

IN-USE DIESEL OFF-ROAD EQUIPMENT RULE REGULATORY CONCEPTS – July 2006 Update

- I. **Purpose** – The overall goals of the Air Resources Board (ARB) for reducing public exposure to diesel particulate matter (PM), which is a toxic air contaminant, are described in ARB's 2000 *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. The primary purpose of this measure is to reduce diesel PM emissions from in-use off-road equipment as much as technically and economically feasible in the short- and long-term. A secondary purpose is to reduce oxides of nitrogen (NOx) emissions as well.

- II. **Applicability** – Rule will apply to any person who owns or operates any diesel-fueled compression ignition mobile off-road compression ignition equipment engine with maximum power of 25 horsepower (hp) or greater. Such equipment is used in construction, mining, airport ground support equipment, and industrial operations. The measure will not cover locomotives, commercial marine vessels, marine engines, recreational vehicles, or combat and tactical support equipment. The measure will also not cover stationary or portable equipment, or equipment used in agricultural operations, at ports or intermodal railyards, or already covered by another measure or agreement.

- III. **Definitions**
 - a. Agricultural operations – Agricultural operations means (1) the growing or harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution, or (2) agricultural crop preparation services such as packinghouses, cotton gins, nut hullers and processors, dehydrators, and feed and grain mills. Agricultural crop preparation services include only the first processing after harvest, not subsequent processing, canning, or other similar activities.

 - b. Airport Ground Support Equipment Fleet – An airport ground support equipment fleet is a fleet that contains primarily airport ground support equipment. Airport ground support equipment (GSE) is mobile diesel-fueled off-road compression ignition equipment with maximum power of 25 horsepower or greater used to service and support aircraft operations. GSE perform a variety of functions, including but not limited to: starting aircraft, aircraft maintenance, aircraft fueling, transporting cargo to and from aircraft, loading cargo, baggage handling, lavatory service, and food service. GSE fleets include equipment types such as baggage tugs, belt loaders, and cargo loaders.

 - c. Alternative Fuel – Alternative fuel means natural gas, propane, ethanol, methanol, gasoline (when used in hybrid electric equipment only), hydrogen, electricity, fuel cells, or advanced technologies that do not rely on diesel fuel.

“Alternative fuel” also means any of these fuels used in combination with each other or in combination with other non-diesel fuels.

- d. Combat and Tactical Support Equipment – Equipment that meets military specifications, is owned by the U.S. Department of Defense and /or the U.S. military services or its allies, and is used in combat, combat support, combat service support, tactical or relief operations or training for such operations.
- e. Construction/Mining/Industrial Equipment Fleet – A fleet that is not used primarily as airport ground support equipment. Construction/mining/industrial equipment fleets include fleets owned by construction, mining, rental, landscaping, recycling, landfilling, manufacturing, warehousing, ski industry, and composting companies, as well as government agencies.
- f. Engine Identification Number – Unique engine identification number assigned by ARB to each engine in an owner’s fleet subject to this rule. Equipment will be labeled with the engine identification number for each engine, and all reporting and recordkeeping will link engine data with this number.
- g. Equipment to Alleviate Emergency Event – Equipment to alleviate emergency event is equipment (1) kept in California and used exclusively for emergency operations or (2) brought into California and kept in California for less than 6 months for use in emergency operations. Emergency operation means helping alleviate an immediate threat to public health or safety. Examples of emergency operation include repairing or preventing damage to roads, buildings, terrain, and infrastructure as a result of an earthquake, flood, storm, fire, terrorism, or other act of nature.
- h. Fleet – All diesel-fueled compression ignition mobile off-road equipment engines with maximum power of 25 horsepower or greater owned by a person, business, or agency, plus all such engines in equipment rented or leased for a period of one year or more or reasonably expected to be rented or leased for a period of one year or more by that person, business, or agency. Equipment owned by rental companies that are leased to others for one year or more are not considered part of the rental fleet for compliance reporting. Fleets are classified by size as follows:
 - Large fleet – Fleet with total maximum power of greater than 20,000 horsepower. A fleet must meet large fleet requirements if the total equipment under common ownership would be defined as a large fleet. All fleets owned by United States federal agencies or State of California agencies must meet the large fleet requirements.
 - Medium Fleet – Fleet with total maximum power greater than 1,500 horsepower but less than or equal to 20,000 horsepower.

Small fleet - Fleet with total maximum power of less than or equal to 1,500 horsepower.

