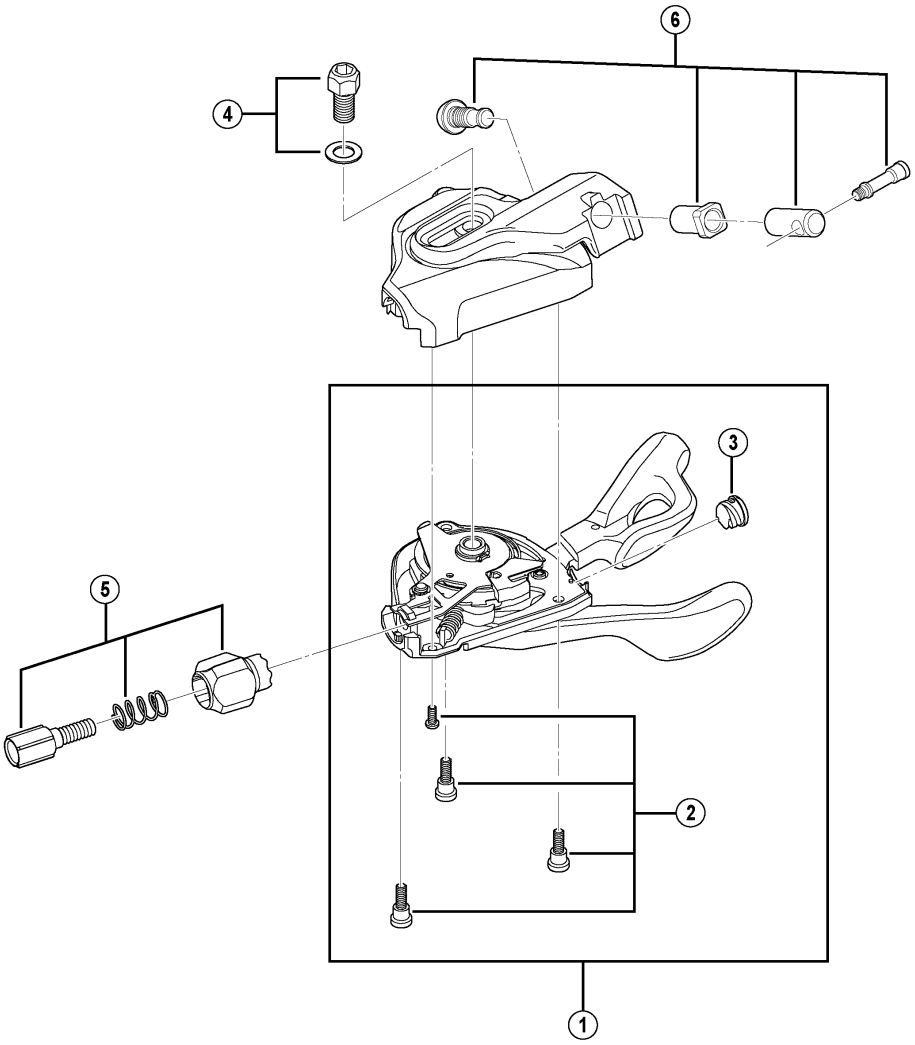
DEORE XT Rapidfire Plus Lever

SL-M780-B-I (I-spec B-type)



SL-M780

ITEM NO.	SHIMANO CODE NO.	DESCRIPTION	INTERCHANGEABILITY		
1	**Y6UU98010**	R.H. Shifting Lever Unit			
	Y6UV98010	L.H. Shifting Lever Unit			
2	**Y6T798020**	Shifting Lever Fixing Screw Unit			
3	**Y6CD33000**	Inner Hole Cap	A		
4	**Y6T798050**	Unit Fixing Bolt (M5 x 9.5) & Washer			
5	**Y6TA98020**	R.H. Cable Adjustting Bolt Unit	A		
	Y6UV98020	L.H. Cable Adjustting Bolt Unit	A		
6	**Y6UV98090**	Bolt & Nut Unit			

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

Mar.-2013-3533

SHIMANO

General Safety Information

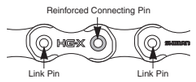
⚠ WARNING

"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."

- **In order to obtain good gear shifting performance, this chain has a forward side and a reverse side, and the sides are marked so that the chain will face the correct way when installed. The proper design performance will be obtained when the chain is installed so that it faces the correct way. If it is installed so that it faces the opposite way, the chain may come off and the bicycle may fall over and serious injury may occur as a result.**
- Use the reinforced connecting pin only for connecting the narrow type of chain.
- 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
10-speed super narrow chain for MTB	with groove (3) / with groove (2)	TL-CN32 TL-CN23 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. The chain will be damaged if it is cut at a place where it has been joined with a reinforced connecting pin.



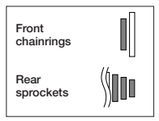
- Be careful not to let the cuffs of your clothes get caught in the chain while riding, otherwise you may fall off the bicycle.
- Check that the tension of the chain is correct and that the chain is not damaged. If the tension is too weak or the chain is damaged, the chain should be replaced. If this is not done, the chain may break and cause serious injury.
- The two left crank arm mounting bolts should be tightened alternately in stages rather than each bolt being fully tightened all at once. Use a torque wrench to check that the final tightening torques are within the range of 12 - 14 N·m. Furthermore, after riding approximately 100 km (60 miles), use a torque wrench to re-check the tightening torques. It is also important to periodically check the tightening torques. If the tightening torques are too weak or if the mounting bolts are not tightened alternately in stages, the left crank arm 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.
- If the inner cover is not installed correctly, the axle may rust and become damaged, and the bicycle may fall over and serious injury may occur as a result.
- **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

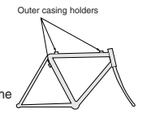
- If the chain is on the smallest or intermediate chainring, there is the danger of injury from the tips of the teeth on the largest chainring.

