

**SHIMANO NEXUS 3-SPEED HUB**

# SG-3R40

**SERVICE MANUAL**

**vol.1**



## Disassembly of the Inter-3 hub



SG-3R40

### Tools



**TL-HS20**

Hub spanners  
Part no. Y-320 90010  
15 mm/17 mm (2 pcs.)

**TL-HS10**

Hub spanners  
Part no. Y-230 90010  
13 mm x 14 mm (2 pcs.)

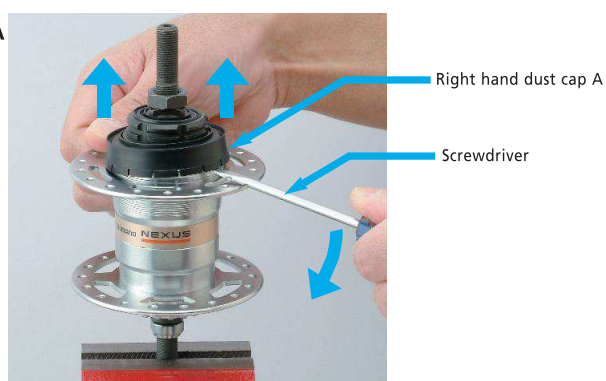
**Screwdriver**

1. Hold the two bevelled surfaces of the hub axle in a vice.

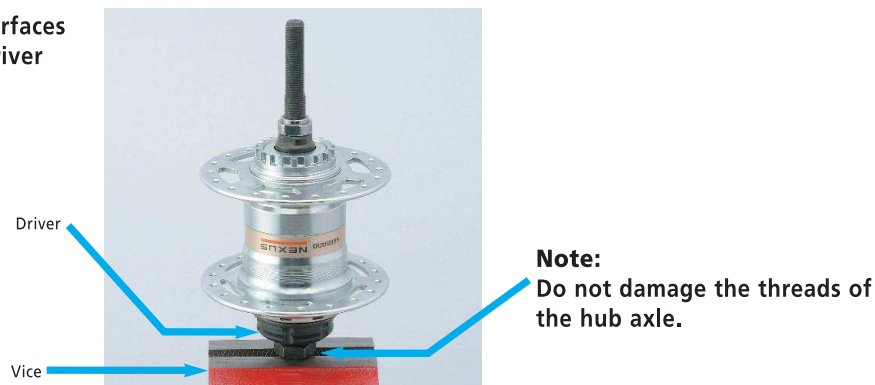


**Note:**  
Do not damage the threads of the hub axle.

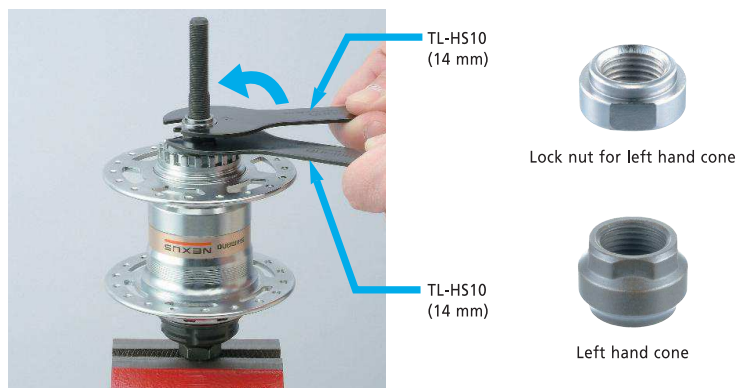
2. Remove the right hand dust cap A with a screwdriver.



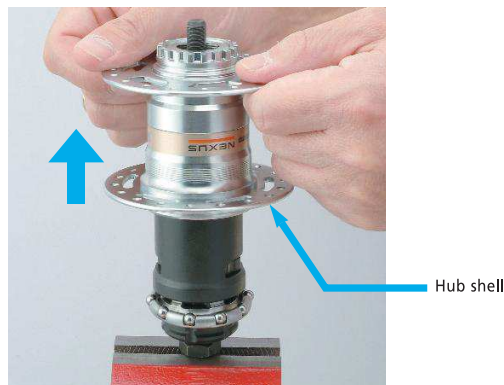
3. Hold the two bevelled surfaces of the hub axle on the driver side in a vice.



