Connecticut Department of Energy and Environmental Protection

Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (RICE Rule)

40 CFR 63 Subpart ZZZZ
Major Source New Non-Emergency Spark Ignition 4-Stroke Rich Burn Engine ≤500 Horsepower

Connecticut Department of Energy and Environmental Protection

To comply with this rule, you must meet the following standards:

- Comply with Spark Ignition New Source Performance Standards (SI NSPS) (40 CFR 60 Subpart JJJJ) at all times.

Spark Ignition New Source Performance Standards (SI NSPS)

You are subject to the SI NSPS (40 CFR 60 subpart JJJJ) if your engine was:

–Constructed (ordered*) after June 12, 2006 **AND**

- 500 HP manufactured on/after July 1, 2007
- <500 HP manufactured on/after July 1, 2008

OR

–Modified/reconstructed after June 12, 2006

*NOTE: For the purposes of this rule, the date that construction commences is the date the engine is ordered by the owner or operator.

Spark Ignition New Source Performance Standards (SI NSPS)

Photo credit: EPA

<u>If you are subject to the SI NSPS,</u>
<u>you must meet these requirements:</u>

- **Emission and Operating Limits, Testing Requirements, Monitoring Requirements:**
  - See Table
  - Must meet these standards for the life of the engine
- **Fuel Requirements:**
  - Gasoline engines must use gas that meets the sulfur limit: cap of 80 ppm/gal

Spark Ignition New Source Performance Standards (SI NSPS)

If you are subject to the SI NSPS, you must meet these requirements:

- **Compliance Requirements:**
  - If you have a *certified* engine:
    - Install, operate, and maintain engine according to manufacturer's instructions
    - If you do not operate/maintain according to manufacturer's instructions for engines ≥100 HP:
      - –Keep maintenance plan and maintenance records, operate consistent with good air pollution control practices
      - –Initial performance test and retest if engine is rebuilt or undergoes major repair or maintenance
  - If you have a *non-certified* engine >25 HP:
    - Maintenance plan
    - Initial performance test and retest if engine is rebuilt or undergoes major repair or maintenance

- **Recordkeeping/Reporting:**
  - Documentation of certification (EPA Certificate of Conformity)
  - Records of engine maintenance
  - Initial notification for non-certified engines with HP=500
  - Notification of Intent to Conduct Performance Testing 30 days prior to test
  - Results of performance testing within 60 days of test

