SPECTER

Workshop manual

Specter 1
Specter 1 - Long Range
Model year 2024

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1.Cockpit

1.1 Screen Disassemby

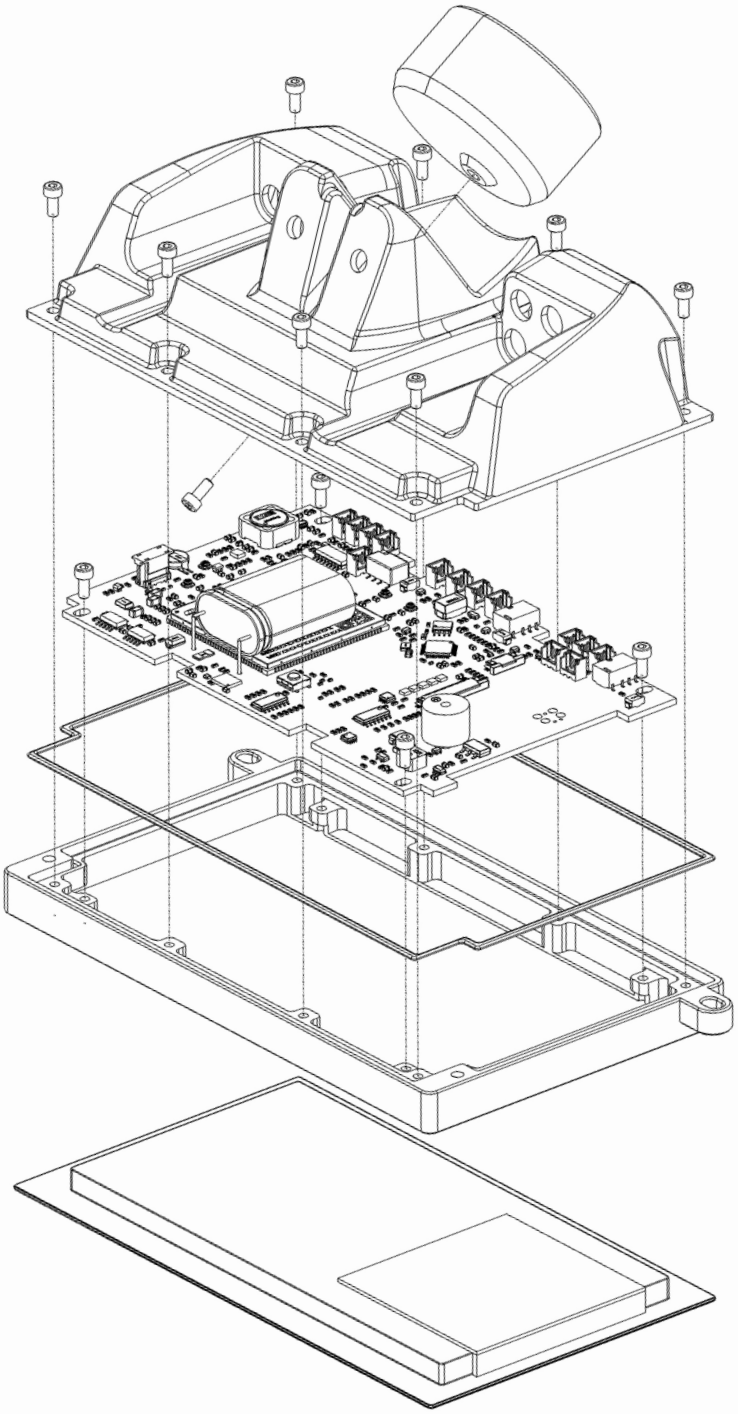
- Shut down the bike and/or remove the downtube battery
- Ideally wait for 20 minutes so the internal screen battery is completly flat
- Remove the 2 covers at the bottom of the handlebar that obscure the brake lines
- Remove the front light including the bracket, this is held in place with 2 M3 bolts at the back of the bracket
- Remove the 2 bolts at the bottom of the handlebar that hold the screen in place (M4)
- You can now pivot the screen in the handlebar
- Remove the connectors on the underside of the screen, take extra care to label the Blue Male connectors (4 pin connector) as there are 2 similar plugs that need to be connected in the correct order. It is recommended to leave the plugs on their respective sides
- Remove the M2,5 (8x) bolts that hold the back cover on to the display
- Pivot the cover slightly so you can see the M3 bolt that holds the horn into place
- Remove the M4 bolt holding in the horn, take care not to loose the rubber washer
- Important not to touch the circuit boards
- You can now remove the screen from the handlebar

1.2 Screen assembly

- Make sure the downtube battery is removed
- Open het back cover of the display unit and reconnect the horn, make sure you use the rubber washer to ensure water tightness (2,5 Nm)
- Close the display unit, make sure the seal in the metal part is properly fitted, tighten all 8 M2,5 bolts in a cross pattern, hand tight
- Place the display unit in the handlebar so you can pivot into place later
- Reconnect the connectors, take extra care with the Blue (4 pin connectors) that they are in the correct order. If you are unsure about the connections, never push the buttons with the LED rings as this can cause a short circuit if they are not connected in the correct order. (see diagram 1.3)
- Once all connectors are reconnected it is suggested to test if everything works in the following manner:
    - Place the main battery (check beforehand if it is charged by pressing the button on the screen)
    - Wait for the screen to boot without touching any of the buttons
    - Both LED rings on the large buttons should light up, if this is not the case, the connectors have not been installed in the correct order. **DO NOT PUSH any of the buttons**

- Install the display into the handlebars, taking extra care that all the wires are not getting trapped.
- Once the display is in place, mount the 2 M4 bolts (3 Nm)
- Reassemble the front light unit, 2x M3 (2,5 Nm)
- Reassemble the 2 covers after making sure the cables are inside the handlebars (2,5 Nm)

Warning
Maintenace work on the circuit boards or display should be carried out by Specter or a Specter Certified Workshop



1.3 Screen Connectors Diagram

1. Motor brake (Red Male, 2 pin)
2. Brake Signal Left (Red Female, 2 pin)
3. Brake Signal Right (Red Female ,2 pin)
4. Big button Left (Blue Female, 4 pin)
5. Motor communication (Purple Male, 6 pin)
6. Lights (Blue Female, 4 pin) ⚠
7. Small buttons right (Blue Male, 4 pin)
8. Big button Right (Blue Female, 4 pin) ⚠

Warning
Connecting the pins in the wrong order can result in short circuit which can cause display failure. Always mark the 4 pin blue connectors (6 and 8) to assemble them in the correct order

It's recommened after reconnecting, to install the main battery and not to touch any of the buttons, the bike will start up automatically if the battery has enough charge. If one or both of the LED rings on the big buttons is not working, the connections are wrong and pressing the button will result in a short circuit. If the bike doesn't start up by it's self, it's recommened to check the connections

2.Handlebar

2.1 Tighten header series

- Remove plastic cap by pulling it outward on the underside
- Loosen the 4 M6 bolts without removing them (1 or 2 turns)
- Tighten the top bolt (T30) untill te required tension is achieved
- To check the header series tightness, turn the wheel 90° and with the front brake activated move back and forward the bike. If there is a knocking sensation the header needs to be tightened.
- If ok make sure the handlebar is straight in relation to the wheel
- Tighten the 4 M6 bolts (10 Nm)
- Reinstall the cap

2.2 Removing the handlebar

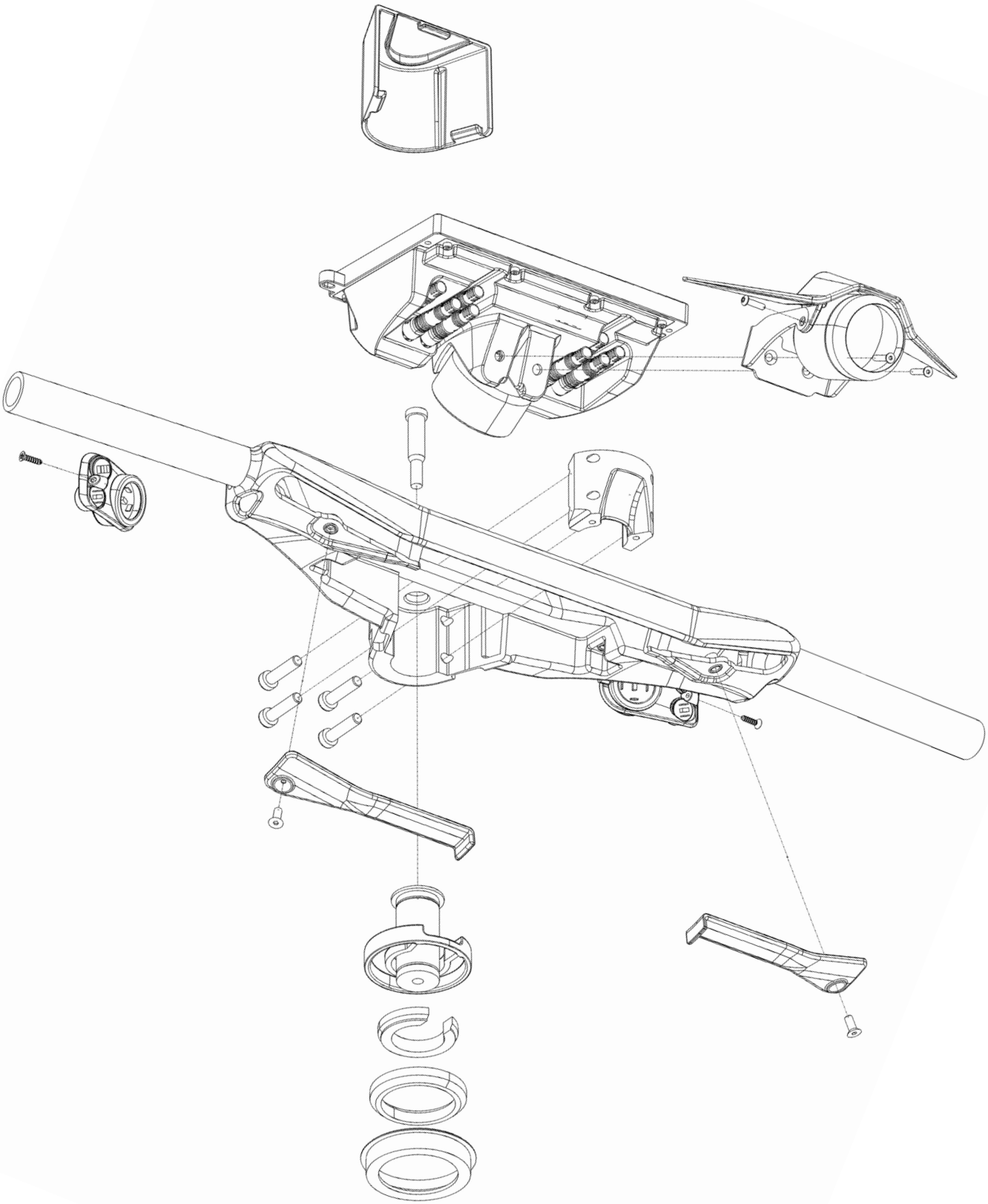
- Remove the display unit by follow steps described in 1.1
- Remove the brake leavers so they can hang loose, the brake lines don't need to be disconnected
- Remove the top cap
- Remove the 4 M6 Bolts
- Remove the 2 cables that run through the handlebar (Purple Female 5 Pin and Blue Male 4 pin), the cables for the buttons etc can stay on the handlebar
- Lift the handlebar free

