

Large Fleet Average Calculator User Guide

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Introduction

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

To assist large fleets (>5,000 total hp) with planning for compliance with the Off-Road Regulation, we have developed the Large Fleet Average Calculator. The calculator is a spreadsheet that takes the vehicle hp and engine model year for each vehicle in a fleet and calculates its current Oxides of Nitrogen (NOx) emissions and upcoming emissions performance requirements each year from 2014 to 2023. 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, please 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. In order to give large fleets additional time to comply, the 2014 compliance date is being delayed to July 1, 2014. All subsequent compliance dates will be on January 1 of each year.
- The calculator requires **Microsoft Excel 2010**, and will not work with older versions.
- This calculator is only for fleets subject to the large fleet requirements. Only fleets with 5,000 or more total hp, all state or federal fleets, and non-captive attainment area fleet portions of a large fleet family are subject to the large fleet requirements.
- The calculator reflects the December 2010 revisions to the Off-Road Regulation (i.e., those that became effective in December 2011).
- The calculator does **NOT** account for all provisions in the regulation. Provisions not reflected in the calculator include:
 - all subsections of Vehicles and Systems Used in Place of Diesel Vehicles (§2449(d)(1)) except for subsection (B) Electric Vehicles;
 - Exemptions from Best Available Control Technologies (BACT) (§2449.1(b)(2));
 - Order of BACT Requirements (§2449.1(b)(4)); and
 - Delay Tier 2 Turnover (§2449.1(b)(6)).

Please familiarize yourself with the provisions above before turning over vehicles in the calculator to ensure you receive the proper amount of credits.

Calculator Overview

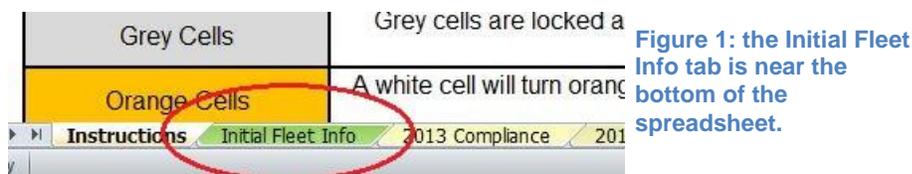
White Cells	User inputs vehicle information here.
Grey Cells	Locked cells. Most grey cells contain calculations that return values based on the data entered into the white cells.
Orange Cells	Indicates a cell with user input that has been altered from the previous compliance year, allowing fleets to 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 Instructions tab. Carefully read over the sections pertaining to cells with user input, order of vehicle turnover and BACT exemptions, and cells with calculated data.

Step 2: Entering Initial Fleet Information



After reading the instructions, click on “Initial Fleet Info” tab as shown in Figure 1 above. Initial Fleet Info is where you will enter the baseline information for your fleet as it existed on December 31, 2012. Most of the cells are optional, but the Engine Model Year and the Engine Horsepower are required. The easiest way to enter your fleet data is to copy from your Diesel Off-road On-line Reporting System (DOORS) account and paste into the calculator; see Appendix A for instructions. The calculator automatically updates its calculated values as you enter new information. 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 additions in the appropriate cells as shown in Figure 2 below. Additionally, you do not need to include part-time agricultural vehicles, dedicated snow-removal vehicles, or emergency-use vehicles in the list – even though you must register such vehicles in DOORS, they are exempt from the performance requirements, and so are not counted in the calculations.

Total Fleet Horsepower		2013 Fleet Average Index		Baseline fleet information as of December 31, 2012														
5123		7.2		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	Purchase Year / Type if Electric	Emission Factor if Non-standard	Engine Tier	Emission Factor	Effect on Fleet Avg. Index	Target Factor
x	x	x	1970	400	Permanent									T0	14.1	N/A	5.9	
x	x	x	1977	300	Year-by-year									T0	13.0	N/A	5.9	
x	x	x	1990	450						Two				T0	7.3	0.6	5.9	
x	x	x	1982	300						Highest	20%			T0	6.9	0.3	5.9	
x	x	x	1990	450										T0	8.9	1.4	5.9	

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 early credits you have accrued prior to December 31, 2012, and you must also determine if your fleet is eligible for the Delayed Requirements for Early Compliance (§2449.1(b)(7)). You will find your early credits and your Early Compliance eligibility within the Compliance Snapshot page in DOORS. Log on to your account in DOORS, and click on your fleet in the left-hand window. Once you've selected your fleet, a series of options will appear in the middle window. Scroll down to the bottom of these options (using the middle window's scroll bar), then 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.