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.
- If a squeaking noise is heard coming from the bottom bracket axle and the left crank arm connector, apply grease to the connector and then tighten it to the specified torque.
- Use a neutral detergent to clean the crank arm and the bottom bracket. Using alkaline or acidic detergents may cause discoloration.
- Do not wash the bottom bracket with high-pressure jets of water.
- If you feel any looseness in the bearings, 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 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.
- 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.
- For frames with suspension, the chain stay angle will vary depending on whether the bicycle is being ridden or not being ridden. When the bicycle is not being ridden and the chain is positioned on the largest/larger chainring and on the smallest sprocket, the chain guide outer plate of the front derailleur may touch the chain.
- The cuffs of your clothing may get dirty from the chain while riding.
- Apply grease to the left and right adapters before installing them.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.
- The front derailleur is for double front chainwheels only. It cannot be used with triple front chainwheels, as the shifting points will 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.
- A special grease is used for the gear shifting cable. Do not use DURA-ACE grease or other types of grease, otherwise they may cause deterioration in gear shifting performance.
- 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.
- If the brake fluid used in the oil disc brakes is of a type which tends to adhere to the plastic parts of the shifting lever, this may cause the plastic parts to crack or become discolored. Therefore, you should make sure that the brake fluid does not adhere to these plastic parts. The mineral oil which is used in SHIMANO disc brakes does not cause cracking or discoloration if it adheres to plastic parts, but such parts should be cleaned with alcohol beforehand to prevent foreign particles from adhering.
- Do not disassemble the indicator and shifting lever unit, as this may damage them or cause mis-operation.
- Be sure to read the service instructions for the Rear Drive System in conjunction with these service instructions (SL-M780-I).
- 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.

SI-5MZ0A-001 Technical Service Instructions

Front Drive System (2x10)

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

Series	XT (2x10)
Shifting lever	SL-M780-L / SL-M780-IL
Outer casing	OT-SP41
Front derailleur	FD-M785 / FD-M785-E2 / FD-M786 / FD-M786-D
Front chainwheel	FC-M785
Chain	CN-HG94
Bottom bracket cable guide	SM-SP17

Specifications

Front Derailleur

X = Available

Model number		FD-M785	FD-M785-E2	FD-M786	FD-M786-D
Normal type		X	X	X	X
Top route type		X	X	X	X
Front chainwheel tooth difference		14T	12T	14T	14T
Front derailleur installation band diameter		S, M, L	–	S, M, L	–
Chainstay angle (α)		66° - 69°	66° - 69°	66° - 69°	66° - 69°
Applicable chain line	48.8 mm	44-38T	40-38T	44-38T	44-38T

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

When using the S, M size, use an installation band with a diameter of 28.6 mm, 31.8mm and install it to a L size adapter.

Chainwheel

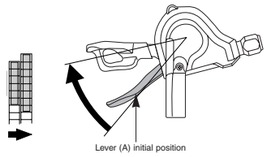
Model number	FC-M785	
Chainwheel tooth combination	38-26T	40-28T
Bolt circle diameter	104 / 64 mm	104 / 64 mm
Crank arm length	165, 170, 175, 180 mm	165, 170, 175, 180 mm
Chain line	48.8 mm	48.8 mm
Bottom bracket shell width	68, 73 mm	68, 73 mm
Thread dimensions	BC1.37 (68, 73mm)	BC1.37 (68, 73mm)
Applicable bottom bracket	SM-BB70 / SM-BB71-41A	

Gear shifting operation

The INSTANT RELEASE mechanism makes fast releasing possible because cable tension is released immediately when a lever is depressed. This release lever is equipped with a 2-way release mechanism which allows release operations to be carried out by either pushing or pulling the lever.
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.

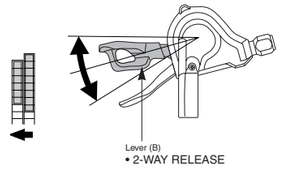
To shift from the smaller chainring to the larger chainring (Lever A)
When lever (A) is pressed once, there is a shift of one step from the smaller chainring to the larger chainring.

Example:
From smaller chainring to larger chainring.



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

Example:
From larger chainring to smaller chainring.



Installation of the Front Chainwheel

Follow the procedure in the figure.

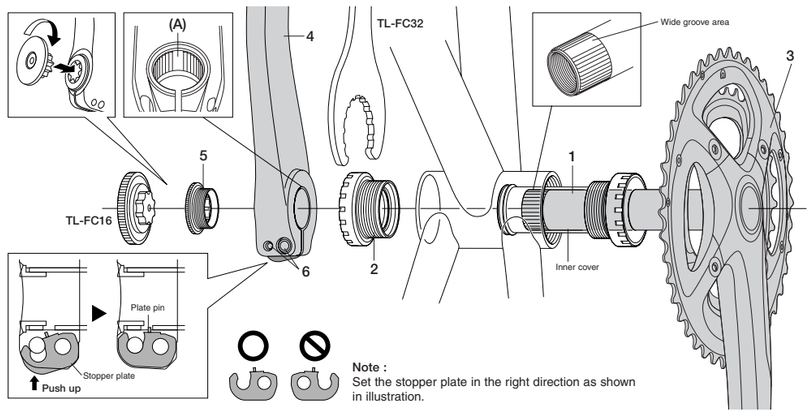
1, 2 Use the special tool TL-FC32/36 to install the right adapter (counterclockwise thread) and the left adapter (clockwise thread).
Tightening torque: 35 - 50 N·m {305 - 435 in. lbs.}
Note : Spacers may be necessary depending on the bottom bracket shell width. For details, refer to "Spacer installation method".

