



# Air Resources Board



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**Edmund G. Brown Jr.**  
Governor

July 11, 2014

Mail-Out #MSC 14-09

TO: All Interested Parties

SUBJECT: APPROVED REVISIONS TO THE CARL MOYER PROGRAM  
GUIDELINES

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This mail-out describes the most recent approved revisions to the Carl Moyer Memorial Air Quality Standards Attainment (Carl Moyer) Program Guidelines herein referred to as the Guidelines. Detailed descriptions of these changes were released for public comment on April 28, 2014, under Mailout #MSC 14-06.

In addition, staff has made some minor revisions to the originally proposed changes described in Mailout #MSC 14-06. These revisions were made in consideration of comments received during the public comment period and are described in the table below and revised Guideline language attached. All approved revisions are incorporated into the current Guidelines and can be found at:  
<http://www.arb.ca.gov/msprog/moyer/guidelines/current.htm>.

**Background:** Since 1998, the Carl Moyer Program has filled a critical niche in California's strategy to achieve clean air. The Carl Moyer Program provides grant funding for the incremental cost of cleaner-than-required engines, equipment, and emission reduction technologies. The Carl Moyer Program complements California's regulatory program by funding emission reductions that are surplus, i.e., early and/or in excess of what is required by regulation.

State law (Health & Safety Code Section 44287) authorizes the Air Resources Board (ARB) to revise the Guidelines when necessary to improve the ability of the program to achieve its goals. This section also instructs ARB to work with the implementing air districts and hold at least one public meeting to consider public comments. The public meeting regarding the Guideline revisions proposed under Mailout #MSC 14-06 was held on May 2, 2014. The 45-day review period ended on June 12, 2014. This executed mailout serves as notice that the revisions are now effective.

*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

**Revisions to the Guideline modifications originally proposed under  
Mailout #MSC 14-06.**

***Carl Moyer Program Guidelines***

<u>Revision 1.</u> This additional language clarifies that investment options are left solely to the discretion of the district.	Chapter 2, Section OO. and Section PP.  Chapter 3, Section K.5.
<u>Revision 2.</u> Modified language clarifies that the replacement vehicle should be equipped with an engine certified to the appropriate intended service class within a 10 percent allowance for both medium heavy-duty and heavy heavy-duty engines.	Chapter 6, Section C.1.(D)
<u>Revision 3.</u> Additional language includes a reference for Table D-13 which was missing.	Chapter 9, Section C.3.(K)
<u>Revision 4.</u> Modified language provides an improved clarification on funding requirements for repower projects.	Chapter 10, Section C.2.(B) Chapter 10, Section C.2.(C)
<u>Revision 5.</u> Modified language provides a correction to the table for funding amounts for specific horsepower classes in which the original change was an error.	Appendix O, Replacement Funding Matrix – Construction Tractor/Loader /Backhoe Table and VIP Replacement Funding Matrix – Agricultural Tractor Table Amend Table
<u>Revision 6.</u> Modified language provides a correction for Tables D-1 through D4, revising the title names of the tables.	Appendix D, Tables for Emission Reduction and Cost- Effectiveness Calculations

If you have any questions regarding these changes please contact Yvonne Sanchez, Air Resources Engineer, at (626) 575-6618 or via email at [ysanchez@arb.ca.gov](mailto:ysanchez@arb.ca.gov).

Sincerely,



Erik White, Chief  
Mobile Source Control Division

Attachment

cc: See next page.

All Interested Parties  
July 11, 2014  
Page 3

cc: Yvonne Sanchez  
Air Resources Engineer  
Mobile Source Control Division

All Interested Parties  
July 11, 2014  
Page 4

bcc: Scott Rowland, MSCD  
David Salardino, MSCD  
Tess Sicat, MSCD  
Doug Thompson, MSCD

ITAB Files, MSCD (ITAB#630-219)

## ATTACHMENT

### Revisions to the Originally Proposed Carl Moyer Guidelines (Guidelines) Included in Mailout #MSC 14-06 Released for Public Comment Period April 29, 2014 to June 12, 2014

Originally proposed modifications to the Guidelines language are indicated by underlined text. Originally proposed deletions to the language are indicated by ~~strikeout~~ text. Changes to the original modifications are indicated by double underlined text and deletions indicated by ~~double strikeout~~ text. The "\*\*\*\*\*" indicates the subsequent language in the section does not change. Revision numbers are provided in the left column for simple reference.

