Non-Confidential Business Information (Non-CBI)

Certification Test Report

United States Stove Company

Pellet-Fired Freestanding Room Heater

Model: 5710 & 5501S Series

Prepared for:	United States Stove Company 227 Industrial Park Road P.O. Box 151 South Pittsburg, TN 37380
Prepared by:	OMNI-Test Laboratories, Inc. 13327 NE Airport Way Portland, OR 97230 (503) 643-3788
Test Period:	February 23, 2016
Report Date:	May 2016
Report Revision Date:	**July 7, 2021**
Report Number:	0215PS050E

-Edition Number (004) 7/7/21 -

AUTHORIZED SIGNATORIES

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

Evaluator:

Bruce Davis, Testing Manager
OMNI-Test Laboratories, Inc.

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Section 1

Sampling Procedures and Test Results

INTRODUCTION

United States Stove Company retained OMNI-Test Laboratories, Inc. (*OMNI*) to perform U.S. Environmental Protection Agency (EPA) certification testing on the 5710 & 5501S Series. The 5710 & 5501S Series is a line of freestanding, pellet-fired room heaters.

The testing was performed at *OMNI*'s testing facility in Portland, Oregon. The altitude of the laboratory is 30 feet above sea level. A sample unit, the base model 5710, was received in good condition and logged in at the *OMNI*'s testing facility on 2/12/2016. It was assigned and labeled with *OMNI* ID #2150. *OMNI* representative Aaron Kravitz conducted the certification testing and completed all testing by 2/23/2016.

This report is organized in accordance with the EPA-recommended outline and is summarized in the Table of Contents immediately preceding this section. The results in this report are limited to the item(s) submitted.

SAMPLING PROCEDURE

The 5710 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 E2779. The fuel used for certification testing was Lignetics "Premium Quality" hardwood pellet fuel; this fuel was graded as Premium by the Pellet Fuels Institute and was produced at registered mill # 03304. Particulate emissions were measured using dual sampling trains consisting of two sets of filters (front and back). The results of the integrated test run indicate an average particulate emission rate of 1.03 g/hr. The 5710 results are within the emission limit of 2.0 g/hr for affected facilities manufactured on or after May 15, 2020.

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.

An ambient filter (Background) was not operated during this series, there were no operations in the area that would have generated additional particulate into the ambient air. Running an ambient filter can only reduce emissions by backing out any particulate not generated by fuel in the appliance, it can never increase emissions. Tests conducted without an ambient filter are considered worse case.

The model 5710 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 68.53%. The calculated CO emission rate was 5.7 g/hr.

RUN DISCUSSION

Run 1 was an attempt at an integrated test run consisting of burn settings that result in 60 +5/-0 minutes at maximum, 120 +5/-0 minutes at medium (<50% of maximum), and 180 +5/-0 minutes at minimum. Each burn category in this run was achieved, meeting both time and burn rate requirements. No sampling anomalies occurred, so this integrated test run is valid and appropriate per ASTM E2779, no further tests are needed.

SUMMARY OF RESULTS

The average particulate emission rate over the complete, integrated test run was measured to be 1.03 g/hr.

The average particulate emission factor for the complete, integrated test run was measured to be 1.21 g/dry kg of fuel.

The average thermal efficiency for the complete, integrated test run was measured to be 68.53%.

The particulate emission rate calculated from the one-hour filter was 1.11 g/hr.

Negative filter weights shown in this report are due to filter residue sticking to O-ring gaskets, this transfer can be seen as positive weights on O-ring components. There is no indication of actual loss of filter material.

Carbon Monoxide (CO) emissions for the Maximum and Medium burn rate was calculated as zero, this was caused by CO emissions emitted from the tested appliance being less than could be detected by an analyzer reading percent CO. There is no claim that zero emissions were emitted.

For compliance with ASTM 2779 clause 9.4.1.2, the burn setting for both low and medium was set to position 1, this was required to achieve a burn rate less than 50% of high. To generate a low burn rate lower than the medium, the air damper was fully open. This is the lowest possible setting allowed by user controls.

During testing, it was determined that a lower burn rate could be achieved by fully opening the damper. This was information was not included in the original manual, therefore to be compliant, an updated manual was created to direct the consumer to the most optimal operation of the product.

The proportionality results and sample train agreement for the test run was acceptable. Quality check results for each test run are presented in Section 3 of this report.

SUMMARY TABLES

Table 1.1 – Particulate Emissions

	One-Hour Filter	Integrated Total
Emission Rate (g/hr)	1.11	1.03
Emission Factor (g/dry kg)	0.76	1.21

Table 1.2 – Efficiency and CO

	Burn Rate Segment			Integrated
	Maximum	Medium	Minimum	Total
Time (minutes)	61	121	184	366
Burn Rate (dry kg/hr)	1.49	0.73	0.72	0.85
Heat Input Rate (BTU/hr, HHV)	27,492	13,464	13,281	15,710
Heat Output Rate (BTU/hr, HHV)	20,076	9,279	8,606	10,766
Efficiency (%, HHV)	73.03%	68.92%	64.80%	68.53%
Efficiency (%, LHV)	78.17%	73.77%	69.36%	73.36%
CO Emission Rate (g/hr)	0.0	0.0	11.2	5.7

1. Zero CO emissions was caused by concentrations in the flue being less than could be detected by an analyzer set up for percent CO.

Table 1.3 – Test Facility Conditions

	Initial	Middle	Final
Room Temperature (°F)	71	70	68
Barometric Pressure (in Hg)	30.47	30.39	30.32
Air Velocity (ft/min)	< 50	< 50	< 50
Induced Draft (in H2O)	0	0	0

Table 1.4 – Fuel Measurement Summary

Segment	**Time** (min)	**Burn Rate** (dry kg/hr)	**Consumed Fuel Weight** (lbs)	**Fuel Moisture Content** (dry basis - %)
Pretest	75	1.38	4.0	5.05
Maximum	61	1.49	3.5	5.05
Medium	121	0.73	3.4	5.05
Minimum	184	0.72	5.1	5.05
Integrated Total	366	0.85	12.0	5.05

Table 1.5 – Dilution Tunnel and Flue Gas Measurements

Segment	**Average Flue Draft** (in H_2O)	**Average Dilution Tunnel Gas Measurements**		
		Velocity (ft/sec)	**Flow Rate** (dscf/min)	**Temperature** (°F)
Integrated Total	-0.031	11.64	131.1	89.5

Table 1.6 – Heater Configuration

Segment	**Burn Setting**	**Damper Setting**
Pretest	5	Fully Open
Maximum	5	Fully Open
Medium	1	Fully Closed
Minimum	1	Fully Open

Section 2

Photographs
Appliance Description

United States Stove Company
5710 & 5501S Series

PHOTOGRAPHS

	
5710 Front	**5710 Back**
	
5710 Left	**5710 Right**

APPLIANCE DESCRIPTION

Appliance Manufacturer: United States Stove Company

Pellet Stove Model: 5710

Type: Freestanding, air-circulating type, pellet-fired room heater.

The 5710's principle elements include a fuel hopper, steel firebox chamber, steel burn pot, and electrical fuel feed, combustion air, and convection air supply systems.

Air is forced by the combustion air blower through 0.19" diameter holes in the burn pot and combustion products are routed out of the firebox chamber through a 3-inch diameter flue outlet located on the rear of the unit.

Fuel is supplied from the hopper to the burn pot via a 55 degree inclined auger Fuel supply rate is varied by cycling the auger motor as needed.

Ashes fall through the burn pot into a removable ash drawer located at the bottom of the unit. The drawer is accessed through the front firebox door, which also features a 9" x 10" 5mm glass panel sealed with ¾" fiberglass rope gasketing.

The electrical systems are regulated by a user-operated control board. On this board settings such as heat level and trim can be adjusted to achieve desired heat output. The unit can also be controlled by an external thermostat system.

Model Variations: The model line consists of two distinct units, the 5710 and 5501. The other units in the model line, featuring the AP and VG prefixes, are identical and distinguished only by marketing.

The 5501 series differs from the 5710 only in its outer appearance and cabinet design. The differences between the two models do not affect emissions performance in any way. A complete drawing package for the 5501 series is presented in the Engineering Drawings section of this report.

Section 3

Quality Assurance/Quality Control

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.

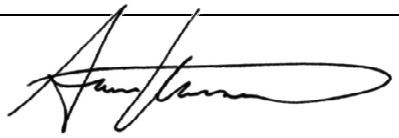
The manufacturing facilities and quality control system for the production of the 5710 at United States Stove Company were evaluated to determine if sufficient to maintain conformance with OMNI's requirements for product certification. OMNI has concluded that the manufacturing facilities, processes, and quality control system are adequate to produce the appliance congruous with the standards and model codes to which it was evaluated.

Sample Analysis

Analysis Worksheets
Moisture Content Worksheet
Fuel Certification Label
Tared Filter, Probe, and O-Ring Data

Pellet Heater Lab Data - ASTM E2779 / ASTM E2515

Manufacturer:	US Stove	Equipment Numbers:	23, 283A, 592
Model:	5710		
Tracking No.:	2150		
Project No.:	0215PH050E		
Run #:	1		
Date:	2/23/16		



TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	C355	122.4	121.1	1.3
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. Filter seals catch*	Seals				0.0

Sub-Total	Total Particulate, mg:	1.3

TRAIN 1 (Remainder of Test)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	C353	125.5	120.8	4.7
B. Rear filter catch	Filter	C356	120.5	120.9	-0.4
C. Probe catch*	Probe	14	114555.6	114555.6	0.0
D. Filter seals catch*	Seals	R386	4079.0	4077.1	1.9

Sub-Total	Total Particulate, mg:	6.2
Train 1 Aggregate	Total Particulate, mg:	**7.5**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	C352	127.1	120.8	6.3
B. Rear filter catch	Filter	C356	120.9	120.9	0.0
C. Probe catch*	Probe	14	114325.0	114325.0	0.0
D. Filter seals catch*	Seals	R386	3356.5	3356.0	0.5

Total Particulate, mg:	6.8

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

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

OMNI-Test Laboratories, Inc.

ASTM E2779 Pellet Heater Run Sheets

Client: **US Stove** Project Number: **0215PS050E** Run Number: 1

Model: **5710** Tracking Number: 2150 Date: 2/23/16

Test Crew: **A. Kravitz**

OMNI Equipment ID numbers: 23, 185, 132, 209, 335, 336, 410, 420, 559, 592

ASTM E2515 Lab Sheet

Assembled By: A. Kravitz

Date/Time in Dessicator: 2/23/16 16:00

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date:	2/24/16	2/26/16	2/29/16		
Time:	16:00	1200	0900		
R/H %:	10.8	16.1	13.8		
Temp:	73.9	74.1	72.6		
Audit:	1999.9 | 2000.0 | 100000.0	1999.8 | 2000.3 | 99999.9	1999.9 | 2000.3 | 100000.0		
Initials:	SB				

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	Front Filter	C355	121.1	122.5	122.4	-		
	Rear Filter	N/A	—					
	Probe	N/A	—					
	O-Ring Set	N/A	—					
A (Remainder)	Front Filter	C353	120.8	125.6	125.5	-		
	Rear Filter	C356	120.9	120.5	120.5	-		
	Probe	14	114555.6	114555.6	114555.6	-		
	O-Ring Set	R386	4077.1	4079.9	4079.1	4079.0		
B	Front Filter	C352	120.8	127.1	127.1	-		
	Rear Filter	C354	120.9	120.9	120.9	-		
	Probe	13	114325.0	114325.0	114325.0	-		
	O-Ring Set	R385	3356.0	3357.2	3356.6	3356.5		
BG	Filter	N/A	—					

Technician Signature: A. Kravitz Date: 2/29/16

Twin Ports Testing, Inc.
1301 North 3rd Street
Superior, WI 54880
p: 715-392-7114
p: 800-373-2562
f: 715-392-7163
www.twinportstesting.com

Analytical Test Report

Report No: USR:W215-0901-01
Issue No: 1

Client: OMNI-TEST LABORATORIES INC.
13327 NE Airport Way
Portland, OR 97230
Attention: Sebastian Button

PO No: OTL-15-030

Signed:

Stephen Sundeen
Chemistry Laboratory Manager

Date of Issue: 8/20/2015

Sample Details

Sample Log No:	W215-0901-01	**Sample Date:**	
Sample Designation:	Lignetics #1	**Sample Time:**	
Sample Recognized As:	Pellets	**Arrival Date:**	8/13/2015

Test Results

	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		5.05
Ash	ASTM D1102	wt. %	0.83	0.79
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.003	0.003
SO_2	Calculated	lb/mmbtu		0.007
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	18.20	16.28
Net Cal. Value at Const. Pressure	ISO 1928	J/g	18196	16282
Gross Cal. Value at Const. Vol.	ASTM E711	J/g	19492	18508
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8381	7957
Carbon	ASTM D5373	wt. %	49.23	46.74
Hydrogen*	ASTM D5373	wt. %	5.95	5.65
Nitrogen	ASTM D5373	wt. %	< 0.20	< 0.19
Oxygen*	ASTM D3176	wt. %	> 43.79	> 41.58
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft^3		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt.%		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

*Note: As received values do not include hydrogen and oxygen in the total moisture.

Comments

TARE SHEET - FILTERS

Date Placed in Dessicator: 1/15/16 16:30

Thermohygrometer ID #: 291

Cleaned By: S. Button

Balance ID #: 23

Audit Weight ID #: 131

Filter ID #	Date: 1/17/16 Time: 12:30 RH %: 14.1% T (°F): 78.1 Audit: 500.1	Date: 1/18/16 Time: 8:00 RH %: 16.1% T (°F): 79.1 Audit: 500.1	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
C338	120.6	120.5			[redacted]		
C339	120.8	120.9					
C340	120.4	120.3					
C341	120.6	120.6					
C342	120.7	120.7					
C343	120.5	120.4					
C344	120.9	121.0					
C345	120.9	120.8					
C346	120.5	120.5					
C347	120.5	120.4					
C348	121.3	121.3					
C349	120.7	120.6					
C350	120.0	119.9					
C351	120.4	120.4					
C352	120.9	120.8			2/23/16	0215PS050 E	1
	Initials: SB	Initials: SB	Initials:	Initials:			

Final Technician Signature: [signature]

Date: 1/18/16

TARE SHEET - FILTERS

Date Placed in Dessicator: 1/15/16 16:30

Thermohygrometer ID #: 291

Cleaned By: S. Button

Balance ID #: 23

Audit Weight ID #:

Filter ID #	Date: 2/8/16 Time: 1600 RH %: 14.5 T (°F): 25.0 Audit: 500.2	Date: 2/12/16 Time: 1530 RH %: 11.1 T (°F): 23.5 Audit: 500.2	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
C353	120.9	120.8			2/23/16	0215PS050E	1
C354	121.0	120.9			↓	↓	↓
C355	121.1	121.1					
C356	121.1	120.9					
C357	121.0	120.8					
C358	120.8	120.8					
C359	120.8	120.9					
C360	121.5	121.5					
C361	121.3	121.3					
C362	120.7	120.7					
C363	121.4	121.4					
C364	121.1	121.0					
C365	120.6	120.6					
C366	121.0	120.9					
C367	120.8	120.9					
	Initials:	Initials:	Initials:	Initials:			

[redacted]

Final Technician Signature:

Date: 2/12/16

TARE SHEET - PROBES

Date Placed in Dessicator: 11/5/15 1610

Thermohygrometer ID #: OMNI-00391

Cleaned By: B Davis

Balance ID #: OMNI 00023

Audit Weight ID #: OMNI-00283A

Probe ID #	Date: 1/12/16 Time: 1400 RH %: 15.6 T (°F): 74.2 Audit: 99.999 g	Date: 1/13/16 Time: 1000 RH %: 16.6 T (°F): 76.1 Audit: 100000.0	Date: 1/14/16 Time: 1130 RH %: 20.1 T (°F): 71.2 Audit: 100000.0	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
1	122770.9	122771.4	122771.5		[redacted]		
2	115017.4	115017.6	-				
OES 3	114771.2	114771.4	-				
4	114862.9	114863.7	114863.6				
6	~~115344.~~ 115354.4	115355.0	115355.0				
OES 6	113701.9	113702.7	113702.5				
7	114984.7	114984.9	-				
8	115596.4	115597.0	115597.1				
9	115693.4	115693.7	115693.5				
11	114191.9	114192.4	114192.4				
12	114286.8	114287.4	114287.5				
13	114324.5	114325.2	114325.0		2/23/16	0215PS050E	1
14	114555.4	114555.6	-		"	"	"
15	114347.9	114348.1	-		[redacted]		
18	114404.5	114405.2	114405.1				
	Initials: SB	Initials:	Initials:	Initials:			

Final Technician Signature: [signature]

Date: 1/14/16

O-RING TARES

Date Placed in Desiccator: 9/24/15 Technician: A. Kranitz Balance ID # 23

Thermo/Hygro meter ID #: 291 Audit Weight ID # 283A (Balance audit mfr. Std.: 500 ± 0.72)

O-Ring Size/ID# (47)	Date: 10/1 Time: 1300 RH%: 23.1 T (F): 74.1 Initials: AK	Date: 10/2 Time: 1030 RH%: 24.2 T (F): 73.6 Initials: A	Date: 10/5 Time: 1200 RH%: 16.1 T (F): 75.0 Initials: A	Date: Time: RH%: T (F): Initials:	Manufacturer	Appliance	Project No.	Run No.
R379	3390.4	3390.5	-		[redacted]			
R380	4172.4	4172.4	-					
R381	3377.6	3377.7	-					
R382	4320.0	4319.8	-					
R383	4121.7	4121.5	-					
R384	3325.9	3325.8	-					
R385	3356.2	3356.6	-		US Stove	5710	0215 PSOSDE	1
R386	4077.5	4077.2	4077.1		1	1	1	1
R387	3360.8	3360.4	3360.3		[redacted]			
R388	4127.6	4127.2	4127.2					
R389	3290.5	3290.3	-					
R390	3608.9	3609.0	-					
R391	4519.5	4519.1	4519.1					
R392	3345.6	3345.3	3345.1					
Audit :	5000.2	5000.1	5000.1					

Final Technician signature: [signature] Date: 10/5/15

Calibrations

EPA Method 28R, ASTM E2515, ASTM E2779

ID #	Lab Name/Purpose	Log Name	Attachment Type
23	Scale-Analytical Balance	Mettler Analytical Balance	Calibration Certificate
131	500 mg Weight	Ohaus Weight Standard, 500 mg	Calibration Certificate
132	10 lb Weight	Weight Standard, 10 lb.	Calibration Log
185	Platform Scale	Weigh-Tronix Platform Scale	Calibration Certificate
209	Barometer	Barometer – Princo	Equipment Record
283A	Calibration Weights	Troemner Metric Weight Standards	Calibration Certificate
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
410	Microtector	Dwyer Microtector	Equipment Record
420	Combustion Gas Analyzer	CAI Gas Analyzer	Equipment Record
559	Vaneometer	Dwyer Vaneometer	Equipment Record
592	Thermohygrometer	Omega Digital Thermohygrometer	Calibration Log

Certificate of Calibration

Certificate Number: **615462**

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

PO: **160070**
Order Date: **03/04/2016**
Authorized By: **N/A**

0723.01
Calibration

Property #: **OMNI-00023**
User: **N/A**
Department: **N/A**
Make: **Mettler**
Model: **AE200**
Serial #: **E17657**
Description: **Scale, 205g**
Procedure: **DCN 500818/500887**
Accuracy: **±0.0004g ±1 LSD**

Calibrated on: **03/04/2016**
*Recommended Due: **09/04/2016**
Environment: **20 °C 40 % RH**
* As Received: **Out of Tolerance**
* As Returned: **Within Tolerance**
Action Taken: **Calibrated**
Technician: **123**

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
723A	Rice Lake	1mg-200g (Class O)	Mass Set	12/01/2016	603626

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before							Accredited = ✓
Force							
	g	0.00100	0.0005	0.0015	0.0001	**0.0011** g	5.7E-04 ✓
	g	0.01000	0.0095	0.0105	0.0002	0.0102 g	5.7E-04 ✓
	g	0.10000	0.0995	0.1005	0.0002	0.1002 g	5.7E-04 ✓
	g	0.50000	0.4995	0.5005	0.0002	0.5002 g	5.7E-04 ✓
	g	1.00000	0.9995	1.0005	0.0002	1.0002 g	5.7E-04 ✓
	g	40.00000	39.9995	40.0005	0.0010	40.0010 g	5.7E-04 ✓
	g	80.00000	79.9995	80.0005	0.0019	80.0019 g	5.7E-04 ✓
	g	120.00000	119.9995	120.0005	0.0028	120.0028 g	5.7E-04 ✓
	g	160.00000	159.9995	160.0005	0.0039	160.0039 g	5.8E-04 ✓
	g	200.00000	199.9995	200.0005	0.0043	200.0043 g	5.7E-04 ✓
After		Reference	Min	Max	*Error		Accredited = ✓
	g	0.00100	0.0005	0.0015	0.0000	0.0010 g	5.7E-04 ✓
	g	0.01000	0.0095	0.0105	0.0000	0.0100 g	5.7E-04 ✓
	g	0.10000	0.0995	0.1005	0.0000	0.1000 g	5.7E-04 ✓
	g	0.50000	0.4995	0.5005	0.0001	0.4999 g	5.7E-04 ✓
	g	1.00000	0.9995	1.0005	0.0000	1.0000 g	5.7E-04 ✓
	g	40.00000	39.9995	40.0005	0.0002	40.0002 g	5.7E-04 ✓
	g	80.00000	79.9995	80.0005	0.0003	80.0003 g	5.7E-04 ✓
	g	120.00000	119.9995	120.0005	0.0002	120.0002 g	5.7E-04 ✓
	g	160.00000	159.9995	160.0005	0.0004	160.0004 g	5.8E-04 ✓
	g	200.00000	199.9995	200.0005	0.0004	200.0004 g	5.7E-04 ✓

Certificate of Calibration

Certificate Number: **547339**

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

ACCREDITED
0723.01
Calibration

PO: OTL-13-035
Order Date: 11/19/2013
Authorized By: N/A

Property #: OMNI-00131
User: N/A
Department: N/A
Make: Ohaus
Model: 500mg
Serial #: 27503
Description: Mass
Procedure: DCN 500901
Accuracy: CLASS F (±0.72mg)

Calibrated on: 12/02/2013
*Recommended Due: 12/02/2018
Environment: 20 °C 34 % RH
As Received: Within Tolerance
As Returned: Within Tolerance
Action Taken: Calibrated
Technician: 34

Remarks: * Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired

Refer to attachment for measurement results.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
432A	Sartorius	C-44	Microbalance 5.1g	03/11/2014	517747
723A	Rice Lake	1mg-200g (Class O)	Mass Set	09/05/2014	540048

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 12/06/2013 Rev # 14

Inspector

SCALE WEIGHT CALIBRATION DATA SHEET

Weight to be calibrated: 10 lb

ID Number: 132

Standard Calibration Weight: 10 lb

ID Number: 256

Scale Used: MTW-150K

ID Number: 353

Date: 2/19/13 By: A. Kravitz

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: 2/19/13

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

OMNI-Test Laboratories, Inc.
13327 NE Airport Way
Portland, OR 97230

Report Number: OMNE0321676151027

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Weigh-Tronix	WI-127	21676	185	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.2	QC033	10/27/15	N/A	10/2016

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 300 Tol: 0.4	Test Wt: HB44 Tol: HB44	Test Wt: 500 Tol: 0.2	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 18.8°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	1000.0	1000.0	0.16
700	700.0	700.0	0.16
500	500.0	500.0	0.13
200	200.0	200.0	0.13
100	100.0	100.0	0.11
50	50.0	50.0	0.11

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	10/28/13	10/2015	34XX

Permanent Information Concerning this Equipment:

Comments/Information Concerning this Calibration

Report prepared/reviewed by: J. Colacchio **Date:** 10/27/15

Technician: J. Colacchio
Signature:

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.

OMNI-Test Laboratories, Inc.
Beaverton, OR (503) 643-3788

Equipment Record

Name: Fortin Type Mercurial Barometer

Type of Equipment: Barometer

S/N: 0674 **OMNI ID #:** OMNI-00209

Manufacturer: PRINCO Instruments, Inc.

Is Manufacturer's manual available in the equipment file? : Yes, if not why?

Date Received: June 2000 **Date Placed in Service:** June 2000

Condition When Received: : New 9 Used 9 Reconditioned

Location: Lab

Location of Calibration Procedures: All PRINCO Fortin mercurial barometers have scales which are set at the time of manufacture to a near zero correction by comparison with a Fortin type mercurial barometer whose scales were calibrated traceable to NIST. If the barometer is not abused an any way , it should never go out of calibration.

Location of Dates/Results of Calibrations: If the barometer is not abused an any way , it should never go out of calibration. The barometer currently hangs on the wall and is never moved.

Location of Maintenance Procedures: Maintenance is performed on an "as needed" basis.

Dates / Results of Maintenance: Regularly scheduled maintenance is not required. Pre-service and post-service maintenance is conducted per QA Manual Section 5.3.5. To date, maintenance has not been required beyond the in-service maintenance prescribed in QA Manual Section 5.3.5.

Any Planned Maintenance? : No, if yes what:

Equipment History of any damage, malfunction, modification and/or repair (including a statement on the suitability of the equipment for testing): To date, this instrument has not been damaged, has not malfunctioned, has not been modified, and has not been repaired.

