temporarily remove the brake calipers etc., and adjust the brake hoses so that a length of about 100mm more than the appropriate length can be pulled out.

4

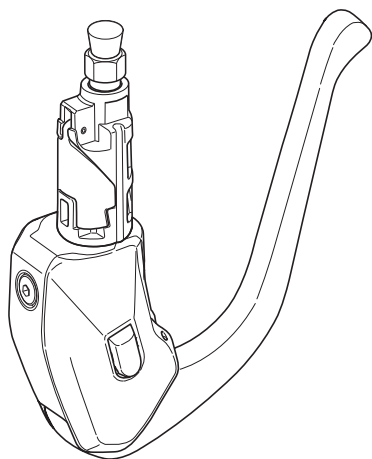


Mark the brake hose again 21mm away from the mark made 30mm inward from the end surface of the handlebar to indicate where the brake hose should be cut.

- (y) 21mm
- (z) Mark for cutting

Installation of the brake hose (easy hose joint system)

5

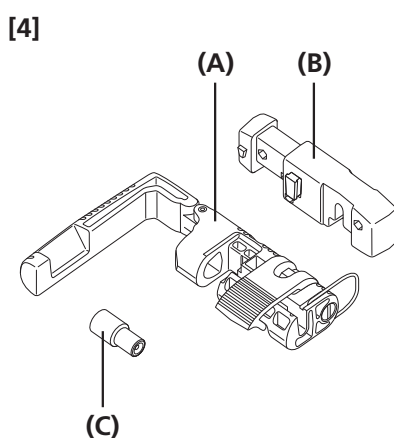
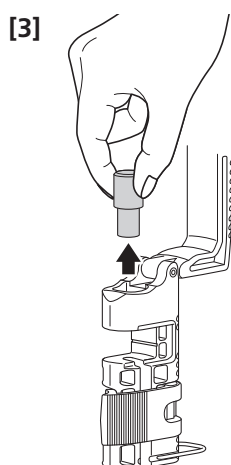
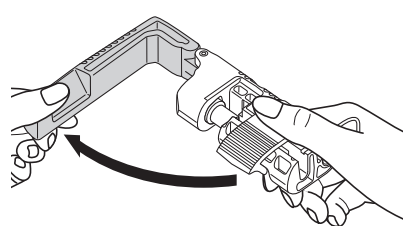
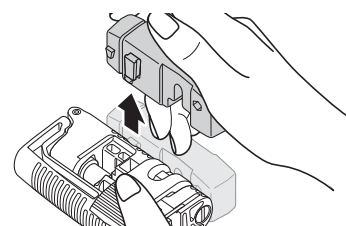
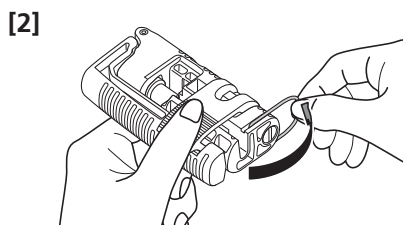
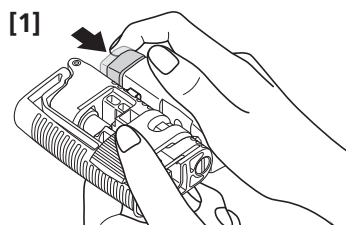


Orient the brake hose connection port of the dual control lever upward when securing.

6

Prepare the Shimano original tool TL-BH62 for cutting the brake hose as follows.

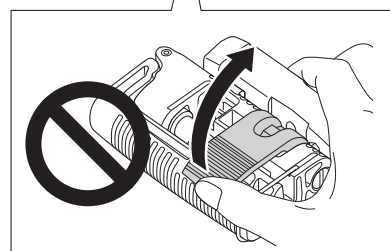
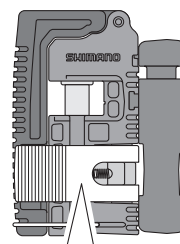
Disassemble the Shimano original tool TL-BH62 as shown in the illustrations.



- (A) Body of tool
- (B) Hose cutter
- (C) Press block

NOTE

- Do not move the lever indicated in the illustration before disassembling the Shimano original tool TL-BH62.



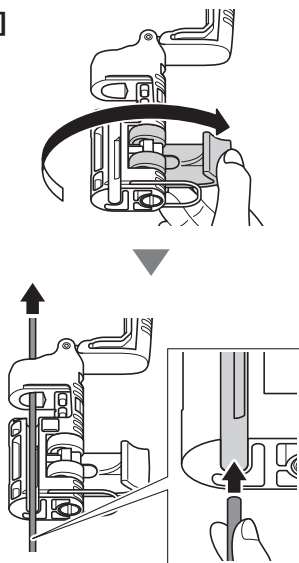
- Make sure to also read the instruction manual for the Shimano original tool TL-BH62.

Installation of the brake hose (easy hose joint system)

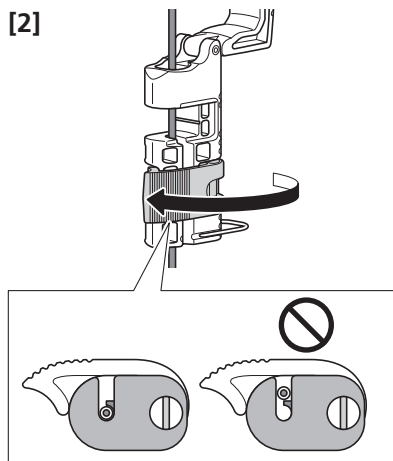
Insert the brake hose into the tool as shown in the illustration.

Check the location of the mark for cutting and secure the brake hose in place.

[1]

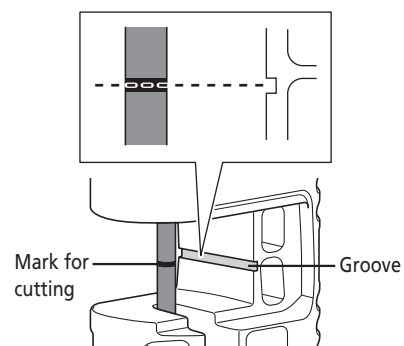


[2]



NOTE

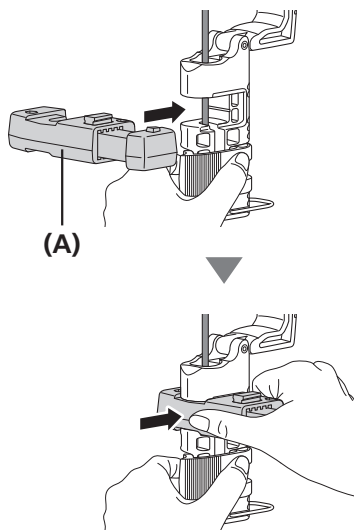
When inserting the brake hose into the tool, align the mark for cutting with the groove in the tool.



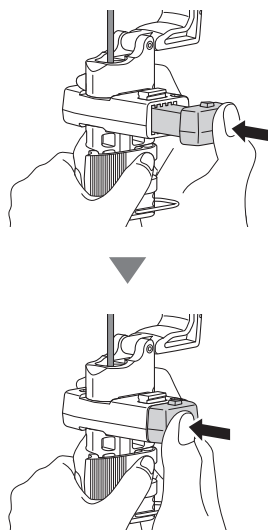
Check that the hose is secure and then attach the hose cutter.

Press the hose cutter as shown in illustration [2] to cut the brake hose.

[1]

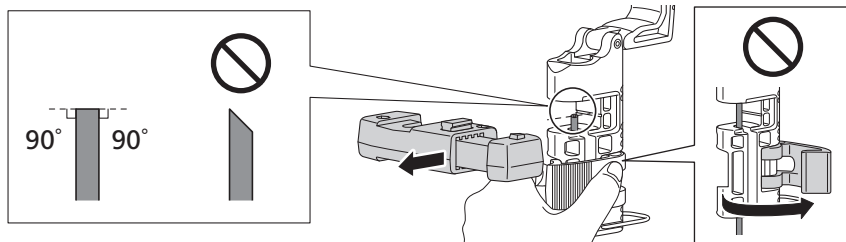


[2]



(A) Hose cutter

Detach the hose cutter and check that the cut end is horizontal.



9

Prepare the connector insert for insertion into the brake hose as follows.

Attach the connector insert to the press block and then set the press block in the tool.

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

(A) Press block

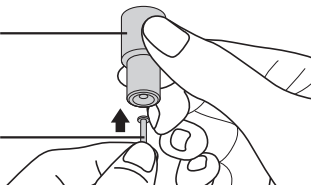
(B) Connector insert

10

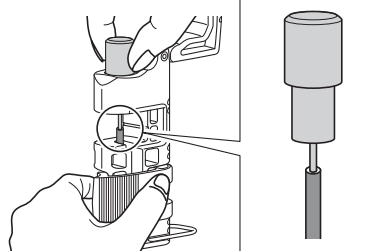
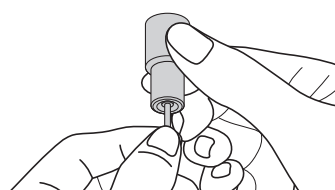
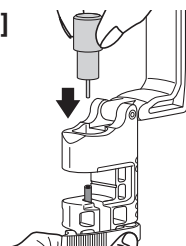
[1]

(A)

(B)



[2]

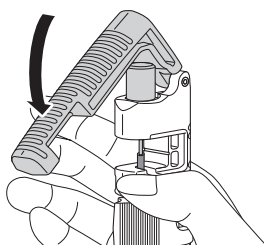


11

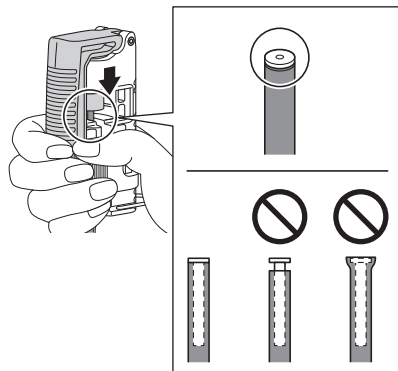
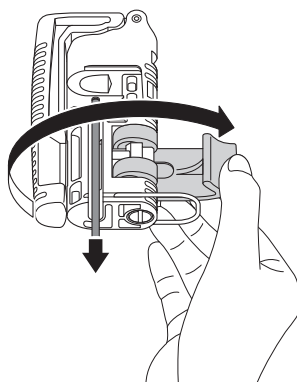
Grip the lever on the tool to insert the connector insert into the brake hose, as shown in the illustrations.

Check that the connector insert has been inserted correctly, and then remove the brake hose from the tool.

[1]

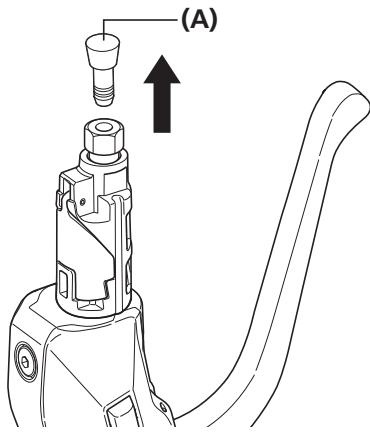


[2]



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

12



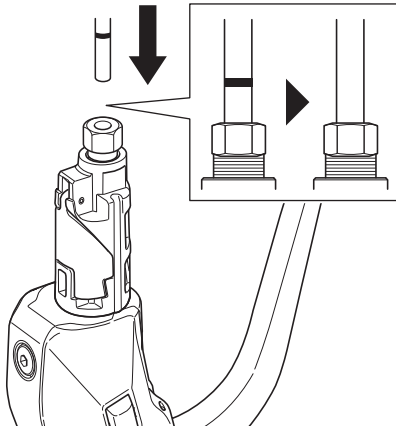
Remove the seal plug.

(A) Seal plug

NOTE

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

13



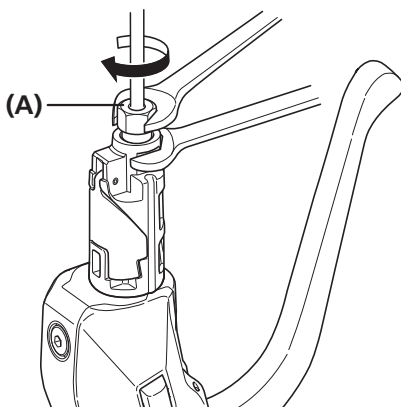
Insert the brake hose into the joint component until the mark on the hose is hidden.



TECH TIPS

- It comes with a built-in olive. Insert it while making sure that it will not get snagged on the olive.
- Check that the brake hose is inserted until the line printed on it or the mark made previously are hidden.
- Use a waste cloth when inserting the brake hose as some oil inside may leak.

14



Tighten the connecting bolt with spanners while pushing in the brake hose.

Then, wipe off any oil residue.

(A) Connecting bolt

Tightening torque



5 - 6 N·m

NOTE

Make sure that the brake hose is inserted properly and the connecting bolt is tightened correctly.
Oil leakage or inadequate braking power may result.



TECH TIPS

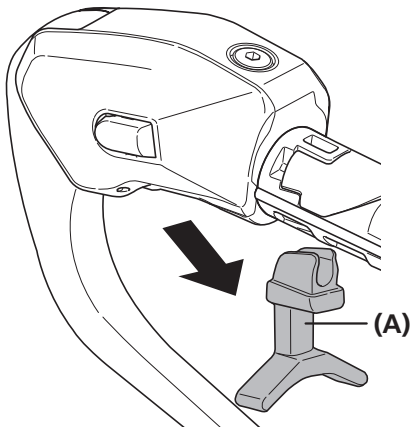
For details on installing the dual control levers, refer to the section "Installation to the handlebar".

15

Install the dual control levers.

Installation of the brake hose (easy hose joint system)

16



Remove the brake lever stopper.

(A) Lever stopper

NOTE

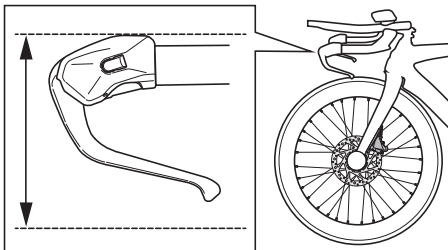
After removing the lever stopper, check that the pad spacer is installed on the caliper side or that the caliper is installed to the bicycle and the disc brake rotor is between the two sides of the caliper, before depressing the lever.
After installation to the bicycle, make sure to check that the lever stopper is removed.



TECH TIPS

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

17

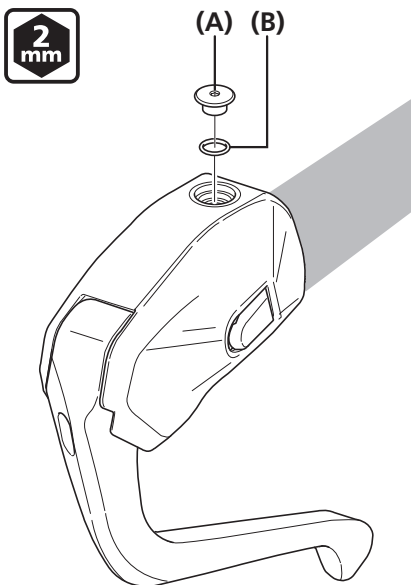


Adjust the position of the bleed screw so that its surface is parallel to the ground.

NOTE

When tilting, be careful not to forcibly pull on the brake hose or electric wires.

18



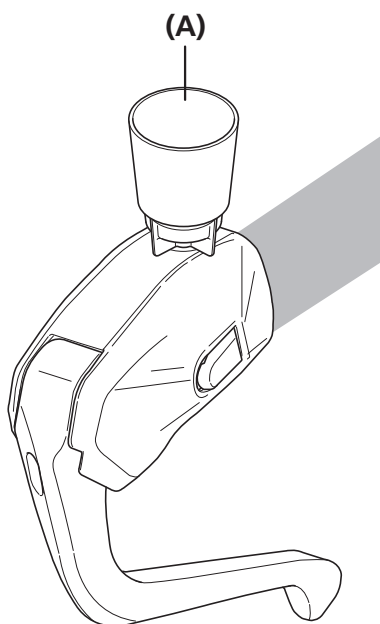
Remove the bleed screw and O-ring.

(A) Bleed screw
(B) O-ring

NOTE

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

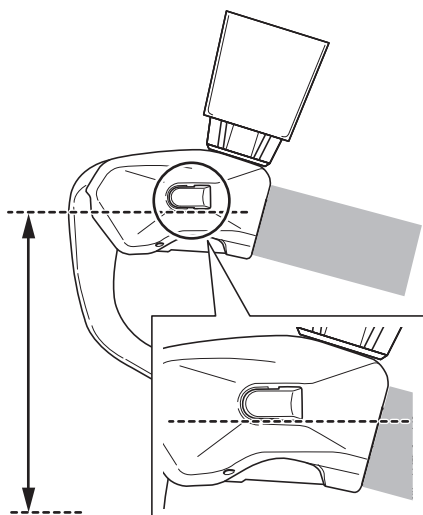
19



Mount the oil funnel.

(A) Oil funnel

20



Make adjustments, such as changing the angle of the handlebar, so that the side of the bracket indicated in the illustration is parallel to the ground.

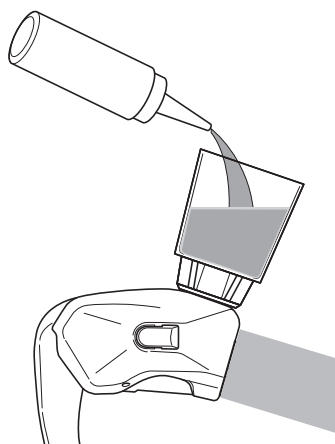
NOTE

When tilting, be careful not to forcibly pull on the brake hose or electric wires.

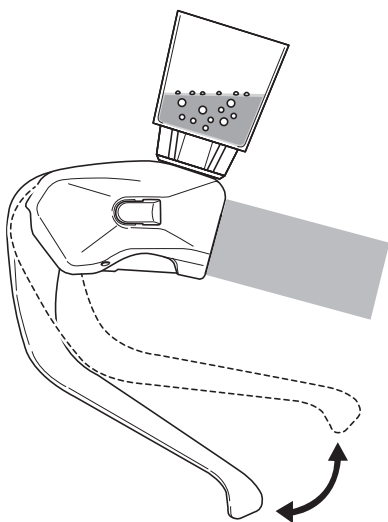
21

Secure the brake caliper in a vise while bleeding.

22



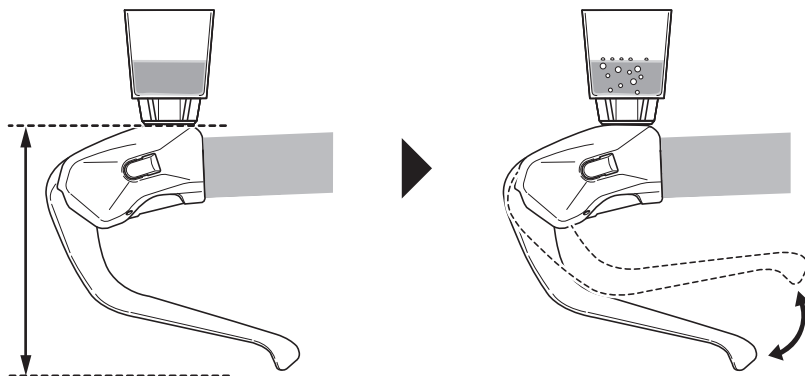
Fill the oil funnel with oil.

►► Installation of the brake hose (easy hose joint system)**23**

Slowly apply and release the lever until no more air bubbles are emitted.

24

Make adjustments, such as changing the angle of the handlebar, so that the head of the bleed screw is parallel to the ground, and slowly apply and release the lever until no more air bubbles are emitted.



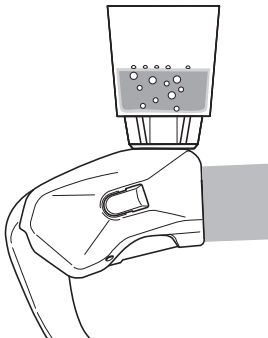
If the brake lever is then operated, air bubbles in the system will rise up through the port into the oil funnel.

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

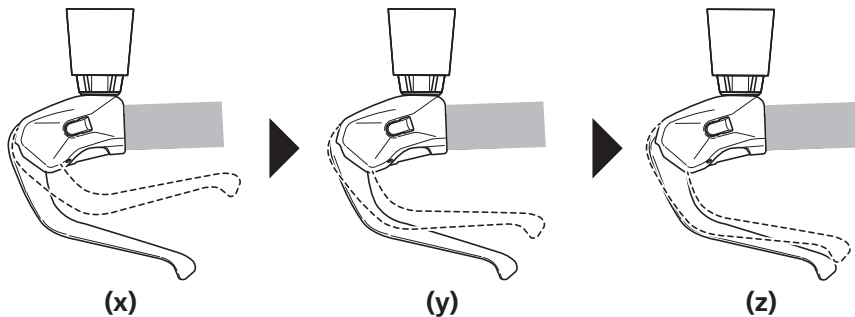
Under the normal condition, the lever action should feel stiff at this point.

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

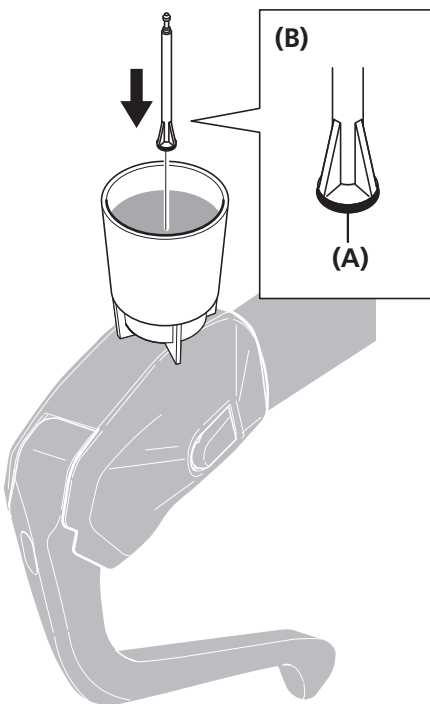
25



Lever operation



26



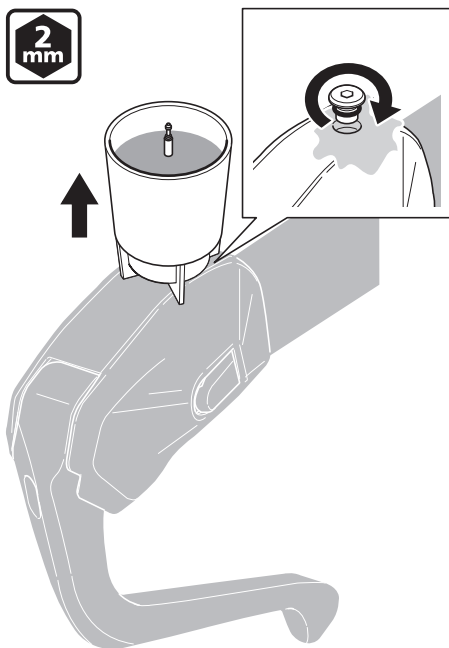
Plug the oil funnel with the oil stopper so that the O-ring mounted side is facing downward.

- (A) O-ring
- (B) Oil stopper

INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM

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

27



Remove the oil funnel while still plugged with the oil stopper.

Attach the O-ring to the bleed screw and tighten it while letting oil flow out so as to make sure that no air bubbles remain inside the reservoir tank.

Tightening torque

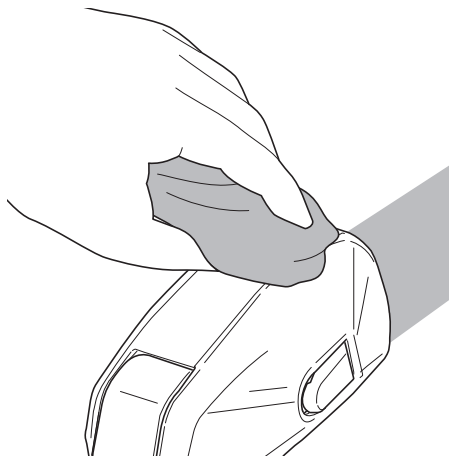


0.5 - 0.7 N·m

NOTE

- Do not operate the brake lever. Otherwise, air bubbles may enter the cylinder.
- Use a waste cloth to prevent the oil from flowing to surrounding areas.

28

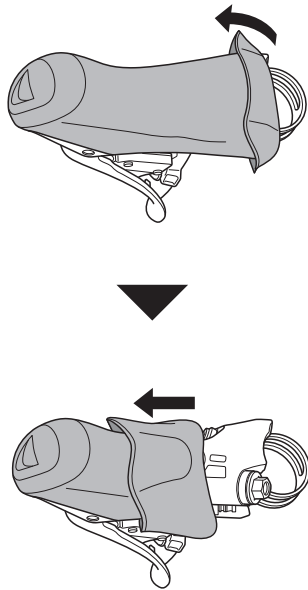


Wipe away any oil which has flowed out.

■ Installation to the handlebar

ST-R9170

1



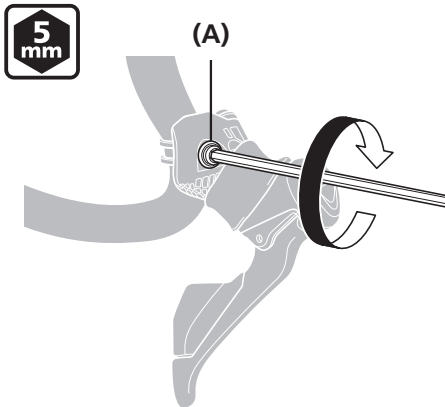
Turn over the bracket cover from the back side.

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

NOTE

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

2



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

(A) Clamp bolt

Tightening torque



6 - 8 N·m

NOTE

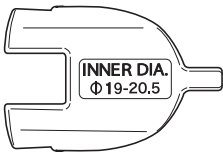
When mounting the shifting lever to a drop handlebar, loosen the clamp bolt sufficiently. Otherwise, the handlebar may be damaged.

ST-R9180

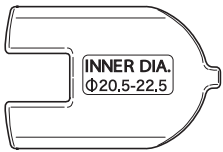
Two fixed shoes of differing size are included with this product.
Before installation, check the inner diameter of the handlebar and use the appropriate fixed shoe. (A size S fixed shoe is attached at the time of purchase.)

Handlebar inner diameter	Fixed shoe
Ø19.0 - 20.5mm	Size S
Ø20.5 - 22.5mm	Size L

Fixed shoe (size S)



Fixed shoe (size L)



Replacement procedure for fixed shoe

1.5 mm

1

Diagram showing the removal of the fixed shoe. A 1.5 mm hexagon wrench is used to turn the bolt (A) counter-clockwise. The fixed shoe (B) is shown being lifted away from the handlebar.

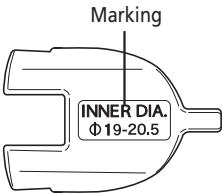
Remove the bolt of the fixed shoe using a 1.5mm hexagon wrench, as shown in the illustration.

After this, remove the fixed shoe.

- (A) Bolt
- (B) Fixed shoe

TECH TIPS

The range of supported handlebar inner diameter sizes is marked on the fixed shoe.



1.5 mm

2

Diagram showing the attachment of the other fixed shoe. A 1.5 mm hexagon wrench is used to turn the bolt clockwise to tighten it. The fixed shoe is shown being attached to the handlebar.

Attach the other fixed shoe (of differing size), and tighten the bolt.

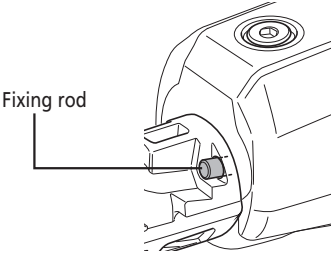
Tightening torque



0.3 - 0.5 N·m

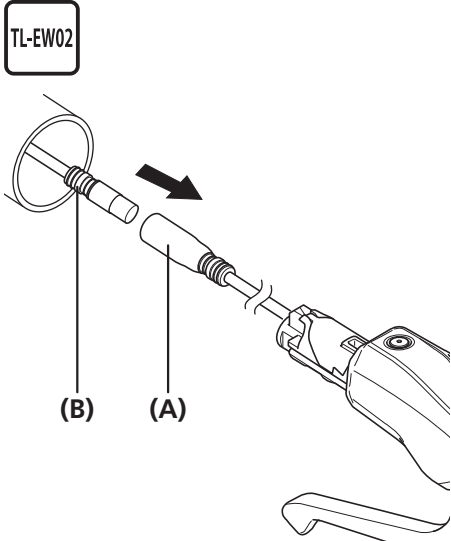
NOTE

Be careful if a fixed shoe is not attached as if the product is subjected to a strong shock, the fixing rod may fly out.



