



# Air Resources Board



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Governor

June 17, 2010

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To: ALL ON-ROAD HEAVY-DUTY DIESEL ENGINE AND VEHICLE MANUFACTURERS  
ALL OTHER INTERESTED PARTIES

SUBJECT: Public Workshop to Discuss Attributes of 2011 and Later Model Year Heavy-Duty Diesel Engines, 2012 and Later Model Year Light Heavy-Duty Diesel Engines and Other Vehicles/Engines Using Selective Catalytic Reduction (SCR) Emission Control Technology

SCR is currently the primary oxides of nitrogen (NOx) control strategy for most heavy-duty on-road diesel engines. Because SCR systems involve operator intervention, SCR systems should be designed to assure NOx emissions compliance and continued safe vehicle operation. The California Air Resources Board (ARB) is holding a public workshop to discuss the SCR system attributes that will be evaluated during staff's review of an application for certification. The workshop may consist of two sessions, the first session will focus on on-road heavy duty diesel engines, but all interested parties may attend. The second session, if requested, will allow interested parties to provide views on applicability to off-road diesel engines. The United States Environmental Protection Agency (U.S. EPA) intends to participate in the workshop. Engine manufacturers and other interested parties are encouraged to provide input. The workshop will be held at the following time and location:

Date: Tuesday, July 20, 2010  
Time: 10:00 a.m. – 4:00 p.m. (PST)  
Location: California Air Resources Board  
Annex 4 Auditorium  
9528 Telstar Avenue  
El Monte, CA 91731

ARB has approved 2010 and 2011 model year heavy-duty diesel engines with SCR that are designed with certain strategies affecting operation and detection of malfunctions. Most manufacturers have developed warning signals for the operator to become aware of low diesel exhaust fluid (DEF) volume and malfunctions (the term DEF will be used to represent any reductant used in combination with SCR, not just urea). However, for future vehicles seeking certification, ARB expects manufacturers to do a better job of assuring that vehicles are not allowed to operate out of compliance for significant

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California Environmental Protection Agency

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periods of time due to operators' actions or inactions or equipment deficiencies or failures.

ARB intends to discuss approaches to assuring NOx emission compliance which differ from the policies outlined in the February 2009 and December 2009 U.S. EPA SCR guidance documents. Below are attributes staff expects model year 2011 and later model year diesel engines certified after the workshop that are equipped with SCR systems to use in order to better ensure compliance with NOx emission standards when the SCR system is not functioning as designed due to operator intervention or equipment deficiency or failure. Other examples will be discussed at the workshop, as will the potential impact on the safety of operators and the driving public.

- a. When a low level of DEF remains, for example sufficient to drive about 100 miles under typical driving conditions, warning signals begin and become increasingly urgent thereafter.
- b. After the DEF tank level triggered in paragraph a. and before an empty DEF tank, a noticeable derate begins and is sustained until paragraph c.
- c. When the DEF tank is empty, a more significant derate occurs. Operation at this second derate occurs no longer than necessary to safely reach a location where the engine can be safely shut down, for example, no more that one hour. At the end of this period, the vehicle speed is limited to 5 mph maximum.
- d. Upon a disconnected SCR monitor, sensor, or component, warning signals begin and become increasingly urgent thereafter and the engine will be noticeably derated.
- e. After an hour of operation pursuant to paragraph d., a second significant derate will occur. The engine will operate at this derated level for no longer than necessary to confirm disconnection, for example, no more than four hours. At the end of this period the vehicle speed is limited to 5 mph maximum. Normal operation cannot be resumed until the disconnection is cleared.
- f. If repeated disconnects and reattachments of a SCR monitor, sensor, or component are detected, the attributes in paragraph c. apply. Normal operation cannot be resumed until the disconnections are cleared.
- g. Proper DEF dosing should occur within 40 minutes of a freezing event.

Additional SCR-related attributes, for example DEF tank size, detection of poor DEF quality, toxics, and self-healing procedures due to tampering events will also be discussed. Although the SCR workshop will be primarily focused on heavy-duty on-road diesel engines, the attributes reviewed may apply to other categories using SCR emission control technology. The second session, if requested, is set up for these discussions. Therefore, ARB encourages all diesel manufacturers using or intending to use SCR emission control technology to attend the workshop.

Prior to the workshop, a more detailed workshop agenda and any handouts will be available on the ARB website at <http://www.arb.ca.gov/msprog/onroad/onroadhd.htm>.

If you have a disability-related accommodation need, please go to <http://www.arb.ca.gov/html/ada/ada.htm> for assistance or contact the ADA (Americans with Disabilities Act) Coordinator at (916) 323-4916. If you need assistance in a language other than English, please contact the Bilingual Coordinator at (916) 322-0473.

Your participation in the workshop is welcome. If you cannot attend, but would like to provide comments, or if you have any questions regarding the workshop, please contact Ms. Kimberly Pryor, Manager, Compression-Ignition and Heavy-Duty Certification Section, at (626) 575-6640 or by email at [kpryor@arb.ca.gov](mailto:kpryor@arb.ca.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Annette Hebert". The signature is fluid and cursive, written in a professional style.

Annette Hebert, Chief  
Mobile Source Operations Division