Engine Certification

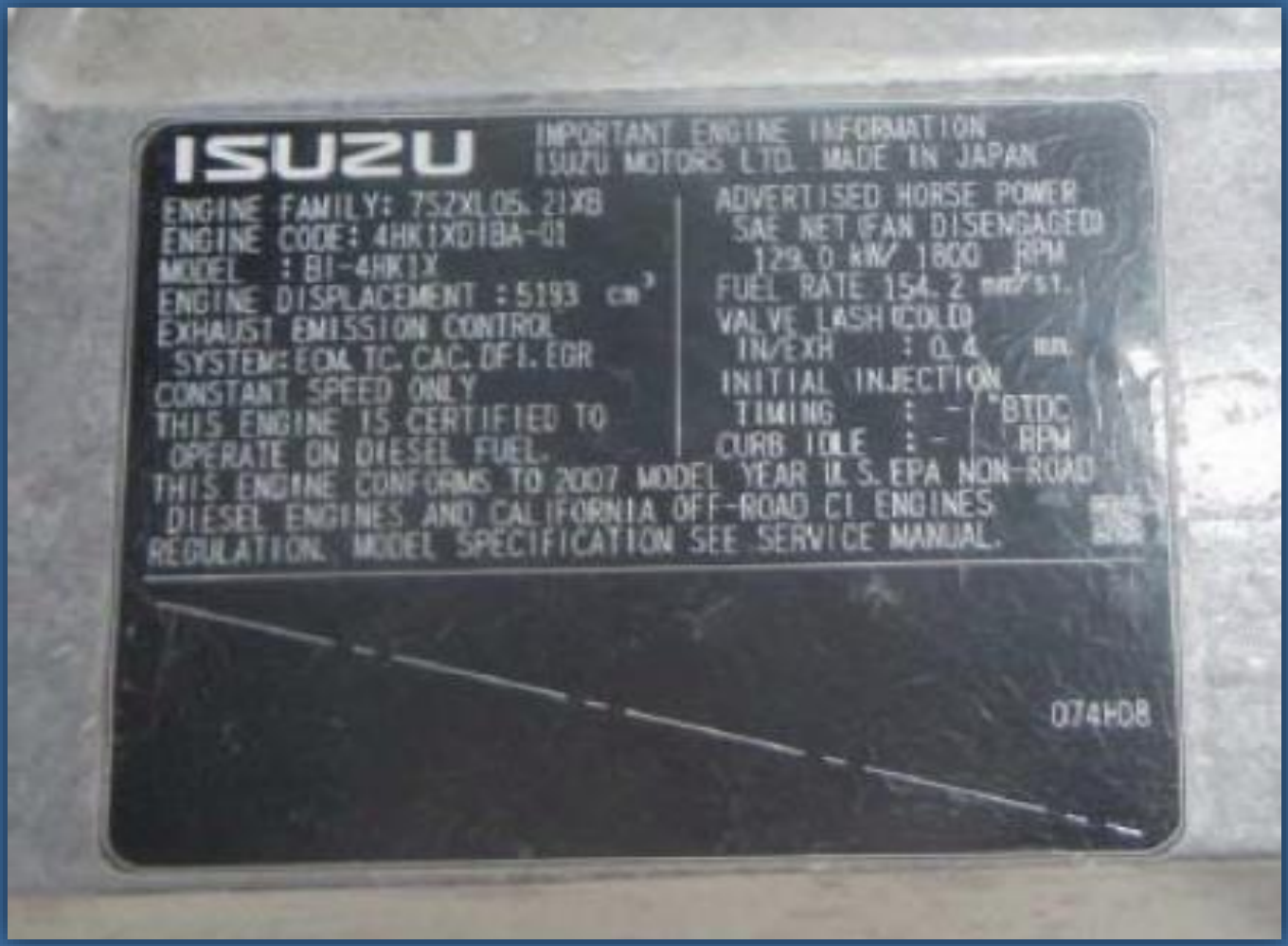
