SI-6UAFA-003-00

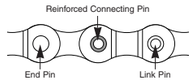
General Safety Information

⚠ WARNING

"Maintenance interval depends on the usage and riding circumstances. Clean regularly the chain with an appropriate chaincleaner. Never use alkali based or acid based solvents such as rust cleaners. If those solvent be used chain might break and cause serious injury."

- Use the reinforced connecting pin only for connecting the narrow type of chain.
- There are two different types of reinforced connecting pins 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	6.5mm Silver	TL-CN32 / TL-CN27
8- / 7- / 6-speed narrow chain such as CN-HG50 / CN-HG40	7.1mm Black	TL-CN32 / TL-CN27



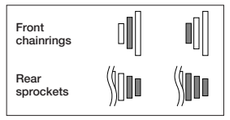
- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut at some other place than the place where the chain has been joined using a reinforced connecting pin or an end pin. The chain will be damaged if it is cut at a place where it has been 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 cause serious injury.
- It is important to periodically check the tightening torques for the crank arms and pedals. After riding approximately 100 km (60 miles), re-check the tightening torques. If the tightening torques are too weak, the crank arms or pedals may come off and the bicycle may fall over, and serious injury may occur as a result.
- 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 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.
- Read these Technical Service Instructions carefully, and keep them in a safe place for later reference.

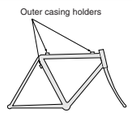
⚠ CAUTION

- If the chain is on the smallest or intermediate chainring, there is the danger of injury from the tips of the teeth on the largest chainring.

Note

- In addition, if pedaling performance does not feel normal, check this once more.
- Before riding the bicycle, check that there is no play or looseness in the connection. Also, be sure to retighten the crank arms and pedals at periodic intervals.
- When installing the pedals, apply a small amount of grease to the threads to prevent the pedals from sticking. Use a torque wrench to securely tighten the pedals. Tightening torque: 35 - 55 N·m {305 - 479 in. lbs.}. The right-hand crank arm has a right-hand thread, and the left-hand crank arm has a left-hand thread.
- 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.
- 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 a effective way of extending the useful life of the chainrings and the chain.
- The cuffs of your clothing may get dirty from the chain while riding.
- If the chain keeps coming off the chainrings during use, replace the chainrings and the chain.
- When the chain is in the position shown in the illustration, the chain may contact the front chainrings or front derailleur and generate noise. If the noise is a problem, shift the chain onto the next-larger rear sprocket or the one after.
- Apply grease to the bottom bracket before installing it.
- For smooth operation, 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.
- 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.





Technical Service Instructions SI-6UAFA-003

Front Drive System

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

Gears	Right	SIS 9-gears	SIS 8 / 7-gears
	Left	SIS 3-gears	SIS 3-gears
Shifting lever		ST-M390 / SL-M390 / ST-EF65	ST-EF65
Outer casing		OT-SP40	
Front derailleur		FD-M390	FD-M360 / M311 / M190A / M190 / M191
Front chainwheel		FC-M391 / FC-M391-8	FC-M311 / FC-M311-8 / FC-M171 / FC-M131
Bottom bracket		BB-UN26 (-K) / BB-ES25 (-K)	
Chain		CN-HG53	CN-HG50 / CN-HG40
Bottom bracket cable guide		SM-SP18 / SM-BT18 / SM-SP17 / SM-BT17	

This service instruction explains how to use and maintain the Shimano bicycle parts which have been used on your new bicycle.
For any questions regarding your bicycle or other matters which are not related to Shimano parts, please contact the place of purchase or the bicycle manufacturer.

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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. (English) © May 2011 by Shimano Inc. XBC IZM Printed in Singapore.

