OMNI-Test Laboratories, Inc.

EPA Standard of Performance for New Residential Wood Heaters

Certification Test Report

Confidential Business Information
(Non - CBI)

Manufacturer: Hearth & Home Technologies, Inc.
Heater Type: Wood-Fired, Freestanding
Model: Encore Model 2040-CAT-C

Prepared for:
Hearth & Home Technologies, Inc.
352 Mountain House Road
Halifax, PA 17032
USA

Prepared by:
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Test Period: October 30 – November 6, 2018

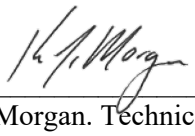
Report Date: December 5, 2018

Report Number: 0135WS042E
Report Revision Date: January 17, 2024

Authorized Signatories

This report has been reviewed and approved by the following authorized signatories:

Evaluator:



Ken Morgan. Technical Services Director
OMNI-Test Laboratories, Inc.

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Section 1 - Summary

1.1 - Summary Tables

Table 1 – Particulate Emissions

Run	Burn Rate	ASTM E2515 Emissions Uncorrected[1]	ASTM E2515 Emissions Corrected[2]
	(kg/hr dry)	(g/hr)	(g/hr)
1	0.872	0.546	0.546
2	1.510	0.808	0.808
3	2.895	2.803	2.803
4	0.873	0.844	0.844
*5	*0.874*	*0.659*	*0.659*
Weighted Average:		**1.061**	**1.061**

*Run 5 is a fan confirmation, this is not included in the weighted average.

[1]Uncorrected refers to gravimetric analysis that takes negative filter weights as a negative value in cases where filter residue was transferred to (stuck to) O-ring gaskets to account for the mass transfer as per the test method.

[2]Corrected refers to gravimetric analysis where negative filter weights are taken as zero, thus reporting a higher value by over-reporting of transferred filter material. The uncorrected values were added to this for comparison as requested by the US EPA.

Table 2 – First Hour Emissions

Run	E2515 Emissions – 1st Hour Uncorrected[1] (g/hr)	E2515 Emissions – 1st Hour Corrected[2] (g/hr)
1	0.20	0.20
2	1.14	1.14
3	3.95	3.95
4	1.03	1.03
5	0.37	0.37

Table 3 – Test Facility Conditions

Run	Room Temperature (°F)		Barometric Pressure ("Hg)		Air Velocity (ft/min)	
	Before	After	Before	After	Before	After
1	68		30.40	30.30	<50	<50
2	69		30.21	30.25	<50	<50
3	73		30.25	30.25	<50	<50
4	70		30.31	30.35	<50	<50
5	67		30.19	30.17	<50	<50

Table 4- Efficiency & CO

Run	Heat Output	HHV Efficiency	LHV Efficiency	CO Emissions		
	(BTU/hr)	(%)	(%)	(g/MJ Output)	(g/kg Dry Fuel)	(g/hr)
1	12,974	80.1%	86.5%	2.24	35.5	30.58
2	21,414	76.7%	82.9%	4.06	61.7	91.69
3	37,102	68.9%	74.5%	8.75	119.5	342.32
4	12,879	79.0%	85.4%	3.07	48.1	41.68
5	12,829	78.6%	84.9%	3.52	54.8	47.62
Weighted Average:		**76.8%**		Arithmetic Average (g/min):		**2.11**

Table 5 – Heater Configuration

	Air Settings	Photograph (if Applicable)
Category I	Primary @ min. (Fixed stop) Fan at min. fixed stop	N/A
Category II	~5° From low Fan at ~15° From low	
Category III	~15° From low Fan at ~15° From low	
Category IV	Primary @ max. (Fixed Stop) Fan at max fixed stop	N/A

Section 2
Performance Testing

2.1 – Procedures, Narrative, and Results Summary
2.2 – Appliance Description
2.3 – Appliance Photographs

2.1 – Procedures, Results Summary and Run Narratives

INTRODUCTION

Testing was performed at OMNI-Test Laboratories located in Portland Oregon. The altitude of the laboratory is 30 feet above sea level. The unit was received in good condition and was assigned OMNI ID #2326. OMNI employee Aaron Kravitz conducted the certification testing beginning on October 30 and completed all testing on November 6, 2018.

TESTING PROCEDURE

The Encore Model 2040-CAT-C was tested in accordance with the U.S. EPA 40 CFR Part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters using ASTM E2515 and ASTM E2780. The fuel used for certification testing was premium Douglas Fir 2x4 and 4x4 nominal lumber. Fueling protocols were in conjustion with EPA Method 28 and 28R. Two parallel sample trains were used per ASTM E2515, each with a front & rear filter.

For all runs, the 5-minute startup procedures were the same. The primary air control was set at the start of the test run and not manipulated. At the start of the test run, the bypass and doors were opened. The test fuel was then loaded as quickly as possible, photographed, and the doors and bypass closed again. This was accomplished in under 1 minute for all test runs.

RESULTS SUMMARY

The weighted average emissions of the four test runs included in the results indicate a particulate emissions rate of 1.06 grams per hour. Testing consisted of 6 certification tests, with 4 being used in the weighted average (Run 1-4). Run 5 was excluded from the weighted average due to fan confirmation and Run 6 was excluded from the weighted average due to ceasing of combustion. The results are within the emissions limit of 2.0 g/h for affected appliances manufactured on or after May 15, 2020.

The model Encore Model 2040-CAT-C was tested for thermal efficiency and carbon monoxide (CO) emissions in accordance with CSA B415.1-10. The heater has a demonstrated an average thermal efficiency of 76.8%. The calculated CO emission rate was 2.11 g/min.

Efficiency results were calculated using spread sheet Version 2.2 created 12/14/2009 and distributed by CSA. Example calculations for CSA B415.1 were not provided by CSA; spreadsheet is protected from modifications by means of a password.

Upon completion of emissions certification testing, the sample unit was sealed and will be stored by the manufacturer in accordance with the requirements of the CFR.

RUN NARRATIVES

Run 1 - Attempted category 1 burn rate with a primary air setting of full closed. Measured burn rate of 0.87 kg/hr. (category 2). No sampling anomalies occurred during this sampling run which was determined to be valid and appropriate for inclusion in the weighted average.

Run 2 - Attempted category 2 burn rate at primary air setting of ~15° open from fully closed position. Measured burn rate of 1.51 kg/hr. (category 3). No sampling anomalies occurred during this sampling run which was determined to be valid and appropriate for inclusion in the weighted average.

Run 3 - Attempted category 4 burn rate at primary air setting of fully open. Measured burn rate of 2.89 kg/hr. (category 4). No sampling anomalies occurred during this sampling run which was determined to be valid and appropriate for inclusion in the weighted average.

Run 4 - Attempted category 2 burn rate at primary air setting of ~15° open from fully closed position. Measured burn rate of 0.87 kg/hr. (category 2). No sampling anomalies occurred. This test run is valid and appropriate for inclusion in the weighted average.

Run 5 – Fan confirmation test, not included in the weighted average. Attempted category 2 burn rate at primary air setting of ~5° from low. Observed burn rate of 0.87 kg/hr. (category 2). No sampling anomalies occurred during this sampling run which was determined to be valid and appropriate. This test (fan confirmation) was not included in the weighted average.

Run 6 – The manufacturer wished to attempt certification without the catalytic combustor, so it was removed & sealed. A category 1 burn rate was attempted with the air setting fully closed. The fire went out during the test run and was deemed invalid. The manufacturer made the decision to not to pursue certification without the catalyst.

2.2 - Appliance Description

Appliance Manufacturer: Hearth & Home Technologies, Inc.

Wood Stove Model: Encore Model 2040-CAT-C

Materials of Construction: The unit is constructed primarily of cast iron. The firebox is lined with refractory brick. The feed doors feature fiberglass rope gasketing to retain 5mm ceramic glass panels.

Air Introduction System: Primary air is controlled by a Bi-metallic spring thermostat located at the right rear of the stove top. Moving the control arm fully to the left opens the air control, fully to the right closes the air. As the spring heats up, it tightens causing the controlling damper to close. Secondary air is un-controlled, it enters the appliance through an opening located at the rear of the stove on the bottom side. Air travels into the refractory secondary combustion system and enters the flame path through orifices in the refractory walls.

Combustion Control Mechanisms: Primary air is controlled by a Bi-metallic spring thermostat located at the right rear of the stove top. Moving the control arm fully to the left opens the air control, fully to the right closes the air. As the coil spring heats up, it tightens causing the controlling damper to close, cooling of the spring loosens the coil and allows the controlling damper to open. Position of the control arm sets the tension of the coil that determines how much heat is needed to cause the control damper to close.

Combustor: A rectangular, ceramic-substrate combustor is located within the refractory assembly and all combustion products are directed through it when the bypass is closed

Internal Baffles: An internal baffle is not used; flame path is either directed through a bypass opening or through the refractory combustion chamber.

Other Features: A bypass is operated by a handle located on the left side of the firebox. The ash pan is accessed through a door located under the front fuel loading door; a top fuel loading door is in the stove top.

Flue Outlet: The 6” diameter flue outlet is located in the top rear of the unit.

Wood Heater Operating Instructions: Specific Written Instructions: See Appendix F of this report. All markings and instruction materials were reviewed for content prior to printing.

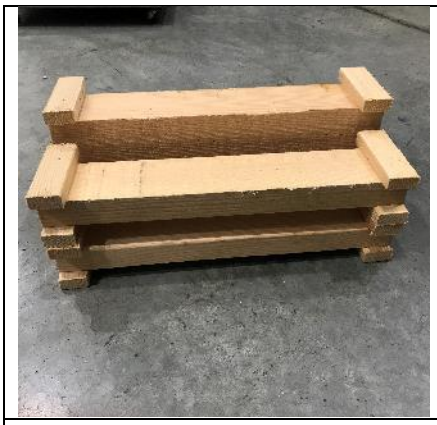
2.3 – Appliance & Fuel Photographs

Model: Encore Model 2040-CAT-C
Test Dates: 8/30/2018 – 11/6/2018

	
Encore Model 2040-CAT-C Front	**Encore Model 2040-CAT-C Back**

	
Encore Model 2040-CAT-C Left	**Encore Model 2040-CAT-C Right**

		
Run 1 Fuel - Front	**Run 1 Fuel - Side**	**Run 1 Fuel - Loaded**
		
Run 2 Fuel - Front	**Run 2 Fuel - Side**	**Run 2 Fuel - Loaded**
		
Run 3 Fuel - Front	**Run 3 Fuel - Side**	**Run 3 Fuel - Loaded**
		
Run 4 Fuel - Front	**Run 4 Fuel - Side**	**Run 4 Fuel - Loaded**

		
Run 5 Fuel - Front	**Run 5 Fuel - Side**	**Run 5 Fuel - Loaded**
		
Run 6 Fuel - Front	**Run 6 Fuel - Side**	**Run 6 Fuel - Loaded**

Sealed Test Unit

Section 3
Laboratory Quality Assurance

3.1 - Quality Assurance/Quality Control

3.1 - Quality Assurance/Quality Control

OMNI follows the guidelines of ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories," and the quality assurance/quality control (QA/QC) procedures found in *OMNI*'s Quality Assurance Manual.

OMNI's scope of accreditation includes, but is not limited to, the following:

- ANSI (American National Standards Institute) for certification of product to safety standards.
- To perform product safety testing by the International Accreditation Service, Inc. (formerly ICBO ES) under accreditation as a testing laboratory designated TL-130.
- To perform product safety testing as a "Certification Organization" by the Standards Council of Canada (SCC).
- Serving as a testing laboratory for the certification of wood heaters by the U.S. Environmental Protection Agency.

This report is issued within the scope of *OMNI*'s accreditation. Accreditation certificates are available upon request.

The manufacturing facilities and quality control system for the production of the Encore Model 2040-CAT-C at Hearth & Home Technologies, Inc. were evaluated to determine if sufficient to maintain conformance with OMNI's requirements for product certification. OMNI has concluded that the manufacturing facilities, processes, and quality control system are adequate to produce the appliance congruous with the standards and model codes to which it was evaluated.

Appendix A – Test Data by Run

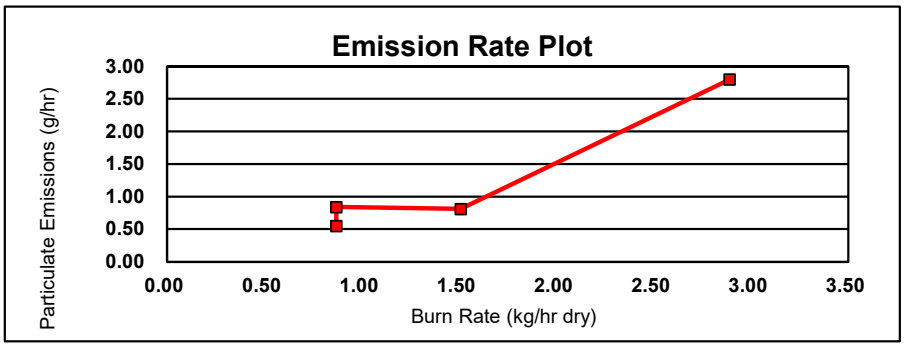
Includes:

Run 1
Run 2
Run 3
Run 4
Run 5 (fan confirmation)
Run 6 (aborted)

EPA Weighted Average Emissions
EPA Method 28R

Client:	Hearth and Home Tecl	Status:	Preliminary
Stove Model:	Encore Model 2040-C	Stove Type:	Catalytic Stove
Test Dates:	10/30/2018 - 11/06/2018		
Project Number:	0135WS042E		
Tracking Number:	2326		

Weighted Averages		
	Emissions (g/hr):	1.1
	HHV Efficeincy (%):	76.8
	LHV Efficeincy (%):	83.0



Run #	1	
Burn Rate (dry kg/hr)	0.87	
Category	2	
LHV Efficiency (%)	86.5	
HHV Efficiency (%)	80.1	
Emissions (g/hr)	0.55	
Weighting Factor	0.272	15.94%

Run #	4	
Burn Rate (dry kg/hr)	0.87	
Category	2	
LHV Efficiency (%)	85.4	
HHV Efficiency (%)	79	
Emissions (g/hr)	0.84	
Weighting Factor	0.483	28.28%

Run #	2	
Burn Rate (dry kg/hr)	1.51	
Category	3	
LHV Efficiency (%)	82.9	
HHV Efficiency (%)	76.7	
Emissions (g/hr)	0.81	
Weighting Factor	0.709	41.50%

Run #	3	
Burn Rate (dry kg/hr)	2.89	
Category	4	
LHV Efficiency (%)	74.5	
HHV Efficiency (%)	68.9	
Emissions (g/hr)	2.8	
Weighting Factor	0.244	14.29%

Wood Heater Test Results

Manufacturer: HHT Halifax
Model: Encore
Project No.: 0135WS042E
Tracking No.: 2326
Run: 1
Test Date: 10/30/18

Burn Rate	**0.87 kg/hr dry**
Average Tunnel Temperature	79 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	14.03 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	9630.1 dscf/hour
Average Delta p	0.054 inches H20
Total Time of Test	334 minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	53.399 cubic feet	54.583 cubic feet	9.532 cubic feet
Average Gas Meter Temperature	69 degrees Fahrenheit	79 degrees Fahrenheit	80 degrees Fahrenheit	74 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	52.423 dscf	53.408 dscf	9.437 dscf
Total Particulates - m_n	0 mg	3 mg	3 mg	0.2 mg
Particulate Concentration (dry-standard) - C_r/C_s	0.000000 grams/dscf	0.00006 grams/dscf	0.00006 grams/dscf	0.00002 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	3.07 grams	3.01 grams	0.20 grams
Particulate Emission Rate	0.00 grams/hour	0.55 grams/hour	0.54 grams/hour	0.20 grams/hour
Emissions Factor		0.63 g/kg	0.62 g/kg	0.11 g/kg
Difference from Average Total Particulate Emissions		0.03 grams	0.03 grams	

Dual Train Comparison Results Are Acceptable

FINAL AVERAGE RESULTS

Complete Test Run	
Total Particulate Emissions - E_T	3.04 grams
Particulate Emission Rate	**0.55 grams/hour**
Emissions Factor	0.63 grams/kg
First Hour Emissions	
Total Particulate Emissions - E_T	0.20 grams
Particulate Emission Rate	0.20 grams/hour
Emissions Factor	0.11 grams/kg
7.5% of Average Total Particulate Emissions	0.23 grams

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK
Stove Surface ΔT	OK
Train Precesion 7.5%	0.93
Train Precision 0.5g/kg	0.01

Technician Signature: 

Wood Heater Efficiency Results - CSA B415.1

Technician Signature: 

Manufacturer: HHT Halifax
Model: Encore
Date: 10/30/18
Run: 1
Control #: 0135WS042E
Test Duration: 334
Output Category: II

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	80.1%	86.5%
Combustion Efficiency	97.7%	97.7%
Heat Transfer Efficiency	82%	88.6%

Output Rate (kJ/h)	13,677	12,974	**(Btu/h)**
Burn Rate (kg/h)	0.86	1.90	**(lb/h)**
Input (kJ/h)	17,084	16,206	**(Btu/h)**

Test Load Weight (dry kg)	4.80	10.58	**dry lb**
MC wet (%)	16.68980839		
MC dry (%)	20.03		
Particulate (g)	0.55		
CO (g)	170		
Test Duration (h)	5.57		

Emissions	Particulate	CO
g/MJ Output	0.01	2.24
g/kg Dry Fuel	0.11	35.46
g/h	0.10	30.58
lb/MM Btu Output	0.02	5.20

Air/Fuel Ratio (A/F)	12.29

VERSION: **2.2** **12/14/2009**

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 1
Model: Encore | Tracking Number: 2326 | Date: 10/30/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 335, 336, 185

Wood Heater Run Notes

Air Control Settings

Primary: On minimum (fixed stop)

Secondary: Fixed

Tertiary/Pilot: Fixed

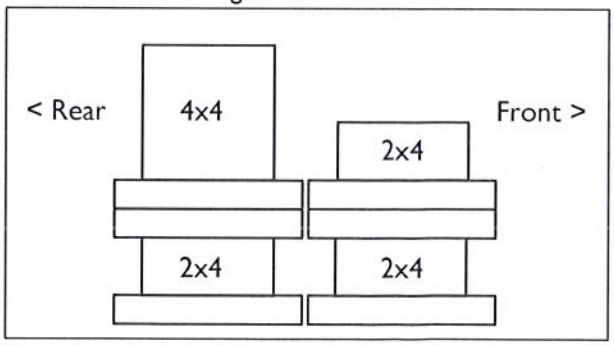
Fan: On Low

Preburn Notes

Time	Notes
–	15 lb closed bypass
–	12 lb
20:00	stirred PB
4:00	stirred

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Closed @ :50 sec
Fuel loaded by: 40 sec
Door closed at: 45 sec
Primary air: set throughout

Notes:

Time	Notes
60:00	swapped Filter A

Technician Signature: _____ Date: 10/30/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 1
Model: Encore | Tracking Number: 2326 | Date: 10/30/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 437, 340, 241-T55

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16 8 in	19.2	7	16 8 in	19.8
2	8 in	19.4	8	8 in	20.0
3	8 in	21.7	9	8 in	20.5
4	8 in	21.1	10	8 AA in	18.9
5	8 in	19.4	11	16 in	22.8
6	8 in	19.8	12	in	

AA

Total Pre-Burn Fuel Weight: 17.8

Time (clock): 11:00 Room Temperature (F): 67 Initials: [signature]

Test Fuel

Firebox Volume (ft³): 2.02 Test Fuel Piece Length (in): 19.5
Load Weight Range (lb): 12.7-15.5
Fuel Type & Amount: 2 x 4: 3 Weight (2x4s with spacers): 7.5
4 x 4: 1 Weight (4x4s with spacers): 5.2
Total Wet Fuel Load Weight (lb): 12.7

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	~~2.0~~ A	~~27.2~~ A	~~21.0~~ A	~~22.0~~ A	2x4
2	2.0	19.3	19.6	19.9	"
3	2.0	19.3	19.3	19.1	"
4	4.7	~~19.4~~ A 27.2	21.0	22.0	4x4
5	2.0	19.1	19.0	19.6	2x4
6					
7					

Spacer Moisture Readings (%DB)

10.1	16.1	12.8	9.0				
10.5	8.5	9.7	10.8				
10.3	9.8	10.2	8.4				
9.9	11.0	9.0	9.1				

Time (clock): 11:00 Room Temperature (F): 67 Initials: [signature]

Technician Signature: [signature] Date: 10/30/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 1
Model: Encore Tracking Number: 2326 Date: 10/30/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 132, ~~410~~ A, 554, 635, 850, 653

ASTM E2515 Sampling Information

Test Location: OMNI E1 Clock Time @ ET=0: 13:37
Span Gas Concentrations: **CO_2(%):** 17.06 **CO(%):** 4.290 **CO(ppm):** 901

Test Run Validation Checks	Pre Test	Post Test
Zero Stack Gas Leakage	✓	✓
Zero Pitot Line Leakage	✓	✓
Zero Induced Draft	✓	
100% Smoke Capture	✓	

Test Run Validation Measurements	Pre Test		Post Test	
Scale Audit (lbs)	10.0		10.0	
CO_2 % (Zero/Span)	0.00	17.05	-0.02	16.95
CO % (Zero/Span)	0.000	4.290	-0.002	4.273
CO ppm (Zero/Span)	2		-1	891
Sample A Leakage (cfm @"Hg)	0		0 @ -10	
Sample B Leakage (cfm @"Hg)	0		0.001 @ -14	
Room Air Velocity (ft/min)	<50		<50	
Barometric Pressure ("Hg)	30.40		30.30	
Relative Humidity (%)	41.2		37.4	
Tunnel Static ("H_2O)	-0.20		-0.20	

Last Cleaning Dates

Flue Pipe	10/30/18
Dilution Tunnel	10/26/18
Sample Dryers	10/24/18

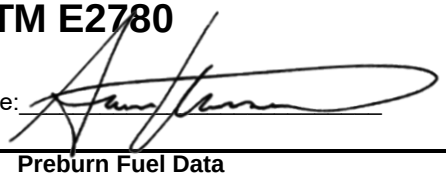
Dilution Tunnel Traverse

Traverse Point	1	2	Center	3	4	5	6	7	8
Δp ("H_2O)	0.040	0.043	0.050	0.046	0.034	0.034	0.044	0.045	0.035
T (°F)	80	80	80	80	80	79			

Technician Signature: [signature] Date: 10/30/18

Wood Heater Preburn Data - ASTM E2780

Run:	**1**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/30/18
Beginning Clock Time:	11:51

Preburn Fuel Data

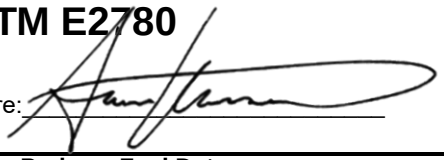
Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	17.8		
Fuel Moisture Readings (% DB):	19.2	20.9	18.9
	19.4	20.9	22.8
	21.7	20	
	21.1	19.8	
	19.4	19.8	
Avg Preburn Moisture (% DB):	**20.33**		

Coal Bed Range (lb):	**2.5** (min)	**3.2** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
0	11.6	-0.054	541	314	161	69	246	266.2	413	68
1	11.5	-0.053	518	315	166	69	250	263.6	362	68
2	11.3	-0.05	498	316	172	69	252	261.4	340	67
3	11.2	-0.051	482	317	179	69	252	259.8	329	68
4	11	-0.049	468	318	185	69	253	258.6	324	68
5	10.9	-0.05	457	318	191	69	252	257.4	322	67
6	10.8	-0.05	448	319	197	69	251	256.8	323	68
7	10.7	-0.05	439	319	203	69	250	256	322	68
8	10.5	-0.049	433	320	209	69	249	256	323	68
9	10.4	-0.049	428	320	216	69	248	256.2	322	68
10	10.3	-0.05	424	320	223	69	246	256.4	321	67
11	10.1	-0.049	421	320	229	69	245	256.8	321	68
12	10	-0.049	418	320	236	69	244	257.4	327	68
13	9.9	-0.049	415	320	243	69	242	257.8	326	68
14	9.8	-0.049	414	320	250	69	241	258.8	326	68
15	9.6	-0.049	412	321	256	70	240	259.8	329	68
16	9.5	-0.049	412	320	262	70	239	260.6	326	67
17	9.4	-0.049	412	320	268	69	237	261.2	327	68
18	9.3	-0.049	412	321	273	70	237	262.6	325	67
19	9.2	-0.049	412	320	278	70	236	263.2	324	67
20	9	-0.049	412	320	284	70	235	264.2	326	67
21	15.5	-0.076	418	320	289	70	235	266.4	590	67
22	8.5	-0.059	442	322	294	70	236	272.8	490	68
23	8.4	-0.055	445	322	298	70	238	274.6	408	68
24	8.2	-0.053	440	322	302	70	238	274.4	373	68
25	8.1	-0.052	436	323	307	70	239	275	354	67
26	8	-0.051	433	323	310	70	239	275	344	67
27	7.9	-0.048	432	324	314	70	239	275.8	336	67
28	7.8	-0.048	434	324	316	70	240	276.8	329	68
29	7.7	-0.056	431	325	319	70	240	277	328	68
30	7.6	-0.048	434	325	321	70	240	278	319	67
31	7.5	-0.048	434	326	322	70	241	278.6	321	67
32	7.4	-0.053	434	326	324	70	241	279	318	67
33	7.3	-0.048	440	327	325	70	241	280.6	318	67
34	7.2	-0.046	442	327	326	70	242	281.4	315	68
35	7.1	-0.047	443	327	328	70	243	282.2	315	68
36	7	-0.046	447	328	329	70	244	283.6	313	67
37	6.9	-0.047	449	328	330	70	244	284.2	313	67
38	6.8	-0.048	451	328	331	70	245	285	314	67

Wood Heater Preburn Data - ASTM E2780

Run:	**1**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/30/18
Beginning Clock Time:	11:51

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	17.8		
Fuel Moisture Readings (% DB):	19.2	20.9	18.9
	19.4	20.9	22.8
	21.7	20	
	21.1	19.8	
	19.4	19.8	
Avg Preburn Moisture (% DB):	**20.33**		

Coal Bed Range (lb):	**2.5** (min)	**3.2** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
39	6.7	-0.046	454	328	333	70	246	286.2	311	67
40	6.7	-0.048	455	328	333	70	247	286.6	313	67
41	6.6	-0.045	455	328	334	70	248	287	308	67
42	8.2	-0.054	452	328	335	70	248	286.6	401	67
43	6.2	-0.056	467	330	336	71	249	290.6	463	67
44	6	-0.054	478	331	337	71	250	293.4	389	67
45	5.9	-0.053	485	332	338	71	252	295.6	365	67
46	5.8	-0.052	481	331	341	71	253	295.4	352	68
47	5.7	-0.051	472	330	344	71	254	294.2	345	67
48	5.5	-0.051	466	330	348	71	254	293.8	343	68
49	5.4	-0.051	462	329	351	71	254	293.4	339	68
50	5.3	-0.051	459	329	355	71	255	293.8	334	67
51	5.2	-0.05	456	329	358	71	255	293.8	332	67
52	5.1	-0.05	455	328	362	71	256	294.4	331	67
53	5	-0.049	453	328	365	71	256	294.6	328	67
54	4.9	-0.048	455	329	368	71	257	296	320	67
55	4.8	-0.047	458	329	371	71	258	297.4	317	68
56	4.8	-0.046	459	330	374	71	259	298.6	315	67
57	4.7	-0.044	461	330	375	71	260	299.4	309	67
58	6.7	-0.048	463	331	375	72	260	300.2	377	67
59	4.4	-0.053	477	332	375	72	261	303.4	432	67
60	4.3	-0.05	484	332	374	72	264	305.2	370	67
61	4.2	-0.05	487	332	375	72	266	306.4	346	67
62	4.2	-0.046	490	331	376	72	268	307.4	332	67
63	4.1	-0.045	489	331	377	72	270	307.8	321	67
64	4	-0.044	487	330	378	72	272	307.8	315	67
65	4	-0.044	485	329	378	72	274	307.6	305	68
66	3.9	-0.043	486	329	378	72	276	308.2	298	67
67	3.9	-0.044	483	329	377	72	278	307.8	293	67
68	3.9	-0.043	480	328	376	72	280	307.2	293	68
69	3.8	-0.042	475	327	374	72	281	305.8	294	67
70	3.8	-0.041	474	326	373	72	281	305.2	286	68
71	3.8	-0.04	474	326	370	72	283	305	285	68
72	3.7	-0.04	476	326	368	72	284	305.2	280	68
73	3.7	-0.041	477	326	366	72	284	305	278	67
74	3.7	-0.04	479	325	363	72	285	304.8	276	68
75	3.6	-0.038	482	325	360	72	287	305.2	272	68
76	3.6	-0.039	484	325	358	72	288	305.4	267	68
77	3.6	-0.038	487	324	355	72	289	305.4	267	68

Wood Heater Preburn Data - ASTM E2780

Run:	**1**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/30/18
Beginning Clock Time:	11:51

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	17.8		
Fuel Moisture Readings (% DB):	19.2	20.9	18.9
	19.4	20.9	22.8
	21.7	20	
	21.1	19.8	
	19.4	19.8	
Avg Preburn Moisture (% DB):	**20.33**		

Coal Bed Range (lb):	**2.5** (min)	**3.2** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
78	3.6	-0.038	491	325	352	72	290	306	265	68
79	3.6	-0.037	493	324	348	71	291	305.4	266	68
80	3.5	-0.037	494	324	345	72	292	305.4	262	68
81	3.5	-0.037	496	324	342	72	293	305.4	259	68
82	3.5	-0.036	497	325	339	72	294	305.4	260	68
83	3.5	-0.037	499	325	336	72	295	305.4	257	68
84	3.5	-0.037	500	325	332	72	296	305	256	67
85	3.4	-0.036	501	325	329	72	297	304.8	253	68
86	3.4	-0.037	502	324	326	72	298	304.4	254	68
87	3.4	-0.037	503	324	322	310	298	351.4	253	68
88	3.4	-0.036	503	325	319	311	299	351.4	252	68
89	3.3	-0.036	503	325	315	312	299	350.8	250	68
90	3.3	-0.035	503	325	312	312	300	350.4	251	68
91	3.3	-0.035	501	325	309	312	300	349.4	250	67
92	3.3	-0.035	500	326	305	312	301	348.8	248	68
93	3.3	-0.034	499	326	302	312	301	348	246	68
94	3.2	-0.034	497	326	299	312	302	347.2	247	68
95	3.2	-0.033	496	326	295	312	302	346.2	245	68
96	3.2	-0.034	494	327	292	312	301	345.2	243	67
97	5.5	-0.016	493	327	289	311	302	344.4	243	68
98	3.1	-0.034	489	327	286	310	301	342.6	276	68
99	3.1	-0.034	485	327	283	309	301	341	256	68
100	3.1	-0.034	480	327	280	309	301	339.4	246	67
101	3.1	-0.034	473	327	277	307	301	337	242	68
102	3.1	-0.033	468	327	275	305	300	335	237	68
103	3.1	-0.033	465	326	272	304	300	333.4	235	67
104	3	-0.032	461	326	270	303	299	331.8	232	67
105	3	-0.032	456	326	268	301	298	329.8	231	68

Wood Heater Test Fuel Data

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/30/2018
Run No.:	1

Firebox Volume (ft^3):	2
Fuel Piece Length (in):	19.5
2x4 Crib Weight (lb):	7.5
4x4 Crib Weight (lb):	5.2

Total Fuel Weight (Dry Basis, lb):	10.7	
Fuel Density (lb/ft^3, Dry Basis):	28.10	OK
Loading Density (lb/ft^3, Wet Basis):	6.35	OK
2x4 Percentage:	59%	OK

Coal Bed Range (20-25%): **2.54 - 3.175**

Test Fuel Piece	Weight (lb)	Size	Readings (Dry Basis %)			Dry Weight (lb)
1	4.7	4"x 4"	23.2	21.0	22.0	3.85
2	2	2"x 4"	19.3	19.6	19.9	1.67
3	2	2"x 4"	19.3	19.3	19.1	1.68
4	2	2"x 4"	19.1	19.0	19.6	1.68

Spacer Readings (Dry Basis %)			
10.1	8.1		
10.1	8.8		
10.5	10.8		
10.3	9.0		
9.8	12.8		
8.5	9.7		
9.8	10.2		
11.0	9.0		

Technician Signature: 

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average	
	30.40	30.20	30.30	30.30	0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			1.02	71	1.86	0.94	72	1.0	96	0.054			12.7		457	324	265	300	296	328	767	270	67	66	67	67	68	-0.033	1.65	0.2
1	0.151	0.158	0.15	0.16	1.36	71	2.05	1.13	72	1.0	114	0.052	101	103	12.7	0	440	324	264	299	296	325	770	251	67	67	68	67	68	-0.036	1.02	0.16
2	0.310	0.321	0.16	0.16	1.37	71	2.06	1.12	72	1.0	92	0.054	102	102	12.6	-0.1	423	323	262	296	294	320	797	269	67	68	69	67	68	-0.037	7.32	0.21
3	0.470	0.484	0.16	0.16	1.37	71	2.06	1.12	72	1.0	86	0.052	104	104	12.6	0	409	322	261	294	292	316	821	257	67	68	69	67	69	-0.038	9.84	0.16
4	0.629	0.646	0.16	0.16	1.35	71	2.05	1.11	72	1.0	83	0.055	100	100	12.5	-0.1	397	322	260	290	288	311	836	255	67	68	69	67	68	-0.038	9.62	0.13
5	0.789	0.807	0.16	0.16	1.36	71	2.06	1.11	72	1.0	81	0.054	102	100	12.5	0	387	321	259	286	285	308	847	255	67	68	69	67	68	-0.038	9.88	0.12
6	0.948	0.969	0.16	0.16	1.36	71	2.05	1.11	72	1.0	81	0.053	102	102	12.4	-0.1	378	320	259	282	281	304	858	256	67	68	69	67	68	-0.039	9.84	0.12
7	1.107	1.132	0.16	0.16	1.35	71	2.05	1.11	72	1.0	80	0.055	100	100	12.4	0	371	320	260	278	278	301	861	258	67	68	69	67	68	-0.039	9.94	0.074
8	1.266	1.294	0.16	0.16	1.35	71	2.05	1.11	72	1.0	80	0.054	101	101	12.3	-0.1	363	319	260	274	274	298	869	258	67	68	69	67	68	-0.039	10.16	0.055
9	1.425	1.455	0.16	0.16	1.36	72	2.06	1.10	72	1.0	80	0.055	100	99	12.2	-0.1	361	318	261	271	271	296	890	260	67	68	69	67	68	-0.039	10.5	0.058
10	1.583	1.617	0.16	0.16	1.34	72	2.04	1.11	72	1.0	80	0.055	99	100	12.2	0	357	317	262	267	267	294	913	264	67	68	69	67	68	-0.040	10.89	0.12
11	1.742	1.779	0.16	0.16	1.35	72	2.04	1.10	73	1.0	80	0.056	99	99	12.1	-0.1	354	317	263	264	264	292	925	269	67	68	69	67	68	-0.040	10.88	0.13
12	1.901	1.940	0.16	0.16	1.35	72	2.05	1.10	73	1.0	80	0.054	101	100	12.0	-0.1	352	316	265	261	262	291	939	270	67	68	69	67	68	-0.041	10.91	0.15
13	2.060	2.101	0.16	0.16	1.35	72	2.04	1.10	73	1.0	80	0.053	102	101	12.0	0	349	315	267	258	259	290	949	271	67	68	69	68	67	-0.041	11.04	0.12
14	2.219	2.262	0.16	0.16	1.34	72	2.04	1.10	73	1.0	80	0.053	102	101	11.9	-0.1	348	314	269	255	256	288	962	273	67	68	69	68	67	-0.041	11.23	0.2
15	2.378	2.425	0.16	0.16	1.34	72	2.04	1.10	73	1.0	80	0.054	101	101	11.8	-0.1	347	314	271	253	254	288	981	275	67	68	69	68	67	-0.041	11.52	0.26
16	2.536	2.585	0.16	0.16	1.34	72	2.04	1.09	73	1.0	80	0.054	100	99	11.7	-0.1	346	313	274	250	252	287	997	277	67	68	69	68	67	-0.041	11.7	0.23
17	2.695	2.746	0.16	0.16	1.34	72	2.04	1.10	73	1.0	80	0.056	99	98	11.7	0	346	312	276	248	250	286	1007	277	67	68	69	68	67	-0.041	11.77	0.19
18	2.853	2.910	0.16	0.16	1.34	73	2.04	1.12	73	1.0	80	0.053	101	103	11.6	-0.1	345	311	279	247	248	286	1018	281	67	69	69	68	68	-0.041	11.8	0.24
19	3.011	3.074	0.16	0.16	1.34	73	2.04	1.12	74	1.0	81	0.054	100	102	11.5	-0.1	344	311	281	246	246	286	1029	281	67	69	69	68	68	-0.042	11.81	0.2
20	3.170	3.237	0.16	0.16	1.33	73	2.04	1.11	74	1.0	81	0.055	100	100	11.4	-0.1	344	310	284	244	244	285	1035	281	67	69	70	68	67	-0.041	11.79	0.19
21	3.329	3.400	0.16	0.16	1.34	73	2.04	1.12	74	1.0	81	0.056	99	99	11.3	-0.1	344	309	287	242	243	285	1043	283	67	69	70	68	68	-0.042	11.8	0.2
22	3.488	3.563	0.16	0.16	1.33	73	2.04	1.12	74	1.0	81	0.053	102	102	11.2	-0.1	345	308	290	240	241	285	1049	285	67	69	70	68	68	-0.043	11.98	0.17
23	3.646	3.726	0.16	0.16	1.33	73	2.04	1.12	74	1.0	81	0.053	101	102	11.2	0	346	308	293	239	240	285	1058	286	67	69	70	68	68	-0.043	12.02	0.24
24	3.805	3.890	0.16	0.16	1.34	73	2.04	1.12	74	1.1	81	0.055	100	101	11.1	-0.1	347	307	295	237	238	285	1065	286	67	69	70	68	67	-0.043	11.98	0.27
25	3.963	4.053	0.16	0.16	1.33	74	2.04	1.12	74	1.1	81	0.054	100	101	11.0	-0.1	348	306	298	236	237	285	1079	289	67	69	70	68	67	-0.043	12.17	0.35
26	4.122	4.216	0.16	0.16	1.34	74	2.04	1.12	75	1.0	81	0.054	101	101	10.9	-0.1	350	305	300	235	236	285	1094	289	67	69	70	68	67	-0.043	12.19	0.38
27	4.280	4.379	0.16	0.16	1.34	74	2.04	1.12	75	1.0	81	0.054	100	101	10.8	-0.1	352	305	303	233	236	286	1103	294	67	69	70	68	67	-0.044	12.29	0.34
28	4.439	4.543	0.16	0.16	1.34	74	2.03	1.12	75	1.1	81	0.053	102	102	10.7	-0.1	352	304	305	233	235	286	1103	295	67	69	70	68	67	-0.044	12.32	0.32
29	4.598	4.706	0.16	0.16	1.34	74	2.04	1.12	75	1.1	81	0.055	100	100	10.6	-0.1	355	304	308	232	234	287	1116	294	67	69	70	68	67	-0.044	12.44	0.39
30	4.757	4.870	0.16	0.16	1.34	74	2.04	1.12	75	1.0	81	0.054	101	101	10.6	0	357	303	310	231	234	287	1121	295	67	69	70	68	67	-0.044	12.58	0.4
31	4.916	5.033	0.16	0.16	1.33	74	2.04	1.11	75	1.0	81	0.054	101	101	10.5	-0.1	360	302	313	231	233	288	1128	296	67	69	70	68	67	-0.043	12.75	0.41
32	5.075	5.196	0.16	0.16	1.33	75	2.04	1.12	75	1.0	82	0.053	101	102	10.4	-0.1	367	302	315	230	233	289	1140	300	67	69	70	68	67	-0.045	13.11	0.51
33	5.233	5.359	0.16	0.16	1.34	75	2.05	1.12	76	1.1	82	0.053	101	102	10.3	-0.1	374	301	318	230	233	291	1157	302	67	70	70	68	67	-0.045	13.56	0.82
34	5.392	5.523	0.16	0.16	1.33	75	2.04	1.12	76	1.1	82	0.055	100	100	10.2	-0.1	382	300	320	230	232	293	1165	305	67	70	70	68	67	-0.046	13.5	0.78

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average	
	30.40	30.20	30.30	30.30	0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature: _____

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
35	5.551	5.687	0.16	0.16	1.34	75	2.05	1.12	76	1.1	82	0.053	101	102	10.1	-0.1	388	300	323	230	232	295	1175	309	67	70	70	68	67	-0.046	13.69	0.85
36	5.710	5.850	0.16	0.16	1.34	75	2.05	1.12	76	1.1	82	0.054	100	101	10.0	-0.1	392	299	325	229	232	295	1177	307	67	70	70	68	67	-0.046	13.58	0.72
37	5.869	6.013	0.16	0.16	1.34	75	2.04	1.12	76	1.1	82	0.053	101	102	9.9	-0.1	395	299	328	229	232	297	1178	308	67	70	70	69	67	-0.046	13.55	0.59
38	6.028	6.176	0.16	0.16	1.34	75	2.04	1.12	76	1.1	82	0.054	100	101	9.8	-0.1	396	298	330	229	232	297	1182	309	67	70	70	69	67	-0.046	13.61	0.62
39	6.187	6.340	0.16	0.16	1.34	75	2.05	1.12	76	1.1	82	0.054	100	101	9.7	-0.1	400	298	332	229	233	298	1194	309	67	70	70	69	67	-0.047	13.89	0.74
40	6.346	6.504	0.16	0.16	1.34	75	2.05	1.12	76	1.1	83	0.054	101	101	9.6	-0.1	406	297	335	229	233	300	1206	314	67	70	70	69	68	-0.046	14.21	1.12
41	6.505	6.668	0.16	0.16	1.33	75	2.05	1.12	77	1.1	83	0.053	102	102	9.5	-0.1	410	297	337	229	234	301	1213	317	67	70	70	69	67	-0.047	14.18	1.1
42	6.664	6.831	0.16	0.16	1.33	76	2.05	1.12	77	1.1	83	0.054	100	101	9.4	-0.1	415	296	340	230	234	303	1217	316	67	70	70	69	67	-0.047	14.01	0.99
43	6.823	6.994	0.16	0.16	1.34	76	2.04	1.12	77	1.1	83	0.052	102	103	9.3	-0.1	421	296	342	230	235	305	1218	317	67	70	70	69	67	-0.047	13.94	0.9
44	6.982	7.158	0.16	0.16	1.35	76	2.05	1.12	77	1.0	83	0.053	101	102	9.2	-0.1	425	296	344	231	235	306	1214	316	67	70	70	69	67	-0.045	13.86	0.7
45	7.141	7.321	0.16	0.16	1.35	76	2.04	1.12	77	1.1	83	0.054	100	101	9.1	-0.1	427	295	346	231	236	307	1211	315	67	70	70	69	67	-0.049	13.74	0.59
46	7.300	7.486	0.16	0.17	1.34	76	2.05	1.12	77	1.1	82	0.054	100	102	9.0	-0.1	426	295	348	232	236	307	1204	313	67	70	70	69	67	-0.048	13.7	0.5
47	7.460	7.649	0.16	0.16	1.34	76	2.04	1.11	77	1.1	83	0.054	101	101	8.9	-0.1	429	295	350	233	237	309	1191	311	67	71	70	69	68	-0.046	13.42	0.47
48	7.620	7.812	0.16	0.16	1.33	76	2.05	1.12	77	1.1	83	0.053	102	102	8.8	-0.1	430	294	351	233	238	309	1187	309	67	71	70	69	67	-0.045	13.36	0.44
49	7.779	7.976	0.16	0.16	1.34	76	2.04	1.12	77	1.1	83	0.053	101	102	8.8	0	429	294	352	234	238	309	1182	309	67	71	70	69	67	-0.043	13.33	0.46
50	7.938	8.139	0.16	0.16	1.34	76	2.05	1.12	77	1.1	83	0.056	99	99	8.7	-0.1	430	294	352	234	239	310	1171	308	67	71	70	69	67	-0.045	13.33	0.52
51	8.097	8.303	0.16	0.16	1.34	76	2.04	1.13	77	1.1	83	0.054	100	101	8.6	-0.1	428	293	353	234	240	310	1163	305	67	71	70	69	67	-0.045	13.46	0.43
52	8.256	8.467	0.16	0.16	1.34	76	2.04	1.12	78	1.1	83	0.053	101	102	8.5	-0.1	429	293	353	235	240	310	1163	309	67	71	70	69	67	-0.046	13.41	0.44
53	8.415	8.631	0.16	0.16	1.33	77	2.04	1.12	78	1.1	83	0.055	99	100	8.4	-0.1	431	293	353	235	241	311	1151	306	67	71	70	69	68	-0.045	13.2	0.46
54	8.575	8.794	0.16	0.16	1.34	77	2.04	1.12	78	1.1	83	0.055	100	100	8.3	-0.1	434	292	353	236	242	311	1148	305	67	71	70	69	68	-0.045	13.13	0.66
55	8.734	8.958	0.16	0.16	1.34	77	2.04	1.12	78	1.1	82	0.056	98	99	8.2	-0.1	437	292	353	236	242	312	1156	307	67	71	70	69	67	-0.044	13.2	0.56
56	8.893	9.122	0.16	0.16	1.35	77	2.04	1.12	78	1.1	83	0.055	99	100	8.2	0	440	292	353	237	243	313	1162	308	67	71	70	70	67	-0.044	13.32	0.54
57	9.053	9.286	0.16	0.16	1.34	77	2.05	1.12	78	1.1	83	0.054	101	101	8.1	-0.1	444	292	353	239	244	314	1162	307	67	71	70	70	67	-0.044	13.29	0.59
58	9.213	9.450	0.16	0.16	1.33	77	2.04	1.12	78	1.1	83	0.055	100	100	8.0	-0.1	448	291	352	239	245	315	1165	306	67	71	70	70	67	-0.046	13.17	0.59
59	9.373	9.613	0.16	0.16	1.34	77	2.04	1.11	78	1.1	82	0.055	100	99	7.9	-0.1	453	291	352	239	246	316	1162	305	67	71	70	70	67	-0.045	13.27	0.48
60	9.532	9.777	0.16	0.16	1.34	77	2.04	1.12	78	1.1	83	0.054	100	101	7.8	-0.1	457	291	352	240	247	317	1163	307	67	71	70	70	68	-0.048	13.29	0.45
61	9.688	9.940	0.16	0.16	1.34	77	2.04	1.12	78	1.1	83	0.053	99	101	7.7	-0.1	461	291	352	241	247	318	1158	307	68	71	70	70	68	-0.044	13.18	0.47
62	9.848	10.104	0.16	0.16	1.34	77	2.04	1.12	78	1.1	82	0.054	101	101	7.7	0	464	291	352	242	248	319	1158	311	67	71	70	70	67	-0.045	13.18	0.47
63	10.006	10.269	0.16	0.17	1.34	77	2.05	1.13	78	1.1	83	0.055	99	101	7.6	-0.1	466	291	351	242	250	320	1147	308	67	71	70	70	67	-0.043	13.15	0.47
64	10.166	10.433	0.16	0.16	1.34	77	2.05	1.12	78	1.1	82	0.053	102	102	7.5	-0.1	469	290	351	243	250	321	1147	305	67	71	70	70	68	-0.043	13.09	0.42
65	10.326	10.597	0.16	0.16	1.34	77	2.05	1.12	78	1.1	83	0.053	102	102	7.4	-0.1	469	289	351	244	251	321	1136	302	67	71	70	70	68	-0.044	13.23	0.35
66	10.485	10.760	0.16	0.16	1.34	77	2.05	1.12	78	1.1	83	0.054	100	100	7.3	-0.1	472	289	350	246	251	322	1122	301	67	71	70	70	68	-0.044	12.89	0.29
67	10.646	10.924	0.16	0.16	1.33	77	2.05	1.12	78	1.1	82	0.055	100	100	7.3	0	473	289	350	246	252	322	1115	300	67	72	70	70	67	-0.044	12.88	0.32
68	10.805	11.088	0.16	0.16	1.34	77	2.05	1.12	79	1.1	82	0.053	101	102	7.2	-0.1	475	289	349	246	252	322	1110	302	67	72	70	70	67	-0.044	12.89	0.27
69	10.965	11.252	0.16	0.16	1.34	77	2.05	1.12	79	1.1	82	0.054	101	101	7.1	-0.1	476	289	348	246	253	322	1108	299	67	72	70	70	68	-0.044	12.84	0.25

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average	
	30.40	30.20	30.30	30.30	0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
70	11.124	11.416	0.16	0.16	1.34	77	2.04	1.12	79	1.1	82	0.055	99	100	7.0	-0.1	479	289	347	247	254	323	1107	299	67	72	70	70	68	-0.043	12.78	0.28
71	11.284	11.580	0.16	0.16	1.33	77	2.05	1.12	79	1.1	82	0.052	103	103	7.0	0	480	288	346	247	255	323	1115	300	67	72	70	70	67	-0.043	12.8	0.39
72	11.443	11.744	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.051	103	104	6.9	-0.1	483	288	346	247	256	324	1119	301	67	72	70	70	68	-0.044	12.9	0.41
73	11.603	11.907	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.053	102	101	6.8	-0.1	485	288	345	248	257	325	1121	299	67	72	70	70	68	-0.043	12.78	0.43
74	11.762	12.071	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.054	100	101	6.8	0	485	288	344	249	257	325	1124	301	67	72	70	70	68	-0.043	12.93	0.37
75	11.925	12.238	0.16	0.17	1.34	78	2.04	1.12	79	1.1	82	0.055	102	102	6.7	-0.1	486	288	344	250	258	325	1123	299	67	72	70	70	68	-0.044	12.82	0.39
76	12.084	12.403	0.16	0.17	1.34	78	2.04	1.13	79	1.1	82	0.055	99	101	6.6	-0.1	486	288	343	250	259	325	1123	298	67	72	70	70	67	-0.044	12.62	0.49
77	12.244	12.567	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.055	100	100	6.5	-0.1	488	288	343	251	260	326	1124	299	67	72	70	70	67	-0.047	12.61	0.5
78	12.403	12.730	0.16	0.16	1.34	78	2.04	1.11	79	1.1	82	0.054	100	100	6.5	0	490	288	342	251	261	326	1122	299	67	72	70	70	67	-0.047	12.84	0.52
79	12.563	12.894	0.16	0.16	1.35	78	2.05	1.12	79	1.1	82	0.053	102	102	6.4	-0.1	492	287	342	252	262	327	1114	297	67	72	70	70	67	-0.043	12.85	0.52
80	12.723	13.058	0.16	0.16	1.34	78	2.03	1.12	79	1.1	82	0.052	102	103	6.3	-0.1	493	287	342	253	263	328	1114	295	67	72	70	70	68	-0.043	12.67	0.5
81	12.883	13.222	0.16	0.16	1.33	78	2.04	1.12	79	1.1	82	0.054	101	101	6.2	-0.1	495	287	341	254	263	328	1105	296	70	72	70	70	67	-0.043	12.69	0.59
82	13.043	13.386	0.16	0.16	1.34	78	2.05	1.12	79	1.1	82	0.055	100	100	6.2	0	492	287	341	255	264	328	1098	298	70	72	70	70	68	-0.043	13.05	0.59
83	13.202	13.551	0.16	0.17	1.34	78	2.04	1.12	79	1.1	82	0.056	98	100	6.1	-0.1	490	287	340	255	265	327	1096	296	70	72	70	70	68	-0.044	12.7	0.56
84	13.362	13.714	0.16	0.16	1.34	78	2.04	1.11	79	1.1	82	0.053	102	101	6.0	-0.1	492	287	340	256	266	328	1091	296	70	72	70	70	67	-0.044	12.97	0.36
85	13.522	13.878	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.054	101	101	5.9	-0.1	493	287	339	256	266	328	1094	295	70	72	70	70	67	-0.042	12.73	0.41
86	13.681	14.042	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.053	101	102	5.9	0	494	287	338	257	267	329	1087	297	70	72	70	70	68	-0.043	12.84	0.34
87	13.841	14.206	0.16	0.16	1.34	78	2.04	1.13	79	1.1	82	0.051	103	104	5.8	-0.1	495	286	338	258	268	329	1081	296	70	72	70	70	68	-0.043	12.78	0.3
88	14.000	14.370	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.054	100	101	5.7	-0.1	496	286	337	258	269	329	1079	293	70	72	70	70	67	-0.043	12.82	0.18
89	14.160	14.535	0.16	0.17	1.34	78	2.05	1.12	79	1.1	82	0.053	102	102	5.7	0	497	286	337	259	270	330	1081	294	70	72	70	70	68	-0.043	12.88	0.18
90	14.320	14.699	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.055	100	100	5.6	-0.1	498	286	336	260	271	330	1085	294	70	72	70	70	68	-0.043	12.75	0.15
91	14.480	14.862	0.16	0.16	1.35	78	2.05	1.12	79	1.1	81	0.054	100	100	5.5	-0.1	497	286	336	260	272	330	1083	297	70	72	70	70	68	-0.043	12.88	0.16
92	14.640	15.027	0.16	0.16	1.34	78	2.05	1.12	79	1.1	81	0.053	101	102	5.5	0	499	286	335	260	272	330	1072	291	70	72	70	70	67	-0.042	12.54	0.18
93	14.800	15.191	0.16	0.16	1.34	78	2.05	1.13	79	1.1	82	0.054	101	101	5.4	-0.1	501	285	335	261	273	331	1063	292	70	72	70	70	67	-0.042	12.46	0.29
94	14.960	15.355	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.054	101	101	5.3	-0.1	502	285	334	262	274	331	1057	292	70	72	70	71	67	-0.042	12.62	0.21
95	15.120	15.519	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.054	100	101	5.3	0	501	285	334	262	275	331	1052	294	70	72	70	71	67	-0.041	12.44	0.28
96	15.280	15.683	0.16	0.16	1.34	78	2.05	1.12	79	1.1	81	0.055	100	100	5.2	-0.1	501	285	333	262	275	331	1044	291	70	72	70	71	67	-0.042	12.33	0.19
97	15.440	15.847	0.16	0.16	1.34	78	2.05	1.12	79	1.1	81	0.054	100	101	5.1	-0.1	501	285	332	263	276	331	1043	295	70	72	70	71	67	-0.042	12.36	0.26
98	15.599	16.011	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.055	99	100	5.1	0	502	285	331	263	276	331	1036	292	70	72	70	71	67	-0.041	12.22	0.23
99	15.759	16.175	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.055	100	100	5.0	-0.1	502	284	331	264	276	331	1032	290	70	72	70	71	67	-0.042	12.11	0.16
100	15.919	16.339	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.054	100	101	4.9	-0.1	503	284	330	264	277	332	1027	289	70	72	70	71	67	-0.042	12	0.14
101	16.079	16.504	0.16	0.17	1.34	78	2.04	1.12	80	1.1	81	0.053	101	102	4.9	0	502	284	329	265	277	331	1020	288	70	72	70	71	68	-0.042	11.9	0.12
102	16.238	16.668	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.054	100	101	4.8	-0.1	503	284	328	265	278	332	1013	285	70	72	70	71	68	-0.043	11.85	0.1
103	16.398	16.832	0.16	0.16	1.34	78	2.03	1.12	80	1.1	81	0.054	100	101	4.8	0	504	284	327	266	278	332	1004	282	70	72	70	71	68	-0.040	11.7	0.073
104	16.558	16.996	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.053	101	101	4.7	-0.1	503	284	326	266	278	331	998	284	70	72	70	71	69	-0.041	11.55	0.089

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.40	30.20	30.30	30.30 0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
105	16.718	17.160	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.054	100	101	4.7	0	504	284	325	266	279	332	992	282	70	72	70	71	68	-0.042	11.47	0.082
106	16.878	17.324	0.16	0.16	1.35	78	2.04	1.12	80	1.1	81	0.053	101	101	4.6	-0.1	504	283	324	267	279	331	987	279	70	72	70	71	67	-0.041	11.31	0.1
107	17.039	17.488	0.16	0.16	1.34	78	2.03	1.12	80	1.1	81	0.053	102	101	4.6	0	509	283	323	268	280	333	983	281	70	72	70	71	68	-0.041	11.28	0.078
108	17.199	17.653	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.055	100	100	4.5	-0.1	511	283	322	268	280	333	976	282	70	72	70	71	67	-0.041	10.95	0.084
109	17.359	17.817	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.053	101	101	4.5	0	511	283	321	268	281	333	972	278	70	72	70	71	68	-0.042	10.8	0.084
110	17.518	17.981	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.054	100	101	4.4	-0.1	507	283	320	269	281	332	964	275	70	72	70	71	68	-0.039	10.74	0.09
111	17.679	18.145	0.16	0.16	1.34	78	2.04	1.12	80	1.1	80	0.053	102	101	4.4	0	504	283	319	269	282	331	958	275	70	72	70	71	68	-0.040	10.59	0.1
112	17.838	18.309	0.16	0.16	1.34	78	2.04	1.12	80	1.1	80	0.055	99	100	4.3	-0.1	502	283	318	269	282	331	951	273	70	72	70	71	67	-0.040	10.46	0.09
113	17.998	18.472	0.16	0.16	1.34	78	2.04	1.16	80	1.1	80	0.054	100	100	4.3	0	500	282	316	270	282	330	947	274	70	72	70	71	68	-0.040	10.4	0.12
114	18.158	18.630	0.16	0.16	1.34	78	2.04	1.06	80	1.0	80	0.052	102	99	4.2	-0.1	497	282	315	270	282	329	949	274	70	72	70	71	68	-0.040	10.33	0.16
115	18.318	18.791	0.16	0.16	1.34	78	2.04	1.11	80	1.1	80	0.054	100	99	4.2	0	495	282	314	270	283	329	949	274	70	72	70	70	68	-0.039	10.34	0.16
116	18.477	18.954	0.16	0.16	1.34	78	2.04	1.11	80	1.1	80	0.054	100	100	4.1	-0.1	493	282	313	270	283	328	945	274	70	72	70	70	68	-0.040	10.29	0.16
117	18.637	19.118	0.16	0.16	1.35	78	2.03	1.11	80	1.1	80	0.054	100	100	4.1	0	491	282	311	271	283	328	943	273	70	72	70	70	68	-0.039	9.96	0.21
118	18.798	19.281	0.16	0.16	1.35	78	2.03	1.11	80	1.1	80	0.053	102	101	4.0	-0.1	489	282	310	272	283	327	941	271	70	72	70	70	68	-0.039	9.95	0.22
119	18.957	19.445	0.16	0.16	1.34	78	2.04	1.11	80	1.1	80	0.054	100	100	4.0	0	488	281	309	272	284	327	937	270	70	72	70	70	68	-0.039	9.94	0.19
120	19.117	19.608	0.16	0.16	1.34	79	2.04	1.11	80	1.1	80	0.056	98	98	4.0	0	487	281	308	272	284	326	929	270	70	72	70	70	68	-0.039	9.88	0.19
121	19.278	19.771	0.16	0.16	1.35	78	2.04	1.11	80	1.1	80	0.054	101	100	3.9	-0.1	487	281	307	272	284	326	920	267	70	72	70	70	68	-0.039	9.7	0.19
122	19.438	19.934	0.16	0.16	1.34	79	2.04	1.11	80	1.1	80	0.055	99	99	3.9	0	486	281	306	273	284	326	912	268	70	72	70	70	68	-0.038	9.64	0.19
123	19.598	20.098	0.16	0.16	1.35	79	2.04	1.11	80	1.1	80	0.053	101	101	3.8	-0.1	486	281	304	272	284	325	907	269	70	72	70	70	68	-0.038	9.54	0.2
124	19.758	20.261	0.16	0.16	1.34	79	2.04	1.10	80	1.1	80	0.053	101	101	3.8	0	484	281	303	273	284	325	900	267	70	72	70	70	68	-0.039	9.42	0.19
125	19.918	20.424	0.16	0.16	1.33	79	2.03	1.11	80	1.1	79	0.055	99	99	3.8	0	483	281	302	273	284	325	894	264	70	72	70	70	68	-0.038	9.54	0.16
126	20.078	20.587	0.16	0.16	1.33	79	2.04	1.11	80	1.1	79	0.053	101	101	3.7	-0.1	484	280	300	274	285	325	899	264	70	72	70	70	68	-0.038	9.26	0.28
127	20.238	20.750	0.16	0.16	1.33	79	2.03	1.11	80	1.1	79	0.055	99	99	3.7	0	486	280	299	274	284	325	903	264	70	72	70	70	68	-0.038	9.19	0.28
128	20.397	20.915	0.16	0.16	1.34	79	2.03	1.10	80	1.1	79	0.054	99	101	3.7	0	485	280	298	275	285	325	903	261	70	72	70	70	68	-0.038	9.17	0.28
129	20.557	21.078	0.16	0.16	1.34	79	2.03	1.11	80	1.1	80	0.052	102	102	3.6	-0.1	484	279	296	275	284	324	899	261	70	72	70	70	68	-0.038	9.2	0.25
130	20.717	21.241	0.16	0.16	1.34	79	2.03	1.11	80	1.1	80	0.053	101	101	3.6	0	483	279	295	275	285	323	894	259	70	72	70	70	69	-0.038	9.19	0.23
131	20.877	21.404	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.057	97	97	3.6	0	482	279	293	275	284	323	890	259	70	72	70	70	68	-0.038	9.13	0.26
132	21.037	21.567	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.053	101	101	3.5	-0.1	483	279	292	275	284	323	886	259	70	72	70	70	68	-0.037	9.21	0.23
133	21.197	21.731	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.054	100	100	3.5	0	482	279	291	275	284	322	882	260	70	72	70	70	68	-0.037	9.32	0.24
134	21.357	21.894	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.053	101	101	3.4	-0.1	487	279	289	275	284	323	877	257	70	72	70	70	68	-0.037	9.18	0.25
135	21.517	22.057	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.054	100	100	3.4	0	492	278	288	275	283	323	878	261	70	72	70	70	68	-0.037	9.27	0.27
136	21.678	22.220	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.055	100	99	3.4	0	493	278	286	275	283	323	880	257	70	72	70	70	68	-0.037	9.27	0.28
137	21.838	22.384	0.16	0.16	1.33	79	2.04	1.10	80	1.1	79	0.055	99	99	3.3	-0.1	490	278	285	276	283	322	877	258	70	72	70	70	68	-0.037	9.34	0.27
138	21.998	22.547	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.053	101	101	3.3	0	489	278	284	276	283	322	872	257	70	72	70	70	68	-0.037	9.4	0.24
139	22.158	22.711	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.053	101	101	3.3	0	489	278	283	276	282	322	864	257	70	72	70	70	68	-0.036	9.59	0.21

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.40	30.20	30.30	30.30 0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
140	22.318	22.874	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.054	100	100	3.2	-0.1	493	278	282	276	282	322	861	255	70	72	70	70	68	-0.036	9.8	0.21
141	22.478	23.037	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.054	100	100	3.2	0	498	277	280	276	282	323	860	258	70	72	70	70	68	-0.037	9.97	0.22
142	22.635	23.197	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.055	97	97	3.1	-0.1	502	277	279	276	282	323	861	257	70	72	70	70	68	-0.036	9.93	0.22
143	22.795	23.361	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.054	100	100	3.1	0	502	277	278	276	282	323	861	259	70	72	70	70	68	-0.037	9.76	0.23
144	22.954	23.525	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.054	99	100	3.0	-0.1	498	277	277	276	282	322	858	257	70	72	70	70	68	-0.037	9.57	0.2
145	23.115	23.687	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.055	100	98	3.0	0	496	277	276	276	282	321	855	258	70	72	70	70	68	-0.037	9.58	0.21
146	23.275	23.851	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.053	101	101	3.0	0	493	277	275	276	282	321	850	257	70	72	70	70	68	-0.037	9.42	0.2
147	23.435	24.014	0.16	0.16	1.35	79	2.05	1.11	80	1.1	79	0.055	99	99	2.9	-0.1	495	276	274	277	281	321	849	255	70	72	70	70	68	-0.036	9.11	0.23
148	23.595	24.178	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	99	99	2.9	0	496	276	274	276	281	321	855	256	70	72	70	70	68	-0.037	8.95	0.27
149	23.755	24.341	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.054	100	100	2.9	0	498	276	273	276	282	321	859	254	70	72	70	70	68	-0.037	8.75	0.28
150	23.916	24.504	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.056	99	98	2.8	-0.1	499	276	272	276	281	321	860	256	70	72	70	70	68	-0.036	8.69	0.29
151	24.076	24.668	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.054	100	100	2.8	0	499	276	271	276	281	321	856	256	70	72	70	70	68	-0.036	8.71	0.27
152	24.236	24.831	0.16	0.16	1.35	79	2.04	1.11	80	1.1	79	0.053	101	101	2.8	0	498	276	270	276	281	320	853	253	70	72	70	70	68	-0.036	8.65	0.27
153	24.396	24.994	0.16	0.16	1.35	79	2.04	1.11	80	1.1	79	0.055	99	99	2.8	0	497	275	269	276	281	320	850	253	70	72	70	70	68	-0.036	8.53	0.27
154	24.556	25.158	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	99	99	2.7	-0.1	498	275	268	277	281	320	848	254	70	72	70	70	68	-0.036	8.61	0.28
155	24.716	25.321	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.056	98	98	2.7	0	498	275	268	277	280	320	846	251	70	72	70	70	68	-0.035	8.61	0.28
156	24.875	25.484	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	99	99	2.7	0	498	275	267	277	280	319	846	252	70	72	70	70	68	-0.035	8.68	0.28
157	25.035	25.647	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.055	99	99	2.6	-0.1	496	275	266	276	280	319	844	252	70	72	70	70	68	-0.036	8.67	0.29
158	25.195	25.811	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.056	98	99	2.6	0	494	274	265	276	279	318	846	251	70	72	70	70	69	-0.035	8.67	0.32
159	25.355	25.975	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	99	99	2.6	0	493	274	264	276	279	317	848	248	70	71	70	70	68	-0.036	8.71	0.32
160	25.515	26.138	0.16	0.16	1.35	79	2.04	1.10	80	1.1	79	0.056	98	98	2.5	-0.1	492	274	263	276	279	317	849	250	70	71	70	70	68	-0.035	8.71	0.33
161	25.675	26.301	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.054	100	100	2.5	0	490	274	262	276	278	316	847	250	70	71	70	70	68	-0.035	8.68	0.33
162	25.835	26.464	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	100	100	2.5	0	487	273	262	276	278	315	847	247	70	71	70	70	68	-0.035	8.67	0.32
163	25.995	26.627	0.16	0.16	1.35	79	2.04	1.11	80	1.1	79	0.056	98	98	2.4	-0.1	485	273	261	276	277	314	844	250	70	71	70	70	68	-0.035	8.7	0.31
164	26.156	26.791	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	100	99	2.4	0	484	273	260	275	277	314	841	250	70	71	70	70	68	-0.035	8.61	0.31
165	26.316	26.955	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	100	100	2.4	0	483	273	259	276	277	314	839	248	70	71	70	70	68	-0.035	8.56	0.31
166	26.476	27.118	0.16	0.16	1.33	79	2.04	1.10	80	1.1	78	0.055	99	99	2.4	0	480	273	259	275	276	313	835	247	70	71	70	70	68	-0.035	8.48	0.31
167	26.636	27.281	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	100	100	2.3	-0.1	477	272	258	275	276	312	829	247	70	71	70	70	68	-0.034	8.51	0.3
168	26.796	27.444	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.053	101	101	2.3	0	473	272	257	275	276	311	820	245	70	71	70	70	68	-0.034	8.43	0.27
169	26.956	27.608	0.16	0.16	1.33	79	2.04	1.11	80	1.1	78	0.055	99	99	2.3	0	470	272	256	275	275	310	814	245	70	71	70	70	68	-0.034	8.37	0.26
170	27.116	27.771	0.16	0.16	1.33	79	2.04	1.11	80	1.1	78	0.054	100	100	2.2	-0.1	468	272	256	274	275	309	809	245	70	71	70	70	68	-0.034	8.32	0.26
171	27.276	27.934	0.16	0.16	1.34	79	2.04	1.10	80	1.1	78	0.054	100	100	2.2	0	466	271	255	274	275	308	804	244	70	71	70	70	68	-0.034	8.28	0.26
172	27.436	28.097	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.052	102	102	2.2	0	464	271	254	274	274	307	799	243	70	71	70	70	68	-0.034	8.15	0.26
173	27.596	28.260	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	99	99	2.2	0	462	271	253	273	274	307	795	242	70	71	70	70	68	-0.034	8.08	0.26
174	27.756	28.424	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	99	99	2.2	0	461	271	252	273	274	306	790	240	70	71	70	70	68	-0.034	8	0.27

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.40	30.20	30.30	30.30 0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
175	27.916	28.588	0.16	0.16	1.34	79	2.04	1.10	80	1.1	78	0.054	100	100	2.1	-0.1	459	270	251	273	273	305	788	240	70	71	70	70	68	-0.033	7.93	0.27
176	28.076	28.751	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	99	99	2.1	0	457	270	250	273	273	305	786	239	70	71	70	70	68	-0.033	7.9	0.28
177	28.236	28.914	0.16	0.16	1.34	79	2.05	1.11	80	1.1	78	0.055	99	99	2.1	0	456	270	249	273	272	304	780	238	70	71	70	70	68	-0.033	7.86	0.27
178	28.396	29.077	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	99	99	2.1	0	454	270	248	272	271	303	778	236	70	71	70	70	68	-0.033	7.79	0.27
179	28.556	29.240	0.16	0.16	1.34	79	2.03	1.11	80	1.1	78	0.054	100	100	2.1	0	452	269	247	272	271	302	774	237	70	71	70	69	69	-0.034	7.78	0.28
180	28.717	29.404	0.16	0.16	1.33	79	2.04	1.10	80	1.1	78	0.055	100	99	2.0	-0.1	452	269	246	272	270	302	770	235	70	71	70	69	68	-0.032	7.73	0.26
181	28.877	29.568	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	99	99	2.0	0	450	269	245	272	270	301	767	234	70	71	70	69	68	-0.033	7.7	0.27
182	29.037	29.730	0.16	0.16	1.34	79	2.04	1.10	80	1.1	77	0.055	99	98	2.0	0	448	269	244	272	269	300	763	233	70	71	70	69	68	-0.032	7.61	0.3
183	29.197	29.894	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	99	99	2.0	0	447	268	243	272	269	300	760	232	70	71	70	69	68	-0.032	7.59	0.27
184	29.357	30.057	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	100	100	2.0	0	446	268	243	271	269	299	757	231	70	71	70	69	68	-0.032	7.51	0.29
185	29.518	30.221	0.16	0.16	1.33	79	2.03	1.11	80	1.1	78	0.055	100	99	2.0	0	445	268	242	271	269	299	753	231	70	71	70	69	68	-0.032	7.48	0.27
186	29.677	30.384	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	99	100	1.9	-0.1	444	267	241	270	269	298	749	230	70	71	70	69	68	-0.032	7.48	0.28
187	29.837	30.547	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	100	100	1.9	0	442	267	240	270	268	297	748	231	70	71	70	69	69	-0.032	7.41	0.28
188	29.997	30.710	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	100	100	1.9	0	441	267	239	270	267	297	748	230	70	71	70	69	69	-0.031	7.37	0.3
189	30.157	30.874	0.16	0.16	1.34	79	2.04	1.11	80	1.1	77	0.055	99	99	1.9	0	440	267	238	270	268	297	753	231	70	71	70	69	69	-0.031	7.38	0.32
190	30.317	31.037	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	99	99	1.9	0	439	266	237	270	267	296	754	229	70	71	70	69	68	-0.032	7.37	0.32
191	30.478	31.201	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	101	100	1.9	0	437	266	236	269	266	295	752	228	70	71	70	69	69	-0.032	7.33	0.33
192	30.638	31.364	0.16	0.16	1.34	79	2.03	1.10	80	1.1	77	0.053	101	101	1.8	-0.1	436	265	235	269	266	294	752	229	70	71	70	69	68	-0.031	7.33	0.33
193	30.798	31.527	0.16	0.16	1.35	79	2.03	1.11	80	1.1	77	0.052	102	101	1.8	0	435	265	235	268	265	294	750	229	70	71	70	69	68	-0.032	7.33	0.33
194	30.958	31.690	0.16	0.16	1.34	79	2.04	1.11	80	1.1	77	0.053	101	101	1.8	0	434	265	234	268	266	293	749	230	69	71	70	69	68	-0.032	7.25	0.33
195	31.118	31.854	0.16	0.16	1.35	79	2.03	1.11	80	1.1	77	0.052	102	102	1.8	0	432	264	233	268	264	292	750	228	69	71	70	69	69	-0.032	7.22	0.34
196	31.279	32.018	0.16	0.16	1.34	79	2.04	1.11	80	1.1	77	0.055	100	99	1.8	0	431	264	233	268	263	292	751	229	69	71	70	69	69	-0.032	7.16	0.34
197	31.439	32.181	0.16	0.16	1.35	79	2.04	1.11	80	1.1	77	0.055	99	99	1.8	0	430	264	232	268	262	291	754	228	69	71	70	69	69	-0.031	7.15	0.36
198	31.599	32.344	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.055	99	99	1.7	-0.1	427	263	232	267	264	291	753	227	69	71	70	69	69	-0.031	7.14	0.37
199	31.760	32.507	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	101	100	1.7	0	426	263	231	267	263	290	754	227	69	71	70	69	69	-0.032	7.07	0.36
200	31.920	32.670	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.055	99	99	1.7	0	424	263	231	266	264	290	750	227	69	71	70	69	69	-0.030	7.02	0.36
201	32.080	32.834	0.16	0.16	1.33	79	2.04	1.11	80	1.1	78	0.055	99	99	1.7	0	422	262	230	266	265	289	750	227	70	71	70	69	70	-0.030	7.02	0.35
202	32.240	32.998	0.16	0.16	1.33	79	2.04	1.11	80	1.1	78	0.055	99	99	1.7	0	421	262	230	266	263	288	749	225	70	71	70	69	69	-0.031	6.96	0.35
203	32.399	33.161	0.16	0.16	1.34	79	2.03	1.10	80	1.1	78	0.055	98	99	1.7	0	419	262	229	266	264	288	746	224	70	70	70	69	69	-0.030	6.87	0.35
204	32.560	33.324	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	100	99	1.7	0	418	261	229	265	262	287	744	223	70	71	70	69	69	-0.030	6.93	0.35
205	32.720	33.487	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	100	100	1.6	-0.1	416	261	229	266	261	287	741	222	70	70	70	69	69	-0.030	6.86	0.35
206	32.879	33.651	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	98	99	1.6	0	415	261	228	265	260	286	740	222	70	70	70	69	69	-0.030	6.81	0.35
207	33.039	33.815	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	100	100	1.6	0	414	260	228	265	259	285	737	223	70	70	70	69	69	-0.030	6.83	0.35
208	33.200	33.978	0.16	0.16	1.34	79	2.04	1.10	80	1.1	78	0.054	101	100	1.6	0	412	260	227	265	258	284	735	223	70	70	70	69	69	-0.030	6.83	0.35
209	33.360	34.141	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	99	99	1.6	0	411	260	227	264	258	284	733	222	70	70	70	69	69	-0.029	6.75	0.34

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.40	30.20	30.30	30.30 0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
210	33.520	34.304	0.16	0.16	1.34	79	2.03	1.11	80	1.1	78	0.054	100	100	1.6	0	409	260	226	264	257	283	731	221	70	70	70	69	69	-0.029	6.69	0.34
211	33.680	34.467	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	100	100	1.6	0	408	259	226	264	256	283	728	222	70	70	70	69	69	-0.029	6.65	0.34
212	33.841	34.631	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.054	101	100	1.5	-0.1	406	259	225	263	256	282	724	221	70	70	70	69	69	-0.029	6.47	0.33
213	34.001	34.794	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.054	100	100	1.5	0	404	259	224	263	255	281	720	222	70	70	70	69	69	-0.029	6.52	0.33
214	34.161	34.957	0.16	0.16	1.33	79	2.04	1.11	80	1.1	79	0.054	100	100	1.5	0	402	258	224	262	254	280	715	220	70	70	70	69	69	-0.029	6.43	0.33
215	34.321	35.120	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.054	100	100	1.5	0	401	258	223	261	254	279	715	218	70	70	70	69	69	-0.029	6.38	0.33
216	34.481	35.284	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.056	98	99	1.5	0	400	258	223	261	254	279	710	219	70	70	70	69	69	-0.028	6.35	0.33
217	34.641	35.448	0.16	0.16	1.33	79	2.03	1.11	80	1.1	79	0.055	99	99	1.5	0	398	257	222	261	253	278	708	217	71	70	70	69	69	-0.028	6.3	0.33
218	34.801	35.611	0.16	0.16	1.34	80	2.04	1.11	80	1.1	79	0.056	98	98	1.5	0	397	257	222	260	252	278	706	217	71	70	71	69	70	-0.028	6.29	0.33
219	34.960	35.774	0.16	0.16	1.34	80	2.04	1.10	80	1.1	79	0.054	99	100	1.4	-0.1	395	256	221	260	252	277	703	217	71	70	71	69	70	-0.028	6.25	0.33
220	35.120	35.937	0.16	0.16	1.34	80	2.05	1.11	80	1.1	79	0.054	100	100	1.4	0	394	256	220	259	251	276	703	216	71	70	71	69	70	-0.028	6.16	0.32
221	35.280	36.100	0.16	0.16	1.34	80	2.04	1.10	80	1.1	79	0.054	100	100	1.4	0	393	256	219	258	250	275	697	217	71	70	71	69	70	-0.028	6.13	0.32
222	35.440	36.264	0.16	0.16	1.34	80	2.04	1.11	80	1.1	79	0.054	100	100	1.4	0	392	255	219	258	250	275	695	217	71	70	71	69	70	-0.028	6.15	0.33
223	35.600	36.427	0.16	0.16	1.34	80	2.04	1.11	81	1.1	79	0.054	100	100	1.4	0	391	255	218	257	250	274	691	214	71	70	71	69	70	-0.028	6.12	0.32
224	35.760	36.590	0.16	0.16	1.33	80	2.05	1.10	81	1.1	79	0.054	100	100	1.4	0	390	254	217	256	249	273	688	213	71	70	71	69	70	-0.028	6.06	0.32
225	35.920	36.753	0.16	0.16	1.34	80	2.04	1.10	81	1.1	79	0.054	100	100	1.4	0	388	254	216	256	249	273	685	214	71	70	71	69	70	-0.028	5.97	0.32
226	36.081	36.917	0.16	0.16	1.35	80	2.05	1.11	81	1.1	79	0.053	101	101	1.4	0	388	254	216	256	249	273	682	212	71	70	71	69	70	-0.027	5.95	0.32
227	36.241	37.080	0.16	0.16	1.34	80	2.04	1.10	81	1.1	79	0.055	99	99	1.4	0	386	253	215	255	248	271	679	211	71	71	71	69	70	-0.027	5.91	0.31
228	36.401	37.244	0.16	0.16	1.34	80	2.03	1.10	81	1.1	79	0.055	99	99	1.3	-0.1	386	253	215	254	248	271	676	212	71	71	71	69	70	-0.028	5.87	0.31
229	36.561	37.407	0.16	0.16	1.33	80	2.04	1.10	81	1.1	79	0.053	101	101	1.3	0	384	252	214	254	247	270	670	212	71	71	71	69	71	-0.028	5.73	0.31
230	36.721	37.570	0.16	0.16	1.33	80	2.04	1.10	81	1.1	80	0.053	101	101	1.3	0	383	252	213	253	247	270	666	211	71	70	71	69	71	-0.027	5.65	0.3
231	36.881	37.733	0.16	0.16	1.33	80	2.04	1.11	81	1.1	80	0.054	100	100	1.3	0	382	252	212	253	247	269	662	212	71	70	71	69	71	-0.027	5.57	0.3
232	37.041	37.896	0.16	0.16	1.33	80	2.04	1.11	81	1.1	80	0.055	99	99	1.3	0	381	251	212	252	247	269	659	210	71	71	71	69	70	-0.027	5.55	0.3
233	37.201	38.060	0.16	0.16	1.33	80	2.05	1.11	81	1.1	80	0.055	99	99	1.3	0	380	251	211	252	246	268	655	211	71	71	71	69	70	-0.027	5.53	0.3
234	37.361	38.224	0.16	0.16	1.34	80	2.04	1.10	81	1.1	80	0.055	99	99	1.3	0	379	250	210	251	246	267	651	210	71	71	71	69	71	-0.026	5.57	0.31
235	37.521	38.386	0.16	0.16	1.34	80	2.04	1.11	81	1.1	80	0.053	101	100	1.3	0	379	250	210	250	246	267	648	210	71	71	71	69	71	-0.026	6.51	0.28
236	37.681	38.549	0.16	0.16	1.34	80	2.04	1.11	81	1.1	80	0.054	100	100	1.2	-0.1	379	250	209	250	246	267	640	208	71	71	71	69	71	-0.026	6.75	0.25
237	37.841	38.713	0.16	0.16	1.33	80	2.05	1.11	81	1.1	80	0.053	101	101	1.2	0	378	249	208	249	246	266	633	206	72	71	71	69	71	-0.026	6.72	0.25
238	38.001	38.877	0.16	0.16	1.34	80	2.04	1.11	81	1.1	80	0.054	100	100	1.2	0	378	249	207	249	245	266	626	205	72	71	71	69	71	-0.026	6.66	0.25
239	38.161	39.040	0.16	0.16	1.34	80	2.05	1.10	81	1.1	80	0.054	100	100	1.2	0	378	248	206	248	246	265	622	206	72	71	71	69	71	-0.025	6.63	0.25
240	38.321	39.203	0.16	0.16	1.34	80	2.04	1.11	81	1.1	80	0.055	99	99	1.2	0	379	248	206	248	245	265	618	204	72	71	72	69	71	-0.025	6.56	0.26
241	38.481	39.366	0.16	0.16	1.33	80	2.05	1.11	81	1.1	80	0.054	100	100	1.2	0	378	247	205	248	245	265	615	204	72	71	72	69	71	-0.025	6.49	0.25
242	38.642	39.530	0.16	0.16	1.33	80	2.04	1.11	81	1.1	80	0.054	101	100	1.2	0	378	247	204	248	245	264	613	202	72	71	72	69	71	-0.025	6.45	0.25
243	38.802	39.693	0.16	0.16	1.34	81	2.04	1.11	81	1.1	79	0.055	99	99	1.1	-0.1	377	247	203	247	244	264	611	203	72	71	72	69	71	-0.025	6.39	0.25
244	38.963	39.857	0.16	0.16	1.34	81	2.04	1.11	81	1.1	79	0.053	101	101	1.1	0	377	246	202	246	244	263	612	203	72	71	72	69	70	-0.025	6.39	0.27

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average	
	30.40	30.20	30.30	30.30	0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature:

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
245	39.122	40.020	0.16	0.16	1.34	81	2.04	1.10	81	1.1	80	0.052	101	102	1.1	0	376	246	202	246	244	263	612	202	72	71	72	69	71	-0.025	6.38	0.27
246	39.282	40.183	0.16	0.16	1.34	81	2.04	1.11	81	1.1	80	0.054	100	100	1.1	0	375	246	201	245	244	262	612	202	72	71	72	69	71	-0.025	6.31	0.27
247	39.442	40.346	0.16	0.16	1.33	81	2.05	1.11	81	1.1	80	0.053	101	101	1.1	0	374	246	200	244	244	262	610	201	72	71	72	69	71	-0.025	6.21	0.27
248	39.602	40.510	0.16	0.16	1.33	81	2.04	1.11	81	1.1	80	0.054	100	100	1.1	0	374	245	200	244	244	261	608	202	72	71	72	69	71	-0.025	6.22	0.27
249	39.762	40.674	0.16	0.16	1.33	81	2.05	1.10	81	1.1	80	0.052	102	102	1.1	0	373	245	199	243	244	261	608	201	72	71	72	69	71	-0.025	6.21	0.27
250	39.922	40.837	0.16	0.16	1.34	81	2.04	1.10	82	1.1	80	0.054	100	99	1.1	0	372	245	198	242	244	260	605	201	72	71	72	69	71	-0.025	6.2	0.27
251	40.082	41.000	0.16	0.16	1.33	81	2.04	1.11	82	1.1	79	0.054	100	99	1.0	-0.1	371	245	198	242	244	260	603	202	72	71	72	69	71	-0.025	6.15	0.27
252	40.242	41.163	0.16	0.16	1.33	81	2.04	1.11	82	1.1	80	0.053	101	100	1.0	0	371	244	197	241	245	260	603	202	72	71	72	69	71	-0.025	6.07	0.27
253	40.402	41.326	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.054	100	99	1.0	0	370	244	197	241	245	259	601	200	72	71	72	70	71	-0.024	6.05	0.27
254	40.562	41.491	0.16	0.16	1.33	81	2.05	1.11	82	1.1	79	0.054	100	101	1.0	0	369	244	196	240	244	259	599	200	72	71	72	70	71	-0.024	6.02	0.27
255	40.722	41.654	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.054	100	99	1.0	0	369	244	196	239	245	259	598	201	72	71	72	69	71	-0.025	6.01	0.27
256	40.882	41.817	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.053	101	100	1.0	0	368	243	195	239	245	258	597	199	72	71	72	70	72	-0.024	6.01	0.27
257	41.043	41.980	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.054	100	99	1.0	0	367	243	194	238	245	257	597	198	72	71	72	70	71	-0.025	6.08	0.27
258	41.203	42.144	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.055	99	99	1.0	0	366	243	194	237	245	257	593	200	72	71	72	70	71	-0.024	6.14	0.27
259	41.364	42.307	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.054	100	99	0.9	-0.1	365	243	193	237	245	257	593	199	72	71	72	70	71	-0.024	6.14	0.26
260	41.524	42.471	0.16	0.16	1.32	81	2.04	1.11	82	1.1	80	0.055	99	99	0.9	0	364	242	193	237	245	256	587	199	72	71	72	70	72	-0.024	6.07	0.26
261	41.684	42.634	0.16	0.16	1.33	81	2.05	1.10	82	1.1	80	0.054	100	99	0.9	0	364	242	193	237	247	257	583	198	72	71	72	70	71	-0.024	6.08	0.24
262	41.844	42.797	0.16	0.16	1.33	81	2.05	1.11	82	1.1	79	0.054	100	99	0.9	0	363	242	192	236	246	256	579	199	72	71	72	70	71	-0.024	6	0.24
263	42.004	42.961	0.16	0.16	1.33	81	2.04	1.11	82	1.1	79	0.054	100	100	0.9	0	363	242	192	235	247	256	575	200	72	71	72	70	72	-0.024	5.93	0.24
264	42.164	43.124	0.16	0.16	1.33	81	2.04	1.11	82	1.1	79	0.054	100	99	0.9	0	362	241	191	235	248	255	573	199	72	71	72	70	72	-0.024	5.84	0.24
265	42.324	43.288	0.16	0.16	1.33	81	2.05	1.11	82	1.1	79	0.053	101	101	0.9	0	361	241	191	235	250	256	570	198	72	71	72	70	72	-0.024	5.88	0.25
266	42.484	43.452	0.16	0.16	1.34	81	2.04	1.10	82	1.1	79	0.055	99	99	0.8	-0.1	361	241	190	234	249	255	568	196	72	71	72	70	71	-0.025	5.77	0.24
267	42.644	43.615	0.16	0.16	1.34	81	2.05	1.11	82	1.1	79	0.055	99	98	0.8	0	360	241	189	234	249	255	565	195	72	71	72	70	71	-0.024	5.72	0.24
268	42.804	43.778	0.16	0.16	1.34	81	2.04	1.11	82	1.1	79	0.054	100	99	0.8	0	359	240	189	233	250	254	564	195	72	71	72	70	71	-0.025	5.67	0.24
269	42.964	43.941	0.16	0.16	1.34	81	2.04	1.11	82	1.1	78	0.052	102	101	0.8	0	359	240	188	233	251	254	563	194	72	71	72	70	71	-0.024	5.64	0.25
270	43.124	44.105	0.16	0.16	1.34	81	2.04	1.11	82	1.1	78	0.054	100	100	0.8	0	359	239	188	233	251	254	559	195	72	71	72	70	72	-0.025	5.64	0.25
271	43.285	44.269	0.16	0.16	1.34	81	2.05	1.11	82	1.1	78	0.055	99	99	0.8	0	358	239	188	233	252	254	555	195	72	71	72	70	71	-0.024	5.7	0.23
272	43.445	44.432	0.16	0.16	1.34	82	2.05	1.10	82	1.1	77	0.054	99	99	0.8	0	358	238	187	232	253	254	551	196	72	71	72	70	71	-0.025	5.74	0.23
273	43.605	44.595	0.16	0.16	1.33	82	2.05	1.11	82	1.1	77	0.054	99	99	0.8	0	358	238	186	232	253	253	547	194	72	71	72	70	71	-0.024	5.71	0.22
274	43.766	44.759	0.16	0.16	1.34	82	2.04	1.11	82	1.1	77	0.055	99	99	0.7	-0.1	357	237	186	232	254	253	544	193	72	71	72	70	71	-0.024	5.75	0.22
275	43.927	44.922	0.16	0.16	1.34	82	2.04	1.11	82	1.1	77	0.054	100	99	0.7	0	357	237	186	231	256	253	539	193	72	71	72	70	71	-0.024	5.72	0.22
276	44.087	45.087	0.16	0.17	1.33	82	2.05	1.11	82	1.1	77	0.055	98	100	0.7	0	357	237	185	231	257	253	538	191	72	71	72	70	71	-0.024	5.71	0.22
277	44.248	45.250	0.16	0.16	1.34	82	2.04	1.11	82	1.1	77	0.055	99	98	0.7	0	356	236	185	230	258	253	535	192	72	71	72	70	71	-0.024	5.77	0.22
278	44.408	45.413	0.16	0.16	1.34	82	2.05	1.11	82	1.1	77	0.056	98	97	0.7	0	356	236	184	230	259	253	533	192	72	71	72	70	71	-0.024	5.85	0.22
279	44.568	45.576	0.16	0.16	1.34	82	2.04	1.11	82	1.1	77	0.055	98	98	0.7	0	356	235	183	229	260	253	529	190	72	71	72	70	71	-0.024	5.83	0.21

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.40	30.20	30.30	30.30 0

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
280	44.729	45.740	0.16	0.16	1.33	82	2.05	1.11	82	1.1	77	0.055	99	99	0.7	0	356	235	183	229	261	253	526	189	72	71	72	70	72	-0.023	5.8	0.21
281	44.889	45.904	0.16	0.16	1.33	82	2.05	1.11	82	1.1	77	0.054	99	100	0.6	-0.1	356	234	182	228	263	253	524	188	72	71	72	70	71	-0.023	5.81	0.21
282	45.049	46.068	0.16	0.16	1.33	82	2.04	1.11	82	1.1	77	0.055	98	99	0.6	0	355	234	182	227	263	252	521	187	72	71	72	70	71	-0.023	5.86	0.22
283	45.210	46.231	0.16	0.16	1.33	82	2.04	1.10	82	1.1	77	0.054	100	99	0.6	0	355	233	181	227	264	252	518	188	72	71	72	70	71	-0.023	5.83	0.22
284	45.370	46.395	0.16	0.16	1.34	82	2.05	1.11	82	1.1	76	0.054	99	100	0.6	0	355	233	180	226	265	252	517	187	72	71	72	70	71	-0.023	5.78	0.22
285	45.530	46.558	0.16	0.16	1.34	82	2.04	1.11	82	1.1	76	0.055	98	98	0.6	0	354	232	180	225	265	251	516	187	71	71	72	70	71	-0.023	5.74	0.22
286	45.691	46.722	0.16	0.16	1.34	82	2.04	1.11	82	1.1	76	0.055	99	99	0.6	0	353	232	179	225	266	251	513	185	71	71	72	70	71	-0.023	5.71	0.22
287	45.851	46.886	0.16	0.16	1.34	82	2.05	1.11	82	1.1	76	0.056	97	98	0.6	0	353	231	179	224	268	251	510	185	71	71	72	70	71	-0.022	5.71	0.23
288	46.012	47.050	0.16	0.16	1.34	82	2.04	1.11	82	1.1	76	0.054	100	100	0.6	0	352	231	178	223	268	250	508	185	71	71	72	70	71	-0.023	5.71	0.22
289	46.172	47.213	0.16	0.16	1.34	82	2.04	1.10	82	1.1	76	0.052	101	101	0.5	-0.1	352	230	177	222	268	250	504	185	71	71	72	70	71	-0.023	5.76	0.22
290	46.332	47.377	0.16	0.16	1.34	82	2.05	1.11	82	1.1	76	0.053	100	101	0.5	0	351	230	177	221	268	249	503	186	71	71	71	70	71	-0.023	5.73	0.22
291	46.493	47.540	0.16	0.16	1.34	82	2.04	1.11	82	1.1	75	0.054	100	99	0.5	0	351	230	176	220	268	249	499	184	71	71	71	70	71	-0.023	5.7	0.22
292	46.654	47.704	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.055	99	99	0.5	0	351	229	175	220	268	249	495	185	71	71	71	70	71	-0.023	5.71	0.22
293	46.814	47.869	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	99	100	0.5	0	351	229	175	219	269	249	493	184	71	71	71	70	71	-0.023	5.71	0.22
294	46.975	48.032	0.16	0.16	1.35	82	2.04	1.11	82	1.1	75	0.055	99	98	0.5	0	351	229	174	218	270	248	490	183	71	71	71	70	71	-0.022	5.7	0.21
295	47.135	48.195	0.16	0.16	1.35	81	2.04	1.11	82	1.1	75	0.055	98	98	0.5	0	351	228	173	217	271	248	488	182	71	71	71	70	71	-0.022	5.7	0.21
296	47.296	48.359	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	100	100	0.5	0	351	228	173	217	272	248	486	180	71	71	71	70	71	-0.022	5.69	0.21
297	47.457	48.523	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	100	100	0.5	0	351	227	172	216	272	248	480	180	71	71	71	70	71	-0.022	5.61	0.2
298	47.618	48.686	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.054	100	99	0.5	0	351	227	171	215	274	248	477	180	71	71	71	70	71	-0.022	5.59	0.21
299	47.779	48.851	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.056	98	98	0.4	-0.1	351	227	171	215	275	248	474	180	71	71	71	70	71	-0.022	5.55	0.21
300	47.939	49.014	0.16	0.16	1.34	81	2.05	1.10	82	1.1	75	0.055	98	98	0.4	0	350	226	170	215	275	247	474	182	71	71	71	70	70	-0.022	5.73	0.23
301	48.099	49.178	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.055	98	99	0.4	0	350	226	169	214	276	247	473	180	71	71	71	70	70	-0.022	5.74	0.22
302	48.260	49.341	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.055	99	98	0.4	0	350	225	169	213	277	247	473	178	70	71	71	70	70	-0.022	5.83	0.23
303	48.421	49.505	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.055	99	99	0.4	0	349	225	168	213	278	247	474	179	71	71	71	70	70	-0.021	5.83	0.24
304	48.581	49.669	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.053	100	101	0.4	0	348	224	167	212	278	246	478	180	70	71	71	70	71	-0.022	5.8	0.26
305	48.742	49.833	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.053	101	101	0.4	0	347	224	167	212	278	246	479	179	70	71	71	70	70	-0.022	5.81	0.27
306	48.902	49.997	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.055	98	99	0.4	0	346	224	166	211	278	245	484	178	70	71	71	70	70	-0.022	5.74	0.28
307	49.062	50.160	0.16	0.16	1.34	81	2.04	1.10	82	1.1	75	0.056	98	97	0.3	-0.1	346	223	166	211	278	245	486	179	70	71	71	70	70	-0.022	5.71	0.28
308	49.223	50.324	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	100	100	0.3	0	344	223	166	210	277	244	486	180	70	71	71	70	70	-0.022	5.6	0.29
309	49.384	50.487	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.055	99	98	0.3	0	343	222	165	209	276	243	489	179	70	71	71	70	70	-0.022	5.55	0.3
310	49.544	50.652	0.16	0.16	1.34	81	2.04	1.11	82	1.1	74	0.053	100	101	0.3	0	343	222	165	209	276	243	492	180	70	71	71	70	70	-0.022	5.49	0.32
311	49.705	50.816	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.053	101	101	0.3	0	342	221	165	208	277	243	497	179	70	71	71	70	70	-0.022	5.44	0.32
312	49.865	50.979	0.16	0.16	1.34	81	2.04	1.10	82	1.1	75	0.056	98	97	0.3	0	341	221	165	207	278	242	497	180	70	71	71	70	70	-0.022	5.38	0.31
313	50.026	51.143	0.16	0.16	1.35	81	2.05	1.11	82	1.1	74	0.056	98	98	0.3	0	340	220	164	207	276	241	500	180	70	71	70	70	70	-0.022	5.32	0.31
314	50.186	51.306	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.055	98	98	0.3	0	339	220	164	206	277	241	500	181	70	71	70	70	70	-0.022	5.29	0.33

