Removing Drive Unit (BDU450 CX / 490P)

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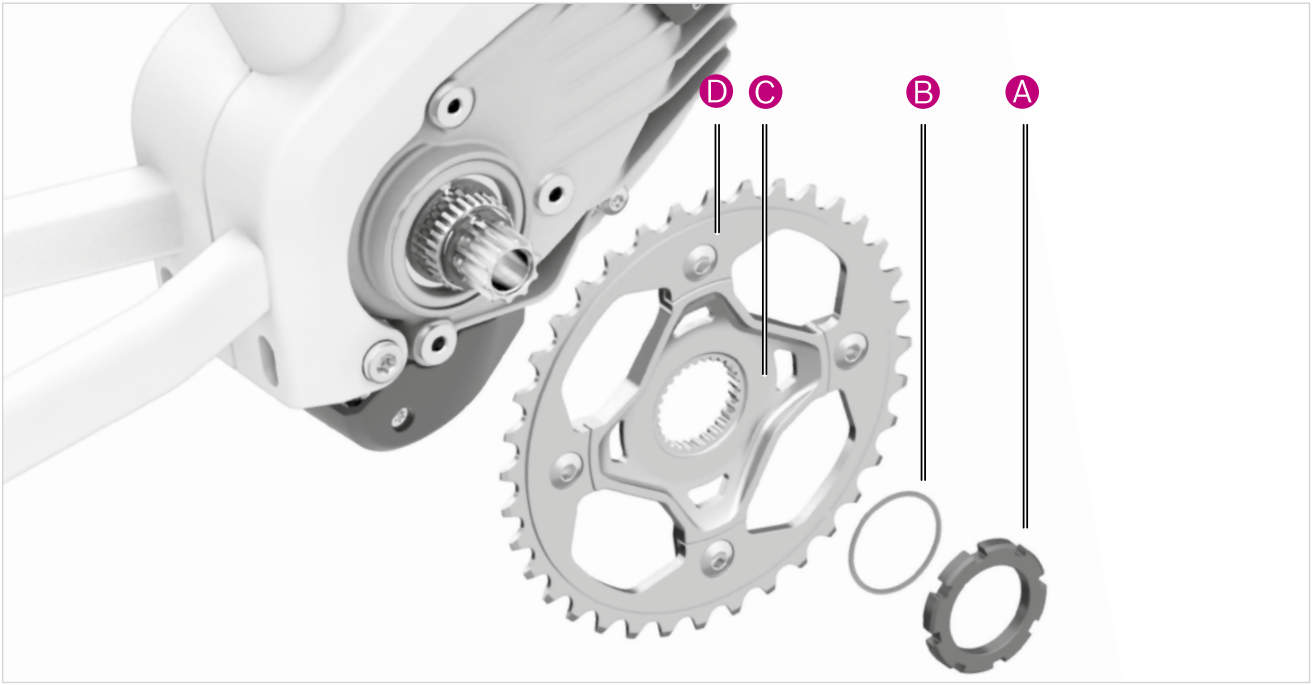

Work steps

Detach the spider from the Drive Unit

1. Remove the crank arms
2. Block the rear wheel, e.g. secure the brake lever with a cable tie or similar
3. Use the Spider tool to unscrew the lock ring Ⓐ
   As it has a left-hand thread, turn it to the right
4. Loosen the brake lever again
5. Remove the chain
6. Remove the O-ring Ⓑ and carefully check it for damage. Only reuse O-rings if they are intact
7. Remove the chainring Ⓓ with the mounted spider Ⓒ

Retrofit / replacement of bearing protection ring BDU4xx / 374y

- **Assembly instructions:**

bosch-ebike.net
→ *Service* → *Technical Information* → *Assembly Instructions*

Tools

- Allen key size 8
- Standard crank-puller
- Spider tool for BDU4xx, available from the Bosch eBike B2B online store

