Dealer's Manual

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

SHIMANO ALFINE S7051 Series

SG-S7051-11
SG-S7051-8
SM-S705
MU-UR510
MU-UR500
MU-S705

SW-S705
ST-S705-R
BL-S705-L
SC-S705
SC-MT800

SM-BTR1
SM-BMR1 (Ver.2.0.0 or above)
SM-BMR2
BM-DN100
SM-JC40
EW-SD50
SM-EWC2
SM-BCR1
SM-BCC1

SM-BTR2
BT-DN110-A
BT-DN110
SM-BCR2
SM-JC41
EW-SD50-I
EW-SD300
EW-SD300-I
EW-CC300
EW-JC304
EW-JC302
EW-AD305

CONTENTS

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.

TO ENSURE SAFETY

⚠ DANGER

Be sure to also inform users of the following:

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

■ Lithium ion battery

- 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

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

- Use an AC adapter with a USB port with a voltage of 5.0 Vdc and with a current equal to or higher than 1.0 Adc. 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.

⚠ WARNING

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

Be sure to also inform users of the following:

- ***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.***
- ***Clean the chain with an appropriate chain cleaner regularly. Intervals between maintenance depend on the use and riding circumstances.***
- Check that the wheels are fastened securely before riding the bicycle. You may fall or collide and be seriously injured.
- Check the chain for any damage (deformation or cracking), skipping, or other abnormalities such as unintended gear shifting. The chain may break, and you may fall.

■ 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.

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.
- Do not use the battery outside its operating temperature ranges. 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 are given below:
  1. During discharge: –10°C - 50°C
  2. During charging: 0°C - 45°C

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.
- Do not use the battery outside its operating temperature ranges. 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 are given below:
  1. During discharge: –10°C - 50°C
  2. During charging: 0°C - 45°C

■ 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 symptoms are observed, stop using the device. A fire or electric shock may be caused.
  * 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 charging cable, be sure to hold the cable by the plug. Failure to do so may cause a fire or electric shock. If the following symptoms are observed, stop using the device. A fire or electric shock may be caused.
  * 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 Vdc and with a current equal to or higher than 1.0 Adc. If the one with a current lower than 1.0 Adc is used, a charge error may occur or the AC adapter may heat up, leading to a fire.
- Do not use a USB hub when connecting the cable to a computer USB port. This may cause a charging error or fire due to overheating.
- Be careful not to damage the charging cable. Do not damage, process, let near hot objects, bend, twist or pull them; do not place heavy objects on top or bundle them tightly. If they are used while damaged, fire, electric shocks or short-circuits may occur.

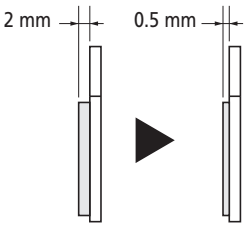
■ Brake

- Because each bicycle may handle slightly differently depending on the model, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. Improper use of your bicycle's brake system may result in a loss of control, which could lead to serious injury due to a fall or collision.
- Do not apply the front brake too strongly. If you do so, the front wheel may lock and the bicycle may fall forward, and serious injury may result.
- Because the required braking distance will be longer during wet weather, reduce your speed and apply the brakes early and gently. You may fall or collide and be seriously injured.
- A wet road surface may cause tires to lose traction; therefore, to avoid this, reduce your speed and apply the brakes early and gently. If the tires lose traction, it may result in serious injury due to a fall or collision.

■ Disc brake

- Keep your fingers away from rotating disc brake rotors. Disc brake rotors are sharp enough to severely injure your fingers if caught within the openings of a disc brake rotor.

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



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

For Installation to the Bicycle, and Maintenance:

- When installing the hub to the frame, be sure to install the correct non-turn washers to the left and right sides, and securely tighten the hub nuts to the specified torques. If the non-turn washer is installed only on one side or the hub nut is not fully tightened, the non-turn washer may come off, causing the hub axle and the motor unit to turn, which in turn may cause the electric wire to be disconnected or damage the motor unit.
- Assemble the wheel with 3x or 4x lacing, and do not spoke the wheel radially.
  Otherwise, the spokes or the wheel may get damaged, or noise may occur when braking.

⚠ 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-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.

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)

• If the device will not be used for an extended period, store it after charging indoors (approx. 10 - 20°C) where the battery will not be exposed to direct sunlight or rain, and charge every six months.

■ Disc brake

• To optimize the performance of the brake pads and disc brake rotor, perform the bed-in procedure as explained in the steps below:

1. Ride your bicycle in a flat and safe area without obstacles and accelerate to a moderate speed.
2. Operate the brake lever until you slow down to walking speed.
   Perform this operation carefully with only one brake lever at a time. Always operate your brake lever with moderation, especially when you bed in the front brake.
3. Repeat steps 1 and 2 for at least 20 times for both the front and rear brakes.
   While repeating the process, the brake force will increase.

NOTICE

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.
- The connectors are small and waterproof, so do not connect and disconnect electric wires except when necessary. Doing so may impair the waterproofing.
- Be careful not to get water into the E-TUBE port area.
- 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.
- 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.
- The most up-to-date information on software for this product 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.

■SG-S7051-11 / SG-S7051-8

- The internal geared hub is not completely waterproof. Avoid using the hub in places where water might get inside and do not use high-pressure water to clean the hub, otherwise the internal mechanism may rust.
- You can shift gears while pedaling, but on rare occasions the pawls and ratchet inside the hub may produce some noise afterwards as part of normal gear shifting operation.
- The internal geared hub has a built-in mechanism to support shifting, and when this support mechanism operates during shifting, noise or vibration may occur. Depending on gear position, gear-shifting may feel different.
  Noise may also occur if the gear is positioned at 5 to 8 (SG-S7051-8) or 7 to 11 (SG-S7051-11), when the crank is turned backward or when the bicycle is pushed backward.
  All of these phenomena occur due to the built-in gear-shifting structure and are not the failure of the internal components.

■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.

For information on used batteries, contact the place of purchase or a bicycle dealer.

■ Lithium ion battery

- Lithium-ion batteries are recyclable, valuable resources.
- 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 too 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 too 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

- 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.
- 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.

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

- 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 again.
- 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.

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.
- The sprockets 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 sprocket and the chain.
- If the chain keeps coming off the gears during use, replace the sprockets and chain.

■Internal geared hub

- The sprocket should be used from 16T to 23T.

	Sprocket
When using chain tensioner	16T, 18T, 20T
When not using chain tensioner*	16T, 18T, 19T, 20T, 21T, 22T, 23T

* A chain tensioner cannot be used with the MU-UR510 motor unit.

- It is recommended that the chainring of the front be set to a gear ratio of 2 to 2.25.

	Gear ratio	Front	Rear
11-speed	1.8 - 2.0	45T	23T
		42T	21T, 22T, 23T
		39T	20T, 21T
		38T	19T, 20T, 21T
8-speed	2 - 2.25	45T	20T, 21T, 22T
		42T	19T, 20T, 21T
		39T	18T, 19T
		38T	18T, 19T
		33T	16T

- In order to maintain proper performance, it is recommended that you carry out maintenance such as replacing the oil and applying grease to the internal unit after riding 1,000 km from the start of use, then after about once every year (or once about every 2,000 km if the bicycle is used very frequently). If the bicycle is used under harsh conditions, more frequent maintenance is required.
  Also, for carrying out maintenance, the use of SHIMANO internal geared hub grease or a lubrication kit is recommended. If SHIMANO grease or a SHIMANO lubrication kit is not used, problems such as a malfunction in shifting unit may occur.
- If the wheel becomes stiff and difficult to turn, perform an inspection.

■SG-S7051-11

- When you perform oil maintenance, use the SG-S700 OIL or TL-S703 maintenance kit.
  When you replace the oil, follow the manual for TL-S703. When you replace the seal on the right side, use TL-S704.
  If SG-S700 OIL is not used, problems such as an oil leakage and gear shifting malfunction may occur.

■SG-S7051-8

- When you perform oil maintenance, use the WB maintenance oil or the WB maintenance oil set.
  If the WB maintenance oil is not used, problems such as an oil leakage and gear shifting malfunction may occur.

■Electric wires

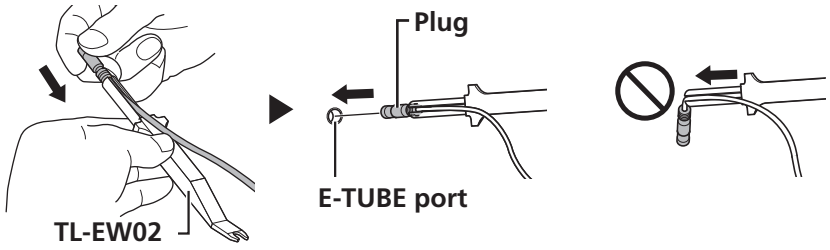
- There are two types of electric wire: the EW-SD300 and the EW-SD50. The supported electric wire differs according to the model. Check the component specifications on the SHIMANO product website in advance (https://productinfo.shimano.com/).
- The SHIMANO original tool used for installation/removal and the accessories used for wiring differ for the EW-SD300 and EW-SD50 as shown below. Be sure to use a compatible product

Product name	Intended purpose	EW-SD50 type	EW-SD300 type
SHIMANO original tool	Connecting / disconnecting the electric wire	TL-EW02	TL-EW300
Dummy plug	Blocking empty ports	Y6VE15000	Y7HE30000
Cord clip	Binding the wiring and the outer casing / brake hose together	Y70H98040	EW-CL300-S (for shift outer casing) EW-CL300-M (for outer casing and brake hose)
Cord cover	Supporting / protecting the electric wire (external wiring)	SM-EWC2	EW-CC300
Grommets	Installing to the wire insertion hole of a frame that supports internal wiring	SM-GM01 SM-GM02	EW-GM300-S EW-GM300-M
Cord band	Supporting the electric wire (flat handlebar external wiring)	SM-EWE1	EW-CB300-S EW-CB300-M EW-CB300-L
Junction [A]	Gathering the wiring around the cockpit. Also has functions for changing the shift mode, etc.	EW-RS910 SM-EW90-A SM-EW90-B	-
Junction [B]	Conjoining the wiring inside and outside the frame	SM-JC41 SM-JC40 EW-JC200 EW-JC130	EW-JC304 EW-JC302
Conversion adapter	Connecting the EW-SD50 and EW-SD300	EW-AD305	

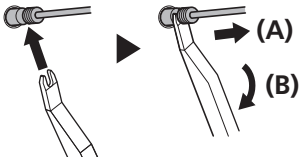
- Secure the electric wires with a zip tie so that they do not interfere with the chainrings, sprockets or tires.
- Do not remove the wire holders which are attached to the built-in type electric wires (EW-SD50-I / EW-SD300-I).
  The wire holders prevent the electric wires from moving inside the frame.

■EW-SD50

- When connecting the EW-SD50, use the method indicated in the figure. When connecting, push it straight in until you feel it click into place.

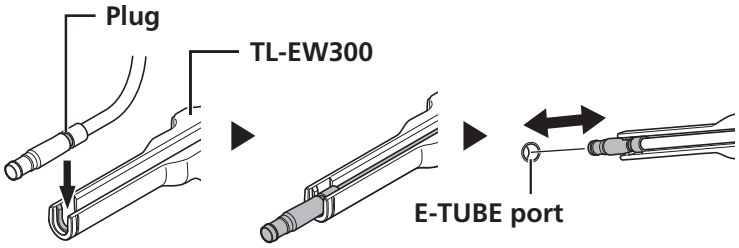


- When disconnecting the EW-SD50, lift the TL-EW02 straight up as indicated in (A), or use the TL-EW02 as a lever as indicated in (B).

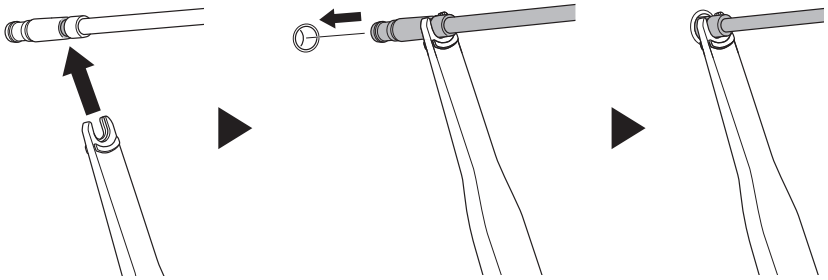


■EW-SD300

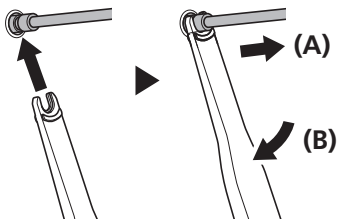
- When connecting or disconnecting the EW-SD300, use the method indicated in the figure. When connecting, push it straight in until you feel it click into place.



- When connecting the EW-SD300, the method below can also be used.



- When disconnecting the EW-SD300, the method below can also be used. Lift the TL-EW300 straight up as indicated in (A), or use the TL-EW300 as a lever as indicated in (B).



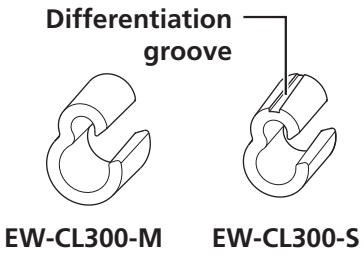
■Electric wire cover/cord cover

- If the electric wire cover/cord cover is deformed, the adhesive may weaken. To avoid deformation, store away from direct sunlight and hot and humid places.
- If there is dirt or oil on the frame, or if the surface is rough, the adhesive may weaken.
- Depending on the frame paint finish, the adhesive may weaken.
- The adhesive will strengthen 2 to 3 days after affixing the electric wire cover/cord cover.

• The strength of the adhesive is fairly weak to prevent the paint on the frame from being peeled off when removing the electric wire cover/cord cover, such as when replacing the electric wires. If the electric wire cover/cord cover is peeled off, replace it with a new one. When removing the electric wire cover/cord cover, do not peel it off too vigorously. Otherwise, the paint on the frame will peel off, too.

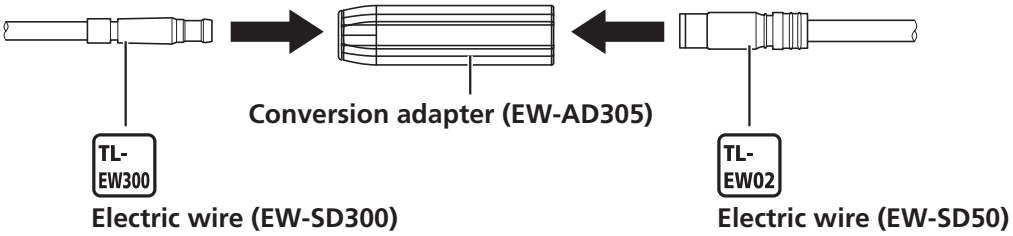
■Cord clip

• EW-CL300-S is marked with a groove in order to differentiate it from EW-CL300-M.



■Conversion adapter

• A conversion adapter (EW-AD305) is required to connect the EW-SD50 to a component with an E-TUBE port for the EW-SD300.



■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.

■SM-BMR1/Battery mount

• This is supported by the firmware versions 2.0.0 and later.

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

For Installation to the Bicycle, and Maintenance:

■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.

■About system power reset

- When the system fails to operate, the system may be recovered by resetting the system power.
- Remove the battery and wait about one minute. Then re-mount the battery.

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 E-TUBE PROJECT Professional can be used to carry out tasks such as customizing single components or the whole system and updating their firmware.
  If your version of E-TUBE PROJECT Professional and the 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.

■Connection and communication with smartphone

- E-TUBE PROJECT Cyclist can be used to carry out tasks such as customizing single components or the whole system and updating their firmware, after connecting the bicycle (system or components) to a smartphone via Bluetooth® LE.
- Disconnect the Bluetooth® LE connection when not using E-TUBE PROJECT Cyclist.
  Using a system information display without disconnecting the Bluetooth® LE connection could increase battery consumption.

About compatibility with E-TUBE PROJECT

- For details on compatibility with E-TUBE PROJECT, refer to the following website.
  (https://bike.shimano.com/e-tube/project/compatibility.html#guide_list)

LIST OF TOOLS TO BE USED

LIST OF TOOLS TO BE USED

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

Tool		Tool		Tool	
	2 mm hexagon wrench		15 mm spanner		TL-EW300
	2.5 mm hexagon wrench		17 mm spanner		TL-LR10
	3 mm hexagon wrench		Hexalobular[#5]		TL-SGE1 (Tools for mounting motor unit to the hub)
	4 mm hexagon wrench		Adjustable wrench		Special snap ring removal tool Y6RT68000
	5 mm hexagon wrench		Snap ring pliers		Soft face mallet
	10 mm spanner		TL-EW02		

INSTALLATION

INSTALLATION

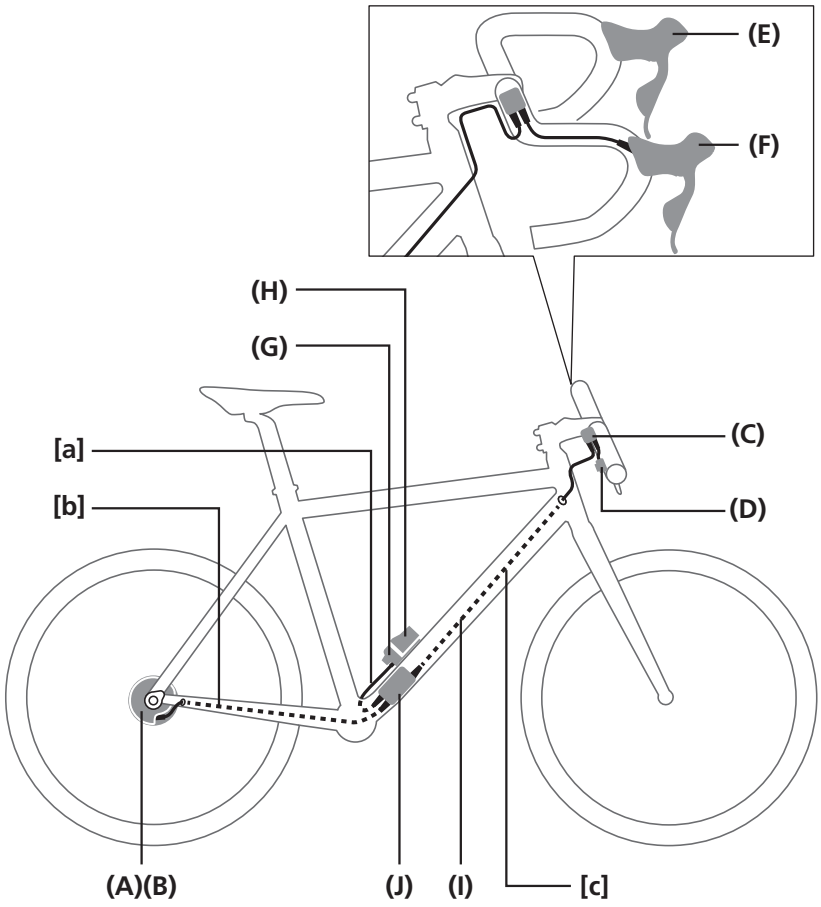
■ Names and example locations of each part

Lithium ion battery (external type) SM-BTR1

Junction [B] built-in type

When using the combination of units in the figure, make sure to use the system information display, battery, and battery mount combinations specified below.

System information display	Battery	Battery mount
SC-S705	SM-BTR1	SM-BMR2
SC-MT800	SM-BTR1	BM-DN100



(A) **MU-UR500 / MU-S705:**
Motor unit (EW-SD50 type)
MU-UR510:
Motor unit (EW-SD300 type)

(B) **SG-S7051-11:**
Internal geared hub 11-speed/
SG-S7051-8:
Internal geared hub 8-speed

(C) **SC-S705 / SC-MT800:**
System information display (EW-SD50 type)

(D) **SW-S705:**
Shifting switch (EW-SD50 type)

(E) **BL-S705-L:**
Brake lever

(F) **ST-S705-R:**
Dual control lever (EW-SD50 type)

(G) **SM-BMR2 / BM-DN100:**
Battery mount (EW-SD50 type)

(H) **SM-BTR1:**
Lithium ion battery (EW-SD50 type)

(I) **EW-SD50-I:**
Electric wire

(J) **SM-JC41:**
Junction [B] (EW-SD50 type)

NOTICE

Make sure to only use the system information display, battery, and battery mount combinations specified in the table.

