



Michigan Department Of Environmental Quality
Air Quality Division

EFFECTIVE DATE:

ISSUED TO

Federal-Mogul Powertrain, Inc.

State Registration Number (SRN): N6327

LOCATED AT

47001 Port Street, Plymouth, Michigan 48170

RENEWABLE OPERATING PERMIT

Permit Number: MI-ROP-N6327-2009

Expiration Date: November 12, 2014

Administratively Complete ROP Renewal Application Due Between
May 12, 2013, and May 12, 2014.

This Renewable Operating Permit (ROP) is issued in accordance with and subject to Section 5506(3) of Article II, Chapter 1, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Michigan Air Pollution Control Rule 210(1), this ROP constitutes the permittee's authority to operate the stationary source identified above in accordance with the general conditions, special conditions and attachments contained herein. Operation of the stationary source and all emission units listed in the permit are subject to all applicable future or amended rules and regulations pursuant to PA 451 and the federal Clean Air Act.

SOURCE-WIDE PERMIT TO INSTALL

Permit Number: MI-PTI-N6327-2009

This Permit to Install (PTI) is issued in accordance with and subject to Section 5505(5) of Article II, Chapter 1, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Michigan Air Pollution Control Rule 214a, the terms and conditions herein, identified by the underlying applicable requirement citation of Rule 201(1)(a), constitute a federally enforceable PTI. The PTI terms and conditions do not expire and remain in effect unless the criteria of Rule 201(6) are met. Operation of all emission units identified in the PTI is subject to all applicable future or amended rules and regulations pursuant to PA 451 and the federal Clean Air Act.

Michigan Department of Environmental Quality

Teresa Seidel, Southeast Michigan District Supervisor

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AUTHORITY AND ENFORCEABILITY

For the purpose of this permit, the **permittee** is defined as any person who owns or operates an emission unit at a stationary source for which this permit has been issued. The department is defined in Rule 104(d) as the Director of the Michigan Department of Environmental Quality (MDEQ) or his or her designee.

The permittee shall comply with all specific details in the permit terms and conditions and the cited underlying applicable requirements. All terms and conditions in this ROP are both federally enforceable and state enforceable unless otherwise footnoted. Certain terms and conditions are applicable to most stationary sources for which an ROP has been issued. These general conditions are included in Part A of this ROP. Other terms and conditions may apply to a specific emission unit, several emission units which are represented as a flexible group, or the entire stationary source which is represented as a source-wide group. Special conditions are identified in Parts B, C, D and/or the appendices.

In accordance with Rule 213(2)(a), all underlying applicable requirements will be identified for each ROP term or condition. All terms and conditions that are included in a Permit to Install (PTI), are streamlined or subsumed, or are state-only enforceable will be noted as such.

In accordance with Section 5507 of Article II, Chapter 1, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, the permittee has included in the ROP application a compliance certification, a schedule of compliance, and a compliance plan. For applicable requirements with which the source is in compliance, the source will continue to comply with these requirements. For applicable requirements with which the source is not in compliance, the source will comply with the detailed schedule of compliance requirements that are incorporated as an appendix in this ROP. Furthermore, for any applicable requirements effective after the date of issuance of this ROP, the stationary source will meet the requirements on a timely basis, unless the underlying applicable requirement requires a more detailed schedule of compliance.

Issuance of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.

A. GENERAL CONDITIONS

Permit Enforceability

- All conditions in this permit are both federally enforceable and state enforceable unless otherwise noted. **(R 336.1213(5))**
- Those conditions that are hereby incorporated in a state only enforceable Source-wide PTI pursuant to Rule 201(2)(d) are designated by footnote one. **(R 336.1213(5)(a), R336.1214a(5))**
- Those conditions that are hereby incorporated in federally enforceable Source- wide PTI No. MI-PTI-N0731-2009 pursuant to Rule 201(2)(c) are designated by footnote two. **(R 336.1213(5)(b), R 336.1214a(3))**

General Provisions

1. The permittee shall comply with all conditions of this ROP. Any ROP noncompliance constitutes a violation of Act 451, and is grounds for enforcement action, for ROP revocation or revision, or for denial of the renewal of the ROP. All terms and conditions of this ROP that are designated as federally enforceable are enforceable by the Administrator of the United States Environmental Protection Agency (USEPA) and by citizens under the provisions of the federal Clean Air Act (CAA). Any terms and conditions based on applicable requirements which are designated as "state only" are not enforceable by the USEPA or citizens pursuant to the CAA. **(R 336.1213(1)(a))**
2. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this ROP. **(R 336.1213(1)(b))**
3. This ROP may be modified, revised, or revoked for cause. The filing of a request by the permittee for a permit modification, revision, or termination, or a notification of planned changes or anticipated noncompliance does not stay any ROP term or condition. This does not supersede or affect the ability of the permittee to make changes, at the permittee's own risk, pursuant to Rule 215 and Rule 216. **(R 336.1213(1)(c))**
4. The permittee shall allow the department, or an authorized representative of the department, upon presentation of credentials and other documents as may be required by law and upon stating the authority for and purpose of the investigation, to perform any of the following activities **(R 336.1213(1)(d))**:
 - a. Enter, at reasonable times, a stationary source or other premises where emissions-related activity is conducted or where records must be kept under the conditions of the ROP.
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the ROP.
 - c. Inspect, at reasonable times, any of the following:
 - i. Any stationary source.
 - ii. Any emission unit.
 - iii. Any equipment, including monitoring and air pollution control equipment.
 - iv. Any work practices or operations regulated or required under the ROP.
 - d. As authorized by Section 5526 of Act 451, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the ROP or applicable requirements.
5. The permittee shall furnish to the department, within a reasonable time, any information the department may request, in writing, to determine whether cause exists for modifying, revising, or revoking the ROP or to determine compliance with this ROP. Upon request, the permittee shall also furnish to the department copies of any records that are required to be kept as a term or condition of this ROP. For information which is claimed by the permittee to be confidential, consistent with the requirements of the 1976 PA 442, MCL §15.231 et seq.,

