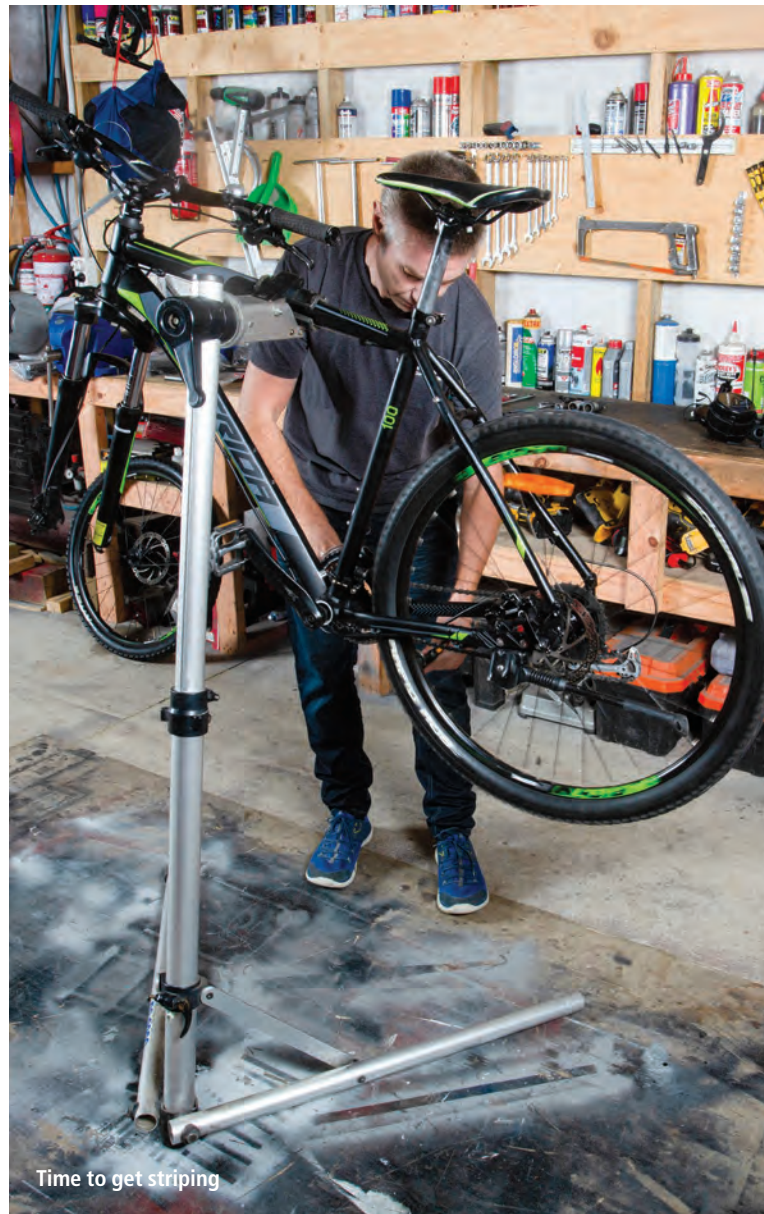
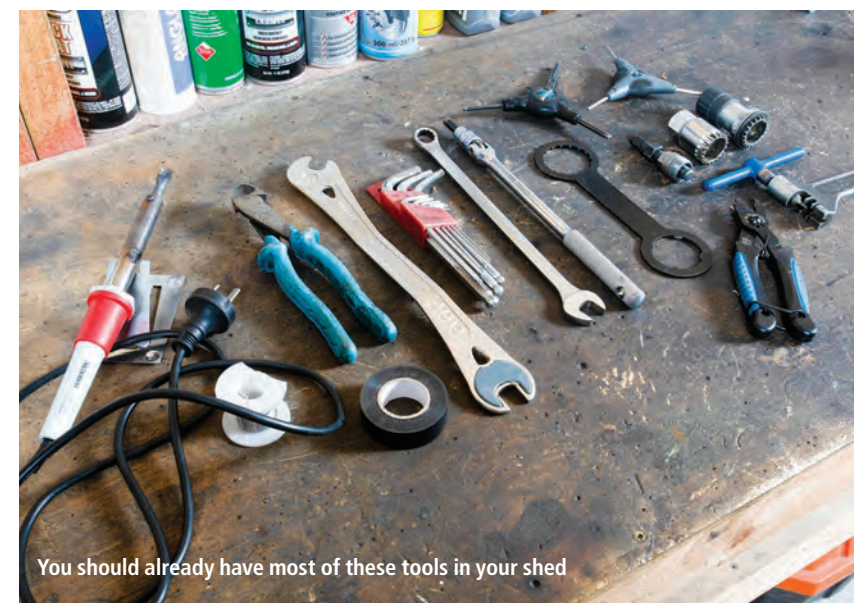