- i. Low-use Equipment – Low-use equipment is equipment that operates less than 100 hours per year, based on a three calendar-year rolling engine-hour average. Until March 1, 2010, if less than three years of engine operating hour data are available, the low-use definition may be based on an average of annual engine operating hours since March 1, 2007. Equipment that operates both inside and outside of California can meet the low-use equipment definition if it is used less than 100 hours per year in California, based on a three-year rolling engine-hour average. Engine operating hour data must be from an hour meter; equipment without a properly functioning hour meter cannot be defined as low-use equipment.
- j. Maximum power – For uncertified engines, maximum power is the maximum rated horsepower output of an engine at rated speed as stated by the manufacturer in the manufacturer's sales and service literature. For engines certified to the Tier 1, 2, or 3 new off-road diesel emission standards in Title 13, CCR Section 2423, maximum power is the maximum rated power of an engine as defined in title 13, CCR, section 2421(a)(35). For engines certified to the interim or final Tier 4 new off-road diesel emission standards in Title 13, CCR, Section 2423, maximum power is the maximum engine power of an engine as defined in title 13, CCR, section 2421(a)(34).
- k. Mobile Off-road Equipment Engine – To be a mobile off-road equipment engine, an engine must be used to provide motive power to a self-propelled piece of equipment or vehicle. If such an engine is in a piece of equipment or vehicle that is **not** a motor vehicle according to Title 40, Code of Federal Regulations (CFR), Section 85.1703, it is a mobile off-road equipment engine. If such an engine is in a piece of equipment or vehicle that **is** a motor vehicle according to Title 40, CFR, Section 85.1703, it is a mobile off-road equipment engine if and only if it meets any one of the following criteria:
 1. It is subject to off-road engine standards in Title 13, California Code of Regulations (CCR), Section 2423 and/or Title 40, Code of Federal Regulations (CFR), Part 89.112(a) or Part 1039.101; or
 2. The vehicle has a California Special Construction Equipment plate as defined in California Vehicle Code Section 565 and 570; or
 3. The vehicle has a permanently mounted auger or blower for snow removal; or
 4. The vehicle is a drill rig, crane, or concrete pump truck used predominantly off of public roads.

- l. Replacement Engine – Replacement engine as defined in Title 13, CCR, Section 2423(j).
- m. Tier 0 Engine – Tier 0 engines are mobile off-road equipment engines not subject to the requirements in Title 13, CCR, Section 2423, Title 40, Code of Federal Regulations (CFR), Part 89, or Title 40, CFR, Part 1039.
- n. Tier 1 Engine – An engine subject to the Tier 1 new engine emission standards in Title 13, CCR, Section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 1 Family Emission Limits (FEL) listed in Title 13, CCR, 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).
- o. Tier 2 Engine – An engine subject to the Tier 2 new engine emission standards in Title 13, CCR, Section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 2 FEL listed in Title 13, CCR, 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).
- p. Tier 3 Engine – An engine subject to the Tier 3 new engine emission standards in Title 13, CCR, Section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 3 FEL listed in Title 13, CCR, 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).
- q. Tier 4 Final Engine – An engine subject to the final after-treatment-based Tier 4 emission standards in Title 13, CCR, Section 2423(b)(1)(B) and/or Title 40, CFR, Part 1039.101. This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 4 FEL listed in Title 13, CCR, 2423(b)(2)(B) and/or Title 40, CFR, Part 1039.101.
- r. Tier 4 Interim Engine – An engine subject to the interim Tier 4 emission standards (also known as transitional) in Title 13, CCR, Section 2423(b)(1)(B) and/or Title 40, CFR, Part 1039.101. This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 4 FEL listed in Title 13, CCR, 2423(b)(2)(B) and/or Title 40, CFR, Part 1039.101.
- s. To Retire – To take an engine out of service and not operate it again in the State of California. Engine may be moved outside of California, sold outside of California, or scrapped.
- t. Total maximum power - Sum of maximum power for all of a fleet's diesel fueled compression ignition mobile off-road equipment engines with maximum power greater than or equal to 25 horsepower. If various portions of a fleet are under the control of different responsible officials, the fleet portions may

comply separately and be reported separately. However, the total maximum power of the equipment under common ownership determines whether the fleet must meet the small, medium, or large fleet requirements. A fleet must meet large fleet requirements if the total equipment under common ownership would be defined as a large fleet.¹ A fleet must meet medium fleet requirements if the total equipment under common ownership would be defined as a medium fleet. Individual federal or state agencies may report their equipment separately, but all equipment owned by United States federal agencies or State of California agencies must meet the large fleet requirements.