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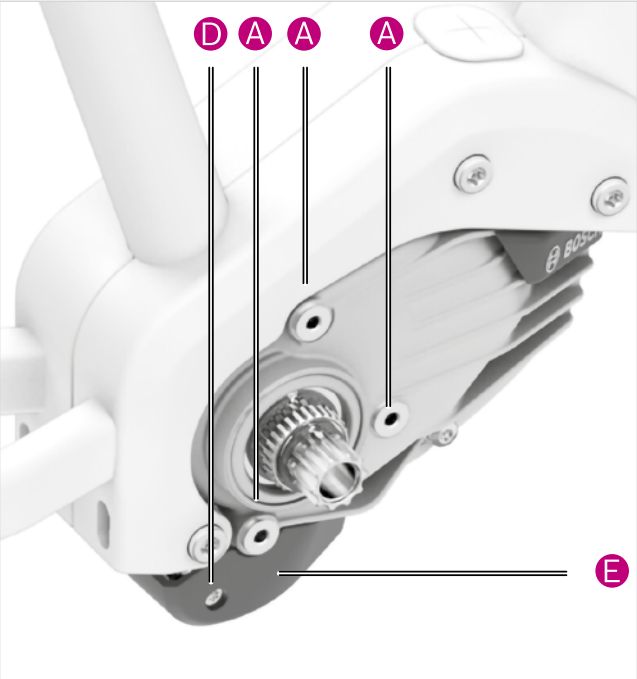

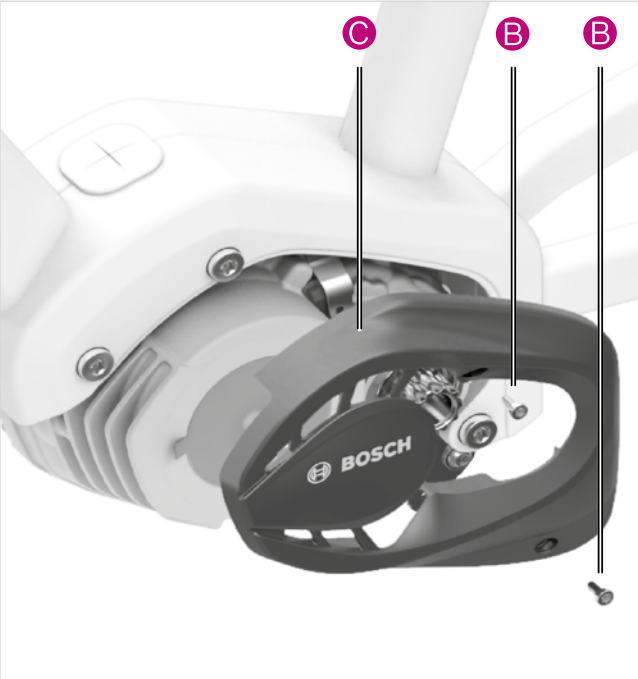

Work steps

Remove the chain guard or chain guide adapter

- If there is a chain guard or chain guide adapter

1. Remove the M6 x 10 screws A
2. Remove the chain guard / chain guide adapter

Manufacturer-specific mounts, chain guide and chain guard solutions ("Bashguard") are possible on the thread inserts

Remove the design cover

- Version with glued logo cover: Skip step

1. Remove two pan head Torx screws M4 x 12 B
2. Remove the design cover C

Remove the design cover on the chainring side

1. Remove two pan head Torx screws M4 x 12 D
2. Remove the design cover E

Disconnect the cable connections on the Drive Unit

1. Remove the cable ties
2. Carefully detach all cables using an electronics-suitable flat nose pliers

- The connector plug on the battery has a locking latch F. When removing it, make sure to use a screwdriver to pry it up by 1 – 2 mm

- Do not damage the plug or cable. Never pull the cable directly
- Do not use magnetised tools

Tools

- Appropriate tool for chain guard screws
- Torx T20
- Side cutters
- Small slot-headed screwdriver
- Electronics-suitable flat nose pliers

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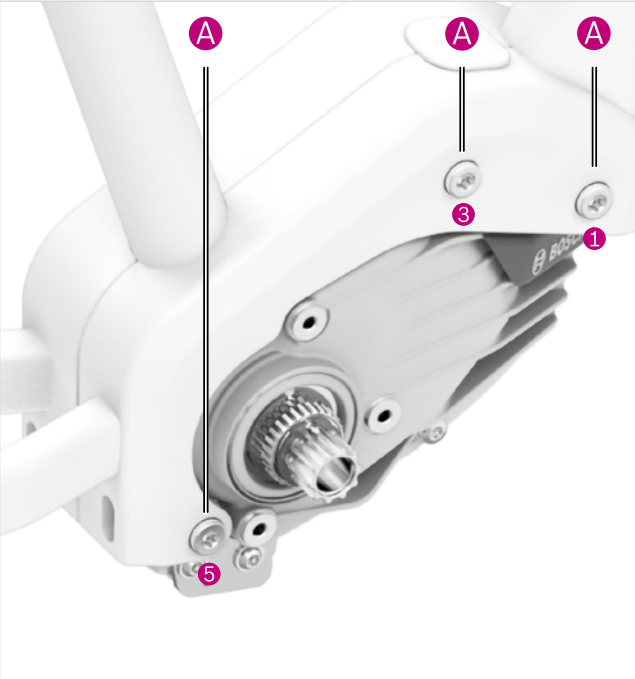

