SHIFT YOUR RIDE

Technical Manual
E-Shift | V2025.12

1. General

The 3X3 NINE gear hub is designed for use in a wide variety of applications. For e-bikes as well as for conventional bikes. Whether urban, cargo, trekking or MTB. Our gearbox stands for more freedom, fun and autonomy while biking.

Why?

3X3 offers bike technology that will make riding, and especially shifting, as easy and intuitive as possible in the future. Made in Germany for our highest quality promise.

This manual is an integral part of your 3X3 NINE gear hub and provides the essential technical information and safety instructions for operation, assembly and maintenance. Before using our gearbox, we therefore strongly advise you to read this manual and observe the safety instructions.

When installing the 3X3 NINE gear hub, it is essential to consider the compatibility of all components with each other. Therefore, also pay attention to the manuals of the other components of your bike (belt, wheel, chain, quick release, etc.).

1.1 Target group

The target group of this manual is the original equipment manufacturer / the assembler of the gear hub in the bicycle.

Assembly and maintenance works of the gear hub requires basic knowledge in bicycle technology. If there is any doubt, a trained bicycle mechanic or the 3X3 service team (service@3x3.bike) should be consulted.

Incorrect assembly or incorrect maintenance of the gear hub can lead to serious accidents with fatal consequences!

1.2 Validity

This manual is valid for the technical condition of the 3X3 NINE gear hub on Dezember 2025. Deviations are possible and all items are subject to technical changes. Graphics and technical drawings may vary.

1.3 Tools

Work on the gear hub may only be carried out using suitable tools. Screw connections must be tightened to a defined torque using a torque wrench.

A proper installation and removal of components can only be guaranteed when using perfectly functioning and undamaged tools.

1.4 Warranty and guarantee

All information about warranty and guarantee can be found at www.3x3.bike.

1.5 Wearing parts

The following components are subject to constant wear:

- sprocket
- chain / belt
- chain ring / pulley
- tension rollers of the chain tensioner
- brake rotor

The wear of these components is strongly dependent on the conditions of use (load, dirt, weather, care). To guarantee functional reliability, the parts must be replaced when they reach their permissible wear limit. Have the drive components of your bike checked regularly by a specialist workshop.

1.6 Exclusion of liability

The tasks described in this manual require special knowledge and should only be carried out by people with sufficient expertise.

We are not liable for damages as a result of:

> Misuse or any other cause beyond the range of the intended use (see „2.5 Intended use“)
> Exceeding the maximum system weight (see „2.3 Maximum system weight“)
> Non-compliance with safety regulations
> Improper assembly, repair and maintenance
> Use of unapproved replacement parts and accessories

The user is liable for the aforementioned damages. In case of uncertainties or occurrence of problems, the 3X3 service team (service@3x3.bike) or a trained bicycle mechanic must always be consulted!

1.7 Retrofitting

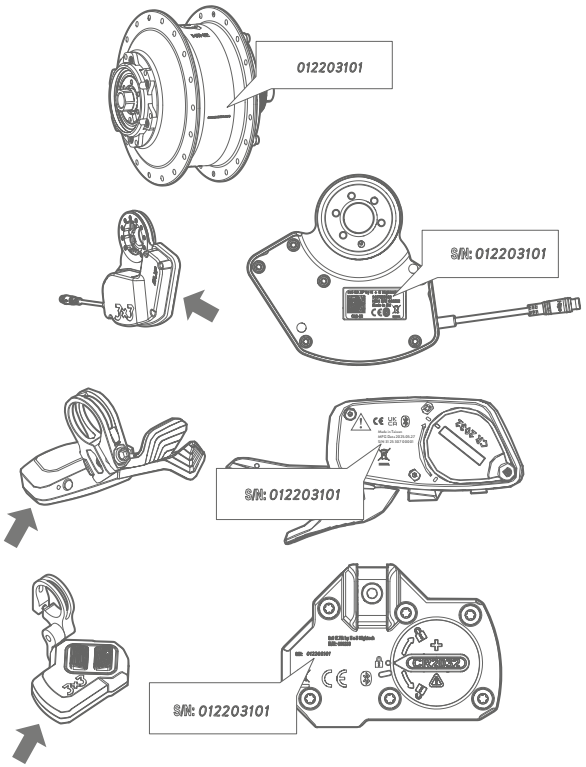
The 3X3 Nine can only be retrofitted in combination with an E-Shift under the following circumstances:

> Special software is required on the e-bike system.
> A new complete EMC test of the entire bicycle must be carried out.
> The bicycle manufacturer must give its approval for the conversion.
> There must be sufficient installation space available on the rear triangle, especially on the brake rotor side in the area of the brake caliper mount and the axle plate.

1.8 List of abbreviations

Abbreviation	Meaning
AP	Axle plate
TA	Thru Axle 142/148
QR	Quick release 135mm
PM	Postmount
BS	Belt Sprocket
CS	Chain Sprocket
R	Rotary
E	Electronic
SB	Shift box
XP	Actuator
TR	Trigger
RS	Twist grip / Shifter
CBL	Cables
SP	Complete gear hub
GR	Gearbox assembly
BRK	brake disc
ADPTR	Adapter installation width

1.9 Serial number



Each 3X3 NINE gear hub, each trigger and each actuator has a consecutive, individual serial number. Each gear hub is also provided with a QR code on the hub shell. These are used to identify the product and are required for warranty and guarantee claims and as proof of ownership.

The use of a separate QR code app is recommended for reading the QR code, as integrated QR scanners on mobile devices may not reliably recognize the code.

2. Safety

2.1 Explanation signs and symbols used

DANGER

...indicates an immediate hazard that will result in death or serious injury if not avoided.

CAUTION

...indicates a potential hazard that may result in minor injury if not avoided.

NOTE! ... indicates further notes or tips.

2.2 GENERAL SAFETY INFORMATION

CAUTION

Risk of accident due to incorrect or impermissible assembly!

Before mounting, make sure that your bike frame is compatible with the 3X3 NINE gear hub and the selected components. All works and modifications carried out improperly can cause malfunctions and, as a result, accidents. It is therefore essential to ensure proper installation of the gear hub and accessories. The first step must therefore be to read this manual and follow the instructions.

- We recommend that all assembly work be carried out by a qualified specialist workshop.
- The specified torques of the screw connections must be observed.
- The smallest permissible belt or chain transmission ratio must not be undercut (see „6.8 Permissible primary ratio“ on page 30).
- In the case of rear suspensions, a minimum length of the belt or chain must be maintained so that the full compression of the rear end is not restricted. More information on this can be obtained from the bicycle manufacturer.

CAUTION

Risk of accident due to incorrect handling and use of the gear hub!

Compliance with the following provisions is a prerequisite for accident-free use and faultless performance.

- The gear hub is to be used exclusively for the intended use (see „2.5 Intended use“) . The user is liable for any improper use.
- The maximum system weight (see „2.3 Maximum system weight“) must not be exceeded.
- The hub must be compatible with all relevant parts of the bike.
- Only use original spare parts.
- The hub must not be changed or modified.
- The hub must not be used if it is damaged or there are any signs of damage. If in doubt, contact the 3X3 service team (service@3x3.bike).

CAUTION

Danger of accident due to incorrectly mounted E-Shift-trigger!

Incorrect installation of the trigger can result in restricted braking and steering function and poses a risk of accidents.

- The position of the trigger must under no circumstances affect the functionality of the brake lever.

CAUTION

Danger of accident due to contaminated brake rotor!

If the brake rotor becomes contaminated with oil, grease (including skin grease) or with other lubricating substances, the brake rotor cannot achieve its desired braking force.

- Be careful not to contaminate the brake rotor during installation.
- Clean the brake rotor after assembly with a strongly degreasing, residue-free and flash-off cleaner.

CAUTION

Risk of injury due to accidental activation of the e-bike drive system!

- Before carrying out any work on the e-bike (e.g. inspection, repair, assembly, maintenance, work on the chain, etc.), before transportation (in a car, aircraft, etc.) and before storage, it must be ensured that the system is deactivated and secured against being switched on.

CAUTION

Risk of damage to electrical components!

- The 3X3 components must not be opened. Unauthorized opening of the components voids all warranty claims.
- Never disconnect plug connections when the drive system is switched on, as this can lead to irreparable damage.

2.3 Maximum system weight

The maximum system weight of your bike in conjunction with a 3x3 NINE gear hub is 250 kg.

The system weight is the sum of the rider, bicycle, clothing, luggage and a trailer and its contents. If your bike is approved for use with a child seat, the weight of the seat and additional passenger will also be added to the maximum system weight.

2.4 Maximum input torque

The 3X3 NINE gear hub is designed for high performance. The maximum input/output torque must not exceed 250 Nm. See also „6.8 Permissible primary ratio“ on page 30.

2.5 Intended use

The 3X3 NINE gear hub is approved exclusively for use on bicycles that are not considered motor vehicles according to § 1 Para. 3 StVG (German Road Traffic Act) and comply with the generally applicable safety standards. Other types of installation must be checked and approved in advance by H+B Hightech GmbH.

The gear hub may only be used with a torque support.

If the gear hub is used with a belt, only a Gates Carbon Drive belt may be used.

