OMNI-Test Laboratories, Inc.

EPA Standard of Performance for New Residential Wood Heaters

Certification Test Report

Non-Confidential Business Information (Non-CBI)

Manufacturer: Hearth & Home Technologies, LLC
Heater Type: Pellet-Fired Fireplace Insert Room Heater
Model: P40i

Prepared for:
Hearth & Home Technologies, LLC
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Lakeville, MN 55044
USA

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Test Period: April 3, 2019

Report Date: April 24, 2019

Report Number: 0061PN103E

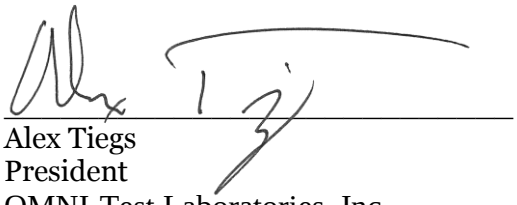
AUTHORIZED SIGNATORIES

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

Evaluator:

Bruce Davis
Technician
OMNI-Test Laboratories, Inc.

Reviewer:



Alex Tiegs
President
OMNI-Test Laboratories, Inc.

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1.1 - Summary Tables

Table 1 – Particulate Emissions

	One-Hour Filter	Integrated Total
Emission Rate (g/hr)	2.23	**1.27**
Emission Factor (g/dry kg)	0.96	1.07

Table 2 – Efficiency and CO

	Burn Rate Segment			Integrated Total
	Maximum	**Medium**	**Minimum**	
Time (minutes)	60	120	180	360
Burn Rate (dry kg/hr)	2.33	0.99	0.93	1.19
Heat Input Rate (BTU/hr, HHV)	43,418	18,493	17,421	22,111
Heat Output Rate (BTU/hr, HHV)	33,444	13,922	13,243	16,865
Efficiency (%, HHV)	77.0%	75.3%	76.0%	76.3%
Efficiency (%, LHV)	82.5%	80.7%	81.5%	81.7%
CO Emission Rate (g/min)	0.046	0.020	0.018	0.023

1.1 - Summary Tables

Table 3 – Test Facility Conditions

	Initial	Middle	Final
Room Temperature (˚F)	66	67	70
Barometric Pressure (in Hg)	29.96	29.95	29.93
Air Velocity (ft/min)	<50	<50	<50
Induced Draft (in H2O)	*Φ*	*Φ*	*Φ*

Table 4 – Heater Configuration

	Pretest	Burn Rate Segment		
		Maximum	Medium	Minimum
Heat Output Setting	Feed limit on 5.27, Temperature knob set to # 7 (max), Stove operation set to constant burn (max). Fan is automatic	Feed limit on 5.27, Temperature knob set to # 7 (max), Stove operation set to constant burn (max). Fan is automatic	Feed limit on 1.5, Temperature knob set to # 7 (max), Stove operation set to constant burn (max). Fan is automatic	Feed limit on 1.25, Temperature knob set to # 1 (min), Stove operation set to constant burn (max). Fan is automatic

1.2 - Procedures and Results Summary

TESTING PROCEDURE

The P40i 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 model was tested for thermal efficiency and carbon monoxide (CO) emissions in accordance with CSA B415.1-10. The fuel used for certification testing was Energex brand hard wood pellet fuel; this fuel was graded as Premium by the Pellet Fuels Institute and was produced at registered mill # 16012. Particulate emissions were measured using dual sampling trains consisting of two sets of filters (front and back).

A single test run was performed. The unit was installed and adjusted in accordance with the manufacturer's instructions

The manufacturer's instructions specified operating the preburn and high burn segments at Feed limit on 5.27, Temperature knob set to # 7 (max), Stove operation set to constant burn (max). Fan is automatic. The medium burn segment was operated at Feed limit on 1.5, Temperature knob set to # 7 (max), Stove operation set to constant burn (max). Fan is automatic. The low burn segment at Feed limit on 1.25, Temperature knob set to # 1 (min), Stove operation set to constant burn (max). Fan is automatic.

RESULTS SUMMARY

Proportionality results of the integrated test run, in addition to all other validity criteria, were within specified limits, and no sampling anomalies occurred. All burn rate categories were achieved. Therefore, this test run is considered valid.

The P40i results indicate an average particulate emission rate of 1.27 g/hr. The results are within the emission limit of 2.0 g/h for affected appliances manufactured on or after May 15, 2020.

The heater demonstrated an average thermal efficiency of 76.3%. The calculated CO emission rate was 0.023 g/min.

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

1.3 - Appliance Description

Appliance Manufacturer: Hearth & Home Technologies , LLC

Pellet Stove Model: P40i

Type: Pellet-Fired Fireplace Insert Room Heater

The P40i's principle elements include a fuel hopper, cold rolled steel burn pot, and electrical fuel feed, combustion air, and convection air supply systems. The frame of the unit is constructed of mild steel, as is the outer fascia.

Combustion products are routed out of the firebox chamber via a baffle-type heat exchanger through a 4-inch diameter flue outlet located on the top of the unit.

Fuel is supplied from the hopper to the burn pot via a screw-type auger, mounted horizontally. Fuel supply rate is varied by cycling the auger motor as needed.

Ashes are pushed off the front of the fire pot and fall into an ash drawer below. Cleaning of the firepot and ash removal is accessed through the grey iron front firebox door, which also features a 14.9 x 11.5" glass panel.

The electrical systems are regulated by three control knobs that limit fuel feed and control heat output governed by room temperature or programed heat settings in constant burn mode.

More detailed information is shown in the manufacturer's design drawings, Appendix C of this report. This information is considered confidential business information (CBI) by the manufacturer and is not included in the non-CBI version of this report.

Control Photographs
P40i

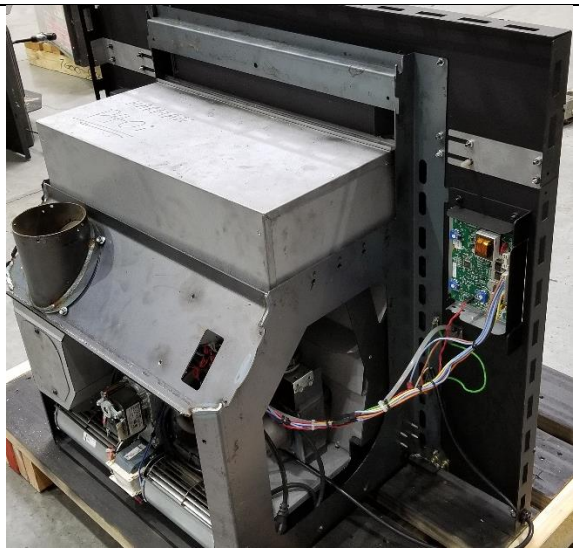
Control Position (Maximum)

Control Position (Medium)

Control Position (Minimum)

Appliance Photographs
P40i

	
P40i Front	**P40i Back**

	
P40i Left	**P40i Right**

Section 2
Test Data

P40i Burn Settings for 04-03-2019

Preset:

40 pounds of Energex Pellets, Push pellets toward rear when filling.

Do not open hopper during test

Connect DDM

Set Mode knob to OFF before plugging in stove.

Power supply: Make sure Range Switch is 120V 60Hz. Set to 114V then slowly increase until supply just changes to 115V.

Plug in stove to power supply.

Draft adjust -41V (already set)

High: (Setting when ready to start test)

Feed Adjuster: #5.27 (screen d)

Temperature knob: Max CW #7

Mode knob: Constant Burn mode=14 (screen e) pointing at space between words "Constant Burn"

Medium<50%:

Feed Adjuster: #1.57 (screen d)

Low:

Feed Adjuster: #1.28 (screen d)

Temperature knob: Max CCW #1

Pellet Heater Conditioning Data - ASTM E2779

Manufacturer:	Hearth & Home
Model:	P40i
Tracking No.:	2364
Project No.:	0061PN103E
Test Date:	3/1/2019
Operation Category:	Medium

Elapsed Time (hours)	Scale Reading (lbs)	Stack (°F)
0	70.6	66
1	63.1	455
2	54.4	459
3	49.4	282
4	45.7	271
5	43.1	255
6	40.5	256
7	38.0	252
8	35.5	257
9	33.1	252
10	30.5	256
11	27.9	254
12	25.2	250
13	22.6	256
14	20.1	255
15	37.1	411
16	30.9	260
17	29.0	232
18	26.5	260
19	24.7	250
20	22.4	288
21	21.0	255
22	37.1	403
23	31.7	414
24	27.6	283
25	25.1	266
26	22.9	256
27	20.7	256
28	18.6	253
29	16.3	257
30	14.2	286
31	12.1	296
32	9.9	292
33	7.8	293
34	5.6	298
35	3.4	295
36	1.2	292
37	1.1	115
38	36.5	409
39	30.9	413
40	26.8	282
41	24.4	262
42	22.0	255
43	19.9	255
44	17.6	257
45	15.4	254
46	13.2	298
47	11.0	291
48	8.8	292
49	6.6	298
50	4.4	294

2.1 - Test Data by Run

Run 1 Notes & Results

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.96	29.95	29.93	29.95 "Hg

OMNI Equipment Numbers: _____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data										
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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			0.78	70	1.67	0.55	70	1.7	100	0.038			31.9		399	67	68	66	-0.059	8.1	0.0081
1	0.156	0.157	0.16	0.16	1.31	70	1.81	1.06	70	1.8	100	0.038	104	105	31.8	-0.1	400	69	69	67	-0.060	9.37	0.00937
2	0.313	0.317	0.16	0.16	1.32	70	1.81	1.06	70	1.8	100	0.038	104	107	31.7	-0.1	399	69	70	67	-0.059	8.08	0.00808
3	0.472	0.476	0.16	0.16	1.32	70	1.82	1.06	70	1.8	101	0.038	106	106	31.6	-0.1	400	70	70	67	-0.060	9.17	0.00917
4	0.630	0.635	0.16	0.16	1.33	70	1.81	1.06	70	1.8	101	0.038	105	106	31.5	-0.1	401	70	71	67	-0.059	9.08	0.00908
5	0.789	0.794	0.16	0.16	1.32	70	1.81	1.05	70	1.8	100	0.038	106	106	31.5	0	400	70	71	67	-0.060	8.8	0.0088
6	0.947	0.952	0.16	0.16	1.32	70	1.81	1.05	70	1.8	100	0.038	105	105	31.4	-0.1	399	70	71	67	-0.060	7.38	0.00738
7	1.104	1.112	0.16	0.16	1.32	70	1.81	1.05	70	1.8	100	0.038	104	107	31.3	-0.1	398	70	71	67	-0.060	8.35	0.00835
8	1.262	1.270	0.16	0.16	1.32	71	1.8	1.05	71	1.8	100	0.038	105	105	31.2	-0.1	400	71	71	67	-0.060	9.11	0.00911
9	1.420	1.428	0.16	0.16	1.32	71	1.81	1.05	71	1.8	101	0.038	105	105	31.1	-0.1	399	71	71	67	-0.060	8.01	0.00801
10	1.578	1.587	0.16	0.16	1.31	71	1.8	1.04	71	1.8	100	0.038	105	106	31.0	-0.1	398	71	71	67	-0.060	7.38	0.00738
11	1.736	1.745	0.16	0.16	1.32	71	1.8	1.04	71	1.8	100	0.038	105	105	31.0	0	397	71	72	67	-0.059	7.78	0.00778
12	1.894	1.904	0.16	0.16	1.31	71	1.8	1.05	71	1.8	101	0.038	105	106	30.9	-0.1	396	71	72	67	-0.059	7.82	0.00782
13	2.051	2.061	0.16	0.16	1.30	71	1.8	1.04	71	1.8	100	0.038	104	105	30.8	-0.1	396	72	72	67	-0.059	8.54	0.00854
14	2.209	2.219	0.16	0.16	1.31	71	1.8	1.04	72	1.8	100	0.038	105	105	30.7	-0.1	397	72	72	67	-0.060	8.71	0.00871
15	2.366	2.378	0.16	0.16	1.31	72	1.8	1.03	72	1.8	99	0.035	108	110	30.6	-0.1	399	72	72	67	-0.059	9.25	0.00925
16	2.523	2.536	0.16	0.16	1.31	72	1.8	1.04	72	1.8	99	0.034	110	111	30.5	-0.1	399	72	72	67	-0.059	8.65	0.00865
17	2.682	2.694	0.16	0.16	1.33	72	1.84	1.04	72	1.8	100	0.039	104	104	30.4	-0.1	399	72	72	67	-0.059	8.95	0.00895
18	2.844	2.855	0.16	0.16	1.38	72	1.87	1.08	72	1.8	99	0.042	102	102	30.3	-0.1	401	72	72	67	-0.059	8.67	0.00867
19	3.005	3.016	0.16	0.16	1.38	72	1.87	1.08	72	1.8	99	0.040	104	104	30.2	-0.1	399	72	72	67	-0.060	7.88	0.00788
20	3.167	3.178	0.16	0.16	1.37	72	1.87	1.08	73	1.8	99	0.042	102	102	30.1	-0.1	400	72	73	67	-0.060	8.43	0.00843
21	3.329	3.340	0.16	0.16	1.37	73	1.87	1.08	73	1.8	99	0.040	104	105	30.0	-0.1	400	73	73	67	-0.059	8.37	0.00837
22	3.490	3.501	0.16	0.16	1.36	73	1.87	1.08	73	1.8	99	0.040	104	104	29.9	-0.1	399	73	73	67	-0.060	8.54	0.00854
23	3.652	3.662	0.16	0.16	1.37	73	1.87	1.08	73	1.8	99	0.040	104	104	29.9	0	399	73	73	67	-0.059	8.4	0.0084
24	3.814	3.824	0.16	0.16	1.37	73	1.87	1.08	73	1.8	99	0.040	104	105	29.8	-0.1	400	73	73	67	-0.060	9.03	0.00903
25	3.975	3.986	0.16	0.16	1.37	73	1.87	1.08	74	1.8	98	0.041	102	103	29.7	-0.1	401	73	73	67	-0.059	10.01	0.01001
26	4.137	4.147	0.16	0.16	1.37	73	1.87	1.08	74	1.8	98	0.043	100	100	29.6	-0.1	403	73	73	68	-0.059	9.7	0.0097
27	4.299	4.309	0.16	0.16	1.36	74	1.87	1.08	74	1.8	99	0.042	102	102	29.5	-0.1	402	73	73	68	-0.059	8.63	0.00863
28	4.460	4.471	0.16	0.16	1.37	74	1.87	1.08	74	1.8	99	0.042	101	102	29.4	-0.1	401	73	73	67	-0.059	8.21	0.00821
29	4.622	4.632	0.16	0.16	1.38	74	1.87	1.08	74	1.8	99	0.040	104	104	29.3	-0.1	402	73	73	67	-0.060	9.03	0.00903
30	4.784	4.793	0.16	0.16	1.37	74	1.87	1.08	75	1.8	99	0.042	102	101	29.2	-0.1	402	73	73	67	-0.059	8.36	0.00836
31	4.946	4.955	0.16	0.16	1.37	74	1.87	1.08	75	1.8	99	0.043	100	101	29.1	-0.1	401	73	73	67	-0.060	8.66	0.00866
32	5.108	5.118	0.16	0.16	1.37	75	1.87	1.08	75	1.8	98	0.042	101	102	29.0	-0.1	400	73	73	67	-0.060	8.25	0.00825
33	5.270	5.279	0.16	0.16	1.37	75	1.87	1.08	75	1.8	98	0.042	101	101	28.9	-0.1	401	73	73	67	-0.060	8.22	0.00822
34	5.432	5.440	0.16	0.16	1.37	75	1.88	1.08	75	1.8	99	0.044	99	99	28.9	0	400	73	73	67	-0.059	7.86	0.00786

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) ____ (Amb)

Barometric Pressure: Begin 29.96 Middle 29.95 End 29.93 Average 29.95 "Hg

OMNI Equipment Numbers: ____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	5.594	5.602	0.16	0.16	1.38	75	1.87	1.08	75	1.8	99	0.042	101	102	28.8	-0.1	401	73	74	67	-0.059	8.93	0.00893
36	5.756	5.765	0.16	0.16	1.37	75	1.87	1.08	76	1.8	98	0.044	99	100	28.7	-0.1	401	73	73	67	-0.060	8.26	0.00826
37	5.918	5.926	0.16	0.16	1.37	75	1.87	1.08	76	1.8	99	0.042	101	101	28.6	-0.1	401	73	74	67	-0.060	8.64	0.00864
38	6.080	6.087	0.16	0.16	1.37	75	1.87	1.09	76	1.8	99	0.041	103	102	28.5	-0.1	401	73	74	67	-0.060	8.32	0.00832
39	6.243	6.249	0.16	0.16	1.37	76	1.88	1.08	76	1.8	98	0.041	103	103	28.4	-0.1	400	74	74	67	-0.059	8.31	0.00831
40	6.405	6.412	0.16	0.16	1.37	76	1.88	1.09	76	1.8	99	0.042	101	102	28.4	0	398	74	74	68	-0.059	7.08	0.00708
41	6.567	6.573	0.16	0.16	1.38	76	1.88	1.08	76	1.8	99	0.041	102	102	28.3	-0.1	398	74	74	67	-0.059	8.91	0.00891
42	6.729	6.735	0.16	0.16	1.37	76	1.88	1.08	76	1.8	99	0.039	105	105	28.2	-0.1	399	74	74	68	-0.060	9.02	0.00902
43	6.892	6.896	0.16	0.16	1.37	76	1.88	1.08	77	1.8	99	0.042	102	101	28.1	-0.1	399	74	74	68	-0.059	9.04	0.00904
44	7.054	7.060	0.16	0.16	1.37	76	1.88	1.08	77	1.8	99	0.042	101	103	28.0	-0.1	400	74	74	67	-0.060	8.11	0.00811
45	7.217	7.221	0.16	0.16	1.38	76	1.88	1.08	77	1.8	98	0.042	102	101	27.9	-0.1	400	74	74	67	-0.060	8.72	0.00872
46	7.379	7.383	0.16	0.16	1.37	76	1.88	1.09	77	1.8	99	0.044	99	99	27.8	-0.1	400	74	74	67	-0.059	8.83	0.00883
47	7.542	7.545	0.16	0.16	1.37	77	1.88	1.09	77	1.8	99	0.042	102	101	27.7	-0.1	400	74	74	67	-0.059	9.11	0.00911
48	7.705	7.708	0.16	0.16	1.37	77	1.88	1.08	77	1.8	99	0.040	104	105	27.6	-0.1	400	74	74	67	-0.059	7.65	0.00765
49	7.868	7.870	0.16	0.16	1.36	77	1.88	1.08	77	1.8	99	0.043	100	100	27.6	0	399	74	74	67	-0.059	7.74	0.00774
50	8.031	8.031	0.16	0.16	1.37	77	1.88	1.08	77	1.8	99	0.043	100	100	27.5	-0.1	399	74	74	67	-0.060	8.83	0.00883
51	8.193	8.193	0.16	0.16	1.38	77	1.88	1.08	78	1.8	99	0.040	103	104	27.4	-0.1	402	74	74	67	-0.060	9.71	0.00971
52	8.356	8.356	0.16	0.16	1.36	77	1.89	1.09	78	1.8	98	0.044	99	99	27.3	-0.1	403	74	74	68	-0.060	9.62	0.00962
53	8.519	8.518	0.16	0.16	1.38	77	1.88	1.08	78	1.8	99	0.041	103	102	27.2	-0.1	403	74	74	68	-0.060	9.18	0.00918
54	8.682	8.680	0.16	0.16	1.37	77	1.88	1.09	78	1.8	99	0.044	99	99	27.1	-0.1	403	74	74	68	-0.059	8.48	0.00848
55	8.845	8.842	0.16	0.16	1.37	77	1.88	1.09	78	1.8	98	0.042	102	101	27.0	-0.1	403	74	74	67	-0.060	8.78	0.00878
56	9.007	9.005	0.16	0.16	1.38	77	1.88	1.09	78	1.8	98	0.041	102	103	26.9	-0.1	402	74	74	68	-0.060	8.24	0.00824
57	9.170	9.167	0.16	0.16	1.38	77	1.88	1.08	78	1.8	99	0.042	102	101	26.8	-0.1	403	74	74	68	-0.061	8.66	0.00866
58	9.332	9.329	0.16	0.16	1.38	78	1.88	1.09	78	1.8	99	0.041	102	102	26.7	-0.1	403	74	74	67	-0.060	8.86	0.00886
59	9.495	9.491	0.16	0.16	1.38	78	1.88	1.09	78	1.8	99	0.044	99	99	26.6	-0.1	403	74	74	67	-0.060	8.99	0.00899
60	9.658	9.653	0.16	0.16	1.38	78	1.88	1.09	78	1.8	99	0.040	104	104	26.5	-0.1	404	74	74	68	-0.060	9.24	0.00924
61	9.824	9.816	0.17	0.16	1.37	78	1.89	1.09	78	1.8	99	0.041	105	103	26.5	0	403	74	74	67	-0.060	8.85	0.00885
62	9.986	9.978	0.16	0.16	1.37	78	1.89	1.08	78	1.8	99	0.042	101	101	26.4	-0.1	404	75	74	68	-0.060	9.75	0.00975
63	10.149	10.140	0.16	0.16	1.37	78	1.89	1.09	79	1.8	98	0.039	105	105	26.3	-0.1	401	75	74	68	-0.060	6.81	0.00681
64	10.312	10.302	0.16	0.16	1.37	78	1.88	1.09	79	1.8	97	0.043	100	100	26.2	-0.1	393	75	74	67	-0.058	5.95	0.00595
65	10.475	10.466	0.16	0.16	1.37	78	1.88	1.08	79	1.8	95	0.041	102	103	26.2	0	380	75	74	67	-0.056	5.04	0.00504
66	10.639	10.628	0.16	0.16	1.36	78	1.89	1.08	79	1.8	94	0.040	104	103	26.1	-0.1	370	75	74	67	-0.055	5.21	0.00521
67	10.802	10.790	0.16	0.16	1.37	78	1.88	1.08	79	1.8	93	0.042	101	101	26.1	0	362	75	74	67	-0.054	4.67	0.00467
68	10.965	10.952	0.16	0.16	1.37	78	1.88	1.08	79	1.8	93	0.044	99	98	26.1	0	355	74	74	68	-0.053	4.28	0.00428
69	11.128	11.115	0.16	0.16	1.37	78	1.89	1.09	79	1.8	92	0.041	102	102	26.0	-0.1	348	74	74	67	-0.051	4.16	0.00416

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) ____ (Amb)

Barometric Pressure: Begin 29.96 Middle 29.95 End 29.93 Average 29.95 "Hg

OMNI Equipment Numbers: ____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	11.291	11.277	0.16	0.16	1.38	78	1.88	1.08	79	1.8	92	0.043	100	99	26.0	0	341	74	74	67	-0.050	3.86	0.00386
71	11.454	11.439	0.16	0.16	1.37	78	1.88	1.08	79	1.8	91	0.042	101	100	25.9	-0.1	337	74	74	67	-0.049	4.43	0.00443
72	11.616	11.602	0.16	0.16	1.38	79	1.88	1.08	79	1.8	91	0.042	100	101	25.9	0	333	74	73	67	-0.049	4.62	0.00462
73	11.779	11.764	0.16	0.16	1.37	79	1.88	1.09	79	1.8	91	0.042	101	100	25.9	0	329	74	73	67	-0.050	4.21	0.00421
74	11.943	11.928	0.16	0.16	1.37	79	1.87	1.09	79	1.8	91	0.042	101	102	25.8	-0.1	324	73	73	67	-0.049	3.57	0.00357
75	12.106	12.090	0.16	0.16	1.38	79	1.89	1.08	79	1.8	90	0.043	99	99	25.8	0	319	73	73	67	-0.049	4.03	0.00403
76	12.269	12.252	0.16	0.16	1.37	79	1.88	1.08	79	1.8	90	0.041	102	101	25.7	-0.1	318	73	73	67	-0.048	4.72	0.00472
77	12.433	12.415	0.16	0.16	1.38	79	1.88	1.09	79	1.8	88	0.042	101	101	25.7	0	310	73	73	67	-0.046	3.93	0.00393
78	12.596	12.578	0.16	0.16	1.37	79	1.89	1.09	79	1.8	87	0.044	98	98	25.7	0	302	73	73	68	-0.045	4.25	0.00425
79	12.759	12.741	0.16	0.16	1.37	79	1.88	1.09	79	1.8	87	0.045	97	97	25.6	-0.1	297	73	73	67	-0.045	4.23	0.00423
80	12.923	12.903	0.16	0.16	1.37	79	1.88	1.08	79	1.8	86	0.043	99	99	25.6	0	293	73	73	67	-0.044	4.56	0.00456
81	13.086	13.065	0.16	0.16	1.38	79	1.89	1.09	79	1.8	86	0.044	98	98	25.6	0	290	73	73	68	-0.044	4.69	0.00469
82	13.250	13.228	0.16	0.16	1.38	79	1.88	1.09	79	1.8	85	0.043	99	99	25.5	-0.1	287	73	73	67	-0.044	4.79	0.00479
83	13.413	13.392	0.16	0.16	1.38	79	1.88	1.09	79	1.8	85	0.043	99	100	25.5	0	286	72	72	67	-0.043	4.79	0.00479
84	13.576	13.554	0.16	0.16	1.37	79	1.88	1.08	79	1.8	85	0.043	99	99	25.5	0	283	72	72	67	-0.043	4.23	0.00423
85	13.739	13.716	0.16	0.16	1.38	79	1.88	1.09	79	1.8	84	0.044	98	97	25.4	-0.1	281	72	72	67	-0.043	4.3	0.0043
86	13.903	13.879	0.16	0.16	1.38	79	1.89	1.09	79	1.8	84	0.041	102	102	25.4	0	279	72	72	67	-0.042	4.87	0.00487
87	14.066	14.042	0.16	0.16	1.38	79	1.88	1.09	79	1.8	84	0.043	99	99	25.4	0	277	72	72	67	-0.042	4.12	0.00412
88	14.230	14.205	0.16	0.16	1.38	79	1.88	1.08	79	1.8	83	0.046	96	96	25.3	-0.1	275	72	72	67	-0.042	4.12	0.00412
89	14.393	14.368	0.16	0.16	1.38	79	1.88	1.09	79	1.8	83	0.045	96	97	25.3	0	275	72	72	67	-0.042	4.65	0.00465
90	14.557	14.530	0.16	0.16	1.38	79	1.89	1.09	79	1.8	83	0.044	98	97	25.2	-0.1	275	72	72	67	-0.041	5.56	0.00556
91	14.721	14.693	0.16	0.16	1.38	79	1.88	1.09	79	1.8	83	0.042	100	100	25.2	0	274	72	72	67	-0.042	4.65	0.00465
92	14.885	14.856	0.16	0.16	1.37	79	1.89	1.09	79	1.8	83	0.045	97	97	25.1	-0.1	272	72	72	67	-0.042	4.82	0.00482
93	15.048	15.019	0.16	0.16	1.38	79	1.88	1.09	79	1.8	83	0.043	99	99	25.1	0	273	72	72	67	-0.041	5.11	0.00511
94	15.212	15.182	0.16	0.16	1.38	79	1.88	1.08	79	1.8	83	0.044	98	98	25.1	0	272	72	72	67	-0.041	4.14	0.00414
95	15.375	15.344	0.16	0.16	1.38	79	1.88	1.08	79	1.8	83	0.042	100	100	25.0	-0.1	271	72	72	67	-0.041	4.76	0.00476
96	15.539	15.507	0.16	0.16	1.37	79	1.88	1.08	79	1.8	82	0.043	99	99	25.0	0	270	72	72	67	-0.041	4.02	0.00402
97	15.702	15.671	0.16	0.16	1.39	79	1.89	1.09	79	1.8	83	0.043	99	100	25.0	0	269	71	72	67	-0.041	4.46	0.00446
98	15.865	15.833	0.16	0.16	1.38	79	1.89	1.09	79	1.8	83	0.044	97	97	24.9	-0.1	268	71	72	67	-0.041	4.55	0.00455
99	16.029	15.996	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.043	99	99	24.9	0	267	71	71	67	-0.040	3.96	0.00396
100	16.193	16.158	0.16	0.16	1.38	79	1.88	1.09	79	1.8	83	0.044	98	97	24.9	0	266	71	71	67	-0.040	4.07	0.00407
101	16.357	16.321	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.042	100	100	24.8	-0.1	265	71	71	67	-0.040	4.58	0.00458
102	16.520	16.485	0.16	0.16	1.38	79	1.89	1.08	79	1.8	83	0.044	97	98	24.8	0	265	71	71	67	-0.041	4.71	0.00471
103	16.684	16.648	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.043	99	99	24.8	0	265	71	71	67	-0.040	4.8	0.0048
104	16.848	16.810	0.16	0.16	1.37	79	1.89	1.09	79	1.8	82	0.043	99	98	24.7	-0.1	265	71	71	67	-0.040	4.78	0.00478

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) ____ (Amb)

Barometric Pressure: Begin 29.96 | Middle 29.95 | End 29.93 | Average 29.95 "Hg

OMNI Equipment Numbers: ____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	17.012	16.973	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.043	99	99	24.7	0	265	71	71	67	-0.040	4.71	0.00471
106	17.176	17.136	0.16	0.16	1.37	79	1.89	1.09	79	1.8	82	0.044	98	98	24.7	0	264	71	71	67	-0.040	4.25	0.00425
107	17.339	17.300	0.16	0.16	1.39	79	1.88	1.09	79	1.8	82	0.046	95	96	24.6	-0.1	263	71	71	67	-0.040	4.51	0.00451
108	17.502	17.463	0.16	0.16	1.38	79	1.89	1.08	79	1.8	82	0.045	96	97	24.6	0	263	71	71	67	-0.040	4.67	0.00467
109	17.666	17.625	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.044	98	97	24.6	0	263	71	71	67	-0.040	4.96	0.00496
110	17.830	17.788	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.045	97	97	24.5	-0.1	263	71	71	67	-0.040	4.72	0.00472
111	17.994	17.951	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.044	98	98	24.5	0	263	71	71	67	-0.040	4.72	0.00472
112	18.157	18.115	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.043	99	100	24.4	-0.1	262	71	71	67	-0.039	4.45	0.00445
113	18.321	18.277	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.044	98	97	24.4	0	262	71	71	67	-0.039	4.52	0.00452
114	18.485	18.440	0.16	0.16	1.37	79	1.89	1.09	79	1.8	82	0.043	99	99	24.4	0	263	71	71	67	-0.040	4.78	0.00478
115	18.649	18.603	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.044	98	98	24.3	-0.1	263	71	71	67	-0.039	4.62	0.00462
116	18.813	18.766	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.043	99	99	24.3	0	263	71	71	67	-0.040	4.36	0.00436
117	18.976	18.929	0.16	0.16	1.37	79	1.88	1.09	79	1.8	82	0.043	99	99	24.3	0	262	71	71	67	-0.040	4.54	0.00454
118	19.140	19.092	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.044	98	98	24.2	-0.1	263	71	71	67	-0.040	5.2	0.0052
119	19.303	19.255	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.042	100	100	24.2	0	262	71	71	67	-0.040	4.23	0.00423
120	19.467	19.418	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.044	98	98	24.2	0	261	71	71	67	-0.040	4.1	0.0041
121	19.630	19.581	0.16	0.16	1.38	79	1.88	1.09	79	1.8	81	0.044	97	98	24.1	-0.1	260	71	71	67	-0.039	4.42	0.00442
122	19.794	19.744	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.045	97	97	24.1	0	260	71	71	67	-0.040	4.41	0.00441
123	19.958	19.906	0.16	0.16	1.38	79	1.89	1.08	79	1.8	82	0.045	97	96	24.1	0	260	71	71	67	-0.039	4.98	0.00498
124	20.121	20.069	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.044	97	98	24.0	-0.1	260	71	71	67	-0.039	4.58	0.00458
125	20.286	20.232	0.17	0.16	1.37	79	1.89	1.09	79	1.8	81	0.044	99	98	24.0	0	260	71	71	67	-0.039	5.14	0.00514
126	20.449	20.395	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.043	99	99	23.9	-0.1	260	71	71	67	-0.039	4.77	0.00477
127	20.613	20.558	0.16	0.16	1.37	79	1.89	1.09	79	1.8	82	0.043	99	99	23.9	0	260	71	71	67	-0.039	4.48	0.00448
128	20.777	20.721	0.16	0.16	1.38	79	1.89	1.08	79	1.8	82	0.043	99	99	23.9	0	260	71	71	67	-0.040	5.04	0.00504
129	20.940	20.883	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.044	97	97	23.8	-0.1	260	71	71	67	-0.040	4.82	0.00482
130	21.103	21.046	0.16	0.16	1.37	79	1.88	1.09	79	1.8	82	0.042	100	100	23.8	0	261	71	71	67	-0.039	4.64	0.00464
131	21.267	21.210	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.044	98	98	23.8	0	261	71	71	67	-0.039	4.31	0.00431
132	21.430	21.373	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.045	96	97	23.7	-0.1	261	71	71	67	-0.039	4.63	0.00463
133	21.594	21.535	0.16	0.16	1.38	79	1.88	1.08	79	1.8	82	0.042	100	99	23.7	0	261	71	71	67	-0.039	4.2	0.0042
134	21.758	21.698	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.043	99	99	23.7	0	260	71	71	67	-0.039	4.12	0.00412
135	21.921	21.861	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.043	99	99	23.6	-0.1	260	71	71	67	-0.039	4.89	0.00489
136	22.085	22.025	0.16	0.16	1.37	79	1.89	1.09	79	1.8	82	0.042	100	101	23.6	0	260	71	71	67	-0.039	5.11	0.00511
137	22.249	22.187	0.16	0.16	1.38	79	1.88	1.09	79	1.8	82	0.044	98	97	23.5	-0.1	262	71	71	67	-0.040	5.26	0.00526
138	22.413	22.350	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.045	97	97	23.5	0	261	71	71	67	-0.040	4.98	0.00498
139	22.577	22.512	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.042	100	99	23.5	0	262	71	71	67	-0.039	4.56	0.00456

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) ____ (Amb)

