

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

Item #	Title	Project #	Status
1	<b>Fuel Storage and Handling</b>	<b>CRC AVFL-15</b>	<b>AVFL-15 preliminary work is underway; more funding needed</b>
<p>The 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 limited the scope of AVFL-15, preventing a definitive program, hence additional testing is required.</p>			
2	<b>Base Engine Durability</b>	<b>CRC CM-136-09</b>	<b>The initial phase of this program is underway</b>
<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. Phase 1 of this program began in the fall of 2009.</p>			
3	<b>On-Board Diagnostics (OBD) Evaluation</b>	<b>CRC E-90</b>	<b>The pilot phase of E-90 is nearing completion; more data needed</b>
<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 testing has been completed—report due out soon.</p>			
4	<b>Tailpipe Emissions for SULEV Vehicles and at Cold Ambient Temperatures</b>	<b>CRC E-92</b>	<b>Planning for future work is ongoing pending available funding</b>
<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. Since this program does not envision aging the vehicles it should not be unusually expensive.</p>			
5	<b>Catalyst Durability and Degradation</b>	<b>CRC E-87</b>	<b>The course and fate of this program is currently unclear</b>
<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. Durability testing to identify this phenomenon was planned for CRC program E-87-2. E-87-1 was funded by CRC and the report is on <a href="http://www.crao.org">www.crao.org</a>. E-87-2 is funded by DOE with minor funding from CRC.</p>			
6	<b>Evaporative Emissions Durability</b>	<b>CRC E-91</b>	<b>This program is underway</b>
<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. This project is defined in CRC RFP No. E-91. The contract has been awarded and test vehicles have been acquired for initial work under the 2010-2011 program.</p>			
7	<b>Emissions Inventory and Air Quality Modeling</b>	<b>A-67 / A-73</b>	<b>A-67 results to be released in early 2010 and A-73 is planned for a completion late in 2010</b>
<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 will rely on obtaining emissions data from the other CRC programs above.</p>			
8	<b>Exhaust Emissions on Vehicles Aged On Mid-Level Ethanol Blends</b>	<b>CRC New Project</b>	<b>Portions of this work will be addressed under A-73</b>
<p>A good collection of aged vehicle data will be acquired as part the overall program effort. These data will be used to assess direct emissions impacts from intermediate ethanol blends and for conducting air quality modeling evaluations.</p>			