and known as the Freedom of Information Act, the person may also be required to furnish the records directly to the USEPA together with a claim of confidentiality. **(R 336.1213(1)(e))**

6. A challenge by any person, the Administrator of the USEPA, or the department to a particular condition or a part of this ROP shall not set aside, delay, stay, or in any way affect the applicability or enforceability of any other condition or part of this ROP. **(R 336.1213(1)(f))**
7. The permittee shall pay fees consistent with the fee schedule and requirements pursuant to Section 5522 of Act 451. **(R 336.1213(1)(g))**
8. This ROP does not convey any property rights or any exclusive privilege. **(R 336.1213(1)(h))**

Equipment & Design

9. Any collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
10. Any air cleaning device shall be installed, maintained, and operated in a satisfactory manner and in accordance with the Michigan Air Pollution Control rules and existing law. **(R 336.1910)**

Emission Limits

11. Except as provided in Subrules 2, 3, and 4 of Rule 301, states in part; "a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of Rule 301(1)(a) or (b) unless otherwise specified in this ROP." The grading of visible emissions shall be determined in accordance with Rule 303. **(R 336.1301(1) in pertinent part):**
 - a. A 6-minute average of 20 percent opacity, except for one 6-minute average per hour of not more than 27 percent opacity.
 - b. A limit specified by an applicable federal new source performance standard.
12. The permittee shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other air contaminants, either of the following:
 - a. Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.¹ **(R 336.1901(a))**
 - b. Unreasonable interference with the comfortable enjoyment of life and property.¹ **(R 336.1901(b))**

Testing/Sampling

13. The department may require the owner or operator of any source of an air contaminant to conduct acceptable performance tests, at the owner's or operator's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001(1). **(R 336.2001)**
14. Any required performance testing shall be conducted in accordance with Rule 1001(2), Rule 1001(3) and Rule 1003. **(R 336.2001(2), R 336.2001(3), R 336.2003(1))**
15. Any required test results shall be submitted to the Air Quality Division (AQD) in the format prescribed by the applicable reference test method within 60 days following the last date of the test. **(R 336.2001(4))**

Monitoring/Recordkeeping

16. Records of any periodic emission or parametric monitoring required in this ROP shall include the following information specified in Rule 213(3)(b)(i), where appropriate **(R 336.1213(3)(b))**:
 - a. The date, location, time, and method of sampling or measurements.
 - b. The dates the analyses of the samples were performed.
 - c. The company or entity that performed the analyses of the samples.
 - d. The analytical techniques or methods used.
 - e. The results of the analyses.
 - f. The related process operating conditions or parameters that existed at the time of sampling or measurement.
17. All required monitoring data, support information and all reports, including reports of all instances of deviation from permit requirements, shall be kept and furnished to the department upon request for a period of not less than 5 years from the date of the monitoring sample, measurement, report or application. Support information includes all calibration and maintenance records and all original strip-chart recordings, or other original data records, for continuous monitoring instrumentation and copies of all reports required by the ROP. **(R 336.1213(1)(e), R 336.1213(3)(b)(ii))**

Certification & Reporting

18. Except for the alternate certification schedule provided in Rule 213(3)(c)(iii)(B), any document required to be submitted to the department as a term or condition of this ROP shall contain an original certification by a responsible official which states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. **(R 336.1213(3)(c))**
19. A responsible official shall certify to the appropriate AQD District Office and to the USEPA that the stationary source is and has been in compliance with all terms and conditions contained in the ROP except for deviations that have been or are being reported to the appropriate AQD District Office pursuant to Rule 213(3)(c). This certification shall include all the information specified in Rule 213(4)(c)(i) through (v) and shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the certification are true, accurate, and complete. The USEPA address is: USEPA, Air Compliance Data - Michigan, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604. **(R 336.1213(4)(c))**
20. The certification of compliance shall be submitted annually for the term of this ROP as detailed in the special conditions, or more frequently if specified in an applicable requirement or in this ROP. **(R 336.1213(4)(c))**
21. The permittee shall promptly report any deviations from ROP requirements and certify the reports. The prompt reporting of deviations from ROP requirements is defined in Rule 213(3)(c)(ii) as follows, unless otherwise described in this ROP. **(R 336.1213(3)(c))**
 - a. For deviations that exceed the emissions allowed under the ROP, prompt reporting means reporting consistent with the requirements of Rule 912 as detailed in Condition 25. All reports submitted pursuant to this paragraph shall be promptly certified as specified in Rule 213(3)(c)(iii).
 - b. For deviations which exceed the emissions allowed under the ROP and which are not reported pursuant to Rule 912 due to the duration of the deviation, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe reasons for each deviation and the actions taken to minimize or correct each deviation.
 - c. For deviations that do not exceed the emissions allowed under the ROP, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe the reasons for each deviation and the actions taken to minimize or correct each deviation.

