

# Revolt Powersports RTX-1 User's Manual

**This manual shall be considered a permanent part of the motorcycle and shall remain with the motorcycle when resold or transferred to a new owner or driver.**

**This manual contains important safety information and instructions that must be carefully read before operating the motorcycle.**

## Important Information

You must read the contents of this manual and strictly abide by the instructions in it. Failure to do so may result in harm, injury, and even death to you and others. Failure to do so may also lead to permanent damage or failure of components and/or the motorcycle itself.

Pay strict attention to words such as warning, caution, attention, and note in this manual, they emphasize the importance and severity of the following information.

The battery used in this motorcycle is a CATL ternary lithium battery.

Unauthorized modification or incorrect use of the charger, motor, motor controller, software settings, or battery provided by our company may lead to injury, failure, and/or fire. Any change or modification to the prior-listed components will also fully void any and all warranty and technical support whether written or implied.

This motorcycle is designed specifically for off-road use and is not intended to be used on public roads. It is also not intended to be used in a competition-type environment. The company is not responsible for the damage to the vehicle, property, operator or spectators, as well as the casualties or injuries caused by improper use or unauthorized modification.

Use of the motorcycle outside of its intended purpose will also fully void any and all warranty and technical support whether written or implied.

### **Warning**

Indicates a potential hazard that may result in severe or traumatic injury up to and including death and/or permanent and irreparable damage to the motorcycle or equipment.

### **Attention**

Indicates a potential hazard that may result in minor or moderate injury and damage to the motorcycle or equipment.

### **! Caution !**

Indicates a potential hazard that may result in damage to the motorcycle or equipment.

### **Note:**

Additional information that may help clarify operation, maintenance, or repairs.

## Foreword

To help ensure your safety and the performance and longevity of the motorcycle, you must thoroughly familiarize yourself with the information contained in this owner's manual before riding your motorcycle.

This manual outlines how to properly operate and maintain your motorcycle. If you strictly follow the instructions and suggestions listed in this manual, your motorcycle will have a longer service life and be less likely to break down.

The information and specifications in this manual are the latest product information and specification data at the time of publication. Due to the continuous improvement of products and other changes, your motorcycle may have inconsistencies with this manual. Revolt Powersports, reserves the right to change the content at any time without prior notice and does not assume any responsibility or obligation for discrepancies between product and manual.



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**User Notice**

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## Adding Accesories

Adding unsuitable accessories can lead to unsafe operating conditions resulting in injury or death. Exercise caution when selecting and installing accessories for your vehicle. It is not possible to test every accessory on the market or a combination of all available accessories. You must be personally responsible for proper selection, installation, and use of accessories. Your dealer can assist you in selecting high-quality accessories and installing them correctly. If you have any questions, consult your Revolt Powersports dealer.



### Warning

Improper attachment of accessories or modifications to the motorcycle may result in operational changes that may lead to accidents.

Do not use inappropriate parts or accessories. You must ensure that any parts or accessories used are properly installed in accordance with their instructions for use. All parts added to the motorcycle should either be provided by Revolt Powersports or Originally Equipped by the Manufacturer (OEM) equivalent. If you have any questions, contact your dealer.

## Accessory Installation Guide

After installation of accessories, inspect your motorcycle for the following;

1. Check that the accessory does not reduce ground clearance and/or lean angle.
2. Check to ensure that the steering and suspension travel are not interfered with or hindered in any way.
3. Check that the accessory does not alter your riding position or interfere with operating any controls.
4. Check to insure that the braking ability is not hindered or diminished in any way.
5. Check to insure the front - rear balance has not been altered.

Attachments fitted to the handlebar or front fork area can cause serious stability problems. The extra weight will reduce the responsiveness of the motorcycle to steering input.

Select electrical accessories that do not exceed the capacity of the motorcycle's electrical system. Overloading the electrical system can damage the harness and cause failure, fire, and possible electrocution.

## Important Safety Information

When riding a motorcycle, it is necessary to take some additional precautions to ensure the safety of the rider. The preventive measures are as follows:

### **Wear a Safety Helmet and Riding Gear**

It is a proven fact: helmets significantly reduce the number and severity of head injuries. Always wear an approved motorcycle helmet any time you ride. We recommend that you wear eye protection, sturdy boots, gloves, and other protective gear.

### **Never Carry a Passenger**

Your motorcycle is designed for one person only. There are no handholds, footrests, or seat for a second person.

A passenger may interfere with your ability to freely adjust your position which is needed to maintain your balance and control of the motorcycle.

### **Ride Off-Road Only**

Your motorcycle is designed and manufactured for off-road use only. The tires are not made for pavement, and the motorcycle does not have turn signals and other features required for use on public roads. If you need to cross a paved or public road, get off and walk your motorcycle across.

Please ride only in designated riding areas specifically designated for off-road use.

### **Inspection before riding**

You must carefully read the instructions in the Inspection and Maintenance section of this manual. Adhering to these guidelines can help prevent accidents due to equipment failure .

## **Familiarize yourself with the motorcycle controls and operation.**

Your driving skills and mechanical knowledge are the basis for safe driving. Practice in an open place with few obstacles and no people until you are fully familiar with the mechanical properties and control methods of the motorcycle.

### **Understand your limits**

Pushing beyond your limits and abilities can cause motorcycle accidents.

Never exceed your personal abilities or ride faster than conditions warrant.

Remember that alcohol, drugs, fatigue, and inattention can significantly impair your judgment and ability to ride safely.

## **Warning**

Do not submerge the battery pack, motor controller or motor unit under water.

Doing so can result in catastrophic failure of the unit, placing it in a non-repairable condition. In addition, doing so could possibly result in the electrocution of the operator and spontaneous combustion of the battery unit. Submersion of these components, regardless of whether by accident or intent, will result in immediate voiding of all warranty coverage.



## Labels

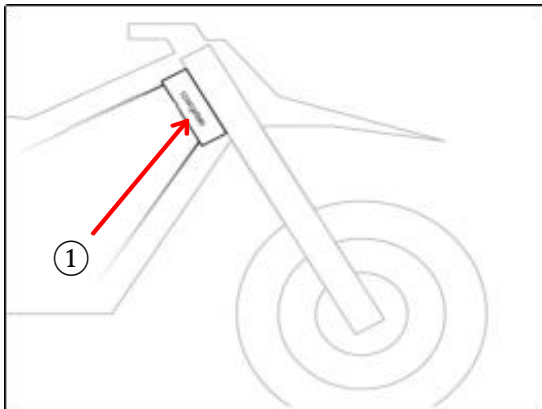
Read, understand, and follow all labels on the motorcycle.

Do not remove any labels from the motorcycle.

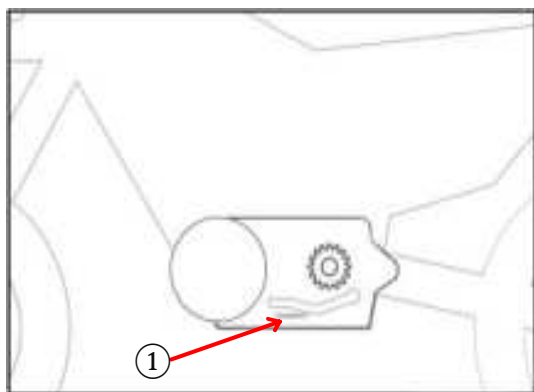
### Frame number (VIN) and engine serial number location

The frame number and engine serial number are used to register the motorcycle with technical support. When ordering parts or special services, this number can help dealers provide better service for you.

The frame number (VIN) is printed on the head tube on the front of the frame ①.



The engine number is printed on the motor gearbox near the gear selector input shaft ①.