Barometric Pressure: Begin 29.96 | Middle 29.95 | End 29.93 | Average 29.95 "Hg

OMNI Equipment Numbers: ____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	22.740	22.675	0.16	0.16	1.37	79	1.89	1.09	79	1.8	82	0.044	97	98	23.4	-0.1	260	71	71	67	-0.039	4.28	0.00428
141	22.903	22.839	0.16	0.16	1.39	79	1.89	1.09	80	1.8	82	0.042	100	101	23.4	0	261	71	71	67	-0.039	5.03	0.00503
142	23.067	23.002	0.16	0.16	1.38	79	1.89	1.09	80	1.8	82	0.043	99	99	23.4	0	262	71	71	67	-0.040	4.5	0.0045
143	23.230	23.164	0.16	0.16	1.38	79	1.89	1.09	80	1.8	82	0.045	96	96	23.3	-0.1	262	71	71	67	-0.040	4.91	0.00491
144	23.394	23.327	0.16	0.16	1.38	79	1.89	1.09	79	1.8	82	0.043	99	99	23.3	0	264	71	71	67	-0.040	5.1	0.0051
145	23.558	23.490	0.16	0.16	1.37	79	1.89	1.09	79	1.8	82	0.043	99	99	23.2	-0.1	264	71	71	67	-0.039	4.88	0.00488
146	23.721	23.654	0.16	0.16	1.37	79	1.88	1.09	80	1.8	82	0.045	96	97	23.2	0	263	71	71	67	-0.040	4.72	0.00472
147	23.885	23.816	0.16	0.16	1.37	79	1.88	1.08	80	1.8	82	0.044	98	97	23.2	0	263	71	71	67	-0.040	4.55	0.00455
148	24.049	23.979	0.16	0.16	1.37	79	1.89	1.09	80	1.8	83	0.041	102	101	23.1	-0.1	263	71	71	67	-0.040	4.93	0.00493
149	24.213	24.141	0.16	0.16	1.38	79	1.89	1.09	80	1.8	82	0.043	99	98	23.1	0	262	71	71	67	-0.040	4.42	0.00442
150	24.376	24.304	0.16	0.16	1.37	79	1.89	1.09	80	1.8	82	0.043	99	99	23.1	0	262	71	71	67	-0.039	4.28	0.00428
151	24.540	24.468	0.16	0.16	1.38	79	1.89	1.09	80	1.8	83	0.044	98	98	23.0	-0.1	262	71	71	68	-0.039	4.43	0.00443
152	24.703	24.631	0.16	0.16	1.38	79	1.88	1.09	80	1.8	83	0.042	100	100	23.0	0	263	71	71	68	-0.040	5.06	0.00506
153	24.866	24.793	0.16	0.16	1.38	79	1.88	1.09	80	1.8	83	0.045	96	96	22.9	-0.1	263	71	71	68	-0.039	4.94	0.00494
154	25.030	24.956	0.16	0.16	1.38	79	1.88	1.09	80	1.8	83	0.044	98	98	22.9	0	262	71	71	68	-0.039	4.17	0.00417
155	25.193	25.119	0.16	0.16	1.38	79	1.89	1.09	80	1.8	82	0.043	99	99	22.9	0	262	71	71	67	-0.039	4.32	0.00432
156	25.357	25.282	0.16	0.16	1.38	79	1.89	1.09	80	1.8	83	0.045	97	97	22.8	-0.1	260	71	71	67	-0.039	4.38	0.00438
157	25.521	25.445	0.16	0.16	1.38	79	1.88	1.08	80	1.8	83	0.044	98	98	22.8	0	261	71	71	68	-0.039	4.98	0.00498
158	25.685	25.607	0.16	0.16	1.37	79	1.89	1.09	80	1.8	83	0.044	98	97	22.7	-0.1	262	71	71	67	-0.039	4.8	0.0048
159	25.849	25.770	0.16	0.16	1.37	79	1.89	1.09	80	1.8	83	0.043	99	99	22.7	0	262	71	71	68	-0.040	5.03	0.00503
160	26.012	25.934	0.16	0.16	1.37	79	1.89	1.09	80	1.8	83	0.043	99	99	22.7	0	262	71	71	68	-0.040	5.12	0.00512
161	26.176	26.096	0.16	0.16	1.38	79	1.89	1.08	80	1.8	83	0.044	98	97	22.6	-0.1	262	71	71	68	-0.039	4.14	0.00414
162	26.339	26.259	0.16	0.16	1.38	79	1.89	1.09	80	1.8	83	0.045	96	97	22.6	0	261	71	71	68	-0.040	4.35	0.00435
163	26.502	26.421	0.16	0.16	1.39	79	1.89	1.09	80	1.8	83	0.041	101	101	22.6	0	261	71	71	68	-0.039	4.43	0.00443
164	26.665	26.585	0.16	0.16	1.38	79	1.89	1.09	80	1.8	83	0.043	99	99	22.5	-0.1	261	71	71	68	-0.039	4.53	0.00453
165	26.829	26.748	0.16	0.16	1.39	79	1.89	1.08	80	1.8	83	0.043	99	99	22.5	0	260	71	71	68	-0.039	4.01	0.00401
166	26.993	26.911	0.16	0.16	1.38	79	1.89	1.08	80	1.8	83	0.041	102	101	22.5	0	259	71	71	68	-0.039	4.31	0.00431
167	27.157	27.073	0.16	0.16	1.38	80	1.88	1.09	80	1.8	83	0.042	100	99	22.4	-0.1	259	71	71	68	-0.039	4.43	0.00443
168	27.320	27.236	0.16	0.16	1.37	80	1.88	1.09	80	1.8	83	0.043	98	99	22.4	0	259	71	71	68	-0.039	4.9	0.0049
169	27.484	27.399	0.16	0.16	1.37	79	1.89	1.09	80	1.8	82	0.043	99	99	22.3	-0.1	259	71	71	68	-0.039	4.67	0.00467
170	27.648	27.563	0.16	0.16	1.37	80	1.89	1.09	80	1.8	83	0.044	98	98	22.3	0	259	71	71	68	-0.039	5.04	0.00504
171	27.811	27.725	0.16	0.16	1.38	80	1.88	1.09	80	1.8	83	0.043	98	98	22.3	0	260	71	71	68	-0.039	4.76	0.00476
172	27.975	27.888	0.16	0.16	1.38	80	1.89	1.08	80	1.8	83	0.042	100	100	22.2	-0.1	261	71	71	68	-0.039	4.95	0.00495
173	28.139	28.051	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.043	99	99	22.2	0	261	71	71	68	-0.039	4.47	0.00447
174	28.302	28.213	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.042	100	99	22.1	-0.1	260	71	71	68	-0.039	4.44	0.00444

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) ____ (Amb)

Barometric Pressure: Begin 29.96 Middle 29.95 End 29.93 Average 29.95 "Hg

OMNI Equipment Numbers: ____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data										
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	28.465	28.377	0.16	0.16	1.38	80	1.89	1.09	80	1.9	83	0.044	97	98	22.1	0	260	71	71	68	-0.039	4.67	0.00467
176	28.629	28.539	0.16	0.16	1.38	80	1.89	1.08	80	1.8	83	0.043	99	98	22.1	0	261	71	71	68	-0.039	4.59	0.00459
177	28.792	28.702	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.043	98	99	22.0	-0.1	261	71	71	68	-0.039	4.7	0.0047
178	28.956	28.865	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.043	99	99	22.0	0	261	71	71	68	-0.039	4.64	0.00464
179	29.119	29.028	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.044	97	98	21.9	-0.1	262	71	71	68	-0.039	5.09	0.00509
180	29.283	29.191	0.16	0.16	1.38	80	1.89	1.08	80	1.8	83	0.042	100	100	21.9	0	262	71	71	69	-0.040	4.77	0.00477
181	29.447	29.353	0.16	0.16	1.37	80	1.89	1.09	80	1.9	83	0.043	99	98	21.9	0	263	71	71	68	-0.039	4.79	0.00479
182	29.611	29.516	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.043	99	99	21.8	-0.1	263	71	71	69	-0.039	4.7	0.0047
183	29.774	29.679	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.042	100	100	21.8	0	263	71	71	68	-0.040	4.39	0.00439
184	29.938	29.842	0.16	0.16	1.37	80	1.9	1.09	80	1.8	83	0.041	101	101	21.8	0	263	71	71	68	-0.039	4.74	0.00474
185	30.101	30.005	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.042	100	100	21.7	-0.1	263	71	71	69	-0.040	4.3	0.0043
186	30.264	30.167	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.044	97	97	21.7	0	262	71	71	68	-0.039	4.77	0.00477
187	30.428	30.330	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.042	100	100	21.6	-0.1	262	71	71	68	-0.040	4.28	0.00428
188	30.591	30.493	0.16	0.16	1.39	80	1.88	1.09	80	1.8	83	0.042	100	100	21.6	0	261	71	71	69	-0.039	3.91	0.00391
189	30.755	30.657	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.042	100	101	21.6	0	260	71	71	68	-0.039	4.27	0.00427
190	30.919	30.819	0.16	0.16	1.38	80	1.89	1.08	80	1.8	83	0.043	99	98	21.5	-0.1	258	71	71	68	-0.038	3.77	0.00377
191	31.082	30.982	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.042	100	100	21.5	0	257	71	71	69	-0.038	4.16	0.00416
192	31.246	31.144	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.043	99	98	21.5	0	257	71	71	68	-0.038	4.26	0.00426
193	31.410	31.307	0.16	0.16	1.37	80	1.9	1.09	80	1.8	83	0.041	101	101	21.4	-0.1	258	72	71	69	-0.038	4.48	0.00448
194	31.574	31.471	0.16	0.16	1.37	80	1.89	1.09	80	1.8	83	0.043	99	99	21.4	0	256	71	71	69	-0.038	4.28	0.00428
195	31.737	31.634	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.040	102	102	21.4	0	256	72	71	69	-0.038	4	0.004
196	31.901	31.796	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.041	101	101	21.3	-0.1	256	72	71	69	-0.039	4.26	0.00426
197	32.064	31.959	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.040	102	102	21.3	0	255	72	71	69	-0.039	4.1	0.0041
198	32.227	32.122	0.16	0.16	1.38	80	1.89	1.09	80	1.9	83	0.042	100	100	21.3	0	256	72	71	69	-0.038	4.43	0.00443
199	32.391	32.285	0.16	0.16	1.38	80	1.89	1.09	80	1.9	83	0.041	101	101	21.2	-0.1	256	72	71	69	-0.038	4.61	0.00461
200	32.555	32.448	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.041	101	101	21.2	0	255	72	71	68	-0.038	3.91	0.00391
201	32.718	32.611	0.16	0.16	1.38	80	1.89	1.08	80	1.9	83	0.041	101	101	21.1	-0.1	255	72	71	69	-0.038	4.31	0.00431
202	32.882	32.774	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.043	99	99	21.1	0	254	72	71	69	-0.038	3.75	0.00375
203	33.046	32.937	0.16	0.16	1.37	80	1.89	1.09	80	1.8	83	0.041	101	101	21.1	0	253	72	71	69	-0.037	3.81	0.00381
204	33.210	33.100	0.16	0.16	1.37	80	1.89	1.09	80	1.9	83	0.042	100	100	21.0	-0.1	253	72	71	69	-0.038	4.04	0.00404
205	33.374	33.262	0.16	0.16	1.37	80	1.9	1.09	80	1.9	83	0.043	99	98	21.0	0	253	72	71	69	-0.038	4.29	0.00429
206	33.537	33.425	0.16	0.16	1.38	80	1.89	1.09	80	1.8	82	0.045	96	97	21.0	0	252	72	71	69	-0.038	3.71	0.00371
207	33.701	33.588	0.16	0.16	1.37	80	1.89	1.09	80	1.8	82	0.043	99	99	20.9	-0.1	252	72	71	69	-0.038	4.11	0.00411
208	33.864	33.752	0.16	0.16	1.38	80	1.89	1.09	80	1.9	83	0.043	98	99	20.9	0	252	72	71	69	-0.038	4.03	0.00403
209	34.027	33.914	0.16	0.16	1.38	80	1.89	1.09	80	1.9	83	0.044	97	97	20.9	0	253	72	71	69	-0.038	4.47	0.00447

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) ____ (Amb)

Barometric Pressure: Begin 29.96, Middle 29.95, End 29.93, Average 29.95 "Hg

OMNI Equipment Numbers: ____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	34.191	34.077	0.16	0.16	1.38	80	1.9	1.09	80	1.8	82	0.043	99	99	20.8	-0.1	252	72	71	69	-0.037	4.05	0.00405
211	34.355	34.239	0.16	0.16	1.38	80	1.9	1.09	80	1.9	82	0.044	98	97	20.8	0	252	72	71	69	-0.038	4.27	0.00427
212	34.519	34.403	0.16	0.16	1.38	80	1.89	1.09	80	1.8	82	0.043	99	99	20.8	0	252	72	71	69	-0.038	4.3	0.0043
213	34.682	34.566	0.16	0.16	1.37	80	1.89	1.09	80	1.8	83	0.044	97	98	20.7	-0.1	252	72	71	69	-0.038	4.45	0.00445
214	34.846	34.729	0.16	0.16	1.37	80	1.89	1.08	80	1.9	83	0.043	99	99	20.7	0	253	72	71	69	-0.038	4.71	0.00471
215	35.010	34.891	0.16	0.16	1.37	80	1.9	1.09	80	1.8	83	0.045	97	96	20.7	0	254	72	72	69	-0.038	4.27	0.00427
216	35.173	35.054	0.16	0.16	1.37	80	1.89	1.09	80	1.9	83	0.041	101	101	20.6	-0.1	254	72	71	68	-0.038	4.56	0.00456
217	35.337	35.217	0.16	0.16	1.38	80	1.9	1.09	80	1.8	83	0.042	100	100	20.6	0	254	72	72	69	-0.038	4.49	0.00449
218	35.501	35.380	0.16	0.16	1.37	80	1.9	1.09	80	1.8	83	0.043	99	99	20.5	-0.1	254	72	72	69	-0.038	4.1	0.0041
219	35.664	35.543	0.16	0.16	1.38	80	1.89	1.08	80	1.8	83	0.044	97	98	20.5	0	253	72	72	69	-0.038	3.82	0.00382
220	35.827	35.705	0.16	0.16	1.38	80	1.89	1.08	80	1.8	83	0.044	97	97	20.5	0	253	72	71	69	-0.038	3.96	0.00396
221	35.991	35.868	0.16	0.16	1.38	80	1.89	1.09	80	1.9	83	0.044	98	98	20.4	-0.1	253	72	71	69	-0.039	4.08	0.00408
222	36.154	36.031	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.046	95	96	20.4	0	253	72	72	69	-0.038	4.12	0.00412
223	36.318	36.195	0.16	0.16	1.38	80	1.89	1.09	80	1.8	83	0.042	100	101	20.4	0	254	72	72	69	-0.038	4.67	0.00467
224	36.482	36.357	0.16	0.16	1.38	80	1.89	1.08	80	1.9	83	0.042	100	99	20.3	-0.1	254	72	72	69	-0.038	4.03	0.00403
225	36.645	36.519	0.16	0.16	1.38	80	1.89	1.09	80	1.9	83	0.044	97	97	20.3	0	254	72	72	69	-0.038	4.2	0.0042
226	36.809	36.682	0.16	0.16	1.37	80	1.9	1.09	80	1.8	83	0.042	100	100	20.3	0	255	72	72	69	-0.038	4.68	0.00468
227	36.973	36.845	0.16	0.16	1.37	80	1.9	1.08	80	1.8	83	0.042	100	100	20.2	-0.1	255	72	72	69	-0.038	4.49	0.00449
228	37.137	37.008	0.16	0.16	1.38	80	1.89	1.09	81	1.9	83	0.041	101	101	20.2	0	256	72	72	69	-0.038	4.6	0.0046
229	37.301	37.171	0.16	0.16	1.38	80	1.9	1.08	81	1.8	83	0.043	99	99	20.1	-0.1	256	72	72	69	-0.038	4.37	0.00437
230	37.464	37.333	0.16	0.16	1.37	80	1.9	1.09	81	1.9	83	0.042	100	99	20.1	0	256	72	72	69	-0.039	4.48	0.00448
231	37.627	37.496	0.16	0.16	1.38	80	1.89	1.09	81	1.9	83	0.043	98	99	20.1	0	255	72	72	69	-0.038	3.69	0.00369
232	37.791	37.660	0.16	0.16	1.38	80	1.89	1.09	81	1.8	83	0.042	100	100	20.0	-0.1	254	72	72	69	-0.038	3.82	0.00382
233	37.954	37.823	0.16	0.16	1.38	80	1.9	1.08	81	1.8	83	0.042	100	100	20.0	0	254	72	72	69	-0.037	4.06	0.00406
234	38.118	37.985	0.16	0.16	1.38	80	1.9	1.09	81	1.8	83	0.043	99	98	20.0	0	253	72	72	69	-0.038	4.11	0.00411
235	38.282	38.148	0.16	0.16	1.38	80	1.89	1.09	81	1.8	83	0.041	101	101	19.9	-0.1	253	72	72	69	-0.038	3.73	0.00373
236	38.446	38.311	0.16	0.16	1.38	80	1.89	1.09	81	1.8	83	0.044	98	98	19.9	0	253	72	72	69	-0.037	4.47	0.00447
237	38.610	38.475	0.16	0.16	1.37	80	1.9	1.08	81	1.8	83	0.041	101	102	19.9	0	252	72	72	69	-0.037	4.12	0.00412
238	38.773	38.637	0.16	0.16	1.37	80	1.89	1.09	81	1.8	83	0.041	101	100	19.8	-0.1	253	72	72	69	-0.038	4.3	0.0043
239	38.937	38.799	0.16	0.16	1.38	80	1.89	1.08	81	1.9	83	0.041	101	100	19.8	0	254	72	72	69	-0.038	3.99	0.00399
240	39.101	38.962	0.16	0.16	1.37	80	1.9	1.09	81	1.8	83	0.043	99	99	19.7	-0.1	254	72	72	69	-0.038	4.28	0.00428
241	39.264	39.125	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.042	100	100	19.7	0	254	72	72	69	-0.038	4.25	0.00425
242	39.427	39.289	0.16	0.16	1.38	81	1.9	1.09	81	1.9	83	0.042	99	100	19.7	0	255	72	72	69	-0.038	4.77	0.00477
243	39.591	39.451	0.16	0.16	1.38	81	1.89	1.08	81	1.9	84	0.043	99	98	19.6	-0.1	256	72	72	69	-0.039	4.02	0.00402
244	39.755	39.614	0.16	0.16	1.38	81	1.9	1.09	81	1.9	83	0.041	101	101	19.6	0	255	72	72	70	-0.038	3.6	0.0036

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) ____ (Amb)

Barometric Pressure: Begin 29.96 | Middle 29.95 | End 29.93 | Average 29.95 "Hg

OMNI Equipment Numbers: ____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	39.918	39.777	0.16	0.16	1.39	81	1.9	1.09	81	1.9	83	0.042	99	100	19.6	0	254	72	72	70	-0.038	3.82	0.00382
246	40.082	39.940	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.040	103	102	19.5	-0.1	254	72	72	69	-0.038	3.97	0.00397
247	40.246	40.103	0.16	0.16	1.37	81	1.9	1.09	81	1.8	84	0.040	103	102	19.5	0	254	72	72	69	-0.038	4.3	0.0043
248	40.410	40.266	0.16	0.16	1.38	81	1.89	1.08	81	1.9	84	0.040	103	102	19.5	0	254	72	72	69	-0.038	4.17	0.00417
249	40.574	40.429	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.040	103	102	19.4	-0.1	254	72	72	69	-0.038	3.73	0.00373
250	40.738	40.592	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.039	104	104	19.4	0	253	72	72	70	-0.038	3.87	0.00387
251	40.901	40.755	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.041	101	101	19.4	0	253	72	72	70	-0.038	3.95	0.00395
252	41.065	40.918	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.041	101	101	19.3	-0.1	253	72	72	70	-0.037	4.08	0.00408
253	41.228	41.080	0.16	0.16	1.38	81	1.89	1.08	81	1.9	84	0.041	101	101	19.3	0	253	72	72	70	-0.038	4.36	0.00436
254	41.391	41.243	0.16	0.16	1.38	81	1.9	1.09	81	1.8	84	0.042	100	100	19.3	0	253	72	72	69	-0.037	4.15	0.00415
255	41.555	41.406	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.042	100	100	19.2	-0.1	252	72	72	70	-0.037	4.01	0.00401
256	41.718	41.569	0.16	0.16	1.38	81	1.9	1.09	81	1.9	83	0.040	102	102	19.2	0	252	72	72	69	-0.038	4.26	0.00426
257	41.882	41.732	0.16	0.16	1.37	81	1.9	1.09	81	1.8	84	0.040	103	102	19.2	0	252	72	72	70	-0.037	4.18	0.00418
258	42.046	41.895	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.042	100	100	19.1	-0.1	252	72	72	70	-0.038	4.14	0.00414
259	42.210	42.057	0.16	0.16	1.37	81	1.89	1.09	81	1.8	84	0.041	101	101	19.1	0	253	72	72	70	-0.038	4.57	0.00457
260	42.374	42.220	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.043	99	99	19.0	-0.1	254	72	72	70	-0.038	4.46	0.00446
261	42.537	42.384	0.16	0.16	1.37	81	1.89	1.08	81	1.9	84	0.041	101	102	19.0	0	254	72	72	70	-0.038	4.4	0.0044
262	42.701	42.546	0.16	0.16	1.38	81	1.9	1.08	81	1.9	84	0.041	101	101	19.0	0	254	72	72	70	-0.037	4.28	0.00428
263	42.864	42.709	0.16	0.16	1.38	81	1.89	1.08	81	1.9	84	0.044	97	98	18.9	-0.1	254	72	72	70	-0.038	4.45	0.00445
264	43.027	42.871	0.16	0.16	1.39	81	1.9	1.09	81	1.9	84	0.042	100	99	18.9	0	254	72	72	69	-0.037	4.12	0.00412
265	43.190	43.034	0.16	0.16	1.38	81	1.89	1.09	81	1.9	84	0.042	100	100	18.9	0	253	72	72	69	-0.038	4.38	0.00438
266	43.354	43.198	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.041	101	102	18.8	-0.1	254	72	72	69	-0.038	4.5	0.0045
267	43.518	43.361	0.16	0.16	1.38	81	1.9	1.08	81	1.9	84	0.042	100	100	18.8	0	254	72	72	69	-0.038	4.27	0.00427
268	43.682	43.523	0.16	0.16	1.38	81	1.91	1.09	81	1.9	84	0.042	100	99	18.7	-0.1	254	72	72	69	-0.037	4.35	0.00435
269	43.845	43.686	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.042	100	100	18.7	0	254	72	72	69	-0.037	4.23	0.00423
270	44.009	43.849	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.043	99	99	18.7	0	254	72	72	69	-0.038	4.28	0.00428
271	44.173	44.013	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.042	100	101	18.6	-0.1	253	72	72	70	-0.038	4.19	0.00419
272	44.337	44.175	0.16	0.16	1.38	81	1.89	1.08	81	1.9	84	0.041	101	101	18.6	0	252	72	72	70	-0.037	4.1	0.0041
273	44.501	44.338	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.042	100	100	18.6	0	253	72	72	70	-0.038	4.19	0.00419
274	44.664	44.501	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.042	100	100	18.5	-0.1	253	72	72	70	-0.037	4.59	0.00459
275	44.827	44.664	0.16	0.16	1.38	81	1.89	1.09	81	1.9	83	0.042	99	100	18.5	0	253	72	72	70	-0.037	4.45	0.00445
276	44.990	44.827	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.042	100	100	18.5	0	254	72	72	70	-0.038	4.38	0.00438
277	45.154	44.989	0.16	0.16	1.37	81	1.89	1.08	81	1.9	84	0.043	99	98	18.4	-0.1	253	73	72	70	-0.037	4.05	0.00405
278	45.318	45.152	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.040	103	102	18.4	0	253	72	72	70	-0.037	3.8	0.0038
279	45.481	45.315	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.041	101	101	18.4	0	253	72	72	70	-0.038	4.02	0.00402

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) _____ (Amb)

Barometric Pressure:

Begin	Middle	End	Average
29.96	29.95	29.93	29.95 "Hg

OMNI Equipment Numbers: _____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	45.645	45.478	0.16	0.16	1.37	81	1.9	1.09	81	1.9	83	0.041	101	101	18.3	-0.1	252	73	72	70	-0.038	3.84	0.00384
281	45.809	45.641	0.16	0.16	1.38	81	1.91	1.09	81	1.9	84	0.041	101	101	18.3	0	252	73	72	70	-0.038	3.92	0.00392
282	45.973	45.804	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.042	100	100	18.2	-0.1	253	73	72	70	-0.038	4.3	0.0043
283	46.136	45.966	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.042	100	99	18.2	0	254	73	72	69	-0.038	4.61	0.00461
284	46.300	46.129	0.16	0.16	1.37	81	1.91	1.09	81	1.9	84	0.043	99	99	18.2	0	254	73	72	70	-0.038	4.3	0.0043
285	46.464	46.293	0.16	0.16	1.38	81	1.9	1.09	81	1.9	83	0.043	99	99	18.1	-0.1	254	73	72	70	-0.038	4.55	0.00455
286	46.627	46.456	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.043	98	99	18.1	0	255	73	72	70	-0.038	4.45	0.00445
287	46.790	46.618	0.16	0.16	1.38	81	1.91	1.09	81	1.9	84	0.041	101	101	18.1	0	255	73	72	70	-0.038	4.48	0.00448
288	46.954	46.781	0.16	0.16	1.38	81	1.91	1.09	81	1.9	84	0.041	101	101	18.0	-0.1	256	73	72	70	-0.039	4.67	0.00467
289	47.117	46.944	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.040	102	102	18.0	0	256	73	72	70	-0.038	4.73	0.00473
290	47.281	47.107	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.043	99	99	17.9	-0.1	257	73	72	70	-0.039	4.39	0.00439
291	47.445	47.270	0.16	0.16	1.38	81	1.91	1.09	81	1.9	84	0.042	100	100	17.9	0	258	73	72	70	-0.038	4.85	0.00485
292	47.608	47.432	0.16	0.16	1.37	81	1.91	1.09	81	1.9	84	0.043	98	98	17.9	0	257	73	72	70	-0.038	3.91	0.00391
293	47.772	47.595	0.16	0.16	1.37	81	1.91	1.08	81	1.9	84	0.042	100	100	17.8	-0.1	256	73	72	70	-0.038	4.29	0.00429
294	47.936	47.758	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.044	98	98	17.8	0	256	73	72	70	-0.038	4.23	0.00423
295	48.100	47.922	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.044	98	98	17.7	-0.1	256	73	72	70	-0.038	4.21	0.00421
296	48.264	48.084	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.043	99	98	17.7	0	255	73	72	70	-0.038	4.15	0.00415
297	48.427	48.247	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.044	97	98	17.7	0	255	73	72	70	-0.038	4.27	0.00427
298	48.590	48.410	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.041	101	101	17.6	-0.1	254	73	72	70	-0.038	3.79	0.00379
299	48.753	48.573	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.042	100	100	17.6	0	254	73	72	70	-0.038	4.13	0.00413
300	48.917	48.736	0.16	0.16	1.38	81	1.9	1.08	81	1.9	84	0.044	98	98	17.6	0	255	73	72	70	-0.038	4.66	0.00466
301	49.081	48.899	0.16	0.16	1.38	81	1.91	1.08	81	1.9	84	0.044	98	98	17.5	-0.1	255	73	72	70	-0.038	4.58	0.00458
302	49.245	49.061	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.042	100	99	17.5	0	254	73	72	70	-0.038	3.86	0.00386
303	49.408	49.224	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.043	98	99	17.5	0	253	73	72	70	-0.038	3.82	0.00382
304	49.572	49.387	0.16	0.16	1.37	81	1.91	1.09	81	1.9	84	0.044	98	98	17.4	-0.1	253	73	72	70	-0.038	4.03	0.00403
305	49.736	49.550	0.16	0.16	1.36	81	1.9	1.08	81	1.9	84	0.041	101	101	17.4	0	253	73	72	70	-0.037	4.24	0.00424
306	49.900	49.713	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.038	105	105	17.4	0	252	73	72	70	-0.037	4.01	0.00401
307	50.064	49.876	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.042	100	100	17.3	-0.1	251	73	72	70	-0.037	3.67	0.00367
308	50.227	50.039	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.041	101	101	17.3	0	250	73	72	70	-0.037	3.88	0.00388
309	50.390	50.202	0.16	0.16	1.38	81	1.91	1.09	81	1.9	84	0.042	100	100	17.3	0	250	73	72	70	-0.037	4.22	0.00422
310	50.553	50.365	0.16	0.16	1.38	81	1.91	1.08	81	1.9	84	0.042	100	100	17.2	-0.1	251	73	72	70	-0.037	4.47	0.00447
311	50.717	50.527	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.042	100	99	17.2	0	251	73	72	70	-0.037	4.61	0.00461
312	50.880	50.689	0.16	0.16	1.38	81	1.9	1.09	81	1.9	84	0.041	101	101	17.1	-0.1	253	73	72	70	-0.038	4.91	0.00491
313	51.044	50.853	0.16	0.16	1.37	81	1.91	1.09	81	1.9	84	0.041	101	102	17.1	0	253	73	73	70	-0.038	4.28	0.00428
314	51.208	51.017	0.16	0.16	1.37	81	1.9	1.08	81	1.9	84	0.041	101	102	17.1	0	252	73	73	70	-0.037	3.94	0.00394

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) ____ (Amb)

Barometric Pressure: Begin 29.96 Middle 29.95 End 29.93 Average 29.95 "Hg

OMNI Equipment Numbers: ____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	51.371	51.179	0.16	0.16	1.37	81	1.91	1.08	81	1.9	84	0.043	98	98	17.0	-0.1	251	73	73	70	-0.037	3.8	0.0038
316	51.535	51.341	0.16	0.16	1.37	81	1.9	1.09	81	1.9	84	0.040	103	102	17.0	0	251	73	73	70	-0.038	4.07	0.00407
317	51.699	51.504	0.16	0.16	1.36	81	1.9	1.09	81	1.9	84	0.041	101	101	17.0	0	252	73	73	70	-0.038	4.65	0.00465
318	51.862	51.667	0.16	0.16	1.37	81	1.91	1.09	82	1.9	84	0.041	101	101	16.9	-0.1	253	73	73	70	-0.038	4.84	0.00484
319	52.026	51.830	0.16	0.16	1.37	81	1.91	1.08	82	1.9	84	0.042	100	100	16.9	0	255	73	73	71	-0.038	5.02	0.00502
320	52.189	51.993	0.16	0.16	1.38	81	1.9	1.08	81	1.9	84	0.044	97	98	16.8	-0.1	256	73	73	70	-0.038	4.67	0.00467
321	52.352	52.155	0.16	0.16	1.37	81	1.91	1.08	81	1.9	84	0.044	97	97	16.8	0	257	73	73	70	-0.038	4.18	0.00418
322	52.515	52.318	0.16	0.16	1.38	81	1.9	1.08	81	1.9	84	0.043	98	99	16.8	0	256	73	73	70	-0.038	3.9	0.0039
323	52.679	52.481	0.16	0.16	1.37	81	1.91	1.09	81	1.9	84	0.043	99	99	16.7	-0.1	254	73	73	70	-0.038	3.63	0.00363
324	52.842	52.644	0.16	0.16	1.38	81	1.91	1.09	82	1.9	85	0.041	101	101	16.7	0	254	73	73	70	-0.038	3.83	0.00383
325	53.006	52.807	0.16	0.16	1.38	82	1.91	1.08	82	1.9	85	0.041	101	101	16.7	0	254	73	73	70	-0.038	3.84	0.00384
326	53.170	52.969	0.16	0.16	1.37	82	1.91	1.08	82	1.9	84	0.043	99	98	16.6	-0.1	254	73	73	70	-0.038	4.06	0.00406
327	53.333	53.132	0.16	0.16	1.36	82	1.91	1.08	82	1.9	84	0.042	99	100	16.6	0	254	73	73	71	-0.038	4.58	0.00458
328	53.497	53.295	0.16	0.16	1.36	82	1.91	1.09	82	1.9	85	0.040	102	102	16.6	0	254	73	73	70	-0.038	4.51	0.00451
329	53.660	53.458	0.16	0.16	1.37	82	1.91	1.08	82	1.9	85	0.043	98	99	16.5	-0.1	255	73	73	70	-0.038	4.44	0.00444
330	53.824	53.620	0.16	0.16	1.37	82	1.9	1.09	82	1.9	84	0.041	101	100	16.5	0	255	73	73	70	-0.038	4.3	0.0043
331	53.988	53.783	0.16	0.16	1.37	82	1.9	1.09	82	1.9	85	0.043	99	99	16.5	0	254	73	73	70	-0.037	4.07	0.00407
332	54.151	53.946	0.16	0.16	1.38	82	1.9	1.08	82	1.9	85	0.042	99	100	16.4	-0.1	255	73	73	70	-0.038	5	0.005
333	54.314	54.110	0.16	0.16	1.38	82	1.9	1.08	82	1.9	85	0.041	101	102	16.4	0	255	73	73	70	-0.037	4.33	0.00433
334	54.477	54.272	0.16	0.16	1.37	82	1.9	1.09	82	1.9	85	0.042	99	99	16.3	-0.1	255	73	73	70	-0.038	4.18	0.00418
335	54.641	54.434	0.16	0.16	1.38	82	1.9	1.09	82	1.9	85	0.042	100	99	16.3	0	257	73	73	71	-0.038	4.62	0.00462
336	54.804	54.597	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.043	98	99	16.3	0	257	73	73	70	-0.038	4.23	0.00423
337	54.968	54.760	0.16	0.16	1.38	82	1.9	1.08	82	1.9	85	0.043	99	99	16.2	-0.1	257	73	73	70	-0.038	4.35	0.00435
338	55.131	54.924	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.042	99	100	16.2	0	258	73	73	70	-0.038	4.6	0.0046
339	55.295	55.086	0.16	0.16	1.37	82	1.91	1.08	82	1.9	85	0.042	100	99	16.1	-0.1	258	73	73	70	-0.038	4.47	0.00447
340	55.459	55.248	0.16	0.16	1.36	82	1.91	1.08	82	1.9	85	0.041	101	100	16.1	0	258	73	73	71	-0.038	4.41	0.00441
341	55.622	55.411	0.16	0.16	1.38	82	1.91	1.08	82	1.9	85	0.042	99	100	16.1	0	258	73	73	70	-0.038	4.36	0.00436
342	55.786	55.574	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.042	100	100	16.0	-0.1	259	73	73	70	-0.038	4.59	0.00459
343	55.950	55.737	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.041	101	101	16.0	0	259	73	73	70	-0.038	4.54	0.00454
344	56.113	55.900	0.16	0.16	1.38	82	1.91	1.08	82	1.9	85	0.043	98	99	16.0	0	259	73	73	70	-0.038	4.06	0.00406
345	56.276	56.062	0.16	0.16	1.38	82	1.91	1.08	82	1.9	85	0.040	102	102	15.9	-0.1	258	73	73	70	-0.038	4.32	0.00432
346	56.439	56.225	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.041	101	101	15.9	0	258	73	73	70	-0.038	4.16	0.00416
347	56.603	56.389	0.16	0.16	1.38	82	1.9	1.09	82	1.9	85	0.043	99	99	15.8	-0.1	258	73	73	70	-0.038	4.54	0.00454
348	56.766	56.551	0.16	0.16	1.37	82	1.91	1.08	82	1.9	85	0.043	98	98	15.8	0	258	73	73	70	-0.038	4.44	0.00444
349	56.930	56.713	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.041	101	100	15.8	0	259	73	73	70	-0.039	4.56	0.00456

