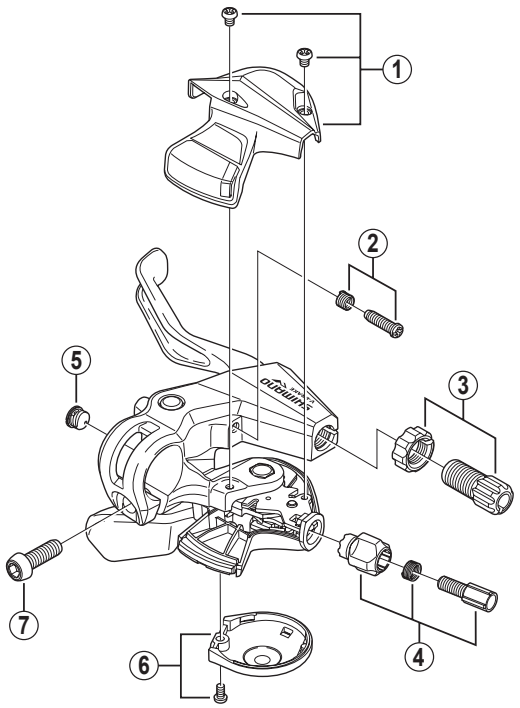
Rapidfire Plus Lever (2-Finger / For V-BRAKE)

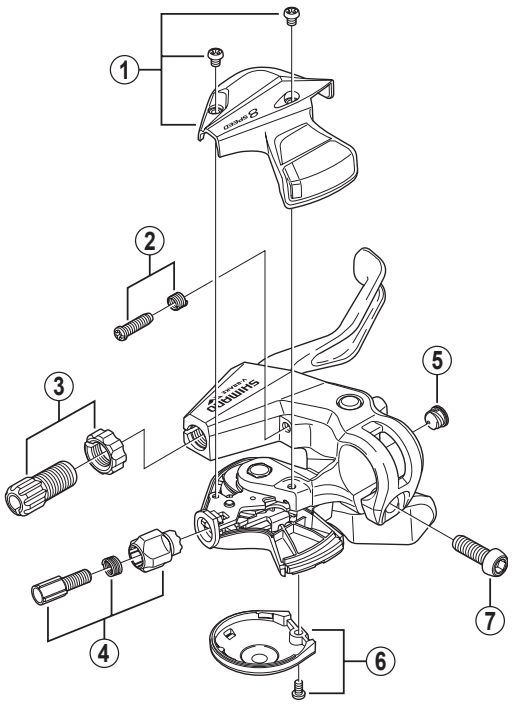
ST-M310-8R2/L2 (S) Silver Version

ST-M310-8R2/L2 (L) Black Version

For Left Hand



For Right Hand



ITEM NO.	SHIMANO CODE NO.	DESCRIPTION	INTERCHANGE-ABILITY SL-M310	ST-M360-2A	ST-EF51-2A
1	**Y6UH98010**	R.H. Indicator Unit	B		
	Y6UJ98010	L.H. Indicator Unit	A		
2	**Y6UH98030**	Reach Adjusting Screw (M4 x 14.5) & Spring			
3	**Y8UM98010**	Brake Cable Adjusting Bolt & Nut			A
4	**Y6PZ98070**	Shifting Cable Adjusting Bolt Unit	A		
5	**Y6CD33000**	Inner Hole Cap	A	A	
6	**Y6TB98060**	Main Lever Cover & Fixing Screw	A		
7	**Y6UD89000**	Clamp Bolt (M6 x 17.5)			

A: Same parts.
B: Parts are usable, but differ in materirals, appearance, finish, size, etc.
Absence of mark indicates non-interchangeability.