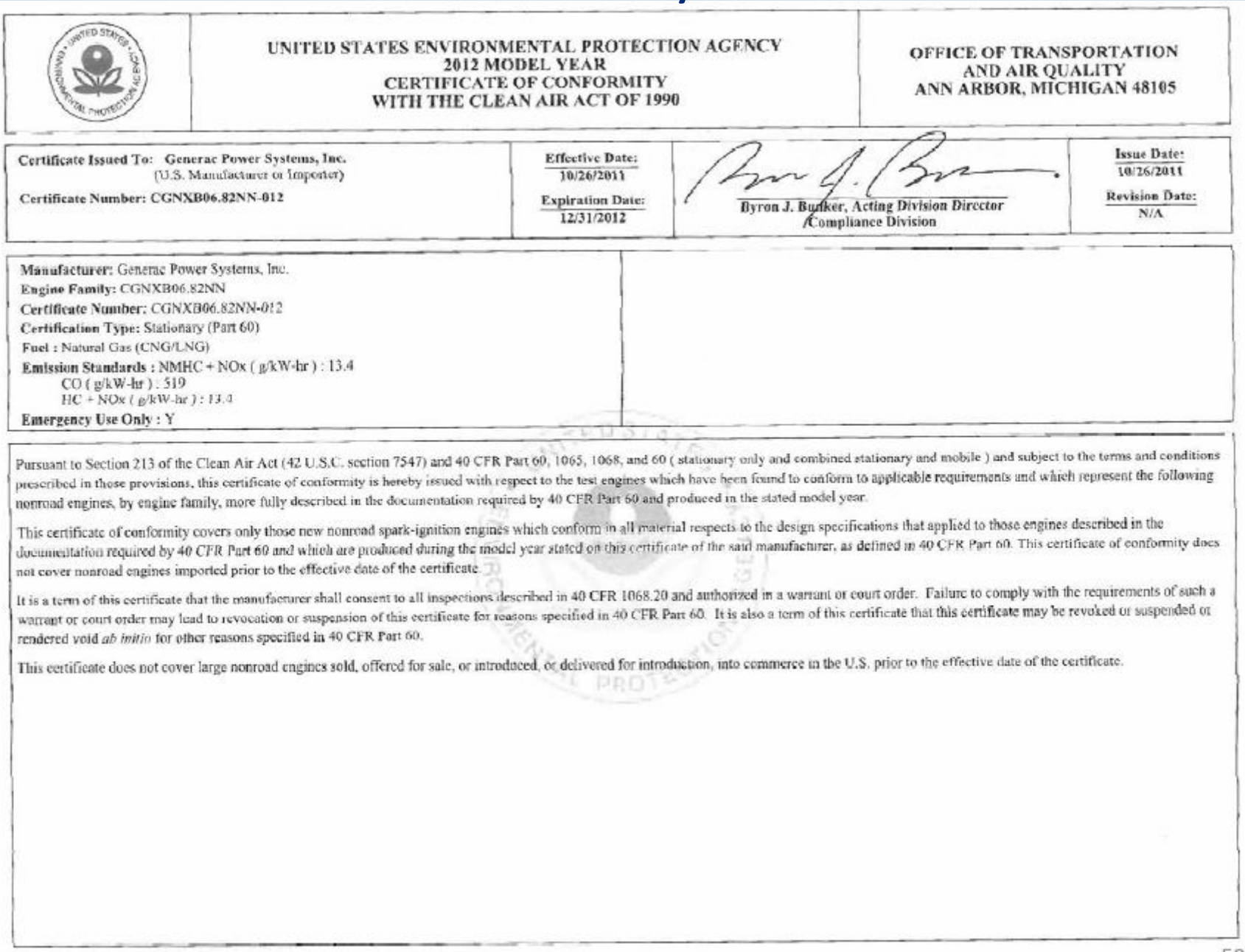


