

Dealer's Manual

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

XTR DI2

M9050 series

XTR

RD-M9050

FD-M9050

FD-M9070

SM-FD905

SW-M9050

SM-BTC1

BT-DN110

BT-DN110-A

BM-DN100

SC-M9050

SC-M9051

CONTENTS

IMPORTANT NOTICE.....	4
TO ENSURE SAFETY.....	5
LIST OF TOOLS TO BE USED.....	15
INSTALLATION	17
Electrical wiring diagram.....	17
Installing the system information display.....	20
Installation of junction A.....	22
Installation of the shifting switch	23
Installation of the front derailleur.....	24
Installation of the rear derailleur.....	31
Connection of the electric wires	33
Installation of the battery	37
Installation of the chain.....	47
HOW TO OPERATE	49
Basic operations of the shifting switch.....	49
Gear position control.....	50
Displaying and operating the system information display.....	51
Error message.....	57
About wireless functions (SC-M9051)	58
ADJUSTMENT	61
Adjustment of the rear derailleur.....	61
Adjustment of the front derailleur	66
Adjusting rear derailleur friction	79

CHARGING THE BATTERY.....	82
Names of parts	82
Charging the battery	84
When charging is not possible	86
CONNECTION AND COMMUNICATION WITH DEVICES.....	89
Settings customizable in E-TUBE PROJECT	89
Connecting to a PC.....	91
MAINTENANCE.....	95
Replacing parts – shifting switch.....	95
Replacing parts – rear derailleur	96
Replacing parts – front derailleur	102
Replacing rubber pad A.....	108
Replacing rubber pad B	111
Disconnection of the electric wires	112

IMPORTANT NOTICE

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

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

- Make sure to read all instruction manuals included with the product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All dealer's manuals and instruction manuals can be viewed on-line on our website (<http://si.shimano.com>).
- 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



Be sure to also inform users of the following:

■ Lithium ion battery

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

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

■ Battery charger/Battery charger cord

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

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

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


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

 **WARNING**

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

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

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

-  Be sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.
- After reading the dealer's manual thoroughly, keep it in a safe place for later reference.

Be sure to also inform users of the following:

- *Intervals between maintenance depend on the use and riding circumstances. Clean the chain with an appropriate chain cleaner regularly. Never use alkali based or acid based solvents, such as rust cleaners. If those solvents are used the chain might break and cause serious injury.*
- When the shifting switch is operated, the powerful motor which drives the front or rear derailleur will operate to the shifting lever position without stopping, so be careful not to get your fingers caught.
- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and cause serious injury.
- Check the chain for any damage (deformation or crack), skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency. The chain may break, and you may fall.
- Be careful not to let the hemming of your clothes get caught in the chain while riding. Otherwise you may fall off the bicycle.

■ **About the multi-shift function**

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

Item	Multi-shift speed	Characteristics	Usage notes	Crank rotation speed when operating multi-shift
Very fast	High speed	Quick multi-shifting is possible <ul style="list-style-type: none"> • The crank rotation speed can be adjusted quickly depending on changes in riding conditions. • The speed can be adjusted quickly. 	<ul style="list-style-type: none"> • Over-shifting occurs easily. • If the rotation speed of the crank is low, the chain will be unable to follow the movement of the rear derailleur. The chain may therefore slip over the tip of the cassette sprocket teeth. 	High crank rotation speed
Fast				
Normal	Default setting			
Slow				
Very slow	Low speed	Accurate multi-shifting is possible	Multi-shifting takes some time	

By default it is set to **Normal**.

Fully understand the features of the multi-shift speed, and choose a multi-shift gear shifting setting according to the riding conditions (terrain, riding method, etc.).

■ Lithium ion battery

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

SM-BTR1: Lithium ion battery

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

SM-BTR2/BT-DN110/BT-DN110-A: Lithium ion battery

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

■ Battery charger/Battery charger cord**SM-BCR1: Battery charger for SM-BTR1**

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

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

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

■ Brake

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



Be sure to also inform users of the following:

■ Lithium ion battery

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

SM-BTR1: Lithium ion battery

- 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

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

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

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

NOTICE

Be sure to also inform users of the following:

- Be careful not to get water into the E-TUBE port.
- Be sure to attach dummy plugs to any unused E-TUBE ports. If water gets into any of the components, operating problems or rusting may result.
- Be sure to rotate the crank when carrying out switch operations which are related to gear shifting.
- 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.
- The components are designed to be fully waterproofed to withstand wet weather riding conditions; however, do not deliberately place them into water.
- Do not clean the bicycle with a high-pressure wash. Moreover, do not place any components in water. 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. The internal battery may be damaged. If the product has been subjected to a shock, consult a dealer.
- Do not use thinners or similar substances to clean the products. Such substances may damage the surfaces.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- Contact the place of purchase for updates of the component software. The most up-to-date information is available on the Shimano website.
- Products are not guaranteed against natural wear and deterioration from normal use and aging.
- For maximum performance we highly recommend Shimano lubricants and maintenance products.

■ Lithium ion battery

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

SM-BTR1: Lithium ion battery


- 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

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

■ **Battery charger/Battery charger cord**

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

	<p>Disposal information for countries outside the European Union</p> <p>This symbol is only valid within the European Union. For information on used batteries, contact the place of purchase or a bicycle dealer.</p>
---	---

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

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

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

■ **Front derailleur**

- Make sure that the plug cover is attached to the E-TUBE port when using the product.

■ **Rear derailleur**

- Be sure to check that the plate unit cover and cap are installed before riding the bicycle.
- Make sure that the plug cover is attached to the E-TUBE port when using the product.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- If the chain keeps skipping, ask the place of purchase to replace the chainrings, sprockets and/or the chain.
- If there is a large gap in the pulleys which causes a lot of noise, ask the place of purchase to replace the pulleys.
- The gears should be periodically washed with a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the life of the gears and the chain.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.

For Installation to the Bicycle, and Maintenance:

- Be sure to attach dummy plugs to any unused E-TUBE ports.
- Be sure to use Shimano original tool (TL-EW02) to remove the electric wires.
- The motors of the motor unit cannot be repaired.
- Contact Shimano for information regarding the shipment of the battery charger to South Korea and Malaysia.
- Use an electric wire which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- Use the specified cable and cable guide for smooth operation.
- When replacing the brake oil, be careful not to let the oil splash onto the system information display. This may damage the product.

■ Electric wires/Electric wire covers

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

■ Shifting switch

- 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.

■ Rear derailleur

- Always be sure to adjust the top adjustment bolt and the low adjustment bolt according to the instructions given in the adjustment section. If these bolts are not adjusted, the chain may become clamped between the spokes and the largest sprocket and the wheel may lock, or the chain may slip onto the small sprocket.
- Periodically clean the derailleur and lubricate all moving parts (mechanism and pulleys).
- If gear shifting adjustments cannot be carried out, check the degree of parallel of the rear dropouts.
- The pulley has an arrow on it to indicate the direction of rotation. Make sure that the arrow points in the direction of movement of the chain.

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

■ About system power reset

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

In the case of using SM-BTR1

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

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

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

■ Connection and communication with PC

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

	PC linkage device	E-TUBE PROJECT	Firmware
SM-BMR2/SM-BTR2	SM-PCE1/SM-BCR2	Version 2.6.0 or later	Version 3.0.0 or later
BT-DN110/BT-DN110-A/BM-DN100		Version 3.0.0 or later	Version 4.0.0 or later

■ Connection and communication with smartphone or tablet

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












About compatibility with E-TUBE PROJECT

- For details on compatibility with E-TUBE PROJECT, refer to the following website.
(http://e-tubeproject.shimano.com/guide/#guide_list)

LIST OF TOOLS TO BE USED

LIST OF TOOLS TO BE USED

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

Tool		Tool		Tool	
	2 mm hexagon wrench		5 mm hexagon wrench		TL-EW02
	2.5 mm hexagon wrench		Screwdriver[#2]		TL-FDM905
	3 mm hexagon wrench		Hexalobular[#8]		Snap ring pliers
	4 mm hexagon wrench		Hexalobular[#30]		

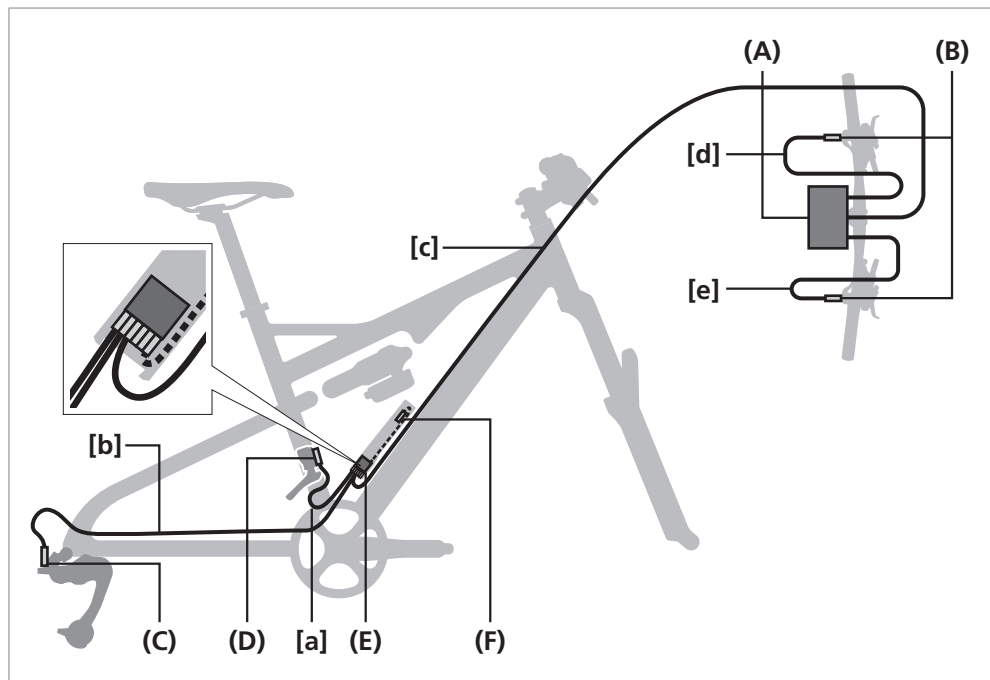
INSTALLATION

INSTALLATION

■ Electrical wiring diagram

The connections shown below are only examples. The wiring method may differ depending on the type of frame. For details, contact a manufacturer of completed bicycles.

External battery type (without suspension connection/SM-BTC1)



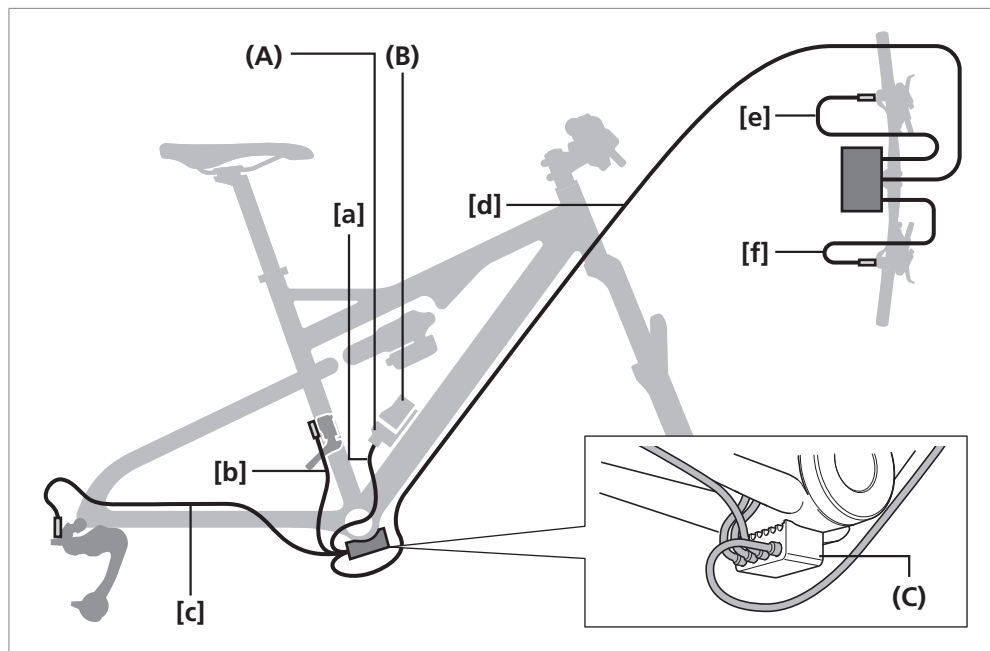
- (A)** System information display/
junction A
- (B)** Shifting switch
- (C)** Rear derailleur
- (D)** Front derailleur
- (E)** Battery case SM-BTC1
- (F)** Battery
SM-BTR2/BT-DN110/BT-DN110-A



Cable length (EW-SD50)

- [a] ≤ 300 mm
- [b] ≤ 1000 mm
- [c] ≤ 1200 mm
- [d] ≤ 300 mm
- [e] ≤ 300 mm

External battery type (without suspension connection/SM-JC40)



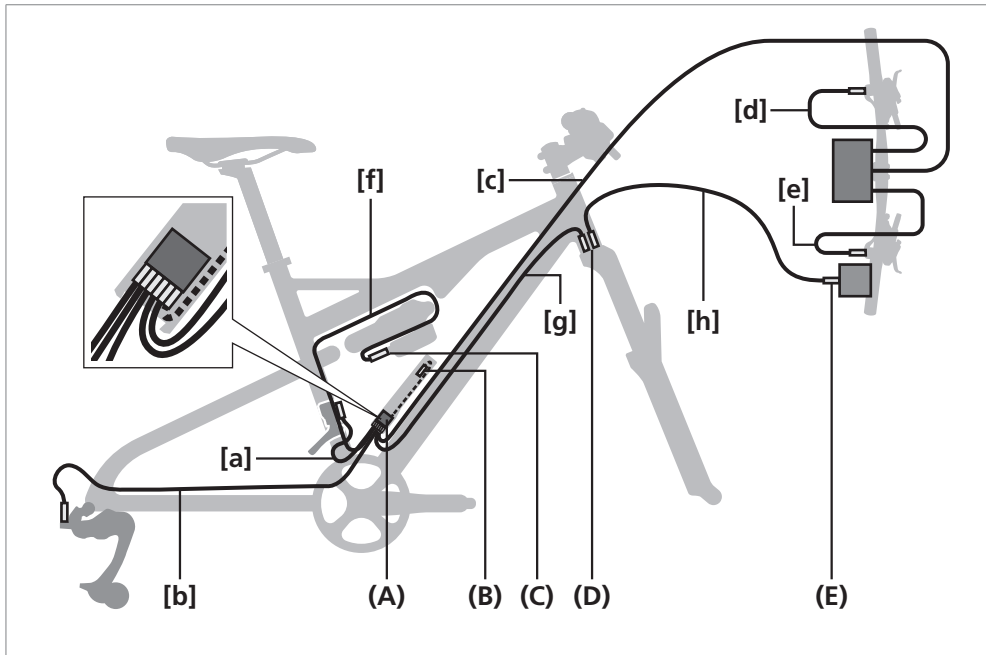
- (A)** Battery mount
SM-BMR2/BM-DN100
- (B)** Battery SM-BTR1
- (C)** Junction B SM-JC40



Cable length (EW-SD50)

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

External battery type (with suspension connection/SM-BTC1)



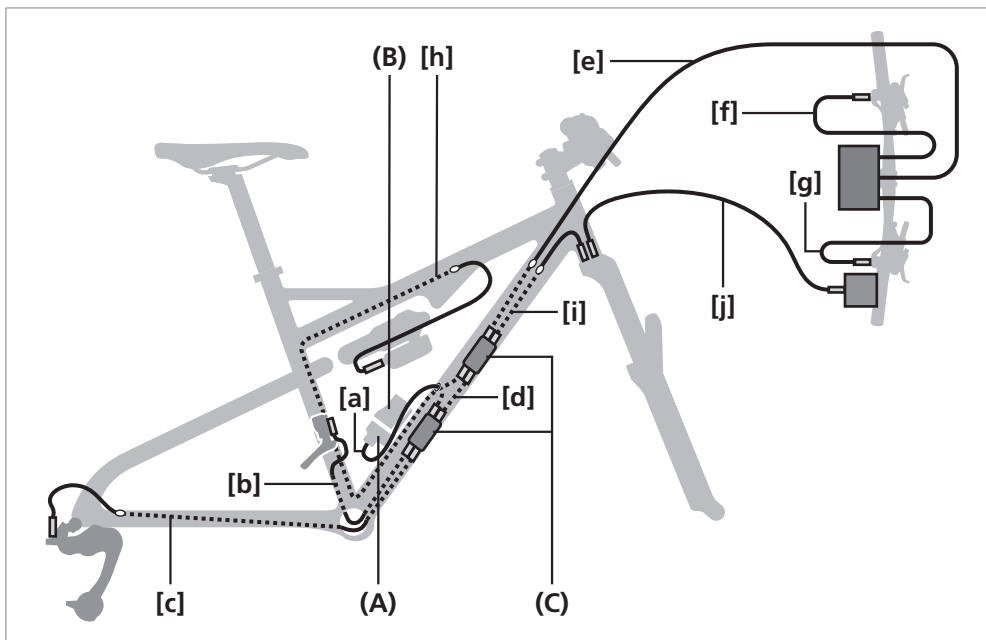
- (A)** Battery case SM-BTC1
- (B)** Battery
SM-BTR2/BT-DN110/BT-DN110-A
- (C)** Rear suspension motor unit
- (D)** Front suspension motor unit
- (E)** Suspension lock switch



Cable length (EW-SD50)

- [a] ≤ 300 mm
- [b] ≤ 1000 mm
- [c] ≤ 1200 mm
- [d] ≤ 300 mm
- [e] ≤ 300 mm
- [f] ≤ 1000 mm
- [g] ≤ 1000 mm
- [h] ≤ 600 mm

External battery type (with suspension connection/SM-JC41)



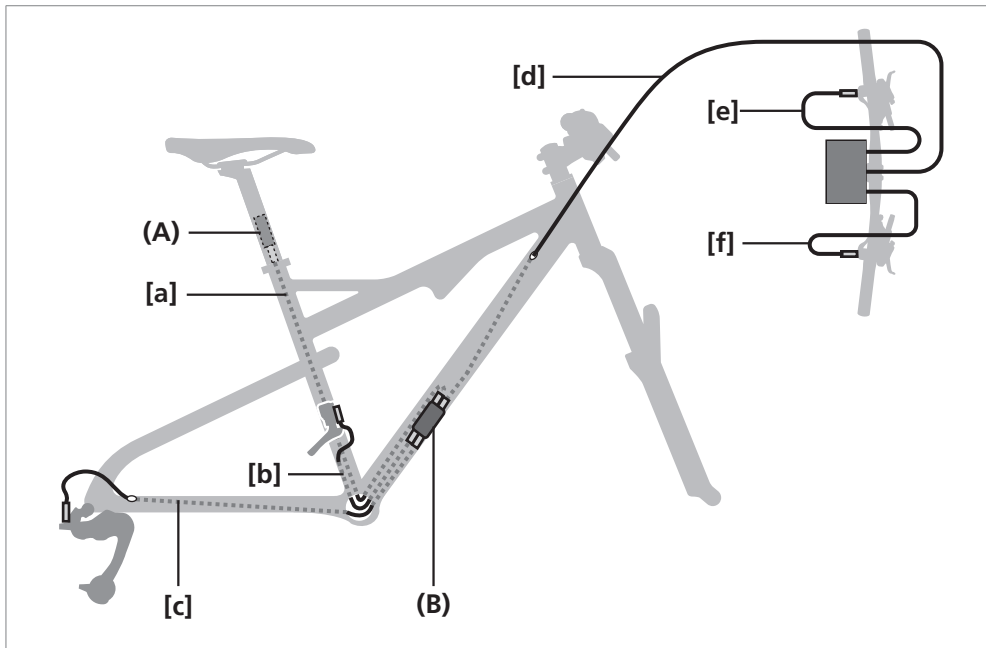
- (A)** Battery mount
SM-BMR2/BT-DN110/BT-DN110-A
- (B)** Battery SM-BTR1
- (C)** Junction B SM-JC41



Cable length (EW-SD50)

- [a] + [b] ≤ 1500 mm
- [a] + [c] ≤ 1700 mm
- [d] ≤ 150 mm
- [e] ≤ 1200 mm
- [f] ≤ 250 mm
- [g] ≤ 250 mm
- [h] ≤ 1500 mm
- [i] ≤ 1000 mm
- [j] ≤ 600 mm

Built-in battery type (seat post type) without suspension connection



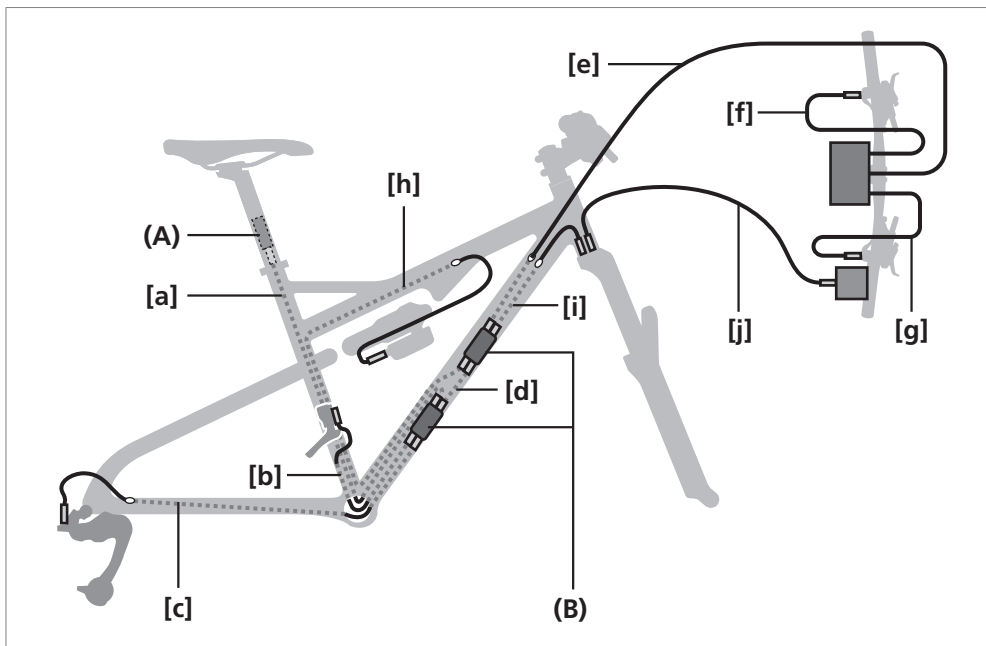
- (A)** Battery
SM-BTR2/BT-DN110/BT-DN110-A
- (B)** Junction B SM-JC41



Cable length (EW-SD50)

- [a] ≤ 1000 mm
- [b] ≤ 500 mm
- [c] ≤ 800 mm
- [d] ≤ 1400 mm
- [e] ≤ 250 mm
- [f] ≤ 250 mm

Built-in battery type (seat post type)



- (A)** Battery
SM-BTR2/BT-DN110/BT-DN110-A
- (B)** Junction B SM-JC41



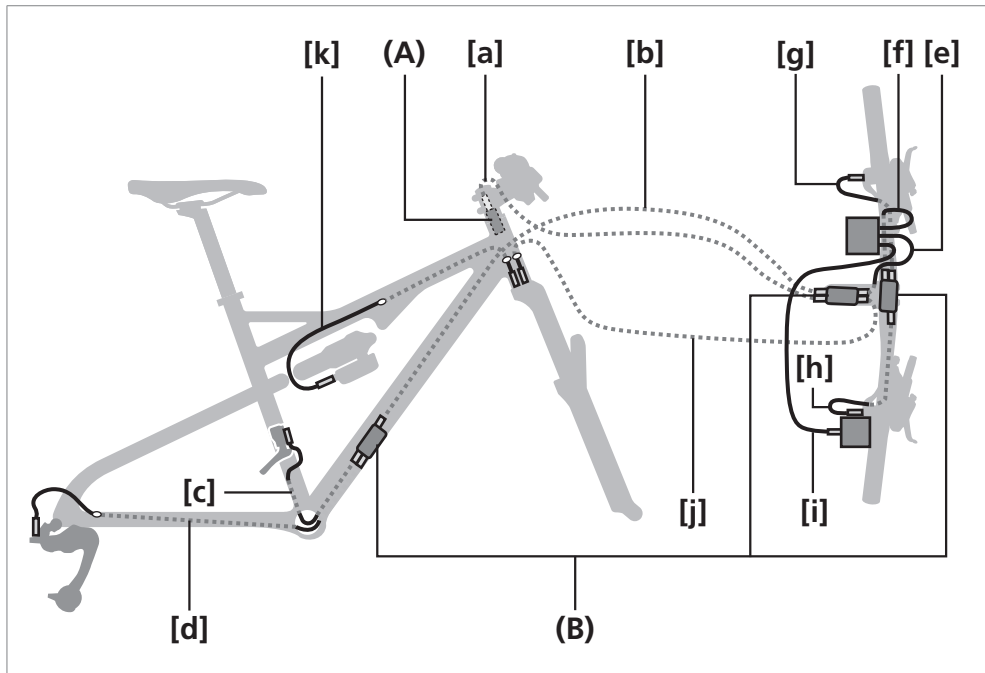
Cable length (EW-SD50)

- [a] ≤ 1000 mm
- [b] ≤ 500 mm
- [c] ≤ 800 mm
- [d] ≤ 150 mm
- [e] ≤ 1200 mm
- [f] ≤ 250 mm
- [g] ≤ 250 mm
- [h] ≤ 1500 mm
- [i] ≤ 1000 mm
- [j] ≤ 600 mm

INSTALLATION

▶▶ Installing the system information display

Built-in battery type (head tube type)



- (A) Battery
SM-BTR2/BT-DN110/BT-DN110-A
- (B) Junction B SM-JC41



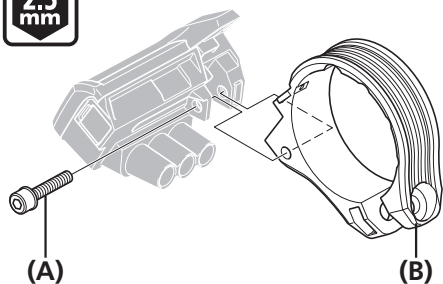
Cable length (EW-SD50)

- [a] ≤ 150 mm
- [b] ≤ 1400 mm
- [c] ≤ 500 mm
- [d] ≤ 800 mm
- [e] ≤ 150 mm
- [f] ≤ 400 mm
- [g] ≤ 750 mm
- [h] ≤ 250 mm
- [i] ≤ 150 mm
- [j] ≤ 600 mm
- [k] ≤ 800 mm

■ Installing the system information display

Install the system information display or junction A first.