Pellet Heater Test Data - ASTM E2779 / ASTM E2515

Run: 1

Manufacturer: Hearth & Home
Model: P40i
Tracking No.: 2364
Project No.: 0061PN103E
Test Date: 03-Apr-19
Beginning Clock Time: 10:06

High Burn End Time: 60
Medium Burn End Time: 180
Total Sampling Time: 360 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 1.022 (1) 0.995 (2) _____ (Amb)

Barometric Pressure:

Begin	Middle	End	Average
29.96	29.95	29.93	29.95 "Hg

OMNI Equipment Numbers: _____

PM Control Modules: 335, 336
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.190 "H2O
Tunnel Area: 0.196 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 13.07 ft/sec.
Intial Tunnel Flow: 137.5 scfm
Average Tunnel Flow: 145.5 scfm
Post-Test Leak Check (1): 0.000 cfm @ 7 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 7 in. Hg
Fuel Moisture: 5.15 Dry Basis %

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.030	0.040	0.040	0.030	0.028	0.038	0.040	0.030	0.039	"H2O
Temp:	99	99	99	99	99	99	99	99	100	°F

V_{strav} 12.72 ft/sec V_{scent} 13.47 ft/sec F_p 0.944

	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	57.094	56.876	0.16	0.16	1.37	82	1.9	1.09	82	1.9	85	0.041	101	101	15.7	-0.1	259	73	73	70	-0.038	4.55	0.00455
351	57.257	57.039	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.041	101	101	15.7	0	259	73	73	70	-0.038	3.92	0.00392
352	57.421	57.203	0.16	0.16	1.36	82	1.9	1.08	82	1.9	86	0.041	101	102	15.7	0	258	73	73	70	-0.039	4.05	0.00405
353	57.585	57.365	0.16	0.16	1.38	82	1.91	1.08	82	1.9	85	0.042	100	99	15.6	-0.1	258	73	73	70	-0.038	4.2	0.0042
354	57.748	57.528	0.16	0.16	1.37	82	1.9	1.09	82	1.9	85	0.042	99	100	15.6	0	257	73	73	70	-0.038	4.2	0.0042
355	57.912	57.690	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.043	99	98	15.6	0	257	73	73	70	-0.038	4.03	0.00403
356	58.075	57.853	0.16	0.16	1.37	82	1.91	1.09	82	1.9	85	0.043	98	99	15.5	-0.1	256	73	73	70	-0.038	4.18	0.00418
357	58.238	58.017	0.16	0.16	1.38	82	1.91	1.09	82	1.9	85	0.042	99	100	15.5	0	256	73	73	70	-0.038	4.07	0.00407
358	58.402	58.179	0.16	0.16	1.38	82	1.91	1.08	82	1.9	85	0.040	102	102	15.4	-0.1	256	73	73	70	-0.039	4.61	0.00461
359	58.565	58.342	0.16	0.16	1.37	82	1.91	1.08	82	1.9	85	0.042	99	100	15.4	0	256	73	73	70	-0.038	4.59	0.00459
360	58.728	58.504	0.16	0.16	1.36	82	1.91	1.08	82	1.9	85	0.043	98	98	15.4	0	256	73	73	70	-0.038	4.67	0.00467
Avg/Tot	58.728	58.504	0.16	0.16	1.37	79	1.89	1.08	79	1.84	87	0.04	100	100			287	72	72	68	-0.043	5.14	0.01

Pellet Heater Lab Data - ASTM E2779 / ASTM E2515

Manufacturer:	Hearth & Home	Equipment Numbers:	23, 283A, 592
Model:	P40i		
Tracking No.:	2364		
Project No.:	0061PN103E		
Run #:	1		
Date:	4/3/19		

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	D668	123.3	120.8	2.5
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:	2.5

TRAIN 1 (Remainder of Test)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	D672	128.2	122.1	6.1
B. Rear filter catch	Filter	D715	119.5	119.7	-0.2
C. Probe catch*	Probe	6	115349.6	115349.3	0.3
D. Filter seals catch*	Seals	R761	3401.5	3401.2	0.3

Sub-Total	Total Particulate, mg:	6.5
Train 1 Aggregate	Total Particulate, mg:	**9.0**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	D676	128.6	120.8	7.8
B. Rear filter catch	Filter	D677	121.2	121.3	-0.1
C. Probe catch*	Probe	OES6	113710.3	113710.1	0.2
D. Filter seals catch*	Seals	R762	4149.5	4149.6	0.0

	Total Particulate, mg:	7.9

AMBIENT

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

	Total Particulate, mg:	0.0

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

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

Pellet Heater Test Results - ASTM E2779 / ASTM E2515

Manufacturer: Hearth & Home
Model: P40i
Project No.: 0061PN103E
Tracking No.: 2364
Run: 1
Test Date: 04/03/19

Burn Rate (Composite)	**1.19 kg/hr dry**
Average Tunnel Temperature	87 degrees F
Average Gas Velocity in Dilution Tunnel - vs	13.07 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8732.4 dscf/hour
Average Delta p	0.042 inches H20
Average Delta H	1.37 inches H20
Total Time of Test	360 minutes

Burn Rate (High)	**2.33** kg/hr dry
Burn Rate (Med)	**0.99** kg/hr dry
	42.6% of High
Burn Rate (Low)	**0.93** kg/hr dry
	40.1% of High

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	1st HR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	58.728 cubic feet	58.504 cubic feet	9.658 cubic feet
Average Gas Meter Temperature	68 degrees F	79 degrees F	79 degrees F	74 degrees F
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	59.013 dscf	57.174 dscf	9.798 dscf
Total Particulates - m_n	0 mg	9 mg	7.9 mg	2.5 mg
Particulate Concentration (dry-standard) - C_f/C_s	0.000000 grams/dscf	0.00015 grams/dscf	0.00014 grams/dscf	0.00026 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	7.99 grams	7.24 grams	2.23 grams
Particulate Emission Rate	0.00 grams/hour	1.33 grams/hour	1.21 grams/hour	2.23 grams/hour
Emissisons Factor		1.12 g/kg	1.02 g/kg	0.96 g/kg
Difference from Average Total Particulate Emissions		0.38 grams	0.38 grams	

Dual Train Comparison Results Are Acceptable

FINAL AVERAGE RESULTS

Integrated Test Run	
Total Particulate Emissions - E_T	7.62 grams
Particulate Emission Rate	**1.27 grams/hour**
Emissisons Factor	1.07 grams/kg
First Hour Emissions	
Total Particulate Emissions - E_T	2.23 grams
Particulate Emission Rate	2.23 grams/hour
Emissisons Factor	0.96 grams/kg

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK
Medium Burn Rate < 50%	OK

OMNI-Test Laboratories

Manufacturer: Hearth & Home
Model: P40i
Date: 04/03/19
Run: 1
Control #: 0061PN103E
Test Duration: 360
Output Category: Integrated

Technicians:

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	76.3%	81.7%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	77%	82.1%

Output Rate (kJ/h)	17,779	16,865	**(Btu/h)**
Burn Rate (kg/h)	1.19	2.62	**(lb/h)**
Input (kJ/h)	23,309	22,111	**(Btu/h)**

Test Load Weight (dry kg)	7.12	15.69	**dry lb**
MC wet (%)	4.897765097		
MC dry (%)	5.15		
Particulate (g)	7.62		
CO (g)	8		
Test Duration (h)	6.00		

Emissions	Particulate	CO
g/MJ Output	0.07	0.08
g/kg Dry Fuel	1.07	1.17
g/h	1.27	1.38
lb/MM Btu Output	0.17	0.18

Air/Fuel Ratio (A/F)	23.83

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

OMNI-Test Laboratories

Manufacturer: Hearth & Home
Model: P40i
Date: 04/03/19
Run: 1
Control #: 0061PN103E
Test Duration: 60
Output Category: Maximum

Technicians: _____

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	77.0%	82.5%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	77%	83.0%

Output Rate (kJ/h)	35,255	33,444	**(Btu/h)**
Burn Rate (kg/h)	2.33	5.14	**(lb/h)**
Input (kJ/h)	45,770	43,418	**(Btu/h)**

Test Load Weight (dry kg)	2.33	5.14	**dry lb**
MC wet (%)	4.897765097		
MC dry (%)	5.15		
Particulate (g)	0		
CO (g)	3		
Test Duration (h)	1.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.00	0.08
g/kg Dry Fuel	0.00	1.17
g/h	0.00	2.73
lb/MM Btu Output	0.00	0.18

Air/Fuel Ratio (A/F)	14.25

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

OMNI-Test Laboratories

Manufacturer: Hearth & Home
Model: P40i
Date: 04/03/19
Run: 1
Control #: 0061PN103E
Test Duration: 120
Output Category: Medium

Technicians: _____

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	75.3%	80.7%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	76%	81.1%

Output Rate (kJ/h)	14,676	13,922	**(Btu/h)**
Burn Rate (kg/h)	0.99	2.19	**(lb/h)**
Input (kJ/h)	19,495	18,493	**(Btu/h)**

Test Load Weight (dry kg)	1.98	4.37	**dry lb**
MC wet (%)	4.897765097		
MC dry (%)	5.15		
Particulate (g)	0		
CO (g)	2		
Test Duration (h)	2.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.00	0.08
g/kg Dry Fuel	0.00	1.18
g/h	0.00	1.17
lb/MM Btu Output	0.00	0.18

Air/Fuel Ratio (A/F)	25.84

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

OMNI-Test Laboratories

Manufacturer: Hearth & Home
Model: P40i
Date: 04/03/19
Run: 1
Control #: 0061PN103E
Test Duration: 180
Output Category: Minimum

Technicians: _____

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	76.0%	81.5%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	76%	81.9%

Output Rate (kJ/h)	13,960	13,243	**(Btu/h)**
Burn Rate (kg/h)	0.93	2.06	**(lb/h)**
Input (kJ/h)	18,364	17,421	**(Btu/h)**

Test Load Weight (dry kg)	2.80	6.18	**dry lb**
MC wet (%)	4.897765097		
MC dry (%)	5.15		
Particulate (g)	0		
CO (g)	3		
Test Duration (h)	3.00		

Emissions	Particulate	CO
g/MJ Output	0.00	0.08
g/kg Dry Fuel	0.00	1.17
g/h	0.00	1.10
lb/MM Btu Output	0.00	0.18

Air/Fuel Ratio (A/F)	28.73

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

OMNI-Test Laboratories, Inc.

Pellet Heater Certification Run Sheets

Client: Hearth & Home Project Number: 0061PN103E Run Number: 1

Model: P40i Tracking Number: 2364 Date: 4/3/19

Test Crew: B. Davis

OMNI Equipment ID numbers: 132, 283A, 335, 336, 410, 584, 559, 592, 637, 650

ASTM E2515 Sampling Information

Test Location: OMNI Portland Clock Time @ ET=0: 10:06 - 16:06

Span Gas Concentrations: CO_2(%): 10.08 CO(%): 2.53 CO(ppm): ~~907~~ 500

Test Run Validation Checks	Pre Test	Post Test
Zero Stack Gas Leakage	good	good
Zero Pitot Line Leakage	good	good
Zero Induced Draft	0.0 "	
100% Smoke Capture	100 %	

Test Run Validation Measurements	Pre Test		Post Test	
Scale Audit (lbs)	10.0		10.0	
CO_2 % (Zero/Span)	0.00	10.03	-0.01	10.03
CO % (Zero/Span)	0.000	2.529	-0.002	2.522
CO ppm (Zero/Span)	0	500	-3	494
Sample A Leakage (cfm @"Hg)	Ø		0.0 @ 7	
Sample B Leakage (cfm @"Hg)	Ø		0.0 @ 7	
Room Air Velocity (ft/min)	< 50		< 50	
Barometric Pressure ("Hg)	29.96		29.93	
Relative Humidity (%)	39.4		34.9	
Tunnel Static ("H_2O)	-.19		-.19	

Last Cleaning Dates

Flue Pipe	4/1/19
Dilution Tunnel	4/1/19
Sample Dryers	4/2/19

Dilution Tunnel Traverse

Traverse Point	1	2	Center	3	4	5	6	7	8
Δp ("H_2O)	.030	.040	.039 ~~.050~~	.040	.030	.028	.038	.040	.030
T (°F)	99	99	100	99	99	99	99	99	99

Technician Signature: Date: 4/3/19

OMNI-Test Laboratories, Inc.

Pellet Heater Certification Run Sheets

Client: Hearth & Home Project Number: 0061PN103E Run Number: 1
Model: P40i Tracking Number: 2364 Date: 4/3/19
Test Crew: B. Davis
OMNI Equipment ID numbers: 132, 283A, 335, 336, 410, 594, 559, 592, 637, 650

ASTM E2779 Run Notes

Air Control Settings

High Burn Rate Target: 100%
Settings: Feed adjuster # 5.27 (Screen D)
Temperature knob, Turned Fully clock wise # 7
Constant Burn = 14. Knob pointed at space between "Constant" Burn",

Medium Burn Rate Target: <50%
Settings: Feed adjuster to 1.57 on (Screen D) 1.5 on control knob
All other settings are the same as High.

Low Burn Rate Target: Minimum
Settings: Feed adjust to 1.28 (Screen D) ≈ 1.25 on knob
Temperature knob MAX Counter Clock wise to # 1

Additional Settings Notes: A digital display was used to adjust setting to maximum just prior to the High limit control stepping back burn Rate.

Pellet Moisture Content: 5.15
Pellet Specifications: Premium Hardwood
Pellet Analysis Notes: Twin Ports Report # USR:W218-0922-01

Preburn Notes

Time	Notes
~~to~~ N/A	clean

Test Notes

Time	Notes
60	changed setting to achieve med Burn Rate
180	changed settings to achieve Low Burn Rate

Technician Signature: [signature] Date: 4/3/19

2.2 - Sample Analysis & Tares

Analysis Worksheets
Tared Filter, Probe, and O-Ring Data
Pellet Fuel Label
Pellet Fuel Analysis Report

OMNI-Test Laboratories, Inc.

Pellet Heater Certification Run Sheets

Client: Hearth & Home Project Number: 0061PN103E Run Number: 1

Model: P40i Tracking Number: 2364 Date: 4/3/19

Test Crew: B. Davis

OMNI Equipment ID numbers: 283A, 637, 592

ASTM E2515 Lab Sheet

Assembled By:

B Davis

Date/Time in Desiccator:

4/3/19 1648

	Weighing #1	Weighing #2	Weighing #3	Weighing #4
	Date: 4/5/19	Date: 4/10/19	Date:	Date:
	Time: 0830	Time: 0913	Time:	Time:
	R/H %: 18.4	R/H %: 18.2	R/H %:	R/H %:
	Temp (F): 70.6	Temp (F): 68.2	Temp (F):	Temp (F):
	Audit 1: 200.1	Audit 1: 200.1	Audit 1:	Audit 1:
	Audit 2: 4999.8	Audit 2: 4999.9	Audit 2:	Audit 2:
	Audit 3: 99997.7	Audit 3: 99997.7	Audit 3:	Audit 3:
	Initials: BD	Initials: BD	Initials:	Initials:

Train	Item	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A	Front Filter (60 min)	D668	120.8	123.4	123.3	✓	
A	Front Filter (Remainder)	D672	122.1	128.1	128.2	✓	
A	Rear Filter	D715	119.7	119.5	119.5	✓	
A	Probe	6	115349.3	115349.6	115349.6	✓	
A	O-Ring Set	R761	3401.2	3401.7	3401.5	✓	
B	Front Filter	D676	120.8	128.7	128.6	✓	
B	Rear Filter	D677	121.3	121.3	121.2	✓	
B	Probe	OES 6	113710.1	113710.4	113710.3	✓	
B	O-Ring Set	R762	4149.6	4149.6	4149.5	✓	
BG	Filter						

Technician Signature: BD Date: 4/10/19

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

Prepared By: BDAVIS Balance ID #: OMNI-00637 Thermohygrometer ID #: OMNI-00592 Audit Weight ID #/Mass: 00283A 1 200 mg

Placed in Dessicator: Date: 1/16/19 Time: 0830 ID #	Date: 1/17/19 Time: 1215 RH %: 11.9 T (°F): 71.7 Audit: 199.9	Date: 1/18/19 Time: 0811 RH %: 10.8 T (°F): 70.1 Audit: 200.0	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
D653	120.9	121.0					
D654	121.6	121.5					
D655	121.2	121.1					
D656	120.7	120.8					
D657	121.2	121.0					
D658	120.8	120.8					
D659	120.8 ~~120.0~~	120.7					
D660	120.6	120.4					
D661	120.6	120.6					
D662	121.5	121.4					
D663	120.4	120.6					
D664	121.5	121.5					
D665	120.2	120.1					
D666	121.0	120.8					
D667	120.8	120.7					
D668	120.8	120.8			4/3/19	0061PM103E	1
D669	120.1	120.3					
D670	120.9	120.9					
D671	120.8	120.8					
D672	122.1	122.1			4/3/19	0061PM103E	1
	Initials: BD	Initials: BR	Initials:	Initials:			

Final Technician Signature: BD Date: 2/22/19 Evaluator signature: K. Mong

Tare Sheet: Probes___ 47mm Filters_✓_ 100mm Filters___ O-Ring Pair___

Date/time Placed in Dessicator: 1/29/19 0910

Thermohygrometer ID #: OMNI-00592

Prepared By: D Davis

Analytical Balance ID #: OMNI-00637

Audit Weight ID #/Mass: OMNI-00283A / 200 mg

ID #	Date: 1/30/19 Time: 0930 RH %: 12.0 T (°F): 71.1 Audit: 200.1	Date: 1/31/19 Time: 0820 RH %: 13.7 T (°F): 70.3 Audit: 200.1	Date: 2/1/19 Time: 0823 RH %: 11.0 T (°F): 71.6 Audit: 200.1	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
D673	121.1	121.1					
D674	121.0	121.1					
D675	120.7	120.6					
D676	120.7	120.8			4/3/19	C061PN103E	1
D677	121.2	121.3			↓	↓	↓
D678	121.1	121.0					
D679	120.9	120.9					
D680	120.4	120.2					
D681	121.5	121.4					
D682	121.3	121.2					
D683	121.1	121.0					
D684	120.3	120.1					
D685	122.4	122.0	122.2				
D686	121.4	121.1	121.3				
D687	120.9	121.0					
D688	120.5	120.1	120.2				
D689	120.7	120.6					
D690	120.6	120.6					
D691	120.9	120.6	120.8				
D692	120.9	120.6	120.8				
D693	120.6	120.6					
D694	121.3	121.0	121.2				
	Initials: BR	Initials: BR	Initials: BR	Initials:			

Final Technician Signature: _____ Date: 2/1/19

Evaluator signature: _____

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

Prepared By: B Davis Balance ID #: omni-00627 Thermohygrometer ID #: omni-00592 Audit Weight ID #/Mass: omni-213A / 200 mg

Placed in Dessicator: Date: 3/29/19 Time: 0840 ID #	Date: 3/29/19 Time: 1529 RH %: 21.5 T (°F): 72.8 Audit: 200.1	Date: 4/2/19 Time: 0815 RH %: 17.7 T (°F): 71.5 Audit: 200.1	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
D715	119.8	119.7			4/3/19	0061PN103E	1
D716	120.1	120.3					
D717	121.1	121.1					
D718	122.0	122.0					
D719	121.2	121.2					
D720	122.0	122.0					
D721	121.9	121.8					
D722	120.1	120.1					
D723	BR ~~121.2~~ 120.9	120.9					
D724	121.4	121.3			✓		
	Initials: BR	Initials: BR	Initials:	Initials:			

Final Technician Signature: _____ Date: 4/4/19 Evaluator signature: _____

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

Prepared By: B Davis Balance ID #: OMNI-00637 Thermohygrometer ID #: OMNI-00592 Audit Weight ID #/Mass: OMNI-00283A / 100g

Placed in Dessicator: Date: 3/12/19 Time: 0810 ID #	Date: 3/13/19 Time: 10:10 RH %: 11.4 T (°F): 71.2 Audit: 99997.8	Date: 3/15/19 Time: 0850 RH %: 8.4 T (°F): 70.8 Audit: 99997.8	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
OES 6	113710.1	113710.1	✓		4/3/19	0061 PN 103 E	1
6	115349.3	115349.3	✓		↓	↓	↓
38	114150.8	114151.0	✓				
53	118273.3	118273.3	✓				
58	117066.0	117066.0	✓				
62	117661.0	117661.0	✓				
64	118206.4	118206.6	✓				
65	117084.1	117084.2	✓				
66	118454.8	118454.9	✓				
67	117759.4	117759.5	✓				
68	116803.9	116804.0	✓				
69	117369.4	117369.4	✓				
	Initials: BR	Initials: BR	Initials:	Initials:			

Final Technician Signature: [signature] Date: 3/15/19 Evaluator signature: [signature]

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

Prepared By: BDAVIS Balance ID #: OMNI-00637 Thermohygrometer ID #: OMNI-00592 Audit Weight ID #/Mass: OMNI-002834 / 5g

Placed in Dessicator: Date: 3/11/19 Time: 11:10 ID #	Date: 3/12/19 Time: 0915 RH %: 16.7 T (°F): 71.2 Audit: 5000.0	Date: 3/13/19 Time: 0847 RH %: 16.1 T (°F): 70.3 Audit: 5000.0	Date: 3/14/19 Time: 0830 RH %: 10.8 T (°F): 70.7 Audit: 5000.0	Date: 3/15/19 Time: 0850 RH %: 8.1 T (°F): 70.8 Audit: 5000.0	Date Used	Project Number	Run No.
R761	3402.1	3401.1	3401.2	–	4/3/19	00GIPN103E	1
R762	4150.8	4150.1	4149.7	4149.6	– ↓	↓	↓
R763	3356.6	3356.1	3356.0	–			
R764	4113.9	4113.3	4113.3	–			
R765	3319.9	3319.6	3319.7	–			
R766	3347.6	3347.0	3346.7	3346.7			
R767	3290.4	3289.6	3289.8	–			
R768	4058.7	4058.3	4058.1	–			
R769	3284.5	3284.3	–				
R770	3550.4	3550.5	–				
R771	3549.2	3548.8	3548.9	–			
R772	3621.9	3621.3	3621.1	–			
R773	3383.0	3382.5	3382.2	3382.0			
R774	3327.9	3326.9	3327.0	–			
R775	3392.1	3391.8	3391.3	3391.2			
R776	3573.0	3573.0	–				
	Initials: BDR	Initials: BDR	Initials: BDR	Initials: BDR			

Final Technician Signature: _____ Date: 3/15/19 Evaluator signature: _____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Analytical Test Report

Report No: USR:W218-0922-01
Issue No: 1

Client: Hearth & Home Technologies
352 Mountain House Rd.
Halifax, PA 17032
Attention: Corie Podschelnec

PO No:

Signed: Katy Jahr
Katy Jahr
Chemistry Lab Supervisor
Date of Issue: 10/2/2018

Sample Details

Sample Log No:	W218-0922-01	**Sample Date:**	
Sample Designation:	Energex 40 Lb Pellet Bag	**Sample Time:**	
Sample Recognized As:	Wood Pellets	**Arrival Date:**	9/27/2018

Test Results

	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		5.15
Ash	ASTM D1102	wt. %	0.39	0.37
Volatile Matter	ASTM D3175	wt. %	81.58	77.37
Fixed Carbon by Difference	ASTM D3172	wt. %	18.03	17.10
Sulfur	ASTM D4239	wt. %	0.010	0.010
SO_2	Calculated	lb/mmbtu		0.024
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	18.32	17.25
Net Cal. Value at Const. Pressure	ISO 1928	J/g	18319	17249
Gross Cal. Value at Const. Vol.	ASTM E711	J/g	19643	18631
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8445	8010
Carbon	ASTM D5373	wt. %	49.45	46.90
Hydrogen*	ASTM D5373	wt. %	6.08	5.77
Nitrogen	ASTM D5373	wt. %	< 0.20	< 0.19
Oxygen*	ASTM D3176	wt. %	> 43.87	> 41.61
Chlorine	ASTM D6721	mg/kg	48	46
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft^3		45.63
Fines (Less than 1/8")	TPT CH-P-06	wt.%		0.16
Durability Index	Kansas State	PDI		98.8
Sample Above 1.50"	TPT CH-P-06	wt.%		0.0
Maximum Length (Single Pellet)	TPT CH-P-06	inch		1.233
Diameter, Range	TPT CH-P-05	inch	0.259 to	0.262
Diameter, Average	TPT CH-P-05	inch		0.261
Stated Bag Weight	TPT CH-P-01	lbs		40.0
Actual Bag Weight	TPT CH-P-01	lbs		40.3

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

Comments

Section 3

3.1 - Quality Assurance/Quality Control
3.2 - Calibration Data
3.3 - Example Calculations

3.1 - Quality Assurance/Quality Control

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

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

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

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

The manufacturing facilities and quality control system for the production of the P40i at Hearth & Home Technologies 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.

3.2 - Calibration Data

Equipment for ASTM E2515, ASTM E2779, & EPA Method 28R

ID #	Lab Name/Purpose	Log Name	Attachment Type
132	10 lb Weight	Weight Standard, 10 lb.	Calibration Certificate
283A	Audit Weights	Troemner 21pc Msas Set	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	Calibration Certificate
594	Combustion Gas Analyzer	CAI Gas Analyzer	See Run Sheet
559	Vaneometer	Dwyer Vaneometer	Equipment Record
592	Thermohygrometer	Omega Digital Thermohygrometer	Calibration Log
637	Milligram Balance	Analytical Balance - Mettler - Toledo	Calibration Certificate
650	Barometer/Hygrometer	Digital Barometer	Calibration Certificate

SCALE WEIGHT CALIBRATION DATA SHEET

Weight to be calibrated: 10 pounds

ID Number: OMNI-00132

Standard Calibration Weight: 10 pounds

ID Number: OMNI-00255

Scale Used: MTW-150K

ID Number: OMNI-00353

Date: 2/23/2018 By: B. Davis

Standard Weight (A) (Lb.)	Weight Verified (B) (Lb.)	Difference (A - B)	% Error
10.0	10.0	0.0	0

*Acceptable tolerance is 1%.

This calibration is traceable to NIST using calibrated standard weights.

Technician signature: _____ Date: 2/23/18

Certificate of Calibration

Certificate Number: **685888**

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: **180188**
Order Date: 10/09/2018
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, 21pc
Procedure: DCN 500901
Accuracy: Class F

Calibrated on: 10/26/2018
*Recommended Due: 10/26/2023
Environment: 20 °C 57 % RH
* As Received: Within Tolerance
* As Returned: Within Tolerance
Action Taken: Calibrated
Technician: 139

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.

This set meets Class F specifications.
Received and returned eight (8) masses in a black case secured by a rubber band.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
723A	Rice Lake	1mg-200g (Class 0)	Mass Set,	03/23/2019	668240
800A	Sartorius	MSA225W100DI	Analytical Balance	12/11/2018	663857

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	kError	UUT	Uncertainty
Before/After							Accredited = ✓
Mass							
Dot	200 mg	200.00030	199.4603	200.5403	0.0500	200.0503 mg	6.2E-01 ✓
	1 g	1.00000880	0.9991088	1.0009088	0.0000000	1.0000088 g	1E-03 ✓
	2 g	2.00001470	1.9989147	2.0011147	0.0003250	2.0003397 g	1.3E-03 ✓
	5 g	5.00000840	4.9985084	5.0015084	0.0000400	4.9999684 g	1.7E-03 ✓
	10 g	10.0000100	9.998010	10.002010	0.000245	9.999765 g	2.3E-03 ✓
Dot	20 g	20.0000140	19.996014	20.004014	0.000990	20.001004 g	4.6E-03 ✓
	50 g	49.9999660	49.989966	50.009966	0.000595	49.999371 g	1.1E-02 ✓
	100 g	100.000000	99.98000	100.02000	0.00194	99.99806 g	2.3E-02 ✓

Reviewer

3 Issued 10/29/2018 Rev # 15

Inspector

Thermal Metering System Calibration
Y Factor

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

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

Calibration Date:	01/21/19	
Calibrated by:	B. Davis	
Calibration Frequency:	Six months	
Next Calibration Due:	7/21/2019	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.38	"Hg
Signature/Date:		1/21/2019

Previous Calibration Comparision

		Acceptable Deviation (5%)	Deviation
Date	1/17/2018		
y Factor	0.986	0.0493	0.036
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.007
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	14-Nov-18	
	Calib. Value	0.9981	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	2.00	1.38	1.00
Initial Reference Meter	983.3	990.201	995.9
Final Reference Meter	990.109	995.804	1003.2
Initial DGM	0	0	0
Final DGM	6.684	5.539	7.299
Temp. Ref. Meter (°F), Tr	64.7	64.9	65.9
Temperature DGM (°F), Td	73.0	74.0	76.0
Time (min)	34.0	34.5	52.5
Net Volume Ref. Meter, Vr	6.809	5.603	7.300
Net Volume DGM, Vd	6.684	5.539	7.299
Gas Meter y Factor =	**1.028**	**1.024**	**1.015**
Gas Meter y Factor Deviation (from avg.)	0.006	0.002	0.007
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|

** 2. y = [Vr x (y factor (ref)) x (Pb + (Pr/ 13.6)) x (Td + 460)]/ [Vd x (Pb + (Pd / 13.6)) x (Tr + 460)]

** 3. dH@ = 0.0317 x Pd / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory

** Equations come from EPA Method 5

The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer

Maximum Range: 0-2" WC ID Number: OMNI-00335

Calibration Instrument: Digital Manometer ID Number: OMNI-00395

Date: 1/21/19 By: B. Davis

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference (Input - Response)	% Error of Full Span*
0-20% Max. Range 0 - 0.4	0.070	0.074	0.004	0.2
20-40% Max. Range 0.4 - 0.8	0.620	0.620	0.000	0.0
40-60% Max. Range 0.8 – 1.2	0.980	0.977	0.003	0.15
60-80% Max. Range 1.2 – 1.6	1.277	1.273	0.004	0.2
80-100% Max. Range 1.6 – 2.0	1.716	1.714	0.002	0.1

*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: 1/21/2019

Reviewed by: _____ Date: 2/25/2019

Temperature Calibration
EPA Method 28R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
Mobile	National Instruments Logger	00335, 00336

Reference Meter Equipment Number: 00373	Calibration Due Date: 8/02/17

Calibration Performed By:	Date:	Ambient Temperature:	Barometric Pressure:
B. Davis	1/21/19	67	30.38

Input Temperature (F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	Ø	1	Ø	1	Ø	Ø	Ø
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	1000	1000	1000	1000	1000	1000	1000

Input (F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	Ø	Ø	Ø	Ø	Ø	1	Ø	1	Ø
100	100	100	100	100	100	100	100	100	100
300	300	300	300	300	300	300	300	300	300
500	500	500	500	500	500	500	500	500	500
700	700	700	700	700	700	700	700	700	700
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Technician signature: _____ Date: 1/21/19

Reviewed By: _____ Date: 2/25/2019

Thermal Metering System Calibration
Y Factor

Manufacturer:	APEX
Model:	XC-60-EP
Serial Number:	606002
OMNI Tracking No.:	OMNI-00336
Calibrated Orifice:	☐ Yes

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

Calibration Date:	1/21/019	
Calibrated by:	B. Davis	
Calibration Frequency:	Six months	
Next Calibration Due:	7/21/2019	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.38	"Hg
Signature/Date:		1/17/2018

Previous Calibration Comparision

		Acceptable Deviation (5%)	Deviation
Date	1/17/2018		
y Factor	0.985	0.04925	0.010
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.005
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	14-Nov-18	
	Calib. Value	0.9981	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	1.94	1.20	0.80
Initial Reference Meter	6.1	13.7	19.402
Final Reference Meter	13.503	19.3	25
Initial DGM	0	0	0
Final DGM	7.525	5.699	5.746
Temp. Ref. Meter (°F), Tr	67.6	68.3	69.3
Temperature DGM (°F), Td	78.0	79.0	80.0
Time (min)	35.3	32.5	39.5
Net Volume Ref. Meter, Vr	7.403	5.600	5.598
Net Volume DGM, Vd	7.525	5.699	5.746
Gas Meter y Factor =	**0.997**	**0.998**	**0.990**
Gas Meter y Factor Deviation (from avg.)	0.002	0.003	0.005
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|

** 2. y = [Vr x (y factor (ref)) x (Pb + (Pr/ 13.6)) x (Td + 460)]/ [Vd x (Pb + (Pd / 13.6)) x (Tr + 460)]

** 3. dH@ = 0.0317 x Pd / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory

** Equations come from EPA Method 5

The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer

Maximum Range: 0-2" WC ID Number: OMNI-00336

Calibration Instrument: Digital Manometer ID Number: OMNI-00395

Date: 1/21/19 By: B. Davis

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference (Input - Response)	% Error of Full Span*
0-20% Max. Range 0 - 0.4	0.079	0.078	.001	0.05
20-40% Max. Range 0.4 - 0.8	0.762	0.766	.004	0.2
40-60% Max. Range 0.8 – 1.2	0.943	0.949	.006	0.3
60-80% Max. Range 1.2 – 1.6	1.435	1.440	.005	0.25
80-100% Max. Range 1.6 – 2.0	1.644	1.650	.006	0.3

*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: 1/21/2019

Reviewed by: _____ Date: 2/25/2019

Temperature Calibration
EPA Method 28R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
Mobile	National Instruments Logger	00335, 00336

Reference Meter Equipment Number: 00373	Calibration Due Date: 8/02/17

Calibration Performed By:	Date:	Ambient Temperature:	Barometric Pressure:
B. Davis	1/21/19	67	30.38

Input Temperature (F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	Ø	1	Ø	1	Ø	Ø	Ø
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	1000	1000	1000	1000	1000	1000	1000

Input (F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	Ø	Ø	Ø	Ø	Ø	1	Ø	1	Ø
100	100	100	100	100	100	100	100	100	100
300	300	300	300	300	300	300	300	300	300
500	500	500	500	500	500	500	500	500	500
700	700	700	700	700	700	700	700	700	700
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Technician signature: _____ Date: 1/21/19

Reviewed By: _____ Date: 2/25/2019

Certificate of Calibration

Certificate Number: **686722**

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: **180192**
Order Date: 10/22/2018
Authorized By: **N/A**

Property #: OMNI-00410
User: N/A
Department: N/A
Make: Dwyer
Model: 1430
Serial #: OMNI-00410
Description: Microtector
Procedure: DCN 500908
Accuracy: ±0.00025" WC

Calibrated on: 10/30/2018
*Recommended Due: 10/30/2019
Environment: 22 °C 44 % RH
* As Received: Limited
* As Returned: Limited
Action Taken: Calibrated
Technician: **111**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Previous limitation of micrometer head calibrated only continued. .001" reading micrometer head ±.001" (LSD) tolerance applied.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
541A	Select	E8FED2	Gage Block Set, 8pc	12/18/2018	663864

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	ᵏError	UUT	Uncertainty Accredited = ✓
Before/After							
Length							
	Inch	0.1300	0.129	0.131	0.001	0.129 Inch	1.1E-03 ✓
	Inch	0.3850	0.384	0.386	0.001	0.384 Inch	1.1E-03 ✓
	Inch	0.6150	0.614	0.616	0.001	0.614 Inch	1.1E-03 ✓
	Inch	0.8700	0.869	0.871	0.001	0.869 Inch	1.1E-03 ✓
	Inch	1.0000	0.999	1.001	0.001	0.999 Inch	1.1E-03 ✓

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 10/31/2018 Rev # 15

Inspector

ZRE NDIR/O_2

USER'S MANUAL

1312 West Grove Avenue
Orange, CA 92865-4134
Phone: 714-974-5560 Fax: 714-921-2531
www.gasanalyzers.com

Calibration Record

Vaneometer Air Velocity Meter OMNI-00559

Calibration Service Record			
Date	**By**	**Results**	**Date of next Calibration**
11/17/17	BR	Installed New Vane From Manufacturer	5/17/18
7/12/18	BR	Installed New Vane from Manufacturer	1/12/19
6/13/19	BR	Installed New Vane From Manufacture	6/15/19

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: 1/29/19 ~~1/29/19~~ BD Technician: B Davis

Time in desiccate: 0840 Recording time: 1415

NIST Standard Temperature: 70.2 °F NIST Standard Humidity: 14.6

Test Unit Temperature Reading: 69.9 °F Test Unit Humidity Reading: 12.1

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

Technician Signature: BD

Comments: A difference of 2.5% was found, with a full scale of 90% on the Instrument this gives a 2.77% deviation.

