SERVICE INSTRUCTIONS **SI-F100C**

Front Drive System

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

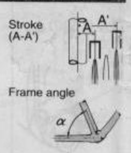
In order to realize the best performance, we recommend that the following combination be used.

	DEORE LX	EXAGE ES	EXAGE LX	ALTUS A10	ALTUS A20	ALTUS C10
Rapidfire	ST-M560	ST-M520	ST-M320	ST-AT10	ST-AT20	ST-CT10 ST-CT15
Outer casing	SIS-SP outer casing					
Front derailleur	FD-M560 FD-M561	FD-M520 FD-M521	FD-M320 FD-M321	FD-AT10 FD-AT11	FD-AT20	FD-CT10 FD-CT10-C
Front chainwheel	FC-M560	FC-M520	FC-M320	FC-AT10	FC-AT20	FC-CT10
Bottom bracket	BB-UN51 / BB-LP30 / BB-LP20					BB-CS21 BB-CS11
Chain	CN-HG70	CN-HG50				
Bottom bracket cable guide	SM-SP55 / SM-SP25 / SM-SP16 / SM-SP15					

Specifications

Combinations chart

Front derailleur installation band diameter	Chain line	Spindle length (Shell width)	
		BB-UN51 / BB-LP30 / BB-LP20	BB-CS21 / BB-CS11
φ28.6 (S) φ31.8 (M) φ34.9 (L)	47.5 mm	113 (68, 70)	122.5 (68, 70, 73)
	50 mm	118 (68, 70)	127.5 (68, 70, 73)



Front Derailleur

Note: The chain line for FD-AT20 and FD-CT10 can only be 47.5 mm.

Model number	FD-M560 FD-M520 FD-M320	FD-M561 FD-M521 FD-M321	FD-AT10	FD-AT11	FD-AT20 FD-CT10	FD-CT10-C
Normal type	○		○		○	○
Top route type		○		○		
Capacity	φ28.6 (S), φ31.8 (M) φ34.9 (L)		φ28.6 (S) φ31.8 (M)		φ28.6 (S)	
Stroke (A-A')	38-58		38-54			
Front angle (α)	66° - 69°					63° - 66°

Front chainwheel

Model number	FC-M560	FC-M520	FC-M320	FC-AT10	FC-AT20	FC-CT10
Material	Light alloy		Steel			
Bolt circle diameter	110 mm (outer, middle) 74 mm (inner)				Integrated	
Front chainwheel tooth combination	F-46-36-26		G-46-36-26		48-38-28	
Crank arm length (mm)	175,170	175,170,165			175,170	170
Pedal thread dimensions	BC 9/16"×20 T.P.I. (English thread)					
Bottom bracket cup thread dimensions	BC 1.37"×24T.P.I. (68, 73 mm), M36×24T.P.I. (70 mm)					

Bottom Bracket

Model number	BB-UN51 / BB-LP30 / BB-LP20		BB-CS21 / BB-CS11
Stamped marking	LL113	XL118	D-NL
Spindle length	113	118	122.5
Chain line	47.5	50	47.5

Note

- The installation and operation methods are the same as before when a thumb shifter was used, but the friction mode is employed.
- For smooth operation, always be sure to use the SIS-SP 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.
- For the chain, be sure to use only the Shimano narrow type HG chain. The wide type chain cannot be used.
- When installing the top route type, choose a frame that has three outer casing holders as shown in the illustration at right.



SHIMANO

SHIMANO AMERICAN CORPORATION
One Shimano Drive, P.O. Box 7959, Irvine, California U.S.A. 92716 Tel. (714) 951-5003

SHIMANO EUROPA GmbH
Kleinhülsen 1-3 4010 Hilden, Germany Tel. 02103-5005-0

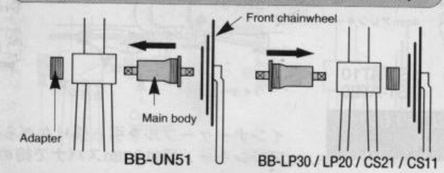
SHIMANO INC.
77 Oimatsu-cho, Sakai, Osaka, 590 Japan Tel. (0722)-23-3243

Please note: Specifications are subject to change for improvement without notice. (English)
© Jun. 1992 by Shimano Inc. XBC SZK Printed in Japan.

Installation of the bottom bracket

Install using the special tool TL-UN72. First install the main body, then the adapter.
Note: Direction of insertion depends on the model.

Tightening torque: 500-700 kgfcm (435-608 in. lbs.)

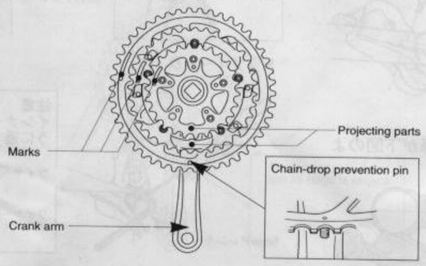


Installation of the chainrings (FC-M560/FC-M520/FC-M320/FC-AT10)

Be sure to use one of the following combinations for the tooth configuration.

F46-36-26 G46-36-26

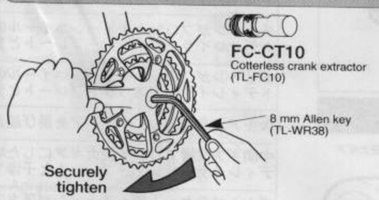
Position so that, when looking from the rear side, the F-[] or G-[] marks come to the positions as shown in the illustration, and so that the chain-drop prevention pin is directly behind the crank arm.



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

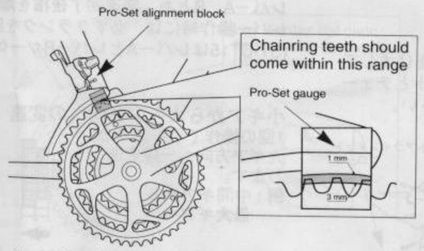
Installation of the front chainwheel

Tightening torque: 350-450 kgfcm (305-391 in. lbs.)



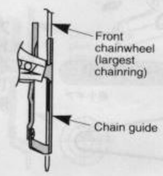
Installation to the frame

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



2. The level section of the chain guide outer plate should be directly above and parallel to the largest chainring.
3. Secure using a 5 mm Allen key or a 9 mm spanner.

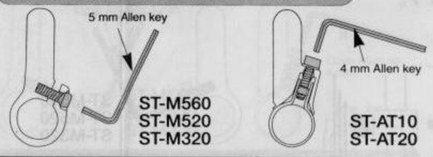
Tightening torque: 50-70 kgfcm (44-60 in. lbs.)



Installation of the lever

Rapidfire Plus

Tightening torque: 50-70 kgfcm (44-60 in. lbs.)

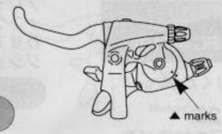


Use a handlebar with a maximum outer diameter of 32 mm.

Installation of the shifting lever

Align the ▲ marks on both the brake lever and the shifting lever, and then install them. There is only one position for installation.

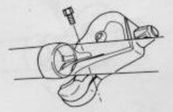
Tightening torque: 25-30 kgfcm (22-26 in. lbs.)



Rapidfire ST-CT10

Install using an T-wrench or a "+"screwdriver.

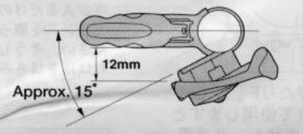
Tightening torque: 25-30 kgfcm (22-26 in. lbs.)



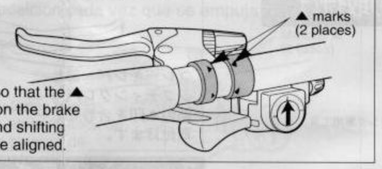
ST-CT15

For the ST-CT15, install so that the position of the Rapidfire with respect to the brake lever is as shown in the illustration.

Set the clearance to a width that is sufficient for your fingers (12 mm). If this is not done, your fingers will be clamped by the Rapidfire.

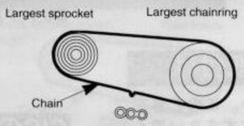


Positioning marks have been provided on the BL-CT10 and ST-CT15 to make correct installation easier.



Chain length

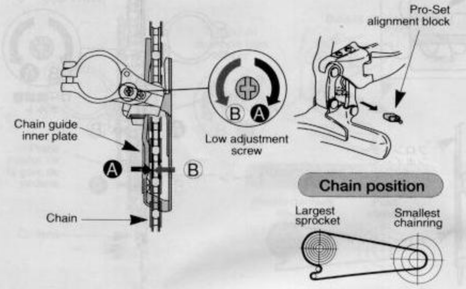
Add 2 links
(with chain tightened)



SIS adjustment

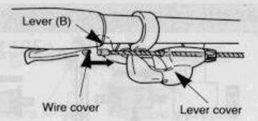
Be sure to follow the sequence described below.

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 0-0.5mm.

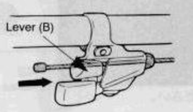


2. Connection and securing of the cable
Press lever (B) 2 or more times to set the lever to the highest position. Lever (A) and lever (B) are integrated in the ST-CT15.

Rapidfire Plus



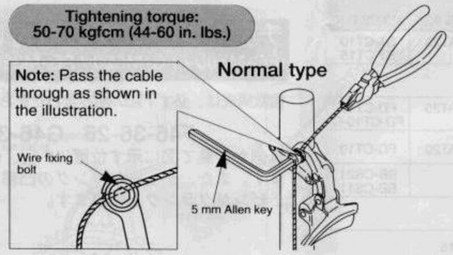
Rapidfire (ST-CT10)



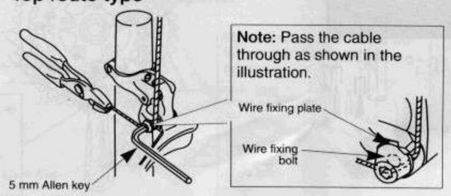
While firmly pulling the cable, tighten the fixing bolt with a 5 mm Allen key or a 9 mm spanner to secure the cable.

Tightening torque: 50-70 kgfcm (44-60 in. lbs.)

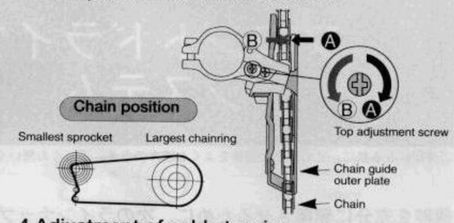
Note: Pass the cable through as shown in the illustration.



Top route type



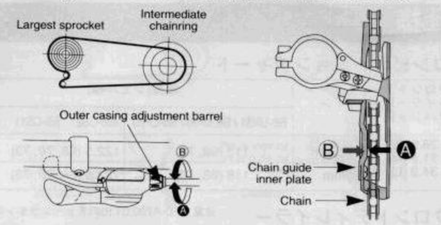
3. Top adjustment
Set so that the clearance between the chain guide outer plate and the chain is 0-0.5 mm.



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



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 cable adjusting barrel so that the clearance between the chain guide inner plate and the chain is 0-0.5 mm.



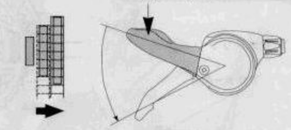
5. Troubleshooting chart
After completion of steps 1 - 4, move the shifting lever to check the shifting. (This also applies if shifting becomes difficult during use.)

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 cable adjusting barrel counterclockwise (1 or 2 turns)
If there is interference between the chain and front derailleur inner plate when the chain is shifted to the largest sprocket and at the intermediate chainring position	Tighten the cable adjusting barrel clockwise (1 or 2 turns).
If the chain falls to the bottom bracket side	Tighten the low adjustment screw clockwise (about 1/2 turn).

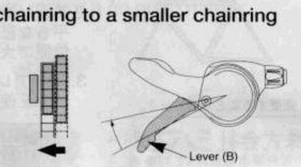
Gear shifting operation

Both lever (A) and lever (B) always return to the initial position when they are released after shifting.
When operating one of the levers, always be sure to turn the crank arm at the same time.
Lever (A) and lever (B) are integrated in the ST-CT15.

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



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



SERVICE INSTRUCTIONS SI-F330A

Front Drive System

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

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

Series	DEORE XT		DEORE LX
Rapidfire	ST-M739	ST-M008	ST-M567
Outer casing	SIS-SP40 sealed outer casing		
Front derailleur	FD-M739		FD-M567
Front chainwheel	FC-M737-IG		FC-M563-IG
Bottom bracket	BB-UN72 / BB-UN52		
Chain	CN-IG90 / CN-IG70		
Bottom bracket cable guide	SM-SP17 / SM-BT17		

Specifications

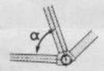
Front derailleur

Model number	FD-M739	FD-M567
Normal type	○	○
Top route type	○	○
Front derailleur installation band diameter	S, M, L	S, M, L
Stroke (A-A')	38 - 58	
Chainstay angle (α)	66° - 69°	63° - 66°, 66° - 69°
Applicable chain line	47.5 mm, 50 mm	

Stroke (A-A')



Chainstay angle



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

Front chainwheel

Model number	FC-M737-IG	FC-M563-IG
Material	Light alloy	
Bolt circle diameter	94 mm (largest, intermediate), 58 mm (smallest)	
Front chainwheel tooth combination	42 - 32 - 22	42 - 32 - 22
Crank arm length (mm)	180, 175, 170, 165	175, 170
Pedal thread dimensions	BC 9/16"×20 T.P.I. (English thread)	
Applicable chain line	47.5 mm, 50 mm	

Note: FC-M737 also includes a 44T largest chainring.
Furthermore, the smallest chainring is made of steel.

Bottom bracket

Model number	BB-UN72 / BB-UN52	
Stamped marking	MM107	LL113
Spindle length	107 (68, 70, 73)	113 (68, 70, 73)
Chain line	47.5 mm	50 mm
Bottom bracket cup thread dimensions	BC 1.37×24T.P.I. (68, 73 mm), M36×24T.P.I. (70 mm)	

Note: BB-UN52 are not compatible with the MM107 shell width of 73 mm.

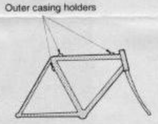
⚠ CAUTION

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

Note

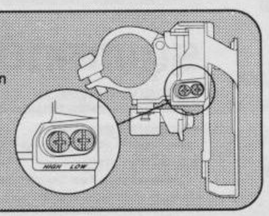
- Apply grease to the bottom bracket before installing it.
- For smooth operation, always be sure to use the specified outer casing and the bottom bracket cable guide.
- This front derailleur is for triple front chainwheel use only. It cannot be used with the double front chainwheel, as the shifting points do not match.
- When installing the top route type, choose a frame that has three outer casing holders as shown in the illustration at right.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- For any questions regarding methods of installation, adjustment, maintenance or operation, please contact a professional bicycle dealer.

Outer casing holders



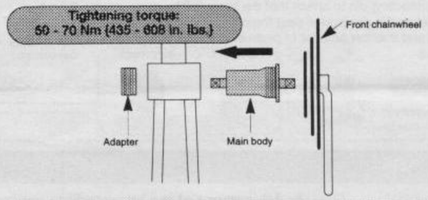
FD-M739/FD-M567 Adjustment Bolts

Because of the different construction of the new link, the positions of the top and low adjustment bolts on the FD-M739 / FD-M567 are reversed from the positions on previous front derailleurs.



Installation of the bottom bracket

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

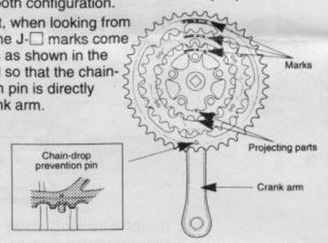


Installation of the chainrings

Be sure to use the following combination for the front chainwheel's tooth configuration.

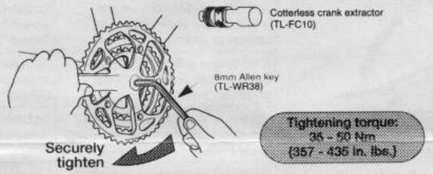
J 42-32-22 (44)

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



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

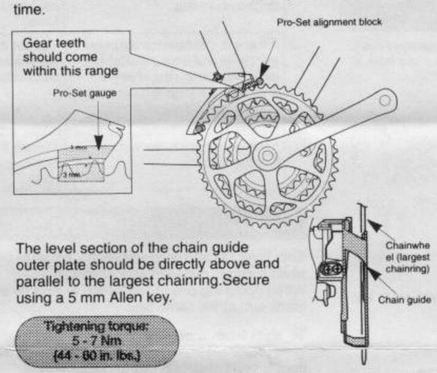
Installation of the front chainwheel



Tightening torque:
35 - 50 Nm
{357 - 435 in. lbs.}

Installation fo the front derailleur

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



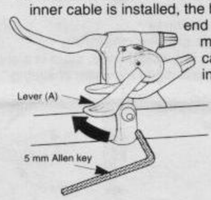
The level section of the chain guide outer plate should be directly above and parallel to the largest chainring.Secure using a 5 mm Allen key.

Tightening torque:
5 - 7 Nm
{44 - 60 in. lbs.}

Installation of the brake lever

Move lever (A) so that the installation bolt can be seen, and then use a 5 mm Allen key to install.

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

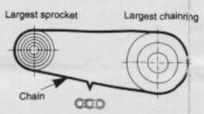


Allen key tightening torque:
6 - 8 Nm {53 - 69 in. lbs.}

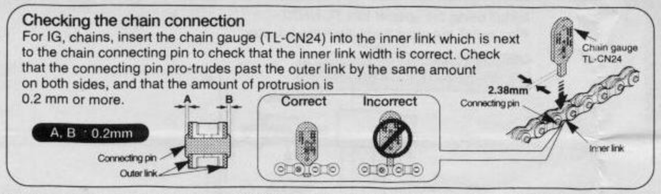
Use a handlebar grip with a maximum outer diameter of 32 mm.

Chain length

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



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

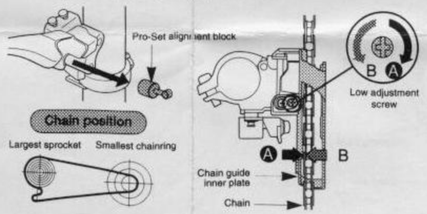


SIS adjustment

Be sure to follow the sequence described below.

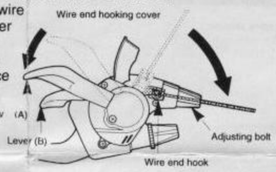
1. Low adjustment

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



2. Connection and securing of the inner cable

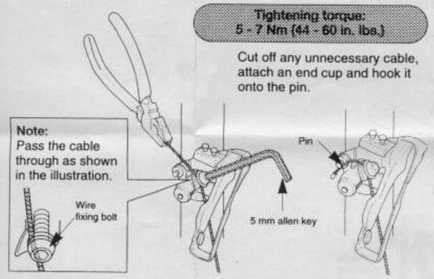
Operate lever (B) two times or more. After checking on the indicator that the lever is at the lowest position, turn the cable adjusting bolt until the slit is on the same side as the handlebar. Open the wire end hooking cover as shown in the illustration, and then pull the wire end hook toward you (if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



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

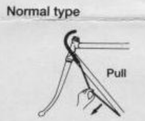
Tightening torque:
5 - 7 Nm {44 - 60 in. lbs.}

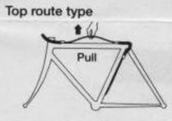
Cut off any unnecessary cable, attach an end cup and hook it onto the pin.



3. Adjustment of cable tension

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

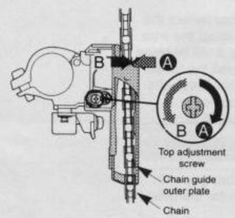




4. Top adjustment

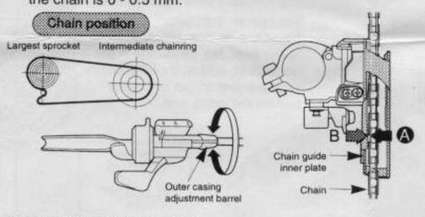
Set so that the clearance between the chain guide outer plate and the chain is 0 - 0.5 mm.

Chain position
Smallest sprocket
Largest chainring



5. 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.



6. Troubleshooting chart

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

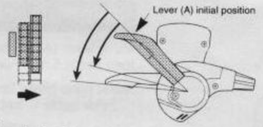
If the chain falls to the crank side	Tighten the top adjustment screw clockwise (about 1/4 turn).
If shifting is difficult from the intermediate chainring to the largest chainring	Loosen the top adjustment screw counterclockwise (about 1/8 turn).
If shifting is difficult from the intermediate chainring to the smallest chainring	Loosen the low adjustment screw counterclockwise (about 1/4 turn).
If there is interference between the chain and the front derailleur inner plate at the largest chainring	Tighten the top adjustment screw clockwise (about 1/8 turn).
If there is interference between the chain and the front derailleur outer plate at the largest chainring	Loosen the top adjustment screw counterclockwise (about 1/8 turn).
If the intermediate chainring is skipped when shifting from the largest chainring	Loosen the outer casing adjustment barrel counterclockwise (1 or 2 turns).
If there is interference between the chain and front derailleur inner plate when the chain is shifted to the largest sprocket and at the intermediate chainring position	Tighten the outer casing adjustment barrel clockwise (1 or 2 turns).
If the chain falls to the bottom bracket side	Tighten the low adjustment screw clockwise (about 1/2 turn).

Gear shifting operation

Both lever (A) and lever (B) always return to the initial position when they are released after shifting.
When operating one of the levers, always be sure to turn the crank arm at the same time.

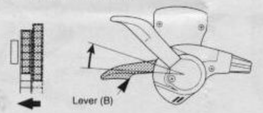
To shift from a small chainring to a larger chainring

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



To shift from a large chainring to a smaller chainring

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



Replacement of the shifting lever unit and indicator

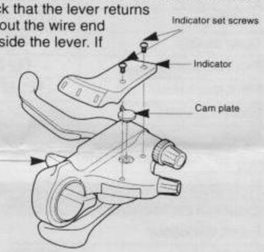
Disassembly and reassembly should only be carried out when replacing the indicator.

Removal of the indicator

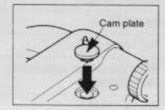
1. Remove the two indicator set screws which are securing the indicator.

Tightening torque : 0.3 - 0.5 Nm {3 - 4 in. lbs.}

2. Remove the indicator unit and cam plate as shown in the illustration.
3. Operate lever (B) two times or more to set the lever to the lowest position. At this time, check that the lever returns to the proper position without the wire end hook becoming hooked inside the lever. If the lever does not return, use the end of the inner cable to unhook the wire end hook.



4. Push the cam plate onto the hexagonal end of the shaft so that the plate is in the position shown in the illustration.
Note: Do not deliberately turn this hexagonal shaft with any tools, as this will damage the internal mechanism.



5. After checking that the indicator needle is at the right edge, set the indicator so that it is directly above the cam plate, and then secure it with the two indicator set screws.
6. Check the operation of the indicator. If it does not operate correctly, re-install the indicator by while taking particular note of steps 3. and 5.

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

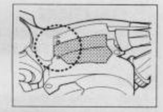
Replacement of the shifting lever unit

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. Carry out steps 1 - 2 for replacement of the indicator.
3. Remove the three shifting lever mounting screws, and then remove the shifting lever unit and wire end hooking cover as shown in the illustration.

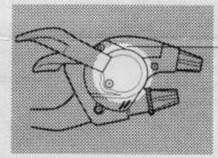
Tightening torque :
0.5 - 0.8 Nm {4 - 7 in. lbs.}



4. To assemble, align the shifting lever unit and the brake lever bracket, install the wire end hooking cover while being careful that the pins at both ends go into their respective holes, and then secure the shifting lever mounting screws.



5. Carry out steps 3 - 5 for replacement of the indicator.



Do not disassemble the indicator and shifting lever unit, as this may damage them or cause mis-operation.

