

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

B623031021

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|--|-------------------------------|---------------------------|
| FACILITY: FORD MOTOR CO RESEARCH & DEV CTR | | SRN / ID: B6230 |
| LOCATION: 1701 Village Road, DEARBORN | | DISTRICT: Detroit |
| CITY: DEARBORN | | COUNTY: WAYNE |
| CONTACT: | | ACTIVITY DATE: 08/07/2015 |
| STAFF: Jorge Acevedo | COMPLIANCE STATUS: Compliance | SOURCE CLASS: MAJOR |
| SUBJECT: Dynamometer Laboratory | | |
| RESOLVED COMPLAINTS: | | |

COMPANY NAME : Ford R&E Center
 FACILITY ADDRESS : 21500 Oakwood Blvd, Dearborn 48124
 STATE REGISTRAT. NUMBER : B6230
 NAICS CODE : 541712
 EPA SOURCE CLASS : A
 EPA POLLUTANT CLASS : C,N,V
 LEVEL OF INSPECTION : PCE
 DATE OF INSPECTION : 8/7/15
 TIME OF INSPECTION : 10:30 AM
 DATE OF REPORT : 08/21/15
 REASON FOR INSPECTION : Annual Compliance Inspection
 INSPECTED BY : Jorge Acevedo
 PERSONNEL PRESENT : Lori Brinkman, Mark Oleszkowicz
 FACILITY PHONE NUMBER : (313) 248-1334
 FACILITY FAX NUMBER : (313) 323-0559

FACILITY BACKGROUND:

The R&E Center is a 40 building research and development complex engaged in testing various automobile engines and components. Approximately 25000 are employed at the complex including all shift workers and salaried personnel. Wayne County was redesignated to attainment for PM 2.5 on August 29, 2013. Wayne County was redesignated to attainment for Ozone on June 29, 2009.

The R & E Center is a major source under the following programs:

Renewable Operating Permit (ROP) program and Prevention of Significant Deterioration program.

INSPECTION NARRATIVE:

On August 7, 2015, I conducted an annual compliance inspection of the Ford Motor – Research and Engineering Center (R&E Center). I met with Lori Brinkman and Mark Oleszkowicz at the F & G wings of the Dynamometer Building. We went into the offices at the F&G Wing and talked about a couple of items before heading into the F&G Wings. I asked if there were any changes to the facility and Ms. Brinkman explained that there were talks about expanding one of the dynamometer wings. I discussed an update of their request to terminate the Consent Order.

We began the inspection by walking into the A wing. Currently, the "A" wing has 12 rooms but will be expanded into 16 rooms. The "A" wing is part of the grandfathered part of the facility. In the "A" wing, catalyst aging is performed. The emissions from the testing are exhausted through the floor and through a water system before exhausting out of the building.

We went outside of the "A" wing to get a better idea of what the expansion would look like. We went into the "D" wing. The "D" wing consists of 16 cells. Mainly durability tests are conducted in the "D" wing.

We then walked into the "E" wing. The "E" wing, as explained by Mr. Oleszkowicz was built around 1979/1980 and was commissioned approximately in 1984. We went back through the wings and observed several cold cleaners. The two that I observed were not in use and had their lids closed. We then went on the roof to observe the thermal oxidizers. We first went into the control room to see the temperatures.

All four of the oxidizers were currently operating at above 1400°F.

Next, we went to observe the thermal oxidizers. I observed the computer system monitoring the oxidizer operations. I then walked to the roof to observe the oxidizers. I did not observe any opacity. I again took note of the oxidizers at 12:10PM:

Oxidizer #1 1453 °F

Oxidizer #2 1451 °F

Oxidizer #3 1450 °F

Oxidizer #4 1449 °F

Next, we went to the trade services building and I observed the paint booth. I reviewed the log of paint usage and it was in quarts of usage.

We went into Ms. Brinkman's office. I reviewed records for the F&G wing. Records are submitted monthly as a result of the Consent Order. Fuel usage and emissions were well below permitted limits. I also reviewed RICE MACT records and hours were logged and below 100 hrs/yr.

I left the facility at 1:30PM.

COMPLAINT/COMPLIANCE HISTORY:

There have not been any citizen complaints registered against Ford. Ford R&E Center is under Consent Order AQD 14-2010.

OUTSTANDING CONSENT ORDERS:

None

OUTSTANDING LOVs

None

OPERATING SCHEDULE/PRODUCTION RATE:

The Dynamometer Building is a 24-hour per day, 7 days per week, 8760 hours per year operation. The SRL is an 8-hour per day, 5 days per week, 2080 hours per year operation.