**Controls for Operation**

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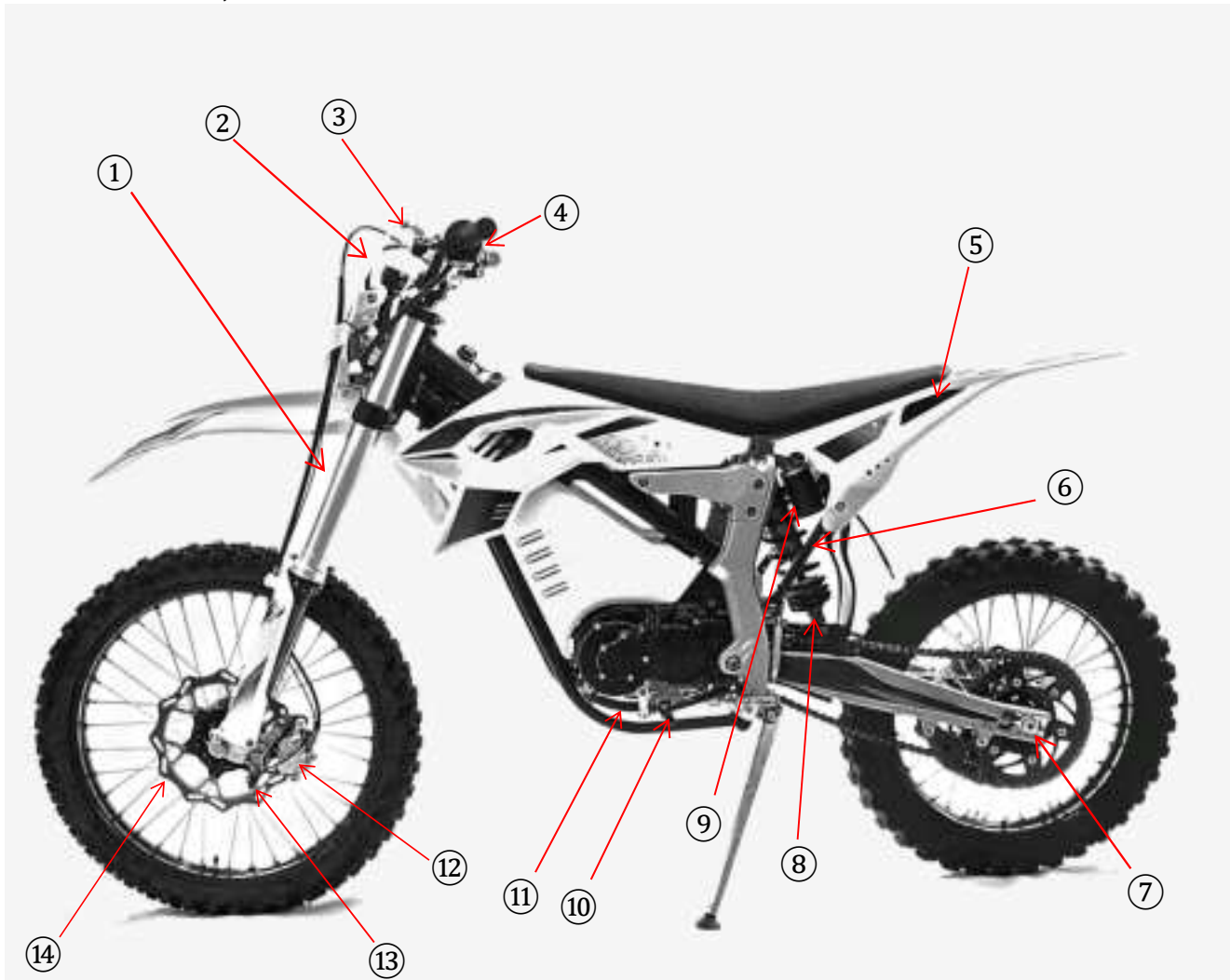
## Control Locations



- ① 72vDC to 12vDC converter
- ② Keyed main power switch
- ③ Fork rebound adjustment
- ④ Throttle
- ⑤ Right hand switch assembly
- ⑥ Front brake lever
- ⑦ Front brake master cylinder

- ⑧ Headlamp
- ⑨ Fork compression adjustment
- ⑩ Oil filler/Dipstick
- ⑪ Oil level window
- ⑫ Rear brake pedal
- ⑬ Rear brake arm
- ⑭ Rear brake master cylinder
- ⑮ Rear wheel brake caliper
- ⑯ Rear brake rotor

## Control Locations, cont.



- ① Front fork
- ② Display unit
- ③ Clutch handle
- ④ Left hand switch assembly
- ⑤ Seat release lever
- ⑥ Rear Subframe
- ⑦ Chain adjuster, each side
- ⑧ Rear rebound adjustment

- ⑨ Rear compression adjustment
- ⑩ Gear shift lever
- ⑪ Gear case oil drain
- ⑫ Front wheel brake caliper
- ⑬ Speed sensor
- ⑭ Front brake rotor

## Key

The motorcycle is factory equipped with a main starting key and a spare starting key. You should keep the spare key in a safe place.

## Key switch

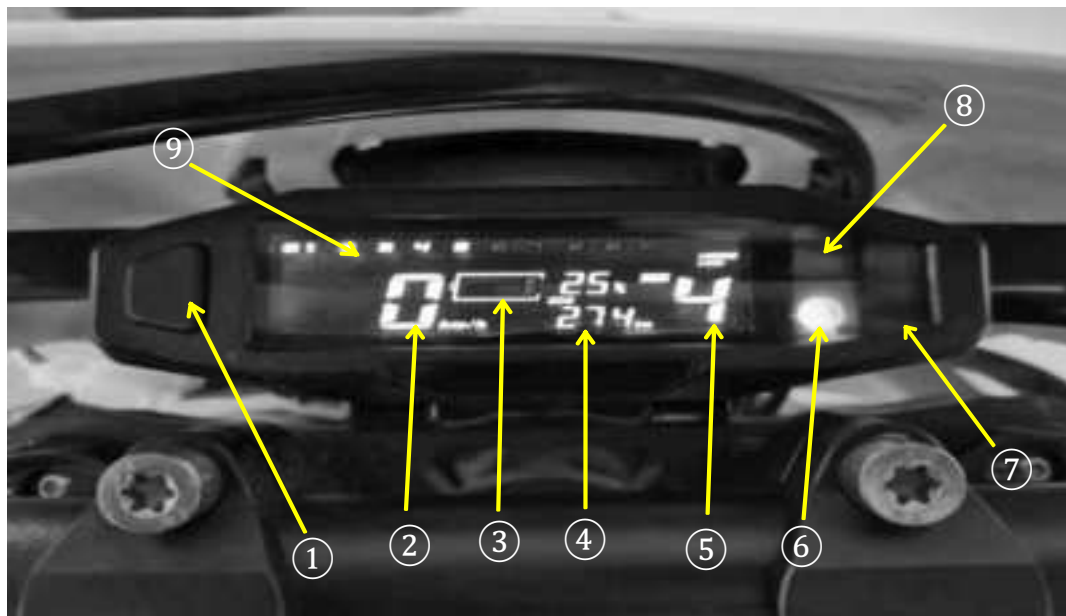
1. Insert the start key into the keyhole on the start switch.
2. Gently turn the key clockwise to turn the system on and counterclockwise to turn the system off.
3. The display will power on and system initialization will begin.

The initialization can take up to 60 seconds to complete. Be patient and do not ride until the initialization is finished.

**Note:** During initialization, a “P-21” code will be displayed. This is a reminder of the front rim size used for speed/distance calculation and can be ignored.

**Note:** The key can only be removed after turning the entire system off.

## Dashboard



- |                                 |                             |
|---------------------------------|-----------------------------|
| ① Function switch               | ⑥ Mode indicator            |
| ② Speed                         | ⑦ Headlight indicator       |
| ③ Battery charge remaining      | ⑧ Forward/Reverse indicator |
| ④ Mileage display / Error codes | ⑨ Motor RPM                 |
| ⑤ Gear indicator                |                             |

## Dashboard Operation

This will overview the nine areas of the display with their function and operation.

