# Dealer's Manual

## DURA-ACE

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<th>ROAD</th>
<th>MTB</th>
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### DURA-ACE

- SW-R9150
- SW-R9160
- SW-R610
- ST-R9150
- ST-R9160
- ST-R9170
- ST-R9180
- FD-R9150
- RD-R9150
- BR-R9170
- SM-EW90-A
- SM-EW90-B
- EW-R5910
- EW-WU111
- EW-SD50
- EW-SD50-I
- EW-JC130
- SM-EWC2
- SM-JC40
- SM-JC41
- SM-BTR1
- BT-DN110
- BT-DN110-A
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- SM-RT900
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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 manuals and technical documents are accessible online at https://si.shimano.com.

• For consumers who do not have easy access to the internet, please contact a SHIMANO distributor or any of the SHIMANO offices to obtain a hardcopy of the User's Manual.

• Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.

• 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.
DANGER

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 lighting 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 5.0 V DC and with a current equal to or higher than 1.0 A DC. If the one with a current lower than 1.0 A is used, the AC adapter may heat up, potentially causing a fire, smoke, overheating, destruction, electric shock, or burns.
TO ENSURE SAFETY

WARNING

- Be sure to follow the instructions provided in the manuals when installing the product. It is recommended that you use SHIMANO genuine parts. If parts such as screws and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.

- Wear approved eye protection while performing maintenance tasks such as replacing components.

- 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 (https://si.shimano.com).

Be sure to also inform users of the following:
- 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. Intervals between maintenance depend on the use and riding circumstances. Clean the chain with an appropriate chain cleaner regularly.

- 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 cause serious injury.

- Check the chain for any damage (deformation or crack), skipping, or other abnormalities such as unintended gear shifting. The chain may break, and you may fall. If any problems are found, consult a dealer or an agency.

- 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.

- Be careful when crank revolutions are set to low with a faster setting of the multi-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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Multi-shift speed</th>
<th>Characteristics</th>
<th>Usage notes</th>
<th>Crank rotation speed when operating multi-shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very fast</td>
<td>High speed</td>
<td>Quick multi-shifting is possible</td>
<td>• Over-shifting occurs easily.</td>
<td>High crank rotation speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The crank rotation speed can be adjusted quickly depending on changes in riding conditions.</td>
<td>• 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.</td>
<td></td>
</tr>
<tr>
<td>Fast</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>Default setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slow</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very slow</td>
<td>Low speed</td>
<td>Accurate multi-shifting is possible</td>
<td>Multi-shifting takes some time</td>
<td></td>
</tr>
</tbody>
</table>

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.).
TO ENSURE SAFETY

**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.
- Do not use it outside these operating temperature ranges of the battery. If the battery is used or stored in temperatures which are outside these ranges, fire, injury or problems with operation may occur. The operating temperature ranges for the battery are given below.
  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 - 240 V 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 battery charger with commercially-available electrical transformers designed for overseas use (travel converters). They may damage the battery 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 5.0 V DC and with a current equal to or higher than 1.0 A DC. If the one with a current lower than 1.0 A DC 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.
TO ENSURE SAFETY

■ Brake

• Because each bicycle may handle slightly differently depending on the model, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. Improper use of your bicycle’s brake system may result in a loss of control or a fall, which could lead to severe injury.

• Do not apply the front brake too strongly. If you do so, the front wheel may lock and the bicycle may fall forward, and serious injury may result.

• Because the required braking distance will be longer during wet weather, reduce your speed and apply the brakes early and gently. You may fall or collide and be seriously injured.

• A wet road surface may cause tires to skid; therefore, to avoid this, reduce your speed and apply the brakes early and gently. If the tires skid, you may fall and be seriously injured.

■ Hydraulic disc brake

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

• Do not touch the calipers and disc brake rotor while riding or immediately after dismounting from the bicycle. The calipers and disc brake rotor will become hot when the brakes are operated, so you may get burned if you touch them.

• Be careful not to allow any oil or grease to get onto the disc brake rotor and brake pads. Riding the bicycle with oil or grease on the disc brake rotor and brake pads may prevent the brakes from operating and result in serious injury due to a fall or collision.

• Check the thickness of the brake pads and do not use them if they have a thickness of 0.5 mm or less. Doing so may prevent the brakes from operating and result in serious injury.

• Do not use the disc brake rotor if it is cracked or deformed. The disc brake rotor may break, and result in serious injury due to a fall.

• Do not use the disc brake rotor if its thickness is 1.5 mm or less. Also do not use it if the aluminum surface becomes visible. The disc brake rotor may break, and result in serious injury due to a fall.

• Do not continuously apply the brakes. Doing so may cause a sudden increase in the brake lever stroke and prevent the brakes from operating and result in serious injury.

• Do not use the brakes with fluid leaking. Doing so may prevent the brakes from operating and result in serious injury.
TO ENSURE SAFETY

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 rotor.

• Do not use the disc brake rotor if it is cracked or warped. The disc brake rotor may break, and result in serious injury due to a fall.

• Do not use the disc brake rotor if its thickness is 1.5 mm or less. Also do not use it if the aluminum surface becomes visible. The disc brake rotor may break, and result in serious injury due to a fall.

• 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. Riding the bicycle in that state may prevent the brakes from operating and result in serious injury due to a fall or collision.

• Check the thickness of the brake pads and do not use them if they have a thickness of 0.5 mm or less. Doing so may prevent the brakes from operating and result in serious injury.

• Do not use oil other than SHIMANO genuine mineral oil. Doing so may prevent the brakes from operating and result in serious injury.

• Be sure to use only oil from a freshly-opened container. Doing so may prevent the brakes from operating and result in serious injury.

• Do not let water or air bubbles to get into the brake system. Doing so may prevent the brakes from operating and result in serious injury.

