Safety Fast!

THE MARQUE OF FRIENDSHIP

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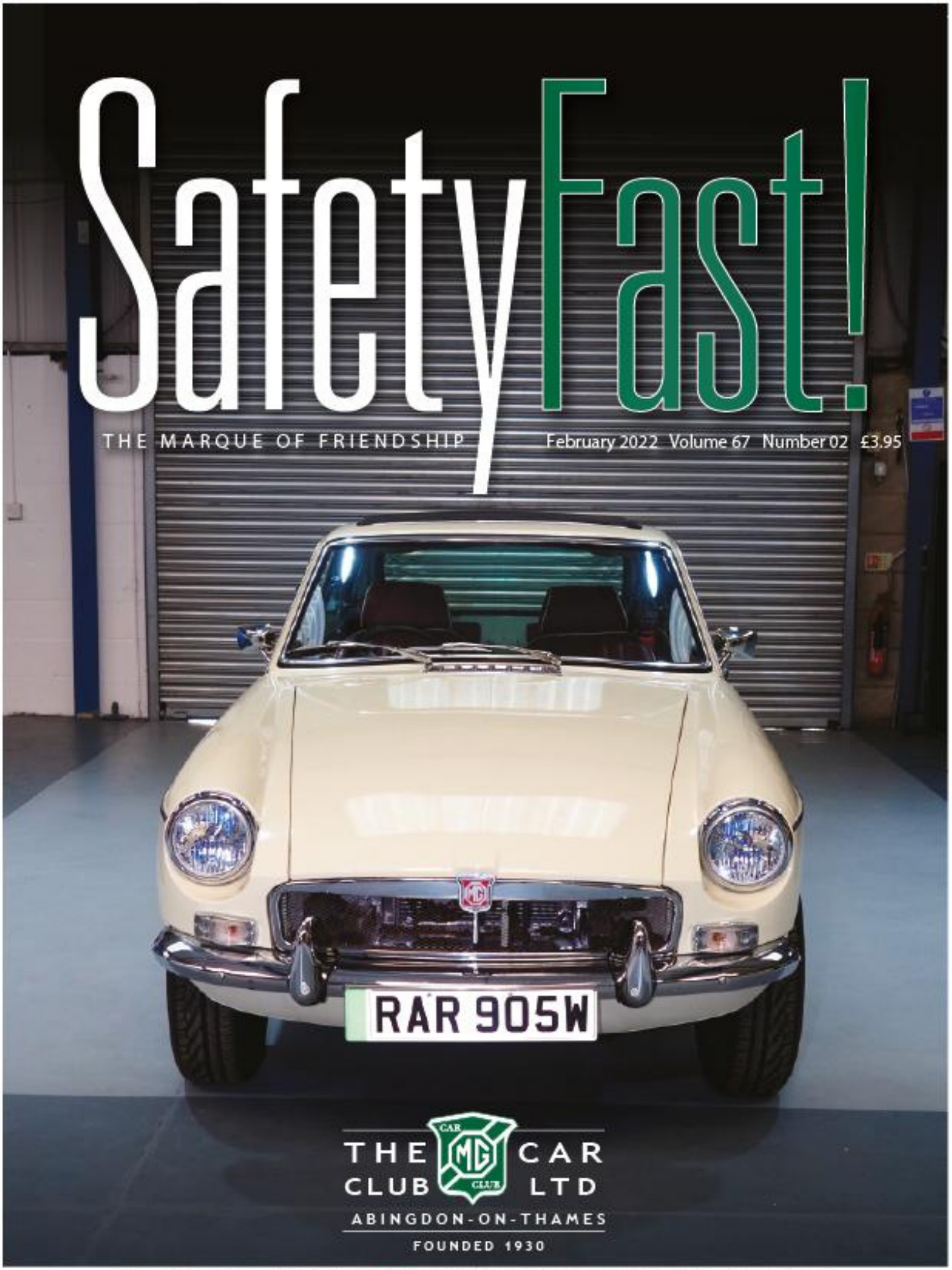


