



DLA Aviation leads bio-based synthetic oil testing for federal vehicles

By Chris Erbe | April 27, 2016

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Non-tactical federal vehicles may soon become less environmentally harmful, thanks to the Defense Logistics Agency Aviation [Hazardous Minimization and Green Products Program](#).

DLA, in partnership with the Air Force Research Laboratory, is now testing and validating "bio-based" synthetic oil in government vehicles at four Air Force bases and a Department of Homeland Security installation. Program managers plan to expand testing to several other federal agencies soon.

Bio-based oil is a blend of 25- to 40-percent agricultural content — such as canola oil, soybean oil and/or oils from animal fat — and commercial synthetic oil.

"Our office funds projects like this to find alternatives not only to reduce hazardous materials, but to reduce our reliance on foreign oil," said Andy Shaban, chemical engineer and DLA Aviation program manager. "Oil and greases are typically composed of base oils thickened with polymers, solids and other additives, which are considered hazardous. Our job is to find an environmentally safer substitute for the traditional oil that military and federal agencies use in non-tactical vehicles."

In January, Air Force personnel at Seymour-Johnson Air Force Base in North Carolina separated four vehicles from the motor pool and replaced the conventional motor oil with bio-based synthetic oil. The conventional oil was sent to a lab for analysis for the purpose of establishing a baseline for later comparison with the bio-based product. Over several weeks, project participants repeated the procedure on a total of 40 vehicles at the DHS Federal Law Enforcement Training Center in Georgia, Luke AFB in Arizona, Fairchild AFB in Washington and Malmstrom AFB in Montana.

Project participants used products from three manufacturers of bio-based synthetic engine oil: Biosynthetic Technologies, b2 biOil (Loch Sciences) and [BioBlend](#). Manufacturers of bio-based oils have made significant strides in recent years. Industry test results show that use of the "green" product contributes to higher gas mileage, longer oil-change intervals and reductions of greenhouse gases. Additionally, bio-based motor oil can simply replace conventional oil without modification to the engine.

Shaban is hopeful that DLA's tests will validate those results. The testing period will last from 12-18 months and will include long idling sessions as well as driving. "Some of the testing will be based on mileage, some will be time-based," Shaban said. "After a certain mileage or time frame, the oil will be removed and sent to a lab for testing. If the requirement was to change the conventional oil at 5,000 miles, we will test the bio-based oil at 5,000 miles and compare."

The testing locations were also part of the project. "We picked bases and agencies in various climate regions around the country," Shaban said, "so we can find out how different environmental conditions affect the data."

DoD uses about 1.1 million gallons of four-cycle engine oil annually in 180,000 vehicles. The entire federal government, including the military services, civilian agencies and the U.S. Postal Service, maintains a total of 633,000 vehicles.

If testing and evaluation shows that bio-based oil is comparable to or better than conventional oil, it could lead to a complete conversion to the bio-based synthetic oil in the federal government's fleet of non-tactical vehicles. Pressure to convert comes in the form of DoD sustainable procurement directives, Federal Acquisition Regulations and laws such as the Farm Security and Rural Investment Act of 2002, which stresses the need for the government to procure and use bio-based products.

A successful outcome will be good news for farmers, as it will expand the market for domestically produced agricultural products. Other potential benefits include a reduced lifecycle carbon footprint and reduced dependency on foreign petroleum.

DLA Aviation's Hazardous Minimization and Green Products Program and their partners will continue to expand testing and analyze data. Considering the impact of the large number of federal non-tactical vehicles in use, their efforts could allow the federal government to take a big step in the right environmental direction.

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Photos 1 of 1



Airmen 1st Class Michael Schulz, 341st Logistics Readiness Squadron vehicle management flight mechanic, changes the oil of a government vehicle March 22, 2016, at Malmstrom Air Force Base, Mont. Schulz was one of two Airmen tasked with changing the oil of six vehicles which will be testing a new bio-based synthetic oil which could potentially help the Air Force's initiative to use more sustainable materials and be environmentally conscious. (Photo by Airmen 1st Class Magen M. Reeves)

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