Mar.-2011-3258

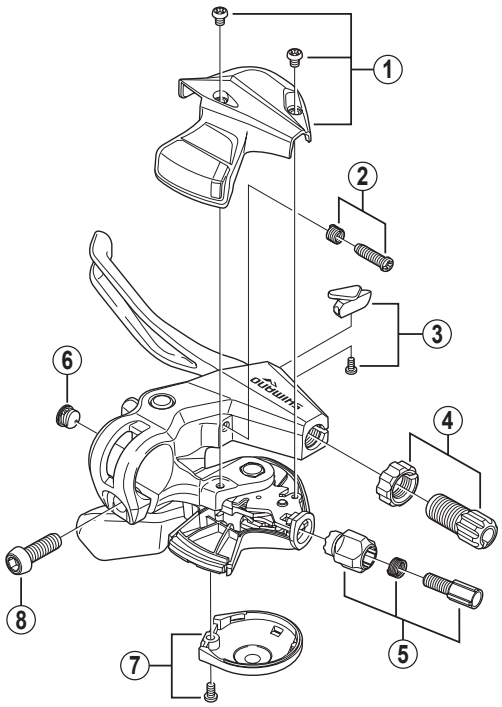
Specifications are subject to change without notice.

SHIMANO

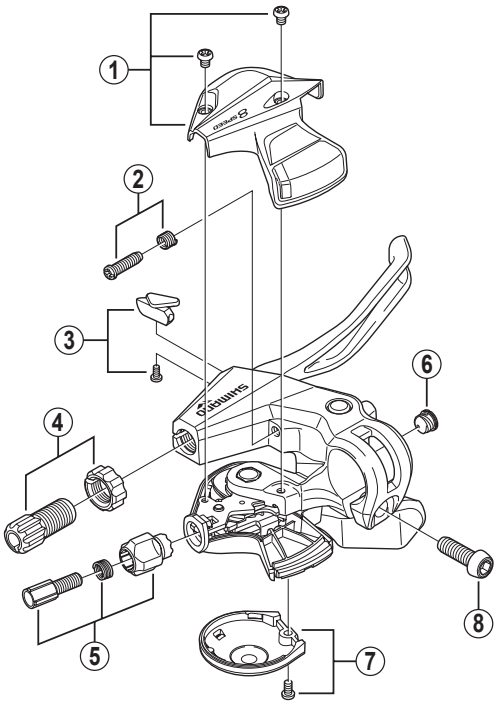
Rapidfire Plus Lever (4-Finger)

ST-M310-8R4/L4 (S) Silver Version
ST-M310-8R4/L4 (L) Black Version

For Left Hand



For Right Hand



ITEM NO.	SHIMANO CODE NO.	DESCRIPTION	INTERCHANGE-ABILITY		
			SL-M310	ST-M360-4A	ST-EF51-4A
1	**Y6UH98010**	R.H. Indicator Unit	B		
	Y6UJ98010	L.H. Indicator Unit	A		
2	**Y6UH98030**	Reach Adjusting Screw (M4 x 14.5) & Spring			
3	**Y8TS98010**	R.H. Adjustment Block & Fixing Screw		A	A
	Y8TS98020	L.H. Adjustment Block & Fixing Screw		A	A
4	**Y8UM98010**	Brake Cable Adjusting Bolt & Nut		A	A
5	**Y6PZ98070**	Shifting Cable Adjusting Bolt Unit	A		
6	**Y6CD33000**	Inner Hole Cap	A	A	
7	**Y6TB98060**	Main Lever Cover & Fixing Screw	A		
8	**Y6UD89000**	Clamp Bolt (M6 x 17.5)			

A: Same parts.
B: Parts are usable, but differ in materirals, appearance, finish, size, etc.
Absence of mark indicates non-interchangeability.

Mar.-2011-3259

Specifications are subject to change without notice.

SHIMANO

General Safety Information

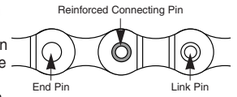
⚠ WARNING

"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."

- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and serious injury may result.
- 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.

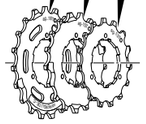


- Check that the tension of the chain is correct and that the chain is not damaged. If the tension is too weak or the chain is damaged, the chain should be replaced. If this is not done, the chain may break and cause serious injury.
- **Obtain and read the service instructions carefully prior to installing 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.