THE MG CAR CLUB LTD

ABINGDON-ON-THAMES

FOUNDED 1930

TIME TO B ELECTRIFIED? ● MOVING THE GAME ON? ● COOL IT MGB

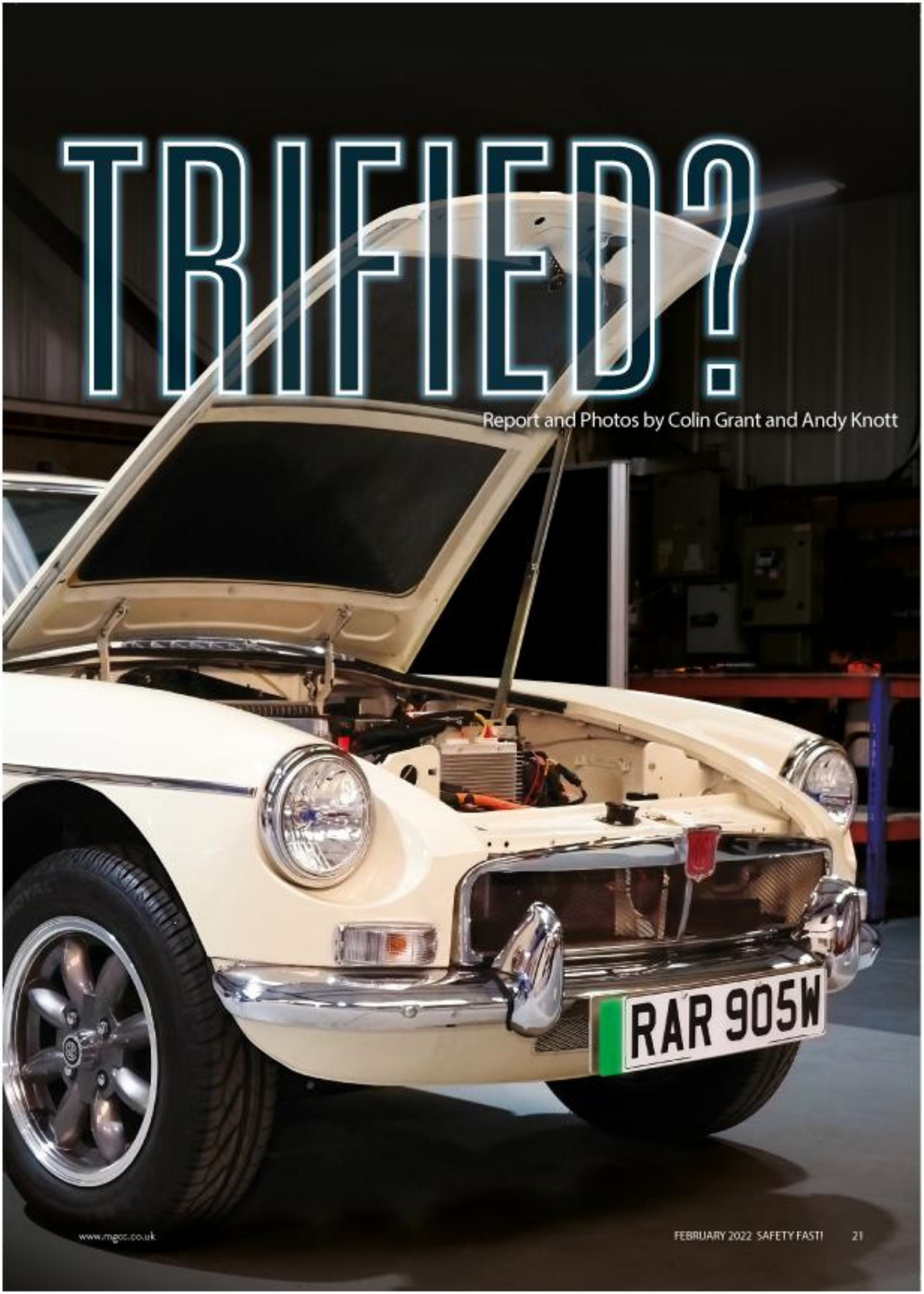
TIME TO BE ELEC

I'm sure we all remember those futuristic films where cars were shown running on non-conventional power, and wondering if we would ever witness this? Well, it's happening now!

We were recently invited to visit a company called Vital Spark who has brought the future to now, and in their words 'are passionate about our beautiful British Classic Cars and keen to ensure that they can be enjoyed for generations to come; however, that doesn't mean that it has to cost our planet to keep them on the road... electric-powered cars are no longer the future and are the only way that we can maintain our heritage vehicles whilst limiting our impact on the environment.' At the moment electric cars seem to be the way forward for many manufacturers, including MG Motor, and this in time could be forced upon the classic car owner due to spiralling costs of petrol, even more legislation preventing us from using our classic cars when we want to, maybe even being limited to a number of days usage a year, and of course being restricted from entering pollution free zones in cities etc including parts of Oxford, the birthplace of MG.

TRIFIED?

