RUNGU DUALIE® RUGGED OWNER MANUAL

Congratulations on purchasing a Rungu Dualie[1]! You own the latest generation of the ultimate electric alternative to a Quad ATV for off-road utility and fun. Before you ride, *please read the following instructions carefully*.

Rungu Dualie uses the Bafang BBSHD mid-drive motor with a custom Rungu 52V (nominal voltage) input that generates more than 1.4kW of mechanical power for off-road use. You access the power by pedaling ("Pedal Assist") or pressing the thumb throttle. In "Pedal Assist," the Dualie senses when you start to pedal and engages the motor to assist your pedaling - you don't have to use the throttle if you don't want to. The amount of power assist varies based on the power level you select as you ride. Unless you have ordered your Dualie with Class 1 or Class 2 reprogramming, we ship the Dualie configured with five selectable power levels starting with very little assistance up to full power, which is intended for use off-road only. The power settings are discussed below.

Note: US Federal Law mandates a 750W/20 MPH limit for riding an e-bike on public roads without a license. Please check with your local government to ensure you follow all local laws and ordinances. Standard Bearer Machines are not liable for those who choose not to follow their local laws.

CAUTION: STANDARD BEARER MACHINES WILL NOT BE HELD RESPONSIBLE FOR PEOPLE WHO CHOOSE TO DISREGARD THE LAW!

WARNING: IMPORTANT- STANDARD BEARER MACHINES WILL NOT BE LIABLE FOR ANY DAMAGE OR INJURY THAT MAY OCCUR DUE TO OPERATION OF YOUR DUALIE. BY USING THE DUALIE, YOU ARE AGREEING TO STANDARD BEARER MACHINES TERMS AND CONDITIONS AND THE WARNINGS AND CONDITIONS OF THE GENERIC BIKE MANUAL WHICH ARE INCLUDED WITH OTHER LINKS ON THE MANUAL GUIDE THAT COMES WITH THIS PRODUCT.

Standard Bearer Machines, LLC (Standard Bearer Machines) thanks you for your purchase!

[1] As the owner, you agree and are bound by all sales and transfer conditions as defined in "Rungu Sales Terms and Conditions" Copies of these documents are available on the list of electronic document links that ship with the product or upon request by e-mailing sales@riderungu.com.

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Rungu Dualie parts identification

The following images show the names of various components on a Rungu Dualie

Figure 1 Right Side View

Figure 2 Steering assembly

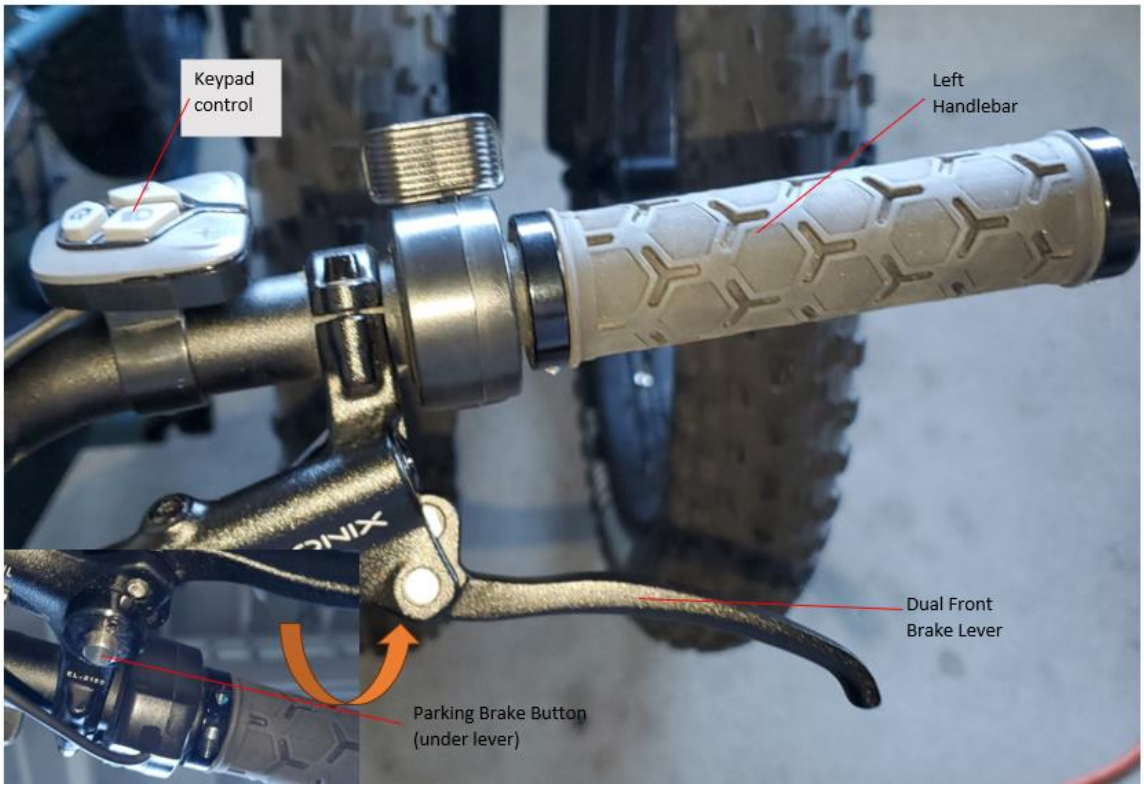


Figure 3 Parking Brake View

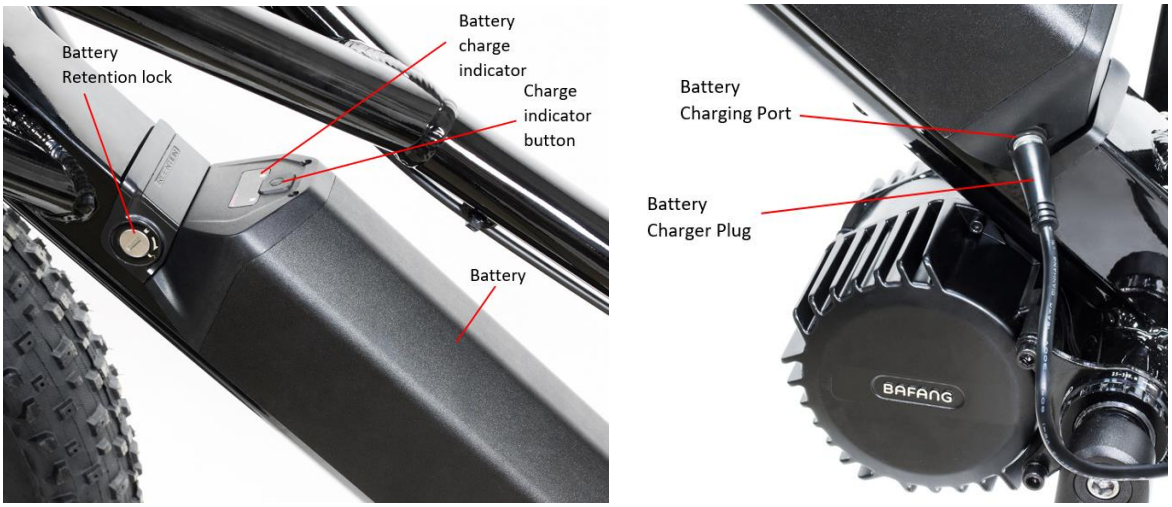


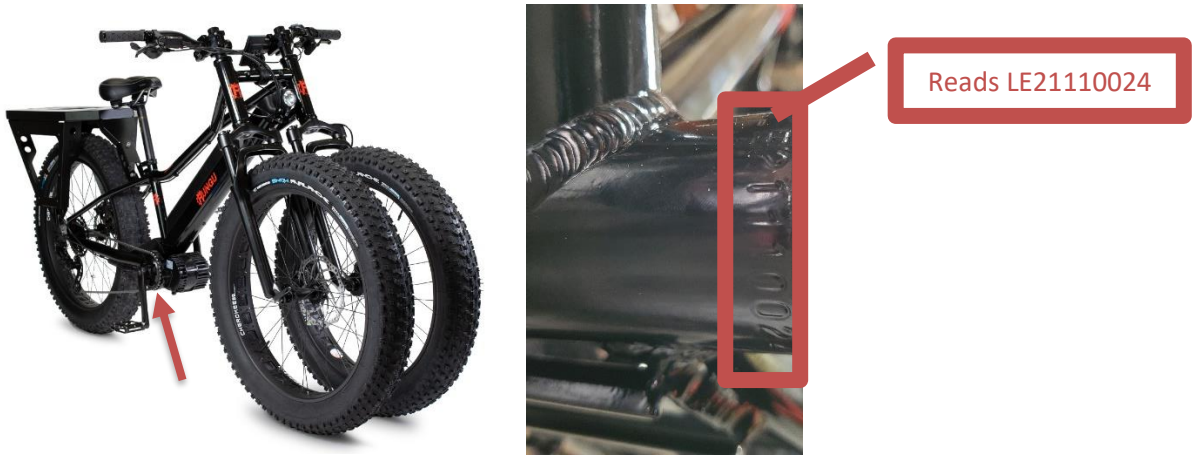
Figure 4 Battery access and charging views

Serial Number Location

You may need the serial number for insurance or support purposes. Rungu Dualie bikes have the same serial number located in two places, and under certain conditions you can contact Rungu to look up the serial number of your bike as well.

1. Behind the battery. Use the keys provided to remove the battery case. Directions on how to do this can be found in the Charging your Main Battery after removing the battery– Dualie (single battery version only) section. The serial number is printed on a label on the inside of the frame behind the battery.

2. On the bottom of the bottom bracket shell. You can find the serial number etched into the frame on the circumference of the bottom bracket shell. The motor (and skid plate, if installed) interfere with easy view of the number. And most of the time the paint on the frame obscures the serial number. You may need a very bright light to decipher the serial number.



3. If you are the first owner of the Rungu Dualie, you can also find the serial number on the packing list you received with the shipment, or you can contact Rungu to look up your serial number, though allow a few business days for research.

Unpacking and Assembly Instructions

Before you ride and make new tracks, please follow the assembly instructions carefully. The team at Standard Bearer Machines recommends that you have the assembly performed by a qualified bike mechanic.

WARNING: FAILURE TO FOLLOW THESE INSTRUCTIONS MAY LEAD TO INCOMPLETE OR FAULTY ASSEMBLY THAT CAN RESULT IN ACCIDENTAL RIDER INJURY OR DEATH. IF YOU ARE NOT COMFORTABLE PERFORMING THE STEPS BELOW, HAVE A PROFESSIONAL BICYCLE TECHNICIAN ASSEMBLE YOUR DUALIE.

Note: If you have a high bandwidth Internet connection, click here to watch a video of these assembly instructions.

Tools required

- 2.5mm Hex wrench
- 4mm Hex wrench
- 5mm Hex wrench
- 6mm Hex wrench
- #2 Philips screw driver (not included)

Recommended: CRAFTSMAN Screwdriver, Phillips, Bi-Material, PH #2 X 4 Inch (CMHT65054N)

- Tire inflation pump (not included)

Recommended: CYCPLUS Tire Inflator Portable Air Compressor 2600mAh Smart Cordless Electric Air Pump for Car Tires, Motorcycle, Bike, Balls A7

- Bicycle Tire pressure gauge – presta valve (not included)

Recommended: Accu-Gage by Milton Presta Valve Bike Tire Pressure Gauge with Bleeder Valve, for 0-15 PSI - ANSI Certified (PR15BX)

- Wire cutters or scissors (not included)

Recommended: IRWIN VISE-GRIP Diagonal Cutting Pliers, 6-Inch (2078306)

Instructions

Rungu Dualie comes in a cardboard carton. After you have removed the binding straps, remove the top cover. If you intend to ship or return your Rungu, please keep all packing materials.

1. If you have purchased a model with a Rungu Cargo Rack or an optional Cargo Rack, remove the rack and place it to one side.
2. Remove the accessory box(es) containing Quick Release Skewers, AC battery charger, tools, Presta adapters, keys and pedals as well as other accessories that come with the specific model you ordered.

Note: If you purchased a Dualie with the optional Cargo Rack, remove the rack first and place it to the side.

1. Remove the two wheels from the carton and place them aside carefully to avoid damaging the disc brake rotors.
2. Lift the frame and rear wheel from the carton and place the assembly on the floor gently so that it stands upright as it was in the carton.

CAUTION: DUALIE FRAME AND REAR WHEEL WEIGH MORE THAN 60 LBS (27 KG). USE TWO (2) PEOPLE TO REMOVE THE DUALIE FROM THE CARTON TO AVOID INJURY.

3. Remove the packaging from the front forks steering assembly and handlebars.

   CAUTION: AVOID USING A KNIFE TO REMOVE PACKAGING. USING A KNIFE MAY SCRATCH THE FINISH OF YOUR NEW DUALIE.

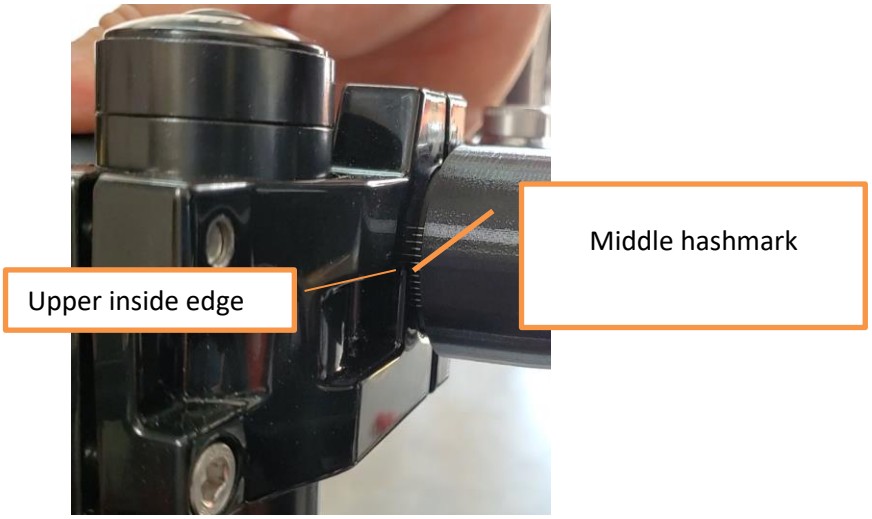
4. Use the 5mm hex wrench to loosen and remove the four bolts from the right-side handlebar clamp

5. Open the right-side handlebar clamp to allow placement of the right-side handlebar.

6. Place the right-side handlebar in the clamp such that there's a 1/8" gap between the handlebar end stop and the side of the stem as seen from the front of the handlebar.

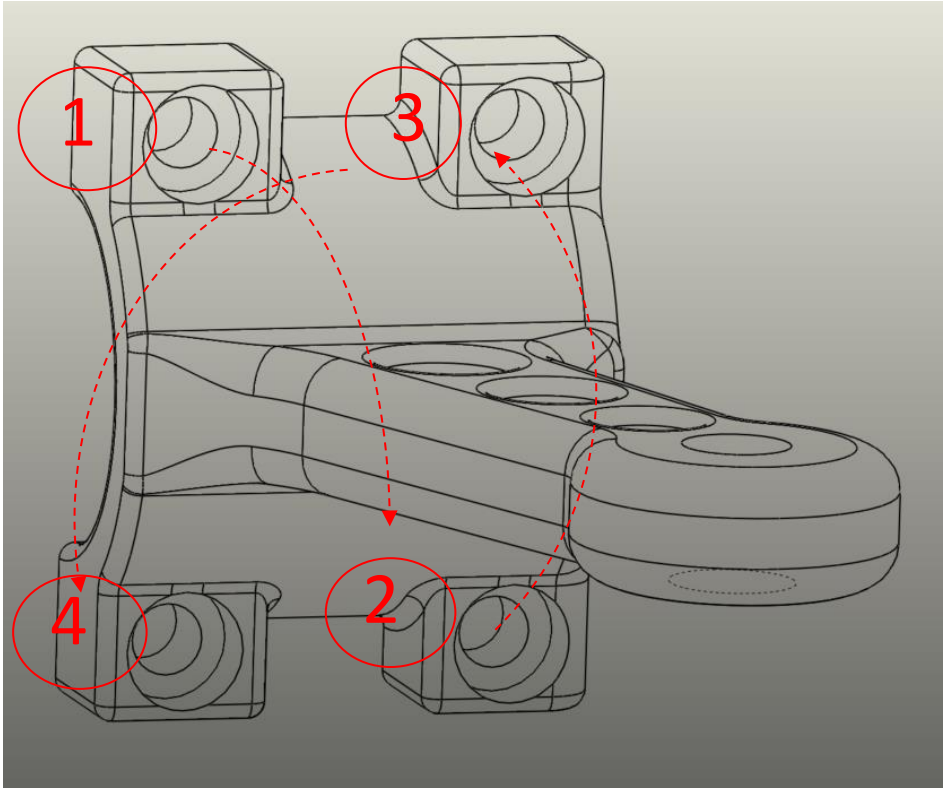
7. Replace the four bolts in the handlebar clamp and finger tighten.

8. From the front of the bike, align the handlebar by rotating it so the middle hashmark lines up with the upper inside edge of the stem as shown below.



CAUTION: FAILURE TO EXTEND THE HANDLEBAR AS SHOWN MAY RESULT IN WHEELS MAKING CONTACT WITH FORKS, WHICH CAN LEAD TO FORK OR TIRE DAMAGE.

9. Fasten, the right-side retention bolts using a crossing pattern (shown below) of tightening the upper handlebar retention screw and then bottom screw instead of tightening both top screws and then the bottom screws for each clamp.



WARNING: TIGHTENING HANDLEBAR RETENTION SCREWS BEYOND 6NM (53 IN LBS.) OR FAILING TO ALIGN THE SCREWS WITH THE THREADS IN THE STEM MAY STRIP THREADS IN STEM LEADING TO INSUFFICIENT TIGHTENING OF THE HANDLEBAR. FAILURE TO TIGHTEN HANDLEBAR SUFFICIENTLY MAY RESULT IN UNEXPECTED HANDLEBAR ROTATION THAT CAN RESULT IN ACCIDENTAL RIDER INJURY OR DEATH.