Requirements	
Your Current Fleet Average:	6.2
2015 Fleet Target:	5.7
Exemption from 2014 requirements (Delayed Requirements for Early Compliance):	Yes

Figure 4: determining whether or not your fleet has met the Early Compliance Requirements for 2014.

On the Compliance Snapshot page scroll down to the Requirements table, and if the lists an "exemption from 2014 requirements" as shown in Figure 4 above, then your fleet has met the Early Compliance requirements. You can indicate that you have met the requirements in the top-left corner of the Initial Fleet Info tab, as shown in Figure 5 below.

Early Credits:	430	Early Reduced Fleet HP:	0	Early Compliance Met:	Yes
Baseline fleet information as of					
Total Fleet Horsepower	2013 Fleet Average Index				

Figure 5: entering Early Credits, Early Reduced Fleet HP, and indicating that Early Compliance has been met.

Next, scroll down to the Credit Summary table. Add together the Horsepower Credits listed in the Early Repowers/Rebuilds, Early Replacement, Early VDECS Double Credit, 2010-2011 Reduced Fleet HP, and Interim Replacement/Retirement rows as circled below in Figure 6, and then enter the total into the Early Credits cell in the Initial Fleet Info tab as circled in red in Figure 5 above. Finally, take the credits listed in just the Early Reduced Fleet HP row (also shown in Figure 6) and enter it into the Early Reduced Fleet HP cell in the Initial Fleet Info tab, again like in Figure 5.

Credit Summary		
Reference Regulation Section 2449.1(b)	These credits are provided in sections of the regulation cited in the right column You may show or hide individual credit details by clicking the labels or <input type="button" value="Show All Credit Details"/>	Horsepower Credit (Rounded)
(13)	Early Repowers/Rebuilds	0
(14)	Early Replacement	0
(15)	Early VDECS Double Credit - Highest level PM VDECS credit - NOx + Not highest level PM VDECS credit - NOx + Highest level PM VDECS credit	0
(16)	Early Reduced Fleet HP (only to be used after 2014)	11
(17)	2010-2011 Reduced Fleet HP	171
(18)	Interim Replacement/Retirement	1857

Figure 6: the Early Credits total in this example would be 1,028, and the Early Reduced Fleet HP total is 11.

Step 3: Actions Taken on the Fleet for the 2014 Compliance Date

NOTE: the first compliance date for large fleets has been pushed back to July 1, 2014. All other compliance dates are still on January 1 of each year.

All Remaining Vehicles Exempt from this year's BACT Requirement:															
Actions taken on fleet between January 1, 2013 and December 31, 2013															
Total Fleet Horsepower	2014 Fleet Average Index	2014 Fleet Average Target	7/1/2014 Target Met	2014 BACT Requirement	BACT Credits Earned	7/1/2014 BACT Met	Carryover BACT Req. for 1/1/2015	Extra BACT Credit for 1/1/2015							
5423	7.9	6.0	NO	290	400	YES		120							
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	Purchase Year / Type if Electric	Emission Factor if Non-standard	Engine Tier	Emission Factor	Effect on Fleet Avg. Index	Target Factor	
x	x	x	1970	Retired							TO	13.0	2.1	5.9	
x	x	x	1977	300							TO	8.9	1.4	5.9	
x	x	x	1990	450							TO	11.9	4.8	5.9	
x	x	x	1982	300											

Figure 7: determine your compliance for the first compliance date in this tab.