• Do not use with a tandem bicycle. Doing so may prevent the brakes from operating and result in serious injury due to a fall or collision.

• If the quick release lever is on the same side as the disc brake rotor, check that it does not interfere with the disc brake rotor.

• 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

• Refer to the table below, and do not use an incorrect connector insert. Doing so may prevent the brakes from operating and result in serious injury.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Connector insert</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
</tr>
<tr>
<td>SM-BH90-JK-SSR</td>
<td>11.2 mm</td>
</tr>
</tbody>
</table>

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

• Note the specifications for compatible handlebars.

**ST-R9160/ST-R9180/SW-R9160**

• Handle inner diameter: Ø19.0 - 22.5 mm
• Handle outer diameter: Ø22.2 - 24.0 mm
• 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-R5910 (Built-in bar end type)**

• Handle inner diameter: Ø20.5 - 21.5 mm
• Handle outer diameter: Ø23.8 - 24.2 mm
TO ENSURE SAFETY

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 SHIMANO genuine mineral oil
  • In the event of eye contact, flush with fresh water and seek medical assistance immediately. Contact with eyes may result in irritation.
  • In the event of skin contact, wash well with soap and water. Contact with eyes may result in irritation.
  • Cover nose and mouth with a respirator type mask and use in a well ventilated area. Inhalation of mineral oil mist or vapors may cause nausea. If mineral oil mist or vapor is inhaled, go immediately to an area with fresh air. Cover up with a blanket. Stay warm and stable and seek professional medical advice.

Burn-in period
  • Disc brakes have a burn-in period, and the braking force will gradually increase as the burn-in period progresses. Make sure that you are aware of any such increases in braking force when using the brakes during the burn-in period. The same thing will happen when the brake pads or disc brake rotor are replaced.

For Installation to the Bicycle, and Maintenance:

■ Hydraulic disc brake

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

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.
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 cleaners or silencing agents, as they can cause damage to parts such as seals.
TO ENSURE SAFETY

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.
TO ENSURE SAFETY

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-SD50-1). 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)
• Use isopropyl alcohol, soapy water or a dry cloth when cleaning and carrying out maintenance of the brake system. Do not use commercially available brake cleaners or silencing agents. 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.
TO ENSURE SAFETY

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](table)

- **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.
    - [https://e-tubeproject.shimano.com/guide/#guide_list](https://e-tubeproject.shimano.com/guide/#guide_list)
The following tools are needed for installation, adjustment, and maintenance purposes.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Tool</th>
<th>Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 mm</td>
<td>2 mm hexagon wrench</td>
<td>Screwdriver(#2)</td>
</tr>
<tr>
<td>2.5 mm</td>
<td>2.5 mm hexagon wrench</td>
<td>Soft face mallet</td>
</tr>
<tr>
<td>3 mm</td>
<td>3 mm hexagon wrench</td>
<td>Slotted screwdriver</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blade width: 4.0 - 5.0 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blade thickness: 0.5 - 0.6 mm</td>
</tr>
<tr>
<td>4 mm</td>
<td>4 mm hexagon wrench</td>
<td>Utility knife</td>
</tr>
<tr>
<td>5 mm</td>
<td>5 mm hexagon wrench</td>
<td>Handlebar tape cutout tool</td>
</tr>
<tr>
<td>23 mm</td>
<td>23 mm hub spanner</td>
<td>Special E-ring removal tool</td>
</tr>
</tbody>
</table>

Hexalobular[#5]
Hexalobular[#10]
TL-CT12
TL-CT12
TL-EW02
TL-EW02
**INSTALLATION**

Electric wire wiring diagram (overall conceptual diagram)

Lithium ion battery (external type) SM-BTR1

External type (SM-JC40)

![Electric wire wiring diagram](image)

**TECH TIPS**

- **Cable length (EW-SD50)**
  
  - 
  a + [b] ≤ 900 mm
  - 
  a + [c] ≤ 1100 mm
  - 
  d ≤ 1400 mm
  - 
  e, f ≤ 500 mm

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

<table>
<thead>
<tr>
<th></th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>L3 (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EW-JC130-SS</td>
<td>350</td>
<td>50</td>
<td>250</td>
</tr>
<tr>
<td>EW-JC130-MM</td>
<td>350</td>
<td>50</td>
<td>450</td>
</tr>
<tr>
<td>EW-JC130-MM</td>
<td>550</td>
<td>50</td>
<td>550</td>
</tr>
</tbody>
</table>

- If using EW-WU111, use it in combination with BT-DN110, BT-DN110-A or BM-DN100.
Electric wire wiring diagram (overall conceptual diagram)

Built-in type (SM-JC41)

(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
(H) EW-WU111
(I) EW-RS910

TECH TIPS

• Cable length (EW-SD50)
  \[a] + [b] \leq 1500 \text{ mm}
  \[a] + [c] \leq 1700 \text{ mm}
  \[d] \leq 1400 \text{ mm}
  \[e], [f] \leq 500 \text{ mm}

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

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<tr>
<td>EW-JC130-SS</td>
<td>350</td>
<td>50</td>
<td>250</td>
</tr>
<tr>
<td>EW-JC130-SM</td>
<td>350</td>
<td>50</td>
<td>450</td>
</tr>
<tr>
<td>EW-JC130-MM</td>
<td>550</td>
<td>50</td>
<td>550</td>
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</table>

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

Electric wire wiring diagram (overall conceptual diagram)

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

Built-in type (SM-JC41)

(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)
  
  \[
  [a] + [b] \leq 1500 \text{ mm} \\
  [a] + [c] \leq 1700 \text{ mm} \\
  [d] \leq 1400 \text{ mm} \\
  [e], [f] \leq 500 \text{ mm}
  \]

