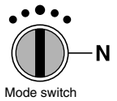
General Safety Information

⚠ WARNING

– To avoid serious injuries:

- If a problem occurs with the operation of the sensor that limits automatic gear shifting, the pedals will suddenly become easy to turn, and this may cause a fall.
  If you feel that there is a problem with gear shifting operation when you get onto the bicycle, do not ride the bicycle, and ask a professional bicycle dealer to check the operation.
- Do not operate the mode switch while riding the bicycle, otherwise your fingers may get caught in the wheel or the bicycle may become unstable because of being ridden with one hand, and this may cause a fall.



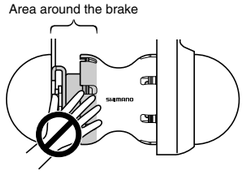
Mode switch

- 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 sever injury. Because each bicycle may handle differently, be sure to learn the proper braking technique (including bicycle control characteristics) and operation of your bicycle. This can be done by consulting your professional bicycle dealer and the bicycle owner's manual, and by practicing your riding and braking technique.
- Use a neutral detergent to clean the chain. Do not use alkaline or acidic detergents that are designed to remove things such as rust, as they can damage the chain and cause the chain to break.
- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and serious injury may result.
- Obtain and read the service instructions carefully prior to installing the parts. Loose, worn, or damaged parts may cause serious injury to the rider.
  We strongly recommend only using genuine Shimano replacement parts.
- Read these Technical Service Instructions carefully, and keep them in a safe place for later reference.

⚠ CAUTION

– To avoid serious injuries:

- The hub dynamo generates an extremely high voltage. Never touch the connection terminal of the hub dynamo directly while riding the bicycle or while the wheel is spinning. Touching the dynamo terminal may cause an electric shock.
- Never put your feet on the bell crank arms, otherwise it may cause problems when gear shifting.
- If using a hub dynamo other than the DH-2N01, it may damage the automatic unit or cause problems with gear shifting.
- This automatic unit is an automatic gear shifting system that determines shifting points in accordance with the bicycle's speed (rotation of the wheels). Because of this, gear shifting will occur regardless of the intentions of the rider, and so you may feel unexpected shifting shocks at the point when shifting occurs. Make sure that you fully understand the shifting characteristics and are used to the feel of shifting before riding the bicycle.
- Avoid continuous application of the brakes when riding down long slopes, as this will cause the internal brake parts to become very hot, and this may weaken braking performance. It may also cause a reduction in the amount of brake grease inside the brake, and this can lead to problems such as abnormally sudden braking.
- Spin the wheel and confirm that the braking force of the coaster brake is correct.
- If the brake is used frequently, the area around the brake may become hot. Do not touch the area around the brake for at least 30 minutes after you finish riding the bicycle.



NOTE:

- This automatic unit will return the bicycle to first gear when the bicycle stops.
- Check the degree of parallel of the front fork end. If the front fork end is severely out of parallel, deformation of the hub axle may cause noise from an obstruction inside the hub dynamo to be generated.
- Install the hub dynamo to the front fork so that the side with the connection terminal is on the right when facing toward the front of the bicycle. If the side with the connection terminal is facing toward the left, the hub dynamo may not turn properly while riding.
- Check that the hub dynamo connection terminal is securely connected before using the hub dynamo.
- For correct operation during gear shifting, a small amount of noise might be generated between the pawl inside the hub and the ratchet.
- If the wheel becomes stiff and difficult to turn, you should replace the brake shoes or lubricate with grease.
- Do not disassemble the internal hub mechanism.
- Do not apply any lubricant to the inside of the hub, otherwise the grease will come out and it may cause problems with conductivity.
- The hub dynamo will cause the turning of the wheel to become slightly heavier because of the magnet inside the hub.
- Do not clean the bicycle with high-pressure sprays. If moisture gets into the components, it may cause operating problems or rust.
- Do not disassemble any of the units, otherwise they may not operate correctly.
- Use a dry cloth or a cloth that is lightly moistened with neutral detergent to clean the unit. Solvents such as thinner will damage the unit's surface.
- You should periodically wash the sprockets in a neutral detergent and then lubricate them again. In addition, cleaning the chain with neutral detergent and lubricating it can be a effective way of extending the useful life of the sprockets and the chain.
- If the chain keeps coming off the sprockets during use, replace the sprockets and the chain.
- Each unit has a waterproof design to protect it when riding in the rain, but do not immerse the units in water.
- For details on installing the bicycle wheels, refer to the Shimano website at www.shimano.com or contact a professional bicycle dealer.
- Be sure to read the technical service instructions for the CN-NX01 together with these technical service instructions.
- Parts are not guaranteed against natural wear or deterioration resulting from normal use.
- For any questions regarding methods of handling or maintenance, please contact the place of purchase.