Photo credit: EPA

EPA Certificate of Conformity



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2012 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT OF 1990

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Generac Power Systems, Inc.
(U.S. Manufacturer or Importer)

Certificate Number: CGNXB06.82NN-012

Effective Date: 10/26/2011

Expiration Date: 12/31/2012

Byron J. Bunker, Acting Division Director
Compliance Division

Issue Date: 10/26/2011

Revision Date: N/A

Manufacturer: Generac Power Systems, Inc.
Engine Family: CGNXB06.82NN
Certificate Number: CGNXB06.82NN-012
Certification Type: Stationary (Part 60)
Fuel : Natural Gas (CNG/LNG)
Emission Standards : NMHC + NOx (g/kW-hr) : 13.4
CO (g/kW-hr) : 519
HC + NOx (g/kW-hr) : 13.4
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

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Photo credit: EPA

Engine Category	Date Constructed/ Reconstructed/ Manufactured	Size/Engine Type/Fuel	Emission Standards	Importing/ Installing Requirements[5]	Compliance Requirements				Notification, Reports, and Records Reqs	General Reqs (40 CFR part 60)
					Engines being operated and maintained in a certified manner[1]		Engines being operated and maintained in a non-certified manner[2]			
					General Compliance	Performance Testing	General Compliance	Performance Testing		
<500 HP	Commenced construction after 6/12/2006 and manufactured on or after 7/1/2008	≤25 HP	60.4231(a) 60.4233(a)	60.4236(a),(d)	60.4243(a)(1) If using AFRC: 60.4243(g) 40 CFR part 1068, subparts A-D.	None	60.4243(a)(2)(i) If using AFRC: 60.4243(g)	None	60.4245(a)	60.4246 Table 3
		25<HP<500 Gasoline	60.4231(b) 60.4233(b)				If using AFRC: 60.4243(g) **<100 HP:** 60.4243(a)(2)(i) **100≤HP:** 60.4243(a)(2)(ii)	**<100 HP**: None **100≤HP**: 60.4243(a)(2)(ii)[4] 60.4244	60.4245(a),(d)	
		25<HP<500 Rich Burn LPG	60.4231(c) 60.4233(c)							
		25<HP<100 (except gasoline and rich burn LPG)	60.4233(d)[3]	60.4236(a)	If using AFRC: 60.4243(g) **Certified**: 60.4243(b)(1) **Non-certified:** 60.4243(b)(2)	**Certified**: None **Non-Certified**: 60.4243(b)(2)(i)[4], 60.4244	60.4243(a)(2)(i) If using AFRC: 60.4243(g)	**All Engines**: 60.4244 **Certified**: ≥100 HP: 60.4243(a)(2)(ii) **Non-Certified**: 60.4243(b)(2)(i)[4]		
		100≤HP<500 (except gasoline and rich burn LPG)	60.4233(e)[4] Table 1				60.4243(a)(2)(ii) If using AFRC: 60.4243(g)	**All Engines**: 60.4244 **Certified**: 60.4243(a)(2)(ii) **Non-Certified**: 60.4243(b)(2)(i)[4]		
500 HP	Commenced construction after 6/12/2006 and manufactured on or after 7/1/2007	≥500 HP Gasoline	60.4231(b) 60.4233(b)	60.4236(b),(d)	If using AFRC: 60.4243(g) **Manufactured before 7/1/2008:** 60.4243(h) **Manufactured after 7/1/2008:** 60.4243(a)(1) 40 CFR part 1068, subparts A-D, as applicable.	None	If using AFRC: 60.4243(g) **Manufactured before 7/1/2008**: 60.4243(h) **Manufactured after 7/1/2008**: 60.4243(a)(2)(iii)	**Manufactured before 7/1/2008**: None **Manufactured after 7/1/2008**: 60.4243(a)(2)(iii)[4] 60.4244	**All Engines**: 60.4245(a),(d) **Non-certified**: 60.4245(c)	
		500 HP Rich Burn LPG	60.4231(c) 60.4233(c)				If using AFRC: 60.4243(g) **Manufactured before 7/1/2008**: 60.4243(h)	**Manufactured before 7/1/2008**: None **Manufactured after 7/1/2008**: 60.4243(a)(2)(iii)[5] 60.4244		
		500 HP (except gasoline and rich burn LPG)	60.4233(e)	60.4236(b)	If using AFRC: 60.4243(g) **Certified**: 60.4243(b)(1) 60.4243(a)(1) **Non-certified**: 60.4243(b)(2)	**Non-Certified**: 60.4243(b)(2)(ii), 60.4244 **Certified**: None	60.4243(a)(2)(iii) If using AFRC: 60.4243(g)	60.4243(a)(2)(iii) 60.4244		
Modified/ Reconstructed	Modified or reconstructed after 6/12/2006	≤25 HP	60.4233(f)(1)	None	If using AFRC: 60.4243(g) 60.4243(i)				60.4245(a)	
		>25 HP Gasoline	60.4233(f)(2)						60.4245(a),(d)	
		>25 HP Rich Burn LPG	60.4233(f)(3)							
		>25 HP natural gas and lean burn LPG	60.4233(f)(4)							

[1]If you operate and maintain the certified engine and control device according to the manufacturer's emission-related instructions, you are operating in a certified manner.

[2]If you do not operate and maintain the certified engine and control device according to manufacturer's emission-related instructions, engine will be considered a non-certified engine.

[3]Owners and operators of ICE with a maximum power >19 KW (25 HP) and <75 KW (100 HP) manufactured prior to January 1, 2011, that were certified to the standards in Table 1 to the rule applicable to engines with a maximum power ≥100 HP and <500 HP, may optionally choose to meet those standards.