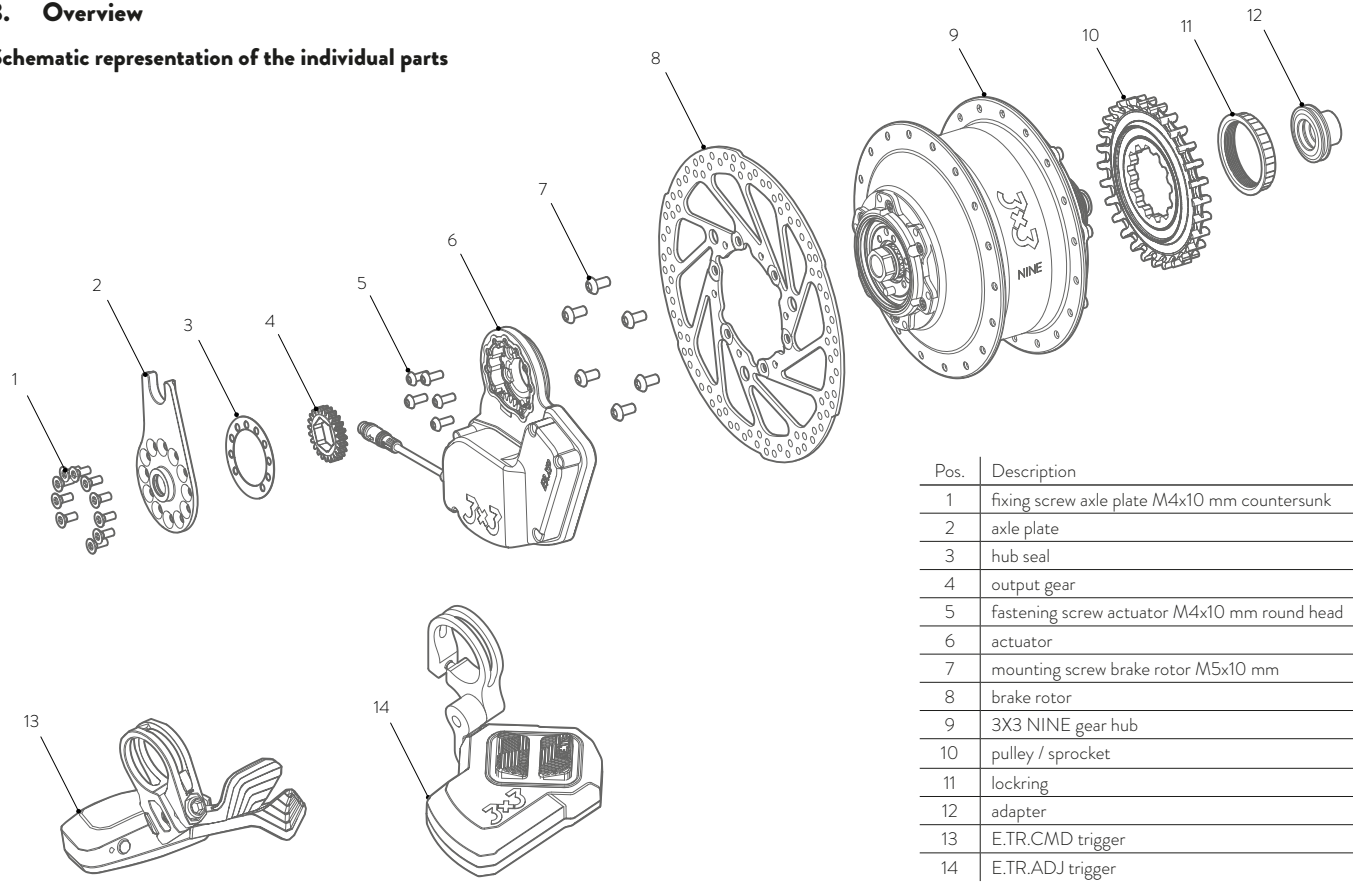
The 3X3 NINE gear hub may only be laced in 18" to 29" rims.

The 3X3 NINE gear hub is not compatible with coaster brakes.

The 3X3 NINE gear hub must not be used under water.

3. Overview

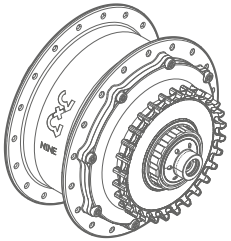
Schematic representation of the individual parts



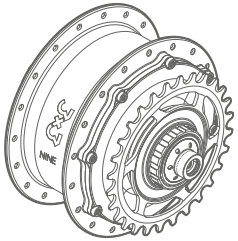
Pos.	Description
1	fixing screw axle plate M4x10 mm countersunk
2	axle plate
3	hub seal
4	output gear
5	fastening screw actuator M4x10 mm round head
6	actuator
7	mounting screw brake rotor M5x10 mm
8	brake rotor
9	3X3 NINE gear hub
10	pulley / sprocket
11	lockring
12	adapter
13	E.TR.CMD trigger
14	E.TR.ADJ trigger

We offer the following configurations:

3.1 Drive unit

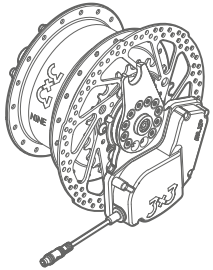


Pulley 3X3 RS.32



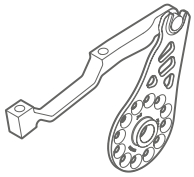
Sprocket 3X3 CS.28

3.2 Gear mech

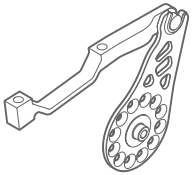


3X3 NINE E9.XP

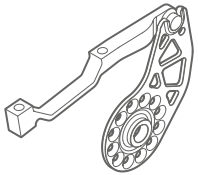
3.3 Torque support



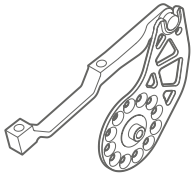
3X3 AP.TA PM.2 with PM adapter



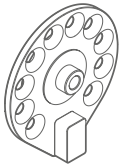
3X3 AP.QR PM.2 with PM Adapter



3X3 AP.TA PM.1 with PM adapter



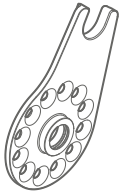
3X3 AP.QR PM1 with PM adapter



3X3 AP.QR OE.1

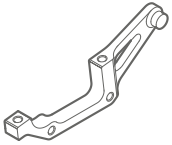
3X3 AP.TA OE.3

3X3 AP.TA D.13

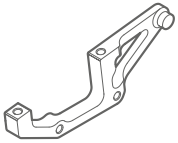


3X3 AP.TA OE.8

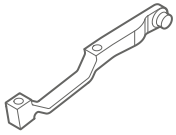
3X3 AP.TA CSTM.1



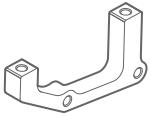
Postmount IS2000 - PM180



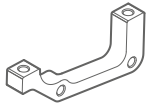
Postmount IS2000 - PM203



PM Adapter 160 - 180
PM Adapter 180 -203



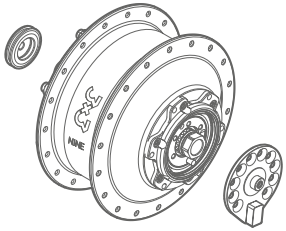
3X3 IS.2000 PM.203.NT



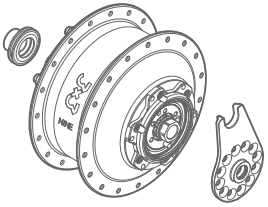
3X3 IS.2000 PM.180.NT

In addition to the standard torque supports shown here, individual supports are available to suit specific requirements of some frames.

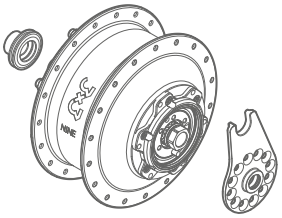
3.4 Frame width



3X3 NINE SP.36.**135**

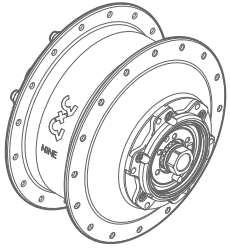


3X3 NINE SP.36.**142**

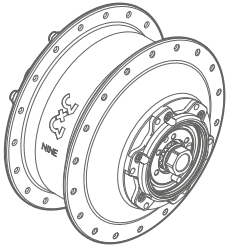


3X3 NINE SP.36.**148**

3.5 Spoke holes

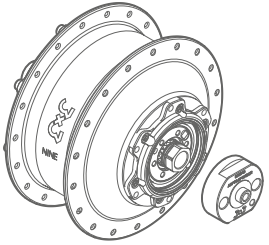


3X3 NINE SP.**32**.135

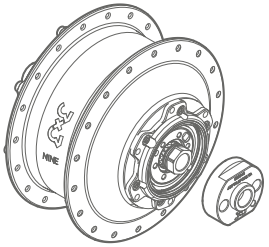


3X3 NINE SP.**36**.135

3.6 Lacing adapter



000345 3X3 ADAPTER.SPOKE.QR



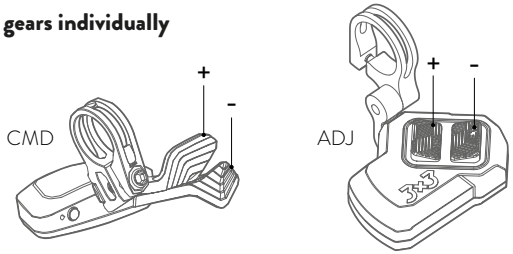
000346 3X3 ADAPTER.SPOKE.TA

For more information on the lacing adapters, see „7.6 Mounting the lacing adapter“ on page 34.

4. Operation

4.1 Shifting gears

Shifting gears individually



There are two buttons on the 3X3 trigger (control unit on the handlebars) which are used to initiate gear changes.

The upper "+" button shifts the gear hub to ninth gear.

The lower "-" button shifts the gear hub in the direction of first gear.

Auto-downshift

The auto-downshift function of the E-Shift actuator allows the 3X3 gear hub to shift to a preselected gear when the bike is stationary (currently only available in combination with Bosch Smart System).

If the e-bike system detects that the bike is stationary, it automatically shifts down to the start gear; to do this, the last gear engaged must be higher than the start gear.

In the factory setting, the auto-downshift function is active and 3rd gear is selected as the starting gear.

NOTE!
Note: The auto-downshift function and the start gear can be set by the using the 3X3 service tool (see „4.6 3X3 Servicetool“ on page 13).

4.2 Riding noise

When riding, different types of riding noise can be heard in certain gears. Due to the design, there are different freewheeling sounds, which change in the gear steps 3 - 4, as well as 6 - 7.

Depending on the frame type, these transmission noises are amplified or transmitted differently (the tubes of the frame / frame material act as a resonating body).

4.3 Running-in time

All gears and clutch elements of the 3X3 NINE gear hub are made of hardened special steel and are manufactured with high precision.

Within the first 500 km, the 3X3 NINE gear hub receives its final polish.

This makes riding noises quieter and gearshifts smoother. The run-in period is not associated with any restrictions.

4.4 Pushing the bike

When pushing the bicycle, the crank may rotate with it. This does not represent an error. When pushing the bike, the same noises occur as described in chap. „4.2 Riding noise“. Pushing the bike backwards is not a problem, here the crank inevitably turns with it.

4.5 Removing and installing the wheel

When removing and installing the rear wheel, a certain sequence of steps must be followed. For „5.7 Installing and removing the wheel“ on page 26 also observe the information provided by the frame or bicycle manufacturer.

4.6 3X3 Servicetool

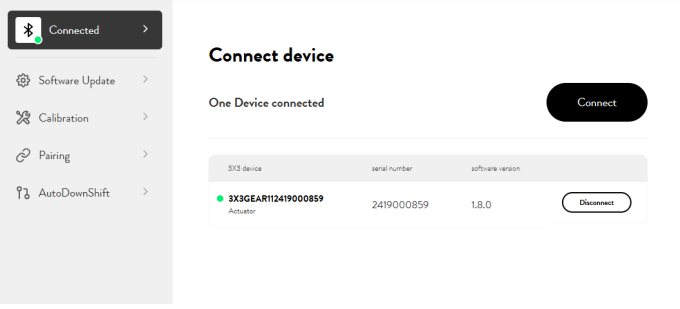
The 3X3 service tool is an online tool that you can use to make adjustments to your 3X3 NINE E-Shift gear hub. You can access it via service.3x3.bike. Using a Bluetooth-enabled device (smartphone, tablet, notebook), you can connect to your E-Shift gear hub. The prerequisite is that your device supports the Web Bluetooth API and the Google Chrome browser is installed.