Certificate of Calibration

Certificate Number: **692254**

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

ACCREDITED
0723.01
Calibration

PO: **181203**
Order Date: **01/11/2019**
Authorized By: **N/A**

Property #: **OMNI-00637**
User: **N/A**
Department: **N/A**
Make: **Mettler Toledo**
Model: **MS104TS/00**
Serial #: **B729400181**
Description: **Analytical Scale, 120g**
Procedure: **DCN 500887**
Accuracy: **±0.0005g**

Calibrated on: **01/11/2019**
*Recommended Due: **07/11/2019**
Environment: **19** °C **43** % RH
* As Received: **Within 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
256A	Rice Lake	W0133K	Mass Set,	05/30/2019	660578

Measurement Data

Parameter / Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = ü
Force								
		g	10.00000	9.9995	10.0005	0.0000	10.0000 g	5.7E-04 ü
		g	30.00000	29.9995	30.0005	0.0000	30.0000 g	5.7E-04 ü
		g	60.00000	59.9995	60.0005	0.0002	59.9998 g	5.7E-04 ü
		g	90.00000	89.9995	90.0005	0.0001	89.9999 g	5.7E-04 ü
		g	120.00000	119.9995	120.0005	0.0002	119.9998 g	5.7E-04 ü

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 01/14/2019 Rev # 15

Inspector

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

ACCREDITED
A2LA Certificate No. 1750.01
Calibration

Cert. No.: 6530-9263396

Traceable® Certificate of Calibration for Digital Barometer

Manufactured for and distributed by : Control Company "Drawer 58307,Houston,TX,77258,USA"

Instrument Identification:

Model: 6530, S/N: 181062211 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Barometer	D4540001	09 Oct 2018	1000415948
Digital Thermometer	130070752	02 Mar 2018	4000-8360837
Chilled Mirror Hygrometer	44654/2H3737	02 Nov 2019	15478
Climate Chamber	W613.0046		

Certificate Information:

Technician: 57 Procedure: CAL-31 Cal Date: 26 Feb 2018 Cal Due Date: 26 Feb 2020

Test Conditions: 54.9%RH 22.83°C 1023mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
%RH	N.A.	N.A.		51.21	52	Y	49	55	0.74	>4:1
°C	N.A.	N.A.		24.55	24.3	Y	24.15	24.96	0.051	>4:1
mb/hPa	N.A.	N.A.		1010.30	1010	Y	1007	1015	0.62	>4:1
mb/hPa	N.A.	N.A.		806.75	806	Y	803	811	0.62	>4:1
mb/hPa	N.A.	N.A.		908.50	908	Y	905	913	0.62	>4:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) – Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

Nicol Rodriguez, Quality Manager

Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Barometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Barometer change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.control3.com

3.3 - Example Calculations

Equations and Sample Calculations – ASTM E2779 & E2515

Manufacturer:	Hearth & Home
Model:	P40i
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:

5.2 %
M_{Swb} = 31.9 lbs
M_{Ewb} = 15.4 lbs
0.4536 = Converstion factor from lbs to kg

M_{Bdb} = [(31.9 x 0.4536) - (15.4 x 0.4536)] (100/(100 + 5.15)

M_{Bdb} = **7.1** 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 = 5.2 %

M_{SSiwb} = 26.5 lbs

M_{ESiwb} = 21.9 lbs

0.4536 = Converstion factor from lbs to kg

M_{BSidb} = [(26.5 x 0.4536) - (21.9 x 0.4536)] (100/(100 + 5)

M_{BSidb} = **2** 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} = 7.12 kg

θ = 360 min

$$BR = \frac{60 \times 7.12}{360}$$

BR = **1.19** 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} = 1.98 kg

θ = 120 min

$$BR = \frac{60 \times 1.98}{120}$$

BR = **0.99** 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:

$$Fp = \frac{12.72}{13.47} = 0.944$$

$$V_s = 0.944 \times 85.49 \times 0.99 \times 0.205 \times \left(\frac{86.5 + 460}{\left(29.95 + \frac{-0.19}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **13.07** 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:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 13.07 \times 0.196 \times \frac{528}{86.5 + 460} \times \frac{29.9 + \frac{-0.19}{13.6}}{29.92}$$

Q_{sd} = **8732.4** 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:

$$V_{m(std)} = 17.64 \times 58.728 \times 1.022 \times \frac{\left(29.95 + \frac{1.37}{13.6}\right)}{(79.1 + 460)}$$

$V_{m(std)}$ = **59.013** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 58.504 \times 0.995 \times \frac{\left(29.95 + \frac{1.08}{13.6}\right)}{(79.3 + 460)}$$

$V_{m(std)}$ = **57.174** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{\left(\underline{29.95} + \frac{0.00}{13.6}\right)}{(68.4 + 460)}$$

$V_{m(std)}$ = **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 + 2.5 + 0.0

m_n = 2.5 mg

Using equation for Train 1 (remainder):

m_n = 0.3 + 5.9 + 0.3

m_n = 6.5 mg

Train 1 Aggregate = **9.0** mg

Using equation for Train 2:

m_n = 0.2 + 7.7 + 0.0

m_n = **7.9** 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:

$$C_s = 0.001 \times \frac{9.0}{59.01}$$

C_s = **0.00015** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{7.9}{57.17}$$

C_s = **0.00014** 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 = (0.000153 - 0.000000) x 8732.4 x 360 /60

E_T = 7.99 g

For Train 2

E_T = (0.000138 - 0.000000) x 8732.4 x 360 /60

E_T = 7.24 g

Average

E = 7.62 g

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

7.5% of the average =	0.57
Train 1 difference =	0.38
Train 2 difference =	0.38

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):

$$PR = \left(\frac{360 \times 0.156 \times 13.07 \times (100.0 + 460) \times (79.1 + 460)}{1 \times 58.73 \times 12.56 \times (86.5 + 460) \times (70.0 + 460)} \right) \times 100$$

PR = 104 %

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) = 7.62 g

θ = 360 min

$PM_R = 60$ x (7.62 / 360)

PM_R = **1.27** 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) = 7.62 g

M_{Bdb} = 7.12 kg

PM_F = 7.62 / 7.12)

PM_F = **1.07** g/kg

Appendix A – Labeling & Owner's Manual

MODEL / MODÈLE: "P40i PELLET INSERT"
Room Heater Pellet Fuel-Burning Type
SUITABLE FOR MOBILE-HOME INSTALLATION
This pellet burning appliance has been tested and listed for use in
Manufactured Homes In accordance with OAR 814-23-900 through 814-23-909

Test réalisés par OMNI-Test Laboratories, Inc.
Report #/Rapport# 0061PN103E / 0061PN103S
Tested to/Testé a: ASTM E 1509-04, ULC-S627-00, ASTM E 2515-11, ASTM E 2779-10

This pellet burning appliance has been tested and listed for use in

Manufactured Homes in accordance with OAR 814-23-900 through 814-23-909

"PREVENT HOUSE FIRES" Install and use only in accordance with the manufacturer's installation and operation instructions. Contact local building or fire officials about restrictions and inspection in your area.

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: FOR MANUFACTURED HOMES: Do not install appliance in a sleeping room. An outside combustion air inlet must be provided.

The structural integrity of the manufactured home floor,ceiling and walls must be maintained.

Refer to manufacturer's instructions and local codes for precautions required for passing chimney through a combustible wall or ceiling.

Inspect and clean exhaust venting system frequently in accordance with manufacturer's instructions.

Use a 3" or 4" diameter type "L" or "PL" venting system, or 4" stainless steel flex as per manual.

Do not connect this unit to a chimney flue servicing another appliance.

FOR USE WITH WOOD PELLET FUEL ONLY.

Input Rating Max: 4.11b. fuel/hr.

EPA Certified Emissions: 1.27 g/hr

US ElectricalRating: 115 VAC,60Hz, Start 4.2 AMPS, Run 2.8 AMPS

DANGER: Risk of electrical shock. Disconnect power supply before servicing.

For further instruction refer to owner's manual.

Replace glass only with 5mm ceramic available from your dealer.

OPERATE ONLY WITH DOORS CLOSED.

DANGER: Risque d'électrocution. Débrancher l'appareilavant toute intervention.

Pour une information plus complète, se reporter à la notice d'utilisation.

Ne remplacer la vitre qu'avec une vitre céramique 5 mm de même qualité disponible auprés de votre revendeur.

Tenir la porte frontale et le couvercle de trémie hermétiquement clos durant le fonctionnement de l'appareil.

Ce poêle à granules a été testé et homologué pour une utilisation dans

Maisons fabriqués conformément aux OAR 814-23-900 travers 814-23-909

"PRÉVENIR LES INCENDIES HOUSE" Installez et utilisez uniquement en conformité avec installation et d'utilisation les instructions du fabricant. Contactez local building ou d'incendie concernant les restrictions et l'inspection dans votre région.

Ce poêle à bois doit inspection périodique et la réparation 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: POUR maisons préfabriquées: Ne pas installer l'appareil dans une chambre à coucher. Une entrée d'air de combustion à l'extérieur doit être fournie.

L'intégrité structurale de la maison étage, plafond et murs fabriqués doit être maintenue.

Reportez-vous aux instructions du fabricant et les codes locaux pour les précautions nécessaires pour faire passer la cheminée à travers un mur ou un plafond combustible.

Inspectez et nettoyez système d'évacuation souvent en conformité avec les instructions du fabricant.

Utilisez un "ou 4" Type de diamètre «L» 3 ou le système de ventilation "PL", en acier ou 4 "flex inoxydable selon manuel.

Ne pas connecter cet appareil à un conduit de cheminée desservant un autre appareil.

POUR UTILISATION EN BOIS GRANULES SEULEMENT.

Entrée Max Note: 4.11b. carburant / h.

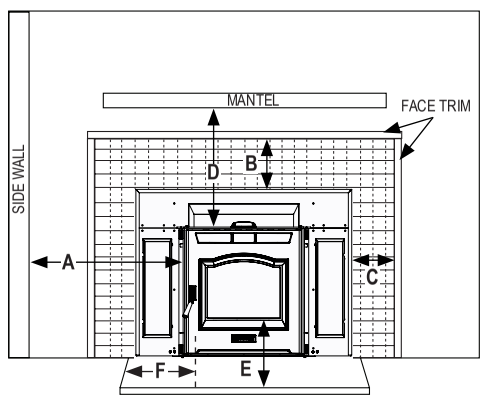
Émissions certifiés EPA: 1,27 g / h

US ElectricalRating: 115 VAC, 60Hz, Start 4,2 AMPS, Run 2,8 AMPS

P.N. 8390-040_R1

Serial No.
Nº de série: **HF**

BARCODE LABEL



MINIMUM CLEARANCES TO COMBUSTIBLE MATERIAL
ECARTS MINIMUM DE SÉCURITÉ

Location		Inches	Millimeters
A	Insert to combustible sidewall	13	330
B	Surround top to face trim	0	0
C	Surround side to face trim	1	25
D	Insert top to (max) 12" mantel	12	305

Non-combustible floor protector. La protection de sol doit être litre constituée de matériau incombustible

Location		Inches	Millimeters
E	Window opening to front	6	152
F	Window opening to side	6	152

CAUTION: HOT WHILE IN OPERATION.KEEP CHILDREN AND CLOTHING AWAY.CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS.KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROMTHIS APPLIANCE. KEEP HOPPER LID CLOSED DURING OPERATION.FAILURE TO DO SO MAY RESULT IN EMISSION OF PRODUCTS OF COMBUSTION FROMTHE HOPPER UNDER CERTAIN CONDITIONS.MAINTAIN HOPPER SEAL IN GOOD CONDITION. DO NOT OVERFILLTHE HOPPER.

DANGER: CHAUD- NE PAS TOUCHER.TENIR LES ENFANTS ET LES VENTEMENTS A I!ECART. RISQUE DE BRULURE.VOIR INSTRUCTIONSSUR LA PLAQUE. LAISSER UNE DISTANCESUFFISANTE ENTRE I!APPAREIL ET LES MEUBLES OU AUTRES OBJEST A RISQUE.N'UTILISER CET APPAREIL QUE LORSQUE LE COUVERCLE DE LA TREMIE EST BIEN FERME-IGNORER CETTE CONSIGNE PEUT ENTRAINER DES EMANATIONS DE PRODUITS ISSUS DE LA COMBUSTION ATRAVERS LATREMIE DANS CERTAINES CONDITIONS-VEILLER AU BON ETAT DUJOINT DE LATREMIE- NE PAS EXCEDER LA CAPACITE DE LA TREMIE.

DO NOT OBSTRUCT THE SPACE BENEATH THE HEATER.

MADE IN USA of US and Imported Parts
Fabriqué aux États-Unis-d'Amérique par des piéces d'origine américaine et pièces importées

DO NOT REMOVE THIS LABEL /NE PAS ENLEVER CETTE ÉTIQUETTE

HARMAN®

US ENVIRONMENTAL PROTECTION AGENCY
The P40i is Certified to comply with 2020 particulate emission standards.
La P40i est certifié conforme aux normes d'émission de particules de 2020.

Date of Manufacture / Date de fabrication:

2019	2020	2021	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Manufactured by / Fabriqué par: Hearth and Home Technologies 352 Mountain House Road, Halifax PA 17032

LABEL TICKET			
ECO:	90156	**LABEL SIZE:**	6" H x 17.75" W
PART # / REV:	8390-040	**ADHESIVE:**	3M 486 Adhesive
ORIGINATOR:	Spidlet	**MATERIAL:**	24 Gauge Aluminum
DATE:	02/15/19	**INK:**	Black Background
HARMAN® BUILT TO A STANDARD, NOT A PRICE	352 Mountain House Road Halifax, PA 17032	(2) Holes = Ø.3125 Hole location from left side edge - 7.375 / 10.375 Hole location from bottom edge - 1.528	

Owner's Manual

Care and Operation

INSTALLER: Leave this manual with party responsible for use and operation.
OWNER: Retain this manual for future reference.
Contact your local dealer with questions on installation, operation or service.

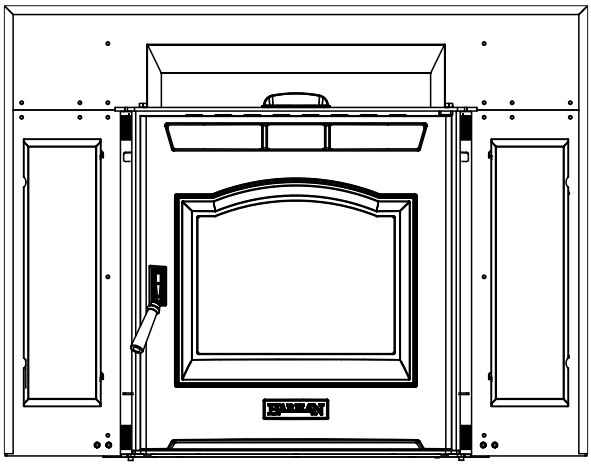
NOTICE: SAVE THESE INSTRUCTIONS

HARMAN®

BUILT TO A STANDARD, NOT A PRICE

Model(s):

P40i Pellet Insert



NATIONAL FIREPLACE INSTITUTE® A CERTIFICATION AGENCY

EM OMNI C US

Pellet Fuels Institute

⚠ CAUTION

Check building codes prior to installation.

- Installation MUST comply with local, regional, state and national codes and regulations.
- Contact local building or fire officials about restrictions and installation inspection requirements in your area.

⚠ CAUTION

Tested and approved for wood pellets only burning of any other type of fuel voids your warranty. When burning higher ash content pellets more frequent cleanings may be required.

⚠ WARNING

Please read this entire manual before installation and use of this pellet fuel-burning room heater.
Failure to follow these instructions could result in property damage, bodily injury or even death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do not overfire - If any external part starts to glow, you are overfiring. Reduce feed rate. Overfiring will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may cause house fire.

⚠ WARNING

HOT SURFACES!

Glass and other surfaces are hot during operation and cool down.

Hot glass will cause burns.

- Do not touch glass until it is cooled
- NEVER allow children to touch glass
- Keep children away
- CAREFULLY SUPERVISE children in same room as stove.
- Alert children and adults to hazards of high temperatures.

  High temperatures may ignite clothing or other flammable materials.
- Keep clothing, furniture, draperies and other flammable materials away.

NOTE

To obtain a French translation of this manual, please contact your dealer or visit www.harmanstoves.com

Pour obtenir une traduction française de ce manuel, s'il vous plaît contacter votre revendeur ou visitez www.harmanstoves.com

Table of Contents

➔ = Contains updated information

⚠ Safety Alert Key:

- ***DANGER!*** *Indicates a hazardous situation which, if not avoided* ***will*** *result in death or serious injury.*
- ***WARNING!*** *Indicates a hazardous situation which, if not avoided* ***could*** *result in death or serious injury.*
- ***CAUTION!*** *Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.*
- ***NOTICE:*** *Used to address practices not related to personal injury.*

A. Sample of Serial Number / Safety Label

Read this manual before operating this appliance.
Please retain this Owner's Manual for future reference.
Read the Installation Manual before making any installation or finishing changes.

Congratulations, The Harman® P40i pellet insert you have selected is designed to provide the utmost in safety, reliability, and efficiency.

As the owner of a new pellet stove, you'll want to read and carefully follow all of the instructions contained in this owner's manual. Pay special attention to all cautions and warnings.

This owner's manual should be retained for future reference. We suggest that you keep it with your other important documents and product manuals.

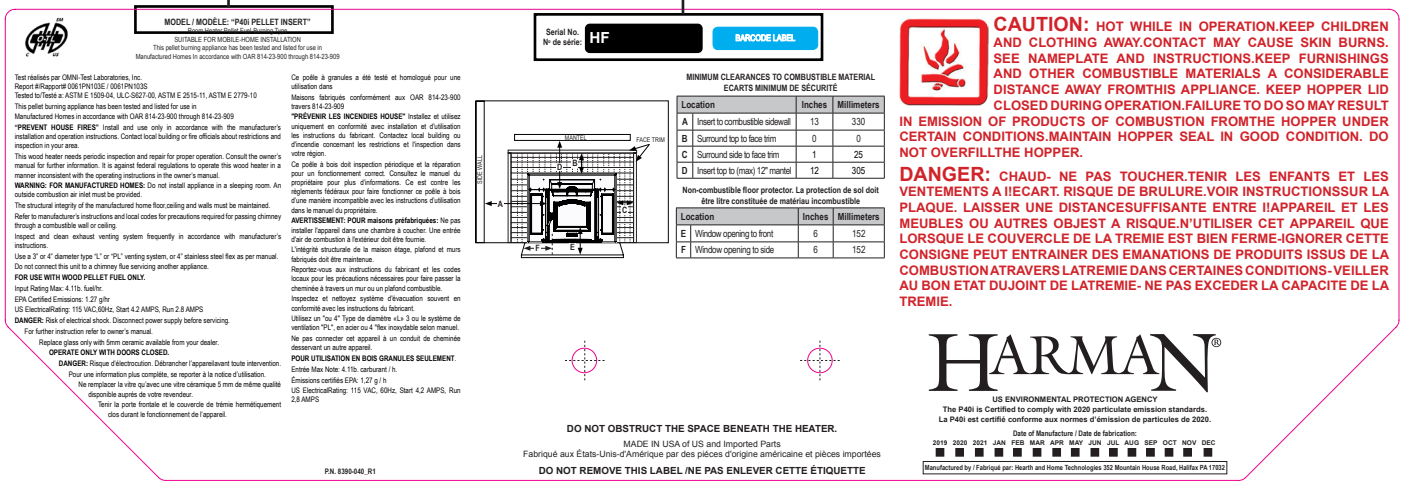
Your new Harman® P40i Pellet Insert will give you years of durable use and trouble-free enjoyment. Welcome to the Harman® family!

Listing Label Information/Location

The model information regarding your specific stove can be found on the rating plate usually located on the underside of the hopper lid.

Model Name

Serial Number



B. Limited Lifetime Warranty

Hearth & Home Technologies
LIMITED LIFETIME WARRANTY

Hearth & Home Technologies, on behalf of its hearth brands ("HHT"), extends the following warranty for HHT gas, wood, pellet and electric hearth appliances that are purchased from an HHT authorized dealer.

WARRANTY COVERAGE:

HHT warrants to the original owner of the HHT appliance at the site of installation, and to any transferee taking ownership of the appliance at the site of installation within two years following the date of original purchase, that the HHT appliance will be free from defects in materials and workmanship at the time of manufacture. After installation, if covered components manufactured by HHT are found to be defective in materials or workmanship during the applicable warranty period, HHT will, at its option, repair or replace the covered components. HHT, at its own discretion, may fully discharge all of its obligations under such warranties by replacing the product itself or refunding the verified purchase price of the product itself. The maximum amount recoverable under this warranty is limited to the purchase price of the product. This warranty is subject to conditions, exclusions and limitations as described below.

WARRANTY PERIOD:

Warranty coverage for consumers begins at the date of installation. In the case of new home construction, warranty coverage begins on the date of first occupancy of the dwelling or six months after the sale of the product by an independent, authorized HHT dealer/ distributor, whichever occurs earlier. However, the warranty shall commence no later than 24 months following the date of product shipment from HHT, regardless of the installation or occupancy date. The warranty period for parts and labor for covered components is produced in the following table.

The term "Limited Lifetime" in the table below is defined as: 20 years from the beginning date of warranty coverage for gas appliances, and 10 years from the beginning date of warranty coverage for wood and pellet appliances. These time periods reflect the minimum expected useful lives of the designated components under normal operating conditions.

Warranty Period		**HHT Manufactured Appliances and Venting**					
Parts	Labor	Gas	Pellet	Wood	Electric	Venting	Components Covered
1 Year		X	X	X	X	x	All parts and material except as covered by Conditions, Exclusions, and Limitations listed
2 years			**X**	**X**			Igniters, auger motors, electronic components, and glass
		X	**X**	**X**			Factory-installed blowers
				X			Molded refractory panels
		X					Ignition Modules
3 years			**X**				Firepots, burnpots, mechanical feeders/auger assemblies
5 years	1 year	**X**					Vent Free burners, Vent Free ceramic fiber logs, Aluminized Burners
			X	**X**			Castings and Baffles
6 years	3 years			**X**			Catalyst - limitations listed
7 years	3 years		**X**	**X**			Manifold tubes, HHT chimney and termination
10 years	1 year	**X**					Burners, logs and refractory
Limited Lifetime	3 years	**X**	**X**	**X**			Firebox and heat exchanger, Grate and Stainless Steel Burners, FlexBurn® System (engine, inner cover,access cover and fireback)
90 Days		**X**	**X**	**X**	**X**	**X**	All replacement parts beyond warranty period

WARRANTY CONDITIONS:

- This warranty only covers HHT appliances that are purchased through an HHT authorized dealer or distributor. A list of HHT authorized dealers is available on the HHT branded websites.
- This warranty is only valid while the HHT appliance remains at the site of original installation.
- This warranty is only valid in the country in which the HHT authorized dealer or distributor that sold the appliance resides.
- Contact your installing dealer for warranty service. If the installing dealer or distributor is unable to provide necessary parts, contact the nearest HHT authorized dealer or supplier. Additional service fees may apply if you are seeking warranty service from a dealer other than the dealer from whom you originally purchased the product.
- Check with your dealer in advance for any costs to you when arranging a warranty call. Travel and shipping charges for parts are not covered by this warranty.
- Limited Catalyst Warranty
    - o For wood burning products containing a catalyst, the catalyst will be warranted for a six-year period as follows: if the original catalyst or a replacement catalyst proves defective or ceases to maintain 70% of its particulate emission reduction activity (as measured by an approved testing procedure) within 36 months from the purchase date, the catalyst will be replaced for free.
    - o From 37 to 72 months a pro-rated credit will be allowed against a replacement catalyst and labor credit necessary to install the replacement catalyst. The proration rate is as follows:

Amount of Time Since Purchase	Credit Towards Replacement Cost
0 - 36 Months	100%
37 - 48 Months	30%
49 - 60 Months	20%
61 - 72 Months	10%

    - o Any replacement catalyst will be warranted under the terms of the catalyst warranty for the remaining term of the original warranty. The purchaser must provide the name, address, and telephone number of the location where the product is installed, proof of original purchase date, date of failure, and any relevant information regarding the failure of the catalyst.

WARRANTY EXCLUSIONS:

This warranty does not cover the following:

- Changes in surface finishes as a result of normal use. As a heating appliance, some changes in color of interior and exterior surface finishes may occur. This is not a flaw and is not covered under warranty.
- Damage to printed, plated, or enameled surfaces caused by fingerprints, accidents, misuse, scratches, melted items, or other external sources and residues left on the plated surfaces from the use of abrasive cleaners or polishes.
- Repair or replacement of parts that are subject to normal wear and tear during the warranty period are not covered. These parts include: paint, wood and pellet gaskets, firebricks, grates, flame guides, batteries and the discoloration of glass.
- Minor expansion, contraction, or movement of certain parts causing noise. These conditions are normal and complaints related to this noise are not covered by this warranty.
- Damages resulting from: (1) failure to install, operate, or maintain the appliance in accordance with the installation instructions, operating instructions, and listing agent identification label furnished with the appliance; (2) failure to install the appliance in accordance with local building codes; (3) shipping or improper handling; (4) improper operation, abuse, misuse, continued operation with damaged, corroded or failed components, accident, or improperly/incorrectly performed repairs (5) environmental conditions, inadequate ventilation, negative pressure, or drafting caused by tightly sealed constructions, insufficient make-up air supply, or handling devices such as exhaust fans or forced air furnaces or other such causes; (6) use of fuels other than those specified in the operation instructions; (7) installation or use of components not supplied with the appliance or any other components not expressly authorized and approved by HHT; (8) modification of the appliance not expressly authorized and approved by HHT in writing; and/or (9) interruptions or fluctuations of electrical power supply to the appliance.
- Non-HHT venting components, hearth connections or other accessories used in conjunction with the appliance.
- Any part of a pre-existing fireplace system in which an insert or a decorative gas appliance is installed.
- HHT's obligation under this warranty does not extend to the appliance's capability to heat the desired space. Information is provided to assist the consumer and the dealer in selecting the proper appliance for the application. Consideration must be given to the appliance location and configuration, environmental conditions, insulation and air tightness of the structure.

This warranty is void if:

- The appliance has been over-fired, operated in atmospheres contaminated by chlorine, fluorine, or other damaging chemicals. Over-firing can be identified by, but not limited to, warped plates or tubes, deformation/warping of interior cast iron structure or components, rust colored cast iron, bubbling, cracking and discoloration of steel or enamel finishes.
- The appliance is subjected to prolonged periods of dampness or condensation.
- There is any damage to the appliance or other components due to water or weather damage which is the result of, but not limited to, improper chimney or venting installation.

LIMITATIONS OF LIABILITY

- The owner's exclusive remedy and HHT's sole obligation under this warranty, under any other warranty, express or implied, or in contract, tort or otherwise, shall be limited to replacement, repair, or refund, as specified above. In no event will HHT be liable for any incidental or consequential damages caused by defects in the appliance. Some states do not allow exclusions or limitation of incidental or consequential damages, so these limitations may not apply to you. This warranty gives you specific rights; you may also have other rights, which vary from state to state. EXCEPT TO THE EXTENT PROVIDED BY LAW, HHT MAKES NO EXPRESS WARRANTIES OTHER THAN THE WARRANTY SPECIFIED HEREIN. THE DURATION OF ANY IMPLIED WARRANTY IS LIMITED TO DURATION OF THE EXPRESSED WARRANTY SPECIFIED ABOVE.

1 Product Specific and Important Safety Information

A. Appliance Certification

MODEL:	P40i Pellet Insert
LABORATORY:	OMNI Test Laboratories, Inc
REPORT NO.	0061PN103E / 0061PN103S
TYPE:	Pellet Fueled Insert/Supplementary For Residential Use
STANDARD(s):	ASTM E 2779-10, ASTM E 2515-11, ASTM E 1509-12, ULC-S628-93
ELECTRICAL RATING:	120 VAC, 60 Hz, Start 3.5 Amps, Run 2.5 Amps
GLASS SPECIFICATION:	5mm mirrored ceramic glass

The P40i Pellet Insert is certified to comply with 2020 EPA particulate emission standards.

NOTE: This installation must conform with local codes. In the absence of local codes you must comply with the ASTM E 1509-12, ULC-S628-93 **& (UM) 84-HUD**

B. Mobile Home Approved

This appliance is approved for mobile home installations when not installed in a sleeping room and when an outside combustion air inlet is provided.

The structural integrity of the mobile home floor, ceiling, and walls must be maintained. The appliance must be properly grounded to the frame of the mobile home and use only listed pellet vent, Class “PL” connector pipe.

A Harman® Outside Air Kit must be installed in a mobile home installation.

⚠ CAUTION

THE STRUCTURAL INTEGRITY OF THE MANUFACTURED HOME FLOOR, WALL, AND CEILING/ ROOF MUST BE MAINTAINED.

DO NOT INSTALL IN SLEEPING ROOM.

⚠ WARNING

Risk of Fire! *Hearth & Home Technologies disclaims any responsibility for, and the warranty and agency listing will be voided by the below actions.*

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.

C. BTU & Efficiency Specifications

EPA Certification Number:	
EPA Certified Emissions:	1.27%
***LHV Tested Efficiency:**	81.7%
****HHV Tested Efficiency:**	76.3%
*****EPA BTU Output:**	13,240 - 33,440
******BTU Input**	17,420 - 43,420
Vent Size:	4 Inch
Hopper Capacity:	64.5 lbs
Fuel	Wood Pellet

** Weighted average LHV efficiency using data collected during EPA emissions test.*

***Weighted average HHV efficiency using data collected during EPA emissions test.*

****A range of BTU outputs based on EPA Default Efficiency and the burn rates from the low and high EPA tests.*

*****Based on the maximum feed rate per hour multiplied by approximately 8600 BTU’s which is the average BTU’s from a pound of pellets.*

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.

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.

DO NOT:

- *Install or operate damaged appliance*
- *Modify appliance*
- *Install other than as instructed by Hearth & Home Technologies*
- *Operate the appliance without fully assembling all components*
- *Overfire*
- *Install any component not approved by Hearth & Home Technologies*
- *Install parts or components not Listed or approved.*
- *Disable safety switches*

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.

For assistance or additional information, consult a qualified installer, service agency or your dealer.

NOTE: Hearth & Home Technologies, manufacturer of this appliance, reserves the right to alter its products, their specifications and/or price without notice.

D. Appliance Safety

WARNING

If you expect that small children or vulnerable adults may come into contact with this appliance, the following precautions are recommended:

- Install a physical barrier such as:
  - A decorative fire screen.
  - Adjustable safety gate.
- Never leave children alone near a hot stove, whether operating or cooling down.
- Teach children to ***NEVER*** touch the stove.
- Consider not using the stove when children will be present.
- Use only specified components as replacement parts. Other components may not allow your stove to operate as it was intended.

Contact your dealer for more information, or visit: www.hpba.org/safety-information.

To prevent unintended operation when not using your stove for an extended period of time (summer months, vacations, trips, etc):

- Unplug stove from receptacle.

Due to high temperatures, this stove should be placed away from traffic, furniture and draperies.

Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burns to the skin and/or clothing.

Young children should be carefully supervised when they are in the same room as the stove.

Clothing and other flammable materials should not be placed on or near this stove.

Installation and repair of this stove should be done by a qualified service person. The appliance should be inspected before use and at least annually by a qualified service person. More frequent cleaning will be required. It is imperative that control compartments and circulating air passageways of this stove be kept clean.

Connect the power cord into a 120 VAC, 60 Hz grounded receptacle. (A surge protector is recommended to protect the circuit board.) Be sure the polarity of the outlet the stove is plugged into is correct.

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.

E. California

WARNING

This product and the fuels used to operate this product (wood), and the products of combustion of such fuels, can expose you to chemicals including carbon black, which is known to the State of California to cause cancer, and carbon monoxide, which is know to the State of California to cause birth defects or other reproductive harm. For more information go to: www.P65Warnings.ca.gov

F. Clear Space

WARNING

RISK OF FIRE! Do NOT place combustible objects in front or to the sides of the appliance. High temperatures may ignite clothing, furniture or draperies.

NOTICE: Clearances may only be reduced by means approved by the regulatory authority having jurisdiction.

WARNING

RISK OF FIRE! Keep combustible materials, gasoline and other flammable vapors and liquids clear of appliance.

- Do **NOT** store flammable materials in the appliance's vicinity.
- Do **NOT** use gasoline, lantern fuel, kerosene, charcoal lighter fluid or similar liquids to start or "freshen up" a fire in this heater.

Keep all such liquids well away from the heater while it is in use as combustible materials may ignite.

WARNING

MOBILE/MANUFACTURED HOME GUIDELINES: DO NOT ALLOW INSTALLATION IN A SLEEPING ROOM.