Certificate of Calibration

Certificate Number: **543402**

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: OTL-13-031
Order Date: 09/27/2013
Authorized By: N/A

Property #: OMNI-00283A
User: N/A
Department: N/A
Make: Troemner Inc
Model: 1mg-100g (Class F)
Serial #: 47883
Description: Mass Set, 21 Pc.
Procedure: DCN 500901
Accuracy: Class F

Calibrated on: 10/09/2013
*Recommended Due: 10/09/2018
Environment: 20 °C 41 % RH
As Received: Other - See Remarks
As Returned: Within Tolerance
Action Taken: Calibrated
Technician: 34

Remarks: * Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired

Changed set from a Class 4 to a Class F per Jeremy Clark.
Received missing 1g weight.
Refer to attachment for measurement results.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
432A	Sartorius	C-44	Microbalance 5.1g	03/11/2014	517747
479A	Sartorius	MC210S	Scale, 210g	02/22/2014	517755
503A	Rice Lake	1mg-200g (Class O)	Mass Set	12/07/2013	517746
723A	Rice Lake	1mg-200g (Class O)	Mass Set	09/05/2014	540048

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 10/11/2013 Rev # 14

Inspector

Thermal Metering System Calibration
Y Factor

Manufacturer:	APEX Instruments
Model:	XC-60-EP
Serial Number:	606001
OMNI Tracking No.:	OMNI-00335
Calibrated Orifice:	☐ Yes

Average Gas Meter y Factor	Orifice Meter dH@
1.001	N/A

Calibration Date:	01/07/16	
Calibrated by:	B. Davis	
Calibration Frequency:	Six month	
Next Calibration Due:	7/6/2016	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	29.98	"Hg
Signature/Date:	BD	1/7/16

Previous Calibration Comparision

Date	6/4/2015	Acceptable Deviation (5%)	Deviation
y Factor	1.001	0.05005	0.000
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.002
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	05-Nov-15	
	Calib. Value	0.9983	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	1.30	2.22	0.70
Initial Reference Meter	653.7	659.252	666.017
Final Reference Meter	659.162	665.997	671.748
Initial DGM	0	0	0
Final DGM	5.535	6.827	5.861
Temp. Ref. Meter (°F), Tr	68.0	67.0	67.0
Temperature DGM (°F), Td	78.0	79.0	80.0
Time (min)	34.0	32.0	49.0
Net Volume Ref. Meter, Vr	5.462	6.745	5.731
Net Volume DGM, Vd	5.535	6.827	5.861
Gas Meter y Factor =	**1.001**	**1.003**	**0.999**
Gas Meter y Factor Deviation (from avg.)	0.000	0.002	0.002
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: Flue draft box 00335

Maximum Range: 0.25 " wc ID Number: OMNI-00335

Calibration Instrument: Digital Manometer ID Number: OMNI-00396

Date: 1/8/16 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 - 0.05	0.035	0.034	0.001	0.4
20-40% Max. Range 0.05 - 0.10	0.072	0.064	0.008	3.2
40-60% Max. Range 0.10 - 0.15	0.150	0.145	0.005	2.0
60-80% Max. Range 0.15 - 0.20	0.200	0.192	0.008	3.2
80-100% Max. Range 0.20 - 0.25	0.235	0.226	0.009	3.6

*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: 1/8/16

Reviewed by: _____ Date: 1/11/16

Temperature Calibration
EPA Method 28R, ASTM 2515

BOOTH:	TEMPERATURE MONITOR TYPE:	EQUIPMENT NUMBER:
E1	National Instruments Type K data logger	OMNI-00335 - OMNI 00336

REFERENCE METER EQUIPMENT NUMBER:	Calibration Due Date:

CALIBRATION PERFORMED BY:	DATE:	AMBIENT TEMPERATURE:	BAROMETRIC PRESSURE:
B. Davis	1-8-16	66	30.16

Input Temperature (F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	Catalyst
0	0	0	0	0	0	-1	0
100	100	100	100	100	100	100	100
300	300	300	300	300	300	300	300
500	500	500	500	500	500	500	500
700	700	700	700	700	700	700	700
1000	1001	1001	1001	1001	1000	1000	1001

Input (F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stack
0	0	-1	0	-1	-1	-1
100	100	100	99	100	100	100
300	300	300	300	300	300	300
500	500	500	500	500	500	500
700	700	700	700	700	700	700
1000	1000	1000	1000	1000	1000	1000

Technician signature: _____ Date: 1/8/16

Reviewed By: _____ Date: 1/11/16

Thermal Metering System Calibration
Y Factor

Manufacturer:	APEX Instruments
Model:	XC-60-EP
Serial Number:	606001
OMNI Tracking No.:	OMNI-00336
Calibrated Orifice:	☐ Yes

Average Gas Meter y Factor	Orifice Meter dH@
1.001	N/A

Calibration Date:	01/07/16	
Calibrated by:	B. Davis	
Calibration Frequency:	Six month	
Next Calibration Due:	7/6/2016	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	29.98	"Hg
Signature/Date:	B.D. 1/7/16	

Previous Calibration Comparision

Date	6/4/2015	Acceptable Deviation (5%)	Deviation
y Factor	1.003	0.05015	0.002
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.002
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	05-Nov-15	
	Calib. Value	0.9983	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	0.51	1.00	1.84
Initial Reference Meter	671.748	679.511	686.563
Final Reference Meter	679.472	686.515	693.337
Initial DGM	0	0	0
Final DGM	7.822	7.133	6.878
Temp. Ref. Meter (°F), Tr	67.0	68.0	68.0
Temperature DGM (°F), Td	77.0	80.0	79.0
Time (min)	66.0	44.0	32.0
Net Volume Ref. Meter, Vr	7.724	7.004	6.774
Net Volume DGM, Vd	7.822	7.133	6.878
Gas Meter y Factor =	**1.003**	**1.000**	**0.999**
Gas Meter y Factor Deviation (from avg.)	0.002	0.001	0.002
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: Tunnel Static box 00336

Maximum Range: 1" wc ID Number: OMNI-00336

Calibration Instrument: Digital Manometer ID Number: OMNI-00396

Date: 1/8/16 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 - 0.2	0.128	0.133	0.005	0.5
20-40% Max. Range 0.2 - 0.4	0.382	0.387	0.005	0.5
40-60% Max. Range 0.4 - 0.6	0.576	0.574	0.002	0.2
60-80% Max. Range 0.6 - 0.8	0.749	0.747	0.002	0.2
80-100% Max. Range 0.8 - 1.0	0.870	0.864	0.006	0.6

*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: 1/11/16

Reviewed by: _____ Date: 1/11/16

Temperature Calibration
EPA Method 28R, ASTM 2515

BOOTH:	TEMPERATURE MONITOR TYPE:	EQUIPMENT NUMBER:
E1	National Instruments Type K data logger	OMNI-00335 - OMNI 00336

REFERENCE METER EQUIPMENT NUMBER:	Calibration Due Date:

CALIBRATION PERFORMED BY:	DATE:	AMBIENT TEMPERATURE:	BAROMETRIC PRESSURE:
B. Davis	1-8-16	66	30.16

Input Temperature (F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	Catalyst
0	0	0	0	0	0	-1	0
100	100	100	100	100	100	100	100
300	300	300	300	300	300	300	300
500	500	500	500	500	500	500	500
700	700	700	700	700	700	700	700
1000	1001	1001	1001	1001	1000	1000	1001

Input (F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stack
0	0	-1	0	-1	-1	-1
100	100	100	99	100	100	100
300	300	300	300	300	300	300
500	500	500	500	500	500	500
700	700	700	700	700	700	700
1000	1000	1000	1000	1000	1000	1000

Technician signature: _____ Date: 1/8/16

Reviewed By: _____ Date: 1/11/16

Equipment Record

Name: Microtector

Type of Equipment: Hook Gage Liquid Manometer with Micrometer Gage in Inches

Model: 1430

S/N: 115004-00 **OMNI ID #:** OMNI-00410

Manufacturer: Dwyer Instruments

Vendor/Retailer: Dwyer Instruments

Is Manufacturer's manual available in the equipment file? ☒ Yes, if not why?

Date Received: December 2007 **Date Placed in Service:** December 2007

Condition When Received: ☒ New ☐ Used ☐ Reconditioned

Location: shop

Location of Calibration Procedures: Calibrate prior to use using NIST Traceable standard OMNI-00033. "Zeroing" instructions in attached manual.

Location of Dates/Results of Calibrations: N/A

Location of Maintenance Procedures: Maintenance is performed on an "as needed" basis as determined by calibrations.

Dates / Results of Maintenance: Regularly scheduled maintenance is not required. Pre- and post-service maintenance is conducted per QA Manual Section 5.3.5. To date, maintenance has not been required beyond the in-service maintenance prescribed in QA Manual Section 5.3.5.

Any Planned Maintenance? ☒ No, if yes what:

Equipment History of any damage, malfunction, modification and/or repair (including a statement on the suitability of the equipment for testing): To date, this instrument has not been damaged, modified or repaired, nor has it malfunctioned.

Equipment Record

Name: Infrared Gas Analyzer

Type of Equipment: gas analyzer **Model:** 300 NDIR

S/N: A8P9073T **OMNI ID #:** OMNI-00420

Manufacturer: California Analytical Instruments

Vendor/Retailer: California Analytical Instruments

Is Manufacturer's manual available in the equipment file? ☒ Yes, if not why?

Date Received: 5/2009 **Date Placed in Service:** 6/2009

Condition When Received: ☒ New ☐ Used ☐ Reconditioned

Location: shop

Location of Calibration Procedures: Unit is calibrated prior to use using the procedures and specifications outlined in the instruction manual. Additional information avail in file OMNI-00419

Location of Dates/Results of Calibrations: See attached calibration sheets.

Location of Maintenance Procedures: Maintenance is performed on an "as needed" basis as determined by calibrations.

Dates / Results of Maintenance: Regularly scheduled maintenance is not required. Pre- and post-service maintenance is conducted per QA Manual Section 5.3.5. To date, maintenance has not been required beyond the in-service maintenance prescribed in QA Manual Section 5.3.5.

Any Planned Maintenance? ☒ No, if yes what:

Equipment History of any damage, malfunction, modification and/or repair (including a statement on the suitability of the equipment for testing): To date, this instrument has not been damaged, modified or repaired, nor has it malfunctioned.

Equipment Record

Name: Vaneometer Air Velocity Meter

Type of Equipment: Air Velocity Meter **Model:** 480

S/N: T36Z **OMNI ID #:** OMNI-00559

Manufacturer: Dwyer Instruments

Vendor/Retailer: Dwyer Instruments

Is Manufacturer's manual available in the equipment file? ☒ **Yes, if not why?** _____

Date Received: 9/5/2014 **Date Placed in Service:** 9/5/2014

Condition When Received: ☒ New ☐ Used ☐ Reconditioned ☐ Unknown

Location: Cabinet 1

Location of Calibration Procedures: The meter is equipped with a factory pre-calibrated vane. The vane is replaced at least every six months, or in case of damage.

Location of Dates/Results of Calibrations: See attached calibration record.

Location of Maintenance Procedures: Maintenance is performed on a six month basis by replacing the pre-calibrated vane.

Dates / Results of Maintenance: See attachments.

Any Planned Maintenance? ☒ **No, if yes what:** _____

Equipment History of any damage, malfunction, modification and/or repair (including a statement on the suitability of the equipment for testing): _____

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: 1/13/16 Technician: B Davis

Time in desiccate: 10:30 Recording time: 14:30

NIST Standard Temperature: 74.5 °F NIST Standard Humidity: ~~21.7~~ 19.2 (30)

Test Unit Temperature Reading: 74.4 °F Test Unit Humidity Reading: 16.8

Test unit OMNI- 00592 is X or was not ___ within acceptable limits.

Technician Signature: B Davis

Comments: Hygrometer OMNI-00291 was used to verify new unit. A difference of 2.4% RH was found, this result is within ± 4%, with a full scale of 100% for OMNI-00291, and 95% for OMNI-00592

Example Calculations

Equations and Sample Calculations – ASTM E2779 & E2515

Manufacturer:	US Stove
Model:	5710
Run:	1
Category:	[Integrated]

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations 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_{Bdb} – Weight of test fuel burned during test run, dry basis, kg

M_{BSidb} – Weight of test fuel burned during test run segment *i* , dry basis, kg

BR – Average dry burn rate over full integrated test run, kg/hr

BR_{Si} – Average dry burn rate over test run segment *i* , kg/hr

V_s – Average gas velocity Dry burn rate, kg/hr

Q_{sd} – Average gas flow ra Total particulate matter collected, mg

$V_{m(std)}$ – Volume of Gas S Volume of gas sampled corrected to standard conditions, dscf

m_n – Total Particulate Ma Average dilution tunnel gas velocity, ft/sec

C_s - Concentration of part Particulate concentration, g/dscf

E_T – Total Particulate Em Dilution tunnel gas flow rate, dscf/min

PR - Proportional Rate Va Particulate emission rate, lbs/hr

PM_R – Average particulat Total particulate emissions, grams

PM_F – Average particulat Average fuel load moisture content, %

M_{Bdb} – Weight of test fuel burned during test run, dry basis, kg
ASTM E2779 equation (1)

$$M_{Bdb} = (M_{Swb} - M_{Ewb})(100/(100 + FM))$$

Where,

FM = average fuel moisture of test fuel, % dry basis
M_{Swb} = weight of test fuel in hopper at start of test run, wet basis, kg
M_{Ewb} = weight of test fuel in hopper at end of test run, wet basis, kg

Sample Calculation:

5.1 %
M_{Swb} = 16.7 lbs
M_{Ewb} = 4.7 lbs
0.4536 = Converstion factor from lbs to kg

M_{Bdb} = [(16.7 x 0.4536) - (4.7 x 0.4536)] (100/(100 + 5.05)

M_{Bdb} = **5.2** kg

M_{BSidb} – Weight of test fuel burned during test run segment *i* , dry basis, kg
ASTM E2779 equation (2)

$$M_{BSidb} = (MS_{Siwb} - M_{ESiwb})(100/(100 + FM))$$

Where,

M_{SSiwb} = weight of test fuel in hopper at start of test run segment *i* , wet basis, kg

M_{ESiwb} = weight of test fuel in hopper at end of test run segment *i* , wet basis, kg

Sample Calculation (from medium burn rate segment):

FM = 5.1 %

M_{SSiwb} = 13.2 lbs

M_{ESiwb} = 9.8 lbs

0.4536 = Converstion factor from lbs to kg

M_{BSidb} = [(13.2 x 0.4536) - (9.8 x 0.4536)] (100/(100 + 5)

M_{BSidb} = **1.5** kg

BR – Average dry burn rate over full integrated test run, kg/hr
ASTM E2779 equation (3)

$$BR = \frac{60\ M_{Bdb}}{\theta}$$

Where,

θ = Total length of full intergrated test run, min

Sample Calculation:

M_{Bdb} = 5.18 kg

θ = 366 min

$$BR = \frac{60 \times 5.18}{366}$$

BR = **0.85** kg/hr

BR_{Si} – Average dry burn rate over test run segment *i* , kg/hr
ASTM E2779 equation (4)

$$BR_{Si} = \frac{60\ M_{BSidb}}{\theta_{Si}}$$

Where,

θ_{Si} = Total length of test run segment *i* , min

Sample Calculation (from medium burn rate segment):

M_{BSidb} = 1.47 kg

θ = 121 min

$$BR = \frac{60 \times 1.47}{121}$$

BR = **0.73** kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec
ASTM E2515 equations (9)

$$V_s = F_p \times K_p \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_s}{P_s \times M_s}}$$

Where:

F_p	=	Adjustment 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 diltuion 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:

$$Fp = \frac{11.68}{13.80} = 0.847$$

$$V_s = 0.847 \times 85.49 \times 0.99 \times 0.205 \times \left(\frac{89.5 + 460}{\left(30.39 + \frac{-0.14}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **11.64** 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)

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_s} \times \frac{P_s}{P_{std}}$$

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 diltuion tunnel, = P_{bar} + P_g , in Hg
T_s	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 11.64 \times 0.196 \times \frac{528}{89.5 + 460} \times \frac{30.4 + \frac{-0.14}{13.6}}{29.92}$$

Q_{sd} = **7868.7** dscf/hr

$V_{m(std)}$ – Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf
ASTM E2515 equation (6)

$$V_{m(std)} = K_1 \times V_m \times Y \times \frac{P_{bar} + \left(\frac{\Delta H}{13.6}\right)}{T_m}$$

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:

$$V_{m(std)} = 17.64 \times 54.352 \times 1.001 \times \frac{\left(30.39 + \frac{0.91}{13.6}\right)}{(79.2 + 460)}$$

$V_{m(std)}$ = **54.214** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 55.031 \times 1.001 \times \frac{\left(30.39 + \frac{1.13}{13.6}\right)}{(79.8 + 460)}$$

$V_{m(std)}$ = **54.866** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{\left(30.39 + \frac{0.00}{13.6}\right)}{(69.4 + 460)}$$

$V_{m(std)}$ = **0.000** 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 + 1.3 + 0.0

m_n = 1.3 mg

Using equation for Train 1 (remainder):

m_n = 0.0 + 4.3 + 1.9

m_n = 6.2 mg

Train 1 Aggregate = **7.5** mg

Using equation for Train 2:

m_n = 0.0 + 6.3 + 0.5

m_n = **6.8** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions, g/dsc
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:

$$C_s = 0.001 \times \frac{7.5}{54.21}$$

C_s = **0.00014** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{6.8}{54.87}$$

C_s = **0.00012** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{0.00}$$

C_r = **0.000000** 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 = (0.000138 - 0.000000) x 7868.7 x 366 /60

E_T = 6.64 g

For Train 2

E_T = (0.000124 - 0.000000) x 7868.7 x 366 /60

E_T = 5.95 g

Average

E = 6.29 g

Total emission values shall not differ by more than 7.5% from the total average emissions

7.5% of the average =	0.47
Train 1 difference =	0.35
Train 2 difference =	0.35

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):

$$PR = \left(\frac{366 \times 0.14 \times 11.64 \times (95.0 + 460) \times (79.2 + 460)}{1 \times 54.35 \times 11.70 \times (89.5 + 460) \times (73.0 + 460)} \right) \times 100$$

PR = 96 %

PM_R – Average particulate emissions for full integrated test run, g/hr
ASTM E2779 equation (5)

$$PM_R = 60 (E_T/\theta)$$

Where,

E_T = Tota particulate emissions, grams

θ = Total length of full intergrated test run, min

Sample Calculation:

E_T (Dual train average) = 6.29 g

θ = 366 min

$PM_R = 60$ x (6.29 / 366)

PM_R = **1.03** g/hr

PM_F – Average particulate emission factor for full integrated test run, g/dry kg of fuel burned
ASTM E2779 equation (6)

$$PM_F = E_T/M_{Bdb}$$

Where,

E_T = Tota particulate emissions, grams

M_{Bdb} = Weight of test fuel burned during test run, dry basis, kg

Sample Calculation:

E_T (Dual train average) = 6.29 g

M_{Bdb} = 5.18 kg

PM_F = 6.29 / 5.18)

PM_F = **1.21** g/kg

Section 4

Labeling & Owner's Manual

LABELING VENDOR NOTES:

MATERIAL: 0.012 THK. ALUMINUM / 3M 9672 ADEHESIVE BACKED.

FINISH: BLACK BACKGROUND, ALUMINUM TO SHOW THRU (ALL TEXT AND ILLUSTRATIONS) UNLESS NOTED OTHERWISE.

TEXT: ALL TEXT TO BE 0.06 HIGH UNLESS OTHERWISE SPECIFIED

HEATER MANUFACTURER INSTRUCTIONS:

ALL PLATES ARE TO BE STAMPED BY THE HEATER MFG. WITH A FACTORY IDENTIFIER NUMBER ISSUED BY USSC. (i.e. 00000-XX)

WHEN LABEL IS APPLIED TO THE HEATER, IT IS TO BE FIRMLY PRESSED OVER THE ENTIRE SURFACE TO ENSURE IT PROPERLY ADHERES TO THE MATING SURFACE OF THE HEATER.

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	3/3/16	SEH
B	ADDED VG5710, AP5710, SP5710, SP51 NEW OMNI LOGO CHANGED CORRECTED CERTIFIED TO MADE 2020 UPDATE OMNI LOGO ADDED EFFICIENCY	4/4/18 5/17/19 10/18/19	SEH
C	CHANGED TO PFS REMOVED SP5710 & SP51	1/29/20	SEH
D	REMOVED (UM) HUD AND CONTRTOL #'S	5/20/20	SEH

1 INCH SQ. BORDER, LOGS AND FLAMES ARE TO BE RED

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

SEE NOTE

0.10 TEXT HEIGHT

CAUTION: HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN AND CLOTHING AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS. KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM THE APPLIANCE.

CAUTION: OPERATE THIS UNIT ONLY WITH THE FUEL HOPPER LID CLOSED. FAILURE TO DO SO MAY RESULT IN MISSION OF PRODUCTS OF COMBUSTION FROM THE HOPPER UNDER CERTAIN CONDITIONS. DO NOT OVERFILL HOPPER.

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ATTENTION: FAIRE FONCTIONNER CETTE UNITÉ UNIQUEMENT AVEC LE COUVERCLE DE TRÉMIE DU COMBUSTIBLE FERMÉ. NES PAS LE FAIRE PEUT ENTRÎNER DES ÉMISSIONS DE PRODUITS DE LA TRÉMIE DANS CERTAINES CONDITIONS. NE PAS SURCHARGER LA TRÉMIE.

CAUTION: Moving parts may cause injury. Do not operate with the side panels or repair panel removed. Do not place hands or fingers in the moving auger area at the bottom of the hopper. Do not obstruct the combustion air inlet opening at the rear of the appliance. DANGER: Risk of electrical shock. Disconnect power before servicing unit. Route power supply cord away from the appliance. Keep viewing and ash removal doors tightly closed during operation. Replace glass with 5mm ceramic glass ONLY. IMPORTANT: When the hopper lid is open, the auger will stop. Close the hopper lid to allow system to operate. Provide a source of fresh air to the room where the appliance is installed. Do not obstruct the space beneath the appliance. Inspect and clean exhaust vent system frequently in accordance with manufacturer's instructions. Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not install in a sleeping room. Do not connect this unit to a chimney flue serving another appliance. Refer to local building codes and the installation and operating instructions for precautions required for passing an exhaust venting system through a combustible wall or ceiling. Components required for residential or mobile home installation: Model PL Vent Chimney and Components - 3"/75mm or 4" 100mm diameter. START-UP / Automatic Ignition - Position damper between closed and 1/4" open. Then press the ON/OFF button. Green power light begins to blink. When the light becomes solid, set the desired heat level. Damper may need to be adjusted based upon heat level. SHUT DOWN: Press the "OFF" button. Unit will shutdown automatically after fuel burns out and unit cools down.. This wood heater needs periodic inspection and repair. 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 the operating instructions in the owner's manual. Warning: Disconnect the electric power before installation and servicing.

ATTENTION: Les pièces en mouvement peuvent provoquer des blessures. Ne pas faire fonctionner cette unité avec les panneaux latéraux ou le panneau arrière retirés. Ne pas placer les mains ou les doigts à l'intérieur de la zone de la vis sans fin en bas de la trémie. N'obstruez pas l'admission d'air de combustion. DANGER: Risque de choc électrique. Déconnecter l'alimentation avant de réaliser l'entretien de l'unité. Faire passer le cordon d'alimentation à distance de l'unité. Maintenir les portes d'inspection et de retrait des cendres bien fermées pendent le fonctionnement. Remplacer le verre uniquement par du verre céramique (5mm). IMPORTANT: Quand le couvercle de la trémie est ouvert, la vis sans fin d'alimentation s'arrêtera. Fermer le couvercle pour permettre au système de fonctionner. Fournir une source d'air frais dans le chambre. Ne pas obsturer l'espace sous l'app. de chauffage. Inspecter et nettoer fréquemment le système de ventilation d'évacuation conformément aux instructions du fabricant. Installer et utiliser conformément aux instructions du fabricant uniquement. Contacter les fonctionnaires locaux de construction ou fonctionnaires des services d'incendie concernant les limitations et l'inspection de l'installation dans votre maison. Ne pas installer dans une chambre à coucher. Ne pas connecter cette unité à un carneau de chiminée utilisé pour un autre appareil. Consulter le code local de construction et les instructions du fabricant pour les précautions requises pour passer à travers un mur ou un plafond combustible. Composants nécessaires pour une installation dans une résidence ou une maison mobile: Ventilation modèle PL chiminée et composants - Diamètre de 3"/75mm ou 4"/100mm. MISE en MARCHE / Allumage Automatique - Ajuster la tige du régulateur de tirage entre la position fremée et 6mm(1/4 po). Appuyer sur le buoton ON/OFF. Le voyant vert se met à clignoter. Lorsque le voyant s'arrête de clignoter et reste allumé, régler le thermostat au niveau souhaité. Régler le régulateur de tirage suivant le niveau de chaleur souhaité. ARRÊT: Placer le réglage de chaleur sur "OFF". L'unité s'éteindra automatiquement une fois que le combustible sera consumé et que l'unité ait refroidi. Ce poêle à bois doit inspection et la réparation périodique. Pour un fonctionnement correct, consultez le manuel du propriétaire pour plus d'informations. Ce est contre les règlements fédéraux pour faire fonctionner ce poêle à bois d'une manière incompatible avec les instructions d'utilisation dans le manuel du propriétaire. Avertissement: Deconnecter du circuit d'alimentation electrique avant l'installation et l'entretien.

MODÈL / MODÈLE : 5710, AP5710, VG5710

[redacted]
SERIAL NUMBER / NUMÉRO DU SÉRIE

[redacted]
DATE OF MANUFACTURE / DATE DE FABRICATION

U.S. Stove Company
227 Industrial Park Road, South Pittsburg, TN 37380
Phone: (800) 750-2723, Web: www.usstove.com

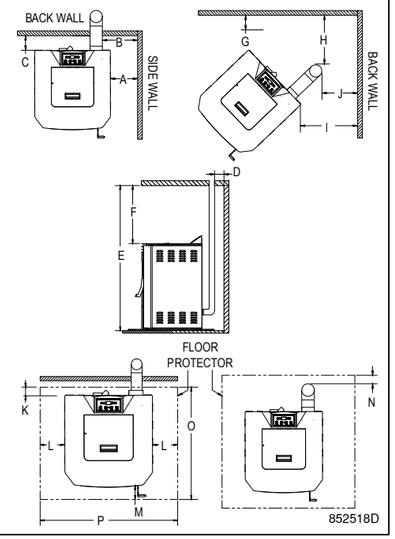
Certified to: ASTM Std E1509-12 (2017)
Certified to: ULC Std S627-00
Room Heater, Pellet Fuel-Burning Type, Also for Use in Mobile Homes. (US Only). For use with wood pellet fuel only. Use of other fuels will void warranty. /
Appareil de chauffage inséré de combustible solide/de type de boulettes. l'installation dans les maisons mobile. (USA only). Pour Utilisation avec dec granulés uniquement! L'utilisation d'autres combustibles annulera la garantie.

DO NOT REMOVE OR COVER THIS LABEL / NE PAS RETIRER OU COUVRIR CETTE ÉTIQUETTE

PFS C US
Report No. / Rapport N° F19-549
ELECTRICAL RATING: 110-120Vac, 60Hz, 3A

ENVIRONMENTAL PROTECTION AGENCY
Certified to comply with 2020 particulate emission standards.
Tested to ASTM E2779-10 & ASTM E2515-17 at 1.0 g/hr. Efficiency of 69%.

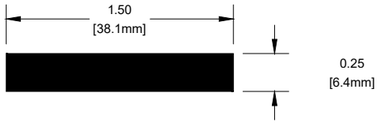
Clearances to Combustibles: Residential and Mobile Home Dégagements Combustibles: Dans Une Résidence ou Une Maison Mobile		
A	Side Wall to Stove/Mur Side à Poêle	10" (254mm)
B	Side Wall to Vent Pipe/Mur latéral tuyau d'évent	11.5" (292mm)
C	Back Wall to Stove/Mur Retour à poêle	3" (76mm)
D	Back Wall to Vent Pipe/Paroi arrière tuyau d'évent	11.875" (302mm)
E	Ceiling to Floor /Sol au plafond	84" (2134mm)
F	Ceiling to Stove/Plafond à Stove	53.875" (1434mm)
G	(Corner Install) Side Wall to Stove/(À l'angle d'installation) paroi latérale pour poêle	7.5" (191mm)
H	(Corner Install) Side Wall to Vent Pipe/(À l'angle d'installation) paroi latérale tuyau d'évent	11.25" (286mm)
I	(Corner Install) Back Wall to Stove/(À l'angle d'installation) mur Retour au poêle	7.5" (191mm)
J	(Corner Install) Back Wall to Vent Pipe/(À l'angle d'installation) mur Retour à tuyau de ventilation	3" (76mm)
K	Back to Stove/Retour à Stove	1" (26mm) Canada 8" (204mm)
L	Side to Stove/Side à Poêle	U.S, 6" (153mm) Canada 8" (204mm)
M	Front to Stove/Avant de poêle	U.S, 6" (153mm) Canada 8" (204mm)
N	Back to Flue/Retour à combustion	2" (51mm)
O	Overall Length/Longueur totale	31" (788mm)
P	Overall Width/Largeur totale	38" (966mm)



5.50

12.00

SERIAL & DATE BOX DETAIL



TOLERANCES EXCEPT AS NOTED
HOLES ± .005"
DECIMAL .XX = 0.03 .XXX = 0.010
ANGULAR ± 2°

DESCRIPTION: SEE NOTES
FINISH: SEE NOTES
REFERENCE: 5710, AP5710, VG5710 SP5710, SP51
SCALE: 1:1
DWN BY: SEH
DATE: 3/3/16
SIZE: B
REV: D

UNITED STATES STOVE COMPANY
ESTABLISHED 1869

TITLE: CERTIFICATION LABEL
NUMBER: 852518
SHEET: 1 OF 1

LABELING VENDOR NOTES:

MATERIAL: 0.012 THK. ALUMINUM / 3M 9672 ADEHESIVE BACKED.

FINISH: BLACK BACKGROUND, ALUMINUM TO SHOW THRU (ALL TEXT AND ILLUSTRATIONS) UNLESS NOTED OTHERWISE.

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REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	4/29/16	SEH
B	CHANGED CORRECTED CERTIFIED TO AND MADE 2020 UPDATE OMNI LOGO ADDED EFFICIENCY	5/17/19 10/18/19	SEH
C	CHANGED TO PFS	1/30/20	SEH
D	REMOVED (UM) 84-HUD & CONTROL #	5/20/20	SEH
E	CHANGED ULC-S627-00-REV1	1/14/21	SEH

1 INCH SQ. BORDER, LOGS AND FLAMES ARE TO BE RED

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

SEE NOTE

0.10 TEXT HEIGHT

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0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

ATTENTION: CHAUD PENDANT LE FONCTIONNEMENT-NE PAS TOUCHER MAINTENIR LES ENFANTS ET LES VÊTEMENTS ÉLOIGNÉS. TOUT CONTACT PEUT ENTRAÎNER DES BRÛLURES. CONSULTER LA PLAQUE SIGNALÉTIQUE ET LES INSTRUCTIONS. MAINTENIR LE MOBILIER ET LES AUTRES MATIÈRES COMBUSTIBLES À BONNE DISTANCE DE L'APPAREIL.