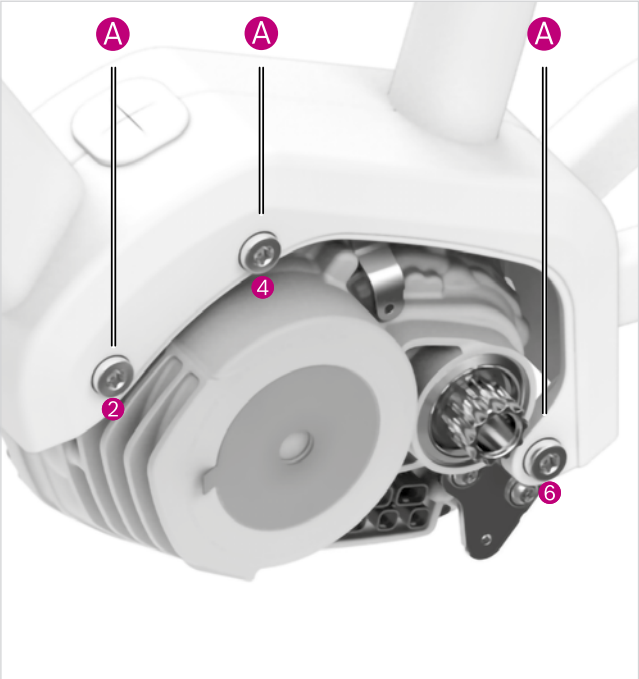

Work steps

Remove the Drive Unit from the frame

1. Check that all cables are disconnected. Carefully pull out all cables as far as possible from the frame interface
2. Loosen six M8 x 16 Torx Plus screws Ⓐ in the specified order ❶ to ❻ or, alternatively: ❶❸❺❷❹❻
3. Remove the Drive Unit from the housing without applying force

Make sure to secure the Drive Unit so it cannot fall. If necessary remove it in an inverted position

Secure mounting plates (CCP) on the Drive Unit

- Check and tighten loose screw connections between the Drive Unit and mounting plates
- **Assembly instructions:**

bosch-ebike.net
→ *Service* → *Technical Information* → *Assembly Instructions*

If these instructions are followed carefully, the warranty will remain valid

Otherwise: Never loosen the mounting plates in the motor housing. Screws may not be inserted directly into the magnesium housing or removed from the housing. This would lead to a risk of corrosion and to a loss of warranty

Tools

- Torx Plus 40 ?

? Torx Plus 40

Special profile for mechanical screw joints with particularly flat screw heads with high tightening torques. Standard Torx 40 can be used, but even with a new screw insert there is a risk of increased wear and possible damage to the screw threads

Installing Drive Unit (BDU450 CX / 490P)

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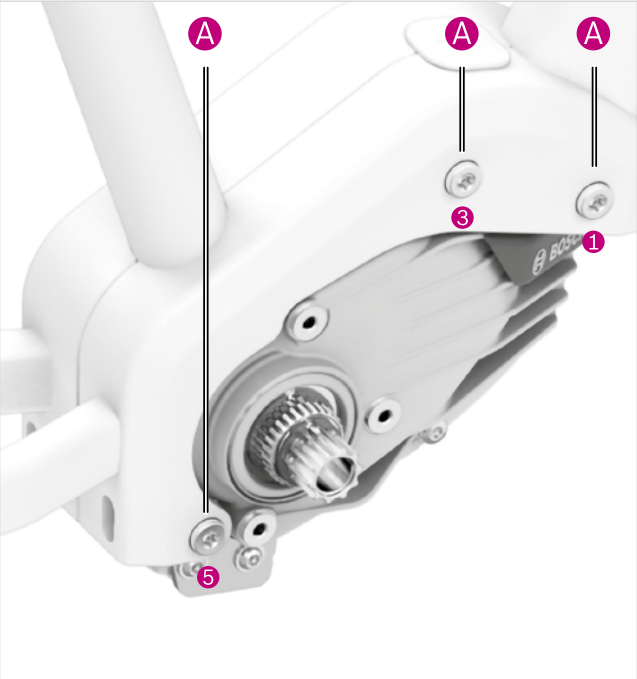

