

SERVICE INSTRUCTIONS

INSTRUCTIONS DE MONTAGE

INSTRUCCIONES DE SERVICIO

取扱説明書



# **DURA-ACE**

## **ST-7970**

DUAL CONTROL LEVER

Levier à commande double

Palanca de doble control

デュアルコントロールレバー



**S**  **IS**  
SHIMANO ELECTRONIC INTELLIGENT SYSTEM

# **SHIMANO**

**INDEX** English 3 – 14

- Gear shifting operation ..... 4
- Installation ..... 5
- Adjustment ..... 6
- Other lever operation functions ..... 10
- Maintenance ..... 11

**INDEX** French 15 – 26

- Fonctionnement du changement de vitesses ..... 16
- Montage ..... 17
- Réglage ..... 18
- Autres fonctions d'utilisation des leviers ..... 22
- Entretien ..... 23

**INDEX** Spanish 27 – 38

- Funcionamiento de los cambios ..... 28
- Instalación ..... 29
- Ajuste ..... 30
- Otras funciones de la palanca ..... 34
- Mantenimiento ..... 35

**もくじ** Japanese 39 – 50

- 変速操作方法 ..... 40
- 取付け ..... 41
- 調整 ..... 42
- その他のレバー操作機能 ..... 46
- メンテナンス ..... 47

## General Safety Information

### WARNING

- When the shifting switch is operated, the motor which drives the front derailleur will operate without stopping at the shifting lever position. Always be sure to remove the battery before carrying out installation and adjustment, otherwise your fingers may become stuck.
- Obtain and read the service instructions carefully prior to installing the parts. Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. We strongly recommend only using genuine Shimano replacement parts.
- Obtain and read the service instructions carefully prior to installing the parts. If adjustments are not carried out correctly, the chain may come off and this may cause you to fall off the bicycle which could result in serious injury.
- Use the ST-7970 with the BR-7900. Do not use the BR-7900 in combination with previous STI levers for road riding or with the BL-R770/ BL-R550 brake levers for flat handlebars, otherwise the braking performance provided will be much too strong.
- Because of the characteristics of the carbon fiber material, you must never modify the levers, otherwise the lever may break and the brakes may no longer work as a result.
- Before riding the bicycle, check that there is no damage such as carbon fiber peeling or cracking. If there is any damage, replace with a new part immediately without trying to repair the damage, otherwise the lever may break and the brakes may no longer work as a result.
- Read these Technical Service Instructions carefully, and keep them in a safe place for later reference.

### Note

- RD-7970: Be sure to adjust the top adjustment bolt and the low adjustment bolt by following the procedures in the Service Instructions. If these bolts are not adjusted, the chain may become clamped between the spokes and the large sprocket and the wheel may lock, or the chain may slip onto the small sprocket.
- Use a soft cloth to clean the carbon fiber levers, and be sure to moisten the cloth with neutral detergent before using it, otherwise the lever material may become damaged and lose its strength.
- Avoid leaving the carbon fiber levers in places where high temperatures are present. Also keep them well away from fire.
- Operation of the levers related to gear shifting should be made only when the front chainwheel is turning.
- Always be sure to use the TL-EW01 special tool to remove the cable.
- Be careful not to let water get into the terminal.
- Parts are not guaranteed against natural wear or deterioration resulting from normal use.
- For maximum performance we highly recommend Shimano lubricants and maintenance products.
- For any questions regarding methods of installation, adjustment, maintenance or operation, please contact a professional bicycle dealer.

In order to realize the best performance, we recommend that the following combination be used.

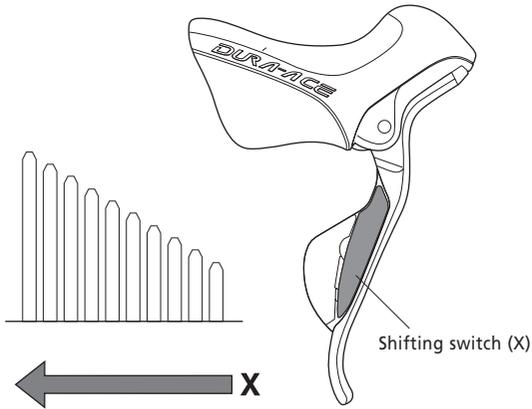
Series	DURA-ACE
Dual control lever	ST-7970
Electric cable	EW-7970/7972/7973/7975, SM-EW79A
Battery / Battery charger	SM-BTR1 / SM-BCR1
Gears	20
Front derailleur	FD-7970
Front chainwheel	FC-7900
Rear derailleur	RD-7970
Freehub	FH-7900
Cassette sprocket	CS-7900 (Except for 11-28T)
Chain	CN-7900
Caliper brake	BR-7900