Installation procedures

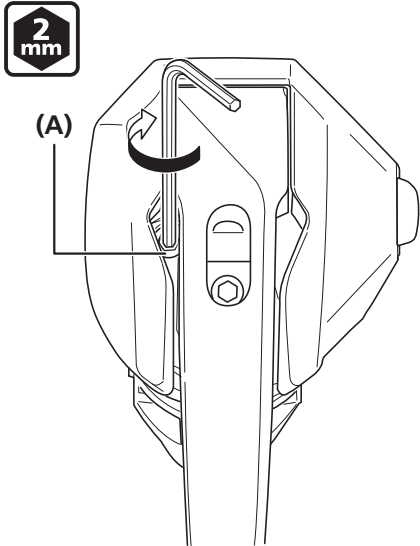
1



Connect the electric wire to the connector (female) extending from the lever.

- (A) Connector (female)
(B) Electric wire

2



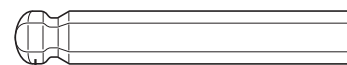
Install to the handlebar by tightening the fixing bolt clockwise with a hexagon wrench, as in the illustration.

- (A) Fixing bolt

Tightening torque	
	1 - 1.3 N·m

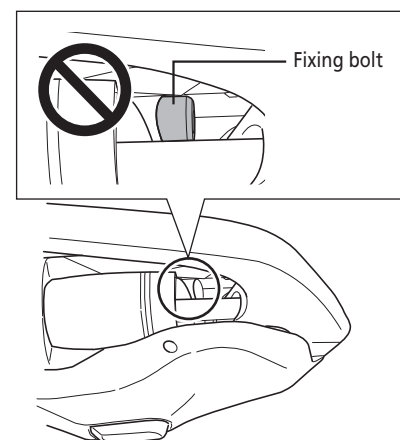
NOTE

- Do not use a ball point hexagon wrench.



Ball point hexagon wrench

- When loosening the fixing bolt make sure not to loosen it more than necessary. The bolt may fall out if loosened too much. (As a guide, make sure that the bolt cannot fly out from the hole indicated in the illustration.)

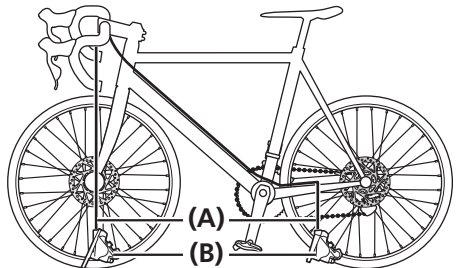


▶▶ Adding Shimano genuine mineral oil and bleeding air

■ Adding Shimano genuine mineral oil and bleeding air

ST-R9170

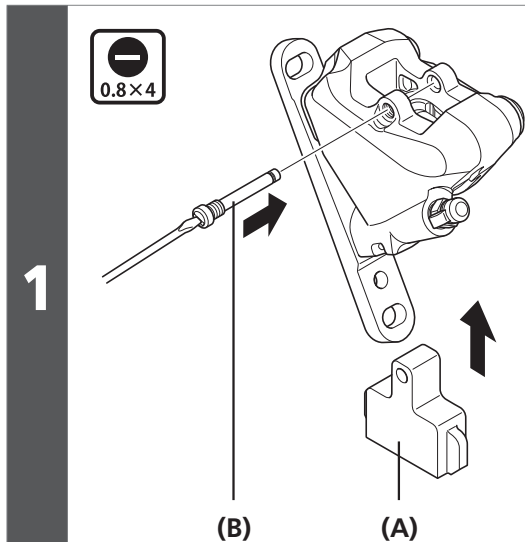
With the bleed spacer (yellow) attached to the brake caliper, place the bicycle in the work stand as shown in the illustration.



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

NOTE

When bleeding the brake caliper, SM-DISC (oil funnel and oil stopper) and the funnel adapter are required.



Mount the bleed spacer (yellow).

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

Tightening torque



0.1 - 0.3 N·m

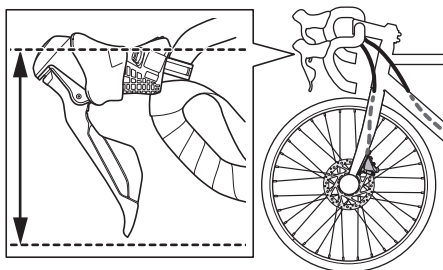
▶▶ Adding Shimano genuine mineral oil and bleeding air

2



Turn over the bracket cover from the back side.

3



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

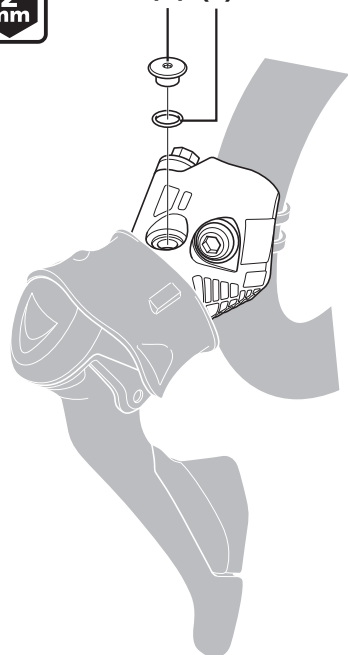
NOTE

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

4



(A) (B)



Remove the bleed screw and O-ring.

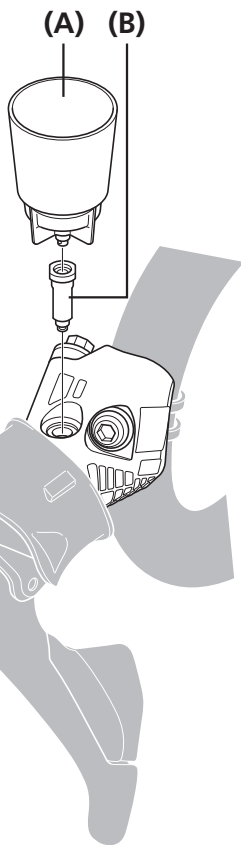
- (A) Bleed screw
- (B) O-ring

NOTE

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

►► Adding Shimano genuine mineral oil and bleeding air

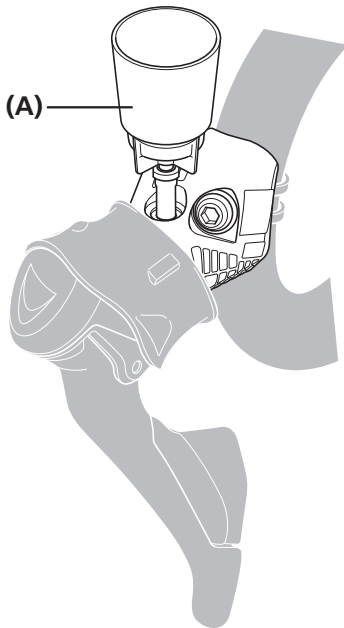
5



Attach the funnel adapter to the oil funnel.

- (A) Oil funnel
- (B) Funnel adapter

6



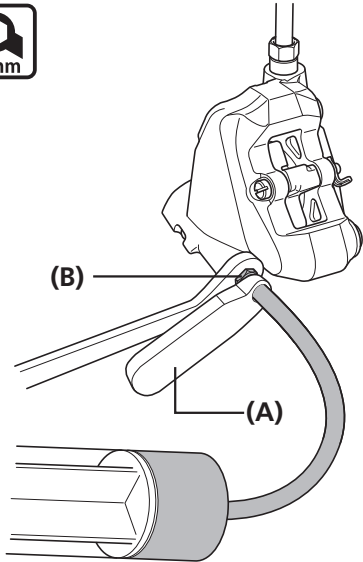
Mount the oil funnel.

- (A) Oil funnel

7

Secure the brake caliper in a vise while bleeding.

8



Set a 7mm socket wrench in place.

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

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

(A) Tube holder

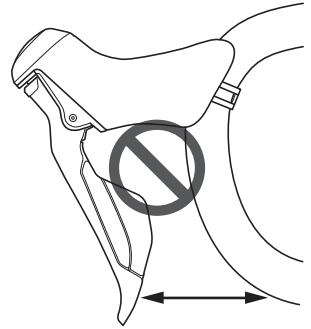
(B) Bleed nipple

NOTE

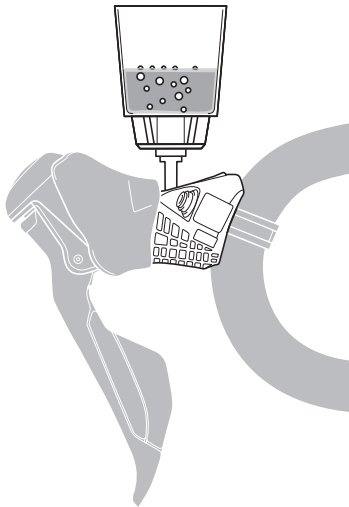
Secure the brake caliper in a vise to prevent the tube from being accidentally disconnected.

Do not depress and release the lever repeatedly.

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



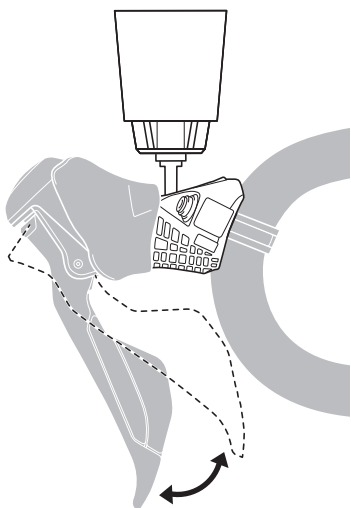
9



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

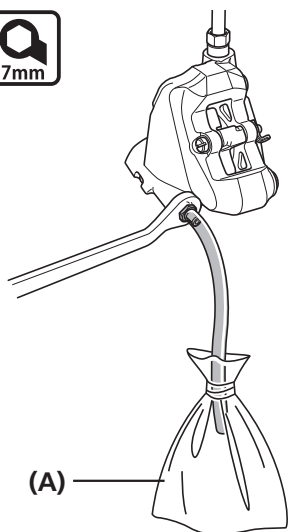
Remove the syringe while covering the end of the syringe tube with a waste cloth to prevent oil from spattering.

10



Operate the brake lever about 10 times.

11

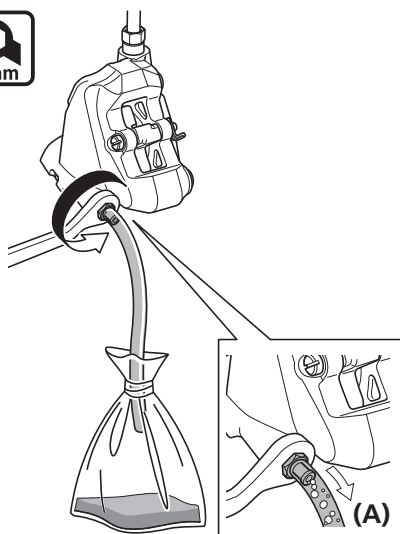


Tie the supplied tube and bag with rubber bands.

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

(A) Bag

12



Loosen the bleed nipple.

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

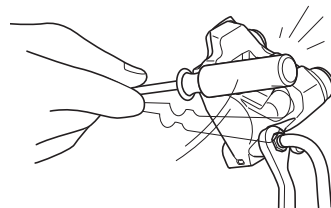
After a little while, the oil and air bubbles will flow naturally from the bleed nipple into the tube.

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

(A) Air bubbles



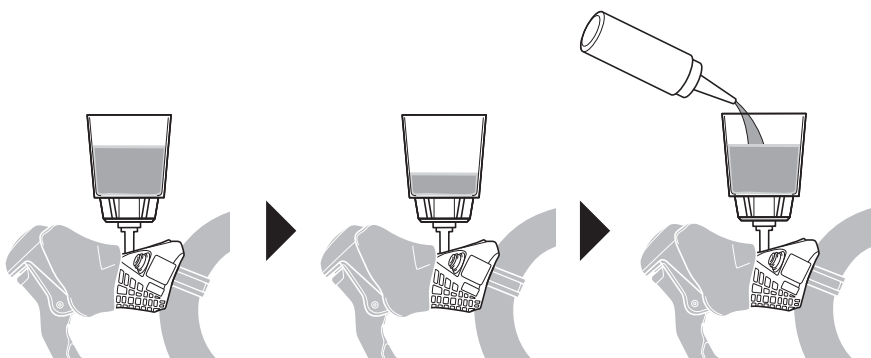
It may be effective to shake the brake hose gently, to tap the lever bracket or brake calipers gently with a screwdriver, or to move the position of the calipers at this time.



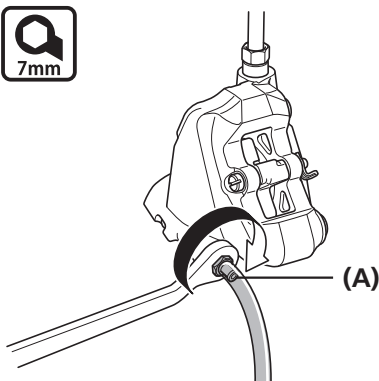
▶▶ Adding Shimano genuine mineral oil and bleeding air

13

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



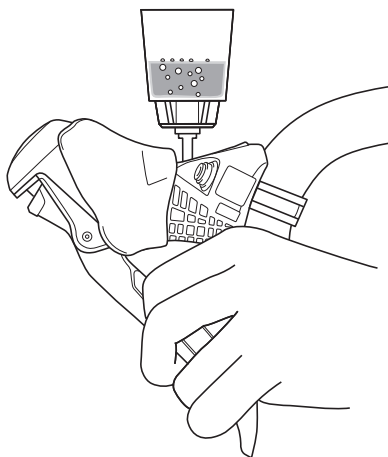
14



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

(A) Bleed nipple

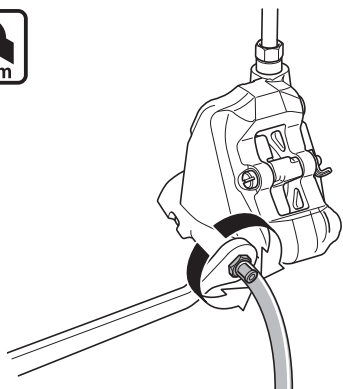
15



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

Repeat this procedure about 2 to 3 times.

16



Tighten the bleed nipple.

Tightening torque

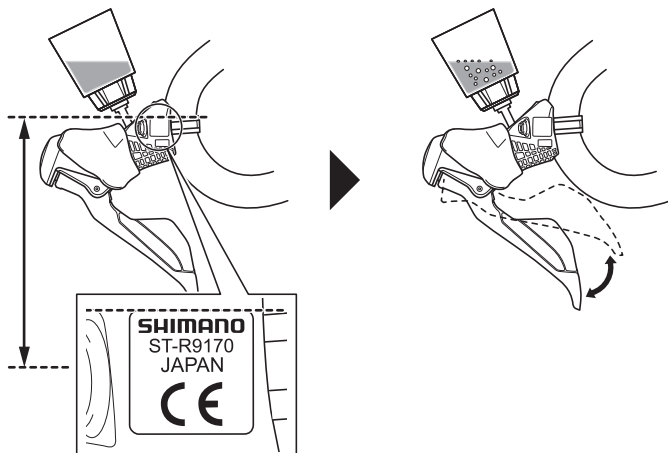


4 - 7 N·m

▶▶ Adding Shimano genuine mineral oil and bleeding air

17

Make adjustments, such as changing the angle of the handlebar, so that the side of the bracket indicated in the illustration is parallel to the ground, and slowly apply and release the lever until no more air bubbles are emitted.



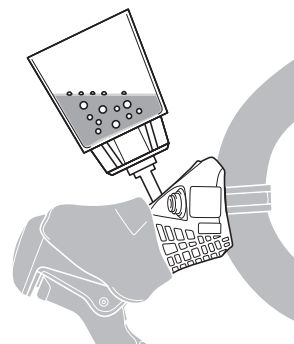
If the brake lever is then operated, air bubbles in the system will rise up through the port into the oil funnel.

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

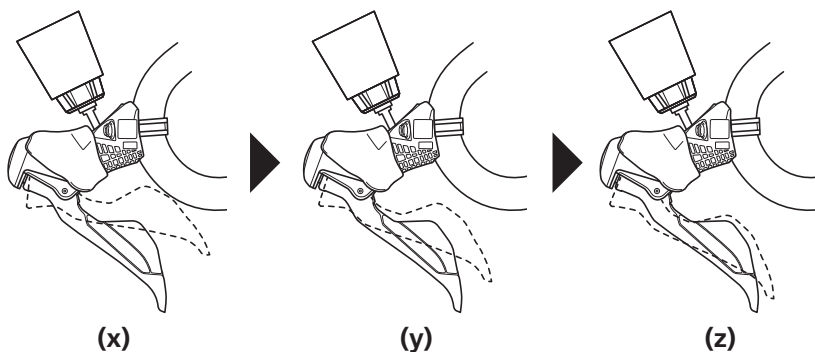
Under the normal condition, the lever action should feel stiff at this point.

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

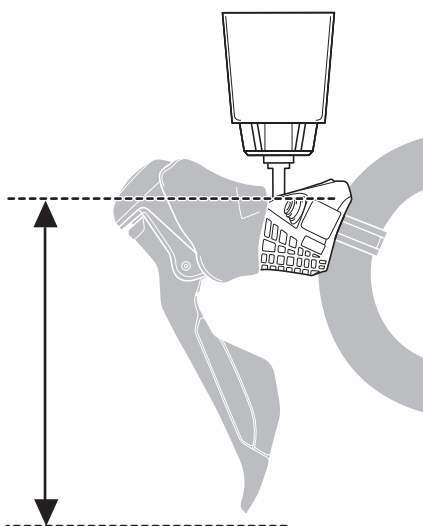
18



Lever operation

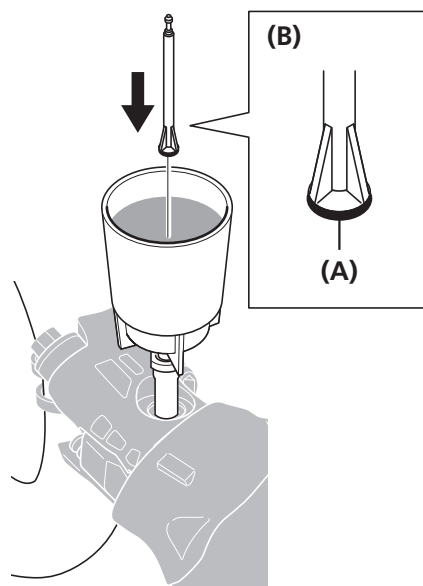


19



Make adjustments, such as changing the angle of the handlebar, so that the head of the bleed screw is parallel to the ground.

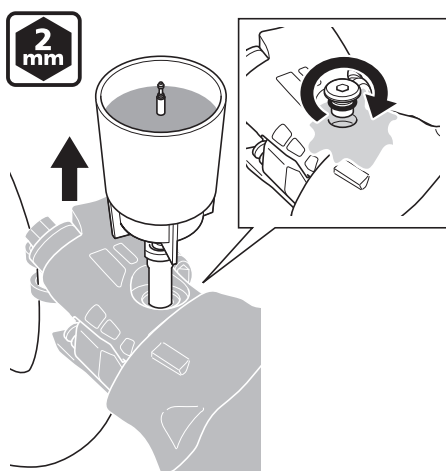
20



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

(A) O-ring
(B) Oil stopper

21



Remove the oil funnel and funnel adapter while still plugged with the oil stopper.

Attach the O-ring to the bleed screw and tighten it while letting oil flow out so as to make sure that no air bubbles remain inside the reservoir tank.

Tightening torque

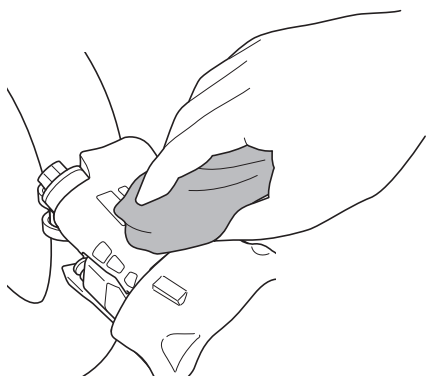


0.5 - 0.7 N·m

NOTE

- Do not operate the brake lever. Otherwise, air bubbles may enter the cylinder.
- Use a waste cloth to prevent the oil from flowing to surrounding areas.

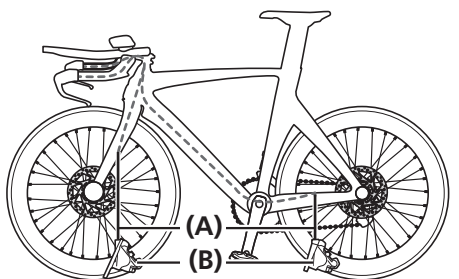
22



Wipe away any oil which has flowed out.

ST-R9180

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

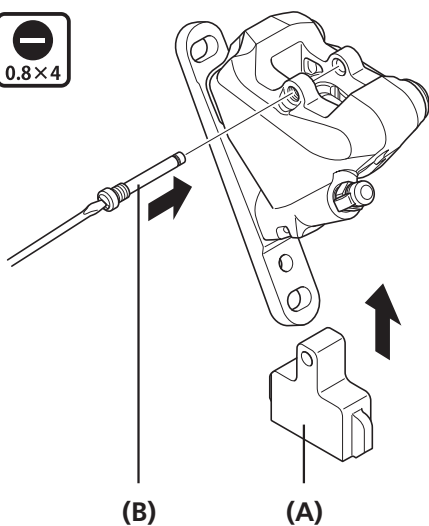


- (A) Brake hose
- (B) Brake caliper

NOTE

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

1



Mount the bleed spacer (yellow).

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

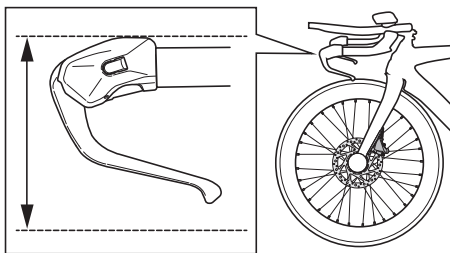
Tightening torque



0.1 - 0.3 N·m

▶▶ Adding Shimano genuine mineral oil and bleeding air

2

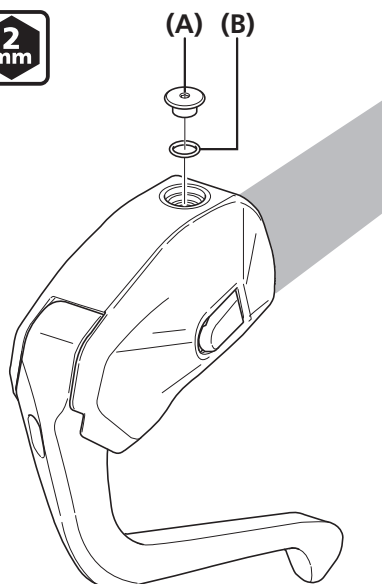


Adjust the position of the bleed screw so that its surface is parallel to the ground.

NOTE

When tilting, be careful not to forcibly pull on the brake hose or electric wires.

3



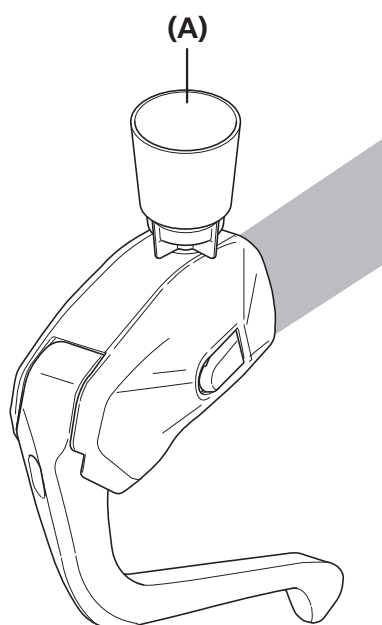
Remove the bleed screw and O-ring.

- (A) Bleed screw
- (B) O-ring

NOTE

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

4



Mount the oil funnel.

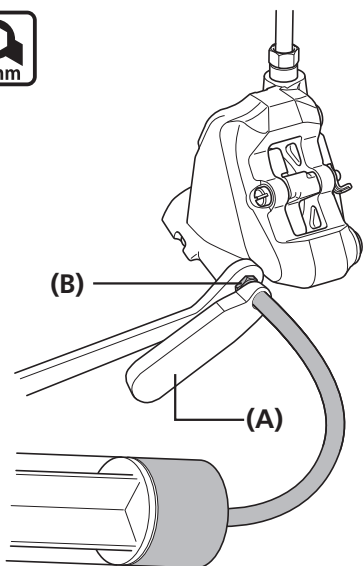
- (A) Oil funnel

5

Secure the brake caliper in a vise while bleeding.

▶▶ Adding Shimano genuine mineral oil and bleeding air

6



Set a 7mm socket wrench in place.

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

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

(A) Tube holder

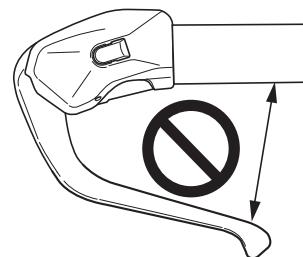
(B) Bleed nipple

NOTE

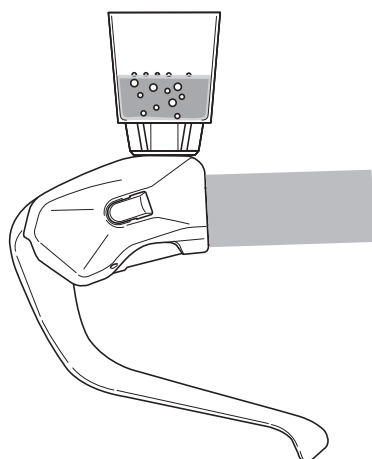
Secure the brake caliper in a vise to prevent the tube from being accidentally disconnected.

Do not depress and release the lever repeatedly.

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



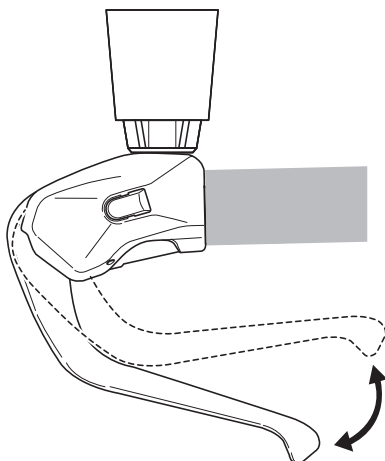
7



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

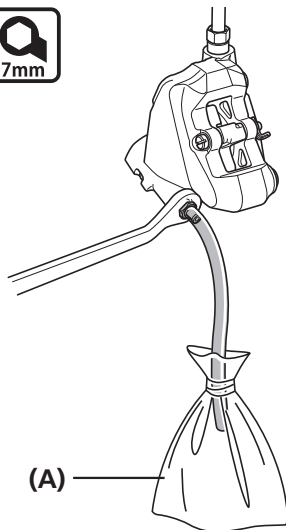
Remove the syringe while covering the end of the syringe tube with a waste cloth to prevent oil from spattering.

8



Operate the brake lever about 10 times.

9

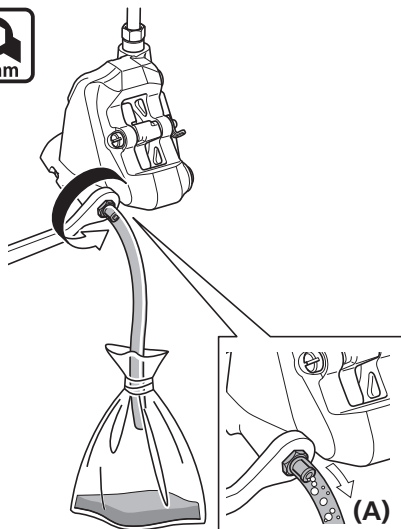


Tie the supplied tube and bag with rubber bands.

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

(A) Bag

10



Loosen the bleed nipple.

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

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

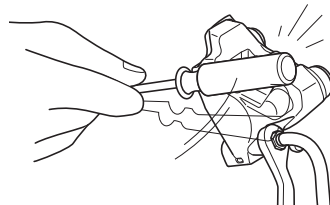
In this way it will be possible to easily extract the greater part of the air bubbles remaining inside the brake system.