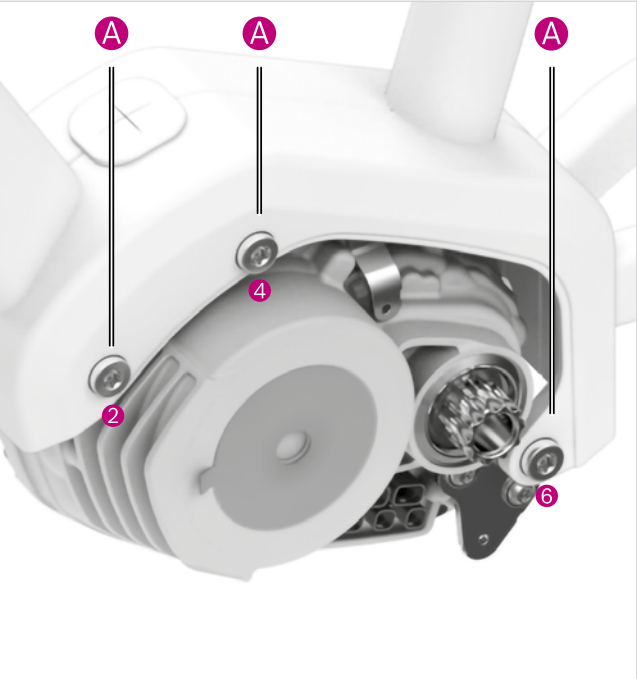

Work steps

Insert the Drive Unit

1. Place the Drive Unit onto the frame interface. Do not allow cables to pinch
2. Loosely screw in six M8 x 16 Torx Plus screws Ⓐ then tighten them in the specified order ❶ to ❻ or, alternatively: ❶❸❺❷❹❻

▶ When reinstalling an already used Drive Unit: Remove any reside on screws and mounting plate threads. Use a medium-strength screw adhesive (e.g. Loctite 243) to secure screws

Connect the cable connections

1. Secure excess cable lengths using cable ties
2. Plugs have latching lugs Ⓑ to prevent polarity reversal. Make sure that these point in the right direction

You should feel them engage. Plugs are colour coded and mechanically coded (see next page) and can be attached almost without any force. Do not apply force!

Latching lug on plug for front light

Tools

▶ Torx Plus 40
▶ Torque wrench

Tightening torques

▶ Drive Unit on the frame: **20 Nm ± 2 Nm**

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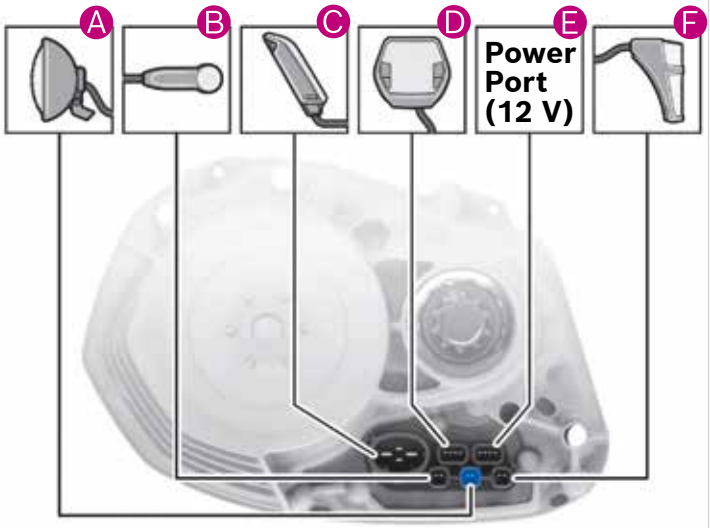
Electrical connections
Performance Line CX (BDU450 CX), Performance Line Speed (BDU490P), Cargo Line Cruise (BDU450 CX), Cargo Line Speed (BDU490P)

The Drive Unit can be damaged if a plug is connected incorrectly

Pos.	Connection	Colour	Voltage
A	Front lamp	Blue	12 V
B	Speed sensor	Grey	3.3 V / min. 3.1 V
C	Battery	Black	36 V
D	Display	Black	12 V
E	Power Port (12 V)	Black	12 V
F	Rear light	Black	12 V