TECH TIPS

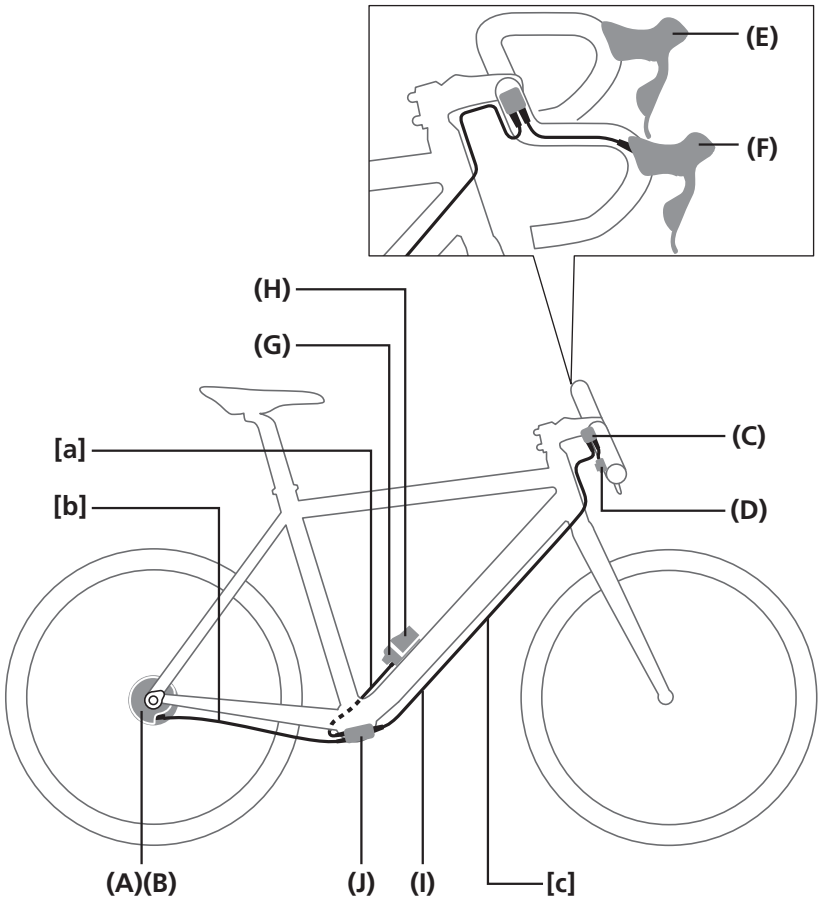
Length of electric wire

[a] + **[b]** ≤ 1,600 mm
[c] ≤ 1,400 mm
If (A) is the MU-UR510 (EW-SD300 type), use the conversion adapter (EW-AD305) in [b] to connect the EW-SD50-I and EW-SD300-I.

Junction [B] external type

When using the combination of units in the figure, make sure to use the system information display, battery, and battery mount combinations specified below.

System information display	Battery	Battery mount
SC-S705	SM-BTR1	SM-BMR2
SC-MT800	SM-BTR1	BM-DN100



(A) **MU-UR500 / MU-S705:**
Motor unit (EW-SD50 type)
MU-UR510:
Motor unit (EW-SD300 type)

(B) **SG-S7051-11:**
Internal geared hub 11-speed/
SG-S7051-8:
Internal geared hub 8-speed

(C) **SC-S705 / SC-MT800:**
System information display (EW-SD50 type)

(D) **SW-S705:**
Shifting switch (EW-SD50 type)

(E) **BL-S705-L:**
Brake lever

(F) **ST-S705-R:**
Dual control lever (EW-SD50 type)

(G) **SM-BMR2 / BM-DN100:**
Battery mount (EW-SD50 type)

(H) **SM-BTR1:**
Lithium ion battery

(I) **EW-SD50:**
Electric wire

(J) **SM-JC40:**
Junction [B] (EW-SD50 type)

NOTICE

Make sure to only use the system information display, battery, and battery mount combinations specified in the table.

TECH TIPS

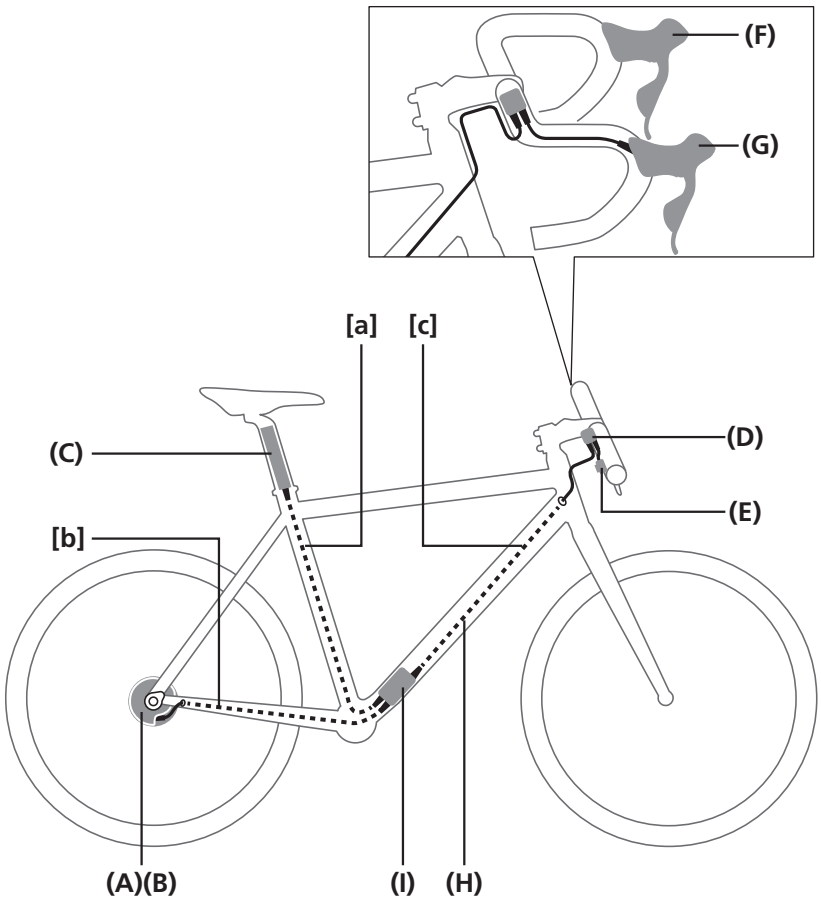
Length of electric wire

[a] + **[b]** ≤ 1,100 mm
[c] ≤ 1,400 mm
If (A) is the MU-UR510 (EW-SD300 type), use the conversion adapter (EW-AD305) in [b] to connect the EW-SD50 and EW-SD300.

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

When using the combination of units in the figure, make sure to use the system information display and battery combinations specified below.

System information display	Battery
SC-S705	SM-BTR2
SC-MT800	BT-DN110 / BT-DN110-A



(A) **MU-UR500 / MU-S705:**
Motor unit (EW-SD50 type)
MU-UR510:
Motor unit (EW-SD300 type)

(B) **SG-S7051-11:**
Internal geared hub 11-speed/
SG-S7051-8:
Internal geared hub 8-speed

(C) **SM-BTR2 / BT-DN110 / BT-DN110-A:**
Lithium ion battery (EW-SD50 type)

(D) **SC-S705 / SC-MT800:**
System information display (EW-SD50 type)

(E) **SW-S705:**
Shifting switch (EW-SD50 type)

(F) **BL-S705-L:**
Brake lever

(G) **ST-S705-R:**
Dual control lever (EW-SD50 type)

(H) **EW-SD50-I:**
Electric wire

(I) **SM-JC41:**
Junction [B] (EW-SD50 type)

NOTICE

Make sure to only use the system information display and battery combinations specified in the table.

TECH TIPS

Length of electric wire

[a] + **[b]** ≤ 1,600 mm
[c] ≤ 1,400 mm
If (A) is the MU-UR510 (EW-SD300 type), use the conversion adapter (EW-AD305) in [b] to connect the EW-SD50-I and EW-SD300-I.

Names and example locations of each part

Installation of sprockets to the hub (SG-S7051-11 / SG-S7051-8 / SM-S705)

Install the following parts to the driver on the right side of the hub body.
- SG-S7051-11 : Right-hand dust cap D
- SG-S7051-8 : Right-hand dust cap B

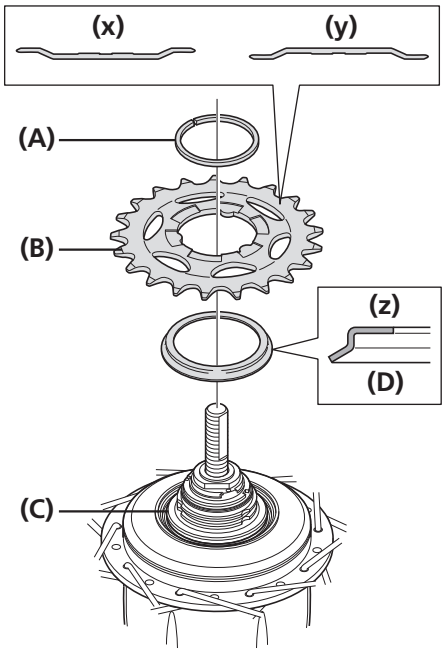
Next, install the sprocket and secure it in place with the snap ring.

(x) Outward assembling: MU-UR510 only

(y) Inward assembling: Compatible with all motor units

(z) Note the direction

Internal geared hub	Sprocket	Number of teeth on sprocket	
		Outward assembling	Inward assembling
SG-S7051-11	SM-GEAR	16T to 23T	20T to 23T
	CS-S500	18T, 20T	
SG-S7051-8	SM-GEAR	16T to 23T	18T to 23T
	CS-S500	18T, 20T	



(A) Snap ring
(B) Sprocket
(C) Driver
(D) Right-hand dust cap B (SG-S7051-8) / Right-hand dust cap D (SG-S7051-11)

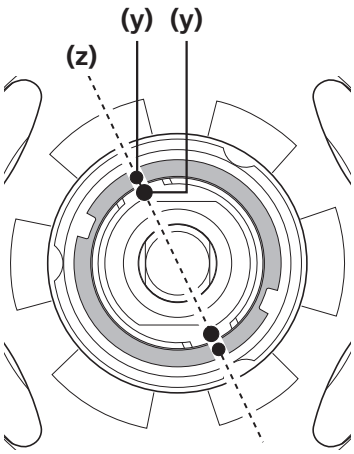
NOTICE

- If using the MU-UR510 motor unit, outward assembling of the sprocket is possible.
- CS-S500 can only be used on models without a chain guide.

■ Installation of the motor unit to the hub (MU-UR510 / MU-UR500 / MU-S705)

Unless otherwise noted, MU-UR500 is used as an example for this explanation.

1

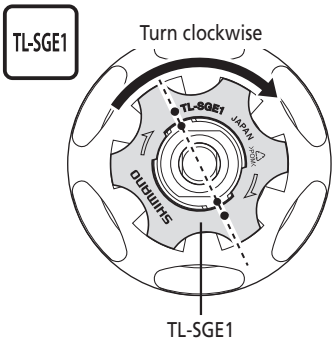


Check that the two ● marks (y) (red) on the right side of the hub body are aligned.

(z) Should be aligned

TECH TIPS

If the two ● marks (y) (red) are not aligned, use the TL-SGE1 to align the two ● marks (y) (red).



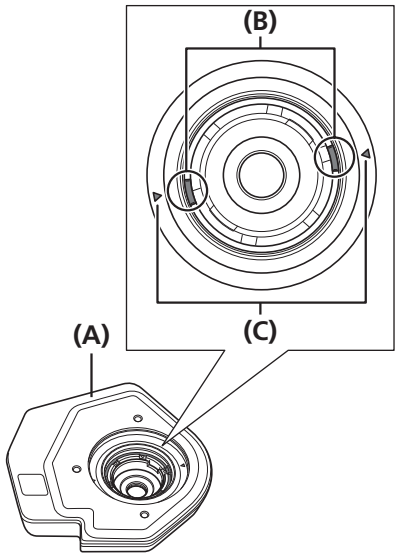
To be continued on next page

2

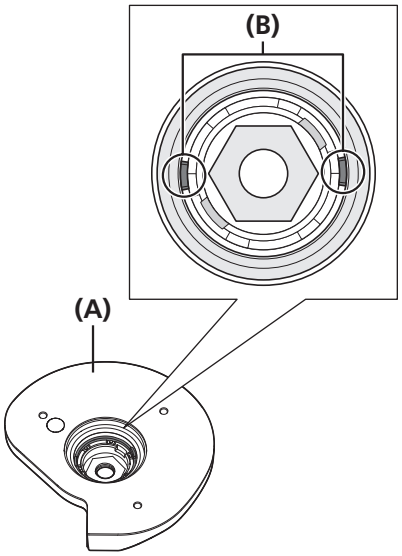
Make sure that the two protrusions on the inside of the motor unit are at the initial positions.

- For MU-UR500 / MU-UR510, confirm that the mark and protrusions are aligned.
- For MU-S705, confirm that the protrusions are positioned as shown in the figure.

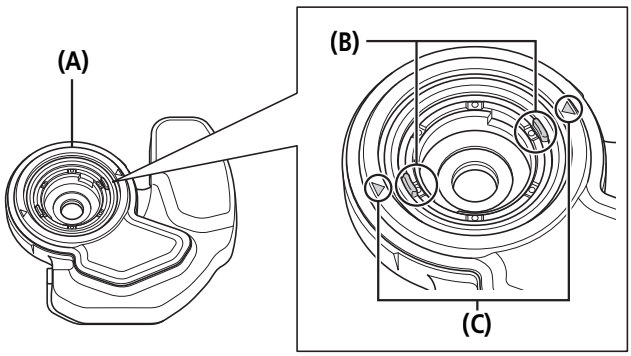
MU-UR500

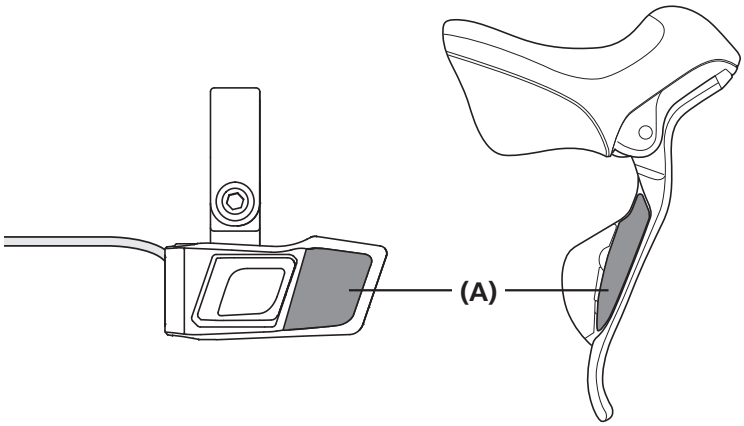


MU-S705



MU-UR510



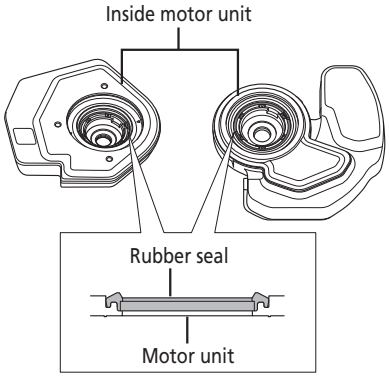


(A) Inside motor unit
(B) Protrusion
(C) Mark (MU-UR500 / MU-UR510)

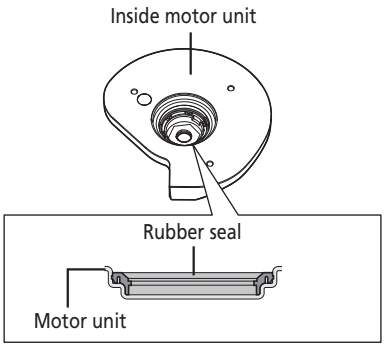
NOTICE

Check that the rubber seal is attached. If the rubber seal is not attached, attach as shown in the illustration. There is no compatibility between MU-UR510 / MU-UR500 and MU-S705 rubber seals.

MU-UR500 **MU-UR510**



MU-S705



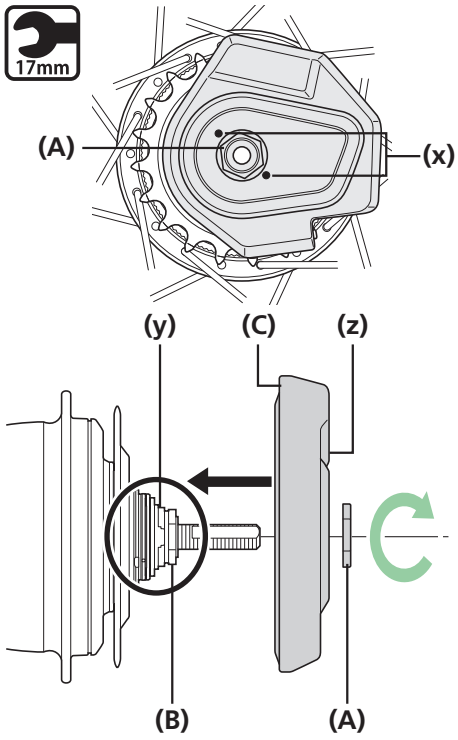
(A) Shifting switch

NOTICE

The motor unit is set at the initial position when it is shipped; therefore, install it without changing the position. If the motor unit may not be at the initial position, push the following shifting switch ten or more times to move the protrusions on the motor unit clockwise (check from the inside of the motor unit). (Check the shifting up and down of the shifting switch in advance as it may have been switched by customization.) If the motor unit is installed off the initial position, some gears may become unavailable and the hub or the motor unit may be damaged.

To be continued on next page

3



Install the motor unit to the hub so that the • mark **(x)** on the motor unit is aligned with the • mark **(y)** on the hub lock spacer.

After this, gently push the motor unit while turning it slowly to set it correctly until it stops turning on the hub axle.

Next, secure the motor unit by tightening right-hand lock nut B.

(x) Motor unit • mark
MU-UR510 / MU-UR500: Silver
MU-S705: Yellow

(y) hub lock spacer • mark (red)
This is the mark for which the position was aligned in step 1.

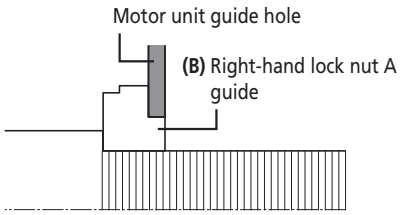
(z) Outer side

(A) Right-hand lock nut B
(B) Right-hand lock nut A
(C) Motor unit

Tightening torque	
17mm	6 - 10 N·m

NOTICE

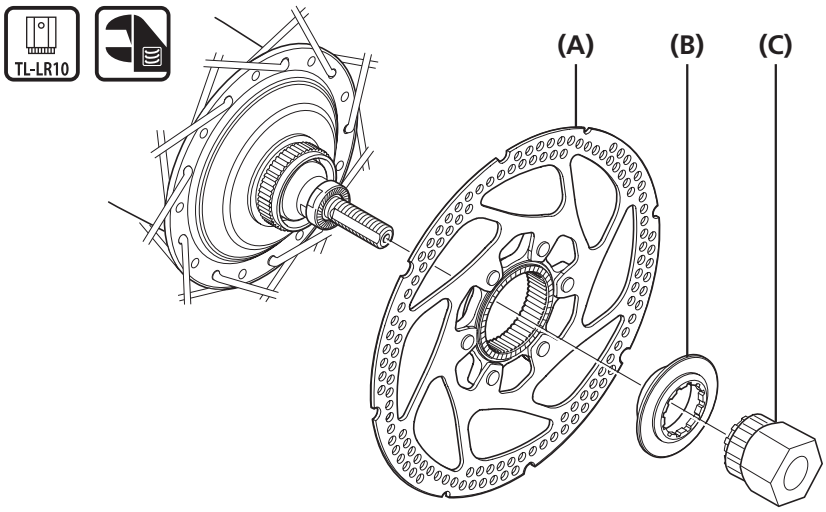
Check that the guide of right-hand lock nut A is seated securely in the guide hole on the front of the motor unit.



■ Installation of the disc brake rotor

Install the disc brake rotor as shown in the illustration.

