

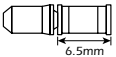
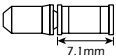


Front Drive System

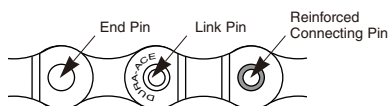
General Safety Information

⚠ WARNING

- Use neutral detergent to clean the chain. Do not use alkali-based or acid based detergent such as rust cleaners as it may result in damage and/or failure of the chain.
- Use the reinforced connecting pin only for connecting the narrow type of chain.
- There are two different types of reinforced connecting pin available. Be sure to check the table below before selecting which pin to use. If connecting pins other than reinforced connecting pins are used, or if a reinforced connecting pin or tool which is not suitable for the type of chain is used, sufficient connection force may not be obtained, which could cause the chain to break or fall off.

Chain	Reinforced connecting pin	Chain tool
9-speed super narrow chain such as CN-7701 / CN-HG93	 Silver	TL-CN31/TL-CN22
8-/7-/6-speed narrow chain such as CN-HG50 / CN-IG51	 Black	TL-CN31/TL-CN22 and TL-CN30/TL-CN21

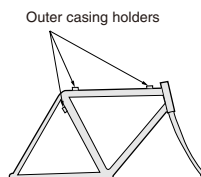
- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut at some other place than the place where the chain has been joined using a reinforced connecting pin or an end pin. The chain will be damaged if it is cut at a place where it has been joined with a reinforced connecting pin or an end pin.



- Be careful not to let the cuffs of your clothes get caught in the chain while riding, otherwise you may fall off the bicycle.
 - Check that the tension of the chain is correct and that the chain is not damaged. If the tension is too weak or the chain is damaged, the chain should be replaced. If this is not done, the chain may break and you may fall off the bicycle.
 - Check that there are no cracks in the crank arms before riding the bicycle. If there are any cracks, the crank arm may break and you may fall off the bicycle.
 - Obtain and read the service instructions carefully prior to installing the parts. Loose, worn, or damaged parts may cause injury to the rider.
- We strongly recommend only using genuine Shimano replacement parts.
- Read these Technical Service Instructions carefully, and keep them in a safe place for later reference.

Note

- Be sure to use a 9-speed super narrow chain.
- In addition, if pedaling performance does not feel normal, check this once more.
- Check that there is no looseness in any joints or connections before riding the bicycle. (BB-FC, FC-PD)
- Do not wash the bottom bracket with high-pressure jets of water.
- If you feel any looseness in the bottom bracket axle, the bottom bracket should be replaced.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.
- Apply grease to the bottom bracket before installing it.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.
- You should periodically wash the chainrings in a neutral detergent and then lubricate them again. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the useful life of the chainrings and the chain.
- If the chain keeps coming off the chainrings during use, replace the chainrings and the chain.
- This front derailleur is for triple front chainwheel use only. It cannot be used with the double front chainwheel, as the shifting points do not match.
- When installing the top route type, choose a frame that has three outer casing holders as shown in the illustration at right.



- Use an outer casing which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- Operation of the levers related to gear shifting should be made only when the front chainwheel is turning.
- 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.

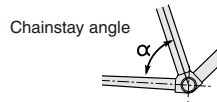
Series	NEXAVE
Shifting lever	ST-C503
Outer casing	SP40 sealed outer casing
Front derailleur	FD-C510 / FD-C511
Front chainwheel	FC-C503
Bottom bracket	BB-UN25-K (122.5 mm)
Chain	CN-HG73
Bottom bracket cable guide	SM-SP18 / SM-BT18

Specifications

Front Derailleur

Model number	FD-C511	FD-C510
Normal type	○	
Top route type	○	
Front chainwheel tooth difference	22T	
Min. difference between top and intermediate	12T	
Front derailleur installation band diameter	S, M, L	
Chainstay angle (α)	63° - 66°, 66° - 69°	
Applicable front chainwheel	FC-C503	