SHIMANO®

SHIMANO AMERICAN CORPORATION
One Shimano Drive P.O. Box 19615 Irvine California U.S.A. 92713-9615 Phone 714-951-5003

SHIMANO EUROPA
Industrieweg 24 NL-8071 CT Nunspeet Holland Phone 31-3412-72222

SHIMANO INC.
77 Oimatsu-cho 3-cho Sakai Osaka 590 Japan Phone 0722-23-3243

These service instructions are printed on recycled paper and can be recycled again

Please note: specifications are subject to change for improvement without notice. (English)

© Jun. 1995 by Shimano Inc. XBC SZK Printed in Japan

SERVICE INSTRUCTIONS SI-F420A

Front Drive System

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

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

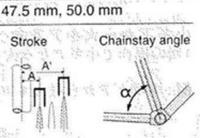
Series	STX RC	STX	ALIVIO
Rapidfire SL	SL-MC38	SL-MC37	
Outer casing	SP40 sealed outer casing		
Front derailleur	FD-MC36	FD-MC34	FD-MC14
Front chainwheel	FC-MC36	FC-MC34	FC-MC16
Bottom bracket	BB-UN52-E	BB-LP26-E	
Chain	CN-IG51		
Bottom bracket cable guide	SM-SP18 / SM-BT18		

Specifications

Front Derailleur

Model number	FD-MC36	FD-MC34	FD-MC14
Normal type	○	○	○
Top route type	○	○	○
Front chainwheel tooth difference	20T	20T	18T
Min. difference between top and intermediate	10T	10T	8T
Front derailleur installation band diameter	S, M, L		
Stroke (A-A')	38 - 58		
Chainstay angle (α)	63°-66°, 66°-69°		
Applicable chain line	47.5 mm, 50.0 mm		

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



Chainwheel

Model number	FC-MC36	FC-MC34	FC-MC16
Chainwheel tooth combination	42T-32T-22T		42T-34T-24T
Bolt circle diameter	94mm / 58mm		67mm
Crank arm length	170 mm, 175 mm		
Pedal thread dimensions	BC 9/16" X 20 T.P.I. (English thread)		

Bottom Bracket

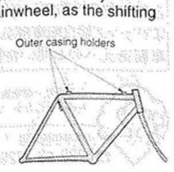
Model number	BB-UN52-E	BB-LP26-E
Stamped marking	LL113	MM110
Spindle length	113 mm	110 mm
Chain line	50.0 mm	47.5 mm
Thread dimensions	BC 1.37" X 24 T.P.I. (68, 73 mm)	

⚠ CAUTION

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

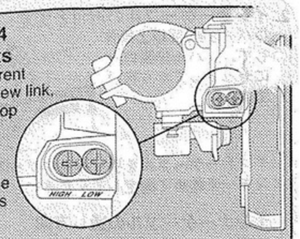
Note

- Apply grease to the bottom bracket before installing it.
- For smooth operation, always be sure to use the specified outer casing and the bottom bracket cable guide.
- This front derailleur is for triple front chainwheel use only. It cannot be used with the double front chainwheel, as the shifting points do not match.
- When installing the top route type, choose a frame that has three outer casing holders as shown in the illustration at right.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.



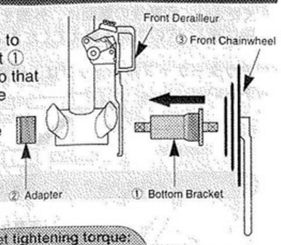
FD-MC36/34/14 Adjustment Bolts

Because of the different construction of the new link, the positions of the top and low adjustment bolts on the FD-MC36/34/14 are reversed from the positions on previous front derailleurs.



Installation of the Front Derailleur, Bottom Bracket and Front Chainwheel

Use the special tools (TL-UN70 and TL-UN73) 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.

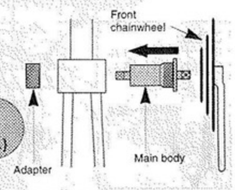


Adapter / bottom bracket tightening torque:
50 - 70 Nm {435 - 608 in. lbs.}
Front chainwheel tightening torque:
35 - 50 Nm {305 - 435 in. lbs.}

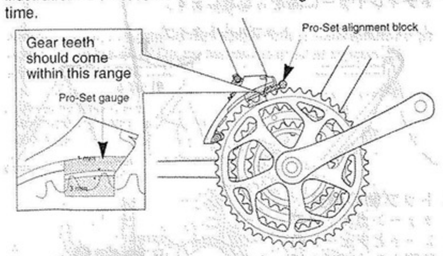
〈FD-MC14 / FC-MC16〉

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

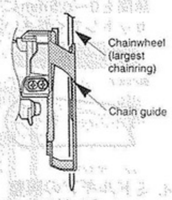
Adapter / bottom bracket tightening torque:
50 - 70 Nm {435 - 608 in. lbs.}



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

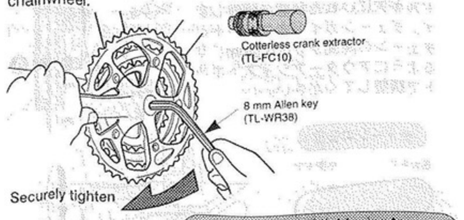


The level section of the chain guide outer plate should be directly above and parallel to the largest chainring. Secure using a 5 mm Allen key.



Tightening torque:
5 - 7 Nm
{44 - 60 in. lbs.}

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



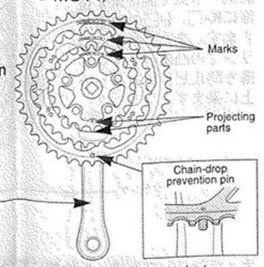
Front chainwheel tightening torque:
35 - 50 Nm {305 - 435 in. lbs.}

Installation of the chainrings

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

K 42-32-22 (FC-MC36/FC-MC34)
I 42-34-24 (FC-MC14)

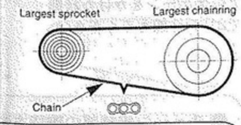
Position so that, when looking from the rear side, the **K-□**, **I-□** marks come to the positions as shown in the illustration, and so that the chain-drop prevention pin is directly behind the crank arm.



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

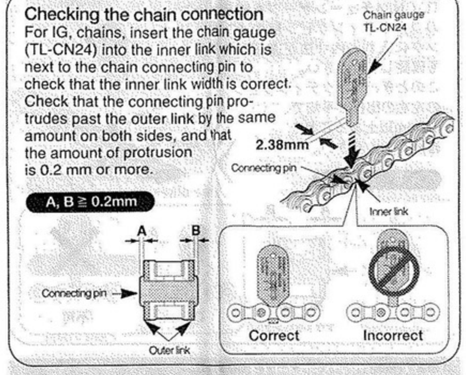
Chain length

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



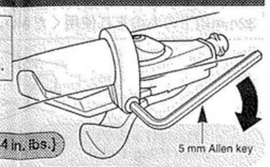
Checking the chain connection

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



Installation of the brake lever

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



Tightening torque: 5 Nm {44 in. lbs.}

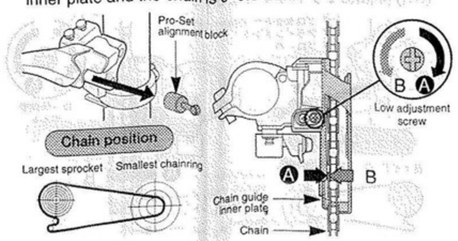
Install the brake lever in a position where it will not obstruct brake operation. Do not use in a combination which causes brake operation to be obstructed.

SIS adjustment

Be sure to follow the sequence described below.

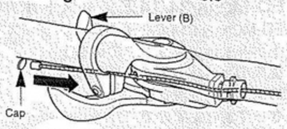
1. Low adjustment

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



2. Connection and securing of the inner cable

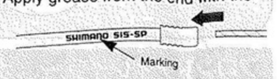
Operate lever (B) 2 or more times to set the lever to the lowest position.



While firmly pulling the inner cable, secure by tightening the fixing bolt with a 5 mm Allen key.

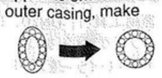
Inserting the inner cable

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.

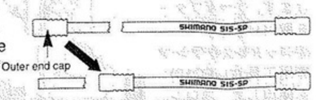


Cutting the outer casing

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.

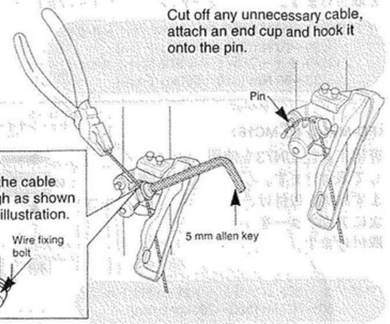


Attach the same outer end cap to the cut end of the outer casing.



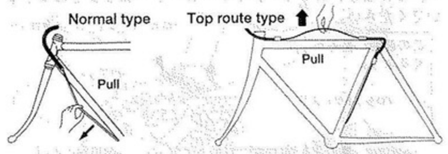
Tightening torque: 5 - 7 Nm {44 - 60 in. lbs.}

Cut off any unnecessary cable, attach an end cup and hook it onto the pin.



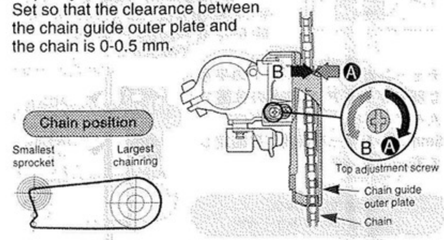
Note:
Pass the cable through as shown in the illustration.

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



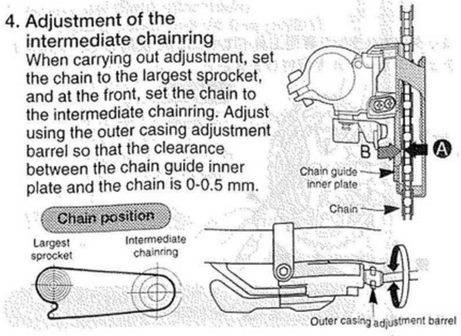
3. Top adjustment

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



4. Adjustment of the intermediate chainring

When carrying out adjustment, set the chain to the largest sprocket, and at the front, set the chain to the intermediate chainring. Adjust using the outer casing adjustment barrel so that the clearance between the chain guide inner plate and the chain is 0-0.5 mm.



5. Troubleshooting chart

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

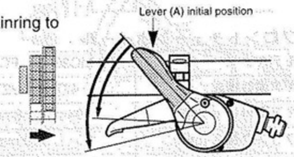
If the chain falls to the crank side.	Tighten the top adjustment screw clockwise (about 1/4 turn).
If shifting is difficult from the intermediate chainring to the largest chainring.	Loosen the top adjustment screw counterclockwise (about 1/8 turn).
If shifting is difficult from the intermediate chainring to the smallest chainring.	Loosen the low adjustment screw counterclockwise (about 1/4 turn).
If there is interference between the chain and the front derailleur inner plate at the largest chainring.	Tighten the top adjustment screw clockwise (about 1/8 turn).
If there is interference between the chain and the front derailleur outer plate at the largest chainring.	Loosen the top adjustment screw counterclockwise (about 1/8 turn).
If the intermediate chainring is skipped when shifting from the largest chainring.	Loosen the outer casing adjustment barrel counterclockwise (1 or 2 turns).
If there is interference between the chain and front derailleur inner plate when the rear sprocket is shifted to the largest sprocket when the chainwheel is at the intermediate chainring position.	Tighten the outer casing adjustment barrel clockwise (1 or 2 turns).
If the chain falls to the bottom bracket side.	Tighten the low adjustment screw clockwise (about 1/2 turn).

Gear shifting operation

Both lever (A) and lever (B) always return to the initial position when they are released after shifting.
When operating one of the levers, always be sure to turn the crank arm at the same time.

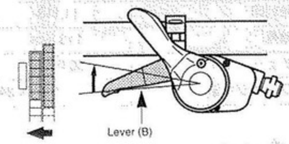
To shift from a small chainring to a larger chainring

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



To shift from a large chainring to a smaller chainring

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



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®

These service instructions are printed on recycled paper and can be recycled again

SHIMANO AMERICAN CORPORATION
One Shimano Drive P.O. Box 19615 Irvine California U.S.A. 92713-9615 Phone 714-951-5003

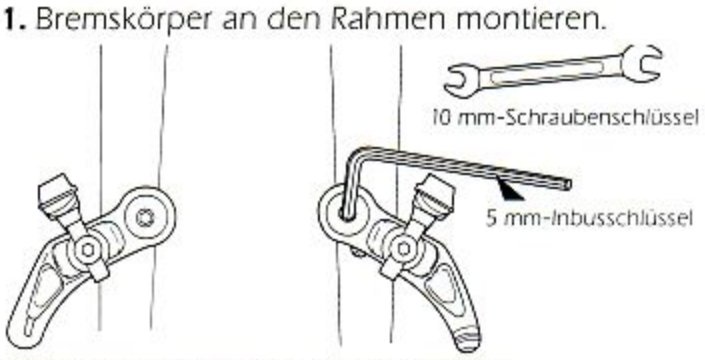
SHIMANO EUROPA
Industrieweg 24 NL-8071 CT Nunspeet Holland Phone 31-3412-72222

SHIMANO INC.
77 Oimatsu-cho 3-cho Sakai Osaka 590-77 Japan Phone 0722-23-3243

Please note: specifications are subject to change for improvement without notice. (English)
© Mar. 1996 by Shimano Inc. XBC SZK Printed in Japan

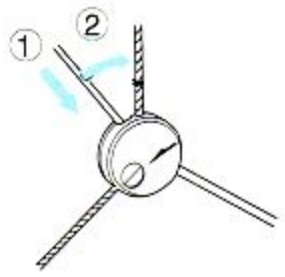
Montage mit „Unit link"-Verbindungskabel (mit Einstellhülse und -markierung, beweglicher oder fester Typ)

1. Bremskörper an den Rahmen montieren.



Anziehmoment: 50 – 70 kgfcm

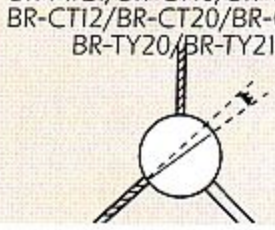
2. Bremszug durch den Kabelhalter und Einstellhülse führen.

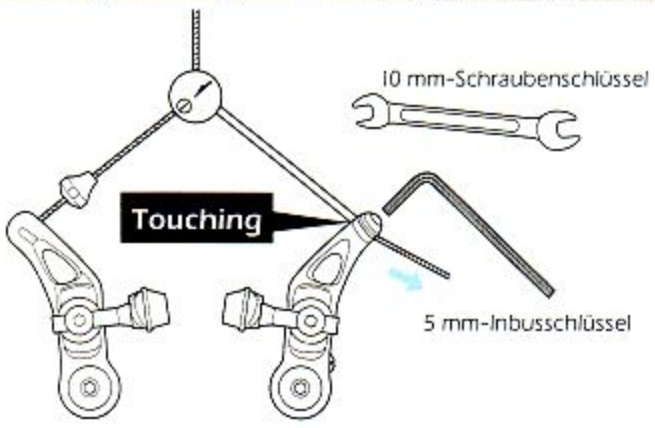


3. Befestigen Sie das Kabel vorübergehend so, daß sich der Kabelhalter in der in der Abbildung angegebenen Position befindet.

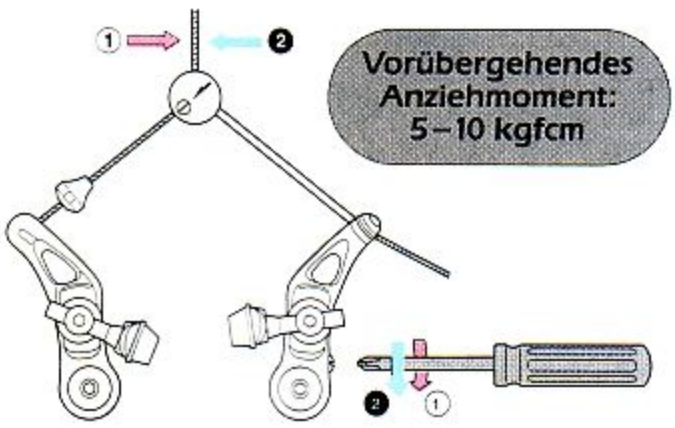
„Unit link", beweglich, mit Einstellhülse und -markierung	„Unit link", fest, mit Einstellhülse und -markierung
BR-M520/BR-M521 BR-M320/BR-M321	BR-AT10/BR-AT11/BR-AT20 BR-AT21/BR-CT10/BR-CT11/ BR-CT12/BR-CT20/BR-CT21/ BR-TY20/BR-TY21



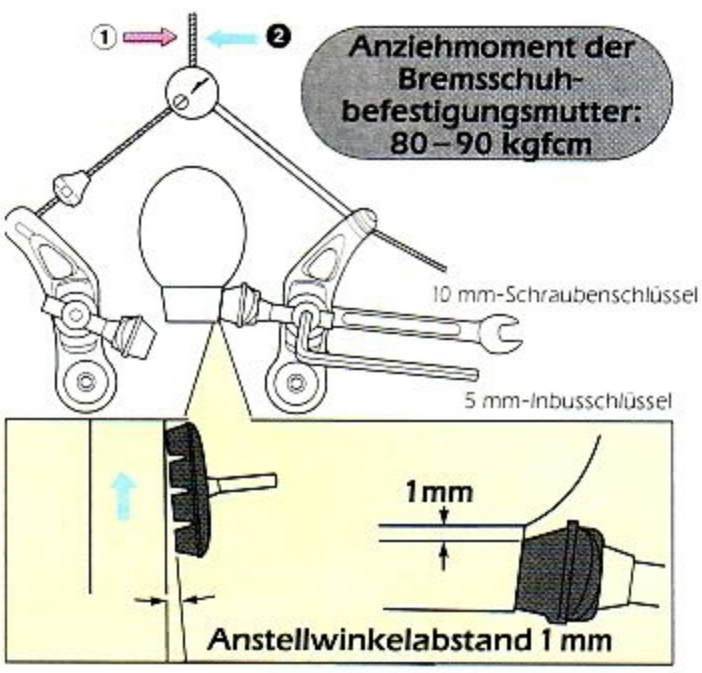




4. Zentrieren des Kabelhalters mit der Federspannungs-Einstellschraube.

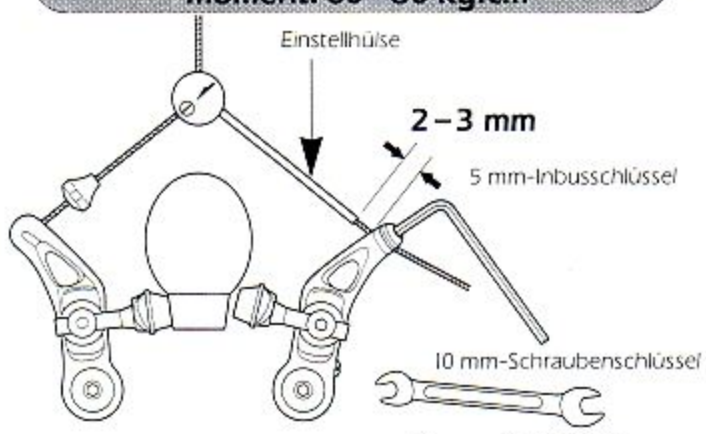


5. Bremsschuheinstellung in Fahrtrichtung mit Anlaufwinkel (Abstand 1mm).

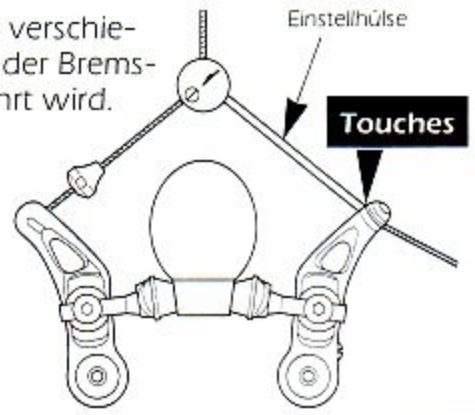


6. Kabelbefestigungsschraube lösen, Bremskörperabstand zwischen Einstellhülse und Bremskörper 2 – 3 mm, dann Kabel befestigen.

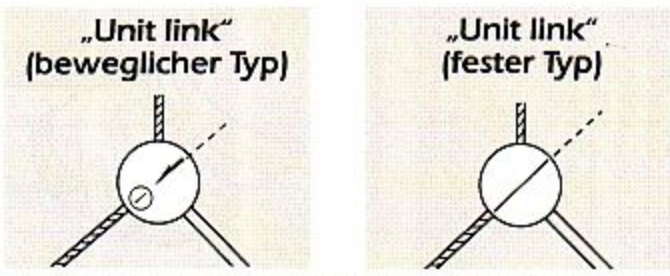
Kabelbefestigungsschrauben-Anziehmoment: 60 – 80 kgfcm



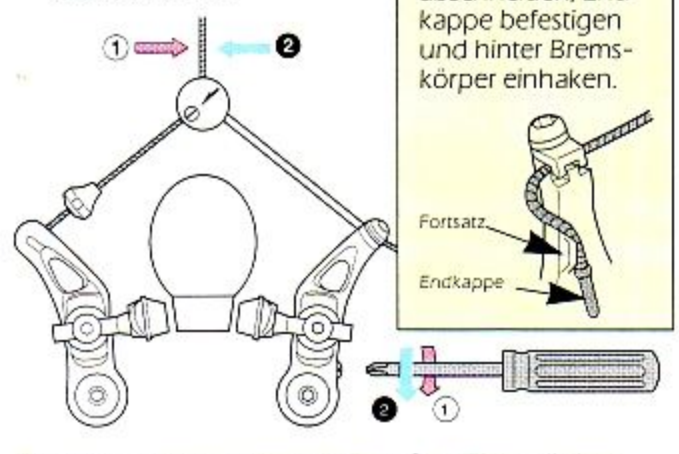
7. Einstellhülse verschieben, so daß der Bremskörper berührt wird.



8. Befindet sich der Kabelhalter in der angegebenen Position, ist die Einstellung fertig.



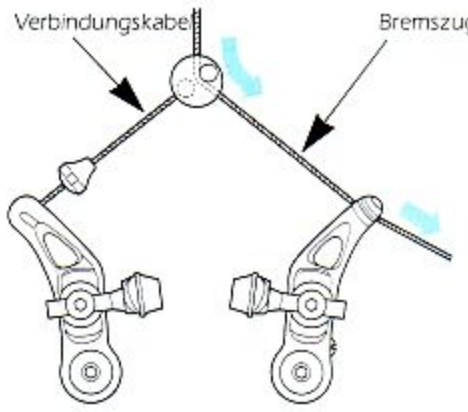
9. Die eventuelle zusätzliche Zentrierung der Bremse mit der Federspannungs-Einstellschraube durchführen.



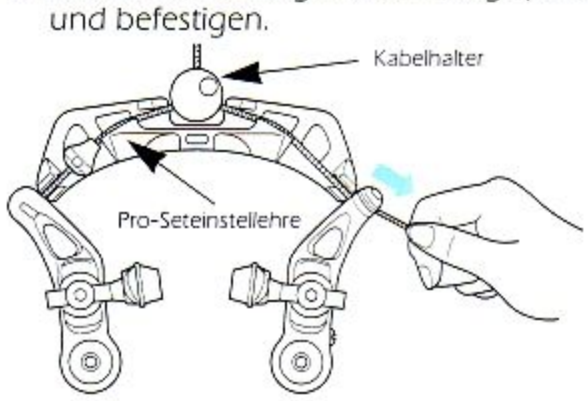
Einstellung ist auch mit Pro-Set-Einstellehre möglich.

Montage mit Standard-Bremskörperverbindungskabel (Spezialwerkzeug)

1. Bremszug durch Kabelhalter führen und provisorisch am Bremskörper befestigen.

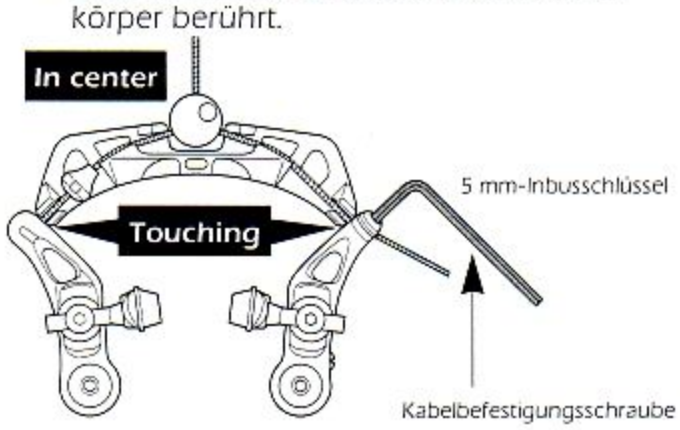


2. Pro-Set-tool einlegen, Bremszug spannen und befestigen.



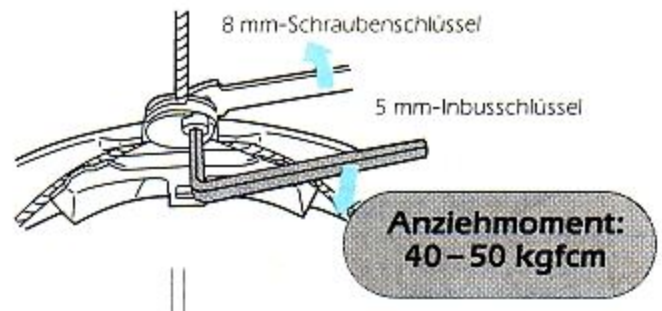
3. Befestigen Sie das Kabel mit der Kabelbefestigungsschraube. Prüfen Sie zu diesem Zeitpunkt folgendes:

- Daß der Kabelhalter sich in der Mitte der Pro-Set-Einstellehre befindet.
- Daß die Pro-Set-Einstellehre den Bremskörper berührt.