Preparations

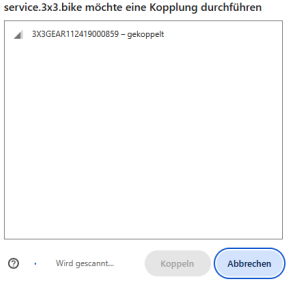
Beforehand, the rear wheel must be mounted and connected to the e-bike system via the cable. The software of the e-bike system must be installed and up-to-date so that the 3X3 E-Shift is supplied with power.

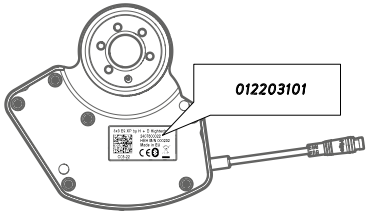
Servicetool "Connect"

Switch on your e-bike system to supply the actuator with power. Click on the "Connect" button in the service tool.



A list of Bluetooth devices in your area will appear. You can recognize your 3X3 actuator by the Bluetooth device name, which begins with "3X3-Gear.....". The following series of numbers corresponds to the serial number, which you can also find on the back of the actuator housing. Now select the correct device and press "Pair".

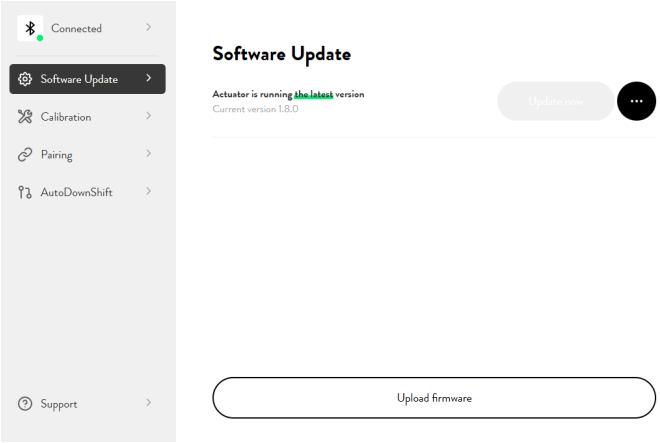




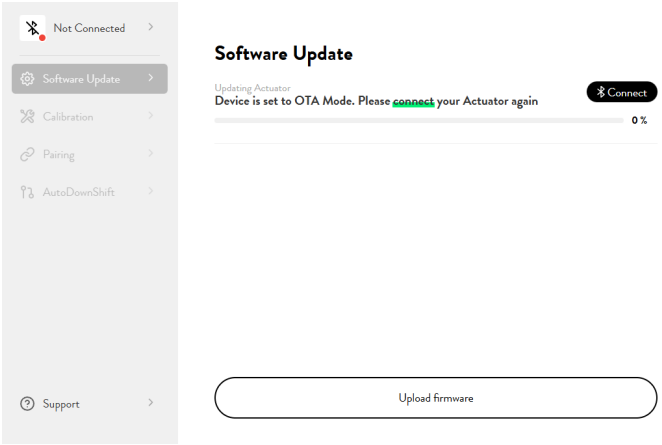
After a successful connection, the display changes to "Connected" in the top left corner and shows which devices are connected.

Servicetool "Software Update"

Under the "Software update" menu item, you can see which software version is installed on your actuator and whether a newer software version is available. If a newer software version is available, you can start the update process by clicking the "Update now" button.



To do this, your device is set to "OTA" update mode and the connection must be re-established. To do this, press the "Connect" button that is now visible on the screen. A Bluetooth device list will appear in which you must select the "OTA" device.

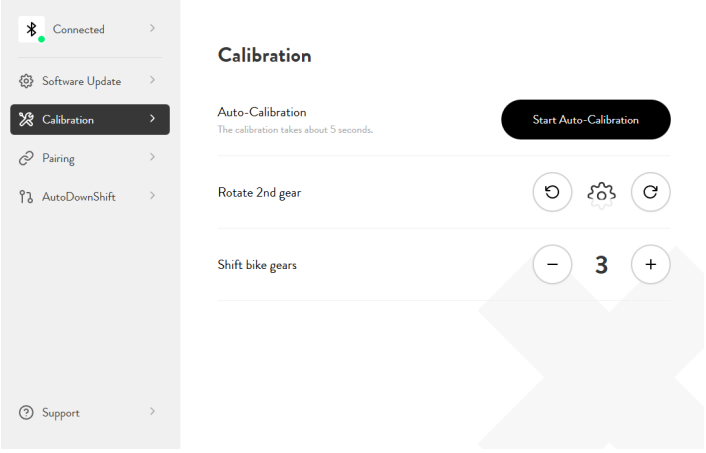


The progress of the update is now displayed. After a successful update you will receive a message. Please restart your e-bike to complete the update.

Servicetool "Calibration"

You can calibrate your 3X3 E-Shift under the "Calibration" menu item. First make sure that the pedals are not loaded during the calibration process.
Press the "Start Auto-Calibration" button. All gears of your hub are now automatically shifted through. The process is completed after approx. 5 seconds.

Calibration is essential to ensure harmonious switching if the hub and actuator were separated from each other.

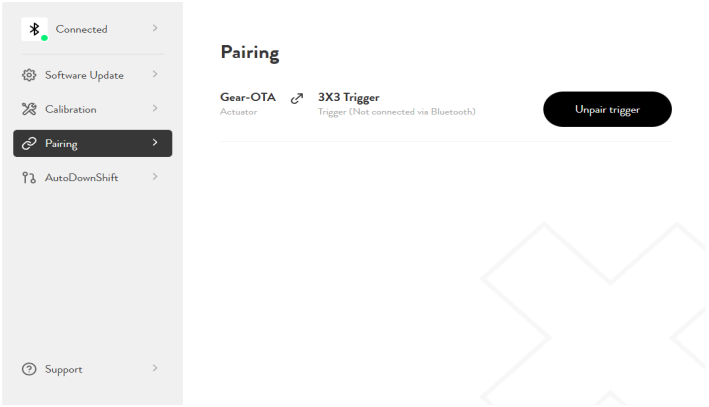


The "Rotate 2nd gear" button can be used to rotate the gear that is half visible so that the last gear can be inserted. A calibration ride must be carried out afterwards!

The "Shift bike gears" buttons can be used to switch the actuator if the trigger is not currently accessible (e.g. after a fall) in order to find an emergency gear that can be used to drive home.

Servicetool "Pairing"

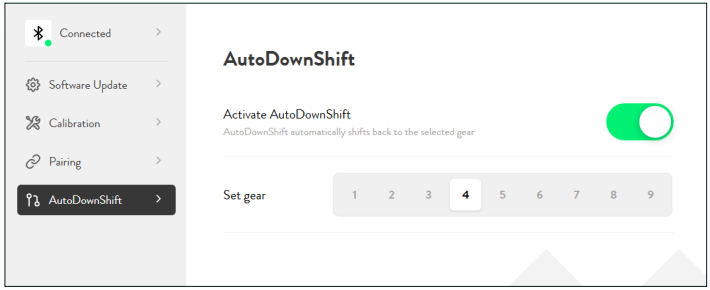
1. If a new trigger is connected to the actuator, the old trigger must first be deleted from the system. Click on "Unpair Trigger".
2. Restart your E-Bike system.
3. Insert a new battery into the trigger.
4. Connect the actuator to the service tool.
5. Wake the trigger from sleep mode by pressing a button.
6. Connect the trigger to the service tool using the same procedure as for the actuator.
7. Check both components for the correct software version and carry out an update if necessary.
8. Go to the "Pairing" menu and click on "Pair Trigger".
9. Check the successful coupling of the components by switching up and down on the trigger. The hub should shift the gears.



Servicetool "AutoDownShift"

In the "AutoDownShift" menu item, you can set a gear that is shifted to when the bike comes to a standstill (e.g. at traffic lights). We recommend selecting gear 2-5 as the starting gear.

You can deactivate this function if required.



Updating the trigger software

The E.TR.ADJ Trigger software can also be updated via the Service Tool. Your E-Bike system can remain switched off during the update, as the trigger is supplied with power via its integrated battery. Before the trigger appears in the Bluetooth device list, it must be woken up from its "sleep mode" by pressing any button on the trigger.

4.7 Visual status display

Both triggers are equipped with an LED that provides information to the rider to visualize the status of the E-Shift control.

Trigger E.TR.CMD

The LED on the E.TR.CMD trigger lights up after a button on the trigger has been pressed. The color of the LED provides information about the battery and operating status:

LED	Operating status
lights up green	Battery capacity >30%
lights up red	Battery capacity 10-30%
flashes red	Battery capacity < 10%
flashes orange	Error
flashes red and green	Shifting operation was rejected, e.g. if the temperature is lower than -15°C.

Trigger E.TR.ADJ

The LED on the E.TR.ADJ trigger communicates operating statuses and error codes via flashing signals:

LED	Status	Remark
1x flashing	Connection established	System ready for operation
6x flashing	Not ready for operation	No connection, not paired, active error
4x flashing	Switching not possible at the moment	Switching process aborted, overcurrent, switching error, highest/ lowest gear reached
2x flashing	Battery replacement request	after each keystroke

4.8 Error codes

In the event of an error, error codes are shown on the bike's display to provide information about the status of the E-Shift gear hub (currently only available with Bosch Smart System).

Error code	Error	Description
0x1C7540	Permanent defect	Permanent error in your electronic circuit.
0x1C7541	Configuration incorrect	The configuration of your electronic circuit is faulty.
0x1C7542	temporary defect	Temporary error in your electronic circuit.
0x1C7543	Trigger battery empty	The battery of your trigger is empty.
0x1C7544	Overtemperature	The temperature of your electronic circuit is too high.
0x1C7545	Trigger battery almost empty.	The battery of your trigger is almost empty.
0x1C7546	Service overdue	Your electronic shifting system is overdue for service.

These error codes can be read out and removed using the Bosch diagnostic tool if the error has been rectified.

5. Installation and initial operation

You can also find all the assembly steps as a video at https://www.3x3.bike/tutorials/

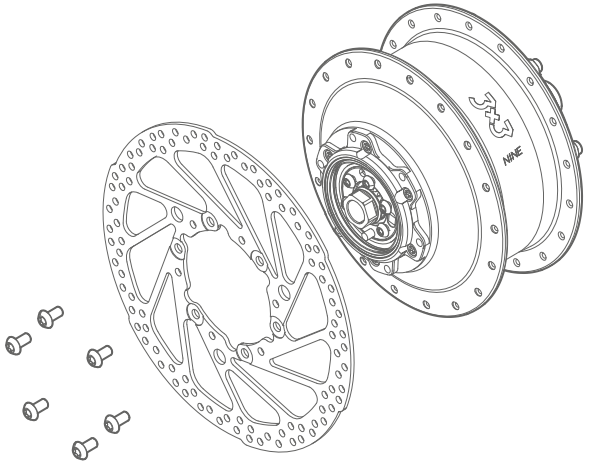
5.1 Mounting the brake rotor

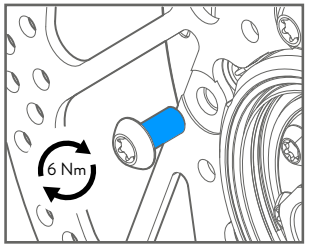
Required tools and materials	Specifications
torx key	TX25
torque wrench	effective range 6 Nm
threadlocker	medium strength
degreaser / brake cleaner	completely flashing off, e.g. disc brake cleaner from Muc-Off

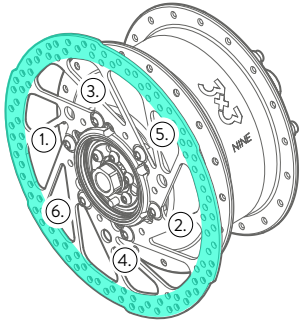
Brake rotors from Fahrwerker, Magura and Tektro are currently available.
The supplied screws (M5x10 flat head TX15) must be used with Magura brake rotor.