Installation band diameters: S (28.6 mm), M (31.8 mm), L (34.9 mm)



Chainwheel

Model number	FC-C503
Chainwheel tooth combination	46T-34T-24T
Bolt circle diameter	110 mm / 64 mm
Crank arm length	170 mm / 175 mm

Bottom Bracket

Type	Chain line	Shell width	Spindle length	Thread dimensions
Triple	48 mm + t	68 mm	122.5 mm	BC1.37 X 24 T.P.I.

t : Chain case thickness; t < 2.5 mm

Installation of the Front Derailleur, Bottom Bracket and Front Chainwheel

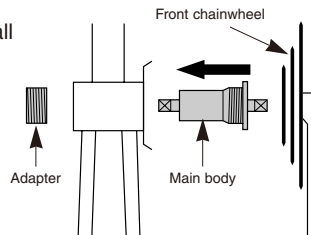
Install using the TL-UN74 special tool. First install the main body, then the adapter. After this, use the TL-FC10 to install the front chainwheel.

Adapter / bottom bracket tightening torque:

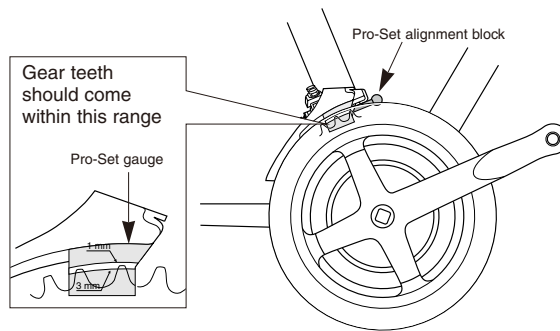
50 - 70 N·m {435 - 608 in. lbs.}

Front chainwheel tightening torque:

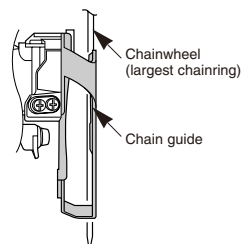
35 - 50 N·m {305 - 435 in. lbs.}



Adjust and then install the front derailleur as shown in the illustration. Do not remove the Pro-Set alignment block at this time.



The level section of the chain guide outer plate should be directly above and parallel to the largest chainring. Secure using a 5 mm Allen key.

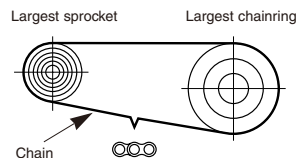


Tightening torque:

5 - 7 N·m {44 - 60 in. lbs.}

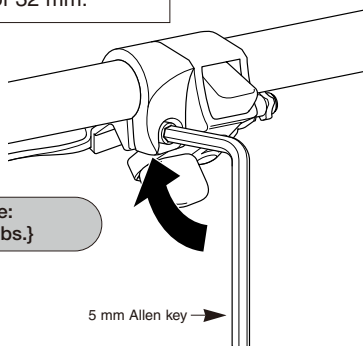
Chain length

Add 2 links (with the chain on both the largest sprocket and the largest chainring)



Installation of the lever

Use a handlebar grip with a maximum outer diameter of 32 mm.



Tightening torque:

6-8 N·m {53-69 in. lbs.}

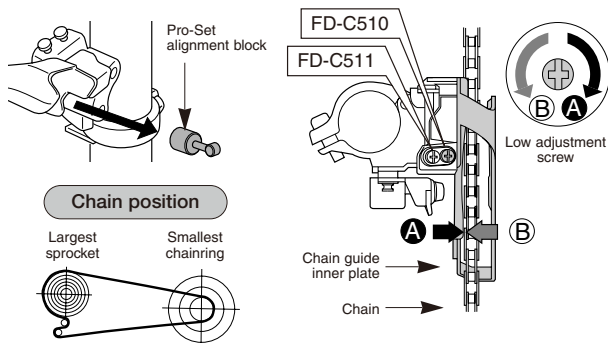
SIS adjustment

Be sure to follow the sequence described below.