2.3 Installing the handlebar

- Make sure you have the following elements fitted before starting
    - Make sure the fork is properly fitted (top and bottom bearings, C ring, etc)
    - Fork expander
    - Fork claming system, can be loosely fitted
    - Cables are not pinched in C clamp

- Run the 2 cables that run through the handlebar (Purple Female 5 Pin and Blue Male 4 pin)
- Mount the handlebar onto the clamping system, loosy fitted
- Install the display unit (See 1.2). While doing this you need to check the cables and brake lines have ample freedom of movement. Before reassembling the covers, mount the brake levers and then assemble the bottom covers
- Straighten the handlebar
- Tighten the header series
- Tighten the 4 M6 Bolts, (10 Nm)
- Reinstall the top cap

2.Handlebar



3. Front Fork

3.1 Removing the front fork

Specter 1:
- Remove the handlebar, see 2.2. It's possible to leave the power cables inside the handelbar if you don't intend to replace these.
- Remove the handlebar clamp by removing the top bolt
- Remove the fork expander
- Disconnect the brake line from the front brake lever
- Remove any rings at the top of the fork untill you can see the bearing an C-ring
- Carefully press down the fork until it not held by the top bearing
- Pull the fork from the frame and guide the front brake line through
- Made sure you don’t catch any of the connectors

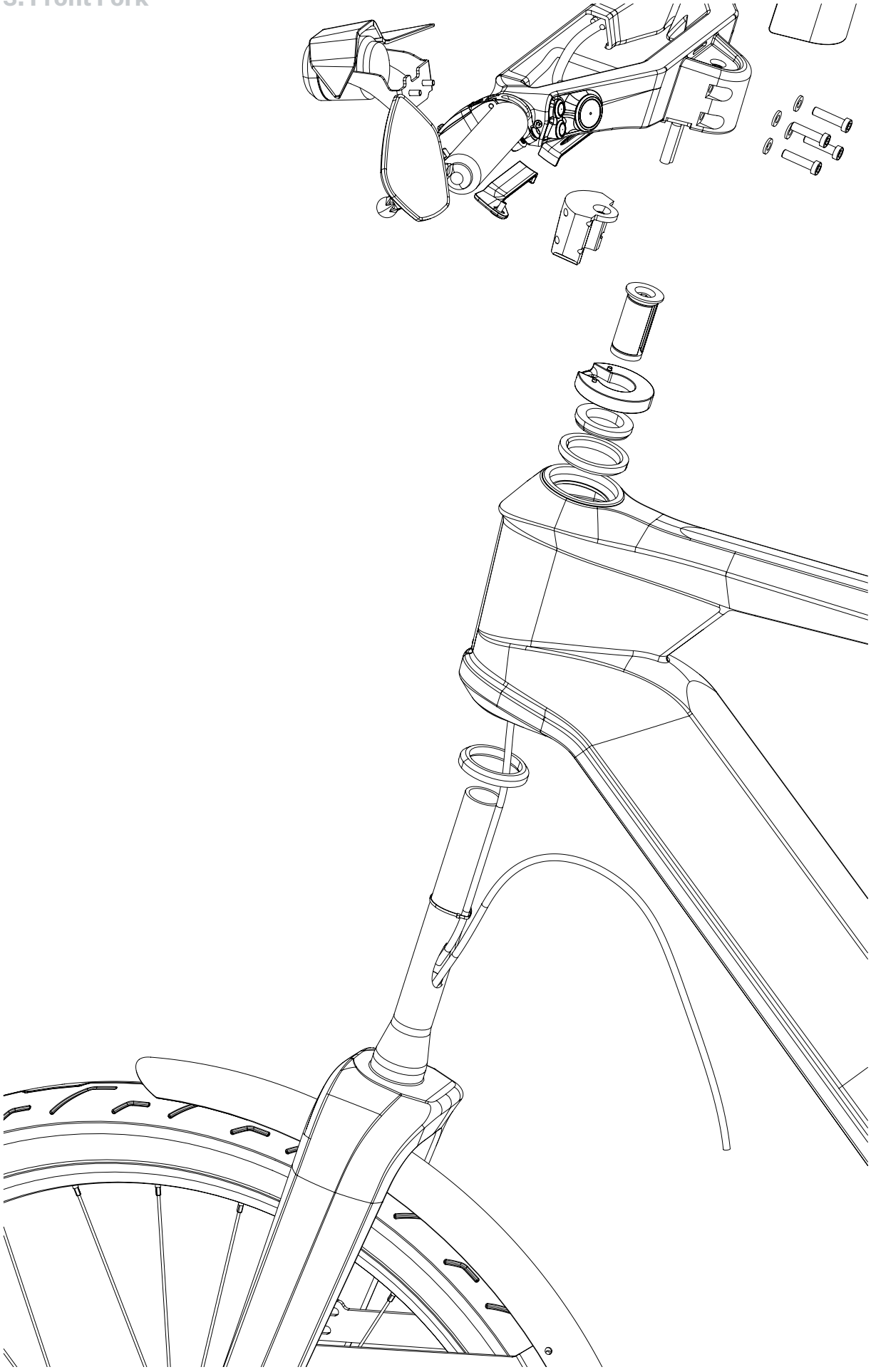
Specter 1 - Long Range
- Same proces but the Long Range models have an additional motor cable going inside the front fork. The fork can be removed with this cable connected, but the cable will still be attached to the bike. If you want to remove the fork completly there are 2 options:
    - Cut the front motor cable (Disconnect mid battery first! see 4.4)
    - Disconnect the cable on the battery side (see 4.4)

3.1 Reinstalling the front fork

Specter 1:
- Make sure all bearings, crown race, etc are installed
- Guide the fork and front brake line through the frame
- Once through Slide the C-ring over the fork and push it into the bearing. Be carefull no cables are pinched and that they can move freely
- Add the other rings and caps over the fork stem
- Insert and tighten the fork expander
- Place the clamping system in place with the top bolt to secure the fork. No need to tighten it too much at this point
- Reinstall the handlebar (M6)
- Tighten the head series (T30)
- Torque the handlebar bolts to (M6) 10 Nm
- Reconnect the brake line
- Bleed the brakes
- Reinstall the cover over the brake line
- Reinstall the top cap

Specter 1 - Long Range:
- Same proces
- If you have cut the power cable you have to resolder the wires, make sure the mid battery is disconnected
- Make sure your connection is not in a place where it will be stressed (close to the fork hole)
- Resolder the wires by matching the color and thickness
- Use shrinking tubes on every wire and at the end a larger one over all the wires
- Recalibrate the engine via the service menu (see Calibration chapter 8)

3. Front Fork



4. Batteries

4.1 Removing the main (downtube) battery (1)

- Turn the wheel for better access
- Insert the key into the lock
- Hold het battery at the bottom (2)
- Turn the key (3), the battery should come loose
- The battery should drop down into your hand, if not slightly pull it back

4.2 Installing the main (downtube) battery (1)

- Take the key (3) out of the lock
- Insert the battery with the top part (4) first, slide it upward until you feel it's inside the catch
- Lift the bottom part of battery (2) into the frame
- You should hear a noticable 'click', if you don't hear this the battery is not secured and could fall out while riding!
- If you are unsure if the lock has clicked, you can try by pulling the battery back out, this should not be possible without turning the lock

4.3 Removing the mid battery (5) (Long Range, only for service)

- Remove the main battery (see 4.1)
- The mid battery is held on by 2 screws in the downtube (T25), remove these
- Lift the battery up at the top part and pull it out of the frame
- The cables will still be connected at this point, for furth disassembly see 4.4

Warning
Never turn the battery key without holding the battery, it could fall out resulting in damage. Always make sure you hear the lock click when reinstalling.