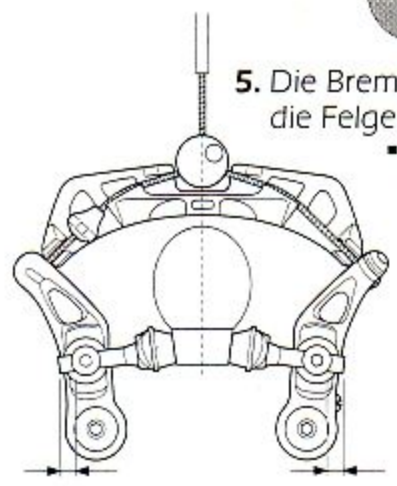
Anziehmoment: 60 – 80 kgfcm

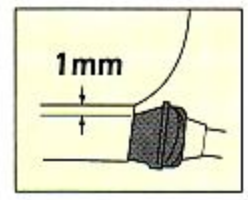
4. Befestigen Sie den Kabelhalter.



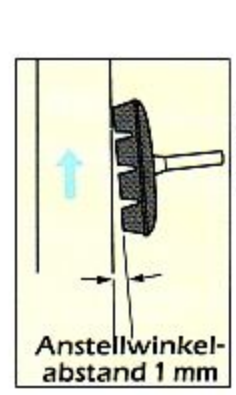
5. Die Bremsschuhe müssen die Felge fest berühren.

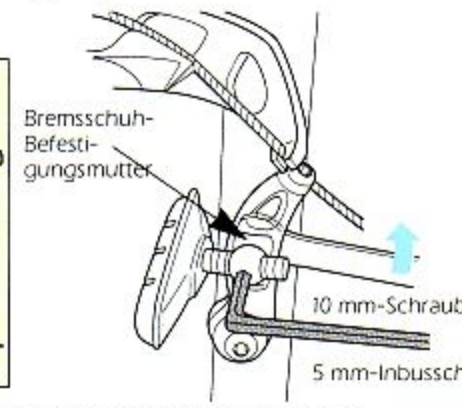
- Zentrieren Sie den Kabelhalter und die Pro-Set-Einstellehre.





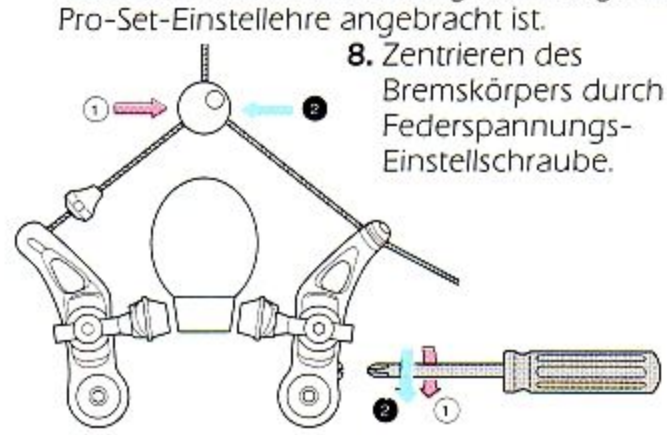
6. Bremsschuhanstellwinkelabstand 1 mm einstellen. Befestigung der Bremsschuhe.





7. Entfernen Sie die Pro-Set-Einstellehre.
Hinweis: Bremshebel betätigen, solange die Pro-Set-Einstellehre angebracht ist.

8. Zentrieren des Bremskörpers durch Federspannungs-Einstellschraube.



⚠ WARNING

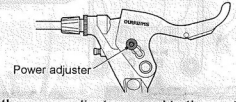
- It is important to completely understand the operation of your bicycle's brake system. Improper use of your bicycle's brake system may result in a loss of control or an accident, which could lead to severe injury. Because each bicycle may handle differently, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. This can be done by consulting your professional bicycle dealer and the bicycle's owners manual, and by practicing your riding and braking technique.
- The M600 brake system was developed specifically for racing, and is equipped with a race-standard power adjuster in the wire hooking unit of the BL-M600 brake lever.
  If this power adjuster is moved, the braking force will be dramatically increased, so that a high level of braking performance can be achieved from only a small amount of lever movement.
  Accordingly, normal braking operation may cause a greater-than-expected amount of braking force to be applied, which could make the bicycle fall forward, causing serious injury to the rider. To avoid this, please read the following instructions thoroughly before moving the power adjuster.

Do not move the power adjuster for normal road riding.

The bicycle might fall forward if you have to apply the brakes suddenly, such as when a vehicle appears.

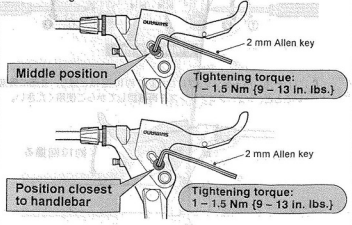
1) Without power adjuster being moved (standard specifications for shipment)

This is the standard configuration for mountain bike racing.



2) With the power adjuster moved to the position shown in the figure below

An ample degree of braking force can be obtained from a small amount of brake lever input, to provide a high level of racing brake performance. However, if the brakes are operated suddenly with a normal amount of brake lever input, there is the danger that the bicycle may fall forward. After moving the power adjuster, first ride the bicycle at a speed of less than 6 mph (10 km/h) while applying the brakes repeatedly in order to get a feel for the difference in braking characteristics before riding at higher speeds. Beginners should be particularly careful.
When the power adjuster is moved from the middle position to the position closest to the handlebar, the braking force will be even more sensitive to the amount of lever input. Beginners or those who are not fully confident should not use the brakes in this configuration.



- ***Use the BR-M600 brake arch with SERVO WAVE ACTION adjustable V-brake levers such as the BL-M600/BL-M739/ST-M739/BL-M950/ST-M950 brake levers.***

SERVICE INSTRUCTIONS SI-B440B

Multi-Condition Brake System

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

Multi-Condition Brake System
By providing superior wet weather braking performance (control and modulation), braking performance will not vary in a multitude of conditions when using this brake system.

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

Series	DEORE LX
Brake lever	BL-M600
V-brake	BR-M600
Brake cable	

NOTE:

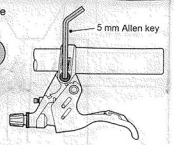
- By using these parts as a set, the optimum efficiency of the Multi-Condition Brake System can be realized.
- For any questions regarding methods of handling or maintenance, please contact the place of purchase.

Installation of the brake lever

Use a 5 mm Allen key to install the brake lever.

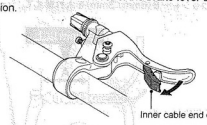
Tightening torque:
6 – 8 Nm {52 – 69 in. lbs.}

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

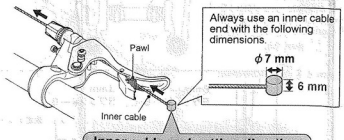


Installing the inner cable

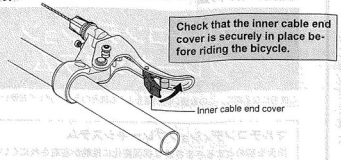
1. Slide the inner cable end cover of the brake lever as shown in the illustration.



2. Pass the inner cable through the inside of the brake lever, and place the innercable end against the pawl of the brake lever body.

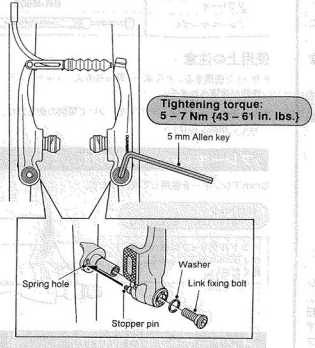


3. Return the inner cable end cover to its original position.

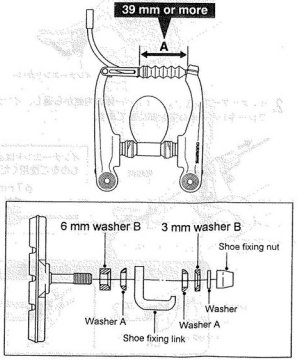


Installation of the V-brake

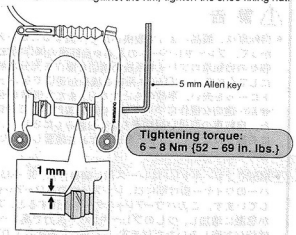
1. Insert the stopper pin of the brake body into the center spring hole in the frame mounting boss, and then secure the brake body to the frame with the link fixing bolt.



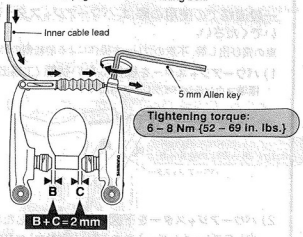
2. While holding the shoe against the rim, adjust the amount of shoe protrusion by changing over the washer B (6 mm or 3 mm) so that dimension A is kept at 39 mm or more.



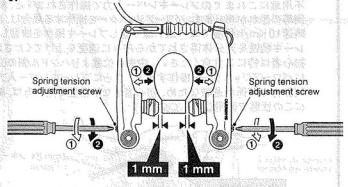
3. While holding the shoe against the rim, tighten the shoe fixing nut.



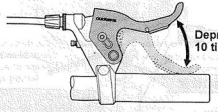
4. Pass the inner cable through the inner cable lead, and after setting so that the total of the clearances between the left and right shoes and the rim is 2 mm, tighten the cable fixing bolt.



5. Adjust the balance with the spring tension adjustment screws.



6. Depress the brake lever about 10 times as far as the grip and check that everything is operating correctly and that the shoe clearance is correct before using the brakes.



Please note: Specifications are subject to change for improvement without notice. (English)

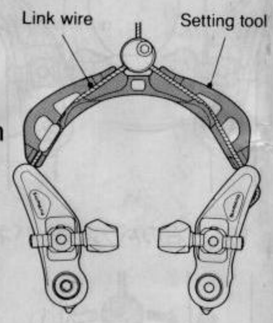
SHIMANO®
SHIMANO AMERICAN CORPORATION
One Shimano Drive, P.O. Box 19615, Irvine, California U.S.A. 92623-9615 Phone 714-951-5003
SHIMANO EUROPA
Industrieweg 24 NL-8071 CT Nunspeet, Holland Phone 31-3412-72222
SHIMANO INC.
3-77 Oimatsucho, Sakai, Osaka, Japan Phone 0722-23-3243
These service instructions are printed on recycled paper and can be recycled again.

© Jul. 1996 by Shimano Inc. PIT. IZM. Printed in Japan

SERVICE INSTRUCTIONS

BR-M734 BR-M650 BR-M651 Cantilever Brake

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



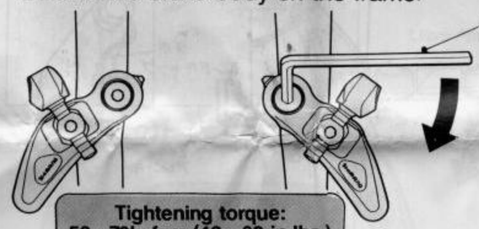
■Combinations

The setting tool and link wire and different for each cantilever brake model. Combine the parts correctly.

Setting tool (TL-CB10)	Cantilever brake	Link wire
Color: Blue A/73	BR-M734 BR-M650	A/73 For front ∅2.0mm
Color: Violet B/82	BR-M734 BR-M650	B/82 For rear ∅2.0mm
Color: Yellow C/106	BR-M651	C/106 ∅1.6mm
Color: Orange D/93	BR-M651	D/93 ∅1.6mm

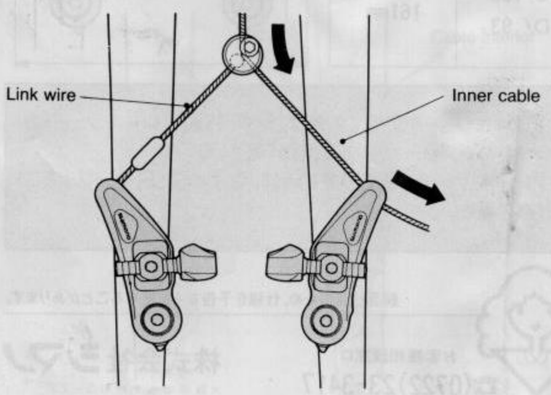
Installation of cantilever brake

1. Install the brake body on the frame.

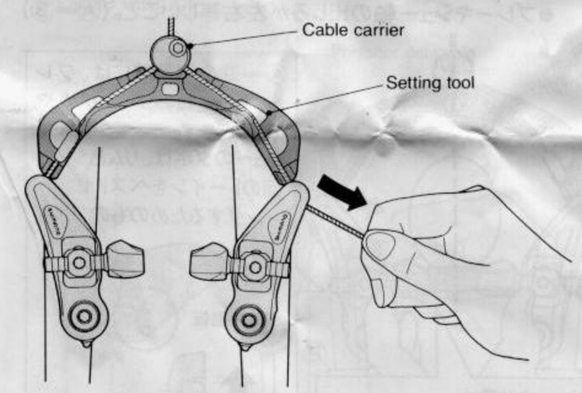




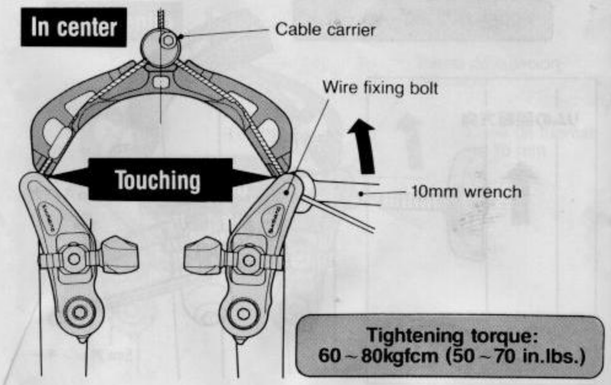
2. Set the link wire and inner cable. Do not fix them yet.



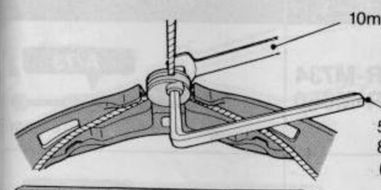
3. Attach the setting tool and pull the inner cable.



4. Fix by tightening the wire fixing nut.
At this time check the following.
- That the cable carrier is positioned in the center of the setting tool.
- That the setting tool is touching the brake body.

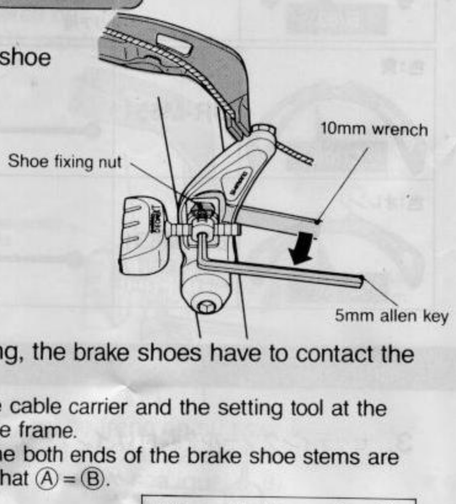


5. Fix the cable carrier.

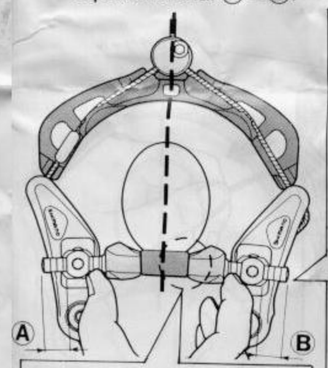


Tightening torque:
40 ~ 50kgfcm (35 ~ 43 in.lbs.)

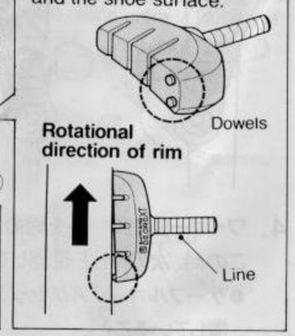
6. Loosen the shoe fixing nut.



7. For attaching, the brake shoes have to contact the rim firmly.
- Position the cable carrier and the setting tool at the center of the frame.
- Adjust so the both ends of the brake shoe stems are equal and that Ⓐ = Ⓑ.



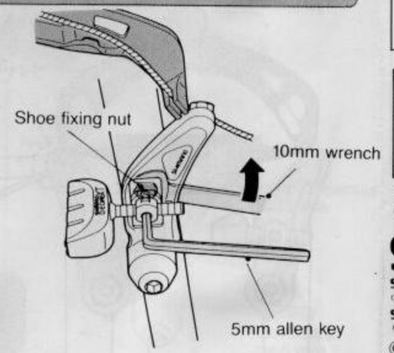
When adjusting so Ⓐ = Ⓑ, the lines on the brake shoe shaft serve as the guide. The shoe dowels are to obtain the best setting of the toe-in between the rim and the shoe surface.



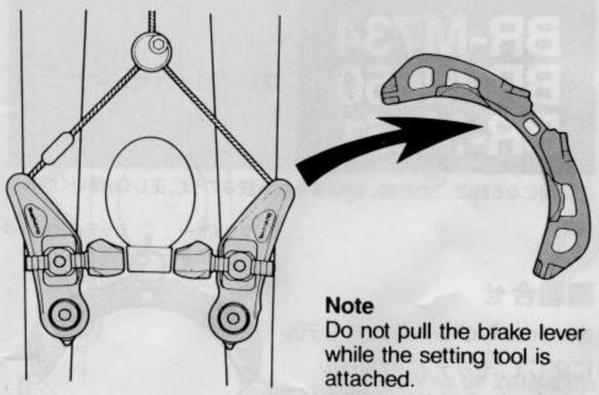
8. Fix by tightening the shoe fixing nut.

Shoe fixing nut tightening torque: 80 ~ 90kgfcm (70 ~ 80 in.lbs.)



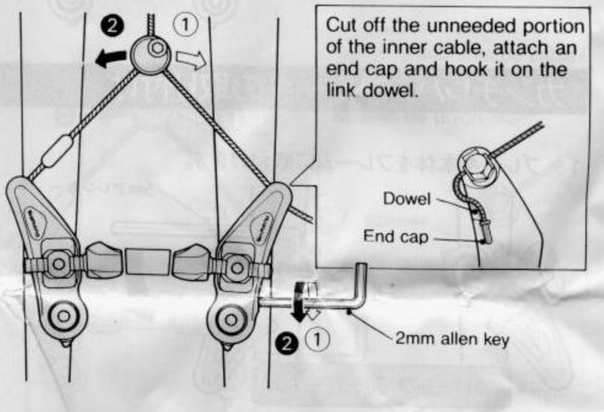


9. Remove the setting tool.



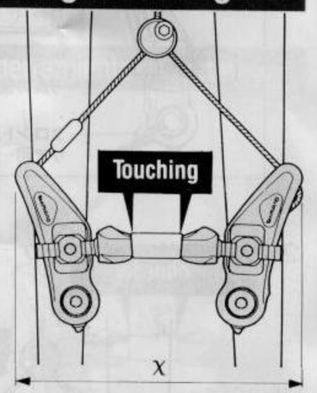
Note
Do not pull the brake lever while the setting tool is attached.

10. Match the balance on right and left using the spring force adjustment screw.



Installation without using the setting tool

Use the values of the outside width when the shoe touches the rim as a guide.



Link wire	χ
A/73 B/82	138mm
C/106 D/93	161mm

- Use genuine Shimano brake shoe (for cantilever brake) when replacing a brake shoe.
- Use Shimano SLR cable when replacing a brake cable.

Please note: specifications are subject to change for improvement without notice. (English)

SHIMANO

SHIMANO AMERICAN CORPORATION
One Shimano Drive, P.O. Box 19615, Irvine, California U.S.A. 92718 Tel. (714) 951-5003

SHIMANO INC.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

SHIMANO (EUROPA) GmbH.
Kleinhohnen 1-3, 4010 Hilden, West Germany Tel. 02103-5095-0

© Mar. 1991 by Shimano Co., Ltd. U-003A XBC SZK Printed in Japan

SERVICE INSTRUCTIONS

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

U-Brake

BR-MT63

Brake Lever

BL-MT62

(normal type)

BL-MT63

(two-finger type)

SHIMANO DEORE II

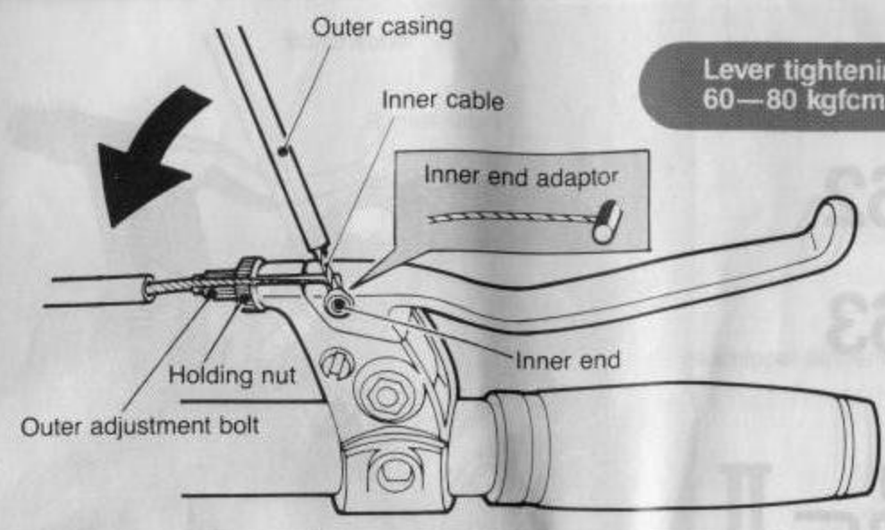


Weight

- **BR-MT63**
  330g
- **BL-MT62**
  340g (left/right pair)
- **BL-MT63**
  272g (left/right pair)

Installation of the brake lever and cable

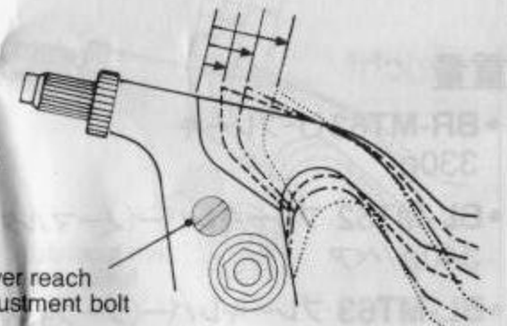
Pass the inner cable through the outer end cap and the outer casing; then align the lever's slit and the slit of the holding nut and the outer adjustment bolt, and install the brake cable.



Lever tightening torque: 60—80 kgfcm (50—65 in.lbs.)

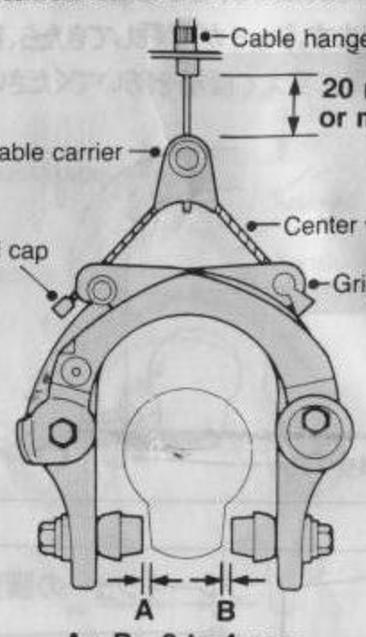
■ **The use of 1.6-mm inner cable and 5-mm outer casing is standard.**

■ Four lever reach settings can be made by turning the lever reach adjustment bolt at the rear of the lever.