22. For reports required pursuant to Rule 213(3)(c)(ii), prompt certification of the reports is described in Rule 213(3)(c)(iii) as either of the following **(R 336.1213(3)(c))**:
 - a. Submitting a certification by a responsible official with each report which states that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.
 - b. Submitting, within 30 days following the end of a calendar month during which one or more prompt reports of deviations from the emissions allowed under the ROP were submitted to the department pursuant to Rule 213(3)(c)(ii), a certification by a responsible official which states that, "based on information and belief formed after reasonable inquiry, the statements and information contained in each of the reports submitted during the previous month were true, accurate, and complete". The certification shall include a listing of the reports that are being certified. Any report submitted pursuant to Rule 213(3)(c)(ii) that will be certified on a monthly basis pursuant to this paragraph shall include a statement that certification of the report will be provided within 30 days following the end of the calendar month.
23. Semiannually for the term of the ROP as detailed in the special conditions, or more frequently if specified, the permittee shall submit certified reports of any required monitoring to the appropriate AQD District Office. All instances of deviations from ROP requirements during the reporting period shall be clearly identified in the reports. **(R 336.1213(3)(c)(i))**
24. On an annual basis, the permittee shall report the actual emissions, or the information necessary to determine the actual emissions, of each regulated air pollutant as defined in Rule 212(6) for each emission unit utilizing the emissions inventory forms provided by the department. **(R 336.1212(6))**
25. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the appropriate AQD District Office. The notice shall be provided not later than two business days after the start-up, shutdown, or discovery of the abnormal conditions or malfunction. Notice shall be by any reasonable means, including electronic, telephonic, or oral communication. Written reports, if required under Rule 912, must be submitted to the appropriate AQD District Supervisor within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal conditions or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5) and shall be certified by a responsible official in a manner consistent with the CAA. **(R 336.1912)**

Permit Shield

26. Compliance with the conditions of the ROP shall be considered compliance with any applicable requirements as of the date of ROP issuance, if either of the following provisions is satisfied. **(R 336.1213(6)(a)(i), R 336.1213(6)(a)(ii))**
 - a. The applicable requirements are included and are specifically identified in the ROP.
 - b. The permit includes a determination or concise summary of the determination by the department that other specifically identified requirements are not applicable to the stationary source.

Any requirements identified in Part E of this ROP have been identified as non-applicable to this ROP and are included in the permit shield.

27. Nothing in this ROP shall alter or affect any of the following:
 - a. The provisions of Section 303 of the CAA, emergency orders, including the authority of the USEPA under Section 303 of the CAA. **(R 336.1213(6)(b)(i))**
 - b. The liability of the owner or operator of this source for any violation of applicable requirements prior to or at the time of this ROP issuance. **(R 336.1213(6)(b)(ii))**
 - c. The applicable requirements of the acid rain program, consistent with Section 408(a) of the CAA. **(R 336.1213(6)(b)(iii))**

- d. The ability of the USEPA to obtain information from a source pursuant to Section 114 of the CAA. **(R 336.1213(6)(b)(iv))**
28. The permit shield shall not apply to provisions incorporated into this ROP through procedures for any of the following:
 - a. Operational flexibility changes made pursuant to Rule 215. **(R 336.1215(5))**
 - b. Administrative Amendments made pursuant to Rule 216(1)(a)(i)-(iv). **(R 336.1216(1)(b)(iii))**
 - c. Administrative Amendments made pursuant to Rule 216(1)(a)(v) until the amendment has been approved by the department. **(R 336.1216(1)(c)(iii))**
 - d. Minor Permit Modifications made pursuant to Rule 216(2). **(R 336.1216(2)(f))**
 - e. State-Only Modifications made pursuant to Rule 216(4) until the changes have been approved by the department. **(R 336.1216(4)(e))**
29. Expiration of this ROP results in the loss of the permit shield. If a timely and administratively complete application for renewal is submitted not more than 18 months, but not less than 6 months, before the expiration date of the ROP, but the department fails to take final action before the end of the ROP term, the existing ROP does not expire until the renewal is issued or denied, and the permit shield shall extend beyond the original ROP term until the department takes final action. **(R 336.1217(1)(c), R 336.1217(1)(a))**

Revisions

30. For changes to any process or process equipment covered by this ROP that do not require a revision of the ROP pursuant to Rule 216, the permittee must comply with Rule 215. **(R 336.1215, R 336.1216)**
31. A change in ownership or operational control of a stationary source covered by this ROP shall be made pursuant to Rule 216(1). **(R 336.1219(2))**
32. For revisions to this ROP, an administratively complete application shall be considered timely if it is received by the department in accordance with the time frames specified in Rule 216. **(R 336.1210(9))**
33. Pursuant to Rule 216(1)(b)(iii), Rule 216(2)(d) and Rule 216(4)(d), after a change has been made, and until the department takes final action, the permittee shall comply with both the applicable requirements governing the change and the ROP terms and conditions proposed in the application for the modification. During this time period, the permittee may choose to not comply with the existing ROP terms and conditions that the application seeks to change. However, if the permittee fails to comply with the ROP terms and conditions proposed in the application during this time period, the terms and conditions in the ROP are enforceable. **(R 336.1216(1)(c)(iii), R 336.1216(2)(d), R 336.1216(4)(d))**