PROCESS DESCRIPTION:

In the Dynamometer Building, Ford has six wings (A, C, D, E, F, G) and tests internal combustion engines in dynamometer cells. The dynamometers are electrical diagnostics devices measuring mechanical performance of the engines. All dynamometers are interfaced with personal computers that continuously monitor engine feedback parameters. Emissions result from the combustion of gasoline by the engines. The typical engine tests are as follows:

- Engine Durability -- The durability test evaluates the effect of running the engine under harsh conditions for extended period of time. This is accomplished by operating the engine for extended period while varying engine speeds.
- Engine Performance- The performance test takes the engine to a particular speed, stops the engine for several minutes, takes the engine to the next speed, stops for several minutes, etc;
- Engine Break-in- During the engine break-in test, speed and load points are varied to "break-in" the engine;
- Transient Emissions- The transient emissions test operates the engine for a period, then stops and allows the engine to return to ambient temperature;
- Transient Performance Test- This test takes the engine from zero revolutions per minute (RPM) to maximum horsepower in few seconds. The engine is then stopped and the test is immediately repeated;
- Engine component Testing- Some of the test cells evaluate the performance of specific engine components (oil pump, throttle body, etc.), often times without actually running the engine under its own power and;
- Engine Mapping test- Consists of running engine at various speed, load, spark and fuel set points where data is taken to determine engine performance, fuel economy, exhaust emission, etc. according to engine program

In the SRL, Ford tests internal combustion engines in 10 dynamometer cells. The focus in the SRL is not that much different than in the Dynamometer Building. Rather than focusing on endurance as in the Dynamometer Building, the focus in the SRL is on how the engines and their components react with different fuels. Also, the focus is on projects that are in the development stages and 3-10 years from production.

EQUIPMENT AND PROCESS CONTROLS

12 test cells are located in the "A Wing". 3 are currently inactive. The test cells in the "A Wing" are grandfathered. The wing has two stacks and does not have any add on controls.

14 test cells are located in the "C Wing". 7 are currently inactive. The test cells in the "C Wing" are grandfathered. The wing has two stacks and does not have any add on controls.

12 test cells are located in the "D Wing". 4 are currently inactive. The test cells in the "D Wing" are grandfathered. The wing has two stacks and does not have any add on controls.

19 test cells are located in the "E Wing". None are currently inactive. The test cells in the "E Wing" were built in 1979 and 1980 and are exempt. The facility was able to use the Rule 285 (g) exemption because rule 278 was not promulgated until 1993. The wing has two stacks and does not have any add on controls.

13 test cells are located in the "F Wing" and 17 are located in the "G Wing." The test cells are controlled by four thermal oxidizers. The exhaust loading supplied by the cells under test automatically activates the oxidizer's variable fan speed. Each oxidizer is equipped with tube heat exchangers for some recuperative potential. Each oxidizer maintains a minimum temperature of 1400° F with a minimum retention time of .5 seconds. The test cells' ability to run is dependent on the temperature. If the oxidizer temperature falls below 1400°, the test cells will not be able to run. Average volumetric air flow rate is 16000 acfm. There are four stacks, one for each oxidizer. Each oxidizer stack is 2.2' internal diameter and 57' high.

10 test cells are located in the SRL and are uncontrolled. The amount of time they are used does not justify the cost for controls.

APPLICABLE RULES/PERMIT CONDITIONS:

ROP MI-ROP-B6230-2009 was finalized on December 18, 2013.

Permit conditions are evaluated in Appendix A. (Appendix A)

The following conditions apply Source-Wide to: FGOTHERDYNO-S1

DESCRIPTION

This flexible group represents the 30 Dynamometer Test Cells located in the Dynamometer Laboratory (F&G Wings). The dynamometers are controlled with four oxidizers.

Emission Units: EUTHERDYNO1-S1 through EUTHERDYNO30-S1

POLLUTION CONTROL EQUIPMENT

Four Thermal Oxidizers

I. EMISSION LIMIT(S)

| Pollutant | Limit | Compliance Status | Comments |
|--------------------|------------------------------|-------------------|--|
| 1. Carbon Monoxide | 1416 pounds/day ² | Compliance | Records are provided monthly as a result of Consent Order. The highest emissions of CO did not exceed 1416 pounds. |
| 2. Carbon Monoxide | 44.3 Tons/year ² | Compliance | Records are provided monthly as a result of Consent Order. |
| 3. Nitrogen Oxides | 1200 pounds/day ² | Compliance | Records are provided monthly as a result of Consent Order |
| 4. Nitrogen Oxides | 37.5 Tons/year ² | Compliance | Records are provided monthly as a result of Consent Order |
| 5. 1,3-Butadiene | 32.6 Pounds/day ¹ | Compliance | Records are provided monthly as a result of Consent Order |