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



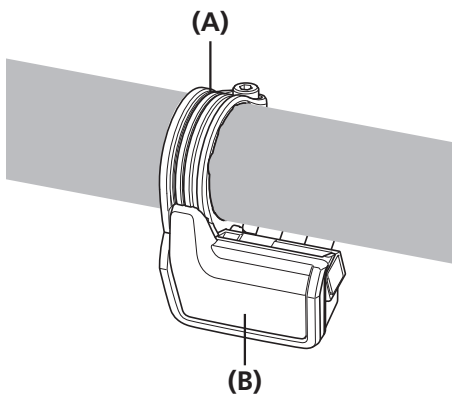
0.6 N·m

NOTICE

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

Installing to the handlebar

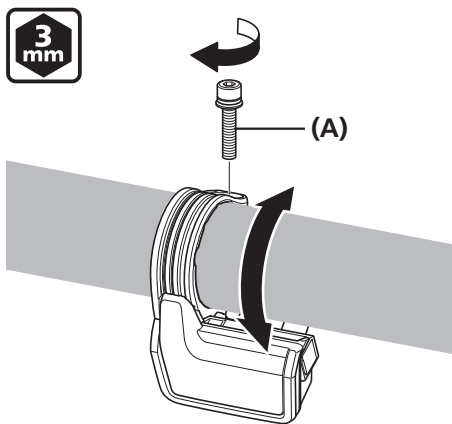
1



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

- (A)** Clamp band
- (B)** System information display

2



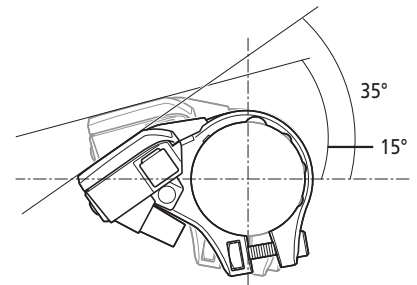
Adjust the angle of the system information display so that it is easy to see, and then use a 3 mm hexagon wrench to tighten the clamp bolt.

- (A)** Clamp bolt

Tightening torque	
	0.8 N·m

NOTICE

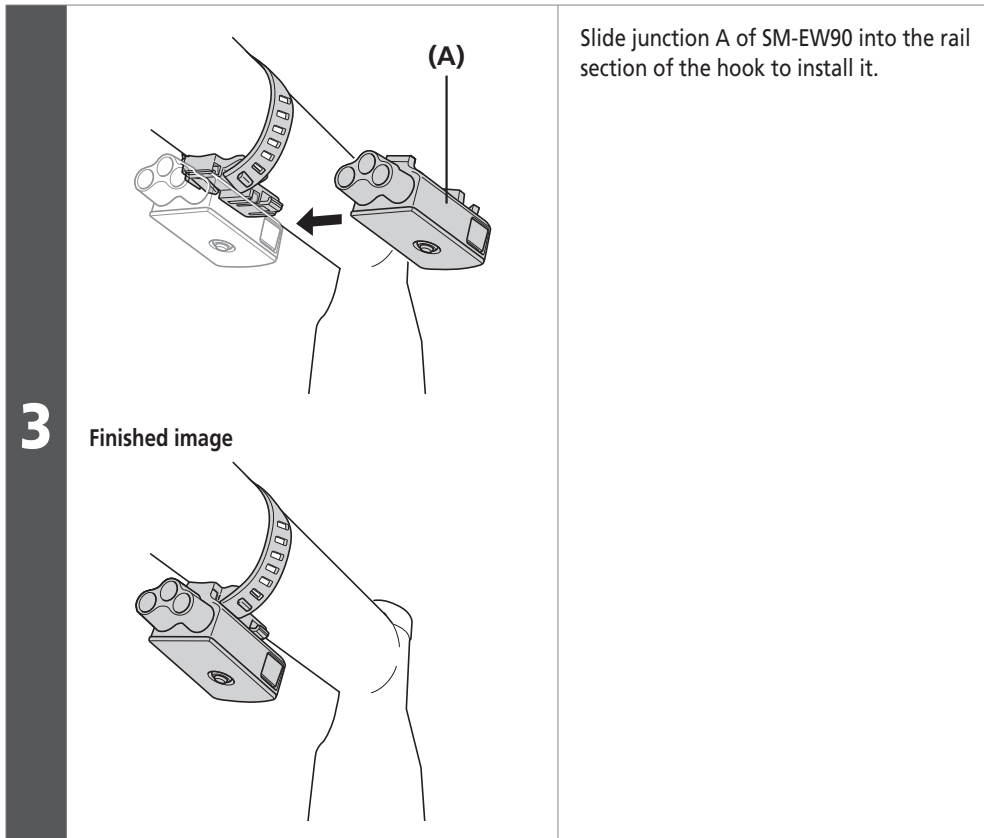
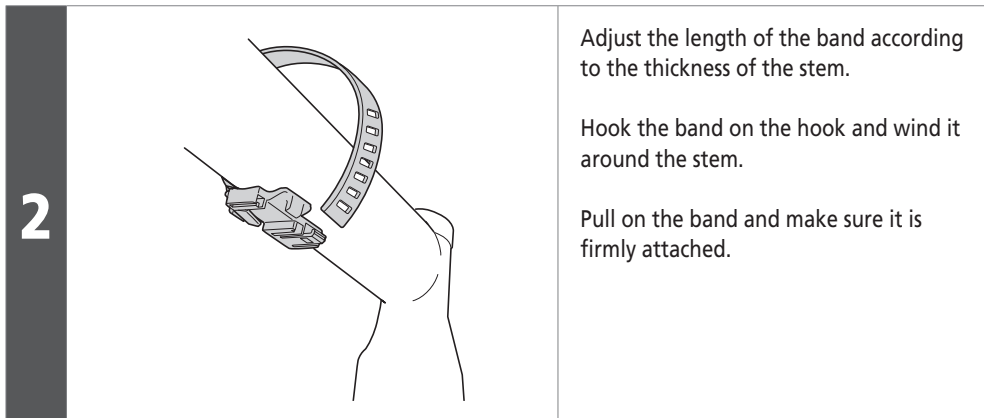
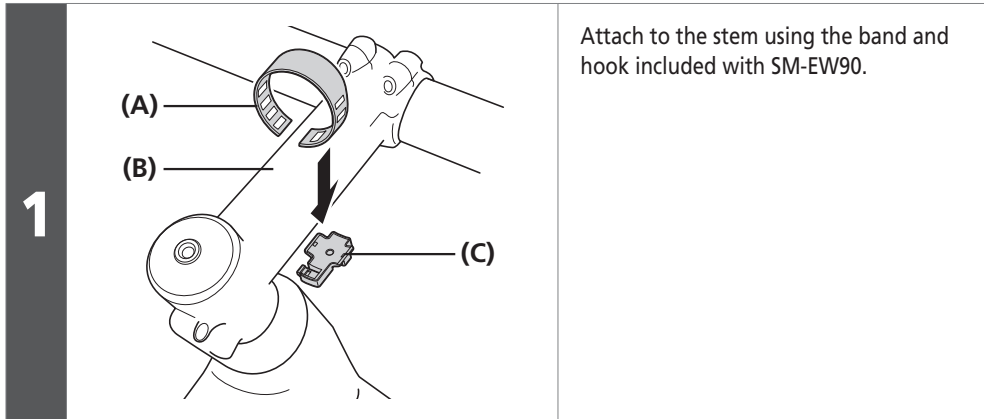
Recommended installation angle of the information display: The angle of the display is between 15° to 35° to the horizontal



INSTALLATION

▶▶ Installation of junction A

■ Installation of junction A



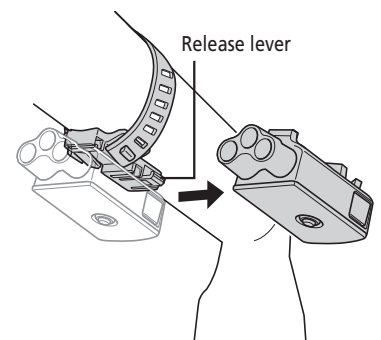
- (A) Band
- (B) Stem
- (C) Hook

NOTICE

Synchronized shift requires SC-M9050.
Synchronized shift can only be used with MTB.



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

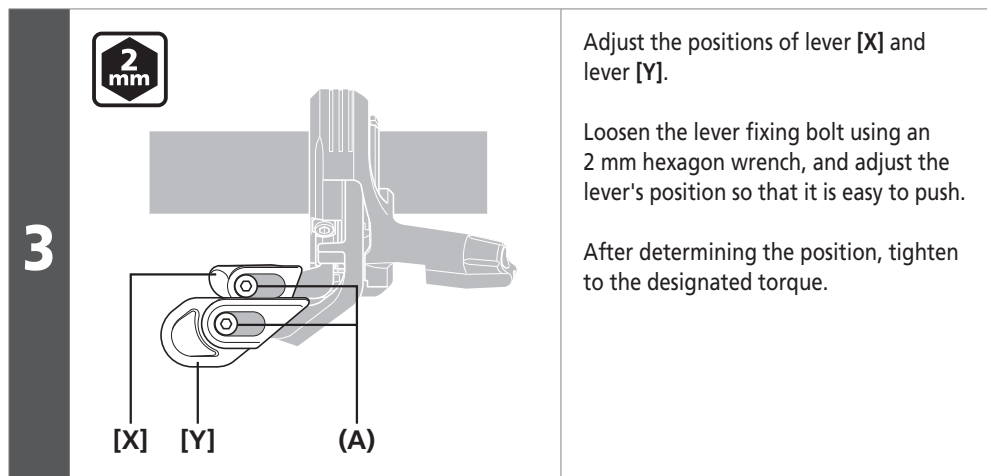
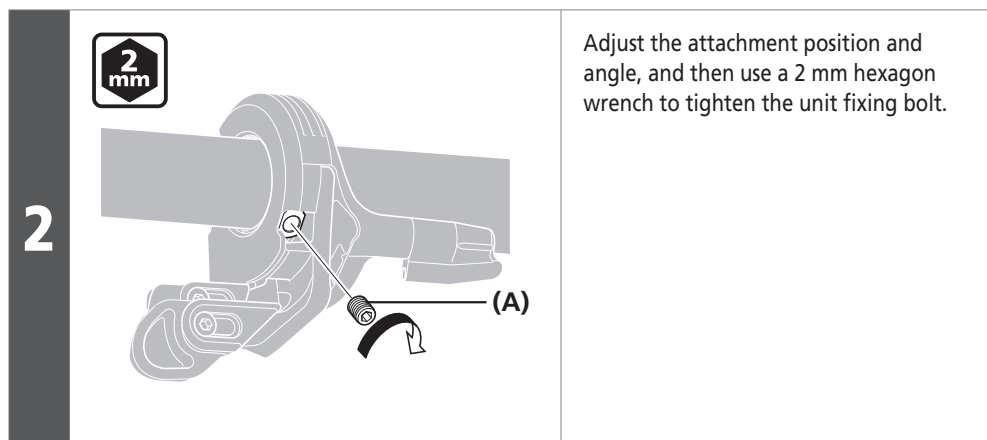
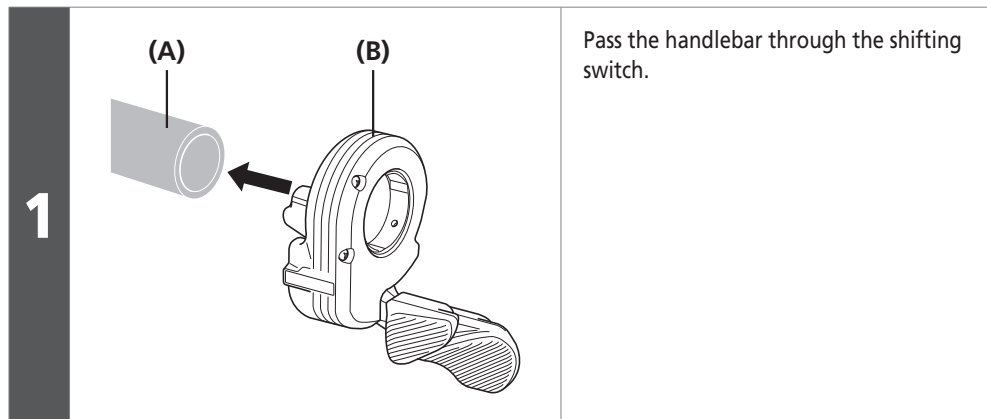


INSTALLATION

▶▶ Installation of the shifting switch

■ Installation of the shifting switch

The illustration shows the right-side lever.



- (A) Handlebar
- (B) Shifting switch



TECH TIPS

Applicable handlebars:
Ø22.2 mm - Ø22.5 mm

- (A) Unit fixing bolt

Tightening torque



0.9 N·m

NOTICE

Attach the lever in a position where it will not touch the brake lever when pushed all the way in.

- (A) Lever fixing bolt

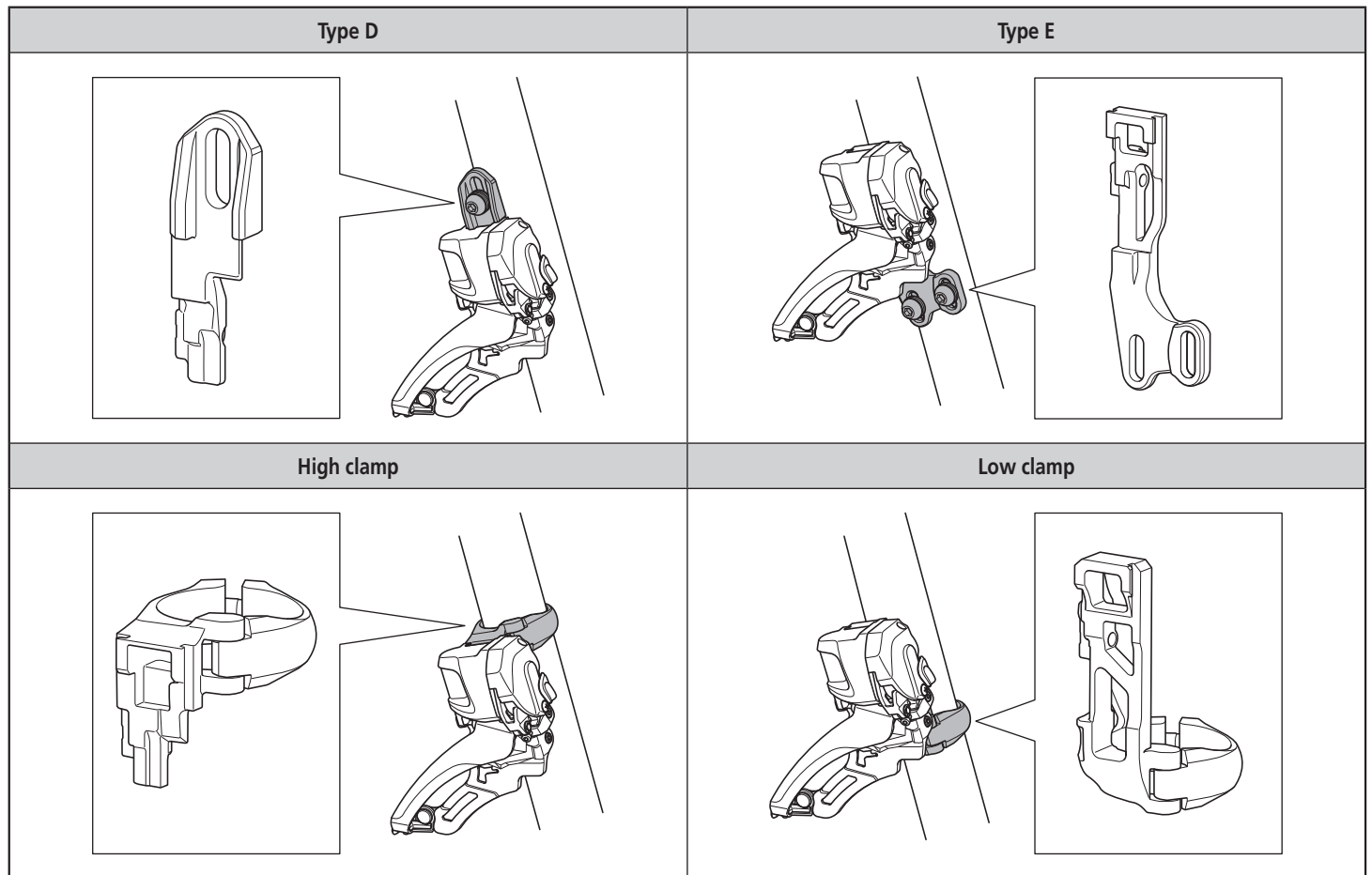
Tightening torque



0.5 - 0.7 N·m

■ Installation of the front derailleur**Types of adapters**

There are four types of front derailleur adapters. Choose one according to the shape of the frame.

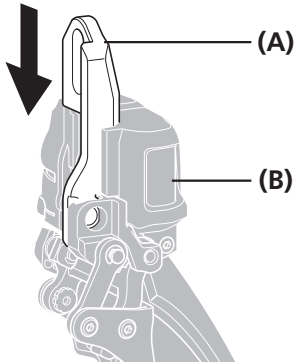


INSTALLATION

►► Installation of the front derailleur

Installing the adapter

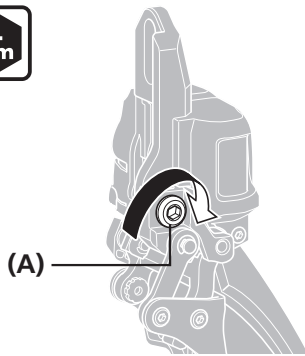
1



Slide the adapter onto the front derailleur and insert it.

(A) Adapter
(B) Front derailleur

2



Install the bracket mounting bolt at the position specified in the illustration, and tighten it with a 4 mm hexagon wrench.

(A) Bracket mounting bolt

Tightening torque



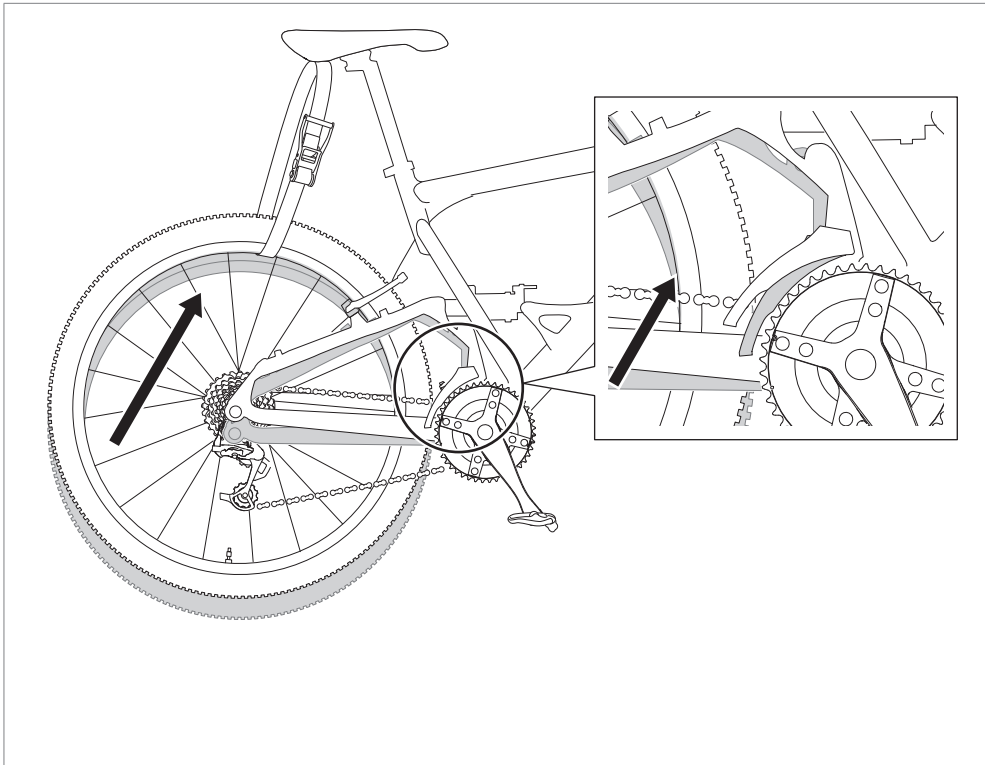
5 - 7 N·m



TECH TIPS

- Although the illustration shows a type D adapter, the installation method is the same for all adapters.
- When replacing, reverse the procedure.

Installation on rear suspension types



NOTICE

When installing components to a carbon frame/handlebar, check the tightening torque recommended by the carbon frame or component manufacturer to avoid carbon material damage due to excessive tightening or insufficient component holding force resulting from insufficient tightening torque.

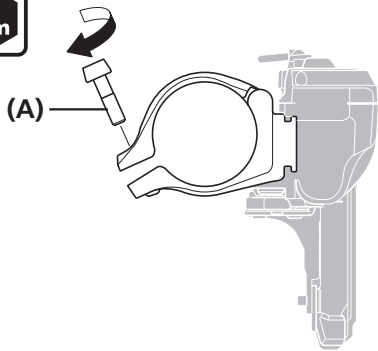
 **TECH TIPS**

Adjust so that there is a clearance of 1 – 3 mm between the chain guide outer plate and the largest chainring. (Common to all types)

- Bicycles with rear suspensions may be positioned differently when a rider is off the bicycle and on the bicycle. By referring to the illustration, perform installation and SIS adjustment while seated on the bicycle. Also, before riding the bicycle, make sure there is no interference between the front derailleur and the front chainring when the rear suspension is stroked.

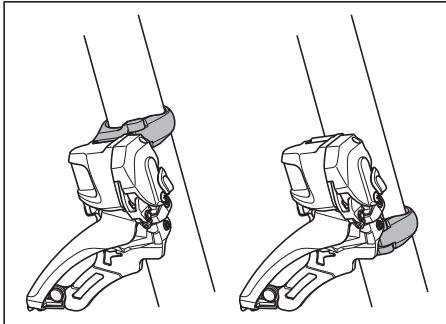
Band type

1



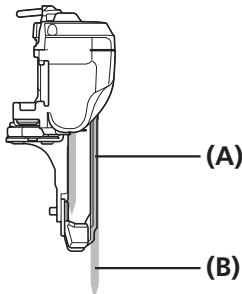
Install the front derailleur to the frame.

Temporarily fix the clamp bolt with a 4 mm hexagon wrench.



(A) Clamp bolt

2

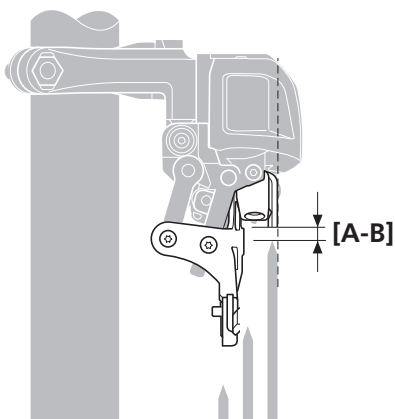


Position the front derailleur so that the flat part of the chain guide outer plate is directly above and parallel to the largest chainring.

Check that the distance from the tip of the teeth of the largest chainring is 1 to 3 mm.

After adjusting the position, tighten the clamp bolt to the designated torque.

[A-B] 1 - 3 mm



(A) Chain guide outer plate

(B) Largest chainring

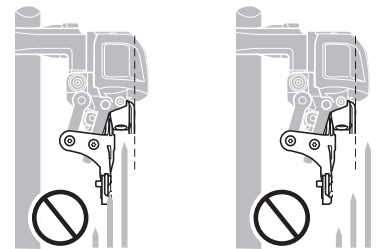
Tightening torque



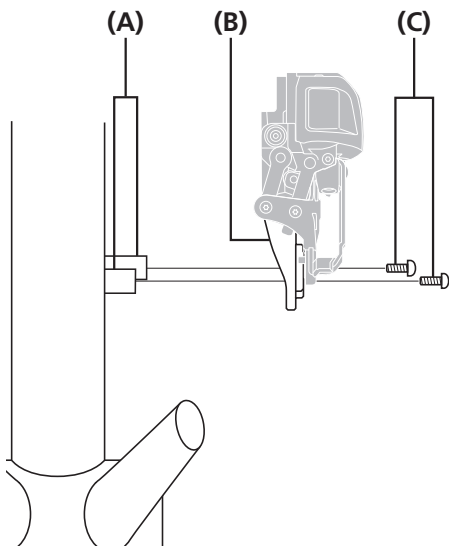
5 - 7 N·m

NOTICE

Make sure not to position the chain guide as shown in the illustration.



Type E



Install the front derailleur with bottom bracket mount fixing bolts.

Temporarily fix the bottom bracket mount fixing bolt.

Fixing position varies depending on the number of gear teeth used.

See below for the fixing position.

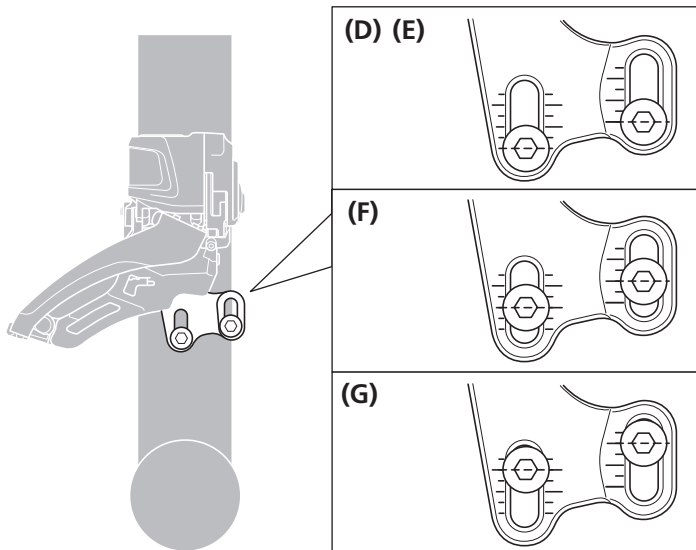
- (A)** Bottom bracket mount
- (B)** Adapter
- (C)** Bottom bracket mount fixing bolt

NOTICE

Shimano does not provide the bottom bracket mount fixing bolts.

1

Fixing position

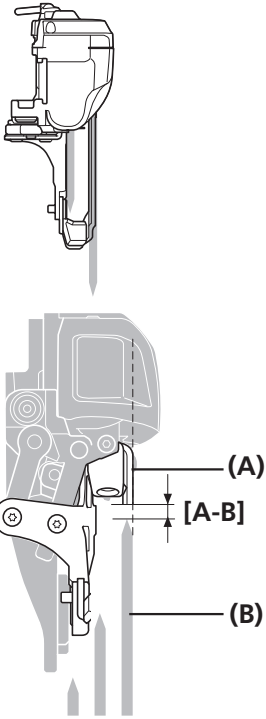


- (D)** Triple:
Largest chainring 40T
- (E)** Double:
Largest chainring 38T
- (F)** Double:
Largest chainring 36T
- (G)** Double:
Largest chainring 34T

INSTALLATION

Installation of the front derailleur

2



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

Make sure that distance from the tip of the teeth of the largest chainring is 1 to 3 mm, then mount the mounting bolt.

