

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

For engines below 100 HP at major sources or engines below 300 HP at area sources (as well as for emergency-use engines) there are no prescribed emissions control requirements.

CO Emissions must be controlled for engines between 100 and 300 HP at major sources to a limit of 230 ppm. For engines between 300 and 500 HP at either a major or area source, CO emissions must be controlled to 49 ppm, or alternatively the engine must achieve a 70% CO₂ reduction. For engines larger than 500 HP, CO emissions must be controlled to 23 ppm, or alternatively the engine must achieve a 70% CO₂ reduction.

Hoses and Belts must be inspected on all of these engines after 500 hours, or annually, and replaced “as necessary.” Air cleaners must be inspected at 1000 hours, or at least annually.

Oil and Filters must be replaced at 500 hours, or annually, except for non-emergency engines smaller than 100 HP at major sources or smaller than 300 HP at area sources where this inspection can be deferred until 1000 hours. For engines with a compliant oil analysis program, these limits may be extended.

Startup Requirements pursuant to 40 CFR Subpart E, apply to these CI engines.

Initial Performance Tests must also be performed on every engine greater than 100 HP at a major source or greater than 300 HP at an area source. For those greater than 500HP, **recurring tests** are also required during the lesser of every 3 years (or 5 years for “limited use” engines at area sources), or 8760 hours.

Oxidation Catalyst is required on engines over 300 HP and must maintain a pressure drop of not more than 2 psi and an inlet temperature between 450 and 1350°F. These must be continually monitored for engines larger than 500 HP, or if a catalyst is not being used, those operating parameters required by the Administrator must be continually monitored.

Recordkeeping is required for non-emergency engines larger than 100 HP. Records must include hours of operation per a non-resettable hour meter, oil and filter change dates, inspection and replacement of air cleaners, hoses and belts, and other emission-related service, all by date and. Records of maintenance per manufacturer’s requirements are also required for crankcase systems (closed ventilation or open filtration) for covered engines over 300 HP.

Reporting is required for stationary CI RICE on a semi-annual basis (or annual basis for limited-use) , as listed in the NESHAP General Provisions, 40 CFR part 63, subpart A, including initial notification, notification of performance test, and notification of compliance. Deviations and malfunctions must also be reported. Annual fuel consumption and heating value reports are also required.

This rule is effective May 3, 2010. Compliance is required by May 3, 2013.

Draft - Proposed Existing Engine NESHAP^a Overview^b - Draft

Engine Rule Applicability													RICE MACT Final Rule NESHAP, Subpart ZZZZ <ul style="list-style-type: none"> Proposed December 19, 2002 Finalized February 26, 2004 Existing if pre 12/19/02 Applies to engines > 500 hp at major sources of HAPs Controls HAPs – formaldehyde Complex administrative burdens for notifications, testing, monitoring and SSM Plans (start-up, shutdown, and malfunctions). Few engines are controlled by this rule, Many companies choose to over control emission to become area source to avoid administrative burden. Engines <500 hp delayed due to lack of sufficient data. 	Compression Ignition NSPS Final Rule NSPS^c, Subpart IIII <ul style="list-style-type: none"> Proposed July 11, 2005 Finalized July 11, 2006 Applies to all new/reconstructed (after July 11, 2005) compression ignition (CI, diesel fueled engines) Controls criteria pollutants (NOx, CO, PM and HC) Uses manufacture emission certification for most engines Some non-certified engines have emission limits Operator responsible for maintenance and operation to manufacturer recommendations, as well as maintaining emission limits for life of engine. Restricts definition of emergency and adds requirements for these engines.
HP	Major Sources						Area Sources							
	Existing			New/Reconstructed			Existing			New/Reconstructed				
	CI	RB	LB	CI	RB	LB	CI	RB	LB	CI	RB	LB		
>1350	Oxy Cat	NSCR		Oxy Cat	NSCR	Oxy Cat	Oxy Cat	NSCR	Oxy Cat	MC	NSCR	CBT		
500-1350	Oxy Cat	NSCR		Oxy Cat	NSCR	Oxy Cat	Oxy Cat	NSCR	Oxy Cat	MC	NSCR	CBT		
300-500	Oxy Cat	NSCR	Oxy Cat	MC	NSCR	CBT/Oxy Cat	Oxy Cat	NSCR	Oxy Cat	MC	NSCR	CBT		
250-300	EL - 230	NSCR	Oxy Cat	MC	NSCR	CBT/Oxy Cat	MMP	NSCR	Oxy Cat	MC	NSCR	CBT		
100-250	EL - 230	NSCR	EL	MC	NSCR	CBT	MMP	NSCR	Maint ¹	MC	NSCR	CBT		
50-100	MMP	NSCR	EL	MC	NSCR	CBT	MMP	NSCR	Maint ¹	MC	NSCR	CBT		
25-50	MMP	EL	EL	MC	NSCR	CBT	MMP	Maint ²	Maint ²	MC	NSCR	CBT		
<25	MMP	EL	EL	MC	MC	MC	MMP	Maint ²	Maint ²	MC	MC	MC		