SI-7CB0A

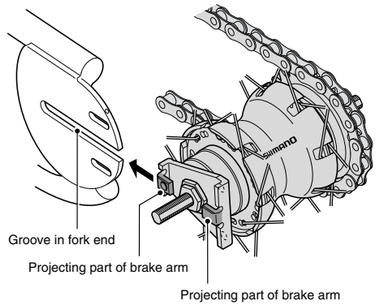
AI-3S01	Automatic Unit
SG-3C01	Rear Hub
SM-BC01	Bell Crank
DH-2N01	Hub Dynamo
CN-NX01	Chain
FC-S090	Front Chainwheel

Technical Service Instructions

SG-3C01 Rear Hub
SM-BC01 Bell Crank

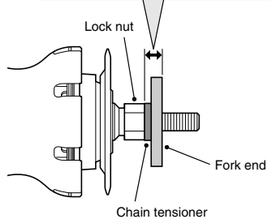
Installation of the hub to the frame

Mount the chain onto the sprocket, and then set the hub axle and the brake arm into the fork end, while making sure that the projecting parts on the brake arm are facing the correct way.



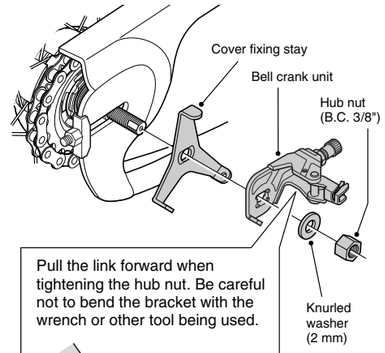
Note:
If using a reverse fork end, be sure to use a chain tensioner at the right side.

Total thickness of fork end and chain tensioner should be 4.5 – 9.5 mm.

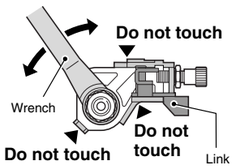


Installation of the right-hand bell crank

1. After placing the hub unit onto the frame, install the bell crank parts in the order shown in the illustration below, and secure them with the hub nut.

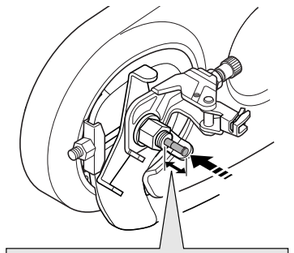


Pull the link forward when tightening the hub nut. Be careful not to bend the bracket with the wrench or other tool being used.



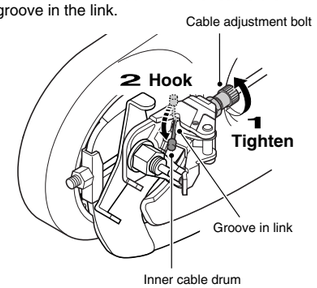
Tightening torque:
30 – 45 N·m
{260 – 390 in. lbs.}

2. Insert the push rod into the hub axle.



The correct amount of protrusion for the push rod is approximately 14 mm from the end of the hub axle.

3. Tighten the cable adjustment bolt of the bell crank unit, pass the inner cable through the cable adjustment bolt, and hook the inner cable drum into the groove in the link.

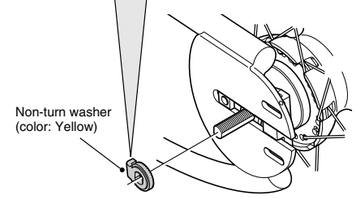


For details on adjusting the SM-BC01 bell crank, read the "N Position Adjustment" section of the AI-3S01 service instructions.