Note

- 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 clean the derailleur and lubricate all moving parts (mechanism and pulleys).
- If gear shifting adjustment cannot be carried out, check the degree of parallelism at the rear end of the bicycle. Also check if the cable is lubricated and if the outer casing is too long or too short.
- If you hear abnormal noise as a result of looseness in a pulley, you should replace the pulley.
- If the wheel becomes stiff and difficult to turn, you should lubricate it with grease.
- Do not apply any oil to the inside of the hub, otherwise the grease will come out.
- You should periodically wash the sprockets 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 sprockets and the chain.
- If the chain keeps coming off the sprockets during use, replace the sprockets and the chain.
- Always be sure to use the sprocket set bearing the same group marks. Never use in combination with a sprocket bearing a different group mark.
- Use a frame with internal cable routing is strongly discouraged as it has tendencies to impair the SIS shifting function due to its high cable resistance.

Group marks



- 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.

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.

SHIMANO

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

Technical Service Instructions **SI-6UH0A-001**

Rear Drive System

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

Rapidfire Plus	ST-M310-8R
Outer casing	SP40
Rear derailleur	RD-M310
Type	Smart Cage
Freehub	FH-RM30-8
Gears	8
Cassette sprocket	CS-HG31-8
Chain	CN-HG50 / CN-HG40
Bottom bracket guide	SM-SP18 / SM-BT18

Specifications

Rear Derailleur

Model number	RD-M310
Type	Smart Cage
Total capacity	43T
Largest sprocket	34T
Smallest sprocket	11T
Front chainwheel tooth difference	20T
Applicable front chainwheel (chainring tooth configuration)	FC-M361 / M311 (48-38-28T / 42-32-22T) FC-M361-8 / M311-8 (42-32-22T)

Cassette sprocket tooth combination

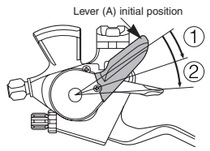
Model number	Sprockets	Group name	Tooth combination
CS-HG31-8	8	an	11, 13, 15, 17, 20, 23, 26, 30T
	8	aw	11, 13, 15, 18, 21, 24, 28, 32T
	8	ao	11, 13, 15, 17, 20, 23, 26, 34T

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.

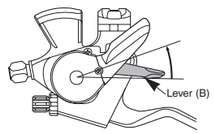
To shift from a small sprocket to a larger sprocket (Lever A)

To shift one step only, press lever (A) to the (1) position. To shift two steps at one time, press to the (2) position.



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

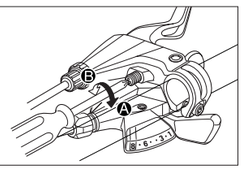
Press lever (B) once to shift one step from a larger to a smaller sprocket.



Adjusting the grip width

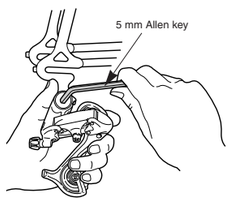
It is recommended that you adjust the grip widths of the levers to the most comfortable widths for gear shifting and braking.

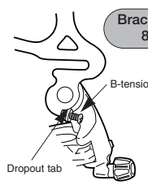
Ⓐ : **Becomes narrower**
Ⓑ : **Becomes wider**



Installation of the rear derailleur

When installing, be careful that deformation is not caused by the B-tension adjustment screw coming into contact with the dropout tab.

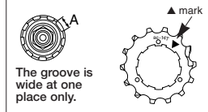




Bracket spindle tightening torque: 8 - 10 N·m {70 - 86 in. lbs.}

Installation of the sprockets

For each sprocket, the surface that has the group mark should face outward and be positioned so that the triangle (▲) mark on each sprocket and the A part (where the groove width is wide) of the freewheel body are aligned.

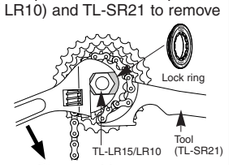


The groove is wide at one place only.

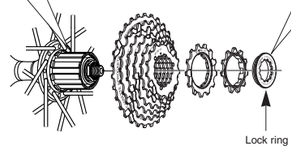
For installation of the HG sprockets, use the special tool (TL-LR15 / LR10) to tighten the lock ring.

Tightening torque: 30 - 50 N·m {261 - 434 in. lbs.}

To replace the HG sprockets, use the special tool (TL-LR15 / LR10) and TL-SR21 to remove the lock ring.