Maint¹ – Maintenance requirements for engines not requiring catalyst and >50 hp include changing oil every 500 hours, replacing spark plugs every 1000 hours and inspecting the hoses and belts every 1000 hours.
 Maint² – Maintenance requirements for engines not requiring catalyst and <50 hp include changing oil every 200 hours, replacing spark plugs every 500 hours and inspecting the hoses and belts every 500 hours.
 EL – Emission Limit set for existing engines located at major sources and not requiring catalyst (for LB in PPMvd CO @15% O2)
 MC – Manufacturer Certification is required for almost all diesel, gasoline or LPG fueled engines. MC required for natural gas (NG) fueled engines <25 hp, but voluntary for all other sizes of NG fueled engines.
 CBT – Clean Burn Technology New lean burn are able to meet the Stage 1 emission limits of this rule with at least clean burn technology.
 NSCR – Non-Selective Catalytic Reduction; CI – Compression Ignition; RB – Rich Burn; LB – Lean Burn; MACT – Max Achievable Control Tech

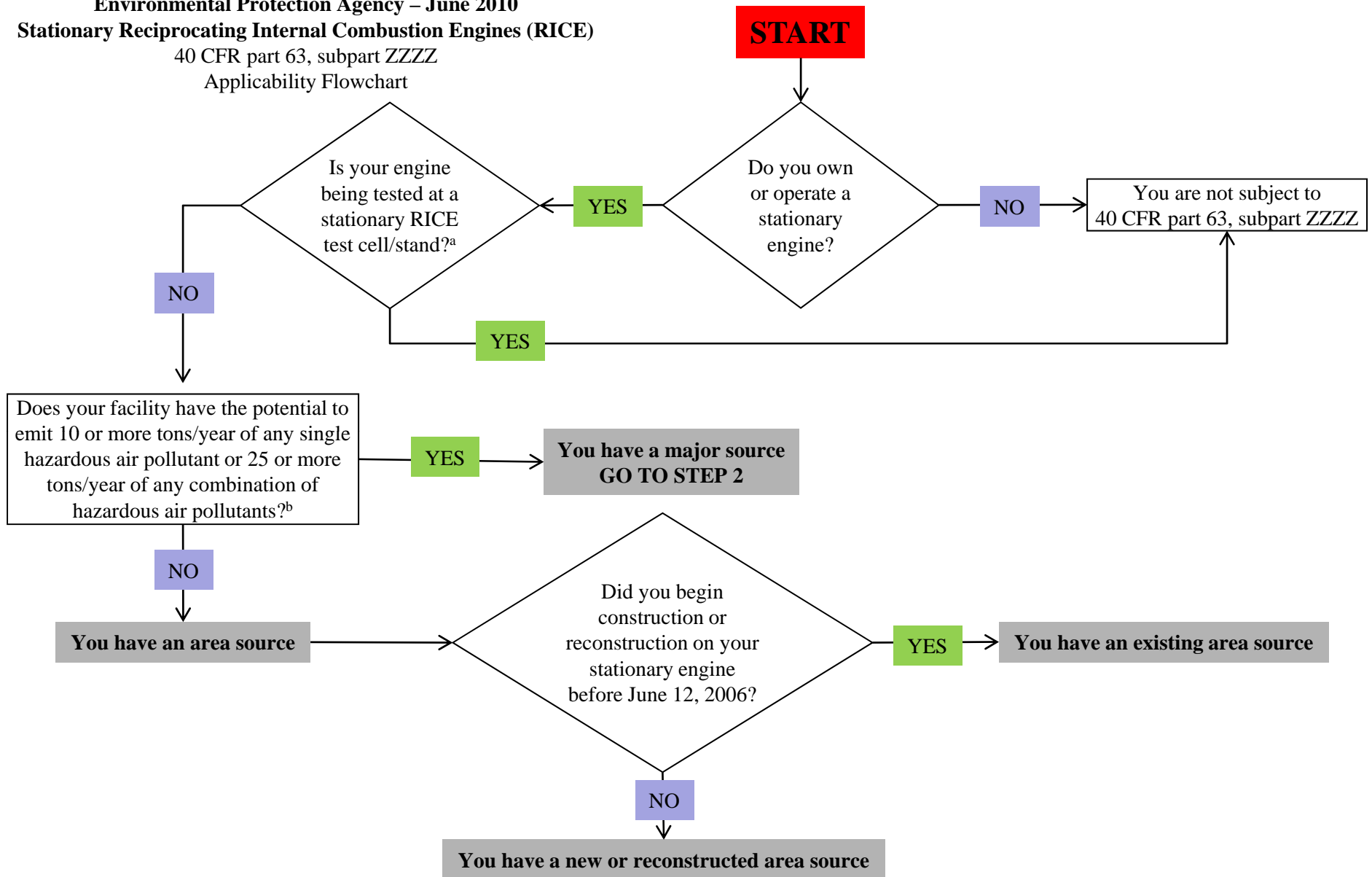
<p align="center">Existing SI Engine NESHAP Proposed Rule</p> <p align="center">General Rule Information</p> <ul style="list-style-type: none"> Proposal published March 4, 2009 Consent decree final SI Rule Deadline - August 10, 2010 Existing if constructed before 6/12/2006 Two new engine groups covered <ul style="list-style-type: none"> All existing engines at area sources Existing engines <500 hp at major sites Revised rules for <ul style="list-style-type: none"> Adds emission standard for startup and malfunction periods for all engines. <p align="center">Basic Issues</p> <ul style="list-style-type: none"> Use of MMP in lieu of controls at rural area sources Cost in economic justification for above the floor emission controls (catalyst). Use of operational variability in the calculation of the MACT floor MMP frequency of 1,440 hrs for all maintenance practices (i.e. oil change, spark plug replacement and hose/belt inspection). Obtain final approval of Method 323 as an alternative formaldehyde test to FTIR 	<p align="center">Rule Requirements</p> <ul style="list-style-type: none"> Requirements apply at all times; including startup, shutdown and malfunction (SSM) events Rich burn engines >50 hp require NSCR <ul style="list-style-type: none"> Formaldehyde controlled limit 200 ppbvd Formaldehyde uncontrolled limit 2 