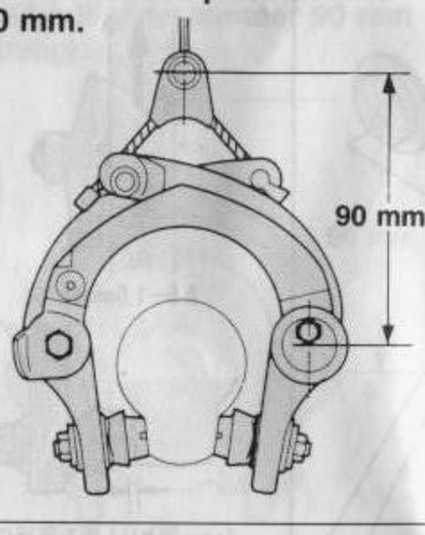
Installation and adjustment of the U-brake

Installation of the center wire

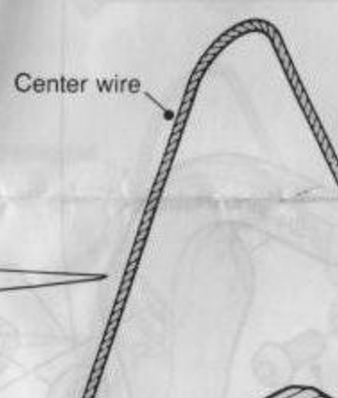


A + B = 3 to 4 mm

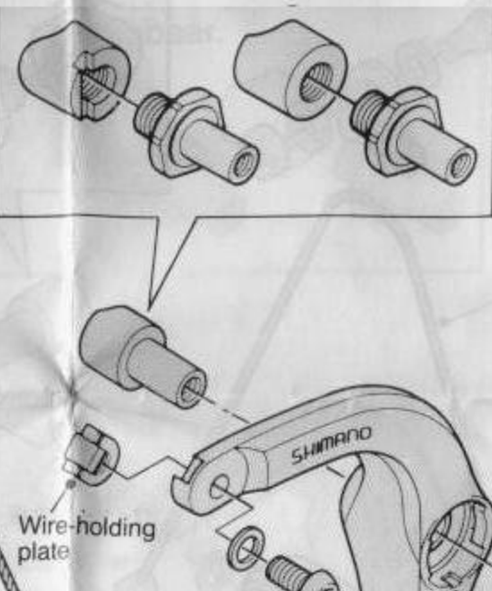
The best setting is so that the clearance between the cable carrier and the pivot boss is 90 mm.

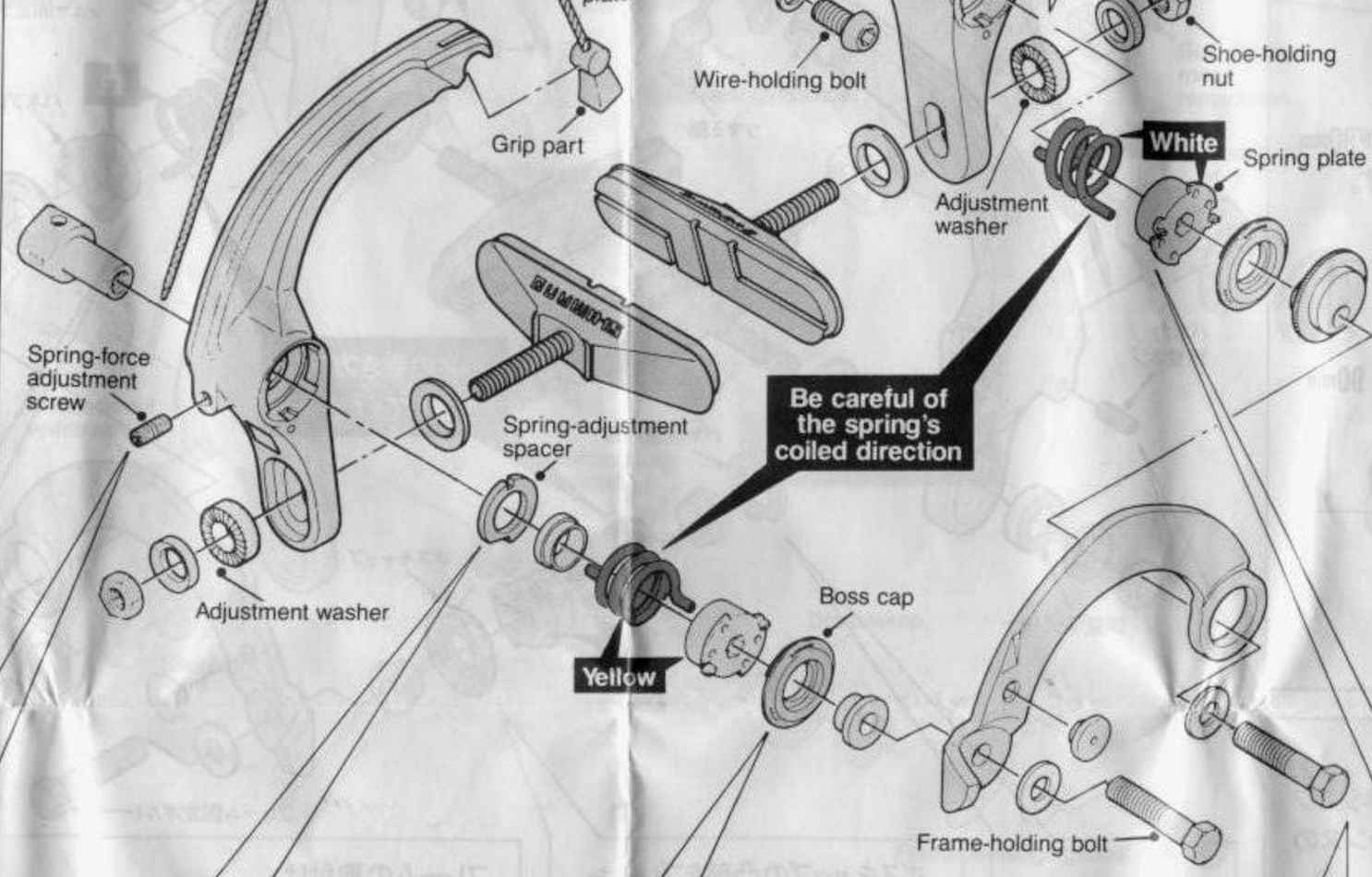




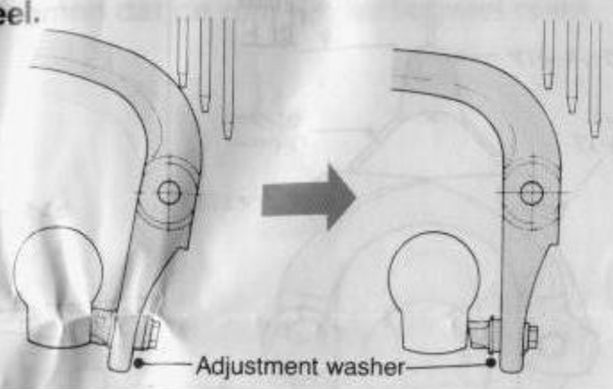


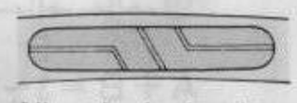
Pivot boss for light alloy frame is also available.



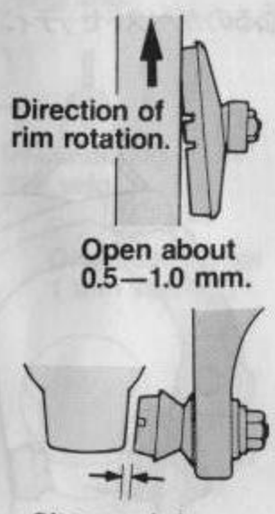


As the brake shoes wear down, the brake may contact the chain wheel. If the shoes wear down, move the adjustment washer to the inside to prevent the brake from contacting the chain wheel.



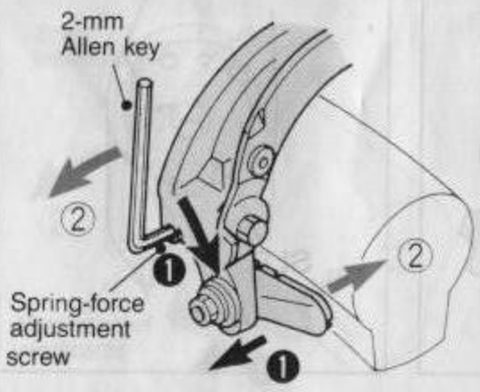


Align the brake shoe with the rim surface.



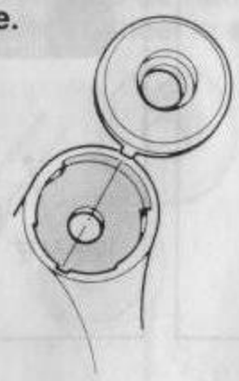
Fine adjustment of shoe clearance

The fine adjustment of the shoe clearance centering (after installation) can be made by the spring-force adjustment screw of the brake arm.





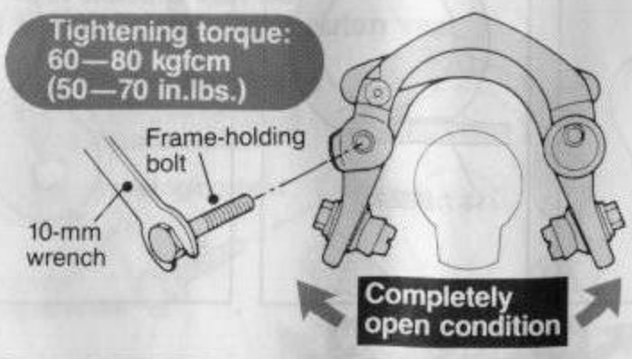
Assemble by aligning the convex parts of the boss cap with the notches of the brake.



Installation to the frame

With the arm completely opened, tighten by using the frame-holding bolts.

Tightening torque: 60—80 kgfcm (50—70 in.lbs.)



Use a 6-mm Allen key to push in, and then set so that the projections of the spring plate contact the projections of the brake.

Spring position selection



Please note: Specifications are subject to change for improvement without notice. (English)

SHIMANO AMERICAN CORPORATION
One Shimano Drive, Irvine, California U.S.A. 92718 Tel. (714) 951-5003

SHIMANO (EUROPA) GmbH.
Im Hülsenfeld 13 4010 Hilden, West Germany Tel. 02103-5005-0

SHIMANO (SINGAPORE) PTE. LTD.
No. 20, Benoi Sector, Jurong Town, Singapore 2262 Tel. 2654777

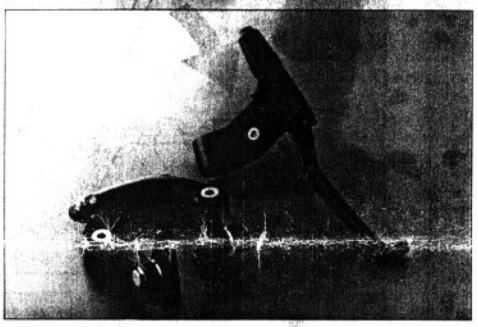
SHIMANO INDUSTRIAL CO.,LTD.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

© Jul. 1988 by Shimano Co., Ltd. R-82 XBC IZM Printed in Japan

SERVICE INSTRUCTION

Shimano DEORE XT U-Brake

BR-M731 • U-Brake
BL-M730 • Brake lever



SHIMANO DEORE XT

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

■Specifications

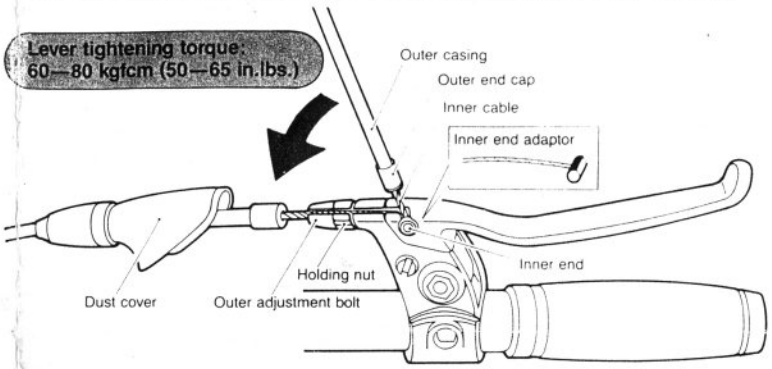
BR-M731: U-brake
- Weight: 286g (Bolt type)
- Material: Light alloy, steel and resin
- Brake shoe: Low-Profile 60

BL-M730: Brake lever
- Weight: 340g/Pair
- Material: Light alloy and steel
- Installation band diameter: ∅22.2 mm

Installation of the brake lever and cable

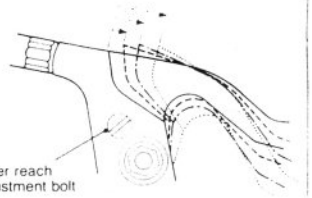
Pass the inner cable through the outer end cap and the outer casing; then align the lever's slit and the slit of the holding nut and the outer adjustment bolt, and install the brake cable.

Lever tightening torque: 60—80 kgfcm (50—65 in.lbs.)



■ The use of 2-mm inner cable and 6-mm outer casing is standard.

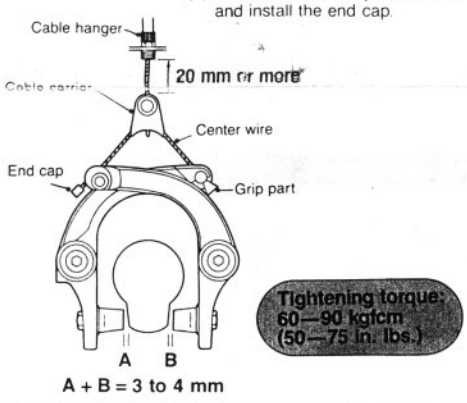
■ Four lever reach settings can be made by turning the lever reach adjustment bolt at the rear of the lever.



Installation of the U-brake

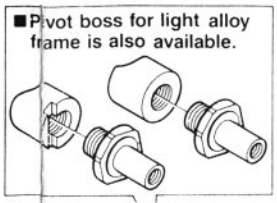
3 ■Installation of the center wire

(1) Install the cable carrier to the inner cable.
*The length of cable between the cable carrier and cable hanger should be 20 mm or more.
(2) Set the center wire as shown in the figure, align the left and right space between the brake shoes and rim equally and adjust the total space to about 3 or 4 mm, and then tighten by using the wire-holding nut.
(3) Cut the unnecessary center wire and install the end cap.



Tightening torque: 60—90 kgfcm (50—75 in. lbs.)

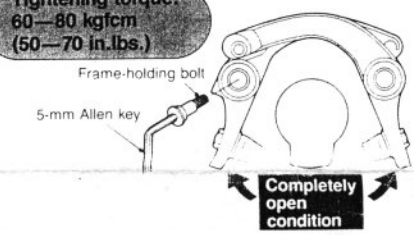
■Pivot boss for light alloy frame is also available.

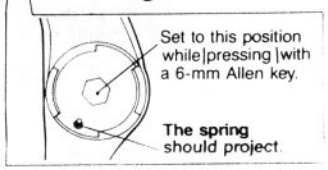


2 ■Installation to the frame

With the arm completely opened, tighten by using the frame-holding bolts.

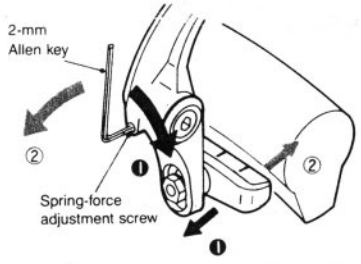
Tightening torque: 60—80 kgfcm (50—70 in.lbs.)

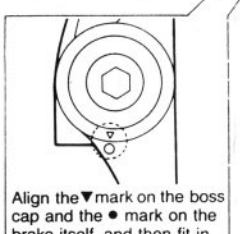




■Fine adjustment of shoe clearance

The fine adjustment of the shoe clearance centering (after installation) can be made by the spring-force adjustment screw of the brake arm.





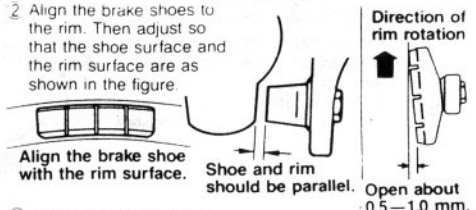
■The nut type is also available.



1 ■Adjustment and securing of the brake shoes

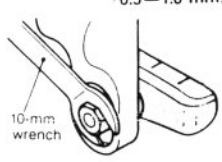
① With the frame holding bolt loosely tightened (so that the arm can move freely), adjust the brake shoe.

② Align the brake shoes to the rim. Then adjust so that the shoe surface and the rim surface are as shown in the figure.



③ When the adjustment is completed, tighten and secure the shoe-holding nut by using a 10-mm spanner.

Tightening torque: 60—90 kgfcm (50—75 in. lbs.)



Please note: Specifications are subject to change for improvement without notice.
(English)

SHIMANO AMERICAN CORPORATION
One Shimano Drive, Irvine, California, U.S.A. 92718 Tel. (714) 951-5003

SHIMANO (EUROPA) GmbH.
Im Hubertkeil 13 4010 Hilden, West Germany Tel. 02103-5005-0

SHIMANO (SINGAPORE) PTE. LTD.
No. 20, Benoi Sector, Jurong Town, Singapore 2262 Tel. 2654777

SHIMANO INDUSTRIAL CO., LTD.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

© Jan. 1987 by Shimano P-37-B XBC SZK Printed in Japan.

SERVICE INSTRUCTIONS **SI-R100C**

Rear Drive System

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

In order to realize the best performance, be sure to use in the following combination.

	DEORE LX	EXAGE ES	EXAGE LX	ALTUS A10	ALTUS A20	ALTUS C10
Rapidfire	ST-M560	ST-M520	ST-M320	ST-AT10	ST-AT20	ST-CT10 ST-CT15
Outer casing	SIS-SP outer casing					
Rear derailleur	RD-M560-GS RD-M560-SGS	RD-M520-GS RD-M520-SGS	RD-M320-GS RD-M320-SGS	RD-AT10-GS RD-AT10-SGS	RD-AT20-GS RD-AT20-SGS	RD-CT10-GS RD-CT10-SGS
Freehub	FH-M560	FH-HG50 / FH-HG20				
Cassette sprocket	CS-HG70	CS-HG50				
Chain	CN-HG70	CN-HG50				
Bottom bracket guide	SM-SP55 / SM-SP25 / SM-SP16 / SM-SP15					

Specifications

Rear Derailleur

Type	GS	SGS
Sprockets	7	7
Total capacity	36T or less	38T or less
Largest sprocket	30T	32T
Smallest sprocket	12T	12T

Cassette sprocket tooth combination

E	12, 14, 16, 18, 21, 24, 28T
F	14, 16, 18, 21, 24, 28, 32T
G	13, 15, 17, 20, 23, 26, 30T
M	13, 15, 17, 19, 21, 24, 28T

Rapidfire

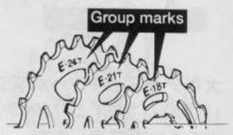
Model number	ST-M560	ST-M520	ST-M320	ST-AT10	ST-AT20	ST-CT15	ST-CT10
Sprockets	7	7	7	7	7	7	7
Rapidfire Plus	○	○	○	○	○		
Rapidfire						○	○

Freehub

Model number	FH-M560	FH-HG50	FH-HG20
Sprockets	7	7	7
No. of spoke holes	36・32	36・32	36・32

Note

*The installation and operation methods are the same as before when a thumb shifter was used.
*Because the high cable resistance of a frame with internal cable routing would impair the SIS function, this type of frame should not be used.
*Always be sure to use the HG (Hyperglide) sprocket set bearing the same group marks. Never use in combination with a sprocket bearing a different group mark.
*Always be sure to use a Shimano narrow type HG chain on the HG sprocket set.
*For any questions regarding methods of handling or maintenance, please contact the place of purchase.

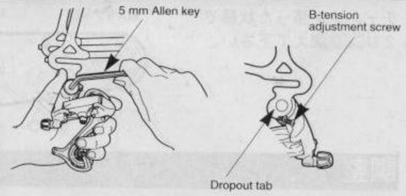


SHIMANO
SHIMANO AMERICAN CORPORATION
One Shimano Drive, P.O. Box 19615, Irvine, California 92713-9615, U.S.A. (714)951-5003
SHIMANO (EUROPA) GmbH. Kleinhulsen 1-3 4010 Hilden, Germany Tel. 02103-5005-0
SHIMANO INC. 77 Oimatsu-cho, 3-cho, Sakai, Osaka, 590 Japan Tel. (0722)-23-3243

Please note: Specifications are subject to change for improvement without notice. (English)
© Jun. 1992 by Shimano Inc. XBC SZK Printed in Japan.

Installation of the rear derailleur

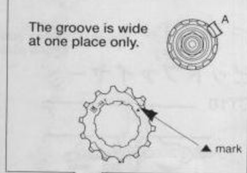
When installing, be careful that deformation is not caused by the B-tension adjustment screw coming into contact with the dropout tab.



Bracket spindle tightening torque: 80-100 kgfcm (70-86 in. lbs.)

Installation of the HG sprockets

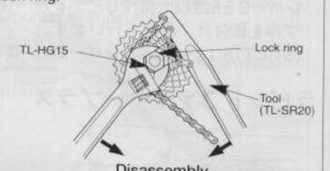
For each sprocket, the surface that has the group mark should face outward and be positioned so that the triangle (▲) mark on each sprocket and the A part (where the groove width is wide) of the freewheel body are aligned.

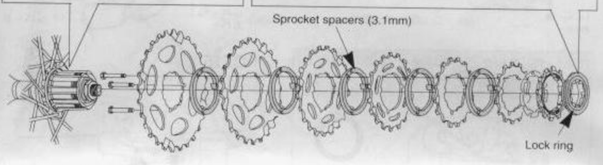


•For installation of the HG sprockets, use the special tool (TL-HG15) to tighten the lock ring.

Tightening torque: 300-500 kgfcm (261-434 in. lbs.)

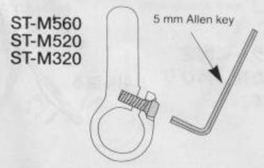
•To replace the HG sprockets, use the special tool (TL-HG15) and TL-SR20 to remove the lock ring.

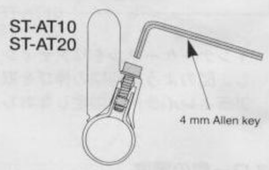




Installation of the lever

Rapidfire Plus

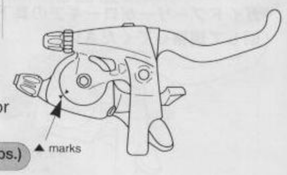




Use a handlebar with a maximum outer diameter of 32 mm.

Installation of the shifting lever
Align the ▲ marks on both the brake lever and the shifting lever, and then install them.There is only one position for installation.

Tightening torque: 25-30 kgfcm (22-26 in. lbs.)

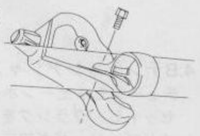


Rapidfire

Install using an 8 mm T-wrench or a "+" screwdriver.

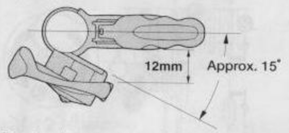
Tightening torque: 25-30 kgfcm (22-26 in. lbs.)

ST-CT10



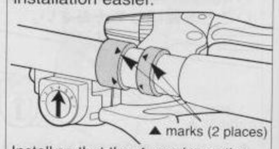
ST-CT15

For the ST-CT15, install so that the position of the Rapidfire with respect to the brake lever is as shown in the illustration.



Set the clearance to a width that is sufficient for your fingers (12 mm). If this is not done, your fingers will be clamped by the Rapidfire.

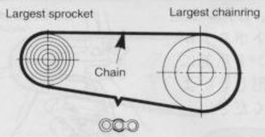
Positioning marks have been provided on the BL-CT10 and ST-CT15 to make correct installation easier.



Install so that the ▲ marks on the brake lever and shifting lever are aligned.

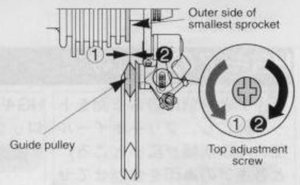
Chain length

Add 2 links
(with chain tightened)



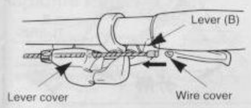
Adjustment

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.



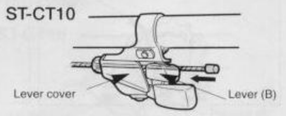
2. Connection and securing of the cable
Press lever (B) 6 or more times to set the lever to the highest position, and then install the cable.
Lever (A) and lever (B) are integrated in the ST-CT15.

Rapidfire Plus

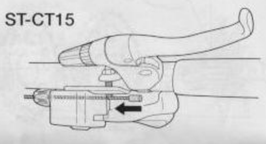


Rapidfire

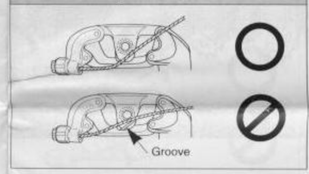
ST-CT10



ST-CT15



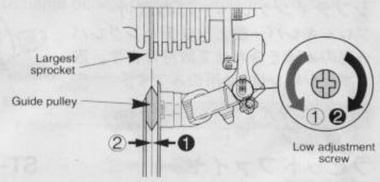
Note: Be sure that the cable is securely in the groove.



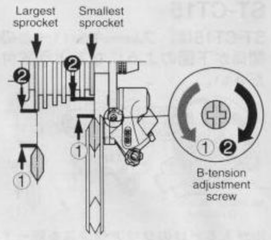
Connect the cable to the rear derailleur and, after taking up the initial slack in the cable, re-secure to the front derailleur as shown in the illustration.



