

Grease Is the Word: Fill It Up With Fry Oil

By *JIM NORMAN*

ON a recent return trip from Massachusetts to my home in New Jersey, a distance of 160 miles, I burned a total of two cups of diesel fuel in my 2001 Volkswagen Jetta TDI.

Since that would indicate fuel economy of more than 600 miles per gallon, something didn't quite compute.

The missing part of the equation was this: I was returning from Easthampton, Mass., where Daryl Beck, a mechanic well versed in such matters, had just installed a secondary fuel system in my car. The main fuel I used on the drive home was not diesel, which the Jetta was designed to burn, but straight vegetable oil.

I used diesel fuel for only the first 10 miles of the trip. After that, the diesel gauge stayed right where it was while the VW sped happily along on soybean oil — the same stuff that restaurants use for deep-frying and salad dressing. I used less than three gallons of oil for the final 150 miles of my trip home, which calculates out to more than 50 miles per gallon. Not bad.

The conversion kit that Mr. Beck installed was produced by Greasecar, a manufacturer of vegetable fuel units for diesel cars; gasoline engines cannot be converted to burn vegetable oil. The kit cost about \$900, including an optional temperature gauge and audible warning signal, and another \$1,000 for the installation, which takes an experienced mechanic about seven hours.

Now, after more than 2,000 miles on Veggie oil, there seem to be few disadvantages to the transformation. My car seems to get slightly better mileage, it seems to run a little more quietly and it has just as much zip as it does on diesel. According to test results I've seen, vegetable oil burns somewhat cleaner in most categories than diesel fuel, and emits absolutely no sulfur. What a veggie car does emit is a smell faintly redolent of the kind

of oil being burned — or, in the case of used oil, the scent of whatever it might have cooked previously.

Vegetable oil, of course, is a renewable resource that emits no more carbon dioxide than next year's crop will absorb and requires no drilling for soybeans in the Arctic

National Wildlife Refuge or anywhere else. The environmentally aware will give you even more points in the game of green for using oil previously used for cooking.

You'll get no points, though, from the federal Environmental Protection Agency which recently issued a statement stating flatly that using vegetable oil as fuel is a violation of the Clean Air Act and that modifying a car for vegetable oil subjects the owner to a \$2,750 fine.

Justin Carven, the founder and owner of Greasecar, says his company has started the process of qualifying his conversion kit for E.P.A. certification.

Going veggie is not the gas-and-go type of driving Americans are accustomed to. At discount stores like Costco or Sam's Club, soybean oil costs about \$13 for a 35-pound "cubic," a squarish jug that holds about 4 1/2 gallons. That makes it a few costless per gallon than the current price of diesel fuel.

It's possible to pay less — or nothing at all. I have also collected 20 cubies of waste oil, just for the asking, from various restaurants and from a generous fellow greaser with an excess of oil. Now that I have my filtration station up and running in the corner of my garage, even visits to the local big-box store will be few and far between.

There are a few things I must be attentive to: I have to remember to purge my fuel lines of vegetable oil and switchback to diesel a few minutes before ending a trip. If I forget this on a cold night, the oil could congeal and make starting the next morning impossible without the aid of a hair dryer

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I have to remember to use the purge function on my dash-mounted fuel selection switch for no more than 20 seconds or so. If I leave it in purge position, it can allow diesel fuel to flow back into the vegetable oil tank and overfill it until it flows through the air vent, a mess I would rather not experience.

Add a few factors to the category of minor inconvenience that accompanies my energy-independence euphoria: I have to carry a spare vegetable oil filter for that inevitable moment when the original says it has had enough. I also have a filter wrench and a pair of oven gloves to let me change filters while the engine is still hot. And I mustn't forget the turkey baster: that's to fill the new filter with vegetable oil from the tank, so I don't introduce an air bubble into the system, causing the engine to stall.

My trunk is a little — no, a lot — less spacious than it used to be, because of the spare cubic of oil I carry, along with a big funnel that lets me fill the tank without spills. The spare tire also takes up space inside the trunk now; the veggie oil tank occupies the wheel well that used to contain the spare.

Notwithstanding the inconveniences, my wife is as enamored of this experiment as I am. She has claimed the Jetta as her own, but has volunteered to help with the mechanical work to convert another car for me. She calls the experience the "Noah project," named after our 11-month-old grandson, who she hopes will benefit from a better world if others do the same thing.

Despite the obvious benefits of using a fuel that contributes to the nation's energy independence, that is relatively cheap and that can be burned after having already served its original purpose— cooking food— it is worth noting that vegetable oil is unlikely to replace petroleum anytime soon.