Wood Heater Test Data
Emissions Data

Run: 1

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 30-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 334 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.40	30.20	30.30	30.30

OMNI Equipment Numbers: ##########

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 14.03 ft/sec.
Initial Tunnel Flow: 152.3 scfm
Average Tunnel Flow: 160.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.03 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.040	0.043	0.046	0.034	0.034	0.044	0.045	0.035	0.050	"H2O
Temp:	80	80	80	80	79	79	79	79	80	

V_{strav} 13.47 ft/sec V_{scent} 14.87 ft/sec F_p 0.906

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
315	50.347	51.470	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	100	100	0.3	0	338	220	164	205	275	240	501	181	70	71	70	70	70	-0.023	5.26	0.32
316	50.507	51.634	0.16	0.16	1.34	81	2.04	1.11	82	1.1	74	0.052	101	101	0.3	0	337	219	164	205	275	240	503	182	70	71	70	70	70	-0.023	5.27	0.36
317	50.668	51.798	0.16	0.16	1.34	81	2.04	1.11	82	1.1	74	0.054	100	100	0.3	0	336	219	164	204	274	239	507	181	70	71	70	70	70	-0.022	5.29	0.36
318	50.829	51.962	0.16	0.16	1.35	81	2.04	1.11	82	1.1	74	0.053	101	100	0.2	-0.1	335	218	164	203	273	239	510	182	70	71	70	70	70	-0.023	5.43	0.36
319	50.989	52.125	0.16	0.16	1.35	81	2.04	1.11	82	1.1	74	0.055	98	98	0.2	0	334	218	164	202	273	238	513	182	70	71	70	70	70	-0.023	5.42	0.36
320	51.150	52.289	0.16	0.16	1.34	81	2.04	1.11	82	1.1	74	0.055	99	99	0.2	0	334	217	164	202	271	238	508	182	70	71	70	70	70	-0.023	5.53	0.28
321	51.311	52.453	0.16	0.16	1.34	81	2.05	1.11	82	1.1	74	0.056	98	98	0.2	0	334	217	164	201	271	237	500	182	70	71	70	70	70	-0.022	5.39	0.28
322	51.472	52.617	0.16	0.16	1.33	81	2.04	1.11	81	1.1	74	0.055	99	99	0.2	0	333	217	164	200	270	237	495	182	70	71	70	70	70	-0.022	5.26	0.29
323	51.632	52.781	0.16	0.16	1.34	81	2.05	1.11	82	1.1	74	0.054	99	100	0.2	0	333	216	164	200	271	237	493	182	70	71	70	70	70	-0.022	5.18	0.31
324	51.793	52.944	0.16	0.16	1.34	81	2.05	1.10	82	1.1	74	0.054	100	99	0.2	0	332	216	164	200	271	237	493	182	70	71	70	70	70	-0.022	5.17	0.31
325	51.953	53.108	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	99	100	0.2	0	330	215	164	199	271	236	496	181	70	71	70	69	69	-0.022	5.13	0.32
326	52.114	53.271	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	100	99	0.2	0	329	215	164	198	269	235	497	181	70	71	70	69	69	-0.023	4.91	0.31
327	52.275	53.435	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	100	100	0.2	0	329	215	164	198	269	235	495	181	70	71	70	70	70	-0.023	4.83	0.33
328	52.435	53.600	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	99	100	0.1	-0.1	328	214	163	197	267	234	497	180	70	71	70	70	70	-0.023	4.85	0.33
329	52.596	53.763	0.16	0.16	1.33	81	2.04	1.11	81	1.1	74	0.054	100	99	0.1	0	327	214	163	196	268	234	497	180	70	71	70	69	70	-0.023	4.81	0.33
330	52.756	53.927	0.16	0.16	1.34	80	2.04	1.11	81	1.1	74	0.055	99	99	0.1	0	326	213	163	196	267	233	496	179	69	71	70	69	70	-0.023	4.74	0.33
331	52.917	54.091	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	100	100	0.1	0	325	213	163	195	265	232	497	181	69	71	70	69	69	-0.022	4.7	0.33
332	53.077	54.254	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	99	99	0.1	0	324	212	163	195	265	232	496	181	69	71	70	69	69	-0.023	4.67	0.33
333	53.238	54.418	0.16	0.16	1.34	80	2.04	1.11	81	1.1	74	0.055	99	99	0.1	0	323	212	163	194	264	231	493	180	69	71	70	69	69	-0.023	4.58	0.33
334	53.399	54.583	0.16	0.16	1.34	80	2.05	1.11	81	1.1	73	0.054	100	100	0.0	-0.1	321	211	163	193	263	230	494	180	69	71	70	69	69	-0.023	4.52	0.32
Avg/Tot	53.399	54.583	0.16	0.16	1.34	79		1.11	80		79	0.054	100	100								98.2				71	70	69	69	-0.034		

Wood Heater Test Results

Manufacturer:	HHT Halifax
Model:	Encore
Project No.:	0135WS042E
Tracking No.:	2326
Run:	2
Test Date:	10/31/18

Burn Rate	**1.51 kg/hr dry**
Average Tunnel Temperature	87 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	13.33 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	9000.5 dscf/hour
Average Delta p	0.052 inches H20
Total Time of Test	197 minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	31.719 cubic feet	31.964 cubic feet	9.599 cubic feet
Average Gas Meter Temperature	69 degrees Fahrenheit	77 degrees Fahrenheit	79 degrees Fahrenheit	74 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	31.132 dscf	31.243 dscf	9.483 dscf
Total Particulates - m_n	0 mg	2.8 mg	2.8 mg	1.2 mg
Particulate Concentration (dry-standard) - C_f/C_s	0.000000 grams/dscf	0.00009 grams/dscf	0.00009 grams/dscf	0.00013 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	2.66 grams	2.65 grams	1.14 grams
Particulate Emission Rate	0.00 grams/hour	0.81 grams/hour	0.81 grams/hour	1.14 grams/hour
Emissions Factor		0.54 g/kg	0.53 g/kg	0.39 g/kg
Difference from Average Total Particulate Emissions		0.00 grams	0.00 grams	

Dual Train Comparison Results Are Acceptable

FINAL AVERAGE RESULTS

Complete Test Run	
Total Particulate Emissions - E_T	2.65 grams
Particulate Emission Rate	**0.81 grams/hour**
Emissions Factor	0.54 grams/kg
First Hour Emissions	
Total Particulate Emissions - E_T	1.14 grams
Particulate Emission Rate	1.14 grams/hour
Emissions Factor	0.39 grams/kg
7.5% of Average Total Particulate Emissions	0.20 grams

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK
Stove Surface ΔT	OK
Train Precesion 7.5%	0.18
Train Precision 0.5g/kg	0.00

Technician Signature: _____

Wood Heater Efficiency Results - CSA B415.1

Manufacturer: HHT Halifax
Model: Encore
Date: 10/31/18
Run: 2
Control #: 0135WS042E
Test Duration: 197
Output Category: III

Technician Signature: 

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	76.7%	82.9%
Combustion Efficiency	95.6%	95.6%
Heat Transfer Efficiency	80%	86.7%

Output Rate (kJ/h)	22,574	21,414	**(Btu/h)**
Burn Rate (kg/h)	1.49	3.28	**(lb/h)**
Input (kJ/h)	29,438	27,925	**(Btu/h)**

Test Load Weight (dry kg)	4.88	10.75	**dry lb**
MC wet (%)	17.28131247		
MC dry (%)	20.89		
Particulate (g)	0.81		
CO (g)	301		
Test Duration (h)	3.28		

Emissions	Particulate	CO
g/MJ Output	0.01	4.06
g/kg Dry Fuel	0.17	61.70
g/h	0.25	91.69
lb/MM Btu Output	0.03	9.44

Air/Fuel Ratio (A/F)	9.62

VERSION: **2.2** **12/14/2009**

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 2
Model: Encore | Tracking Number: 2326 | Date: 10/31/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 335, 331, 132, 185

Wood Heater Run Notes

Air Control Settings

Primary: ~15° from Low

Secondary: Fixed

Tertiary/Pilot: N/A

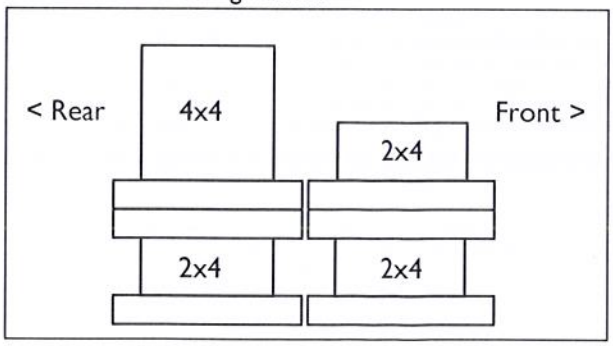
Fan: ~15° from low

Preburn Notes

Time	Notes
-	Closed bypass @ 15.0 lb
-	Shutdown @ 12.0 lb
20:00	stirred
43:00	stirred
1:00	stirred

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Closed by 0:40
Fuel loaded by: 0:25
Door closed at: 0:40
Primary air: set throughout

Notes:

Time	Notes
60:00	Changed filter A

Technician Signature: [signature]

Date: 10/31/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 2
Model: Encore | Tracking Number: 2326 | Date: 10/31/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 340, 431, 296 - T55

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16 8 in	21.2	7	16 8 in	24.5
2	8 in	20.5	8	8 in	24.5
3	8 in	24.6	9	8 in	23.6
4	8 in	20.0	10	8 in	20.8
5	8 in	19.7	11	in	19.6
6	8 in	23.6	12	in	

Total Pre-Burn Fuel Weight: 18.3

Time (clock): 1050 Room Temperature (F): 71 Initials: A

Test Fuel

Firebox Volume (ft^3): 2.02 Test Fuel Piece Length (in): 19.5
Load Weight Range (lb): 12.7-15.5
Fuel Type & Amount: 2 x 4: 3 Weight (2x4s with spacers): 7.8
4 x 4: 1 Weight (4x4s with spacers): 5.2
Total Wet Fuel Load Weight (lb): 13.0

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	4.6	21.5	24.5	23.4	4x4
2	2.0	19.8	19.7	19.1	2x4
3	2.0	19.5	19.5	20.0	"
4	2.0	22.3	22.3	19.1	"
5					
6					
7					

Spacer Moisture Readings (%DB)

9.2	8.5	9.3	10.3				
9.4	8.7	9.2	8.3				
8.8	8.9	8.9	8.2				
10.2	8.7	8.7	9.7				

Time (clock): 1130 Room Temperature (F): 68 Initials: A

Technician Signature: [signature] Date: 10/31/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: **HHT Halifax** Project Number: **0135WS042E** Run Number: 2

Model: **Encore** Tracking Number: **2326** Date: 10/31/18

Test Crew: **Aaron Kravitz**

OMNI Equipment ID numbers: 209, ~~446~~, 579, 592, 635, 653

ASTM E2515 Sampling Information

Test Location: OMNI E1 Clock Time @ ET=0: 12:48

Span Gas Concentrations: **CO_2(%):** 17.06 **CO(%):** 4.290 **CO(ppm):** 901

Test Run Validation Checks	Pre Test	Post Test
Zero Stack Gas Leakage	✓	✓
Zero Pitot Line Leakage	✓	✓
Zero Induced Draft	✓	
100% Smoke Capture	✓	

Test Run Validation Measurements	Pre Test		Post Test	
Scale Audit (lbs)	10.0		10.0	
CO_2 % (Zero/Span)	-0.01	17.06	-0.01	17.07
CO % (Zero/Span)	-0.002	4.288	-0.001	4.287
CO ppm (Zero/Span)	0	901	0	899
Sample A Leakage (cfm @"Hg)	∅		∅ @ 10.4	
Sample B Leakage (cfm @"Hg)	∅		∅ @ 15.0	
Room Air Velocity (ft/min)	<50		<50	
Barometric Pressure ("Hg)	30.21		30.25	
Relative Humidity (%)	46.7		51.8	
Tunnel Static ("H_2O)	-0.20		-0.20	

Last Cleaning Dates

Flue Pipe	10/30/18
Dilution Tunnel	10/26/18
Sample Dryers	10/26/18

Dilution Tunnel Traverse

Traverse Point	1	2	Center	3	4	5	6	7	8
Δp ("H_2O)	0.036	0.043	0.053	0.046	0.037	0.033	0.042	0.046	0.039
T (°F)	88	→	→	→	87	→	→	→	→

Technician Signature: [signature] Date: 10/31/18

Wood Heater Preburn Data - ASTM E2780

Run:	**2**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/18
Beginning Clock Time:	11:51

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	18.3		
Fuel Moisture Readings (% DB):	21.2	23.6	19.6
	20.5	24.5	
	24.6	24.5	
	20	23.6	
	19.7	20.8	
Avg Preburn Moisture (% DB):	**22.05**		

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
0	11.5	-0.06	661	283	185	247	260	327.2	424	68
1	11.3	-0.059	642	287	195	250	261	327	408	68
2	11.1	-0.06	623	290	204	254	262	326.6	396	68
3	10.9	-0.058	607	293	213	258	262	326.6	381	68
4	10.8	-0.057	592	297	222	261	262	326.8	377	68
5	10.7	-0.056	578	299	230	265	263	327	369	68
6	10.6	-0.054	564	302	237	268	263	326.8	363	68
7	10.5	-0.054	553	305	242	270	262	326.4	356	69
8	10.3	-0.053	543	307	246	273	262	326.2	350	68
9	10.2	-0.052	535	310	249	276	262	326.4	348	68
10	10.1	-0.052	527	312	252	280	261	326.4	349	68
11	10	-0.051	520	314	253	283	260	326	346	68
12	9.9	-0.051	515	316	254	286	260	326.2	346	68
13	9.8	-0.05	512	318	255	290	260	327	343	68
14	9.7	-0.05	509	320	256	294	260	327.8	346	68
15	9.7	-0.05	508	321	256	298	260	328.6	343	68
16	9.6	-0.05	508	323	256	302	261	330	344	69
17	9.5	-0.048	511	324	256	306	261	331.6	344	69
18	9.4	-0.051	516	325	256	309	260	333.2	345	68
19	9.3	-0.051	522	326	256	313	261	335.6	345	68
20	9.2	-0.049	528	326	255	317	260	337.2	344	68
21	8.8	-0.063	553	327	255	321	259	343	428	68
22	8.6	-0.054	557	329	255	325	260	345.2	389	68
23	8.4	-0.054	548	331	256	328	261	344.8	379	68
24	8.3	-0.054	541	333	258	332	261	345	379	68
25	8.1	-0.055	535	335	260	335	261	345.2	379	68
26	8	-0.054	532	336	264	339	261	346.4	380	68
27	7.9	-0.054	530	338	267	343	262	348	378	68
28	7.7	-0.054	528	341	272	346	263	350	379	68
29	7.6	-0.054	524	343	276	349	263	351	378	68
30	7.5	-0.054	524	347	280	353	264	353.6	376	68
31	7.4	-0.053	522	350	284	356	264	355.2	375	68
32	7.2	-0.055	520	353	287	359	264	356.6	375	68
33	7.1	-0.054	518	357	291	362	265	358.6	373	68
34	7	-0.054	516	361	294	364	265	360	373	67
35	6.9	-0.054	514	365	297	367	265	361.6	374	67
36	6.8	-0.053	511	369	300	370	265	363	373	67
37	6.7	-0.054	510	374	303	372	265	364.8	371	67
38	6.5	-0.054	510	378	306	374	266	366.8	371	67

Wood Heater Preburn Data - ASTM E2780

Run:	**2**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/18
Beginning Clock Time:	11:51

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	18.3		
Fuel Moisture Readings (% DB):	21.2	23.6	19.6
	20.5	24.5	
	24.6	24.5	
	20	23.6	
	19.7	20.8	
Avg Preburn Moisture (% DB):	**22.05**		

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
39	6.4	-0.054	510	384	309	376	266	369	372	67
40	6.3	-0.054	510	388	311	378	266	370.6	371	68
41	6.2	-0.055	510	393	314	380	266	372.6	375	68
42	6.1	-0.054	511	398	317	382	267	375	374	67
43	6.1	-0.054	510	402	320	385	266	376.6	407	68
44	5.7	-0.061	534	407	323	387	266	383.4	485	67
45	5.5	-0.06	552	411	325	389	268	389	431	68
46	5.4	-0.057	567	414	329	394	270	394.8	411	68
47	5.2	-0.059	577	417	332	391	272	397.8	405	68
48	5.1	-0.056	584	419	335	392	274	400.8	403	68
49	5	-0.057	587	421	339	392	276	403	405	69
50	4.8	-0.057	590	422	343	392	277	404.8	400	68
51	4.7	-0.054	589	423	346	390	279	405.4	397	68
52	4.6	-0.055	592	425	348	388	281	406.8	392	68
53	4.5	-0.055	599	427	350	386	283	409	384	68
54	4.5	-0.054	601	429	351	384	284	409.8	375	68
55	4.4	-0.053	604	431	352	382	285	410.8	369	68
56	4.3	-0.054	604	434	351	380	286	411	365	68
57	4.2	-0.053	606	436	350	378	287	411.4	365	68
58	4.2	-0.052	609	439	349	378	289	412.8	362	68
59	4.1	-0.051	608	442	347	376	290	412.6	360	68
60	4	-0.052	609	446	345	375	292	413.4	359	68
61	6.1	-0.061	608	447	343	373	292	412.6	446	68
62	3.6	-0.06	623	450	342	372	295	416.4	450	68
63	3.5	-0.058	640	449	342	373	300	420.8	406	68
64	3.4	-0.055	648	447	344	374	305	423.6	390	68
65	3.4	-0.054	653	444	346	375	309	425.4	375	68
66	3.3	-0.053	654	441	347	377	313	426.4	368	68
67	3.2	-0.051	649	439	348	378	317	426.2	360	68
68	3.2	-0.05	643	436	348	379	321	425.4	353	68
69	3.1	-0.051	630	433	348	377	323	422.2	346	68
70	3.1	-0.049	617	431	347	378	326	419.8	337	68
71	3	-0.049	608	428	346	376	328	417.2	334	68
72	3	-0.048	601	426	345	375	329	415.2	331	68
73	2.9	-0.047	595	423	344	374	331	413.4	327	68
74	2.9	-0.047	591	421	342	372	333	411.8	327	68
75	2.9	-0.047	589	419	340	371	334	410.6	324	69
76	2.9	-0.046	585	417	338	370	336	409.2	322	68
77	2.8	-0.046	580	415	335	368	336	406.8	320	68

Wood Heater Preburn Data - ASTM E2780

Run:	**2**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/18
Beginning Clock Time:	11:51

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	18.3		
Fuel Moisture Readings (% DB):	21.2	23.6	19.6
	20.5	24.5	
	24.6	24.5	
	20	23.6	
	19.7	20.8	
Avg Preburn Moisture (% DB):	**22.05**		

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
78	2.8	-0.046	575	413	333	367	337	405	315	69
79	2.8	-0.045	571	411	330	366	337	403	312	68
80	2.8	-0.046	565	409	327	363	337	400.2	310	68
81	2.7	-0.044	562	407	324	362	338	398.6	311	68
82	2.7	-0.044	559	405	321	360	338	396.6	307	68
83	2.7	-0.043	558	404	318	361	338	395.8	306	69

Wood Heater Test Fuel Data

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/2018
Run No.:	2

Firebox Volume (ft^3):	2
Fuel Piece Length (in):	19.5
2x4 Crib Weight (lb):	7.8
4x4 Crib Weight (lb):	5.2

Total Fuel Weight (Dry Basis, lb):	10.9	
Fuel Density (lb/ft^3, Dry Basis):	27.63	OK
Loading Density (lb/ft^3, Wet Basis):	6.50	OK
2x4 Percentage:	60%	OK

Coal Bed Range (20-25%): **2.6 - 3.25**

Test Fuel Piece	Weight (lb)	Size	Readings (Dry Basis %)			Dry Weight (lb)
1	4.6	4"x 4"	21.5	24.5	23.4	3.74
2	2	2"x 4"	19.8	19.7	19.1	1.67
3	2	2"x 4"	19.5	19.5	20.0	1.67
4	2	2"x 4"	22.3	22.3	19.1	1.65

Spacer Readings (Dry Basis %)			
9.2	9.7		
9.4	8.2		
8.8	8.3		
10.2	10.3		
8.5	8.7		
8.7	8.9		
8.9	9.2		
8.7	9.3		

Technician Signature: 

Wood Heater Test Data
Emissions Data

Run: 2

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 197 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.21	30.23	30.25	30.23

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.33 ft/sec.
Initial Tunnel Flow: 151.3 scfm
Average Tunnel Flow: 150.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.89 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.043	0.046	0.037	0.033	0.042	0.046	0.039	0.053	"H2O
Temp:	88	88	88	87	87	87	87	87	88	

V_{strav} 13.46 ft/sec V_{scent} 15.47 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			1.20	71	1.87	0.86	72	1.1	109	0.053			13.0		552	401	314	359	338	393	857	329	66	72	67	69	69	-0.047	8.75	0.11
1	0.159	0.162	0.16	0.16	1.40	71	1.96	1.14	72	1.1	126	0.052	104	105	12.9	-0.1	531	399	311	360	337	388	877	296	66	71	67	69	69	-0.047	3.91	0.22
2	0.321	0.326	0.16	0.16	1.40	71	1.96	1.13	72	1.1	102	0.054	101	102	12.9	0	507	398	308	356	336	381	931	308	66	71	67	69	68	-0.049	2	0.19
3	0.483	0.489	0.16	0.16	1.40	71	1.95	1.12	72	1.1	94	0.052	103	103	12.8	-0.1	488	396	306	351	332	375	966	314	66	71	67	69	68	-0.049	9.3	0.16
4	0.644	0.652	0.16	0.16	1.38	71	2	1.12	72	1.1	92	0.055	99	100	12.7	-0.1	477	395	304	346	330	370	991	320	67	71	67	69	68	-0.050	10.82	0.14
5	0.805	0.814	0.16	0.16	1.38	71	2	1.11	72	1.1	90	0.056	98	98	12.6	-0.1	463	393	302	341	325	365	1000	320	68	71	68	69	68	-0.049	10.97	0.11
6	0.966	0.977	0.16	0.16	1.38	71	2	1.11	72	1.1	89	0.055	99	99	12.5	-0.1	452	392	302	336	322	361	1023	325	68	71	68	69	68	-0.050	11.18	0.12
7	1.127	1.139	0.16	0.16	1.37	71	1.99	1.11	72	1.1	89	0.055	99	99	12.4	-0.1	445	390	302	331	318	357	1046	328	68	71	69	69	68	-0.050	11.1	0.09
8	1.287	1.301	0.16	0.16	1.37	71	1.99	1.11	73	1.1	89	0.054	99	99	12.3	-0.1	439	388	303	325	313	354	1060	333	68	71	69	69	69	-0.051	11.32	0.13
9	1.448	1.463	0.16	0.16	1.37	71	1.99	1.11	73	1.1	88	0.053	100	100	12.2	-0.1	439	386	304	321	309	352	1085	339	68	71	69	69	68	-0.051	11.96	0.23
10	1.608	1.626	0.16	0.16	1.36	71	1.99	1.11	73	1.1	88	0.054	99	100	12.1	-0.1	429	384	306	315	306	348	1095	340	69	71	69	69	68	-0.051	12.16	0.2
11	1.768	1.788	0.16	0.16	1.37	71	1.98	1.10	73	1.1	88	0.052	101	101	12.0	-0.1	421	383	308	311	302	345	1108	340	69	71	69	69	68	-0.051	12.52	0.25
12	1.929	1.950	0.16	0.16	1.36	72	1.98	1.10	73	1.1	89	0.054	99	99	11.9	-0.1	431	381	311	307	299	346	1156	348	69	71	69	69	68	-0.053	12.6	0.17
13	2.089	2.111	0.16	0.16	1.35	72	1.99	1.10	73	1.1	89	0.053	100	100	11.8	-0.1	455	379	314	303	295	349	1177	351	69	71	69	69	68	-0.054	12.89	0.17
14	2.248	2.273	0.16	0.16	1.35	72	1.98	1.10	73	1.1	89	0.052	100	101	11.6	-0.2	442	377	318	300	293	346	1174	352	69	72	69	69	68	-0.053	13.82	0.65
15	2.408	2.435	0.16	0.16	1.35	72	1.98	1.09	73	1.1	90	0.053	100	100	11.5	-0.1	445	376	321	299	291	346	1213	360	69	72	70	69	68	-0.054	13.41	0.32
16	2.568	2.596	0.16	0.16	1.34	72	1.99	1.10	74	1.1	90	0.054	99	99	11.4	-0.1	452	374	325	295	289	347	1228	366	70	72	70	69	68	-0.055	13.45	0.15
17	2.727	2.758	0.16	0.16	1.35	72	1.99	1.09	74	1.1	91	0.053	99	100	11.2	-0.2	462	372	330	293	288	349	1230	368	70	72	70	69	69	-0.056	14.2	0.55
18	2.887	2.920	0.16	0.16	1.35	72	1.98	1.09	74	1.1	91	0.053	100	100	11.1	-0.1	464	371	334	292	286	349	1241	374	70	72	70	69	68	-0.055	14.1	0.42
19	3.046	3.081	0.16	0.16	1.35	73	1.99	1.09	74	1.1	92	0.054	98	99	11.0	-0.1	482	369	338	290	284	353	1284	379	70	72	70	69	68	-0.057	14.03	0.46
20	3.206	3.242	0.16	0.16	1.35	73	1.99	1.09	74	1.1	93	0.053	100	100	10.8	-0.2	507	367	342	289	283	358	1375	385	70	72	71	69	68	-0.059	14.16	0.47
21	3.366	3.404	0.16	0.16	1.35	73	1.98	1.09	74	1.1	94	0.054	99	100	10.6	-0.2	516	365	347	287	282	359	1388	396	71	72	71	69	68	-0.059	14.68	0.85
22	3.525	3.565	0.16	0.16	1.35	73	2	1.09	74	1.1	95	0.054	99	99	10.4	-0.2	517	364	353	287	282	361	1386	397	71	72	71	69	68	-0.059	14.96	2.07
23	3.685	3.726	0.16	0.16	1.35	73	1.99	1.09	74	1.1	95	0.055	98	98	10.3	-0.1	524	362	359	287	283	363	1379	398	71	72	72	69	69	-0.058	14.93	2.67
24	3.845	3.887	0.16	0.16	1.35	73	1.99	1.09	75	1.1	95	0.054	99	99	10.1	-0.2	534	361	364	286	283	366	1387	398	71	73	72	70	69	-0.060	15.02	2.1
25	4.005	4.048	0.16	0.16	1.34	73	2	1.09	75	1.1	95	0.055	98	98	10.0	-0.1	540	359	369	285	283	367	1421	400	72	73	72	70	68	-0.060	15.03	1.52
26	4.164	4.210	0.16	0.16	1.34	74	2	1.09	75	1.1	96	0.054	98	100	9.8	-0.2	542	357	373	285	283	368	1440	404	72	73	72	70	69	-0.061	14.97	1.03
27	4.323	4.371	0.16	0.16	1.34	74	2.01	1.09	75	1.1	96	0.053	99	100	9.7	-0.1	545	356	378	284	283	369	1475	407	72	73	72	70	68	-0.062	15.06	1.1
28	4.483	4.532	0.16	0.16	1.34	74	2.01	1.09	75	1.1	97	0.054	99	99	9.5	-0.2	550	354	383	284	284	371	1447	410	72	73	72	70	69	-0.061	15.31	1.51
29	4.642	4.694	0.16	0.16	1.34	74	2.01	1.09	75	1.1	97	0.055	98	99	9.3	-0.2	555	352	388	284	285	373	1448	412	72	73	72	70	68	-0.062	15.22	2.67
30	4.802	4.855	0.16	0.16	1.34	74	2.01	1.08	76	1.1	98	0.055	98	98	9.1	-0.2	564	350	392	285	287	376	1444	412	72	73	73	70	69	-0.061	15.06	3.45
31	4.961	5.015	0.16	0.16	1.34	74	2.01	1.08	76	1.1	97	0.054	99	98	9.0	-0.1	573	349	396	287	289	379	1432	409	72	73	73	70	68	-0.061	15.08	3.39
32	5.120	5.176	0.16	0.16	1.34	74	2.01	1.09	76	1.1	97	0.051	101	102	8.8	-0.2	581	348	400	286	291	381	1428	409	73	73	73	70	68	-0.062	15.13	3.25
33	5.279	5.338	0.16	0.16	1.34	75	2.01	1.08	76	1.1	98	0.055	98	99	8.6	-0.2	590	346	403	287	293	384	1420	410	73	73	73	70	68	-0.061	15.2	3
34	5.439	5.499	0.16	0.16	1.34	75	2.01	1.08	76	1.1	98	0.052	101	101	8.5	-0.1	598	345	405	289	295	386	1426	409	73	74	73	70	69	-0.060	15.25	2.72

Wood Heater Test Data
Emissions Data

Run: 2

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 197 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.21	30.23	30.25	30.23

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.33 ft/sec.
Initial Tunnel Flow: 151.3 scfm
Average Tunnel Flow: 150.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.89 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.043	0.046	0.037	0.033	0.042	0.046	0.039	0.053	"H2O
Temp:	88	88	88	87	87	87	87	87	88	

V_{strav} 13.46 ft/sec V_{scent} 15.47 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
35	5.599	5.660	0.16	0.16	1.34	75	2.01	1.08	76	1.1	98	0.055	98	98	8.3	-0.2	604	344	408	289	298	389	1424	408	73	74	73	70	68	-0.061	15.26	2.63
36	5.759	5.821	0.16	0.16	1.34	75	2	1.08	76	1.2	98	0.054	99	99	8.1	-0.2	608	343	409	290	300	390	1425	411	73	74	73	71	68	-0.060	15.24	2.72
37	5.918	5.982	0.16	0.16	1.34	75	2.01	1.08	77	1.2	99	0.055	98	98	8.0	-0.1	610	341	411	291	303	391	1434	411	73	74	73	71	69	-0.061	15.26	2.76
38	6.078	6.143	0.16	0.16	1.34	75	2.01	1.08	77	1.2	98	0.054	99	99	7.8	-0.2	614	340	413	292	305	393	1425	408	73	74	73	71	69	-0.061	15.3	2.76
39	6.237	6.304	0.16	0.16	1.34	75	2	1.08	77	1.1	98	0.054	98	99	7.7	-0.1	619	339	415	293	308	395	1420	406	73	74	73	71	69	-0.061	15.52	2.59
40	6.396	6.466	0.16	0.16	1.34	75	2.01	1.08	77	1.1	97	0.055	97	98	7.5	-0.2	625	338	416	295	311	397	1403	407	73	74	73	71	69	-0.061	15.56	2.09
41	6.556	6.627	0.16	0.16	1.34	75	2.01	1.08	77	1.1	96	0.054	99	99	7.4	-0.1	631	336	417	295	314	399	1379	406	72	74	73	71	69	-0.059	15.45	1.72
42	6.716	6.788	0.16	0.16	1.34	76	2	1.09	77	1.2	96	0.054	99	99	7.3	-0.1	639	335	417	297	316	401	1365	404	72	74	73	71	69	-0.060	15.39	1.47
43	6.876	6.949	0.16	0.16	1.35	76	2	1.09	77	1.2	95	0.055	98	98	7.1	-0.2	646	334	417	297	319	403	1355	403	72	75	73	71	70	-0.059	15.25	1.29
44	7.036	7.111	0.16	0.16	1.35	76	2	1.08	77	1.1	95	0.054	99	99	7.0	-0.1	655	333	416	298	320	404	1350	398	72	75	73	71	69	-0.058	15.23	1.13
45	7.196	7.272	0.16	0.16	1.35	76	2.01	1.09	78	1.1	94	0.054	99	98	6.9	-0.1	661	332	415	300	322	406	1341	396	72	75	73	71	68	-0.058	15.17	1.12
46	7.356	7.433	0.16	0.16	1.35	76	2	1.09	78	1.2	94	0.053	99	99	6.8	-0.1	662	331	414	301	323	406	1336	393	72	75	72	71	68	-0.057	15.19	1.08
47	7.516	7.595	0.16	0.16	1.35	76	1.99	1.09	78	1.1	94	0.053	99	100	6.7	-0.1	662	330	413	301	325	406	1332	392	72	75	72	72	70	-0.058	15.06	1.03
48	7.676	7.757	0.16	0.16	1.35	76	2	1.09	78	1.1	94	0.053	99	100	6.5	-0.2	660	329	412	302	327	406	1324	391	72	75	72	72	70	-0.058	15.04	0.9
49	7.837	7.918	0.16	0.16	1.35	76	2	1.08	78	1.1	93	0.053	100	99	6.4	-0.1	657	328	410	303	328	405	1317	389	72	75	72	72	68	-0.057	15.03	0.9
50	7.997	8.079	0.16	0.16	1.34	76	1.99	1.09	78	1.1	93	0.051	101	101	6.3	-0.1	655	327	409	304	330	405	1317	389	72	75	72	72	68	-0.057	15.09	0.89
51	8.158	8.242	0.16	0.16	1.35	76	1.99	1.09	78	1.1	93	0.052	101	101	6.2	-0.1	650	327	408	305	333	405	1319	390	71	75	72	72	68	-0.058	15.26	1.11
52	8.317	8.403	0.16	0.16	1.34	77	1.99	1.08	78	1.1	93	0.052	100	100	6.1	-0.1	646	326	407	306	335	404	1319	387	71	75	72	72	69	-0.055	15.2	1.06
53	8.478	8.564	0.16	0.16	1.34	77	2	1.08	78	1.1	93	0.053	100	99	5.9	-0.2	645	325	406	307	338	404	1311	387	71	76	72	72	69	-0.056	15.08	0.87
54	8.638	8.726	0.16	0.16	1.34	77	2	1.08	78	1.1	93	0.051	101	102	5.8	-0.1	642	324	405	309	340	404	1308	385	71	76	72	72	70	-0.054	15.14	0.95
55	8.798	8.888	0.16	0.16	1.34	77	1.99	1.08	78	1.1	93	0.051	101	102	5.7	-0.1	638	324	404	309	343	404	1314	385	71	76	72	72	70	-0.055	15.11	0.85
56	8.958	9.049	0.16	0.16	1.34	77	2	1.08	79	1.1	93	0.050	102	102	5.6	-0.1	636	323	403	310	345	403	1303	383	71	76	72	72	69	-0.057	15.09	0.69
57	9.119	9.211	0.16	0.16	1.34	77	2	1.09	79	1.1	92	0.052	101	100	5.5	-0.1	634	322	402	310	346	403	1295	382	71	76	72	72	68	-0.057	14.97	0.67
58	9.279	9.372	0.16	0.16	1.35	77	1.99	1.09	79	1.1	92	0.052	100	100	5.4	-0.1	631	322	401	311	349	403	1288	382	71	76	72	72	68	-0.054	14.88	0.63
59	9.439	9.535	0.16	0.16	1.35	77	1.99	1.09	79	1.1	92	0.051	101	102	5.3	-0.1	626	321	401	312	350	402	1282	376	71	76	71	72	68	-0.055	14.95	0.63
60	9.599	9.696	0.16	0.16	1.35	77	1.99	1.08	79	1.1	92	0.053	99	99	5.2	-0.1	623	320	399	312	352	401	1278	372	71	76	71	73	68	-0.054	14.84	0.63
61	9.763	9.858	0.16	0.16	1.34	77	1.99	1.09	79	1.1	91	0.051	103	101	5.1	-0.1	619	320	399	313	353	401	1271	373	71	76	71	73	68	-0.054	14.76	0.47
62	9.923	10.020	0.16	0.16	1.35	77	2	1.09	79	1.1	91	0.052	100	100	5.0	-0.1	615	319	398	314	355	400	1256	368	72	76	71	73	69	-0.054	14.29	0.22
63	10.083	10.182	0.16	0.16	1.35	77	1.99	1.09	79	1.1	91	0.051	101	101	4.9	-0.1	609	319	396	314	355	399	1241	367	73	76	71	73	69	-0.052	14.05	0.21
64	10.244	10.343	0.16	0.16	1.34	77	1.99	1.08	79	1.1	90	0.050	102	102	4.9	0	605	318	395	313	357	398	1230	361	73	76	71	73	69	-0.053	13.91	0.13
65	10.405	10.505	0.16	0.16	1.35	78	1.98	1.09	79	1.1	90	0.053	99	99	4.8	-0.1	604	318	393	313	358	397	1221	361	73	77	71	73	69	-0.052	13.63	0.2
66	10.566	10.667	0.16	0.16	1.35	78	1.99	1.09	79	1.1	90	0.050	102	102	4.7	-0.1	606	317	392	314	359	398	1208	353	73	77	71	73	69	-0.050	13.42	0.23
67	10.726	10.830	0.16	0.16	1.35	78	1.99	1.09	79	1.1	89	0.052	100	101	4.6	-0.1	609	317	390	314	360	398	1194	353	72	77	71	73	70	-0.052	13.24	0.25
68	10.887	10.991	0.16	0.16	1.35	78	1.99	1.09	79	1.1	90	0.051	101	101	4.5	-0.1	610	316	388	314	361	398	1196	355	72	77	71	73	69	-0.050	13.54	0.42
69	11.048	11.153	0.16	0.16	1.36	78	1.98	1.09	79	1.1	89	0.053	99	99	4.5	0	612	316	386	314	361	398	1194	354	72	77	71	73	70	-0.049	13.44	0.34

Wood Heater Test Data
Emissions Data

Run: 2

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 197 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.21	30.23	30.25	30.23

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.33 ft/sec.
Initial Tunnel Flow: 151.3 scfm
Average Tunnel Flow: 150.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.89 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.043	0.046	0.037	0.033	0.042	0.046	0.039	0.053	"H2O
Temp:	88	88	88	87	87	87	87	87	88	

V_{strav} 13.46 ft/sec V_{scent} 15.47 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
70	11.209	11.315	0.16	0.16	1.36	78	1.98	1.09	80	1.1	89	0.051	101	101	4.4	-0.1	615	316	384	314	362	398	1190	353	72	77	71	73	70	-0.049	13.52	0.3
71	11.370	11.478	0.16	0.16	1.35	78	1.99	1.09	80	1.1	89	0.052	100	101	4.3	-0.1	619	316	382	315	362	399	1183	354	72	77	71	73	70	-0.050	13.39	0.26
72	11.531	11.640	0.16	0.16	1.36	78	1.98	1.08	80	1.1	89	0.053	99	99	4.3	0	621	316	380	314	362	399	1174	351	72	77	71	73	69	-0.050	13.26	0.29
73	11.692	11.802	0.16	0.16	1.36	78	1.98	1.08	80	1.1	89	0.052	100	100	4.2	-0.1	621	315	378	316	361	398	1168	347	72	77	71	73	70	-0.049	13.23	0.26
74	11.853	11.964	0.16	0.16	1.36	78	1.99	1.09	80	1.1	88	0.053	99	99	4.1	-0.1	620	315	376	315	361	397	1163	347	72	77	71	73	68	-0.050	13.18	0.25
75	12.014	12.127	0.16	0.16	1.36	78	1.98	1.09	80	1.1	88	0.053	99	100	4.0	-0.1	620	315	374	315	360	397	1157	346	72	77	71	73	69	-0.050	13.01	0.21
76	12.175	12.289	0.16	0.16	1.36	78	1.98	1.08	80	1.1	88	0.053	99	99	4.0	0	620	315	372	315	360	396	1140	344	72	77	71	73	70	-0.048	12.97	0.05
77	12.337	12.451	0.16	0.16	1.36	78	1.98	1.09	80	1.1	87	0.053	100	99	3.9	-0.1	620	315	370	315	360	396	1119	341	72	77	71	73	68	-0.048	12.78	0.05
78	12.498	12.613	0.16	0.16	1.36	78	1.98	1.09	80	1.1	87	0.052	100	100	3.9	0	620	315	368	315	359	395	1107	340	72	77	71	73	69	-0.048	12.39	0.2
79	12.659	12.776	0.16	0.16	1.36	78	1.98	1.09	80	1.1	87	0.052	100	100	3.8	-0.1	621	314	366	316	358	395	1102	338	72	77	71	73	69	-0.047	12.21	0.19
80	12.820	12.938	0.16	0.16	1.35	78	1.97	1.09	80	1.1	87	0.051	101	101	3.7	-0.1	622	314	364	316	359	395	1096	333	72	77	71	73	70	-0.047	12.01	0.2
81	12.981	13.100	0.16	0.16	1.36	78	1.98	1.09	80	1.1	87	0.052	100	100	3.7	0	622	314	361	316	357	394	1084	335	72	77	71	73	70	-0.048	11.81	0.19
82	13.142	13.262	0.16	0.16	1.36	78	1.98	1.09	80	1.1	86	0.053	99	99	3.6	-0.1	622	314	359	317	357	394	1072	332	72	77	71	73	69	-0.046	11.61	0.19
83	13.304	13.425	0.16	0.16	1.35	78	1.97	1.09	80	1.1	87	0.052	101	100	3.6	0	623	314	357	318	358	394	1057	327	72	77	71	73	69	-0.046	11.52	0.18
84	13.465	13.588	0.16	0.16	1.35	78	1.98	1.09	80	1.1	87	0.051	101	101	3.5	-0.1	619	314	355	318	357	393	1048	325	72	77	71	74	69	-0.046	11.43	0.19
85	13.626	13.750	0.16	0.16	1.36	78	1.97	1.09	80	1.1	86	0.052	100	100	3.5	0	612	314	352	318	356	390	1040	324	72	77	71	74	68	-0.047	11.28	0.19
86	13.788	13.912	0.16	0.16	1.36	78	1.98	1.09	80	1.1	86	0.052	101	100	3.4	-0.1	607	314	350	318	356	389	1030	323	71	77	71	73	68	-0.046	11.26	0.19
87	13.949	14.074	0.16	0.16	1.35	78	1.98	1.09	80	1.1	86	0.051	101	101	3.4	0	603	314	347	319	355	388	1021	320	71	77	71	74	70	-0.045	11.12	0.18
88	14.110	14.237	0.16	0.16	1.36	78	1.97	1.09	80	1.1	86	0.053	99	99	3.3	-0.1	601	314	345	318	353	386	1011	320	71	77	71	74	70	-0.045	11.09	0.16
89	14.271	14.400	0.16	0.16	1.35	78	1.97	1.09	80	1.1	85	0.052	100	100	3.3	0	597	314	342	319	353	385	1001	317	71	78	71	74	70	-0.045	11.09	0.15
90	14.433	14.562	0.16	0.16	1.35	79	1.97	1.09	80	1.1	85	0.053	99	99	3.3	0	594	313	340	319	354	384	992	313	71	78	71	74	70	-0.045	11.04	0.14
91	14.594	14.724	0.16	0.16	1.35	78	1.98	1.10	80	1.1	85	0.051	101	101	3.2	-0.1	592	313	338	319	353	383	985	314	71	77	71	74	71	-0.045	11.05	0.15
92	14.756	14.887	0.16	0.16	1.36	79	1.97	1.09	80	1.1	85	0.053	99	99	3.2	0	591	313	335	319	353	382	979	315	71	77	71	74	70	-0.044	10.96	0.15
93	14.917	15.050	0.16	0.16	1.35	78	1.98	1.09	80	1.1	84	0.053	99	99	3.1	-0.1	590	313	333	319	353	382	975	314	71	77	71	74	70	-0.044	11.04	0.16
94	15.078	15.212	0.16	0.16	1.36	79	1.97	1.09	80	1.1	84	0.054	98	98	3.1	0	589	313	331	319	352	381	969	311	71	77	71	74	70	-0.045	10.92	0.14
95	15.240	15.375	0.16	0.16	1.35	79	1.98	1.09	80	1.1	84	0.053	99	99	3.0	-0.1	588	313	329	319	351	380	964	308	71	77	71	74	69	-0.044	10.84	0.11
96	15.401	15.537	0.16	0.16	1.35	79	1.97	1.09	80	1.1	84	0.052	100	99	3.0	0	587	313	326	320	350	379	955	307	71	77	71	74	70	-0.043	10.88	0.11
97	15.562	15.700	0.16	0.16	1.35	79	1.97	1.09	80	1.1	84	0.051	101	101	2.9	-0.1	585	313	324	320	349	378	950	308	71	77	71	73	68	-0.044	11.03	0.1
98	15.724	15.862	0.16	0.16	1.35	79	1.98	1.09	80	1.1	84	0.052	100	99	2.9	0	583	314	322	321	348	378	945	306	71	77	71	73	68	-0.043	10.96	0.07
99	15.885	16.025	0.16	0.16	1.36	79	1.98	1.09	80	1.1	84	0.053	99	99	2.9	0	580	314	320	320	348	376	936	306	71	77	71	73	68	-0.042	10.89	0.08
100	16.047	16.187	0.16	0.16	1.35	79	1.98	1.09	80	1.1	84	0.053	99	99	2.8	-0.1	578	314	318	321	347	376	933	304	71	77	71	73	68	-0.042	10.88	0.09
101	16.208	16.350	0.16	0.16	1.36	79	1.98	1.09	80	1.1	84	0.052	100	100	2.8	0	575	314	316	321	346	374	933	303	71	77	71	73	69	-0.042	10.72	0.11
102	16.370	16.513	0.16	0.16	1.36	79	1.97	1.09	80	1.1	83	0.052	100	100	2.7	-0.1	574	314	314	321	345	374	936	302	71	77	71	73	70	-0.043	10.73	0.17
103	16.531	16.675	0.16	0.16	1.36	79	1.97	1.09	80	1.1	83	0.052	99	99	2.7	0	573	314	313	320	344	373	939	302	71	77	71	73	70	-0.043	10.71	0.19
104	16.692	16.837	0.16	0.16	1.36	79	1.98	1.09	80	1.1	83	0.052	99	99	2.7	0	572	314	311	320	344	372	943	302	71	77	70	73	70	-0.043	10.72	0.22

Wood Heater Test Data
Emissions Data

Run: 2

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 197 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.21	30.23	30.25	30.23

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.33 ft/sec.
Initial Tunnel Flow: 151.3 scfm
Average Tunnel Flow: 150.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.89 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.043	0.046	0.037	0.033	0.042	0.046	0.039	0.053	"H2O
Temp:	88	88	88	87	87	87	87	87	88	

V_{strav} 13.46 ft/sec V_{scent} 15.47 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
105	16.854	17.000	0.16	0.16	1.35	79	1.97	1.09	80	1.1	83	0.051	101	101	2.6	-0.1	571	314	309	320	344	372	942	302	71	77	70	73	70	-0.043	10.62	0.18
106	17.015	17.163	0.16	0.16	1.35	79	1.98	1.09	80	1.1	83	0.051	100	101	2.6	0	570	314	308	320	343	371	940	303	71	77	70	73	69	-0.043	10.61	0.2
107	17.177	17.326	0.16	0.16	1.35	79	1.97	1.09	80	1.1	83	0.051	101	101	2.5	-0.1	570	314	307	320	342	371	936	302	71	77	70	73	70	-0.043	10.69	0.17
108	17.338	17.488	0.16	0.16	1.36	79	1.97	1.09	80	1.1	83	0.052	99	99	2.5	0	569	314	305	321	342	370	934	303	71	77	70	73	68	-0.042	10.64	0.2
109	17.500	17.650	0.16	0.16	1.36	79	1.97	1.10	80	1.1	83	0.053	99	98	2.5	0	567	314	304	321	341	369	931	301	71	76	70	73	69	-0.042	10.67	0.19
110	17.661	17.813	0.16	0.16	1.36	79	1.98	1.10	80	1.1	83	0.053	99	99	2.4	-0.1	565	314	302	322	341	369	929	300	71	76	70	73	70	-0.042	10.81	0.19
111	17.823	17.976	0.16	0.16	1.36	79	1.98	1.09	80	1.1	83	0.052	100	100	2.4	0	563	314	301	321	341	368	927	297	71	76	70	73	70	-0.043	10.87	0.18
112	17.984	18.139	0.16	0.16	1.35	79	1.98	1.09	80	1.1	83	0.051	100	101	2.3	-0.1	561	314	300	321	339	367	927	297	71	76	70	73	70	-0.042	10.8	0.2
113	18.146	18.301	0.16	0.16	1.36	79	1.97	1.09	80	1.1	83	0.051	101	100	2.3	0	559	314	298	323	338	366	931	298	71	76	70	73	69	-0.042	10.82	0.21
114	18.307	18.464	0.16	0.16	1.36	79	1.97	1.09	80	1.1	83	0.053	99	99	2.2	-0.1	558	315	297	323	338	366	935	296	71	76	70	73	69	-0.042	10.85	0.23
115	18.469	18.626	0.16	0.16	1.36	79	1.98	1.09	80	1.1	83	0.053	99	98	2.2	0	556	315	296	323	337	365	942	294	71	76	70	73	68	-0.042	10.87	0.24
116	18.630	18.789	0.16	0.16	1.36	79	1.97	1.09	80	1.1	83	0.053	99	99	2.2	0	556	315	295	324	337	365	948	295	71	76	70	73	69	-0.042	10.71	0.35
117	18.792	18.951	0.16	0.16	1.36	79	1.98	1.09	80	1.1	83	0.051	101	100	2.1	-0.1	555	315	294	324	336	365	949	298	71	76	70	73	68	-0.042	10.93	0.25
118	18.953	19.114	0.16	0.16	1.35	79	1.98	1.09	80	1.1	83	0.053	99	99	2.1	0	556	315	293	324	335	365	952	296	71	76	70	73	69	-0.042	10.84	0.33
119	19.115	19.276	0.16	0.16	1.35	79	1.97	1.10	80	1.1	83	0.052	100	99	2.0	-0.1	556	315	293	324	334	364	949	296	71	76	70	73	69	-0.043	10.72	0.29
120	19.276	19.440	0.16	0.16	1.36	79	1.97	1.09	80	1.1	82	0.050	101	103	2.0	0	556	315	292	324	334	364	944	295	71	76	70	73	69	-0.042	10.5	0.3
121	19.438	19.602	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.051	101	100	2.0	0	555	315	291	324	334	364	943	295	71	76	70	73	70	-0.042	10.26	0.33
122	19.599	19.764	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.051	100	100	1.9	-0.1	555	315	291	323	333	363	937	294	71	76	70	73	69	-0.042	10.12	0.32
123	19.761	19.927	0.16	0.16	1.35	79	1.97	1.10	80	1.1	82	0.050	102	102	1.9	0	556	315	290	323	334	364	932	294	71	76	70	73	69	-0.041	9.97	0.31
124	19.922	20.090	0.16	0.16	1.36	79	1.97	1.10	80	1.1	82	0.050	101	102	1.9	0	556	315	289	323	333	363	925	292	70	76	70	73	69	-0.042	9.88	0.3
125	20.084	20.253	0.16	0.16	1.36	79	1.97	1.09	80	1.1	82	0.051	101	101	1.8	-0.1	554	315	288	323	332	362	918	292	70	76	70	73	70	-0.042	9.85	0.3
126	20.245	20.415	0.16	0.16	1.36	79	1.97	1.09	80	1.1	82	0.052	99	99	1.8	0	554	315	288	323	332	362	908	293	70	76	70	73	69	-0.041	9.94	0.26
127	20.407	20.577	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.052	100	99	1.8	0	554	315	286	323	331	362	897	290	70	76	70	72	69	-0.041	9.89	0.24
128	20.569	20.740	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.051	101	101	1.7	-0.1	552	315	285	323	330	361	887	287	70	76	70	72	69	-0.041	9.75	0.23
129	20.730	20.904	0.16	0.16	1.36	79	1.98	1.09	80	1.1	81	0.052	99	100	1.7	0	551	315	284	323	330	361	880	288	70	76	70	72	70	-0.041	9.77	0.24
130	20.892	21.066	0.16	0.16	1.36	79	1.97	1.09	80	1.1	81	0.050	102	101	1.6	-0.1	550	315	283	324	330	360	875	286	70	76	70	72	71	-0.041	9.71	0.24
131	21.054	21.228	0.16	0.16	1.36	79	1.97	1.09	80	1.1	81	0.053	99	98	1.6	0	550	316	282	324	329	360	874	284	70	76	70	72	70	-0.041	9.74	0.26
132	21.215	21.391	0.16	0.16	1.35	79	1.98	1.09	80	1.1	81	0.052	99	100	1.6	0	550	315	281	324	331	360	871	285	70	75	70	72	70	-0.040	9.83	0.23
133	21.377	21.553	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.050	102	101	1.6	0	550	315	279	324	330	360	863	287	70	75	70	72	71	-0.041	9.91	0.21
134	21.539	21.716	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.050	102	102	1.6	0	550	315	279	324	330	360	853	287	70	75	70	72	71	-0.041	9.91	0.21
135	21.700	21.879	0.16	0.16	1.36	79	1.97	1.09	80	1.1	82	0.051	100	101	1.5	-0.1	550	315	277	324	331	359	852	283	70	75	70	72	71	-0.039	9.77	0.23
136	21.862	22.041	0.16	0.16	1.36	79	1.97	1.09	80	1.1	82	0.053	99	98	1.5	0	549	315	276	324	330	359	850	286	70	75	70	72	71	-0.039	9.74	0.24
137	22.023	22.204	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.051	100	101	1.4	-0.1	548	315	275	323	328	358	846	281	70	75	70	72	71	-0.040	9.64	0.24
138	22.185	22.367	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.051	101	101	1.4	0	546	315	273	323	328	357	843	282	70	75	70	72	71	-0.039	9.62	0.23
139	22.346	22.530	0.16	0.16	1.36	79	1.98	1.09	80	1.1	82	0.050	101	102	1.4	0	545	315	272	323	327	356	840	280	70	75	70	72	71	-0.039	9.62	0.24

Wood Heater Test Data
Emissions Data

Run: 2

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 197 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.21	30.23	30.25	30.23

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.33 ft/sec.
Initial Tunnel Flow: 151.3 scfm
Average Tunnel Flow: 150.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.89 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.043	0.046	0.037	0.033	0.042	0.046	0.039	0.053	"H2O
Temp:	88	88	88	87	87	87	87	87	88	

V_{strav} 13.46 ft/sec V_{scent} 15.47 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
140	22.508	22.692	0.16	0.16	1.35	79	1.98	1.09	80	1.1	83	0.050	102	101	1.4	0	544	315	271	323	327	356	838	280	70	75	70	72	71	-0.039	9.53	0.24
141	22.669	22.854	0.16	0.16	1.35	79	1.98	1.10	80	1.1	83	0.051	100	100	1.3	-0.1	543	315	270	322	326	355	836	282	70	75	70	72	69	-0.039	9.51	0.24
142	22.831	23.017	0.16	0.16	1.35	79	1.97	1.09	80	1.1	83	0.051	101	101	1.3	0	540	315	269	322	327	355	833	281	70	75	70	72	71	-0.039	9.44	0.24
143	22.993	23.180	0.16	0.16	1.35	79	1.97	1.09	80	1.1	83	0.050	102	102	1.3	0	539	316	268	321	325	354	828	277	70	75	70	72	70	-0.038	9.36	0.24
144	23.154	23.343	0.16	0.16	1.35	79	1.98	1.09	80	1.1	83	0.051	100	101	1.2	-0.1	537	315	267	322	324	353	824	279	70	75	70	72	70	-0.038	9.33	0.22
145	23.315	23.505	0.16	0.16	1.35	79	1.97	1.09	80	1.1	83	0.052	99	99	1.2	0	535	316	266	321	324	352	822	276	70	75	70	72	70	-0.038	9.16	0.23
146	23.477	23.667	0.16	0.16	1.36	79	1.98	1.09	80	1.1	83	0.052	100	99	1.2	0	533	316	265	321	323	352	819	274	70	75	71	72	70	-0.038	9.07	0.23
147	23.638	23.830	0.16	0.16	1.36	79	1.98	1.09	80	1.1	83	0.049	102	103	1.2	0	531	316	264	321	323	351	815	275	70	75	71	72	70	-0.038	9.08	0.24
148	23.799	23.993	0.16	0.16	1.36	79	1.98	1.09	80	1.1	83	0.051	100	101	1.1	-0.1	530	316	263	321	322	350	812	275	70	75	71	72	71	-0.038	9.04	0.24
149	23.961	24.155	0.16	0.16	1.35	79	1.98	1.09	81	1.1	83	0.051	101	100	1.1	0	529	316	262	320	321	350	807	274	71	75	71	72	71	-0.038	8.95	0.24
150	24.122	24.317	0.16	0.16	1.35	79	1.98	1.09	80	1.1	83	0.052	99	99	1.1	0	527	316	261	321	321	349	805	274	71	75	71	72	71	-0.037	8.8	0.24
151	24.284	24.480	0.16	0.16	1.35	79	1.97	1.09	81	1.1	83	0.050	102	102	1.1	0	525	316	260	320	320	348	804	272	71	75	71	72	69	-0.038	8.78	0.24
152	24.445	24.644	0.16	0.16	1.35	79	1.97	1.09	81	1.1	83	0.052	99	100	1.1	0	523	317	259	320	321	348	802	275	71	75	71	72	71	-0.037	8.93	0.26
153	24.606	24.806	0.16	0.16	1.36	79	1.97	1.09	81	1.1	83	0.052	99	99	1.0	-0.1	520	316	258	320	319	347	800	275	71	75	71	72	70	-0.037	8.88	0.26
154	24.768	24.968	0.16	0.16	1.36	79	1.98	1.09	81	1.1	83	0.051	101	100	1.0	0	518	316	257	320	318	346	798	272	71	75	71	72	70	-0.037	8.85	0.27
155	24.929	25.130	0.16	0.16	1.36	79	1.97	1.09	81	1.1	82	0.052	99	99	1.0	0	516	316	256	319	318	345	796	273	71	75	71	72	71	-0.037	8.8	0.27
156	25.091	25.293	0.16	0.16	1.35	79	1.97	1.09	81	1.1	82	0.051	101	101	1.0	0	514	316	255	318	318	344	794	271	71	75	71	72	71	-0.037	8.79	0.27
157	25.252	25.456	0.16	0.16	1.36	79	1.97	1.09	81	1.1	82	0.052	99	100	0.9	-0.1	513	316	254	318	318	344	792	271	71	75	71	72	71	-0.037	8.76	0.28
158	25.414	25.618	0.16	0.16	1.35	79	1.97	1.09	81	1.1	82	0.053	99	98	0.9	0	511	316	253	318	318	343	789	269	71	75	71	72	71	-0.037	8.68	0.27
159	25.575	25.781	0.16	0.16	1.36	79	1.97	1.09	81	1.1	82	0.051	100	101	0.9	0	510	316	253	318	318	343	786	270	71	75	71	72	71	-0.037	8.65	0.26
160	25.736	25.943	0.16	0.16	1.36	79	1.97	1.09	81	1.1	82	0.050	101	101	0.9	0	509	316	252	317	318	342	782	269	71	75	71	72	72	-0.037	8.63	0.27
161	25.898	26.107	0.16	0.16	1.36	80	1.97	1.09	81	1.1	82	0.052	100	100	0.9	0	507	316	251	318	317	342	781	270	71	75	71	72	71	-0.036	8.54	0.27
162	26.059	26.269	0.16	0.16	1.36	80	1.98	1.09	81	1.1	82	0.052	99	99	0.8	-0.1	505	316	250	317	317	341	779	269	71	75	71	72	72	-0.037	8.5	0.27
163	26.221	26.431	0.16	0.16	1.36	80	1.98	1.09	81	1.1	82	0.049	103	102	0.8	0	503	315	249	316	317	340	777	264	71	75	71	72	71	-0.036	8.39	0.28
164	26.382	26.594	0.16	0.16	1.36	80	1.97	1.09	81	1.1	82	0.048	103	104	0.8	0	501	315	249	316	316	339	775	265	71	75	71	72	71	-0.037	8.39	0.28
165	26.544	26.756	0.16	0.16	1.35	80	1.97	1.09	81	1.1	82	0.050	102	101	0.8	0	500	315	248	317	316	339	776	266	71	74	71	72	71	-0.037	8.38	0.29
166	26.706	26.919	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.049	103	103	0.8	0	499	314	248	316	314	338	777	266	71	74	71	72	70	-0.037	8.15	0.3
167	26.867	27.082	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.051	100	101	0.7	-0.1	497	314	247	316	314	338	776	266	71	74	71	72	71	-0.037	8.14	0.31
168	27.029	27.244	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.051	101	100	0.7	0	495	314	246	315	314	337	774	267	71	74	71	72	70	-0.037	8.17	0.32
169	27.190	27.406	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.051	100	100	0.7	0	492	313	246	315	314	336	774	266	71	74	71	72	71	-0.037	8.08	0.32
170	27.352	27.570	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.051	101	101	0.7	0	491	314	245	314	312	335	772	269	71	74	71	72	70	-0.037	8	0.32
171	27.513	27.732	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.050	101	101	0.7	0	489	314	244	314	311	334	775	268	71	74	71	72	69	-0.037	7.96	0.32
172	27.675	27.895	0.16	0.16	1.36	80	1.97	1.09	81	1.1	80	0.050	102	102	0.6	-0.1	487	314	244	313	310	334	778	273	71	74	71	71	69	-0.038	7.94	0.37
173	27.837	28.057	0.16	0.16	1.35	80	1.98	1.10	81	1.1	81	0.050	102	101	0.6	0	486	313	243	313	310	333	779	276	71	74	71	71	69	-0.038	8.19	0.37
174	27.998	28.220	0.16	0.16	1.36	80	1.97	1.10	81	1.1	81	0.053	98	99	0.6	0	485	313	242	313	309	332	773	278	71	74	71	71	69	-0.038	8.06	0.37

Wood Heater Test Data
Emissions Data

Run: 2

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 197 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.21	30.23	30.25	30.23

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.33 ft/sec.
Initial Tunnel Flow: 151.3 scfm
Average Tunnel Flow: 150.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ -16 in. Hg
Average Test Piece Fuel Moisture: 20.89 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.043	0.046	0.037	0.033	0.042	0.046	0.039	0.053	"H2O
Temp:	88	88	88	87	87	87	87	87	88	

V_{strav} 13.46 ft/sec V_{scent} 15.47 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
175	28.160	28.383	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.051	101	101	0.6	0	484	313	242	312	308	332	766	278	71	74	71	71	69	-0.038	8.28	0.3
176	28.322	28.546	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.052	100	100	0.6	0	483	313	241	313	307	331	763	275	71	74	71	71	69	-0.037	8.17	0.3
177	28.483	28.708	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.051	100	100	0.5	-0.1	481	313	241	312	306	331	760	276	71	74	71	71	69	-0.038	8.14	0.29
178	28.645	28.871	0.16	0.16	1.36	80	1.97	1.10	81	1.1	81	0.051	101	101	0.5	0	479	313	240	312	305	330	758	277	71	74	71	71	69	-0.038	8.19	0.3
179	28.807	29.034	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.053	99	99	0.5	0	478	312	240	311	305	329	755	277	71	74	71	71	69	-0.038	8.26	0.3
180	28.968	29.197	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.051	100	101	0.5	0	477	312	239	311	304	329	756	274	71	74	71	71	69	-0.038	8.21	0.3
181	29.130	29.359	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.052	100	99	0.4	-0.1	476	312	238	311	304	328	754	276	71	74	71	71	70	-0.038	8.11	0.31
182	29.292	29.522	0.16	0.16	1.36	80	1.97	1.10	81	1.1	81	0.051	101	101	0.4	0	476	311	238	312	304	328	753	276	71	74	71	71	71	-0.038	8.1	0.31
183	29.454	29.684	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.052	100	99	0.4	0	475	311	237	311	304	328	752	276	71	74	71	71	71	-0.038	8.01	0.31
184	29.615	29.848	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.051	100	101	0.4	0	474	311	237	312	303	327	751	276	71	74	71	71	71	-0.038	7.99	0.32
185	29.777	30.011	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.054	98	98	0.3	-0.1	473	310	236	312	302	327	752	277	71	74	70	71	69	-0.038	7.97	0.32
186	29.939	30.173	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.051	101	100	0.3	0	471	310	236	312	301	326	750	275	71	74	71	71	69	-0.038	7.94	0.33
187	30.101	30.336	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.053	99	99	0.3	0	471	310	235	312	300	326	749	275	70	74	71	71	69	-0.038	7.88	0.33
188	30.263	30.498	0.16	0.16	1.36	80	1.98	1.10	81	1.1	81	0.052	100	99	0.3	0	470	309	235	313	300	325	749	275	70	74	71	71	69	-0.038	7.86	0.33
189	30.424	30.662	0.16	0.16	1.36	80	1.97	1.10	81	1.1	81	0.053	98	99	0.3	0	469	309	235	312	298	325	749	273	70	74	71	71	69	-0.038	7.81	0.34
190	30.586	30.824	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.051	101	100	0.2	-0.1	468	309	234	313	298	324	750	273	71	74	70	71	69	-0.038	7.81	0.34
191	30.748	30.987	0.16	0.16	1.36	80	1.97	1.09	81	1.1	81	0.051	101	101	0.2	0	467	308	234	313	297	324	750	272	70	74	70	71	70	-0.038	7.83	0.35
192	30.910	31.150	0.16	0.16	1.35	80	1.98	1.09	81	1.1	81	0.053	99	99	0.2	0	466	308	233	313	297	323	748	274	70	74	70	71	70	-0.038	7.83	0.35
193	31.071	31.313	0.16	0.16	1.36	80	1.97	1.10	81	1.1	81	0.052	99	100	0.2	0	465	307	233	313	297	323	748	276	70	74	70	71	69	-0.038	7.77	0.35
194	31.233	31.476	0.16	0.16	1.35	80	1.98	1.09	81	1.1	81	0.052	100	100	0.2	0	464	307	232	313	296	322	748	274	70	74	70	71	69	-0.038	7.67	0.37
195	31.395	31.638	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.051	101	100	0.1	-0.1	463	307	232	315	296	323	742	275	70	74	70	71	70	-0.038	7.62	0.37
196	31.557	31.801	0.16	0.16	1.36	80	1.98	1.09	81	1.1	81	0.051	101	101	0.1	0	465	306	231	315	295	322	733	274	70	74	70	71	69	-0.038	8.49	0.28
197	31.719	31.964	0.16	0.16	1.35	80	1.98	1.09	81	1.1	81	0.052	100	100	0.0	-0.1	467	306	231	315	295	323	754	274	70	74	70	71	69	-0.038	8.29	0.28
Avg/Tot	31.719	31.964	0.16	0.16	1.35	77		1.09	79		87	0.052	100	100								70.0				75	71	72	69	-0.046		

Wood Heater Test Results

Manufacturer:	HHT Halifax
Model:	Encore
Project No.:	0135WS042E
Tracking No.:	2326
Run:	3
Test Date:	10/31/18

Burn Rate	**2.89**	**kg/hr dry**
Average Tunnel Temperature	112	degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	11.97	feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	7731.1	dscf/hour
Average Delta p	0.040	inches H20
Total Time of Test	100	minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	16.000 cubic feet	16.201 cubic feet	9.550 cubic feet
Average Gas Meter Temperature	73 degrees Fahrenheit	79 degrees Fahrenheit	81 degrees Fahrenheit	77 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	15.671 dscf	15.783 dscf	9.383 dscf
Total Particulates - m_n	0 mg	6 mg	5.4 mg	4.8 mg
Particulate Concentration (dry-standard) - C_f/C_s	0.000000 grams/dscf	0.00038 grams/dscf	0.00034 grams/dscf	0.00051 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	4.93 grams	4.41 grams	3.95 grams
Particulate Emission Rate	0.00 grams/hour	2.96 grams/hour	2.65 grams/hour	3.95 grams/hour
Emissions Factor		1.02 g/kg	0.91 g/kg	1.01 g/kg
Difference from Average Total Particulate Emissions		0.26 grams	0.26 grams	

Dual Train Comparison Results Are Acceptable

FINAL AVERAGE RESULTS

Complete Test Run		
Total Particulate Emissions - E_T	4.67	grams
Particulate Emission Rate	**2.80**	**grams/hour**
Emissions Factor	0.97	grams/kg
First Hour Emissions		
Total Particulate Emissions - E_T	3.95	grams
Particulate Emission Rate	3.95	grams/hour
Emissions Factor	1.01	grams/kg
7.5% of Average Total Particulate Emissions	0.35	grams

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK
Stove Surface ΔT	OK
Train Precesion 7.5%	5.62
Train Precision 0.5g/kg	0.11

Technician Signature: _____

Wood Heater Efficiency Results - CSA B415.1

Manufacturer: HHT Halifax
Model: Encore
Date: 10/31/18
Run: 3
Control #: 0135WS042E
Test Duration: 100
Output Category: IV

Technician Signature: 

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	68.9%	74.5%
Combustion Efficiency	91.3%	91.3%
Heat Transfer Efficiency	76%	81.6%

Output Rate (kJ/h)	39,112	37,102	**(Btu/h)**
Burn Rate (kg/h)	2.86	6.31	**(lb/h)**
Input (kJ/h)	56,748	53,832	**(Btu/h)**

Test Load Weight (dry kg)	4.77	10.52	**dry lb**
MC wet (%)	18.42838692		
MC dry (%)	22.59		
Particulate (g)	2.80		
CO (g)	571		
Test Duration (h)	1.67		

Emissions	**Particulate**	**CO**
g/MJ Output	0.04	8.75
g/kg Dry Fuel	0.59	119.50
g/h	1.68	342.32
lb/MM Btu Output	0.10	20.34

Air/Fuel Ratio (A/F)	8.22

VERSION: **2.2** **12/14/2009**

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 3
Model: Encore | Tracking Number: 2326 | Date: 11/1/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 335, 336, 115, 132

Wood Heater Run Notes

Air Control Settings

Primary: Maximum (fixed stop)

Secondary: Fixed

Tertiary/Pilot: N/A

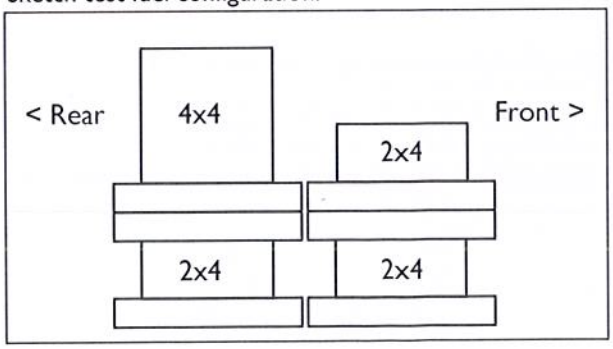
Fan: On high

Preburn Notes

Time	Notes
70:00	Closed bypass, on test setting
90:00	stirred
145:00	PB Ind

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: 45 sec
Fuel loaded by: 30 sec
Door closed at: 40 sec
Primary air: Set throughout

Notes:

Time	Notes
60:00	Swapped filter A

Technician Signature: [signature]

Date: 11/1/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 3
Model: Encore | Tracking Number: 2326 | Date: 11/1/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 340, 431, 296-T55

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	8 in	20.3	7	8 in	22.1
2	8 in	19.5	8	8 in	21.9
3	8 in	19.9	9	8 in	23.2
4	8 in	20.9	10	8 in	20.4
5	8 in	22.3	11	in	21.6
6	8 in	22.2	12	in	22.5

Total Pre-Burn Fuel Weight: 10.8+15.2

Time (clock): 9:50 Room Temperature (F): 69 Initials: A

Test Fuel

Firebox Volume (ft³): 2.02
Load Weight Range (lb): 12.7-15.5
Fuel Type & Amount: 2 x 4: 3 | 4 x 4: 1

Test Fuel Piece Length (in): 19.5
Weight (2x4s with spacers): 7.9
Weight (4x4s with spacers): 5.2
Total Wet Fuel Load Weight (lb): 12.9

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	4.6	23.1	24.3	23.6	4x4
2	2.2	21.9	20.6	22.6	2x4
3	2.2	19.9	21.7	22.2	↓
4	2.2	22.3	24.3	24.6	↓
5					
6					
7					

Spacer Moisture Readings (%DB)

18.2							
17.1							
19.7	wt from same piece. lb total						
18.9							

Time (clock): 1030 Room Temperature (F): 69 Initials: A

Technician Signature: [signature] Date: 11/1/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: **HHT Halifax** Project Number: **0135WS042E** Run Number: 3

Model: **Encore** Tracking Number: **2326** Date: 11/1/18

Test Crew: **Aaron Kravitz**

OMNI Equipment ID numbers: ~~457~~ ~~416~~, 559, 172, 635, 650, 653

ASTM E2515 Sampling Information

Test Location: E1 Clock Time @ ET=0: 11:16

Span Gas Concentrations: **CO_2(%):** 17.06 **CO(%):** 4.290 **CO(ppm):** 901

Test Run Validation Checks	Pre Test	Post Test
Zero Stack Gas Leakage	✓	✓
Zero Pitot Line Leakage	✓	✓
Zero Induced Draft	✓	
100% Smoke Capture	✓	

Test Run Validation Measurements	Pre Test		Post Test	
Scale Audit (lbs)	10.0		10.6	
CO_2 % (Zero/Span)	0.00	17.06	0.00	17.05
CO % (Zero/Span)	-0.001	4.284	0.00	
CO ppm (Zero/Span)	0	901	-1	892
Sample A Leakage (cfm @"Hg)	0		0 @ -10	
Sample B Leakage (cfm @"Hg)	0		0.001 @ -14	
Room Air Velocity (ft/min)	<50		<50	
Barometric Pressure ("Hg)	30.25		30.25	
Relative Humidity (%)	62.3		54.9	
Tunnel Static ("H_2O)	-0.20		-0.20	

Last Cleaning Dates

Flue Pipe	10/30/18
Dilution Tunnel	10/26/18
Sample Dryers	10/26/18

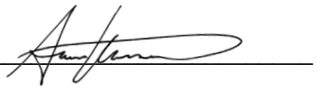
Dilution Tunnel Traverse

Traverse Point	1	2	Center	3	4	5	6	7	8
Δp ("H_2O)	0.036	0.040	0.050	0.044	0.036	0.029	0.043	0.042	0.034
T (°F)	111	111	110	110	116	→			

Technician Signature: Aaron Kravitz Date: 11/1/18

Wood Heater Preburn Data - ASTM E2780

Run:	**3**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/18
Beginning Clock Time:	11:51

Preburn Fuel Data

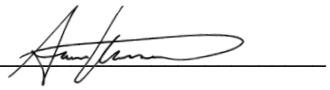
Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	19		
Fuel Moisture Readings (% DB):	20.3	22.2	21.6
	19.5	22.1	22.5
	19.9	21.9	
	20.9	23.2	
	22.3	20.4	
Avg Preburn Moisture (% DB):	**21.40**		

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
0	8.6	-0.06	688	308	101	204	200	300.2	560	68
1	8.3	-0.058	684	316	104	208	204	303.2	428	68
2	8.2	-0.055	689	322	107	210	205	306.6	378	68
3	8	-0.053	683	328	109	211	206	307.4	356	69
4	7.9	-0.052	663	334	111	211	205	304.8	346	68
5	7.8	-0.051	648	338	113	210	205	302.8	340	68
6	7.6	-0.051	637	342	115	209	204	301.4	334	68
7	7.5	-0.05	634	347	116	208	203	301.6	331	68
8	7.4	-0.05	633	349	118	207	202	301.8	326	68
9	7.3	-0.05	629	352	119	206	202	301.6	323	69
10	7.2	-0.05	627	354	121	205	201	301.6	323	68
11	7.1	-0.049	637	356	122	204	201	304	321	68
12	7	-0.049	654	358	124	203	201	308	324	69
13	6.8	-0.049	667	358	125	203	201	310.8	325	68
14	6.7	-0.05	677	359	126	203	202	313.4	325	69
15	6.6	-0.05	687	360	127	204	203	316.2	329	68
16	6.4	-0.051	700	360	129	206	205	320	334	68
17	6.3	-0.051	712	360	130	208	207	323.4	347	68
18	6.2	-0.051	722	359	131	210	209	326.2	353	68
19	6	-0.052	732	359	133	212	212	329.6	364	68
20	5.8	-0.052	738	359	134	214	214	331.8	370	68
21	5.7	-0.053	744	358	135	216	217	334	377	68
22	5.5	-0.053	748	358	136	218	219	335.8	381	68
23	5.4	-0.053	748	357	138	220	222	337	386	69
24	5.2	-0.076	735	357	139	223	224	335.6	500	69
25	5	-0.057	725	358	140	226	225	334.8	441	68
26	4.7	-0.058	717	359	142	231	226	335	428	68
27	4.6	-0.059	711	359	144	235	227	335.2	434	68
28	4.4	-0.059	707	361	147	239	228	336.4	437	68
29	4.2	-0.059	702	362	150	242	228	336.8	439	69
30	4	-0.059	699	365	153	245	228	338	441	69
31	3.9	-0.059	698	368	157	248	228	339.8	444	69
32	3.7	-0.059	698	373	160	249	229	341.8	446	69
33	3.6	-0.059	697	378	163	251	229	343.6	448	68
34	3.4	-0.058	696	384	167	252	230	345.8	446	69
35	3.3	-0.059	696	390	169	253	231	347.8	442	69
36	3.2	-0.059	693	397	172	254	232	349.6	441	69
37	3.1	-0.058	691	404	174	255	233	351.4	440	69
38	2.9	-0.058	687	412	175	256	234	352.8	439	69

Wood Heater Preburn Data - ASTM E2780

Run:	**3**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/18
Beginning Clock Time:	11:51

Preburn Fuel Data

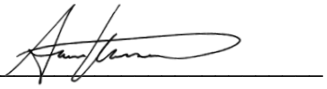
Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	19		
Fuel Moisture Readings (% DB):	20.3	22.2	21.6
	19.5	22.1	22.5
	19.9	21.9	
	20.9	23.2	
	22.3	20.4	
Avg Preburn Moisture (% DB):	**21.40**		

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
39	2.8	-0.058	682	420	177	258	235	354.4	437	69
40	2.7	-0.058	676	428	178	259	236	355.4	436	69
41	2.6	-0.057	670	436	179	260	237	356.4	436	69
42	2.5	-0.057	661	444	180	261	238	356.8	432	69
43	2.4	-0.056	650	453	181	262	238	356.8	433	69
44	2.3	-0.056	641	461	181	263	239	357	429	69
45	2.3	-0.056	633	470	182	264	239	357.6	423	69
46	2.2	-0.055	627	478	182	264	239	358	420	69
47	2.2	-0.055	618	486	182	265	238	357.8	416	70
48	2.1	-0.054	607	495	182	265	238	357.4	414	69
49	2	-0.054	598	502	182	265	237	356.8	411	69
50	2	-0.054	591	509	182	265	236	356.6	408	69
51	2	-0.053	582	514	181	264	236	355.4	406	69
52	1.9	-0.053	575	522	181	263	235	355.2	404	69
53	1.9	-0.053	569	527	180	262	234	354.4	401	69
54	1.8	-0.053	563	532	180	262	234	354.2	399	69
55	1.8	-0.053	556	537	179	261	233	353.2	398	69
56	1.8	-0.053	551	542	179	260	232	352.8	396	69
57	1.7	-0.052	548	545	178	259	231	352.2	394	69
58	1.7	-0.052	541	549	178	258	231	351.4	393	69
59	1.7	-0.052	537	552	177	257	230	350.6	390	69
60	1.6	-0.052	532	554	177	256	230	349.8	390	69
61	1.6	-0.052	529	556	176	255	229	349	390	69
62	1.6	-0.052	525	558	176	254	229	348.4	389	69
63	1.5	-0.058	521	558	176	255	230	348	425	69
64	10.9	-0.059	504	556	175	256	231	344.4	436	70
65	16.5	-0.056	482	548	175	253	229	337.4	412	70
66	16.2	-0.061	472	541	174	248	225	332	417	70
67	15.9	-0.062	497	532	173	243	223	333.6	444	69
68	15.5	-0.067	539	525	172	240	221	339.4	469	69
69	15.1	-0.071	577	518	170	237	221	344.6	528	69
70	14.8	-0.063	603	511	168	234	223	347.8	536	70
71	14.5	-0.065	584	505	167	232	225	342.6	462	69
72	14.3	-0.064	562	500	166	230	226	336.8	451	69
73	14	-0.065	552	495	168	227	227	333.8	454	69
74	13.8	-0.065	549	490	171	224	227	332.2	459	69
75	13.5	-0.066	548	485	176	222	228	331.8	464	70
76	13.3	-0.065	552	481	182	221	230	333.2	464	69
77	13.1	-0.066	556	478	187	219	231	334.2	467	69

Wood Heater Preburn Data - ASTM E2780

Run:	**3**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/18
Beginning Clock Time:	11:51

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

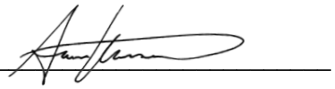
Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	19		
Fuel Moisture Readings (% DB):	20.3	22.2	21.6
	19.5	22.1	22.5
	19.9	21.9	
	20.9	23.2	
	22.3	20.4	
Avg Preburn Moisture (% DB):	**21.40**		

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
78	12.8	-0.066	560	474	192	218	234	335.6	470	69
79	12.6	-0.066	570	471	197	217	236	338.2	472	69
80	12.4	-0.066	578	467	202	216	239	340.4	475	70
81	12.1	-0.066	583	465	207	216	242	342.6	476	69
82	11.9	-0.067	588	462	211	216	245	344.4	483	69
83	11.7	-0.068	592	459	215	215	248	345.8	485	69
84	11.4	-0.067	596	457	219	215	252	347.8	486	69
85	11.2	-0.068	601	454	223	216	256	350	489	69
86	11	-0.07	606	452	226	216	260	352	500	69
87	10.7	-0.069	611	449	230	216	264	354	504	69
88	10.5	-0.069	616	447	235	216	268	356.4	507	69
89	10.2	-0.07	624	445	240	217	273	359.8	505	69
90	10	-0.069	634	443	245	217	277	363.2	501	70
91	9.7	-0.071	645	441	249	218	282	367	502	70
92	9.4	-0.07	666	439	253	219	286	372.6	501	70
93	8.9	-0.071	686	436	255	223	290	378	525	70
94	8.6	-0.071	696	435	256	226	295	381.6	511	70
95	8.4	-0.071	697	433	257	229	298	382.8	508	69
96	8.1	-0.071	702	431	257	231	300	384.2	508	69
97	7.9	-0.071	705	429	258	233	301	385.2	506	70
98	7.6	-0.07	709	427	259	235	301	386.2	508	70
99	7.4	-0.07	710	425	261	237	301	386.8	508	69
100	7.1	-0.069	712	424	263	239	301	387.8	508	69
101	6.9	-0.07	714	423	265	241	301	388.8	510	71
102	6.7	-0.07	718	421	267	243	301	390	513	70
103	6.5	-0.07	720	421	269	245	301	391.2	515	70
104	6.3	-0.07	724	420	271	247	301	392.6	516	70
105	6.1	-0.07	726	420	273	249	301	393.8	516	70
106	5.9	-0.07	728	420	275	251	302	395.2	516	70
107	5.7	-0.069	730	420	277	253	302	396.4	514	70
108	5.5	-0.069	733	421	278	255	302	397.8	513	70
109	5.4	-0.069	737	422	279	257	303	399.6	512	70
110	5.2	-0.067	742	423	280	260	303	401.6	509	71
111	5.1	-0.068	745	425	280	262	303	403	506	70
112	4.9	-0.067	748	428	280	264	304	404.8	505	71
113	4.8	-0.067	752	430	279	266	304	406.2	502	70
114	4.7	-0.066	753	433	278	268	305	407.4	498	70
115	4.5	-0.065	752	436	277	270	305	408	495	71
116	4.4	-0.065	751	439	276	272	305	408.6	492	70

Wood Heater Preburn Data - ASTM E2780

Run:	**3**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/18
Beginning Clock Time:	11:51

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	19		
Fuel Moisture Readings (% DB):	20.3	22.2	21.6
	19.5	22.1	22.5
	19.9	21.9	
	20.9	23.2	
	22.3	20.4	
Avg Preburn Moisture (% DB):	**21.40**		

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
117	4.3	-0.064	744	443	274	273	304	407.6	489	70
118	4.2	-0.065	736	446	272	274	304	406.4	486	70
119	4.1	-0.063	730	450	270	275	304	405.8	483	73
120	4	-0.063	724	455	268	276	304	405.4	481	73
121	4	-0.064	717	461	266	277	304	405	478	70
122	3.9	-0.063	712	465	264	278	303	404.4	476	72
123	3.8	-0.062	707	471	262	278	303	404.2	471	72
124	3.7	-0.062	703	476	260	279	302	404	469	70
125	3.6	-0.062	699	481	258	280	302	404	464	73
126	3.6	-0.061	696	488	256	280	302	404.4	462	71
127	3.5	-0.061	691	493	254	281	301	404	461	71
128	3.4	-0.061	688	498	252	282	300	404	458	70
129	3.4	-0.061	683	503	250	282	300	403.6	456	70
130	3.3	-0.06	678	509	248	283	301	403.8	453	70
131	3.2	-0.06	673	513	246	283	301	403.2	450	71
132	3.2	-0.06	668	517	244	284	301	402.8	447	71
133	3.1	-0.06	663	522	242	284	301	402.4	444	70
134	3.1	-0.059	654	527	240	283	301	401	441	71
135	3	-0.059	645	532	238	283	301	399.8	440	71
136	3	-0.058	637	537	236	282	301	398.6	437	71
137	3	-0.058	630	542	234	282	301	397.8	436	71
138	2.9	-0.057	624	547	232	281	301	397	432	71
139	2.9	-0.057	620	552	230	280	301	396.6	427	70
140	2.8	-0.057	616	557	228	280	301	396.4	429	71
141	2.8	-0.057	612	561	226	279	300	395.6	425	71
142	2.7	-0.056	609	565	224	278	300	395.2	423	71
143	2.7	-0.056	606	569	223	277	300	395	421	71
144	2.7	-0.056	603	573	221	277	299	394.6	419	71
145	2.6	-0.056	601	576	219	276	299	394.2	415	73

Wood Heater Test Fuel Data

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	10/31/2018
Run No.:	3

Firebox Volume (ft^3):	2
Fuel Piece Length (in):	19.5
2x4 Crib Weight (lb):	7.8
4x4 Crib Weight (lb):	5.2

Total Fuel Weight (Dry Basis, lb):	10.6	
Fuel Density (lb/ft^3, Dry Basis):	28.86	OK
Loading Density (lb/ft^3, Wet Basis):	6.50	OK
2x4 Percentage:	60%	OK

Coal Bed Range (20-25%): **2.6 - 3.25**

Test Fuel Piece	Weight (lb)	Size	Readings (Dry Basis %)			Dry Weight (lb)
1	4.6	4"x 4"	23.1	24.3	23.6	3.72
2	2.2	2"x 4"	21.9	20.6	22.6	1.81
3	2.2	2"x 4"	19.9	21.7	22.2	1.81
4	2.2	2"x 4"	22.3	24.3	24.6	1.78

Spacer Readings (Dry Basis %)			
18.2			
17.9			
19.7			
18.9			

Technician Signature: _____

Wood Heater Test Data
Emissions Data

Run: 3

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 100 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.25	30.25	30.25	30.25