1. **Function Switch:** This is a multi-function switch. Pressing once will toggle between the odometer and trip meter readings. While on the trip reading, pressing the switch for 2 seconds will reset the trip meter. While on the odometer reading, pressing the switch for 2 seconds will switch between mph and kph
2. **Speed:** The current speed of the motorcycle.
3. **Battery Charge Remaining:** Graphical representation for the status of the battery. The actual percentage remaining is indicated to the right of the icon.
4. **Mileage Display:** The current trip mileage or total mileage based on the selection mode of the Function Switch.  
**Error Code:** The system is experiencing issues, it may display codes on the dashboard where the mileage is normally located. A description of these codes can be located in the "Troubleshooting" section.
5. **Gear Indicator:** The current gear status of the transmission. This will indicate either; N-Neutral, 1-1<sup>st</sup> gear, 2-2<sup>nd</sup> gear, 3-3<sup>rd</sup> gear, 4-4<sup>th</sup> gear.  
**Note:** No gear indicator display can mean your transmission is between gear sets. Attempting to operate the motorcycle in this condition can cause failure of the transmission. If this occurs, try moving the gear selector up or down, or try rolling the motorcycle forward and backward until the gear set engages.
6. **Mode Indicator:** This light will indicate the current status of the mode selector switch.
  - \* A green LED indicates the switch is set to the Low position.
  - \* No LED indicates the switch is in the High position.
7. **Headlight Indicator:** When the symbol is illuminated, the headlight is on.

8. **Forward/Reverse Indicator:** This light will indicate the current status of the direction selector switch.

- \* No LED indicates the direction switch is in forward mode.
- \* When the LED is red, the direction switch is in the reverse mode.



**EXTREME CAUTION** must be used when in reverse mode as the motorcycle will now accelerate backwards when throttle is applied. The speed and torque are limited when in this mode, but loss of control and severe injury may occur when utilizing it.

9. **Motor RPM:** Current RPM of the motor x 1000.

## Controls (See page 11 & 12 for locations)

**Front Brake Lever:** Used to slow the motorcycle.

Located on the right handlebar in front of the throttle. Pulling in on the lever applies braking force to the front brake.

**Rear Foot Brake:** Used to slow the motorcycle.

Located on the right side of the frame, forward of the right foot peg. Pressing down on the lever with your foot applies braking force to the rear brake.

**Throttle:** Used to control acceleration. Located on the right handlebar and integrated with the grip. Rotating the throttle tube counter-clockwise increases acceleration. Rotation of the throttle tube clockwise decreases acceleration but will not slow the motorcycle.

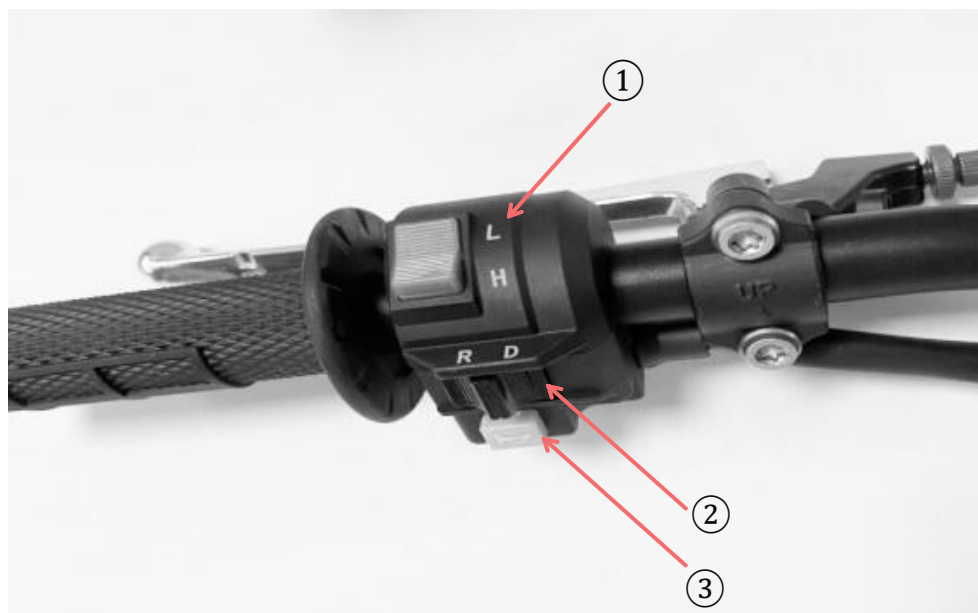
**Clutch Lever:** Located on the left handlebar in front of the grip. Pulling the lever inward disengages the drive of the motor from the gear box.

**Shifter:** Used to select the proper torque output to suit the given terrain and conditions. The gear shift is located on the left side of the engine in front of the left foot peg.

This is operated by the left foot by pushing down or by pulling up with your foot.

The RTX has a 4-speed gear box. Neutral is in the lowest position with each subsequent gear being one shift up. N-1-2-3-4

## Left handlebar switch unit



- ① Mode selector switch (L is low power, H is high power) (See page 16)
- ② Direction switch (R for reverse, D for forward)
- ③ Horn switch

## Right handlebar switch unit



- ① Motor Start/Stop switch
- ② Headlight switch (Off/On)
- ③ Boost (Erupt) switch (See page 16)

## Mode Transfer Switch

The mode transfer switch is located on top of the left handlebar switch assembly. It is a two position switch labeled “L” for low and “H” for high.

By selecting “L” or “H”, the rider can change the torque and power output of the motor unit to better suit their riding conditions.

When combined with the 4-speed transmission, this switch gives the rider eight forward torque and power combinations.

Low, or “L”, will reduce both the torque and maximum power output by approximately 25%. This will also give a notable reduction in energy consumption. It is ideal to select this when traveling at a reduced or constant speed or when maximum power and torque are not desired.

High, or “H” will provide maximum power and torque at all times. This will also give a notable increase in energy consumption versus the Low mode. It is ideal to select this mode when maximum speed and torque are required.

## Boost Switch

The Boost or “Erupt” switch, when pushed and held, will provide up to a 15% increase in overall power output. When the button is released, the power output will return to the normal level.

Due to the extra load placed on the entire electrical system and motor unit, the button must not be used for more than 10 seconds at a time.

Excessive use can result in overheating and/or failure of the controller unit and motor as well as a shortened service life.

## Clutch Use

The torque output of the motor is much higher than that of an internal combustion engine. Therefore, the use of the clutch is only needed when shifting gears. The clutch is not needed to start the motorcycle moving, regardless of gear selection.



### Attention

The practice of slipping your clutch is strongly discouraged and not necessary.

If the clutch is slipped continuously for more than 5 seconds, the clutch system can be permanently damaged.

Due to these factors, the clutch plates and disks are not warranted.

Use as directed to reduce the damage to the clutch system!



### **Inspection and Maintenance**

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## Inspection Prior to Use

Failure to perform periodic inspections, spot checks, and routine maintenance of the motorcycle will increase the risk of accidents, injury, malfunctions, and failures.

It is your responsibility to spot check the motorcycle prior to the first use and before each subsequent use to ensure that it is safe to operate. Refer to the following areas for spot checks. For your safety, address any issues you discover before operating the motorcycle.

### Attention

Before performing an inspection, or any type of maintenance procedure, the Motor Start/Stop switch must be in the off position and the key removed from the key switch.

#### Steering Input

1. Should feel smooth and require minimal effort.
2. No binding, restriction, or interference
3. No slack or looseness in the head bearings.
4. No slack or looseness with the front wheel, axle, or wheel bearings.

#### Throttle

1. The operation should be smooth and without grittiness or binding.
2. When released, the throttle handle should return to the closed state smoothly, quickly and without interruption.

#### Switch-gear

1. All switches can operate through their given range without binding or interference.

#### Headlight

1. Headlight operates normally when switched on.

#### Horn

1. The horn should be loud and audible over surrounding noise.

#### Brake System

1. The hand and foot brake operate freely without binding.
2. Check there is adequate brake fluid in the sight window of both hand and foot master cylinders.
3. Check the brake pads/discs for excessive wear.
4. Brake lines aren't crimped or nicked.

## Rear Shock and Front Forks

1. Forks and shocks should move freely without sticking or binding.
2. Inspect the fork seals and shock shaft for dirt and debris. Clean if necessary.
3. Inspect the lower fork legs, fork seals, and shock shaft for oil.

**Note:** Oil leaking from forks or shock is indicative of the need for repair or replacement.

## Tires/Wheels

1. Check tire pressure is correct for your weight and riding conditions.
2. The tread depth is sufficient.
3. No signs of cracks or cuts.
4. Check the spokes for uniform tension.
5. Inspect the rim for warping or flat spots.
6. Verify wheels rotate freely and are securely attached.