(A) Air bubbles



TECH TIPS

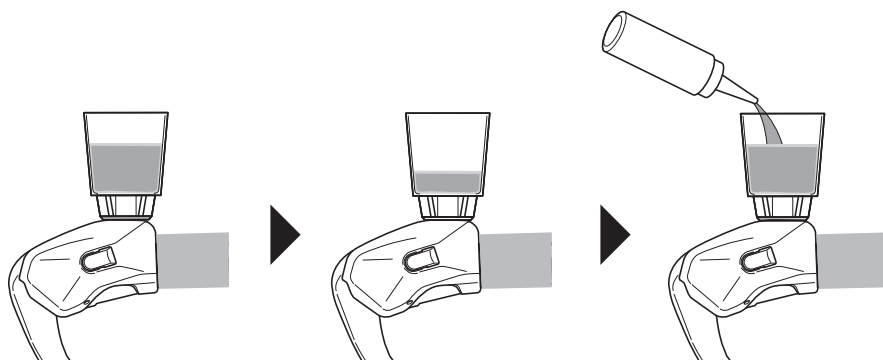
It may be effective to shake the brake hose gently, to tap the lever bracket or brake calipers gently with a screwdriver, or to move the position of the calipers at this time.



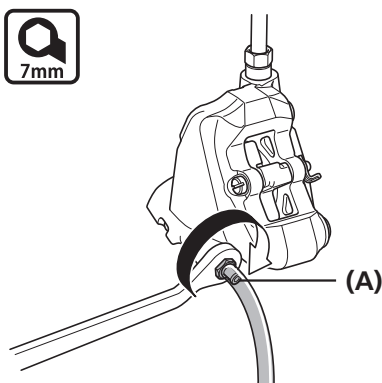
▶▶ Adding Shimano genuine mineral oil and bleeding air

11

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



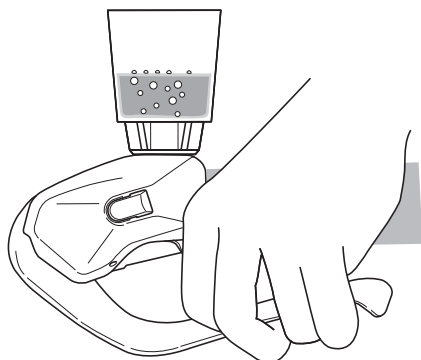
12



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

(A) Bleed nipple

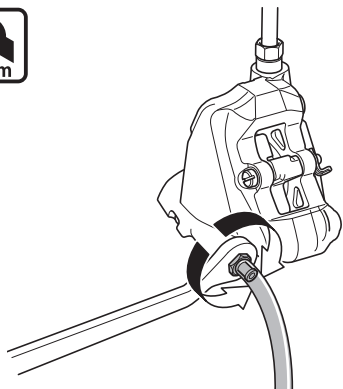
13



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

Repeat this procedure about 2 to 3 times.

14



Tighten the bleed nipple.

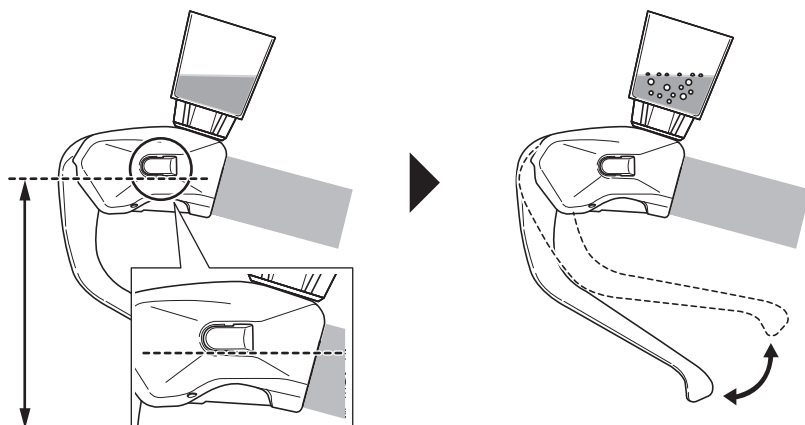
Tightening torque



4 - 7 N·m

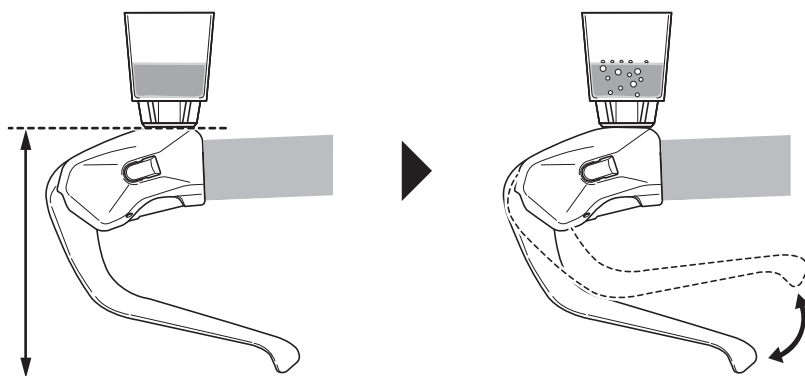
15

Make adjustments, such as changing the angle of the handlebar, so that the side of the bracket indicated in the illustration is parallel to the ground, and slowly apply and release the lever until no more air bubbles are emitted.



16

Make adjustments, such as changing the angle of the handlebar, so that the head of the bleed screw is parallel to the ground, and slowly apply and release the lever until no more air bubbles are emitted.



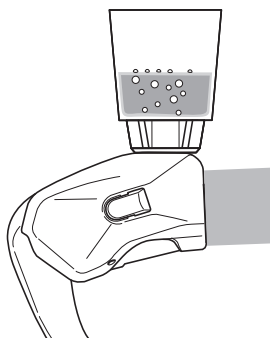
If the brake lever is then operated, air bubbles in the system will rise up through the port into the oil funnel.

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

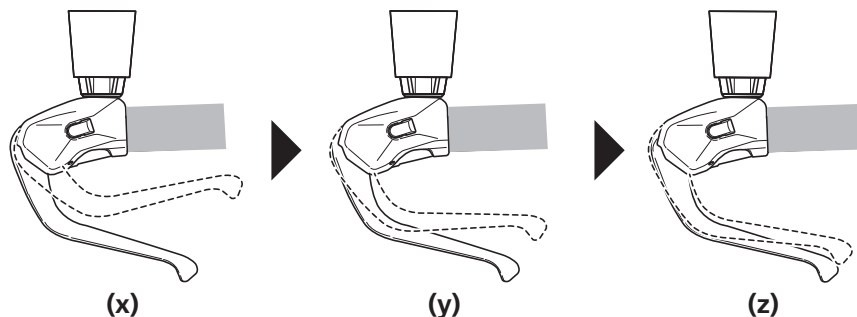
Under the normal condition, the lever action should feel stiff at this point.

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

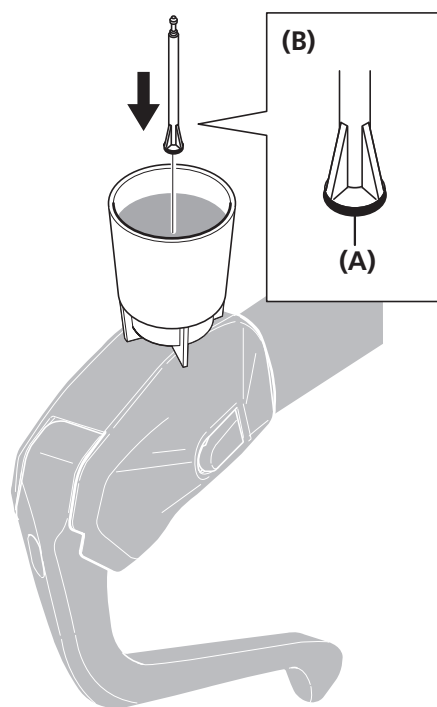
17



Lever operation



18

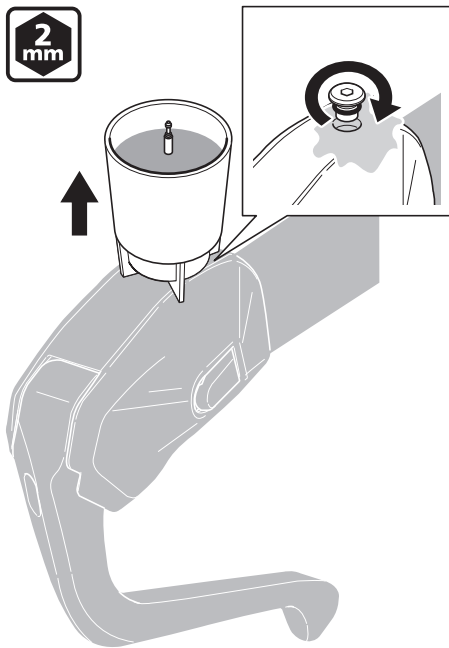


Plug the oil funnel with the oil stopper so that the O-ring mounted side is facing downward.

- (A)** O-ring
- (B)** Oil stopper

▶▶ Adding Shimano genuine mineral oil and bleeding air

19



Remove the oil funnel while still plugged with the oil stopper.

Attach the O-ring to the bleed screw and tighten it while letting oil flow out so as to make sure that no air bubbles remain inside the reservoir tank.

Tightening torque

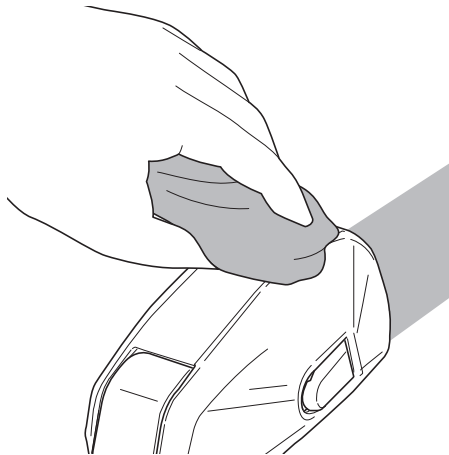


0.5 - 0.7 N·m

NOTE

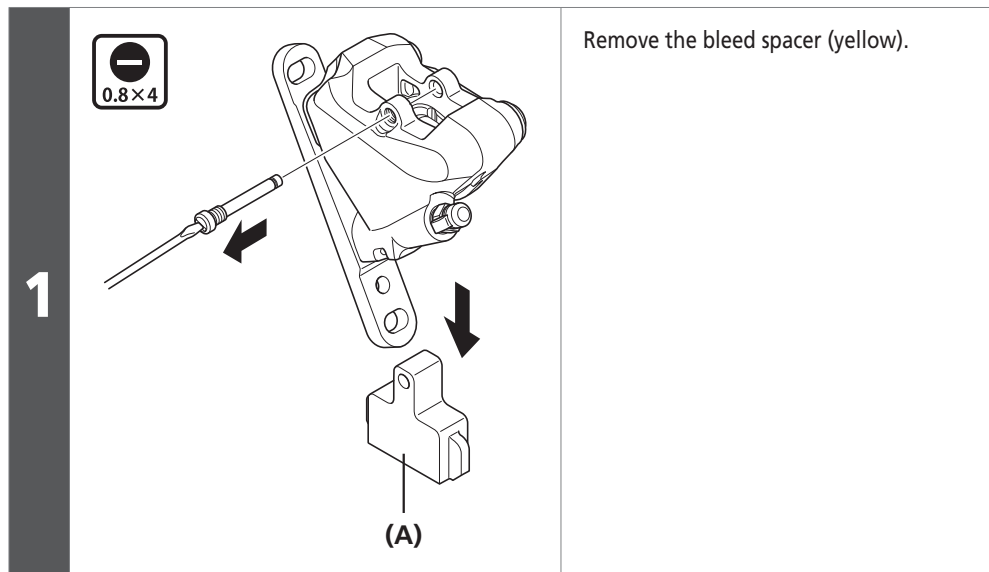
- Do not operate the brake lever. Otherwise, air bubbles may enter the cylinder.
- Use a waste cloth to prevent the oil from flowing to surrounding areas.

20

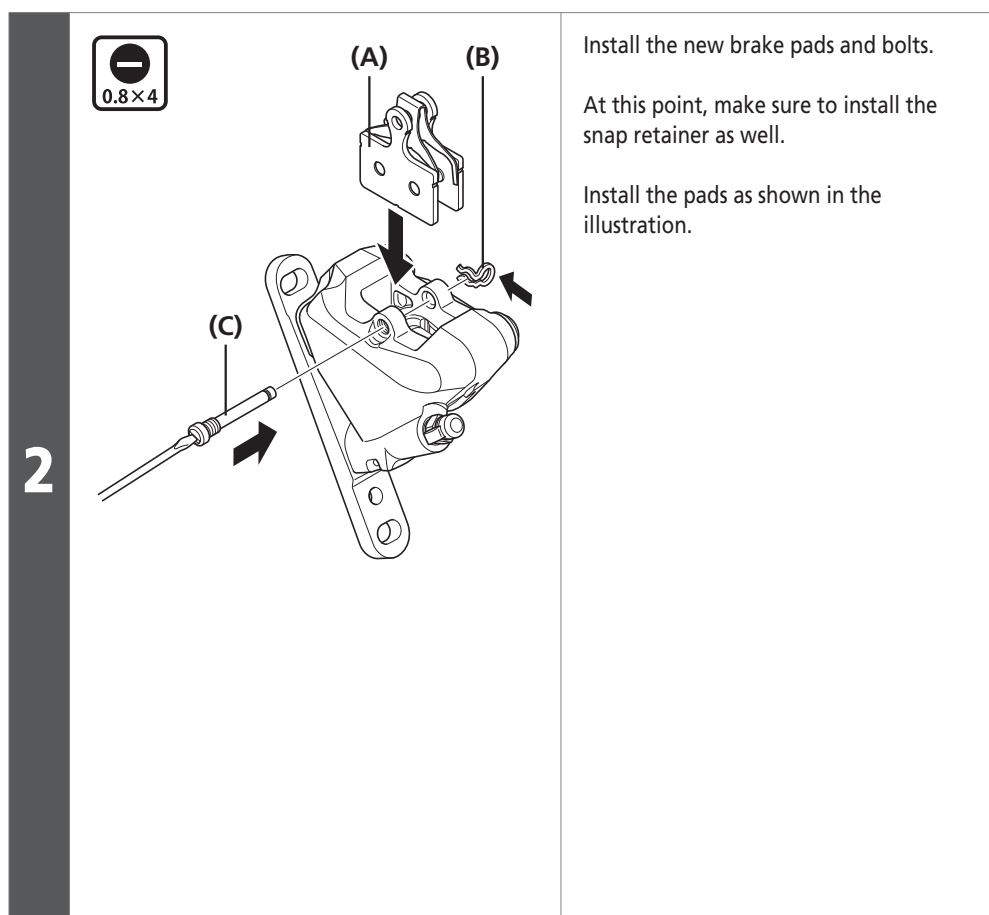


Wipe away any oil which has flowed out.

■ Installing the brake caliper



(A) Bleed spacer



(A) Brake pads
(B) Snap retainer
(C) Pad axle

Tightening torque



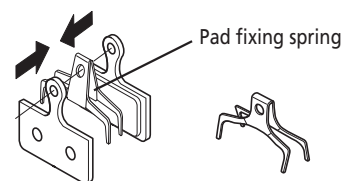
0.1 - 0.3 N·m

NOTE

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



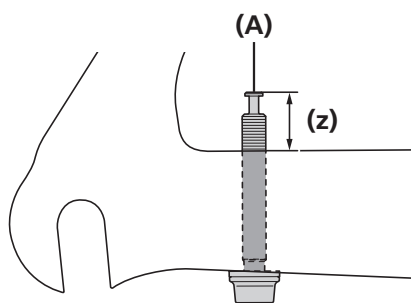
TECH TIPS



Install the pad fixing spring as shown in the illustration.

Check the length of brake caliper mounting bolt C

Rear (same for both 140mm and 160mm)



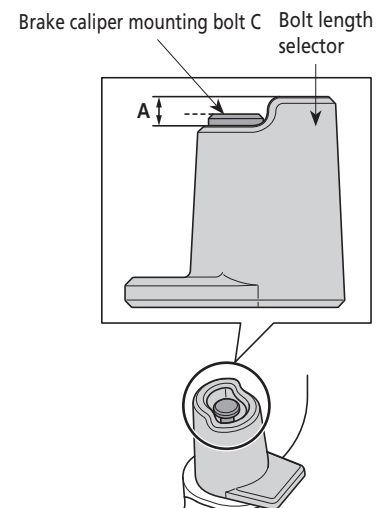
Insert the brake caliper mounting bolts C into the frame mount area, and make sure that the lengths of the protruding sections of the bolts are 13mm.

(z) 13mm

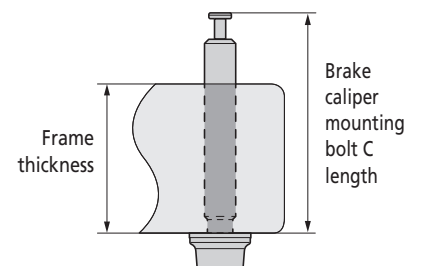
(A) Brake caliper mounting bolt C

NOTE

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



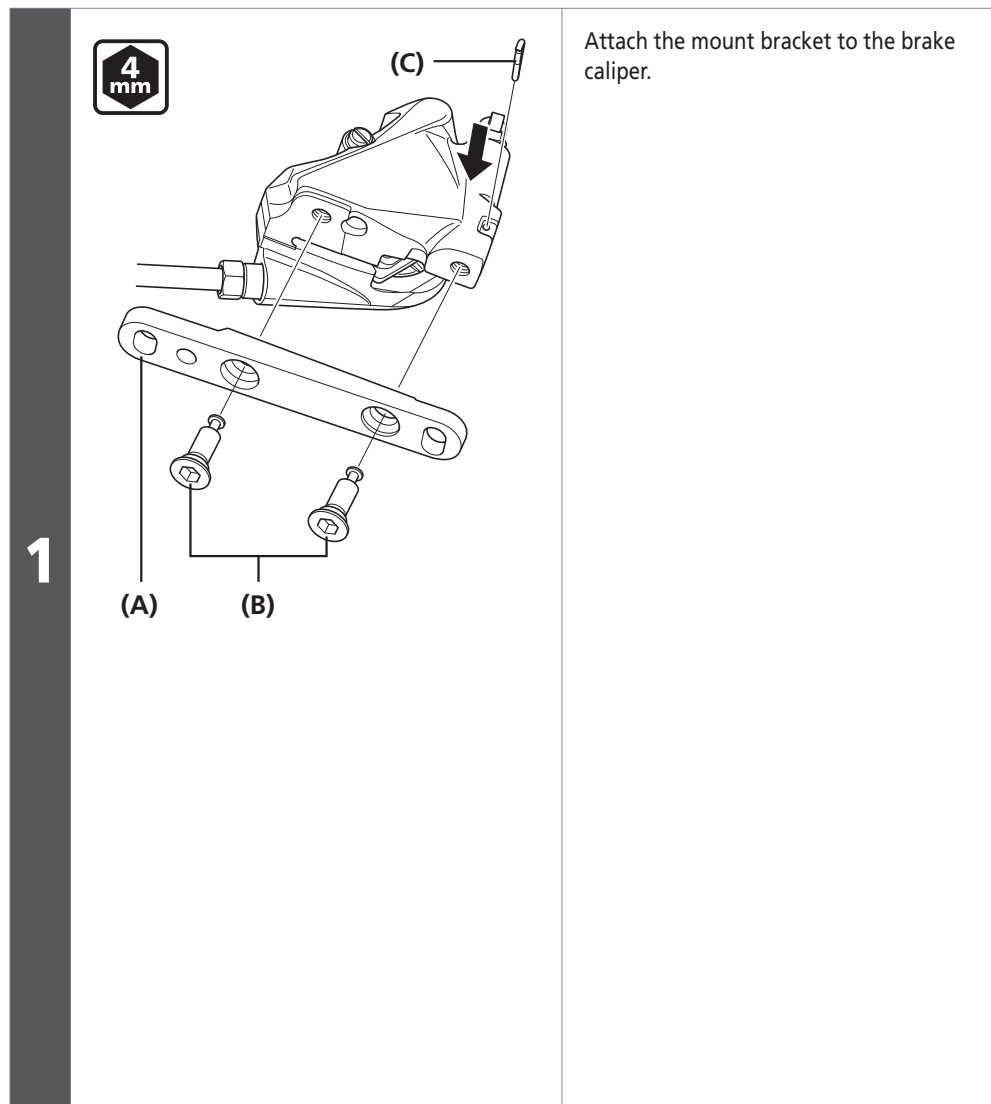
- Do not use a washer when checking the length of brake caliper mounting bolt C.
- The length of the brake caliper mounting bolt C used varies depending on thickness of the frame. Use brake caliper mounting bolt C that is suitable for the thickness of the frame.



Frame thickness	Brake caliper mounting bolt C length	Y-part
20mm	33mm	Y8PU08010
25mm	38mm	Y8PU08020
30mm	43mm	Y8PU08030

►► Installing the brake caliper

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

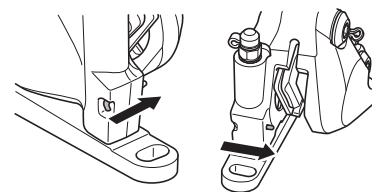


- (A) Mount bracket
- (B) Brake caliper mounting bolt B
- (C) Bolt fixing pin

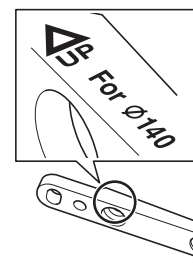
Tightening torque	
4 mm	6 - 8 N·m

NOTE

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

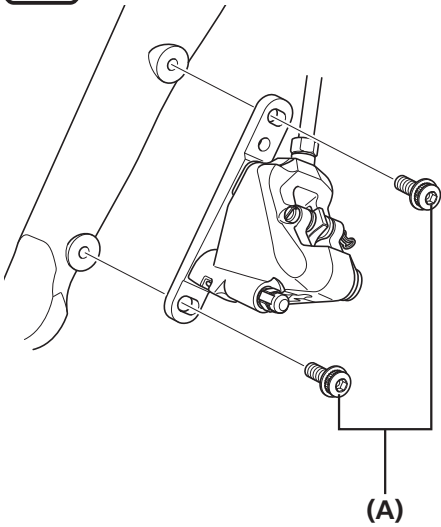


- Observe the direction indicated on the mount bracket when installing it.



▶▶ Installing the brake caliper

2



Temporarily attach the mount bracket to the frame.

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

(A) Brake caliper mounting bolt A

Tightening torque

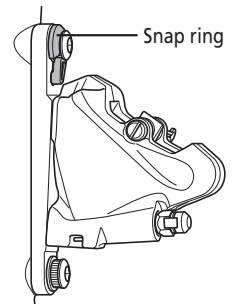


6 - 8 N·m

NOTE

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

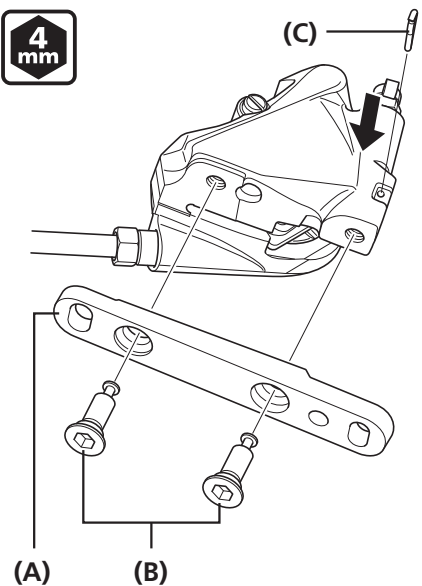
* The snap ring installation position is different for 140mm and 160mm. (The illustration shows a 140mm rotor.)



▶▶ Installing the brake caliper

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

1



(C)

(A)

(B)

4 mm

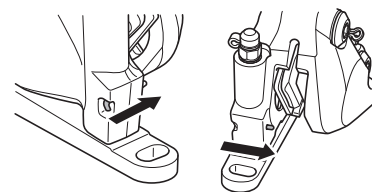
Attach the mount bracket to the brake caliper.

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

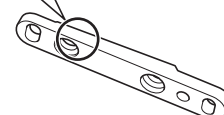
Tightening torque	
4 mm	6 - 8 N·m

NOTE

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

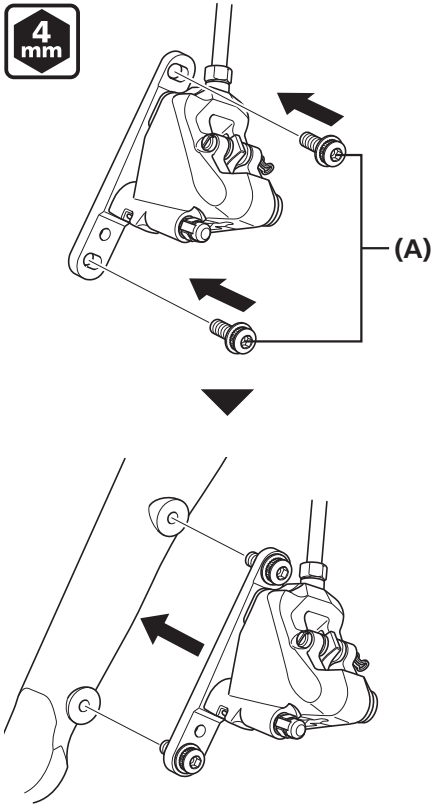


- Observe the direction indicated on the mount bracket when installing it.



▶▶ Installing the brake caliper

2



Insert the brake caliper mounting bolts A into the holes in the mount bracket first and then temporarily attach the mount bracket to the frame, as in the illustration.

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

(A) Brake caliper mounting bolt A

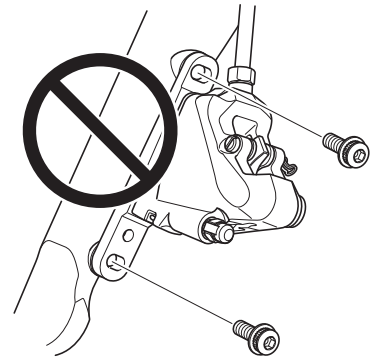
Tightening torque



6 - 8 N·m

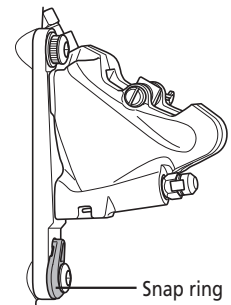
NOTE

- Do not insert the brake caliper mounting bolts A after placing the mount bracket on to the surface of the frame. The brake caliper may be scratched by the mounting bolts.



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

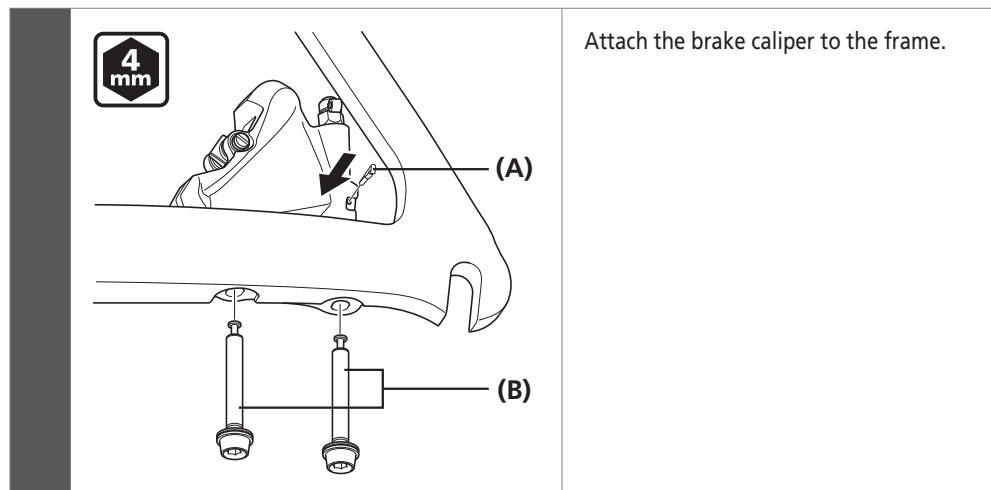
* The snap ring installation position is different for 140mm and 160mm. (The illustration shows a 160mm rotor.)