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Revision 1. Chapter 2, General Criteria, Section OO. and Section PP

- OO. Any funds earned or collected by the air district through Carl Moyer Program resources must be reported and either returned to ARB or spent on the air district's Carl Moyer program. The Carl Moyer Program does not require Districts to earn funds through its program actions. Districts are not expected to base business decisions on their ability to generate returns or collect funds through program activity.
- PP. Any Carl Moyer grant funds lost due to air district investment choice will be replaced by the air district. Air Districts are free to designate the type of storage account based on the needs of their business.

Chapter 3, Program Administration, Section K.5., Earned Interest

5. Reporting Requirements: Each air district must report on interest and other funds generated through the Carl Moyer program in Yearly Reports to ARB using the format provided by ARB.
- (A) Air districts must report on projects funded with earned interest or other funds earned through the Carl Moyer program the same way air districts report on Carl Moyer Program-funded projects (i.e., by entering projects in the CARL and in their Yearly Reports). The Carl Moyer Program does not specify that Air Districts perform any program actions in such a way that they generate proceeds or returns on Carl Moyer Program business.

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Revision 2. Chapter 6, Emergency Vehicles (Fire Apparatus), Section C.1.(D)

- (D) ~~MHD Intended Service Class Flexibility: Engines certified to the MHD service class (i.e., GVWR between 14,000 and 33,000 pounds) must be installed in a MHD vehicle as shown on the engine certification EO. However, MHD engines may be installed in a vehicle with a GVWR up to 36,300 pounds (20 percent higher than 33,000 GVWR) with written warranty verification by the engine and chassis manufacturer. A copy of the written warranty verification must be maintained in the air district project file.~~

~~Engine Class: The engine's intended service class and the vehicle's weight class must match (i.e., a medium heavy-duty diesel engine is used in a vehicle with a GVWR of 19,501–33,000 pounds and a heavy heavy-duty diesel engine is used in a vehicle with a GVWR greater than 33,000 pounds). As an exception, a heavy heavy-duty engine may be installed in a medium heavy-duty vehicle if necessary for vocational purposes but only if the gross vehicle weight rating is within ten (10) percent of the engine's intended service class (i.e., GVWR of 29,701 lbs or greater).~~

~~Intended Service Class Flexibility: Engines certified to the MHD service class (i.e., GVWR between 14,000 and 33,000 pounds) must be installed in a MHD vehicle as shown on the engine certification EO. However, MHD engines may be installed in a vehicle with a GVWR up to 36,300 pounds (10 percent higher than 33,000 GVWR) with written warranty verification by the engine and chassis manufacturer. A copy of the written warranty verification must be maintained in the air district project file.~~

~~Engines certified to the HHD service class (i.e., GVWR greater than 33,000 pounds) may be installed in a vehicle no less than GVWR 29,701 pounds (10 percent lower than 33,001 GVWR).~~

Revision 3. Chapter 9, Off-Road Equipment Replacement, Section C.3.(K)

- (K) ~~Project load factors for calculating emission reductions and cost-effectiveness are listed in Appendix D, Table D-10 and Table D-13. Load factors shall be selected by first choosing the equipment category (i.e. Airport GSE, Mobile Agriculture, Construction, etc.), then by selecting the equipment type within the category. This is consistent with how the equipment category and load factor inputs are selected in CARL.~~

Revision 4. Chapter 10, Portable and Stationary Agricultural Sources, Section C.2.(B) and Section C.2.(C)

- (B) ~~New~~ Engine/motor repower projects in which the horsepower of the new engine/motor is an increase to 150 percent or larger from the baseline (existing) engine ~~requires a case-by-case approval from ARB.~~ may be funded at an air district's discretion if the applicant pays for the additional cost associated with the larger engine/motor. The maximum eligible grant funding will be based on the cost of the smaller sized replacement engine/motor. The emission reduction calculations shall be based upon the funded (higher horsepower) engine/motor. Air district's that choose this option to fund horsepower engine/motor shall include in the project file, documentation of the equipment cost of the funded (higher horsepower) engine/motor as well as the method used to determine the project grant amount (e.g. dealership cost estimate of the lower horsepower engine/motor.)
- (C) A repower project in which the total number of existing engines is different than the total number of replacement engines/motors requires a non-calculation project entry into CARL. If the total sum of the new engine(s)/motor(s) horsepower is greater than 125 percent of the sum of the existing engine(s)/motor(s) total horsepower then the load factor will need to be adjusted. ~~case-by-case approval from ARB.~~ If the total horsepower increase is greater than 150 percent then criteria C.2.(B) applies.

