

Internal Combustion Engines Air Updates 2010

Stationary Source or Non-road Engine?

- *Regulated stationary source:*
 1. At point of use for \geq 12 months or full operating season (3-12 months)
 - Point of use is considered to be where the engine is in operation or continuously connected (not in storage) and ready to activate. For example, an emergency engine connected to the grid and available to provide electricity at any time.
 - It does not include engines in storage, waiting to be deployed for use, and not connected or available to serve as backup power.
 - If an engine is replaced at a point of use with another engine, you consider both engines when calculating consecutive time period. For example, an engine connected to a tub grinder is in place for six months and is replaced with a different engine for another eight months. Because an engine has been at the same point of use for 14 months, the second engine is treated as a stationary source.
 2. Not used to propel a motor vehicle
 3. Not a non-road engine as defined in 40 CFR 1068.30
 - Non-road engines are self-propelled or serve a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers).
 - Used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers).
 - By itself or in or on a piece of equipment, it is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another (wheels, skids, carrying handles, dolly, trailer, or platform).
 - ★ Must be moved to remain non-road (remember “point of use”)
 - ★ Does not include temporary stationary sources, e.g., asphalt plants, concrete batch plants, etc.

- ★ Non-road engines attached to & are integral part of temporary stationary source are considered stationary.

Permitting

- Stationary Engines
 - We do not permit or report emissions from non-road engines.
- Construction Permits
 - Might be units that need a permit that didn't obtain at the time of installation
 - Based on when the unit is installed and potential emissions
 - Diesel Engines
 - June 6, 1972 – December 14, 1993
 - 50 lb/24-hours NO_x
 - 67 HP engine
 - After December 15, 1993
 - 40 tons/year NO_x
 - 295 HP engine
 - After May 29, 1995
 - Consider Net Emissions Increase
 - Gasoline Engines
 - June 6, 1972 – June 4, 1988
 - 50 lb/24-hours NO_x
 - 190 HP engine
 - June 5, 1988 - December 14, 1993
 - 100 tons/year CO
 - 52 HP engine
 - After December 15, 1993
 - 50 tons/year CO
 - 26 HP engine
 - After May 29, 1995
 - Consider Net Emissions Increase
 - Natural Gas Engines
 - June 6, 1972 – December 14, 1993
 - 50 lb/24-hours NO_x
 - 94 HP engine
 - After December 15, 1993
 - 40 tons/year NO_x
 - 413 HP engine
 - After May 29, 1995
 - Consider Net Emissions Increase

- May want to take limits in construction permit
 - 500 hr/year – may reduce requirements
 - Hours of operation or fuel usage
 - May reduce or eliminate modeling required
 - Emergency or Limited Use – limit your use to only operate in emergency situations with some testing or limited use
 - Lesser NSPS & NESHAP requirements
- Operating Permits
 - If you only need permit due to emissions from an emergency generator for power backup
 - No permit needed
 - Provide report if operate >500 hours in 12 months
 - Engines no longer qualify as an insignificant activity
 - All are affected sources under NESHAP (& maybe NSPS) even if you have no requirements under the rules

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- Stationary sources
- 40 CFR Part 63 Subpart ZZZZ for Reciprocating Internal Combustion Engines – 63.6580
- What you need to know to determine applicability and compliance
 - Major or area source of HAP
 - New or existing source
 - Manufacture date of engine
 - Installation date of engine
 - Startup date of engine
 - Fuel combusted: diesel, natural gas, dual fuel, landfill/digester gas
 - Brake horsepower site rating
 - Displacement in liters/cylinder
- 3 significant actions, each include regulations for different types of engines
 - Original: June 15, 2004 (Correction: June 26, 2006)
 - Revision: January 18, 2008
 - Revision: March 3, 2010

Engine Type & Applicable Rules	Major source	Area source
Existing and > 500hp	Yes (2004 rule) ¹ Compression Ignition (2010 rule) ⁴	Compression Ignition (2010 rule) ³
Existing and ≤ 500 hp	Compression Ignition (2010 rule)	
New/reconstructed and > 500hp	Yes (2004 rule) ¹	Yes (2008 rule) ^{2, 3}
New/reconstructed and ≤ 500 hp	Yes (2008 rule) ²	

¹For the 2004 rule, new or reconstructed means that construction or reconstruction of the RICE commenced on or after December 19, 2002. Otherwise, it is existing.

