

Preliminary Final Technical Progress Report for Project
Entitled “Fuel and Lube Additive Study”

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Conclusions

This study had the primary purpose of evaluating the performance of the ACES II fuel additive and the ACES III Lubricant additive. With regard to ACES II, the experimental observations support the following conclusions:

1. ACES II reduced NO_x emissions, particulate emissions and fuel consumption by 11%, 47% and 6%, respectively, on average over the fifty hour test.
2. At the treat rate recommended for the additive, ACES II does not alter the cetane number, viscosity, flash point or smoke point of the base diesel fuel, nor does it have a measurable impact on fuel injection timing. However, ACES II did retard the timing of the peak heat release rate and thereby lowered NO_x emissions.
3. ACES II appears to function as a friction reducer through formation of a residue on the cylinder liner, thereby decreasing friction horsepower losses, as claimed by American Clean Energy Systems.
4. ACES II led to the formation of a significant combustion chamber deposit after fifty hours of operation.
5. ACES III reduced wear in the four-ball wear test by 25%.