Reopenings

34. A ROP shall be reopened by the department prior to the expiration date and revised by the department under any of the following circumstances:
 - a. If additional requirements become applicable to this stationary source with three or more years remaining in the term of the ROP, but not if the effective date of the new applicable requirement is later than the ROP expiration date. **(R 336.1217(2)(a)(i))**
 - b. If additional requirements pursuant to Title IV of the CAA become applicable to this stationary source. **(R 336.1217(2)(a)(ii))**
 - c. If the department determines that the ROP contains a material mistake, information required by any applicable requirement was omitted, or inaccurate statements were made in establishing emission limits or the terms or conditions of the ROP. **(R 336.1217(2)(a)(iii))**
 - d. If the department determines that the ROP must be revised to ensure compliance with the applicable requirements. **(R 336.1217(2)(a)(iv))**

Renewals

35. For renewal of this ROP, an administratively complete application shall be considered timely if it is received by the department not more than 18 months, but not less than 6 months, before the expiration date of the ROP. **(R 336.1210(7))**

Stratospheric Ozone Protection

36. If the permittee is subject to Title 40 of the Code of Federal Regulations (CFR), Part 82 and services, maintains, or repairs appliances except for motor vehicle air conditioners (MVAC), or disposes of appliances containing refrigerant, including MVAC and small appliances, or if the permittee is a refrigerant reclaiming, appliance owner or a manufacturer of appliances or recycling and recovery equipment, the permittee shall comply with all applicable standards for recycling and emissions reduction pursuant to 40 CFR, Part 82, Subpart F.
37. If the permittee is subject to 40 CFR, Part 82, and performs a service on motor (fleet) vehicles when this service involves refrigerant in the MVAC, the permittee is subject to all the applicable requirements as specified in 40 CFR, Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners. The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed by the original equipment manufacturer. The term MVAC as used in Subpart B does not include the air-tight sealed refrigeration system used for refrigerated cargo or an air conditioning system on passenger buses using Hydrochlorofluorocarbon-22 refrigerant.

Risk Management Plan

38. If subject to Section 112(r) of the CAA and 40 CFR, Part 68, the permittee shall register and submit to the USEPA the required data related to the risk management plan for reducing the probability of accidental releases of any regulated substances listed pursuant to Section 112(r)(3) of the CAA as amended in 40 CFR, Part 68.130. The list of substances, threshold quantities, and accident prevention regulations promulgated under 40 CFR, Part 68, do not limit in any way the general duty provisions under Section 112(r)(1).
39. If subject to Section 112(r) of the CAA and 40 CFR, Part 68, the permittee shall comply with the requirements of 40 CFR, Part 68, no later than the latest of the following dates as provided in 40 CFR, Part 68.10(a):
- June 21, 1999,
 - Three years after the date on which a regulated substance is first listed under 40 CFR, Part 68.130, or
 - The date on which a regulated substance is first present above a threshold quantity in a process.
40. If subject to Section 112(r) of the CAA and 40 CFR, Part 68, the permittee shall submit any additional relevant information requested by any regulatory agency necessary to ensure compliance with the requirements of 40 CFR, Part 68.
41. If subject to Section 112(r) of the CAA and 40 CFR, Part 68, the permittee shall annually certify compliance with all applicable requirements of Section 112(r) as detailed in Rule 213(4)(c)). **(40 CFR, Part 68)**

Emission Trading

42. Emission averaging and emission reduction credit trading are allowed pursuant to any applicable interstate or regional emission trading program that has been approved by the Administrator of the USEPA as a part of Michigan's State Implementation Plan. Such activities must comply with Rule 215 and Rule 216. **(R 336.1213(12))**

Permit To Install (PTI)

- 43. The process or process equipment included in this permit shall not be reconstructed, relocated, or modified unless a PTI authorizing such action is issued by the department, except to the extent such action is exempt from the PTI requirements by any applicable rule.² **(R 336.1201(1))**
- 44. The department may, after notice and opportunity for a hearing, revoke PTI terms or conditions if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of the PTI or is violating the department's rules or the CAA.² **(R 336.1201(8), Section 5510 of Act 451)**
- 45. The terms and conditions of a PTI shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by the PTI. If a new owner or operator submits a written request to the department pursuant to Rule 219 and the department approves the request, this PTI will be amended to reflect the change of ownership or operational control. The request must include all of the information required by Subrules (1)(a), (b) and (c) of Rule 219. The written request shall be sent to the appropriate AQD District Supervisor, MDEQ.² **(R 336.1219)**
- 46. If the installation, reconstruction, relocation, or modification of the equipment for which PTI terms and conditions have been approved has not commenced within 18 months, or has been interrupted for 18 months, the applicable terms and conditions from that PTI shall become void unless otherwise authorized by the department. Furthermore, the person to whom that PTI was issued, or the designated authorized agent, shall notify the department via the Supervisor, Permit Section, MDEQ, AQD, P. O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or modification of the equipment allowed by the terms and conditions from that PTI.² **(R 336.1201(4))**

Footnotes:

¹This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

²This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

B. SOURCE-WIDE CONDITIONS

Part B outlines the source-wide terms and conditions that apply to this stationary source. The permittee is subject to these special conditions for the stationary source in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply to this source, NA (not applicable) has been used in the table. If there are no source-wide conditions, this portion of the permit will be left blank.