Work steps

Connect bicycle lighting

1. Only connect DC headlamps without a parking light function
2. Observe the current rating:
   – Output power for lighting: max. 18 W, output current max. 1.5 A
   – Distribution of the output current to the front and rear light as required
3. Remove the blanking plugs on the slots to connect the lighting cable. It is not necessary to occupy both lighting slots
4. ***Activate the light switch function*** via the DiagnosticTool (see p. 115)

- ▶ Adjust the ***lighting system output*** when a stronger headlight is installed
- ▶ According to the StVZO (German Road Traffic Licensing Regulations), the lighting must provide light for at least another 2 hours without eBike support

Original Bosch eBike lighting cables are available from the Bosch eBike B2B online store

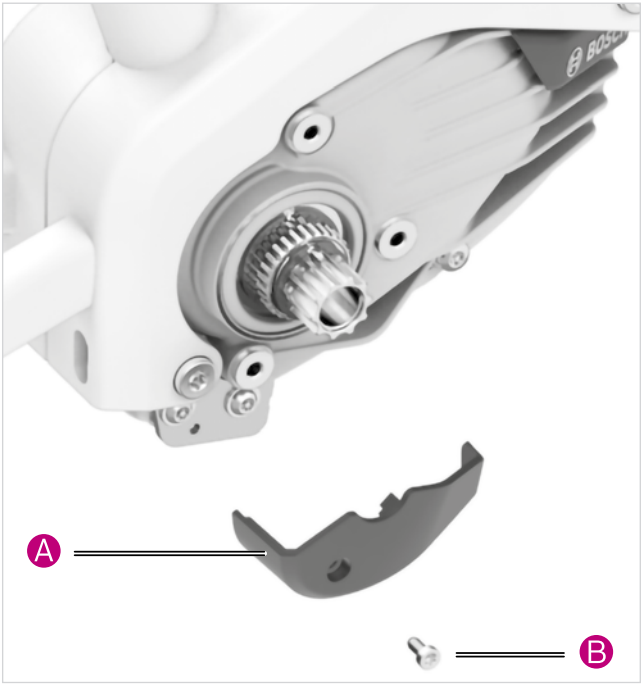
Unused connections must be closed off with blanking plugs – risk of corrosion

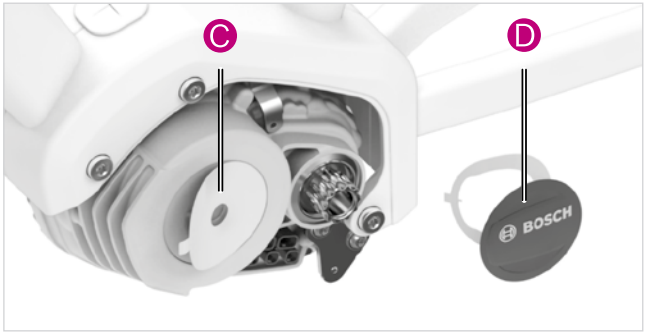
Connection to Power Port (12 V)

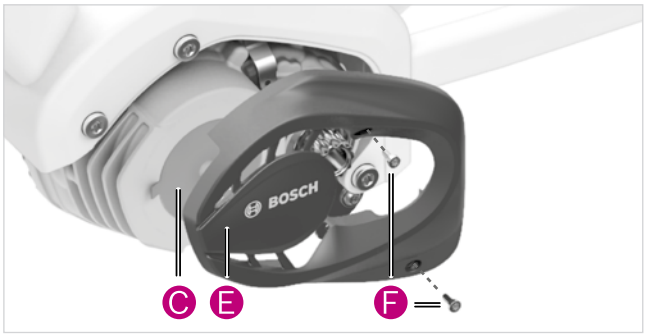
- ▶ For supplying power to 12 V consumers, such as Bosch eBike ABS, eSuspension or other 12 V components
- ▶ Max. output power: 12 V, 1 A
  – 3 A for 3 s

- ▶ When the Bosch eBike ABS is connected, no other consumers may be connected to the Power Port (12 V)
- ▶ Take care not to confuse the display port D with the Power Port (12 V) E

12 V connector cables for third components are available from the Bosch eBike B2B online store







Work steps

Attach the design cover on the chainring side

1. Attach cover Ⓐ to the mounting plate of the Drive Unit
2. Tighten pan head Torx screw M4 x 12 Ⓑ (self-tapping on first assembly)