## Gear shifting operation

### ■ Rear shifting switch operation

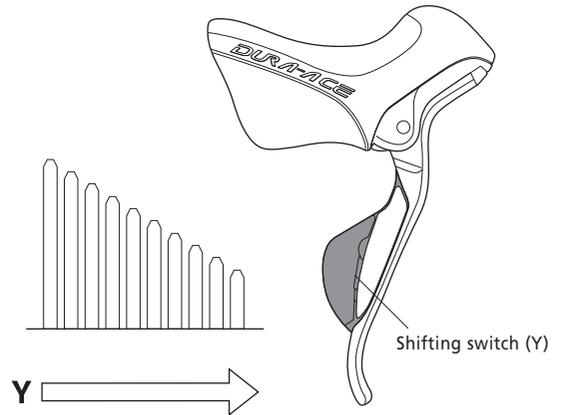
#### < Shifting switch (X) >

The chain moves from a small sprocket to a larger sprocket each time the switch is operated.



#### < Shifting switch (Y) >

The chain moves from a large sprocket to a smaller sprocket each time the switch is operated.



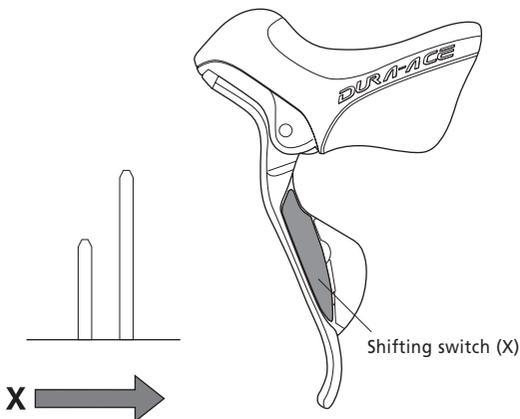
The checker (SM-EC79) can be used to shift up and shift down shifting switches (X) and (Y).

\* For details on the shifting switch selection method, refer to the Service Instructions for the checker.

### ■ Front shifting switch operation

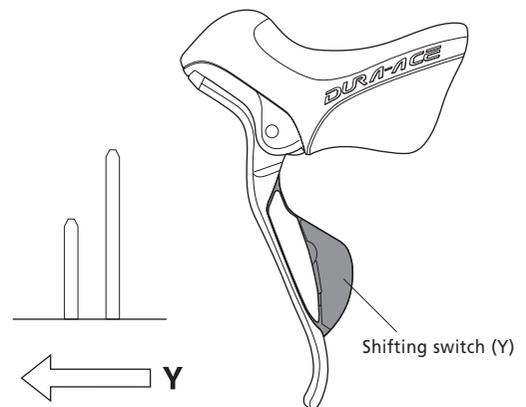
#### < Shifting switch (X) >

The chain moves from the small chainring to the large chainring.



#### < Shifting switch (Y) >

The chain moves from the large chainring to the small chainring.



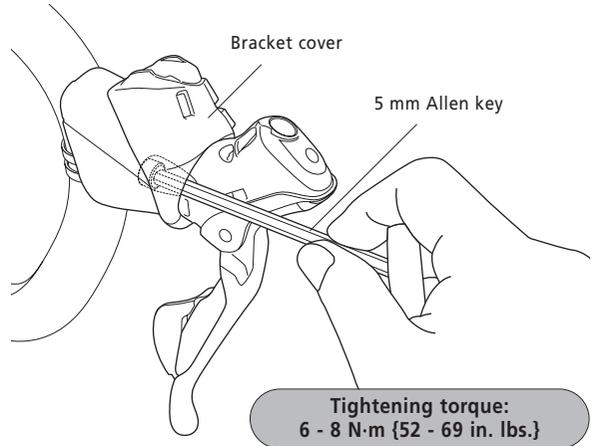
If the chain falls off on the inside, keep pressing shifting switch (X) to move the front derailleur to the outermost position in order to reset the chain.

# Installation

## ■ Installation to the handlebars

Wind the bracket cover from the front, and then use a 5 mm Allen key to tighten the mounting nut in order to secure the bracket cover.

When installing the components to carbon frame/handle bar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.



## ■ Installation of the brake cables

Cables used

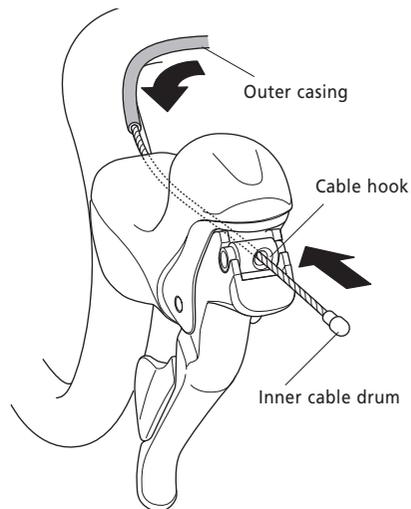
- Inner cable (PTFE inner cable) ..... 1.6 mm dia.