  - Cable length (EW-JC130)
  EW-JC130 is available in three variations of differing length.
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<td>50</td>
<td>250</td>
</tr>
<tr>
<td>EW-JC130-SM</td>
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<td>50</td>
<td>450</td>
</tr>
<tr>
<td>EW-JC130-MM</td>
<td>550</td>
<td>50</td>
<td>550</td>
</tr>
</tbody>
</table>

- 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 ×2
- (B) Port for remote sprinter shifter (ST-R9170 does not have this port.)
- (C) Junction A
- (D) E-TUBE port ×3
- (E) Junction B
Clip-on bar type

![Electric wire wiring diagram (junction A side)](image)

- **SM-EW90-A**
- **SW-R610 (L)**
- **SW-R610 (R)**
- **ST-R9150/ST-R9170 (L)**
- **ST-R9150/ST-R9170 (R)**
- **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 ×2
(C) Junction A
(D) Junction B
(E) E-TUBE port ×3
SM-EW90-B (5 port type)

Clip-on bar type

- E-TUBE connector
- Connector for remote sprinter shifter

(A) Port for remote sprinter shifter (ST-R9170 does not have this port.)
(B) E-TUBE port ×2
(C) Junction A
(D) Junction B
(E) E-TUBE port ×5
**EW-RS910 (Built-in bar end type)**

**Drop handlebar type**

![Diagram of EW-RS910 setup]

- **ST-R9150/ST-R9170 (L)**
  - (A) Venture Ahead
  - (B) Control Unit

- **ST-R9150/ST-R9170 (R)**
  - (A) Venture Ahead
  - (B) Control Unit

- **SW-R9150 (L)**
- **SW-R9150 (R)**

- **EW-WU111 (E)**
- **EW-JC130 (D)**

- **EW-RS910 (C)**

- **E-TUBE connector**

- **(y) At least 40 mm**
- **(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**
EW-RS910 (Built-in frame type)

Drop handlebar type

- E-TUBE connector
- To frame (EW-RS910)
- Port for remote sprinter shifter (ST-R9170 does not have this port.)
- E-TUBE port ×2
- Wireless unit
INSTALLATION

Electric wire wiring diagram (junction A side)

Clip-on bar type

EW-RS910

EW-WU111

ST-R9150/ST-R9170 (L) SW-R9160 (L) SW-R9160 (R) ST-R9150/ST-R9170 (R)

To frame (EW-RS910)

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

E-TUBE port ×2

Wireless unit

(z)
**INSTALLATION**

Electric wire wiring diagram (junction A side)

Time trial/triathlon handle type

---

- **EW-RS910**
- **SW-R9160 (L)**
- **SW-R9160 (R)**
- **SM-JC41**
- **EW-JC130**
- **EW-WU111 (A)**
- **ST-R9160/ST-R9180 (L)**
- **ST-R9160/ST-R9180 (R)**

- **E-TUBE connector**
- **(z)** To frame (EW-RS910)
- **(A)** Wireless unit
Using the Shimano original tool TL-EW02

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

NOTICE

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.

Plug
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.

**NOTICE**

- 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**

<table>
<thead>
<tr>
<th>BC-9000/BC-R680 inner cable</th>
<th>Outer casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø1.6 mm</td>
<td>Ø5 mm</td>
</tr>
</tbody>
</table>
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.

2

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

(A) Clamp bolt

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 8 N·m</td>
</tr>
</tbody>
</table>

NOTICE

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

NOTICE

- 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

NOTICE
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.

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

TECH TIPS
The illustration is of the right brake lever.

NOTICE
The knurled grooves should be aligned.

<table>
<thead>
<tr>
<th>4 mm</th>
<th>6 - 8 N·m</th>
</tr>
</thead>
</table>

Knurled grooves
Pass the inner cable through.

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

**NOTICE**

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

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

**NOTICE**

- 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.**

(A) Support bolt

(T) Location where support bolt touches seat tube

TECH TIPS

After the checking the position, loosen the support bolt and return it to its original position.
Installation of the front derailleur

Attach the backup plate where the support bolt touches the seat tube. After that install the front derailleur to the frame.

(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.

Tightening torque

5 - 7 N·m

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

(A) Backup plate
(B) Mounting washer
(C) Fixing bolt
Use a 5 mm 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 - 1 mm from the front edge.

\[ A-B \] 0.5 - 1 mm

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 2 mm hexagon wrench to adjust.

### Tightening torque

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5 mm</strong></td>
<td><strong>5 - 7 N·m</strong></td>
</tr>
</tbody>
</table>

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

(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)** 2 mm hexagon wrench
- **(D)** Band adapter (for Ø28.6)
- **(E)** Fixing bolt

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5 mm</strong></td>
</tr>
</tbody>
</table>

**NOTICE**
- 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 - 3 mm between the chain guide outer plate and the largest chainring.**

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

[A-B] Clearance: 1 - 3 mm
Use a 5 mm 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 - 1 mm from the front edge.

**[A-B]** 0.5 - 1 mm

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 2 mm hexagon wrench to adjust.

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

<table>
<thead>
<tr>
<th><strong>Tightening torque</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5 mm</strong></td>
</tr>
</tbody>
</table>

(A) Support bolt
Installation of the rear derailleur

Install the rear derailleur to the frame.

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

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 - 10 N·m</td>
</tr>
</tbody>
</table>

NOTICE

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

Installation

1. 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

TECH TIPS
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.

TECH TIPS
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.

13.5 mm
9.1 mm
Installing the shifting switch

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

**NOTICE**
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.

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

TECH TIPS

• 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.

To be continued on next page
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.

Secure to the handlebar.
4. Cut off any excess zip tie with a pair of nippers or similar.

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

Installing the shifting switch

SW-R9160 (Shifting switch for aero bar)

Routing map

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

1. Connect the electric wire to the shifting switch.

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

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

TECH TIPS

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.)