Warning
Always take out the key of the lock before inserting th e downtube battery, make sure you hear a click

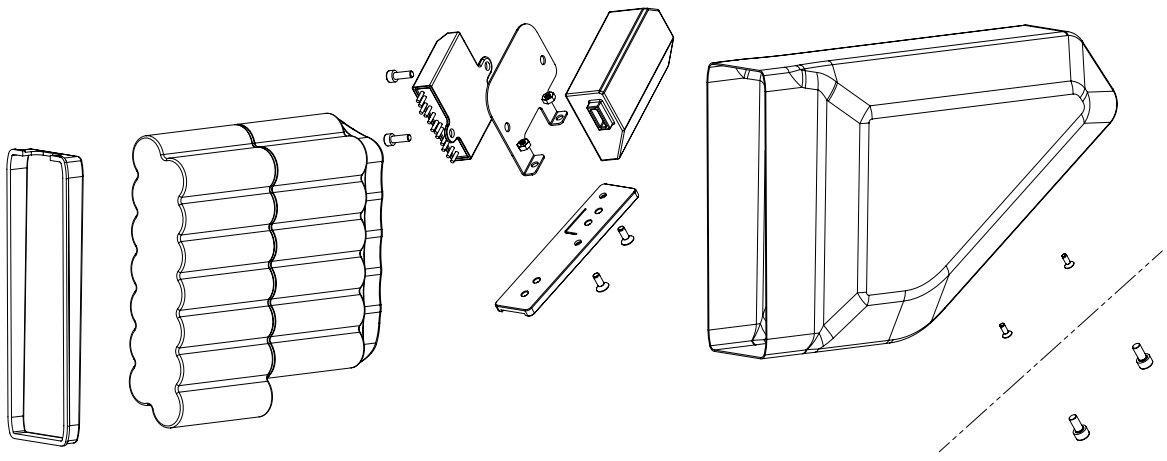

1
2
3
4
5

4.4 Disassembling the mid battery and components

- Follow steps described in 4.3
- Remove the cover at the back of the box, first remove the water seal at the top
- Remove the water seal at the bottom of the box
- Remove the 2 screws at the bottom of the box (T10 or T20)
- Remove the battery (carefully shake the box to make it slide out)
- Disconnect the battery (2 connectors) from the wireloom
- Disconnect the charging port
- Disconnect the charge ballancer
- Disconnect the hall fases (yellow XT connector) from the controller
- Disconnect the JST connector from the controller

4.5 Assembling the mid battery and components

- Reconnect all connections
- Place the controller with bracket back into the right position, use the acces hole at the bottom to position it and rescrew the 2 bolts to hold in place
- Slide the battery back into the box (taking into account the shape), make sure all the cables run at the side were the there is a hole in the back cover. If the battery cannot move forward enough, rearrange the cables
- Remount the back cover
- Remount the water seal at the top part of the back cover
- Remount the water seal at the bottom of the box, make sure the box can move freely over the frame. If needed use a new self adhesive seal (EPDM)
- Place the box back into the frame, be carfull not to damage the paintwork. Guide the wires at the back to sit inside the back cover
- Reinsert the screws in the downtube (T10 or T20) (3 Nm)



Warning
Make sure no wires are pinched while re-assembling. This can result in short circuits and controller faillure

4. Batteries

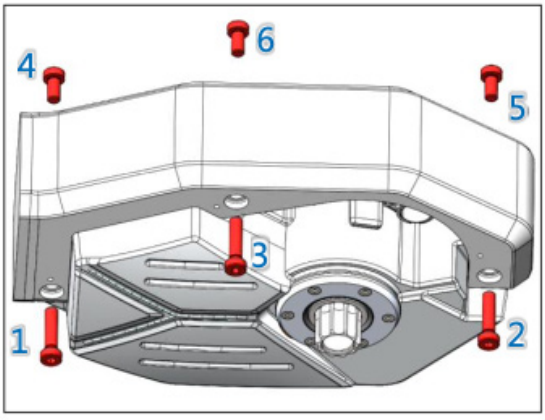
5. Motors

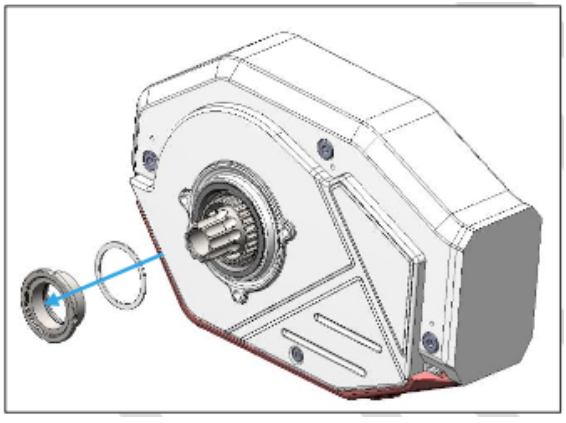
5.1 Removing the mid motor

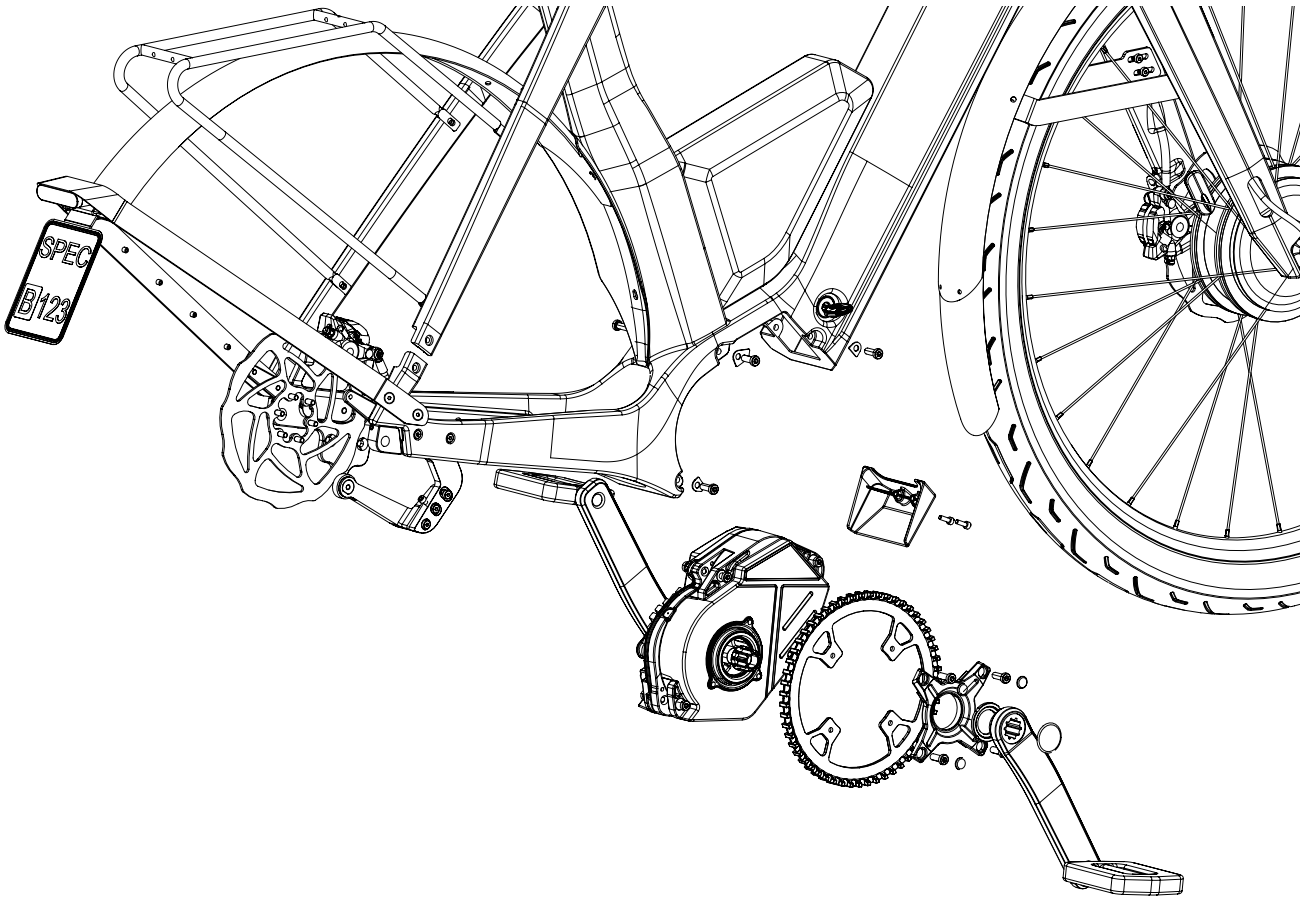
- Remove the downtube battery
- Loosen belt tension (see Wheels 6.1)
- Remove drive side crank arm with a crank puller
- Remove the spider usings the specific spider tool, this nut has reverse tread
- Remove the 6 engine bolt (M6)
- Reinsert the longest or other M6 bolts in the drive side and tap them with a hammer to slide bak the internal bushings
- Once you remove those bolts the engine should drop out
- Be careful not let the engine hang on the connectors
- Remove all connectors starting with the battery (largest plug)

5.2 Mounting the mid motor

- If needed tap the bushings on the drive side back to flush
- Reconnect all the connectors, the connectors are labeled and so are the sockets
- When pushing the engine back into the frame, be carefull to guide all wires and make sure none of them are pinched between the frame and engine
- Once you have the holes lined up you can insert the bolt by hand and tighten them slightly
- install all non-drive side bolts (M6), front, back, top and torque to 10 Nm (do not use locktite)
- install all drive side bolts (M6), front, back, top and torque to 10 Nm, this will make the bushings in the engine move to mount flush to the frame (do not use locktite)
- Reinstall the spider (reverse tread) and torque to 40 Nm
- Reinstall the drive side crank and torque to 40 Nm
- Retension belt (see Wheels 6.1)