10. Repeat steps 6 through 11 for the left-side handlebar.
11. Install the keypad control by using a 2.5 mm hex wrench to remove the retention screw from the back of the keypad.

12. Mount the keypad onto the left handlebar and slide the keypad near the throttle (or left brake if no throttle installed per class 1 programming).

13. Reinsert the retention screw and tighten so the keypad doesn't rotate on the handlebar.

14. Open the accessory box to remove the two quick release skewers from the packaging.
15. Select which wheel is the right-side wheel and the left-side wheel. Each wheel is labeled "Left" or "Right". This means that the brakes have been adjusted differently for each wheel – use the labels to guide which wheel mounts on which side.

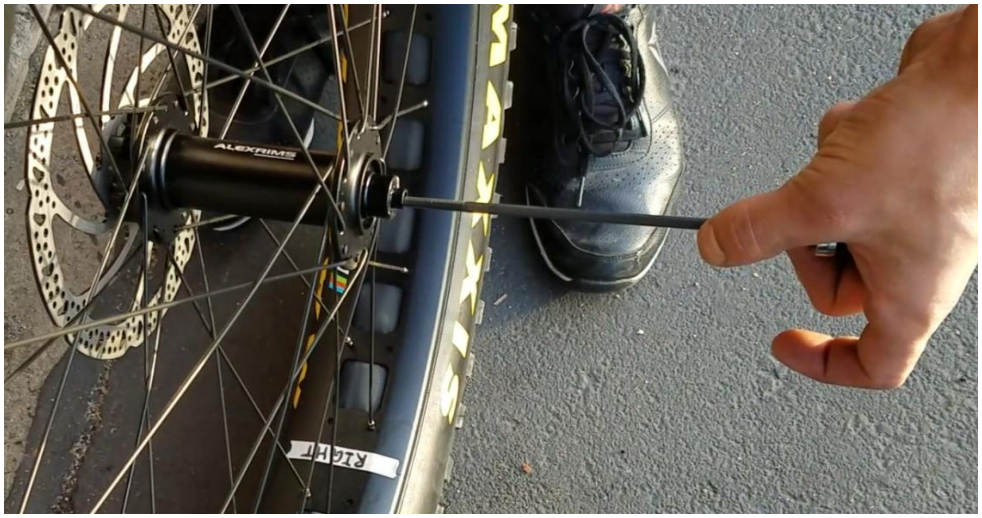
Note: The left side is considered the side with the brake rotors. The right side has the chain and gearing.

16. Remove the two quick release skewers from the accessories box. Unscrew the end cap nut from the quick-release skewers and remove one of the two conical springs for each skewer.

17. Insert the skewer into the LEFT wheel from the side of the brake disc as shown below.

18. Replace the conical spring (small end first) on the other side of the wheel. Screw the end cap on a few turns to ready the wheel for installation.

19. Prep the RIGHT wheel. Insert the other skewer into the RIGHT wheel from the side OPPOSITE to the brake disc as shown below.

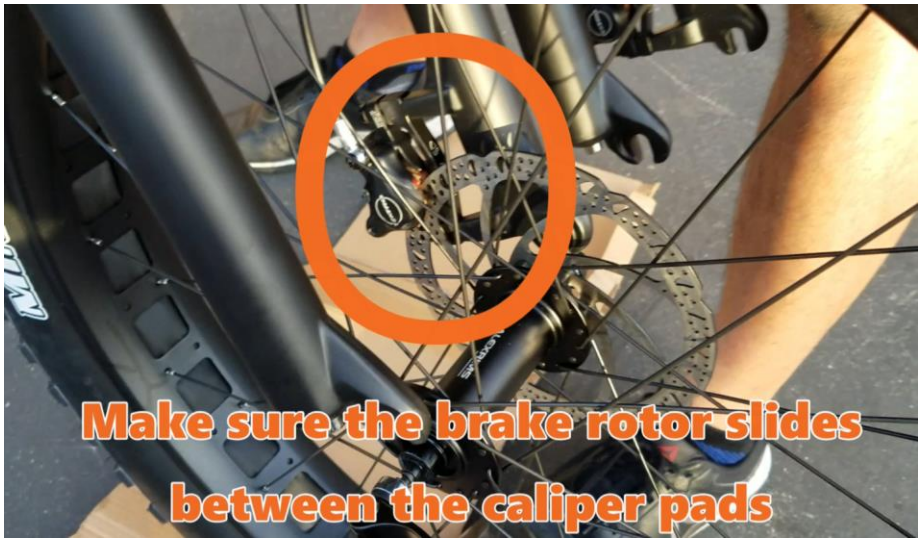


20. Replace the conical spring (small end first) on the other side of the wheel. Screw on the end cap with a few turns to ready the wheel for installation.

GET THE BIKE READY TO MOUNT THE FRONT WHEELS BY MAKING SURE THE PARKING BRAKE IS OFF (WHICH IS THE WAY THE BIKE SHIPS). SEE THE SECTION " USING THE PARKING BRAKE" ON PAGE 66 MORE INFORMATION.

21. Remove the brake blocks from each of the front calipers before continuing to the next steps. Pull on the tab as shown below to remove each brake block.

22. Lift the front of the bike and mount the RIGHT wheel to the RIGHT fork making sure that the rotor fits between the brake caliper pads.



23. The ends of the axle will sit in the fork “dropouts” when correctly aligned. You may have to unscrew the end cap a turn or two if the fork doesn’t drop in place.

24. Tilt the bike and mount the LEFT wheel to the LEFT fork making sure that the rotor fits between the brake caliper pads.

25. The ends of the axle will sit in the fork “dropouts” when correctly aligned. You may have to unscrew the end cap a turn or two if the fork doesn’t drop in place.

26. Tighten the end cap nut on the LEFT wheel and close the quick-release lever. As a guideline the end cap nut should begin to clamp onto the fork drop out when the lever points away from the wheel at a right angle.

WARNING: MAKE SURE TO TIGHTEN THE QUICK-RELEASE IN THE FORK SO THAT THE WHEEL CANNOT FALL OUT OF THE FORK; FAILURE TO ADEQUATELY TIGHTEN THE QUICK-RELEASE CAN RESULT IN ACCIDENTAL RIDER INJURY OR DEATH.

27. Tighten the end cap nut on the RIGHT wheel and close the quick-release lever. As a guideline the end cap nut should begin to clamp onto the fork drop out when the lever points away from the wheel at a right angle.

WARNING: MAKE SURE TO TIGHTEN THE QUICK-RELEASE IN THE FORK SO THAT THE WHEEL CANNOT FALL OUT OF THE FORK; FAILURE TO ADEQUATELY TIGHTEN THE QUICK-RELEASE CAN RESULT IN ACCIDENTAL RIDER INJURY OR DEATH.

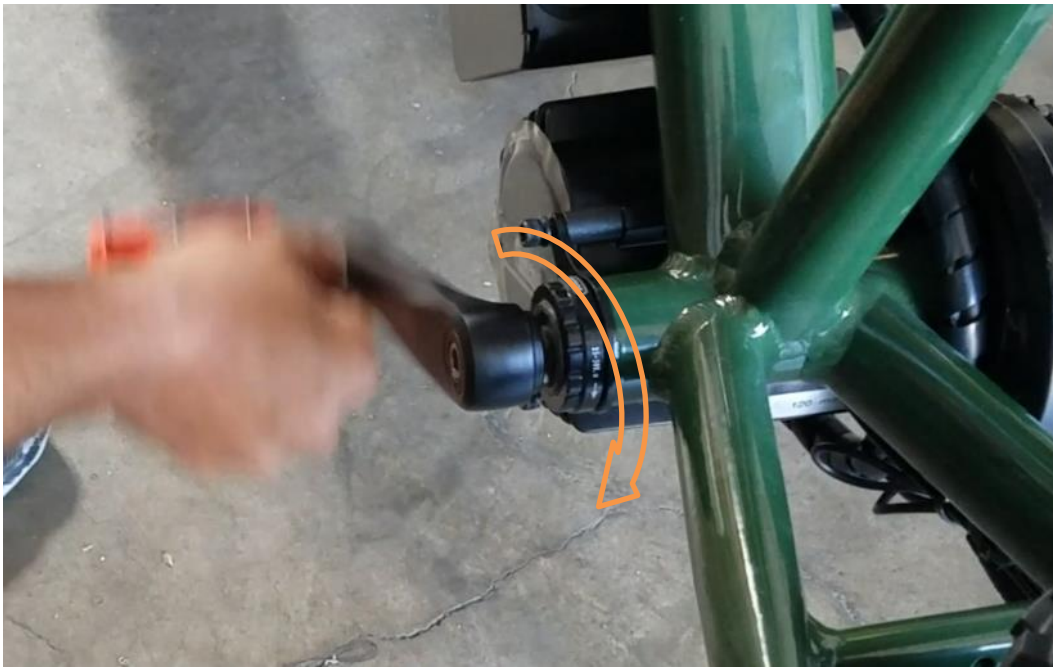
28. Remove the pedals from the box and install the RIGHT Pedal first – the RIGHT pedal is marked with an “R” as shown below.

29. Use your fingers to thread the pedal shaft by inserting the threaded shaft into the crank arm. Then hold the threaded section of the pedal in the crank arm mounting hole and spin the entire crank arm in a counterclockwise motion as depicted below.
CAUTION: DO NOT FORCE THE THREADING OF THE PEDAL ONTO THE CRANKSET. WARRANTY DOES NOT COVER REPLACEMENT CRANKS FOR STRIPPED THREADS.

30. Use a 6mm Hex wrench to tighten the pedal once the pedal is fully inserted.

31. Install the LEFT Pedal next – LEFT pedal is marked with an “L” as shown below.

32. Use your fingers to thread the pedal shaft by inserting the threaded shaft into the crank arm. Then hold the threaded section of the pedal in the crank arm mounting hole and spin the entire crank arm in a clockwise motion as depicted below.
CAUTION: DO NOT FORCE THE THREADING OF THE PEDAL ONTO THE CRANKSET. WARRANTY DOES NOT COVER REPLACEMENT CRANKS FOR STRIPPED THREADS.



33. Use a 6mm Hex wrench to tighten the pedal once the pedal is fully inserted.

34. Inflate each tire between 5 and 10 PSI (34 to 69 KPa). See the section Inflating Tires – using Presta valve adapters for directions.

Note: Tire pressure plays an especially important role in how you enjoy your Rungu Dualie. If you plan to ride mostly on soft ground like sand or snow, use a tire pressure of 5 PSI (34 kPa) for best traction and control as well as minimizing tread wear. Use 10 PSI (69 kPa) if you plan to ride on harder surfaces like rock or dirt road. On harder surfaces, a higher pressure minimizes tread wear and improves the range of your Dualie.

CAUTION: AVOID UNDERINFLATING AND OVER INFLATING THE TIRES. UNDER INFLATION (BELOW 5 PSI) MAY PREVENT THE TIRE FROM SEATING ON THE RIM AND PREVENT YOU FROM RIDING DUALIE. OVER INFLATION (MORE THAN 15 PSI – 103 KPA) MAY RESULT IN TIRE BLOW-OUT WHILE RIDING.

35. Loosen the Seat Post Clamp by opening the lever. Insert the seat post and adjust to the height that suits you, then tighten the clamp by closing the lever.

Note: Failure to tighten the seat post can result in discomfort or injury while riding Dualie.

WARNING: DO NOT EXTEND THE SEAT POST BEYOND THE MAXIMUM HEIGHT LIMIT BEFORE CLAMPING. THIS CAN RESULT IN THE SEAT POST BREAKING AND SEVERE INJURY OR DEATH.

36. If the package you purchased includes optional mud flaps (Steep, Rugged, Rubicon Trail Edition) or the Rungu Cargo Rack with the range-extending battery, continue to the Additional Instructions for installation. If you have purchased (or you also have) the Rungu Cargo Rack, please refer to the Rungu Cargo Rack installation instructions for assembly.
37. Before riding, refer to the section Operating the Dualie.

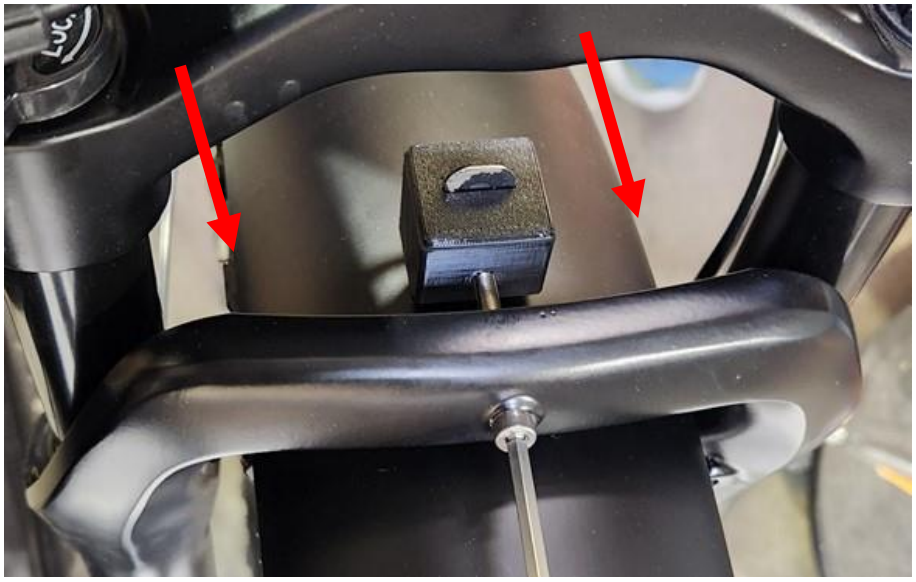
Installation Instructions – Mud Guards - Front

As of January 2024, Rungu ships full-length aluminum mud guards for the front wheels. These mud guards provide full leg protection in muddy/wet riding and only function the integrated battery frame design common to the 2024 models of the Rungu Dualie Standard, Steep and Rugged. Rungu modified the handlebar end stops to prevent the mud guard wire stay from touching the fork stanchions when turning. This change increases the minimum turning circle. If you prefer a smaller turning circle consistent with older models, contact sales@riderungu.com to order legacy mud guards – note that legacy mudguards do not provide full leg protection in muddy and wet riding.

1. Remove the mud guards from packaging along with their M5x45 screws.

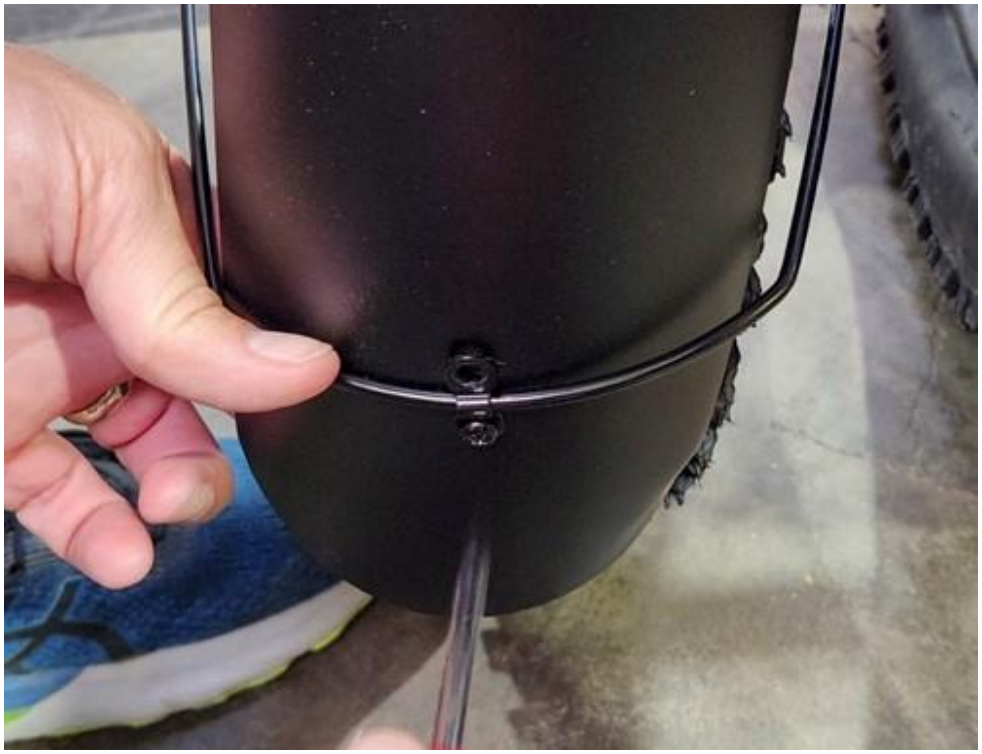
2. Cut and discard zip ties that hold the mud guard stays in place for shipment. Rotate the metal wire backwards so that it lays on the tire.

3. Slide the first mud guard through the fork from the rear towards the front as shown. Insert the M5x45 screw through the front of the fork. Use the 4mm hex wrench to fasten the screw finger tight. Do not fully tighten yet.



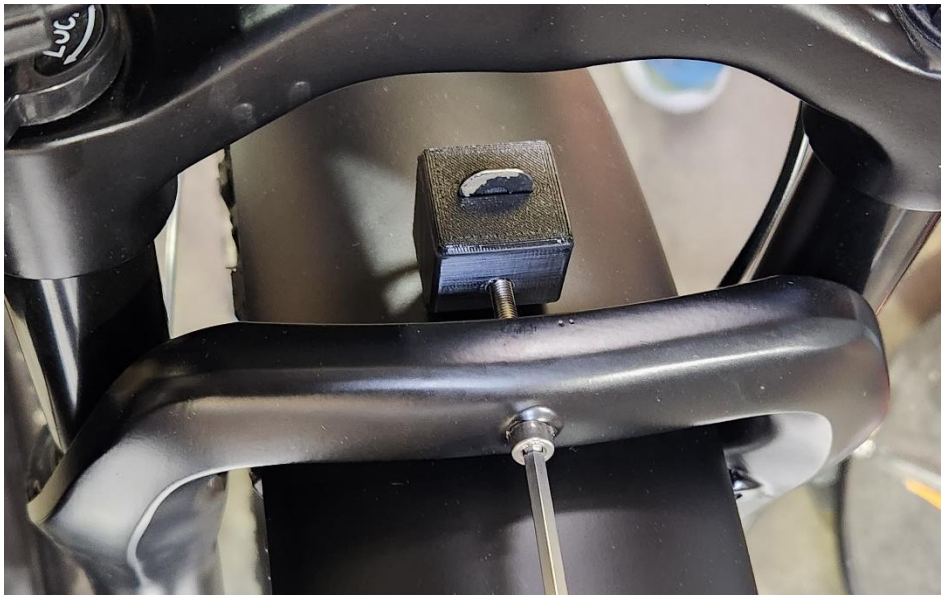
4. Using a Phillips screwdriver, loosen and remove the top screw found at the bottom of the mud guard. Loosen, but do not remove the bottom screw. Rotate the mud guard stay between the lower screw and the upper screw location as shown below.