- SLR outer casing ..... 5 mm dia.



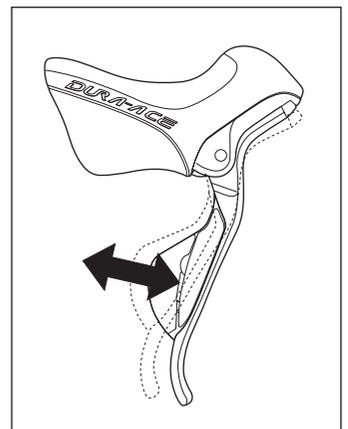
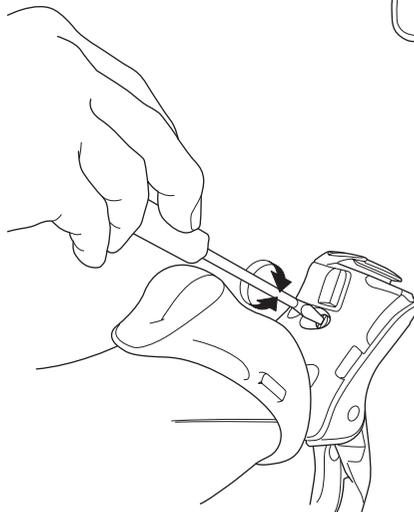
Use cables which are long enough so that they still have some slack even when the handlebars are turned as far as they will go to the left and to the right.



1. Gently pull the brake lever.

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

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



\* Refer to the Service Instructions for the electric cables when connecting and routing the electric cables.

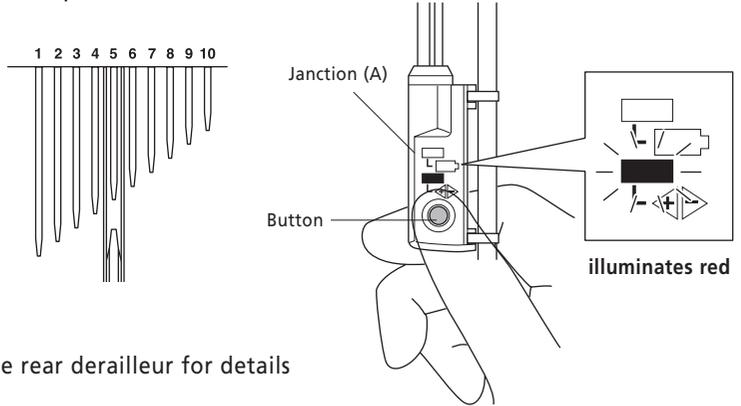
# Adjustment

## ■ Adjustment of the rear derailleur (RD-7970)

1. Install the battery.
2. Shift the rear derailleur to the 5th sprocket position.

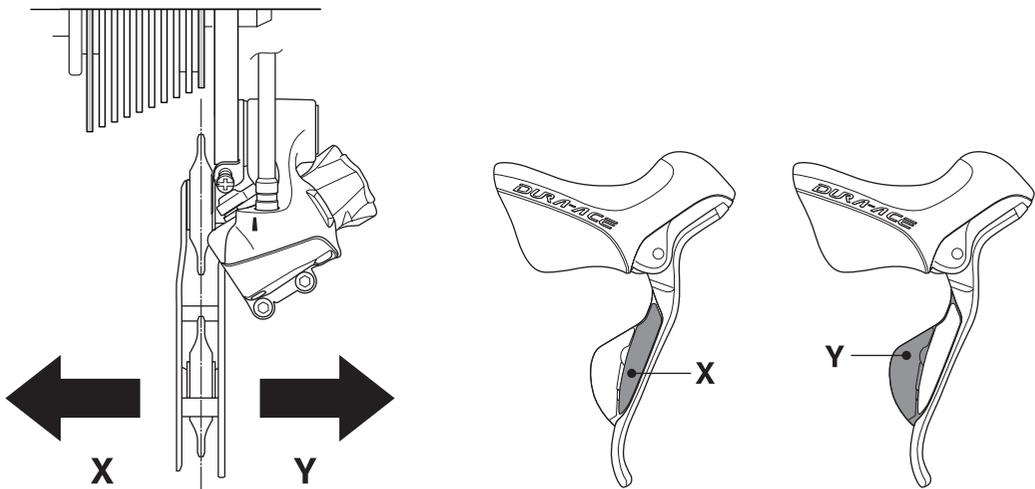
Press the button at the junction (A) of the SM-EW79A until the red LED turns on in order to switch to rear derailleur adjustment mode.

Note that if you keep pressing the button after the red LED has turned on, protection recovery operation will begin.



\* Refer to the Service Instructions for the rear derailleur for details on the protection function.