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.97 ft/sec.
Initial Tunnel Flow: 144.0 scfm
Average Tunnel Flow: 128.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 22.59 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.040	0.044	0.036	0.029	0.043	0.042	0.034	0.050	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.33 ft/sec V_{scent} 15.32 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			1.04	73	1.97	1.03	76	1.1	141	0.041			12.9		592	579	217	277	301	393	916	402	70	76	71	74	73	-0.058	1.38	0.20
1	0.146	0.157	0.15	0.16	1.37	73	2.04	1.13	75	1.1	149	0.042	93	99	12.8	-0.1	564	576	216	277	299	386	977	360	70	75	73	73	73	-0.058	1.47	0.25
2	0.306	0.320	0.16	0.16	1.38	73	2.04	1.13	75	1.1	123	0.041	101	102	12.6	-0.2	540	571	214	273	295	379	1163	412	71	75	74	73	72	-0.061	14.50	0.30
3	0.467	0.483	0.16	0.16	1.37	74	2.04	1.12	75	1.1	115	0.041	101	101	12.5	-0.1	522	566	213	268	289	372	1251	440	72	75	75	73	71	-0.063	15.39	0.49
4	0.627	0.646	0.16	0.16	1.36	74	2.05	1.12	76	1.1	113	0.041	100	101	12.3	-0.2	516	560	215	263	283	367	1293	457	73	75	75	73	71	-0.065	15.62	0.23
5	0.787	0.809	0.16	0.16	1.36	74	2.05	1.12	76	1.1	113	0.043	98	98	12.0	-0.3	540	553	218	258	278	369	1382	476	73	75	76	73	73	-0.067	16.25	1.55
6	0.947	0.972	0.16	0.16	1.36	74	2.05	1.12	76	1.1	113	0.041	100	101	11.8	-0.2	559	546	224	254	274	371	1421	487	73	75	75	73	72	-0.068	16.06	1.96
7	1.107	1.135	0.16	0.16	1.36	74	2.05	1.11	76	1.1	113	0.041	100	101	11.6	-0.2	569	540	231	250	270	372	1432	494	73	75	75	72	72	-0.069	15.84	2.71
8	1.267	1.297	0.16	0.16	1.35	74	2.05	1.11	76	1.1	114	0.040	101	101	11.4	-0.2	584	535	238	247	267	374	1450	501	73	74	75	71	72	-0.069	16.13	2.44
9	1.426	1.459	0.16	0.16	1.34	74	2.05	1.11	76	1.1	115	0.040	101	101	11.1	-0.3	592	529	246	245	265	375	1447	504	74	74	75	71	71	-0.070	15.29	4.36
10	1.585	1.621	0.16	0.16	1.34	74	2.05	1.11	76	1.1	116	0.039	102	103	10.9	-0.2	600	523	252	243	265	377	1393	509	74	74	76	71	73	-0.069	15.63	2.25
11	1.744	1.784	0.16	0.16	1.34	74	2.06	1.11	76	1.1	116	0.043	97	98	10.6	-0.3	608	517	258	242	265	378	1398	511	74	74	76	70	73	-0.070	15.69	2.03
12	1.902	1.945	0.16	0.16	1.33	75	2.05	1.10	76	1.1	116	0.041	99	100	10.4	-0.2	616	511	262	241	265	379	1408	514	75	74	76	70	73	-0.070	15.70	2.11
13	2.061	2.107	0.16	0.16	1.34	75	2.05	1.10	77	1.1	117	0.039	102	103	10.1	-0.3	625	505	266	240	266	380	1443	516	75	73	76	70	73	-0.071	15.65	2.96
14	2.220	2.269	0.16	0.16	1.33	75	2.05	1.10	77	1.1	118	0.041	100	100	9.9	-0.2	635	500	270	239	267	382	1410	518	76	73	77	70	73	-0.071	14.89	5.20
15	2.378	2.431	0.16	0.16	1.33	75	2.06	1.09	77	1.1	119	0.041	99	100	9.6	-0.3	648	495	273	240	268	385	1389	520	76	73	77	70	73	-0.071	15.03	4.75
16	2.538	2.592	0.16	0.16	1.34	75	2.08	1.09	77	1.1	119	0.039	103	102	9.3	-0.3	660	489	275	240	269	387	1386	519	77	73	77	70	72	-0.071	14.99	4.77
17	2.698	2.753	0.16	0.16	1.34	75	2.08	1.08	77	1.1	119	0.041	100	100	9.1	-0.2	670	483	277	241	270	388	1381	519	77	73	77	70	73	-0.071	15.13	4.29
18	2.857	2.915	0.16	0.16	1.34	75	2.09	1.09	77	1.1	119	0.040	101	102	8.8	-0.3	677	479	278	241	270	389	1372	521	77	73	78	70	71	-0.071	15.21	4.04
19	3.016	3.077	0.16	0.16	1.33	76	2.09	1.08	78	1.1	119	0.041	99	100	8.5	-0.3	681	474	278	242	271	389	1385	522	77	73	78	70	71	-0.071	15.33	3.92
20	3.175	3.237	0.16	0.16	1.33	76	2.09	1.08	78	1.1	119	0.041	99	99	8.3	-0.2	684	470	279	242	272	389	1408	520	77	73	78	70	73	-0.070	15.58	3.38
21	3.333	3.398	0.16	0.16	1.34	76	2.09	1.09	78	1.2	119	0.041	99	99	8.1	-0.2	684	465	280	242	274	389	1404	522	77	73	78	70	72	-0.071	15.87	2.95
22	3.492	3.560	0.16	0.16	1.33	76	2.09	1.09	78	1.2	119	0.040	101	101	7.8	-0.3	685	461	281	243	277	389	1410	523	78	74	78	71	73	-0.071	16.00	2.56
23	3.650	3.721	0.16	0.16	1.33	76	2.1	1.08	78	1.2	119	0.042	98	98	7.6	-0.2	688	456	282	243	280	390	1424	525	78	74	78	71	74	-0.071	16.08	2.52
24	3.809	3.882	0.16	0.16	1.33	76	2.1	1.09	78	1.2	119	0.042	98	98	7.4	-0.2	692	452	283	243	283	391	1453	526	78	74	78	71	73	-0.071	16.11	2.81
25	3.969	4.043	0.16	0.16	1.33	77	2.09	1.09	79	1.2	119	0.041	100	99	7.2	-0.2	694	448	285	244	285	391	1451	528	78	74	78	71	74	-0.070	15.95	3.62
26	4.128	4.205	0.16	0.16	1.33	77	2.1	1.08	79	1.2	119	0.042	98	99	6.9	-0.3	696	445	286	244	288	392	1443	526	78	74	78	71	72	-0.071	15.68	4.31
27	4.286	4.365	0.16	0.16	1.33	77	2.1	1.08	79	1.2	120	0.041	99	99	6.7	-0.2	699	441	287	245	290	392	1447	526	78	74	78	71	74	-0.071	15.73	4.29
28	4.445	4.527	0.16	0.16	1.32	77	2.1	1.08	79	1.2	120	0.040	101	101	6.4	-0.3	701	438	287	246	293	393	1443	525	78	74	78	71	74	-0.071	15.71	4.42
29	4.604	4.689	0.16	0.16	1.32	77	2.1	1.08	79	1.2	120	0.039	102	103	6.2	-0.2	704	434	287	247	296	394	1441	522	78	74	78	71	75	-0.070	15.69	4.36
30	4.762	4.849	0.16	0.16	1.33	77	2.1	1.08	79	1.2	120	0.040	100	100	6.0	-0.2	707	431	288	248	298	394	1443	522	78	74	78	72	73	-0.070	15.80	3.93
31	4.921	5.010	0.16	0.16	1.32	78	2.1	1.08	80	1.2	119	0.041	99	99	5.8	-0.2	711	427	288	249	301	395	1443	524	78	74	78	72	74	-0.070	15.96	3.25
32	5.079	5.171	0.16	0.16	1.33	78	2.11	1.08	80	1.2	119	0.040	100	100	5.6	-0.2	717	425	288	251	305	397	1455	524	78	74	78	72	73	-0.070	16.13	2.50
33	5.239	5.333	0.16	0.16	1.33	78	2.1	1.08	80	1.2	119	0.040	101	101	5.4	-0.2	722	422	288	252	308	398	1465	526	78	75	77	72	74	-0.070	16.30	1.94
34	5.398	5.493	0.16	0.16	1.33	78	2.11	1.08	80	1.2	119	0.040	100	100	5.2	-0.2	726	419	289	254	311	400	1457	524	77	75	77	72	73	-0.071	16.41	1.52

Wood Heater Test Data
Emissions Data

Run: 3

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 100 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.25	30.25	30.25	30.25

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.97 ft/sec.
Initial Tunnel Flow: 144.0 scfm
Average Tunnel Flow: 128.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 22.59 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.040	0.044	0.036	0.029	0.043	0.042	0.034	0.050	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.33 ft/sec V_{scent} 15.32 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
35	5.556	5.654	0.16	0.16	1.33	78	2.1	1.08	80	1.2	118	0.041	98	99	5.0	-0.2	730	416	289	255	315	401	1447	522	77	75	77	72	74	-0.070	16.28	1.21
36	5.715	5.816	0.16	0.16	1.32	78	2.1	1.08	80	1.2	118	0.040	100	101	4.9	-0.1	736	413	290	256	317	402	1443	522	77	75	77	72	73	-0.069	16.39	1.01
37	5.874	5.977	0.16	0.16	1.33	79	2.1	1.08	80	1.2	118	0.039	101	102	4.7	-0.2	742	411	290	258	320	404	1441	518	77	75	77	73	74	-0.070	16.31	0.85
38	6.033	6.138	0.16	0.16	1.32	79	2.1	1.08	81	1.2	118	0.040	100	100	4.5	-0.2	748	408	290	260	322	406	1446	519	77	75	77	73	73	-0.071	16.14	0.79
39	6.192	6.299	0.16	0.16	1.33	79	2.1	1.08	81	1.2	118	0.040	100	100	4.4	-0.1	746	406	290	261	323	405	1439	522	77	75	77	73	73	-0.070	16.42	0.71
40	6.351	6.461	0.16	0.16	1.33	79	2.09	1.08	81	1.2	117	0.039	101	102	4.2	-0.2	751	404	290	262	325	406	1424	519	77	75	77	73	72	-0.069	15.87	0.67
41	6.510	6.622	0.16	0.16	1.33	79	2.09	1.08	81	1.2	117	0.039	101	101	4.1	-0.1	756	402	290	264	327	408	1406	517	76	75	76	73	73	-0.069	15.63	0.50
42	6.670	6.783	0.16	0.16	1.33	79	2.09	1.09	81	1.2	116	0.040	101	100	4.0	-0.1	759	400	289	265	327	408	1384	513	76	75	76	73	72	-0.068	15.49	0.32
43	6.830	6.944	0.16	0.16	1.33	79	2.09	1.09	81	1.2	116	0.041	99	99	3.8	-0.2	755	399	289	268	327	408	1374	510	76	75	76	73	72	-0.069	15.41	0.28
44	6.990	7.106	0.16	0.16	1.34	79	2.08	1.08	81	1.2	116	0.041	99	99	3.7	-0.1	751	398	288	271	326	407	1363	506	76	76	76	73	73	-0.068	15.28	0.14
45	7.149	7.267	0.16	0.16	1.34	79	2.09	1.08	81	1.2	115	0.038	102	102	3.6	-0.1	745	396	287	275	325	406	1353	502	76	76	76	74	74	-0.067	14.87	0.06
46	7.308	7.429	0.16	0.16	1.34	80	2.08	1.08	82	1.2	115	0.040	100	100	3.5	-0.1	741	395	285	279	323	405	1338	498	75	76	75	74	74	-0.068	14.52	0.04
47	7.468	7.591	0.16	0.16	1.34	80	2.08	1.09	82	1.2	114	0.042	98	98	3.4	-0.1	736	394	284	283	321	404	1322	495	75	76	75	74	73	-0.067	14.09	0.02
48	7.628	7.752	0.16	0.16	1.34	80	2.07	1.08	82	1.2	114	0.038	103	102	3.3	-0.1	732	393	282	287	320	403	1307	493	75	76	75	74	73	-0.066	13.63	0.01
49	7.787	7.913	0.16	0.16	1.33	80	2.07	1.09	82	1.2	113	0.041	98	98	3.2	-0.1	725	392	280	290	318	401	1289	489	75	76	75	74	74	-0.065	13.37	0.01
50	7.948	8.075	0.16	0.16	1.34	80	2.08	1.09	82	1.2	113	0.039	102	101	3.1	-0.1	718	391	278	292	316	399	1272	488	75	76	75	74	73	-0.066	13.15	0.01
51	8.107	8.238	0.16	0.16	1.34	80	2.07	1.09	82	1.2	113	0.039	101	102	3.0	-0.1	712	390	276	295	315	398	1251	484	74	76	75	74	73	-0.065	12.88	0.02
52	8.267	8.399	0.16	0.16	1.34	80	2.08	1.08	82	1.2	112	0.039	101	101	2.9	-0.1	706	390	275	296	313	396	1234	480	74	76	74	74	75	-0.064	12.61	0.02
53	8.428	8.560	0.16	0.16	1.34	80	2.07	1.09	82	1.2	111	0.040	101	99	2.8	-0.1	700	390	272	297	311	394	1223	478	74	76	74	74	73	-0.063	12.54	0.02
54	8.587	8.722	0.16	0.16	1.34	80	2.07	1.09	82	1.2	111	0.040	99	100	2.8	0	695	390	270	298	309	392	1210	473	74	76	74	74	73	-0.063	12.40	0.02
55	8.748	8.885	0.16	0.16	1.35	80	2.07	1.08	82	1.2	110	0.040	100	100	2.7	-0.1	690	390	268	299	308	391	1199	472	74	76	74	74	72	-0.064	12.19	0.02
56	8.908	9.046	0.16	0.16	1.35	80	2.07	1.08	83	1.2	110	0.040	100	99	2.6	-0.1	686	390	265	299	307	389	1189	470	73	76	74	75	73	-0.063	12.09	0.03
57	9.069	9.208	0.16	0.16	1.34	81	2.07	1.09	83	1.2	110	0.040	100	100	2.5	-0.1	682	390	263	300	306	388	1184	467	73	76	74	75	75	-0.063	12.04	0.03
58	9.230	9.370	0.16	0.16	1.35	81	2.07	1.09	83	1.1	109	0.039	101	101	2.5	0	679	390	261	300	305	387	1174	464	73	77	74	75	75	-0.063	11.93	0.03
59	9.390	9.533	0.16	0.16	1.34	81	2.06	1.09	83	1.2	109	0.041	98	99	2.4	-0.1	677	391	259	300	304	386	1167	465	73	77	74	75	73	-0.063	11.77	0.04
60	9.550	9.695	0.16	0.16	1.35	81	2.06	1.09	83	1.2	109	0.040	100	100	2.3	-0.1	675	392	257	300	303	385	1161	462	73	76	73	75	74	-0.062	11.54	0.05
61	9.713	9.856	0.16	0.16	1.33	81	2.07	1.09	83	1.2	109	0.040	101	99	2.3	0	672	394	254	300	302	384	1154	460	74	76	73	75	74	-0.062	11.41	0.08
62	9.873	10.018	0.16	0.16	1.34	81	2.08	1.09	83	1.2	108	0.040	99	99	2.2	-0.1	669	394	252	300	301	383	1147	458	74	77	73	75	73	-0.062	11.23	0.11
63	10.034	10.181	0.16	0.16	1.35	81	2.06	1.09	83	1.1	108	0.039	101	101	2.1	-0.1	667	395	250	300	300	382	1139	456	73	76	73	75	72	-0.062	11.10	0.14
64	10.195	10.343	0.16	0.16	1.35	81	2.06	1.09	83	1.1	108	0.040	100	99	2.1	0	664	396	248	300	299	381	1132	453	73	77	73	75	72	-0.061	11.04	0.15
65	10.355	10.505	0.16	0.16	1.35	81	2.06	1.09	83	1.1	108	0.039	101	101	2.0	-0.1	661	397	247	300	299	381	1126	451	73	77	73	75	74	-0.061	10.89	0.16
66	10.516	10.667	0.16	0.16	1.34	81	2.06	1.09	83	1.1	107	0.041	99	98	1.9	-0.1	658	399	245	300	298	380	1118	449	72	77	73	75	75	-0.060	10.80	0.17
67	10.677	10.830	0.16	0.16	1.34	81	2.06	1.09	83	1.1	107	0.040	100	100	1.9	0	655	401	243	300	297	379	1109	447	72	77	73	75	75	-0.060	10.71	0.18
68	10.837	10.993	0.16	0.16	1.34	81	2.06	1.09	83	1.1	107	0.041	98	99	1.8	-0.1	652	403	241	299	296	378	1102	447	72	77	73	75	73	-0.060	10.61	0.20
69	10.998	11.155	0.16	0.16	1.34	81	2.06	1.09	83	1.1	107	0.041	99	98	1.8	0	649	405	240	299	295	378	1094	446	72	77	73	75	72	-0.060	10.40	0.22

Wood Heater Test Data
Emissions Data

Run: 3

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 31-Oct-18
Beginning Clock Time: 13:37

Total Sampling Time: 100 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.25	30.25	30.25	30.25

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.97 ft/sec.
Initial Tunnel Flow: 144.0 scfm
Average Tunnel Flow: 128.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 22.59 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.036	0.040	0.044	0.036	0.029	0.043	0.042	0.034	0.050	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.33 ft/sec V_{scent} 15.32 ft/sec F_p 0.870

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
70	11.159	11.317	0.16	0.16	1.34	81	2.06	1.09	83	1.1	106	0.040	100	99	1.7	-0.1	647	407	238	298	294	377	1086	444	72	77	73	75	72	-0.060	10.35	0.23
71	11.320	11.479	0.16	0.16	1.34	81	2.05	1.09	83	1.1	106	0.041	99	98	1.6	-0.1	643	408	236	298	293	376	1081	441	71	77	73	75	72	-0.060	10.27	0.24
72	11.481	11.643	0.16	0.16	1.34	81	2.05	1.09	83	1.1	106	0.040	100	101	1.6	0	639	410	235	297	293	375	1075	440	71	77	73	75	72	-0.060	10.21	0.24
73	11.642	11.805	0.16	0.16	1.35	81	2.06	1.09	83	1.1	106	0.040	100	99	1.5	-0.1	636	412	233	296	292	374	1069	438	71	77	73	75	72	-0.059	10.16	0.26
74	11.803	11.967	0.16	0.16	1.35	81	2.06	1.09	83	1.1	105	0.039	101	100	1.5	0	634	413	232	296	292	373	1065	438	71	77	73	75	74	-0.058	10.04	0.28
75	11.964	12.130	0.16	0.16	1.34	81	2.05	1.10	83	1.1	105	0.039	101	101	1.4	-0.1	631	415	230	295	291	372	1061	434	71	77	73	75	74	-0.059	10.02	0.30
76	12.125	12.292	0.16	0.16	1.35	81	2.05	1.09	84	1.1	105	0.041	99	98	1.4	0	629	418	229	294	291	372	1056	433	71	77	73	75	74	-0.059	9.87	0.31
77	12.286	12.456	0.16	0.16	1.35	81	2.06	1.09	84	1.1	105	0.040	100	100	1.3	-0.1	626	420	228	293	291	372	1049	431	71	77	73	75	73	-0.059	9.94	0.31
78	12.447	12.618	0.16	0.16	1.35	81	2.05	1.09	84	1.1	105	0.040	100	99	1.3	0	623	421	226	293	290	371	1045	431	71	77	73	75	74	-0.058	10.03	0.31
79	12.608	12.780	0.16	0.16	1.35	82	2.04	1.09	84	1.1	105	0.040	100	99	1.2	-0.1	620	424	225	292	290	370	1040	431	71	77	73	75	72	-0.058	9.90	0.31
80	12.769	12.943	0.16	0.16	1.35	82	2.05	1.09	84	1.1	104	0.038	102	102	1.1	-0.1	619	425	224	291	289	370	1034	427	71	77	73	75	74	-0.058	9.79	0.33
81	12.931	13.106	0.16	0.16	1.36	82	2.04	1.10	84	1.1	104	0.041	99	98	1.1	0	617	426	222	290	289	369	1032	428	71	77	73	75	73	-0.058	9.76	0.34
82	13.092	13.269	0.16	0.16	1.36	82	2.05	1.09	84	1.1	104	0.041	98	98	1.0	-0.1	615	428	221	290	289	369	1026	428	71	77	73	76	73	-0.058	9.60	0.35
83	13.253	13.431	0.16	0.16	1.36	82	2.04	1.09	84	1.1	104	0.039	101	100	1.0	0	614	430	220	289	288	368	1021	425	71	77	73	75	72	-0.058	9.53	0.37
84	13.415	13.594	0.16	0.16	1.36	82	2.04	1.10	84	1.1	104	0.040	100	100	0.9	-0.1	613	432	219	288	288	368	1018	424	71	77	73	76	74	-0.058	9.54	0.38
85	13.576	13.757	0.16	0.16	1.36	82	2.04	1.10	84	1.1	104	0.040	100	100	0.9	0	611	433	217	287	288	367	1014	423	71	77	73	76	74	-0.058	9.52	0.37
86	13.738	13.920	0.16	0.16	1.36	82	2.04	1.09	84	1.1	103	0.039	101	101	0.8	-0.1	612	433	216	287	287	367	1008	422	71	77	73	76	72	-0.057	9.37	0.39
87	13.899	14.083	0.16	0.16	1.36	82	2.03	1.09	84	1.1	103	0.040	99	99	0.8	0	613	435	215	286	287	367	1002	421	71	77	73	76	73	-0.056	9.25	0.38
88	14.061	14.245	0.16	0.16	1.36	82	2.04	1.10	84	1.1	103	0.041	99	98	0.7	-0.1	613	436	214	286	287	367	997	419	71	77	73	76	72	-0.056	9.09	0.39
89	14.222	14.408	0.16	0.16	1.36	82	2.03	1.10	84	1.1	103	0.040	99	99	0.7	0	614	438	213	285	286	367	992	418	72	77	73	75	72	-0.056	9.09	0.41
90	14.384	14.571	0.16	0.16	1.36	82	2.04	1.09	84	1.1	103	0.040	100	99	0.6	-0.1	617	439	212	285	286	368	988	417	72	77	73	75	72	-0.056	9.09	0.42
91	14.545	14.735	0.16	0.16	1.35	82	2.04	1.09	84	1.1	103	0.039	101	101	0.6	0	621	440	211	284	285	368	982	419	72	77	73	75	71	-0.056	8.95	0.42
92	14.707	14.898	0.16	0.16	1.36	82	2.03	1.10	84	1.1	103	0.039	101	101	0.5	-0.1	625	441	210	283	285	369	975	417	72	77	73	75	73	-0.056	9.01	0.41
93	14.868	15.060	0.16	0.16	1.36	82	2.04	1.09	84	1.1	103	0.040	99	99	0.5	0	627	441	209	283	284	369	971	417	72	77	73	75	72	-0.056	8.91	0.40
94	15.030	15.223	0.16	0.16	1.36	82	2.04	1.09	84	1.1	103	0.039	101	101	0.4	-0.1	626	442	208	282	284	368	971	415	72	77	73	75	72	-0.056	8.92	0.40
95	15.192	15.386	0.16	0.16	1.36	82	2.04	1.10	84	1.1	103	0.039	101	101	0.3	-0.1	619	443	207	281	283	367	965	413	72	77	73	75	73	-0.055	10.91	0.18
96	15.353	15.550	0.16	0.16	1.36	82	2.04	1.10	84	1.1	103	0.039	101	101	0.3	0	615	443	206	281	283	366	957	411	72	76	73	75	73	-0.055	10.77	0.15
97	15.515	15.712	0.16	0.16	1.36	82	2.03	1.09	84	1.1	102	0.040	100	99	0.2	-0.1	613	444	205	281	282	365	949	409	72	77	73	75	73	-0.056	10.46	0.16
98	15.676	15.875	0.16	0.16	1.37	82	2.03	1.09	84	1.1	102	0.040	99	99	0.2	0	611	445	204	281	283	365	943	408	72	76	73	75	72	-0.055	10.07	0.19
99	15.838	16.038	0.16	0.16	1.36	82	2.03	1.10	84	1.1	102	0.039	101	101	0.1	-0.1	609	447	204	282	283	365	938	408	72	77	73	75	72	-0.055	9.65	0.23
100	16.000	16.201	0.16	0.16	1.37	82	2.03	1.10	84	1.1	102	0.041	99	98	0.0	-0.1	607	448	203	283	283	365	931	408	72	76	73	75	74	-0.054	9.46	0.23
Avg/Tot	16.000	16.201	0.16	0.16	1.34	79		1.09	81		112	0.040	100	100								28.4				76	75	73	73	-0.064		

Wood Heater Test Results

Manufacturer:	HHT Halifax
Model:	Encore
Project No.:	0135WS042E
Tracking No.:	2326
Run:	4
Test Date:	11/02/18

Burn Rate	**0.87**	**kg/hr dry**
Average Tunnel Temperature	81	degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	13.00	feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8903.1	dscf/hour
Average Delta p	0.052	inches H20
Total Time of Test	338	minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	54.853 cubic feet	55.196 cubic feet	9.661 cubic feet
Average Gas Meter Temperature	71 degrees Fahrenheit	81 degrees Fahrenheit	81 degrees Fahrenheit	77 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	53.707 dscf	53.881 dscf	9.530 dscf
Total Particulates - m_n	0 mg	5.4 mg	4.8 mg	1.1 mg
Particulate Concentration (dry-standard) - C_f/C_s	0.000000 grams/dscf	0.00010 grams/dscf	0.00009 grams/dscf	0.00012 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	5.04 grams	4.47 grams	1.03 grams
Particulate Emission Rate	0.00 grams/hour	0.90 grams/hour	0.79 grams/hour	1.03 grams/hour
Emissions Factor		1.03 g/kg	0.91 g/kg	0.59 g/kg
Difference from Average Total Particulate Emissions		0.29 grams	0.29 grams	

Dual Train Comparison Results Are Acceptable

FINAL AVERAGE RESULTS

Complete Test Run	
Total Particulate Emissions - E_T	4.76 grams
Particulate Emission Rate	**0.84 grams/hour**
Emissions Factor	0.97 grams/kg
First Hour Emissions	
Total Particulate Emissions - E_T	1.03 grams
Particulate Emission Rate	1.03 grams/hour
Emissions Factor	0.59 grams/kg
7.5% of Average Total Particulate Emissions	0.36 grams

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK
Stove Surface ΔT	OK
Train Precesion 7.5%	6.04
Train Precision 0.5g/kg	0.12

Technician Signature: _____

Wood Heater Efficiency Results - CSA B415.1

Manufacturer: HHT Halifax
Model: Encore
Date: 11/02/18
Run: 4
Control #: 0135WS042E
Test Duration: 338
Output Category: II

Technician Signature: 

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	79.0%	85.4%
Combustion Efficiency	96.8%	96.8%
Heat Transfer Efficiency	82%	88.2%

Output Rate (kJ/h)	13,576	12,879	**(Btu/h)**
Burn Rate (kg/h)	0.87	1.91	**(lb/h)**
Input (kJ/h)	17,182	16,299	**(Btu/h)**

Test Load Weight (dry kg)	4.89	10.77	**dry lb**
MC wet (%)	17.16139721		
MC dry (%)	20.72		
Particulate (g)	0.84		
CO (g)	235		
Test Duration (h)	5.63		

Emissions	Particulate	CO
g/MJ Output	0.01	3.07
g/kg Dry Fuel	0.17	48.06
g/h	0.15	41.68
lb/MM Btu Output	0.03	7.14

Air/Fuel Ratio (A/F)	12.37

VERSION: **2.2** **12/14/2009**

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 4
Model: Encore Tracking Number: 2326 Date: 11/2/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 335, 331, 185

Wood Heater Run Notes

Air Control Settings

Primary: ~5° from fully closed

Secondary: Fixed

Tertiary/Pilot: N/A

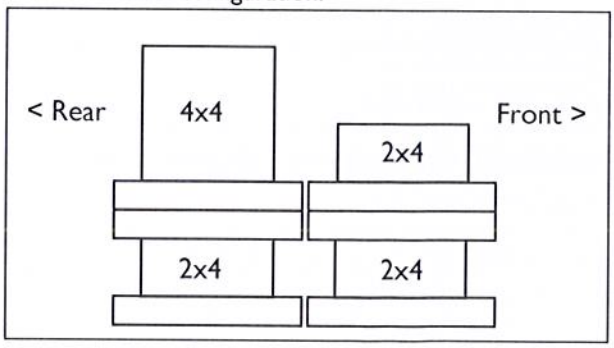
Fan: ~15° from low

Preburn Notes

Time	Notes
12:00	Set air to test setting
16:00	Noted glass gasket loose, tightened retaining tabs
56:00	Stirred
96:00	stirred

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Closed @ 1:00
Fuel loaded by: 0:40
Door closed at: 1:00
Primary air: set throughout

Notes:

Time	Notes
66:00	Swapped filter A

Technician Signature: _____ Date: 11/2/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 4
Model: Encore | Tracking Number: 2326 | Date: 11/2/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 296-TCS, 340, 421

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16" 8 in	24.5	7	16" 8 in	23.8
2	8 in	24.3	8	8 in	22.6
3	8 in	22.3	9	8 in	23.8
4	8 in	19.2	10	8 in	23.8
5	8 in	18.8	11	in	19.6
6	8 in	20.3	12	in	19.7
					227

Total Pre-Burn Fuel Weight: 19.7

Time (clock): 11:00 Room Temperature (F): 70 Initials: A

Test Fuel

Firebox Volume (ft³): 2.02 Test Fuel Piece Length (in): 19.5
Load Weight Range (lb): 12.7-15.5
Fuel Type & Amount: 2 x 4: 3 Weight (2x4s with spacers): 7.4
4 x 4: 1 Weight (4x4s with spacers): 5.6
Total Wet Fuel Load Weight (lb): 13.0

Piece:	Weight (lbs):	Moisture Readings (%DB):				Fuel Type:
1	4.9	19.4	20.0	23.0		4x4
2	1.9	21.0	19.1	22.4		2x4
3	2.1	19.1	22.6	20.0		↓
4	2.3	22.0	21.0	18.0		↓
5						
6						
7						

Spacer Moisture Readings (%DB)

18.7	10.9	16.4	16.6				
14.9	13.1	18.6	16.2				
10.2	13.9	8.1	17.7				
20.7	16.5	16.6	15.0				

Time (clock): 12:00 Room Temperature (F): 70 Initials: A

Technician Signature: [signature] Date: 11/2/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 4
Model: Encore | Tracking Number: 2326 | Date: 11/2/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 132, ~~HHP~~, 559, 635, 654, 653

ASTM E2515 Sampling Information

Test Location: OMNI F1 | Clock Time @ ET=0: ~~11:14~~ A 13:28
Span Gas Concentrations: CO_2(%): 17.06 | CO(%): 4.290 | CO(ppm): 901

Test Run Validation Checks	Pre Test	Post Test
Zero Stack Gas Leakage	✓	✓
Zero Pitot Line Leakage	✓	✓
Zero Induced Draft	✓	
100% Smoke Capture	✓	

Test Run Validation Measurements	Pre Test		Post Test	
Scale Audit (lbs)	10.0		10.0	
CO_2 % (Zero/Span)	0.00	17.05	-0.01	17.03
CO % (Zero/Span)	0.000	4.288	-0.001	4.276
CO ppm (Zero/Span)	0	902	1	890
Sample A Leakage (cfm @"Hg)	0		0	@ -10
Sample B Leakage (cfm @"Hg)	0		0.001	@ -15
Room Air Velocity (ft/min)	<50		<50	
Barometric Pressure ("Hg)	30.31		30.35	
Relative Humidity (%)	49.0		31.7	
Tunnel Static ("H_2O)	-0.20		-0.020	

Last Cleaning Dates

Flue Pipe	10/~~30~~/18
Dilution Tunnel	10/26/18
Sample Dryers	10/26/18

Dilution Tunnel Traverse

Traverse Point	1	2	Center	3	4	5	6	7	8
Δp ("H_2O)	0.033	0.039	0.051	0.043	0.034	0.036 ~~0.038~~	0.039	0.041	0.035
T (°F)	84								

Technician Signature: _____ Date: 11/2/18

Wood Heater Preburn Data - ASTM E2780

Run:	**4**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/2/18
Beginning Clock Time:	11:51

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	19.7		
Fuel Moisture Readings (% DB):	24.5	23.8	19.7
	24.3	22.6	22.3
	22.3	27.8	
	19.2	23.8	
	18.8	19.6	
Avg Preburn Moisture (% DB):	**22.39**		

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
0	11.6	-0.063	706	419	241	306	335	401.4	403	70
1	11.4	-0.063	695	421	248	307	333	400.8	401	71
2	11.3	-0.06	678	422	255	307	332	398.8	396	69
3	11.1	-0.06	655	423	263	307	330	395.6	389	70
4	11	-0.054	634	422	270	307	328	392.2	387	69
5	10.9	-0.058	616	424	277	306	326	389.8	381	69
6	10.7	-0.059	599	424	283	306	324	387.2	379	69
7	10.6	-0.057	586	424	289	307	322	385.6	379	69
8	10.5	-0.057	575	425	294	307	320	384.2	378	69
9	10.4	-0.057	566	425	299	307	318	383	377	69
10	10.2	-0.055	559	425	304	307	316	382.2	376	69
11	7.6	-0.058	553	425	308	308	314	381.6	400	69
12	10	-0.062	550	426	312	309	313	382	378	70
13	10.1	-0.055	547	426	315	310	312	382	370	70
14	9.7	-0.063	536	426	317	312	311	380.4	472	70
15	7.4	-0.078	537	428	320	314	309	381.6	630	70
16	9.1	-0.065	550	430	321	317	307	385	519	71
17	8.9	-0.06	547	433	322	319	306	385.4	431	69
18	8.8	-0.056	532	435	324	319	305	383	385	69
19	8.7	-0.054	518	436	326	317	303	380	356	69
20	8.7	-0.053	506	437	327	317	301	377.6	336	69
21	8.6	-0.052	497	438	328	315	299	375.4	323	70
22	8.5	-0.051	489	439	328	313	297	373.2	316	69
23	8.4	-0.05	480	439	329	312	295	371	307	69
24	8.3	-0.049	474	439	329	311	293	369.2	298	69
25	8.3	-0.049	468	439	328	308	292	367	295	70
26	8.2	-0.049	462	440	328	306	290	365.2	291	69
27	8.1	-0.048	458	440	327	304	288	363.4	288	69
28	8	-0.048	454	439	327	302	287	361.8	286	69
29	8	-0.047	450	439	326	301	285	360.2	285	69
30	7.9	-0.047	447	439	326	299	284	359	283	69
31	7.8	-0.046	443	439	325	299	282	357.6	283	69
32	7.7	-0.043	442	439	325	296	281	356.6	308	71
33	7.4	-0.052	453	438	325	296	279	358.2	490	70
34	7.3	-0.052	459	439	324	295	280	359.4	401	70
35	7.1	-0.05	464	439	324	295	281	360.6	378	70
36	7	-0.049	463	438	322	295	282	360	341	69
37	6.8	-0.048	461	438	321	294	283	359.4	323	69
38	6.7	-0.046	459	437	318	294	285	358.6	312	70

Wood Heater Preburn Data - ASTM E2780

Run:	**4**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/2/18
Beginning Clock Time:	11:51

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

Preburn Fuel Data

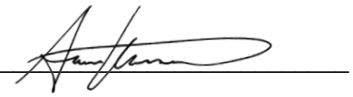
Fuel Piece Lengths (in.):	16
Total Preburn Weight (lb):	19.7

Fuel Moisture Readings (% DB):	24.5	23.8	19.7
	24.3	22.6	22.3
	22.3	27.8	
	19.2	23.8	
	18.8	19.6	
Avg Preburn Moisture (% DB):	**22.39**		

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
39	6.6	-0.047	457	437	316	293	286	357.8	305	71
40	6.5	-0.046	457	437	313	292	288	357.4	300	70
41	6.3	-0.044	458	436	310	292	289	357	295	70
42	6.2	-0.045	459	436	307	291	290	356.6	290	69
43	6.1	-0.043	460	435	304	292	292	356.6	287	69
44	6	-0.043	462	434	301	290	293	356	283	70
45	5.9	-0.043	463	434	297	290	293	355.4	280	70
46	6.1	-0.062	465	433	294	289	295	355.2	298	70
47	5.7	-0.046	471	434	291	290	296	356.4	293	70
48	5.6	-0.046	470	435	289	289	297	356	284	70
49	5.5	-0.044	469	435	287	289	298	355.6	281	70
50	5.4	-0.044	468	435	286	288	297	354.8	276	69
51	5.4	-0.043	466	435	287	287	297	354.4	271	71
52	5.3	-0.043	465	435	288	288	297	354.6	267	71
53	5.3	-0.041	464	435	289	288	296	354.4	262	70
54	5.2	-0.041	463	435	290	287	296	354.2	259	70
55	5.2	-0.042	462	435	291	286	295	353.8	259	70
56	4.6	-0.047	464	434	293	286	294	354.2	397	70
57	4.9	-0.048	468	433	294	287	295	355.4	335	70
58	4.8	-0.046	468	433	295	288	294	355.6	309	70
59	4.7	-0.047	461	431	297	287	294	354	296	70
60	4.6	-0.046	456	428	299	288	293	352.8	294	69
61	4.6	-0.047	451	427	303	289	292	352.4	290	70
62	4.5	-0.047	446	425	307	287	291	351.2	294	70
63	4.4	-0.046	443	422	312	287	290	350.8	294	69
64	4.3	-0.046	440	420	316	287	288	350.2	290	69
65	4.3	-0.044	438	418	321	287	288	350.4	287	69
66	4.2	-0.043	436	416	325	287	288	350.4	285	70
67	4.2	-0.043	435	414	328	287	287	350.2	280	70
68	4.1	-0.042	434	412	331	287	287	350.2	276	70
69	4.1	-0.042	434	410	334	288	286	350.4	272	69
70	4	-0.041	434	408	335	288	285	350	269	70
71	4	-0.041	434	406	337	288	285	350	265	70
72	3.9	-0.039	434	404	338	289	285	350	262	71
73	3.9	-0.039	434	402	338	289	284	349.4	258	70
74	3.9	-0.038	434	400	338	289	284	349	255	70
75	3.8	-0.038	435	399	338	289	284	349	252	70
76	3.8	-0.038	435	397	337	289	283	348.2	250	70
77	3.8	-0.038	435	396	336	289	283	347.8	248	70

Wood Heater Preburn Data - ASTM E2780

Run:	**4**

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/2/18
Beginning Clock Time:	11:51

Coal Bed Range (lb):	**2.6** (min)	**3.3** (max)

Preburn Fuel Data

Fuel Piece Lengths (in.):	16
Total Preburn Weight (lb):	19.7

Fuel Moisture Readings (% DB):			
	24.5	23.8	19.7
	24.3	22.6	22.3
	22.3	27.8	
	19.2	23.8	
	18.8	19.6	
Avg Preburn Moisture (% DB):	**22.39**		

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
78	3.8	-0.037	435	394	335	290	283	347.4	245	70
79	3.8	-0.037	438	392	333	291	284	347.6	243	71
80	3.7	-0.036	440	391	331	291	284	347.4	240	70
81	3.7	-0.036	443	390	329	291	284	347.4	238	69
82	3.7	-0.036	445	388	327	292	284	347.2	238	70
83	3.7	-0.036	446	387	324	292	284	346.6	238	71
84	3.7	-0.036	446	386	322	292	284	346	236	71
85	3.6	-0.035	449	384	319	292	284	345.6	235	70
86	3.6	-0.035	450	383	317	293	285	345.6	235	70
87	3.6	-0.034	452	382	314	293	284	345	237	70
88	3.6	-0.034	452	381	311	293	284	344.2	234	71
89	3.6	-0.035	452	380	308	293	284	343.4	234	70
90	3.6	-0.034	453	378	306	293	284	342.8	233	69
91	3.6	-0.034	455	378	303	293	284	342.6	232	70
92	3.5	-0.033	455	376	300	294	284	341.8	231	69
93	3.5	-0.033	455	375	298	294	284	341.2	228	71
94	3.5	-0.033	455	375	295	293	283	340.2	228	70
95	3.5	-0.033	455	373	292	294	284	339.6	227	70
96	3.5	-0.033	454	372	290	293	283	338.4	225	69
97	3.5	-0.033	454	371	287	293	283	337.6	223	70
98	3.5	-0.032	453	370	284	292	283	336.4	222	69
99	3.5	-0.033	452	370	282	292	282	335.6	222	69
100	3.3	-0.036	456	368	279	293	282	335.6	321	70
101	3.3	-0.036	459	368	277	293	282	335.8	272	70
102	3.3	-0.033	459	367	276	293	283	335.6	250	71
103	3.3	-0.035	455	366	274	293	283	334.2	239	71
104	3.3	-0.034	455	365	272	292	283	333.4	232	70
105	3.3	-0.034	454	364	271	291	284	332.8	229	70
106	3.3	-0.033	454	363	269	291	284	332.2	226	70
107	3.3	-0.033	453	361	268	291	283	331.2	225	70
108	3.2	-0.032	451	360	266	290	283		224	70
109	3.2	-0.032	449	358	265	289	283		222	70
110	3.2	-0.032	448	357	263	289	283		219	70

Wood Heater Test Fuel Data

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/2/2018
Run No.:	4

Firebox Volume (ft^3):	2
Fuel Piece Length (in):	19.5
2x4 Crib Weight (lb):	7.4
4x4 Crib Weight (lb):	5.6

Total Fuel Weight (Dry Basis, lb):	10.8	
Fuel Density (lb/ft^3, Dry Basis):	29.36	OK
Loading Density (lb/ft^3, Wet Basis):	6.50	OK
2x4 Percentage:	57%	OK

Coal Bed Range (20-25%): **2.6 - 3.25**

Test Fuel Piece	Weight (lb)	Size	Readings (Dry Basis %)			Dry Weight (lb)
1	4.9	4"x 4"	19.4	20.0	23.0	4.06
2	1.9	2"x 4"	21.0	19.1	22.4	1.57
3	2.1	2"x 4"	19.1	22.6	20.0	1.74
4	2.3	2"x 4"	22.0	21.0	19.0	1.91

Spacer Readings (Dry Basis %)			
18.7	16.4		
14.9	18.6		
10.2	8.1		
20.3	16.6		
10.9	16.6		
13.1	16.2		
13.8	17.7		
16.5	15.0		

Technician Signature: 

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			0.99	73	1.84	0.92	75	1.1	100	0.050			13.0		443	356	261	287	282	326	735	257	69	68	70	68	70	-0.034	1.91	0.27
1	0.146	0.148	0.15	0.15	1.39	73	2.06	1.13	74	1.1	119	0.051	95	96	12.9	-0.1	425	354	260	288	281	322	765	244	70	70	71	70	71	-0.028	0.97	0.15
2	0.308	0.312	0.16	0.16	1.39	73	2.04	1.12	74	1.1	98	0.051	104	104	12.9	0	410	353	258	286	280	317	782	236	70	71	71	70	70	-0.037	8.90	0.25
3	0.470	0.476	0.16	0.16	1.39	74	2.04	1.12	74	1.1	89	0.053	101	101	12.9	0	397	351	256	283	277	313	800	234	70	71	71	70	70	-0.038	7.77	0.34
4	0.631	0.639	0.16	0.16	1.39	74	2.04	1.12	74	1.1	86	0.053	100	100	12.8	-0.1	386	350	255	279	275	309	808	233	70	71	71	70	70	-0.038	8.02	0.25
5	0.793	0.802	0.16	0.16	1.39	74	2.04	1.12	74	1.1	84	0.051	102	102	12.8	0	376	349	254	276	272	305	821	234	70	71	71	70	71	-0.038	8.33	0.29
6	0.955	0.965	0.16	0.16	1.38	74	2.03	1.12	75	1.1	83	0.051	102	102	12.7	-0.1	367	347	253	273	269	302	836	235	70	71	71	70	70	-0.038	8.67	0.28
7	1.116	1.128	0.16	0.16	1.38	74	2.04	1.12	75	1.1	82	0.052	100	101	12.7	0	360	346	253	270	265	299	856	238	70	71	71	70	70	-0.038	9.30	0.34
8	1.277	1.292	0.16	0.16	1.38	74	2.03	1.12	75	1.1	82	0.050	102	104	12.6	-0.1	354	344	253	266	262	296	878	241	70	71	71	70	69	-0.039	9.63	0.37
9	1.439	1.454	0.16	0.16	1.38	74	2.03	1.11	75	1.1	81	0.051	102	101	12.6	0	349	343	253	262	259	293	900	243	70	71	71	70	70	-0.039	9.97	0.42
10	1.600	1.616	0.16	0.16	1.37	74	2.02	1.12	75	1.1	81	0.051	101	101	12.5	-0.1	344	342	254	259	257	291	921	246	71	71	71	70	71	-0.040	10.45	0.41
11	1.761	1.779	0.16	0.16	1.38	74	2.02	1.11	75	1.1	81	0.051	101	102	12.4	-0.1	341	340	255	256	254	289	936	248	71	71	71	70	70	-0.040	10.70	0.42
12	1.923	1.942	0.16	0.16	1.38	74	2.01	1.11	75	1.1	81	0.052	101	101	12.4	0	339	339	257	253	251	288	960	252	71	71	72	70	70	-0.040	10.80	0.53
13	2.084	2.105	0.16	0.16	1.38	74	2.02	1.11	75	1.1	81	0.052	100	101	12.3	-0.1	338	337	258	250	249	286	980	254	71	71	72	71	70	-0.041	10.93	0.60
14	2.245	2.267	0.16	0.16	1.38	75	2.01	1.11	75	1.1	81	0.052	100	100	12.2	-0.1	338	336	260	247	246	285	994	259	71	71	72	71	70	-0.041	10.87	0.60
15	2.405	2.429	0.16	0.16	1.37	75	2.02	1.11	75	1.1	81	0.050	101	102	12.1	-0.1	337	334	262	245	244	284	1006	260	71	71	72	71	69	-0.042	10.71	0.57
16	2.566	2.591	0.16	0.16	1.38	75	2.02	1.10	76	1.1	81	0.050	102	102	12.1	0	337	333	265	242	242	284	1017	262	71	71	72	71	70	-0.042	10.93	0.57
17	2.727	2.755	0.16	0.16	1.37	75	2.01	1.10	76	1.1	82	0.051	101	102	12.0	-0.1	338	332	267	241	240	284	1027	264	71	71	72	71	70	-0.041	11.00	0.58
18	2.888	2.917	0.16	0.16	1.37	75	2.01	1.10	76	1.1	82	0.052	100	100	11.9	-0.1	339	331	270	239	239	284	1034	264	71	72	72	71	71	-0.042	11.16	0.52
19	3.049	3.079	0.16	0.16	1.37	75	2.02	1.10	76	1.1	82	0.052	100	100	11.8	-0.1	340	329	272	237	237	283	1037	266	71	72	72	71	70	-0.043	10.75	0.47
20	3.210	3.241	0.16	0.16	1.37	75	2.01	1.10	76	1.1	82	0.051	101	101	11.8	0	342	328	275	236	236	283	1037	265	71	72	72	71	71	-0.042	10.67	0.44
21	3.370	3.404	0.16	0.16	1.37	75	2.01	1.10	76	1.1	82	0.052	100	101	11.7	-0.1	345	326	277	233	234	283	1036	268	71	72	72	71	70	-0.043	10.87	0.46
22	3.531	3.567	0.16	0.16	1.36	76	2.01	1.10	76	1.1	82	0.050	102	103	11.6	-0.1	349	325	279	231	233	283	1039	270	71	72	72	71	70	-0.043	11.02	0.47
23	3.692	3.728	0.16	0.16	1.37	76	2	1.10	77	1.1	82	0.050	102	101	11.5	-0.1	352	323	281	230	232	284	1047	271	71	72	72	71	70	-0.043	11.34	0.50
24	3.853	3.891	0.16	0.16	1.37	76	2.01	1.10	77	1.1	82	0.051	101	101	11.5	0	355	322	283	228	230	284	1056	274	71	72	72	71	69	-0.044	11.34	0.51
25	4.014	4.053	0.16	0.16	1.37	76	2.01	1.10	77	1.1	82	0.052	100	100	11.4	-0.1	359	321	285	228	230	285	1062	273	71	72	72	71	70	-0.044	11.55	0.55
26	4.175	4.216	0.16	0.16	1.37	76	2.02	1.10	77	1.1	82	0.051	101	101	11.3	-0.1	364	319	287	226	229	285	1067	273	71	72	72	71	69	-0.045	11.43	0.51
27	4.336	4.378	0.16	0.16	1.37	76	2	1.09	77	1.1	82	0.051	101	101	11.2	-0.1	370	318	289	225	229	286	1067	277	71	72	72	71	71	-0.045	11.50	0.50
28	4.498	4.541	0.16	0.16	1.37	77	2.01	1.10	77	1.1	83	0.051	101	102	11.1	-0.1	374	317	290	225	228	287	1066	278	71	72	72	71	70	-0.044	11.40	0.48
29	4.659	4.703	0.16	0.16	1.37	77	2.01	1.10	77	1.1	83	0.053	99	99	11.0	-0.1	378	316	292	224	227	287	1065	280	71	72	72	71	69	-0.044	11.37	0.46
30	4.820	4.866	0.16	0.16	1.37	77	2	1.10	78	1.1	83	0.051	101	101	11.0	0	384	315	294	223	227	289	1063	281	71	72	72	71	70	-0.045	11.46	0.48
31	4.981	5.028	0.16	0.16	1.37	77	2.01	1.09	78	1.1	83	0.052	100	100	10.9	-0.1	389	314	295	222	227	289	1068	283	71	72	72	71	70	-0.045	11.72	0.51
32	5.142	5.190	0.16	0.16	1.37	77	2.01	1.10	78	1.1	83	0.053	99	99	10.8	-0.1	394	313	296	222	226	290	1073	283	72	72	72	71	70	-0.045	11.91	0.57
33	5.303	5.353	0.16	0.16	1.37	77	2.01	1.10	78	1.1	83	0.052	100	100	10.7	-0.1	400	312	298	222	226	292	1079	283	72	72	72	71	70	-0.045	11.95	0.61
34	5.464	5.515	0.16	0.16	1.37	77	2.01	1.10	78	1.1	83	0.052	100	100	10.6	-0.1	406	311	299	222	226	293	1080	284	72	72	72	71	70	-0.045	11.98	0.60

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
35	5.626	5.678	0.16	0.16	1.37	77	2.02	1.10	78	1.1	83	0.051	101	101	10.5	-0.1	411	309	301	221	226	294	1080	284	72	72	72	71	70	-0.045	11.99	0.60
36	5.787	5.841	0.16	0.16	1.36	77	2.01	1.09	78	1.1	83	0.051	101	101	10.4	-0.1	413	308	302	221	226	294	1082	285	72	72	72	71	70	-0.046	12.09	0.60
37	5.948	6.003	0.16	0.16	1.37	78	2.02	1.10	78	1.1	83	0.052	100	100	10.3	-0.1	414	307	303	221	226	294	1086	286	72	72	72	71	70	-0.045	12.09	0.62
38	6.109	6.166	0.16	0.16	1.37	78	2.02	1.10	78	1.1	83	0.052	100	100	10.3	0	418	306	304	220	225	295	1088	287	72	72	72	71	70	-0.045	12.13	0.61
39	6.270	6.329	0.16	0.16	1.37	78	2.01	1.10	79	1.1	83	0.051	101	101	10.2	-0.1	423	305	305	220	225	296	1091	286	72	72	72	71	70	-0.046	12.24	0.64
40	6.432	6.491	0.16	0.16	1.36	78	2.01	1.10	79	1.1	83	0.051	101	101	10.1	-0.1	428	304	306	220	225	297	1095	286	72	72	72	71	70	-0.046	12.31	0.70
41	6.593	6.653	0.16	0.16	1.37	78	2.01	1.10	79	1.1	83	0.051	101	101	10.0	-0.1	431	303	307	220	225	297	1102	286	72	72	72	71	70	-0.045	12.42	0.76
42	6.754	6.816	0.16	0.16	1.37	78	2.01	1.10	79	1.1	84	0.052	100	100	9.9	-0.1	436	302	308	220	226	298	1111	285	72	72	72	71	70	-0.045	12.61	0.92
43	6.916	6.979	0.16	0.16	1.36	78	2.01	1.10	79	1.1	83	0.051	101	101	9.8	-0.1	440	301	309	220	226	299	1121	287	72	72	72	71	70	-0.046	12.66	1.01
44	7.077	7.143	0.16	0.16	1.36	78	2.02	1.10	79	1.1	84	0.053	99	100	9.7	-0.1	443	300	310	220	226	300	1125	287	72	72	72	71	70	-0.046	12.62	0.99
45	7.238	7.305	0.16	0.16	1.36	78	2.01	1.10	79	1.1	84	0.051	101	101	9.6	-0.1	445	299	311	220	226	300	1129	288	72	72	72	71	70	-0.045	12.58	0.81
46	7.400	7.467	0.16	0.16	1.36	79	2.01	1.10	79	1.1	84	0.053	99	99	9.6	0	449	298	312	220	227	301	1128	288	72	73	72	71	70	-0.045	12.38	0.68
47	7.561	7.630	0.16	0.16	1.36	79	2.01	1.10	79	1.1	84	0.051	101	101	9.5	-0.1	452	297	314	221	227	302	1128	288	72	73	72	71	71	-0.045	12.20	0.66
48	7.723	7.793	0.16	0.16	1.36	79	2.01	1.10	79	1.1	84	0.052	100	100	9.4	-0.1	455	296	315	221	228	303	1129	287	72	73	72	71	71	-0.046	12.13	0.61
49	7.884	7.956	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.051	101	101	9.3	-0.1	457	296	316	222	228	304	1130	286	72	73	72	71	70	-0.045	12.14	0.60
50	8.046	8.118	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.052	100	100	9.3	0	459	295	317	222	228	304	1133	286	72	73	72	71	70	-0.046	12.28	0.61
51	8.208	8.281	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.051	101	101	9.2	-0.1	461	294	318	222	229	305	1139	285	72	73	72	72	70	-0.046	12.36	0.62
52	8.369	8.444	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.051	101	101	9.1	-0.1	461	293	318	222	229	305	1143	288	72	73	72	72	70	-0.046	12.59	0.65
53	8.530	8.607	0.16	0.16	1.36	79	2.02	1.10	80	1.1	84	0.052	100	100	9.0	-0.1	463	292	319	223	230	305	1142	288	72	73	72	72	70	-0.046	12.66	0.62
54	8.692	8.770	0.16	0.16	1.37	79	2.01	1.10	80	1.1	84	0.051	101	101	8.9	-0.1	463	291	320	224	230	306	1142	289	72	73	72	72	71	-0.046	12.73	0.61
55	8.853	8.932	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.052	100	100	8.8	-0.1	463	290	321	224	231	306	1136	289	72	73	72	72	69	-0.046	12.77	0.60
56	9.015	9.095	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.053	99	99	8.8	0	465	290	322	224	232	307	1134	290	72	73	72	72	70	-0.046	12.80	0.62
57	9.176	9.258	0.16	0.16	1.36	79	2.02	1.10	80	1.1	84	0.051	101	101	8.7	-0.1	464	289	323	224	232	306	1135	291	72	73	72	72	71	-0.046	12.79	0.60
58	9.338	9.422	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.050	102	103	8.6	-0.1	465	288	323	225	233	307	1134	293	72	73	72	72	70	-0.045	12.82	0.58
59	9.500	9.584	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.051	101	100	8.5	-0.1	465	287	324	226	233	307	1132	291	72	73	72	72	70	-0.045	12.79	0.58
60	9.661	9.747	0.16	0.16	1.36	79	2.01	1.10	80	1.1	84	0.052	100	100	8.4	-0.1	465	286	324	226	234	307	1129	292	72	73	72	72	70	-0.046	12.74	0.52
61	9.825	9.909	0.16	0.16	1.37	80	2.01	1.10	80	1.1	84	0.052	101	100	8.4	0	466	286	324	226	235	307	1126	292	73	73	72	72	71	-0.045	12.58	0.46
62	9.987	10.072	0.16	0.16	1.37	80	2	1.10	80	1.1	84	0.052	100	100	8.3	-0.1	463	285	325	227	235	307	1126	291	74	73	72	72	70	-0.046	12.50	0.47
63	10.149	10.236	0.16	0.16	1.37	80	2	1.10	80	1.1	84	0.052	100	101	8.2	-0.1	461	284	325	228	236	307	1119	289	74	73	72	72	70	-0.045	12.40	0.43
64	10.311	10.399	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.051	101	101	8.1	-0.1	459	284	325	228	237	307	1118	287	74	73	72	72	70	-0.045	12.45	0.43
65	10.473	10.562	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.051	101	101	8.1	0	459	283	325	229	237	307	1113	286	74	73	72	72	70	-0.045	12.33	0.39
66	10.635	10.724	0.16	0.16	1.37	80	2.02	1.10	81	1.1	84	0.052	100	99	8.0	-0.1	459	283	325	229	238	307	1108	288	74	73	72	72	70	-0.044	12.31	0.39
67	10.797	10.888	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.052	100	101	7.9	-0.1	462	282	325	229	238	307	1108	288	73	73	72	72	70	-0.045	12.10	0.34
68	10.959	11.052	0.16	0.16	1.37	80	2	1.10	81	1.1	84	0.051	101	102	7.8	-0.1	468	281	325	229	240	309	1105	289	73	73	73	72	70	-0.045	12.17	0.36
69	11.121	11.214	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.052	100	99	7.8	0	473	281	325	230	240	310	1098	287	73	73	73	72	71	-0.044	12.00	0.35

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
70	11.283	11.377	0.16	0.16	1.36	80	2.01	1.10	81	1.1	84	0.052	100	100	7.7	-0.1	477	280	325	231	241	311	1090	287	73	73	72	72	70	-0.044	11.87	0.33
71	11.444	11.540	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.051	100	101	7.6	-0.1	481	280	325	231	242	312	1082	285	73	73	73	72	71	-0.044	11.70	0.34
72	11.606	11.703	0.16	0.16	1.38	80	2.01	1.10	81	1.1	83	0.051	101	101	7.6	0	483	279	325	231	242	312	1072	283	73	73	72	72	71	-0.044	11.49	0.33
73	11.768	11.867	0.16	0.16	1.38	80	2.01	1.10	81	1.1	84	0.051	101	102	7.5	-0.1	483	278	324	232	243	312	1067	283	73	73	73	72	70	-0.044	11.63	0.34
74	11.930	12.030	0.16	0.16	1.37	80	2	1.10	81	1.1	83	0.051	101	101	7.4	-0.1	484	278	323	232	244	312	1063	283	73	73	73	72	70	-0.044	11.65	0.34
75	12.092	12.193	0.16	0.16	1.37	80	2.01	1.10	81	1.1	83	0.050	102	102	7.4	0	487	277	323	233	244	313	1059	284	73	73	73	72	70	-0.044	11.59	0.33
76	12.254	12.356	0.16	0.16	1.38	80	2	1.11	81	1.1	84	0.051	101	101	7.3	-0.1	491	277	322	234	246	314	1052	283	73	73	73	72	71	-0.043	11.61	0.32
77	12.416	12.519	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.051	101	101	7.3	0	491	276	321	234	246	314	1051	280	73	73	73	72	70	-0.044	11.72	0.34
78	12.578	12.683	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.052	100	101	7.2	-0.1	490	276	321	235	247	314	1051	283	73	73	73	72	70	-0.044	11.80	0.37
79	12.740	12.846	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.051	101	101	7.1	-0.1	493	276	320	235	248	314	1050	283	73	73	73	72	70	-0.044	11.55	0.36
80	12.902	13.009	0.16	0.16	1.37	80	2.01	1.10	81	1.1	84	0.052	100	100	7.1	0	496	275	319	236	249	315	1046	281	73	73	73	72	71	-0.044	11.48	0.35
81	13.064	13.171	0.16	0.16	1.37	81	2.01	1.11	81	1.1	83	0.052	100	99	7.0	-0.1	499	274	318	236	249	315	1041	279	73	73	73	72	70	-0.044	11.48	0.35
82	13.227	13.335	0.16	0.16	1.37	81	2.01	1.10	81	1.1	83	0.053	99	100	6.9	-0.1	502	274	317	237	251	316	1037	279	73	73	73	72	70	-0.044	11.48	0.33
83	13.389	13.499	0.16	0.16	1.37	81	2.01	1.10	81	1.1	83	0.050	102	102	6.9	0	503	274	316	238	252	317	1034	279	73	73	73	72	70	-0.044	11.56	0.35
84	13.551	13.662	0.16	0.16	1.37	81	2.01	1.10	81	1.1	83	0.051	101	101	6.8	-0.1	505	273	316	238	253	317	1033	283	73	73	73	72	70	-0.044	11.63	0.35
85	13.713	13.825	0.16	0.16	1.37	81	2.01	1.10	81	1.1	83	0.052	100	100	6.7	-0.1	508	273	315	238	254	318	1030	284	72	73	72	72	70	-0.043	11.56	0.35
86	13.875	13.988	0.16	0.16	1.37	81	2.01	1.10	81	1.1	83	0.052	100	100	6.7	0	511	272	314	239	255	318	1030	282	72	73	72	72	70	-0.044	11.58	0.36
87	14.037	14.151	0.16	0.16	1.37	81	2	1.10	81	1.1	83	0.053	99	99	6.6	-0.1	514	272	313	240	256	319	1028	279	72	73	72	72	70	-0.044	11.59	0.36
88	14.199	14.315	0.16	0.16	1.37	81	2.01	1.11	81	1.1	83	0.052	100	100	6.5	-0.1	517	271	312	240	257	319	1029	279	72	73	72	72	70	-0.044	11.55	0.37
89	14.361	14.478	0.16	0.16	1.38	81	2.02	1.10	82	1.1	83	0.052	100	100	6.5	0	517	271	311	241	258	320	1025	279	72	73	72	72	70	-0.043	11.54	0.37
90	14.524	14.641	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.053	99	99	6.4	-0.1	512	270	311	242	259	319	1024	278	72	73	73	72	71	-0.043	11.54	0.39
91	14.686	14.804	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.051	101	101	6.4	0	508	270	310	242	260	318	1028	280	72	73	73	72	70	-0.044	11.63	0.38
92	14.848	14.967	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.051	101	101	6.3	-0.1	507	270	309	243	261	318	1025	279	72	73	73	72	70	-0.044	11.52	0.38
93	15.010	15.130	0.16	0.16	1.37	81	2	1.10	82	1.1	83	0.053	99	99	6.2	-0.1	507	270	309	244	262	318	1019	279	72	73	73	72	70	-0.043	11.41	0.38
94	15.172	15.294	0.16	0.16	1.37	81	2.02	1.10	82	1.1	83	0.052	100	100	6.2	0	507	269	308	244	263	318	1021	280	72	73	73	72	71	-0.043	11.57	0.43
95	15.335	15.457	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.053	99	99	6.1	-0.1	507	268	308	245	264	318	1023	278	72	73	73	72	71	-0.042	11.44	0.42
96	15.497	15.620	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.053	99	99	6.0	-0.1	507	268	307	246	264	318	1027	277	72	73	73	72	71	-0.043	11.48	0.45
97	15.659	15.783	0.16	0.16	1.36	81	2.01	1.10	82	1.1	83	0.052	100	100	6.0	0	510	267	307	246	265	319	1031	277	72	73	72	72	71	-0.043	11.61	0.47
98	15.821	15.946	0.16	0.16	1.36	81	2.02	1.10	82	1.1	83	0.052	100	100	5.9	-0.1	512	266	307	247	267	320	1034	279	72	73	73	72	71	-0.044	11.74	0.50
99	15.984	16.110	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.050	102	102	5.8	-0.1	514	266	307	247	268	320	1042	280	72	73	72	72	71	-0.044	11.80	0.53
100	16.146	16.273	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.052	100	100	5.8	0	517	265	307	248	269	321	1050	281	72	73	72	72	71	-0.044	12.02	0.57
101	16.309	16.437	0.16	0.16	1.37	81	2.02	1.10	82	1.1	83	0.050	102	102	5.7	-0.1	520	265	307	249	271	322	1058	283	72	73	72	72	71	-0.044	12.18	0.56
102	16.471	16.599	0.16	0.16	1.37	81	2.02	1.11	82	1.1	83	0.051	101	100	5.6	-0.1	524	265	307	250	273	324	1062	284	72	73	72	72	71	-0.044	12.11	0.53
103	16.633	16.763	0.16	0.16	1.38	81	2.02	1.11	82	1.1	83	0.051	101	101	5.6	0	529	264	307	250	273	325	1059	282	72	73	72	72	71	-0.044	11.99	0.5
104	16.795	16.927	0.16	0.16	1.37	81	2.02	1.10	82	1.1	83	0.052	100	100	5.5	-0.1	533	264	307	252	275	326	1056	281	72	73	72	72	71	-0.043	11.87	0.52

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
105	16.958	17.090	0.16	0.16	1.38	81	2.01	1.10	82	1.1	84	0.051	101	101	5.4	-0.1	536	264	307	252	277	327	1053	282	72	73	72	72	70	-0.044	11.68	0.51
106	17.120	17.253	0.16	0.16	1.38	81	2.01	1.10	82	1.1	83	0.051	101	101	5.4	0	539	264	307	253	278	328	1045	281	72	73	72	72	70	-0.044	11.52	0.5
107	17.282	17.416	0.16	0.16	1.38	81	2.02	1.11	82	1.1	84	0.052	100	100	5.3	-0.1	542	263	307	254	279	329	1037	279	72	73	72	72	71	-0.043	11.41	0.51
108	17.445	17.579	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.053	99	99	5.3	0	542	263	307	254	280	329	1032	280	72	73	72	72	71	-0.043	11.26	0.51
109	17.607	17.743	0.16	0.16	1.37	81	2.02	1.10	82	1.1	84	0.052	100	100	5.2	-0.1	545	263	307	255	282	330	1026	278	72	73	72	72	71	-0.043	11.2	0.5
110	17.769	17.907	0.16	0.16	1.38	81	2.01	1.10	82	1.1	84	0.052	100	100	5.1	-0.1	545	262	307	256	283	331	1021	276	72	73	73	72	70	-0.043	11.13	0.5
111	17.931	18.070	0.16	0.16	1.37	81	2.01	1.10	82	1.1	84	0.051	101	101	5.1	0	546	262	306	257	284	331	1014	277	72	73	73	72	71	-0.043	11.06	0.49
112	18.093	18.233	0.16	0.16	1.38	81	2.02	1.10	82	1.1	84	0.051	101	101	5.0	-0.1	546	262	305	257	285	331	1009	277	72	73	73	72	70	-0.043	10.98	0.48
113	18.255	18.396	0.16	0.16	1.38	81	2.01	1.11	82	1.1	83	0.053	99	99	5.0	0	546	262	305	258	285	331	1002	273	72	73	73	72	70	-0.043	10.9	0.47
114	18.418	18.560	0.16	0.16	1.37	81	2.02	1.10	82	1.1	83	0.052	100	100	4.9	-0.1	546	261	304	259	286	331	993	275	72	73	73	72	70	-0.043	10.71	0.45
115	18.580	18.724	0.16	0.16	1.38	81	2.01	1.11	82	1.1	83	0.051	101	101	4.9	0	545	261	303	259	287	331	989	273	72	73	73	72	71	-0.043	10.6	0.45
116	18.743	18.887	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.051	101	101	4.8	-0.1	544	261	302	260	289	331	982	272	72	73	73	72	72	-0.042	10.6	0.44
117	18.905	19.050	0.16	0.16	1.38	81	2.01	1.10	82	1.1	83	0.051	101	101	4.8	0	542	261	301	259	289	330	977	272	72	73	73	72	70	-0.042	10.59	0.44
118	19.067	19.213	0.16	0.16	1.38	81	2.01	1.10	82	1.1	83	0.051	101	101	4.7	-0.1	540	260	299	260	289	330	971	271	72	73	73	72	70	-0.042	10.46	0.43
119	19.229	19.376	0.16	0.16	1.38	81	2.01	1.11	82	1.1	83	0.052	100	100	4.7	0	538	260	298	260	290	329	968	271	72	73	73	72	70	-0.042	10.43	0.43
120	19.392	19.541	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.053	99	100	4.6	-0.1	538	260	297	260	290	329	961	268	72	73	73	72	71	-0.042	10.33	0.41
121	19.554	19.704	0.16	0.16	1.38	81	2.01	1.10	82	1.1	83	0.054	98	98	4.6	0	537	259	295	261	291	329	957	268	72	73	73	72	71	-0.041	10.4	0.41
122	19.717	19.866	0.16	0.16	1.37	81	2.02	1.10	82	1.1	83	0.051	101	100	4.5	-0.1	535	259	294	261	291	328	953	267	72	73	73	72	71	-0.041	10.35	0.41
123	19.879	20.030	0.16	0.16	1.37	81	2.02	1.11	82	1.1	83	0.052	100	100	4.5	0	534	259	293	262	291	328	949	268	72	73	73	72	71	-0.041	10.4	0.4
124	20.042	20.193	0.16	0.16	1.37	81	2.01	1.11	82	1.1	83	0.051	101	101	4.4	-0.1	533	258	291	262	291	327	945	267	72	73	73	72	71	-0.041	10.4	0.4
125	20.204	20.357	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.052	100	100	4.4	0	532	258	290	262	292	327	942	266	72	73	73	72	71	-0.040	10.31	0.41
126	20.366	20.520	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.051	101	101	4.3	-0.1	531	258	289	262	292	326	940	265	72	73	73	72	70	-0.041	10.33	0.4
127	20.529	20.683	0.16	0.16	1.37	81	2.02	1.10	82	1.1	83	0.053	99	99	4.3	0	530	258	288	262	292	326	936	263	72	73	73	72	70	-0.040	10.36	0.39
128	20.691	20.847	0.16	0.16	1.36	81	2.01	1.10	82	1.1	82	0.052	100	100	4.2	-0.1	530	257	286	262	292	325	930	264	72	73	73	72	70	-0.041	10.27	0.37
129	20.854	21.010	0.16	0.16	1.36	81	2.01	1.10	82	1.1	83	0.052	100	100	4.2	0	530	257	285	263	293	326	922	260	72	73	73	72	71	-0.040	10.14	0.33
130	21.016	21.174	0.16	0.16	1.37	81	2.01	1.11	82	1.1	83	0.053	99	99	4.1	-0.1	530	257	284	263	293	325	914	260	72	73	73	72	71	-0.039	10.07	0.33
131	21.179	21.338	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.051	101	101	4.1	0	535	256	283	263	293	326	914	258	72	73	73	72	71	-0.040	10.02	0.35
132	21.341	21.500	0.16	0.16	1.37	81	2.01	1.10	82	1.1	83	0.053	99	98	4.1	0	535	256	282	264	293	326	908	257	72	73	73	72	71	-0.039	9.84	0.33
133	21.503	21.664	0.16	0.16	1.37	81	2.01	1.10	82	1.1	82	0.051	101	101	4.0	-0.1	535	255	281	264	293	326	901	256	72	73	73	72	71	-0.039	9.74	0.3
134	21.666	21.827	0.16	0.16	1.37	81	2.01	1.10	82	1.1	82	0.050	102	102	4.0	0	531	255	280	264	293	325	895	255	72	73	73	72	72	-0.039	9.55	0.3
135	21.828	21.990	0.16	0.16	1.37	81	2.01	1.11	82	1.1	82	0.052	100	100	3.9	-0.1	523	255	279	264	293	323	884	252	72	73	73	72	71	-0.038	9.57	0.24
136	21.991	22.154	0.16	0.16	1.37	81	2.02	1.10	82	1.1	82	0.052	100	100	3.9	0	516	254	277	264	293	321	877	252	72	73	73	72	71	-0.039	9.63	0.24
137	22.153	22.317	0.16	0.16	1.37	81	2.01	1.10	82	1.1	82	0.052	100	100	3.9	0	510	254	276	264	293	319	869	250	72	73	73	72	72	-0.038	9.23	0.23
138	22.315	22.480	0.16	0.16	1.37	81	2.01	1.10	82	1.1	82	0.050	102	102	3.8	-0.1	505	254	275	264	292	318	863	249	72	73	73	72	71	-0.038	9.12	0.23
139	22.477	22.644	0.16	0.16	1.38	81	2.01	1.10	82	1.1	82	0.053	99	99	3.8	0	501	254	273	263	292	317	858	249	72	73	73	72	71	-0.039	9.07	0.22

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
140	22.640	22.807	0.16	0.16	1.38	81	2.01	1.10	82	1.1	82	0.053	99	99	3.8	0	498	253	272	263	291	315	850	249	72	73	73	72	71	-0.038	8.97	0.21
141	22.802	22.971	0.16	0.16	1.37	81	2.01	1.11	82	1.1	82	0.051	101	101	3.7	-0.1	496	253	271	263	291	315	845	247	72	73	73	72	71	-0.037	8.91	0.22
142	22.964	23.135	0.16	0.16	1.38	81	2.02	1.10	82	1.1	82	0.052	100	100	3.7	0	495	253	269	262	291	314	840	245	72	73	73	72	71	-0.038	9.04	0.21
143	23.127	23.298	0.16	0.16	1.37	81	2.01	1.10	82	1.1	82	0.051	101	101	3.7	0	493	252	268	263	290	313	834	244	72	73	73	72	71	-0.038	9.11	0.2
144	23.289	23.461	0.16	0.16	1.37	81	2.01	1.10	82	1.1	81	0.052	100	99	3.6	-0.1	491	252	267	262	290	312	829	243	72	73	73	72	71	-0.037	8.89	0.19
145	23.452	23.624	0.16	0.16	1.37	82	2.01	1.10	82	1.1	81	0.053	99	99	3.6	0	488	252	266	262	289	311	826	241	72	73	73	72	71	-0.037	8.63	0.2
146	23.614	23.788	0.16	0.16	1.37	82	2.01	1.11	82	1.1	81	0.053	98	99	3.6	0	487	251	264	261	289	310	824	240	72	73	73	72	71	-0.037	8.54	0.21
147	23.777	23.952	0.16	0.16	1.37	82	2.01	1.10	82	1.1	81	0.052	100	100	3.5	-0.1	486	251	263	261	288	310	820	240	72	73	73	72	71	-0.037	8.44	0.2
148	23.939	24.115	0.16	0.16	1.37	82	2.01	1.10	82	1.1	81	0.052	99	99	3.5	0	484	251	262	261	288	309	816	240	72	73	73	72	72	-0.036	8.59	0.2
149	24.102	24.278	0.16	0.16	1.38	82	2.01	1.10	82	1.1	81	0.052	100	99	3.5	0	482	251	261	261	287	308	813	238	72	73	73	72	71	-0.037	8.42	0.21
150	24.265	24.441	0.16	0.16	1.37	82	2	1.10	82	1.1	81	0.051	101	100	3.5	0	478	251	260	260	286	307	808	237	72	73	73	72	71	-0.036	8.25	0.19
151	24.427	24.605	0.16	0.16	1.37	82	2.01	1.10	83	1.1	81	0.053	98	99	3.4	-0.1	476	250	258	260	285	306	804	236	72	73	73	72	71	-0.035	8.14	0.19
152	24.589	24.769	0.16	0.16	1.38	82	2.01	1.10	83	1.1	81	0.052	99	100	3.4	0	473	250	257	259	285	305	801	235	72	73	73	72	71	-0.035	8.18	0.2
153	24.752	24.932	0.16	0.16	1.37	82	2.01	1.10	83	1.1	81	0.052	100	99	3.4	0	471	250	256	259	284	304	799	233	72	73	73	72	71	-0.035	8.03	0.2
154	24.915	25.095	0.16	0.16	1.36	82	2.01	1.10	83	1.1	81	0.051	101	100	3.4	0	469	250	255	258	284	303	795	232	72	73	73	72	72	-0.035	8.1	0.19
155	25.077	25.259	0.16	0.16	1.37	82	2.01	1.10	83	1.1	81	0.051	100	101	3.3	-0.1	468	249	254	258	283	302	790	232	72	73	73	72	71	-0.035	8.16	0.2
156	25.240	25.422	0.16	0.16	1.37	82	2.01	1.10	83	1.1	80	0.052	100	99	3.3	0	467	249	253	257	282	302	785	234	72	73	73	72	71	-0.035	8.16	0.2
157	25.402	25.586	0.16	0.16	1.37	82	2.01	1.11	83	1.1	80	0.053	98	99	3.3	0	465	249	252	257	282	301	779	232	72	73	73	72	71	-0.034	8.11	0.18
158	25.565	25.750	0.16	0.16	1.37	82	2.01	1.10	83	1.1	80	0.051	101	101	3.3	0	463	249	251	257	281	300	775	233	72	73	73	72	71	-0.035	8.05	0.18
159	25.727	25.913	0.16	0.16	1.38	82	2.01	1.10	83	1.1	80	0.055	97	96	3.2	-0.1	464	249	250	256	280	300	773	229	72	73	73	72	71	-0.034	8.08	0.19
160	25.890	26.076	0.16	0.16	1.38	82	2.01	1.10	83	1.1	80	0.052	100	99	3.2	0	464	249	249	256	280	300	772	231	72	72	73	72	71	-0.034	8.18	0.19
161	26.053	26.240	0.16	0.16	1.37	82	2.02	1.11	83	1.1	80	0.051	101	101	3.2	0	464	248	248	256	279	299	767	231	72	72	73	72	71	-0.035	8.28	0.19
162	26.215	26.403	0.16	0.16	1.37	82	2.01	1.10	83	1.1	80	0.052	99	99	3.2	0	462	248	247	255	279	298	766	230	72	72	73	72	72	-0.034	8.08	0.2
163	26.377	26.567	0.16	0.16	1.37	82	2.01	1.10	83	1.1	80	0.052	99	100	3.1	-0.1	457	248	246	255	278	297	766	228	72	72	73	72	71	-0.034	8.23	0.19
164	26.540	26.731	0.16	0.16	1.38	82	2	1.10	83	1.1	80	0.052	100	100	3.1	0	454	247	245	254	278	296	767	226	72	72	73	72	71	-0.034	8.18	0.2
165	26.702	26.894	0.16	0.16	1.38	82	2.01	1.10	83	1.1	80	0.052	99	99	3.1	0	451	247	244	254	277	295	765	227	72	72	73	72	71	-0.034	8.18	0.19
166	26.864	27.057	0.16	0.16	1.38	82	2.01	1.10	83	1.1	80	0.052	99	99	3.1	0	448	247	243	254	276	294	760	226	72	72	72	72	71	-0.034	8.21	0.15
167	27.026	27.221	0.16	0.16	1.38	82	2.01	1.11	83	1.1	80	0.052	99	100	3.0	-0.1	447	247	242	253	275	293	755	225	72	72	72	72	70	-0.034	8.2	0.19
168	27.189	27.384	0.16	0.16	1.37	82	2.01	1.11	83	1.1	80	0.052	100	99	3.0	0	447	247	241	252	275	292	757	226	72	72	72	72	71	-0.034	8.21	0.19
169	27.352	27.548	0.16	0.16	1.37	82	2.01	1.10	83	1.1	80	0.053	99	99	3.0	0	447	246	240	252	274	292	751	225	72	72	72	71	71	-0.034	8.28	0.18
170	27.514	27.711	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.052	99	99	3.0	0	448	246	240	252	274	292	749	224	72	72	72	72	70	-0.033	8.31	0.18
171	27.677	27.875	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.050	102	102	3.0	0	448	246	239	252	273	292	747	225	72	72	72	72	71	-0.033	8.23	0.19
172	27.839	28.038	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.052	99	99	2.9	-0.1	448	246	238	251	273	291	745	224	72	72	72	71	71	-0.034	8.13	0.19
173	28.002	28.201	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.052	100	99	2.9	0	447	246	238	251	272	291	743	223	72	72	72	71	71	-0.034	8.11	0.19
174	28.165	28.366	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.053	99	99	2.9	0	445	246	237	251	271	290	738	222	72	72	72	71	70	-0.033	8.1	0.16

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
175	28.327	28.529	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.052	99	99	2.9	0	445	246	236	251	271	290	737	221	72	72	72	71	70	-0.033	8.07	0.19
176	28.490	28.692	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.052	100	99	2.8	-0.1	443	245	235	251	270	289	734	222	72	72	72	71	71	-0.033	8.14	0.16
177	28.652	28.856	0.16	0.16	1.38	82	2.02	1.11	83	1.1	79	0.051	100	101	2.8	0	441	245	235	250	269	288	733	221	72	72	72	71	71	-0.033	8.09	0.18
178	28.815	29.019	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.051	101	100	2.8	0	440	245	234	250	269	288	736	222	72	72	72	71	71	-0.033	8.05	0.19
179	28.978	29.183	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.052	100	100	2.8	0	439	245	234	249	268	287	737	224	72	72	72	71	71	-0.033	8.08	0.19
180	29.140	29.347	0.16	0.16	1.37	82	2.01	1.11	83	1.1	79	0.051	100	101	2.7	-0.1	439	245	233	249	267	287	738	223	72	72	72	71	71	-0.033	7.95	0.21
181	29.303	29.510	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.052	100	99	2.7	0	437	245	232	249	267	286	735	223	72	72	72	71	71	-0.033	7.68	0.21
182	29.465	29.673	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.051	100	100	2.7	0	435	244	232	249	266	285	734	223	72	72	72	71	71	-0.033	7.48	0.22
183	29.628	29.836	0.16	0.16	1.38	82	2.02	1.10	83	1.1	79	0.052	100	99	2.7	0	434	244	231	248	265	284	739	222	72	72	72	71	70	-0.033	7.54	0.22
184	29.791	30.000	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.051	101	101	2.7	0	432	244	231	248	264	284	741	223	72	72	72	71	72	-0.032	7.55	0.23
185	29.953	30.164	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.052	99	100	2.7	0	431	244	230	248	264	283	741	222	72	72	72	71	72	-0.033	7.57	0.23
186	30.116	30.328	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.052	100	100	2.6	-0.1	430	244	230	247	263	283	744	222	72	72	72	71	71	-0.033	7.62	0.24
187	30.278	30.491	0.16	0.16	1.37	82	2.02	1.11	83	1.1	79	0.052	99	99	2.6	0	429	244	230	247	262	282	747	223	72	72	72	71	71	-0.033	7.55	0.25
188	30.440	30.654	0.16	0.16	1.37	82	2.01	1.11	83	1.1	79	0.051	100	100	2.6	0	428	243	229	247	262	282	749	225	72	72	72	71	71	-0.033	7.59	0.25
189	30.603	30.818	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.052	100	100	2.6	0	427	243	229	246	261	281	749	223	72	72	72	71	71	-0.033	7.61	0.25
190	30.765	30.981	0.16	0.16	1.38	82	2.01	1.11	83	1.1	79	0.051	100	100	2.5	-0.1	426	243	229	246	260	281	749	224	72	72	72	71	71	-0.033	7.59	0.27
191	30.928	31.145	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.052	100	100	2.5	0	426	243	228	246	259	280	748	225	72	72	72	71	70	-0.033	7.74	0.24
192	31.090	31.309	0.16	0.16	1.38	82	2.02	1.10	83	1.1	79	0.051	100	101	2.5	0	425	243	228	246	259	280	743	223	72	72	72	71	71	-0.033	7.7	0.24
193	31.253	31.472	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.053	99	98	2.5	0	424	243	228	246	258	280	742	222	72	72	72	71	71	-0.032	7.7	0.24
194	31.415	31.635	0.16	0.16	1.38	82	2	1.11	83	1.1	79	0.051	100	100	2.5	0	423	243	228	245	258	279	742	223	72	72	72	71	71	-0.033	7.67	0.24
195	31.578	31.799	0.16	0.16	1.38	82	2.01	1.11	83	1.1	79	0.053	99	99	2.4	-0.1	423	243	227	245	257	279	748	223	72	72	72	71	71	-0.033	7.49	0.27
196	31.741	31.963	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.051	101	101	2.4	0	423	242	227	245	257	279	756	224	72	72	72	71	70	-0.034	7.41	0.27
197	31.904	32.126	0.16	0.16	1.38	82	2.02	1.10	83	1.1	79	0.053	99	98	2.4	0	423	242	227	245	256	279	758	225	72	72	72	71	71	-0.034	7.42	0.28
198	32.066	32.290	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.052	99	100	2.4	0	424	242	226	245	255	278	757	224	72	72	72	71	70	-0.034	7.38	0.29
199	32.229	32.453	0.16	0.16	1.37	82	2.02	1.10	83	1.1	79	0.051	101	100	2.4	0	424	242	226	245	255	278	759	226	72	72	72	71	71	-0.034	7.41	0.29
200	32.392	32.617	0.16	0.16	1.37	82	2.01	1.11	83	1.1	79	0.052	100	100	2.3	-0.1	423	241	226	245	254	278	759	227	72	71	72	71	70	-0.034	7.4	0.3
201	32.555	32.780	0.16	0.16	1.37	82	2.01	1.11	83	1.1	79	0.050	102	101	2.3	0	423	241	226	245	254	278	760	226	72	71	72	71	71	-0.034	7.35	0.3
202	32.717	32.944	0.16	0.16	1.36	82	2.01	1.10	82	1.1	79	0.052	99	100	2.3	0	423	241	225	244	253	277	759	225	72	71	72	71	70	-0.034	7.34	0.3
203	32.880	33.108	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.053	99	99	2.3	0	422	241	225	244	253	277	759	225	72	71	72	71	71	-0.033	7.21	0.3
204	33.042	33.271	0.16	0.16	1.38	82	2.01	1.10	82	1.1	79	0.052	99	99	2.2	-0.1	422	241	225	245	252	277	755	224	72	71	72	71	71	-0.033	7.26	0.31
205	33.205	33.434	0.16	0.16	1.37	82	2.02	1.11	83	1.1	79	0.051	101	100	2.2	0	420	240	225	245	251	276	755	224	72	71	72	71	71	-0.033	7.17	0.32
206	33.367	33.598	0.16	0.16	1.38	82	2.02	1.10	82	1.1	79	0.052	99	100	2.2	0	418	240	224	245	251	276	753	225	72	71	72	71	70	-0.034	7.12	0.32
207	33.530	33.762	0.16	0.16	1.38	82	2.02	1.10	82	1.1	79	0.052	100	100	2.2	0	417	240	224	245	251	275	757	224	72	71	72	71	71	-0.034	7.1	0.36
208	33.693	33.925	0.16	0.16	1.37	82	2.02	1.11	83	1.1	79	0.052	100	99	2.2	0	416	240	224	245	250	275	763	226	72	71	72	71	71	-0.033	7.13	0.38
209	33.855	34.088	0.16	0.16	1.38	82	2.02	1.10	83	1.1	79	0.052	99	99	2.2	0	414	239	224	244	250	274	764	226	72	71	72	71	71	-0.033	7.09	0.37

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
210	34.017	34.252	0.16	0.16	1.38	82	2.02	1.11	83	1.1	79	0.052	99	100	2.1	-0.1	413	239	223	244	249	274	764	224	72	71	72	71	71	-0.033	7.03	0.37
211	34.180	34.416	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.053	99	99	2.1	0	412	239	223	244	249	273	762	225	72	71	72	71	72	-0.033	6.97	0.37
212	34.342	34.579	0.16	0.16	1.39	82	2.01	1.11	83	1.1	79	0.051	100	100	2.1	0	410	238	223	244	248	273	760	223	72	71	72	71	72	-0.033	6.96	0.37
213	34.505	34.744	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.051	101	102	2.1	0	409	238	223	244	248	272	760	224	72	71	72	71	71	-0.033	6.98	0.37
214	34.667	34.907	0.16	0.16	1.38	82	2.01	1.10	82	1.1	79	0.053	98	98	2.1	0	408	237	222	244	247	272	756	224	72	71	72	71	71	-0.033	6.88	0.36
215	34.830	35.070	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.052	100	99	2.1	0	406	237	222	243	246	271	754	225	72	71	72	71	71	-0.033	6.86	0.37
216	34.993	35.233	0.16	0.16	1.37	82	2.01	1.11	83	1.1	79	0.053	99	98	2.0	-0.1	405	237	222	243	246	271	751	224	72	71	72	70	71	-0.033	6.85	0.36
217	35.155	35.397	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.050	101	102	2.0	0	404	236	222	244	245	270	747	222	72	71	72	70	71	-0.032	6.81	0.36
218	35.318	35.561	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.052	100	100	2.0	0	403	236	221	243	245	270	746	221	72	71	72	70	70	-0.033	6.75	0.36
219	35.481	35.725	0.16	0.16	1.38	82	2.01	1.11	83	1.1	79	0.051	101	101	2.0	0	402	235	221	243	244	269	742	221	72	71	72	70	71	-0.032	6.73	0.36
220	35.644	35.888	0.16	0.16	1.38	82	2.02	1.10	83	1.1	79	0.052	100	99	2.0	0	402	235	221	243	244	269	741	221	72	71	72	70	71	-0.033	6.54	0.35
221	35.807	36.052	0.16	0.16	1.38	82	2.01	1.10	83	1.1	79	0.052	100	100	2.0	0	401	235	220	242	244	268	736	219	72	71	72	70	71	-0.032	6.54	0.35
222	35.969	36.215	0.16	0.16	1.37	82	2.02	1.11	83	1.1	79	0.051	100	100	1.9	-0.1	400	234	220	242	244	268	733	221	72	71	72	70	71	-0.032	6.53	0.35
223	36.132	36.379	0.16	0.16	1.37	82	2.02	1.11	83	1.1	79	0.051	101	101	1.9	0	399	234	220	242	243	268	729	219	72	71	72	70	71	-0.033	6.5	0.35
224	36.295	36.543	0.16	0.16	1.37	82	2.02	1.10	83	1.1	79	0.052	100	100	1.9	0	398	233	219	242	243	267	728	219	72	71	72	70	71	-0.032	6.45	0.35
225	36.458	36.706	0.16	0.16	1.37	82	2.01	1.10	83	1.1	79	0.051	101	100	1.9	0	398	233	219	241	243	267	722	218	72	71	72	70	71	-0.032	6.44	0.35
226	36.621	36.869	0.16	0.16	1.38	82	2.01	1.10	82	1.1	79	0.051	101	100	1.9	0	396	233	218	241	242	266	718	218	72	71	72	70	71	-0.032	6.45	0.35
227	36.783	37.033	0.16	0.16	1.37	82	2.01	1.10	82	1.1	79	0.052	99	100	1.9	0	395	232	218	242	242	266	714	217	72	71	72	70	71	-0.032	6.39	0.34
228	36.946	37.197	0.16	0.16	1.37	82	2.02	1.11	82	1.1	79	0.052	100	100	1.9	0	394	232	217	241	242	265	714	217	72	71	72	70	72	-0.032	6.35	0.35
229	37.109	37.360	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.050	102	101	1.8	-0.1	393	231	217	241	241	265	710	217	72	71	72	70	71	-0.032	6.33	0.34
230	37.271	37.524	0.16	0.16	1.36	82	2.02	1.11	82	1.1	79	0.052	99	100	1.8	0	392	231	216	241	241	264	707	216	72	71	72	70	71	-0.031	6.34	0.34
231	37.434	37.688	0.16	0.16	1.38	82	2.02	1.10	82	1.1	79	0.052	100	100	1.8	0	391	230	216	241	240	264	705	215	72	71	72	70	71	-0.031	6.29	0.34
232	37.596	37.851	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.053	98	98	1.8	0	390	230	215	240	240	263	702	216	72	71	72	70	70	-0.031	6.22	0.34
233	37.759	38.014	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.051	101	100	1.8	0	389	230	214	240	239	262	698	213	72	71	72	70	71	-0.031	6.21	0.34
234	37.922	38.178	0.16	0.16	1.38	82	2.02	1.10	82	1.1	79	0.053	99	99	1.8	0	388	229	214	239	239	262	695	214	72	71	72	70	71	-0.031	6.21	0.34
235	38.084	38.342	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.053	98	99	1.8	0	387	229	213	239	239	261	694	214	72	71	72	70	71	-0.031	6.21	0.34
236	38.247	38.506	0.16	0.16	1.38	82	2.01	1.10	83	1.1	78	0.051	101	101	1.8	0	386	229	212	239	238	261	690	215	72	71	72	70	70	-0.031	6.21	0.34
237	38.410	38.669	0.16	0.16	1.38	82	2.02	1.10	83	1.1	78	0.053	99	98	1.7	-0.1	385	228	212	239	238	260	688	214	72	71	72	70	71	-0.031	6.16	0.34
238	38.573	38.832	0.16	0.16	1.38	82	2.01	1.11	83	1.1	79	0.052	100	99	1.7	0	384	228	211	239	237	260	684	214	72	71	72	70	70	-0.031	6.25	0.31
239	38.735	38.996	0.16	0.16	1.37	82	2.01	1.10	83	1.1	78	0.052	99	100	1.7	0	384	227	211	238	237	259	679	212	72	71	72	70	71	-0.031	6.18	0.3
240	38.898	39.159	0.16	0.16	1.37	82	2.02	1.11	83	1.1	78	0.052	100	99	1.7	0	383	227	210	238	237	259	671	210	72	71	72	70	71	-0.031	6.03	0.3
241	39.061	39.324	0.16	0.16	1.37	82	2.02	1.11	82	1.1	78	0.052	100	100	1.7	0	382	226	209	238	236	258	667	211	72	71	72	70	70	-0.031	5.86	0.3
242	39.224	39.487	0.16	0.16	1.37	82	2.01	1.10	83	1.1	78	0.051	101	100	1.7	0	381	226	208	238	236	258	662	209	72	71	72	70	71	-0.031	5.7	0.3
243	39.387	39.650	0.16	0.16	1.37	82	2.01	1.10	83	1.1	78	0.051	101	100	1.7	0	379	226	208	237	235	257	662	209	72	71	72	70	70	-0.031	5.69	0.32
244	39.549	39.813	0.16	0.16	1.37	82	2.01	1.10	83	1.1	78	0.051	100	100	1.7	0	378	225	207	237	235	256	658	210	72	71	72	70	71	-0.031	5.64	0.32

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
245	39.712	39.977	0.16	0.16	1.37	82	2.01	1.10	83	1.1	78	0.054	98	98	1.6	-0.1	377	225	206	236	235	256	657	208	72	71	72	70	71	-0.030	5.62	0.32
246	39.875	40.141	0.16	0.16	1.38	82	2.02	1.10	83	1.1	78	0.052	100	100	1.6	0	375	225	205	236	234	255	653	209	72	71	72	70	70	-0.030	5.62	0.32
247	40.038	40.305	0.16	0.16	1.38	82	2.02	1.11	83	1.1	78	0.052	100	100	1.6	0	374	224	204	235	234	254	651	208	72	70	72	70	70	-0.031	5.65	0.32
248	40.201	40.468	0.16	0.16	1.38	82	2.01	1.10	83	1.1	78	0.052	100	99	1.6	0	373	224	203	235	233	254	649	209	72	70	72	70	70	-0.030	5.64	0.32
249	40.363	40.632	0.16	0.16	1.38	82	2.01	1.10	82	1.1	78	0.053	98	99	1.6	0	371	224	203	235	233	253	646	208	72	70	72	70	70	-0.030	5.54	0.31
250	40.525	40.795	0.16	0.16	1.38	82	2.01	1.10	82	1.1	78	0.054	97	97	1.6	0	370	223	202	235	232	252	645	209	72	70	72	70	71	-0.030	5.57	0.32
251	40.688	40.959	0.16	0.16	1.39	82	2.01	1.10	82	1.1	78	0.051	101	101	1.6	0	369	223	201	235	232	252	640	208	72	70	72	70	70	-0.030	5.57	0.32
252	40.850	41.123	0.16	0.16	1.38	82	2.02	1.10	82	1.1	78	0.052	99	100	1.6	0	367	222	201	234	232	251	640	205	72	70	72	70	71	-0.030	5.5	0.32
253	41.013	41.287	0.16	0.16	1.38	82	2.01	1.11	82	1.1	78	0.053	99	99	1.5	-0.1	366	222	200	234	231	251	637	207	72	70	72	70	70	-0.030	5.56	0.31
254	41.176	41.450	0.16	0.16	1.38	82	2.01	1.11	82	1.1	78	0.052	100	99	1.5	0	365	222	199	233	231	250	631	204	72	70	72	70	70	-0.030	5.46	0.3
255	41.338	41.613	0.16	0.16	1.37	82	2.01	1.11	82	1.1	78	0.051	100	100	1.5	0	364	221	199	233	230	249	627	205	72	70	72	70	70	-0.030	5.36	0.3
256	41.501	41.777	0.16	0.16	1.38	82	2.01	1.11	82	1.1	77	0.053	99	99	1.5	0	363	221	198	233	230	249	625	206	72	70	72	70	70	-0.030	5.32	0.3
257	41.664	41.941	0.16	0.16	1.38	82	2.01	1.11	82	1.1	77	0.051	101	101	1.5	0	362	221	197	232	229	248	620	205	72	70	72	70	70	-0.030	5.27	0.3
258	41.827	42.105	0.16	0.16	1.38	82	2.01	1.10	82	1.1	78	0.053	99	99	1.5	0	360	220	196	232	228	247	619	203	72	70	72	70	71	-0.030	5.23	0.3
259	41.989	42.268	0.16	0.16	1.37	82	2.01	1.10	82	1.1	78	0.052	99	99	1.5	0	359	220	196	232	228	247	619	205	72	70	72	70	70	-0.030	5.22	0.31
260	42.152	42.431	0.16	0.16	1.38	82	2.02	1.11	82	1.1	77	0.051	101	100	1.5	0	358	220	195	232	227	246	617	205	72	70	72	70	71	-0.030	5.26	0.32
261	42.315	42.595	0.16	0.16	1.38	82	2.01	1.11	82	1.1	78	0.051	101	101	1.5	0	357	219	194	231	227	246	616	205	72	70	72	70	71	-0.030	5.31	0.32
262	42.478	42.758	0.16	0.16	1.38	82	2.01	1.11	82	1.1	77	0.051	101	100	1.5	0	357	219	194	231	227	246	613	205	72	70	72	70	71	-0.029	5.3	0.33
263	42.641	42.923	0.16	0.16	1.37	82	2.02	1.11	82	1.1	78	0.052	100	100	1.4	-0.1	356	218	193	231	226	245	611	205	72	70	72	70	71	-0.030	5.37	0.32
264	42.804	43.086	0.16	0.16	1.37	82	2.02	1.11	82	1.1	78	0.051	101	100	1.4	0	355	218	192	231	226	244	609	204	72	70	72	70	71	-0.030	5.35	0.33
265	42.967	43.249	0.16	0.16	1.38	82	2.01	1.10	82	1.1	78	0.052	100	99	1.4	0	355	218	192	230	226	244	608	204	72	70	72	70	71	-0.030	5.36	0.32
266	43.129	43.413	0.16	0.16	1.38	82	2.01	1.10	82	1.1	78	0.052	99	100	1.4	0	354	217	191	230	225	243	605	207	72	70	72	70	71	-0.032	5.39	0.32
267	43.292	43.576	0.16	0.16	1.37	82	2.01	1.11	82	1.1	78	0.051	101	100	1.4	0	353	217	190	230	225	243	611	216	72	70	72	70	71	-0.032	5.47	0.43
268	43.455	43.740	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.053	99	99	1.4	0	353	216	190	231	224	243	618	220	72	70	72	70	71	-0.032	5.97	0.48
269	43.618	43.904	0.16	0.16	1.37	82	2.01	1.10	82	1.1	79	0.052	100	100	1.3	-0.1	353	216	190	231	223	243	627	223	71	70	72	70	71	-0.032	6.17	0.48
270	43.780	44.068	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.052	99	100	1.3	0	354	215	189	231	223	242	631	225	71	70	72	70	71	-0.033	5.9	0.49
271	43.943	44.231	0.16	0.16	1.38	82	2.02	1.10	82	1.1	79	0.052	100	99	1.3	0	355	215	189	230	223	242	636	227	72	70	72	70	71	-0.033	5.83	0.49
272	44.105	44.394	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.052	99	99	1.3	0	355	214	189	230	222	242	638	227	71	70	72	69	71	-0.033	5.81	0.5
273	44.268	44.558	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.052	100	100	1.3	0	355	214	189	230	222	242	641	229	71	70	72	69	71	-0.034	5.78	0.5
274	44.431	44.722	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.053	99	99	1.3	0	355	213	189	230	221	242	643	231	71	70	72	69	71	-0.034	5.83	0.51
275	44.594	44.886	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.052	100	100	1.2	-0.1	356	213	189	231	221	242	644	232	71	70	72	69	71	-0.033	5.84	0.51
276	44.757	45.049	0.16	0.16	1.39	82	2.01	1.10	82	1.1	79	0.053	99	98	1.2	0	355	212	189	231	221	242	646	232	72	70	72	70	71	-0.033	5.9	0.51
277	44.920	45.213	0.16	0.16	1.38	82	2.02	1.11	82	1.1	79	0.052	100	100	1.2	0	356	212	189	231	221	242	646	231	71	70	72	69	71	-0.033	5.91	0.51
278	45.083	45.376	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.052	100	99	1.2	0	356	211	189	231	221	242	648	232	71	70	72	69	71	-0.034	5.94	0.51
279	45.246	45.540	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.051	101	101	1.2	0	356	211	190	230	221	242	651	233	71	70	72	69	71	-0.034	6.06	0.53