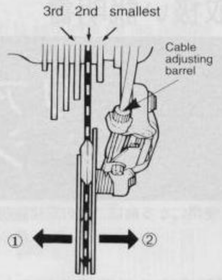
3. Low adjustment
Turn the low adjustment screw so that the guide pulley moves to a position directly in line with the largest sprocket.



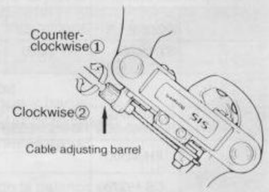
4. How to use the B-tension adjustment screw
Mount the chain on the smallest chainring and the largest sprocket, and turn the crank backward. Then turn the B-tension adjustment screw to adjust the guide pulley as close to the sprocket as possible but not so close that it touches. Next, set the chain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



5. SIS Adjustment
(1) Operate the shifting lever to move the chain from the smallest sprocket to the 2nd sprocket.
*If the chain will **not move to the 2nd sprocket,** turn the cable adjusting barrel to increase the tension-----① **(counter -clockwise)**
*If the chain **moves past the 2nd sprocket,** decrease the tension---② **(clockwise)**



(2) Next, with the chain on the 2nd sprocket, increase the cable tension ① while turning the crank forward. Stop turning the cable adjusting barrel **just before the chain makes noise against the 3rd sprocket.**
This completes the adjustment.

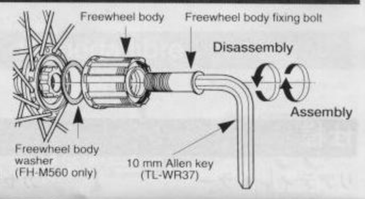


For the best SIS performance, periodically lubricate all power-transmission parts.

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: 350-500 kgfcm (305-434 in. lbs.)

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.
Lever (A) and lever (B) are integrated in the ST-CT15.

To shift from a small sprocket to a larger sprocket

To shift one step only, press to the (1) position; to shift two steps at one time, press to the (2) position. With the Rapidfire Plus, a maximum three-step shift can be made in this manner. With the ST-CT15 and ST-CT10, one-step shifting only is possible each time the Rapidfire is pressed.

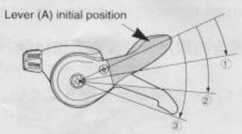
Rapidfire

ST-CT15

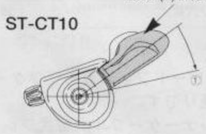


Lever (A) initial position

Rapidfire Plus



ST-CT10

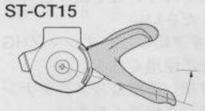


To shift from a large sprocket to a smaller sprocket

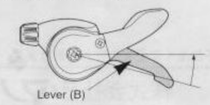
Press once to shift from a larger to one smaller sprocket.

Rapidfire

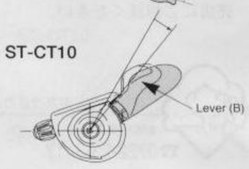
ST-CT15



Rapidfire Plus



ST-CT10



SERVICE INSTRUCTIONS

FC-M730-SG FC-MT60-SG FC-M550 FC-M500 FC-M400 FC-M300 FC-M200

Front Chainwheel

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

Note

If used with STI, be sure to use the following product combination.

- Front derailleur.....FD-M735/FD-M650/FD-M550/FD-M500/FD-M400/FD-M300/FD-M201
- Front chainwheel.....FC-M730-SG/FC-MT60-SG/FC-M550/FC-M500/FC-M400/FC-M300/FC-M200
- Chain.....Hyperglide compatible narrow type UG chain

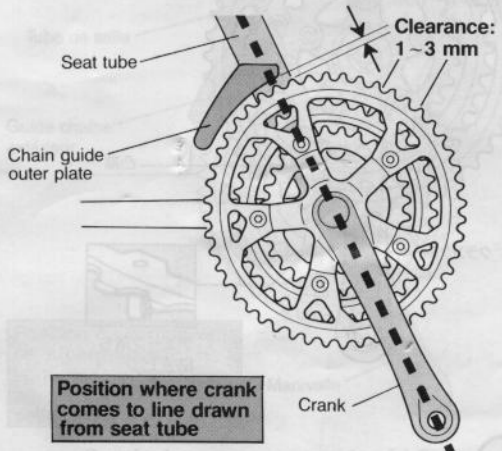
Chains other than the Shimano narrow-type chain cannot be used.

Note that SG gear tooth number combinations are restricted to those shown below.

- SG Biopace.....48T × 38T × 28T, 46T × 36T × 26T
- SG Round gear....48T × 38T × 28T, 46T × 36T × 24T

Note the following cautions regarding the SG Biopace chain ring.

- Use a front derailleur that has a capacity that is equivalent to the difference of number of teeth between the front chainwheel's large gear (SG) and small gear (SG), plus 2 teeth.
- The installation position of the front derailleur should be where the crank comes to the position of an imaginary line drawn from the seat tube. Then adjust so that the clearance between the large gear and the chain guide outer plate is 1 ~ 3 mm and install the front derailleur.



Tightening torque to front chainwheel axle:
Bolt type: 350 ~ 450 kgfcm (322 ~ 414 in.lbs.)
Nut type: 400 ~ 500 kgfcm (368 ~ 460 in.lbs.)

Specifications

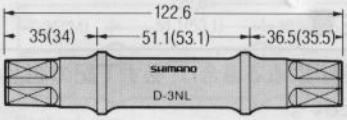
Front chainwheel

Bolt circle diameter	110 mm (outer, middle) 74 mm (inner)
Applicable chain	1/2″ × 3/32″ narrow type
Chain line	47 ~ 47.5 mm

The chain line indications are our standard established dimensions.

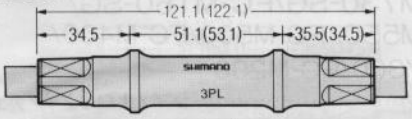
Hanger axle set

- For FC-M730-SG and FC-MT60-SG



Unit: mm Figures in ( ) are for 70-mm width.
Width 68 mm: D-3NL
Width 70 mm: D-5NL

- For FC-M550, FC-M500, FC-M400, FC-M300 and FC-M200.

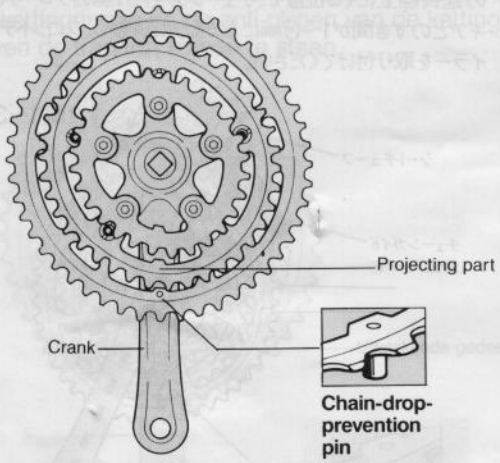


Unit: mm Figures in ( ) are for 70-mm width.
Width 68 mm: 3PL
Width 70 mm: 5PL

Installation of the chain ring

The benefits of the SG gear will not be realized if the chain ring is installed in the wrong position. Be sure the chain ring is properly installed.

In addition, position so that, when looking from the rear side, the projecting part of the chain ring and the chain-drop-prevention pin are directly behind the crank arm.



Please note: specifications are subject to change for improvement without notice.
(English)

SHIMANO
SHIMANO AMERICAN CORPORATION
One Shimano Drive, Irvine, California, U.S.A. 92718 Tel. (714) 951-5003
SHIMANO (EUROPA) GmbH.
Kleinhülsen 1-3, 4010 Hilden, West Germany Tel. 02103-5005-0
SHIMANO (SINGAPORE) PTE. LTD.
No. 20, Benoi Sector, Jurong Town, Singapore 2262 Tel. 2654777
SHIMANO INDUSTRIAL CO., LTD.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

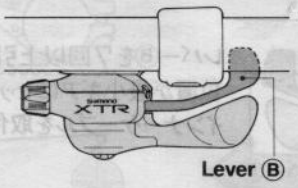
© Feb. 1990 by Shimano Co., Ltd. T-30D XBC SHS Printed in Japan.

Notes:

SHIMANO
TOTAL
INTEGRATION

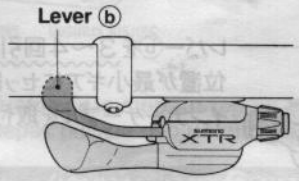
Notes when securing the inner cable

●Rear



After pulling the lever Ⓑ **seven times or more** (so that the lever is set for the smallest sprocket), connect the inner cable.

●Front



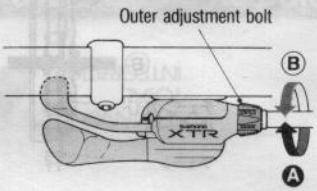
After pulling the lever ⓑ **three or four times** (so that the lever is set for the smallest chainring), connect the inner cable.

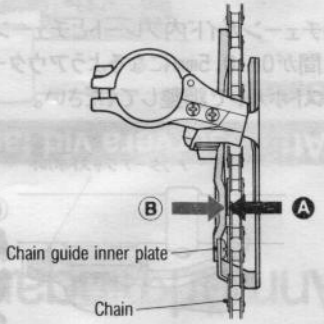
Cable tension adjustment (front derailleur)

① Set the chain to the **largest rear sprocket,** and the front, use the Rapidfire to shift **from the largest chainring to the intermediate chainring.**



② Adjust, by using the outer adjustment bolt so that the clearance between the chain guide inner plate and the chain is 0—0.5mm.





© Sep. 1991 by Shimano Inc. U-138 XBC SZK Printed in Japan.

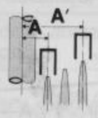
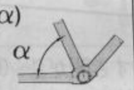
SERVICE INSTRUCTIONS

FD-M900
FD-M901
(Top pull type)

Front Derailleur

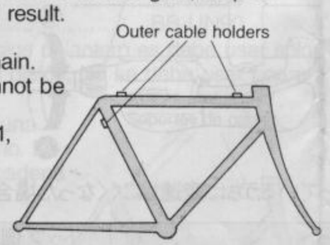
For proper and safe performance, read and follow these instructions carefully.

Specifications

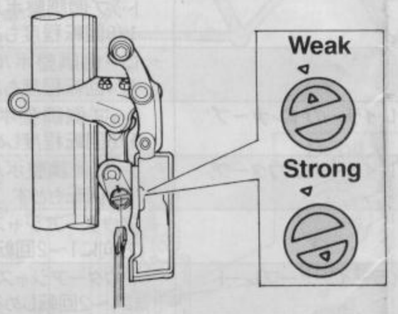
Capacity (front gear tooth difference	Round gear	8T—26T
Installation band diameter	∅28.0—∅28.6 mm, ∅31.8 mm, ∅34.9 mm	
Stroke (A—A′) 	∅28.0—∅28.6 mm	35—55 mm
	∅31.8 mm	37—57 mm
	∅34.9 mm	38—58 mm
Frame angle (α) 	66°—69°	

Note:

- Be sure to use in the following combination.
  - Front Derailleur.....FD-M900/FD-M901
  - Rapidfire.....ST-M900
  - Front chainwheel.....FC-M900
  - Bottom bracket.....BB-UN90
- This front derailleur is for front chainwheel triple gear use only. It cannot be used with the double gear, as poor shifting performance will result.
- Be sure to use only the Shimano narrow-type chain. The wide-type chain cannot be used.
- When installing FD-M901, choose a frame that has three outer cable holders as shown in the illustration below.

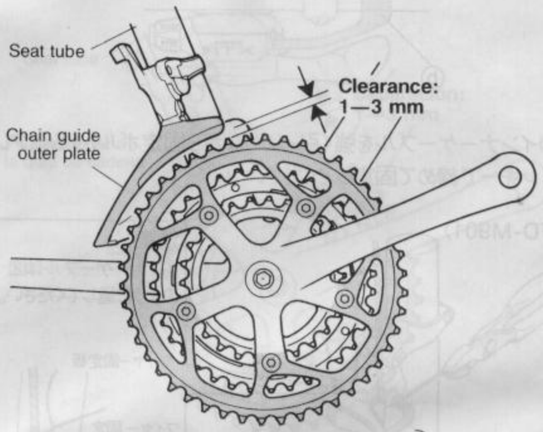


- The load strength can be changed from strong to weak and vice versa.

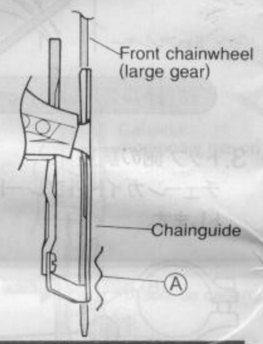


Installation to the frame

1. Adjust so that clearance between the outside plate of the chain guide and the large gear is 1—3 mm, and then install.



2. The outside surface Ⓐ of the chain guide should be directly above and parallel to the large gear.



3. Secure by using a 5mm Allen key.

Tightening torque: 50 kgfcm (43 in.lbs.)

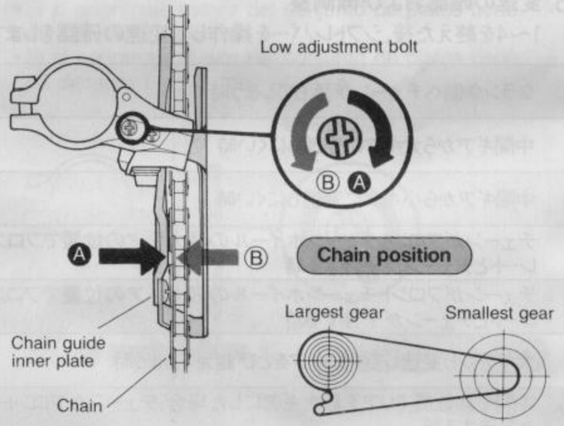
Adjustment and cable securing

Be sure to follow the sequence described below.

1. Low adjustment

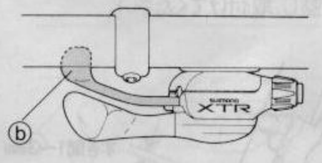
Set so that the clearance between the chain guide inner plate and the chain is as follows:

- If the largest gear of the front chainwheel has 46T: 0—0.5mm.
- If the largest gear of the front chainwheel has 48T: 1—1.5mm.



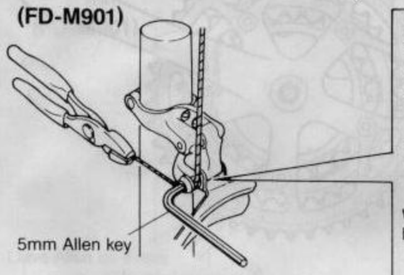
2. Fixing the cable

① Pull lever ⓑ 3 or 4 times to move the lever to low position.

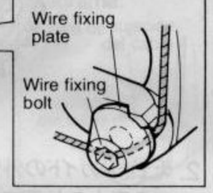


② While pulling the inner cable firmly, tighten the wire fixing bolt with a 5mm Allen key.

(FD-M901)



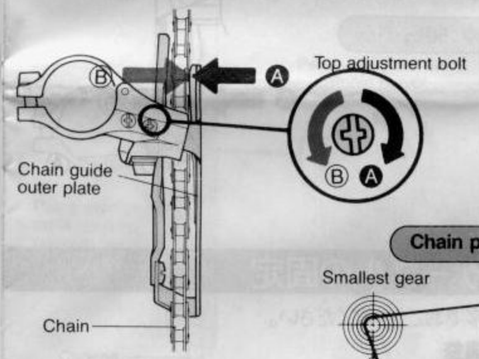
Caution
Thread the inner cable as shown in the diagram.



Tightening torque: 50 kgfcm

3. Top adjustment

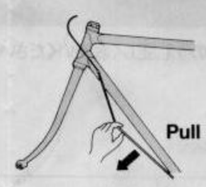
Set so that the clearance between the chain guide outer plate and the chain is 0—0.5 mm.



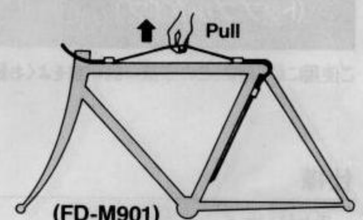
4. Tension adjustment of the cable

If use is not as Shimano Total Integration, the step "Tension adjustment of the cable" is not necessary.

① After taking up the initial slack in the cable, reattach to the front derailleur.

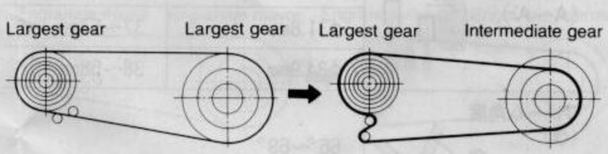


(FD-M900)

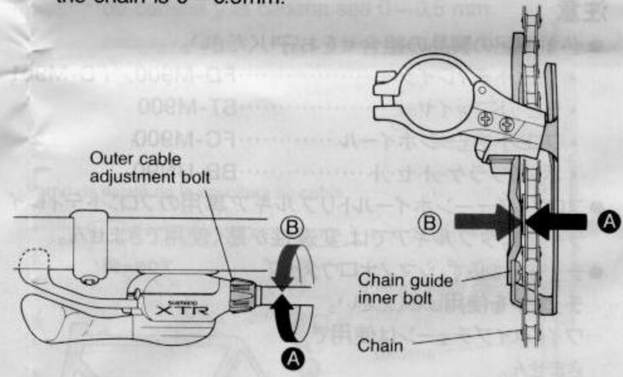


(FD-M901)

② Set the chain to the **largest rear sprocket,** and, at the front, use the Rapidfire to shift **from the largest chainwheel to the intermediate chainwheel.**



③ Adjust by using the outer adjustment bolt so that the clearance between the chain guide inner plate and the chain is 0—0.5mm.



5. Trouble shooting chart

After completion of 1—4, move the shift 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 bolt clockwise (about 1/4 turn).
If shifting is difficult from the intermediate gear to the large gear	Loosen the top adjustment bolt counterclockwise (about 1/8 turn).
If shifting is difficult from the intermediate gear to the small gear	Loosen the low adjustment bolt counterclockwise (about 1/4 turn).
If there is interference of the chain and front derailleur inner plate at the largest gear of the front chain wheel	Tighten the top adjustment bolt clockwise (about 1/8 turn).
If there is interference of the chain and front derailleur outer plate at the largest gear of the front chain wheel	Loosen the top adjustment bolt counterclockwise (1/8 turn).
If the intermediate gear is skipped when shifting from the largest gear	Loosen the outer cable adjustment bolt counterclockwise (1 or 2 turns). ★
If there is interference of the chain and front derailleur inner plate when, at the intermediate gear position, the rear chainwheel is shifted to the largest gear.	Tighten the outer cable adjustment bolt clockwise (1 or 2 turns). ★
If the chain falls to the bottom bracket side	Tighten the low adjustment bolt clockwise (1/2 turn).

Note: If use is not as Shimano Total Integration, items marked ★ are not necessary.

SHIMANO
SHIMANO AMERICAN CORPORATION
One Shimano Drive, P.O. Box 19615, Irvine, California U.S.A. 92718 Tel. (714) 951-5003

SHIMANO (EUROPA) GmbH.
Kleinhuisen 1-3 4010 Hilden, Germany Tel. 02103-5005-0

SHIMANO INC.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

Please note: specifications are subject to change for improvement without notice. (English)

© Oct. 1991 by Shimano Inc. U-110A XBC IZM Printed in Japan.

SERVICE INSTRUCTIONS SI-BB95A

BB-M950 Bottom Bracket

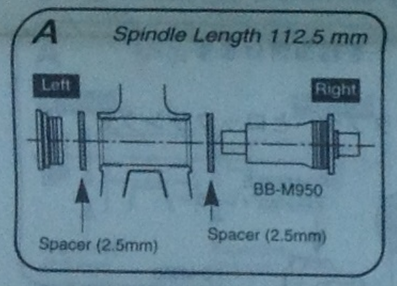
Before use, read these instructions carefully, and follow them for correct use.

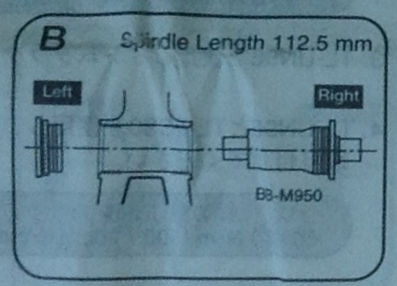
Installing the BB-M950

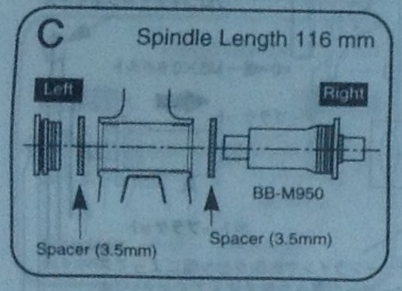
When installing the BB-M950, the correct combination of the three types of spacer must be used in accordance with the type of front derailleur, the bottom bracket shell width and the specified chain line. Refer to cases A to F in the table below to choose the correct combination of spacers.

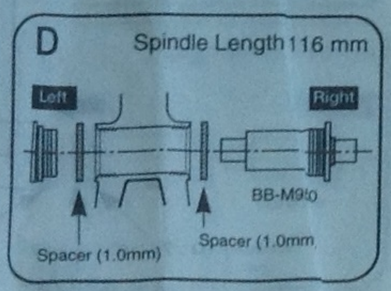
Front derailleur	Front chainwheel	47.5 mm chain line		50 mm chain line	
		68mm (BC1.37)	73mm (BC1.37)	68mm (BC1.37)	73mm (BC1.37)
FD-M950 (band type)	FC-M950	A	B	C	D
FD-M950-E (bracket type)		E			F

● *FD-M950 (Band type)*

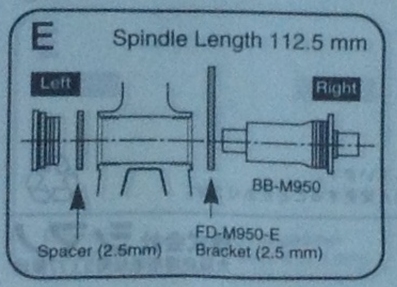


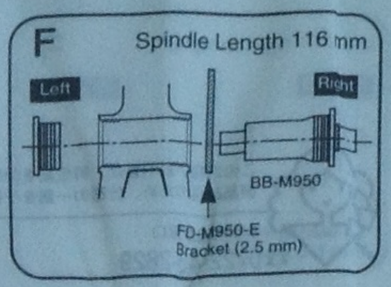






● FD-M950-E (Bracket type)





Removing the left-hand adapter unit

1. While pushing in the right-hand adapter unit as shown in Fig. 1, remove the left-hand adapter unit. (Refer to Fig. 2.) Be careful not to hold the inner cover too firmly at this time.

Fig.1

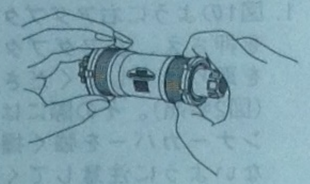
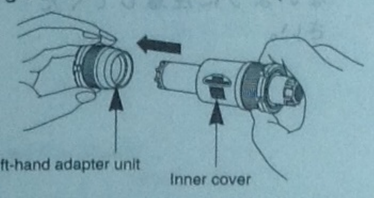
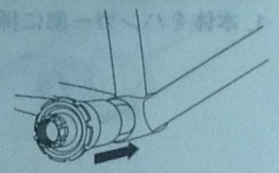


Fig.2



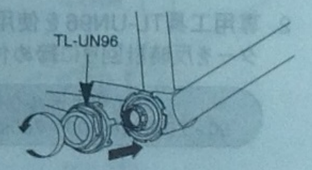
Installing the bottom bracket

1. Insert the bottom bracket into the hanger.



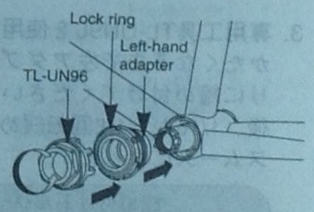
2. Tighten the right-hand adapter by turning it counterclockwise using the special tool (TL-UN96).