WARNING

USE OF IMPROPER FUELS, FIRESTARTERS OR ALTERING THE STOVE FOR HIGHER HEAT OUTPUT MAY CAUSE DAMAGE TO THE STOVE AND COULD RESULT IN A HOUSE FIRE. USE ONLY APPROVED FUELS AND OPERATION GUIDELINES

G. Helpful Hints

When operating your Harman® P40i Pellet Insert, follow basic safety standards. Read these instructions carefully before you attempt to operate the P40i Pellet Insert. Failure to do so may result in damage to property or personal injury and may void the product warranty.

Cleaning Burn Pot: Whenever your stove is not burning, take the opportunity to scrape the burn pot to remove carbon buildup. A vacuum cleaner is handy to remove the residue. Be sure the stove is cold if you use a vacuum.

Carbon buildup can be scraped loose with the fire burning using the special tool provided with your stove. Scrape the floor and sides of the burn pot. The carbon will be pushed out by the incoming fuel. Always wear gloves when scraping the burnpot.

Disposal of Ashes: Ashes should be placed in a steel container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible 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 cinders have thoroughly cooled. Other waste shall not be placed in this container.

Soot and Flyash Formation and Need for Removal: The products of combustion will contain small particles of flyash. The flyash will collect in the exhaust venting system and restrict the flow of the flue gases. Incomplete combustion, such as occurs during startup, shutdown, or incorrect operation of the room heater will lead to some soot formation which will collect in the exhaust venting system. The exhaust venting system should be inspected at least once every year to determine if cleaning is necessary.

When burning wood pellets on low, the potential exists for creosote to form. The venting system should be inspected periodically throughout the heating season to determine if creosote buildup has occurred. If a significant layer of creosote has accumulated (1/8" or more), it should be removed to reduce the risk of a chimney fire. If a fire occurs, call the fire department, shut down the stove, and evacuate the residence. Before using the appliance, have the venting system thoroughly inspected and replace any damaged components.

With any hearth appliance, installation of smoke detectors is recommended on every level of the home.

Possible causes of smoke detector activation:

Paint curing process - Open a window near the appliance for the first few hours of burning.

Exhaust being drawn back inside the dwelling - Outside air connection to the appliance is necessary.

Vent leakage - All interior seams and joints should be sealed with silicone where applicable. Follow vent manufacturers instructions for proper sealing.

⚠ CAUTION

This appliance must be vented to the outside

H. Fuel Specifications

The P40i Pellet Insert is approved for burning any grade of pelletized bio-mass fuel.

It should be noted, however, that higher ash content will require more frequent cleaning.

The moisture content of pellets must not exceed 8%. Higher moisture will rob BTU's and may not burn properly.

Fuel should **not** be stored within the stove installation clearances or within the space required for cleaning and ash removal.

Fuel and Fuel Storage

Pellet fuel quality can fluctuate from manufacturer to manufacturer, and even from bag to bag.

Hearth & Home Technologies recommends using only fuel that is certified by the Pellet Fuels Institute (PFI).

Fuel Material
- Made from sawdust and/or other wood by-products
- Source material typically determines ash content

Higher Ash Content Material
- Hardwoods with high mineral content
- Bark and leaves as source material
- "Standard" grade pellets and other biomass

Lower Ash Content Material
- Softwood; pine, fir, etc.
- Materials with lower mineral content
- "Premium" grade pellets

Performance
- Higher ash content requires more frequent maintenance.
- "Premium" grade pellets will produce the highest heat output.
- Burning pellets longer than 1-1/2 inches (38mm) can cause inconsistent feeding and/or ignition.

Clinkers
- Minerals and other non-combustible materials, like sand, will turn into a hard glass-like substance when heated.
- Trees from different areas will vary in mineral content. For this reason, some fuels will produce more clinkers than others.

Moisture
- Always burn dry fuel. Burning fuel with high moisture content takes energy to dry and tends to cool the appliance thus, robbing heat from your home.
- Damp pellet fuel could turn back into sawdust which does not flow properly through the feed system.

H. Fuel Specifications *(Cont.)*

Storage

- Wood pellets should be left in their original sealed bag until ready to use, to prevent moisture.
- Do not store fuel within the specified clearance areas, or in a location that will interfere with routine cleaning and maintenance procedures.

NOTICE

Hearth & Home Technologies is not responsible for stove performance or extra maintenance required as a result of using fuel with higher ash or mineral content.

⚠ CAUTION

Do not burn fuel that contains an additive.

- May cause hopper fire
- Damage to product may result

Read the list of ingredients on the packaging.

⚠ CAUTION

Odors and vapors released during initial operation.

- Curing of high temperature paint.
- Open windows for air circulation.

Odors may be irritating to sensitive individuals.

⚠ CAUTION

Tested and approved for use with wood pellets ONLY. Burning of any other fuel will void your warranty.

⚠ WARNING

BURNING COLORED PAPER, CARDBOARD, SOLVENTS, TRASH AND GARBAGE OR ALTERING THE STOVE FOR HIGHER HEAT OUTPUT MAY CAUSE DAMAGE TO THE STOVE AND COULD RESULT IN A HOUSE FIRE. USE ONLY APPROVED FUELS AND FOLLOW ONLY THESE OPERATION GUIDELINES.

⚠ WARNING

NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR 'FRESHEN UP' A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER, WHILE IN USE.

I. Frequently Asked Questions

With proper installation, operation, and maintenance your appliance will provide years of trouble-free service. If you do experience a problem, this troubleshooting guide will assist a qualified service person in the diagnosis of a problem and the corrective action to be taken.

Contact your dealer for additional information regarding operation and troubleshooting. Visit www.harmanstoves.com to find a dealer.

ISSUES	SOLUTIONS
Metallic noise.	Noise is caused by metal expanding and contracting as it heats up and cools down, similar to the sound produced by a furnace or heating duct. This noise does not affect the operation or longevity of your appliance.
White ash buildup on glass.	This is normal. Clean the glass using any non-abrasive glass cleaner.
Glass has buildup of black soot	Excessive build-up of ash. The lower burn settings will produce more ash, the higher burn settings produce less. The more it burns on low the more frequent cleaning of the glass is required.
Glass has turned dirty.	Excessive build up of ash. The lower burn settings will produce more ash, the higher burn settings produce less. The more it burns on low the more frequent cleaning of the glass is required.
Fire has tall flames with black tails and is lazy.	The feed rate needs to be reduced or the burnpot needs cleaning. Heat exchanger or exhaust blower needs cleaning.
Smoky start-up or puffs of smoke from the airwash.	Burnpot may be dirty, Clean the burnpot.
Large flame at start-up.	This is normal. Flame will settle down once the fire is established.
Missed Ignition	Ensure pellets in burnpot Ensure holes in burnpot are clear of obstructions above the igniter. See Burnpot Maintenance. Check to see if the ignitor is getting hot, if not replace ignitor. *See addendum for manual ignition instructions for emergency heating needs.

2 Operating Instructions

A. Fire Safety

You can never be too cautious when it comes to fire safety. Please give serious consideration to the following:

- Install at least one smoke detector and CO detector on each level of the home.
- Locate detectors away from the appliance and close to the sleeping quarters.
- Follow the manufacturer's guidelines on placement and installation as well as maintaining regularly.
- Place a Class A fire extinguisher nearby to contend with small fires.
- In the event of a fuel hopper fire:
  - Evacuate the house immediately.
  - Notify the Fire Department.

B. Fuel and Fuel Storage

Pellet fuel quality can fluctuate. This appliance is designed to burn a wide variety of pellet fuel, giving you the freedom to choose the most economical fuel in your area.

Hearth & Home Technologies strongly recommends that you choose a fuel that is recognized by the Pellet Fuels Institute (PFI).

Pellet fuels are made from sawdust, or other wood fibers. The source material determines the ash and heat content. Higher ash content fuel, or Standard Grade, may contain bark, leaves, stems, or other by-products. Higher ash may not mean more or less heat value, but it will require more maintenance and cleaning. Low ash content fuel, or Premium Grade, is made from only the cleanest sawdust. Cleaning and maintenance are greatly reduced while typically higher heat value is experienced.

APPROVED FUELS

- **Wood Pellets** - Any grade of wood or biomass pelletized fuel. Pellets should be either 1/4" or 5/16" (6 - 8mm) in diameter, and no more than 1-1/2" (38mm) in length.

⚠ WARNING

"NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR "FRESHEN UP " A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER WHILE IN USE".

⚠ WARNING

BURNING COLORED PAPER, CARDBOARD, SOLVENTS, TRASH AND GARBAGE OR ALTERING THE STOVE FOR HIGHER HEAT OUTPUT MAY CAUSE DAMAGE TO THE STOVE AND COULD RESULT IN A HOUSE FIRE. USE ONLY APPROVED FUELS AND FOLLOW ONLY THESE OPERATION GUIDELINES.

STORAGE

Fuel should be stored in a dry area, preferably indoors, and well away from the appliance clearance area.

⚠ CAUTION

Tested and approved for use with wood pellets ONLY. Burning of any other fuel will void your warranty.

NOTICE

Hearth & Home Technologies is not responsible for stove performance or extra maintenance required as a result of using fuel with higher ash or mineral content.

C. General Operating Information

The P40i's ESP control will maintain an output level to fit your temperature demands. There are two modes of operation; "Constant Burn" mode, where the control will maintain a specified constant temperature, regardless of the surrounding environment temperature conditions, Or "Room Temp" mode, where the control will adjust the rate of burn to meet a specified room temperature setting. You also have the choice of Automatic or Disabled ignition. Regardless of the mode selected, operation is controlled by both, exhaust temperature- being reported by the ESP (Exhaust Sensing Probe), and the microprocessor control board.

We'll discuss these control devices and their functions now.

ESP (Exhaust Sensing Probe)
The ESP is a tiny thermistor located in the exhaust stream, Figure 2.1. The probe changes it's thermal resistance based on minute changes in temperature, which is monitored by the control board and used to determine the need for changes in the burn rate to meet the temperature demand.

Control Board
As stated previously, the control board is a microprocessor, which means it has the ability to "think" and adjust itself based on both, reported temperatures and demand temperature. The control board will also flash a code sequence on the Status light if an error is detected.

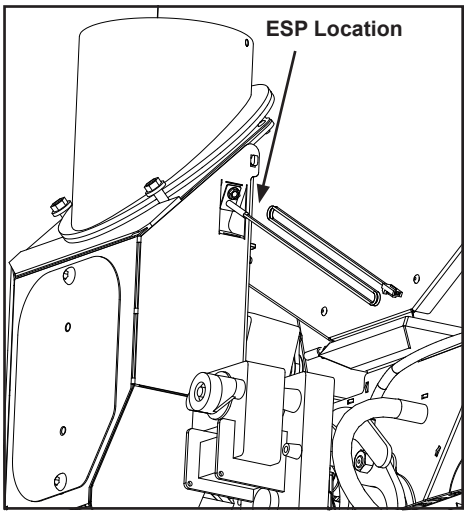
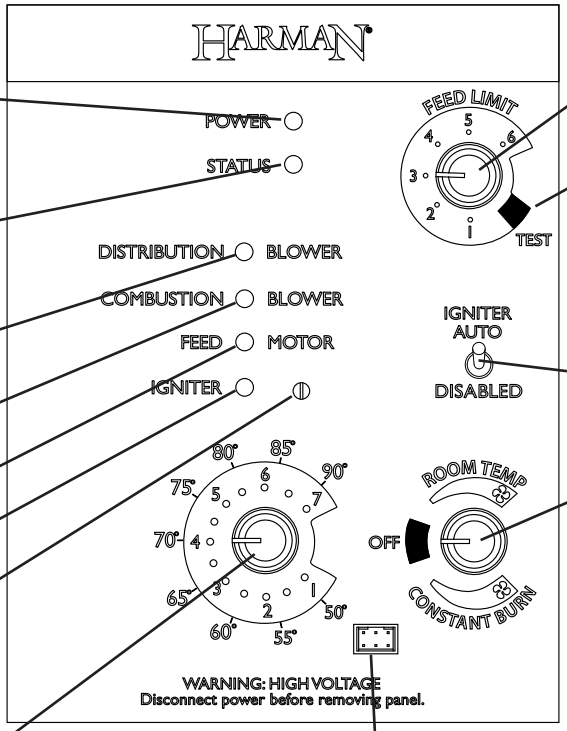


Figure 2.1



Power Light
Indicates power to the control.

Status Light
Will be lit in either "Constant Burn" or "Room Temp" mode when pointer is not within off position band except after normal shut down. Blinks to indicate errors detected. (See troubleshooting)

Indicates power to distribution blower.

Indicates power to combustion blower.

Indicates power to the feed motor.

Indicates power to the igniter.

Low Draft Adjustment Screw

Feed Limit
Sets the maximum feed rate.

Test
Runs all motors at full speed for one minute to check operation. Afterwards the combustion blower will remain on low burn voltage.

Igniter switch
Set to appropriate Start-Up mode.

Mode Selector
Allows you to choose between "Room Temp" Mode, "Constant Burn" Mode, or OFF. Also allows you to vary the distribution blower speed by turning the knob to the high or low side of each mode.
Distribution Blower speed adjustment range. L = low
H = high
Variable speed anywhere between L and H; although as the stove temperature goes up , so does the low end of the scale.

Temp dial
Allows you to adjust the room temperature in "Room Temp" Mode using the outer scale marked in degrees Fahrenheit. It also allows you to adjust the stove temperature while in "Constant Burn" Mode using the inner scale marked from 1 to 7.

Dealer Diagnostic Port
For dealer maintenance only. Requires special DDM monitor supplied to Harman® Dealers exclusively.

Feed Limit Adjustment
The Control board runs on a one minute timer cycle. Each minute, the board is thinking ahead to what it needs to do for the next minute to maintain or achieve the demanded temperature. What you are setting on the Feed Limit dial is the maximum amount of feed time, per minute, that you'll allow.

The control board will make its own determination of how long to run the feeder, **UP TO** the maximum, as set on the dial. For instance, a number 4 setting on the Feed Limit will allow a maximum of 40 seconds per minute of feed. If the room temperature is satisfied, with only feeding 20 seconds, then that is all the control board will run the feeder. When heating a large area, the number 4 setting is usually adequate, however, fuel quality may dictate a higher or lower setting. If you see unburned or burning fuel being pushed off of the grate during a high demand period, the feed rate is set too high. Ideally, you'll want to see about an inch of ashes in front of the burning fuel during a peak demand period. When the appliance is located in a smaller room or area, the Feed Limit may need to be kept at a lower setting of #2 or #3, to maintain a fire with less frequent shut-down and ignition cycles. Always allow a minimum of fifteen minutes between making any adjustments to the feed rate.

Note: Since the control board is feeding as needed, only adjust the feed rate while maximum demand is occurring. (Constant Burn Mode, with a temp dial setting of #7 will create maximum demand.)

Mode Selection
Room-Temp mode is the ideal mode of operation if you wish to maintain a comfortable temperature in the room. As the outdoor temperature fluctuates, the control will adjust the feed rate to maintain the desired temperature setting in the room. For best results, be sure the room sensor is located away from drafty areas and not positioned on the floor or near an exterior wall.

Constant Burn mode is more of a manual method of operation. The stove will run at a constant heat output, regardless of surrounding air temperature. Note that on the coldest days, your indoor heated space will be cooler than on the warmer days. The only real benefit to this mode of operation is that you'll be able to know exactly how long a hopper full of fuel will last, because the consumption is going to stay relatively the same.

Temperature Dial
The temperature dial is a dual purpose dial. In Room-Temp mode, you select the room temperature you want the stove to maintain at the room sensor probe. This is marked in Fahrenheit scale from 50 to 90 degrees. In Constant Burn mode, you select a temperature setting based on the #1 - 7 with 1 being a minimum burn and 7 being a maximum burn rate.

Blower Speed Adjustment
The mode selector is also marked with a L to H scale in each mode. This is a variable speed control for the distribution blower. **L** is the low setting, and **H** is the high setting. It is important to note that the blower will not come on until the ESP reaches a specific temperature, to ensure that cold air is not being blown out into the room. Also, the speed of the blower, when set on lower speeds, will automatically increase as the temperature of the stove increases.

Igniter Auto Mode Switch
The toggle switch for the igniter is a two position switch. Select from either Igniter Auto or Disabled.

Igniter Auto - Will automatically start the fire in either Constant Burn or Room Temp mode.

Constant Burn: The ignition mode will start the fire one time only. Since Constant Burn maintains a constant output, the fire will never go out to need re-ignited.

Room Temp: The ignition mode will start the first fire. Then, if the room temperature is satisfied, the fire will go out. Once the room cools, the ignition mode will start another fire, and so on. This mode provides fully automatic temperature control.

Disabled - The fire must be started manually using starting gel or other manufactured fire starter.

Disabled - With the igniter switch in the MANUAL position, the igniter is disabled.

Constant Burn: The fire would need to be started manually, and will maintain a constant output based on the temperature setting.

Room Temp: The fire would need to be started manually. The control will adjust output to maintain a constant room temperature, however it will not allow the fire to go out. If the room temperature is satisfied, the control will adjust to the minimum burn rate and hold there until the room temperature decreases.

D. Before Your First Fire

- Be sure the appliance is installed properly and that all safety requirements have been met. Pay particular attention to the clearances to combustibles, floor protection and the venting instructions.
- Test your smoke detector(s) and CO detector(s) to the specifications of the manufacturer.
- Double check that the ash pan and internal firebox are empty.
- Be sure to read this entire manual.

E. Draft Test Procedure

- Open left hand side panel and locate draft access port just below control board, figure 2.2.
- Remove the tube cap from the silicone tubing and Insert the draft meter hose into the draft tube.
- Be sure the meter is capable of a scale between 0 and 1 inch Water Column. Zero the meter if necessary, and be sure it is set up to read in negative pressure.
- Be sure the ash pan, door, and hopper lid are all closed and latched.
- Turn the Feed Limit dial to "Test" mode.
- During the first minute of test, the combustion blower will be on high. Record the high draft reading here _____-W.C. The high draft should be above -0.5" W.C. but no higher than -1" W.C.
- After a minute, the combustion blower will go to low speed. Here you want to see a reading between -0.30" and -0.35". If necessary, adjust the draft voltage using the low draft adjustment screw on the control board (See Page 24). Clockwise will increase the draft and counter-clockwise will decrease it.
- Once set, record the low draft reading here:_____ -W.C.
- Be sure and turn off of "Test" mode. Disconnect the draft meter and return the tube cap onto the draft tube.

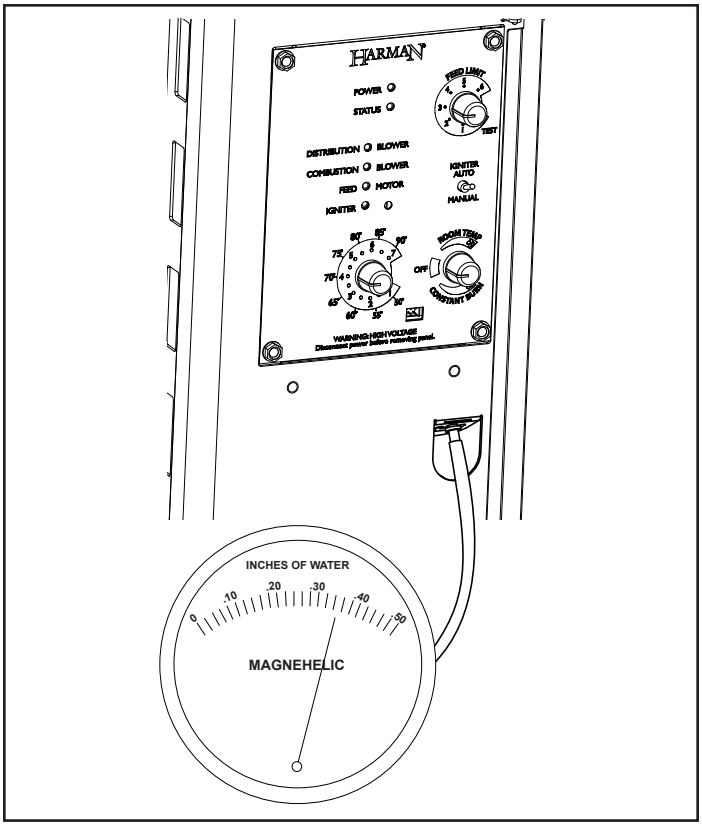


Figure 2.2

WARNING

TESTED AND APPROVED FOR USE WITH WOOD PELLETS ONLY. USE OF ANY OTHER TYPE OF FUEL WILL VOID THE APPLIANCE WARRANTY.

WARNING

"NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR "FRESHEN UP " A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER WHILE IN USE".

The optimal method of operation is in Room Temp mode, with the Ignition switch set to Automatic.

F. Starting a Fire - "AUTOMATIC"

1. With the mode selector in the "Off" position, and the Feed Limit **NOT** on "Test", plug the power cord into a properly grounded receptacle.
2. Fill the hopper with DRY fuel.
3. Turn the Feed Limit dial to "Test". This will run the feed motor for one minute. If you begin to see fuel entering the burn pot, you can stop the test cycle. Return to #4 or #5 to start out.
4. Position the Igniter switch to Igniter Auto.
5. Turn the mode selector dial to the desired mode. This will start the combustion blower, feeder, and igniter operating. **If Room Temp is selected, be sure to turn the temperature dial above the current room temperature.**
6. After the initial feed cycle is typically when you'll begin to see sparks, smoke, or flames.

Keep Hopper Lid, Ash Pan, and Fire viewing doors closed while in operation. Maintain all door seals and gaskets in good condition. Replace gaskets when necessary using parts obtained through your Harman® dealer.

G. Maintaining the Fire

Once the Distribution Blower begins operation, your fire is well established. Now, you can make any desired adjustments to the temperature dial. Remember, in Constant Burn, the temperature dial uses the inner portion of the scale (#1 thru 7). In Room Temp, select the desired temperature in Fahrenheit from 50° to 90°.

The flames should appear brisk and bright. If you see deep orange and lazy flames, it is usually an indication that the burn pot needs to be cleaned. Refer to the Maintenance Section of this manual.

WARNING! RISK OF FIRE! Keep combustible materials, gasoline, and other flammable vapors or liquids clear of this appliance.

- Do **NOT** store flammable materials in the vicinity of this appliance.
- DO NOT BURN COLORED PAPER, CARDBOARD, SOLVENTS, TRASH, GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPTHA OR ENGINE OIL.
- DO NOT USE CHEMICALS OR FLUIDS TO START A FIRE.

Keep all such liquids well away from the heater while it is in use, combustible materials may ignite!

H. Shut-Down

During operation in Room Temp / Igniter Auto mode, the appliance will shut down naturally when demand is met or exceeded. In other modes of operation, the unit will shut-down only if or when it runs out of fuel.

To kill or stop a fire, turn the mode selector dial to "OFF". The shut down cycle will slow or stop the feeder to gradually cool the fire and ensure that all of the exhaust gases are safely expelled before stopping the combustion blower. This not only ensures removal of all smoke and gases, it also keeps the fire from attempting to travel into the fuel storage hopper. For this reason; Hearth & Home Technologies recommends installing a battery back-up in areas where frequent power outages are experienced.

NEVER ATTEMPT TO EXTINGUISH A FIRE BY PULLING THE PLUG OR OTHERWISE DISCONNECTING THE ELECTRICITY SUPPLY.

The best way to extinguish a fire, especially at the end of the heating season, is to simply allow it to run out of fuel.

3 Maintenance & Service

When properly maintained, your stove will give you many years of trouble-free service. **Contact your dealer** to answer questions regarding proper operation, trouble-shooting and service for your appliance. Visit www.harmanstoves.com to find a dealer. We recommend annual service by a qualified service technician.

A. Proper Shutdown Procedure

⚠ CAUTION

Shock and Smoke Hazard

- Turn unit to the off position, let appliance completely cool and combustion fan must be off. Now you can unplug appliance before servicing.
- Smoke spillage into room can occur if appliance is not cool before unplugging.
- Risk of shock if appliance not unplugged before servicing appliance.

Follow the detailed instructions found in this section for each step listed in the chart below.

NOTICE

The type of fuel you are burning will dictate how often you have to clean your burnpot. Clean more frequently if you encounter heavy build-up of ash at the recommended interval or you see soot coming from the vent. **Not properly cleaning your appliance on a regular basis will void your warranty.**

Note: Do not use a household vacuum to clean the stove. We recommend that you use a shop vacuum that is equipped with a fine dust filter called a HEPA filter or a vacuum specially made for fly ash and soot. USING A VACUUM WHICH IS NOT EQUIPPED WITH A FINE DUST FILTER WILL BLOW FLY ASH AND SOOT OUT INTO THE ROOM.

NOTE: THE STOVE MUST BE COMPLETELY OUT BEFORE YOU VACUUM THE STOVE. LIVE PELLET EMBERS, IF SUCKED INTO THE VACUUM, WILL LIGHT THE VACUUM ON FIRE AND MAY ULTIMATELY CAUSE A HOUSE FIRE.

B. Quick Reference Maintenance Chart

Frequency	Cleaning Procedure	Safety Measures	Tips
Daily	Scrape Burn pot	Wear flame resistant gloves[3]	Vigorous, strong scraping specifically near neck of burn pot. Scrape every time you add pellets or at least every 3 bags of fuel.[2]
Weekly	Empty Ash Pan	Wear protective gloves.[1] Put ashes into a steel non-combustible container with tight fitting lid outside.	Unit does not need to be turned off. Reduce to low burn during removal.
	Clean the Glass	Stove must be turned off and cold.	
Monthly	Scrape & Vacuum Heat Exchanger	Stove must be turned off and cold.	Use provided scraper. Scrape back and sides of firebox.
	Brush & vacuum the distribution fan	Stove must be turned off, cold and unplugged from power supply.	Use provided paint brush. This should be done approximately every 25 bags.[2]
	Inspect Hopper lid gasket for damage		Replace gasketing if frays, tears or other visible damage to gasket. This should be done approximately every 50 bags.[2]
	Clean Igniter	Stove must be turned off, cold and unplugged from power supply. Wear protective gloves.[1] Put ashes into a steel non-combustible container with tight fitting lid outside.	Use provided paint brush. Vacuum loose ash from around igniter and inside burn pot.
Stove MUST be turned off, cold and unplugged from power supply for Yearly Cleaning.			
Yearly[4]	Brush & vacuum the combustion fan and venting/exhaust path	Wear protective gloves.[1] Put ashes into a steel non-combustible container with tight fitting lid outside.	Use provided paint brush to brush fan blades. *Use flue brush to clean venting being careful not to damage the ESP.[2]
	Inspect door gasket		Replace gasketing if frays, tears or other visible damage to gasket.
	Brush & vacuum venting system	Wear protective gloves.[1] Put ashes into a steel non-combustible container with tight fitting lid outside.	

* A flue brush of appropriate size and length may need to be purchased for proper maintenance.

1. Protective gloves will help prevent skin abrasion while working on steel surfaces.
2. Frequency of cleaning depends largely on fuel type. Lower quality pellets require most frequent cleaning.
3. Flame resistant gloves will help protect your skin from potential contact with heat or flames.
4. Yearly cleaning is also known as a Total Clean. This requires completing all the Daily, Weekly, Monthly and Yearly maintenance mentioned. This should be done before you begin burning the unit each heating season.

C. Unit Maintenance

Daily/Weekly Maintenance: It is recommend that the burn pot be scraped whenever adding fuel; taking the opportunity to clean the burn pot will insure proper daily operation.

Scraping the Burn Pot-

- Using flame resistant gloves, vigorously scrape the top holed surface and sides of the burn pot down to auger tube, be sure to concentrate in the neck of the burnpot. Figure 2.1.
- Scrape loosened material over edge of burnpot grate into the ashpan.
- If needed, empty the ash pan while adding fuel and after scraping the burn pot.

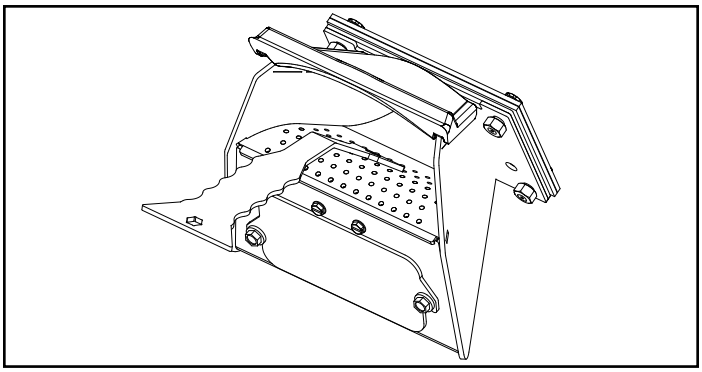


Figure 2.1

Monthly Maintenance: It is recommend that the unit be shut down and unplugged from any power source for a monthly cleaning. Monthly cleanings will insure proper operation of your unit throughout the heating season.

- Cleaning Glass - Once unit is cold, use a non-abrasive glass cleaner on glass and wipe clean.
- Scrape and Vacuum Heat Exchanger.

Cleaning the Heat Exchanger-
Clean the heat exchanger with scraper as shown in Figure 2.2. Brush or scrape the inside of the stove to remove fly ash. Remove the ash pan and dispose of ashes in an approved manner, according to local codes.

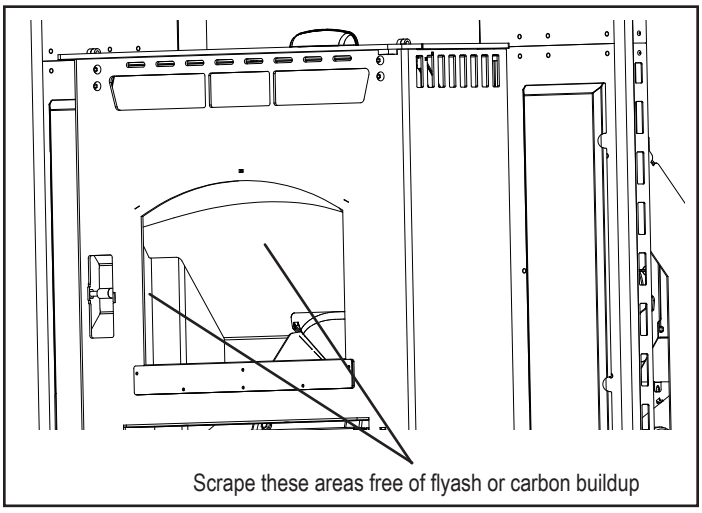


Figure 2.2

Cleaning the Burn Pot-

- Vigorously scrape the top holed surface and sides of the burn pot down to auger tube, as suggested in the Daily/ Weekly Maintenance Section.
- Use the supplied allen wrench to remove any build-up that may have accumulated in the holes of the burn pot grate. Simply push the allen wrench down through each hole ensuring it is clear of any build-up paying attention not to damage the igniter element in the process. Figure 2.3.

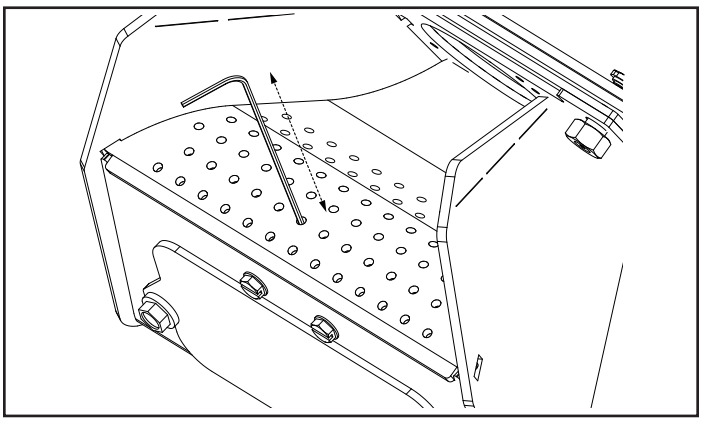


Figure 2.3

DANGER

Disconnect the power to the unit before removing cover.

- Loosen (2) 1/4-20 Flange Bolts and pull up on cover and remove to gain access to igniter element and cradle. Figure 2.4.
- Using the brush supplied, brush the igniter element free of any ash or debris. Figure 2.4.

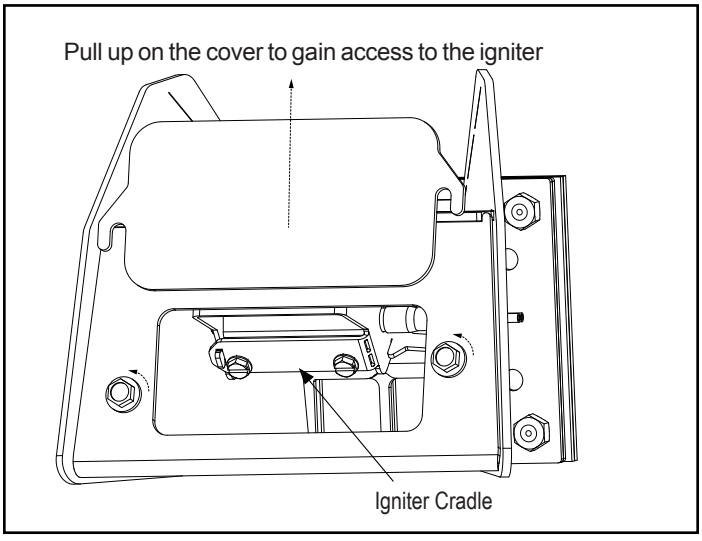


Figure 2.4 - Viewed from below through the ash pan opening.

The burnpot grate can be removed if needed. Figure 2.5.

- Remove the flame Enhancer by pulling straight up removing tabs from burn pot sides.
- Remove the (2) 1/2” allen head bolts from each side of the burn pot.
- Slide the grate toward you to remove.

NOTE: the grate **does not** need to be removed to properly clean the igniter. This part is removable for part(s) replacement only.

NOTE: The grate must be installed fully to the rear of the burnpot and the rear edge should be in contact with the front face of the burnpot flange before tightening the bolts.

Cleaning Igniter Bracket-

Check cleanliness of the igniter and inner burnpot. If the igniter has ash buildup it must be removed to insure proper ignition. Use the provided brush to remove ash buildup from in and around the igniter. Once ash is loose vacuum around igniter and at the base of burn pot.

⚠ WARNING

Use caution when cleaning burn pot clean-out chamber. Do not damage the high temperature igniter wires.

Yearly Maintenance: Cleaning Heat Exchanger & Exhaust

- **Frequency:** Monthly or after each ton of fuel is burned.
- **By:** User

It is recommended that you use a vacuum that is designed for ash, as ashes may block conventional vacuum filters.