IT'S A SIMPLE PROCESS TO CONVERT YOUR BIKE INTO AN E-BIKE. HERE'S HOW



**VENTURE**  
**SCOOTERS**  
LIFE ON THE MOVE





*You probably already have the skills and basic tools to turn your trusty two-wheeled steed into an electric bike*

### How to make your kit last

Make sure you charge the battery every time you use it. Lithium-ion batteries will last longer if they are subjected to lots of smaller charges rather than run flat every time. Performance is always better and you will get maximum range with a fully charged battery. The motor will pull harder with the extra voltage too.

### Important stuff ! Spacers needed here



The days are getting longer and the temperature is rising. You look at your bike in the shed which has been gathering dust all winter and contemplate getting fit for the summer and enjoying some of the great trails that New Zealand has to offer.

Your neighbours have just bought electric bikes and have been telling you how much fun they are and how they can now ride up any hill and reach that popular café in only half an hour as well as get home again with energy to spare.

The thought of having an electric bike is very tempting and makes the idea of reaching that café far more appealing, but the cost of replacing your bike has you thinking twice about making the jump.

Besides being a bit dusty, you have a good bike that cost a few dollars in its

day and it seems a shame to banish it to the corner of the shed forever.

But what if you could turn your bike into an electric bike without breaking the bank?

### It's a project most can tackle

Well you can, and if you have some basic mechanical skills and tools you can turn your trusty two-wheeled steed into an electric bike that will be the envy of your friends and neighbours.

This article focuses on converting a standard bike into a mid-drive electric bike, or 'e-bike'.

There's a lot of debate around rear-hub-drive motors verses mid-drive motors. Mid-drive systems make a more versatile bike, as you get to use the bike's

rear-gear system to give more low speed torque and a higher top speed. The weight is more evenly distributed and the motors are more efficient, giving greater range. A converted mid-drive bike will usually be lighter than a similar high-spec new bike.

All electric bikes need a controller, or 'brain', and this is enclosed within the motor which eliminates the need for an ugly controller box on the frame or to have to fit it within the battery box. Fixing a rear puncture is also a lot easier.

The other big advantage of fitting a mid-drive system to your bike is that it will be cheaper than buying a brand-new hub-drive bike.

### Will my bike take a kit?

The kit used in this article is made by the Chinese company Bafang, which



is the world's biggest manufacturer of electric-bike products and supply a lot of mainstream brands with motors and control systems.

The Bafang BBS range of conversion kits has been in production for a few years now and has a reputation for being very reliable and rugged if used correctly.

They are designed to fit bikes with standard English threaded bottom brackets, which is what most aluminium- and steel-framed bikes have. A standard kit will fit a bottom-bracket width of 68–73mm. Other widths are available and bottom-bracket adaptors are available for some other frame types. Venture Scooters carries all parts for the Bafang range of Mid drive motors.

The kit will fit most frame sizes from XS to XXL. The main thing to consider on smaller frames is whether there is room

to fit the battery inside the frame. This is the ideal position, but batteries can be mounted on rear carriers or under the down tube in front of the motor.

### How much power do I need?

The BBS range of motors come in 250W through to 1000W. The legal limit for an e-bike in New Zealand is 300W although our most popular kit is the 500watt system.

The benefit of buying a more powerful kit is that it can be reprogrammed to a lower wattage if desired, which puts a lot less stress on the controller and motor internals and creates an even more reliable system. The motor controllers can be reprogrammed to adjust how the motor performs but this should only be done by a competent reseller with ►





Leftover bits and pieces



Plenty of room for the battery here

*The main thing to consider on smaller frames is whether there is room to fit the battery inside the frame*

## Let the motor rev!

All mid-drive motors like to rev, so avoid taking off in a high gear and using too much throttle unless pedalling normally. If you subject the controller to high or maximum amps and the motor isn't revving sufficiently then a lot of heat is generated internally which can destroy the controller.