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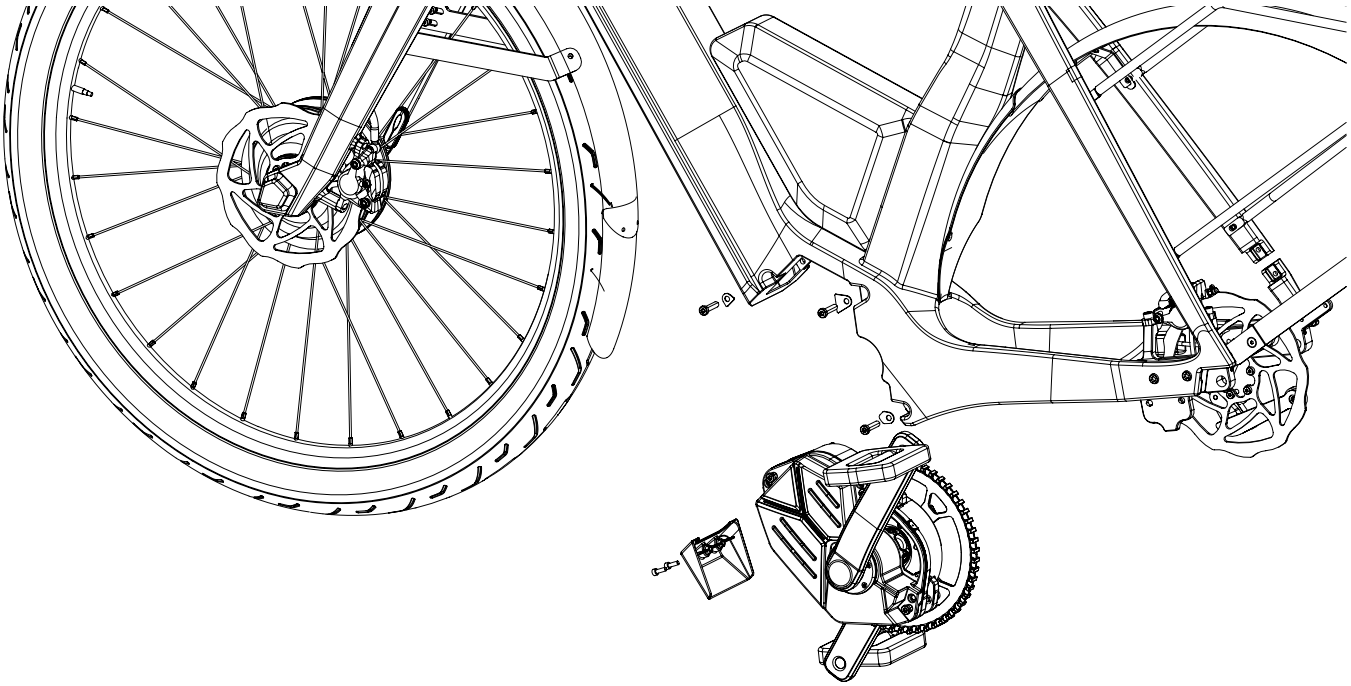
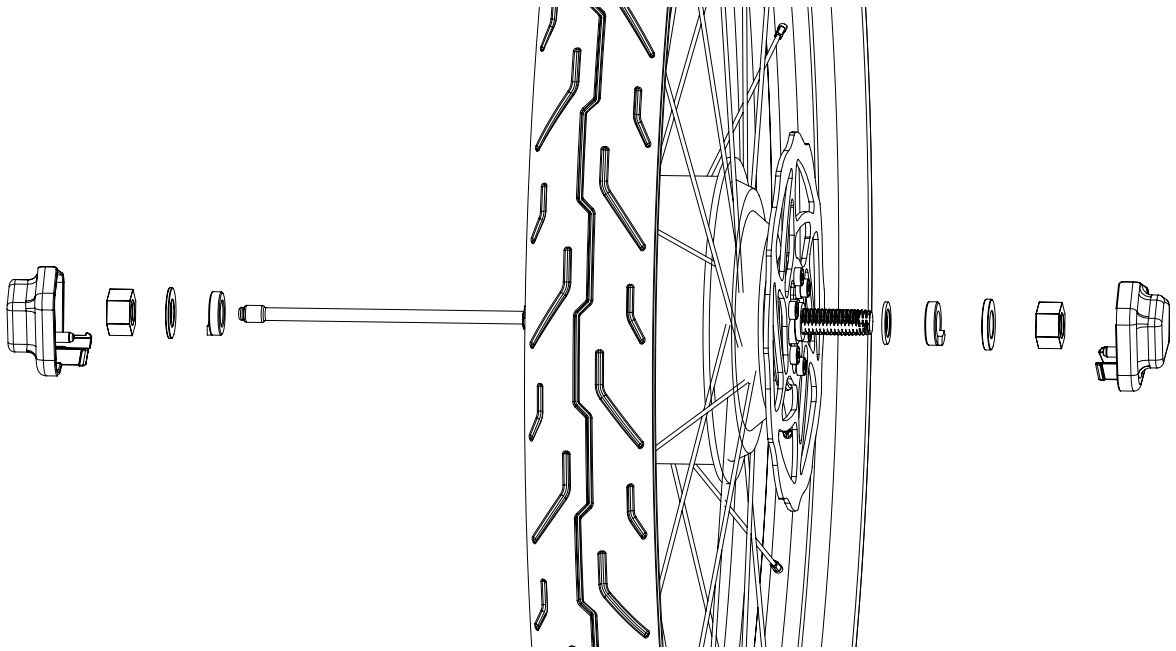


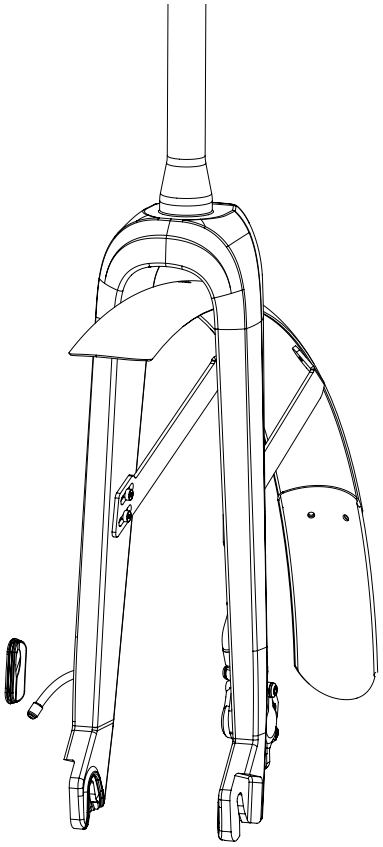
5.3 Removing the front motor (Long Range)

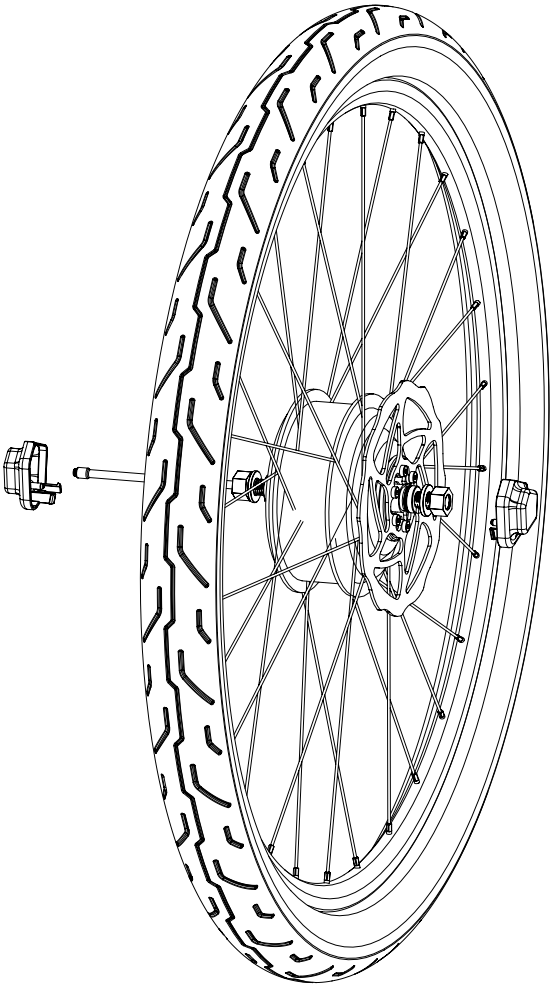
- Recommended to shut down the bike
- Remove the rubber grommet around the motor cable
- Pull back the motor cable and disconnect the plug
- Remove the caps on the axles
- Loosen both nuts on the axle (M18)
- Slide the wheel out of the axle

5.4 Assembling the front motor (Long Range)

- Add all the spacers on the axle:
  - Notched spacers on the inside of the fork legs
  - 1 round spacers between the notched on disc side of the engine
  - rond spacer on both sides between the fork and the nut
- Place the fork over the engine, using the weight of the bike to make sure the axle is completly at the highest point in the fork
- Tighten the nuts no at least 25 Nm
- Reconnect the engine connecter (check arrow for alignment)
- Feed the cable back into the fork (might require some ‘loops’)
- Reinstall the grommet
- Reinstal the axle caps







6. Wheels

6.1 Removing the rear wheel

- Remove the 2 bolts (T25) of the belt retainer, loosen the 3rd bolt
- Loosen the adjusting screws at the back of the dropout (both sides
- Loosen the 4 dropout bolts (M6) (1 turn)
- Push the wheel forward and remove the belt from the front sprocket
- Disconnect the connector on the gearbox
- Remove the 2 axle bolts
- Pull back the non drive side spacer to free the wheel
- Take out the wheel