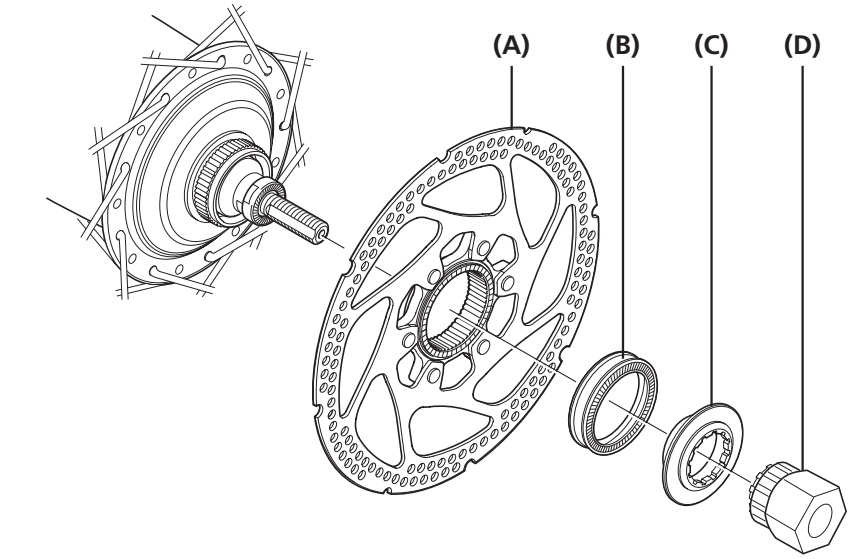
SG-S7051-8



(A) Disc brake rotor
(B) Disc brake rotor installation ring
(C) TL-LR10

Tightening torque	
TL-LR10	40 N·m

SG-S7051-11



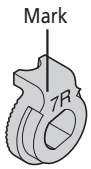
(A) Disc brake rotor
(B) Rotor spacer
(C) Disc brake rotor installation ring
(D) TL-LR10

Tightening torque	
TL-LR10	40 N·m

■ Installation of the hub to the frame

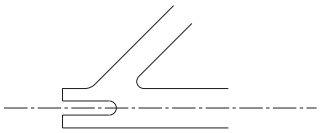
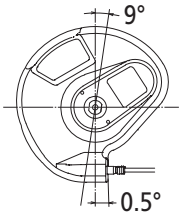
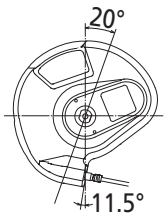
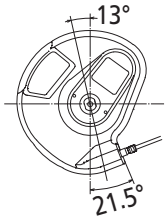
Non-turn washer

Use non-turn washers to secure the internal geared hub and motor unit to the frame.
Non-turn washers are classified with a mark and main body color for easy identification. There are left and right types, and the right type is normally used on the chain side.
Refer to the following to select the non-turn washer based on the shape of the motor unit and rear dropout to use.

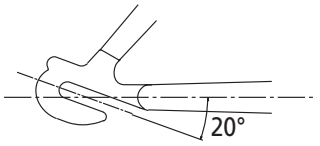
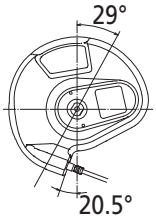
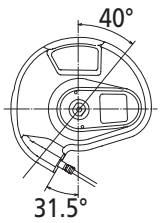
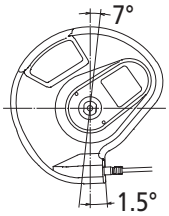
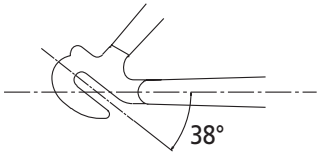
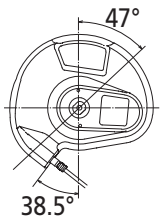
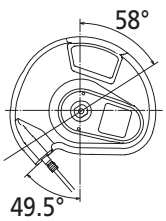
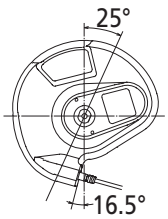


MU-S705

• When the rear dropout is the reversed type

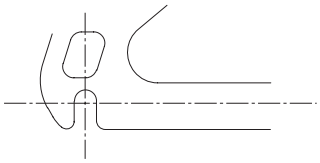
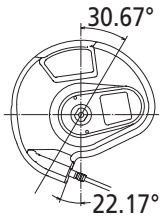
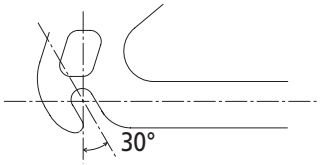
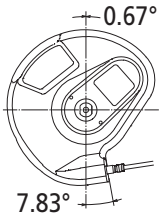
Rear dropout	Installation angle of non-turn washer and motor unit		
	5R (yellow) / 5L (brown)	6R (silver) / 6L (white)	7R (black) / 7L (gray)
			

• When the rear dropout is the standard type

Rear dropout	Installation angle of non-turn washer and motor unit		
	5R (yellow) / 5L (brown)	6R (silver) / 6L (white)	7R (black) / 7L (gray)
			
			

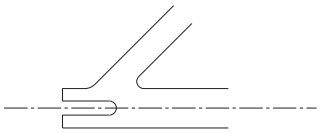
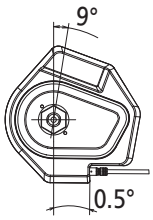
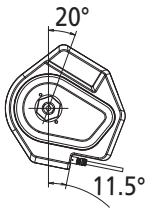
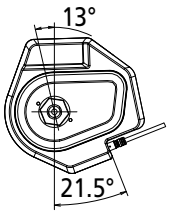
Installation of the hub to the frame

- When the rear dropout is the straight drop type

Rear dropout	Installation angle of non-turn washer and motor unit
	8R (blue) / 8L (green)
	
	

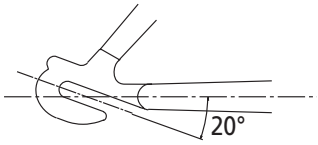
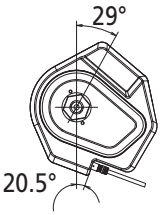
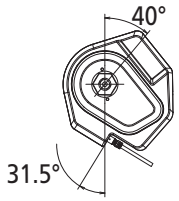
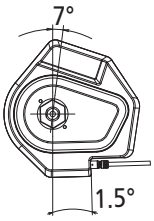
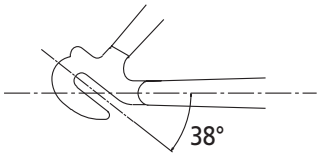
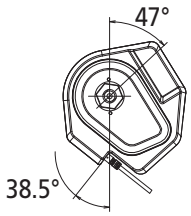
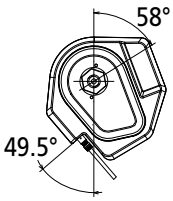
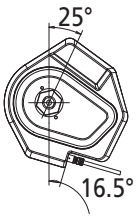
MU-UR500

- When the rear dropout is the reversed type

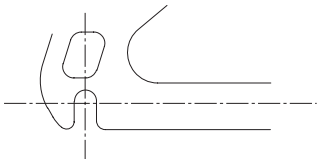
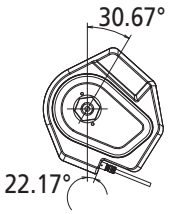
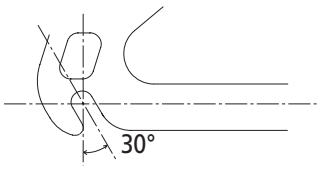
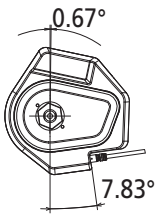
Rear dropout	Installation angle of non-turn washer and motor unit		
	5R (yellow) / 5L (brown)	6R (silver) / 6L (white)	7R (black) / 7L (gray)
			

Installation of the hub to the frame

• When the rear dropout is the standard type

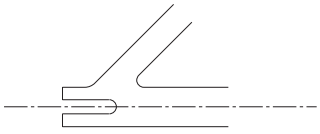
Rear dropout	Installation angle of non-turn washer and motor unit		
	5R (yellow) / 5L (brown)	6R (silver) / 6L (white)	7R (black) / 7L (gray)
			
			

• When the rear dropout is the straight drop type

Rear dropout	Installation angle of non-turn washer and motor unit
	8R (blue) / 8L (green)
	
	

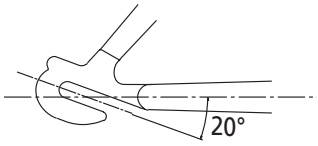
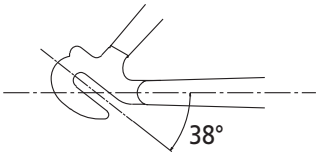
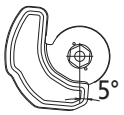
MU-UR510

• When the rear dropout is the standard type

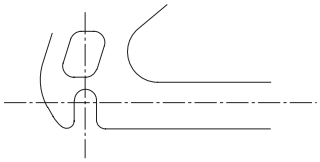
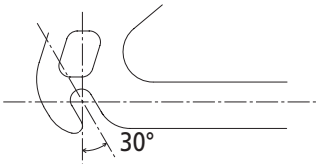
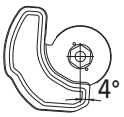
Rear dropout	Installation angle of non-turn washer and motor unit
	6R (silver) / 6L (white)
	

Installation of the hub to the frame

- When the rear dropout is the reversed type

Rear dropout	Installation angle of non-turn washer and motor unit 5R (yellow) / 5L (brown)	Rear dropout shape	Installation angle of non-turn washer and motor unit 7R (black) / 7L (gray)
			

- When the rear dropout is the straight drop type

Rear dropout	Installation angle of non-turn washer and motor unit 8R (blue) / 8L (green)	Rear dropout shape	Installation angle of non-turn washer and motor unit 9R (light green) / 9L (light brown)
			

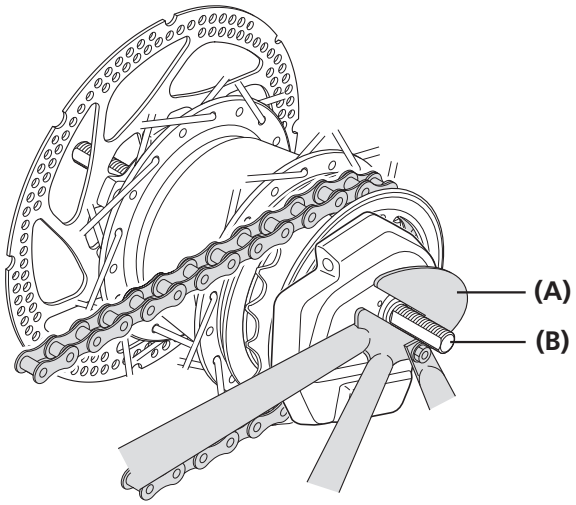
Installation methods

The method of installing the hub to the frame is the same when the chain tensioner is being used and when it is not being used.

1

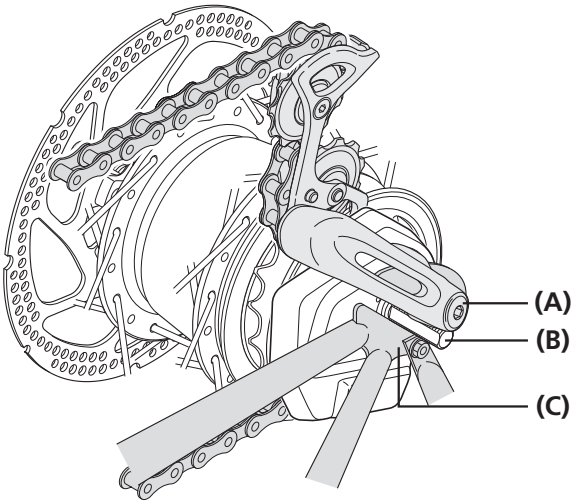
Mount the chain on the sprocket, then set the hub axle into the rear dropout.

When not using chain tensioner



(A) Rear dropout
(B) Hub axle

When using chain tensioner



(A) Chain tensioner
(B) Hub axle
(C) Rear dropout

NOTICE

- A chain tensioner cannot be used with the MU-UR510 motor unit.

TECH TIPS

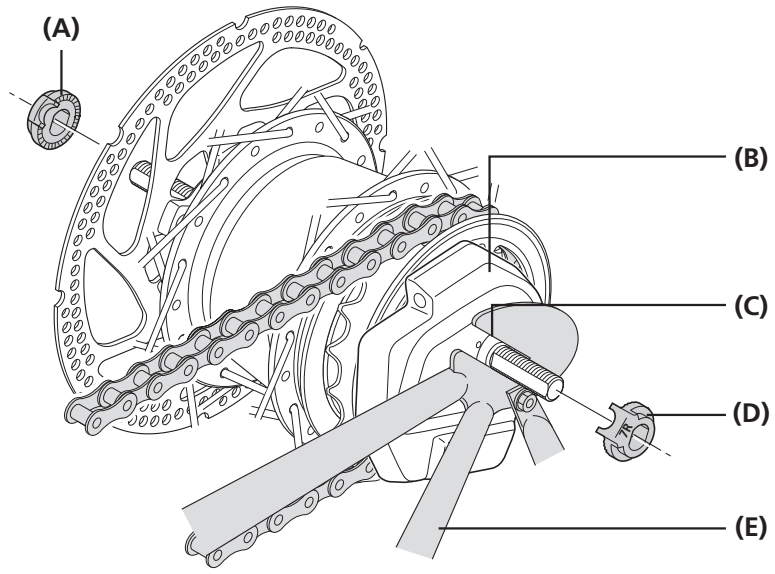
When using the chain tensioner, be sure to read the attached owner's manual for the CT-S500 chain tensioner.

To be continued on next page

2

Place non-turn washers and onto the right and left sides of the hub axle.

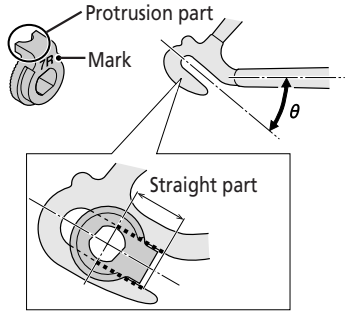
At this time, turn the motor unit so that the protrusion of the non-turn washers fit into the grooves of the rear dropout and align the washers to be almost parallel to the chainstay.



(A) Non-turn washer (for left-side use)
(B) Motor unit
(C) Rear dropout groove
(D) Non-turn washer (for right-side use)
(E) Chainstay

TECH TIPS

- Install the non-turn washer with its protrusion part aligned with the straight part of the rear dropout.

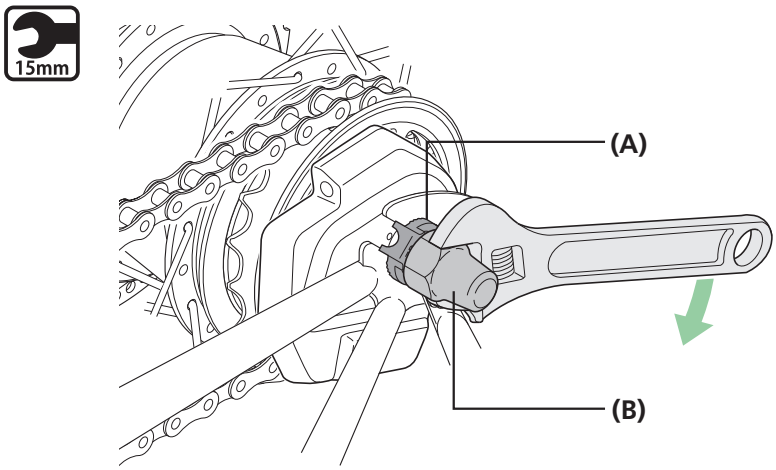


- Install the non-turn washer so that the protrusion fits securely in the rear dropout groove at the front and back sides of the hub axle.

To be continued on next page

3

Take up slack in the chain and secure the wheel to the frame with the hub nut.

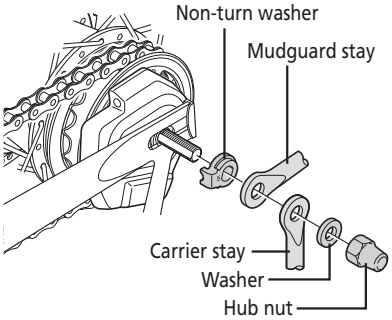


(A) Non-turn washer
(B) Hub nut

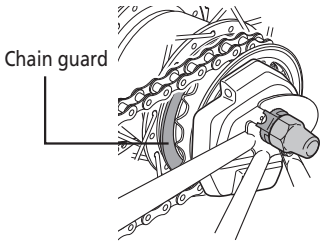
Tightening torque	
15mm	30 - 45 N·m

NOTICE

- When installing parts such as a mudguard stay to the hub axle, install them in the order shown in the figure.

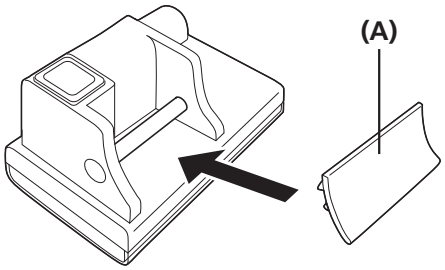


- When installing the hub to the frame, the chain guard may come off, so check that the chain guard is securely installed.
If not properly installed, noise may be generated.



■ Installation of the system information display (SC-S705)

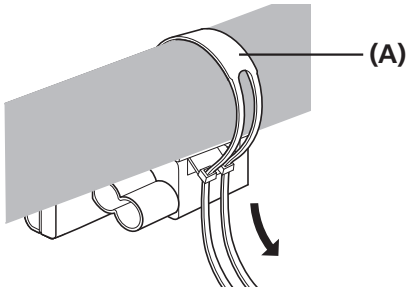
1



Install the rubber spacer to the system information display.

(A) Rubber spacer

2



Attach to the handle with the included zip tie.

Manually tighten the zip tie completely.

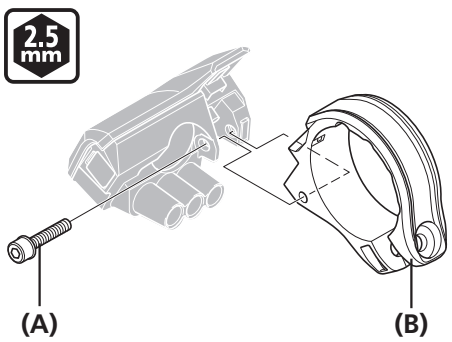
(A) Zip tie

TECH TIPS

Use a handle with a diameter of Ø25.6 to 31.8.

■ Installing the system information display (SC-MT800)

Replacing the clamp band



Remove the case mounting bolt with a 2.5 mm hexagon wrench and replace the clamp band.

(A) Case mounting bolt
(B) Clamp band

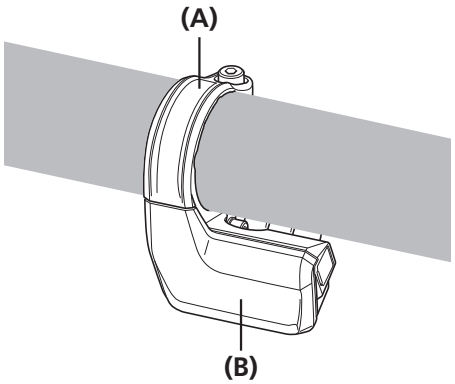
Tightening torque	
2.5 mm	0.6 N·m

NOTICE

If using a handlebar with a thick diameter, reinstall it using the included Ø35 mm clamp band.

Installing to the handlebar

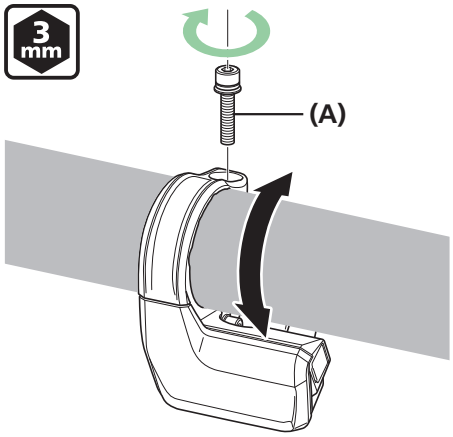
1



Insert the clamp band of the system information display into the handlebar.

(A) Clamp band
(B) System information display

2



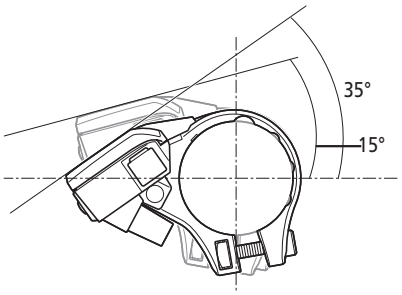
Adjust the angle of the system information display so that it is easy to see, and then use a 3 mm hexagon wrench to tighten the clamp bolt.

(A) Clamp bolt

Tightening torque	
3 mm	0.8 N·m

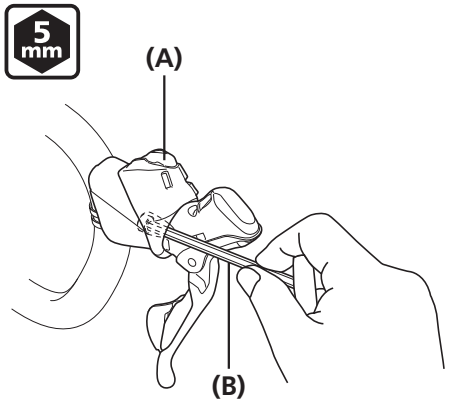
NOTICE

Recommended installation angle (angle of screen): 15° to 35° to the horizontal



■ Installation of the dual control lever: Drop handlebar (ST-S705-R / BL-S705-L)

When using a model not indicated here, refer to the dual control lever dealer's manual.



Pull back the bracket cover from the front and use a 5 mm hexagon wrench to tighten the fixing nut.

(A) Bracket cover
(B) 5 mm hexagon wrench

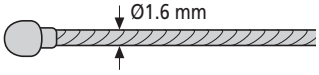
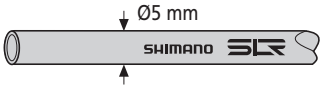
Tightening torque	
5 mm	6 - 8 N·m

NOTICE

Even with the recommended tightening torque, there is a possibility that the carbon handlebars may become damaged and insufficiently tightened. For the appropriate torque value, consult with the manufacturer of the completed bicycle or the manufacturer of the handle.