ATTENTION: FAIRE FONCTIONNER CETTE UNITÉ UNIQUEMENT AVEC LE COUVERCLE DE TRÉMIE DU COMBUSTIBLE FERMÉ. NES PAS LE FAIRE PEUT ENTRÎNER DES ÉMISSIONS DE PRODUITS DE LA TRÉMIE DANS CERTAINES CONDITIONS. NE PAS SURCHARGER LA TRÉMIE.

CAUTION: Moving parts may cause injury. Do not operate with the side panels or repair panel removed. Do not place hands or fingers in the moving auger area at the bottom of the hopper. Do not obstruct the combustion air inlet opening at the rear of the appliance. DANGER: Risk of electrical shock. Disconnect power before servicing unit. Route power supply cord away from the appliance. Keep viewing and ash removal doors tightly closed during operation. Replace glass with 5mm ceramic glass ONLY. IMPORTANT: When the hopper lid is open, the auger will stop. Close the hopper lid to allow system to operate. Provide a source of fresh air to the room where the appliance is installed. Do not obstruct the space beneath the appliance. Inspect and clean exhaust vent system frequently in accordance with manufacturer's instructions. Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not install in a sleeping room. Do not connect this unit to a chimney flue serving another appliance. Refer to local building codes and the installation and operating instructions for precautions required for passing an exhaust venting system through a combustible wall or ceiling. Components required for residential or mobile home installation: Model PL Vent Chimney and Components - 3"/75mm or 4" 100mm diameter. START-UP / Automatic Ignition - Position damper between closed and 1/4" open. Then press the ON/OFF button. Green power light begins to blink. When the light becomes solid, set the desired heat level. Damper may need to be adjusted based upon heat level. SHUT DOWN: Press the "OFF" button. Unit will shutdown automatically after fuel burns out and unit cools down.. This wood heater needs periodic inspection and repair. 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 the operating instructions in the owner's manual. Warning: Disconnect the electric power before installation and servicing.

ATTENTION: Les pièces en mouvement peuvent provoquer des blessures. Ne pas faire fonctionner cette unité avec les panneaux latéraux ou le panneau arrière retirés. Ne pas placer les mains ou les doigts à l'intérieur de la zone de la vis sans fin en bas de la trémie. N'obstruez pas l'admission d'air de combustion. DANGER: Risque de choc électrique. Déconnecter l'alimentation avant de réaliser l'entretien de l'unité. Faire passer le cordon d'alimentation à distance de l'unité. Maintenir les portes d'inspection et de retrait des cendres bien fermées pendent le fonctionnement. Remplacer le verre uniquement par du verre céramique (5mm). IMPORTANT: Quand le couvercle de la trémie est ouvert, la vis sans fin d'alimentation s'arrêtera. Fermer le couvercle pour permettre au système de fonctionner. Fournir une source d'air frais dans le chambre. Ne pas obsturer l'espace sous l'app. de chauffage. Inspecter et nettoer fréquemment le système de ventilation d'évacuation conformément aux instructions du fabricant. Installer et utiliser conformément aux instructions du fabricant uniquement. Contacter les fonctionnaires locaux de construction ou fonctionnaires des services d'incendie concernant les limitations et l'inspection de l'installation dans votre maison. Ne pas installer dans une chambre à coucher. Ne pas connecter cette unité à un carneau de cheminée utilisé pour un autre appareil. Consulter le code local de construction et les instructions du fabricant pour les précautions requises pour passer à travers un mur ou un plafond combustible. Composants nécessaires pour une installation dans une résidence ou une maison mobile: Ventilation modèle PL cheminée et composants - Diamètre de 3"/75mm ou 4"/100mm. MISE en MARCHE / Allumage Automatique - Ajuster la tige du régulateur de tirage entre la position fremée et 6mm(1/4 po). Appuyer sur le buoton ON/OFF. Le voyant vert se met à clignoter. Lorsque le voyant s'arrête de clignoter et reste allumé, régler le thermostat au niveau souhaité. Régler le régulateur de tirage suivant le niveau de chaleur souhaité. ARRÊT: Placer le réglage de chaleur sur "OFF". L'unité s'éteindra automatiquement une fois que le combustible sera consumé et que l'unité ait refroidi. Ce poêle à bois doit inspection et la réparation périodique. Pour un fonctionnement correct, consultez le manuel du propriétaire pour plus d'informations. Ce est contre les règlements fédéraux pour faire fonctionner ce poêle à bois d'une manière incompatible avec les instructions d'utilisation dans le manuel du propriétaire. Avertissement: Deconnecter du circuit d'alimentation electrique avant l'installation et l'entretien.

ENVIRONMENTAL PROTECTION AGENCY
Certified to comply with 2020 particulate emission standards.
Tested to ASTM E2779-10 & ASTM E2515-17 at 1.0 g/hr. Efficiency of 69%.

Serial No. / N° de série

Manufacture Date / Date de Fabrication

MODEL / MODÈLE : 5501S

Certified to: ASTM Std E1509-12 (2017),
Certified to: ULC-S627-00-REV1
Room Heater, Pellet Fuel-Burning Type, Also for Use in Mobile Homes. For use with wood pellet fuel only. Use of other fuels will void warranty. /
Appareil de chauffage inséré de combustible solide/de type de boulettes. l'installation dans les maisons mobile. Pour Utilisation avec dec granulés uniquement! L'utilisation d'autres combustibles annulera la garantie.

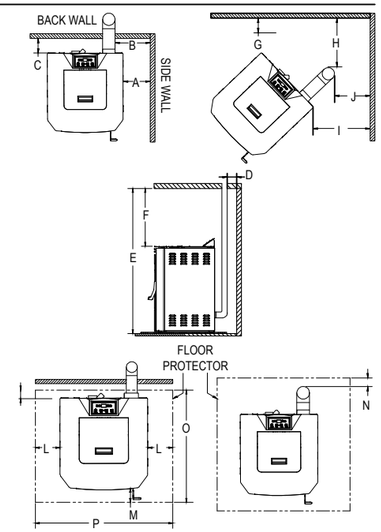
U.S. Stove Company
227 Industrial Park Road, South Pittsburg, TN 37380
Phone: (800) 750-2723, Web: www.usstove.com

PFS C US
Report no. / Rapport No.: F19-549

ELECTRICAL RATING: 110-120Vac, 60Hz, 3A

DO NOT REMOVE OR COVER THIS LABEL / NE PAS RETIRER OU COUVRIR CETTE ÉTIQUETTE

Clearances to Combustibles: Residential and Mobile Home / Dégagements Combustibles: Dans Une Résidence ou Une Maison Mobile		
A	Side Wall to Stove/Mur Side à Poêle	10" (254mm)
B	Side Wall to Vent Pipe/Mur latéral tuyau d'évent	11.5" (292mm)
C	Back Wall to Stove/Mur Retour à poêle	3" (76mm)
D	Back Wall to Vent Pipe/Paroi arrière tuyau d'évent	11.875" (302mm)
E	Ceiling to Floor /Sol au plafond	84" (2134mm)
F	Ceiling to Stove/Plafond à Stove	53.875" (1434mm)
G	(Corner Install) Side Wall to Stove/(À l'angle d'installation) paroi latérale pour poêle	7.5" (191mm)
H	(Corner Install) Side Wall to Vent Pipe/(À l'angle d'installation) paroi latérale tuyau d'évent	11.25" (286mm)
I	(Corner Install) Back Wall to Stove/(À l'angle d'installation) mur Retour au poêle	7.5" (191mm)
J	(Corner Install) Back Wall to Vent Pipe/(À l'angle d'installation) mur Retour à tuyau de ventilation	3" (76mm)
K	Back to Stove/Retour à Stove	1" (26mm) Canada 8" (204mm)
L	Side to Stove/Side à Poêle	U.S, 6" (153mm) Canada 8" (204mm)
M	Front to Stove/Avant de poêle	U.S, 6" (153mm) Canada 8" (204mm)
N	Back to Flue/Retour à combustion	2" (51mm)
O	Overall Length/Longueur totale	31" (788mm)
P	Overall Width/Largeur totale	38" (966mm)

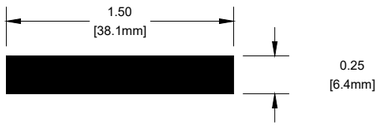


852474E

5.50

12.00

SERIAL & DATE BOX DETAIL



TOLERANCES EXCEPT AS NOTED
HOLES ± .005"
DECIMAL .XX = 0.03 XXX = 0.010
ANGULAR ± 2°

DESCRIPTION: SEE NOTE
FINISH: SEE NOTE
REFERENCE: 5501S
SCALE: 1:1
DWN BY: SEH
DATE: 4/29/16
SIZE: B
REV: E

UNITED STATES STOVE COMPANY
ESTABLISHED 1869

TITLE: CERTIFICATION LABEL
NUMBER: 852474
SHEET: 1 OF 1

UNITED STATES STOVE Co
ESTª 1869

MODEL: 5710

- PLEASE READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS APPLIANCE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY, OR EVEN DEATH.
- CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT OBTAINING PERMITS, RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.
- SAVE THESE INSTRUCTIONS. THIS MANUAL WILL HELP YOU TO OBTAIN EFFICIENT, DEPENDABLE SERVICE FROM THE HEATER, AND ENABLE YOU TO ORDER REPAIR PARTS CORRECTLY. KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

ALL PICTURES SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL PRODUCT MAY VARY DUE TO PRODUCT ENHANCEMENT.

This manual is subject to change without notice.

PFS® C US

Report #: F19-549

Certified to: ASTM E1509-12 (2017) and Certified to: ULC-S627-00

This unit is not intended to be used as a primary source of heat.

U.S. Environmental Protection Agency
Certified to comply with 2020 particulate emissions standards.

⚠CALIFORNIA PROPOSITION 65 WARNING:
This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause cancer, birth defects and/or other reproductive harm. For more information, go to www.P65warnings.ca.gov

U.S. Stove Company
227 Industrial Park Road, South Pittsburg, TN 37380
Phone 800-750-2723 www.usstove.com

852517J-2302J

Safety Precautions

- IMPORTANT: Read this entire manual before installing and operating this product. Failure to do so may result in property damage, bodily injury, or even death. Proper installation of this stove is crucial for safe and efficient operation.
- Install vent at clearances specified by the vent manufacturer.
- Do not connect the pellet vent to a vent serving any other appliance or stove.
- Do not install a flue damper in the exhaust venting system of this unit.
- Use of outside air is not required for this unit.
- Contact your local building officials to obtain a permit and information on any additional installation restrictions or inspection requirements in your area.
- Do not throw this manual away. This manual has important operating and maintenance instructions that you will need at a later time. Always follow the instructions in this manual.
- This appliance is designed for the use of pelletized fuel that meet or exceed the standard set by the Pellet Fuel Institute(PFI).
- Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or 'freshen up' a fire in this stove. Keep all such liquids well away from the stove while it is in use.
- A working smoke detector must be installed in the same room as this product.
- Install a smoke detector on each floor of your home; incase of accidental fire from any cause it can provide time for escape.
- The smoke detector must be installed at least 15 feet (4,57 M) from the appliance in order to prevent undue triggering of the detector when reloading.
- Do not unplug the stove if you suspect a malfunction. Turn the ON/OFF SWITCH to "OFF' and contact customer service.
- Your stove requires periodic maintenance and cleaning (see "MAINTENANCE "). Failure to maintain your stove may lead to improper and/or unsafe operation.
- Disconnect the power cord before performing any maintenance! NOTE: Turning the ON/OFF Switch to "OFF" does not disconnect all power to the electrical components of the stove.
- Never try to repair or replace any part of the stove unless instructions for doing so are given in this manual. All other work should be done by a trained technician.
- Do not operate your stove with the viewing door open. The auger will not feed pellets under these circumstances and a safety concern may arise from sparks or fumes entering the room.
- Allow the stove to cool before performing any maintenance or cleaning. Ashes must be disposed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible surface or on the ground, well away from all combustible materials, pending final disposal.
- The exhaust system should be checked monthly during the burning season for any build-up of soot or creosote.
- Do not touch the hot surfaces of the stove. Educate all children on the dangers of a high-temperature stove. Young children should be supervised when they are in the same room as the stove.
- The hopper and stove top will be hot during operation; therefore, you should always use some type of hand protection when refueling your stove.
- A power surge protector is required. This unit must be plugged into a 110 - 120V, 60 Hz grounded electrical outlet. Do not use an adapter plug or sever the grounding plug. Do not route the electrical cord underneath, in front of, or over the heater. Do not route the cord in foot traffic areas or pinch the cord under furniture.
- The heater will not operate during a power outage. If a power outage does occur, check the heater for smoke spillage and open a window if any smoke spills into the room.
- The feed door must be closed and sealed during operation.
- Never block free airflow through the open vents of the unit.
- Keep foreign objects out of the hopper.
- The moving parts of this stove are propelled by high torque electric motors. Keep all body parts away from the auger while the stove is plugged into an electrical outlet. These moving parts may begin to move at any time while the stove is plugged in.
- Do not place clothing or other flammable items on or near this stove.
- When installed in a mobile home, the stove must be grounded directly to the steel chassis and bolted to the floor. WARNING - THIS UNIT MUST NOT BE INSTALLED IN THE BEDROOM. CAUTION - The structural integrity of the mobile home floor, wall, and ceiling/roof must be maintained.
- This appliance is not intended for commercial use.
- CAUTION: Burning fuel creates carbon monoxide and can be hazardous to your health if not properly vented.
- *This appliance is a freestanding heater. It is not intended to be attached to any type of ducting. It is not a furnace.

Specifications

Heating Specifications	
Fuel Burn Rate* (lowest setting)	1.5 lbs./hr. (0.7 kg/hr)
Burn Time (lowest setting)	13 hrs. (approximate)
Hopper Capacity	20 lbs. (9.1kg)
Flue Size	3" or 4"

* Pellet size may effect the actual rate of fuel feed and burn times. Fuel feed rates may vary by as much as 20%. Use PFI listed fuel for best results.

Dimensions	
Height	30.125" (766 mm)
Width	18.5" (47 mm)
Depth	20.375" (52 mm)
Weight	128lbs

Electrical Specifications	
Electrical Rating	110-120 volts ac, 60 HZ, 3.0 Amps
Watts (operational)	125
Watts (igniter running)	310

FUEL CONSIDERATIONS

Your pellet stove is designed to burn premium hardwood pellets that comply with the Pellet Fuel Institute (PFI) standards (minimum of 40 lbs density per cubic ft, 1/4" to 5/16" diameter, length no greater than 1.5", not less than 8,200 BTU/lb, moisture under 8% by weight, ash under 1% by weight, and salt under 300 parts per million). Pellets that are soft, contain excessive amounts of loose sawdust, have been, or are wet, will result in reduced performance. Store your pellets in a dry place. DO NOT store the fuel within the installation clearances of the unit or within the space required for refuelling and ash removal. Doing so could result in a house fire. Do not over fire or use volatile fuels or combustibles, doing so may cause a personal and property damage hazards.

SAFETY AND EPA COMPLIANCE

Your pellet stove has been approved for installation in the USA and Canada. It may also be installed in a manufactured or mobile home. Your stove conforms to ASTM E1509-12 (2017) and Certified to ULC S627-00. This manual describes the installation and operation of the U.S. Stove, 5710 wood heater. This heater meets the 2020 U.S. Environmental Protection Agency's crib wood emission limits for wood heaters sold after May 15, 2020. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 13,281 to 27,492 Btu/hr. This heater achieved a particulate emissions rate of 1.0 g/hr when tested to method ASTM E2779-10 (*and an efficiency of 69%).

WARNING: It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

Note: Register your product on line at www.usstove.com. Save your receipt with your records for any claims.

Installation

INSTALLATION OPTIONS

Read this entire manual before you install and use your pellet stove. Failure to follow instructions may result in property damage, bodily injury, or even death! See specific installation details for clearances and other installation requirements.

Freestanding Unit - Supported by pedestal/legs and placed on a non-combustible floor surface in compliance with clearance requirements for a freestanding stove installation. Your pellet stove may be installed to code in either a conventional or mobile home (see "Special Mobile Home Requirements"). It is recommended that only a authorized technician install your pellet stove, preferably an NFI certified specialist. DO NOT CONNECT THIS UNIT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM. The use of other components other than stated herein could cause bodily harm, heater damage, and void your warranty.

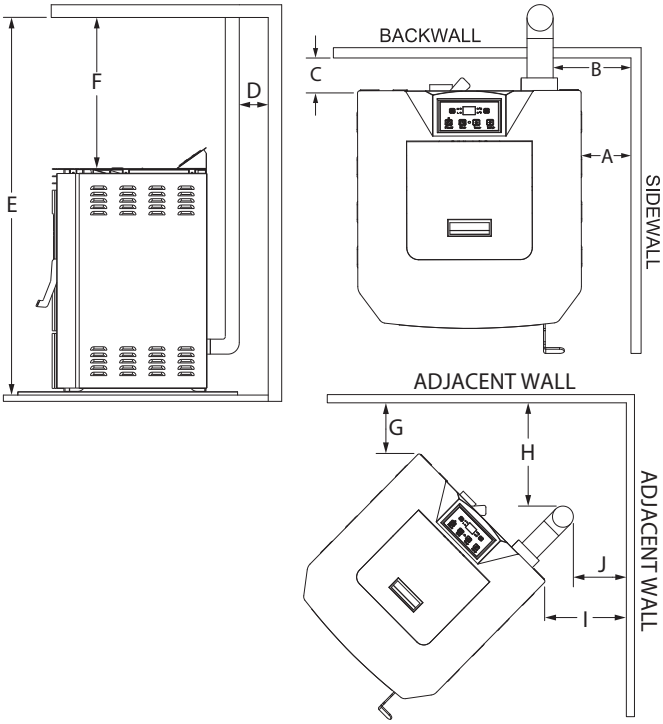
IMPROPER INSTALLATION

The manufacturer will not be held responsible for damage caused by the malfunction of a stove due to improper venting or installation. Call (800) 750-2723 and/or consult a professional installer if you have any questions.

CLEARANCES

Your pellet stove has been tested and listed for installation in residential, mobile home in accordance with the clearances given below. For safety reasons, please adhere to the installation clearances and restrictions. Any reduction in clearance to combustibles may only be done by means approved by a regulatory authority.

		in	mm
A	Side Wall to Stove	10	254
B	Side Wall to Vent Pipe	11.5	292
C	Back Wall to Stove	11.875	302
D	Back Wall to Vent Pipe	3	76
E	Ceiling to Floor	84	2134
F	Ceiling to Stove	53.875	1434
G	Side Wall to Stove	7.5	191
H	Side Wall to Vent Pipe	11.25	286
I	Back Wall to Stove	7.5	191
J	Back Wall to Vent Pipe	3	76

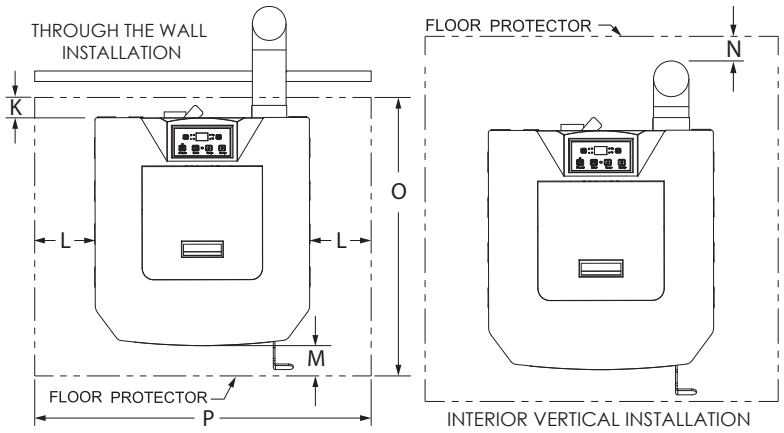


FLOOR PROTECTION

This heater must have a non-combustible floor protector (UL1618 ember protection) installed beneath it if the floor is of combustible material. US: Floor protector should be UL listed or equal too, needs to extend 6" to the front, 6" to each side, 1" to the rear of the unit. Under and 2" beyond each side of the cleanout tee if an interior vertical installation.

Canada: Floor protector should comply with CAN/ULC standards. Needs to extend 18" to the front, 8" beyond each side of the unit.

			in	mm
K	Back to Stove	USA	1	26
		CAN	8	204
L	Side to Stove	USA	6	153
		CAN	8	204
M	Front to Stove	USA	6	153
		CAN	8	204
N	Back to Flue		2	51
O	Overall Length		31	788
P	Overall Width		38	966



VENTING REQUIREMENTS

- Install vent at clearances specified by the vent manufacturer.
- Do not connect the pellet vent to a vent serving any other appliance or stove.
- Do not install a flue damper in the exhaust venting system of this unit.

The following installation guidelines must be followed to ensure conformity with both the safety listing of this stove and to local building codes. Do not use makeshift methods or compromise in the installation.

IMPORTANT: This unit is equipped with a negative draft system that pulls air through the burn pot and pushes the exhaust out of the dwelling. If this unit is connected to a flue system other than the way explained in this manual, it will not function properly.

MAXIMUM VENTING DISTANCE

Installation MUST include at least 3-feet of vertical pipe outside the home. This will create some natural draft to reduce the possibility of smoke or odor during appliance shutdown and keep exhaust from causing a nuisance or hazard by exposing people or shrubs to high temperatures. The maximum recommend vertical venting height is 12-feet for 3-inch type "PL" vent. Total length of horizontal vent must not exceed 4-feet. This could cause back pressure. Use no more than 180 degrees of elbows (two 90-degree elbows, or two 45-degree and one 90-degree elbow, etc.) to maintain adequate draft.

IMPORTANCE OF PROPER DRAFT

Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance. Inadequate draft may cause backpuffing into the room and 'plugging' of the chimney. Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints. An uncontrollable burn or excessive temperature indicates excessive draft. Take into account the chimney's location to ensure it is not too close to neighbours or in a valley which may cause unhealthy or nuisance conditions.

PELLET VENT TYPE

A certified 3-inch or 4-inch type "PL" pellet vent exhaust system must be used for installation and attached to the pipe connector provided on the back of the stove (use a 3-inch to 4-inch adapter for 4-inch pipe). Connection at back of stove must be sealed using Hi-Temp RTV. Use 4-inch vent if the vent height is over 12-feet or if the installation is over 2,500 feet above sea level. We recommend the use of Simpson Dura-Vent® or Metal-Fab® pipe (if you use other pipe, consult your local building codes and/or building inspectors). Do not use Type-B Gas Vent pipe or galvanized pipe with this unit. The pellet vent pipe is designed to disassemble for cleaning and should be checked several times during the burning season. Pellet vent pipe is not furnished with the unit and must be purchased separately.

PELLET VENT INSTALLATION

The installation must include a clean-out tee to enable collection of fly ash and to permit periodic cleaning of the exhaust system. 90-degree elbows accumulate fly ash and soot thereby reducing exhaust flow and performance of the stove. Each elbow or tee reduces draft potential by 30% to 50%. All joints in the vent system must be fastened by at least 3 screws, and all joints must be sealed with Hi-Temp RTV silicone sealant to be airtight. The area where the vent pipe penetrates to the exterior of the home must be sealed with silicone or other means to maintain the vapor barrier between the exterior and the interior of the home. Vent surfaces can get hot enough to cause burns if touched by children. Noncombustible shielding or guards may be required.

PELLET VENT TERMINATION

Do not terminate the vent in an enclosed or semi-enclosed area, such as; carport, garage, attic, crawl space, under a sun deck or porch, narrow walkway, or any other location that can build up a concentration of fumes. Termination in one of these areas can also lead to unpredictable pressure situations with the appliance, and could result in improper performance and/or malfunction. The termination must exhaust above the outside air inlet elevation. The termination must not be located where it will become plugged by snow or other materials. Do not terminate the venting into an existing steel or masonry chimney.

VENT TERMINATION CLEARANCES

A. Minimum 4-foot (1.22m) clearance below or beside any door or window that opens.

B. Minimum 1-foot (0.3m) clearance above any door or window that opens.

C. Minimum 3-foot (0.91m) clearance from any adjacent building.

D. Minimum 7-foot (2.13m) clearance from any grade when adjacent to public walkways.

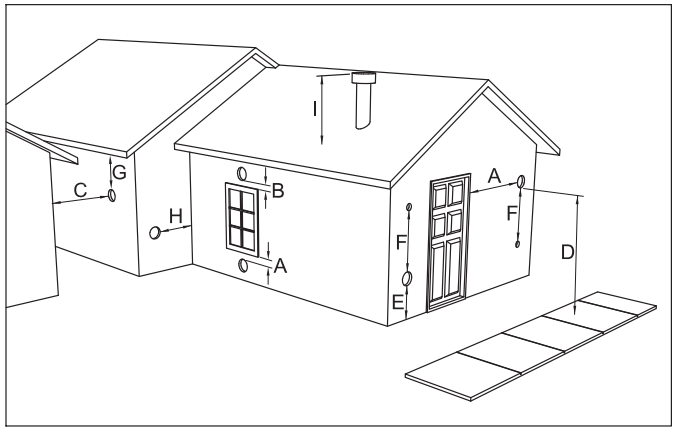
E. Minimum 2-foot (0.61m) clearance above any grass, plants, or other combustible materials.

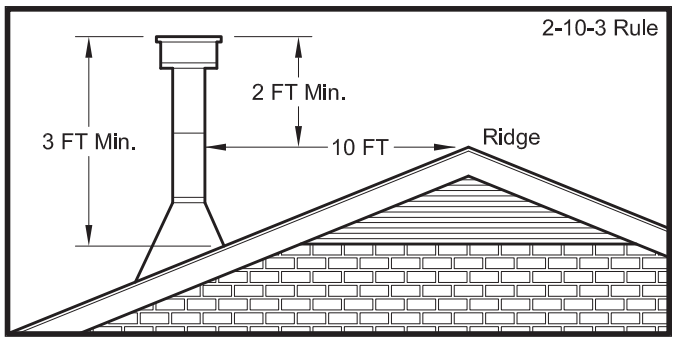
F. Minimum 3-foot (0.91m) clearance from an forced air intake of any appliance.

G. Minimum 2-foot (0.61m) clearance below eves or overhang.

H. Minimum 1-foot (0.3m) clearance horizontally from combustible wall.

I. Must be a minimum of 3 foot (0.91m) above the roof and 2 foot (0.61m) above the highest point or the roof within 10 feet (3.05m).





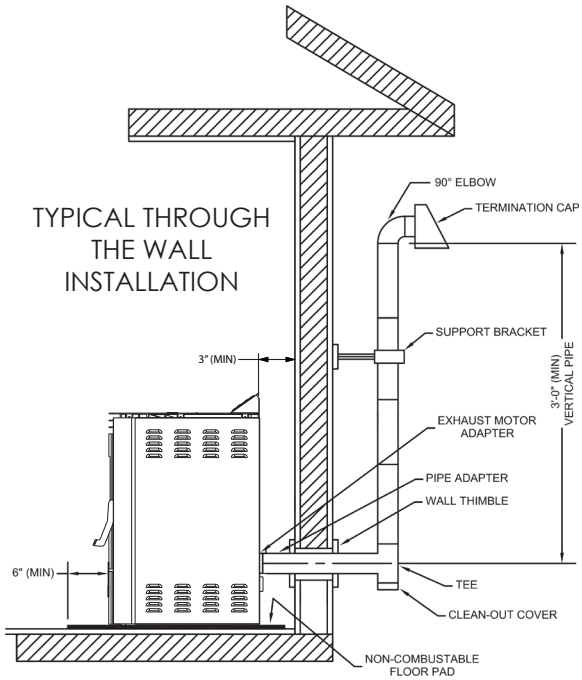
THROUGH THE WALL INSTALLATION (RECOMMENDED INSTALLATION)

Canadian installations must conform to CAN/CSA-B365.

To vent the unit through the wall, connect the pipe adapter to the exhaust motor adapter. If the exhaust adapter is at least 18" (457 mm) above ground level, a straight section of pellet vent pipe can be used through the wall.

Your heater dealer should be able to provide you with a kit that will handle most of this installation, which will include a wall thimble that will allow the proper clearance through a combustible wall. Once outside the structure, a 3" (76 mm) clearance should be maintained from the outside wall and a clean out tee should be placed on the pipe with a 90-degree turn away from the house. At this point, a 3ft (0.91m) (minimum) section of pipe should be added with a horizontal cap, which would complete the installation.