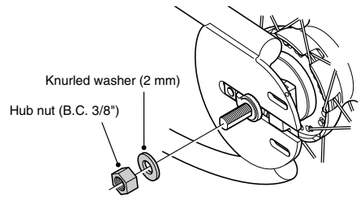
Installation of the left-hand parts

1. Place the non-turn washer onto the outside of the left side of the hub axle. At this time, turn the hub axle so that the projection of the non-turn washer fits into the groove of the fork end.

- **The projecting part should be on the fork end side.**
- **Install the non-turn washer so that the projecting part is securely in the fork end groove on either side of the hub axle.**

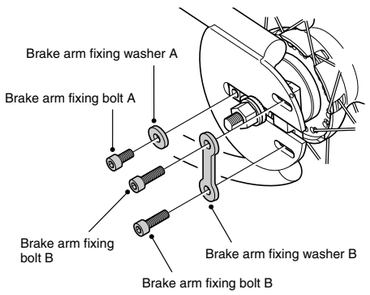


2. Install the bicycle wheel to the frame with the hub nut in the order shown in the illustration below.



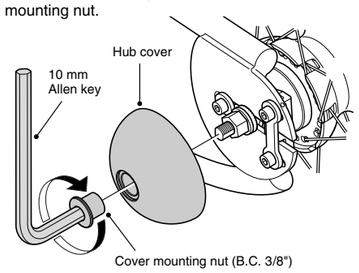
Tightening torque:
30 – 45 N·m {260 – 390 in. lbs.}

3. Install the brake arm parts onto the fork end in the order shown in the illustration below.



Tightening torque:
3 – 5 N·m {26 – 43 in. lbs.}

4. Attach the hub cover, and secure it with the cover mounting nut.



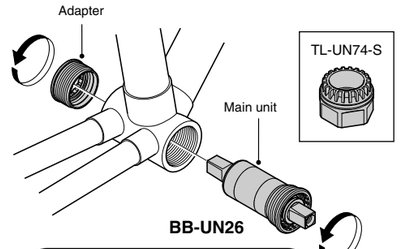
Tightening torque:
15 – 25 N·m {130 – 217 in. lbs.}

Note:
The cover mounting nut for the rear hub and the hub nut for the hub dynamo are not interchangeable.

FC-S090 Front Chainwheel

Installation of the bottom bracket

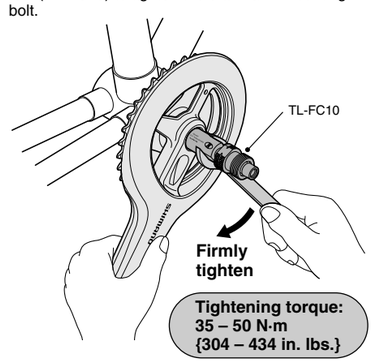
Use the special tool (TL-UN74-S) to install the bottom bracket. First install the main unit, then install the adapter.



Tightening torque:
50 – 70 N·m {434 – 608 in. lbs.}

Installation of the front chainwheel

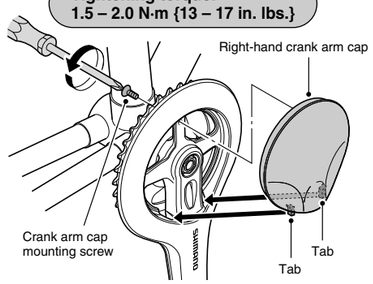
1. Install the right-hand crank arm by using the special tool (TL-FC10) to tighten the crank arm mounting bolt.



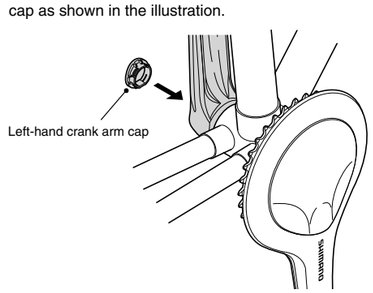
Tightening torque:
35 – 50 N·m
{304 – 434 in. lbs.}

2. Hook the tab inside the right-hand crank arm cap into the right-hand crank arm to attach the right-hand crank arm cap, and then secure it by tightening the crank arm cap mounting screw.