Installation of the brake cable

Cable used

Inner cable	SLR outer casing
	

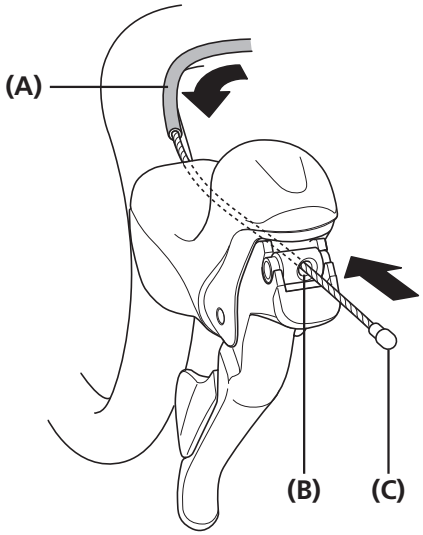
TECH TIPS

Use cables which are long enough so that they still have some slack even when the handlebars are turned as far as they will go to the left and to the right.

Installation

1 Gently pull the brake lever.

2

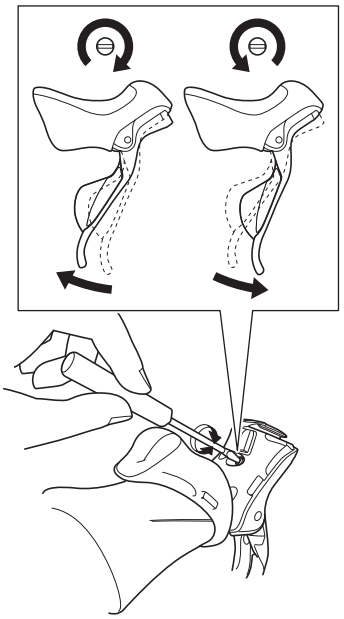


Pass the inner cable through from directly in front, set the inner cable drum into the cable hook, and then install the outer casing from the opposite side.

(A) Outer casing
(B) Cable hook
(C) Inner cable drum

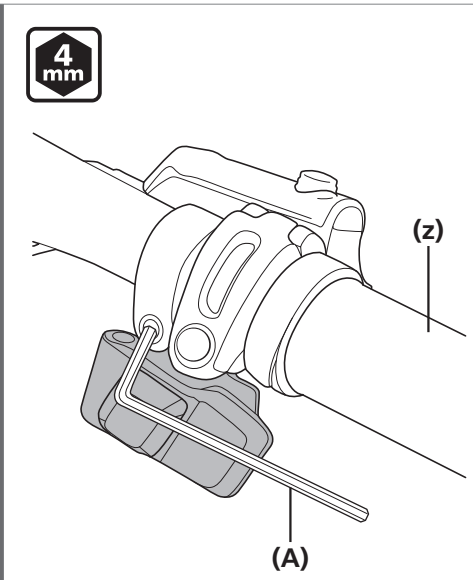
TECH TIPS

The lever stroke can be smoothly adjusted using the bolt on the top of the bracket body. Check the lever operation while adjusting.



■ Installation of the shifting switch: Flat handlebar (SW-S705)

When using a model not indicated here, refer to the switch unit dealer's manual.



Install as shown in the illustration.

(z) Handlebar diameter: 22.2 mm

(A) 4 mm hexagon wrench

Tightening torque	
4 mm	5 - 7 N·m

TECH TIPS

Use a handlebar grip with an outer diameter of Ø32 mm or less.

■ Installation of the battery

In the case of an external battery

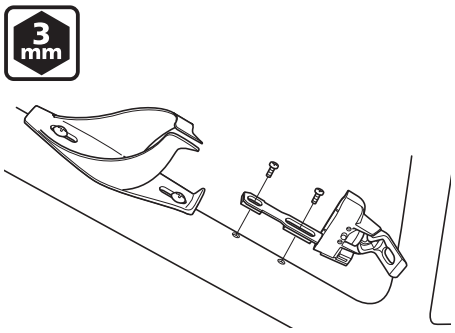
Both SM-BMR1 and 2 can be installed using the same procedure. The down tube (under the bottle cage) is used for explanation here, but the mounting location is not limited to this section.

1

Set the battery mount into position.

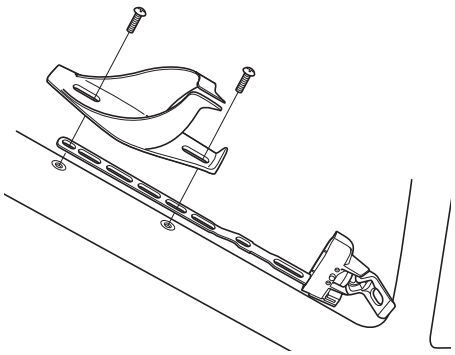
Use the bottle cage fixing bolt to temporarily install the battery mount onto the bottom of the bottle cage.

Short type



Use the included M4 screws to secure the short type.

Long type



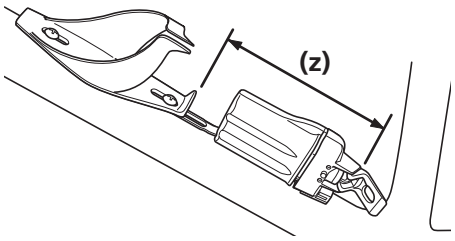
Use the bolts which are included with the bottle cage to secure the long type.

Tightening torque	
3 mm	1.2 - 1.5 N·m

TECH TIPS

Refer to the manual for the bottle cage for details on the tightening torques.

2



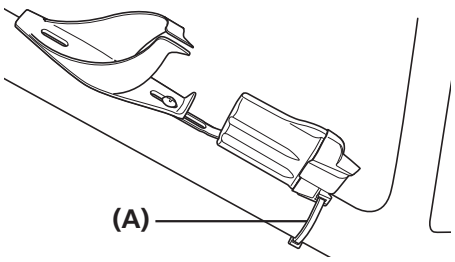
Leave a space of 108 mm or more at the end of the battery mount.

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

(z) 108 mm

To be continued on next page

3



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

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

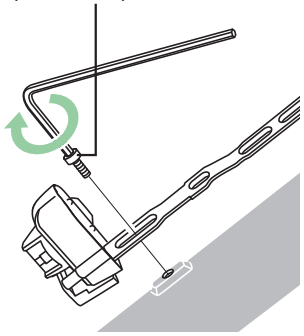
(A) Zip tie

TECH TIPS

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

2 mm

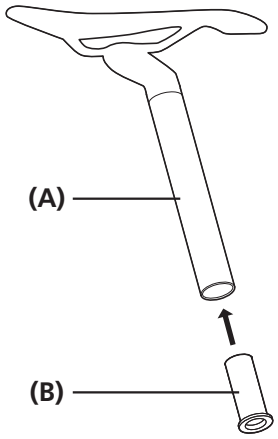
Battery mount mounting screw (M4 x 15 mm)



Tightening torque	
2 mm	1.2 - 1.5 N·m

In the case of a built-in battery

1



Insert the seat post collar into the seat post.

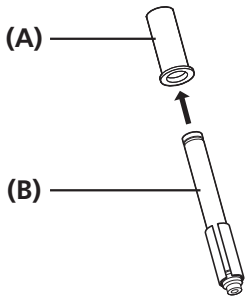
(A) Seat post
(B) Seat post collar

TECH TIPS

- Depending on the type of frame, the way the internal battery is installed may differ. For details, contact the manufacturer of the frame.
- Prepare a seat post that is compatible with Di2 (SM-BTR2 / BT-DN110 / BT-DN110-A).

* If you have any questions, consult with the manufacturer of seat post.

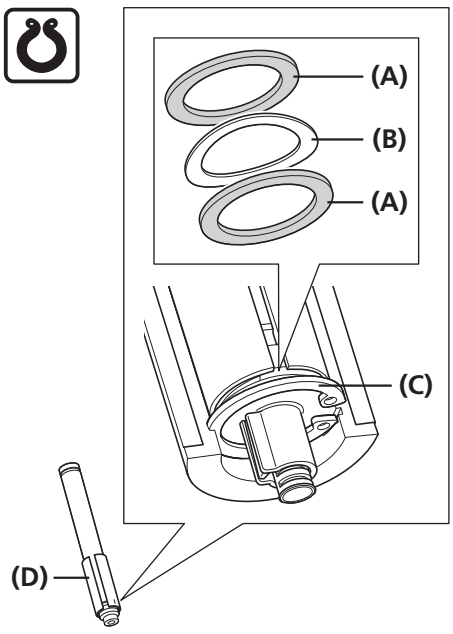
2



Insert the lithium ion battery (built-in type) into the seat post collar from the bottom of the 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

Use snap ring pliers (with a claw diameter of 2.0 mm or less) to mount the snap ring.

CONNECTION OF THE ELECTRIC WIRES

CONNECTION OF THE ELECTRIC WIRES

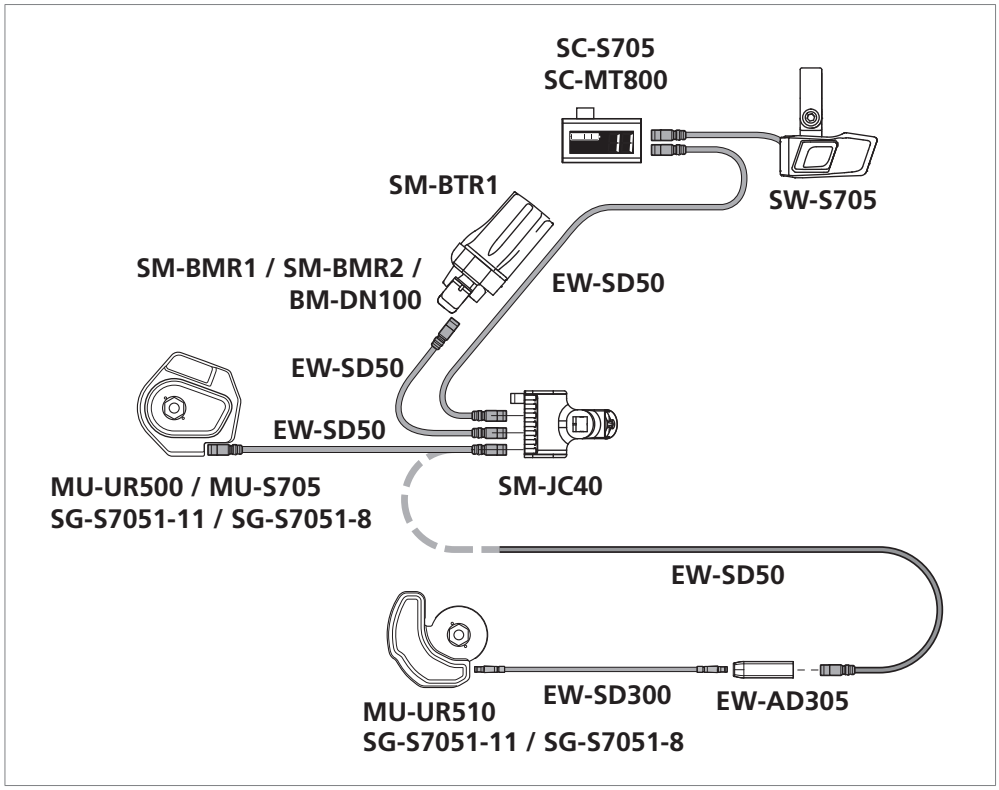
NOTICE

Information on the electric wire and the SHIMANO original tool is described in "NOTICE" in "TO ENSURE SAFETY". Be sure to refer to it before starting the work.

■ Overall wiring diagram

External battery type: SM-JC40 (Junction [B]: external type)

Flat handlebar use

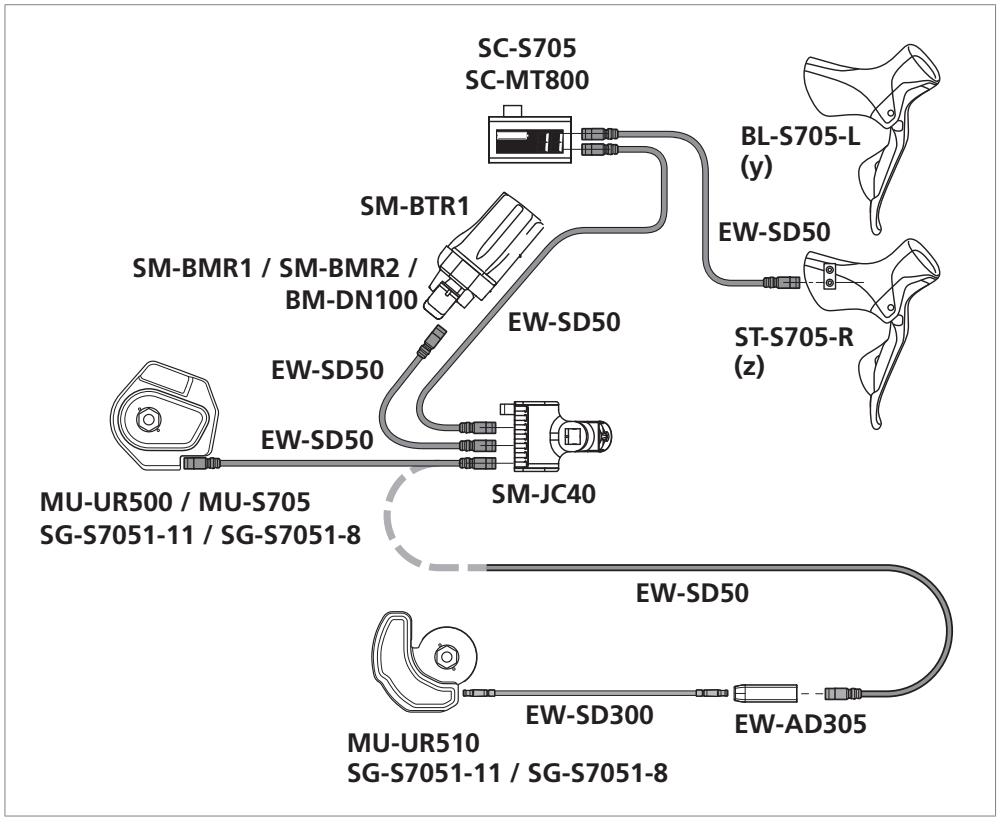


NOTICE

If the motor unit is the MU-UR510, use the EW-AD305 to connect the EW-SD50 and EW-SD300, then connect them to junction [B]. If this part is wired externally, it is necessary to prepare both the electric wire cover for the EW-SD50 and the cord cover for the EW-SD300.

Overall wiring diagram

Drop handlebar use

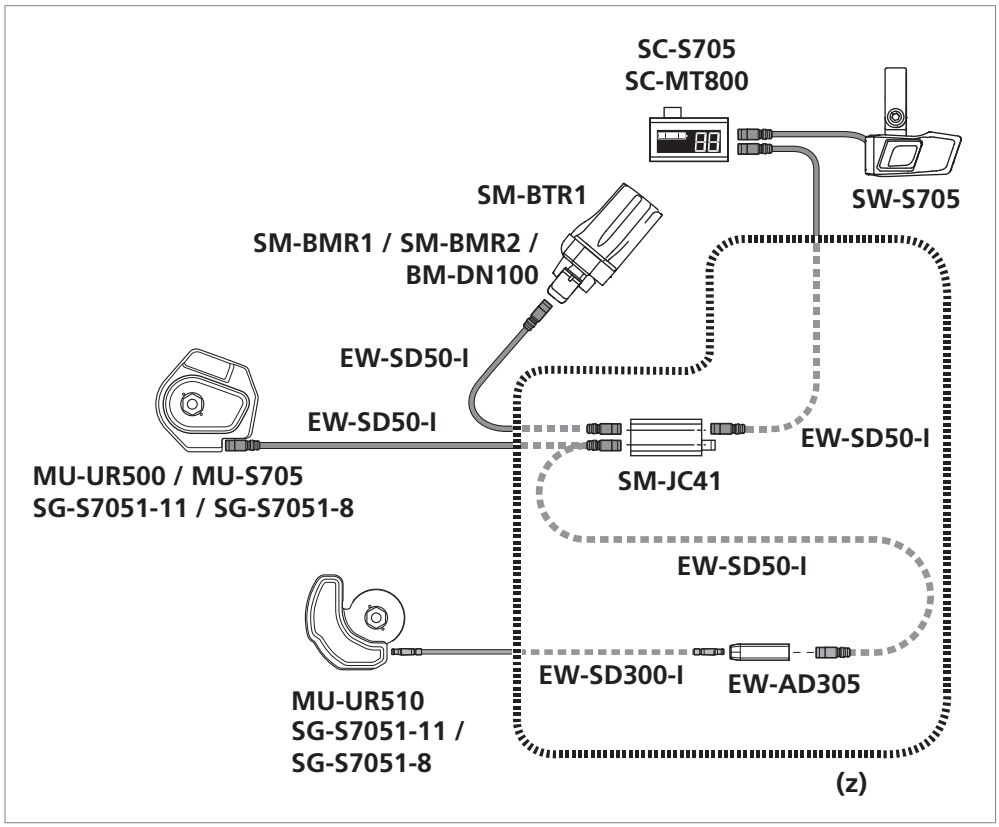


(y) No E-TUBE port

(z) E-TUBE port x 2

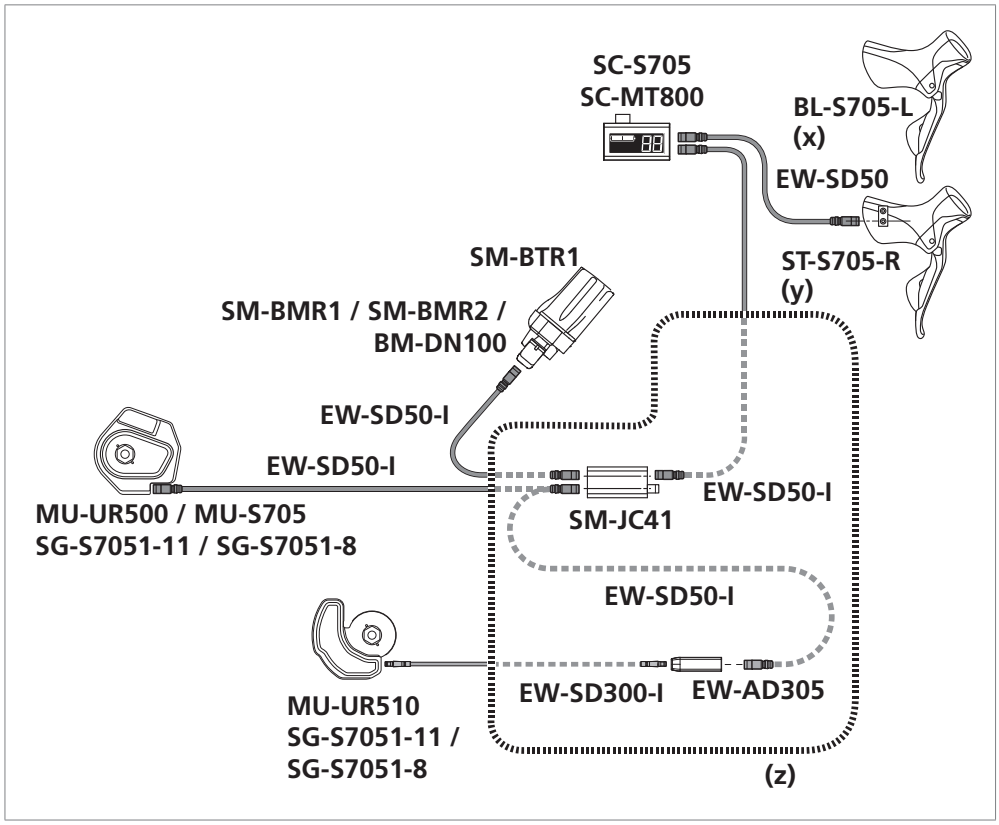
External battery type: SM-JC41 (Junction [B]: built-in type)