6.2 Installing the rear wheel

- Put the wheel back into the frame make sure the belt is in between the belt retainer
- Insert the 2 axle bolts
- Push the non drive side spacer back
- Tighten the axle bolts (12 Nm)
- Tighten the adjusting screws to get the correct belt tension (use Gates Belt tension tool) and wheel alignment (make sure the will is straight in relation to the chainstays)
- Tighten the 4 dropout bolts (M6) (9 Nm)
- Recheck the belt tension, we suggest to put it at the maximum of the range provided by gates as the belt will stretch over time
- Reinstal the belt retainer screws and use the adjustor screw to make sure the bearing is 1mm below the belt (use a feeler gauge), belt retainer bolts (7 Nm)

6.3 Removing the front wheel

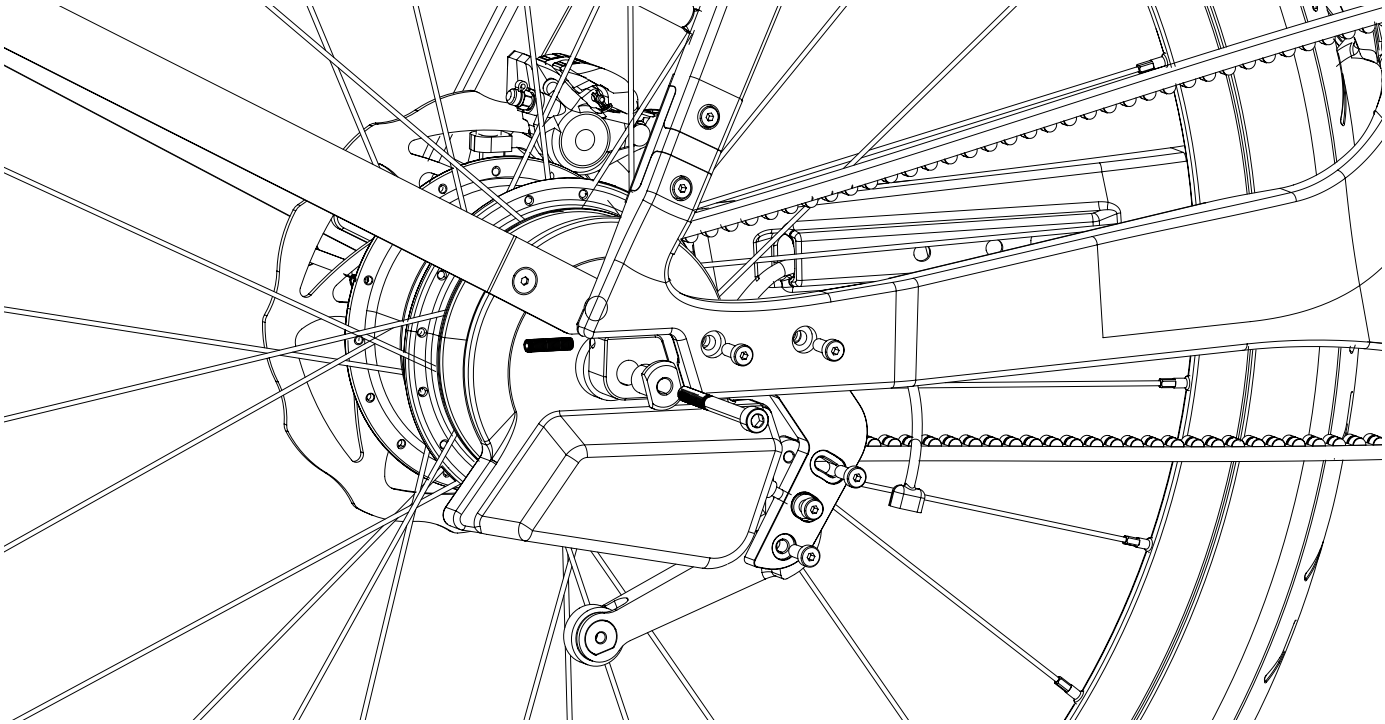
- Specter 1, remove the front axle
- Specter 1 - Long Range, see 5.3

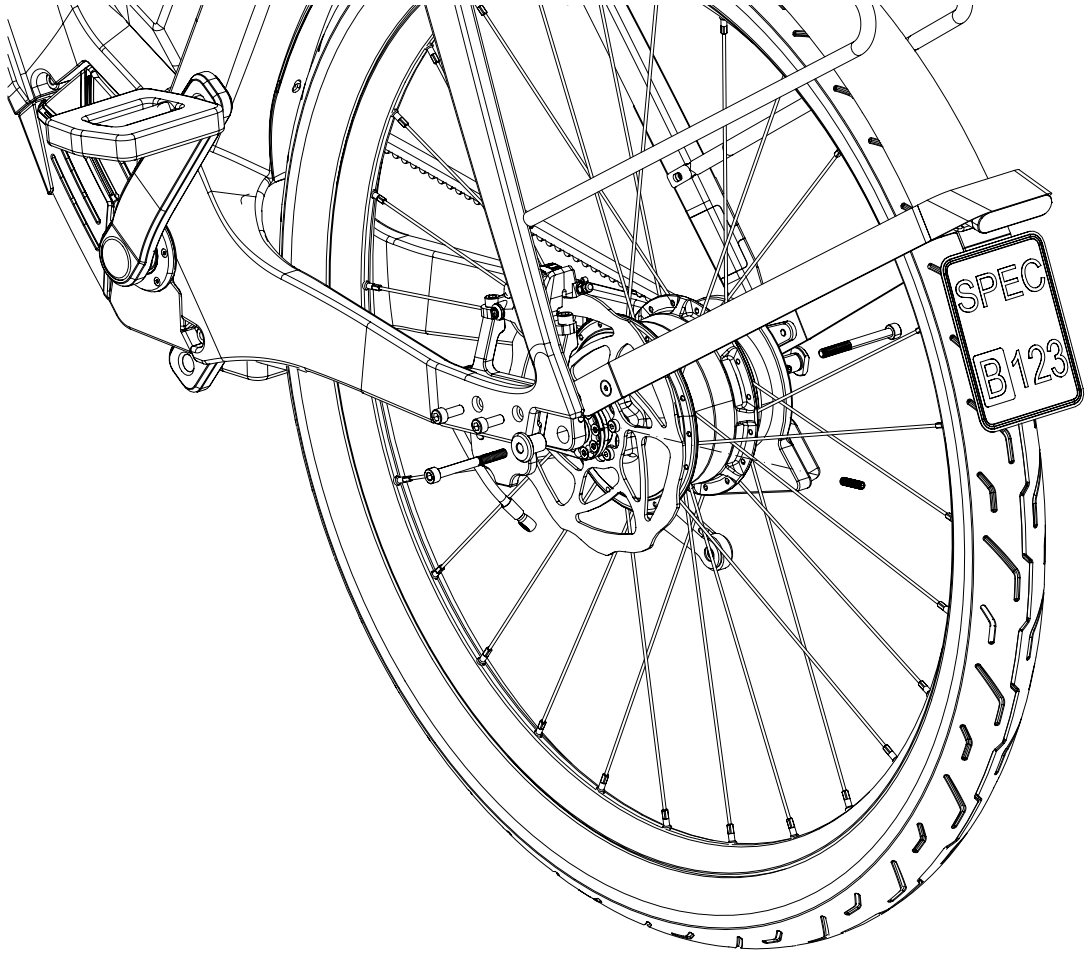
6.4 Installing the front wheel

- Specter 1, place the axle and torque to spec noted on axle
- Specter 1 - Long Range, see 5.4
- Check brake disc alignment

6.3 Changing tires

- Follow the instructions to remove the wheel (5.3 and 6.3)
- Remove outer tire using tire spoons
- Remove the inner tire
- Check the inside of the outer tire for any sharp objects
- install the new inner tire
- Install the outer tire
- Recommended tire pressue 2,5 bar
- Reinstall the wheels following the instructions (5.4, 6.2 and 6.4)

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7. Belt drive

7.1 Adjusting the belt

- The belt tension can be adjust using 2 adjusting screws in the rear dropout (see drawing chapter 6).
- Loosen the 4 M6 bolts on the dropouts (1 Turn)
- Adjust the belt tension and measure the belt tension with a Gates tension tool
- We recommend to adjust it to the top part of the green zone on the tool
- Make sure the wheel is straight inside the frame
- Tighten the dropout bolts (9 Nm)
- Adjust the belt tensioner (see 6.2)

7.2 Replacing the belt

- Release the tension on the belt (see 6.1) and take it off the front sprocket
- Remove the section from the drive side chainstay (M5 or M4)
- Remove the rear light holder from the drive side dropout (M5)
- Remove the belt
- Install the new belt, the text on the belt should be readable if you are standing on the drive side of the bike
- Reinstall the rear light holder
- Reinstall the frame cutout (9 Nm)
- Tighten the belt (see 7.1)

