

Biodiesel – Saviour of the Planet or a Curse? - A Discussion

We hear a lot about Biodiesel today but what is it? Basically it's a mixture of Vegetable Oil (Bio) and Hydrocarbon Oil (Diesel). The Bio element can be Rape Seed Oil (Europe), Soy Bean Oil (USA), Palm Oil (Asia) or new and recovered Cooking Oils & Fats. When you see news items reporting that such and such a transport or bus company is switching over to Biodiesel the general public perception is that they are going to switch over to an environmentally friendly 100% bio fuel! In very few cases is this actually true! The term "Biodiesel" has come to mean 2 things in the UK: either a mix of Biodiesel (E.G. 5% blend with 95% normal diesel) or 100% pure Biodiesel. Unfortunately this dual meaning can be misleading and can lead to misunderstandings. Yes 100% Biodiesel can be used, but as we will see later there are huge cost and environmental implications.

So what is Biodiesel? Biodiesel as sold in the UK and Europe is a 5% mix of refined Vegetable Oil to 95% Diesel Oil and is controlled by EU standard EN14214 and UK standard BS EN590. This is commonly called, particularly by the Super Markets, 'City Diesel'. The European Government has decreed that this 5% Bio content should increase to 10% by 2020.

With today's increasing 'Greenhouse' gasses, in particular, CO² (Carbon Dioxide) the emphasis on reducing the reliance on Hydrocarbon fuels, Diesel and Petrol, is on everyone's mind, and as time goes on this shift towards Bio fuels must increase.

In the UK most Biodiesel contains Rape Seed Oil, and part of the manufacturing process is to remove the Glycerine by 'Transesterification', this is a fundamental process because, when heated, Glycerine thickens. Some people claim that they buy large quantities of 'Cooking Oil' from the local super market and use this as Bio fuel. This cooking oil has not had the Glycerine removed! Users of this 'Fuel' run the real risk of engine damage! Also, when very cold, cooking oil can 'Settle' out, you've probably seen sediment in the bottom of a bottle of old cooking oil. Therefore if cooking oil is used it usually requires heating before the engine will start. For under £900.00 you can buy a 'Biodiesel Processor' to turn waste 'Chip oil' into Biodiesel. The UK Government allows you to 'make' 2500 litres of Biodiesel per year without penalty; the cost per litre can be as low as 15 pence!

Biodiesel, in high concentrations, is a very effective 'Paint Stripper' and, unless all tanks and fuel lines are thoroughly cleaned, premature fuel filter clogging will occur. On older engines Biodiesel will also 'Attack' all 'O' rings and fuel pump oil seals with consequential fuel leakage problems. Modern engines are fitted with Bio proof components. As though this is not enough, Biodiesel being vegetable based will dilute the engine oil, reducing its viscosity thus reducing oil change intervals. An engine running on 5% Biodiesel will have no problems in this area but if 50% or more Bio is used the servicing intervals are reduced to 30% of normal, with, in some cases, an oil filter change between oil changes. What does this mean in financial terms? Simply, 3 times the quantity of engine oil and up to 6 times the number of filters, not to mention 'Down Time' while the vehicle is being serviced. You don't have to be a mathematician to work this out! (Engine oil, Filters and Oil containers are now classified as 'Hazardous waste' and as hazardous waste there is a legal obligation to pass it on to someone who has the necessary authority to dispose of it!)

A few manufacturers to-day produce specially designed engines which are capable of running on Biodiesel with up to 100% Bio content, but with reduced service intervals and the requirement for special engine oil.

All diesel engines will happily operate on EU/UK standard Biodiesel without any problems and with NO engine damage. Owners of 'Classic' tractors should be aware that their engine is using 'Yesterdays' technology and, whilst quite happy to run on a 5% Bio mix, will not operate on an up-to 100% Bio mix without the real risk of engine problems.

When you hear Governmental and media statements regarding Biodiesel they are always totally devoid of the actual % of Bio content leaving the public to assume that it is 100% Bio! In reality it will most likely be the standard 5% mix EN590. Whilst this is a contribution to reducing CO² it is, at best, a very small contribution. Bio is calculated as being Carbon Neutral. Some web sites make extravagant claims regarding the reduction of harmful emissions when using Biodiesel, but are very careful not to mention the % mix, which, to substantiate the claims is 100% Bio. The general term for describing the % Bio mix is B05 (5%) to B100 (100%).

The UK government gives tax relief of 20 pence per litre on Bio, but Bio costs 20 pence more per litre than standard Diesel to produce! Therefore the tax benefit is neutral, a fact that the Chancellor of the Exchequer never reveals!

If the Bio content of Biodiesel is 5% then this amounts to 50cc of Bio per litre of fuel. 5% of 20 pence (The tax concession) is 1 pence per litre of Biodiesel! This hardly represents a cost benefit. Recent reports suggest that the cost of producing Bio, in terms of fuel used to sow the seeds, harvest the crop, refining and transportation to the forecourt pump is not cost effective. This is due to the 'Carbon Footprint' of the production methods and the increase in cost of food due to oil producing plants being planted in favour of food producing plants. There is also the problem of deforestation in South America and Asia where forests are cleared to plant Palm Oil Trees!

The use of Biodiesel has NO effect on European Exhaust Emission legislation. If an engine is 'Certified' to a particular emission level the use of Biodiesel won't take it up into the next level! It may reduce the CO² emissions but CO² is not a legislated emission! The use of EN590 Biodiesel reduces Carbon Monoxide (CO) and Particulate Matter (PM) by a small amount but Nitrogen Oxide (NO_x) is slightly increased! To get a significant reduction in CO & PM then 100% Bio use is required, the penalty is a 10% increase in NO_x.

Exhaust Emission legislation is a different subject altogether and not covered in this article.

As mentioned before all Diesel engines will run on EN590 Biodiesel. It's a different matter when it comes to owners of 'Common Rail Diesels' who may wish to use a high % of Bio in their fuel. Bio has an 'Ultra Low Sulphur Content' which can damage the very high pressure (1600 Bar or more) fuel pumps fitted to these engines!