FINAL REPORT

ROUSH INDUSTRIES

LIVONIA, MICHIGAN

COMPLIANCE TESTING REPORT: FG-BLD15TCELL & FG-BLD16TCELL EMISSIONS REPORT

RWDI #2400294

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SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI USA LLC (RWDI) was retained by Roush Industries (Roush) to complete the emission sampling program at their facility located at 36630 Commerce, Livonia, Michigan. Roush facility operates an engine testing facility and is permitted under Renewable Operating Permit (ROP) MI-ROP-M4780-2023. Testing consisted of emissions for nitrogen oxides (NO_x), carbon monoxide (CO), and 1,3-butadiene from dynamometer Cell D located in FG-BLD15TCELL (Building 15) and dynamometer Cell B2 located in FG-BLD16TCELL (Building 16). Two conditions were tested in each building:

1. Worldwide Mapping Point (WWMP) @ 1500 RPM
2. High RPM Load @ 3500 RPM

Compliance testing was completed for Building 15 on November 14th, 2023, and for Building 16 on November 16th, 2023.

Executive Table i: Results Summary – Cell D Building 15 -- WWMP

Analyte	Units	Average
NO_x	$ppmv_d$	860.93
	lb/hr	0.26
	lb/gal	0.09
CO	$ppmv_d$	7,357.87
	lb/hr	1.35
	lb/gal	0.47
1,3-butadiene	$ppmv_d$	3.22
	lb/hr	0.0011
	lb/gal	3.94E-04

Executive Table ii: Results Summary – Cell D Building 15 – High Load

Analyte	Units	Average
NO_x	$ppmv_d$	4,048.40
	lb/hr	5.16
	lb/gal	0.33
CO	$ppmv_d$	7.255.55
	lb/hr	5.63
	lb/gal	0.36
1,3-butadiene	$ppmv_d$	5.38
	lb/hr	0.0081
	lb/gal	5.20E-04

Executive Table iii: Results Summary – Cell B2 Building 16 – WWMP Load

Analyte	Units	Average
NO_x	$ppmv_d$	494.45
	lb/hr	0.15
	lb/gal	0.056
CO	$ppmv_d$	8.25
	lb/hr	1.53E-03
	lb/gal	5.58E-04
1,3-butadiene	$ppmv_d$	0.33
	lb/hr	1.22E-04
	lb/gal	4.51E-05

Executive Table iv: Results Summary – Cell B2 Building 16 – High Load

Analyte	Units	Average
NO_x	$ppmv_d$	254.79
	lb/hr	0.39
	lb/gal	0.026
CO	$ppmv_d$	772.75
	lb/hr	0.75
	lb/gal	0.049
1,3-butadiene	$ppmv_d$	3.63
	lb/hr	0.0065
	lb/gal	4.32E-04

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1 INTRODUCTION

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1. Worldwide Mapping Point (WWMP) @ 1500 RPM
2. High RPM Load @ 3500 RPM

Compliance testing was completed for Building 15 on November 14th, 2023, and for Building 16 on November 16th, 2023.

1.1 Location and Date of Testing

The testing program was completed on November 14th and November 16th, 2023 at the Roush facility located at 36630 Commerce, Livonia, Michigan.

1.2 Purpose of the Testing

The purpose of testing was to determine emission factors to show compliance with Renewable Operating Permit (ROP) MI-ROP-M4780-2023.

1.3 Description of the Source

Roush Industries is an advanced engineering firm for engine testing. Roush operates engine dynamometer test cells to conduct automotive and development of engine components. The test cells have the ability of firing a variety of specific fuels. For the Renewable Operating Permit (ROP) MI-ROP-M4780-2023, test cells in Buildings 15 and 16 are required to be tested for carbon monoxide (CO), oxides of Nitrogen (NO_x) and 1,3-Butadiene under Flexible Groups FG-BLD15TCELL and FG-BLD16TCELL.

1.3.1 FG-BLD15TCELL

Five (5) sets of Engine Dynamometer single-ended test cells located in Building No. 15 identified as: EU-TCellB15A, EU-TCellB15D, EU-TCellB15M, EU-TCellB15R, and EU-TCellB15S. Seven (7) sets of Engine Dynamometer double-ended test cells located in Building No. 15 identified as: EU-TCellB15B/C, EU-TCellB15E/F, EU-TCellB15G/H, EU-TCellB15I/J, EU-TCellB15K/L, EU-TCellB15N/O, and EU-TCellB15P/Q. Some engines in EU-Bld15TCells may be controlled by catalytic converters.