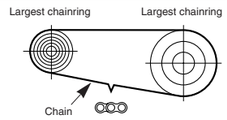


Disassembly

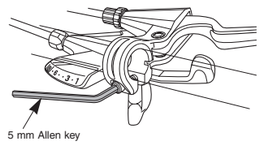


Chain length

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



Mounting the shifting lever



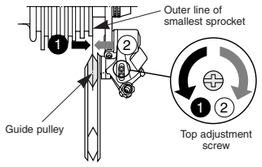
Use a handlebar grip with a maximum outer diameter of 36 mm.

Allen key tightening torque: 6 - 8 N·m {53 - 69 in. lbs.}

SIS Adjustment

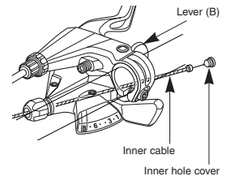
1. Top adjustment

Turn the top adjustment screw to adjust so that the guide pulley is in line with the outer line of the smallest sprocket when looking from the rear.

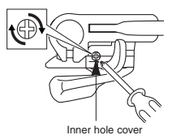


2. Connecting and securing the inner cable

Operate lever (B) 7 times or more, and check on the indicator that the lever is at the highest position. Then remove the inner hole cover and connect the inner cable.



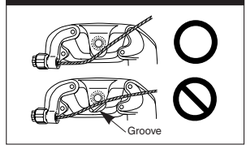
Install the inner hole cover by turning it as shown in the illustration until it stops.
Do not turn it any further than this, otherwise it may damage the screw thread.



Connect the cable to the rear derailleur and, after taking up the initial slack in the cable, re-secure to the rear derailleur as shown in the illustration.

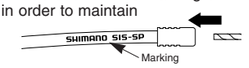
Tightening torque : 5 - 7 N·m {44 - 60 in. lbs.}

Note: Be sure that the cable is securely in the groove.



Inserting the inner cable

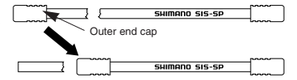
Insert the inner cable into the outer casing from the end with the marking on it. Apply grease from the end with the marking in order to maintain cable operating efficiency.



Cutting the outer casing

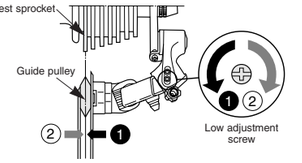
When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

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



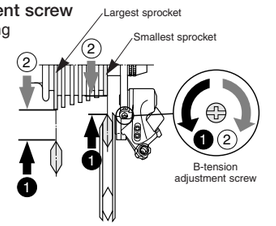
3. Low adjustment

Turn the low adjustment screw so that the guide pulley moves to a position directly in line with the largest sprocket.



4. How to use the B-tension adjustment screw

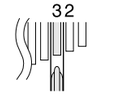
Mount the chain on the smallest chainring and the largest sprocket, and turn the crank arm backward. Then turn the B-tension adjustment screw to adjust the guide pulley as close to the sprocket as possible but not so close that it touches. Next, set the chain to the smallest sprocket and repeat the above to make sure that the pulley does not touch the sprocket.



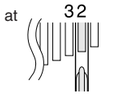
5. SIS Adjustment

Operate the shifting lever several times to move the chain to the 2nd sprocket. Then, while pressing the lever just enough to take up the play in the lever, turn the crank arm.

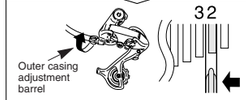
When shifting to 3rd



When no sound at all is heard



Tighten the outer cable adjusting barrel until the chain returns to the 2nd sprocket. (clockwise)



Loosen the outer casing adjustment barrel until the chain touches the 3rd sprocket and makes noise. (counter clockwise)

Best setting

The best setting is when the shifting lever is operated just enough to take up the play and the chain touches the 3rd sprocket and makes noise.

* Return the lever to its original position (the position where the lever is at the 2nd sprocket setting and it has been released) and then turn the crank arm clockwise. If the chain is touching the 3rd sprocket and making noise, turn the outer casing adjustment barrel clockwise slightly to tighten it until the noise stops and the chain runs smoothly.

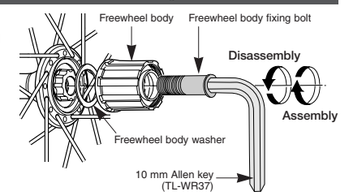
Operate lever to change gears, and check that no noise occurs in any of the gear positions.

For the best SIS performance, periodically lubricate all power-transmission parts.

