

**After converting it to run on vegetable oil, Lindsay Porter's T5 TDI Camper doesn't create CO<sub>2</sub> – it recycles it!**



# Green machine

**'THE BIG ADVANTAGE IS THAT IT'S NOT ONLY CONSIDERABLY CHEAPER BUT IT IS ALSO VERY ENVIRONMENTALLY-FRIENDLY'**

SEVERAL MONTHS AGO, I had my Land Rover converted to run on vegetable oil, by a company called DieselVeg, based in Wolverhampton. I know that older Land Rovers have more primitive diesel technology than modern VWs and I asked one of the DieselVeg partners, Nick Hicken, how far away they were from being able to provide a conversion kit for my T5's 174 PS TDI PD engine. 'We're there already,' replied Nick, 'in fact we've converted a couple of Touaregs with the same engine.'

But first, by way of explanation, some background information. Dr Rudolf

Diesel, who developed the diesel engine, built the first ones to run on vegetable oil, so it's nothing new. The power available from vegetable oil is virtually identical to that of diesel fuel. The big advantage is that it's not only considerably cheaper, less than half the price of pump diesel, but it is also very environmentally-friendly.

There are some practical considerations to overcome, though. At typical ambient temperatures, vegetable oil is much too thick for standard pumps and injectors, but at 80-90°C (about the standard running temperature of an engine) its consistency matches that of diesel fuel. So, to run on vegetable oil, you need a special kit to preheat the oil and thin it down, using heat from the engine's cooling system.

The most economical way of converting your diesel VW to run on vegetable oil is to buy a kit from DieselVeg and fit it yourself. It's not a job for the absolute

beginner, as you do need a fair level of competence, but neither is it rocket science.

First, you need to fit an extra fuel tank. This is because you need to start up on diesel and run the engine until warm. You also have to shut down on diesel so the engine doesn't subsequently try to start on thick, unheated vegetable oil.

On the dash you'll fit a controller which selects between diesel and vegetable oil and also controls the purge system which automatically pumps vegetable oil rapidly out of the system when you switch back to diesel. It also contains a low-level warning light for the second tank.

There'll be an extra fuel pipe for the vegetable fuel and a cable for the low-level warning light, both of which are run under the vehicle, from back to front.

Finally, there are the under-bonnet components seen in the following picture sequence...



Here are the engine bay parts laid out on the bench as Neil Pickford and Nick Hicken of DieselVeg discuss how the conversion will be carried out.

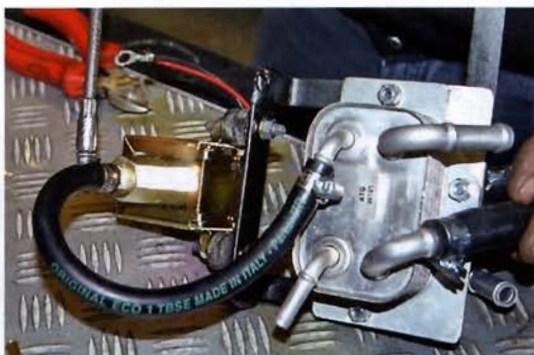
Under-bonnet solenoids switch between diesel fuel and vegetable oil, as required. Hoses are easier to connect before fitting. Extra filters are supplied.

## PROS

- + Using recycled vegetable oil is the most environmentally-friendly way of running a diesel engine.
- + Plants which are harvested to make the oil have already absorbed the same amount of CO<sub>2</sub> that the engine puts out, so you're not adding any to the atmosphere.
- + There are no sulphates or other additives to be churned out into the atmosphere.
- + It can be less than half the price of diesel.

## CONS

- You've got the hassle of filling up yourself, but it only takes about 10 minutes to save £40 per fill-up.
- You have to find somewhere to put the extra tank, not such a problem on the Camper but other vehicles may lose some luggage space.
- There's the cost of the conversion, but it's quickly recouped.
- Diesel engines are least efficient at tickover, which is why most smoke a little when revved, after ticking over for long periods. Tickover is also when there is most fuel-to-engine oil contamination. With regular diesel, any ingress mostly evaporates but vegetable oil doesn't, so engine oil changes are strongly recommended every 5,000 miles or so. DieselVeg advise users to switch the engine off in traffic jams, or switch temporarily to diesel, to avoid excessive idling.



The twin heat exchangers fitted to TDI PD engines serve two purposes. One of them uses engine coolant to heat the vegetable oil. On PD engines, recirculated fuel is very hot so the second heat exchanger prevents it from overheating.



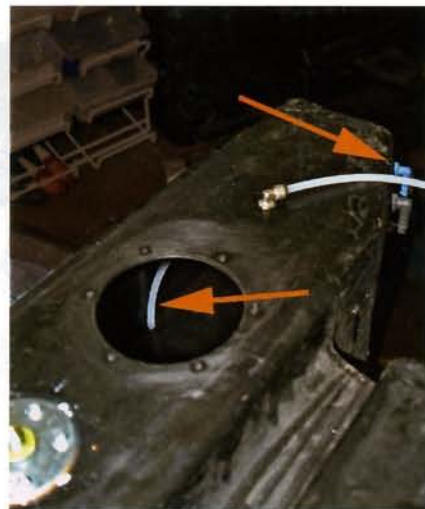
The wiring supplied is connected to solenoids and switches according to the comprehensive instructions and wiring diagrams supplied with each kit.



The heat exchangers and supplementary pump (the T5's own lift pump isn't suitable to pump vegetable oil) were fitted to the bulkhead. Mounting brackets are made to suit your own installation. Solenoid switches are also mounted on the underside of the rain channel.



DieselVeg stocks many different shapes and sizes of fuel tank. In our Leisuredrive Camper, one would have fitted neatly under the bed base.



Instead, I chose an underslung tank from CAK Tanks, using a waste water tank manufactured specifically for the T5. DieselVeg added the breather pipes and a fuel pickup.



The CAK tank comes with its own mounting bracket. I had mine galvanised.



I also wanted a gauge rather than just a low-level warning, so fitted one, purchased from DieselVeg, on the side of the recess.



Rather than get involved in recycling dirty used cooking oil, the simplest approach is to use fresh cooking oil from the supermarket, in 1-litre containers.

## Costs

The P120811 kit as fitted to my T5 retails for £366 as a DIY-fit (including a DieselVeg tank instead of the CAK tank). Extra heat exchanger WT01: £59.55. Electric fuel pump EK1208: £57.02. Fitting costs are typically £550 (All cost are plus VAT.)

Costs for other VWs differ and are usually less for non-PD systems, where DieselVeg fits a smaller 22-litre start-up diesel tank and vegetable oil goes into the original fuel tank.

## Prospecting for oil

The cheapest vegetable oil is available in 1-litre quantities from Tesco supermarkets, where it is readily available both in-store and online at 65p per litre (compared with diesel at around £1.10 per litre).

**'RECYCLING OLD COOKING OIL IS THE CHEAPEST AND MOST ENVIRONMENTALLY-FRIENDLY WAY OF RUNNING YOUR VEHICLE BUT IT IS MESSY AND TIME-CONSUMING...'**

The disadvantage is that you have to empty each individual container, one at a time. So, buy a large funnel into which two or more 1-litre containers can be poured simultaneously, and punch a breather hole in the end of each container to allow it to drain more quickly.

Recycling old cooking oil is the cheapest and most environmentally-friendly way of running your vehicle but it is messy and time-consuming. Used oil often has debris in it and first needs to be filtered to remove large items.