

ZIPP

ZM2 SL Hubs



SERVICE MANUAL

Warranty and Trademark

For SRAM Warranty information, visit: www.sram.com/warranty.

For SRAM Trademark information, visit: www.sram.com/website-terms-of-use.

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SAFETY FIRST!

We care about YOU. Please, always wear your safety glasses and protective gloves when servicing SRAM® products. Protect yourself! Wear your safety gear!

Zipp Service

We recommend that you have your Zipp components serviced by a qualified bicycle mechanic. Servicing Zipp components requires the use of specialized tools. Failure to follow the procedures outlined in this service manual may cause damage to your component and void the warranty.

Visit www.zipp.com/support for the latest Zipp Spare Parts catalog and technical information. For order information, please contact your local Zipp distributor or dealer.

Information contained in this publication is subject to change at any time without prior notice.

Your product's appearance may differ from the pictures contained in this publication.



For recycling and environmental compliance information, please visit www.sram.com/company/environment.

Part Preparation

Remove the component from the bicycle before service.

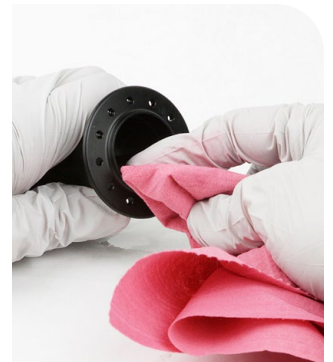
Clean the exterior of the product with mild soap and water to avoid contamination of internal sealing part surfaces.

Service Procedures

The following procedures should be performed throughout service, unless otherwise specified.

Clean the part with isopropyl alcohol and a clean, lint-free shop towel.

Clean the sealing surface on the part and inspect it for scratches.



Rim and Wheel Building Specifications

For spoke lengths, tension, rim ERD, hub dimensions, and technical specifications, please refer to the Zipp Wheel Specifications document available at sram.com/service.

Component Removal

Prior to service, remove the wheels from the bicycle according to the bicycle manufacturer's instructions and thoroughly clean the exterior of the product to avoid contamination of internal sealing part surfaces.

For additional information about Zipp wheels and hubs, user manuals are available at www.Zipp.com.

Parts, Tools, and Supplies

Parts

- Wheel bearing kit front/rear for Zipp ZR1/ZM2 hubs, 61903
- End cap set rear ZM2SL hub 12X148 MS
- End cap set rear ZM2SL hub 12X148 XD
- Axle kit rear ZM2SL hub
- Freehub kit ZM2SL MICROSPLINE
- Freehub kit ZM2SL SRAM XD

Safety and Protection Supplies

- Apron
- Clean, lint-free shop towels
- Nitrile gloves
- Safety glasses

Lubricants and Fluids

- Isopropyl alcohol
- Zipp Cognition or Klüber Staburags NBU30 grease
- SRAM Butter grease

Zipp/SRAM Tools

- Bearing press tool 61903 ZM2 SL

Bicycle Tools

- Axle and Spindle Vise Inserts - Park Tool AV-5
- Blind Hole Bearing Puller Set
 - 17 mm slotted attachment
- Wheels Manufacturing Press-1 Sealed Bearing Press Kit or similar
 - 6903 30x17 bearing press adapters (x2)
 - 6803 26x17 bearing press adapters (x2) (optional)
 - T-handle threaded bearing press