## Gear-case Oil Level

1. With the motorcycle level, the correct oil volume would be half way up in the oil level window or between the minimum/maximum level on the dipstick. If the oil level is between the lower edge and mid way of the oil window and between the minimum and maximum level on the dipstick, the motorcycle is safe to operate.

If the level is below the lower edge of the oil window or the minimum mark of the dipstick, please examine the motor/ gear-case unit for cracks or leaks.

Inspect the seals around the gear selector shaft and sprocket counter shaft for leaks. If any are found, they must be replaced or repaired prior to use.

If no leaks are present, add oil to the recommended level.

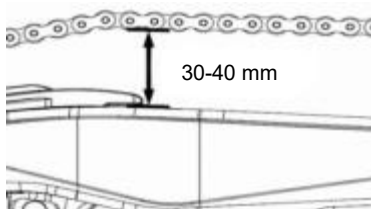
## Cables and Wiring

1. Inspect the clutch cable for fraying, crimping, or excessive wear.
2. Inspect the wiring harness for any loose connections, missing or cracked insulation, or exposed wires.
3. Inspect the three primary voltage lines located on the left side of the motor and connecting to the main controller unit. These must not be crimped or have their insulating cover compromised in any way.

## Chain Tension

1. Begin without any weight on the motorcycle so that the rear spring is relaxed. Midway over the swing-arm, move the chain up and down by hand and check whether the amount of movement is within the recommended range: 30-40 mm.

If the chain does not match this measurement, an adjustment must be performed.



**Note:** As you spin the wheel, the chain may become looser or tighter. You must find a compromise so that the average measurement is 30-40 mm

## Battery Connections and Charge Status

1. The orange primary and black/green auxiliary power connectors must be firmly and securely connected to the battery.
2. Optimally, the battery should be fully charged prior to riding.



### Warning

Riding until the battery is completely drained can irreversibly damage your battery. It is recommended to not go below 10%.

## Routine maintenance items



### Attention

Before performing any type of maintenance procedure, the Motor Start/Stop switch must be in the off position and the key removed from the key switch.

1. After each use, check the tightness of the chain. Replace the chain when it reaches it's wear limit.
2. After each ride, check all the spokes for uniform tension and that the rims are straight and true. Inspect spokes and rims more frequently if riding in rugged or rocky terrain.
3. The motorcycle should be washed after use, especially in muddy or extremely dusty conditions.

A hose, bucket, brush or sponge, and mild detergent are recommended. Avoid spraying high pressure water directly into any of the connectors.

When finished, clear the switches and plugs of excess water with compressed air to prevent corrosion.

4. After washing, clean the chain and coat it with a lubricant specifically designed for chains.
5. If the battery is not used for more than 30 days, unplug the battery from the controller (large orange plug). The best storage voltage is 72-74V. Check the voltage every 30 days and charge as needed.

See: **Battery Pack** for more information.

6. Monthly, through the BMS app, perform an Auto-Balance on the battery pack.
7. Monthly, check all brake pads for wear. The wear indicator slot should be visible through the face of the caliper. Failure to see this slot is an indicator to replace your pads. It is always advisable to replace both set of pads at the same time.
8. The first oil change must be performed after 10 hours or 200 miles of use, whichever comes first. Subsequent oil changes should be performed after 40 hours of use or 1000 miles, whichever comes first.

Due to the unique design and operation of the electric motor and transmission unit, more frequent changes are not necessary.

It is recommended to use 10w30 below 60F and 10w40 above 60F. This oil must be specifically formulated for wet clutches and meeting JASO-MA2 standards.

Standard, petroleum based oil is preferred and semi-synthetic is acceptable. Full synthetic is not recommended.

Crankcase oil volume is approximately 950 ml +/- 50ml.



### Attention

The use of any oil not specifically formulated for wet clutches or meeting JASO MA2 standards will permanently damage your internal clutch mechanism resulting in a voiding of your warranty.

## Oil Change Procedure.

Items required (not provided).

1. One quart or liter of appropriate oil.  
(Refer to Item 8, Routine Maintenance)
2. A 14mm wrench or socket and handle.
3. An oil catch pan.
4. Disposable rags or paper towels.
5. Disposable gloves.

Before you begin, the motorcycle must be placed on the side stand on a firm, level area. The power must be off and the key removed from the switch.

From the left side of the motorcycle look below the motor in the area between the motor and frame and locate the 14mm drain bolt.



With the wrench or socket, loosen but do not remove the drain bolt.

Place the oil catch pan below the drain.

Put on your gloves.

Completely remove the drain bolt and crush washer. Inspect the crush washer for deformation, replace if necessary.

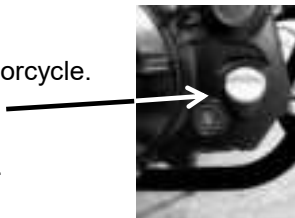
Allow the oil to fully drain from the gear case.

Once the oil has completed draining, place the crush washer on the bolt and insert the bolt into the drain hole. Hand tighten.

Wipe any excess oil from the motor and frame.

With the wrench or socket, firmly tighten the drain bolt to 26 ft/lb.

Go to the right side of the motorcycle. Remove the oil fill/dipstick.



Add the full quart or liter of oil. Wipe up any excess oil.

Insert and tighten the oil filler/dipstick.

With the motorcycle off the stand and in a vertical position, check the oil level in the sight window or on the dipstick.

Dispose of the gloves and towels appropriately.

Dispose of the used oil in accordance with your local or state regulation.

## Chain Tension Adjustment

The chain transfers power output from the motor to the rear wheel, it is therefore one of the more critical parts of the motorcycle. Due to this, the chain needs frequent inspection and maintenance to ensure its' proper function. It is vital that the chain is in good condition, is well lubricated, and is at the proper tension for it to work correctly.

The chain tension can be adjusted as follows:

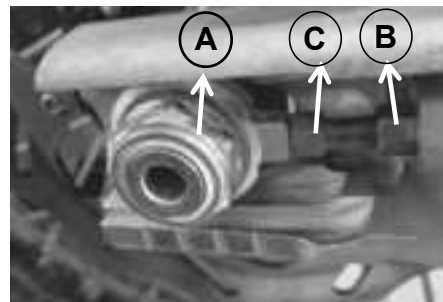
Items required (not provided).

1. A motorcycle lift or stand
2. 27mm socket
3. Torque wrench. (using the same drive size as the socket)
4. 2 - 10 mm open end wrenches.

Place the motorcycle on the lift or stand with rear wheel suspended.

As previously instructed under "Chain Tension", verify the distance between the chain and swinging arm is between 25-35 mm.

If the chain does not match this measurement, an adjustment must be performed.



Using the 27 mm socket and wrench, loosen the rear axle nut (A).

With a 10 mm wrench, loosen the locking nut (B) located on both sides of the swinging arm.

With the other 10 mm wrench, turn the chain tension bolt (C) outward to increase chain tension and turn it inward to decrease tension.

With the notches on the swinging arm as a guide, adjust the chain tension bolt (C) to equal settings on both sides of the swinging arm while achieving the correct tension.

Once correct chain tension is achieved, while holding tension bolt (C) stationary with the first 10 mm wrench, firmly tighten lock nut (B) with the second 10 mm wrench to hold the setting. Perform this on both sides.

Using the 27mm socket and torque wrench, tighten the rear axle nut (A) to 60 ft/lb.

Check the chain tension again and re-adjust if necessary.