1.3.2 FG-BLD16TCELL

Five (5) sets of Engine Dynamometer test Cells located in Building No. 16 with catalytic converters identified as: EU-TCellB16A1, EU-TCellB16B2, EU-TCellB16C3, EU-TCellB16D4, and EU-TCellB16E5. One (1) set of Engine Dynamometer test Cells located in Building 16 without catalytic converters identified as: EU-TCellB16F6/G7.

Only one stack is used at a time between stacks SV-TCellB16F6/G7 & SV-TCellB16F6/G7a.

1.4 Personnel Involved in Testing

Table 1.4.1: List of Testing Personnel

Jeffrey Carter Dynamometer Supervisor Jeffrey.Carter@roush.com	**Roush Industries** 36630 Commerce Livonia, MI 48150	734-779-7000
Mason Sakshaug Technical Supervisor Mason.Sakshaug@rwdi.com	**RWDI USA LLC** 2239 Star Court Rochester Hills, MI 48309	(248) 234-3885
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2 SUMMARY OF RESULTS

2.1 Operating Data

Operational data collected during the testing included the following (found in **Appendix A**):

- Volume of gasoline used (gallons);
- Size and type of engine being tested;
- Engine running conditions.

2.2 Applicable Permit Number

Renewable Operating Permit (ROP) MI-ROP-M4780-2023

3 SOURCE DESCRIPTION

3.1 Description of Process and Emission Control Equipment

Refer to Section 1.3 for a description of the testing cells.

3.2 Process Flow Sheet or Diagram

A process schematic can be provided upon request.

3.3 Type and Quantity of Raw and Finished Materials

The engines burn gasoline.

3.4 Normal Rated Capacity of Process

There is not a rated capacity for the dynamometer cells.

3.5 Process Instrumentation Monitored During the Testing

There is no continuous pollutant monitor installed at this location.

4 POLLUTANTS TO BE MEASURED

Testing consisted of emissions for nitrogen oxides (NO_x), carbon monoxide (CO), and 1,3-butadiene.

5 SAMPLING AND ANALYSIS PROCEDURES

The following section provides brief descriptions of the proposed sampling methods and discusses any proposed modifications to the reference test methods.

5.1 Stack Velocity, Temperature, and Volumetric Flow Rate Determination

The exhaust velocities and flow rates were determined following the USEPA Method 2, "Determination of Stack Gas Velocity and Flow Rate (Type S Pitot Tube)" from the outlet only. Velocity measurements were taken with a standard pitot tube and digital manometer. Volumetric flow rates were determined following the equal area method as outlined in US EPA Method 2. Temperature measurements were made simultaneously with the velocity measurements and were conducted using a chromel-alumel type "k" thermocouple in conjunction with a digital temperature indicator.

The dry molecular weight of the stack gas was determined following calculations outlined in US EPA Method 3A "Determination of Molecular Weight of Dry Stack Gas" for O_2. USEPA Method 320 was used for CO_2 content.

Stack moisture content was determined in accordance with USEPA Method 320.

5.2 NO_x, CO, and 1,3-Butadiene by USEPA Method 320

Emissions testing was performed at the outlet of each engine. Pollutant concentrations was determined utilizing RWDI's continuous emissions monitoring system (CEM) which consists of the FTIR and oxygen analyzer (measuring on wet basis).

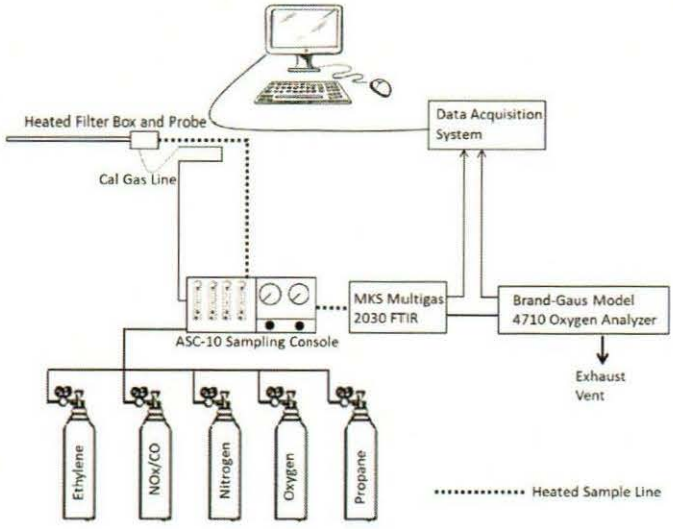
Stack gas concentrations for NO_x, CO, H_2O, 1,3-butadiene, CO_2 and O_2 was measured using EPA Reference Methods 320 and 3A.

