

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	SHIMANO XTR	
Rapidfire SL	ST-M950 / SL-M950	
Outer casing	SIS-SP40 sealed outer casing	
Front derailleur	FD-M950-E / FD-M950	
Front chainwheel	FC-M950	FC-M950-HG
Chain	CN-IG90	CN-HG91
Bottom bracket	BB-M950	
Bottom bracket cable guide	SM-SP18	

Specifications

Front derailleur		
Model number	FD-M950-E	FD-M950
Normal type		
Top route type		
Front derailleur installation band diameter	—	S, M, L
Stroke (A-A')	38-58	
Chainstay angle (α)	66°-69°	
Applicable chain line	47.5mm, 50mm	
Installation band diameters: S (28.0~28.6mm), M (31.8mm), L (34.9mm)		

Front chainwheel		
Model number	FC-M950	FC-M950-HG
Applicable chain	CN-IG90	CN-HG91
Bolt circle diameter	112 / 68mm	110 / 74mm
Front chainwheel tooth combination	46-34-24	46-36-26
Crank arm length (mm)	180, 175, 170, 165	180, 175, 170, 165
Pedal thread dimensions	BC 9/16" X 20 T.P.I. (English thread)	
Applicable chain line	47.5mm, 50mm	

Bottom bracket		
Model number	BB-M950	
Stamped marking		
Spindle length	112.5mm	116mm
Chain line	47.5mm	50mm
Bottom bracket cup thread dimensions	1.37X24T.P.I. (68, 73mm)	

CAUTION

- Be sure to use only the Shimano IG chain with the FC-M950 IG front chainwheel. The HG or UG type of chain cannot be used.
- Be sure to use only the Shimano HG chain with the FC-M950 HG front chainwheel. The IG type of chain cannot be used.

Note

- 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.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- For any questions regarding methods of installation, adjustment, maintenance or operation, please contact a professional bicycle dealer.

Adjustment Bolts

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

Installing the BB-M950

When installing the BB-M950, the correct combination of the three types of spacer must be used in accordance with the type of front derailleur, the bottom bracket shell width and the specified chain line. Refer to cases A to F in the table below to choose the correct combination of spacers.

Front derailleur	Front chainwheel	47.5 mm chain line	50 mm chain line
		68mm (BC1.37)	73mm (BC1.37)
FD-M950 (band type)	FC-M950	A	B
FD-M950-E (bracket type)		E	F

FD-M950 (Band type)

A Spindle Length 112.5 mm

Spacer (2.5mm) Spacer (2.5mm)

B Spindle Length 112.5 mm

Spacer (2.5mm) Spacer (1.0mm)

C Spindle Length 116 mm

Spacer (3.5mm) Spacer (3.5mm)

D Spindle Length 116 mm

Spacer (1.0mm) Spacer (1.0mm)

FD-M950-E (Bracket type)

E Spindle Length 112.5 mm

FD-M950-E Bracket (2.5 mm) Spacer (2.5mm)

F Spindle Length 116 mm

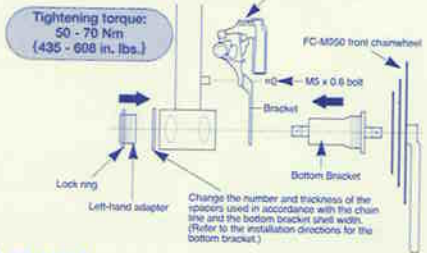
FD-M950-E Bracket (2.5 mm) Spacer (2.5mm)

Installation of the front derailleur, bottom bracket and front chainwheel

FD-M950-E

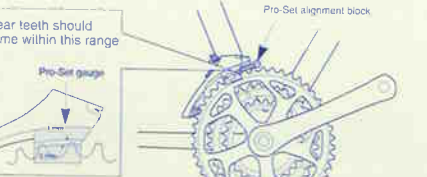
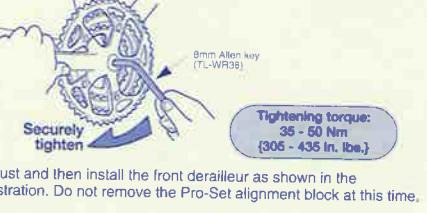
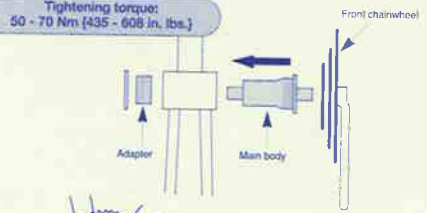
(a special frame with mounting bosses is required)