5. Rotate the metal clip to capture the mud guard stay in place as shown below.



6. Reinsert the top screw through the bracket into the hole and reach between the mud guard and tire to align the screw with threaded hole in the bracket under the mud guard. Use the Philips screwdriver to tighten the top screw that was removed in the previous steps. Fully tighten both screws.

7. Use the 4mm hex wrench to fully tighten the M5x45 screw.

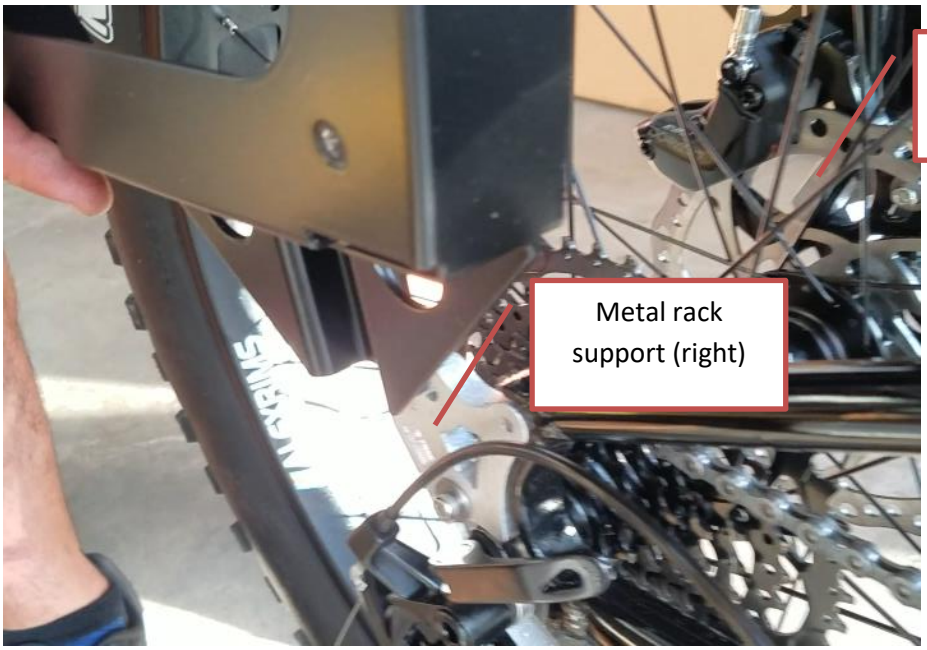


8. Repeat this procedure for the second mud guard.

9. Adjust the mud flap to align it with the tire and fully tighten the nut.

Additional Installation Instructions – Rungu Cargo Rack

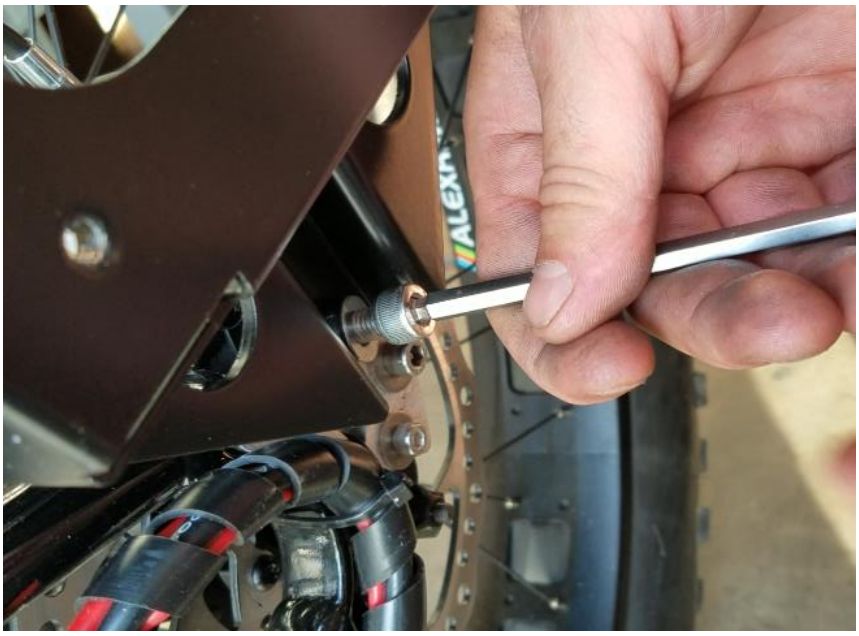
1. Place the rack over the rear tire making sure that the tabs at the bottom of the rack are on the outside of the metal rack supports.



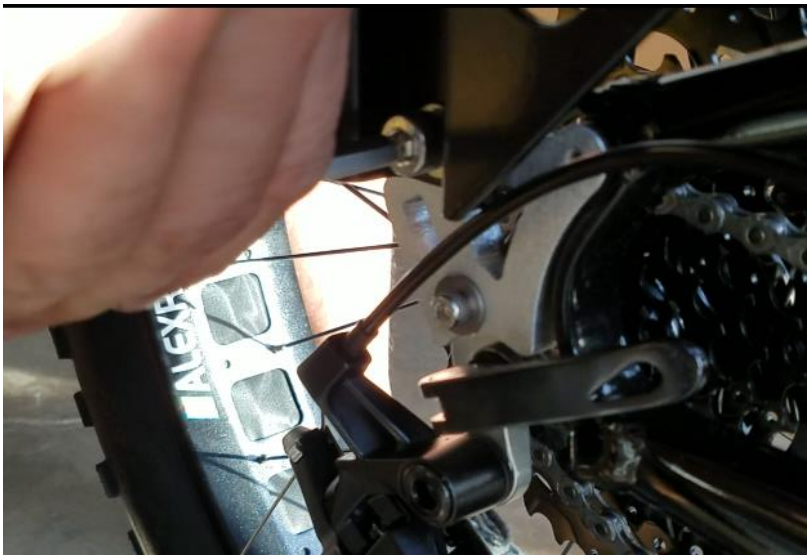
2. Slide the front tab of the rack into the rear rack support as shown. The rack will come to rest here and on the right and left rack supports so you can insert fasteners next.

3. Align the front rack tab with the mounting bracket and place an M8 screw and washer through the mounting bracket hole. Thread the screw into the threaded hole on the front of the rack. Finger tighten.

4. Align the holes in the tab at the bottom left side of the rack with the fastening location on the left side metal rack support. Thread an M8 screw and washer through the tab and into the rack support. Finger tighten the screw.



5. Align the holes in the tab at the bottom right side of the rack with the fastening location on the right-side metal rack support. Thread an M8 screw and washer through the tab and into the rack support. Finger tighten the screw.

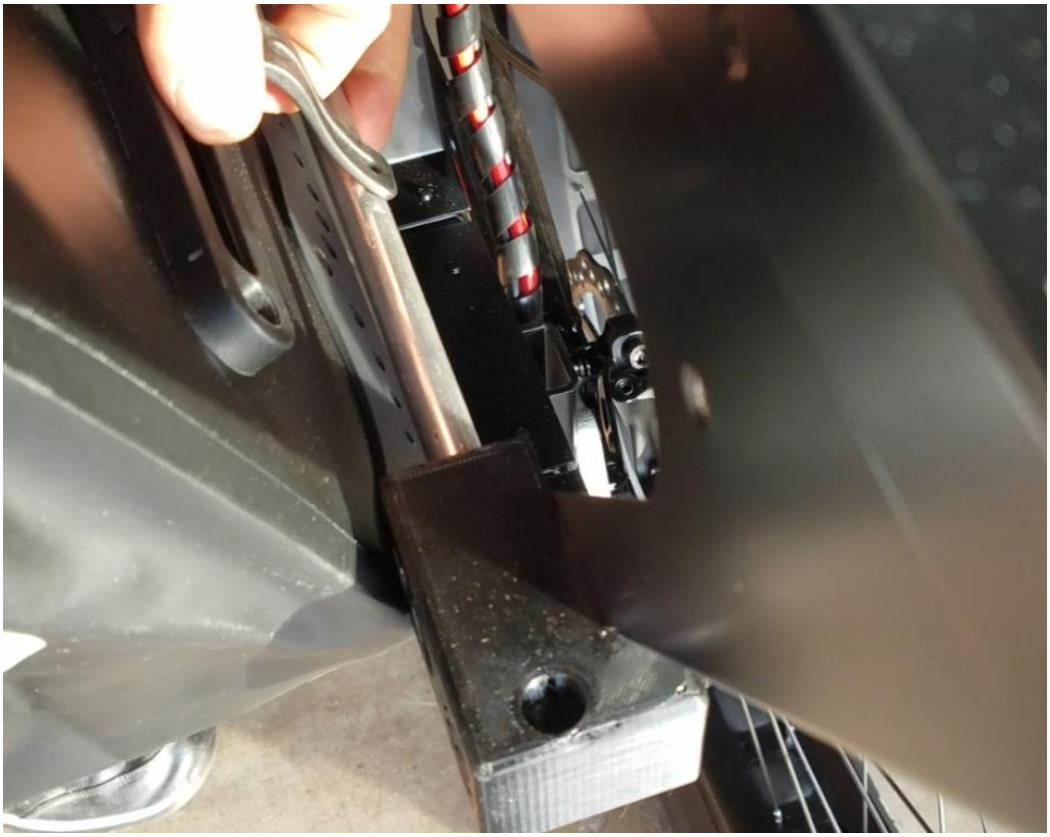


6. Use a 6 mm hex wrench to tighten all three screws, start with the screw on the mounting plate in the front.

Additional Installation Instructions – Pannier Bags.

If you purchased the pannier bag mounts as an accessory, mounting and removing pannier bags has never been easier.

1. Adjust the bottom clip using the adjustment knob on the bag so that the clip faces down. Align the bag with the bottom mount so that the clip mount channel fits between the two pannier bag mount blocks.



2. Adjust the upper quick-release catches using the adjustment knobs so that the catches fit between the two upper mounting blocks.

3. Push down on the pannier while pulling up on the quick release strap. This opens the two catches so that they engage the upper mounting tube.

4. Lower the pannier onto the upper mounting tube and let go of the quick release strap. This locks the pannier in place.

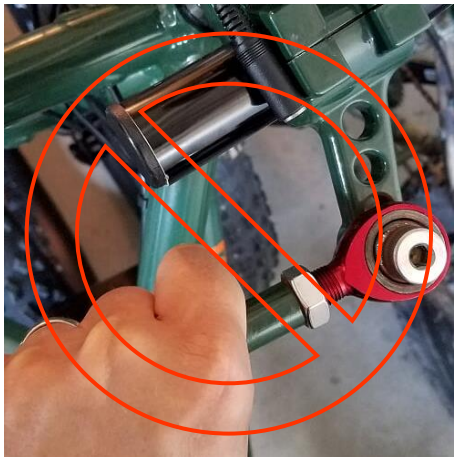
Cautions and Safety

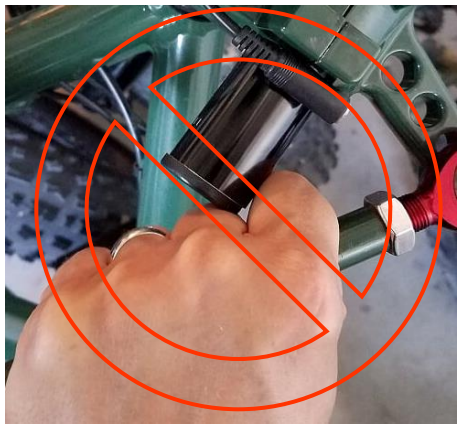
General Cautions and Warnings

The Rungu Dualie is an electric vehicle that you can ride like a bicycle with the added benefit of more stability on soft ground and difficult terrain.

For all bicycle riding cautions and warnings, refer to the **All-Purpose Bicycle Manual** available as an electronic link on the list of documentation that came with your Dualie. If you cannot find your copy of the All-Purpose Bicycle Manual, email support@riderungu.com and request an electronic copy.

WARNING: THE DUALIE HAS A TIE-ROD THAT CONNECTS THE TWO FRONT FORKS. DO NOT USE THE TIE-ROD TO LIFT DUALIE. THE STEERING USES THE TIE ROD AS A HARD STOP SO THE FORKS DON'T RUB AGAINST THE FRONT WHEELS. GRASPING THE TIE ROD WHEN LIFTING WILL RESULT IN A PINCH TO THE HAND AND FINGERS THAT MAY LEAD TO HAND OR FINGER INJURY. ONLY GRASP PARTS OF THE FRAME OR SADDLE TO LIFT DUALIE.

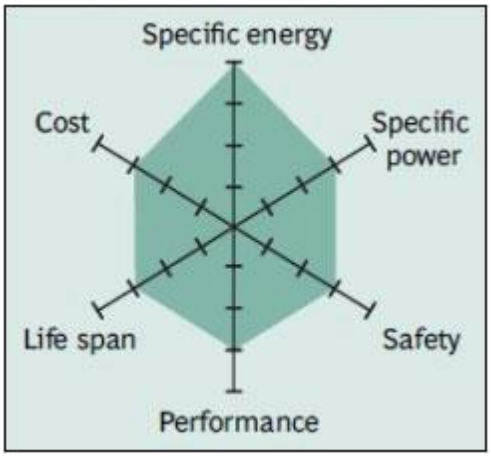




Battery Safety

NOTE: If you ever suspect a battery problem, please contact Rungu Support immediately by email or phone so we can go through the appropriate steps/procedures to make sure everything is okay with the battery system.

At Standard Bearer Machines, safety is our number one concern. Standard Bearer Machines wants our customers to enjoy an excellent product that will give those customers years of trouble-free operation. As much as Standard Bearer Machines and its battery manufacturers invest to minimize the risk of these state-of-the-art batteries, there are always safety concerns with Lithium-Ion Batteries. All new portable electronics, including cell phones and laptops, contain lithium batteries. Rungu batteries use the same technology but on a much bigger scale. Standard Bearer Machines makes every effort to have the highest quality battery cells and best battery protection (called a BMS or Battery Management System) to minimize any risk associated with these bigger batteries.



Standard Bearer Machines uses a battery chemistry that is popular with production electric vehicles because of its high energy density. The battery chemistry is the same that large car manufacturers (such as Nissan) use in their hybrid and electric vehicles. This state-of-the-art battery chemistry is called Lithium Nickel Manganese Cobalt (LiNiMnCoO2) or LiNMC for short. The electric vehicle industry prefers this chemistry due to the combination of power, safety, performance, and life span compared to the other options available.

Each battery has a Battery Management System (BMS) built into the battery to protect you and the Rungu from dangerous battery faults. Lithium cells have a lot of energy stored in a small package. There is always a possibility a battery cell fault can release this energy and can cause fire and/or severe injury unless the battery is constantly monitored during discharging and charging. The state-of-the-art Battery Management System found on all our battery packs do that. They continuously monitor the cells and pack to avoid failure.

CAUTION: BATTERY PACKS CAN FAIL AS A RESULT OF A BMS FAILURE, PUNCTURE OR DESTRUCTION OF THE BATTERY PACK, OR ATTEMPTING TO CHARGE, SHORT CIRCUIT, OVER DISCHARGE THE BATTERY CELLS IN A WAY THAT DOESN'T USE THE PROTECTIONS OF THE BMS.

The main cause of failure in lithium batteries occurs during the charging portion, when cells can be overcharged. This is the number one failure and can lead to batteries which vent and eventually release all their energy at once (or can even cause the battery pack to catch fire). This can happen if the BMS fails, you try to charge the pack using the output plug instead of the charging plug, or you use a charger that isn't designed to charge lithium-ion batteries. Cells in the battery can fall out of balance and result in a cell over charging, which leads to a fire. Standard Bearer Machines always recommends disconnecting the battery and charging it away from the DUALIE.

CAUTION: CHARGING ON A CONCRETE FLOOR, SUCH AS IN A GARAGE, AWAY FROM DEBRIS AND MATERIAL IS ALWAYS RECOMMENDED AS A SAFETY PRECAUTION.

Battery Safety Precautions

Standard Bearer Machines recommends keeping the following immediately accessible where you recharge your Rungu

- Class D Fire Extinguisher: can be used in the event of a lithium fire.
- ABC Fire Extinguisher: If you cannot get a Class D, this will do the job by preventing other materials around the ruptured battery from catching on fire.

If your charger typically takes less than 3 hours to charge your battery, but it seems to be taking longer, unplug the battery and investigate. If you suspect a bad BMS, smell the top of the battery. If there is a burnt smell, it is a failed BMS and stop charging immediately. If nothing is wrong, it is okay to continue charging as the battery is simply balancing individual cells while charging and it may take longer than normal.

If you experience a sudden loss of power while riding your Rungu, **STOP IMMEDIATELY**. Turn off the Dualie and inspect your battery system. Check for a burnt smell and inspect there are no melted or shorted wires. Shorted wires or a burnt smell indicate a shorted or failed BMS, stop using Rungu and contact us as soon as possible.

If you notice that your battery is swollen, damaged, or smoking contact Rungu Support immediately so we can diagnose the problem and talk you through next steps.

Catastrophic Battery Failure

Although extremely rare, all lithium batteries are capable of catastrophic failure if mishandled or mistreated. The following are guidelines for a battery pack failure. Great caution needs to be exercised during a catastrophic battery failure.