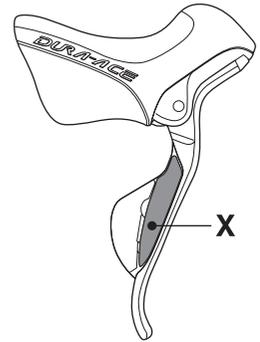
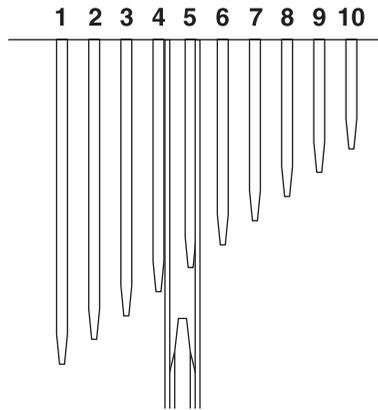
3. If shifting switch (X) is pressed once, the guide pulley will move one step toward the inside.  
If shifting switch (Y) is pressed once, the guide pulley will move one step toward the outside.  
The guide pulley can move 12 steps inward and 12 steps outward from the initial position, for a total of 25 positions.



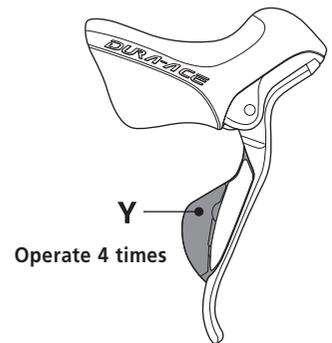
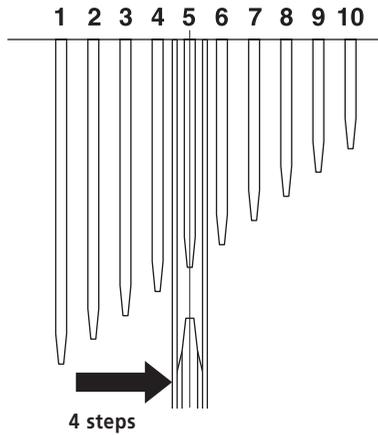
When adjusting, the guide pulley will overrun slightly and then move back in an exaggerated movement so that you can check the adjustment direction.

When checking the positions of the guide pulley and the sprocket, check at the position where the guide pulley finally stops.

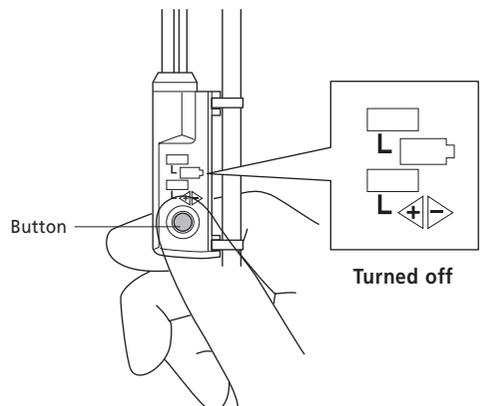
4. While turning the crank arm, operate shifting switch (X) to move the guide pulley toward the inside until the chain touches the 4th sprocket and makes a slight noise.



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



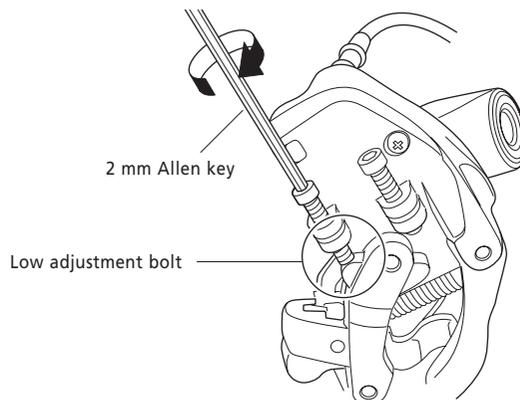
Press the button at junction (A) until the red LED turns off in order to switch from rear derailleur adjustment mode to gear shifting mode. Shift to each gear and check that no noise is generated at any gear position. If fine adjustment is needed, switch back to adjustment mode and readjust the rear derailleur.