4. Hold the left hand cone, and then remove the lock nut for left hand cone. Next, remove the left hand cone.



5. Remove the hub shell.



Now it can be replaced with the new internal assembly.

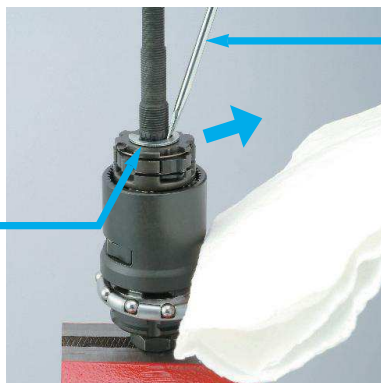


Internal assembly for quick replacement

Part no.	Axle length
Y-33S 90700	170.3 mm
Y-33S 98270	176.8 mm
Y-33S 90710	189.4 mm

6. Remove the stop ring with a screwdriver.

Stop ring (9.6 mm dia.)



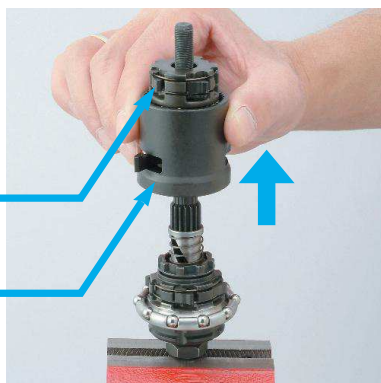
Screwdriver

At this time, the stop ring come off with great force. Be careful of the safety using cloth and so on.

7. Remove the carrier unit and the ring gear unit at the same time while turning the ring gear unit slightly to the left and right.

Carrier unit

Ring gear unit



Carrier unit

Ring gear unit

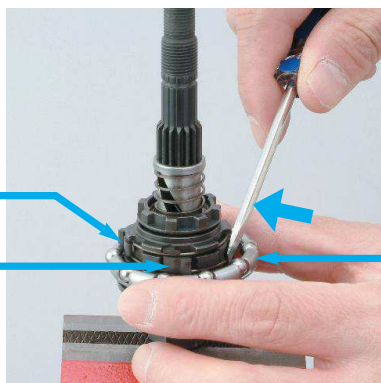
After removing them at the same time, remove the carrier unit from the ring gear unit.