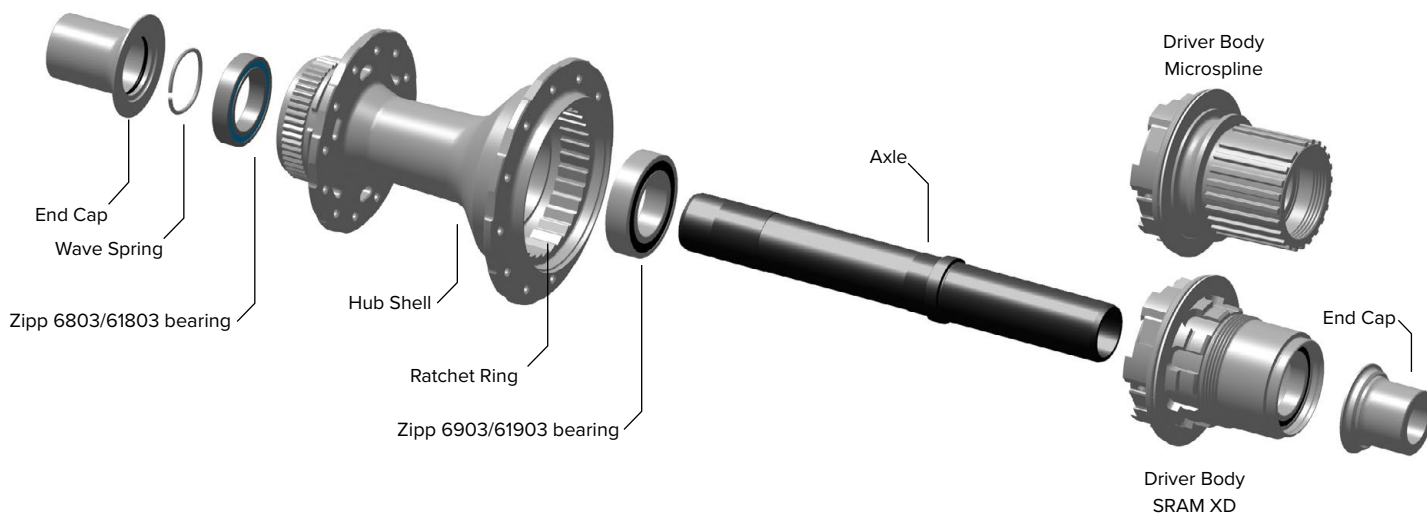
Common Tools

- Bench vise
- Flat blade screwdriver
- Needle-nose pliers
- Grease brush
- Rubber or plastic mallet
- Vise soft jaws (aluminum)

SAFETY INSTRUCTIONS

Always wear nitrile gloves when working with bicycle grease.

Exploded View - Rear Hub



Rear Hub End Caps

Hub	Variants			DRIVE SIDE			NON-DRIVE SIDE			
				Current Identification Text On End Cap	Previous Identification Text On End Cap	Spare Part Kit Number	Current Identification Text On End Cap	Previous Identification Text On End Cap	Spare Part Kit Number	
ZM2 SL	REAR	12 X 148	CL	XD	151-030	12x(142/148)DS XD(R)	11.2028.061.002	251-000	—	11.2018.061.002
				Microspline	151-070	—	11.2028.061.001	—	—	11.2018.061.001

Rear Bearing Removal

Procedures are the same for rim brake and disc brake rear hubs. Disc brake hub pictured.

- 1 Insert the Park Tool AV-4 or AV-5 Axle and Spindle Vise Insert tool into a vise. Clamp one end cap into the vise insert tool and pull up on the wheel/hub to remove the end cap.
Repeat to remove the other end cap.



- 2 Pull the driver body from the hub by hand.



- 3 Use a soft face mallet to tap the non-drive side of the axle to remove the axle and bearing from the hub.
Pull the axle and drive side bearing out of the drive side of the hub.
If the drive side bearing was not removed with the axle, it must be removed with the Bearing Puller tool as instructed in step 7.



- 4** The wave spring installed on the non-drive side of the axle will slide off when the axle is removed. Set the wave spring aside.

NOTICE

Do not discard or misplace the wave spring. It is crucial to hub performance and the hub will not function properly without the spring.

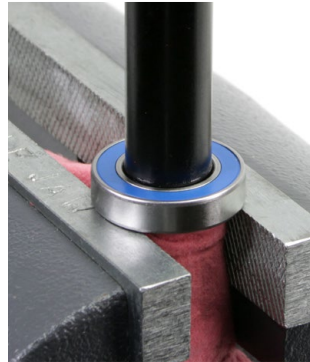


- 5** If the drive side bearing was not removed with the axle, it must be removed with the Bearing Puller tool as instructed in step 7.

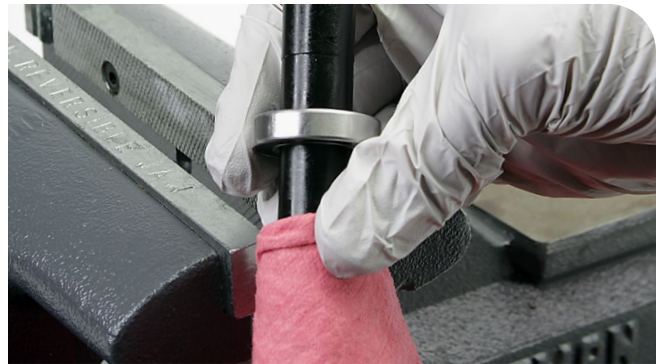
Place the axle in between flat aluminum vise soft jaws, drive side down, with the bearing resting on top of the soft jaws. Make sure the axle bearing step does not contact the soft jaws. Use a plastic mallet to gently tap on the top of the non-drive end of the axle until it is dislodged from the bearing. Discard the bearing.