As the number of conversions rises, users will eventually soak up the supply of used cooking oil. As

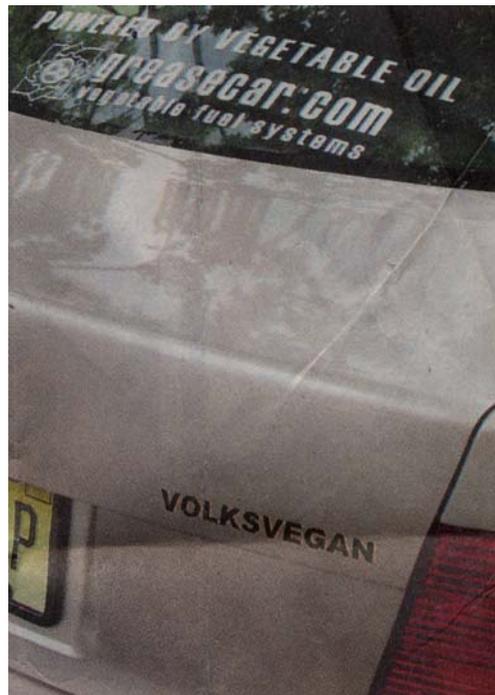
with ethanol, and other agriculture-based fuels, it remains to be seen whether growing soybean is an efficient way to produce non-petroleum fuels, since the arming process consumes large amounts of fuel and chemical rich fertilizers. Also, growing crops for use as fuels could have unforeseen effects on the prices and supplies of food.

The territory is uncharted in other ways, as well, as in the comments posted in an online forum sponsored by Greasecar.com. Take the case of "Chase," a Massachusetts resident who was perhaps not as careful as he might have been in the storage of his cache of oil. "No BooBoo to be seen," Chase wrote, "but this AM there was a really big black bear with its snout in an opened and overturned 5-gallon container. Luckily the grease spilled onto my gravel driveway, so it soaked in soon enough. Also lucky she did not get into the 12 other buckets! Some arm waving and yelling sent it packing."

A frequent question about vegetable oil is whether cars run more sluggishly on it. Consider "TDIGuy," who sought advice on whether a blown head gasket could have resulted from "running a VW too fast for too long" and "hitting the gas pretty hard." After receiving some helpful comments, TDIGuy came clean: "When I said speeding a little, and a little hard on the gas, I was actually trying to hit 140 (MPH) in the car. Managed to 130, but I think I put too much stress on the engine."

A common concern about converting a car for vegetable oil is that it could harm the engine. But some people who have done conversions say they've seen no damage, even after many miles. Phil Gibbs, a New York City firefighter who makes a 75-mile commute twice a week from his Putnam County home, said he had driven his 2002 Jetta 75,000 miles on vegetable oil with no trouble.

The car had 70,000 miles on it before it was converted. "It runs like it did when it was new," Mr.



Gibbs said. The key, he added, is making certain not to switch to vegetable oil until it has reached the proper temperature.

The typical conversion involves in-stalling a parallel fuel system with an independent tank (mine is aluminum, shaped like a hockey puck and holds 13 gallons), a heating system that diverts hot engine coolant through copper coils placed within the tank and wrapped around a specially installed vegetable oil filter in the engine compartment, and a set of solenoid-activated valves controlled by a dash-mounted switch that diverts the flow between diesel fuel and vegetable oil.

There is also a fuel temperature gauge that tells the driver when to Switch from diesel fuel to vegetable oil after starting out, and a somewhat representational fuel gauge that gives a rough approximation of how much vegetable oil is in the tank.



Greasecar, the company that built my conversion kit was started in 2000 by Mr. Carven, a Hampshire College mechanical design graduate who had experimented as a school project on a junk car he bought for \$300. He went on to celebrate his graduation with a cross-country trip in an old VW van that he equipped with a vegetable oil system. Now, Greasecar has 14 employees and ships about 300 conversion kits a month from its shop in a 19th-century brick factory complex.

Many buyers follow the instruction manuals that come with the kits and do the installations themselves. Others, like me, seek experienced mechanics who know exactly what they are doing and keep up with the latest developments in the art

of greasing. Several manufacturers of similar kits have loose networks of recommended installers. In addition to the commercially available kits, many home-built systems are being installed by backyard tinkerers all over the country. You can get in touch with them on Internet forums like the ones at the Web sites for Greasecar.com; for another kit manufacturer, Frybrid.com; and at Biodiesel.infopop.cc/eve.

To convert a car to run on vegetable oil, you have to start with a diesel car; it cannot be done with a gasoline engine. Not all states allow the sale of new diesel-powered passenger cars, and there are different state rules governing the sale of used ones. I was a lucky buyer; even though the car had 147,000 miles on the odometer, and was in fine condition, exactly as described by the seller.

I was surprised to learn that Rudolf Diesel, inventor of the combustion cycle bearing his name, originally intended his engine to run on vegetable oil. In 1912, seven years after he introduced his engine at a Paris exposition, he said: "The use of vegetable oils for engine fuels may seem insignificant today. But such oils may become in the course of time as important as the petroleum and coal tar products of the present time."

For me and my Volksvegan, that course of time is now.

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