

## Small Fleet Average Calculator User Guide

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### Introduction

Nearly all commercially-operated self-propelled off-road diesel vehicles of 25 horsepower (hp) or greater and most two-engine on-road vehicles (except on-road two-engine sweepers) used in California are subject to the Regulation for In-Use Off-Road Diesel-Fueled Fleets (Off-Road Regulation).

To assist small fleets (less than or equal to 2,500 total hp) with planning for compliance with the Off-Road Regulation, we have developed the Small Fleet Average Calculator (Calculator). The calculator is a spreadsheet that takes the vehicle hp and engine model year for each vehicle in a fleet and calculates current Oxides of Nitrogen (NOx) emissions and upcoming emissions performance requirements each year from 2019 to 2028. Fleets can enter actions taken on vehicles such as retrofits, retirements, and engine repowers during each compliance year to see how these actions will affect their compliance. In this way, a fleet can experiment with a variety of different actions to find the compliance path that works best for them. For information about complying with the Off-Road Regulation, visit our Knowledge Center at <http://www.arb.ca.gov/msprog/ordiesel/knowcenter.htm>.

### Important Notes

- The Air Resources Board received authorization from the U.S. Environmental Protection Agency to enforce all provisions of the Off-Road Regulation on September 13, 2013.
- The calculator requires **Microsoft Excel 2010**, and may not work with older versions.
- This calculator is only for fleets subject to the small fleet requirements. Small fleets include those with less than or equal to 2,500 total hp, fleets (or fleet portions) that operate exclusively in Captive Attainment Areas, and low-population municipalities. Calculators for medium or large fleets can be found at <http://www.arb.ca.gov/msprog/ordiesel/fac.htm>.
- There is an optional compliance schedule for fleets with less than or equal to 500 total hp. For more information, see the Optional Compliance Schedule for Fleets with 500 Horsepower or Less Frequently Asked Questions (FAQ) document in the Knowledge Center.
- The calculator does **NOT** account for all provisions in the regulation. Provisions not reflected in the calculator include:
  - Exemptions from Best Available Control Technologies (BACT) (§2449.1(b)(2));
  - Order of BACT Requirements (§2449.1(b)(4))

Please familiarize yourself with the regulation's provisions prior to entering actions in the calculator to ensure that the calculator provides you with the proper amount of credits.

## Calculator Overview

White Cells	User inputs vehicle information here.
Grey Cells	Locked cells. Most grey cells contain calculations that return values based on the data entered into the white cells.
Orange Cells	Indicates a cell with user input that has been altered from the previous compliance year, allowing fleets to track their changes.
Green Cells	Indicates a beneficial aspect. In a given year if the fleet has met either the Fleet Average Target or the BACT Requirement, the fleet is in compliance, and the appropriate cell will be displayed as green. Additionally, green cells in the Effect on Fleet Avg. column indicate a beneficial influence on the Fleet Average Index for that year; darker green cells indicate more benefits to your fleet.
Red Cells	Indicates a detrimental aspect. In a given year if the fleet has not met either the Fleet Average Target or the BACT Requirement, the fleet is not in compliance, and the appropriate cells will turn red. Additionally, red cells in the Effect on Fleet Avg. column indicate a detrimental influence on the Fleet Average Index for that year; darker red cells indicate a greater detriment to your fleet.

## Using the Calculator

### **Step 1: Review Instructions Tab**

Upon opening the Fleet Average Calculator you will see the contents of the Instructions tab. Carefully read over the sections pertaining to cells with user input, the Early Actions tab, order of vehicle turnover and BACT exemptions, and cells with calculated data.

### **Step 2: Entering Baseline Fleet Information**



Figure 1: The Baseline Fleet Info tab near the bottom of the spreadsheet.