Snap ring

▶▶ Installing the brake caliper

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



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

Tightening torque

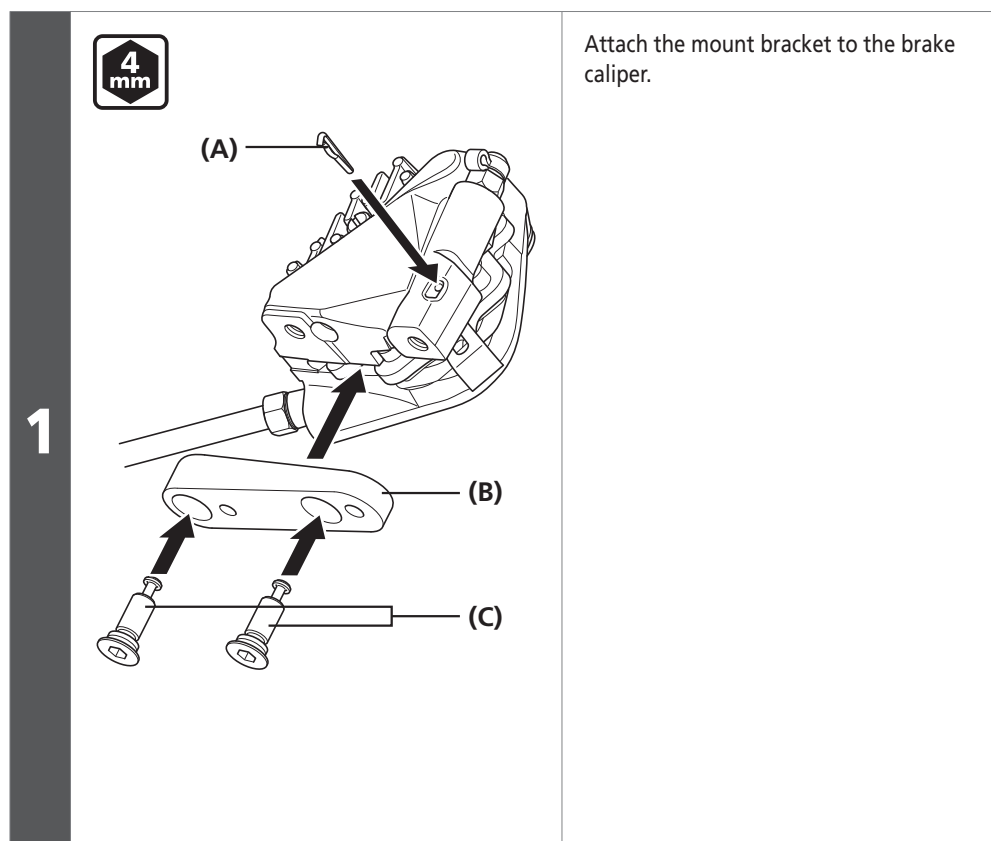


6 - 8 N·m

NOTE

Be sure to attach the bolt fixing pin.

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



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

Tightening torque



6 - 8 N·m

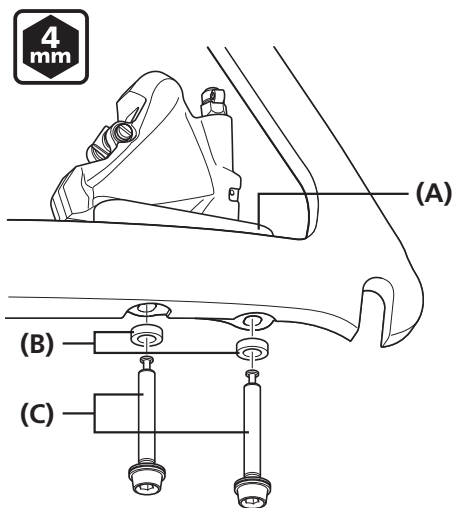
NOTE

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



▶▶ Installing the brake caliper

2



Attach the mount bracket to the frame.

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

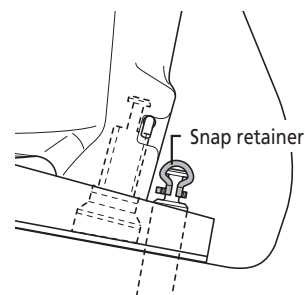
Tightening torque



6 - 8 N·m

NOTE

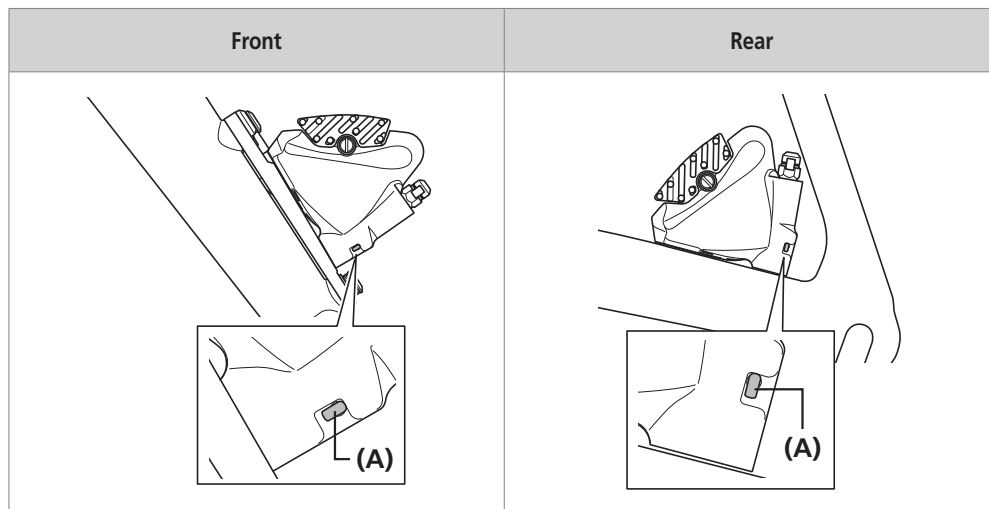
- Be sure to use the washers when installing the mount bracket.
- Be sure to attach a snap retainer when installing brake caliper mounting bolts C.



▶▶ Temporary tightening of the frame fixing bolts

■ Temporary tightening of the frame fixing bolts

Fixing pin insertion method



(A) Bolt fixing pin

CONNECTION OF ELECTRIC WIRES

CONNECTION OF ELECTRIC WIRES

For details on using the Shimano original tool TL-EW02, refer to the section "Using the Shimano original tool TL-EW02".

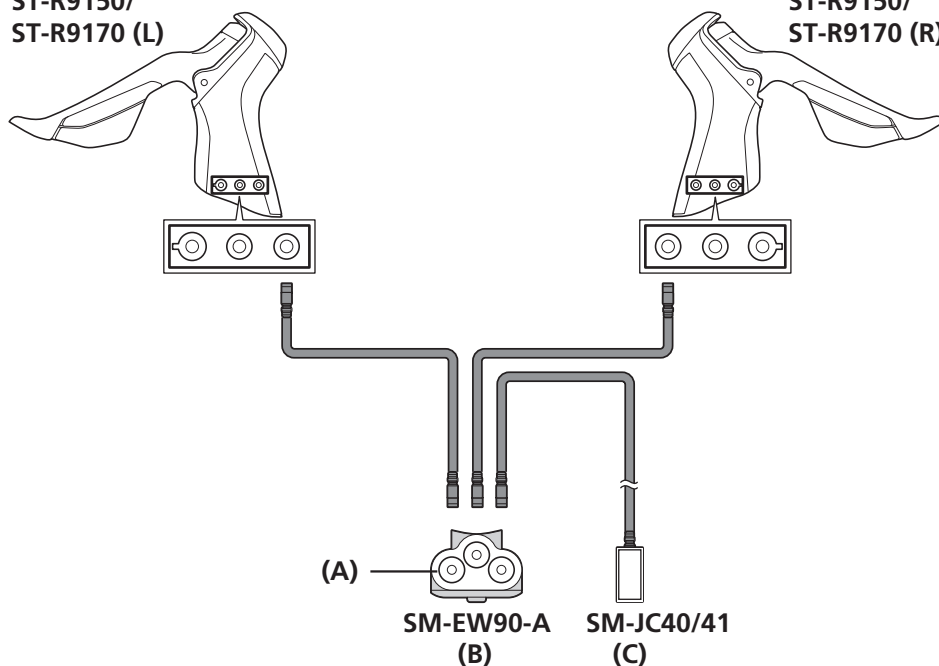
■ Connection of junction A

ST-R9150/ST-R9170 with SM-EW90 routing map

3 port type

ST-R9150/
ST-R9170 (L)

ST-R9150/
ST-R9170 (R)



(A) E-TUBE port x3

(B) Junction A

(C) Junction B

(D) E-TUBE port x5



TECH TIPS

When wiring SM-EW90, consider the positioning of ST-R9150/ST-R9170 and ensure that there is sufficient slack in the wires to allow for the full turning of the handlebar.

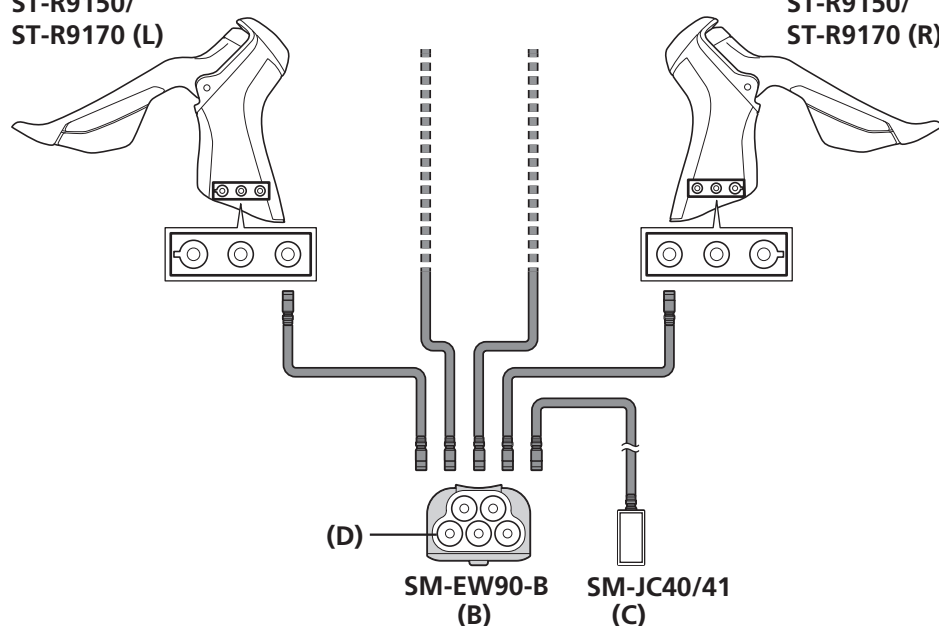
NOTE

ST-R9170 does not have a port for remote sprinter shifter.

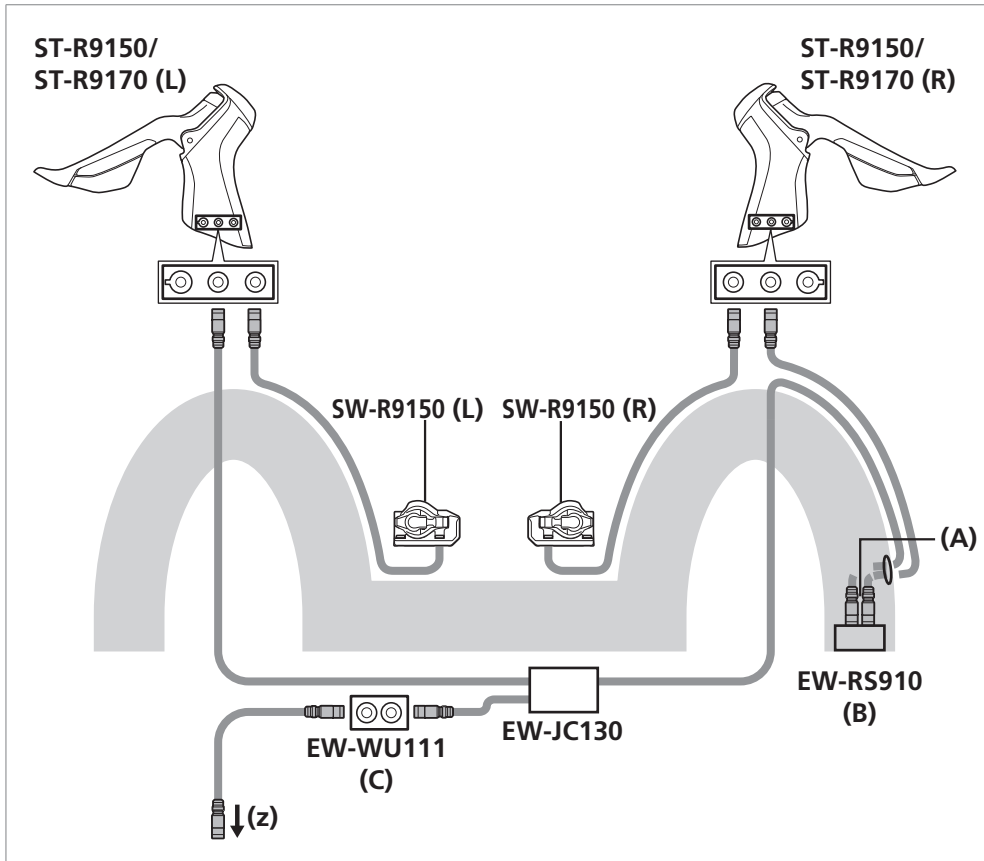
5 port type

ST-R9150/
ST-R9170 (L)

ST-R9150/
ST-R9170 (R)



ST-R9150/ST-R9170 with EW-RS910 routing map



(z) To frame (Junction B)

(A) E-TUBE port x2

(B) Junction A
(2 port bar end type junction)

(C) Wireless unit



TECH TIPS

When wiring EW-RS910 consider the positioning of ST-R9150/ST-R9170 and ensure that there is sufficient slack in the wires to allow for the full turning of the handlebar.

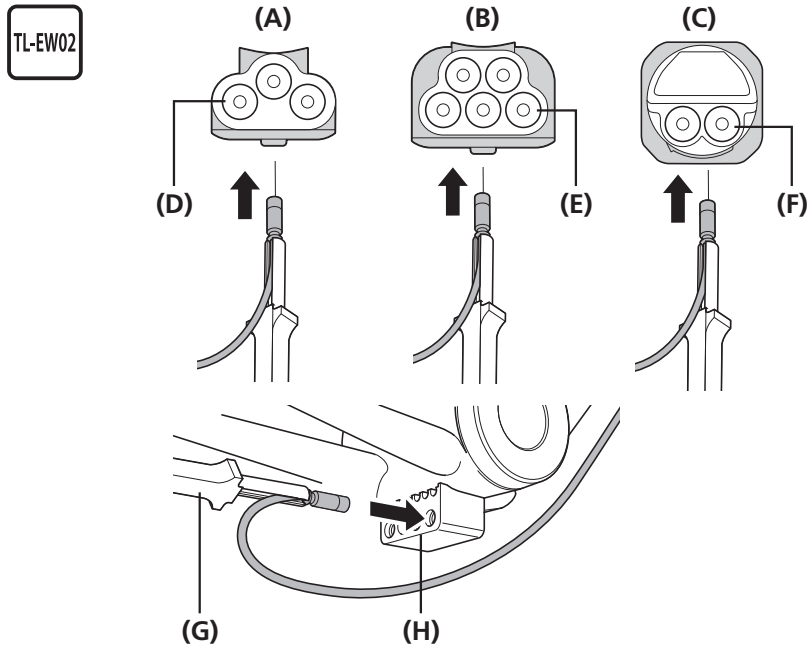
NOTE

ST-R9170 does not have a port for remote sprinter shifter.

■ Connection of junction B

External type (SM-JC40)

Connect the electric wires to junction A and junction B.



- (A) SM-EW90-A Junction A
- (B) SM-EW90-B Junction A
- (C) EW-RS910 Junction A
- (D) E-TUBE port x3
- (E) E-TUBE port x5
- (F) E-TUBE port x2
- (G) Shimano original tool TL-EW02
- (H) Junction B



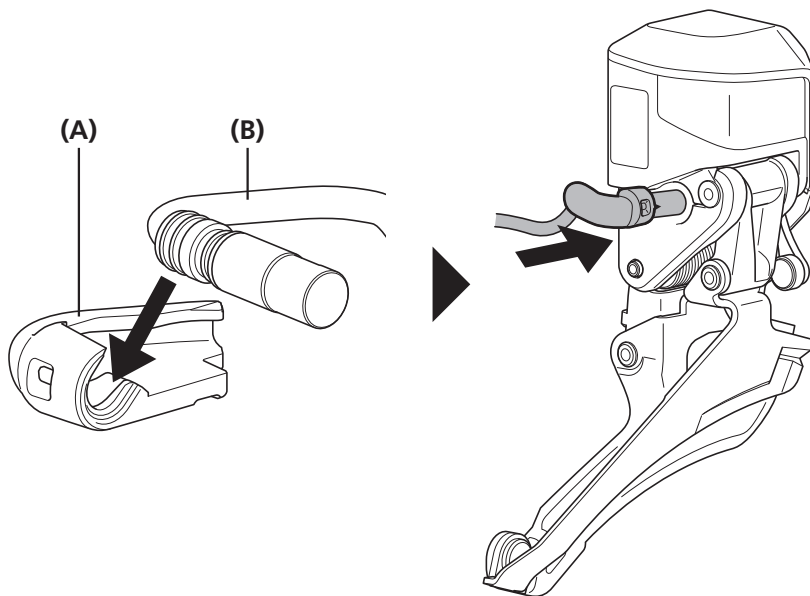
TECH TIPS

When connecting electric wires, push them in until you feel and hear a click.

Connecting to FD-R9150

Attach the plug cover to the electric wire.

Connect the electric wire to the front derailleur together with the plug cover.



- (A) Plug cover
- (B) Electric wire

Connecting to other parts

2

Connect the electric wires to the rear derailleur and the battery mount.

Rear derailleur

Battery mount

(A) Shimano original tool TL-EW02

3

Temporarily secure the electric wire along the frame with tape, and connect it to junction B.

NOTE

When routing the electric wire to the rear derailleur, be sure to install it to the bottom of the chainstay to avoid any interference between the cable and the chain.

4

Wind any excess length of electric wire inside junction B to adjust the length.

Example of adjusting junction B length

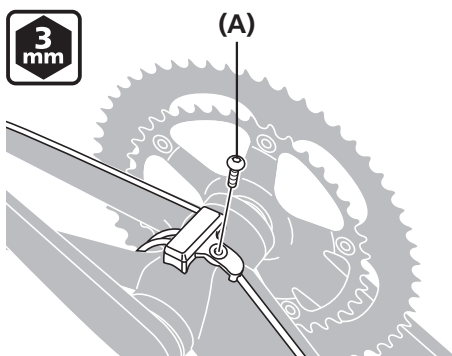
▼ To be continued on next page

132

CONNECTION OF ELECTRIC WIRES

►► Connection of junction B

5



Once the electric wires have been routed, secure junction B underneath the bottom bracket shell.

(A) Junction B fixing bolt
(10.5mm or 15mm)

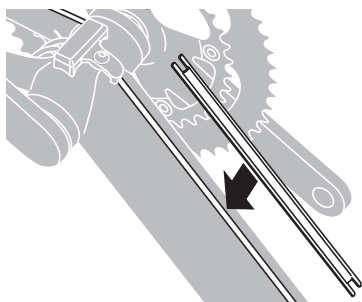
Tightening torque



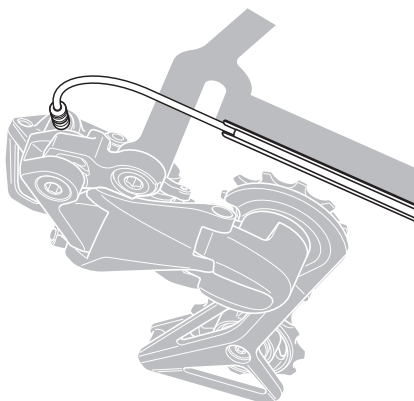
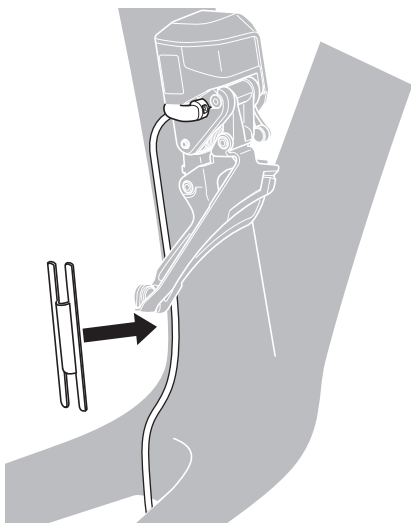
1.5 - 2 N·m

Next, install the electric wire cover onto the frame.

Place the electric wire cover over the electric wires, and then attach it to the frame.



6

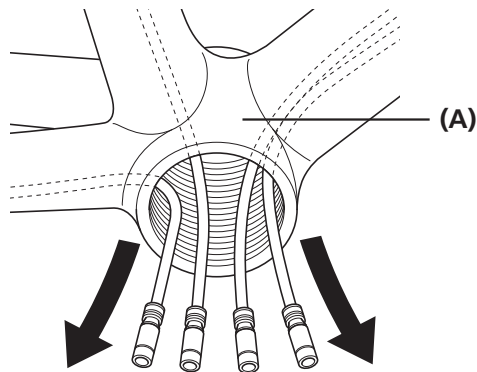


NOTE

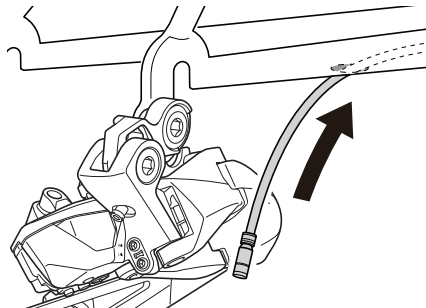
To ensure adhesion, before installing the electric wire cover, wipe off the grease on the frame with alcohol or a cleaner.

Built-in type (SM-JC41)

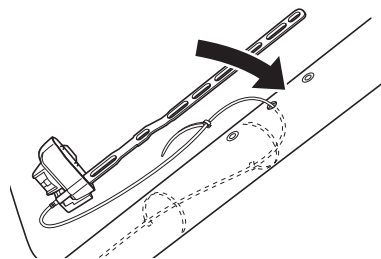
First pass the electric wires for junction A, the battery mount, the front derailleur and the rear derailleur through the holes in the frame into the bottom bracket shell.



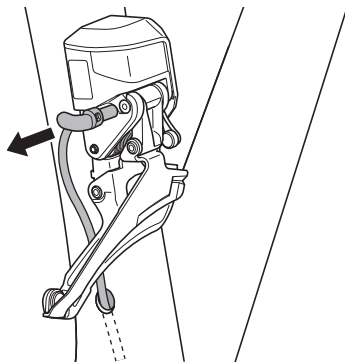
Electric wire for rear derailleur



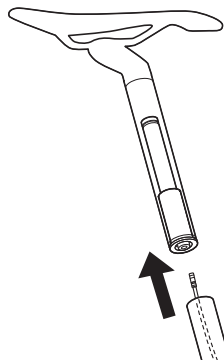
Electric wire for battery mount
[In the case of an external battery (SM-BTR1)]



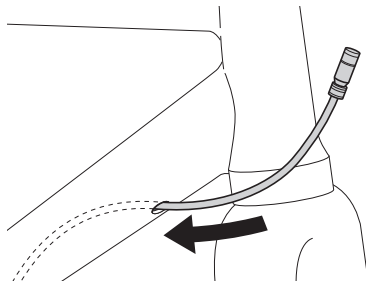
Electric wire for front derailleur



Electric wire for battery mount
[In the case of a built-in battery (SM-BTR2/
BT-DN110/BT-DN110-A)]



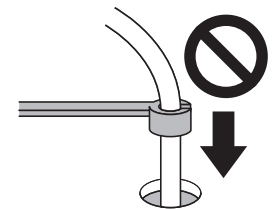
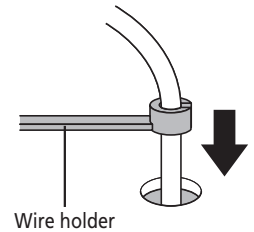
Electric wire for junction A



(A) Bottom bracket shell

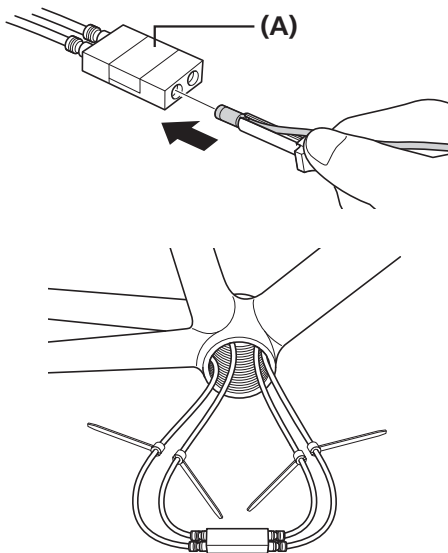


The electric wires for built-in use can be inserted only in one direction. Make sure that you insert them from the direction shown in the illustration.



▶▶ Connection of junction B

2



Connect each electric wire to junction B.

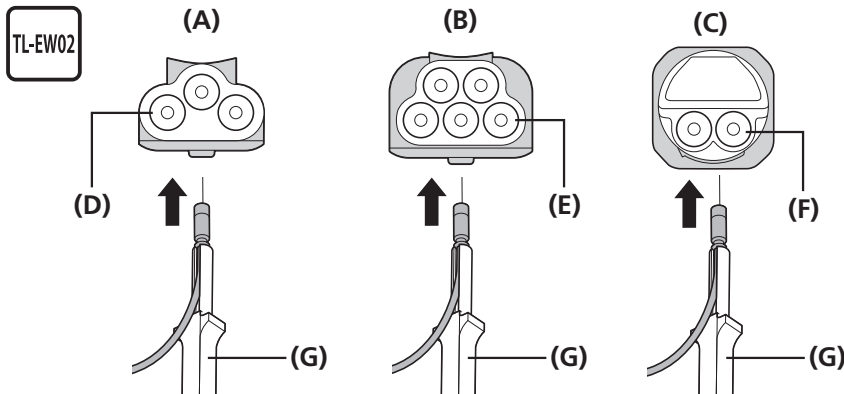
(A) SM-JC40/41 Junction B



When connecting electric wires, push them in until you feel and hear a click.

3

Connect the electric wires to junction A.



(A) SM-EW90-A Junction A

(B) SM-EW90-B Junction A

(C) EW-RS910 Junction A

(D) E-TUBE port x3

(E) E-TUBE port x5

(F) E-TUBE port x2

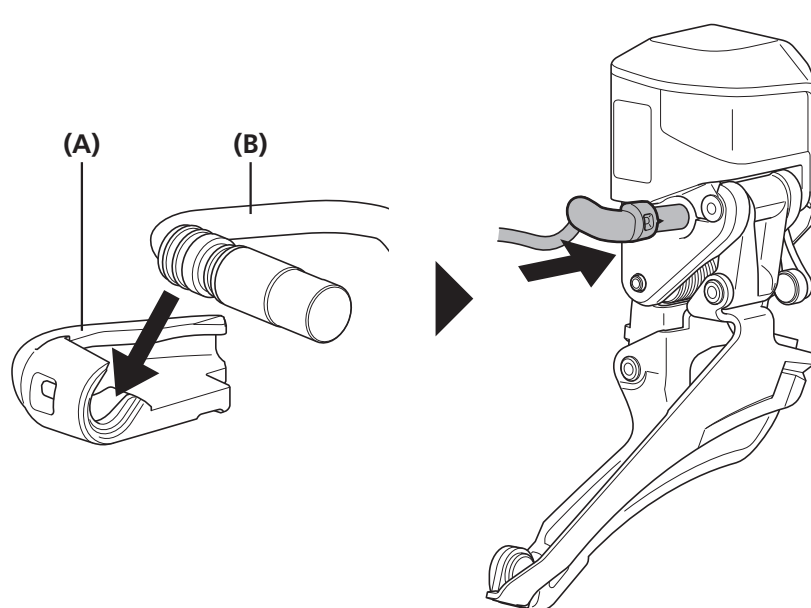
(G) Shimano original tool TL-EW02

Connecting to FD-R9150

4

Attach the plug cover to the electric wire.

Connect the electric wire to the front derailleur together with the plug cover.



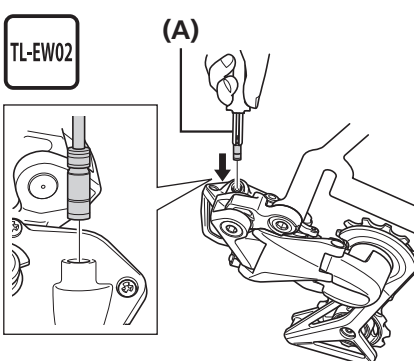
- (A) Plug cover
- (B) Electric wire

Connecting to other parts

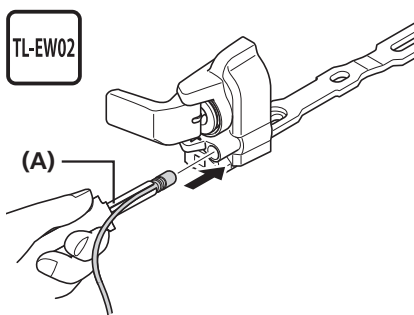
4

Connect the electric wires to the rear derailleur and the battery mount.