5. Next, carry out the adjustments for the low adjustment bolt and top adjustment bolt.

**< Low adjustment >**

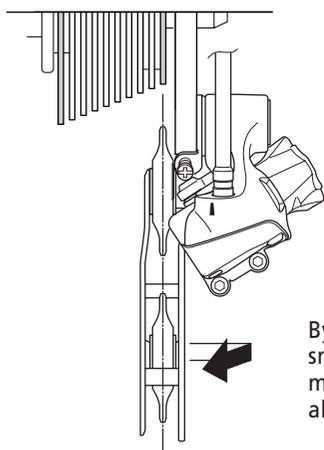
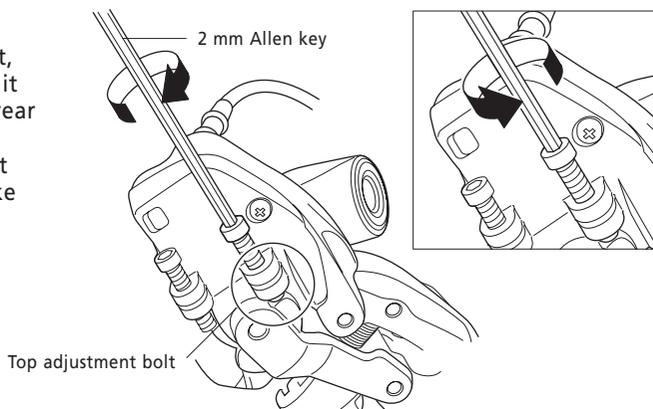
Shift the rear derailleur to the largest sprocket, and then tighten the low adjustment bolt until it touches the stopper.



**< Top adjustment >**

Shift the rear derailleur to the smallest sprocket, and then tighten the top adjustment bolt until it touches the stopper at the position where the rear derailleur finally stopped.

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



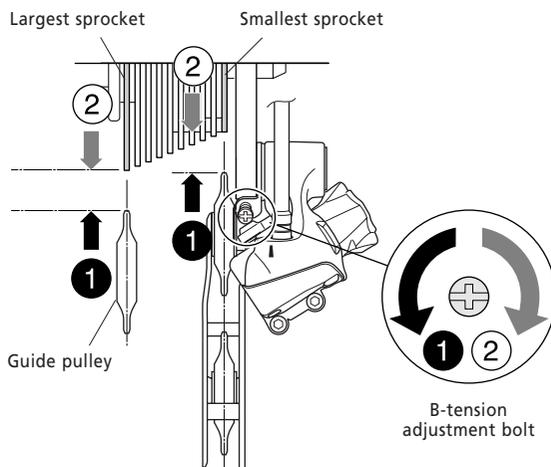
By shifting from the largest sprocket to the smallest sprocket, the rear derailleur will move toward the outside by the over-stroke allowance and then move back.

### 6. B-tension adjustment bolt adjustment

Set the chain onto the small chainring and the largest sprocket, and then turn the crank arm backward.

Turn the B-tension adjustment bolt to adjust so that the guide pulley moves close to the sprocket without obstructing the chain.

Next, set the chain onto the smallest sprocket and check in the same way that the guide pulley does not obstruct the chain.



### ■ Adjustment of the front derailleur (FD-7970)

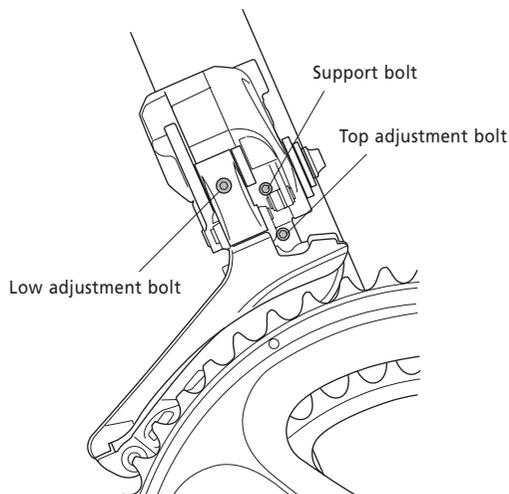
#### ⚠ WARNING

When the shifting switch is operated, the motor which drives the front derailleur will operate without stopping at the shifting lever position.

Always be sure to remove the battery before carrying out installation and adjustment, otherwise your fingers may become stuck.

#### Note:

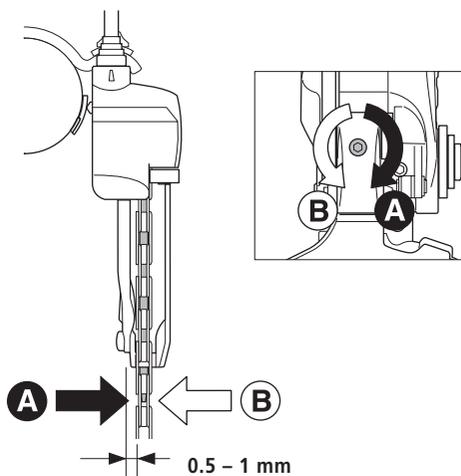
The low adjustment bolt, the top adjustment bolt and the support bolt are close to each other. Make sure that you are using the correct bolt for adjustment.