To mount the brake rotor, the gear housing must already be spoked. The gear mech or the actuator must not yet be mounted.
Before mounting the brake rotor, make sure that the contact surface of the brake rotor on the hub is clean and that the threads and screws are free of grease.

1. When using a brake disk speed magnet:
   Place the magnet in the hole provided in the brake rotor.
2. Clean the contact surfaces of the brake rotor and hub.
3. Place the brake rotor on the hub.
   = Pay attention to the direction of rotation (see arrow marking on the brake rotor).
4. Degrease the threads of the screws and apply a medium-strength threadlocker.
   = Some screws are already pre-treated with an encapsulated threadlocker. The threads do not need to be degreased and no additional threadlocker needs to be applied.
5. Screw in all six screws, but do not tighten them yet.
   = Only screws with a maximum head height of 2.7 mm may be used!
6. Tighten the screws crosswise (see numbering diagram) first hand-tight and then with a torque of 6 Nm.
7. Check that the brake rotor lies flat on the hub.







FETTFREI SCHRAUBENSICHERUNGSMITTEL

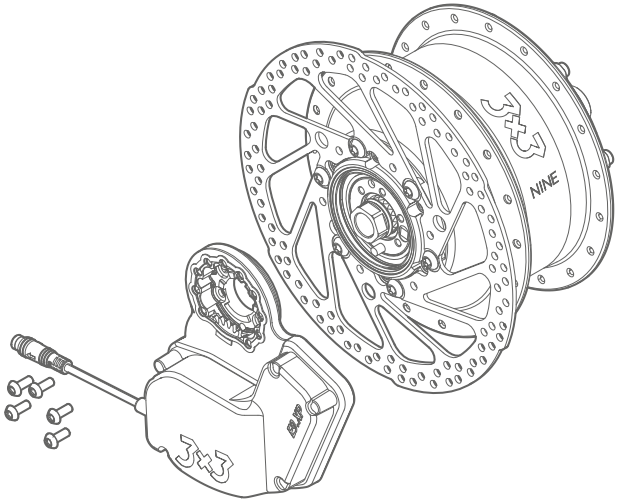
5.2 Mounting the E-Shift

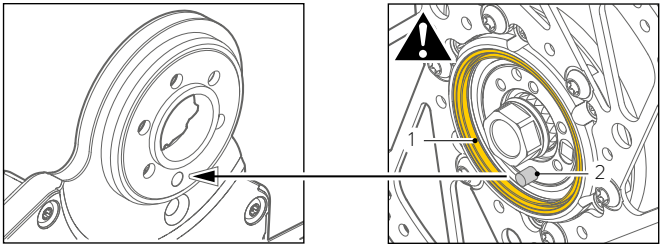
Mounting the actuator

Required tools and materials	Specifications
Torx key	T20
socket/ open-end wrench	17 mm
torque wrench	effective range 3 Nm
grease	3X3 GEAR GREASE

The brake rotor must already be fitted in order to install the actuator.

1. Clean the contact surfaces of the actuator and the hub.
2. Grease the sealing ring (1) in the hub with 3X3 Gear Grease.
3. Check whether there is threadlocker on the screws. Apply medium-strength threadlocker if necessary.
4. Place the actuator on the hub and make sure that the pin (2) is positioned correctly. Then take three of the five screws and insert them so that a hole remains free between each screw in order to be able to fix the actuator evenly.
5. Lightly tighten the three pre-positioned screws crosswise. Then check whether the actuator rests evenly on the hub and can be turned freely in both directions without great effort.
6. Position the two missing screws in the free holes of the actuator, put them in place and then tighten all screws crosswise with a TX 20 wrench and a torque of 3 Nm.
7. Check the clearance of the actuator.
   = The gear mech must not collide with any other component during a 360° rotation.
8. Check the minimum distance between the brake rotor and the actuator. This must be at least 1 mm.



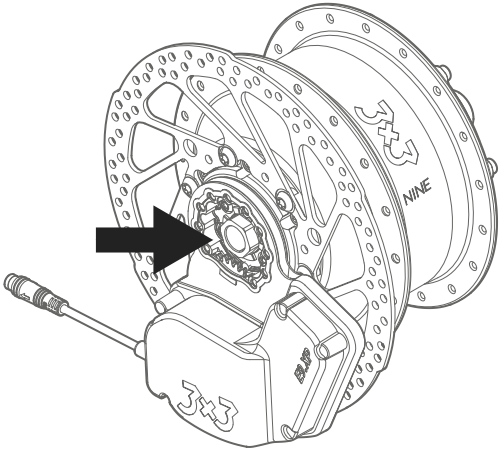


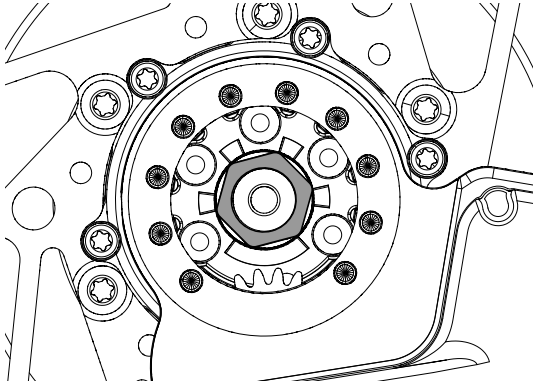
Shift hub to first gear

To ensure that the hub is in the starting position for the following assembly steps, the hub must be manually shifted into first gear via the shift drum.

The hub is normally supplied in gear 1.

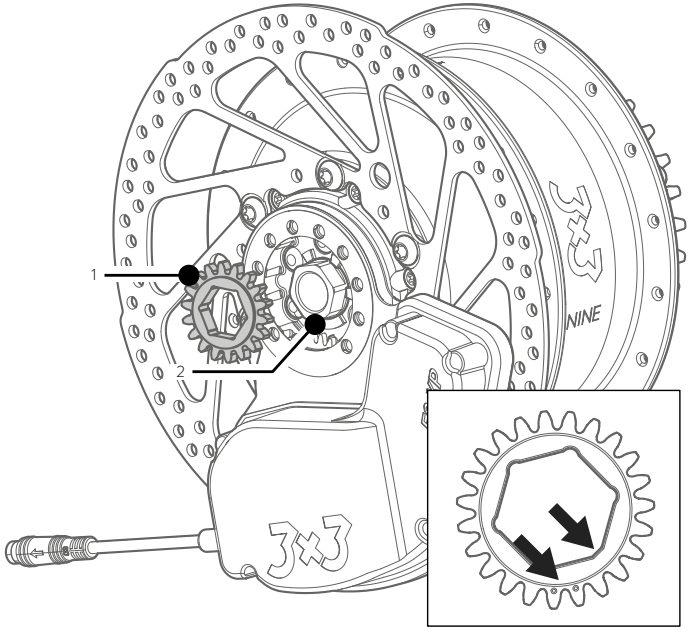
1. Turn the hexagon of the shift drum counterclockwise with a 17 mm socket until it stops.
   > The hexagon of the shift drum must not be clamped in the vise!
   > The hub is now in the first gear.





Mounting the output gear

1. Clean the output gear (1) and the mounting surface and grease the output wheel.
   = The output gear must be greased all round, otherwise it will be dry against the housing and the axle plate.
2. Place the output gear (1) on the shift drum (2). It is only possible to engage the output gear in a certain position (see flattening on the shift drum and dots on the hexagon gear). This position only applies in gear 1 of the hub.

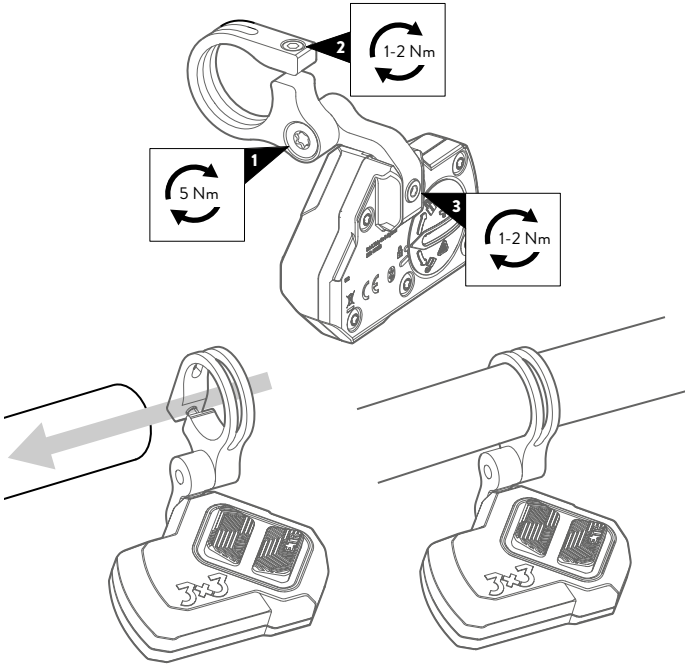


5.3 Mounting the trigger [E.TR.ADJ]

NOTE! To connect the trigger to the actuator, the trigger must be removed from the handlebars. If a connection has not yet been established, installation can be carried out later.

Required tools and materials	Specifications
hex key / hex bit	2.5 mm
Torx key	TX25
torque wrench	effective range 1 - 5 Nm
assembly paste (only required for carbon handlebars)	according to the handlebar manufacturer

1. Insert the battery before installing the trigger (see „7.5 Insert/replace trigger battery“ on page 33).
2. Fit the handlebar clamp to the trigger so that the screw head disappears into the recess on the handlebar clamp. Tighten the screw (3) to 1 to 2 Nm.
3. Remove the grip from the handlebar, loosen the screw on the brake lever and move it inwards. Then slide the trigger with the handlebar clamp onto the handlebar. Install the grip according to the manufacturer's instructions.
4. Adjust the position of the brake lever and fix it. Follow the manufacturer's instructions.
5. Tighten the bolt of the handlebar clamp (2) with a 2.5 mm hex key to 1 to 2 Nm.
6. Slightly open the positioning screw (1) and set the ergonomic position of the trigger. Tighten the screw to 5 Nm.
   = The trigger must not be restricted in its function and must not restrict other control elements (brake lever, etc.).
7. Verify the tight fit of the trigger.
   = It must not be possible to twist the trigger on the handlebars with normal force! If the trigger can be turned on the handlebar, disassemble it, thoroughly clean and degrease the mounting surfaces and apply a suitable assembly paste. If the clamping force is still too low, the bicycle must not be put into operation. Contact the 3X3 service team if you have any questions.