NOTICE: For optimal performance of your pellet burning appliance, you must perform regular cleaning and maintenance as directed in this manual. Not doing so will result in:

- Poor performance
- Smoke spillage into the room
- Overheating of components

Failure to perform regular cleaning on your pellet burning appliance will void the warranty.

a. Make sure the fire is out and cool. Disconnect power cord prior to servicing.

b. Scrape the majority of ashes into the ash pan. Begin with the back and roof above the burn pot.

c. Scrape the ashes from both sides, into the ash pan.

d. Remove the ash pan. Dispose of the ashes in a metal container with a tight fitting lid.

e. Brush or vacuum the remaining ash from the firebox.

f. Guide the vacuum hose upward into the exhaust passage in the right rear corner of the firebox, Figure 2.5.

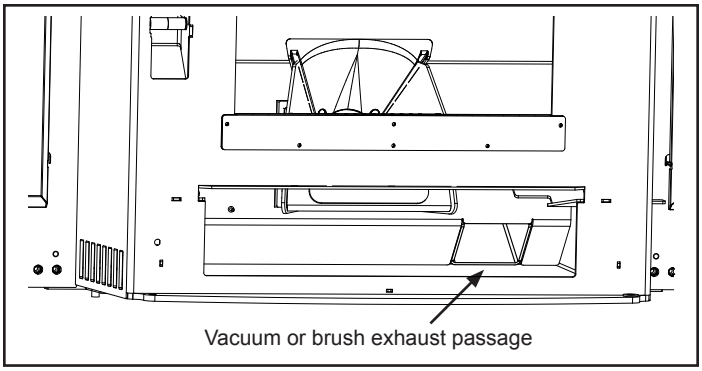


Figure 2.5

g. You can now return the ashpan.

h. Using the T-Handle allen wrench supplied with the unit, loosen allen bolts and slide unit from frame (Figure 2.6) onto the hearth or onto the service rail kit, if purchased.

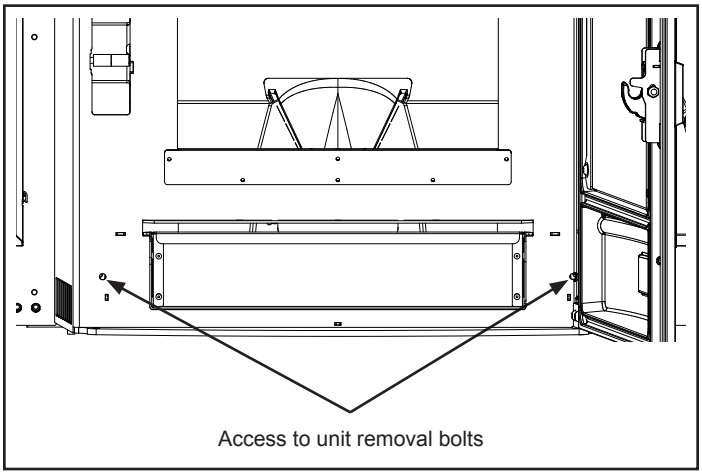


Figure 2.6

i. Slide unit back into the mounting frame to within an 1/8” of the surround face. Insert the T-Handle allen wrench through the holes in the front of the unit and push bolt inward until you see it align with the tightening nut located on the mounting frame. While pushing inward tighten bolt, Figure 2.7.

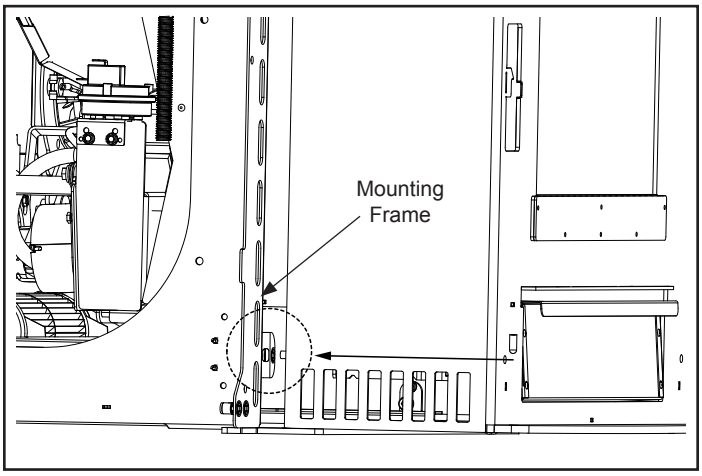


Figure 2.7 - Align bolt with tightening nut.

j. Remove the exhaust chamber access cover on the right rear of the insert, Figure 2.8

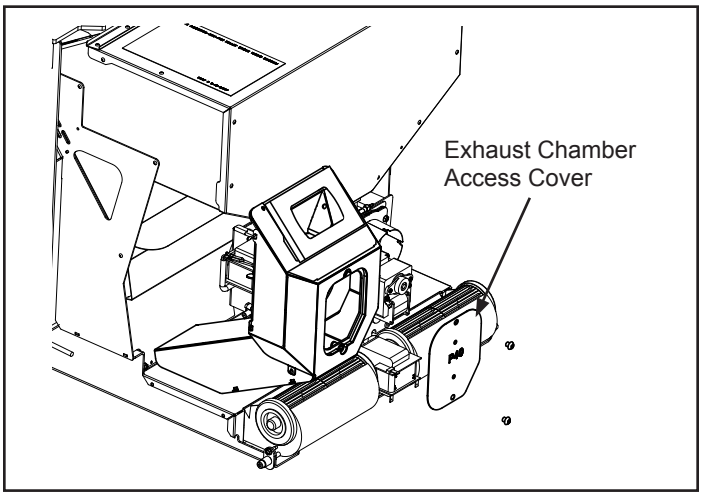


Figure 2.8

k. With this cover removed, you can vacuum the paddle fan and the inside of the chamber. Be careful not to bend the blades on the paddle fan.

l. Before re-installing the access cover, make sure the insulation between the two layers is in tact, Figure 2.9.

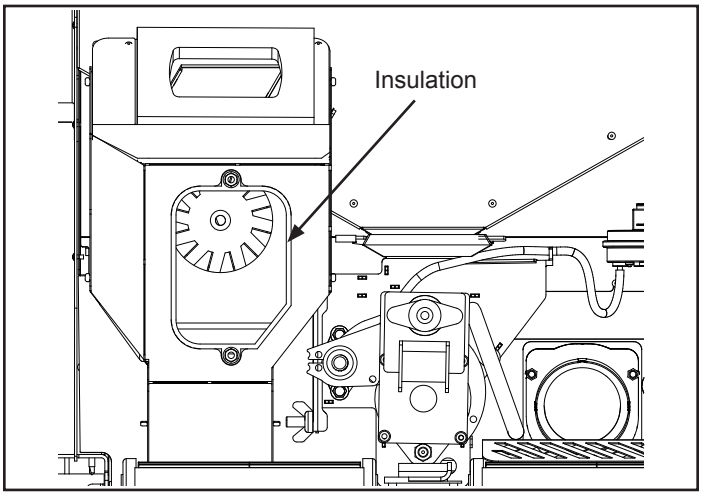


Figure 2.9

6. Inspect / Clean Hopper

- **Frequency:** Whenever run to empty
- **By:** User

Whenever the hopper is empty, inspect and remove any large amounts of sawdust or fines. Although this finer material will mostly feed through with the fuel, large quantities of sawdust may restrict feeder flow.

7. Cleaning the Door Glass

- **Frequency:** As needed / Weekly
- **By:** User

Whenever the view of the fire is obstructed, or weekly, clean the glass using a soft cloth dampened with standard household glass cleaner.

Never spray glass cleaner directly onto hot glass. Apply the cleaner to the cloth then wipe the glass.

Inspect the glass and sealing gasket. Replace gasket as needed. Do not operate the stove with a broken glass. Replacement glass, which is mirrored ceramic glass, should be obtained through your Harman® dealer.

To replace a broken glass; first be sure to carefully remove the broken glass and any remaining shards or pieces. With the door laying on a flat surface, lay the gasketed glass panel onto the door and be sure it is properly fitted into the channel. Lay the glass retainer clips in place near each corner, and secure them using the 1/4-20 button head screws. Be sure to tighten each screw equally so you don't create a pressure point on the glass.

NEVER OPERATE THIS APPLIANCE WITH THE GLASS DOOR REMOVED, CRACKED, BROKEN, OR SCRATCHED.

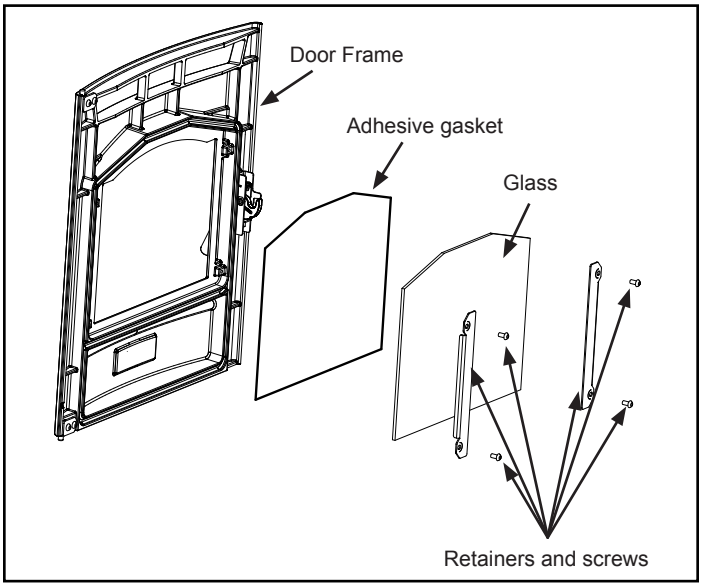


Figure 2.10

⚠ CAUTION

Handle glass with care.

When cleaning door glass;

- Avoid striking, scratching, or slamming glass.
- Do NOT Clean Glass When Hot.
- Do NOT use abrasive cleaners.
- Inspect gasket, replace if necessary.

3 Reference Material

A. Service Parts

HARMAN®
BUILT TO A STANDARD, NOT A PRICE

Service Parts — **Accentra52i-TC**

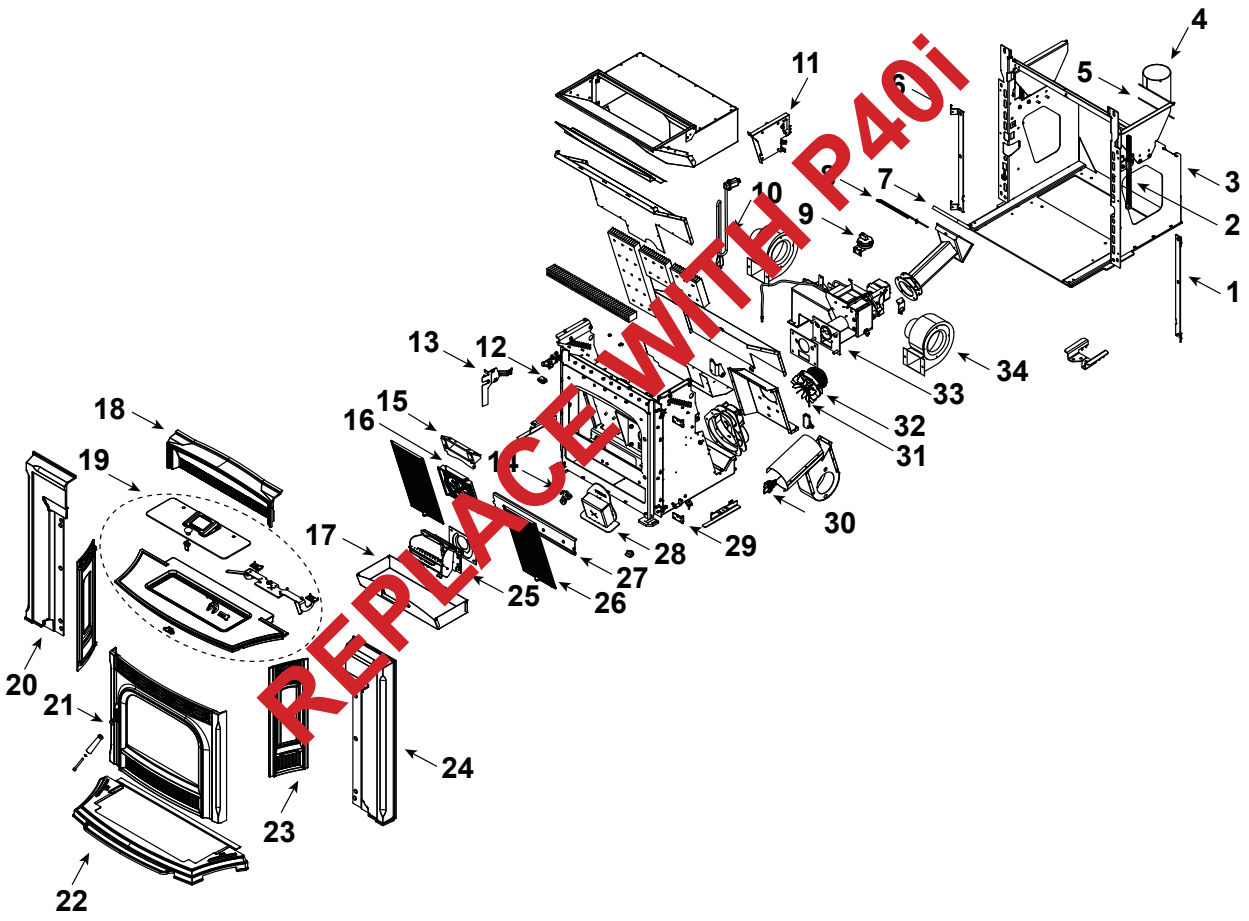
Pellet Insert

Beginning Manufacturing Date: July 2017
Ending Manufacturing Date:

20" Hopper:
1-90-584200-1 (Black)
1-90-584200-14 (Majolica Brown)

22" Hopper:
1-90-584220-1 (Black)
1-90-584220-14 (Majolica Brown)

24" Hopper:
1-90-584240-1 (Black)
1-90-584240-14 (Majolica Brown)



Part number list on following page.

01/19

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

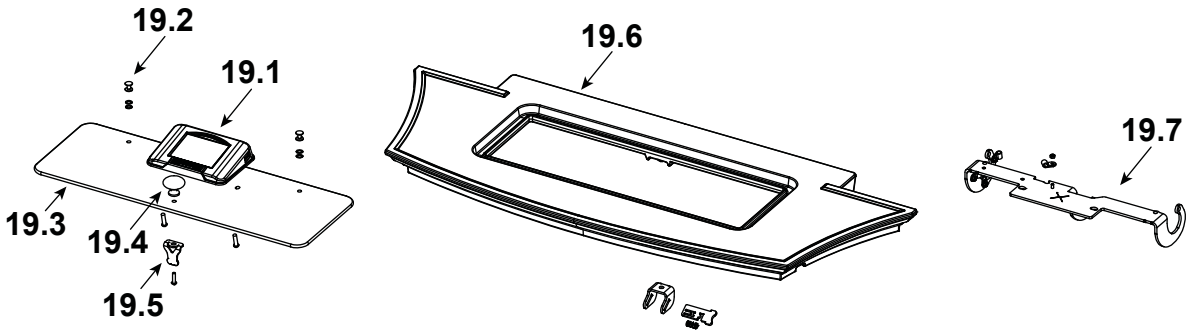
ITEM	Description	COMMENTS	PART NUMBER	Stocked at Depot
1	Cast Side Hinge	Right & Left	1-00-574075	
2	All Thread .500-13 x 12, Frame Jacking	Qty 2 req	3-31-00949	
	Jack Plate	Qty 2 req	1-10-574099W	
3	Mounting Frame Assembly		1-10-584031A	
	Roller hardware	4 sets	1-00-02243	**Y**
4	Pipe Stub for 4 in. Flex/PL w/gasket		1-00-574034	**Y**
5	Pipe Stub Plate Gasket		3-44-574045	**Y**
6	Cast Side Hinge	Right & Left	1-00-574075	
7	Docking Gasket Silicone		3-44-06108	**Y**
8	Thermister Probe (ESP Probe)		3-20-00844	**Y**
9	Differential Switch		3-20-6866	**Y**
	Silicone Tubing, 1/8”	5 Ft	1-00-5113574	**Y**
10	Power Cord - 14’		3-20-584024	**Y**
	Line Filter		3-20-803744	**Y**
11	Control Board Mounting Plate		1-10-584012A	
	Control Board		1-00-05372	**Y**
	Gasket, Hopper Top	20 ft	1-00-375501	**Y**
	Gasket, Hopper Throat		3-44-677185	**Y**
12	Wiring Harness		3-20-08727	**Y**
13	Line Filter Mounting Bracket		1-00-584034	
14	Combustion Cover Latch Assembly		1-00-574080	
15	Medallion Holder		1-10-574098W	**Y**
16	Cast Center Medallion		3-00-584027	**Y**
17	Ash Pan		1-10-574007A	**Y**
18	Cast Wing Center	Black Paint	4-00-574323P	**Y**
		Majolica Brown	1-10-574323-14	**Y**
19	Cast Top / Hopper Lid Assembly		**See following page**	
20	Cast Wing Left	Black Paint	4-00-574321P	**Y**
		Majolica Brown	1-10-574321-14	**Y**
21	Door Assembly		**See following page**	
22	Cast Bottom Ashlip	Black Paint	3-00-574318P	
		Majolica Brown	1-10-574318-14	
	Magnetic Latch Assembly w/3/16” Hole	2 Sets	1-00-08288	
23	Cast Side Panel, Qty 2 req	Black Paint	4-00-674054P	
		Majolica Brown	1-10-574054-14	
24	Cast Wing Right	Black Paint	4-00-574322P	**Y**
		Majolica Brown	1-10-574322-14	**Y**
25	Burn Pot Weldment		**See following page**	

Additional service parts on following page.

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

ITEM	Description	COMMENTS	PART NUMBER	Stocked at Depot
26	Cast Heat Exchanger CVR	Qty 2 req	3-00-674050	**Y**
27	Cleanout Plate Assembly		1-00-574086	
	Cleanout Plate Gasket	12 Ft	1-00-10050	**Y**
28	Combustion Cover		1-10-574087A	
29	Hinge Plate	Qty 2 req	3-00-674047	
30	Spring Latches with hardware	Set of 2	1-00-00927	**Y**
31	Fan Blade	Commonly required for Combustion Blower replacement	1-10-574500A	**Y**
	Blower Mounting Screws (5 Sets)		1-00-832150	
32	Combustion Blower		1-00-02275	**Y**
33	Feeder Assembly		**See following page**	
34	Distribution Blower	Qty 2 req	3-21-33647	**Y**

#19 Hopper Lid Assembly



19.1	Touch Control		1-00-777552	**Y**
	Cable Cover Gasket	Post HF2084013	3-44-777549	
19.2	Screw Post Kit	Set of 20	1-00-129004	**Y**
19.3	Touch Control Hopper Lid Glass		3-40-574365	**Y**
19.4	Hopper Lid Knob w/Screw	Black	1-00-02000-1	
19.5	Hopper Lid Latch		1-00-0669697	**Y**
19.6	Cast Top	Black Paint	4-00-584020P	
		Majolica Brown	1-00-584020-14	
19.7	Hopper Lid Hinge w/Hardware		1-00-584003	**Y**
	Gasket, 3/8 x 1/2	20 Ft	1-00-375501	**Y**
	Ball Plunger Retainer	6 Sets	1-00-5500	**Y**
	Hinge Pin Plate w/Hardware	1 Set	1-00-777560	
	Dowel Pin, 1/4 x 3/4	Pkg of 15	3-30-2015-15	
	Hopper Lid Latch Release Kit w/Hardware		1-00-584345	**Y**

Additional service parts on following page.

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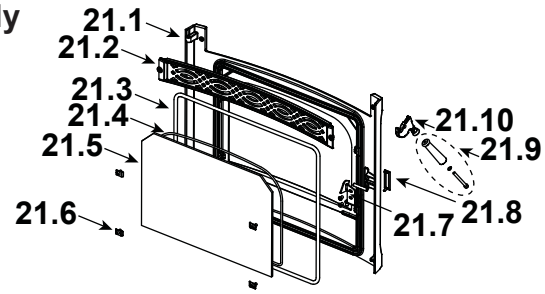
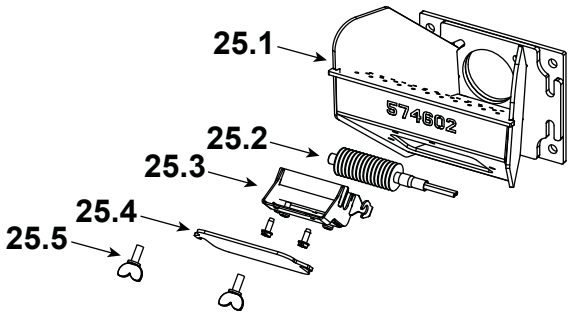
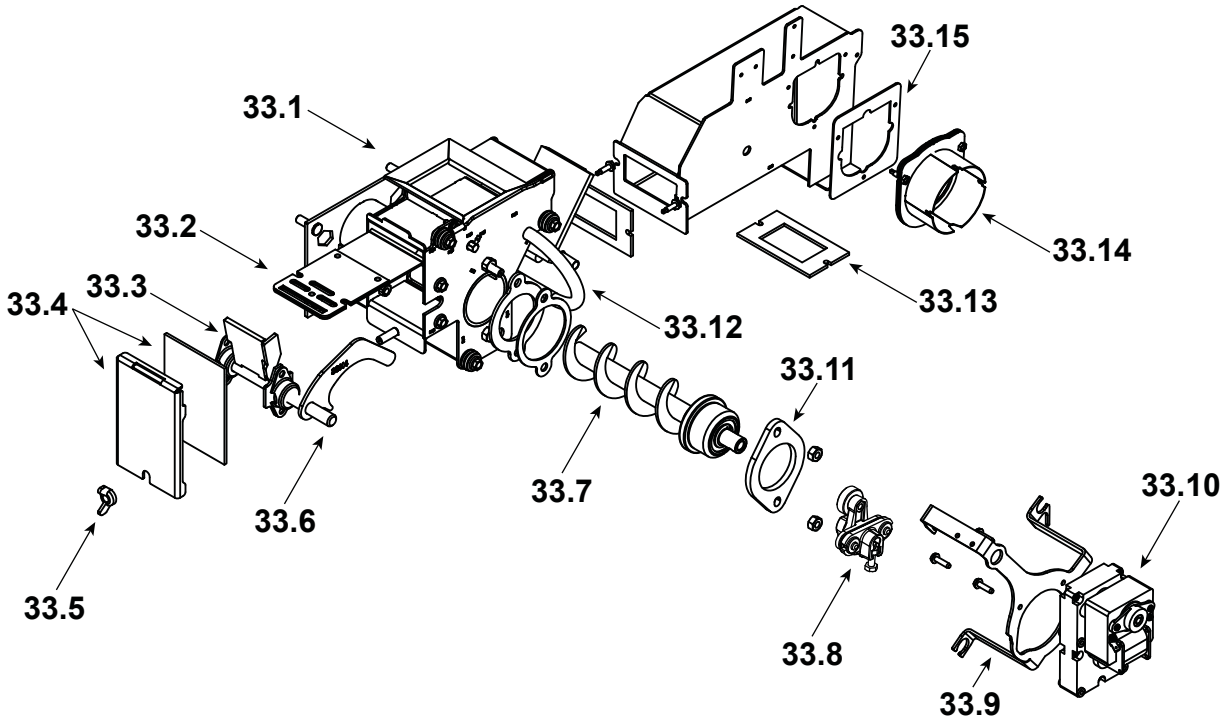
ITEM	Description	COMMENTS	PART NUMBER	Stocked at Depot
#21 Load Door Assembly 				
21.1	Door Assembly	Black Paint	4-00-674053A	**Y**
		Majolica Brown	4-00-674053-14A	**Y**
21.2	Air Grill		3-00-674052S	**Y**
21.3	Gasket, 3/8 4 Strand	30 Ft	1-00-00888	**Y**
21.4	Gasket, 3/16 Round w/PSA	10 FT	1-00-1186258229	**Y**
21.5	Glass w/Gasket		1-00-677000	**Y**
21.6	Glass Clips	Pkg of 4	1-00-249140	**Y**
21.7	Latch Retainer		2-00-674098S	
21.8	Latch Trim Plate (Enamel Only)		2-00-674206P	
21.9	Wooden Handle w/Bolt	Pkg of 2	1-00-00247	
21.10	Door Latch, Painted		3-00-249119P	**Y**
	Door Latch Roller Hardware		1-00-05230	**Y**
#25 Burn Pot Weldment 				
25.1	Burn Pot Weldment w/Cradle		1-00-574605	**Y**
25.2	Igniter Element		3-20-677200	**Y**
		Pkg of 10	1-00-677200	**Y**
25.3	Igniter Cradle		1-00-777907	**Y**
25.4	Burn Pot Cleanout Cover w/Wing Screws	2 sets	1-00-06623	**Y**
25.5	Thumb Screw, 1/4-20 x 5/8	Pkg of 10	3-31-782108-10	**Y**
	Gasket, Burn Pot		3-44-237639	**Y**
	Flame Guide		3-00-03000	**Y**

Additional service parts on following page.

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

#33 Feeder Assembly



ITEM	Description	COMMENTS	PART NUMBER	Stocked at Depot
33.1	Ultra Feeder Weldment		1-10-680021W	Y
33.2	Slide Plate Assembly		1-10-677121A	Y
33.3	Pusher Arm Pillow Block	Pkg of 4	3-31-3614087-4	Y
33.4	Gasket, UL Feeder Cover		1-00-677122	Y
33.5	5/16-18 wing screw	Pkg of 25	3-30-8012-25	
33.6	UL Feeder Pusher Arm		1-10-677187W	Y
33.7	UL Feeder Auger Assembly		3-50-00565	Y
33.8	Cam Block Assembly		1-10-777950A	Y
	Cam Bearing		3-31-3014	Y
33.9	Motor Mount w/Hardware		1-00-584035	Y
33.10	Pellet Feeder Gear Motor, 4 RPM		3-20-60906	Y
33.11	Bearing Flange w/Hardware		1-00-04035	Y
33.12	Feeder Air Crossover Kit		1-00-67900	Y
	9MM Silicone Tube	5 Ft	1-00-511427	Y
33.13	Gasket Ultra Air Intake	Pkg of 10	3-44-677160-10	Y
33.14	Pellet Air Intake Assembly		1-10-06810A	
33.15	Gasket Feeder Air Intake	Pkg of 6	3-44-72224-6	Y

Additional service parts on following page.

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

ITEM	Description	COMMENTS	PART NUMBER	Stocked at Depot
	Burn Pot Scraper	Pkg of 10	2-00-777692-10	
	Communication Cable		3-20-72662	Y
	Draft Meter Assembly		1-00-00637	Y
	Draft Meter Bolt & Tube		1-00-04004	
	Fuse, Ceramic 5A	Pkg of 5	1-00-05237	Y
	Labels, Caution & Danger	10 Ea	1-00-200408541	
	Manual Pack	Black	SRV1-00-00584BK	
		Majolica Brown	SRV1-00-00584MH	
	Return Air Sensor		3-20-08780	Y
	Room/Return Sensor Extension	14 FT	3-20-584023	
	Touch Up Paint. Black	12 oz Can	3-42-19905	
	Touch Up Paint	Majolica Brown	1-00-0014	
	Wiring Harness		3-20-08888	Y

B. Loss of Power

Minimizing Smoke During Loss of Power Using Battery Back-up

Harman® strongly recommends installing battery back-up to minimize entry of smoke into the room in the event of power loss.

Your pellet/biomass burning appliance relies on a combustion blower to remove exhaust. A power failure will cause the combustion blower to stop. This may lead to exhaust seeping into the room. Vertical rise in the venting may provide natural draft. It is, however, no guarantee against leakage.

There is one Harman® approved UPS option for your appliance:

Uninterruptible Power Supply UPS battery back-ups are available online or at computer and office equipment stores. Your Harman® appliance with Rev E or later software available beginning in November 2010 may be plugged directly into a Harman® approved UPS:

- **TrippLite model INTERNET750U** is tested and approved. Other brands or models may not be compatible.

When power is lost, a fully charged UPS will power a safe, combustion blower only shut-down. Your appliance will pulse the blower every few seconds to clear exhaust until the fire is out. **NOTE: The UPS provides safe shut-down only. It is not intended for continued operation.**

- A Inverter/Charger connects to a 12 volt deep cycle battery that will run your appliance for up to eight (8) hours. It includes a trickle charge feature that keeps your battery charged when power is available. **NOTE:** If the power is out for longer than battery life, smoke leakage may still occur unless your stove has been safely shut down.

For an approved Inverter/Charger refer to www.harmanstoves.com.

Your appliance will recognize when power is restored. What happens depends on ESP temperature and whether it is equipped with automatic ignition:

- **In "Automatic" Mode**, units equipped with automatic ignition will respond to the set point and ESP temperature and resume normal operation.
- **In "Idle" Mode**, or for units without automatic ignition:
  - If the ESP is cool, the appliance will remain shut down.
  - If the fire is out and the ESP is still warm, the feeder may restart. Since the fire is out, the ESP temperature will not rise. The unit will then shut-down, and may flash a six-blink status error. (See ESP error codes)
  - If the fire is still burning, it will resume normal operation.

Contact your dealer if you have questions about UPS compatibility with your appliance.

⚠ WARNING

Use only Harman® approved battery back-up devices. Other products may not operate properly, can create unsafe conditions or damage your appliance.

⚠ CAUTION

Always keep appliance doors and hopper lid closed and latched during operation and during power failures to minimize risk of smoke or burn-back.

C. Emergency Manual Ignition

Harman® pellet stoves and inserts should be lit using the automatic ignition system. This is the safest and most reliable way for igniting the unit. In the event the automatic igniter is not functioning, the steps below may be followed to manually light the stove or insert in the "Constant Burn" mode. Manual lighting is for emergency purposes only, and the igniter should be repaired or replaced as soon as practical.

⚠ WARNING

Only use firestarter commercially marketed for pellet stoves and inserts, including wax coated wood chips, pellet starter gel and pellet igniter blocks. Use of any other type of firestarter is prohibited.

To avoid serious injury or death read and follow manufacturer's warning and instructions for use of firestarter. Use of firestarter is only permitted when performing a cold start.

Never attempt to manually light a stove or insert that has been operated recently and is not at room temperature. If automatic ignition was attempted, be sure to give the stove or insert at least 30 minutes or longer to cool to room temperature.

Be sure that the stove or insert is in the "Igniter - Disabled" mode of operation.

Once all the precautions have been taken, follow these steps:

1. Turn the Mode Selector to "OFF".
2. Fill burn pot with pellets, only half way. (Do Not Over Fill).
3. Add firestarter to pellets following manufacturer's instructions.
4. Light pellet gel with a match, and close the door, turn Mode Selector to Constant Burn. Operation will begin when the fire reaches the proper temperature.

D. Troubleshooting

With proper installation, operation, and maintenance, your appliance will provide years of trouble-free service. If you do experience a problem, this troubleshooting guide will assist a qualified service person in proper diagnosis and repair. This guide is intended for qualified service technician use only.

Error Message	Possible Cause	Corrective Action
2-Blinks; Open feed control	Pressure switch, Hopper switch	Check doors / Check connections / Replace pressure switch or Hopper Switch
3-Blinks; Poor ESP Signal	Broken, Wire or connection	Check connection / Replace Probe
	Exhaust temperature has gone out of range multiple times.	Clean exhaust - possible soot or creosote accumulation near ESP.
4-Blinks; Poor room sensor signal	Broken Sensor, wire or connection	Check connections / Replace sensor
5-Blinks; Failed ignition	No fuel in hopper	Add fuel
	Door, hopper lid, or ash pan open	Close all doors and check seals
	Poor draft / weak combustion blower	Perform draft test, clean exhaust, replace blower if necessary.
	Fuel feed restriction	Check operation in "Test" mode. Clear obstruction
	Blocked airflow / Ignition failure	Open burn pot cleanout to access igniter - clean Check igniter, replace if necessary
6-Blinks; Poor combustion	No fuel in hopper	Add fuel
	Door, hopper lid, or ash pan open	Close all doors and check seals
	Poor draft / weak combustion blower	Perform draft test, clean exhaust, replace blower if necessary
	Fuel feed restriction	Check operation in "Test" mode, Clear obstruction
Symptom	**Possible Cause**	**Corrective Action**
Low volume or no fuel feed	No fuel in hopper	Add fuel
	Door, hopper lid, or ash pan open	Close all doors and check seals
	Poor draft / weak combustion blower	Perform draft test, clean exhaust, replace blower if necessary
	Fuel feed restriction	Check operation in "Test" mode, Clear obstruction
	Failed feed motor	Replace motor if necessary
No Distribution Blower	Fire isn't hot enough for blower operation	Increase temperature setting
	Disabled / Constant Burn	When operating in Disabled / Constant Burn Mod, the blower will not run below a #3 setting on the temperature dial. Increase temperature setting
	Failed motor or connection- "Test" mode	Check connections / Replace blower
Low heat output, or room temperature doesn't match thermometer or other readings	Feed Limit too low	Set Feed Limit at #4 or higher
	Room sensor location different than thermometer location	Room sensor reports the room air temperature to the control board. Move sensor location or adjust set pint accordingly.
	Excessive ash buildup on heat exchanger or in the exhaust	Clean exhaust, firebox and heat exchanger thoroughly

E. Contact Information

HARMAN®
a brand of
Hearth & Home Technologies
352 Mountain House Road, Halifax, PA 17032
www.harmanstoves.com

Please contact your Harman® dealer with any questions or concerns.
For the location of your nearest Harman® dealer,
please visit www.harmanstoves.com.

- NOTES -

NOTICE

DO NOT DISCARD THIS MANUAL

- Important operating and maintenance instructions included.
- Read, understand and follow these instructions for safe installation and operation.
- Leave this manual with party responsible for use and operation.

Printed in U.S.A.

Installation Manual

Installation and Appliance Setup

INSTALLER: Leave this manual with party responsible for use and operation.
OWNER: Retain this manual for future reference.

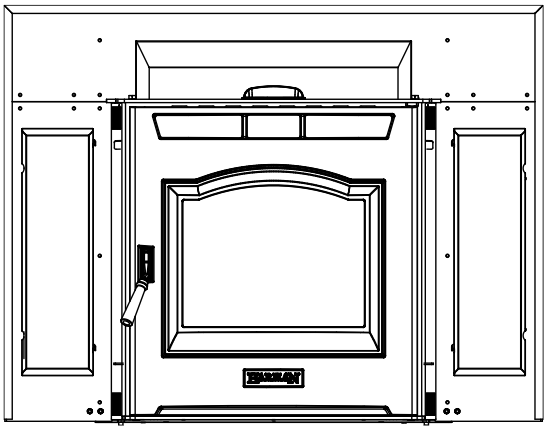
NOTICE: SAVE THESE INSTRUCTIONS

HARMAN®

BUILT TO A STANDARD, NOT A PRICE

Model(s):

P40i Pellet Insert



EPA EMISSIONS COMPLIANT

Pellet Fuels Institute

NFI NATIONAL FIREPLACE INSTITUTE A CERTIFICATION AGENCY

⚠ CAUTION

Check building codes prior to installation.