- u. Verified Diesel Emission Control System (VDECS) – An emissions control strategy, designed primarily for the reduction of diesel PM emissions, which has been verified pursuant to the “Verification Procedures for In-Use Strategies to Control emissions from Diesel Engines” in Title 13, CCR, commencing with Section 2700. VDECS can be verified to Level 1 (25% reduction), Level 2 (50% reduction), or Level 3 (85% reduction). For purposes of determining highest level VDECS, Level 3 is higher than Level 2, which is higher than Level 1.

¹ For example, a subsidiary of a parent company must meet large fleet requirements if the total fleet of the parent company plus all its subsidiaries would be defined as large, even if the subsidiary’s equipment alone would be defined as small.

IV. Performance Requirements –

To comply with the proposed regulatory concept, each fleet must show that they have met the fleet average requirements each year as described in section IV.a. If unable to meet the fleet average requirements due to inadequate availability of VDECS or other reasons fleet must demonstrate that it applied the best available control technology (BACT) as described in section IV.b. All fleets must comply with the idling requirements in section IV.c.

Fleets do not need to pick a compliance path; i.e., a fleet may meet the fleet average requirements one year and the BACT requirements the next. There are differing requirements for small, medium, and large fleets. Small fleets that become medium must meet the medium fleet requirements within one year after becoming medium.

Until March 1, 2020, low-use equipment is not included in determining the compliance requirements (i.e., not counted in the fleet average and exempt from the BACT requirements). However, by March 1, 2020, the exemption for low use equipment ends and fleets must include their low-use equipment in their fleet compliance demonstration.

Equipment that formerly met the low-use equipment definition, but whose use increases to 100 hours per year or greater, based on a three calendar-year rolling engine-hour average, must meet the BACT or be included in the fleet average calculation by the next compliance date. For example, consider a fleet with a formerly low-use engine that is reported on April 1, 2014 to have exceeded 100 hours/year for the 3-year period March 1, 2011 to March 1, 2014. When the fleet reports on April 1, 2015, it must include the formerly low-use engine in its fleet when showing how it met either the fleet average or BACT requirements.

a. Fleet Average Requirements

To meet the fleet average requirements, a fleet must demonstrate that its overall fleet average emission rate is less than or equal to the calculated target rate. The fleet average targets used to calculate the fleet average target rate (TargetRate) and compliance dates are shown in Tables 1 and 2.

To avoid having to meet multiple sets of fleet average targets, each equipment owner should choose whether his fleet is construction/mining/industrial, or airport ground support equipment, based on the primary function of his fleet. For example, a fleet that contains some construction equipment but is used primarily for aircraft support operations would be defined as “airport ground support.”

On dates in between the compliance dates fleets must maintain the fleet average of the previous compliance date. For example, between March 1, 2010 and March 1, 2013, medium and large fleets must meet the March 1, 2010 target. After

the final compliance date shown, fleets must maintain compliance with the final fleet average.

If a fleet owner adds equipment to his fleet (either by purchase or lease of one year or more), the fleet has three months from the purchase or lease date to meet the previous compliance date fleet average target.

Table 1 – Construction/Mining/Industrial Equipment Fleet Average Targets¹
[g/bhp-hr]

Large and Medium Fleet Compliance Date: March 1 of Year	Small Fleet Compliance Date: March 1 of Year	[g/bhp-hr]		
		25-99 hp	100-750 hp	>750 hp
2009 (large fleets only)	Not applicable	0.40	0.25	0.25
2010	2015	0.35	0.20	0.20
2013	2018	0.29	0.16	0.17
2017	2022	0.12	0.06	0.08
2020	2025	0.08	0.04	0.06

¹ – Large and medium fleets must meet the large and medium fleet compliance dates. Small fleets must meet the small fleet compliance dates.

Table 2 – Airport Ground Support Equipment Fleet Average Targets¹
[g/bhp-hr]

Large and Medium Fleet Compliance Date: March 1 of Year	Small Fleet Compliance Date: March 1 of Year	[g/bhp-hr]		
		25-99 hp	100-750 hp	>750 hp
2009 (large fleets only)	Not applicable	0.40	0.25	0.25
2010	2015	0.34	0.19	0.20
2013	2018	0.27	0.15	0.17
2017	2022	0.09	0.05	0.08
2020	2025	0.06	0.03	0.06

¹ – Large and medium fleets must meet the large and medium fleet compliance dates. Small fleets must meet the small fleet compliance dates.