8. Remove ball retainer K while pressing in pawl A-1 and pawl A-2 on the driver unit with your fingers.

Pawl A-1

Pawl A-2

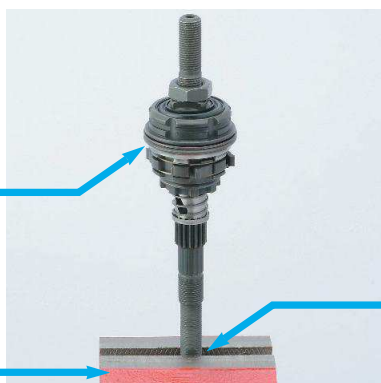
Ball retainer K



9. Turn the axle unit with driver upside down and hold the two bevelled surfaces of the axle in a vice.

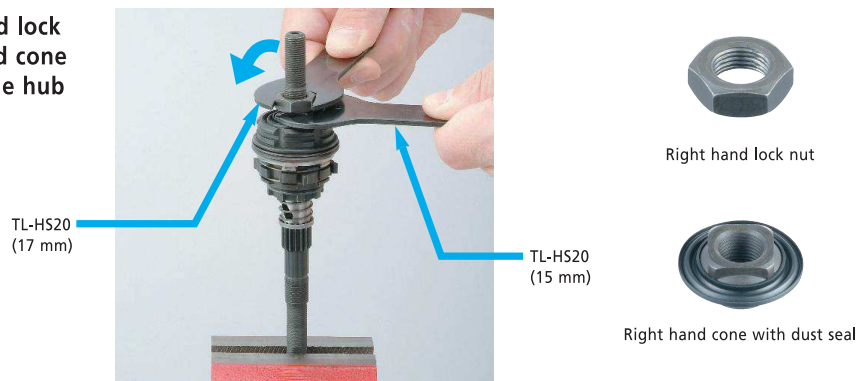
Axle unit with driver

Vice

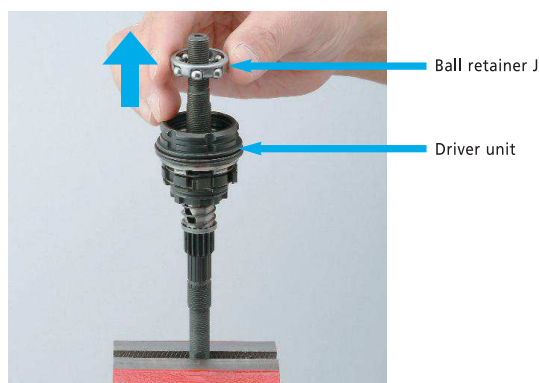


**Note:**  
Do not damage the threads of the hub axle.

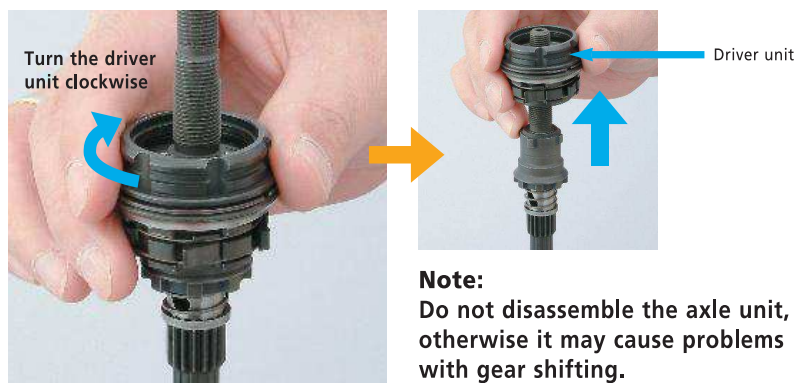
- 
- 10.** Remove the right hand lock nut and the right hand cone with dust seal from the hub axle.



- 
- 11.** Remove ball retainer J from the driver unit.



- 
- 12.** Turn the driver unit clockwise to remove it from the axle unit.



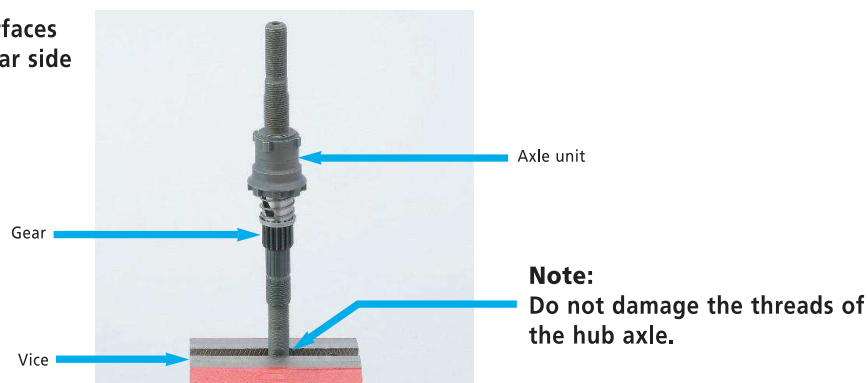
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**This completes the disassembly of the Inter-3 hub.**