C. EMISSION UNIT CONDITIONS

Part C outlines terms and conditions that are specific to individual emission units listed in the Emission Unit Summary Table. The permittee is subject to the special conditions for each emission unit in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no conditions specific to individual emission units, this section will be left blank.

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EU-TESTCELL1	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL2	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL3	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL4	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL5	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL6	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL7	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EU-TESTCELL8	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL9	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL10	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL11	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL12	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL13	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL14	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS
EU-TESTCELL15	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EU-TESTCELL16	One of 16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	11/01/98	FG-ALLCELLS

D. FLEXIBLE GROUP CONDITIONS

Part D outlines terms and conditions that apply to more than one emission unit. The permittee is subject to the special conditions for each flexible group in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no special conditions that apply to more than one emission unit, this section will be left blank.

FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FG-ALLCELLS	16 individual dynamometer test cells using diesel, E-85, and gasoline fuel. Fifteen cells test engines ranging in size from 250 to 600 horsepower and one cell tests small engines. Each cell has its own individual stack with identical parameters.	EU-TESTCELL1, EU-TESTCELL2 EU-TESTCELL3, EU-TESTCELL4 EU-TESTCELL5, EU-TESTCELL6 EU-TESTCELL7, EU-TESTCELL8 EU-TESTCELL9, EU-TESTCELL10 EU-TESTCELL11, EU-TESTCELL12 EU-TESTCELL13, EU-TESTCELL14 EU-TESTCELL15, EU-TESTCELL16

FG-ALLCELLS FLEXIBLE GROUP CONDITIONS
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DESCRIPTION

Emission Units: 16 Gasoline/Diesel/E-85 Engine Test Cells. For the purposes of this permit, E-85 means ethanol-gasoline blends of up to 85% ethanol and the remainder gasoline and will be treated as gasoline.

POLLUTION CONTROL EQUIPMENT

Federal-Mogul installed an Air Injection Control System (AICS) in 2004 to control CO and VOC emissions from the test cells. The AICS works by injecting a measured stream of air into the exhaust gas which is hotter than the auto ignition point of CO, causing the CO to oxidize in the exhaust pipe. The air injection rate (scfm) is dependent on the type of durability or DTS test being performed. The exhaust temperature is monitored before and after air injection to assure sufficient destruction efficiency. The exhaust temperature needs to reach 1100°F to oxidize CO; exhaust temperatures using the AICS usually exceed 1400°F. The AICS does, however, cause a minor increase in NOx emissions. The AICS is used with durability and deep thermal shock testing for most gasoline engines, but is not used with diesel or small engines or during developmental testing.

The facility also operates an Automatic Data Acquisition System, which monitors all operating parameters of the test cells on a continuous basis. These parameters include fuel usage, exhaust temperature, and air injection rate.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. VOC	5.6 tons per year ²	12-month rolling time period	FG- ALLCELLS	See Appendix 7	R336.1205(1)(a) & (3), R336.1702(a)
2. Carbon Monoxide	223.3 tons per year ²	12-month rolling time period	FG- ALLCELLS	See Appendix 7	R336.1205(1)(a) & (3)
3. NOx	62.1 tons per year ²	12-month rolling time period	FG- ALLCELLS	See Appendix 7	R336.1205(1)(a) & (3)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Gasoline including E-85	2,630,750 lb/year ²	12-month rolling time period	FG-ALLCELLS	SC VI.1, SC VI.10	R336.1205(1)(a) & (3), 40 CFR 52.21(c)&(d)
2. Gasoline including E-85	16,713 lb/day ²	Per day	FG-ALLCELLS	SC VI.1, SC VI.9	R336.1205(1)(a) & (3), R336.1225
3. Gasoline including E-85	2,327 lb/hr ²	Per hour	FG-ALLCELLS	SC VI.1, SC VI.8	R336.1205(1)(a) & (3), R336.1225, 40 CFR 52.21(c) & (d)
4. Diesel or fuel oil	1,418,000 lb/year ²	12-month rolling time period	FG-ALLCELLS	SC VI.2, SC VI.10	R336.1205(1)(a) & (3), 40 CFR 52.21(c)&(d)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
5. Diesel or fuel oil	19,143 lb/day ²	Per day	FG-ALLCELLS	SC VI.2, SC VI.9	R336.1205(1)(a) & (3), 40 CFR 52.21 (c) and (d)
6. Diesel or fuel oil	0.30% sulfur content in fuel ²	Test Protocol	FG-ALLCELLS	SC VI.16	R.336.1402, Michigan State Implementation Plan

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. NA

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The AICS shall maintain the air injection rate as stated below or establish an alternative minimum air injection rate based on a minimum average temperature differential of 190 °F between the exhaust temperature and a point downstream of the air injection location and a minimum oxygen concentration of 1 percent downstream of the air injection location. Operating below the minimum air injection rates in the table below, or alternative air injection rates, for more than 20 seconds is an excursion. Documentation of any alternative minimum air injection rates shall be kept on file for a period of at least five years. Proper operating parameters may be updated and applied by the permittee provided the changes have been submitted to and approved by the District Supervisor, AQD.² **(R336.1205 (1)(a) & (3), R336.1225, R336.1702(a), R336.1910, 40 CFR 64.6(c)(2))**