Rear derailleur



Battery mount



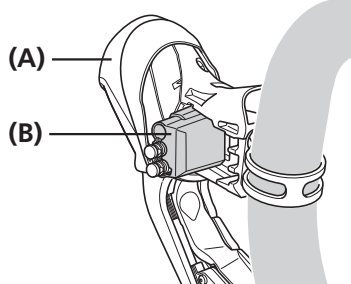
- (A) Shimano original tool TL-EW02

136

■ Connecting to the dual control lever

ST-R9150/ST-R9170

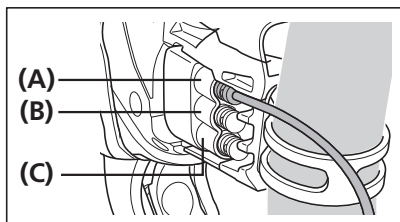
1



Pull back the bracket cover from the rear and lift up the connector cover.

- (A) Bracket cover
- (B) Connector cover

TL-EW02



Use TL-EW02 to connect the connector of the electric wire to an E-TUBE port in the lever.

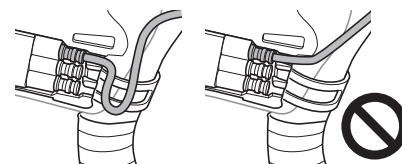
Connect to either E-TUBE port [X] or E-TUBE port [Y].
(A connection can be made with either E-TUBE port [X] or E-TUBE port [Y].)

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

- (A) E-TUBE port [X]
- (B) E-TUBE port [Y]
- (C) Port for remote sprinter shifter (ST-R9170 does not have this port.)
- (D) Shimano original tool TL-EW02

NOTE

- When the handle is gripped or the bar tape is wound, the electric wires may be pulled out. By allowing sufficient wire length, accidental disconnection can be prevented after winding the bar tape.
- This length margin of electric wire is also necessary to open the bracket cover when additional switch and the SM-PCE1 is connected.



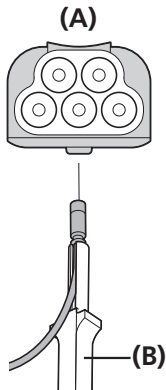
TECH TIPS

The remaining unused E-TUBE port [X] or E-TUBE port [Y] can be used for an additional shifting switch or SM-PCE1. (The port for remote sprinter shifter cannot be used for an additional shifting switch or SM-PCE1.) This is an example connection.

SW-R9160/ST-R9160/ST-R9180

For the following models, attach the electric wire of the product to junction A.

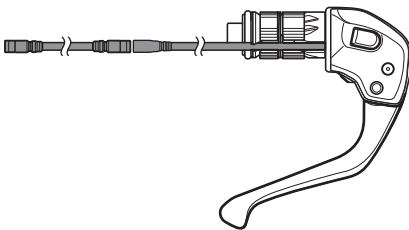
TL-EW02



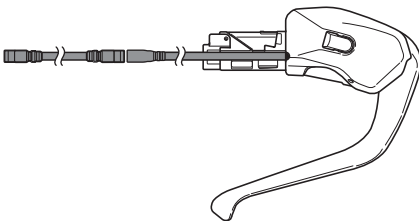
SW-R9160



ST-R9160



ST-R9180

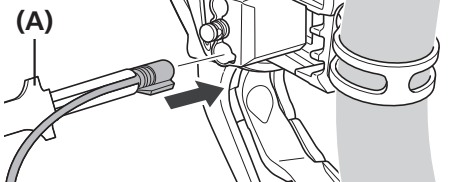


(A) Junction A

(B) Shimano original tool TL-EW02

SW-R610

TL-EW02



SW-R610



(A) Shimano original tool TL-EW02

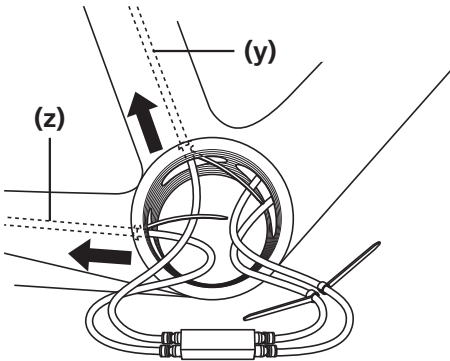


TECH TIPS

The port shape is different only for SW-R610.

■ Routing junction B and the electric wires inside the frame

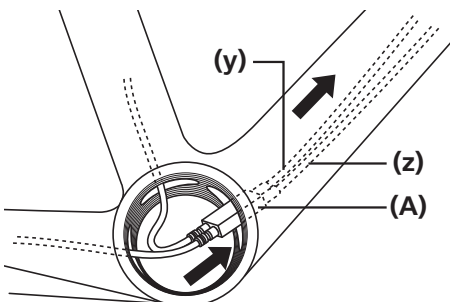
1



Pass the electric wires for the front derailleur and the rear derailleur through the seat tube and chainstay respectively.

(y) For front derailleur
(z) For rear derailleur

2



Pass the electric wires for junction A, the battery mount, and junction B through the down tube.

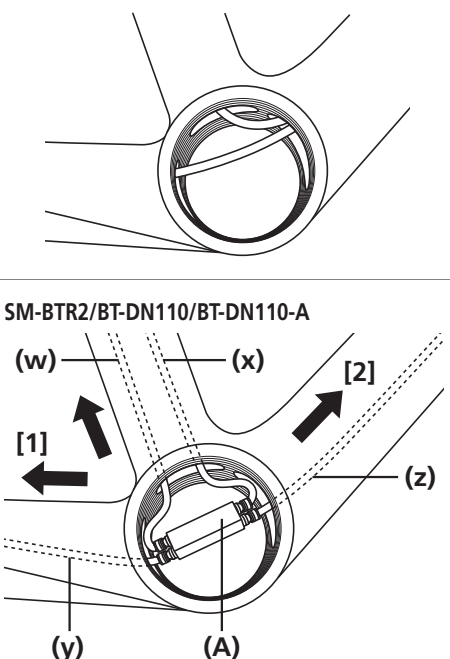
(y) For junction A
(z) For battery mount
(A) For junction B

(A) Junction B

NOTE

Be careful not to damage any parts with the screws of the bottom bracket shell.

3



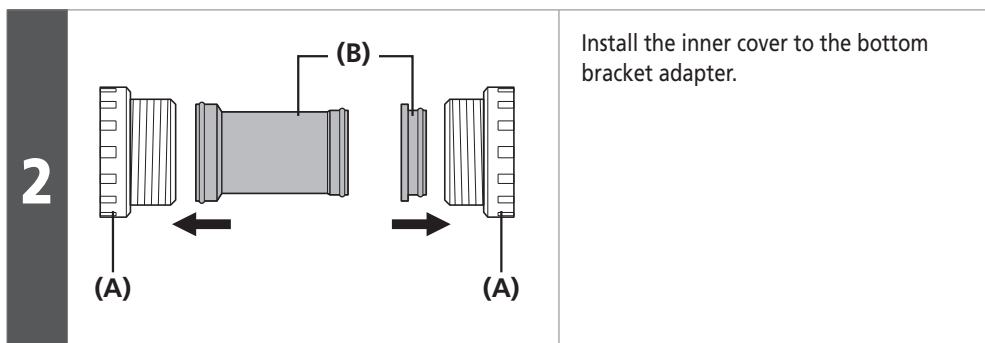
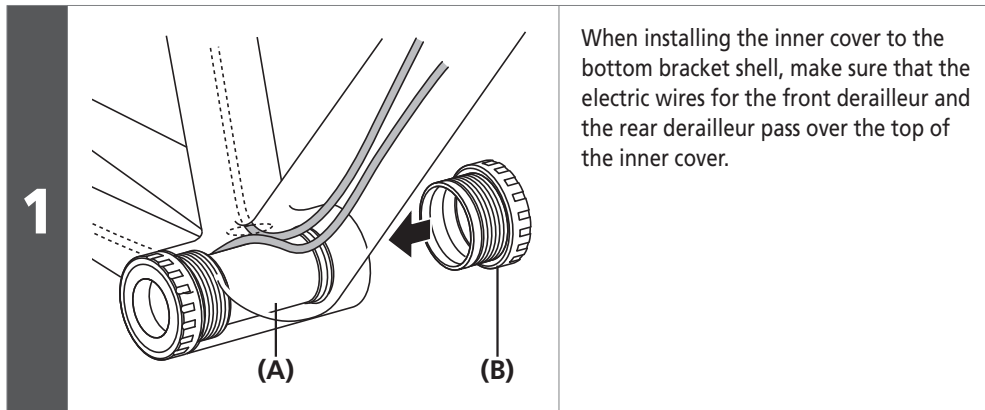
Set the electric wires so that only the electric wires for the front derailleur and the rear derailleur are visible inside the bottom bracket shell, and if any extra parts such as wire holders are protruding, push them back inside the frame.

SM-BTR2/BT-DN110/BT-DN110-A

(w) For lithium ion battery (built-in type)
(x) For front derailleur
(y) For rear derailleur
(z) For junction A

(A) Junction B

■ Assembly of the bottom bracket

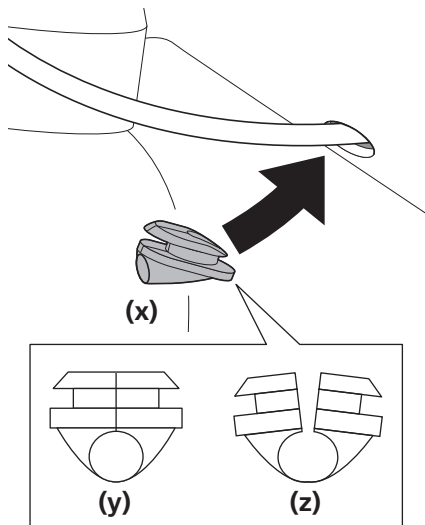


NOTE

If using a frame which does not have enough space between the inside of the bottom bracket shell and the inner cover to route the electric wires use an inner cover which is sold separately.

■ Installation of grommets

1



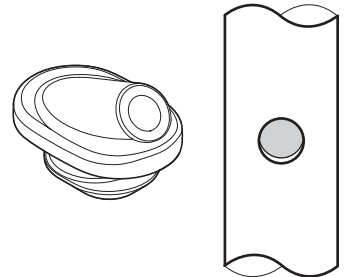
Install grommets in appropriate positions for the electric wires.

- (x) Junction A side
- (y) Close
- (z) Open

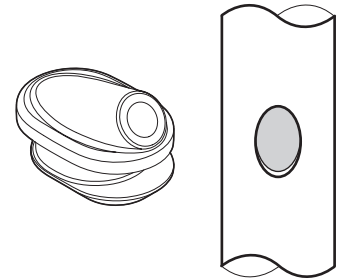


There are two types of grommets. Choose one according to the shape of the hole in the frame.

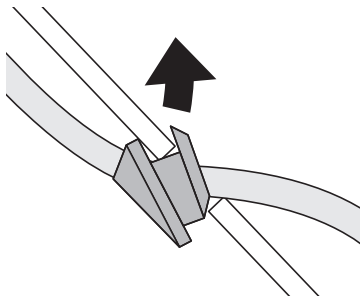
Circle: SM-GM01



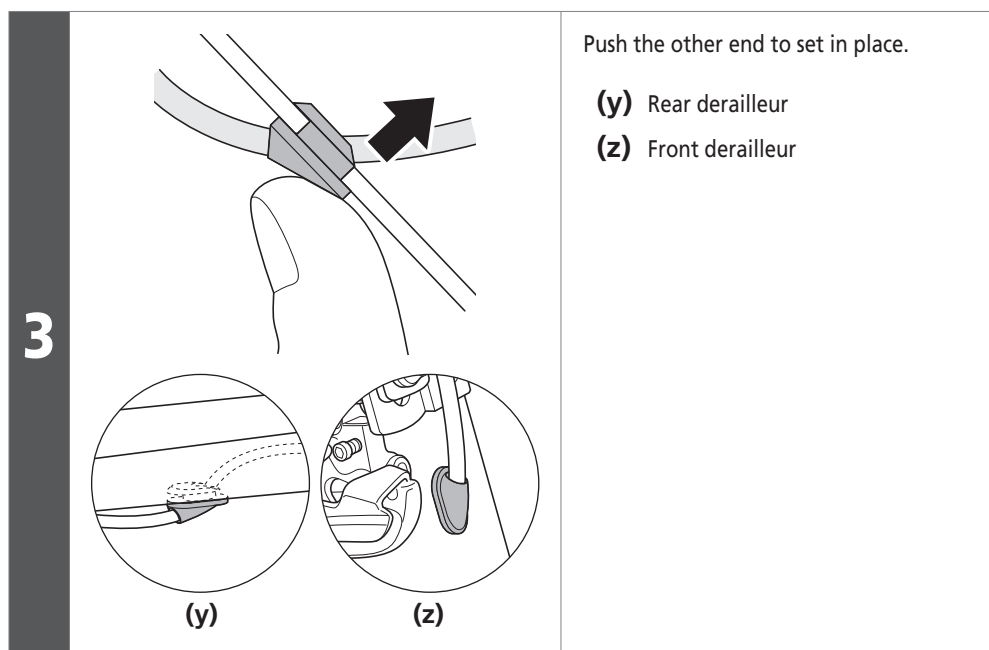
Ellipse: SM-GM02



2



Insert the grommets into the holes in the frame starting with the rear end.



■ Checking connections

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

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

2

CAUTION

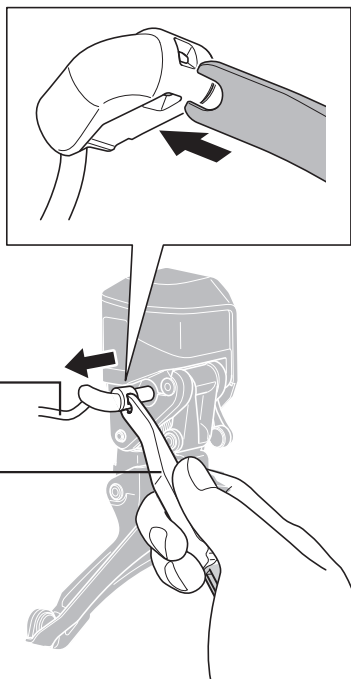
Make sure to remove the battery before performing operations that involve close proximity to the front derailleur, such as installation/uninstallation of the front chainwheel or front derailleur, or installation/adjustment of the chain.

If the front derailleur is activated by accident, there is a risk of your fingers getting caught and injury.

■ Disconnection of the electric wires

FD-R9150

TL-EW02



Insert the tips of the wide end of the TL-EW02 Shimano original tool into the holes (2 places) in the plug cover to disconnect the electric wire.

(A) Electric wire

(B) Shimano original tool TL-EW02

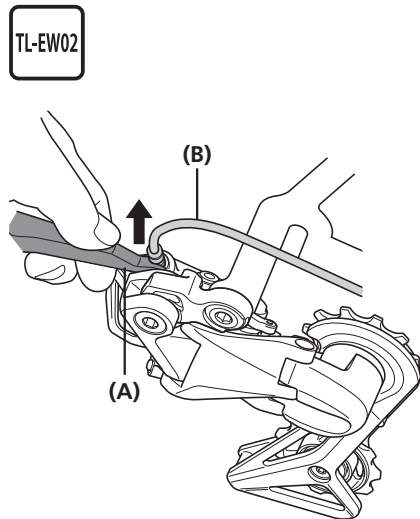
NOTE

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

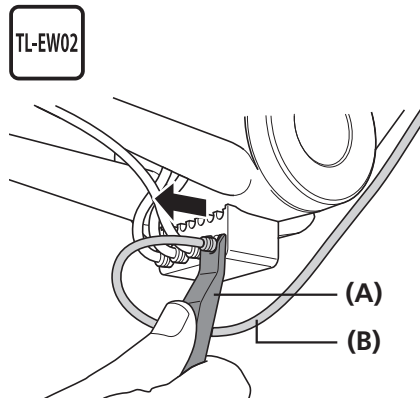
Disconnection of other parts

With the base portion of the hook firmly held down using the wider end of the Shimano original tool TL-EW02, remove the electric wire.

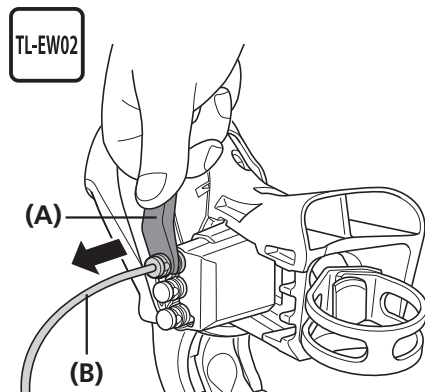
RD-R9150



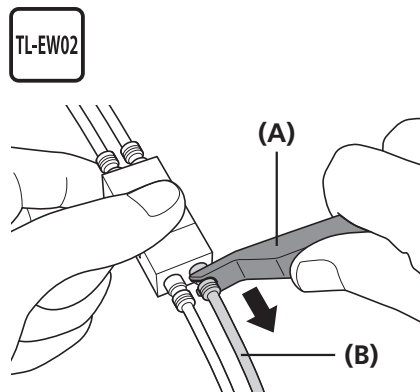
SM-JC40



ST-R9150/ST-R9170



SM-JC41



- (A) Shimano original tool TL-EW02
(B) Electric wire

NOTE

- Do not keep connecting and disconnecting the small waterproof connector. The waterproof section or the connecting section may become worn or deformed, and the function may be affected.
- When removing the electric wire, use the wider end of the Shimano original tool TL-EW02 as shown in the illustration. If you pull too firmly on the connectors, problems with operation may occur.
- ST-R9170 does not have a port for remote sprinter shifter.

HOW TO OPERATE

HOW TO OPERATE

■ Gear position control

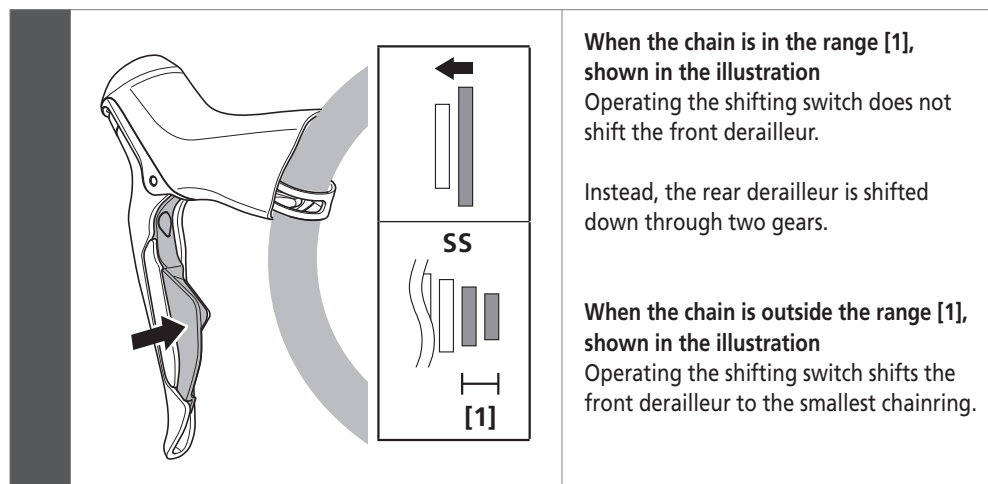
This gear-shifting system is programmed to prevent shifting into gears that would lower the chain tension.

Therefore, if you try to shift into such gears, shifting may function differently from the basic operations.

The illustration below shows the gear positions that would lower the chain tension and the shifting operations performed when you shift into those gears.

Points to remember when shifting the front derailleur

When you shift into the smallest chainring, shifting is controlled as follows.



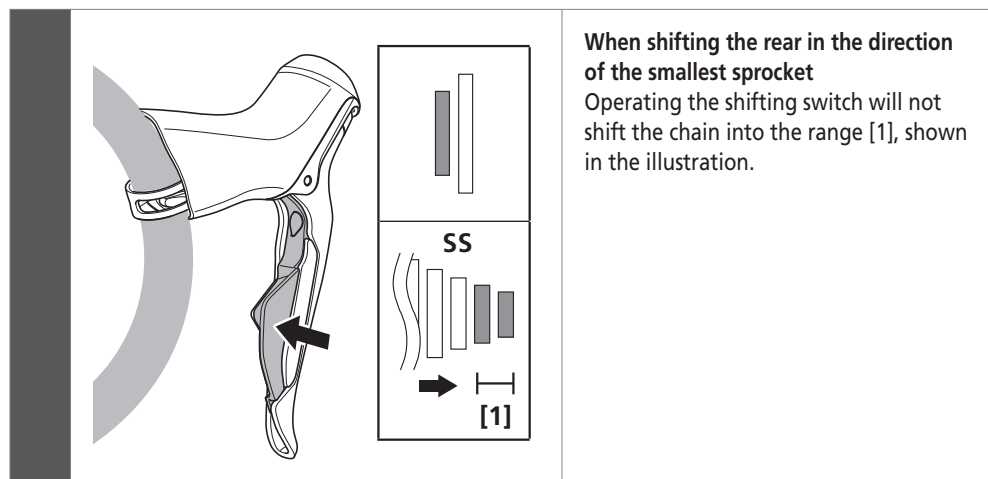
[1] From the smallest to the second sprocket.

NOTE

- If you use combinations of front and rear derailleurs besides those recommended, the shifting-restricted range may become larger.
- Restrictions on gear position can be disabled via the Customize menu in E-TUBE PROJECT. (Restrictions cannot be disabled for 52–36T or 50–34T.)

Points to remember when shifting the rear derailleur

When the chain position is in the smallest front chainring, gear shifting is controlled as follows.



[1] From the smallest to the second sprocket.

ADJUSTMENT

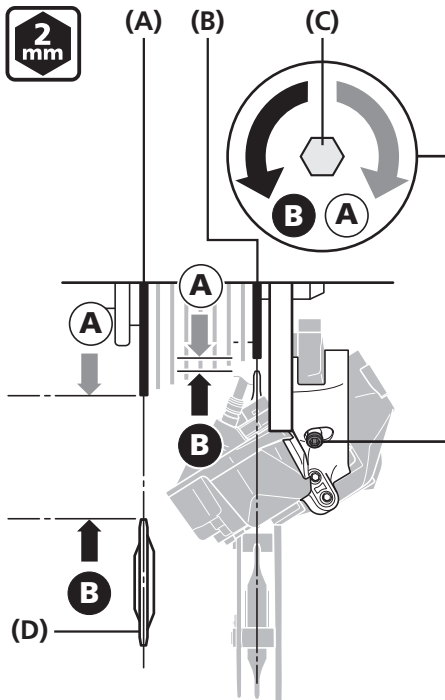
ADJUSTMENT

■ Adjustment of the rear derailleur

1

Install the battery.

2



Adjust the end adjust bolt.

Mount the chain on the largest sprocket, and shift gears turning the crank arm.

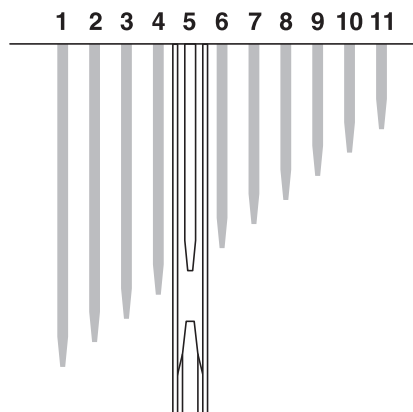
Turn the end adjust bolt to move the guide pulley as close to the sprocket as possible but not so close that the chain gets jammed.

Next, check that the chain does not get jammed when it is on the smallest sprocket.

If there is any slack in the chain when the chain is mounted on the smallest chainring and smallest sprocket, adjust the end adjust bolt to eliminate it.

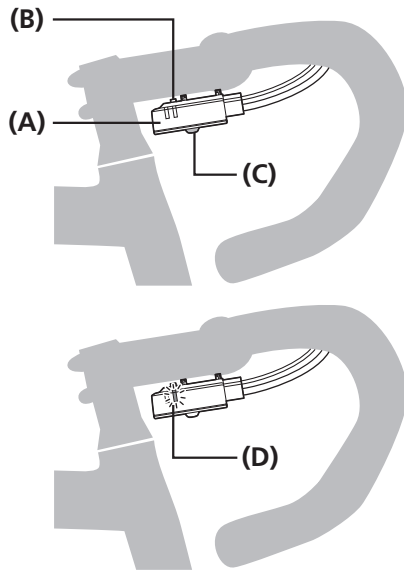
- (A)** Largest sprocket
- (B)** Smallest sprocket
- (C)** End adjust bolt
- (D)** Guide pulley

3



Shift the rear derailleur to the 5th sprocket position.

SM-EW90-A/B



Press the button at junction A until the button LED illuminates in order to switch from gear shifting mode to adjustment mode.

- (A) Junction A
- (B) LED window for button
- (C) Button
- (D) Red LED

NOTE

Note that if you keep pressing the button after the button LED has illuminated, RD Protection Reset will begin.

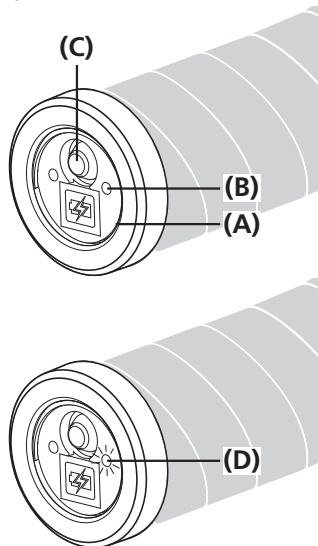


TECH TIPS

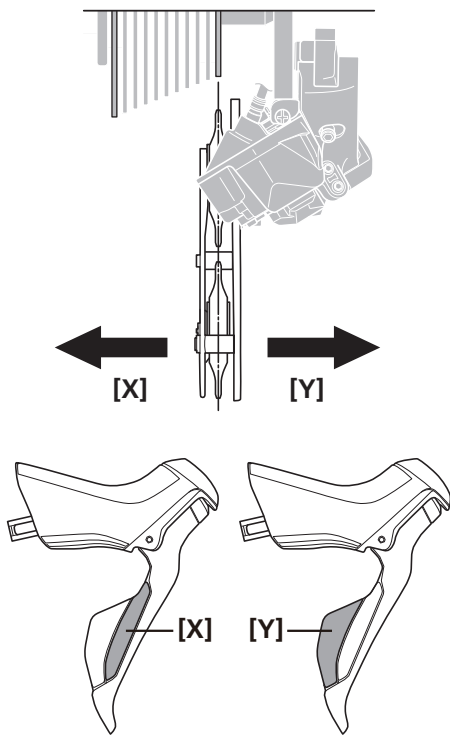
For details on RD Protection, refer to "About RD Protection Function" in the user's manual for the rear derailleur (DI2).

4

EW-RS910



5



If shifting switch [X] is pressed once while the initial setting condition is active, the guide pulley will move one step toward the inside.

If shifting switch [Y] is pressed once, the guide pulley will move one step toward the outside.

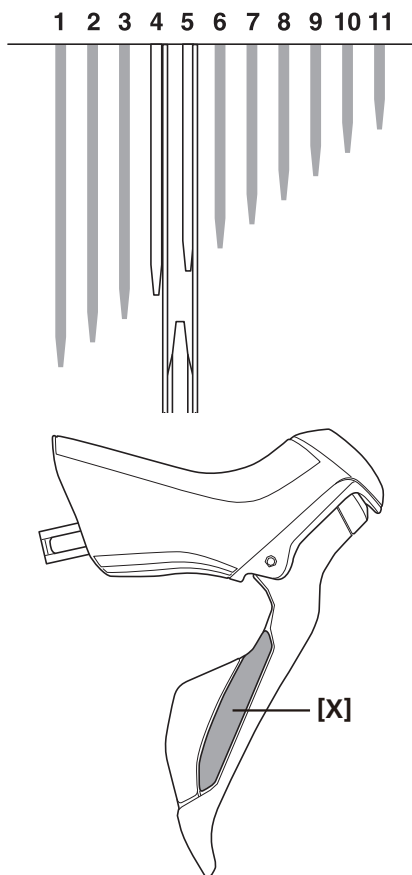
The guide pulley can move 16 steps inward and 16 steps outward from the initial position, for a total of 32 positions.



