

Summary of Auto/Oil E10+ Test Program for Highway "Non-FFV" Vehicles

Item #	Title	Project #	Status
1	Vehicle Fuel System Durability	CRC AVFL-15	AVFL-15 pilot complete; 2nd phase underway (AVFL-15a)
<p>The auto and energy industries understand system components for E10 and also for E85, but it is unclear at what level of ethanol content above 10% that E10-rated parts fail. The objective of AVFL-15 is to determine the durability of wetted fuel components/systems. Fuel storage and handling is studied in component/systems durability testing. Resource constraints limit the scope of AVFL-15, preventing a definitive program, hence additional testing is required. AVFL-15 final report released Jan 2012; AVFL-15a was issued in January 2013.</p>			
2	Base Engine Durability	CRC CM-136-09	The phases of E20, E15, and E0 testing complete
<p>The industry knows what is required to upgrade engine components for E22, E85 and E100. Some automakers have done internal testing and have found sensitivity to intermediate ethanol blend levels for non-FFV vehicles. The testing for base engine durability (base refers to the actual machinery as opposed to the sensors, controls and the like) is embodied in CRC RFP No. CM-136-09. The Final Report was issued April 2012.</p>			
3	On-Board Diagnostics (OBD) Evaluation	CRC E-90	The pilot phase of E-90 is complete; E-90-2a completed; data being collected E-902b.
<p>The automakers have a good understanding of the theoretical effects of ethanol on OBD. The issue is how OBD systems actually work in a fleet of aged production vehicles. The initial phase of vehicle data collection has been completed and two final reports are posted on www.crcao.org. Additional data were collected in E-90-2b.</p>			
4	Tailpipe Emissions for SULEV Vehicles and at Cold Ambient Temperatures	CRC E-92	Planning for future work is ongoing pending available funding
<p>Starting with the 2010 model year automakers have to meet Non-Methane Hydrocarbon (NMHC) emissions at a 20F start temperature. Automakers have had to meet stringent SULEV emissions at a 50F start temperature for many years. The enrichment due to oxygen in ethanol and the low volatility of the ethanol portion of the fuel blend at low temperature gives concerns that existing and planned vehicles designed for federal and California emissions test fuels will not meet their required emissions standards when operated on mid-level ethanol blends. This program does not envision vehicle aging, however limited funding has delayed the start of this test program.</p>			
5	Catalyst Durability and Degradation	CRC E-87	The CRC pilot phase is complete; DOE testing focused mainly on new vehicles
<p>The issue of accelerated catalyst aging with intermediate ethanol blends was well-documented in the Orbital research study conducted in Australia. DOE found that 44% of vehicles they tested had the same control architecture as those that had problems with E20 in Australia and their data, when combined with CRC E-87-1 data indicate that 35-45% of the US fleet will have this sensitive control architecture. E-87-1 was funded by CRC and the report is on www.crcao.org. Durability testing to identify this phenomenon is the scope of follow-on testing completed through DOE funding. Final Report from DOE was issued in 2012.</p>			
6	Evaporative Emissions Durability	CRC E-91	This program is nearing completion in 2012
<p>As reported in previous intermediate ethanol blend research coordination meetings, CRC has conducted research projects under E-65 and E-77 on the effects of ethanol on evaporative emissions. However, these tests have all looked at the effects of short exposures. System durability testing for a sample of in-use vehicles is nearing completion with a final report issued September 2012.</p>			
7	Emissions Inventory and Air Quality Modeling	A-67 / A-73-2	A-67 pilot development is completed; A-73 dependent on new data for completion
<p>The CRC Atmospheric Impacts Committee is leading this effort in coordination with other stakeholders. A-67 (Estimating Ozone from Fuel Reformulation) and A-73 (Emissions Modeling and Air Quality Modeling) are the two CRC programs that will address this subject. These efforts rely on obtaining emissions data from the other CRC, EPA, and DOE programs.</p>			
8	Exhaust Emissions of Vehicles Operating On Mid-Level Ethanol Blends	E-89, A-73-1,	Portions of this work will use data collected in EPA/DOE's Fuel Effects Emissions Study
<p>A collection of aged vehicle data was acquired. These data were used to assess direct emissions impacts from intermediate ethanol blends and for conducting air quality modeling evaluations. Report issued May 2013.</p>			