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
280	45.408	45.704	0.16	0.16	1.37	82	2.02	1.11	82	1.1	79	0.052	99	100	1.1	-0.1	356	210	190	230	221	241	654	233	71	70	72	69	71	-0.034	6.19	0.54
281	45.571	45.868	0.16	0.16	1.38	82	2.01	1.11	82	1.1	79	0.052	100	100	1.1	0	356	210	190	230	221	241	656	234	71	70	72	69	71	-0.034	6.22	0.54
282	45.734	46.031	0.16	0.16	1.37	82	2.02	1.11	82	1.1	79	0.053	99	98	1.1	0	356	209	190	229	221	241	658	234	71	70	72	69	71	-0.034	6.17	0.54
283	45.897	46.194	0.16	0.16	1.38	82	2.01	1.10	82	1.1	80	0.052	100	99	1.1	0	356	209	190	229	221	241	660	232	71	70	72	69	71	-0.034	6.15	0.54
284	46.060	46.358	0.16	0.16	1.38	82	2.01	1.11	82	1.1	80	0.053	99	99	1.1	0	357	208	190	229	221	241	660	233	71	70	72	69	71	-0.034	6.21	0.54
285	46.223	46.522	0.16	0.16	1.38	82	2.02	1.11	82	1.1	80	0.052	100	100	1.0	-0.1	357	208	190	229	221	241	663	233	71	70	72	69	71	-0.034	6.23	0.55
286	46.386	46.686	0.16	0.16	1.38	82	2.01	1.10	82	1.1	80	0.052	100	100	1.0	0	357	207	191	229	221	241	664	234	71	70	72	69	71	-0.035	6.21	0.56
287	46.549	46.849	0.16	0.16	1.38	82	2.02	1.11	82	1.1	80	0.052	100	99	1.0	0	357	207	191	229	221	241	666	235	71	70	72	69	70	-0.034	6.19	0.56
288	46.711	47.013	0.16	0.16	1.38	82	2.01	1.11	82	1.1	80	0.052	99	100	1.0	0	357	206	191	229	221	241	667	235	71	70	72	69	71	-0.035	6.19	0.55
289	46.874	47.176	0.16	0.16	1.39	82	2.02	1.11	82	1.1	80	0.053	99	98	1.0	0	358	206	191	229	221	241	666	236	71	70	72	69	71	-0.035	6.13	0.55
290	47.036	47.340	0.16	0.16	1.38	82	2.02	1.11	82	1.1	80	0.053	98	99	0.9	-0.1	358	206	191	229	220	241	666	237	71	70	72	69	71	-0.034	6.05	0.55
291	47.199	47.504	0.16	0.16	1.38	82	2.02	1.11	82	1.1	80	0.053	99	99	0.9	0	358	205	191	229	221	241	666	236	71	70	72	69	71	-0.035	6.07	0.55
292	47.362	47.668	0.16	0.16	1.38	82	2.02	1.11	82	1.1	80	0.051	101	101	0.9	0	358	205	192	229	221	241	665	236	71	70	72	69	71	-0.035	6.07	0.55
293	47.525	47.831	0.16	0.16	1.38	82	2.02	1.10	82	1.1	80	0.052	100	99	0.9	0	358	205	192	229	221	241	665	236	71	70	72	69	71	-0.035	5.99	0.54
294	47.688	47.995	0.16	0.16	1.39	82	2.02	1.11	82	1.1	80	0.053	99	99	0.9	0	358	204	192	229	221	241	663	236	71	70	72	69	71	-0.034	6.01	0.54
295	47.851	48.158	0.16	0.16	1.38	81	2.02	1.11	82	1.1	80	0.053	99	98	0.9	0	358	204	192	229	221	241	663	236	71	70	72	69	71	-0.035	6.01	0.55
296	48.014	48.322	0.16	0.16	1.38	81	2.01	1.11	82	1.1	80	0.052	100	100	0.8	-0.1	358	204	192	229	221	241	663	235	71	70	72	69	70	-0.034	5.97	0.55
297	48.177	48.486	0.16	0.16	1.38	81	2.01	1.11	82	1.1	80	0.052	100	100	0.8	0	358	203	192	229	222	241	663	237	71	70	72	69	71	-0.035	5.95	0.54
298	48.339	48.650	0.16	0.16	1.37	81	2.02	1.10	82	1.1	80	0.052	99	100	0.8	0	363	203	192	229	222	242	656	238	71	70	72	69	71	-0.034	8.28	0.43
299	48.503	48.813	0.16	0.16	1.38	81	2.02	1.11	82	1.1	80	0.053	100	98	0.7	-0.1	370	203	192	230	223	244	636	235	71	70	72	69	71	-0.033	8.51	0.35
300	48.666	48.976	0.16	0.16	1.37	81	2.01	1.11	82	1.1	80	0.051	101	100	0.7	0	377	202	192	230	224	245	620	233	71	70	72	69	71	-0.033	8.02	0.34
301	48.828	49.140	0.16	0.16	1.38	81	2.01	1.11	82	1.1	80	0.054	98	98	0.7	0	380	202	192	230	225	246	609	232	71	70	72	69	70	-0.033	7.61	0.34
302	48.991	49.304	0.16	0.16	1.38	81	2.02	1.11	82	1.1	80	0.052	100	100	0.7	0	383	202	192	230	226	247	603	230	71	70	72	69	71	-0.033	7.42	0.34
303	49.154	49.468	0.16	0.16	1.38	81	2.02	1.10	82	1.1	80	0.051	101	101	0.6	-0.1	385	202	191	230	228	247	599	228	71	70	72	69	71	-0.033	7	0.32
304	49.317	49.631	0.16	0.16	1.37	81	2.02	1.11	82	1.1	79	0.052	100	99	0.6	0	385	202	191	230	229	247	592	226	71	70	72	69	71	-0.032	6.85	0.33
305	49.480	49.794	0.16	0.16	1.38	81	2.02	1.11	82	1.1	79	0.051	101	100	0.6	0	387	202	190	230	230	248	590	225	71	70	72	69	71	-0.032	6.71	0.34
306	49.642	49.958	0.16	0.16	1.38	81	2.02	1.11	82	1.1	80	0.051	100	101	0.6	0	387	201	189	230	232	248	590	224	71	70	72	69	71	-0.032	6.64	0.36
307	49.804	50.122	0.16	0.16	1.39	81	2.02	1.11	82	1.1	79	0.052	99	100	0.6	0	387	201	189	230	232	248	593	224	71	70	72	69	70	-0.032	6.56	0.39
308	49.967	50.286	0.16	0.16	1.38	81	2.01	1.11	82	1.1	79	0.053	99	99	0.5	-0.1	387	201	188	230	233	248	595	223	71	70	72	69	71	-0.032	6.48	0.39
309	50.130	50.450	0.16	0.16	1.38	81	2.02	1.11	82	1.1	79	0.051	101	101	0.5	0	387	201	188	230	235	248	598	223	71	70	72	69	71	-0.033	6.38	0.41
310	50.293	50.613	0.16	0.16	1.39	81	2.02	1.10	82	1.1	79	0.052	100	99	0.5	0	386	201	187	230	235	248	600	224	71	70	72	69	71	-0.032	6.29	0.41
311	50.456	50.776	0.16	0.16	1.39	81	2.01	1.11	82	1.1	79	0.052	100	99	0.5	0	385	201	187	230	235	248	603	222	71	70	72	69	71	-0.032	6.21	0.41
312	50.618	50.940	0.16	0.16	1.39	81	2.01	1.11	82	1.1	79	0.052	99	100	0.5	0	384	201	186	230	236	247	604	223	71	70	72	69	71	-0.032	6.16	0.41
313	50.781	51.103	0.16	0.16	1.39	81	2.02	1.10	82	1.1	79	0.050	102	101	0.5	0	383	201	186	230	236	247	605	222	71	70	72	69	70	-0.032	6.11	0.4
314	50.944	51.268	0.16	0.16	1.38	81	2.02	1.11	82	1.1	79	0.051	101	102	0.5	0	382	201	186	229	236	247	605	221	71	70	72	69	70	-0.032	6.1	0.4

Wood Heater Test Data
Emissions Data

Run: 4

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 02-Nov-18
Beginning Clock Time: 13:37

Total Sampling Time: 338 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.31	30.33	30.35	30.33

OMNI Equipment Numbers: see run sheets

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.00 ft/sec.
Initial Tunnel Flow: 143.4 scfm
Average Tunnel Flow: 148.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.72 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.033	0.039	0.043	0.034	0.036	0.039	0.041	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.24 ft/sec V_{scent} 15.45 ft/sec F_p 0.857

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
315	51.107	51.431	0.16	0.16	1.38	81	2.01	1.11	82	1.1	79	0.053	99	98	0.4	-0.1	381	201	186	229	237	247	605	219	71	70	72	69	70	-0.032	6.05	0.41
316	51.270	51.595	0.16	0.16	1.38	81	2.02	1.10	82	1.1	79	0.052	100	100	0.4	0	380	201	185	229	237	246	605	220	71	70	72	69	71	-0.032	6.1	0.41
317	51.433	51.758	0.16	0.16	1.38	81	2.02	1.10	82	1.1	79	0.053	99	98	0.4	0	379	201	185	228	238	246	605	220	71	70	72	69	71	-0.032	6.1	0.4
318	51.597	51.922	0.16	0.16	1.38	81	2.02	1.11	82	1.1	79	0.054	99	98	0.4	0	378	202	185	229	238	246	604	220	71	70	72	69	71	-0.032	6.12	0.39
319	51.759	52.086	0.16	0.16	1.38	81	2.02	1.11	82	1.1	79	0.051	100	101	0.4	0	377	202	185	228	238	246	604	221	71	70	72	69	71	-0.032	6.09	0.39
320	51.922	52.250	0.16	0.16	1.38	81	2.02	1.11	82	1.1	79	0.051	101	101	0.4	0	375	202	185	228	239	246	602	222	71	70	72	69	71	-0.032	6.18	0.39
321	52.085	52.414	0.16	0.16	1.39	81	2.02	1.11	82	1.1	79	0.052	100	100	0.4	0	375	202	184	227	239	245	602	220	71	70	72	69	70	-0.032	6.14	0.39
322	52.248	52.577	0.16	0.16	1.38	81	2.02	1.10	82	1.1	79	0.049	103	102	0.3	-0.1	374	202	184	227	239	245	601	219	71	70	72	69	71	-0.032	6.03	0.39
323	52.411	52.740	0.16	0.16	1.39	81	2.02	1.11	82	1.1	79	0.052	100	99	0.3	0	372	202	184	227	238	245	601	218	71	70	72	69	71	-0.032	5.96	0.39
324	52.573	52.904	0.16	0.16	1.37	81	2.01	1.11	82	1.1	78	0.053	98	99	0.3	0	372	202	184	226	238	244	600	218	71	70	72	69	70	-0.032	5.97	0.4
325	52.736	53.068	0.16	0.16	1.38	81	2.01	1.11	82	1.1	79	0.052	100	100	0.3	0	371	202	184	226	239	244	601	218	71	70	72	69	71	-0.032	5.93	0.4
326	52.898	53.232	0.16	0.16	1.38	81	2.02	1.11	82	1.1	79	0.053	98	99	0.3	0	370	203	184	226	240	245	604	217	71	70	72	69	71	-0.032	5.89	0.42
327	53.061	53.395	0.16	0.16	1.38	81	2.01	1.10	82	1.1	79	0.051	101	100	0.3	0	369	203	184	225	241	244	606	218	71	70	72	69	71	-0.032	5.9	0.42
328	53.224	53.559	0.16	0.16	1.39	81	2.01	1.11	82	1.1	79	0.052	100	100	0.2	-0.1	368	203	183	225	239	244	607	219	71	70	72	69	70	-0.032	5.85	0.43
329	53.387	53.722	0.16	0.16	1.38	81	2.01	1.11	82	1.1	78	0.052	100	99	0.2	0	367	203	183	224	239	243	609	219	71	70	72	69	70	-0.032	5.8	0.43
330	53.550	53.886	0.16	0.16	1.39	81	2.02	1.11	82	1.1	79	0.052	100	100	0.2	0	366	203	183	224	240	243	610	218	71	70	72	69	70	-0.032	5.85	0.44
331	53.713	54.050	0.16	0.16	1.38	81	2.01	1.10	82	1.1	79	0.052	100	100	0.2	0	365	203	183	224	238	243	611	219	71	70	72	69	70	-0.032	5.79	0.44
332	53.875	54.214	0.16	0.16	1.38	81	2.02	1.11	82	1.1	78	0.052	99	100	0.2	0	364	204	183	223	238	242	612	221	71	70	72	69	70	-0.032	5.79	0.44
333	54.038	54.377	0.16	0.16	1.38	81	2.01	1.10	82	1.1	78	0.052	100	99	0.2	0	364	204	183	223	238	242	612	219	71	70	72	69	71	-0.032	5.79	0.44
334	54.201	54.541	0.16	0.16	1.38	81	2.02	1.10	82	1.1	78	0.054	98	98	0.2	0	363	204	183	223	238	242	613	219	71	70	72	69	71	-0.032	5.79	0.44
335	54.365	54.704	0.16	0.16	1.38	81	2.02	1.11	82	1.1	78	0.055	98	96	0.1	-0.1	362	204	183	222	237	242	614	219	71	70	72	69	70	-0.032	5.76	0.44
336	54.528	54.868	0.16	0.16	1.38	81	2.01	1.11	82	1.1	78	0.053	99	99	0.1	0	362	205	183	222	237	242	612	220	71	70	72	69	70	-0.032	6.21	0.41
337	54.690	55.032	0.16	0.16	1.38	81	2.02	1.11	82	1.1	78	0.053	98	99	0.1	0	362	205	183	221	237	242	609	220	71	70	72	69	70	-0.032	6.72	0.37
338	54.853	55.196	0.16	0.16	1.38	81	2.02	1.11	82	1.1	78	0.053	99	99	0.0	-0.1	363	205	183	221	236	242	604	218	71	70	72	69	70	-0.031	7.02	0.37
Avg/Tot	54.853	55.196	0.16	0.16	1.37	81		1.10	81		81	0.052	100	100								84.2				72	72	71	71	-0.037		

Wood Heater Test Results

Manufacturer:	HHT Halifax
Model:	Encore
Project No.:	0135WS042E
Tracking No.:	2326
Run:	5
Test Date:	11/05/18

Burn Rate	**0.87**	**kg/hr dry**
Average Tunnel Temperature	81	degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	12.93	feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8815.5	dscf/hour
Average Delta p	0.052	inches H20
Total Time of Test	345	minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	56.107 cubic feet	56.084 cubic feet	9.699 cubic feet
Average Gas Meter Temperature	67 degrees Fahrenheit	78 degrees Fahrenheit	78 degrees Fahrenheit	74 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	54.972 dscf	54.762 dscf	9.574 dscf
Total Particulates - m_n	0 mg	4.3 mg	3.9 mg	0.4 mg
Particulate Concentration (dry-standard) - C_f/C_s	0.000000 grams/dscf	0.00008 grams/dscf	0.00007 grams/dscf	0.00004 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	3.97 grams	3.61 grams	0.37 grams
Particulate Emission Rate	0.00 grams/hour	0.69 grams/hour	0.63 grams/hour	0.37 grams/hour
Emissions Factor		0.79 g/kg	0.72 g/kg	0.18 g/kg
Difference from Average Total Particulate Emissions		0.18 grams	0.18 grams	

Dual Train Comparison Results Are Acceptable

FINAL AVERAGE RESULTS

Complete Test Run		
Total Particulate Emissions - E_T	3.79	grams
Particulate Emission Rate	**0.66**	**grams/hour**
Emissions Factor	0.75	grams/kg
First Hour Emissions		
Total Particulate Emissions - E_T	0.37	grams
Particulate Emission Rate	0.37	grams/hour
Emissions Factor	0.18	grams/kg
7.5% of Average Total Particulate Emissions	0.28	grams

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK
Stove Surface ΔT	OK
Train Precesion 7.5%	4.69
Train Precision 0.5g/kg	0.07

Technician Signature: _____

Wood Heater Efficiency Results - CSA B415.1

Manufacturer: HHT Halifax
Model: Encore
Date: 11/05/18
Run: 5
Control #: 0135WS042E
Test Duration: 345
Output Category: II

Technician Signature: 

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	78.6%	84.9%
Combustion Efficiency	96.2%	96.2%
Heat Transfer Efficiency	82%	88.3%

Output Rate (kJ/h)	13,524	12,829	**(Btu/h)**
Burn Rate (kg/h)	0.87	1.91	**(lb/h)**
Input (kJ/h)	17,210	16,326	**(Btu/h)**

Test Load Weight (dry kg)	5.00	11.01	**dry lb**
MC wet (%)	17.21854305		
MC dry (%)	20.80		
Particulate (g)	0.66		
CO (g)	274		
Test Duration (h)	5.75		

Emissions	Particulate	CO
g/MJ Output	0.01	3.52
g/kg Dry Fuel	0.13	54.82
g/h	0.11	47.62
lb/MM Btu Output	0.02	8.18

Air/Fuel Ratio (A/F)	11.88

VERSION: **2.2** **12/14/2009**

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 5
Model: Encore Tracking Number: 2326 Date: 11/5/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 375, 331, 185, 132

Wood Heater Run Notes

Air Control Settings

Primary: ~5° from fully closed

Secondary: Fixed

Tertiary/Pilot: N/A

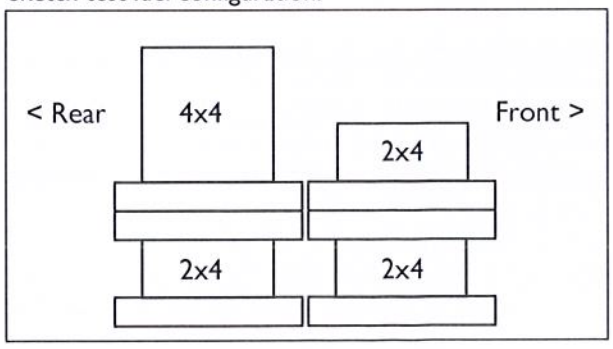
Fan: (Off)

Preburn Notes

Time	Notes
27:00	Stirred
75:00	Stirred
85:00	Stirred

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Closed by 0:50
Fuel loaded by: 0:30
Door closed at: 0:45
Primary air: Set throughout

Notes: Fan Confirmation Run

Time	Notes
60:00	Swapped filter A

Technician Signature: [signature] Date: 11/5/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 5
Model: Encore | Tracking Number: 2326 | Date: 11/5/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 431, 340, 296-T55

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16" 8 in	19.7	7	16" 8 in	18.7
2	8 in	22.3	8	8 in	24.5
3	8 in	21.1	9	8 in	23.8
4	8 in	18.0	10	8 in	19.9
5	8 in	18.9	11	in	21.2
6	8 in	19.3	12	in	27.0

A B

Total Pre-Burn Fuel Weight: 18.9

Time (clock): 0900 Room Temperature (F): 64 Initials: A

Test Fuel

Firebox Volume (ft³): 2.02 Test Fuel Piece Length (in): 19.5
Load Weight Range (lb): 12.7-15.5
Fuel Type & Amount: 2 x 4: 3 Weight (2x4s with spacers): 8.0
4 x 4: 1 Weight (4x4s with spacers): 5.3
Total Wet Fuel Load Weight (lb):

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	4.8	20.2	19.8	20.6	4x4
2	2.0	18.1	19.0	20.3	2x4
3	2.2	20.2	20.9	20.4	"
4	2.1	19.2	24.6	24.4	"
5					"
6					
7					

Spacer Moisture Readings (%DB)

16.4	19.4	16.9	17.0				
17.0	13.3	14.0	14.0				
18.8	14.8	17.1	19.1				
17.2	18.0	16.6	18.9				

Time (clock): 1000 Room Temperature (F): 69 Initials: A

Technician Signature: _____ Date: 11/5/18

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax | Project Number: 0135WS042E | Run Number: 5
Model: Encore | Tracking Number: 2326 | Date: 11/5/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 209, ~~440~~, 559, 135, 150, 653

ASTM E2515 Sampling Information

Test Location: OMNI E1 | Clock Time @ ET=0: 11:23
Span Gas Concentrations: CO_2(%): 17.06 | CO(%): 4.290 | CO(ppm): 901

Test Run Validation Checks	Pre Test	Post Test
Zero Stack Gas Leakage	✓	✓
Zero Pitot Line Leakage	✓	✓
Zero Induced Draft	✓	
100% Smoke Capture	✓	

Test Run Validation Measurements	Pre Test		Post Test	
Scale Audit (lbs)	10.0		10.0	
CO_2 % (Zero/Span)	0.00	17.06	-0.00	17.01
CO % (Zero/Span)	0.000	1.290	-0.002	4.278
CO ppm (Zero/Span)	0	901	2	891
Sample A Leakage (cfm @"Hg)	Ø		Ø @ -10	
Sample B Leakage (cfm @"Hg)	Ø		Ø @ -15	
Room Air Velocity (ft/min)	<50		<50	
Barometric Pressure ("Hg)	30.19		30.17	
Relative Humidity (%)	40.6		44.6	
Tunnel Static ("H_2O)	-0.20		-0.20	

Last Cleaning Dates

Flue Pipe	10/30/18
Dilution Tunnel	10/25/18
Sample Dryers	10/26/18

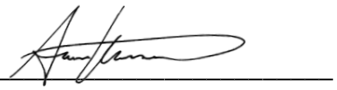
Dilution Tunnel Traverse

Traverse Point	1	2	Center	3	4	5	6	7	8
Δp ("H_2O)	0.032	0.040	0.051 ~~0.044~~	0.014	0.032	0.030	0.041	0.043	0.035
T (°F)	84	84	78	84	84	78	→	→	→

Technician Signature: [signature] Date: 11/5/18

Wood Heater Preburn Data - ASTM E2780

Run:	5

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/5/18
Start Clock Time:	9:32

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	18.9		
Fuel Moisture Readings (% DB):	19.7	19.3	21.2
	22.3	18.7	27.0
	24.1	24.5	
	19.0	23.8	
	19.9	19.9	
Avg Preburn Moisture (% DB):	**21.6**		

Coal Bed Range (lb):	**2.7** (min)	**3.3** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Amb.
0	12	-0.062	665	200	218	319	296	339.6	521	68
1	11.8	-0.06	645	205	224	326	301	340.2	417	67
2	11.6	-0.059	620	210	231	330	305	339.2	371	67
3	11.5	-0.057	592	215	237	334	308	337.2	348	67
4	11.3	-0.057	570	219	244	336	309	335.6	339	67
5	11.2	-0.057	551	224	251	336	310	334.4	336	67
6	11.1	-0.054	535	228	260	336	311	334	333	67
7	11	-0.055	522	232	269	335	311	333.8	330	67
8	10.8	-0.054	511	236	278	334	311	334	327	67
9	10.7	-0.053	503	239	287	332	310	334.2	324	67
10	10.6	-0.053	496	243	297	330	310	335.2	325	67
11	10.5	-0.054	491	246	306	328	309	336	327	68
12	10.4	-0.055	487	249	316	326	308	337.2	330	68
13	10.3	-0.054	483	252	326	324	308	338.6	332	67
14	10.1	-0.054	479	255	336	321	307	339.6	335	68
15	10	-0.054	476	258	346	319	306	341	335	67
16	9.9	-0.055	473	261	356	317	305	342.4	334	67
17	9.8	-0.054	470	263	366	315	305	343.8	335	67
18	9.6	-0.054	469	265	376	312	304	345.2	339	67
19	9.5	-0.055	467	268	386	310	304	347	337	67
20	9.4	-0.054	466	270	396	308	304	348.8	339	67
21	9.3	-0.055	466	272	405	306	304	350.6	339	67
22	9.2	-0.055	466	273	414	304	304	352.2	341	68
23	9	-0.055	466	275	422	302	304	353.8	342	67

Wood Heater Preburn Data - ASTM E2780

24	8.9	-0.055	467	277	431	301	303	355.8	344	67
25	8.8	-0.055	468	278	439	300	303	357.6	344	67
26	8.7	-0.056	469	279	446	298	303	359	347	67
27	8.5	-0.056	471	281	454	297	303	361.2	350	68
28	8.4	-0.055	475	282	462	295	303	363.4	350	67
29	8.4	-0.076	480	283	469	295	304	366.2	460	67
30	8	-0.061	483	284	475	294	305	368.2	430	68
31	7.8	-0.06	484	285	480	295	306	370	387	68
32	7.7	-0.059	487	286	484	296	307	372	372	67
33	7.5	-0.057	492	287	488	297	308	374.4	365	67
34	7.4	-0.057	497	288	492	297	309	376.6	357	67
35	7.3	-0.056	501	288	497	298	310	378.8	351	67
36	7.2	-0.053	502	289	500	299	311	380.2	346	68
37	7.1	-0.053	503	289	503	299	311	381	338	68
38	7	-0.05	504	290	505	300	312	382.2	332	69
39	6.9	-0.051	503	290	506	300	313	382.4	325	69
40	6.8	-0.052	500	290	508	301	314	382.6	322	67
41	6.7	-0.051	495	291	508	302	314	382	322	68
42	6.6	-0.051	491	291	509	302	314	381.4	321	67
43	6.6	-0.05	488	291	511	302	314	381.2	321	67
44	6.5	-0.05	484	291	513	303	314	381	320	66
45	6.5	-0.075	486	291	514	303	314	381.6	499	67
46	6.1	-0.058	506	292	516	304	314	386.4	416	66
47	5.9	-0.056	515	292	518	304	315	388.8	374	66
48	5.8	-0.057	520	293	520	305	316	390.8	358	67
49	5.7	-0.056	522	293	523	305	317	392	353	67
50	5.6	-0.055	523	293	526	306	318	393.2	347	67
51	5.5	-0.055	521	293	529	307	319	393.8	345	67
52	5.4	-0.054	519	294	531	307	319	394	341	66
53	5.3	-0.055	513	294	534	308	320	393.8	339	67
54	5.2	-0.053	504	294	537	308	320	392.6	339	67
55	5.1	-0.053	497	294	539	308	320	391.6	340	67
56	5	-0.053	491	294	541	308	320	390.8	341	67
57	4.9	-0.052	487	295	544	308	321	391	336	66
58	4.8	-0.05	482	295	546	308	321	390.4	330	66
59	4.7	-0.051	481	295	549	309	321	391	325	66
60	4.7	-0.048	479	295	551	308	321	390.8	321	67
61	4.6	-0.049	478	296	552	308	321	391	314	67
62	4.6	-0.048	477	296	552	308	322	391	309	68
63	4.5	-0.046	476	296	552	308	322	390.8	301	67
64	4.5	-0.047	477	297	551	308	322	391	296	66
65	4.4	-0.046	480	297	550	308	323	391.6	294	68
66	4.4	-0.046	495	297	548	308	323	394.2	290	66

Wood Heater Preburn Data - ASTM E2780

67	4.4	-0.044	505	298	546	309	324	396.4	287	67
68	4.3	-0.045	513	298	544	310	325	398	282	67
69	4.3	-0.044	519	299	541	310	326	399	282	67
70	4.3	-0.044	522	299	539	311	326	399.4	281	67
71	4.2	-0.043	523	300	536	312	327	399.6	278	67
72	4.2	-0.043	519	301	533	313	328	398.8	275	68
73	4.2	-0.043	518	301	529	313	328	397.8	272	67
74	4.1	-0.042	516	302	526	314	329	397.4	273	67
75	5	-0.043	516	303	523	314	330	397.2	271	67
76	4	-0.046	516	303	520	316	331	397.2	375	67
77	3.9	-0.047	509	304	517	316	331	395.4	325	67
78	3.9	-0.045	501	304	513	316	331	393	302	67
79	3.8	-0.044	493	305	511	316	332	391.4	289	67
80	3.8	-0.043	488	306	509	317	332	390.4	280	66
81	3.8	-0.042	484	307	507	317	332	389.4	275	67
82	3.7	-0.041	479	307	506	317	332	388.2	268	67
83	3.7	-0.04	479	308	504	317	332	388	261	67
84	3.7	-0.04	477	308	502	318	332	387.4	259	67
85	3.7	-0.04	476	309	500	318	333	387.2	257	68
86	3.7	-0.04	477	309	498	318	333	387	254	67
87	3.6	-0.039	476	309	496	318	333	386.4	252	68
88	3.6	-0.039	476	309	494	319	333	386.2	251	67
89	3.6	-0.039	475	310	491	319	333	385.6	250	68
90	3.6	-0.038	474	310	488	319	333	384.8	248	68
91	3.6	-0.038	474	310	486	319	333	384.4	247	67
92	3.6	-0.038	474	310	483	320	334	384.2	244	67
93	3.5	-0.038	474	310	480	320	334	383.6	244	68
94	3.5	-0.038	472	310	477	320	334	382.6	242	66
95	3.4	-0.055	470	310	474	320	335	381.8	329	67
96	3.3	-0.045	479	310	471	320	335	383	354	67
97	3.3	-0.042	477	310	469	321	335	382.4	302	66
98	3.3	-0.048	474	310	467	321	335	381.4	280	67
99	3.3	-0.039	471	310	466	322	335	380.8	265	67
100	3.3	-0.039	467	310	464	322	335	379.6	259	67
101	3.2	-0.039	463	311	463	322	335	378.8	253	68
102	3.2	-0.038	461	310	462	322	335	378	248	68
103	3.2	-0.037	459	310	460	322	335	377.2	244	68
104	3.2	-0.037	458	311	459	322	335	377	243	67
105	3.2	-0.037	456	311	457	322	335	376.2	243	68
106	3.2	-0.037	455	311	456	322	334	375.6	242	68
107	3.2	-0.036	455	311	454	322	334	375.2	241	67
108	3.1	-0.037	454	311	453	321	333	374.4	238	66
109	3.1	-0.035	453	310	451	322	333	373.8	240	67

Wood Heater Preburn Data - ASTM E2780

110	3.1	-0.036	453	310	450	321	333	373.4	238	66

Wood Heater Test Fuel Data

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/5/2018
Run No.:	5

Firebox Volume (ft^3):	2.0
Fuel Piece Length (in):	19.5
2x4 Crib Weight (lb):	8.0
4x4 Crib Weight (lb):	5.3

Total Fuel Weight (Dry Basis, lb):	11.1	
Fuel Density (lb/ft^3, Dry Basis):	29.38	OK
Loading Density (lb/ft^3, Wet Basis):	6.65	OK
2x4 Percentage:	60%	OK

Coal Bed Range (20-25%): **2.66 - 3.325**

Test Fuel Piece	Weight (lb)	Size	Readings (Dry Basis %)			Dry Weight (lb)
1	4.8	4"x 4"	20.2	19.8	20.6	3.99
2	2.1	2"x 4"	19.0	19.0	20.3	1.76
3	2.2	2"x 4"	20.2	20.9	20.4	1.83
4	2.1	2"x 4"	20.2	24.6	24.4	1.71

Spacer Readings (Dry Basis %)

16.4	16.+9		
17.0	14.0		
18.8	17.6		
17.2	16.6		
19.4	17.0		
13.3	19.0		
14.9	19.1		
18.0	18.8		

Technician Signature: 

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature: _____

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			0.56	70	1.19	0.06	72	-0.4	101	0.052			13.3		455	310	447	321	332	373	903	324	66	70	66	69	67	-0.042	1.65	0.20
1	0.151	0.156	0.15	0.16	1.41	70	1.96	1.11	72	1.1	113	0.052	97	100	13.3	0	444	310	445	322	332	371	889	278	66	71	68	70	67	-0.042	1.03	0.17
2	0.313	0.319	0.16	0.16	1.41	71	1.97	1.11	72	1.1	95	0.051	103	104	13.2	-0.1	429	310	444	321	331	367	941	270	67	72	68	70	67	-0.042	10.60	0.43
3	0.475	0.482	0.16	0.16	1.40	71	1.96	1.11	72	1.1	88	0.053	100	101	13.2	0	414	310	442	319	329	363	977	267	67	72	68	70	67	-0.043	10.75	0.38
4	0.637	0.644	0.16	0.16	1.41	71	1.96	1.11	72	1.1	86	0.050	103	103	13.1	-0.1	403	310	441	316	326	359	999	267	67	72	68	70	67	-0.042	10.83	0.36
5	0.800	0.806	0.16	0.16	1.40	71	1.96	1.11	72	1.1	84	0.052	101	101	13.0	-0.1	392	310	440	314	323	356	1018	265	67	72	68	70	67	-0.045	10.82	0.38
6	0.962	0.968	0.16	0.16	1.39	71	1.97	1.11	72	1.1	83	0.052	101	101	13.0	0	383	310	440	311	319	353	1032	269	67	72	68	70	67	-0.045	10.93	0.33
7	1.124	1.131	0.16	0.16	1.40	71	1.96	1.11	72	1.1	82	0.051	102	102	12.9	-0.1	375	309	440	308	316	350	1044	271	67	72	68	70	67	-0.045	11.17	0.51
8	1.286	1.293	0.16	0.16	1.40	71	1.97	1.10	72	1.1	82	0.051	102	102	12.8	-0.1	370	309	441	304	312	347	1061	275	67	72	68	70	67	-0.045	11.34	0.69
9	1.448	1.455	0.16	0.16	1.39	71	1.97	1.10	72	1.1	82	0.051	102	102	12.8	0	367	309	442	301	309	346	1071	278	67	72	68	70	66	-0.045	11.55	0.61
10	1.610	1.617	0.16	0.16	1.39	71	1.96	1.10	72	1.1	82	0.051	102	102	12.7	-0.1	363	308	443	298	306	344	1079	281	68	72	68	70	67	-0.046	11.63	0.60
11	1.772	1.780	0.16	0.16	1.39	71	1.95	1.09	72	1.1	82	0.049	104	104	12.6	-0.1	361	308	445	295	302	342	1089	281	68	72	69	70	67	-0.047	11.66	0.63
12	1.934	1.941	0.16	0.16	1.38	71	1.96	1.09	72	1.1	81	0.053	100	99	12.5	-0.1	357	308	447	292	299	341	1095	284	68	72	69	70	67	-0.046	11.48	0.58
13	2.095	2.103	0.16	0.16	1.38	71	1.96	1.10	72	1.1	81	0.053	99	100	12.4	-0.1	356	307	449	290	296	340	1105	285	68	72	69	70	66	-0.046	11.90	0.62
14	2.257	2.265	0.16	0.16	1.38	72	1.95	1.09	73	1.1	81	0.050	102	102	12.4	0	356	307	452	287	293	339	1116	286	68	72	69	70	67	-0.047	11.92	0.49
15	2.419	2.427	0.16	0.16	1.38	72	1.96	1.09	73	1.1	82	0.052	100	100	12.3	-0.1	358	306	454	285	291	339	1128	287	68	72	69	70	66	-0.047	12.28	0.55
16	2.580	2.588	0.16	0.16	1.38	72	1.95	1.09	73	1.1	81	0.052	100	100	12.2	-0.1	358	306	456	282	288	338	1140	290	68	72	69	70	66	-0.047	12.63	0.59
17	2.742	2.750	0.16	0.16	1.38	72	1.95	1.09	73	1.1	81	0.052	100	100	12.1	-0.1	358	305	459	280	286	338	1152	293	68	72	69	70	67	-0.047	12.76	0.55
18	2.904	2.911	0.16	0.16	1.38	72	1.95	1.09	73	1.1	81	0.051	101	101	12.0	-0.1	358	305	462	278	284	337	1157	295	68	72	69	70	67	-0.048	12.69	0.43
19	3.065	3.074	0.16	0.16	1.38	72	1.96	1.09	73	1.1	81	0.051	101	102	11.9	-0.1	359	304	465	276	281	337	1165	297	68	72	69	70	67	-0.048	12.78	0.41
20	3.227	3.235	0.16	0.16	1.38	72	1.96	1.08	73	1.1	82	0.051	101	101	11.8	-0.1	360	304	468	274	280	337	1174	299	68	72	69	70	66	-0.048	13.00	0.46
21	3.388	3.396	0.16	0.16	1.37	72	1.95	1.09	74	1.1	82	0.052	100	100	11.7	-0.1	361	304	471	273	278	337	1182	298	68	72	69	70	66	-0.049	13.14	0.48
22	3.550	3.558	0.16	0.16	1.38	73	1.96	1.09	74	1.1	82	0.052	100	100	11.6	-0.1	363	303	474	271	276	337	1193	300	68	72	69	71	66	-0.049	13.31	0.45
23	3.711	3.720	0.16	0.16	1.38	73	1.95	1.09	74	1.1	82	0.052	100	100	11.5	-0.1	365	303	477	269	274	338	1201	301	68	73	69	71	67	-0.048	13.31	0.43
24	3.873	3.881	0.16	0.16	1.38	73	1.95	1.09	74	1.1	82	0.053	99	99	11.4	-0.1	368	302	480	268	273	338	1209	304	68	73	69	71	67	-0.049	13.50	0.46
25	4.035	4.042	0.16	0.16	1.38	73	1.95	1.08	74	1.1	82	0.052	100	100	11.3	-0.1	370	302	483	267	272	339	1216	306	68	73	69	71	67	-0.049	13.52	0.48
26	4.196	4.204	0.16	0.16	1.37	73	1.95	1.09	74	1.1	82	0.051	101	101	11.3	0	374	301	486	265	270	339	1222	310	69	73	69	71	67	-0.049	13.53	0.50
27	4.358	4.366	0.16	0.16	1.37	73	1.95	1.08	74	1.1	82	0.051	101	101	11.2	-0.1	378	301	489	264	269	340	1233	309	69	73	69	71	67	-0.049	13.64	0.70
28	4.520	4.527	0.16	0.16	1.37	73	1.95	1.09	75	1.1	83	0.051	101	101	11.1	-0.1	383	300	492	263	268	341	1241	310	69	73	69	71	66	-0.049	13.80	0.77
29	4.681	4.689	0.16	0.16	1.38	74	1.96	1.09	75	1.1	83	0.053	99	99	11.0	-0.1	387	300	495	262	267	342	1253	314	69	73	69	71	66	-0.050	13.96	0.86
30	4.843	4.851	0.16	0.16	1.38	74	1.95	1.09	75	1.1	83	0.050	102	102	10.9	-0.1	390	299	498	262	266	343	1265	316	69	73	69	71	67	-0.050	14.09	1.02
31	5.005	5.013	0.16	0.16	1.38	74	1.96	1.08	75	1.1	83	0.051	101	101	10.7	-0.2	395	299	501	261	265	344	1275	318	69	73	69	71	66	-0.051	14.25	1.12
32	5.167	5.174	0.16	0.16	1.38	74	1.96	1.08	75	1.1	83	0.051	101	101	10.6	-0.1	400	298	505	261	264	346	1282	321	69	73	69	71	67	-0.051	14.32	1.16
33	5.328	5.336	0.16	0.16	1.38	74	1.95	1.09	75	1.1	84	0.052	100	100	10.5	-0.1	406	298	508	260	264	347	1289	323	69	73	70	71	66	-0.051	14.41	1.24
34	5.490	5.498	0.16	0.16	1.38	74	1.95	1.09	75	1.1	83	0.052	100	100	10.4	-0.1	409	297	511	259	264	348	1296	325	69	73	70	71	66	-0.051	14.43	1.28

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
35	5.652	5.659	0.16	0.16	1.38	74	1.96	1.08	75	1.1	84	0.051	101	101	10.3	-0.1	414	297	515	259	263	350	1301	327	69	73	70	71	66	-0.052	14.53	1.41
36	5.814	5.821	0.16	0.16	1.39	75	1.95	1.09	76	1.1	84	0.049	103	103	10.2	-0.1	418	296	519	259	263	351	1308	328	69	73	70	71	66	-0.052	14.51	1.38
37	5.976	5.982	0.16	0.16	1.38	75	1.95	1.08	76	1.1	84	0.052	100	99	10.1	-0.1	422	295	522	258	262	352	1317	330	69	73	70	71	66	-0.051	14.60	1.59
38	6.138	6.145	0.16	0.16	1.38	75	1.96	1.09	76	1.1	84	0.052	100	101	10.0	-0.1	425	294	525	258	262	353	1319	330	69	73	70	71	66	-0.052	14.63	1.61
39	6.300	6.306	0.16	0.16	1.38	75	1.96	1.08	76	1.1	84	0.052	100	99	9.9	-0.1	429	294	529	258	262	354	1321	331	69	73	70	71	67	-0.052	14.56	1.62
40	6.462	6.468	0.16	0.16	1.39	75	1.96	1.09	76	1.1	83	0.053	99	99	9.8	-0.1	432	294	532	258	262	356	1312	331	69	74	70	71	68	-0.052	14.40	1.47
41	6.624	6.630	0.16	0.16	1.38	75	1.96	1.09	76	1.1	83	0.051	101	101	9.7	-0.1	437	293	535	258	262	357	1293	331	69	74	70	71	66	-0.052	14.10	1.16
42	6.786	6.792	0.16	0.16	1.38	75	1.95	1.09	76	1.1	83	0.053	99	99	9.6	-0.1	442	293	538	258	262	359	1288	329	69	74	70	71	66	-0.052	13.98	0.99
43	6.949	6.954	0.16	0.16	1.38	75	1.95	1.08	76	1.1	84	0.051	102	101	9.5	-0.1	447	292	539	259	262	360	1284	326	69	74	70	71	67	-0.050	14.03	0.97
44	7.110	7.115	0.16	0.16	1.38	75	1.95	1.08	76	1.1	84	0.052	99	99	9.4	-0.1	451	292	541	259	263	361	1280	324	69	74	70	71	67	-0.050	14.06	0.91
45	7.272	7.277	0.16	0.16	1.38	75	1.95	1.08	77	1.1	83	0.051	101	101	9.3	-0.1	454	292	542	259	263	362	1278	324	69	74	70	71	67	-0.052	14.05	0.96
46	7.434	7.440	0.16	0.16	1.38	75	1.95	1.09	77	1.1	83	0.051	101	101	9.2	-0.1	459	291	543	260	263	363	1272	322	69	74	70	71	67	-0.052	13.90	0.88
47	7.596	7.601	0.16	0.16	1.38	76	1.96	1.09	77	1.1	83	0.051	101	100	9.1	-0.1	461	291	544	260	264	364	1264	321	69	74	70	72	67	-0.050	13.84	0.77
48	7.758	7.763	0.16	0.16	1.39	76	1.95	1.09	77	1.1	83	0.050	102	102	9.0	-0.1	464	290	544	261	265	365	1259	322	69	74	70	72	67	-0.051	13.91	0.72
49	7.919	7.925	0.16	0.16	1.37	76	1.97	1.09	77	1.1	83	0.051	100	101	8.9	-0.1	467	290	545	261	265	366	1253	321	65	74	70	72	67	-0.051	13.82	0.73
50	8.080	8.088	0.16	0.16	1.38	76	1.98	1.08	77	1.1	83	0.051	100	101	8.8	-0.1	468	290	545	261	266	366	1247	320	65	74	70	72	67	-0.050	13.77	0.69
51	8.242	8.249	0.16	0.16	1.38	76	1.98	1.08	77	1.1	83	0.051	101	100	8.7	-0.1	471	289	545	262	266	367	1245	321	65	74	70	72	66	-0.050	13.79	0.75
52	8.404	8.411	0.16	0.16	1.37	76	1.98	1.08	77	1.1	83	0.050	102	102	8.6	-0.1	474	289	546	262	267	368	1247	319	65	74	70	72	67	-0.050	13.82	0.77
53	8.566	8.573	0.16	0.16	1.38	76	1.97	1.09	77	1.1	83	0.051	101	101	8.6	0	476	288	546	263	268	368	1251	321	65	74	70	72	66	-0.051	13.71	0.75
54	8.728	8.736	0.16	0.16	1.38	76	1.97	1.09	77	1.1	83	0.050	102	102	8.5	-0.1	477	288	546	264	268	369	1245	318	65	74	70	72	66	-0.050	13.70	0.79
55	8.889	8.898	0.16	0.16	1.38	76	1.98	1.08	77	1.1	83	0.053	98	99	8.4	-0.1	477	287	546	264	269	369	1247	318	65	74	70	72	67	-0.050	13.77	0.72
56	9.051	9.060	0.16	0.16	1.38	76	1.97	1.09	77	1.1	83	0.051	101	101	8.3	-0.1	476	287	546	265	270	369	1242	317	65	74	70	72	66	-0.051	13.72	0.94
57	9.213	9.222	0.16	0.16	1.38	76	1.98	1.09	77	1.1	83	0.051	101	101	8.2	-0.1	475	287	546	265	270	369	1241	316	65	74	70	72	67	-0.048	13.68	1.01
58	9.375	9.384	0.16	0.16	1.38	76	1.98	1.09	78	1.1	84	0.051	101	101	8.1	-0.1	476	286	546	266	271	369	1247	317	65	74	70	72	66	-0.050	13.76	0.82
59	9.537	9.547	0.16	0.16	1.38	76	1.97	1.09	78	1.1	83	0.052	100	100	8.0	-0.1	476	286	546	266	271	369	1239	314	65	74	70	72	67	-0.049	13.81	0.79
60	9.699	9.709	0.16	0.16	1.38	77	1.97	1.09	78	1.1	83	0.051	101	101	7.9	-0.1	477	285	546	267	272	369	1246	315	65	74	70	72	67	-0.050	13.83	0.85
61	9.864	9.871	0.17	0.16	1.38	77	1.97	1.09	78	1.1	84	0.051	103	101	7.9	0	478	285	546	267	272	370	1239	314	69	74	70	72	68	-0.049	13.61	0.72
62	10.026	10.033	0.16	0.16	1.38	77	1.97	1.09	78	1.1	84	0.052	100	100	7.8	-0.1	480	284	545	268	273	370	1234	310	70	74	70	72	67	-0.047	13.64	0.73
63	10.188	10.196	0.16	0.16	1.38	77	1.97	1.09	78	1.1	84	0.050	102	102	7.7	-0.1	482	284	545	269	274	371	1234	309	70	74	70	72	67	-0.049	13.72	0.83
64	10.350	10.358	0.16	0.16	1.38	77	1.98	1.08	78	1.1	84	0.051	101	101	7.6	-0.1	484	284	545	269	275	371	1236	309	70	74	70	72	67	-0.048	13.53	0.78
65	10.512	10.520	0.16	0.16	1.38	77	1.97	1.09	78	1.1	84	0.053	99	99	7.5	-0.1	485	283	545	270	275	372	1233	310	70	74	70	72	66	-0.048	13.72	0.85
66	10.674	10.682	0.16	0.16	1.38	77	1.98	1.09	78	1.1	84	0.052	100	100	7.4	-0.1	488	283	544	271	276	372	1231	307	70	74	70	72	67	-0.047	13.61	0.77
67	10.837	10.845	0.16	0.16	1.38	77	1.98	1.09	78	1.1	85	0.051	101	101	7.4	0	491	282	544	271	277	373	1232	308	70	74	70	72	68	-0.047	13.66	0.82
68	10.999	11.007	0.16	0.16	1.38	77	1.97	1.08	78	1.1	84	0.050	102	102	7.3	-0.1	494	282	544	272	278	374	1229	306	70	74	70	72	66	-0.047	13.60	0.83
69	11.161	11.169	0.16	0.16	1.38	77	1.98	1.09	78	1.1	84	0.051	101	101	7.2	-0.1	497	282	544	273	279	375	1227	304	69	74	70	72	67	-0.047	13.53	0.78

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
70	11.323	11.331	0.16	0.16	1.37	77	1.97	1.09	78	1.1	84	0.052	100	100	7.1	-0.1	499	281	543	273	279	375	1224	306	69	74	70	72	66	-0.048	13.50	0.67
71	11.486	11.494	0.16	0.16	1.38	77	1.98	1.09	78	1.1	84	0.051	101	101	7.0	-0.1	501	281	543	274	280	376	1221	304	69	75	70	72	67	-0.048	13.53	0.73
72	11.648	11.657	0.16	0.16	1.38	77	1.97	1.09	78	1.1	85	0.050	102	102	7.0	0	502	281	543	275	281	376	1219	303	69	75	70	72	67	-0.048	13.58	0.66
73	11.810	11.819	0.16	0.16	1.37	77	1.98	1.09	78	1.1	85	0.049	103	103	6.9	-0.1	502	280	542	276	282	376	1216	307	69	75	70	72	67	-0.047	13.64	0.63
74	11.972	11.981	0.16	0.16	1.36	77	1.98	1.09	78	1.1	84	0.052	100	100	6.8	-0.1	504	280	542	277	283	377	1215	306	69	74	70	72	67	-0.047	13.52	0.58
75	12.135	12.143	0.16	0.16	1.37	77	1.97	1.09	78	1.1	84	0.051	101	101	6.7	-0.1	507	280	541	277	284	378	1216	306	69	75	70	72	68	-0.047	13.50	0.69
76	12.297	12.306	0.16	0.16	1.37	77	1.97	1.09	78	1.1	85	0.051	101	101	6.6	-0.1	512	279	541	278	285	379	1214	303	69	75	70	72	67	-0.047	13.50	0.64
77	12.459	12.468	0.16	0.16	1.37	77	1.97	1.09	78	1.1	85	0.052	100	100	6.6	0	512	279	540	279	285	379	1215	303	69	75	70	72	67	-0.049	13.48	0.68
78	12.622	12.630	0.16	0.16	1.37	77	1.98	1.09	78	1.1	85	0.048	105	104	6.5	-0.1	510	278	540	280	286	379	1209	304	69	75	70	72	67	-0.047	13.46	0.73
79	12.784	12.793	0.16	0.16	1.38	77	1.98	1.09	78	1.1	85	0.049	103	103	6.4	-0.1	507	278	540	281	288	379	1209	303	69	75	70	72	67	-0.047	13.55	0.86
80	12.946	12.956	0.16	0.16	1.38	77	1.98	1.09	78	1.1	85	0.053	99	99	6.3	-0.1	504	278	539	281	289	378	1205	302	69	75	70	72	67	-0.046	13.53	0.69
81	13.108	13.118	0.16	0.16	1.38	77	1.98	1.09	78	1.1	85	0.050	102	102	6.2	-0.1	502	278	539	282	290	378	1209	302	69	75	70	72	68	-0.046	13.48	0.64
82	13.271	13.280	0.16	0.16	1.37	77	1.98	1.09	78	1.1	85	0.052	100	100	6.2	0	502	277	538	283	291	378	1202	303	70	75	70	72	67	-0.047	13.54	0.65
83	13.433	13.442	0.16	0.16	1.38	77	1.97	1.09	79	1.1	85	0.049	103	103	6.1	-0.1	499	277	538	284	292	378	1204	303	70	75	70	72	67	-0.047	13.52	0.68
84	13.595	13.605	0.16	0.16	1.37	77	1.98	1.09	79	1.1	85	0.050	102	102	6.0	-0.1	499	277	537	285	293	378	1206	305	70	75	70	72	68	-0.046	13.67	0.72
85	13.757	13.767	0.16	0.16	1.37	77	1.98	1.09	79	1.1	86	0.051	101	101	5.9	-0.1	502	276	537	285	294	379	1204	302	70	75	70	72	68	-0.046	13.63	0.72
86	13.919	13.929	0.16	0.16	1.38	78	1.98	1.09	79	1.1	85	0.051	101	101	5.9	0	505	276	537	286	295	380	1205	303	70	75	70	72	67	-0.047	13.79	0.74
87	14.081	14.091	0.16	0.16	1.38	78	1.98	1.09	79	1.1	86	0.051	101	101	5.8	-0.1	506	276	536	287	296	380	1208	305	70	75	70	72	68	-0.046	13.84	0.78
88	14.243	14.254	0.16	0.16	1.38	78	1.97	1.09	79	1.1	86	0.050	102	102	5.7	-0.1	506	275	536	288	297	380	1204	305	70	75	71	73	68	-0.047	14.08	0.93
89	14.405	14.417	0.16	0.16	1.38	78	1.98	1.09	79	1.1	86	0.051	101	101	5.6	-0.1	508	275	536	289	298	381	1206	304	70	75	71	72	67	-0.047	14.03	0.94
90	14.568	14.579	0.16	0.16	1.37	78	1.97	1.08	79	1.1	86	0.049	103	103	5.5	-0.1	510	275	536	289	299	382	1211	305	70	75	71	72	68	-0.046	13.94	0.89
91	14.730	14.741	0.16	0.16	1.38	78	1.98	1.09	79	1.1	86	0.049	103	103	5.5	0	510	275	536	290	300	382	1209	304	70	75	71	73	67	-0.047	14.01	0.86
92	14.892	14.903	0.16	0.16	1.38	78	1.97	1.09	79	1.1	86	0.049	103	103	5.4	-0.1	510	274	536	291	301	382	1205	306	70	75	71	73	68	-0.047	13.95	0.93
93	15.054	15.066	0.16	0.16	1.38	78	1.97	1.08	79	1.1	86	0.049	103	103	5.3	-0.1	512	274	536	291	302	383	1205	304	70	75	71	73	68	-0.047	13.90	0.93
94	15.217	15.228	0.16	0.16	1.38	78	1.97	1.08	79	1.1	86	0.051	101	101	5.2	-0.1	514	274	536	292	303	384	1203	305	70	75	71	73	68	-0.046	13.96	0.95
95	15.379	15.391	0.16	0.16	1.38	78	1.98	1.09	79	1.1	86	0.049	103	103	5.2	0	516	274	536	293	305	385	1203	304	70	75	71	73	67	-0.046	13.79	0.92
96	15.541	15.553	0.16	0.16	1.38	78	1.98	1.09	79	1.1	86	0.049	103	103	5.1	-0.1	517	273	536	294	306	385	1202	304	70	75	71	73	68	-0.045	13.97	0.90
97	15.703	15.715	0.16	0.16	1.38	78	1.97	1.09	79	1.1	87	0.051	101	101	5.0	-0.1	515	273	536	295	307	385	1207	305	70	75	71	73	68	-0.046	14.03	0.90
98	15.866	15.878	0.16	0.16	1.38	78	1.97	1.09	79	1.1	87	0.050	102	102	4.9	-0.1	511	273	536	295	308	385	1211	304	70	75	71	73	68	-0.046	14.01	0.94
99	16.028	16.040	0.16	0.16	1.38	78	1.98	1.08	79	1.1	87	0.051	101	101	4.8	-0.1	507	273	536	296	309	384	1217	305	70	75	71	73	67	-0.047	14.11	0.88
100	16.191	16.203	0.16	0.16	1.38	78	1.98	1.09	79	1.1	86	0.050	102	102	4.8	0	505	272	537	297	310	384	1209	304	70	75	71	73	68	-0.047	14.03	0.78
101	16.353	16.365	0.16	0.16	1.38	78	1.98	1.08	79	1.1	86	0.051	101	101	4.7	-0.1	503	272	537	297	311	384	1206	302	70	75	71	73	68	-0.046	13.87	0.77
102	16.516	16.528	0.16	0.16	1.37	78	1.97	1.09	79	1.1	86	0.051	101	101	4.6	-0.1	509	272	537	298	312	386	1201	303	70	75	71	73	68	-0.046	13.87	0.76
103	16.678	16.691	0.16	0.16	1.37	78	1.97	1.08	79	1.1	86	0.049	103	103	4.5	-0.1	512	272	537	299	314	387	1197	301	70	75	71	73	68	-0.046	13.74	0.77
104	16.840	16.853	0.16	0.16	1.38	78	1.98	1.09	79	1.1	86	0.051	101	101	4.5	0	515	272	537	299	315	388	1195	304	70	75	71	73	68	-0.046	13.69	0.77

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
105	17.003	17.015	0.16	0.16	1.37	78	1.98	1.09	80	1.1	87	0.051	101	101	4.4	-0.1	516	271	537	300	316	388	1194	303	70	75	71	73	68	-0.046	13.83	0.78
106	17.165	17.178	0.16	0.16	1.37	78	1.97	1.09	80	1.1	87	0.051	101	101	4.3	-0.1	518	271	537	301	317	389	1193	303	70	75	71	73	68	-0.046	13.82	0.81
107	17.328	17.341	0.16	0.16	1.37	78	1.98	1.09	80	1.1	86	0.050	102	102	4.3	0	522	271	537	302	318	390	1195	303	70	75	71	73	68	-0.047	13.81	0.84
108	17.491	17.503	0.16	0.16	1.37	79	1.98	1.08	80	1.1	86	0.052	100	100	4.2	-0.1	525	271	537	303	319	391	1197	301	70	75	71	73	69	-0.045	13.84	0.84
109	17.653	17.665	0.16	0.16	1.37	79	1.98	1.09	80	1.1	86	0.051	100	101	4.1	-0.1	529	271	537	303	320	392	1197	303	70	75	71	73	68	-0.046	13.88	0.86
110	17.815	17.828	0.16	0.16	1.37	79	1.98	1.09	80	1.1	86	0.052	100	100	4.0	-0.1	533	271	537	304	321	393	1195	303	70	75	71	73	68	-0.046	13.86	0.84
111	17.978	17.991	0.16	0.16	1.38	79	1.98	1.09	80	1.1	86	0.051	101	101	4.0	0	535	270	537	305	322	394	1194	301	71	75	71	73	69	-0.046	13.72	0.79
112	18.140	18.153	0.16	0.16	1.38	79	1.98	1.08	80	1.1	86	0.050	101	102	3.9	-0.1	536	270	537	307	323	395	1192	300	70	75	71	73	68	-0.046	13.7	0.79
113	18.303	18.315	0.16	0.16	1.37	79	1.98	1.09	80	1.1	86	0.050	102	102	3.8	-0.1	538	270	537	307	325	395	1191	300	70	75	71	73	69	-0.045	13.6	0.76
114	18.465	18.478	0.16	0.16	1.38	79	1.98	1.09	80	1.1	86	0.052	100	100	3.8	0	539	270	537	308	326	396	1188	301	71	75	71	73	70	-0.045	13.56	0.74
115	18.628	18.641	0.16	0.16	1.37	79	1.98	1.09	80	1.1	86	0.047	105	105	3.7	-0.1	544	270	537	309	327	397	1180	299	71	75	71	73	69	-0.046	13.33	0.63
116	18.790	18.804	0.16	0.16	1.38	79	1.98	1.09	80	1.1	85	0.051	100	101	3.6	-0.1	545	270	536	310	328	398	1169	297	71	75	71	73	69	-0.044	12.96	0.54
117	18.952	18.966	0.16	0.16	1.38	79	1.98	1.08	80	1.1	85	0.050	101	101	3.6	0	549	270	536	311	329	399	1158	295	71	75	71	73	69	-0.045	12.78	0.52
118	19.115	19.128	0.16	0.16	1.38	79	1.98	1.09	80	1.1	85	0.050	102	101	3.5	-0.1	551	269	535	312	329	399	1146	294	71	75	71	73	68	-0.043	12.61	0.46
119	19.277	19.291	0.16	0.16	1.38	79	1.97	1.09	80	1.1	85	0.051	100	101	3.5	0	556	269	534	314	331	401	1135	292	71	75	71	73	68	-0.044	12.31	0.41
120	19.440	19.454	0.16	0.16	1.37	79	1.98	1.09	80	1.1	85	0.051	101	101	3.4	-0.1	559	269	533	315	331	401	1124	291	71	75	71	73	69	-0.045	12.19	0.36
121	19.602	19.616	0.16	0.16	1.38	79	1.97	1.08	80	1.1	84	0.052	99	99	3.4	0	563	269	532	315	332	402	1112	290	71	75	71	73	69	-0.044	12.04	0.31
122	19.765	19.779	0.16	0.16	1.38	79	1.97	1.09	80	1.1	84	0.053	99	99	3.3	-0.1	564	269	530	317	333	403	1101	289	71	75	71	73	68	-0.044	11.82	0.26
123	19.927	19.941	0.16	0.16	1.38	79	1.98	1.09	80	1.1	84	0.051	100	100	3.3	0	564	269	529	318	334	403	1086	286	70	75	71	73	69	-0.044	11.42	0.16
124	20.090	20.104	0.16	0.16	1.38	79	1.97	1.09	80	1.1	83	0.054	98	98	3.2	-0.1	564	269	527	318	335	403	1072	284	70	75	71	73	68	-0.044	11.14	0.12
125	20.253	20.267	0.16	0.16	1.38	79	1.97	1.09	80	1.1	83	0.053	99	99	3.2	0	564	269	525	320	335	403	1056	282	70	75	71	73	69	-0.044	10.97	0.08
126	20.416	20.429	0.16	0.16	1.38	79	1.97	1.08	80	1.1	82	0.051	101	100	3.1	-0.1	556	269	523	320	336	401	1047	282	70	75	71	73	67	-0.044	10.92	0.09
127	20.579	20.592	0.16	0.16	1.38	79	1.97	1.09	80	1.1	82	0.053	99	99	3.1	0	553	269	521	321	336	400	1031	279	70	75	71	73	68	-0.043	10.7	0.07
128	20.741	20.755	0.16	0.16	1.38	79	1.97	1.09	80	1.1	83	0.051	100	101	3.1	0	548	268	519	321	337	399	1021	277	70	75	71	73	69	-0.042	10.46	0.06
129	20.904	20.918	0.16	0.16	1.37	79	1.97	1.09	80	1.1	82	0.051	101	101	3.0	-0.1	546	268	516	322	337	398	1004	275	70	75	71	73	69	-0.042	10.21	0.04
130	21.068	21.080	0.16	0.16	1.37	79	1.97	1.09	80	1.1	81	0.052	100	99	3.0	0	541	268	514	322	337	396	999	273	70	75	71	73	68	-0.042	10.15	0.04
131	21.230	21.243	0.16	0.16	1.38	79	1.97	1.09	80	1.1	82	0.051	100	101	3.0	0	537	268	511	322	337	395	995	269	70	75	71	73	69	-0.040	10.08	0.05
132	21.393	21.405	0.16	0.16	1.38	79	1.98	1.09	80	1.1	83	0.052	100	99	2.9	-0.1	534	268	508	323	337	394	989	268	70	75	71	73	69	-0.042	10.08	0.05
133	21.557	21.568	0.16	0.16	1.38	79	1.97	1.09	81	1.1	81	0.052	100	100	2.9	0	533	268	506	323	337	393	984	268	70	75	71	73	69	-0.042	9.91	0.04
134	21.719	21.732	0.16	0.16	1.38	79	1.97	1.09	80	1.1	81	0.052	99	100	2.9	0	531	268	503	323	337	392	976	266	70	75	71	73	69	-0.042	10.01	0.05
135	21.882	21.894	0.16	0.16	1.38	79	1.97	1.09	80	1.1	81	0.052	100	99	2.8	-0.1	533	268	500	323	338	392	974	267	70	75	71	73	69	-0.042	9.96	0.04
136	22.044	22.057	0.16	0.16	1.38	79	1.98	1.09	80	1.1	81	0.053	98	99	2.8	0	535	268	498	324	338	393	968	267	70	75	70	73	69	-0.041	9.92	0.05
137	22.207	22.220	0.16	0.16	1.38	79	1.98	1.10	80	1.1	81	0.053	99	99	2.8	0	535	268	495	324	337	392	960	263	70	75	70	73	68	-0.041	9.96	0.04
138	22.370	22.382	0.16	0.16	1.38	79	1.98	1.09	80	1.1	81	0.053	99	98	2.7	-0.1	536	268	492	324	338	392	954	260	70	75	70	73	68	-0.040	9.91	0.05
139	22.533	22.546	0.16	0.16	1.39	79	1.98	1.09	80	1.1	81	0.053	99	99	2.7	0	537	268	490	325	338	392	952	259	70	75	70	73	69	-0.041	9.75	0.05

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
140	22.696	22.709	0.16	0.16	1.38	79	1.98	1.08	80	1.1	81	0.053	99	99	2.7	0	537	268	487	325	337	391	945	262	70	75	70	73	69	-0.040	9.53	0.05
141	22.859	22.871	0.16	0.16	1.38	79	1.97	1.09	80	1.1	81	0.053	99	98	2.7	0	537	267	485	326	337	390	938	262	70	75	70	73	69	-0.039	9.37	0.06
142	23.022	23.034	0.16	0.16	1.38	79	1.98	1.09	80	1.1	81	0.052	100	100	2.6	-0.1	537	267	482	326	337	390	935	258	69	75	70	73	69	-0.039	9.23	0.06
143	23.185	23.197	0.16	0.16	1.38	79	1.97	1.09	80	1.1	81	0.051	101	101	2.6	0	537	268	480	326	337	390	930	257	69	75	70	73	69	-0.039	9.05	0.08
144	23.348	23.360	0.16	0.16	1.38	79	1.98	1.09	80	1.1	81	0.053	99	99	2.6	0	536	268	477	327	337	389	929	258	69	75	70	73	68	-0.038	8.94	0.09
145	23.511	23.523	0.16	0.16	1.38	79	1.97	1.09	80	1.1	81	0.053	99	99	2.6	0	536	267	475	327	337	388	923	257	69	75	70	73	69	-0.039	8.89	0.11
146	23.674	23.685	0.16	0.16	1.38	79	1.97	1.09	80	1.1	80	0.053	99	98	2.5	-0.1	536	268	472	327	337	388	921	253	69	74	70	73	68	-0.039	8.65	0.12
147	23.838	23.848	0.16	0.16	1.38	79	1.97	1.09	80	1.1	80	0.052	100	100	2.5	0	533	268	470	327	336	387	914	253	69	74	70	73	68	-0.038	8.57	0.12
148	24.000	24.011	0.16	0.16	1.38	79	1.97	1.09	80	1.1	80	0.053	98	99	2.5	0	532	268	467	328	336	386	904	255	69	74	70	73	68	-0.039	8.57	0.12
149	24.164	24.174	0.16	0.16	1.39	79	1.97	1.09	80	1.1	80	0.052	100	100	2.5	0	532	267	465	328	336	386	898	255	69	74	70	73	69	-0.038	8.41	0.1
150	24.327	24.337	0.16	0.16	1.37	79	1.97	1.09	80	1.1	80	0.052	100	100	2.5	0	531	267	463	328	336	385	889	252	69	74	70	73	69	-0.038	8.32	0.11
151	24.490	24.500	0.16	0.16	1.39	79	1.96	1.09	80	1.1	79	0.051	100	100	2.4	-0.1	531	267	460	329	335	384	880	251	69	74	70	73	68	-0.038	8.16	0.11
152	24.652	24.663	0.16	0.16	1.38	79	1.97	1.09	80	1.1	80	0.053	98	99	2.4	0	532	267	458	329	335	384	874	248	69	74	70	73	68	-0.037	8	0.11
153	24.815	24.826	0.16	0.16	1.38	79	1.98	1.09	80	1.1	80	0.052	100	100	2.4	0	531	267	455	328	335	383	870	246	69	74	70	73	68	-0.038	7.96	0.12
154	24.978	24.989	0.16	0.16	1.39	79	1.97	1.09	80	1.1	80	0.052	100	100	2.4	0	529	267	453	329	334	382	867	243	69	74	70	73	69	-0.038	7.82	0.12
155	25.141	25.151	0.16	0.16	1.39	79	1.96	1.09	80	1.1	79	0.054	98	97	2.4	0	527	267	451	329	334	382	860	243	69	74	70	73	68	-0.037	7.86	0.12
156	25.304	25.314	0.16	0.16	1.39	79	1.98	1.09	80	1.1	79	0.052	99	100	2.4	0	525	267	448	329	334	381	855	241	69	74	69	72	68	-0.037	7.86	0.12
157	25.468	25.477	0.16	0.16	1.38	79	1.96	1.09	80	1.1	79	0.055	97	97	2.4	0	523	267	446	329	333	380	850	242	69	74	69	72	68	-0.037	7.82	0.12
158	25.631	25.641	0.16	0.16	1.39	79	1.97	1.09	80	1.1	79	0.053	99	99	2.3	-0.1	521	267	443	329	333	379	844	241	69	74	69	72	68	-0.036	7.84	0.12
159	25.794	25.803	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.053	99	98	2.3	0	520	267	441	329	332	378	837	240	69	74	69	72	68	-0.037	7.73	0.12
160	25.957	25.966	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.051	100	100	2.3	0	518	267	438	329	332	377	833	242	69	74	69	72	69	-0.037	7.78	0.13
161	26.121	26.129	0.16	0.16	1.38	79	1.97	1.09	80	1.1	78	0.052	100	99	2.3	0	517	267	436	329	332	376	828	239	69	74	69	72	69	-0.036	7.69	0.14
162	26.284	26.292	0.16	0.16	1.38	79	1.96	1.09	80	1.1	78	0.053	98	98	2.3	0	514	267	434	329	331	375	820	238	69	74	69	72	68	-0.036	7.85	0.12
163	26.447	26.456	0.16	0.16	1.39	79	1.97	1.09	80	1.1	78	0.051	100	101	2.3	0	512	267	431	329	330	374	809	239	68	73	69	72	67	-0.036	7.82	0.1
164	26.610	26.618	0.16	0.16	1.39	79	1.97	1.09	80	1.1	77	0.051	100	100	2.2	-0.1	509	267	428	328	330	372	801	240	68	73	69	72	67	-0.036	7.74	0.09
165	26.773	26.781	0.16	0.16	1.39	79	1.97	1.09	80	1.1	77	0.052	99	99	2.2	0	507	266	426	328	330	371	794	239	68	73	69	72	67	-0.036	7.66	0.1
166	26.936	26.943	0.16	0.16	1.37	79	1.97	1.09	80	1.1	79	0.051	100	100	2.2	0	505	266	423	328	329	370	786	236	68	73	69	72	68	-0.035	7.75	0.1
167	27.099	27.106	0.16	0.16	1.39	79	1.97	1.09	80	1.1	78	0.052	99	99	2.2	0	504	266	421	328	329	370	785	236	68	73	69	72	68	-0.035	7.62	0.14
168	27.262	27.270	0.16	0.16	1.39	79	1.97	1.09	80	1.1	78	0.051	100	101	2.2	0	502	266	419	328	328	369	785	236	68	73	69	72	68	-0.035	7.59	0.14
169	27.425	27.432	0.16	0.16	1.38	79	1.96	1.09	80	1.1	78	0.052	99	99	2.2	0	500	266	416	328	327	367	780	234	68	73	69	72	68	-0.036	7.66	0.14
170	27.588	27.595	0.16	0.16	1.39	79	1.96	1.09	80	1.1	78	0.050	101	101	2.2	0	498	266	414	327	327	366	779	234	68	73	69	72	68	-0.035	7.63	0.14
171	27.751	27.758	0.16	0.16	1.39	79	1.97	1.09	80	1.1	78	0.053	98	98	2.1	-0.1	496	265	412	327	326	365	777	233	68	73	69	72	67	-0.035	7.64	0.14
172	27.914	27.921	0.16	0.16	1.39	79	1.97	1.09	80	1.1	78	0.054	98	98	2.1	0	495	265	410	327	326	365	775	231	68	73	69	72	68	-0.034	7.59	0.14
173	28.078	28.085	0.16	0.16	1.38	79	1.97	1.09	80	1.1	78	0.052	100	100	2.1	0	493	265	408	326	325	363	769	231	68	73	69	72	68	-0.035	7.65	0.13
174	28.241	28.247	0.16	0.16	1.39	79	1.97	1.09	80	1.1	77	0.052	99	99	2.1	0	492	265	406	326	324	363	764	231	68	73	69	72	68	-0.036	7.63	0.14

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
175	28.404	28.410	0.16	0.16	1.38	78	1.97	1.09	80	1.1	77	0.053	99	98	2.1	0	491	264	404	326	324	362	763	230	68	73	69	72	67	-0.035	7.56	0.16
176	28.567	28.573	0.16	0.16	1.38	78	1.97	1.09	80	1.1	77	0.052	99	99	2.1	0	490	264	402	325	323	361	760	230	68	73	69	71	68	-0.034	7.55	0.15
177	28.731	28.736	0.16	0.16	1.38	78	1.96	1.09	80	1.1	77	0.052	100	99	2.1	0	488	264	400	325	322	360	759	230	68	73	68	71	68	-0.034	7.49	0.15
178	28.894	28.899	0.16	0.16	1.38	78	1.97	1.09	80	1.1	77	0.052	99	99	2.0	-0.1	487	264	398	325	322	359	760	229	68	73	69	71	67	-0.034	7.44	0.17
179	29.057	29.061	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.052	100	99	2.0	0	486	264	396	324	321	358	757	227	68	73	68	71	68	-0.035	7.43	0.17
180	29.220	29.224	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.053	99	99	2.0	0	484	264	394	324	321	357	755	226	68	73	68	71	68	-0.034	7.47	0.17
181	29.383	29.387	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.051	101	101	2.0	0	483	264	393	323	320	357	756	227	68	73	68	71	68	-0.034	7.53	0.17
182	29.546	29.551	0.16	0.16	1.39	78	1.96	1.09	79	1.1	78	0.051	101	101	2.0	0	482	263	391	323	319	356	756	227	68	72	68	71	67	-0.035	7.49	0.18
183	29.709	29.713	0.16	0.16	1.39	78	1.98	1.09	79	1.1	77	0.052	99	99	2.0	0	481	263	389	323	319	355	758	228	68	72	68	71	67	-0.034	7.47	0.18
184	29.872	29.876	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.052	99	100	2.0	0	479	263	388	322	319	354	755	230	68	72	68	71	68	-0.034	7.53	0.18
185	30.035	30.039	0.16	0.16	1.39	78	1.96	1.09	79	1.1	77	0.051	100	100	1.9	-0.1	478	263	386	322	318	353	754	229	68	72	68	71	67	-0.034	7.56	0.18
186	30.198	30.202	0.16	0.16	1.39	78	1.96	1.09	79	1.1	77	0.053	99	99	1.9	0	476	263	385	321	317	352	749	229	68	72	68	71	67	-0.034	7.5	0.18
187	30.361	30.365	0.16	0.16	1.38	78	1.98	1.09	79	1.1	78	0.053	99	99	1.9	0	472	262	383	321	317	351	748	227	68	72	68	71	67	-0.033	7.44	0.17
188	30.524	30.528	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.052	99	100	1.9	0	470	262	382	320	316	350	744	226	68	72	68	71	67	-0.033	7.46	0.17
189	30.688	30.690	0.16	0.16	1.38	78	1.96	1.09	79	1.1	78	0.051	101	100	1.9	0	467	262	380	320	315	349	738	225	68	72	68	71	68	-0.034	7.33	0.18
190	30.851	30.853	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.052	99	100	1.9	0	464	262	379	319	315	348	734	226	68	72	68	71	68	-0.034	7.36	0.16
191	31.014	31.016	0.16	0.16	1.38	78	1.97	1.09	79	1.1	77	0.053	99	99	1.9	0	462	261	378	319	314	347	726	224	68	72	68	71	66	-0.033	7.19	0.16
192	31.177	31.180	0.16	0.16	1.38	78	1.97	1.09	79	1.1	77	0.051	100	101	1.9	0	460	261	376	318	314	346	721	223	68	72	68	71	67	-0.033	7.12	0.16
193	31.340	31.342	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.050	102	101	1.8	-0.1	457	261	375	318	313	345	714	225	68	72	68	70	67	-0.031	7.29	0.16
194	31.503	31.504	0.16	0.16	1.38	78	1.96	1.09	79	1.1	78	0.052	100	99	1.8	0	456	261	373	317	312	344	710	223	68	72	68	70	67	-0.032	7.31	0.15
195	31.666	31.667	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.053	99	99	1.8	0	454	261	372	317	312	343	706	221	68	72	68	70	66	-0.032	7.3	0.16
196	31.829	31.830	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.053	99	99	1.8	0	451	260	371	316	311	342	702	219	68	72	68	70	67	-0.031	7.4	0.15
197	31.992	31.993	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.053	99	99	1.8	0	450	260	369	315	310	341	701	218	68	72	68	70	66	-0.032	7.34	0.16
198	32.154	32.156	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.053	98	99	1.8	0	448	260	368	315	310	340	696	218	68	72	68	70	66	-0.032	7.36	0.16
199	32.317	32.318	0.16	0.16	1.39	78	1.96	1.09	79	1.1	78	0.051	101	100	1.8	0	449	259	367	314	309	340	697	216	68	72	68	70	66	-0.031	7.39	0.16
200	32.480	32.481	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.052	100	100	1.8	0	447	259	365	314	309	339	699	218	68	72	68	70	66	-0.031	7.36	0.19
201	32.643	32.644	0.16	0.16	1.39	78	1.96	1.09	79	1.1	78	0.052	100	100	1.7	-0.1	445	259	364	313	308	338	700	217	68	72	68	70	66	-0.031	7.29	0.19
202	32.806	32.807	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.051	101	101	1.7	0	445	258	363	313	307	337	696	217	68	72	68	70	66	-0.031	7.31	0.17
203	32.970	32.970	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.054	98	98	1.7	0	443	258	362	312	307	336	695	216	68	72	68	70	66	-0.031	7.27	0.17
204	33.133	33.132	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.052	100	99	1.7	0	440	258	360	312	306	335	694	217	68	72	68	70	66	-0.031	7.31	0.18
205	33.296	33.295	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.053	99	99	1.7	0	440	257	359	311	306	335	691	216	68	72	68	70	66	-0.031	7.05	0.19
206	33.459	33.459	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.052	100	100	1.7	0	440	257	358	311	305	334	692	216	68	71	68	70	66	-0.032	6.9	0.21
207	33.622	33.621	0.16	0.16	1.38	78	1.96	1.08	79	1.1	77	0.051	100	100	1.7	0	439	257	357	311	304	334	694	217	68	71	68	70	66	-0.032	6.92	0.21
208	33.785	33.784	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.053	99	99	1.7	0	437	256	356	310	304	333	695	215	68	71	68	70	66	-0.032	6.93	0.21
209	33.948	33.946	0.16	0.16	1.38	78	1.96	1.09	79	1.1	77	0.052	99	99	1.6	-0.1	436	256	355	310	303	332	695	215	68	71	68	70	66	-0.031	6.86	0.21

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
210	34.111	34.109	0.16	0.16	1.39	78	1.96	1.09	79	1.1	77	0.051	100	100	1.6	0	435	256	354	309	303	331	695	215	68	71	68	70	66	-0.031	6.76	0.21
211	34.274	34.273	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.053	99	99	1.6	0	432	255	353	309	302	330	693	215	68	71	68	70	66	-0.031	6.7	0.23
212	34.437	34.435	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.053	99	98	1.6	0	431	255	353	308	301	330	696	216	68	71	68	70	66	-0.031	6.73	0.23
213	34.600	34.597	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.053	99	98	1.6	0	429	254	352	308	301	329	696	215	68	71	68	70	67	-0.032	6.68	0.23
214	34.762	34.760	0.16	0.16	1.38	78	1.97	1.09	79	1.1	77	0.051	100	100	1.6	0	429	254	351	307	300	328	700	213	68	71	68	70	66	-0.031	6.58	0.24
215	34.926	34.923	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.053	99	99	1.6	0	427	254	350	307	300	328	702	214	68	71	68	70	66	-0.032	6.58	0.24
216	35.089	35.086	0.16	0.16	1.39	78	1.96	1.09	79	1.1	77	0.052	99	100	1.6	0	425	254	349	306	299	327	700	214	68	71	68	70	66	-0.032	6.62	0.24
217	35.251	35.249	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.053	98	99	1.6	0	424	253	349	306	298	326	701	215	68	71	68	69	65	-0.031	6.65	0.24
218	35.415	35.411	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.052	100	99	1.5	-0.1	422	253	348	305	298	325	702	215	68	71	68	69	65	-0.031	6.61	0.24
219	35.578	35.574	0.16	0.16	1.38	78	1.97	1.09	79	1.1	77	0.052	99	100	1.5	0	421	252	347	305	297	324	702	214	68	71	68	69	65	-0.031	6.64	0.25
220	35.741	35.738	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.052	99	100	1.5	0	419	252	346	305	297	324	702	215	68	71	68	69	65	-0.031	6.67	0.25
221	35.904	35.900	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.051	100	100	1.5	0	418	251	345	304	296	323	702	214	68	71	68	69	65	-0.031	6.63	0.25
222	36.067	36.063	0.16	0.16	1.39	78	1.96	1.09	79	1.1	77	0.053	99	99	1.5	0	418	251	345	304	295	323	702	214	68	71	68	69	66	-0.031	6.54	0.26
223	36.231	36.225	0.16	0.16	1.38	78	1.97	1.09	79	1.1	76	0.051	101	100	1.5	0	417	251	344	303	295	322	704	213	68	71	68	69	67	-0.032	6.47	0.27
224	36.394	36.388	0.16	0.16	1.38	78	1.97	1.09	79	1.1	76	0.052	99	99	1.5	0	415	250	343	303	294	321	705	215	68	71	68	69	67	-0.031	6.54	0.27
225	36.557	36.552	0.16	0.16	1.39	78	1.96	1.09	79	1.1	76	0.053	98	99	1.5	0	415	250	342	302	294	321	706	214	68	71	68	69	67	-0.032	6.57	0.28
226	36.720	36.714	0.16	0.16	1.38	78	1.96	1.09	79	1.1	75	0.050	101	101	1.4	-0.1	413	249	342	302	293	320	706	214	68	71	68	69	67	-0.032	6.62	0.29
227	36.883	36.877	0.16	0.16	1.39	78	1.96	1.09	79	1.1	75	0.053	98	98	1.4	0	412	249	341	301	293	319	704	214	68	71	68	69	67	-0.033	6.63	0.28
228	37.046	37.040	0.16	0.16	1.39	78	1.97	1.10	79	1.1	75	0.052	99	99	1.4	0	411	249	340	301	292	319	701	214	68	71	68	69	66	-0.031	6.61	0.29
229	37.208	37.202	0.16	0.16	1.40	78	1.97	1.09	79	1.1	76	0.053	98	98	1.4	0	410	248	340	301	292	318	702	213	68	71	68	69	66	-0.031	6.43	0.29
230	37.371	37.366	0.16	0.16	1.39	78	1.96	1.09	79	1.1	76	0.053	98	99	1.4	0	409	248	339	300	291	317	702	213	68	71	68	69	67	-0.031	6.39	0.29
231	37.535	37.529	0.16	0.16	1.39	78	1.97	1.09	79	1.1	76	0.052	100	99	1.4	0	408	247	339	300	291	317	699	214	68	71	68	69	67	-0.031	6.35	0.28
232	37.697	37.691	0.16	0.16	1.39	78	1.97	1.09	79	1.1	76	0.054	97	97	1.4	0	405	247	338	299	291	316	698	212	68	71	68	69	66	-0.031	6.27	0.28
233	37.860	37.854	0.16	0.16	1.39	78	1.97	1.09	79	1.1	76	0.051	100	100	1.4	0	404	246	338	298	290	315	698	212	68	71	68	69	65	-0.031	6.28	0.28
234	38.024	38.017	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.052	100	100	1.3	-0.1	403	246	337	298	290	315	696	213	68	71	68	69	65	-0.030	6.26	0.28
235	38.187	38.180	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.052	99	100	1.3	0	402	246	336	297	289	314	692	211	68	71	68	69	66	-0.031	5.9	0.26
236	38.350	38.343	0.16	0.16	1.39	78	1.96	1.09	79	1.1	77	0.053	99	99	1.3	0	401	245	336	297	289	314	688	212	68	71	68	69	66	-0.031	6.28	0.28
237	38.513	38.505	0.16	0.16	1.38	78	1.97	1.09	79	1.1	77	0.051	100	100	1.3	0	400	245	335	296	288	313	687	211	68	70	68	69	66	-0.031	6.34	0.28
238	38.677	38.668	0.16	0.16	1.38	78	1.97	1.09	79	1.1	77	0.052	100	100	1.3	0	400	244	335	296	288	313	682	212	68	70	68	69	66	-0.030	6.47	0.25
239	38.840	38.831	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.053	99	99	1.3	0	398	244	334	295	288	312	677	212	68	70	68	69	65	-0.030	6.51	0.24
240	39.003	38.994	0.16	0.16	1.38	78	1.97	1.09	79	1.1	77	0.053	99	99	1.3	0	397	243	334	295	288	311	670	211	68	70	68	69	66	-0.030	6.59	0.25
241	39.166	39.157	0.16	0.16	1.39	78	1.97	1.09	79	1.1	77	0.053	99	99	1.3	0	396	243	333	294	288	311	664	209	68	70	68	69	66	-0.030	6.65	0.24
242	39.329	39.319	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.053	99	98	1.2	-0.1	396	242	332	293	289	310	657	209	68	70	68	69	66	-0.030	6.6	0.22
243	39.492	39.482	0.16	0.16	1.39	78	1.97	1.09	78	1.1	78	0.054	98	98	1.2	0	395	242	332	293	289	310	652	208	68	70	68	69	66	-0.030	6.43	0.21
244	39.654	39.646	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.053	98	99	1.2	0	394	241	331	292	290	310	645	208	68	70	68	69	66	-0.029	6.32	0.21

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
245	39.817	39.808	0.16	0.16	1.39	78	1.97	1.09	78	1.1	78	0.052	100	99	1.2	0	394	241	330	292	291	310	639	208	68	70	68	69	66	-0.030	6.26	0.2
246	39.980	39.971	0.16	0.16	1.39	78	1.96	1.09	78	1.1	78	0.050	102	102	1.2	0	394	240	329	291	291	309	637	207	68	70	68	69	66	-0.029	6.13	0.2
247	40.143	40.133	0.16	0.16	1.39	78	1.97	1.09	78	1.1	78	0.053	99	98	1.2	0	393	240	328	291	292	309	636	204	68	70	68	69	66	-0.029	6.13	0.2
248	40.306	40.296	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.053	99	99	1.2	0	391	240	328	290	293	308	635	204	68	70	68	69	66	-0.029	6.06	0.2
249	40.469	40.460	0.16	0.16	1.39	78	1.97	1.09	78	1.1	77	0.051	100	101	1.2	0	391	239	326	289	293	308	632	204	68	70	68	69	66	-0.029	6.02	0.2
250	40.633	40.622	0.16	0.16	1.38	78	1.97	1.09	78	1.1	78	0.052	100	99	1.2	0	390	239	325	289	294	307	627	204	68	70	68	69	66	-0.028	5.96	0.2
251	40.796	40.784	0.16	0.16	1.39	78	1.97	1.09	78	1.1	78	0.053	99	98	1.2	0	388	238	324	288	294	306	624	203	68	70	68	69	66	-0.029	5.9	0.2
252	40.959	40.947	0.16	0.16	1.38	78	1.97	1.09	78	1.1	78	0.052	100	100	1.1	-0.1	388	238	323	287	295	306	622	203	68	70	68	69	66	-0.028	5.85	0.2
253	41.122	41.110	0.16	0.16	1.39	78	1.96	1.09	78	1.1	78	0.052	100	100	1.1	0	388	238	322	286	295	306	616	201	68	70	68	69	66	-0.029	5.74	0.2
254	41.285	41.273	0.16	0.16	1.38	78	1.97	1.09	78	1.1	78	0.054	98	98	1.1	0	386	237	321	286	296	305	613	202	68	70	68	69	65	-0.029	5.7	0.2
255	41.448	41.436	0.16	0.16	1.38	78	1.97	1.09	78	1.1	78	0.053	99	99	1.1	0	385	237	320	285	297	305	610	201	68	70	68	69	66	-0.028	5.67	0.2
256	41.611	41.598	0.16	0.16	1.39	78	1.96	1.09	78	1.1	78	0.052	100	99	1.1	0	385	236	319	284	297	304	605	201	68	70	68	69	66	-0.029	5.61	0.19
257	41.774	41.761	0.16	0.16	1.38	78	1.96	1.09	78	1.1	78	0.052	100	100	1.1	0	383	236	318	284	298	304	602	200	68	70	68	69	66	-0.028	5.64	0.19
258	41.937	41.924	0.16	0.16	1.39	78	1.97	1.09	78	1.1	77	0.052	99	100	1.1	0	383	236	317	283	298	303	599	197	68	70	68	69	66	-0.028	5.56	0.19
259	42.100	42.087	0.16	0.16	1.38	78	1.97	1.09	78	1.1	77	0.051	100	101	1.1	0	382	235	315	282	299	303	596	199	68	70	68	69	66	-0.028	5.58	0.2
260	42.263	42.249	0.16	0.16	1.38	78	1.97	1.09	78	1.1	77	0.052	99	99	1.1	0	381	235	314	281	300	302	594	200	68	70	68	69	66	-0.028	5.54	0.2
261	42.425	42.412	0.16	0.16	1.39	78	1.97	1.09	78	1.1	77	0.052	99	100	1.0	-0.1	381	235	313	280	300	302	591	198	68	70	68	69	66	-0.028	5.49	0.2
262	42.588	42.575	0.16	0.16	1.39	78	1.96	1.09	78	1.1	77	0.052	99	100	1.0	0	380	234	312	280	300	301	586	197	68	70	68	69	66	-0.028	5.49	0.2
263	42.752	42.738	0.16	0.16	1.39	78	1.96	1.09	78	1.1	77	0.052	100	100	1.0	0	380	234	311	279	301	301	584	196	68	70	68	69	66	-0.028	5.62	0.2
264	42.914	42.901	0.16	0.16	1.39	78	1.97	1.09	78	1.1	77	0.052	99	100	1.0	0	380	234	310	278	301	301	583	197	68	70	68	69	66	-0.028	5.69	0.2
265	43.077	43.063	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.052	100	99	1.0	0	379	233	308	277	301	300	580	198	68	70	68	69	66	-0.028	5.72	0.2
266	43.241	43.226	0.16	0.16	1.39	78	1.97	1.09	79	1.1	78	0.052	100	100	1.0	0	378	233	307	276	302	299	578	198	68	70	68	69	67	-0.027	5.67	0.21
267	43.404	43.389	0.16	0.16	1.39	78	1.96	1.09	79	1.1	77	0.053	99	99	1.0	0	377	232	306	275	302	298	575	197	68	70	68	69	66	-0.028	5.58	0.21
268	43.567	43.552	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.053	99	99	1.0	0	376	232	305	275	302	298	577	197	68	70	68	69	66	-0.027	5.61	0.21
269	43.730	43.715	0.16	0.16	1.38	78	1.97	1.09	79	1.1	78	0.053	99	99	1.0	0	375	232	304	274	302	297	571	196	68	70	68	69	66	-0.026	5.55	0.21
270	43.893	43.877	0.16	0.16	1.38	78	1.96	1.09	78	1.1	78	0.053	99	98	1.0	0	375	231	303	273	303	297	569	196	68	70	68	69	67	-0.026	5.56	0.21
271	44.056	44.040	0.16	0.16	1.38	78	1.97	1.09	78	1.1	78	0.052	100	100	0.9	-0.1	375	231	302	272	303	297	568	196	68	70	68	69	66	-0.026	5.5	0.21
272	44.219	44.203	0.16	0.16	1.38	78	1.98	1.09	78	1.1	78	0.050	102	102	0.9	0	374	231	301	272	303	296	564	194	68	70	68	69	67	-0.026	5.42	0.2
273	44.382	44.366	0.16	0.16	1.39	78	1.97	1.09	79	1.1	79	0.051	101	101	0.9	0	373	231	300	271	303	296	563	194	68	70	68	69	67	-0.026	5.41	0.21
274	44.545	44.528	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.053	99	98	0.9	0	372	230	299	270	304	295	562	194	68	70	69	69	67	-0.026	5.51	0.21
275	44.708	44.691	0.16	0.16	1.39	78	1.97	1.09	79	1.1	79	0.052	100	100	0.9	0	371	230	298	269	305	295	558	194	68	70	69	69	67	-0.026	5.48	0.22
276	44.870	44.853	0.16	0.16	1.39	78	1.97	1.09	79	1.1	79	0.051	100	100	0.9	0	370	230	297	268	305	294	557	194	68	70	69	69	67	-0.026	5.48	0.22
277	45.033	45.017	0.16	0.16	1.39	78	1.97	1.09	79	1.1	79	0.053	99	99	0.9	0	370	229	296	268	306	294	557	194	68	70	69	69	67	-0.025	5.46	0.23
278	45.196	45.179	0.16	0.16	1.39	78	1.97	1.08	79	1.1	79	0.052	100	99	0.9	0	369	229	295	267	307	293	552	193	68	70	69	69	67	-0.026	5.37	0.23
279	45.359	45.342	0.16	0.16	1.39	78	1.97	1.09	79	1.1	79	0.051	101	101	0.9	0	368	229	294	266	308	293	552	192	69	70	69	69	67	-0.026	5.4	0.24