Flat handlebar use



(z) Inside frame

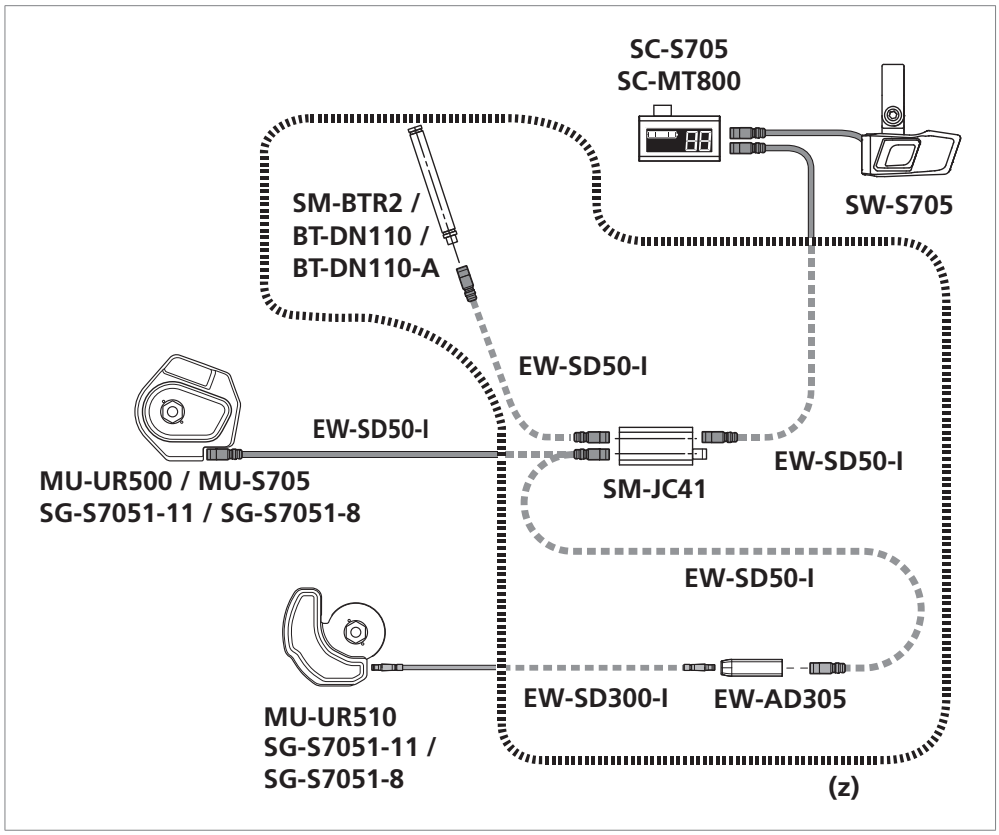
Drop handlebar use



(x) No E-TUBE port
(y) E-TUBE port x 2
(z) Inside frame

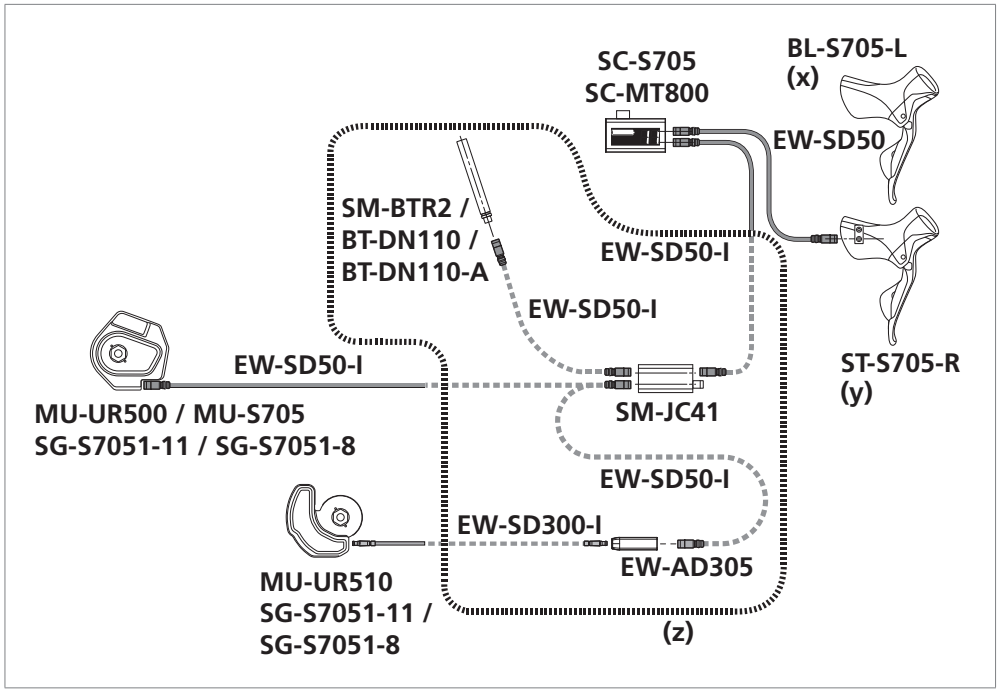
Built-in battery mount type: SM-JC41 (Junction [B]: built-in type)

Flat handlebar use



(z) Inside frame

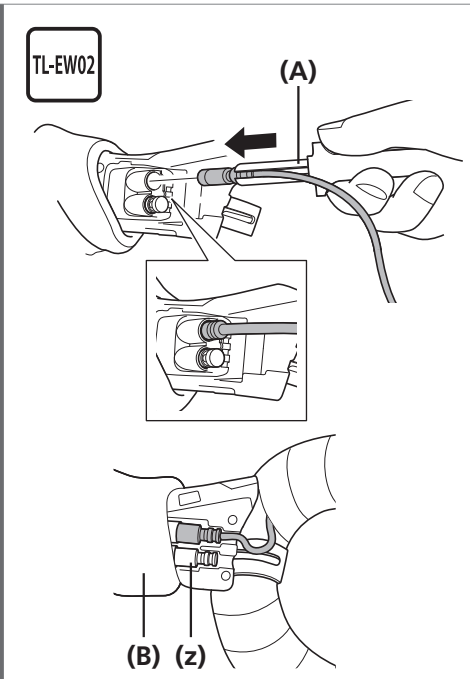
Drop handlebar use



(x) No E-TUBE port
(y) E-TUBE port x 2
(z) Inside frame

■ Connection to the dual control lever

When routing the electric wires, allow enough looseness in the cable so that the dual control lever, shifting switch installation position can be adjusted and so that the handlebars can be turned fully to the left and right.
The electric wire for the dual control lever can be wound around the handle when the bar tape is wrapped.



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

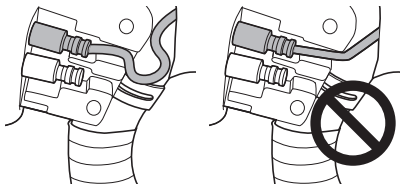
Use the TL-EW02 to connect the connector of the electric wire to the E-TUBE port on the lever side.

(z) The remaining terminal can be used for an additional satellite switch or PC linkage device.

(A) TL-EW02
(B) Bracket cover

NOTICE

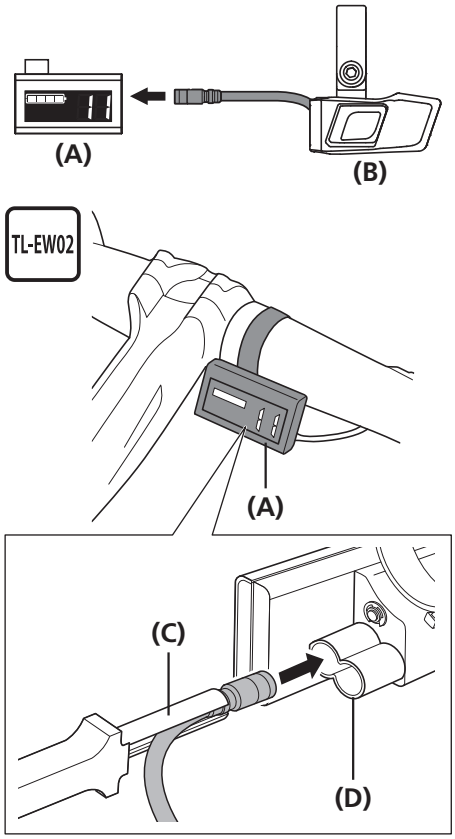
- When the handle is gripped or the bar tape is wound, the electric wires may be pulled out. By allowing sufficient wire length, accidental disconnection can be prevented after winding the bar tape.
- This length margin of electric wire is also necessary to open up the bracket cover when an additional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



■ Connection to the shifting switch/system information display

When using a model not indicated here, refer to the switch unit dealer's manual.

When using SC-S705



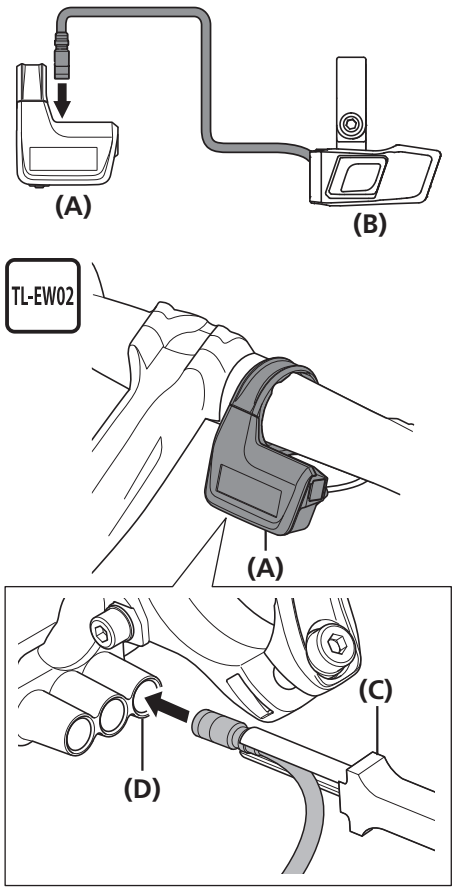
Connect the electric wire of the shifting switch to the system information display (SC-S705) using TL-EW02.

(A) System information display (SC-S705)
(B) Shifting switch
(C) TL-EW02
(D) E-TUBE ports

NOTICE

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

When using SC-MT800



Connect the electric wire of the shifting switch to the system information display (SC-MT800) using TL-EW02.

(A) System information display (SC-MT800)
(B) Shifting switch
(C) TL-EW02
(D) E-TUBE ports

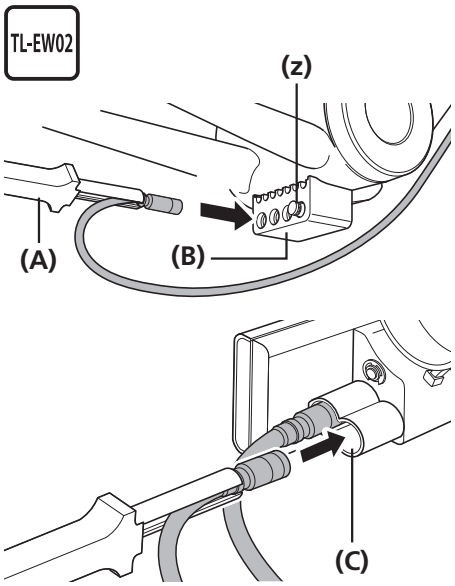
NOTICE

- Be sure to push them together until they connect with a click.
- Be sure to attach dummy plugs to any unused E-TUBE ports.

■ Connection of junction

External battery mount type (SM-JC40)

1



Connect the electric wire to the SC-S705 E-TUBE ports and junction [B].

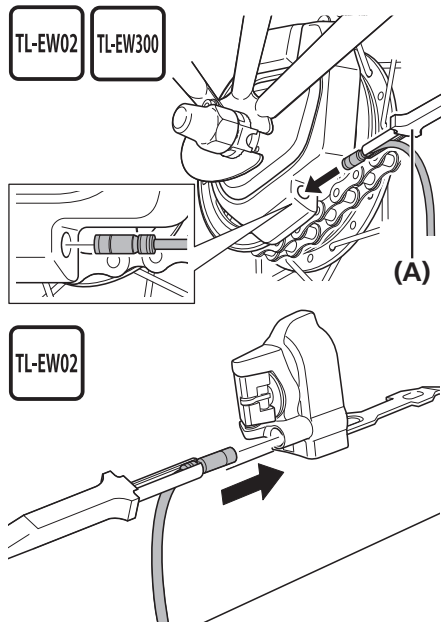
(z) Insert dummy plugs included with the motor unit in unused E-TUBE ports.

(A) TL-EW02
(B) Junction [B]
(C) E-TUBE ports

NOTICE

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

2

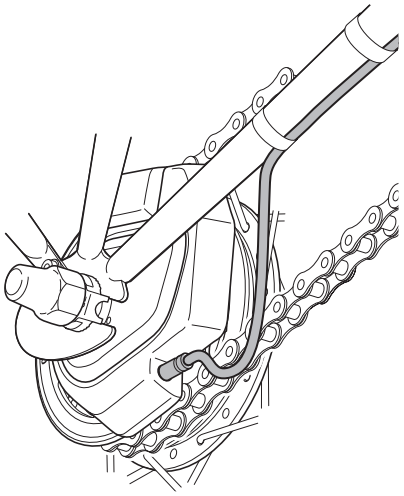


Connect the electric wires to the motor unit and the battery mount.

(A) TL-EW02 (MU-UR500 / MU-S705)
TL-EW300 (MU-UR510)

To be continued on next page

3

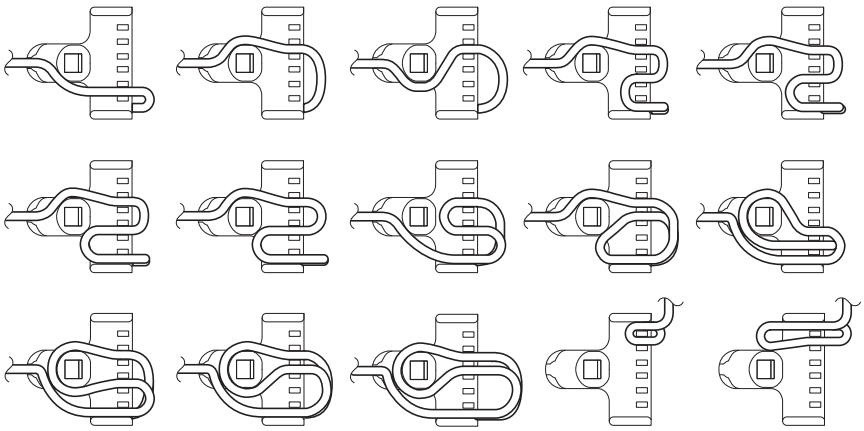


Temporarily secure the electric wire along the frame with tape, and connect it to junction [B].

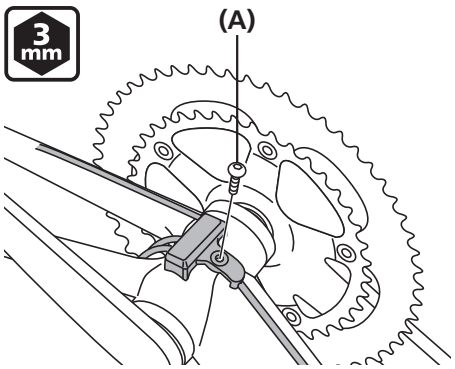
4

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

Example of adjusting junction [B] length



5



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

NOTICE

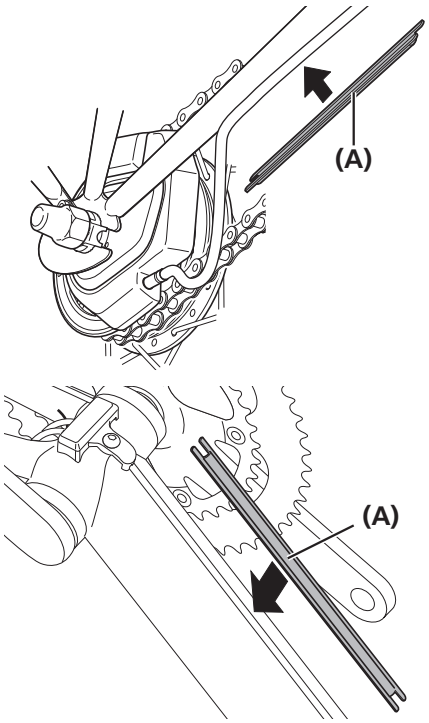
- When routing the electric wire to the motor unit, be sure to install it to the bottom of the chainstay to avoid any interference between the cable and the chain.
- If the motor unit is the MU-UR510, use the EW-AD305 to connect the EW-SD50 and EW-SD300, then connect them to junction [B].

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

Tightening torque	
3 mm	1.5 - 2 N·m

To be continued on next page

6



Install the electric wire cover/cord cover onto the frame.

In order to make sure that the electric wire cover/cord cover is securely attached, clean the frame with alcohol or some other cleaning agent to remove any grease or other substances before installing the cover.

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

(A) Electric wire cover (EW-SD50 type)
SM-EWC2
Cord cover (EW-SD300 type)
EW-CC300

7

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

Check that gear-shifting of the rear can be performed properly by operating the shifting switch.

Disconnection of the electric wires

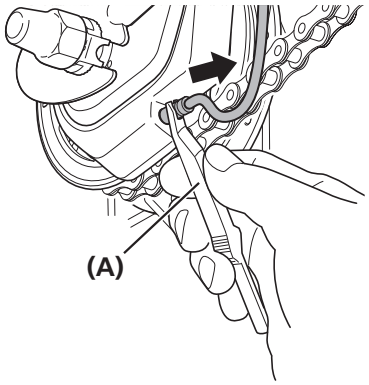
NOTICE

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.

1

Motor unit

TL-EW02
TL-EW300



Remove the electric wire on the motor unit side.

(A) TL-EW02 (MU-UR500 / MU-S705)
TL-EW300 (MU-UR510)

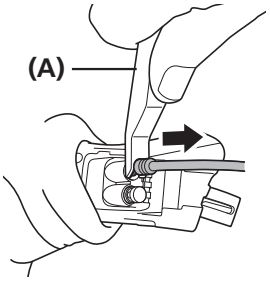
2

When disconnecting the electric wire from a lever, face the flat side toward the lever.

When disconnecting the connector of junction, insert the SHIMANO original tool so that the flat side is facing toward junction.

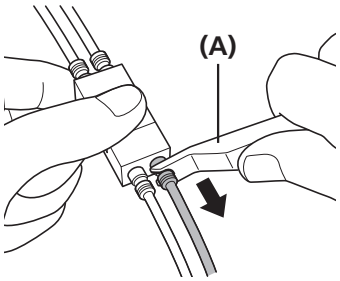
ST-S705

TL-EW02



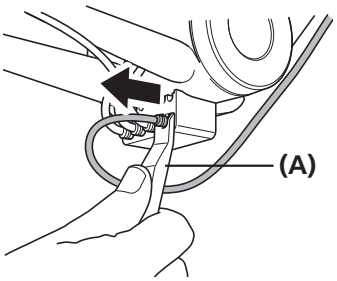
SM-JC41

TL-EW02



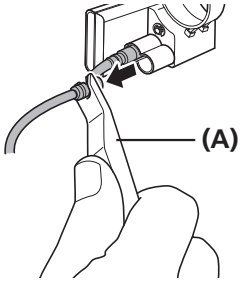
SM-JC40

TL-EW02



SC-S705

TL-EW02



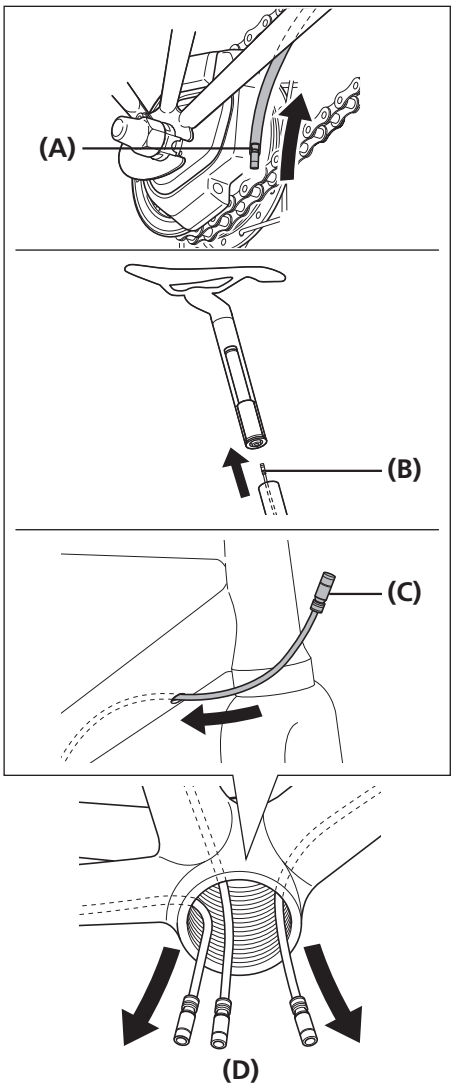
(A) TL-EW02

3

Run any excess length of electric wire along the handlebar, and use zip tie or similar to secure the electric wire to the handlebar.

Built-in battery mount type (SM-JC41)

1

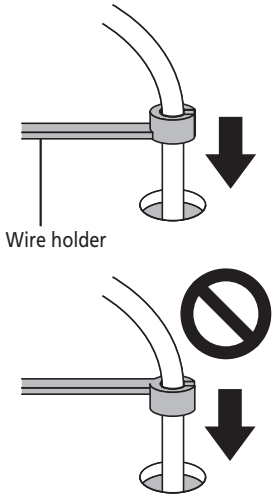


First, insert the electric wire for each of SC-S705, the battery mount, and the motor unit through the hole in the frame to the bottom bracket shell.