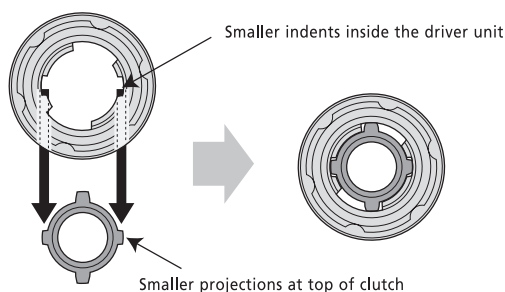
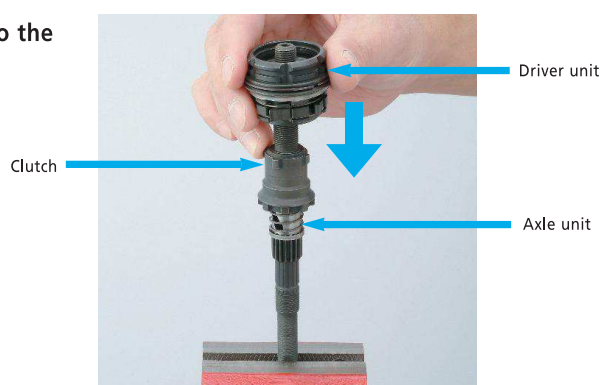


## Assembly of the Inter-3 hub

1. Hold the two bevelled surfaces of the axle unit on the gear side in a vice.



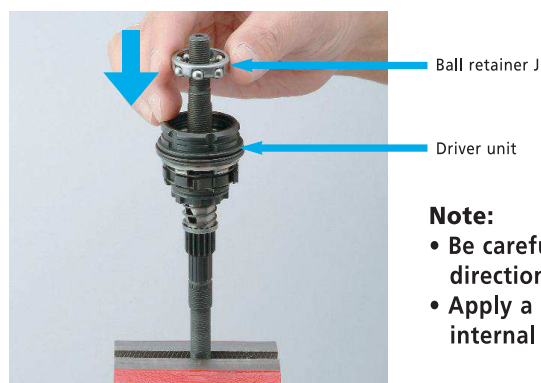
2. Install the driver unit onto the axle unit.



**Note:**

Align the two smaller indents inside the driver unit with the two smaller projections at the top of the clutch when installing the driver unit.

3. Place ball retainer J onto the driver unit.



**Note:**

- Be careful of the setting direction.
- Apply a liberal coating of internal hub grease.



(Y-041 20600)



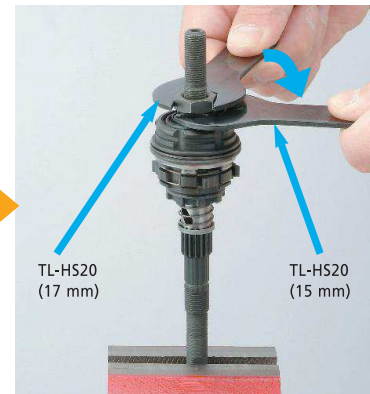
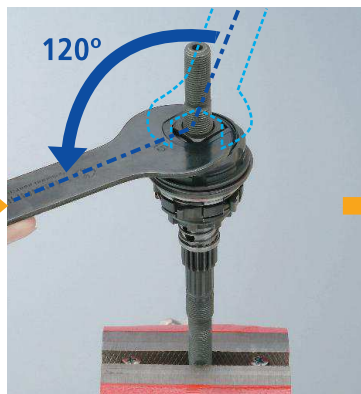
4. Screw the right hand cone with dust seal onto the hub axle as far as it will go. Then turn the right hand cone counterclockwise by 120 degree, and then secure it by tightening the right hand lock nut.



Right hand lock nut



Right hand cone with dust seal

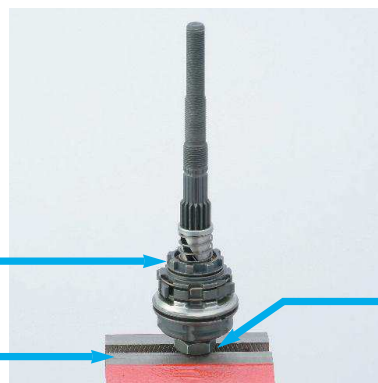


Tightening torque:  
12 - 20 N·m {104 - 174 in.lbs}

5. Turn the axle unit with driver upside down and hold the two bevelled surfaces of the axle on the driver side in a vice.