A support bracket should be placed just below the termination cap or one every 4ft (1.22m) to make the system more stable. If you live in an area that has heavy snowfall, it is recommended that the installation be taller than 3ft (0.91m) to get above the snowdrift line. This same installation can be used if your heater is below ground level by simply adding the clean-out section and vertical pipe inside until ground level is reached. With this installation you have to be aware of the snowdrift line, dead grass, and leaves. We recommend a 3ft (0.91m) minimum vertical rise on the inside or outside of the house. The "through the wall" installation is the least expensive and simplest installation. Never terminate the end vent under a deck, in an alcove, under a window, or between two windows. We recommend Simpson Dura-Vent® or Metal-Fab® kits.



THROUGH THE ROOF/CEILING INSTALLATION

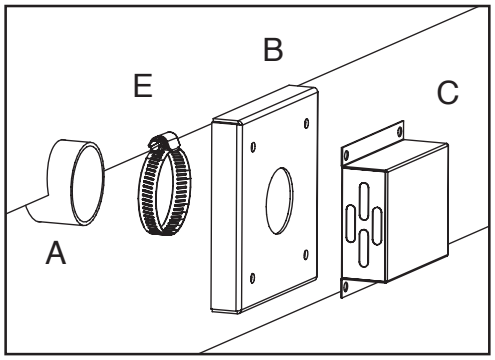
When venting the heater through the ceiling, the pipe is connected the same as through the wall, except the clean-out tee is always on the inside of the house, and a 3" (76 mm) adapter is added before the clean-out tee. You must use the proper ceiling support flanges and roof flashing (supplied by the pipe manufacturer; follow the pipe manufacturer's directions). It is important to note that if your vertical run of pipe is more than 12ft (3.7m), the pellet vent pipe size should be increased to 4" (102 mm) in diameter. Do not exceed more than 4ft (1.22m) of pipe on a horizontal run and use as few elbows as possible. If an offset is required, it is better to install 45-degree elbows rather than 90-degree elbows.

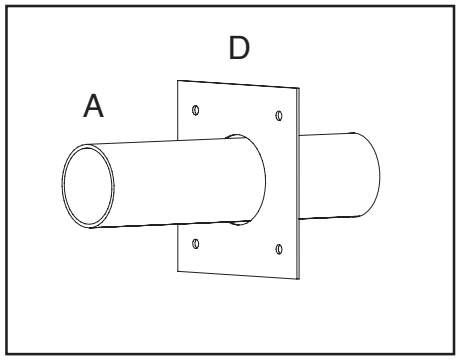
ATTENTION: DO NOT vent under any porch, deck, awning, or in any semi enclosed or roofed area. Doing so may result in unpredictable airflow at the vent cap under certain conditions and can affect the performance of your stove, as well as, other unforeseeable issues.

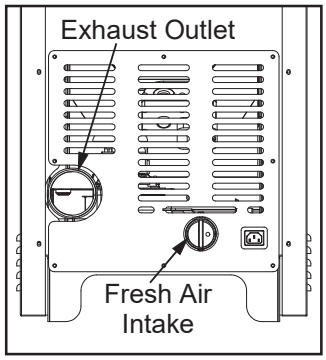
69FAK OUTSIDE AIR SUPPLY (OPTIONAL, UNLESS INSTALLING IN A MOBILE HOME)

Depending on your location and home construction, outside air may be necessary for optimal performance.

1. With the stove in the operating position, mark and drill a hole to accommodate the 2" flexible hose.
2. Insert the hose through the wall and attach the Outside Cover with one of the 2" hose clamps provided.
3. Then attach the Outside Cover to the outside wall.
4. Next, attach the Rodent Cover to the Outside Cover using four (4) of the #10 x 3/4 screws supplied.
5. On the inside of the home, slide the Inside Plate over the tube then attach to the wall with the four drywall anchors and screws provided.
6. On the Air Inlet Tube coming out of the firebox, there is a cap that must have four (4), 5/32" (0.156) diameter holes drilled in it for the fresh air installation. The cap is on the front side of the tube just under the burnpot. Remove burnpot. Using a long screwdriver or equivalent, knock the cap off by inserting it from the back of the stove and pecking with a hammer. Drill holes, then replace cap and burnpot.
7. Attach one of the 2" flex hoses to the backside of the firebox, then to air inlet pipe at the back of the stove as shown.
8. Stretch the 2" flex hose to the air inlet on the back of the stove. Attach using the other 2" hose clamp. The hose will extend up to 4 feet in length.

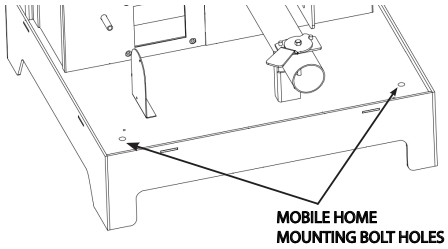






SPECIAL MOBILE HOME REQUIREMENTS

- **WARNING! - Do not install in a sleeping room**
- **CAUTION! - The structural integrity of the mobile home floor, wall, and ceiling/roof must be maintained.**

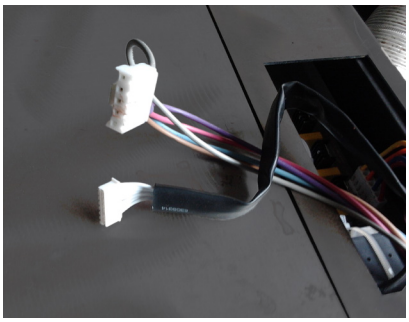


In addition to the previously detailed installation requirements, mobile home installations must meet the following requirements:

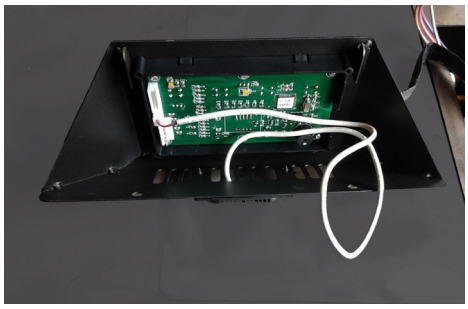
- This stove must be securely fastened to the floor of the mobile home through the two holes in the rear of the stove using two 1/4" lag bolts that are long enough to go through both a hearth pad, if used, and the floor of the home.
- The heater must be electrically grounded to the steel chassis of the mobile home with 8 GA copper wire using a serrated or star washer to penetrate paint or protective coating to ensure grounding.
- Vent must be 3 or 4-inch "PL" Vent and must extend a minimum or 36" (914 mm) above the roof line of the mobile home and must be installed using a certified ceiling fire stop and rain cap.
- When moving your mobile home, all exterior venting must be removed while the mobile home is being relocated. After relocation, all venting must be reinstalled and securely fastened.
- Outside Air is mandatory for mobile home installation. See Outside Air Supply section and your dealer for purchasing.
- Check with your local building officials as other codes may apply.

Assembly Instructions

Step 1
Pull the factory installed wires out of the top of the stove. There will be two wire harnesses, as shown.



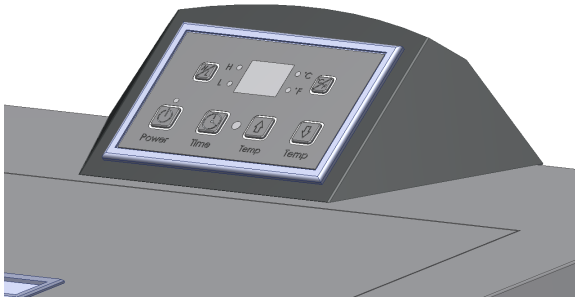
Step 2
Unpack the top mount controls and ensure that the wiring harness shown is attached securely.



Step 3
Connect the factory installed wiring harnesses to the control panel as shown.

Step 4
Attach the control panel to the top of the stove, as shown.

Step 5
Secure with two sheet metal screws.



Control Panel

PANEL CONTROLS

The blowers and automatic fuel supply are controlled from a panel on the top of the unit. The control panel functions are a follows.

A. ON/OFF SWITCH ("POWER" BUTTON)

- When pushed, the stove will automatically ignite. No other fire starter is necessary. The igniter will stay on for at least 10 and up to 12 minutes, depending on when Proof of Fire is reached. The fire should start in approximately 5 minutes.
- The red light located above the "POWER" button will turn green when pressed and remain green until the stove is turned off.
- After pushing "POWER", the auger motor is on for 3.5 minutes, off for 1 minute. During the remainder of the start-up period, the auger motor operates on the heat range "1" setting.
- During start up the heat level advance (Up and Down keys) will change the heat range indicator level accordingly, but there is no change in the stoves operating conditions until start-up is completed.
- During start-up ignition must occur within 12 minutes or the stove will error out and show E4.
- During the start-up phase, the Mode key does not function.

B. LEVEL / TEMP ARROW BUTTONS

- These buttons when pushed will set the pellet feed rate, hence the heat output or heat range of your stove.
- The levels of heat output will incrementally change on the bar graph starting from heat range "1" to heat range "5".

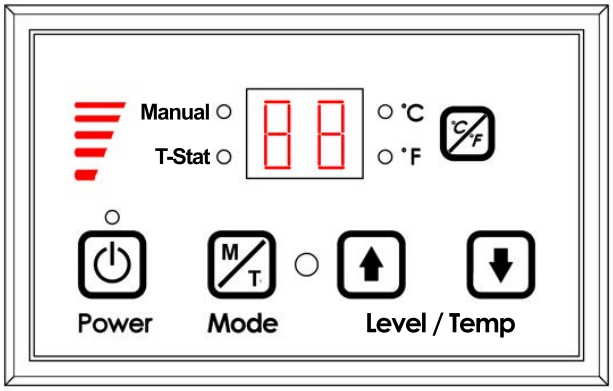
C. °C / °F Button

- The °C / °F button changes the two digit display from degrees Celsius to degrees Fahrenheit.

D. MODE (M/T) BUTTON

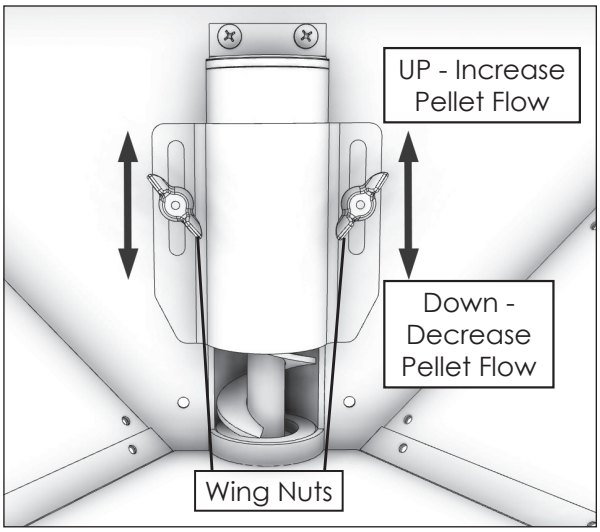
- The Mode of the stove can be switched between manual and controlled with a Thermostat. Separate LEDs to the left of the two digit display indicate the mode of operation – Manual or T-Stat. The stove has to be in normal operation to be switched from Manual to T-Stat mode.

- Manual mode operates according to the 5 set levels of feed on the bar graph from heat range "1" to heat range "5".
- T-Stat mode works as follows:
- The stove has a built in Thermostat into the controls of the appliance. The temperature sensor for the T-Stat is located on the back of the stove behind the display board.
- Once the stove has gone into run mode the stove can be switch into T-Stat mode.
- The Up and Down Level / Temp Arrow buttons are used to change the desired set-point temperature. Once the desired temperature is reached the two digit display will flash for four seconds and reset to the actual room temperature.



- Once the stove reaches within 3°F of the desired temperature set point, it returns to the heat range that the stove was set on before it was switched to T-Stat mode (if the stove was running on heat range "5" when switched to T-stat mode when it gets within 3°F of the set point it will return to heat range "5").
- Once the stove reaches the desired set-point, the stove will drop to heat range "1".
- When room temperature drops below desired set-point the stove will ramp back up until it reaches the desired temperature.

It is a common occurrence in the pellet industry for the average pellet size to vary. Due to the varying sizes of pellets, this appliance utilizes a fuel adjuster to adjust the amount of fuel allowed to pass into the auger assembly. The fuel adjuster is located inside the hopper. Note: To increase the flow of pellets move the fuel adjuster up. To decrease the flow of pellets move the fuel adjuster down.



HOW TO ADJUST THE FUEL ADJUSTER

1. Turn off and unplug the appliance.
2. Loosen the two wing-nuts.
3. Adjust up to increase, or down to reduce the fuel usage based on the size of the pellets.
4. Tighten the two wing-nuts.

Operation

- DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE - Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in this stove. Keep all such liquids well away from the stove while it is in use.
- HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.

This heater is designed to burn only PFI Premium grade pellets. DO NOT BURN:

1. Garbage;
2. Lawn clippings or yard waste;
3. Materials containing rubber, including tires;
4. Materials containing plastic;
5. Waste petroleum products, paints or paint thinners, or asphalt products;
6. Materials containing asbestos;
7. Construction or demolition debris;
8. Railroad ties or pressure-treated wood;
9. Manure or animal remains;
10. Salt water driftwood or other previously salt water saturated materials;
11. Unseasoned wood; or
12. Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater.

Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.

PROPER FUEL

THIS STOVE IS APPROVED FOR BURNING PELLETIZED WOOD FUEL ONLY ! Factory-approved pellets are those 1/4" or 5/16" in diameter and not over 1" long. Longer or thicker pellets sometimes bridge the auger flights, which prevents proper pellet feed. Burning wood in forms other than pellets is not permitted. It will violate the building codes for which the stove has been approved and will void all warranties. The design incorporates automatic feed of the pellet fuel into the fire at a carefully prescribed rate. Any additional fuel introduced by hand will not increase heat output but may seriously impair the stoves performance by generating considerable smoke. Do not burn wet pellets. The stove's performance depends heavily on the quality of your pellet fuel. Avoid pellet brands that display these characteristics:

1. Excess Fines – "Fines" is a term describing crushed pellets or loose material that looks like sawdust or sand. Pellets can be screened before being placed in hopper to remove most fines.
2. Binders – Some pellets are produced with materials to hold the together, or "bind" them.
3. High ash content – Poor quality pellets will often create smoke and dirty glass. They will create a need for more frequent maintenance. You will have to empty the burn pot plus vacuum the entire system more often. Poor quality pellets could damage the auger. We cannot accept responsibility for damage due to poor quality pellet.

PRE-START-UP CHECK

Remove burn pot, making sure it is clean and none of the air holes are plugged. Clean the firebox, and then reinstall burn pot. Clean door glass if necessary (a dry cloth or paper towel is usually sufficient). Never use abrasive cleaners on the glass or door. Check fuel in the hopper, and refill if necessary.

BUILDING A FIRE

Never use a grate or other means of supporting the fuel. Use only the burn pot supplied with this heater. Hopper lid must be closed in order for the unit to feed pellets. During the start-up period:

1. Make sure burn pot is free of pellets.
2. DO NOT open the viewing door.
3. DO NOT add pellets to the burn pot by hand.

NOTE: During the first few fires, your stove will emit an odor as the high temperature paint cures or becomes seasoned to the metal. Maintaining smaller fires will minimize this. Avoid placing items on stove top during this period because paint could be affected. Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to the heater.

AUTOMATIC IGNITOR

Fill hopper and clean burn pot.

1. Press "On/Off" button. Make sure green light comes on.w
2. Adjust feed rate to desired setting by pressing "Heat Level Advance" button.

If fire doesn't start in 12 minutes, press "On/Off", wait a few minutes, clear the burn pot, and start procedure again.

DAMPER CONTROL

The damper control lever is located on the back of the stove on the lower left side. The damper adjusts the combustion air. This control is necessary due to the varied burn characteristics of individual installations, different pellet brands and pellet feed rates. It allows you to improve the efficiency of your stove. Providing correct combustion air will reduce the frequency of cleaning your glass door and prevent the rapid buildup of creosote inside your stove and chimney. You should adjust the damper based on the fire's appearance. A low, reddish, dirty fire can be improved by turning the damper slightly to the right. A "blow torch" fire can be improved by turning the dampener to the left a little bit.

OPTIMAL OPERATION

This pellet stove has been certified by the US EPA to meet strict 2020 guidelines. To Insure this unit produces the optimal minimal emissions, it is critical to follow the following guidelines.
To achieve a "high burn" your stove should be set on setting 5 with the damper fully open.
To achieve a "medium burn" your stove should be set on setting 1 with the damper fully closed.
To achieve a "low burn" your stove should be set on setting 1 with the damper open.
Settings 2,3 & 4 will give you a higher heat output above medium and the damper should be open for these settings. If the door is opened while the stove is in operation it must be closed within 30 seconds or the stove will shut down. If the stove shuts down push the "On/Off" button to re-start your stove. The stove will have to fully shut down and turn off before you will be able to restart the stove.

ROOM AIR FAN

When starting your stove the Room Air Fan will not come on until the stove's heat exchanger warms up. This usually takes about 10 minutes from start-up.

IF STOVE RUNS OUT OF PELLETS

The fire goes out and the auger motor and blowers will run until the stove cools. This will take 30 minutes or longer depending on the heat remaining in the appliance. After the stove components stop running all lights on the display will go out and the two digit display will begin flashing "E3"

REFUELLING

- The hopper and stove top will be hot during operation; therefore, you should always use some type of hand protection when refuelling your stove.
- Never place your hand near the auger while the stove is in operation.

We recommend that you not let the hopper drop below 1/4 full.

TAMPER WARNING

This wood heater has a manufacturer-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.

KEEP HOPPER LID CLOSED AT ALL TIMES EXCEPT WHEN REFILLING. DO NOT OVERFILL HOPPER.

SHUTDOWN PROCEDURE

Turning your stove off is a matter of pressing the "POWER" button on the display board. The green light will turn back to red when the "POWER" button is pushed. The auger motor will stop, and the blowers will continue to operate until the internal firebox temperatures have fallen to a preset level.

WARNING: Never shut down this unit by unplugging it from the power source.

1. Your stove is equipped with a high temperature thermodisc. This unit has a manual reset thermodisc. This safety switch has two functions.
   A. To recognize an overheat situation in the stove and shut down the fuel feed or auger system.
   B. In case of a malfunctioning convection blower, the high-temperature thermodisc will automatically shut down the auger, preventing the stove from overheating.

NOTE: On some units, once tripped, like a circuit breaker, the reset button will have to be pushed before restarting your stove. On other units the thermodisc has no reset button and will reset itself once the stove has cooled. The manufacturer recommends that you call your dealer if this occurs as this may indicate a more serious problem. A service call may be required.

2. If the combustion blower fails, an air pressure switch will automatically shut down the auger.

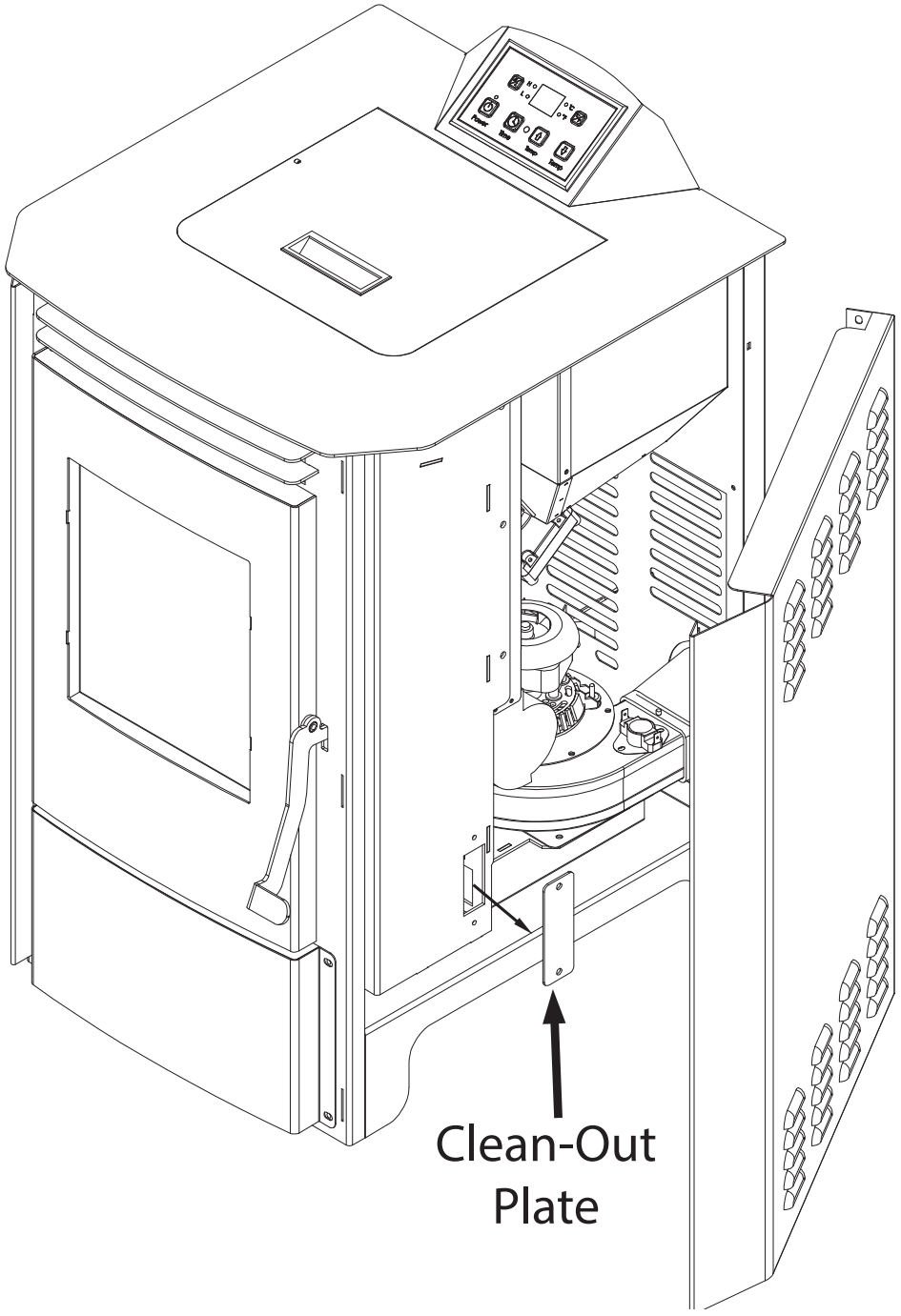
NOTE: Opening the stove door for more than 30 seconds during operation will cause enough pressure change to activate the air switch, shutting the fuel feed off. The stove will shut down and show "E2" on the two digit display. The stove has to fully shut down before restarting.

WARNING: FAILURE TO PROPERLY MAINTENANCE THE CLEAN OUTS WILL RESULT IN POOR PERFORMANCE OF THIS STOVE.

INTERIOR CHAMBERS

- Burn Pot: Periodically remove and clean the burn pot and the area inside the burn pot housing. In particular, it is advisable to clean out the holes in the burn pot to remove any build up that may prevent air from moving through the burn pot freely.
- Heat Exchanger: There is a clean out plate on both sides of the heat exchanger that need to be removed to clean fly ash out of the heat exchanger. The cleanouts are located inside the cabinet doors, on the lower front corners of the heat exchanger. To access these clean outs, you must remove both side panels. The clean outs are secured to the firebox with (2) 5/16" screws. Remove the clean outs and vacuum out any accumulated ash. This should be done at least once per month or more frequently if large amounts of ash are noticed while cleaning or if the stove does not seem to be burning properly.

If a vacuum is used to clean your stove, we suggest using the AV15E AshVac vacuum. The AV15E AshVac is designed for ash removal. Some regular vacuum cleaner (i.e. shop vacs) may leak ash into the room.
DO NOT VACUUM HOT ASH.



Maintenance

- Failure to clean and maintain this unit as indicated can result in poor performance, safety hazards, fire, and even death.
- Unplug your stove's electrical cord prior to removing the back panel or opening the exhaust system for any inspection, cleaning, or maintenance work.
- Never perform any inspections, cleaning, or maintenance on a hot stove.
- Do not operate stove with broken glass, leakage of flue gas may result.

EXHAUST SYSTEM

Creosote Formation – When any wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue or a newly started fire or from a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire, which may damage the chimney or even destroy the house. Despite their high efficiency, pellet stoves can accumulate creosote under certain conditions.

Fly Ash – This accumulates in the horizontal portion of an exhaust run. Though non-combustible, it may impede the normal exhaust flow. It should therefore be periodically removed.

Inspection and Removal – The chimney connector and chimney should be inspected by a qualified person annually or per ton of pellets to determine if a creosote or fly ash build-up has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire. Inspect the system at the stove connection and at the chimney top. Cooler surfaces tend to build creosote deposits quicker, so it is important to check the chimney from the top as well as from the bottom. The creosote should be removed with a brush specifically designed for the type of chimney in use. A qualified chimney sweep can perform this service. It is also recommended that before each heating season the entire system be professionally inspected, cleaned and, if necessary, repaired. To clean the chimney, disconnect the vent from the stove.

ASH REMOVAL

Remove the ashes periodically to avoid unnecessary ash build up. Ash removal is as follows:

1. Let fire burn out and allow unit cool to room temperature.
2. Clean the heat exchanger tubes (see Heat Exchanger Cleaning section) – Make sure Pellet Stove is at room temperature before touching .
3. Open the ash pan door, remove the burn pot and empty into metal container.
4. Vacuum to remove ashes from the firebox.
5. BE SURE THAT ASHES ARE COOL TO THE TOUCH BEFORE VACUUMING. Some vacuum cleaners may leak ash into the room. Your vacuum cleaner should have a special filter or bag to eliminate leakage.
6. Remove ash pan and dispose of ashes into metal container.
7. Reinstall ash pan.
8. Reinstall burn pot.

ASH DISPOSAL

Remove ashes when unit has cooled. Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all embers have been thoroughly cooled. The container shall not be used for other trash or waste disposal. If combined with combustible substances, ashes and embers may ignite.

SMOKE AND CO MONITORS

Burning wood naturally produces smoke and carbon monoxide(CO) emissions. CO is a poisonous gas when exposed to elevated concentrations for extended periods of time. While the modern combustion systems in heaters drastically reduce the amount of CO emitted out the chimney, exposure to the gases in closed or confined areas can be dangerous. Make sure you stove gaskets and chimney joints are in good working order and sealing properly to ensure unintended exposure. It is recommended that you use both smoke and CO monitors in areas having the potential to generate CO.

CHECK AND CLEAN THE HOPPER

Check the hopper periodically to determine if there is any sawdust (fines) that is building up in the feed system or pellets that are sticking to the hopper surface. Clean as needed.

DOOR AND GLASS GASKETS

Inspect the main door and glass window gaskets periodically. The main door may need to be removed to have frayed, broken, or compacted gaskets replaced by your authorized dealer. This unit's door uses a 5/8" diameter rope gasket.

BLOWER MOTORS

Clean the air holes on the motors of both the exhaust and distribution blowers annually. Remove the exhaust blower from the exhaust duct and clean out the internal fan blades as part of your fall start-up. If you have indoor pets your power motors should be inspected monthly to make sure they are free of animal hair build up. Animal hair build up in blowers can result in poor performance or unforeseen safety hazards.

PAINTED SURFACES

Painted surfaces may be wiped down with a damp cloth. If scratches appear, or you wish to renew your paint, contact your authorized dealer to obtain a can of suitable high-temperature paint.

GLASS - CLEANING, REMOVAL, AND REPLACEMENT OF BROKEN DOOR GLASS

Cleaning - We recommend using a high quality glass cleaner. Should a buildup of creosote or carbon accumulate, you may wish to use 000 steel wool and water to clean the glass. DO NOT use abrasive cleaners. DO NOT perform the cleaning while the glass is HOT. Do not attempt to operate the unit with broken glass. Replacement glass may be purchased from your U.S. Stove dealer. If glass is broken, follow these removal procedures:

1. Remove the four (4) screws and glass retainers.
2. While wearing leather gloves (or any other gloves suitable for handling broken glass), carefully remove any loose pieces of glass from the door frame. Dispose of all broken glass properly. ONLY high temperature ceramic glass of the correct size and thickness may be used. DO NOT substitute alternative materials for the glass. Contact your authorized dealer to obtain this glass.
3. Re-install the new glass by re-attaching the retainers and screws, be careful not to over tighten the screws for this could damage the glass.