(A) Electric wire for motor unit
(B) Electric wire for built-in battery
(C) Electric wire for system information display
(D) Bottom bracket shell

NOTICE

The electric wires have a correct way of being inserted.
Make sure that you insert them from the direction shown in the illustration.



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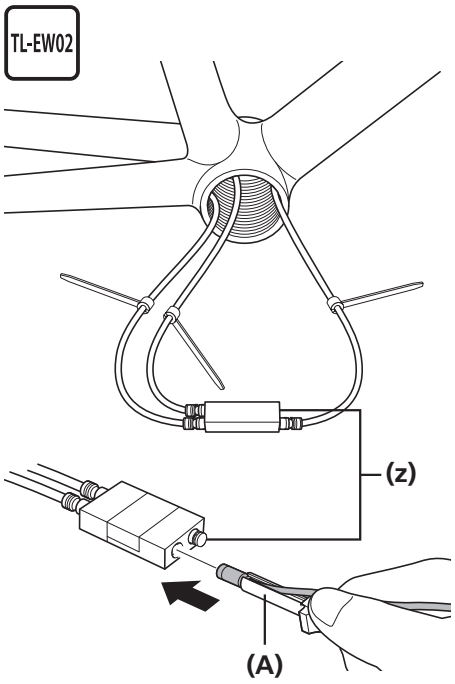
2



Connect each electric wire to junction [B].

(z) Insert a dummy plug in the unused E-TUBE ports. (Dummy plugs are included with the motor unit.)

(A) TL-EW02

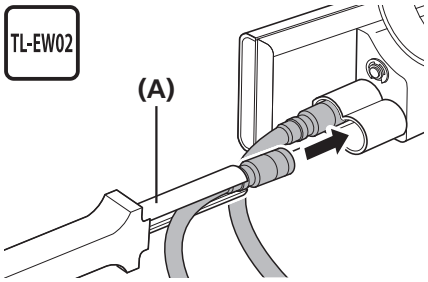
NOTICE

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

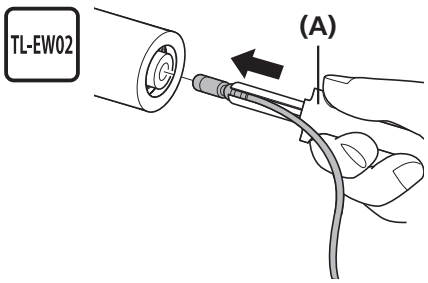
3

Connect the electric wires to the system information display, motor unit, and battery mount.

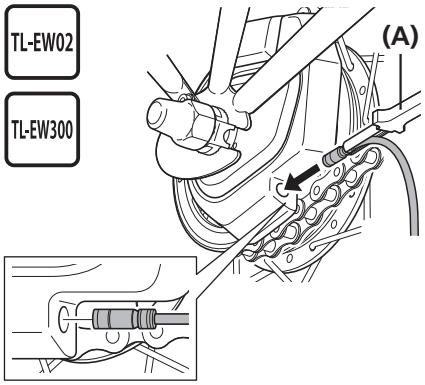
System information display



Battery mount



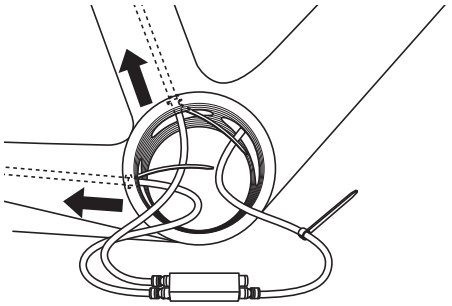
Motor unit



(A) TL-EW02
TL-SW300 (for the MU-UR510)

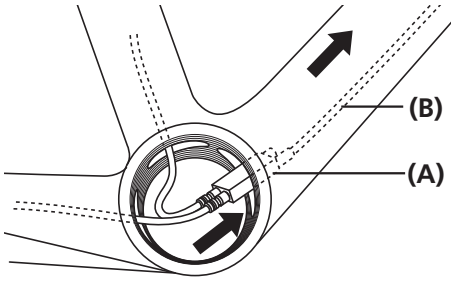
Routing junction [B] and the electric wires inside the frame

1



Pass the electric wires for the motor unit and the built-in battery through the chainstay and the seat tube, respectively.

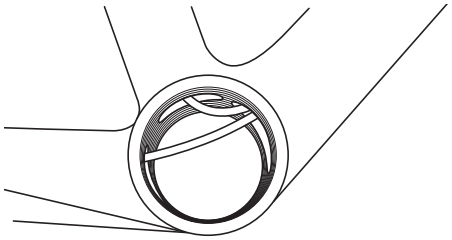
2



Install the electric wire for the system information display and junction [B] inside the down tube.

Check that the screws of the bottom bracket shell do not damage any of the components at this time.

3

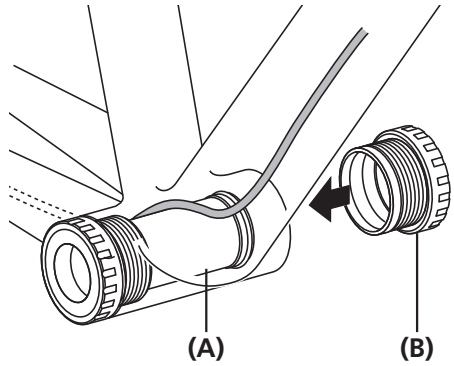


Make only the electric wires for the motor unit and the built-in battery visible inside the hanger; push unnecessary protruding components such as the wire holder into the frame.

(A) Junction [B]
(B) Electric wire for system information display

Assembly of the bottom bracket shell

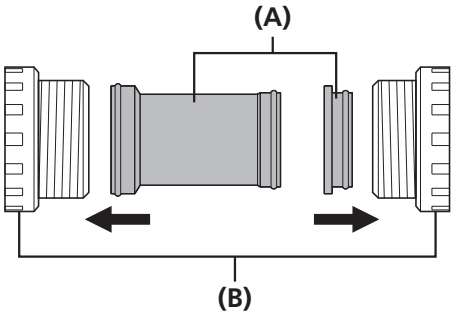
1



When installing the inner cover to the hanger, pass the electric wires for the motor unit and the built-in battery over the inner cover.

(A) Inner cover
(B) Adapter

2



Install the inner cover to the bottom bracket adapter.

(A) Inner cover
(B) Adapter

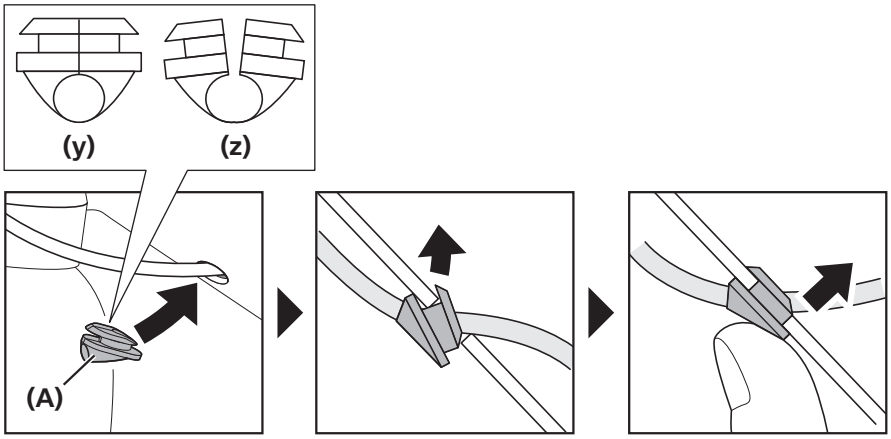
NOTICE

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.

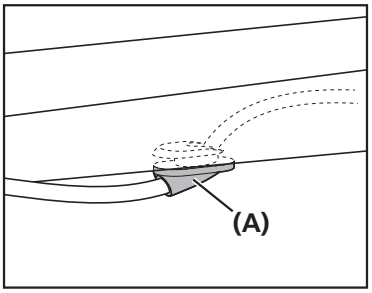
Installation of the grommets

Install grommets in appropriate positions for the electric wires by inserting the bottoms into the holes in the frame and then pushing the tops to fit them into place.

At system information display



At motor unit



(A) Grommet
SM-GM01 / SM-GM02 (EW-SD50 type)
EW-GM300-S / EW-GM300-M (EW-SD300 type)

(y) Close

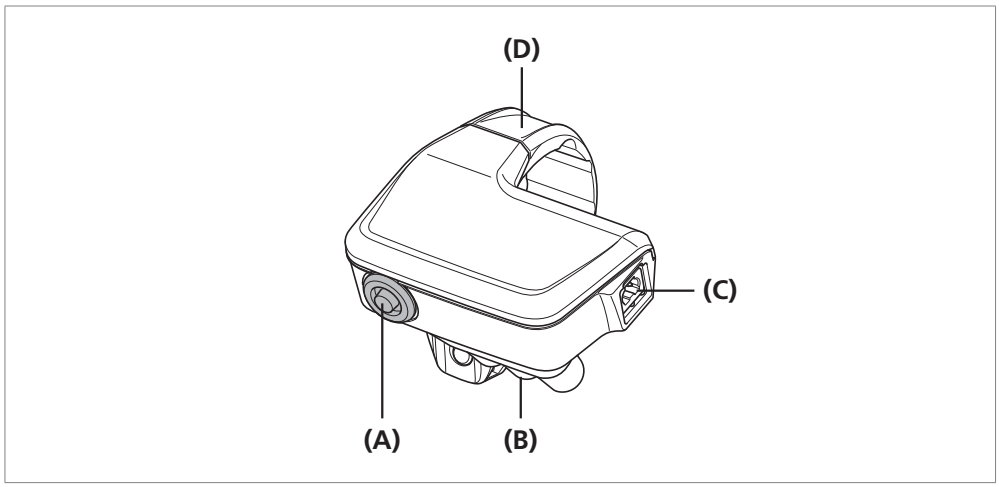
(z) Open

OPERATION

OPERATION

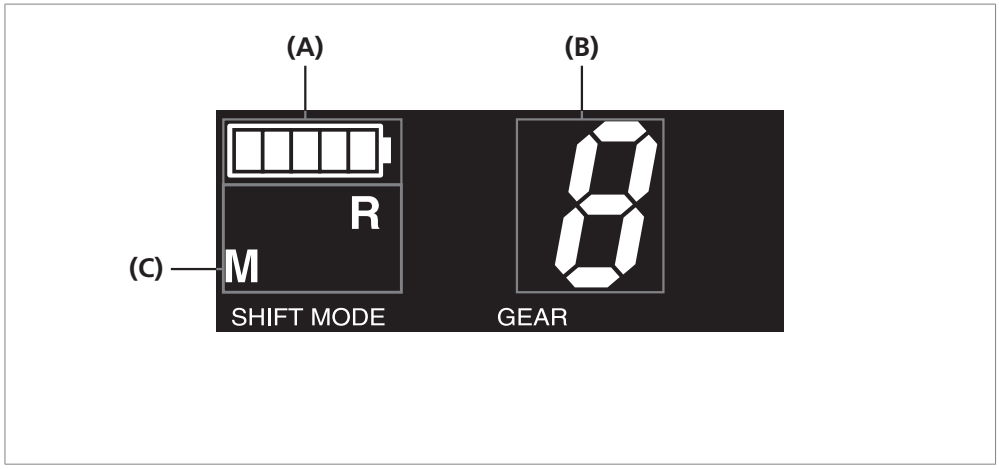
■ Displaying and operating the system information display (SC-MT800)

Names of parts



(A) Mode switch
(B) E-TUBE port area
(C) Charging port
(D) Clamp band

Basic screen display

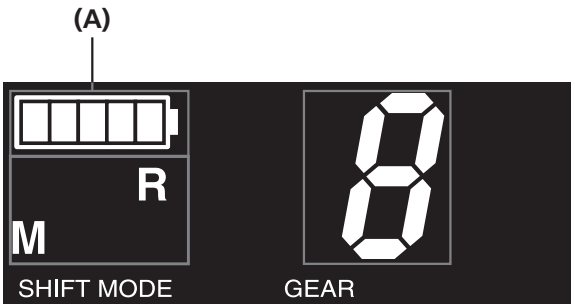


(A) Battery level
(B) Gear position/Adjustment level/ RD Protection Reset mode
(C) Operation mode

NOTICE

RD Protection Reset mode can be selected, however, RD Protection Reset cannot be performed.
The function is operable on rear derailleurs (Di2) only.
For details on RD Protection, refer to the user's manual of a supported model.

Battery level



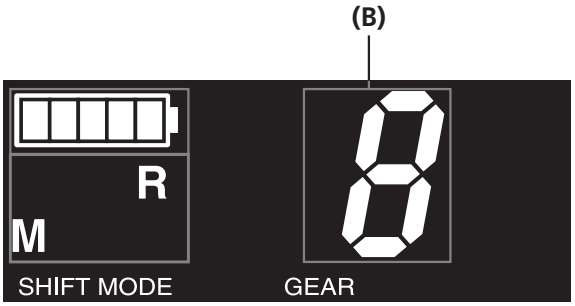
(A) Battery level

Display	Battery level
	81% – 100%
	61% – 80%
	41% – 60%
	26% – 40%
	1% – 25%
	0%*

TECH TIPS

* When there is insufficient battery power, the motor unit will cease operating and gear positions will remain fixed at the last engaged positions. The battery indicator blinks for 2 seconds at the time of input operation. It is recommended to charge the battery as soon as possible.

Gear position/Adjustment level



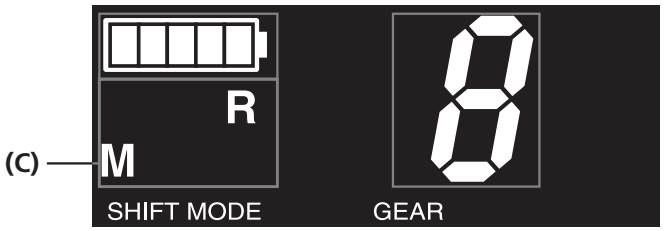
(B) Gear position/Adjustment level

Setting mode	Details
Shift mode	Gear position of the internal geared hub is displayed.
Adjustment mode	When adjusting the motor unit, the adjustment level is displayed.

TECH TIPS

The display information varies depending on the mode setting.

Operation mode



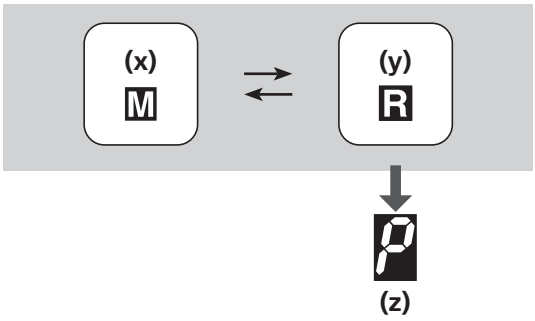
(C) Operation mode

Display	Details
R	**Adjustment of the motor unit** The motor unit can be adjusted in this mode. Adjustment can be performed 4 increments in the + direction and 4 decrements in the – direction; a total adjustment range of 8 values. Adjustment values can be changed using the dual control lever or shifting switches.
M	**Manual shift** Gears are shifted manually in this mode.

⚠ CAUTION

- Improper adjustment may cause gear engagement skipping, resulting in an accidental fall.
- Perform adjustment only when you have an unusual feel during shifting. If there is no problem with shifting, unnecessary adjustment may worsen shifting performance.

How to operate



→ Single click (2 seconds)

← Single click (0.5 seconds)

➡ Pressing and holding down (5 seconds or more)

(x) Shift mode

(y) Adjustment mode

(z) RD Protection Reset mode (RD Protection Reset cannot be used.)

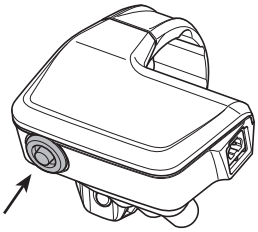
NOTICE

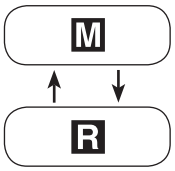
RD Protection Reset mode can be selected, however, RD Protection Reset cannot be performed.
The function is operable on rear derailleurs (Di2) only.
For details on RD Protection, refer to the user's manual of a supported model.

Switching operating modes

When using a system information display, use it in combination with one of the below units.
External type: BM-DN100, Built-in type: BT-DN110 / BT-DN110-A

You can switch between operating modes with a single click (2 seconds).





↓ Single click (2 seconds)
↑ Single click (0.5 seconds)

■ Error message

About the beep

Beep sounds	Situation
One short beep	Indicates that the gear shifting limit has been reached.

TECH TIPS

Beeps are set to sound in certain situations during gear operation.

■ About wireless functions (SC-MT800)

Functions

ANT® connection

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

(1)	Gear position (rear)
(2)	Di2 battery level information (External type: BM-DN100, Built-in type: BT-DN110 / BT-DN110-A)
(3)	Adjustment mode information

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

TECH TIPS

The latest functions can be checked by updating the software via E-TUBE PROJECT Cyclist.

Bluetooth® LE connection

E-TUBE PROJECT Cyclist may be used if a Bluetooth® LE connection is established with a smartphone.

How to make connections

ANT® connection

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

1 Put the cycle computer into connection mode.

2

When using an external battery

Check that the electric wires are connected to the system information display, and then remove and remount the external battery.

When using a built-in battery

Check that the electric wires are connected to the system information display, and then remove the electric wires from the system information display and reconnect them.

TECH TIPS

Connection transmission begins about 30 seconds after the battery is remounted or the electric wires are reconnected to the system information display.

To be continued on next page

3 This completes the connection process.

TECH TIPS

- Check on the cycle computer to see if connection was successful.
- If a connection cannot be made in the way described above, refer to the manual for your cycle computer.
- For information on how to show gear position or the Di2 battery level, refer to the manual for the cycle computer.

E-TUBE PROJECT connection

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

1 Open E-TUBE PROJECT Cyclist and set it to listen for Bluetooth® LE signals.

2 Press the mode switch until "C" appears on the display.

The unit on the bicycle will begin signal transmission. The unit name displays in E-TUBE PROJECT Cyclist.
(Release the mode switch or button as soon as the unit on the bicycle begins signal transmission. If the mode switch or button is held down for any longer, a different mode will be activated.)

3 Select the unit name displayed on screen.

TECH TIPS

When disconnecting, cancel the Bluetooth® LE connection from the smartphone. (The bicycle will switch from the connection mode to the normal operation mode.)

CHARGING THE BATTERY

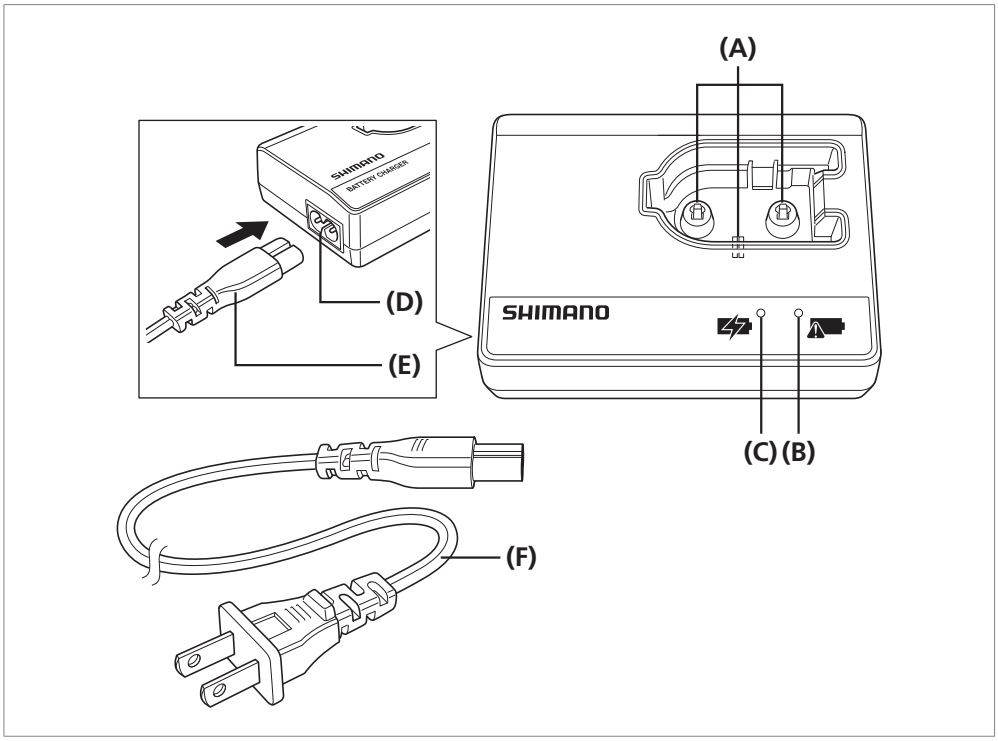
CHARGING THE BATTERY

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)

Battery 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

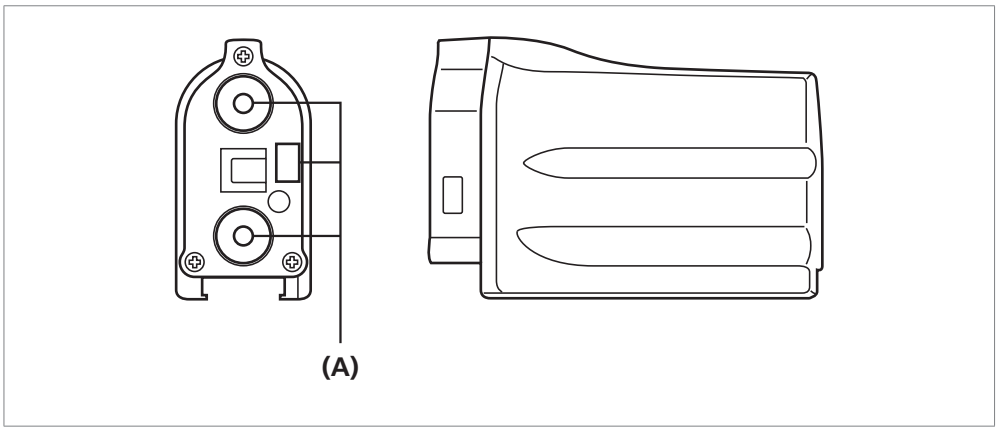
(E) Power cord:
Insert into the connector.
Insert as far as it will go.