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
280	45.522	45.504	0.16	0.16	1.39	78	1.97	1.09	79	1.1	79	0.051	101	100	0.9	0	367	228	293	265	308	292	555	192	69	70	69	69	67	-0.026	5.39	0.23
281	45.685	45.667	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.053	99	99	0.8	-0.1	367	228	292	264	309	292	555	193	69	70	69	69	68	-0.025	5.45	0.23
282	45.848	45.830	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.052	100	100	0.8	0	367	228	291	264	310	292	553	192	69	70	69	69	67	-0.025	5.37	0.23
283	46.010	45.993	0.16	0.16	1.38	78	1.97	1.08	79	1.1	79	0.050	101	102	0.8	0	366	227	290	263	311	291	549	191	69	70	69	69	67	-0.026	5.36	0.23
284	46.173	46.155	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.051	101	100	0.8	0	366	227	289	262	311	291	545	192	69	70	69	69	68	-0.026	5.33	0.23
285	46.336	46.318	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.053	99	99	0.8	0	364	227	288	261	312	290	544	190	69	70	69	69	67	-0.025	5.27	0.23
286	46.499	46.481	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.053	99	99	0.8	0	363	226	287	261	312	290	540	190	69	70	69	69	68	-0.025	5.41	0.23
287	46.662	46.643	0.16	0.16	1.37	78	1.97	1.09	79	1.1	79	0.051	101	100	0.8	0	363	226	287	260	313	290	542	189	69	70	69	69	68	-0.025	5.42	0.22
288	46.825	46.806	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.052	100	100	0.8	0	362	226	286	259	313	289	538	188	69	70	69	69	68	-0.025	5.38	0.23
289	46.987	46.968	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.052	99	99	0.8	0	362	225	285	258	313	289	536	188	69	70	69	69	67	-0.025	5.36	0.24
290	47.150	47.131	0.16	0.16	1.38	78	1.97	1.09	79	1.1	79	0.052	100	100	0.8	0	361	225	284	258	313	288	538	187	69	70	70	69	68	-0.025	5.31	0.24
291	47.313	47.295	0.16	0.16	1.38	78	1.98	1.09	79	1.1	79	0.051	101	101	0.8	0	360	225	283	257	313	288	533	188	69	70	70	69	68	-0.025	5.25	0.24
292	47.476	47.457	0.16	0.16	1.38	78	1.98	1.09	79	1.1	79	0.052	100	99	0.7	-0.1	359	224	283	256	313	287	535	187	69	70	70	69	68	-0.025	5.22	0.24
293	47.638	47.619	0.16	0.16	1.37	79	1.98	1.09	79	1.1	79	0.052	99	99	0.7	0	359	224	282	256	313	287	533	187	69	70	70	69	68	-0.025	5.24	0.25
294	47.801	47.782	0.16	0.16	1.39	79	1.97	1.09	79	1.1	79	0.053	99	99	0.7	0	358	224	281	255	313	286	531	187	69	70	70	69	68	-0.025	5.1	0.24
295	47.963	47.945	0.16	0.16	1.38	79	1.97	1.09	79	1.1	79	0.051	100	101	0.7	0	358	223	280	255	313	286	530	186	69	70	70	69	68	-0.025	5.14	0.25
296	48.126	48.108	0.16	0.16	1.38	79	1.97	1.09	79	1.1	79	0.051	100	101	0.7	0	357	223	279	254	313	285	526	185	69	70	70	69	68	-0.025	5.09	0.24
297	48.288	48.270	0.16	0.16	1.38	79	1.98	1.09	79	1.1	79	0.055	96	96	0.7	0	357	223	279	253	313	285	528	186	69	70	70	69	68	-0.025	5.05	0.26
298	48.451	48.432	0.16	0.16	1.38	79	1.98	1.09	79	1.1	79	0.049	102	102	0.7	0	356	222	278	252	312	284	527	185	69	70	70	69	68	-0.025	5.06	0.27
299	48.614	48.595	0.16	0.16	1.38	79	1.98	1.09	79	1.1	79	0.051	100	101	0.7	0	355	222	277	252	312	284	526	186	69	71	70	69	68	-0.024	5.04	0.25
300	48.777	48.758	0.16	0.16	1.38	79	1.98	1.09	79	1.1	79	0.051	100	101	0.7	0	354	221	276	251	312	283	523	186	69	70	70	69	68	-0.024	4.98	0.25
301	48.939	48.921	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.051	100	100	0.7	0	354	221	276	250	312	283	523	186	69	71	70	69	68	-0.024	4.96	0.25
302	49.102	49.083	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.053	99	98	0.7	0	353	220	275	250	311	282	522	186	69	71	70	69	68	-0.024	4.92	0.27
303	49.265	49.246	0.16	0.16	1.38	79	1.98	1.09	80	1.1	79	0.052	99	100	0.7	0	353	220	274	249	311	281	523	185	70	71	70	69	68	-0.024	4.9	0.27
304	49.428	49.409	0.16	0.16	1.38	79	1.98	1.09	80	1.1	79	0.052	99	100	0.6	-0.1	352	220	274	248	310	281	526	185	70	71	70	69	68	-0.024	4.9	0.28
305	49.591	49.572	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.053	99	99	0.6	0	351	219	273	248	310	280	525	185	70	71	70	69	68	-0.024	4.89	0.29
306	49.754	49.734	0.16	0.16	1.37	79	1.97	1.08	80	1.1	79	0.053	99	98	0.6	0	350	219	273	247	309	280	523	185	70	71	70	69	68	-0.025	4.86	0.28
307	49.917	49.897	0.16	0.16	1.37	79	1.98	1.09	80	1.1	79	0.052	99	100	0.6	0	350	219	272	246	309	279	524	185	70	71	70	69	68	-0.024	4.89	0.27
308	50.080	50.060	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.051	100	100	0.6	0	349	218	271	246	308	278	522	185	70	71	70	69	68	-0.024	4.89	0.3
309	50.243	50.223	0.16	0.16	1.38	79	1.98	1.09	80	1.1	79	0.052	99	100	0.6	0	349	218	271	245	308	278	520	185	70	71	70	69	68	-0.024	4.83	0.28
310	50.406	50.386	0.16	0.16	1.38	79	1.98	1.09	80	1.1	79	0.052	99	100	0.6	0	347	217	270	244	307	277	522	185	70	71	70	70	68	-0.024	4.7	0.28
311	50.568	50.548	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.053	98	98	0.6	0	345	217	270	244	306	276	521	185	70	71	70	70	68	-0.024	4.68	0.3
312	50.731	50.711	0.16	0.16	1.38	79	1.98	1.09	80	1.1	79	0.052	99	100	0.6	0	345	216	269	243	306	276	522	184	70	71	70	70	68	-0.024	4.66	0.3
313	50.894	50.873	0.16	0.16	1.38	79	1.98	1.09	80	1.1	79	0.050	101	101	0.6	0	343	216	269	242	305	275	523	184	70	71	70	70	68	-0.024	4.58	0.32
314	51.056	51.037	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.051	100	101	0.6	0	342	216	268	242	304	274	528	185	70	71	70	70	68	-0.024	4.51	0.34

Wood Heater Test Data
Emissions Data

Run: 5

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 05-Nov-18
Beginning Clock Time: 11:23

Total Sampling Time: 345 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.19	30.18	30.17	30.18

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.93 ft/sec.
Initial Tunnel Flow: 142.1 scfm
Average Tunnel Flow: 146.9 scfm
Post-Test Leak Check (1): 0.000 cfm @ -10 in. Hg
Post-Test Leak Check (2): 0.001 cfm @ -14 in. Hg
Average Test Piece Fuel Moisture: 20.80 Dry Basis %

Technician Signature:

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.032	0.040	0.044	0.032	0.030	0.041	0.043	0.035	0.051	"H2O
Temp:	111	111	110	110	110	110	110	110	110	

V_{strav} 13.18 ft/sec V_{scent} 15.48 ft/sec F_p 0.851

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
315	51.219	51.199	0.16	0.16	1.38	79	1.98	1.09	80	1.1	79	0.052	99	99	0.6	0	340	215	268	241	303	273	530	185	70	71	70	70	68	-0.024	4.46	0.34
316	51.382	51.362	0.16	0.16	1.38	79	1.97	1.09	80	1.1	79	0.051	100	100	0.5	-0.1	339	215	267	240	302	273	534	185	70	71	70	70	68	-0.024	4.47	0.34
317	51.545	51.524	0.16	0.16	1.38	79	1.98	1.09	80	1.1	79	0.052	99	99	0.5	0	338	214	267	239	302	272	538	183	70	71	70	70	68	-0.024	4.39	0.33
318	51.707	51.687	0.16	0.16	1.39	79	1.97	1.09	80	1.1	79	0.053	98	99	0.5	0	336	214	267	239	300	271	535	184	70	71	70	70	69	-0.025	4.37	0.34
319	51.870	51.851	0.16	0.16	1.39	79	1.97	1.09	80	1.1	79	0.051	100	101	0.5	0	335	213	266	238	299	270	540	184	70	71	70	70	69	-0.024	4.36	0.34
320	52.033	52.013	0.16	0.16	1.38	79	1.97	1.08	80	1.1	79	0.052	99	99	0.5	0	333	213	266	237	298	269	540	184	70	71	70	70	69	-0.025	4.32	0.34
321	52.196	52.176	0.16	0.16	1.38	80	1.97	1.09	80	1.1	79	0.051	100	100	0.5	0	333	212	266	237	297	269	558	193	70	71	70	70	68	-0.030	4.37	0.36
322	52.359	52.338	0.16	0.16	1.38	80	1.98	1.09	80	1.1	80	0.052	99	99	0.5	0	334	212	265	236	296	269	573	208	70	71	70	70	69	-0.029	4.87	0.5
323	52.522	52.501	0.16	0.16	1.38	80	1.97	1.09	80	1.1	80	0.053	98	99	0.5	0	336	211	265	236	296	269	567	213	70	71	70	70	68	-0.029	5.65	0.39
324	52.685	52.665	0.16	0.16	1.38	80	1.98	1.09	80	1.1	80	0.051	100	101	0.4	-0.1	339	211	265	235	295	269	556	214	70	71	70	70	68	-0.030	5.62	0.33
325	52.849	52.827	0.16	0.16	1.38	80	1.98	1.08	80	1.1	80	0.054	98	97	0.4	0	342	210	265	235	295	269	536	215	70	71	70	70	68	-0.029	5.64	0.26
326	53.012	52.990	0.16	0.16	1.39	80	1.97	1.09	80	1.1	80	0.052	99	100	0.4	0	345	210	264	235	296	270	529	214	70	71	70	70	68	-0.029	5.43	0.27
327	53.175	53.153	0.16	0.16	1.38	80	1.98	1.09	80	1.1	80	0.052	99	100	0.4	0	347	209	264	235	296	270	519	214	70	71	70	70	68	-0.029	5.28	0.29
328	53.338	53.316	0.16	0.16	1.38	80	1.98	1.09	80	1.1	80	0.053	98	99	0.4	0	349	208	263	234	296	270	517	215	70	71	70	70	68	-0.029	5.27	0.31
329	53.500	53.479	0.16	0.16	1.38	80	1.97	1.09	80	1.1	80	0.052	99	100	0.4	0	350	208	263	234	297	270	518	214	70	71	70	70	69	-0.029	5.2	0.33
330	53.663	53.642	0.16	0.16	1.38	80	1.97	1.09	80	1.1	80	0.050	101	102	0.3	-0.1	351	207	262	234	297	270	512	214	70	71	70	70	69	-0.029	5.23	0.34
331	53.826	53.804	0.16	0.16	1.39	80	1.97	1.09	80	1.1	80	0.050	101	101	0.3	0	352	206	262	234	297	270	517	214	70	71	70	70	68	-0.029	5.4	0.34
332	53.988	53.967	0.16	0.16	1.38	80	1.97	1.09	80	1.1	80	0.051	100	101	0.3	0	353	206	261	234	298	270	519	214	70	71	70	70	68	-0.029	5.42	0.35
333	54.152	54.131	0.16	0.16	1.38	80	1.98	1.09	80	1.1	80	0.053	99	99	0.3	0	354	205	261	233	298	270	515	216	70	71	70	70	69	-0.029	5.36	0.36
334	54.314	54.294	0.16	0.16	1.38	80	1.97	1.09	80	1.1	81	0.054	97	98	0.3	0	355	205	260	233	299	270	520	216	70	71	70	70	69	-0.029	5.38	0.37
335	54.477	54.456	0.16	0.16	1.39	80	1.98	1.09	80	1.1	81	0.054	98	97	0.3	0	354	204	260	233	299	270	523	216	70	71	70	70	69	-0.029	5.33	0.39
336	54.640	54.619	0.16	0.16	1.38	80	1.98	1.09	80	1.1	81	0.052	99	100	0.2	-0.1	355	203	259	232	299	270	527	217	70	71	70	70	70	-0.029	5.29	0.41
337	54.803	54.782	0.16	0.16	1.37	80	1.98	1.09	80	1.1	81	0.051	100	101	0.2	0	355	203	259	232	299	270	532	217	70	71	71	70	70	-0.029	5.25	0.43
338	54.966	54.945	0.16	0.16	1.38	80	1.97	1.09	80	1.1	81	0.050	101	102	0.2	0	355	203	258	232	300	270	536	217	70	71	71	70	69	-0.030	5.25	0.42
339	55.129	55.108	0.16	0.16	1.38	80	1.98	1.09	80	1.1	81	0.051	100	101	0.2	0	354	202	258	231	300	269	533	216	70	71	71	70	69	-0.030	5.13	0.38
340	55.292	55.270	0.16	0.16	1.38	80	1.98	1.09	80	1.1	80	0.052	99	99	0.2	0	352	202	258	231	300	269	533	217	70	71	71	70	70	-0.030	5.07	0.38
341	55.456	55.433	0.16	0.16	1.38	80	1.98	1.09	81	1.1	80	0.051	101	100	0.2	0	351	201	257	230	300	268	532	218	70	71	71	70	69	-0.030	5.13	0.38
342	55.619	55.596	0.16	0.16	1.38	80	1.97	1.09	81	1.1	79	0.053	98	98	0.1	-0.1	350	201	257	230	300	268	533	219	70	71	71	70	70	-0.030	5.25	0.37
343	55.781	55.760	0.16	0.16	1.38	80	1.97	1.08	80	1.1	79	0.050	101	102	0.1	0	350	200	257	230	300	267	528	218	70	71	71	70	70	-0.030	5.37	0.37
344	55.944	55.922	0.16	0.16	1.39	80	1.97	1.09	81	1.1	79	0.051	100	100	0.1	0	350	200	257	230	300	267	531	217	70	71	71	70	70	-0.031	5.42	0.38
345	56.107	56.084	0.16	0.16	1.38	80	1.97	1.09	81	1.1	79	0.051	100	100	0.0	-0.1	350	200	257	229	300	267	535	218	70	71	71	70	70	-0.030	5.49	0.39
Avg/Tot	56.107	56.084	0.16	0.16	1.38	78		1.09	78		81	0.052	100	100								105.8				72	69	71	67	-0.037		

Run Aborted

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 6
Model: Encore Tracking Number: 2326 Date: 11/6/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 132, 185, 209, 283A, 296-T32, 335, 336, 340, 431, 559, 592, 635, 637

Wood Heater Run Notes

Air Control Settings

Primary:

Catalyst Removed
Fully closed

Secondary: Fixed

Tertiary/Pilot: N/A

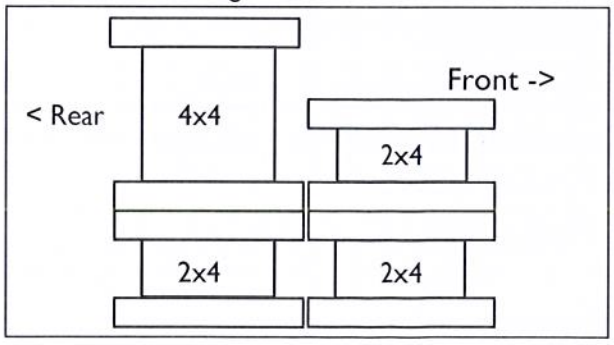
Fan: On Low

Preburn Notes

Time	Notes
12:00	Reduced to test setting, stirred
0:30:00	stirred
0:55:00	stirred
1:10:00	Stirred <30 sec (level only)

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Closed @ 0:50
Fuel loaded by: 0:45
Door closed at: 0:45
Primary air: Set throughout

Notes: No Catalyst

Time	Notes
ET: 520	Fire out, test run Aborted

Technician Signature: [signature] Date: 11/6/18

Run Aborted

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 6
Model: Encore Tracking Number: 2326 Date: 11/6/16
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 132, 185, 209, 283A, 296-T32, 335, 336, 340, 431, 559, 592, 635, 637

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16 in	19.7	7	16 in	25.4
2	16 in	21.1	8	16 in	24.1
3	16 in	19.0	9	16 in	24.6
4	16 in	20.0	10	16 in	23.8
5	16 in	21.7	11	16 in	19.9
6	16 in	22.8	12	16 in	22.0

Total Pre-Burn Fuel Weight: _____

Time (clock): 0500 Room Temperature (F): 70 Initials: A

Test Fuel

Firebox Volume (ft³): 2.02 Test Fuel Piece Length (in): 19.5
Load Weight Range (lb): 12.7-15.5
Fuel Type & Amount: 2 x 4: 3 Weight (2x4s with spacers): 5.4
4 x 4: 1 Weight (4x4s with spacers): 7.9

Total Wet Fuel Load Weight (lb): 13.3

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	4.0	20.0	19.2	19.3	4x4
2	2.3	19.8	19.7	18.4	2x4
3	2.2	24.7	23.8	25.0	"
4	2.1	19.1	19.5	19.0	"
5					
6					
7					

Spacer Moisture Readings (%DB)

13.5	14.7	13.6	13.8				
12.8	14.0	13.7	12.6				
12.8	13.6	14.9	14.7				
11.8	13.1	12.4	14.4				

Time (clock): 0800 Room Temperature (F): 70 Initials: A

Technician Signature: _____ Date: 11/6/16

RUN ABORTED

Wood Heater Preburn Data - ASTM E2780

Run: 6

Technician Signature: _____

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/6/18
Beginning Clock Time:	11:03

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	17.8		
Fuel Moisture Readings (% DB):	19.2	20.9	18.9
	19.4	20.9	22.8
	21.7	20	
	21.1	19.8	
	19.4	19.8	
Avg Preburn Moisture (% DB):	**20.33**		

Coal Bed Range (lb):	**2.7** (min)	**3.3** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
0	11.5	-0.054	475	239	163	283	251	282.2	412	68
1	11.2	-0.052	476	243	165	283	252	283.8	365	69
2	11	-0.049	475	248	165	283	252	284.6	336	68
3	10.8	-0.051	470	252	165	283	253	284.6	318	68
4	10.6	-0.049	470	255	165	282	253	285	313	68
5	10.4	-0.052	467	259	165	281	252	284.8	317	68
6	10.2	-0.048	458	262	166	280	252	283.6	314	69
7	10.1	-0.046	448	266	169	278	252	282.6	295	68
8	10	-0.044	439	269	174	276	251	281.8	282	68
9	9.9	-0.042	431	272	177	274	249	280.6	270	68
10	9.9	-0.042	423	276	180	272	249	280	262	68
11	9.8	-0.041	417	279	181	270	247	278.8	258	68
12	9.7	-0.041	410	282	183	269	246	278	255	68
13	9.6	-0.041	405	285	185	267	245	277.4	254	68
14	9.5	-0.039	402	288	186	264	243	276.6	250	68
15	9.5	-0.039	399	291	188	263	242	276.6	247	68
16	9.4	-0.039	396	293	190	261	241	276.2	245	68
17	9.3	-0.038	395	295	191	259	240	276	243	68
18	9.2	-0.037	393	298	192	258	239	276	240	69
19	9.2	-0.039	392	300	194	256	238	276	239	69
20	9.1	-0.04	391	302	195	255	237	276	240	69
21	9	-0.038	390	304	196	254	237	276.2	238	69
22	8.9	-0.038	390	305	198	253	238	276.8	238	69
23	8.9	-0.038	390	307	199	251	235	276.4	237	69
24	8.8	-0.037	390	309	200	250	234	276.6	235	68
25	8.7	-0.037	390	310	200	249	232	276.2	236	68
26	8.6	-0.038	391	311	201	247	231	276.2	240	68
27	8.6	-0.038	393	313	202	247	230	277	240	68
28	8.5	-0.04	394	314	203	246	230	277.4	243	67
29	8.4	-0.039	395	315	205	245	229	277.8	244	67
30	8.4	-0.037	395	316	206	244	228	277.8	243	68
31	8.1	-0.074	396	316	208	244	227	278.2	510	68
32	7.9	-0.052	403	317	210	244	227	280.2	391	67
33	7.8	-0.051	398	318	213	244	227	280	353	67
34	7.7	-0.051	394	319	220	244	227	280.8	336	67
35	7.6	-0.05	390	320	229	243	226	281.6	329	68
36	7.5	-0.05	387	321	239	243	226	283.2	325	68
37	7.4	-0.05	385	322	248	243	226	284.8	325	68
38	7.3	-0.05	384	323	258	243	226	286.8	323	68

RUN ABORTED

Wood Heater Preburn Data - ASTM E2780

Run: 6

Technician Signature: 

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/6/18
Beginning Clock Time:	11:03

Coal Bed Range (lb):	2.7 (min)	3.3 (max)

Preburn Fuel Data

Fuel Piece Lengths (in.):	16
Total Preburn Weight (lb):	17.8

Fuel Moisture Readings (% DB):			
	19.2	20.9	18.9
	19.4	20.9	22.8
	21.7	20	
	21.1	19.8	
	19.4	19.8	
Avg Preburn Moisture (% DB):	**20.33**		

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
39	7.2	-0.05	382	324	266	243	226	288.2	322	68
40	7.1	-0.05	382	325	275	242	226	290	323	68
41	7	-0.05	381	326	283	243	225	291.6	324	68
42	6.9	-0.05	382	326	291	243	225	293.4	327	68
43	6.8	-0.05	382	327	298	243	225	295	326	68
44	6.7	-0.05	383	328	305	243	225	296.8	327	67
45	6.6	-0.05	384	329	312	244	225	298.8	328	68
46	6.5	-0.05	385	329	318	244	226	300.4	325	68
47	6.4	-0.05	387	329	324	244	226	302	326	67
48	6.3	-0.05	388	331	329	245	227	304	327	68
49	6.2	-0.049	390	331	333	246	227	305.4	325	68
50	6.1	-0.049	391	331	337	246	228	306.6	323	67
51	6	-0.049	393	332	341	248	228	308.4	323	68
52	6	-0.049	395	333	344	248	229	309.8	320	68
53	5.9	-0.047	398	333	347	249	230	311.4	319	68
54	5.8	-0.047	400	334	350	251	231	313.2	316	68
55	5.7	-0.048	402	334	352	253	231	314.4	315	68
56	5.7	-0.048	405	334	354	253	232	315.6	314	68
57	5.4	-0.058	419	335	354	255	232	319	495	68
58	5.3	-0.055	435	335	355	257	235	323.4	404	69
59	5.2	-0.052	447	336	356	260	238	327.4	372	68
60	5.1	-0.052	456	337	359	263	241	331.2	354	68
61	5	-0.051	462	337	362	265	244	334	342	68
62	4.9	-0.051	459	337	364	268	246	334.8	333	68
63	4.9	-0.049	456	338	366	269	247	335.2	328	68
64	4.8	-0.049	454	338	367	271	249	335.8	324	68
65	4.8	-0.049	452	338	368	272	250	336	318	68
66	4.7	-0.048	452	339	369	274	252	337.2	313	67
67	4.6	-0.047	452	339	369	275	253	337.6	311	68
68	4.6	-0.048	453	340	368	276	255	338.4	308	68
69	4.5	-0.046	453	340	368	277	256	338.8	305	68
70	4.5	-0.045	453	341	367	278	257	339.2	302	67
71	4.4	-0.044	453	341	365	280	259	339.6	296	68
72	4.4	-0.044	455	342	363	281	260	340.2	292	68
73	4.4	-0.043	457	342	361	283	261	340.8	286	67
74	4.4	-0.043	459	343	359	283	262	341.2	281	67
75	4.3	-0.043	462	343	356	284	263	341.6	279	68
76	4.3	-0.042	465	344	352	285	264	342	273	68
77	7.4	-0.056	464	343	348	286	265	341.2	356	68

RUN ABORTED

Wood Heater Preburn Data - ASTM E2780

Run: 6

Technician Signature: _____

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/6/18
Beginning Clock Time:	11:03

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	17.8		
Fuel Moisture Readings (% DB):	19.2	20.9	18.9
	19.4	20.9	22.8
	21.7	20	
	21.1	19.8	
	19.4	19.8	
Avg Preburn Moisture (% DB):	**20.33**		

Coal Bed Range (lb):	**2.7** (min)	**3.3** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
78	4.1	-0.046	472	344	345	287	267	343	331	67
79	4	-0.046	466	345	342	290	268	342.2	309	67
80	4	-0.045	462	345	341	290	269	341.4	297	68
81	4	-0.044	458	345	340	290	271	340.8	290	68
82	3.9	-0.043	454	345	340	292	272	340.6	283	68
83	3.9	-0.042	451	345	340	293	273	340.4	280	68
84	3.9	-0.042	448	344	339	293	274	339.6	278	68
85	3.8	-0.042	448	344	339	294	275	340	274	68
86	3.8	-0.041	446	344	338	294	276	339.6	268	69
87	3.8	-0.041	445	344	336	295	277	339.4	266	68
88	3.8	-0.039	443	343	335	295	278	338.8	263	67
89	3.8	-0.04	442	342	333	296	279	338.4	260	68
90	3.7	-0.039	441	342	331	297	279	338	257	69
91	3.7	-0.039	441	342	328	297	281	337.8	254	68
92	3.7	-0.039	441	341	325	297	281	337	251	68
93	3.7	-0.039	440	341	322	297	282	336.4	247	68
94	3.7	-0.038	440	340	319	298	283	336	246	67
95	3.7	-0.038	441	340	316	299	283	335.8	243	67
96	3.7	-0.037	440	339	313	299	283	334.8	241	67
97	3.6	-0.037	440	339	309	299	283	334	240	67
98	3.6	-0.037	440	339	306	299	284	333.6	239	67
99	3.6	-0.036	441	338	302	299	285	333	238	67
100	3.6	-0.036	441	338	299	299	285	332.4	237	67
101	3.6	-0.036	441	337	296	300	285	331.8	234	67
102	3.6	-0.035	441	337	292	299	285	330.8	234	67
103	3.6	-0.035	442	337	289	300	286	330.8	231	67
104	3.5	-0.035	441	336	285	299	286	329.4	229	67
105	3.5	-0.035	441	335	282	299	286	328.6	226	67
106	3.5	-0.034	441	335	279	299	286	328	227	67
107	3.5	-0.034	441	334	276	298	286	327	224	67
108	3.5	-0.034	441	334	272	299	287	326.6	223	67
109	3.5	-0.033	441	333	269	298	287	325.6	221	67
110	3.5	-0.032	440	333	266	298	287	324.8	220	68
111	3.4	-0.033	440	333	263	297	286	323.8	219	68
112	3.4	-0.033	440	332	260	296	287	323	216	67
113	3.4	-0.031	439	332	257	296	286	322	216	67
114	3.4	-0.031	438	331	254	296	286	321	216	67
115	3.4	-0.031	437	331	252	295	286	320.2	215	67
116	3.4	-0.031	437	330	249	295	286	319.4	215	67

RUN ABORTED

Wood Heater Preburn Data - ASTM E2780

Run: 6

Technician Signature: _____

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/6/18
Beginning Clock Time:	11:03

Preburn Fuel Data

Fuel Piece Lengths (in.):	16		
Total Preburn Weight (lb):	17.8		
Fuel Moisture Readings (% DB):	19.2	20.9	18.9
	19.4	20.9	22.8
	21.7	20	
	21.1	19.8	
	19.4	19.8	
Avg Preburn Moisture (% DB):	**20.33**		

Coal Bed Range (lb):	**2.7** (min)	**3.3** (max)

			Temperatures (°F)							
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Avg. FB	Stack	Ambient
117	3.4	-0.031	437	330	246	294	286	318.6	213	67
118	3.4	-0.03	436	329	244	294	285	317.6	211	67
119	3.3	-0.03	435	329	241	294	285	316.8	209	67
120	3.3	-0.03	435	329	239	294	284	316.2	207	67
121	3.3	-0.03	435	328	236	293	284	315.2	206	67
122	3.3	-0.029	435	328	234	291	284	314.4	205	67
123	3.3	-0.029	435	327	232	291	284	313.8	205	67
124	3.3	-0.028	434	326	230	291	282	312.6	204	68
125	3.3	-0.029	434	326	228	289	282	311.8	203	67
126	3.3	-0.028	433	326	225	289	282	311	202	68
127	3.8	-0.033	430	325	224	290	282	310.2	240	68
128	3.2	-0.031	437	325	222	289	281	310.8	231	67
129	3.2	-0.031	440	324	220	288	280	310.4	220	67
130	3.2	-0.03	440	324	218	287	280	309.8	216	67
131	3.2	-0.03	440	323	216	287	280	309.2	212	67
132	3.1	-0.03	439	323	213	285	279	307.8	209	67
133	3.1	-0.029	438	323	211	285	278	307	206	67
134	3.1	-0.03	437	322	209	284	277	305.8	207	67
135	3.1	-0.029	436	321	207	283	277	304.8	205	68

RUN ABORTED

Wood Heater Test Fuel Data

Manufacturer:	HHT Halifax
Model:	Encore
Tracking No.:	2326
Project No.:	0135WS042E
Test Date:	11/6/2018
Run No.:	6

Firebox Volume (ft^3):	2
Fuel Piece Length (in):	19.5
2x4 Crib Weight (lb):	7.9
4x4 Crib Weight (lb):	5.4

Total Fuel Weight (Dry Basis, lb):	11.1	
Fuel Density (lb/ft^3, Dry Basis):	30.23	OK
Loading Density (lb/ft^3, Wet Basis):	6.65	OK
2x4 Percentage:	59%	OK

Coal Bed Range (20-25%): **2.66 - 3.325**

Test Fuel Piece	Weight (lb)	Size	Readings (Dry Basis %)			Dry Weight (lb)
1	4.9	4"x 4"	20.0	19.2	19.3	4.10
2	2.3	2"x 4"	19.8	19.7	19.4	1.92
3	2.2	2"x 4"	24.7	23.8	25.0	1.77
4	2.1	2"x 4"	19.1	19.5	19.0	1.76

Spacer Readings (Dry Basis %)			
13.5	14.4		
12.8	14.3		
12.8	12.6		
11.8	13.8		
14.7	12.9		
14.0	14.8		
13.6	13.7		
13.1	13.6		

Technician Signature: _____

RUN ABORTED

Wood Heater Test Data Emissions Data

Run: 6

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 06-Nov-18
Beginning Clock Time: 11:51

Total Sampling Time: 520 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure: Begin 30.32 Middle _____ End _____ Average 30.32 0

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.90 ft/sec.
Initial Tunnel Flow: 149.1 scfm
Average Tunnel Flow: 147.7 scfm
Post-Test Leak Check (1): N/A cfm @ _____ in. Hg
Post-Test Leak Check (2): N/A cfm @ _____ in. Hg
Average Test Piece Fuel Moisture: 20.71 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.044	0.038	0.034	0.044	0.046	0.032	0.058	"H2O
Temp:	79	79	79	79	79	79	79	79	79	

V_{strav} 13.35 ft/sec V_{scent} 16.02 ft/sec F_p 0.833

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			1.02	71	1.86	0.94	72	1.0	96	0.054			12.7		457	324	265	300	296	328	767	270	67	66	67	67	68	-0.033	1.65	0.2
1	0.151	0.158	0.15	0.16	1.36	71	2.05	1.13	72	1.0	114	0.052	157	161	12.7	0	440	324	264	299	296	325	770	251	67	67	68	67	68	-0.036	1.02	0.16
2	0.310	0.321	0.16	0.16	1.37	71	2.06	1.12	72	1.0	92	0.054	159	160	12.6	-0.1	423	323	262	296	294	320	797	269	67	68	69	67	68	-0.037	7.32	0.21
3	0.470	0.484	0.16	0.16	1.37	71	2.06	1.12	72	1.0	86	0.052	162	162	12.6	0	409	322	261	294	292	316	821	257	67	68	69	67	69	-0.038	9.84	0.16
4	0.629	0.646	0.16	0.16	1.35	71	2.05	1.11	72	1.0	83	0.055	156	156	12.5	-0.1	397	322	260	290	288	311	836	255	67	68	69	67	68	-0.038	9.62	0.13
5	0.789	0.807	0.16	0.16	1.36	71	2.06	1.11	72	1.0	81	0.054	158	156	12.5	0	387	321	259	286	285	308	847	255	67	68	69	67	68	-0.038	9.88	0.12
6	0.948	0.969	0.16	0.16	1.36	71	2.05	1.11	72	1.0	81	0.053	159	158	12.4	-0.1	378	320	259	282	281	304	858	256	67	68	69	67	68	-0.039	9.84	0.12
7	1.107	1.132	0.16	0.16	1.35	71	2.05	1.11	72	1.0	80	0.055	156	156	12.4	0	371	320	260	278	278	301	861	258	67	68	69	67	68	-0.039	9.94	0.074
8	1.266	1.294	0.16	0.16	1.35	71	2.05	1.11	72	1.0	80	0.054	157	157	12.3	-0.1	363	319	260	274	274	298	869	258	67	68	69	67	68	-0.039	10.16	0.055
9	1.425	1.455	0.16	0.16	1.36	72	2.06	1.10	72	1.0	80	0.055	156	154	12.2	-0.1	361	318	261	271	271	296	890	260	67	68	69	67	68	-0.039	10.5	0.058
10	1.583	1.617	0.16	0.16	1.34	72	2.04	1.11	72	1.0	80	0.055	155	155	12.2	0	357	317	262	267	267	294	913	264	67	68	69	67	68	-0.040	10.89	0.12
11	1.742	1.779	0.16	0.16	1.35	72	2.04	1.10	73	1.0	80	0.056	154	154	12.1	-0.1	354	317	263	264	264	292	925	269	67	68	69	67	68	-0.040	10.88	0.13
12	1.901	1.940	0.16	0.16	1.35	72	2.05	1.10	73	1.0	80	0.054	157	156	12.0	-0.1	352	316	265	261	262	291	939	270	67	68	69	67	68	-0.041	10.91	0.15
13	2.060	2.101	0.16	0.16	1.35	72	2.04	1.10	73	1.0	80	0.053	159	157	12.0	0	349	315	267	258	259	290	949	271	67	68	69	68	67	-0.041	11.04	0.12
14	2.219	2.262	0.16	0.16	1.34	72	2.04	1.10	73	1.0	80	0.053	159	157	11.9	-0.1	348	314	269	255	256	288	962	273	67	68	69	68	67	-0.041	11.23	0.2
15	2.378	2.425	0.16	0.16	1.34	72	2.04	1.10	73	1.0	80	0.054	157	157	11.8	-0.1	347	314	271	253	254	288	981	275	67	68	69	68	67	-0.041	11.52	0.26
16	2.536	2.585	0.16	0.16	1.34	72	2.04	1.09	73	1.0	80	0.054	156	155	11.7	-0.1	346	313	274	250	252	287	997	277	67	68	69	68	67	-0.041	11.7	0.23
17	2.695	2.746	0.16	0.16	1.34	72	2.04	1.10	73	1.0	80	0.056	154	153	11.7	0	346	312	276	248	250	286	1007	277	67	68	69	68	67	-0.041	11.77	0.19
18	2.853	2.910	0.16	0.16	1.34	73	2.04	1.12	73	1.0	80	0.053	157	160	11.6	-0.1	345	311	279	247	248	286	1018	281	67	69	69	68	68	-0.041	11.8	0.24
19	3.011	3.074	0.16	0.16	1.34	73	2.04	1.12	74	1.0	81	0.054	156	158	11.5	-0.1	344	311	281	246	246	286	1029	281	67	69	69	68	68	-0.042	11.81	0.2
20	3.170	3.237	0.16	0.16	1.33	73	2.04	1.11	74	1.0	81	0.055	155	156	11.4	-0.1	344	310	284	244	244	285	1035	281	67	69	70	68	67	-0.041	11.79	0.19
21	3.329	3.400	0.16	0.16	1.34	73	2.04	1.12	74	1.0	81	0.056	154	155	11.3	-0.1	344	309	287	242	243	285	1043	283	67	69	70	68	68	-0.042	11.8	0.2
22	3.488	3.563	0.16	0.16	1.33	73	2.04	1.12	74	1.0	81	0.053	158	159	11.2	-0.1	345	308	290	240	241	285	1049	285	67	69	70	68	68	-0.043	11.98	0.17
23	3.646	3.726	0.16	0.16	1.33	73	2.04	1.12	74	1.0	81	0.053	157	159	11.2	0	346	308	293	239	240	285	1058	286	67	69	70	68	68	-0.043	12.02	0.24
24	3.805	3.890	0.16	0.16	1.34	73	2.04	1.12	74	1.1	81	0.055	155	157	11.1	-0.1	347	307	295	237	238	285	1065	286	67	69	70	68	67	-0.043	11.98	0.27
25	3.963	4.053	0.16	0.16	1.33	74	2.04	1.12	74	1.1	81	0.054	156	157	11.0	-0.1	348	306	298	236	237	285	1079	289	67	69	70	68	67	-0.043	12.17	0.35
26	4.122	4.216	0.16	0.16	1.34	74	2.04	1.12	75	1.0	81	0.054	157	157	10.9	-0.1	350	305	300	235	236	285	1094	289	67	69	70	68	67	-0.043	12.19	0.38
27	4.280	4.379	0.16	0.16	1.34	74	2.04	1.12	75	1.0	81	0.054	156	157	10.8	-0.1	352	305	303	233	236	286	1103	294	67	69	70	68	67	-0.044	12.29	0.34
28	4.439	4.543	0.16	0.16	1.34	74	2.03	1.12	75	1.1	81	0.053	158	159	10.7	-0.1	352	304	305	233	235	286	1103	295	67	69	70	68	67	-0.044	12.32	0.32
29	4.598	4.706	0.16	0.16	1.34	74	2.04	1.12	75	1.1	81	0.055	155	156	10.6	-0.1	355	304	308	232	234	287	1116	294	67	69	70	68	67	-0.044	12.44	0.39
30	4.757	4.870	0.16	0.16	1.34	74	2.04	1.12	75	1.0	81	0.054	157	158	10.6	0	357	303	310	231	234	287	1121	295	67	69	70	68	67	-0.044	12.58	0.4
31	4.916	5.033	0.16	0.16	1.33	74	2.04	1.11	75	1.0	81	0.054	157	157	10.5	-0.1	360	302	313	231	233	288	1128	296	67	69	70	68	67	-0.043	12.75	0.41
32	5.075	5.196	0.16	0.16	1.33	75	2.04	1.12	75	1.0	82	0.053	158	159	10.4	-0.1	367	302	315	230	233	289	1140	300	67	69	70	68	67	-0.045	13.11	0.51
33	5.233	5.359	0.16	0.16	1.34	75	2.05	1.12	76	1.1	82	0.053	157	158	10.3	-0.1	374	301	318	230	233	291	1157	302	67	70	70	68	67	-0.045	13.56	0.82
34	5.392	5.523	0.16	0.16	1.33	75	2.04	1.12	76	1.1	82	0.055	155	156	10.2	-0.1	382	300	320	230	232	293	1165	305	67	70	70	68	67	-0.046	13.5	0.78
35	5.551	5.687	0.16	0.16	1.34	75	2.05	1.12	76	1.1	82	0.053	158	159	10.1	-0.1	388	300	323	230	232	295	1175	309	67	70	70	68	67	-0.046	13.69	0.85
36	5.710	5.850	0.16	0.16	1.34	75	2.05	1.12	76	1.1	82	0.054	156	157	10.0	-0.1	392	299	325	229	232	295	1177	307	67	70	70	68	67	-0.046	13.58	0.72
37	5.869	6.013	0.16	0.16	1.34	75	2.04	1.12	76	1.1	82	0.053	158	158	9.9	-0.1	395	299	328	229	232	297	1178	308	67	70	70	69	67	-0.046	13.55	0.59
38	6.028	6.176	0.16	0.16	1.34	75	2.04	1.12	76	1.1	82	0.054	156	157	9.8	-0.1	396	298	330	229	232	297	1182	309	67	70	70	69	67	-0.046	13.61	0.62
39	6.187	6.340	0.16	0.16	1.34	75	2.05	1.12	76	1.1	82	0.054	156	158	9.7	-0.1	400	298	332	229	233	298	1194	309	67	70	70	69	67	-0.047	13.89	0.74
40	6.346	6.504	0.16	0.16	1.34	75	2.05	1.12	76	1.1	83	0.054	157	158	9.6	-0.1	406	297	335	229	233	300	1206	314	67	70	70	69	68	-0.046	14.21	1.12
41	6.505	6.668	0.16	0.16	1.33	75	2.05	1.12	77	1.1	83	0.053	158	159	9.5	-0.1	410	297	337	229	234	301	1213	317	67	70	70	69	67	-0.047	14.18	1.1
42	6.664	6.831	0.16	0.16	1.33	76	2.05	1.12	77	1.1	83	0.054	156	157	9.4	-0.1	415	296	340	230	234	303	1217	316	67	70	70	69	67	-0.047	14.01	0.99
43	6.823	6.994	0.16	0.16	1.34	76	2.04	1.12	77	1.1	83	0.052	159	160	9.3	-0.1	421	296	342	230	235	305	1218	317	67	70	70	69	67	-0.047	13.94	0.9
44	6.982	7.158	0.16	0.16	1.35	76	2.05	1.12	77	1.0	83	0.053	158	159	9.2	-0.1	425	296	344	231	235	306	1214	316	67	70	70	69	67	-0.045	13.86	0.7
45	7.141	7.321	0.16	0.16	1.35	76	2.04	1.12	77	1.1	83	0.054	156	157	9.1	-0.1	427	295	346	231	236	307	1211	315	67	70	70	69	67	-0.049	13.74	0.59
46	7.300	7.486	0.16	0.17	1.34	76	2.05	1.12	77	1.1	82	0.054	156	159	9.0	-0.1	426	295	348	232	236	307	1204	313	67	70	70	69	67	-0.048	13.7	0.5
47	7.460	7.649	0.16	0.16	1.34	76	2.04	1.11	77	1.1	83	0.054	157	157	8.9	-0.1	429	295	350	233	237	309	1191	311	67	71	70	69	68	-0.046	13.42	0.47
48	7.620	7.812	0.16	0.16	1.33	76	2.05	1.12	77	1.1	83	0.053	159	158	8.8	-0.1	430	294	351	233	238	309	1187	309	67	71	70	69	67	-0.045	13.36	0.44
49	7.779	7.976	0.16	0.16	1.34	76	2.04	1.12	77	1.1	83	0.053	158	159	8.8	0	429	294	352	234	238	309	1182	309	67	71	70	69	67	-0.043	13.33	0.46
50	7.938	8.139	0.16	0.16	1.34	76	2.05	1.12	77	1.1	83	0.056	153	154	8.7	-0.1	430	294	352	234	239	310	1171	308	67	71	70	69	67	-0.045	13.33	0.52
51	8.097	8.303	0.16	0.16	1.34	76	2.04	1.13	77	1.1	83	0.054	156	158	8.6	-0.1	428	293	353	234	240	310	1163	305	67	71	70	69	67	-0.045	13.46	0.43
52	8.256	8.467	0.16	0.16	1.34	76	2.04	1.12	78	1.1	83	0.053	158	159	8.5	-0.1	429	293	353	235	240	310	1163	309	67	71	70	69	67	-0.046	13.41	0.44
53	8.415	8.631	0.16	0.16	1.33	77	2.04	1.12	78	1.1	83	0.055	155	156	8.4	-0.1	431	293	353	235	241	311	1151	306	67	71	70	69	68	-0.045	13.2	0.46

RUN ABORTED

Wood Heater Test Data Emissions Data

Run: 6

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 06-Nov-18
Beginning Clock Time: 11:51

Total Sampling Time: 520 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure: Begin 30.32 Middle _____ End _____ Average 30.32 0

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.90 ft/sec.
Initial Tunnel Flow: 149.1 scfm
Average Tunnel Flow: 147.7 scfm
Post-Test Leak Check (1): N/A cfm @ _____ in. Hg
Post-Test Leak Check (2): N/A cfm @ _____ in. Hg
Average Test Piece Fuel Moisture: 20.71 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.044	0.038	0.034	0.044	0.046	0.032	0.058	"H2O
Temp:	79	79	79	79	79	79	79	79	79	

V_{strav} 13.35 ft/sec V_{scent} 16.02 ft/sec F_p 0.833

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
54	8.575	8.794	0.16	0.16	1.34	77	2.04	1.12	78	1.1	83	0.055	156	155	8.3	-0.1	434	292	353	236	242	311	1148	305	67	71	70	69	68	-0.045	13.13	0.66
55	8.734	8.958	0.16	0.16	1.34	77	2.04	1.12	78	1.1	82	0.056	153	154	8.2	-0.1	437	292	353	236	242	312	1156	307	67	71	70	69	67	-0.044	13.2	0.56
56	8.893	9.122	0.16	0.16	1.35	77	2.04	1.12	78	1.1	83	0.055	155	156	8.2	0	440	292	353	237	243	313	1162	308	67	71	70	70	67	-0.044	13.32	0.54
57	9.053	9.286	0.16	0.16	1.34	77	2.05	1.12	78	1.1	83	0.054	157	157	8.1	-0.1	444	292	353	239	244	314	1162	307	67	71	70	70	67	-0.044	13.29	0.59
58	9.213	9.450	0.16	0.16	1.33	77	2.04	1.12	78	1.1	83	0.055	156	156	8.0	-0.1	448	291	352	239	245	315	1165	306	67	71	70	70	67	-0.046	13.17	0.59
59	9.373	9.613	0.16	0.16	1.34	77	2.04	1.11	78	1.1	82	0.055	155	155	7.9	-0.1	453	291	352	239	246	316	1162	305	67	71	70	70	67	-0.045	13.27	0.48
60	9.532	9.777	0.16	0.16	1.34	77	2.04	1.12	78	1.1	83	0.054	156	157	7.8	-0.1	457	291	352	240	247	317	1163	307	67	71	70	70	68	-0.048	13.29	0.45
61	9.688	9.940	0.16	0.16	1.34	77	2.04	1.12	78	1.1	83	0.053	155	158	7.7	-0.1	461	291	352	241	247	318	1158	307	68	71	70	70	68	-0.044	13.18	0.47
62	9.848	10.104	0.16	0.16	1.34	77	2.04	1.12	78	1.1	82	0.054	157	157	7.7	0	464	291	352	242	248	319	1158	311	67	71	70	70	67	-0.045	13.18	0.47
63	10.006	10.269	0.16	0.17	1.34	77	2.05	1.13	78	1.1	83	0.055	154	157	7.6	-0.1	466	291	351	242	250	320	1147	308	67	71	70	70	67	-0.043	13.15	0.47
64	10.166	10.433	0.16	0.16	1.34	77	2.05	1.12	78	1.1	82	0.053	158	159	7.5	-0.1	469	290	351	243	250	321	1147	305	67	71	70	70	68	-0.043	13.09	0.42
65	10.326	10.597	0.16	0.16	1.34	77	2.05	1.12	78	1.1	83	0.053	158	159	7.4	-0.1	469	289	351	244	251	321	1136	302	67	71	70	70	68	-0.044	13.23	0.35
66	10.485	10.760	0.16	0.16	1.34	77	2.05	1.12	78	1.1	83	0.054	156	156	7.3	-0.1	472	289	350	246	251	322	1122	301	67	71	70	70	68	-0.044	12.89	0.29
67	10.646	10.924	0.16	0.16	1.33	77	2.05	1.12	78	1.1	82	0.055	156	156	7.3	0	473	289	350	246	252	322	1115	300	67	72	70	70	67	-0.044	12.88	0.32
68	10.805	11.088	0.16	0.16	1.34	77	2.05	1.12	79	1.1	82	0.053	157	158	7.2	-0.1	475	289	349	246	252	322	1110	302	67	72	70	70	67	-0.044	12.89	0.27
69	10.965	11.252	0.16	0.16	1.34	77	2.05	1.12	79	1.1	82	0.054	157	157	7.1	-0.1	476	289	348	246	253	322	1108	299	67	72	70	70	68	-0.044	12.84	0.25
70	11.124	11.416	0.16	0.16	1.34	77	2.04	1.12	79	1.1	82	0.055	154	156	7.0	-0.1	479	289	347	247	254	323	1107	299	67	72	70	70	68	-0.043	12.78	0.28
71	11.284	11.580	0.16	0.16	1.33	77	2.05	1.12	79	1.1	82	0.052	160	160	7.0	0	480	288	346	247	255	323	1115	300	67	72	70	70	67	-0.043	12.8	0.39
72	11.443	11.744	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.051	160	162	6.9	-0.1	483	288	346	247	256	324	1119	301	67	72	70	70	68	-0.044	12.9	0.41
73	11.603	11.907	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.053	158	157	6.8	-0.1	485	288	345	248	257	325	1121	299	67	72	70	70	68	-0.043	12.78	0.43
74	11.762	12.071	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.054	156	157	6.8	0	485	288	344	249	257	325	1124	301	67	72	70	70	68	-0.043	12.93	0.37
75	11.925	12.238	0.16	0.17	1.34	78	2.04	1.12	79	1.1	82	0.055	158	158	6.7	-0.1	486	288	344	250	258	325	1123	299	67	72	70	70	68	-0.044	12.82	0.39
76	12.084	12.403	0.16	0.17	1.34	78	2.04	1.13	79	1.1	82	0.055	154	156	6.6	-0.1	486	288	343	250	259	325	1123	298	67	72	70	70	67	-0.044	12.62	0.49
77	12.244	12.567	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.055	155	156	6.5	-0.1	488	288	343	251	260	326	1124	299	67	72	70	70	67	-0.047	12.61	0.5
78	12.403	12.730	0.16	0.16	1.34	78	2.04	1.11	79	1.1	82	0.054	156	156	6.5	0	490	288	342	251	261	326	1122	299	67	72	70	70	67	-0.047	12.84	0.52
79	12.563	12.894	0.16	0.16	1.35	78	2.05	1.12	79	1.1	82	0.053	158	158	6.4	-0.1	492	287	342	252	262	327	1114	297	67	72	70	70	67	-0.043	12.85	0.52
80	12.723	13.058	0.16	0.16	1.34	78	2.03	1.12	79	1.1	82	0.052	160	160	6.3	-0.1	493	287	342	253	263	328	1114	295	67	72	70	70	68	-0.043	12.67	0.5
81	12.883	13.222	0.16	0.16	1.33	78	2.04	1.12	79	1.1	82	0.054	157	157	6.2	-0.1	495	287	341	254	263	328	1105	296	70	72	70	70	67	-0.043	12.69	0.59
82	13.043	13.386	0.16	0.16	1.34	78	2.05	1.12	79	1.1	82	0.055	155	156	6.2	0	492	287	341	255	264	328	1098	298	70	72	70	70	68	-0.043	13.05	0.59
83	13.202	13.551	0.16	0.17	1.34	78	2.04	1.12	79	1.1	82	0.056	153	155	6.1	-0.1	490	287	340	255	265	327	1096	296	70	72	70	70	68	-0.044	12.7	0.56
84	13.362	13.714	0.16	0.16	1.34	78	2.04	1.11	79	1.1	82	0.053	158	157	6.0	-0.1	492	287	340	256	266	328	1091	296	70	72	70	70	67	-0.044	12.97	0.36
85	13.522	13.878	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.054	157	157	5.9	-0.1	493	287	339	256	266	328	1094	295	70	72	70	70	67	-0.042	12.73	0.41
86	13.681	14.042	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.053	157	158	5.9	0	494	287	338	257	267	329	1087	297	70	72	70	70	68	-0.043	12.84	0.34
87	13.841	14.206	0.16	0.16	1.34	78	2.04	1.13	79	1.1	82	0.051	161	162	5.8	-0.1	495	286	338	258	268	329	1081	296	70	72	70	70	68	-0.043	12.78	0.3
88	14.000	14.370	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.054	156	157	5.7	-0.1	496	286	337	258	269	329	1079	293	70	72	70	70	67	-0.043	12.82	0.18
89	14.160	14.535	0.16	0.17	1.34	78	2.05	1.12	79	1.1	82	0.053	158	159	5.7	0	497	286	337	259	270	330	1081	294	70	72	70	70	68	-0.043	12.88	0.18
90	14.320	14.699	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.055	155	155	5.6	-0.1	498	286	336	260	271	330	1085	294	70	72	70	70	68	-0.043	12.75	0.15
91	14.480	14.862	0.16	0.16	1.35	78	2.05	1.12	79	1.1	81	0.054	156	156	5.5	-0.1	497	286	336	260	272	330	1083	297	70	72	70	70	68	-0.043	12.88	0.16
92	14.640	15.027	0.16	0.16	1.34	78	2.05	1.12	79	1.1	81	0.053	158	159	5.5	0	499	286	335	260	272	330	1072	291	70	72	70	70	67	-0.042	12.54	0.18
93	14.800	15.191	0.16	0.16	1.34	78	2.05	1.13	79	1.1	82	0.054	157	157	5.4	-0.1	501	285	335	261	273	331	1063	292	70	72	70	70	67	-0.042	12.46	0.29
94	14.960	15.355	0.16	0.16	1.34	78	2.04	1.12	79	1.1	82	0.054	157	157	5.3	-0.1	502	285	334	262	274	331	1057	292	70	72	70	71	67	-0.042	12.62	0.21
95	15.120	15.519	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.054	156	157	5.3	0	501	285	334	262	275	331	1052	294	70	72	70	71	67	-0.041	12.44	0.28
96	15.280	15.683	0.16	0.16	1.34	78	2.05	1.12	79	1.1	81	0.055	155	155	5.2	-0.1	501	285	333	262	275	331	1044	291	70	72	70	71	67	-0.042	12.33	0.19
97	15.440	15.847	0.16	0.16	1.34	78	2.05	1.12	79	1.1	81	0.054	156	157	5.1	-0.1	501	285	332	263	276	331	1043	295	70	72	70	71	67	-0.042	12.36	0.26
98	15.599	16.011	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.055	154	155	5.1	0	502	285	331	263	276	331	1036	292	70	72	70	71	67	-0.041	12.22	0.23
99	15.759	16.175	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.055	155	155	5.0	-0.1	502	284	331	264	276	331	1032	290	70	72	70	71	67	-0.042	12.11	0.16
100	15.919	16.339	0.16	0.16	1.34	78	2.04	1.12	79	1.1	81	0.054	156	157	4.9	-0.1	503	284	330	264	277	332	1027	289	70	72	70	71	67	-0.042	12	0.14
101	16.079	16.504	0.16	0.17	1.34	78	2.04	1.12	80	1.1	81	0.053	158	159	4.9	0	502	284	329	265	277	331	1020	288	70	72	70	71	68	-0.042	11.9	0.12
102	16.238	16.668	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.054	155	157	4.8	-0.1	503	284	328	265	278	332	1013	285	70	72	70	71	68	-0.043	11.85	0.1
103	16.398	16.832	0.16	0.16	1.34	78	2.03	1.12	80	1.1	81	0.054	156	157	4.8	0	504	284	327	266	278	332	1004	282	70	72	70	71	68	-0.040	11.7	0.073
104	16.558	16.996	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.053	158	158	4.7	-0.1	503	284	326	266	278	331	998	284	70	72	70	71	69	-0.041	11.55	0.089
105	16.718	17.160	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.054	156	157	4.7	0	504	284	325	266	279	332	992	282	70	72	70	71	68	-0.042	11.47	0.082
106	16.878	17.324	0.16	0.16	1.35	78	2.04	1.12	80	1.1	81	0.053	158	158	4.6	-0.1	504	283	324	267	279	331	987	279	70	72	70	71	67	-0.041	11.31	0.1
107	17.039	17.488	0.16	0.16	1.34	78	2.03	1.12	80	1.1	81	0.053	159	158	4.6	0	509	283	323	268	280	333	983	281	70	72	70	71	68	-0.041	11.28	0.078

RUN ABORTED

Wood Heater Test Data Emissions Data

Run: 6

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 06-Nov-18
Beginning Clock Time: 11:51

Total Sampling Time: 520 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure: Begin 30.32 Middle _____ End _____ Average 30.32 0

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.90 ft/sec.
Initial Tunnel Flow: 149.1 scfm
Average Tunnel Flow: 147.7 scfm
Post-Test Leak Check (1): N/A cfm @ _____ in. Hg
Post-Test Leak Check (2): N/A cfm @ _____ in. Hg
Average Test Piece Fuel Moisture: 20.71 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.044	0.038	0.034	0.044	0.046	0.032	0.058	"H2O
Temp:	79	79	79	79	79	79	79	79	79	

V_{strav} 13.35 ft/sec V_{scent} 16.02 ft/sec F_p 0.833

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
108	17.199	17.653	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.055	155	156	4.5	-0.1	511	283	322	268	280	333	976	282	70	72	70	71	67	-0.041	10.95	0.084
109	17.359	17.817	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.053	158	158	4.5	0	511	283	321	268	281	333	972	278	70	72	70	71	68	-0.042	10.8	0.084
110	17.518	17.981	0.16	0.16	1.34	78	2.04	1.12	80	1.1	81	0.054	155	157	4.4	-0.1	507	283	320	269	281	332	964	275	70	72	70	71	68	-0.039	10.74	0.09
111	17.679	18.145	0.16	0.16	1.34	78	2.04	1.12	80	1.1	80	0.053	159	158	4.4	0	504	283	319	269	282	331	958	275	70	72	70	71	68	-0.040	10.59	0.1
112	17.838	18.309	0.16	0.16	1.34	78	2.04	1.12	80	1.1	80	0.055	154	155	4.3	-0.1	502	283	318	269	282	331	951	273	70	72	70	71	67	-0.040	10.46	0.09
113	17.998	18.472	0.16	0.16	1.34	78	2.04	1.16	80	1.1	80	0.054	156	155	4.3	0	500	282	316	270	282	330	947	274	70	72	70	71	68	-0.040	10.4	0.12
114	18.158	18.630	0.16	0.16	1.34	78	2.04	1.06	80	1.0	80	0.052	159	154	4.2	-0.1	497	282	315	270	282	329	949	274	70	72	70	71	68	-0.040	10.33	0.16
115	18.318	18.791	0.16	0.16	1.34	78	2.04	1.11	80	1.1	80	0.054	156	154	4.2	0	495	282	314	270	283	329	949	274	70	72	70	70	68	-0.039	10.34	0.16
116	18.477	18.954	0.16	0.16	1.34	78	2.04	1.11	80	1.1	80	0.054	155	155	4.1	-0.1	493	282	313	270	283	328	945	274	70	72	70	70	68	-0.040	10.29	0.16
117	18.637	19.118	0.16	0.16	1.35	78	2.03	1.11	80	1.1	80	0.054	156	156	4.1	0	491	282	311	271	283	328	943	273	70	72	70	70	68	-0.039	9.96	0.21
118	18.798	19.281	0.16	0.16	1.35	78	2.03	1.11	80	1.1	80	0.053	159	157	4.0	-0.1	489	282	310	272	283	327	941	271	70	72	70	70	68	-0.039	9.95	0.22
119	18.957	19.445	0.16	0.16	1.34	78	2.04	1.11	80	1.1	80	0.054	155	156	4.0	0	488	281	309	272	284	327	937	270	70	72	70	70	68	-0.039	9.94	0.19
120	19.117	19.608	0.16	0.16	1.34	79	2.04	1.11	80	1.1	80	0.056	153	153	4.0	0	487	281	308	272	284	326	929	270	70	72	70	70	68	-0.039	9.88	0.19
121	19.278	19.771	0.16	0.16	1.35	78	2.04	1.11	80	1.1	80	0.054	157	155	3.9	-0.1	487	281	307	272	284	326	920	267	70	72	70	70	68	-0.039	9.7	0.19
122	19.438	19.934	0.16	0.16	1.34	79	2.04	1.11	80	1.1	80	0.055	155	154	3.9	0	486	281	306	273	284	326	912	268	70	72	70	70	68	-0.038	9.64	0.19
123	19.598	20.098	0.16	0.16	1.35	79	2.04	1.11	80	1.1	80	0.053	157	158	3.8	-0.1	486	281	304	272	284	325	907	269	70	72	70	70	68	-0.038	9.54	0.2
124	19.758	20.261	0.16	0.16	1.34	79	2.04	1.10	80	1.1	80	0.053	157	157	3.8	0	484	281	303	273	284	325	900	267	70	72	70	70	68	-0.039	9.42	0.19
125	19.918	20.424	0.16	0.16	1.33	79	2.03	1.11	80	1.1	79	0.055	154	154	3.8	0	483	281	302	273	284	325	894	264	70	72	70	70	68	-0.038	9.54	0.16
126	20.078	20.587	0.16	0.16	1.33	79	2.04	1.11	80	1.1	79	0.053	157	157	3.7	-0.1	484	280	300	274	285	325	899	264	70	72	70	70	68	-0.038	9.26	0.28
127	20.238	20.750	0.16	0.16	1.33	79	2.03	1.11	80	1.1	79	0.055	154	154	3.7	0	486	280	299	274	284	325	903	264	70	72	70	70	68	-0.038	9.19	0.28
128	20.397	20.915	0.16	0.16	1.34	79	2.03	1.10	80	1.1	79	0.054	155	157	3.7	0	485	280	298	275	285	325	903	261	70	72	70	70	68	-0.038	9.17	0.28
129	20.557	21.078	0.16	0.16	1.34	79	2.03	1.11	80	1.1	80	0.052	159	158	3.6	-0.1	484	279	296	275	284	324	899	261	70	72	70	70	68	-0.038	9.2	0.25
130	20.717	21.241	0.16	0.16	1.34	79	2.03	1.11	80	1.1	80	0.053	157	157	3.6	0	483	279	295	275	285	323	894	259	70	72	70	70	69	-0.038	9.19	0.23
131	20.877	21.404	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.057	152	151	3.6	0	482	279	293	275	284	323	890	259	70	72	70	70	68	-0.038	9.13	0.26
132	21.037	21.567	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.053	157	157	3.5	-0.1	483	279	292	275	284	323	886	259	70	72	70	70	68	-0.037	9.21	0.23
133	21.197	21.731	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.054	156	156	3.5	0	482	279	291	275	284	322	882	260	70	72	70	70	68	-0.037	9.32	0.24
134	21.357	21.894	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.053	157	157	3.4	-0.1	487	279	289	275	284	323	877	257	70	72	70	70	68	-0.037	9.18	0.25
135	21.517	22.057	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.054	156	155	3.4	0	492	278	288	275	283	323	878	261	70	72	70	70	68	-0.037	9.27	0.27
136	21.678	22.220	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.055	155	154	3.4	0	493	278	286	275	283	323	880	257	70	72	70	70	68	-0.037	9.27	0.28
137	21.838	22.384	0.16	0.16	1.33	79	2.04	1.10	80	1.1	79	0.055	154	155	3.3	-0.1	490	278	285	276	283	322	877	258	70	72	70	70	68	-0.037	9.34	0.27
138	21.998	22.547	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.053	157	157	3.3	0	489	278	284	276	283	322	872	257	70	72	70	70	68	-0.037	9.4	0.24
139	22.158	22.711	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.053	157	158	3.3	0	489	278	283	276	282	322	864	257	70	72	70	70	68	-0.036	9.59	0.21
140	22.318	22.874	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.054	156	155	3.2	-0.1	493	278	282	276	282	322	861	255	70	72	70	70	68	-0.036	9.8	0.21
141	22.478	23.037	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.054	156	155	3.2	0	498	277	280	276	282	323	860	258	70	72	70	70	68	-0.037	9.97	0.22
142	22.635	23.197	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.055	152	151	3.1	-0.1	502	277	279	276	282	323	861	257	70	72	70	70	68	-0.036	9.93	0.22
143	22.795	23.361	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.054	156	156	3.1	0	502	277	278	276	282	323	861	259	70	72	70	70	68	-0.037	9.76	0.23
144	22.954	23.525	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.054	155	156	3.0	-0.1	498	277	277	276	282	322	858	257	70	72	70	70	68	-0.037	9.57	0.2
145	23.115	23.687	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.055	155	153	3.0	0	496	277	276	276	282	321	855	258	70	72	70	70	68	-0.037	9.58	0.21
146	23.275	23.851	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.053	157	158	3.0	0	493	277	275	276	282	321	850	257	70	72	70	70	68	-0.037	9.42	0.2
147	23.435	24.014	0.16	0.16	1.35	79	2.05	1.11	80	1.1	79	0.055	154	154	2.9	-0.1	495	276	274	277	281	321	849	255	70	72	70	70	68	-0.036	9.11	0.23
148	23.595	24.178	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	154	155	2.9	0	496	276	274	276	281	321	855	256	70	72	70	70	68	-0.037	8.95	0.27
149	23.755	24.341	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.054	156	155	2.9	0	498	276	273	276	282	321	859	254	70	72	70	70	68	-0.037	8.75	0.28
150	23.916	24.504	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.056	154	153	2.8	-0.1	499	276	272	276	281	321	860	256	70	72	70	70	68	-0.036	8.69	0.29
151	24.076	24.668	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.054	156	156	2.8	0	499	276	271	276	281	321	856	256	70	72	70	70	68	-0.036	8.71	0.27
152	24.236	24.831	0.16	0.16	1.35	79	2.04	1.11	80	1.1	79	0.053	157	157	2.8	0	498	276	270	276	281	320	853	253	70	72	70	70	68	-0.036	8.65	0.27
153	24.396	24.994	0.16	0.16	1.35	79	2.04	1.11	80	1.1	79	0.055	154	154	2.8	0	497	275	269	276	281	320	850	253	70	72	70	70	68	-0.036	8.53	0.27
154	24.556	25.158	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	154	155	2.7	-0.1	498	275	268	277	281	320	848	254	70	72	70	70	68	-0.036	8.61	0.28
155	24.716	25.321	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.056	153	153	2.7	0	498	275	268	277	280	320	846	251	70	72	70	70	68	-0.035	8.61	0.28
156	24.875	25.484	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	153	154	2.7	0	498	275	267	277	280	319	846	252	70	72	70	70	68	-0.035	8.68	0.28
157	25.035	25.647	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.055	154	154	2.6	-0.1	496	275	266	276	280	319	844	252	70	72	70	70	68	-0.036	8.67	0.29
158	25.195	25.811	0.16	0.16	1.34	79	2.05	1.11	80	1.1	79	0.056	153	153	2.6	0	494	274	265	276	279	318	846	251	70	72	70	70	69	-0.035	8.67	0.32
159	25.355	25.975	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	154	155	2.6	0	493	274	264	276	279	317	848	248	70	71	70	70	68	-0.036	8.71	0.32
160	25.515	26.138	0.16	0.16	1.35	79	2.04	1.10	80	1.1	79	0.056	153	153	2.5	-0.1	492	274	263	276	279	317	849	250	70	71	70	70	68	-0.035	8.71	0.33
161	25.675	26.301	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.054	156	155	2.5	0	490	274	262	276	278	316	847	250	70	71	70	70	68	-0.035	8.68	0.33

RUN ABORTED

Wood Heater Test Data Emissions Data

Run: 6

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 06-Nov-18
Beginning Clock Time: 11:51

Total Sampling Time: 520 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure: Begin 30.32 Middle _____ End _____ Average 30.32 0

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.90 ft/sec.
Initial Tunnel Flow: 149.1 scfm
Average Tunnel Flow: 147.7 scfm
Post-Test Leak Check (1): N/A cfm @ _____ in. Hg
Post-Test Leak Check (2): N/A cfm @ _____ in. Hg
Average Test Piece Fuel Moisture: 20.71 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.044	0.038	0.034	0.044	0.046	0.032	0.058	"H2O
Temp:	79	79	79	79	79	79	79	79	79	

V_{strav} 13.35 ft/sec V_{scent} 16.02 ft/sec F_p 0.833

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
162	25.835	26.464	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	156	155	2.5	0	487	273	262	276	278	315	847	247	70	71	70	70	68	-0.035	8.67	0.32
163	25.995	26.627	0.16	0.16	1.35	79	2.04	1.11	80	1.1	79	0.056	153	153	2.4	-0.1	485	273	261	276	277	314	844	250	70	71	70	70	68	-0.035	8.7	0.31
164	26.156	26.791	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.055	155	155	2.4	0	484	273	260	275	277	314	841	250	70	71	70	70	68	-0.035	8.61	0.31
165	26.316	26.955	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	156	156	2.4	0	483	273	259	276	277	314	839	248	70	71	70	70	68	-0.035	8.56	0.31
166	26.476	27.118	0.16	0.16	1.33	79	2.04	1.10	80	1.1	78	0.055	154	154	2.4	0	480	273	259	275	276	313	835	247	70	71	70	70	68	-0.035	8.48	0.31
167	26.636	27.281	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	156	155	2.3	-0.1	477	272	258	275	276	312	829	247	70	71	70	70	68	-0.034	8.51	0.3
168	26.796	27.444	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.053	157	157	2.3	0	473	272	257	275	276	311	820	245	70	71	70	70	68	-0.034	8.43	0.27
169	26.956	27.608	0.16	0.16	1.33	79	2.04	1.11	80	1.1	78	0.055	154	155	2.3	0	470	272	256	275	275	310	814	245	70	71	70	70	68	-0.034	8.37	0.26
170	27.116	27.771	0.16	0.16	1.33	79	2.04	1.11	80	1.1	78	0.054	156	155	2.2	-0.1	468	272	256	274	275	309	809	245	70	71	70	70	68	-0.034	8.32	0.26
171	27.276	27.934	0.16	0.16	1.34	79	2.04	1.10	80	1.1	78	0.054	156	155	2.2	0	466	271	255	274	275	308	804	244	70	71	70	70	68	-0.034	8.28	0.26
172	27.436	28.097	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.052	159	158	2.2	0	464	271	254	274	274	307	799	243	70	71	70	70	68	-0.034	8.15	0.26
173	27.596	28.260	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	154	154	2.2	0	462	271	253	273	274	307	795	242	70	71	70	70	68	-0.034	8.08	0.26
174	27.756	28.424	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	154	155	2.2	0	461	271	252	273	274	306	790	240	70	71	70	70	68	-0.034	8	0.27
175	27.916	28.588	0.16	0.16	1.34	79	2.04	1.10	80	1.1	78	0.054	156	156	2.1	-0.1	459	270	251	273	273	305	788	240	70	71	70	70	68	-0.033	7.93	0.27
176	28.076	28.751	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	154	154	2.1	0	457	270	250	273	273	305	786	239	70	71	70	70	68	-0.033	7.9	0.28
177	28.236	28.914	0.16	0.16	1.34	79	2.05	1.11	80	1.1	78	0.055	154	154	2.1	0	456	270	249	273	272	304	780	238	70	71	70	70	68	-0.033	7.86	0.27
178	28.396	29.077	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	154	154	2.1	0	454	270	248	272	271	303	778	236	70	71	70	70	68	-0.033	7.79	0.27
179	28.556	29.240	0.16	0.16	1.34	79	2.03	1.11	80	1.1	78	0.054	156	155	2.1	0	452	269	247	272	271	302	774	237	70	71	70	69	69	-0.034	7.78	0.28
180	28.717	29.404	0.16	0.16	1.33	79	2.04	1.10	80	1.1	78	0.055	155	155	2.0	-0.1	452	269	246	272	270	302	770	235	70	71	70	69	68	-0.032	7.73	0.26
181	28.877	29.568	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	154	155	2.0	0	450	269	245	272	270	301	767	234	70	71	70	69	68	-0.033	7.7	0.27
182	29.037	29.730	0.16	0.16	1.34	79	2.04	1.10	80	1.1	77	0.055	154	153	2.0	0	448	269	244	272	269	300	763	233	70	71	70	69	68	-0.032	7.61	0.3
183	29.197	29.894	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	154	155	2.0	0	447	268	243	272	269	300	760	232	70	71	70	69	68	-0.032	7.59	0.27
184	29.357	30.057	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	156	155	2.0	0	446	268	243	271	269	299	757	231	70	71	70	69	68	-0.032	7.51	0.29
185	29.518	30.221	0.16	0.16	1.33	79	2.03	1.11	80	1.1	78	0.055	155	155	2.0	0	445	268	242	271	269	299	753	231	70	71	70	69	68	-0.032	7.48	0.27
186	29.677	30.384	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	155	155	1.9	-0.1	444	267	241	270	269	298	749	230	70	71	70	69	68	-0.032	7.48	0.28
187	29.837	30.547	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	156	155	1.9	0	442	267	240	270	268	297	748	231	70	71	70	69	69	-0.032	7.41	0.28
188	29.997	30.710	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	156	155	1.9	0	441	267	239	270	267	297	748	230	70	71	70	69	69	-0.031	7.37	0.3
189	30.157	30.874	0.16	0.16	1.34	79	2.04	1.11	80	1.1	77	0.055	154	155	1.9	0	440	267	238	270	268	297	753	231	70	71	70	69	69	-0.031	7.38	0.32
190	30.317	31.037	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	154	154	1.9	0	439	266	237	270	267	296	754	229	70	71	70	69	68	-0.032	7.37	0.32
191	30.478	31.201	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	157	156	1.9	0	437	266	236	269	266	295	752	228	70	71	70	69	69	-0.032	7.33	0.33
192	30.638	31.364	0.16	0.16	1.34	79	2.03	1.10	80	1.1	77	0.053	157	156	1.8	-0.1	436	265	235	269	266	294	752	229	70	71	70	69	68	-0.031	7.33	0.33
193	30.798	31.527	0.16	0.16	1.35	79	2.03	1.11	80	1.1	77	0.052	159	158	1.8	0	435	265	235	268	265	294	750	229	70	71	70	69	68	-0.032	7.33	0.33
194	30.958	31.690	0.16	0.16	1.34	79	2.04	1.11	80	1.1	77	0.053	157	156	1.8	0	434	265	234	268	266	293	749	230	69	71	70	69	68	-0.032	7.25	0.33
195	31.118	31.854	0.16	0.16	1.35	79	2.03	1.11	80	1.1	77	0.052	159	159	1.8	0	432	264	233	268	264	292	750	228	69	71	70	69	69	-0.032	7.22	0.34
196	31.279	32.018	0.16	0.16	1.34	79	2.04	1.11	80	1.1	77	0.055	155	155	1.8	0	431	264	233	268	263	292	751	229	69	71	70	69	69	-0.032	7.16	0.34
197	31.439	32.181	0.16	0.16	1.35	79	2.04	1.11	80	1.1	77	0.055	154	154	1.8	0	430	264	232	268	262	291	754	228	69	71	70	69	69	-0.031	7.15	0.36
198	31.599	32.344	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.055	154	154	1.7	-0.1	427	263	232	267	264	291	753	227	69	71	70	69	69	-0.031	7.14	0.37
199	31.760	32.507	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.054	157	155	1.7	0	426	263	231	267	263	290	754	227	69	71	70	69	69	-0.032	7.07	0.36
200	31.920	32.670	0.16	0.16	1.34	79	2.03	1.11	80	1.1	77	0.055	154	154	1.7	0	424	263	231	266	264	290	750	227	69	71	70	69	69	-0.030	7.02	0.36
201	32.080	32.834	0.16	0.16	1.33	79	2.04	1.11	80	1.1	78	0.055	154	155	1.7	0	422	262	230	266	265	289	750	227	70	71	70	69	70	-0.030	7.02	0.35
202	32.240	32.998	0.16	0.16	1.33	79	2.04	1.11	80	1.1	78	0.055	154	155	1.7	0	421	262	230	266	263	288	749	225	70	71	70	69	69	-0.031	6.96	0.35
203	32.399	33.161	0.16	0.16	1.34	79	2.03	1.10	80	1.1	78	0.055	153	154	1.7	0	419	262	229	266	264	288	746	224	70	70	70	69	69	-0.030	6.87	0.35
204	32.560	33.324	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	155	154	1.7	0	418	261	229	265	262	287	744	223	70	71	70	69	69	-0.030	6.93	0.35
205	32.720	33.487	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	156	155	1.6	-0.1	416	261	229	266	261	287	741	222	70	70	70	69	69	-0.030	6.86	0.35
206	32.879	33.651	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	153	155	1.6	0	415	261	228	265	260	286	740	222	70	70	70	69	69	-0.030	6.81	0.35
207	33.039	33.815	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	156	156	1.6	0	414	260	228	265	259	285	737	223	70	70	70	69	69	-0.030	6.83	0.35
208	33.200	33.978	0.16	0.16	1.34	79	2.04	1.10	80	1.1	78	0.054	157	155	1.6	0	412	260	227	265	258	284	735	223	70	70	70	69	69	-0.030	6.83	0.35
209	33.360	34.141	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.055	154	154	1.6	0	411	260	227	264	258	284	733	222	70	70	70	69	69	-0.029	6.75	0.34
210	33.520	34.304	0.16	0.16	1.34	79	2.03	1.11	80	1.1	78	0.054	156	155	1.6	0	409	260	226	264	257	283	731	221	70	70	70	69	69	-0.029	6.69	0.34
211	33.680	34.467	0.16	0.16	1.34	79	2.04	1.11	80	1.1	78	0.054	156	155	1.6	0	408	259	226	264	256	283	728	222	70	70	70	69	69	-0.029	6.65	0.34
212	33.841	34.631	0.16	0.16	1.34	79	2.04	1.11	80	1.1	79	0.054	157	156	1.5	-0.1	406	259	225	263	256	282	724	221	70	70	70	69	69	-0.029	6.47	0.33
213	34.001	34.794	0.16	0.16	1.34	79	2.04	1.10	80	1.1	79	0.054	156	155	1.5	0	404	259	224	263	255	281	720	222	70	70	70	69	69	-0.029	6.52	0.33
214	34.161	34.957	0.16	0.16	1.33	79	2.04	1.11	80	1.1	79	0.054	156	155	1.5	0	402	258	224	262	254	280	715	220	70	70	70	69	69	-0.029	6.43	0.33
215	34.321	35.120	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.054	156	155	1.5	0	401	258	223	261	254	279	715	218	70	70	70	69	69	-0.029	6.38	0.33

RUN ABORTED

Wood Heater Test Data Emissions Data

Run: 6

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 06-Nov-18
Beginning Clock Time: 11:51

Total Sampling Time: 520 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure: Begin 30.32 Middle _____ End _____ Average 30.32 0

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.90 ft/sec.
Initial Tunnel Flow: 149.1 scfm
Average Tunnel Flow: 147.7 scfm
Post-Test Leak Check (1): N/A cfm @ _____ in. Hg
Post-Test Leak Check (2): N/A cfm @ _____ in. Hg
Average Test Piece Fuel Moisture: 20.71 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.044	0.038	0.034	0.044	0.046	0.032	0.058	"H2O
Temp:	79	79	79	79	79	79	79	79	79	

V_{strav} 13.35 ft/sec V_{scent} 16.02 ft/sec F_p 0.833

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
216	34.481	35.284	0.16	0.16	1.34	79	2.03	1.11	80	1.1	79	0.056	153	153	1.5	0	400	258	223	261	254	279	710	219	70	70	70	69	69	-0.028	6.35	0.33
217	34.641	35.448	0.16	0.16	1.33	79	2.03	1.11	80	1.1	79	0.055	154	155	1.5	0	398	257	222	261	253	278	708	217	71	70	70	69	69	-0.028	6.3	0.33
218	34.801	35.611	0.16	0.16	1.34	80	2.04	1.11	80	1.1	79	0.056	153	153	1.5	0	397	257	222	260	252	278	706	217	71	70	71	69	70	-0.028	6.29	0.33
219	34.960	35.774	0.16	0.16	1.34	80	2.04	1.10	80	1.1	79	0.054	155	155	1.4	-0.1	395	256	221	260	252	277	703	217	71	70	71	69	70	-0.028	6.25	0.33
220	35.120	35.937	0.16	0.16	1.34	80	2.05	1.11	80	1.1	79	0.054	156	155	1.4	0	394	256	220	259	251	276	703	216	71	70	71	69	70	-0.028	6.16	0.32
221	35.280	36.100	0.16	0.16	1.34	80	2.04	1.10	80	1.1	79	0.054	156	155	1.4	0	393	256	219	258	250	275	697	217	71	70	71	69	70	-0.028	6.13	0.32
222	35.440	36.264	0.16	0.16	1.34	80	2.04	1.11	80	1.1	79	0.054	156	156	1.4	0	392	255	219	258	250	275	695	217	71	70	71	69	70	-0.028	6.15	0.33
223	35.600	36.427	0.16	0.16	1.34	80	2.04	1.11	81	1.1	79	0.054	156	155	1.4	0	391	255	218	257	250	274	691	214	71	70	71	69	70	-0.028	6.12	0.32
224	35.760	36.590	0.16	0.16	1.33	80	2.05	1.10	81	1.1	79	0.054	156	155	1.4	0	390	254	217	256	249	273	688	213	71	70	71	69	70	-0.028	6.06	0.32
225	35.920	36.753	0.16	0.16	1.34	80	2.04	1.10	81	1.1	79	0.054	156	155	1.4	0	388	254	216	256	249	273	685	214	71	70	71	69	70	-0.028	5.97	0.32
226	36.081	36.917	0.16	0.16	1.35	80	2.05	1.11	81	1.1	79	0.053	158	157	1.4	0	388	254	216	256	249	273	682	212	71	70	71	69	70	-0.027	5.95	0.32
227	36.241	37.080	0.16	0.16	1.34	80	2.04	1.10	81	1.1	79	0.055	154	154	1.4	0	386	253	215	255	248	271	679	211	71	71	71	69	70	-0.027	5.91	0.31
228	36.401	37.244	0.16	0.16	1.34	80	2.03	1.10	81	1.1	79	0.055	154	155	1.3	-0.1	386	253	215	254	248	271	676	212	71	71	71	69	70	-0.028	5.87	0.31
229	36.561	37.407	0.16	0.16	1.33	80	2.04	1.10	81	1.1	79	0.053	157	156	1.3	0	384	252	214	254	247	270	670	212	71	71	71	69	71	-0.028	5.73	0.31
230	36.721	37.570	0.16	0.16	1.33	80	2.04	1.10	81	1.1	80	0.053	157	157	1.3	0	383	252	213	253	247	270	666	211	71	70	71	69	71	-0.027	5.65	0.3
231	36.881	37.733	0.16	0.16	1.33	80	2.04	1.11	81	1.1	80	0.054	156	155	1.3	0	382	252	212	253	247	269	662	212	71	70	71	69	71	-0.027	5.57	0.3
232	37.041	37.896	0.16	0.16	1.33	80	2.04	1.11	81	1.1	80	0.055	154	154	1.3	0	381	251	212	252	247	269	659	210	71	71	71	69	70	-0.027	5.55	0.3
233	37.201	38.060	0.16	0.16	1.33	80	2.05	1.11	81	1.1	80	0.055	154	155	1.3	0	380	251	211	252	246	268	655	211	71	71	71	69	70	-0.027	5.53	0.3
234	37.361	38.224	0.16	0.16	1.34	80	2.04	1.10	81	1.1	80	0.055	154	155	1.3	0	379	250	210	251	246	267	651	210	71	71	71	69	71	-0.026	5.57	0.31
235	37.521	38.386	0.16	0.16	1.34	80	2.04	1.11	81	1.1	80	0.053	157	156	1.3	0	379	250	210	250	246	267	648	210	71	71	71	69	71	-0.026	6.51	0.28
236	37.681	38.549	0.16	0.16	1.34	80	2.04	1.11	81	1.1	80	0.054	156	155	1.2	-0.1	379	250	209	250	246	267	640	208	71	71	71	69	71	-0.026	6.75	0.25
237	37.841	38.713	0.16	0.16	1.33	80	2.05	1.11	81	1.1	80	0.053	157	158	1.2	0	378	249	208	249	246	266	633	206	72	71	71	69	71	-0.026	6.72	0.25
238	38.001	38.877	0.16	0.16	1.34	80	2.04	1.11	81	1.1	80	0.054	156	156	1.2	0	378	249	207	249	245	266	626	205	72	71	71	69	71	-0.026	6.66	0.25
239	38.161	39.040	0.16	0.16	1.34	80	2.05	1.10	81	1.1	80	0.054	156	155	1.2	0	378	248	206	248	246	265	622	206	72	71	71	69	71	-0.025	6.63	0.25
240	38.321	39.203	0.16	0.16	1.34	80	2.04	1.11	81	1.1	80	0.055	154	154	1.2	0	379	248	206	248	245	265	618	204	72	71	72	69	71	-0.025	6.56	0.26
241	38.481	39.366	0.16	0.16	1.33	80	2.05	1.11	81	1.1	80	0.054	156	155	1.2	0	378	247	205	248	245	265	615	204	72	71	72	69	71	-0.025	6.49	0.25
242	38.642	39.530	0.16	0.16	1.33	80	2.04	1.11	81	1.1	80	0.054	157	156	1.2	0	378	247	204	248	245	264	613	202	72	71	72	69	71	-0.025	6.45	0.25
243	38.802	39.693	0.16	0.16	1.34	81	2.04	1.11	81	1.1	79	0.055	154	154	1.1	-0.1	377	247	203	247	244	264	611	203	72	71	72	69	71	-0.025	6.39	0.25
244	38.963	39.857	0.16	0.16	1.34	81	2.04	1.11	81	1.1	79	0.053	158	157	1.1	0	377	246	202	246	244	263	612	203	72	71	72	69	70	-0.025	6.39	0.27
245	39.122	40.020	0.16	0.16	1.34	81	2.04	1.10	81	1.1	80	0.052	157	158	1.1	0	376	246	202	246	244	263	612	202	72	71	72	69	71	-0.025	6.38	0.27
246	39.282	40.183	0.16	0.16	1.34	81	2.04	1.11	81	1.1	80	0.054	155	155	1.1	0	375	246	201	245	244	262	612	202	72	71	72	69	71	-0.025	6.31	0.27
247	39.442	40.346	0.16	0.16	1.33	81	2.05	1.11	81	1.1	80	0.053	157	157	1.1	0	374	246	200	244	244	262	610	201	72	71	72	69	71	-0.025	6.21	0.27
248	39.602	40.510	0.16	0.16	1.33	81	2.04	1.11	81	1.1	80	0.054	155	156	1.1	0	374	245	200	244	244	261	608	202	72	71	72	69	71	-0.025	6.22	0.27
249	39.762	40.674	0.16	0.16	1.33	81	2.05	1.10	81	1.1	80	0.052	158	159	1.1	0	373	245	199	243	244	261	608	201	72	71	72	69	71	-0.025	6.21	0.27
250	39.922	40.837	0.16	0.16	1.34	81	2.04	1.10	82	1.1	80	0.054	155	155	1.1	0	372	245	198	242	244	260	605	201	72	71	72	69	71	-0.025	6.2	0.27
251	40.082	41.000	0.16	0.16	1.33	81	2.04	1.11	82	1.1	79	0.054	155	155	1.0	-0.1	371	245	198	242	244	260	603	202	72	71	72	69	71	-0.025	6.15	0.27
252	40.242	41.163	0.16	0.16	1.33	81	2.04	1.11	82	1.1	80	0.053	157	156	1.0	0	371	244	197	241	245	260	603	202	72	71	72	69	71	-0.025	6.07	0.27
253	40.402	41.326	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.054	155	155	1.0	0	370	244	197	241	245	259	601	200	72	71	72	70	71	-0.024	6.05	0.27
254	40.562	41.491	0.16	0.16	1.33	81	2.05	1.11	82	1.1	79	0.054	155	157	1.0	0	369	244	196	240	244	259	599	200	72	71	72	70	71	-0.024	6.02	0.27
255	40.722	41.654	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.054	155	155	1.0	0	369	244	196	239	245	259	598	201	72	71	72	69	71	-0.025	6.01	0.27
256	40.882	41.817	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.053	157	156	1.0	0	368	243	195	239	245	258	597	199	72	71	72	70	72	-0.024	6.01	0.27
257	41.043	41.980	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.054	156	155	1.0	0	367	243	194	238	245	257	597	198	72	71	72	70	71	-0.025	6.08	0.27
258	41.203	42.144	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.055	154	154	1.0	0	366	243	194	237	245	257	593	200	72	71	72	70	71	-0.024	6.14	0.27
259	41.364	42.307	0.16	0.16	1.34	81	2.04	1.11	82	1.1	80	0.054	156	155	0.9	-0.1	365	243	193	237	245	257	593	199	72	71	72	70	71	-0.024	6.14	0.26
260	41.524	42.471	0.16	0.16	1.32	81	2.04	1.11	82	1.1	80	0.055	154	154	0.9	0	364	242	193	237	245	256	587	199	72	71	72	70	72	-0.024	6.07	0.26
261	41.684	42.634	0.16	0.16	1.33	81	2.05	1.10	82	1.1	80	0.054	155	155	0.9	0	364	242	193	237	247	257	583	198	72	71	72	70	71	-0.024	6.08	0.24
262	41.844	42.797	0.16	0.16	1.33	81	2.05	1.11	82	1.1	79	0.054	155	155	0.9	0	363	242	192	236	246	256	579	199	72	71	72	70	71	-0.024	6	0.24
263	42.004	42.961	0.16	0.16	1.33	81	2.04	1.11	82	1.1	79	0.054	155	156	0.9	0	363	242	192	235	247	256	575	200	72	71	72	70	72	-0.024	5.93	0.24
264	42.164	43.124	0.16	0.16	1.33	81	2.04	1.11	82	1.1	79	0.054	155	155	0.9	0	362	241	191	235	248	255	573	199	72	71	72	70	72	-0.024	5.84	0.24
265	42.324	43.288	0.16	0.16	1.33	81	2.05	1.11	82	1.1	79	0.053	157	157	0.9	0	361	241	191	235	250	256	570	198	72	71	72	70	72	-0.024	5.88	0.25
266	42.484	43.452	0.16	0.16	1.34	81	2.04	1.10	82	1.1	79	0.055	154	154	0.8	-0.1	361	241	190	234	249	255	568	196	72	71	72	70	71	-0.025	5.77	0.24
267	42.644	43.615	0.16	0.16	1.34	81	2.05	1.11	82	1.1	79	0.055	154	153	0.8	0	360	241	189	234	249	255	565	195	72	71	72	70	71	-0.024	5.72	0.24
268	42.804	43.778	0.16	0.16	1.34	81	2.04	1.11	82	1.1	79	0.054	155	155	0.8	0	359	240	189	233	250	254	564	195	72	71	72	70	71	-0.025	5.67	0.24
269	42.964	43.941	0.16	0.16	1.34	81	2.04	1.11	82	1.1	78	0.052	158	158	0.8	0	359	240	188	233	251	254	563	194	72	71	72	70	71	-0.024	5.64	0.25

RUN ABORTED

Wood Heater Test Data Emissions Data

Run: 6

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 06-Nov-18
Beginning Clock Time: 11:51

Total Sampling Time: 520 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.32			30.32 0

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.90 ft/sec.
Initial Tunnel Flow: 149.1 scfm
Average Tunnel Flow: 147.7 scfm
Post-Test Leak Check (1): N/A cfm @ _____ in. Hg
Post-Test Leak Check (2): N/A cfm @ _____ in. Hg
Average Test Piece Fuel Moisture: 20.71 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.044	0.038	0.034	0.044	0.046	0.032	0.058	"H2O
Temp:	79	79	79	79	79	79	79	79	79	