NOTICE

To avoid damage to the axle, do not allow the axle to contact the vise. If the axle bearing step is damaged, the axle must be replaced.



Plastic Mallet



- 6** Clean the axle with isopropyl alcohol and a shop towel.

NOTICE

To prevent damage to the hub surfaces, do not use acetone or similar products to clean parts.



Isopropyl Alcohol

Shop Towel

7 Insert the 17 mm Bearing Puller slotted attachment through the non-drive side bearing. Align the slotted attachment with the bottom of the bearing, and expand it inside the bearing.

Do not over tighten the slotted attachment. For more detailed assembly and usage, see the bearing puller manufacturer's instructions.

Grip the slide hammer and forcefully pull away from the slotted attachment to remove the bearing from the driver body.



17 mm Slotted Attachment



8 Insert the 17 mm Bearing Puller slotted attachment through the drive side bearing. Align the slotted attachment with the bottom of the bearing, and expand it inside the bearing.

Do not over tighten the slotted attachment. For more detailed assembly and usage, see the bearing puller manufacturer's instructions.

Grip the slide hammer and forcefully pull away from the slotted attachment to remove the bearing from the driver body.



17 mm Slotted Attachment



9 Clean the bearing bores with isopropyl alcohol and a shop towel.



10 Clean the ratchet ring and hub internals with isopropyl alcohol, a shop towel, and cotton swabs. Do not remove the ratchet ring.



NOTICE

To prevent damage when pressing the bearings into the rear hub, make sure that the bearing press tool contacts both the inner and outer races of the bearing.

- 1 Install a new Zipp 6803 bearing into the non-drive side of the hub with the **black** seal facing outward.

Note: Ceramic bearings have **blue** seals on both sides of the bearing; installation orientation is not important.



- 2 Install a 6903 30x17 tool into the drive-side bearing bore.

Insert the threaded rod through the drive side of the hub shell. Slide a second 6903 30x17 tool onto the threaded rod.

Thread the Press Tool handle onto the threaded rod.

Turn the handle clockwise to press the bearing into the hub until it is hand-tight.

Do not overtighten the bearing.

Remove the tools.



6903 30x17



6903 30x17

NOTICE

To prevent damage when pressing the bearing into the hub, make sure that the bearing press tools contact both the inner and outer bearing races or bearing bores and not the hub shell.



6903 30x17

6903 30x17

- 3 Install a new bearing onto the longer, non-drive side of the axle, with the **blue** bearing seal facing away from the raised step on the axle.

Insert the non-drive side of the axle into a 61903 ZM2 SL bearing press tool, with the flat, non-stepped end of the tool against the bearing.

Note: Ceramic bearings have **blue** seals on both sides of the bearing; installation orientation is not important.



Zipp 61903 ZM2 SL bearing press tool

- 4** Use a rubber or plastic mallet to tap the drive side of the axle until the raised step on the axle contacts the bearing.
Remove the axle from the tool.



- 5** Insert a SRAM 6903 tool into the non-drive side bearing bore with the flat, non-stepped end of the tool against the bearing.
Install the non-drive side end of the axle through the hub and into the SRAM 6903 tool.



- 6** Install a Zipp 61903 tool onto the drive side end of the axle with the stepped end of the tool contacting the bearing.



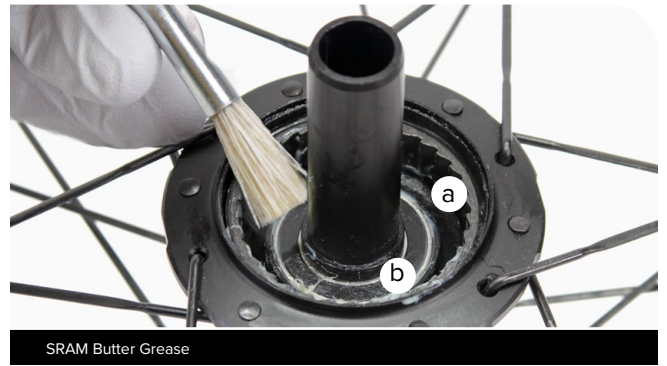
- 7** Use a rubber mallet to tap the drive side of the axle until the raised step on the axle contacts the bearing.
Remove the tool from the axle.



