Dealer's Manual

ROAD	GRAVEL	MTB
E-BIKE	LIFESTYLE	GENERAL

SHIMANO STEPS E5100 / E5000 / E5080 Series

E5100

DU-E5100

E5000

DU-E5000
DU-E5080
DU-E5080-H

SHIMANO (E-BIKE)

FC-E5000
FC-E5010
FC-E6000
FC-E6010
SM-CRE50
SM-DUE10
SM-DUE11
SM-DUE50-T
SM-DUE50-TC
SM-DUE50-C
SM-DUE50-CC

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IMPORTANT NOTICE

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

  Users who are not professionally trained for bicycle assembly should not attempt to install the components themselves using the dealer's manuals.

  If any part of the information on the manual is unclear to you, do not proceed with the installation. Instead, contact your place of purchase or a distributor for assistance.
- Make sure to read all manuals included with each product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All manuals and technical documents are accessible online at https://si.shimano.com .
- For consumers who do not have easy access to the internet, please contact a SHIMANO distributor or any of the SHIMANO offices to obtain a hardcopy of the user's manual.
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.
- 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:

To ensure the safety of your E-BIKE, make sure to also refer to the user's manual for each product such as the battery, battery charger, cycle computer, and switch unit.

⚠ WARNING

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

  Only use SHIMANO genuine parts. If a component or replacement part is incorrectly assembled or adjusted, it can lead to component failure and cause the rider to lose control and crash.
-  Wear approved eye protection while performing maintenance tasks such as replacing components.
- For information on products not explained in this manual, refer to the manuals for each product.

Be sure to also inform users of the following:

- Do not disassemble or modify the product. This may cause the product to not operate correctly, and you may suddenly fall and be seriously injured.

■ Riding precautions

- Be sufficiently familiar with how to start the power assisted bicycle before riding on busy streets. You may start the bicycle unexpectedly, which may result in an accident.
- Be careful not to let the hemming of your clothes get caught in the chain while riding. You may fall and be seriously injured.
- Keep your fingers away from the chainrings, sprockets, and chain. They can be seriously injured if caught in the drive train.
- Ensure that head and tail lights can turn on before riding the bicycle.

■ Safety precautions

- Do not touch the drive unit when it has been continuously used for a long period of time. The surface of the drive unit becomes hot and could cause burns.

■ For installation to the bicycle and maintenance

- Be sure to remove the battery and charging cable before wiring or attaching parts to the bicycle. Failure to do so may cause an electric shock.
- Clean the chain with an appropriate chain cleaner regularly. Intervals between maintenance depend on the use and riding circumstances.
- Never use alkali- or acid-based solvents such as rust cleaners. If those solvents are used the chain might break and cause serious injury.

⚠ CAUTION

Be sure to also inform users of the following:

■ Riding precautions

- Observe the instructions in the manual for the bicycle in order to ride safely.

■ Safety precautions

- Never modify the system. Doing so may cause a system error.

- Use the product under the supervision of someone responsible for safety, and only as instructed. Do not allow anyone (including children) with reduced physical, sensory, or mental capacity, or those without experience or knowledge, to use the product.
- Do not allow children to play near the product.

NOTICE

Be sure to also inform users of the following:

■ Riding precautions

- Avoid wearing clothing that may get caught in a chain or wheel, as this may cause an accident.

■ Safety precautions

- If any malfunction or trouble occurs, consult the place of purchase.
- For any questions regarding methods of installation and maintenance, please contact your place of purchase.
- Be sure to attach dummy plugs to any unused E-TUBE ports.
- For installation and adjustment of the product, consult the place of purchase.
- The components are designed to be fully waterproofed to withstand wet weather riding conditions. However, do not deliberately place them into water.
- Do not clean the bicycle with a high-pressure wash. If water gets into any of the components, operating problems or rusting may result.
- Do not turn the bicycle upside down. There is a risk of damage to the cycle computer and switch unit.
- Handle the components carefully, and avoid subjecting them to strong shock.
- Although the bicycle still functions as a normal bicycle even when the battery is removed, the light will not turn on if it is connected to the electric power system. Be aware that using the bicycle under these conditions will be considered non-observance of the road traffic laws in Germany.
- Contact the place of purchase for updates of the component software. The most up-to-date information is available on the SHIMANO website. For details, refer to the " Connection and communication with devices " section.
- 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.

■ Connection and communication with PC

The PC linkage device is needed to connect the bicycle to a PC. Using E-TUBE PROJECT Professional enables you to perform a range of tasks, such as customizing individual components or the entire system, or updating firmware.

- PC linkage device: SM-PCE02
- E-TUBE PROJECT Professional: PC application
- Firmware: Software inside each component

■ Connection and communication with smartphone

Components that support Bluetooth ® LE are required to connect the bicycle to a smartphone. Using E-TUBE PROJECT Cyclist enables you to perform a range of tasks, such as customizing individual components or the system, or updating firmware.

- E-TUBE PROJECT Cyclist: Application for smartphones
- Firmware: Software inside each component

■ Care and maintenance

- Do not use the thinners or harsh solvents to clean the products. Such substances may damage the surface.
- The chainrings and sprockets should be periodically washed with a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the life of the chainrings, sprockets, and the chain.
- Use a damp, well wrung out cloth when cleaning the battery and plastic cover.

■ Assist

The proper level of assistance cannot be achieved unless the proper settings have been made (proper adjustment of the chain tension, etc.), so consult with the place of purchase.

■ Labels

Some of the important information contained in this manual is also indicated on the device label.

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

Anti-tampering function

Be sure to also inform users of the following:

The tampering of peripheral devices related to the drive unit or assist control of e-bikes is prohibited, including both software and hardware modifications. Be sure to convey this information to customers.

Tampering (*1) may reduce the service life of and even cause extensive damage to the assist control system, bike components including the drive unit, and the bike itself. Furthermore, because modifying this system will likely void the warranties of SHIMANO products, the user may be forced to pay substantial costs to repair or replace items affected by tampering.

SHIMANO STEPS systems have a sensor that detects tampering and will display an error code when tampering (*1) is detected.

*1: Tampering refers to the state where a product does not comply with national or regional standards.

For details on error/warning codes, check the latest versions below:



https://si.shimano.com/error

Booklet structure

■ User's manual

SHIMANO STEPS series user's manuals are split among several booklets, as described below.

The latest manuals are available on our website (https://si.shimano.com).

Name	Details
SHIMANO STEPS User's Manual • DU-E5100 / DU-E5000 • DU-E5080	This is the basic manual for the SHIMANO STEPS series. It contains the following content: • SHIMANO STEPS quick guide • Basic operations when riding • How to operate assist bicycles that use flat handlebars, such as city, trekking, or MTB type bicycles
SHIMANO STEPS User's Manual for Drop Handlebar Bicycles	This booklet describes how to operate assist bicycles that use a drop handlebar and are controlled using dual control levers. This should be read along with the SHIMANO STEPS User's Manual.
SHIMANO STEPS special battery and parts user's manual	It contains the following content: • How to charge and handle the SHIMANO STEPS special battery • How to attach and remove the SHIMANO STEPS special battery to the bicycle • How to use the satellite system ON/OFF switch and satellite charging port • How to read the battery LEDs when charging or during an error
SHIMANO STEPS Cycle Computer User's Manual • Clamp band type (SC-EM800) • Clamp band type (SC-E7000) • Bracket installation type (SC-E6100) • Switch unit integrated type (SC-E5000 / SC-E5003)	It contains the following content: • Method for configuring settings via the main body buttons and switch unit • Wireless communication method (supported models only)
Switch Unit User's Manual	This is the assist switch and shift switch user's manual. It describes switch unit handling and operations only.

■ Dealer's manual

SHIMANO STEPS series dealer's manuals are split among several booklets, as described below.

The latest manuals are available on our website (https://si.shimano.com).

Name	Details
SHIMANO STEPS Dealer's Manual	This is the basic manual for the SHIMANO STEPS series. • Overall wiring diagram • Overall flow of operations for installing the SHIMANO STEPS components to an assist bicycle • Installation / removal and maintenance of the drive unit area • Installation / removal of the speed sensor
SHIMANO STEPS Dealer's Manual for Drop Handlebar Bicycles	It specializes in the following information regarding assist bicycles that use a drop handlebar and are controlled using dual control levers. This should be read along with the SHIMANO STEPS Dealer's Manual. • Overall wiring diagram • Cautions to follow when installing the drive unit
SHIMANO STEPS Special Battery and Parts Dealer's Manual	It contains the following content: • How to install the battery mount • How to install the satellite system ON/OFF switch and satellite charging port
SHIMANO STEPS Cycle Computer and Switch Unit Parts Dealer's Manual	It contains the following content: • Installation and maintenance of the SHIMANO STEPS special cycle computer, special junction [A] and switch unit • How to connect to E-TUBE PROJECT Professional

List of tools to be used

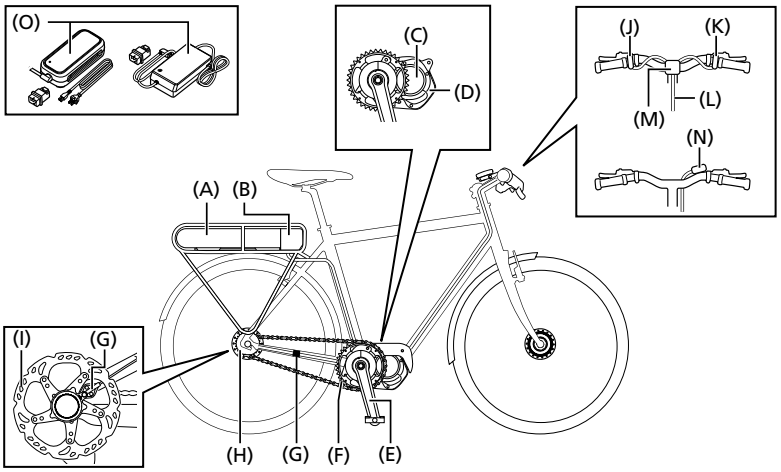
The following tools are needed for installation/removal, adjustment, and maintenance purposes.

