Large Spark Ignition Engines

Overview

- Sector description
- Who must certify
- Reporting requirements
- Special provisions
- Important considerations – Maps and Leaks
- Special test procedures
- Alternative useful life
- Diagnosing malfunctions
- Compliance assistance

Sector Description

- Governed by 40 CFR 1048
- Also covered by 40 CFR 60 JJJJ
- What is included
  - Mobile applications greater than 19 kw maximum power
  - Stationary applications – Applications greater than 19 kw
    - Emergency
    - Non-emergency
- Part 1065 testing requirements apply
- Part 1068 applies

Who Must Certify

- All manufacturers of spark ignition mobile non-road engines except those covered by:
  - 40 CFR 1051 – Recreational engines and vehicles
  - 40 CFR 1045 – Propulsion marine engines
  - 40 CFR 1033 – Locomotives
- All manufacturers of stationary spark ignition engines except
  - SI engines less than 19 kw
  - SI engines less than 30 kw and with a displacement less than 1,000 cc (optional to certify to 40 CFR 1054)
  - Voluntary Certification 40 CFR 60.4241 and Table 1
    - Greater than 19 kw and
    - Do not use Gasoline or are not rich burn LPG

Further Clarification of JJJJ

- Manufacturers participating in the voluntary program
  - Table 4 of 40 CFR 60 JJJJ indicates the applicability of provisions of 40 CFR 1048, 1065 and 1068

- Emergency generators 25 – 130 HP follow Phase 1 emission standards for class II engines in 40 CFR 90 and other new nonroad requirements of 40 CFR 90

Reporting

- Production line and in-use testing
  - Engine families subject to the requirements of 40 CFR 1048 are required to perform production line testing
  - Fill out the appropriate template and download into EVCIS
  - EPA is reviewing reporting history and is assisting manufacturers who have had or are having difficulty reporting
- Separate production reports are also required
- EPA has specific templates for reporting
  - Manufacturers are encouraged to use these templates
  - If there are problems with the template – Notify EPA
  - Do not alter the templates
    - EPA uses these for a certification streamlining process
    - Altering template will slow your certification process

Special Provisions

- Motor Vehicle Program
  - Can introduce engines certified under 40 CFR 85 and 86
  - Less than 50% of engines can be sold for non road applications
  - Proper labeling must be used (citation)
  - Must communicate intent to EPA
- Noncommercial Fuels – 40 CFR 1048.625
  - Not included in 40 CFR 1065 Subpart H descriptions
  - Must make request
  - Must be in a separate engine family
  - Specification of adjustments
  - Proper labeling
  - Contact us before hand and we will work with you on the certification process
  - Typically noncommercial fuel is wellhead gas

Important Considerations

- EPA continues to request engine maps and calculations per 40 CFR 1065.510 and 1065.610
- EPA reviewing pre-catalyst exhaust leaks
  - 40 CFR 1065.130(e)
    - Asks that a chemical balance be performed
    - EPA will ask for the results of that chemical balance or other proof that leaks are minimized
  - EPA is exploring methods of characterizing the volume of leaks
    - Will seek to add that volume to post catalyst emissions to arrive at a true emission picture
  - Will be testing during compliance tests and in-use testing
  - Engine manufacturers must ensure that equipment manufacturers install their engine in a manner that maintains exhaust integrity

Important Considerations

- Examples of Exhaust Flanges that lacked integrity

Sleeved Connection

Warped 2 Bolt Flange

Special Test Procedures

- 40 CFR 1065.10 allows for special test procedures
- What EPA looks for is a viable special test procedure
  - Compelling evidence that the standard test procedure cannot be used or is not representative
  - Evidence that use of the new test procedure does not affect your ability to show compliance to the standard
  - This is a case-by-case decision, manufacturers should consult with EPA well before any testing is required

Alternative Useful Life

- Manufacturer may request a longer or shorter useful life (40 CFR 1048.101(g)
- For a shorter in-use life the life (in hours) may be shortened but not to less than 1000 hours
- EPA examines these issues on a case-by-case basis as there are unique aspects to each

Diagnosing Malfunctions

- Engines must have a diagnostic system
  - If operated at stoichiometry it must identify when the A/F ratio does not cross stoichiometry for one minute
  - If not operated at stoichiometry – we must approve in advance your methodology of detecting when the emission control system is not functioning properly
- EPA is placing closer scrutiny on this issue
- Will be testing the diagnostic systems in the field

Compliance Assistance – Online Resources

- Support documents for Large SI:
  - Templates
  - Verify Users Manual
  - https://www.epa.gov/vehicle-and-engine-certification/support-files-all-nonroad-spark-ignition-si-engines
- General certification for Large SI:
  - https://www.epa.gov/ve-certification/certification-nonroad-nr-spark-ignition-si-engines
- Guidance Letters Library
  - https://iaspub.epa.gov/otaqpub/

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