Tightening torque:
1.5 – 2.0 N·m {13 – 17 in. lbs.}



3. Install the left-hand crank arm by using the special tool (TL-FC10) in the same way as for the right-hand crank arm. After that, install the left-hand crank arm cap as shown in the illustration.

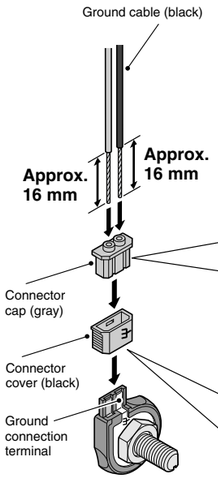


DH-2N01 Hub Dynamo

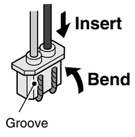
Connection of the hub dynamo cables

At the hub dynamo

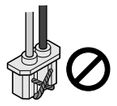
Insert the hub dynamo cables that are coming out from the frame into the connector cap as shown in the illustration, and then install the connector cover. Next, place the connector cover onto the hub dynamo so that the side with the black cable is aligned with the ground connection terminal of the hub dynamo.



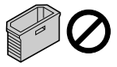
Note:
- Bend the cable wires and run them along the grooves.



- Do not allow the cable wires to touch each other.

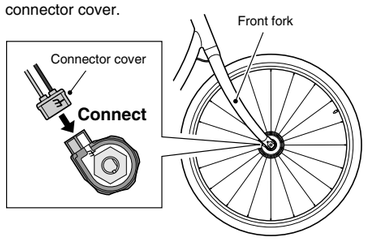


Note:
- Set so that it faces the right way.



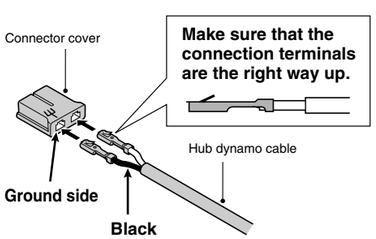
- Press in until you hear a click.

Note:
When removing the bicycle wheel, first remove the connector cover. If the cables are pulled strongly, it may break the cable wires or cause poor contacts. Furthermore, when installing the wheel, first secure the wheel to the front forks and then connect the connector cover.



At the automatic unit

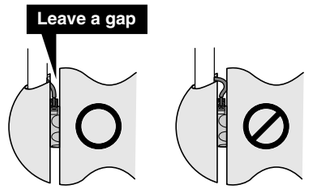
At the automatic unit, insert the connection terminals into the connector cover until they click into place. Insert the connection terminal for the black cable into the ground side of the connector cover at this time.

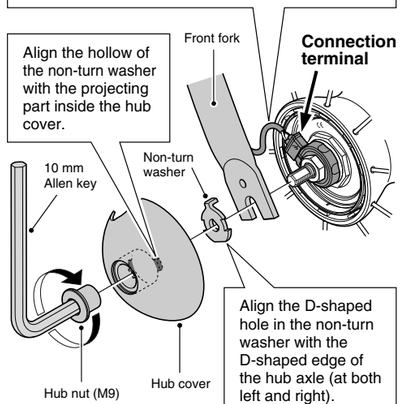


Installation of the front wheel

Install the wheel following the procedure shown in the illustration below so that the side with the hub dynamo connection terminals is on the right side when looking toward the front of the bicycle.

Note:
Make sure that the connection terminal cables do not touch the hub shell.