3 Insert the right crank unit.

4 Set section A of the left crank into the axle of the right crank unit where the groove is wide.

5 Use the TL-FC16/18 to tighten the cap.
Tightening torque: 0.7 - 1.5 N·m {6 - 13 in. lbs.}

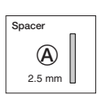
6 Push in the stopper plate and check that the plate pin is securely in place, and then tighten the bolt of the left crank arm. (5 mm Allen key)
Note : Each of the bolts should be evenly and equally tightened to 12 - 14 N·m {106 - 122 in. lbs.}.



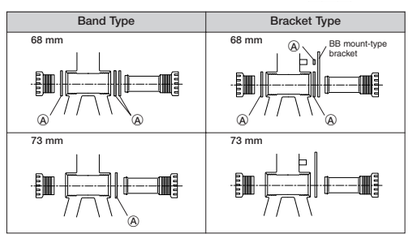
Note :
Set the stopper plate in the right direction as shown in illustration.

■ Spacer installation method

(1) Check whether the width of the bottom bracket shell is 68 mm or 73 mm.
(2) Next, install the adapter while referring to the illustrations.

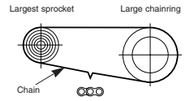


* If using a bottom bracket shell having a width of 68 mm which is a band type, an 1.8 mm spacer and a 0.7 mm spacer can be used together instead of a 2.5 mm spacer.



Chain length

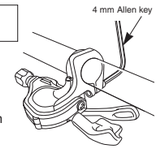
Add 2 links (with the chain on both the largest sprocket and the large chainring).



Installation of the shifting lever

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

Tightening torque : 3 N·m {27 in. lbs.}



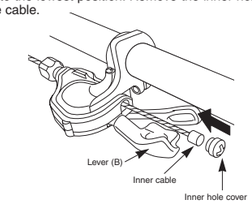
- Install the shifting lever in a position where it will not obstruct brake operation and gear shifting operation.
- Do not use in a combination which causes brake operation to be obstructed.

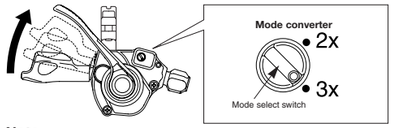
Note:
When installing the components to carbon frame/handle bar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.

Refer to the FD-M785 / M785-E2 / M786 / M786-D (Front Derailleur) Service Instructions for details on installing the front derailleur and SIS adjustment.

Connecting and securing the inner cable

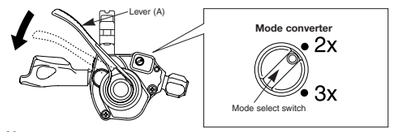
Switch the mode converter to the 3x (triple mode) position, and then check the lowest position. Operate lever B two times or more to set the lever to the lowest position. Remove the inner hole cover, and install the cable.





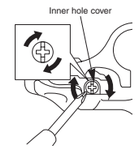
Note:
Do not force the mode select switch to turn. If you force it to turn, it will break.

Operate lever A once to set it to the middle position. Switch the mode converter to the 2x (double mode) position.



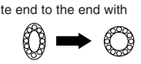
Note:
The mode converter cannot be switched while the lever is at the lowest position. Be sure to operate lever (A) one or more times before switching. Do not turn the mode converter by force, otherwise it may break.

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 thread on the cover.

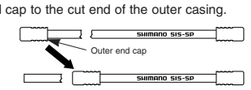


Cutting the outer casing

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.

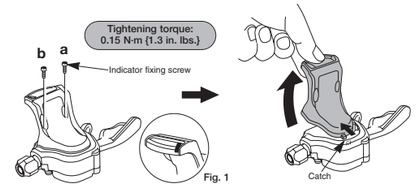


This service instruction explains how to use and maintain the Shimano bicycle parts which have been used on your new bicycle. For any questions regarding your bicycle or other matters which are not related to Shimano parts, please contact the place of purchase or the bicycle manufacturer.

Replacement and reassembly of the indicator unit and shifting lever unit

Carry out disassembly and reassembly only when replacing the indicator unit and the shifting lever unit.

■ Replacement of the indicator unit



<Disassembly>

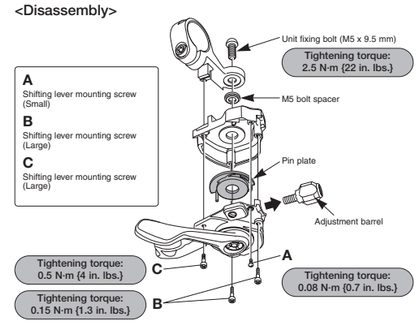
1. Operate lever B two times or more to set the lever to the lowest position.
2. Remove the indicator fixing screws (a) and (b) which are securing the indicator unit, and then lift up the lens of the indicator unit to disengage the catch as shown in the illustration. Then remove the indicator unit.
   * Do not mix up screws (a) and (b). If they are mixed up, damage may result.

<Assembly>

1. Operate lever B two times or more to set the lever to the lowest position.
2. Check that the indicator needle is at the right edge. (Fig. 1)
3. Install the indicator unit by first engaging the catch, and then secure it by tightening indicator fixing screws (a) and (b).
4. Check the operation. If the indicator unit does not operate correctly, reassemble while paying particular attention to steps 1 and 2.

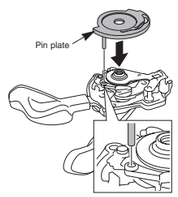
■ Replacement and reassembly of the shifting lever unit

<Disassembly>



1. 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.
2. Remove the indicator unit by following the disassembly procedure given in "Replacement of the indicator unit".
3. Remove the adjustment barrel.
4. Remove the unit fixing bolt.
5. Remove the four shifting lever unit mounting screws, and then remove the shifting lever unit as shown in the illustration.
   * Be careful not to mix up screws A, B, and C.
6. Remove the pin plate from the shifting lever unit.