Revision 5. Off- Road Voucher Incentive Program, Appendix O, VIP Replacement Funding Matrix – Construction Tractor/Loader /Backhoe Table and VIP Replacement Funding Matrix – Agricultural Tractor Table Amend Table:

(Amend Table)

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VIP Replacement Funding Matrix – Construction Tractor/Loader/Backhoe								
Minimum Annual Usage (Hours)	125-149 Horsepower				150-174 Horsepower			
	Tier 3	Tier 4 Phase Out	Tier 4 Phase-In or Alternate NOx	Tier 4 Final	Tier 3	Tier 4 Phase Out	Tier 4 Phase-In or Alternate NOx	Tier 4 Final
400								\$11,000
500		\$10,000	\$10,000	\$11,500		\$12,000	\$12,000	\$14,000
600		\$12,000	\$12,000	\$14,000	\$11,500	\$14,000	\$14,500	\$17,000
700	\$11,000	\$14,000	\$14,000	\$16,500	\$13,500	\$16,500	\$17,000	\$19,500
800	\$13,000	\$16,000	\$16,000	\$19,000	\$15,500	\$19,000	\$19,500	\$22,500
900	\$14,500	\$18,000	\$18,000	\$21,000	\$17,500	\$21,500	\$22,000	\$25,500
1000	\$16,000	\$20,000	\$20,000	\$23,500	\$19,500	\$24,000	\$24,500	\$28,500
1100	\$17,500	\$22,000	\$22,000	\$26,000	\$21,500	\$26,000	\$26,500	\$31,000
1200	\$19,500	\$24,000	\$24,500	\$28,500	\$23,500	\$28,500	\$29,000	\$34,000
1300	\$21,000	\$26,000	\$26,500	\$30,500	\$25,000	\$31,000	\$31,500	\$37,000
1400	\$22,500	\$28,000	\$28,500	\$33,000	\$27,000	\$33,500	\$34,000	\$39,500
1500	\$24,000	\$30,000	\$30,500	\$35,500	\$29,000	\$36,000	\$36,500	\$42,500
1600	\$26,000	\$32,000	\$32,500	\$38,000	\$31,000	\$38,000	\$39,000	\$45,500
1700	\$27,500	\$34,000	\$34,500	\$40,000	\$33,000	\$40,500	\$41,500	\$48,000
1800	\$29,000	\$36,000	\$36,500	\$42,500	\$35,000	\$43,000	\$44,000	\$51,000
1900	\$31,000	\$38,000	\$38,500	\$45,000	\$37,000	\$45,500	\$46,500	\$54,000
2000	\$32,500	\$40,000	\$40,500	\$47,500	\$39,000	\$48,000	\$49,000	\$57,000
2100	\$34,000	\$42,000	\$42,500	\$49,500	\$41,000	\$50,000	\$51,000	\$59,500
2200	\$35,500	\$44,000	\$44,500	\$50,000	\$43,000	\$52,500	\$53,500	\$60,000
2300	\$37,500	<del>\$46,500</del> \$46,000	<del>\$46,500</del> <del>\$46,000</del> \$46,500	\$50,000	\$45,000	\$55,000	\$56,000	\$60,000
2400	\$39,000	\$48,000	\$49,000	\$50,000	\$47,000	\$57,500	\$58,500	\$60,000
2500	\$40,500	\$50,000	\$50,000	\$50,000	\$48,500	\$60,000	\$60,000	\$60,000
2600	\$42,000	\$50,000	\$50,000	\$50,000	\$50,500	\$60,000	\$60,000	\$60,000
2700	\$44,000	\$50,000	\$50,000	\$50,000	\$52,500	\$60,000	\$60,000	\$60,000
2800	\$45,500	\$50,000	\$50,000	\$50,000	\$54,500	\$60,000	\$60,000	\$60,000
2900	\$47,000	\$50,000	\$50,000	\$50,000	\$56,500	\$60,000	\$60,000	\$60,000
3000	\$48,500	\$50,000	\$50,000	\$50,000	\$58,500	\$60,000	\$60,000	\$60,000
3100+	\$50,000	\$50,000	\$50,000	\$50,000	\$60,000	\$60,000	\$60,000	\$60,000