## RECOMMENDED SERVICE / INSPECTION SCHEDULE

	Every 40 hrs			
	Monthly			
	Post Ride			
	Prior to Riding			
Steering Input.	•			
Throttle	•			
Brake System	•			
Rear Shock and Front Fork	•	•		
Tires/Wheels	•	•		
Lighting	•			
Switch-gear	•			
Horn	•			
Battery Connections and Charge	•	•		
Gear Case Oil Level	•			
Chain Slack	•	•		
Cables and Wiring	•	•		
Wash the motorcycle		•		
Lubricate the chain		•		
Charge the Battery		•	•	
Inspect Brake Pad wear Front and Rear			•	
Perform an Auto Balance on the Battery			•	
Change the Gear-Case Oil				•

**Power Management**

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Power Supply and Charging.....Page 22

Motor and Controller.....Page 24

## Battery Pack

The RTX-1 uses a CATL lithium battery. The ideal operating condition for this battery is when ambient temperature is between 50°F~90°F. The maximum ambient temperature range is 20°F~105°F. Too low or too high ambient temperature will affect the battery pack performance and service life. Do not use the battery in temperatures beyond the maximum allowable range.

When the ambient temperature is below 50°F, the performance of the battery pack will be negatively affected and it is normal to see a reduction of range.

When the ambient temperature is above 95°F, and the battery pack is in use, the internal temperature of the pack may become too high. This will trigger the thermal limiting features within the BMS. When this occurs, the battery pack will shut down until the temperature recovers to within limits.

In both instances, the performance of the battery pack will automatically recover after the temperature returns back to the ideal working range of 50°F~90°F.

When the battery pack will not be in use for more than 30 days, you must charge the battery to minimum of 60%~80% capacity prior to storage. Once stored, you will need to check the remaining battery percentage every 30 days. If the battery percentage drops below 30%, it must be recharged back to the 60% ~ 80% level.

## Warning

Do not expose the battery pack to a high pressure water stream or immerse pack under water.

The battery pack is water resistant and sealed to protect the high voltage circuitry and components located inside the pack itself. Even with this seal, there is still the potential for moisture to enter the pack, especially if it is subjected to a high pressure stream, water immersion, or damage to the structure of the case.

## Warning

If moisture or water has entered the pack or the structural integrity of case has been compromised in any way, you are strictly prohibited from charging or using the pack.

Doing so may result in a catastrophic failure of the pack. A catastrophic failure may result in total combustion of the unit resulting in damage and injury to surrounding items, structures, and/or persons.

If the external structure is damaged in any way, please contact your dealer for a replacement.

The damaged pack must be disposed of in a manner consistent with local, state, and federal guidelines for your location.

## Warning

It is strictly prohibited for customers to disassemble, attempt to disassemble, or modify the battery pack in any way. Doing so may result in failure of the pack resulting in potential damage, failure, fire, serious injury, and even death.

Furthermore, any disassembly, attempted disassembly, or modification to the battery pack will invalidate all warranty coverage of the motorcycle.

## Power Supply and Charging

Your charger will work best when connected to a dedicated electric circuit. Before charging, ensure the input voltage range of the charger is consistent with your outlet voltage, AC 110 ~ 125V.

Ensure that the amperage load of the AC outlet can meet the power requirements of charger. 15A.

This charger is for indoor use. Please use it in a dry and well ventilated environment. Place the battery and charger in a safe place beyond the reach of children.

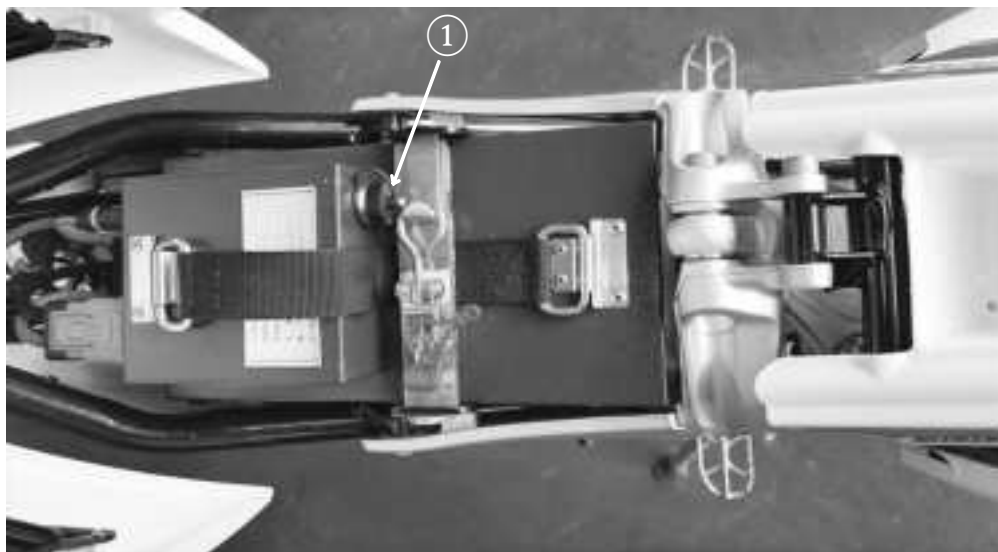
Prior to charging, inspect all cables and connectors for broken or cracked insulated covering, exposed wires, and bent or missing connector pins. Do not attempt to use the charging system if any of these conditions are found. Do not attempt any repairs on the charging system or any of its components. Please contact your dealer for replacement parts.

The charging cable plugs into the battery charging port located on the battery pack (See photo). The battery can be charged on or off of the motorcycle. When charging, connect the system in the following sequence.

1. The battery pack to the charger.
2. Then connect the AC power plug from the charger to an appropriate outlet that meets the previously stated requirements of AC 110 ~ 125V and 15A.

**Note:** If not performed in this order, the system may not charge correctly.

**Note:** The location and style of the charge port is subject to change based on the version and size of the battery.



① Charging Port

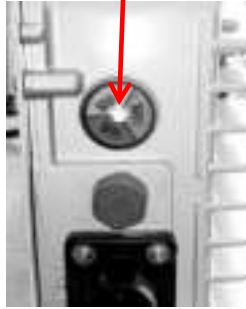
**Note:** The charging cable plug is keyed to only fit one way. Do not force the plug into the charging port. Rotate it until the proper alignment is found before inserting the plug into the connector.





Upon completion of all the connections, the charger fan will turn on and the charge indicator will illuminate and start to slowly blink.

The light will glow red if the battery is below 80%, Yellow if between 80 and 100% and green when close to 100%. When the battery is fully charged, the light will stop blinking and change to a solid green. At this point, the charger will automatically turn off and the fan will stop running.



Disconnect the AC power cable from the outlet and disconnect the charging connector from the battery. After charging, seal the battery charging port with the rubber screw cap.

The charge time of the battery pack is directly dependent on the initial amount of charge in the battery. Expect a full charge to take approximately 4 hours to completion at normal ambient temperature of 50°F~90°F.

Charging, battery level, and status may be monitored through the ANT-BMS app.

### **! Caution !**

Avoid using the battery pack after it has just completed charging.

It is recommended to allow the battery to cool down for minimum of 10 minutes prior to use. The longer the battery cools, the better.

### **⚠ Warning ⚠**

Always charge the battery pack in a well ventilated place away from any flammable material or potential fire hazard.

If you want to charge the motorcycle outdoors, do not charge in the rain or humidity greater than 90%.

### **⚠ Warning ⚠**

The battery pack must only be charged with a special charger supplied with the motorcycle or specified by the manufacturer. The use of unauthorized chargers or accessories may cause damage or failure of the battery pack resulting in fire or an explosion.

### **! Caution !**

Do not charge the battery when the pack's internal temperature is below 32°F; otherwise it will damage the pack. The pack can only be charged after the internal temperature of the pack rises above 32°F.

The battery's internal temperature can be monitored through the BMS app, refer to section 5 for information about the app.

### **! Caution !**

The maximum allowable internal temperature of the pack is 140°F while charging. If the internal temperature of the battery pack exceeds this temperature, permanent damage may occur. Charging may resume once the internal temperature falls below 140°F.

If the battery pack is discharged rapidly due to extreme riding, the internal temperature of the battery pack may still be higher than 140°F even if the ambient temperature is low. Again, the battery's internal temperature can be monitored through the BMS app.

### **! Caution !**

The battery pack may not be able to charge immediately after high power output or high temperature operation.

The battery pack must cool down for a minimum of 30 minutes before charging, longer is preferred.

The battery management system (BMS) does not allow charging when the internal temperature is too high.

Charging with high internal temperatures can shorten the life of the battery and lead to permanent internal damage.