Oxygen measurements were taken continuously following USEPA Method 3A on the outlet (using a wet oxygen analyzer or equivalent).

Regular performance checks on the CEMS were carried out by zero and span calibration checks on the oxygen analyzer and necessary QA procedures on the FTIR using USEPA Protocol calibration gases. These checks will verify the ongoing precision of the FTIR with time by introducing pollutant-free (zero) air followed by known calibration gas (span) into the FTIR. The response of the monitor to pollutant-free air and the corresponding sensitivity to the span gases was reviewed frequently as an ongoing indication of analyzer performance.

Monitoring was conducted by drawing a sample stream of flue gases through a stainless-steel probe attached to a heated filter and a heated sample line that is attached to the MAX Analytical ASC-10ST sampling console. Lengths of unheated sample line was kept to a minimum and insulated. The ASC-10ST sampling console delivers a continuous sample to the MKS MultiGas 2030 FTIR and oxygen analyzer for analysis. The heated filter and line were maintained at approximately 191°C (375°F) and the MKS MultiGas 2030 FTIR and ASC-10ST gas components were kept at 191°C (375°F). The end of the probe was connected to a heated Teflon sample line, which will deliver the sample gases from the stack to the FTIR system. The heated sample line was designed to maintain the gas temperature at approximately 375°F to prevent condensation of stack gas moisture within the line and condition air to the same temperature as the FTIR. A schematic of the sampling system setup is depicted in **Figure 5.2a.**

Figure 5.2a: MKS 2030 Multigas FTIR/ASC-10ST/Model 4710 Oxygen Analyzer Sampling System Schematic



The ASC-10ST was used to deliver calibration gases (Calibration Transfer Standard (CTS), QA Spike and Nitrogen) to the FTIR in direct (to analyzer) and system (to probe) modes.

A laptop computer was utilized for operating the MKS MultiGas 2030 FTIR and MAX Analytical ASC-10ST sampling console and logging the multi-gas FTIR data. Data was logged as one-minute averages for the actual test period (FTIR PRN files and Spectra). All concentration data was determined using the MKS 2030 MultiGas FTIR software. A typical MKS 2030 FTIR and ASC-10 ST configuration is depicted in **Figure 5.2b.**

For oxygen measurement only, prior to testing, a 3-point analyzer calibration error check was conducted using USEPA protocol gases. The calibration error check was performed by introducing zero, mid and high-level calibration gases directly into the analyzer. The calibration error check was performed to confirm that the analyzer response is within ±2% of the certified calibration gas introduced. Prior to each test run, a system-bias test was performed where known concentrations of calibration gases were introduced at the probe tip to measure if the analyzers response was within ±5% of the introduced calibration gas concentrations. At the conclusion of each test run a system-bias check was performed to evaluate the percent drift from pre and post-test system bias checks. The system bias checks were used to confirm that the analyzer did not drift greater than ±3% throughout a test run. The analyzer will measure the respective gas concentrations on a wet volumetric basis which was converted to a dry volumetric number.

The probe tip was equipped with a heated filter for particulate removal. The end of the probe was connected to a heated Teflon sample line, which will deliver the sample gases from the stack to the FTIR/4710 Oxygen analyzer system. The heated sample line was designed to maintain the gas temperature at approximately 375°F to prevent condensation of stack gas moisture within the line.

Figure 5.2b: Typical MKS 2030 Multigas FTIR and ASC-10ST Configuration

6 NUMBER AND LENGTH OF SAMPLING RUNS

Testing consisted of triplicate 1-hour tests on each Engine.

7 STACK INFORMATION

Engine 1 and Engine 2 had identical stack measurements.

Table 7.1: Summary of the Stack Characteristics

Source	Diameter	Duct Diameters from Flow Disturbance	Number of Ports	Points per Traverse	Total Points per Test
Cell D & Cell B2	5.5"	8.18 downstream and 17.45 upstream	2	6	12 Flow

8 FLUE GAS CONDITIONS

Table 8.1: Flue Gas Conditions – Building 15 – Cell D

Parameter	Flue Gas Conditions		
	Stack Temperature	Flow Rate	Percent Moisture
WWMP	119°F	42 dscfm	13.4%
High Load	850°F	179 dscfm	13.6%

Table 8.2: Flue Gas Conditions – Building 16 – Cell B2

Parameter	Flue Gas Conditions		
	Stack Temperature	Flow Rate	Percent Moisture
WWMP	122°F	43 dscfm	10.9%
High Load	482°F	221 dscfm	14.3%

9 TEST RESULTS AND DISCUSSION

9.1 Detailed Results

Detailed results for all analytes are provided in **Appendix B**.