After reading the instructions, click on “BaselineFleet Info”, as shown in Figure 1 above. Baseline Fleet Info is where you enter the baseline information for your fleet as it currently exists. Most of the cells are optional, but the Engine Model Year and Engine Horsepower are required. You may opt to use the “Data for FAC” button in DOORS to easily transfer the necessary fleet information into the Calculator. Please see Appendix A for additional help in copying your fleet data from DOORS into the Calculator. If you have low-use vehicles, vehicles with on-road engines, Verified Diesel Emission Control Strategies (VDECS) retrofits, electric vehicles, or vehicles with non-standard engines, indicate those properties in the appropriate cells as shown in Figure 2 on the next page. Calculated values are updated automatically as you enter information. **Additionally, you do not need to include agricultural vehicles, dedicated snow-removal vehicles, emergency-use vehicles, or vehicles awaiting sale in the list – even though you must report such vehicles in DOORS, they are not counted in the fleet’s total hp or emissions calculations.**

Credits:	48												
Baseline fleet information													
Total Fleet Horsepower	Fleet Average Index												
2078	6.8												
Vehicle EMI	Vehicle Serial Number	Your Vehicle Number	Engine Model Year (Required)	Engine Horsepower (Required)	Designated Low-Use	On-Road Engine	PM VDECS Level	NOx VDECS % reduction	Purchase Year / Type if Electric	Emission Factor if Non-standard	Engine Tier	Emission Factor	Effect on Fleet Avg. Index
X	X	X	1995	150	Year-by-year						T0	9.3	N/A
X	X	X	2004	200							T2	4.3	-6.4
X	X	X	2000	88							T2	4.9	-6.2
X	X	X	1990	332							T0	8.9	1.8

Figure 2: A fleet's baseline information has been entered into the calculator.

Once all of the vehicles in your fleet have been entered, you must manually enter any BACT credits your fleet has accrued up to this point. You may find your BACT credits within the Compliance Snapshot page in DOORS. Log in to your DOORS and click on your fleet in the left-hand window. A series of options will appear in the middle window once you've selected your fleet. Click on the Compliance Snapshot button as shown in Figure 3 below and you will be taken to your fleet's Compliance Snapshot page.



Figure 3: Finding the Compliance Snapshot button in DOORS.

Scroll down to the Credit Summary table on the Compliance Snapshot Page and find the Total Credits found at the bottom, as shown below in Figure 4. Lastly, enter the Total Credits amount from the table into the Early Credits cell in the Baseline Fleet Info tab as shown in Figure 5 below. If no Early Credits were earned then this cell should be left blank.

REG Credit	
S credit	
<b>Total Credits</b>	<b>45 Hp</b>

Figure 4: The Total Credits value is at the bottom of the Credits Summary Table.

Credits:	45
Total Fleet Horsepower	Fleet Average Index
2078	6.8

Figure 5: Enter your fleet's Early Credits here, in the Initial Fleet Info tab.

### Step 3: Optional – Taking Early Actions to Aid in Compliance

Early Credits: 45		Early Actions Taken on Fleet Prior to January 1, 2018												
Total Fleet Horsepower	Fleet Average Index													
2138	6.5													
Vehicle ERI	Vehicle Serial Number	Your Vehicle Number	Engine Model Year (Required)	Engine Horsepower (Required)	Year that Action was Taken	Designated Low-Use	On-Road Engine	PM VDECS Level	NOx VDECS % reduction	Purchase Year / Type if Electric	Emission Factor if Non-standard	Engine Tier	Emission Factor	Effect on Fleet Avg. Index
x	x	x	1995	Retired	2018									
x	x	x	2004	200	2017			Highest				T2	3.0	-4.8
x	x	x	2016	100	2015							T3	2.6	-4.4
x	x	x	1998	332								T0	8.9	1.0
x	x	x	1998	55								T0	9.9	6.2

Figure 6: A fleet has taken early actions to help bring itself into compliance early.

After you have finished entering the baseline information for your fleet, you may choose to take early actions to aid in achieving future compliance requirements. Note that step 3 is optional, and if you do not plan to take any early actions on your fleet, please proceed to Step 4: Entering Each Type of Action into the Calculator.