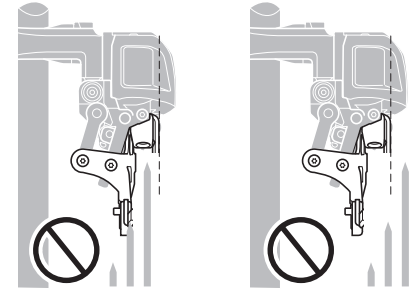
[A-B] 1 - 3 mm

(A) Chain guide outer plate

(B) Largest chainring

NOTICE

Make sure not to position the chain guide as shown in the illustration.

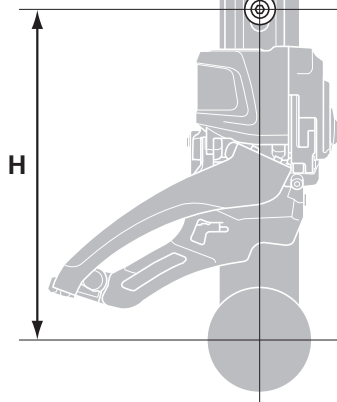


TECH TIPS

If the clearance does not fall within the range, adjust the fixing position with the elongated hole and fix the fixing bolt again.

Type D

1



Temporarily attach the front derailleur to the frame.

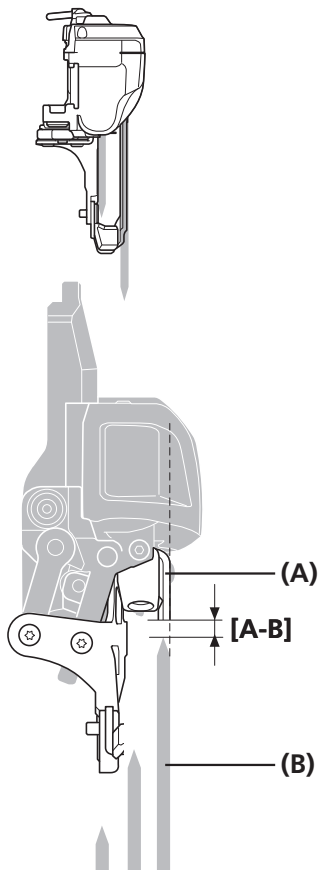
NOTICE

Compatible chainrings vary depending on mount height. Be sure to check the dimensions of the frame.

H (Height)	Largest compatible chainring
155.5 mm	34T - 38T
159.5 mm	36T - 38T

* For triple chainrings, the front derailleur can be mounted to both bases.

2



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

Check that the distance from the tip of the teeth of the largest chainring is 1 to 3 mm.

After adjusting the position, tighten the clamp bolt to the designated torque.

[A-B] 1 - 3 mm

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

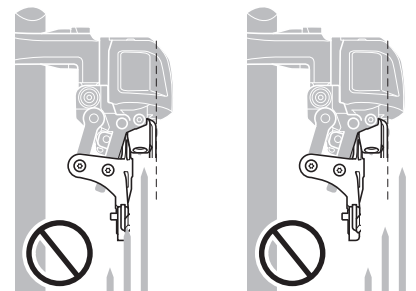
Tightening torque



5 - 7 N·m

NOTICE

Make sure not to position the chain guide as shown in the illustration.



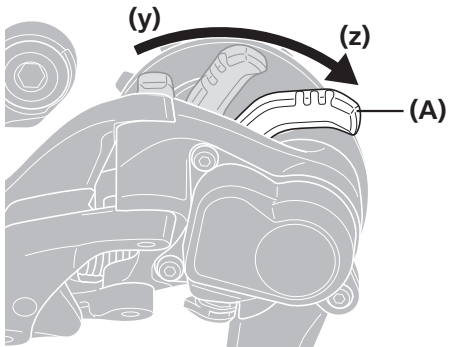
INSTALLATION

Installation of the rear derailleur

Installation of the rear derailleur

Standard type

1



Make sure that the lever switch is in the OFF position.

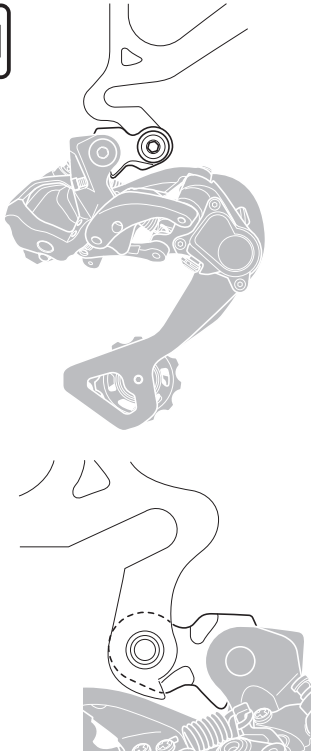
If the lever switch is in the ON position, be sure to move it to the OFF position.

(y) ON

(z) OFF

(A) Lever switch

2



Install the rear derailleur.

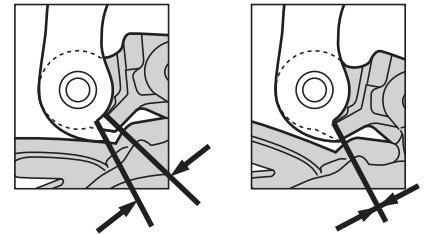
Tightening torque



8 - 10 N·m

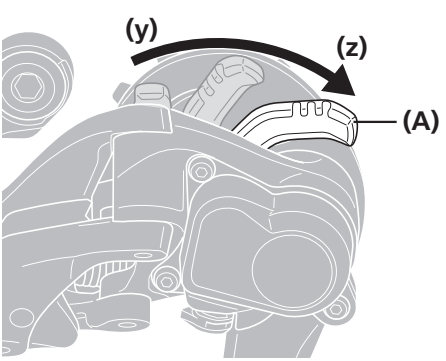
NOTICE

Periodically check that there is no gap between the B-tension stop and bracket as shown in the illustration. Any gap between them may interfere with shifting performance.



Direct mount type

1



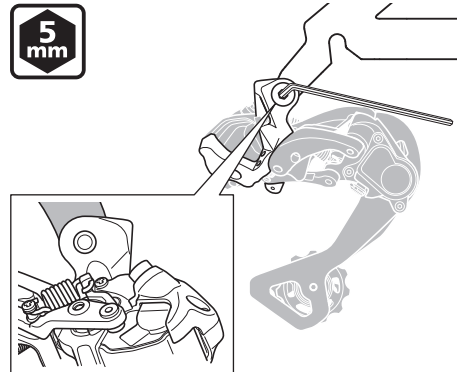
Make sure that the lever switch is in the OFF position.

If the lever switch is in the ON position, be sure to move it to the OFF position.

(y) ON
(z) OFF


(A) Lever switch

2



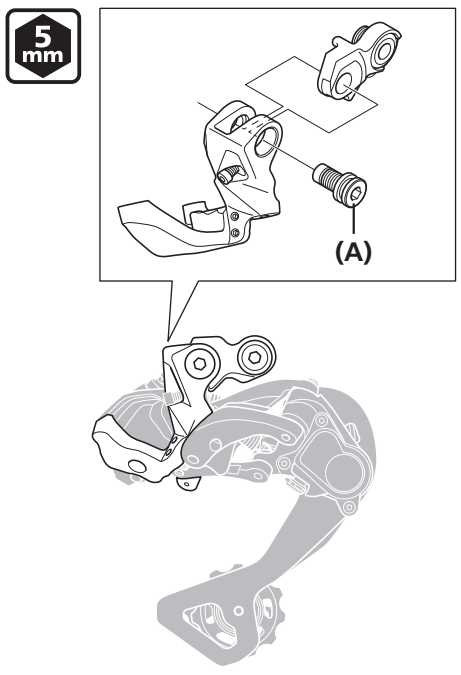
Install the direct mount rear derailleur.

Direct mount rear derailleurs can only be installed to frames supporting direct mounting.

Tightening torque	
	8 - 10 N·m

Replacing with a direct mount type

5 mm



Remove the bracket axle.

(A) Bracket axle

(A) Bracket axle

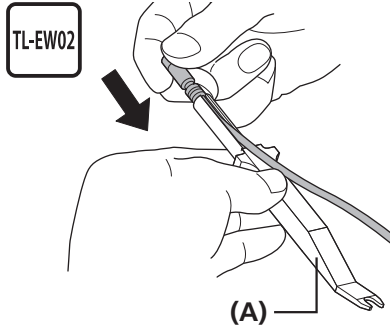
INSTALLATION

▶▶ Connection of the electric wires

■ Connection of the electric wires

Precautions for connecting electric wires

Use the Shimano original tool for installation and removal of the electric wire.

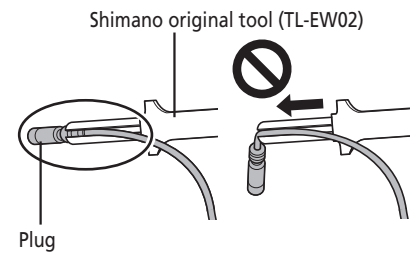


Set so that the projection on the connector is aligned with the groove on the narrow end.

(A) Shimano original tool (TL-EW02)

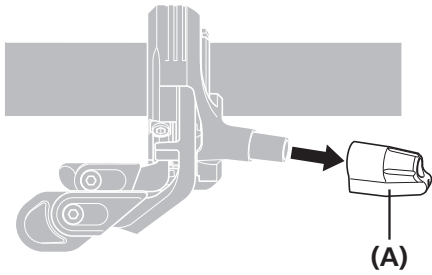
NOTICE

- Do not keep connecting and disconnecting the small waterproof connector. The waterproof section or the connecting section may become worn or deformed, and the function may be affected.
- When connecting electric wires, push them in until you feel and hear a click.
- Use the Shimano original tool for installation and removal of the electric wire.
- When installing the electric wire, do not forcibly bend the plug. It may result in a poor connection.



Connecting the shifting switch

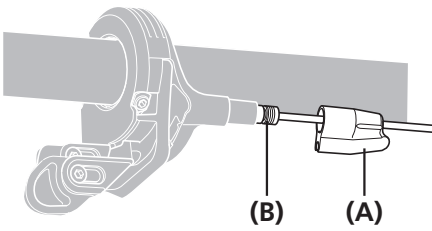
1



Remove the cable cap from the shifting switch.

(A) Cable cap

2



Pass the electric wire through the cable cap, and connect it to the shifting switch.

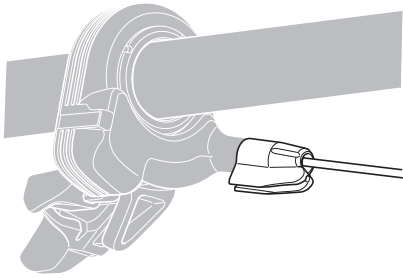
(A) Cable cap
(B) Electric wire

NOTICE

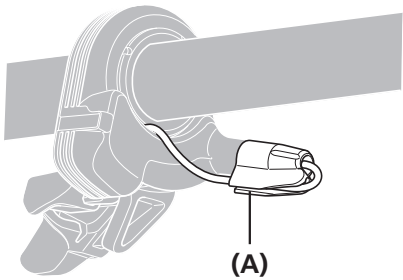
Make sure the electric wire is connected through the cable cap. If the wire is not passed through the cable cap, the electric wire connector may be damaged.

3

When routing the electric wire in the direction of the stem



When using a cable-routed handlebar



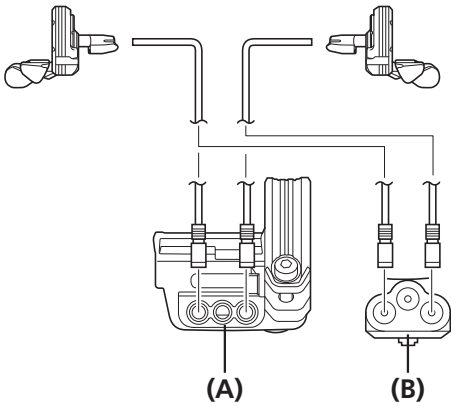
Install the cable cap.

When routing the electric wire along a cable built-in handlebar, run the wire along the guide of the cable cap then the handlebar.

(A) Guide

Installing the system information display/junction A

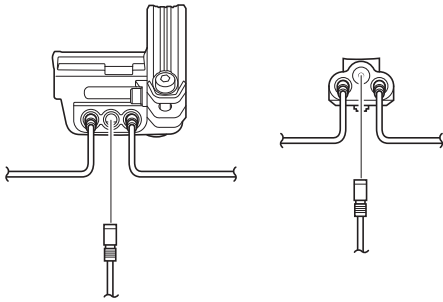
1



Connect the electric wire of the shifting switch to the system information display or to junction A.

- (A)** System information display
- (B)** Junction A

2



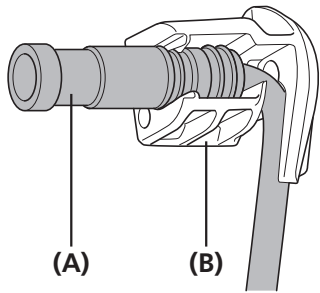
Connect the electric wire that connects to the battery.

NOTICE

The dummy plug must be attached when the front shifting switch is not used.

Connecting the front derailleur

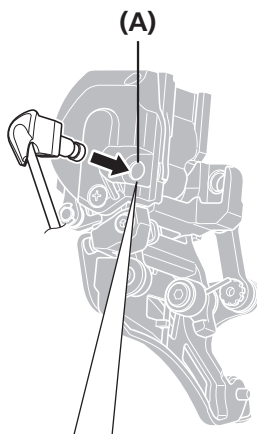
1



Install the electric wire to the plug cover as shown in the illustration.

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

2



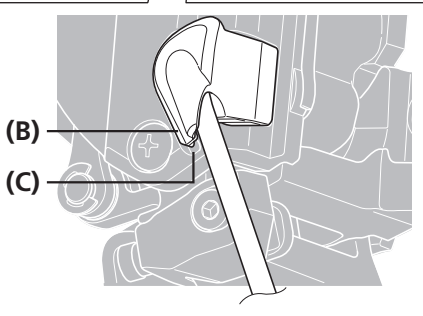
Align the plug cover arm with the front derailleur groove, and push the electric wire connector into the port section.

Be sure to push them in until you feel and hear a click.

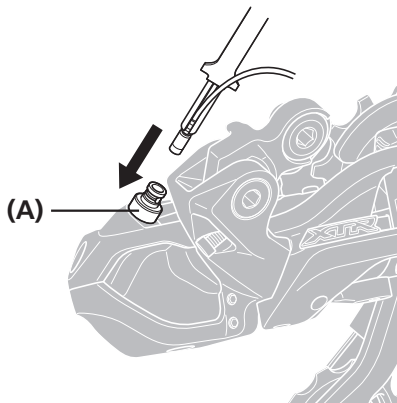
- (A) Port
- (B) Arm
- (C) Groove

NOTICE

Be sure to install the plug cover.



Connecting the rear derailleur



Connect the electric wire to the rear derailleur.

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

- (A) Plug cover

NOTICE

Be sure to install the plug cover.

INSTALLATION

▶▶ Installation of the battery

■ Installation of the battery

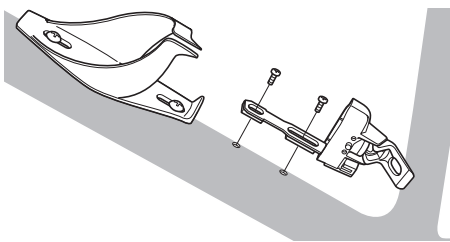
In the case of an external battery (SM-BTR1)

Installation of the battery mount

Set the battery mount into position.

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

Short type



Use the included M4 bolts to secure the short type.

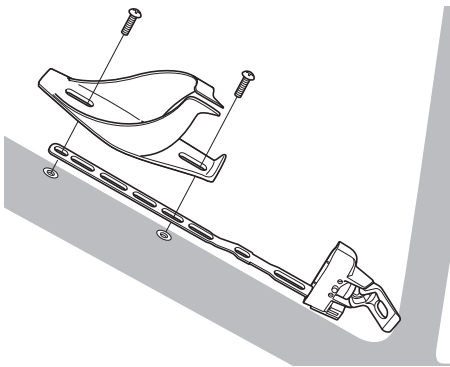
Short type Tightening torque



1.2 - 1.5 N·m

1

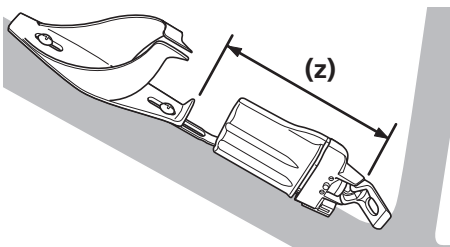
Long type



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

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

2



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

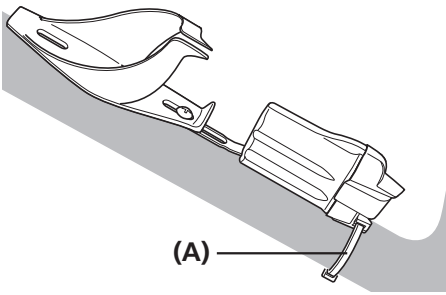
Check that the battery can be inserted and removed while the bottle cage is installed.

(z) 108 mm

INSTALLATION

▶▶ Installation of the battery

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

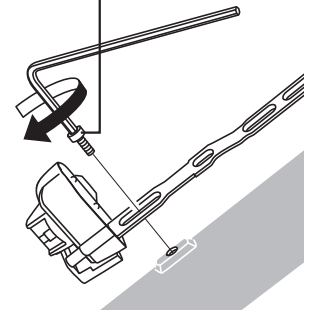


TECH TIPS

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 bolt.



Battery mount mounting bolt
(M4 x 15 mm)



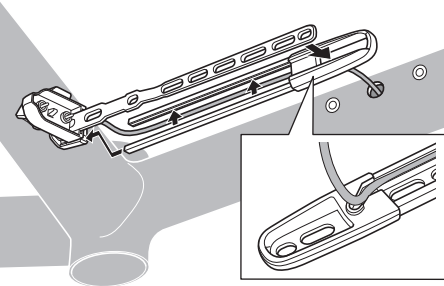
Tightening torque



1.2 - 1.5 N·m

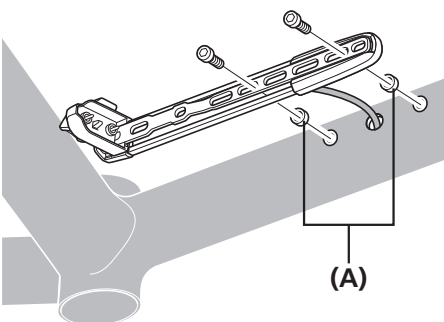
Installation of the electric wire cover

1



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

2



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

(A) Spacer



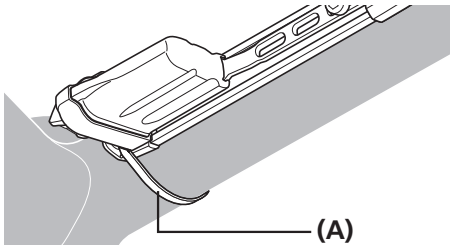
TECH TIPS

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

INSTALLATION

▶▶ Installation of the battery

3



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

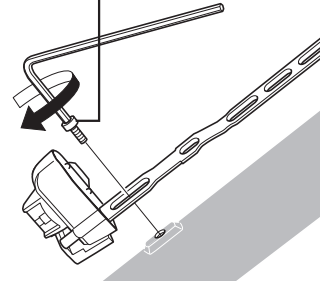
(A) Zip tie



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



Battery mount mounting bolt
(M4 x 15 mm)



Tightening torque



1.2 - 1.5 N·m

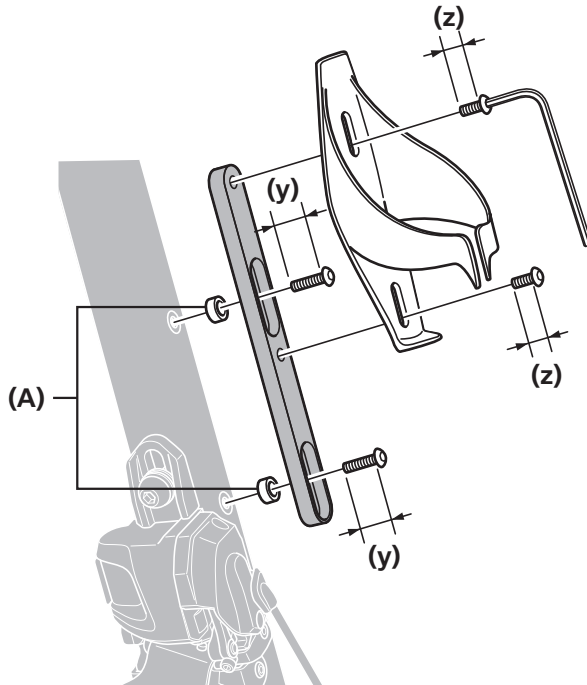
INSTALLATION

►► Installation of the battery

Installation of the bottle cage adapter

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

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



(y) 15 mm

(z) 10 mm

(A) Spacer

Tightening torque



3 N·m

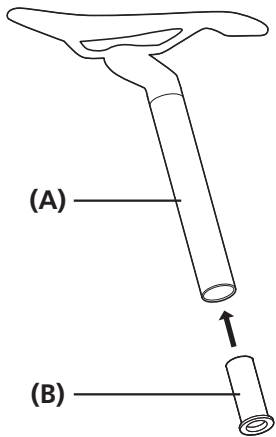


- If it interferes with the mounting boss for the front derailleur, use the included spacer.
- Refer to the Service Instructions for the bottle cage for details on the tightening torques.

In the case of a built-in battery (SM-BTR2/BT-DN110/BT-DN110-A)

Installation of the built-in battery


1



Insert the seat post collar into the seat post.

(A) Seat post
(B) Seat post collar

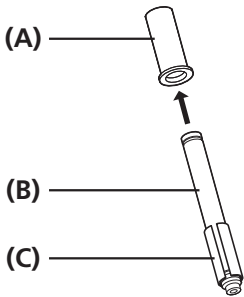
(A) Seat post
(B) Seat post collar

 **TECH TIPS**

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

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

2

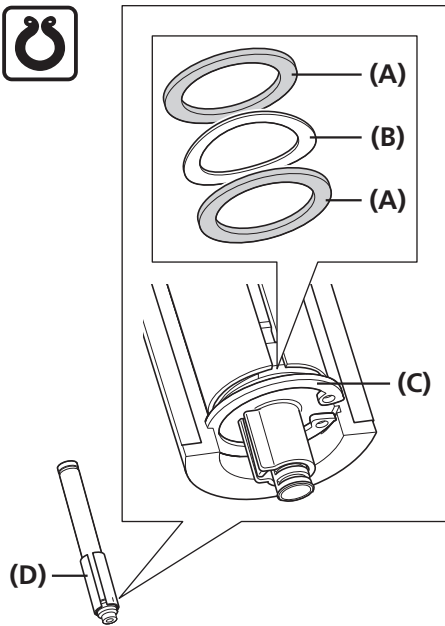


Insert the lithium ion battery (built-in type) into the seat post collar from the bottom of the seat post.

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

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


3



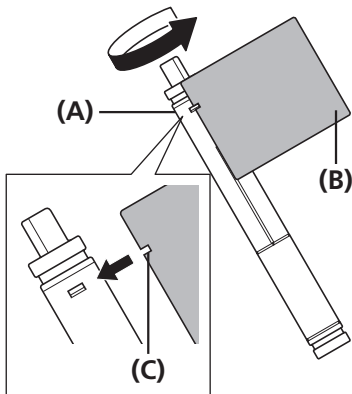
Mount a wave washer between two washers to the groove of the battery adapter, and fix them in place with a snap ring.

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

(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.

In the case of an external battery (SM-BTR2, BT-DN110/BT-DN110-A/SM-BTC1)**Preparing to install****1**

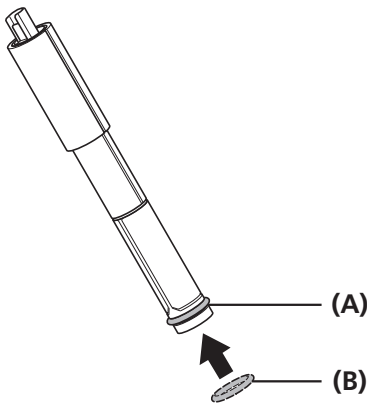
Affix the protective sheet to the battery.

Remove the back sheet from the back of the protective sheet and wrap the protective sheet around the battery for one turn with the groove in the protective sheet aligned with the groove in the battery as shown in the illustration.

- (A)** Battery
(SM-BTR2/BT-DN110/BT-DN110-A)
- (B)** Protective sheet
- (C)** Groove

NOTICE

Wipe off any dirt or oil from the battery before affixing the protective sheet.

2

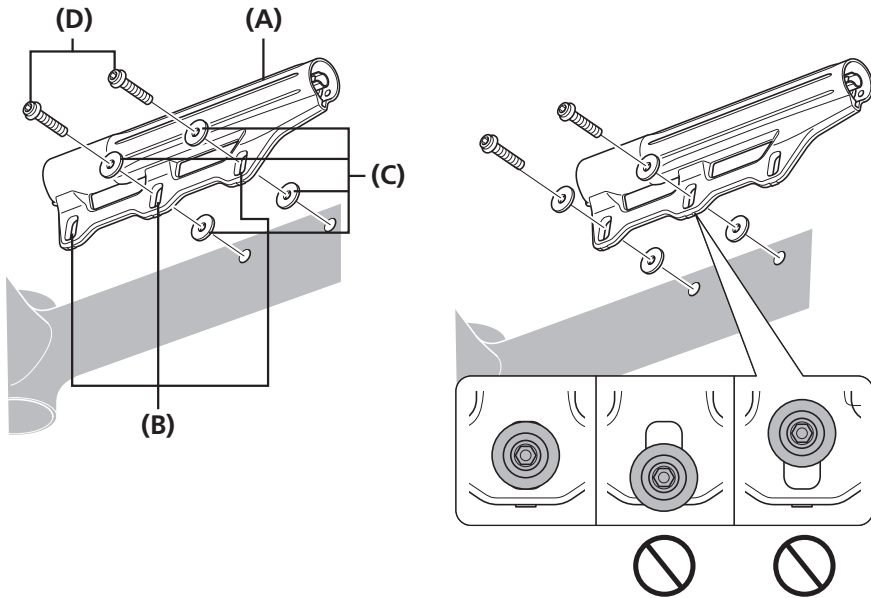
Insert the O-ring included with the battery case into the groove from below the battery.

- (A)** Groove
- (B)** O-ring

Installing the battery case and connecting the electric wires

Use the mounting bolts to mount the battery case to the frame at one of the mounting points so that bolts are in the center of the frame installation holes of the battery case as shown in the illustration.