WARNING: AS SOON AS A PROBLEM IS DETECTED (BATTERY IS HISSING, YOU SMELL A BURNING SMELL, IT IS BILLOWING SMOKE ETC), TAKE BATTERY SYSTEM OR BIKE OUTSIDE IMMEDIATELY, AWAY FROM ALL STRUCTURES AND PEOPLE, PREFERABLY ON CONCRETE (LIKE A DRIVEWAY).

Observe the battery pack from a safe distance. Monitor the battery pack until the cells drop below critical temperature and start to cool off. ***Contact local authorities if necessary!***

Battery Safety (In Depth)

Main reasons a battery packs fail

Battery packs can fail when the BMS fails or is over-ridden allowing the following to occur:

- Short-circuit
- Over-charging – voltage higher than tolerated by cells
- Forced over-discharge – more current than the battery can source
- Excessive heat or incineration
- Crush, puncture, or disassembly

Standard Bearer Machines uses batteries that meet Air Cargo standards (UN38.3 certified), so they are tolerant of adverse conditions, but these highly active chemical systems have limitations. Certain hazards are associated with exposure to heat and its subsequent effects on sealed cells. These hazards include the potential for cell venting, explosion, and/or fires. The initial source of heat can be external (welding, soldering, etc.) or internal such as heating caused by short circuiting, excessive running currents for prolonged periods of time, forced over-discharge, charging, or excessive mechanical abuse. Specifically, mechanical abuse in the form of excessive shock or vibration can result in case deformation, crushing, and damage to the electrode materials.

WARNING: NOT GUARDING AGAINST THESE CONDITIONS MAY RESULT IN A HOT CELL OR A BATTERY PACK THAT COULD VENT OR EXPLODE.

Only trained and equipped emergency responders should respond to an incident with hot or vented cell. Consult federal, state, and local regulations for emergency response regulations.

Hot Cells

A hot cell is a condition that arises due to a short circuit of the cell or battery, either internal or external. The cell/battery temperature rises as the event continues which can lead to the cell reaching critical temperature and the potential to vent or explode.

Vented Cells

It is unlikely that any lithium battery would explode. These events are rare and are usually the result of an abusive condition or misuse that raises the cell temperature above its critical point.

In the event of a lithium battery explosion, a room can quickly fill with a dense white smoke that can cause severe irritation to the respiratory tract, eyes, and skin. Limit exposure to these fumes.

Battery Failure Response Procedure

WARNING: IF THERE IS A FIRE, STAY AWAY FROM THE SMOKE, FUMES AND FLAMES. CONTACT LOCAL FIRE AUTHORITIES TO PUT OUT THE FIRE.

- Monitor the temperature from a safe distance using a non-contact thermometer or thermal imager.
- If temperature monitoring equipment is not available, keep the area evacuated and secure and do not handle the cell/battery for at least 24-hours.
- If the battery cools, continue to monitor until it reaches ambient temperature.
- Remove the battery from the area once it is cool.
- Dispose of the cell in accordance with waste or recycling protocols.
- For more information on Lithium batteries, please visit Battery University as a source of knowledge.

Operating Rungu Dualie

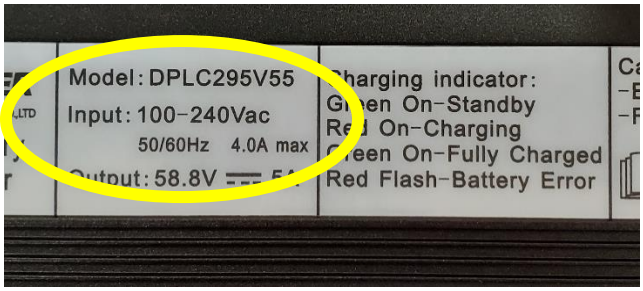
NOTE: Your Dualie ships with the batteries partially discharged to allow longer storage. Before riding, fully charge the battery or batteries prior to your first ride. A full charge may take between more than one hour, but in some cases less than 10 minutes depending on the amount of current discharged prior to shipment.

NOTE: Your Dualie battery has a built-in battery gauge. To estimate the amount of charge remaining in your battery without turning on your Rungu Dualie, you can press the button on the front (top when mounted on bike) of the battery. Up to four (4) LED segments may light to show the estimate amount of charge remaining in the battery.

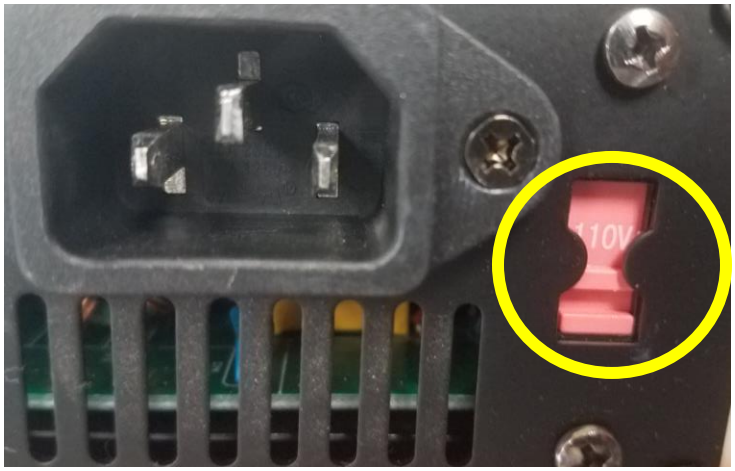
NOTE: Your Dualie battery has a built-in USB charging port. This port is available for use as long as the battery is charged.

Preparing your Battery Charger for use

Rungu Dualie Standard and Steep owners receive one of two different battery chargers. If you receive a charger with labeling showing “110-240VAC 50/60Hz” (as shown below) continue reading at the next section about charging your battery.



If you do not have a charger with the same label, make sure your charger is set to the correct voltage for your country’s power requirement. On the back of your battery charger is an input voltage switch. Check that the voltage switch is switched correctly for your voltage standard – 110V refers to 110-120VAC 60Hz common to North America. 220V refers to 220-240VAC 50Hz common to Europe and Asia.



If the voltage input switch is set incorrectly for your voltage standard, use the blade of a small screwdriver to push the switch to the correct setting.

Charging without removing the battery– Rungu Dualie

WARNING: REMOVE YOUR BATTERY AND CHARGE IT INDOORS IF YOUR RUNGU DUALIE IS STORED AT A TEMPERATURE OF 32° F (0° C) OR LOWER. CHARGING THE BATTERY IN AN AMBIENT TEMPERATURE OF 32° F (0° C) OR LOWER WILL DAMAGE THE BATTERY AND REDUCE CAPACITY BY A SIGNIFICANT AMOUNT VOIDING MANUFACTURER WARRANTY. REFER TO THE NEXT SECTION – CHARGING YOUR MAIN BATTERY AFTER REMOVING THE BATTERY FOR INSTRUCTIONS ON HOW TO REMOVE THE BATTERY.

1. Uncover the battery charging port and USB port access on the right side of the battery case.
2. Plug the charger plug to the connector extended from the battery. The connector is keyed, so there is only one way that the plug will fit.

3. Plug the battery charger into an AC wall outlet using the provided AC cord.
4. A red light should appear on the charger right after you plug in the battery and a fan will turn on. Wait until the light on the charger turns green for a full charge. You should expect a full charge in fewer than four (4) hours. If it fails to charge, please look at the troubleshooting section for further information.

WARNING: IF YOU FULLY CHARGE THE BATTERY, DISCONNECT THE BATTERY FROM THE CHARGER AS SOON AS POSSIBLE OR WITHIN A FEW HOURS OF COMPLETING A FULL CHARGE. FAILURE TO DO SO MAY CAUSE THE BATTERY TO SWELL AND FAIL. A SWOLLEN BATTERY IS NOT COVERED BY THE WARRANTY

NOTE: You do not always need to wait for a full charge, you may use your batteries at any time since the batteries have no memory. For extended use, it will always be better to get

a full charge so that you do not deplete your batteries too far when you ride. It is better in the long run to use less than 80% capacity of the battery when riding if possible.

CAUTION: REFER TO THE BATTERY CARE SECTION IN THIS DOCUMENT FOR MORE INSTRUCTIONS ON HOW TO MAXIMIZE THE LIFE OF YOUR BATTERIES.

5. Disconnect the charger connector, disconnect the charger from AC power and replace the battery charge port cover.

CAUTION: DO NOT LEAVE CHARGER PLUGGED INTO WALL AFTER COMPLETING CHARGING – THIS MAY DAMAGE THE BATTERY CHARGER. UNPLUG OR OTHERWISE DISCONNECT THE CHARGER FROM AC POWER WHEN IT IS NOT IN USE. FAILURE TO DO SO WILL VOID YOUR WARRANTY.

Charging your Main Battery after removing the battery– Dualie (single battery version only)

1. If the ambient temperature surrounding your Dualie is below 32^{o} F (0 C) and you want to charge your Main Battery indoors, you can remove the battery and charge it indoors. Use the keys supplied with your Dualie to unlock the battery from the left side of the frame

2. Grasp the battery and rotate it sideways away from the frame. Place the battery on the floor away from flammable objects and insert the charging plug into the charging port as shown above.

CAUTION: IF YOU DECIDE TO REMOVE THE BATTERY, MAKE SURE YOU HAVE THE GRIP AND ARM STRENGTH TO REMOVE IT – THE BATTERY WEIGHS APPROXIMATELY 10 LBS. (4.5 KGS).

3. Place the battery on the ground or in a secure location and follow the instructions in the prior section to recharge the battery.
   CAUTION: REFER TO THE BATTERY CARE SECTION IN THIS DOCUMENT FOR MORE INSTRUCTIONS ON HOW TO MAXIMIZE THE LIFE OF YOUR BATTERIES.

   WARNING: IF YOU FULLY CHARGE THE BATTERY, DISCONNECT THE BATTERY FROM THE CHARGER AS SOON AS POSSIBLE OR WITHIN A FEW HOURS OF COMPLETING A FULL CHARGE. FAILURE TO DO SO MAY CAUSE THE BATTERY TO SWELL AND FAIL. A SWOLLEN BATTERY IS NOT COVERED BY THE WARRANTY.

4. Once the battery is charged, disconnect the battery from the charger and the charger from AC power. Place the bottom of the battery into the frame and rotate the battery into place until the battery latches in place.

   CAUTION: DO NOT LEAVE CHARGER PLUGGED INTO WALL AFTER COMPLETING CHARGING – THIS MAY DAMAGE THE BATTERY CHARGER. UNPLUG OR OTHERWISE DISCONNECT THE CHARGER FROM AC POWER WHEN IT IS NOT IN USE. FAILURE TO DO SO WILL VOID YOUR WARRANTY.

Inflating Tires – using Presta valve adapters

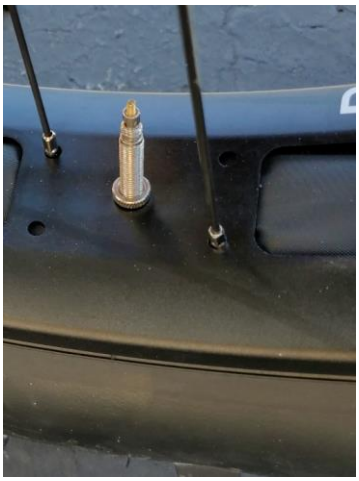
Your Rungu Dualie comes with “Presta” or “French Valve” innertubes, which work better at low pressures than “Schraeder” or “English Valves” (standard on car tires). Some bicycle pumps come with Presta valve adapters built into the pump outlet, but many do not. Rungu ships Dualie Standard, Dualie Steep and Dualie XR bikes with a “screw-on” adapter. Rungu ships the Dualie Rugged and Dualie XR Rubicon Trail edition units with the Cycplus portable tire pump; the pump uses a standard Schraeder” valve outlet; use it with the Presta “screw-on” valve adapters to inflate your tires as shown below.

CAUTION: DO NOT USE GAS-STATION AIR PUMPS OR OTHER HIGH-VOLUME AIR COMPRESSORS TO INFLATE YOUR TIRES. THEY MAY QUICKLY EXCEED THE LIMITS OF THE TIRE AND TUBE AND CAUSE THE TIRE TO EXPLODE.

Using the Presta “screw-on” valve adapters

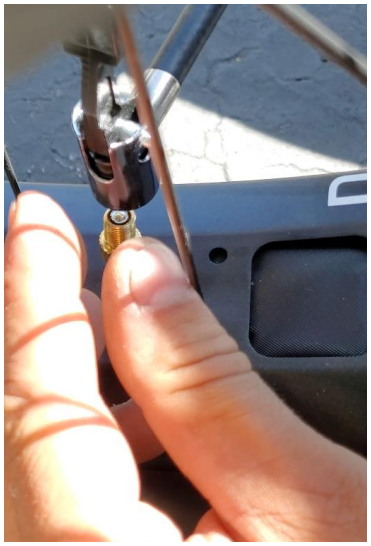
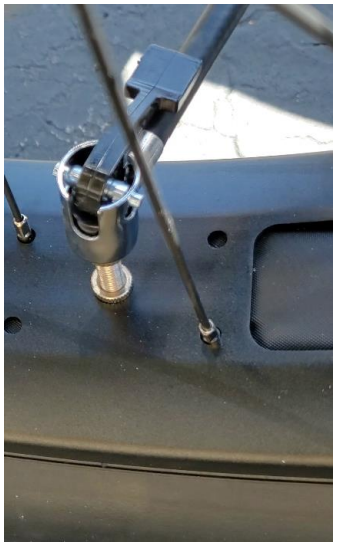
1. Unscrew the protective cap from the presta valve on the tire you want to inflate.


2. Unscrew the captive nut on the top of the presta valve to allow air to flow into the tire.



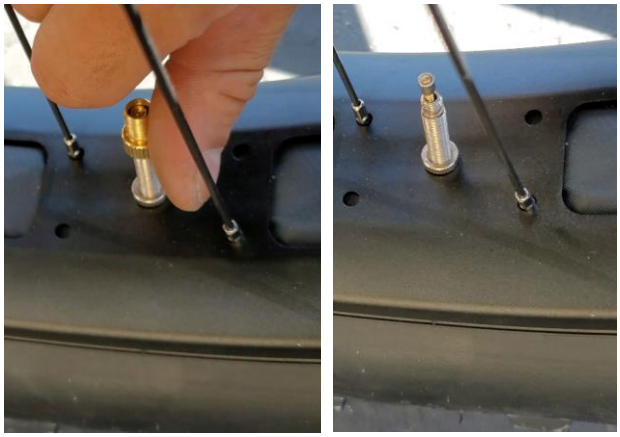

3. Screw on the Presta valve adapter.


4. Connect the bike tire pump and inflate tire to the pressure appropriate for where you're riding – as recommended in the before you ride section of this document.

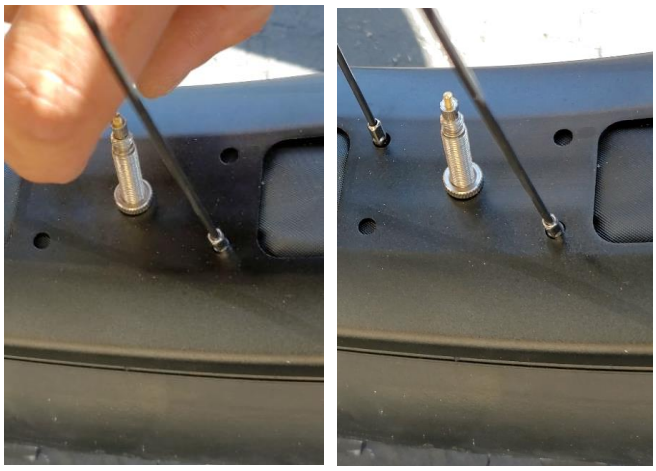



5. Remove the bike tire pump and unscrew the Presta valve adapter. Put the valve adapter in a safe place; they are easy to lose.

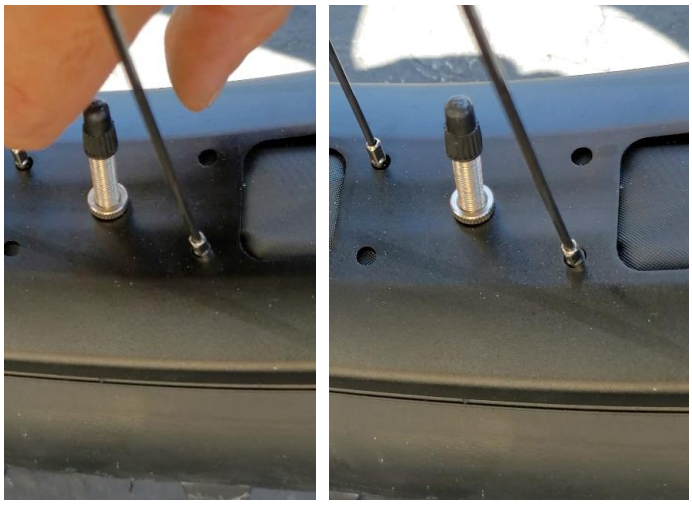
   CAUTION: DO NOT LEAVE THE PRESTA VALVE ADAPTER IN PLACE. THE CAPTIVE NUT NEEDS TO BE RE-FASTENED TO RETAIN TIRE AIR PRESSURE.



6. Tighten the captive nut on the top of the Presta valve to keep the valve from leaking air.



7. Replace the protective cap, which protects the captive nut and thread from corrosion.



Before you ride – Safety Check

Note: If you have assembled the DUALIE yourself, Standard Bearer Machines recommends you take the DUALIE to a local bike shop for final tuning and adjustment.

As explained in the unpacking and assembly instruction, Standard Bearer Machines recommends the DUALIE to be assembled professionally once you receive it. The following ten steps are intended to help make your first and every ride a safe one.

Note: Standard Bearer Machines tune every Rungu prior to shipping. During shipping, shifters, brakes and other mechanical parts may move out of alignment.