Specifications

Front Derailleur

X = Available

Model number	FD-M390	FD-M360	FD-M311	FD-M190A	FD-M190	FD-M191
Applicable to both normal type and top route type	X	X	X	X	X	X
TOP SWING	X	X	–	X	X	X
Applicable front chainwheel	FC-M391 / M391-8	FC-M311 / FC-M311-8		FC-M171 / M131		
Top gear tooth	44 / 48T	42 / 48T	42 / 48T	42T	42T	48T
Front chainwheel tooth difference	22T	20T	20T	18T	18T	20T
Min. difference between top and intermediate	12T	10T	10T	8T	8T	10T
Front derailleur installation band diameter	S, M, L					
Chainstay angle (α)	63°- 66° / 66°- 69°			66°- 69°	63°- 66°	63°- 66° / 66°- 69°
Applicable bottom bracket	BB-UN26 (-K) / BB-ES25 (-K)					
Applicable chain line	50 mm	47.5 / 50 mm				

Installation band diameters: S [28.6 mm], M [31.8 mm], L [34.9 mm] (Use the adapter for S and M sizes.)

Chainstay angle

Chainwheel

Model number	FC-M391	FC-M391-8	FC-M311	FC-M311-8	FC-M171	FC-M131
Chainwheel tooth combination	44-32-22T / 48-36-26T		42-32-22T / 48-38-28T	42-32-22T	42-34-24T / 48-38-28T	
Bolt circle diameter	104 / 64 mm		—		—	
Crank arm length	170 / 175 mm		170 / 175 mm		170 / 175 mm	
Pedal thread dimensions	BC 9/16" X 20 T.P.I. (English thread)					
Applicable bottom bracket	BB-UN26 (-K)	BB-ES25 (-K)	BB-UN26 (-K)	BB-ES25 (-K)	BB-UN26 (-K)	

Bottom Bracket

Model number	BB-UN26 (-K)			BB-ES25 (-K)
Stamped marking	LL123	D-NL K	D-NL	126 (-K)
Spindle length	122.5 mm			126 mm
Chain line	50 mm	47.5 mm + t*	47.5 mm	50 mm
Thread dimensions	BC 1.37" X 24 T.P.I. (68, 73 mm)			

* t = Chain case thickness (1.5 - 2.1 mm)

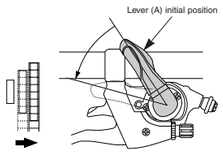
Gear shifting operation

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 (Lever A)

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

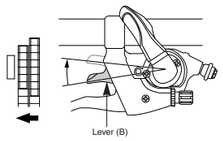
Example:
from intermediate chainring to largest chainring.



To shift from a large chainring to a smaller chainring (Lever B)

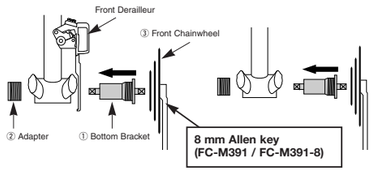
When lever (B) is pressed once, there is a shift of one step from a large chainring to a smaller chainring.

Example:
from largest chainring to intermediate chainring.



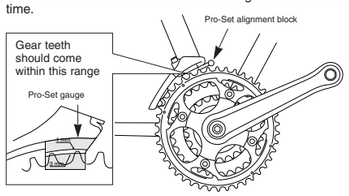
Installation of the Front Derailleur, Bottom Bracket and Front Chainwheel

Use the special tools (TL-UN66 and TL-UN74-S) to install the bottom bracket ① and the front derailleur so that they face as shown in the illustration. Install the adapter ②, and then use the cotterless crank extractor (TL-FC10) to install the front chainwheel.



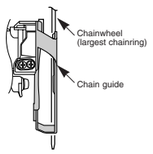
Adapter / bottom bracket tightening torque:
50 - 70 N·m {435 - 608 in. lbs.}
Front chainwheel tightening torque:
35 - 50 N·m {305 - 435 in. lbs.}

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



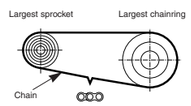
The level section of the chain guide outer plate should be directly above and parallel to the largest chainring. Secure using a 5 mm Allen key.

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



Chain length

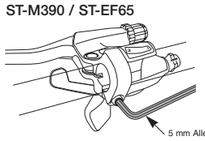
Add 2 links (with the chain on both the largest sprocket and the largest chainring)



Installation of the lever

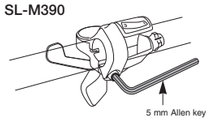
Use a handlebar grip with a maximum outer diameter of 36 mm (M390) / 32 mm (EF65).