(F) Charger cord (Sold separately)

TECH TIPS

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

Special battery (SM-BTR1)



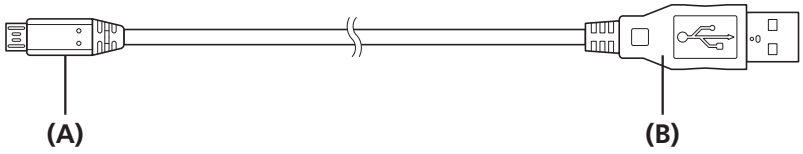
(A) Electrical contacts:
If these are modified or damaged, problems with operation will occur. Be very careful when handling them.

TECH TIPS

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

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

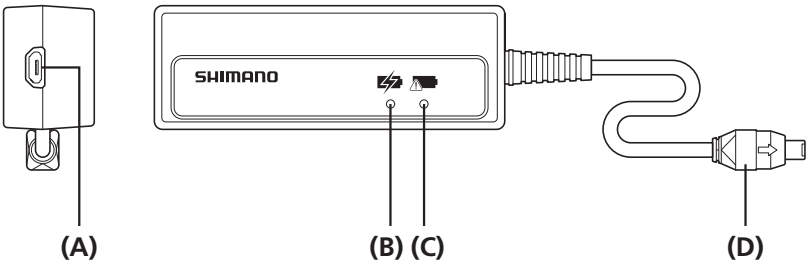
USB cable



(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.

Battery charger (SM-BCR2)



(A) Micro USB connector

(B) CHARGE indicator

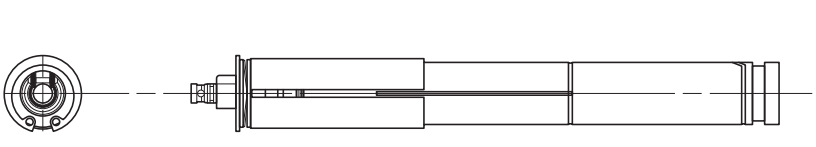
(C) ERROR indicator

(D) Plug for product connection:
Connect to the junction [A] or the charging connector of the system information display.

TECH TIPS

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

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



TECH TIPS

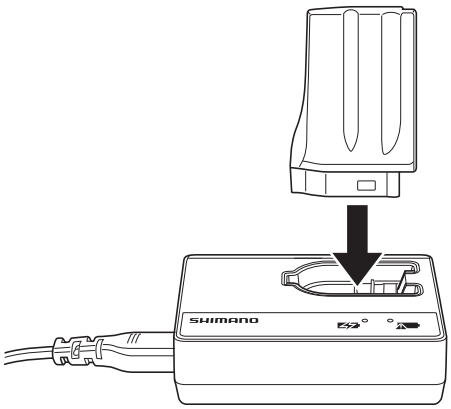
This is a lithium ion battery.
Use the special charger (SM-BCR2) to charge the battery.

■ Charging method

External type (SM-BCR1 / SM-BTR1)

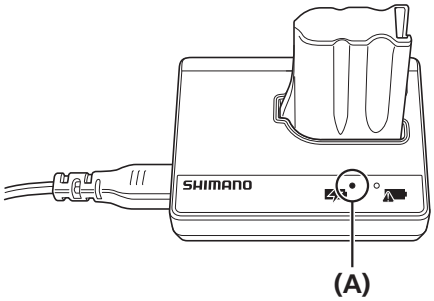
1 Insert the power plug of the battery charger into an electrical outlet.

2



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

3



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

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.

TECH TIPS

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

(A) CHARGE indicator

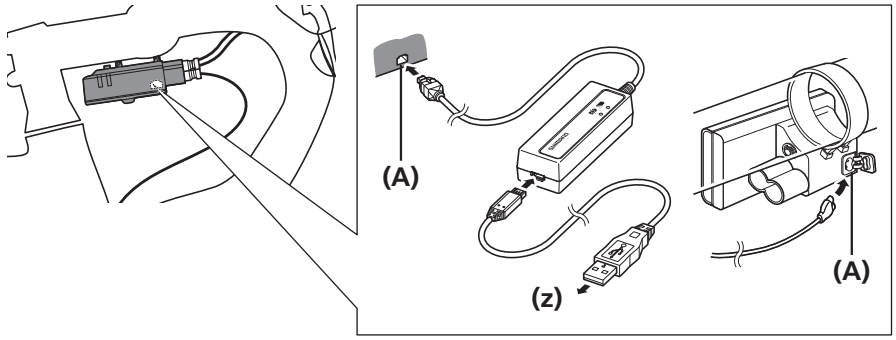
NOTICE

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.

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

Example of connection for charging

The position of the charging port differs depending on the product.



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

(A) Charging port

1 Connect the battery to the junction [A] or system information display.

TECH TIPS

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

2 Connect the charging cable to the junction [A] or the charging port of the system information display.

TECH TIPS

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 remaining battery charge.) Depending on the specifications of the AC adapter, recharging via the AC adapter may require as much time (about 3 hours) as recharging via PC.

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

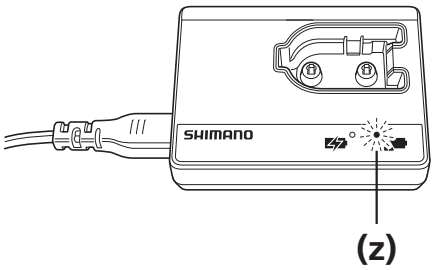
TECH TIPS

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

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

■ When charging is not possible

External type (SM-BCR1 / SM-BTR1)



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

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

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

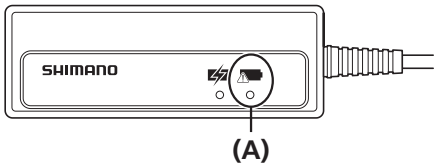
When charging is not possible

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

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

2

If the ERROR indicator blinks

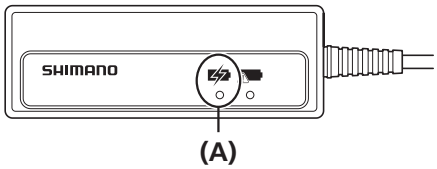


If the ERROR indicator blinks, the ambient temperature during charging may fall outside the operating temperature limits.

Check that the temperature is appropriate.

(A) ERROR indicator

If the CHARGE indicator blinks



If the CHARGE indicator blinks, refer to the following.

- The current capacity of your AC adapter with a USB port is lower than 1.0 Adc.
  ⇨Use an AC adapter with a USB port with a current capacity equal to or higher than 1.0 Adc.

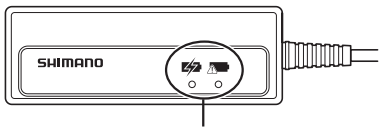
- A USB port is used to connect to the PC.
  ⇨Remove the USB hub.

(A) CHARGE indicator

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 power of the battery using junction [A] or the system information display.



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

The bicycle (system or components) can be connected to a PC to carry out tasks such as customization and updating their firmware.

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

Download E-TUBE PROJECT Professional from our support website (**https://bike.shimano.com/e-tube/project.html**).

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

TECH TIPS

You need the SM-PCE02 and SM-JC40/JC41 to connect the system to a PC. The SM-JC40/JC41 is not required if there is an available port. Firmware is subject to change without notice.

NOTICE

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

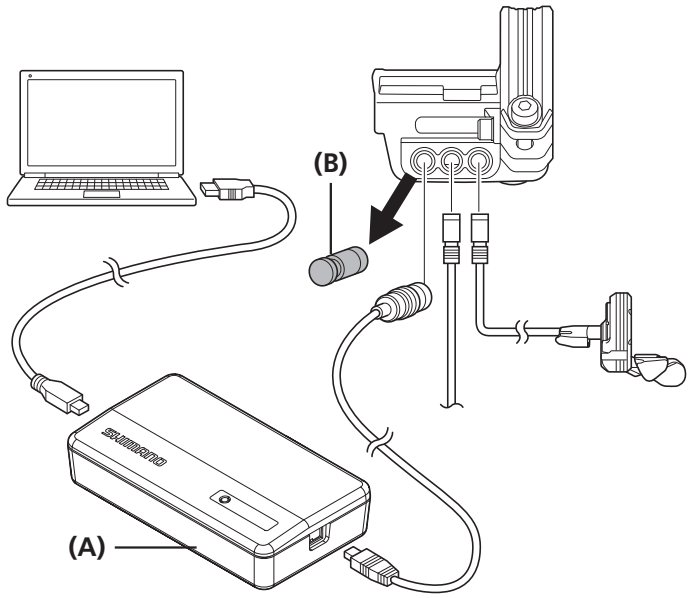
■ Settings customizable in E-TUBE PROJECT

Display settings	**Beep setting**	You can switch the beep between ON and OFF.
	Display time setting	Sets the time until the display turns off when the display monitor is left unattended.
Switch setting		Changes the function settings of the shifting switch and suspension switch.
Motor unit adjustment setting		Adjusts motor unit-driven gear shifting.
Configure multi shift mode settings	**Multi-shift mode ON/OFF**	Select whether or not to use multi-shift.
	Gear-shifting interval	Sets the gear-shifting interval for multi-shift.
	Gear number limit	Sets the limit on the number of gears shifted when the shifting switch is held down.

■ Connecting to a PC

When using SC-MT800

Remove the dummy plug from the system information display, and connect the PC linkage device.



(A) PC linkage device
(B) Dummy plug

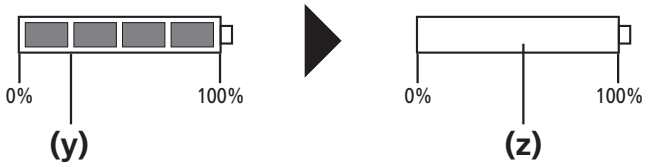
MAINTENANCE

MAINTENANCE

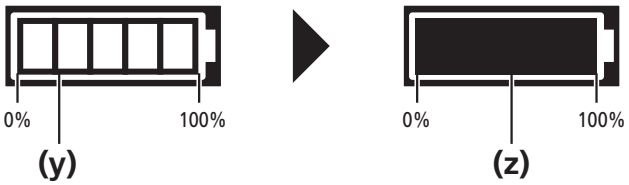
■ Battery level indicator

- When the battery level is low, the motor unit becomes fixed at the last gear position and stops operating.
- When the battery indicator is at a level that requires charging, it is recommended that the battery be charged soon.

SC-S705



SC-MT800



(y) Charging needed

(z) If the battery level is ZERO, not displayed on screen.

■ System power reset

SM-BTR1

After the battery is removed, about one minute is usually required for the system power to reset.

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.

■ Troubleshooting

	Symptoms	Remedies
MU-UR510 / MU-UR500 / MU-S705	System information display does not show the number of the gears.	Check if motor unit is connected.
SC-S705 / SC-MT800	The number of the gears on system information display does not change.	Check if motor unit is connected.

■ Adjusting the motor unit (connection and communication with PC)

For the latest information on E-TUBE PROJECT Professional, check https://bike.shimano.com/e-tube/project.html.

⚠ CAUTION

- Improper adjustment may cause gear engagement skipping, resulting in an accidental fall.
- Perform adjustment only when you have an unusual feel during shifting. If there is no problem with shifting, unnecessary adjustment may worsen shifting performance.

1 Download the latest version of E-TUBE PROJECT Professional from the support website.
(**https://bike.shimano.com/e-tube/project.html**)

2 Use the SM-PCE02 to connect the bicycle (system or component) to the PC.

3 Perform adjustment in E-TUBE PROJECT Professional.
For the adjustment procedure, refer to the user's manual for E-TUBE PROJECT Professional.

4 Finally, ride the bicycle to check whether there is no problem.

■ Adjusting the motor unit (Connection and communication with smartphone)

For the latest information on E-TUBE PROJECT Cyclist, check https://bike.shimano.com/e-tube/project.html.

⚠ CAUTION

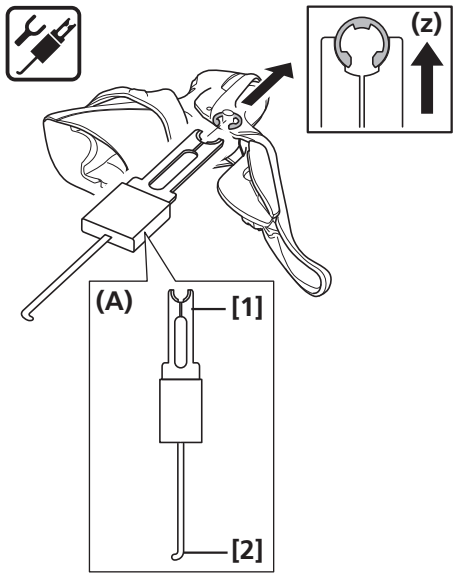
- Improper adjustment may cause gear engagement skipping, resulting in an accidental fall.
- Perform adjustment only when you have an unusual feel during shifting. If there is no problem with shifting, unnecessary adjustment may worsen shifting performance.

1. Download E-TUBE PROJECT Cyclist.
2. Refer to "About wireless functions (SC-MT800)" and connect with the smartphone via Bluetooth® LE.
3. Perform adjustment in E-TUBE PROJECT Cyclist.
   For the adjustment procedure, refer to the user's manual for E-TUBE PROJECT Cyclist.
4. Finally, ride the bicycle to check whether there is no problem.

■ Disassembly of bracket body and lever body (ST-S705-R)

When using a model not indicated here, refer to the dual control lever dealer's manual.

1



Use the SHIMANO original tool which is sold separately to remove the snap ring.

Align part **[2]** of the SHIMANO original tool with the removal direction of the snap ring. Next, set part **[1]** against the snap ring and remove the snap ring.

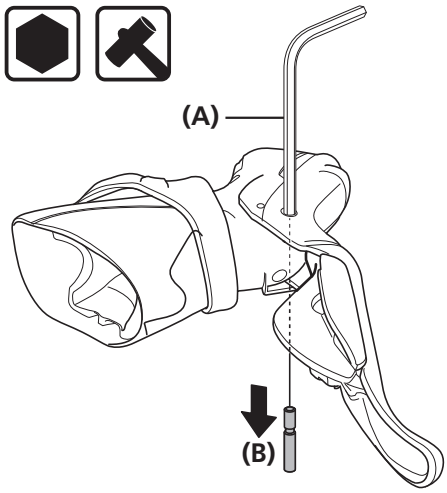
(z) Snap ring removal direction

(A) Special snap ring removal tool Y6RT68000

NOTICE

When you remove the snap 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.

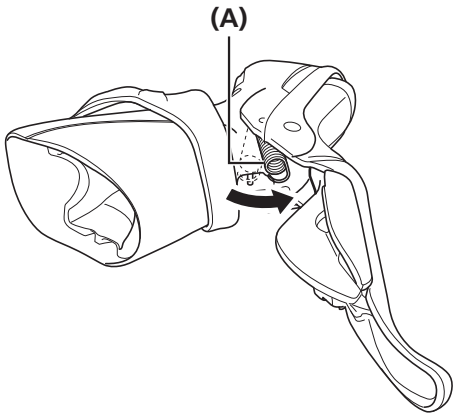
2



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

(A) Hexagon wrench
(B) Lever axle

3



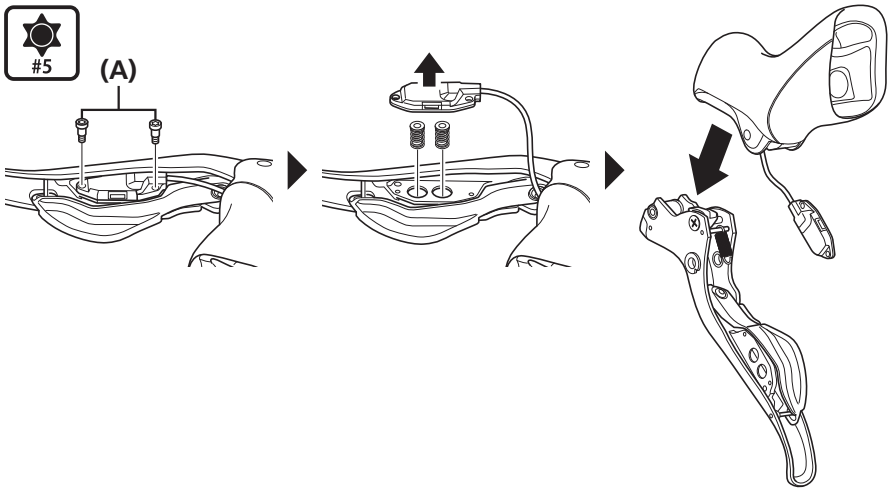
Remove the return spring.

(A) Return spring

To be continued on next page

4

After removing the two switch unit fixing screws, the switches and the switch springs, it can be disassembled into the bracket body and the lever body.

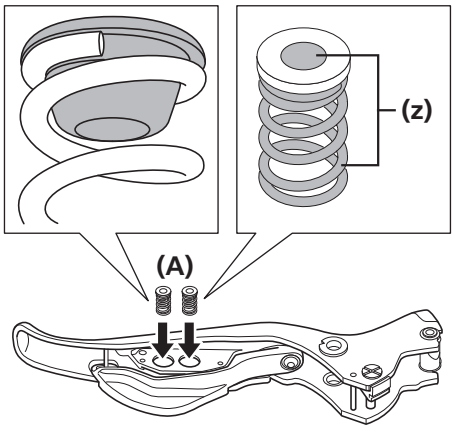


(A) Switch unit fixing screw (Hexalobular[#5])

■ Assembly of the switch unit (ST-S705-R)

When using a model not indicated here, refer to the dual control lever dealer's manual.

1

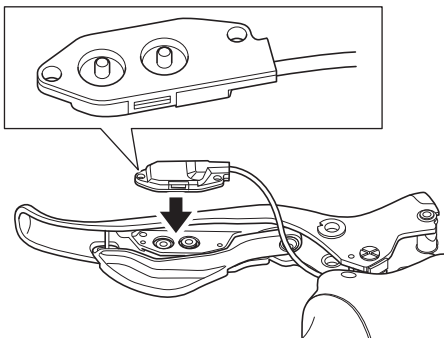


Check that the buttons are attached to the springs, then insert the switch springs into the holes in the switch unit setting plate.

(z) Applying grease
Premium grease (Y04110000)

(A) Switch spring

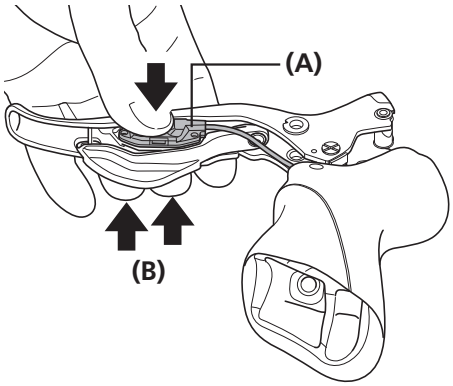
2



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

To be continued on next page

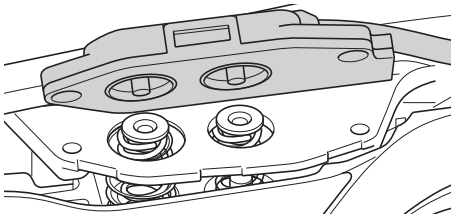
3



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

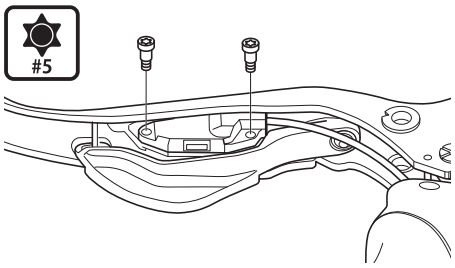
(A) Switch unit
(B) Shifting switches [X/Y]

4



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.