Axle unit with driver

Vice



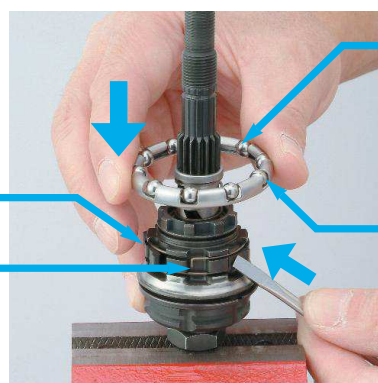
**Note:**

Do not damage the threads of the hub axle.

6. Install ball retainer K while pressing in pawl A-1 and pawl A-2 on the driver unit with your fingers.

Pawl A-1

Pawl A-2



**Note:**

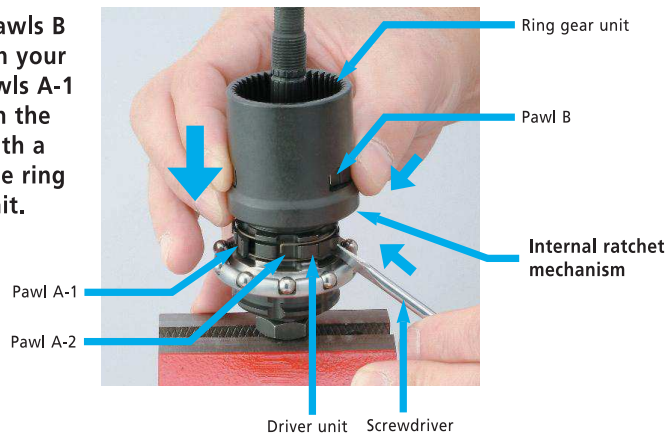
- Be careful of the setting direction.
- Apply a liberal coating of internal hub grease.

Ball retainer K



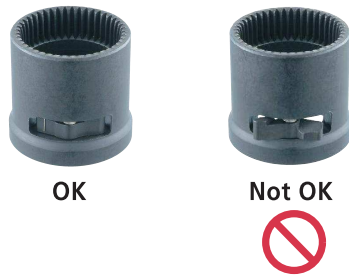
(Y-041 20600)

7. While pushing the two pawls B on the ring gear unit with your fingers, push the two pawls A-1 and the two pawls A-2 on the driver unit one by one with a screwdriver and install the ring gear unit to the driver unit.



**Note:**

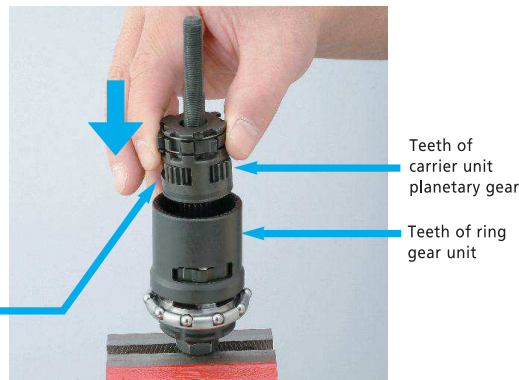
- Be careful of the directions of the two pawls B.
- Apply a liberal coating of internal hub grease.
- Check that pawls B are not hooked onto the clutch.
- Check that pawls A-1 and A-2 are engaged with the ratchet mechanism in the ring gear unit.
- Apply a liberal coating of internal hub grease to the gear inside the ring gear unit.



8. Engage the teeth of the planetary gear of the carrier unit with the teeth of the ring gear unit while turning the carrier unit slightly to the left and right and pushing it onto the ring gear unit.