²For the 2008 rule, new or reconstructed means that construction or reconstruction of the RICE commenced on or after June 12, 2006. Otherwise, it is existing.

³Horsepower designations do not apply to area sources.

⁴Non-emergency CI engines with a site rating >500 HP

- Rules for existing spark ignition to be final in August 2010 – No requirements until then
 - Existing major ≤ 500 HP & existing area sources
 - 4SLB
 - 2SLB
 - 4SRB
 - Landfill/Digester Gas

- No requirements under NESHAP or NSPS Subparts IIII or JJJJ
 - Existing residential, commercial, & institutional at area sources
 - Existing limited use >500 HP at major source
 - Existing emergency >500 HP at major source
 - Existing spark ignition 4SLB >500 HP at major source
 - Existing spark ignition 2SLB >500 HP at major source
 - Existing landfill digester gas >500 HP at major source
 - New reconstructed or constructed on or after 6/12/06 and before 1/1/08 that is non-emergency spark ignition ≥ 250 HP at major source

- No requirements under NESHAP, subject to NSPS (as applicable)
 - New or reconstructed area sources
 - New or reconstructed major sources ≤ 500 HP
 - Limited Use
 - Emergency
 - Non-emergency compression ignition
 - Spark ignition < 250 HP
 - Spark ignition 2SLB
 - Spark ignition 4SRB
 - Landfill/Digester Gas

- Limited requirements under NESHAP, subject to NSPS (as applicable)
 - Must submit NESHAP initial notification
 - New reconstructed or constructed > 500 HP at major source
 - Emergency
 - Limited Use
 - Limited monitoring, recordkeeping, and reporting
 - Landfill/digester gas that is new reconstructed or constructed > 500 HP at major source
 - Install non-resettable hour meter
 - New or reconstructed and manufactured after 1/1/08 that is emergency spark ignition 4SLB ≥ 250 HP at major source

- Existing compression ignition area sources
 - Subject to 3/3/10 rules
 - ≤ 300 HP, emergency, and black start
 - Work practice standards
 - Change oil, inspect air cleaner & hoses periodically
 - Emergency – non-resettable hour meter
 - No initial notification or compliance status notification required
 - Non-emergency engines > 300 HP
 - Subject to numerical emission standards for carbon monoxide.
 - 49 ppmvd @ 15% O₂ for CO or 70% reduction of CO.
 - May need control equipment to meet limits.
 - Initial testing required
 - Install a closed crankcase ventilation system or an open crankcase filtration emission control system.

- With a displacement of less than 30 liters per cylinder subject to fuel requirements.
- Non-emergency engines > 500 HP
 - 23 ppmvd @ 15% O₂ for CO or 70% reduction CO.
 - Utilizing oxidation catalyst required to follow operating limitations, monitor the pressure drop across the catalyst, and maintain the catalyst inlet temperature.
 - Initial testing and every 8,760 hours of operation or every three years.
 - Limited use engines – initial testing and every 8,760 hours or every five years.
- Initial notification required by 8/31/10
- Compliance status notification required by 7/2/13
- All engines have startup requirements
 - Minimize idling at startup to less than 30 minutes.
- Compliance Date = 5/3/13
- Existing compression ignition at major sources
 - Subject to 3/3/10 rules
 - <100 HP, emergency, and black start
 - Work practice standards
 - Change oil, inspect air cleaner & hoses periodically
 - Emergency – non-resettable hour meter
 - No initial notification or compliance status notification required
 - Non-emergency engines ≥ 100 HP
 - Subject to numerical emission standards for carbon monoxide or formaldehyde.
 - 230 ppmvd @ 15% O₂ CO
 - May need control equipment to meet limits.
 - Initial testing required
 - Non-emergency engines > 300 HP
 - 49 ppmvd @ 15% O₂ CO or 70% reduction of CO
 - Install a closed crankcase ventilation system or an open crankcase filtration emission control system.
 - With a displacement of less than 30 liters per cylinder subject to fuel requirements.
 - Ultra Low Sulfur Diesel Fuel with sulfur content of 15 ppm maximum

