



828-253-1034
828-253-8882 fax
info@blueridgebiofuels.com
www.blueridgebiofuels.com

General Information on Running Biodiesel in Diesel Vehicles

Overview

Biodiesel is a direct replacement for petroleum diesel and can be used in any diesel engine without modifications. The first diesel engine was designed to run on peanut oil by German engineer Rudolf Diesel in 1893. Biodiesel is typically made by reacting vegetable oils and/or animal fats with an alcohol and a catalyst to create an alternative fuel suitable for diesel engines. Biodiesel can be blended with petroleum diesel at any ratio. Common blends are B5, B20, B50, and B99. The B-factor represents how much biodiesel is in the fuel mixture. Biodiesel blends are used in diesel cars, trucks, buses, off-road equipment, and oil furnaces across the country. The use of biodiesel can reduce a diesel engine's **overall** emissions up to 75 percent. It can also reduce engine wear and tear and help a diesel vehicle last longer due to its naturally high lubricity. Biodiesel is the first fuel to be commercially produced nationwide which meets the US EPA's definition of an Advanced Biofuel.

Fuel Quality

Biodiesel is an internationally recognized fuel that must meet ASTM specifications in order to be sold to consumers. In addition, the BQ-9000 certification program assists biodiesel producers in further improving their fuel quality standards. Biodiesel companies are also regulated by the state and federal governments to ensure that only quality fuel is sold. Biodiesel is created through a manufacturing process and is not the same product as straight vegetable oil (also called used or waste cooking oil). While diesel engines can run on straight vegetable oil, a "conversion kit" is required to do so. Straight vegetable oil is not recognized as a legal motor fuel by the EPA and is much less accessible than biodiesel. Quality biodiesel meeting ASTM and BQ-9000 standards is available to the general public via pump stations in Western North Carolina and across the country.

Fuel Hoses and Seals

While no modifications are required to begin using biodiesel, there are some specific upgrades that a new biodiesel consumer may want an automotive technician to complete on their vehicle. This is because biodiesel acts as a solvent, which can clean out a vehicle's fuel system and can also deteriorate natural rubbers more quickly than petro-diesel. These upgrades are usually **not** necessary for most vehicles if running on B20 or below. When running high blends, we recommend having an automotive technician install Viton (synthetic rubber) hoses and seals in a vehicle's fuel system. This upgrade is usually not necessary **before** running biodiesel; again, it is only recommended as a preventative

measure. Eventually, all fuel hoses and seals need to be replaced on a vehicle due to regular wear and tear, regardless of the fuel being used or what materials the fuel system contains. Switching to Viton only increases the longevity of a fuel system's components upon switching to biodiesel. This switch is simple and inexpensive, typically only costing about \$50 and around 30 minutes of an automotive technician's time.

Fuel Filters

One other precautionary measure we recommend when using high blends is to monitor fuel filters. Upon the initial switch to biodiesel, a vehicle's fuel filter may need to be switched up to 2-3 times within the first few months of using high blends. The solvent properties of biodiesel can clean out a vehicle's fuel system by loosening diesel sediment at the bottom of the fuel tank (thus clogging your filter with diesel "sludge" or sediment). This typically only occurs in older vehicles and those with high mileage. In the long run, a cleaner fuel system is actually better for the engine and helps it last longer. Symptoms of a clogged fuel filter can include mild loss of power or a hard start. A fuel filter typically costs approximately \$15-\$30 at any auto parts store. We recommend that new biodiesel users always keep a spare fuel filter on hand in their vehicle. Many biodiesel users find it easy to change their fuel filters themselves; otherwise, an automotive technician can have it switched out in approximately 30-45 minutes. After these initial fuel filter changes, typically a vehicle can return to the manufacturer's normal recommendation for filter change intervals. Many vehicles do not require any change in fuel filter change intervals when running on lower blends such as B20 and below.

Gelling

Another characteristic to keep in mind is that because biodiesel is made from natural oils and fats, it can gel at a slightly higher temperature than petro-diesel. A biodiesel consumer can easily prevent any gelling from occurring in their vehicle by using biodiesel blends appropriate for their particular climate. In Western North Carolina, the highest blend we recommend during the colder months is B50. Running B99 is only suitable for our climate in WNC during the warmer months of the year.

Purchasing a Biodiesel Vehicle

There are several options to consider before purchasing a diesel vehicle if you plan to run it on biodiesel. One option is which blend you would like to use. All diesel vehicles can run on lower blends of biodiesel without any modifications. However, using higher blends reduces your own personal carbon footprint and reduces our nation's dependence on foreign, petroleum-based fuels. Most OEMs (Original Engine Manufacturers) have not researched using high blends in their vehicles and thus hard data on using high blends in any diesel vehicle is hard to come by. The most reliable information on using high blends is often personal testimonies. Over the years, we have found the online biodiesel forum Biodiesel.Info.com to be particularly helpful for this purpose.

Older Models

The two most available and reliable older passenger vehicles for running high blends are the 1981-1985 diesel Mercedes-Benz and the 1996-2003 Volkswagen TDIs. In addition, medium-duty trucks such as the Ford 7.3L Power Stroke diesels and the Dodge 5.9L Cummins diesel also run very well on high blends. There are also many other vehicles that run great on high blends. If you have a particular vehicle you are interested in running on high blends, we recommend going online and reading other users' experiences of running high blends in that particular vehicle.

Newer Models

Because of the strict US emissions standards enacted over the past several years, and also due to the switch from LSD (low sulfur diesel) to ULSD (ultra-low sulfur diesel), many OEMs have been required to redesign their fuel system, engine, and emissions components. Unfortunately, these newer diesel designs have been proven to run less effectively on biodiesel (especially higher blends) than their older counterparts. Therefore, your best bet for running high blends is to purchase an older vehicle. If you are interested in purchasing a newer vehicle, we recommend beginning with a lower blend such as B20. Biodiesel industry liaisons (such as the National Biodiesel Board) are currently working directly with many OEMs to research how to make these newer diesel engines more compatible with biodiesel.

Warranties

One final consideration is a vehicle's warranty. One very common biodiesel "myth" is that using biodiesel will void a vehicle's warranty. The only statement on **any** warranty concerning biodiesel is a recommendation of which blend to use based on that particular manufacturer's research. Since most OEMs have not researched using higher blends, they only recommend the lower blends that they have researched. Many automotive technicians incorrectly believe that they can void a vehicle's warranty for using a higher blend than the manufacturer recommends, and in some cases, for using biodiesel at all. However, an automotive technician **cannot** void a biodiesel consumer's warranty and does not have the authority to do so. First to consider is that engine manufacturers can only warranty the products they create – engines. No warranty covers any fuel used in a vehicle (whether it is biodiesel or petroleum diesel). Secondly, the only way that biodiesel (or any fuel) could **ever** void your warranty is if a sample of the fuel is taken from the fuel tank at the time that the issue arises, is sent to a third-party lab, and is proven to be out of spec (doesn't meet ASTM fuel standards) or is otherwise proven to directly contribute to the issue at hand. It is then still up to the discretion of the engine manufacturer to void a warranty (not a mechanic). According to biodiesel industry experts, this is a very rare occurrence and typically only occurs when the biodiesel is found to be out of spec. Finally, for older vehicles, there is no need to worry about a warranty if it has already expired. If an automotive technician still insists that a warranty will be voided by using biodiesel, it is likely that they have not received formal training on the use of biodiesel in diesel vehicles. Ultimately, it is **your** decision on which fuel to use in **your** vehicle.