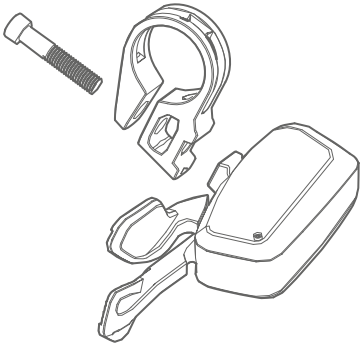


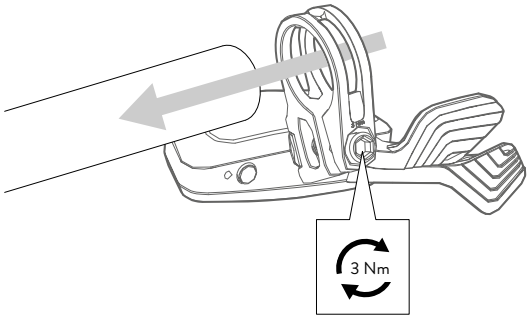
5.4 Mounting the trigger [E.TR.CMD]

NOTE!
To connect the trigger to the actuator, the trigger must be removed from the handlebars. If a connection has not yet been established, installation can be carried out later.

Required tools and materials	Specifications
hex key / hex bit	4 mm
torque wrench	effective range 3 Nm
assembly paste (only required for carbon handlebars)	according to the handlebar manufacturer

1. Insert the battery before installing the trigger (see „7.5 Insert/replace trigger battery“ on page 33).
2. Fit the handlebar clamp to the trigger.
3. Remove the grip from the handlebar, loosen the screw on the brake lever and move it inwards. Then slide the trigger with the handlebar clamp onto the handlebar. Install the grip according to the manufacturer's instructions.
4. Adjust the position of the brake lever and fix it.
5. Tighten the handlebar clamp to 3 Nm using a 4 mm hex key.
   = The trigger must not be restricted in its function and must not restrict other control elements (brake lever, etc.).
6. Verify the tight fit of the trigger.
   = It must not be possible to twist the trigger on the handlebars with normal force! If the trigger can be turned on the handlebar, disassemble it, thoroughly clean and degrease the mounting surfaces and apply a suitable assembly paste. If the clamping force is still too low, the bicycle must not be put into operation. If you have any questions, please contact the 3X3 service team.



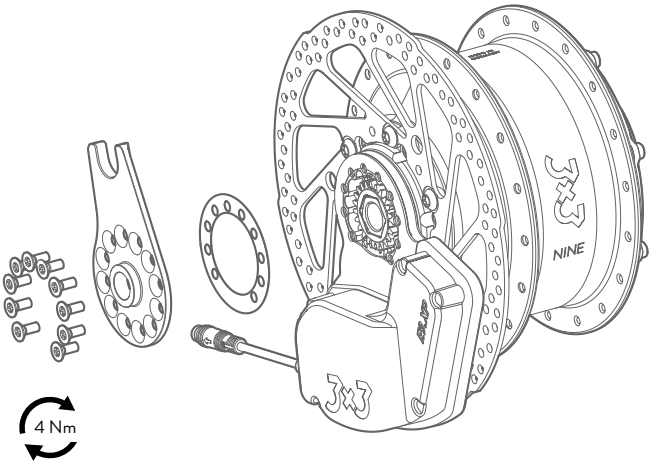


5.5 Mounting the axle plate

Required tools and materials	Specifications
Torx wrench / Torx bit	T20
torque wrench	effective range 4 Nm
threadlocker medium strength	Loctite 243

The axle plate is supported on the torque support or in the dropout of the bike frame. Different versions of the axle plate are available. The position of the axle plate must be aligned with the position of the torque support on the bike.

1. Place the paper gasket on the actuator and align it with the screw holes.
2. Place the axle plate on the actuator and position it to match the torque support. Moisten the threads of the screws with medium-strength threadlocker. New screws are already pre-wetted with threadlocker.
3. Screw in the screws, secure the actuator against rotating and tighten the screws crosswise with a torque of 4 Nm.
   = Screw in all the screws. The function of the torque support is only given with the full number of possible screws.



5.6 Mounting the sprocket/ pulley

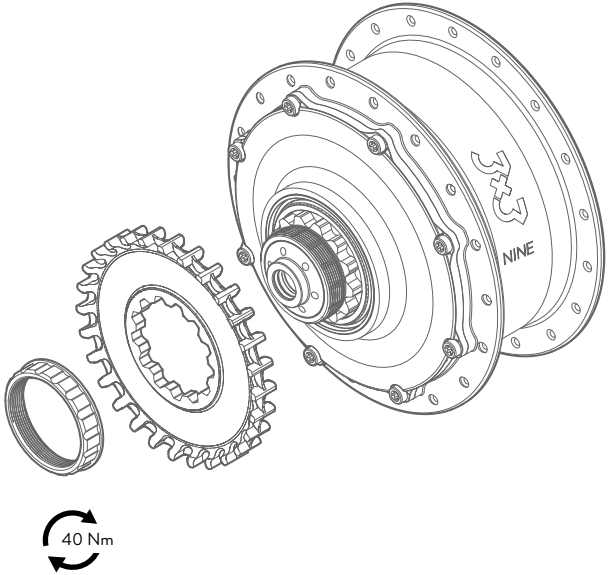
Required tools and materials	Specifications
strap wrench (pulley)	e.g. Gates GCD241236 / Strap Wrench
chain whip (chain sprocket)	e. g. BBB Cycling BTL 12 S
lockring tool	BSA Hollowtech II tool
torque wrench	effective range 40 Nm
cleaner	solvent-free cleaner, e.g. Muc Off
grease	3X3 Gear Grease

The 3X3 NINE gear hub can be fitted with either a chain sprocket or a belt pulley. The chain/belt line is determined by the hub. The front chainring or pulley must be adjusted to the appropriate position.

1. Clean the driver on the hub and the sprocket or pulley.
2. Make sure that the aluminum ring and the radial shaft seal are fully inserted in the housing cover. Slide the sprocket or pulley onto the hub driver.
3. Apply grease to the seal.
4. Slide the sprocket or pulley onto the hub driver.

NOTE! The labeling on the sprocket/pulley must point in the direction of the viewer.

5. Turn the lockring onto the driver.
6. Hold the sprocket with a chain whip or the pulley with a strap wrench and tighten the lockring with an bottom bracket tool to 40 Nm.



5.7 Installing and removing the wheel

Installing the wheel

In addition to the bike manufacturer's specifications, the following points must be observed:

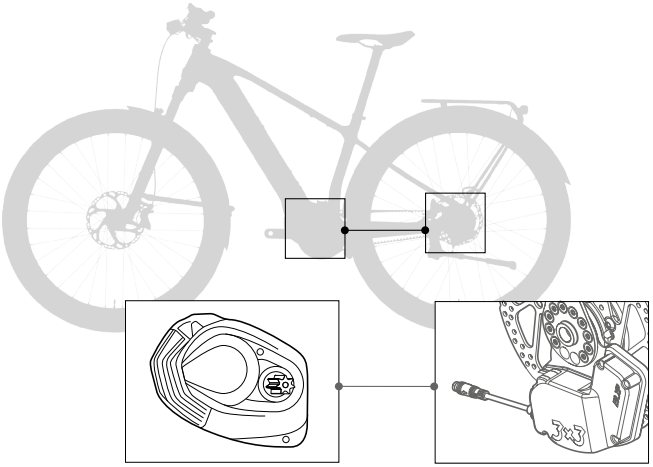
1. Grease the thru axle and the axle plate with 3X3 Gear Grease.
2. Bring the rear wheel into position and place the chain / belt on the sprocket / pulley.
3. Thread the rear wheel into the dropout.
   = Make sure that the brake rotor is threaded between the brake pads and that the fork of the axle plate engages with the pin of the torque support on the frame.
4. Insert the thru axle through the dropout and tighten it according to the manufacturer's instructions, whereby a torque of 16 Nm must not be exceeded.
   = Make sure that the rubber seals in the axle plate and in the adapter are not damaged.
5. Connect the plug of the actuator to the e-bike.
   = The actuator cable must not be kinked on the brake rotor or frame.
6. Check that the rear wheel turns freely.

Removing the wheel

NOTE!
Before removing the rear wheel, the hub should be shifted into first gear.

1. Switch off the e-bike system and disconnect the plug of the actuator from the E-Bike system.
2. Open or loosen the rear wheel attachment according to the bike manufacturer's instructions.
3. Remove the rear wheel from the bike.
   = Take care not to jam the torque support.
   = Take care not to damage the rubber seals in the axle plate and in the adapter.
4. Remove the chain / belt from the sprocket / pulley.

5.8 Initial operation



1. Now lay the connection cable on or in the frame and plug it into the HPP (HighPowerPort) of the drive unit. Connect your E-Shift actuator with the connection cable to the e-bike system (currently only available for Bosch Smart System). Make sure the connectors are clean and dry.
   = When routing the connection cable, make sure that it cannot rub against the wheel or restrict the wheel's functions
2. Make sure that a battery is inserted in the trigger (see „7.5 Insert/replace trigger battery“ on page 33).
3. Switch on the e-bike system.
4. Now perform the pairing with the trigger (see „4.6 3X3 Servicetool“ on page 13).
5. Carry out the initial ride.

5.9 Pairing the trigger [E.TR.ADJ]

1. Connect the 3X3 actuator to a Bosch e-bike system.
2. Switch on the Bosch e-bike system.
3. Connect the actuator to the 3X3 service tool as described in „4.6 3X3 Servicetool“ on page 13 and, if necessary, disconnect the old trigger in the Trigger Pairing menu.
4. Switch off the e-bike system.
5. Take a new trigger and insert a fresh battery as described in „7.5 Insert/replace trigger battery“ on page 33.
6. Check the function of the trigger by pressing a shift button. The LED between the buttons should flash.
7. Switch the e-bike system back on.
8. Proceed with the pairing of the new actuator as described in chapter 4.6 3X3 Service tool - Pairing
9. Mount the trigger as described in „5.3 Mounting the trigger [E.TR.ADJ]“ on page 22.