- Non-emergency engines > 500 HP
 - 23 ppmvd @ 15% O₂ CO or 70% reduction of formaldehyde
 - Utilizing oxidation catalyst required to follow operating limitations, monitor the pressure drop across the catalyst, and maintain the catalyst inlet temperature.
 - Initial testing and every 8,760 hours of operation or every three years.
 - Limited use engines - initial testing and every 8,760 hours or every five years.
 - Initial notification required by 8/31/10
 - Compliance status notification required by 7/2/13
 - All engines have startup requirements
 - Minimize idling at startup to less than 30 minutes.
 - Compliance Date = 5/3/13
- New or reconstructed spark ignition at major source manufactured after 1/1/08 that is non-emergency spark ignition 4SLB ≥ 250 and ≤ 500 HP
 - Subject to 1/18/08 rules – may be subject to NSPS
 - Subject to numerical emission standards for formaldehyde (14 ppmvd @ 15% O₂) or carbon monoxide (93% reduction)
 - Operating limitations if using catalyst
 - Initial testing required.
 - Compliance Date = 1/18/08 or upon startup
 - Initial Notification due 7/16/08 or 120 days after startup
- Existing and new or reconstructed spark ignition 4SRB at major source >500 HP
 - Subject to 6/15/04 rules, may be subject to NSPS
 - Subject to numerical emission standards for formaldehyde (76% reduction or 350 ppbv @ 15% O₂).
 - Operating limitations using non-selective catalytic reduction.
 - Conduct initial testing and semiannual testing.
 - Compliance Date = 6/15/07 (existing) & 8/16/04 or upon startup (new)
 - Initial Notification due 12/13/04 or 120 days after startup
 - Compliance Status Notification due 8/14/07 (existing) or 10/15/04 or 60 days after compliance date (new)
- New or reconstructed compression ignition, 4SLB, and 2SLB >500 HP at major source
 - Subject to 6/15/04 rules, may be subject to NSPS

- Subject to numerical emission standards for formaldehyde or carbon monoxide
 - CI – formaldehyde (580 ppbvd @ 15% O₂) or CO (70% reduction)
 - 2SLB – formaldehyde (12 ppmvd @ 15% O₂) or CO (58% reduction)
 - 4SLB – formaldehyde (14 ppmvd @ 15% O₂) or CO (93% reduction)
- Operating limitations if using catalyst
- Conduct initial testing and semiannual testing.
- Compliance Date = 8/16/04 or upon startup
- Initial Notification due 12/13/04 or 120 days after startup
- Compliance Status Notification due 10/15/04 or 60 days after compliance date

New Source Performance Standards (NSPS)

- Stationary sources
- What you need to know to determine applicability and compliance
 - Manufacture date of engine
 - Order date of engine
 - Fuel combusted: diesel, natural gas, dual fuel, landfill/digester gas
 - Brake horsepower site rating or KW site rating
 - Displacement in liters/cylinder
 - Certified and labeled per 40 CFR Part 89, 94, or 1039
 - Fire pump engine? Certified per National Fire Protection Association (NFPA)?
 - Testing conducted on that unit or similar unit?
- 40 CFR Part 60 Subpart IIII for Compression Ignition Internal Combustion Engines – 60.4200
 - Final 7/11/06
 - Proposed amendments – 6/8/10
 - Applicability
 - Engine ordered after 7/11/05 and
 - Non-fire pump manufactured after 4/1/06 or
 - Certified NFPA fire pump engine manufactured after 7/1/06
 - Engine modified or reconstructed after 7/11/05
 - Emission standards dependant on model year and engine size or displacement in liters/cylinder for NO_x, NMHC, CO, & PM
 - Non-emergency: Pre-2007 model year and 2007 and later