NOTICE

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 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)

1. Attach to the stem using the band and hook included with SM-EW90.
   - (A) Band
   - (B) Stem
   - (C) Hook

2. Adjust the length of the band according to the thickness of the stem.
   Hook the band on the hook and wind it around the stem.
   Pull on the band and make sure it is firmly attached.

3. Slide SM-EW90 into the rail section of the hook to install it.
   - (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.

2. Connect the electric wires to 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 soft face mallet or similar tool when inserting it.
Remove the release back sheet from the handle holders, and then install them to the handlebar.

 TECH TIPS

- 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.

20 mm
13 mm

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

 TECH TIPS

When securing the electric wires, make length adjustments by tucking any excess length into the handlebar etc.
Cut the end of the handlebar tape diagonally and wrap it over the handle holders as shown in the illustrations.

6

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

**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.

**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. Connect the electric wires to junction A.
   - (A) Junction A

3. Insert junction A into the frame and attach the holder plate.
   - (A) Fixing bolt
   - (B) Holder plate

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.26 - 0.4 N·m</td>
</tr>
</tbody>
</table>
■ Installation of junction B

1. Remove the wire guide from the frame, if attached.

2. Attach junction B using the wire guide mounting hole.

- (A) Wire guide
- (B) 3 mm hexagon wrench
- (A) Junction B
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.

About wireless functions

Cycle computer connection

ANT™ connection transmits the following four types of information to cycle computers or receivers that are compatible with ANT™ or Bluetooth® LE connections.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Gear position (front, rear)</td>
</tr>
<tr>
<td>(2)</td>
<td>D12 battery level information</td>
</tr>
<tr>
<td>(3)</td>
<td>Adjustment mode information</td>
</tr>
<tr>
<td>(4)</td>
<td>D-FLY channel switch information</td>
</tr>
</tbody>
</table>

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

E-TUBE PROJECT 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

1. Connect the electric wires to the wireless unit.

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

   NOTICE
   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

Cycle computer 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. Perform gear shifting operations.
   If you cannot connect after performing gear shifting operations, perform the following operations.
   **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.

- 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.
INSTALLATION

Attaching the wireless unit (EW-WU111)

E-TUBE PROJECT 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.

(A) Remote switch
(ST-R9150/ST-R9170)
(B) Brake lever
(C) Shifting switch

(z) E-TUBE port section
Installing the battery

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

Installing the battery mount

1. 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 owner's manual for the bottle cage for details on the tightening torques.

<table>
<thead>
<tr>
<th>Short type</th>
<th>Long type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use the included M4 bolts to secure the short type.</td>
<td>For the long type, secure it with the bolts supplied with the frame or the bottle cage. Refer to the owner's manual for the bottle cage for details on the tightening torques.</td>
</tr>
</tbody>
</table>

2. Leave a space of 108 mm 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) 108 mm
Installing the battery

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

TECH TIPS

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 (M4×15 mm)

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.

   - **TECH TIPS**
     - If installing the bottle cage, it is easier to install it at this stage.
     - Refer to the owner's manual for the bottle cage for details on the tightening torques.

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

   - **TECH TIPS**
     - 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 (M4×15 mm)**

   - **Tightening torque**
     - 1.2 - 1.5 N·m
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 32 mm and a maximum of 50 mm from the original installation position.

(A) Spacer

<table>
<thead>
<tr>
<th>(y)</th>
<th>15 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>(z)</td>
<td>10 mm</td>
</tr>
</tbody>
</table>

3 mm

Tightening torque

| 3 mm | 3 N·m |

TECH TIPS

- If it interferes with the mounting boss for the front derailleur, use the included spacer.
- Refer to the owner’s manual for the bottle cage for details on the tightening torques.
Installing the battery

1. Insert the seat post collar into the seat post.

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

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**

- 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.
- 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 2.0 mm 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".

<table>
<thead>
<tr>
<th>Tool</th>
<th>Tool</th>
<th>Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 mm</td>
<td>7 mm socket wrench</td>
<td>TL-BT03/TL-BT03-S</td>
</tr>
<tr>
<td>2 mm</td>
<td>Slotted screwdriver (nominal dia. 0.8 x 4)</td>
<td>TL-BH62</td>
</tr>
<tr>
<td>4 mm</td>
<td>Adjustable wrench</td>
<td>TL-EW02</td>
</tr>
<tr>
<td>5 mm</td>
<td>Utility knife</td>
<td>TL-LR15</td>
</tr>
<tr>
<td>8 mm</td>
<td>TL-BH61</td>
<td></td>
</tr>
<tr>
<td>12 mm</td>
<td>Funnel adapter</td>
<td></td>
</tr>
</tbody>
</table>


Installation of the disc brake rotor

Center lock type

![Diagram of Center Lock Type]

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

<table>
<thead>
<tr>
<th>Internal spline type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rotor fixing lock ring</strong></td>
</tr>
<tr>
<td><strong>Lock ring tightening tool</strong></td>
</tr>
<tr>
<td>TL-LR15</td>
</tr>
<tr>
<td>Adjustable wrench</td>
</tr>
</tbody>
</table>

Tightening torque

| TL-LR15 |
| 40 - 50 N·m |

Installation of the brake hose

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

(z) 90°

**NOTICE**

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

**TECH TIPS**

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

\[ (z) \ 15 \text{ mm} \]

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.

**NOTICE**

- 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.

\( \text{BR-R9170: 13.8 mm} \)
\( \text{ST-R9180: 16.8 mm} \)
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.

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

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

**NOTICE**
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.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Length</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM-BH90-JK-SSR</td>
<td>11.2 mm</td>
<td>Silver</td>
</tr>
</tbody>
</table>
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**

(y)

(A)

(z)

(A)

**ST-R9180/BR-R9170**

(y)

(A)

(z)

(A)
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.