5.10 Pairing the trigger [E.TR.CMD]

1. Connect the 3X3 actuator to a Bosch e-bike system.
2. Switch on the Bosch e-bike system.
3. Connect the actuator to the 3X3 service tool as described in „4.6 3X3 Servicetool“ on page 13.
4. Check whether software version 1.8.0 or higher is installed on the actuator. Carry out an update if required.
5. If necessary, disconnect the old trigger in the "Trigger pairing" menu.
6. Switch off the e-bike system.
7. Press the function button on the E.TR.CMD trigger for 10 seconds until the LED flashes slowly.
8. Switch the e-bike system back on.
9. The LED flashes quickly to indicate successful pairing.
10. Mount the trigger as described in „5.4 Mounting the trigger [E.TR.CMD]“ on page 23.

6. Technical data

6.1 Interfaces with the bicycle

maximum torque	250 Nm
axle diameter	5 mm (for 135 mm installation width, only as quick release version)
	12 mm (for 142/148 mm installation width)
total axle width with 135 mm installation width	145 mm
axle bore diameter	for 135 mm installation width 5.2 mm
	for thru axle 12.2 mm
installation widths in the frame	135 mm, 142 mm, 148 mm
brake rotor diameter	180 mm, 200 mm, 203 mm

6.2 Wheel Building

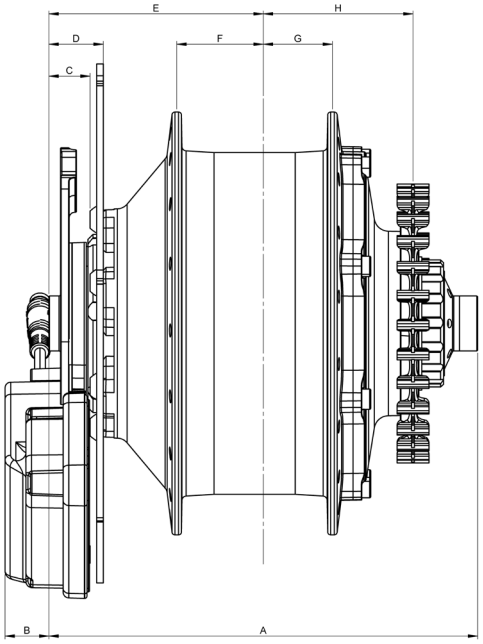
number of spokes	32 or 36 hole
hub flange distance	distance flange left:
	135 mm installation width: 26.9 mm
	142 mm installation width: 26.9 mm
	148 mm installation width: 29.9 mm
	distance flange right:
	135 mm installation width: 26.9 mm
	142 mm installation width: 26.9 mm
	148 mm installation width: 23.9 mm
hub flange diameter	134 mm (left and right)
spoke hole diameter	2.8 mm
hub flange width	in the center of a spoke hole: 4 mm
maximum spoke tension	1500 N
preferred lacing pattern	24-29“: two-cross with 12 mm nipples 12-18”: one-cross with 12 mm nipples We recommend Sapim Strong ED 2.34- 2.0 mm spokes with Sapim Polyax Secure Lock nipples and angled rims, e.g. Ryde Andra series.

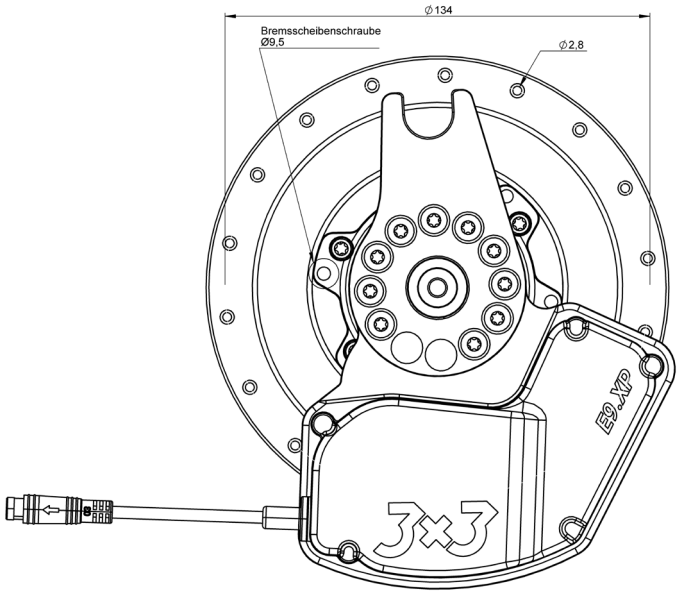
We recommend using the lacing adapters for lacing the wheel (see „3.6 Lacing adapter“ on page 11).

6.3 General technical data

number of gears	9
gear steps	approx. 24 %
total transmission	554 %
weight	2 kg
brake rotor centering diameter	Ø61.5 mm +0.2/0
bolt circle diameter of the brake disc mount	Ø72.25 mm ±0.1
brake rotor fixing screws	6 x M5 x 10 (TX25) Head height must not exceed 2.7 mm! Always use the screws supplied!
sprocket toothing	for bicycle chains 1/2 x 11/128" (ISO No. 082); corresponds to 10-speed chains
sprocket number of teeth	chain: 24, 26, 28, 30
	belt: 28, 30, 32, 34
belt/chain line	135/ 142 mm installation width: 54.7 mm
	148 mm installation width: 51.7 mm
shift operation	via rotary shift (right or left possible) and e-shift (only right possible)

6.4 Dimensions



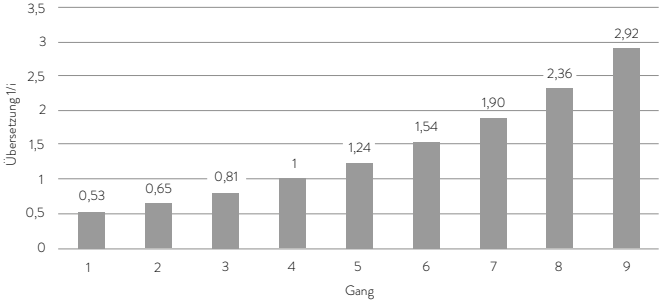


	135 mm installation width	142 mm installation width	148 mm installation width
A	135	142	148
B	18.6	15.1	15.1
C	10.6	14.1	14.1
D	15.3	18.8	18.8

	135 mm installation width	142 mm installation width	148 mm installation width
E	67.5	71	74
F	26.9	26.9	29.9
G	26.9	26.9	23.9
H	54.7	54.7	51.7

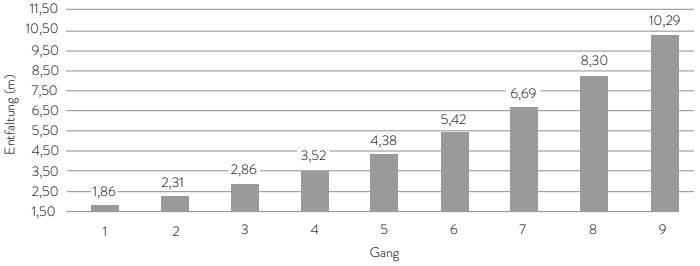
6.5 Gear ratio

The internal ratio refers to the ratio or reduced ratio of only the gearbox. From this and from the primary ratio, the desired gear inches can be calculated.



6.6 Gear inches

The values are based on a 55-622 tire, a 46T pulley and a 30T sprocket at one crank revolution.



6.7 Torques

quick release	bbserve the manufacturer's specifications
thru axle	observe the manufacturer's specifications
torque support/axle plate	3,5 – 4 Nm
adapter	35 – 40 Nm
pulley / sprocket	40 Nm
brake rotor bolt	6 Nm
trigger E.TR.ADJ positioning	5 Nm
trigger E.TR.ADJ on clamp	1-2 Nm
trigger E.TR.ADJ clamp on handlebars	1-2 Nm
trigger E.TR.CMD clamp	3 Nm
housing - Cover	2 Nm
gear mech/actuator	3 Nm
axle plate	4 Nm
cable pulley shift box	1 – 2 Nm
headless pin cable pulley	2.5 Nm

6.8 Permissible primary ratio

To protect the 3X3 NINE gear hub from overloading, the primary ratio must be selected so that the maximum torque of 250 Nm is not exceeded.

NOTE!
Contact our service department for primary ratio recommendations (service@3x3.bike).

6.9 Wheel building

Wheels should always be assembled by a specialist in compliance with all technical specifications. Spoke lengths can be calculated using the following tools:

- https://www.sapim.be/spoke-calculator
- https://whizz-wheels.de/speichenrechner
- https://spokes-calculator.dtswiss.com

All hub dimensions for calculating the spokes can be found under „6.4 Dimensions“ on page 29.

We recommend the following specialist companies for wheel building:

SES Sandmann Spare Parts Service e.K.
https://ses-sandmann.de/
Rehbecke 1
58091 Hagen/Germany

WHIZZ-WHEELS
https://whizz-wheels.de/
Hegnerweg 17
71101 Schönaich/Germany

Roland Werk GmbH
https://roland-werk.de/
Industriestr. 16
49681 Garrel/Germany

Ginkgo Veloteile, Leupold and Söhnchen GbR
https://shop.ginkgo-veloteile.de/
Creidlitzer Straße 47
96450 Coburg/Germany

Atasoy GmbH
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7. Activities before the ride and care

The 3X3 NINE gear hub is protected from dirt and water by a special sealing concept and is low maintenance. Therefore, the care and maintenance work is mainly limited to the chain, or the belt drive and the associated tensioner, as well as the actuator.

The intervals at which care and maintenance work becomes necessary on the 3X3 NINE gear hub itself depend greatly on the frequency of use and the effects of the weather. The more extreme the conditions under which the gear hub is used (water, dirt, kilometers driven, etc.), the more frequently care and maintenance work is also required here.

7.1 Activities before the ride

The following table shows the specific activities that must be performed before the first ride or before each ride. In addition, please note the activities that affect your bike.

Task	Before your first ride	Before each ride
Check all screws for tightness and tighten to specific torque if necessary.	X	
Clean the hub (see „7.2 Cleaning“).	X	
Check that the brake rotor is free of oil and dirt.	X	X
Check the proper function of the brake.	X	X
Check the tight fit of the quick release / thru axle.	X	X
Verify the tight fit of the actuator.	X	X
Check if all gears can be shifted.	X	
Check the chain / belt for wear.		X

7.2 Cleaning

The 3X3 NINE gear hub is protected against moisture penetration according to the latest standards. However, it is strongly discouraged to clean the bike with a pressure washer. Aggressive cleaners can also cause damage to the hub. Use qualified bicycle cleaners for cleaning and follow the cleaner's application instructions.

Be careful with the disc brake! Contaminants on the brake system, including cleaning agents, can massively impair braking behavior.

7.3 Lubrication

The 3X3 NINE gear hub is factory filled with a high performance grease. The sealing surfaces must be regreased when servicing the sprocket/pulley and gear mech.