This is why a lot of brands don't fit throttles to their bikes; they are dumbed down to avoid problems from misuse.

However, these motors will go for many thousands of kilometres if they are used properly. You wouldn't take off in top gear in a manual car, so why treat your bike motor any differently?

a lot of experience in this field. Out of the box these kits go OK, but when reprogrammed correctly they come to life and perform so much better even in the lower power settings.

Venture Scooters reprogram every motor that we sell & fine tune settings to suit you.

## What size battery?

Batteries are measured in watt hours Whrs which is battery voltage multiplied by ampere hours Ahr

The higher the Whr the more range you will get for the same effort.

Battery W-h typically range from 360W-h to 840W-hr

The battery used in this conversion is 36V 17.5whr which gives you 640whr

This combination will give you approx. 60-90km depending on rider weight,

speed, hills, tyre pressures, etc. This is a popular battery choice.

Be wary of any manufacturer that claims exaggerated ranges for its products. Unless it has some magic new

battery technology, its bike will not go any further than yours under the same conditions.

## Fitting the kit

The key to obtaining the best result with these kits to take your time. None of the steps are overly technical but everything needs to be done right to ensure that you get a reliable system that should give years of trouble-free service.

Allow three to five hours to make a nice job depending on the type of bike and your experience. If you want to do the complete job yourself, you will probably need to invest in a crank-removal tool and a bottom-bracket tool. These are available from Venture Scooters. All other tools should be in your basic hand-tool collection.

The first thing to do is to strip the ►



Popular 17.5ahr 640whr battery showing off its USB and charging ports



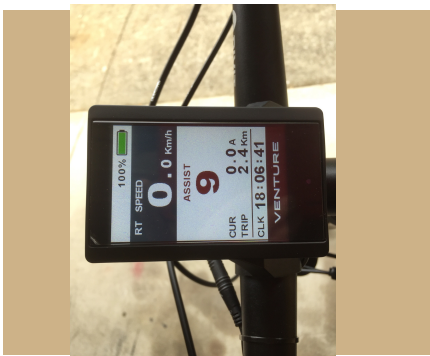


Left: Don't forget to make sure that the chain is long enough for all the gears  
Below: Controls mounted on the left side of the handlebars



## The main points

- You can build your own high-performance e-bike for a lot less money than buying new.
- The ideal bike has an aluminium or steel frame with a standard threaded bottom bracket.
- The motor shown here will fit new or used bikes.
- It's versatile and can be refitted to another bike if needed.
- It can be installed with standard hand tools and takes about four hours.
- Professional fitting service available from Venture Scooters
- A range of different motor and battery sizes are available to suit your needs and budget
- Custom motor programming from Venture Scooters to suit you.
- The bike can be ridden with throttle only.
- Venture Scooters offers a full parts range and repair service.



Cool colour screen



Reprogramming the motor for better performance and to suit the rider

Time to strip down the bike. You may need some special tools for this. We carry these in stock as well.

Removing the bottom bracket can be a little frustrating for some people. If the bike is a few years old and seen some weather then the threads can seize in the frame and resist coming loose. The right-hand side is a left-hand thread, and the left side is a right-hand thread. Don't forget this, otherwise it will be a long day!

## IMPORTANT

Getting the motor fitted correctly is the most important part of the conversion

process. Make sure the motor slides through the bottom-bracket shell freely and that all parts are clean and dry. Bikes that have the gear cables running under the bottom bracket will have a cable guide that can be too tall and stop the motor from sliding in, so you may have to modify the guide. You shouldn't have to force the motor into place. The right-hand motor casing needs to clear the chain stay of the frame. Spacers are available to move the motor over so there is some clearance.

If you tighten the motor and the casing is rubbing against the frame then you

will probably crack the casing, so make sure there is some clearance.

If the bottom-bracket shell is 68mm wide then you can use all the fittings from the kit.

Apply a good thick grease to the motor and inside of the bottom-bracket shell and install motor.

