SERVICE INSTRUCTIONS **SI-F220B**

Front Drive System

Before use, read these instructions carefully, and follow them for correct use.

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

Series	STX RC	STX	ALIVIO
Rapidfire Plus	ST-MC33	ST-MC32 ST-MC35	ST-MC12 ST-MC15
Outer casing	SIS-SP		
Front derailleur	FD-MC33	FD-MC32	FD-MC12
Front chainwheel	FC-MC33	FC-MC32	FC-MC12
Bottom bracket	BB-UN91 / BB-UN71 BB-UN51 / BB-LP30 BB-LP25 / BB-LP20		BB-LP25
Chain	CN-IG50 / CN-IG30		
Bottom bracket cable guide	SM-SP17 / SM-BT17		

Specifications

Front Derailleur

Model number	FD-MC33	FD-MC32	FD-MC12
Normal type	○	○	○
Top route type	○	○	○
Front chainwheel tooth difference	22T	22T	18T
Min. difference between top and intermediate	10T	10T	8T
Front derailleur installation band diameter	S, M, L		
Stroke (A-A')	38 - 58		
Chainstay angle (α)	63°-66°, 66°-69°		
Applicable chain line	47.5 mm, 50.0 mm		

Installation band diameters:
S (28.0 - 28.6 mm), M (31.8 mm), L (34.9 mm)

Chainwheel

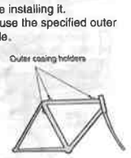
Model number	FC-MC33	FC-MC32	FC-MC12
Chainwheel tooth combination	42T-32T-22T		42T-34T-24T
Bolt circle diameter	94 mm / 58 mm		67 mm
Crank arm length	170 mm, 175 mm		
Pedal thread dimensions	BC 9/16" X 20 T.P.I. (English thread)		

Bottom Bracket

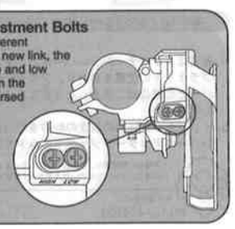
Model number	BB-UN91 / BB-UN71 / BB-UN51 / BB-LP30 / BB-LP25 / BB-LP20	BB-UN51 / BB-LP30 / BB-LP25 / BB-LP20
Stamped marking	LL113	MM110
Spindle length	113 mm	110 mm
Chain line	50.0 mm	47.5 mm
Thread dimensions	BC 1.37" X 24 T.P.I. (68, 73 mm), M36 X 24 T.P.I. (70 mm)	

Note

- **Be sure to use only the Shimano IG chain with the IG front chainwheel. The HG or UG type of chain cannot be used.**
- Apply grease to the bottom bracket before installing it.
- For smooth operation, always be sure to use the specified outer casing and the bottom bracket cable guide.
- 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.
- For any questions regarding methods of installation, adjustment, maintenance or operation, please contact a professional bicycle dealer.



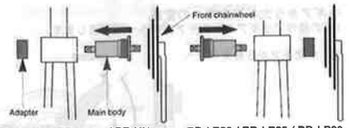
FD-MC12 Adjustment Bolts
Because of the different construction of the new link, the positions of the top and low adjustment bolts on the FD-MC12 are reversed from the positions on previous front derailleurs.



Installation of the bottom bracket

Install using the special tool TL-UN73.
First install the main body, then the adapter.

Tightening torque: 50 - 70 Nm (435 - 608 in. lbs.)



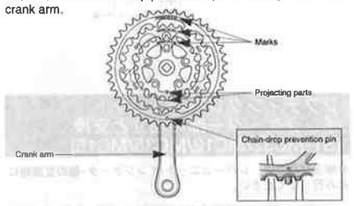
BB-UN91 / BB-UN71 / BB-UN51 BB-LP30 / BB-LP25 / BB-LP20

Installation of the chainrings

Be sure to use the following combination for the tooth configuration.

K 42-32-22 (FC-MC33/FC-MC32)
I 42-34-24 (FC-MC12)

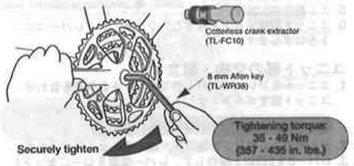
Position so that, when looking from the rear side, the **K-□**, **I-□** marks come to the positions as shown in the illustration, and so that the chain-drop prevention pin is directly behind the crank arm.



The features of the SIS will not be obtained if the chainrings are installed in the incorrect position, or if a chainring with a mark other than **K-□**, **I-□** is being combined. Therefore, be sure to install them in the correct position.

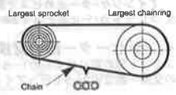
Installation of the front chainwheel

Use the cotterless crank extractor (TL-FC10) to install the front chainwheel.