1. Make sure you wear a helmet. "Fifty-four percent of bicyclists killed in 2017 were not wearing helmets. However, helmet use among those killed has remained relatively consistent at 16 percent since 2010."[2] Wear a helmet.
2. Make sure the stems are tightly clamped to your forks. To do this, stand in front of the Rungu astride the left wheel facing the steering assembly. Hold both handlebars and try to turn the steering. The fork and wheel should flex, but the handlebars shouldn't turn independently of the wheel you're bracing. If the other wheel moves when you turn the handlebars, STOP. The stems aren't tightened enough; Turn the handlebars back to visually align the two front wheels with handlebars and tighten the two bolts on the back of the stem, where the stem clamps to the fork. Repeat this step for the right wheel.

3. Make sure each wheel is fully inserted into its dropout. Look carefully at both sides of the quick release on each wheel and make sure that the quick release skewer ends are seated inside the recesses on the bottom of the forks for each fork and inside the slot in the frame of the rear

[2] https://helmets.org/stats.htm

dropout for the rear wheel. If they are not, STOP. Unclamp the quick release, reposition the wheel and re-clamp the quick release to retain the wheel.

4. Make sure each quick release skewer is clamping the wheel. The quick releases should be difficult to open. If they are not, STOP. Open the quick release lever and screw in the retention nut to make the clamping tighter. The quick release should begin to clamp when the quick release lever is pointing perpendicularly away from the wheel.
5. Ensure that critical fasteners are tightened. Use a ¼" Hex Wrench provided with your purchase and check if you can loosen the Linkage Rod Retention bolts applying minimal force. If you can, STOP. Tighten each bolt. Use an 8mm hex wrench to check that the crank bolts are tightened and on both right and left sides. If you have a cargo rack, use a 6 mm wrench to check that all of the cargo rack fasteners are tightened as well.
6. Make sure the handlebars don't twist in place. Hold each grip and try to twist the handlebars. If they twist, STOP. Re-orient the handlebars according to your preference and re-tighten the four screws on each linkage arm to clamp the handlebars.
7. Make sure the handlebar ends extend past the stems by at least 45 mm (1 ¾"). To check this, move the handlebars to each stop – where the handlebar end contacts the linkage rod. Look to see if the inside of the tire touches the outside of the neighboring fork. If it touches, STOP. Follow the instructions in the assembly section to reposition the handlebar end so that it extends at least 45 mm from the stem.

8. Make sure your seat post and seat are tightened. With the seat post clamp tightened, try to rotate the saddle. If the saddle moves, STOP. Open the seat post clamp and tighten the clamping mechanism before adjusting saddle height and orientation, then clamp it again.
9. Make sure your tires are inflated to the right pressure for the terrain you're going to ride. Use a tire pressure gauge to check the pressure of your tires. If the tire pressure is below 4 PSI or

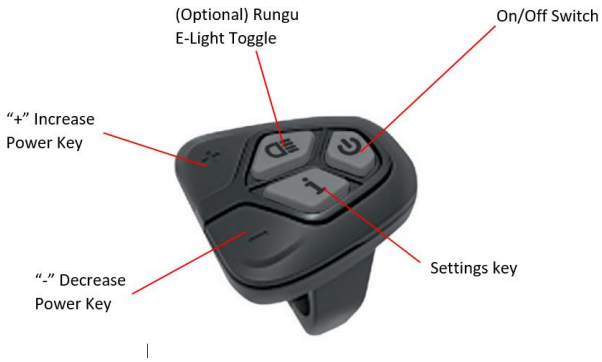
above 15 PSI (103 KPa), STOP. Inflate the tires to be 5 PSI (34 KPa) or above, or release air from the tire to lower the pressure below 15 PSI (103 KPa).

Note: Tire pressure plays an especially important role in how you enjoy your Rungu DUALIE. If you plan to ride mostly on soft ground like sand or snow, use a tire pressure between 5 (34 kPa) and 6 PSI (41 kPa) for best traction and control as well as minimizing tread wear. Use 10 PSI (69 kPa) if you plan to ride on harder surfaces like rock or dirt road. On harder surfaces, a higher pressure minimizes tread wear and improves the range of your Dualie.

CAUTION: AVOID UNDERINFLATING AND OVER INFLATING THE TIRES. UNDER INFLATION (BELOW 5 PSI) WILL PREVENT THE TIRE FROM SEATING ON THE RIM AND PREVENT YOU FROM RIDING DUALIE. OVER INFLATION (MORE THAN 15 PSI – 103 KPA) MAY RESULT IN TIRE BLOW-OUT WHILE RIDING.

Using the control keypad and understanding the dashboard

The Dualie comes with a display and keypad that differs from other manufacturers using Bafang BBSHD motors due to the higher voltages used. The keypad has the on and off switch, controls the power output level of the motor, turns the integrated Rungu E-Light on and off, and sets up the display settings. This section provides an overview of the controls that gives you enough information to operate your Dualie. For detailed instructions refer to the document "Rungu MDV Display User Guide" that you can find online at this link[3].



Turning on Dualie

Press and hold the on/off switch for one to two seconds. The Display will show a start-up screen and then show the dashboard.

[3] The guide and some of the images reference a "Sport" and "ECO" mode. The 52V standard only uses the Sport mode. Ignore references to ECO mode.

Reading the dashboard

When the display turns on, it acts as the dashboard showing all the motor and battery information at any time. This section describes each of the display elements at a high-level. For detailed information refer to the "Rungu Dualie Display User Guide" that you can find online at this link[4].

Banner section – Battery and Light status, time

The Battery Indicator on the right side of the banner gives a visual representation of the remaining capacity of the battery. Next to the Battery Indicator is the "State of Charge", it can show percent of battery charge or the voltage depending on the setting.

Note: Voltage displayed varies up and down during your ride. Rungu "State of Charge" value defaults to showing voltage because the value responds faster to changes in the battery than the Battery Indicator and provides an alternative perspective on how load affects the battery. The DUALIE voltage varies between 44V (fully discharged) and 58~60V. You may observe that voltage drops significantly during a hill climb or when riding on soft surfaces only to rebound afterwards. Voltage drops when the battery experiences greater loading (throttle, hill climbs, etc.), when load is removed a battery "relaxes" and returns to its unloaded voltage.

The e-Light status changes when you turn on the integrated headlight. To turn on the integrated headlight, press and hold the Rungu E-light toggle on the keypad for one to two seconds. When you turn on the headlight, an image of the headlight appears at the top of the display and the screen dims for night-time riding. You can also set the light to turn on automatically in low-light situations by changing the AL Sensitivity option in the display settings described below. To turn the headlight off, press and hold the Rungu E-light toggle on the keypad again for one to two seconds.

[4] Same

The time appears on the left of the banner. You can set the time using the display settings described below.

For detailed information on how to change Display settings, refer to the "Rungu MDV Display User Guide" that you can find online at this link[5].

Center Dial – Speedometer and power meter

In the center of the display appears a graphic representation of Dualie speed and battery output power. When riding, the digits in the center will display your speed. Depending on a display setting, the speed appears in miles per hour or kilometers per hour. When riding, a green arc appears and extends clockwise to give a graphic indication of speed relative to maximum speed. On the right side, another arc appears and extends counterclockwise to indicate the battery output power in watts. The amount of power output depends on the power level setting, the terrain, gearing, and the speed you are trying to maintain.

Footer – Trip information, operating mode and power level

Trip information, the operating mode and the power level appear at the bottom of the display. The display settings control the different measures that appear as trip information – the default is distance (odometer). Press the "i" key repeatedly to sequence through different trip computer output. Finally, the number bracketed in the center is the power level of the motor. The power level at start up is set to 1 - the lowest level of pedal assist. Default power level ranges from 0 (off) to 5 (full power).

CAUTION: RANGE ESTIMATES CAN BE MISLEADING. PRESSING THE "I" KEY CAN CAUSE THE RANGE TO DISPLAY. THIS OUTPUT OF THE TRIP COMPUTER ESTIMATES RANGE REMAINING FOR THE BATTERY CHARGE. THE TRIP COMPUTER CONTINUOUSLY RECALCULATES REMAINING RANGE BASED ON THE WAY YOU HAVE BEEN LOADING THE BATTERY SINCE THE LAST RECHARGE. IF YOUR ROUTE VARIES AND YOU START BY GOING UP HILL OR THROUGH SOFT TERRAIN, THE COMPUTER ESTIMATES A VERY SHORT RANGE; THE COMPUTER ASSUMES YOUR ROUTE TO CONTINUE TO LOAD THE BATTERY IN THE SAME WAY. IF YOUR ROUTE BEGINS ON A LONG DOWNHILL; THE COMPUTER ASSUMES CONTINUED LIGHT LOADING AND ESTIMATES A VERY LONG RANGE.

Accessing the display settings

To access the display settings, press the "i" button twice in succession within a second (like a double-click). The screen shows three settings: Display Setting, Information, and Exit. Navigate the list using the "+" and "-" keys; use the "i" key to make a selection. The Display Setting item has multiple settings that are fully described in the "Rungu MDV Display User Guide" that you can find online at this link[6].

[5] The guide and some of the images reference a "Sport" and "ECO" mode. The 52V standard only uses the Sport mode. Ignore references to ECO mode.

[6] The guide and some of the images reference a "Sport" and "ECO" mode. The 52V standard only uses the Sport mode. Ignore references to ECO mode.

Toggling the Integrated Headlight on and off

The Rungu integrated headlight toggle turns the light on and off. Press and hold the Rungu E-Light toggle for two seconds and release to turn the light on. Do the same to turn it off. The screen will dim when you turn the light on for nighttime visibility.

Choose the AL Sensitivity setting in Display Settings to have the light turn on automatically in low light environment. The option has five levels of sensitivity so that the light sensor in the display will decide when to turn on the light based on surrounding light levels.

Turning off Dualie

Use the on/off key to turn off Dualie. Dualie also turns off if left idle for a few minutes. Display settings control the amount of time in minutes.

Built-in USB charging port

The Display has a USB (Type A) charging port under the bottom of the display protected by a rubber cover. Lift the cover to access the port.

You can charge your phone or power a GPS unit with a standard USB charging cable. The charger is only active while the Rungu Dualie display is turned on.

PIN Code

You can also prevent accidental or unwanted Dualie activation by implementing a PIN code at power-on. Using the Display setting "Password," set a four-digit password for powering Dualie. The next time you power Dualie, the Display will require you to enter the four digits using the "+" and "-" keys to scroll 0 through 9 and advance to the next digit using the "i" key. The Display Setting item is described in the "Rungu MDV Display User Guide" that you can find online at this link[7].

Walk assistance

Dualie can also help you push if you are walking alongside. Hold the "-" key down for more than two seconds; the motor turns and will help you push Dualie at approximately 3 miles per hour – walking pace.

[7] The guide and some of the images reference a "Sport" and "ECO" mode. The 52V standard only uses the Sport mode. Ignore references to ECO mode.

Riding the Rungu Dualie

Riding Dualie, the first time

Be prepared for a learning curve riding Rungu the first time. Dualie rides differently than bicycles and e-bikes and requires five to thirty minutes of riding before feeling comfortable. The additional front wheel adds more inertia to turning; riding Dualie feels more like riding a motorcycle than riding a bicycle. We recommend starting on pavement in an area with no other vehicular traffic and using power level 1 only to get used to turning and changing gears.

Watch our introductory video: Rungu Dualie Instructional Videos - Volume 2: Rungu First Ride before your first ride.

Riding with long pants

Your Rungu Dualie comes with a Chainguard and your pant cuffs are protected.

Figure 5 Rungu Dualie Chain Guard

If you do not use a Rungu Chainguard, but ride with long pants, use a pants cuff protector to keep your pants cuff from getting caught in the chain. Pants cuff protectors are commonly available where bikes or sold and from Amazon as shown below.

Sponsored

Duszake High Reflective Trouser Pant Safety Metal Clips,Pant Leg Cuff Clips Bike Bicycle 1 Pair

4.5 ★ 160

$8.69

prime FREE Delivery Fri, Mar 19

+1 colors/patterns

Leg Shield Bike Pant Protector - Completely Protects Cyclist's Pants from Grease and Chain Unlike Existing Straps and Clips -...

4.5 ★ 692

$12.99 ~~$14.95~~

Reflective Running Gear Bands Armband Belt for Night Walking Bike, Adjustable Reflective Bands for Runners Women Kids Men, Bicycle...

4.5 ★ 170

$7.99

prime FREE One-Day

Pant Reflective Ankle , 2PCS Bike Bands For Men & Women , First Rate Fitness Equipment , High Visibility And Safety Outdoor Clip Leg Strap...

4.0 ★ 64

$7.49

Save 10% with coupon

WARNING: RIDING WITH LONG PANTS WITHOUT USING A PANTS CUFF PROTECTOR OR CHAINGUARD MAY CAUSE THE CHAIN AND CHAINRING TO CATCH YOUR PANTS CUFF, WHICH CAN LEAD TO LOSING CONTROL OF THE RUNGU DUALIE AND SEVERE INJURY OR DEATH.

Using Derailleur (Gear) Shifters

You use a shifter on the right-side handlebar to change gears and optimize your Dualie riding experience. Selecting the right gear lets you apply the appropriate power for the appropriate terrain. The shifters let you change the gear ratio between the motor and the rear wheel to best leverage the power coming from the motor regardless the power level. Like the transmission in a car, being in the wrong gear can cause the car to stall or use excessive energy to maintain speed. The same holds true with your Dualie.

Each Dualie has 9 gears – first gear is the largest sprocket on the rear wheel; ninth uses the smallest. First gear has the lowest gear ratio between the motor and the rear wheel. First gear is used for hill climbing or crossing the most difficult soft terrain. Ninth gear has the highest gear ratio; it's used for cruising on flat roads to achieve the highest speed.

Changing gears with the BOX Prime 9 system

If you have the derailleur pictured below, your Dualie is equipped with the BOX Prime 9 system.

You only need to use your right thumb to shift gears. There are two thumb triggers – Upper and Lower.

Each press of the thumb against one of the triggers indexes the gear. A long press of the Lower Thumb Trigger decreases the gear by one gear at a time starting in ninth gear. A short press of the Upper Thumb Trigger increases the gear by one gear at a time starting with first gear.

How and when to change gears

ALWAYS shift gears while pedaling to avoid cassette damage and broken chains. The shifter controls the rear derailleur, which moves the chain from one gear to the next. The derailleur can shift gears only while the chain is moving. The Mid-Drive motor moves the chain when you throttle or pedal, and Dualie also uses an electronic clutch (gearsensor.com) to shut off the motor during each gear change. It is designed so you MUST pedal to complete the gear change. Shutting the motor off and relying on pedaling minimizes the force on the chain and sprockets during gear changes to avoid damage to the chain or cassette.

WARNING: IF YOU DO NOT PEDAL DURING A GEAR CHANGE, THE MOTOR WILL REACTIVATE AND PROBABLY BREAK THE CHAIN OR CASSETTE WHEN COMPLETING THE GEAR CHANGE.

When operating under heavy load (power level 4 and 5), temporarily reduce the power level to 3 before completing the gear change. Avoid changing gears without pedaling or when experiencing heavy load going up hills or deep snow. Read the section below for more information.

CAUTION: RUNGU WARRANTY DOES NOT COVER DAMAGED/WORN CASSETTES AND BROKEN CHAINS.

Understanding and changing Rungu Dualie Power Level

Each Dualie is factory configured to five selectable power levels for the mid-drive motor. At the lowest level, the motor provides little assistance to pedaling. At level 2, Dualie can qualify as a "Class 1" [8] (Pedelec) electric bike or Throttle Powered "Class II"[9] electric bike. At levels 3, 4 and 5, you access the full power of the mid-drive motor, which is intended for off-road use only.

In the Display Settings, you can also change the number of Power Level increments with the MAX PAS setting. DUALIE default is five, but you can also have three levels (33%, 67%, 100%) or nine levels in 11% increments.

Press "+" to increase the power by one level; Press "-" key to decrease the power by one increment. As you're riding you can increase and decrease the power output of the DUALIE motor in this way. If you're operating DUALIE on flat paved roads, using level 2 or 3 is adequate to maintain a speed of 10 mph with minimal effort. If you're riding steep inclines off-road or in deep sand/snow, use a combination of appropriate gearing and a power level of four or five. The table below shows the 5 standard power levels and how they correspond to the maximum power to the wheels:

Power Level	% Maximum Power	Maximum output power (W)	Maximum Power (hp)
0	0	0	0
1	20%	286	0.4
2	40%	572	0.8
3	60%	857	1.1
4	80%	1,143	1.5
5	100%	1,429	1.9

[8] Dualie is configured for off-road riding only unless otherwise specified by the customer and configured accordingly at the factory. Classification according to California Ebike Standards. Learn more at https://en.wikipedia.org/wiki/Electric_bicycle_laws#California

[9] Ibid.

As noted, you can also set the number of power levels to be three or nine. Here are the power output tables for these levels.

Power Level	% Maximum Power	Maximum output power (W)	Maximum Power (hp)
0	0	0	0
1	33%	476	0.6
2	67%	953	1.3
3	100%	1,429	1.9

Power Level	% Maximum Power	Maximum output power (W)	Maximum Power (hp)
0	0	0	0
1	11%	159	0.2
2	22%	318	0.4
3	33%	476	0.6
4	44%	635	0.9
5	56%	794	1.1
6	67%	953	1.3
7	78%	1,112	1.5
8	89%	1,270	1.7
9	100%	1,429	1.9

If you purchased your Dualie configured as a Class 1 or Class 2 e-bike, you'll find the output to be half what is displayed above.

Power level and gear combination guidelines

For best results and the longest life of your chain and cassette follow these guidelines:

1. ON EVEN OR ROLLING ROADS, Use power level 3 (60%) and pedal. Change gears at will to manage speed. Avoid power levels 4 (80%) and 5 (100%) when using 8th or 9th gear. The force of acceleration at high power levels on these small cassette sprockets leads to premature wear.
2. ON STEEP HILLS (greater than 20% grade), stay in first or second gear and leave the power level set to 5 (100%). Avoid changing gears. Changing gears under load may cause the chain to break or the sprockets in the cassette to bend. If you plan to ride off-road and encounter steep terrain, it is advisable to bring a spare chain and a master link chain tool.