Once you have entered in your initial fleet information, click on the “2013 Compliance” tab at the bottom of the spreadsheet as shown previously in Figure 1. All of the information in the Initial Fleet Info tab is automatically copied over into this tab, and all future compliance years have their information copied over from the previous year. At the top of the table in this tab is a breakdown of whether or not your fleet will be considered in compliance on the July 1, 2014, compliance date (all future compliance dates are on January 1; see “Important Notes” above) as shown in Figure 7 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 for 2014; these changes will appear as orange so you can track what you’ve changed, again as shown in Figure 7 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. The following actions can be taken to meet either of the above requirements:

- **Retiring a vehicle:** To 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 8 below. Retiring older vehicles will help lower your Fleet Average Index, and if the vehicle meets the Order of BACT requirements, retiring it will generate credits. Please see “Step 4: Bringing a Fleet into Compliance for the 2014 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 8: designating vehicles as retired.

- **Entering a new vehicle:** To enter in a new vehicle, enter the engine model year and hp (and any applicable optional information) at the bottom of the current list of vehicles. Vehicles with newer engines will help 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 9 below. Repowering a vehicle will lower your Fleet Average Index, and if the vehicle is not exempt from the BACT Requirements, repowering it will generate credits if the new engine is a higher tier than the old engine. Please see “Step 4: Bringing a Fleet into Compliance for the 2014 Compliance Date” for more information on BACT Exemptions.

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

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

Figure 9: designating vehicles as repowered with new engines.

- **Entering a VDECS:** To enter in a new VDECS retrofit that reduces Particulate Matter (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 in its percent reduction value into the NOx VDECS % Reduction column. Some VDECS may reduce both PM and NOx emissions. 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>. Level 2 or highest-level PM VDECS and all NOx VDECS will lower your Fleet Average Target, but only highest level PM VDECS and NOx VDECS will generate credits. Note that the Order of BACT requirements do not apply to VDECS.
- **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 4: Bringing a Fleet into Compliance for the 2014 Compliance Date” for more information on the Order of BACT requirements.

Step 4: Bringing a Fleet into Compliance for the 2014 Compliance Date

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.

NOTE: the first compliance date for large fleets has been pushed back to July 1, 2014. All other compliance dates are

All Remaining Vehicles Exempt from this year's BACT Requirement:									
Actions taken on fleet between January 1, 2013 and December 31, 2013									
Total Fleet Horsepower	2014 Fleet Average Index	2014 Fleet Average Target	7/1/2014 Target Met	2014 BACT Requirement	BACT Credits Earned	7/1/2014 BACT Met	Carryover BACT Req. for 1/1/2015	Extra BACT Credit for 1/1/2015	
5823	8.3	6.0	NO	280	150	NO	130		
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	1970	400					
x	x	x	1977	300					
x	x	x	1990	450					

Figure 10: this fleet is not yet compliant with 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 below. Any excess credits will carry over into the next Compliance Year for later use (also shown in Figure 11).

NOTE: the first compliance date for large fleets has been pushed back to July 1, 2014. All other compliance dates are

All Remaining Vehicles Exempt from this year's BACT Requirement:									
Actions taken on fleet between January 1, 2013 and December 31, 2013									
Total Fleet Horsepower	2014 Fleet Average Index	2014 Fleet Average Target	7/1/2014 Target Met	2014 BACT Requirement	BACT Credits Earned	7/1/2014 BACT Met	Carryover BACT Req. for 1/1/2015	Extra BACT Credit for 1/1/2015	
5423	7.9	6.0	YES	280	550	YES		270	
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	1970	Retired					
x	x	x	1977	300					
x	x	x	1990	450					

Figure 11: this fleet has met the BACT Requirement for the year, so it is in compliance. They also have 270 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 are no other non-exempt Tier 0 or Tier 1 vehicles 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.

NOTE: the first compliance date for large fleets has been pushed back to July 1, 2014. All other compliance dates are

All Remaining Vehicles Exempt from this year's BACT Requirement:									
Yes									
Actions taken on fleet between January 1, 2013 and December 31, 2013									
Total Fleet Horsepower	2014 Fleet Average Index	2014 Fleet Average Target	7/1/2014 Target Met	2014 BACT Requirement	BACT Credits Earned	7/1/2014 BACT Met	Carryover BACT Req. for 1/1/2015	Extra BACT Credit for 1/1/2015	
5823	8.3	6.0	YES		150	YES			
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	1970	400					
x	x	x	1977	300					
x	x	x	1990	450					

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 BACT requirements. The exemptions for both large and medium 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 July 1, 2014 compliance date) is exempt.
- If a vehicle had the highest-level PM VDECS installed within the last 6 years, it 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 the vehicle had the highest-level PM VDECS installed prior to January 1, 2013, then that vehicle may be considered exempt. Note that no more than 15 percent of the total fleet hp can qualify for this exemption.