1



- (A) Battery case
- (B) Frame installation hole
- (C) Washer
- (D) Fixing bolt (M5)

Tightening torque

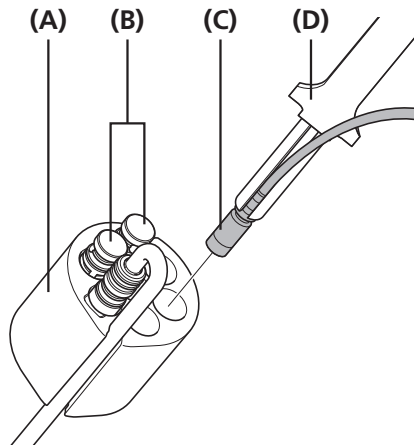


2.5 - 3 N·m

NOTICE

When installing the bottle cage, do so using whichever torque is the lowest among the battery case, the frame, or the bottle cage's respective tightening torque upper limits.

2



Connect the electric wires using the Shimano original tool.

Connect the electric wires from each component to an empty port in the junction assembly.

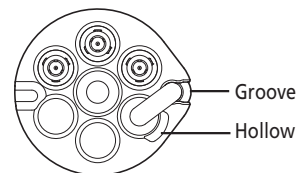
- (A) Junction assembly
- (B) Dummy plug
- (C) Electric wire
- (D) Shimano original tool (TL-EW02)

NOTICE

Be sure to connect dummy plugs to any unused ports.



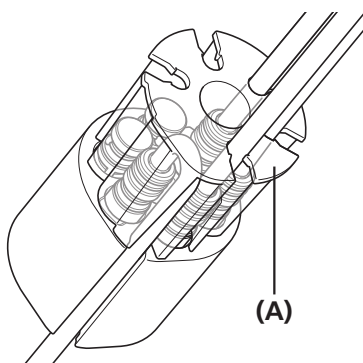
The electric wires for battery connection are connected by default. If the electric wires are disconnected, insert the connector into the port with a depression in it, and fix the electric wire to the groove on the side.



INSTALLATION

▶▶ Installation of the battery

3



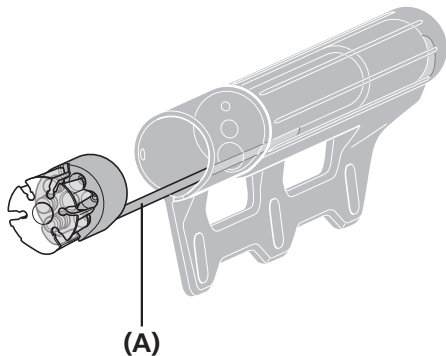
Install the junction spacer.

Install the junction spacer and junction assembly so that their directions are aligned as shown in the illustration.

After installation, pass the electric wire through the junction spacer and fix it in place.

(A) Junction spacer

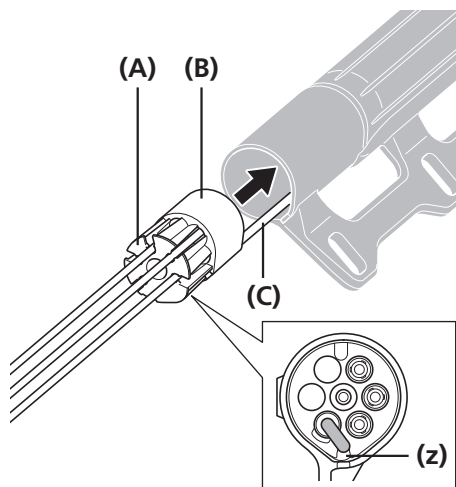
4



Pass the electric wires for battery connection through the holes on the inside of the battery case, so that the wires come out the top of the battery case.

(A) Electric wire for battery connection

5



Insert the junction assembly and junction spacer from below the battery case.

Insert the tab on the junction spacer in the direction shown in the illustration.

(z) Junction spacer tab

(A) Junction spacer
(B) Junction assembly
(C) Electric wire for battery connection

INSTALLATION

▶ Installation of the battery


6

Pass the electric wires connected to the junction assembly through the hole in cap A.

Mount cap A to the battery case as shown in the illustration.

Fix to the battery case using the supplied fixing bolt.

- (A) Cap A
- (B) Fixing bolt (M3)

Tightening torque	
	0.26 - 0.4 N·m

7

With the connecting terminal side facing up, insert the battery from the upper part of the battery case.

Install so that the connecting terminal opening is oriented as shown in the illustration.

- (A) Connection terminal
- (B) Connecting terminal opening

8


Connect the electric wire to the battery connecting terminal using the Shimano original tool.

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

9

Install cap B to the battery case, and fix it in place using the supplied fixing bolt.

- (A) Cap B
- (B) Fixing bolt

Tightening torque	
	0.26 - 0.4 N·m

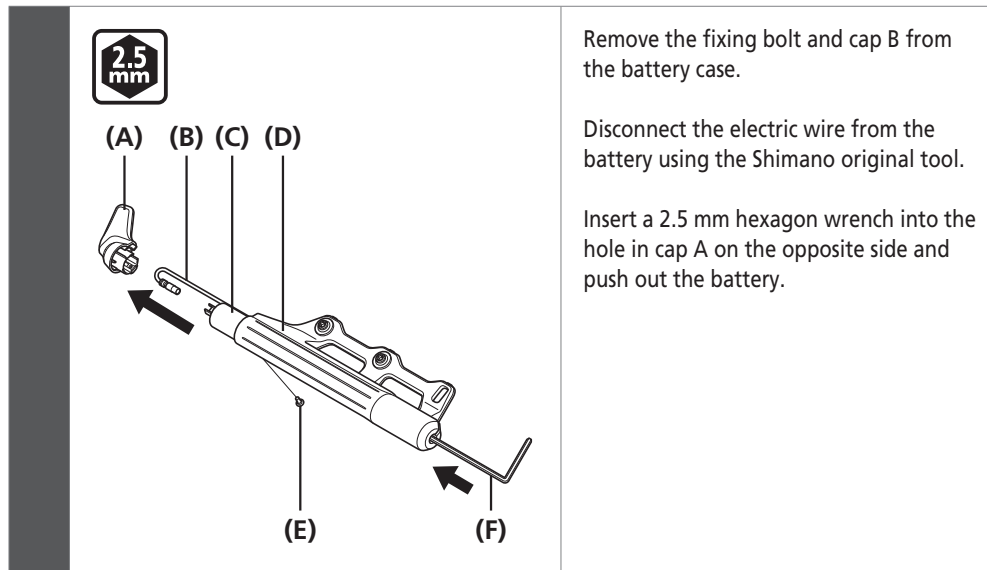
NOTICE

Make sure that the electric wire is not pinched by the cap.

INSTALLATION

▶▶ Installation of the battery

Removing the battery



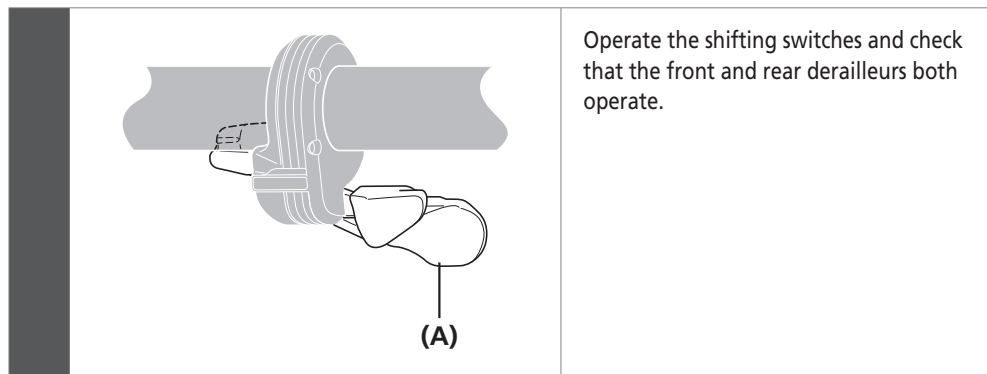
- (A) Cap B
- (B) Electric wire
- (C) Battery
- (D) Battery case
- (E) Fixing bolt
- (F) 2.5 mm hexagon wrench

Connecting the suspension

When connecting the suspension, use one that is compatible with the system. For details on how to connect it, contact the manufacturer of the suspension.

Checking connections

Connect the electric wires to all of the components, install the battery, and then check the operation.



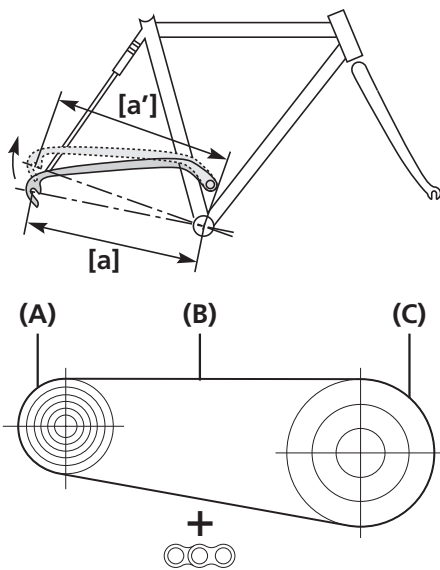
- (A) Shifting switch



If the front or rear derailleur does not operate properly, refer to the "CONNECTION AND COMMUNICATION WITH DEVICES" section.

■ Installation of the chain

Chain length



The length of [a] will vary depending on the movement of the rear suspension.

Consequently, an excessive load may be placed on the drive system if the chain length is too short.

The rear suspension operates and stops when dimension [a] is at its greatest extension.

Mount the chain on to the largest sprocket and the largest chainring.

Next, add 2 links to set the length of the chain.

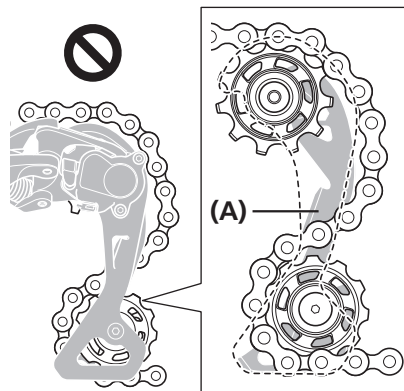
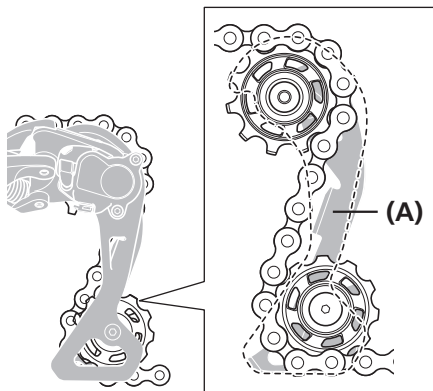
- (A)** Largest sprocket
- (B)** Chain
- (C)** Largest chainring

NOTICE

If there is a lot of movement in the rear suspension, the slack in the chain may not be taken up properly when the chain is on the smallest chainring and smallest sprocket. Add 2 links (with the chain on the largest sprocket and the largest chainring).



The same chain length checking method applies to the triple front gear, the double front gear, and the single front gear.



- (A)** Chain derailment prevention plate

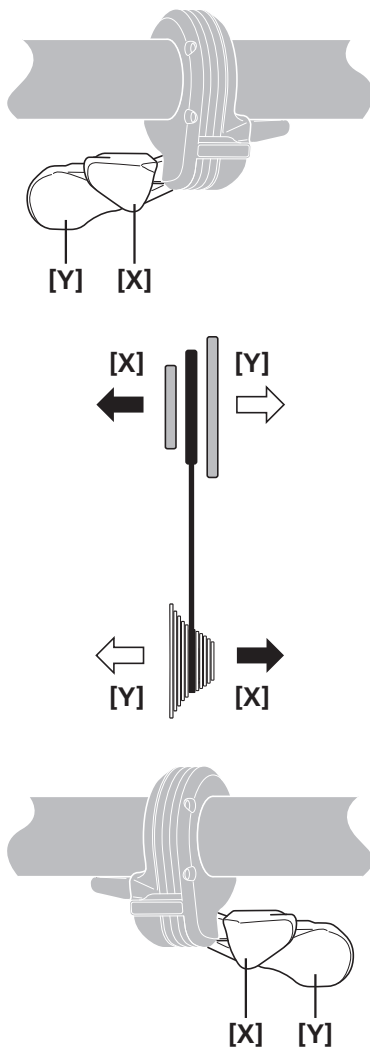
NOTICE

The rear derailleur plate assembly is equipped with a pin or plate that prevents the chain from derailing. When passing the chain through the rear derailleur, pass it through the rear derailleur body from the side of the chain derailment prevention plate as shown in the illustration. If the chain is not passed through the correct position, damage may be caused to the chain or rear derailleur.

HOW TO OPERATE

HOW TO OPERATE

■ Basic operations of the shifting switch



Factory default setting of the shifting switch:
The shifting switch is set at default to shift the gear in the directions shown in the illustration.

NOTICE

Check the firmware version of the system before use. Check the version compatibility of the firmware according to the "CONNECTION AND COMMUNICATION WITH DEVICES" section. If the firmware is old, update it to the latest version.

TECH TIPS

You can configure the settings in E-TUBE PROJECT. For details, refer to "CONNECTION AND COMMUNICATION WITH DEVICES" – "Settings customizable in E-TUBE PROJECT".

■ Gear position control

This gear-shifting system is programmed to prevent shifting into gears that would lower the chain tension. Therefore, if you try to shift into such gears, shifting may function differently from the basic operations. The illustration below shows the gear positions that would lower the chain tension and the shifting operations performed when you shift into those gears.

Points to remember when shifting the front derailleur

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

When the chain is in the ranges [1] or [2] in the illustration
 Operating the shifting switch does not shift the front derailleur.

Instead, the rear derailleur is shifted down through two gears.

When the chain is outside the ranges [1] or [2] in the illustration
 Operating the shifting switch shifts the front derailleur to the smallest chainring.

- [1]** From the smallest to the third sprocket.
- [2]** Smallest sprocket

NOTICE

- It is not recommended to use triple front chainrings with a GS rear derailleur.
- If you use combinations of front and rear derailleurs besides those recommended, the shifting-restricted range may become larger.

Points to remember when shifting the rear derailleur

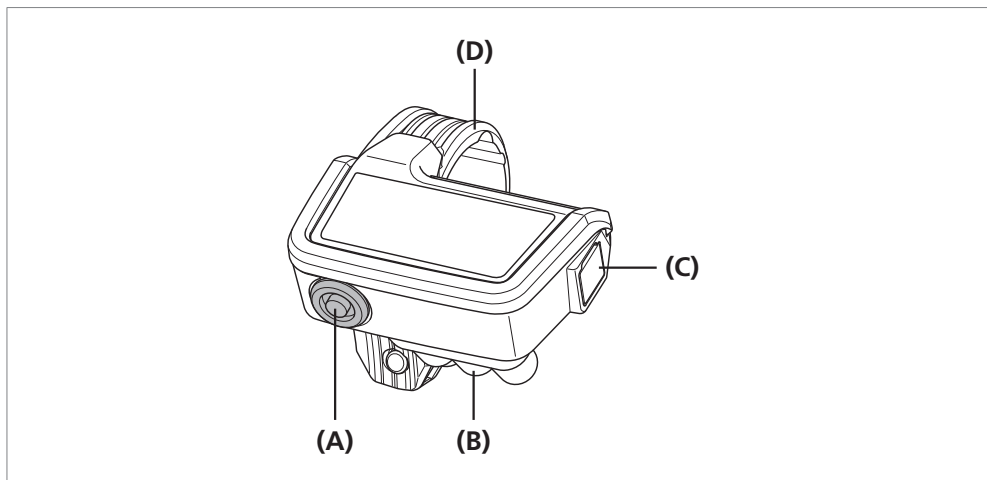
When the chain position is in the smallest front chainring, gear shifting is controlled as follows.

When shifting the rear in the direction of the smallest sprocket
 Operating the shifting switch will not shift the chain into ranges [1] or [2] in the illustration.

- [1]** From the smallest to the third sprocket.
- [2]** Smallest sprocket

■ Displaying and operating the system information display

Names of parts

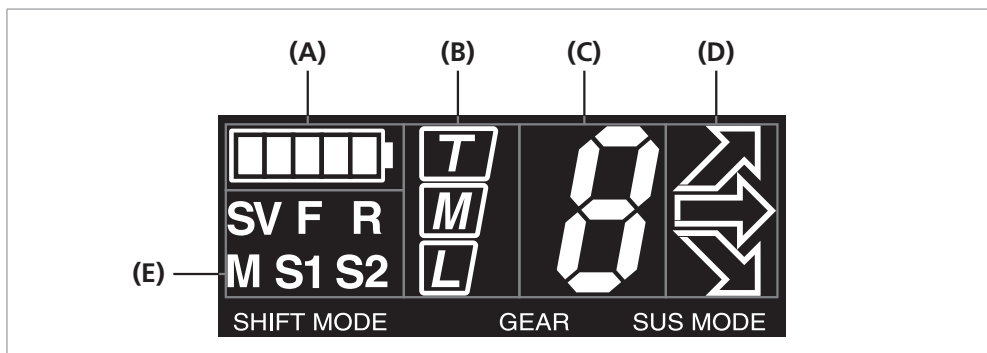


- (A) Mode switch
- (B) E-TUBE port section
- (C) Charging port
- (D) Clamp band

Basic screen display

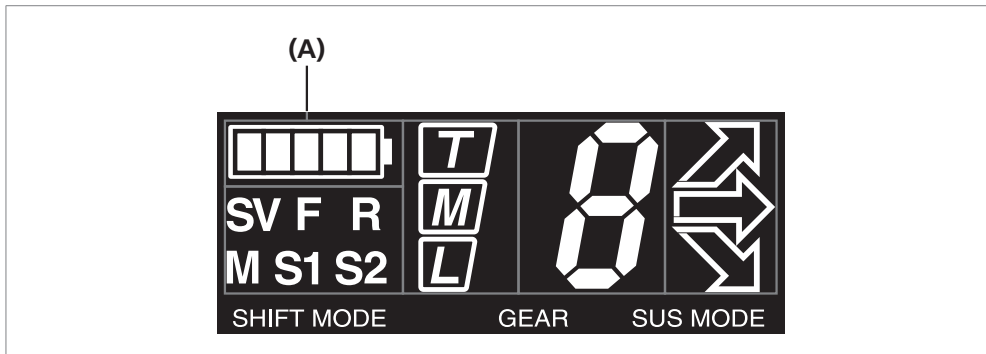


The screen displays of SC-M9050 and SC-M9051 differ slightly.



- (A) Battery level
- (B) Front derailleur
Gear position
- (C) Rear derailleur
Gear position/Adjustment level
- (D) Suspension setting
- (E) Operation mode

Battery level

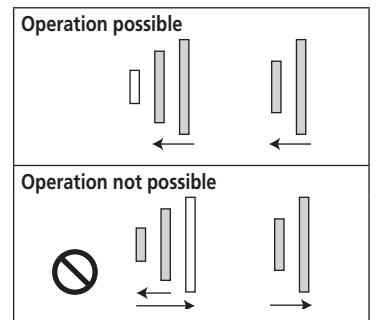


(A) Battery level

Display	Battery level
	81% – 100%
	61% – 80%
	41% – 60%
	26% – 40%
	1% – 25% *1*2*3
	0%*3

TECH TIPS

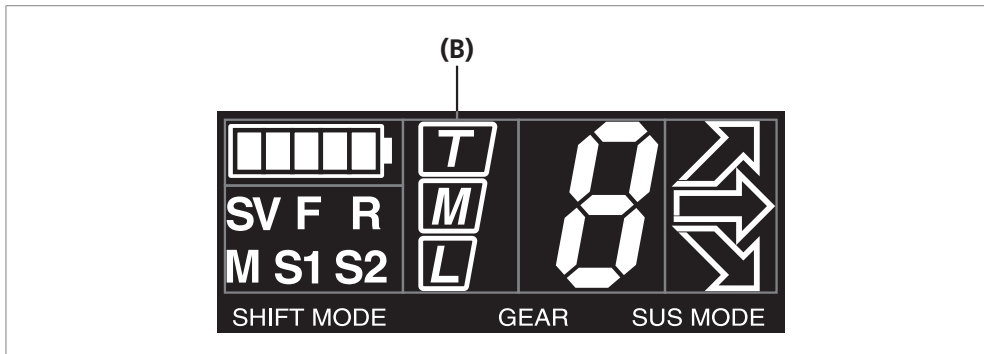
- *1 When the battery level is low, the operation of the suspension will be limited to the lock release. The operation of the rear suspension is restricted first, then that of the front suspension.
- *2 When the battery level drops below 5%, the operation of the front derailleur is restricted.



- *3 When the battery level decreases further, both the suspensions and derailleurs cease operating, with the derailleurs fixed at the last shifted position. The battery indicator blinks for 2 seconds at the time of input operation. It is recommended to charge the battery as soon as possible.

▶▶ Displaying and operating the system information display

Front derailleur: Gear position



(B) Front derailleur
Gear position

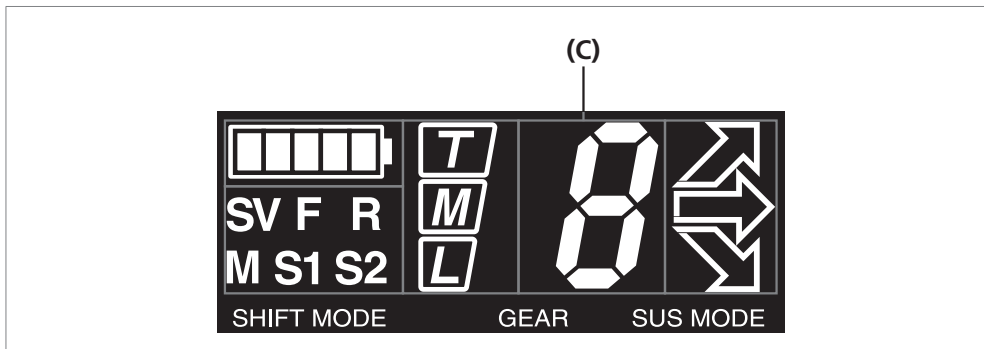
Display	Gear position
	Largest chainring
	Middle chainring
	Smallest chainring



The gear position of the front derailleur is displayed.

* In the case of double specification, only the largest chainring and smallest chainring are displayed.

Rear derailleur: Gear position/Adjustment level



(C) Rear derailleur
Gear position/Adjustment level

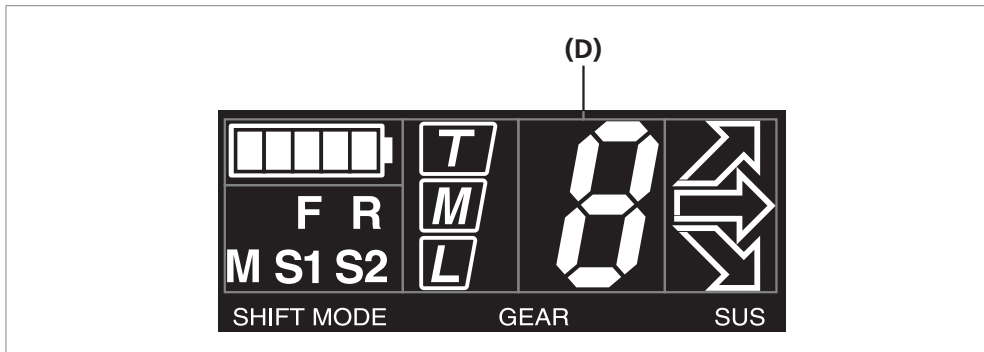
Setting mode	Details
Shift mode	The gear position of the rear derailleur is displayed.
Adjustment mode	When adjusting the front derailleur and rear derailleur, the adjustment level is displayed.



The display information varies depending on the mode setting.

▶▶ Displaying and operating the system information display

RD Protection Reset mode



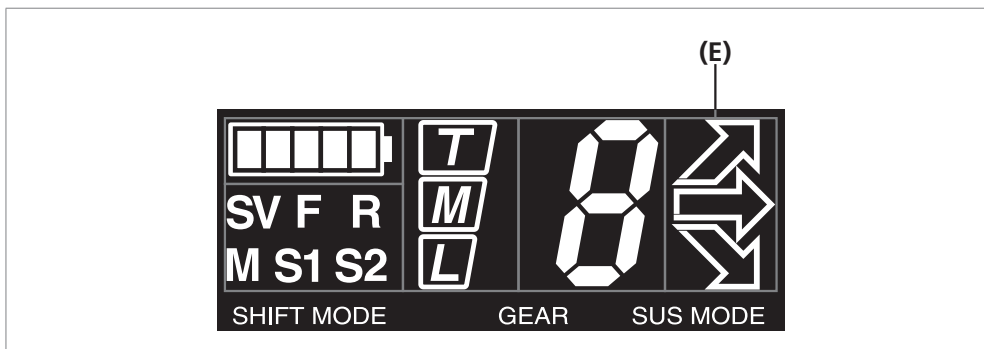
(D) RD Protection Reset mode

Display	Details
	RD Protection Reset will operate.



The display information varies depending on the mode setting.

Suspension setting



(E) Suspension setting

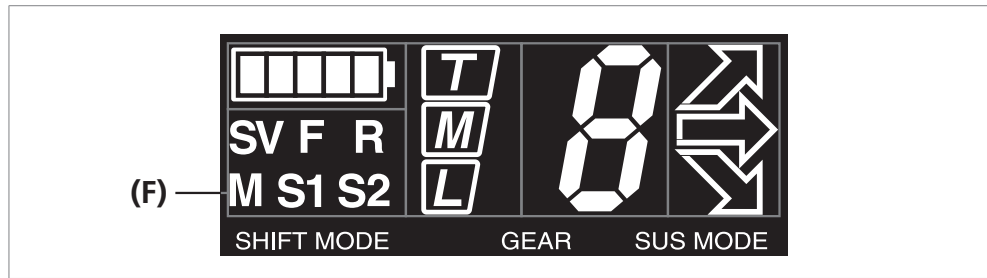
Display	Details
	If the suspension settings are already configured, one of the settings can be selected from the screen indications.* ^{1,2}
	If the suspension settings are not configured, the suspensions are not connected, or the battery level is running low, the display will be blank.



Three types of front and rear suspension combinations can be configured.

- *1 Suspension settings are configured in E-TUBE PROJECT. For details, consult a dealer or an agency.
- *2 Depending on the type of suspension, settings may be factory configured at the time of shipment. Check the indications displayed on the information display screen, and if the arrows are displayed, be sure to check the setting details.