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

**ST-R9170**
- When installing the brake hose with the dual control lever secured to the handlebar, adjust the angle of the bracket to make it easier to turn the spanner. At that time, be careful not to damage the handlebar and other parts.

**ST-R9180**
- Pass the brake hose through the handlebar before attaching the brake hose to the dual control lever.

**TECH TIPS**
- This step is not required for ST-R9180.
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)

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.

NOTICE

• The illustration is a rough image. For details on routing the brake hoses, consult the manufacturer of the completed bicycle or refer to the owner’s 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.
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.

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

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

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.

NOTICE

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

**NOTICE**

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

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.

**NOTICE**

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

- Make sure to also read the owner’s manual for the Shimano original tool TL-BH62.
7

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.

8

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.

9

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

NOTICE

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

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.
**INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM**

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

---

**12**

Remove the seal plug.

---

**13**

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

---

**14**

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

Then, wipe off any oil residue.

---

**NOTICE**

Cover the seal plug with a clean rag as the oil applied to the seal plug may leak.

---

**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 clean rag when inserting the brake hose as some oil inside may leak.

---

**Flanged connecting bolt**

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 mm</td>
</tr>
<tr>
<td>5 - 6 N·m</td>
</tr>
</tbody>
</table>

**NOTICE**

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

---

*To be continued on next page*
15

Remove the brake lever stopper.

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.

(A) Lever stopper

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

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

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

NOTICE
When tilting, be careful not to forcibly pull on the brake hose or electric wires.
Remove the bleed screw and O-ring.

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

Attach the funnel adapter to the oil funnel.

**NOTICE**
Be careful not to drop the bleed screw and O-ring.
Mount the oil funnel.

![Mount the oil funnel.](image)

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

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.

![Make adjustments, such as changing the angle of the handlebar.](image)

**NOTICE**
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.

![Secure the brake caliper in a vise.](image)

23
Fill the oil funnel with oil.

![Fill the oil funnel with oil.](image)
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
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.

**NOTICE**

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

**Tightening torque**

|  | 0.5 - 0.7 N·m |
Wipe away any oil which has flowed out.

**ST-R9180**

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

**NOTICE**

- The illustration is a rough image. For details on routing the brake hoses, consult the manufacturer of the completed bicycle or refer to the owner’s 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).
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.

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

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

NOTICE
• 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 100 mm more than the appropriate length can be pulled out.
Orient the brake hose connection port of the dual control lever upward when securing.

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

NOTICE
- Do not move the lever indicated in the illustration before disassembling the Shimano original tool TL-BH62.
- Make sure to also read the owner’s manual for the Shimano original tool TL-BH62.
**INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM**

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

---

### 7

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]**

---

### 8

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]**

---

### 9

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

---

**NOTICE**

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

---

**A** Hose cutter

---
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.

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

Remove the seal plug.

(A) Seal plug

NOTICE
Cover the seal plug with a clean rag as the oil applied to the seal plug may leak.

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 clean rag when inserting the brake hose as some oil inside may leak.

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

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

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

(A) Connecting bolt

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>8mm</td>
</tr>
<tr>
<td>12mm</td>
</tr>
</tbody>
</table>

Then, wipe off any oil residue.

Install the dual control levers.

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

To be continued on next page
To be continued on next page

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

16

Remove the brake lever stopper.

(A) Lever stopper

**NOTICE**

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

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

**TECH TIPS**

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

17

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

**NOTICE**

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

18

Remove the bleed screw and O-ring.

(A) Bleed screw

(B) O-ring

**NOTICE**

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

To be continued on next page
19 Mount the 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.

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

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.

Lever operation

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

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

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

**NOTICE**

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

Wipe away any oil which has flowed out.
Installation of Hydraulic Disc Brake System

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.

Notices:

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

2

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

(A) Clamp bolt

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 mm</td>
</tr>
<tr>
<td>6 - 8 N·m</td>
</tr>
</tbody>
</table>

Notices:

When mounting the shifting lever to a drop handlebar, loosen the clamp bolt sufficiently. Otherwise, the handlebar may be damaged.
INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM

Installation to the handlebar

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.)

<table>
<thead>
<tr>
<th>Handlebar inner diameter</th>
<th>Fixed shoe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø19.0 - 20.5 mm</td>
<td>Size S</td>
</tr>
<tr>
<td>Ø20.5 - 22.5 mm</td>
<td>Size L</td>
</tr>
</tbody>
</table>

Replacement procedure for fixed shoe

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

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

**TECH TIPS**

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

**NOTICE**

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 to the handlebar

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

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 mm</td>
</tr>
<tr>
<td>1 - 1.3 N·m</td>
</tr>
</tbody>
</table>

**NOTICE**

- Do not use a 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

ST-R9170

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

![Diagram of bicycle with brake hose and caliper](image)

NOTICE

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

Mount the bleed spacer (yellow).

![Diagram of bleed spacer and pad axle](image)

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 - 0.3 N·m</td>
</tr>
</tbody>
</table>
INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM

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.

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

4

Remove the bleed screw and O-ring.

(A) Bleed screw
(B) O-ring

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

To be continued on next page
5 Attach the funnel adapter to the oil funnel.

6 Mount the oil funnel.

7 Secure the brake caliper in a vise while bleeding.
Set a 7 mm socket wrench in place.

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

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

NOTICE

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

Do not depress and release the lever repeatedly.

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

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

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) Bag

(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.
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.

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

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.

Tighten the bleed nipple.

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - 7 N·m</td>
</tr>
</tbody>
</table>
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.

Lever operation

(x) Loose
(y) Slightly stiff
(z) Stiff
Make adjustments, such as changing the angle of the handlebar, so that the head of the bleed screw is parallel to the ground.

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

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

| 2 mm | 0.5 - 0.7 N·m |

NOTICE

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

NOTICE

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

Mount the bleed spacer (yellow).