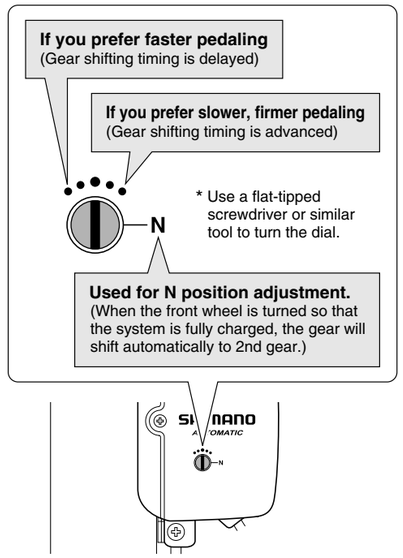


Note:
Provisionally install the non-turn washers, hub covers and hub nuts at both the left and right, and then fully tighten the hub nuts.
If you concentrate on fully tightening or fully loosening only one hub nut at a time when tightening or loosening the hub nuts, it will force the hub axle to turn and this will cause the lock nuts to loosen or tighten. To avoid this, you should tighten the left and right nuts each a little bit at a time.

AI-3S01 Automatic Unit

Operation of the mode switch

The gear shifting timing can be adjusted to one of five settings.

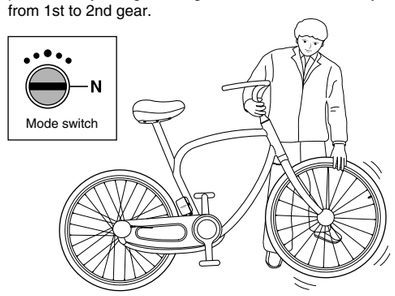


N position adjustment

At the main unit

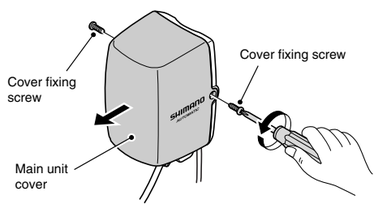
■ When using the hub dynamo power supply

Set the mode switch to "N", and then set the winder unit of the automatic unit to the N position. At this time, turn the front wheel to fully charge the power. When the power is fully charged, the gear will shift automatically from 1st to 2nd gear.



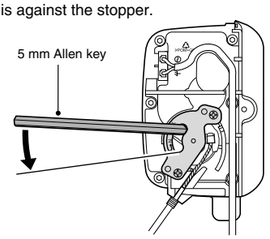
■ When not using the hub dynamo power supply

1. Use a Phillips screwdriver to loosen the two cover fixing screws, and then remove the main unit cover.

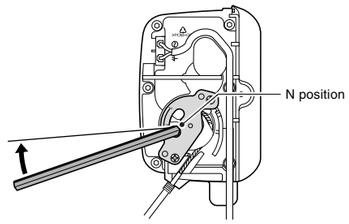


Note:
If the main unit cover cannot be removed because the frame is in the way, remove the entire automatic unit from the mounting rail.

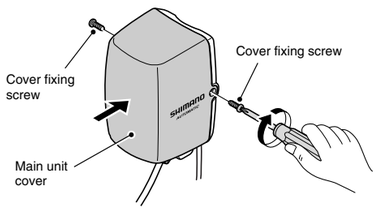
2. Insert a 5 mm Allen key into the hexagonal recess in the winder unit as shown in the illustration, and use it to turn the winder unit in the direction of the arrow until it is against the stopper.



3. Next, turn the winder unit back in the direction of the arrow until it stops (N position).



4. Install the main unit cover, and then securely tighten the two cover fixing screws.



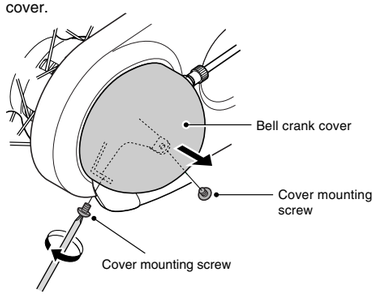
Tightening torque: 0.3 – 0.6 N·m {2.6 – 5.2 in. lbs.}

Note:
If the automatic unit has been removed from the frame, place the automatic unit securely onto the mounting rail and then tighten the main unit fixing screw.