Component	Location used / screw type	Tool	
Electric wire	Plug	TL-EW02 / TL-EW300	TL-EW02 / TL-EW300
Speed sensor (SM-DUE10)	Mounting screw	4 / 25	4 mm hexagon wrench / hexalobular [#25]
	Magnet fixing screw	2	Cross head screwdriver [#2]
Speed sensor (SM-DUE11)	Mounting screw	10	Hexalobular [#10]
Drive unit	Mounting screw (M8)	-	Contact the bicycle manufacturer.
	Drive unit cover	2	Cross head screwdriver [#2]
Light cable	Light cable mounting screw	2	Cross head screwdriver [#2]
Chainring	Lock ring	TL-FC39 + TL-FC32	TL-FC39 + TL-FC32
		TL-FC39 + TL-FC33	TL-FC39 + TL-FC33
		TL-FC39 + TL-FC36	TL-FC39 + TL-FC36
	Chain guard Arm cover	2	Cross head screwdriver [#2]
Crank arm	Crank mounting screw	8	8 mm hexagon wrench
Chain	Tension adjustment for internal geared hub models	TL-DUE60	TL-DUE60

Installing electrical parts

Names of parts

Rear carrier type



(A)	Battery	(B)	Battery mount
(C)	Drive unit	(D)	Drive unit cover
(E)	Crank arm	(F)	Chainring
(G)	Speed sensor * 1	(H)	Shifting unit * 2
(I)	Rotor	(J)	Switch unit (assist switch)
(K)	Switch unit (shift switch) or shifter	(L)	Electric wire
(M)	Cycle computer * 3	(N)	Junction [A] (wireless unit) * 3
(O)	Battery charger		

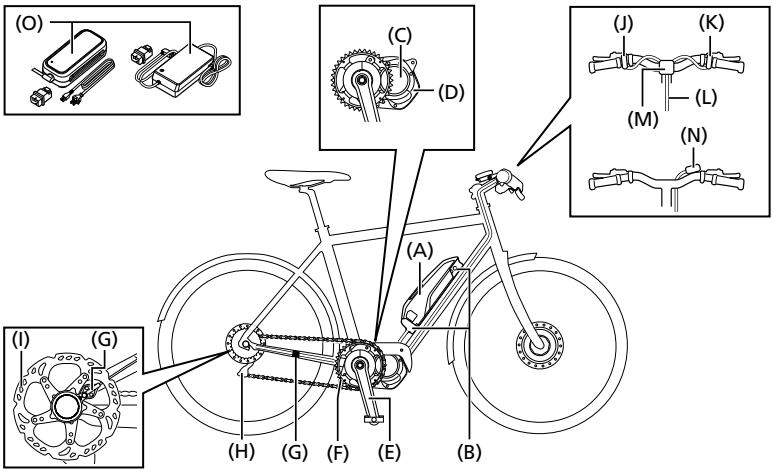
* 1 Attach it to one of the two locations specified in the figure.

* 2 Electronic gear shifting: Di2 rear derailleur or motor unit + Di2 internal geared hub

Mechanical gear shifting: rear derailleur or internal geared hub

* 3 Use either one.

External type



(A)	Battery * 1	(B)	Battery mount
(C)	Drive unit	(D)	Drive unit cover
(E)	Crank arm	(F)	Chainring
(G)	Speed sensor * 2	(H)	Shifting unit * 3
(I)	Rotor	(J)	Switch unit (assist switch)
(K)	Switch unit (shift switch) or shifter	(L)	Electric wire
(M)	Cycle computer * 4	(N)	Junction [A] (wireless unit) * 4
(O)	Battery charger		

* 1 Depending on the frame, the battery may be installed at a location different from the position specified in the figure.

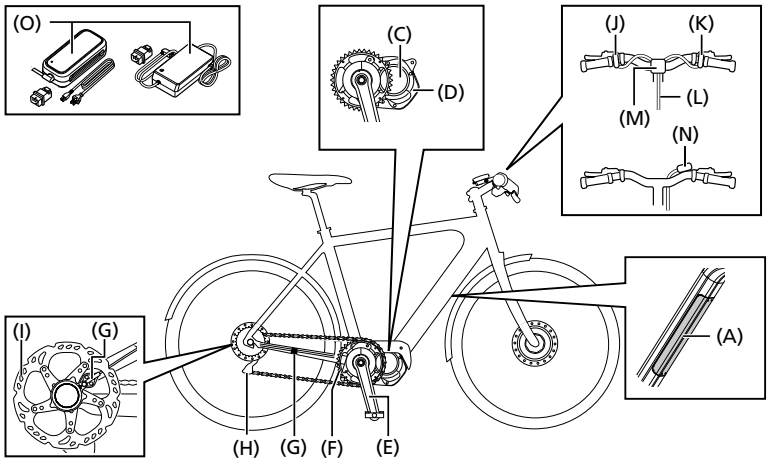
* 2 Attach it to one of the two locations specified in the figure.

* 3 Electronic gear shifting: Di2 rear derailleur or motor unit + Di2 internal geared hub

Mechanical gear shifting: rear derailleur or internal geared hub

* 4 Use either one.

Integrated type



(A)	Battery * 1	(B)	Battery mount * 2
(C)	Drive unit	(D)	Drive unit cover
(E)	Crank arm	(F)	Chainring
(G)	Speed sensor * 3	(H)	Shifting unit * 4
(I)	Rotor	(J)	Switch unit (assist switch)
(K)	Switch unit (shift switch) or shifter	(L)	Electric wire
(M)	Cycle computer * 5	(N)	Junction [A] (wireless unit) * 5
(O)	Battery charger		

* 1 Depending on the frame, the battery may be installed at a location different from the position specified in the figure.

* 2 Attach the integrated type battery mount inside the frame.

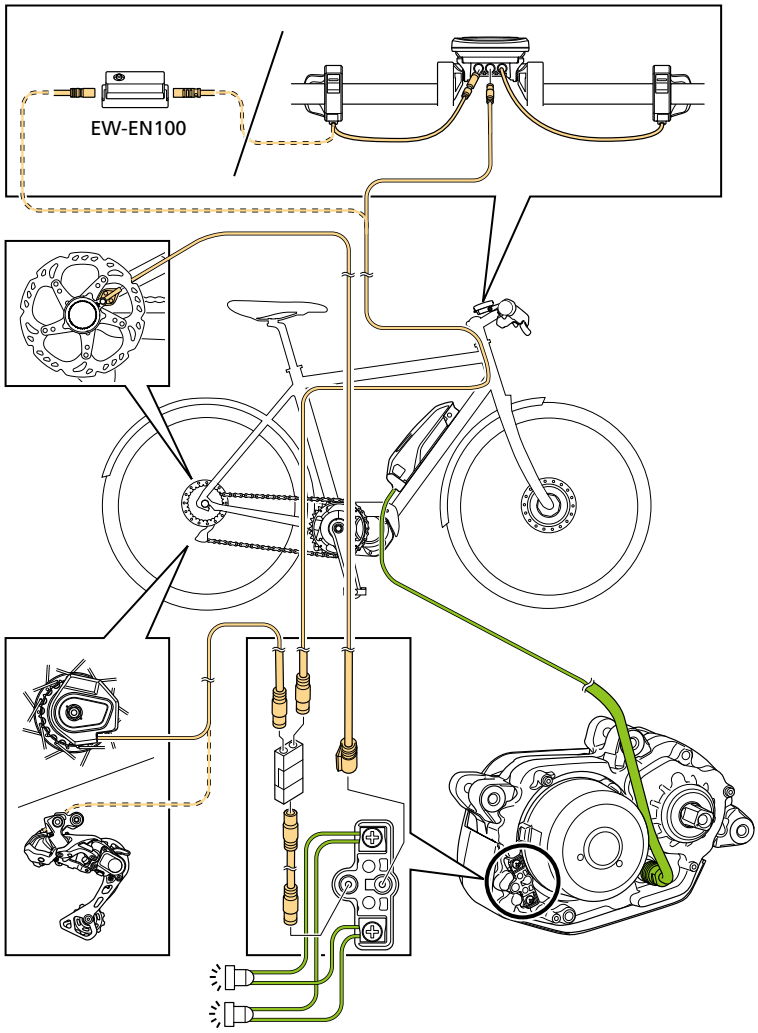
* 3 Attach it to one of the two locations specified in the figure.

* 4 Electronic gear shifting: Di2 rear derailleur or motor unit + Di2 internal geared hub

Mechanical gear shifting: rear derailleur or internal geared hub

* 5 Use either one.

Overall wiring diagram



NOTICE

- The maximum electric wire length between components is 1,600 mm. Ensure that the total length is 1,600 mm or less when connecting via a junction [B] or conversion adapter.