<Assembly>



1. Install the pin plate to the newly-assembled shifting lever unit.
   * Insert the projections on the pin plate into the holes in the shifting lever unit as shown in the illustration.
2. Align the shifting lever unit and the bracket, and then secure with the four shifting lever unit mounting screws.
   * Install the M5 bolt spacer before securing the screws.
3. Tighten the unit fixing bolt.
4. Install the adjustment barrel.
5. Install the indicator unit by following the assembly procedure given in "Replacement of the indicator unit".

* There is no pin plate installed to the SL-M780-I.

■ For details on reassembly without the indicator and reassembly of the bracket band (SM-SL78), refer to the Service Instructions for the rear drive system.

SHIMANO

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

SI-5N20A-002-00

General Safety Information

⚠ WARNING

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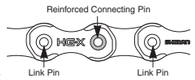
- Use the reinforced connecting pin only for connecting the narrow type of chain.
- If connecting pins other than reinforced connecting pins are used, or if a reinforced connecting pin or tool which is not suitable for the type of chain is used, sufficient connection force may not be obtained, which could cause the chain to break or fall off.
- 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. The chain will be damaged if it is cut at a place where it has been joined with a reinforced connecting pin.

Chain	Reinforced connecting pin	Chain tool
10-speed super narrow chain for MTB	with groove (3) / with groove (2)	TL-CN32 TL-CN23 TL-CN27



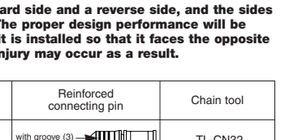
- Be careful not to let the cuffs of your clothes get caught in the chain while riding, otherwise you may fall off the bicycle.
- Check that the tension of the chain is correct and that the chain is not damaged. If the tension is too weak or the chain is damaged, the chain should be replaced. If this is not done, the chain may break and cause serious injury.
- The two left crank arm mounting bolts should be tightened alternately in stages rather than each bolt being fully tightened all at once. Use a torque wrench to check that the final tightening torques are within the range of 12 - 14 N·m. Furthermore, after riding approximately 100 km (60 miles), use a torque wrench to re-check the tightening torques. It is also important to periodically check the tightening torques. If the tightening torques are too weak or if the mounting bolts are not tightened alternately in stages, the left crank arm 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.
- If the inner cover is not installed correctly, the axle may rust and become damaged, and the bicycle may fall over and serious injury may occur as a result.
- **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

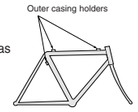
- If the chain is on the smallest or intermediate chainring, there is the danger of injury from the tips of the teeth on the largest chainring.

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.
- If a squeaking noise is heard coming from the bottom bracket axle and the left crank arm connector, apply grease to the connector and then tighten it to the specified torque.
- Use a neutral detergent to clean the crank arm and the bottom bracket. Using alkaline or acidic detergents may cause discoloration.
- Do not wash the bottom bracket with high-pressure jets of water.
- If you feel any looseness in the bearings, 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 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.
- 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 if the chain is in the position shown in Figure 1. Shift the chain onto the next-smaller sprocket or the one after if it is in the position shown in Figure 2.



- For frames with suspension, the chain stay angle will vary depending on whether the bicycle is being ridden or not being ridden. When the bicycle is not being ridden and the chain is positioned on the largest/larger chainring and on the smallest sprocket, the chain guide outer plate of the front derailleur may touch the chain.
- The cuffs of your clothing may get dirty from the chain while riding.
- Apply grease to the left and right adapters before installing them.
- 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.
- A special grease is used for the gear shifting cable. Do not use DURA-ACE grease or other types of grease, otherwise they may cause deterioration in gear shifting performance.
- 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.
- If the brake fluid used in the oil disc brakes is of a type which tends to adhere to the plastic parts of the shifting lever, this may cause the plastic parts to crack or become discolored. Therefore, you should make sure that the brake fluid does not adhere to these plastic parts. The mineral oil which is used in SHIMANO disc brakes does not cause cracking or discoloration if it adheres to plastic parts, but such parts should be cleaned with alcohol beforehand to prevent foreign particles from adhering.
- Do not disassemble the indicator and shifting lever unit, as this may damage them or cause mis-operation.
- Be sure to read the service instructions for the Rear Drive System in conjunction with these service instructions (SL-M780-I).
- 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.

SI-5N20A-002 Technical Service Instructions

Front Drive System (3x10)

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

Series	XT MTB (3x10)	XT Trekking (3x10)
Shifting lever	SL-M780-L / SL-M780-IL	SL-M780-L / SL-M780-IL
Outer casing	OT-SP41	OT-SP41
Front derailleur	FD-M780 / FD-M780-E / FD-M781 / FD-M781-D	FD-T780 / FD-T781
Front chainwheel	FC-M780	FC-T780 / FC-T781 / FC-T551
Chain	CN-HG94	CN-HG94
Bottom bracket cable guide	SM-SP17	SM-SP17

Specifications

Front Derailleur

X = Available

Model number	FD-M780	FD-M780-E	FD-M781	FD-M781-D	FD-T780	FD-T781
Normal type	X	X	X	X	X	X
Top route type	X	X	X	X	X	X
Front chainwheel tooth difference	18T	18T	18T	18T	22T	22T
Min. difference between top and intermediate	10T	10T	10T	10T	12T	12T
Front derailleur installation band diameter	S, M, L	–	S, M, L	–	S, M, L	S, M, L
Chainstay angle (α)	66° - 69°	66° - 69°	66° - 69°	66° - 69°	63° - 66° / 66° - 69°	63° - 66°
Applicable chain line	50 mm					

