

Frequently Asked Questions Off-Road Large Spark-Ignition Engine Fleet Requirements Regulation

FLEET AVERAGE – FLEET AVERAGE EMISSION LEVEL (FAEL) CALCULATIONS

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1. What is the FAEL?

The term “FAEL” means Fleet Average Emission Level which is the arithmetic mean of the combined hydrocarbon plus oxides of nitrogen emissions certification standard or verification absolute emissions level for each applicable large spark-ignition (LSI) engine with an emission control system and the default emission rate for each uncontrolled LSI engine comprising an operator’s fleet. For complete definition of the FAEL see LSI Fleet Regulation section 2775 (d)(16).

2. Do I have to do “tailpipe testing?”

No. The Large Spark-Ignition (LSI) Engine Fleet Requirements Regulation (LSI Fleet Regulation) requires that the fleet average is based either upon:

- (1) the standards to which new engines are certified and retrofitted engines are verified, or
- (2) the assigned default emission rate for LSI engines without emissions controls (three-way catalyst, oxygen sensor, and electronic fuel-air controller).

Tailpipe testing information is not accepted as a surrogate for the default emission rate prescribed by the LSI Fleet Regulation for uncontrolled LSI engines.

3. What specific numbers do I use in calculating my fleet average, including for electric-powered equipment?

The LSI fleet average is based solely upon new engine certification standards, retrofit verification standards¹, or a prescribed default emission rate for uncontrolled engines. Below are the engine certifications standards and default emission rates that must be used in the calculation:

- 2000 and older model year (MY) engines and 2001 through 2003 MY engines without emission controls (as evidenced by a label or placard on the engine that states something to the effect of "this engine conforms to the California regulation for emission non-compliant LSI engines") are assigned a default hydrocarbon plus oxides of nitrogen (HC+NOx) emission rate of 12.0 g/bhp-hr (16.0 g/kW-hr).

¹ <https://ww2.arb.ca.gov/lsi-verified-retrofit-systems>

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- 2001 through 2003 MY engines with emissions controls (as evidenced by a label or placard on the engine that states something to the effect of "this engine conforms to the [insert model year] California emission regulations for off-road LSI engines") have a HC+NOx emission standard of 3.0 g/bhp-hr (4.0 g/kW-hr).
- 2004 through 2006 MY engines have a HC+NOx emission standard of 3.0 g/bhp-hr (4.0 g/kW-hr).
- 2007 through 2009 MY engines have a HC+NOx emission standard of 2.0 g/bhp-hr (2.7 g/kW-hr). However, many engine manufacturers certified these engines to optional HC+NOx emission standards as low as 0.6 g/bhp-hr (0.8 g/kW-hr).
- 2010 and later MY engines have a HC+NOx emission standard of 0.6 g/bhp-hr (0.8 g/kW-hr).

The label or placard on 2007 and subsequent model year engines specify the emission standard to which the engine was certified. Be sure to view the engine labels of your new equipment before performing your fleet average calculation.

All Class 1 and 2 electric forklifts may be included in the forklift fleet average calculation and are considered to have a HC+NOx emission level of zero. Class 3 pallet jacks and walkies are not considered forklifts by definition in the LSI Regulation, are not part of the fleet size determination, and are not allowed to be included in the fleet average calculation.

Non-forklift electric-powered equipment may be included in the non-forklift fleet average calculations. This equipment is considered to have a HC+NOx emission level of zero.

Both forklift and non-forklift electric equipment with a power rating of less than 19 kW may be included fleet average calculations provided that the equipment meets the definition for one of the four categories of affected LSI equipment and performs, with similar efficiency, the same function as an LSI engine-powered piece of equipment in that category.

On-road equivalent ground support equipment may use an emission rate of 0.7g/bhp-hr (0.9 g/kW-hr) for the purposes of determining the 1/1/2013 FAEL non-forklift standard.

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4. I have performed my fleet average calculation. Do I round my result to see if I am in compliance with the LSI Fleet Regulation? For example, does a fleet average of 1.44 g/bhp-hr comply with a requirement of 1.4 g/bhp-hr?

ARB accepts common rounding conventions for FAEL standards calculations performed under the LSI Fleet Regulation. Those conventions specify that you round up if the last digit is five through nine and you round down if the last digit is zero through four. Under these rounding conventions, a calculated fleet average value of 1.44 g/bhp-hr would meet a 1.4 g/bhp-hr standard, but 1.45 g/bhp-hr would round to 1.5 g/bhp-hr.

5. Can I include equipment that has been ordered, but not yet received, in my fleet average calculation?

Yes, the California Air Resources Board (CARB) allows equipment and retrofits that were purchased on or before the date of a compliance date - as evidenced by purchase orders for retrofit kits and purchase orders, bills of lading, or factory shipping documents for pieces of equipment - to be incorporated into the fleet average calculation. This equipment must physically enter the fleet or have the retrofit kit installed within a reasonable period of time. CARB reserves the right to confirm that purchase order equipment has been placed in the fleet and not cancelled.

6. Must I include equipment in the fleet average calculation if it is used infrequently?

The LSI Fleet Regulation allows equipment with limited hours of use (LHU) to be excluded from the fleet average calculation. LHU equipment is equipment that is used fewer than 200 hours per year based on records of prior calendar year readings. The equipment must be equipped with a non-resettable hour meter to be eligible for this provision. This equipment must be reported and labeled. For more information on LHU equipment, please see the Frequently Asked Questions page in the Off-Road Zone at www.arb.ca.gov/offroadzone.

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7. Are rental or leased equipment exempt from the LSI regulation?

Only rental or leased equipment that is operated in California no more than 30 aggregated calendar days per year are exempt from the LSI Regulation. The purpose of this exemption is for short-term operation of rental equipment.

8. Can I exclude rental and lease equipment from my fleet average calculation?

Yes, provided all the following requirements are met:

- (1) the rental or lease period is less than one year,
- (2) the rental or lease component of the fleet comprises no more than 20 percent of the operator's equipment at any time, and
- (3) the equipment is controlled to a HC+NO_x standard of 2.0 g/bhp-hr (2.7 g/kW-hr) or better.

If your rental or lease component exceeds 20 percent, the first 20 percent may be excluded providing the other conditions are met. Equipment in excess of 20 percent must be included in the fleet average calculation. All equipment rented or leased for a period of one year or more must be included in the fleet average calculations, unless it meets the operational exemption described in Question 7.

9. How does the operational exemption for rental or lease equipment differ from the rental/lease period exclusion?

The operational exemption is only for rental and leased equipment that operate 30 calendar days or less per year (in aggregate). For example, consider the scenario where an operator needs to rent a forklift. Four scenarios describe how the LSI Regulation considers the forklift:

1. The forklift is exempt from all provisions of the LSI Regulation as long as it does not operate more than 30 aggregated calendar days per year in the operator's fleet.
2. If the forklift is operated more than 30 aggregated calendar days per year and meets the requirements described in Question 8, then the operator may exclude the forklift from its fleet average calculation.
3. If the forklift is operated more than 30 aggregated calendar days per year, is rented/leased for period of less than one year, but does not meet all the remaining requirements described in Question 8, then the operator must include the forklift in its fleet average calculation. This equipment must be reported and labeled.
4. If the forklift is operated more than 30 aggregated calendar days per year and is rented or leased for a period of one year or more, then the operator must include the forklift in its fleet average calculation. This equipment must be reported and labeled.

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