Taking certain specific early actions on your fleet can give you credit towards meeting future requirements that you would not otherwise be able to receive until 2018. In order to indicate such early actions, click on the “Early Actions” tab at the bottom of the spreadsheet, as shown previously in Figure 1. All of your fleet’s baseline information will have been copied over into the Early Actions tab, and you can begin taking actions in order to receive early credits. Any actions you take will be highlighted orange as shown in Figure 6 above to help you keep track of the actions you’ve taken. You can receive early credits through the following actions, as long as the action was taken (or is planned to be taken) prior to January 1, 2018:

- Repowering a Tier 0 or Tier 1 vehicle with a Tier 2 or better engine will generate credits equal to the horsepower of the old engine.
- Installing a highest level verified Diesel Particulate Filter that reduces particulate matter (PM) emissions and/or NOx emissions will generate double the normal credit amount if done before January 1<sup>st</sup>, 2018.
- Retiring or replacing over 8% of your fleet in a given year generates credits equal to the excess horsepower in excess of that 8%. For example, if your fleet has 1,000 total hp and you replace an old 100-hp vehicle with a new vehicle, you would generate 20 early BACT credits.

Specific guidelines for entering actions into the calculator can be found in Step 4.

### Step 4: Entering in Each Type of Action into the Calculator

There are a variety of fleet modifications you can make to meet regulatory requirements. These actions can be taken in the Early Actions tab or in any of the other tabs for future compliance years. Be sure to indicate the year a given action was taken when in the Early Actions tab by selecting the year in the “Year that Action was Taken” column. All of these actions can lower your Fleet Average Index to meet regulatory performance requirements. Performance requirements can be met several different ways, such as:

- **Retiring a vehicle:** To sell or retire a vehicle from your fleet, choose the “retired” option in the drop-down menu in the Engine Horsepower cell for the vehicle, as shown in Figure 7 below. Selling/retiring older can lower your Fleet Average Index, and if the vehicle meets the Order of BACT Requirements, selling/retiring it will generate credits.

Please see “Step 5: Bringing a Fleet into Compliance for the 2019 Compliance Date” for more information on the Order of BACT Requirements and BACT Exemptions.

Year (Required)	Horsepower (Required)	Low-Use
1970	Retired	
1977	300	
1990	Retired	
1982	300	
1990	450	
1991	200	

Figure 7: Designating vehicles as retired.

- **Entering a newly purchased vehicle:** To enter a new vehicle, enter the engine model year and hp (and any applicable optional information) at the bottom of the current list of vehicles. Entering vehicles with newer engines can lower your Fleet Average Index.
- **Repowering a vehicle:** To repower a vehicle with a new engine, replace its engine model year and hp with the new engine’s model year and hp, as shown in Figure 8 below. Repowering a vehicle can lower your Fleet Average Index, and if the original engine was tier 0 or 1 and the new engine’s tier is 2 or higher, BACT Credit will be generated. Please see “Step 5: Bringing a Fleet into Compliance for the 2019 Compliance Date” for more information on the Order of BACT Requirements.

Year (Required)	Horsepower (Required)	Low-Use
1970	400	
1977	300	
1990	450	
1982	300	
1990	450	
1991	200	



Year (Required)	Horsepower (Required)	Low-Use
2007	380	
2008	320	
1990	450	
1982	300	
1990	450	
1991	200	

Figure 8: Designating vehicles as repowered with new engines.

- **Entering a VDECS:** Some VDECS may reduce both PM and NOx emissions. To enter a new VDECS retrofit that reduces PM emissions, choose its level from the drop-down menu of the PM VDECS Level column. Keep in mind that level 1 VDECS will not lower your Fleet Average Index, nor will it generate credits. If the VDECS reduces NOx emissions, enter its percent reduction value into the NOx VDECS % Reduction column. Level 2 or highest-level PM VDECS and all NOx VDECS can lower your Fleet Average Target, but only highest level PM VDECS and NOx VDECS will generate BACT credits. Note that the Order of BACT Requirements do not apply to VDECS. To see if there is a verified exhaust retrofit available for a given vehicle, visit the VDECS webpage at <http://www.arb.ca.gov/msprog/ordiesel/vdecs.htm>.
- **Designating a vehicle as Low-Use:** To mark a vehicle as year-by-year or permanent low-use, select the appropriate choice in the drop-down menu in the Designated Low-Use column. Low-use vehicles are not counted in your total fleet hp or your Fleet Average Index. Year-by-year low-use vehicles can be brought out of low-use at any time with no penalties. Permanent low-use vehicles cannot be brought out of low-use unless they meet the Adding Vehicles Requirements (§2449(d)(6)), but vehicles designated as permanent low-use will generate retirement credits as long as they meet the Order of BACT Requirements. Please see “Step 5: Bringing a Fleet into Compliance for the 2019 Compliance Date” for more information on the Order of BACT Requirements.