Specifications

Operating temperature range * 1	-10 - 50°C
Storage temperature * 1	-20 - 70°C
Drive unit type	Midship
Motor type	Brushless DC
Rated drive unit power	250 W

* 1 These are the temperature specifications of the drive unit alone. The values in the temperature specifications may differ according to the battery and other components used in your E-BIKE. Refer to the user's manual of each product to ensure proper usage and storage.

TECH TIPS

- The maximum speed provided by assist is set by the manufacturer, but may vary depending on the conditions under which the bicycle is used.

Electric wires

There are two types of electric wire: the EW-SD300 and the EW-SD50. The supported electric wire differs based on the component model. Check the component specifications on the SHIMANO product website in advance (https://productinfo.shimano.com/).

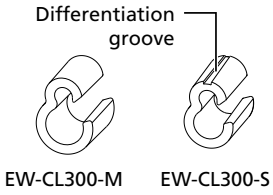
Supported products

The following products support each type of electric wire.

Product name	Intended purpose	EW-SD300 type	EW-SD50 type
SHIMANO original tool	Connecting / disconnecting the electric wires	TL-EW300	TL-EW02
Dummy plug	Plugging empty ports	Y7HE30000	Y6VE15000
Cord clip	Binding the wiring and the outer casing / brake hose together	EW-CL300-S (for shift outer casing) EW-CL300-M (for brake outer casing and brake hose)	Y70H98040
Wire cover	Supporting / protecting the electric wire (external wiring)	EW-CC300	SM-EWC2
Grommet	Installing to the wire insertion hole of a frame that supports internal wiring	EW-GM300-S EW-GM300-M	SM-GM01 SM-GM02
Cord band	Supporting the electric wire (flat handlebar external wiring)	EW-CB300-S EW-CB300-M EW-CB300-L	SM-EWE1
Junction [A] (for Di2)	Gathering the wiring around the cockpit. Also has functions for changing the shift mode, etc.	-	EW-RS910 SM-EW90-A SM-EW90-B
Junction [B]	Branching / conjoining the wiring inside and outside the frame	EW-JC304 EW-JC302	SM-JC41 SM-JC40 EW-JC200 EW-JC130
Conversion adapter	Refer to the " Conversion adapter " section	EW-AD305	EW-AD305

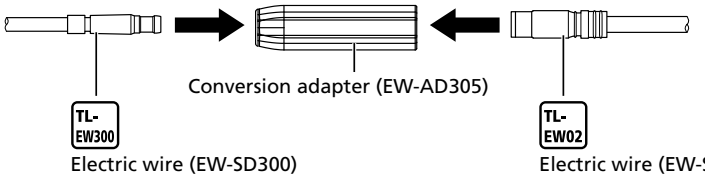
NOTICE

- The SHIMANO original tool used for installation/removal and the accessories used for wiring differ for the EW-SD300 and EW-SD50. Be sure to use a compatible product.
- EW-CL300-S is marked with a groove in order to differentiate it from EW-CL300-M.



Conversion adapter

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



Connecting / disconnecting the electric wires

Be sure to use the SHIMANO original tool to remove and insert electric wires.

NOTICE

- When connecting and disconnecting electric wires, do not forcibly bend the plug part. It may result in a poor connection.

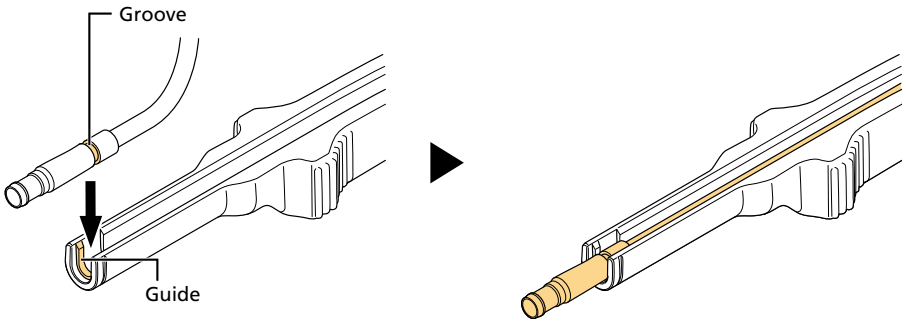
Connecting the electric wire (EW-SD300)

Connect the electric wire to the E-TUBE port.

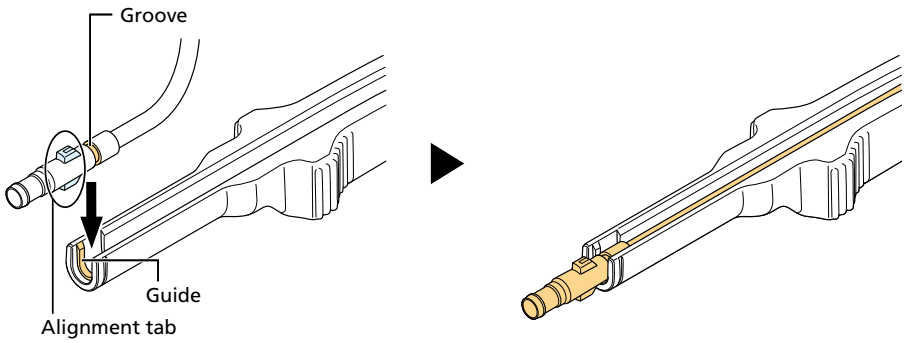
1. **Set the plug of the electric wire to the TL-EW300.**

   If there is an alignment tab on the plug of the electric wire, check the shape of the E-TUBE port you are trying to connect to, and set it aligned with the alignment tab as shown in the figure.

Without alignment tab on plug

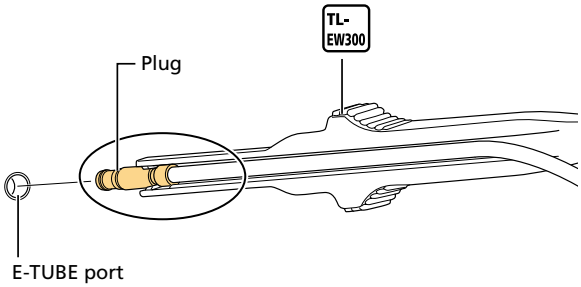


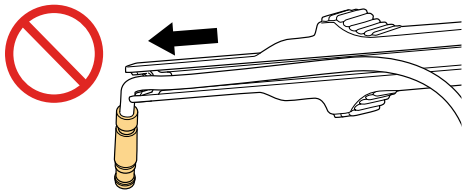
With alignment tab on plug



2. **Insert the plug on the electric wire into the E-TUBE port.**

   Push it straight in until you feel it click into place.





Removing the electric wire (EW-SD300)

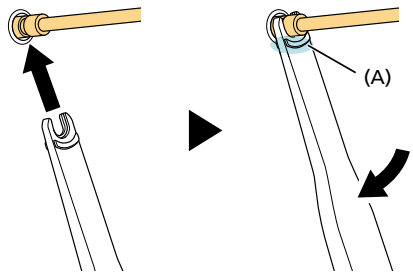
1. **Disconnect the electric wire.**

   (1) Insert the TL-EW300 into the groove on the plug part of the electric wire.

   (2) Disconnect the electric wire from the E-TUBE port.

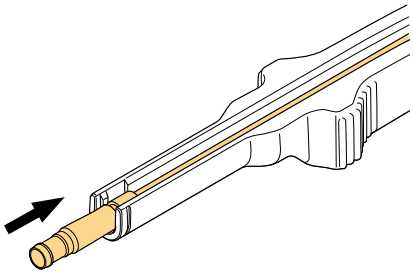
   * As shown in the figure, use part (A) of the TL-EW300 as a fulcrum, move the tool like a lever, then disconnect the plug part.

(1) (2)



TECH TIPS

- If there is limited space to insert the tool, you can use the TL-EW300 as indicated in the figure to disconnect the electric wire.



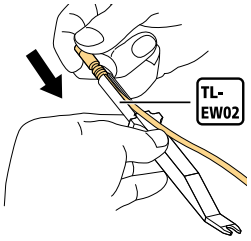
Connecting the electric wire (EW-SD50)

Connect the electric wire to the E-TUBE port.

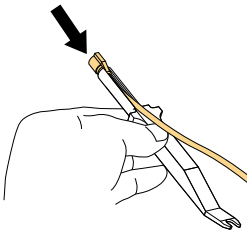
1. **Set the plug of the electric wire to the TL-EW02.**

   If there is an alignment tab on the plug of the electric wire, set it aligned with the groove on the SHIMANO original tool.

Without alignment tab on plug

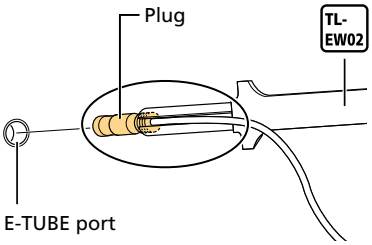


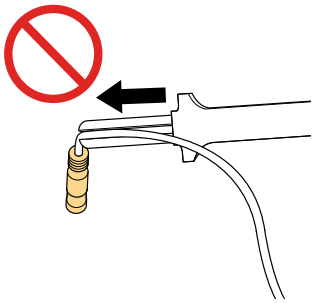
With alignment tab on plug



2. **Insert the plug on the electric wire into the E-TUBE port.**

   Push it straight in until you feel it click into place.





Removing the electric wire (EW-SD50)

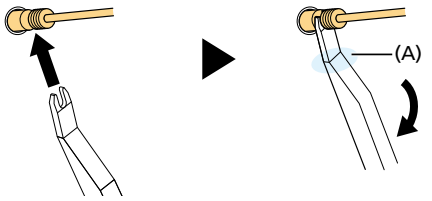
1. **Disconnect the electric wire.**

   (1) Insert the TL-EW02 into the groove on the plug of the electric wire.