Tightening torque: 50 - 70 Nm {435 - 608 in. lbs.}



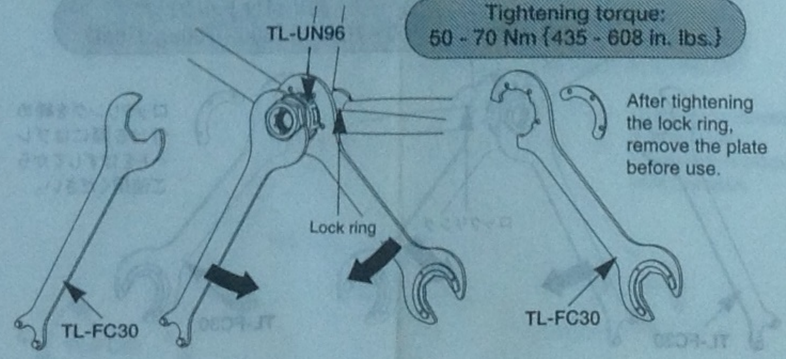
3. Use the special tool (TL-UN96) to tighten the left-hand adapter by turning it clockwise until the spindle turning effort increases sharply. After tightening the left-hand adapter, loosen it by about 1/16 to 1/8 of a turn so that the spindle rotates smoothly.

Tightening torque: 50 - 70 Nm {435 - 608 in. lbs.}

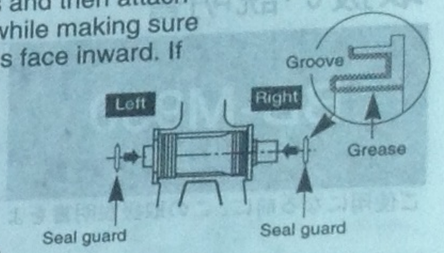


4. Tighten the lock ring while using the special tools (TL-UN96 and TL FC30) to push in the left-hand adapter.

Tightening torque: 50 - 70 Nm {435 - 608 in. lbs.}



5. Apply grease to the seal guards and then attach the seal guards to the spindle, while making sure that the grooves of the seal rings face inward. If the grooves face outward after the seal rings are installed, the water-tightness will drop significantly. (The seal guards are pushed into the proper positions when the crank arms are installed, so do not force the seal rings on when installing them.)



6. Install the right-hand crank arm, and then check that there is no play in the bearing cone is adjusted correctly. If there is some play in the bearing cone, loosen the lock ring and then tighten the left-hand adapter by as little as possible. Repeat steps 4 and 6 until there is no more play.

● **If using the FD-M950-E (a special frame with mounting bosses is required)**

1. Pass the bottom bracket through the bracket hole, and then provisionally secure it to the frame.

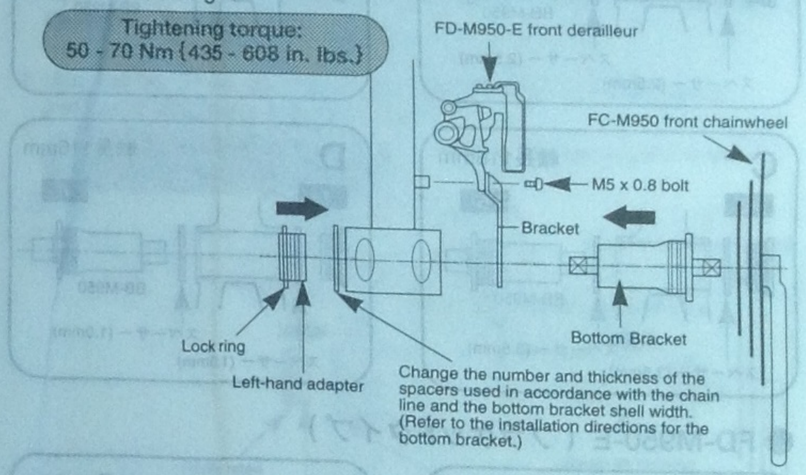
2. Secure the front derailleur to the special boss using an M5x0.8 bolt.

Tightening torque: 4 - 5 Nm {34 - 44 in. lbs.}

3. Use the special tool (TL-UN96) to tighten the bottom bracket.

4. Use the special tools (TL-UN96 and TL-FC30) to install the adapter and the lock ring.

Tightening torque: 50 - 70 Nm {435 - 608 in. lbs.}



SHIMANO®

SHIMANO AMERICAN CORPORATION
One Shimano Drive P.O. Box 19615 Irvine California U.S.A. 92713-9615 Phone 714-951-5003

SHIMANO EUROPA
Industrieweg 24 NL-8071 CT Nunspeet Holland Phone 31-3412-72222

SHIMANO INC.
77 Oimatsu-cho 3-cho Sakai Osaka 590-77 Japan Phone 0722-23-3243

These service instructions are printed on recycled paper and can be recycled again

Please note: specifications are subject to change for improvement without notice. (English)

©Sep. 1996 by Shimano Inc. XBC SZK Printed in Japan.

SERVICE INSTRUCTIONS

RD-M735
RD-M650
RD-M550

Rear Derailleur

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

Capacity

Type	Total capacity	Rear smallest sprocket	Rear largest sprocket
Long cage (RD-M550)	36T or less	12T	28T~30T
Super long cage (RD-M735/ RD-M650/ RD-M550)	38T or less	12T	28T~32T

Note: The above capacity is the value when the B-tension adjustment bolt is completely tightened.

Note

- Be sure to follow the recommendations below regarding combinations of components.
  - Rapidfire ST-M090/ST-M070/ST-M060/
  - Rear derailleur.....RD-M735/RD-M650/RD-M550
  - Freehub.....FH-M732/FH-M650/FH-M550
  - Cassette sprocket (7-speed).....CS-HG90/CS-HG70
  - Chain.....CN-HG90/CN-HG70
  - Outer cable.....Shimano SIS-SP cable
- Because the high cable resistance of a frame with internal cable guides would impair the SIS function, this type of frame should not be used.
- RD-M735, RD-M650 and RD-M550 cannot be used in combination with the Dura Ace shifting lever.
- The tension of the guide spring can be set to any one of three steps. If a higher return force for the rear derailleur is necessary because riding conditions are poor, set to the STRONG setting. If the riding conditions are very good, a lighter, smoother lever operation feeling can be obtained by setting to the WEAK position.



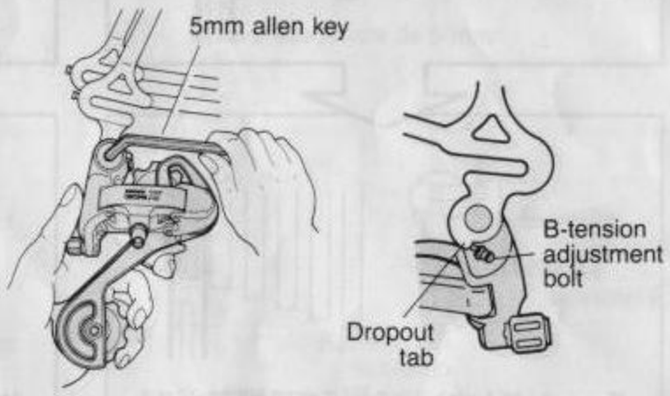
- The setting is strong at the ○ mark.

Assembly and Adjustment

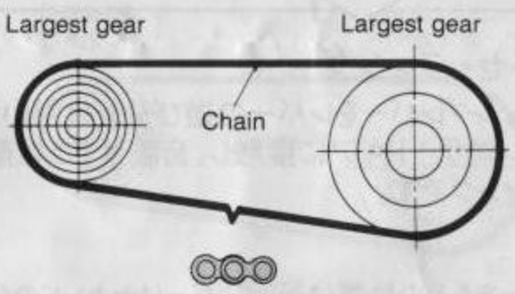
1. Assembly to Frame

Bracket axle tightening torque: 80—100 kgfcm (70—85 in.lbs.)

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



2. Chain Assembly

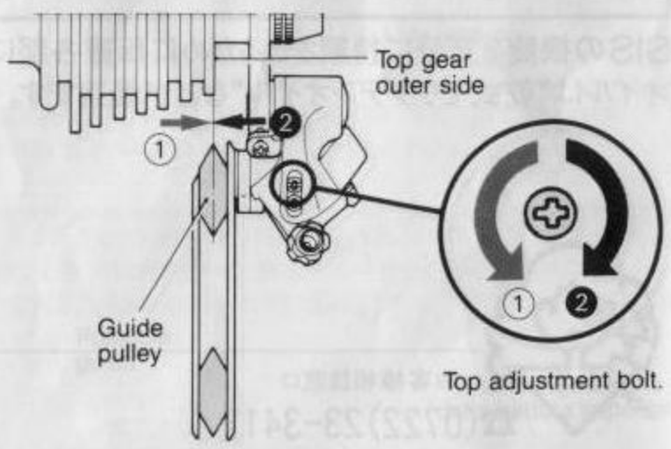


Add 2 links (with chain tightened)

3. Stroke Adjustment and Cable Connection

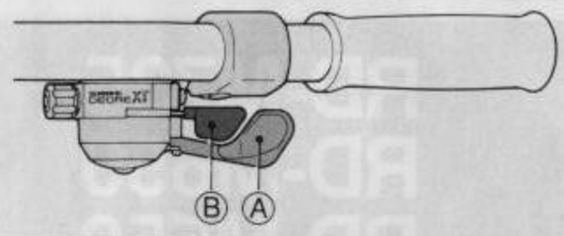
1. Top adjustment

Turn the top adjustment bolt to adjust so that, looking from the rear, the guide pulley is below the outer line of the top gear.

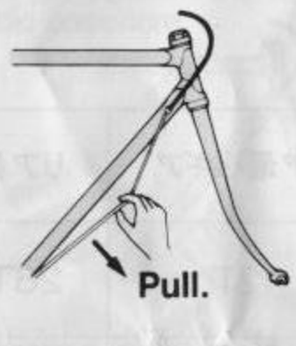


2. Inner cable connection

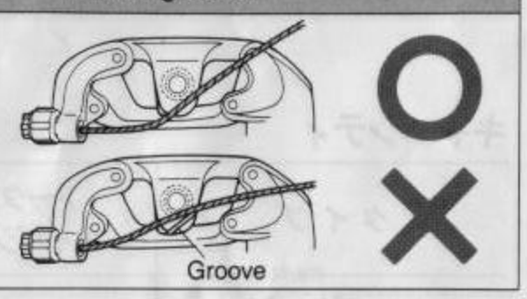
Press the lever Ⓑ **six times or more** to first set the lever to top gear.



Connect the inner cable to the rear derailleur and, after the pre-stretch as shown in the figure, reconnect to the rear derailleur.

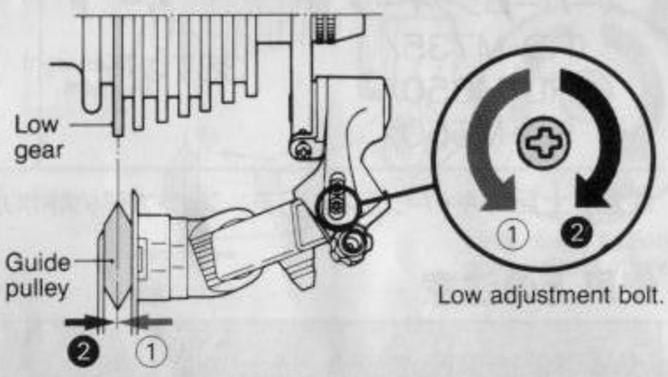


Note: Be sure the inner cable is securely in the groove.



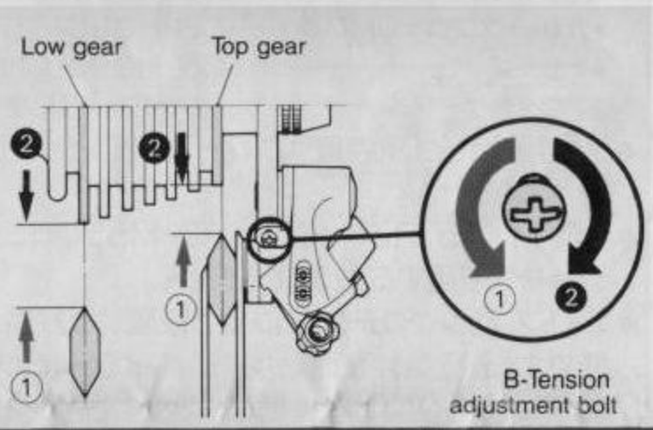
3. Low adjustment

Shift to lowest gear and turn the low adjustment bolt to adjust so that the guide pulley moves to a position directly below the low gear.



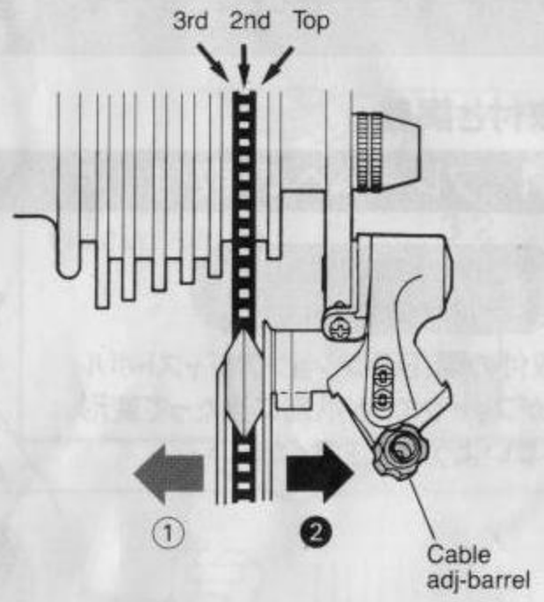
4. How to Use B-Tension Adjustment Bolt

Mount the chain on the chainwheel's smallest gear and the freewheel's largest gear, and turn the crank backward. Then turn the B-tension adjustment bolt to adjust the guide pulley as close to the gear as possible but not so close that it touches. Next, set the freewheel to the smallest gear and repeat the above to make sure the pulley does not touch.

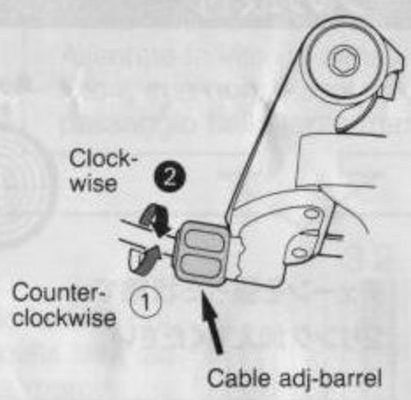


5. SIS Adjustment

1. Operate the shifting lever to move the chain from the top gear to the 2nd gear.
- If the chain will **not move to the 2nd gear,** turn the cable adjusting barrel to increase the tension.....① **(counter clockwise)**
- If the chain **moves past the 2nd gear,** decrease the tension.....② **(clockwise)**



2. Next with the chain on the 2nd gear, increase the inner cable tension ① while turning the crank forward. Stop turning the cable adjusting barrel **just before the chain makes noise against the 3rd gear.** This completes the adjustment.



For the best SIS performance, lubrication is recommended for all power-transmission parts. The optimum oil is dry molybdenum oil or a similar oil.

SHIMANO

SHIMANO AMERICAN CORPORATION
One Shimano Drive, Irvine, California U.S.A. 92718 Tel. (714) 951-5003

SHIMANO (EUROPA) GmbH.
Kleinhülsen 1-3 4010 Hilden, West Germany Tel. 02103-5005-0

SHIMANO INC.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

Please note: specifications are subject to change for improvement without notice. (English)

© Mar. 1991 by Shimano Co., Ltd. T-8B XBC SZK Printed in Japan.

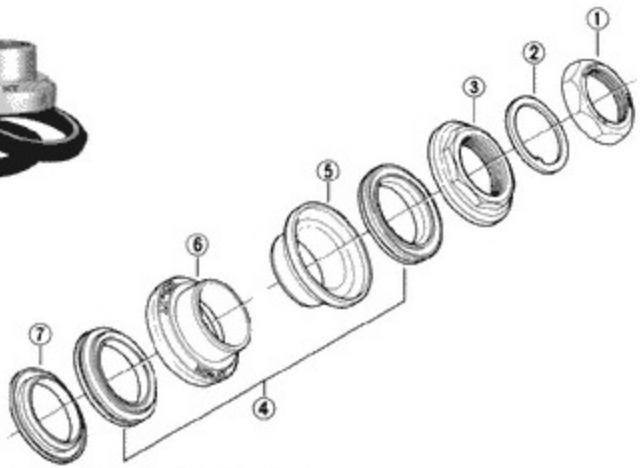
DEORE XT Head Parts

HP-M740 B.C. 1" x 24T or M25 x P1.0

HP-M741 B.C. 1-1/8" x 26T

HP-M742 B.C. 1-1/4" x 26T





- Weight: 115g (HP-M740) / 127g (HP-M741) / 143g (HP-M742)
- Stack Height: 37.6mm (HP-M740, HP-M741) / 39.9mm (HP-M742)

ITEM NO.	PART NO.	DESCRIPTION	INTERCHANGE-ABILITY HP-M735 / M736 / M737	INTERCHANGE-ABILITY HP-M563 / M564
1	787 9801	Lock Nut B.C.1" x 24T (English & JIS Thread) w/Stem Seal for HP-M740	B	B
	787 9802	Lock Nut M25 x P1.0 (French Thread) w/Stem Seal for HP-M740	B	B
	788 9801	Lock Nut B.C.1-1/8" x 26T (English Thread) w/Stem Seal for HP-M741	B	B
	789 9801	Lock Nut B.C.1-1/4" x 26T (English Thread) w/Stem Seal for HP-M742	B	B
2	715 0200	Lock Washer (English & JIS) for HP-M740	A	A
	715 0210	Lock Washer (French) for HP-M740	A	A
	712 0700	Lock Washer (English) for HP-M741	A	A
	712 0710	Lock Washer (English) for HP-M742	A	
3	787 0100	Upper Head Cone Housing B.C.1" x 24T (English & JIS Thread) for HP-M740		B
	787 0110	Upper Head Cone Housing M25 x P1.0 (French Thread) for HP-M740		B
	788 0100	Upper Head Cone Housing B.C.1-1/8" x 26T (English Thread) for HP-M741		B
	789 0100	Upper Head Cone Housing B.C.1-1/4" x 26T (English Thread) for HP-M742		B
4	787 9803	Cartridge Type Bearing (5/32" x 18) 2 pcs. for HP-M740		B
	788 9802	Cartridge Type Bearing (5/32" x 20) 2 pcs. for HP-M741		B
	789 9802	Cartridge Type Bearing (5/32" x 22) 2 pcs. for HP-M742		
5	787 0210	Upper Head Cup Housing ø30.0mm (JIS) for HP-M740		B
	787 0200	Upper Head Cup Housing ø30.2mm for HP-M740		B
	788 0200	Upper Head Cup Housing ø34.0mm for HP-M741		B
	789 0200	Upper Head Cup Housing ø37.0mm for HP-M742		
6	787 9804	Lower Head Cup Housing ø30.0mm (JIS) for HP-M740		B
	787 9805	Lower Head Cup Housing ø30.2mm for HP-M740		B
	788 9803	Lower Head Cup Housing ø34.0mm for HP-M741		B
	789 9803	Lower Head Cup Housing ø37.0mm for HP-M742		
7	787 0410	Lower Head Cone Housing ø27.0mm (JIS) for HP-M740		B
	787 0400	Lower Head Cone Housing ø26.4mm for HP-M740		B
	788 0400	Lower Head Cone Housing ø30.0mm for HP-M741		B
	789 0400	Lower Head Cone Housing ø33.0mm for HP-M742		

Model HP-M900
Model HP-M901
Model HP-M902

SHIMANO XTR

Model HP-M900
Model HP-M901
Model HP-M902

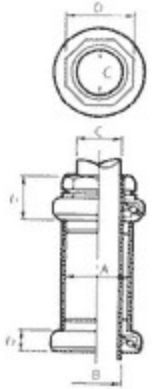


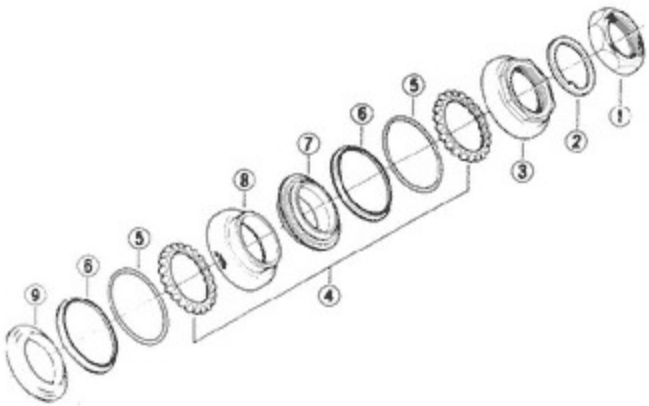


■ Specifications

Weight ● 119g.(HP-M900)
Features ● Lightweight Design.
Contact Seals on Both Upper and Lower Cones.
Type ● Off-Road Type.
Material & Finish ● Locknut, Both Upper and Lower Cap : Aluminum.
Variation & Dimensions ●

Type	HP-M900		HP-M901	HP-M902
Thread	BC1" × 24T.	M25 × P1.0	BC1-1/8" × 26T.	BC1-1/4" × 26T.
A	30.2mm/30.0mm.(JIS)	30.2mm.	34.0mm.	37.0mm.
B	26.4mm/27.0mm.(JIS)	26.4mm.	30.0mm.	33.0mm.
C	22.1mm.		25.5mm.	28.7mm.
D	32.0mm.		36.0mm.	40.0mm.
ℓ1	22.8mm.		22.8mm.	27.3mm.
ℓ2	11.5mm.		11.5mm.	13.0mm.





ITEM NO.	PART NO.	DESCRIPTION
1	733 9804	Lock Nut B. C. 1" × 24T (English & JIS Thread) w/Stem Seal for HP-M900
	733 9801	Lock Nut M25 × P1.0 (French Thread) w/Stem Seal for HP-M900
	734 9801	Lock Nut B. C. 1-1/8" × 26T (English Thread) w/Stem Seal for HP-M901
	736 9801	Lock Nut B. C. 1-1/4" × 26T (English Thread) w/Stem Seal for HP-M902
2	715 0200	Lock Washer (English & JIS) for HP-M900
	715 0210	Lock Washer (French) for HP-M900
	712 0700	Lock Washer (English) for HP-M901
	712 0710	Lock Washer (English) for HP-M902
3	733 9805	Upper Head Cup B. C. 1" × 24T (English & JIS Thread) for HP-M900
	733 9806	Upper Head Cup M25 × P1.0 (French Thread) for HP-M900
	734 9803	Upper Head Cup B. C. 1-1/8" × 26T (English Thread) for HP-M901
	736 9803	Upper Head Cup B. C. 1-1/4" × 26T (English Thread) for HP-M902
4	733 9811	Ball Retainer (3/16" × 20) 2pcs. for HP-M900
	734 9805	Ball Retainer (3/16" × 22) 2pcs. for HP-M901
	736 9805	Ball Retainer (3/16" × 24) 2pcs. for HP-M902

ITEM NO.	PART NO.	DESCRIPTION
5	733 0800	O-Ring for HP-M900
	734 0900	O-Ring for HP-M901
	736 0800	O-Ring for HP-M902
6	733 0700	Dust Seal for HP-M900
	734 0800	Dust Seal for HP-M901
	736 0700	Dust Seal for HP-M902
7	733 9808	Upper Head Cone ø30.0mm (JIS) for HP-M900
	733 9807	Upper Head Cone ø30.2mm for HP-M900
	734 9804	Upper Head Cone ø34.0mm for HP-M901
	736 9804	Upper Head Cone ø37.0mm for HP-M902
8	733 9803	Lower Head Cup ø30.0mm (JIS) for HP-M900
	733 9802	Lower Head Cup ø30.2mm for HP-M900
	734 9802	Lower Head Cup ø34.0mm for HP-M901
	736 9802	Lower Head Cup ø37.0mm for HP-M902
9	733 9810	Lower Head Cone w/Press-Fit Ring ø27.0mm (JIS) for HP-M900
	733 9809	Lower Head Cone w/Press-Fit Ring ø26.4mm for HP-M900
	734 0700	Lower Head Cone ø30.0mm for HP-M901
	736 0600	Lower Head Cone ø33.0mm for HP-M902

9106-1134

*: JIS : Japanese Industrial Standard.

Specifications are subject to change without notice.