Table 9.1.1: Results Summary – Cell D Building 15 -- WWMP

Analyte	Units	Average
NO_x	$ppmv_d$	860.93
	lb/hr	0.26
	lb/gal	0.09
CO	$ppmv_d$	7,357.87
	lb/hr	1.35
	lb/gal	0.47
1,3-butadiene	$ppmv_d$	3.22
	lb/hr	0.0011
	lb/gal	3.94E-04

Table 9.1.2: Results Summary – Cell D Building 15 – High Load

Analyte	Units	Average
NO_x	$ppmv_d$	4,048.40
	lb/hr	5.16
	lb/gal	0.33
CO	$ppmv_d$	7.255.55
	lb/hr	5.63
	lb/gal	0.36
1,3-butadiene	$ppmv_d$	5.38
	lb/hr	0.0081
	lb/gal	5.20E-04

Table 9.1.3: Results Summary – Cell B2 Building 16 – WWMP Load

Analyte	Units	Average
NO_x	$ppmv_d$	494.45
	lb/hr	0.15
	lb/gal	0.056
CO	$ppmv_d$	8.25
	lb/hr	1.53E-03
	lb/gal	5.58E-04
1,3-butadiene	$ppmv_d$	0.33
	lb/hr	1.22E-04
	lb/gal	4.51E-05

Table 9.1.4: Results Summary – Cell B2 Building 16 – High Load

Analyte	Units	Average
NO_x	$ppmv_d$	254.79
	lb/hr	0.39
	lb/gal	0.026
CO	$ppmv_d$	772.75
	lb/hr	0.75
	lb/gal	0.049
1,3-butadiene	$ppmv_d$	3.63
	lb/hr	0.0065
	lb/gal	4.32E-04

9.2 Discussion of Results

The detailed results of individual tests can be found in **Appendices B and C** and all field notes can be found in **Appendix D.**

9.3 Variations in Testing Procedures

There was no variation in testing procedures.

9.4 Process Upset Conditions During Testing

There were no upsets in the process during testing.

9.5 Maintenance Performed in Last Three Months

All maintenance in the last three months has been routine.

9.6 Re-Test

This was not a retest.

9.7 Audit Samples

This test did not require any audit samples.

9.8 Process Data

Process data can be found in **Appendix A**.

9.9 Calibration Data

Calibration can be found in **Appendix E**.

9.10 Example Calculations

Example calculations can be found in **Appendix F**.

9.11 Laboratory Data

There was no laboratory data affiliated with this testing.

9.12 Source Testing Plan and EGLE Correspondence

Copy of the correspondence received from the Source Testing Plan from EGLE and the Source Testing Plan submitted can be found in **Appendix G**.

TABLES

Table 1: Summary of Sampling Parameters and Methodology

Source Location	No. of Tests	Sampling Parameter	Sampling Method
Building 15 Cell D	3 - WWMP Condition 3 - High Load Condition	Velocity, Temperature and Flow Rate	U.S. EPA [1] Methods 1 & 2
		Oxygen	U.S. EPA [1] Method 3A
		Nitrogen Oxides, Carbon Monoxide, Carbon Dioxide, 1,3-Butadiene	U.S. EPA [1] Method 320
Building 16 Cell B2	3 - WWMP Condition 3 - High Load Condition	Velocity, Temperature and Flow Rate	U.S. EPA [1] Methods 1 & 2
		Oxygen	U.S. EPA [1] Method 3A
		Nitrogen Oxides, Carbon Monoxide, Carbon Dioxide, 1,3-Butadiene	U.S. EPA [1] Method 320

Notes:

[1] U.S. EPA - United States Environmental Protection Agency

Table 2: Sampling Summary and Sample Log

Capacity and Test #	Sampling Date	Start Time	End Time
Building 15 Cell D WWMP Condition			
Test #1	14-Nov-23	9:00 AM	9:59 AM
Test #2	14-Nov-23	10:40 AM	11:39 AM
Test #3	14-Nov-23	12:08 PM	1:07 PM
Building 15 Cell D High Load Condition			
Test #1	14-Nov-23	1:52 PM	2:51 PM
Test #2	14-Nov-23	3:43 PM	4:43 PM
Test #3	14-Nov-23	5:51 PM	6:51 PM
Building 16 Cell B2 WWMP Condition			
Test #1	16-Nov-23	12:06 PM	1:05 PM
Test #2	16-Nov-23	1:35 PM	2:34 PM
Test #3	16-Nov-23	3:05 PM	4:04 PM
Building 16 Cell B2 High Load Condition			
Test #1	16-Nov-23	4:41 PM	5:40 PM
Test #2	16-Nov-23	6:16 PM	7:15 PM
Test #3	16-Nov-23	7:56 PM	8:55 PM