## Step 5: Bringing a Fleet into Compliance for the 2019 Compliance Date

All Remaining Vehicles Exempt from this year's BACT Requirement:		Actions taken on fleet between January 1, 2018 and December 31, 2018												
Total Fleet Horsepower	2019 Fleet Average Index	2019 Fleet Average Target	1/1/2019 Target Met	2019 BACT Requirement	BACT Credits Earned	1/1/2019 BACT Met	Carryover BACT Req. for 1/1/2020	Extra BACT Credit for 1/1/2020						
2735	8.5	8.2	NO	208	845	YES		837						
Vehicle EIN	Vehicle Serial Number	Your Vehicle Number	Engine Model Year (Required)	Engine Horsepower (Required)	Designated Low-Use Year-by-year	On-Road Engine	PM VDECS Level	NOx VDECS % reduction	Purchase Year / Type if Electric	Emission Factor if Non-standard	Engine Tier	Emission Factor	Effect on Fleet Avg. Index	
x	x	x	1995	200			Highway				T3	3.3	-0.8	
x	x	x	2010	105							T3	2.6	-0.4	
x	x	x	1998	352							T2	8.9	1.8	

Figure 9: Determine your compliance for the first compliance date in the “2018 Compliance” tab.

Once you have entered any potential early actions that you will be taking on the vehicles in your fleet, click on the “2018 Compliance” tab at the bottom of the spreadsheet as shown previously in Figure 1. All the information from that tab is copied over into this one, and all future compliance years have their information copied over from the previous year as well. At the top of the table in this tab is a breakdown of whether or not your fleet will be considered to be in compliance on the January 1, 2019, compliance date, as shown in Figure 9 above. In this tab you can enter various actions on the vehicles in your fleet in order to meet either the Fleet Average Target or the BACT Requirement during 2018; these changes will appear as orange so you can track what you’ve changed, again as shown in Figure 9 above. Your Fleet Average Index can be lowered in order to meet the Fleet Average Target by reducing the emissions across your fleet (retiring older vehicles, adding new ones, etc.), whereas the BACT Requirement can be met by generating credits through vehicle retirement, engine repowers, and VDECS retrofits. Some actions will lower your Fleet Average Index while also generating credits.

In order for a fleet to be in compliance for a given compliance date, its Fleet Average Index must be equal to or less than its Fleet Average Target, OR the fleet must generate enough credits to meet that year’s BACT Requirement. The BACT Requirement is the BACT Rate multiplied by the total fleet hp, and the “BACT Requirement” cell shows how many credits are needed each year. Compliance with either method is demonstrated in the Target Met and BACT Met cells, shown below in Figure 10.

All Remaining Vehicles Exempt from this year's BACT Requirement:		Actions taken on fleet between January 1, 2018 and December 31, 2018							
Total Fleet Horsepower	2019 Fleet Average Index	2019 Fleet Average Target	1/1/2019 Target Met	2019 BACT Requirement	BACT Credits Earned	1/1/2019 BACT Met	Carryover BACT Req. for 1/1/2020	Extra BACT Credit for 1/1/2020	
2224	7.3	6.7	NO	107	50	NO	57		
Vehicle EIN	Vehicle Serial Number	Your Vehicle Number	Engine Model Year (Required)	Engine Horsepower (Required)	Designated Low-Use	On-Road Engine	PM VDECS Level	NOx VDECS % reduction	
x	x	x	2005	85					
x	x	x	1998	50	Year-by-year				

Figure 10: This fleet is not yet compliant on the first compliance date.

Once a fleet has met either the Fleet Average Target or the BACT Requirement for a Compliance Year, the appropriate cell or cells will show green instead of red, as shown in Figure 11 on the next page. Any excess credits will carry over into the next Compliance Year for later use (also shown in Figure 11).