DO NOT abuse the door glass by striking, slamming, or similar trauma. Do not operate the stove with the glass removed, cracked, or broken.

FALL START UP

Prior to starting the first fire of the heating season, check the outside area around the exhaust and air intake systems for obstructions. Clean and remove any fly ash from the exhaust venting system. Clean any screens on the exhaust system and on the outside air intake pipe. Turn all of the controls on and make sure that they are working properly. This is also a good time to give the entire stove a good cleaning throughout.

SPRING SHUTDOWN

After the last burn in the spring, remove any remaining pellets from the hopper and the auger feed system. Scoop out the pellets and then run the auger until the hopper is empty and pellets stop flowing (this can be done by pressing the "ON" button with the viewing door open). Vacuum out the hopper. Thoroughly clean the burn pot, and firebox. It may be desirable to spray the inside of the cleaned hopper with an aerosol silicone spray if your stove is in a high humidity area. The exhaust system should be thoroughly cleaned.

MAINTENANCE SCHEDULE

Use the following as a guide under average use conditions. Gaskets around door and door glass should be inspected and repaired or replaced when necessary.

	Daily	Weekly	Monthly or as needed
Burn Pot	Stirred	Empty	
Combustion Chamber		Brushed	
Ashes		Check	Empty
Interior Chambers			Vacuumed
Combustion Blower Blades			Vacuumed / Brushed
Convection Blower Impeller			Vacuumed / Brushed
Vent System			Cleaned
Gaskets			Inspected
Glass	Wiped	Cleaned	
Hopper (end of season)			Empty and vacuumed

Trouble Shooting Guide

When your stove acts out of the ordinary, the first reaction is to call for help. This guide may save time and money by enabling you to solve simple problems yourself. Problems encountered are often the result of only five factors: 1) poor fuel; 2) poor operation or maintenance; 3) poor installation; 4) component failure; 5) factory defect. You can usually solve those problems related to 1 and 2. Your dealer can solve problems relating to 3, 4 and 5. Refer to diagrams on page 25 to help locate indicated parts.

For the sake of troubleshooting and using this guide to assist you, you should look at your heat level setting to see which light is flashing.

- **Disconnect the power cord before performing any maintenance! NOTE: Turning the ON/OFF Switch to "OFF" does not disconnect all power to the electrical components of the stove.**
- **Never try to repair or replace any part of the stove unless instructions for doing so are given in this manual. All other work should be done by a trained technician.**

Display is Flashing "E1"	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
The convection blower is overheating and tripping the internal temperature shutoff.	Clean any dust off of the windings and fan blade. If oiling the blower does not help, the blower may be bad.
The stove is being left on the highest setting for extended periods of time.	If operating the heater on the highest heat setting, the room temperature could increase enough and lead to potential overheating situations. If this happens try operating at a lower heat setting.
Fuel other than wood pellets is being burned in the stove.	This pellet stove is designed and tested to use wood pellets. Check for signs of fuel other than wood pellets. No other types of fuel have been approved for this pellet stove. If there are signs of other types of fuel being used, stop using them immediately.
Power surge or brown out situation.	A power surge, spike, or voltage drop could cause the high limit switch to trip. Check to see if a surge protector is being used on the stove. If not, recommend one to the customer.
High Limit Switch is malfunctioning.	If the other items check out OK, replace the high limit switch.

ATTENTION: 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.

Trouble Shooting Guide

Display is Flashing "E2"	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
Airflow switch hose or stove attachment pipes for hose are blocked.	Unhook air hose from the air switch and blow through it. If air flows freely, the hose and tube are fine. If air will not flow throw the hose, use a wire coat hanger to clear the blockage.
The air inlet, burnpot, interior combustion air chambers, combustion blower, or exhaust pipe are blocked with ash or foreign material.	Follow all cleaning procedures in the maintenance section of the owner's manual.
The firebox is not properly sealed.	Make sure the door is closed and that the gasket is in good shape.
Vent pipe is incorrectly installed.	Check to make sure vent pipe installation meets criteria in owner's manual.
The airflow switch wire connections are bad.	Check the connectors that attach the gray wires to the air switch.
Combustion blower failure.	With the stove on, check to see if the combustion blower is running. If it is not, you will need to check for power going to the combustion blower. It should be a full current. If there is power, the blower is bad. If there is not, see #8.
Control board not sending power to combustion blower.	If there is no current going to the combustion blower, check all wire connections. If all wires are properly connected, you have a bad control board.
Control board not sending power to air switch.	There should be a 5-volt current (approximately) going to the air switch after the stove has been on for 30 seconds.
Air switch has failed.	To test the air switch, you will need to disconnect the air hose from the body of the stove. With the other end still attached to the air switch, very gently suck on the loose end of the hose (you may want to remove the hose entirely off the stove and the air switch first and make sure it is clear). If you hear a click, the air switch is working. BE CAREFUL TOO MUCH VACUUM CAN DAMAGE THE AIR SWITCH.

Trouble Shooting Guide

Display is Flashing "E3"	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
The hopper is out of pellets	Refill the hopper.
The air dampener is too far open for a low feed setting	If on the low setting, you may need to close the dampener all the way.
The burnpot holes are blocked.	Remove the burnpot and thoroughly clean it.
The air inlet, the interior chambers, or exhaust system has a partial blockage.	Follow all cleaning procedures in the maintenance section of the owner's manual
The hopper safety switch has failed or hopper is open.	When operating the unit, be sure the hopper lid is closed so that the hopper safety switch will activate. Check the wires leading from the hopper safety switch to the control panel and auger motor for secure connections. Use a continuity tester to test the hopper safety switch; replace if necessary.
The auger shaft is jammed.	"Start by emptying the hopper. Then remove the auger motor by removing the auger pin, then remove the two bolts that hold the auger bracket to the auger tube. The auger bracket will now be able to be removed form the auger tube. Remove the two bolts on the side of the auger tube to remove the lower bearing of the auger. Pull the auger out of the tube to free the jam.
The auger motor has failed.	Remove the auger motor from the auger shaft and try to run the unit. If the motor will turn the shaft is jammed on something. If the motor will not turn, the motor is bad.
The Proof of Fire (POF) thermodisc has malfunctioned.	Temporarily bypass the POF thermodisc by disconnecting the two wires and connecting them with a short piece of wire. Then plug the stove back up. If the stove comes on and works, you need to replace the POF thermodisc. This is for testing only. DO NOT LEAVE THE THERMODISC BYPASSED. Your blowers will never shut off and if the fire went out the auger will continue to feed pellets until the hopper is empty if you leave the POF thermodisc bypassed.
The control board is not sending power to the POF thermodisc or other auger system components.	There should be a 5-volt (approximately) current going to the POF thermodisc after the stove has been on for 10 minutes.

Trouble Shooting Guide

Display is Flashing "E4"	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
The air inlet, burnpot, interior combustion air chambers, combustion blower, or exhaust pipe are blocked with ash or foreign material.	Follow all cleaning procedures in the maintenance section of the owner's manual.
The Proof of Fire (POF) thermodisc has came unplugged	Check the (POF) thermodisc to see if the wires are connected properly.
The Proof of Fire (POF) thermodisc has malfunctioned.	Temporarily bypass the POF thermodisc by disconnecting the two wires and connecting them with a short piece of wire. Then plug the stove back up. If the stove comes on and works, you need to replace the POF thermodisc. This is for testing only. DO NOT LEAVE THE THERMODISC BYPASSED. Your blowers will never shut off and if the fire went out the auger will continue to feed pellets until the hopper is empty if you leave the POF thermodisc bypassed.
The hopper is out of Pellets.	Refill the hopper.
The hopper safety switch has failed or hopper is open.	When operating the unit, be sure the hopper lid is closed so that the hopper safety switch will activate. Check the wires leading from the hopper safety switch to the control panel and auger motor for secure connections. Use a continuity tester to test the hopper safety switch; replace if necessary.
The auger shaft is jammed.	Start by emptying the hopper. Then remove the auger motor by removing the auger pin. Remove the auger shaft inspection plate in the hopper so that you can see the auger shaft. Gently lift the auger shaft straight up so that the end of the auger shaft comes up out of the bottom auger bushing. Next, remove the two nuts that hold the top auger biscuit in. Then rotate the bottom end of the auger shaft up towards you until you can lift the shaft out of the stove. After you have removed the shaft, inspect it for bent flights, burrs, or broken welds. Remove any foreign material that might have caused the jam. Also, check the auger tube for signs of damage such as burrs, rough spots, or grooves cut into the metal that could have caused a jam.
The auger motor has failed.	Remove the auger motor from the auger shaft and try to run the unit. If the motor will turn the shaft is jammed on something. If the motor will not turn, the motor is bad.

Display is Flashing "E5"	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
The stove automatically flashes "E5" when turned on	The T-stat sensor has come unplugged form the control board. Check to see if the sensor is unplugged. If the sensor is not unplugged then the sensor is damaged or has a short. If the sensor is damaged or has a short it will need to be replaced.

Trouble Shooting Guide

Stove Feeds Pellets, But Will Not Ignite	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
Air damper open too far for ignition.	In some situations it may be necessary to have the damper completely closed for ignition to take place. After there is a flame, the damper can then be adjusted for the desired feed setting. See Page 11
Blockage in igniter tube or inlet for igniter tube.	Find the igniter housing on the backside of the firewall. The air intake hole is a small hole located on bottom side of the housing. Make sure it is clear. Also, look from the front of the stove to make sure there is not any debris around the igniter element inside of the igniter housing.
The burnpot is not pushed completely to the rear of the firebox.	Make sure that the air intake collar on the burnpot is touching the rear wall of the firebox.
Bad igniter element.	Put power directly to the igniter element. Watch the tip of the igniter from the front of the stove. After about 2 minutes the tip should glow. If it does not, the element is bad.
The control board is not sending power to the igniter.	Check the voltage going to the igniter during startup. It should be a full current. If the voltage is lower than full current, check the wiring. If the wiring checks out good, the board is bad.

Smoke Smell Coming Back Into The Home	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
There is a leak in the vent pipe system.	Inspect all vent pipe connections. Make sure they are sealed with RTV silicone that has a temperature rating on 500 degree F or higher. Also, seal joints with UL-181-AP foil tape. Also, make sure the square to round adapter piece on the combustion blower has been properly sealed with the same RTV.
The gasket on the combustion blower has gone bad.	Inspect both gaskets on the combustion blower to make sure they are in good shape.
Because it is a wood-burning device, your pellet heater may emit a faint wood-burning odor. If this increases beyond normal, or if you notice an unusual soot build-up on walls or furniture, check your exhaust system carefully for leaks. All joints should be properly sealed. Also clean your stove, following instructions in "Maintenance". If problem persists, contact your dealer.	

Convection Blower Shuts Off And Comes Back On	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
The convection blower is overheating and tripping the internal temperature shutoff.	Clean any dust off of the windings and fan blades. If cleaning the blower does not help, the blower may be bad.
Circuit board malfunction.	Test the current going to the convection blower. If there is power being sent to the blower when it is shut off, then the control board is fine. If there is NOT power being sent to the blower when it shuts off during operation, then you have a bad control board.

Trouble Shooting Guide

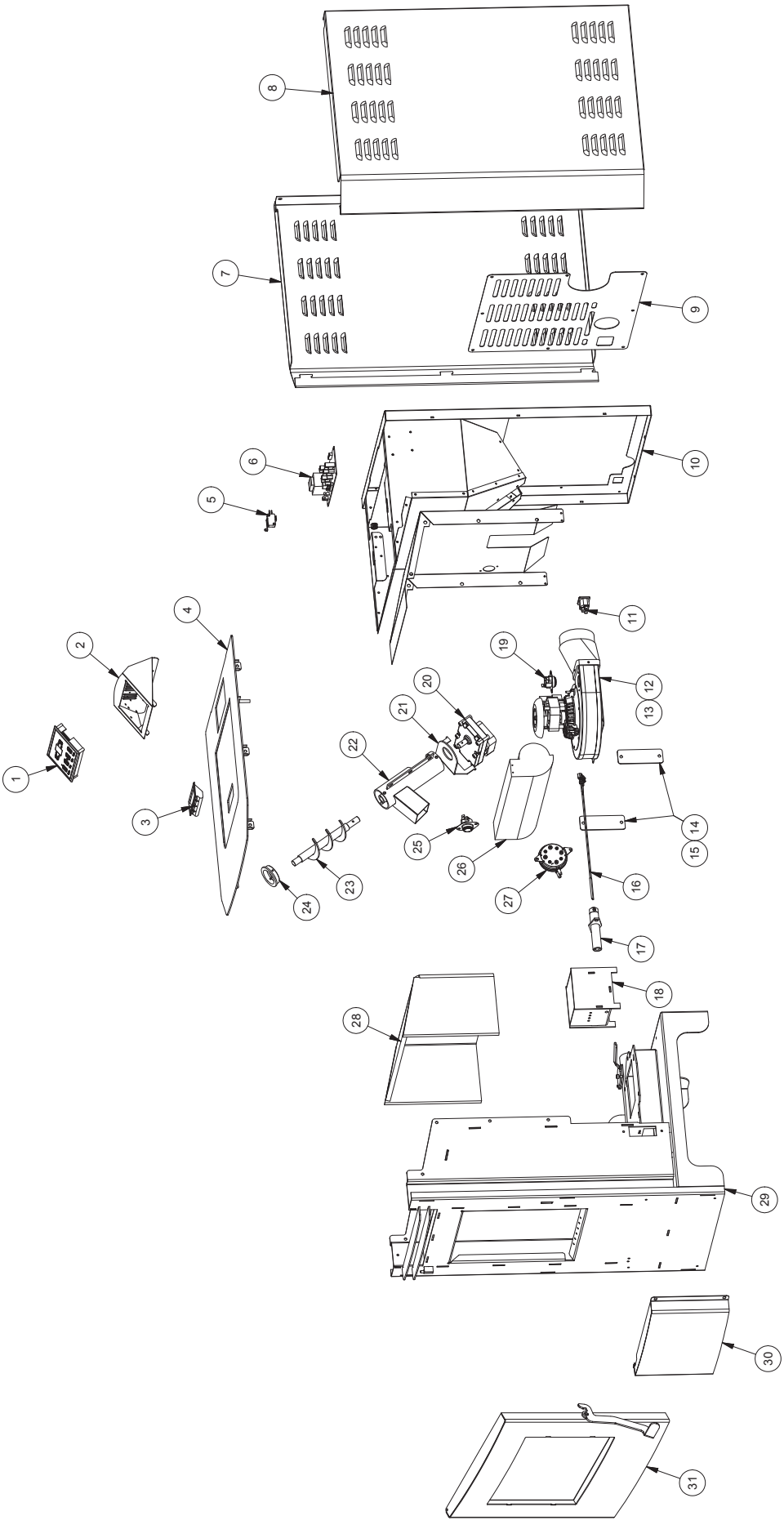
Stove Will Not Feed Pellets, But Fuel Feed Light Comes On As Designed	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
High limit switch has tripped or is defective.	Wait for the stove to cool for about 30 - 45 minutes. Locate the High Limit thermodisc and press the reset button on the back of it. If the heater will not restart, check the thermodisc to see if it's bad. To test if the thermodisc is bad, you can bypass it as described previously for the POF thermodisc.
Bad Auger Motor.	Remove the auger motor from the auger shaft and try to run the unit. If the motor will turn the shaft is jammed on something. If the motor will not turn, the motor is bad.
Auger Jam.	Start by emptying the hopper. Then remove the auger motor by removing the auger pin. Remove the auger shaft inspection plate in the hopper so that you can see the auger shaft. Gently lift the auger shaft straight up so that the end of the auger shaft comes up out of the bottom auger bushing. Next, remove the two nuts that hold the top auger biscuit in. Then rotate the bottom end of the auger shaft up towards you until you can lift the shaft out of the stove. After you have removed the shaft, inspect it for bent flights, burrs, or broken welds. Remove any foreign material that might have caused the jam. Also, check the auger tube for signs of damage such as burrs, rough spots, or grooves cut into the metal that could have caused a jam.
Loose wire or connector.	Check all wires and connectors that connector to the auger motor, high limit switch, and the Molex connector.
Bad control board.	If the fuse is good, the wires and connectors check out good, and the high limit switch did not trip, test for power going to the auger motor. If there is not a full current going to the auger motor when the fuel feed light is on, you have a bad control board.

High Limit Switch Keeps Tripping	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
The convection blower is overheating and tripping the internal temperature shutoff.	Clean any dust off of the windings and fan blades. If oiling the blower does not help, the blower may be bad.
The stove is being left on the highest setting for extended periods of time.	If operating the heater on the highest heat setting, the room temperature could increase enough and lead to potential overheating situations. If this happens, try operating at a lower heat setting.
Fuel other than wood pellets is being burned in the stove.	This pellet stove is designed and tested to use wood pellets. Check for signs of fuel other than wood pellets. No other types of fuel have been approved for this pellet stove. If there are signs of other types of fuel being used, stop using them immediately.
Power surge or brown out situation.	A power surge, spike, or voltage drop could cause the high limit switch to trip. Check to see if a surge protector is being used on the stove. If not, recommend one to the consumer.
High limit switch is malfunctioning.	If the other items check out OK, replace the high limit switch.

Trouble Shooting Guide

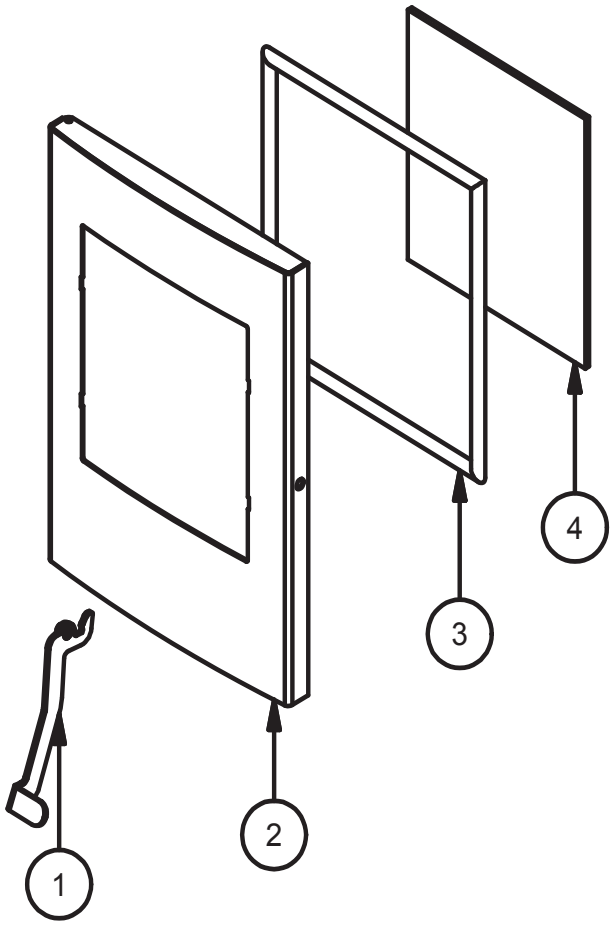
Glass "Soot's" Up At A Very Fast Rate Flame Is Lazy, Dark, And Has Black Tips After Stove Has Been On For A While, The Burnpot Overfills	
Possible Causes	Possible Remedies: (Unplug stove first when possible)
Stove or vent pipe is dirty, which restricts airflow through the burnpot.	Follow all cleaning procedure in the maintenance section of the owner's manual.
Vent pipe installed improperly.	Check to make sure the vent pipe has been installed according to the criteria in the owner's manual.
Air damper is set too far in (closed) for a higher setting.	Pull the damper knob farther out away from the side of the stove and try to burn the unit again.
Burnpot holes are blocked.	Remove the burnpot and thoroughly clean it.
Air damper is broken.	Visually inspect the damper assembly. Make sure the damper plate is attached to the damper rod. When the damper rod is moved the plate should move with it.
Blockage in air intake pipe.	Visually inspect the air intake pipe that leads into the burnpot for foreign material.
Combustion blower is not spinning fast enough.	Test the RPM on the blower after the blades have been cleaned. The RPM should be approximately 3000 RPM.
Bad Pellets. (Applies to GLASS "SOOT'S" UP AT A VERY FAST RATE Only)	The brand of pellets or the batch of pellets that are being used may be of poor quality. If possible, try a different brand of pellets. You might also want to try a brand that is made from a different type of wood (softwood vs. hardwood). Different woods have different characteristics when being burned.

Parts Diagram



Parts List

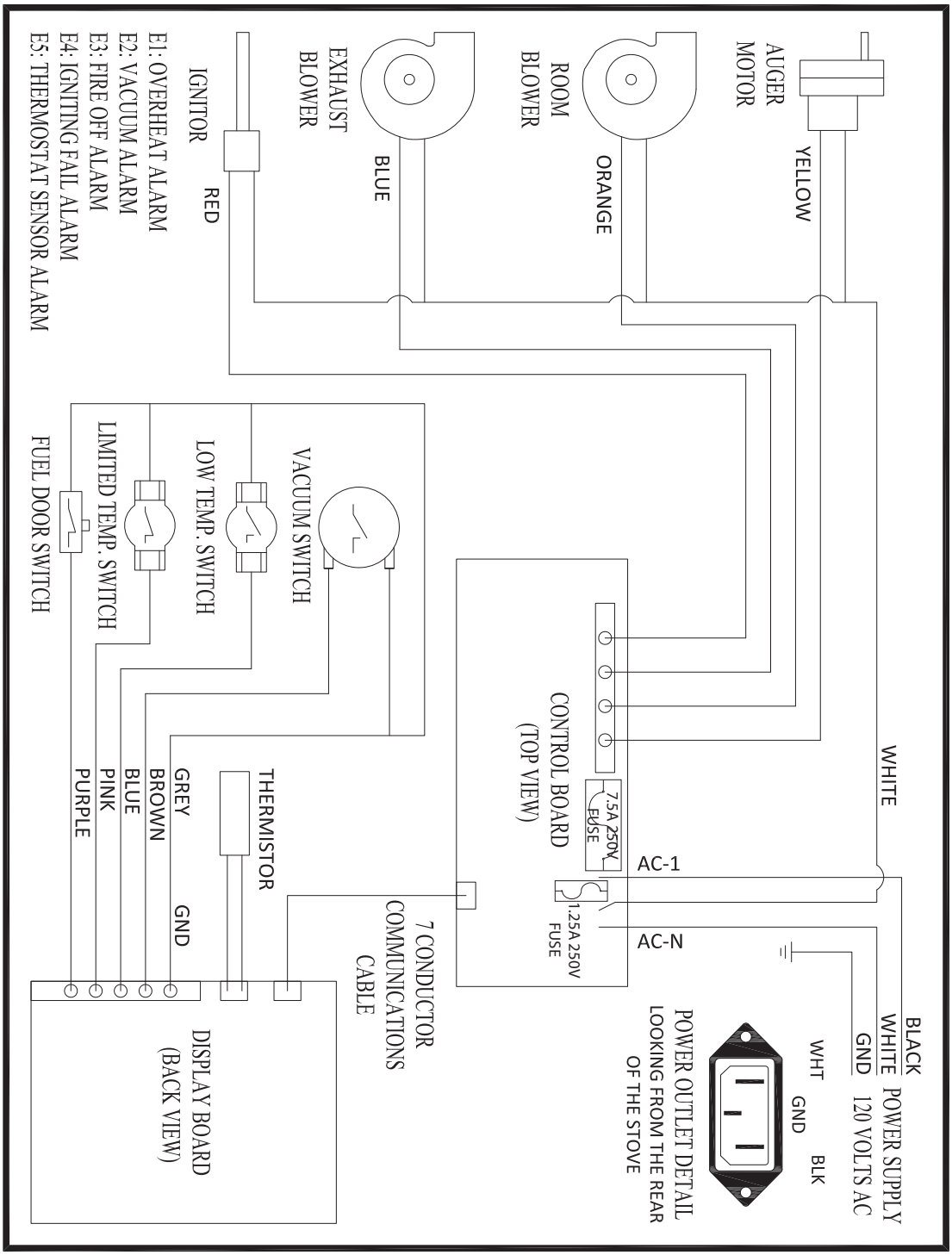
Key	Part#	Description	Qty
1	892199	Housing, PCBA Controller	1
2	80630	PCBA, Controller	1
3	891148	Lid Latch	1
4	892669	Top Weldment	1
5	80491	Lid Switch	1
6	80631	PCBA	1
7	892672	Vented Side Panel, Right	1
8	892673	Vented Side Panel, Left	1
9	892674	Vented Back Panel	1
10	892660	Hopper	1
11	80462	AC Electrical Connector	1
12	80602	Exhaust Blower	1
13	88166	Gasket, Exhaust Blower	1
14	892668	Ash Clean-Out Covers	2
15	88258	Gasket, Ash Clean-out	2
16	80607	Igniter	1
17	83538	Shaft Collar - Ignitor Tube	1
18	69762	Burnpot	1
19	80599	T-Disc, Exhaust	1
20	80529	Auger Motor	1
21	892665	Auger Motor Mounting Bracket	1
22	892661	Auger Housing Weld.	1
23	892677	Auger	1
24	892664	Agitator Bushing	1
25	80455	T-Disc, Room Air	1
26	80709	Room Blower	1
27	80549	Vacuum Switch	1
28	88176	Insulation Blanket	1
29	892659	Main Weldment	1
30	892671	Front Bottom	1
31	892670	Door Assembly	1
*	80710	Wiring Harness	1
*	80711	Thermistor	1
* Item Not Shown			

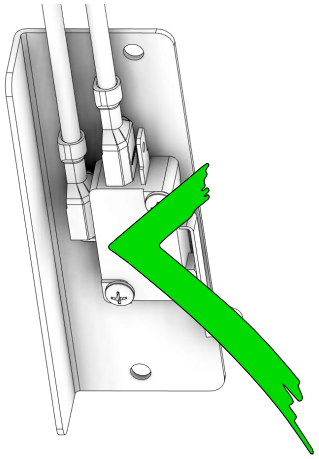


Key	Part#	Description	Qty
1	892663	Handle Assembly	1
2	40792	Feed Door	1
3	88066	3/4" Round Rope Gasket	46"
4	892667	Door Glass	1

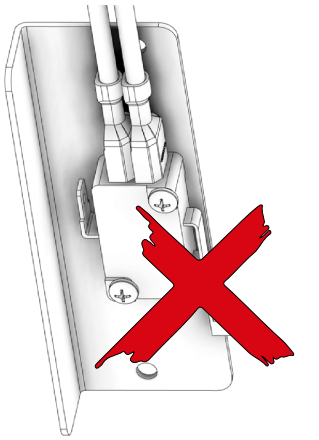
IN ORDER TO MAINTAIN WARRANTY, COMPONENTS MUST BE REPLACED USING USSC PARTS PURCHASED THROUGH YOUR DEALER OR DIRECTLY FROM USSC. USE OF THIRD PARTY COMPONENTS WILL VOID THE WARRANTY.

Wiring Diagram





CORRECT



WRONG

Ensure the wires are connected to the bottom two prongs of the hopper switch as shown.

Service Record

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

SERVICE PROVIDER

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions. Always use the manufacturer's specified spare part when replacement is necessary.

Service 01 Date:_____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 02 Date:_____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 03 Date:_____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 04 Date:_____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 05 Date:_____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 06 Date:_____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 07 Date:_____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 08 Date:_____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

How To Order Repair Parts

This manual will help you obtain efficient, dependable service from your heater, and enable you to order repair parts correctly.

Keep this manual in a safe place for future reference.

When writing, always give the full model number which is on the nameplate attached to the heater.

When ordering repair parts, always give the following information as shown in this list:

1. The part number _____
2. The part description _____
3. The model number _____
4. The serial number _____

Comment Commander Des Pièces De Rechange

Ce manuel vous aidera à obtenir un service fiable et efficace de votre appareil de chauffage, et vous permettre de commander correctement les pièces de rechange.

Conservez ce manuel dans un endroit sûr pour référence future.

Lors de l'écriture, toujours donner le numéro de modèle complet qui se trouve sur la plaque signalétique fixée sur l'appareil de chauffage.

Lors de la commande des pièces de rechange, fournir les informations suivantes comme indiqué dans cette liste:

1. Le numéro de pièce _____
2. La description de la pièce _____
3. Le numéro de modèle _____
4. Le numéro de série _____

UNITED STATES STOVE Co
ESTº 1869

United States Stove Company
227 Industrial Park Rd.,
South Pittsburg, TN 37380
PH: (800) 750-2723
www.usstove.com

Section 5

Test Data by Run

Appliance operated for 50 hours at a medium burn rate.