7.3 Maintenance

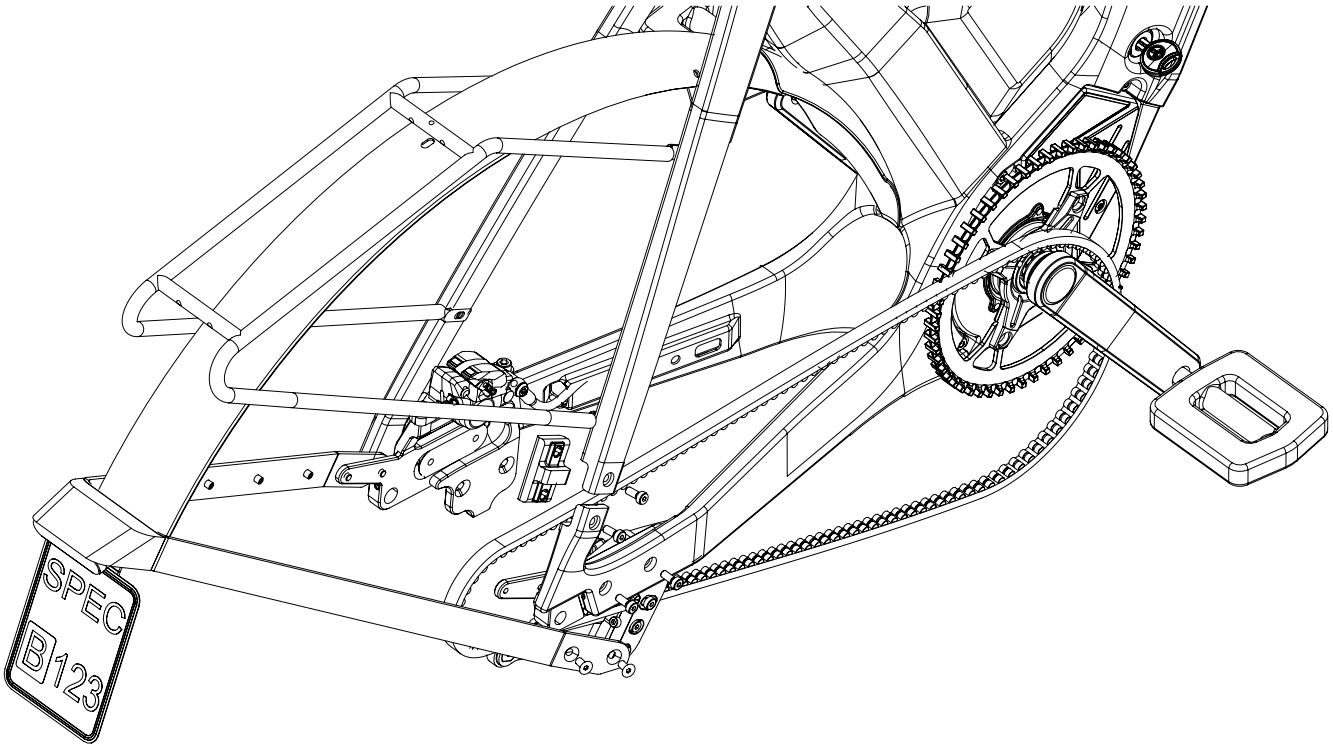
- Always check for wear on the belt (if there is damage on the side of the belt it should be replaced)
- If the belt makes noise, start by cleaning it
- Replace belt every 10.000 km or when you see visible damage

7.4 Belt skipping

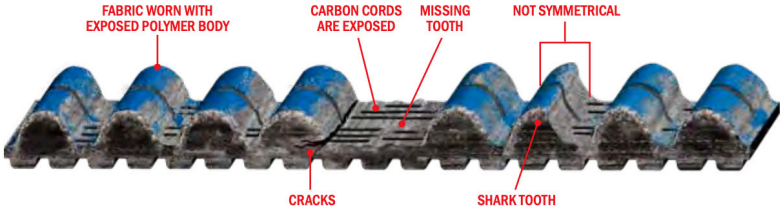
- If the belt skips, it wll make a loud sound under acceleration. This reduces belt life. If everything is correctly mounted, there should not be any belt skipping
- Check the belt tension with the belt tool
- Check if the belt retainer is at the correct distance to the belt (1 mm)

Warning
Never mount or force the belt by placing it on the sprocket and turning the crank, this will result in structural damage on the belt and will reduce the lifetime.

7. Belt drive

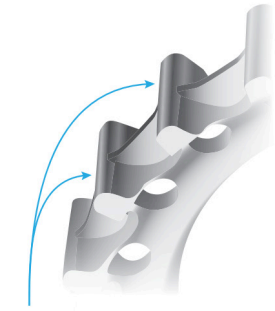


This belt is in **excellent condition**. Loss of blue color does NOT indicate wear.

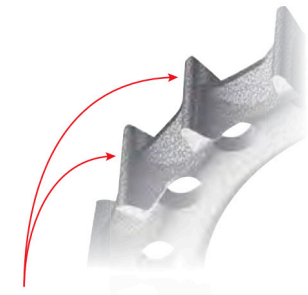


Replace your belt when it shows these signs of wear and tear.

WARNING: Using a worn or damaged Carbon Drive belt or failing to properly inspect the Carbon Drive belt before each usage can result in property damage and serious bodily injury, including death.



This sprocket is in **excellent condition**.



Replace your sprockets when the teeth become worn.

8. Brakes

8.1 Replacing the brake pads

- Remove the caliper (M6)
- Replace the brake pads, use copper grease at the back of the pads if required
- Reinstall the caliper (M6), use treadblock, (7 Nm)

8.2 Bleeding the brakes

- Check TRP user manual

8.3 Disc rubbing

- Due to heat cycles, the disc's can warp, this can be adjusted using a disc straightner

8.4 Swapping the front and rear brake lever

- Only allowed in certain markets, please check the applicable law
- Remove the covers from the bottom of the handlebar (M3)
- Remove the brake line caps
- Remove the brake lines from both levers (M8), it can be easier to also remove the lever
- Remove the old olives and compression parts
- Install new olives and compression rings
- Screw the brake lines back in place
- Bleed the brakes (see 8.2)
- Reinstall the brake line caps
- Reinstall the covers on the bottom of the handlebar (M3)

8.5 Changing the disc brakes

- Procedure similar for both wheels, the discs are the same size
- Remove the old disc brake by removing the 6 bolts
- Remember which spacers go where, both front and rear discs have Spacers, only the regular Specter 1 Front wheel doesn't have any spacers
- Install the new disc
- Install the 6 bolt's (M5), use blue locktite, tighten to at 8 Nm
- Reinstall the wheels (see chapter 6)
- Check disc aligment and bleed brakes if required (see 8.2 and 8.3)

Warning
It's critical that the brakes are well maintaned, properly bled and checked before riding the bike at any speeds.

Bleeding The Brakes

- Place the bike in a work-stand, setting the lever so that the reservoir is parallel to the ground.
- Remove pads,
- Insert a disc brake piston setting tool or other non-sharp tool and push the pistons back into the caliper.
- Using a T15 Torx, remove the reservoir bleed plug. Set aside.
- Install the knurled bleed fitting supplied with the bleed kit into the reservoir port. Firmly attach a long plastic tube over the bleed fitting, placing the other end into a clean, dry empty bottle or plastic bag.
- Fill the syringe halfway with brake fluid. Hold the syringe vertically with the tip up and tap out any air bubbles.
- Secure the oil-filled syringe hose to the bleed valve on the caliper.
- Use a disc brake piston setting tool or equivalent spacer to keep the pistons from moving.
- Loosen the bleed valve 1/8-1/4 turn or remove the bleed cap
- While holding the pistons in place, start filling the brake with new mineral oil by pushing the syringe. Air bubbles may come out of the reservoir. Continue pushing fluid until you no longer see bubbles coming out of the tube.
- Close the caliper bleed valve. Tighten to 0.3-0.5Nm (2.8-4.3in lbs.)
- Remove the syringe.
- Repeatedly squeeze the brake lever a few times. You may see a few more bubbles come up. The action should feel stiff and not spongy.
- Remove the knurled bleed fitting.
- Replace reservoir bleed plug. Tighten to 2-4Nm (18-35 in-lb.)
- Wipe off any excess oil from the lever and caliper body.

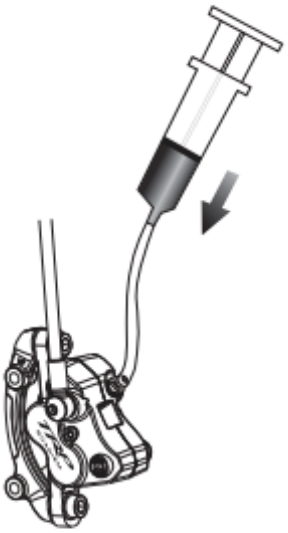


Fig. 5

ITEM	TORQUE
Disc / Rotor Screws	6- 8 Nm (53 - 71 in-lbs)
Handlebar Master Cylinder Clamp Screw	5 - 7 Nm (44 - 62 in-lbs)
Master Cylinder Hose Retainer Bolt	5 - 7 Nm (44 - 62 in-lbs)
Master Cylinder Bleed Screw	0.6 - 0.8 Nm (5.3 - 7.0 in lbs)
Reservoir Cap Screw	0.5 - 0.6 Nm (4.4 - 5.3 in lbs)
Adapter Bolts	6 - 8 Nm (53 - 71 in lbs)
Lever Pivot Pin	0.5 - 0.6 Nm (4.4 - 5.3 in lbs)
Caliper Mount Bolts	6 - 8 Nm (53 - 71 in lbs)
Banjo Hose Connection - Caliper	6 - 8 Nm (53 - 71 in lbs)

PROBLEM	POSSIBLE CAUSE	SOLUTION CORRECTIVE ACTION
Lever falls to handlebar	Air in system System leak	Re-bleed look for leak and See "fluid loss"
Disc rotor rubbing on pads	Caliper not centered Inadequate clearance Bent disc / rotor	Re-center caliper over disc Push pistons back Replace disc / rotor
Spongy lever	Air in system	Re-bleed
No braking power	Dirty disc / rotor Contaminated pads	Clean disc / rotor with alcohol Replace pads
Fluid Loss	Banjo leaking Hose leaking Master cylinder cap leaking	Replace hose Tighten hose nut Replace hose Tighten cap screws

9. Calibration

9.1 Calibrating the front motor

Whenever the front motor connector is disconnected, the front motor is replaced or the display gives a warning "critical front motor error", it is required to recalibrate the front motor

- Put the bike in a bike stand so the wheels can move freely
- Make sure the bike is charged and doesn't display the warning 'full power available after charging'
- Go to the about menu on the bike
- Select Service
- Enter the service code (set by Specter, available on request)
- Select 'calibrate front engine'
- Select ok if you are sure the wheel can move freely
- The engine will run by it's self an calibrate
- If succesfull, you can save the calibration
- Exit the service menu by locking and unlocking the bike

9.2 Calibrating the gearbox

If the gearbox is not responding as expected, you can recalibrate it.

