

YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT

RULE 2.32 -- STATIONARY INTERNAL COMBUSTION ENGINES

(Revised October 10, 2001)

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100 GENERAL

101 **PURPOSE:** The purpose of this Rule is to limit the emission of oxides of nitrogen (NO_x) and carbon monoxide (CO) from stationary internal combustion engines.

102 **APPLICABILITY:** This Rule applies to any stationary internal combustion engine rated at more than 50 brake horsepower, operated on any gaseous fuel, including liquid petroleum gas (LPG), or diesel fuel. This Rule shall not apply to engines used directly and exclusively for agricultural operations necessary for the growing of crops or the raising of fowl or animals.

110 **EXEMPTIONS:** The provisions of this Rule, except for Section 503, shall not apply to the operation of stationary internal combustion engines used under any the following conditions:

110.1 Engines rated 50 brake horsepower or less, or

110.2 Engines operated less than 200 hours per calendar year, or

110.3 Emergency standby engines operated either during an emergency or maintenance operation. Maintenance operation is limited to 50 hours per calendar year, or

110.4 Engines used in research or teaching programs, or

110.5 Engine test stands used for evaluating engine performance, or

110.6 Diesel engines with a permitted capacity factor of 15 percent or less, or

110.7 Diesel engines used to power cranes and

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welding equipment.

200 DEFINITIONS

201 **DIESEL ENGINE:** A compression ignited two or four-stroke engine in which liquid fuel injected into the combustion chamber ignites when the air charge has been compressed to a temperature sufficiently high for auto-ignition.

202 **EMERGENCY STANDBY ENGINE:** An internal combustion engine used only as follows:

202.1 When normal power line or natural gas service fails.

202.2 For the emergency pumping of water for either fire protection or flood relief.

An emergency standby engine may not be operated to supplement a primary power source when the load capacity or rating of the primary power source has either been reached or exceeded.

203 **ENGINE RATING:** The rating of an engine as determined by the engine manufacturer and listed on the nameplate of the engine, regardless of any derating.

204 **LEAN-BURN ENGINE:** Any two or four-stroke spark-ignited engine where the manufacturer's original recommended air-to-fuel ratio operating range is fuel lean of stoichiometry, and the engine normally operates with an exhaust oxygen concentration of greater than 2 percent.

205 **MAINTENANCE OPERATION:** The use of an emergency standby engine and fuel system during testing, repair and routine maintenance to verify its readiness for emergency standby use.

206 **PERMITTED CAPACITY FACTOR:** The annual permitted fuel use divided by the product of the manufacturer's

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specified maximum hourly fuel consumption times 8,760 hours per year.

- 207 **RICH-BURN ENGINE:** A two or four-stroke spark-ignited engine that is not a lean burn engine.
- 208 **STATIONARY INTERNAL COMBUSTION ENGINE:** Any internal combustion engine of the reciprocating type that is operated at a site for more than one year or is attached to a foundation, not including engines used for self-propulsion.
- 209 **STOICHIOMETRY:** The precise air/fuel ratio where all fuel and all oxygen in the air/fuel mixture will be consumed.

300 STANDARDS

301 LIMITS:

- 301.1 After the applicable compliance date specified in Section 401.1 of this Rule, the owner or operator of a stationary internal combustion engine to which this Rule is applicable shall limit the emissions from that engine to no more than the following:
 - a. Rich-burn stationary internal combustion engine NO_x emissions shall not exceed 9.5 g/bhp-hr or 640 ppmv and CO emissions shall not exceed 2,000 ppmv.
 - b. Lean-burn stationary internal combustion engine NO_x emissions shall not exceed 10.1 g/bhp-hr or 740 ppmv and CO emissions shall not exceed 2,000 ppmv.
 - c. Diesel fired stationary internal combustion engine NO_x emissions shall not exceed 9.6 g/bhp-hr or 700 ppmv and CO emissions shall not exceed 2,000 ppmv.

where g/bhp-hr = grams per brake

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		horsepower hour
ppmv	=	parts per million volume at 15% oxygen on a dry basis
NO _x	=	oxides of nitrogen
CO	=	carbon monoxide

301.2 In lieu of compliance with the NO_x emission limits specified in Section 301.1 of this Rule, engines shall not exceed the following emission limits in accordance with the compliance schedule in Section 401.2 of this Rule:

- a. Rich-burn stationary internal combustion engine NO_x emissions shall not exceed 90 ppmv and CO emissions shall not exceed 2,000 ppmv.
- b. Lean-burn stationary internal combustion engine NO_x emissions shall not exceed 150 ppmv and CO emissions shall not exceed 2,000 ppmv.
- c. Diesel fired stationary internal combustion engine NO_x emissions shall not exceed 600 ppmv and CO emissions shall not exceed 2,000 ppmv.

where ppmv = parts per million volume at 15% oxygen on a dry basis
 NO_x = oxides of nitrogen
 CO = carbon monoxide

301.3 In lieu of the emission limits specified in Sections 301.1 or 301.2 of this Rule, an owner or operator of an internal combustion engine may elect to replace the unit with an electric motor or permanently remove the engine from service in accordance with the applicable compliance schedule specified in Section 401.3 of this Rule.