Chainwheel

Model number	FC-M780	FC-T780	FC-T781	FC-T781	FC-T551	FC-T551
Chainwheel tooth combination	42-32-24T	48-36-26T	48-36-26T	44-32-24T	48-36-26T	44-32-24T
Bolt circle diameter	104 / 64 mm					
Crank arm length	165, 170, 175, 180 mm				170, 175 mm	
Chain line	50 mm					
Bottom bracket shell width	68, 73 mm					
Thread dimensions	BC1.37 (68, 73mm)					
Applicable bottom bracket	SM-BB70 / SM-BB71-41A				SM-BB51	

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

When using the S, M size, use an installation band with a diameter of 28.6 mm, 31.8mm and install it to a L size adapter.

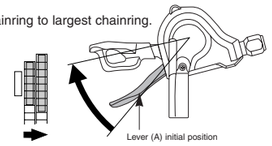
Chainstay angle

Gear shifting operation

The INSTANT RELEASE mechanism makes fast releasing possible because cable tension is released immediately when a lever is depressed. This release lever is equipped with a 2-way release mechanism which allows release operations to be carried out by either pushing or pulling the lever.
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.

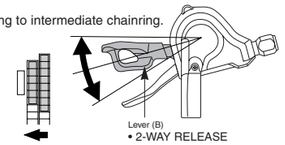
To shift from a small chainring to a larger chainring (Lever A)
When lever (A) is pressed once, there is a shift of one step from a small chainring to a larger chainring.

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 Chainwheel

Follow the procedure in the figure.

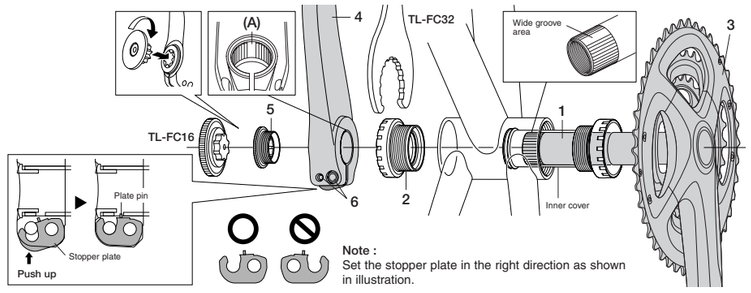
1, 2 Use the special tool TL-FC32/36 to install the right adapter (counterclockwise thread) and the left adapter (clockwise thread).
Tightening torque: 35 - 50 N·m {305 - 435 in. lbs.}
Note : Spacers may be necessary depending on the bottom bracket shell width. For details, refer to "Spacer installation method".

3 Insert the right crank unit.

4 Set section A of the left crank into the axle of the right crank unit where the groove is wide.

5 Use the TL-FC16/18 to tighten the cap.
Tightening torque: 0.7 - 1.5 N·m {6 - 13 in. lbs.}

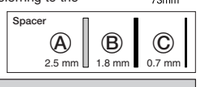
6 Push in the stopper plate and check that the plate pin is securely in place, and then tighten the bolt of the left crank arm. (5 mm Allen key)
Note : Each of the bolts should be evenly and equally tightened to 12 - 14 N·m {106 - 122 in. lbs.}.



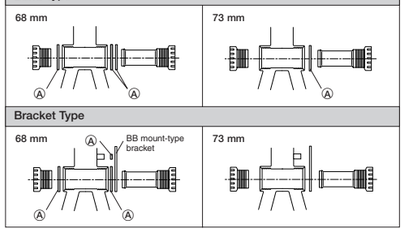
Note :
Set the stopper plate in the right direction as shown in illustration.

■ Spacer installation method

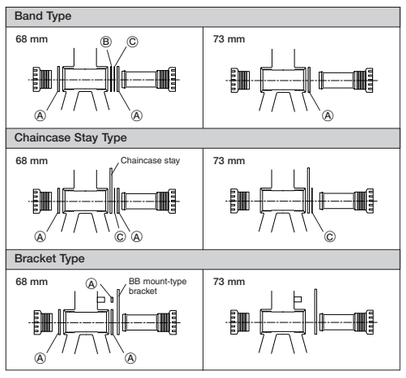
1 Check whether the width of the bottom bracket shell is 68 mm or 73 mm.
2 Next, install the adapter while referring to the illustrations below.



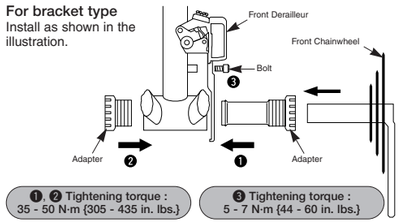
< FC-M780 / FC-T780 >



< FC-T781 / FC-T551>



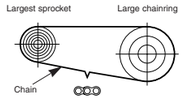
For bracket type
Install as shown in the illustration.



❶, ❷ Tightening torque : 35 - 50 N·m {305 - 435 in. lbs.}
❸ Tightening torque : 5 - 7 N·m {44 - 60 in. lbs.}

Chain length

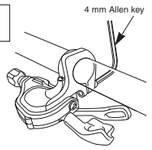
Add 2 links (with the chain on both the largest sprocket and the large chainring).



Installation of the shifting lever

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

Tightening torque : 3 N·m {27 in. lbs.}



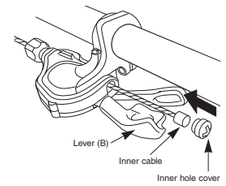
- Install the shifting lever in a position where it will not obstruct brake operation and gear shifting operation.
- Do not use in a combination which causes brake operation to be obstructed.