- 8** Apply grease to the ratchet ring (a) and the seal surface (b) of the hub shell.

NOTICE

If a brush is used to apply grease, confirm there are no loose bristles in the grease or on the part.



- 9** Apply grease to the last 10-15mm of the axle. Installation of the driver body will distribute the grease on the entire hub axle.

NOTICE

If a brush is used to apply grease, confirm there are no loose bristles in the grease or on the part.



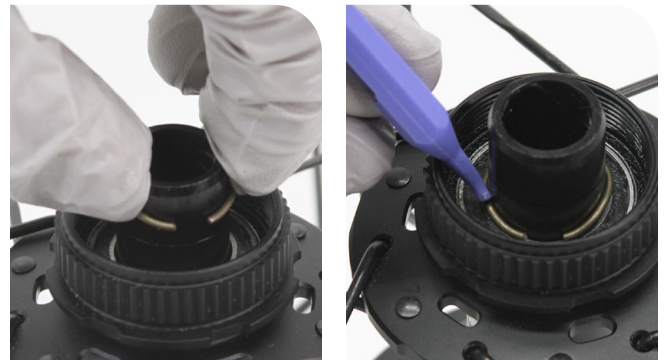
- 10** Install the driver body onto the axle and twist it counter-clockwise to seat the driver body and driver body seal. Make sure the driver body seal is fully seated into the seal groove. The installation process is the same for 11 speed and XD driver bodies.



- 11** Install the wave spring onto the non-drive side of the axle. You may need a tool to press the wave spring against the bearing face.

NOTICE

Do not scratch the axle when using a tool to install the wave spring. The wave spring is crucial to hub performance and must be installed onto the axle.

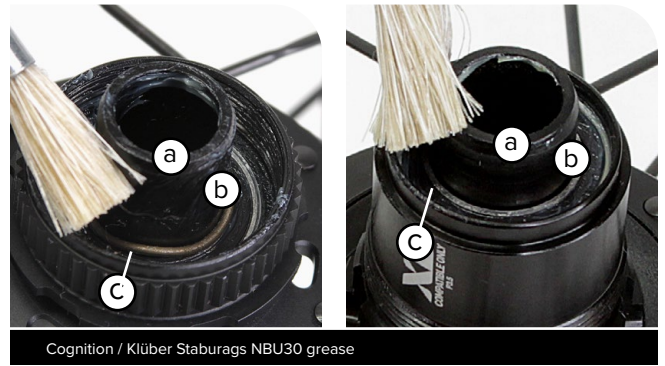


12 Apply grease to the following locations on the drive side and non-drive side axle end:

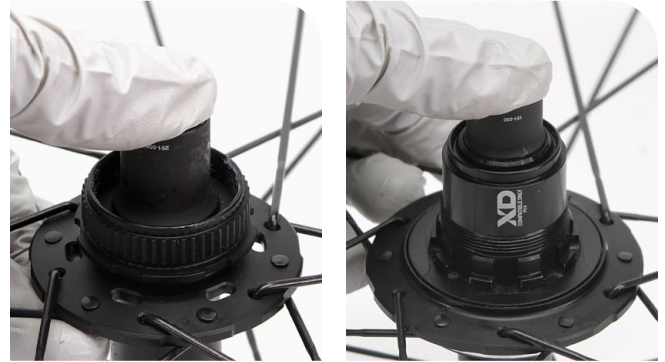
- Axle front surface (a)
- Axle radial surface (b)
- Bearing front face across bearing seal, inner- and outer ring (c)

NOTICE

If a brush is used to apply grease, confirm there are no loose bristles in the grease or on the part.



13 Press the end caps onto the axle.



14 Clean the hub with isopropyl alcohol and a shop towel.



Driver Cleaning (optional) - Coil Spring Driver

- 1** Inspect the rubber seal for damage. If the seal is damaged, replace the driver.



- 2** Use your fingers or a small flat blade screwdriver to lift the snap ring from the driver.



- 3** Use your fingers, a pick, or needle-nose pliers to remove the pawls and coil springs from the driver.



- 4** Clean the pawl slots with a cotton swab and the driver body with isopropyl alcohol and a shop towel.