[4]If you own/operate an engine ≤500 HP and you purchase a non-certified engine or you do not operate and maintain your certified engine and control device according to the manufacturer's emission-related instructions, you are required to perform initial performance testing as indicated in this section, but you are not required to conduct subsequent performance testing unless the engine is rebuilt or undergoes major repair or maintenance. A rebuilt ICE means an engine that has been rebuilt as that term is defined in 40 CFR 94.11(a).

[5]The requirements of this section do not apply to ICE that have been modified or reconstructed, and they do not apply to engines that were removed from one existing location and reinstalled at a new location.

Test Methods

Conduct performance tests according to the procedures in (a) through (f):

(a) Each test must be conducted within 10% of 100% peak (or the highest achievable) load and according to the requirements in 40 CFR 60.8 and under the specific conditions that are specified by Table 2 to the rule.

(b) You may not conduct tests during startup, shutdown, or malfunctions, as specified in 40 CFR 60.8(c). If your RICE is non-operational, you do not need to startup the engine solely to conduct a test; however, you must conduct the test immediately upon startup of the engine.

(c) Conduct 3 test runs for each test required in this section, as specified in 40 CFR 60.8(f). Each run must be conducted within 10% of 100% peak (or the highest achievable) load and last at least 1 hour.

Test Methods

Conduct performance tests according to the procedures in (a) through (f):

(d) To determine compliance with the NO_X mass per unit output emission limitation, convert the concentration of NO_X in the engine exhaust using the following equation:

$ER = (C_d \times 1.912 \times 10^{-3} \times Q \times T)/HP\text{-}hr$

Where:

ER = Emission rate of NO_X in g/HP-hr.

C_d= Measured NO_X concentration in parts per million by volume (ppmv).

1.912×10^{-3} = Conversion constant for ppm NO_X to grams per standard cubic meter at 20°C.

Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis.

T= Time of test run, in hours.

HP-hr = Brake work of the engine, horsepower-hour (HP-hr).

(e) To determine compliance with the CO mass per unit output emission limitation, convert the concentration of CO in the engine exhaust using the following equation:

$ER = (C_d \times 1.164 \times 10^{-3} \times Q \times T)/HP\text{-}hr$

Where:

ER = Emission rate of CO in g/HP-hr.

C_d= Measured CO concentration in ppmv.

1.164×10^{-3} = Conversion constant for ppm CO to grams per standard cubic meter at 20°C.

Test Methods

(f) When calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limit, convert the concentration of VOC in the engine exhaust using:

$ER = (C_d \times 1.833 \times 10^{-3} \times Q \times T)/HP\text{-}hr$

Where:

ER = Emission rate of VOC in g/HP-hr.

C_d= VOC concentration measured as propane in ppmv.

1.833×10^{-3} = Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20°C.

Photo credit: EPA

Test Methods

(g) If you choose to measure VOC emissions using either Method 18 of 40 CFR part 60, appendix A, or Method 320 of 40 CFR part 63, appendix A, then you have the option of correcting the measured VOC emissions to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 can be corrected for response factor differences using the following equations. The corrected VOC concentration can then be placed on a propane basis using the last equation in this section.

$$RF_i = C_Mi/C_Ai$$

Where:

RF_i= Response factor of compound i when measured with EPA Method 25A.

C_Mi= Measured concentration of compound i in ppmv as carbon.

C_Ai= True concentration of compound i in ppmv as carbon.

$$Ci_{corr} = RF_i \times Ci_{meas}$$

Where:

Ci_{corr}= Concentration of compound i corrected to the value that would have been measured by EPA Method 25A, ppmv as carbon.

Ci_{meas}= Concentration of compound i measured by EPA Method 320, ppmv as carbon.

$$C_{Peq} = 0.6098 \times Ci_{corr}$$

Where:

C_{Peq}= Concentration of compound i in mg of propane equivalent per DSCM.

Where do I send any reports?

EPA REGION 1:

US Environmental Protection Agency
5 Post Office Square, Suite 100, Mail code: OES04-2
Boston, MA 02109-3912
Attention: Air Clerk

By when must I comply with the rule?