(2) Disconnect the electric wire from the E-TUBE port.

* As shown in the figure, use part (A) of the TL-EW02 as a fulcrum, move the tool like a lever, then disconnect the plug part. If there is limited space to insert the tool, lift the TL-EW02 straight up and disconnect the electric wire.

(1) (2)



Installing cockpit peripheral components

Refer to the “ SHIMANO STEPS Cycle Computer and Switch Unit Parts Dealer's Manual .”

Installing the battery mount and parts

Refer to the “ SHIMANO STEPS Special Battery and Parts Dealer's Manual .”

Installing the speed sensor

NOTICE

- For details on the compatibility of the speed sensor and drive unit, refer to the compatibility information (https://productinfo.shimano.com/#/com).

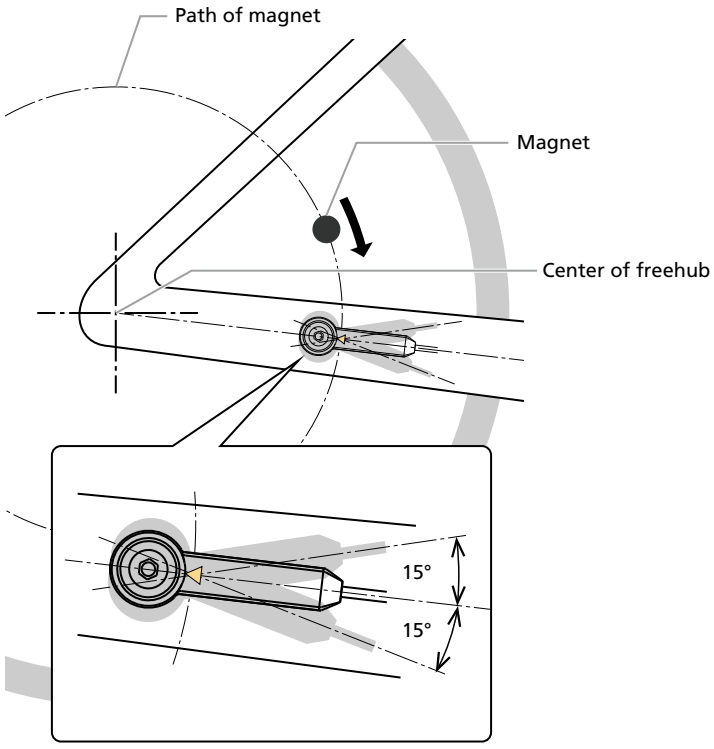
Generic type

For models: SM-DUE10 (SD50 type)

The generic type speed sensor can be installed regardless of the type of brake, such as rim brake, roller brake, or coaster brake. Install the magnet on a spoke on the rear wheel.

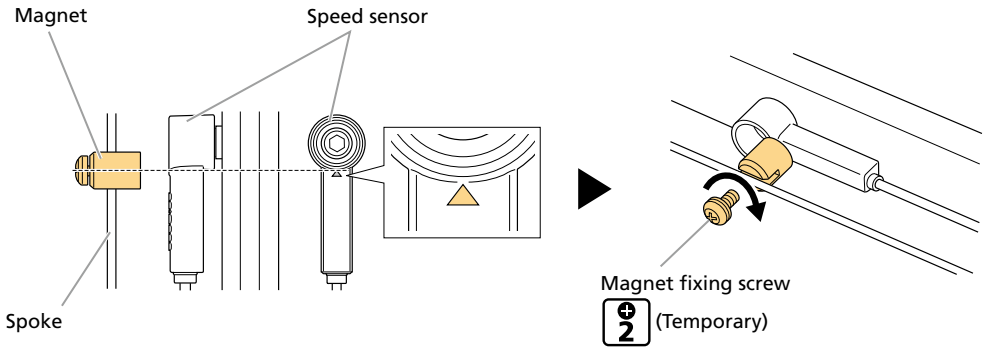
NOTICE

- Refer to the installation angle in the figure when installing a generic type speed sensor. It may not operate correctly if it is installed with the position of the Δ marking exceeding the allowed range.



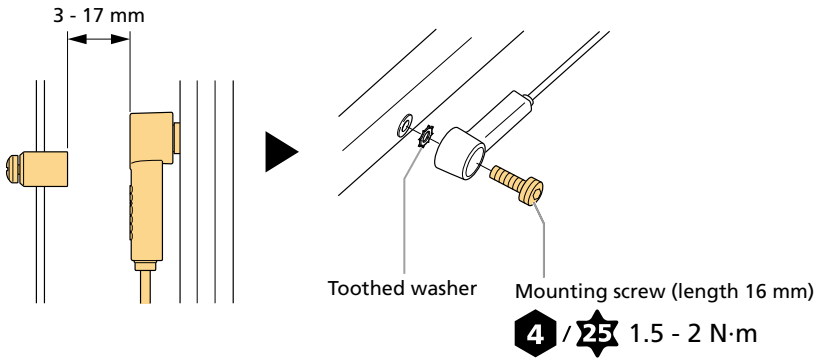
1. **Temporarily install the magnet to the spoke.**

   Determine the installation position of the magnet so that the center of the magnet is aligned with the tip of the Δ marking on the speed sensor.

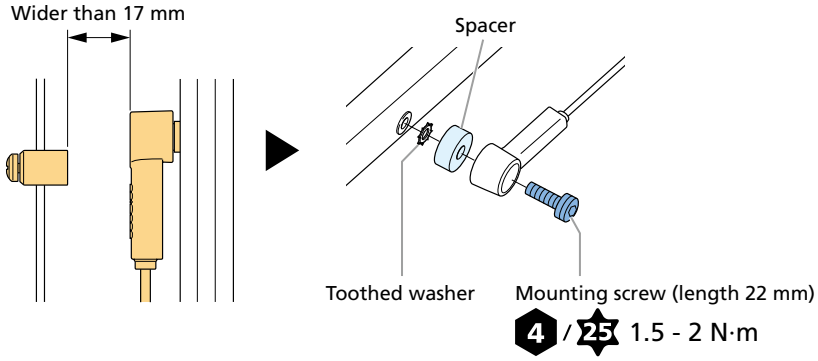


2. **Install the speed sensor.**

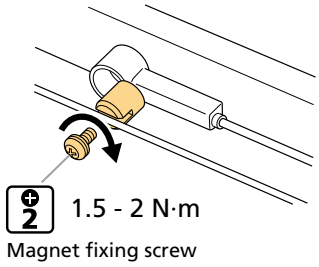
   Clearance between speed sensor and magnet is 3 to 17 mm



   Clearance between speed sensor and magnet exceeds 17 mm



3. **Secure the magnet.**



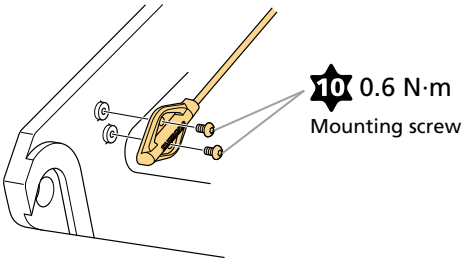
4. **Route the electric wire for the speed sensor to the frame along the chainstay and wire it to the drive unit.**

Type designed exclusively for use with a rotor with magnet

For models: SM-DUE11 (SD50 type)

Use in combination with a rotor with magnet (rear wheel only).

1. **Install the rotor to the wheel.**
   - Refer to the “Disc Brake” chapter of General Operations for the installation method.
   - The rotor with magnet is the internal spline type. Install it using the TL-LR15 SHIMANO original tool.
2. **Install the speed sensor to the frame.**



3. **Affix the wire for the speed sensor to the chainstay and wire it to the drive unit.**
4. **Install the rear wheel in the frame.**

Installing the drive unit and peripheral parts

Introduction

Use the following procedure to install the drive unit and peripheral parts:

(1) Installing the drive unit

(2) Wiring to the drive unit

(3) Installing the drive unit cover

(4) Installing the chainring and crank arms

TECH TIPS

- To check the wiring of the drive unit on a completed bicycle, you will need to first remove the drive unit cover. Remove the left cover to access the power cord and terminal block.

Installing the drive unit

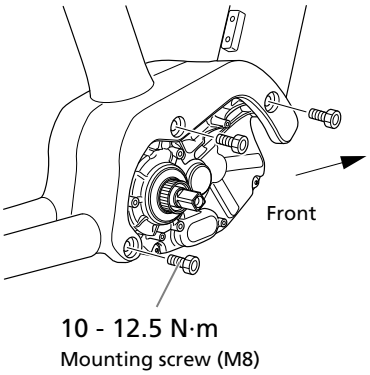
Before installing the drive unit to the frame, first check that all the wires that connect to the drive unit have been routed to the drive unit installation area.

NOTICE

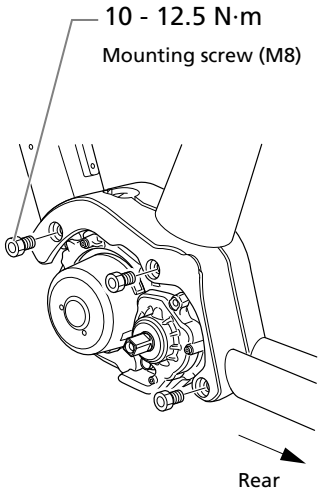
- Mounting screws (M8) are not included with SHIMANO products. Use the screws supplied by the bicycle manufacturer.