ppmvd Lean burn engines >250 hp require Oxy Cat <ul style="list-style-type: none"> CO used as surrogate for HAPs Controlled limit is 10% of uncontrolled 4SLB uncontrolled limit is 95 ppmvd 2SLB uncontrolled limit is 85 ppmvd Performance test requirements for catalyst <ul style="list-style-type: none"> 100 – 500 hp initial performance test >500 hp initial & every 8760 run hours <p align="center">Contradictory Provisions</p> <ul style="list-style-type: none"> Existing LB engines >500 hp at major sources require no controls, while all other LB engines >250 hp require controls New and Existing RB engines >500 hp at major sources have 350 ppbvd formaldehyde limit, while RB have 200 ppbvd limit the proposed rule. 	<p align="center">Final Diesel Existing Engine NESHAP</p> <ul style="list-style-type: none"> Final Rule Published March 3, 2010 SSM Provision Effective Date – May 3, 2010 Existing Engine Compliance Date – May 3, 2013 <p align="center">Improved Requirements</p> <ul style="list-style-type: none"> 200 hr oil change frequency for small engines (<300 hp) increased to 500 hr for emergency and 1000 hr for non-emergency engines. Emission limits for emergency and <100 hp at major sources replaced by maintenance management practice (MMP) Increased emission limit/decrease control efficiency <ul style="list-style-type: none"> 300-500 hp – 49 PPMvd CO or 70% Reduction >500 hp – 23 PPMvd CO or 70% Reduction Added an oil condition analysis (OCA) option to changing the oil. Start-up work practice allowance of max. 30 min. for warm-up w/o EL. SSM Plans requirements appear to be removed, but text still vague. <p align="center">New or More Stringent Requirements</p> <ul style="list-style-type: none"> Malfunction emission limit raised from MACT Floor to same as in normal operation Added MMP requirement to inspect air filter every 1000 hr Added requirement for crankcase ventilation control of oil mist, particulate and metallic HAPs for engines >300 hp. 	<p align="center">Consolidated Engine Final Rule NSPS, Subpart JJJJ & Amendments to NESHAP, Subpart ZZZZ</p> <ul style="list-style-type: none"> Proposed: June 12, 2006; Final: January 18, 2008 Three separate rules in one <ul style="list-style-type: none"> New Source Performance Standard (NSPS, 40 CFR, Part 60) Subpart JJJJ NESHAP, MACT Small Engine Standard at a Major Source National Emission Standards for Hazardous Air Pollutants (NESHAP) Areas Source Standard Applies to new/reconstructed (after July 12, 2006) spark ignition (SI; natural gas, gasoline or LPG fueled) engines <p align="center">NSPS, Subpart JJJJ Rule Summary</p> <ul style="list-style-type: none"> Controls criteria pollutants (NOx, CO, PM and HC) Some engines have Manufacture Certification requirement (see MC note in table) All engines have maintenance requirements Most engines require performance testing (initial test for engines <500 hp, initial and every 8760 hours for engines >500 hp). <p align="center">NESHAP, Subpart ZZZZ Rule Summary</p> <ul style="list-style-type: none"> Most engine categories demonstrate NESHAP compliance by NSPS compliance <ul style="list-style-type: none"> CO and VOCs are used as a surrogate for HAPs (predominately formaldehyde) No NESHAP requirements, notifications or General Provisions apply Lean burn engines between 250 hp and 500 hp at major sources have requirements that are identical to the 2004 RICE MACT (except that new/ reconstructed/existing threshold date is June 12, 2006) Restricts definition of emergency and adds requirements for these engines.
--	---	---	---

^a NESHAP – National Emission Standards for Hazardous Air Pollutants, found in 40 CFR, Part 63.

^b This is a **Draft Overview Only and is NOT intended to be used as a compliance tool** because regulatory requirements have been left out for simplification and brevity. Its purpose is to promote a general understanding of the multiple new regulations that cover Internal Combustion Engines (ICE).

^c NSPS – New Source Performance Standard, found in 40 CFR, Part 60.

Environmental Protection Agency – June 2010
Stationary Reciprocating Internal Combustion Engines (RICE)
 40 CFR part 63, subpart ZZZZ
 Applicability Flowchart



^aAn engine test cell/stand is any apparatus used for testing uninstalled stationary or uninstalled mobile (motive) engines.

^bFor assistance in determining the potential to emit, please refer to <http://www.epa.gov/ttn/chief/ap42/index.html> or contact your EPA regional office or state permitting staff. To determine the potential to emit, you may use emission factors from <http://www.epa.gov/ttn/chief/ap42/ch03/index.html>, test data, or other published information.

Environmental Protection Agency – June 2010
Stationary Reciprocating Internal Combustion Engines (RICE)
40 CFR part 63, subpart ZZZZ
Applicability Flowchart