ON LOOSE GROUND LIKE DEEP SNOW OR SOFT SAND, use power levels 3-5 and low tire pressures (as discussed above), always start in first or second gear before changing gears to get a higher speed. As with steep hills, changing gears under load may cause the chain to break or the sprockets in the cassette to bend.

The Importance of Shifting into the Correct Gear

Appropriate gearing takes full advantage at each power level. Using the shifter on the right handlebar, you can change the Dualie gearing. Dualie has nine gear ratios or speeds. The largest gear ratio for the microSHIFT advent cassette is 30:11. At a ratio of 30:11, every rotation of the crank arms turns the rear wheel 2.7 times, which is good for maintaining higher speeds. However, the torque output is around 1/3rd of the motor output so accelerating from a stop and hill climbing using this gear ratio is a bad idea. In the lowest gear (largest cog), the gear ratio for the microSHIFT advent cassette is 30:42. For every rotation of the crank arms, the rear wheel turns 71% of a full rotation; not so good for maintaining higher speeds, but great for getting the most torque out of the motor for hill climbs and on soft ground

(snow, sand, and mud). Learn to use the gear shifter to adjust to terrain to take full advantage of each power level you choose AND REMEMBER TO ALWAYS SHIFT WHILE PEDALING.

Power Level selection guidelines: Problems resulting from not following gear shifting

CAUTION: AVOID SHIFTING WHEN DUALIE IS UNDER LOAD. SHIFTING GEARS WHILE USING POWER LEVEL 4 OR 5 AND HILL CLIMBING MAXIMIZES CHAIN WEAR AND MAY RESULT IN A BROKEN CHAIN, BENT CASSETTE COGS OR BOTH. THE DUALIE USES A CHAIN DESIGNED FOR THE OUTPUT OF THE MOTOR, HOWEVER REPEATED GEAR CHANGES AT THE HIGHER POWER LEVELS GENERATES VERY HIGH FORCE AND CAN BREAK A LINK. IF YOU PLAN TO OPERATE DUALIE IN DIFFICULT OR CHALLENGING TERRAIN BE PREPARED. ALWAYS CARRY AN EXTRA CHAIN FOR REPLACEMENT.

Bent 3rd gear cog resulting from gear change while hill-climbing and power level set to 5 – older Shimano cassette

CAUTION: AVOID ACCELLERATING AND PROLONGED USE OF 8TH AND 9TH GEAR WHILE POWER LEVEL SET TO 4 OR 5. POWER LEVELS 4 AND 5 PRODUCE SIGNIFICANT FORCE ON THE TWO SMALLEST COGS AND LEAD TO RAPID COG WEAR AND RESULT IN INCONSISTENT CHAIN ENGAGEMENT (CHAIN SKIPS). YOUR WARRANTY DOES NOT COVER DAMAGE TO THE CASSETTE DUE TO WEAR OR LOADING.

New 10th speed cog – older Shimano Cassette

Same cog after three miles of acceleration from a full stop in 10th gear using power level 5. Note tooth damage. Also prior Shimano version of Cassette.

For detailed information on how to change Display settings, refer to the "Rungu MDV Display User Guide" that you can find online at this link.

Rungu Dualie Operation Cautions

1. DO NOT use FULL throttle for prolonged periods of time. This will result in excessive heat buildup in the motor, throttle and batteries. Think about what would happen to your car if you redlined for prolonged periods of time... the engine won't last long. Do not abuse your system, and it will last you a long time!
2. DO NOT operate in excessive heat (over 100 degrees Fahrenheit) for a prolonged period of time. Doing so may result in excessive heat buildup and some components may shut down due to thermal protection.
3. If you notice a decrease in performance or abnormal operation, cease electrical operation immediately. Failure to do so may result in damage to electrical components.
4. DO NOT apply the brakes abruptly when going downhill as this may result in loss of control. Use consistent, gradual braking.
5. When riding with long pants, use a pants cuff protector to prevent your right pants cuff from getting caught in the chainring.
6. For best results and the longest life of your chain and cassette follow these guidelines:
    a. ON EVEN OR ROLLING ROADS, Use power level 3 (60%) and pedal. Change gears at will to manage speed. Avoid power levels 4 (80%) and 5 (100%) when using 8th or 9th gear. The force of acceleration at high power levels on these small cassette sprockets leads to premature wear.
    b. ON STEEP HILLS (greater than 20% grade), stay in first or second gear and leave the power level set to 5 (100%). Avoid changing gears. Changing gears under load may cause the chain to break or the sprockets in the cassette to bend. If you plan to ride off-road and encounter steep terrain, it is advisable to bring a spare chain and a master link chain tool. The chain tool can also be used to straighten out bent sprockets.
    c. ON LOOSE GROUND LIKE DEEP SNOW OR SOFT SAND, use power levels 3-5 and low tire pressures (as discussed above), always start in first or second gear before changing gears to get a higher speed. As with steep hills, changing gears under load may cause the chain to break or the sprockets in the cassette to bend.

Note: Always ride Dualie at a level and speed you are comfortable with. If you're uncomfortable with the terrain, walk the bike.

Note: Dualie Warranty does not cover damaged/worn cassettes and broken chains.

7. NEVER jump with the Dualie. The Dualie is designed for moderate bumps but jumping your Dualie can lead to serious injury and/or damage.
8. ALWAYS follow local laws regarding your Dualie. If your Dualie is over legal speed and power limits, reduce your power level to legal limits when riding on public roads or property.
9. MINIMIZE shifting gears at power level 5 to increase chain life.

Riding Safety

Follow these guidelines to improve your safety when riding Dualie

1. ALWAYS wear proper safety equipment
2. NEVER operate at speeds that exceed your ability to operate Dualie safely
3. ALWAYS know your surrounding and actively scan the terrain for obstacles
4. DO NOT wear loose fitting clothes or articles
5. NEVER ride with more than 1 rider
6. Suitable for riders 16 and older.
7. Know your Dualie and your personal limits

WARNING: DO NOT RIDE AT NIGHT WITHOUT APPROPRIATE REFLECTORS AND LIGHTING. STANDARD BEARER MACHINES DOES NOT SHIP THE DUALIE OR DUALIE XR WITH ANY COMPONENTS FOR NIGHT-TIME RIDING SAFETY. IT IS THE OWNER'S RESPONSIBILITY TO EQUIP DUALIE WITH APPROPRIATE REFLECTORS AND LIGHTING TO RIDE SAFETY AT NIGHT.

WARNING: IF ANY INJURIES OR HARM OCCUR WHEN YOU USE THE PRODUCT, Standard Bearer Machines OR ITS DISTRIBUTOR WILL NOT BEAR ANY RESPONSIBILITY

Adjusting the Front Suspension

The front suspension has two manual controls that can change ride and handling characteristics. Looking from above astride the Dualie, the left-side knob controls the stiffness of the suspension. The right-side switch is used to disable/enable the suspension.

To stiffen or loosen the suspension, turn the right-side knob clockwise or counterclockwise respectively. All Dualies ship with the suspension at the loosest setting. If you find that the front-end dives too much, or that you are having difficulty turning on soft ground (sand, snow), increase the stiffness of both forks by turning the knob clockwise.

When activated, the optional front suspension for the Dualies makes cornering on hard surfaces smooth and improves control on soft sand. The team at Rungu recommends leaving the suspension activated (not locked out) for all terrain, but you may want to try de-activating the suspension if you're in deeper snow for better carving capability.

Using the parking brake

The front hydraulic brake lever has a parking brake. To engage the brake, pull in the left brake lever while pressing the button under the hinge lever. The button will press upwards when it engages the lever activating the parking brake. Release the lever when the button engages; the button stays engaged/depressed.

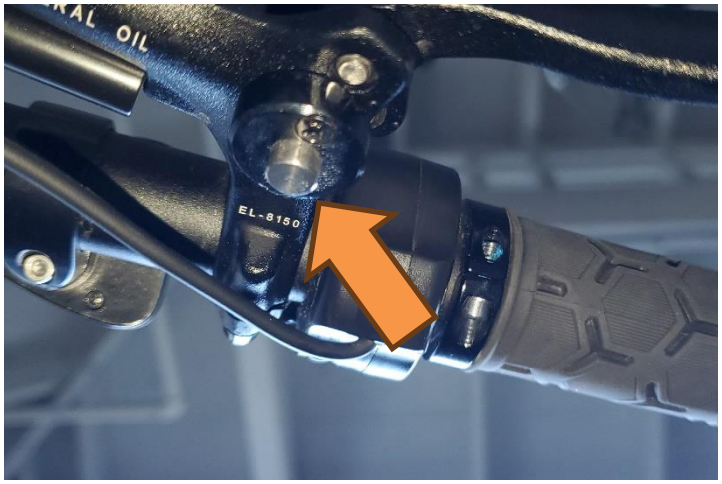


Figure 6 Parking brake button under left brake lever

Figure 7 Button engaged, front parking brake on

CAUTION: DO NOT ENGAGE THE PARKING BRAKE IF YOU HAVE REMOVED ONE OR BOTH FRONT WHEELS. ENGAGING THE PARKING BRAKE OR ACTIVATING THE FRONT BRAKES IN THIS CONDITION CAN CAUSE THE BRAKE CALIPERS TO JAM AND REQUIRE MANUAL INTERVENTION TO SEPARATE THE BRAKE CALIPERS BEFORE REPLACING WHEELS.

Engaging the parking brake disables the motor.

To disengage the parking brake, pull in the left brake lever as far as it will go. You'll hear a "click" when the button resets and the parking brake disengages.

NOTE: Riding with the parking brake engaged produces significant wear on the brake pads leading to a decrease in brake pad life and stopping power. Warranty terms DO NOT cover replacement brake pads.

Rungu Dualie Maintenance, Care and Repair

Before Each Ride

See section labeled "Before your first ride – Safety Check"

Securing your Dualie

When riding the Dualie in areas where theft is a concern, use appropriate cable or chain locking devices and make sure to thread the cable/or chain through the frame, wheels and saddle/seatpost to avoid quick removal.

Standard Bearer Machines recommends you use the Password feature found in the display settings described in an earlier section of this document.

After Each Ride

1. Clean and inspect Dualie. Hose off (Use a shower mode or light spray, avoid powerful spray settings) or wipe down DUALIE and dry it with a towel. Look for any damage to the frame or components that may need maintenance.
2. Wipe and lubricate the chain. Depending on the riding environment apply a dry or wet lubricant after wiping the chain clean and dry. See more about chain maintenance in Chain Maintenance section below.

Battery Care

There are three rules to extend battery life in day to day use:

1. Charge the batteries in a cool, dry location. Heat is not a friend of the charger or the battery.
2. Only fully charge the batteries if you plan to use the Dualie within the next few days.
3. If you plan to not use the Dualie for more than a few days, keep the batteries charged around 50% of their capacity (Voltage level of 50-52 V) and recharge the battery the day before your next ride.

CAUTION: IT IS IMPORTANT THAT THE BATTERY CHARGER GETS AIR FLOWING OVER THE HEATSINK AND IS OUT OF DIRECT SUN TO AVOID OVERHEATING OR BATTERY FAILURE

WARNING: NEVER CHARGE BATTERIES AT TEMPERATURES AT OR BELOW FREEZING (32°F OR 0°C). CHARGING AT THESE TEMPERATURES CAUSES PERMANENT DAMAGE TO THE BATTERY REDUCING LIFE AND CAPACITY. BATTERY DAMAGE IS EXCLUDED FROM YOUR WARRANTY.

Storage When Not Using Dualie for Periods of Two Weeks or Longer

Standard Bearer Machines selected these batteries and the electrical system to be as maintenance free as possible. In the event you plan to not use the Dualie for a period of more than three weeks, open the battery case (or cases), disconnect the battery from both connectors, and remove the battery(ies) and store it (them) with ~50% charge (around 50-52V). For long term storage (for the winter) store batteries in a room temperature location and away from Dualie. For best results, every month you don't use Dualie, hook the battery up to the charger for 10-20 minutes as the battery will lose charge over time and this will allow you to put some extra charge in the battery and balance the cells.

Note: You can purchase an outlet timer that switches the charger on every week for a period of 10 minutes and keep the charger connected to the battery. In this situation, the charger is only powered by AC when the outlet timer is on.

Recommended: BN-LINK 7 Day Heavy Duty Digital Programmable Timer, FD60 U6, 115V, 60Hz, Dual Outlet, Indoor, for Lamp Light Fan Security UL Listed

Prolonging the Life of your Battery – Best Practices

The Dualie features powerful, lightweight and high-performing batteries. NMC based systems should expect around 3-5 years of use depending on how you take care of your battery and up to 800 charge cycles. These batteries do have a shelf life so even if you are not using the pack, the battery will only be good for so long.

To prolong the life and performance of the pack, it is best to not drain the pack to zero capacity (like when the battery management system shuts it off). Going from 100% to zero capacity will adversely affect your life cycles. It is much better, for instance, to go from 100% to 50%. If you only rode your bike 3 miles every day, you are better off charging the battery after each ride instead of waiting until the battery is dead. Keeping the depth of discharge less than 80% (so from 100% to 20%) will make sure you get the full life from the battery.

Heat and discharge rate also will adversely affect the life and performance of the battery. If you want more life from your battery and system, it is best to use a lower power level. The lower the power level, the less stress (and heat) it puts on the battery cells and battery management system. This equates to a longer cycle life and better performing battery.

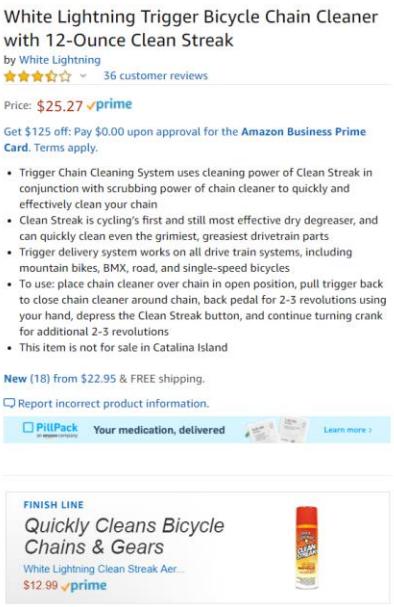
Chain Maintenance – Cleaning and Lubrication every 40 miles of hard use

Proper chain maintenance can make the difference between a successful back country trip and one where you're walking back. A clean and correctly lubricated chain prevents "chain suck", which occurs when the chain on the return line (bottom of the chainring) attaches to the chain ring instead of returning to the rear derailleur. At its worst, "chain suck" can cause the rear derailleur to break away from the frame and even dislodge the rear wheel from the dropouts.

Figure 8 Image of chain suck - note chain wrapped around chainring

To avoid "chain suck", clean the chain and reapply lubricant every 40 miles in wet, salty or muddy conditions. Also clean and reapply lubricant when weather conditions change – if you are in a dry climate and have been using a dry-lubricant, and then go to a rain/mud wet environment, it's important clean and reapply lubricant.

To do so, first clean wipe the chain with a rag and then use a chain cleaner like the one in the image below. We recommend the White Lightning Chain Cleaner Degreaser because it is easy to run the cleaning head back and forth over the chain without relying on rotating the crank arms backwards like most chain cleaning systems – The motor prevents reversing direction of chain travel.



Here's a link to a video showing the more traditional way of using the chain cleaner.
https://www.youtube.com/watch?v=Aiql_2UNTEE

After using the degreaser, empty the reservoir in the chain cleaner and fill it with water and run the chain cleaning mechanism over the chain again to remove the degreaser.

Wipe and dry the chain with a new rag.

With the chain clean, use the Lubrication guidelines below to choose the chain lube best for your environment. Follow application instructions printed on the chain lube bottle.

Conditions	Chain lubricant
Dirt/dry	White Lightning Clean Ride or Boeshield T-9
Dirt/wet (Stream crossings)	First choice Muc-Off E-bike Wet Weather Ceramic Lube (ebike wet chain lube) – Second Choice White Lighting Wet Ride
Mud	First choice Muc-Off E-bike Wet Weather Ceramic Lube (ebike wet chain lube) – Second Choice White Lighting Wet Ride
Sand/soft sand/beach	White Lightning Clean Ride or Boeshield T-9
Snow/Rain	First choice Muc-Off E-bike Wet Weather Ceramic Lube (ebike wet chain lube) – Second Choice White Lighting Wet Ride

Maintenance – After strenuous rides, and every 500 miles or six months

1. ALWAYS check the integrity of the battery case and battery system. Make sure the battery padding is usable, and each battery is secured well in its case. If you notice wear marks on the battery casing, use duct tape to cover the wear marks and add padding in the wear area (packing foam is fine).
2. Check spokes on all three wheels. The rear wheel often requires more attention due to the torque of the motor. Spoke and wheel maintenance are part of a normal bicycle maintenance procedure and will be accelerated with an electric motor. Do not take chances with the spokes and if you think they are loose, chances are you are correct. The spokes should all have the same tension. If they are loose, tighten them yourself, or take it to your local bike shop to get fixed.
3. Check and replace tires as necessary.
4. Check all electrical connections making sure that they are all tight. Bad contact means energy is wasted as heat, which can cause a breakdown of wire insulation. Any wire with melted insulation indicates a poor connection nearby. Disconnect the batteries and do not operate if insulation is melted or wire is exposed.
5. Inspect and lubricate your chain (as described earlier), or if necessary, replace the chain. If you observe gear changes to take longer than normal, it may be time to replace the chain. Contact support@riderungu.com or consult the Internet for the most appropriate replacement chain on the market at the time.
6. Inspect the cassette cogs for wear. If you experience chain skip at higher power levels, your cassette cogs may be worn and require replacement. Contact support@riderungu.com, a qualified bicycle technician, or the Internet on sourcing and exchanging your replacement cassette.
7. Service your brakes and brake pads. You can source maintenance supplies from Rungu, but Bicycle stores also have equipment to bleed the hydraulic system and replace the mineral oil. The same is true for brake pads. Check the components tab on the Support page of the Rungu Website to find links to useful maintenance videos appropriate for the Dualie. Standard Bearer Machines periodically updates these links, if you cannot find information you need send an email to support@riderungu.com.