Operation mode

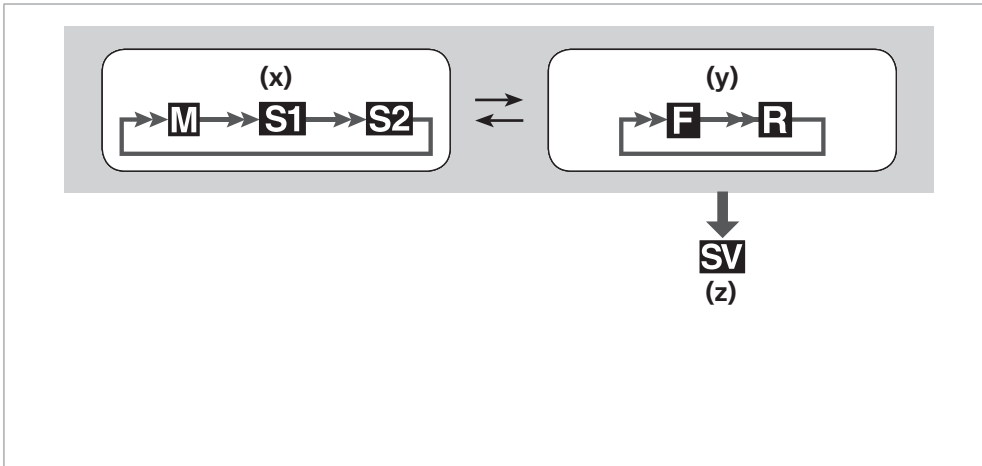


(F) Operation mode

Display	Details
SV	RD Protection Reset RD Protection Reset will operate. * Only displays on SC-M9050.
F R	Front derailleur/rear derailleur/adjustment Adjustment setting is done in this mode. For the setting procedure, contact a dealer or an agency.
M	Manual shift Gears are shifted manually in this mode.
S1	Shift mode 1 The shift mode set in E-TUBE PROJECT can be used. The initial setting for MTB is Synchronized shift 1. This setting mode is designed for riders with strong legs.
S2	Shift mode 2 The shift mode set in E-TUBE PROJECT can be used. The initial setting for MTB is Synchronized shift 2. This setting mode is designed for courses with considerable terrain variation.

How to operate

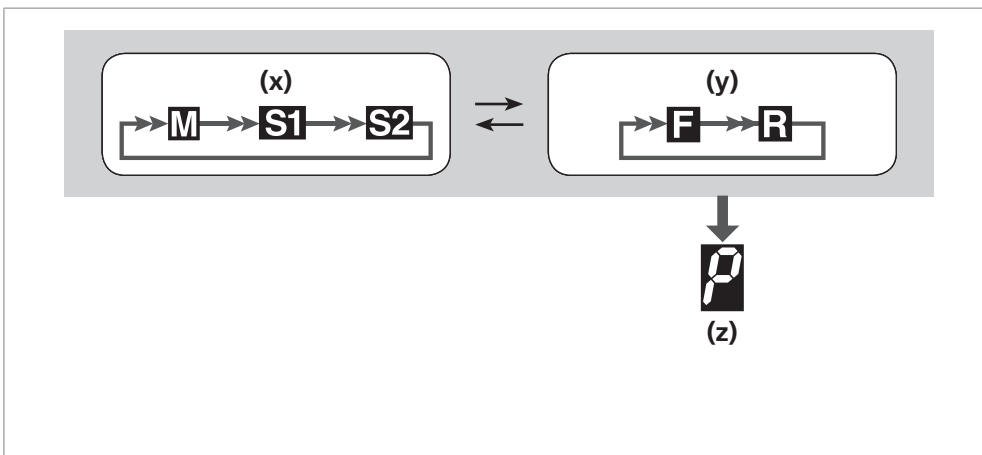
SC-M9050(SM-BMR2/SM-BTR2)



- Single click (0.5 seconds)
- ← Single click (0.5 seconds)
- ⇒ Double click
- ➔ Pressing and holding down (3 seconds or more)

- (x)** Shift mode
- (y)** Adjustment mode
- (z)** RD Protection Reset is activated.

SC-M9050/SC-M9051(BM-DN100/BT-DN110/BT-DN110-A)

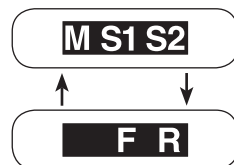
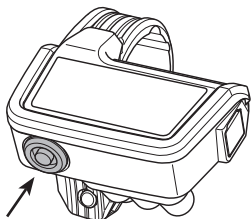


- Single click (2 seconds)
- ← Single click (0.5 seconds)
- ⇒ Double click
- ➔ Pressing and holding down (5 seconds or more)

- (x)** Shift mode
- (y)** Adjustment mode
- (z)** RD Protection Reset is activated.

Switching operating modes

You can switch between operating modes with a single click (0.5 seconds).



TECH TIPS

- If using SC-M9051, use it in combination with one of the below units.
External type: BM-DN100
Built-in type: BT-DN110/BT-DN110-A
- If using SC-M9051, single click (2 seconds) to switch between operating modes.

Switching selections in each mode

Double click to switch selections within the mode.

RD Protection Reset

Holding the mode button down for at least 5 seconds when RD Protection is in operation will reset the system connection and restore normal operation.



RD Protection is a function that cuts the transmission of power between the motor and the link in cases where the rear derailleur is pressed in by a strong impact such as from when falling from the bicycle. The rear derailleur cannot function when RD Protection is in operation. If this happens, pressing the mode button on the system information display or the button on junction A for 5 seconds or more will restore the connection between the motor and the link and the rear derailleur will start operating normally. The connection can also be restored manually. For details, contact the distributor.

■ Error message

About the beep

Beep sounds	Situation
One short beep	Indicates that the gear shifting limit has been reached. (When the chain is on the highest gear for both front and rear or lowest gear for both front and rear)
Two short beeps	Indicates that the front chainrings are being shifted in the synchronized shift mode. These beeps sound the next time the front chainrings are shifted.
One long beep	Indicates that the front derailleur cannot be shifted when the battery is running low. Blinking continues for 2 seconds after the sound has stopped. (Only one beep sounds when the gears are shifted)
	Indicates that there is an error with the suspension. All suspension mode arrows blink and continue to blink for 2 seconds after the sound has stopped.



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

■ About wireless functions (SC-M9051)

Functions

Cycle computer connection

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

(1)	Gear position (front, rear)
(2)	DI2 battery level information
(3)	Adjustment mode information
(4)	D-FLY channel switch information

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

E-TUBE PROJECT connection

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



TECH TIPS

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

How to make connections

Cycle computer connection

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

1 Put the cycle computer into connection mode.

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

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.

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/tablet.

1

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

2**Setting up via information display**

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

**Setting up via junction A**

Press the button on junction (A) until the green LED and red LED begin to blink alternately.

3

The unit on the bicycle will begin signal transmission. The unit name displays in E-TUBE PROJECT.

(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.)

4

Select the unit name displayed on screen.

**TECH TIPS**

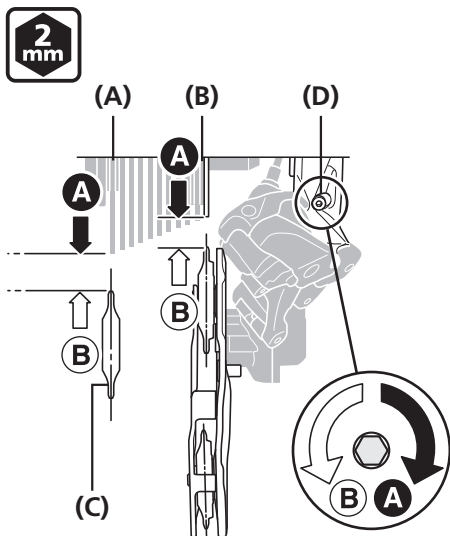
To disconnect, cancel the Bluetooth LE connection from the smartphone/tablet. (The cycle computer will exit connection mode and return to regular operation mode.)

ADJUSTMENT

ADJUSTMENT

■ Adjustment of the rear derailleur

1 Install the battery.



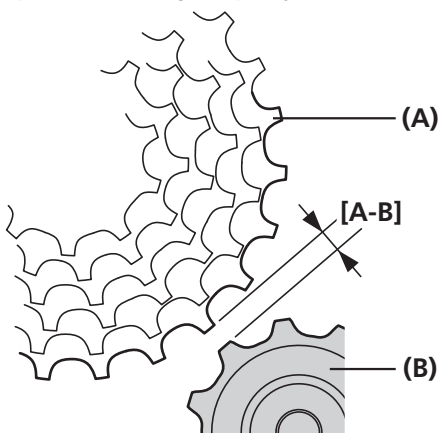
Adjust the end adjust bolt.

Mount the chain on the smallest chainring and the largest sprocket, and turn the crank arm.

Adjust the end adjust bolt so that the guide pulley does not interfere with the sprocket, but do not let the guide pulley come so close to the chain that they come into contact with each other.

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

2 Checking the distance between the largest sprocket and the guide pulley



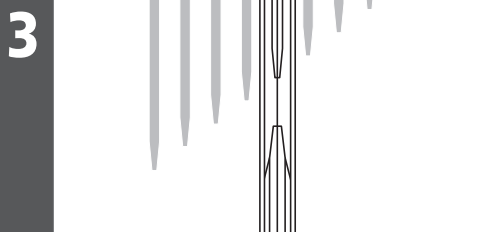
Set the rear derailleur on the largest sprocket, and with the wheel stopped, make sure that the clearance between the tip of the guide pulley and the tip of the largest sprocket is within the range of [A-B].

- [A-B]** 5 - 6 mm
(When largest sprocket is a 42T sprocket or smaller)
- 8 - 9 mm
(When largest sprocket is a 46T sprocket or smaller)

- (A) Largest sprocket
- (B) Guide pulley

NOTICE

Check the distance between the largest sprocket and the guide pulley with the rear suspension at its greatest extension.

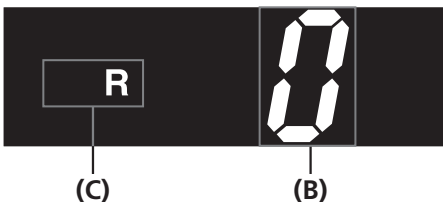
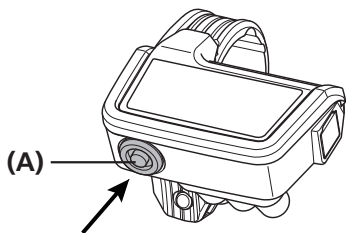


Shift the rear derailleur to the 5th sprocket position.

3

Switch to adjustment mode.

In the case of system information display



Single click the button to switch to adjustment mode.

The adjustment mode indicator "R" flashes.

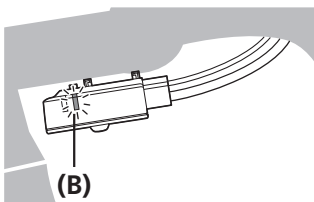
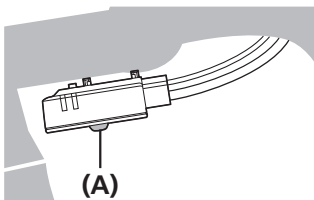
- (A) Button
- (B) Adjustment level
- (C) Adjustment mode

NOTICE

Single click duration varies by product. Refer to the table below.

SC-M9050		SC-M9051
SM-BMR2/ SM-BTR2	BM-DN100/ BT-DN110/ BT-DN110-A	2 seconds
0.5 seconds	2 seconds	

In the case of Junction A



Press the junction A button until the red LED lights up.

- (A) Button
- (B) Red LED

NOTICE

When operating junction A, note that if you keep pressing the button after the red LED has illuminated, RD Protection Reset will begin.

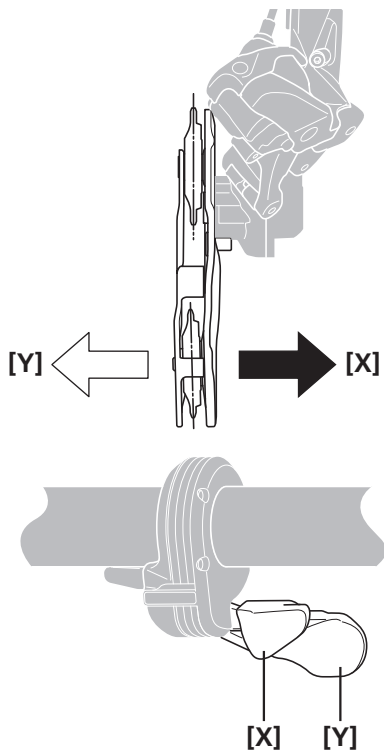


For details on RD Protection, refer to "About the RD Protection Function" in the user's manual for the rear derailleur (D12).

ADJUSTMENT

▶▶ Adjustment of the rear derailleur

5



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

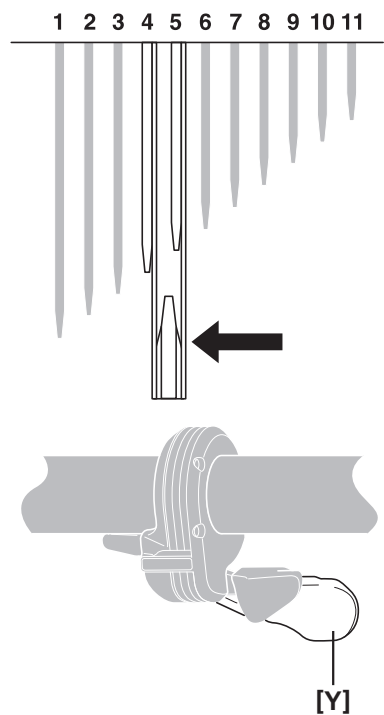
If shifting switch [X] is pressed once, the guide pulley will move one step toward the outside.



TECH TIPS

The guide pulley can move 16 steps inward and 16 steps outward from the initial position, for a total of 33 positions.

6

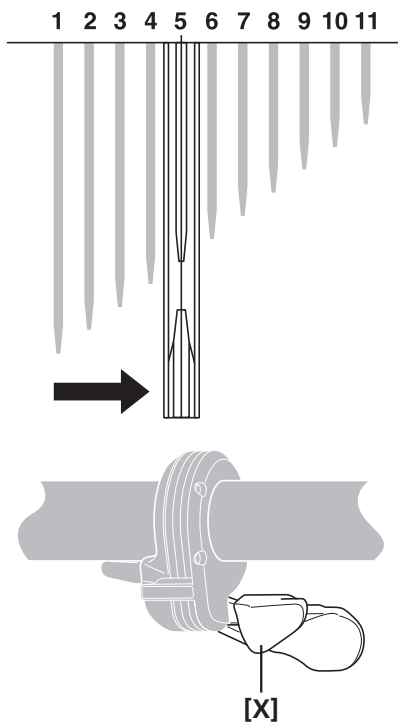


While turning the front chainwheel, operate shifting switch [Y] to move the guide pulley toward the inside until the chain touches the 4th sprocket and makes a slight noise.

ADJUSTMENT

▶▶ Adjustment of the rear derailleur

7

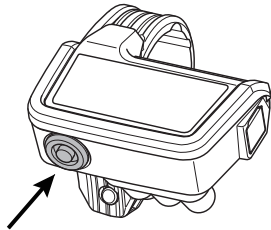


Next, operate shifting switch [X] 5 times to move the guide pulley toward the outside by 5 steps to the target position.

8

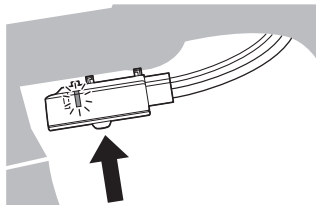
Exit adjustment mode.

In the case of system information display



Single click the button (0.5 seconds) to switch from adjustment mode to shift mode.

In the case of Junction A



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

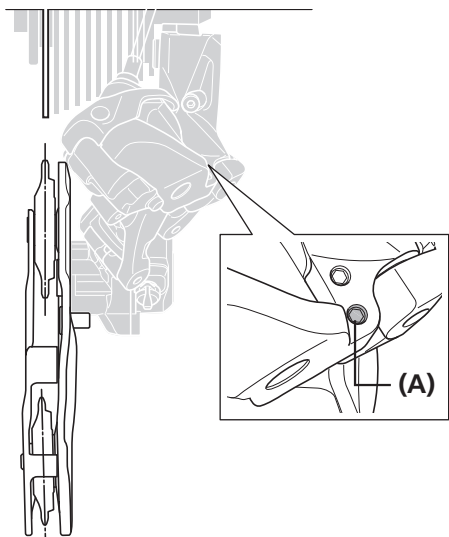
ADJUSTMENT

► Adjustment of the rear derailleur

9

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

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



Adjust the low-side stopper adjustment bolt with a 2 mm hexagon wrench.

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

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

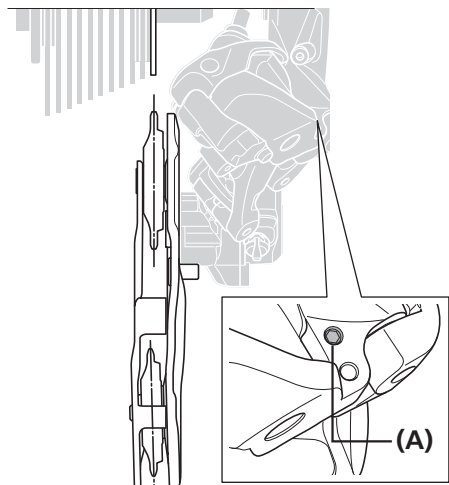
(A) Low-side stopper adjustment bolt



Possible occurrences if the adjustment bolt is overtightened

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

10



Adjust the top-side stopper bolt with a 2 mm hexagon wrench.

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

(A) Top-side stopper bolt

11

ADJUSTMENT

►► Adjustment of the front derailleur

■ Adjustment of the front derailleur

Adjust the front derailleur using the following procedure.

Top side position adjustment	Use the adjustment bolt of the front derailleur for adjustment.
Middle position adjustment (for front triple)	Switch the system information display to adjustment mode and use the shifting switch for adjustment.
Low-side position adjustment	



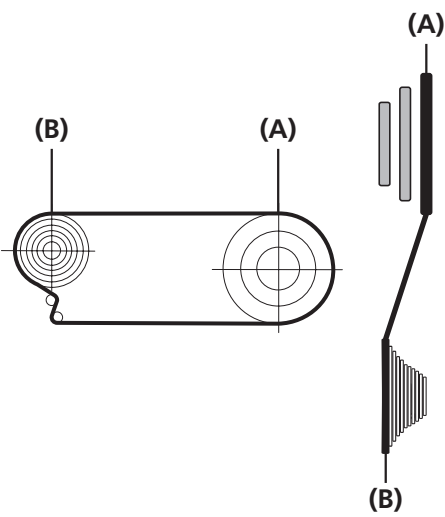
TECH TIPS

The shifting switch configuration is divided into two types: right and left shifting switches or a one-side shifting switch. The adjustment of the front derailleur differs depending on the type used. Refer to "When using two shifting switches for adjustment" or "When using one shifting switch for adjustment" depending on the number of shifting switches your bicycle has.

When using two shifting switches for adjustment

Top side position adjustment

1



Set the chain onto the largest chainring and the largest sprocket.

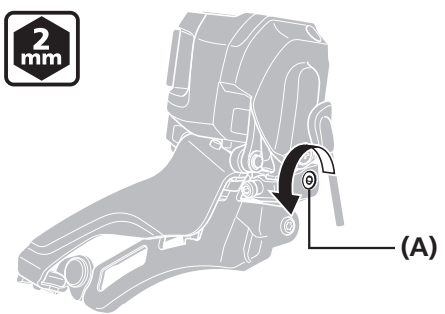
(A) Largest chainring
(B) Largest sprocket



TECH TIPS

If the rear derailleur cannot be set to the largest sprocket in synchronized mode, switch to manual mode before setting the rear derailleur to the largest sprocket.

2



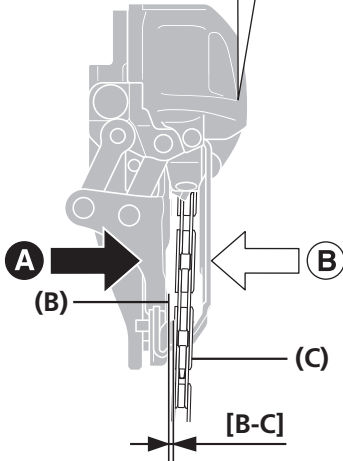
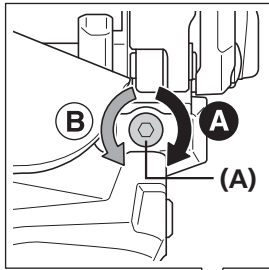
Loosen the stroke mounting bolt with a 2 mm hexagon wrench.

(A) Stroke mounting bolt

ADJUSTMENT

▶▶ Adjustment of the front derailleur

3



Turn the top adjustment bolt with a 2 mm hexagon wrench to adjust the clearance.

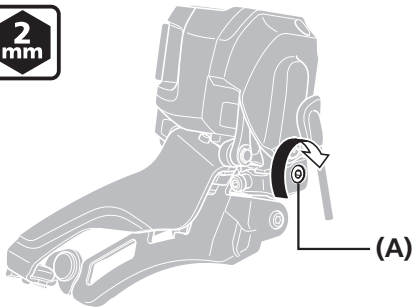
Adjust the chain guide while pushing it towards B.

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

[B-C] 0 - 0.5 mm

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

4



After adjustment, securely tighten the stroke mounting bolt while pushing the chain guide towards the frame.

- (A)** Stroke mounting bolt

Tightening torque



0.5 N·m

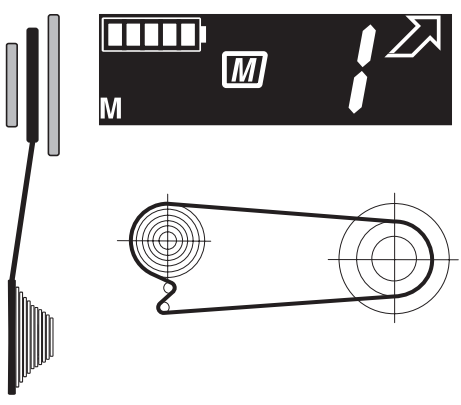
ADJUSTMENT

►► Adjustment of the front derailleur

Middle position adjustment

For front double, the adjustment of the middle chainring is not required. Adjust the low side position.

1

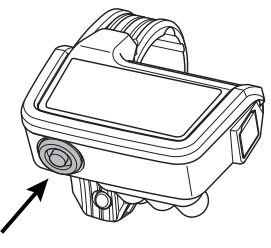



Set the chain onto the middle chainring and the largest sprocket.

2


Switch to adjustment mode.

In the case of system information display





(A)

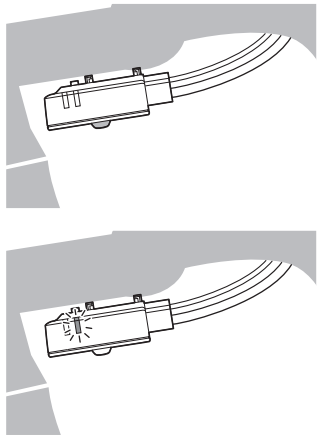


(B)

Single click the button to switch to adjustment mode. The adjustment mode indication "R" and the adjustment level indicator flash.

2

In the case of Junction A



Press the junction A button until the red LED lights up.

- (A)** Adjustment mode
- (B)** Adjustment level

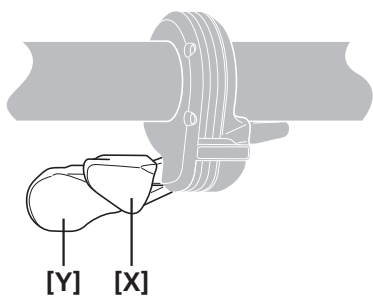
NOTICE

Single click duration varies by product. Refer to the table below.

SC-M9050		SC-M9051
SM-BMR2/ SM-BTR2	BM-DN100/ BT-DN110/ BT-DN110-A	2 seconds
0.5 seconds	2 seconds	

▶▶ Adjustment of the front derailleur

3



(A) (B) (C)

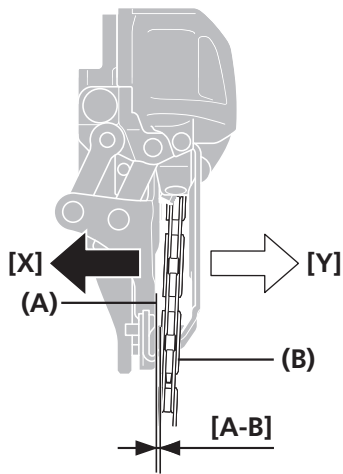
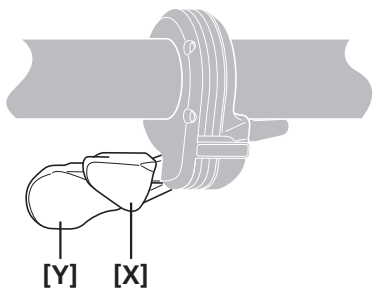
Press the lever of the front-side shifting switch to adjust the clearance.

Pressing the lever switches the on-screen mode indication to a flashing "F" for front derailleur adjustment.

The adjustment level of the front derailleur is displayed on the adjustment level indicator.

- (A) Front derailleur adjustment
- (B) Front derailleur gears
- (C) Adjustment level (Front derailleur)

4



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

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

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

[A-B] 0 - 0.5 mm

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



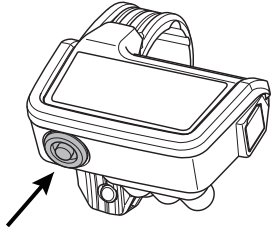
The guide pulley can move 16 steps inward and 16 steps outward from the initial position, for a total of 33 positions.

ADJUSTMENT

►► Adjustment of the front derailleur

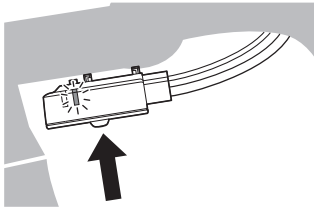
After adjustment, exit the adjustment mode.

In the case of system information display



Single click the button (0.5 seconds) to switch from adjustment mode to shift mode.

In the case of Junction A



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

5

ADJUSTMENT

▶▶ Adjustment of the front derailleur

Low-side position adjustment

1

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

Switch to adjustment mode.

In the case of system information display

(A) (B)

Single click the button to switch to adjustment mode. The adjustment mode indication "R" and the adjustment level indicator flash.

In the case of Junction A

Press the junction A button until the red LED lights up.

- (A) Adjustment mode
- (B) Adjustment level

NOTICE

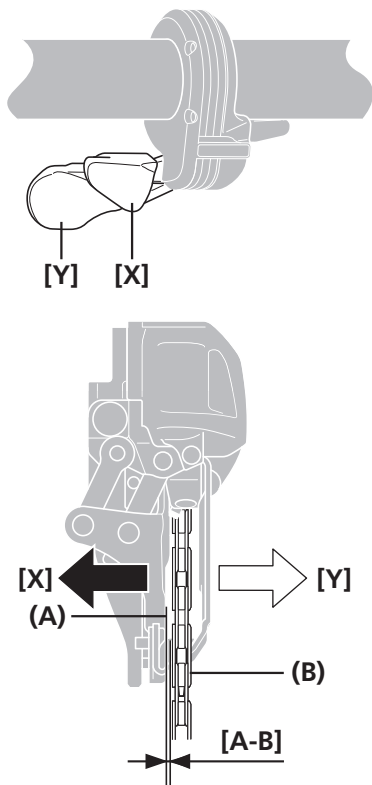
Single click duration varies by product. Refer to the table below.