The fleet average emission rate (FleetAvg) and the calculated target emission rate (TargetRate) are defined below:

$$\text{FleetAvg} = \frac{[\text{SUM of } (\text{Max Hp} \times \text{Emission Factor}) \text{ for each engine in fleet}]}{[\text{SUM of } (\text{Max Hp}) \text{ for all engines in fleet}]}$$

TargetRate = [Target₂₅₋₉₉ x (SUM of *Max Hp* for all engines with 25-99 max hp) + Target₁₀₀₋₇₅₀ x (SUM of *Max Hp* for all engines with 100-750 max hp) + Target_{>750} x (SUM of *Max Hp* for all engines with >750 max hp)] ÷ [SUM of (*Max Hp*) for all engines in fleet]

where Target₂₅₋₉₉, Target₁₀₀₋₇₅₀, and Target_{>750} are in Tables 1 and 2.

Emission Factor = PM emission standard in g/bhp-hr to which engine is certified.²
If the engine is not certified to an emission standard (i.e., is a Tier 0 engine or a Tier 1 engine with no PM standard), the Emission Factor is the uncontrolled emission factor shown in Appendix A. If the PM emission standard to which the engine is certified is unknown, the Emission factor is the uncontrolled emission factor shown in Appendix A for <1970 model year.

For engines certified to a Family Emission Limit (FEL), the Emission Factor is the FEL, as described in Title 13, CCR, Section 2423(b)(2).

For engines that have been retrofit with VDECS, the Emission Factor is the PM emissions standard to which the engine is certified times 0.75 for a Level 1 VDECS, 0.50 for a Level 2 VDECS, or 0.15 for a Level 3 VDECS.

NOTE: Each fleet meeting the overall fleet average target, TargetRate, is in compliance whether or not the fleet average targets for individual horsepower groups are met.

Electric and Alternative Fuel Equipment

Electric and alternative fuel equipment purchased January 1, 2007 or later with maximum rated power 25 horsepower or greater may be counted in the fleet average if the following three conditions are met:

- (1) the owner can demonstrate it serves a function equivalent to and performs the work equivalent to that of diesel equipment,
- (2) the equipment is not already counted toward the fleet average emission level requirements for large spark ignition engine fleets in Title 13, Section 2775.1; and
- (3) if the equipment is alternative fuel equipment with certified NOx emission levels lower than the NOx standard for the same model year and horsepower in Title 13, CCR, Section 2423(b)(1) and Title 40, CFR, Part 89.112(a) and Title 40, CFR, Part 1039.101.

² To get standard in g/bhp-hr, the standard in g/kW-hr is multiplied by 0.746.

Include such equipment's maximum rated power as a *Max Cert Hp* in the calculations of FleetAvg and TargetRate above, along with an *Emission Factor* of 0. This provision may be used for mobile electric equipment or for stationary or portable electric equipment used to replace mobile diesel equipment, such as a conveyor system used to replace diesel haul trucks at a mine.

Electric airport GSE purchased prior to January 1, 2007 may be partially counted in the fleet average as follows:

Include such equipment's maximum rated power times 0.2 as the *Max Hp* in the calculations of FleetAvg and TargetRate above, along with an *Emission Factor* of 0.

Fleet owners may apply to the Executive Office to count non-GSE electric equipment purchased prior to January 1, 2007 and/or alternative fuel equipment purchased prior to January 1, 2007 in the fleet average if the following conditions are met:

- (1) the owner demonstrates it serves a function equivalent to and performs the work equivalent to that of diesel equipment,
- (2) the equipment is not already counted toward the fleet average emission level requirements for large spark ignition engine fleets in Title 13, Section 2775.1;
- (3) if the equipment is alternative fuel equipment, certified NOx emission levels are lower than the NOx standard for the same model year and horsepower in Title 13, CCR, Section 2423(b)(1) and Title 40, CFR, Part 89.112(a) and Title 40, CFR, Part 1039.101; and
- (4) the owner demonstrates that if the electric or alternative fuel had not been purchased, it is virtually certain that diesel equipment would have been purchased to accomplish the same work.

b. **BACT Off-ramp**

If a fleet does not meet the fleet average requirements in IV.a., it must meet the BACT off-ramp requirements in IV.b. To meet the BACT requirements, large fleets must meet the compliance schedule in Table 1 for each year from 2009 to 2020, medium fleets must meet it for each year from 2010 to 2020, and small fleets must meet it for each year from 2015 to 2025. BACT requirements consist of a combination of engine retrofit and accelerated turnover, as described in Table 1.

