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# Getting It Right: Accurate Testing and Assessments Critical to Deploying the Next Generation of Auto Fuels

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The Energy Department's all-of-the-above approach to American energy is driven by cutting-edge research and innovation from our world-class national laboratories, leading universities, small business entrepreneurs and other industry partners. This is JUST as true for the Vehicles program that I manage within the Office of Energy Efficiency and Renewable Energy, as it is for the Office of Nuclear Energy, the Office of Science and all other offices here at the Department. Amongst all of these experts spanning many different fields, there is a consensus that accurate, thorough and tested assessments of technology are critical to understanding our progress and identifying the best opportunities for breakthroughs.

Today, a research organization for jointly-funded work by the auto and oil industries, called the Coordinating Research Council (CRC), released a report on the effects of E15 and E20, or gasoline mixed with up to 15 or 20 percent ethanol, respectively, on vehicle engines. The study claims mechanical damage and suggests degraded engine performance, emissions and durability on conventional vehicles from the use of E15 or E20 fuel. We believe the study is significantly flawed.

The CRC failed to establish a proper control group, a standard component of scientific, data-driven testing and a necessity to determine statistical significance for any results.

- Instead, only three out of the eight engines were tested with straight gasoline containing no ethanol (E0), and one of those three failed the CRC's test.
- **No engines were tested with E10 fuel, the *de facto* standard gasoline for all grades, which represents more than 90 percent of gasoline available in the U.S. market. Even though E10 fuel has been in the market for over 30 years and is used in all current conventional gasoline vehicles and small non-road engines, it was not part of the CRC test program.**
- The CRC also employed a test cycle designed specifically to stress the engine valve train. This test cycle was developed specifically for this study and thus there is no experience base for how to interpret results from the testing.
- The CRC used the arbitrary criterion of 10 percent engine leakdown (a diagnostic test in which an engine cylinder is pressurized with compressed air, and the rate at which the cylinder loses pressure is measured) to determine if an engine "failed." This is not a standard previously employed by either industry or federal agencies during testing, nor as a criterion for any warranty claims. Further, the Energy Department's own rigorous testing has shown that it is not reliable indicator of durability issues.
- Perhaps most surprisingly, the CRC decided to select several engines already known to have durability issues, including one that was subject to a recall involving valve problems when running on E0 gasoline and E10. It is no surprise that an engine having problems with traditional fuels might also "fail" with E15 or E20 ethanol-blended fuels -- especially using a failure criterion chosen to demonstrate sensitivity to ethanol and operated on a cycle designed to stress the valves.

Prior to the CRC's findings, the Energy Department conducted its own rigorous, thorough and peer-reviewed study of the impact of E15 fuel on current, conventional vehicle catalyst systems. The Energy Department study included an inspection of critical engine components, such as valves, and did not uncover unusual wear that would be expected to impact performance. Rather

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than using an aggressive test cycle intended to severely-stress valves, the Energy Department program was run using a cycle more closely resembling normal driving. The Energy Department testing program was run on standard gasoline, E10, E15, and E20. The Energy Department test program was comprised of 86 vehicles operated up to 120,000 miles each using an industry-standard EPA-defined test cycle (called the Standard Road Cycle). The resulting Energy Department data showed no statistically significant loss of vehicle performance (emissions, fuel economy, and maintenance issues) attributable to the use of E15 fuel compared to straight gasoline. The Energy Department test program also showed that 10% engine leakdown is not a reliable indicator of vehicle performance. In the Energy Department program, there were vehicles found to exceed 10% leakdown for all fuels, including vehicles running on E0 and E10. There was no correlation between fuel type and leakdown, and high leakdown measurements did not correlate to degradation in engine or emissions performance.

We believe the choice of test engines, test cycle, limited fuel selection, and failure criteria of the CRC program resulted in unreliable and incomplete data, which severely limits the utility of the study.

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