TECH TIPS

When adjusting, the guide pulley will overrun slightly and then move back in an exaggerated movement so that you can check the adjustment direction.
When checking the positions of the guide pulley and the sprocket, check the position where the guide pulley finally stops.

6

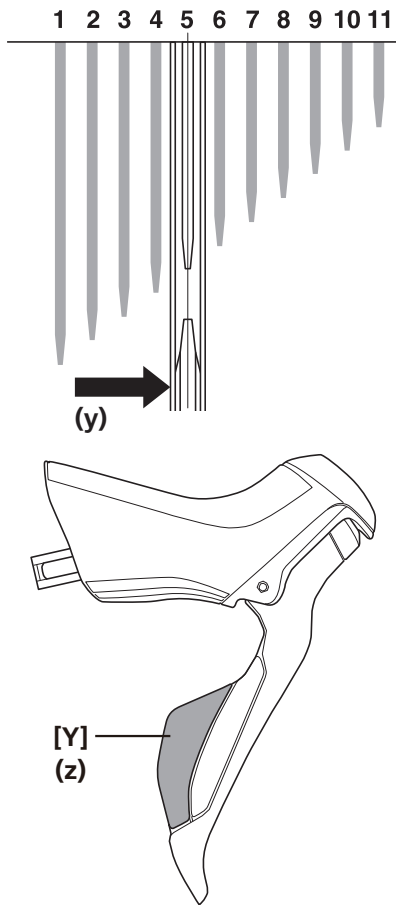


While turning the front chainwheel, operate shifting switch [X] to move the guide pulley toward the inside until the chain touches the 4th sprocket and makes a slight noise.

ADJUSTMENT

► Adjustment of the rear derailleur

7



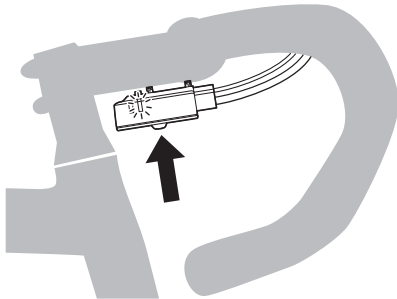
Next, operate shifting switch [Y] 4 times to move the guide pulley toward the outside by 4 steps to the target position.

(y) 4 steps

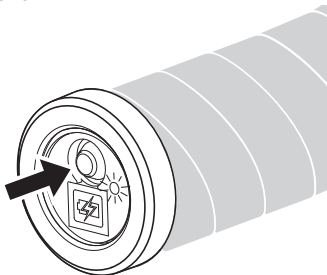
(z) 4 times

8

SM-EW90-A/B



EW-RS910



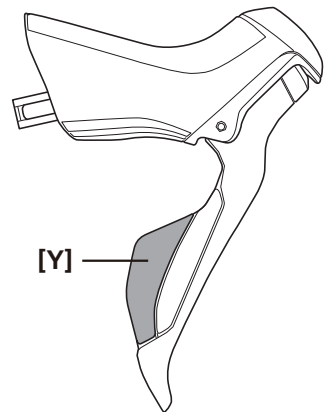
Press the button at junction A until the red LED turns off in order to switch from rear derailleur adjustment mode to gear shifting mode.

Shift to each gear and check that no noise is generated at any gear position.

If adjustment is needed, switch back to adjustment mode and readjust the rear derailleur.

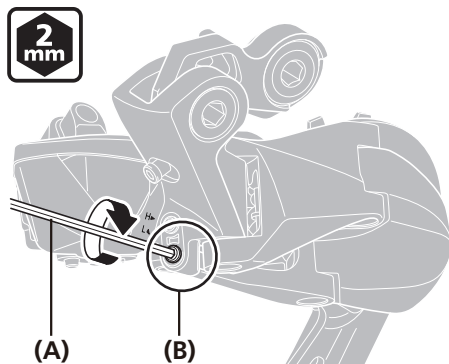
NOTE

Change to adjustment mode, operate shifting switch [Y], and move the guide pulley outwards until shift shock is alleviated.



Next, adjust the stopper bolt.

Adjustment of the low-side stopper bolt



Shift the rear derailleur to the largest sprocket, and then tighten the low-side stopper bolt until it just touches the left link.

If it is tightened too much, the motor will detect a problem and gear shifting will not operate correctly.

(A) 2mm hexagon wrench

(B) Low-side stopper bolt



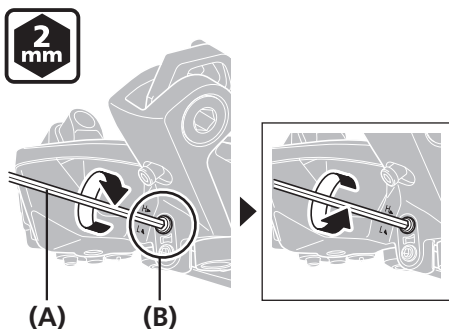
TECH TIPS

Possible occurrences if the adjustment bolt is overtightened

- Gears do not shift to the top/low gear. (Even if you shift gears to the top or low gear, the gear may shift back by one gear after about 5 seconds.)
- Noise does not stop.
- The battery level drops quickly. (Load is being placed on the motor)
- The motor may be damaged. (irreparable)

9

Adjustment of the top-side stopper bolt



Shift to the smallest sprocket, and then tighten the top-side stopper bolt until it touches the left link at the position where the rear derailleur stops.

From this position, turn the top-side stopper bolt counterclockwise one turn so that an over-stroke allowance can always be maintained.

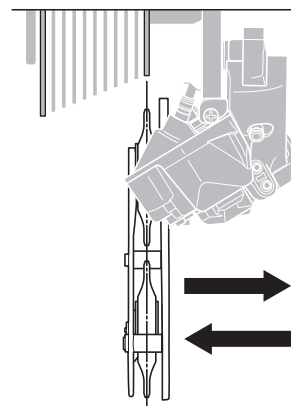
(A) 2mm hexagon wrench

(B) Top-side stopper bolt



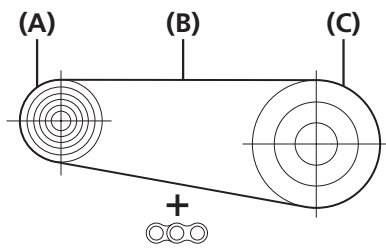
TECH TIPS

By shifting from the largest sprocket to the smallest sprocket, the rear derailleur will move toward the outside by the over-stroke allowance and then move back.



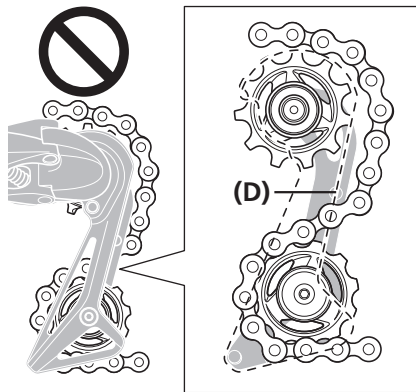
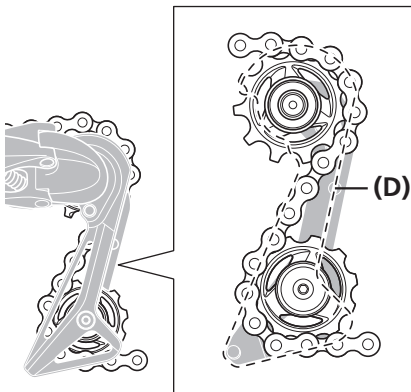
■ Installing the chain

Chain length



Mount the chain on to the largest sprocket at the rear and the largest chainring at the front.

Next, add 1 to 3 links to set the length of the chain.



- (A)** Largest sprocket
- (B)** Chain
- (C)** Largest chainring
- (D)** Pin for preventing chain derailment

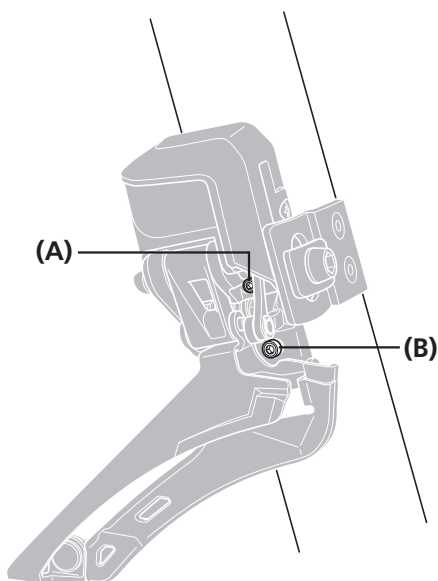
NOTE

The rear derailleur plate assembly is equipped with a pin or plate that prevents the chain from derailing.

When passing the chain through the rear derailleur, pass it through the rear derailleur body from the side of the chain derailment prevention plate as shown in the illustration. If the chain is not passed through the correct position, damage may be caused to the chain or rear derailleur.

■ Adjustment of the front derailleur

Checking bolt positions



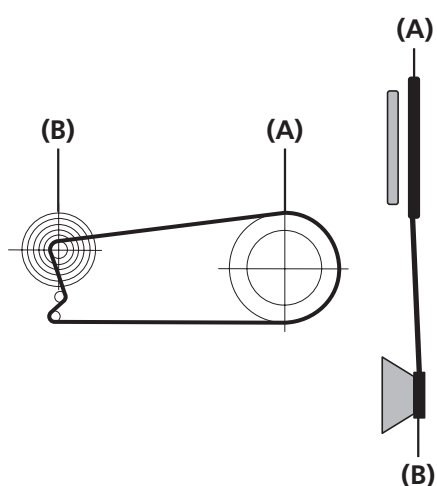
The top adjustment bolt and the support bolt are close to each other.

Make sure that you are using the correct bolt for adjustment.

- (A)** Support bolt
- (B)** Top adjustment bolt

Top adjustment

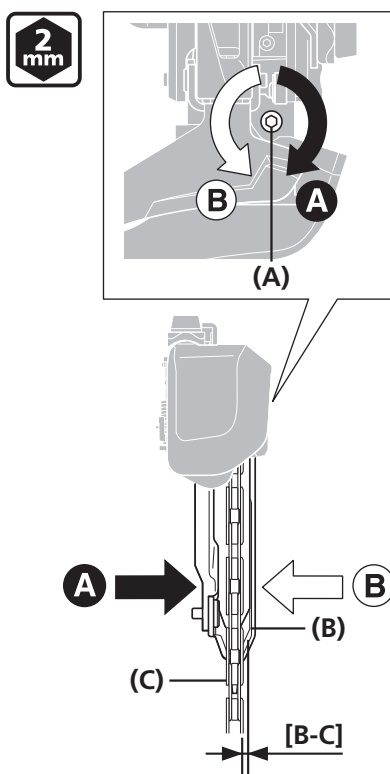
1



Set the chain on the largest chainring at the front and the smallest sprocket at the rear.

- (A) Largest chainring
(B) Smallest sprocket

2



Use a 2mm hexagon wrench to turn the top adjustment bolt.

Adjust so that there is a clearance of 0.5 - 1mm between the chain and the chain guide outer plate.

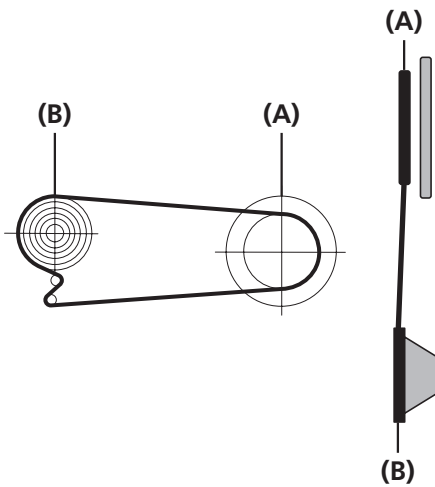
[B-C] 0.5 - 1mm

- (A) Top adjustment bolt
(B) Chain guide outer plate
(C) Chain

Low position electrical adjustment

For drop handlebar type

1

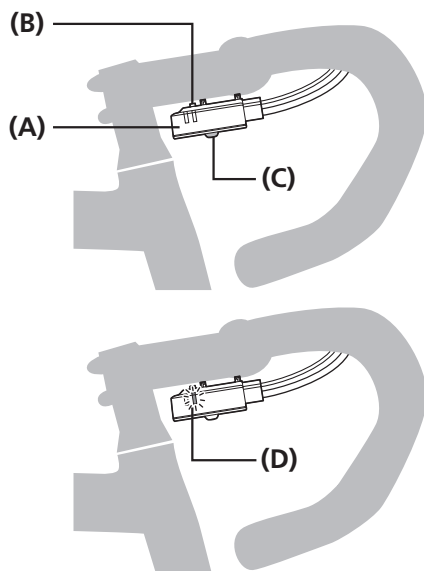


Set the chain on the smallest chainring at the front and the largest sprocket at the rear.

- (A) Smallest chainring
- (B) Largest sprocket

2

SM-EW90-A/B



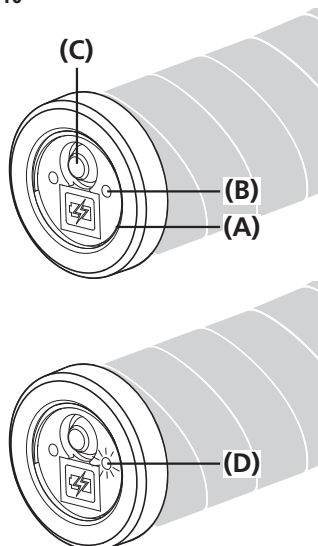
Press the button at junction A until the button LED illuminates in order to switch from gear shifting mode to adjustment mode.

- (A) Junction A
- (B) LED window for button
- (C) Button
- (D) Red LED

NOTE

Note that if you keep pressing the button after the button LED has illuminated, RD Protection Reset will begin.

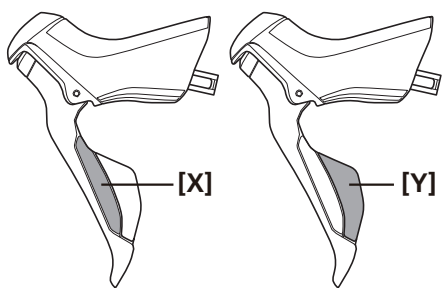
EW-RS910



ADJUSTMENT

► Adjustment of the front derailleur

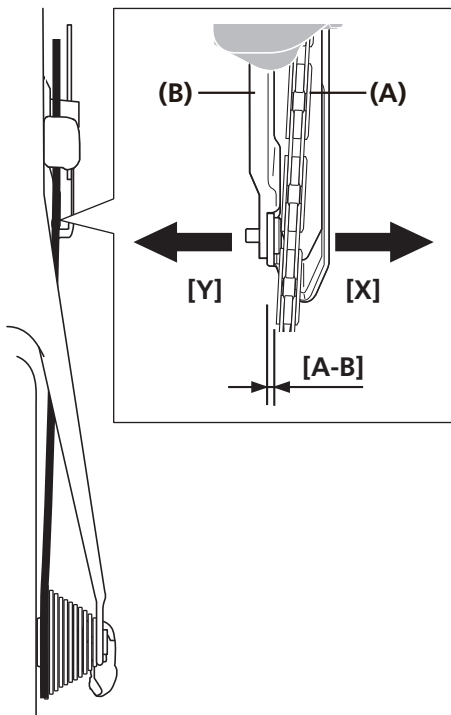
3



Operate shifting switch [X] or [Y].

Adjust so that there is a clearance of 0 – 0.5mm between the chain and the chain guide inner plate.

[A-B] 0 – 0.5mm



(A) Chain

(B) Chain guide inner plate

NOTE

Shift the front derailleur and the rear derailleur to all gears to make sure that the chain does not contact the chain guide.

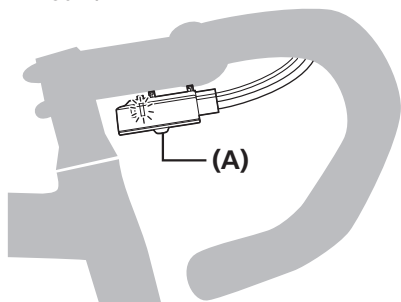


TECH TIPS

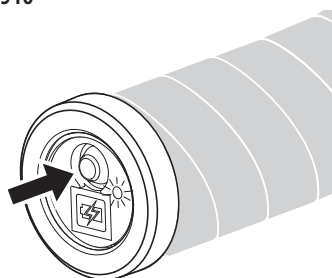
- The adjustable range is 37 steps. (18 steps inward and 18 steps outward from the initial position)
- When adjusting, the chain guide will overrun slightly and then move back in an exaggerated manner to help in verifying the adjustment direction. Make sure to check the positions of the chain guide and the chain when the chain guide has come to a stop.

4

SM-EW90-A/B



EW-RS910

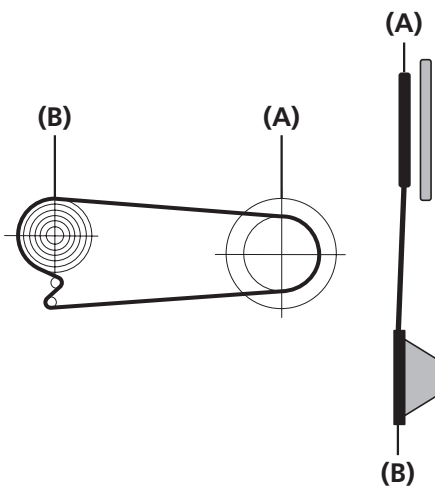


Press the button at junction A until the red LED turns off in order to switch from adjustment mode to gear shifting mode.

(A) Button

For time trial/triathlon handle type

1



Set the chain on the smallest chainring at the front and the largest sprocket at the rear.

- (A) Smallest chainring
(B) Largest sprocket

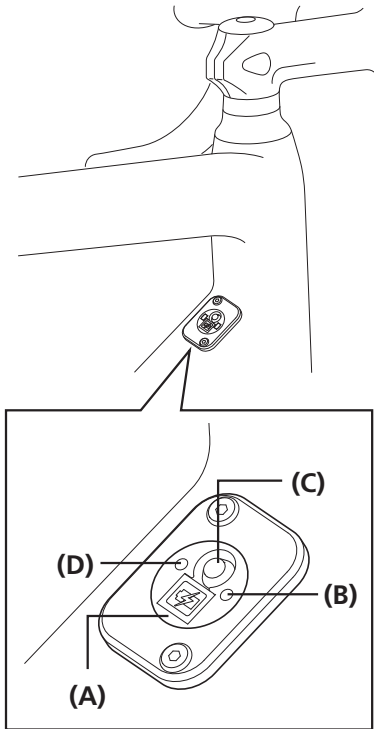


TECH TIPS

E-TUBE PROJECT can be used to set the chain to the smallest chainring and largest sprocket.

2

EW-RS910



Press the button at junction A until the button LED illuminates in order to switch from gear shifting mode to adjustment mode.

- (A) Junction A
(B) LED window for button
(C) Button
(D) Battery level display LED

NOTE

Note that if you keep pressing the button after the button LED has illuminated, RD Protection Reset will begin.



TECH TIPS

SM-EW90-A/B can also be switched to adjustment mode by operating the button the same way.

3

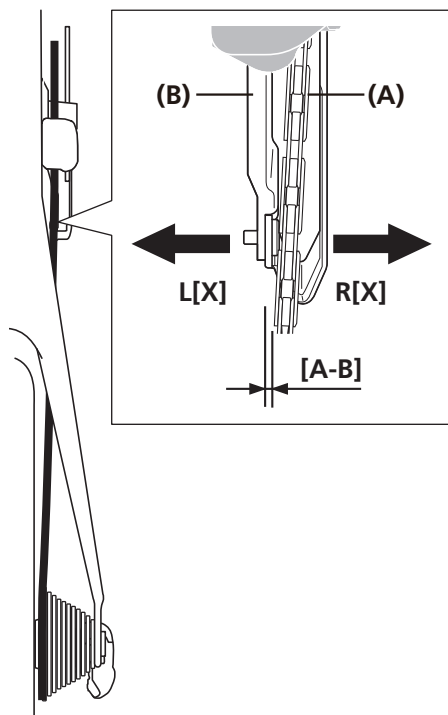
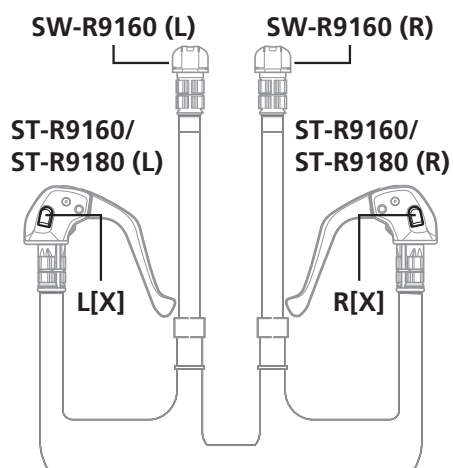
Double-click the button at junction A, and switch to front derailleur adjustment mode.



TECH TIPS

When you switch to front derailleur adjustment mode, the battery level display LED flashes red.

4



Operate shifting switch R[X] or L[X].

Adjust so that there is a clearance of 0 – 0.5mm between the chain and the chain guide inner plate.

[A-B] 0 – 0.5mm

- (A)** Chain
(B) Chain guide inner plate

NOTE

Shift the front derailleur and the rear derailleur to all gears to make sure that the chain does not contact the chain guide.

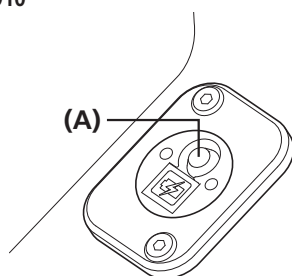


TECH TIPS

- The adjustable range is 37 steps.
(18 steps inward and 18 steps outward from the initial position)
- When adjusting, the chain guide will overrun slightly and then move back in an exaggerated manner to help in verifying the adjustment direction. Make sure to check the positions of the chain guide and the chain when the chain guide has come to a stop.
- The shifting switch on SW-R9160 (L)/SW-R9160 (R) can also be used to perform the operation shown to the left.

5

EW-RS910



Press the button at junction A until the two LEDs turn off in order to switch from adjustment mode to gear shifting mode.

- (A)** Button



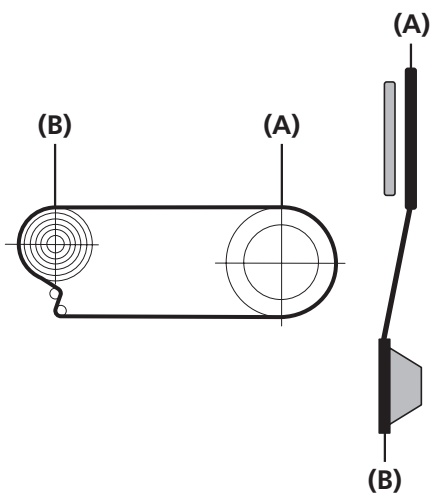
TECH TIPS

SM-EW90-A/B can also be switched to gear shifting mode by operating the button the same way.

Top position electrical adjustment

For drop handlebar type

1



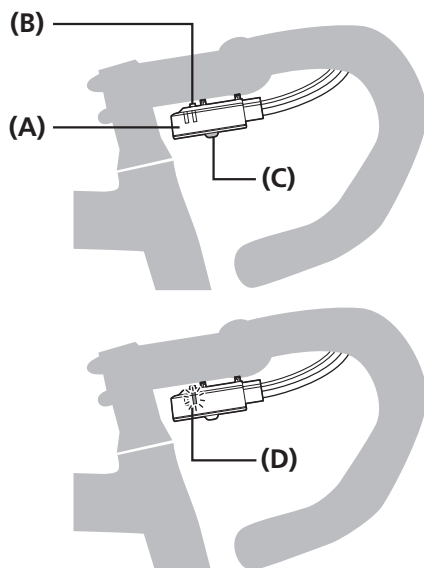
Set the chain onto the largest chainring at the front and the largest sprocket at the rear.

(A) Largest chainring

(B) Largest sprocket

2

SM-EW90-A/B



Press the button at junction A until the button LED illuminates in order to switch from gear shifting mode to adjustment mode.

(A) Junction A

(B) LED window for button

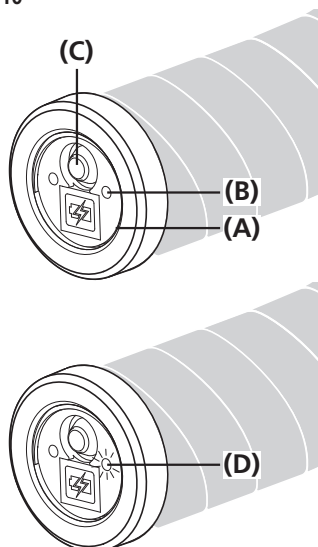
(C) Button

(D) Red LED

NOTE

Note that if you keep pressing the button after the button LED has illuminated, RD Protection Reset will begin.

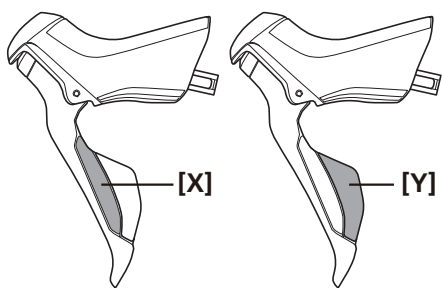
EW-RS910



ADJUSTMENT

► Adjustment of the front derailleur

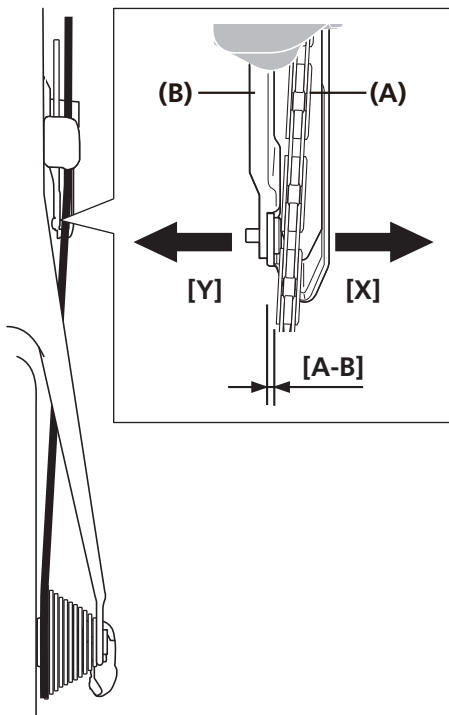
3



Operate shifting switch [X] or [Y].

Adjust so that there is a clearance of 0 – 0.5mm between the chain and the chain guide inner plate.

[A-B] 0 – 0.5mm



(A) Chain

(B) Chain guide inner plate

NOTE

Shift the front derailleur and the rear derailleur to all gears to make sure that the chain does not contact the chain guide.

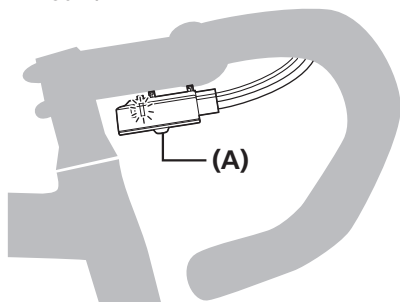


TECH TIPS

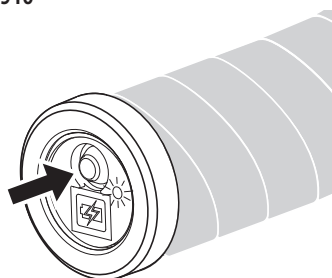
- The adjustable range is 25 steps. (12 steps inward and 12 steps outward from the initial position)
- When adjusting, the chain guide will overrun slightly and then move back in an exaggerated manner to help in verifying the adjustment direction. Make sure to check the positions of the chain guide and the chain when the chain guide has come to a stop.

4

SM-EW90-A/B



EW-RS910

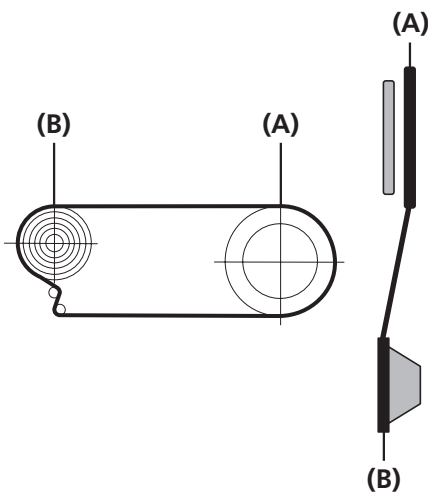


Press the button at junction A until the red LED turns off in order to switch from rear derailleur adjustment mode to gear shifting mode.

(A) Button

For time trial/triathlon handle type

1



Set the chain onto the largest chainring at the front and the largest sprocket at the rear.