If a fleet owner adds equipment to his fleet (either by purchase or lease of one year or more), the owner has three months from the date of purchase or lease to meet the previous compliance date BACT requirement. For example, if a large fleet owner purchases a piece of used equipment on June 1, 2011, the owner has until September 1, 2011 to meet the BACT retrofit requirement for that newly purchased piece.

If a fleet owner is unable to determine an engine's model year or whether it has a VDECS, the engine shall be considered to be an engine older than 5 years with no VDECS.

Table 1 – BACT Requirements and Schedule

Large and Medium Fleet Compliance Date: March 1 of Year	Small Fleet Compliance Date: March 1 of Year	BACT: Retrofit Requirement	BACT: Accelerated Turnover Requirement
2009 (large fleets only) 2010 2011 2012	2015 2016 2017	Retrofit all engines older than 5 years (and, for vehicles older than 5 years, any replacement engines or engines installed as repowers) that are not already retrofit with a VDECS with highest level VDECS. ¹	None
2013 2014 2015 2016 2017 2018 2019 2020	2018 2019 2020 2021 2022 2023 2024 2025	Retrofit all engines older than 5 years (and, for vehicles older than 5 years, any replacement engines or engines installed as repowers) that are not already retrofit with a VDECS with highest level VDECS. ¹ For any engines retrofit with a Level 1 or 2 VDECS, if VDECS installation date was more than 6 years before the compliance date, check if a Level 3 VDECS has been verified, ¹ and – if so – install the Level 3 VDECS.	Accelerated Turnover Engines are defined in IV.b.1. Fleet owner must retire or sell Accelerated Turnover Engines according to the schedule described in IV.b.2. and in the order described in IV.b.3.

¹ – Highest level VDECS is the highest level device verified as of 10 months prior to the compliance date. So, for a March 1, 2010 compliance date, for example, the highest level VDECS is the highest level device verified as of May 1, 2009.

1. Accelerated Turnover Engines - Accelerated Turnover Engines must all be replaced according to the schedule described in IV.b.2. and include the following:

- Engines older than 10 years that have no VDECS;
- Replacement and repower engines that have no VDECS and are in vehicles older than 10 years; and
- Tier 0 engines and Tier 1 engines not certified to a PM standard that were retrofit with a Level 1 or 2 VDECS more than 6 years before the compliance date and for which there is not a Level 3 VDECS verified.

2. Accelerated Turnover Rate – Fleets not meeting the fleet average must show they have retired or sold engines representing 10% of the fleet horsepower each year, as described in Table 1. Fleets must turn over 10% of their total maximum power each year (10% by March 1, 2013, another 10% by March 1, 2014, etc.) until the fleet average is met or all engines subject to the turnover requirements have been retired or sold. If a fleet adds uncontrolled equipment with no VDECS after March 1, 2012, it must still reduce its total maximum power of engines subject to the accelerated turnover requirement (Accelerated Turnover Engines) with no VDECS by 10% of its total maximum power each year. The rate at which they must be retired or sold depends on the total maximum (Max) power of the fleet as described in the equation below:

(Total Max Hp of Accelerated Turnover Engines to be Retired or Sold by March 1 of Year $x+1$) =

(Total Max Hp of Fleet on March 1 of Year x) \times 0.1 + (Total Max Hp of Accelerated Turnover Engines added to fleet between March 1 of Year x and March 1 of Year $x+1$)

For example, a medium fleet with total maximum power of 10,000 horsepower on March 1, 2012 would need to retire or sell at least 1,000 horsepower per year of Accelerated Turnover Engines by March 1, 2013. If that same fleet adds a 6-year old engine with maximum power of 500 horsepower and with no VDECS to its fleet on June 1, 2012, it must replace 1,500 horsepower (1,000 + 500) by March 1, 2013.

