Fuel stability woes challenge the increase of FAME (Fatty Acid Methyl Ester) biodiesel beyond the current B5, or 5% blend. Mercedes-Benz and some other original engine manufacturers (OEM's) will not warranty their engines when blends of B6 or higher are used. The reason is due to poor oxidation stability that causes the fuel to biodegrade over time. This process is amplified due to improper storage and handling along the retail fuel distribution chain. Fuels that are in spec at the time of blending have shown degradations in quality as they move out through retailers. The results of oxidation can include bacterial growth in gas tanks and sludging of engines, fuel injectors and fuel filters.

FAME biodiesel is the most popular type of alternative diesel fuel available today. FAME biodiesel is produced through transesterification of fats with methanol, the fats are obtained from vegetable oils or other fatty acids such as animal fats or waste cooking oils. Biodiesel is hydroscopic, meaning that it attracts moisture and once moisture sets in it can hydrolyze and form a variety of organic acids and bacteria. The main problem with FAME biodiesel is low oxidative stability meaning that it does not store well over time relative to petroleum diesel leading to the buildup of acids and sediments. Factors affecting oxidative stability include the degree of saturation of the feedstock, level of natural antioxidants, carbon chain length and the presence of glycerides.

While all engine manufacturers support the use of B5, they offer varying opinions on blends of B6-B20 and B100. FAME biodiesel is not supported in aviation, especially in the use of shared pipelines and storage tanks which can allow cross contamination of fuel. Engine manufacturers such as Audi/Volkswagen, BMW, Mercedes-Benz, Kenworth and Peterbuilt will only warranty B5. In regions where higher blends are on the market and limited consumer choice is available, some manufacturers have said they will honor warranties on a case-by-case basis as long as additional maintenance routines are carried out such as increased frequency of oil changes. Other OEM's such as Freightliner and Case specify warranties based on engine model.

The differences in warranties between the OEM's lies in the engineering of the engines themselves. Technical variables such as the specifics of fuel injection and oil pan size can make one engine friendlier to higher biodiesel blends than another. Biodiesel has a tendency to collect in the oil pan as sludge and cause oil levels to rise, and depending on the size of the oil pan can cause problems. Other problems include fouled fuel filters, fuel pumps and oil filters.

Source: http://breakingenergy.com/2014/07/30/fuel-stability-problems-challenge-fame-biodiesel/