Replacement of the freewheel body

After removing the hub axle, remove the freewheel body fixing bolt (inside the freewheel body), and then replace the freewheel body.

Note:
Do not attempt to disassemble the freewheel body, because it may result in a malfunction.



Tightening torque: 35 - 50 N·m {305 - 434 in. lbs.}

SI-6UJ0A-002-00

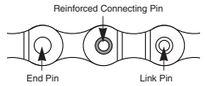
General Safety Information

⚠ 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	Silver (6.5mm)	TL-CN32 / TL-CN27
8-/7-/6-speed narrow chain such as CN-HG50 / CN-HG40	Black (7.1mm)	TL-CN32 / TL-CN27



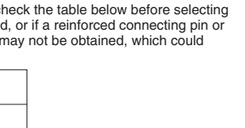
- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut at some other place than the place where the chain has been joined using a reinforced connecting pin or an end pin. The chain will be damaged if it is cut at a place where it has been 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-6UJ0A-002**

Front Drive System

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.

SHIMANO

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

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

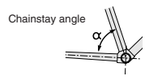
Gears	Right	SIS 8-gears
	Left	SIS 3-gears
Rapidfire Plus		ST-M310-L
Outer casing		OT-SP40
Front derailleur		FD-M311 / FD-M310 / FD-M190-3 / FD-M190A / FD-M191
Front chainwheel		FC-M361 / FC-M361-8 / FC-M311 / FC-M311-8 / FC-M171 / FC-M131
Bottom bracket		BB-UN26 (-K) / BB-ES25 (-K)
Chain		CN-HG50 / CN-HG40
Bottom bracket cable guide		SM-SP17 / SM-BT17 / SM-SP18 / SM-BT18

Specifications

Front Derailleur

X = Available

Model number	FD-M311/FD-M310	FD-M191	FD-M190-3	FD-M190A
Normal type	X	X	X	X
Top route type	X	X	X	X
Front chainwheel tooth difference	20T	20T	18T	18T
Min. difference between top and intermediate	10T	10T	8T	8T
Front derailleur installation band diameter	S, M, L	S, M, L	S, M, L	S, M, L
Chainstay angle (α)	63°- 66° / 66°- 69°		63°- 66°	66°- 69°
Applicable chain line	47.5/50 mm	47.5/50 mm	47.5/50 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.)

Chainwheel

Model number	FC-M361 / FC-M311	FC-M361-8 / FC-M311-8	FC-M171 / FC-M131	FC-M171 / FC-M131
Chainwheel tooth combination	42T-32T-22T 48T-38T-28T	42T-32T-22T	48T-38T-28T	42T-34T-24T
Bolt circle diameter	—	—	—	—
Crank arm length	170 mm, 175 mm	170 mm, 175 mm	170 mm	170 mm
Pedal thread dimensions	BC 9/16° X 20 T.P.I. (English thread)			
Applicable front derailleur	FD-M311 / FD-M310		FD-M191	FD-M190-3 / FD-M190A
Applicable chain line	50 mm		47.5 mm / 47.5 mm + t *	
Applicable bottom bracket	BB-UN26 (-K)	BB-ES25 (-K)	BB-UN26 (-K)	BB-UN26 (-K)

Bottom Bracket

Model number	BB-UN26 (-K)	BB-UN26 (-K)	BB-ES25 (-K)
Spindle length	123 mm	122.5 mm	126 mm
Chain line 47.5 mm	—	D-NL	—
Chain line 50 mm	LL123 (K)	—	126 (K)
Chain line 47.5 mm + t *	—	D-NL K	—
Thread dimensions	BC 1.37" X 24 T.P.I. (68, 73 mm)		

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

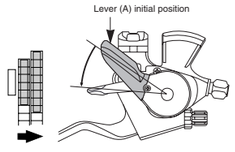
Gear shifting operation

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.

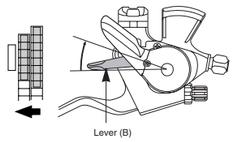
Example:
from intermediate chainring to largest chainring.



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.

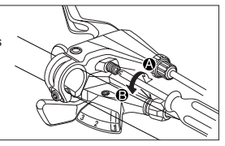
Example:
from largest chainring to intermediate chainring.