3. Order of Accelerated Turnover –

Fleet must replace Accelerated Turnover Engines in the following order:

- 1) All uncontrolled (i.e., not retrofit with a VDECS) pre-1988 model year Tier 0 engines, before
- 2) All pre-1988 model year Tier 0 engines retrofit with a Level 1 VDECS, that must be replaced per IV.b.1., before
- 3) Other remaining Tier 0 and Tier 1 engines that must be replaced per IV.b.1., before
- 4) Other remaining Tier 2 and Tier 3 engines that must be replaced per IV.b.1., before
- 5) Tier 4 interim engines that must be replaced per IV.b.1.

c. Idling Limit

As of January 1, 2008, small, medium, and large fleets must not idle diesel-fueled compression ignition mobile off-road equipment engines 25 horsepower or greater for more than 5 minutes.

As of January 1, 2008, medium and large fleets must also have a written idling policy that limits idling to 5 minutes or less.

The idling limit does not apply to:

- (1) idling when queuing,
- (2) idling to verify that the equipment is in safe operating condition,
- (3) idling for testing, servicing, repairing or diagnostic purposes,
- (4) idling necessary to accomplish work for which the equipment was designed such as operating a crane,
- (5) idling required to bring the machine system to operating temperature, and
- (6) idling necessary to ensure safe operation of the equipment.

An equipment owner may apply to the Executive Officer for a waiver to allow additional idling beyond 5 minutes. The equipment owner must provide justification as to why such idling is necessary.

d. Encouraging NOx Reductions

The off-road equipment rule regulatory concepts have until now been designed primarily to reduce direct diesel PM emissions. However, recent work has made it clear that the rule also needs to reduce NOx emissions to the maximum extent feasible. Recent estimates of the health impact due to diesel equipment show that the mortality from secondary particulate matter formed from diesel NOx emissions can be as severe as that due to direct diesel PM (ARB's *Emission Reduction Plan for Ports and Goods Movement, March 2006*). In addition, the South Coast and San Joaquin Valley have attainment deadlines for fine particulate matter and eight-hour ozone standards approaching in the 2015-2025 timeframe. To achieve these health-based standards, the State will need to dramatically reduce NOx emissions.

ARB staff is therefore now evaluating ways to more strongly encourage NOx reductions as part of the off-road equipment rule. Staff is considering three options to achieve this and would like to solicit stakeholder input on these ideas:

- Include a mandatory level of turnover of all Tier 0 and 1 engines, on top of meeting the PM fleet average or BACT requirements. For example, all fleets could be asked to turn over 10% of their fleet per year until all Tier 0 and 1 engines had been turned over, in addition to meeting the PM requirements.
- Include a NOx or secondary PM fleet average requirement. Statewide average secondary PM can be calculated from the statewide NOx emissions. Reductions in NOx result in secondary PM emissions reductions. Staff is evaluating whether this could be combined with the existing PM fleet average requirements in the rule or should a separate average for secondary PM also need to be met. If primary and secondary PM were to be combined, the TargetRates in Table 1 and 2 would have to be reworked to include this change.
- Mandate a maximum allowed percentage of Tier 0 and Tier 1 engines in each fleet. The maximum allowed percentage would decline each year until all Tier 0 and 1 engines have been phased out. For example, the rule could require no more than 20% Tier 0 engines in each fleet in 2010, 15% in 2011, 10% in 2012,

etc. A Tier 1 phase-out schedule could also be established. No fleet would be required to turn over more than 10% of its fleet per year.

e. Special Provisions/ Compliance Extensions

1. **Verified Diesel Emission Control System (VDECS) Failure:** For any fleet not meeting the fleet average and complying with the BACT requirements instead, if the VDECS fails or is damaged within its warranty period and it can not be repaired, the owner must replace it with same level VDECS or higher for the equipment within 90 days of the failure. If the VDECS fails or is damaged outside of its warranty period and it cannot be repaired, within 90 days of the failure, the owner must replace it with highest level VDECS available for engine at time of failure or meet another BACT option for the equipment.
2. **Fuel Strategy VDECS:**
 - (a) If an equipment owner determines that the highest level diesel emission control strategy for a small percentage of his fleet would be a level 2 fuel-based strategy, and implementation of this diesel emission control strategy would require installation of a dedicated storage tank, then the owner may request prior approval from the Executive Officer to allow use of a lower level diesel emission control strategy under the BACT requirements.
 - (b) If an owner elects to use level 2 fuel-based diesel emission control strategy across its fleet, and some equipment can use a level 3 hardware diesel emission control strategy, then the owner may request prior approval from the Executive Officer to allow use of the level 2 fuel-based diesel emission control strategy across his whole fleet under the BACT requirements.
3. **Equipment to Alleviate an Emergency Event:** Equipment to alleviate an emergency event is exempt from this rule.
4. **Compliance Extension for an Engine Near Retirement:** The BACT retrofit requirements in Table 1 do not need to be applied to engines scheduled to be retired from the fleet within one year of the applicable compliance deadline. The owner does not need to apply BACT to those engines, provided (1) BACT has been or is being applied to all other engines in the owner's fleet, and (2) the owner maintains appropriate records and documentation regarding the assigned retirement dates and the engines are retired on or before the assigned dates.