Time	Rise	Ambient	Absolute	Weight of Fuel Added (lbs)
1/27/2016 9:20	129	57	186	19.8
1/27/2016 10:20	367	61	428	
1/27/2016 11:20	356	63	419	
1/27/2016 12:20	354	65	419	
1/27/2016 13:20	367	66	433	
1/27/2016 14:20	368	67	435	
1/27/2016 15:20	358	67	425	
1/27/2016 16:20	365	68	433	
1/27/2016 17:20	356	66	422	12.6
1/27/2016 18:20	363	65	428	
1/27/2016 19:20	362	63	425	
1/27/2016 20:20	367	63	430	
1/27/2016 21:20	364	62	426	
1/27/2016 22:20	367	61	428	
1/27/2016 23:20	357	61	418	
1/28/2016 0:20	345	60	405	
1/28/2016 1:20	364	59	423	
1/28/2016 2:20	348	58	406	
1/28/2016 3:20	366	58	424	
1/28/2016 4:20	363	56	419	
1/28/2016 5:20	370	54	424	19.3
1/28/2016 6:20	380	54	434	
1/28/2016 7:20	368	55	423	
1/28/2016 8:20	355	53	408	
1/28/2016 9:20	336	60	396	
1/28/2016 10:20	374	68	442	
1/28/2016 11:20	369	75	444	
1/28/2016 12:20	370	79	449	
1/28/2016 13:20	373	83	456	
1/28/2016 14:20	389	65	454	
1/28/2016 15:20	376	64	440	12.8
1/28/2016 16:20	358	71	429	
1/28/2016 17:20	373	73	446	
1/28/2016 18:20	382	68	450	
1/28/2016 19:20	381	65	446	
1/28/2016 20:20	373	63	436	
1/28/2016 21:20	391	62	453	
1/28/2016 22:20	368	61	429	
1/28/2016 23:20	338	59	397	
Gap in Burn				
1/29/2016 7:20	364	53	417	13.1
1/29/2016 8:20	371	64	435	
1/29/2016 9:20	377	70	447	
1/29/2016 10:20	384	69	453	

1/29/2016 11:20	381	70	451	
1/29/2016 12:20	392	66	458	
1/29/2016 13:20	384	71	455	
1/29/2016 14:20	399	71	470	
1/29/2016 15:20	384	70	454	12.7
1/29/2016 16:20	389	69	458	
1/29/2016 17:20	393	66	459	
1/29/2016 18:20	412	64	476	
1/29/2016 19:20	399	62	461	
1/29/2016 20:20	402	61	463	
1/29/2016 21:20	409	59	468	
1/29/2016 22:20	398	58	456	
1/29/2016 23:20	354	56	410	

Run 1

Pellet Heater Test Results - ASTM E2779 / ASTM E2515

Manufacturer: US Stove
Model: 5710
Project No.: 0215PH050E
Tracking No.: 2150
Run: 1
Test Date: 02/23/16

Burn Rate (Composite)	**0.85 kg/hr dry**
Average Tunnel Temperature	90 degrees F
Average Gas Velocity in Dilution Tunnel - vs	11.64 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	7868.7 dscf/hour
Average Delta p	0.042 inches H20
Average Delta H	0.91 inches H20
Total Time of Test	366 minutes

Burn Rate (High)	**1.49**	kg/hr dry
Burn Rate (Med)	**0.73**	kg/hr dry
	49.0%	of High
Burn Rate (Low)	**0.72**	kg/hr dry
	48.3%	of High

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	1st HR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	54.352 cubic feet	55.031 cubic feet	9.168 cubic feet
Average Gas Meter Temperature	69 degrees F	79 degrees F	80 degrees F	76 degrees F
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	54.214 dscf	54.866 dscf	9.199 dscf
Total Particulates - m_n	0 mg	7.5 mg	6.8 mg	1.3 mg
Particulate Concentration (dry-standard) - C_r/C_s	0.000000 grams/dscf	0.00014 grams/dscf	0.00012 grams/dscf	0.00014 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	6.64022 grams	5.948899 grams	1.11 grams
Particulate Emission Rate	0.00 grams/hour	1.09 grams/hour	0.98 grams/hour	1.11 grams/hour
Emissisons Factor		1.28 g/kg	1.15 g/kg	0.76 g/kg
Difference from Average Total Particulate Emissions		0.35 grams	0.35 grams	

Dual Train Comparison Results Are Acceptable (<0.5g)

FINAL AVERAGE RESULTS

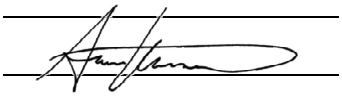
Integrated Test Run	
Total Particulate Emissions - E_T	6.294561 grams
Particulate Emission Rate	**1.03 grams/hour**
Emissisons Factor	1.21 grams/kg
Train Difference, %	10.98
Train Precision ± 0.5 g/kg	0.13
First Hour Emissions	
Total Particulate Emissions - E_T	1.11 grams
Particulate Emission Rate	1.11 grams/hour
Emissisons Factor	0.76 grams/kg
7.5% of Average Total Particulate Emissions	0.47 grams

Calculated as follows, (6.64023 - 5.9489) / 6.2946 * 100 = 10.98

OMNI-Test Laboratories, Inc.

Manufacturer:	US Stove
Model:	5710
Date:	02/23/16
Run:	1
Control #:	2150
Test Duration:	366
Output Category:	Integrated

Technicians: A. Kravitz



Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	68.5%	73.4%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	69%	73.7%

Output Rate (kJ/h)	11,349	10,766	**(Btu/h)**
Burn Rate (kg/h)	0.85	1.87	**(lb/h)**
Input (kJ/h)	16,561	15,710	**(Btu/h)**

Test Load Weight (dry kg)	5.18	11.42	**dry lb**
MC wet (%)	4.81		
MC dry (%)	5.05		
Particulate (g)	0		
CO (g)	35		
Test Duration (h)	6.10		

Emissions	**Particulate**	**CO**
g/MJ Output	0.00	0.50
g/kg Dry Fuel	0.00	6.74
g/h	0.00	5.73
lb/MM Btu Output	0.00	1.17

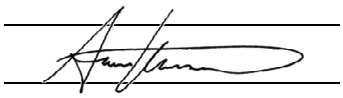
Air/Fuel Ratio (A/F)	25.19

VERSION: **2.3** **3/23/2010**

OMNI-Test Laboratories, Inc.

Manufacturer:	US Stove
Model:	5710
Date:	02/23/16
Run:	1
Control #:	2150
Test Duration:	61
Output Category:	Max

Technicians: A. Kravitz



Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	73.0%	78.2%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	73%	78.6%

Output Rate (kJ/h)	21,164	20,076	**(Btu/h)**
Burn Rate (kg/h)	1.49	3.28	**(lb/h)**
Input (kJ/h)	28,982	27,492	**(Btu/h)**

Test Load Weight (dry kg)	1.51	3.33	**dry lb**
MC wet (%)	4.81		
MC dry (%)	5.05		
Particulate (g)	0		
CO (g)	0		
Test Duration (h)	1.02		

Emissions	**Particulate**	**CO**
g/MJ Output	0.00	0.00
g/kg Dry Fuel	0.00	0.00
g/h	0.00	0.00
lb/MM Btu Output	0.00	0.00

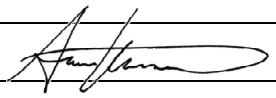
Air/Fuel Ratio (A/F)	17.38

VERSION: **2.3** **3/23/2010**

OMNI-Test Laboratories, Inc.

Manufacturer:	US Stove
Model:	5710
Date:	02/23/16
Run:	1
Control #:	2150
Test Duration:	121
Output Category:	Med

Technicians: A. Kravitz



Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	68.9%	73.8%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	69%	74.1%

Output Rate (kJ/h)	9,781	9,279	**(Btu/h)**
Burn Rate (kg/h)	0.73	1.60	**(lb/h)**
Input (kJ/h)	14,193	13,464	**(Btu/h)**

Test Load Weight (dry kg)	1.47	3.24	**dry lb**
MC wet (%)	4.81		
MC dry (%)	5.05		
Particulate (g)	0		
CO (g)	0		
Test Duration (h)	2.02		

Emissions	**Particulate**	**CO**
g/MJ Output	0.00	0.00
g/kg Dry Fuel	0.00	0.00
g/h	0.00	0.00
lb/MM Btu Output	0.00	0.00

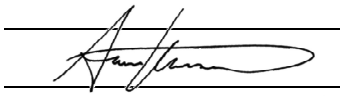
Air/Fuel Ratio (A/F)	25.70

VERSION: **2.3** **3/23/2010**

OMNI-Test Laboratories, Inc.

Manufacturer:	US Stove
Model:	5710
Date:	02/23/16
Run:	1
Control #:	2150
Test Duration:	184
Output Category:	Min

Technicians: A. Kravitz



Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	64.8%	69.4%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	65%	69.7%

Output Rate (kJ/h)	9,072	8,606	**(Btu/h)**
Burn Rate (kg/h)	0.72	1.58	**(lb/h)**
Input (kJ/h)	14,000	13,281	**(Btu/h)**

Test Load Weight (dry kg)	2.20	4.85	**dry lb**
MC wet (%)	4.81		
MC dry (%)	5.05		
Particulate (g)	0		
CO (g)	34		
Test Duration (h)	3.07		

Emissions	**Particulate**	**CO**
g/MJ Output	0.00	1.24
g/kg Dry Fuel	0.00	15.63
g/h	0.00	11.23
lb/MM Btu Output	0.00	2.88

Air/Fuel Ratio (A/F)	29.16

VERSION: **2.3** **3/23/2010**

OMNI-Test Laboratories, Inc. **ASTM E2779 Pellet Heater Run Sheets**

Client: **US Stove** Project Number: **0215PS050E** Run Number: 1

Model: **5710** Tracking Number: 2150 Date: 2/23/11

Test Crew: **A. Kravitz**

OMNI Equipment ID numbers: 23, 185, 132, 209, 335, 336, 410, 420, 559, 592

Pellet Heater Run Notes

Air Control Settings

High Burn Rate Target: 100%

Settings: Burn setting = 5
Damper = Fully open

Medium Burn Rate Target: ~50%

Settings: Burn setting = 1
Damper = Fully Closed

Low Burn Rate Target: Minimum

Settings: Burn Setting = 1
Damper = Fully Open

Additional Settings Notes:

Lower BR achieved with more dilution air.

Preburn Notes

Time	Notes
	None

Test Notes

Time	Notes
	None

Pellet Moisture Content: 5.05 %

Technician Signature: [signature]

Date: 2/23/11

OMNI-Test Laboratories, Inc.

ASTM E2779 Pellet Heater Run Sheets

Client: **US Stove** Project Number: **0215PS050E** Run Number: 1

Model: **5710** Tracking Number: 2150 Date: 2/23/16

Test Crew: **A. Kravitz**

OMNI Equipment ID numbers: 23, 185, 132, 209, 335, 336, 410, 420, 559, 592

Pellet Heater Supplemental Data

Start Time: 9:52

Stop Time: 15:56

Booth #: E1

Stack Gas Leak Check:

Initial: Ø Final: Ø

Sample Train Leak Check:

A: Ø @ -6 "Hg

B: Ø @ -7 "Hg

Calibrations: Span Gas CO_2: 16.84 CO: 4.293

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	9:30	9:32	4:02	4:04
CO_2	0.00	16.90	0.08	16.80
CO	0.000	4.290	0.028	4.282

Air Velocity (ft/min): Initial: 450 Final: 456

Scale Audit (lbs): Initial: 10.0 Final: 10.6

Pitot Tube Leak Test: Initial: ✓ Final: ✓

Stack Diameter (in): 3

Induced Draft: 0

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: 2/18/16 Initials: [signature]

	Initial	Middle	Ending
P_b (in/Hg)	30.18	30.14	30.10
Ambient (°F)	71	70	68

Background Filter Volume: N/A

Tunnel Traverse		
Microtector Reading	dP (in H_2O)	T(°F)
0.010	0.020	95
0.017	0.034	
0.020	0.040	
0.011	0.022	
0.011	0.022	
0.014	0.038	
0.017	0.034	
0.012	0.024	
Center:		
0.021	0.042	95
Static:		
~~-0.14~~	-0.14	95

Technician Signature: [signature] Date: 2/23/16

Pellet Heater Preburn Data - ASTM E2779

Manufacturer: US Stoves
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 2/23/2016

PB Length: 75 min
Recording Interval: 1 min

		Averages:	339	71	0		
Elapsed Time (min)	Scale Reading	Weight Change	Stack (F)	Ambient (F)	Draft ("H2O)	CO2 (%)	CO (%)
0	20.7	-	234	71	-0.02		
1	20.7	0	222	71	-0.02		
2	20.7	0	210	71	-0.01		
3	20.6	-0.1	211	71	-0.02		
4	20.6	0	222	71	-0.02		
5	20.5	-0.1	239	71	-0.02		
6	20.4	-0.1	257	71	-0.03		
7	20.3	-0.1	276	71	-0.03		
8	20.2	-0.1	294	71	-0.03		
9	20.1	-0.1	308	71	-0.03		
10	20.1	0	319	71	-0.03		
11	20.0	-0.1	327	71	-0.04		
12	19.9	-0.1	333	71	-0.04		
13	19.9	0	335	71	-0.04		
14	19.8	-0.1	338	71	-0.04		
15	19.8	0	340	71	-0.04		
16	19.7	-0.1	342	71	-0.04		
17	19.7	0	343	71	-0.04		
18	19.6	-0.1	344	71	-0.04		
19	19.6	0	347	71	-0.04		
20	19.5	-0.1	347	72	-0.04		
21	19.5	0	348	72	-0.04		
22	19.4	-0.1	349	72	-0.04		
23	19.3	-0.1	350	72	-0.04		
24	19.3	0	351	72	-0.04		
25	19.2	-0.1	352	72	-0.04		
26	19.2	0	353	72	-0.04		
27	19.1	-0.1	354	72	-0.04		
28	19.0	-0.1	354	72	-0.04		
29	19.0	0	355	72	-0.04		
30	18.9	-0.1	356	72	-0.04		
31	18.9	0	358	72	-0.04		
32	18.8	-0.1	357	71	-0.04		
33	18.8	0	355	71	-0.04		
34	18.7	-0.1	354	71	-0.04		
35	18.7	0	353	71	-0.04		
36	18.6	-0.1	354	72	-0.04		
37	18.5	-0.1	354	72	-0.04		
38	18.5	0	354	72	-0.04		
39	18.4	-0.1	354	72	-0.04		
40	18.4	0	354	72	-0.04		
41	18.3	-0.1	354	72	-0.04		
42	18.3	0	354	71	-0.04		
43	18.2	-0.1	355	72	-0.04		
44	18.2	0	354	72	-0.04		
45	18.1	-0.1	353	72	-0.04		
46	18.1	0	352	71	-0.04		
47	18.0	-0.1	354	72	-0.04		
48	18.0	0	355	71	-0.04		
49	17.9	-0.1	356	71	-0.04		
50	17.8	-0.1	358	71	-0.04		
51	17.7	-0.1	360	71	-0.04		
52	17.7	0	360	71	-0.04		
53	17.6	-0.1	359	71	-0.04		
54	17.6	0	358	71	-0.04		
55	17.5	-0.1	357	71	-0.04		
56	17.5	0	358	71	-0.04		
57	17.4	-0.1	358	71	-0.04		
58	17.4	0	357	72	-0.04		
59	17.4	0	357	72	-0.04		
60	17.3	-0.1	357	72	-0.04		
61	17.3	0	358	71	-0.04		
62	17.3	0	358	72	-0.04		
63	17.3	0	357	72	-0.04		
64	17.2	-0.1	357	71	-0.04		
65	17.2	0	356	71	-0.04		
66	17.1	-0.1	356	72	-0.04		
67	17.0	-0.1	356	71	-0.04		
68	16.9	-0.1	357	72	-0.04		
69	16.9	0	356	72	-0.04		
70	16.9	0	356	71	-0.04		
71	16.9	0	357	71	-0.04		
72	16.8	-0.1	356	71	-0.04		
73	16.8	0	355	71	-0.04		
74	16.7	-0.1	355	71	-0.04		
75	16.7	0	355	71	-0.04		

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data										
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			0.02	73	1.1	0.89	73	2.15	95	0.042			16.7		355	73	73	71	-0.039	5.2	0
1	0.140	0.143	0.14	0.14	0.98	73	1.1	1.22	73	2.25	95	0.042	96	97	16.6	-0.1	356	74	74	71	-0.039	5.6	0
2	0.293	0.297	0.15	0.15	0.99	73	1.1	1.23	73	2.24	95	0.042	105	104	16.6	0	356	74	74	71	-0.040	5.8	0
3	0.445	0.453	0.15	0.16	0.99	73	1.1	1.22	73	2.25	95	0.042	104	106	16.5	-0.1	356	74	74	71	-0.040	5.7	0
4	0.598	0.608	0.15	0.16	0.99	73	1.1	1.22	73	2.25	95	0.042	105	105	16.4	-0.1	356	74	74	71	-0.039	5.4	0
5	0.752	0.763	0.15	0.16	0.99	73	1.1	1.22	73	2.25	95	0.042	105	105	16.4	0	355	74	74	71	-0.040	5.7	0
6	0.904	0.917	0.15	0.15	0.99	73	1.1	1.22	73	2.24	93	0.042	104	104	16.3	-0.1	355	74	74	70	-0.040	5.5	0
7	1.057	1.072	0.15	0.16	0.98	73	1.1	1.21	74	2.24	93	0.042	105	105	16.2	-0.1	356	74	74	70	-0.040	5.4	0
8	1.210	1.227	0.15	0.16	1.00	73	1.1	1.22	74	2.23	92	0.042	104	104	16.2	0	356	74	73	70	-0.040	5.5	0
9	1.363	1.382	0.15	0.16	0.99	73	1.1	1.22	74	2.23	92	0.042	104	104	16.1	-0.1	356	74	73	69	-0.040	5.9	0
10	1.516	1.536	0.15	0.15	0.99	74	1.1	1.22	74	2.24	93	0.042	104	104	16.0	-0.1	356	74	73	69	-0.040	5.9	0
11	1.669	1.691	0.15	0.16	0.99	74	1.1	1.22	74	2.23	93	0.042	104	105	15.9	-0.1	357	74	73	69	-0.040	5.6	0
12	1.822	1.845	0.15	0.15	0.98	74	1.1	1.21	74	2.23	93	0.042	104	104	15.8	-0.1	357	74	73	70	-0.040	5.8	0
13	1.975	2.000	0.15	0.16	0.99	74	1.1	1.22	74	2.23	94	0.042	104	105	15.8	0	357	74	73	70	-0.039	6	0
14	2.128	2.154	0.15	0.15	0.99	74	1.1	1.21	74	2.22	94	0.042	104	104	15.7	-0.1	357	74	73	70	-0.040	5.9	0
15	2.281	2.308	0.15	0.15	0.99	74	1.1	1.22	74	2.23	95	0.042	105	104	15.6	-0.1	358	74	73	70	-0.040	5.7	0
16	2.434	2.463	0.15	0.16	0.99	74	1.1	1.20	74	2.22	95	0.042	105	105	15.6	0	359	74	73	71	-0.040	5.8	0
17	2.587	2.617	0.15	0.15	0.98	74	1.1	1.21	74	2.23	95	0.042	105	104	15.5	-0.1	359	74	73	71	-0.040	5.9	0
18	2.740	2.772	0.15	0.16	0.98	74	1.1	1.20	74	2.23	96	0.042	105	105	15.5	0	359	74	73	71	-0.040	6	0
19	2.892	2.926	0.15	0.15	0.98	74	1.1	1.21	75	2.23	96	0.042	104	104	15.4	-0.1	359	74	73	71	-0.040	5.8	0
20	3.045	3.080	0.15	0.15	0.98	75	1.1	1.21	75	2.23	96	0.042	104	104	15.4	0	359	74	73	71	-0.040	5.8	0
21	3.199	3.234	0.15	0.15	0.98	75	1.1	1.21	75	2.23	97	0.042	105	104	15.3	-0.1	358	74	73	71	-0.039	5.9	0
22	3.351	3.389	0.15	0.16	0.99	75	1.1	1.20	75	2.23	97	0.042	104	105	15.3	0	358	74	73	71	-0.039	5.7	0
23	3.504	3.543	0.15	0.15	0.98	75	1.1	1.21	75	2.22	97	0.042	105	104	15.2	-0.1	358	74	73	71	-0.039	5.3	0
24	3.657	3.697	0.15	0.15	0.99	75	1.1	1.20	75	2.23	97	0.042	105	104	15.2	0	357	74	73	71	-0.039	5.5	0
25	3.810	3.851	0.15	0.15	0.98	75	1.1	1.21	75	2.22	97	0.042	105	104	15.1	-0.1	356	74	73	71	-0.039	5.7	0
26	3.963	4.006	0.15	0.16	0.98	75	1.1	1.20	76	2.23	97	0.042	105	105	15.1	0	356	74	73	71	-0.039	5.4	0
27	4.116	4.160	0.15	0.15	0.98	76	1.1	1.21	76	2.24	98	0.042	104	104	15.0	-0.1	358	74	74	71	-0.039	5.3	0
28	4.269	4.314	0.15	0.15	0.98	76	1.1	1.20	76	2.23	98	0.042	104	104	15.0	0	357	74	74	71	-0.039	5.6	0
29	4.422	4.468	0.15	0.15	0.99	76	1.1	1.21	76	2.23	98	0.042	104	104	14.9	-0.1	356	74	74	71	-0.039	6.1	0
30	4.574	4.623	0.15	0.16	0.98	76	1.1	1.20	76	2.23	97	0.042	104	105	14.9	0	356	74	74	70	-0.039	5.5	0
31	4.728	4.777	0.15	0.15	0.98	76	1.1	1.20	76	2.23	97	0.042	105	104	14.8	-0.1	356	74	74	71	-0.039	5.5	0
32	4.880	4.932	0.15	0.16	0.98	76	1.1	1.21	77	2.23	97	0.042	104	104	14.8	0	355	74	74	70	-0.039	5.5	0
33	5.033	5.086	0.15	0.15	0.98	77	1.1	1.21	77	2.24	98	0.042	104	104	14.7	-0.1	356	74	74	70	-0.039	5.5	0
34	5.187	5.240	0.15	0.15	0.98	77	1.1	1.20	77	2.23	98	0.042	105	104	14.7	0	356	74	74	70	-0.039	5.5	0

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data										
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
35	5.339	5.394	0.15	0.15	0.99	77	1.1	1.20	77	2.23	98	0.042	104	104	14.6	-0.1	356	74	74	70	-0.039	5.7	0
36	5.493	5.549	0.15	0.16	0.98	77	1.1	1.20	77	2.23	98	0.042	105	104	14.6	0	355	74	74	70	-0.038	5.7	0
37	5.646	5.703	0.15	0.15	0.99	77	1.1	1.21	77	2.24	99	0.042	104	104	14.5	-0.1	355	74	74	70	-0.038	5.3	0
38	5.799	5.859	0.15	0.16	0.98	77	1.1	1.20	77	2.24	99	0.042	104	105	14.5	0	355	74	74	70	-0.038	5.5	0
39	5.953	6.012	0.15	0.15	0.98	77	1.1	1.20	78	2.23	99	0.042	105	103	14.4	-0.1	355	74	74	70	-0.039	5.8	0
40	6.105	6.168	0.15	0.16	0.99	78	1.1	1.20	78	2.23	99	0.042	103	105	14.4	0	356	74	74	70	-0.038	5.6	0
41	6.259	6.321	0.15	0.15	0.98	78	1.1	1.20	78	2.24	99	0.042	105	103	14.3	-0.1	356	74	74	70	-0.038	5.8	0
42	6.412	6.477	0.15	0.16	0.98	78	1.1	1.19	78	2.24	99	0.042	104	105	14.3	0	356	75	74	71	-0.038	6	0
43	6.565	6.630	0.15	0.15	0.98	78	1.1	1.20	78	2.24	100	0.042	104	103	14.2	-0.1	355	75	74	71	-0.038	5.7	0
44	6.718	6.786	0.15	0.16	0.98	78	1.1	1.19	78	2.23	100	0.042	104	105	14.1	-0.1	356	75	74	71	-0.039	5.5	0
45	6.871	6.939	0.15	0.15	0.98	78	1.1	1.20	78	2.23	100	0.042	104	103	14.1	0	356	75	74	71	-0.038	5.4	0
46	7.024	7.094	0.15	0.16	0.98	78	1.1	1.19	78	2.24	100	0.042	104	104	14.1	0	356	75	74	71	-0.038	5.9	0
47	7.178	7.248	0.15	0.15	0.98	78	1.1	1.20	79	2.24	100	0.042	105	104	14.0	-0.1	355	75	74	72	-0.038	5.8	0
48	7.330	7.403	0.15	0.15	0.98	78	1.1	1.20	79	2.24	100	0.042	104	104	13.9	-0.1	356	75	74	71	-0.038	5.3	0
49	7.484	7.557	0.15	0.15	0.98	79	1.1	1.20	79	2.24	100	0.042	105	104	13.9	0	357	75	74	72	-0.038	5.3	0
50	7.637	7.712	0.15	0.15	0.98	79	1.1	1.19	79	2.24	100	0.042	104	104	13.8	-0.1	358	75	74	72	-0.038	5.7	0
51	7.790	7.866	0.15	0.15	0.98	79	1.1	1.20	79	2.24	100	0.042	104	104	13.8	0	357	75	74	72	-0.038	6.2	0
52	7.944	8.021	0.15	0.16	0.98	79	1.1	1.19	79	2.24	100	0.042	105	104	13.7	-0.1	358	75	74	72	-0.038	6	0
53	8.096	8.175	0.15	0.15	0.98	79	1.1	1.20	79	2.23	100	0.042	103	104	13.7	0	358	75	74	72	-0.039	5.6	0
54	8.249	8.330	0.15	0.15	0.98	79	1.1	1.20	79	2.24	101	0.042	104	104	13.6	-0.1	359	75	75	72	-0.038	5.9	0
55	8.403	8.484	0.15	0.15	0.98	79	1.1	1.20	79	2.24	101	0.042	105	104	13.6	0	359	75	75	72	-0.038	6.1	0
56	8.555	8.639	0.15	0.15	0.98	79	1.1	1.19	80	2.24	101	0.042	103	104	13.5	-0.1	359	75	75	72	-0.039	6	0
57	8.709	8.792	0.15	0.15	0.98	79	1.1	1.20	80	2.24	101	0.042	105	103	13.5	0	360	75	75	72	-0.039	5.9	0
58	8.861	8.948	0.15	0.16	0.98	79	1.1	1.19	80	2.24	101	0.042	103	105	13.4	-0.1	359	76	75	72	-0.038	5.9	0
59	9.014	9.101	0.15	0.15	0.98	80	1.1	1.19	80	2.25	101	0.042	104	103	13.3	-0.1	359	76	75	72	-0.039	5.9	0
60	9.168	9.258	0.15	0.16	0.98	80	1.1	1.19	80	2.23	101	0.042	105	105	13.3	0	361	75	75	72	-0.039	5.8	0
61	9.320	9.412	0.15	0.15	0.98	80	1.1	1.19	80	2.23	99	0.042	103	103	13.2	-0.1	349	76	75	72	-0.037	5.8	0
62	9.474	9.568	0.15	0.16	0.97	80	1.1	1.20	80	2.24	98	0.042	104	105	13.2	0	339	76	75	72	-0.036	6.4	0
63	9.626	9.722	0.15	0.15	0.98	80	1.1	1.20	80	2.24	96	0.042	103	103	13.2	0	331	76	75	72	-0.036	5.9	0
64	9.779	9.877	0.15	0.16	0.97	80	1.1	1.19	80	2.24	94	0.042	103	103	13.2	0	325	76	75	71	-0.035	4.9	0
65	9.932	10.031	0.15	0.15	0.97	80	1.2	1.19	80	2.24	94	0.042	103	103	13.1	-0.1	318	76	75	71	-0.034	4.2	0
66	10.085	10.186	0.15	0.15	0.97	80	1.2	1.20	81	2.24	94	0.042	103	103	13.1	0	314	76	75	72	-0.034	3.8	0
67	10.238	10.340	0.15	0.15	0.97	80	1.2	1.19	81	2.24	94	0.042	103	103	13.1	0	311	75	75	72	-0.033	3.5	0
68	10.391	10.495	0.15	0.15	0.97	80	1.2	1.19	81	2.24	94	0.042	103	103	13.0	-0.1	308	75	75	72	-0.033	3.7	0
69	10.543	10.650	0.15	0.16	0.97	80	1.1	1.19	81	2.25	94	0.042	103	103	13.0	0	305	75	75	72	-0.032	3.9	0