Adjusting the grip width

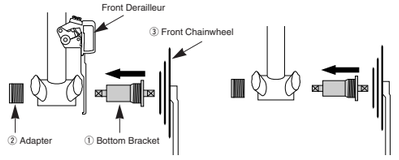
It is recommended that you adjust the grip widths of the levers to the most comfortable widths for gear shifting and braking.

Ⓐ : Becomes narrower
Ⓑ : Becomes wider



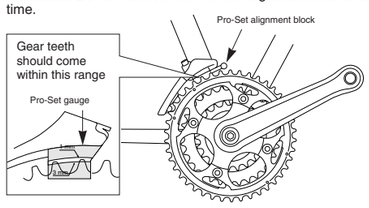
Installation of the Front Derailleur, Bottom Bracket and Front Chainwheel

Use the special tools (TL-UN65 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.



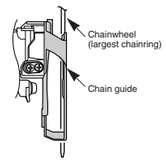
Adapter / bottom bracket tightening torque:
50 - 70 N·m {435 - 608 in. lbs.}
Front chainwheel tightening torque:
35 - 50 N·m {305 - 435 in. lbs.}

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



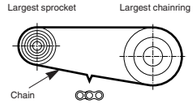
The level section of the chain guide outer plate should be directly above and parallel to the largest chainring. Secure using a 5 mm Allen key.

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



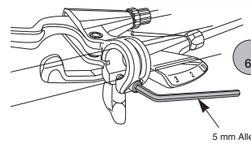
Chain length

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



Mounting the shifting lever

Use a handlebar grip with a maximum outer diameter of 36 mm.



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

SIS adjustment

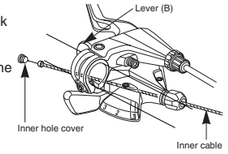
Be sure to follow the sequence described below.

1. Low adjustment

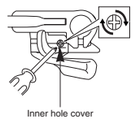
First remove the Pro-Set alignment block.
Next, set so that the clearance between the chain guide inner plate and the chain is 0-0.5 mm.

2. Connecting and securing the inner cable

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.

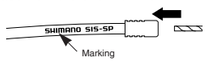


Install the inner hole cover by turning it as shown in the illustration until it stops.
Do not turn it any further than this, otherwise it may damage the screw thread.



Inserting the inner cable

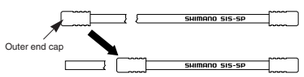
Insert the inner cable into the outer casing from the end with the marking on it. Apply grease from the end with the marking in order to maintain cable operating efficiency.



Cutting the outer casing

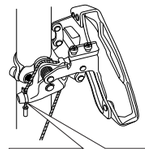
When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

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.

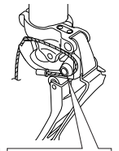
< FD-M310/M191/M190-3/M190A >

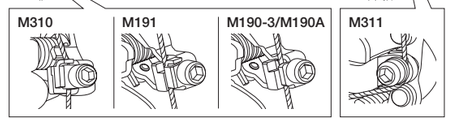


Note:
Pass the cable through as shown in the illustration.

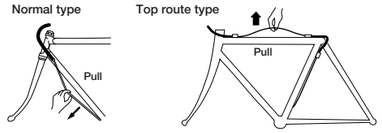
Tightening torque :
5 - 7 N·m {44 - 60 in. lbs.}

< FD-M311 >



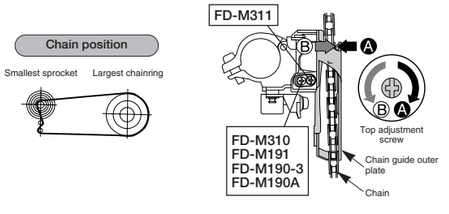


After taking up the initial slack in the cable, re-secure to the front derailleur as shown in the illustration.



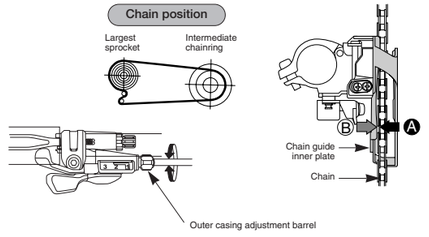
3. Top adjustment

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.)

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).