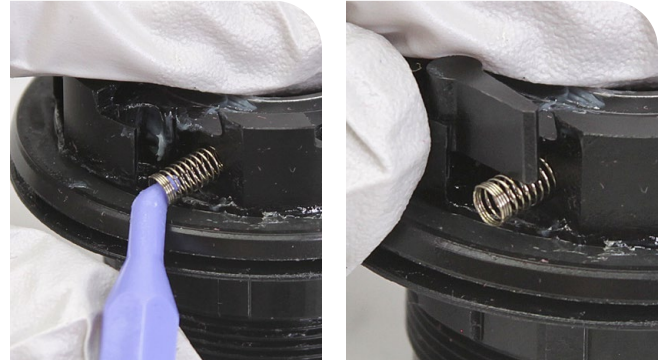


- 5** Using a grease syringe, apply a small amount of SRAM Butter grease to the pawl pockets.



- 6** Insert a coil spring into one of the spring slots, then install a pawl into the pawl slot.

Note: The springs and pawls are symmetrical and can be installed in any orientation.



- 7** Use a small flat blade screwdriver or pick to compress the spring to allow the pawl to drop into the slot, then adjust the spring so that it is perpendicular to the back of the pawl.

Repeat steps 6-7 to install the other springs and pawls.



- 8** Orient the end of the snap ring into the hole in the driver and push the snap ring onto the channel of the driver until it is fully seated.



Driver Bearing Replacement (optional)

- 1** Insert the 17 mm Bearing Puller slotted attachment through the outboard bearing. Align the slotted attachment with the bottom of the bearing, and expand it inside the bearing.
Do not over tighten the slotted attachment. For more detailed assembly and usage, see the bearing puller manufacturer's instructions.
Thread the rod of the bearing puller into the attachment. Grip the slide hammer and forcefully pull away from the slotted attachment to remove the bearing from the driver.



- 2** Insert the 17 mm Bearing Puller slotted attachment through the inboard bearing. Align the slotted attachment with the bottom of the bearing and expand it inside the bearing.
Do not over tighten the slotted attachment. For more detailed assembly and usage, see the bearing puller manufacturer's instructions.
Thread the rod of the bearing puller into the attachment. Grip the slide hammer and forcefully pull away from the slotted attachment to remove the bearing from the driver.



- 3** Clean the driver bearing bores with a shop towel and cotton swabs.



- 4** Place the driver on flat surface, outboard side up. Insert a new Zipp 6803/61803 driver bearing into the outboard side of the driver body, with the **black** seal facing outward.

Note: Ceramic bearings have **blue** seals on both sides of the bearing; installation orientation is not important.

Insert a 6803 26x17 tool onto the bearing.



5 Insert the threaded rod through the outboard side of the driver. Slide a second 6803 26x17 tool onto the threaded rod.

Thread the Press Tool handle onto the threaded rod.

Turn the handle clockwise to press the bearing into the driver body until it is hand-tight.

Do not overtighten the bearing.

Remove the tools.

NOTICE

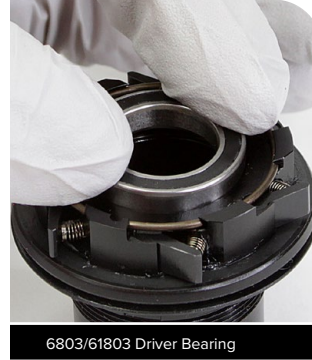
To prevent damage when pressing the bearing into the driver body, make sure that the bearing press tools contact both the inner and outer bearing races or bearing bores and not the driver body.



6 Place the driver on a flat surface, inboard side up. Insert a new Zipp 6803/61803 bearing into the inboard side of the driver body, with the **black** seal facing outward.

Note: Ceramic bearings have **blue** seals on both sides of the bearing; installation orientation is not important.

Insert a 6803 26x17 tool onto the bearing.



7 Insert the threaded rod through the inboard side of the driver. Slide a second 6803 26x17 tool onto the threaded rod.

Thread the Press Tool handle onto the threaded rod. Turn the handle clockwise to press the bearing into the driver until it is hand-tight.

Do not overtighten the bearing.

Remove the tools.

NOTICE

To prevent damage when pressing the bearing into the driver body, make sure that the bearing press tools contact both the inner and outer bearing races or bearing bores and not the driver body.



Component Removal

The hub can be serviced while in the wheel. However, if your spokes or rim are damaged, you can remove the hub from the wheel which will make servicing your hub easier. To remove the hub, use a spoke wrench to de-tension the spokes, then use a pair of metal snips to cut the spokes, remove the hub from the wheel, and remove the spoke ends from the hub (not pictured).