Table 3A: Summary of Emissions - Building 15 Cell D - WWMP Condition

Facility: Roush
City: Livonia, MI
Source: Building 15 Cell D
Condition WWMP
Date: 11/14/2023

	Symbol	Units	Test 1	Test 2	Test 3	Average
Nitrogen Oxides Concentration	NO_x	ppmvd	856.10	853.51	873.19	860.93
Carbon Monoxide Concentration	CO	ppmvd	7433.88	7306.02	7333.70	7,357.87
1,3 Butadiene Concentration	C_4H_6	ppmvd	3.28	3.23	3.14	3.22
Oxygen Concentration	O_2	$\%_{wet}$	0.33	0.34	0.33	0.33
Oxygen Concentration	O_2	$\%_{dry}$	0.38	0.40	0.38	0.39
Nitrogen Oxides Emission Rate	NO_x	pph	0.28	0.25	0.26	0.26
Carbon Monoxide Emission Rate	CO	pph	1.45	1.30	1.31	1.35
1,3 Butadiene Emission Rate	C_4H_6	pph	0.0012	0.0011	0.0011	0.0011
Nitrogen Oxides Concentration	NO_x	lb/gal	0.09	0.09	0.09	0.09
Carbon Monoxide Concentration	CO	lb/gal	0.50	0.45	0.45	0.47
1,3 Butadiene Emission Rate	C_4H_6	lb/gal	4.26E-04	3.83E-04	3.72E-04	3.94E-04

Table 3B: Flow Data - Building 15 Cell D - WWMP Condition

Facility: Roush
City: Livonia, Michigan
Source: Building 15 Cell D
Condition: WWMP

Parameter	Units	Test 1	Test 2	Test 3	Average
Stack Gas Temperature	°F	119	119	119	119
Stack Gas Moisture	%	13.59	13.41	13.26	13.42
Velocity	ft/sec	5.80	5.26	5.27	5.44
Actual Flowrate	acfm	58	52	52	54
Dry Reference Flowrate	dscfm	45	41	41	42
Dry Reference Flowrate	m^3/s	0.021	0.019	0.019	0.020

Table 4A: Summary of Emissions - Building 15 Cell D - High Load Condition

Facility: Roush
City: Livonia, MI
Source: Building 15 Cell D
Condition High Load
Date: 11/14/2023

	Symbol	Units	Test 1	Test 2	Test 3	Average
Nitrogen Oxides Concentration	NO_x	ppmvd	3946.20	4134.70	4064.29	4,048.40
Carbon Monoxide Concentration	CO	ppmvd	7221.35	7207.04	7338.26	7,255.55
1,3 Butadiene Concentration	C_4H_6	ppmvd	4.98	4.97	6.17	5.38
Oxygen Concentration	O_2	$\%_{wet}$	0.34	0.38	0.47	0.40
Oxygen Concentration	O_2	$\%_{dry}$	0.40	0.44	0.54	0.46
Nitrogen Oxides Emission Rate	NO_x	pph	5.04	5.31	5.14	5.16
Carbon Monoxide Emission Rate	CO	pph	5.62	5.64	5.65	5.63
1,3 Butadiene Emission Rate	C_4H_6	pph	0.0075	0.0075	0.0092	0.0081
Nitrogen Oxides Concentration	NO_x	lb/gal	0.33	0.34	0.33	0.33
Carbon Monoxide Concentration	CO	lb/gal	0.37	0.36	0.36	0.36
1,3 Butadiene Emission Rate	C_4H_6	lb/gal	4.89E-04	4.82E-04	5.89E-04	5.20E-04

Table 4B: Flow Data - Building 15 Cell D - High Load Condition

Facility: Roush
City: Livonia, Michigan
Source: Building 15 Cell D
Condition: High Load

Parameter	Units	Test 1	Test 2	Test 3	Average
Stack Gas Temperature	°F	850	850	850	850
Stack Gas Moisture	%	14.09	13.55	13.26	13.63
Velocity	ft/sec	52.7	52.5	51.4	52.2
Actual Flowrate	acfm	521	520	509	517
Dry Reference Flowrate	dscfm	179	180	177	179
Dry Reference Flowrate	m^3/s	0.085	0.085	0.083	0.084

Table 5A: Summary of Emissions - Building 16 Cell B2 - WWMP Condition

Facility: Roush
City: Livonia, MI
Source: Building 16 Cell B2
Condition WWMP
Date: 11/14/2023