SC-M9050		SC-M9051
SM-BMR2/ SM-BTR2	BM-DN100/ BT-DN110/ BT-DN110-A	2 seconds
0.5 seconds	2 seconds	

ADJUSTMENT

▶▶ Adjustment of the front derailleur

3



Press the lever of the front-side shifting switch to adjust the clearance.

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

[A-B] 0 - 0.5 mm

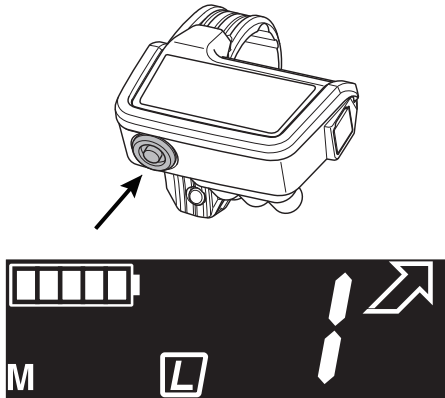
(A) Chain guide inner plate

(B) Chain

4

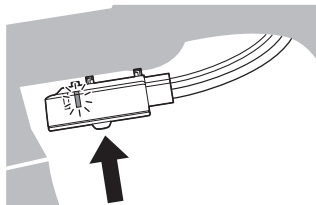
After adjustment, switch to adjustment mode.

In the case of system information display



Single click the button (0.5 seconds) to switch from adjustment mode to shift mode.

In the case of Junction A

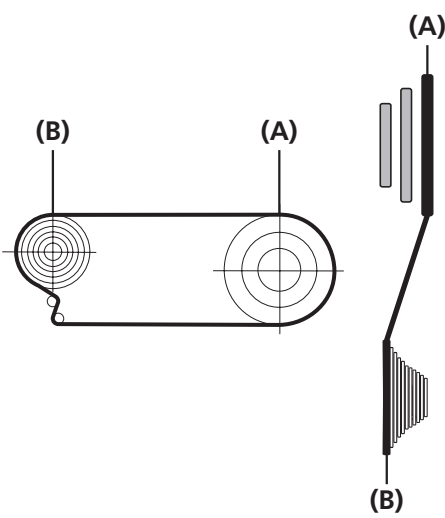


Press the button at junction A until the red LED turns off in order to switch from rear derailleur adjustment mode to gear shifting mode.

When using one shifting switch for adjustment

Top side position adjustment


1



Set the chain onto the largest chainring and the largest sprocket.

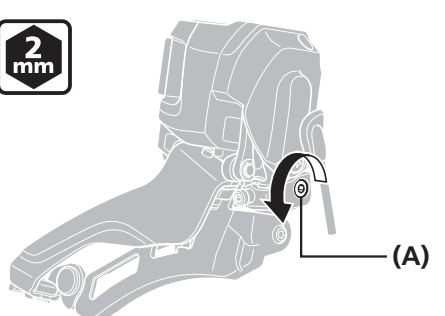
(A) Largest chainring
(B) Largest sprocket

(A) Largest chainring
(B) Largest sprocket

 **TECH TIPS**

If the rear derailleur cannot be set to the largest sprocket in synchronized mode, switch to manual mode before setting the rear derailleur to the largest sprocket.

2

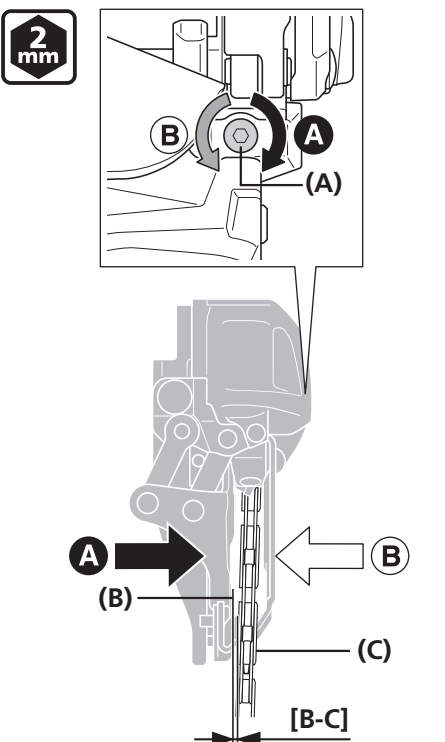


Loosen the stroke mounting bolt with a 2 mm hexagon wrench.

(A) Stroke mounting bolt

(A) Stroke mounting bolt

3



Turn the top adjustment bolt with a 2 mm hexagon wrench to adjust the clearance.

Adjust the chain guide while pushing it towards B.

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

[B-C] 0 - 0.5 mm

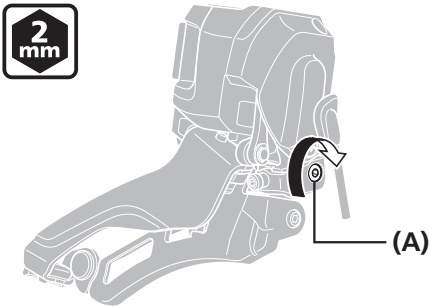
(A) Top adjustment bolt
(B) Chain guide inner plate
(C) Chain

(A) Top adjustment bolt
(B) Chain guide inner plate
(C) Chain

ADJUSTMENT

► Adjustment of the front derailleur

4



After adjustment, securely tighten the stroke mounting bolt while pushing the chain guide towards the frame.

(A) Stroke mounting bolt

Tightening torque

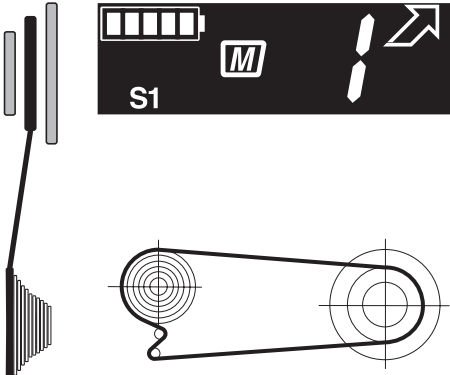


0.5 N·m

Middle position adjustment

For front double, the adjustment of the middle chainring is not required. Adjust the low side position.

1

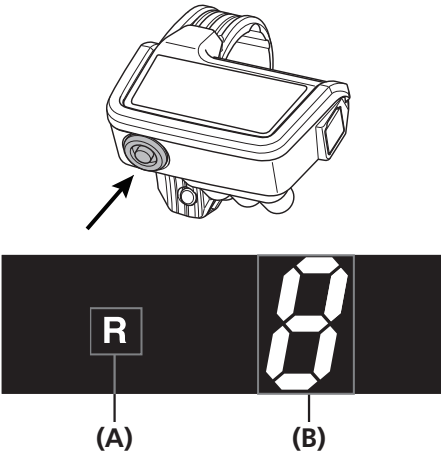


Set the chain onto the middle chainring and the largest sprocket.

NOTICE

If only one shifting switch is provided, the front derailleur cannot be adjusted using junction A.

2



Single click the button to switch to adjustment mode.

The adjustment mode indicator "R" flashes.

(A) Adjustment mode

(B) Adjustment level

NOTICE

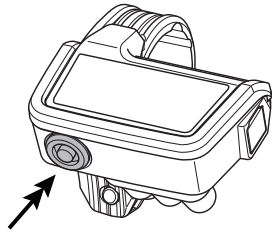
Single click duration varies by product. Refer to the table below.

SC-M9050		SC-M9051
SM-BMR2/ SM-BTR2	BM-DN100/ BT-DN110/ BT-DN110-A	2 seconds
0.5 seconds	2 seconds	

ADJUSTMENT

▶▶ Adjustment of the front derailleur

3



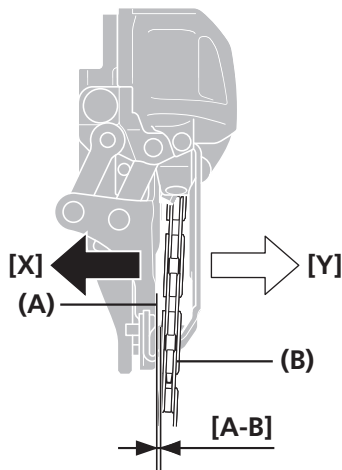
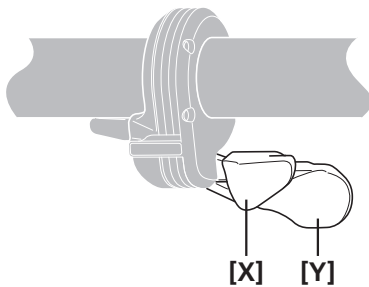
Switch the adjustment mode.

Every time the button is double-clicked, the blinking indicator switches between "F" and "R".

Select "F" for front derailleur adjustment.

(A) Front derailleur adjustment

4



Press the lever of the shift switch to adjust the clearance.

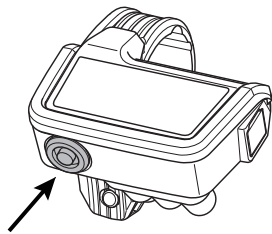
Adjust so that there is a clearance of 0 - 0.5 mm between the chain and the chain guide inner plate.

[A-B] 0 - 0.5 mm

(A) Chain guide inner plate

(B) Chain

5



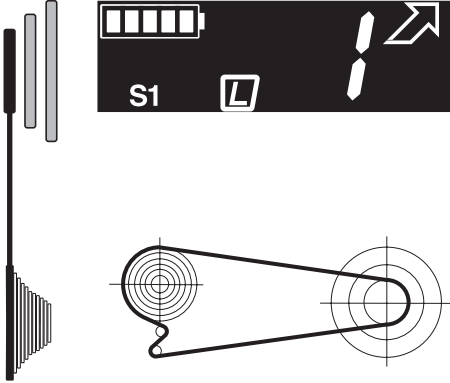
After adjustment, single click the button (0.5 seconds) to switch from adjustment mode to shift mode.

ADJUSTMENT

▶▶ Adjustment of the front derailleur

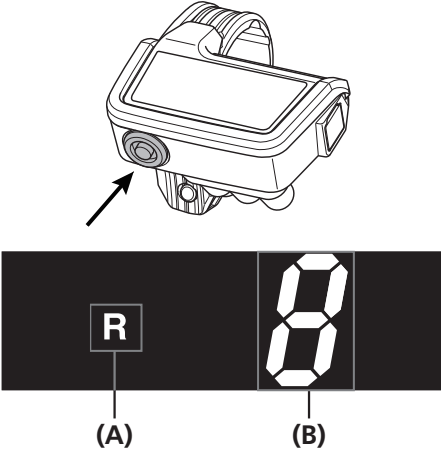
Low-side position adjustment

1



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

2



Single click the button to switch to adjustment mode.

The adjustment mode indicator "R" flashes.

(A) Adjustment mode
(B) Adjustment level

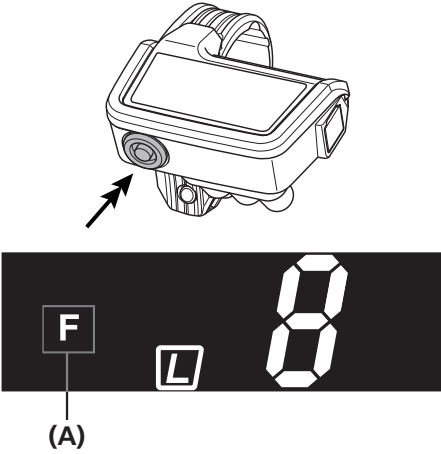
- (A) Adjustment mode
- (B) Adjustment level

NOTICE

Single click duration varies by product. Refer to the table below.

SC-M9050		SC-M9051
SM-BMR2/ SM-BTR2	BM-DN100/ BT-DN110/ BT-DN110-A	2 seconds
0.5 seconds	2 seconds	

3



Switch the adjustment mode.

Every time the button is double-clicked, the blinking indicator switches between "F" and "R".

Select "F" for front derailleur adjustment.

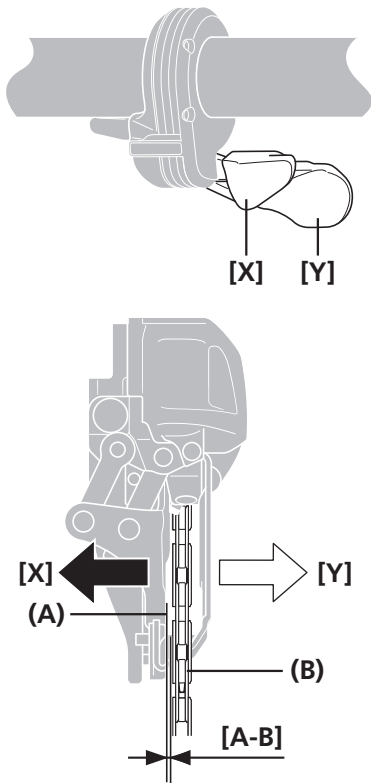
(A) Front derailleur adjustment

- (A) Front derailleur adjustment

ADJUSTMENT

▶▶ Adjustment of the front derailleur

4



Press the lever of the shift switch to adjust the clearance.

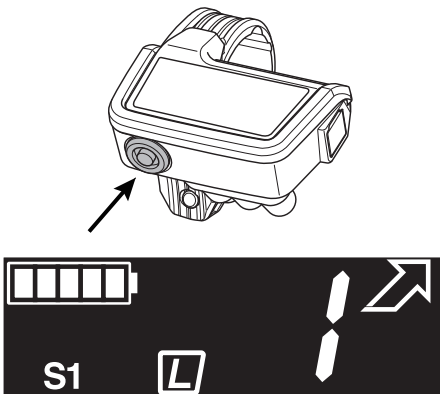
Adjust so that there is a clearance of 0 - 0.5 mm between the chain and the chain guide inner plate.

[A-B] 0 - 0.5 mm

(A) Chain guide inner plate

(B) Chain

5



After adjustment, single click the button (0.5 seconds) to switch from adjustment mode to shift mode.

Troubleshooting chart

After adjusting the front derailleur, check the shifting by operating the shifting lever.
(This also applies if shifting becomes difficult during use.)

Use the table as a reference when adjusting the bolts. Turn the screw by 1/8 of turn for each adjustment of the top side position and by 1 click for each adjustment of the middle and low side positions.

NOTICE

After adjusting the top adjustment bolt, recheck the middle and low side positions.

In the case of a front triple

If the chain falls to the crank side.	Turn the top adjustment bolt counterclockwise.
If shifting is difficult from the middle chainring to the largest chainring.	Turn the top adjustment bolt clockwise.
If shifting is difficult from the largest chainring to the middle chainring.	Perform readjustment according to "Middle position adjustment" in "Adjustment of the front derailleur". Adjust the chain guide inward (X direction).
If the chain falls to the bottom bracket side.	Perform readjustment according to "Low-side position adjustment" in "Adjustment of the front derailleur". Adjust the chain guide outward (Y direction).
If the middle chainring is skipped when shifting from the largest chainring.	Perform readjustment according to "Middle position adjustment" in "Adjustment of the front derailleur". Adjust the chain guide outward (Y direction).
If shifting is difficult from the middle chainring to the smallest chainring.	Perform readjustment according to "Low-side position adjustment" in "Adjustment of the front derailleur". Adjust the chain guide inward (X direction).

In the case of a front double

If the chain falls to the crank side.	Turn the top adjustment bolt counterclockwise.
If shifting is difficult from the smallest chainring to the largest chainring.	Turn the top adjustment bolt clockwise.
If shifting is difficult from the largest chainring to the smallest chainring.	Perform readjustment according to "Low-side position adjustment" in "Adjustment of the front derailleur". Adjust the chain guide inward (X direction).
If the chain falls to the bottom bracket side.	Perform readjustment according to "Low-side position adjustment" in "Adjustment of the front derailleur". Adjust the chain guide outward (Y direction).

ADJUSTMENT

▶▶ Adjusting rear derailleur friction

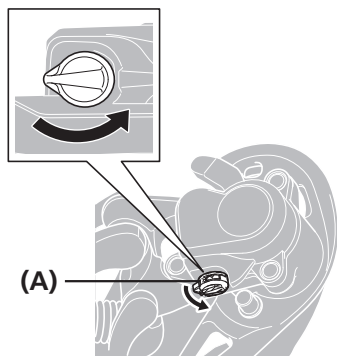
■ Adjusting rear derailleur friction

The friction capacity can be adjusted as desired. Furthermore, you can also adjust after a change of the friction occurs during use.

Friction adjustment

1 Move the lever switch to the ON position.

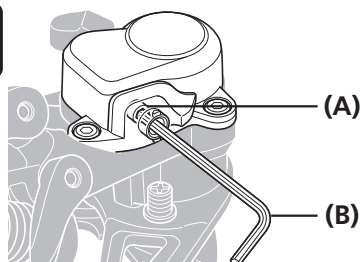
2



Remove the plate unit cap by hand as shown in the illustration.

(A) Plate unit cap

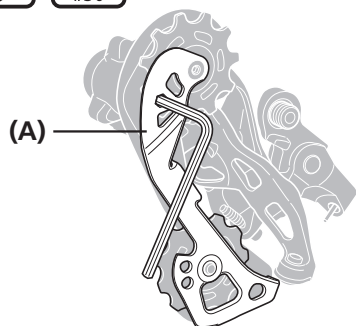
3



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

(A) Friction adjustment bolt
(B) 2 mm hexagon wrench

4



Insert an 5 mm hexagon wrench or hexalobular wrench into the left plate and check the friction torque.

(A) Left plate

Friction torque



3.5 - 5.4 N·m

NOTICE

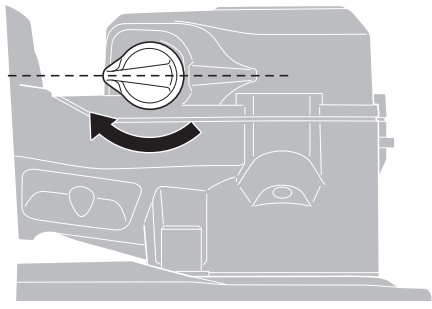
Check the shape of the hole and use a tool that fits into the hole in the left plate.

Tool specifications:
• 5 mm hexagon wrench
• Hexalobular[#30]

ADJUSTMENT

▶▶ Adjusting rear derailleur friction

5



Install the plate unit cap so that it is in the position shown in the illustration.

CHARGING THE BATTERY

CHARGING THE BATTERY

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

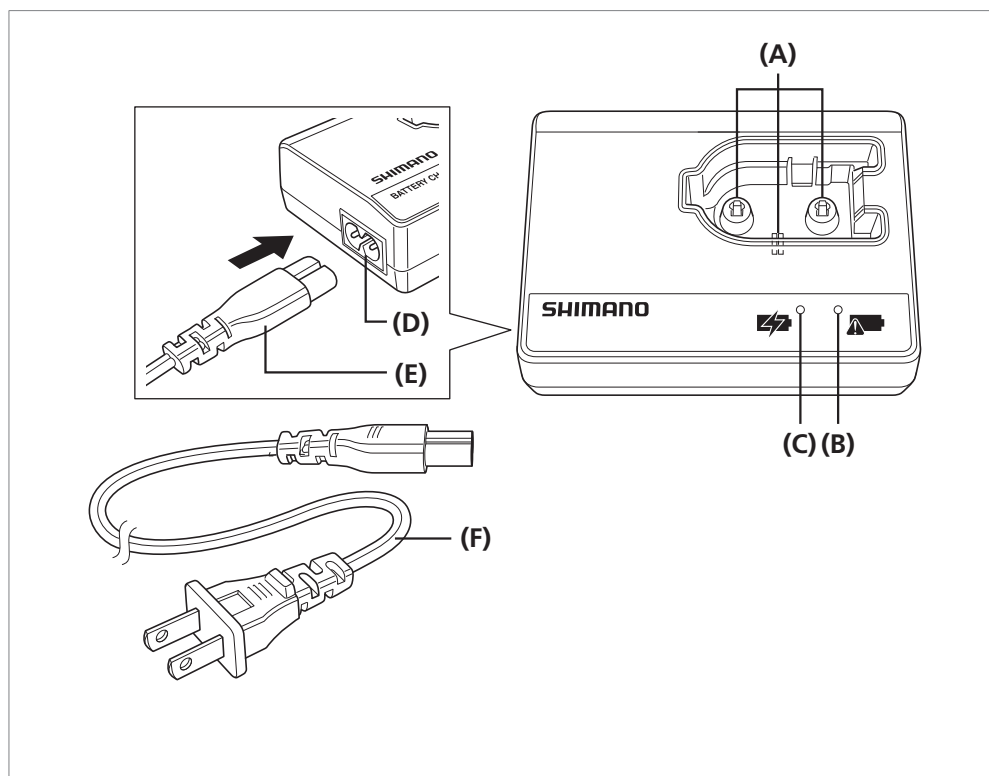
Any other combinations may cause rupture or fire.

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)

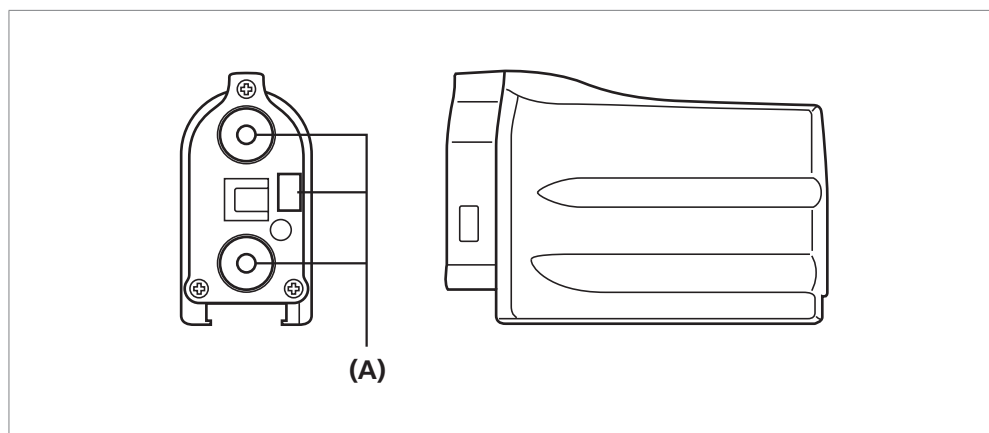


- (A)** Electrical contacts:
If these are modified or damaged, problems with operation will occur. Be very careful when handling them.
- (B)** ERROR indicator:
This flashes when there is an error.
- (C)** CHARGE indicator:
This illuminates while charging is in progress.
- (D)** Power cord connector
-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



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

Special battery (SM-BTR1)



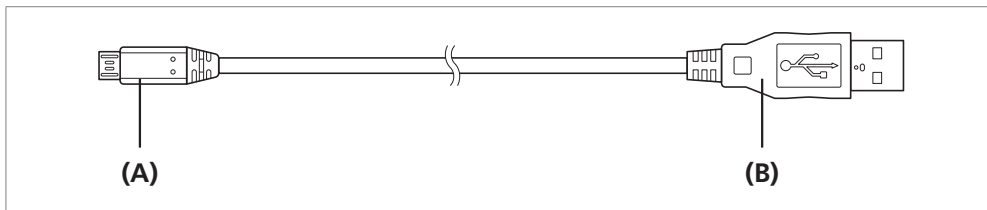
- (A)** Electrical contacts:
If these are modified or damaged, problems with operation will occur. Be very careful when handling them.



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

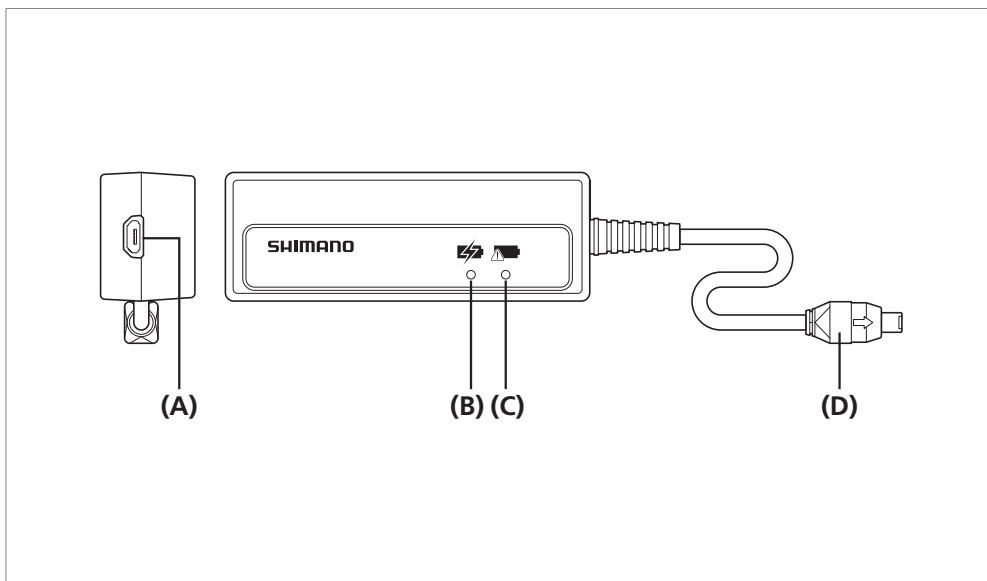
Built-in type (SM-BCR2/SM-BTR2, BT-DN110/BT-DN110-A)

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)

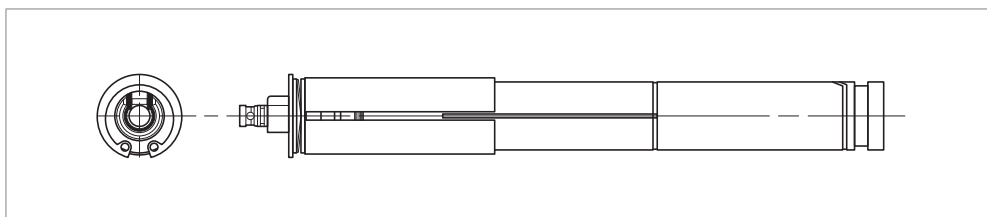


- (A)** Micro USB connector
- (B)** CHARGE indicator
- (C)** ERROR indicator
- (D)** Plug for product connection:
Connect to junction A or the charging connector of the system information display.