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 all 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 13 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 5: Using the Calculator for 2015 and Beyond

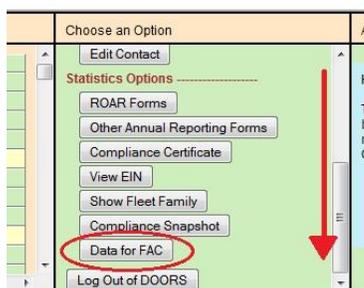
Once your actions in the calculator have brought your fleet into compliance for 2014, you can start planning out your compliance for future years. Click on the “2015 Compliance” tab and then plan out your compliance strategy for that year just like you did for the 2014 compliance year. Continue on through 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.

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 (ARB) 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.

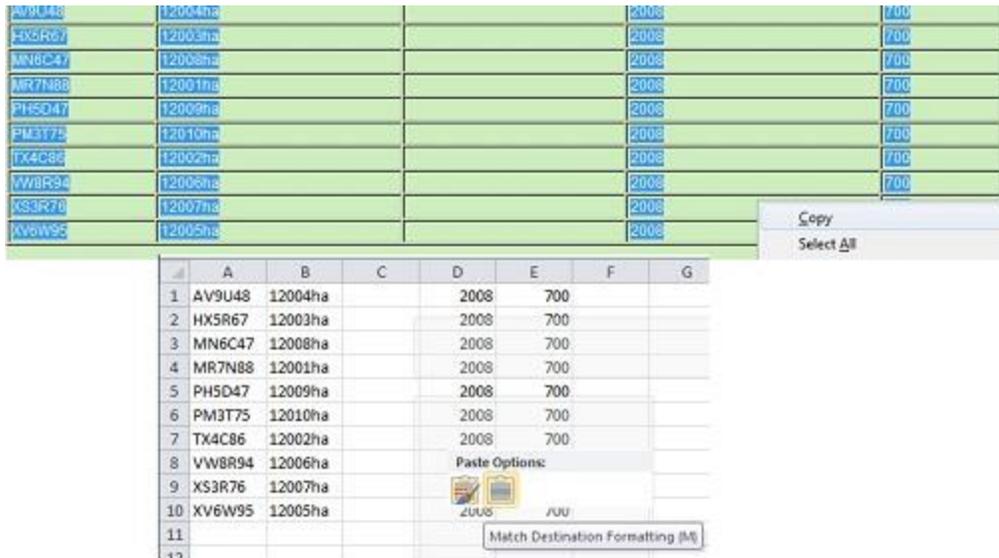


To copy your fleet data from your DOORS account, log into DOORS, choose “Data for FAC” button at the bottom of the main menu below Compliance Snapshot.

The Fleet Average Calculator data page in DOORS looks like the figure below. There are five fields. The calculator needs engine model year and hp. You can copy and paste all five columns directly into the Fleet Average Calculator. Notice that clicking on a column heading will sort all the data. For example, clicking on the “Eng hp” column heading will sort all data by lowest to highest hp, or click again and all data will sort by highest to lowest hp.

Excel Fleet Average Calculator Data				
Copy the vehicle information below and paste into the Excel Fleet Average Calculator .				
EIN	Veh serial num	Your veh num	Eng model year	Eng hp

Select your data by holding down the left mouse button and moving the mouse, then right-click and choose Copy (or select from the top menu in Excel).



You can copy all the data at one time using Select All. However not all of the data needs to be copied at one time; portions may be done at a time, which may be easier if you have many vehicles in your fleet. Be sure to avoid copying the same data twice. To paste the data into the calculator, right-click and choose “Values” under “paste options”. 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. They should match, but if they do not, there are likely exempt vehicles (such as vehicles designated in DOORS as low-use) that have not yet been marked correctly in the Fleet Average Calculator.