©Jan. 1992 by Shimano Inc. €192 C1/1.3M Printed in Japan CI

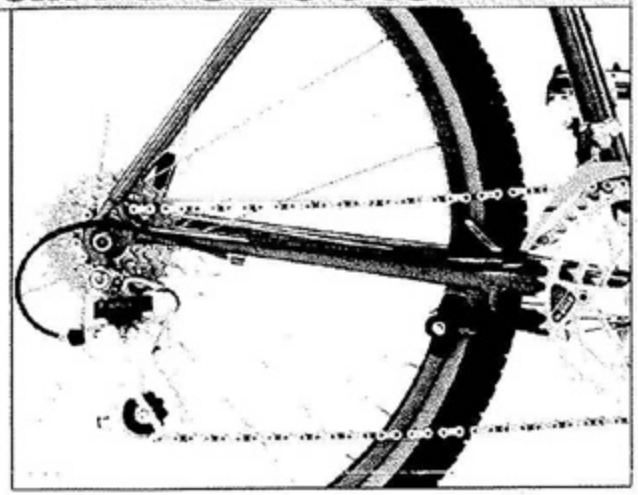
SHIMANO

SERVICE INSTRUCTION

Shimano DEORE XT

Chain Deflector

DF-M730





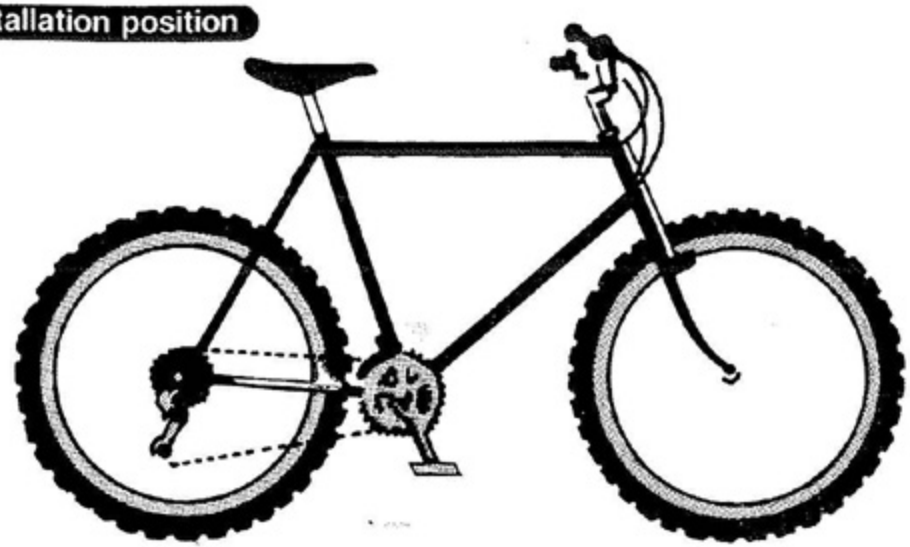
Before use, read these instructions carefully, and follow them for correct use.

■Specifications

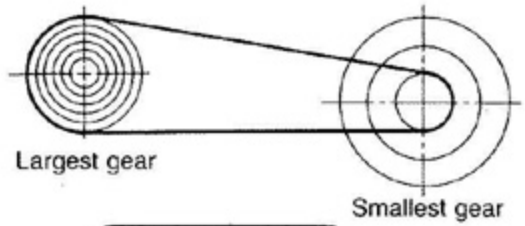
- Weight: 0.3 oz. (9g)
- Material: Resin
- Installation position: Chainstay
- Feature: Keeps the Chain from Jamming between the Tire and Chainstay

Installation Instruction

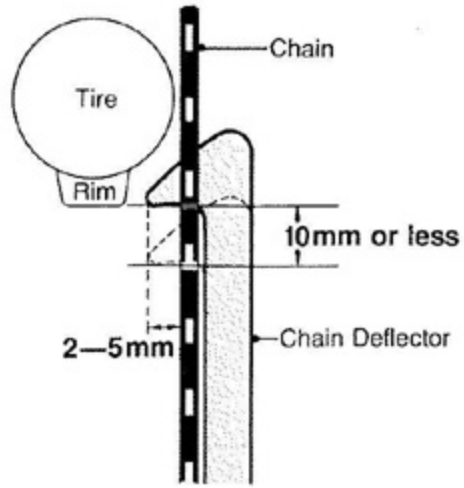
Installation position



Refer to the illustration below when installing.



Chain position



SHIMANO SALES CORPORATION
9530 Canoga Avenue, Chatsworth, California 91311 Tel. (818) 882-4411

SHIMANO AMERICAN CORPORATION
205 Jefferson Road, Parsippany, New Jersey 07054 U.S.A. Tel. (201) 884-2300

SHIMANO (EUROPA) GmbH.
Im Hyserfeld 13 4010 Hilden, West Germany Tel. 02103 5005 0

SHIMANO (SINGAPORE) PTE. LTD.
No. 20, Benoi Sector, Jurong Town, Singapore 2262 Tel. 2654777

SHIMANO INDUSTRIAL CO., LTD.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

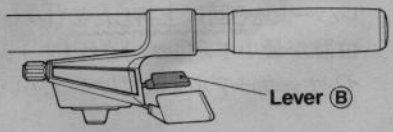
© Oct. 1986 by Shimano P-60 XBC CTA Printed in Japan

NOTES:

SHIMANO
TOTAL
INTEGRATION

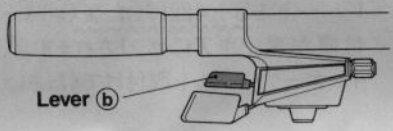
Notes when securing the inner cable

●Rear



After pressing the lever Ⓑ **six times or more** (so that the lever is set for the smallest sprocket), connect the inner cable.

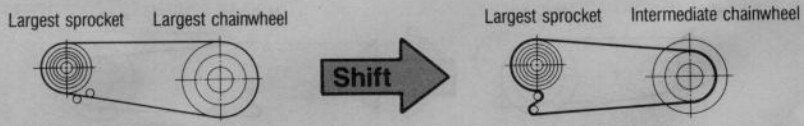
●Front



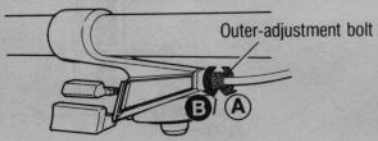
After pressing the lever ⓑ **three or four times** (so that the lever is set for the smallest chainwheel), connect the inner cable.

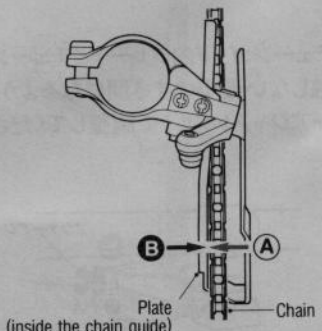
Cable tension adjustment (front derailleur)

① Set the chain to the **largest rear sprocket,** and, at the front, use the Rapidfire to shift **from the largest chainwheel to the intermediate chainwheel.**



② Adjust, by using the outer-adjustment bolt, so that there is the minimum clearance, but so that the chain and the plate (inside the chain guide) do not contact.





© May. 1990 by Shimano Co., Ltd. T-50B XBC SZK Printed in Japan.

SERVICE INSTRUCTIONS

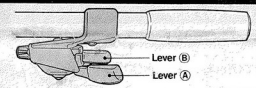
ST-M060
ST-M050-R/L
ST-M050-C

Rapidfire

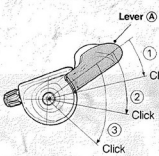
Before use, read these instructions carefully, and follow them for correct use.

■Operation

Caution:
Do not press both right hand (rear) shift control levers Ⓐ and Ⓑ or both left hand (front) shift control levers ⓐ and ⓑ at the same time. Damage to the shift control may result.



●Lever Ⓐ (shifting from a small sprocket to a larger sprocket)





① To shift one gear at a time from a small sprocket to a larger sprocket
Example: from 2nd to 3rd

② To shift two gears at a time from a small sprocket to a larger sprocket
Example: from 2nd to 4th

③ To shift three gears at a time from a small sprocket to a larger sprocket
Example: from 2nd to 5th

●Lever Ⓑ (shifting from a large sprocket to a small sprocket)

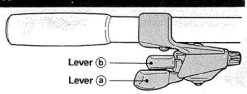




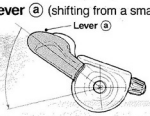
When lever Ⓑ is pressed once, there is a one-step shift from a larger gear to a smaller gear.
Example: from 3rd to 2nd

Front lever operation

Lever ⓐ does not include a position-finding mechanism.



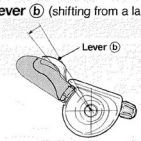
●Lever ⓐ (shifting from a small chainwheel to a larger chainwheel)





When it is pressed one time, there is a shift of one gear from a smaller chainwheel to a larger chainwheel.
Example: from mid-range to largest chainwheel

●Lever ⓑ (shifting from a large chainwheel to a smaller chainwheel)





When it is pressed one time, there is a shift of one gear from a large chainwheel to a smaller chainwheel.
Example: from largest chainwheel to mid-range.

●Noise-prevention mechanism (trimming)
If chain noise occurs, due to overshifting, when a shift is made from the smallest chainwheel to the intermediate chainwheel, the overshifting can be adjusted by gently pressing lever ⓑ to move the front derailleur slightly toward the small chainwheel, thus activating the noise-prevention mechanism.

Please note: specifications are subject to change for improvement without notice. (English)

SHIMANO
SHIMANO AMERICAN CORPORATION
One Shimano Drive, P.O. Box 19615, Irvine, California U.S.A. 92718 Tel: (714) 951-5003
SHIMANO EUROPA GmbH
Kleinhaltinger 1-3, 4878 Wolfen, Germany Tel: 02181-5065-0
SHIMANO INC.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

© May 1991 by Shimano Inc. U-011A XBC SZK Printed in Japan.

Notes:

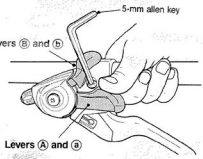
- Be sure to follow the recommendations below regarding combinations of components.
  - Rapidfire ST-M060/ST-M050/ST-M050-C/ST-M070
  - Rear derailleur RD-M550/RD-M500/RD-M500-C/RD-M400/RD-M300/RD-M650
  - Free hub FH-M550/FH-HG50/FH-M650
  - Cassette sprocket (7-speed) CS-HG70/CS-HG50
  - Front derailleur FD-M550/FD-M500/FD-M500-C/FD-M400/FD-M300/FD-M650
  - Front chainwheel FC-M550/FC-M500/FC-M500-C/FC-M400/FC-M300/FC-MT50-SG
  - Chain CN-HG70/CN-HG50
  - Brake BR-M550/BR-M501/BR-M502/BR-C510/BR-M453/BR-M454/BR-M452/BR-M351/BR-M250/BR-M201/BR-MT82/BR-MT63
  - Outer cable ..... Shimano SIS-SP cable (shifting)
    Shimano SLR outer cable (brake)
- Because the wire efficiency is poor, the type of frame with inner cable incorporated cannot be used.
- ST-M060 and ST-M050 cannot be used in combination with the Dura-Ace rear derailleur.

■Installation

Installation to the handlebar

Move lever Ⓐ and lever ⓐ so that the installation bolt can be seen, and then use a 5-mm allen key to install.

Installation torque:
60—80 kgfcm
(50—70 in.lbs.)

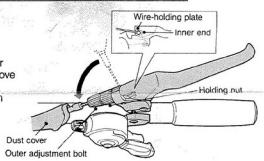


Installation of the brake cable

Use the ∅1.6-mm inner cable and ∅5-mm outer casing.

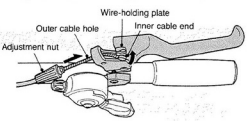
●ST-M060

① Attach the inner end to the wire-holding plate.
② Align the groove of the outer adjustment bolt and the groove of the holding nut with the groove in the lever, and then connect the brake cable.

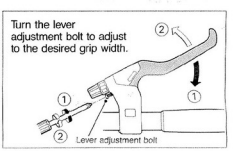


●ST-M050

① Insert the cable into the outer cable hole.
② Hook the inner cable end to the wire-holding plate.

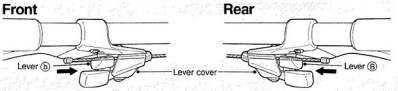


Note:
Check to be sure that the adjustment nut is seated in the outer cable hole.

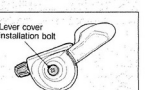


Connection of the shifting cable

First, for the rear, press lever Ⓑ six times or more, and then, for the front, press lever ⓑ three or four times.



Never remove the lever cover. Do not loosen the lever cover installation bolt.

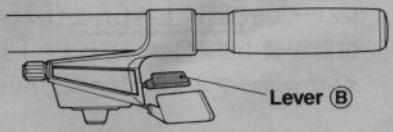


NOTES:

SHIMANO
TOTAL
INTEGRATION

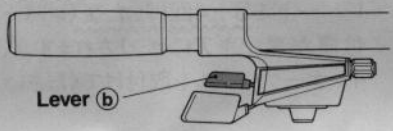
Notes when securing the inner cable

●Rear



After pressing the lever Ⓑ **six times or more** (so that the lever is set for the smallest sprocket), connect the inner cable.

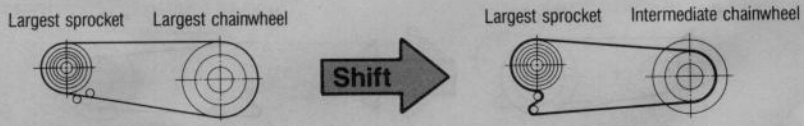
●Front



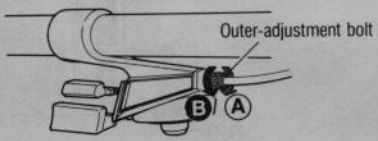
After pressing the lever ⓑ **three or four times** (so that the lever is set for the smallest chainwheel), connect the inner cable.

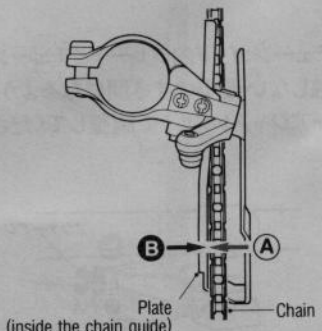
Cable tension adjustment (front derailleur)

① Set the chain to the **largest rear sprocket,** and, at the front, use the Rapidfire to shift **from the largest chainwheel to the intermediate chainwheel.**



② Adjust, by using the outer-adjustment bolt, so that there is the minimum clearance, but so that the chain and the plate (inside the chain guide) do not contact.





© May. 1990 by Shimano Co., Ltd. T-50B XBC SZK Printed in Japan.

SERVICE INSTRUCTIONS

ST-M090 (4-finger type)
ST-M091 (2-finger type)
ST-M070 (4-finger type)
ST-M071 (2-finger type)

Rapidfire

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

SHIMANO

SHIMANO AMERICAN CORPORATION
One Shimano Drive, Irvine, California, U.S.A. 92718 Tel. (714) 951-5003

SHIMANO (EUROPA) GmbH.
Kleinhulsen 1-3, 4010 Hilden, West Germany Tel. 02103-5005-0

SHIMANO (SINGAPORE) PTE. LTD.
No. 20, Benoi Sector, Jurong Town, Singapore 2262 Tel. 2654777

SHIMANO INDUSTRIAL CO., LTD.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

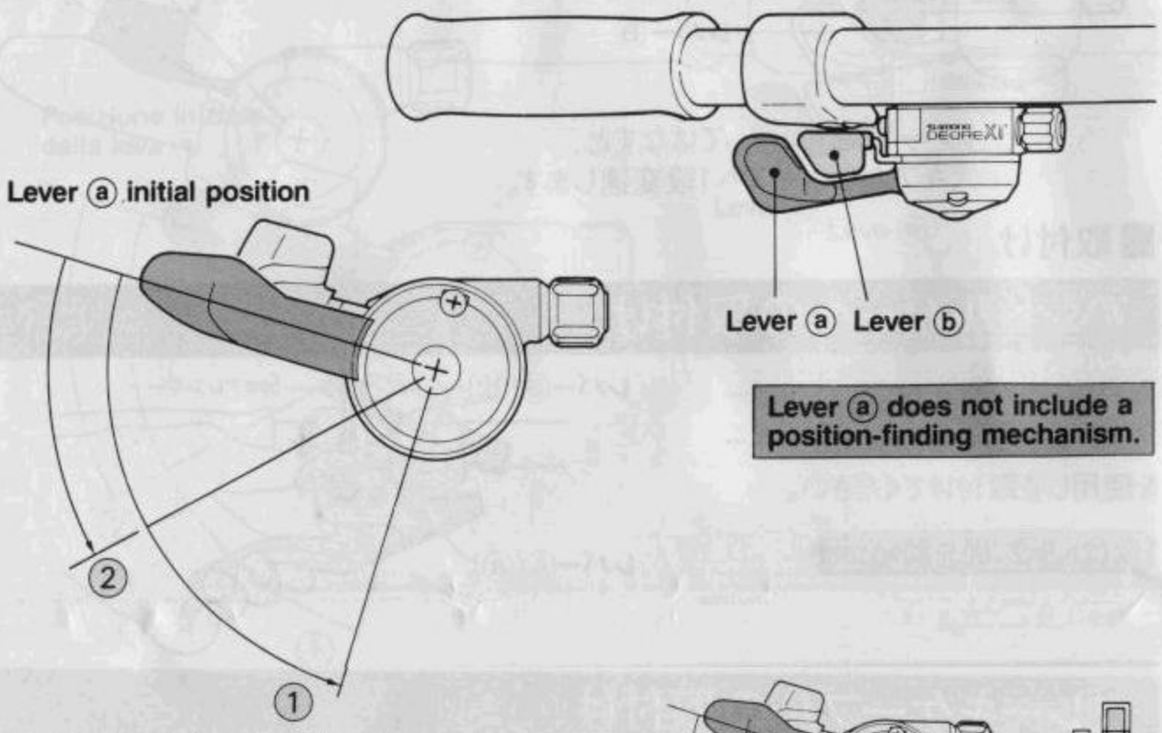
© May 1990 by Shimano Co., Ltd. T-2C XBC SZK Printed in Japan.

■Operation

Front lever operation

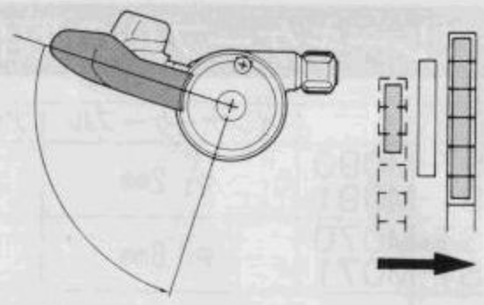
Both lever ⓐ and lever ⓑ, the lever always returns to the initial position when it is released after shifting

●To shift from a small chainwheel to a larger chainwheel

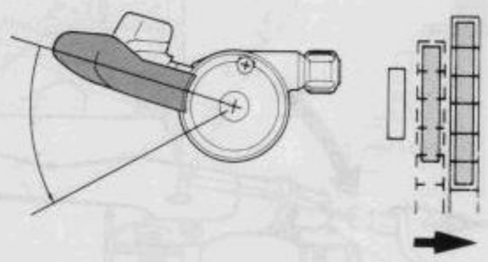


Lever ⓐ does not include a position-finding mechanism.

- As shown by ① in the illustration, when the lever is pressed the full stroke there is a shift (of two gears) from the smallest chainwheel to the largest chainwheel.



- As shown by ② in the illustration, when the lever is pressed to the mid-point of a full stroke there is a shift (of one gear) from a small chainwheel to the next larger chainwheel.
  Example: from the intermediate chainwheel to the largest chainwheel



●To shift from a large chainwheel to a smaller chainwheel

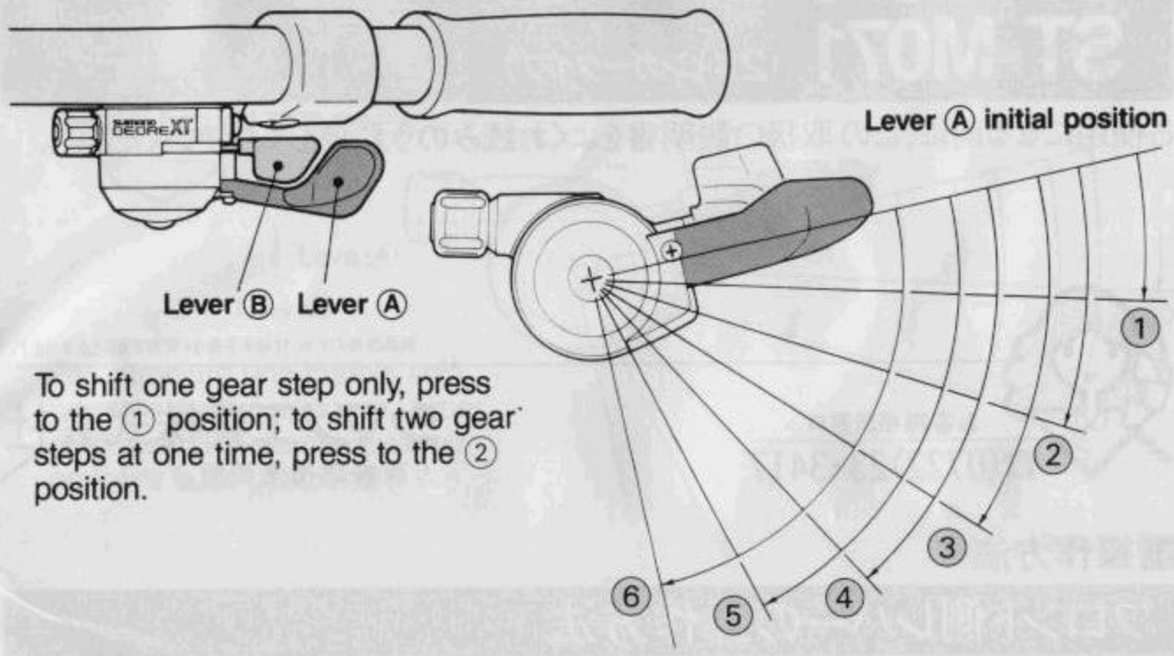
- As shown by ① in the illustration, when the lever is pressed the full stroke there is a shift to the smallest chainwheel. (either from the largest chainwheel to the smallest chainwheel, or from the intermediate chainwheel to the smallest chainwheel)
- ② is for shifting from the one chainwheel to the next chainwheel.

●Noise-prevention mechanism (trimming)
If chain noise occurs, due to overshifting, when a shift is made from the smallest chainwheel to the intermediate chainwheel, the overshifting can be adjusted by gently pressing lever ⓑ to move the front derailleur slightly toward the small chainwheel, thus activating the noise-prevention mechanism.

Rear lever operation

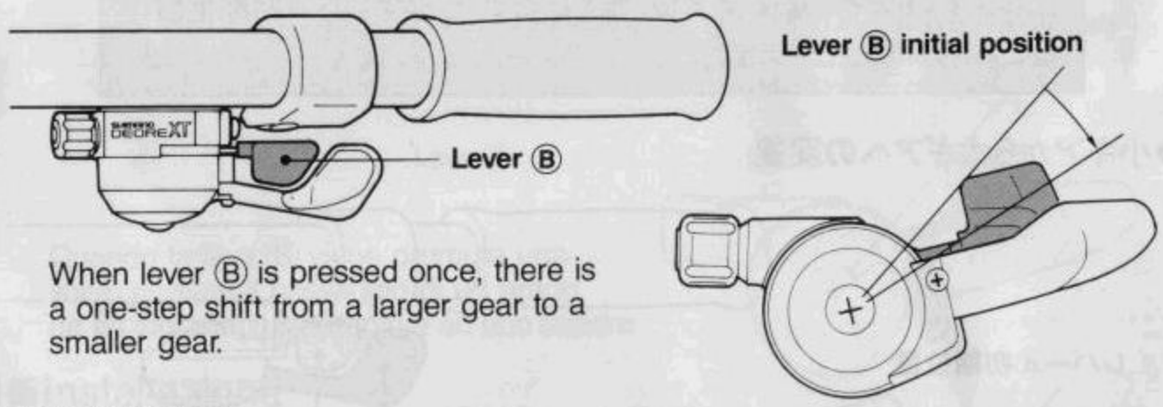
For both lever Ⓐ and lever Ⓑ, the lever always returns to the initial position when it is released after shifting is finished.

●To shift from a small sprocket to a larger sprocket



To shift one gear step only, press to the ① position; to shift two gear steps at one time, press to the ② position.

●To shift from a large sprocket to a smaller sprocket



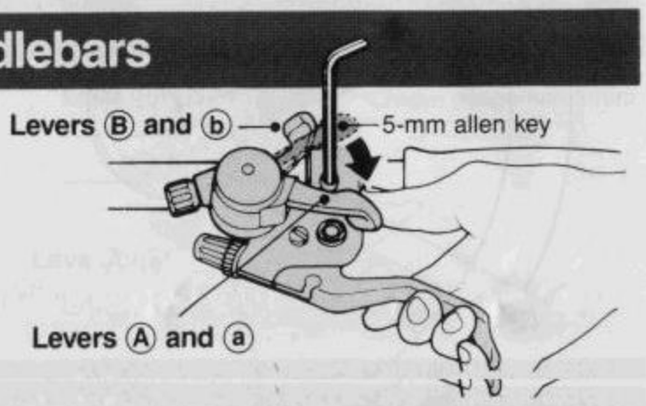
When lever Ⓑ is pressed once, there is a one-step shift from a larger gear to a smaller gear.