Rear wheel removal or replacement

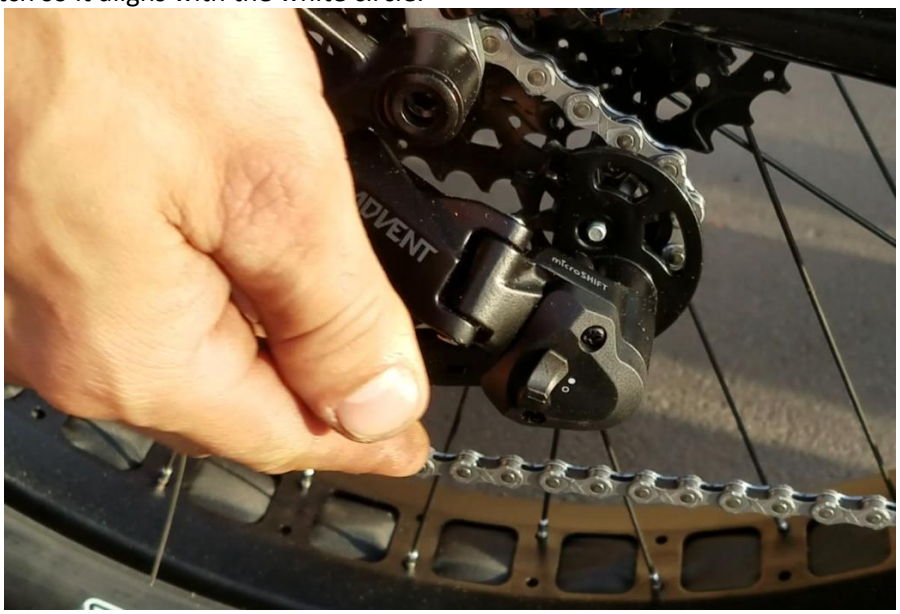
You may have to remove the rear wheel to fix a flat, replace the tire or replace the cassette. These directions explain the steps to remove and replace the rear wheel.

How to remove the rear wheel

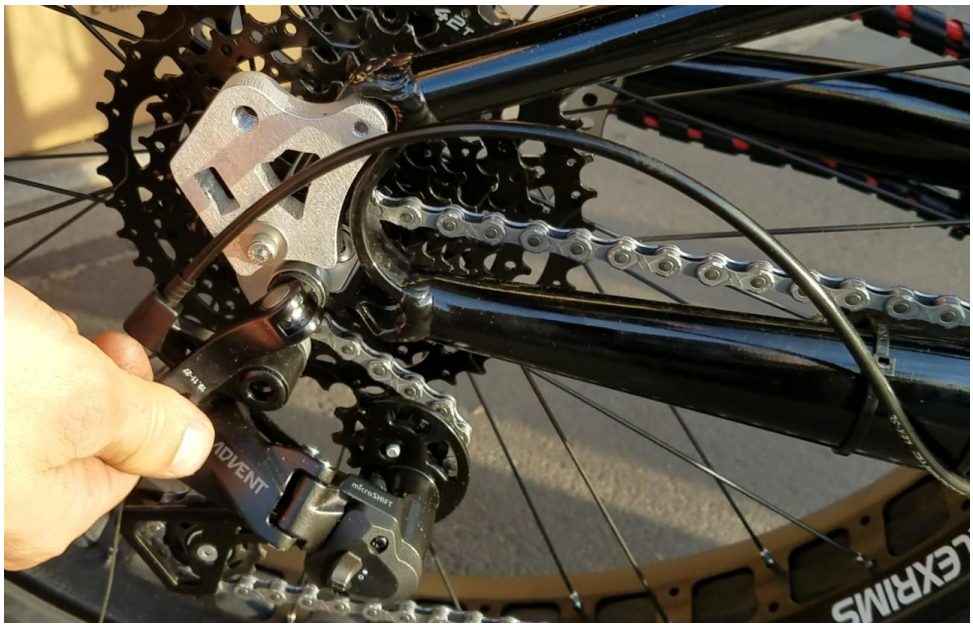
1. First, shift the rear wheel into 9th gear. Whether or not the chain is on the Rungu, shifting to 9th gear before wheel removal makes wheel removal easier.

2. If possible, find an object (e.g. empty bucket, cardboard box) that you can use to support the bike after the rear wheel is removed. Alternatively, hang the rear triangle from straps or ropes to support the rear triangle after the rear wheel is removed.

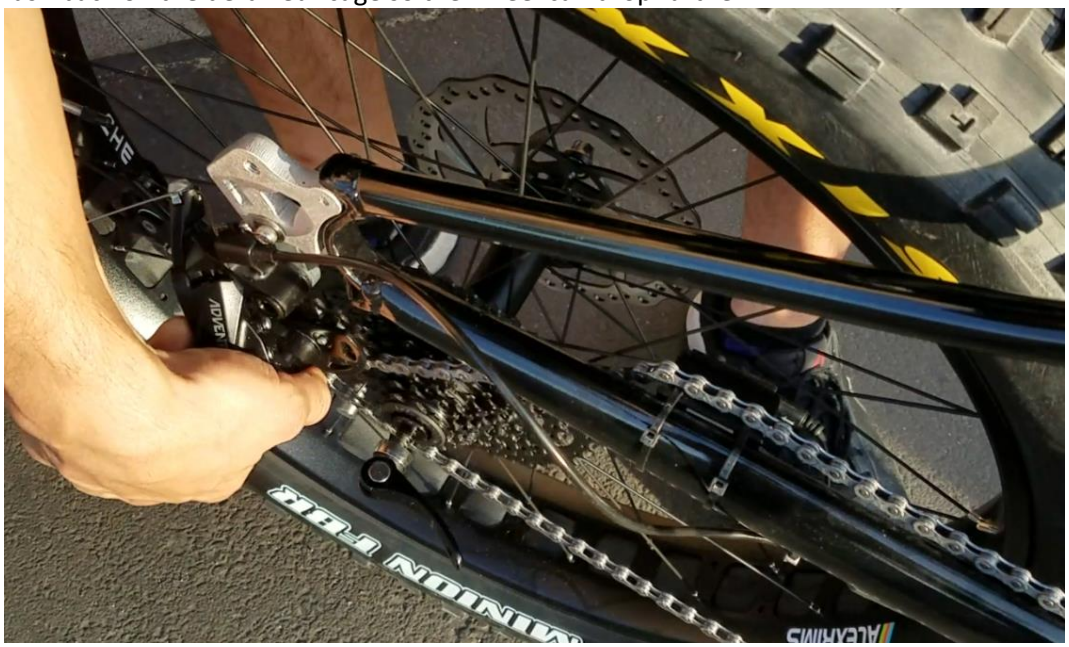
3. If you have the microSHIFT Advent Derailleur, switch off the derailleur clutch by pushing down on the switch so it aligns with the white circle.



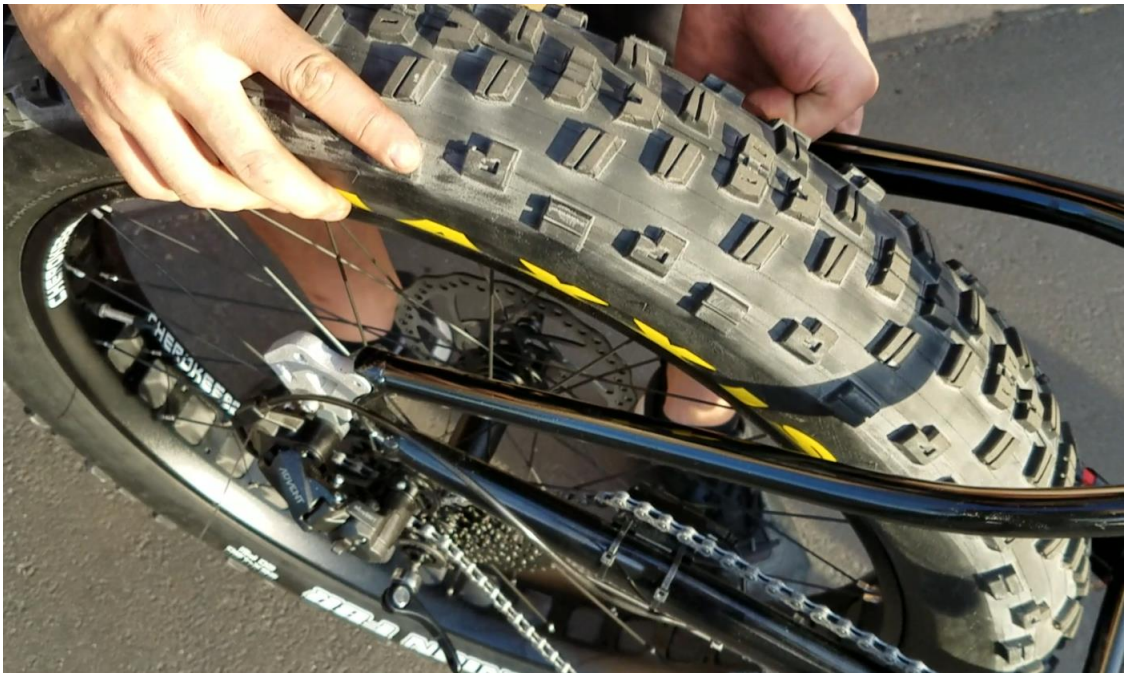
4. Release the quick release lever



5. Loosen the quick release skewer by unscrewing the end cap. Be careful to not lose the springs or other components of the skewer if you remove the end cap.
6. The wheel will drop out and the cassette will get caught on the derailleur pulley.
7. Push back on the derailleur cage so the wheel can drop further.



8. Move the chain above the cassette so it doesn't interfere with wheel removal.

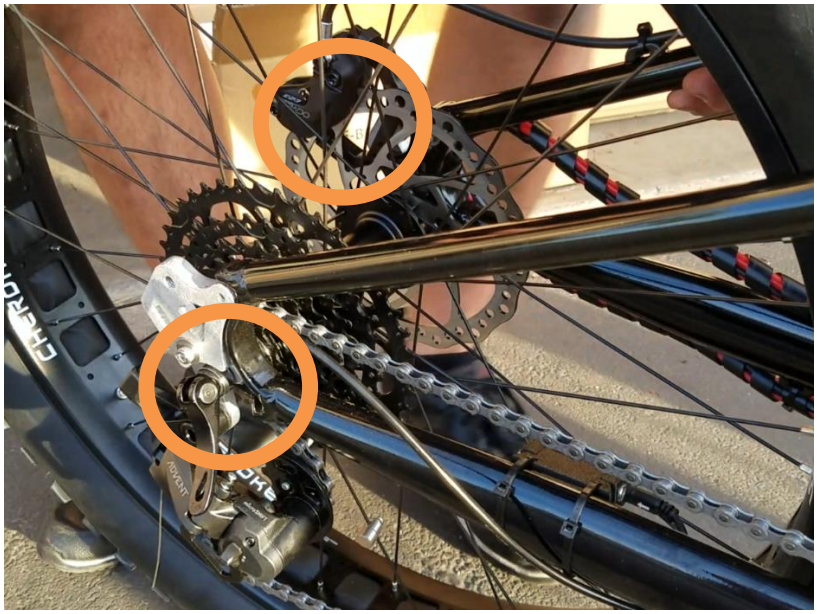


9. Put the rear wheel aside and support the frame as noted above while you service the rear wheel.

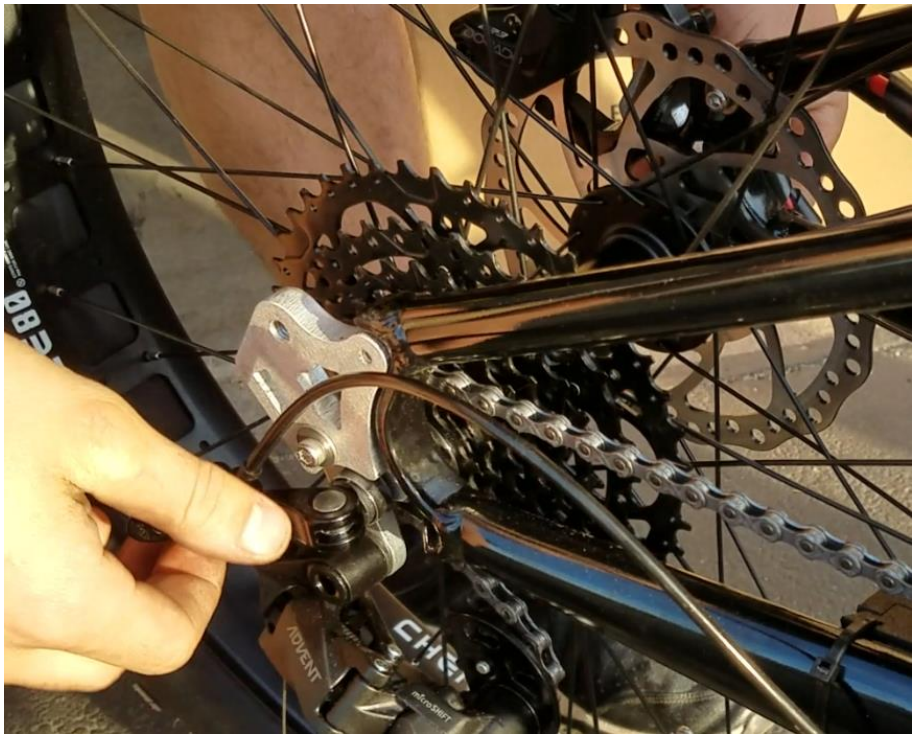
How to replace the rear wheel

1. If you have the microSHIFT Advent derailleur, make sure that the derailleur clutch switch is OFF. Regardless the derailleur, make sure that the derailleur is shifted into 9th gear. Lift the rear of the frame and position the rear wheel underneath and pull back on the derailleur so you can orient the chain around 9th gear on the cassette.

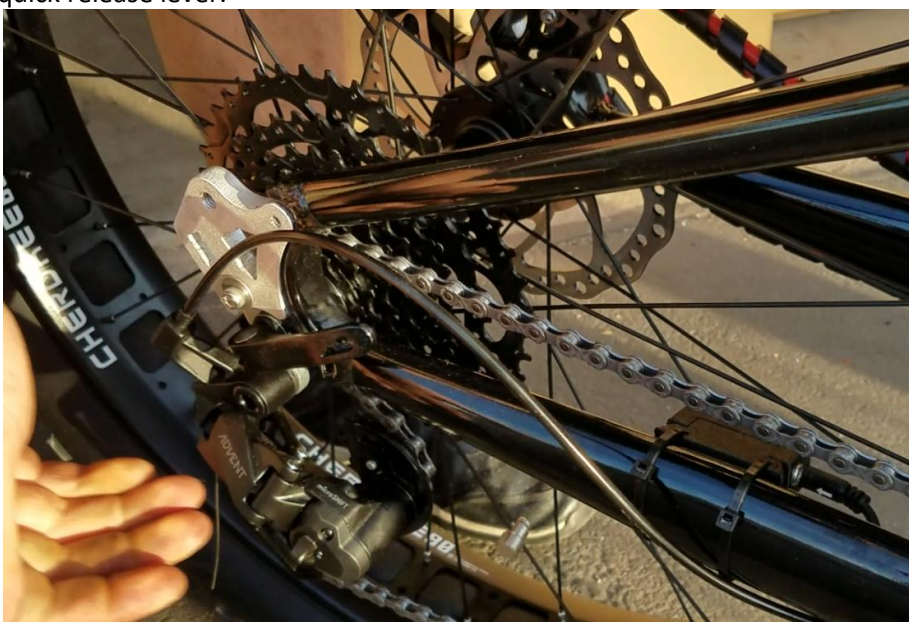
2. Remove any support for the frame and lower the frame so the axle of the wheel moves up into the dropouts. Take care to slide the brake rotor between the brake caliper pads on the left side of the bike.



3. Make sure the wheel axle is seated in the left and right dropouts, then carefully lower the wheel onto the ground. Gravity helps seat the axle in the dropouts. Then, tighten the quick release end cap. As a guideline the end cap nut should begin to clamp onto the left drop out when the quick release lever points away from the wheel at a right angle.



4. Close the quick release lever.



5. If the wheel doesn't appear to be vertical as in the picture below, loosen the quick release, realign and re-tighten the quick release.

6. After checking that the rear wheel is fastened tightly, switch on the derailleur clutch and test ride the Rungu for more than five minutes to make sure the speedometer is working.

WARNING: MAKE SURE TO TIGHTEN THE QUICK-RELEASE IN THE FRAME SO THAT THE WHEEL CANNOT FALL OUT; FAILURE TO ADEQUATELY TIGHTEN THE QUICK-RELEASE CAN RESULT IN ACCIDENTAL RIDER INJURY OR DEATH.

Fixing a broken chain

Because the Rungu Dualie motor produces high torque and many Rungu Dualie riders don't have the experience shifting gears as described earlier, broken chains a common problem encountered by new Dualie riders. A chain breaking while on a ride can ruin the ride if you haven't prepared with either a spare chain or at a minimum, a spare master link – most of the time chain breaks occur at the master link.

This section explains how to repair a chain with the spare master link Rungu ships with every new Dualie. The instructions in this section also apply to replacing a broken chain with a spare. But the instructions do not cover the repair of chains broken where a master link cannot be placed without the removal of plates from the chain.

There are many good videos available on YouTube on chain repair. The team at Rungu recommends the Park Tool video - https://www.youtube.com/watch?v=HpUCCrgugQE

1. Turn off the Rungu Dualie, and with the chain off, shift into 9th gear.
2. Route the broken chain (or new chain) through the derailleur, around the top of 9th gear (smallest cog) and over the chainstay. The images below show how the chain feeds through the Advent Derailleur.

3. Drape the end of the other end of the chain over the chainring so one end dangles from the chainring or pedal and other from the derailleur.