- Installation MUST comply with local, regional, state and national codes and regulations.
- Contact local building or fire officials about restrictions and installation inspection requirements in your area.

⚠ CAUTION

Tested and approved for wood pellets only burning of any other type of fuel voids your warranty. When burning higher ash content pellets more frequent cleanings may be required.

⚠ WARNING

Please read this entire manual before installation and use of this pellet fuel-burning room heater.
Failure to follow these instructions could result in property damage, bodily injury or even death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do not overfire - If any external part starts to glow, you are overfiring. Reduce feed rate. Overfiring will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may cause house fire.

⚠ WARNING

HOT SURFACES!

Glass and other surfaces are hot during operation and cool down.

Hot glass will cause burns.

- Do not touch glass until it is cooled
- NEVER allow children to touch glass
- Keep children away
- CAREFULLY SUPERVISE children in same room as stove.
- Alert children and adults to hazards of high temperatures.

  High temperatures may ignite clothing or other flammable materials.
- Keep clothing, furniture, draperies and other flammable materials away.

NOTE

To obtain a French translation of this manual, please contact your dealer or visit www.harmanstoves.com

Pour obtenir une traduction française de ce manuel, s'il vous plaît contacter votre revendeur ou visitez www.harmanstoves.com

⚠ Safety Alert Key:

- ***DANGER!*** Indicates a hazardous situation which, if not avoided will result in death or serious injury.
- ***WARNING!*** Indicates a hazardous situation which, if not avoided could result in death or serious injury.
- ***CAUTION!*** Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- ***NOTICE:*** Indicates practices which may cause damage to the stove or to property.

TABLE OF CONTENTS

➔ = Contains updated information

Installation Standard Work Checklist

ATTENTION INSTALLER:

Follow this Standard Work Checklist

This standard work checklist is to be used by the installer in conjunction with, not instead of, the instructions contained in this installation manual.

Customer: _____
Lot/Address: _____
_____
Model: _____

Date Installed: _____
Location of Stove: _____
Installer: _____
Dealer/Distributer Ph # _____
Serial Number: _____

> ***WARNING! Risk of Fire or Explosion! Failure to install appliance to these instructions can lead to a fire or explosion.***

Appliance Install Section 3	**YES**	**IF NO, WHY?**
Required non-combustible floor protection	☐	_____
Verified clearances to combustible.	☐	_____
Unit is Leveled and secured.	☐	_____
Venting/Chimney Section 4		
Venting Configuration complies to vent diagrams.	☐	_____
Venting installed, sealed and secured in place with proper clearances.	☐	_____
Exterior wall/roof flashing installed and sealed	☐	_____
Terminations installed and sealed.	☐	_____
Electrical Section 1		
120 VAC unswitched power provided to the appliance.	☐	_____
Check outlet with multi-meter for proper voltage. (115-120 VAC)	☐	_____
Record voltage reading: _____		
Appliance Setup Section 5		
All packaging and protective materials are removed	☐	_____
Accessories installed properly	☐	_____
Manual bag and all it's contents are removed from inside the appliance and given to party responsible for use and operation	☐	_____
Started appliance and verified that all motors and blowers operate as they should.	☐	_____
Checked draft using a Manometer. Record readings: _____	☐	_____

Hearth and Home Technologies recommends the following:
Photographing the installation and copying this checklist for your file.
This checklist remain visible at all times on the appliance until the installation is complete.

Comments: Further description of the issues, who is responsible (Installer/Builder/Other Trades, etc.) and corrective action needed _____

_____

_____

Comments communicated to party responsible_____ by _____ on _____
(Builder / Gen Contractor) (Installer) (Date)

04/17

1 Product Specific and Important Safety Information

A. Appliance Certification

MODEL:	P40i Pellet Insert
LABORATORY:	OMNI Test Laboratories, Inc
REPORT NO.	
TYPE:	Pellet Fueled Insert/Supplementary For Residential Use
STANDARD(s):	ASTM E 2779-10, ASTM E 2515-11, ASTM E 1509-12, ULC-S628-93

NOTE: This installation must conform with local codes. In the absence of local codes you must comply with the ASTM E1509-12, ULC-S628-93 & **(UM) 84-HUD**

The P40i Pellet Insert is certified to comply with 2020 EPA particulate emission standards.

Note: This installation must conform with local codes. In the absence of local codes you must comply with the **ASTM E 1509-2012, ULC S628-93, (UM) 84-HUD**

B. Glass Specifications

This appliance is equipped with 5mm ceramic glass. Replace glass only with 5mm ceramic glass. Please contact your dealer for replacement glass.

C. Mobile Home Approved

This appliance is approved for mobile home installations when not installed in a sleeping room and when an outside combustion air inlet is provided.

The structural integrity of the mobile home floor, ceiling, and walls must be maintained. The appliance must be properly grounded to the frame of the mobile home using a minimum of 8 AWG copper solid or stranded, insulated or bare wire or equivalent and use only listed pellet vent, Class “PL” connector pipe.

A Harman® Outside Air Kit must be installed in a mobile home installation.

⚠ WARNING

DO NOT INSTALL IN SLEEPING ROOM.

⚠ CAUTION

THE STRUCTURAL INTEGRITY OF THE MANUFACTURED HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

D. BTU & Efficiency Specifications

EPA Certification Number:	
EPA Certified Emissions:	1.27%
***LHV Tested Efficiency:**	81.7%
****HHV Tested Efficiency:**	76.3%
*****EPA BTU Output:**	13,240 - 33,440
******BTU Input**	17,420 - 43,420
Vent Size:	4 Inch
Hopper Capacity:	64.5 lbs
Fuel	Wood Pellet

* Weighted average LHV efficiency using data collected during EPA emissions test.

**Weighted average HHV efficiency using data collected during EPA emissions test.

***A range of BTU outputs based on EPA Default Efficiency and the burn rates from the low and high EPA tests.

******Based on the maximum feed rate per hour multiplied by approximately 8600 BTU’s which is the average BTU’s from a pound of pellets.

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.

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.

Note: Some generator or battery back-up systems may not be compatible with the micro-processor electronics on this appliance. Please consult the power supply manufacturer for compatible systems.

Note: Hearth & Home Technologies, manufacturer of this appliance, reserves the right to alter its products, their specifications and/or price without notice.

Harman® is a registered trademark of Hearth & Home Technologies.

E. Non-Combustible Materials Specification

Material which will not ignite and burn. Such materials are those consisting entirely of steel, iron, brick, tile, concrete, slate, glass or plasters, or any combination thereof.

Materials that are reported as passing **ASTM E 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750º C** and **UL763** shall be considered non-combustible materials.

F. Combustible Materials Specification

Materials made of or surfaced with wood, compressed paper, plant fibers, plastics, or other material that can ignite and burn, whether flame proofed or not, or plastered or unplastered shall be considered combustible materials.

G. Electrical Codes

120 VAC, 60 Hz, Start 5.0 Amps, Run 4.0 Amps

Note: Some generator or battery back-up systems may not be compatible with the micro-processor electronics on this appliance. Please consult the power supply manufacturer for compatible systems.

WARNING! Risk of Fire! *Hearth & Home Technologies disclaims any responsibility for, and the warranty and agency listing will be voided by the below actions.*

DO NOT:

- *Install or operate damaged appliance*
- *Modify appliance*
- *Install other than as instructed by Hearth & Home Technologies*
- *Operate the appliance without fully assembling all components*
- *Overfire*
- *Install any component not approved by Hearth & Home Technologies*
- *Install parts or components not Listed or approved.*
- *Disable safety switches*

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.

For assistance or additional information, consult a qualified installer, service agency or your dealer.

H. California

⚠ WARNING

This product and the fuels used to operate this product (wood), and the products of combustion of such fuels, can expose you to chemicals including carbon black, which is known to the State of California to cause cancer, and carbon monoxide, which is know to the State of California to cause birth defects or other reproductive harm. For more information go to: www.P65Warnings.ca.gov

NOTE: Hearth & Home Technologies, manufacturer of this appliance, reserves the right to alter its products, their specifications and/or price without notice.

2 Getting Started

A. Design and Installation Considerations

1. Appliance Location

NOTICE: *Check building codes prior to installation.*

- Installation MUST comply with local, regional, state and national codes and regulations.
- Consult insurance carrier, local building inspector, fire officials or authorities having jurisdiction over restrictions, installation inspection and permits.

It is a good idea to plan your installation on paper, using exact measurements for clearances and floor protection, before actually beginning the installation

Consideration must be given to:

- Safety, convenience, traffic flow
- Placement of the chimney and chimney connector.
- If you are not using an existing chimney, place the appliance where there will be a clear passage for a factory-built listed chimney through the ceiling and roof.
- Installing an optional outside air kit would affect the location of the vent termination.

Suitable fireplaces for installation:

- Masonry Fireplace
- Existing Factory Built Wood Burning Fireplace
- Harman® Zero Clearance Cabinet - Part #1-00-574323

EXCEPTION: Masonry or steel, including the damper plate, may be removed from the smoke shelf and adjacent damper frame if necessary to accommodate a chimney liner, provided that their removal will not weaken the structure of the fireplace and chimney, and will not reduce protection for combustible materials to less than that required by the National Building Code.

Since pellet exhaust can contain ash, soot or sparks, you must consider the location of:

- Windows
- Air Intakes
- Air Conditioner
- Overhangs, soffits, porch roofs, adjacent walls
- Landscaping, vegetation

When locating vent and venting termination, vent above roof line when possible.

Warning! Risk of Fire *Damaged parts could impair safe operation. Do NOT install damaged, incomplete or substitute components.*

NOTICE: *Locating the appliance in a location of considerable air movement can cause intermittent smoke spillage from appliance. Do not locate appliance near:*

- *Frequently open doors*
- *Central heat outlets or returns*

myhht FACTORY training

Installation and service of this appliance should be performed by qualified personnel. Hearth & Home Technologies recommends HHT Factory Trained or NFI Certified professionals.

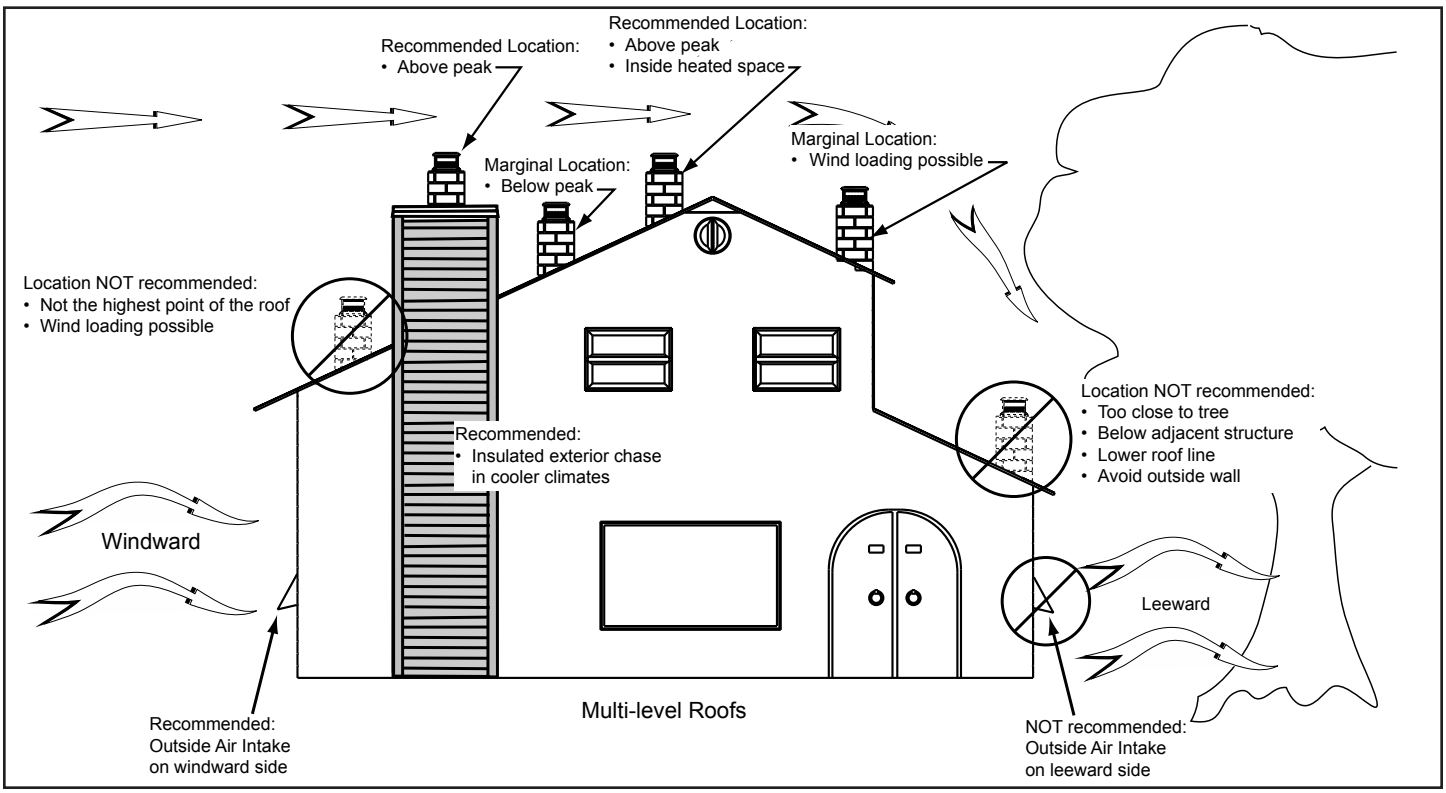


Figure 2.1

B. Tools And Supplies Needed

Tools and building supplies normally required for installation, unless installing into an existing masonry fireplace:

Reciprocating Saw	Gloves
Hammer	Safety Glasses
Phillips Screw driver	Electric Drill & Bits
Tape Measure	
Level	**May also need:**
Non-Combustible Sealant Material	Vent Support Straps
	Venting Paint

C. Inspect Appliance and Components

- Carefully remove the appliance and components from the packaging.
- The vent system components and decorative doors and fronts may be shipped in separate packages.
- If optional log set is purchased, the log bracket must be installed prior to installing the log set.
- Report to your dealer any parts damaged in shipment, particularly the condition of the glass.
- **Read all of the instructions before starting the installation. Follow these instructions carefully during the installation to ensure maximum safety and benefit.**

⚠ WARNING

RISK OF FIRE OR EXPLOSION! Damaged parts could impair safe operation. DO NOT install damaged, incomplete or substitute components. Keep appliance dry.

Hearth & Home Technologies disclaims any responsibility for, and the warranty will be voided by, the following actions:

- Installation and use of any damaged appliance or vent system component.
- Modification of the appliance or vent system.
- Installation other than as instructed by Hearth & Home Technologies.
- Installation and/or use of any component part not approved by Hearth & Home Technologies.

Any such action may cause a fire hazard.

⚠ WARNING

Risk of Fire, Explosion or Electric Shock! DO NOT use this appliance if any part has been under water. Call a qualified service technician to inspect the appliance and to replace any part of the control system that has been under water.

3 Clearances

A. Appliance Dimension Diagram

Dimensions are actual appliance dimensions. Use for reference only.

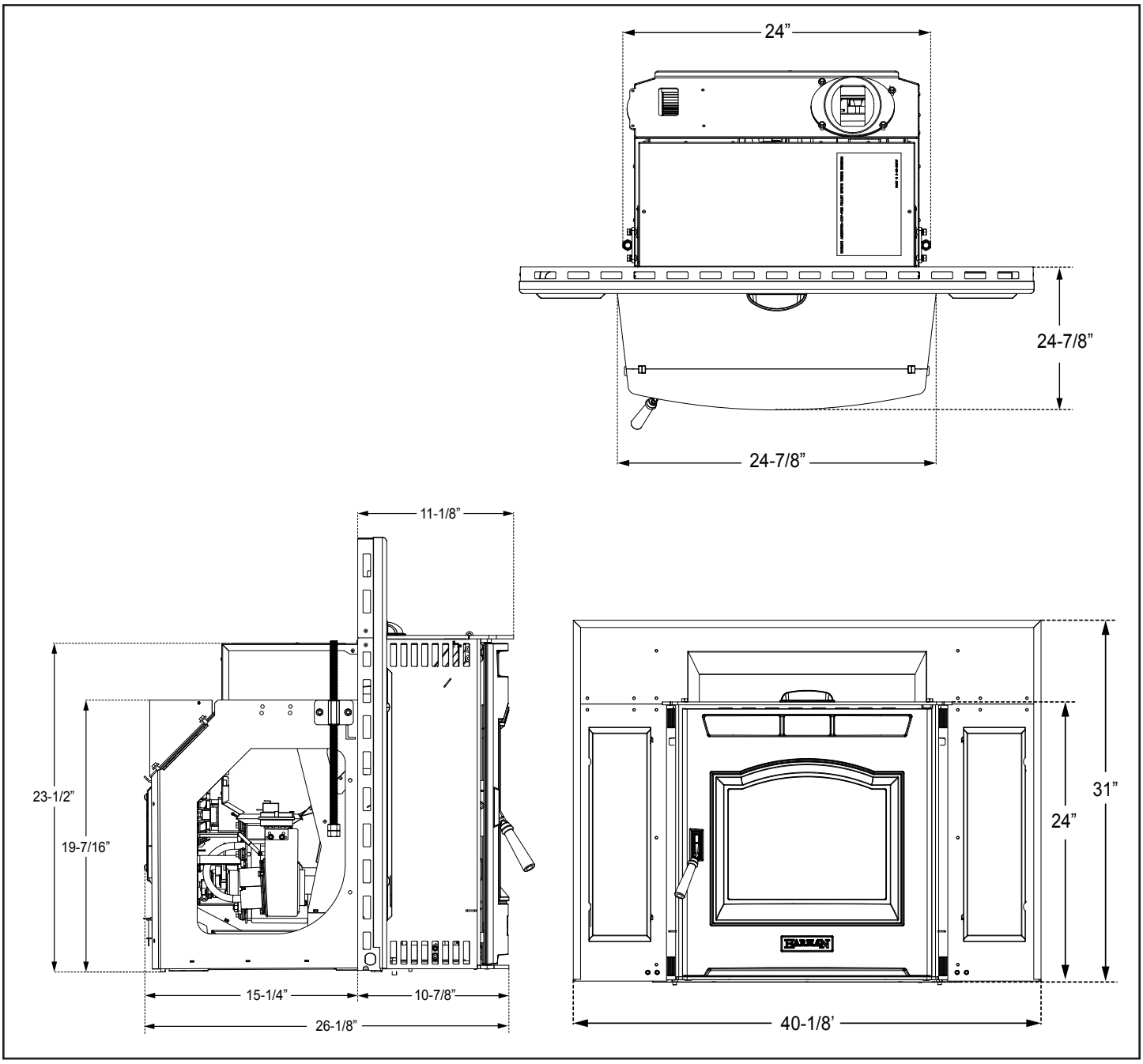


Figure 3.1

B. Clearances to Combustibles & Floor Protection

When selecting a location for the appliance it is important to consider the required clearances to walls (see Figure 3.2).

WARNING! Risk of Fire or Burns! *Provide adequate clearance around air openings and for service access. Due to high temperatures, the appliance should be located out of traffic and away from furniture and draperies.*

NOTICE: *Illustrations reflect typical installations and are FOR DESIGN PURPOSES ONLY. Illustrations/diagrams are not drawn to scale. Actual installation may vary due to individual design preference.*

* Floor protection must be used from hearth opening to 6" (152mm) in front of door glass and 6" (152mm) to each side of the stove body OR 8" (203mm) to sides to protect combustibles from hot ashes. A minimum size will be 16.5" deep by 30" wide and be made of a non-combustible material or meet UL approval.

Clearances:	A	B	*C	*D	E (From Glass)
From Insert Body:	12" (305 mm)	12" (305 mm)	0"	0"	6" (152 mm)
*3/4 Trim, Zero Clearance to Cast Surround					

A = to sidewall
B = to 12" mantel
C = to 3/4" trim
D = to 3/4" trim
E = floor protection

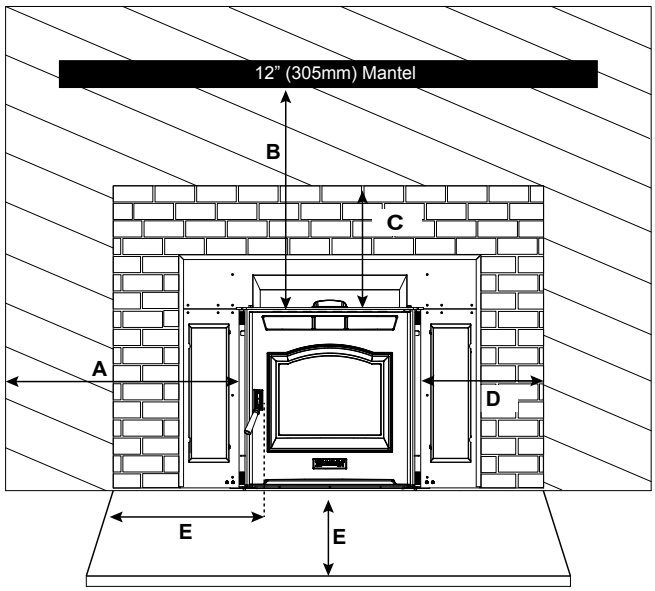
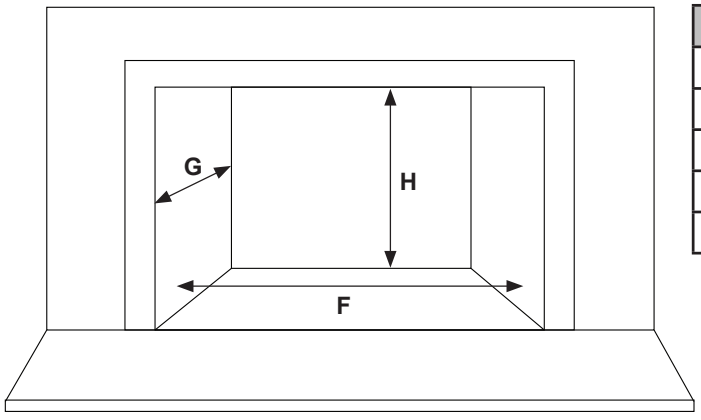


Figure 3.2

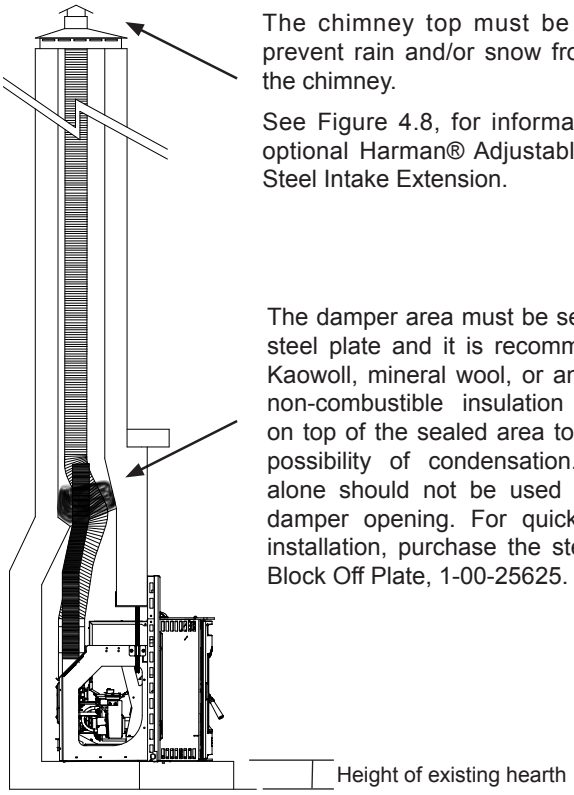
C. Minimum Opening - Masonry and Manufactured Fireplaces



Location		Inches	Millimeters
F	Minimum Width	24-7/8	632
G	Minimum Depth	15-9/16	395
H	Minimum Height #1-90-574240	24	610
H	Minimum Height #1-90-574220	22	779
H	Minimum Height #1-90-574200	20	508

4 Termination Location and Vent Information

A. Venting Termination Design



The chimney top must be capped to prevent rain and/or snow from entering the chimney.

See Figure 4.8, for information on the optional Harman® Adjustable Stainless Steel Intake Extension.

The damper area must be sealed with a steel plate and it is recommended that Kaowoll, mineral wool, or an equivalent non-combustible insulation be placed on top of the sealed area to reduce the possibility of condensation. Insulation alone should not be used to seal the damper opening. For quick and easy installation, purchase the steel Harman Block Off Plate, 1-00-25625.

Figure 4.1

#1 Installing into an existing fireplace chimney

This method provides excellent venting with 100% outside air which is the most efficient operation of this unit. This method also provides natural draft in the event of a power failure.

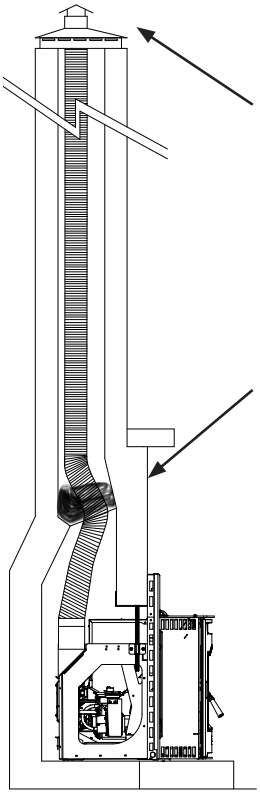
A 4" stainless steel flex pipe is needed for the flue pipe, and 3" aluminum or Stainless Steel Flex Pipe is used for the intake.

⚠ WARNING

CHIMNEY CONNECTOR PIPE MAY NOT PASS THROUGH CONCEALED SPACES INCLUDING AN ATTIC, ROOF SPACE, CLOSET, FLOOR OR CEILING.

⚠ WARNING

DO NOT REMOVE BRICKS OR MORTAR FROM THE EXISTING FIREPLACE.



The chimney top must be capped to prevent rain and/or snow from entering the chimney.

The damper area must be sealed with a steel plate and it is recommended that Kaowoll, mineral wool, or an equivalent non-combustible insulation be placed on top of the sealed area to reduce the possibility of condensation. Insulation alone should not be used to seal the damper opening. For quick and easy installation, purchase the steel Harman Block Off Plate, 1-00-25625.

Figure 4.2

#2 Installing into an existing fireplace chimney

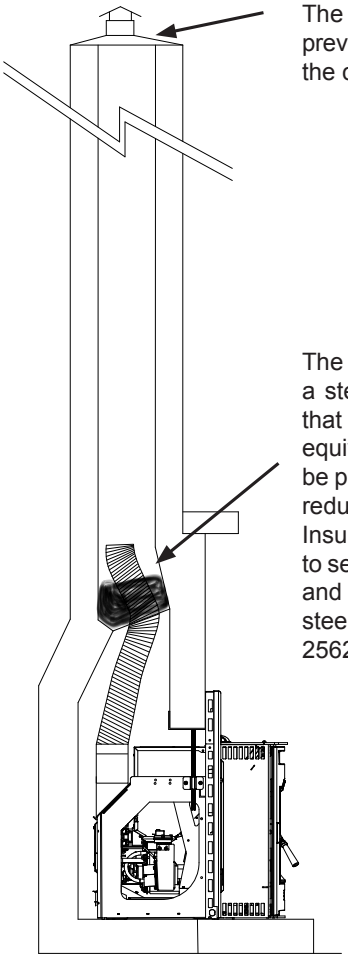
This method provides excellent venting for normal operation. This method also provides natural draft in the event of a power failure.

A cap should be installed on the chimney to keep out rain.

Combustion air is provided from the living area and enters the feed system from around the wing and stove body spaces.

⚠ WARNING

DO NOT REMOVE BRICKS OR MORTAR FROM THE EXISTING FIREPLACE.



The chimney top must be capped to prevent rain and/or snow from entering the chimney.

The damper area must be sealed with a steel plate and it is recommended that Kaowoll, mineral wool, or an equivalent non-combustible insulation be placed on top of the sealed area to reduce the possibility of condensation. Insulation alone should not be used to seal the damper opening. For quick and easy installation, purchase the steel Harman Block Off Plate, 1-00-25625.

Figure 4.3

#3 Installing into an existing chimney

This method provides excellent venting for normal operation. This method also provides natural draft in the event of a power failure. If the chimney condition is questionable you may want to install a liner as in method #2.

This is the minimum allowed vent pipe using 4" stainless steel flex pipe.

The vent pipe must extend past the damper sealing area by at least 12 inches.

Note: The insulation material must not be allowed to expand to the point that it covers the end of the flex pipe.

The chimney should be capped with any style cap that will not allow rain or snow to enter.

In some places in the US and Canada, it is required that the vent pipe extend all the way to the top of the chimney. Check your local codes.

⚠ WARNING

CHIMNEY CONNECTOR PIPE MAY NOT PASS THROUGH CONCEALED SPACES INCLUDING AN ATTIC, ROOF SPACE, CLOSET, FLOOR OR CEILING.

⚠ WARNING

DO NOT REMOVE BRICKS OR MORTAR FROM THE EXISTING FIREPLACES.

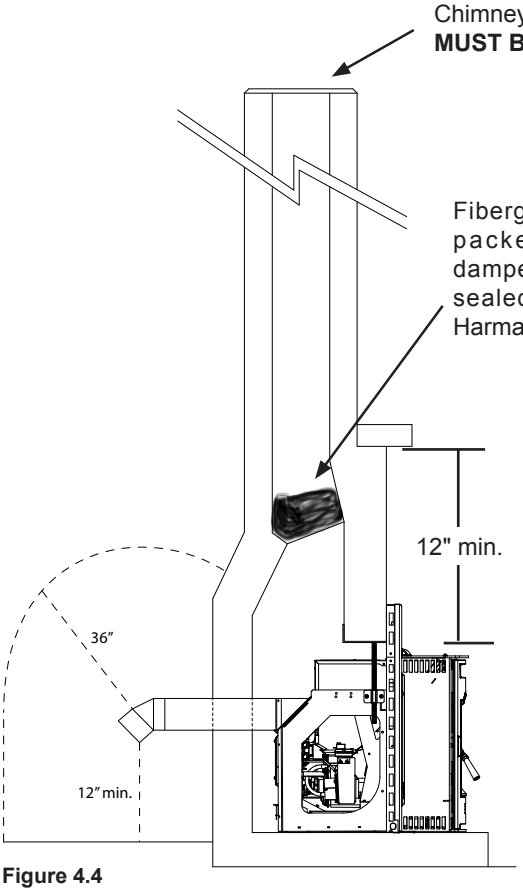


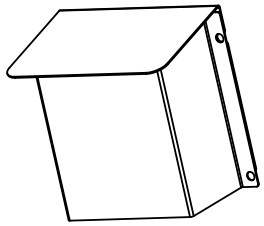
Figure 4.4

#4 Preferred method

This method provides excellent venting for normal operation and in a fireplace with inadequate flue space, or a height of over 30 feet. 4" PL vent pipe should be used with the needed swivel flue stub.

Note: With a 100% outside air kit the outside air can be installed in the same manner as the flue pipe.

Stainless Steel Outside Air Inlet Cover
Part# 1-10-09542



⚠ CAUTION

KEEP COMBUSTIBLES (SUCH AS GRASS, LEAVES, ETC.) AT LEAST 3 FEET AWAY FROM THE FLUE OUTLET ON THE OUTSIDE OF THE BUILDING.

IN CANADA: This fireplace insert must be installed with a continuous chimney liner of a minimum 4" diameter extending from the insert to the top of the chimney. The chimney liner must conform to the Class 3 requirements of CAN/ULC-S635, Standard for Lining Systems for Existing Masonry or Factory Built Chimneys and Vents, or CAN/ULC-S640, Standard for Lining Systems for New Masonry Chimneys.

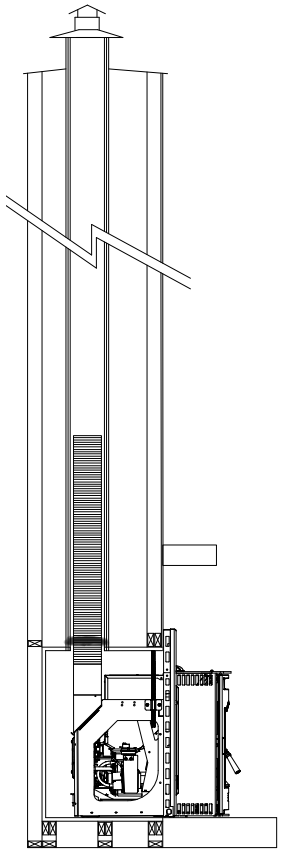


Figure 4.5

Installing the P40i Pellet Insert into an existing factory built wood burning fireplace

When installing the P40i Pellet Insert into a factory built wood burning fireplace, the Manufactured Fireplace Installation Kit #1-00-574205 must be used. In addition, several things need to be taken into consideration.

The size of the fireplace opening. Will the unit fit into the opening? Many of these units have metal smoke shields inside the top that can be removed to gain height. Often the side and rear refractory can be removed to gain depth and width. In some circumstances, the front lower lip or grill work may also be removed. Be sure and follow the guidelines in the kit instructions. Floor protection guidelines, as listed on Figure 3.2 must also be followed.

The factory built chimney must be listed per UL 127 (US) and meet type HT requirements of UL 103 (US). Factory Built fireplace chimneys tested to UL 127-98 may be, at the fireplace manufacturers option, tested to the same criteria as UL 103HT requirements. If the chimney is not listed as meeting HT requirements, or if the factory built fireplace was tested prior to 1998, a full height listed chimney liner must be installed from the appliance flue collar to the chimney top. Liner must meet high temperature (2100° F) per UL1777 (US). The liner must be securely attached to both the flue collar and the chimney cap. To prevent room air passage to the chimney cavity of the fireplace, seal the damper area around the chimney liner with fiberglass batting.

Note: If the Harman® P40i Pellet Insert is installed into a factory built wood burning fireplace, this label (Harman® part #3-90-674204) MUST be attached to the altered fireplace. This label is included in the Manufactured fireplace installation kit.

THIS FIREPLACE HAS BEEN ALTERED TO ACCOMMODATE A FIREPLACE INSERT AND SHOULD BE INSPECTED BY A QUALIFIED PERSON PRIOR TO REUSE AS A CONVENTIONAL FIREPLACE

Additionally, the firebox floor of the Zero Clearance Wood or Gas Fireplace may be removed down to the outer metal shell of the fireplace if kit 1-00-574305 is used. The kit includes installation instructions and all materials needed to remove the firebox floor and still maintain a safe, compliant installation. Be certain to contact local code enforcement officials before beginning any modifications, as they may not be reversible in many cases.