1. Low adjustment

First remove the Pro-Set alignment block .

Next, set so that the clearance between the chain guide inner plate and the chain is 0 - 0.5 mm.

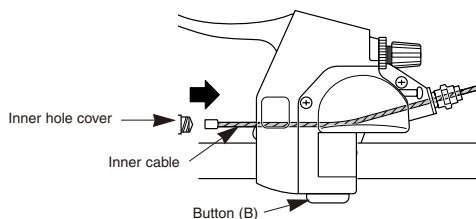


2. Connection and securing of the inner cable

Press button (B) 2 or more times to set the lever to the lowest position, check on the indicator that the lowest position is correct, and then install and adjust the inner cable.

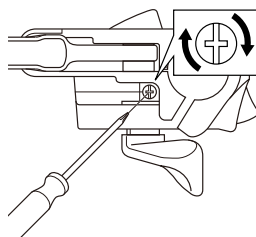
Then remove the inner hole cover and connect the inner cable.

Note that the inner cable bends along its routing path.



Install the inner hole cover by turning it as shown in the illustration until it stops.

Do not turn it any further than this, otherwise it may damage the screw thread.



Tightening torque:
0.3 - 0.5 N·m {3 - 5 in. lbs.}

While firmly pulling the inner cable, secure by tightening the fixing bolt with a 5 mm Allen key.

Tightening torque:
5 - 7 N·m
{44 - 60 in. lbs.}

Inserting the inner cable

Insert the inner cable into the outer casing from the end with the marking on it. Apply grease from the end with the marking in order to maintain cable operating efficiency.

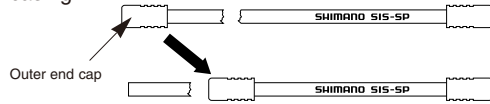


Cutting the outer casing

When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

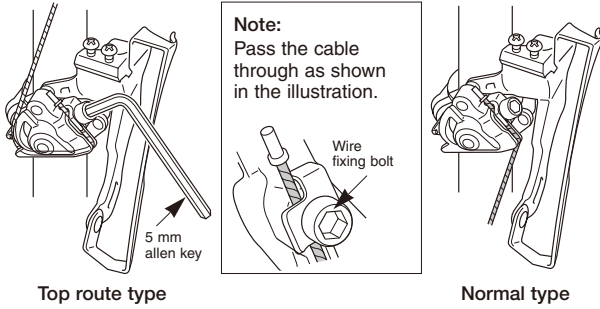


Attach the same outer end cap to the cut end of the outer casing.

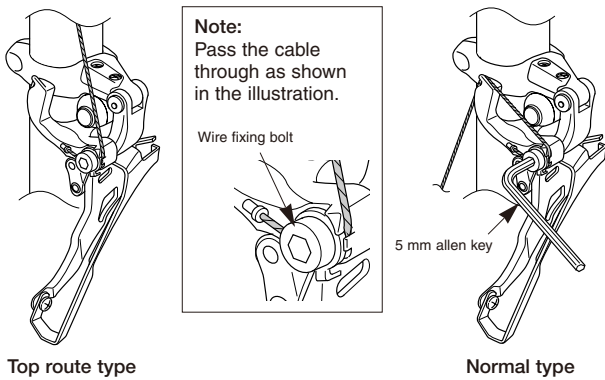


Cut off the excess length of inner cable and then install the inner end cap.