V_{strav} 13.35 ft/sec V_{scent} 16.02 ft/sec F_p 0.833

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
270	43.124	44.105	0.16	0.16	1.34	81	2.04	1.11	82	1.1	78	0.054	155	156	0.8	0	359	239	188	233	251	254	559	195	72	71	72	70	72	-0.025	5.64	0.25
271	43.285	44.269	0.16	0.16	1.34	81	2.05	1.11	82	1.1	78	0.055	155	154	0.8	0	358	239	188	233	252	254	555	195	72	71	72	70	71	-0.024	5.7	0.23
272	43.445	44.432	0.16	0.16	1.34	82	2.05	1.10	82	1.1	77	0.054	155	154	0.8	0	358	238	187	232	253	254	551	196	72	71	72	70	71	-0.025	5.74	0.23
273	43.605	44.595	0.16	0.16	1.33	82	2.05	1.11	82	1.1	77	0.054	155	154	0.8	0	358	238	186	232	253	253	547	194	72	71	72	70	71	-0.024	5.71	0.22
274	43.766	44.759	0.16	0.16	1.34	82	2.04	1.11	82	1.1	77	0.055	154	154	0.7	-0.1	357	237	186	232	254	253	544	193	72	71	72	70	71	-0.024	5.75	0.22
275	43.927	44.922	0.16	0.16	1.34	82	2.04	1.11	82	1.1	77	0.054	156	154	0.7	0	357	237	186	231	256	253	539	193	72	71	72	70	71	-0.024	5.72	0.22
276	44.087	45.087	0.16	0.17	1.33	82	2.05	1.11	82	1.1	77	0.055	153	155	0.7	0	357	237	185	231	257	253	538	191	72	71	72	70	71	-0.024	5.71	0.22
277	44.248	45.250	0.16	0.16	1.34	82	2.04	1.11	82	1.1	77	0.055	154	153	0.7	0	356	236	185	230	258	253	535	192	72	71	72	70	71	-0.024	5.77	0.22
278	44.408	45.413	0.16	0.16	1.34	82	2.05	1.11	82	1.1	77	0.056	152	152	0.7	0	356	236	184	230	259	253	533	192	72	71	72	70	71	-0.024	5.85	0.22
279	44.568	45.576	0.16	0.16	1.34	82	2.04	1.11	82	1.1	77	0.055	153	153	0.7	0	356	235	183	229	260	253	529	190	72	71	72	70	71	-0.024	5.83	0.21
280	44.729	45.740	0.16	0.16	1.33	82	2.05	1.11	82	1.1	77	0.055	154	154	0.7	0	356	235	183	229	261	253	526	189	72	71	72	70	72	-0.023	5.8	0.21
281	44.889	45.904	0.16	0.16	1.33	82	2.05	1.11	82	1.1	77	0.054	155	155	0.6	-0.1	356	234	182	228	263	253	524	188	72	71	72	70	71	-0.023	5.81	0.21
282	45.049	46.068	0.16	0.16	1.33	82	2.04	1.11	82	1.1	77	0.055	153	154	0.6	0	355	234	182	227	263	252	521	187	72	71	72	70	71	-0.023	5.86	0.22
283	45.210	46.231	0.16	0.16	1.33	82	2.04	1.10	82	1.1	77	0.054	156	154	0.6	0	355	233	181	227	264	252	518	188	72	71	72	70	71	-0.023	5.83	0.22
284	45.370	46.395	0.16	0.16	1.34	82	2.05	1.11	82	1.1	76	0.054	155	155	0.6	0	355	233	180	226	265	252	517	187	72	71	72	70	71	-0.023	5.78	0.22
285	45.530	46.558	0.16	0.16	1.34	82	2.04	1.11	82	1.1	76	0.055	153	153	0.6	0	354	232	180	225	265	251	516	187	71	71	72	70	71	-0.023	5.74	0.22
286	45.691	46.722	0.16	0.16	1.34	82	2.04	1.11	82	1.1	76	0.055	154	154	0.6	0	353	232	179	225	266	251	513	185	71	71	72	70	71	-0.023	5.71	0.22
287	45.851	46.886	0.16	0.16	1.34	82	2.05	1.11	82	1.1	76	0.056	152	152	0.6	0	353	231	179	224	268	251	510	185	71	71	72	70	71	-0.022	5.71	0.23
288	46.012	47.050	0.16	0.16	1.34	82	2.04	1.11	82	1.1	76	0.054	156	155	0.6	0	352	231	178	223	268	250	508	185	71	71	72	70	71	-0.023	5.71	0.22
289	46.172	47.213	0.16	0.16	1.34	82	2.04	1.10	82	1.1	76	0.052	157	157	0.5	-0.1	352	230	177	222	268	250	504	185	71	71	72	70	71	-0.023	5.76	0.22
290	46.332	47.377	0.16	0.16	1.34	82	2.05	1.11	82	1.1	76	0.053	156	157	0.5	0	351	230	177	221	268	249	503	186	71	71	71	70	71	-0.023	5.73	0.22
291	46.493	47.540	0.16	0.16	1.34	82	2.04	1.11	82	1.1	75	0.054	155	154	0.5	0	351	230	176	220	268	249	499	184	71	71	71	70	71	-0.023	5.7	0.22
292	46.654	47.704	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.055	154	154	0.5	0	351	229	175	220	268	249	495	185	71	71	71	70	71	-0.023	5.71	0.22
293	46.814	47.869	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	155	156	0.5	0	351	229	175	219	269	249	493	184	71	71	71	70	71	-0.023	5.71	0.22
294	46.975	48.032	0.16	0.16	1.35	82	2.04	1.11	82	1.1	75	0.055	154	153	0.5	0	351	229	174	218	270	248	490	183	71	71	71	70	71	-0.022	5.7	0.21
295	47.135	48.195	0.16	0.16	1.35	81	2.04	1.11	82	1.1	75	0.055	153	153	0.5	0	351	228	173	217	271	248	488	182	71	71	71	70	71	-0.022	5.7	0.21
296	47.296	48.359	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	156	155	0.5	0	351	228	173	217	272	248	486	180	71	71	71	70	71	-0.022	5.69	0.21
297	47.457	48.523	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	156	155	0.5	0	351	227	172	216	272	248	480	180	71	71	71	70	71	-0.022	5.61	0.2
298	47.618	48.686	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.054	156	154	0.5	0	351	227	171	215	274	248	477	180	71	71	71	70	71	-0.022	5.59	0.21
299	47.779	48.851	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.056	153	153	0.4	-0.1	351	227	171	215	275	248	474	180	71	71	71	70	71	-0.022	5.55	0.21
300	47.939	49.014	0.16	0.16	1.34	81	2.05	1.10	82	1.1	75	0.055	153	153	0.4	0	350	226	170	215	275	247	474	182	71	71	71	70	70	-0.022	5.73	0.23
301	48.099	49.178	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.055	153	154	0.4	0	350	226	169	214	276	247	473	180	71	71	71	70	70	-0.022	5.74	0.22
302	48.260	49.341	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.055	154	153	0.4	0	350	225	169	213	277	247	473	178	70	71	71	70	70	-0.022	5.83	0.23
303	48.421	49.505	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.055	154	154	0.4	0	349	225	168	213	278	247	474	179	71	71	71	70	70	-0.021	5.83	0.24
304	48.581	49.669	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.053	156	157	0.4	0	348	224	167	212	278	246	478	180	70	71	71	70	71	-0.022	5.8	0.26
305	48.742	49.833	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.053	157	157	0.4	0	347	224	167	212	278	246	479	179	70	71	71	70	70	-0.022	5.81	0.27
306	48.902	49.997	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.055	153	154	0.4	0	346	224	166	211	278	245	484	178	70	71	71	70	70	-0.022	5.74	0.28
307	49.062	50.160	0.16	0.16	1.34	81	2.04	1.10	82	1.1	75	0.056	152	151	0.3	-0.1	346	223	166	211	278	245	486	179	70	71	71	70	70	-0.022	5.71	0.28
308	49.223	50.324	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	156	155	0.3	0	344	223	166	210	277	244	486	180	70	71	71	70	70	-0.022	5.6	0.29
309	49.384	50.487	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.055	154	153	0.3	0	343	222	165	209	276	243	489	179	70	71	71	70	70	-0.022	5.55	0.3
310	49.544	50.652	0.16	0.16	1.34	81	2.04	1.11	82	1.1	74	0.053	156	157	0.3	0	343	222	165	209	276	243	492	180	70	71	71	70	70	-0.022	5.49	0.32
311	49.705	50.816	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.053	157	157	0.3	0	342	221	165	208	277	243	497	179	70	71	71	70	70	-0.022	5.44	0.32
312	49.865	50.979	0.16	0.16	1.34	81	2.04	1.10	82	1.1	75	0.056	152	151	0.3	0	341	221	165	207	278	242	497	180	70	71	71	70	70	-0.022	5.38	0.31
313	50.026	51.143	0.16	0.16	1.35	81	2.05	1.11	82	1.1	74	0.056	153	152	0.3	0	340	220	164	207	276	241	500	180	70	71	70	70	70	-0.022	5.32	0.31
314	50.186	51.306	0.16	0.16	1.34	81	2.05	1.11	82	1.1	75	0.055	153	153	0.3	0	339	220	164	206	277	241	500	181	70	71	70	70	70	-0.022	5.29	0.33
315	50.347	51.470	0.16	0.16	1.34	81	2.04	1.11	82	1.1	75	0.054	156	155	0.3	0	338	220	164	205	275	240	501	181	70	71	70	70	70	-0.023	5.26	0.32
316	50.507	51.634	0.16	0.16	1.34	81	2.04	1.11	82	1.1	74	0.052	157	158	0.3	0	337	219	164	205	275	240	503	182	70	71	70	70	70	-0.023	5.27	0.36
317	50.668	51.798	0.16	0.16	1.34	81	2.04	1.11	82	1.1	74	0.054	156	155	0.3	0	336	219	164	204	274	239	507	181	70	71	70	70	70	-0.022	5.29	0.36
318	50.829	51.962	0.16	0.16	1.35	81	2.04	1.11	82	1.1	74	0.053	157	156	0.2	-0.1	335	218	164	203	273	239	510	182	70	71	70	70	70	-0.023	5.43	0.36
319	50.989	52.125	0.16	0.16	1.35	81	2.04	1.11	82	1.1	74	0.055	153	153	0.2	0	334	218	164	202	273	238	513	182	70	71	70	70	70	-0.023	5.42	0.36
320	51.150	52.289	0.16	0.16	1.34	81	2.04	1.11	82	1.1	74	0.055	154	154	0.2	0	334	217	164	202	271	238	508	182	70	71	70	70	70	-0.023	5.53	0.28
321	51.311	52.453	0.16	0.16	1.34	81	2.05	1.11	82	1.1	74	0.056	153	152	0.2	0	334	217	164	201	271	237	500	182	70	71	70	70	70	-0.022	5.39	0.28
322	51.472	52.617	0.16	0.16	1.33	81	2.04	1.11	81	1.1	74	0.055	154	154	0.2	0	333	217	164	200	270	237	495	182	70	71	70	70	70	-0.022	5.26	0.29
323	51.632	52.781	0.16	0.16	1.34	81	2.05	1.11	82	1.1	74	0.054	155	155	0.2	0	333	216	164	200	271	237	493	182	70	71	70	70	70	-0.022	5.18	0.31

RUN ABORTED

Wood Heater Test Data Emissions Data

Run: 6

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Test Date: 06-Nov-18
Beginning Clock Time: 11:51

Total Sampling Time: 520 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 0.986 (1) 0.985 (2) _____ (Amb)

Barometric Pressure:

Begin	Middle	End	Average
30.32			30.32

0

OMNI Equipment Numbers: see run notes

PM Control Modules: 335/336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.200 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 12.90 ft/sec.
Initial Tunnel Flow: 149.1 scfm
Average Tunnel Flow: 147.7 scfm
Post-Test Leak Check (1): N/A cfm @ _____ in. Hg
Post-Test Leak Check (2): N/A cfm @ _____ in. Hg
Average Test Piece Fuel Moisture: 20.71 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.044	0.038	0.034	0.044	0.046	0.032	0.058	"H2O
Temp:	79	79	79	79	79	79	79	79	79	

V_{strav} 13.35 ft/sec V_{scent} 16.02 ft/sec F_p 0.833

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
324	51.793	52.944	0.16	0.16	1.34	81	2.05	1.10	82	1.1	74	0.054	156	154	0.2	0	332	216	164	200	271	237	493	182	70	71	70	70	70	-0.022	5.17	0.31
325	51.953	53.108	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	155	155	0.2	0	330	215	164	199	271	236	496	181	70	71	70	69	69	-0.022	5.13	0.32
326	52.114	53.271	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	156	154	0.2	0	329	215	164	198	269	235	497	181	70	71	70	69	69	-0.023	4.91	0.31
327	52.275	53.435	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	156	155	0.2	0	329	215	164	198	269	235	495	181	70	71	70	70	70	-0.023	4.83	0.33
328	52.435	53.600	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	155	156	0.1	-0.1	328	214	163	197	267	234	497	180	70	71	70	70	70	-0.023	4.85	0.33
329	52.596	53.763	0.16	0.16	1.33	81	2.04	1.11	81	1.1	74	0.054	156	154	0.1	0	327	214	163	196	268	234	497	180	70	71	70	69	70	-0.023	4.81	0.33
330	52.756	53.927	0.16	0.16	1.34	80	2.04	1.11	81	1.1	74	0.055	153	154	0.1	0	326	213	163	196	267	233	496	179	69	71	70	69	70	-0.023	4.74	0.33
331	52.917	54.091	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	156	155	0.1	0	325	213	163	195	265	232	497	181	69	71	70	69	69	-0.022	4.7	0.33
332	53.077	54.254	0.16	0.16	1.34	81	2.04	1.11	81	1.1	74	0.054	155	154	0.1	0	324	212	163	195	265	232	496	181	69	71	70	69	69	-0.023	4.67	0.33
333	53.238	54.418	0.16	0.16	1.34	80	2.04	1.11	81	1.1	74	0.055	154	154	0.1	0	323	212	163	194	264	231	493	180	69	71	70	69	69	-0.023	4.58	0.33
334	53.399	54.583	0.16	0.16	1.34	80	2.05	1.11	81	1.1	73	0.054	156	156	0.0	-0.1	321	211	163	193	263	230	494	180	69	71	70	69	69	-0.023	4.52	0.32
Avg/Tot	53.399	54.583	0.16	0.16	1.34	79		1.11	80		79	0.054	156	156								328.4				71	70	69	69	-0.034		

Appendix B – Sample Analysis

Includes:

Run 1
Run 2
Run 3
Run 4
Run 5 (fan confirmation)

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 1

Model: Encore Tracking Number: 2326 Date: 10/30/18

Test Crew: Aaron Kravitz

OMNI Equipment ID numbers: 283A, 542, 137

ASTM E2515 Lab Sheet

Assembled By: A. Kravitz

Date/Time in Desiccator: 10/30/18 1600 to 20:00

	Weighing #1	Weighing #2	Weighing #3	Weighing #4
Date:	11/12/18	11/14/18		
Time:	1200	1500		
R/H %:	17.4	19.0		
Temp (F):	66.7	67.8		
Audit 1:	199.9	199.9		
Audit 2:	2000.2	2000.0		
Audit 3:	99995.0	99997.8		
Initials:	A	A		

Train	Item	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A	Front Filter (60 min)	D466	119.6	119.7	119.8		
A	Front Filter (Remainder)	D467	119.8	238.1	238.0		
A	Rear Filter	D468	116.0				
A	Probe	12	114285.4 ~~114322.5~~	114285.4	114285.5		
A	O-Ring Set	R679	3313.6	3314.1	3314.1		
B	Front Filter	D392	111.4	224.5	224.4		
B	Rear Filter	D393	111.1				
B	Probe	13	114322.5	114322.5	114322.6		
B	O-Ring Set	R680	4088.9	4089.9	4089.9		
BG	Filter						

Technician Signature: [signature] Date: 11/19/18

Wood Heater Lab Data

Manufacturer:	HHT Halifax	Equipment Numbers:	132, 283A, 637, 592
Model:	Encore		
Tracking No.:	2326		
Project No.:	0135WS042E		
Run #:	1		
Date:	10/30/18		

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D466	119.8	119.6	0.2
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe				0.0
E. Filter seals catch*	Seals				0.0

Sub-Total | Total Particulate, mg: | 0.2

TRAIN 1 (Post First Hour Change-out)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D467	238.0	119.8	118.2
C. Rear filter catch	Filter	D468		116.0	-116.0
D. Probe catch*	Probe	12	114285.5	114285.4	0.1
E. Filter seals catch*	Seals	R679	3314.1	3313.6	0.5

Sub-Total | Total Particulate, mg: | 2.8

Train 1 Aggregate | Total Particulate, mg: | **3.0**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	D392	224.4	111.4	113.0
B. Rear filter catch	Filter	D393		111.1	-111.1
C. Probe catch*	Probe	13	114322.6	114322.5	0.1
D. Filter seals catch*	Seals	R680	4089.9	4088.9	1.0

Total Particulate, mg: | **3.0**

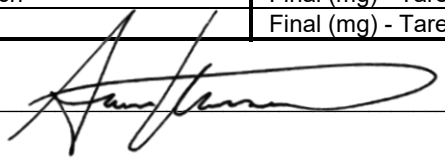
AMBIENT

Sample Component	Reagent	Filter # or Probe #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch*	Filter				0.0

Total Particulate, mg: | **0.0**

*Particulate catch that results in a negative number, is assumed to be zero for probes and seals, negative numbers for filters are assumed to be part of the seal weight.

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Probe catch	Final (mg) - Tare (mg) = Particulate, mg

Technician Signature: 

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 2
Model: Encore Tracking Number: 2326 Date: 10/31/18
Test Crew: Aaron Kravitz
OMNI Equipment ID numbers: 283A, 592, 637

ASTM E2515 Lab Sheet

Assembled By: A. Kravitz

Date/Time in Desiccator: 10/13/18

	Weighing #1	Weighing #2	Weighing #3	Weighing #4
Date:	11/12/18	11/19/18		
Time:	1200	1500		
R/H %:	12.4	10.0		
Temp (F):	66.7	67.8		
Audit 1:	199.9	199.9		
Audit 2:	20002	20000		
Audit 3:	19998.0	19997.8		
Initials:	AK	AK		

Train	Item	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A	Front Filter (60 min)	D587	120.5	121.8	121.7		
A	Front Filter (Remainder)	D588	121.1	242.4	242.3		
A	Rear Filter	D589	121.1	↗			
A	Probe	14	114548.7	114548.7	114548.8		
A	O-Ring Set	R681	3403.2	3404.8	3304.6		
B	Front Filter	D590	121.2	242.6	242.5		
B	Rear Filter	D591	120.8	↗			
B	Probe	15	114342.0	114341.9	114342.0		
B	O-Ring Set	R682	3356.0	3358.5	3358.3		
BG	Filter						

Technician Signature: [signature] Date: 11/19/18

Wood Heater Lab Data

Manufacturer:	HHT Halifax	Equipment Numbers:	
Model:	Encore		
Tracking No.:	2326		
Project No.:	0135WS042E		
Run #:	2		
Date:	10/31/18		

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D587	121.7	120.5	1.2
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe				0.0
E. Filter seals catch*	Seals				0.0

Sub-Total Total Particulate, mg: 1.2

TRAIN 1 (Post First Hour Change-out)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D588	242.3	121.1	121.2
C. Rear filter catch	Filter	D589		121.1	-121.1
D. Probe catch*	Probe	14	114548.8	114548.7	0.1
E. Filter seals catch*	Seals	R681	3404.6	3403.2	1.4

Sub-Total Total Particulate, mg: 1.6

Train 1 Aggregate Total Particulate, mg: **2.8**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	D590	242.5	121.2	121.3
B. Rear filter catch	Filter	D591		120.8	-120.8
C. Probe catch*	Probe	15	114342.0	114342.0	0.0
D. Filter seals catch*	Seals	R682	3358.3	3356.0	2.3

Total Particulate, mg: **2.8**

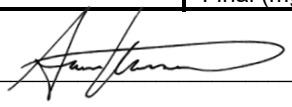
AMBIENT

Sample Component	Reagent	Filter # or Probe #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch*	Filter				0.0

Total Particulate, mg: **0.0**

*Particulate catch that results in a negative number, is assumed to be zero for probes and seals, negative numbers for filters are assumed to be part of the seal weight.

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Probe catch	Final (mg) - Tare (mg) = Particulate, mg

Technician Signature: 

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 3

Model: Encore Tracking Number: 2326 Date: 11/1/18

Test Crew: Aaron Kravitz

OMNI Equipment ID numbers: 283A, 542, 637

ASTM E2515 Lab Sheet

Assembled By: A. Kravitz

Date/Time in Desiccator: 11/1/18

	Weighing #1	Weighing #2	Weighing #3	Weighing #4
	Date: 11/12/18	Date: 11/16/18	Date:	Date:
	Time: 1200	Time: 1500	Time:	Time:
	R/H %: 12.4	R/H %: 19.0	R/H %:	R/H %:
	Temp (F): 66.7	Temp (F): 67.8	Temp (F):	Temp (F):
	Audit 1: 199.9	Audit 1: 199.9	Audit 1:	Audit 1:
	Audit 2: 2000.2	Audit 2: 2000.0	Audit 2:	Audit 2:
	Audit 3: 99998.0	Audit 3: 99997.8	Audit 3:	Audit 3:
	Initials:	Initials:	Initials:	Initials:

Train	Item	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A	Front Filter (60 min)	D593	120.6	125.4	125.4		
A	Front Filter (Remainder)	D594	120.8	242.2	242.3		
A	Rear Filter	D595	121.3				
A	Probe	16	114266.4	114266.7	114266.8		
A	O-Ring Set	RC83	3289.3	3289.9	3289.9		
B	Front Filter	D596	121.8	246.2	246.2		
B	Rear Filter	D597	119.3				
B	Probe	17	114560.3	114560.4	114560.5		
B	O-Ring Set	RC84	3391.0	3391.1	3391.1		
BG	Filter						

Technician Signature: _____ Date: 11/19/18

Wood Heater Lab Data

Manufacturer:	HHT Halifax	Equipment Numbers:	
Model:	Encore		
Tracking No.:	2326		
Project No.:	0135WS042E		
Run #:	3		
Date:	10/31/18		

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D593	125.4	120.6	4.8
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe				0.0
E. Filter seals catch*	Seals				0.0

Sub-Total Total Particulate, mg: 4.8

TRAIN 1 (Post First Hour Change-out)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D594	242.3	120.8	121.5
C. Rear filter catch	Filter	D595		121.3	-121.3
D. Probe catch*	Probe	16	114266.8	114266.4	0.4
E. Filter seals catch*	Seals	R683	3289.9	3289.3	0.6

Sub-Total Total Particulate, mg: 1.2

Train 1 Aggregate Total Particulate, mg: **6.0**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	D596	246.2	121.8	124.4
B. Rear filter catch	Filter	D597		119.3	-119.3
C. Probe catch*	Probe	17	114560.5	114560.3	0.2
D. Filter seals catch*	Seals	R684	3391.1	3391.0	0.1

Total Particulate, mg: **5.4**

AMBIENT

Sample Component	Reagent	Filter # or Probe #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch*	Filter				0.0

Total Particulate, mg: **0.0**

*Particulate catch that results in a negative number, is assumed to be zero for probes and seals, negative numbers for filters are assumed to be part of the seal weight.

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Probe catch	Final (mg) - Tare (mg) = Particulate, mg

Technician Signature: 

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 4

Model: Encore Tracking Number: 2326 Date: 10/2/18

Test Crew: Aaron Kravitz

OMNI Equipment ID numbers: 283A, 592, 637

ASTM E2515 Lab Sheet

Assembled By: A. Kravitz

Date/Time in Desiccator: 11/2/18

	Weighing #1	Weighing #2	Weighing #3	Weighing #4
Date:	11/12/18	11/19/18		
Time:	1200	1500		
R/H %:	12.4	10.0		
Temp (F):	66.7	67.8		
Audit 1:	199.9	199.9		
Audit 2:	200.2	200.0		
Audit 3:	99998.0	99997.8		
Initials:	A	A		

Train	Item	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A	Front Filter (60 min)	D598	120.9	122.0	122.0		
A	Front Filter (Remainder)	D599	121.3	246.0	246.1		
A	Rear Filter	0600	121.2	↗			
A	Probe	18	114402.1	114402.2	114402.1		
A	O-Ring Set	R673	3555.9	3556.6	3556.6		
B	Front Filter	D601	120.9	246.7	246.8		
B	Rear Filter	D602	121.7	↗			
B	Probe	20	114253.0	114253.2	114253.1		
B	O-Ring Set	R674	3534.2	3534.7	3534.7		
BG	Filter						

Technician Signature: [signature] Date: 11/19/18

Wood Heater Lab Data

Manufacturer:	HHT Halifax	Equipment Numbers:	
Model:	Encore		
Tracking No.:	2326		
Project No.:	0135WS042E		
Run #:	4		
Date:	11/2/18		

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D598	122.0	120.9	1.1
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe				0.0
E. Filter seals catch*	Seals				0.0

Sub-Total | Total Particulate, mg: | 1.1

TRAIN 1 (Post First Hour Change-out)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D599	246.1	121.3	124.8
C. Rear filter catch	Filter	D600		121.2	-121.2
D. Probe catch*	Probe	18	114402.1	114402.1	0.0
E. Filter seals catch*	Seals	R673	3356.6	3355.9	0.7

Sub-Total | Total Particulate, mg: | 4.3

Train 1 Aggregate | Total Particulate, mg: | **5.4**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	D601	246.8	120.9	125.9
B. Rear filter catch	Filter	D602		121.7	-121.7
C. Probe catch*	Probe	20	114253.1	114253.0	0.1
D. Filter seals catch*	Seals	R674	3534.7	3534.2	0.5

Total Particulate, mg: | **4.8**

AMBIENT

Sample Component	Reagent	Filter # or Probe #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch*	Filter				0.0

Total Particulate, mg: | **0.0**

*Particulate catch that results in a negative number, is assumed to be zero for probes and seals, negative numbers for filters are assumed to be part of the seal weight.

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Probe catch	Final (mg) - Tare (mg) = Particulate, mg

Technician Signature:_____

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: HHT Halifax Project Number: 0135WS042E Run Number: 5

Model: Encore Tracking Number: 2326 Date: 11/5/18

Test Crew: Aaron Kravitz

OMNI Equipment ID numbers: 283A, 592, 637

ASTM E2515 Lab Sheet

Assembled By: A. Kravitz

Date/Time in Desiccator: 11/5/18

	Weighing #1	Weighing #2	Weighing #3	Weighing #4
Date:	11/12/18	11/19/18	11/20/18	
Time:	1200	1500	0830	
R/H %:	12.4	19.0	21.0	
Temp (F):	61.7	67.8	64.1	
Audit 1:	199.9	199.9	N/A	
Audit 2:	2000.2	2000	N/A	
Audit 3:	99998.0	99997.8	99998.0	
Initials:	A	A	A	

Train	Item	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A	Front Filter (60 min)	D603	120.4	120.8	120.8	-	
A	Front Filter (Remainder)	D604	121.5	245.7 ~~245.7~~ A	245.8	-	
A	Rear Filter	D605	120.9			-	
A	Probe	7	114981.9	114981.5	114981.8	114981.9	
A	O-Ring Set	R676	35884	3588.8	3588.9	-	
B	Front Filter	D606	120.6	245.6 ~~245.6~~ A	245.7	-	
B	Rear Filter	D607	121.4			-	
B	Probe	8	115594.0	115593.9	115594.0	-	
B	O-Ring Set	R675	3552.3	3552.4	3552.5	-	
BG	Filter						

Technician Signature: [signature] Date: 11/20/18

Wood Heater Lab Data

Manufacturer: HHT Halifax
Model: Encore
Tracking No.: 2326
Project No.: 0135WS042E
Run #: 5
Date: 11/5/18

Equipment Numbers:

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D603	120.8	120.4	0.4
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe				0.0
E. Filter seals catch*	Seals				0.0

Sub-Total Total Particulate, mg: 0.4

TRAIN 1 (Post First Hour Change-out)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	D604	245.8	121.5	124.3
C. Rear filter catch	Filter	D605		120.9	-120.9
D. Probe catch*	Probe	7	114981.9	114981.9	0.0
E. Filter seals catch*	Seals	R676	3588.9	3588.4	0.5

Sub-Total Total Particulate, mg: 3.9

Train 1 Aggregate Total Particulate, mg: **4.3**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	D606	245.7	120.6	125.1
B. Rear filter catch	Filter	D607		121.4	-121.4
C. Probe catch*	Probe	8	115594.0	115594.0	0.0
D. Filter seals catch*	Seals	R684	3552.5	3552.3	0.2

Total Particulate, mg: **3.9**

AMBIENT

Sample Component	Reagent	Filter # or Probe #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch*	Filter				0.0

Total Particulate, mg: **0.0**

*Particulate catch that results in a negative number, is assumed to be zero for probes and seals, negative numbers for filters are assumed to be part of the seal weight.

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Probe catch	Final (mg) - Tare (mg) = Particulate, mg

Technician Signature: 

Tare Sheet: (check one) **Probes** ✓ **47mm Filters**____ **100mm Filters**____ **O-Ring Pair**____

Prepared By: B Davis Balance ID #: Omni-00637 Thermohygrometer ID #: Omni-00592 Audit Weight ID #/Mass: Omni-283A 1/100g

Placed in Dessicator: Date: 9/27/18 Time: 10:05 ID #	Date: 10/11/2018 Time: 10:30 am RH %: 18.9 T (°F): 73.0 Audit: 99997.9	Date: 10/19/18 Time: 0800 RH %: 17.9 T (°F): 71.6 Audit: 99997.9	Date: 10/22/18 Time: 0836 RH %: 14.7 T (°F): 70.7 Audit: 99997.7	Date: 10/31/18 Time: 1000 RH %: 15.5 T (°F): 72.6 Audit: 5000	Date Used	Project Number	Run No.
OES 4	114145.7	114145.6	✓		6/5/18	0135WS042E	6
3	116010.0	116009.8	✓		↓	↓	↓
OE							
OE							
12	114285.6	114285.4	✓		10/30/18	0135WS042E	1
13	114322.6	114322.5	✓		↓	↓	↓
14	114548.8	114548.7	✓		10/31/18	↓	2
15	114342.2	114341.8	114342.2	114342.0 ✓	↓	↓	↓
16	114266.6	114266.3	114266.6	114266.4 ✓	11/1/18	↓	3
17	114560.5	114560.3	✓		↓	↓	↓
18	114402.2	114402.1	✓		11/2/18	↓	4
20	114253.4	114253.0	114253.0	✓	↓	↓	↓
	Initials: ML	Initials: DD2	Initials: BR	Initials: AL			

Final Technician Signature: [signature] Date: 10/31/18 Evaluator signature: [signature]

Tare Sheet: (check one) Probes_____ 47mm Filters_____ 100mm Filters_____ O-Ring Pair ✓

Prepared By: B Davis Balance ID #: omni-00637 Thermohygrometer ID #: omni-0~~0592~~ 592 Audit Weight ID #/Mass: omni-00283A 1.5g

Placed in Dessicator: Date: Sept '18 Time:	Date: 10/11/2018 Time: 4:00 RH %: 14.4 % T (°F): 74.4° Audit: 500.2	Date: 10/19/18 Time: 0800 RH %: 17.9 T (°F): 71.6 Audit: 500.1	Date: 10/22/18 Time: 0836 RH %: 14.7 T (°F): 70.7 Audit: 500.1	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
ID #							
RG71	~~3510.3~~ 3356.0 mL	3509.8	3510.2		11/5/18	0135WS042E	C
RG72	3545.3	3545.1			↓	↓	↓
RG73	3556.2	3555.7	3555.9		11/2/18	0135WS042E	4
RG74	3534.4	3534.0	3534.2		↓	↓	↓
RG75	3552.6	3552.2	3552.3		11/5/18	0135WS042E	5
RG76	3588.6	3588.4			~~10/24/18~~ ↓	~~0135PS023E-R1~~ ↓	~~1~~ ↓ A
RG79	3313.8	3313.4	3313.6		10/30/18	0135WS042E	1
RG80	4089.3	4089.0	4088.9		↓	↓	↓
RG81	3403.6	3403.2	3403.2		10/31/18	↓	2
RG82	3356.1	3356.0			↓	↓	↓
RG83	3289.8	3289.3	3289.3		11/1/18	↓	3
RG84	3391.4	3390.8	3391.0		↓	↓	↓
	Initials:	Initials: BA	Initials: BA	Initials:			

Final Technician Signature: _____ Date: 10/22/18 Evaluator signature: _____

Tare Sheet: Probes___ 47mm Filters_✓_ 100mm Filters___ O-Ring Pair___

Date/time Placed in Dessicator: 1/4/18 1410

Thermohygrometer ID #: OMNI-00592

Prepared By: B Davis

Analytical Balance ID #: OMNI-00637

Audit Weight ID #/Mass: OMNI-00283A / 200 mg

ID #	Date: 1/5/18 Time: 1425 RH %: 19.8 T (°F): 71.2 Audit: 0.2001	Date: 1/8/18 Time: 10:20 RH %: 14.6 T (°F): 74.4 Audit: 0.2000	Date: 1/9/18 Time: 0820 RH %: 8.6 T (°F): 77 Audit: 0.2000	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
D392	111.2	111.4	✓		10/30/18	G135WS042E	1
D393	110.9	111.1	✓		↓	↓	↓
	Initials: BR	Initials: BR	Initials: BR	Initials:			

Final Technician Signature: _____ Date: 1/10/18

Evaluator signature: _____

Tare Sheet: Probes___ 47mm Filters_✓_ 100mm Filters___ O-Ring Pair___

Date/time Placed in Dessicator: 3/14/18 1210

Thermohygrometer ID #: Omni-00592

Prepared By: B Davis

Analytical Balance ID #: Omni-00637

Audit Weight ID #/Mass: Omni-02834 / 200 mg

ID #	Date: 3/15/18 Time: 1212 RH %: 15.0 T (°F): 70.7 Audit: 200.0	Date: 3/16/18 Time: 0811 RH %: 17.1 T (°F): 69.6 Audit: 200.0	Date: 3/16/18 Time: 1449 RH %: 17.9 T (°F): 71.6 Audit: 200.0	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
DH6	119.6	119.6	✓		10/30/18	0135P5042E	1
DH7	119.7	119.8	✓		↓	↓	↓
DH8	116.0	116.0	✓		↓	↓	↓
	—						
PTFE	222.7	222.4	222.2	✓			
	Initials: BR	Initials: BR	Initials: BR	Initials:			

Final Technician Signature: _____ Date: 3/29/18

Control No. P-SFDP-0001.xls, Effective date: 9/9/2015

Evaluator signature: _____

Tare Sheet: (check one) Probes_____ 47mm Filters ✓ 100mm Filters_____ O-Ring Pair_____

Prepared By: B Davis Balance ID #: OMNI-00637 Thermohygrometer ID #: OMNI-00592 Audit Weight ID #/Mass: OMNI-00283A / 200 mg

Placed in Dessicator: Date: 9/27/18 Time: 10:05 ID #	Date: 10/11/2018 Time: 4:00 Pm RH %: 15.1% T (°F): 73.2° Audit: 500.2	Date: 10/12/2018 Time: 4:00 P.M. RH %: 21.2% T (°F): 73.5° Audit: 500.1	Date: 10/19/18 Time: 0800 RH %: 17.9 T (°F): 71.6 Audit: 500.1	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
D587	120.7	120.3	120.5	✓	10/31/18	0135WS042E	2
D588	121.0	120.9	121.1	✓	↓	↓	↓
D589	121.2	121.1	–				
D590	121.3	121.2	–				
D591	120.9	120.8	–				
D592	122.0	121.8	–				
	Initials: ML	Initials: ML	Initials: BR	Initials:			

Final Technician Signature: _____ Date: 10-19-18 Evaluator signature: _____

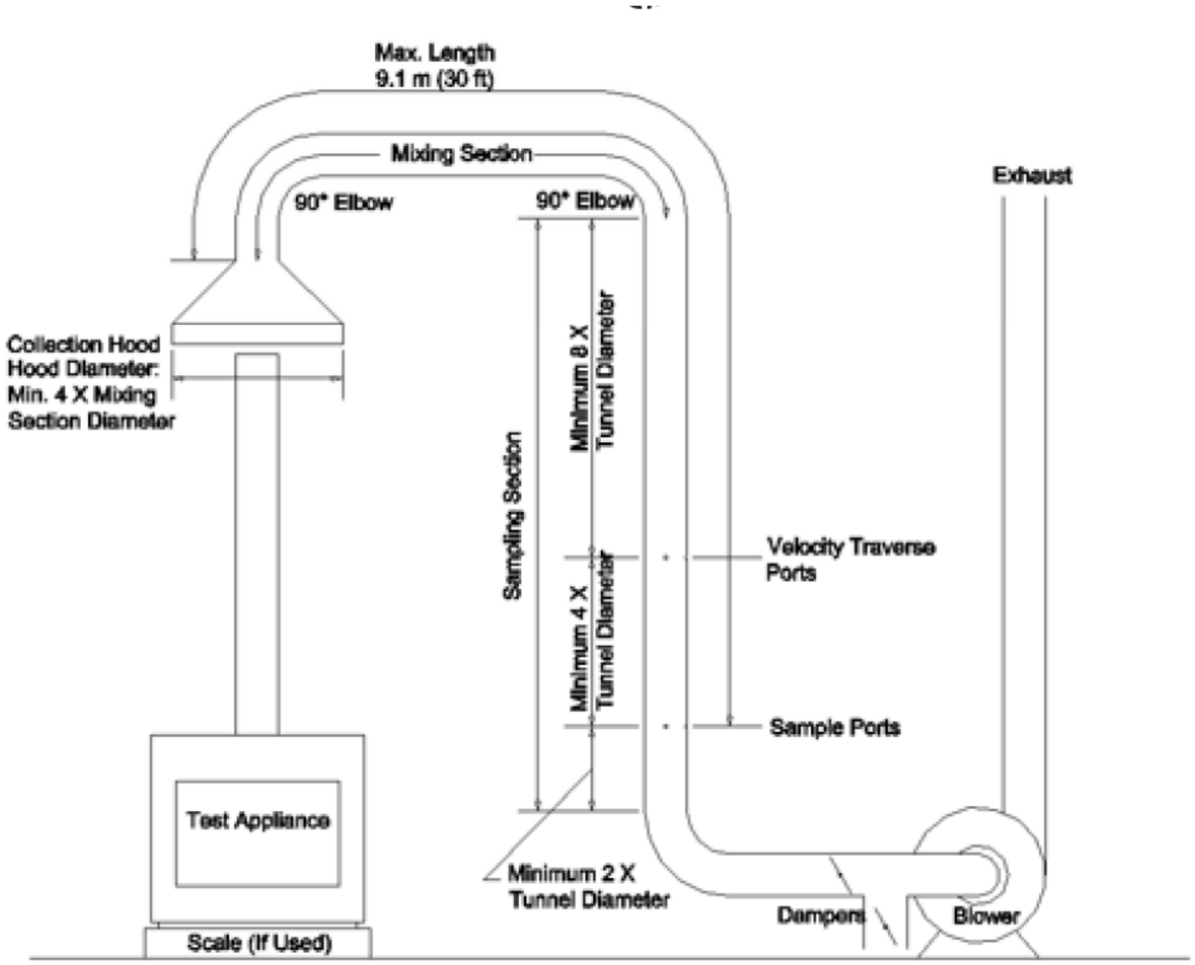
Tare Sheet: (check one) Probes_____ 47mm Filters✓ 100mm Filters_____ O-Ring Pair_____

Prepared By: A. Kravitz Balance ID #: Thermohygrometer ID #: Audit Weight ID #/Mass: /

Placed in Dessicator: Date: 10/30/18 Time: 0800 ID #	Date: 10/31/18 Time: 0970 RH %: 19.3 T (°F): 72.3 Audit: 500.0	Date: 11/1/18 Time: 0760 RH %: 22.0 T (°F): 69.8 Audit: 500.1	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
D593	120.5	120.6			11/1/18	0135WS042 E	3
D594	120.8	120.8			↓	↓	↓
D595	121.3	121.3			↓	↓	↓
D596	121.8	121.8			↓	↓	↓
D597	119.1	119.3			↓	↓	↓
D598	121.0	120.9			11/2/18	↓	4
D599	121.4	121.3			↓	↓	↓
D600	121.2	121.2			↓	↓	↓
D601	120.8	120.9			↓	↓	↓
D602	121.9	121.7			↓	↓	↓
D603	120.4	120.4			11/5/18	↓	5
D604	121.5	121.5			↓	↓	↓
D605	121.0	120.9			↓	↓	↓
D606	120.6	120.7			↓	↓	↓
D607	120.7	120.6			↓	↓	↓
D608	121.5	121.4			11/6/18	↓	6
D609	122.4	122.5			↓	↓	↓
D610	120.3	120.4			↓	↓	↓
D611	122.6	122.4			↓	↓	↓
D612	~~122.0~~ 121.8	121.9			↓	↓	↓
	Initials:	Initials:	Initials:	Initials:			

Final Technician Signature: _____ Date: 11/1/18 Evaluator signature: _____

Appendix C – Equipment and Calibrations



Dilution tunnel specifications from ASTM E2515

Prior to testing, sample point and traverse point locations were verified to ensure placement was within specifications. Collection hood, tunnel diameter, and mixing section length are also verified to be within specifications. Also prior to the testing series, the interior of the hood and venting were brushed clean.

Equipment for ASTM E2515, ASTM E2780, & EPA Method 28R

ID #	Lab Name/Purpose	Log Name	Attachment Type
132	10 lb Weight	Weight Standard, 10 lb.	Calibration Certificate
185	Platform Scale	Weight Indicator, Model WI-127	Calibration Certificate
283A	Audit Weight Set	Troemer weight set	Calibration Certificate
296-T55	Tape Measure	DeWalt 16' Tape Measure	Calibration Log
335	Sample Box / Dry Gas Meter	Apex Automated Emissions Sampling Box	Calibration Log
336	Sample Box / Dry Gas Meter	Apex Automated Emissions Sampling Box	Calibration Log
340	Moisture Meter	Delmhorst Wood Moisture Meter	See Run Sheet
420	Combustion Gas Analyzer	CAI Gas Analyzer	See Run Sheet
431	Moisture Meter Calibrator	Delmhorst Moisture Content calibrator	Calibration Certificate
559	Vaneometer	Dwyer Vaneometer	Equipment Record
592	Thermohygrometer	Omega Digital Thermohygrometer	Calibration Log
637	Milligram Balance	Analytical Balance - Mettler - Toledo	Calibration Certificate
650*	Barometer/Hygrometer	Digital Barometer	Calibration Certificate

*Barometer 650 was used outside the semi-annual (6-month) calibration cycle required in the test method. The subsequent calibration sheet has been added, which shows that the instrument was received and found “in tolerance” by the ISO 17025 calibration laboratory.

Certificate of Calibration

Certificate Number: **698278**

JJ Calibrations, Inc.
7007 SE Lake Rd
Portland, OR 97267-2105
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

0723.01
Calibration

PO: **190231**
Order Date: 04/04/2019
Authorized By: **N/A**

Property #: OMNI-00650
User: N/A
Department: N/A
Make: Control Company
Model: 6530
Serial #: 181062211
Description: Thermohygrometer / Barometer
Procedure: 403406
Accuracy: ±3%RH, ±.4°C(0.8°F), ±4mbar(0.12inHg)

Calibrated on: 04/18/2019
*Recommended Due: 04/18/2020
Environment: 22 °C 53 % RH
* As Received: Within Tolerance
* As Returned: Within Tolerance
Action Taken: Calibrated
Technician: **146**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
847A	Fluke	RPM4	Reference Pressure Monitor	11/21/2019	688957
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	07/30/2019	674006

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	kError	UUT	Uncertainty
Before/After							Accredited = ✓
Humidity							
	%	13.0	10	16	1	14 %	5.8E-01 ✓
	%	50.0	47	53	2	48 %	5.8E-01 ✓
	%	80.0	77	83	3	77 %	5.8E-01 ✓
Temperature							
	°C	20.00	19.6	20.4	0.4	19.6 °C	8.1E-02 ✓
	°C	35.00	34.6	35.4	0.4	34.6 °C	8.1E-02 ✓
	°C	50.00	49.6	50.4	0.2	49.8 °C	8.1E-02 ✓
Barometer							
	29 inHg	29.6210	29.501	29.741	0.009	29.630 inHg	8.1E-02 ✓

JJ Calibrations, Inc. certifies that this instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual with the stated procedure using standards that are traceable to the National Institute of Standards and Technology (NIST), or other National Measurement Institutes (NMI's), or by using natural physical constants, intrinsic standards or ratio calibration techniques. The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2005, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without prior written consent of JJ Calibrations, Inc.
JJ Calibrations, Inc. quality system has been assessed and accredited to ISO/IEC 17025:2005.

Reviewer

3 Issued 04/19/2019 Rev # 15

Inspector

SCALE WEIGHT CALIBRATION DATA SHEET

Weight to be calibrated: 10 pounds

ID Number: OMNI-00132

Standard Calibration Weight: 10 pounds

ID Number: OMNI-00255

Scale Used: MTW-150K

ID Number: OMNI-00353

Date: 2/23/2018 By: B. Davis

Standard Weight (A) (Lb.)	Weight Verified (B) (Lb.)	Difference (A - B)	% Error
10.0	10.0	0.0	0

*Acceptable tolerance is 1%.

This calibration is traceable to NIST using calibrated standard weights.

Technician signature: _____ Date: 2/23/18

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A2LA ACCREDITED
CERTIFICATE #1550.01

OMNI-Test Laboratories, Inc.
13327 NE Airport Way
Portland, OR 97230

Report Number: OMNE0321676181002

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Weigh-Tronix	WI-127 1000x0.1lb	21676	185	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.1	QC033	10/2/18	10/4/17	10/2019

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 500 Tol: 0.5	Test Wt: HB44 Tol: HB44	Test Wt: 200 Tol: 0.2	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 20.2°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	999.8	999.8	0.12
700	699.8	699.8	0.12
500	499.9	499.9	0.08
200	200.0	200.0	0.08
100	100.0	100.0	0.05
50	50.0	50.0	0.05

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/24/17	11/2019	20172265

Permanent Information Concerning this Equipment:

Comments/Information Concerning this Calibration

10/2/2018 - Relative Humidity = 61.0 %

Report prepared/reviewed by: D **Date:** 10.2.18 **Technician:** D.Oudeans

Signature: D. Oudeans

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy.

Tape Measure Calibration Log

Place the calibrated 12" ruler under the tape measure and verify that each ½" (i.e. 1.5", 2", 2.5") between 0 and 36" is within 1/8".

Calibrated using OMNI-00281

Tape Measure Number	Description	Cal Dates				Technician Initials			
OMNI-00296-T55	Dewalt 16' Tape Measure	12/12/16				BR			
OMNI-00296-T56	Dewalt 25' Tape Measure	12/12/16				BR			
OMNI-00296-T59	Dewalt 25' Tape Measures	12/12/16				BR			
OMNI-00296-T58	Dewalt 25' Tape measure	3/9/17	4/3/18			BR	BR		
OMNI-00296-T40	Stanley FatMax Tape measurer 16'	11/17/17				NHS			
OMNI-00296-T31	Stanley Powerlock Tape Measurer	11/22/17				NHS			
OMNI-00296-T59	DeWalt 25' tape Measure	12/06/17				NHS			
OMNI-00296-T54	DeWalt 25' tape Measure	12/06/17				NHS			
OMNI-00296-T56	DeWalt 25' tape Measure	12/06/17				NHS			
OMNI-00296-T55	DeWalt 25' tape Measure	12/06/17	4/3/18			NHS	BR		

Thermal Metering System Calibration
Y Factor

Manufacturer:	APEX
Model:	XC-60-EP
Serial Number:	606001
OMNI Tracking No.:	OMNI-00335
Calibrated Orifice:	[redacted]

Previous Calibration Comparision

Date	1/17/2018	Acceptable Deviation (5%)	Deviation
y Factor	0.977	0.04885	0.009
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.008
Acceptable dH@ Deviation	N/A
Maximum dH@ Deviation	N/A
Acceptance	Acceptable

Average Gas Meter y Factor	Orifice Meter dH@
0.986	N/A

Calibration Date:	07/17/18	
Calibrated by:	B. Davis	
Calibration Frequency:	Six months	
Next Calibration Due:	1/17/2019	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.12	"Hg
Signature/Date:		7/18/2018

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	OMNI-00001	
	Calib. Date	30-Oct-17	
	Calib. Value	0.9977	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	2.00	1.38	1.00
Initial Reference Meter	609.1	615.5	620.8
Final Reference Meter	615.4	620.7	626.7
Initial DGM	0	0	0
Final DGM	6.292	5.245	5.995
Temp. Ref. Meter (°F), Tr	92.0	93.0	91.0
Temperature DGM (°F), Td	92.0	93.0	91.0
Time (min)			
Net Volume Ref. Meter, Vr	6.300	5.200	5.900
Net Volume DGM, Vd	6.292	5.245	5.995
Gas Meter y Factor =	**0.994**	**0.986**	**0.979**
Gas Meter y Factor Deviation (from avg.)	0.008	0.001	0.007
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|
** 2. y = [Vr x (y factor (ref)) x (Pb + (Pr/ 13.6)) x (Td + 460)]/ [Vd x (Pb + (Pd / 13.6)) x (Tr + 460)]
** 3. dH@ = 0.0317 x Pd / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory
** Equations come from EPA Method 5
The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer

Maximum Range: 0-2" WC ID Number: OMNI-00335

Calibration Instrument: Digital Manometer ID Number: OMNI-00395

Date: 7/18/2018 By: B. Davis

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference (Input - Response)	% Error of Full Span*
0-20% Max. Range 0 - 0.4	0.183	0.183	0.0	0.0
20-40% Max. Range 0.4 - 0.8	0.705	0.704	0.001	0.05
40-60% Max. Range 0.8 – 1.2	1.019	1.016	0.003	0.15
60-80% Max. Range 1.2 – 1.6	1.394	1.391	0.003	0.15
80-100% Max. Range 1.6 – 2.0	1.980	1.978	0.002	0.10

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: _____ Date: 7/18/18

Reviewed by: _____ Date: 7/20/18

Temperature Calibration
EPA Method 28R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
Mobile	National Instruments Logger	00335, 00336

Reference Meter Equipment Number: 00373	Calibration Due Date: 8/02/17

Calibration Performed By:	Date:	Ambient Temperature:	Barometric Pressure:
B. Davis	7/17/18	76	30.12

Input Temperature (F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	0	1	1	1	1	0	0
100	100	101	101	100	100	100	100
300	300	300	300	300	300	300	300
500	500	501	500	500	500	500	500
700	700	700	700	700	700	700	700
1000	1000	1001	1000	1000	1000	1000	1000

Input (F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	0	0	0	0	0	1	1	1	0
100	100	100	100	100	100	101	101	101	100
300	300	300	300	300	300	300	300	300	300
500	500	500	500	500	500	500	500	500	500
700	700	700	700	700	700	700	700	700	700
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

1500
2000

1500
2000

Technician signature: _____ Date: 7/17/18

Reviewed By: _____ Date: 7/20/18

Thermal Metering System Calibration
Y Factor

Manufacturer:	APEX
Model:	XC-60-EP
Serial Number:	606002
OMNI Tracking No.:	OMNI-00336
Calibrated Orifice:	[redacted]

Average Gas Meter y Factor	Orifice Meter dH@
0.985	N/A

Calibration Date:	07/17/18	
Calibrated by:	B. Davis	
Calibration Frequency:	Six months	
Next Calibration Due:	1/17/2019	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.12	"Hg
Signature/Date:		1/17/2018

Previous Calibration Comparision

Date	1/17/2018	Acceptable Deviation (5%)	Deviation
y Factor	0.979	0.04895	0.006
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.003
Acceptable dH@ Deviation	N/A
Maximum dH@ Deviation	N/A
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	OMNI-00001	
	Calib. Date	30-Oct-17	
	Calib. Value	0.9977	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	1.91	1.20	0.80
Initial Reference Meter	572.4	577.5	582.9
Final Reference Meter	577.4	582.604	588.1
Initial DGM	0	0	0
Final DGM	5.061	5.245	5.34
Temp. Ref. Meter (°F), Tr	86.0	86.0	78.0
Temperature DGM (°F), Td	90.0	95.0	86.0
Time (min)	23.5	30.0	37.8
Net Volume Ref. Meter, Vr	5.000	5.104	5.200
Net Volume DGM, Vd	5.061	5.245	5.34
Gas Meter y Factor =	**0.988**	**0.984**	**0.984**
Gas Meter y Factor Deviation (from avg.)	0.003	0.001	0.001
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|

** 2. $y = [Vr \times (y \text{ factor (ref)}) \times (Pb + (Pr/ 13.6)) \times (Td + 460)]/ [Vd \times (Pb + (Pd / 13.6)) \times (Tr + 460)]$

** 3. $dH@ = 0.0317 \times Pd / (Pb (Td + 460)) \times [(Tr + 460) \times time) / Vr]^2$

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory

** Equations come from EPA Method 5

The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer

Maximum Range: 0-2" WC ID Number: OMNI-00336

Calibration Instrument: Digital Manometer ID Number: OMNI-00395

Date: 7/18/18 By: B. Davis

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference (Input - Response)	% Error of Full Span*
0-20% Max. Range 0 - 0.4	0.045	0.041	0.003	0.20
20-40% Max. Range 0.4 - 0.8	0.446	0.447	0.001	0.05
40-60% Max. Range 0.8 – 1.2	0.900	0.901	0.001	0.05
60-80% Max. Range 1.2 – 1.6	1.589	1.592	0.003	0.20
80-100% Max. Range 1.6 – 2.0	1.902	1.908	0.006	0.30

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: _____ Date: 7/18/18

Reviewed by: _____ Date: 7/20/18

Temperature Calibration
EPA Method 28R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
Mobile	National Instruments Logger	00335, 00336

Reference Meter Equipment Number: 00373	Calibration Due Date: 8/02/17

Calibration Performed By:	Date:	Ambient Temperature:	Barometric Pressure:
B. Davis	7/17/18	76	30.12

Input Temperature (F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	0	1	1	1	1	0	0
100	100	101	101	100	100	100	100
300	300	300	300	300	300	300	300
500	500	501	500	500	500	500	500
700	700	700	700	700	700	700	700
1000	1000	1001	1000	1000	1000	1000	1000

Input (F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	0	0	0	0	0	1	1	1	0
100	100	100	100	100	100	101	101	101	100
300	300	300	300	300	300	300	300	300	300
500	500	500	500	500	500	500	500	500	500
700	700	700	700	700	700	700	700	700	700
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

1500
2000

1500
2000

Technician signature: _____ Date: 7/17/18

Reviewed By: _____ Date: 7/20/18

WOOD MOISTURE CONTENT CALIBRATION WORKSHEET

Moisture Content Standard OMNI ID #: 00431

Reference Moisture Content Standard: **OMNI # 00430**

Date	Temp.	Barometric Pressure	Fixed Moisture %	Fixed Moisture %	Observed Moisture %		Initials
11/14/16	68° F	30.10 in Hg	22%	12%	22%	12%	AB2
5/10/17	70°F	30.14 in Hg	22%	12%	22%	12%	ABC
11/17/17	70°F	30.23 in Hg	22%	12%	22%	12%	MHS
5/18/18	71°F	30.12 in Hg	22%	12%	22%	12%	TBD
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			
			22%	12%			

Notes: _____

Technician signature: _____ Date: 11/15/16

Calibration Service Record			
Date	**By**	**Results**	**Date of next Calibration**
7/12/2018	B. Davis	Installed a new Vane as per manufacturer's instructions.	1/12/2019

VWR Temperature Hygrometer Calibration Procedure and Data Sheet

Frequency: Every Two Years

Step 1: Locate NIST traceable standard.

Step 2: Place unit to be calibrated, tracking No. OMNI- 00592 , inside OMNI desiccate box on the same shelf with the NIST traceable standard.

Step 3: After a period of not less than four hours record the temperature and humidity of both units in the spaces provide below.

Step 4: If the unit to be calibrated matches the NIST standard within ± 4%, it is acceptable. If not, the unit needs to be sent to a repair company or replaced.

Verification Data:

Date: 1/8/2018 Technician: B Davis

Time in desiccate: 0910 Recording time: 1335

NIST Standard Temperature: 28.3 °F NIST Standard Humidity: 74.5

Test Unit Temperature Reading: 25.4 °F Test Unit Humidity Reading: 74.3

Test unit OMNI- 00592 is X or was not ___ within acceptable limits.

Technician Signature: B Davis

Comments: Full scale of OMNI-00592 is 90% RH, with a difference of 2.9 this gives a error percentage of 3.22 %. This value is within the allowable 4%.

Certificate of Calibration

Certificate Number: **681844**

JJ Calibrations, Inc.
7007 SE Lake Rd
Portland, OR 97267-2105
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

OnSite

0723.01
Calibration

PO: **180176**
Order Date: **08/07/2018**
Authorized By: **N/A**

Property #: **OMNI-00637**
User: **N/A**
Department: **N/A**
Make: **Mettler Toledo**
Model: **MS104TS/00**
Serial #: **B729400181**
Description: **Analytical Scale, 120g**
Procedure: **DCN 500887**
Accuracy: **±0.0005g**

Calibrated on: **08/07/2018**
*Recommended Due: **02/07/2019**
Environment: **22** °C **38** % RH
* As Received: **Out of Tolerance**
* As Returned: **Within Tolerance**
Action Taken: **Adjusted**
Technician: **111**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Balance went into over range at max capacity. Adjusted balance to bring all points back into tolerance.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
256A	Rice Lake	W0133K	Mass Set,	05/30/2019	660578

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	%Error	UUT	Uncertainty
Before							Accredited = ✓
Force							
	g	10.00000	9.9995	10.0005	0.0004	10.0004 g	5.7E-04 ✓
	g	30.00000	29.9995	30.0005	0.0004	30.0004 g	5.7E-04 ✓
	g	60.00000	59.9995	60.0005	0.0004	60.0004 g	5.7E-04 ✓
	g	90.00000	89.9995	90.0005	0.0005	90.0005 g	5.7E-04 ✓
	g	120.00000	119.9995	120.0005	120.0000	0.0000 g	5.7E-04 ✓
After		Reference	Min	Max	%Error		Accredited = ✓
	g	10.00000	9.9995	10.0005	0.0000	10.0000 g	5.7E-04 ✓
	g	30.00000	29.9995	30.0005	0.0001	29.9999 g	5.7E-04 ✓
	g	60.00000	59.9995	60.0005	0.0001	60.0001 g	5.7E-04 ✓
	g	90.00000	89.9995	90.0005	0.0002	89.9998 g	5.7E-04 ✓
	g	120.00000	119.9995	120.0005	0.0002	119.9998 g	5.7E-04 ✓

JJ Calibrations, Inc. certifies that this instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual with the stated procedure using standards that are traceable to the National Institute of Standards and Technology (NIST), or other National Measurement Institutes (NMI's), or by using natural physical constants, intrinsic standards or ratio calibration techniques. The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2005, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without prior written consent of JJ Calibrations, Inc.
JJ Calibrations, Inc. quality system has been assessed and accredited to ISO/IEC 17025:2005.

Reviewer

3 Issued 08/09/2018 Rev # 15

Inspector

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

ACCREDITED
A2LA Certificate No. 1750.01
Calibration

Cert. No.: 6530-9263396

Traceable® Certificate of Calibration for Digital Barometer

Manufactured for and distributed by : Control Company "Drawer 58307,Houston,TX,77258,USA"

Instrument Identification:

Model: 6530, S/N: 181062211 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Barometer	D4540001	09 Oct 2018	1000415948
Digital Thermometer	130070752	02 Mar 2018	4000-8360837
Chilled Mirror Hygrometer	44654/2H3737	02 Nov 2019	15478
Climate Chamber	W613.0046		

Certificate Information:

Technician: 57 Procedure: CAL-31 Cal Date: 26 Feb 2018 Cal Due Date: 26 Feb 2020

Test Conditions: 54.9%RH 22.83°C 1023mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
%RH	N.A.	N.A.		51.21	52	Y	49	55	0.74	>4:1
°C	N.A.	N.A.		24.55	24.3	Y	24.15	24.96	0.051	>4:1
mb/hPa	N.A.	N.A.		1010.30	1010	Y	1007	1015	0.62	>4:1
mb/hPa	N.A.	N.A.		806.75	806	Y	803	811	0.62	>4:1
mb/hPa	N.A.	N.A.		908.50	908	Y	905	913	0.62	>4:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) – Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

Nicol Rodriguez, Quality Manager

Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Barometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Barometer change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.control3.com

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Incline Manometer

Maximum Range: 0-0.25" WC ID Number: OMNI-00653

Calibration Instrument: Digital Manometer ID Number: OMNI-00633

Date: 10/26/18 By: B. Davis

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference (Input - Response)	% Error of Full Span*
0-20% Max. Range 0 - 0.05	0.041	0.040	0.001	0.4
20-40% Max. Range 0.05 - 0.10	0.077	0.080	0.003	1.2
40-60% Max. Range 0.10– 0.15	0.110	0.110	0.000	0.0
60-80% Max. Range 0.15 – 0.20	0.166	0.170	0.004	1.6
80-100% Max. Range 0.20 – 0.25	0.222	0.225	0.003	1.2

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: _____ Date: 10/26/2018

Reviewed by: _____ Date: 10/26/2018

Appendix D – Example Calculations

Equations and Sample Calculations

Manufacturer:	HHT Halifax
Model:	Encore
Run:	1
Category:	II

Equations used to calculate the parameters listed below are described in this appendix. Sample calculatio are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

M_{Sdb} – Weight of test fuel spacers, dry basis, kg

M_{Cdb}– Weight of test fuel crib, excluding nails and spacers, dry basis, kg

D_{Cdb} - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft^3

M_{FTAdb} - Total weight of fuel crib excluding nails, dry basis, kg

BR – Dry burn rate, kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr

$V_{m(std)}$ – Volume of gas sampled, corrected to dry standard conditions, dscf

m_n – Total particulate matter collected, mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions, g/dscf

E_T – Total particulate emissions, g

PR - Proportional rate variation

PM_R – Particulate emissions for test run, g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned

M_{Sdb} - Weight of test fuel spacers, dry basis, kg

ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})(100/(100 + FM_S))$$

Where,

FM_S = average fuel moisture of test fuel spacers, % dry basis

M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = 9.9 %

M_{Swb} = 2.0 lbs

0.4536 = Conversion factor from lbs to kg

M_{Sdb} = [(2.0 x 0.4536) (100/(100 - 9.9)

M_{Sdb} = **0.83** kg

M_{Cdb}- Weight of test fuel crib, excluding nails and spacers, dry basis, kg

ASTM E2780 equation (2)

$$M_{Cdb} = \Sigma[(M_{CPnwb})(100/(100 + FM_{CPn}))]$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg

FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation (test fuel piece 1):

MC_{Pnwb} = 4.7

FM_{CPn} = 22.1

= 4.7 (100/(100+ 22.1)

= 3.9 lbs

Total crib weight, excluding space 8.88 lbs

M_{Cdb} = **4.03** kg

D_{Cdb} - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft^3

ASTM E2780 equation (3)

$$D_{Cdb} = M_{Cdb}/V_C$$

Where,

V_C = Volume of fuel crib, ft^3

Sample calculation:

V_C = 546 in^3

1728 = conversion from in^3 to ft^3

D_{Cdb} = 8.88 / 546 * 1728

= **28** lbs/ft^3

M_{FTAdb} - Total weight of fuel crib excluding nails, dry basis, kg

ASTM E2780 equation (4)

$$M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

Sample calculation:

$$M_{FTAdb} = 0.83 + 4.03$$

$$= \mathbf{4.85}\ \text{kg}$$

BR – dry burn rate, kg/hr

ASTM E2780 equation (5)

$$BR = \frac{60\ M_{FTAdb}}{\theta}$$

Where,

θ = Total length of test run, min

Sample Calculation:

M_{Bdb} = 4.85 kg

θ = 334 min

$$BR = \frac{60 \times 4.85}{334}$$

BR = **0.87** kg/hr

V_s - Average gas velocity in the dilution tunnel, ft/sec

ASTM E2515 equations (9)

$$v_s = F_P \times k_p \times C_p \times (\sqrt{\Delta P})_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where:

F_p = djustment factor for center of tunnel pitot tube placement, Fp $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)

v_{scent} = Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec

v_{strav} = Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec

k_p = Pitot tube constant, 85.49

C_p = Pitot tube coefficient: 0.99, unitless

ΔP^* = Velocity pressure in the dilution tunnel, in H_2O

T_s = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)

P_s = Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg

P_{bar} = Barometric pressure at test site, in. Hg

P_g = Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)

M_s = **The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{13.47}{14.87} = 0.906$$

$$V_s = 0.906 \times 85.49 \times 0.99 \times 0.233 \times \left(\frac{79.3 + 460}{\left(30.30 + \frac{-0.20}{13.6} \right) \times 28.78} \right)^{1/2}$$

V_s = #### ft/s

*The ASTM test standard mistakenly has the square root of the average delta p instead of the average of the square root of delta p. The current EPA Method 2 is also incorrect. This was verified by Mike Toney at EPA.

**The ASTM test standard mistakenly identifies Ms as the dry molecular weight. It should be the wet molecular weight as indicated in EPA Method 2.

Q_{sd} - Average gas flow rate in dilution tunnel, dscf/hr

ASTM E2515 equation (3)

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_{s(avg)}} \times \frac{P_s}{P_{std}}$$

Where:

3600	=	Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws}	=	Water vapor in gas stream, proportion by volume; assume 2%
A	=	Cross sectional area of dilution tunnel, ft^2
T_{std}	=	Standard absolute temperature, 528 °R
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
$T_{s(avg)}$	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 14.03 \times 0.1963 \times \frac{528}{79.3 + 460} \times \frac{30.3 + \frac{-0.20}{13.6}}{29.92}$$

Q_{sd} = ##### dscf/hr

$V_{m(std)}$ - Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf

ASTM E2515 equation (6)

$$V_{m(std)} = K_1 \, V_m \, Y \frac{P_{bar} + \left(\frac{\Delta H}{13.6}\right)}{T_m}$$

Where:

K_1	=	17.64 °R/in. Hg
V_m	=	Volume of gas sample measured at the dry gas meter, dcf
Y	=	Dry gas meter calibration factor, dimensionless
P_{bar}	=	Barometric pressure at the testing site, in. Hg
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 53.399 \times 0.986 \times \frac{\left(30.3 + \frac{1.34}{13.6}\right)}{(78.6 + 460)}$$

$V_{m(std)}$ = **52.423** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 54.583 \times 0.985 \times \frac{\left(30.3 + \frac{1.11}{13.6}\right)}{(79.5 + 460)}$$

$V_{m(std)}$ = **53.408** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{\left(\underline{30.3} + \frac{0.00}{13.6}\right)}{(68.8 + 460)}$$

$V_{m(std)}$ = **0** dscf

m_n - Total Particulate Matter Collected, mg

ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

m_p = mass of particulate matter from probe, mg

m_f = mass of particulate matter from filters, mg

m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train 1 (first hour):

m_n = 0.0 + 0.2 + 0.0

m_n = 0.2 mg

Using equation for Train 1 (post-first hour):

m_n = 0.1 + 2.2 + 0.5

m_n = 2.8 mg

Train 1 aggregate:

m_n = 0.2 + 2.8

m_n = **3.0** mg

Using equation for Train 2:

m_n = 0.1 + 1.9 + 1

m_n = **3** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions, g/dscf

ASTM E2515 equation (13)

$$C_s = K_2 \times \frac{m_n}{V_{m(std)}}$$

Where:

K_2	=	Constant, 0.001 g/mg
m_n	=	Total mass of particulate matter collected in the sampling train, mg
$V_{m(std)}$	=	Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{3.0}{52.42}$$

C_s = **0.00006** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{3.0}{53.41}$$

C_s = **0.00006** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{0}$$

C_r = **0** g/dscf

E_T - Total Particulate Emissions, g

ASTM E2515 equation (15)

$$E_T = (C_s - C_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculation:

For Train 1

E_T = (0.000057 - 0) x 9630.1 x 334 /60

E_T = 3.07 g

For Train 2

E_T = (0.000056 - 0) x 9630.1 x 334 /60

E_T = 3.01 g

Average

E = 3.04 g

Total emission values shall not differ by more than 7.5% from the total average emissions

7.5% of the average =	0.23
Train 1 difference =	0.03
Train 2 difference =	0.03

PR - Proportional Rate Variation

ASTM E2515 equation (16)

$$PR = \left[\frac{\theta \times V_{mi} \times V_s \times T_m \times T_{si}}{\theta_i \times V_m \times V_{si} \times T_{mi} \times T_s} \right] \times 100$$

Where:

θ = Total sampling time, min

θ_i = Length of recording interval, min

V_{mi} = Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf

V_m = Volume of gas sample as measured by dry gas meter, dcf

V_{si} = Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec

V_s = Average gas velocity in the dilution tunnel, ft/sec

T_{mi} = Absolute average dry gas meter temperature during the "ith" time interval, ^oR

T_m = Absolute average dry gas meter temperature, ^oR

T_{si} = Absolute average gas temperature in the dilution tunnel during the "ith" time interval, ^oR

T_s = Absolute average gas temperature in the dilution tunnel, ^oR

Sample calculation (for the first 1 minute interval of Train 1):

$$PR = \left(\frac{334 \times 0.151 \times 14.03 \times (114.0 + 460) \times (78.6 + 460)}{1 \times 53.399 \times 14.18 \times (79.3 + 460) \times (71.0 + 460)} \right) \times 100$$

PR = 101 %

PM_R – Particulate emissions for test run, g/hr

ASTM E2780 equation (6)

$$PM_R = 60 (E_T/\theta)$$

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation:

E_T (Dual train average) = 3.04 g

θ = 334 min

$PM_R = 60$ x (3.04 / 334)

PM_R = **0.55** g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned

ASTM E2780 equation (7)

$$PM_F = E_T / M_{FTAdb}$$

Sample Calculation:

E_T (Dual train average) = 3.04 g

M_{Bdb} = 4.85 kg

PM_F = 3.04 / 4.85

PM_F = **0.63** g/kg

Appendix E – Conditioning Data, Manufacturer's Written Instructions

2020 Encore Catalytic Operation

The following operating procedures are supplied as guidance for certification runs. Procedures outlined have resulted in coalbeds and stove temperatures resulting in compliant tests.

Category	1 (2)	2	3	4
Setting	Closed	Between closed and single mark	Determine based on cat 2 test	Full open
Fan	Low	Med low	Med	High
Kindling/Preburn	For all tests: 4 lb kindling and one 16 – 18" 2x4. Burn down to about 2 lbs and place preburn fuel. Preburn fuel is 20 pcs of 8" 2x4. Burn with bypass open and air high until 15 lbs, then close bypass. At shutdown weight, stir re-close bypass and set air to run setting.			
Close Down Wt, lb	12	12	13	15
Preburn time, min	110	105	65	60
Operation	Stir/chop preburn every 20 minutes, coals should break up well near the loading weight. Chop and pack well for a level flat coalbed. Pack down immediately before loading test load. Load fuel, close bypass and door immediately. No need to change the air setting. Load and go. Fan remains on all the time.			
Loading Temp*	329	317	388	389
Delta T	-100	-64	-64	-34
Expected Results	0.9 kg/hr 0.1 g/hr	1.13 kg/hr 0.1 g/hr	1.8 kg/hr 0.4 g/hr	3 kg/hr 2.8 g/hr

* Loading temperatures are not absolute but presented as values that have worked for temperature differential compliance with the method.

-TEST load configuration, consistent with the original certification is three 2x4 and one 4x4, all 19.5 inches, 19-22% M.C.

mark@hearthlabsolutions.com

Pre-Conditioning Data

Client: HHT
Model: Encore Model 2040-CAT-C
Date(s): 9/17/2018 – 10/15/2018
Job #:
Tracking #:
Technician: Mark Champion

Elapsed Time (hrs)	Flue (°F)	Catalyst Exit (°F)	Notes: Indicate initial air setting and any changes in in setting during conditioning, as well as weight and average moisture content of all fuel additions.
0	584	1035	Added 12.4 lbs Medium burn rate (air setting -5° from low).Moisture 18.825%
1	785	1265	
2	456	855	
3	522	901	Added 11.9lbs Medium burn rate (air setting -5° from low). Moisture 20.9%
4	978	1496	
5	745	1352	Added 12.5lbs Medium burn rate (air setting -5° from low). Moisture 20.825%
6	796	1362	
7	801	1412	Added 11.2lbs Medium burn rate (air setting -5° from low). Moisture 20.2%
8	756	1387	
9	322	458	
10	704	1187	Added 11.5lbs Medium burn rate (air setting -5° from low). Moisture 20.075%
11	441	874	
12	855	1355	Added 10.9lbs Medium burn rate (air setting -5° from low). Moisture 18.65%
13	946	1504	
14	786	1198	
15	655	1088	
16	420	654	
17	568	786	Added 12.0lbs Medium burn rate (air setting -5° from low). Moisture 21.25%
18	952	1466	
19	770	1400	
20	400	786	
21	587	866	Added 10.9lbs Medium burn rate (air setting -5° from low). Moisture 18.575%
22	678	1048	
23	922	1482	Added 11.5lbs Medium burn rate (air setting -5° from low). Moisture 19.175%
24	798	1250	
25	654	1194	Added 12.9lbs Medium burn rate (air setting -5° from low). Moisture 20.05%
26	826	1302	
27	563	1006	
28	372	400	
29	630	708	Added 11.3lbs Medium burn rate (air setting -5° from low). Moisture 18.25%
30	964	1508	
31	780	1368	Added 11.2lbs Medium burn rate (air setting -5° from low). Moisture 19.2%
32	411	684	
33	630	880	Added 12.3lbs Medium burn rate (air setting -5° from low). Moisture 22.575%
34	982	1484	
35	700	998	Added 11.6lbs Medium burn rate (air setting -5° from low). Moisture 21.875%
36	436	676	
37	503	704	Added 11.8lbs Medium burn rate (air setting -5° from low). Moisture 22.125%
38	944	1486	
39	660	884	
40	400	752	
41	560	784	Added 10.8lbs Medium burn rate (air setting -5° from low). Moisture 19.475%
42	901	1446	
43	803	1194	Added 10.9lbs Medium burn rate (air setting -5° from low). Moisture 17.925%
44	498	564	
45	612	788	Added 11.7lbs Medium burn rate (air setting -5° from low). Moisture 20.125%
46	906	1340	
47	741	1006	Added 11.1lbs Medium burn rate (air setting -5° from low). Moisture 22.225%
48	502	678	
49	311	404	
50	632	906	Added 11.0lbs Medium burn rate (air setting -5° from low). Moisture 17.675%

Signature/Date: _____ *1/16/2024*

Appendix F – Labeling & Owner's Manual

MODEL / MODÈLE: "Encore® Model 2040-CAT-C"
LISTED SOLID FUEL ROOM HEATER BURNING FIREPLACE STOVE
HOMOLOGUE POELE A COMBUSTIBLE SOLIDES

Serial No.
N° de série: HF

BARCODE LABEL

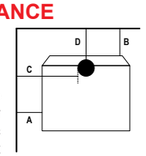
Report #/Rapport # 0135WS042E & 0135WS042S
Tested to / Testé à: ASTM E2515, ASTM E2780, UL 1482-2011, UL 737-2007, ULC-S627-00, EPA Method 28 and 28R
THIS STOVE MEETS UL 737, STANDARD FOR FIREPLACE STOVES, WHEN FIRESCREEN IS PROVIDED. **APPROVED FOR USE IN MOBILE HOMES IN THE U.S. AND CANADA.**
Install and use only in accordance with manufacturer's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Install only with legs provided in accordance with installation instructions.
WARNING: Risk of flame and smoke spillage. Do not obstruct the space beneath the heater.
Fuel: Use with solid wood fuel only. Do not burn other fuels.
Build a fire directly on hearth only. Do not elevate fire. Keep doors fully closed or fully open while operating.
Chimney: Use a minimum 6" or 8" diameter factory built high temperature (H.T.) chimney which is listed to UL-103 (2100° F) or 8"X8" nominal or larger approved masonry chimney with flue liner.
Inspect and clean chimney frequently - under certain conditions of use, creosote buildup may occur rapidly.
DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVICING ANOTHER APPLIANCE
Chimney Connector: Use a minimum 6" or 8" diameter 24 gauge chimney connector. Install chimney connector at least 30" from ceiling.
Refer to local building codes and Vermont Castings Owner's Guide for special precautions for passing a chimney or chimney connector through a combustible wall or ceiling.
Floor Protection U.S.: With the Vermont Castings Bottom Heat Shield installed most installations require an approved hearth pad. The Encore 2040 was test using a 1/2" (13mm) non-combustible hearth material with a thermal conductivity, (k) = 0.47 BTU-in/hr ft^{2}·°F, resulting in the requirement of providing total thermal resistance (R) of 1.06. (Cover with material if desired). The floor protector is required under the stove and must extend 16" from the front, 6" from the rear and sides. It must extend under the chimney connector and 2" to either side. Without Vermont Castings Bottom Heat Shield, only installations over a totally non-combustible floor such as unpainted concrete over earth are acceptable. UL 737 Doors open require 1" floor protection.
Floor Protection Canada: Operate only with Vermont Castings Bottom Heat Shield in place. When installed on a combustible floor, the Encore 2040 was tested using a 1/2" (13mm) non-combustible hearth material with a thermal conductivity, (k) = 0.47 BTU-in/hr ft^{2}·°F, resulting in the requirement of providing total thermal resistance (R) of 1.06. (Cover with decorative non-combustible material if desired).The floor protection must extend 450mm (18in.) to the front and 200mm (8in.) to the front and 200mm (8in.) to the sides and rear. Do not obstruct the space under the heater.
Optional Components: Spark screen Part No. 0127 (only for use with 8" diameter connector and chimney), Flue Collar/8" oval Part No. 0555, Mobile Home Kit-0336, Fan Kit Part No. FK26. 115V 60Hz 1.1 FLA
Replace glass only with Vermont Castings 5mm ceramic glass.
Do not remove or cover this label. **Catalytic Combustor Part No. 30005353**
CAUTION: Burning of materials other than the specified fuels may make the Catalyst in the combustor inactive. The combustor is fragile, handle carefully. The performance of the catalytic device or it's durability have not been evaluated as part of the certification.

Combustion air cannot be obstructed.
Damper must be open before opening doors.
Do not overfire. Glowing parts indicate overfiring.
The space heater must be installed with the legs provided, attached as shown in the installation instructions.

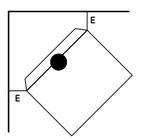
Installer conformément aux instructions du fabricant. Contacter les autorités locates pour connaître les restrictions et inspections nécessaires. N'installer que les pattes qui sont incluses, en conformité avec les instructions du fabricant.
Ne pas obstruer l'espace sous le poele.
Attention: Risque de flammes et de fumée spilage. Ne pas obstruer l'espace sous le chauffe-eau.
Le registre doit être ouvert avant d'ouvrir les portes.
Combustible: N'utiliser que du bois comme combustible. Ne pas utiliser d'autres types de combustible.
Inspecter et nettoyer la cheminée fréquemment - Sous certainesusages, l'accumulation de créosote peu se produire rapidement. Garder les portes toutes fermées ou toutes ouvertes durant l'opération.
Faire le feu directement sur la grille prévue à cet effet. Laisser les portes du poêle soit complètement ouverts ou complètement fermées lors de l'utilisation. Ne pasraccorder le conduit de cheminée du poêle à une cheminée servant à d'autres appareils. N'utiliser que les vitres de céramique Vermont Castings en cas de remplacement de celles-ci.
Protection plancher Canada: fonctionner uniquement avec Vermont Castings écran thermique inférieur en place. Lorsqu'il est installé sur un plancher combustible, le Encore 2010 a été testé en utilisant un 1/2 "(13mm) de matériau de âtre non-combustible avec une conductivité, (k) = 0,47 BTU-in / hr ft^{2}- °F, ce qui entraîne l'obligation de providinga résistance thermique totale (R) de 1,06. (Couvrir avec un matériau non-combustible décorative si désiré) .La protection de plancher doit se prolonger 450mm (18po.) À l'avant et 200 mm (8 po.) À l'avant et 200 mm (8 po.) Sur les côtés et à l'arrière. Ne pas obstruer l'espace sous le poêle.
Accessories disponibles au Canada: écran pare feu 1907 (n'utiliser qu'avac un conduit d'evacuation et une chiminée de 8" de diametre), ventilateur FK26.
Catalyseur pièce no. 30005353
Buse / 8" ovale pièce no. 0555
Replacer uniquement qu'avec une glace 5mm Vermont Castings.
Attention: Bruler des matières autres que celles spécifiées pourrait rendre le caralyseur inactif.
Attention: Le catalyseur est fragile, manipulaer avec soin.

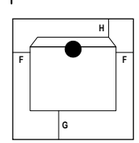
CAUTION: HOT WHILE IN OPERATION- DO NOT TOUCH- KEEP CHILDRENAND CLOTHING AWAY- CONTACT MAY CAUSE SKIN BURNS- SEE NAMEPLATE AND INSTRUCTIONS. KEEP FURNISHINGS AND OTHERCOMBUSTIBLE MATERIALSA CONSIDERABLE DISTANCE AWAY FROM THE APPLIANCE

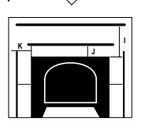
US ENVIRONMENTAL PROTECTION AGENCY
Certified to comply with 2020 US EPA particulate emissions standards at 1.1 g/hr. This wood heater contains a catalytic combustor which needs periodic inspection and replacement for proper operation. Consult the Owner's Manual for further information. It is against Federal Regulations to operate this wood heater in a manner inconsistent with operating instructions in the Owner's Manual.



MINIMUM FLOOR PROTECTION







HEARTH INSTALLATION

VERMONT CASTINGS

Made in U.S.A. of US and imported parts. / Fabriqué aux États-Unis-d'Amérique par des pièces d'origine américaine et pièces importées.

3-90-30007511_R1

ATTENTION: CHAUD LORS DU FONCTIONNEMENT- NE TOUCHEZ PAS L'APPAREIL-GARDEZ LES ENFANTS ET LES VÊTEMENTS ÉLOIGNÉS- TOUT CONTACT PEUT ENTRAÎNER DES BRÛLURES DE LA PEAU. RÉFÉREZ-VOUS À LA PLAQUE SIGNALÉTIQUE ET AU MODE D'EMPLOI. GARDEZ LE MOBILIER ET LES AUTRES MATÉRIAUX COMBUSTIBLES BIEN À L'ÉCART DE L'APPAREIL.

*Less than 3/4" (19mm) protrusion. For additional types of installations and clearabces consult your Owner's Manual. Por autres modes d'installation et degagement supplementaires, consultz votres manual du proprietaire.
Most vertical installations require a ceiling heat shield and a flue collar heat shield to be installed. Consult your Owner's Manual.

MINIMUM CLEARANCES TO COMBUSTIBLE CONSTRUCTION / MINIMUM DE DEGAGEMENT JUSQU'A LA CONSTRUCTION COMBUSTIBLE

A = Unit to Sidewall	19"
B = Unit to Backwall	20"
C = Chimney Connector to Sidewall	29"
D = Chimney Connector to Backwall	21"
E = Unit to Adjacent Wall	18-1/2"
F = Sides (Floor Protection)	6"
G = Front to Glass (Floor Protection)	16"
H = Rear (Floor Protection)	6"
I = Top to Bottom of Mantel	22"
J = Top to Bottom of Top Trim*	28"
K = Edge of Top to Side Wall	21"

A = Entre le mur lateral et l'appareil	483mm
B = Entre le mur arriereet l'appareil	508mm
C = Entre le tuyau et le mur lateral	737mm
D = Entre le tuyau et le mur arriere	534mm
E = Entre le mur adjacent et l'appareil	470mm
F = Côtes (la protection de plancher)	203mm
G = Devant, par rapport au verr	457mm
H = Arrière (la protection de plancher)	203mm
I = De haut en bas de Mantel	556mm
J = De haut en bas de la moulure supérieure*	712mm
K = Edge of Haut de paroi latérale	534mm

Date of Manufacture / Date de fabrication:

2019	2020	2021	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Manufactured by / Fabriqué par: Hearth and Home Technologies 352 Mountain House Road, Halifax PA 17032

LABEL TICKET			
ECO:	89484	**LABEL SIZE:**	4.75" H x 15.75" W
PART # / REV:	3-90-30007511	**ADHESIVE:**	
ORIGINATOR:	Spidlet	**MATERIAL:**	24 Gauge Aluminum
DATE:	12/06/18	**INK:**	Black Background
VERMONT CASTINGS 352 Mountain House Road Halifax, PA 17032		ALL CAUTION LITERATURE IN RED (4) Holes = .156 x .250, Corners .062 Barcode label must have the serial number on it. The barcode label must be able to read Code 39 Full ASCII.	

Installation & Operating Manual

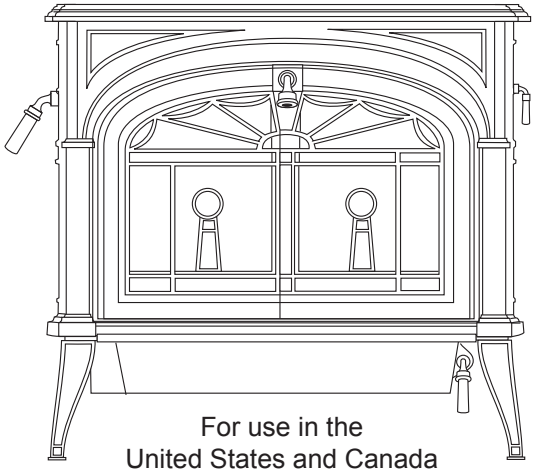
Installation and Appliance Setup - Care and Operation

INSTALLER: Leave this manual with party responsible for use and operation.
OWNER: Retain this manual for future reference.
Call your dealer for questions on Installation, Operation, or Service.

NOTICE: SAVE THESE INSTRUCTIONS

VERMONT CASTINGS

Encore® Model 2040-CAT-C
Wood Burning Stove



For use in the
United States and Canada

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We recommend that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training www.wettinc.ca

SAFETY NOTICE: IF THIS APPLIANCE IS NOT PROPERLY INSTALLED, OPERATED AND MAINTAINED, A HOUSE FIRE MAY RESULT.

TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH. CONTACT LOCAL BUILDING OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

⚠ WARNING

Please read this entire manual before installation and use of this wood-burning room heater.
Failure to follow these instructions could result in property damage, bodily injury or even death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do not overfire - If any external part starts to glow, you are overfiring. Close air controls. Overfiring will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may cause a house fire.

⚠ CAUTION

Tested and approved for use with dry, seasoned cordwood only. Do Not Burn Wet or Green Wood. Burning any other type of fuel will void your warranty.

Installation and service of this appliance should be performed by qualified personnel. Hearth & Home Technologies recommends HHT Factory Trained or NFI certified professionals.

hearthED FACTORY TRAINING Fuel Your Fire

NFI NATIONAL FIREPLACE INSTITUTE® A CERTIFICATION AGENCY

The French language version of this manual is available online:www.vermontcastings.com
La version française de ce manuel est disponible en ligne : www.vermontcastings.com

Congratulations on your choice of a Vermont Castings Encore® Model 2040-CAT-C stove. With this purchase you have made a commitment to make the hearth a place of warmth, beauty and comfort in your home. At Vermont Castings, we share that joy and appreciation for the hearth. We assure you that your cast-iron Vermont Castings stove has been made with the utmost care and will provide you with many years of service.

As you become acquainted with your new stove, you will find that its appearance is matched by its functionality, due to cast iron's unique ability to absorb and radiate heat.

Also, Vermont Castings products are among the cleanest-burning wood stoves available today. However, clean burning depends on both the manufacturer and the operator. Please read this manual carefully to understand how to properly operate and maintain your stove.

At Vermont Castings, we are equally committed to your satisfaction as a customer. That is why we maintain an exclusive network of the finest dealers in the industry. Our dealers are chosen for their expertise and dedication to customer service. They are factory-trained and knowledgeable about every Vermont Castings product. Feel free to contact your Authorized Vermont Castings Dealer anytime you have a particular question about your stove or its performance.

This manual contains valuable instructions on the installation and operation of your Vermont Castings Encore® Model 2040-CAT-C. It also contains useful information on maintenance. Please read the manual thoroughly and keep it as a reference.

This manual describes the installation, operation, and maintenance of the Vermont Castings Encore® Model 2040-CAT-C wood burning heater. This heater meets the U.S. Environmental Protection Agency's emission limits for wood heaters sold on or after May 15, 2020.

Please read this entire manual before you install and use your new stove. Failure to follow instructions may result in property damage, bodily injury, or even death.

Installation Accessories

Warming Shelf		8" Flue Collar	
#0200	Classic Black	#0555	Classic Black
#0205	Biscuit	#0556	Biscuit
#0199	Bordeaux	#0560	Bordeaux
#0208	Brown Majolica	#0557	Brown Majolica
#0198	Twilight	#0561	Twilight
#3264	Mobile Home Bracket Kit		
#3185	Outside Air Adapter		
#0127	Firescreen		
FK26	Fan Kit		
#3190	Connector Pipe Heat Shield		
#0180	Rectangular Ceiling Kit		
#0181	Round Ceiling Kit		
A line of porcelain enamel stove pipe is available in Biscuit, Bordeaux, Brown Majolica colors.			

Table of Contents

Product Specifications and Important Safety Information

Appliance Certification

MODEL:	Encore® Model 2040-CAT-C
LABORATORY:	OMNI Test Laboratories, Inc
REPORT NO.	0135WS042E & 0135WS042S
TYPE:	Solid Fuel Room Heater / Wood Burning Type
STANDARD(s):	ASTM E2515, ASTM E2780, UL 1482-2011, UL 737-2007, ULC-S627-00, EPA Method 28 and 28R
ELECTRICAL RATING:	115 VAC, 60 Hz

Area Heated.....900 - 2,300 Square feet

Loading.....Front and top

Chimney Connector: .....

for 6" flue collar .....6" (152 mm) diameter

for 8" oval flue collar.....8" (203 mm) diameter

Flue Exit Position .....Top or Rear

Primary Air ..... Manually set, thermostatically maintained

Secondary Air .....Fixed, self-regulating

Ash Handling System..... Removable ash pan

Glass Panels .....High-temperature ceramic

Weight.....475 lbs. (215 kg.)

Mobile Home Approved

This appliance is approved for Installation in mobile/manufactured homes in the United States and Canada The structural integrity of the mobile home floor, ceiling and walls must be maintained. The appliance must be properly grounded to the frame of the mobile home, and must never be installed in a room designated for sleeping. The unit must have provisions for an outside air source when installed in a mobile home.

California safety information

⚠ WARNING

This product and the fuels used to operate this product (wood), and the products of combustion of such fuels, can expose you to chemicals including carbon black, which is known to the State of California to cause cancer, and carbon monoxide, which is know to the State of California to cause birth defects or other reproductive harm. For more information go to: www.P65Warnings.ca.gov

Proposition 65 Warning: Fuels used in gas, woodburning or oil fired appliances, and the products of combustion of such fuels, contain chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

California Health & Safety Code Sec. 25249.6

BTU & Efficiency Specifications

EPA Certification Number:	
Catalytic Information	
EPA Certified Emissions:	1.1 g/hr
***EPA Default Efficiency:**	78.0%
****Actual tested Efficiency:**	76.8%
*****EPA BTU Output:**	12,800 - 37,100
******Peak BTU/Hour Output:**	60,200
Other Important Information	
Vent Size:	6 Inch (152 mm) 8 Inch (203 mm)
Firebox Size:	2.3 cu. ft.
Max. Wood Length:	22" Maximum
Ideal Wood Length:	18" (Top Load)
Fuel	Seasoned Cordwood (20% moisture)

**An efficiency based on EPA historical data.*

***Maximum calculated efficiency using Douglas Fire dimensional lumber and data collected during EPA emissions test.*

****A range of BTU outputs based on EPA Default Efficiency and the burn rates from the low and high EPA tests, using Douglas Fir dimensional lumber.*

***** A peak BTU out of the unit calculated using the maximum first hour burn rate from the High EPA Test and BTU content of seasoned cordwood (8600) times the efficiency.*

This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.

Stove Dimensions

Drawing Not to Scale

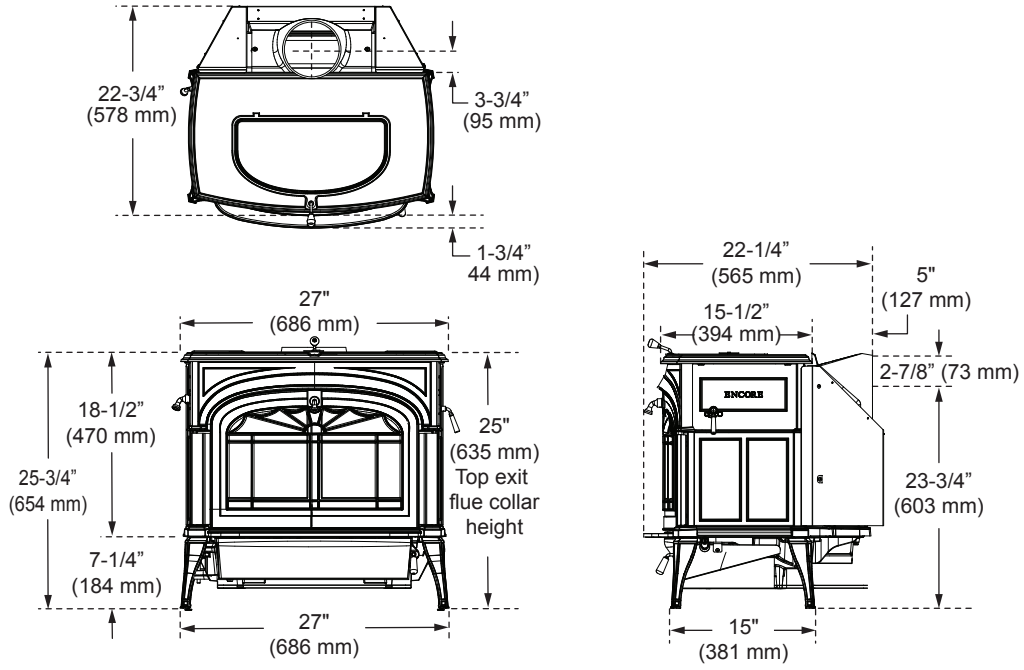


Figure 1

Installation

SAFETY NOTICE: IF YOUR APPLIANCE IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT. TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

Before you begin an installation, be sure that:

- Your stove and chimney connector will be far enough from combustible material to meet all clearance requirements.
- The floor protector is large enough and is constructed properly to meet all requirements.
- You have all necessary permits from local authorities.

Your local building official is the final authority for approving your installation as safe and determining that it meets local and state codes.

The metal label permanently attached to the back of every Vermont Castings' stove indicates that the stove has been tested to current UL and ULC standards, and gives the name of the testing laboratory. Clearance and installation information also is printed on the label. When the stove is installed according to the information both on the label and in this manual, local authorities usually will accept the label as evidence that the installation meets codes and can be approved.