II. MATERIAL LIMIT(S)

| Material | Limit | Compliance Status | Comments |
|----------|--|-------------------|--|
| 1. Fuel | 75,000 MMBTU/year ² | Compliance | Records are provided monthly as a result of Consent Order |
| 2. Fuel | 1200 MMBTU/day ² | Compliance | Records are provided monthly as a result of Consent Order |
| 3. Lead | 7 kilograms of lead in the engine test cells/week ² | Compliance | Leaded fuel is no longer used as indicated by Ms. Brinkman. Records are provided monthly as a result of Consent Order. |

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. Permittee shall not operate FGOTHERDYNO-S1 unless the group of four thermal oxidizers are installed, maintained and operated in a satisfactory manner. Satisfactory operation of the thermal oxidizer includes maintaining a minimum combustion chamber temperature above the most recent acceptable performance test value less 50 degrees Fahrenheit and a minimum design retention time of .5 seconds.² (R 336.1205, R 336.1225, R 336.1901, R

336.1910, R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d), 40 CFR 64.6(c)(1)(i and ii))

Compliance- Oxidizers appeared to be working correctly. Inspection of the temperature indicated that it was above 1400 degrees.

2. Permittee shall develop a test protocol to ensure that representative uncontrolled and controlled emissions can be determined. This protocol must be submitted to the AQD at least 30 days prior to the proposed test date and approved by AQD. Emissions information gathered testing FGOTHERDYNO-S1 can be used to show compliance for FGC10759-52. (R 336.12001)

Compliance- Test protocol was submitted 30 days prior to testing.

IV. DESIGN/EQUIPMENT PARAMETER(S)

N/A

V. TESTING/SAMPLING

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

1. Once during the five years of this permit, the permittee shall verify the CO and VOC reduction efficiency rates of each thermal oxidizer portion of FGOTHERDYNO-S1, by testing at owner's expense, in accordance with Department requirements. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan 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 (R 336.1205, R 336.1910, R 336.2804, R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21 (d))

COMPLIANCE- Stack testing was conducted in December 2014.

2. Once during the five years of this permit, the permittee shall verify the NOx and CO, emission factors from FGOTHERDYNO-S1 prior to control by its thermal oxidizer, by testing at owner's expense, in accordance with Department requirements. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan 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 (R 336.1205, R 336.1225, R 336.1910, R 336.2803, R 336.2804, R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21(c) & (d))

COMPLIANCE - Stack testing was conducted in December 2014.

3. Upon MDEQ request, the permittee shall verify the 1,3 Butadiene concentration from FGOTHERDYNO-S1, by testing at owner's expense, in accordance with EPA Federal Reference Test Method 18. No less than 30 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. (R 336.2004(1)(o), R 336.1213(3))

Compliance- 1,3 Butadiene may be requested to test in the future.

4. Whenever leaded fuel is used, the permittee shall verify the lead usage emission rate from FGOTHERDYNO-S1, in accordance with Appendix 7-51. (R 336.1225, R 336.1901)

COMPLIANCE- Records are kept regarding leaded fuel usage. According to Ms. Brinkman, no leaded fuel is being used.

5. Whenever leaded fuel is used, the permittee shall verify the lead content of the fuel used in FGOTHERDYNO-S1, in accordance with Method 2. (R 336.1225, R 336.1901, 40 CFR Part 80, Appendix B)

COMPLIANCE- According to Ms. Brinkman, no leaded fuel is being used. Records are kept regarding leaded fuel usage.

VI. MONITORING/RECORDKEEPING

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

1. The permittee shall install, calibrate, maintain and operate in a satisfactory manner a temperature monitoring device in the combustion chamber of the thermal oxidizers for FGOTHERDYNO-S1 to monitor and record the combustion temperature on a continuous basis during operation. Temperature data recording shall consist of measurements made at equally spaced intervals, not to exceed 15 minutes per interval. (R 336.1225, R 336.1901, R 336.1910, R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d), 40 CFR 64.6(c)(1)(i and ii))

COMPLIANCE-The temperature of the combustion chamber is monitored continuously.

2. The permittee shall properly maintain the monitoring system including keeping ready access parts for routine repair of the monitoring equipment. (R 336.1225, R 336.1901, R 336.1910, R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d), 40 CFR 64.7(b))

COMPLIANCE- Monitoring system appeared to be working correctly. Dynos are interlocked with the thermal oxidizers, therefore, dynos are shut down if temperature goes below 1400.