 **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.

Battery (SM-BTR2/BT-DN110/BT-DN110-A)



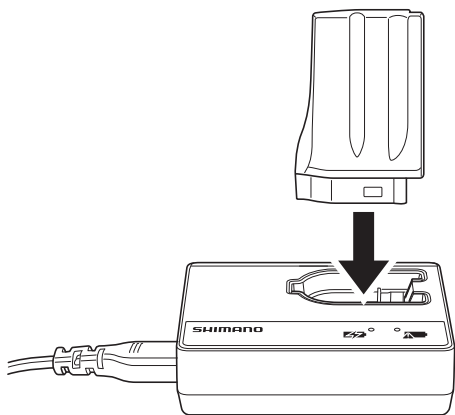
 **TECH TIPS**

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

■ Charging the battery**External type (SM-BCR1/SM-BTR1)**

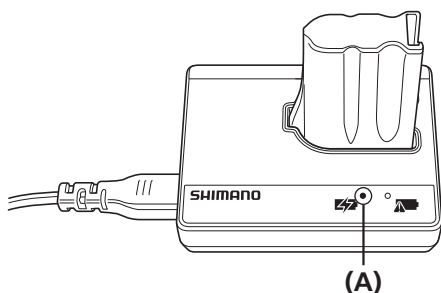
1 Insert the power plug of the battery charger into an electrical outlet.

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.



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

(A) CHARGE indicator



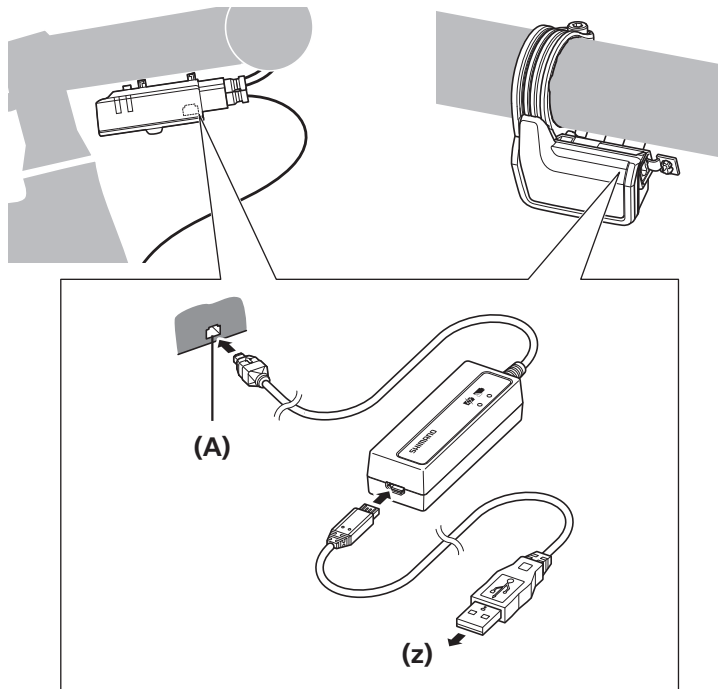
If the ERROR indicator flashes, it means that there may be a problem with the battery. Refer to "When charging is not possible" for more information.

Built-in type (SM-BCR2/SM-BTR2, BT-DN110/BT-DN110-A)**1**

Connect the battery to junction A or the system information display.

2

Connect the charging cable of the battery charger to junction A or the charging port of the system information display.

**3**

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

4

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

**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.

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

(A) Charging port

**TECH TIPS**

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

**TECH TIPS**

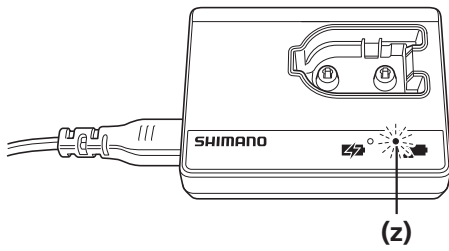
If ERROR indicator or CHARGE indicator blinks, refer to "When charging is not possible".

CHARGING THE BATTERY

▶▶ When charging is not possible

■ 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.

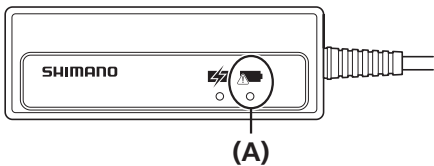
(z) If charging is not possible, the ERROR indicator on the battery charger will flash.

▶▶ 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.

If the ERROR indicator blinks

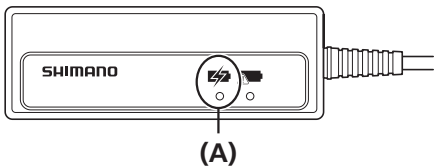


If the ERROR indicator blinks, the ambient temperature during charging may fall outside the operating temperature limits.

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 A DC.
⇒ Use an AC adapter with a USB port with a current capacity equal to or higher than 1.0 A DC.
- A USB port is used to connect to the PC.
⇒ Remove the USB hub.

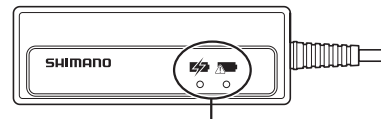
(A) CHARGE indicator

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



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

3

CONNECTION AND COMMUNICATION WITH DEVICES


CONNECTION AND COMMUNICATION WITH DEVICES

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

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

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

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


TECH TIPS

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

System requirements

	PC linkage device	E-TUBE PROJECT	Firmware
SM-BMR2/ SM-BTR2	SM-PCE1/ SM-BCR2	Version 2.6.0 or later	Version 3.0.0 or later
BT-DN110/ BT-DN110-A/ BM-DN100		Version 3.0.0 or later	Version 4.0.0 or later

NOTICE

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

■ Settings customizable in E-TUBE PROJECT

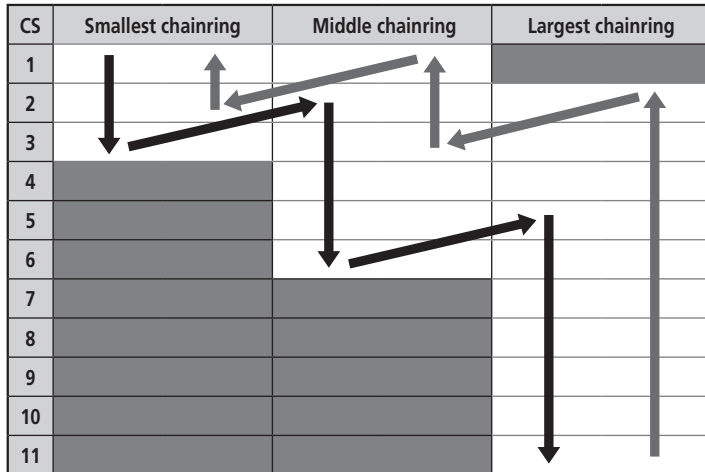
Display settings	Beep setting	You can switch the beep between ON and OFF.
	Display time	Sets the time until the display turns off when the display monitor is left unattended.
Switch setting		Changes the function settings of the shifting switch and suspension switch.
Front derailleur adjustment setting		Adjust the front derailleur.
Rear derailleur adjustment setting		Adjust the rear derailleur.
Synchronized shift map setting		Modify the synchronized shift map settings.
Suspension type setting		Set the suspension type.
Multi-shift mode setting	Multi-shift mode ON/OFF	Select whether or not to use multi-shift.
	Gear-shifting interval	Sets the gear-shifting interval for multi-shift.
	Gear number limit	Sets the limit on the number of gears shifted when the shifting switch is held down.

Synchronized shift map

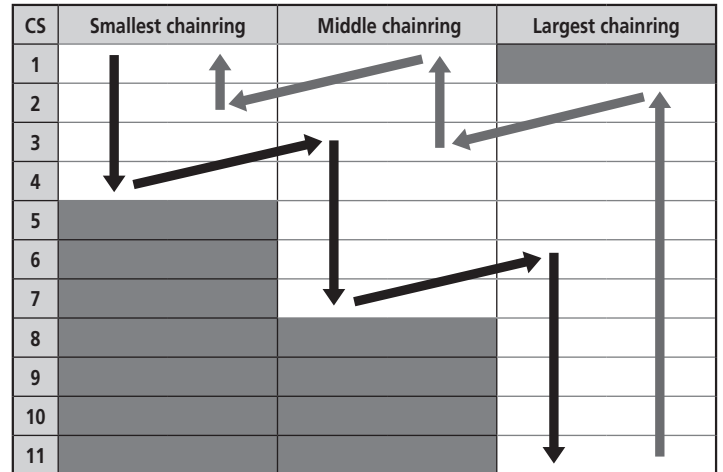
Synchronized shift is a function that automatically shifts gears on the front derailleur in synchronization with rear derailleur gear shifting. The numbers of switch gears for synchronized shift are configured by default as shown in the charts.

Triple specification

• Synchronized shift 1

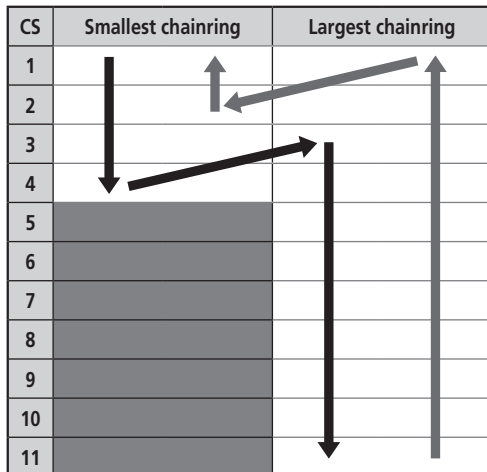


• Synchronized shift 2

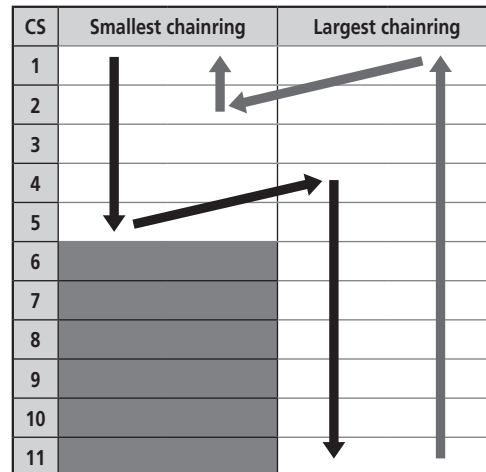


Double specification

• Synchronized shift 1



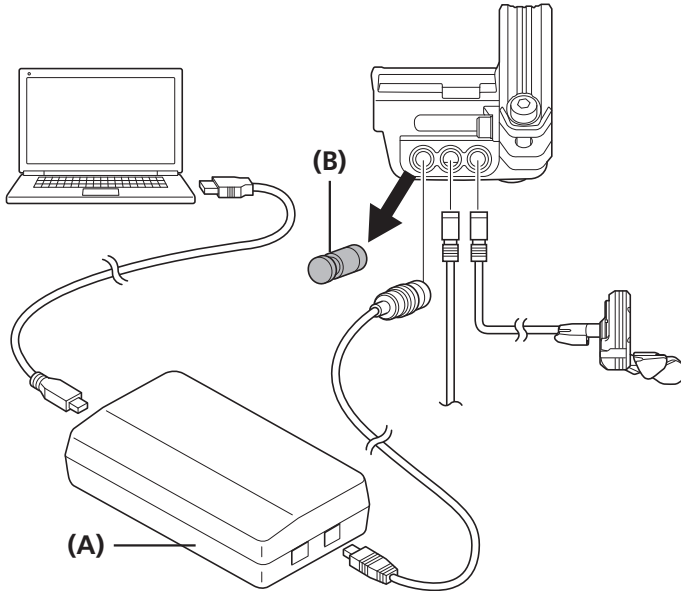
• Synchronized shift 2



■ Connecting to a PC

If there is an empty port in the system information display

Remove the dummy plug from the system information display, and connect SM-PCE1.



(A) SM-PCE1

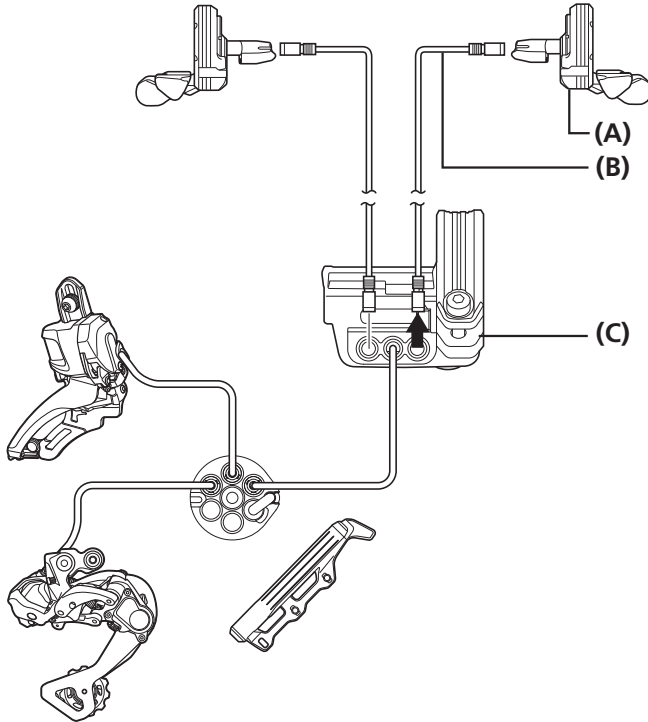
(B) Dummy plug

If there are no empty ports in the system information display

When the electric wire can be disconnected from the shifting switch

Disconnect the electric wire between the system information display and shifting switch.

1



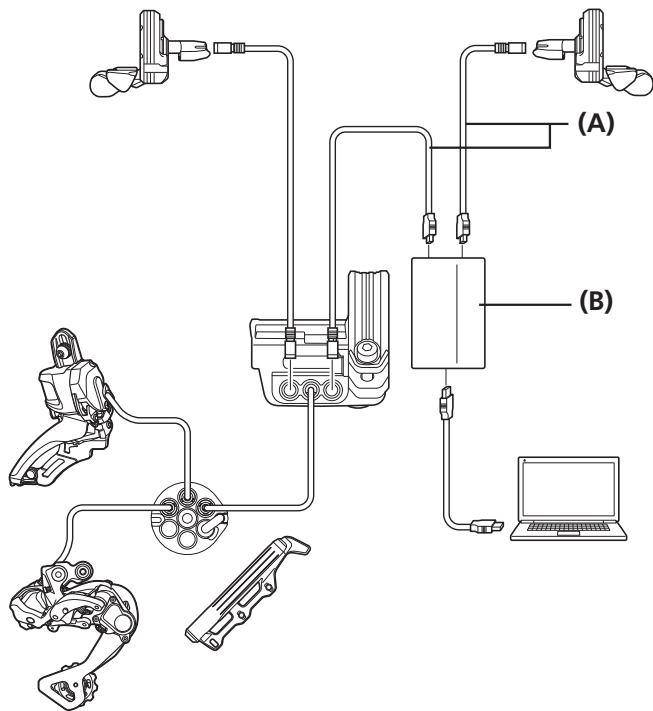
- (A) Shifting switch
- (B) Electric wire
- (C) System information display

▶▶ Connecting to a PC

Connect an unoccupied port of the system information display or shifting switch to an unoccupied port of SM-PCE1 as shown in the illustration.

Use the two PC link cables provided with SM-PCE1 for connection.

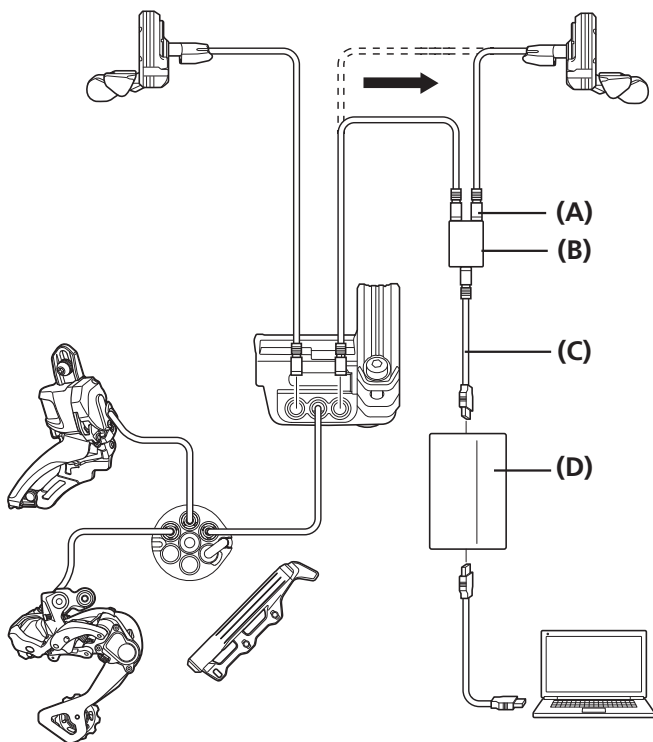
2



- (A) PC link cable
- (B) SM-PCE1

When the electric wire cannot be disconnected from the shifting switch

SM-JC41 and an electric wire (EW-SD50) are required.



- (A) Electric wire
- (B) SM-JC41
- (C) PC link cable
- (D) SM-PCE1

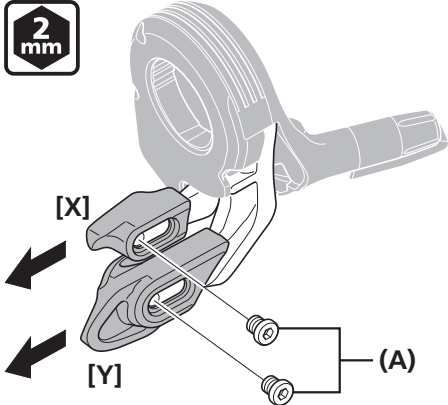
MAINTENANCE

MAINTENANCE

■ Replacing parts - shifting switch

Replacing the lever


Lever [X] and lever [Y] can be replaced.



Remove the lever fixing bolt.

Slide the lever, remove it from the shifting switch, and replace it.

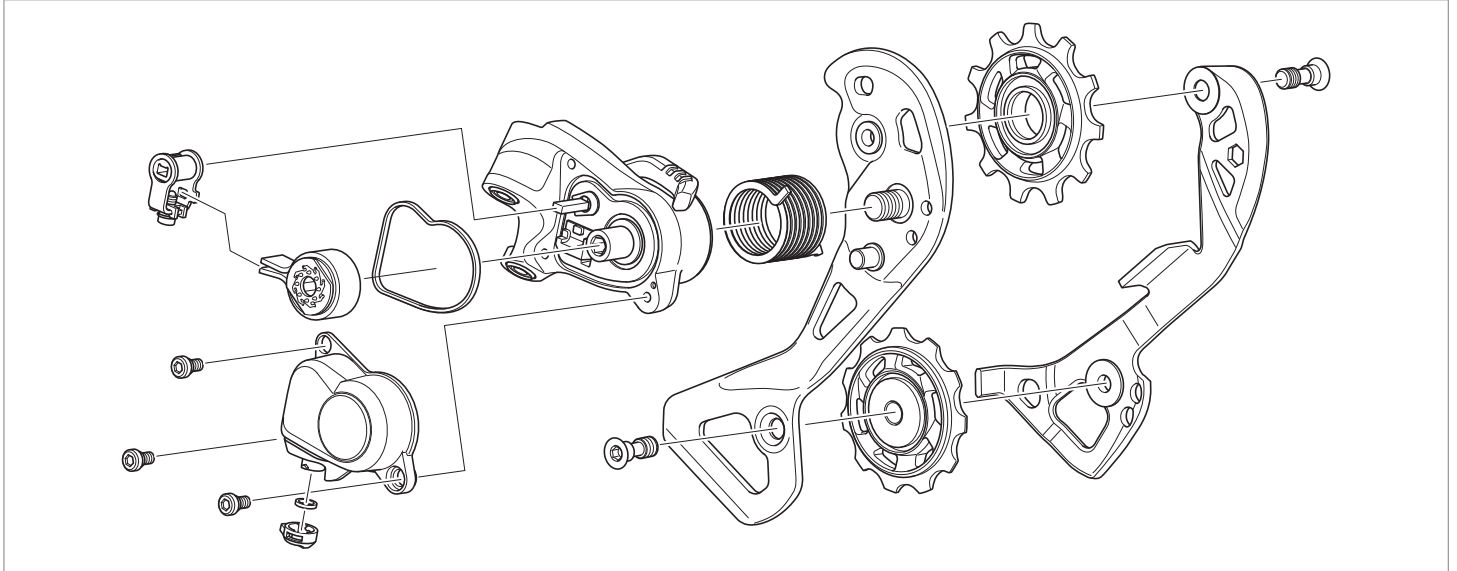
(A) Lever fixing bolt

Tightening torque	
	0.5 - 0.7 N·m

■ Replacing parts - rear derailleur

Replacement of the plate and the plate tension spring

Exploded view



Removal

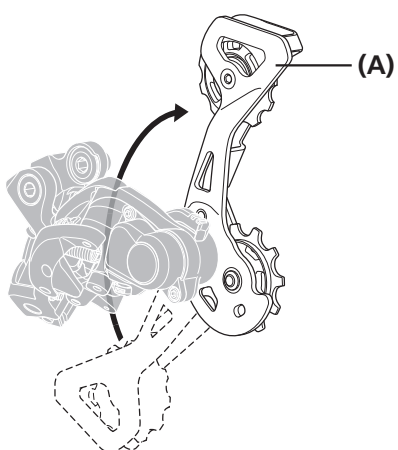
1		<p>Make sure that the lever switch is in the OFF position.</p> <p>If the lever switch is in the ON position, be sure to move it to the OFF position.</p> <p>(y) ON (z) OFF</p>
---	--	--

(A) Friction unit
NOTICE
If operating the lever switch while the plate unit cover is removed, press the friction unit with your finger so that it does not fly out.

2		<p>Set the rear derailleur to the lowest gear.</p> <p>Remove the plate stopper pin with a screwdriver.</p>
---	--	--

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

3

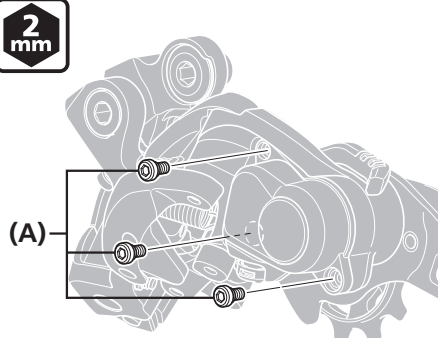


(A)

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

(A) Plate

4



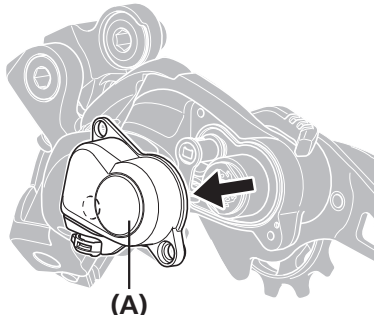
2 mm

(A)

Remove the plate unit cover bolts.

(A) Plate unit cover bolts

5

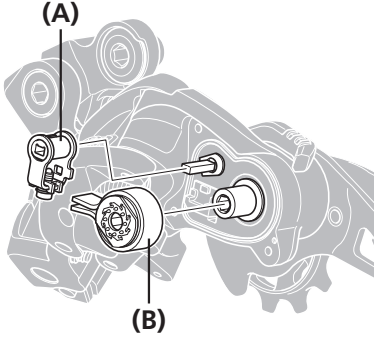


(A)

Remove the plate unit cover.

(A) Plate unit cover

6



(A)

(B)

Remove the cam unit and the chain stabilizer.

(A) Cam unit
(B) Chain stabilizer

7

Remove the plate axle.

(A) Plate axle

Tightening torque	
	8 - 10 N·m

Installation

1

Apply grease to the plate axle.

- (y)** Grease application area
Grease number:
Premium grease
(Y04110000)
- (z)** Chain stabilizer side
(Do not apply grease)

(A) Plate axle

NOTICE

Do not apply grease to the chain stabilizer side of the plate axle.
If grease is applied, grease will get on the inner surface of the roller clutch and friction will be lost.

2

Insert the plate axle and insert the tip of the plate tension spring into the groove of the plate.

(A) Plate tension spring

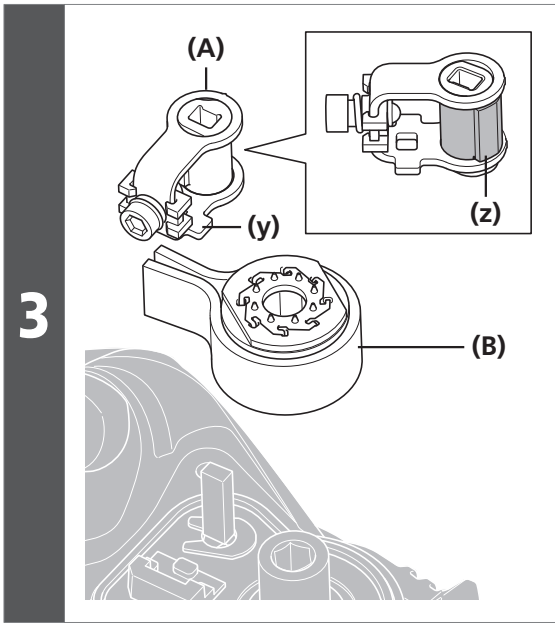
(B) Plate

(C) 4 mm hexagon wrench

NOTICE

When installing the plate stopper pin, first shift RD to a low position, and then install it.

▶▶ Replacing parts - rear derailleur



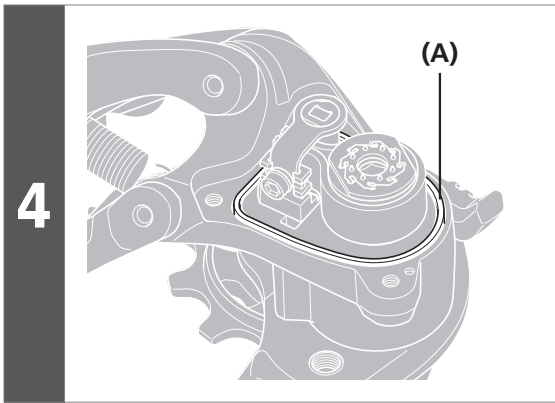
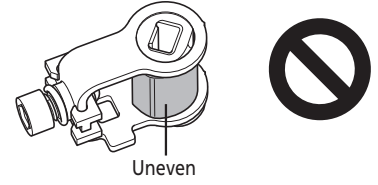
Set the cam unit as shown in the illustration.

- (y) Protrusion
- (z) Uneven

- (A) Cam unit
- (B) Chain stabilizer

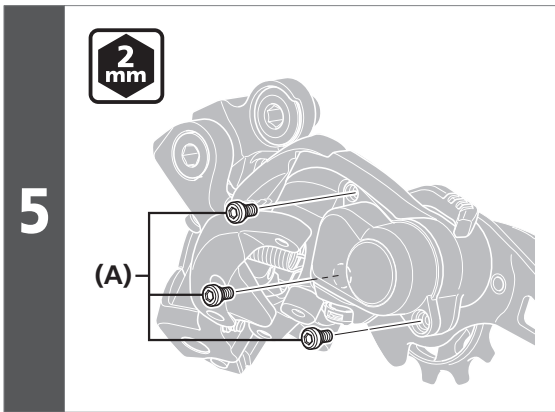
NOTICE

Make sure the cam unit is not set as shown in the following illustration.