Attach the logo cover

Attaching the logo cover on initial assembly

1. Remove the protective foil Ⓒ from the adhesive surface on the motor head
2. Remove the protective foil from the back of the logo cover
3. Position the logo cover Ⓓ on the motor head
   – Pay attention to the installation position: the lettering must be positioned horizontally
4. Firmly press the logo cover onto the adhesive surface at room temperature (> 18 °C), applying constant pressure for at least 10 seconds

Attach the design cover

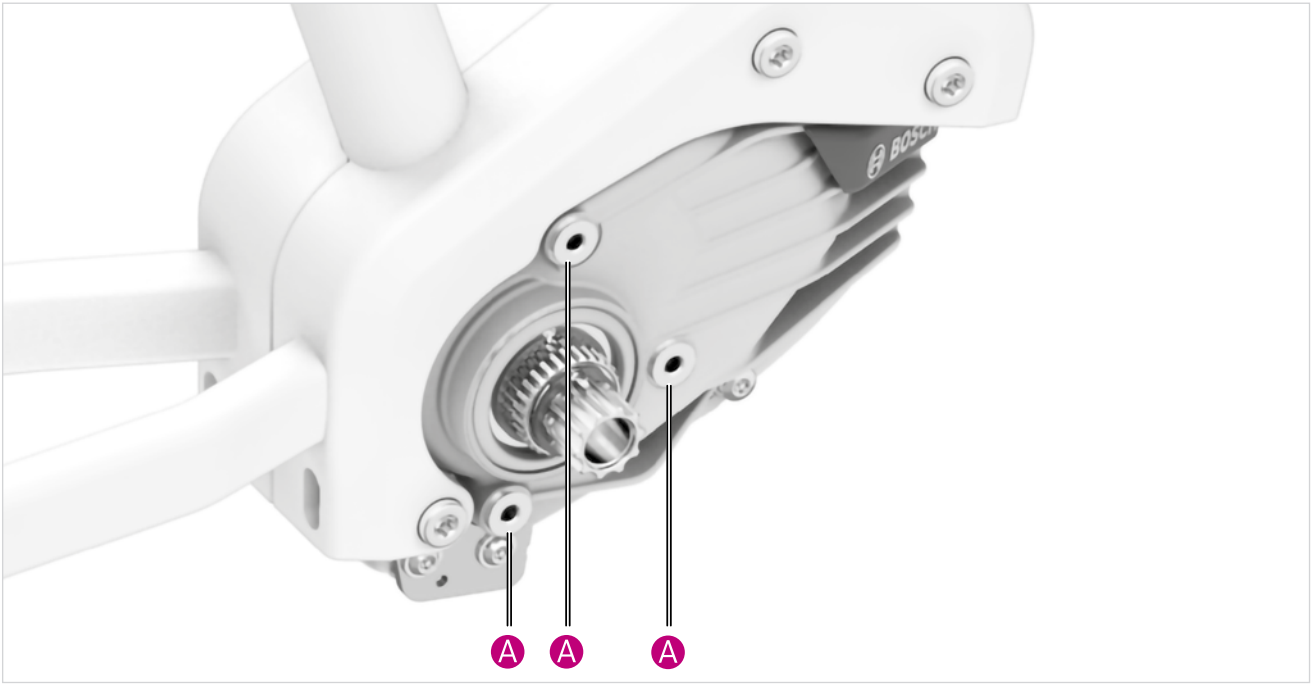
1. In the case of an initial assembly, remove the protective foil Ⓒ from the motor head
2. Place the electrical cables around the crank casing to prevent pinching
3. Attach the design cover Ⓔ to the front cooling rib of the Drive Unit, then attach the rear section
4. Tighten two pan head Torx screws M4 x 12 Ⓕ. The screws are self-tapping on first assembly

Tools

- Torx T20
- Torque wrench

Tightening torques

- Design cover:
  – Initial assembly (self-tapping): **3 Nm ± 0.5 Nm**
  – Subsequent assembly: **2 Nm ± 0.5 Nm**



Work steps

Fit the chain guard or chain guide adapter

- Optional, if intended by the bicycle manufacturer
- Available from bike manufacturers

1. Screw the adapter to the screw-on points provided A (ISCG 5-compatible)
2. Use manufacturer-specific screws with shallow heads