■Installation

Installation to the handlebars

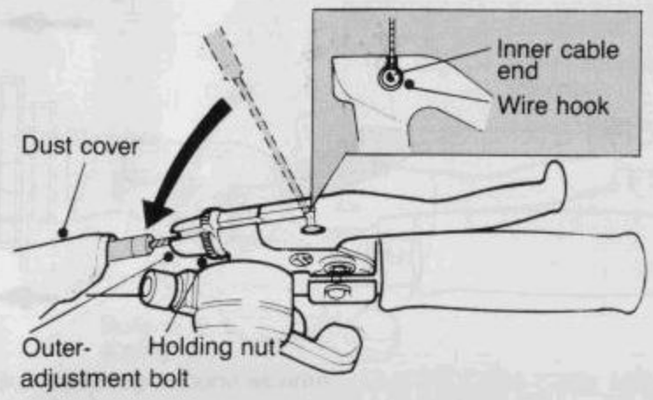
Move lever Ⓐ and lever ⓐ so that the installation bolt can be seen, and then use a 5-mm Allen key to install.

Installation torque: 60—80 kgfcm (50—70 in.lbs.)

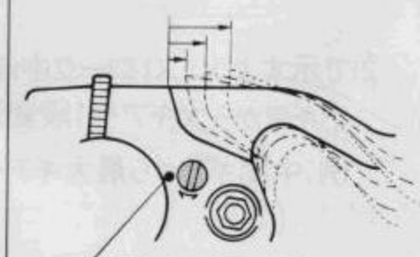


Connection of the brake cable

	Inner cable	Outer casing
ST-M090, ST-M091	∅2 mm	∅6 mm
ST-M070, ST-M071	∅1.6 mm	∅5 mm

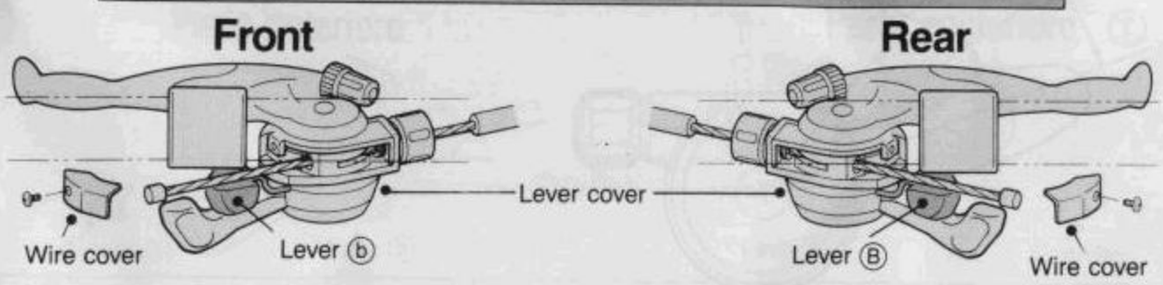


The "reach" of the lever can be adjusted to any one of four steps by using the reach-adjustment bolt (on the rear side of the lever).

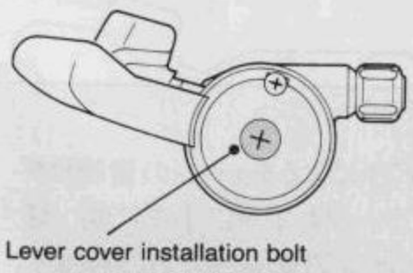


Connection of the shifting cable

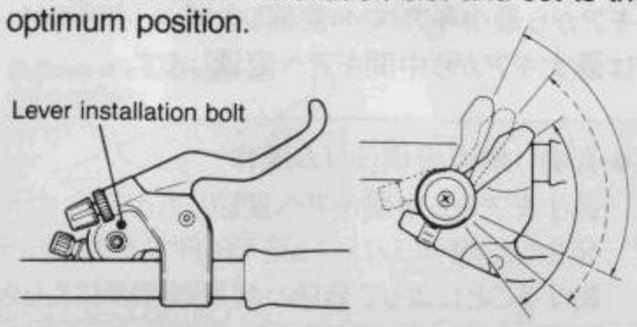
First, for the rear, press lever Ⓑ six times or more, and then, for the front, press lever ⓑ three or four times. Remove the wire cover, and connect the inner cable.



Never remove the lever cover. Do not loosen the lever cover installation bolt.



The finger-reach position can be adjusted to any one of three steps.
Loosen the lever installation blot and set to the optimum position.



SERVICE INSTRUCTIONS

ST-M095 ST-M075 Rapidfire Plus

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

Notes:

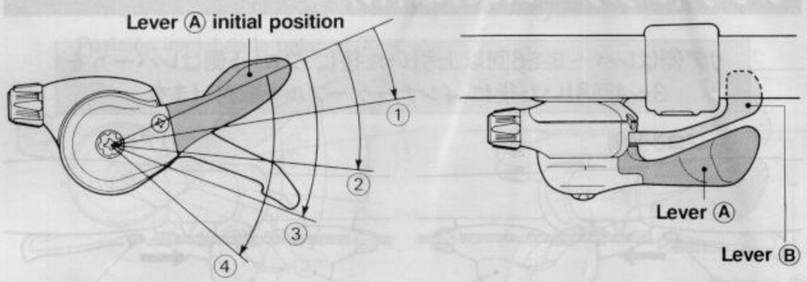
- Be sure to follow the recommendations below regarding combinations of components.
  - Shifting lever ST-M095/ST-M075/ST-M090/ST-M070/ ST-M060/SL-M732/SL-MT62
  - Rear derailleur RD-M735/RD-M650/RD-M550
  - Freehub FH-M732/FH-M650/FH-M550
  - Cassette sprocket (7-speed) CS-HG90/CS-HG70
  - Chain CN-HG90/CN-HG70
  - Outer cable (shifting) ..... Shimano SIS-SP sealed cable (black cap)
    (brake) ..... Shimano SLR outer cable
- Because the wire efficiency is poor, the type of frame with inner cable incorporated cannot be used.
- ST-M095 and ST-M075 cannot be used in combination with the Dura-Ace rear derailleur.

Caution:
Operation of the levers related to gear shifting should be made only when the front chainwheel is turning. Do not operate both right hand (rear) shift control levers Ⓐ and Ⓑ or both left hand (front) shift control levers ⓐ and ⓑ at the same time. Damage to the shift control may result.

Rear lever operation

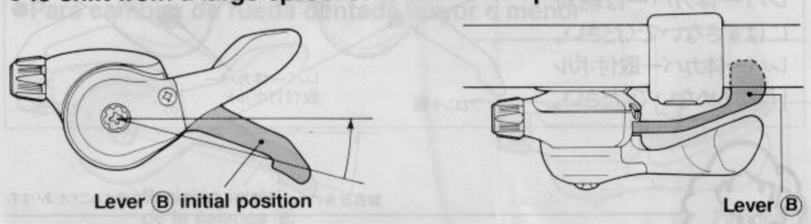
For both lever Ⓐ and lever Ⓑ, the lever always returns to the initial position when it is released after shifting is finished.

●To shift from a small sprocket to a larger sprocket



To shift one gear step, press to the ① position; to shift two gear steps at one time, press to the ② position. A maximum four-step gear shift can be operated in this manner.

●To shift from a large sprocket to a smaller sprocket

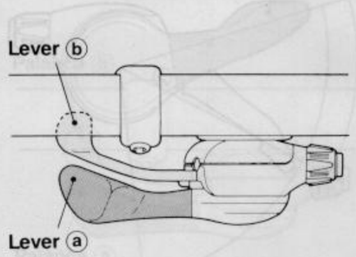


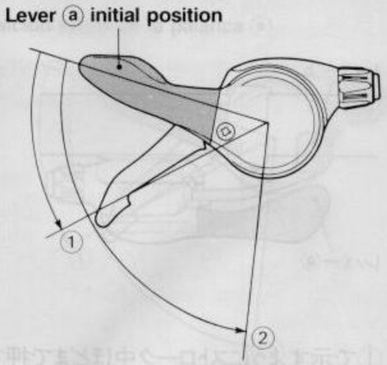
When lever Ⓑ is pulled once and released, there is a one-step shift from a large gear to a smaller gear.

Front lever operation

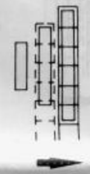
Both lever ⓐ and lever ⓑ, the lever always returns to the initial position when it is released after shifting

●To shift from a small chainwheel to a larger chainwheel

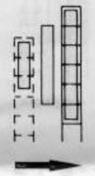




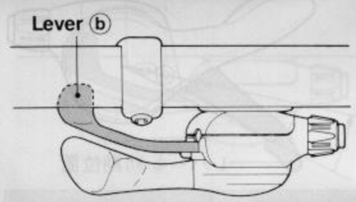
- As shown by ① in the illustration, when the lever is pressed to the mid-point of a full stroke there is a shift (of one gear) from a small chainwheel to the next larger chainwheel.
  Example: from the intermediate chainwheel to the largest chainwheel.



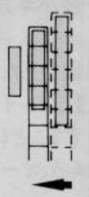
- As shown by ② in the illustration, when the lever is pressed the full stroke there is a shift (of two gears) from the smallest chainwheel to the largest chainwheel.

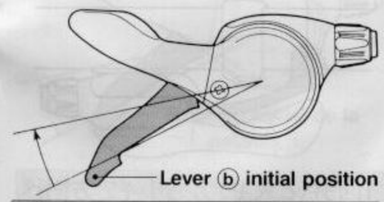


●To shift from a large chainwheel to a smaller chainwheel



When the lever is pulled one time, there is a shift of one gear from a large chainwheel to a smaller chainwheel.
Example: from largest chainwheel to mid-range.





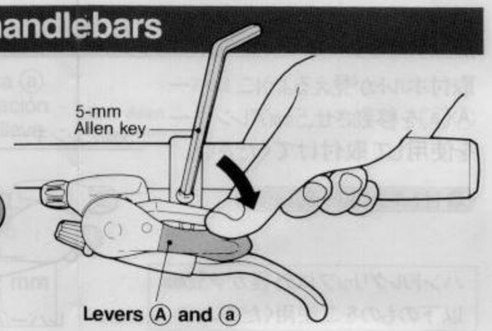
●Noise-prevention mechanism (trimming)
If chain noise occurs due to overshifting when a shift is made from the smallest chainwheel to the intermediate chainwheel, the overshifting can be adjusted by gently pulling lever ⓑ to move the front derailleur slightly toward the small chainwheel, thus activating the noise-prevention mechanism.

Installation to the handlebars

Move lever Ⓐ and lever ⓐ so that the installation bolt can be seen, and then use a 5-mm Allen key to install.

Installation torque: 60—80 kgfcm (50—70 in.lbs.)

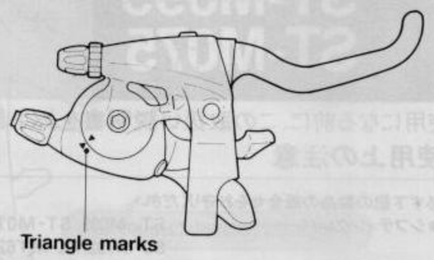
Use handle grips of 32mm diameter or less.



Installation of shifting lever parts

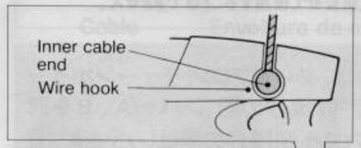
Align the triangular marks on both the brake lever and the shifting parts and then install them. There is only one position for installation.

Installation torque: 25 kgfcm (23 in.lbs.)

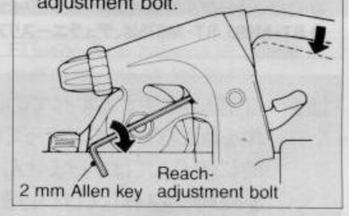


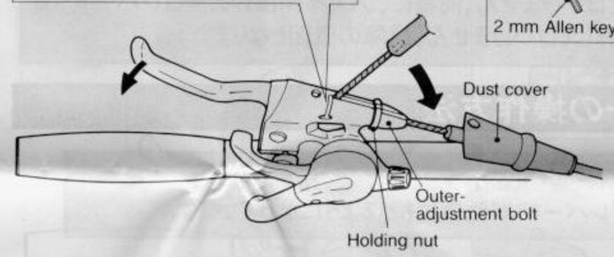
Connection of the brake cable

Inner cable	Outer casing
∅1.6 mm	∅5 mm



The "reach" of the lever can be adjusted by using the reach-adjustment bolt.

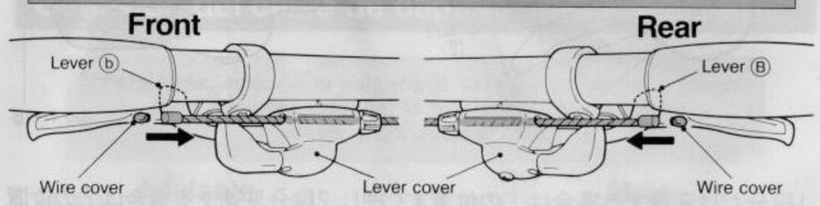




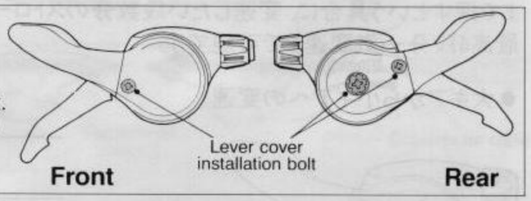
Pull the lever slightly to align the wire hook hole and set the inner cable end.

Connection of the shifting cable

First, for the rear, pull lever Ⓑ six times or more, and then, for the front, pull lever ⓑ three or four times, and connect the inner cable.



Never remove the lever cover. Do not loosen the lever cover installation bolt. Because it may result in a mulfunction.



SHIMANO

SHIMANO AMERICAN CORPORATION
One Shimano Drive, P.O. Box 19615, Irvine, California U.S.A. 92718 Tel. (714) 951-5003

SHIMANO (EUROPA) GmbH.
Kleinhulsen 1-3 4010 Hilden, Germany Tel: 02103-5005-0

SHIMANO INC.
3-77 Oimatsucho, Sakai, Osaka, Japan Tel. (0722) 23-3243

© Feb. 1992 by Shimano Inc. U-117C XBC SZK Printed in Japan.

Please note: specifications are subject to change for improvement without notice. (English)

SERVICE INSTRUCTIONS SI-R420A

Rear Drive System

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

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

Series	STX RC	STX	ALIVIO
Rapidfire SL	SL-MC38	SL-MC37	
Outer casing	SP40 sealed / Rubber shield	SP40 sealed	
Rear derailleur	RD-MC38	RD-MC36 / RD-MC34	RD-MC16
Type	SGS		GS
Freehub	FH-MC38 / FH-R080	FH-MC32 / FH-R050	FH-MC12 / FH-R050
Sprockets	8	7	
Cassette sprocket	CS-IG60-I	CS-IG60	CS-IG50
Chain	CN-IG51		
Bottom bracket cable guide	SM-SP18 / SM-BT18		

Specifications

Rear Derailleur

Model number	RD-MC38	RD-MC34	RD-MC16
Type	SGS		GS
Sprockets	8	7	
Total capacity	39 teeth or less	37 teeth or less	35T
Largest sprocket	32T	28T	30T
Smallest sprocket	11T		
Front chainwheel tooth difference	20T		18T
Applicable front chainwheel (chainring tooth configuration)	FC-MC36-S (42T-32T-22T)	FC-MC34-B (42T-32T-22T)	FC-MC16 (42T-34T-24T)

Cassette sprocket tooth combination

Sprockets	Group name	Tooth combination
8	ah	11, 12, 14, 16, 18, 21, 24, 28T
7	ag	11, 13, 15, 18, 21, 24, 28T
	am	11, 13, 15, 18, 21, 24, 30T

Rapidfire SL

Model number	SL-MC38	SL-MC37
Sprockets	8	7

Freehub

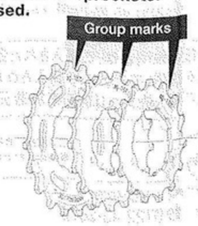
Model number	FH-MC38 / FH-R080	FH-MC32 / FH-R050	FH-MC12 / FH-R050
Sprockets	8	7	
No. of spoke holes	36 / 32		

⚠ CAUTION

* **Be sure to use only the Shimano IG chain with IG sprockets. The HG or UG type of chain cannot be used.**

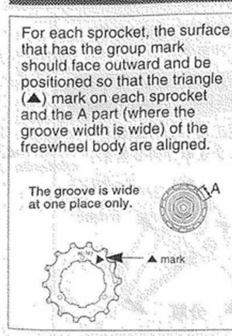
Note

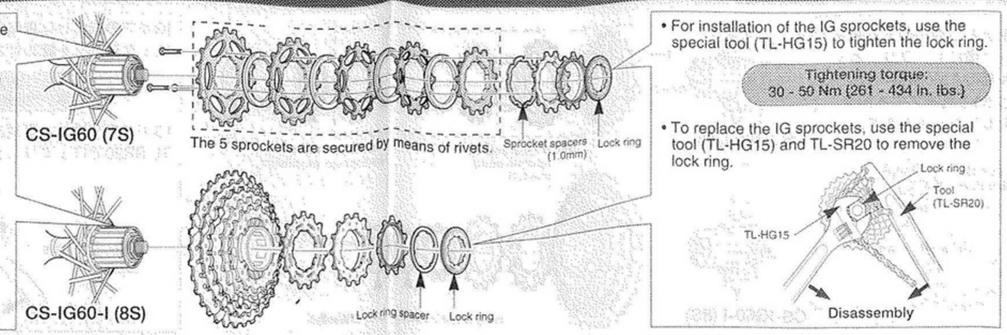
* Always be sure to use the IG sprocket set bearing the same group marks. Never use in combination with a sprocket bearing a different group mark.
* Because the high cable resistance of a frame with internal cable routing would impair the SIS function, this type of frame should not be used.
* Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.



Installation of the IG 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.





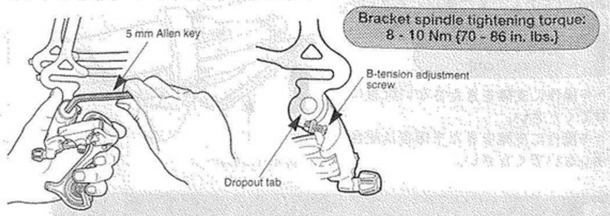
• For installation of the IG sprockets, use the special tool (TL-HG15) to tighten the lock ring.

Tightening torque: 30 - 50 Nm {261 - 434 in. lbs.}

• To replace the IG sprockets, use the special tool (TL-HG15) and TL-SR20 to remove the lock ring.

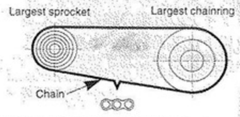
Installation of the rear derailleur

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



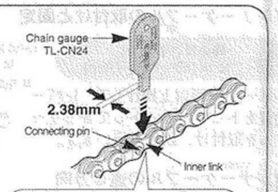
Chain length

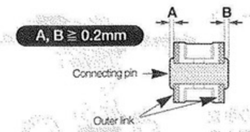
Add 2 links (with the chain on both the largest sprocket and the largest chainring)

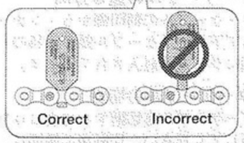


Checking the chain connection

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





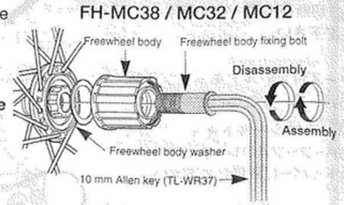


Replacement of the freewheel body

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 Nm {305 - 434 in. lbs.}

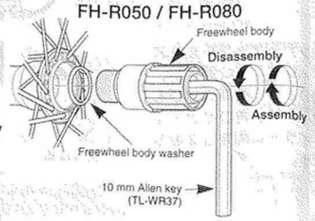
FH-MC38 / MC32 / MC12



Note:
Do not attempt to disassemble the freewheel body, because it may result in a malfunction.
Special grease is used inside the freewheel body.
Do not lubricate the freewheel body with ordinary grease or oil, as this may cause problems with the operation of the clutch mechanism.

Tightening torque: 150 Nm {1300 in. lbs.}

FH-R050 / FH-R080

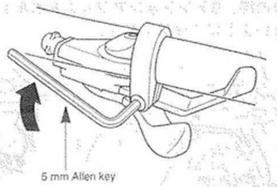


Installation of the brake lever

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

Tightening torque: 5 Nm {44 in. lbs.}

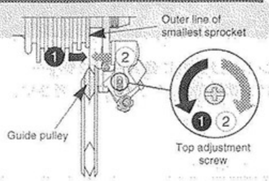
Install the brake lever in a position where it will not obstruct brake operation. Do not use in a combination which causes brake operation to be obstructed.



Adjustment

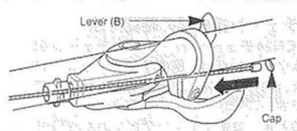
1. Top adjustment

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. Connection and securing of the inner cable

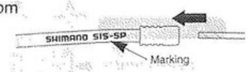
Tightening torque: 5 - 7 Nm {44 - 60 in. lbs.}



Operate lever (B) 7 or more times to set the lever to the highest position, and then install and adjust the inner cable.

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.

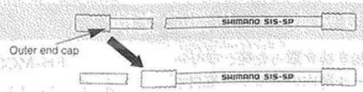


Cutting the outer casing

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

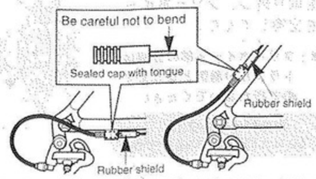


Attach the same outer end cap to the cut end of the outer casing.

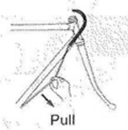


Note regarding the sealed cap with tongue and rubber shield

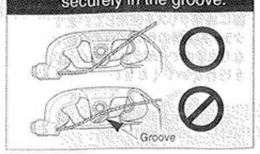
The sealed cap with tongue and the rubber shield should be installed to the outer casing stopper of the frame.



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

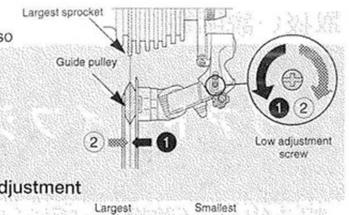


Note: Be sure that the cable is securely in the groove.



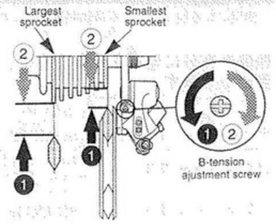
3. Low adjustment

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



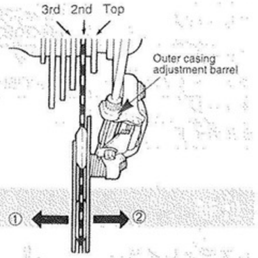
4. How to use the B-tension adjustment screw

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.

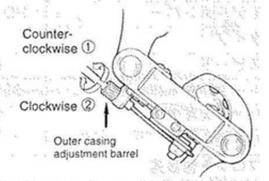


5. SIS Adjustment

(1) Operate the shifting lever to move the chain from the top gear to the 2nd gear.
* If the chain will **not move to the 2nd gear,** turn the outer casing adjustment barrel to increase the tension-----① **(counter clockwise)**
* If the chain **moves past the 2nd gear,** decrease the tension---② **(clockwise)**



(2) Next with the chain on the 2nd gear, increase the inner cable tension ① while turning the crank arm forward. Stop turning the outer casing adjustment barrel **just before the chain makes noise against the 3rd gear.**
This completes the adjustment.



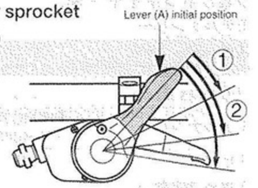
For the best SIS performance, periodically lubricate all power-transmission parts.

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

To shift one step only, press lever (A) to the (1) position. To shift two steps at one time, press to the (2) position. A maximum three-step shift can be made in this manner.



To shift from a large sprocket to a smaller sprocket

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

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

SHIMANO AMERICAN CORPORATION
One Shimano Drive P.O. Box 19615 Irvine California U.S.A. 92713-9615 Phone 714-951-5003

SHIMANO EUROPA
Industrieweg 24 NL-8071 CT Nunspeet Holland Phone 31-3412-72222

SHIMANO INC.
77 Oimatsu-cho 3-cho Sakai Osaka 590-77 Japan Phone 0722-23-3243

These service instructions are printed on recycled paper and can be recycled again

Please note: specifications are subject to change for improvement without notice. (English)
© Mar. 1996 by Shimano Inc. XBC SZK Printed in Japan