



THE ALL-TERRAIN ELECTRIC BIKE BUYING GUIDE



What is an electric all-terrain bike?

An electric all-terrain bike has an integrated battery and motor that assists the rider when pedaling with up to five pedal assist modes on most bikes. There is an option for “full” throttle mode at speeds that can be as high as 28 mph.



Where are the motors located on electric all-terrain bikes?

There are generally two options for the location of a motor on an electric all-terrain bike. The first is a mid-drive motor which is found at the crank in the middle of the bike. This motor location tends to create the most power and torque for the electric all-terrain bike. It is also very well sealed and makes for the best distribution of weight. You will also find the electric all-terrain bikes with mid-drive motors to be a higher price than a hub motor with the same wattage. Mid-drive motors are more efficient because of their prime location within the crank assembly.

The other motor option for electric all-terrain bikes is the hub motor. It is most common to find the hub motor in the rear wheel. One important exception to this is an all wheel drive (AWD) electric all-terrain bike. The AWD bikes have a hub motor in both the rear and front wheel and are great for navigating snow, gravel, and uneven terrain. Hub motors sometimes require more maintenance and cleaning as they are more exposed to dirt, dust, water, and sand than the sealed, mid-drive motors.



What is the difference between full suspension, hardtail and no suspension on electric all-terrain bikes?

Most, if not all, manufacturers produce electric all-terrain bikes with three suspension options. Full-suspension electric all-terrain bikes have suspension components similar to shock absorbers. For comfort, versatility, and traction, full-suspension bikes are the most desirable and carry the highest price. A hardtail bike, also called front suspension, has the shock absorber component only on the front wheels. Front suspension and no suspension electric all-terrain bikes are still very comfortable and versatile and are usually at a lower cost due to the lack of rear suspension or any suspension at all. Typically, if there is no suspension, the electric all-terrain bike will have “fat” tires (usually 4.0 inches wide) to provide comfort for your ride.

How much travel is needed in the suspension?

If the geometry is right in the electric all-terrain bike, you will have the best ride with at least 130 mm of travel. The travel will provide you more traction when you are climbing, and more comfort when coming down.

What is the difference between a derailleur and an internally geared hub for the drivetrain?

The drivetrain for almost all geared bikes uses a cassette and derailleur to change gears as you ride. With all-terrain electric bikes, some manufacturers offer the option of an internally geared rear hub. This is a great option for all-terrain electric bikes, since they are usually ridden in more extreme off-road conditions. For the internally geared rear hub, the gears all sit inside an oil bath that's sealed away from the elements. This makes a geared hub extremely resilient against mud, dirt, sand, snow, brush, etc. with no exposed derailleurs. Gears are shifted via a twist shifter. With an all-terrain electric bike the benefit of the low-maintenance geared hub is nice for your peace of mind. For maintenance, it will require an oil change every 3000 miles or so.

What is the range of an electric all-terrain bike?

The range of your electric all-terrain bike is dependent on a myriad of factors. These factors include the selected pedal assist mode, battery capacity, motor size/output, rider weight, and the elevation of your route. So, it's literally impossible to make a completely accurate statement about the specific distance of a single battery charge initially. However, once you have ridden your electric all-terrain bike for a few weeks, you will become familiar with how you are using the battery and your range will become more predictable. Most manufacturers will give you an expected maximum range. This is typically predicted and tested in the most ideal conditions.

What are the battery options for an electric all-terrain bike?

For most electric all-terrain bike manufacturers, the battery capacity is indicated in AH (Amp Hours). This indicates how much capacity the battery has. Technically, it measures how much current your battery delivers in one hour of usable voltage. As an example, if you have a 14AH 36 Volt battery, you'd have a 504 watt hours battery. In simplest terms, this means your 500 watt output motor could run at its highest level of assist for one hour. Or, you could run it for two hours using only the mid level of assist, and so on.

Using this math, it is important to consider the battery when you are considering the motor. For example, if you plan to purchase an electric all-terrain bike with a 750 watt motor. You are best served to get a battery that is at least 48V and 15.6AH. This will provide you with one hour of max output from your motor. So, you will have at least 2 hours (most likely more because of the various factors mentioned earlier) of available battery by using the pedal-assist up the mountain but no assist down the mountain.

Another thing to consider is you will see options of 36Volt and 48Volt batteries that might have the same overall output when you multiply amp hours times volts. Higher voltage usually means faster power delivery for quicker acceleration. So, if you are looking for faster power delivery, choose the higher volt battery as a rule.

We are starting to see all-terrain electric bikes that have two batteries built on the bike for ranges up to 80 miles with one charge. This obviously adds weight to the bike, but the benefit of having a bike with up to 80 miles is great for overnight camping, or longer trips to your favorite hunting spot.



What is torque and why is it an important consideration for an electric all-terrain bike?

Torque is measured in newton meters. It describes the force with which the electric motor supports the rider when pedaling. In most basic terms it is the force that is applied to cause rotation. The higher the torque, the more the potential assistance. In other words, higher torque will create more acceleration and provide faster takeoffs and up steep hills easier. Higher torque is also very helpful in off road conditions; so that you are able to climb over obstacles without the motor stalling. Electric all-terrain bikes can range from 80 newton meters to 190 newton meters of torque.

What is pedal-assist, throttle-powered, or both?

Electric all-terrain bikes with pedal-assist sense the torque or cadence of the rider and respond by increasing/decreasing power output. There are some electric all-terrain bikes that only provide pedal assistance without throttle power. As well as throttle power only electric all-terrain bikes. However, most of the electric all-terrain bikes manufactured as of 2021 provide both pedal-assist and throttle power.



Hydraulic vs mechanical disc brakes?

First of all, disc brakes are a must for your electric all-terrain bike no matter how powerful your motor is. The benefit to mechanical brakes is they are easy to adjust. Most importantly, you will need to adjust them much more frequently than hydraulic disc brakes. Hydraulic brakes are self adjusting and don't require as much maintenance. Hydraulic brakes also produce better stopping power with less effort by the rider. Overall, both brake types work well for stopping the bike.

What is the controller?

The controller is a LED screen that is usually found on the handlebars of the electric all-terrain bike. It's most basic functions tell you how much battery power is remaining, how fast you are going, and allows you to adjust the amount of assistance the motor gives you. More advanced controllers will track trip distance, direction, elevation, temperature, and many other possible options.

What kind of Electric All-Terrain Bike is right for me?

The most basic question is how and where do you want to ride your electric all-terrain bike. Just like regular all-terrain bikes, electric all-terrain bikes come with a variety of options. Whether you are a trail rider, hunter or an off/on road rider we can help you decide.