Revision 6. Appendix D – Tables for Emission Reduction and Cost Effectiveness Calculations Amend Tables D-1 thru D-4:

(Amend Tables)

**Table D-1**  
**Diesel Heavy-Duty Engines**  
~~Medium Heavy-Duty and Heavy Heavy-Duty~~  
**Converted Emission Standards for Fuel Based Usage Calculations**

<u>EO Certification Standards</u> <u>g/bhp-hr</u>		<u>NOx</u>	<u>ROG<sup>(a)</sup></u>	<u>PM10</u>
		<u>g/gal<sup>(b)(c)(d)</sup></u>		
<u>6.0 NOx</u>	<u>0.60 PM10</u>	<u>103.23</u>	<u>5.33</u>	<u>7.992</u>
<u>5.0 NOx</u>	<u>0.25 PM10</u>	<u>86.03</u>	<u>4.44</u>	<u>3.330</u>
<u>5.0 NOx</u>	<u>0.10 PM10</u>	<u>86.03</u>	<u>4.44</u>	<u>1.332</u>
<u>4.0 NOx</u>	<u>0.10 PM10</u>	<u>68.82</u>	<u>3.55</u>	<u>1.332</u>
<u>2.5 NOx + NMHC</u>	<u>0.10 PM10</u>	<u>40.86</u>	<u>2.11</u>	<u>1.332</u>
<u>1.8 NOx + NMHC</u>	<u>0.01 PM10</u>	<u>29.42</u>	<u>1.52</u>	<u>0.148</u>
<u>1.5 NOx + NMHC</u>	<u>0.01 PM10</u>	<u>24.52</u>	<u>1.27</u>	<u>0.148</u>
<u>1.2 NOx + NMHC</u>	<u>0.01 PM10</u>	<u>19.61</u>	<u>1.01</u>	<u>0.148</u>
<u>0.84 NOx + NMHC</u>	<u>0.01 PM10</u>	<u>13.73</u>	<u>0.71</u>	<u>0.148</u>
<u>0.50 NOx</u>	<u>0.01 PM10</u>	<u>8.60</u>	<u>0.44</u>	<u>0.148</u>
<u>0.20 NOx</u>	<u>0.01 PM10</u>	<u>3.44</u>	<u>0.18</u>	<u>0.148</u>

a -  $ROG = HC * 1.26639$ .

b - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.

c - Fuel based factors are for engines less than 750 horsepower only.

d - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values and the ultra low-sulfur diesel fuel correction factors listed in Tables D-25 and D-26, respectively.

**Table D-2**  
**Alternative Fuel ~~Heavy-Duty~~ Engines**  
**~~Medium Heavy-Duty and Heavy Heavy-Duty~~**  
**Converted Emission Standards for Fuel Based Usage Calculations**

<u>EO Certification Standards</u> <u>g/bhp-hr</u>		<u>NOx</u>	<u>ROG<sup>(a)</sup></u>	<u>PM10</u>
		<u>g/gal<sup>(b)(c)(d)</sup></u>		
<u>6.0 NOx</u>	<u>0.60 PM10</u>	<u>111.00</u>	<u>35.14</u>	<u>11.100</u>
<u>5.0 NOx</u>	<u>0.25 PM10</u>	<u>92.50</u>	<u>29.29</u>	<u>4.625</u>
<u>5.0 NOx</u>	<u>0.10 PM10</u>	<u>92.50</u>	<u>29.29</u>	<u>1.850</u>
<u>4.0 NOx</u>	<u>0.10 PM10</u>	<u>74.00</u>	<u>23.43</u>	<u>1.850</u>
<u>2.5 NOx + NMHC</u>	<u>0.10 PM10</u>	<u>37.00</u>	<u>11.71</u>	<u>1.850</u>
<u>1.8 NOx + NMHC</u>	<u>0.01 PM10</u>	<u>26.64</u>	<u>8.43</u>	<u>0.185</u>
<u>1.5 NOx + NMHC</u>	<u>0.01 PM10</u>	<u>22.20</u>	<u>7.03</u>	<u>0.185</u>
<u>1.2 NOx + NMHC</u>	<u>0.01 PM10</u>	<u>17.76</u>	<u>5.62</u>	<u>0.185</u>
<u>0.84 NOx + NMHC</u>	<u>0.01 PM10</u>	<u>12.43</u>	<u>3.94</u>	<u>0.185</u>
<u>0.50 NOx</u>	<u>0.01 PM10</u>	<u>9.25</u>	<u>2.93</u>	<u>0.185</u>
<u>0.20 NOx</u>	<u>0.01 PM10</u>	<u>3.70</u>	<u>1.17</u>	<u>0.185</u>

a -  $ROG = HC * 1.26639$ .