- Turn the assistance to "OFF"
- Download the Enviolo app on your phone
- Long press the illuminated button on the Enviolo gearbox
- Connect to the Hub via the app
- Select calibrate
- Turn the cranks for as long as the app requires you to do so

9.3 Update gearbox firmware

- You can update the gearbox via the same Enviolo app, connect as described in 9.2
- Choose update firmware
- Wait for the firmware to install

10. Seatpost

10.1 Adjust Standard carbon fibre seatpost

- Always use carbon grease around the seatpost
- To move the seat up and down, loosen the M5 bolt in the frame
- Adjust to the right hight
- If required, shorten the seatpost to make a lower position possible
- minimum insert depth 70mm
- Torque the bolt to 9 Nm

10.2 Adjust saddle on standard seatpost

- The saddle can be adjusted using the lock bolt (M6)
- Loosen the bolt and move the seat (back/forth/angle) in the desired position
- When installing a new saddle, use carbon grease in the mounting
- Troque the bolt (M6) to 12 Nm

10.3 Installing the supended seatpost (Flybridge)

- Use the correct type (300mm or 350mm) so you have at lease insert depth of 100mm
- Install the front and back spacer using ample carbon grease (angled part at the top)
- Position the seatpost at the correct height
- Move the spacers so the angled line sits below the angled line on the seatpost (see drawing
- Torque the frame bolt to 9 Nm (with the spacer it is allowed to over tighten this to max 11 Nm)
- Mount the cover using the plastic push screws
- Check clearance

10.4 Installing or adjusting a saddle on the Flybridge

- Remove the cover by taking out the 4 plastic push screws
- Loosen the 2 M5 bolts below the saddle
- To replace the saddle you might need to take the bolts out completly
- Use the bolts to angle and lock the saddle into place
- Reinstall the plastic cover

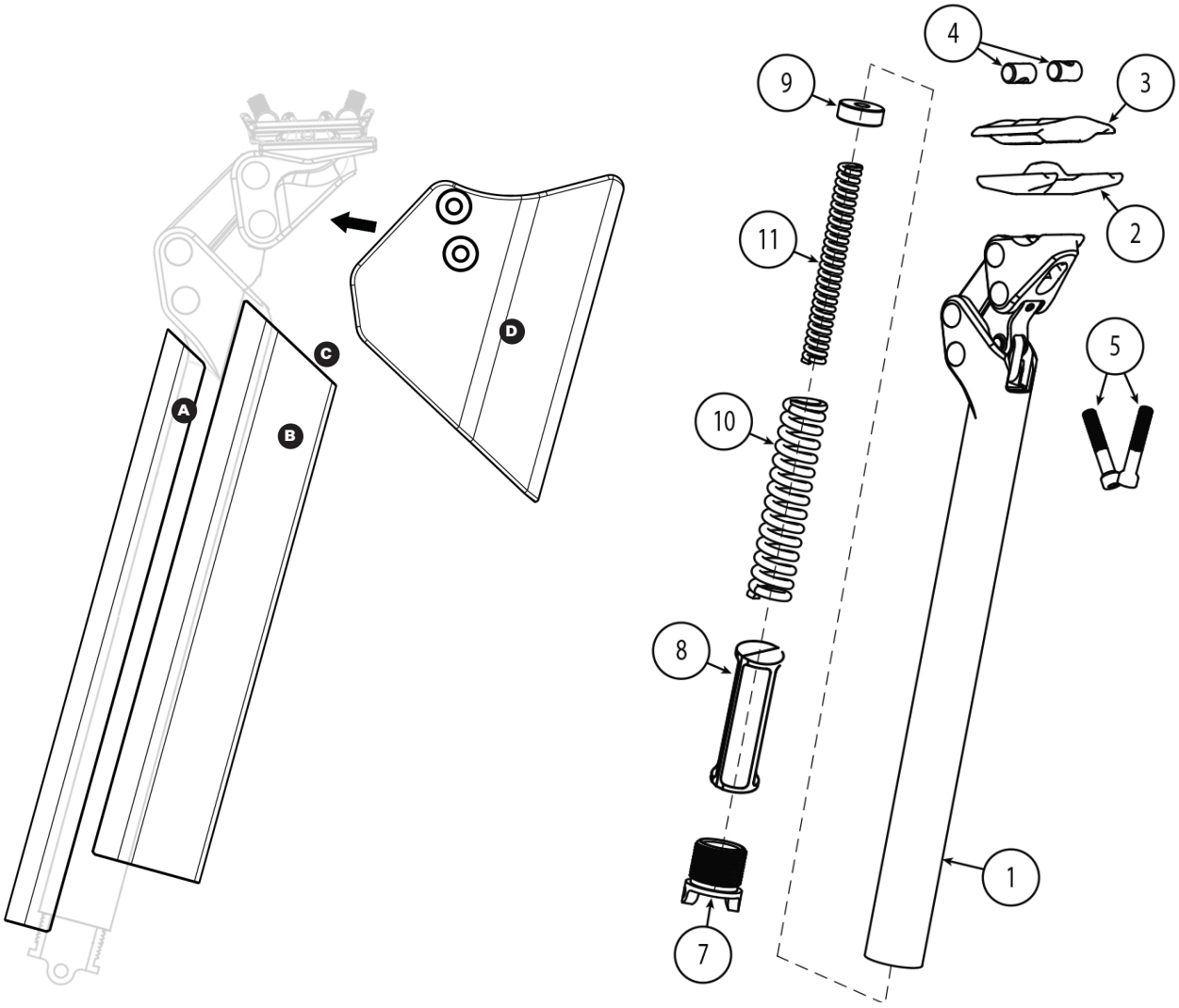
10.5 Ajusting the dampening on the Flybridge

- Remove the seatpost
- Change the pretension by turning the screw at the bottom
- For higher weights you can install a second spring, unscrew the bottom and insert the second spring
- Screw back to the desired setting
- Reinstall the seat post as described in (10.4)

WEIGHT	SUGGESTED PRELOAD RANGE		
	COMFORT (SOFTER)	◄·····►	PERFORMANCE (FIRMER)
< 110 lb < 50 kg	Main Spring Only Preload #1	◄·····►	Main + Inner Spring Preload #2
110-150 lb 50-70 kg	Main Spring Only Preload #2	◄·····►	Main + Inner Spring Preload #3
150-200 lb 70-90 kg	Main Spring Only Preload #3	◄·····►	Main + Inner Spring Preload #4
200-240 lb* 90-110 kg*	Main + Inner Spring Preload #1	◄·····►	Main + Inner Spring Preload #5

⚠ *110 kg max rider weight for 27.2mm and 30.4mm seatposts
*120 kg max rider weight for 30.9mm and 31.6mm seatposts

10. Flybridge seatpost



A. Front spacer
B. Back spacer
D. Cover

1. 1. Seatpost
2. Lower saddle clamp
3. Upper saddle clamp
4. Saddle clamp nuts
5. Saddle clamp bolts
6. Preload adjustment plug
7. N.A.
8. Spring Spacer
9. Spring end caps
10. Main spring
11. Optional Spring

Warning
Always use carbon grease when assembling.

Back spacer (B) can not sit higher than shown on drawing (location C), if not the suspension will not work properly

11. General

11.1 Do’s and don’t

- Clean the bike at regular intervals, dirt will always find it’s way
- Never pressure wash any of these components
    - Electronics
    - Cockpit
    - Lights
    - Bearings
    - Axles
    - Disc brake components
    - Buttons
    - Batteries
- Don't use compressed air to dry electronics or mechanically moving parts
- Always hold downtube battery when turning lock
- Never turn of the bike while charging
- After reaching full charge, disconnect the charger and turn the bike off for optimal battery life
- Restart the bike at regular intervals (leaving the bike on for prolonged times (days/weeks) can result in slower software performance
- It’s considered good practice to periodically and at every service check these items
    - Front and rear disc bolts
    - Axle bolts
    - Dropout bolts
    - Handlebar bolts
- Never store the bike or batteries with very low charge for prolonged periods, especially at colder temperatures
- If the bike is stored for months or longer, it’s recommend to store it at 80% charge and to periodicaly check, turn on and charge the bike
- Under inflating tires for comfort (below 2 bar) can result in poor handling and handlebar wobble, we suggest to always keep it above 2 bar (max 3.5)

11.2 Torque specs

- **Serial number starting with YBP22**

- Front axle 12 Nm
- Rear axle 12 Nm
- Dropout 7 Nm
- Handlebar 7 Nm
- Brake lever 3Nm
- Brake caliper 7 Nm
- Crank Arm 40 Nm
- Pedal 40 Nm
- Saddle Angle 12 Nm
- Seat post 3 Nm
-
- **Serial number starting with YBP24**

- Front axle 10 Nm/Reasonably hard
- Rear axle 12 Nm
- Dropout 9 Nm
- Handlebar 10 Nm
- Brake lever 3 Nm
- Brake Caliper 7 Nm
- Crank Arm 40 Nm
- Pedal 40Nm
- Sadle Angle:
- Carbon post 12Nm/Flybridge 6Nm
- Seat post:
- Carbon post 9Nm/Flybridge 10Nm