- Longer screws may be used, depending on the chain guard manufacturer

Max. screw-in depth of the threads in the Drive Unit: 8.5 mm

Tools

- Depending on the type of screw
- Torque wrench

Tightening torques

- Chain guard / chain guide adapter on Drive Unit: **according to manufacturer's specifications, max. 5 Nm**

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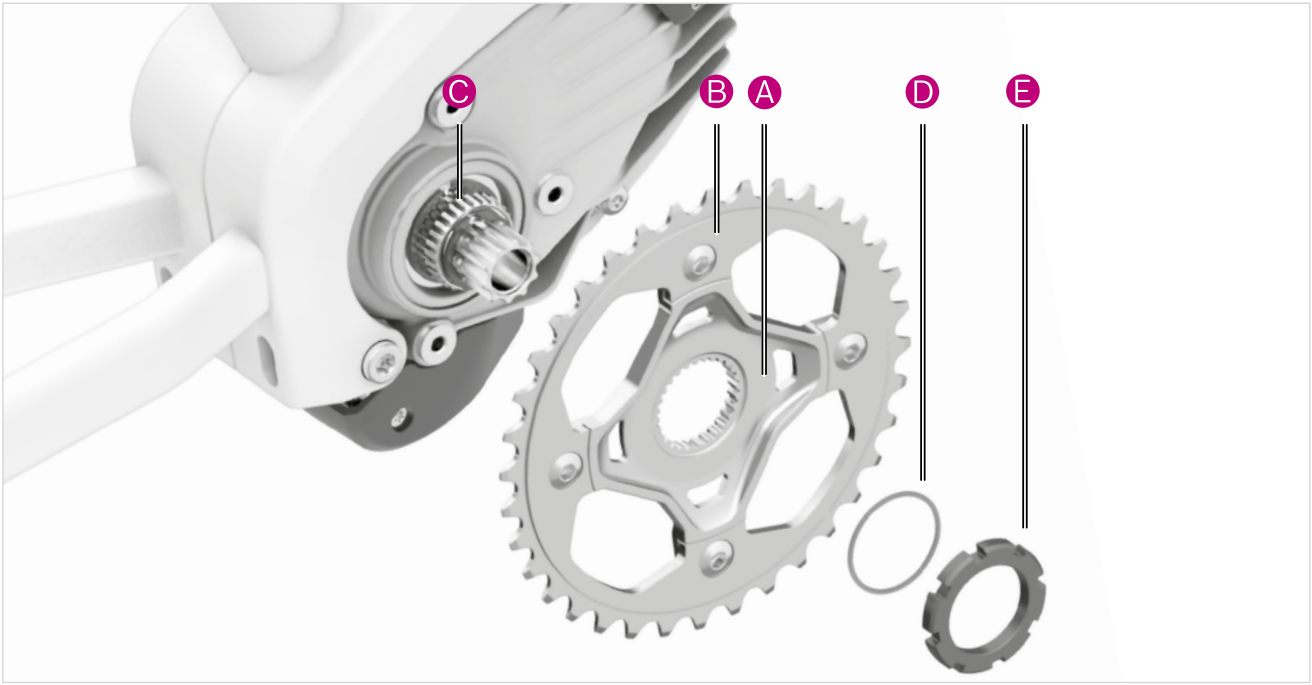

Work steps

Fit the spider to the Drive Unit

1. Mount the left-side crank arm. To do this, grease the bottom bracket shaft and then tighten bolt M15 x 1. Tighten using a torque wrench

   Make sure not to mix up the left and right cranks! Pedals can come loose if assembled incorrectly

2. Clean and grease the internal interlock of the spider Ⓐ
3. Press chainring Ⓑ along with the mounted spider Ⓐ or directly mounted chainring onto the cleaned and lightly greased interlock Ⓒ. The spider must be on the side of the chainring facing toward the bike
4. Slide the O-ring Ⓓ on as far as the spider. Only use O-rings if they are intact!
5. Grease the cleaned lock ring threads and push on the lock ring Ⓔ. The lettering on the lock ring must be visible

   The lock ring has a left-hand thread, so tighten it to the left with the spider tool. Hold it back with the left crank

6. Grease the right-side bottom bracket shaft and mount the crank arm with the crank bolt M15 x 1

Tools

- Allen key size 8
- Torque wrench
- Spider tool for BDU4xx, available from the Bosch eBike B2B online store
- Bearing grease and brush