1. **Tighten the mounting screws on the right side so that the drive unit makes firm contact with the inner surface on the right side of the frame.**

   Make sure to secure it from the right side to ensure an accurate chain line. Failure to do so may affect gear shifting performance.



2. **Tighten the mounting screws on the left side of the frame.**



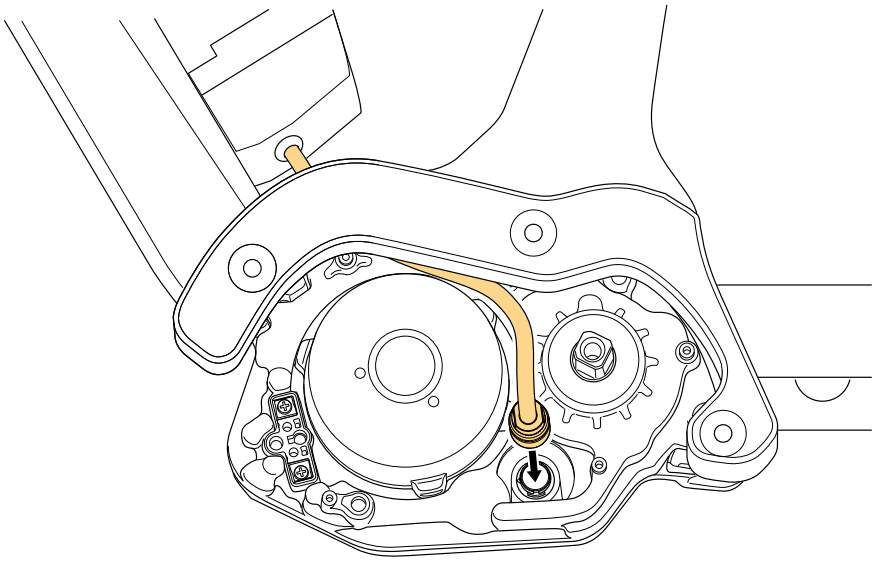
Connecting the power cord

Connection method

1. **Connect the power cord.**

   Align the Δ marking on the drive unit's power port with the arrow marking on the tip of the power cord, then insert the power cord until it clicks.

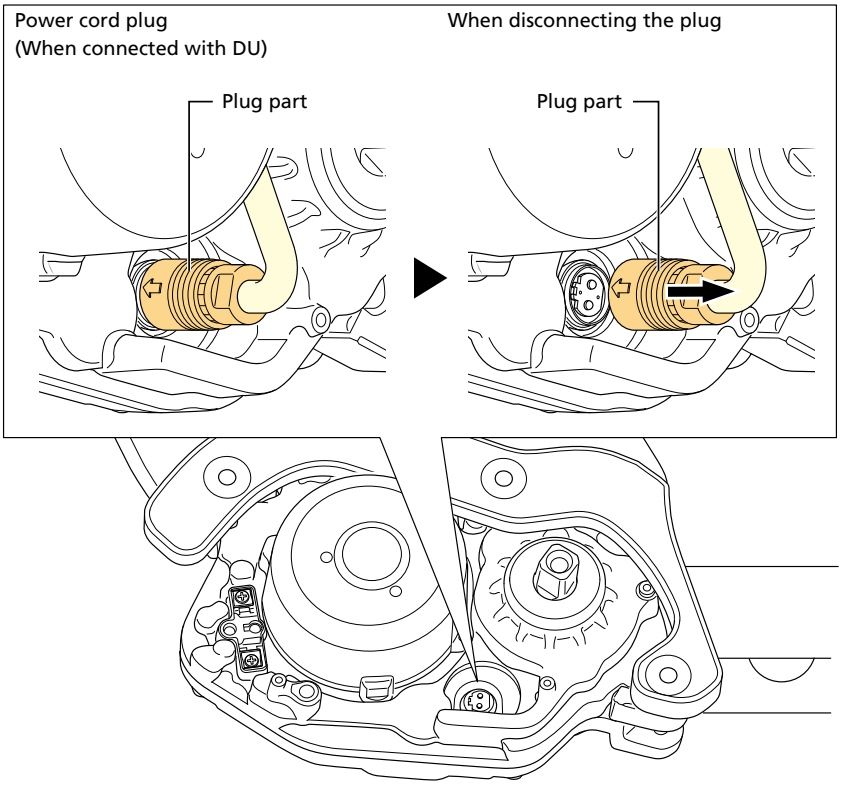
   * Check that it is securely connected.



Removal method

1. **Remove the power cord.**

   Hold the groove on the plug and slide the tip of the plug to pull it out, as shown in the figure.

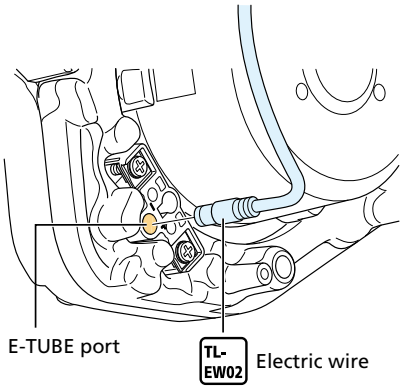

Power cord plug
(When connected with DU)
When disconnecting the plug
Plug part
Plug part

Connecting cockpit peripheral parts and electronic gear shifting components

Connect wires from the cockpit peripheral parts (such as the cycle computer and junction [A]) and (wires) from electronic gear shifting components to the drive unit's terminal block.

1. **Connect the electric wires to the drive unit's E-TUBE ports.**

   Connect the wire from either the cycle computer or junction [A]. Use junction [B] to also connect the wire from the electronic gear shifting component (rear derailleur or motor unit).



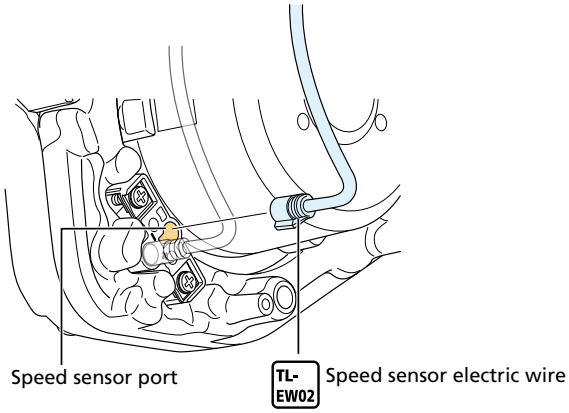
NOTICE

- Be sure to attach dummy plugs to any unused E-TUBE ports.

Connecting the speed sensor

Connect the speed sensor's electric wire to the drive unit's terminal block.

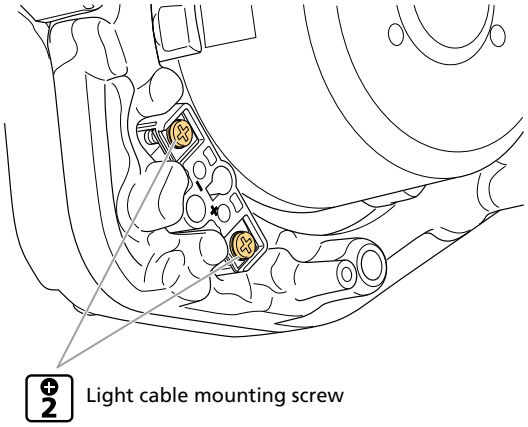
1. **Connect the electric wire to the drive unit's speed sensor port.**



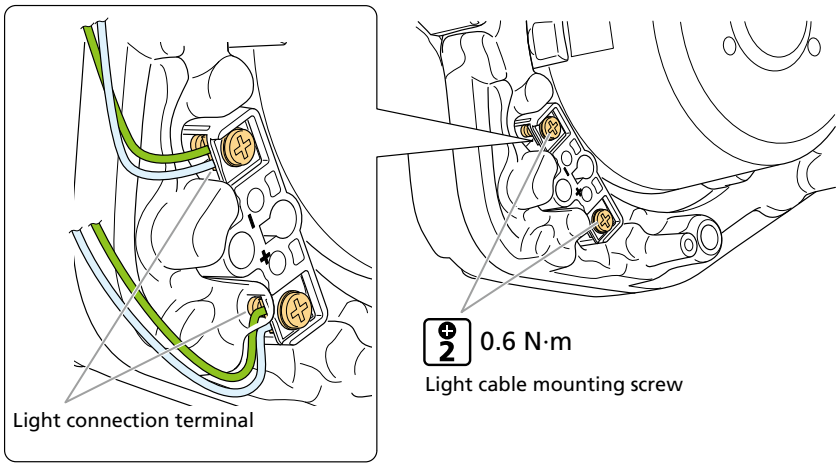
Connecting the light cables

Connect the wires connected to the front and rear lights to the drive unit.