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
70	10.696	10.804	0.15	0.15	0.97	81	1.2	1.20	81	2.25	94	0.042	103	103	13.0	0	303	75	75	72	-0.032	3.9	0
71	10.849	10.959	0.15	0.15	0.97	81	1.2	1.19	81	2.25	94	0.042	103	103	12.9	-0.1	302	75	75	72	-0.032	3.6	0
72	11.001	11.113	0.15	0.15	0.97	81	1.2	1.19	81	2.25	93	0.042	102	103	12.9	0	300	75	75	72	-0.032	3.6	0
73	11.154	11.268	0.15	0.16	0.97	81	1.2	1.18	81	2.26	93	0.042	103	103	12.9	0	297	75	75	72	-0.031	3.6	0
74	11.306	11.422	0.15	0.15	0.97	81	1.2	1.19	81	2.26	93	0.042	102	103	12.9	0	294	75	75	72	-0.031	3.5	0
75	11.458	11.576	0.15	0.15	0.97	81	1.2	1.19	81	2.26	93	0.042	102	103	12.8	-0.1	292	75	75	73	-0.030	3.4	0
76	11.611	11.731	0.15	0.15	0.96	81	1.2	1.19	81	2.26	94	0.042	103	103	12.8	0	290	75	75	73	-0.030	3.3	0
77	11.763	11.885	0.15	0.15	0.97	81	1.2	1.19	81	2.26	93	0.042	102	103	12.8	0	289	75	75	73	-0.030	3.2	0
78	11.915	12.039	0.15	0.15	0.97	81	1.2	1.19	81	2.27	93	0.042	102	103	12.7	-0.1	289	75	75	72	-0.030	3.1	0
79	12.068	12.193	0.15	0.15	0.97	81	1.2	1.18	82	2.27	93	0.042	103	102	12.7	0	287	75	75	72	-0.029	3.2	0
80	12.220	12.347	0.15	0.15	0.96	81	1.2	1.18	82	2.28	93	0.042	102	102	12.7	0	284	75	75	72	-0.029	3.4	0
81	12.372	12.501	0.15	0.15	0.96	81	1.2	1.18	82	2.27	93	0.042	102	102	12.7	0	283	75	75	72	-0.029	3.1	0
82	12.524	12.656	0.15	0.16	0.96	81	1.2	1.18	82	2.28	92	0.042	102	103	12.6	-0.1	282	75	75	72	-0.029	3	0
83	12.676	12.809	0.15	0.15	0.96	81	1.2	1.18	82	2.28	92	0.042	102	102	12.6	0	280	75	75	72	-0.029	3.2	0
84	12.828	12.964	0.15	0.16	0.96	81	1.2	1.18	82	2.28	91	0.042	102	103	12.6	0	278	75	75	72	-0.029	3.2	0
85	12.980	13.117	0.15	0.15	0.96	82	1.2	1.18	82	2.29	91	0.042	102	101	12.5	-0.1	279	75	75	72	-0.029	3.1	0
86	13.132	13.271	0.15	0.15	0.96	82	1.2	1.18	82	2.28	91	0.042	102	102	12.5	0	280	75	74	72	-0.030	3.1	0
87	13.283	13.425	0.15	0.15	0.96	82	1.2	1.18	82	2.29	90	0.042	101	102	12.5	0	281	75	74	72	-0.029	3.4	0
88	13.436	13.579	0.15	0.15	0.96	82	1.2	1.18	82	2.3	90	0.042	103	102	12.4	-0.1	281	75	74	72	-0.030	3.8	0
89	13.587	13.732	0.15	0.15	0.96	82	1.2	1.18	82	2.29	90	0.042	101	101	12.4	0	280	75	74	72	-0.029	3.7	0
90	13.738	13.886	0.15	0.15	0.96	82	1.2	1.17	82	2.3	90	0.042	101	102	12.4	0	281	75	74	72	-0.029	3.7	0
91	13.891	14.039	0.15	0.15	0.96	82	1.2	1.18	82	2.3	90	0.042	103	101	12.3	-0.1	281	75	74	72	-0.030	3.6	0
92	14.042	14.193	0.15	0.15	0.96	82	1.2	1.18	82	2.3	90	0.042	101	102	12.3	0	280	75	74	72	-0.029	3.5	0
93	14.193	14.346	0.15	0.15	0.95	82	1.2	1.17	82	2.3	90	0.042	101	101	12.3	0	279	75	74	72	-0.029	3.4	0
94	14.345	14.500	0.15	0.15	0.95	82	1.2	1.17	83	2.3	90	0.042	102	102	12.3	0	280	75	74	72	-0.030	3.2	0
95	14.496	14.653	0.15	0.15	0.96	82	1.2	1.17	83	2.3	89	0.042	101	101	12.2	-0.1	280	75	74	71	-0.030	3.3	0
96	14.648	14.808	0.15	0.15	0.95	82	1.2	1.17	83	2.3	89	0.042	102	102	12.2	0	279	75	74	71	-0.030	3.7	0
97	14.800	14.960	0.15	0.15	0.95	82	1.2	1.17	83	2.31	88	0.042	102	100	12.2	0	280	75	74	71	-0.030	3.5	0
98	14.951	15.114	0.15	0.15	0.95	82	1.2	1.17	83	2.31	88	0.042	101	102	12.2	0	280	74	73	70	-0.030	3.3	0
99	15.103	15.267	0.15	0.15	0.95	82	1.2	1.17	83	2.32	88	0.042	102	101	12.1	-0.1	279	74	73	70	-0.030	3.4	0
100	15.255	15.421	0.15	0.15	0.95	82	1.2	1.17	83	2.31	87	0.042	102	102	12.1	0	279	74	73	70	-0.030	3.4	0
101	15.406	15.575	0.15	0.15	0.95	82	1.2	1.18	83	2.31	87	0.042	101	102	12.1	0	278	74	73	70	-0.029	3.3	0
102	15.557	15.728	0.15	0.15	0.95	82	1.2	1.17	83	2.32	87	0.042	101	101	12.1	0	278	74	73	71	-0.030	3.3	0
103	15.709	15.882	0.15	0.15	0.95	82	1.2	1.17	83	2.32	87	0.042	102	102	12.0	-0.1	277	74	73	70	-0.030	3.4	0
104	15.860	16.035	0.15	0.15	0.95	82	1.2	1.16	83	2.33	87	0.042	101	101	12.0	0	277	73	73	70	-0.029	3.3	0

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data										
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
105	16.011	16.188	0.15	0.15	0.95	82	1.2	1.16	83	2.33	87	0.042	101	101	12.0	0	276	73	72	70	-0.029	3.3	0
106	16.162	16.341	0.15	0.15	0.94	82	1.2	1.17	83	2.33	87	0.042	101	101	11.9	-0.1	276	73	72	70	-0.030	3.2	0
107	16.314	16.495	0.15	0.15	0.95	82	1.2	1.17	83	2.32	87	0.042	102	102	11.9	0	276	73	72	70	-0.030	3.1	0
108	16.464	16.647	0.15	0.15	0.95	82	1.2	1.17	82	2.32	87	0.042	100	100	11.9	0	275	73	72	69	-0.030	3.4	0
109	16.615	16.801	0.15	0.15	0.95	82	1.2	1.16	82	2.33	87	0.042	101	102	11.9	0	276	73	72	69	-0.031	3.4	0
110	16.767	16.953	0.15	0.15	0.95	82	1.2	1.17	82	2.34	87	0.042	102	100	11.8	-0.1	277	73	72	69	-0.031	3.4	0
111	16.917	17.107	0.15	0.15	0.95	82	1.2	1.16	82	2.34	87	0.042	100	102	11.8	0	279	73	71	69	-0.030	3.8	0
112	17.068	17.260	0.15	0.15	0.95	81	1.2	1.17	82	2.34	86	0.042	101	101	11.8	0	279	72	71	69	-0.031	3.8	0
113	17.220	17.413	0.15	0.15	0.94	81	1.2	1.16	82	2.34	87	0.042	102	101	11.7	-0.1	279	72	71	69	-0.030	3.9	0
114	17.371	17.566	0.15	0.15	0.95	81	1.2	1.16	82	2.34	87	0.042	101	101	11.7	0	279	72	71	69	-0.030	3.6	0
115	17.521	17.718	0.15	0.15	0.95	81	1.2	1.16	82	2.35	87	0.042	100	100	11.7	0	279	72	71	69	-0.030	3.4	0
116	17.672	17.872	0.15	0.15	0.94	81	1.2	1.17	82	2.35	87	0.042	101	102	11.7	0	278	72	71	69	-0.030	3.4	0
117	17.823	18.024	0.15	0.15	0.94	81	1.2	1.17	82	2.35	88	0.042	101	101	11.6	-0.1	279	72	71	69	-0.030	3.5	0
118	17.973	18.178	0.15	0.15	0.94	81	1.2	1.16	82	2.35	88	0.042	101	102	11.6	0	278	72	71	69	-0.030	3.5	0
119	18.124	18.330	0.15	0.15	0.94	81	1.2	1.16	82	2.35	88	0.042	101	101	11.6	0	278	72	71	69	-0.030	3.6	0
120	18.275	18.483	0.15	0.15	0.94	81	1.2	1.16	82	2.35	88	0.042	101	101	11.5	-0.1	279	72	70	69	-0.030	3.4	0
121	18.426	18.636	0.15	0.15	0.94	81	1.2	1.16	82	2.36	88	0.042	101	101	11.5	0	278	72	70	68	-0.030	3.4	0
122	18.576	18.788	0.15	0.15	0.95	81	1.2	1.15	82	2.36	88	0.042	101	101	11.5	0	276	72	70	68	-0.030	3.5	0
123	18.726	18.941	0.15	0.15	0.94	81	1.2	1.15	81	2.35	88	0.042	101	101	11.5	0	276	71	70	69	-0.030	3.1	0
124	18.877	19.093	0.15	0.15	0.94	81	1.2	1.16	81	2.36	87	0.042	101	101	11.4	-0.1	274	71	70	69	-0.030	3	0
125	19.027	19.246	0.15	0.15	0.94	80	1.2	1.15	81	2.37	87	0.042	101	101	11.4	0	275	71	70	68	-0.030	3.1	0
126	19.177	19.398	0.15	0.15	0.94	80	1.2	1.16	81	2.36	87	0.042	101	101	11.4	0	275	71	70	68	-0.030	3.1	0
127	19.328	19.550	0.15	0.15	0.94	80	1.2	1.16	81	2.37	87	0.042	101	101	11.3	-0.1	276	71	70	68	-0.030	3.4	0
128	19.478	19.703	0.15	0.15	0.94	80	1.2	1.16	81	2.37	87	0.042	101	101	11.3	0	275	71	70	68	-0.030	3.3	0
129	19.628	19.855	0.15	0.15	0.93	80	1.2	1.15	81	2.37	87	0.042	101	101	11.3	0	274	71	70	68	-0.030	3.5	0
130	19.778	20.008	0.15	0.15	0.94	80	1.2	1.15	81	2.37	86	0.042	101	101	11.3	0	273	71	70	68	-0.029	3.2	0
131	19.928	20.159	0.15	0.15	0.93	80	1.2	1.15	81	2.37	86	0.042	101	100	11.2	-0.1	273	71	70	68	-0.030	3.2	0
132	20.079	20.312	0.15	0.15	0.93	80	1.2	1.15	81	2.37	86	0.042	101	101	11.2	0	271	71	70	68	-0.030	3.2	0
133	20.228	20.464	0.15	0.15	0.93	80	1.2	1.15	81	2.37	86	0.042	100	101	11.2	0	273	71	70	68	-0.030	3.1	0
134	20.378	20.616	0.15	0.15	0.93	80	1.2	1.15	81	2.37	86	0.042	101	101	11.2	0	274	71	70	68	-0.030	3.4	0
135	20.528	20.768	0.15	0.15	0.93	80	1.2	1.15	81	2.38	86	0.042	101	101	11.1	-0.1	275	71	69	68	-0.031	3.8	0
136	20.678	20.919	0.15	0.15	0.93	80	1.2	1.15	80	2.38	86	0.042	101	100	11.1	0	276	71	69	68	-0.030	3.6	0
137	20.827	21.072	0.15	0.15	0.93	80	1.2	1.15	80	2.38	86	0.042	100	101	11.1	0	276	71	69	68	-0.031	3.8	0
138	20.977	21.223	0.15	0.15	0.93	80	1.2	1.15	80	2.37	86	0.042	101	100	11.0	-0.1	276	70	69	68	-0.031	3.6	0
139	21.127	21.375	0.15	0.15	0.93	80	1.2	1.15	80	2.38	86	0.042	101	101	11.0	0	276	70	69	68	-0.031	3.3	0

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data										
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
140	21.277	21.527	0.15	0.15	0.93	80	1.2	1.15	80	2.38	86	0.042	101	101	11.0	0	276	70	69	68	-0.030	3.5	0
141	21.426	21.678	0.15	0.15	0.93	79	1.2	1.15	80	2.39	86	0.042	100	100	11.0	0	275	70	69	68	-0.030	3.3	0
142	21.575	21.830	0.15	0.15	0.93	79	1.2	1.14	80	2.38	86	0.042	100	101	10.9	-0.1	274	70	69	68	-0.030	3.3	0
143	21.725	21.982	0.15	0.15	0.93	79	1.2	1.14	80	2.39	86	0.042	101	101	10.9	0	275	70	69	68	-0.030	3.2	0
144	21.874	22.132	0.15	0.15	0.92	79	1.2	1.15	80	2.39	86	0.042	100	99	10.9	0	274	70	69	68	-0.030	3.4	0
145	22.024	22.285	0.15	0.15	0.92	79	1.2	1.14	80	2.39	86	0.042	101	101	10.8	-0.1	273	71	70	68	-0.030	3.4	0
146	22.172	22.435	0.15	0.15	0.92	79	1.2	1.14	80	2.39	86	0.042	99	99	10.8	0	275	71	70	68	-0.030	3.1	0
147	22.321	22.586	0.15	0.15	0.92	79	1.2	1.14	80	2.39	85	0.042	100	100	10.8	0	274	71	70	69	-0.030	3.4	0
148	22.471	22.738	0.15	0.15	0.92	79	1.2	1.14	80	2.4	85	0.042	101	101	10.7	-0.1	273	71	70	69	-0.030	3.4	0
149	22.620	22.888	0.15	0.15	0.92	79	1.3	1.14	80	2.4	85	0.042	100	99	10.7	0	271	71	70	69	-0.030	3.3	0
150	22.768	23.039	0.15	0.15	0.92	79	1.2	1.14	80	2.4	85	0.042	99	100	10.7	0	273	71	70	69	-0.030	3	0
151	22.917	23.191	0.15	0.15	0.92	79	1.3	1.14	80	2.41	85	0.042	100	101	10.7	0	272	71	70	69	-0.029	3.2	0
152	23.066	23.341	0.15	0.15	0.92	79	1.3	1.14	80	2.41	86	0.042	100	99	10.6	-0.1	271	71	70	69	-0.030	3.4	0
153	23.215	23.492	0.15	0.15	0.91	79	1.2	1.13	80	2.41	86	0.042	100	100	10.6	0	271	71	70	69	-0.029	3.1	0
154	23.364	23.643	0.15	0.15	0.92	79	1.2	1.13	80	2.41	86	0.042	100	100	10.6	0	272	71	70	69	-0.030	3.1	0
155	23.512	23.793	0.15	0.15	0.92	79	1.3	1.14	80	2.41	86	0.042	99	99	10.5	-0.1	273	71	70	69	-0.030	3.3	0
156	23.661	23.944	0.15	0.15	0.92	79	1.3	1.13	80	2.41	86	0.042	100	100	10.5	0	273	71	70	69	-0.030	3.7	0
157	23.809	24.095	0.15	0.15	0.92	79	1.2	1.13	80	2.41	87	0.042	99	100	10.5	0	274	71	70	69	-0.030	3.5	0
158	23.958	24.244	0.15	0.15	0.91	79	1.3	1.13	80	2.42	86	0.042	100	99	10.5	0	274	71	71	69	-0.030	3.5	0
159	24.107	24.396	0.15	0.15	0.91	79	1.3	1.12	80	2.42	86	0.042	100	101	10.4	-0.1	273	71	71	69	-0.029	3.3	0
160	24.255	24.546	0.15	0.15	0.92	79	1.3	1.13	80	2.41	86	0.042	99	99	10.4	0	272	71	71	69	-0.029	3	0
161	24.403	24.696	0.15	0.15	0.91	79	1.3	1.13	80	2.41	86	0.042	99	99	10.4	0	273	72	71	69	-0.030	2.9	0
162	24.552	24.847	0.15	0.15	0.91	79	1.3	1.12	80	2.42	86	0.042	100	100	10.3	-0.1	274	72	71	70	-0.030	3.1	0
163	24.699	24.997	0.15	0.15	0.91	79	1.3	1.13	80	2.42	86	0.042	99	99	10.3	0	274	72	71	69	-0.029	3.6	0
164	24.848	25.146	0.15	0.15	0.91	79	1.3	1.13	80	2.42	86	0.042	100	99	10.3	0	273	72	71	70	-0.029	3.4	0
165	24.996	25.297	0.15	0.15	0.91	79	1.3	1.12	80	2.42	86	0.042	99	100	10.3	0	273	72	71	69	-0.030	3.4	0
166	25.143	25.447	0.15	0.15	0.91	79	1.3	1.13	80	2.43	86	0.042	99	99	10.2	-0.1	274	72	71	69	-0.030	3.2	0
167	25.291	25.596	0.15	0.15	0.91	79	1.3	1.12	80	2.43	86	0.042	99	99	10.2	0	273	72	71	69	-0.029	3.4	0
168	25.439	25.746	0.15	0.15	0.91	80	1.3	1.12	80	2.43	86	0.042	99	99	10.1	-0.1	273	72	71	69	-0.030	3.2	0
169	25.588	25.897	0.15	0.15	0.90	80	1.3	1.12	80	2.43	86	0.042	100	100	10.1	0	271	72	71	70	-0.030	3.2	0
170	25.736	26.046	0.15	0.15	0.91	80	1.3	1.12	80	2.44	86	0.042	99	99	10.1	0	272	72	71	70	-0.030	2.7	0
171	25.884	26.196	0.15	0.15	0.91	80	1.3	1.12	80	2.43	86	0.042	99	99	10.0	-0.1	272	72	71	70	-0.030	3.3	0
172	26.031	26.346	0.15	0.15	0.91	80	1.3	1.12	80	2.44	86	0.042	99	99	10.0	0	273	72	71	69	-0.030	3.5	0
173	26.178	26.495	0.15	0.15	0.91	80	1.3	1.12	80	2.44	86	0.042	99	99	10.0	0	274	72	71	69	-0.030	3.3	0
174	26.326	26.645	0.15	0.15	0.90	80	1.3	1.12	80	2.44	86	0.042	99	99	9.9	-0.1	272	72	71	70	-0.029	3.5	0

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
175	26.474	26.795	0.15	0.15	0.90	80	1.3	1.11	80	2.44	86	0.042	99	99	9.9	0	269	72	71	70	-0.029	3.1	0
176	26.622	26.944	0.15	0.15	0.90	80	1.3	1.12	80	2.44	86	0.042	99	99	9.9	0	268	72	71	70	-0.028	2.4	0
177	26.770	27.093	0.15	0.15	0.90	80	1.3	1.12	80	2.44	86	0.042	99	99	9.9	0	268	72	71	70	-0.029	2.3	0
178	26.917	27.244	0.15	0.15	0.91	80	1.3	1.11	80	2.44	86	0.042	99	100	9.9	0	268	72	71	70	-0.029	2.6	0
179	27.064	27.393	0.15	0.15	0.90	80	1.3	1.12	80	2.44	86	0.042	99	99	9.8	-0.1	268	72	71	70	-0.028	2.9	0
180	27.211	27.542	0.15	0.15	0.90	80	1.3	1.11	80	2.44	86	0.042	99	99	9.8	0	265	72	71	70	-0.028	3.1	0
181	27.359	27.691	0.15	0.15	0.90	80	1.3	1.11	81	2.44	85	0.042	99	98	9.8	0	266	72	71	70	-0.029	3.1	0
182	27.507	27.841	0.15	0.15	0.90	80	1.3	1.11	81	2.45	86	0.042	99	99	9.8	0	270	72	71	70	-0.030	2.8	0
183	27.654	27.990	0.15	0.15	0.90	80	1.3	1.11	81	2.45	87	0.042	99	99	9.7	-0.1	277	72	71	70	-0.030	2.8	0
184	27.802	28.139	0.15	0.15	0.90	80	1.3	1.11	81	2.46	87	0.042	99	99	9.7	0	281	72	71	70	-0.030	3.3	0
185	27.948	28.289	0.15	0.15	0.90	80	1.3	1.11	81	2.45	88	0.042	98	99	9.7	0	285	72	71	70	-0.031	3	0
186	28.096	28.438	0.15	0.15	0.90	80	1.3	1.10	81	2.45	88	0.042	99	99	9.6	-0.1	289	72	72	70	-0.032	3.2	0
187	28.243	28.587	0.15	0.15	0.90	80	1.3	1.11	81	2.45	88	0.042	99	99	9.6	0	290	72	72	70	-0.031	3.5	0
188	28.390	28.736	0.15	0.15	0.90	80	1.3	1.11	81	2.45	88	0.042	99	99	9.6	0	291	72	72	70	-0.031	3.4	0
189	28.538	28.886	0.15	0.15	0.90	80	1.3	1.11	81	2.45	88	0.042	99	99	9.5	-0.1	292	72	72	70	-0.031	3.3	0
190	28.686	29.034	0.15	0.15	0.90	80	1.3	1.11	81	2.45	88	0.042	99	98	9.5	0	293	72	72	70	-0.032	3.1	0
191	28.833	29.184	0.15	0.15	0.90	80	1.3	1.11	81	2.45	88	0.042	99	99	9.5	0	295	72	72	70	-0.032	3.4	0
192	28.980	29.334	0.15	0.15	0.90	80	1.3	1.10	81	2.46	88	0.042	99	99	9.5	0	295	72	72	70	-0.032	3.4	0
193	29.127	29.483	0.15	0.15	0.90	80	1.3	1.11	81	2.46	89	0.042	99	99	9.4	-0.1	296	72	72	70	-0.032	3.1	0
194	29.274	29.631	0.15	0.15	0.90	80	1.3	1.11	81	2.46	89	0.042	99	98	9.4	0	293	72	72	70	-0.031	3.4	0
195	29.421	29.781	0.15	0.15	0.90	80	1.3	1.11	81	2.46	89	0.042	99	99	9.4	0	291	72	72	70	-0.031	2.8	0
196	29.569	29.930	0.15	0.15	0.90	80	1.3	1.11	81	2.46	89	0.042	99	99	9.3	-0.1	291	72	72	70	-0.031	2.6	0
197	29.716	30.079	0.15	0.15	0.90	80	1.3	1.11	81	2.46	89	0.042	99	99	9.3	0	292	72	72	70	-0.031	2.5	0
198	29.864	30.228	0.15	0.15	0.89	80	1.3	1.11	81	2.46	89	0.042	99	99	9.3	0	288	72	72	70	-0.030	2.5	0
199	30.010	30.378	0.15	0.15	0.90	80	1.3	1.10	81	2.46	89	0.042	98	99	9.3	0	285	72	72	70	-0.030	2.6	0
200	30.158	30.527	0.15	0.15	0.90	80	1.3	1.10	81	2.46	88	0.042	99	99	9.2	-0.1	284	72	72	70	-0.030	2.7	0
201	30.304	30.675	0.15	0.15	0.90	80	1.3	1.11	81	2.46	88	0.042	98	98	9.2	0	284	72	72	70	-0.030	2.8	0
202	30.452	30.824	0.15	0.15	0.90	80	1.3	1.11	81	2.46	88	0.042	99	99	9.2	0	281	72	72	70	-0.030	2.6	0
203	30.599	30.974	0.15	0.15	0.90	80	1.3	1.11	81	2.47	88	0.042	99	99	9.2	0	280	72	72	70	-0.029	2.6	0
204	30.746	31.122	0.15	0.15	0.90	80	1.3	1.11	81	2.46	88	0.042	99	98	9.1	-0.1	280	72	72	70	-0.029	2.6	0
205	30.894	31.271	0.15	0.15	0.90	80	1.3	1.11	81	2.46	88	0.042	99	99	9.1	0	281	72	72	70	-0.030	2.6	0
206	31.040	31.420	0.15	0.15	0.90	80	1.3	1.10	81	2.47	88	0.042	98	99	9.1	0	281	72	72	70	-0.030	2.9	0
207	31.187	31.570	0.15	0.15	0.90	80	1.3	1.11	81	2.46	88	0.042	99	99	9.1	0	282	72	72	70	-0.030	3	0
208	31.334	31.718	0.15	0.15	0.90	80	1.3	1.10	81	2.47	88	0.042	99	98	9.0	-0.1	282	72	72	70	-0.030	2.9	0
209	31.481	31.867	0.15	0.15	0.89	80	1.3	1.10	81	2.47	88	0.042	99	99	9.0	0	283	72	72	70	-0.030	2.8	0