- Emergency: Pre-2007 model year; 2007 and later; fire pumps; and all ≥ 30
 - Testing for engines < 30 liters/cylinder
 - Pre-2007 model year
 - Certified per 40 CFR 80 or 94, performance test of similar unit, or manufacturer data, or control device manufacturer data demonstrating compliance with emission standards OR
 - Conduct performance test to demonstrate compliance
 - 2007 and later model year
 - Must be certified
 - Testing for engines ≥ 30 liters/cylinder
 - All model years
 - Conduct performance test and
 - Establish operating parameters for continuous monitoring and submit petition to EPA for approval
 - Conduct annual performance tests
 - Fuel Standards
 - 10/1/07 – Low Sulfur Diesel – 500 ppm
 - 10/1/10 – Displacement <30 liters/cylinder – Ultra Low Sulfur Diesel - 15 ppm
 - Emergency Engines
 - Install non-resettable hour meter
 - Keep records
 - Using diesel particulate filter
 - Install backpressure monitor
 - Initial Notification – only non-emergency – date of construction (installation on site) within 30 days
 - >3,000 HP **or**;
 - Displacement >10 liters/cylinder **or**;
 - Pre-2007 model year >175 HP and not certified.
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- 40 CFR Part 60 Subpart JJJJ for Spark Ignition Internal Combustion Engines – 60.4230
 - Final 1/18/08
 - Proposed amendments – 6/8/10
 - Applicability
 - Engine modified or reconstructed after 6/12/06
 - Engine ordered after 6/12/06 and
 - Engine (except lean burn) ≥ 500 HP manufactured after 7/1/07

- Lean burn ≥ 500 HP and $< 1,350$ HP manufactured after 1/1/08
 - Engine < 500 HP manufactured after 7/1/08
 - Emergency > 25 HP manufactured after 1/1/09
 - Temporary engines certified as non-road engine at stationary source for < 1 year exempt from NSPS
- Emissions standards – vary depending on engine type, fuel, engine HP, and manufacture date – NO_x, CO, & VOC
- Installation requirements – must meet emission standards
 - ≥ 500 HP (not lean burn) installed after 7/1/09
 - Lean burn ≥ 500 HP and $< 1,350$ HP installed after 1/1/10
 - < 500 HP installed after 7/1/10
 - Emergency > 25 HP installed after 1/1/11
- Gasoline engines - sulfur standards of 30 ppm per gallon average and maximum of 80 ppm per gallon
- Following engines must be certified:
 - All ≤ 25 HP
 - Gasoline > 25 HP
 - LPG rich burn > 25 HP
 - Others may be certified by manufacturer to comply with standards
- Certified Engines
 - Must be labeled
 - Must keep maintenance records, operate according to manufacturer's instructions, and keep record from manufacturer that engine meets standards
 - If not required to be certified – can purchase certified engine to comply with standards – keep records
 - If certified engine is not operated according to manufacturer's instructions
 - Considered not certified
 - Maintenance plan and records
 - Initial performance test for engines ≥ 100 HP
 - Periodic testing for engines > 500 HP
- Non-Certified Engines
 - Must keep maintenance records, operate according to maintenance plan, and keep record from that engine meets standards
 - Initial performance test for engines ≥ 25 HP
 - Periodic testing for engines > 500 HP
- Emergency Engines
 - Must install non-resettable hour meter

- ≥ 500 HP built on or after 7/1/10 and doesn't meet standards for non-emergency engines
 - ≥ 130 HP and < 500 HP built on or after 1/1/11 and doesn't meet standards for non-emergency engines
 - < 130 HP built on or after 7/1/08 and doesn't meet standards for non-emergency engines
- Keep records of hours operated
 - No limit for emergency situations
 - < 100 hours per year maintenance and testing
 - ≤ 50 hours for non-emergency (can't sell to grid), but has to be included in 100 hour limit
- Initial notification for non-certified engines > 500 HP - date of construction (installation on site) within 30 days