#### < Low adjustment >

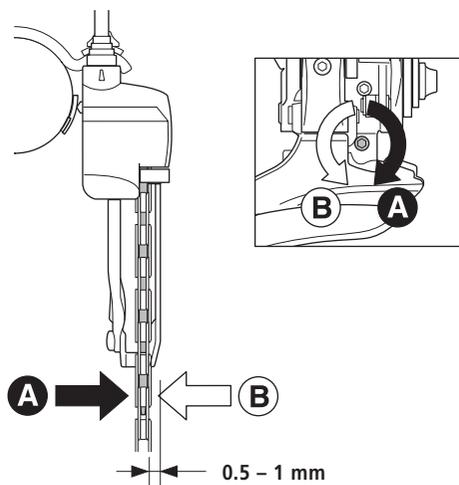
Set the chain onto the small chainring and the largest sprocket.

Use a 2 mm Allen key to turn the low adjustment bolt to adjust so that there is a clearance of 0.5 - 1 mm between the chain and the chain guide inner plate.



## &lt; Top adjustment &gt;

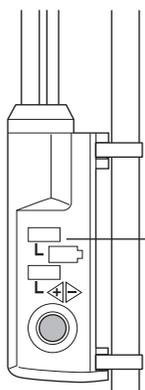
Next, set the chain onto the large chainring and the smallest sprocket.  
Use a 2 mm Allen key to turn the top adjustment bolt to adjust so that there is a clearance of 0.5 - 1 mm between the chain and the chain guide outer plate.  
Move the front derailleur and the rear derailleur to all gear positions, and check that the chain guide does not touch the chain.



## Other lever operation functions

## &lt; Battery charge indicator &gt;

Press and hold either shifting switch for 0.5 seconds or more.  
You can check the amount of battery charge remaining using the battery indicator on top of junction (A).



## Battery indicator

100 %		Illuminates green (for 2 seconds)
50 %		Flashes green (5 times)
25 %		Illuminates red (for 2 seconds)
0 %		Flashes red (5 times)

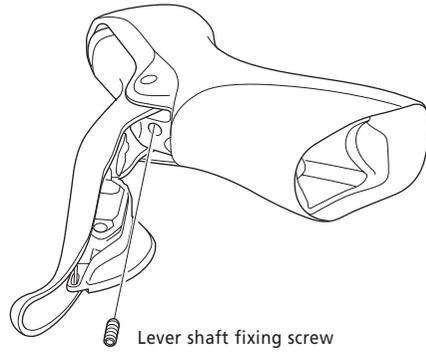
\* When the battery charge is low, first the front derailleur will stop operating, and then the rear derailleur will stop operating. When the battery is fully spent, the derailleurs will stop at the positions where they were last shifted to. If the battery indicator is illuminated red, it is recommended that you recharge the battery as soon as possible.

## Maintenance

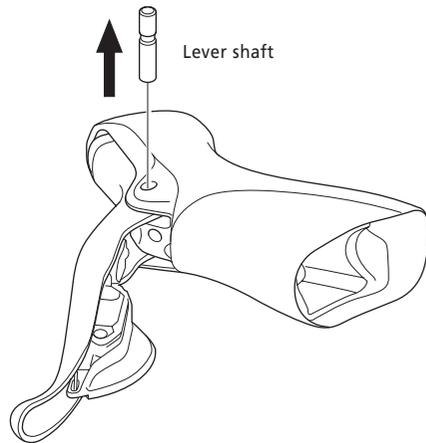
\* The illustrations show the right-side lever.

### ■ Disassembly of the bracket unit and lever unit

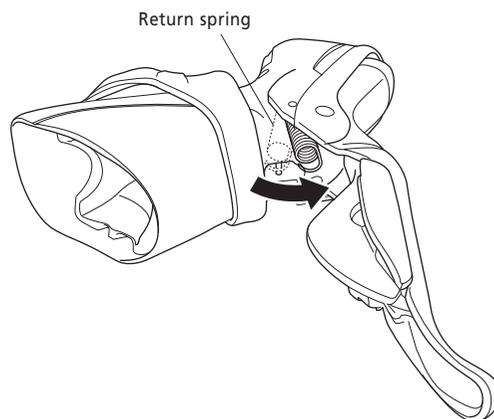
1. Use a 2 mm Allen key to remove the lever shaft fixing screw at the bottom of the bracket unit.