5. **Use of Experimental Diesel Particulate Matter Emission Control Strategies:** An owner may apply to the Executive Officer for a compliance extension for the use of an experimental, or non-verified, diesel PM control strategy if a VDECS is not available or if the owner can demonstrate that an existing VDECS is not feasible for their equipment or application. The owner or operator shall keep documentation of this use in records as specified. The application must include emissions data and detailed control technology description demonstrating the experimental control achieves at least a Level 1 diesel PM emission reduction. If the application demonstrates that the device achieves at least 25% reductions in PM, it may be treated like a Level 1 VDECS for the purposes of complying with the performance requirements in IV. If the application demonstrates that the device achieves at least 50% reductions in PM, it may be treated like a Level 2 VDECS. If the application demonstrates that the device achieves at least 85% reductions in PM, it may be treated like a Level 3 VDECS.

Each equipment engine retrofit with the experimental strategy will be considered to be in compliance for the duration of the experiment, until it expires. The owner must bring the equipment into compliance within six months of the expiration of the experimental diesel PM emission control strategy extension.

6. **Compliance Extension for Equipment Manufacturer Delays.** An owner or operator who has purchased new equipment in order to comply with this regulation, will be considered to be in compliance if the new equipment has not been received due to manufacturing delays as long as the following conditions are met:
- (a) The equipment was purchased, or the owner and seller had entered into contractual agreement for the purchase, at least six months prior to the required compliance date; and
 - (b) Proof of purchase, such as a purchase order or signed contract for the sale, including engine specifications for each applicable piece of equipment, must be maintained by the owner and provided to an agent or employee of ARB upon request.

V. Labeling –

- a. **Apply for engine identification number** – By January 1, 2008, fleet owners and those leasing equipment for more than a year must apply for an engine identification number for each engine in mobile diesel-fueled off-road compression ignition equipment with maximum power of 25 horsepower or greater. Applications for an identification number should be submitted electronically per the guidelines specified for electronic data reporting, or mailed or delivered to ARB at the address listed immediately below:

California Air Resources Board
Mobile Source Control Division (Off-road Equipment)

P.O. Box 2815
Sacramento, CA 95812

- b. **Label with engine identification number** – Within 30 days of receipt of the ARB-issued identification number, owner/operators shall permanently affix or paint the identification number(s) for each engine on the equipment in clear view according to the following specification:
1. The ARB identification number shall be preceded by the letters “ARB”
 2. The identification number shall be black on a white background.
 3. The identification number shall be located in clear view on the left (port) side of the outside of the vehicle approximately 5 feet above the ground, or, if the equipment is not 5 feet tall, on the highest point of the vehicle.
 4. Each character in the identification number shall be at least 3 inches (7.5 centimeters) in height and 1.5 inches (3.8 centimeters) in width.
 5. The identification number shall be maintained in a manner that retains its legibility for the entire life of the equipment.

VI. Reporting –

Reporting is required for each fleet. Large and Medium fleets may report separately for different divisions or subsidiaries of a given company, but the responsibility for the accuracy and timely of reporting remains the responsibility of the primary owner. ARB will design a form for submittal of the required reporting information.

- a. **Initial equipment reporting** – Owners of small, medium, and large fleets must submit the information in a.1. through a.3. to ARB by April 1, 2008.
1. **Owner Contact Information**
 2. **Engine List** – A list of each engine subject to the off-road in-use rule in the fleet as of March 1, 2008, and the equipment manufacturer, equipment model, equipment model year, the engine identification number, engine manufacturer, engine family, engine serial number, engine model year, engine maximum horsepower, Emission Factor as defined in Section IV.a., type of retrofit emission control equipment (if any), date installed, and its verification level. The fleet owner must report the horsepower and Emission Factor for each engine, but if any other information is unknown, the owner may report “unknown.”
 3. **Low-Use Equipment** – For equipment that owners intend to define as low-use, report the hour meter readings for the last three calendar years and the dates of reading, as well as the average annual hours of use based on a three calendar-year rolling engine-hour average. If less than three calendar years of engine operating hour data are available, the annual engine operating hours since March 1, 2007 may be reported.

b. Annual Reporting and Compliance Demonstration – Fleet owners must submit the information in b.1. through b.4. to ARB by April 1 of each reporting year. Large fleet reporting years include each year from 2009 to 2020. Medium fleet reporting years include each year from 2010 to 2020. Small fleet reporting years include each year from 2015 to 2025. ARB will design a form for submittal of the required reporting information.