Test	Minimum Air Injection Rate (scfm)
Durability Cycle A	45
Durability Cycle B	50
Durability Cycle C	72
Durability Cycle D	50
Deep Thermal Shock	45

V. TESTING/SAMPLING

Records shall be maintained on file for a period of 5 years. **(R 336.1213(3)(b)(ii))**

1. Once, during the term of the ROP, verification of NOx and CO emission rates from a representative number of test cells included in FG-ALLCELLS, by testing at owner's expense, in accordance with Department requirements, will be required. A representative number of test cells is defined as a representative 4, 6 and 8 cylinder engine during durability testing using gasoline fuel and one engine for a deep thermal shock test using gasoline fuel. No less than 60 days prior to testing, a complete test plan shall be submitted to the AQD. The final plan must be approved by the AQD prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test.² **(R336.1205(1)(a) & (3), R336.2001, R336.2003, R336.2004)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of 5 years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall install, calibrate, maintain and operate in a satisfactory manner the Automatic Data Acquisition System to monitor and record the gasoline flow for each engine tested, except for the small engine test cell, on a continuous basis.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**

2. The permittee shall install, calibrate, maintain and operate in a satisfactory manner the Automatic Data Acquisition System to monitor and record the diesel flow for each engine tested, on a continuous basis.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
3. The permittee shall install, calibrate, maintain and operate in a satisfactory manner the Automatic Data Acquisition System to monitor and record the exhaust gas temperature just upstream of the air injection point and downstream of the air injection point on a continuous basis during all periods of time when the AICS is operating.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
4. The permittee shall install, calibrate, maintain and operate in a satisfactory manner the Automatic Data Acquisition System to monitor and record the air injection rate (in scfm) on a continuous basis during all periods of time when the AICS is operating.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
5. The permittee shall operate the Automatic Data Acquisition System during all required periods when FG-ALLCELLS is in operation. Data recorded during monitoring malfunctions, repair activities and QA/QC operations shall not be used for 40 CFR Part 64 compliance. **(40 CFR 64.6(c)(3), 64.7(c))**
6. The permittee shall properly maintain the Automatic Data Acquisition System including keeping necessary parts for routine repair of the monitoring equipment. **(40 CFR 64.7(b))**
7. The permittee shall keep, in a satisfactory manner, monthly and previous 12-month NOx emission calculation records for FG-ALLCELLS. **(R336.1205(1)(a) & (3), 40 CFR 52.21 (c) & (d))**
8. The permittee shall keep, in a satisfactory manner, monthly and previous 12-month CO emission calculation records for FG-ALLCELLS.² **(R336.1205(1)(a) & (3))**
9. The permittee shall keep, in a satisfactory manner, monthly and previous 12-month VOC emission calculation records for FG-ALLCELLS.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
10. The permittee shall calculate the hourly gasoline usage rate for FG-ALLCELLS based upon calendar monthly recordkeeping prorated to an hourly rate using actual operating hours.² **(R336.1225, R336.1702(a), 40 CFR 52.21 (c) & (d))**
11. The permittee shall calculate the daily diesel and gasoline usage rate for FG-ALLCELLS based upon calendar monthly recordkeeping prorated to a daily rate using actual operating days.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
12. The permittee shall keep, in a satisfactory manner, monthly gasoline and diesel fuel use records for FG-ALLCELLS.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
13. The permittee shall keep, in a satisfactory manner, a written log of the hours of operation for FG-ALLCELLS.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a), 40 CFR 52.21 (c) & (d))**
14. The permittee shall keep, in a satisfactory manner, records of the air injection rate (scfm) during all periods of time the AICS is operating.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
15. The permittee shall keep, in a satisfactory manner, records of the exhaust gas temperature just upstream of the air injection point and downstream of the air injection point during all periods of time the AICS is operating.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
16. The permittee shall keep, in a satisfactory manner, records of all periods of time the AICS is operating in any of the test cells included in FG-ALLCELLS.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**
17. The permittee shall keep, in a satisfactory manner, annual average CO and VOC destruction efficiency calculation records.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a))**

18. The permittee shall maintain a complete record of fuel oil specifications and/or fuel analysis for each delivery, or storage tank, of fuel oil or diesel fuel. These records may include purchase records for ASTM specification fuel oil, specifications or analyses provided by the vendor at the time of delivery, analytical results from laboratory testing, or any other records adequate to demonstrate compliance with the percent sulfur limit in fuel oil.² **(R336.1201(3))**
19. The permittee shall equip and maintain all gasoline engine test cells included in FG-ALLCELLS that conduct Durability and Deep Thermal Shock testing with an air injection control system (AICS). The AICS must achieve a minimum overall annual average CO and VOC destruction efficiency of 77 percent and 90 percent, respectively. The destruction efficiencies shall be calculated following the procedures in Appendix 7 of ROP No. MI-ROP-N6327-2009. Appendix 7 of ROP No. MI-ROP-N6327-2009 may be updated and applied by the permittee provided any changes have been submitted to and approved by the District Supervisor, AQD. Proper operation of the AICS includes maintaining the cycle average exhaust temperature just upstream of the air injection point and downstream of the air injection point at a minimum of 1300 °F and the procedures listed in SC IV.1. Operating below 1300 °F for more than 30 minutes is an excursion. SC IV.1 may be updated and applied by the permittee provided any changes have been submitted to and approved by the District Supervisor, AQD.² **(R336.1205(1)(a) & (3), R336.1225, R336.1702(a), 40 CFR 64.6(c)(2))**