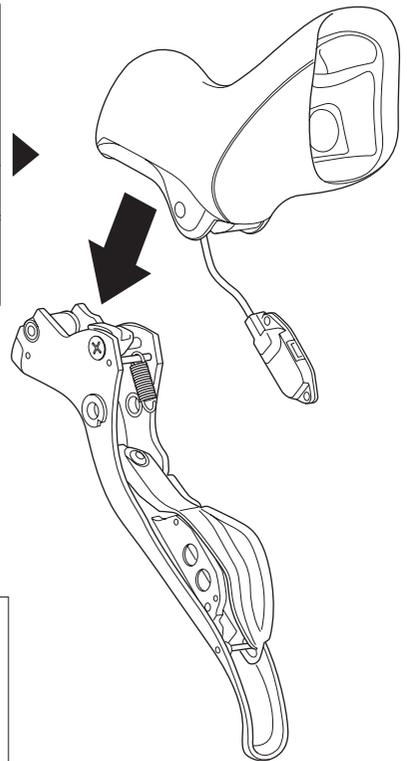
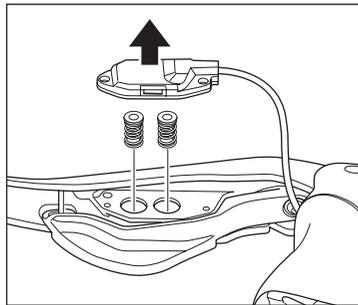
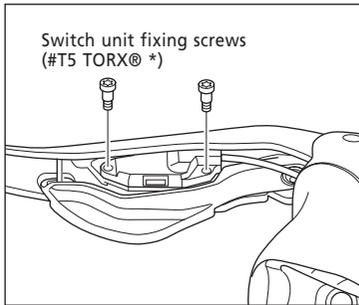
2. Tap an Allen key or similar tool with a plastic mallet to push out the lever shaft.



3. Remove the return spring.



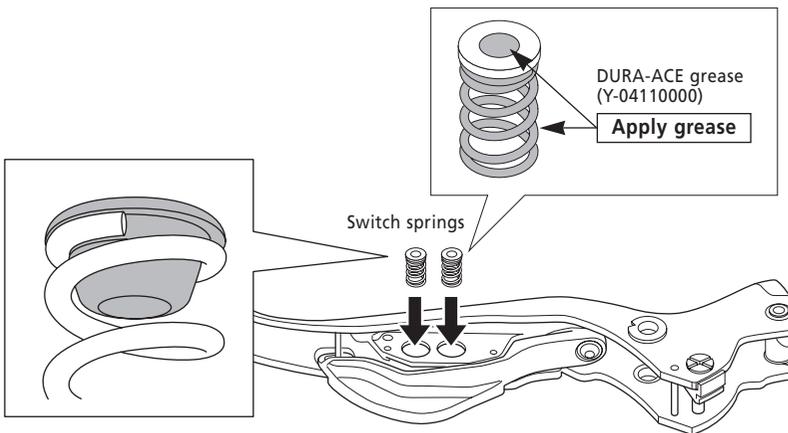
4. Remove the two switch unit fixing screws, and then remove the switches and the switch springs. The bracket unit and the lever unit can then be disassembled.



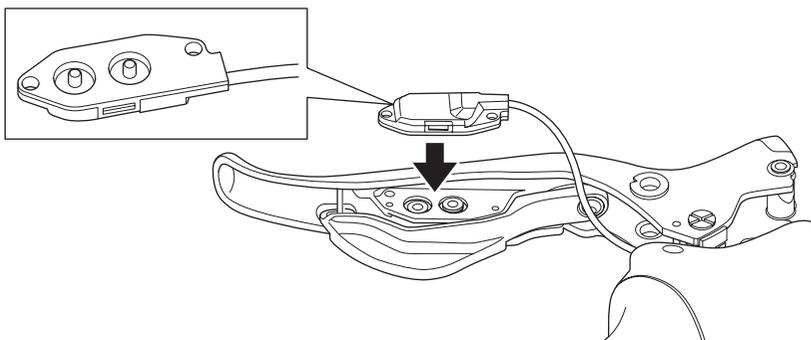
\* TORX is a registered trademark of Camcar LLC.

## ■ Assembly of the switch unit

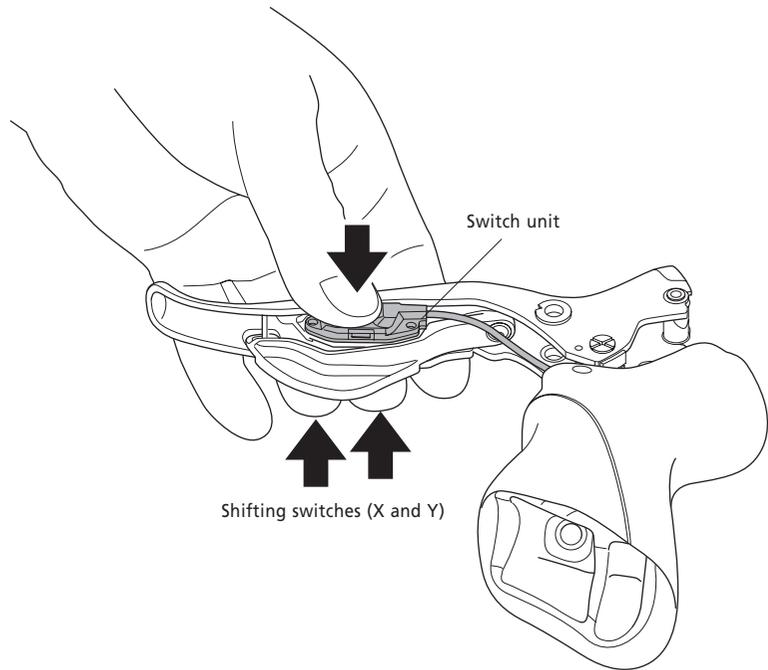
1. Check that the buttons are attached to the springs, and then place the switch springs into the holes in the switch lever setting plate.