1. **Loosen the light cable mounting screws.**



2. **Connect the light cables to the light connection terminals.**



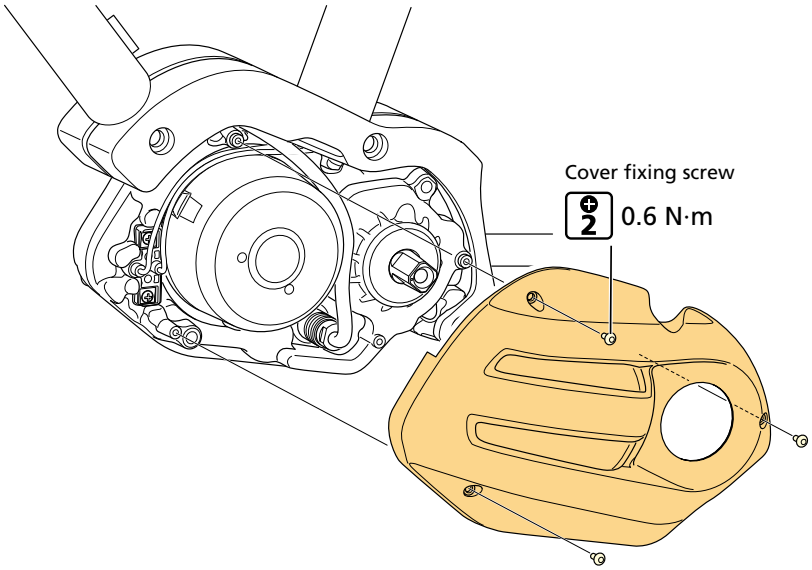
Installing the drive unit cover

- The appearance of the drive unit cover differs depending on the model, but the installation method is the same.
- When also using a drive unit cover from another company, refer to the manual for the frame.

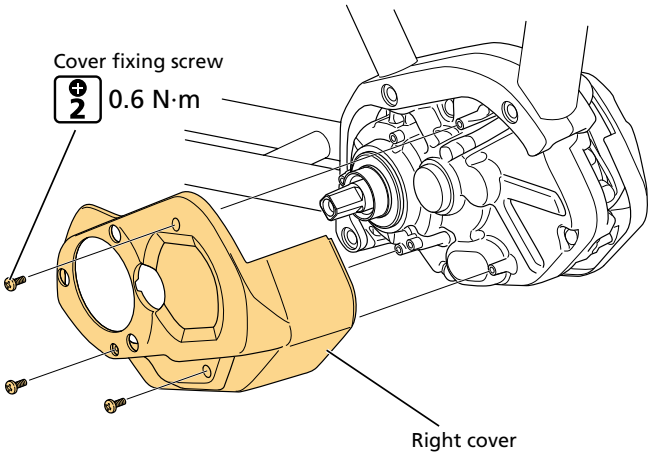
When only using a SHIMANO drive unit cover

For models: SM-DUE50-T, SM-DUE50-C

1. **Install the left cover.**



2. **Install the right cover.**

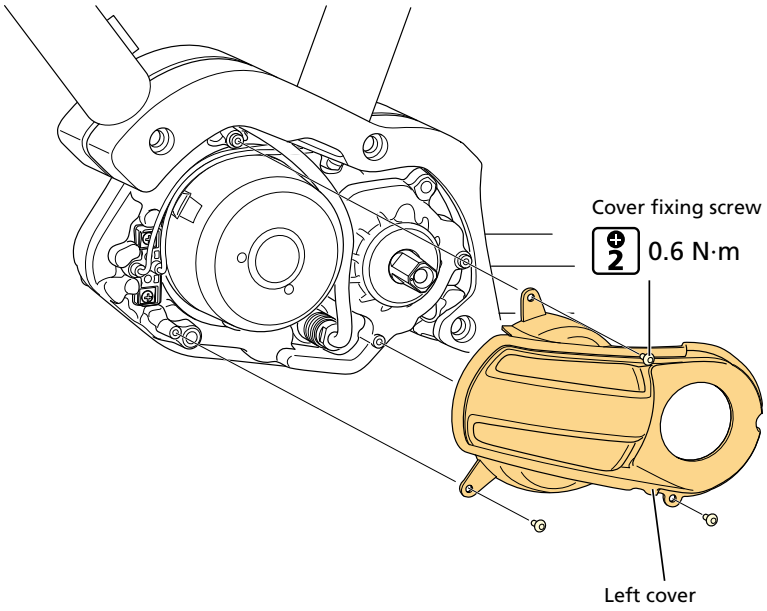


When also using a drive unit cover from another company

For models: SM-DUE50-TC, SM-DUE50-CC

Always install a drive unit cover from another company after installing the SHIMANO drive unit cover.

1. **Install the left cover.**


Cover fixing screw
2
0.6 N·m
Left cover

Installing the chainring and crank arms

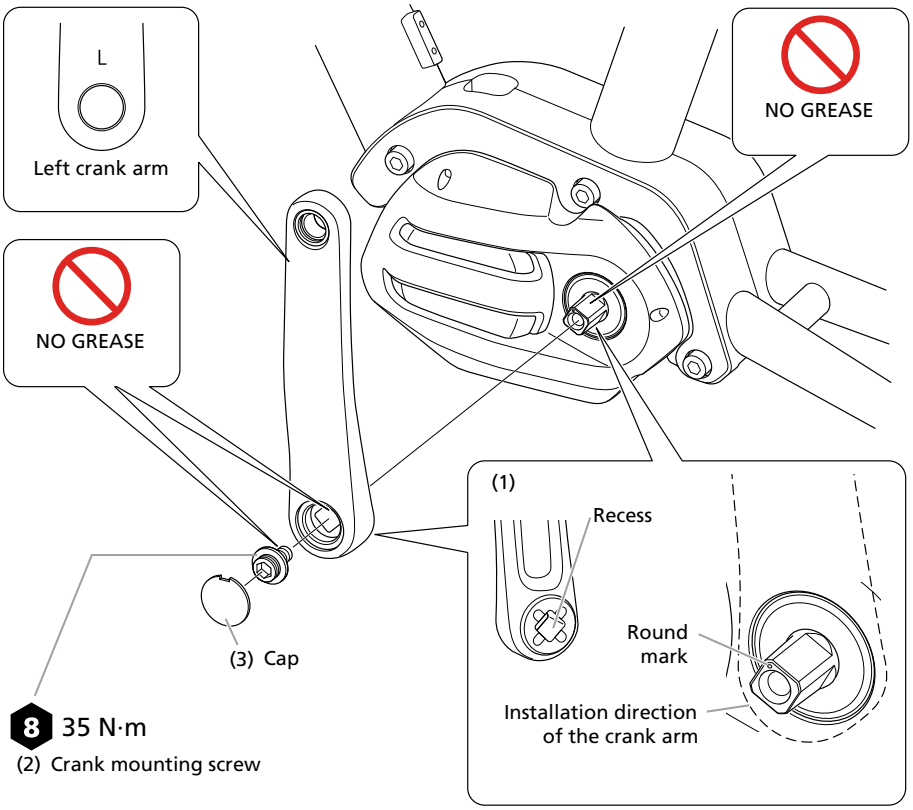
Install the rear wheel in the frame prior to performing the following procedures.

NOTICE

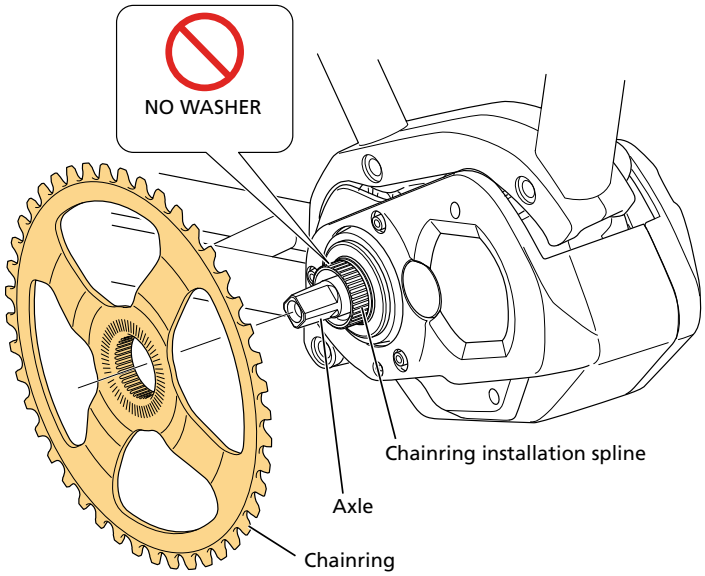
The drive unit has a sensor for detecting the load on the pedal, which is used to control assistance. This sensor may not operate normally if the right crank arm is touching the lock ring for chainring installation. In this state, assistance may be unstable or W013 / E010 may be displayed on the cycle computer and assist traveling may not be possible. Note the following when installing the chainring and crank arms:

- Do not apply grease to the drive unit axle, crank arm axle mounting hole, or crank mounting screw. The crank arm may inappropriately enter the drive unit side.
- Make sure to follow the specified tightening torque when installing the crank mounting screw.
- Do not insert a washer/spacer from another company between the chainring and drive unit.
- The lock ring and right crank arm are designed to not touch each other. After installing the chainring and right crank arm, check that there is a gap of 0.2 mm or more between the lock ring and the right crank arm.

1. **Install the left crank arm.**
   (1) Set with the recess of the left crank arm aligned with the shape of the drive unit axle.
   Set so that the round mark on the drive unit axle and installation direction of the crank arm are in the position shown in the figure.
   (2) Tighten the crank mounting screw.
   (3) Install the cap.



2. Install the chainring.

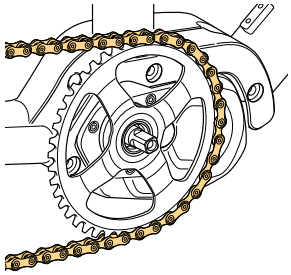


TECH TIPS

- There are three types of chainrings: those with a chain guard on both the inside and outside, those with a chain guard only on the outside, and those with no chain guard. The explanation in this section uses one without a chain guard.