VII. REPORTING

1. Prompt reporting of deviations pursuant to Special Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to Special Condition 23 of Part A. Report shall be received by appropriate AQD district office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to Special Conditions 19 and 20 of Part A. Report shall be received by appropriate AQD district office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. The permittee shall notify the Division if a change in equipment in FG-ALLCELLS occurs which could effect a change in emissions or emission factors relied upon to demonstrate compliance with R336.1225. The notification shall be submitted to the Division within 30 days of the actual equipment change.¹ **(R336.1225)**
5. The permittee shall notify the Division if a change in land use occurs for property classified as industrial or as a public roadway, where this classification was relied upon to demonstrate compliance with R336.1225 for FG-ALLCELLS. The notification shall be submitted to the Division within 30 days of the actual land use change. Within 60 days of the land use change, the permittee shall submit to the Division a plan for complying with the requirements of R336.1225.¹ **(R336.1225)**
6. Each semiannual report of monitoring and deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective action taken. If there were no excursions and/or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances. **(40 CFR 64.9(a)(2)(i))**
7. Each semiannual report of monitoring and deviations shall include summary information on monitor downtimes. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. **(40 CFR 64.9(a)(2)(ii))**

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. Each of the 16 stacks included in SV-ALLCELLS ²	6	32	R336.1225, 40 CFR 52.21 (c) and (d)

IX. OTHER REQUIREMENT(S)

1. The permittee shall promptly notify AQD for the need to modify the CAM Plan if the existing plan is found to be inadequate and shall submit a proposed modification to the ROP if necessary.² **(40 CFR 64.7(e))**
2. The permittee shall comply with all applicable requirements of 40 CFR Part 64.² **(40 CFR Part 64)**

Footnotes:

¹This condition is state enforceable only.
²This condition is established pursuant to Rule 201(1).

E. NON-APPLICABLE REQUIREMENTS

At the time of ROP issuance, the AQD has determined that no non-applicable requirements have been identified for incorporation into the permit shield provision set forth in the General Conditions in Part A pursuant to Rule 213(6)(a)(ii).

APPENDICES

Appendix 1: Abbreviations & Acronyms

The following is an alphabetical listing of abbreviations/acronyms that may be used in this permit.

AQD	Air Quality Division	MM	Million
acfm	Actual cubic feet per minute	MSDS	Material Safety Data Sheet
BACT	Best Available Control Technology	MW	Megawatts
BTU	British Thermal Unit	NA	Not Applicable
°C	Degrees Celsius	NAAQS	National Ambient Air Quality Standards
CAA	Federal Clean Air Act	NESHAP	National Emission Standard for Hazardous Air Pollutants
CAM	Compliance Assurance Monitoring	NMOC	Non-methane Organic Compounds
CEM	Continuous Emission Monitoring	NOx	Oxides of Nitrogen
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	Carbon Monoxide	NSR	New Source Review
COM	Continuous Opacity Monitoring	PM	Particulate Matter
department	Michigan Department of Environmental Quality	PM-10	Particulate Matter less than 10 microns in diameter
dscf	Dry standard cubic foot	pph	Pound per hour
dscm	Dry standard cubic meter	ppm	Parts per million
EPA	United States Environmental Protection Agency	ppmv	Parts per million by volume
EU	Emission Unit	ppmw	Parts per million by weight
°F	Degrees Fahrenheit	PS	Performance Specification
FG	Flexible Group	PSD	Prevention of Significant Deterioration
GACS	Gallon of Applied Coating Solids	psia	Pounds per square inch absolute
gr	Grains	psig	Pounds per square inch gauge
HAP	Hazardous Air Pollutant	PeTE	Permanent Total Enclosure
Hg	Mercury	PTI	Permit to Install
hr	Hour	RACT	Reasonable Available Control Technology
HP	Horsepower	ROP	Renewable Operating Permit
H ₂ S	Hydrogen Sulfide	SC	Special Condition
HVLP	High Volume Low Pressure *	scf	Standard cubic feet
ID	Identification (Number)	sec	Seconds
IRSL	Initial Risk Screening Level	SCR	Selective Catalytic Reduction
ITSL	Initial Threshold Screening Level	SO ₂	Sulfur Dioxide
LAER	Lowest Achievable Emission Rate	SRN	State Registration Number
lb	Pound	TAC	Toxic Air Contaminant
m	Meter	Temp	Temperature
MACT	Maximum Achievable Control Technology	THC	Total Hydrocarbons
MAERS	Michigan Air Emissions Reporting System	tpy	Tons per year
MAP	Malfunction Abatement Plan	µg	Microgram
MDEQ	Michigan Department of Environmental Quality	VE	Visible Emissions
mg	Milligram	VOC	Volatile Organic Compounds
mm	Millimeter	yr	Year

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

Appendix 2. Schedule of Compliance

The permittee certified in the ROP application that this stationary source is in compliance with all applicable requirements and the permittee shall continue to comply with all terms and conditions of this ROP. A Schedule of Compliance is not required. **(R 336.1213(4)(a), R 336.1119(a)(ii))**

Appendix 3. Monitoring Requirements

Specific monitoring requirement procedures, methods or specifications are detailed in Part A or the appropriate source-wide, emission unit and/or flexible group special conditions. Therefore, this appendix is not applicable.

