



Alan C. Lloyd, Ph.D.  
Agency Secretary

# Air Resources Board

1001 I Street • P.O. Box 2815  
Sacramento, California 95812 • [www.arb.ca.gov](http://www.arb.ca.gov)



Arnold Schwarzenegger  
Governor

October 17, 2005

## MANUFACTURERS ADVISORY CORRESPONDENCE (MAC) 2005-05

TO: ALL MANUFACTURERS OF SMALL OFF-ROAD ENGINES  
ALL MANUFACTURERS OF SMALL OFF-ROAD EQUIPMENT  
ALL MANUFACTURERS OF PASSENGER CARS AND LIGHT-DUTY TRUCKS  
ALL MANUFACTURERS OF MEDIUM- AND HEAVY-DUTY VEHICLES  
ALL MANUFACTURERS OF RECREATIONAL VEHICLES  
ALL MANUFACTURERS OF AFTERMARKET PARTS  
ALL OTHER INTERESTED PARTIES

RE: EVAPORATIVE EMISSION REQUIREMENTS FOR VEHICLES WITH  
ON-BOARD GENERATORS

The Air Resources Board (ARB) is issuing this Manufacturers Advisory Correspondence (MAC) to provide guidance to vehicle and generator manufacturers regarding the evaporative emission requirements applicable to on-road vehicles and 2006 and subsequent model-year (MY) small off-road engines (SOREs) when on-board generators are installed in the vehicles that are certified for sale in California. The ARB is issuing this guidance based upon requests and discussions with representatives from the Recreational Vehicle Industry Association, and SORE and aftermarket parts manufacturers.

### **DISCUSSION:**

Motor vehicles fueled with gasoline, liquefied petroleum gas, or alcohol fuels are subject to the evaporative emission standards set forth at title 13, California Code of Regulations, (13 CCR) section 1976. Generators with spark-ignited engines rated at 19 kilowatt (kW) or less must comply with the SORE requirements for exhaust emissions in 13 CCR sections 2400 et seq. The new evaporative emission requirements for these engines are contained in 13 CCR sections 2750 et seq.

The requirements for the control of evaporative emissions from stand-alone generators include meeting diurnal emissions standards, and/or design criteria for the canister, fuel hoses, and fuel tank. However, generators that are fueled directly from the vehicle's fuel tank are exempted by 13 CCR section 2766(c) from the diurnal performance requirements in 13 CCR section 2754 and the fuel tank permeation and carbon canister design requirements in 13 CCR section 2754(b). Such generators must use fuel hoses

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meeting the design requirements specified in 13 CCR section 2754(b). The ARB established the requirement in recognition that the vehicle's evaporative emission control system must incorporate more robust material specifications, and calibration and design criteria to meet vehicular emission standards that are more stringent than the requirements for stand-alone generators.

Notwithstanding, modification of the vehicle's fueling and evaporative system to accommodate fueling of the generator creates potential compliance issues with respect to the vehicle's evaporative certification. Generally, ARB would require a vehicle manufacturer to recertify a new vehicle if the vehicle's emission control system is modified from its originally certified configuration prior to being sold. This MAC establishes an exception with respect to the installation of on-board generators wherein ARB will not require evaporative emission recertification for medium-duty vehicles and heavy-duty vehicles with a GVWR above 8500 pounds.

As long as the integrity of the vehicle's evaporative emission control system can be ensured during the installation, these heavier vehicles and their on-board generators should continue to meet their respective emission requirements described in the Policy section, below. The ARB believes that evaporative system integrity is sufficiently maintained when (i) the vehicle's fuel tank does not require modifications to allow for connection of the generator's fuel hoses, and (ii) the generator's hoses and hose connectors conform to specifications comparable or better than those used by the manufacturer of the vehicle's certified evaporative emission control system, in lieu of the design requirements specified in 13 CCR section 2754(b).