4. Insert the pins of each side of the master link into the ends of the chain.

5. Pull the chain together and align the pins with the slots on the master link plates.

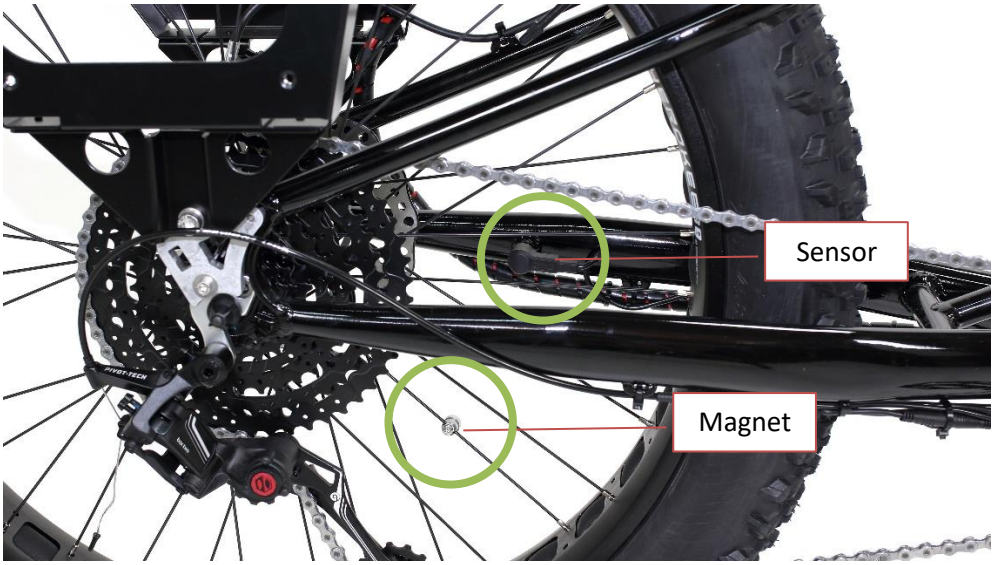
6. Rotate the chain so that the master link is above the chainstay and on the chain ring. With the rear brake engaged, you can step or use your hand on the right-side pedal to pull on the chain and set the master link. You should feel the master links “click” into place. Rotate the chain to verify the master links are set.

Wheel magnet alignment – "Error 21"

Wheel speed sensor alignment is critical to the function of your speedometer. The wheel speed sensor underneath the frame interacts with a magnet mounted onto one spoke on the rear wheel of your Dualie. The speedometer calculates your speed using this sensor and magnet to count rotations/second and translate that in real-time to your actual speed in mph (kph). If the speed sensor is not aligned with the magnet, the speedometer will fail to operate. You will see "Error 21" appear on your display.

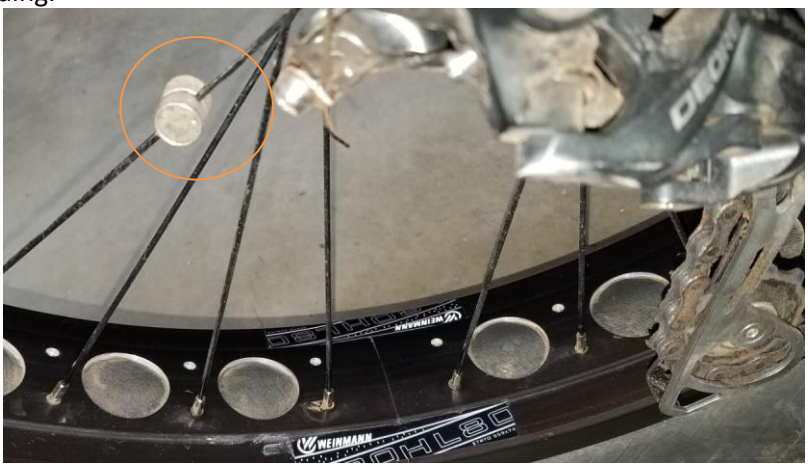
Though we align and test all sensor and magnets at the factory, wheel removal or accident may cause the magnet to change alignment.

1. Check that the sensor is in place. It is found inside the left chain stay. Check the image below and verify the same sensor is on your Dualie. If not contact Rungu or go online to obtain a replacement sensor.



2. Check that the cabling attached to the sensor is attached to the motor.

3. Check the picture below and verify your rear wheel has a magnet attached to one spoke. If you cannot find the magnet on one of the spokes, reorder one from Rungu or other sources online before proceeding.



4. If you are replacing a magnet, place the magnet so that the face of the magnet faces the sensor and algins with the oblong recess on the sensor – it has the word “Bafang” embossed.

Transporting Rungu Dualie

If you plan to transport Rungu Dualie in or on your vehicle, there are some important do's and don'ts to consider.

DO transport your Rungu Dualie upright. Rungu produces a hitch rack designed specifically for the double-wheel e-bike and can be found on the Rungu Website – click or tap here for the link. There are other options that we recommend and they can be found on our website as well – click or tap here for the link.

DON'T transport your Rungu Dualie on its side. Vibration from the transport causes lubricant to move away from transmission components inside the motor, this can result in the motor overheating during a ride requiring a motor replacement. Though motor replacements of this kind are covered under warranty, replacement labor, shipping and tools are not, making this an expensive and time-consuming warranty repair.

DO tie down your Rungu Dualie from the frame. The frame has many attachment points and provides the most rigid connections to your hitch rack or truck bed.

DON'T use ratchet straps when tying down Rungu Dualie. The leveraged force you can achieve on a ratchet strap can bend the frame or even damage the rack to which it is attached. The team at Rungu recommends cambuckle straps instead. Cambuckle straps restrict the retention force to what you can pull, which is enough to stabilize the double-wheel e-bike on any platform.

Technical Information

Default Display Settings

Units: Imperial
Brightness: 100%
MAX PAS: 5
Auto Off: 2 minutes
Power View: Power
SOC View: Volts
Trip Reset: No
AL Sensitivity: Off
Password: None

Dimensions

Rungu Detailed Specs - 2024		Dualie Double Wheel E-bike Models
Category	**Feature/spec**	**Rugged**
Dimensions	Projected length	85 in. (2134 mm)
	Handle bar width (effective)	32.7 in. (830 mm)
	Unit weight (with batteries and accessories)	105 lbs. (47.6 kg) [8]
	Frame size	14.5 in. (368 mm)
	Seat tube length (center to top)	13.4 in. (341 mm)
	Bottom bracket height	13.1 in. (332 mm)
	Chainstay length	22.4 in. (569 mm)
	Head tube angle	66°
	Head tube length	7.6 in. (193 mm)
	Seat post length	15.7 in. (400 mm)
	Seat tube angle	73°
	Top tube effective length (horizontal projection)	23.3 in. (592 mm)
	Seat surface highest position - Standard Saddle	42 in. (1,041 mm)
	Seat surface lowest position - Standard Saddle	34 in. (838 mm)
	Seat surface highest position - Serfas CRS-1 with	43 in. (1,067 mm)
	Seat surface lowest position - Serfas CRS-1 with	35 in. (864 mm)
	Path width (distance from outside of one front tire to the other)	13.75 in. (349 mm)
	Stand-over height	26.5 in. (673 mm)
	Top of stems (highest point on bike with seat in lowest position	43.5 in.(1105 mm)
	Packaging height of bike (front wheels removed - w/o steering risers)	31.6 in. (803 mm)
	Max Transport Height - back edge of cargo rack height (front wheels removed - cargo rack installed)	36.4 in. (925 mm)
	Packaging length of bike (front wheels removed, w or w/o cargo rack installed	71 in. (1803 mm)
	Ground clearance	9 in. (229 mm)
	Breakover angle	36°
	Wheel base	54.7 in. (1390 mm)

Performance

Rungu Detailed Specs - 2024		Dualie Double Wheel E-bike Models
Category	**Feature/spec**	**Rugged**
Performance	Absolute Maximum range on flat pavement with pedal-assist at 10 mph and no wind [1]	135 mi (217 km)
	Estimated off road range with pedal-assist at 10 mph avg speed [1]	24 mi (38 km)
	Max range off road - throttle-only avg 10 mph[1]	21 mi (34 km)
	Max climbing grade seated[2]	53%
	Max descent grade (seated - lowest saddle position - constant speed)	50%+
	Top speed - off-road[3]	24 mph (38 kph)
	Max power output (W)[4]	1429
	Max power output (Hp)[4]	1.9
	Rotational speed at max power out (RPM)	121
	Max torque output (Nm)	197
	Max torque at wheel (Nm)	328 [7]
	Max weight supported (rider and cargo)	335 lbs. (152 kg)
	Max towing weight - hitch on rack	300 lbs. (136 kg)
	Max load - Rungu Cargo Rack	180 lbs. (81.6 kg)

[1] Estimate based on experience and calculation of maximum range for Rungu carrying 175 lbs. load, on flat ground, no wind, no stops/starts

[2] Based on experience and calculations. Conditions include load limited to 175 lbs., hard surface, speed of 3 mph and slope distance of 50 ft. Actual

[3] Based on experience and calculations. Throttle-only speed for 175 lb.

[4] At full charge of 58.8V, 33A input at 121 rpm output

[5] At minimal gear ratio for model 1:1

[6] At minimal gear ratio for model 1:1.4

[7] At minimal gear ratio for model 1:1.67

[8] Includes both bags, spare parts and accessories

[9] Not available with Class 1 configuration/programming

[10] All batteries tested prior to shipment - actual capacity may vary +/- 2%

All specifications and features subject to change without notice

Electrical

Rungu Detailed Specs - 2024		Dualie Double Wheel E-bike Models
Category	**Feature/spec**	**Rugged**
Motor, Battery and Control Circuitry	Bafang BBSHD 1000W (G310.1000) mid-drive motor with 52V modification	Standard
	Minimum operating temperature (Mfg spec)	-4° F (-20° C)
	Maximum operating temperature (Mfg spec)	113° F (45° C)
	IP Rating	IP65 (Dust tight,
	Rungu Integrated 52V 16 Ah[10] (830 Wh) LiNMC locking battery with integrated charging port and USB output	N/A
	Rungu Integrated 52V 19.2Ah[10] (1000 Wh) LiNMC locking battery with integrated charging port and USB output	Standard
	Dual Rungu 52V 18 Ah[10] (Total 1,870Wh) LiNMC batteries, Rungu Battery Link	N/A
	Minimum operating temperature (Mfg spec)	-40° F (-40° C)
	Maximum operating temperature (Mfg spec)	161° F (72° C)
	5 A battery charger - full charge in 4 hours	Standard
	Dual 7.5A battery chargers - full charge in 2.3 hours	N/A
	Rungu Frame Case and Cargo Rack battery storage with locking access	N/A
Motor - Electrical	Nominal voltage (V)	52
	Max voltage (V)	60
	Max continuous input current (A)	28
	Max continuous power input (W)	1680
	Max efficiency	88%

Troubleshooting

Electrical

Problem: Why won't my Dualie turn on?
After pressing the on/off key, the display fails to light up; no power is coming to the motor.
Solution:

1. Press and hold the on/off key for at least two seconds. If that fails to turn on the display,
2. Check the connector to the Display. Reconnect if disconnected, otherwise,
3. Check that the battery is fully charged. Use a voltmeter and test the output on the charging terminals if you do not have an ebike computer. If the voltage is at or below 42V, the battery is fully discharged. If you are having trouble charging the battery, please look below about charging your battery.
4. Check the connections between the motor and the battery – these connectors are located behind the downtube that houses the battery. If your Rungu comes with a connector cover, remove the connector by clipping the two zip-ties that hold it in place and lift the connector off of the frame. Use two zip-ties (available at any hardware store) to re-fasten the cover when you're done.
5. If none of the proposed solutions work, contact Rungu.

Problem: I drove my Dualie until it went completely dead and now it will not charge.
This is a problem that occurs when you fully deplete the battery. The BMS on the battery protects the battery from discharging any further and force shuts itself off.

Solution:
Reset your battery by opening removing it from the battery case and disconnecting the battery from the frame and then reconnecting the battery. In most cases, this action is sufficient to "wake up" the battery so it will charge again. If this action fails to work, contact Rungu.

Problem: I cannot get my battery to charge or my charger is not working
The green light stays on when I know the battery is discharged or no light turns on at all when I plug the battery into the charger.
Solution:

1. If no light turns on when you plug the charger into the battery after plugging the charger into AC, replace the fuse in your charger. Then try charging the battery again. If this fails to charge the battery,
2. Reset the battery (see above), and then plug it into the charger. If this fails to charge the battery,
3. Call Rungu to talk through other troubleshooting steps.

Motor and System Performance

Problem: The Dualie feels sluggish in difficult environments

Hills, snow, and soft sand will slow down the DUALIE and cause you to use more power and pedaling. This is normal. If you feel like you have experienced better power in the past check the following items

Solution:

1. Change to a lower gear.
2. Check the power level setting and make sure is at its highest setting.
3. If you're in soft sand or snow, LOWER the tire pressure to 5 PSI or lower if you notice that the rear wheel is spinning more than pushing.
4. Check that the Battery voltage is greater than 52V. IF the battery is discharged, you'll have less performance than when its charged.

Problem: The display shows "Error 21 – Speed Sensor not functioning", but Dualie continues to work.

The speed sensor has become unattached from the motor controller, the detector magnet has fallen off or the sensor has fallen out of alignment with the magnet. This can happen after changing a rear tire or performing other service on the rear wheel.

Solution:

1. Check that the speed sensor is in place and connected.
2. Refer to the section "Wheel speed sensor alignment" to realign the magnet. If following these instructions fails to correct the problem,
3. Contact Rungu Support to investigate other measures.

Problem: I am not getting the advertised range

Range depends on many factors – surface, tire pressure, power level, load, wind, incline, etc. Like a car, accelerating hard or spending more time in soft sand (you can do that with Rungu) will have a significant impact on the battery range of your Rungu. If you feel you are within the parameters of the performance specifications stated above, check the for the following problems.

Solution:

1. Check the tire pressure. The stated range uses tires at their highest pressure on flat, dirt road.
2. Check that you're riding at optimal power and gear settings. The range is calculated at low speeds and usually in gears 5-7 riding at 7 or 10 mph.
3. Check the battery voltages – The battery should be 58-59 V with a full charge and be fully discharged at 42V. If your battery is not operating in this range, contact Rungu for detailed trouble shooting.
4. Check your brakes by spinning each wheel and listening for the rotor contacting the brake pads. If there is rubbing, align the brake calipers to eliminate the rubbing.
5. Contact Rungu Support if you have other questions.

Mechanical

Problem: I hear a clicking noise when I'm pedaling in every gear; gear changes take long or are difficult
The rear derailleur may be out of adjustment, misaligned or bent, the chain may be worn out, or the cassette may be damaged from a high-power gear change.

Solution:

1. Check the cassette. Use a stand or tethering to raise the rear wheel and while operating the pedals with your hands (or by motor). Rotate the rear wheel and look at the cassette (cogs/gears on rear wheel) and observe if any are bent or "wavy", if so order a new cassette to replace the damaged one. Adjust derailleur alignment (next step) when you complete the replacement. If the cassette is not bent or damaged,
2. Adjust derailleur alignment. Use a stand or tethering to raise the rear wheel and while operating the pedals with your hands, use the shifter barrel adjustment to re-align your derailleur.

   Note: If you have a high-bandwidth Internet connection, please watch this video that shows how to do a derailleur adjustment.

   If this fails to eliminate the clicking noise,
3. Check that the derailleur, derailleur hanger, or frame isn't bent or broken. Replace components as necessary. If the derailleur, hanger and frame are intact,
4. Replace the chain.
5. Contact Rungu Support if you have other questions.

Problem: I hear a loud click noise coming when I'm pedaling in a high gear
The cassette cog is worn out; replace cassette. Refer to the "Understanding and changing the Power Level" section above on how to avoid this problem after replacing the cassette.

Problem: I hear a rubbing or squealing noise from one, or both, of the front wheels when riding.
The rubbing noise may occur from the brake rotor rubbing against a rotor or the tire rubbing against the inside of the fork. A squealing noise indicates the brake pad is rubbing against the brake rotor.

Solution:

1. Check the wheel position in the fork. Loosen the quick release and on level ground apply pressure on the fork to make sure the wheel hub is engaged correctly in the dropouts. Retighten the quick release. If you notice that the tire is rubbing after the correction, take the wheel to be "trued" by bicycle technician. If the brake rotor continues to rub against the brake pad,
2. Re-align the brake caliper. Follow component directions on how to realign your brake caliper or have realignment performed by a qualified technician. If you cannot realign your brake caliper to eliminate the rotor rubbing against the brake pad,
3. The rotor is warped; replace it or have it replaced.
4. Contact Rungu Support if you have other questions.

Problem: I can't change into lower gears.
The derailleur may require adjustment or more seriously you have bent a cassette cog.

Solution:

1. Inspect the largest cassette cogs for damage. If a cog is bent it will prevent the chain from engaging with an adjacent cog. Replace the cassette if this is the case. Refer to the "Understanding and changing the Power Level" section above on how to avoid this problem after replacing the cassette. If the cassettes are undamaged,
2. Check Derailleur alignment. Use a stand or tethering to raise the rear wheel and while operating the pedals with your hands, try to shift into first gear.

   Note: If you have a high-bandwidth Internet connection, please watch this video that shows how to do a derailleur adjustment.

   If the derailleur stops or has difficulty moving the chain into first gear, clean and lubricate the derailleur and refer to component directions to reset the high and low stops for the derailleur to ensure consistent gear changes. If the derailleur adjustments and cleaning fails to correct the problem,
3. Check that the derailleur, derailleur hanger, or frame isn't bent or broken. Replace components as necessary. If the derailleur, hanger and frame are intact,
4. Contact Rungu Support if you have other questions.

Problem: I hear and feel a rattling noise coming from the chain – the chain on the return line is jumping or vibrating even when I'm not riding on rough road.
You may be experiencing "chain suck." The chain is adhering to the chainring on the return line due to friction between the chain and the chainring.

Solution:

1. Clean and relubricate the chain. See the chain maintenance section on how to clean and reapply lubricant to the chain. If you still experience the problem, or cannot clean the chain at the time,
2. Make sure the clutch on the Advent derailleur is engaged, and shift into first or second gear for the duration of the ride to prevent "chain suck" from wrapping the chain around the chainring.
3. Contact Rungu Support if you have other questions.

Getting more information

Thank you again for purchasing a Rungu Dualie. For further questions, please consult the Support Page on the riderungu.com website or email support@riderungu.com.