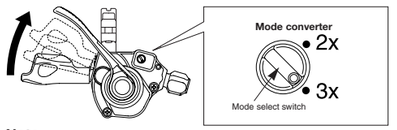
Note:
When installing the components to carbon frame/handle bar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.

Refer to the FD-M780 / M780-E / M781 / M781-D (Front Derailleur), FD-T780 / T781 (Front Derailleur) Service Instructions for details on installing the front derailleur and SIS adjustment.

Connecting and securing the inner cable

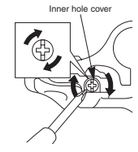
Switch the mode converter to the 3x (triple mode) position, and then check the lowest position. Operate lever B two times or more to set the lever to the lowest position.
Remove the inner hole cover, and install the cable.



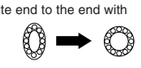


Note:
Do not force the mode select switch to turn. If you force it to turn, it will break.

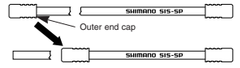
Install the inner hole cover by turning it as shown in the illustration until it stops.
Do not turn it any further than this, otherwise it may damage the thread on the cover.



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.

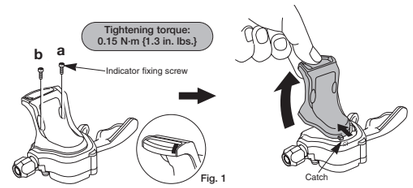


This service instruction explains how to use and maintain the Shimano bicycle parts which have been used on your new bicycle. For any questions regarding your bicycle or other matters which are not related to Shimano parts, please contact the place of purchase or the bicycle manufacturer.

Replacement and reassembly of the indicator unit and shifting lever unit

Carry out disassembly and reassembly only when replacing the indicator unit and the shifting lever unit.

■ Replacement of the indicator unit



<Disassembly>

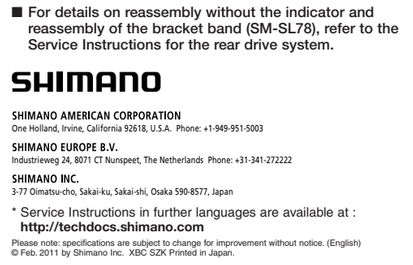
1. Operate lever B two times or more to set the lever to the lowest position.
2. Remove the indicator fixing screws (a) and (b) which are securing the indicator unit, and then lift up the lens of the indicator unit to disengage the catch as shown in the illustration. Then remove the indicator unit.
   * Do not mix up screws (a) and (b). If they are mixed up, damage may result.

<Assembly>

1. Operate lever B two times or more to set the lever to the lowest position.
2. Check that the indicator needle is at the right edge. (Fig. 1)
3. Install the indicator unit by first engaging the catch, and then secure it by tightening indicator fixing screws (a) and (b).
4. Check the operation. If the indicator unit does not operate correctly, reassemble while paying particular attention to steps 1 and 2.

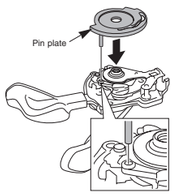
■ Replacement and reassembly of the shifting lever unit

<Disassembly>



1. 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.
2. Remove the indicator unit by following the disassembly procedure given in "Replacement of the indicator unit".
3. Remove the adjustment barrel.
4. Remove the unit fixing bolt.
5. Remove the four shifting lever unit mounting screws, and then remove the shifting lever unit as shown in the illustration.
   * Be careful not to mix up screws A, B, and C.
6. Remove the pin plate from the shifting lever unit.

<Assembly>



1. Install the pin plate to the newly-assembled shifting lever unit.
   * Insert the projections on the pin plate into the holes in the shifting lever unit as shown in the illustration.
2. Align the shifting lever unit and the bracket, and then secure with the four shifting lever unit mounting screws.
   * Install the M5 bolt spacer before securing the screws.
3. Tighten the unit fixing bolt.
4. Install the adjustment barrel.
5. Install the indicator unit by following the assembly procedure given in "Replacement of the indicator unit".

* There is no pin plate installed to the SL-M780-I.

■ **For details on reassembly without the indicator and reassembly of the bracket band (SM-SL78), refer to the Service Instructions for the rear drive system.**

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

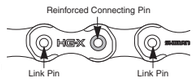
General Safety Information

⚠ 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."

- **In order to obtain good gear shifting performance, this chain has a forward side and a reverse side, and the sides are marked so that the chain will face the correct way when installed. The proper design performance will be obtained when the chain is installed so that it faces the correct way. If it is installed so that it faces the opposite way, the chain may come off and the bicycle may fall over and serious injury may occur as a result.**
- 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.
- 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.
- 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. The chain will be damaged if it is cut at a place where it has been joined with a reinforced connecting 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.

Chain	Reinforced connecting pin	Chain tool
10-speed super narrow chain for MTB	with groove (3) with groove (2)	TL-CN32 TL-CN23 TL-CN27



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.
- 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.
- 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 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.
- A special grease is used for the gear shifting cable. Do not use DURA-ACE grease or other types of grease, otherwise they may cause deterioration in gear shifting performance.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.
- Operation of the levers related to gear shifting should be made only when the front chainwheel is turning.
- If the brake fluid used in the oil disc brakes is of a type which tends to adhere to the plastic parts of the shifting lever, this may cause the plastic parts to crack or become discolored. Therefore, you should make sure that the brake fluid does not adhere to these plastic parts.
  The mineral oil which is used in SHIMANO disc brakes does not cause cracking or discoloration if it adheres to plastic parts, but such parts should be cleaned with alcohol beforehand to prevent foreign particles from adhering.
- Do not disassemble the indicator and shifting lever unit, as this may damage them or cause mis-operation.
- Parts are not guaranteed against natural wear or deterioration resulting from normal use.
- Read these Service Instructions in conjunction with the Service Instructions for the FH-M785 / M788.
- 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-6UU0A-002