Tightening torque: 1.0 – 1.2 N·m {9 – 10 in. lbs.}

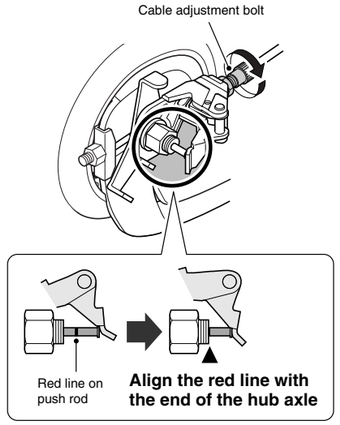
At the bell crank

1. Use a Phillips screwdriver to loosen the two cover mounting screws, and then remove the bell crank cover.



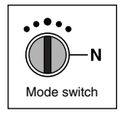
2. Before carrying out N position adjustment, push the link of the bell crank to take up any slack in the inner cable.

3. Turn the cable adjustment bolt of the bell crank counterclockwise so that the end of the hub axle and the red line on the push rod are aligned.



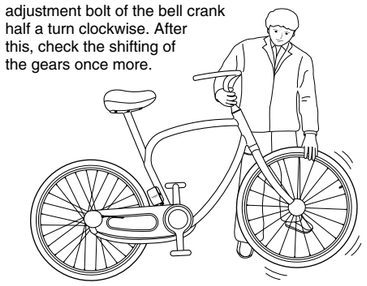
Checking operation

1. Set the mode switch to a position other than "N".

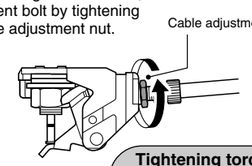


2. Turn the front wheel to fully charge the power. When the power is fully charged, the gear will shift automatically from 2nd to 1st gear.

3. Rotate the front wheel rapidly and check that the gears change from 1st to 2nd to 3rd. If the gear does not change from 2nd to 3rd, stop rotating the front wheel and turn the cable adjustment bolt of the bell crank half a turn clockwise. After this, check the shifting of the gears once more.

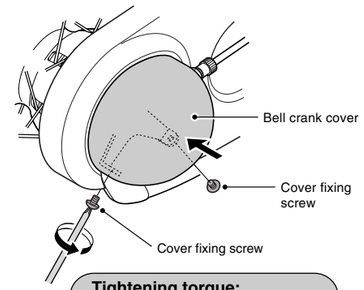


4. After adjusting the bell crank, secure the cable adjustment bolt by tightening the cable adjustment nut.



Tightening torque: 1.5 – 2.5 N·m {13 – 22 in. lbs.}

5. Install the bell crank cover, and then securely tighten the two cover fixing screws.



Tightening torque: 1.0 – 1.5 N·m {9 – 13 in. lbs.}

Troubleshooting

For any questions regarding installation or adjustments, please contact the place of purchase.

Symptom	Check	Remedy
No gear shifting occurs.	Are the cables connected correctly?	Connect the cables correctly between the automatic unit and the hub dynamo.
	Is the gear shifting cable connected correctly?	Connect the cable correctly at the automatic unit and the bell crank.
	Is the gear shifting cable broken?	Replace the cable with a new one.
	Does the bell crank move smoothly?	Replace with a new part, or eliminate the cause of the problem.
	Does the push rod move smoothly?	Replace with a new part, or eliminate the cause of the problem.
	Is the proper push rod being used?	Use the proper push rod.
	Does the gear shifting cable work smoothly?	Replace with a new part, or eliminate the cause of the problem.
	Is the shifting cable winder on the automatic unit blocked with mud or small stones?	Remove the cause of the problem.
	Has the N position been adjusted correctly?	Refer to "N position adjustment".
	Is the mode switch at the "N" position?	Set the mode switch to a position other than "N".

These service instructions explain 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.

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

SHIMANO

SHIMANO AMERICAN CORPORATION
One Holland, Irvine, California 92618, U.S.A. Phone: +1-949-951-5003

SHIMANO EUROPE B.V.
Industrieweg 24, 8071 CT Nunspeet, The Netherlands Phone: +31-341-272222

SHIMANO INC.
3-77 Oimatsu-cho, Sakai-ku, Sakai, Osaka 590-8577, Japan

© Sep. 2006 by Shimano Inc. PIT. SZK. Printed in China