Electrifying DAF

In recent magazines we have reported and commented on the modern vogue and trend for new electric cars. There are mixed opinions about them for many reasons, not least of which is their distance range, how long it takes to charge them, and are they really as "green" as they say, once you consider the manufacturing processes and the minerals and materials needed for the batteries.

But they are here to stay. Governments and people around the world are getting very excited about them. There are also businesses, one of which featured on TV, who make a good living by converting old/classic cars to electric power.

Some of our previous comments may have been less than favourable, and perhaps even slightly cynical. So in the interest of fair play and balance, here we take a look at the quite remarkable job that a long term DAF owner and expert, and member of DAF Club Nederland, has done to convert his DAF 33 to electric power.

Introducing the EV33 – the first electric DAF from Holland

Greetings to my fellow Variomatic fans in Great Britain, here's a note from abroad – following an email conversation with my old friend Richard Butler.

As a mechanical engineer/DAF fanatic I have been thinking of a fully electric one for many years. The usual lead-acid battery limitations kept it a daydream. But in recent times better materials finally became available and now the plan seemed feasible after all.

A small complication is that the Euro rules since 2011 forbid any homemade electronics; you are obliged to use officially approved 'black boxes' containing the controller, DC converter and lots of other electrickery which have been tested for EMC and HT isolation properties. This is a very expensive procedure, so only one make is approved for now. The upside of this is that you don't have to be tinkering with the electrickery yourself; it's more or less plug and play.

I have always kept my first car (since 1983, I've driven it to the big DOC/DCN event in 1985); a DAF 33 from 1974 in the typical "peanutbutter"colour (Terrana). I kept it running over the years but didn't drive it much lately so it seemed a better idea to do something useful with it. The plan was to make a fully electric CVT car as cheap as possible, capable of commuting the 40 km round trip to work, plus some spare capacity for the odd detour. Maximum speed of 85 km/h should be sufficient on this route (no motorway). Also the additional weight should be limited.

A 33 is a lightweight car (660 kg) with a load capacity up to 990 kg = 4 passengers and some luggage. The weight to useful space ratio is hard to beat, ideally suited for EV conversion! This is a big advantage over the Citroen 2CV, which has been converted more than once; you lose two seats in the process and need at least double the battery capacity (and weight). One more victory to the Variomatic – well who am I telling this to?

After considerable discussion with the supplier of the electric stuff we chose a 48V 200 Ah Lithium Iron Phosphate battery system driving a brushless AC 3-phase motor of 15 kW. With 50 Nm torque this is comparable to the original engine giving the same or slightly better acceleration but a lower top speed (original:115 km/h). I designed the CVT controlling device myself, the vacuum system now using an electric vacuum pump and the four-way valve from a DAF 66, controlled by microswitches on the "accelerator" pedal. Couldn't be simpler!

All other stuff was plug and play from the approved set, so I only had to construct a closed steel battery box, engine adapters to connect the electric motor to the former clutch housing and splined driveshaft, and a holder for the black box under the bonnet.

And, of course, removing all the oily bits and installing the wiring for all new switches and obligatory warning lights and buzzers. No rocket science either. Total weight increase is only 84 kg (one average European person). You can still transport three people (or 2+2 kids) and/or some luggage since it's still a four-seater and the boot is still half empty.

After about four months of building time the car was ready for test driving and fine tuning of the black box (by USB & laptop). Everything worked as planned and the range, acceleration and speed were as projected. Then came the long wait for the Dutch State Road and Traffic Institute (known here as the infamous RDW) who took their time to evaluate my application, and finally they invited me for the acceptance test at the national test centre. This only took an hour, and after two more weeks the paperwork was official and I was finally allowed to drive on public road. I even managed to get the model name ‘’EV33’’ on the papers.

Since it now is officially a full EV I can drive it anywhere regardless of environmental restrictions (to come). No road tax either (as long as that lasts, but well it’s also still a classic car of over 40 years old that kept its original registration number - which stays with the car in the Netherlands).

It is incredible fun to drive to work for 50 cents energy cost, without any noise or smoke from the engine and belting happily along in true DAF stepless drive style. Within the hour the battery is full again (using an ordinary 230V wall socket at work or at home). Only thanks to the Variomatic was this all was possible with the smallest motor and battery pack ever used in a regular passenger car conversion, reducing the total cost to 12,000 Euro inc VAT and the RDW test procedure.

You can’t get a new EV (electric vehicle) for that price. The closest is the Renault Twizy which is a two passenger motorbike with half a roof and no doors or luggage space. No match for the DAF, although I understand that Steve had a bit of a fascination about Twizys a few years ago!

The Renault Twizy – doors are an optional extra

You’ll find pictures of the build on my website - http://gromsound.mfbfreaks.com/33e/33e.htm

The “EV33” is a salute to the pioneer EV1 that was axed and destroyed by GM in the nineties. We could have been driving EVs for 20 years now if they hadn’t deliberately sabotaged the technology that is now finally available to all. Watch the documentary *“Who killed the electric car”* for a revealing insight in the methods of the automotive industry.

Best regards from Holland and keep on DAFfing and belting along safely!

Andre (DAF Club Nederland member since 1984)