3. Install the chain.

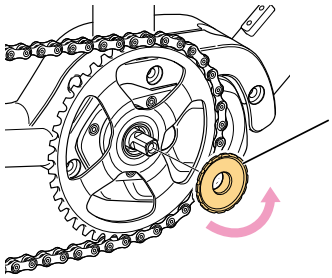
Refer to the dealer's manual for the chain to use.



4. Secure the chainring.

(1) Install the lock ring (left-hand thread) by hand.

(2) Use the SHIMANO original tool to tighten the lock ring while firmly pressing the left crank.



Lock ring
TL-FC39 + TL-FC36 35 - 45 N·m

When tightening the lock ring, the combination of tools indicated below can be used.

Tool combinations		
TL-FC39 + TL-FC32	TL-FC39 + TL-FC33	TL-FC39 + TL-FC36

NOTICE

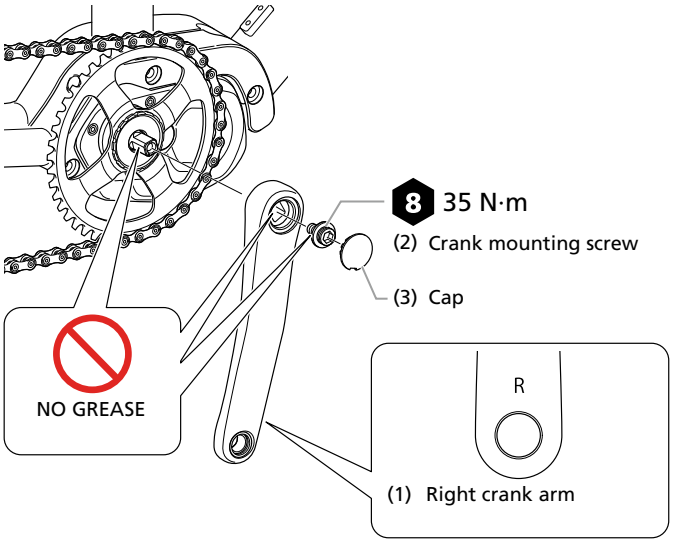
- Do not use an impact wrench.

5. Install the right crank arm.

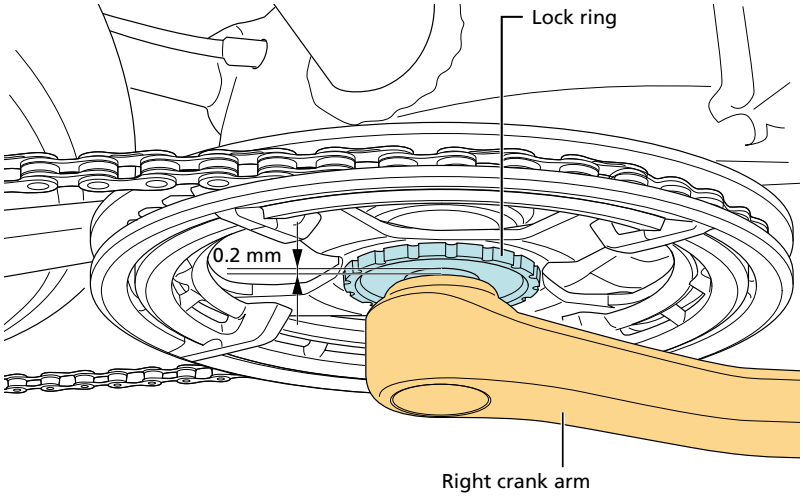
(1) Set the right crank arm in the opposite direction of the left crank arm.

(2) Tighten the crank mounting screw.

(3) Install the cap.



6. Check that there is an appropriate gap between the right crank arm and the lock ring.

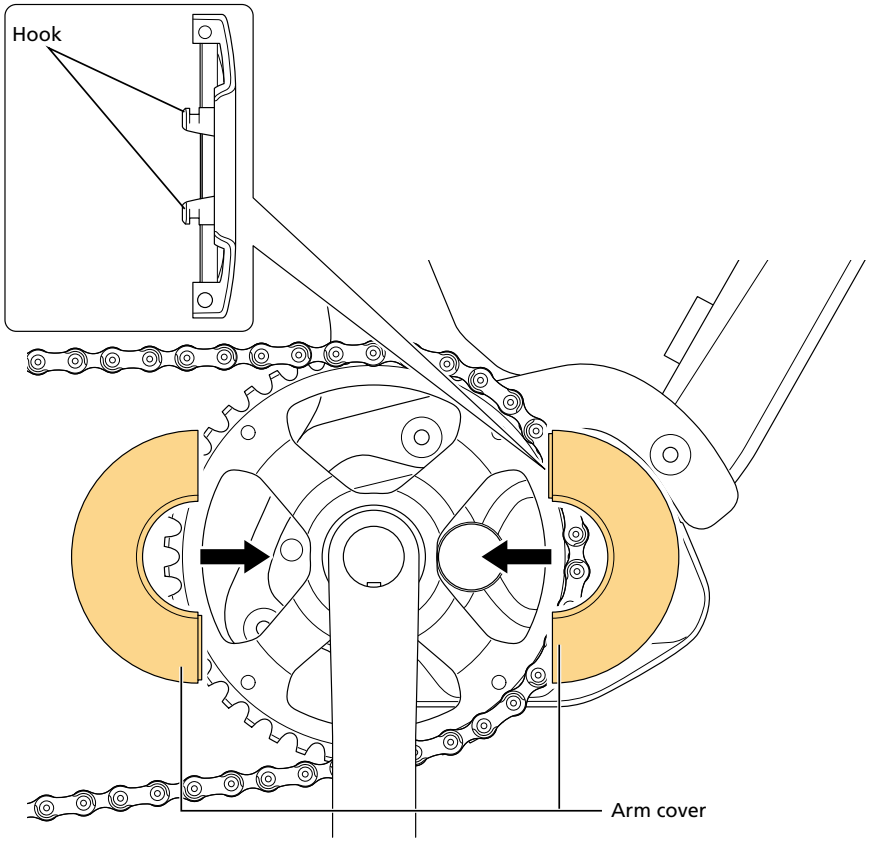


Installing the arm covers

If arm covers are included with the chainring, install the arm covers after installing the chainring to the drive unit.

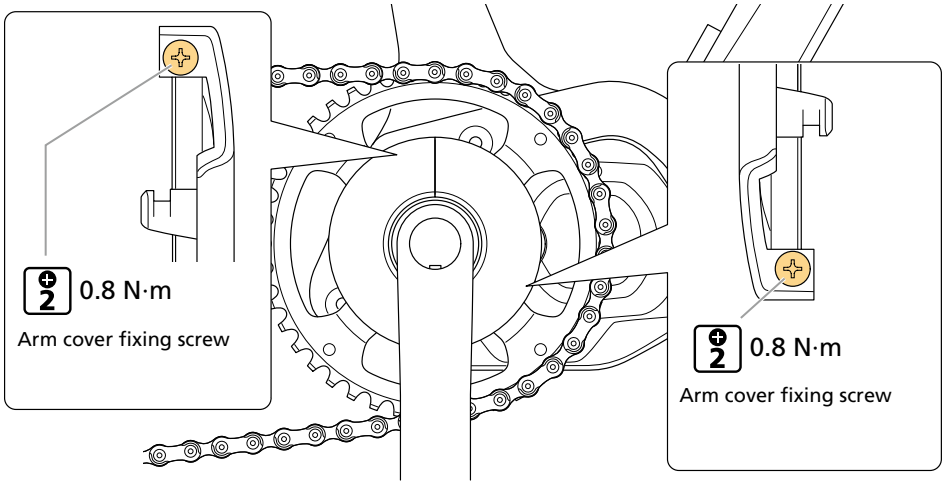
1. **Set the arm covers to the left and right sides of the chainring.**

   Install so that the hooks catch the spider arm on the chainring.



2. **Tighten the two arm cover fixing screws from the left and right.**

   For internal geared hub models, proceed to " Measuring and adjusting the chain tension ."



Measuring and adjusting the chain tension

The chain tension must be adjusted for internal geared hub models.

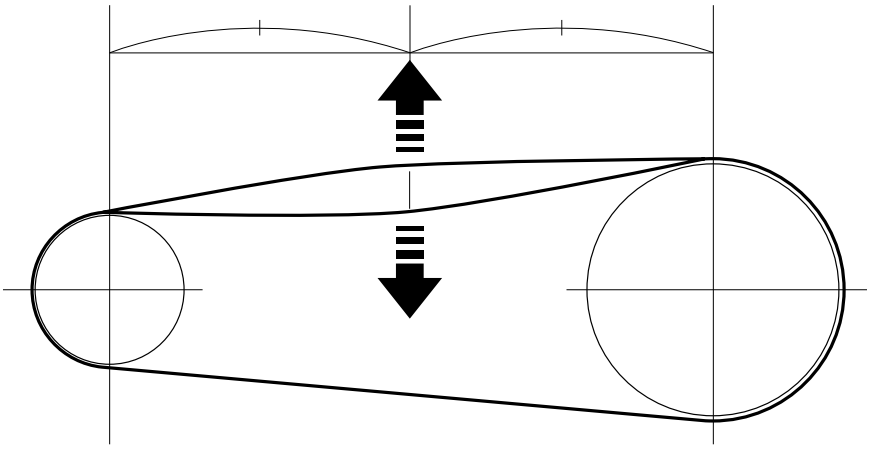
NOTICE

- The proper level of assistance may not be achieved if the chain tension is too high.