- (A) Largest chainring
(B) Largest sprocket

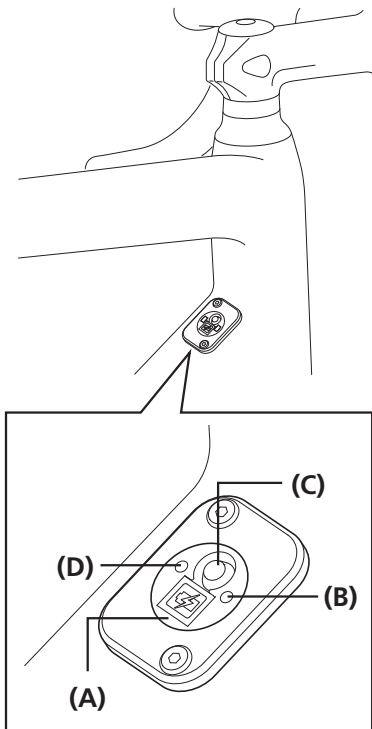


TECH TIPS

- If the rear derailleur cannot be set to the largest sprocket in synchronized mode, switch to manual mode before setting the rear derailleur to the largest sprocket.
- E-TUBE PROJECT can be used to set the chain to the largest chainring and largest sprocket.

2

EW-RS910



Press the button at junction A until the button LED illuminates in order to switch from gear shifting mode to adjustment mode.

- (A) Junction A
(B) LED window for button
(C) Button
(D) Battery level display LED

NOTE

Note that if you keep pressing the button after the button LED has illuminated, RD Protection Reset will begin.



TECH TIPS

SM-EW90-A/B can also be switched to adjustment mode by operating the button the same way.

3

Double-click the button at junction A, and switch to front derailleur adjustment mode.



TECH TIPS

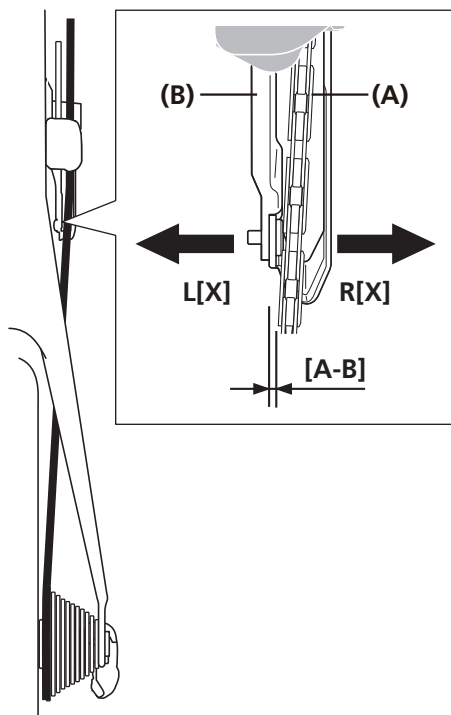
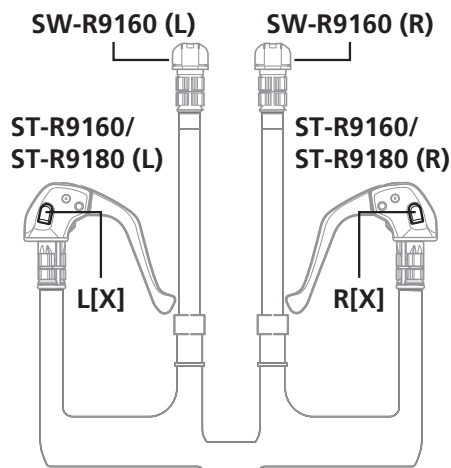
When you switch to front derailleur adjustment mode, the battery level display LED flashes red.



ADJUSTMENT

►► Adjustment of the front derailleur

4



Operate shifting switch R[X] or L[X].

Adjust so that there is a clearance of 0 – 0.5mm between the chain and the chain guide inner plate.

[A-B] 0 – 0.5mm

(A) Chain

(B) Chain guide inner plate

NOTE

Shift the front derailleur and the rear derailleur to all gears to make sure that the chain does not contact the chain guide.

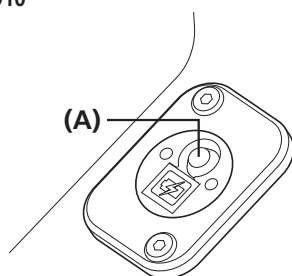


TECH TIPS

- The adjustable range is 25 steps. (12 steps inward and 12 steps outward from the initial position)
- When adjusting, the chain guide will overrun slightly and then move back in an exaggerated manner to help in verifying the adjustment direction. Make sure to check the positions of the chain guide and the chain when the chain guide has come to a stop.
- The shifting switch on SW-R9160 (L)/SW-R9160 (R) can also be used to perform the operation shown to the left.

5

EW-RS910



Press the button at junction A until the two LEDs turn off in order to switch from adjustment mode to gear shifting mode.

(A) Button



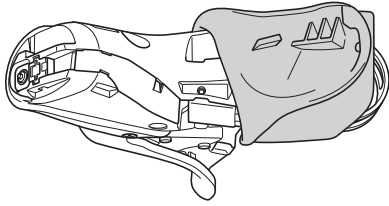
TECH TIPS

SM-EW90-A/B can also be switched to gear shifting mode by operating the button the same way.

■ Adjustment of lever stroke

ST-R9150

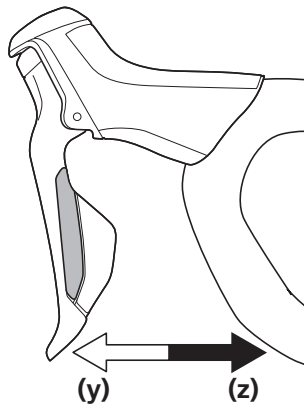
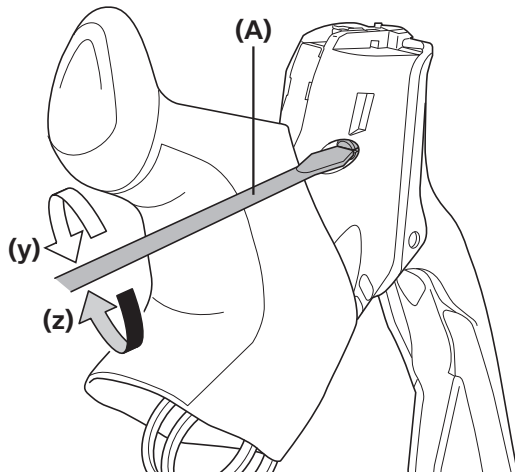
1



Turn over the bracket cover from the front side.

2

Adjust the position of the lever body using the reach adjustment screw.



- (y)** Counterclockwise:
Increases the lever stroke
- (z)** Clockwise:
Decreases the lever stroke

- (A)** Slotted screwdriver
Blade width: 4.0 - 5.0mm
Blade thickness: 0.5 - 0.6mm

NOTE

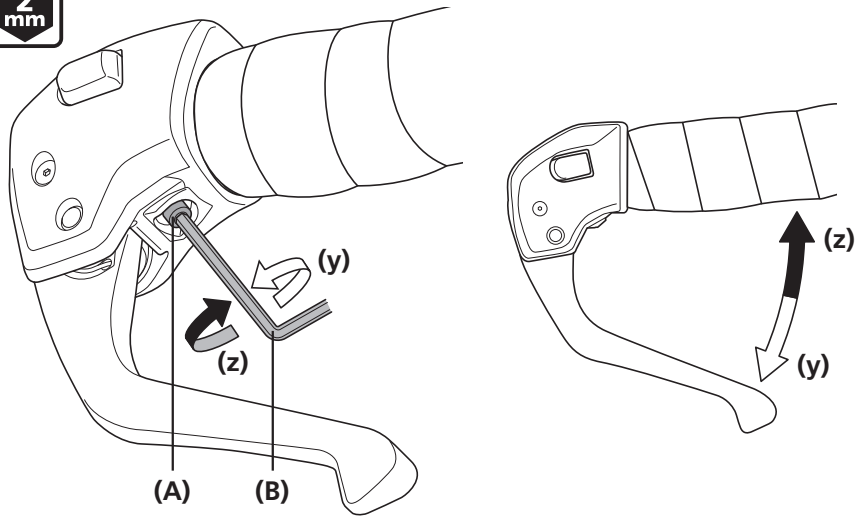
Make sure that braking operates properly after the adjustment.

ADJUSTMENT

►► Adjustment of lever stroke

ST-R9160

Adjust the position of the lever body using the reach adjustment bolt.



(y) Counterclockwise:
Increases the lever stroke

(z) Clockwise:
Decreases the lever stroke

(A) Reach adjustment bolt

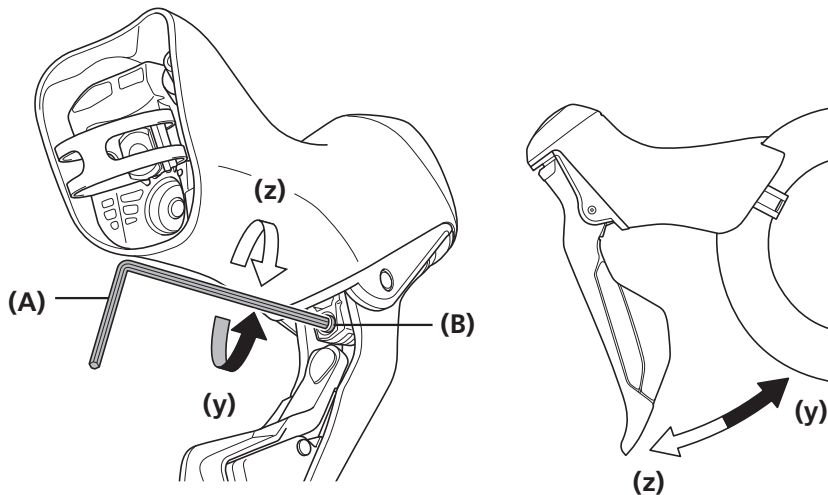
(B) 2mm hexagon wrench

NOTE

Make sure that braking operates properly after the adjustment.

ST-R9170

Adjust the position of the lever body using the reach adjustment bolt.



(y) Counterclockwise:
Decreases the lever stroke

(z) Clockwise:
Increases the lever stroke

(A) 2mm hexagon wrench

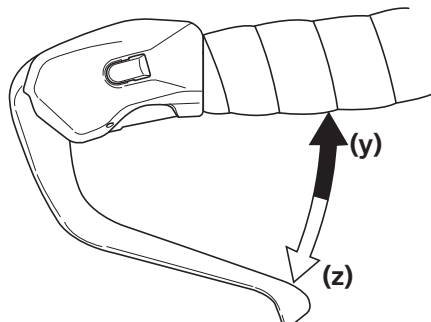
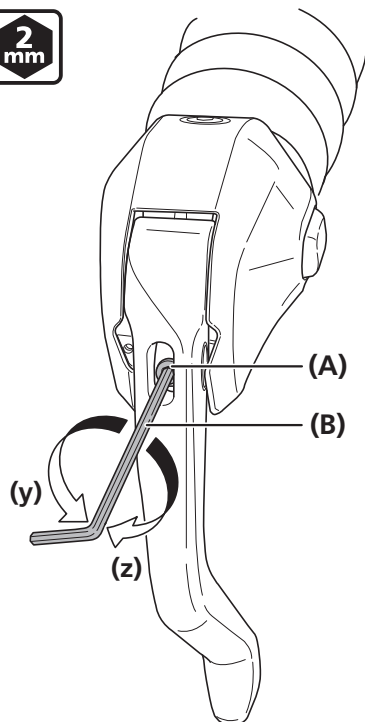
(B) Reach adjustment bolt

NOTE

Make sure that braking operates properly after the adjustment.

ST-R9180

Adjust the position of the lever body using the reach adjustment bolt.



(y) Counterclockwise:
Decreases the lever stroke

(z) Clockwise:
Increases the lever stroke

(A) Reach adjustment bolt

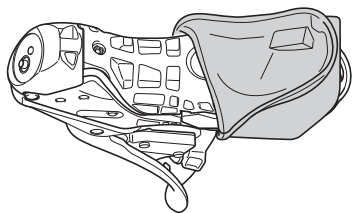
(B) 2mm hexagon wrench

NOTE

Make sure that braking operates properly after the adjustment.

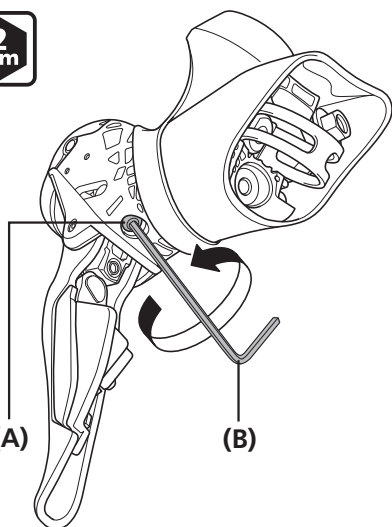
■ Free stroke adjustment (ST-R9170)

1



Turn over the bracket cover from the front side.

2



Turn the free stroke adjustment screw to adjust the stroke.

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

- (A) Free stroke adjustment screw
(B) 2mm hexagon wrench

NOTE

- Stop loosening the free stroke adjustment screw when the free stroke stops increasing. Loosening the free stroke adjustment screw excessively may cause the screw to be removed from the bracket unit. Do not forcibly tighten the free stroke adjustment screw. Otherwise, the adjustment screw may be damaged.
- Do not remove the washer from the free stroke adjustment screw.
- Position the free stroke adjustment screw so that it does not interfere with the bracket cover.

CHARGING THE BATTERY

CHARGING THE BATTERY

Use the specified combination of lithium ion batteries, chargers, and linkage devices.

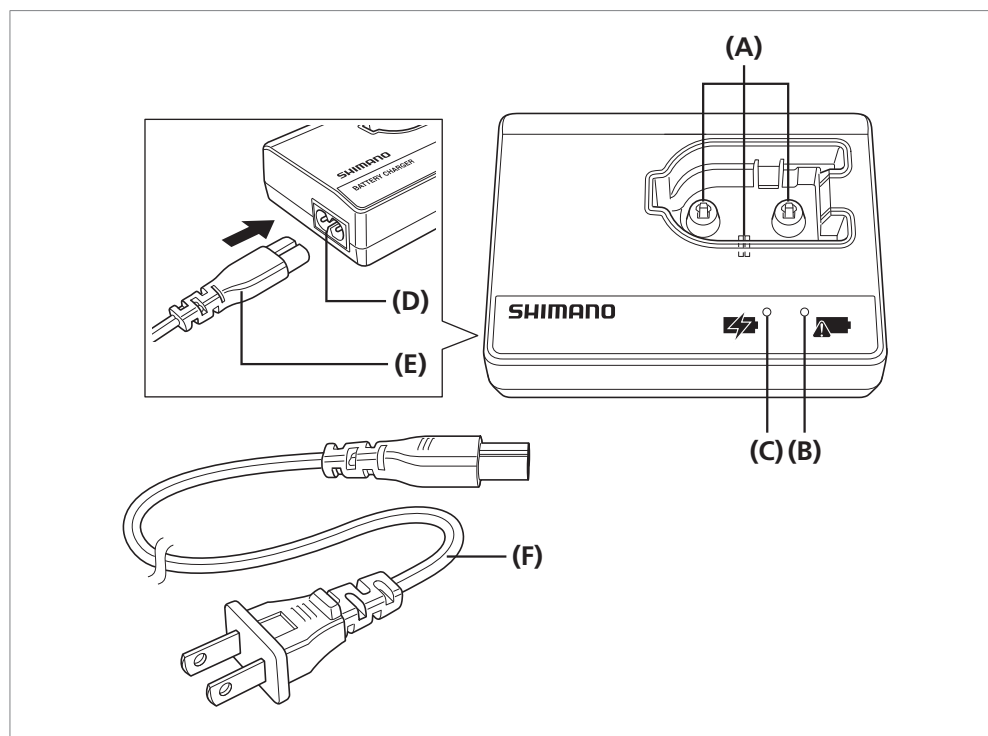
Any other combinations may cause rupture or fire.

Fully understand the precautions for use provided at the beginning of the dealer's manual before using the products.

Names of parts

External type (SM-BCR1/SM-BTR1)

Charger (SM-BCR1)



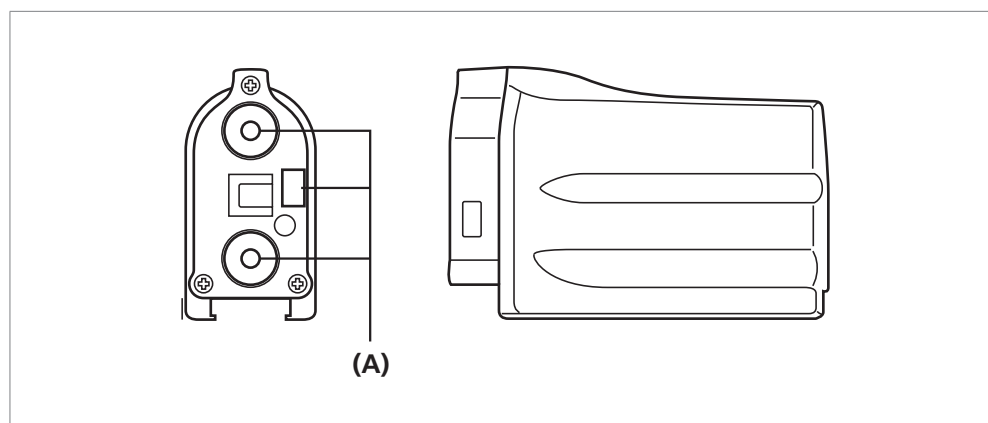
- (A)** Electrical contacts:
If these are modified or damaged, problems with operation will occur. Be very careful when handling them.
- (B)** ERROR indicator:
This flashes when there is an error.
- (C)** CHARGE indicator:
This illuminates while charging is in progress.
- (D)** Power cord connector
- (E)** Power cord:
Insert into the connector.
(Insert all the way)
- (F)** Charger cord (Sold separately)



TECH TIPS

This is a special charger for charging Shimano lithium ion batteries (SM-BTR1).

Special battery (SM-BTR1)



- (A)** Electrical contacts:
If these are modified or damaged, problems with operation will occur. Be very careful when handling them.

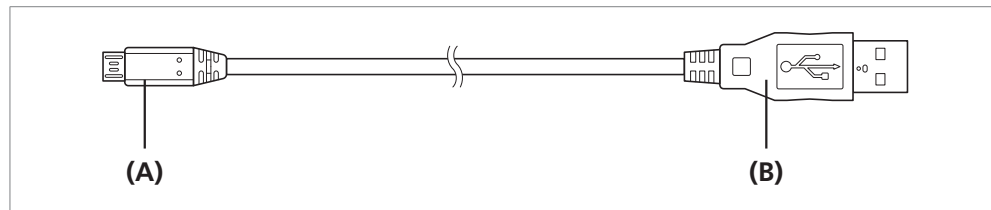


TECH TIPS

This is a lithium ion battery.
Use the special charger (SM-BCR1) to charge the battery.

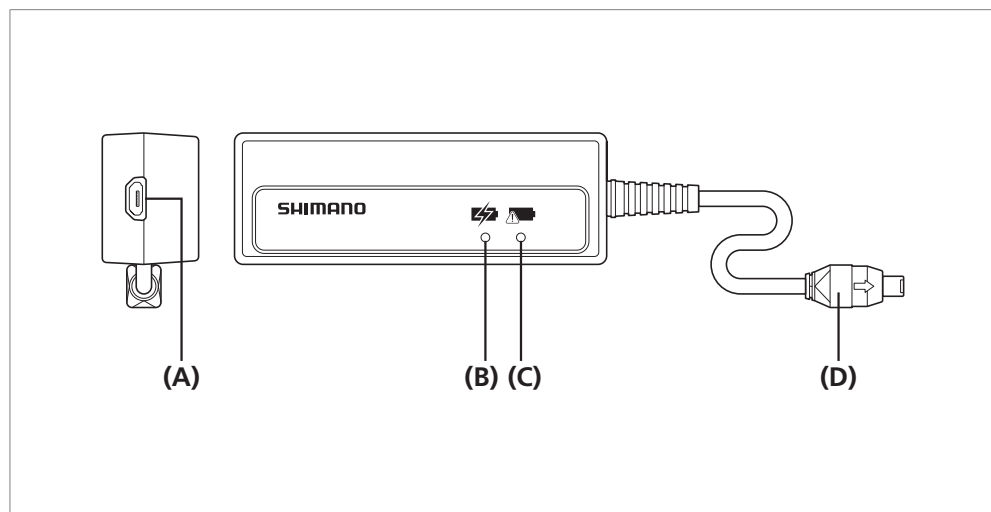
Built-in type (SM-BCR2/SM-BTR2, BT-DN110/BT-DN110-A)

USB cable



- (A)** Micro USB plug:
Connect to the battery charger.
- (B)** USB plug:
Connect to a PC USB port or an AC adapter with a USB port.

Charger (SM-BCR2)



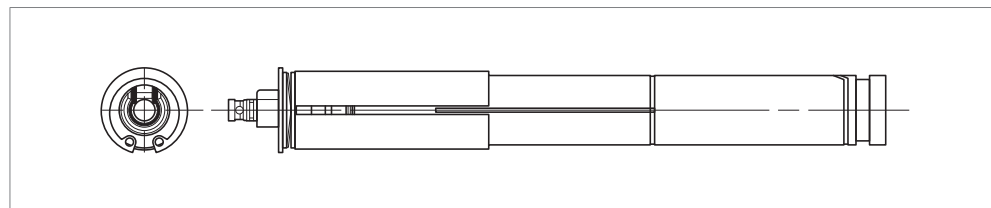
- (A)** Micro USB connector
- (B)** CHARGE indicator
- (C)** ERROR indicator
- (D)** Plug for product connection:
Connect to junction A.



TECH TIPS

- This is a special charger for charging Shimano lithium ion batteries (SM-BTR2/ BT-DN110/BT-DN110-A).
- If water collects in the product connector, connect the plug only after wiping it off.

Special battery (SM-BTR2/BT-DN110/BT-DN110-A)



TECH TIPS

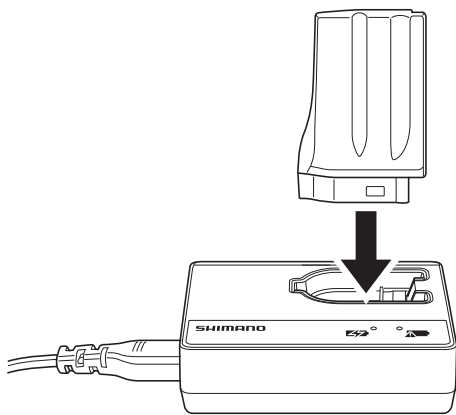
This is a lithium ion battery.
Use the special charger (SM-BCR2) to charge the battery.

■ Charging method

External type (SM-BCR1/SM-BTR1)

- 1 Insert the power plug of the battery charger into an electrical outlet.

2



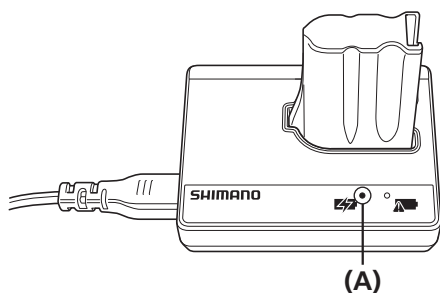
Insert the battery (SM-BTR1) into the battery charger (SM-BCR1) as far as it will go.



TECH TIPS

Charging takes up to approximately 1.5 hours. (Note that the actual time will vary depending on the remaining battery charge.)

3



When the CHARGE indicator (orange) switches off, charging is complete.

(A) CHARGE indicator



TECH TIPS

If the ERROR indicator flashes, it means that there may be a problem with the battery. Refer to "When charging is not possible" for more information.

4

- 4 Disconnect the power plug of the battery charger from the electrical outlet and store the battery charger in a suitable place as specified in the Safety Precautions.

Built-in type (SM-BCR2/SM-BTR2, BT-DN110/BT-DN110-A)

1

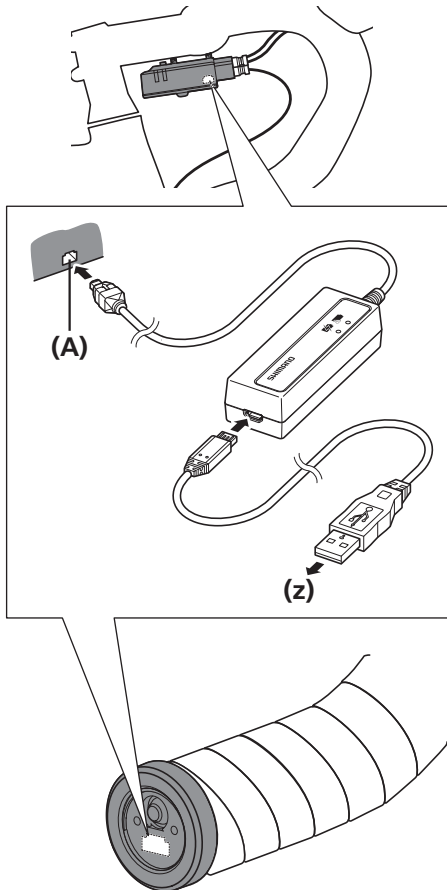
Connect the battery to the junction A.



TECH TIPS

- The battery can be charged by using an AC adapter with a USB port or connecting the charger to the USB connector of a PC.

2



Connect the charging cable of the charger to the junction A.

- (z)** To an AC adapter with a USB port or PC

(A) Charging port

TECH TIPS

- The position of the charging port differs depending on the product.
- The charging time of an AC adapter with a USB port is about 1.5 hours, and that of computer USB port type about 3 hours. (Note that the actual time will vary depending on the amount of charge remaining in the battery. Depending on the specifications of the AC adapter, recharging via the AC adapter may require as much time (about 3 hours) as recharging via PC.)

3

When the CHARGE indicator (orange) switches off, charging is complete.



TECH TIPS

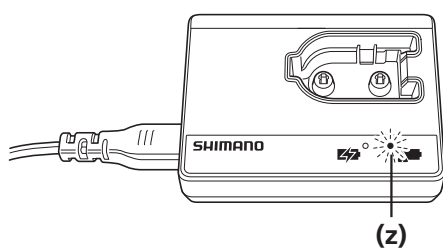
If ERROR indicator or CHARGE indicator blinks, refer to "When charging is not possible".

4

Disconnect the charging cable or USB cable, and keep it at the location specified in the precautions.

■ When charging is not possible

External type (SM-BCR1/SM-BTR1)



Remove the battery from the battery charger, disconnect the power plug of the battery charger from the electrical outlet, and then repeat the charging operation.

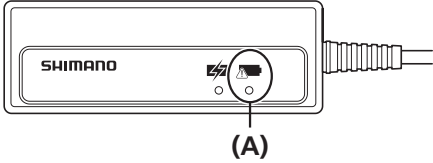
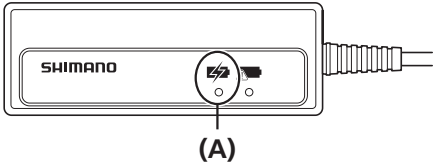
If charging is still not possible after the above steps have been carried out, the ambient temperature may be too low or too high, or there may be a problem with the battery.

- (z)** If charging is not possible, the ERROR indicator on the Battery charger will flash.

▶▶ When charging is not possible

Built-in type (SM-BCR2/SM-BTR2, BT-DN110/BT-DN110-A)

1 Make sure that only one unit of SM-BCR2 is connected to a PC.

2	If the ERROR indicator blinks 	If the ERROR indicator blinks, the ambient temperature during charging may fall outside the operating temperature limits. Check that the temperature is appropriate.
	If the CHARGE indicator blinks 	If the CHARGE indicator blinks, refer to the following. • The current capacity of your AC adapter with a USB port is lower than 1.0Adc. ⇒ Use an AC adapter with a USB port with a current capacity equal to or higher than 1.0Adc. • Connection is using a USB hub. ⇒ Remove the USB hub.

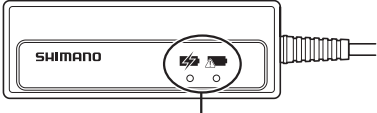
(A)	ERROR indicator
(A)	CHARGE indicator

3 If none of the above (1 to 2) is the case, the battery or junction may be faulty.

NOTE

If the CHARGE indicator does not light up or goes out soon, the battery may be fully charged. Check the remaining charge in the battery via junction A or the system information display.

If the battery is low or dead, contact the place of purchase or a bicycle dealer.