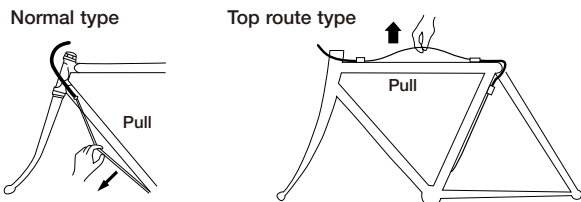
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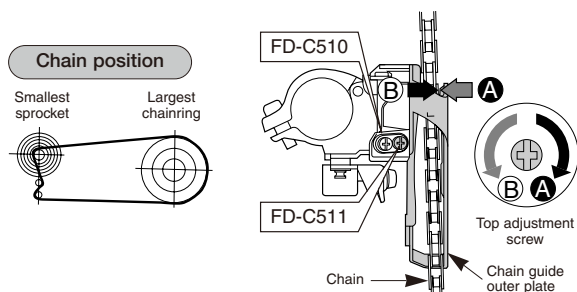
After taking up the initial slack in the cable, re-secure to the front derailleur as shown in the illustration.



Tightening torque :
5 - 7 N·m {44 - 60 in. lbs.}

3. Top adjustment

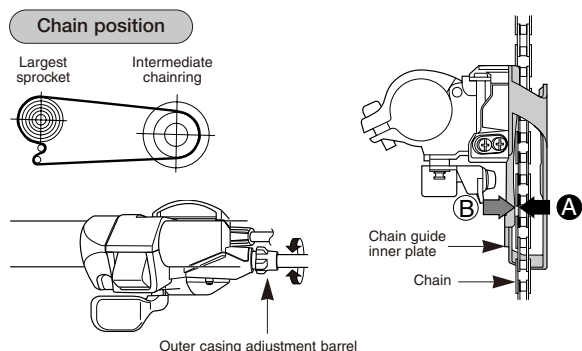
Set so that the clearance between the chain guide outer plate and the chain is 0 - 0.5 mm.





4. Adjustment of the intermediate chainring

When carrying out adjustment, set the chain to the largest sprocket, and at the front, set the chain to the intermediate chainring. Adjust using the outer casing adjustment barrel so that the clearance between the chain guide inner plate and the chain is 0 - 0.5 mm.



5. Troubleshooting chart

After completion of steps 1 - 4, move the shifting lever to check the shifting. (This also applies if shifting becomes difficult during use.)

If the chain falls to the crank side.	Tighten the top adjustment screw clockwise (about 1/4 turn).
If shifting is difficult from the intermediate chainring to the largest chainring.	Loosen the top adjustment screw counterclockwise (about 1/8 turn).
If shifting is difficult from the intermediate chainring to the smallest chainring.	Loosen the low adjustment screw counterclockwise (about 1/4 turn).
If there is interference between the chain and the front derailleur inner plate at the largest chainring.	Tighten the top adjustment screw clockwise (about 1/8 turn).
If there is interference between the chain and the front derailleur outer plate at the largest chainring.	Loosen the top adjustment screw counterclockwise (about 1/8 turn).
If the intermediate chainring is skipped when shifting from the largest chainring.	Loosen the outer casing adjustment barrel counterclockwise (1 or 2 turns).
If there is interference between the chain and front derailleur inner plate when the rear sprocket is shifted to the largest sprocket when the chainwheel is at the intermediate chainring position.	Tighten the outer casing adjustment barrel clockwise (1 or 2 turns).
If the chain falls to the bottom bracket side.	Tighten the low adjustment screw clockwise (about 1/2 turn).

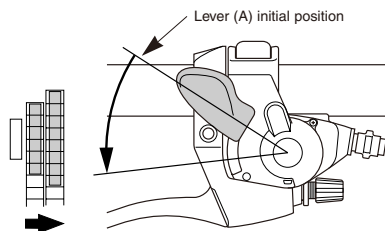
Gear shifting operation

Both lever (A) and button (B) return to the initial lever or button position when they are released after shifting. When operating lever (A) or button (B), always be sure to turn the crank arm at the same time.

To shift from a small chainring to a larger chainring

When lever (A) is pressed once, there is a shift of one step from a small chainring to a larger chainring.

Example:
from intermediate chainring to largest chainring.



To shift from a large chainring to a smaller chainring

When button (B) is pressed once, there is a shift of one step from a large chainring to a smaller chainring.

Example:
from largest chainring to intermediate chainring.