- Pass the bottom bracket through the bracket hole, and then provisionally secure it to the frame.
- Secure the front derailleur to the special boss using an M5x0.8 bolt.
- Use the special tool (TL-UN96) to tighten the bottom bracket.
- Use the special tools (TL-UN96 and TL-FC30) to install the adapter and the lock ring.



FD-M950

Install using the TL-UN95 and TL-FC30 special tools. First install the main body, then the adapter and the lock ring. Install the seal C to the left side spindle.

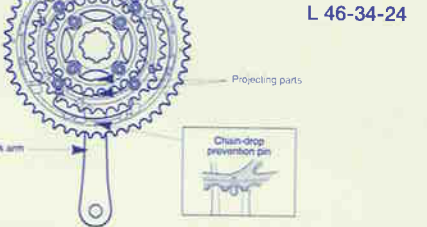
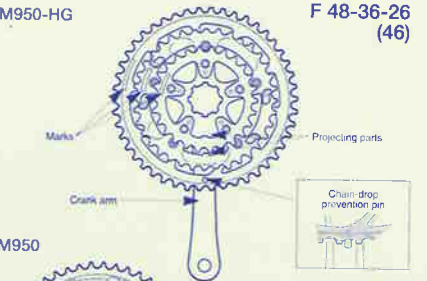


The level section of the chain guide outer plate should be directly above and parallel to the largest chainring. Secure using a 5 mm Allen key.

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

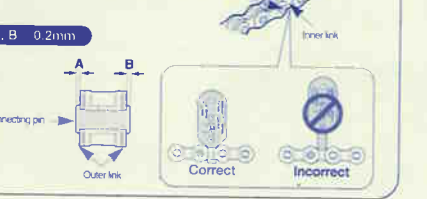
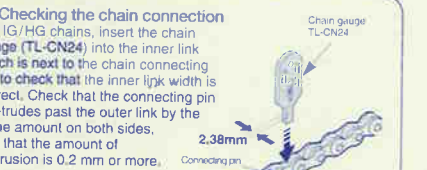
Installation of the chainrings

Be sure to use the following combination for the front chainwheel's tooth configuration. Position so that, when looking from the rear side, the F-□ marks come to the positions as shown in the illustration, and so that the Pain drop prevention pin is directly behind the crank arm.



Chain length

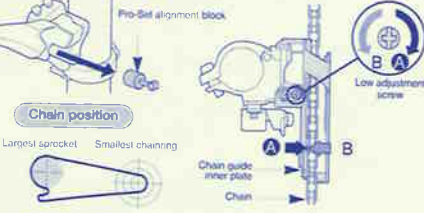
Add 2 links (with the chain on both the largest sprocket and the largest chainring)



SIS adjustment

Be sure to follow the sequence described below.

- 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.

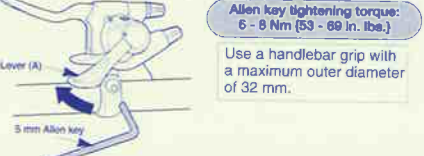


- Connection and securing of the inner cable**
Operate lever (B) two times or more. After checking on the indicator that the lever is at the lowest position, turn the cable adjusting bolt until the slit is on the same side as the handlebar. Remove the screw, open the wire end hooking cover as shown in the illustration, and then pull the wire end hook toward you (if lever (A) is moved as shown in the illustration to take up the play, the wire end hook will be easier to pull out), and then insert the inner cable from the bottom. Place the inner cable into the slit and then close the wire end hooking cover.