1. **Owner Contact Information**

2. **Compliance Certification** – A certification signed by a responsible official that the information reported is accurate and that the fleet is in compliance.

3. **Engine List** – A list of each engine subject to the off-road in-use rule in the fleet as of March 1 of the reporting year, and the equipment manufacturer, equipment model, equipment model year, the engine identification number, engine manufacturer, engine family, engine serial number, engine model year, engine maximum horsepower, Emission Factor as defined in Section IV.a., assigned retirement date for any engines near retirement as in IV.e.4., type of retrofit emission control equipment (if any), date installed, and its verification level. For any engines or retrofit equipment ordered but which have not been received as of March 1 of the reporting year, provide the purchase date. The fleet owner must report the horsepower and Emission Factor for each engine, but if any other information is unknown, the owner may report “unknown.”

4. **Low-Use Equipment** – For equipment defined as low-use, report the hour meter readings for the last three calendar years and the dates of reading, as well as the engine identification number and annual hours of use based on a three calendar-year rolling engine-hour average. If less than three years of engine operating hour data are available, the average annual engine operating hours since March 1, 2007 may be reported.

VII. **Record keeping** –

Fleet owners must maintain the information reported under VI.a. and VI.b., as well as the records described in VII.a. and VII.b. below, and provide them to an agent or employee of the Air Resources Board upon request.

a. VDECS Failure – Records of any VDECS failure and replacement

b. Fuel Strategy – Records of any approval from ARB Executive Officer to use a fuel strategy as in IV.e.2.

c. Experimental Diesel PM Control Strategy – For fleets using an experimental diesel PM control strategy, approval from the Executive Officer for use of the experimental diesel PM control strategy, the test plan and test data used in the experimental diesel PM control strategy application, etc.

d. Manufacturer Delay – For any equipment or VDECS for which the fleet owner is utilizing the equipment manufacturer delay provision in IV.e.7, proof of purchase, such as a purchase order or signed contract for the sale, including engine specifications for each applicable piece of equipment.

VIII. **Right of Entry** – For the purpose of inspecting off-road equipment and their records to determine compliance with these regulations, an agent or employee of the Air Resources Board has the right to enter any facility (with any necessary safety clearances) where off-road equipment is located or off-road equipment records are kept.

Appendix A – Emission Factors for Engines not Certified to a PM Emission Standard [g/bhp-hr]

The following table lists emission factors representing surrogate engine standards for unregulated engines. The emission factors were calculated with the new engine (zero-hour) emissions factors and deterioration rates from the OFFROAD model at 5,000 hours of operation for engines 25 to 49 horsepower and 8,000 hours of operation for engines greater than or equal to 50 horsepower. The hours of operation are consistent with the durability requirements identified in the engine emissions standards (Title 13, CCR, Sections 2423(b)(8) and 2421(a)(59)) for regulated off-road engines. A compliance margin of 20 percent was added, consistent with the compliance margin calculated by the OFFROAD model for regulated engines.

Horsepower Range	Engine Model Year									
	<1970	1970-71	1972-87	1988-95	1996	1997	1998	1999	2000-02	2003
25-49	0.950	0.950	0.950	0.950	0.950	0.950	0.950	--	--	--
50-74	1.200	1.200	1.200	0.980	0.980	0.980	1.090	1.090	1.090	1.090
75-99	1.200	1.200	1.200	0.980	0.980	0.980	1.090	1.090	1.090	1.090
100-174	1.100	0.940	0.780	0.540	0.540	0.600	0.600	0.600	0.600	--
175-299	1.100	0.940	0.780	0.540	--	--	--	--	--	--
300-599	0.950	0.810	0.680	0.490	--	--	--	--	--	--
600-750	0.950	0.810	0.680	0.490	--	--	--	--	--	--
>750	0.950	0.810	0.680	0.490	0.500	0.500	0.500	0.500	--	--