7.4 Regular checks

The following checks should be performed at regular intervals:

Task	Interval
Check all screws for tightness and tighten to specific torque if necessary.	monthly
Check the housing screws for tightness. If they have loosened, tighten them crosswise with 2 Nm.	monthly
Clean the hub (see „7.2 Cleaning“).	as required
Check the brake rotor for wear. The wear limit is indicated on the brake rotor. Replace the brake rotor if necessary (see „8.4 Replacing brake rotor“ on page 36).	3 months
Check the brake pads for wear. The brake pad specifies the wear limit.	monthly
Check the chain / belt for wear. Refer to the chain or belt manufacturer's specifications.	monthly
Check the pulley for wear. Refer to the chain or belt manufacturer's specifications.	3 months

Task	Interval
Check the sprocket for wear. The sprocket is at its wear limit when the teeth have a severe degree and are deformed. Replace the sprocket if necessary (see „5.6 Mounting the sprocket/ pulley“ on page 25).	3 months

If in doubt, contact the 3X3 service team (service@3x3.bike).

7.5 Insert/replace trigger battery

Only use batteries from reputable manufacturers! The battery is not included with the trigger.

CAUTION

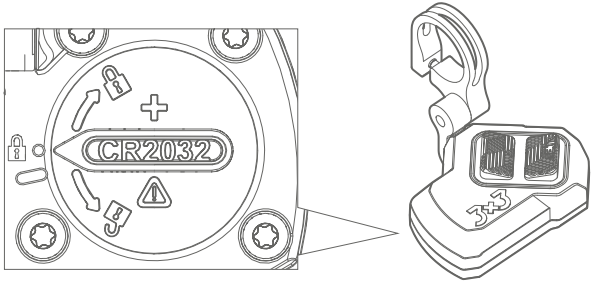
Danger from swallowing button cells!

Swallowing button cell batteries can cause serious damage to the esophagus in children and adults, such as chemical burns or burns.

- Keep the battery out of the reach of children.
- However, if a battery is swallowed, a doctor must be consulted immediately.

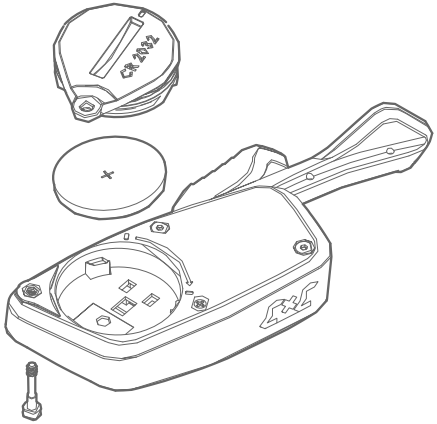
Make sure that the trigger is clean and dry before you open the battery compartment. Remove dirt and deposits from the trigger with a damp cloth. Clean the components with water and cleaning agent only. Rinse the parts thoroughly with water and allow them to dry completely before opening.

Trigger E.TR.ADJ



1. Open the cover of the battery compartment by turning it counterclockwise as far as it will go. Use a suitable object to avoid damaging the housing and the recess.
   = The rear of the housing must not be opened under any circumstances, as this will invalidate the warranty.
2. Remove the battery and replace it with a new one.
   = Only use clean gloves when touching the battery and the open trigger. Contact with moisture, lubricants, cleaning agents or skin care products must be avoided at all costs.
   = Only use batteries of type CR2032.
   = Do not use sharp or conductive objects to remove the batteries. The "+" symbol on the battery must point towards the cover after insertion.
3. Close the battery compartment cover by turning it clockwise as far as it will go.
   = Before closing the cover, check that the O-ring is correctly seated and intact. If necessary, replace it with a new O-ring 21 x 1 mm.
   = The arrow must point to the "Locked" mark.

Trigger E.TR.CMD



Make sure that the trigger is clean and dry before you open the battery compartment. Remove dirt and deposits from the trigger with a damp cloth. Clean the components with water and cleaner only. Rinse the parts thoroughly with water and allow them to dry completely before opening.

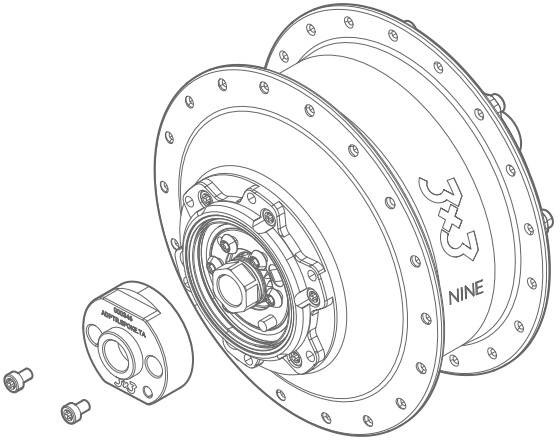
1. Open the cover of the battery compartment by turning it counterclockwise as far as it will go. Use a suitable object to avoid damaging the housing.
2. Insert a new CR2032 battery with the "+" symbol into the battery compartment cover.
   > Do not remove the O-ring of the battery cover to avoid moisture damage.
3. Replace the cover and use a suitable object to turn it clockwise back to its original position.

7.6 Mounting the lacing adapter

Required tools and materials	Specifications
lacing adapter	000345 3X3 ADAPTER.SPOKE.QR 000346 3X3 ADAPTER.SPOKE.TA
torque wrench	Effective range 2 Nm

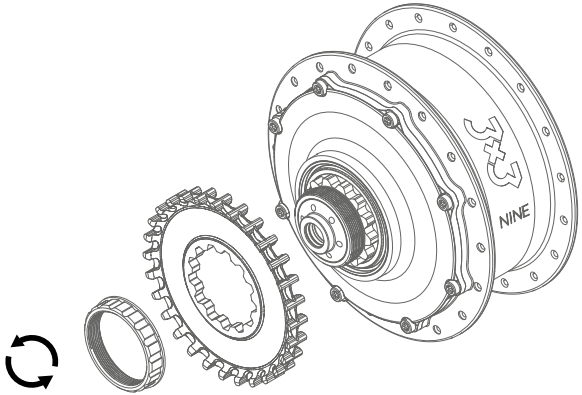
The lacing adapter can be used for various purposes, e.g. for lacing or replacing the adapters.

1. Place the lacing adapter on the main axle and make sure that the torque pin is threaded into the hole provided.
2. Turn the two screws into the main axle and tighten them with a torque of 2 Nm.



8. Changing components

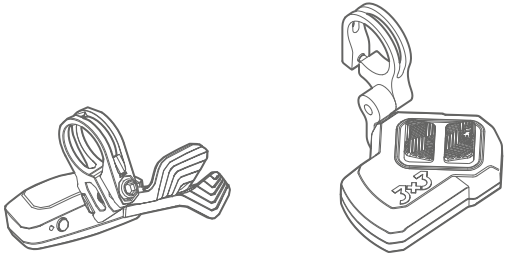
8.1 Changing the sprocket / pulley



1. Clean the sprocket / pulley and the hub shell in the area of the sprocket / pulley.
2. Hold the sprocket with a chain whip or the pulley with a strap wrench and open the nut counterclockwise with a BSA bottom bracket tool.
3. Remove the lockring and pull the sprocket or pulley off the toothing.
4. Clean the teeth and thread and check both for damage.
5. Install the sprocket or pulley (see „5.6 Mounting the sprocket/ pulley“ on page 25).

8.2 Changing the trigger [E.TR.ADJ / E.TR.CMD]

The handlebar clamp can remain fitted to replace the trigger. Only the screw that connects the trigger to the handlebar clamp needs to be loosened.

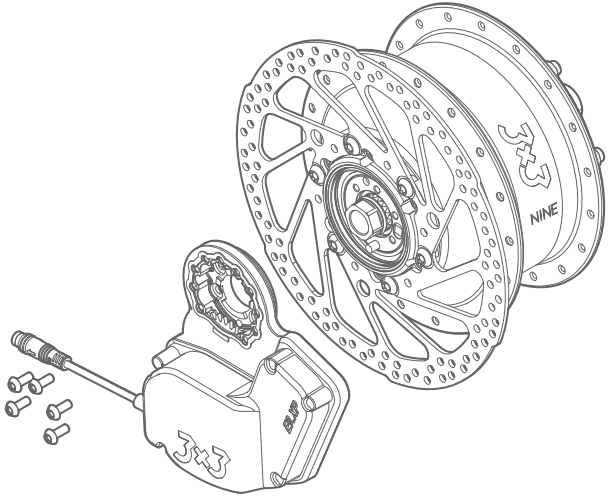


1. Loosen the hexagon socket screw that connects the trigger to the handlebar clamp.
2. Fit a new trigger to the handlebar clamp and screw in the hexagon socket screw. Make sure that the screw is tightened to the correct torque, see „6.7 Torques“ on page 30.

To replace the handlebar clamp, the grip must be removed. Follow the manufacturer's instructions.

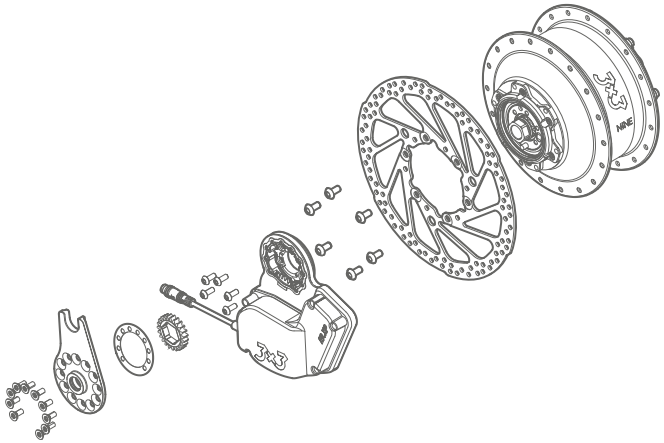
3. Loosen the clamping screw on the handlebar clamp. Check the shifter body (1) for damage.
4. Fit a new handlebar clamp by mounting the handlebar clamp on the handlebar using the clamping screw. Make sure that the clamping screw is tightened to the correct torque (see also „6.7 Torques“ on page 30).
5. The new trigger must then be paired with the actuator (see „4.6 3X3 Servicetool“ on page 13).
6. Check the function of the trigger and the control elements on the handlebar.
   = The trigger must not be restricted in its function and must not restrict other control elements (brake lever, etc.).

8.3 Replacing the actuator



1. Shift the gear hub into first gear.
2. Disconnect the cable connection on the actuator.
3. Dismantle the wheel. Observe the manufacturer's instructions.
4. Mark the position of the axle plate and the input wheel. This facilitates the reassembly.
5. Remove the axle plate.
6. Remove the input wheel.
7. Dismantle the actuator by loosening the five screws.
8. Install a new actuator (see „5.2 Mounting the E-Shift“ on page 19).

8.4 Replacing brake rotor



1. Dismount the actuator (see „8.3 Replacing the actuator“ on page 36).
2. Loosen the fixing screws and disassemble the brake rotor.
3. Mount the brake rotor („5.1 Mounting the brake rotor“ on page 18).
4. Mount the actuator (see „5.2 Mounting the E-Shift“ on page 19) and the axle plate (see „5.5 Mounting the axle plate“ on page 24).