(A) Bleed spacer
(B) Pad axle

Tightening torque

0.1 - 0.3 N·m
2. Adjust the position of the bleed screw so that its surface is parallel to the ground.

3. Remove the bleed screw and O-ring.

(A) Bleed screw
(B) O-ring

4. Mount the oil funnel.

(A) Oil funnel

5. Secure the brake caliper in a vise while bleeding.

NOTICE

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

NOTICE

Be careful not to drop the bleed screw and O-ring.
Set a 7 mm socket wrench in place.

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

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

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 clean rag to prevent oil from spattering.

NOTICE
Secure the brake caliper in a vise to prevent the tube from being accidentally disconnected.
Do not depress and release the lever repeatedly.
Oil without air bubbles may come out as a result of such operation, but air bubbles may remain in the oil inside the brake caliper, and it will take longer to bleed the air. (If you have depressed and released the lever repeatedly, drain out all of the oil and then add oil again.)
8
Operate the brake lever about 10 times.

9
Tie the supplied tube and bag with rubber bands.

(A) Bag

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

(A) Bag

10
Loosen the bleed nipple.

(A) Air bubbles

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.

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.
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.

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - 7 N·m</td>
</tr>
</tbody>
</table>
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.

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.

Lever operation

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

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

(A) O-ring
(B) Oil stopper

To be continued on next page
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

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.5 - 0.7 N·m</td>
<td></td>
</tr>
</tbody>
</table>

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

20
Wipe away any oil which has flowed out.
Installing the brake caliper

1. Remove the bleed spacer (yellow).

2. Set the pad fixing spring as shown in the illustration.

3. Install the new brake pads and bolts. At this point, make sure to install the retaining clip as well. Install the pads as shown in the illustration.

Tightening torque

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.1 - 0.3 N·m</td>
</tr>
</tbody>
</table>

NOTICE

When using a pad with fins, take note of the left (L) and right (R) markings to set it.
Check the length of brake caliper mounting bolt C

Same for 140 mm/160 mm/180 mm disc brake rotors

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 13 mm.

(A) Brake caliper mounting bolt C

Length

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

Bolt length selector

• 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

<table>
<thead>
<tr>
<th>Frame thickness</th>
<th>Brake caliper mounting bolt C length</th>
<th>Y-part</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 mm</td>
<td>33 mm</td>
<td>YBPU08010</td>
</tr>
<tr>
<td>25 mm</td>
<td>38 mm</td>
<td>YBPU08020</td>
</tr>
<tr>
<td>30 mm</td>
<td>43 mm</td>
<td>YBPU08030</td>
</tr>
</tbody>
</table>
INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM

Installing the brake caliper

To be continued on next page

NOTICE

• A special mount bracket may be required depending on the frame and disc brake rotor combination.

<table>
<thead>
<tr>
<th>Fork and frame mount type</th>
<th>Disc brake rotor size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>140 mm (SS)</td>
</tr>
<tr>
<td>Flat mount Ø140/160</td>
<td>Rear</td>
</tr>
<tr>
<td>Flat mount Ø160/180</td>
<td>Rear</td>
</tr>
</tbody>
</table>

* BR-R9170 is not compatible with rear 180 mm (M) rotor.

When using a mount bracket
(140 mm disc brake rotor)
(160 mm disc brake rotors with Ø160/180 mount)

1. Attach the mount bracket to the brake caliper.
2. Install the bolt fixing pin.
3. Check that the bolt fixing pin is fully inserted all the way to the back.

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

Tightening torque

| 4 mm | 6 - 8 N·m |

NOTICE

• 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

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 mm</td>
</tr>
</tbody>
</table>

3

Install the snap ring.

Install the snap ring by inserting the protruding section of the snap ring into the mount bracket hole.

(A) Snap ring
Installing the brake caliper

When using a mount bracket
(160 mm disc brake rotor)
(180 mm disc brake rotors with Ø160/180 mount)

Attach the mount bracket to the brake caliper.
Install the bolt fixing pin.
Check that the bolt fixing pin is fully inserted all the way to the back.

**NOTICE**
• Observe the direction indicated on the mount bracket when installing it.

** Tightening torque **

| 4 mm | 6 - 8 N·m |

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

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 8 N·m</td>
</tr>
</tbody>
</table>

**NOTICE**
- 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.

3

Install the snap ring. Install the snap ring by inserting the protruding section of the snap ring into the mount bracket hole.

(A) Snap ring
Installing the brake caliper

When using a brake caliper mounting bolt C
(140 mm disc brake rotor)
(160 mm disc brake rotors with Ø160/180 mount)

- Attach the brake caliper to the frame.

- Notice:
  - Be sure to attach the bolt fixing pin.

When using a brake caliper mounting bolt C
(160 mm disc brake rotor)
(180 mm disc brake rotors with Ø160/180 mount)

- Attach the mount bracket to the brake caliper.

- Notice:
  - Be sure to attach the bolt fixing pin.
  - Observe the direction indicated on the mount bracket when installing it.
Installing the brake caliper

Attach the mount bracket to the frame.