301.4 After the applicable compliance date specified in Section 401.4 of this Rule, the owner or operator of a stationary internal

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combustion engine to which this Rule is applicable shall limit the emissions from that engine to no more than the following:

- a. Rich-burn stationary internal combustion engine NO_x emissions shall not exceed 90 ppmv and CO emissions shall not exceed 2,000 ppmv.
- b. Lean-burn stationary internal combustion engine NO_x emissions shall not exceed 150 ppmv and CO emissions shall not exceed 2,000 ppmv if the engine rating is greater than 100 horsepower.
- c. Lean-burn stationary internal combustion engine NO_x emissions shall not exceed 300 ppmv and CO emissions shall not exceed 2,000 ppmv if the engine rating is less than or equal to 100 horsepower.
- d. Diesel fired stationary internal combustion engine NO_x emissions shall not exceed 600 ppmv and CO emissions shall not exceed 2,000 ppmv.

where ppmv = parts per million volume
at 15% oxygen on a dry basis
NO_x = oxides of nitrogen
CO = carbon monoxide

302 **ENGINE OPERATOR INSPECTION PLAN:** The operator of an engine subject to the provisions of Section 301 of this Rule shall submit to the Air Pollution Control Officer an Engine Operator Inspection Plan. The plan shall be approved by the Air Pollution Control Officer in writing. The plan shall be updated after any change in operation. For new engines and modifications to existing engines, the plan shall be submitted to and approved by the Air Pollution Control Officer prior to issuance of the Authority to Construct. The operator may request a change to the plan at any time. The plan shall include the following:

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- 302.1 The manufacturer, model number, rated horsepower, and combustion method (i.e., rich-burn, lean-burn, or diesel) of the engine.
- 302.2 A description of the NOx control system installed on the engine (if any), including type (e.g., nonselective catalyst, "clean-burn" combustion) and manufacturer, as well as a description of any ancillary equipment related to the control of emissions (e.g., automatic air/fuel ratio controller, fuel valves).
- 302.3 The company identification and location of the engine by a schematic of the affected facilities.
- 302.4 A specific emission inspection procedure to assure that the engine is operated in continual compliance with the provisions of this Rule. The procedure shall include an inspection schedule. Inspections shall be conducted every quarter or after every 2,000 hours of engine operation. In no event shall the frequency of inspection be less than once per year.
- 302.5 Each preventative or corrective maintenance procedure or practice that will be used to maintain the engine and NOx control system in continual compliance with the provisions of this Rule.

303 SOURCE TESTING:

- 303.1 Engines subject to the provisions of this rule shall be source tested using the methods specified in sections 502.1, 502.2, 502.3 and 502.5 at least once every 24 months.

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303.2 During any year which a source test is not performed, a screening analysis using the methods specified in sections 502.4 and 502.5 of the rule shall be performed. The screening analysis shall be performed for NOx and CO. A reading in excess of the emission standards shall not be considered a violation, so long as the engine is brought into compliance within 15 days of the initial reading, as verified with a subsequent screening analysis.

304 MONITORING EQUIPMENT:

304.1 An owner or operator of an engine subject to this rule shall install a non-resettable totalizing fuel meter and/or a non-resettable hour meter that measures elapsed operating time, as determined appropriate by the Air Pollution Control Officer.

400 ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE SCHEDULE:

401.1 Owners or operators of existing engines shall comply with the applicable provisions of Section 301.1 of this Rule in accordance with the following schedule:

- a. No later than March 10, 1995, submit to the Air Pollution Control Officer:
 - (i) An Engine Operator Inspection Plan pursuant to Section 302 of this Rule and a complete application for an Authority to Construct, as necessary; or
 - (ii) Support documentation for each exempt engine, pursuant to Section 503 of this Rule.
- b. Demonstrate full compliance with all provisions of this Rule no later than

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May 31, 1995.