	Symbol	Units	Test 1	Test 2	Test 3	Average
Nitrogen Oxides Concentration	NO_x	ppmvd	480.55	498.59	504.22	494.45
Carbon Monoxide Concentration	CO	ppmvd	6.12	8.53	10.10	8.25
1,3 Butadiene Concentration	C_4H_6	ppmvd	0.53	0.32	0.14	0.33
Oxygen Concentration	O_2	$\%_{wet}$	1.64	1.60	1.58	1.61
Oxygen Concentration	O_2	$\%_{dry}$	1.85	1.80	1.76	1.80
Nitrogen Oxides Emission Rate	NO_x	pph	0.16	0.15	0.15	0.15
Carbon Monoxide Emission Rate	CO	pph	1.22E-03	1.56E-03	1.80E-03	1.53E-03
1,3 Butadiene Emission Rate	C_4H_6	pph	2.06E-04	1.12E-04	4.90E-05	1.22E-04
Nitrogen Oxides Concentration	NO_x	lb/gal	0.058	0.055	0.053	0.056
Carbon Monoxide Concentration	CO	lb/gal	4.53E-04	5.77E-04	6.43E-04	5.58E-04
1,3 Butadiene Emission Rate	C_4H_6	lb/gal	7.64E-05	4.15E-05	1.75E-05	4.51E-05

Table 5B: Flow Data - Building 16 Cell B2 - WWMP Condition

Facility: Roush
City: Livonia, Michigan
Source: Building 16 Cell B2
Condition: WWMP

Parameter	Units	Test 1	Test 2	Test 3	Average
Stack Gas Temperature	°F	122	122	122	122
Stack Gas Moisture	%	11.27	11.30	10.25	10.94
Velocity	ft/sec	5.82	5.37	5.15	5.45
Actual Flowrate	acfm	58	53	51	54
Dry Reference Flowrate	dscfm	46	42	41	43
Dry Reference Flowrate	m^3/s	0.022	0.020	0.019	0.020

Table 6A: Summary of Emissions - Building 16 Cell B2 - High Load Condition

Facility: Roush
City: Livonia, MI
Source: Building 16 Cell B2
Condition High Load
Date: 11/14/2023

	Symbol	Units	Test 1	Test 2	Test 3	Average
Nitrogen Oxides Concentration	NO_x	ppmvd	293.80	224.10	246.45	254.79
Carbon Monoxide Concentration	CO	ppmvd	738.81	800.35	779.09	772.75
1,3 Butadiene Concentration	C_4H_6	ppmvd	4.66	3.37	2.85	3.63
Oxygen Concentration	O_2	$\%_{wet}$	0.57	0.64	0.48	0.56
Oxygen Concentration	O_2	$\%_{dry}$	0.67	0.75	0.56	0.66
Nitrogen Oxides Emission Rate	NO_x	pph	0.35	0.44	0.39	0.39
Carbon Monoxide Emission Rate	CO	pph	0.53	0.95	0.76	0.75
1,3 Butadiene Emission Rate	C_4H_6	pph	0.0064	0.0077	0.0054	0.0065
Nitrogen Oxides Concentration	NO_x	lb/gal	0.023	0.029	0.026	0.026
Carbon Monoxide Concentration	CO	lb/gal	0.036	0.062	0.050	0.049
1,3 Butadiene Emission Rate	C_4H_6	lb/gal	4.33E-04	5.09E-04	3.55E-04	4.32E-04