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

Tightening torque

| Диаметр | 6 - 8 N·m |

NOTICE

- Be sure to use the washers when installing the mount bracket.
- Be sure to attach a retaining clip when installing brake caliper mounting bolts C.
INSTALLATION OF HYDRAULIC DISC BRAKE SYSTEM

Temporary tightening of the frame fixing bolts

Fixing pin insertion method

<table>
<thead>
<tr>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Diagram of front fixing pin insertion" /></td>
<td><img src="image2.png" alt="Diagram of rear fixing pin insertion" /></td>
</tr>
</tbody>
</table>

(A) Bolt fixing pin
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)

5 port type

- ST-R9150/ST-R9170 (L)
- ST-R9150/ST-R9170 (R)

**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.

**NOTICE**

ST-R9170 does not have a port for remote sprinter shifter.
**CONNECTION OF ELECTRIC WIRES**

Connection of junction A

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

---

**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.

---

**NOTICE**

ST-R9170 does not have a port for remote sprinter shifter.
## Connection of junction B

### External type (SM-JC40)

1. Connect the electric wires to junction A and junction B.

   ![Diagram of connections]

   - (A) SM-EW90-A Junction A
   - (B) SM-EW90-B Junction A
   - (C) EW-RS910 Junction A
   - (D) E-TUBE port ×3
   - (E) E-TUBE port ×5
   - (F) E-TUBE port ×2
   - (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

2. Attach the plug cover to the electric wire.

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

   ![Diagram of connections]

   - (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**
     - Shimano original tool TL-EW02 (A)

   - **Battery mount**
     - Shimano original tool TL-EW02 (A)

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

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

   **Example of adjusting junction B length**

Notices:

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

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

**TECH TIPS**

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.
2

Connect each electric wire to junction B.

(A) SM-JC40/41 Junction B

TECH TIPS
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 ×3
(E) E-TUBE port ×5
(F) E-TUBE port ×2
(G) Shimano original tool TL-EW02
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.

Connecting to other parts

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

(A) Shimano original tool TL-EW02
CONNECTION OF ELECTRIC WIRES

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

2

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

NOTICE

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

**SW-R9160/ST-R9160/ST-R9180**

- (A) Junction A
- (B) Shimano original tool TL-EW02

**SW-R610**

- (A) Shimano original tool TL-EW02

**TECH TIPS**

The port shape is different only for SW-R610.
CONNECTION OF ELECTRIC WIRES

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

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.

   Follow the same procedure when using SM-BTR2/BT-DN110/BT-DN110-A as a battery adapter.
   - (w) For lithium ion battery (built-in type)
   - (x) For front derailleur
   - (y) For rear derailleur
   - (z) For junction A

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

1. When installing the inner cover to the bottom bracket shell, make sure that the electric wires for the front derailleur and the rear derailleur pass over the top of the inner cover.

2. Install the inner cover to the bottom bracket adapter.

**NOTICE**

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

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

**TECH TIPS**

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

- Circle: SM-GM01
- Ellipse: SM-GM02
CONNECTION OF ELECTRIC WIRES

Checking connections

3

Push the other end to set in place.

(y) Rear derailleur

(z) Front derailleur

■ Checking connections

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

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

⚠️ 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

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

NOTICE

- 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.

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

**NOTICE**

- 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

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.

<table>
<thead>
<tr>
<th>When the chain is in the range [1], shown in the illustration</th>
<th>Operating the shifting switch does not shift the front derailleur. Instead, the rear derailleur is shifted down through two gears.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the chain is outside the range [1], shown in the illustration</td>
<td>Operating the shifting switch shifts the front derailleur to the smallest chainring.</td>
</tr>
</tbody>
</table>

NOTICE

- 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.

<table>
<thead>
<tr>
<th>When shifting the rear in the direction of the smallest sprocket</th>
<th>Operating the shifting switch will not shift the chain into the range [1], shown in the illustration.</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1] From the smallest to the second sprocket.</td>
<td></td>
</tr>
</tbody>
</table>

[1] From the smallest to the second sprocket.
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.

3. Shift the rear derailleur to the 5th sprocket position.
Press the button at junction A until the button LED illuminates in order to switch from gear shifting mode to adjustment mode.

**NOTICE**

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).
Adjustment of the rear derailleur

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.

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.

**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.
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

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.

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**

- **A** 2 mm hexagon wrench
- **B** 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.

**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)

**Adjustment of the top-side stopper bolt**

- **A** 2 mm hexagon wrench
- **B** 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.

**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.

**NOTICE**

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.
Adjustment of the front derailleur

Top adjustment

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

2. Use a 2 mm hexagon wrench to turn the top adjustment bolt.
   Adjust so that there is a clearance of 0.5 - 1 mm between the chain and the chain guide outer plate.
   
   **[B-C]** 0.5 - 1 mm
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.

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

**NOTICE**

Note that if you keep pressing the button after the button LED has illuminated, RD Protection Reset will begin.
### Adjustment of the Front Derailleur

Operate shifting switch [X] or [Y].

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

\[
\text{[A-B]} \quad 0 - 0.5 \text{ mm}
\]

**NOTICE**

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.

### Steps

1. **Step 3**
   - Operate shifting switch [X] or [Y].
   - Adjust so that there is a clearance of 0 - 0.5 mm between the chain and the chain guide inner plate.
   - **NOTICE** 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.

2. **Step 4**
   - Press the button at junction A until the red LED turns off in order to switch from adjustment mode to gear shifting mode.
Adjustment of the front derailleur

For time trial/triathlon handle type

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

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

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

- **TECH TIPS**
  - E-TUBE PROJECT can be used to set the chain to the smallest chainring and largest sprocket.
  - SM-EW90-A/B can also be switched to adjustment mode by operating the button the same way.

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

- **TECH TIPS**
  - When you switch to front derailleur adjustment mode, the battery level display LED flashes red.
Adjustment of the front derailleur

Operate shifting switch R[X] or L[X]. Adjust so that there is a clearance of 0 - 0.5 mm between the chain and the chain guide inner plate.

[A-B] 0 - 0.5 mm

**NOTICE**
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.

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.

**TECH TIPS**
SM-EW90-A/B can also be switched to gear shifting mode by operating the button the same way.
Adjustment of the front derailleur

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.