**Note:**

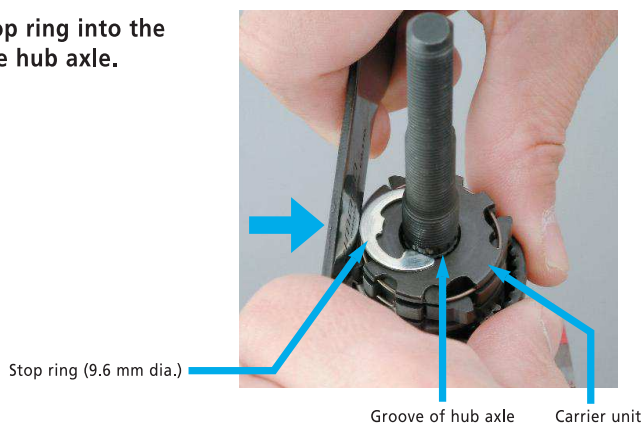
Apply a liberal coating of internal hub grease to the planetary gear (in 4 places) inside the carrier unit.



**Check:**

Check that the stop ring groove of the hub axle is visible from the edge of the carrier unit after the carrier unit has been installed.

9. Insert the stop ring into the groove of the hub axle.

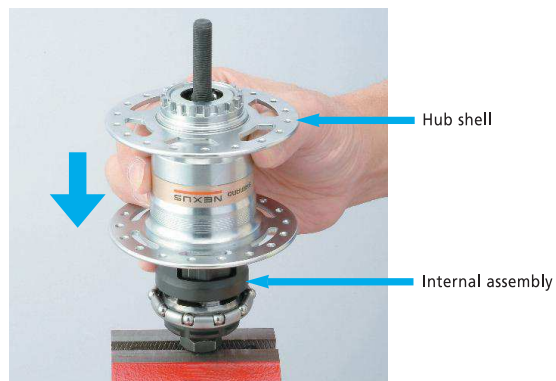


**Note:**

After inserting the stop ring, check that there is a small amount of play in the carrier unit in the vertical direction. If there is no vertical play and the carrier unit turns stiffly, turn the internal assembly upside down and hold the hub axle in a vice. Then loosen the right hand lock nut and the right hand cone with dust seal to adjust until there is sufficient play.

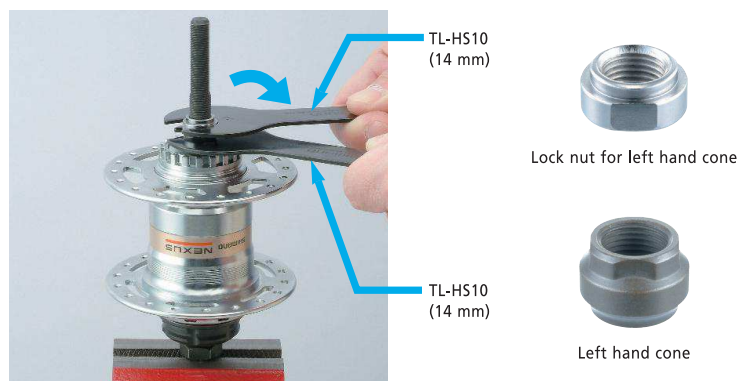


- 10.** While turning the hub shell counterclockwise slightly, place it onto the internal assembly.

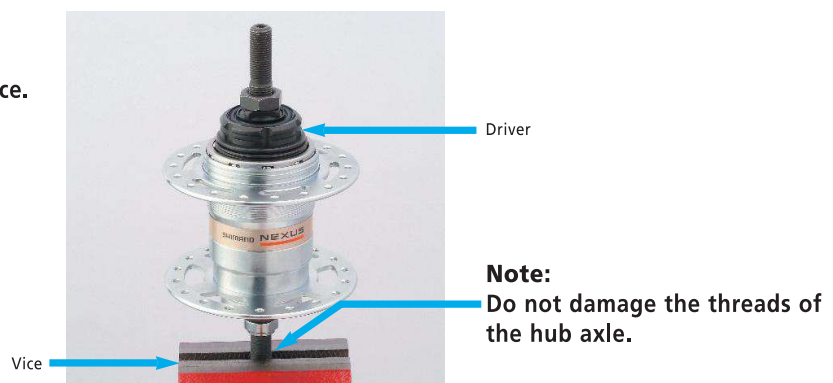


- 11.** Screw on the left hand cone to adjust so that the hub shell can be turned smoothly without any play. After adjusting, secure the left hand cone with the lock nut for left hand cone.