Rear Drive System

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

Series	XT (MTB)	XT (Trekking)
Shifting lever	SL-M780-R / SL-M780-IR	SL-M780-R / SL-M780-IR
Outer casing	OT-SP41	OT-SP41
Rear derailleur	RD-M780	RD-T780
Type	SGS / GS	SGS
Freehub	FH-M785 / FH-M788	FH-M785
Gears	10	10
Cassette sprocket	CS-M771-10	CS-M771-10 / CS-6700
Chain	CN-HG94	CN-HG94
Bottom bracket guide	SM-SP17 / SM-BT17	SM-SP17 / SM-BT17

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

Specifications

Rear Derailleur

Model number	RD-M780		RD-T780
Type	SGS	GS	SGS
Gears	10		10
Total capacity	43T	35T	45T
Largest sprocket	36T		34T
Smallest sprocket	11T		11T
Front chainwheel tooth difference	18T		22T

Cassette sprocket tooth combination

Model number	Group name	Gears	Tooth combination
CS-M771-10	**bJ**	10	11, 13, 15, 17, 19, 21, 23, 26, 30, 34T
	bK	10	11, 13, 15, 17, 19, 21, 24, 28, 32, 36T
	bL	10	11, 12, 14, 16, 18, 20, 22, 25, 28, 32T
CS-6700	**–**	10	11, 12, 13, 14, 15, 17, 19, 21, 24, 28T

* The RD-M780 cannot be used in combination with the CS-6700 (11-28T).
* The RD-T780 cannot be used in combination with the CS-M771-10 (11-36T).

Freehub

Model number	FH-M785 / FH-M788
Gears	10
No. of spoke holes	32

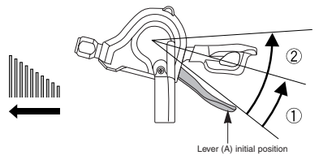
■ **Refer to the RD-M780 or RD-T780 (Rear Derailleur) Service Instructions for details on installation of the sprockets.**

Gear shifting operation

The INSTANT RELEASE mechanism makes fast releasing possible because cable tension is released immediately when a lever is depressed. The levers are also equipped with 2-WAY RELEASE and MULTI RELEASE mechanisms so that you can now shift two gears with a single operation, either by pushing or pulling the lever.
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.

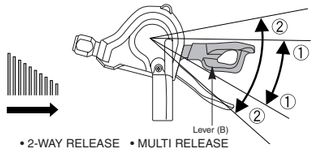
To shift from a small sprocket to a larger sprocket (Lever A)

You can vary the lever stroke to shift the desired number of gears, so that to shift by one gear only, move the lever to the (1) position, and to shift by two gears at one time, move the lever to the (2) position. A maximum two-gear shift can be made in this manner.



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

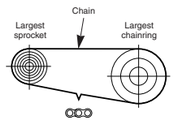
You can vary the lever stroke to shift the desired number of gears, so that to shift by one gear only, move the lever to the (1) position, and to shift by two gears at one time, move the lever to the (2) position. A maximum two-gear shift can be made in this manner.



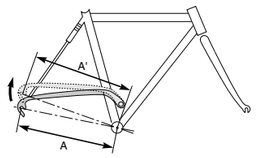
• 2-WAY RELEASE • MULTI RELEASE

Chain length on bicycles with rear suspension

The length of A will vary depending on the movement of the rear suspension. Because of this, an excessive load may be placed on the drive system if the chain length is too short. Set the length of the chain by adding two links to the chain when the rear suspension is at a position where dimension "A" is longest and the chain is on the largest sprocket and the largest chainring. If the amount of movement of the rear suspension is large, the slack in the chain may not be taken up properly when the chain is on the smallest chainring and smallest sprocket.



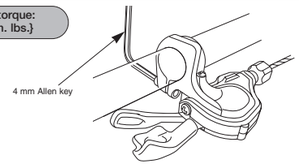
Add 2 links (with the chain on both the largest sprocket and the largest chainring).



Installation of the shifting lever (SL-M780-R)

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

Tightening torque: 3 N·m {27 in. lbs.}



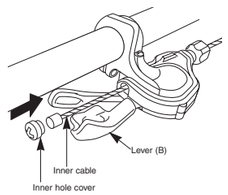
- Install the shifting lever in a position where it will not obstruct brake operation and gear shifting operation.
- Do not use in a combination which causes brake operation to be obstructed.

Note:
When installing the components to carbon frame/handle bar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.

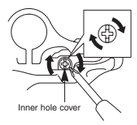
■ **Refer to the RD-M780 or RD-T780 (Rear Derailleur) Service Instructions for details on installing the rear derailleur and SIS adjustment.**

Connection and securing of the inner cable

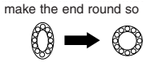
Operate the lever (B) 9 times or more to set the lever to the highest position. Then remove the inner hole cover and connect the inner cable.



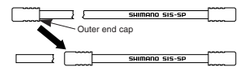
Install the inner hole cover by turning it as shown in the illustration until it stops. Do not turn it any further than this, otherwise it may damage the screw thread.



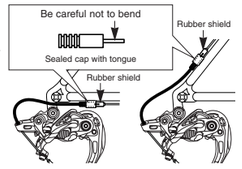
Cutting the outer casing
When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.



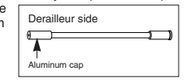
Attach the same outer end cap to the cut end of the outer casing.



The sealed cap with tongue and the rubber shield should be installed to the outer casing stopper of the frame.