5



Return the switch unit to the setting position for the switch unit setting plate, and while pressing it by hand, operate the shifting switches [X/Y] once more and check that the switches turn on.

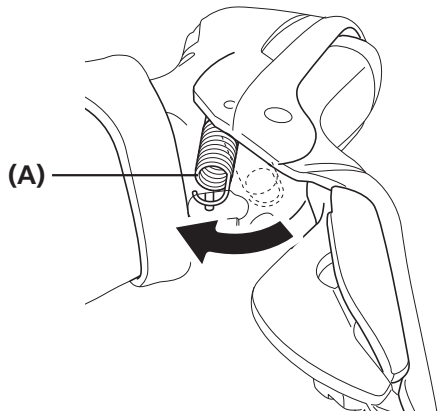
Install the switch using the switch unit fixing screws.

Tightening torque	
#5	0.18 N·m

■ Assembly of bracket body and lever body (ST-S705-R)

When using a model not indicated here, refer to the dual control lever dealer's manual.

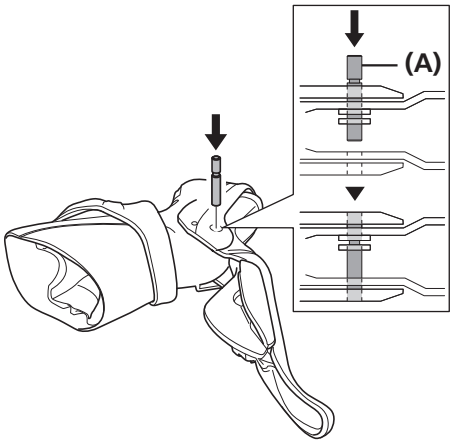
1



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

(A) Return spring

2



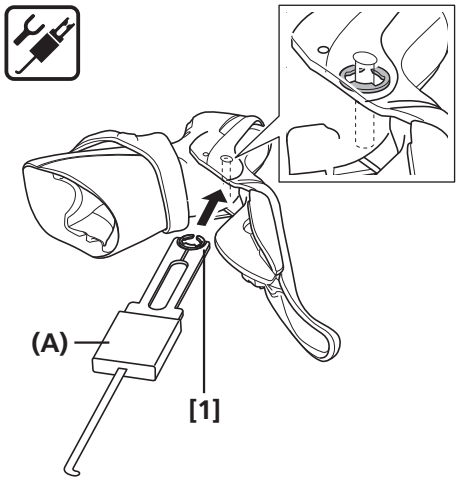
Align with the hole in the axle, and then press-fit the lever axle.

(A) Snap ring groove

TECH TIPS

- The correct direction for the lever axle is for the snap 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 snap ring will fit into the groove.

3



Use part **[1]** of the SHIMANO original tool to install the snap ring.

(A) Special snap ring removal tool Y6RT68000

TECH TIPS

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

■ For internal 8-speed (oil maintenance kit: Y00298010)

Content of kit: WB maintenance oil, Container

General Safety Information

⚠ WARNING

- When lubricating the internal unit, be careful that no oil gets on the disc brake rotor, pads, on the rim when using rim brakes, etc.
  If oil gets on any of these parts, there is a danger that brake performance may be reduced. Take care of this problem according to the procedures in the brake instruction manual.
- Since there is a risk of explosion or fire, do not smoke, eat, or drink while using this oil. In addition, keep it away from ignition sources such as heat, sparks, open flames, or high temperatures and prevent it from catching fire due to static electricity sparks or other sparks.
- Use only outdoors or in a well-ventilated area. Inhalation of oil mist or vapors may cause nausea. Be careful to provide ventilation and use a respirator type mask. If 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.

Cautions regarding handling of WB maintenance oil:

- Use appropriate eye protection when handling, and avoid contact with eyes. In the event of eye contact, flush with fresh water and seek medical assistance immediately. Contact with eyes may result in irritation.
- Use gloves when handling. In the event of skin contact, wash well with soapy water. Contact with skin may cause a rash and discomfort.
- Do not drink. If it is drunk by mistake, do not induce vomiting; make the affected person drink 1 to 2 cups of water and seek medical assistance immediately.
  If the affected person loses consciousness, do not give the person anything by their mouth. If vomiting occurs naturally, tilt the body to prevent inhalation.
- After use, be sure to wash hands thoroughly.
- 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.
- Keep out of reach of children.
- Dispose of used oil, old oil, or oil used for cleaning in accordance with the method stipulated by the law.
- To maintain the product in good working order, lubricate the internal unit after the first 1,000 km from the start of use of the product, and once every year thereafter (after every 2,000 km if bicycle is ridden frequently).
- Do not use oil other than WB maintenance oil. Problems such as an oil leakage and gear shifting malfunction may occur.
- Disposal of used oil: Follow local county and/or state codes for disposal. Use caution when preparing the oil for disposal.
- Read this manual carefully, and keep it in a safe place for later reference.
- For the latest product safety data sheets, check the website https://si.shimano.com.

For internal 8-speed (oil maintenance kit: Y00298010)

1

Fill the container with maintenance oil to a height of 95 mm.

(z) 95 mm

2

Immerse the internal unit in the oil from the left side until the oil reaches up to ring gear unit 1, as shown in the illustration.

(z) Ring gear unit 1

3

Keep the internal unit immersed for approximately 90 seconds.

4

Remove the internal unit from the oil.

5

Let excess oil drain off for approximately 60 seconds.

To be continued on next page

For internal 8-speed (oil maintenance kit: Y00298010)

6

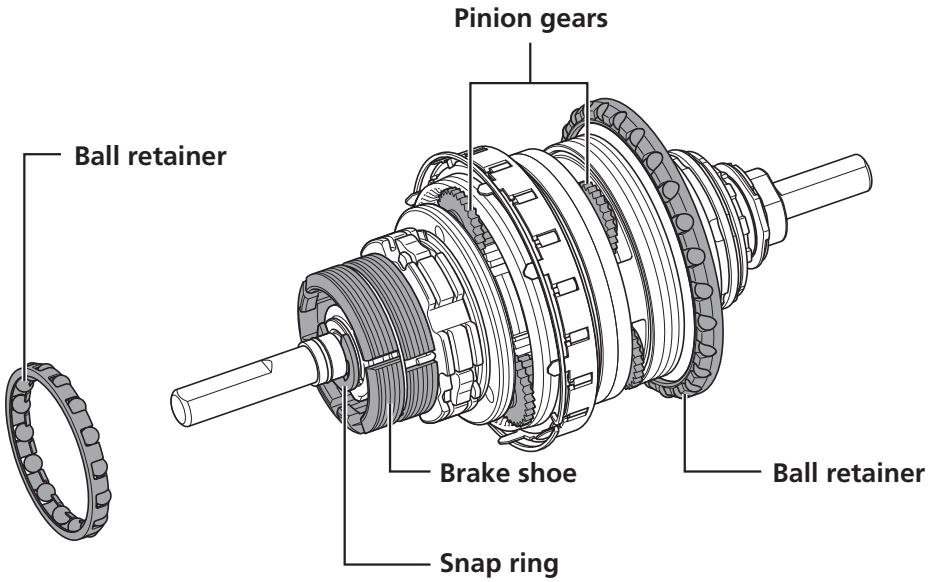
Reassemble the hub.

TECH TIPS

<Maintenance oil>
- The maintenance oil is reusable. Refill it as needed.
- Store it with the lid closed after use.

NOTICE

After oil maintenance, it is recommended that you apply Grease (Y04130100) to the ball retainers, snap ring, brake shoe, and pinion gears.



The illustration shows an example.

■ In the case of 11-speed internal geared hub (Oil maintenance kit: Y13098023)

Tools included in the kit: Syringe, Tube, Bleed nipple, O ring, Container

General Safety Information

⚠ WARNING

- When replacing the oil, be careful that no oil gets on the disc brake rotor, pads, on the rim when using rim brakes, etc.
  If oil gets on any of these parts, there is a danger that brake performance may be reduced.
  Take care of this problem according to the procedures in the brake instruction manual.
- Since there is a risk of explosion or fire, do not smoke, eat, or drink while using this oil. In addition, keep it away from ignition sources such as heat, sparks, open flames, or high temperatures and prevent it from catching fire due to static electricity sparks or other sparks.
- Use only outdoors or in a well-ventilated area. Inhalation of oil mist or vapors may cause nausea. Be careful to provide ventilation and use a respirator type mask.
  If 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.

Cautions regarding handling of SG-S700 OIL:

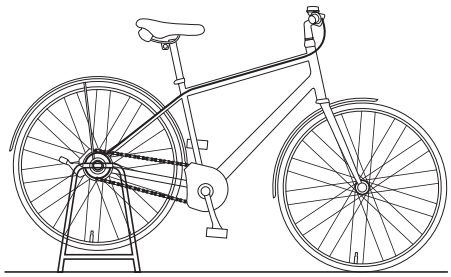
- Use appropriate eye protection when handling, and avoid contact with eyes. In the event of eye contact, flush with fresh water and seek medical assistance immediately. Contact with eyes may result in irritation.
- Use gloves when handling. In the event of skin contact, wash well with soapy water. Contact with skin may cause a rash and discomfort.
- Do not drink. If it is drunk by mistake, do not induce vomiting; make the affected person drink 1 to 2 cups of water and seek medical assistance immediately.
  If the affected person loses consciousness, do not give the person anything by their mouth. If vomiting occurs naturally, tilt the body to prevent inhalation.
- After use, be sure to wash hands thoroughly.
- 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.
- Keep out of reach of children.
- Dispose of used oil, old oil, or oil used for cleaning in accordance with the method stipulated by the law.
- To maintain the product in good working order, replace the oil after the first 1,000 km from the start of use of the product, and once every year thereafter (after every 2,000 km if bicycle is ridden frequently).
- Do not use oil other than SG-S700 OIL. Problems such as an oil leakage and gear shifting malfunction may occur.
- Disposal of used oil: Follow local county and/or state codes for disposal. Use caution when preparing the oil for disposal.
- Read this manual carefully, and keep it in a safe place for later reference.
- For the latest product safety data sheets, check the website https://si.shimano.com.

TECH TIPS

When using a 1L can of oil, it may become impossible to suck out oil with a syringe when there is only a little oil left. First, transfer all oil to a different container.

In the case of 11-speed internal geared hub (Oil maintenance kit: Y13098023)

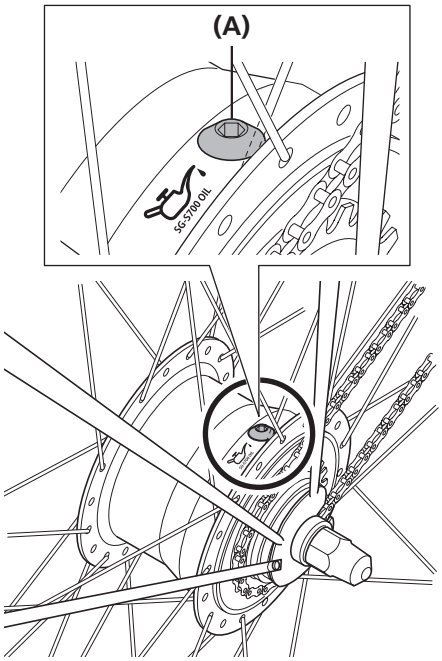
Internal geared hub: Oil replacement



Using a stand, etc., enable the rear wheel to turn while performing work.

Draining out the old oil

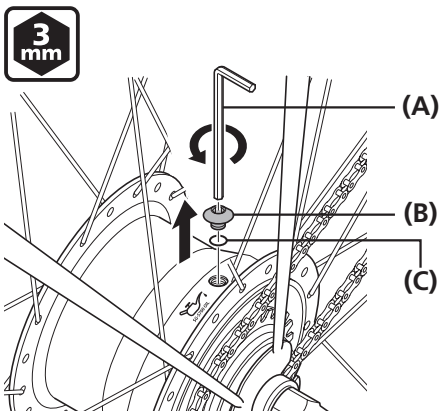
1



Rotate the wheel slowly until the oil port is facing up.

(A) Oil port

2



Remove the oil port bolt and O-ring.

(A) 3 mm hexagon wrench
(B) Oil port bolt
(C) O-ring

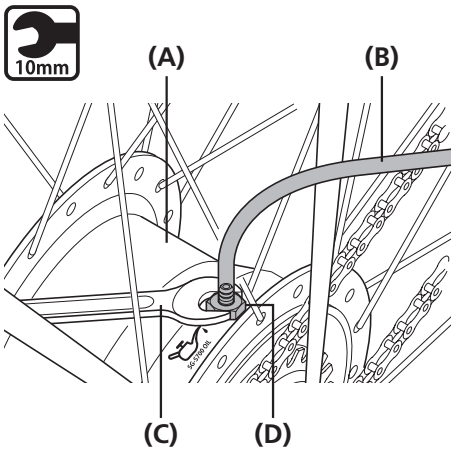
NOTICE

Be careful that the oil port is facing up; if the oil port bolt is loosened when it is not facing up, the oil inside may leak out.

To be continued on next page

In the case of 11-speed internal geared hub (Oil maintenance kit: Y13098023)

3



Attach the bleed nipple with tube attached to the hub shell.

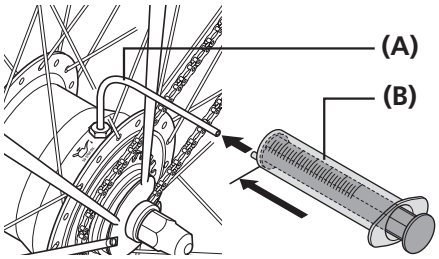
(A) Hub shell
(B) Tube
(C) 10 mm spanner
(D) Bleed nipple

Tightening torque	
10mm	1 - 3 N·m

TECH TIPS

Check that the O-ring is properly installed on the bleed nipple.

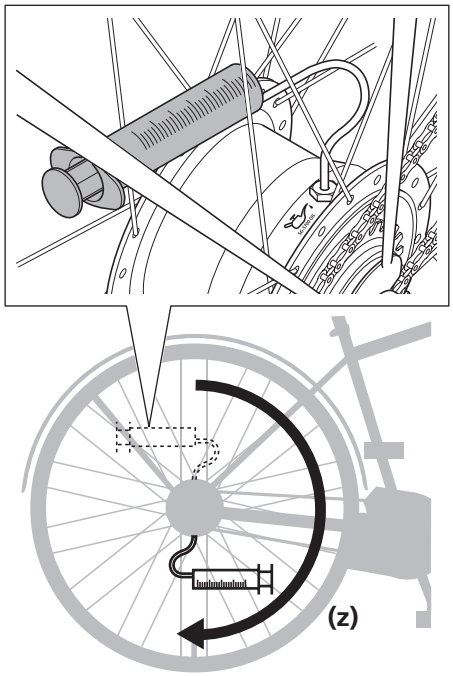
4



With the piston of the syringe pushed fully in, firmly connect the syringe to the tube.

(A) Tube
(B) Syringe

5



Insert the syringe between the spokes, and slowly turn the wheel forward until the oil port is facing down.

(z) Turn in forward direction

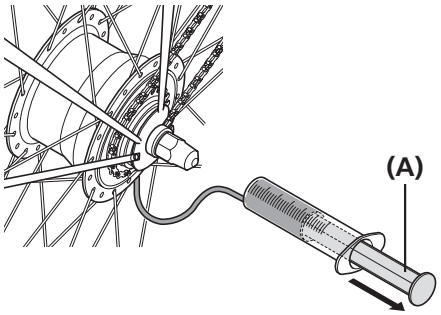
6

Wait about 5 minutes with the hub kept still and not turning so that the oil settles.

To be continued on next page

In the case of 11-speed internal geared hub (Oil maintenance kit: Y13098023)

7



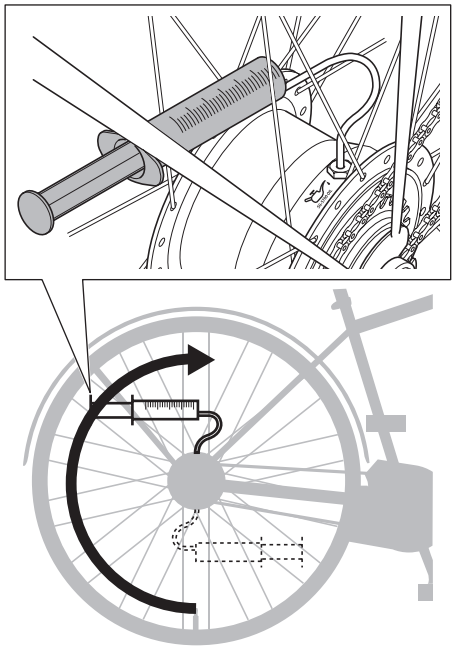
Pull the piston out slowly to draw out the oil inside the hub shell.

(A) Piston

NOTICE

If the piston is pulled out quickly, air is likely to be mixed in.

8

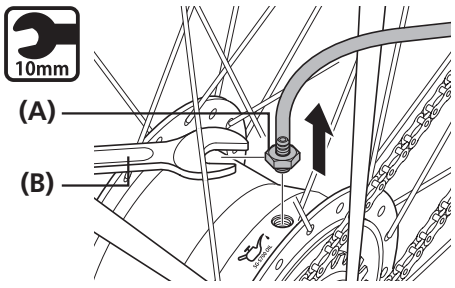


Rotate the wheel slowly until the oil port is facing up.

NOTICE

To make sure that the syringe does not get caught by the chain case, etc., store the syringe between the spokes when turning the wheel.

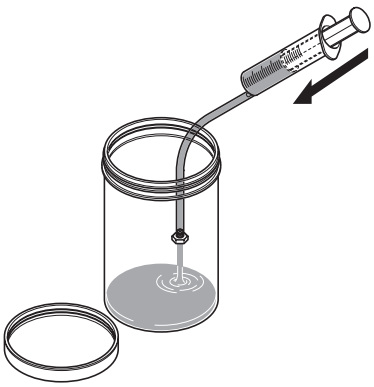
9



While being careful that the tube does not come off the syringe, remove the bleed nipple.

(A) Bleed nipple
(B) 10 mm spanner

10



Remove the old oil from the syringe.

In the case of 11-speed internal geared hub (Oil maintenance kit: Y13098023)

Cleaning the inside

1 Attach the bleed nipple to the hub shell.

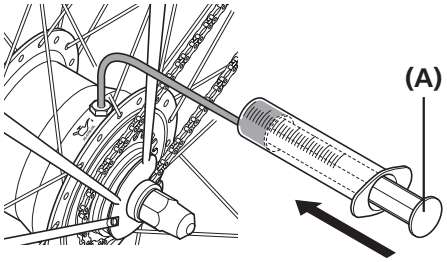
Tightening torque	
10mm	1 - 3 N·m

2 Suck 25 ml of new oil into the syringe and connect it firmly to the tube.

TECH TIPS

If the syringe or tube becomes dirty when removing old oil or cleaning the inside of the hub, clean the syringe and tube using parts cleaner, etc., if necessary.

3



Push the piston to inject the new oil into the inside of the hub.

(A) Piston

TECH TIPS

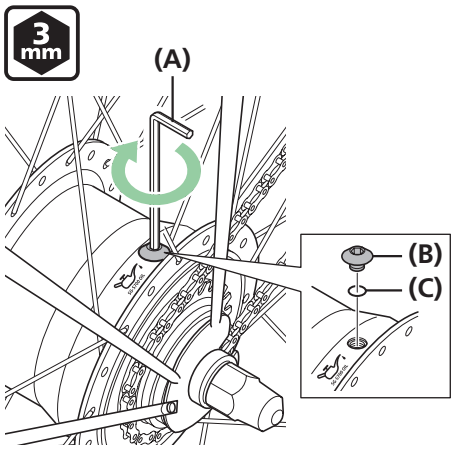
When the oil is forced in, the internal pressure will increase and the piston may push back. If the piston is periodically pulled back to reduce the pressure inside the hub, the oil will be easier to inject into the inside of the hub.

4 After pulling back the piston to reduce the internal pressure, remove the bleed nipple.

TECH TIPS

If the bleed nipple is removed without pulling back the piston, the oil may flow back into the piston together with air from inside the tube and spill out of the piston.

5



Install the O-ring and the oil port bolt.

(A) 3 mm hexagon wrench
(B) Oil port bolt
(C) O-ring

Tightening torque	
3 mm	2 - 3 N·m

To be continued on next page

In the case of 11-speed internal geared hub (Oil maintenance kit: Y13098023)

6 While performing gear-change operations, turn the pedals to turn the wheel for about 1 minute.

7 Keep the wheel still without rotating for about 1 minute.

8 Remove the oil from inside by following the procedures in **Draining out the old** oil above.

Injecting new oil

1 Inject 25 ml of new oil into the hub by following steps **Cleaning the inside 1 - 5** above.

2 Clean off any oil that may have gotten on the hub, etc.

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