Make sure that the plate unit cover gasket is attached along the grooves in the plate unit.

- (A) Plate unit cover gasket



Install the plate unit cover bolts.

- (A) Plate unit cover bolts

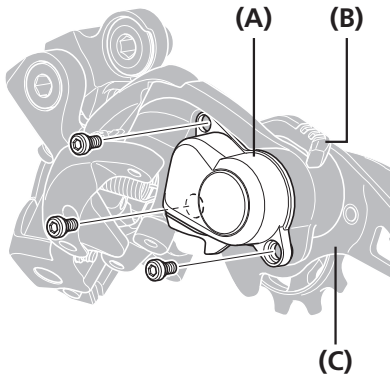
Tightening torque	
	1 - 1.5 N·m

Applying grease to the chain stabilizer

If the friction changes or noise is generated, the grease may have become discolored or may have disappeared. Apply more grease.
 * Reassemble by carrying out the disassembly procedure in reverse.

1 Move the lever switch to the OFF position.

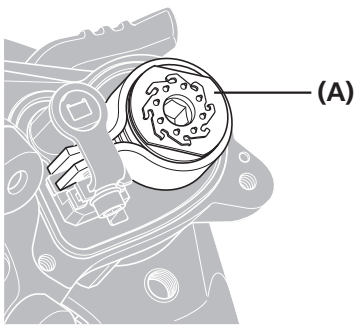
2



Remove the plate unit cover.

- (A)** Plate unit cover
- (B)** Lever switch
- (C)** Plate unit

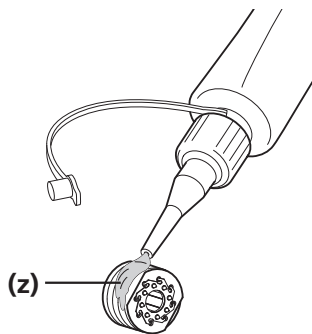
3



Remove the chain stabilizer.

- (A)** Chain stabilizer

4



Apply grease to the clutch.


- (z)** New grease number: Y04121000 (50 g)
- Grease number: Y04120800 (100 g)

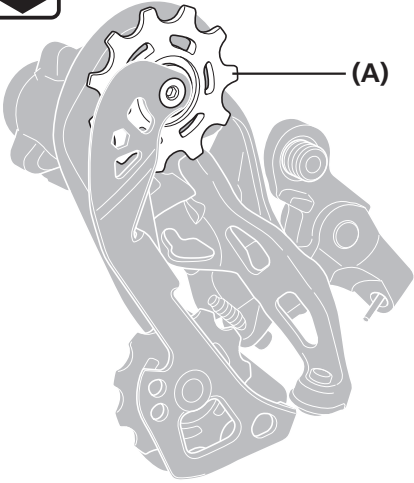
NOTICE

Be careful not to get grease on the inner surface of the roller clutch. If grease gets inside the clutch, it will cause the clutch to malfunction.

Replacement of the pulley


Guide pulley





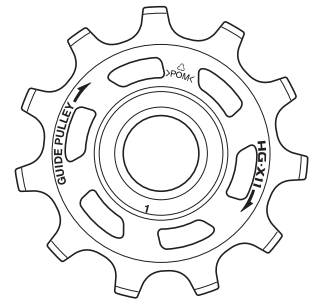
Replace the guide pulley.

(A) Guide pulley


Tightening torque	
	2.5 - 5 N·m

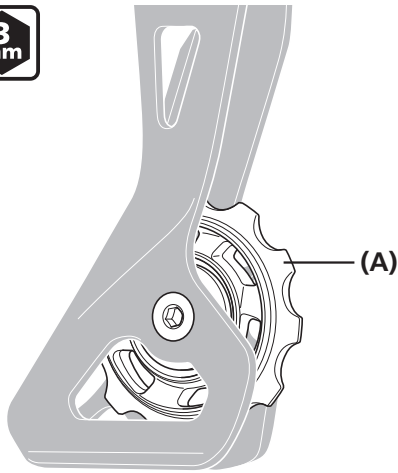
NOTICE

Check the arrow direction on the pulley when installing it.




Tension pulley





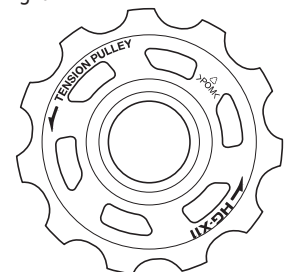
Replace the tension pulley.

(A) Tension pulley

Tightening torque	
	2.5 - 5 N·m

NOTICE

Check the arrow direction on the pulley when installing it.



■ Replacing parts - front derailleur

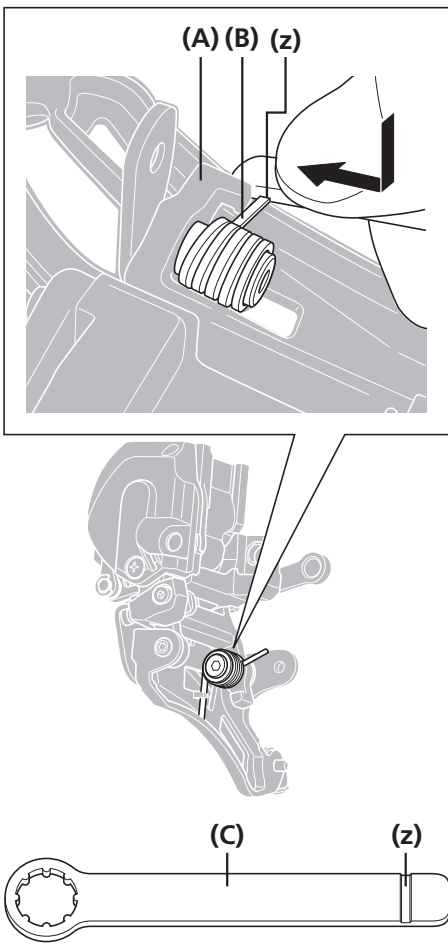
Replacing the chain guide

Removal

<p>1</p>		<p>Set the Shimano original tool on to the chain guide nut and loosen the replace bolt with a hexalobular wrench.</p>	<p>(A) Chain guide nut (B) Replace bolt (C) Shimano original tool (TL-FDM905) (D) Hexalobular[#8]</p>
<p>2</p>		<p>Remove the chain guide nut, the replace bolt and then the link.</p>	<p>(A) Replace bolt (B) Chain guide nut (C) Link</p>

3

TL-FDM905



Remove the guide spring. Fit the tip of the guide spring into the groove in the Shimano original tool and then push down.

Remove the guide spring by sliding it.

(z) Groove

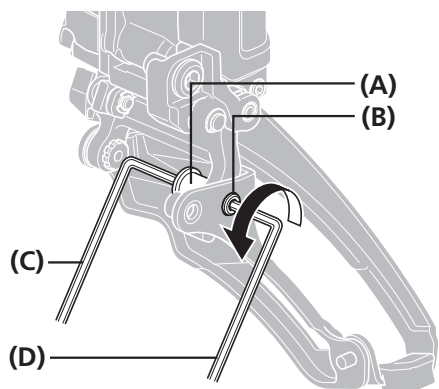
- (A) Mounting area
- (B) Guide spring
- (C) Shimano original tool (TL-FDM905)

NOTICE

Use care to avoid injury as the elastic energy of the spring is very high.

4

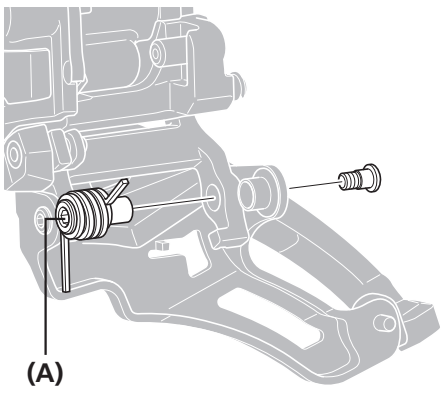
2.5 mm #8



Hold the guide spring nut in place with a 2.5 mm hexagon wrench and remove the replace bolt with a hexalobular wrench.

- (A) Guide spring nut
- (B) Replace bolt
- (C) 2.5 mm hexagon wrench
- (D) Hexalobular[#8]

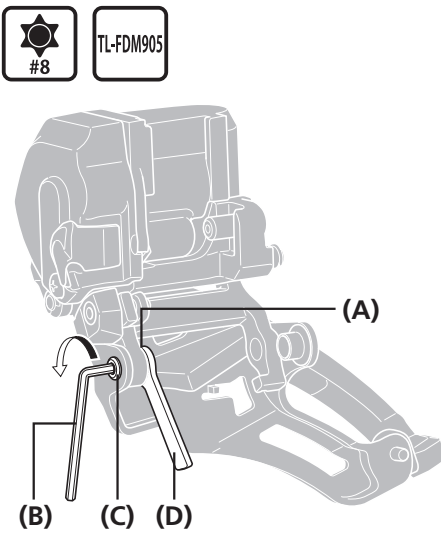
5



Remove the guide spring nut from the front derailleur.

(A) Guide spring nut

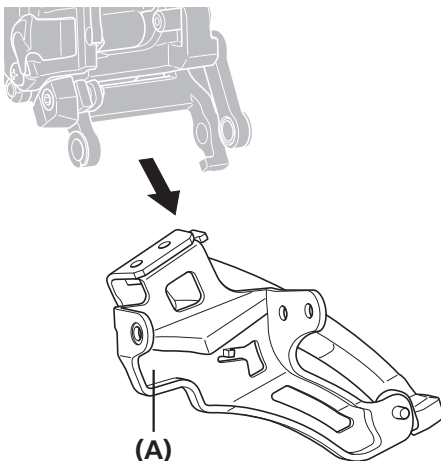
6



Set the Shimano original tool on to the chain guide nut and remove the replace bolt with a hexalobular wrench.

(A) Chain guide nut
(B) Hexalobular[#8]
(C) Replace bolt
(D) Shimano original tool (TL-FDM905)

7

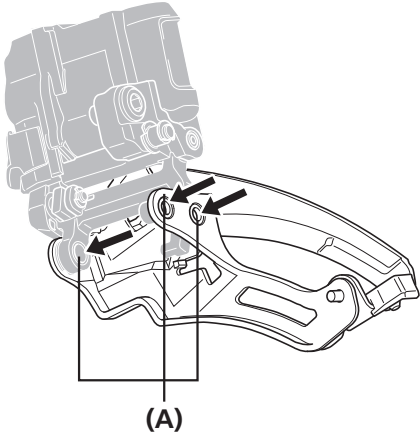


Remove the chain guide nut and then replace the chain guide.

(A) Chain guide

Installation

1



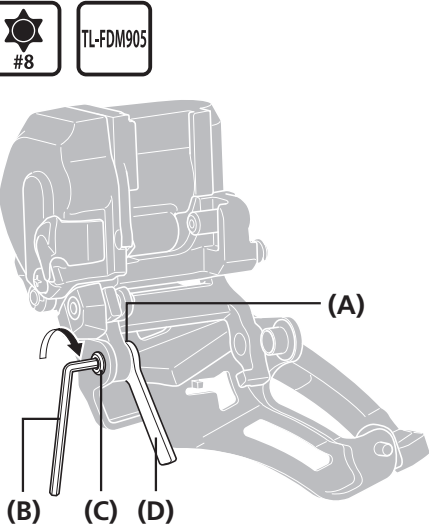
Attach the chain guide to the front derailleur.

Align the 3 bolt holes with their corresponding holes.

(A)

(A) Bolt hole


2



Insert the chain guide nut into the bolt hole, hold it in place with the Shimano original tool and tighten on the replace bolt with a hexalobular wrench.

(A) Chain guide nut
 (B) Hexalobular[#8]
 (C) Replace bolt
 (D) Shimano original tool (TL-FDM905)

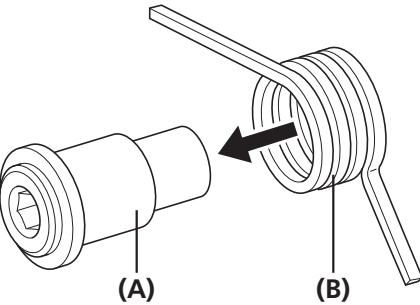
(A) Chain guide nut
 (B) Hexalobular[#8]
 (C) Replace bolt
 (D) Shimano original tool (TL-FDM905)

Tightening torque	
	0.7 N·m

NOTICE

Use new replace bolts when replacing the chain guide.

3

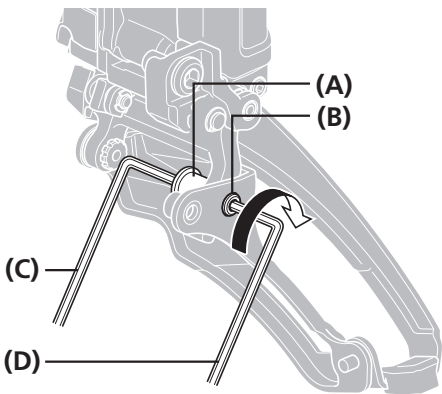


Attach the guide spring to the guide spring nut as in the illustration.

(A) Guide spring nut
 (B) Guide spring

(A) Guide spring nut
 (B) Guide spring

4



Insert the guide spring nut into the hole in the chain guide inner plate.

Hold the guide spring nut in place with a hexagon wrench and tighten the replace bolt with a hexalobular wrench.

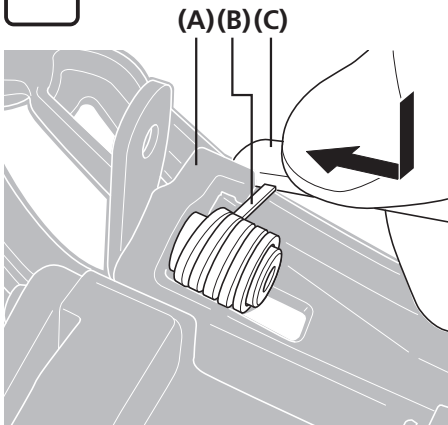
- (A)** Guide spring nut
- (B)** Replace bolt
- (C)** 2.5 mm hexagon wrench
- (D)** Hexalobular[#8]

Tightening torque



0.7 N·m

5



Use the Shimano original tool to secure the guide spring in place.

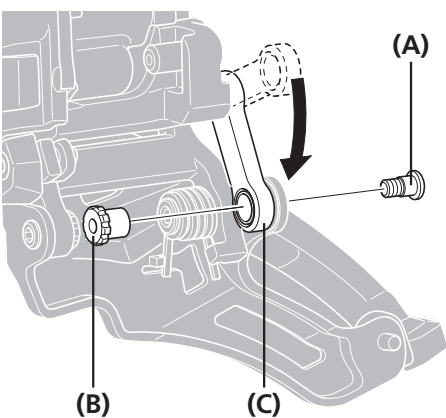
Secure the tip of the guide spring into the mounting area.

- (A)** Mounting area
- (B)** Guide spring
- (C)** Shimano original tool (TL-FDM905)

NOTICE

Use care to avoid injury as the elastic energy of the spring is very high.

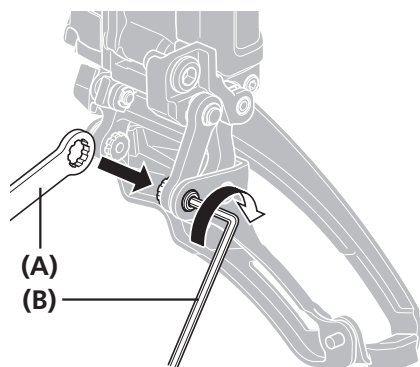
6



Align the hole in the link with the bolt hole and secure with the chain guide nut and replace bolt.

- (A)** Replace bolt
- (B)** Chain guide nut
- (C)** Link

7



Set the Shimano original tool on to the chain guide nut and tighten the replace bolt with a hexalobular wrench.

- (A)** Shimano original tool (TL-FDM905)
- (B)** Hexalobular[#8]

Tightening torque



0.7 N·m

NOTICE

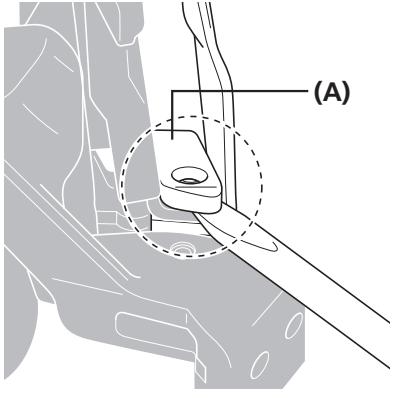
The replace bolts are pre-coated with locking agent.
Do not use the bicycle until at least 24 hours have passed after replacing the chain guide.

■ Replacing rubber pad A

Depending on the specifications, there are also models without rubber pad A.

Removal

1

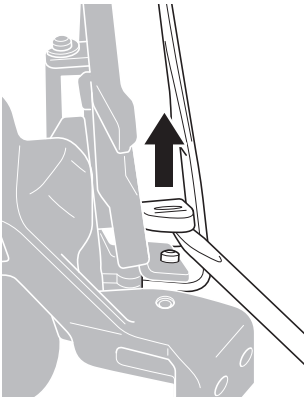


Remove rubber pad A.

Insert a small slotted screwdriver into the gap as shown in the illustration.

(A) Rubber pad A

2



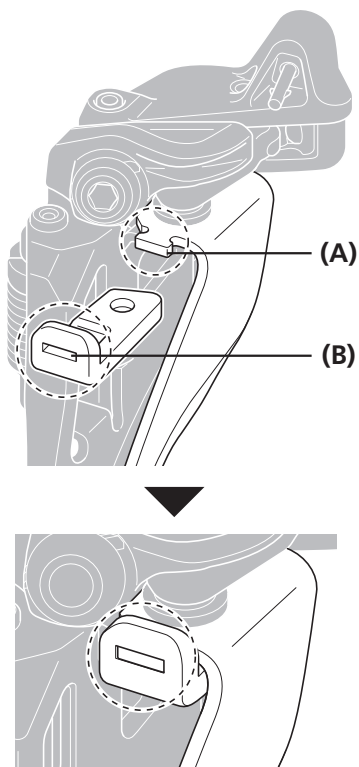
Lift upward to remove it.

NOTICE

- When removing rubber pad A, do not apply excessive force. It may cause damage to the chain guide or unexpected injuries.
- Do not reuse rubber pads that have been removed. The rubber pad may become loose easily due to deformation etc.

Installation

1



Install rubber pad A.

Fit the elongated hole to the arm of rubber pad A.

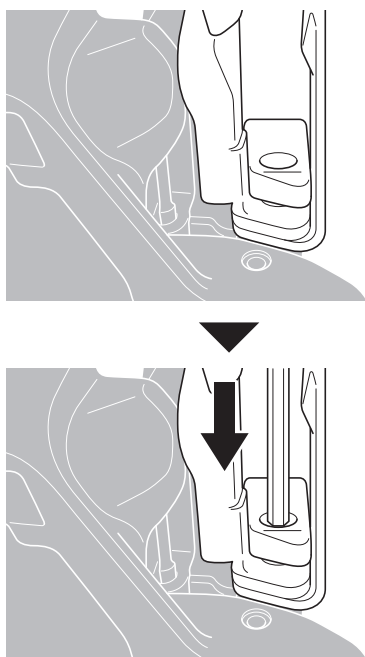
- (A)** Arm of rubber pad A
- (B)** Elongated hole



TECH TIPS

Push in the arm of rubber pad A all the way.

2



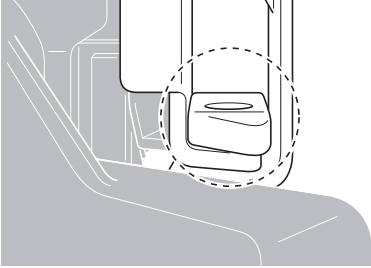
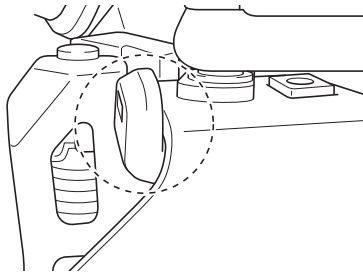
Align the protrusion of rubber pad A with the chain guide hole.

Lightly push in rubber pad A with an 8 mm hexagon wrench or similar tool.

Firmly insert rubber pad A.

▶▶ Replacing rubber pad A

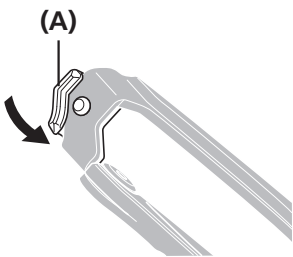
3



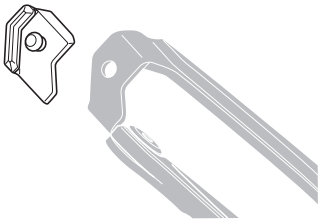
Make sure that rubber pad A is securely attached to the chain guide.

■ Replacing rubber pad B

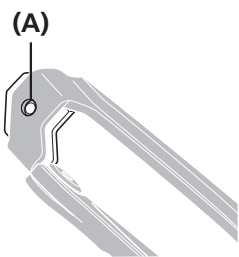
Removal

1		<p>Turn over rubber pad B from the backside of the chain guide and remove it.</p>
---	---	---

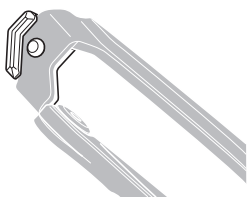
(A) Rubber pad B

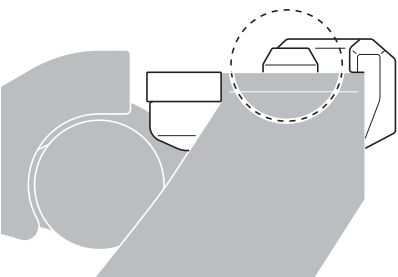
2		<p>Remove rubber pad B from the chain guide.</p>
---	---	--

Installation

1		<p>Align the rubber pad B mounting hole of the chain guide with the protrusion of rubber pad B.</p>
---	---	---

(A) Rubber pad B mounting hole

2		<p>Push in the protrusion from the reverse side of rubber pad B.</p>
---	---	--

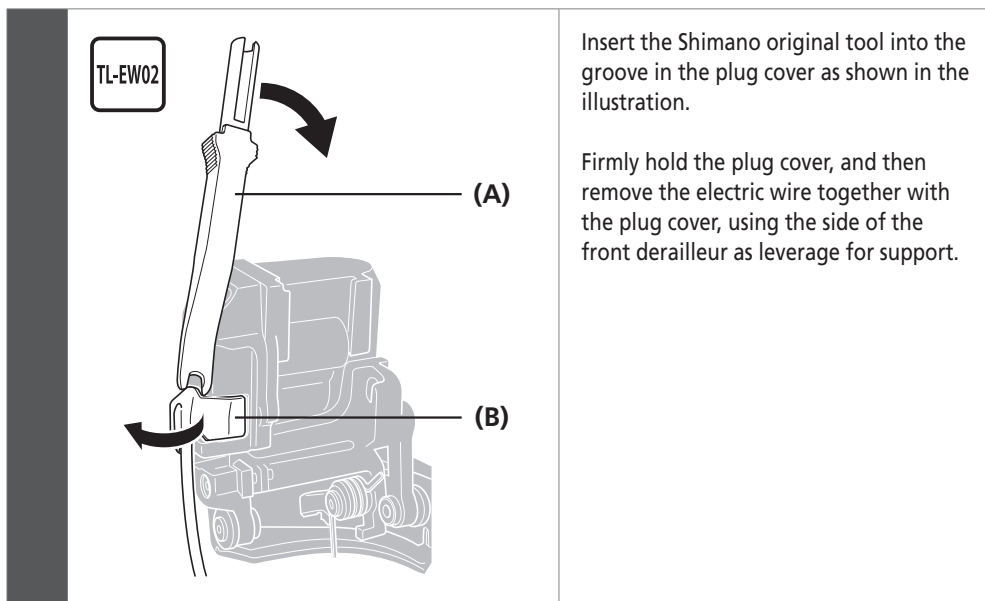
3		<p>Make sure that the protrusion of rubber pad B is securely fitted on the chain guide.</p>
---	---	---

■ 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.
- When removing the electric wire, use the wider end of the Shimano original tool TL-EW02 as shown in the illustration. If you pull too firmly on an electric wire without using the Shimano original tool, a malfunction may occur.
- Forcibly disconnecting an electric wire may damage it.

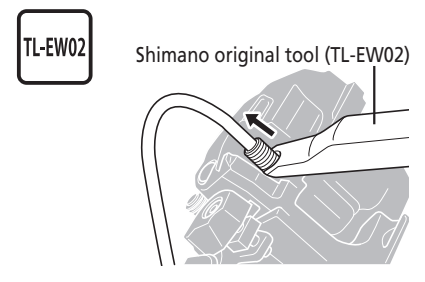
Disconnection from the front derailleur



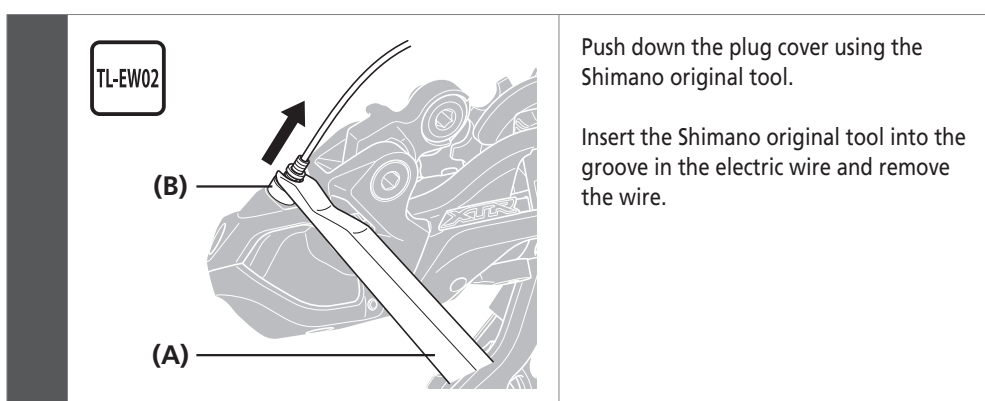
- (A) Shimano original tool (TL-EW02)
- (B) Plug cover



If the plug cover comes loose, remove it completely using the Shimano original tool.



Disconnection from the rear derailleur



- (A) Shimano original tool (TL-EW02)
- (B) Plug cover

SHIMANO

SHIMANO NORTH AMERICA BICYCLE, INC.

One Holland, Irvine, California 92618, U.S.A. Phone: +1-949-951-5003

SHIMANO EUROPE B.V.

High Tech Campus 92, 5656 AG Eindhoven, The Netherlands Phone: +31-402-612222

SHIMANO INC.

3-77 Oimatsu-cho, Sakai-ku, Sakai City, Osaka 590-8577, Japan

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

© Mar. 2019 by SHIMANO INC. ITP