**Tightening torque:**  
12 - 20 N·m {104 - 174 in.lbs}

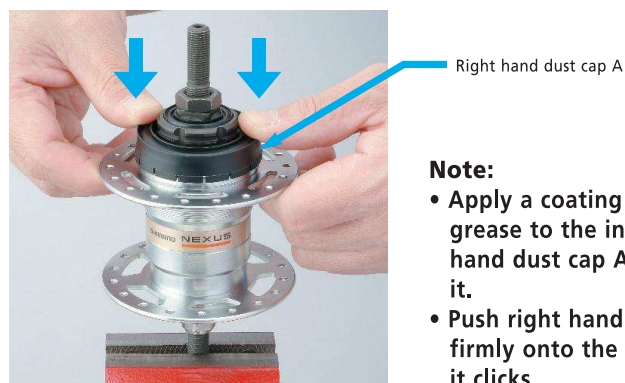


- 12.** Turn the hub upside down and hold the two bevelled surfaces of the axle in a vice.



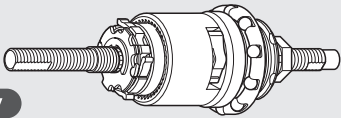
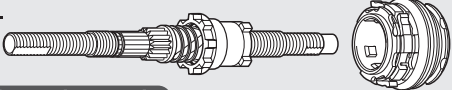
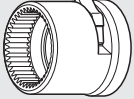

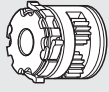




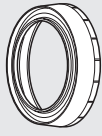
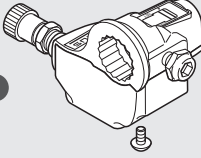

- 13.** Install right hand dust cap A to the hub shell.

**Check:**  
After installing right hand dust cap A to the hub shell, turn the hub shell clockwise and check that it turns smoothly. If the hub shell does not turn smoothly, re-install right hand dust cap A.



**This completes the assembly of the Inter-3 hub.**

## Inter-3 hub troubleshooting

Symptom	Cause and remedy
Mechanism spins freely or slips when in top <b>3</b> gear.	<p>Malfunction of the internal assembly. Replace with a new one.</p> <p><b>Internal assembly</b> </p>
	<p>Malfunction of the axle unit and driver unit. Replace with new ones.</p> <p><b>Axle unit / Driver unit</b> </p>
Mechanism spins freely or slips when in normal <b>2</b> gear.	<p>Malfunction of pawls B. Replace the ring gear unit with a new one.</p> <p><b>Ring gear unit</b> </p>
	<p>Malfunction of pawls A. Replace the driver unit with a new one.</p> <p><b>Driver unit</b> </p>
Mechanism spins freely or slips when in low <b>1</b> gear.	<p>Malfunction of pawl D or the planetary gear. Replace the carrier unit with a new one.</p> <p><b>Carrier unit</b> </p>
	<p>Damaged ball retainer K (7/32" x 10), J (7/32" x 8) or A (1/4" x 7). Replace the damaged part with a new one. Apply grease to the new part when replacing.</p> <p><b>Ball retainer</b>    <b>Internal hub grease</b>  Part no. Y-041 20600</p> <p>K (7/32" x 10) J (7/32" x 8) A (1/4" x 7)</p>
Turning is difficult and noise is heard.	<p>Incorrect installation of right hand dust cap A. Install right hand dust cap correctly to the hub shell.</p> <p><b>Right hand dust cap A</b> </p>
	<p>Malfunction of the bell crank III unit. Replace the bell crank III unit with a new one.</p> <p><b>Bell crank III unit</b> </p>
Gear shifting is not possible.	<p>Incorrect installation of the bell crank III. Install the bell crank correctly.</p>
	<p>Damaged or malfunctioning cable. Replace the cable with a new one of a type recommended by Shimano.</p>
Push rod does not move.	<p>Damaged or malfunctioning push rod. Replace the push rod with a new one.</p> <p><b>Push rod</b> </p>