Manual adjustment

1. **Check and adjust the chain tension.**

   Pull the upper side of the chain up and down with a force of approximately 10 N (1 kgf), roughly in the middle between the drive unit axle and rear wheel axle. Adjust the chain tension so that the chain has a slack of 15 mm or more.



Measuring and adjusting with TL-DUE60

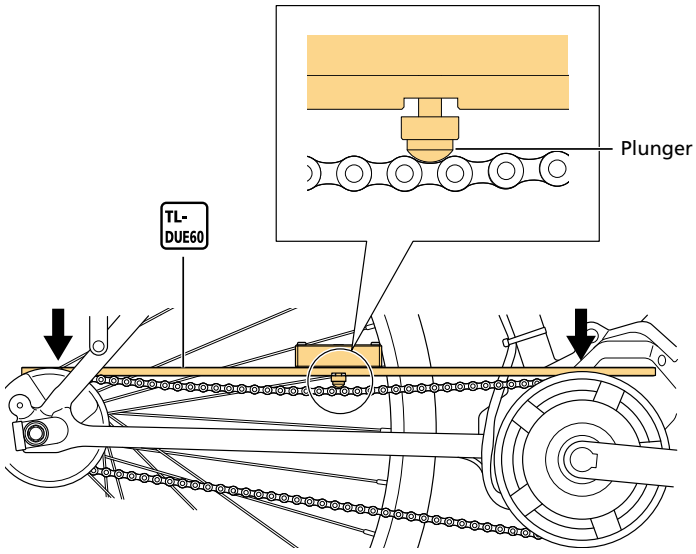
When using chain tension measurement tool TL-DUE60, you can measure and adjust the chain tension from either the top or bottom of the chain.

Measuring and adjusting from the upper side of the chain

1. **Set TL-DUE60.**

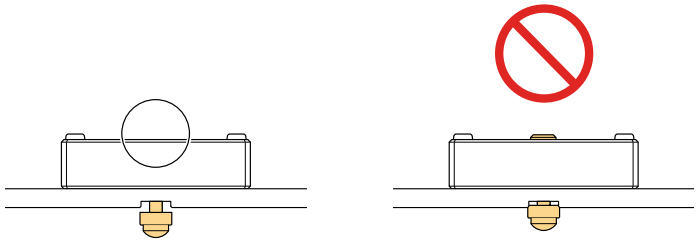
   (1) Set TL-DUE60 to the upper side of the chain.

   (2) Push TL-DUE60 down, and make it touch the chainring and rear sprocket.



2. **Adjust the chain tension so the plunger depresses slightly.**

   Make sure the top of the plunger does not stick out of the top of the frame.

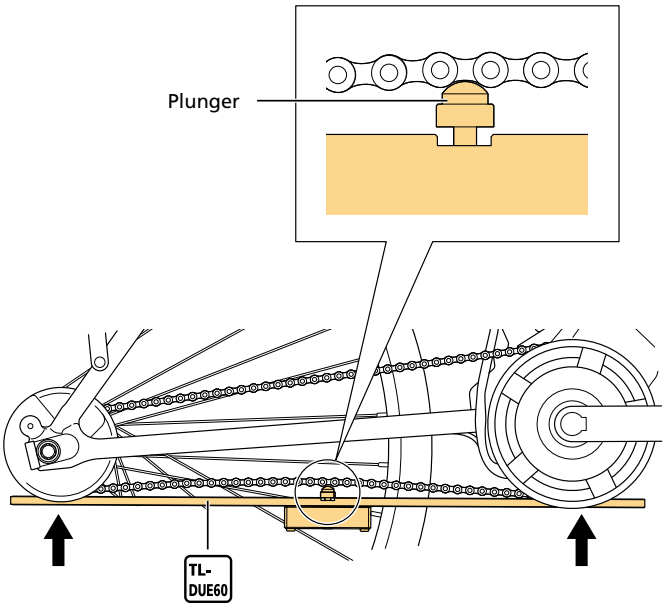


Measuring and adjusting from the lower side of the chain

1. **Set TL-DUE60.**

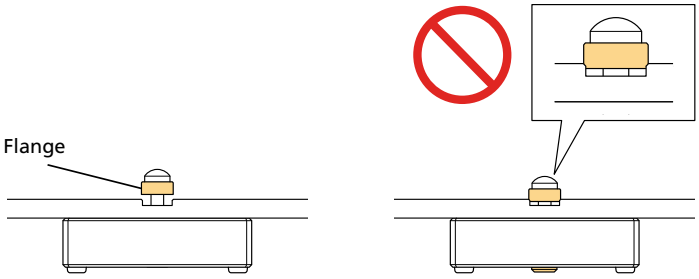
   (1) Set TL-DUE60 to the lower side of the chain.

   (2) Push TL-DUE60 up, and make it touch the chainring and rear sprocket.



2. **Adjust the chain tension so the plunger depresses slightly.**

Make sure that the flange of the plunger does not sink into the hollow of the frame.



Connection and communication with devices

Connecting the bicycle to a device allows you to configure the system, update firmware, and more. Refer to the “ SHIMANO STEPS Cycle Computer User's Manual ” and the “ SHIMANO STEPS Special Cycle Computer and Switch Unit Parts Dealer's Manual ”.

Maintenance

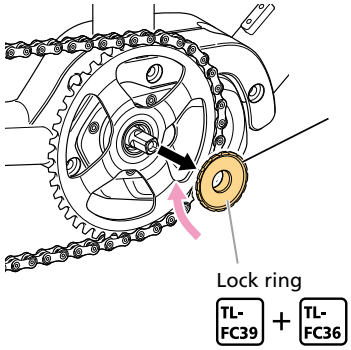
Replacing the chainring

When replacing the chainring, make sure that the chain is attached.

Refer to " Installing the chainring and crank arms " and " Installing the arm covers " for detailed instructions.

1. **Remove the right crank arm.**
2. **Remove the arm cover if it is attached.**
3. **Remove the lock ring (left-hand thread).**

   Hold the rear wheel firmly while removing the lock ring to keep the chainring from turning.

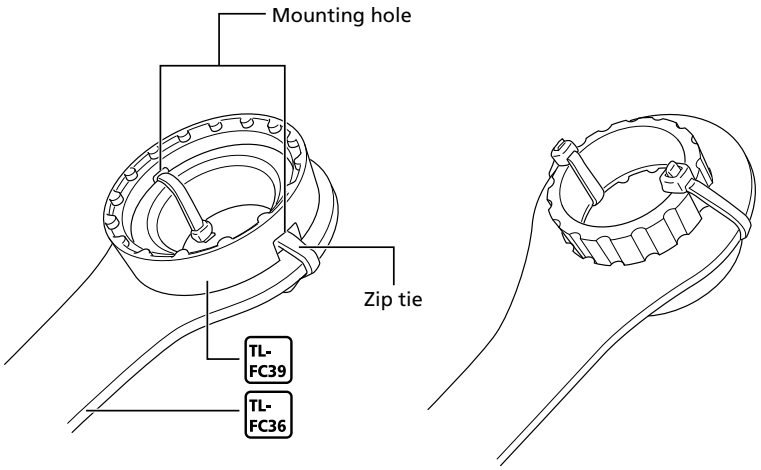


When removing the lock ring, the combination of tools indicated below can be used.

Tool combinations		
TL-FC39 + TL-FC32	TL-FC39 + TL-FC33	TL-FC39 + TL-FC36

TECH TIPS

- The TL-FC39 can be secured to the TL-FC36 with zip ties as indicated in the figure.



4. **Replace the chainring.**

   Remove the chainring, then install a new chainring.

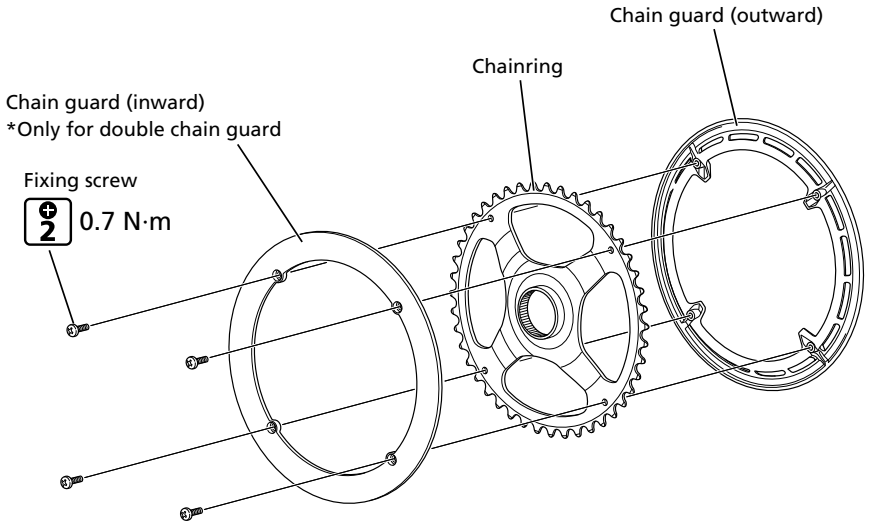
Replacing the chain guard

To replace the chain guard, first remove the chainring from the bicycle.

Refer to the previous item “ Replacing the chainring ” for information on how to remove the chainring.

1. **Remove the chainrings.**
2. **Remove the chain guard then replace it with a new chain guard.**

   The figure shows a double chain guard. The procedure is the same for replacing a single chain guard.



Replacing the arm cover

The arm cover can be replaced with the chainring attached to the drive unit. Refer to “ Installing the arm covers .”

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