- 401.2 Owners or operators of existing engines shall comply with the applicable provisions of Section 301.2 of this Rule in accordance with the following schedule:
- a. No later than March 10, 1995, submit to the Air Pollution Control Officer:
 - (i) An Engine Operator Inspection Plan pursuant to Section 302 of this Rule; or
 - (ii) Support documentation for each exempt engine, pursuant to Section 503 of this Rule.
 - b. Submit a complete application for an Authority to Construct for all modifications no later than May 31, 1995.
 - c. Demonstrate full compliance with the applicable provisions of this Rule no later than May 31, 1997.

401.3 An owner or operator that elects to replace a stationary internal combustion engine with an electric motor as specified in Section 301.3 of this Rule or permanently removes the engine from service shall demonstrate compliance with all the applicable requirements of this Rule no later than May 15, 1999. The owner or operator shall submit a complete application for an Authority to Construct for conversion to electric power no later than January 1, 1997, and shall commence conversion of the unit no later than January 1, 1999 or permanently remove the engine from service by May 15, 1999.

- 401.4 Owners or operators of existing engines shall comply with the applicable provisions of Section 301.4 of this Rule in accordance with the following schedule:
- a. No later than March 8, 2002, submit to

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the Air Pollution Control Officer a complete application for an Authority to Construct, as necessary.

- b. Demonstrate full compliance with all provisions of this Rule, including source testing as required by Section 303.1 and monitoring equipment as required by Section 304, no later than March 7, 2003.

402 **REPORTING REQUIREMENTS:** Prior to renewal of any Permit to Operate, each operator subject to the provisions of this Rule shall provide the Air Pollution Control Officer with a report specifying the actual annual usage (e.g., fuel consumption, actual operating hours) of each affected engine. The report shall also include the engine manufacturer, model number, Permit number, and location of each affected engine, a summary of the maintenance and inspection events required in Section 302 of this Rule, and results from the annual emissions testing event.

403 **VIOLATIONS:**

403.1 Failure to comply with any provision of this Rule shall constitute a violation of this Rule.

403.2 It is the responsibility of the engine operator to demonstrate to the satisfaction of the Air Pollution Control Officer that an engine subject to the provisions of this Rule is being operated in continuous compliance with all applicable provisions of this Rule.

403.3 An engine shall be in violation if it is operated out of compliance with the operating parameters of an approved Engine Operator Inspection Plan. However, if data from a source test of the engine operating

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under identical conditions indicates that the engine is in compliance with the requirements of this Rule, then a violation will not have occurred. The source test shall be conducted at the engine operator's expense. The Engine Operator Inspection Plan shall be amended to reflect the information from this source test.

500 MONITORING AND RECORDS

501 **RECORDS:** The operator of any engine subject to the provisions of Section 301 of this Rule shall maintain an inspection log containing at a minimum, the following data:

- 501.1 Identification and location of each engine subject to the provisions of this Rule;
- 501.2 Date and results of each emission inspection;
- 501.3 The reading of the totalizing fuel meter or the non-resettable hour meter installed pursuant to Section 304.1.
- 501.4 A summary of any corrective emissions maintenance actions taken to ensure compliance with the emissions limits in Sections 301.1, 301.2 or 301.4 of this Rule; and
- 501.5 Any additional information required in the Engine Operator Inspection Plan.

The operator shall maintain the inspection log for a period of two years after the date of each entry. The log shall be available for inspection by the Air Pollution Control Officer upon request.

502 TEST METHODS:

- 502.1 Oxides of nitrogen emissions for compliance

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source tests shall be determined in accordance with EPA Method 7E or CARB Method 100.

502.2 Carbon Monoxide emissions for compliance source tests shall be determined in accordance with EPA Method 10 or CARB Method 100.

502.3 Oxygen content for compliance source tests shall be determined in accordance with EPA Method 3A or CARB Method 100.

502.4 Screening analyses shall be performed by using a portable analyzer approved in writing by the Air Pollution Control Officer.

502.5 NO_x emission limitations specified in Sections 301.1, 301.2 and 301.4 of this Rule shall be expressed as nitrogen dioxide. All ppmv emission limitations are referenced at 15 percent volume stack gas oxygen measured on a dry basis. Source test data point intervals shall be no greater than 5 minutes and data points shall be averaged over 15 consecutive minutes.

503 EXEMPTION RECORDS:

503.1 An owner or operator claiming an exemption under Sections 110.2 or 110.3 of this Rule shall maintain a log of operating hours for each engine. The log of operating hours shall be retained for two years and be made available to the Air Pollution Control Officer upon request.

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