However, codes vary in different areas. Before starting the installation, review your plans with the local building authority. Your local dealer can provide any additional information needed.

For any unresolved installation issues, refer to the National Fire Protection Association's publication ANSI/NFPA 211 Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances. For Canada, the equivalent publication is CSA CAN-B365 Installation Code for Solid Fuel Burning Appliances and Equipment. These standards are the basis for many national codes. They are nationally recognized and are accepted by most local authorities. Your local dealer or your local building official may have a copy of these regulations.

IMPORTANT: Failure to follow these installation instructions may result in a dangerous situation, including a chimney or house fire. Follow all instructions exactly, and do not allow makeshift compromises to endanger property and personal safety.

Outside Air

A source of air (oxygen) is necessary in order for combustion to take place. Whatever combustion air is consumed by the fire must be replaced. Air is replaced via air leakage around windows and under doors. In homes that have tightly sealed doors and windows, an outside air source is needed.

Items Needed for Installation (not supplied)

- Outside air adapter (available at your authorized Vermont Castings dealer)
- Phillips head screw driver
- Silicone sealant
- 3" Flex or Rigid Duct
- 3" Outside Air Termination Cap with Screen
- Hose Clamps
- Drills and saws necessary for cutting holes through the wall or flooring in your home.

1. Using a #2 Phillips screw driver attach the flex adapter to the appliance using 4 screws. Figure 5.13 & 5.14.
2. Floor & Rear Installation: Cut a 3" (76 mm) hole in outside wall or floor to accommodate outside air piping. Use 3" (76 mm) aluminum metal flex or rigid piping to directly connect outside air to appliance intake. Use the supplied termination cap with a rodent screen. Seal between the wall (or floor) and the pipe with silicone to prevent moisture penetration.

When poor draft is caused by a low infiltration rate, opening a ground floor window on the windward side of the house and near the stove will usually alleviate the problem.

A better solution is to install a permanent outside air supply to the stove and/or room. In fact, bringing air for combustion from outside the home directly to the air inlet of the stove is required for new construction in some areas.

Types of Chimney to Use

You must connect this appliance to a code-approved masonry chimney with a flue liner, to a relined masonry chimney that meets local codes, or to a prefabricated metal chimney that complies with the requirements for Type HT chimneys in the Standard for Chimneys, Factory-Built, Residential Type and Building Heating Appliance, UL 103. Figure 2 illustrates the two types. The chimney and chimney connector must be in good condition and kept clean.

If you use an existing masonry chimney, it must be inspected to ensure it is in a safe condition before the stove is installed. Your local professional chimney sweep, building inspector, or fire department official will be able to inspect the chimney or provide a referral to someone who can.

The chimney must extend at least 3' (914 mm) above the highest point where it passes through or near a roof, and at least 2' (610 mm) higher than any part of a building within 10' (3 m) horizontally. (Figure 3)

For proper draft and good performance, any chimney used should extend at least 16' (5 m) above the flue collar of the stove.

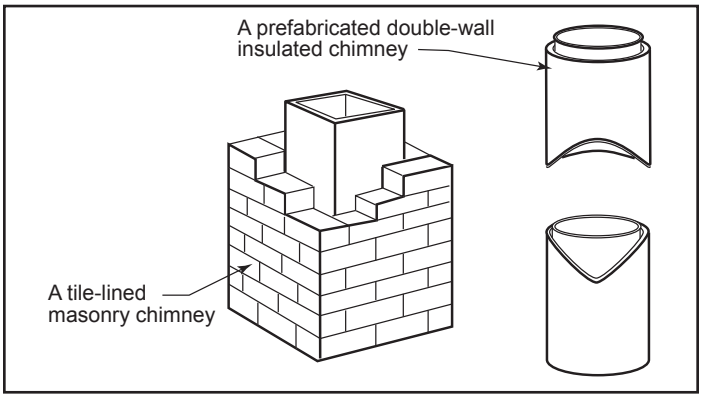


Figure 2 - Approved chimney types.

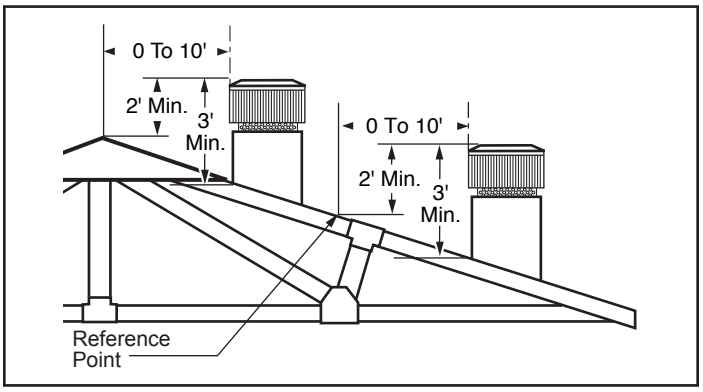


Figure 3 - The 2'-3'10' Chimney Rule.

Masonry Chimneys

An inspection of the chimney must confirm that it has a lining. Do not use an unlined chimney. The chimney should have no cracks, loose mortar, other signs of deterioration, and blockage. Repair any defects before the chimney is used with your stove.

Unused openings in an existing masonry chimney must be sealed with masonry to the thickness of the chimney wall, and the chimney liner should be repaired. Openings sealed with pie plates or wallpaper are a hazard and should be sealed with mortar or refractory cement. In the event of a chimney fire, flames and smoke may be forced out of these unused thimbles.

The chimney should be thoroughly cleaned before use.

A newly-built masonry chimney must conform to the standards of your local building code or, in the absence of a local code, to a recognized national code. Masonry chimneys must be lined, either with code-approved masonry or pre-cast refractory tiles, stainless steel pipe, or a code-approved, "poured-in-place" liner. The chimney's clean-out door must seal tightly. A loose or leaky clean-out door can weaken chimney draft, causing performance problems.

Prefabricated Chimneys

A prefabricated metal chimney must be one tested and listed for use with solid-fuel burning appliances to the High-Temperature (H.T.) Chimney Standard UL-103-1985 (2100°F) for the United States, and High Temperature (650°C) Standard ULC S-629 for Canada.

DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

Chimney Size

This appliance with an 8" (203 mm) flue collar is approved for venting into a masonry chimney with a nominal flue size of 8" x 8" (203 x 203 mm) or 8" x 12" (203 x 305 mm), and into a round flue with nominal flue size of 8" (203 mm). This appliance with a 6" (152 mm) flue connector is approved for venting into a masonry chimney with a nominal flue size of 8" x 8" (203 x 203 mm), and into a round flue with nominal flue of 6" (152 mm).

NOTE: When installed with a 6" flue collar, this appliance may not be operated with the front doors open.

Whatever the flue collar size, this appliance may be vented into larger chimneys as well. However, chimneys with liners larger than 8" x 12" (203 x 305 mm) may experience rapid cooling of smoke and reduction in draft, especially if the chimneys are located outside the home. These large chimneys may need to be insulated or have their flues relined for proper stove performance.

Accessories to help make the connection between stainless steel chimney liners and your appliance are available through your local dealer.

Chimney Connector Guidelines

A chimney connector is the single-wall pipe that connects the stove to the chimney. The chimney itself is the masonry or prefabricated structure that encloses the flue. Chimney connectors are used only to connect the stove to the chimney.

Single-wall connectors should be made of 24 gauge or heavier steel. Do not use galvanized connector; it cannot withstand the high temperatures that can be reached by smoke and exhaust gases, and may release toxic fumes under high heat. The connector may be 6" (152 mm) or 8" (203 mm) in diameter.

If possible, do not pass the chimney connector through a combustible wall or ceiling. If passage through a combustible wall is unavoidable, refer to the section on Wall Pass-Throughs. Do not pass the connector through an attic, a closet or similar concealed space. The whole connector should be exposed and accessible for inspection and cleaning.

In horizontal runs of unshielded chimney connector, maintain a distance of 30" (762 mm) from the ceiling. Keep it as short and direct as possible, with no more than two 90° turns. Slope horizontal runs of connector upward 1/4" per foot (6mm per meter) going from the stove toward the chimney. The recommended maximum length of a horizontal run is 3' (1 m), and the total length should be no longer than 8' (2.4 m). In cathedral ceiling installations, extend the prefabricated chimney downward to within 8' (2.4 m) of the stove. This will help maintain a good draft by keeping the smoke warm, so that it rises readily.

Wear gloves and protective eyewear when drilling, cutting or joining sections of chimney connector.

Single-wall Chimney Connectors

- Begin assembly at the flue collar of the stove. Insert the first crimped end into the stove's flue collar, and keep each crimped end pointing toward the stove. (Figure 4) Using the holes in the flue collar as guides, drill 1/8" (3 mm) holes in the bottom of the first section of chimney connector and secure it to the flue collar with three #10 x 1/2" sheet metal screws. Lift off the griddle, and shield the stove's surface between the griddle opening and the front of the flue collar to protect the finish when you drill the front hole.

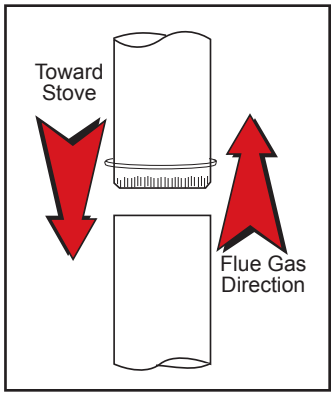


Figure 4 - Chimney connector.

- Fasten each joint between sections of chimney connector, including telescoping joints, with at least three (3) sheet metal screws. The pre-drilled holes in the top of each section of chimney connector serve as guides when you drill 1/8" (3 mm) holes in the bottom of the next section.
- Fasten the chimney connector to the chimney. Instructions for various installations follow. Figure 5 illustrates the general layout of chimney connector parts.
- Be sure the installed stove and chimney connector are correct distances from nearby combustible materials.

NOTE: Special slip pipes and thimble sleeves that form telescoping joints between sections of chimney connector are available to simplify installations. They often eliminate the need to cut individual connector sections. Consult your local dealer about these special pieces.

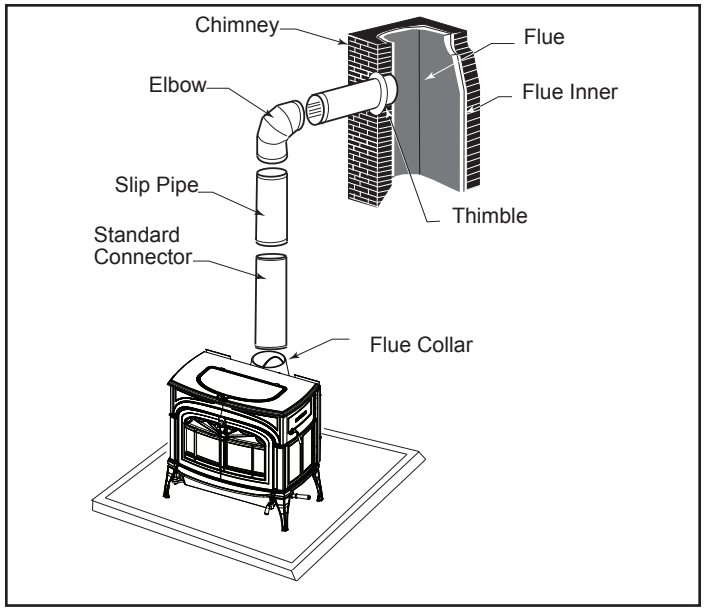


Figure 5 - An exploded view of the chimney connection in a freestanding masonry installation.

Securing the Single-wall Connector to a Prefabricated Chimney

Follow the installation instructions of the chimney manufacturer exactly as you install the chimney. The manufacturer of the chimney will supply the accessories to support the chimney, either from the roof of the house, at the ceiling of the room where the stove is installed, or from an exterior wall.

Special adapters are available from your local dealer to make the connection between the prefabricated chimney and the chimney connector. The top of such adapters attaches directly to the chimney or to the chimney's ceiling support package, while the bottom of the adapter is screwed to the chimney connector.

These adapters are designed so the top end will fit outside the inner wall of the chimney, and the bottom end will fit inside the first section of chimney connector.

Securing the Single-wall Connector to a Masonry Chimney

Both freestanding masonry chimneys and fireplace masonry chimneys may be used for your installation.

Freestanding Installations

If the chimney connector must pass through a combustible wall to reach the chimney, follow the recommendations in the Wall Pass-Through section that follows. The opening through the chimney wall to the flue (the "breech") must be lined with either a ceramic or metal cylinder, called the "thimble," which is cemented securely in place. Most chimney breeches incorporate thimbles, but the fit must be snug and the joint between the thimble and the chimney wall must be cemented firmly.

A special piece called the “thimble sleeve,” slightly smaller in diameter than standard connectors and most thimbles, will facilitate the removal of the chimney connector system for inspection and cleaning. (Figure 6) Thimble sleeves are available from your local dealer.

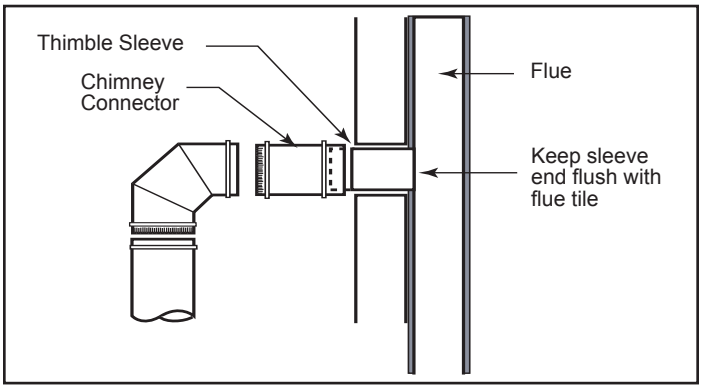


Figure 6 - The thimble, made of either ceramic or metal, must be cemented securely in place.

To install a thimble sleeve, slide it into the breech until it is flush with the inner flue wall. Do not extend it into the actual flue passage, as this could interfere with the draft.

The thimble sleeve should protrude 1-2" (25-50 mm) into the room. Use furnace cement and thin gasketing to seal the sleeve in place in the thimble. Secure the chimney connector to the outer end of the sleeve with sheet metal screws.

Without a thimble, a suitable length of chimney connector can be extended through the breech to the inner face of the flue liner, and cemented securely in place. Additional pieces of connector are then attached with sheet metal screws.

Fireplace Installations

The chimney connector may be connected to the chimney above the fireplace opening or through the fireplace.

Above the Fireplace

Your appliance may be connected to a chimney above a fireplace opening. (Figure 7) In such installations, the stove is positioned on the hearth in front of the fireplace and the chimney connector rises from the stove top and then angles ninety degrees back into the chimney. The chimney liner should extend to the point at which the chimney connector enters the chimney.

If the chimney connector in your installation enters the chimney above a fireplace, follow all the guidelines mentioned above for freestanding installations. In addition, give special consideration to the following points:

- Check the clearance between the mantel and the chimney connector, and any combustible trim or the mantel.
- Check the clearance between the chimney connector and the ceiling. The clearance should be at least 30" (762 mm) with unshielded connectors. Consult the clearance charts for other installation options.

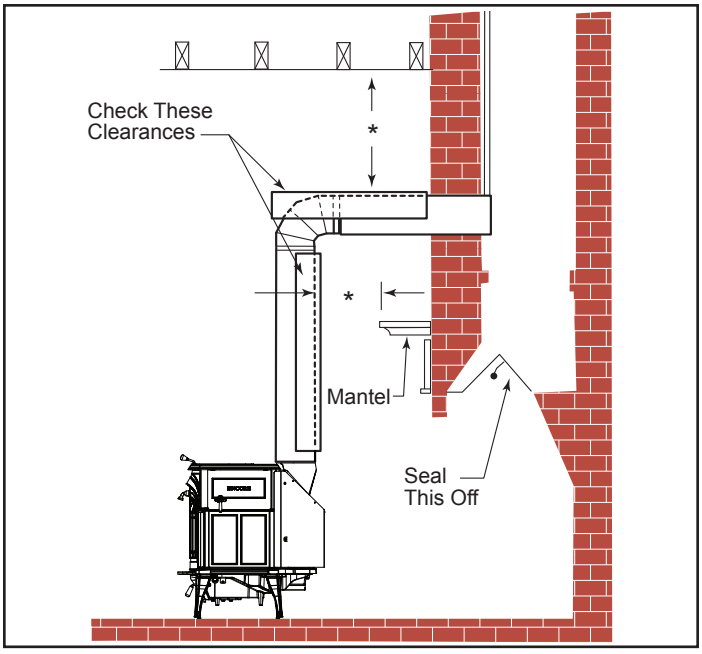


Figure 7 - In this installation, the chimney connector attaches to the chimney above the fireplace opening.

- The fireplace damper must be sealed to prevent room air from escaping up the flue. However, it must be possible to re-open the damper to inspect or clean the chimney.

Through the Fireplace

If your fireplace opening height is at least 29" (737 mm), you may install your appliance through the opening using a “positive connection” kit, available from your local dealer. Positive connection kits ensure a tight fit between the stove flue collar and the chimney flue. (Figure 8)

Fireplace installations, whether connected to the flue above or through the fireplace opening, have special clearance requirements to adjacent trim and the mantel. You’ll find the required safe clearances for fireplace installations on Page 12.

Floor protection requirements also apply to fireplace installations. Refer to the "Floor Protection" section in this manual.

Wall Pass-Throughs

Whenever possible, design your installation so the connector does not pass through a combustible wall. If you are considering a wall pass-through in your installation, check with your building inspector before you begin. Also, check with the chimney connector manufacturer for any specific requirements.

Accessories are available for use as wall pass-throughs. If using one of these, make sure it has been tested and listed for use as a wall pass-through.

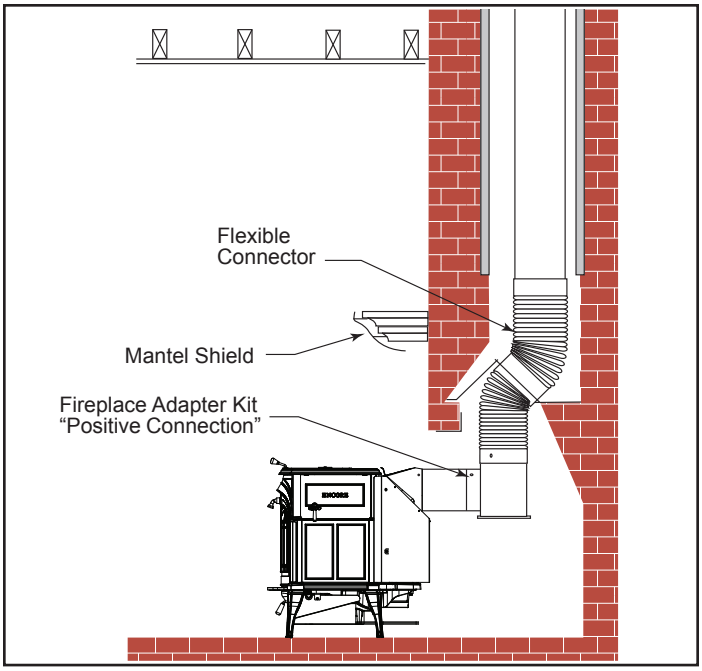


Figure 8 - Through the fireplace installation.

In the United States, the National Fire Protection Association (NFPA) has established guidelines for passing chimney connectors through combustible walls. Many building code inspectors follow these guidelines when approving installations.

Figure 9 shows one NFPA recommended method. All combustible material in the wall is cut away from the single-wall connector to provide the required 12" (305 mm) clearance. Any material used to close up the opening must be noncombustible.

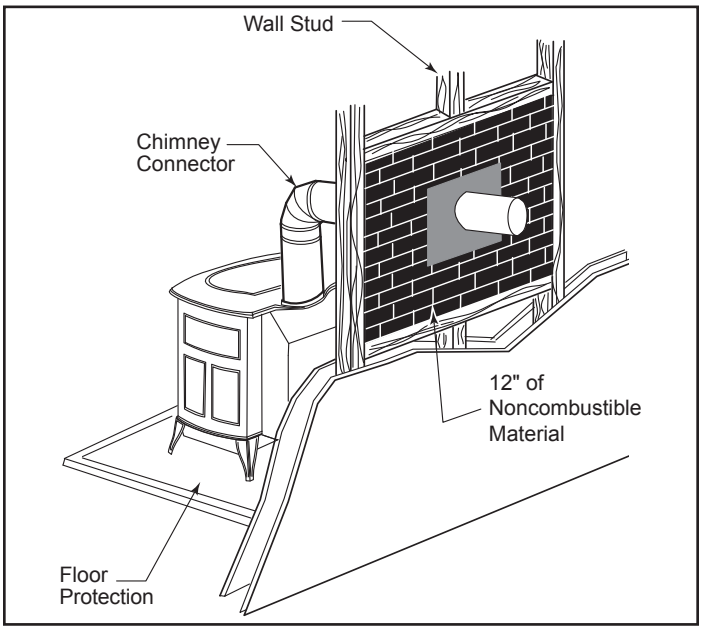


Figure 9 - An approved wall pass-through for the United States.

Three other methods are also approved by the NFPA:

- Placing a section of chimney connector inside a ventilated thimble, which in turn is separated from combustibles by 6" (152 mm) of fiberglass insulating material.
- Placing a section of chimney connector inside a section of 9" (230 mm) diameter, solid-insulated, factory-built chimney, with 2" (51 mm) of air space between the chimney section and combustibles.
- Using a section of solid-insulated double-wall high temperature chimney, with an inside diameter the same as the chimney connector, at least one inch of solid insulation, and a minimum of 9" (229 mm) air space between the outer wall of the chimney section and combustibles.

In Canada, The Canadian Standards Association has established different guidelines for wall pass-throughs. Figure 10 shows one method, in which all combustible material in the wall is cut away to provide the required 18" (457 mm) clearance for the connector. The resulting space must remain empty. A flush-mounted sheet metal cover may be used on one side only. If covers must be used on both sides, each cover must be mounted on noncombustible spacers at least 1" (25 mm) clear of the wall.

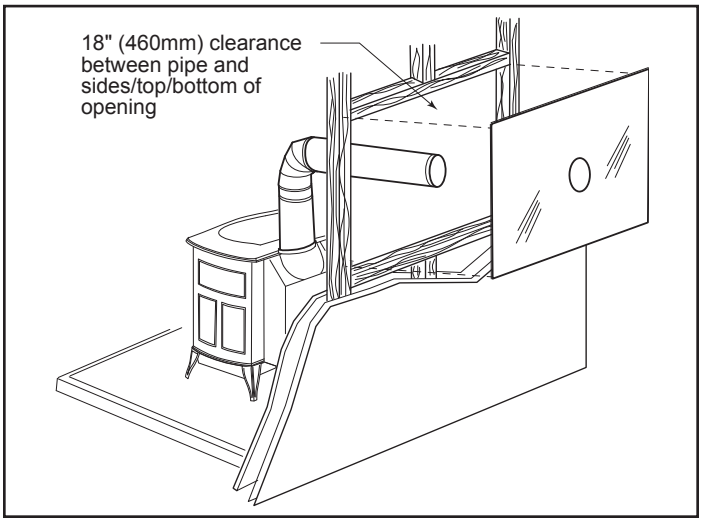


Figure 10 - An approved wall pass-through for Canada.

Your local dealer or your local building inspector can provide details for other approved methods of passing a chimney connector through a combustible wall in your area. In Canada, this type of installation must conform to CAN/CSA-B365, Installation Code for Solid Fuel Burning Appliances and Equipment.

NOTE: Do not vent your applaince into a factory-built (zero-clearance) fireplace. These appliances and their chimneys are specifically designed as a unit for use as fireplaces. It may void the listing or be hazardous to adapt them for any other use.

DO NOT CONNECT THIS APPLIANCE TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

Floor Protection

A tremendous amount of heat radiates from the bottom plate of your stove. The floor area directly under and around the stove will require protection from radiant heat as well as from stray sparks or embers that may escape the firebox.

Heat protection is provided with the use of the Bottom Heat Shield supplied with the stove.

Most installations will require the bottom heat shield to be attached. Only when the stove is placed on a completely noncombustible surface such as unpainted concrete over earth may it be used without the heat shield.

With the bottom heat shield installed this appliance was tested using a 1/2" (13mm) non-combustible hearth material with a thermal conductivity, (k) = 0.47 BTU - in/hr - ft2 -°F, resulting in the requirement of providing a total thermal resistance (R) of 1.06. (Refer to *"How to Determine if Alternate Floor Protection Materials are Acceptable"* section.) The floor protector may be covered with a decorative noncombustible material if desired. Do not obstruct the space under the heater.

When using a fire screen with doors open, UL737, Standard for Fireplace Stoves, this unit was tested using a 1" (25mm) non-combustible hearth pad with a thermal conductivity, (k) = 0.47 BTU - in/hr - ft2 -°F, resulting in the requirement of providing a total thermal resistance (R) of 2.12. (Refer to *"How to Determine if alternate Floor Protection Materials are Acceptable"* section.) The floor protector may be covered with a decorative noncombustible material if desired. Do not obstruct the space under the heater. An 8" chimney and chimney connector is required and the bypass damper must be in the fully open position.

Important: All installations on a combustible floor require the use of the supplied bottom heat shield.

Protection requirements vary somewhat between the Untied States and Canada as follows:

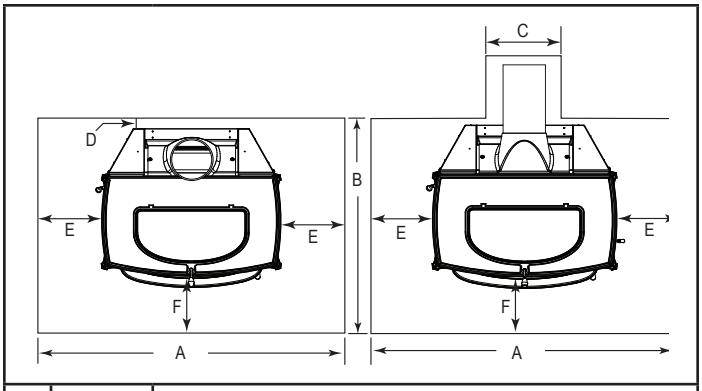
In U. S. installations the floor protector is required under the stove and must extend at least 16" (not including the ash lip) from the front of the stove ("F," Figure 11), and at least 6" from the sides and rear. ("D" and "E," Figure 11)

In rear venting configurations, floor protection must also extend under the chimney connector and 2" to either side. ("C," Figure 11) For the 8" (203 mm) connector, the protector must be a minimum of 12" (305 mm) wide. For the 6" (152 mm) connector, the protector must be 10" (254 mm) wide. The protector must be centered under the connector.

To meet these requirements, a floor protector must be at least 39" wide and 45" deep.

In Canada: A noncombustible floor protector is required under the stove as well. The floor protector must extend 18" (457 mm) to the front ("F," Figure 11), and 8" (203 mm) from the sides and rear. ("D" and "E," Figure 11)

To meet these requirements, a floor protector must be at least 43" (1092 mm) wide and 49" (1245 mm) deep.



	U.S.	Canada
A	39"	43" (1092 mm)
B	45"	49" (1245 mm)
C	12" 10"	12" (305 mm) 8" Connector 10" (250 mm) 6" Connector
D	6"	8" (203 mm)
E	6"	8" (203 mm)
F	16"	18" (460 mm)

Figure 11 - Required floor protection dimensions.

How to Determine if Alternate Floor Protection Materials are Acceptable

All floor protection must be noncombustible (i.e. metals, brick, stone, mineral fiber boards, etc.). Any organic materials (i.e. plastics, wood paper products, etc.) are combustible and must not be used. The floor protection specified includes some form of thermal designation such as R-value (thermal resistance) or k-factor (thermal conductivity).

Procedure:

1. Convert specifications to R-value:
   i. R-value given - no conversion needed.
   ii. K-factor is given with a required thickness (T) in inches:
   $$R = \frac{1}{K} \times T$$
   iii. K-factor is given with a required thickness (T) in inches:
   $$R = \frac{1}{K \times 12} \times T$$
   iv. R-factor is given with a required thickness (T) in inches:
   $R = r \times T$
2. Determine the R-value of the proposed alternate floor protector:
   i. Use the formula in Step 1 to convert values not expressed as R.
   ii. For multiple layers, add R-values of each layer to determine overall R-value.
3. If the overall R-value of the system is greater than the R-value of the specified floor protector, the alternate is acceptable.

EXAMPLE: The specified floor protector should be 1/2-inch thick material with k-factor of 0.84. The proposed alternate is 4" brick with an r-factor of 0.2 over 1/8" mineral board with a k-factor of 0.29

Step a: Use formula above to convert specification to R-value:

$$R = \frac{1}{k} \times T = \frac{1}{0.84} \times 1.00 = 1.18$$

Step b: Calculate R of proposed system.

4" brick of r = 0.2, therefore:

$R_{brick} = 0.2 \times 4 = 0.8$

1/8" mineral board of k = 0.29, therefore

$R_{mineralboard} = \frac{1}{0.29} \times 0.125 = 0.431$

$R_{total} = R_{brick} + R_{mineralboard} = 0.8 + 0.431 = 1.231$

Step c: Compare proposed system Rtotal of 1.231 to specified R of 0.59. Since proposed system Rtotal is greater than required, the system is acceptable.

Definitions

$$R = \frac{(ft^2)(hr)(°F)}{Btu} \qquad K = \frac{(Btu)(in)}{(ft^2)(hr)(°F)} = k \times 12$$

$$K = \frac{(Btu)(ft)}{(ft^2)(hr)(°F)} \qquad r = \frac{(ft^2)(hr)(°F)}{(Btu)(in)} = \frac{1}{k}$$

Floor Protection for Fireplace Installation

Do not assume that your fireplace hearth is completely noncombustible. Many fireplace hearths do not satisfy the “completely noncombustible” requirement because the brick or concrete in front of the fireplace opening is supported by heavy wood framing. Because heat passes readily through brick or concrete, it can easily pass through to the wood. As a result, such fireplace hearths can be a fire hazard and are considered a combustible floor.

For all fireplace installations, follow the floor protection guidelines described above, including the need for a bottom shield. Keep in mind that many raised hearths will extend less than the required clearance from the front of the heater. In such cases, sufficient floor protection as described above must be added in front of the hearth to satisfy the minimum floor protector requirement from the front of the stove: 16" (410 mm) in the United States and 18" (460 mm) in Canada. Hearth rugs do not satisfy the requirement for floor protection as they are not fire proof.

Fireplace installations also have special clearance requirements to the side walls, side decorative trim and fireplace mantel. Refer to the information on fireplace and mantel trim shields in this section.

Keep the Stove a Safe Distance From Surrounding Materials

Both a stove and its chimney connector radiate heat in all directions when operating, and nearby combustible materials can overheat dangerously if they are too close to the heat source. A safe installation requires that adequate clearance be maintained between the hot stove and its connector and nearby combustibles.

Clearance is the distance between either your stove or chimney connector, and nearby walls, floors, the ceiling, and any other fixed combustible surface. This appliance has specific clearance requirements that have been established after careful research and testing. These clearance requirements must be strictly observed.

In addition, keep furnishings and other combustible materials away from the stove. In general, a distance of 48" (1219 mm) must be maintained between the stove and movable combustible items such as drying clothes, furniture, newspapers, firewood, etc. Keeping those clearance areas empty assures that nearby surfaces and objects will not overheat.

Safe Ways to Reduce Clearances

Clearance requirements are established to meet every installation possibility, and they involve the combination of these variables:

- When the stove pipe has no listed heat shield mounted on it.
- When the wall has no heat shield mounted on it.
- When the wall has a heat shield mounted on it.
- When the wall and stove pipe have heat shields.

In general, the greatest clearance is required when you place a stove and its connector near a wall with no heat shield.

For example, when this appliance is installed using 6" connector pipe parallel to the rear wall and no connector shield is used, it must be at least 15" (381 mm) from the wall behind it and at least 19" (483 mm) from walls on either side. These dimensions are measured from the back of the rear shroud and the side edge of the cast iron top to the combustible wall.

If this appliance is installed in a corner and no shield is used, the corners of the stove top must be at least 18-1/2" (470 mm) from nearby walls.

Clearances may be reduced only by means approved by the regulatory authority, and in accordance with the clearances listed in this manual. Refer to the clearance chart for approved clearance reduction specifications.

NOTE: Installation of this appliance is not permitted in alcoves.

Wall Shields

One way to reduce clearances is with a wall shield constructed of 24 gauge or heavier sheet metal, or of another noncombustible material such as 1/2" (13 mm) insulation board such as Durock® or Wonderboard®, or common brick "laid on flat," with the 3-1/2" (90 mm) side down.

Shields must be spaced out from the combustible surface 1" (25 mm) on noncombustible spacers, as in Figure 12. The spacers should not be directly behind the stove or chimney connector.

Air must be able to flow between the wall and the shield. At least 50% of the bottom 1" (25 mm) of the shield must be open, and the shield must be open at the top. Metal screening across the top will keep small stray objects from being trapped behind the shield. (Figure 12)

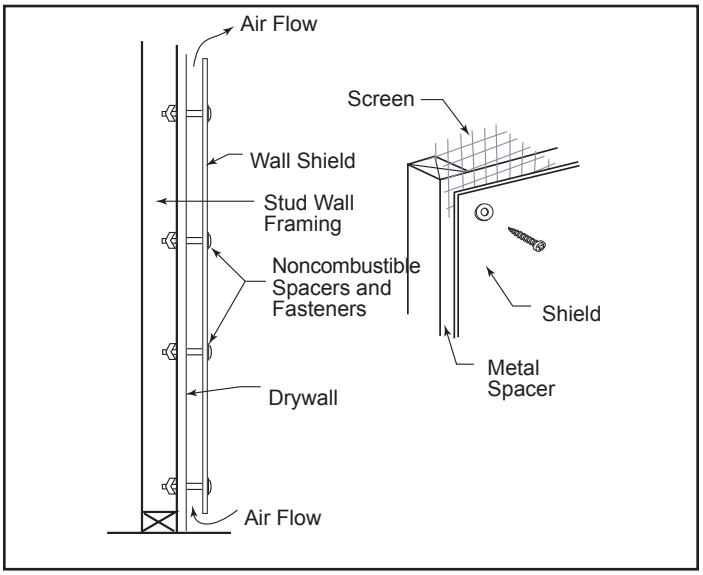


Figure 12 - Approved wall shield construction.

The shield must be a minimum of 48" (1219 mm) tall, and must extend at least 19" (483 mm) higher than the top of the stove, whichever is higher. The shield behind the chimney connector must be 30" (760 mm) wide, centered behind the pipe; for installations that use an approved prefabricated chimney to pass through the ceiling, the shield behind the chimney connector must stop 1" (25 mm) below the ceiling.

With 8" connections and chimneys, because of potentially higher pipe temperatures, the shield must extend the full height of the wall (up to 9' (2.7 m)) and stop 1" (25 mm) below the ceiling.

Fireplace and Mantel Trim Shields

A fireplace installation requires special clearance between the side of the stove and the right and left walls, between the side of the stove and the decorative side trim on the fireplace face, and between the top of the stove and the mantel.

Noncombustible shields installed 1" (25 mm) away from the combustible surface on noncombustible spacers, called ventilated shields, may be used to reduce clearances.

To protect a mantel from the heat of a stove in a fireplace installation, use a custom-made ventilated mantel shield that is at least 48" (1220 mm) long, centered over the stove. (Figure 13) Ventilated shields for side trim must extend the full length of the trim.

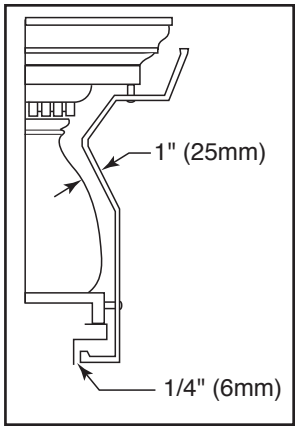


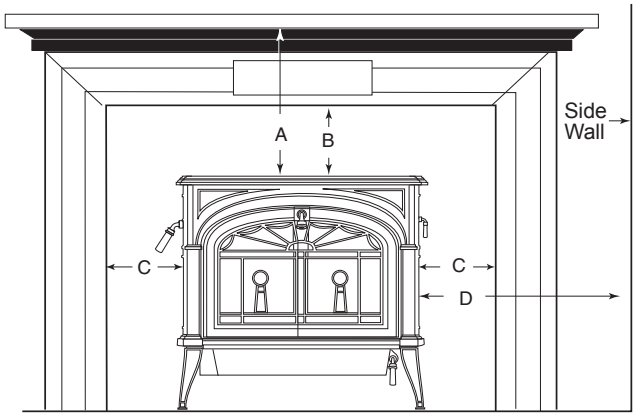
Figure 13 - A custom-formed mantel shield.

An unprotected mantel ("A," Figure 14) cannot be more than 9" (230 mm) deep and must have a minimum clearance of 28" (711 mm), measured from the stove's top plate. With a ventilated shield, this clearance may be reduced safely to 15" (381 mm).

Unprotected top trim (B) protruding 3/4" (19 mm) or less from the face of the fireplace must be a minimum of 25" (635 mm) from the stove's top surface. With a ventilated trim shield, this clearance may not be reduced safely.

Unprotected side trim (C) that protrudes 3/4" (19 mm) or less from the face of a fireplace must have a minimum clearance of 22" (554 mm), measured from the stove's top side edge. If the trim extends more than 3/4" (19 mm), it is subject to the requirements for wall clearance.

The charts and sample installations that follow list all the clearances required for the various installation configurations of this appliance.



Fireplace and Mantel Trim Clearances

		Unprotected	Protected
A	Mantel Trim	28" (711 mm)	15" (281 mm)
B	Top Trim	25" (635 mm)	15" (281 mm)
C	Side Trim	22" (554 mm)	11" (280 mm)
D	Side Wall	22" (559 mm)	11" (280mm)

Figure 14 - Maintain clearances to combustible components of the mantel piece.

Clearance to Combustibles

For use with either 6” or 8” flue collar/chimney connection

	Unprotected Surfaces			Protected Surfaces		
	Stove Clearance					
	Stove Installed Parallel to Wall		Stove In Corner	Stove Installed Parallel to Wall		Stove in Corner[1]
	Side	To Rear Shroud	Corners	Side	To Rear Shroud	Corners
Top Exit, 8” single wall connector without shields, vertical flue collar heat shield installed	(A) 19" (483 mm)	(B) 20" (508 mm)	(C) 18-1/2" (470 mm)	(D) 5" (127 mm)	(E) 7" (178 mm)	(F) 12" (305 mm)
Top Exit, single-wall chimney connector heat shield[2], vertical flue collar h.s. installed	(G) 19" (483 mm)	(H) 10" (254 mm)	(I) 18-1/2" (470 mm)	(J) 6" (152 mm)	(K) 6" (152 mm)	(L) 12" (305 mm)
Rear Exit No flue collar heat shield	(M) 22" (559 mm)	(N) 12" (305 mm)	N/A	(P) 11" (279 mm)	(Q) 12" (305 mm)	N/A
Top Exit, double-wall chimney connector[3], vertical flue collar heat shield installed	(G) 18" (457 mm)	(H) 7" (178 mm)	(I) 12" (305 mm)	(J) 4" (102 mm)	(K) 5" (127 mm)	(L) 5" (127 mm)
	Clearance to Combustibles in Front of Stove					
	All Installations (S) 48" (1219 mm)					

The provided rear shroud must be used in all installations. The flue collar heat shield must be used in all vertical installations.

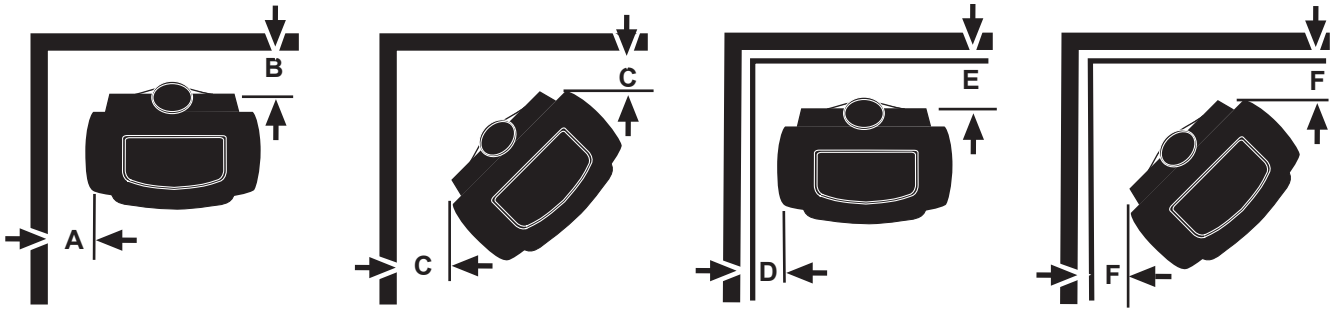
1. A ceiling heat shield 24" (610 mm) in diameter and suspended 1" (25 mm) from the ceiling must surround the pipe in installations where chimney penetrates the ceiling.
2. The connector pipe heat shield must extend 36" (914 mm) above flue collar.
3. Using listed double wall oval to round adapter when installing optional 8" oval flue collar.
4. A minimum of 58” (147 cm) from the top of the stove to the ceiling, is required for all installations of this appliance.

6" Chimney Connector ONLY						
Top Exit, single wall 6" connector without shields, vertical flue collar heat shield installed	(A) 19" (483 mm)	(B) 15" (381 mm)	(C) 18-1/2" (470 mm)	(D) 5" (127 mm)	(E) 7" (178 mm)	(F) 12" (305 mm)

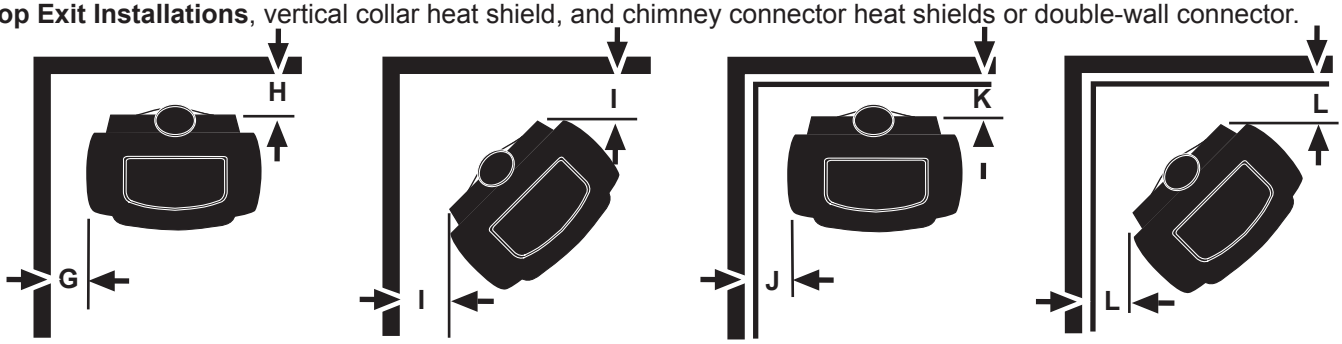
For use with either 6" or 8" flue collar/chimney connector

Unprotected Surfaces		Protected Surfaces	
Stove Installed Parallel to Wall	**Stove in Corner**	**Stove Installed Parallel to Wall**	**Stove Installed Parallel to Wall**

Top Exit Installations, No Stove Heat Shields, collar heat shield installed.



Top Exit Installations, vertical collar heat shield, and chimney connector heat shields or double-wall connector.



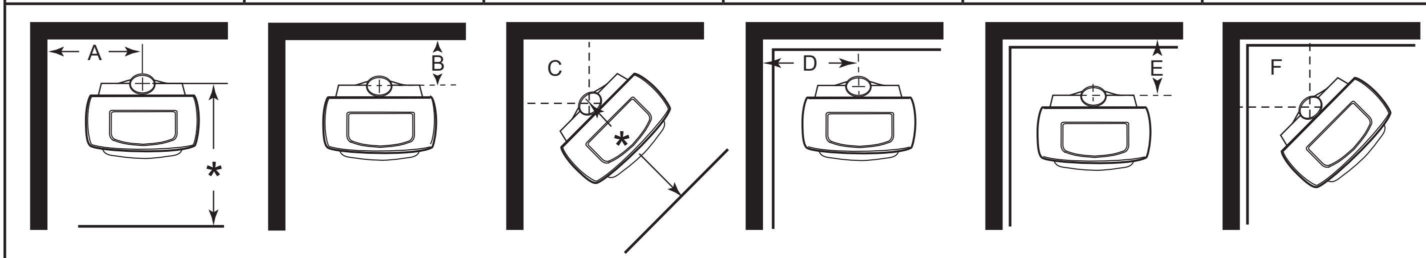
Rear Exit Installations

Distance from the Center of the Flue Collar to the Wall in Top-Exit Installations

The information on this page is helpful in planning stove placement for top-exiting installations, particularly those installations with chimneys that pass through the ceiling. However, this is not a clearance chart. Final stove clearances must adhere to the guidelines stated in the clearance chart on Page 13.

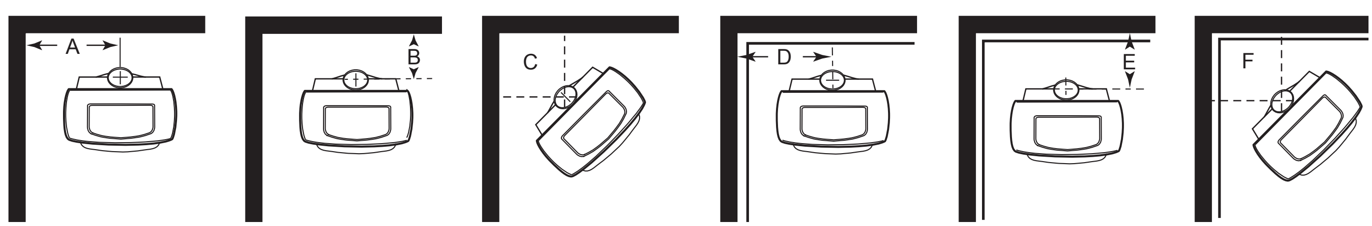
Dimensions indicated are valid for installations with either 6" or 8" flue collars.

WITHOUT Chimney Connector Heat Shields					
Unprotected Surfaces			Protected Surfaces		
Parallel Installations		Corner Installations**	Parallel Installations		Corner Installations**
Side (A)	Rear (B)	Corner (C)	Side (D)	Rear (E)	Corner (F)
32-1/2" (826mm)	23-1/4" (691mm)	22-1/2" (572mm)	18-1/2" (470mm)	10-1/4" (260mm)	18-1/2" (470mm)



* This distance, from the center of the flue collar to the front edge of the hearth, is the same for all installations on this page: 35-1/4" in the United States and 37-1/4" (946 mm) in Canada.

WITH Chimney Connector Heat Shields					
Unprotected Surfaces			Protected Surfaces		
Parallel Installations		Corner Installations**	Parallel Installations		Corner Installations**
Side (A)	Rear (B)	Corner (C)	Side (D)	Rear (E)	Corner (F)
32-1/2" (826 mm)	13-1/4" (337 mm)	22-1/2" (572 mm)	19-1/2" (495 mm)	9-1/4" (235 mm)	18-1/2" (470 mm)



**To locate center of flue collar for corner installation, add 6-1/2" (165 mm) to the clearance distance from stove corner to wall. Mark off the resulting distance from the corner along both walls. Next, measure the same distance from these two points out from the walls. These last two measurements will meet at a point representing the center of the flue collar. Refer to the diagrams above.

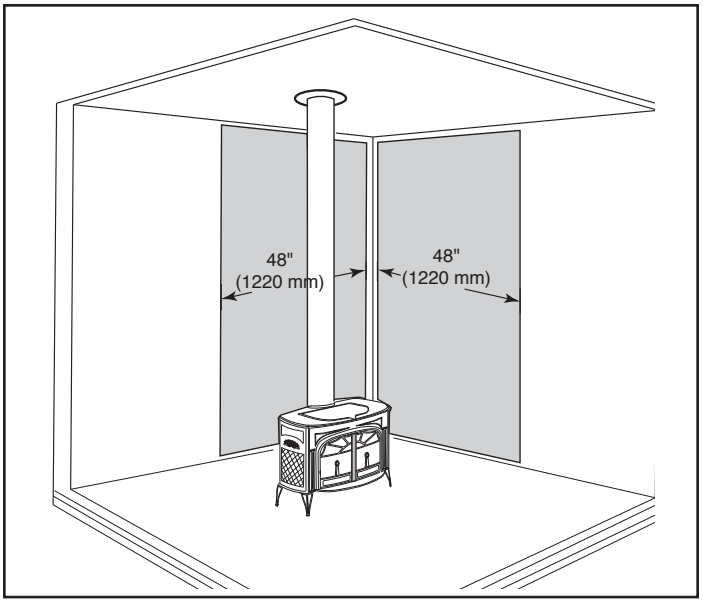


Figure 15 - Parallel installation, vertical chimney connector, two wall shields. Reduced clearances for both rear and side walls. Wall shields may meet at corner if desired. Shielding for connector is centered behind connector.

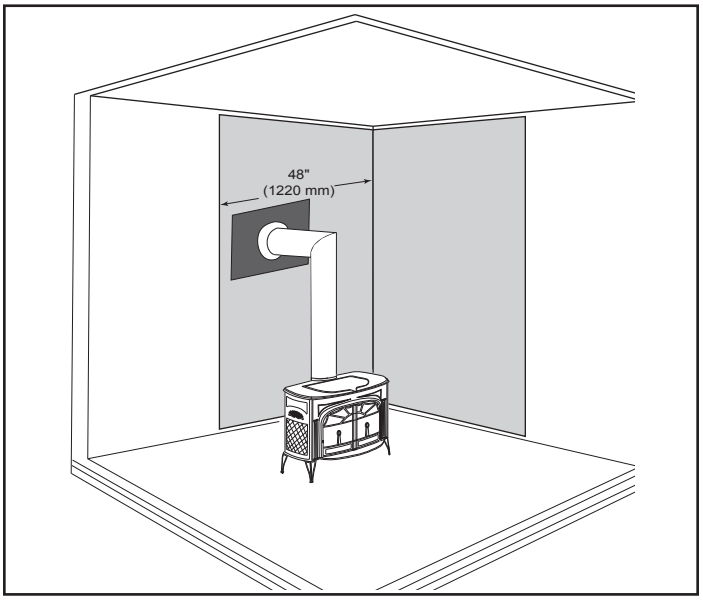


Figure 16 - Parallel installation with rear wall pass-through, two wall shields. Reduced clearances to both rear and side walls. Wall shields may meet at corner if desired. Wall pass-through must comply with codes.
Refer to “Special Installations.”

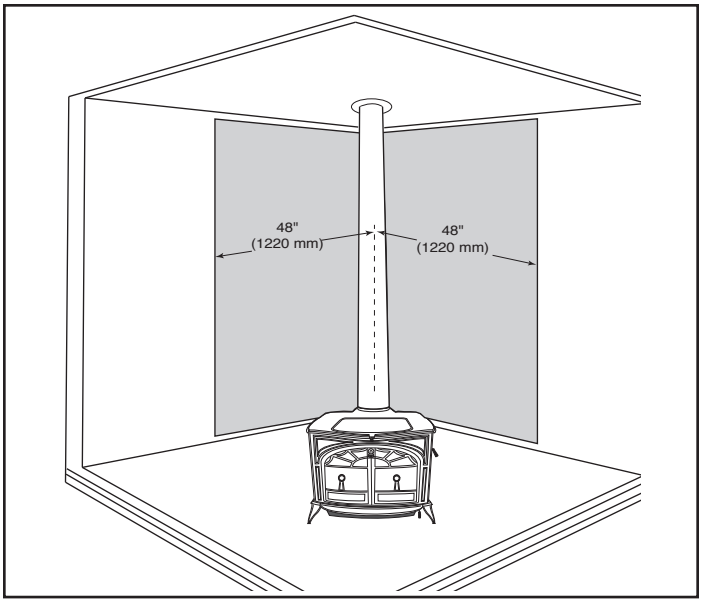


Figure 17 - Corner installation, vertical chimney connector, two wall shields. Reduced side clearances. Wall shield MUST meet at corner.

Mobile Home Installation

1. An outside air inlet must be provided for combustion and must remain clear of leaves, debris, ice and/or snow. It must be unrestricted while stove is in use to prevent room air starvation which can cause smoke spillage and an inability to maintain a fire. Smoke spillage can also set off smoke alarms.
2. The appliance must be secured to the mobile home structure by bolting it to the floor.
3. Stove must be grounded with #8 solid copper grounding wire or equivalent and terminated at each end with N.E.C. approved grounding device.
4. Stove must be installed with an approved UL103 HT ventilated chimney connector, UL103 HT chimney and terminal cap with spark arrestor. Never use a single wall connector (stove pipe) in a mobile home installation. Use only double-wall connector pipe, Dura-Vent DVL, Selkirk metalbestos DS, Security DL double wall connector or any listed double wall pipe connector.
5. Refer to the clearance charts in this manual or the serial number label on the back of the stove for clearances to combustibles.
6. Floor protection requirements must be followed precisely. Refer to the "Floor Protection" section in this manual.
7. In Canada, this appliance must be connected to a 6 inch (152 mm) factory-built chimney conforming to CAN/ULC 629M, STANDARD FOR FACTORY BUILT CHIMNEYS. Refer to the "Floor Protection" section in this manual.
8. Use silicone to create an effective vapor barrier at the location where the chimney or other component penetrates to the exterior of the structure.
9. Follow the chimney and chimney connector manufacturer's instructions when installing the flue system for use in a mobile home.

NOTE: Offsets from the vertical, not exceeding 45°, are allowed per Section 905(a) of the Uniform Mechanical Code (UMC). Offsets greater than 45° are considered horizontal and are also allowed, providing the horizontal run does not exceed 75% of the vertical height of the vent. Construction, clearance and termination must be in compliance with the UMC Table 9C. This installation also complies with NFPA 211.

NOTE: Top sections of the chimney must be removable to allow maximum clearance of 13.5 ft. (411 cm) from ground level for transportation purposes.

10. Burn wood only. Other types of fuels may generate poisonous gases (e.g. carbon monoxide).
11. If unit burns poorly while exhaust blower is on in home, (i.e. kitchen range hood) increase combustion air.

⚠ WARNING

NEVER DRAW COMBUSTIBLE AIR FROM A WALL, FLOOR OR CEILING CAVITY OR FORM ANY ENCLOSED SPACE SUCH AS AN ATTIC OR GARAGE.

⚠ CAUTION

THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL AND CEILING/ROOF MUST BE MAINTAINED. (i.e., DO NOT CUT THROUGH FLOOR JOIST, WALL STUD, CEILING TRUSS, etc.).

⚠ WARNING

DO NOT INSTALL IN SLEEPING ROOM

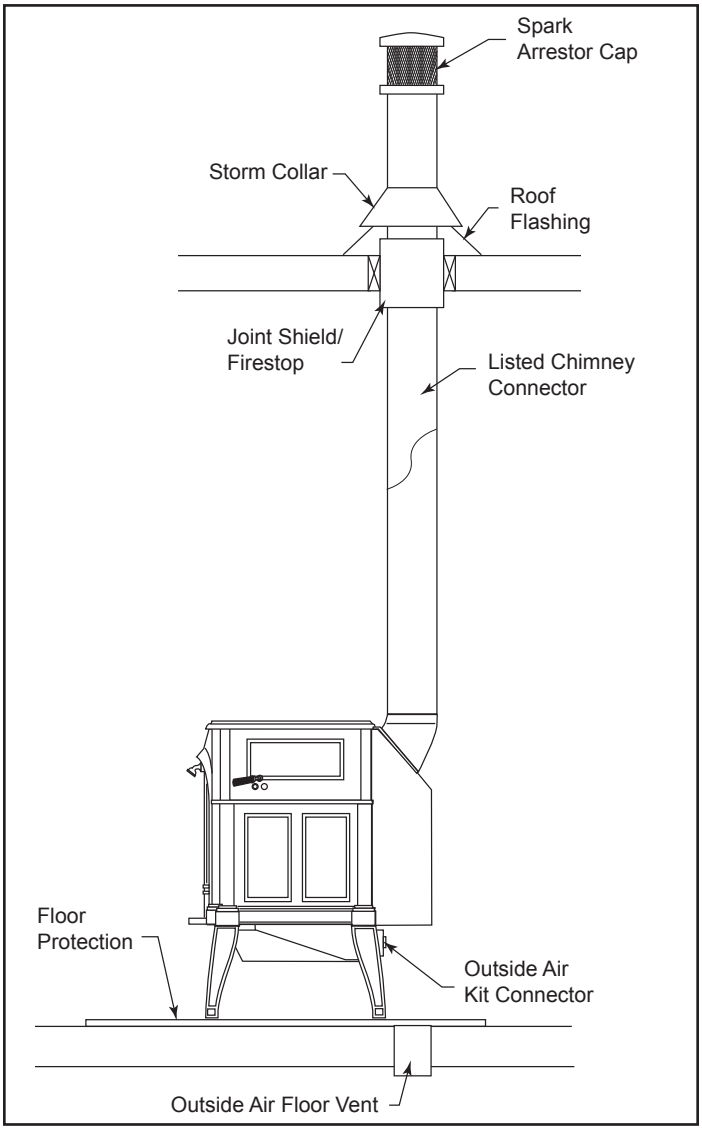


Figure 18 - Mobile home installation.

Assembly

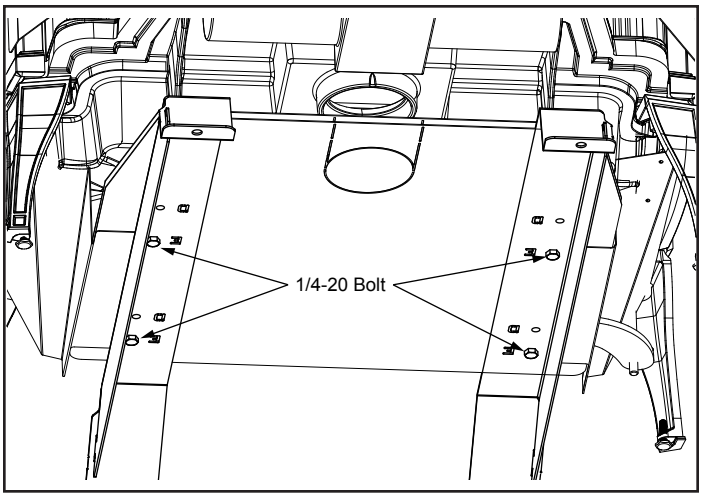


Figure 19 - Remove unit from shipping brackets.

Remove the unit from the shipping brackets by removing (2) 1/4-20 hex head bolts from each shipping bracket, leaving brackets attached to the skid. Figure 19. (Save the 1/4-20 hex head bolts as they will be needed later to install heat shield.)

NOTE: When moving the stove, lift the stove to take weight off the legs whenever possible. Dragging or sliding the stove, especially across rough surfaces can cause the legs to loosen or even break.

Set Up Your Stove

Cast iron stoves are heavy, and it will take two to four people to move your appliance into position.

Wipe the protective coating of oil from the griddle with a clean dry rag or a paper towel.

Install the handle on the griddle. First, place the griddle upside down at the edge of a flat surface and assemble the handle. Figure 20.

With the handle pointing 45° from its final position, tighten the nut as far as possible with the pliers. Move the handle to its final position while still holding the nut with the pliers.

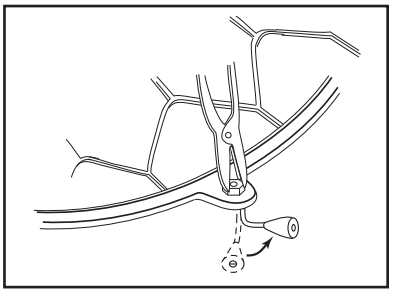


Figure 20 - Attach the griddle handle.

⚠ CAUTION

Overtightening can strip tapped threads.

Storing the Handle

Use the removable handle to open or close the doors. After using it, remove the handle so it will not get hot. Store the handle in the handle holder installed behind the right front leg. (Figure 21)

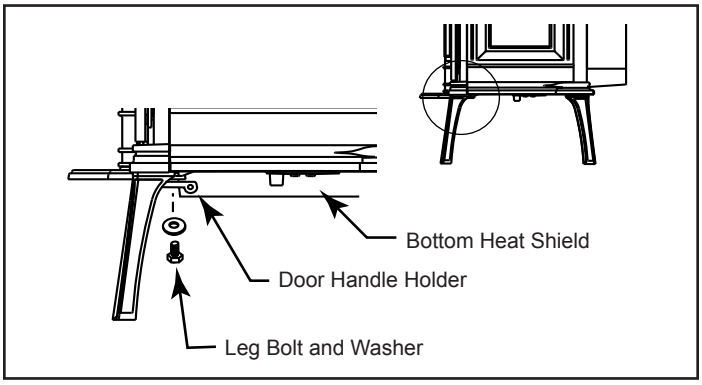


Figure 21 - Handle holder and heat shield positions.

Install the Bottom Heat Shield

NOTE: The Bottom Heat Shield is required in most installations. Refer to Floor Protection, Page 9, for further details.

1. Install (4) 1/4-20 x 3/8" hex bolts supplied in the manual bag into the four holes located under the stove (Figure 22).
2. Align the bottom heat shield key holes to the four hex bolts previously installed into base. (Figure 22). The outside air cutout hole should be toward the rear of the stove.
3. Attach the heat shield sides by passing the slots over the bolt heads. Tighten the hex head bolts. Figure 22.

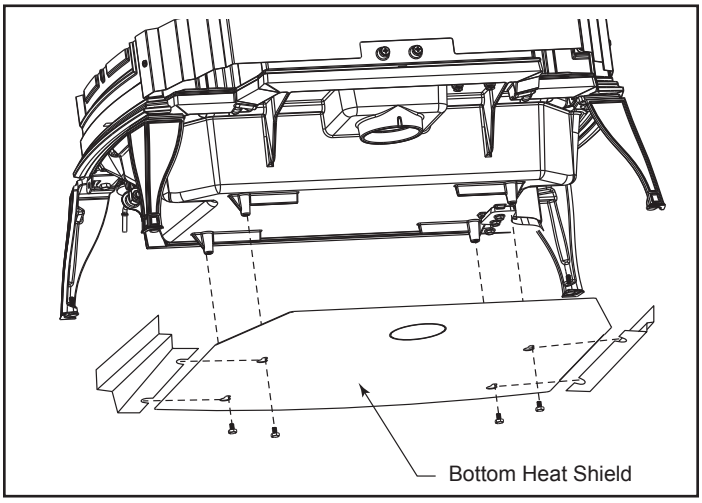


Figure 22 - Attach the bottom heat shield.

Adjust the Leg Levelers
Lift the stove slightly so there is no weight on the leg while making the adjustment.

Reverse the Flue Collar (If necessary)
Reverse the flue collar by removing the two screws that attach it to the back of the stove. Be sure the gasket around the flue collar opening is in position when you screw the collar back onto the stove.

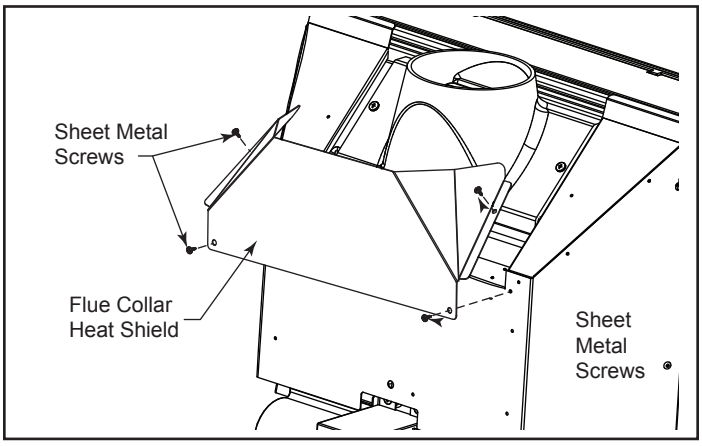


Figure 23 - Install flue collar heat shield.

⚠ WARNING

The flue collar heat shield must be installed in all vertical installations. The flue collar heat shield is not used when the flue collar is in the rear exit position.

Attach the Damper Handle
Use the 1/4"-20 x 3" screw to attach the damper handle to the damper stub on the left side.

Attach the Catalyst Temperature Probe
To install the catalyst temperature probe, remove the hole plug from the cast iron wall behind the rear shield as shown (Figure 24) use two #10 sheet metal screws and bracket supplied, secure the bracket and probe to the back of your stove. (Figure 24)

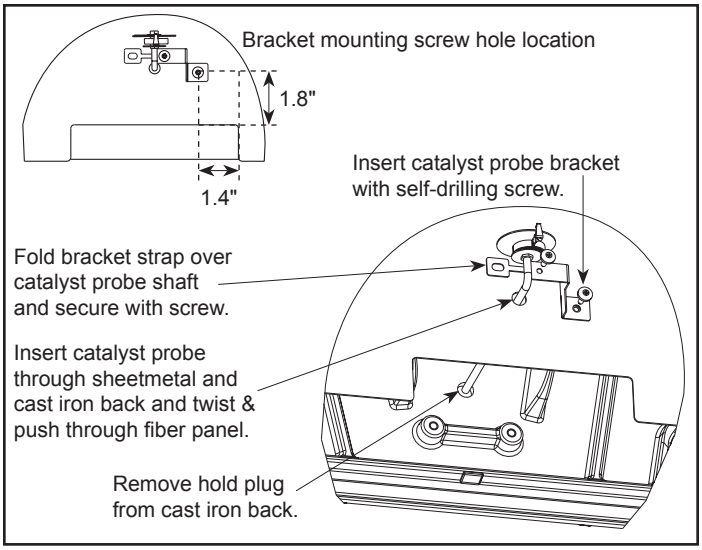


Figure 24 - Install the Catalyst Temperature Probe

Attach the Primary Air Thermostat Handle
The primary air thermostat handle is the smaller of the two black handles. Secure the handle to the stub on the right side of the stove with an 8-32 x 2" slot head machine screw. (Figure 25)

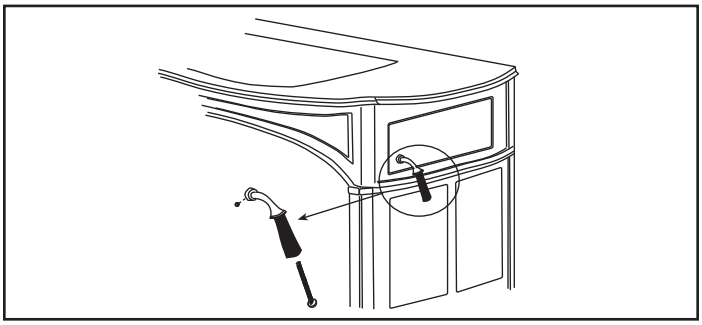


Figure 25 - Attach the thermostat handle.

Assemble the Removable Insert Handle
The wooden removable insert handle opens and closes the front doors. Remove after each use, and store it in the handle holder behind the right front leg. Assemble the handle by passing the 3-3/8" screw through the wooden shaft and into the bright metal nub. (Figure 26) Tighten carefully until snug.

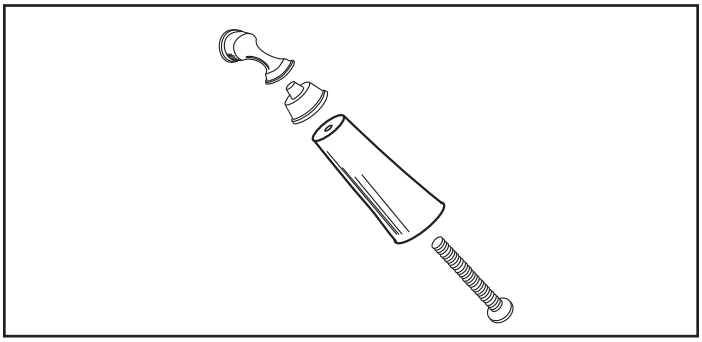


Figure 26 - Assemble the front door handle.

Fan Kit Installation

1. Attach the fan assembly at the bottom edge of the inner back with two (2) 1/4-20 x 3/4" hex head screws.
2. Attach snapstat to the mounting holes on the underside of the bottom with two (2) 1/4-20 pan head screws.
3. Attach the rheostat holder (provided with the stove) under the right front wing of the bottom heat shield with two (2) #10 sheet metal screws.
4. Attach the rheostat to its holder by inserting the rheostat control shaft through the holder hole. Install the retaining ring and rheostat knob onto the shaft.
5. Secure the rheostat cable to the underside of the bottom heat shield using the wire tie provided and the hole at the right rear edge of the heat shield.
6. Fan will not operate until stove reaches approximately 109°F.
7. Plug blower cord into a grounded outlet. Do not remove ground prong from plug. Route power cord to avoid heat from the stove or other damage. Do not route cord under or in front of appliance.

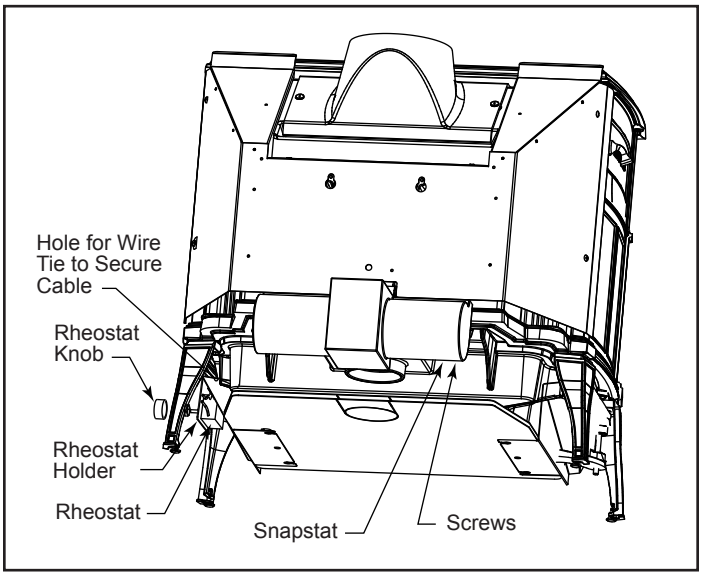


Figure 27 - Fan installation (Kit # 2767).

Installing or Removing Catalyst

1. Remove the access cover by gently lifting up and pulling out from the bottom edge. (Figure 28)
2. Remove the inner cover by pulling it straight out. (Figure 29)
3. Remove the catalyst by gently pulling it straight out. (Figure 30) Place the catalyst where the catalyst's ceramic components will not be damaged.

Figure 28 - Remove access cover.

Figure 29 - Remove inner cover.

Figure 30 - Remove catalyst.

Smoke and CO Detectors

The use of smoke and carbon monoxide (CO) detectors throughout the home is strongly advised, even if not required by building codes or insurance regulations. It is a good idea to install a smoke detector in the living areas and each bedroom. Follow the smoke/CO detector manufactures placement and installation instructions and maintain regularly.

You may not, however, wish to install a detector in the immediate vicinity of the stove. Depending on the sensitivity of the unit, the alarm can be set off while you are tending the fire or emptying the ashes. If you install a detector in the same room, locate it as far away from the stove as possible.

Safety Tips

Conveniently locate a "Class A" fire extinguisher to contend with small fires. Be sure the fire extinguisher works and is clearly visible. All occupants of the house should know where it is, and how it operates. Have heavy stove gloves available near the stove. Have special safety accessories (e.g., Child Guard Screen) available for use if small children will be in the home.

In the event of a stove pipe or chimney fire….

- Evacuate the house immediately
- Notify the fire department
- If the fire isn't too threatening, closing down the stove tight, (damper, primary air, all doors) will help to smother the fire.
- Inspect your stove, stove pipe and chimney for any damage caused by the fire and correct any damage before using your stove again.

Operation

The Encore® Model 2040-CAT-C Controls

Two controls regulate the performance of your appliance: a **primary air control** supplies oxygen for the fire, and a **damper** directs air flow within the stove to activate and deactivate the combustion system. (Figure 31)

Symbols cast into the stove are reminders of the correct directions for using the controls. The words 'Left' and 'right' in these directions are *facing the stove*.

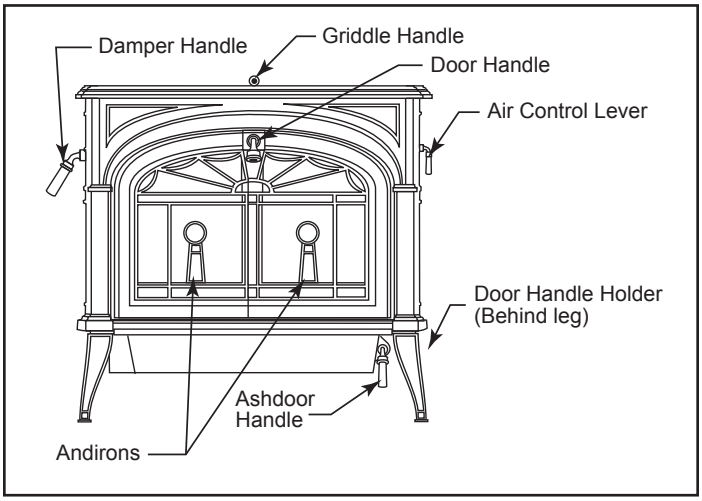


Figure 31 - The controls are conveniently located and easy to operate.

A Single Air Control Regulates Heat Output and Burn Time

The **primary air control lever**, on the right side of the stove, controls the amount of incoming air for starting, maintaining, and reviving a fire.

Once the air control is manually set, a bi-metallic thermostat automatically maintains the heat output at a constant level for a more even heat over the life of the burn.

More air entering the stove makes the fire burn hotter and faster, while less air prolongs the burn at a lower heat output level. (Figure 32)

For the greatest air supply and maximum heat output (but the shortest burn time), move the lever toward the front of the stove. For a fire that will last longer with less heat, move the lever toward the rear of the stove.

⚠ WARNING

This wood heater has a manufactured-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

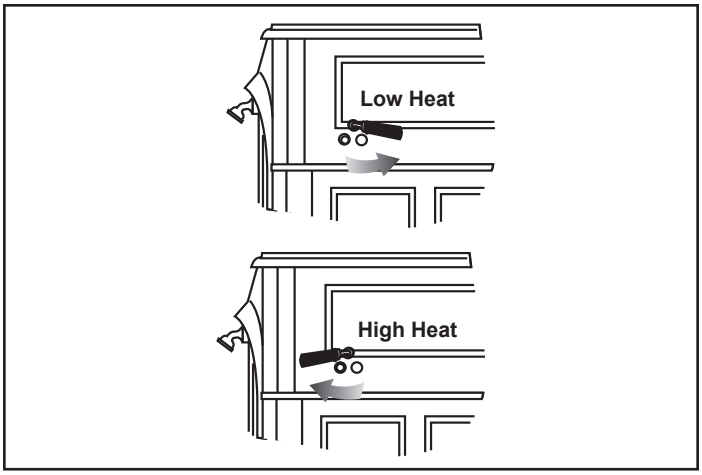


Figure 32 - The handle may be positioned anywhere between the two extremes for different heat levels.

A Damper Directs Air Flow Within the Stove

The **damper handle** on the left side of the stove operates the damper to direct air flow within the stove.

The damper is **open** when the handle points to the **rear**, enabling smoke to pass directly into the chimney. The damper must be open when starting or reviving a fire, and whenever the griddle or doors are opened.

The damper is **closed** when the handle points **forward.** Smoke travels through the secondary combustion system where it can be further burned, before passing up the chimney. (Figure 33)

The damper should always be either fully open or fully closed. There are no intermediate positions. When closing the damper, be sure to pull firmly enough to snap the handle into the locked position.

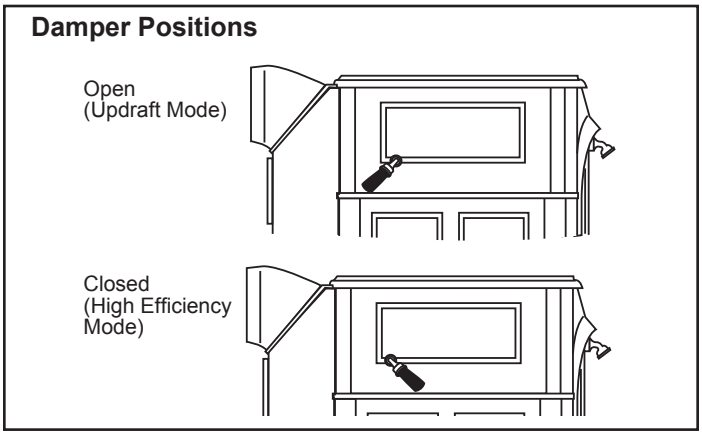


Figure 33 - The damper is either open or closed. There are no intermediate positions.

Conditioning Your Stove
Cast iron is extremely strong, but it can be broken with a sharp blow from a hammer or from the thermal shock of rapid and extreme temperature change.

The cast plates expand and contract with changes in temperature. When you first begin using your appliance, minimize thermal stress by letting the plates adjust gradually during three or four initial break-in fires following Steps 1-3 below.

Wood Burning Operation
Burn only solid wood in this appliance, and burn it directly on the grate. Do not elevate the fuel. Do not burn coal or other fuels. In the United States, it is against the law to operate this wood heater in a manner inconsistent with operating instructions in this manual.

The bypass damper must be open when starting a fire or when refueling.

Do not use chemicals or fluids to start the fire. Do not burn garbage. Never use flammable fluids such as gasoline, gasoline type lantern fuel, kerosene, charcoal lighter fluid, naptha, engine oil or similar liquids to start or "freshen up" a fire in this heater. Keep all such liquids well away from the heater while it is in use.

1. Open the stove bypass damper, and open the primary air control fully.
2. Place several sheets of crumpled newspaper in the stove. Place six or eight pieces of dry kindling split to a finger-width size on the paper. On the kindling, lay two or three larger sticks of split dry wood approximately 1-2" (25-51 mm) in diameter. (Figure 34)

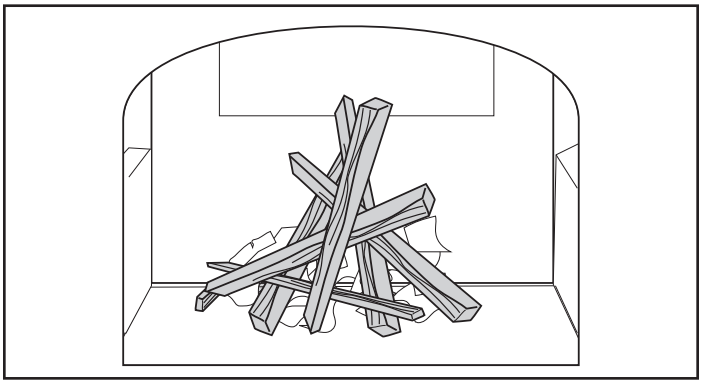


Figure 34 - Start the fire with newspaper and dry kindling.

3. Light the newspaper and close the door. Gradually build up the fire by adding a few 3-5" (80-120 mm) diameter pieces of split firewood. **If this is one of the first few "break-in" fires, let the fire burn brightly, and then let it die out.** During the break-in fires, do not let the stove get hotter than 500°F. (260°C) as measured on an optional stove-top thermometer. Adjust the air control lever as necessary to control the fire. Some odor from the stove's hot metal and the paint is normal for the first few fires.

NOTE: Some chimneys must be "primed," or warmed up, before they will draw sufficiently to start a fire. To correct this situation, roll up a couple pieces of newspaper, place them on top of the kindling and toward the back of the stove, light them, and close the doors. This will encourage the smoke to rise rapidly, making it easier to establish a good draft. Once the draft is established, open the front door and light the rest of the fuel from the bottom. Do not light the main bed of fuel until the chimney begins drawing, and repeat the procedure as often as necessary if the initial attempt is unsuccessful.

NOTE: Effectiveness of a "top-down" method to start a fire. Smoke emissions when starting a fire can be difficult to control because the stove is not yet heated to its optimum temperature. One method of reducing emissions during a cold start-up is the use of a "top-down" kindling procedure. In this, place larger pieces of kindling on the bottom of the kindling pile followed by smaller and smaller pieces as the pile is added to. Very finely split pieces should be on the top. Light the kindling pile with a match at the top and allow the kindling to burn downward into the larger pieces. This reduces smoke by slowly increasing the fire size without creating an air-starved condition.

4. **If your appliance has been broken-in previously** using Steps 1-3, continue to build the fire gradually. Add larger wood with a diameter of 3-4" (75-100 mm). Continue adding split logs of this size to the briskly-burning fire until there is a glowing ember bed 2-3" (51-75 mm) deep. (Figure 38) A good ember bed is necessary for proper functioning of the combustion system.
5. Close the damper when the griddle temperature reaches 450°F (230°C) and sufficient ember bed is established. This will force the smoke into the secondary combustion chamber where the smoke and gases will ignite if the stove is sufficiently hot. Even though it is possible for the fire to get quite hot within a few minutes after a fire is started, secondary combustion may stop or the fire may go out if the fire dies down immediately as a result of the damper being closed too early.
6. Adjust the air control for your desired heat output.

NOTE: Stove installations vary widely, and the operating guidance given here is only a starting point. The *"Draft Management"* section in this manual will explain in detail how the features of your installation may help or hinder good draft, and how you may need to vary your firing technique if your installation doesn't encourage a good draft.

High-Efficiency Wood Burning with the Catalytic Combustor
Your Encore stove was shipped from the factory with a separately packaged catalytic combustor. When operating the stove with the catalytic combustor, use the same operation instructions as outlined in the previous section.

While not required, operating your stove with the catalytic combustor installed creates optimum conditions for secondary combustion and will increase your efficiency up to 15% on low burn, making sure you get the most heat out of each load of wood. Refer back to the *"Installing or Removing Catalyst"* section of this manual.

The catalytic element is a ceramic “honeycomb” coated with the catalytic material. The element sits at the bottom of the secondary combustion chamber. Smoke, gases and particulates that are not fully combusted during the secondary combustion process pass through the catalyst, creating a tertiary burn. This results in higher efficiency and lower emissions.

The catalyst will initiate combustion of smoke and particulates at 500° - 600°F (260° - 315°C), half the temperature normally required for unaided secondary combustion. If you followed the startup operation steps in the previous section the stove will be sufficiently hot to allow the combustor to work. Once the combustor starts working, heat generated by burning the smoke will keep it working.

To determine whether the combustor is operating, refer to the temperature probe which shows the operating range of the catalytic combustor. This is located on the back of the stove and is viewed from the top. **NOTE:** It will take several minutes after closing the bypass damper for the temperature probe to fully adjust to the new temperature. If the probe indicator is below the operate catalyst range, add fuel or open the bypass damper to allow the fire to further build before engaging the catalyst again.

If the probe indicator is above the operate catalyst range, the catalytic combustor is running too hot and may be damaged. In many cases, decreasing the primary air can reduce the catalyst temperature and adding less wood with each loading can also help if overheating is persistent. Do not add wood to the stove if the probe reads above the operate catalyst range.

Avoid using a full load of very dry wood in the firebox, such as dry slab wood or wood with below 14% moisture content. This may result in continuous very high temperatures in the secondary combustion area and damage the combustor.

Never kindle a fire with colored paper or paper that has colored ink or a glossy surface. Never burn treated wood, garbage, solvents or trash. All of these may poison the catalyst and prevent it from operating properly. Never burn cardboard or loose paper except for kindling purposes. Never burn coal; doing so can produce soot or large flakes of char or fly ash that can coat the combustor and cause smoke to spill into the room. Coal smoke can also poison the catalyst so that it won’t operate properly.

NOTE: The ceramic catalytic combustor is fragile and will crack if subjected to thermal shock. Thermal shock can occur when refueling with wet wood or closing the bypass damper too early after refueling. Hairline cracks will not affect the performance of the combustor, but repeated thermal shocks can result in cells falling out, somewhat reducing the effectiveness of the combustor.

Two Ways to Add Fuel

The griddle lifts for convenient top-loading of logs, and is the easiest way to add fuel. (Figure 35)

However, the front doors open as well for adding an occasional log to a fire. If the stove is equipped with 8" (203 mm) stove pipe, the front doors may be opened (or even removed) and the optional spark screen placed in the opening for open-fire viewing. This appliance is not approved for operation with the front doors open if equipped with a 6" (152 mm) chimney connector or chimney.

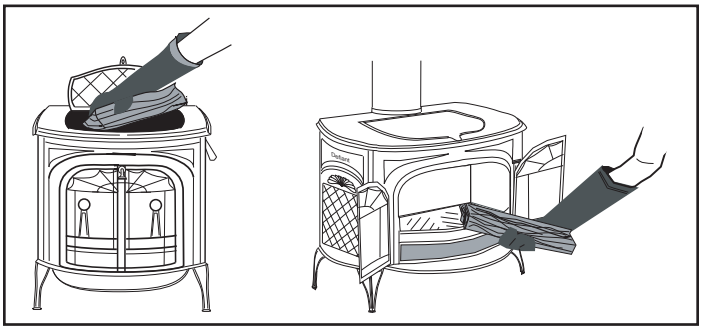


Figure 35 - Top loading is the best way to add fuel during regular use. Front loading is useful for kindling a fire.

To open the front doors, insert the handle into the door latch stub and turn it to the left and up. (Figure 36)

To close them, always close the left door first. Turn the handle in the right door to the left and up (to the open position) and close it. Finally, push on the door as you turn the handle to the right and down. The doors will draw in slightly, and the handle should offer some resistance as you turn it to the closed position.

To reduce the risk of breaking the glass, avoid striking the glass or slamming the doors.

When you are not using the door handle, store it in the holder behind the right front leg of the stove.

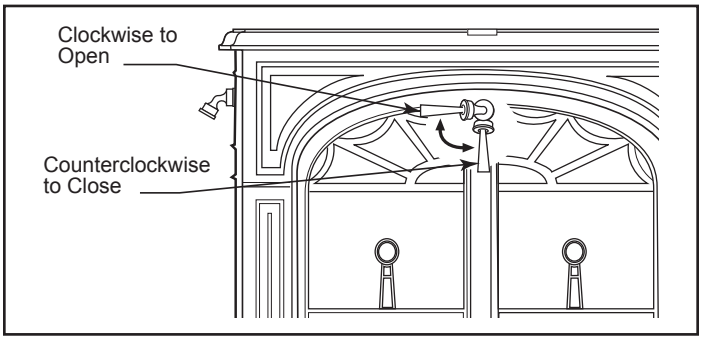


Figure 36 - To open the front doors, turn the handle clockwise.

⚠ WARNING

Fireplace stoves equipped with doors should be operated only with doors fully open or doors fully closed. If doors are left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke.

⚠ WARNING

For safety and greatest efficiency, operate your stove only with all doors/griddles fully closed. The test standard for your stove when it is operated in this mode is UL 1482.

This appliance may be used as a fireplace with the front doors open or removed, BUT only when it is equipped with 8" (203 mm) stove pipe and only when the optional spark screen is secured correctly in the opening to protect against the possibility of sparks and embers leaving the stove. The test standard for your stove when it is operated in this mode is UL 737. 1" floor protection is also required. Refer to the *"Floor Protection"* section in this manual.

Use only the spark screen, Item #0127, with your appliance.

SPARK SCREENS ARE AVAILABLE FROM YOUR VERMONT CASTINGS DEALER.

Refuel While the Embers Are Still Hot

When reloading, best results will be achieved if you first de-ash the stove by stirring the fuel bed to allow ash to fall through the grate into the ash pan.

Do not break the charcoal into very small pieces or pound or compress the charcoal bed. Check to make sure air holes at the bottom of the fireback are not blocked by ash or embers (blockage will reduce performance of the stove).

It is important that air can circulate through the charcoal bed during the burn. Larger pieces of charcoal allow more air to circulate under the wood, resulting in the fire reviving more quickly. (Figure 37)

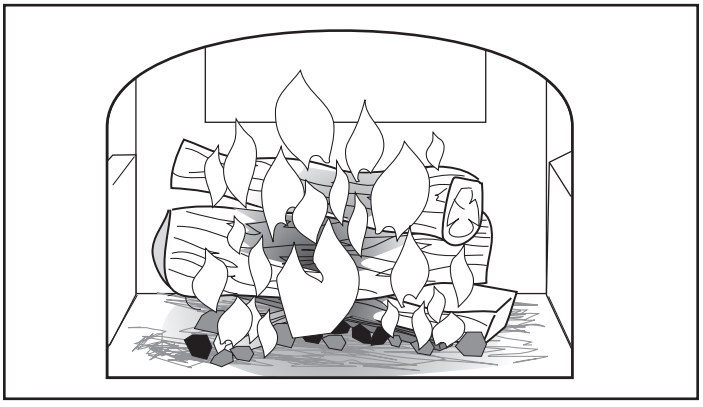


Figure 37 - Add full size logs after the ember bed is 3" (75mm) deep.

For best results when refueling, wear long-cuffed stove gloves to protect your hands and forearms. Add fuel while the stove still has plenty of glowing embers to re-kindle the fire and include some smaller pieces of wood in the new fuel load to help the stove regain its operating temperature quickly. Use this sequence as a guide to successful refueling:

1. Open the damper and turn the primary air control to high.
2. De-ash the stove as described above. Open the ash door and check the level of ash in the ash pan. Empty the pan if necessary and replace it in the stove. Close the ash door.
3. Open the griddle top, load the wood (smaller pieces first), and close the griddle top.
4. Wait several minutes for the new wood to fully ignite and for the stove top surface temperature to reach 450°F (230°C).
5. Close the damper. And adjust the air control for the amount of heat your desire.

NOTE: If the remaining charcoal bed is relatively thick (2-3" / 51-75 mm) and if your fuel is well seasoned, it is possible to add fresh fuel (smaller pieces first), close the door and damper, and reset the primary air control for the desired heat output within five minutes.

⚠ WARNING

DO NOT OPERATE THE STOVE WITH THE ASH DOOR OPEN. OPERATION WITH THE ASH DOOR OPEN CAN CAUSE AN OVER-FIRING CONDITION TO OCCUR. OVER-FIRING THE STOVE IS DANGEROUS AND CAN RESULT IN PROPERTY DAMAGE, INJURY OR LOSS OF LIFE.

Andirons Help Protect the Glass

Your stove has andirons to keep logs away from the glass panels. The andirons are essential to maintain clear fire viewing, and should be left permanently in place. Since the andirons may slightly hinder refueling through the front doors, most stove owners will prefer the convenience of top loading through the griddle. Do not place fuel between the andirons and the doors.

Burn Only High-Quality Wood

This appliance is designed to burn natural wood only; do not burn fuels other than that for which it was designed.

IMPORTANT: Do not burn any type of artificial or synthetic materials such as fire starter logs (containing wax) in this appliance. Never burn liquid-based fuels such as kerosene, gasoline or alcohol.

Burning any materials not allowed in these instructions, or over-firing the stove, may void the warranty.

You'll enjoy the best results when burning wood that has been adequately air-dried. The wood should be 18" - 20" (457-508 mm) in length. Avoid burning "green" wood that has not been properly seasoned. Do not burn construction materials; they often contain chemicals and metals that can damage the inside surfaces of the stove and pollute the air. Do not burn ocean driftwood; when it burns, the salt it contains will attack the cast iron.

The best hardwood fuels include oak, maple, beech, ash, and hickory that has been split, stacked, and air-dried outside under cover for at least one year.

If hardwood is not available, you can burn softwoods that include tamarack, yellow pine, white pine, Eastern red cedar, fir, and redwood. These should also be properly dried.

Store split wood under cover to keep it dry. Even for short-term storage, be sure to keep wood a safe distance from the heater and keep it out of the areas around the heater used for refueling and ash removal.

Surface Thermometer is a Valuable Guide to Operation
An optional surface thermometer tells you when to adjust the air control, and when to refuel. (Figure 38)

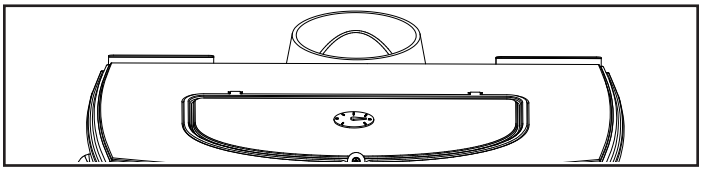


Figure 38 - Take temperature readings with a thermometer located in the middle of the griddle.

For example, when the thermometer registers at least 450°F (230°C) on the stove top after start-up you know the stove is hot enough and it may be time to close the damper if a sufficient ember bed has also been established. Note that the stove will warm up much sooner than the chimney, though; a warm chimney is the key to easy, effective stove operation. Please review the *"Draft Management"* section of this manual to see how the size, type, and location of your chimney will affect your stove operation. When thermometer readings drop below 350°F. (175°C) it's time to adjust the air control for a higher burn rate or to reload the stove. A temperature reading over 650°F. (340°C) is a sign to reduce the air supply to slow the burn rate.

Use the following temperature ranges as a guide:

- Readings in the 350°-500°F. (175°-260°C) range indicate low to medium heat output.
- 500°-600°F. (260°-315°C) readings indicate medium heat output.
- Readings of 600°-650°F. (315-340°C) indicate high heat output. Operating your appliance continuously at griddle temperatures higher than 650° F (340°C) may damage the cast iron or enamel finish.

Use the Air Control Settings that Work Best for You
No single air control setting will fit every situation. Each installation will differ depending on the quality of the fuel, the amount of heat desired, and how long you wish the fire to burn; outdoor air temperature and pressure also affect draft.

The control setting also depends on your particular installation's "draft," or the force that moves air from the stove up through the chimney. Draft is affected by such things as the length, type, and location of the chimney, local geography, nearby obstructions, and other factors. See the *"Draft Management"* section of this manual for details on how the installation affects performance.

Too much draft may cause excessive temperatures in the appliance, and could even damage the stove. On the other hand, too little draft can cause backpuffing into the room and/or the "plugging" of the chimney.

How do you know if your draft is excessively high or low? Symptoms of too much draft include an uncontrollable burn or a glowing-red stove part. Signs of weak draft are smoke leaking into the room through the stove or chimney connector joints or low heat output.