12. Trouble shooting

12.1 Possible issues and solutions

- The front LED DRL is not working but the other lights are
  - Connector disconnected, remove fork and check connection
  - Front LED failed, replace LED
- The brake light is permanently on
  - Cable brake in the A cable
  - Relais failure in the Display
  - Both brake sensors are disconnected or failed
- Difficulty turning on
  - Check main display for (water) damage
  - Check the right large button for connections
- Button LED's are on but the screen is not
  - Software blocked, this can happen is you remove and reinstall the downtube battery quickly
  - Remove downtube battery and wait 5-10 before putting it back, the system should reboot normally
- Touch screen not working (for instance after crash)
  - Check the flat cable inside the display unit. There are 2 flat cables, the smallest one drives the touch screen
  - You can opperate the screen with the buttons as well

12.2 On screen error messages

- "Critical front motor error"
  - First try to recalibrate the engine (see 9.1), if this doesn't work:
    - The connector has come loose in the fork, reconnect
    - Cable break in the front fork or mid battery, check wiring
- "Enviolo gearbox not found"
  - Check connector on gearbox and reboot.
  - Check if gearbox has the correct CANbus setting (requires a QR code) for Specter
  - Check if any error messages appaer in the Enviolo app
  - Check for cable break in wire loom
- "Full power available after charging"
  - The 2 batteries are not in balance, charge the bike to fix this. If this doesn't work:
    - One of the batteries has failed
    - The charging electronics have failed (see mid battery 4.4)
    - Controller has failed, would also indicate "Critical front motor error"
- "Motor communication has failed"
  - The CAN bus system has been restarted, this can happen if the mid motor looses power. If this persist, contact Specter
- "No internet connection"
  - Move the bike outside or and arrea where you know there is cell coverage
  - Check antenna's inside the display unit
  - If this doesn't fix it, contact Specter
- "Motor calibration" and speed displays "--"
  - There is a problem with the speed sensor, most likely the magnet has been misaligned
  - If this doesn't work, check the wiring of the speed sensor

12.3 Gearbox and belt

- **Incorrect Gearbox software (should be V9 or contact specter to verify)**

Software version problem:
In Automatic mode: high cadence at startup
In Manual modes: Gear steps are very small in gear 5 and 6
Both modes: Noticeable cadence fluctuation at top speed. Sometimes feels like engagement is gone.

- **Calibration problem:**

High cadence at top speed.
Update the hub to V10 or V11, calibrate and reinstall V9

- **Hub skipping**

Skipping at low speeds, when setting off with noticable sound
First check belt tension and belt retainer and check if the problem persists

Skipping at high speeds (+40km/h) when gearbox is warm (+10 minutes of driving)
Check with Specter or enviolo

13. Service

13.1 Service Intervals

500km First check

- Check if al updates are installed. Bike will show the update screen after unlocking
- Check that wheels are connected firm to the frame.
- Check belt tension.
- Belt retainer check. Gapping tool on 1.1mm
- Check headset tension. Adjust if there is play.
- Check Enviolo feeling and update software to V09 if that is not the case yet.
- General brake check (Bleed, Pads, brake lights)

2500km Main service

- 500 km service +
- Check state of the carbon paste on seatpost. Torque seat tube clamp.
- 9Nm Carbon Seat post
- 10Nm (and a bit more) for the flybridge.
- Check disc thickness. TRP has a wear indicator on disc
- Check al bolt torques
- Check tire state

5000km Big service

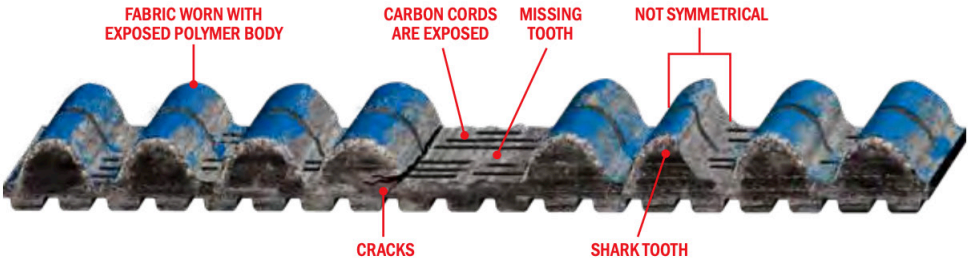
- 2000 km service +
- Regrease engine seal under front chain ring.
- Check state of saddle
- Check belt state according to gates recommendations
- Clean and lightly grease contact areas of dropouts
- Check the state of the headset bearings and regrease/replace if needed
- Check play on wheels

13.2 Belt Drive

The Gates CDX belt drive is an industry standard and very durable if set up correctly. At service check the state of the belt and sprokets. It's vital to keep the belt clean, washing it regularly with water to remove dust. When setting up the belt tension, use a Gates belt tool and set it right at the top of the green area.

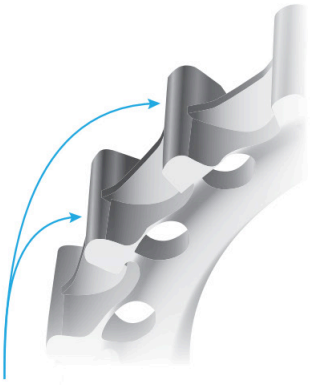
- Belt state

This belt is in **excellent condition**. Loss of blue color does NOT indicate wear.

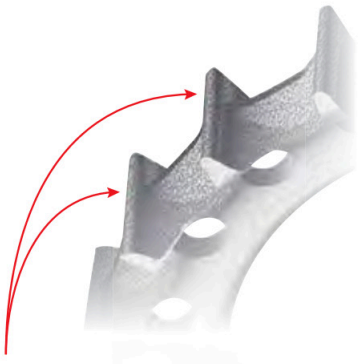


Replace your belt when it shows these signs of wear and tear.

WARNING: Using a worn or damaged Carbon Drive belt or failing to properly inspect the Carbon Drive belt before each usage can result in property damage and serious bodily injury, including death.

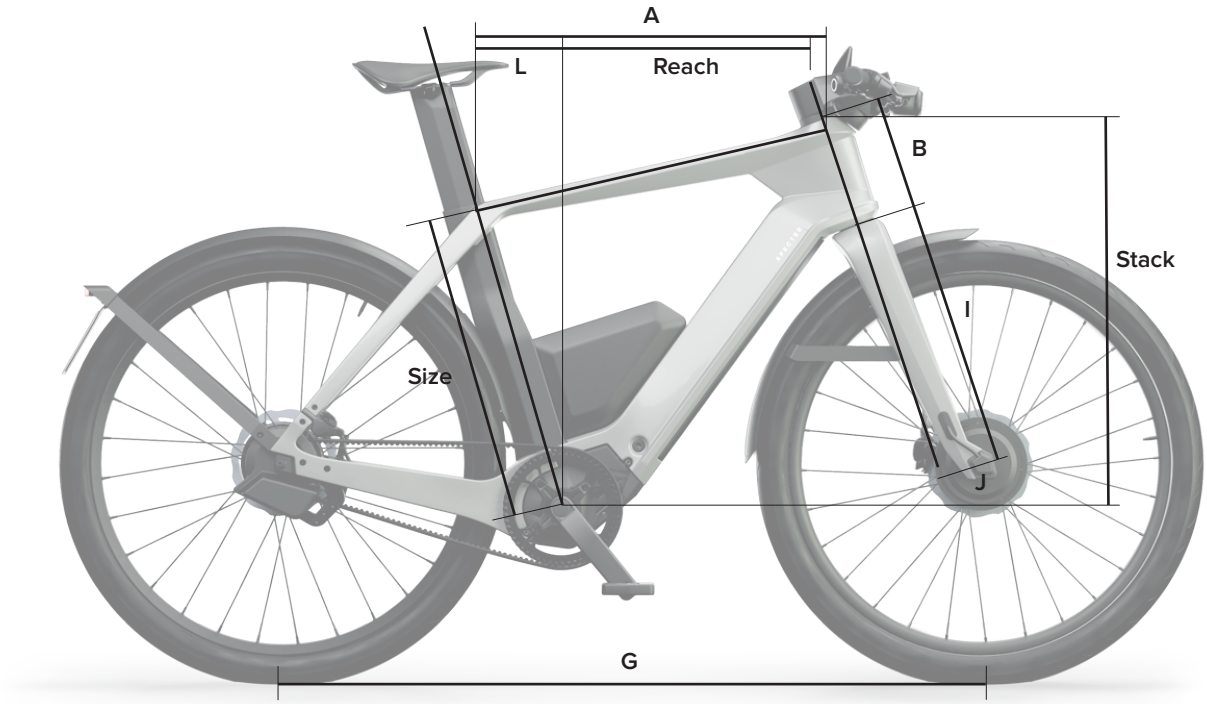


This sprocket is in **excellent condition**.



Replace your sprockets when the teeth become worn.

14. Geometry



Specter 1 Geometry

- **Size:** 665,3
- **Reach:** 422,1
- **Stack:** 639,6
- **A:** 605,5
- **B:** 185,0
- **Seattube angle**: 74°
- **Headtube angle:** 69°
- **Wheelbase (G):** 1156,9
- **Tire size:** 65-622
- **Fork Lenght (i):** 440
- **Fork offset (J):** 50
- **Min saddle height:** 883,0
- **Max saddle height:** 1156,0
- **BB drop:** 74

Specter 1S Geometry

- **Size:** 435,5
- **Reach:** 422,1
- **Stack:** 639,6
- **A:** 585,5
- **B:** 195,0
- **Seattube angle**: 74°
- **Headtube angle:** 69°
- **Wheelbase (G):** 1156,9
- **Tire size:** 65-622
- **Fork Lenght (i):** 440
- **Fork offset (J):** 50
- **Min saddle height:** 781,0
- **Max saddle height:** 1050,0
- **BB drop:** 74