If you don't grease everything now the motor will start creaking inside the bottom bracket and you'll have to pull it out and grease it anyway, so it is a no-brainer to do it now.

If your bottom bracket is 73mm you will need to make up some spacers to



Take your time getting the speed sensor right



For a neat job, you will need to shorten the battery wiring



Nice and tidy

go between the motor and the mounting plate. Push the motor up to touch the bottom of the frame and do up the main mounting nut good and tight.

The mounting plate has teeth on one side which go against the frame. These teeth create small dents in the frame which help to locate the motor and stop it from coming loose. Measure the gap between motor and plate and make spacers to suit. You will need to use longer mounting bolts through the plate to allow for the spacers. Don't over tighten these bolts; they can strip. You can use Polygrip pliers to tighten the main mounting nuts if you have to but Venture Scooters provides a cheap tool to do this. It's worth buying, as you will need to retighten these nuts as things settle.

When fitting the speed sensor make sure the magnet is within 2mm and that the rear wheel can be removed without upsetting the sensor.

Where you fit the throttle and control switch is personal preference. I usually fit them on the left-hand side which leaves your right hand for changing gear.

There are several types of battery cases out there and some are definitely better than others. The case and cradle being fitted here are a proven design with an internal aluminium spine and three slotted mounting holes that allow easy fitting to most bikes.

Occasionally you may need to add an extra rivet nut to the frame but most bikes drink-bottle mounts are in the right place to mount this battery.

If the wiring from the battery is too long you will have to shorten it if you want a nice, tidy job. This battery has the proven XT60 connector which can be easily unsoldered and rejoined. Make sure you remove the battery from the cradle when cutting the wires!

We normally don't supply brake cut out sensors with our kits as we program the motors to stop immediately ►



Above: Excess speed-sensor cable is wrapped around other wires then taped over

## Venture Scooters

Venture Scooters is based just out of Matamata and imports these kits directly, so pricing is extremely competitive and all kits come with a full 12-month warranty.

A complete range of spare parts is carried in stock and a full workshop repair service is available. There is a range of kits available with motors from 300W to 1000W and batteries from 13ahr to 24ahr We also offer a professional while-you-wait fitting service







Two-and-a-half hours later, I have myself an e-bike

when you stop pedalling. If you have cable-operated brakes then you could fit the levers that come with the kit, but they aren't that flash to be honest and you shouldn't need them with the correct programming. This also means less wires hanging around and therefore a tidier, safer bike.

Venture wiring looms only have two plugs for the Speedo and throttle. They are also a custom length which suits 99% of bikes and makes everything a lot more professional looking

Standard four wire looms & factory brake levers available if needed.

Make sure that the handlebars can turn full lock in both directions without pulling at any wiring. You need to allow a little slack in wiring to achieve this, just like the gear cable.

## Time to get turned on

Before you spark up your new bike it pays to go through the gears and make

*None of the steps are overly technical but everything needs to be done correctly*

sure that the chain is long enough to go into the big gears at the back. Depending on the size of the front chainring used, the chain can sometimes end up too short to use the big hill-climbing gears.

Make sure the battery is turned on. There are a few different speedo options available for these kits and this one comes with a nice centre-mounted colour screen that has lots of functions, and the pedal-assist control mounted on the side for easy access.

The speedo should be set for you from us otherwise manuals are on our website.

Presuming you have fitted everything correctly the bike should go and be ready for a few years of enjoyment.

All speedos will automatically start on pedal-assist level one so that there are no surprises. You can adjust assistance levels before starting or while riding.

The throttle can be programmed to give you any power setting you want but most people want full power when required. It doesn't take long to get the hang of these kits. The power will engage fully after a couple of pedal strokes and you're away!

## Periodic maintenance

It pays to check the two main crank bolts after a few rides and then every 1000km, as they tend to settle and can loosen. You may also need to remove the left-hand crank and retighten the motor-mounting nut periodically. The motor-mounting plate also settles over time and the bike can develop a creaking noise when pedalling. This is just normal bike maintenance for these kits and is easy to do with the correct tools.

So there you have it. One high-performance, lightweight electric bike, with large-capacity battery and genuine long range, and tuned to suit you. It will out-perform most other electric bikes on the market for less than half the cost and, even better, it's been made by you in your shed.



Electric motor fitted and ready to hit the road