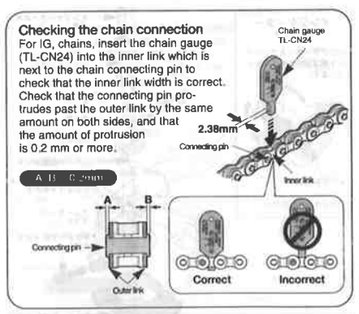
Chain length

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



Checking the chain connection

For IG, chains, insert the chain gauge (TL-CN24) into the inner link which is next to the chain connecting pin to check that the inner link width is correct. Check that the connecting pin protrudes past the outer link by the same amount on both sides, and that the amount of protrusion is 0.2 mm or more.



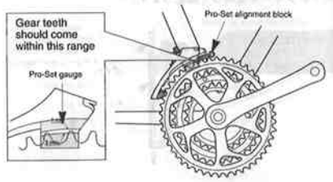
Installation of the lever

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

Allen key tightening torque: 6 - 8 Nm (53 - 69 in. lbs.)

Installation of the front derailleur

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



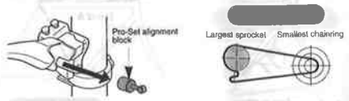
The level section of the chain guide outer plate should be directly above and parallel to the largest chainring.Secure using a 5 mm Allen key.

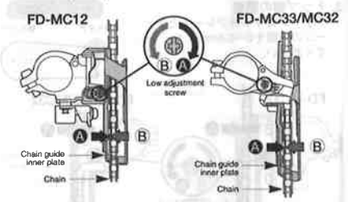
Tightening torque: 5 - 7 Nm (44 - 60 in. lbs.)

SIS adjustment

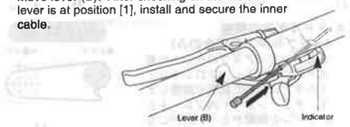
Be sure to follow the sequence described below.

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.





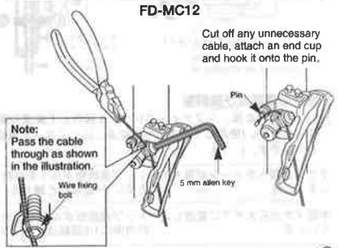
2. Connection and securing of cable
Move lever (B). After checking on the indicator that the lever is at position [1], install and secure the inner cable.



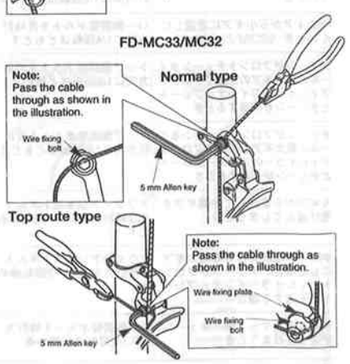
While pulling the inner cable, tighten the wire fixing bolt with a 5 mm allen key to secure the cable.

Tightening torque: 5 - 7 Nm (44 - 60 in. lbs.)

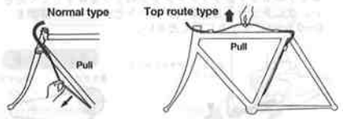
FD-MC12



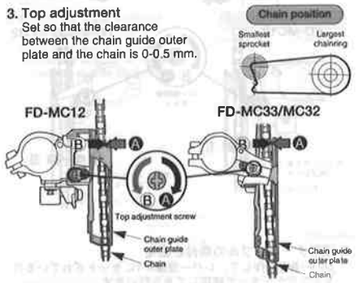
FD-MC33/MC32



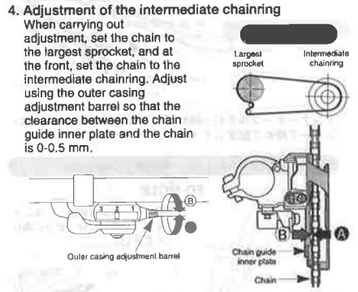
After taking up the initial slack in the cable, re-secure to the front derailleur as shown in the illustration.



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.



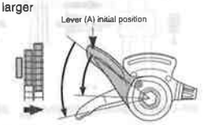
5. Troubleshooting chart
After completion of steps 1 - 4, move the shifting lever to check the shifting. (This also applies if shifting becomes difficult during use.)

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).

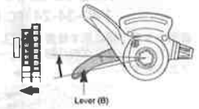
Gear shifting operation

Both lever (A) and lever (B) always return to the initial position when they are released after shifting.
When operating one of the levers, 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 lever (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.



Assembly and replacement of the shifting lever unit and indicator (ST-MC32/MC12/MC35/MC15)

Disassembly and reassembly should only be carried out when replacing the shifting lever unit or indicator.