Report and Photos by Colin Grant and Andy Knott



(L-R) Gary White, Rainmaker, Paul Wawiorko, Chief Spark, Rebecca Denyer, Head of Happiness and Sean White, Business Development

Well aware of the possible implications of this, Vital Spark has been set up with the idea of electrifying an existing car at a reasonable cost, after co-owners Gary and Rebecca approached another company to convert an MGB into an EV. The custom build quote was four times the price of a really good MGB, and it would have been 18 months before work would even start on the conversion. The MGB was chosen as reasonable to good cars are plentiful with parts freely available, making this an ideal model to convert to an EV at a reasonable cost, and the EV conversion may even open up the classic car world to those who are put off by the engine maintenance of a classic car.

Gary White, one of the founders, explained that presently they have a DIY kit designed, as many owners like to work on their own cars, and one completed MGB GT which is now available as a demonstrator. Vital Spark is producing videos to show the DIY installer and professional MG conversion businesses the process for converting the car at home, which can be viewed via an online platform. This is in addition to the assistance and information service they will offer from their premises in Warwickshire, or by phone and email.

Before a conversion can be considered by a DIY installer using a supplied kit, the installer will have to satisfy Vital Spark as to their vehicle suitability. Once the conversion has been completed, the car will have to be inspected again, on customer site, by a Vital Spark technician to check the vehicle meets the required safety standards laid down by the DVLA, and a Completion Certificate will be issued so the owner can contact the DVLA and have the V5 changed to electric power. One thing which is important is that the owner should take photographs of the car before the conversion and during and after the installation has been carried out, in preparation to send this as evidence to the DVLA.

We asked what the procedure was for a conversion carried out by Vital Spark. Gary explained that the first thing they would do is check the car for suitability and structural rigidity; of course a car with a rotten chassis, poor suspension/ bodywork etc would not be considered,

The workings under the bonnet with the cover removed

Close up of EV Controller

Netgain motor, bolted to an aluminium adapter plate

as they have no facilities for carrying out restoration work. A suitable car would then be weighed on each wheel against spec which is normally about 250kg at each wheel, with a slight imbalance at the rear depending on battery location. Coincidentally, with the EV conversion the MGB is a virtually identical weight. Once weighed, the engine, exhaust, petrol tank etc are stripped out leaving the gearbox in situ. The kits are then built on the bench, tested and the assembly fitted to the car. The kit is easy to install, with no modifications to the chassis, and very few holes need to be drilled as existing engine mount holes are utilised. In simplistic terms you have a sealed box in the front of the car and a sealed box in the back containing everything which is pre wired and you link the boxes together. The procedure takes around three weeks.

The new electric motors Vital Spark are using are 80kw units made by Netgain, well known for supplying various companies, especially in the US, with a good track record for reliability. The batteries used in the white MGB GT are ex Jaguar/Land Rover test vehicle batteries, but going forward they will have their own supply of new batteries from Europe and China. Ten sealed battery blocks are used per vehicle in total, six at the front and four at the rear of the car, giving a 60-40 weight split. The batteries are all monitored by the battery management system, which also stops them being overcharged. Located next to this is a motor controller and a charger that charges the 12 volt system. The electric motor sits under these, mated to a specially machined aluminium adapter plate that links it to the existing gearbox, with a coupler to implement the drive.

Gary White with the New MG (Heritage Bodyshell) Roadster that's being electrified

Sitting in the rear of the car is a battery box and a charger. The rear battery pack sits in the load area of a GT but on a roadster its sits where the petrol tank was originally positioned. There is also a data port allowing connectivity for updating software or getting readouts etc. Many safety features are included to stop an owner removing the electronics covers and tampering with the innards; this is because they are using 110V which could be fatal. The car's 12-volt system remains in place as it powers the auxiliaries and is linked to the 110V system. This means that when you turn the key on, it sends a signal to the battery management system and controller to ready it, and you activate the system by pressing a button on the dash, so there are two distinct procedures before you can move off. From the driver's seat the instrument panel dials will be aesthetically pleasing and in appearance resemble the existing dials, but with the rev counter, for example, being a power meter. A custom radiator is still used and fitted behind the iconic MGB grille, but this radiator cools the battery packs, with the coolant circulated via an electric pump. The heater is now an electrical element, but uses the original heater casing and gives instant heat to the cabin. While internal combustion engines require multiple gears with different ratios for power output, electric motors produce a consistent amount of torque at any given RPM within a specific range, so driving the electric MGB is simple: just select 4th gear or reverse (you can just use a switch in the cabin for reverse leaving the car in 4th).