For additional information about Zipp wheels and hubs, user manuals are available at www.Zipp.com.

Parts, Tools, and Supplies

Parts

- Bearing kit ZM2SL front hub
- Axle kit front ZM2SL hub
- End cap set front ZM2SL hub 15x110B 31TC
- End cap set front ZR1 ZM2 SL hub 15x100

Safety and Protection Supplies

- Apron
- Clean, lint-free shop towels
- Nitrile gloves
- Safety glasses

Lubricants and Fluids

- Isopropyl alcohol
- Cognition / Klüber Staburags NBU30 grease
- SRAM Butter grease

Bicycle Tools

- Axle and Spindle Vise Inserts - Park Tool AV-4 or AV-5
- Blind Hole Bearing Puller Set
 - 17 mm slotted attachment
- Wheels Manufacturing Press-1 Sealed Bearing Press Kit or similar
 - 6903 30x17 bearing press adapter
 - 6803 26x17 bearing press adapter
 - T-handle threaded bearing press

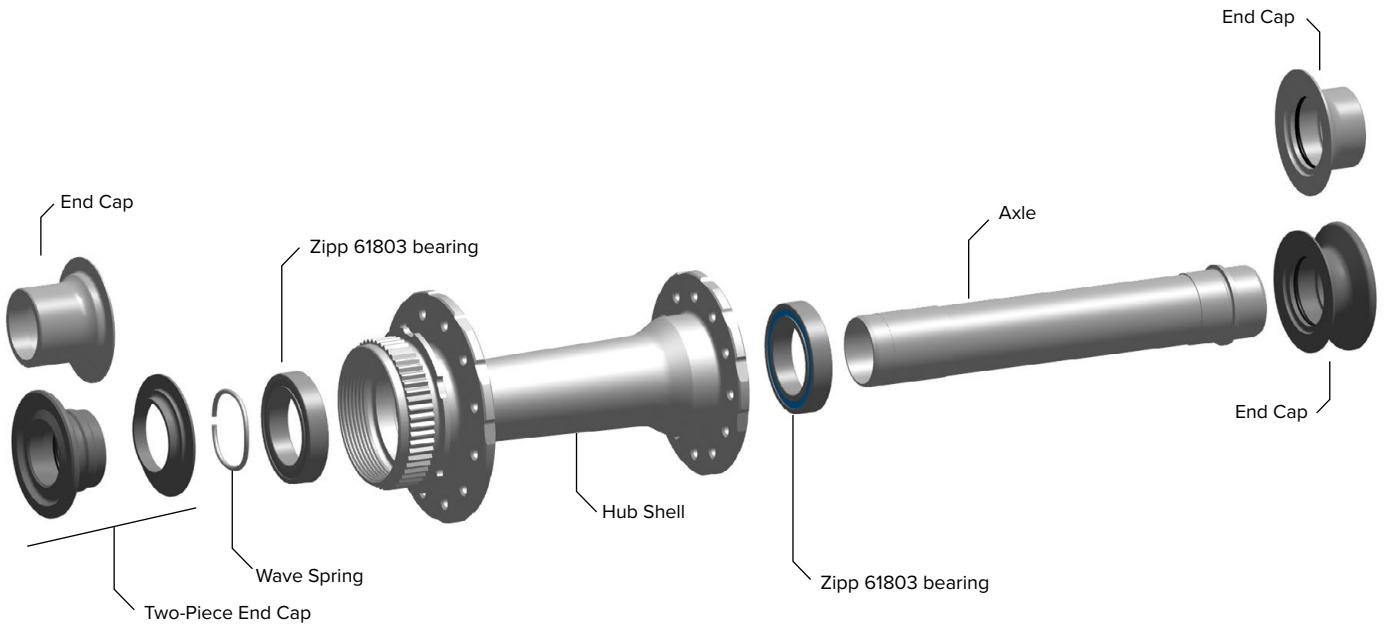
Common Tools

- Bench vise
- Flat blade screwdriver
- Grease brush
- Rubber or plastic mallet

SAFETY INSTRUCTIONS

Always wear nitrile gloves when working with bicycle grease.