Removal of the shifting lever unit

1. Loosen the cable fixing nut of the front derailleur, and then pull the inner cable out of the shifting lever unit.
2. Remove the outer casing adjustment barrel and the reach adjustment bolt.
3. Remove the indicator set screw.
4. Remove the two set screws of the shifting lever unit cover, and then remove the indicator cover.
5. Remove the cam plate.
6. Remove the shifting lever unit fixing bolt, and then remove the shifting lever unit.

Replacement and assembly of the shifting lever unit

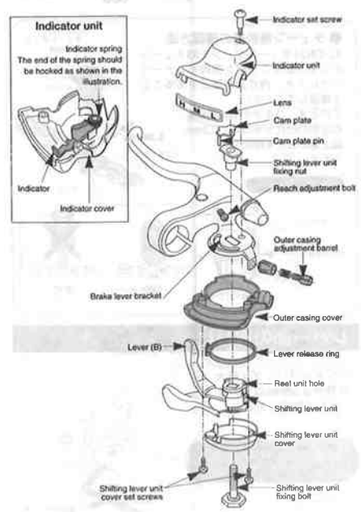
1. Align the shifting lever unit with the brake lever bracket, and then secure the shifting lever unit with the shifting lever unit fixing bolt and nut.

Tightening torque: 2.5 Nm (22 in. lbs.)

2. Align the cam plate pin with the hole of the reel unit, and then install the cam plate.
3. Press lever (B) two or more times to set the lever to the lowest position.
4. Install the lens to the indicator unit, and then after positioning the indicator unit correctly, secure it with the set screw.
5. Install the shifting lever unit cover with the two set screws.

Replacement of the indicator

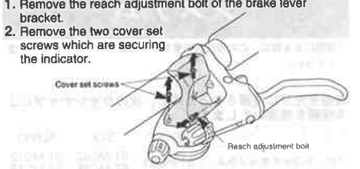
After carrying out steps 1 - 5 for removal of the shifting lever unit, carry out steps 2 - 5 for replacement and assembly of the shifting lever unit.

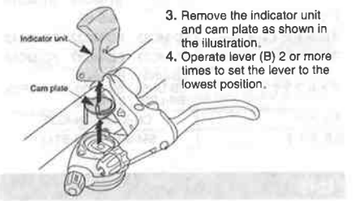


Assembly and replacement of the indicator (ST-MC33)

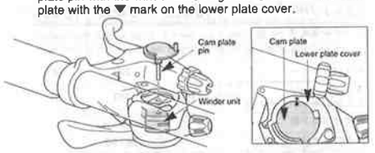
Disassembly and reassembly should only be carried out when replacing the indicator.

1. Remove the reach adjustment bolt of the brake lever bracket.
2. Remove the two cover set screws which are securing the indicator.





3. Remove the indicator unit and cam plate as shown in the illustration.
4. Operate lever (B) 2 or more times to set the lever to the lowest position.
5. Insert the cam plate pin from above after aligning the cam plate pin with the winder unit. Align the ● mark on the cam plate with the ▼ mark on the lower plate cover.

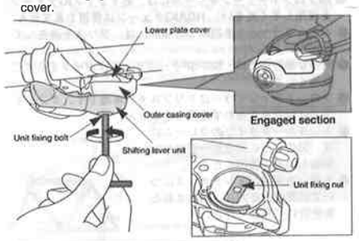


6. After checking that the indicator needle is at the right edge, place the indicator unit so that it is aligned with the lower plate cover and the pawl of the brake bracket as shown in the illustration, and then secure it by tightening the two cover set screws.
7. Tighten the reach adjustment bolt of the brake lever bracket.

Removal, replacement and assembly of the shifting lever unit (ST-MC33)

Disassembly and reassembly should only be carried out when replacing the shifting lever unit.

1. Loosen the cable fixing nut of the front derailleur, and then pull the inner cable out of the shifting lever unit.
2. After removing the outer casing adjustment barrel of the shifting lever, carry out steps 1. to 3. of "Assembly and replacement of the indicator."
3. Remove the unit fixing bolt while pushing the unit fixing nut, and then remove the shifting lever unit while being careful not to disengage the outer casing cover and the lower plate cover.



Tightening torque: 2.5 Nm (22 in. lbs.)

4. To assemble, align the shifting lever unit with the brake lever bracket, and then secure the shifting lever unit with the unit fixing bolt while being careful not to disengage the outer casing cover and the lower plate cover.
5. After carrying out steps 4. to 7. of "Assembly and replacement of the indicator," install the outer casing adjustment barrel of the shifting lever.

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