### **! Caution !**

The battery pack is only allowed to return to normal temperature by itself. Do not use other methods to raise or lower the temperature of the battery pack.

### **⚠ Warning ⚠**

When you find the following situations, you must stop charging immediately, disconnect the power supply, and do not use the motorcycle. Contact the dealer or technical support as soon as possible.

- (1) The appearance of the battery pack is damaged.
- (2) Strange smell during charging.
- (3) The temperature of the battery pack or charger is too high and unable to cool down by itself.
- (4) Charging can not be complete in less than 4 hrs.
- (5) If the battery pack is on fire, please use a fire extinguisher to extinguish. Do not use water or electrocution may result.

## Motor and Controller

The Revolt RTX-1 power system includes a controller, and a motor with an integrated 4-speed gearbox.

The controller and motor contain no user serviceable items.

### **Attention**

The customer is not allowed to disassemble the motor and/or transmission otherwise it may cause the HAL sensor to malfunction and/or damage the corresponding seal which can lead to motor malfunction.

### **Warning**

The controller is a precision high voltage electronic component. Incorrect wiring may cause permanent damage to the controller resulting in system failure and possible fire. Do not disassemble the controller and cable. Doing so may result in electric shock, burns, and/or death.

The power system of the Revolt RTX-1 must be repaired or replaced by a professional technician authorized by the manufacturer. Users are not allowed to disassemble and/or modify the power system in any way. Any attempt to disassemble, repair, or modify any component of the power system will invalidate all warranty coverage on the motorcycle.

**BMS - Battery Management System**

What is a BMS..... Page 26

Where is my BMS..... Page 26

How to monitor the BMS..... Page 26

Adjusting the BMS..... Page 26

Resetting the BMS..... Page 26

Auto Balance..... Page 27

## What is a BMS

A battery management system or BMS is a collection of hardware and software technology dedicated to the oversight of a battery pack, which is itself an assembly of cells combined into modules and electrically organized into rows and column matrix configurations. What makes battery management so challenging is that battery packs can contain a multitude of cells. These cells need to deliver a specific range of voltage and current for a pre-determined duration of time against expected load scenarios and environmental conditions.

To ensure that the battery can operate in these varying scenarios, a BMS will monitor the battery to detect when conditions may be changing, provide protection to the battery in harsh environments, estimate the battery's operational state, optimize the performance of the battery in changing conditions, report the battery's operational status to other related devices, and otherwise communicate with the outside world. Finally, it can log event data so that battery behavior, performance, and safety can be improved.

## Where is my BMS

The BMS for the Revolt RTX is located within the battery unit itself. It cannot be physically accessed by the user.

## How to monitor the BMS

The BMS can be accessed via software using Bluetooth connectivity on your Apple or Android device.

The app is available either through the App Store for IOS or Google Play for Android. Search for "ANT BMS" in the respective app store. Regardless of which version is used, you will connect to your BMS Bluetooth through the app and not through the normal Bluetooth connectivity interface. Connecting to the BMS through the Bluetooth connectivity interface will cause the app to fail to work properly.

## Adjusting the BMS

The BMS can be adjusted using the app and is beyond the scope of this manual.

For a detailed ANT BMS user manual, please visit; [www.rjxzttech.com/new/ant-bms-instructions.html](http://www.rjxzttech.com/new/ant-bms-instructions.html).

You, the user, will only be focusing on two functions within the app; Reset and Auto Balance.

### **Warning**

It is strictly prohibited to manipulate any settings within the BMS beyond those items discussed here. Incorrectly changing the BMS parameters can result in permanent and irreparable damage to the battery and motorcycle. It may also lead to catastrophic battery failure resulting in fire, injury, and even death. Any failure of any component due to the inappropriate adjustment of BMS settings will result in an immediate voiding of all warranty coverage.

## Resetting the BMS

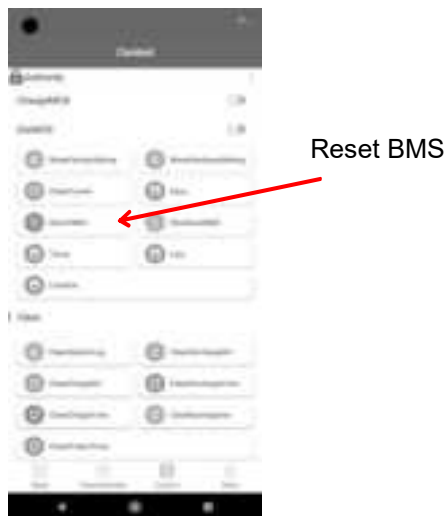
If the situation occurs that the motorcycle will not power on, will not move under its on power, or refuses to charge, a reset of the BMS may be required.

This is accomplished by opening your BMS app and connecting to your battery pack.



Once connected, click on "Control" from the menu or icon located at bottom of the screen.

From the control screen, look for the “Reset BMS” icon.



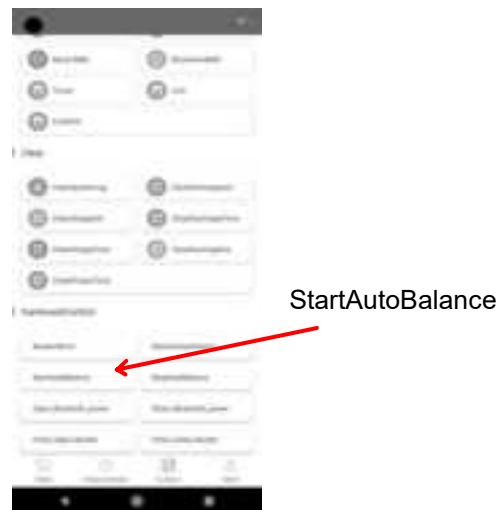
Click “Reset BMS” and wait approximately 30 seconds for the BMS to reset.

## Auto Balance

AutoBalance is used by the BMS to maintain charge uniformity between the individual cells that make up the battery pack. Performing this at least monthly will help maintain battery pack performance. Prior to performing this operation, the battery pack must be fully charged and NOT connected to the charger. This function cannot be used while the motorcycle is in operation or powered on.

To initiate AutoBalance, you will again establish a connection between the app and the battery pack. Next, click “Control” from the menu or icon located at bottom of the screen.

From the “Control” screen, scroll down to the “Hardware Control” section.



Select “StartAutoBalance” icon.

The auto-balance function will operate until the cells are brought within the proper parameters. This function can take up to two hours to complete. It is advisable to allow the cell balancing function to reach completion without interruption.

If it is necessary to stop the balance function prior to completion, select the “StopAutoBalance” icon.

If AutoBalance is interrupted prior to completion, it must be resumed and completed before riding the motorcycle.

**Suspension Setup and Adjustment**

Initial Setup.....Page 29

Rear Spring - Preload.....Page 29

Rear Shock - Compression..... Page 30

Rear Shock - Rebound.....Page 30

Forks - Compression..... Page 31

Forks - Rebound.....Page 31

## Initial Setup

To ensure the best driving characteristics of the vehicle and avoid damage to the swing-arm, shock absorber, forks, and frame, the basic setting of the suspension components must match the riders weight. As delivered, REVOLT motorcycles are designed for a specific rider's weight (wearing all their protective gear).

Rider weight range	154-176 lbs (70 - 80 kg)
--------------------	--------------------------

If the rider's weight is above or below the standard range, the basic setting must be adjusted accordingly. A small weight difference can be compensated by adjusting the rear shock spring preload and adding preload spacers to the forks. However, if the weight difference is too large, the springs must be replaced. When adjusting the suspension settings, first adjust the rear shock and then adjust the forks.

### **! Caution !**

Check the compression and rebound adjustments of the motorcycle with the rider on the motorcycle.

### **⚠ Attention**

Before performing any type of maintenance procedure, the Motor Start/Stop switch must be in the off position and the key removed from the key switch.

The compression adjustment on both the shock and fork, controls how fast they react when encountering an obstacle by dampening the impact. Too little dampening and shock or fork will hit their internal stops resulting in possible damage. Too much dampening and the ride will be harsh and uncontrollable.