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

NOTICE

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

To be continued on next page
Adjustment of the front derailleur

Operate shifting switch [X] or [Y]. Adjust so that there is a clearance of 0 - 0.5 mm between the chain and the chain guide inner plate.

\[ \text{[A-B]} \ 0 - 0.5 \ \text{mm} \]

**NOTICE**
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.

**SM-EW90-A/B**
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.

**EW-RS910**

(A) Chain
(B) Chain guide inner plate

(A) Button
Adjustment of the front derailleur

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. 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

   NOTICE
   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.

To be continued on next page
Adjustment of the front derailleur

Operate shifting switch R[X] or L[X].
Adjust so that there is a clearance of 0 - 0.5 mm between the chain and the chain guide inner plate.

[A-B] 0 - 0.5 mm

NOTICE
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.

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.

   - Counter-clockwise: Increases the lever stroke
   - Clockwise: Decreases the lever stroke

   - Slotted screwdriver
     Blade width: 4.0 - 5.0 mm
     Blade thickness: 0.5 - 0.6 mm

NOTICE

Make sure that braking operates properly after the adjustment.
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) 2 mm hexagon wrench

NOTICE
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) 2 mm hexagon wrench
(B) Reach adjustment bolt

NOTICE
Make sure that braking operates properly after the adjustment.
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) 2 mm hexagon wrench

NOTICE
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) 2 mm hexagon wrench

NOTICE
- 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)

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

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

Names of parts

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 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.

   ![Image of battery charger and battery](image1)

   **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.

   ![Image of battery charger with charge indicator](image2)

   **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. 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.
## CHARGING THE BATTERY

### Charging method

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connect the battery to the junction A.</td>
</tr>
</tbody>
</table>
| 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 battery can be charged by using an AC adapter with a USB port or connecting the charger to the USB connector of a PC.  
- 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.

(2) If charging is not possible, the ERROR indicator on the Battery charger will flash.
CHARGING THE BATTERY

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.

   **If the ERROR indicator blinks**

   ![ERROR indicator](A)

   If the ERROR indicator blinks, the ambient temperature during charging may fall outside the operating temperature limits.

   Check that the temperature is appropriate.

2. If the CHARGE indicator blinks

   ![CHARGE indicator](A)

   If the CHARGE indicator blinks, refer to the following.

   - The current capacity of your AC adapter with a USB port is lower than 1.0 A DC.
     - Use an AC adapter with a USB port with a current capacity equal to or higher than 1.0 A DC.
   - Connection is using a USB hub.
     - Remove the USB hub.

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

**NOTICE**

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

Settings customizable in E-TUBE PROJECT

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 (https://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

<table>
<thead>
<tr>
<th>PC linkage device</th>
<th>E-TUBE PROJECT</th>
<th>Firmware</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM-BMR2/SM-BTR2</td>
<td>SM-PCE1/SM-BCR2</td>
<td>Version 3.2.0 or later</td>
</tr>
<tr>
<td>BT-DN110/BT-DN110-A/BM-DN100</td>
<td></td>
<td>Version 4.0.0 or later</td>
</tr>
</tbody>
</table>

NOTICE

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

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

### 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**

<table>
<thead>
<tr>
<th>CS</th>
<th>(A)</th>
<th>(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
<td></td>
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<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTICE**
Values that can be actually set for number of gears to jump depend on chainring and sprocket size combinations.
Replacing the bracket cover

ST-R9150/ST-R9170

Fit the protruding sections on the bracket cover into the slots on the bracket unit.

**NOTICE**

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 protruding sections 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.

   ![Diagram](image1)

(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 soft face mallet to push out the lever axle.

   ![Diagram](image2)

(A) Hexagon wrench
(B) Lever axle

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

   ![Diagram](image3)

(A) Return spring

To be continued on next page
MAINTENANCE

Assembly of the switch unit

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

NOTICE
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
Assembly of the switch unit

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.

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:

| #5 | 0.1 N·m |
Assembly of the bracket body and lever body

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

   - **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].

   - **E-ring groove**
   - **Lever axle**
   - **Cable**

TECH TIPS

- 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

Replace pulleys using a 3 mm 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) | 3 mm hexagon wrench |

### Tightening torque

![Tightening torque](image)

| 3 mm | 2.5 - 5 N·m |

### TECH TIPS

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

### NOTICE

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

### MAINTENANCE

#### Replacement of the pulley

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

(A) Special E-ring removal tool

![MAINTENANCE](image)
## Replacement of the plate and the plate tension spring

### Removal

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1    | Remove the plate stopper pin.  

(A) Plate stopper pin

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 N·m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Turn the plate to loosen the plate tension spring as shown in the illustration.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3    | Using a Hexalobular[#10], remove the stopper bolt.  

(A) Stopper bolt

<table>
<thead>
<tr>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 N·m</td>
</tr>
</tbody>
</table>
**MAINTENANCE**

Replacement of the plate and the plate tension spring

1. **Cautions when assembling**

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

2. **Detach the plate.**

3. **Apply grease to the plate axle.**

4. **Apply grease.**

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

(A) Plate axle

(B) Plate tension spring
Repeating the brake pads

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

2. Clean the pistons and surrounding area.

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

   Do not push the pistons with a sharp tool.

   The pistons may be damaged.

---

**NOTICE**

- This brake system is designed to automatically adjust the clearance between the disc brake rotor and the brake pads by the piston gradually protruding according to the wear of the brake pads. When you replace the brake pads, you need to push back the piston.

- If oil adheres to the brake pads after oil is added, or if the brake pads are worn down to a thickness of 0.5 mm, or if the brake pad presser springs are interfering with the disc brake rotor, replace the brake pads.

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

---

(A) Brake pads  (B) Retaining clip
Install the new brake pads, the bolt, and the pad spacer (red).
At this point, make sure to install the retaining clip as well.

(A) Brake pads
(B) Retaining clip
(C) Pad axle
(D) Pad spacer (red)

Tightening torque

| 0.1 - 0.3 N·m |

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

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.