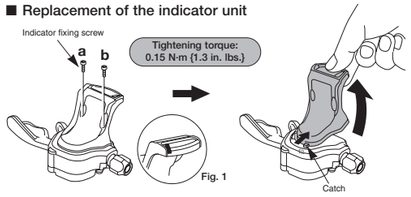
* If the rear derailleur moves to a large degree, such as in bicycles with rear suspension, it is recommended that you replace the cap with an aluminum cap. The end of the outer casing which has the aluminum cap should be at the derailleur side.



Replacement and reassembly of the indicator unit

Carry out disassembly and reassembly only when removing or replacing the indicator unit.

■ **Replacement of the indicator unit**



<Disassembly>

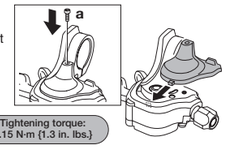
1. Operate lever B nine times or more to set the lever to the highest position.
2. Remove the indicator fixing screws (a) and (b) which are securing the indicator unit, and then lift up the lens of the indicator unit to disengage the catch as shown in the illustration. Then remove the indicator unit.
   * Do not mix up screws (a) and (b).
   If they are mixed up, damage may result.

<Assembly>

1. Operate lever B nine times or more to set the lever to the highest position.
2. Check that the indicator needle is at the left edge. (Fig. 1)
3. Install the indicator unit by first engaging the catch, and then secure it by tightening indicator fixing screws (a) and (b).
4. Check the operation. If the indicator unit does not operate correctly, reassemble while paying particular attention to steps 1 and 2.

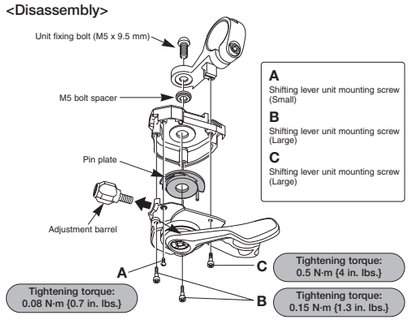
■ **Reassembly without the indicator (cover sold separately)**

Once the indicator unit has been removed, install the cover (sold separately) by first engaging the catch, and then secure it by tightening indicator fixing screw (a).



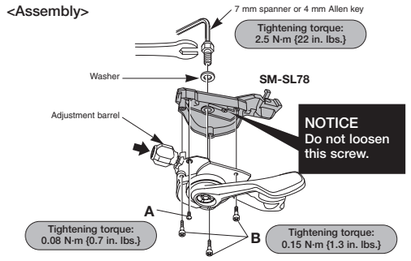
Reassembly of the bracket band (SM-SL78 sold separately)

<Disassembly>



1. Remove the indicator unit by following the disassembly procedure given in "Replacement of the indicator unit".
2. Remove the adjustment barrel.
3. Remove the unit fixing bolt.
4. Remove the four shifting lever unit mounting screws, and then remove the shifting lever unit as shown in the illustration.
   * Be careful not to mix up screws A, B, and C.
5. Remove the pin plate from the shifting lever unit.

<Assembly>



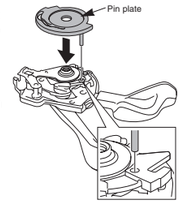
1. With the pin plate removed, align the shifting lever unit and the SM-SL78 bracket band (sold separately), and then secure with the four mounting screws which are included with the SM-SL78.
2. Place the washer onto the bolt, and then tighten the unit fixing bolt.
3. Install the adjustment barrel.

* If reassembling to the normal bracket band from the SM-SL78, be sure to install the pin plate regardless of whether the indicator is being installed or not.

Replacement and reassembly of the shifting lever unit

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

Replacement of the shifting lever unit should be carried out using the same disassembly and reassembly procedures given in "Reassembly of the bracket band".
* If using with the indicator installed, be sure to install the pin plate when carrying out reassembly.
* When reassembling, insert the projections on the pin plate into the holes in the shifting lever unit as shown in the illustration.

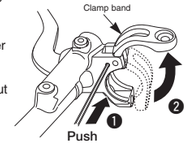


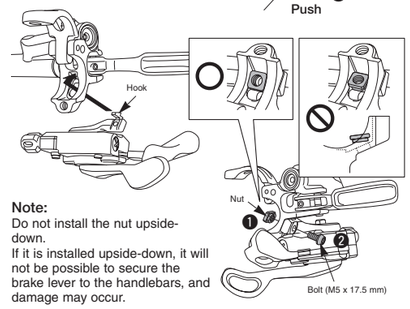
■ **Read these Service Instructions together with the Service Instructions for the BR-M785 (SI-8JZ0A).**

Installation of the SL-M780-I and the BL-M785

Brake levers \ Shifting lever	SL-M780-I
BL-M985 / M988 / M785 / T785 / T780 / M596 / M666	OK
Other Brake lever models	Not compatible

1. Use a 2 mm Allen key to open the clamp band of the brake lever as shown in the illustration.
2. Insert the hook of the shifting lever bracket into the hole in the brake lever bracket, and then provisionally tighten the special nut and special bolt to install it to the handlebar.

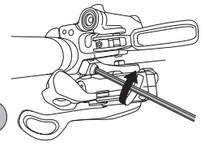




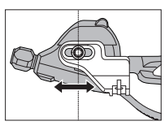
Note:
Do not install the nut upside-down.
If it is installed upside-down, it will not be possible to secure the brake lever to the handlebars, and damage may occur.

3. Use a 4 mm Allen key to secure the shifting lever to the brake lever.

Tightening torque: 4 N·m {35 in. lbs.}



4. Use a 7mm spanner to secure the unit fixing bolt.



Shifting lever position is adjustable by sliding to left or right.

Tightening torque : 2.5 N·m {22 in. lbs.}