All Remaining Vehicles Exempt from this year's BACT Requirement:								
Actions taken on fleet between January 1, 2018 and 1/1/2020								
Total Fleet Horsepower	2019 Fleet Average Index	2019 Fleet Average Target	1/1/2019 Target Met	2019 BACT Requirement	BACT Credits Earned	1/1/2019 BACT Met	Carryover BACT Req. for 1/1/2020	Extra BACT Credit for 1/1/2020
2139	7.4	6.6	NO	107	135	YES		28
Vehicle EIN	Vehicle Serial Number	Your Vehicle Number	Engine Model Year (Required)	Engine Horsepower (Required)	Designated Low-Use	On-Road Engine	PM VDECS Level	NOx VDECS % reduction
x	x	x	2005	Retired				
x	x	x	1998	50	Year-by-year			

Figure 11: This fleet has met the BACT Requirement for the year, so it is in compliance. They also have 28 credits for future compliance dates.

Not all vehicles that are turned over are eligible to generate credits. Turning over a Tier 2 or better vehicle will only generate credits if there is no other non-exempt Tier 0 or Tier 1 vehicle in the fleet. Note that the calculator does not actually account for the incorrect order of vehicle turnover (Order of BACT Requirements) or for turning over vehicles that are exempt from the BACT Requirements. For example, the calculator will allow a fleet to generate credits for turning over a Tier 2 vehicle before any non-exempt Tier 0 vehicles, but in actuality no credits will be generated for the fleet. BACT exemptions are explained in the following section. If all of the remaining vehicles in your fleet are exempt from the BACT Requirement in a given year, then your fleet does not need to meet the Fleet Average Target or the BACT Requirement, and your fleet is considered to be in compliance for that year. In the calculator, you can indicate that you have no remaining non-exempt vehicles in the "All Remaining Vehicles Exempt from this Year's BACT Requirement" cell at the top of the table in any given Compliance Year, as shown in Figure 12 below.

All Remaining Vehicles Exempt from this year's BACT Requirement: Yes								
Actions taken on fleet between January 1, 2018 and 1/1/2020								
Total Fleet Horsepower	2019 Fleet Average Index	2019 Fleet Average Target	1/1/2019 Target Met	2019 BACT Requirement	BACT Credits Earned	1/1/2019 BACT Met	Carryover BACT Req. for 1/1/2020	Extra BACT Credit for 1/1/2020
2224	7.3	6.7	YES		50	YES		50
Vehicle EIN	Vehicle Serial Number	Your Vehicle Number	Engine Model Year (Required)	Engine Horsepower (Required)	Designated Low-Use	On-Road Engine	PM VDECS Level	NOx VDECS % reduction
x	x	x	2005	85				

Figure 12: Indicating that you have no more non-exempt vehicles to turnover.

## BACT Exemptions

Some vehicles are exempt from the BACT Requirements, meaning they are not required to be turned over or otherwise meet the BACT Requirements. The exemptions for small fleets are as follows:

- A vehicle that is less than 10 years old from its date of manufacture on the compliance date (for example, the January 1, 2019 compliance date) is exempt.
- Specialty Vehicles are exempt. A FAQ with more information on Specialty Vehicles is available at <http://www.arb.ca.gov/msprog/ordiesel/faq/specialtyvehfaq.pdf>
- As of 10 months prior to the compliance date, if there is no Level 2 or Level 3 VDECS available for the vehicle, or there is no Level 2 or Level 3 VDECS that could be used without impairing the safe operation of the vehicle, the vehicle is exempt.
- If the vehicle came equipped with an original equipment manufacturer diesel particulate exhaust filter, or if the vehicle has a Tier 4 Interim or Tier 4 Final engine, then it is exempt.
- If a vehicle has already been retrofitted with Level 2 or Level 3 PM VDECS, and at the time of installation it was the highest-level PM VDECS available, it is exempt.

The calculator does not take these exemptions into account, and it will give credit for actions taken on an exempt vehicle even if the fleet has not met the Order of BACT requirements (as previously stated, the regulation requires non-exempt Tier 0 and Tier 1 engines in a fleet to be turned over or retrofitted before BACT credit is granted for actions taken on Tier 2 or higher engines). Please keep this in mind when using the calculator. If you do turn over exempt vehicles, indicate the turnover by just deleting the engine model year and hp as shown in Figure 12 below. A fleet that does not meet the Fleet Average Target must still meet the BACT Requirement with the vehicles that do not qualify for an exemption. If all of the vehicles in a fleet qualify for an exemption, the fleet is exempt from the BACT and Fleet Average Requirements for that year and will be considered to be in compliance. Note that the exemptions listed above do not lower the hp on which the BACT Requirements are calculated. For more information, see section 2449.1(b)(2) of the Off-Road Regulation.