b - Fuel based emissions factors were calculated using fuel consumption rate factors from Table D-24.

c - Fuel based factors are for engines less than 750 horsepower only.

d - Emission standards were converted where appropriate, using the NMHC and NOx fraction default values listed in Table D-25.

**Table D-3**  
**Medium Heavy-Duty Vehicles**  
**14,001-33,000 pounds (lbs) Gross Vehicle Weight Rating (GVWR)**  
**Emission Factors for Mileage Based Calculations (g/mile)<sup>(a)</sup>**

<u>Model Year</u>	<u>Diesel<sup>(b)</sup></u>		
	<u>NOx</u>	<u>ROG<sup>(c)</sup></u>	<u>PM10</u>
<u>Pre-1987</u>	<u>14.52</u>	<u>0.75</u>	<u>0.69</u>
<u>1987-1990</u>	<u>14.31</u>	<u>0.59</u>	<u>0.75</u>
<u>1991-1993</u>	<u>10.70</u>	<u>0.26</u>	<u>0.41</u>
<u>1994-1997</u>	<u>10.51</u>	<u>0.20</u>	<u>0.23</u>
<u>1998-2002</u>	<u>10.33</u>	<u>0.20</u>	<u>0.25</u>
<u>2003-2006</u>	<u>6.84</u>	<u>0.13</u>	<u>0.16</u>
<u>2007-2009</u>	<u>4.01</u>	<u>0.11</u>	<u>0.02</u>
<u>2007-2009</u> <u>(0.50 g/bhp-hr NOx or</u> <u>Cleaner)<sup>(d)</sup></u>	<u>1.73</u>	<u>0.10</u>	<u>0.017</u>
<u>2010+</u>	<u>0.74</u>	<u>0.09</u>	<u>0.02</u>

a - EMFAC 2011 Zero-Mile Based Emission Factors.

b - Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-26.

c -  $ROG = HC * 1.26639$ .

d - Use interpolated values assuming 1.2 g/bhp-hr NOx Standards for 2007-2009 Model Year Grouping and 0.2 g/bhp-hr NOx Standards for 2010+ Model Years.

**Table D-4**  
~~Heavy~~ **Heavy-Duty Vehicles**  
**Over 33,000 lbs GVWR**  
**Emission Factors for Mileage Based Calculations (g/mile)<sup>(a)</sup>**

<u>Model Year</u>	<u>Diesel<sup>(b)</sup></u>		
	<u>NOx</u>	<u>ROG<sup>(c)</sup></u>	<u>PM10</u>
<u>Pre-1987</u>	<u>21.37</u>	<u>1.09</u>	<u>1.25</u>
<u>1987-1990</u>	<u>21.07</u>	<u>0.86</u>	<u>1.35</u>
<u>1991-1993</u>	<u>18.24</u>	<u>0.56</u>	<u>0.56</u>
<u>1994-1997</u>	<u>17.92</u>	<u>0.42</u>	<u>0.37</u>
<u>1998-2002</u>	<u>17.61</u>	<u>0.43</u>	<u>0.40</u>
<u>2003-2006</u>	<u>11.64</u>	<u>0.27</u>	<u>0.25</u>
<u>2007-2009</u>	<u>6.62</u>	<u>0.23</u>	<u>0.03</u>
<u>2007-2009</u> <u>(0.50 g/bhp-hr NOx or</u> <u>Cleaner)<sup>(d)</sup></u>	<u>2.88</u>	<u>0.20</u>	<u>0.028</u>
<u>2010+</u>	<u>1.27</u>	<u>0.19</u>	<u>0.03</u>

a - EMFAC 2011 Zero-Mile Based Emission Factors.

b - Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-26.

c -  $ROG = HC * 1.26639$ .

d - Use interpolated values assuming 1.2 g/bhp-hr NOx Standards for 2007-2009 Model Year Grouping and 0.2 g/bhp-hr NOx Standards for 2010+ Model Years.