Exploded View - Front Hub



Front Hub End Caps

Hub	Variants				DRIVE SIDE			NON-DRIVE SIDE		
					Current Identification Text On End Cap	Previous Identification Text On End Cap	Spare Part Kit Number	Current Identification Text On End Cap	Previous Identification Text On End Cap	Spare Part Kit Number
ZM2 SL	FRONT	15 x 110	CL	—	165-010	—	11.2018.064.005	274-000	—	11.2018.061.000
		15 x 110RS		END CAP	189-000			314-000		
				DUST CAP				276-000		

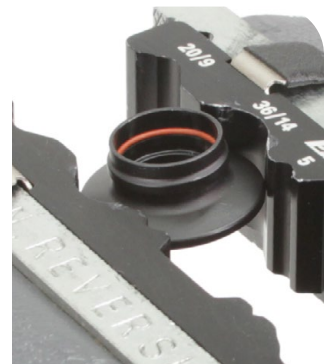
Front Bearing Removal

- 1** Pull the non-drive side end cap from the axle by hand. If the end cap cannot be removed by hand, proceed to step 2.



- 2** If the end cap could not be removed by hand:

Insert the Park Tool AV-4 or AV-5 Axle and Spindle Vise Insert tool into a vise. Clamp the non-drive side end cap into the vise insert tool and pull up on the wheel/hub to remove the end cap.



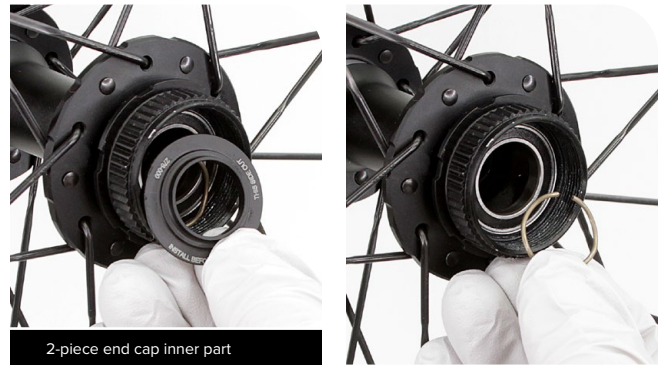
- 3** Gently tap the exposed non-drive side axle end with a plastic mallet to dislodge the axle from the hub bearings. Use your thumb to push the axle through the hub shell.



- 4** If applicable, remove the 2-piece end cap inner part from the hub shell. Remove the wave spring from the hub shell.

NOTICE

Do not discard or misplace the wave spring. It is crucial to hub performance and the hub will not function properly without the spring.



- 5** Use your fingers to remove the end cap from the drive side of the axle.



- 6** Spray isopropyl alcohol onto the axle and clean it with a shop towel.

NOTICE

To prevent damage to the hub surfaces, do not use acetone or similar products to clean parts.



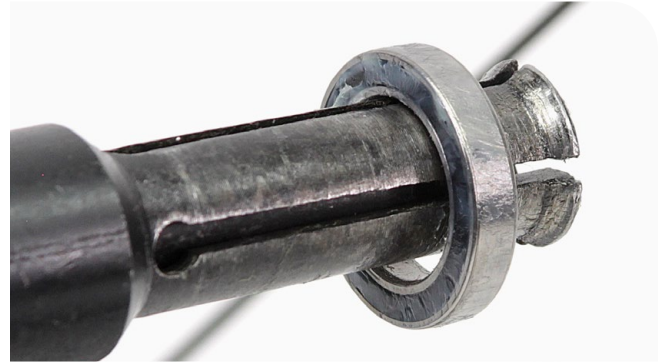
7 Insert the 17 mm Bearing Puller slotted attachment through the non-drive side bearing. Align the slotted attachment with the bottom of the bearing, and expand it inside the bearing.

Do not over tighten the slotted attachment. For more detailed assembly and usage, see the bearing puller manufacturer's instructions.

Grip the slide hammer and forcefully pull away from the slotted attachment to remove the bearing from the hub shell.



17 mm Slotted Attachment



8 Insert the 17 mm Bearing Puller slotted attachment through the drive side bearing. Align the slotted attachment with the bottom of the bearing, and expand it inside the bearing.

Do not over tighten the slotted attachment. For more detailed assembly and usage, see the bearing puller manufacturer's instructions.

Grip the slide hammer and forcefully pull away from the slotted attachment to remove the bearing from the hub shell.



17 mm Slotted Attachment



Front Bearing Installation

- 1 Clean the hub shell and bearing bores with isopropyl alcohol and a shop towel.



