



# Air Resources Board



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**Edmund G. Brown Jr.**  
Governor

November 9, 2015

Mail-Out # ML 15-01

TO: ALL MANUFACTURERS OF  
- SMALL OFF-ROAD ENGINES  
- SMALL OFF-ROAD EQUIPMENT  
- FUEL TANKS FOR USE ON SMALL OFF-ROAD ENGINES OR  
EQUIPMENT  
ALL INTERESTED PARTIES

SUBJECT: SMALL OFF-ROAD ENGINE EVAPORATIVE CERTIFICATION  
CHANGES AND FUEL HOSE REQUIREMENTS

This notice is to inform manufacturers of small off-road engines (SORE), small off-road equipment, and fuel tanks for use on small off-road engines or equipment (collectively, SORE manufacturers) of changes that the Air Resources Board (ARB) is making to the certification process for SORE equipment and fuel tanks. Clarification is also provided in this notice of the requirements for fuel hoses installed on SORE. The document "SORE Evaporative Certification FAQs" has been updated to provide clarification on the topics discussed in this notice and to provide other minor clarifications. It is available at <http://www.arb.ca.gov/msprog/offroad/sore/sorectp/sorectp.htm>.

## **Certification of Metal and Coextruded Multilayer Fuel Tanks**

California Code of Regulations, title 13, section 2766(a) provides an exemption from the requirements of section 2755 for metal tanks, coextruded multilayer tanks, and structurally integrated nylon tanks on SORE equipment with engine displacement less than 80 cc. Section 2755 contains the permeation emissions performance standard for equipment that use engines with displacement less than or equal to 80 cc. This exemption does not apply to any fuel tank for use on SORE equipment with engine displacement greater than 80 cc.

When applying for an Executive Order of Certification to sell SORE in California under Cal. Code Regs., title 13, section 2754(b) (i.e., design-based certification for SORE equipment with engine displacement greater than 80 cc), fuel tank permeation data, fuel hose permeation data, and carbon canister butane working capacity data or equivalent for an engine or equipment that exhibits the highest evaporative emission characteristics for an evaporative family must be submitted as part of the certification

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application. Alternatively, manufacturers may submit the evaporative component Executive Order numbers approving the fuel tank, fuel hose, and carbon canister, respectively. For applications which indicate the use of a metal or coextruded multilayer fuel tank on SORE equipment with engine displacement greater than 80 cc, no permeation emissions data or Executive Order number has been required because it has been assumed that fuel tanks of these types have low permeation emissions. Results from ARB's Model Year 2013 SORE Evaporative Emissions Validation Study (Validation Study) have challenged that assumption.

The Validation Study is required by California Code of Regulations, title 13, section 2754.2 in order to provide ARB's Executive Officer with data to determine whether the performance-based and design-based certification options for SORE are achieving ARB's overall emission reduction goals. For model year 2013, 14 design-based and 3 performance-based units of equipment were tested as part of the Validation Study. Each unit underwent three diurnal emissions tests. Seven of the 14 design-based units met the applicable diurnal emissions standard in all three diurnal emissions tests. Seven of the 14 design-based units and all three performance-based units failed to meet the applicable diurnal emissions standard in at least one of the three diurnal emissions tests. Six of the seven failing design-based units used metal fuel tanks.

In light of the results of the Validation Study, ARB will require fuel tank permeation data or an evaporative component Executive Order number to be submitted as part of a certification application for all SORE equipment using engines with displacement greater than 80 cc beginning with the 2017 model year. This will allow SORE manufacturers time to certify fuel tanks and reference Executive Order numbers of certified fuel tanks in their certification applications. The evaporative certification application applicable to SORE equipment using engines with displacement greater than 80 cc for 2017 and later model years has been updated to reflect the above fuel tank requirement. The test procedure used to determine fuel tank permeation emissions is TP-901, adopted July 26, 2004. The test procedure and updated certification application are available on ARB's website at <http://www.arb.ca.gov/msprog/OFFROAD/sore/sorectp/sorectp.htm>. Fuel tank testing can begin immediately.

### **Evaporative Emissions Certification Fuel and Alternative Test Procedures**

TP-901 and TP-902 (used to determine diurnal emissions from SORE) require the use of Phase II California Reformulated Certification (CERT) fuel as specified in part II, section 100.3.1 of *California Exhaust Emission Standards and Test Procedures For 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles*, as amended May 28, 2004, or Indolene as specified in 40 CFR Part

1065.710(c). Section 15 of TP-901 and section 8 of TP-902 provide for an Alternative Test Procedure (ATP) to be used with approval from ARB's Executive Officer. In the past, ATPs have been approved that include the use of CE10 fuel.

Although CE10 is considered to be a fuel that produces high permeation emissions, its composition is not representative of gasoline. The Reid vapor pressure of CE10 fuel is approximately 3 pounds per square inch (psi), versus approximately 7 psi for CERT fuel and 9 psi for Indolene. Because the emissions resulting from defects in materials or construction of a fuel tank may be lower with a low vapor pressure fuel such as CE10 than they would be with CERT fuel or Indolene, and as a result of the failure of 10 of 17 equipment units in the Validation Study, ARB will discontinue allowing the use of CE10 fuel for new fuel tank permeation emissions testing. Similarly, ARB will discontinue allowing the use of CE10 for diurnal emissions testing on complete engine or equipment units.

The certification status of fuel tanks, engines, and equipment which have already been certified using CE10 fuel for testing will not be affected by this action. In addition, any testing using an approved ATP to TP-901 or TP-902 by the party to which approval was granted that used CE10 and that commenced prior to the issuance of this Mail-Out may be completed with CE10 fuel. Any application for fuel tank certification that uses CE10 fuel for testing and does not reference an approved ATP to TP-901 or TP-902 issued to the applicant or commenced testing after the issuance of this Mail-Out will be rejected. Manufacturers may request approval of ATPs to TP-901 and/or TP-902 that include the option to use California Certification Gasoline Fuel for LEV III Light-Duty Vehicles and Medium-Duty Vehicles as specified in part II., section A.100.3.1.2. of the *California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles* and/or EPA E10 test fuel as specified in 40 CFR Part 1065.710(b) for testing.

### **Fuel Hose Requirements**

ARB staff have received requests to clarify which fuel hoses used on SORE must be certified. Cal. Code Regs., title 13, section 2754 requires fuel hoses to meet a permeation emissions standard of 15 g ROG/m<sup>2</sup>·day. Fuel vapor hoses are not specifically required to meet the permeation emissions standard, although they are covered by the evaporative emissions warranty. Uncontrolled fuel vapor hoses can be a significant source of ROG emissions. ARB recommends using fuel vapor hoses that meet the permeation emissions standard to minimize emissions and ensure compliance with performance standards.

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If you have questions about fuel tank certification, please contact Michele Dunlop at (916) 323-8971 or via email at [Michele.Dunlop@arb.ca.gov](mailto:Michele.Dunlop@arb.ca.gov). If you have general questions about this notice, please contact Angus MacPherson at (916) 445-4686 or via email at [Angus.MacPherson@arb.ca.gov](mailto:Angus.MacPherson@arb.ca.gov) or Christopher Dilbeck at (916) 319-0106 or via email at [Christopher.Dilbeck@arb.ca.gov](mailto:Christopher.Dilbeck@arb.ca.gov).

Sincerely,

/s/

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