2016 DoD Maintenance Innovation Challenge (MIC)

Abstract Form	
Innovation Title:	Single Common Powertrain Lubricant
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Abstract: (300-500 words)

The U.S. Army Tank Automotive Research Development and Engineering Center (TARDEC) has develop a new all season (arctic-to-desert), multipurpose, fuel efficient heavy-duty diesel engine oil called the Single Common Powertrain Lubricant (SCPL). The SCPL enables significant reductions in logistical burden and improved capability compared to existing qualified military engine oils.
Fuel is a major logistical burden for the military. According to a 2001 report published by the Defense Science Board, more than 70% of the total tonnage required to position ground forces into battle is fuel. It doesn't end there, fuel transportation burdens continue as forward operating bases need a constant supply of energy to sustain the fight. Supplying this energy is costly. Reducing energy demand at the source, without the need for expensive hardware changes and retrofits is a main goal of the SCPL. Conducting oil and filter changes are also a significant burden to the war fighter. SCPL will reduce this burden by enabling the current oil drain interval to be doubled.
With the cooperation of industry partners, lubricant candidates were developed, tested, and iteratively improved. The final SCPL candidates have achieved fuel consumption improvements of greater than 2%, as determined by vehicle and dynamometer testing. Engine oil drain intervals twice the current recommendations have been validated (i.e., 6000 miles or 1-year increased to 12,000 miles and 2-years) in engine and vehicle tests. Finally, the SCPL was tested in a variety of military engines ranging from 170 HP to 1050 HP at desert-like conditions and has been shown to maintain the wear and deposit protection of current military lubricants.
Adoption of the SCPL for military tactical and combat equipment will reduce the number of military qualified lubricant grades from 5 to 3, double the current oil drain intervals, and reduce vehicle fuel consumption by 2% or greater. A 2015 economic analysis found that implementing SCPL will result in an estimated annual savings for the Army of more than $8 million. This analysis didn't include logistical savings from eliminating the administrative, storage and handling costs associated with the removal of several oil grades made unnecessary by SCPL. The analysis also didn't account for the potential to reduce soldier risk or the reduction in fuel resupply and waste removal. Additional benefits of the SCPL include reduced risk of misapplications, easier equipment starting and less warm-up, improved hydraulic response over a larger range of ambient temperatures, and greater tolerance to extreme high oil temperature excursions.