8.5 Replacing the gearbox assembly

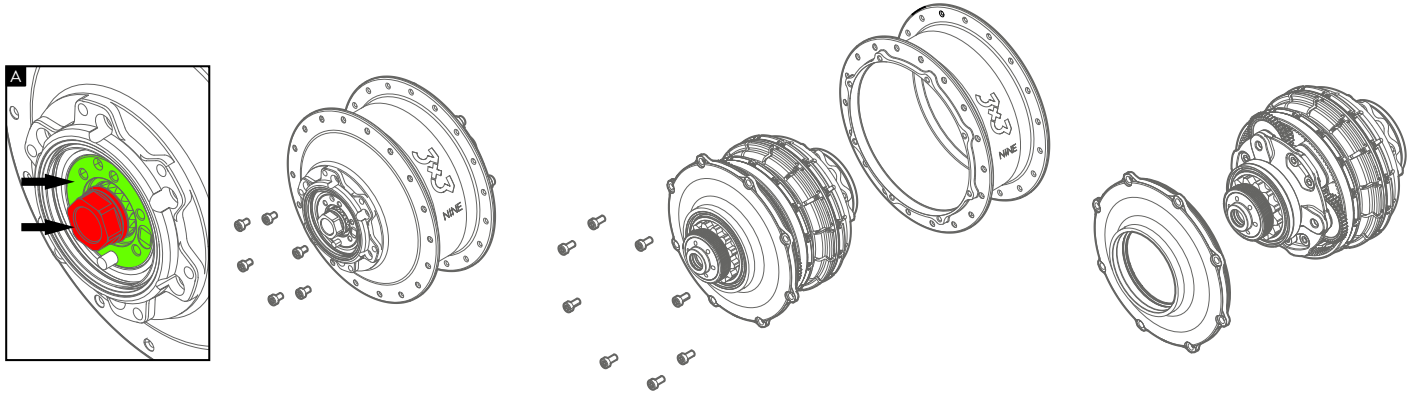
Required tools and materials	Specifications
torque wrench	effective range 2 Nm
cleaner	solvent-free cleaner, e.g. Muc Off
thread locker medium strength	Loctite 243

Preparations

1. Dismount the sprocket/pulley, see „8.1 Changing the sprocket / pulley“ on page 35.
2. Dismount the gear mech, see „5.2 Mounting the E-Shift“ on page 19.
3. Mark the axle plate position, then remove the axle plate.
4. Dismount the brake rotor, if needed, see „8.4 Replacing brake rotor“ on page 36.
5. The wheel can remain spoked.

Dismounting the gearbox assembly

1. Loosen and remove the six screws on the housing on the non drive side.
2. Loosen and remove the eight screws from the housing cover.
3. Remove the gearbox assembly from the hub shell by pressing lightly on the main axle (A/green) in the direction of the cover.
   - = Do not use a hammer or similar.
   - = Do not exert any pressure on the hexagon of the shift drum (A/red).
4. Remove the housing cover from the driver by hand. Avoid tilting the fit in the bearing seat.
5. Remove the rubber ring from the driver. This is reused in the new gearbox.
6. Pack the removed gearbox assembly to protect it from dirt.
7. Check the inside of the housing for dirt and clean it if necessary.
8. Check the sealing rings in the cover and housing for damage.

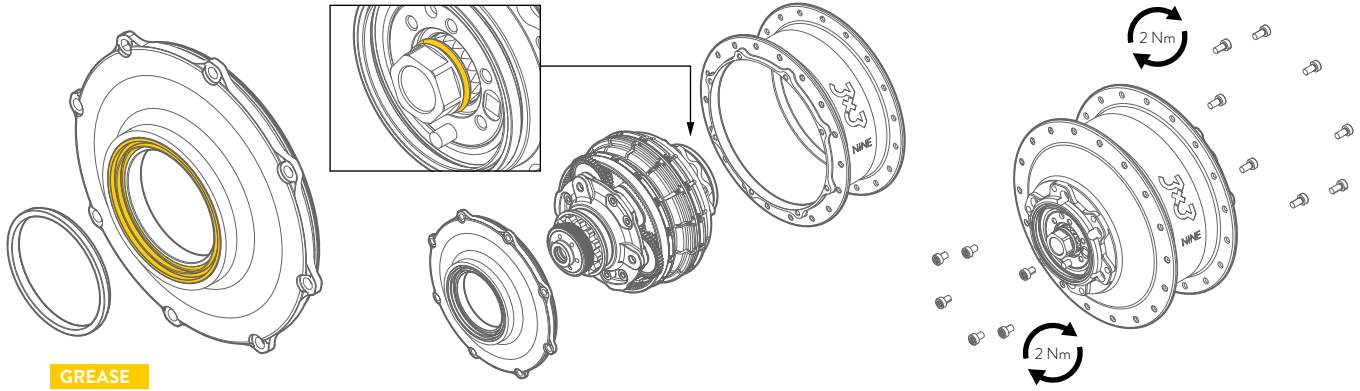


Fitting the gearbox assembly

1. Take the new gearbox assembly out of the packaging.
2. Scan the QR code on the gearbox assembly and on the hub shell and send the number to service@3x3.bike.
   = The new combination of hub shell and gearbox assembly is saved in the 3X3 service database.
3. Remove the aluminum ring from the housing cover and clean and grease the seal.
4. Slide the housing cover onto the driver. Push the bearing as far as it will go onto the fit.
5. Grease the O-ring and insert it into the groove of the driver of the new gearbox assembly.
6. Clean the aluminum ring and insert it into the housing cover. The chamfer of the aluminum ring points towards the hub.
7. Insert the gearbox assembly into the housing.
   = Turn the housing cover so that the holes and threads are on top of each other.
   = Make sure that the toothing of the output matches the toothing of the housing and that the six threaded holes of the output match the six holes in the housing.
8. Coat the eight M4x8 mm TX20 screws on the cover with medium-strength threadlocker and screw them into the threads on the brake rotor side.
   Check that there is no gap between the bearing and the housing. Tighten the screws crosswise to 2 Nm.
9. Apply medium-strength threadlocker to the six M4x6 mm TX20 screws on the driver and screw them crosswise into the housing cover. Check that the housing cover is fully inserted into the housing. Tighten the screws crosswise with a torque of 2 Nm.

Final steps

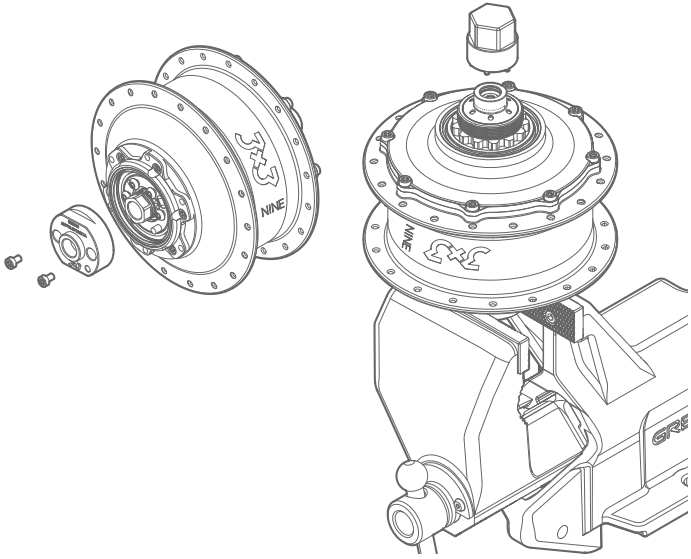
1. Install the sprocket/pulley, see „8.1 Changing the sprocket / pulley“ on page 35.
2. Install the gear mech, see „5.2 Mounting the E-Shift“ on page 19.
3. Align the axle plate using the previously set markings, then fit the axle plate.
4. If servicing is required, pack the old/defective gearbox assembly, contact the service and return it, quoting the service case number.



8.6 Replacing the adapter

Required tools and materials	Specifications
lacing adapter	000345 3X3 ADAPTER.SPOKE.QR 000346 3X3 ADAPTER.SPOKE.TA
adapter tool	000358 3X3 ADPTR.TOOL
torque wrench	effective range 2 Nm / 40 Nm

1. Dismount the actuator, see „8.3 Replacing the actuator“ on page 36.
2. Mark the axle plate position and remove the axle plate.
   If you convert from quick release to thru axle, a new axle plate is required.



Dismounting the adapter

1. Place the lacing adapter on the main axle and make sure that the torque pin is threaded into the hole provided.
2. Turn the two screws into the main axle and tighten them with a torque of 2 Nm.
3. Clamp the gearbox/wheel in a vise over the two flattened points so that the drive side is facing upwards.
4. Place the adapter tool on the adapter and unscrew the adapter counterclockwise using a 24 mm socket.

Mounting the adapter

1. Apply some grease to the sealing ring of the new adapter and screw the adapter into the driver by hand using the adapter tool until the sealing ring has completely disappeared into the adapter. Keep turning the driver slightly counterclockwise to prevent the sealing ring from tilting.
2. Tighten the adapter with 40Nm.
3. Dismount the lacing adapter.

Final steps

If the hub is not laced, no final steps are necessary.

1. Install the sprocket/pulley, see „5.6 Mounting the sprocket/ pulley“ on page 25.
2. Install the gear mech, see „5.2 Mounting the E-Shift“ on page 19.

NOTE: Note the position of the gear mech and axle plate.

NOTE: If you have converted from quick release to thru axle, a new axle plate is required.

9. Declaration of conformity

EU declaration of conformity	ETO GRUPPE MOTION TECHNOLOGIES

Das Produkt funkgesteuerter motorischer E-Bike Aktor, bestehend aus Aktor 143035-xx und Schalter 142729-xx, entspricht den Vorschriften des Gesetzes über elektrische Betriebsmittel für elektromagnetische Verträglichkeit (EMV) und der Richtlinie des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit:

RICHTLINIE 2014/30/EU DES EUROPÄISCHEN PARLAMENTS UND DES RATES (vom 26. Februar 2014)

The product wireless controlled motor drive E-Bike actuator, consisting of actuator 143035-xx and trigger 142729-xx, is conform to the regulations of the law of electrical equipment for electromagnetic compatibility (EMC) and the council directive for approximation of legal provisions on the hamonisation of the laws of the Member States relating to electromagnetic compatibility:

DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL (valid from 26th February 2014)

Durchgeführte Prüfung / *Test performed:*	**Norm / *Standard:***	**Ergebnis / *Result:***
Störfeldstärke / *Interference field strength*	DIN EN 55011:2022-05	i.O. / *passed*
Entladung statischer Elektrizität (ESD) / *Electrostatic discharge*	DIN EN 61000-4-2:2009-12	i.O. / *passed*
Hochfrequente Elektromagnetische Felder / *High frequency electromagnetic fields*	DIN EN IEC 61000-4-3:2021-11	i.O. / *passed*

ETO MAGNETIC Sp. z.o.o.
ul. Eugeniusza Kwiatkowskiego 7
52-407 Wrocław
POLAND

Stockach, den 14.03.2024

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ppa Lutz Mantsch

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i.A. Achim Riedle

CE

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