If it becomes impossible to charge, the CHARGE indicator (orange) or ERROR indicator of the battery charger will blink.

CONNECTION AND COMMUNICATION WITH DEVICES

CONNECTION AND COMMUNICATION WITH DEVICES

Connecting the bicycle (system or components) to a device enables such operations as updating system firmware and customization.

You need E-TUBE PROJECT to configure the system and update firmware.

Download E-TUBE PROJECT from our support website (<http://e-tubeproject.shimano.com>).

For information on how to install E-TUBE PROJECT, check the support website.



TECH TIPS

You need SM-PCE1 and SM-JC40/JC41 to connect the system to a PC. They are not required if there is an available port. Firmware is subject to change without notice.

System requirements

	PC linkage device	E-TUBE PROJECT	Firmware
SM-BMR2/ SM-BTR2	SM-PCE1/ SM-BCR2	Version 3.2.0 or later	Version 3.0.0 or later
BT-DN110/ BT-DN110-A/ BM-DN100			Version 4.0.0 or later

NOTE

If your versions of E-TUBE PROJECT software and firmware for each component are not up to date there could be problems operating the bicycle. Check the versions and update them to the latest ones.

■ Settings customizable in E-TUBE PROJECT

Display settings	Display time	Sets the time until the display turns off when the display monitor is left unattended.
Switch function setting		Modify the shifting switch settings.
Shift mode setting		Change shift mode setting.
Multi-shift mode setting	Multi-shift mode ON/OFF	Select whether or not to use multi-shift.
	Gear-shifting interval	Sets the gear-shifting interval for multi-shift.
	Gear number limit	Sets the limit on the number of gears shifted when the shifting switch is held down.

Shift mode setting (synchronized shifting)

Synchronized shift is a function that maintains optimal front and rear gear positioning by interlinking the shifting of the front and rear derailleurs. There are two Synchronized shift modes, as explained below.

Semi-synchronized shift

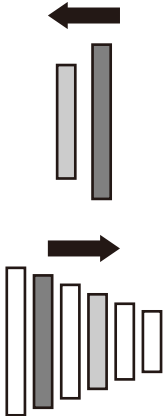
Mechanics

The rear derailleur automatically shifts when the front derailleur is shifted.

The rear derailleur can be set to jump from 1 to 4 gears per shift. (Default setting: 2 gears)

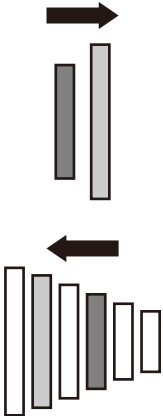
Shifting from largest to smallest chainring

The rear derailleur jumps 1 to 4 gears outward per shift. (Default setting: 2 gears)



Shifting from smallest to largest chainring

The rear derailleur jumps 1 to 4 gears inward per shift. (Default setting: 2 gears)



NOTE

Values that can be actually set for number of gears to jump depend on chainring and sprocket size combinations.

Synchronized shift

Mechanics

The front derailleur automatically shifts when the rear derailleur is shifted.
(The shift points are initially set as shown in the table.)

Initial settings

CS	(A)	(B)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

(A) Smallest chainring

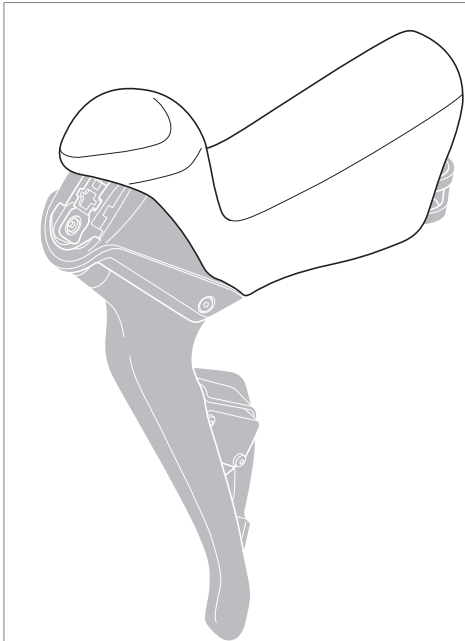
(B) Largest chainring

MAINTENANCE

MAINTENANCE

■ Replacing the bracket cover

ST-R9150/ST-R9170



Fit the tabs on the bracket cover into the slots on the bracket unit.

NOTE

Note the markings

R: for right

L: for left

* The markings can be found on the inner surface of the bracket cover.

ST-R9150

Always replace the bracket cover with the lever removed from the bicycle as shown in the illustration.

ST-R9170

- Replace the bracket cover with the dual control lever and brake hose removed from the bicycle as shown in the illustration. Alternatively, remove the brake caliper from the frame and pass the bracket cover from the caliper side.
- Perform bleeding after removing the brake hose.



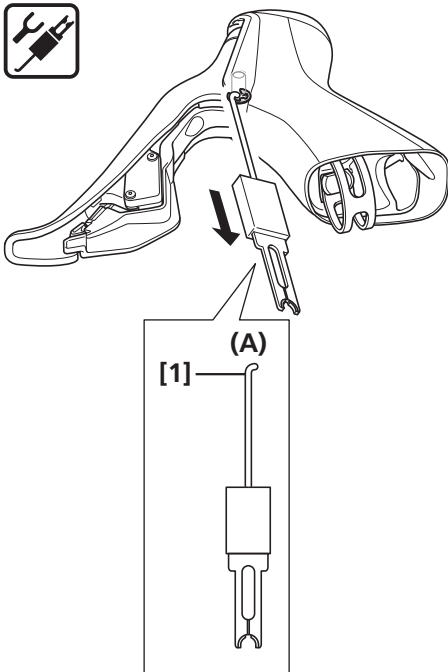
TECH TIPS

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

■ Disassembly of the bracket body and lever body (ST-R9150)



1



Use the Shimano original tool which is sold separately to remove the E-ring.

Hook section [1] of the Shimano original tool on the E-ring and remove it.

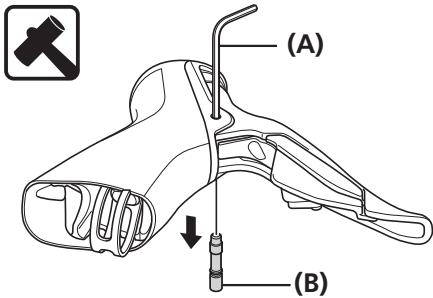
(A) Special E-ring removal tool
Y6RT68000

⚠ CAUTION

- When you remove the E-ring, it may pop out; wear protective glasses while removing it. Check that there is no one or no object around you before starting the work.
- The bracket body and lever body of ST-R9170 cannot be disassembled.



2

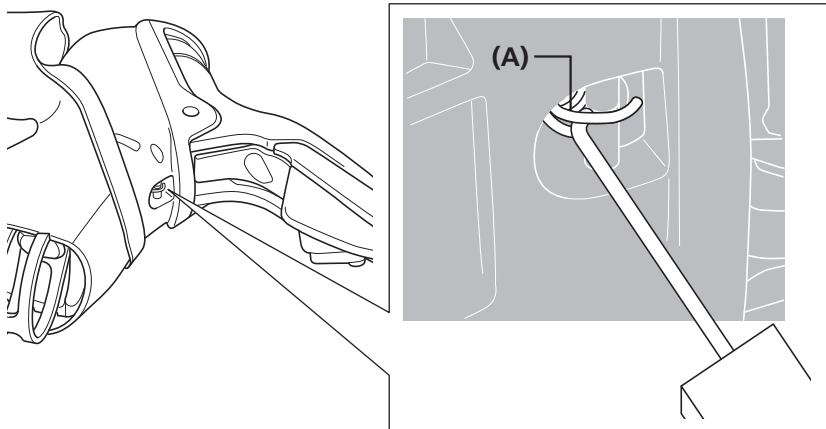


Insert a hexagon wrench or a similar tool into the hole in the lever axle, and then tap it with a plastic mallet to push out the lever axle.

(A) Hexagon wrench
(B) Lever axle

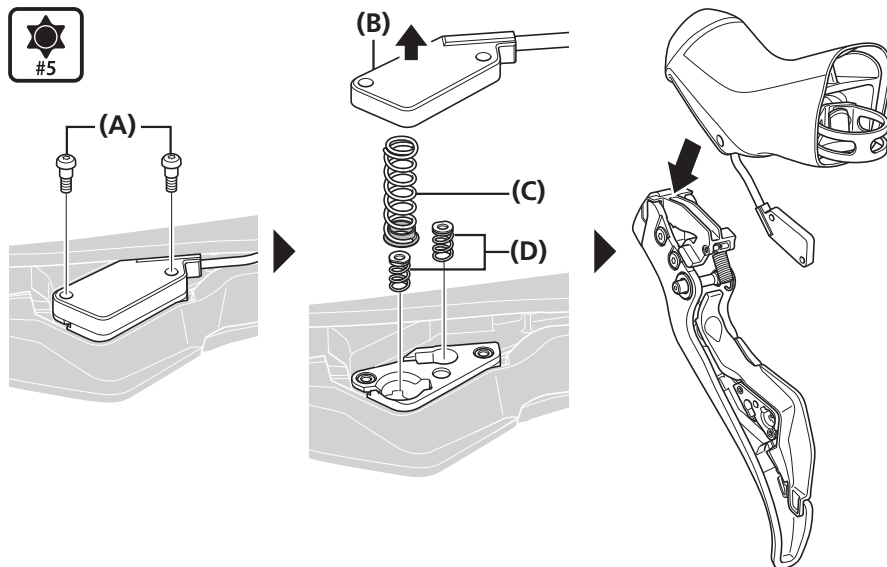
Pull back the bracket cover from the front and remove the return spring using an E-ring removal tool or similar tool.

3



(A) Return spring

The lever body can be disassembled from the bracket body by removing the two switch unit fixing screws and then removing the switch unit with the switch return spring and the switch springs.



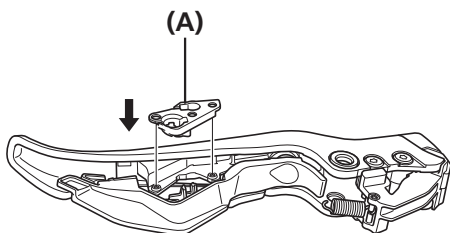
- (A) Switch unit fixing screw (Hexalobular[#5])
- (B) Switch unit
- (C) Switch return spring
- (D) Switch springs

NOTE

When removing the switch unit, the switch unit may be thrust open by the switch return spring or the switch return spring may fly out. Make sure to hold down the switch unit and remove it gradually.

■ Assembly of the switch unit

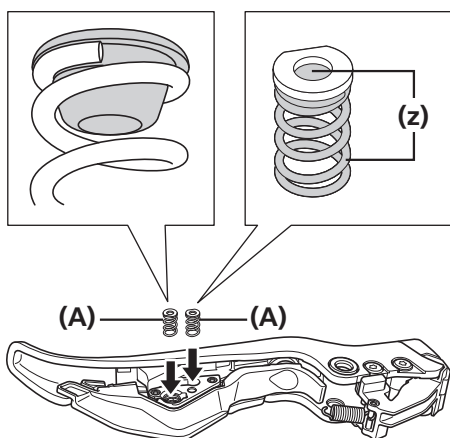
1



Attach the switch unit setting plate to the lever.

- (A) Switch unit setting plate

2

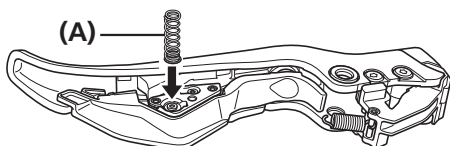


Check that the buttons are attached to the springs, then insert the switch springs into the holes in the switch unit setting plate.

- (z) Applying grease
Premium grease (Y-04110000)

- (A) Switch spring

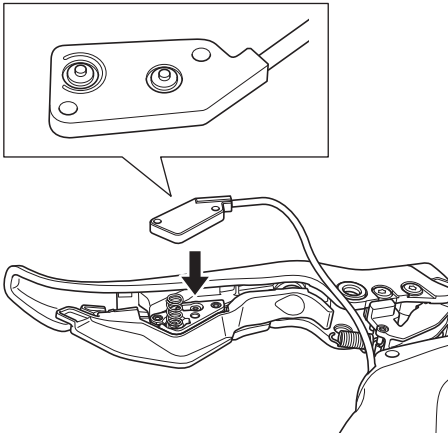
3



Set the switch return spring in the hole in the switch unit setting plate, as shown in the illustration.

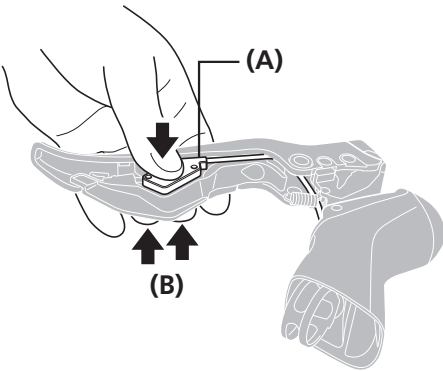
- (A) Switch return spring

4



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

5

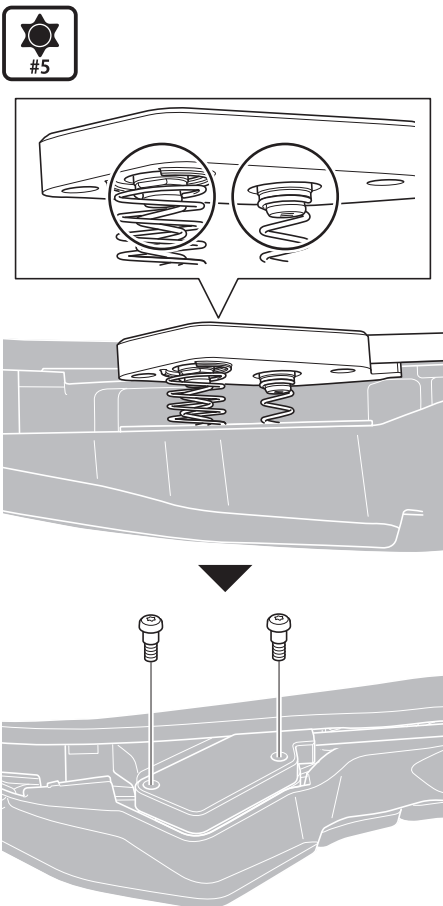


Press the switch unit by hand so that the switch springs go into the grooves in the buttons, and then push the shifting switches [X] and [Y] in as far as they will go.

(A) Switch unit

(B) Shifting switches [X] [Y]

6



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

Tightening torque

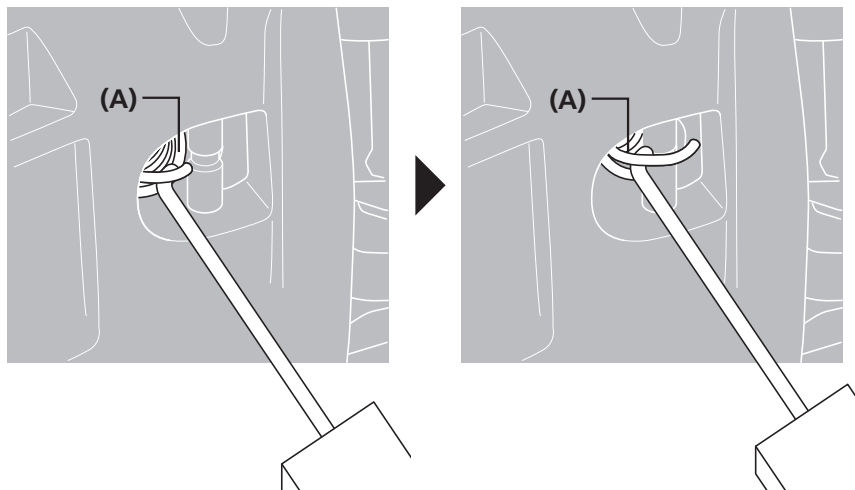


0.1 N·m

■ Assembly of the bracket body and lever body

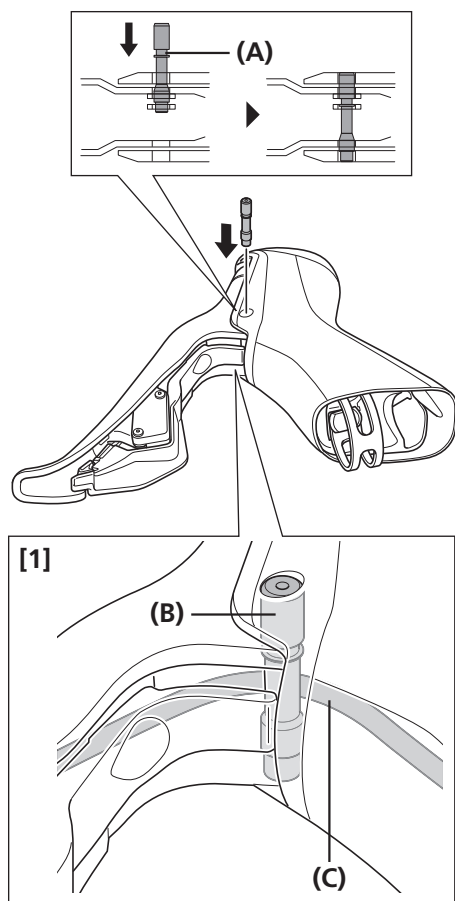
Assemble the bracket body and the lever body, and then attach the return spring.

1



(A) Return spring

2



Align the axle holes, and then press-fit the lever axle.

Make sure to route the cable from the switch unit behind the lever axle, as shown in illustration [1].

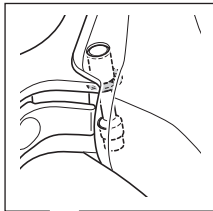
(A) E-ring groove
(B) Lever axle
(C) Cable



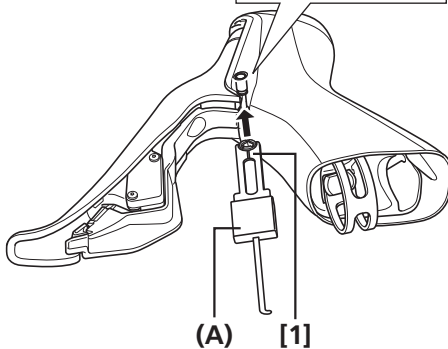
- The correct direction for the lever axle is for the E-ring groove to face up.
- Check that the surface of the bracket body and the top end of the lever axle are flush with each other so that the E-ring will fit into the groove.

►► Replacement of the pulley

3



Use part [1] of the Shimano original tool to install the E-ring.



(A) Special E-ring removal tool

NOTE

Do not use the removed E-ring again.
Be sure to use a new product (Y46RU41100: service parts code).



TECH TIPS

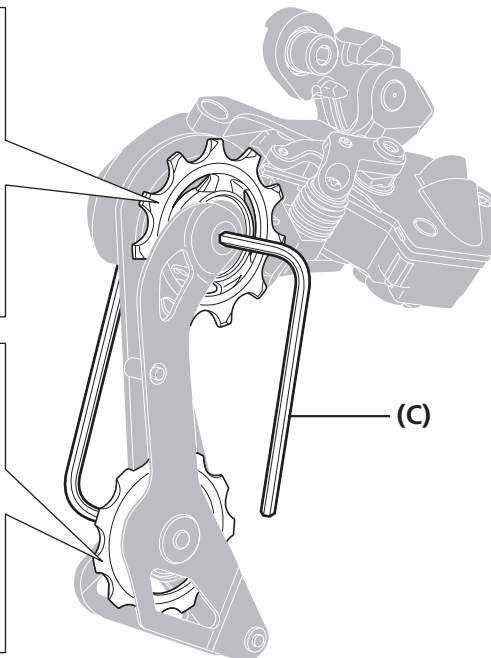
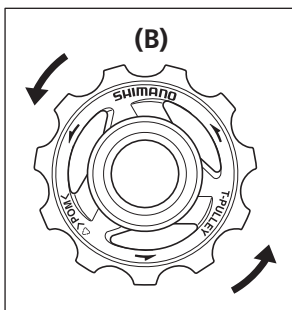
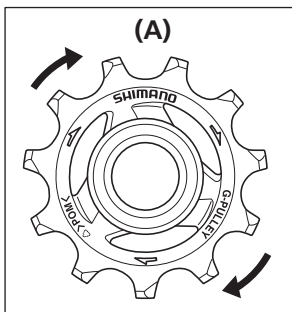
Operate the shifting switches [X] and [Y] to check that they turn on, and check that the lever operates smoothly.

■ Replacement of the pulley

Replace pulleys using a 3mm hexagon wrench.

The guide pulley and tension pulley are marked on one side with arrows to indicate the direction of rotation.

When attaching the pulleys, make sure to orient them so that the sides marked with arrows are visible when viewed from the reverse side of the derailleur, as shown in the illustration.



(A) Guide pulley

(B) Tension pulley

(C) 3mm hexagon wrench

Tightening torque



2.5 - 5 N·m

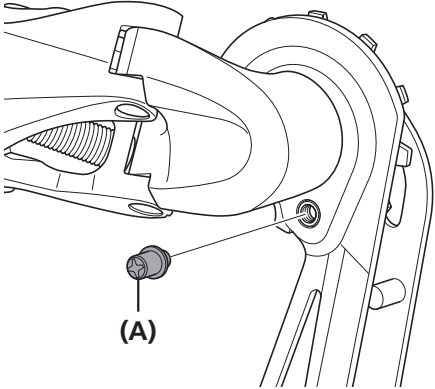
■ Replacement of the plate and the plate tension spring

Removal

1

+

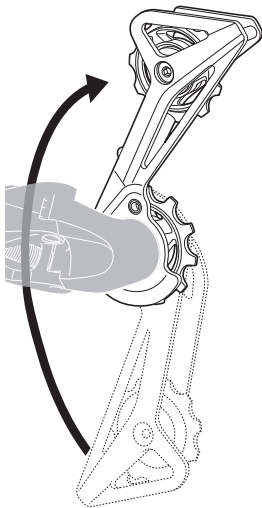
#2



Remove the plate stopper pin.

(A) Plate stopper pin	
Tightening torque	
+ #2	1 N·m

2

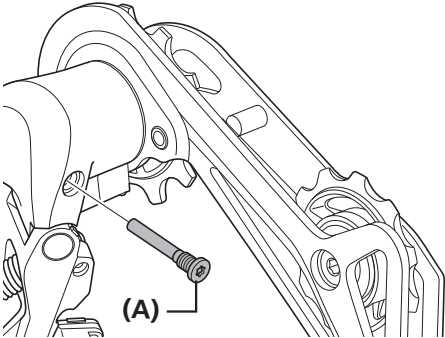


Turn the plate to loosen the plate tension spring as shown in the illustration.

3

☆

#10

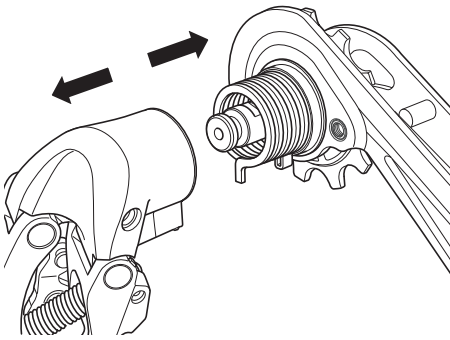


Using a Hexalobular[#10], remove the stopper bolt.

(A) Stopper bolt	
Tightening torque	
☆ #10	1 N·m

►► Replacement of the plate and the plate tension spring

4

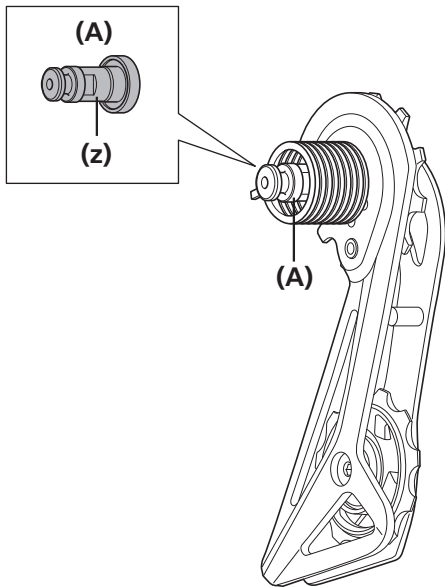


Detach the plate.

Cautions when assembling

Assemble by carrying out the removal procedure in reverse while adhering to the following cautions.

1

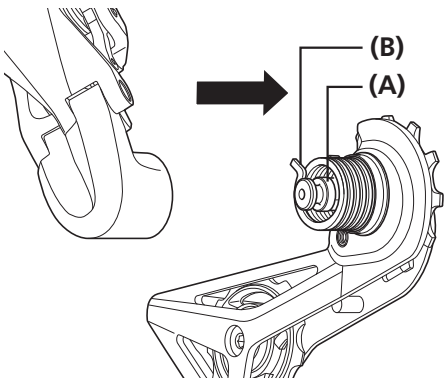


Apply grease to the plate axle.

(z) Apply grease.

(A) Plate axle

2



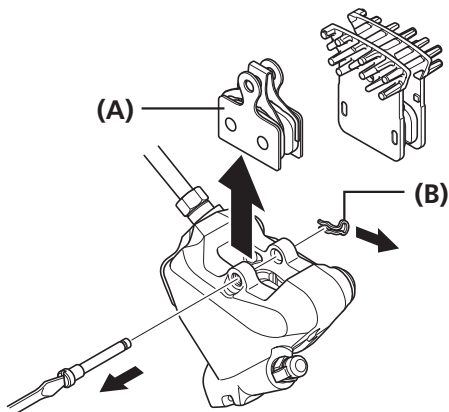
When reassembling, insert the end of the plate tension spring into the groove in the plate.

(A) Plate axle

(B) Plate tension spring

■ Replacing the brake pads

1



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

(A) Brake pads
(B) Snap retainer

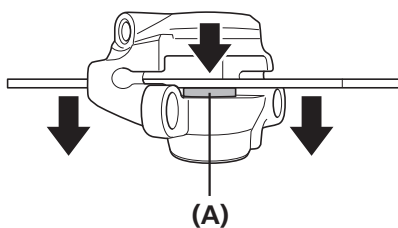
NOTE

- This brake system is designed to automatically adjust the clearance between the disc brake rotor and the brake pads by the piston gradually protruding according to the wear of the brake pads. When you replace the brake pads, you need to push back the piston.
- If oil adheres to the brake pads after oil is added, or if the brake pads are worn down to a thickness of 0.5mm, or if the brake pad presser springs are interfering with the disc brake rotor, replace the brake pads.
- When using a pad with fins, take note of the left (L) and right (R) markings to set it.

2

Clean the pistons and surrounding area.

3



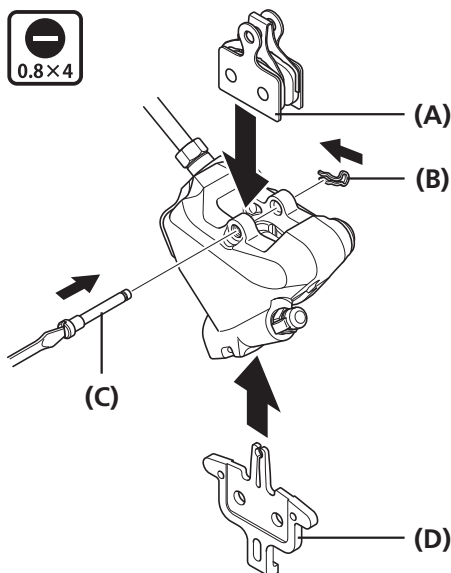
Use a flat-shaped tool to push the pistons straight back in as far as they will go, while being careful not to twist the pistons.

Do not push the pistons with a sharp tool.

The pistons may be damaged.

(A) Piston

4



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

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

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

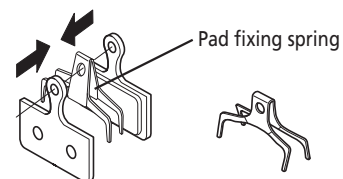
Tightening torque



0.1 - 0.3 N·m



TECH TIPS



Install the pad fixing spring as shown in the illustration.

5

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

6

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

If they are touching, adjust in accordance with section "Installing the brake caliper".

■ Shimano genuine mineral oil replacement

It is recommend to change your oil when the oil in the reservoir tank becomes noticeably discolored.

After attaching the bag and tube to the bleed nipple, open the bleed nipple and drain the oil. At this time, operate the dual control lever to make draining the oil easier. After draining the oil, refer to "Adding Shimano genuine mineral oil and bleeding air", then lubricate with oil from a newly opened container. Use only Shimano genuine mineral oil.

When disposing of used oil, follow local county and/or state codes and ordinances.

SHIMANO

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

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