The rebound adjustment controls how fast the shock or fork returns to the normal position. Too fast and the motorcycle can have a bouncing effect after encountering an obstacle. Too slow and the ride can become harsh and the motorcycle difficult to control.

## Rear Spring - Preload

The rear spring preload can be used to compensate for rider weight that is slightly outside of the recommended range or to fine tune the suspension response to the riders preference.

You will need either a spanner wrench or a brass punch and rubber mallet to make this adjustment. These items are not supplied by REVOLT.

### **! Caution !**

Do not use a screwdriver and hammer to make these adjustments. This may cause permanent damage or failure of the collars.



① Preload lock collar

② Preload adjustment collar

The preload lock collar holds the adjustment collar in place and prevents its movement while in use. This collar will need to be separated from the adjustment collar. Do this by turning it counter clockwise, away from the preload adjustment collar.

The preload adjustment collar may now be used to increase or decrease spring preload.

Turn clockwise to increase spring preload.

Turn counter clockwise to decrease spring preload.

The maximum recommended adjustment range is +/- 12mm from the factory setting. Adjustment beyond this range indicates a firmer or softer spring is required.

## Rear Shock - Compression

The compression adjustment knob is located on the top left side of the rear shock absorber. When this knob is rotated in either direction, detents, or “clicks”, can be felt. These detents help prevent the knob from rotating once the proper setting is found and helps to keep track of your settings.

The adjustment knob is rotated clockwise to increase the dampening rate. This in turn slows down the compression rate of the shock and yields a firmer ride. The adjustment knob is rotated counter clockwise to decrease the dampening rate. This in turn speeds up the compression rate of the shock and yields a softer ride.



① Compression Adjustment Knob

Final setting will be determined by rider weight, terrain, and personal preference.

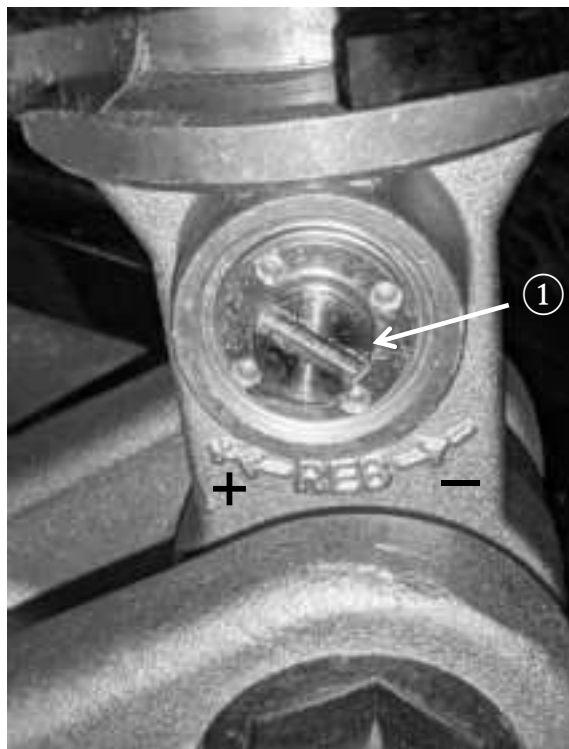
## Rear Shock - Rebound

The rebound adjustment screw is located at the bottom of the rear shock absorber.

“+”, stamped to the left of the adjustment knob, indicates turning the screw in that direction (clockwise) will increase resistance making for a slower rebound.

“-”, stamped to the right of the adjustment screw, indicates turning the knob in that direction (counter-clockwise) will decrease resistance making for a faster rebound.

When the screw is turned in either direction, detents or “clicks” can be felt. These detents help prevent the screw from rotating once the proper setting is found and helps to keep track of your settings.



① Rebound Adjustment Screw

Final setting will be determined by rider weight, terrain, and personal preference.



## Fork - Compression

The compression adjustment screw is located in the recessed area on the bottom of each fork leg. When this screw is rotated in either direction, detents or “clicks” can be felt. These detents help prevent the knob from rotating once the proper setting is found and helps to keep track of your settings.

The adjustment screw is rotated clockwise to increase the dampening rate. This in turn slows down the compression rate of the fork and yields a firmer ride. The adjustment screw is rotated counter clockwise to decrease the dampening rate. This in turn speeds up the compression rate of the fork and yields a softer ride.



① Slotted Compression Adjustment Screw

Final setting will be determined by rider weight, terrain, and personal preference.

**Note:** The adjustments must be consistent between each fork leg for the units to perform at their optimum. The settings on one leg must mirror the other.

## Fork - Rebound

The rebound adjustment knob is located at the top of each fork leg.

“+”, stamped to the left of the adjustment knob, indicates turning the screw in that direction (clockwise) will increase resistance making for a slower rebound.

“-”, stamped to the right of the adjustment screw, indicates turning the knob in that direction (counter-clockwise) will decrease resistance making for a faster rebound.

When the screw is turned in either direction, detents or “clicks” can be felt. These detents help prevent the screw from rotating once the proper setting is found and helps to keep track of your settings.



① Rebound Adjustment Knob

Final setting will be determined by rider weight, terrain, and personal preference.

**Note:** The adjustments must be consistent between each fork leg for the units to perform at their optimum. The settings on one leg must mirror the other.

## **Specification and Fastener Torque Requirements**

Specifications.....	Page 33
Fastener Torque Requirements.....	Page 34

## Specifications

<b>Dimensions and Weight</b>	
L*W*H	83.5"x33.1"x48.2" (2120x840x1225 mm)
Seat Height	35.4" (900 mm)
Ground Clearance	12.5" (318 mm)
Wheelbase	56.1" (1424 mm)
Net Wt with 60Ah Battery	254 lbs (115 kg)
<b>Motor and Gear Box</b>	
Motor Type	BLDC brushless permanent magnet with 4-speed gear case
Power Output Low, High, Peak	3 KW, 5 KW, 12 KW
Torque - Motor shaft	74 ft/lb ( 100 Nm)
Torque - Rear Wheel	107 ft/lb (145 Nm)
Maximum Speed	> 62 mph (> 100 kph)
Gears	0-1-2-3-4 Forward, 1 Electronic Reverse
Gear Case Oil & Capacity	10W-40 (JASO-M Certified), 950 ml +/-50 ml
<b>Battery</b>	
Battery Type	CATL Lithium, 20 Individual Cells
Total Capacity	50 Ah (3.6 KW) or 60 Ah (4.3 KW)
Peak Voltage	84 V DC
Maximum Continuous Discharge	300 A
Burst Discharge Current	450 A
Battery Management System	ANT-BMS
Battery Operating Environment	50° - 90°F (Ideal), 20° - 105°F (Maximum Limit)
<b>Motor Controller</b>	
Controller Type	Full Sine Wave
Peak Output Capacity	600 A
<b>Battery Charger</b>	
Input	110-125 V - AC, Minimum 15A (20A preferred)
Output	72 V - DC, 10 - 15A Variable depending on load.
<b>Drive Train</b>	
Chain	520 Heavy Duty
Front Sprocket	13T (Compatible with CRF230F)
Rear Sprocket	48T (Compatible with KTM 250 EXC)
<b>Frame</b>	
Front Section	Double Cradle High-strength Steel Tube Frame
Mid Section	6061 Aluminum Alloy
Sub Frame	High-strength Alloy Steel Tube
Swing Arm	6061 Forged Aluminium Alloy Structure
<b>Suspension</b>	
Front	Inverted Hydraulic Telescopic, Fully Adjustable, 10.2" (259mm) Wheel Travel
Rear	Single Piston, Nitrogen Charged, Fully Adjustable, 11" (279mm) Wheel Travel
<b>Tires / Wheels, F, R</b>	
Tires	F - 80/100-21, R - 110/90-18
Rims	F - 1.6x21, R - 2.15x18 7116 Aluminium Alloy
<b>Brakes</b>	
Front	Hydraulic twin piston caliper, 260mm disc (Pads compatible with KTM 250 EXC)
Rear	Hydraulic single piston caliper, 240mm disc (Pads compatible with KTM 250 EXC)