3. The permittee shall calculate the daily heat input rate in million BTU based upon monthly recordkeeping prorated to a daily rate. Should the prorated daily rate exceed 90 percent of the daily limit, the permittee shall commence daily recordkeeping for a minimum of two months until the daily rate falls below 90 percent of the daily limit. (See Appendix 7-51) (R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))

Compliance- Records are provided monthly as a result of Consent Order

4. The permittee shall keep a record of the heat input rate in million BTU per calendar month, and the annual heat input usage rate in million BTU per 12-month rolling time period as determined at the end of each calendar month. (R 336.2803, R 336.2804, 40 CFR 52.21 (c) & (d))

COMPLIANCE- Records are provided monthly as a result of Consent Order

5. The permittee shall keep the following information on a monthly basis for FGOTHERDYNO-S1:

- a) A record of the days of operation.
- b) The amount and type of each fuel used, per calendar day, per month and per 12-month rolling time period.
- c) NO_x emission calculations determining the daily emission rate in pounds per calendar day.
- d) NO_x emission calculations determining the monthly emission rate in tons per calendar month.
- e) NO_x emission calculations determining the annual emission rate in tons per 12-month rolling time period as determined at the end of each calendar month.
- f) CO emission calculations determining the daily emission rate in pounds per calendar day.
- g) CO emission calculations determining the monthly emission rate in tons per calendar month.
- h) CO emission calculations determining the annual emission rate in tons per 12-month rolling time period as determined at the end of each calendar month.
- i) 1,3-Butadiene emission calculations determining the daily emission rate in pounds per calendar day.

The permittee shall keep the records in a format acceptable to the AQD District Supervisor. The permittee shall keep all records on file for a period of at least five years and make them available to the Department upon request. (R 336.1205, R336.1225, R 336.2803, R 336.2804, 40 CFR 52.21(c) & (d))

COMPLIANCE- Records are provided monthly as a result of Consent Order

6. The permittee shall calculate and maintain a record of the weekly lead emissions. (R 336.1225, R 336.1901)

COMPLIANCE- Records are provided monthly as a result of Consent Order

VII. REPORTING

1. The permittee shall submit monthly reports of the records required by Special Condition V.5 to the AQD District Supervisor in a format acceptable to the AQD District Supervisor. Reports shall be submitted by the 21st day of the calendar month, for the previous calendar month. (R 336.1205, R336.1225, R 336.2803, R 336.2804, 40 CFR 52.21(c) & (d))

COMPLIANCE- Records are provided monthly as a result of Consent Order.

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 Dimensions (Inches) | Minimum Height Above Ground (feet) | Underlying Applicable Requirements |
|--------------------|-------------------------------------|------------------------------------|--|
| 1.SVDYNO-OXIDIZER | 34 ² | 65 ² | R 336.1225 R 336.1901 R 336.2803 R 336.2804 40 CFR 52.21 (c) & (d) |
| 2.SVDYNO-OXIDIZER2 | 34 ² | 65 ² | R 336.1225 R 336.1901 R 336.2803 R 336.2804 40 CFR 52.21 (c) & (d) |
| 3.SVDYNO-OXIDIZER3 | 34 ² | 65 ² | R 336.1225 R 336.1901 R 336.2803 R 336.2804 40 CFR 52.21 (c) & (d) |
| 4.SVDYNO-OXIDIZER4 | 34 ² | 65 ² | R 336.1225 R 336.1901 R 336.2803 R 336.2804 40 CFR 52.21 (c) & (d) |

COMPLIANCE- Stack heights appeared correct. Measurements were not taken.

IX. OTHER REQUIREMENT(S)

1. For the purposes of Compliance Assurance Monitoring (CAM), excursions will be defined as follows:
(40 CFR 64.6(c)(2))

- a) A temperature excursion is defined as a confirmed three-hour period during which the average fails to meet the specified temperature requirements in Special Condition III.1.
- b) A monitoring excursion is defined as a failure to properly monitor as required in Special Condition VI.1.
(40 CFR 64.3(b)(4))

2. The permittee shall perform quality assurance measures annually on the monitoring equipment to ensure maximum performance. (40 CFR 64.6(c)(1)(iii))

3. The permittee shall comply with all applicable requirements of 40 CFR Part 64. (40 CFR Part 64)

COMPLIANCE- Quality assurance is conducted on monitoring equipment. Temperature monitoring is done continuously and appeared to be working correctly and in the right range. The dynos are interlocked and if there is a drop in temperature- the dynos are automatically shut down.

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).

APPLICABLE FUGITIVE DUST CONTROL PLAN CONDITIONS:

N/A

MAERS REPORT REVIEW

(These figures include grandfathered test cells.)

| Pollutant | 2014 Emissions(TPY) |
|-----------|---------------------|
| CO | 1747.55 |
| NOx | 80.19 |
| PM | 5.07 |
| Sox | 4.55 |
| VOC | 73.4 |

FINAL COMPLIANCE DETERMINATION:

It appears that the Dynamometer Laboratory is operating in compliance with MI-ROP-B6230-2013.

NAME 

DATE 8-21-11

SUPERVISOR 9-10-15