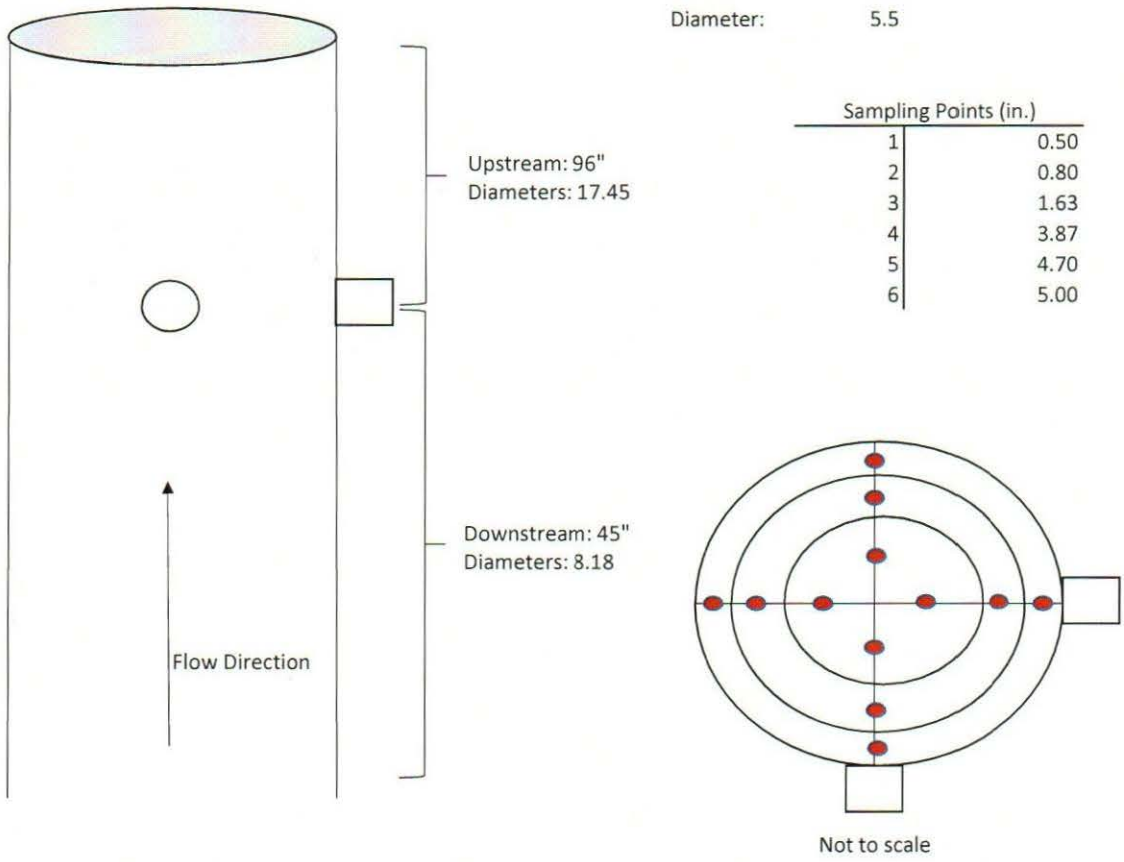
Table 6B: Flow Data - Building 16 Cell B2 - High Load C

Facility: Roush
City: Livonia, Michigan
Source: Building 16 Cell B2
Condition: High Load

Parameter	Units	Test 1	Test 2	Test 3	Average
Stack Gas Temperature	°F	482	482	482	482
Stack Gas Moisture	%	15.29	13.86	13.85	14.33
Velocity	ft/sec	35.7	57.6	47.5	47.0
Actual Flowrate	acfm	354	570	471	465
Dry Reference Flowrate	dscfm	165	273	224	221
Dry Reference Flowrate	m^3/s	0.078	0.129	0.106	0.104