Tightening torques

- Lock ring: **30 Nm**
- Crank: **according to manufacturer's specifications**

Fastening the retaining plates (CCP) to the BDU4xx Drive Unit

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Working steps

Indications

User notices loose screw connections between Drive Unit and retaining plate A

- Creaking / clicking noises from the drive area
- Drive Unit position can be moved with force

Check retaining plates

1. Remove Drive Unit as described in the Bosch eBike manual
2. Secure Drive Unit horizontally on a soft work surface, if necessary by a second person

Prevent rotation of the Drive Unit during work to avoid damage or injury and to ensure that the specified tightening torque is maintained

3. Check by hand whether retaining plates A can be moved or have moved

Fixed retaining plates

- Begin with the retaining plates that have not moved and cannot be moved

1. Screw out each screw individually by 8 – 9 threads B

Do not loosen the second screw until the first is tightened and secured

Self-tapping screws. Never unscrew completely because repeated insertion could damage the formed thread

2. Apply a drop of thread locking compound C. Wipe off any excess compound from the screw head/ retaining plate
3. Tighten the screw with torque wrench D

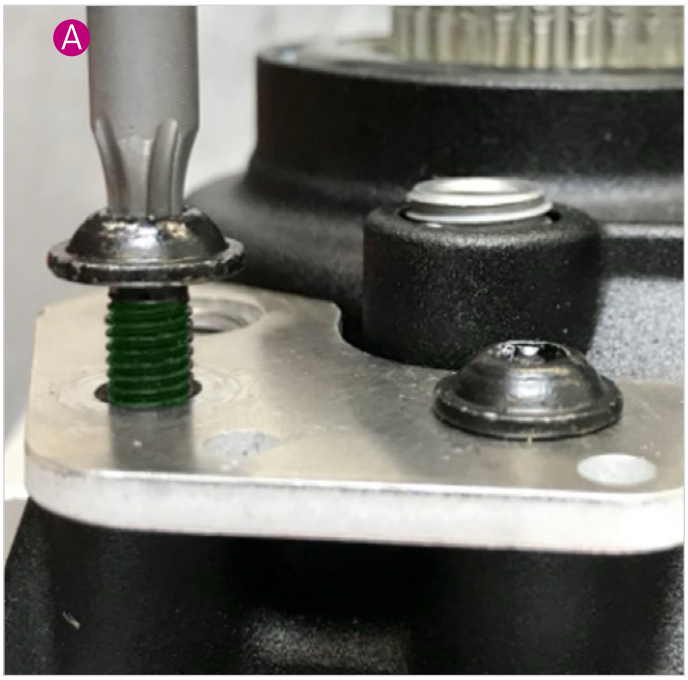
Never exceed the specified tightening torque, there is otherwise a risk of thread breakage in the magnesium housing

Tool

- High-strength thread locking compound such as Loctite 290 / 294
- Torx Plus 25 IPR
- 1 – 10 Nm torque wrench

Tightening torques

- Screws on retaining plate: **$8\ ^{+0}_{-0,3}$ Nm**



Working steps

Movable retaining plates

▶ On retaining plates that are moveable

1. Unscrew both screws by 8 – 9 threads A

Self-tapping screws. Never unscrew completely. Repeated insertion could damage the thread formed in the magnesium housing

2. Apply a drop of thread locking compound B on each screw. Wipe off any excess compound from the screw head/retaining plate
3. Position the retaining plate as centrally as possible under one of the screws and tighten the screw slightly C
4. Fasten the retaining plate as centrally as possible under the second screw. Tighten the screw with torque wrench D
5. Also tighten the first screw with a torque wrench

Never exceed the specified tightening torque, there is otherwise a risk of thread breakage in the magnesium housing

▶ Repeat the procedure with the remaining retaining plates

Reinstalling Drive Unit

▶ Remove the Drive Unit as described in the Bosch eBike manual

▶ If the mounting holes in the bicycle frame are not aligned with the retaining plates and the mounting screws cannot be screwed in:

– Correct the position of the corresponding retaining plate as described above.
– The process must be completed after approx. 10 minutes, before the thread locking compound hardens

If these instructions are followed carefully, the warranty remains valid

Tool

▶ High-strength thread locking compound such as Loctite 290 / 294

▶ Torx Plus 25 IPR

▶ 1 – 10 Nm torque wrench

Tightening torques

▶ Screws on retaining plate: **$8\ ^{+0}_{-0,3}$ Nm**

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