

Revel Motor Install Instructions

Rev B

<i>Tools Required for installation:</i>	<i>Motor kit parts list:</i>
<ul style="list-style-type: none">● Bottom bracket tool (16 notch ~44mm diameter, open ended, such as Park BBT-9)● 3mm, 5mm, 8mm hex wrenches● T25 wrench● Torque wrench● Pedal wrench● Cordless Drill● #2 center drill● 10 mm drill bit● Ruler or Calipers● Cutting fluid● Grease	<ul style="list-style-type: none">● Motor (motor plates, idler, sprocket pre-installed)● Chainring/sprocket ring/freewheel assembly (5@M5x12 flat head bolts w/threadlock)● Torque Sensing BB● Crank arms● Crank arm fixing bolts● #25 chain - pre-lubricated● Adhesive backed foam pad for motor/frame interface● Display● Display connector cable● Speed sensor cable,spoke magnet, spacer if needed, cable ties● X4 Adhesive backed cable guides

Installation:

1. Start by removing pedals, cranks, bottom bracket, and if applicable front derailleur and front derailleur cable/housing leaving the rear derailleur and chain installed.(Figure 1).



Figure 1

2. Clean the frame around the bottom bracket by applying a bicycle cleaning product or mild soapy water to a rag and wiping the frame clean.
3. Locate and mark the hole location for the bottom bracket torque sensor cable **32.5 mm** from the edge of the drive side bottom bracket shell, perpendicular to the ground. If there is already a hole close to this location then mark the hole to be drilled away from the existing hole. Also avoid any welds or structural areas on the BB shell. A center punch is needed to mark the location of the hole and to keep the drill bit in the correct spot when drilling. (figure 3).



Figure 3

4. **Drill the BB shell hole:** apply a few drops of cutting fluid to the center drill or 4mm drill bit and drill the pilot hole. Drill slowly, ensuring the hole is drilled straight and in the correct location. Once the pilot hole has been drilled, install the 10mm drill bit into the drill and add a few drops of cutting fluid to it before finishing the hole. Again, go slow and be careful not to let the bit drill hit the opposite side of the BB shell wall.



Figure 4a



Figure 4b

5. Note: The Revel BB drill jig is available to make this drilling task less difficult for those unsure about drilling a hole into their frame.



Figure 5

6. Use a deburring tool or large drill bit to remove and sharp edges along the hole both on the **inside and outside surfaces of the BB shell**. (Figure 6).



Figure 7



Figure 6

7. Remove any metal debris from the bottom bracket shell and around the hole. Clean the inside of the shell and threads carefully.

8. For aluminum and steel bottom bracket shells apply grease to the threads of the BB shell and a thin layer on the threads of the BB. For titanium BB shells use anti-seize compound. (Figure 7).

**Video for the following steps is located here:

https://www.youtube.com/channel/UCd0p1hBH8bES6N_aVh-E9nw/videos

9. **Prepare the motor for installation** by wrapping the motor strap around the downtube of your frame. Leave the M8 bolts that hold the strap slightly loose.. 3 different lengths of strap are included for differing downtube sizes and frame configurations. This is also a good time to consider the routing of the display (8 pin Higo connector), torque (6 pin black connector), and speed sensor (purple 6 pin connector) cables. Once you have the cables in the right place align the BB hole in the mounting plate with the bottom bracket shell and insert the **Sempu BB install tool** through the motor mounting plate and into the non-drive side bottom bracket cup (figure XX). Rotate the motor and determine where it will contact the frame. Make sure that the foam pad on the motor will be sandwiched between the motor and the frame. If it does not contact the frame, a spacer (included) is required.