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
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Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
210	31.628	32.016	0.15	0.15	0.89	80	1.3	1.10	81	2.46	88	0.042	99	99	9.0	0	283	72	72	70	-0.030	3	0
211	31.775	32.165	0.15	0.15	0.89	80	1.3	1.10	81	2.46	88	0.042	99	99	8.9	-0.1	283	72	72	70	-0.030	2.9	0
212	31.922	32.313	0.15	0.15	0.89	80	1.3	1.10	81	2.47	88	0.042	99	98	8.9	0	282	72	72	70	-0.029	3	0
213	32.070	32.462	0.15	0.15	0.89	80	1.3	1.10	81	2.47	88	0.042	99	99	8.9	0	283	72	72	70	-0.030	2.7	0
214	32.216	32.611	0.15	0.15	0.90	80	1.3	1.11	81	2.47	88	0.042	98	99	8.9	0	285	72	72	70	-0.030	3	0
215	32.362	32.760	0.15	0.15	0.90	80	1.3	1.10	81	2.46	88	0.042	98	99	8.8	-0.1	284	72	72	70	-0.030	3.4	0
216	32.509	32.908	0.15	0.15	0.90	80	1.3	1.11	81	2.48	88	0.042	99	98	8.8	0	282	72	72	70	-0.030	2.5	0.1
217	32.656	33.057	0.15	0.15	0.89	80	1.3	1.11	81	2.47	88	0.042	99	99	8.8	0	281	72	72	70	-0.030	2.3	0.1
218	32.803	33.207	0.15	0.15	0.89	80	1.3	1.10	81	2.47	88	0.042	99	99	8.8	0	280	72	72	70	-0.029	2.5	0
219	32.950	33.354	0.15	0.15	0.89	80	1.3	1.10	81	2.48	88	0.042	99	97	8.7	-0.1	278	72	72	70	-0.030	2.6	0
220	33.097	33.503	0.15	0.15	0.89	80	1.3	1.10	81	2.47	88	0.042	99	99	8.7	0	278	72	72	70	-0.029	2.3	0.1
221	33.244	33.652	0.15	0.15	0.89	80	1.3	1.10	81	2.47	88	0.042	99	99	8.7	0	278	72	72	70	-0.030	2.7	0
222	33.391	33.801	0.15	0.15	0.89	80	1.3	1.10	81	2.48	88	0.042	99	99	8.7	0	278	72	72	70	-0.029	2.9	0
223	33.537	33.949	0.15	0.15	0.89	80	1.3	1.10	81	2.48	88	0.042	98	98	8.6	-0.1	279	72	72	70	-0.030	2.9	0
224	33.684	34.098	0.15	0.15	0.90	80	1.3	1.10	81	2.48	88	0.042	99	99	8.6	0	280	72	72	70	-0.029	3.1	0
225	33.830	34.247	0.15	0.15	0.89	80	1.3	1.09	81	2.48	88	0.042	98	99	8.6	0	278	72	72	70	-0.029	2.9	0
226	33.977	34.396	0.15	0.15	0.89	80	1.3	1.10	81	2.48	88	0.042	99	99	8.5	-0.1	281	72	72	70	-0.030	2.4	0
227	34.124	34.543	0.15	0.15	0.88	80	1.3	1.10	81	2.48	88	0.042	99	97	8.5	0	281	72	72	70	-0.030	3.6	0
228	34.271	34.692	0.15	0.15	0.88	80	1.3	1.10	81	2.48	88	0.042	99	99	8.5	0	282	72	72	70	-0.030	2.7	0.1
229	34.418	34.841	0.15	0.15	0.89	80	1.3	1.09	81	2.48	88	0.042	99	99	8.5	0	282	72	72	70	-0.030	3	0
230	34.564	34.989	0.15	0.15	0.89	80	1.3	1.09	81	2.49	88	0.042	98	98	8.4	-0.1	284	72	72	70	-0.030	3	0
231	34.710	35.137	0.15	0.15	0.89	80	1.3	1.10	81	2.48	88	0.042	98	98	8.4	0	285	72	72	70	-0.030	3.5	0
232	34.857	35.286	0.15	0.15	0.89	80	1.3	1.10	81	2.48	88	0.042	99	99	8.4	0	286	72	72	70	-0.030	3.1	0
233	35.003	35.435	0.15	0.15	0.89	80	1.3	1.10	81	2.48	88	0.042	98	99	8.4	0	284	72	72	70	-0.030	3.4	0
234	35.150	35.583	0.15	0.15	0.89	80	1.3	1.10	81	2.49	88	0.042	99	98	8.3	-0.1	284	72	72	70	-0.030	2.7	0.1
235	35.297	35.731	0.15	0.15	0.89	80	1.3	1.10	81	2.48	88	0.042	99	98	8.3	0	282	72	72	70	-0.029	2.8	0
236	35.443	35.879	0.15	0.15	0.88	80	1.3	1.09	81	2.49	88	0.042	98	98	8.3	0	282	72	72	70	-0.030	2.5	0.1
237	35.590	36.028	0.15	0.15	0.88	80	1.3	1.09	81	2.49	88	0.042	99	99	8.2	-0.1	282	72	72	70	-0.030	2.8	0
238	35.736	36.176	0.15	0.15	0.89	80	1.3	1.10	81	2.49	88	0.042	98	98	8.2	0	283	72	72	70	-0.030	3	0
239	35.883	36.324	0.15	0.15	0.88	80	1.3	1.10	81	2.48	89	0.042	99	98	8.2	0	283	72	72	70	-0.030	3.1	0
240	36.029	36.473	0.15	0.15	0.89	80	1.3	1.10	81	2.49	88	0.042	98	99	8.2	0	283	72	72	70	-0.030	2.9	0
241	36.175	36.621	0.15	0.15	0.89	80	1.3	1.09	81	2.48	88	0.042	98	98	8.1	-0.1	283	72	72	70	-0.030	2.8	0
242	36.321	36.769	0.15	0.15	0.89	80	1.3	1.09	81	2.49	88	0.042	98	98	8.1	0	284	72	72	70	-0.030	3	0
243	36.467	36.917	0.15	0.15	0.89	80	1.3	1.09	81	2.5	88	0.042	98	98	8.1	0	283	72	72	69	-0.030	3.2	0
244	36.614	37.065	0.15	0.15	0.89	80	1.3	1.09	81	2.49	88	0.042	99	98	8.1	0	284	72	72	69	-0.030	2.9	0

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
245	36.760	37.214	0.15	0.15	0.89	80	1.3	1.09	81	2.49	88	0.042	98	99	8.0	-0.1	284	72	72	69	-0.030	3	0.1
246	36.907	37.362	0.15	0.15	0.88	80	1.3	1.10	81	2.49	88	0.042	99	98	8.0	0	283	72	71	69	-0.029	2.9	0.1
247	37.053	37.510	0.15	0.15	0.89	80	1.3	1.10	81	2.49	88	0.042	98	98	8.0	0	282	72	71	69	-0.030	2.9	0.1
248	37.200	37.658	0.15	0.15	0.89	80	1.3	1.09	81	2.49	88	0.042	99	98	7.9	-0.1	285	72	71	69	-0.031	2.7	0.1
249	37.346	37.807	0.15	0.15	0.89	80	1.3	1.09	81	2.49	88	0.042	98	99	7.9	0	283	72	71	69	-0.030	3.6	0
250	37.492	37.955	0.15	0.15	0.89	80	1.3	1.09	81	2.5	88	0.042	98	98	7.9	0	283	72	71	69	-0.030	2.4	0.1
251	37.638	38.103	0.15	0.15	0.89	80	1.3	1.10	81	2.49	88	0.042	98	98	7.9	0	283	72	71	68	-0.031	2.8	0.1
252	37.785	38.251	0.15	0.15	0.89	80	1.3	1.09	81	2.49	88	0.042	99	98	7.8	-0.1	283	72	71	69	-0.030	3	0
253	37.931	38.400	0.15	0.15	0.88	80	1.3	1.09	81	2.49	88	0.042	98	99	7.8	0	282	72	71	68	-0.030	2.8	0
254	38.078	38.548	0.15	0.15	0.89	80	1.3	1.09	81	2.5	88	0.042	99	98	7.8	0	280	72	71	68	-0.030	2.5	0
255	38.224	38.696	0.15	0.15	0.89	80	1.3	1.09	81	2.5	88	0.042	98	98	7.8	0	281	72	71	68	-0.030	2.4	0
256	38.371	38.844	0.15	0.15	0.88	80	1.3	1.09	81	2.5	88	0.042	99	98	7.7	-0.1	280	72	71	68	-0.030	2.8	0
257	38.517	38.993	0.15	0.15	0.89	80	1.3	1.09	81	2.49	88	0.042	98	99	7.7	0	279	72	70	68	-0.029	2.7	0.1
258	38.664	39.141	0.15	0.15	0.89	80	1.3	1.09	81	2.5	88	0.042	99	98	7.7	0	278	71	70	68	-0.029	2.9	0
259	38.810	39.288	0.15	0.15	0.89	80	1.3	1.09	81	2.5	88	0.042	98	97	7.7	0	277	71	70	68	-0.029	2.6	0.1
260	38.955	39.437	0.14	0.15	0.89	80	1.3	1.10	81	2.5	88	0.042	97	99	7.6	-0.1	278	71	70	68	-0.030	2.5	0.1
261	39.102	39.586	0.15	0.15	0.89	80	1.3	1.09	81	2.49	87	0.042	99	99	7.6	0	278	71	70	68	-0.029	2.5	0.1
262	39.248	39.734	0.15	0.15	0.89	80	1.3	1.10	80	2.5	88	0.042	98	98	7.6	0	279	71	70	68	-0.030	2.5	0.1
263	39.394	39.881	0.15	0.15	0.89	80	1.3	1.10	80	2.5	87	0.042	98	97	7.5	-0.1	280	71	70	68	-0.030	2.9	0
264	39.541	40.029	0.15	0.15	0.88	80	1.3	1.09	80	2.51	88	0.042	99	98	7.5	0	279	71	70	68	-0.030	2.9	0
265	39.687	40.178	0.15	0.15	0.88	80	1.3	1.09	80	2.5	88	0.042	98	99	7.5	0	279	71	70	68	-0.030	2.6	0.1
266	39.834	40.326	0.15	0.15	0.88	80	1.3	1.09	80	2.5	88	0.042	99	98	7.5	0	277	71	70	68	-0.029	2.6	0
267	39.980	40.474	0.15	0.15	0.88	80	1.3	1.10	80	2.51	88	0.042	98	98	7.4	-0.1	276	71	70	68	-0.029	2.2	0.1
268	40.126	40.622	0.15	0.15	0.88	80	1.3	1.09	80	2.5	87	0.042	98	98	7.4	0	277	71	70	68	-0.029	2.6	0
269	40.272	40.770	0.15	0.15	0.89	79	1.3	1.09	80	2.5	87	0.042	98	98	7.4	0	278	71	70	68	-0.029	2.9	0
270	40.418	40.919	0.15	0.15	0.89	79	1.3	1.09	80	2.51	87	0.042	98	99	7.4	0	276	71	70	67	-0.029	3.2	0
271	40.564	41.066	0.15	0.15	0.88	79	1.3	1.10	80	2.5	87	0.042	98	97	7.3	-0.1	275	71	70	68	-0.029	2.4	0.1
272	40.710	41.214	0.15	0.15	0.88	79	1.3	1.09	80	2.51	87	0.042	98	98	7.3	0	276	71	70	67	-0.030	2.6	0
273	40.856	41.362	0.15	0.15	0.89	79	1.3	1.09	80	2.51	87	0.042	98	98	7.3	0	276	71	70	68	-0.029	3.1	0
274	41.003	41.511	0.15	0.15	0.88	79	1.3	1.09	80	2.5	87	0.042	99	99	7.3	0	277	71	69	68	-0.029	2.9	0.1
275	41.149	41.659	0.15	0.15	0.88	79	1.3	1.10	80	2.5	87	0.042	98	98	7.2	-0.1	275	71	69	67	-0.029	3	0
276	41.295	41.806	0.15	0.15	0.88	79	1.3	1.09	80	2.51	87	0.042	98	97	7.2	0	275	71	69	67	-0.029	2.3	0.1
277	41.441	41.954	0.15	0.15	0.88	79	1.3	1.09	80	2.51	87	0.042	98	98	7.2	0	276	70	69	67	-0.029	2.7	0
278	41.587	42.103	0.15	0.15	0.88	79	1.3	1.09	80	2.51	87	0.042	98	99	7.2	0	275	70	69	67	-0.029	2.8	0
279	41.734	42.251	0.15	0.15	0.88	79	1.3	1.09	80	2.5	87	0.042	99	98	7.1	-0.1	275	70	69	67	-0.030	2.5	0.1

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
280	41.879	42.397	0.14	0.15	0.88	79	1.3	1.09	80	2.51	87	0.042	97	97	7.1	0	277	70	69	68	-0.030	2.7	0
281	42.025	42.545	0.15	0.15	0.88	79	1.3	1.09	80	2.51	87	0.042	98	98	7.1	0	277	70	69	68	-0.029	3.2	0
282	42.171	42.694	0.15	0.15	0.88	79	1.3	1.08	80	2.51	88	0.042	98	99	7.0	-0.1	277	70	69	68	-0.029	2.8	0.1
283	42.317	42.842	0.15	0.15	0.89	79	1.3	1.09	80	2.51	88	0.042	98	98	7.0	0	278	70	69	68	-0.030	2.6	0.1
284	42.463	42.989	0.15	0.15	0.88	79	1.3	1.09	80	2.51	88	0.042	98	98	7.0	0	278	70	69	68	-0.029	3	0
285	42.609	43.137	0.15	0.15	0.88	79	1.3	1.09	79	2.52	88	0.042	98	98	7.0	0	276	71	69	68	-0.028	2.9	0.1
286	42.755	43.285	0.15	0.15	0.88	79	1.3	1.09	79	2.51	88	0.042	98	98	6.9	-0.1	276	71	70	68	-0.029	2.5	0.1
287	42.900	43.433	0.14	0.15	0.88	79	1.3	1.09	79	2.51	88	0.042	98	98	6.9	0	275	71	70	68	-0.028	2.7	0
288	43.046	43.581	0.15	0.15	0.88	79	1.3	1.08	79	2.51	88	0.042	98	98	6.9	0	274	71	70	68	-0.029	2.5	0.1
289	43.192	43.727	0.15	0.15	0.88	79	1.3	1.08	79	2.51	88	0.042	98	97	6.9	0	276	71	70	68	-0.029	2.5	0.1
290	43.338	43.875	0.15	0.15	0.88	79	1.3	1.08	79	2.52	88	0.042	98	98	6.8	-0.1	276	71	70	68	-0.030	3	0
291	43.484	44.023	0.15	0.15	0.88	79	1.3	1.09	79	2.52	88	0.042	98	98	6.8	0	278	71	70	68	-0.029	2.9	0.1
292	43.629	44.170	0.14	0.15	0.88	79	1.3	1.09	79	2.51	88	0.042	98	98	6.8	0	280	71	70	68	-0.030	3.2	0
293	43.775	44.318	0.15	0.15	0.88	79	1.3	1.09	79	2.51	88	0.042	98	98	6.7	-0.1	280	71	70	68	-0.030	3.1	0
294	43.920	44.465	0.15	0.15	0.88	79	1.3	1.09	79	2.52	88	0.042	98	98	6.7	0	277	71	70	68	-0.029	2.8	0.1
295	44.066	44.613	0.15	0.15	0.88	79	1.3	1.09	80	2.51	88	0.042	98	98	6.7	0	276	71	70	68	-0.029	2.2	0.1
296	44.211	44.761	0.14	0.15	0.88	79	1.3	1.08	79	2.52	88	0.042	98	98	6.7	0	276	71	70	68	-0.029	2.4	0.1
297	44.357	44.908	0.15	0.15	0.88	79	1.3	1.09	79	2.52	88	0.042	98	98	6.6	-0.1	279	71	70	68	-0.030	2.9	0
298	44.502	45.055	0.15	0.15	0.88	79	1.3	1.09	79	2.52	88	0.042	98	98	6.6	0	279	71	70	68	-0.029	3.6	0
299	44.648	45.202	0.15	0.15	0.88	79	1.3	1.08	79	2.52	88	0.042	98	98	6.6	0	279	71	70	68	-0.029	3.1	0
300	44.793	45.350	0.14	0.15	0.88	79	1.3	1.08	79	2.52	88	0.042	98	98	6.5	-0.1	281	71	70	67	-0.030	2.8	0.1
301	44.939	45.497	0.15	0.15	0.87	79	1.3	1.08	79	2.51	88	0.042	98	98	6.5	0	280	71	70	67	-0.029	3.2	0
302	45.085	45.645	0.15	0.15	0.87	79	1.3	1.08	79	2.52	88	0.042	98	98	6.5	0	277	71	70	67	-0.029	3	0.1
303	45.230	45.791	0.14	0.15	0.87	79	1.3	1.09	79	2.52	88	0.042	98	97	6.5	0	279	71	70	67	-0.031	2.2	0.1
304	45.376	45.939	0.15	0.15	0.87	79	1.3	1.08	79	2.53	88	0.042	98	98	6.4	-0.1	280	71	70	67	-0.030	2.7	0.1
305	45.522	46.086	0.15	0.15	0.88	79	1.3	1.08	79	2.52	88	0.042	98	98	6.4	0	280	71	69	67	-0.030	3.3	0
306	45.667	46.234	0.15	0.15	0.87	79	1.3	1.08	79	2.52	88	0.042	98	98	6.4	0	283	71	70	67	-0.031	2.9	0.1
307	45.812	46.381	0.14	0.15	0.88	79	1.3	1.08	79	2.53	88	0.042	98	98	6.3	-0.1	284	71	69	67	-0.031	3.4	0
308	45.957	46.528	0.15	0.15	0.88	79	1.3	1.08	79	2.53	88	0.042	98	98	6.3	0	285	71	69	68	-0.031	3.3	0
309	46.102	46.675	0.14	0.15	0.88	79	1.3	1.08	79	2.52	88	0.042	98	98	6.3	0	285	71	70	68	-0.030	3.1	0
310	46.248	46.822	0.15	0.15	0.87	79	1.3	1.08	79	2.52	88	0.042	98	98	6.2	-0.1	285	71	70	68	-0.030	3.1	0.1
311	46.393	46.970	0.15	0.15	0.88	79	1.3	1.08	79	2.52	88	0.042	98	98	6.2	0	284	71	70	68	-0.030	2.7	0.1
312	46.538	47.117	0.14	0.15	0.88	79	1.3	1.08	79	2.52	88	0.042	98	98	6.2	0	283	70	69	68	-0.029	2.9	0
313	46.683	47.264	0.15	0.15	0.87	79	1.3	1.08	79	2.53	88	0.042	98	98	6.2	0	281	71	70	67	-0.030	2.9	0
314	46.829	47.411	0.15	0.15	0.87	79	1.3	1.08	79	2.54	88	0.042	98	98	6.1	-0.1	282	71	69	67	-0.030	2.5	0.1

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
315	46.974	47.558	0.14	0.15	0.87	79	1.3	1.08	79	2.53	88	0.042	98	98	6.1	0	281	70	70	67	-0.030	2.7	0
316	47.119	47.706	0.15	0.15	0.87	79	1.3	1.08	79	2.53	87	0.042	97	98	6.1	0	282	70	70	67	-0.030	3	0
317	47.264	47.853	0.15	0.15	0.87	79	1.3	1.07	79	2.53	88	0.042	98	98	6.1	0	281	70	70	68	-0.030	3	0
318	47.410	47.999	0.15	0.15	0.87	79	1.3	1.08	79	2.53	88	0.042	98	97	6.0	-0.1	278	71	70	68	-0.029	2.7	0
319	47.555	48.146	0.15	0.15	0.87	78	1.3	1.08	79	2.53	88	0.042	98	98	6.0	0	278	71	70	68	-0.029	2.3	0.1
320	47.700	48.293	0.15	0.15	0.87	79	1.3	1.08	79	2.53	88	0.042	98	98	6.0	0	279	71	70	68	-0.029	2.4	0.1
321	47.845	48.441	0.14	0.15	0.87	79	1.3	1.08	79	2.54	88	0.042	98	98	5.9	-0.1	279	71	70	68	-0.030	2.8	0
322	47.990	48.588	0.15	0.15	0.87	79	1.3	1.08	79	2.53	88	0.042	98	98	5.9	0	279	71	70	68	-0.030	2.8	0.1
323	48.135	48.734	0.14	0.15	0.87	79	1.3	1.08	79	2.53	88	0.042	98	97	5.9	0	279	71	70	68	-0.029	2.9	0
324	48.280	48.880	0.15	0.15	0.87	78	1.3	1.08	79	2.54	88	0.042	98	97	5.9	0	277	71	70	68	-0.029	2.8	0
325	48.425	49.028	0.14	0.15	0.87	79	1.3	1.07	79	2.54	88	0.042	98	98	5.8	-0.1	278	71	70	68	-0.029	2.3	0.1
326	48.570	49.175	0.15	0.15	0.87	79	1.3	1.07	79	2.54	87	0.042	97	98	5.8	0	278	71	70	68	-0.030	2.8	0
327	48.715	49.322	0.15	0.15	0.87	79	1.4	1.08	79	2.54	88	0.042	98	98	5.8	0	280	71	70	68	-0.030	3	0
328	48.859	49.468	0.14	0.15	0.87	79	1.3	1.08	79	2.54	88	0.042	97	97	5.7	-0.1	281	71	70	68	-0.029	3.2	0
329	49.004	49.614	0.14	0.15	0.87	79	1.3	1.07	79	2.53	88	0.042	98	97	5.7	0	280	71	70	68	-0.030	3.2	0.1
330	49.149	49.761	0.15	0.15	0.87	79	1.3	1.08	79	2.54	88	0.042	98	98	5.7	0	280	71	70	68	-0.030	2.7	0.1
331	49.294	49.908	0.14	0.15	0.87	79	1.3	1.07	79	2.54	88	0.042	98	98	5.7	0	278	71	70	68	-0.029	2.8	0
332	49.439	50.055	0.15	0.15	0.87	79	1.4	1.07	79	2.54	87	0.042	97	98	5.7	0	275	71	70	68	-0.029	2.5	0.1
333	49.584	50.202	0.15	0.15	0.87	79	1.3	1.07	79	2.54	87	0.042	97	98	5.6	-0.1	274	71	70	68	-0.029	1.9	0.1
334	49.728	50.348	0.14	0.15	0.87	79	1.3	1.08	79	2.54	87	0.042	97	97	5.6	0	275	71	70	68	-0.029	2.2	0
335	49.873	50.495	0.14	0.15	0.87	79	1.4	1.07	79	2.55	87	0.042	97	98	5.6	0	273	71	70	68	-0.029	2.7	0
336	50.018	50.641	0.15	0.15	0.87	79	1.3	1.07	79	2.54	87	0.042	97	97	5.5	-0.1	273	71	70	68	-0.029	2.5	0.1
337	50.163	50.788	0.14	0.15	0.87	79	1.3	1.07	79	2.55	87	0.042	97	98	5.5	0	275	71	70	68	-0.029	2.6	0
338	50.307	50.935	0.14	0.15	0.87	79	1.4	1.08	79	2.54	87	0.042	97	98	5.5	0	275	71	70	68	-0.029	2.9	0
339	50.452	51.081	0.14	0.15	0.87	79	1.4	1.08	79	2.54	87	0.042	97	97	5.5	0	275	71	70	68	-0.029	2.7	0.1
340	50.597	51.227	0.15	0.15	0.87	79	1.4	1.07	79	2.54	87	0.042	97	97	5.4	-0.1	276	71	70	68	-0.029	2.9	0
341	50.741	51.374	0.14	0.15	0.87	79	1.4	1.07	79	2.54	87	0.042	97	98	5.4	0	276	71	70	68	-0.029	3.1	0
342	50.886	51.520	0.15	0.15	0.86	79	1.3	1.07	79	2.54	87	0.042	97	97	5.4	0	275	71	70	68	-0.029	2.6	0.1
343	51.031	51.667	0.14	0.15	0.86	79	1.4	1.07	79	2.54	87	0.042	97	98	5.4	0	275	71	70	68	-0.029	2.7	0
344	51.176	51.814	0.15	0.15	0.86	79	1.4	1.07	79	2.55	87	0.042	97	98	5.3	-0.1	275	71	70	68	-0.029	2.8	0
345	51.320	51.960	0.14	0.15	0.86	79	1.4	1.07	79	2.54	87	0.042	97	97	5.3	0	276	71	70	68	-0.029	2.6	0.1
346	51.465	52.106	0.15	0.15	0.86	79	1.4	1.07	79	2.55	87	0.042	97	97	5.3	0	278	71	70	68	-0.029	2.8	0.1
347	51.609	52.252	0.14	0.15	0.86	79	1.4	1.07	79	2.55	87	0.042	97	97	5.2	-0.1	278	71	70	68	-0.029	3.3	0
348	51.754	52.399	0.14	0.15	0.86	79	1.4	1.07	79	2.54	87	0.042	97	98	5.2	0	277	71	70	68	-0.029	2.8	0.1
349	51.898	52.546	0.14	0.15	0.86	79	1.4	1.06	79	2.54	87	0.042	97	98	5.2	0	275	71	70	68	-0.029	2.6	0.1

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: US Stove
Model: 5710
Tracking No.: 2150
Project No.: 0215PH050E
Test Date: 23-Feb-16
Beginning Clock Time: 09:52

High Burn End Time: 61
Medium Burn End Time: 182
Total Sampling Time: 366 min
Recording Interval: 1 min
Background Sample Volume: 0 cubic feet

Meter Box Y Factor: 1.001 (1) 1.001 (2) 0 (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	30.47	30.39	30.32	30.39 "Hg

OMNI Equipment Numbers: 335, 336, 410, 420

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: -0.140 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 11.64 ft/sec.
Intial Tunnel Flow: 127.5 scfm
Average Tunnel Flow: 131.1 scfm
Post-Test Leak Check (1): 0.001 cfm @ -9 in. Hg
Post-Test Leak Check (2): 0 cfm @ -6 in. Hg
Fuel Moisture: 5.1 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.020	0.034	0.040	0.022	0.022	0.038	0.034	0.024	0.042	"H2O
Temp:	95	95	95	95	95	95	95	95	95	°F

V_{strav} 11.68 ft/sec V_{scent} 13.80 ft/sec F_p 0.847

	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 Temp 1 (°F)	Meter Vacuum 1 ("Hg)	Orifice dH 2 ("H_2O)	Meter Temp 2 (°F)	Meter Vacuum 2 ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Stack	Filter 1	Filter 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
350	52.043	52.692	0.14	0.15	0.86	79	1.4	1.07	79	2.55	87	0.042	97	97	5.2	0	276	71	70	68	-0.029	2.4	0.1
351	52.188	52.838	0.15	0.15	0.87	79	1.3	1.08	79	2.54	87	0.042	97	97	5.1	-0.1	277	71	70	68	-0.029	2.7	0
352	52.332	52.984	0.14	0.15	0.86	79	1.4	1.07	79	2.55	87	0.042	97	97	5.1	0	278	71	70	68	-0.029	3.4	0
353	52.477	53.130	0.14	0.15	0.86	79	1.4	1.07	79	2.55	87	0.042	97	97	5.1	0	278	71	70	68	-0.029	3.1	0
354	52.621	53.277	0.14	0.15	0.86	79	1.4	1.07	80	2.55	87	0.042	97	97	5.1	0	275	71	70	68	-0.028	2.9	0
355	52.765	53.423	0.14	0.15	0.86	79	1.4	1.06	79	2.55	87	0.042	97	97	5.0	-0.1	276	71	70	68	-0.029	2.2	0.1
356	52.910	53.570	0.14	0.15	0.87	79	1.4	1.07	79	2.55	87	0.042	97	98	5.0	0	276	71	70	68	-0.029	2.6	0
357	53.054	53.716	0.14	0.15	0.86	79	1.4	1.07	79	2.55	87	0.042	97	97	5.0	0	275	71	70	68	-0.029	2.8	0.1
358	53.198	53.861	0.14	0.14	0.86	79	1.4	1.07	79	2.55	87	0.042	97	96	4.9	-0.1	277	71	70	68	-0.029	2.5	0.1
359	53.342	54.008	0.14	0.15	0.86	79	1.4	1.07	79	2.55	87	0.042	97	98	4.9	0	276	71	70	68	-0.029	3	0
360	53.487	54.154	0.15	0.15	0.86	79	1.4	1.06	80	2.56	87	0.042	97	97	4.9	0	280	71	70	68	-0.030	2.6	0.1
361	53.631	54.300	0.14	0.15	0.87	79	1.4	1.06	80	2.55	87	0.042	97	97	4.9	0	279	71	70	68	-0.029	3.4	0
362	53.775	54.447	0.14	0.15	0.86	79	1.4	1.06	80	2.55	87	0.042	97	97	4.8	-0.1	278	71	70	68	-0.029	2.9	0.1
363	53.919	54.593	0.14	0.15	0.87	79	1.4	1.07	80	2.56	87	0.042	97	97	4.8	0	278	71	70	68	-0.029	2.3	0.1
364	54.064	54.738	0.15	0.14	0.86	79	1.4	1.07	80	2.56	87	0.042	97	96	4.8	0	278	71	70	68	-0.029	2.7	0
365	54.208	54.884	0.14	0.15	0.86	79	1.4	1.07	80	2.55	87	0.042	97	97	4.8	0	278	71	70	68	-0.029	2.8	0
366	54.352	55.031	0.14	0.15	0.86	79	1.4	1.07	80	2.55	87	0.042	97	97	4.7	-0.1	278	71	70	68	-0.029	3	0
Avg/Tot	54.352	55.031	0.15	0.15	0.91	79		1.13	80		90	0.042	100	100				72	72	69	-0.031		

Appendix A
Revision History

Date	Project No.	Tech. & Evaluator	Report Sect.	Summary of Changes
May 2016	0215PS050E	Aaron Kravitz	All	Original report was generated.
5/6/21	0215PS050E Edition 001	Bruce Davis	Preface	Cover updated with current edition, signatories updated, table of content updated with revision table.
			1	Sampling procedure updated with 2020 emissions limits. Efficiency and ambient sampling information added. Run discussion updated to show run is valid and appropriate. Summary of results was updated to explain negative filter weights and zero CO emissions. A note was added to table 1.2 providing explanation of zero CO emissions.
			4	Updated manual and label replaced outdated version.
			5	Train precision added to page 113.
			Appendix A	Added Revision table.
7/1/21	0215PS050E Edition 002	B Davis	Cover	Updated for new addition.
			1	Table 1.4 was updated with corrected preburn data.
			4	Manual replaced with updated version showing optimal operation (burn rate settings) on page 67
			5	Conditioning data added to page 84. Preburn data was added to page 94.

Date	Project No.	Tech. & Evaluator	Report Sect.	Summary of Changes
7/6/21	0215PS050E Edition 003	B Davis	1	An error was found in table 1.4, the original author failed to update the table showing preburn results. Table 1.4 was updated with corrected preburn data. Added low burn explanation to Run summary on page 6.
7/7/21	0215PS050E Edition 004	B Davis	3	Twin Ports Fuel analysis form shown in the original report was found to be from a different project, all data used to calculate efficiency is shown on the correct form placed in report edition 004 on page 17. No change in efficiency results were required.