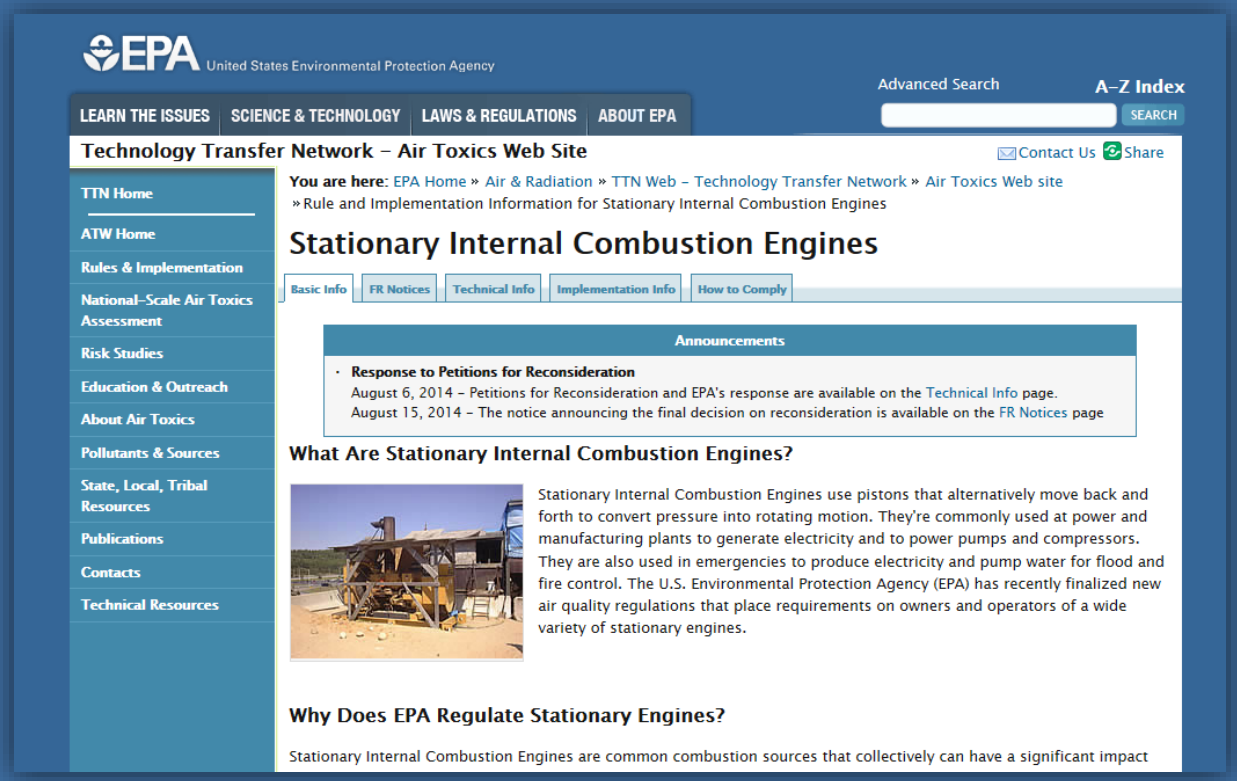
Upon startup

Photo credit: EPA

Visit the EPA RICE Compliance Page

www.epa.gov/ttn/atw/icengines

- Fact sheets
- Regulations
- Example notifications
- Announcements
- Q & A documents
- Testing advice
- Recorded webinars
- …and more!



Take Aways

Engine Type:

•A new or reconstructed non-emergency spark ignition 4-stroke rich burn engine ≤500 HP

Limits, Testing, and Monitoring Requirements:

•See Table

Take Aways

Recordkeeping:

•Documentation of certification (EPA Certificate of Conformity)

•Records of engine maintenance

Reporting:

•Results of performance testing within 60 days of test

Compliance Date:

•You must comply with the requirements of this rule upon startup of the engine.