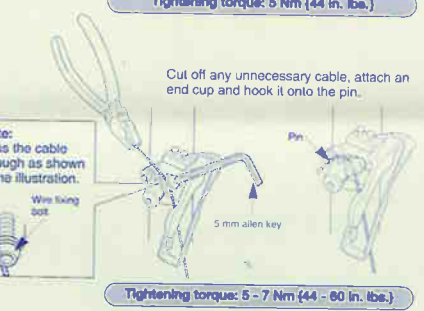
Note: The wire end hook may get hooked inside the lever mechanism, which will stop the lever from moving back to the proper position. If the lever does not return, use the end of the inner cable to unhook the wire end hook.

- Installation of the brake lever**
<ST-M950>
Move lever (A) so that the installation bolt can be seen, and then use a 5 mm Allen key to install.

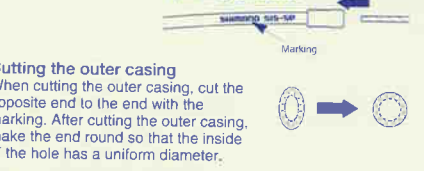
Note: If the brake lever is installed to the handlebar before the inner cable is installed, the handlebars will obstruct the wire end hooking cover and it will become more difficult to install the inner cable. Install the brake lever after installing the inner cable.



- <SL-M950>**
Install the brake lever in a position where it will not obstruct brake operation. Do not use in a combination which causes brake operation to be obstructed.



- 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.



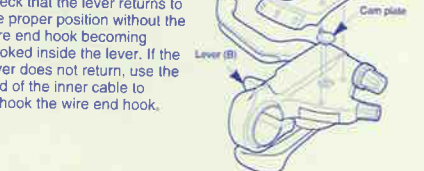
- Cutting the outer casing**
When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.



Replacement of the shifting lever unit and indicator (ST-M950)

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

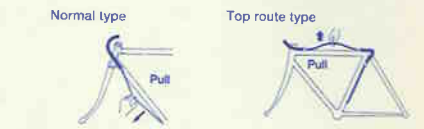
- Removal of the indicator**
1. Remove the two indicator set screws which are securing the indicator.
2. Remove the indicator unit and cam plate as shown in the illustration.



- Push the cam plate onto the hexagonal end of the shaft so that the plate is in the position shown in the illustration.**
Note: Do not deliberately turn this hexagonal shaft with any tools, as this will damage the internal mechanism.
- After checking that the indicator needle is at the right edge, set the indicator so that it is directly above the cam plate, and then secure it with the two indicator set screws.**
- Check the operation of the indicator. If it does not operate correctly, re-install the indicator by while taking particular note of steps 3. and 5.**

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

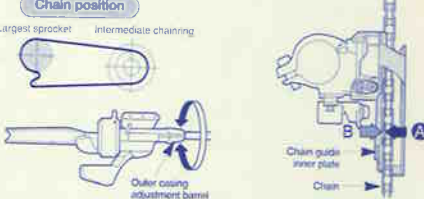
- Adjustment of cable tension**
After taking up the initial slack in the cable, re-secure to the front derailleur as shown in the illustration.



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



- 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.



- Troubleshooting chart**
After completion of steps 1 - 5, 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 chain is shifted to the largest sprocket and 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.

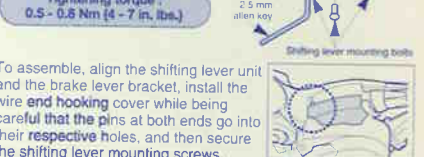


To shift from a large chainring to a smaller chainring
When lever (B) is pressed once, there is a shift of one step from a large chainring to a smaller chainring.



Replacement of the shifting lever unit

- Loosen the cable fixing bolt (nut) of the front derailleur, and then pull the inner cable out of the shifting lever unit in the same way as when installing the inner cable.
- Carry out steps 1 - 2 for replacement of the indicator.
- Remove the three shifting lever mounting bolts, and then remove the shifting lever unit and wire end hooking cover as shown in the illustration.



- To assemble, align the shifting lever unit and the brake lever bracket, install the wire end hooking cover while being careful that the pins at both ends go into their respective holes, and then secure the shifting lever mounting screws.
- Carry out steps 3 - 5 for replacement of the indicator.