



**Response to Statements Condemning the Use of 100 % Plant Oil
in Diesel Engines Issued by the Truck & Engine Manufacturers Association
and the National Renewable Energy Laboratory**

The Truck & Engine Manufacturers Association (“EMA”) and the National Renewable Energy Laboratory (“NREL”) have issued statements¹ condemning the use in diesel engines of untransesterified, straight vegetable oil, like the 100 % plant oil fuel (“POF”) that POP Diesel™ manufactures and sells for use in diesel engines equipped with a POP Diesel Fuel System™. These statements are based on dated and misleading evidence and the misuse of POF in ways that POP Diesel™ advises against.

Petroleum diesel, like POF, can cause fuel system problems if the fuel is not properly managed. Thus, the dangers that the EMA complains of regarding raw vegetable oil may apply to petroleum diesel, under certain circumstances. POP Diesel™’s experience since 2006 making and selling POF to customers having the POP Diesel Fuel System™ installed and its focus on and dedication to this kind of engine fuel displays an unparalleled, first-hand insight on proper POF management.

An engine equipped with the POP Diesel Fuel System™ always starts and shuts down on No. 2 diesel drawn from a dedicated fuel tank. In the interim, the fuel supply is 100 % POF, preheated to reduce its viscosity and drawn from a secondary tank. This contrasts with the use of biodiesel (a reconstruction of the vegetable oil molecule into a different substance) drawn from a single fuel tank and approved for blending with petrodiesel in no more than 20 % concentration.

Experience has shown that POP Diesel™’s method of purging the fuel lines and injectors of POF upon engine shut-down and leaving only No. 2 diesel in the engine for its next start avert the hazards arising from blending raw vegetable oil with petrodiesel in a single fuel supply tank.

The Chair of EMA’s Fuels Group admitted: “Our position on these unprocessed feedstock[s] is derived from industry’s experience from the early 1980’s” using blendstocks of between 5 and 50 % vegetable oil, with the remainder being petrodiesel, coming from a single fuel tank. In other words, EMA’s statement turns on past and rightly discarded use of POF in a manner akin to biodiesel’s present-day blending with petroleum diesel. NREL’s statement similarly pertains to “plant oils or greases used [] at concentrations [of] 10 % to 20 %.” These

¹In response to POP Diesel™’s having published this statement on its website, the EMA thankfully removed theirs from their website. NREL’s statement is from a 2004 publication.

POF blends with petrodiesel are drawn from a single fuel tank, an approach POP Diesel™ would never recommend.

EMA's published statement omitted the following sentence that had appeared in earlier drafts: **“Vehicles may be modified to achieve compatibility between raw vegetable oil and animal fats with the fuel delivery system (e.g., by heating the fuel system to reduce the fuel's viscosity)”** – exactly POP Diesel™'s solution. Similarly, research authority that NREL relied on, in addition to the same early 1980's material as EMA, concluded: **“Raw vegetable oils can be used as fuel in diesel engines with some modifications.”**²

The only other study NREL relied on was a bench test of fuel injectors running on used vegetable oil (“UVO”).³ Injector coking was more pronounced than with petroleum diesel and the degree of coking increased corresponding with the concentration of UVO in the fuel. The test protocol involved both starting and significant idling of the engine on vegetable oil, risks that POP Diesel™'s engine controls avoid by reverting the fuel supply to No. 2 diesel under prescribed conditions. This test combined the visual measurement of soft and any hard carbon deposits, rather than ignoring benign soft deposits and tabulating only harmful, hard deposits. The testers also failed to clean the injectors with petroleum diesel after vegetable oil use.

Neither NREL nor EMA appear to have any reason or data supporting their positions other than the items rebutted above.

Lastly, EMA's statement points out that just like biodiesel, “unprocessed oils, greases, and fats experience significant degradation due to oxidation if stored for a period of more than approximately three to six months.” To prevent this, POP Diesel™'s POF has an anti-oxidant additive to adequately improve storage life.

Performance features of 100 % POF in a diesel engine equipped by POP Diesel™ include cetane comparable to No. 2 diesel; high lubricity; 8 % more fuel volume used; no increase to the engine's service interval; no increase in regulated emissions; and very little net contribution to greenhouse gas accumulation.

The U.S. Environmental Protection Agency has not yet designated POF for registration with the Agency. POF remains unregulated under federal law. Perhaps before long, policy-makers and industry will join POP Diesel™'s customers in appreciating the tremendous cost savings, performance advantages, and environmental benefit of using 100 % POF in engines equipped and fueled by POP Diesel™.

²R. Altin, S. Cetinkaya, and H.S. Yucesu, *The Potential of Using Vegetable Oils as Fuel for Diesel Engines*, 42 *Engine Conversion and Management* 529 (2001).

³S. Jones, C. Peterson, and J. Thompson, *Used Vegetable Oil Fuel Blend Comparisons Using Injector Coking in a DI Diesel Engine*, ASAE Paper No. 01-6051 (2001).