ST-M390 / ST-EF65



Tightening torque:
6 - 8 N·m {53 - 69 in. lbs.}

SL-M390



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

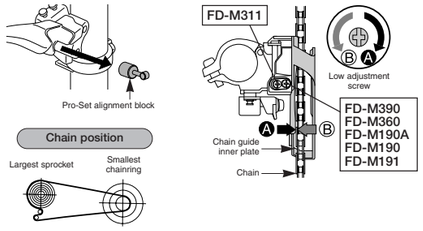
- Install the shifting lever in a position where it will not obstruct brake operation and gear shifting operation.
- Do not use in a combination which causes brake operation to be obstructed.

SIS adjustment

Be sure to follow the sequence described below.

1. Low adjustment

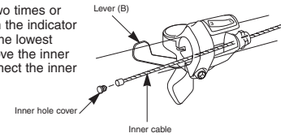
First remove the Pro-Set alignment block.
Next, set so that the clearance between the chain guide inner plate and the chain is 0-0.5 mm.



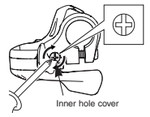
2. Connecting and securing the inner cable

<ST-M390 / SL-M390>

Operate lever (B) two times or more, and check on the indicator that the lever is at the lowest position. Then remove the inner hole cover and connect the inner cable.

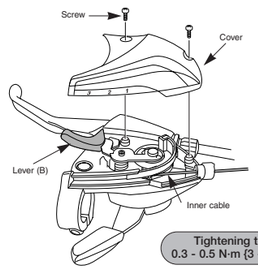


Install the inner hole cover by turning it as shown in the illustration until it stops.
Do not turn it any further than this, otherwise it may damage the screw thread.



<ST-EF65>

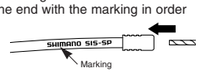
Operate lever (B) two times or more to set the lever to the lowest position. Remove the screw, and then remove the cover. Pull out the inner cable as shown in Figure, and then install the new inner cable.



Tightening torque:
0.3 - 0.5 N·m {3 - 4 in. lbs.}

Inserting the inner cable

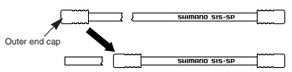
Insert the inner cable into the outer casing from the end with the marking on it. Apply grease from the end with the marking in order to maintain cable operating efficiency.



Cutting the outer casing

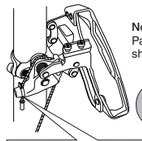
When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

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



Use a 5 mm Allen key to tighten the wire fixing bolt.
Cut off the excess length of inner cable and then install the inner end cap.

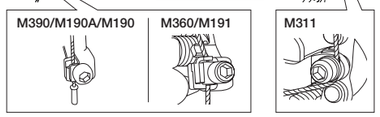
< FD-M390 / M360 / M190A / M190 / M191 >



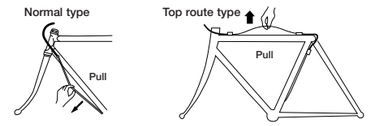
Note:
Pass the cable through as shown in the illustration.

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

< FD-M311 >

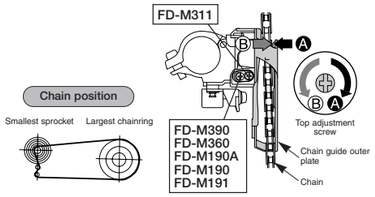


After taking up the initial slack in the cable, re-secure to the front derailleur as shown in the illustration.



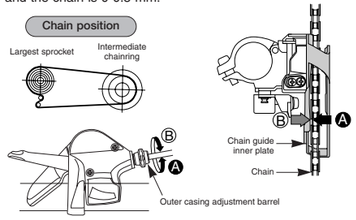
3. Top adjustment

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.)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).
If the lever is stiff when shifting from the intermediate chainring to the largest chainring	Loosen the top adjustment screw counterclockwise (about 1/4 turn).