## Fastener Torque Requirements

Front Axle Pinch Bolts x 4	11 ft/lb 15 NM
Lower Fork Guard Attachment Bolts x 6	7 ft/lb 10 NM
Front Axle Cap Bolt	26 ft/lb 35 NM
Fork Clamp Pinch Bolt - Upper	16 ft/lb 22 NM
Fork Clamp Pinch Bolt - Lower x 2	10 ft/lb 13 NM
Stem Nut	9 ft/lb 12 NM
Stem Nut Clamping Bolt	16 ft/lb 22 NM
Handlebar Clamps x 4	16 ft/lb 22 NM
Handlebar Clamps to Top Fork Clamp Retaining Bolt x 2	30 ft/lb 40 NM
Swing Arm Shaft Retaining Nut	49 ft/lb 66 NM
Aluminum Mid-Frame Attachment Bolt to Frame x 2	30 ft/lb 40 NM
Aluminum Mid-Frame Assembly Bolt x 4	44 ft/lb 60 NM
Front Steel Frame to Aluminum Mid-Frame Attachment x 2	49 ft/lb 66 NM
Front Engine Mounting Bolt, Hex Head	26 ft/lb 35 NM
Rear Engine Mounting Bolt x 2	49 ft/lb 66 NM
Front Brake Caliper Mounting Bolts x 2	26 ft/lb 35 NM
Rear Brake Master Cylinder Mounting Bolts x 2	10 ft/lb 13 NM
Front or Rear Brake Disc Attachment Bolts X 6	13 ft/lb 18 NM
Rear Sprocket Attachment Bolts x 6	26 ft/lb 35 NM
Rear Axle Nut	60 ft/lb 80 NM
Rear Shock Upper and Lower Attachment Bolts x 2	60 ft/lb 80 NM
Steel Sub-Frame to Aluminum Mid-Frame Attachment x 3	30 ft/lb 40 NM
Attachment Screws for Body Plastics	7 ft/lb 10 NM
Spoke Nipple	48 in/lb 5.4 NM

**Basic Troubleshooting**

The motorcycle appears completely dead..... Page 36

The motorcycle stopped working..... Page 36

The motorcycle works but the lights and gauges do not.....Page 36

The key switch doesn't work.....Page 37

The throttle used to work but now its erratic or doesn't work at all..... Page 37

The "Erupt" button doesn't do anything.....Page 37

The motorcycle doesn't have much range when it's cold outside..... Page 37

The charger is quickly flashing between red and green.....Page 37

**Error Codes**

Error codes with descriptions..... Page 38

## **The motorcycle is non-functional**

This issue can arise from a couple of different causes. The following guide will progress from easiest solution to hardest.

1. Is your battery charged to a sufficient level? Check your voltage through the BMS app. If the individual cell voltage falls below 3.4V, the BMS will go into a safety mode to protect the battery. Connect your charger and see if the battery “wakes up”.
2. The BMS may have went into “Sleep Mode”. The BMS is designed to protect and maintain your battery. If the battery hasn’t been used or charged for over 30 days, the BMS will enter a “Sleep Mode” to help protect the battery from excessive draining. To wake up the BMS, disconnect and reconnect the main power connector or connect the charger to the battery.
3. The main battery connector may not be firmly connected. Disconnect and reconnect the main connector using firm, positive pressure.
4. One of the fuses for the 12V aux power supply has failed. Remove the protective grill from the frame downtube. Look for two rubber covered fuse holder. Open the holder and inspect the fuses. Replace with like amperage fuses if needed.
5. One of the connectors in the harness has came loose. Remove the protective grill from the downtube. Firmly press each of the connectors together, verifying each connection.
6. If this does not resolve the issue, please contact Revolt Powersports for assistance.

## **The motorcycle has stopped working**

While ridding the motorcycle, the motor stops responding but the lights and gauges still work.

1. The most common cause for this is the controller entering thermal protection. This is usually encountered when subjecting the motor controller units to high amp loads for extended periods, (i.e.Repeated, extended hill climbs in too high of a gear.) Park and power off the motorcycle for a minimum of 20 minutes or until the controller has cooled off.
2. The main power connector was not securely attached. Disconnect and reconnect the main connector using firm, positive pressure.
3. The battery has dropped below it's safe operating power level. We recommend not going below 10% of remaining charge to help prevent this from occurring. Charge the battery.
4. One of your cells has dropped below 3.4V.The battery pack has several built in safety features to help protect itself and you, the operator. Two of the protectors are;
  - A.) Total pack lower voltage limit (68V)
  - B.) Individual cell voltage is below lower limit (3.4V)

Charge the battery and then perform the Autobalance Function as detailed on Page 29.

5. Water/Moisture has entered the electrical connectors. Even though precautions are taken to prevent water contamination of connectors, it still is possible for it to occur and cause issues. To resolve this, the connectors must have the water removed either by disconnecting them and using compressed air or by placing the motorcycle in a dry area and allowing the connectors to naturally dry out.

6. If this does not resolve the issue, please contact Revolt Powersports for assistance.

## **The motorcycle works but the lights and gauges do not**

If the motorcycle operates normally, but the lights and gauges do not operate at all, the 12V power supply has malfunctioned.

1. One of the fuses for the 12V aux power supply has failed. Remove the protective grill from the frame downtube. Look for two rubber covered fuse holder. Open the holder and inspect the fuses. Replace with like amperage fuses if needed.
2. One of the connectors in the harness has came loose. Remove the protective grill from the downtube. Firmly press each of the connectors together, verifying each connection.
3. If the previous two steps does not resolve the issue, it could indicate the 12V aux power supply unit has failed. Please contact Revolt Powersports for assistance.

## **The key switch doesn't work**

When I turn on the key switch, the motorcycle doesn't do anything.

1. Please refer back to "My motorcycle appears completely dead".
2. The key switch is faulty. Please contact Revolt Powersports.

## **The throttle used to work but now its erratic or doesn't work at all.**

When applying throttle, the motorcycle accelerates erratically or not at all can be traced to the following areas.

1. A loose connection between the throttle module and controller. Check that all connection are properly secured.
2. A damaged throttle tube that goes between the twist throttle and throttle module. Contact Revolt Powersports for assistance.
3. A faulty throttle module. Contact Revolt Powersports for assistance.

## **The "Erupt" button doesn't do anything.**

The button provide a temporary boost of power of up to 15% while in "High" mode. The amount of boost may not be very noticeable in certain terrains and situations.

## **The motorcycle doesn't have much range when it's cold outside.**

The ideal operating temperature for the motorcycle is 50°F~90°F. Operation outside of this range can negatively impact the performance. This is especially true when operating below 50°F. The farther below 50°F the temperature gets, the more severely it will negatively impact your range and performance.

## **The charger is quickly flashing between red and green.**

This indicates an error in the charging system.

1. Disconnect the charger the wall outlet an then from the battery. Allow the charger to stay disconnected for a minimum of 5 minutes.
2. After the minimum time, connect the battery to the charger by firmly pressing the connector into the battery.
3. Connect the charger to the power outlet and observe if the light stays on and at a steady color or if begins to flash between red and green, If the light stays steadily on, then all is good.
4. If the light continues to flash between read and green, you will need to enter your BMS app and look for error(s) listed. Please contact Revolt Powersports for further assistance.

<b>Controller Fault Codes</b>	
E017	Over voltage protection for phase current
E018	Amperage overload protection
E019	System voltage overload protection
E020	System under-voltage protection
E021	Motor over-speed protection
E022	Hall sensor/Motor encoder failure
E023	Motor stalled
E024	Current sensor 1 failure
E025	Current sensor 2 failure
E026	Loss of motor phase
E027	Twist throttle failure
E028	Start-up self-test failure
E029	Busbar over-current

<b>Battery Fault Code</b>	
1	Individual cell over-voltage
2	Battery unit over-voltage
3	Individual cell under-voltage
4	Battery unit under-voltage
5	Individual cell voltage variation too large
6	Battery over-temp, Charging
7	Battery over-temp, Discharging
10	BMS - MOS high temperature
11	Excessive input voltage, Charging
12	Excessive output voltage, Discharging
13	Battery level low warning
14	Battery level extremely low
15	Individual cell malfunction
16	Battery unit malfunction



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