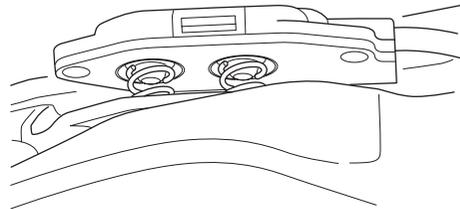
2. Place the switch unit against the mounting surface of the switch unit setting plate.



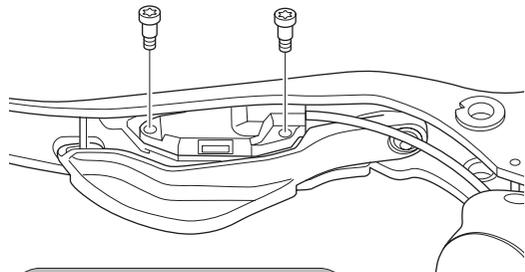
3. Press the switch unit by hand so that the switch springs go into the grooves in the buttons, and then push the shifting switches (X and Y) in as far as they will go.



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



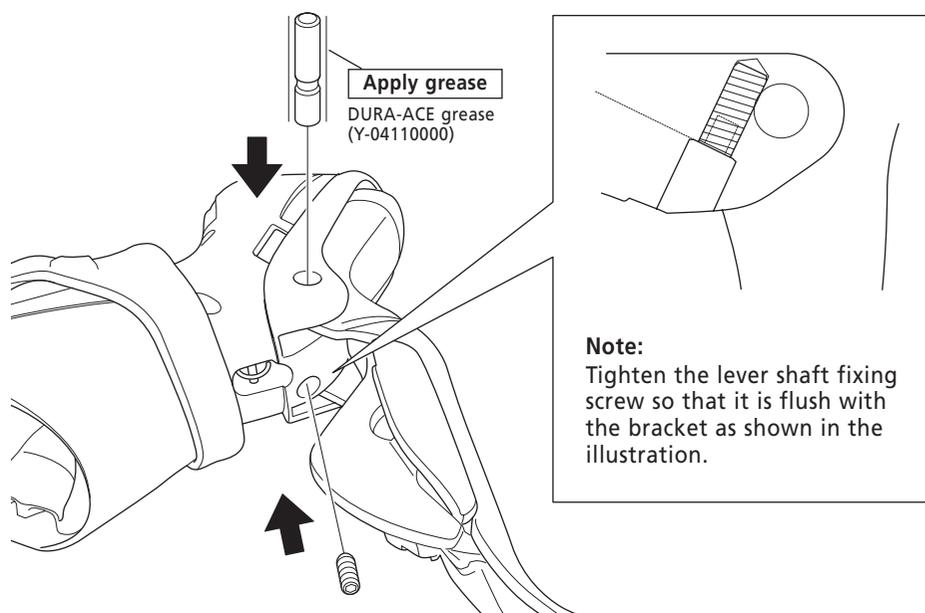
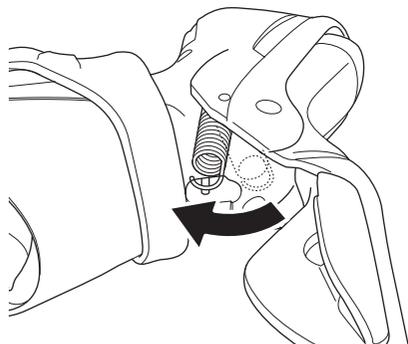
5. Return the switch unit to the setting position for the switch unit setting plate, and while pressing it by hand, operate the shifting switches (X and Y) once more and check that the switches turn on. Install the switch using the switch unit fixing screws.



**Tightening torque:**  
0.18 N·m {1.5 in. lbs.}

## ■ Assembly of the bracket unit and lever unit

1. Assemble the bracket unit and the lever unit, attach the return spring, and then press-fit the lever shaft so that it is facing in the correct direction. Then tighten the lever shaft fixing screw to secure the lever shaft.



\* Operate the shifting switches (X and Y) and check that they turn on, and check that the lever operates smoothly.



**DURA-ACE**

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\* Service Instructions in further languages are available at :  
**<http://techdocs.shimano.com>**

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