- 2 Install a new Zipp 6903/61903 bearing into the drive side of the hub with the **black** seal facing outward.

Note: Ceramic bearings have **blue** seals on both sides of the bearing; installation orientation is not important.



- 3 Slide a 6803 26x17 tool onto the Press Tool threaded rod.
Insert the threaded rod through the non-drive side of the hub shell and through the bearing on the drive side.

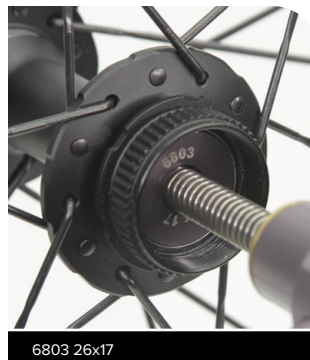
Slide a 6803 26x17 tool onto the threaded rod.

Thread the Press Tool handle onto the threaded rod.

Turn the handle clockwise to press the bearing into the hub until it is hand-tight.

Do not overtighten the bearing.

Remove the tools.



NOTICE

To prevent damage when pressing the bearing into the hub, make sure that the bearing press tools contact both the inner and outer bearing races or bearing bores and not the hub shell.



- 4** Install a new Zipp 6803/61803 bearing into the non-drive side of the hub with the **black** seal facing outward.

Note: Ceramic bearings have **blue** seals on both sides of the bearing; installation orientation is not important.



Zipp 6803/61803 bearing

- 5** Slide a 6803 26x17 tool onto the Press Tool threaded rod.
Insert the threaded rod through the bearing on non-drive side of the hub shell and through the bearing on the drive side.

Slide a 6803 26x17 tool onto the threaded rod.

Thread the Press Tool handle onto the threaded rod.

Turn the handle clockwise to press the bearing into the hub until it is hand-tight.

Do not overtighten the bearing.

Remove the tools.

NOTICE

To prevent damage when pressing the bearing into the hub, make sure that the bearing press tools contact both the inner and outer bearing races or bearing bores and not the hub shell.



6803 26x17



6803 26x17



6803 26x17

6803 26x17

- 6** Apply grease to the non-drive side axle bearing race.



Klüber Staburags NBU30 Grease

- 7** Insert the non-drive side end of the axle into the drive side of the hub, through the drive side bearing, through the hub, and through the non-drive side bearing.

Press the axle into the bearing with your thumb until the axle bearing step fits flush into the bearing.



- 8** Install the wave spring onto the non-drive side of the axle. You may need a tool to press the wave spring against the bearing face.

NOTICE

Do not scratch the axle when using a tool to install the wave spring.
The wave spring is crucial to hub performance and must be installed onto the axle.

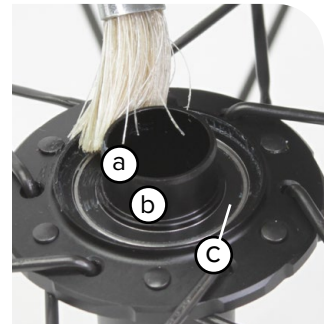
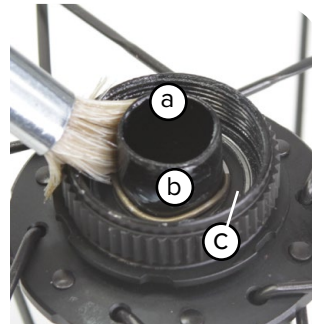


- 10** Apply grease to the following locations on the drive side and non-drive side axle end:

- Axle front surface (a)
- Axle radial surface (b)
- Bearing front face across bearing seal, inner- and outer ring (c)

NOTICE

If a brush is used to apply grease, confirm there are no loose bristles in the grease or on the part.



Cognition / Klüber Staburags NBU30 grease

- 11** Press the non-drive side end cap onto the axle.

2-Piece end caps:

Install the end cap marked "INSTALL BEFORE ROTOR" with the side labelled "THIS SIDE OUT" facing away from the hub.

Install the end cap marked "REMOVE TO INSTALL ROTOR" with the side labelled "THIS SIDE OUT" facing away from the hub.



2-Piece End Cap - inner part



2-Piece End Cap - outer part

12 Press the drive side end cap onto the axle.



13 Clean the hub with isopropyl alcohol and a shop towel.



The logo for ZIIPP, featuring the word "ZIIPP" in a bold, italicized, white sans-serif font on a black rectangular background.

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