FIGURES

Figure No. 1: Building 15 Cell D and Building 16 Cell B2 Stack Diagram

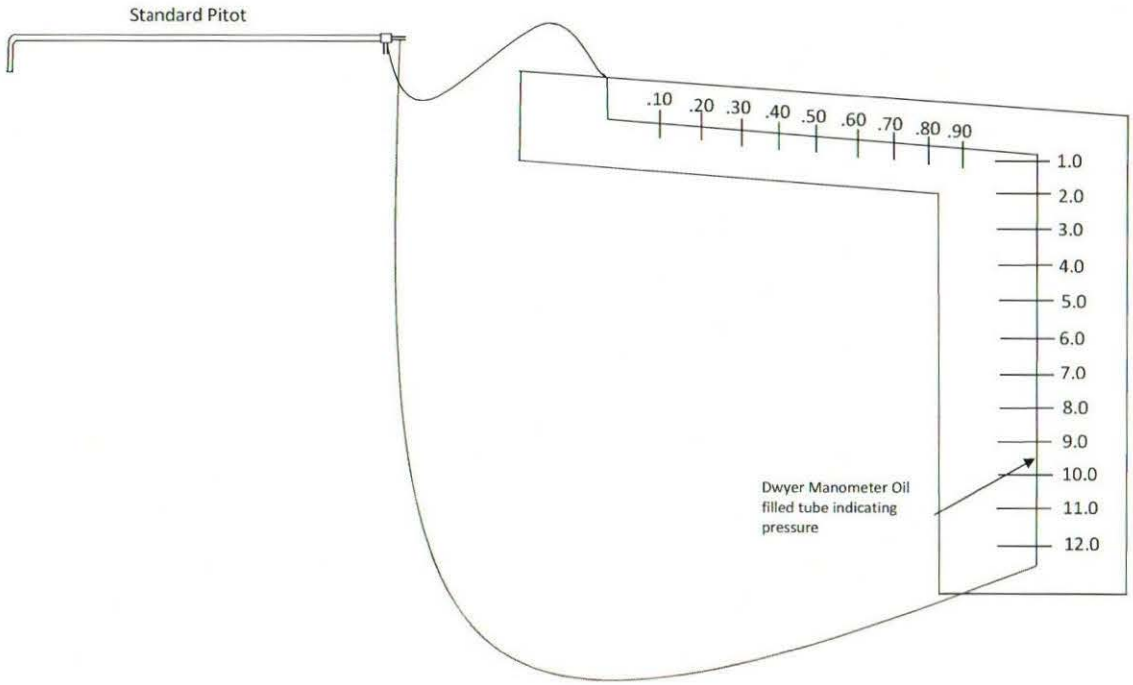


Building 15 Cell D & Building 16 Cell B2
Roush Industries
Roush Dynamometers
Livonia, Michigan

Date:
November 14-16, 2023

RWDI USA LLC
2239 Star Court
Rochester Hills, MI 48309

Figure No. 2: USEPA Method 2



USEPA Method 2

Roush Industries

Dynamometer Test Cells

Building 15 Cell D and Building 16 Cell B2

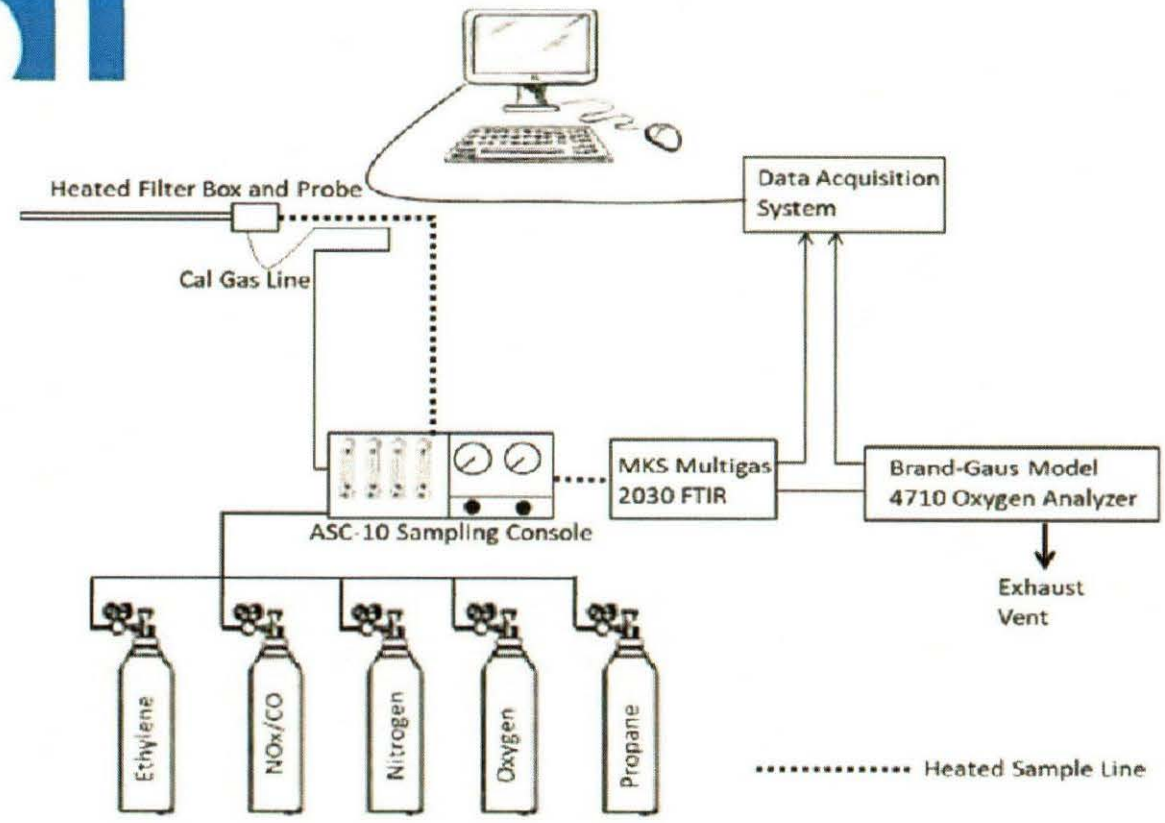
Livonia, Michigan

Project No. 2400294

Figure No. 2

Date: November 14-16, 2023

Figure No. 3: USEPA Method 320/3A



USEPA Method 320

Roush Industries

Roush Dynamometer

Building 15 Cell D and Building 16 Cell B2

Livonia, Michigan

Project No. 2400249

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