Appendix 4. Recordkeeping

Specific recordkeeping requirement formats and procedures are detailed in Part A or the appropriate source-wide, emission unit and/or flexible group special conditions. Therefore, this appendix is not applicable.

Appendix 5. Testing Procedures

There are no specific testing requirement plans or procedures for this ROP. Therefore, this appendix is not applicable.

Appendix 6. Permits to Install

The following table lists any PTIs issued since the effective date of previously issued ROP No. MI-ROP-N6327-2003b. This includes any PTIs that were incorporated into the Source-wide PTI No. MI-PTI-N6327-2003b through amendments or modifications and any PTIs that remained off-permit until this ROP renewal.

Permit to Install Number	Description of Equipment	Corresponding Emission Unit(s) or Flexible Group(s)
368-97C	16 Dynamometer Cells	FG-ALLCELLS
368-97D	16 Dynamometer Cells	FG-ALLCELLS

Appendix 7. Emission Calculations

The permittee shall use the following calculations in conjunction with monitoring, testing or recordkeeping data to determine compliance with the applicable requirements referenced in FG-ALLCELLS.

A: Annual Destruction Efficiency Calculation for CO and VOC

1. Identify the gasoline fueled engine type and the type of test cycle being performed. Exclude the small (non-automotive) engines and those used for developmental testing.
2. Record the quantity of gasoline consumed during that test
3. Determine the uncontrolled emission rates by multiplying the appropriate lb pollutant per lb fuel emission factor for CO and VOC by the quantity of fuel consumed
4. Multiply the uncontrolled emission rates from Step 3 by the appropriate destruction efficiency from Table 2 of Section B of the Appendix.

5. Sum the total controlled and uncontrolled emission rates on an annual basis. Divide the annual controlled emission rate by the annual uncontrolled emission rate to determine the overall annual destruction efficiencies for CO and VOCs.

B: CO, VOC and NOx Emission Calculations

Table 1. Uncontrolled Gasoline Engine Emission Factors

Automotive Engine	Overall Uncontrolled Emission Factors (lb pollutant /lb fuel)		
	CO	VOC	NOx
2.0L	0.853	0.011	0.002
2.4T	0.895	0.024	0.009
2.7T	0.895	0.024	0.009
3.0L	0.895	0.024	0.020
4.6L	0.872	0.003	0.005
5.4L	0.551	0.024	0.024
L6 (4.2L)	0.528	0.017	0.004
5.3L	0.693	0.024	0.018
PV8	0.693	0.024	0.018
6.0L	0.693	0.024	0.018
Briggs & Stratton	0.551	0.024	0.016
Auto	0.551	0.024	0.016
Auto w/AICS	0.551	0.024	0.016
Diesel Engines	0.018	0.007	0.085

Table 2. Destruction Efficiencies Based on AICS

Test Cycles	CO Destruction Efficiency (%)	VOC Destruction Efficiency (%)
Durability Cycle A	95%	95%
Durability Cycle B	83%	95%
Durability Cycle C	57%	95%
Durability Cycle D	92%	95%
Deep Thermal Shock	95%	95%
Developmental		
If stack temp. > 1400 °F	50%	50%
If stack temp. < 1400 °F	0%	0%
Small Engines	0%	0%
Diesel Engines	0%	0%

The permittee shall apply the uncontrolled emission factors and control efficiency factors from Tables 1 and 2 appropriate for an engine in its class and for the type of test being conducted. If engine specific data is not available, the most conservative emission factor for the engine in its class will be used. If no data is available for the class, the most conservative factor for any class will be used. This data, along with the monthly fuel use, shall be used to calculate the monthly and previous 12-month NOx, CO and VOC permit limits.

Durability Cycle A: The engine starts up at idle, no load for 30 minutes and then goes to wide open throttle at a speed which produces the peak torque for the specific engine (determined by initial power curves). Then it operates at no load at elevated speeds and back at the speed and load that produces peak power and peak power plus 6 percent. The cycle repeats as many times as necessary, often for 100 hours or more.

Durability Cycle B: Shaped like a saw tooth with the engine continuously ramping up and down.

Durability Cycle C: Consists of periods of steady operation interrupted by long periods of rapidly changing speed and load conditions

Durability Cycle D: Similar to Cycle A

Deep Thermal Shock (DTS): This cycle alternates between high load (peak torque or peak horsepower) and idle in short intervals. About 1/4 of the time it is at peak horsepower, 1/4 at peak torque and 1/2 at idle.

Developmental: Variety of tests where the engines typically operate at low and intermediate loads. The engines are operated in rich burn conditions (O_2 less than 0.5 percent)

Appendix 8. Reporting

A. Annual, Semi-annual, and Deviation Certification Reporting

The permittee shall use the MDEQ Report Certification form (EQP 5736) and MDEQ Deviation Report form (EQP 5737) for the annual, semi-annual and deviation certification reporting referenced in the Reporting section of the source-wide, emission unit and/or flexible group special conditions. Alternative formats must meet the provisions of Rule 213(4)(c) and Rule 213(3)(c)(i), respectively, and be approved by the AQD District Supervisor.

B. Other Reporting

Specific reporting requirement formats and procedures are detailed in Part A or the appropriate source-wide, emission unit and/or flexible group special conditions. Therefore, Part B of this appendix is not applicable.