Vehicle Number	Engine Model Year (Required)	Engine Horsepower (Required)	Designation Low-Use
x			
x			
x	1990	450	
x	1982	300	
x	1990	450	

Figure 13: If a vehicle that is Exempt from the BACT Requirements is turned over, indicate this by deleting its engine model year and hp entirely.

### Step 7: Using the Calculator for 2020 and Beyond

Once your actions in the calculator have brought your fleet into compliance for 2019, you can start planning out your compliance for future years. Click on the “2019 Compliance” tab, and then plan out your compliance strategy for that year just like you did for the 2018 compliance year. Continue on through each successive year in this manner, and you can make a complete strategy for complying with the Off-Road Regulation many years in advance.

If you have any questions or comments about the Fleet Average Calculator, please contact Kyle Goff, Air Resources Technician II, by phone at (916) 323-1414, or by email at [kgoff@arb.ca.gov](mailto:kgoff@arb.ca.gov).

## Appendix A: Guide to Pasting Fleet Data from the Diesel Off-Road Online Reporting System (DOORS) into the Fleet Average Calculator

If you do not already have your fleet data in a format such as a spreadsheet that can easily be pasted into the Fleet Average Calculator, your fleet data may be copied from your DOORS account.

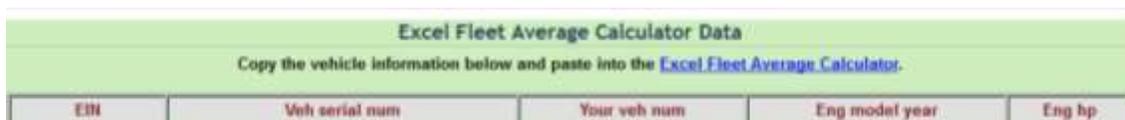
The Air Resources Board recommends you first copy all of your data from DOORS into a **blank** Excel workbook, and then paste the appropriate portion into the Fleet Average Calculator. If you have a different version of Excel than shown in these instructions, your menu selections may be different; see Excel help for information. Please note that the Fleet Average Calculator is not designed to work with Excel versions other than Excel 2010.



Figure 1a: finding the Data for FAC button in DOORS.

To copy your fleet data from your DOORS account, log into DOORS, choose “Data for FAC” button at the bottom of the main menu below Compliance Snapshot, as shown in Figure 1a above.

There are five fields shown in the Data for FAC page, as shown in Figure 2a below: EIN, vehicle serial number, your vehicle number, engine model year, and engine horsepower. You can copy and paste all five columns directly into the Fleet Average Calculator. Clicking on a column heading will sort all the data by that column; for example, clicking the “Eng hp” column heading will sort all data from lowest to highest hp, and clicking again will sort the data from highest to lowest hp.



Excel Fleet Average Calculator Data				
Copy the vehicle information below and paste into the <a href="#">Excel Fleet Average Calculator</a> .				
EIN	Veh serial num	Your veh num	Eng model year	Eng hp

Figure 2a: the five columns as displayed in the Data for FAC page.

Select your data by holding down the left mouse button and moving the mouse, then right-click and choose Copy (or select Copy in the top menu of your web browser), as shown in Figure 3a below.



Figure 3a: copying your fleet data from the Data for FAC page into a blank Excel worksheet.

Once the data has been copied, you can paste the data into the calculator by right-clicking and choosing “Values” or “Match Destination Formatting” under “Paste Options” again as shown in Figure 3a above. After the data is in the calculator, check all the columns to ensure each field is correct.

The Fleet Average Index in the Fleet Average Calculator can be checked against the Average shown in the “Fleet Target and Average Emission Rates” table in the Compliance Snapshot in DOORS. If the two values do not match, there are most likely low-use vehicles, non-standard/non-diesel vehicles, publicly-funded vehicles, VDECS retrofits, or vehicles with other designations that would make them exempt – carefully check your DOORS fleet for such vehicles before proceeding.