The estimated range of the car will be between 100 and 120 miles dependant on a number of factors, mainly weather as mileage is less during the colder weather, and also what 12V electric auxiliaries are in use. As per most modern electric cars, the conversion incorporates switchable regeneration braking that will put more power back in to the batteries, increasing the range. The charging port is located at the rear of the MGB GT, currently where the exhaust would have exited, although this may change. Initially the socket was to be put where the standard filler cap would be located, but because many MGBs are fitted with overriders this did not allow room for it to be used in that position. The charging port is the common Type 2, and using a minimum standard domestic 3.5kW socket, changing time is around seven hours.

Interior of the newly converted GT

The charging port on the electric MGB GT

Vital Spark decided to keep the performance akin to the standard MGB GT: top speed will be capped at 90mph with a 0-60mph time of around 12 seconds. The motor is running conservatively at 65% capacity with those performance figures, and the electronics can be remapped to give better performance but then suspension, brakes and possibly the gearbox would have to be uprated to cope with the extra performance and torque.

Price for the kit start at £28,698 with an extra £4,000 if the conversion is carried out by Vital Spark. In future, with battery technology improving, and finding their own supplier, they hope they can bring the price of the kit down slightly. One development they are working on is to be able to dial into a car and do diagnostic checks/software updates remotely. As with all electrical cars the electrical components are pretty robust, and all the non-electrical servicing such as brakes, suspension etc can be serviced by a normal MG specialist.

Vital Spark has recently expanded the company and its ideas with the acquisition of Sebring International last October, who were making Austin Healey 3000 replicas in fibreglass and fitting various makes of engine. With the now adopted skills of producing a chassis and fibreglass bodykits, it's a natural progression to build a Healey replica with a Tesla electric motor to be sold as a new car, but this is for the future, although they do already have a growing order book! ●

Some of the batteries and the 6.6kW battery charger

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Co-Founder Gary talking through EV wiring diagram

We put some general questions to Vital Spark that a member considering converting their MGB to Electric would ask

Could you confirm the specs of the car, such as kW power, bhp rating, range, charging times, etc.

- 26kWh battery pack, 110V electric motor with max torque of 235N-ms at zero revs restricted to 149N-ms. Restricted top speed of 90mph and 0-60mph in circa 12 seconds.
- 6.6kW, type 2 on-board charger giving an estimated charge time from 10% to 90% of 3 hours 25 mins (assuming a min 7kW home charger) and a calculated range of approximately 100 miles.

Is there any recommendation of the tyres to be used in view of the different power delivery from the electric motor? Would this only have to be considered if you were considering upgrading the power output?

- Given we have throttled down the power output to standard MGB internal combustion engine (ICE) performance figures and kept the weight the same as a standard MGB, the standard MGB tyres can be used. If however a higher performance is desired, a number of standard components will need to be upgraded, for example brakes and suspension, and this also includes tyres.

What is the estimated time you feel it would take for a DIY installation to be carried out in a fully equipped home workshop?

- Our estimate is 2-3 days to remove all ICE components (engine, exhaust, petrol, etc) and 4-5 days to fit EV components.

Before a home installation is carried out, would you like to see evidence that the donor cars meet the standards that are required for installation by Vital Spark?

- Yes – we would need to check that the vehicle to be converted is structurally sound AND has not been modified to the point of being unable to accept the EV kit. This inspection can be achieved remotely.

What guarantee period will be given to a car that has had a Vital Spark installation or a home installation? And what would this cover?

- All components are warranted from defects for a period of five years irrespective of who has installed them. For home installations and as part of the kit price, when a vehicle is completed Vital Spark will physically inspect the vehicle at the customer's premises and will issue a Certificate of Completion to ensure the install has met the safety standards required by the DVLA in order to change the vehicle's V5 from petrol to electric propulsion.

Will you offer a payment plan? Or do you require the money upfront?

- A £5k deposit is required to secure a kit build slot and then the full balance is required prior to shipping the kit.
- Payment plans can be discussed on an individual basis.

What is the procedure for notifying the DVLA that an upgrade to electric power has been carried out?

- Update V5: Section 1 (Change my vehicle details) change 'Type of fuel' to electric and enter electric motor serial number in the 'Engine number' field. Send to DVLA.
- DVLA will send you a V894 Reply slip and V627/1 Built up vehicle report form which you must send back together with pre and post conversion photos. This can be emailed.
- DVLA will then request a physical examination by a third party testing service – DVLA will provide the name and telephone number to make the appointment to enable the vehicle to be signed off.
- DVLA will then send out form V10 so as to tax the vehicle under a new class, Electric.

Please note: It was pointed out by the DVLA that 'at present each conversion application notification is processed on an individual case by case basis taking into account the specific build changes notified to the individual vehicle', so documentation and procedures may be subject to change. We recommend that those who are considering installing a conversion into their MGB should contact the DVLA prior to carrying out the work and enquire as to the process for registering the change.