



Air Resources Board



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TO: All Interested Parties

SUBJECT: PRE-INSTALLATION COMPATIBILITY ASSESSMENT REQUIREMENTS

On January 28, 2010, the Air Resources Board (ARB) approved amendments to the *Verification Procedure, Warranty, and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines* (the Procedure) in Title 13, California Code of Regulations, Sections 2700 through 2711 which include requirements that the diesel emission control strategy (DECS) manufacturers, distributors, or installers be able to demonstrate that the DECS is compatible with the engine on which it is installed. Prior to these amendments, DECS manufacturers, distributors, or installers were responsible for ensuring that only engines and applications that met all the terms and conditions of the applicable Executive Order (EO) would be fitted with DECS and that the assessment was compliant with the DECS manufacturer's assessment policy.

The purpose of this mail-out is to alert verified DECS owners, manufacturers, distributors, and installers to the pre-installation compatibility assessment requirements, effective February 17, 2011. This mail-out only provides a summary of the assessment requirements. The Procedure must be reviewed for all of the specific requirements that must be met regarding verified DECS. All of the approved amendments including the pre-installation compatibility assessment requirements can be found at <http://www.arb.ca.gov/regact/2010/verdev2010/verdev2010.htm>. In addition, the installer and/or distributor must also be sure to follow any additional requirements specified by the DECS manufacturer.

Pre-Installation Compatibility Assessment Requirements

▪ Basic Assessment of Engine Maintenance

The DECS manufacturer should provide detailed instructions including a copy of the governing EO to the installer to ensure that a particular DECS is suitable for a given engine. These instructions must include a basic assessment of each candidate engine's state of maintenance before determining that it is appropriate for use with the DECS along with any other requirements specified by the DECS manufacturer.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

For the basic assessment, the installer must at a minimum do the following:

- If available, review oil consumption and engine maintenance records,
- Visually inspect a fuel sample from the fuel tank for contamination (i.e., engine oil),
- Inspect the engine for signs of poor maintenance including oil leaks,
- Inspect the tailpipe for signs of oil contamination, and
- Inspect the exhaust plume for signs of high PM emissions and oil burning

▪ **Exhaust Gas Temperature Sampling**

If the EO for a DECS specifies exhaust gas temperature requirements, then the following pre-installation compatibility assessment requirements must be completed prior to installation:

The exhaust gas temperatures must be measured and recorded from each candidate engine to determine if it meets the exhaust temperature requirements. As an alternative, representative sampling can be conducted for a group of engines that are similar. However, data from engines outside the group cannot be used to support retrofit of engines within the group. Representative sampling can occur under the following conditions:

- The DECS is verified for only reducing diesel particulate matter (PM).
- At least five representative engines or 10 percent of each group of similar engines, whichever is larger, must be data logged. All engines in a group comprised of 5 or fewer engines must be data logged. Specific conditions that determine which engines belong in a group follows and are defined in Section 2706(t)(1)(B) of the Procedure.
- In cases where representative sampling is selected, the party conducting the pre-installation compatibility assessment is still responsible for ensuring that all installations comply with the terms and conditions of the EO and any other requirements specified by DECS manufacturer for that particular DECS.

▪ **Data Logging Procedures**

Data must be logged according to the following procedures:

- The measured and recorded data must be representative of the actual duty cycle and operation of the candidate engine as best it can be anticipated at the time.
- The exhaust gas temperature must be measured at a point in the exhaust gas system that is within six inches of the proposed location of the inlet of the DECS.
- The data must be measured and recorded for a period long enough to determine the candidate engine's duty cycle but not less than 24 hours of representative, actual engine run time.
 - The data logging strategy must include a means to determine when the engine is actually running. This may include use of a data logging system that starts and stops automatically when the engine starts and stops, or a means to identify and remove data that correspond to the engine being off such as by simultaneously logging data from an engine revolutions per minute sensor or applying a temperature threshold that corresponds to a temperature just below the idle temperature of the engine.
 - The automatic exclusion of data logged during engine shutdown does not have to be integrated in the data logging system but before the data is assessed to determine compatibility, the data logged during engine shutdown must be excluded.
- At least 5 representative engines or 10 percent of each group of similar engines, whichever is larger, must be data logged. All engines in a group of 5 or fewer must be datalogged. Data from engines outside the group cannot be used to support retrofit of engines within the group. A group of engines is similar if:
 - All engines belong to the same common ownership fleet.
 - All engines have the same make and model.
 - All engines are certified to the same PM emissions standard.
 - The maximum power ratings of all engines fall within a range of 100 horsepower.

- None of the engines have exhaust gas recirculation, or all of the engine have external exhaust gas recirculation, or all of the engines have internal exhaust gas recirculation.
- All engines are installed in similar vehicles or equipment that perform a like function and have similar duty cycles.
- The installer must keep a record of the data for the duration of the warranty period of the DECS and make the data available to the DECS manufacturer and ARB upon request. The specific information that must be kept is specified in Section 2706(t)(3) of the Procedure.
- Data logging completed prior to February 17, 2011 may be used provided it complies with the requirements of the DECS manufacturer.

▪ **Data Logging System Requirements**

The exhaust temperatures must be measured and recorded using a stand-alone data logging system that is independent of the DECS that meets the following requirements:

- The recording accuracy must be within four degrees Celsius. The temperature sensor must have a range sufficient to accommodate the highest exhaust gas temperature measured plus 10 percent without exceeding the sensor's full scale rating while ensuring that 90 percent of the measured data are within 10 to 90 percent of the sensor's full scale rating.
- The memory of the data logging system must be of sufficient size that data are not overwritten prior to retrieval.
- All data must be recorded at a frequency of at least once every 5 seconds (0.2 Hertz).
- The data logging system must record the time and date for each data point.
- Data logging performed prior to February 17, 2011 must comply with the requirements of the DECS manufacturer.

▪ **Written Statement of Compatibility**

If the candidate engine is found to be compatible with the DECS, the party conducting the pre-installation compatibility assessment must provide the end user with a written statement stating its compatibility based upon the EO and the DECS manufacturers pre-installation instructions no later than the date of installation. Other information that must also be included in the written statement can be found in Section 2706(t)(1)(C) of the Procedure.

If you have any questions regarding the pre-installation compatibility assessment requirements, please contact Ms. Shawn Daley, Manager, at (626) 575-6972, or by email at sdaley@arb.ca.gov.

Sincerely,

/s/

Robert H. Cross, Chief
Mobile Source Control Division

cc: Ms. Shawn Daley, Manager
Heavy-Duty In-Use Strategies Branch