In some newer homes that are well-insulated and weather-tight, poor draft may result from an insufficient air supply in the house. In such instances, an open window near the stove on the windward side of the house can provide the combustion air supply needed.

Another option for getting more combustion air to the stove is to duct air directly from outside to the stove. In some areas provisions for outside combustion air are required in all new construction.

This appliance is equipped to deliver outside air for combustion. Adapter #3108 is required for installation and any 3" non combustible duct will need to supplied by the installer..

When first using the stove, keep track of the air control settings. You will quickly find that a specific setting will give you a fixed amount of heat. It may take a week or two to determine the amount of heat and the length of burn you should expect from various settings.

Most installations do not require a large amount of combustion air, especially if adequate draft is available. Do not for any reason attempt to increase the firing of your heater by altering the air control adjustment range outlined in these directions.

Use the following air control settings as a starting point to help determine the best settings for your installation. Each is described as a fraction of the total distance the lever may be moved from right to left.

Control Settings

(Refer to the first page of the Operation section.)

DO NOT OPERATE THE STOVE WITH THE ASH DOOR OPEN. OPERATION WITH THE ASH DOOR OPEN CAN CAUSE AN OVER-FIRING CONDITION TO OCCUR. OVER-FIRING THE STOVE IS DANGEROUS AND CAN RESULT IN PROPERTY DAMAGE, INJURY OR LOSS OF LIFE.

Ash Disposal

Routine ash removal is important for ease of maintenance, and is important for the stove's durability. Remove ash before it reaches the top of the ash pan. Check the level at least once a day. Every few days, clear any ash from the outer edges of the firebox. Most of the ash will fall through the grate. Stir the ash with a shovel or poker so that it falls through the grate slots.

IMPORTANT: Check the level of ash in the ash pan before reloading the stove. If the ash level is close to the top edge of the pan, empty the pan according to this procedure:

- Open the damper.
- Open the griddle or front doors, and use a shovel or poker to stir excess ash through the ash slots in the grate down into the ash pan.
- Close the griddle or doors, and unlatch the ash door. (Figure 39) It will pivot, swinging the ash pan out of the stove.

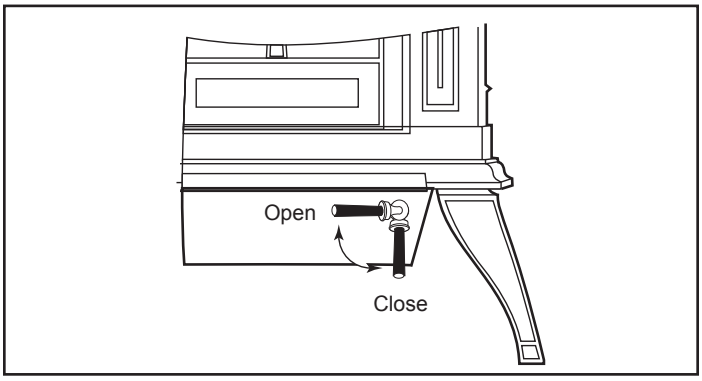


Figure 39- Turn the ashdoor handle clockwise to open and counterclockwise to close.

- Slide the cover onto the pan, making sure it is securely closed. (Figure 40)

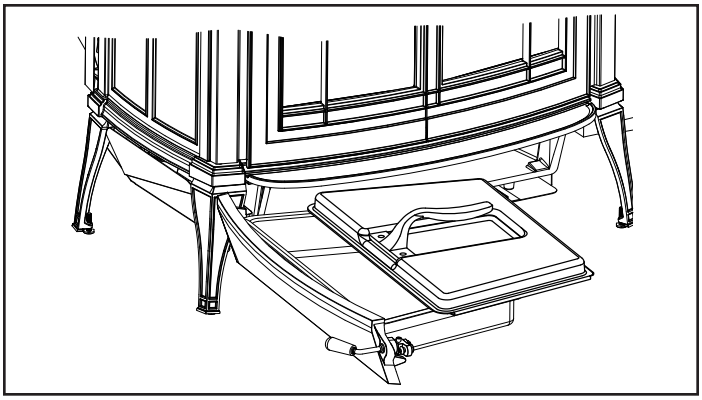


Figure 40 - Be sure the cover is securely attached before removing the ash pan.

- Remove the ash pan, making sure to keep it level.
- To keep the cover from sliding off and to keep ash from falling on the floor, do not tilt the ash pan forward.
- If the stove is in operation, close the ash door while disposing of the ash. You may need to lift the latch end of the door slightly to align the latch with the mating part on the stove bottom.
- Properly dispose of the ash in a metal container with a tight-fitting lid. Store the container outdoors away from all combustible material.
- Return the ash pan to its original position in the stove, and close and latch the ash door. (Figure 41)
- **Do not operate the stove with the ash door open. This will result in over-firing, and could cause damage to the stove, void the warranty, or even lead to a house fire.**

Empty the ash pan regularly, typically every one to three days. The frequency will vary depending on how you operate your appliance: ash will accumulate faster at higher heat outputs.

Removed ash should be placed outdoors in a metal container with a tight-fitting lid. Keep the closed container of ash on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ash is disposed of by burial in soil or otherwise locally dispersed, it should be kept in the closed container until all cinders have thoroughly cooled.

⚠ CAUTION

Never use your household or shop vacuum cleaner to remove ash from the stove; always remove and dispose of the ash properly.

Draft Management

A stove is part of a system, which includes the chimney, the operator, the fuel, and the home. The other parts of the system will affect how well the stove works. When there is a good match between all the parts, the system works well.

Wood stove or insert operation depends on natural (unforced) draft. Natural draft occurs when the exhaust is hotter (and therefore lighter) than the outdoor air at the top of the chimney. The bigger the temperature difference, the stronger the draft. As the hot gases rise through the chimney they provide suction or 'draw' that pulls air into the stove for combustion. A slow, lazy fire with the stove's air inlets fully open indicates a weak draft. A brisk fire, supported only by air entering the stove through the normal inlets, indicates a good draft. The stove's air inlets are passive; they regulate how much air can enter the stove, but they don't move air into it.

Depending on the features of your installation - steel or masonry chimney, inside or outside the house, matched to the stove's outlet or oversized - your system may warm up quickly, or it may take a while to warm up and operate well. With an 'airtight' stove, one which restricts the amount of air getting into the firebox, the chimney must keep the stove's exhaust warm all the way to the outdoors in order for the stove to work well. Some chimneys do this better than others. Here's a list of features and their effects.

Masonry Chimney
Masonry is a traditional material for chimneys, but it can perform poorly when it serves an 'airtight' stove. Masonry is a very effective 'heat sink' - it absorbs a lot of heat. It can cool the chimney gases enough to diminish draft. The bigger the chimney, the longer it takes to warm up. It's often very difficult to warm up an outdoor masonry chimney, especially an oversized one, and keep it warm enough to maintain an adequate draft.

Steel Chimney
Most factory-made steel chimneys have a layer of insulation around the inner flue. This insulation keeps the chimney warm. The insulation is less dense than masonry, so a steel chimney warms up more quickly than a masonry chimney. Steel doesn't have the good looks of masonry, but it performs much better.

Indoor/Outdoor Location
Because the chimney must keep the smoke warm, it's best to locate it inside the house. This uses the house as insulation for the flue and allows some heat release into the home. An indoor chimney won't lose its heat to the outdoors, so it takes less heat from the stove to heat it up and keep it warm.

Chimney Height
The common wisdom tells us that a taller flue draws better than a short one. This isn't necessarily so. If a chimney is tall enough to meet the safety requirements of the 2/3/10 foot rule, then adding more height isn't the right answer to a draft problem. In fact it could make the problem worse by adding more mass to the chimney system, which must be warmed up, a distance from the heat source (the stove). Don't make a chimney taller unless you must in order to meet the safety rules, or unless there's some nearby feature causing a downdraft. Even then, there are downdraft-preventing chimney caps available, which are probably the smarter choice.

Flue Sizing
The inside size of a chimney for an 'airtight' stove should match the size of the stove's flue outlet. When a chimney serves an airtight stove, more is not better; in fact, it can be a disadvantage. Hot gases lose heat faster as they travel slower through a chimney; if we vent a stove with a six-inch flue collar (28 square inch area) into a 10 x 10" flue, the gases slow to one third their original speed. This allows the gases to cool more rapids, which weakens draft strength. If an oversized flue is also outside the house, the heat it absorbs gets transferred to the outdoor air and the flue usually stays cool.

It is common for a masonry flue, especially one serving a fireplace, to be oversized for the stove. It can take quite a while to warm up such a flue, and the results can be disappointing. The best solution to an oversized flue is an insulated steel chimney liner, the same diameter as the stove or inserts flue outlet; the liner keeps the exhaust warm, and the result is a stronger draft. An non-insulated liner is a second choice - the liner keeps the exhaust restricted to its original size, but the hot gases still must warm up the air around the liner. This makes the warm-up process take longer.

Pipe & Chimney Layout
Every turn the exhaust must take as it travels to the chimney top will slow it down. The ideal pipe and chimney layout is to vent vertically into a completely straight and vertical chimney. If you are starting from scratch, use this layout if possible. If the stovepipe must elbow to enter a chimney, locate the thimble about midway between the stove top and the ceiling. This achieves several goals: it allows the gases to speed up before they must turn, it leaves some pipe in the room for heat transfer, and it gives you long-term flexibility for installing a different stove without relocating the thimble.

There should be no more than eight feet of single-wall stove pipe between the stove and a chimney; longer runs can cool the exhaust enough to cause draft and creosote problems. With prefabricated chimney, bring it down to six to eight feet from the stove. With a masonry chimney, arrange the pipe so that it turns into the chimney within eight feet of the stove.

Single Venting
Each 'airtight' stove requires its own flue. If an airtight stove is vented to a flue that also serves an open fireplace, or a leakier stove, it's easier for the chimney draft to pull air in through those channels and performance of the stove suffers. Imagine a vacuum cleaner with a hole in the hose to understand the effect here. In some cases the other appliance can even cause a negative draft through the stove, and result in a dangerous draft reversal.

Creosote
Creosote is a by-product of slow wood-burning. It's an organic tar that can condense in the flue if it is present in the exhaust, slow-moving, and cools to less than 290°F (130°C). Condensed creosote is volatile, and can generate chimney fires if it gets hot enough. All the features that affect chimney draft also affect creosote condensation - so use whatever combination of installation features and operational steps that will encourage good draft and minimize creosote production.

Because letting the exhaust cool off and slow down is one of the keys to creosote accumulation, it makes sense to line a chimney to match the stove's outlet size, for safety reasons as well as performance. Canadian law requires a matching liner to serve any stove or insert vented through a fireplace chimney; in the US, the National Fire Protection Association (NFPA) recommends a chimney liner if the flue is more than three times bigger (in square area) than the outlet on the stove or insert. Some localities enforce the NFPA guidelines as part of their building codes.

Fuel
Even the best stove installation will not perform well with poor fuel. The best fuel is hardwood that has air-dried 12-18 months. Softwood burns, but not as long as hardwood. 'Green' wood contains a lot of moisture; it will burn, but some of the heat potential is used to boil the extra moisture from the wood. This reduces the amount of heat that reaches your home and can contribute to a creosote problem. There are moisture meters available for firewood; you can also judge your wood by its appearance and weight. If you get it green, lift a piece and get a sense of its weight; it can lose a third or more of its weight as it dries. Also look at the ends of a log; as it dries it shrinks and often cracks. The more weathered and cracked a piece is, the drier it is.

Dry wood burns readily with a good chimney draft. But with modern stoves, wood can be too dry and too volatile. Smoke and combustible gases can 'gas out' from the wood quickly and densely enough to overload the combustion system. If you hear a rumbling or roaring noise (like a propane torch) from the stove, that is a sign that the stove is over-firing.

Back-puffing
Back-puffing results when the fire produces volatile gases faster than the chimney draft pulls them out of the firebox. The gases back up in the firebox until they are concentrated enough and hot enough to ignite. If your stove back-puffs, the stove needs to cool down. You should open the damper to let the smoke rise to the flue more quickly, allow more air into the firebox, avoid big loads of firewood and check that the wood moisture is not too low.

Draft Testing
An easy way to test your chimney draft is to close the stove's damper, wait a few minutes to let the airflow stabilize, then see whether you can vary the strength of the fire by swinging the air control open and closed. Results are not always instant; you may need to wait a few minutes for a change in the air control setting to have an effect on the fire. If there's no change, then the draft isn't strong enough yet to let you close the damper, and you'll need to open it for awhile longer and manage the fire with the air inlet until the draft strengthens. If you keep track of your burning habits and relate them to their effects on the stove's operation, you'll be rewarded with good performance and a safe system.

Negative Pressure
Good draft also depends on a supply of air to the stove; a chimney can't pull in more air than is available to it. Sluggish draft results when a house is tight enough to prevent the ready flow of air to the stove, or by competition between the stove and other equipment that sends indoor air outside - especially power-driven equipment like range hoods, clothes dryers, etc. If the chimney draws well with all other equipment turned off (or sealed, in the case of fireplaces and/or other stoves), then you simply need to be careful with timing the use of the other air consuming equipment. If you need to crack a nearby window or door to enable the chimney to flow well, it may be a good idea to install an outside-air intake to bring combustion air directly to the stove. An outside air kit is available to connect the stove directly to a source of outdoor combustion air.

Conclusion
Wood-burning is an art rather than a science. Once the stove and chimney system are in place, you can only vary your technique, mostly your timing, to achieve good results. If you keep track of your burning habits and relate them to their effects on the stove's operation, you'll be rewarded with good performance and year of reliable heating.

Maintenance

Keep Your Stove Looking New and Working Its Best
Let the fire in the stove go out and allow the stove to cool completely before beginning any maintenance procedure.

Care of the Cast Iron Surface
An occasional dusting with a dry rag will keep the painted cast iron of your appliance looking new.

The stove's paint can be touched up as needed. First, mask the areas, such as enameled parts, glass, or handles, around the spot to be painted. Clean the spot with a wire brush. Remove the griddle and set it aside. It is normal for the griddle to darken after use. You can clean it with a fine-bristle wire brush, or steel wool.

Then, touch up the stove with Vermont Castings' high temperature stove paint. Apply the paint sparingly; two light coats of paint are better than a single heavy one.

Care of the Porcelain Enamel Surface
Use a dry or slightly damp rag or soft brush to remove spills or stains. For difficult jobs that require a cleaning agent, use only a kitchen appliance cleaner or polish recommended for use on enamel surfaces.

If porcelain enamel becomes chipped or scratched during use, apply "enamel epoxy" to the damaged area and allow to dry. Once the epoxy has dried, sand the area to blend with surrounding area and apply appropriate color touch-up paint. Allow to dry completely before operating stove.

Cleaning the Glass
Most of the carbon deposits on the glass will burn off during hot fires.

However, the ash residue that accumulates on the glass surface should be removed regularly to prevent etching. To clean the glass, follow this procedure:

- Be sure the glass is completely cool.
- Clean the glass with water or a cleaner made especially for this purpose. Do not use abrasive cleaners. Use cleaning agents sparingly and be sure to keep them off the outer surfaces of the stove.
- Rinse the glass thoroughly.
- Dry the glass completely.

Adjusting Theromstat Control
The thermostat control should be adjusted properly from the factory, if a minor adjustment needs to take place, you will need a flat head screwdriver and a pair of pliers. Locate the primary cover on the lower back portion of the stove (Figure 42). With pliers, bend the tabs to the straight position and use the flat head screw driver to pry the bracket out far enough to remove the cover. Once the cover is off, loosen the thumb screw with the primary handle in the closed position. Adjust the steel cable by either pulling slack out of the cable or allowing more in. Tighten the thumb screw and test the primary control by turning the handle to the open position and checking the position of the flap. There should not be any delay between the handle and the flap. Always ensure the flap will close completely.

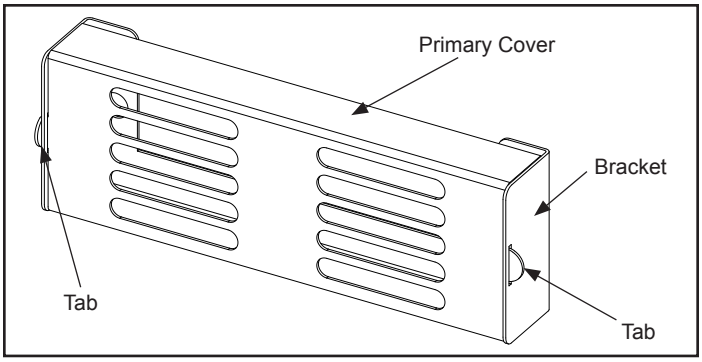


Figure 42 - Primary cover and Bracket.

Replace Broken Glass Immediately
Do not operate your stove if the glass in the doors is damaged.

If you need to replace the glass, use only the high temperature 5 mm ceramic glass supplied by Vermont Castings. Do not use substitutes.

Removing the Glass
1. Remove the right and left door assemblies by raising the door until the lower hinge pin clears its hole; then, angle the door bottom slightly outward and pull down to release the upper hinge pin. Place the doors face down on a padded work surface. Be especially careful with enameled doors.
2. Remove the screws that hold the glass retainer clips in place, and remove the clips.
3. Carefully lift the broken glass panel from the door.

Installing the Glass
Check the gasket around the window; it should be soft and resilient so that the glass will seal properly against the door. Replace the gasket if it has hardened or if it is compressed.

1. Center the glass on the gasket.
2. Secure the glass on both doors with the retainer clips. Tighten all screws. (Figure 43)
3. Replace the doors on the stove.
4. Open and close the doors to check that they fit and work properly. Adjust as necessary.

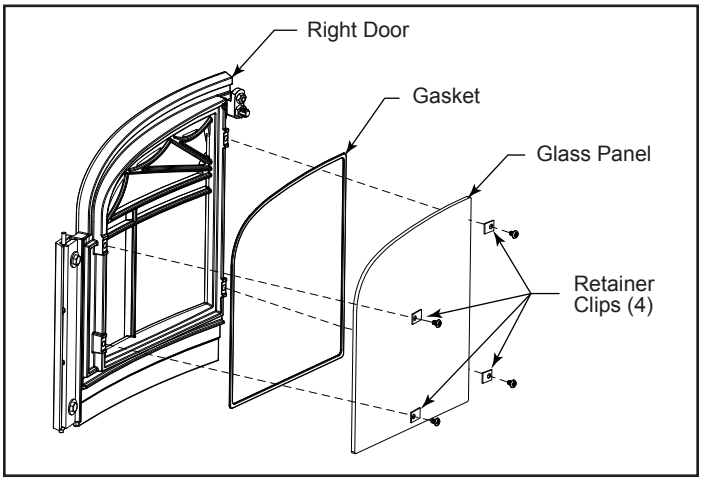


Figure 43 - Exploded view of the glass assembly for the right door.

Adjust the Damper as Needed
The tension on this appliance's damper is adjustable to compensate for compression of the gasket that seals the damper to the upper fireback. To adjust the damper:

1. Remove the griddle. Loosen the lock nut at the center of the damper. (Figure 44)
2. Turn the pressure screw approximately one half turn clockwise with an Allen wrench provided with your stove.
3. Tighten the lock nut. Prevent the pressure screw from turning as you tighten the nut. Re-test the damper.

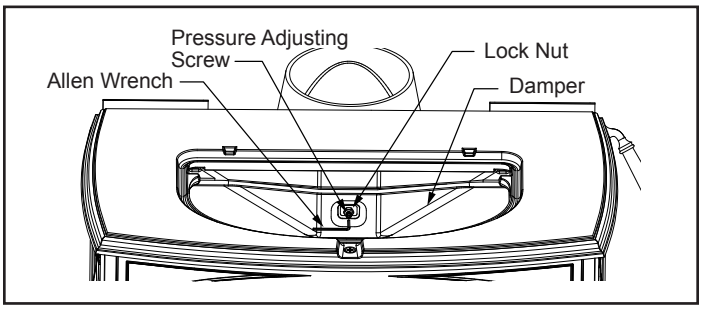


Figure 44 - Adjust the damper with the Allen wrench.

Tighten the Damper Handle as Needed
A handle on the left side of the stove controls the damper. The handle attaches to the damper rod with a set screw. Periodically check the set screw and tighten as necessary.

How to Adjust the Door Latches
The front door of the stove should close securely to prevent accidental opening and should close tightly to prevent air from leaking into the fire chamber. The door handle will be positioned vertically when the door is closed.

Over a period of time, the gasket around the door will compress and the latch may need adjustment. To adjust the handle, follow this procedure:

1. Remove and retain the lock nut with a 9/16" wrench. (Figure 45)
2. Loosen the set screw with a 1/8" Allen wrench.
3. Rotate the pawl 180°. Replace the lock nut. Tighten the set screw.
4. Additional adjustment can be made by removing the flat washer. Or any combination of washer removal and/or pawl rotation.

Test the door seal. Close the door on a dollar bill and attempt to pull it free. If the bill is freed with little resistance, the gasket isn't snug enough at that spot. Continue to make small adjustments until the setting is right.

If additional adjusting of the latch does not enable the door to seal sufficiently in one area, try adjusting the gasket in that area. Pack more cement or a smaller diameter gasket into the channel beneath the gasket so the main gasket is raised and makes contact with the door frame. If this procedure doesn't solve the problem, replace the gasket. Instructions for gasket replacement are given later in this section.

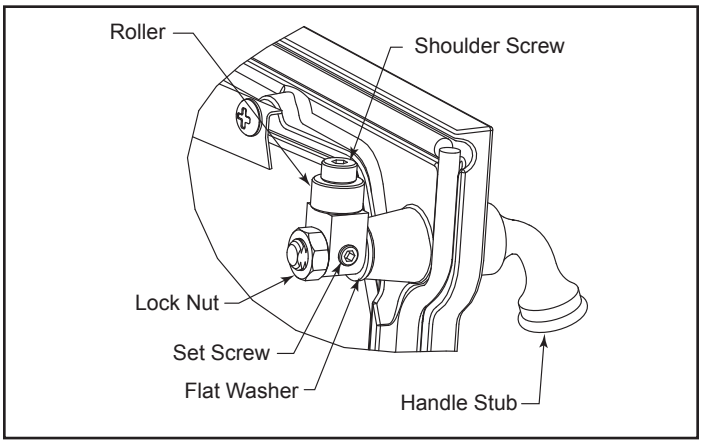


Figure 45 - Rotate pawl and/or remove flat washer to adjust latch.

Replace the Stove Gaskets as Needed
Your appliance uses fiberglass rope gaskets to make a tight seal between some parts. With use, particularly on moving parts, gaskets can become brittle and compressed and can begin to lose their effectiveness. These will need periodic replacement.

The sizes of replaceable gasket are listed below, along with their applications.

Gasket Diameter.....And the Parts it Seals

5/16" The griddle to the stove top (wire reinforced gasket)

5/16" The damper to the upper fireback

3/8" The front doors to the stove front; and the doors to each other.

3/8" The ash door to the front of the bottom panel

3/16" The outer glass panes to the door

If you need to change a gasket, first obtain an appropriate replacement from your Vermont Castings' Authorized Dealer.

Wait until the fire is out and the stove has cooled. Be sure to follow the standard safety procedure for working with dusty materials: wear safety goggles and a dust mask.

The procedure for replacing gaskets is the same, regardless of the gasket location. Follow these steps:

1. Remove the existing gasket by grasping an end and pulling firmly. (Figure 46)

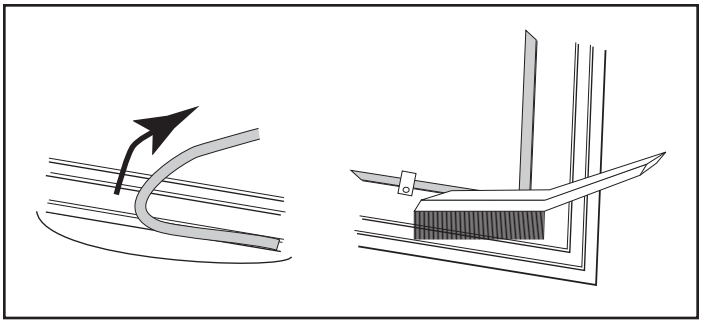


Figure 46 - Remove gasket then clean channel with wire brush.

2. Use a wire brush or the tip of a screwdriver to clean the channel of any remaining cement or bits of gasket. Remove stubborn deposits of cement with a cold chisel if necessary. (Figure 46)
3. Determine the correct length of the appropriate-sized gasket by laying it out in the channel. Allow an extra 1-2" (25-50 mm), and mark the spot to be cut.
4. Remove the gasket from the channel, place it on a wood cutting surface, and cut it at the marked spot with a utility knife.

Twist the ends slightly to keep the gasket from unraveling.

5. Lay an unbroken 1/8" (3 mm) bead of silicone or cement in the newly-cleaned channel. (Figure 47)

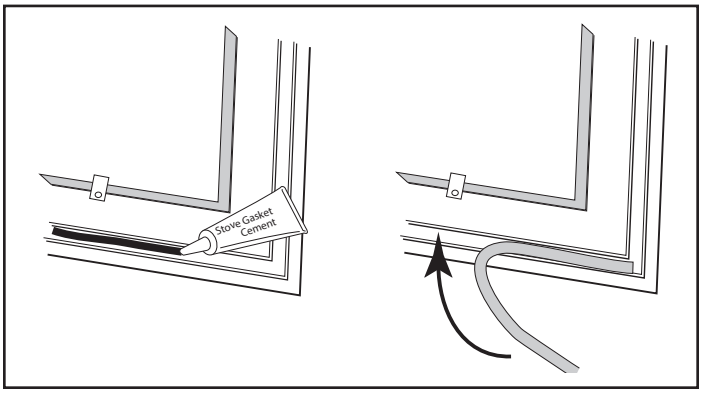


Figure 47 - Lay a bead of gasket silicone or cement then press gasket in place.

6. Starting at one end, press the gasket into the channel. (Figure 47) Ensure a good joint where the gasket meets before trimming any excess. Do not overlap the gasket ends or leave ends with ragged edges.
7. Press the gasketed part firmly against its normal mating surface to seat the gasket evenly in its channel. Close and latch the door to do this, or tap other parts with the rubber mallet (or hammer/block of wood).
8. Clean any excess cement from around the channel, then let the cement that holds the new gasket dry thoroughly.
9. The stove's doors may need adjustment after you have regasketed them. Initially, it may require loosening the latch to accommodate the new gasket; after a few weeks, it may need tightening to compensate for compression of the new gasket. The directions for adjusting the latches are on Page 30.

All Gasketed Construction Gaskets

Other gaskets form seals between all other non-moving parts, but these are not subject to the same wear and deterioration as gaskets on moving parts. It is unlikely that you will ever need to replace these gaskets unless the involved parts are disassembled and then put back together. If this is the case, the job should be done only by a qualified service technician.

5/16" diameter gasket seals the following parts:

- The lower fireback to the back panel
- The left and right air plates (inner sides)
- All connections between the stove plates.

The Chimney System

Creosote

Your appliance is designed to reduce creosote build-up significantly. However, regular chimney inspection and maintenance must still be performed. For safety, good stove performance, and to protect your chimney and chimney connector, inspect your chimney and chimney connector on a regular schedule. Clean the system if necessary. Failure to keep the chimney and connector system clean can result in a serious chimney fire.

When wood is burned slowly, it produces tar, organic vapors and moisture that combine to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire within the flue system that can damage the chimney and overheat adjacent combustible material. If a significant layer of creosote has accumulated —1/8" (3 mm) or more — it should be removed to reduce the risk of a chimney fire.

You can never be too safe. Contact your local fire authority for information on what to do in the event of a chimney fire, and have a clearly understood plan on how to handle one.

If you do experience a chimney fire, act promptly to:

- Close the damper and air control lever.
- Get everyone out of the house.
- Call the Fire Department.

Inspect the system every two weeks during the heating season as part of a regular maintenance schedule. To inspect the chimney, let the stove cool completely. Then, using a mirror and a strong light, sight up through the flue collar into the chimney flue. If you cannot inspect the flue system in this fashion, the stove must be disconnected to provide better viewing access.

Clean the chimney using a brush the same size and shape as the flue liner. Flexible fiberglass rods are used to run the brush up and down the liner, causing any deposits to fall to the bottom of the chimney where they can be removed through the clean-out door.

Clean the chimney connector by disconnecting the sections, taking them outside, and removing any deposits with a stiff wire brush. Reinstall the connector sections after cleaning, being sure to secure the joints between individual sections with sheet metal screws.

If you cannot inspect or clean the chimney yourself, contact your local Vermont Castings dealer or a professional chimney sweep.

Maintenance Schedule - The Stove

Daily:

- Clear any ash build-up from around the air holes and combustion flow path in the lower fireback.
- Ashes should be removed before they reach the top of the ash pan. Check accumulation at least once a day.
- Keep the area around the stove clear of any combustible materials such as wood, furniture or clothing.

Two Months:

- Check door handle to be sure it is working properly. Gasketing becomes compressed after a period of time. Adjust handle tightness if necessary.
- Check leg bolts and heat shield screws; tighten if necessary.

Annual Spring Cleaning:

- Check gasketing for wear, and replace if necessary.
- Remove ashes from the ash pan and replace with a moisture absorbing material (such as kitty litter) to keep the interior of the stove dry.
- Clean the dust from the inner sides of bottom, rear or pipe heat shields if your stove is equipped with them. Clean surfaces are better heat reflectors than dirty surfaces.
- Touch up the black paint.
- Inspect for and remove ash build-up behind the combustion package. This should be done in conjunction with annual cleaning of the chimney connector. Inspect the passage behind the combustion package (a mirror will be helpful) and vacuum away ash using a flexible vacuum hose inserted in the passage. (Figure 48)

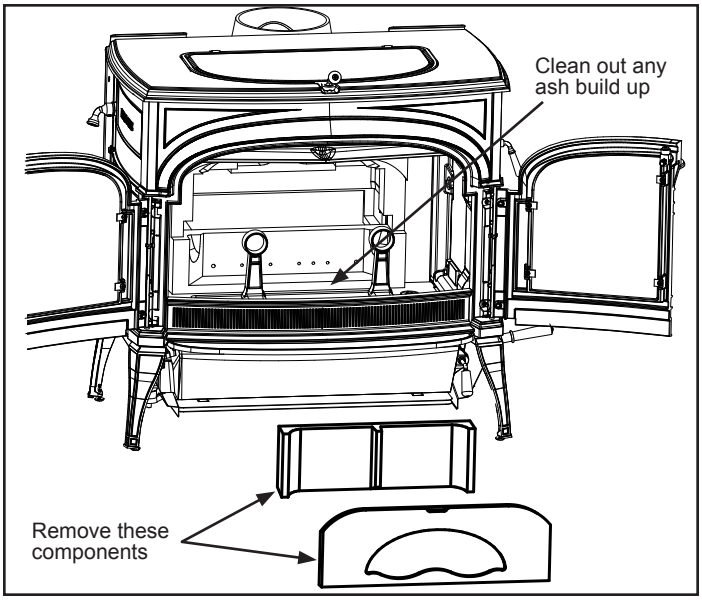


Figure 48 - Inspect and clean out ash accumulation behind the combustion system.

The Chimney Connector

Two Weeks

- Inspect the chimney connector and chimney. Clean if necessary.

Two Months:

- Inspect the chimney and chimney connector. Pay particular attention to the horizontal runs of chimney connector, and the elbows. Clean the system if necessary.

Annual Spring Cleaning:

- Disassemble the chimney connector and take it outdoors for inspection and cleaning. Replace weak sections of connector.
- Inspect the chimney for signs of deterioration. Repairs to a masonry chimney should be made by a professional mason. Replace damaged sections of prefabricated chimney. Your local Vermont Castings dealer or a chimney sweep can help determine when replacement is necessary.
- Thoroughly clean the chimney.

The Catalytic Element
This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. In the United States it is against the law to operate this wood heater in a manner inconsistent with the operating instructions in this manual.

Under normal operating conditions, the catalytic combustor should remain active for two to six years (depending on the amount of wood burned). However, it is important to monitor the combustor periodically to ensure that it is functioning properly, as well as to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency, and an increase in creosote and emissions.

Inspection and Cleaning
Inspect the combustor for fly ash accumulation and physical damage two to three times per year. Clean the combustor as needed.

The refractory package that houses the catalytic combustor should be inspected for a buildup of fly ash and cleaned if necessary. This may be done when you examine the combustor.

When to Suspect a Combustor Problem
The best way to evaluate the performance of your appliance's combustor is to observe the amount of smoke leaving the chimney — both when the combustor has "lighted-off" and when it has not. Follow these steps:

- With a fire going and the combustor properly activated, with the damper closed to route smoke through it as described in the Operation Section, go outside and observe the smoke leaving the chimney.
- Then, open the stove damper and once again check the smoke leaving the chimney.

You should see significantly more smoke when the stove damper is open and exhaust does not pass through the combustor. However, be careful not to confuse smoke with steam from wet wood. Steam dissipates in the air quickly; smoke does not.

If this test indicates a problem, consider other possible factors as well, such as the weather or a change in the quality of your fuel. In warm weather, draft is weaker than it is in colder winter weather, and fires can burn sluggishly. Small, hot fires are a good solution under these conditions.

Burning "green" (insufficiently seasoned) wood will result in poorer performance than burning properly seasoned fuel. Reloading with green wood can also thermal shock the catalyst, resulting in cracking, or the eventual fallout, of the ceramic honeycomb substrate. You may have to run your stove hotter (more air) to achieve acceptable performance using green or wet wood.

Also, consider any changes in your operating routine.

Once you have ruled out any other possible causes for a decline in performance, inspect and clean the combustor if necessary. Be sure to protect any surface you use for setting the stove parts aside.

Inspecting the Combustor
Remove access door and inner fireback. Remove the catalytic combustor by lifting and sliding it towards you. (Figure 49)

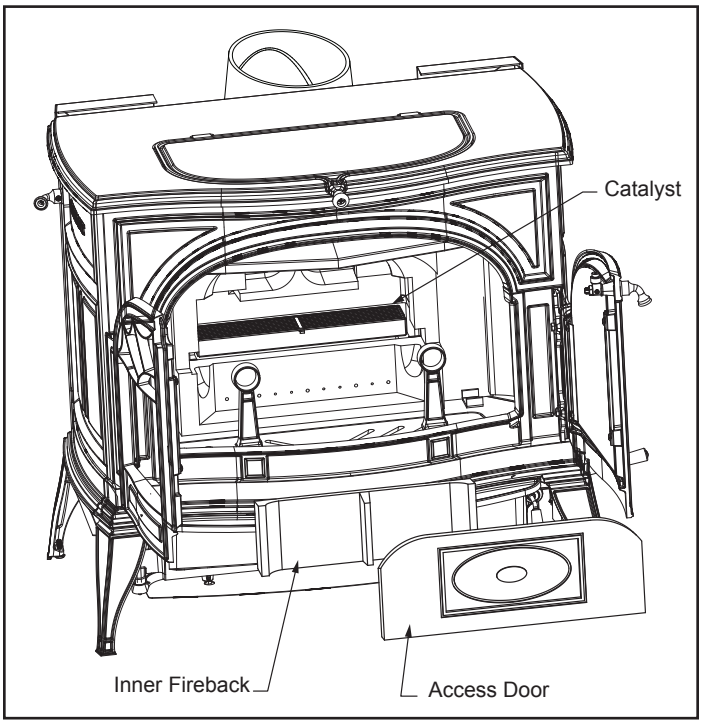


Figure 49 - Inspect the catalytic combustor.

To assure a long life for the combustor, it is recommended to service the combustor on a regular basis based on the amount of use. This procedure takes about five (5) minutes and requires no tools except for a vacuum if cleaning is necessary.

Cleaning the Combustor
1. Check the combustors honeycomb-like element for a buildup of fly ash. If any is evident, take the combustor outside and clean it by blowing air gently through it. Do not push anything through the honeycomb; do not use compressed air to clear the passages. Such abrasion can scrape the thin coating of platinum (the catalyst) off the ceramic base, shortening the catalyst's life and reducing its effectiveness.
2. Inspect the element for damage or degradation. Although small hairline cracks will not affect performance, the element should be essentially intact. If the element is broken in pieces or has sections missing, it should be replaced. Call your local Vermont Castings Authorized Dealer for a replacement element.
3. If the element is in good condition and clean, re-install it in the stove and replace the refractory inner fireback and access door.

Operate the stove in your usual manner for two weeks, inspecting the chimney and the chimney connector frequently during this period.

If creosote does not build up as fast, it is likely that the performance change was caused by fly ash deposits on the catalytic element. However, continue the inspections of the chimney system for a few weeks to ensure that proper performance continues.

If you continue to find a significant creosote buildup or if you continue to see excessive smoke from the chimney, the catalytic element will need to be replaced. Contact your nearest Vermont Castings' Authorized Dealer for information about a replacement element.

NOTE: Use only the replacement catalyst supplied by a Vermont Castings dealer.

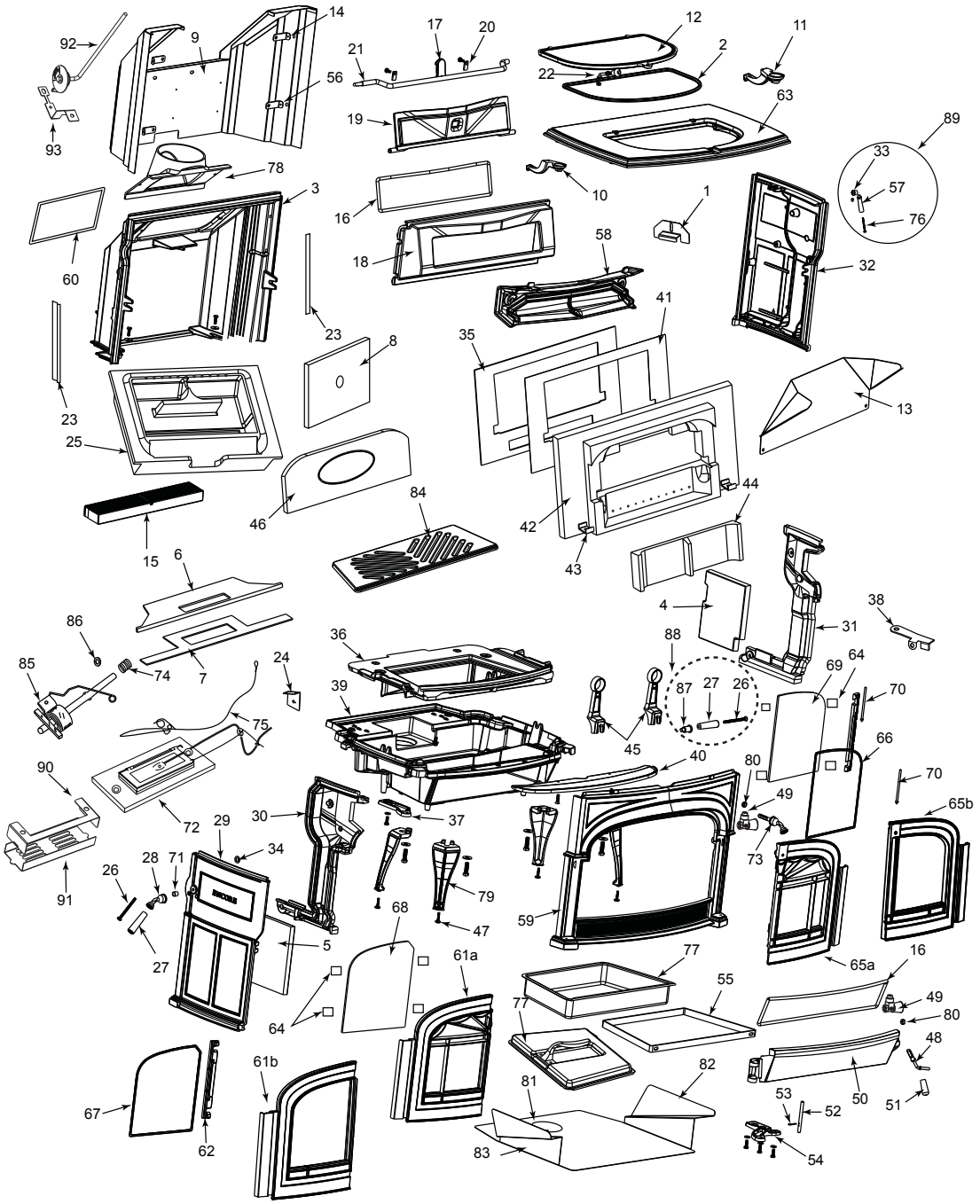
VERMONT CASTINGS

Service Parts

Encore Flexburn

Beginning Manufacturing Date: N/A
Ending Manufacturing Date: Active

0002040 (Classic Black)
0002041 (Biscuit)
0002042 (Majolica Brown)
0002044 (Bordeaux)
0002046 (Twilight)
0002040T (Classic Black w/TransitionDoors)
0002043 (Ebony) (End Manufacturing Date: 2013)
0002045 (Midnight Blue) (End Manufacturing Date: Dec 2014)
0002041T (Biscuit w/Transition Doors (End Manufacturing Date: March 2017)
0002042T (Majolica Brown w/Transition Doors)(End Manufacturing Date:March 2017)
0002044T (Bordeaux w/Transition Doors) (End Manufacturing Date: March 2017)
0002046T (Twilight w/Transition Doors) (End Manufacturing Date: March 2017)



Part number list on following page.

05/18

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
1	Brick Support Bracket		30005279	
2	Griddle Gasket, 10’		1-00-1203668	**Y**
3	Back		30005289A	
4	Refractory Right End		30005497	
5	Refractory Left End		30005498	
6	Refractory Support		30005233	
7	Gasket, Refractory Support		30005237	
8	Back Insulation Board		30005269	
9	Outer Back		30005261	
10	Left Griddle Quadrant		30002399	
11	Right Griddle Quadrant		30002401A	
12	Griddle		30002386A	
13	HS Flue Collar		30005266	
14	Bracket Upper Side		30005267	
15	Catalyst, Ceramic		30006623	
16	Damper Gasket, 15’		1-00-1203588	**Y**
17	Damper Ramp	Pre 0081347991	1301811A	**Y**
		Post 0081347991	2-00-1301811S	**Y**
18	Damper Housing		30005293A	
19	Damper		30006467	
20	Damper Tab	Pkg of 10	1601488-10	
21	Damper Rod		1600851	
22	Griddle Handle Assembly		30002775	**Y**
23	Gasket, Back Refractory, 10’		1-00-30005270	
24	Rheostat Bracket		30002863	
25	Refractory, Engine - E/D		30005202	
26	Damper Handle Screw (Qty 2 req)	Pkg of 10	1201310-10	
27	Damper Handle	Qty 2 req	1600664	**Y**
28	Damper Handle w/Screw		30002720A	**Y**
29	Left Side	Classic Black	30002388	
		Biscuit	30003052	
		Bordeaux	30006679	
		Ebony	30003072	
		Majolica Brown	30004876	
		Twilight	30007027	
30	Left Air Manifold		30002408	
31	Right Air Manifold		30005290	

Additional service part numbers appear on following page.

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
32	Right Side	Classic Black	30002405	
		Biscuit	30003053	
		Bordeaux	30006680	
		Ebony	30003073	
		Majolica Brown	30004877	
		Twilight	30007028	
33	Thermostat Handle Base		30002716	Y
34	Washer Damper Rod	Pkg of 10	30007257-10	
35	Fireback Plate, S/S		30005217	
36	Inner Bottom		30005291	
37	Ashdoor Hinge Upper	Pre 0081347991	30002403	
		Post 0081347991	1-00-30002403	
38	Door Handle Bracket		30002909	
39	Bottom Outer		30005292A	
40	Ashlip	Classic Black	30002402A	
		Biscuit	30003051	
		Bordeaux	30006678	
		Ebony	30003071	
		Majolica Brown	30004862	
		Twilight	30007026	
41	Gasket, Fireback		30005209	
42	Refractory, Fireback		30005302	
43	Retainer, Fireback Refractory		30005248	
44	Refractory, Inner Cover		30005205	Y
45	Andiron		30002397A	Y
46	Refractory, Access Cover		30007251	
47	Leg Leveler	Pkg of 10	1201745-10	
48	Ashdoor Handle Shaft		1600622	
49	Pawl Assembly	Qty 2 req	30005157	Y
50	Ashdoor		30002392A	
51	Ashdoor Handle (Wood)		1600663	Y
52	Ashdoor Hinge Rod	Pre 0081347991	30007285	
	Hinge Hardware	Post 0081347991	1-00-2473	
53	Cotter Pin, Ashdoor	Pre 0081347991	30001749	
54	Ashdoor Hinge Lower	Pre 0081347991	30002404A	
		Post 0081347991	1-00-30002404	
55	Ashpan Bracket		1601039	

Additional service part numbers appear on following page.

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
56	Lower Side Bracket		30005268	
57	Thermostat Handle		1600660	Y
58	Front Manifold		30002407	
59	Front	Classic Black	30002393A	
		Biscuit	30003054	
		Bordeaux	30006681	
		Ebony	30003074	
		Majolica Brown	30004878	
		Twilight	30007029	
60	Flue Collar Gasket	15 Ft	1-00-30002422	
61A	Left Door (Shell Enamel Parts)	Classic Black	30003938A	
		Biscuit	30003958	
		Bordeaux	30006685	
		Ebony	30003962	
		Majolica Brown	30004884	
		Twilight	30007033	
	Left Door Sub Assembly (Shell Enamel Parts) (Does not contain glass or glass gasket)	Classic Black	30003974	
		Biscuit	30003984	
		Bordeaux	30006687	
		Ebony	30003988	
		Majolica Brown	30004882	
		Twilight	30007072	
61B	Left Door (Transition Door Enamel)	Classic Black	30007081A	
		Biscuit	30007083	
		Bordeaux	30007087	
		Majolica Brown	30007085	
		Twilight	30007107	
	Left Door Sub Assembly (Transition Door Enamel)	Classic Black	30007165	
		Biscuit	30007167	
		Bordeaux	30007169	
		Majolica Brown	30007171	
		Twilight	30007173	
62	Door Hinge Strip		1308634A	
63	Top	Classic Black	30002387A	
		Biscuit	30003055	
		Bordeaux	30006682	
		Ebony	30003075	
		Majolica Brown	30004879	
		Twilight	30007030	

Additional service part numbers appear on following page.

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
64	Glass Clip	Qty 8 req	1601394	**Y**
65A	Right Door (Shell Enamel Parts)	Classic Black	30003939A	
		Biscuit	30003959	
		Bordeaux	30006684	
		Ebony	30003963	
		Majolica Brown	30004883	
		Twilight	30007032	
	Right Door Sub Assembly (Shell Enamel Parts) (Does not contain glass or glass gasket)	Classic Black	30003975	
		Biscuit	30003985	
		Bordeaux	30006686	
		Ebony	30003989	
		Majolica Brown	30004881	
		Twilight	30007073	
65B	Right Door (Transition Door Enamel)	Classic Black	30007080A	
		Biscuit	30007082	
		Bordeaux	30007086	
		Majolica Brown	30007084	
		Twilight	30007106	
	Right Door Sub Assembly (Transition Door Enamel)	Classic Black	30007166	
		Biscuit	30007168	
		Bordeaux	30007170	
		Majolica Brown	30007172	
		Twilight	30007174	
66	Door Gasket, 15’		1-00-1203588	**Y**
67	Glass Gasket, 10’		1-00-1186258229	**Y**
68	Left Door Glass		30005300	
69	Right Door Glass		30005299	
70	Door Hinge Pin	Qty 2 req	30002727	**Y**
71	Spacer (for Damper Rod)	Pkg of 10	1201779-10	
72	Primary Air Valve Assembly		30005324	
	Primary Air Frame		1307411	
	Primary Air Rod		30005260	
73	Front Door Handle and Shaft		30002717	**Y**
74	Thermostat Friction Spring	Pkg of 10	1201846-10	
75	Thermostat Cable		5005471	**Y**
76	Thermostat Handle Bolt	Pkg of 10	1201243-10	

Additional service part numbers appear on following page.

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
77	Ash Pan Assembly		5005746	
78	Flue Collar, 6” Round	Classic Black	0001580	
		Biscuit	0001595	
		Bordeaux	30006683	
		Ebony	30003162	
		Majolica Brown	0001589	
		Twilight	30007031	
	Flue Collar, 8” Oval	Classic Black	0000555	
		Biscuit	0000556	
		Bordeaux	0000560	
		Ebony	30003032	
		Majolica Brown	0000557	
		Twilight	0000561	
79	Single Leg	Classic Black	30002396A	
		Biscuit	30003050	
		Bordeaux	30006677	
		Ebony	30003070	
		Majolica Brown	30004874	
		Twilight	30007025	
80	Hex Head Jam Nut (Qty 2 req)	Pkg of 10	1203290-10	
81	Bottom Heat Shield		30002470	
82	Bottom Heat Shield Right Wing		30005030	
83	Bottom Heat Shield Left Wing		30005031	
84	Grate Bottom		30005294	
85	Thermostat Assembly		5005470	
86	Washer	Pkg of 10	1202471-10	
87	Handle Base Sub		30002714	
88	Fallaway Handle Complete		30004175K	
89	Thermostat Handle Assembly		30007067	
90	Primary Air Cover		30007069	
91	Primary Air Base		30007071	
92	Temperature Probe		30007274	
93	Bracket, Temperature Probe		30007278	
	Tempertature Probe Assembly		30007283A	

Additional service part numbers appear on following page.

Hearth & Home Technologies
LIMITED LIFETIME WARRANTY

Hearth & Home Technologies, on behalf of its hearth brands ("HHT"), extends the following warranty for HHT gas, wood, pellet and electric hearth appliances that are purchased from an HHT authorized dealer.

WARRANTY COVERAGE:

HHT warrants to the original owner of the HHT appliance at the site of installation, and to any transferee taking ownership of the appliance at the site of installation within two years following the date of original purchase, that the HHT appliance will be free from defects in materials and workmanship at the time of manufacture. After installation, if covered components manufactured by HHT are found to be defective in materials or workmanship during the applicable warranty period, HHT will, at its option, repair or replace the covered components. HHT, at its own discretion, may fully discharge all of its obligations under such warranties by replacing the product itself or refunding the verified purchase price of the product itself. The maximum amount recoverable under this warranty is limited to the purchase price of the product. This warranty is subject to conditions, exclusions and limitations as described below.

WARRANTY PERIOD:

Warranty coverage for consumers begins at the date of installation. In the case of new home construction, warranty coverage begins on the date of first occupancy of the dwelling or six months after the sale of the product by an independent, authorized HHT dealer/ distributor, whichever occurs earlier. However, the warranty shall commence no later than 24 months following the date of product shipment from HHT, regardless of the installation or occupancy date. The warranty period for parts and labor for covered components is produced in the following table.

The term "Limited Lifetime" in the table below is defined as: 20 years from the beginning date of warranty coverage for gas appliances, and 10 years from the beginning date of warranty coverage for wood and pellet appliances. These time periods reflect the minimum expected useful lives of the designated components under normal operating conditions.

Warranty Period		**HHT Manufactured Appliances and Venting**					
Parts	Labor	Gas	Pellet	Wood	Electric	Venting	Components Covered
1 Year		X	X	X	X	x	All parts and material except as covered by Conditions, Exclusions, and Limitations listed
2 years			**X**	**X**			Igniters, auger motors, electronic components, and glass
		X	**X**	**X**			Factory-installed blowers
				X			Molded refractory panels
		X					Ignition Modules
3 years			**X**				Firepots, burnpots, mechanical feeders/auger assemblies
5 years	1 year	**X**					Vent Free burners, Vent Free ceramic fiber logs, Aluminized Burners
			X	**X**			Castings and Baffles
6 years	3 years			**X**			Catalyst - limitations listed
7 years	3 years		**X**	**X**			Manifold tubes, HHT chimney and termination
10 years	1 year	**X**					Burners, logs and refractory
Limited Lifetime	3 years	**X**	**X**	**X**			Firebox and heat exchanger, Grate and Stainless Steel Burners, FlexBurn® System (engine, inner cover,access cover and fireback)
90 Days		**X**	**X**	**X**	**X**	**X**	All replacement parts beyond warranty period

WARRANTY CONDITIONS:

- This warranty only covers HHT appliances that are purchased through an HHT authorized dealer or distributor. A list of HHT authorized dealers is available on the HHT branded websites.
- This warranty is only valid while the HHT appliance remains at the site of original installation.
- This warranty is only valid in the country in which the HHT authorized dealer or distributor that sold the appliance resides.
- Contact your installing dealer for warranty service. If the installing dealer or distributor is unable to provide necessary parts, contact the nearest HHT authorized dealer or supplier. Additional service fees may apply if you are seeking warranty service from a dealer other than the dealer from whom you originally purchased the product.
- Check with your dealer in advance for any costs to you when arranging a warranty call. Travel and shipping charges for parts are not covered by this warranty.
- Limited Catalyst Warranty
    - For wood burning products containing a catalyst, the catalyst will be warranted for a six-year period as follows: if the original catalyst or a replacement catalyst proves defective or ceases to maintain 70% of its particulate emission reduction activity (as measured by an approved testing procedure) within 36 months from the purchase date, the catalyst will be replaced for free.
    - From 37 to 72 months a pro-rated credit will be allowed against a replacement catalyst and labor credit necessary to install the replacement catalyst. The proration rate is as follows:

Amount of Time Since Purchase	Credit Towards Replacement Cost
0 - 36 Months	100%
37 - 48 Months	30%
49 - 60 Months	20%
61 - 72 Months	10%

    - Any replacement catalyst will be warranted under the terms of the catalyst warranty for the remaining term of the original warranty. The purchaser must provide the name, address, and telephone number of the location where the product is installed, proof of original purchase date, date of failure, and any relevant information regarding the failure of the catalyst.

WARRANTY EXCLUSIONS:

This warranty does not cover the following:

- Changes in surface finishes as a result of normal use. As a heating appliance, some changes in color of interior and exterior surface finishes may occur. This is not a flaw and is not covered under warranty.
- Damage to printed, plated, or enameled surfaces caused by fingerprints, accidents, misuse, scratches, melted items, or other external sources and residues left on the plated surfaces from the use of abrasive cleaners or polishes.
- Repair or replacement of parts that are subject to normal wear and tear during the warranty period are not covered. These parts include: paint, wood and pellet gaskets, firebricks, grates, flame guides, batteries and the discoloration of glass.
- Minor expansion, contraction, or movement of certain parts causing noise. These conditions are normal and complaints related to this noise are not covered by this warranty.
- Damages resulting from: (1) failure to install, operate, or maintain the appliance in accordance with the installation instructions, operating instructions, and listing agent identification label furnished with the appliance; (2) failure to install the appliance in accordance with local building codes; (3) shipping or improper handling; (4) improper operation, abuse, misuse, continued operation with damaged, corroded or failed components, accident, or improperly/incorrectly performed repairs (5) environmental conditions, inadequate ventilation, negative pressure, or drafting caused by tightly sealed constructions, insufficient make-up air supply, or handling devices such as exhaust fans or forced air furnaces or other such causes; (6) use of fuels other than those specified in the operation instructions; (7) installation or use of components not supplied with the appliance or any other components not expressly authorized and approved by HHT; (8) modification of the appliance not expressly authorized and approved by HHT in writing; and/or (9) interruptions or fluctuations of electrical power supply to the appliance.
- Non-HHT venting components, hearth connections or other accessories used in conjunction with the appliance.
- Any part of a pre-existing fireplace system in which an insert or a decorative gas appliance is installed.
- HHT's obligation under this warranty does not extend to the appliance's capability to heat the desired space. Information is provided to assist the consumer and the dealer in selecting the proper appliance for the application. Consideration must be given to the appliance location and configuration, environmental conditions, insulation and air tightness of the structure.

This warranty is void if:

- The appliance has been over-fired, operated in atmospheres contaminated by chlorine, fluorine, or other damaging chemicals. Over-firing can be identified by, but not limited to, warped plates or tubes, deformation/warping of interior cast iron structure or components, rust colored cast iron, bubbling, cracking and discoloration of steel or enamel finishes.
- The appliance is subjected to prolonged periods of dampness or condensation.
- There is any damage to the appliance or other components due to water or weather damage which is the result of, but not limited to, improper chimney or venting installation.

LIMITATIONS OF LIABILITY

- The owner's exclusive remedy and HHT's sole obligation under this warranty, under any other warranty, express or implied, or in contract, tort or otherwise, shall be limited to replacement, repair, or refund, as specified above. In no event will HHT be liable for any incidental or consequential damages caused by defects in the appliance. Some states do not allow exclusions or limitation of incidental or consequential damages, so these limitations may not apply to you. This warranty gives you specific rights; you may also have other rights, which vary from state to state. EXCEPT TO THE EXTENT PROVIDED BY LAW, HHT MAKES NO EXPRESS WARRANTIES OTHER THAN THE WARRANTY SPECIFIED HEREIN. THE DURATION OF ANY IMPLIED WARRANTY IS LIMITED TO DURATION OF THE EXPRESSED WARRANTY SPECIFIED ABOVE.

VERMONT CASTINGS

352 Mountain House Road • Halifax, Pa 17032
www.vermontcastings.com

Appendix G – Manufacturer's QA Plan

(CBI Version Only)

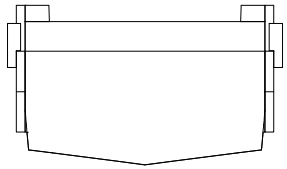
Appendix H – Firebox Volume Drawings

BOM: ENCORE_FIREBOX_VOLUME

Pos	Qty	Part Name	Description	CUBIC FT
10	1	REGION 1 (UNUSABLE)	FRONT	.15
20	1	REGION 2	BASE	1.43
30	2	REGION 3	SIDE	.12
40	1	REGION 4	TOP	.47
50	1	REGION 5 (UNUSABLE)	TOP_BACK_LEFT	.01
60	1	REGION 6 (UNUSABLE)	TOP_BACK_RIGHT	.01
70	2	REGION 7 (UNUSABLE)	BASE_REAR_RIBS	.03

TOTAL CUBIC FT = 2.22

TOTAL USABLE CUBIC FT = 2.02



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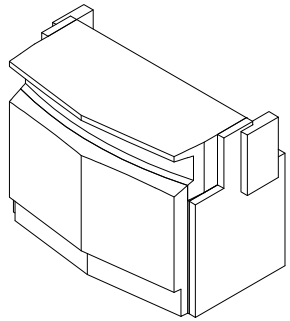

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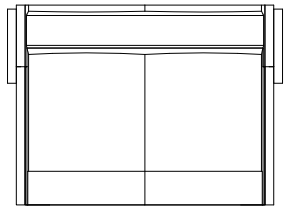

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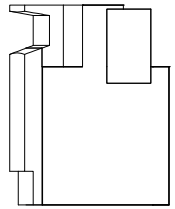

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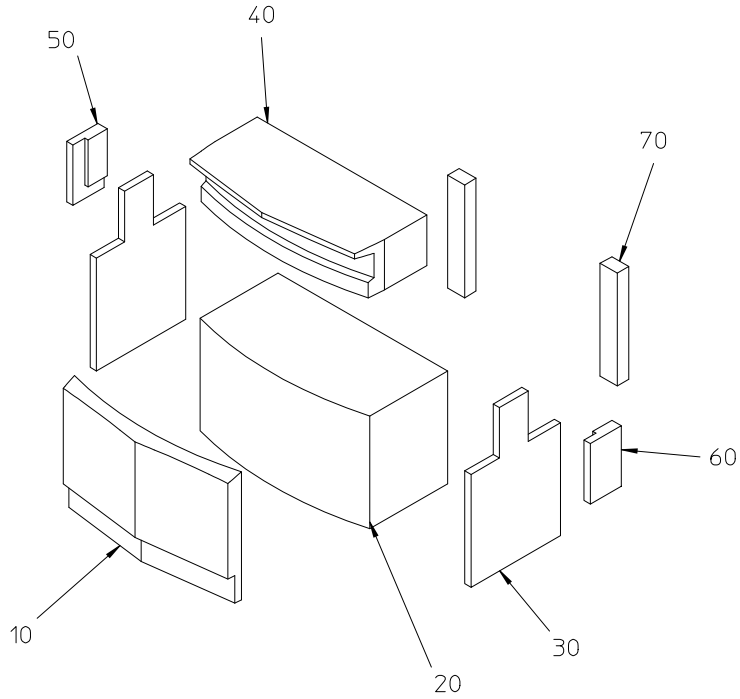

GEN

REV	ECO#	REVISION NOTES	DATE	NAME

UNLESS OTHERWISE SPECIFIED: TOLERANCE - (2) PLACE DEC ±0.03 (3) PLACE DEC: ±0.005 ANGLE: ±2° FRACTION: ±1/16
OUTSIDE MATERIAL. NORMAL DIM & INSIDE MATERIAL. OUTSIDE APEX. INSIDE APEX - DIMS ENCLOSED BY AN OVAL ARE CRITICAL DIMENSIONS

HHT-HFX

HEARTH & HOME technologies

PART NAME: ENCORE_FIREBOX_VOLUME

DRAWN BY: Jerry Frantz | DATE: 1/17/24 9:40 AM | SCALE: 1:10 | MATERIAL / FINISH:

THIS PRINT IS CHECKED AND CONTROLLED BY THE ENGINEERING DEPARTMENTS OF HEARTH & HOME TECHNOLOGIES INC.

SHEET: 1 of 1 | PART NUMBER: ENCORE_FIREBOX_VOLUME | REV: 1.5

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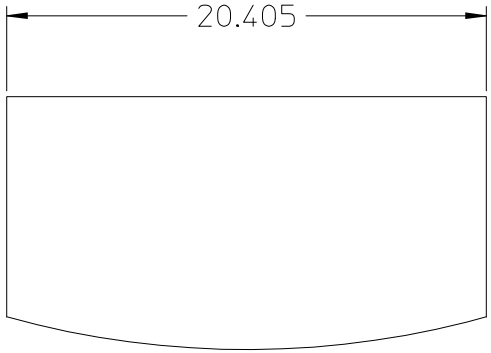

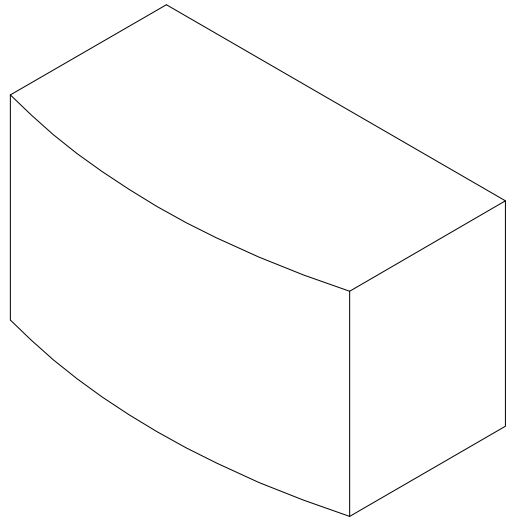

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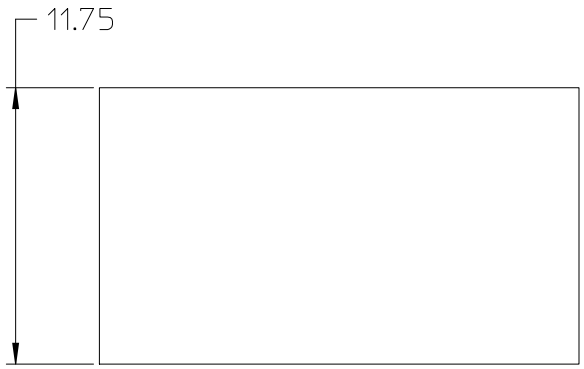

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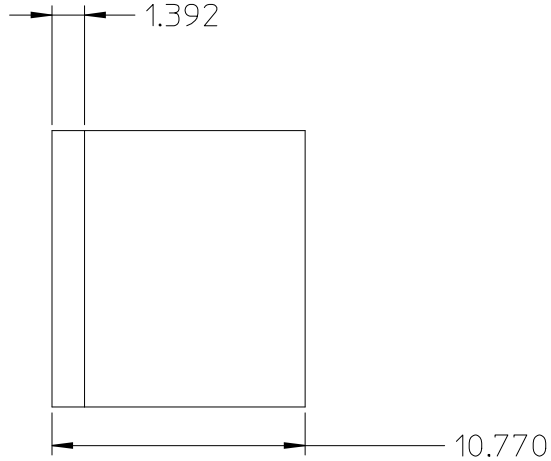

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BASE

REV	ECO#	REVISION NOTES	DATE	NAME

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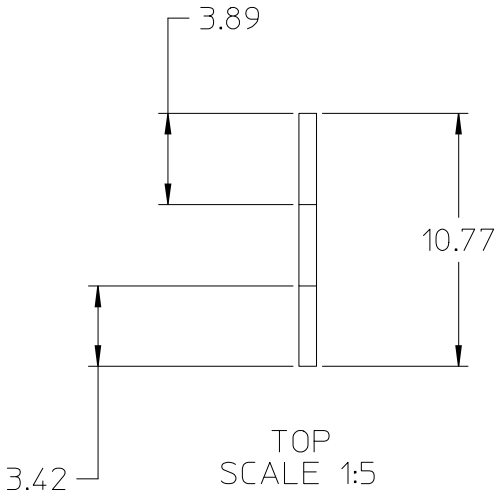
OUTSIDE MATERIAL. NORMAL DIM & INSIDE MATERIAL. OUTSIDE APEX. INSIDE APEX - DIMS ENCLOSED BY AN OVAL ARE CRITICAL DIMENSIONS

HHT-HFX

HEARTH & HOME technologies

PART NAME: ENCORE_FIREBOX_VOLUME			
DRAWN BY: Jerry Frantz	DATE: 1/17/24 9:40 AM	SCALE: 1:10	MATERIAL / FINISH:
THIS PRINT IS CHECKED AND CONTROLLED BY THE ENGINEERING DEPARTMENTS OF HEARTH & HOME TECHNOLOGIES INC.	SHEET: 2 of 3	PART NUMBER: ENCORE_FIREBOX_VOLUME	REV: 1.5



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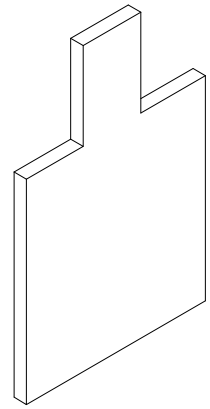

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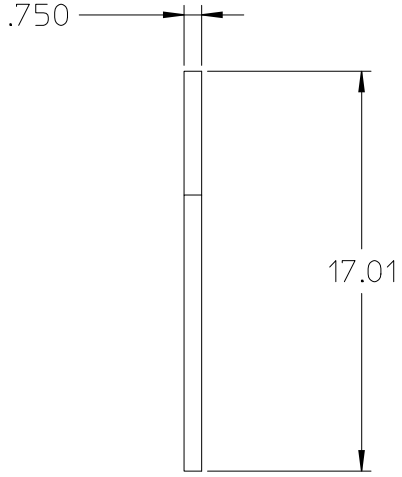

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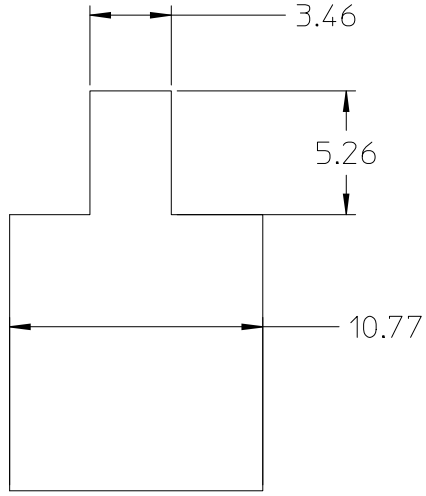

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QUANTITY (2)

SIDES

REV	ECO#	REVISION NOTES	DATE	NAME

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◄◄ OUTSIDE MATERIAL. ◄ NORMAL DIM & INSIDE MATERIAL. ⌐ OUTSIDE APEX. •— INSIDE APEX - DIMS ENCLOSED BY AN OVAL ARE CRITICAL DIMENSIONS

HHT-HFX

HEARTH & HOME technologies

PART NAME: ENCORE_FIREBOX_VOLUME

DRAWN BY:	DATE:	SCALE:	MATERIAL / FINISH:
Jerry Frantz	1/17/24 9:40 AM	1:10	

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SHEET: 3 of 3

PART NUMBER: ENCORE_FIREBOX_VOLUME

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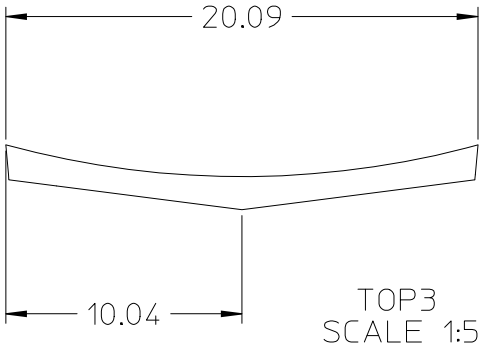

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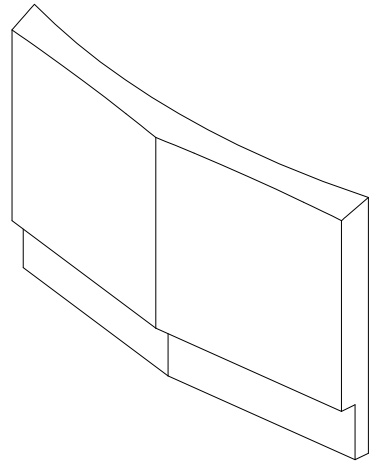

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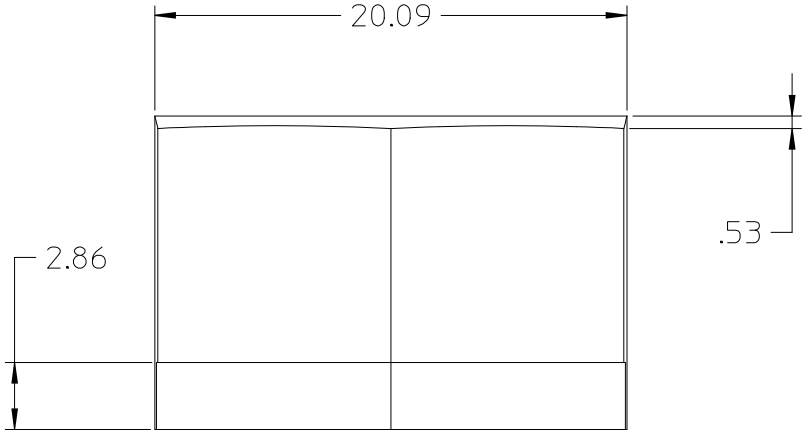

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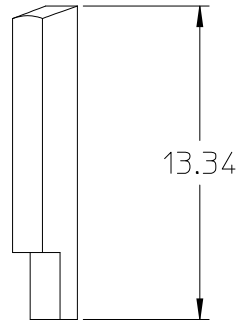

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REV	ECO#	REVISION NOTES	DATE	NAME

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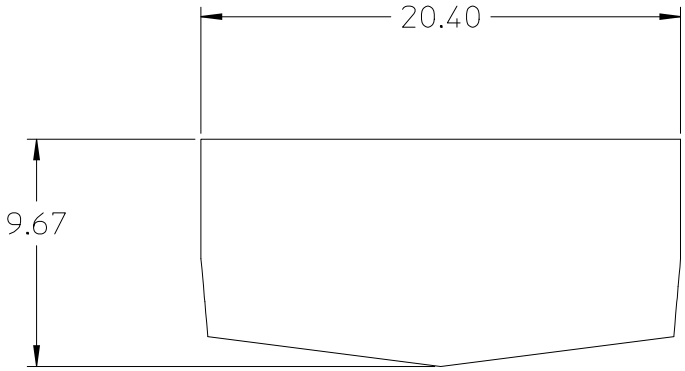
← OUTSIDE MATERIAL. ← NORMAL DIM & INSIDE MATERIAL. ⌐ OUTSIDE APEX. •← INSIDE APEX - DIMS ENCLOSED BY AN OVAL ARE CRITICAL DIMENSIONS

HHT-HFX

HEARTH & HOME technologies

PART NAME:			
ENCORE_FIREBOX_VOLUME			
DRAWN BY: Jerry Frantz	DATE: 1/17/24 9:40 AM	SCALE: 1:10	MATERIAL / FINISH:
SHEET: 4 of 4	PART NUMBER: ENCORE_FIREBOX_VOLUME	REV: 15	



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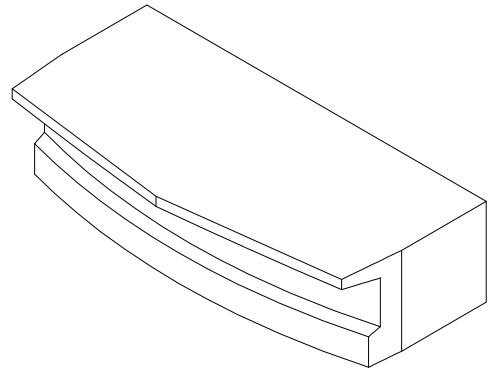

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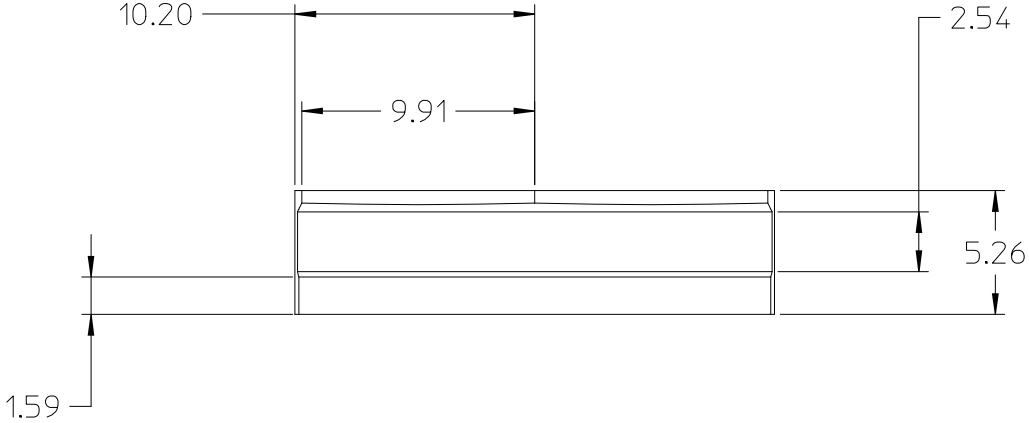
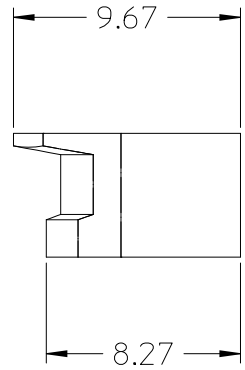


FRONT4
SCALE 1:5



RIGHT4
SCALE 1:5

TOP

REV	ECO#	REVISION NOTES	DATE	NAME

UNLESS OTHERWISE SPECIFIED DIMS ARE INCHES[mm] & TOLERANCES ARE: (2) PLACE DEC :±0.03 (3) PLACE DEC: ±0.005 ANGLE: ±2° FRACTION: ±1/16
←← OUTSIDE MATERIAL. ← NORMAL DIM & INSIDE MATERIAL. ⌐ OUTSIDE APEX. •← INSIDE APEX - DIMS ENCLOSED BY AN OVAL ARE CRITICAL DIMENSIONS

HHT-HFX

HEARTH & HOME technologies

PART NAME: ENCORE_FIREBOX_VOLUME

DRAWN BY:	DATE:	SCALE:	MATERIAL / FINISH:
Jerry Frantz	1/17/24 9:40 AM	1:10	

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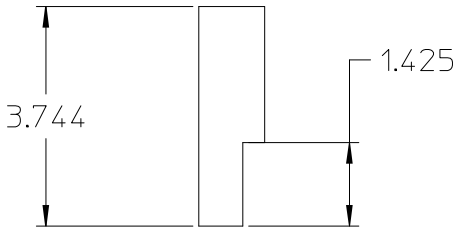
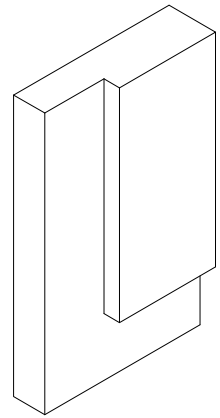
SHEET: 5 of 5

PART NUMBER: ENCORE_FIREBOX_VOLUME

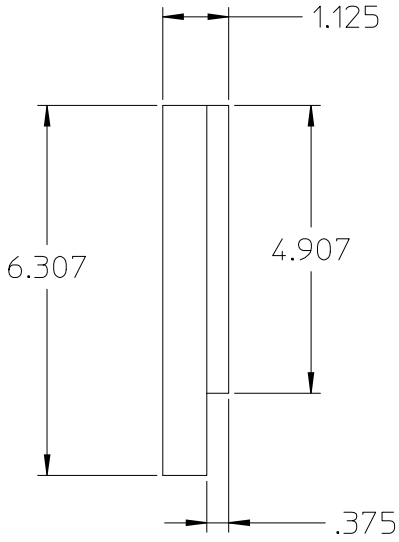
REV:



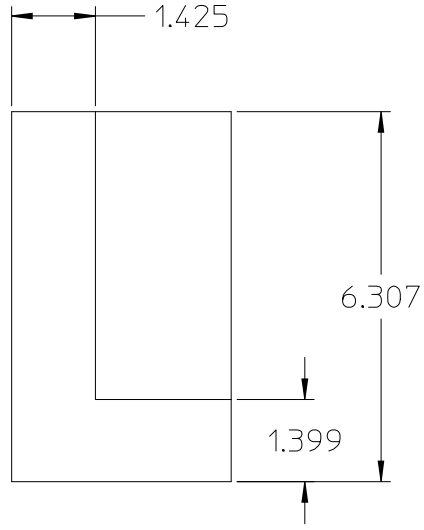
TOP5
SCALE 1:2



ISO6
SCALE 1:2



FRONT5
SCALE 1:2



RIGHT5
SCALE 1:2

TOP BACK LEFT

REV	ECO#	REVISION NOTES	DATE	NAME

UNLESS OTHERWISE SPECIFIED DIMS ARE INCHES[mm] & TOLERANCES ARE: (2) PLACE DEC :±0.03 (3) PLACE DEC: ±0.005 ANGLE: ±2° FRACTION: ±1/16
← OUTSIDE MATERIAL. ← NORMAL DIM & INSIDE MATERIAL. ⌐ OUTSIDE APEX. ⌐ INSIDE APEX - DIMS ENCLOSED BY AN OVAL ARE CRITICAL DIMENSIONS

HHT-HFX

HEARTH & HOME technologies

PART NAME: ENCORE_FIREBOX_VOLUME

DRAWN BY: Jerry Frantz | DATE: 1/17/24 9:40 AM | SCALE: 1:1 | MATERIAL / FINISH:

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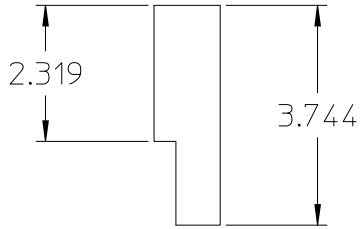
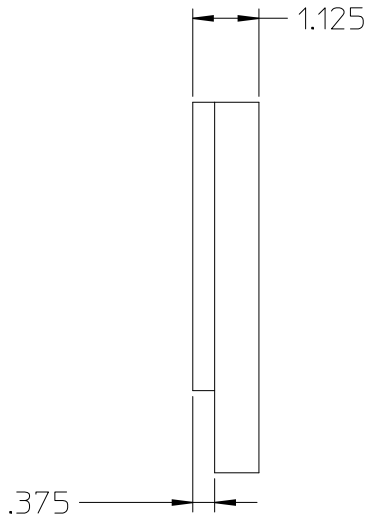
SHEET: 6 of 6 | PART NUMBER: ENCORE_FIREBOX_VOLUME | REV: 15



TOP6
SCALE 1:2



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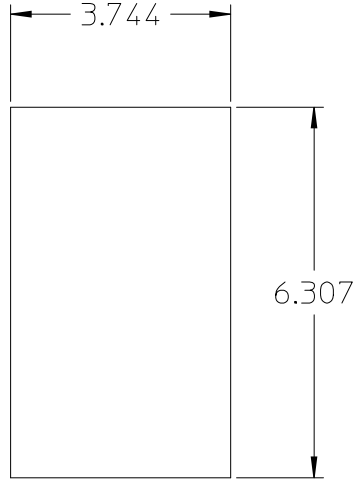

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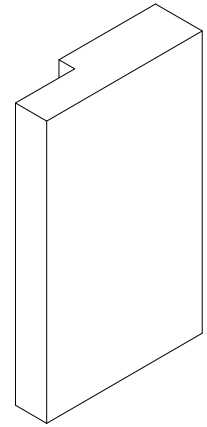

ISO7
SCALE 1:2

TOP BACK RIGHT

REV	ECO#	REVISION NOTES	DATE	NAME

UNLESS OTHERWISE SPECIFIED DIMS ARE INCHES[mm] & TOLERANCES ARE: (2) PLACE DEC :±0.03 (3) PLACE DEC: ±0.005 ANGLE: ±2° FRACTION: ±1/16
←— OUTSIDE MATERIAL. ← NORMAL DIM & INSIDE MATERIAL. ⌐ OUTSIDE APEX. •← INSIDE APEX - DIMS ENCLOSED BY AN OVAL ARE CRITICAL DIMENSIONS

HHT-HFX

HEARTH & HOME technologies

PART NAME: ENCORE_FIREBOX_VOLUME

DRAWN BY:	DATE:	SCALE:	MATERIAL / FINISH:
Jerry Frantz	1/17/24 9:40 AM	1:10	

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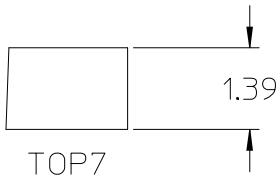
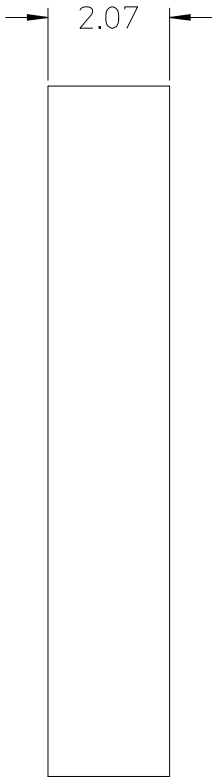
SHEET: 7 of 23

PART NUMBER: ENCORE_FIREBOX_VOLUME

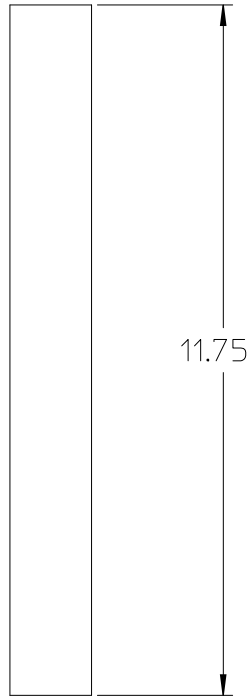
REV:



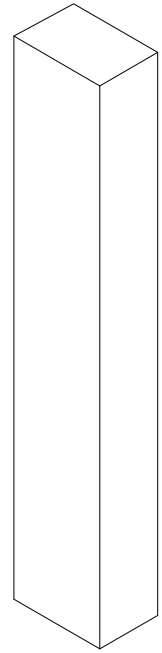
TOP7



FRONT7



RIGHT7



ISO2

QUANTY (2)

BASE REAR RIBS

REV	ECO#	REVISION NOTES	DATE	NAME

UNLESS OTHERWISE SPECIFIED DIMS ARE INCHES[mm] & TOLERANCES ARE: (2) PLACE DEC :±0.03 (3) PLACE DEC: ±0.005 ANGLE: ±2° FRACTION: ±1/16
◄◄ OUTSIDE MATERIAL. ◄ NORMAL DIM & INSIDE MATERIAL. ⌐ OUTSIDE APEX. •◄ INSIDE APEX - DIMS ENCLOSED BY AN OVAL ARE CRITICAL DIMENSIONS

HHT-HFX

HEARTH & HOME technologies

PART NAME: ENCORE_FIREBOX_VOLUME

DRAWN BY:	DATE:	SCALE:	MATERIAL / FINISH:
Jerry Frantz	1/17/24 9:40 AM	1:2	

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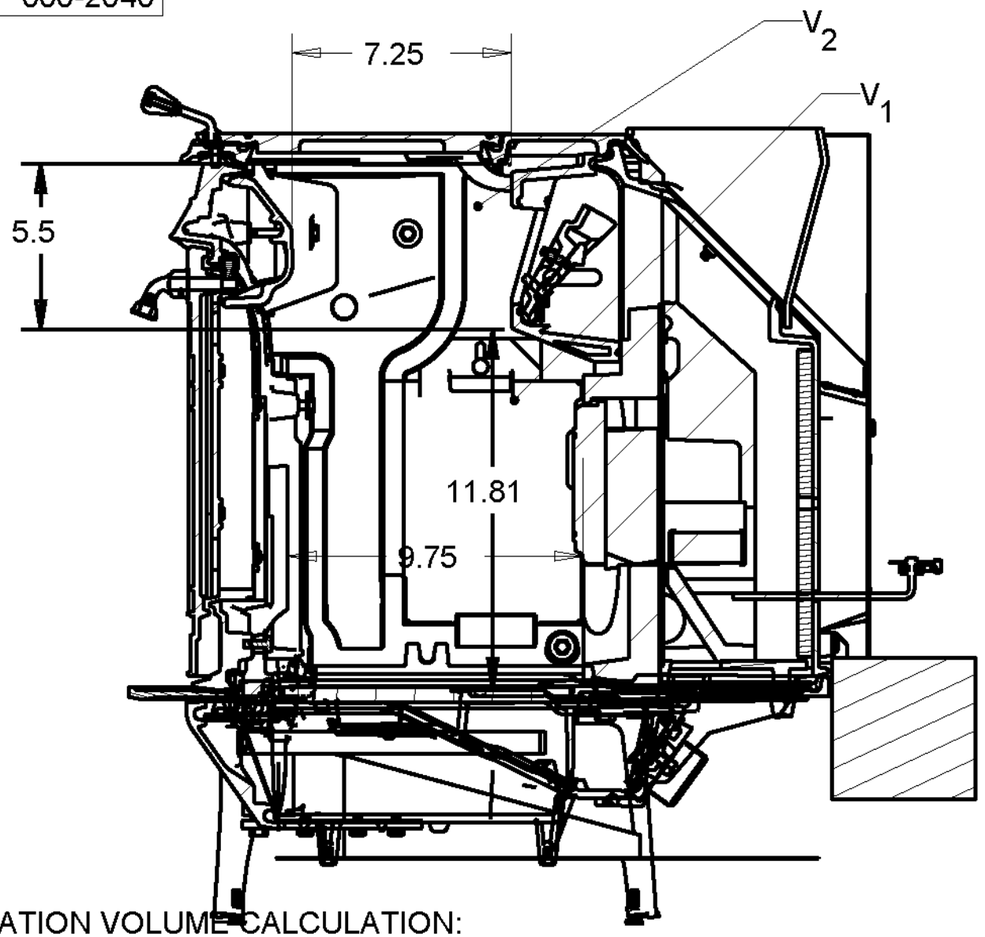
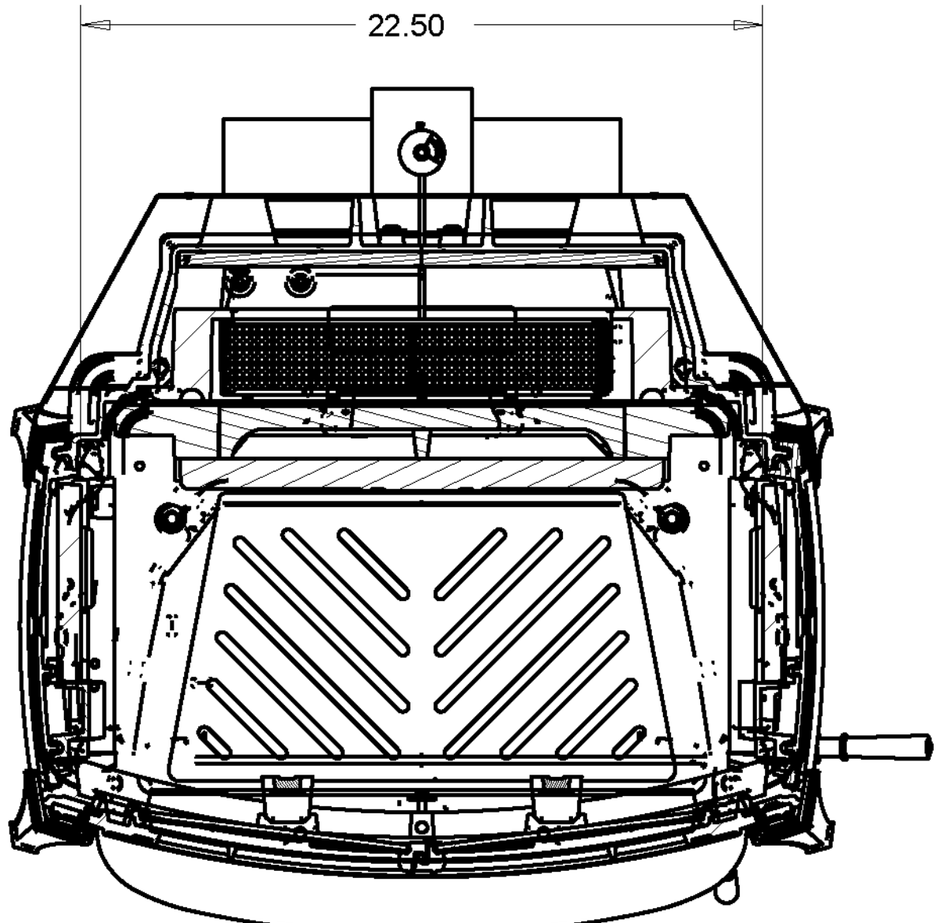
SHEET: 8 of 8

PART NUMBER: ENCORE_FIREBOX_VOLUME

REV:

PART No: 000-2040





CERTIFICATION VOLUME CALCULATION:

V_1 = 9.75 X 11.81 X 22.50 = 2590.82

V_2 = 7.25 X 22.5 X 5.5 = 897.2

F. V. = $V_1 + V_2$ = 897.2 in^3 + 2590.82 in^3 = 3488.0in^3 = 2.02 ft^3

F. V. = 2.02 ft^3

1. BYPASS OPENING 3.156" X 16.812", GASKET:3.5 ft., 5/16 MEDIUM DENSITY FIBERGLASS.
2. DOOR OPENING 21.1" WIDE X 11.1" HEIGHT, GASKET:7 ft 7/16 LOW DENSITY FIBERGLASS ROPE. TWO DOORS.
3. ASH DOOR GASKET: 3.6 ft ,3/8 LOW DENSITY FIBERGLASS
4. MINIMUM SYSTEM AIR CROSS-SECTION, "AIR PLATE", 3.875" X 1.125" OPENING CONTROLLED BY AIR FLAP, PRIMARY AIR RANGE: FULL OPEN (4.36 in^2), FULL CLOSED (0 in^2)

VERMONT CASTINGS

PROPERTY OF MHS Corporation:

CONFIDENTIALITY AGREEMENT:

USED ON: 0002040

TOLERANCES UNLESS OTHERWISE SPECIFIED

LINEAR & DIAMETER	BEND RADIUS
x.x ± 0.039 in (1.0 mm)	0.397 mm +0.025 mm -0
x.xx ± 0.020 in (0.5 mm)	0.0156 in +0.001 in -0
x.xxx ± 0.004 in (0.1 mm)	

GD & T TO COMPLY WITH ANSI Y14.5-1994

THIRD ANGLE PROJECTION: LEFTSIDE FRONT RIGHTSIDE

MATERIAL THICK: mm (in) MAX: mm (in) MIN: mm (in)

MATERIAL SPECIFICATION: AS SHOWN (GA.)

DRAWN BY:	DATE:	SIZE:	MATERIAL FINISH:
VC	06.22.10	B	

DESCRIPTION: ENCORE 2040 FB FIREBOX DETAIL

SHEETS: 1 of 3

ECN No:	REV No:	PART No:
	A	000-2040

Appendix I – Design Changes

(CBI version only)

Appendix J – Revision History

Date	Project No.	Tech. & Evaluator	Report Sect.	Summary of Changes
12/05/2018	0135WS042E	Aaron Kravitz Ken Morgan	ALL	First Issue of Report
10/04/2022	0135WS042E (Edition 001)	Riley Tiegs Ken Morgan	Preface (pg 1-3)	Updated signatories, edition of report, and table of contents
			2.1 (pg8)	Introduction Statement added. Run Narratives updated, B415 statement added in "Results Summary"
			Appendix A	Wood Heater Run Results were updated to include Train Precision and Delta T.
			Appendix I	Approved design change request added to report. Secondary access cover was slightly modified to prevent it from being dislodged during wood stirring.
			Appendix J	Revision History added
			Appendix E	Conditioning Data updated to address Burn Rate
			2.3 (page 10)	Test Date typo corrected
			1.1 (page 5)	Statement added addressing Run 5 being fan confirmation
			Appendix A Pg 16	Weighted Average/s added to report
1/17/24	0135WS042E (Edition 002)	Ken Morgan	Preface	Updated cover, signatures, and table of contents Pages 1-3
			Section 1	Added "Uncorrected" and "Corrected" columns and footnotes to Tables 1 and 2, Page 5
			Section 2	Edited Run Narratives slightly for clarity. Page 9
			Appendix A	Explicit dual train comparisons can be found. Pages 18, 37, 52, 65 and 84
			Appendix C	Diagram of Dilution Tunnel added. Page 135
				Additional calibration certificates were added for Equipment No. 650 Barometer. Pages 136 and 137
			Appendix E	Conditioning data was revised by the manufacturer to include air setting used. Page 171
			Appendix H	Firebox volume calculations were supplemented to include a more detailed analysis. Pages 222 - 230