Figure 9



Figure 9b

10. **Install the bottom bracket:** With the bottom bracket in one hand, use your other hand to guide the torque sensor cable connector into the shell and through the 10mm hole. Carefully push it through and out the hole using one hand to pull the cable slack while the other hand guides the bottom bracket into the shell while keeping the cable lined up with the hole. ***Be very careful not to pinch or damage the cable while installing the bottom bracket.*** Once the connector is outside of the shell, firmly hold the Sempu BB install tool and begin to thread the bottom bracket into the frame by hand. The Sempu BB install tool prevents the center section of the bottom bracket sensor from rotating, which would damage the cable. **Tighten until just snug - do not torque yet!**



Figure 10

11. **Install the left (non-drive side) BB cup:** Remove the Sempu BB install tool. Install the left side BB cup. **Tighten until just snug - do not torque yet!**
12. **Position the motor:** With the BB cups snug, the motor can rotate freely. If the motor can contact the frame, install the foam pad on the motor where it contacts the frame. If the motor cannot contact the frame, install the supplied motor spacer and hold in place while pushing the motor to trap it between the motor and frame. Tighten the right BB cup to hold everything in place.
13. **Tighten motor strap:** Remove slack from motor strap and tighten chainring bolts on both sides of the strap.
14. **Torque BB cups:** Torque right BB cup to 35 Nm, then Torque left BB cup to 35 Nm
15. **Install the non drive side crank arm** by aligning the square taper on the BB with the hole in the crank arm and tighten the bolt
16. **Install the freewheel/spider assembly:** using the 5 M5 flat head screws, bolt the chainring/sprocket to the spider mount on the bottom bracket tightening the bolts to 5NM. (Figure 15).

17. **Install the bicycle chain:** If you removed the chain, install it by routing the chain through the derailleur (16a) and installing the master link or the new appropriate chain pin (consult the installation documentation for the specific chain you are using for exact instructions). Place the chain onto the narrow wide chainring making sure the wider teeth are engaged with the wider gaps of the chain. (16b).



Figure 16a



Figure 16b



Figure 17

-
18. **Install the drive side crank arm** by aligning the square taper on the BB with the hole in the crank arm (making sure it is properly oriented in relation to the non drive side) and tighten the bolt to Nm. (Figure 17).

19. **Install the motor chain:** by placing it on the crank sprocket ring and then over the motor sprocket. Ensure that it is properly aligned, at this point it should be slack. Reinstall the chain tension screw, and tighten just enough to tension the motor chain until the chain tensioned but still deflects when you press down on it with a finger. (see <https://www.youtube.com/watch?v=TRk76SxdPYw> for details)

20. **Install the motor sprocket cover** using the two M3x8 screws.

21. **Install the pedals** making sure to thread the left pedal into the left crank arm and the right pedal into the right crank arm. *Noting that the left pedal threads are backwards.* You may want to use pedal washers between the pedals and the crank arms.



Figure 22

22. Install the BB shell grommet while being careful not to pull or damage the torque sensor cable.
23. Figure out the best/cleanest way to route the cables from the controller. This will vary from frame to frame but it is important to keep them out of the way from the cranks and to ensure they will not get pinched or damaged.
- 24. Connect the torque sensor cable** take the cable running from the bottom bracket and find the corresponding cable from the controller (both have 6 pins). Making sure to line up the pins plug the male end into the female and, check the connection by giving the cables a light pull. It should take a good amount of effort for them to come apart. Use the provided BB hole plug to keep water out of the BB shell.
- 25. Install the speed sensor** by loosely securing it to the non-drive side chainstay with provided cable ties, but don't tighten all the way just yet. Attach the magnet to one of the non drive side spokes so that it faces outwards or away from the hub. Line up the speed sensor and the magnet making sure they are within 5 mm of each other, and that the sensor will be clear of the magnet and the wheel as it spins. Once a good position is achieved, tighten the cable ties and trim the excess. Run the cable along the chainstay to the controller. Secure any excess cable by wrapping it around the chainstay or looping it together and securing it with a cable tie either to the chainstay or to itself so long as it is protected and is out the the way from all moving parts.



Figure 26

26. **Install the display** onto the handlebars being careful not to over tighten the clamp (0.9 Nm max)
27. **Connect the display cable:** connect the display connector cable to the communication cable coming from the motor controller. Determine the best routing along the down tube and use the adhesive back cable guides to secure the cable to the frame. If there is excess cable, wrap the cable from the display around an adjacent piece of brake hose or housing and reconnect the cable.
28. Examine the motor, double check that everything is tightened properly and make sure the cables are out of the way of moving parts and not being pinched or damaged.
29. Power on the battery by pressing and holding the button for ~2 sec. until you see the green light then release (Figure 30).



Figure 30

30. Turn on the display by pressing the button on the top of the display (Figure 27).