Please be advised that the determination of a vehicle's evaporative compliance discussed in the Policy section below does not apply to passenger cars or light-duty trucks under 8500 pounds in gross vehicle weight rating (GVWR). Such vehicles must meet the evaporative and exhaust emission standards when tested according to the Federal Test Procedure (FTP) and Supplemental FTP (SFTP), which includes the SC03 test for vehicular emissions while the vehicle's air conditioning system is in operation. When the air conditioning system of these vehicles draws any electrical energy generated by the on-board generator, whether directly from the generator or via a battery that is recharged by the generator, the ARB will require both the vehicle and its on-board generator to be tested together to demonstrate compliance with the vehicle's exhaust and evaporative emission standards. Compliance will be based on the combined emissions from the vehicle and generator.

**POLICY:**

1. These policies are applicable to on-road motor vehicles with a GVWR in excess of 8500 pounds, and to on-board generators powered by MY2006 and subsequent spark-ignited engines rated at 19 kW or less.
2. An on-board generator fueled from its own fuel tank must be certified to the SORE evaporative emission requirements set forth in 13 CCR section 2750 et seq.
3. If an on-board generator is fueled directly from the vehicle's fuel tank, ARB will consider the vehicle and the generator to be in compliance with their respective evaporative emission requirements with no further certification, provided:
  - (i) The vehicle's certified evaporative system includes a fuel tank that has ports, taps, or other means sufficient for connecting to the generator's fuel hoses without the need for fuel tank modifications, and
  - (ii) The generator's fuel hoses and clamps for securing the hose connections conform to specifications comparable to those used by the manufacturer of the vehicle's certified evaporative emission control system.
4. Recertification of the vehicle's evaporative emission control system under ARB's new vehicle certification program will be required when the vehicle's fuel tank must be modified to enable fueling of the generator from the vehicle's fuel tank (e.g., by modifying the fuel tank or fill pipe to install fuel ports, or replacing the original tank with a new vehicle fuel tank or fill pipe equipped with such ports).
5. Recertification of the vehicle's evaporative emission control system under ARB's new vehicle certification program will also be required when the generator's fuel hoses or the clamps for securing the hose connections do not conform to specifications comparable to those used by the manufacturer of the vehicle's certified evaporative emission control system. Because such fuel hoses and clamps were not included in the original certification of the vehicle's evaporative emission control system, their emissions performance is not represented by the original certification data. In addition to the recertification of the vehicle's evaporative emission control system, the generator's hoses must separately meet the design requirements specified in 13 CCR section 2754(b).

6. Modifications necessary for fueling the generator from the vehicle's fuel tank performed on a used vehicle (e.g., by modifying the existing fuel tank or fill pipe to install fuel ports, or replacing it with a new vehicle fuel tank or fill pipe equipped with such ports) must be exempted by ARB pursuant to Vehicle Code (VC) section 27156.

Thank you for your attention to this matter. Questions concerning the SORE evaporative requirements for on-board generators should be directed to Mr. Jim Watson, Manager, Engineering Development and Testing Section, at (916) 327-1282 or at [jwatson@arb.ca.gov](mailto:jwatson@arb.ca.gov), or Mr. Kumar Muthukumar, Manager, Off-Road Certification/Audit Section, at (626) 575-7040 or at [cmuthuku@arb.ca.gov](mailto:cmuthuku@arb.ca.gov). For questions concerning the certification of vehicular evaporative systems, please contact Mr. Duc Nguyen, Manager, On-Road Certification/Audit Section, at (626) 575-6844 or at [dnguyen@arb.ca.gov](mailto:dnguyen@arb.ca.gov). For questions related to VC section 27156 exemptions, please contact Ms. Rose Castro, Manager, Aftermarket Parts Section, at (626) 575-6848 or at [rcastro@arb.ca.gov](mailto:rcastro@arb.ca.gov). The ARB looks forward to your continued cooperation toward meeting the SORE and vehicular evaporative emission standards.

Sincerely,

/s/

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William V. Loscutoff, Chief  
Monitoring and Laboratory Division

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Allen Lyons, Chief  
Mobile Source Operations Division