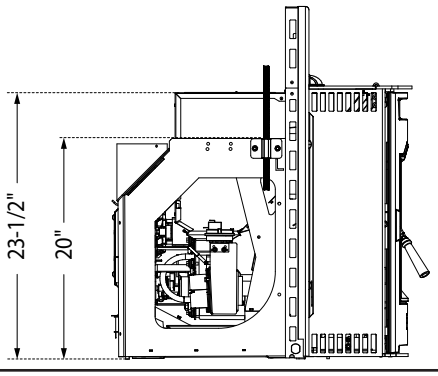
OPTIONAL HOPPER CONFIGURATIONS FOR SMALLER FIREPLACE OPENINGS:

The Harman® P40i Pellet Insert can be factory built with shorter hopper configurations.

The standard requires a 23-1/2" opening. Part #1-90-740235

Option 1: Requires a 20" opening height. Part #1-90-740200

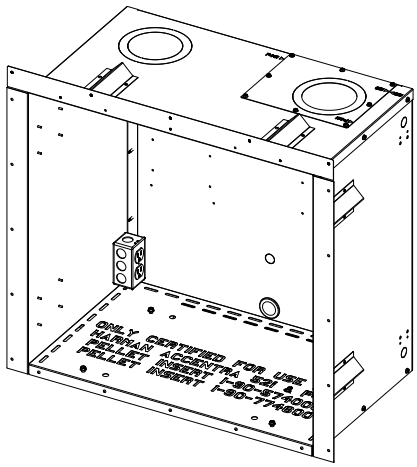
Keep in mind the hopper capacities will decrease with the optional heights.



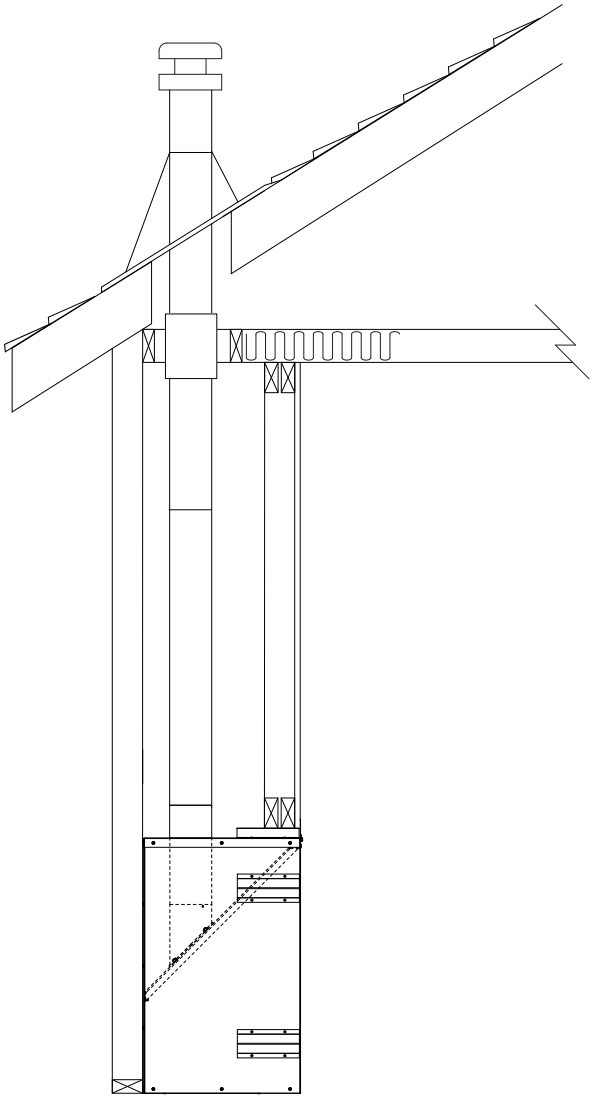
Installing the P40i Pellet Insert into a Harman Zero Clearance Cabinet

If you don't have a factory built fireplace or masonry fireplace, the P40i Pellet Insert can also be installed into the Harman Zero Clearance Cabinet, Part # 1-00-574323. This is the **only permissible** way to install the P40i Pellet Insert without a suitable fireplace. After the Harman Zero Clearance Cabinet is installed, type PL vent pipe, wall pass-throughs and terminations are used (**Note:** Flex pipe is not approved these types of installation). Detailed installation instructions are included with the Zero Clearance Cabinet. These same installation instructions can also be found on-line at www.harmanstoves.com.

Below are two sample installations using the Harman Zero Clearance Cabinet.



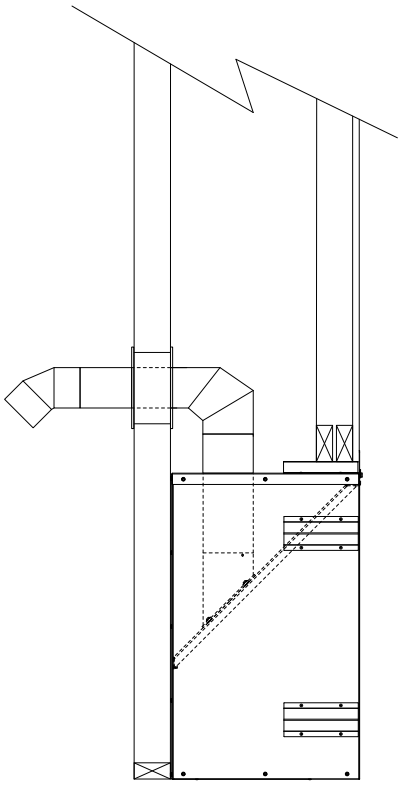
Harman Zero Clearance Cabinet



PL Vent Pipe installed through a ceiling.

Requirements for Terminating the Venting through an Exterior Wall.

The clearance to a window or door that may be opened must be a minimum of 48" to the side and 48" below the window/door, and 12" above the window/door. (**with outside air installed, 12" to the side or below**)



PL Vent Pipe installed through an exterior wall

B. Venting & Use of Elbows

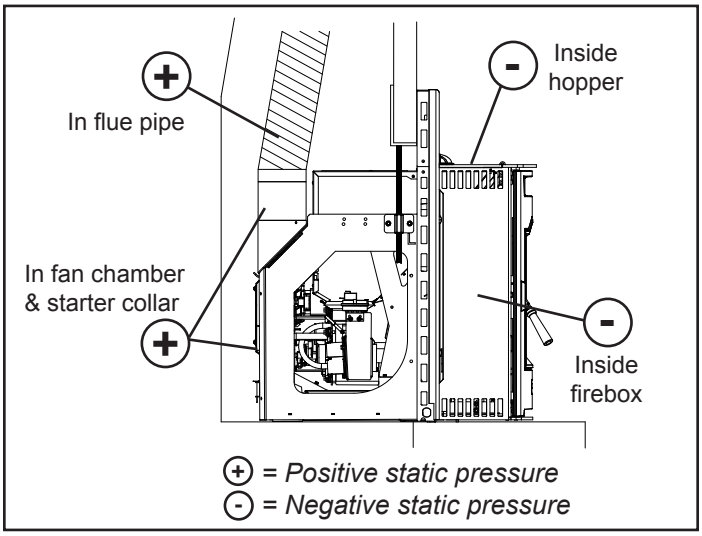


Figure 4.6

A combustion blower is used to extract the combustion gases from the firebox. This causes a negative pressure in the firebox and a positive pressure in the venting system as shown in Figure 4.6. The longer the vent pipe and more elbows used in the system, the greater the flow resistance. **The recommended maximum flue lengths for the P40i Pellet Insert are as follows:**

4" Flex Pipe:
Maximum 30 Ft. Vertical

Long runs of flex or PL vent pipe installed directly vertical from the flue stub may require more frequent cleaning due to fly ash falling off inside and collecting directly above the combustion blower outlet.
Any use of horizontal venting will require more frequent cleaning. It is the responsibility of the installer to make sure the entire flue configuration is accessible for cleaning.

4" stainless steel flex vent piping is only allowed for use in masonry fireplaces and chimneys or factory built wood burning fireplaces with class A metal chimneys. All pellet vent pipe must be secured together either by means provided by pipe manufacturer or by 3 screws at each joint.

Use only the specified venting components. Use of any other components will void the product warranty and may pose a hazard.

DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS APPLIANCE.

DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.

C. Battery Back-up Power

Minimizing Smoke During Loss of Power Using Battery Back-up

Harman® strongly recommends installing battery back-up to minimize entry of smoke into the room in the event of power loss.

Your pellet/biomass burning appliance relies on a combustion blower to remove exhaust. A power failure will cause the combustion blower to stop. This may lead to exhaust seeping into the room. Vertical rise in the venting may provide natural draft. It is, however, no guarantee against leakage.

There are two Harman® approved battery back-up options for your appliance:

Uninterruptible Power Supply (UPS) UPS battery back-ups are available online or at computer and office equipment stores. Your Harman® appliance with Rev E or later software available beginning in November 2010 may be plugged directly into a Harman® approved UPS:

- The APC (American Power Conversion) model #BE750G and the TrippLite model INTERNET750U are tested and approved. Other brands or models may not be compatible.

When power is lost, a fully charged UPS will power a safe, combustion blower only shut-down. Your appliance will pulse the blower every few seconds to clear exhaust until the fire is out.

Note: The UPS provides safe shut-down only. It is not intended for continued operation.

Your appliance will recognize when power is restored. What happens depends on ESP temperature and whether it is equipped with automatic ignition:

- **In "Automatic" setting,** units equipped with automatic ignition will respond to the set point and ESP temperature and resume normal operation.
- **In "Manual" setting** or for units without automatic ignition:
- If the ESP is cool, the appliance will remain shut down.
- If the fire is out and the ESP is still warm, the feeder may restart. Since the fire is out, the ESP temperature will not rise. The unit will then shut-down, and may flash a six-blink status error. (See ESP error codes)
- If the fire is still burning, it will resume normal operation.

Contact your dealer if you have questions about UPS compatibility with your appliance.

⚠ CAUTION

Always keep appliance doors and hopper lid closed and latched during operation and during power failures to minimize risk of smoke or burn-back.

⚠ CAUTION

Use only Harman® approved battery back-up devices. Other products may not operate properly, can create unsafe conditions or damage your appliance.

D. Outside Air

The outside air kit consists of a Intake Stub, Stub Gasket, Outside Air intake Weldment and hardware, Figure 4.7.

An adjustable chimney intake extension, part #1-00-674104 is available to be used on masonry chimneys only, Figure 4.8.

Additional information and diagrams can be found under the “Venting Termination Design” section of the manual.

To install outside air, use kit part #1-00-774696. Follow the installation instructions provided with the kit.

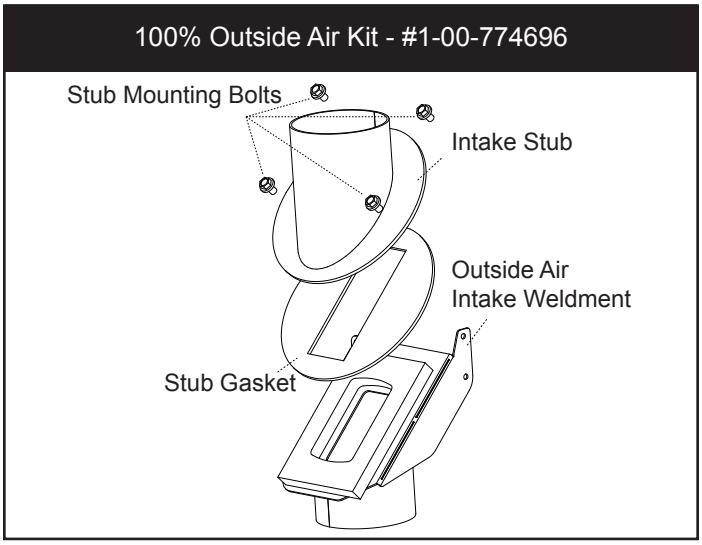


Figure 4.7

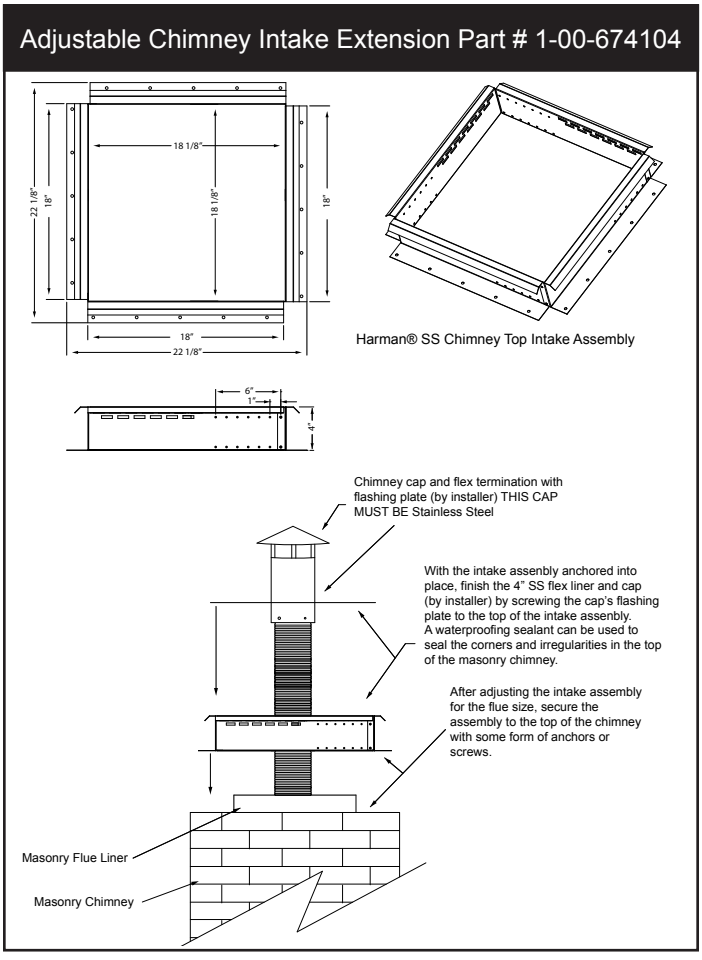


Figure 4.8

E. Locating Your Appliance & Chimney

Location of the appliance and chimney will affect performance.

- Install through the warm airspace enclosed by the building envelope. This helps to produce more draft, especially during lighting and die-down of the fire.
- Penetrate the highest part of the roof. This minimizes the effects of wind loading.
- Locate termination cap away from trees, adjacent structures, uneven roof lines and other obstructions.
- Minimize the use of chimney offsets.
- Consider the appliance location relative to floor and ceiling and attic joists.

⚠ CAUTION

- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVICING ANOTHER APPLIANCE.
- DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

May allow flue gases to enter the house

F. Draft

Draft is the pressure difference needed to vent appliances successfully. When an appliance is drafting successfully, all combustion byproducts are exiting the home through the chimney.

Considerations for successful draft include:

- Negative pressure in the firebox
- Location of appliance and chimney

To measure the draft or negative pressure on your appliance use a magnahelic or a digital pressure gauge capable of reading 0 - 1 inches of water column (W.C.).

The appliance should be running on high for at least 15 minutes for the test.

With the stove running on high you should have a negative pressure equal to or greater than the number given in the chart below. If you have a lower reading than you find on the chart, your appliance does not have adequate draft to burn the fuel properly.

Minimum Vacuum Requirements:	**.20 - .25**

Prior to installing the flue pipe, connect a draft meter. (The draft meter must have a minimum range of 0 - .5”) Record the first reading. Connect flue pipe to stove and be sure all doors and windows in the home are closed. Record the second draft reading _____. If the second reading is more than .05” lower than the first reading, check for possible restrictions or the need for outside air. For more information on the draft test procedure, *refer to “Appliance Set-Up” Section C.*

G. Negative Pressure

WARNING! Risk of Asphyxiation! *Negative pressure can cause spillage of combustion fumes and soot.*

Negative pressure results from the imbalance of air available for the appliance to operate properly. It can be strongest in lower levels of the house.

Causes include:

- Exhaust fans (kitchen, bath, etc.)
- Range hoods
- Combustion air requirements for furnaces, water heaters and other combustion appliances
- Clothes dryers
- Location of return-air vents to furnace or air conditioning
- Imbalances of the HVAC air handling system
- Upper level air leaks such as:
  - Recessed lighting
  - Attic hatch
  - Duct leaks

To minimize the effects of negative air pressure:

- Install the outside air kit with the intake facing prevailing winds during the heating season
- Ensure adequate outdoor air for all combustion appliances and exhaust equipment
- Ensure furnace and air conditioning return vents are not located in the immediate vicinity of the appliance
- Avoid installing the appliance near doors, walkways or small isolated spaces
- Recessed lighting should be a “sealed can” design
- Attic hatches weather stripped or sealed
- Attic mounted duct work and air handler joints and seams taped or sealed

NOTICE: *Hearth & Home Technologies assumes no responsibility for the improper performance of the chimney system caused by:*

- *Inadequate draft due to environmental conditions*
- *Down drafts*
- *Tight sealing construction of the structure*
- *Mechanical exhausting devices*

H. Avoiding Smoke and Odors

Avoiding Smoke and Odors

Negative Pressure, Shut-down, and Power Failure:

T**o reduce the probability of back-drafting or burn-back in the pellet burning appliance during power failure or shut-down conditions, the stove must be able to draft naturally** without exhaust blower operation. Negative pressure in the house will resist this natural draft if not accounted for in the pellet appliance installation.

Heat rises in the house and leaks out at upper levels. This air must be replaced with cold air from outdoors, which flows into lower levels of the house. Vents and chimneys into basements and lower levels of the house can become the conduit for air supply, and reverse under these conditions.

Outside Air:
Hearth & Home Technologies recommend attaching outside air in all installations, especially lower level and main floor locations.

Per national building codes, consideration must be given to combustion air supply to all combustion appliances. Failure to supply adequate combustion air for all appliance demands, may lead to back-drafting of those and other appliances.

When the appliance is side-wall vented: The air intake is best located on the same exterior wall as the exhaust vent outlet and located lower on the wall than the exhaust vent outlet.

When the appliance is roof vented: The air intake is best located on the exterior wall oriented towards the prevailing wind direction during the heating season.

The outside air connection will supply the demands of the pellet appliance, but consideration must be given to the total house demand. House demand may consume some air needed for the stove, especially during a power failure. It may be necessary to add additional ventilation to the space in which the pellet appliance is located. Consult with your local HVAC professional to determine the ventilation demands for your house.

Vent Configurations:

To reduce probability of reverse drafting during shut-down conditions, Hearth & Home Technologies strongly recommends:

- Installing the pellet vent with a minimum vertical run of five feet, preferably terminating above the roof line.
- Installing the outside air intake at least four feet below the vent termination.

To prevent soot damage to exterior walls of the house and to prevent re-entry of soot or ash into the house:

- Maintain specified clearances to windows, doors, and air inlets, including air conditioners.
- Vents should not be placed below ventilated soffits. Run the vent above the roof.
- Avoid venting into alcove locations.
- Vents should not terminate under overhangs, decks or onto covered porches.
- Maintain minimum clearance of 12 inches from the vent termination to the exterior wall. If you see deposits developing on the wall, you may need to extend this distance to accommodate your installation conditions.

Hearth & Home Technologies assumes no responsibility for, nor does the warranty extend to, smoke damage caused by reverse drafting of pellet appliances under shut-down or power failure conditions.

WARNING! DO NOT CONNECT THIS UNIT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

If a rear exit flue configuration is used, with or without outside air, make sure the flue pipe termination clearances are followed as per NFPA 211.

Vent Pipe

Be sure to use approved pellet vent pipe wall and ceiling pass- through fittings to go through combustible walls and ceilings. Be sure to use a starting collar to attach the venting system to the stove. The starting collar must be secured to the flue stub with at least three screws, and sealed with high temp silicone caulking.

4” stainless steel flex vent piping is only allowed for use in masonry fireplaces and chimneys or factory built wood-burning fireplaces with class A metal chimneys.

Pellet venting pipe (also known as Type PL vent) is constructed of two layers with air space between the layers. This air space acts as an insulator and reduces the outside surface temperature to allow a clearance to combustibles of only 1 inch. The sections of pipe lock together to form an air tight seal in most cases; however, in some cases a perfect seal is not achieved. For this reason and the fact that the P40i Pellet Insert operates with a positive vent pressure, we specify that the joints also be sealed with silicone.

Where passing through an exterior wall or roof, be sure to use the appropriate pass-through device providing an adequate vapor barrier. Venting manufacturers generally provide these pas-through devices.

Venting Termination Requirements

1. Termination must exhaust above air inlet elevation. It is recommended that at least 60 inches (1524mm) of vertical pipe be installed when appliance is vented directly through a wall. This will create a natural draft, which will help prevent the possibility of smoke or odor venting into the home during a power outage. It will also keep exhaust from causing a nuisance or hazard by exposing people or shrubs to high temperatures. The safest and preferred venting method is to extend the vent vertically through the roof.
2. Distance from doors and operable windows, gravity or ventilation air inlets into building:
   a. Not less than 48 inches (1219mm) below;
   b. Not less than 48 inches (1219mm) horizontally from;
   c. Not less than 12 inches (305mm) above.
3. Distance from permanently closed windows:
   a. Not less than 12 inches (305mm) below, horizontally from or above.
4. Distance between bottom of termination and grade should be 12 inches (305mm) minimum. This is conditional upon plants in the area, and nature of grade surface. The grade surface must be a non-combustible material (i.e., rock, dirt). The grade surface must not be lawn. Distance between bottom of termination and public walkway should be 84 inches (2134mm) minimum.
5. Distance to combustible materials must be 24 inches (610mm) minimum. This includes adjacent buildings, fences, protruding parts of the structure, roof overhang, plants and shrubs, etc.
6. Termination Cap Location (Home Electrical Service)

- Side-to-side clearance is to be the same as minimum clearance to vinyl inside corners.
- Clearance of a termination cap below electrical service shall be the same as minimum clearance to vinyl soffits.
- Clearance of a termination cap above electrical service will be 12 inches (305mm) minimum.
- Location of the vent termination must not obstruct or interfere with access to the electrical service.

<u>For Canada Only:</u> This Fireplace Insert must be installed with a continuous chimney liner of 4” diameter extending from the fireplace insert to the top of the chimney. The chimney liner must conform to the Class 3 requirements of CAN/ULC-S635, Standard for Lining Systems for Existing Masonry or Factory-Built Chimneys and Vents, or CAN/ULC-S640, Standard for Lining Systems for New Masonry Chimneys.

I. Mobile Home Installation

You must use a Harman® Outside Air Kit for installation in a mobile home.

1. An outside air inlet must be provided for the combustion air and must remain clear of leaves, debris, ice and/or snow. It must be unrestricted while the appliance is in use to prevent room air starvation which causes smoke spillage. Smoke spillage can also set off smoke alarms.
2. The combustion air duct system must be made of metal. It must permit zero clearance to combustible construction and prevent material from dropping into the inlet or into the area beneath the dwelling and contain a rodent screen.
3. The appliance must be secured to the mobile home structure by bolting it to the floor (using lag bolts). Use the same holes that secured the appliance to the shipping pallet.
4. The appliance must be grounded with #8 solid copper grounding wire or equivalent, terminated at each end with an NEC approved grounding device.
5. Refer to "Clearances to Combustibles and Floor Protection" section of this manual for listings to combustibles.
6. Use silicone to create an effective vapor barrier at the location where the chimney or other component penetrates to the exterior of the structure.
7. Follow the chimney manufacturer's instructions when installing the vent system for use in a mobile home.
8. Installation shall be in accordance with the Manufacturers Home & Safety Standard (HUD) CFR 3280, Part 24.

⚠ WARNING

Asphyxiation Risk:

NEVER INSTALL INTO A SLEEPING ROOM

Consumes oxygen in the room

⚠ WARNING

Installation must comply with Manufactured Home and Safety Standard (HUD), CFR 3280, Part 24

⚠ CAUTION

THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL AND CEILING/ROOF MUST BE MAINTAINED.

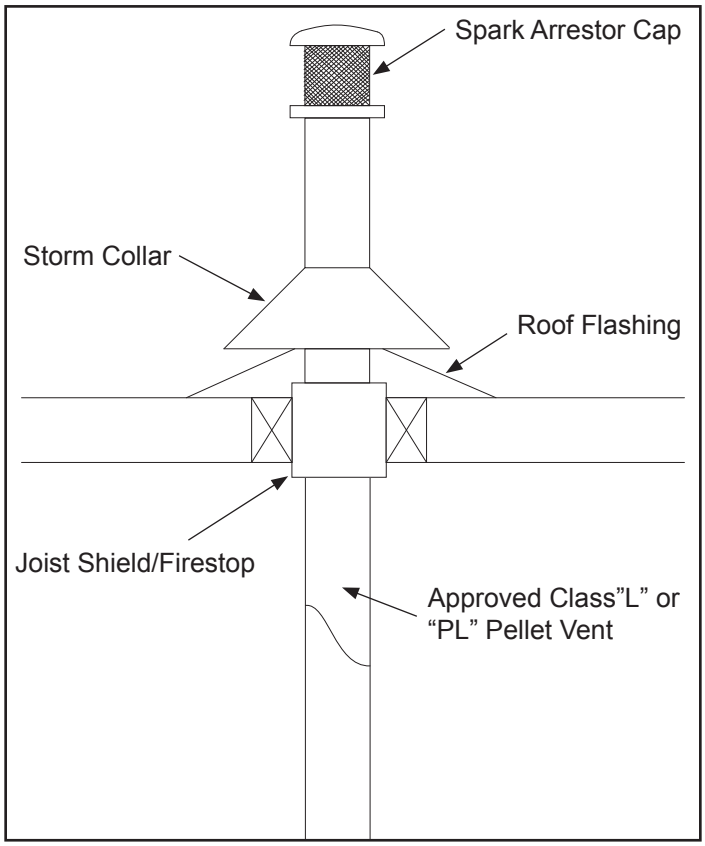
Do NOT cut through:

- Floor joist, wall, studs ceiling trusses.
- Any supporting material that would affect the structural integrity.

⚠ CAUTION

Never draw outside combustion air from:

- Wall, floor or ceiling cavity.
- Enclosed space such as an attic or garage.



J. Fire Safety

To provide reasonable fire safety, the following should be given serious consideration:

- Install at least one smoke detector on each floor of your home.
- Locate smoke detector away from the heating appliance and close to the sleeping areas.
- Follow the smoke detector manufacturer's placement and installation instructions and maintain regularly.
- Conveniently locate a Class A fire extinguisher to contend with small fires.
- In the event of a hopper fire:
  - Evacuate the house immediately.
  - Notify fire department.

⚠ WARNING

Fire Risk.

Hearth & Home Technologies disclaims any responsibility for, and the warranty will be voided by, the following actions:

- Installation and use of any damaged appliance.
- Modification of the appliance.
- Installation other than as instructed by Hearth & Home Technologies.
- Installation and/or use of any component part not approved by Hearth & Home Technologies.
- Operating appliance without fully assembling all components.
- Do NOT Overfire.

Or any such action that may cause a fire hazard.

⚠ 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.

K. Inspect Appliance & Components

- Remove appliance and components from packaging and inspect for damage.
- Report to your dealer any parts damaged in shipment.
- **Read all the instructions before starting the installation. Follow these instructions carefully during the installation to ensure maximum safety and benefit.**

⚠ WARNING

Inspect appliance and components for damage. Damaged parts may impair safe operation.

- Do NOT install damaged components.
- Do NOT install incomplete components.
- Do NOT install substitute components.

Report damaged parts to dealer.

5 Appliance Set-Up

A. Unpacking Stove

Once the box is removed, the unit will need to be remove from the skid.

Firmly grab the stove and pull it toward you and out away from the frame. Set unit to the side, Figure 5.1. **Note: This may take 2 people to achieve.**

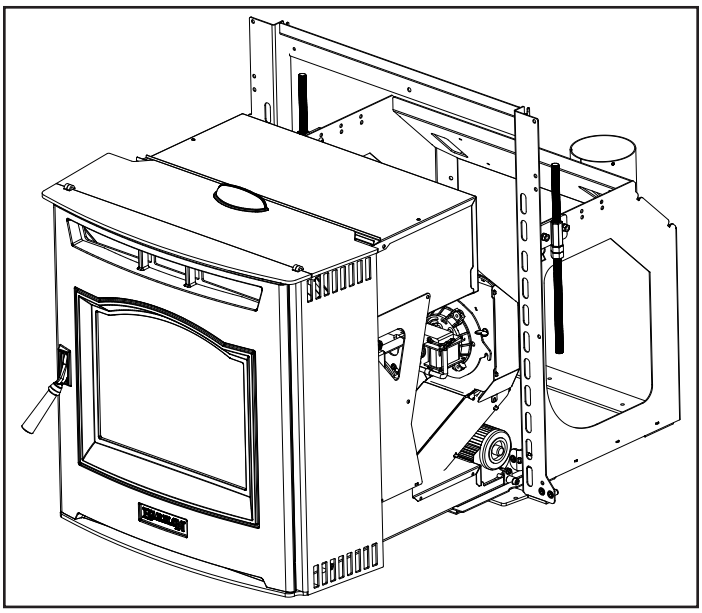


Figure 5.1 - Pull unit away from the mounting frame.

Now that the unit is removed you can now remove the mounting frame from the skid. To do this simply remove (4) 5/16-18 Hex head bolts. Figure 5.2.

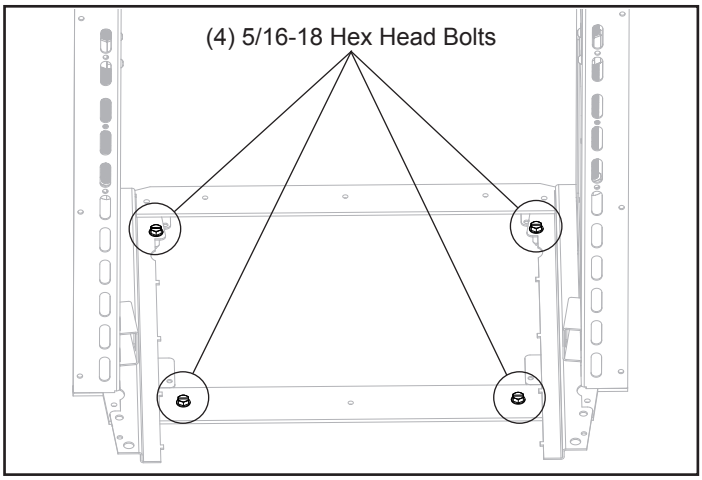


Figure 5.2 - Remove (4) 5/16-18 Hex Head Bolts

Now that the mounting frame is removed from the skid you can now install the surround panels.

Note: Installation instructions for the surround are located inside the box with the surround panels.

B. Securing the Mounting Frame

The mounting frame is the anchor for the appliance. If the frame is not secured properly, shifting will occur when sliding the insert in or out.

The stove is supplied with (4) 5/16-18 Hex Head bolts located in the hardware pack for leg levelers. These bolts should be threaded down through the holes to raise the frame corners as needed to make the frame level as needed, Figure 5.3.

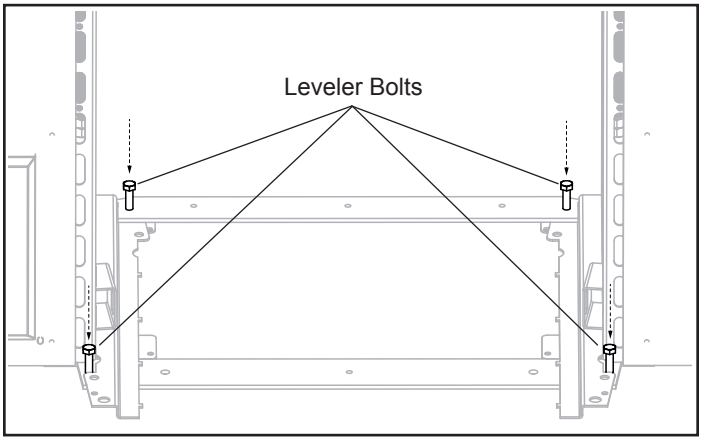


Figure 5.3

Install the coupler nut weldments to the frame in the hole location that suits your needs with the (4) 1/4-20 x 5/8 flange screws and nuts and 1/2” jack bolts. Install the mounting frame into the opening and adjust these bolts to insure the frame is level, Figure 5.4.

Note: The use of all 4 leveling bolts may not be necessary. Tighten the 1/2" jack bolts against the lintel.

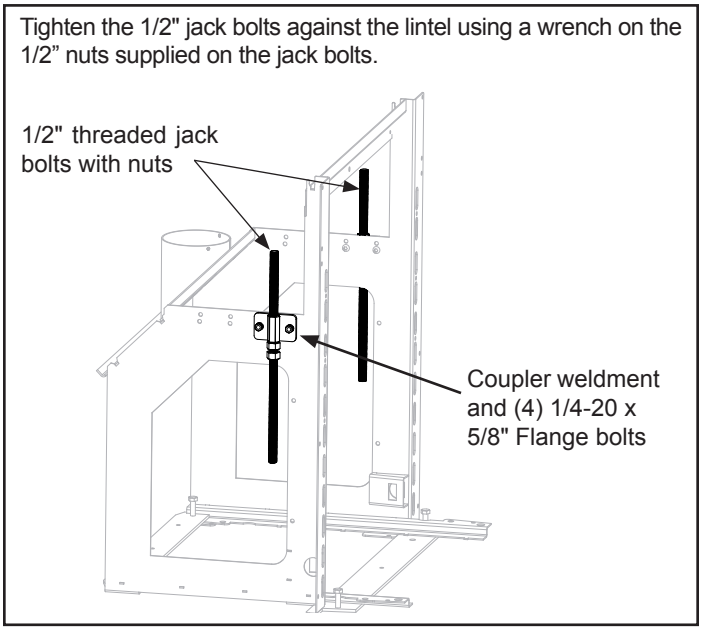


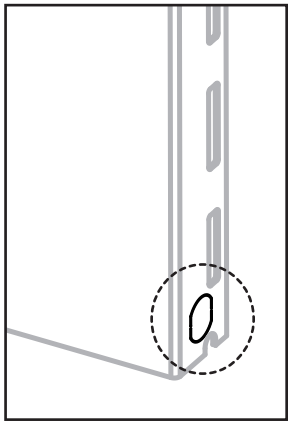
Figure 5.4 - Install jack bolts

C. Routing the Power Cord

When choosing an electrical supply outlet, be sure the polarity is correct, and that the supplied voltage is within the range of 117 to 123 Volts. Surge protection is also recommended to protect the control board software in the event of a surge or spike.

Once the outlet location is decided, you'll need to install and route the power cord.

Remove the power cord from the ash pan.



At the bottom of each of the side surround panels is a knockout for the cord retainer. Remove the appropriate knockout and feed the loose wire end of the power cord into the hole. If your cord needs to exit from the right side, route the cord up the side and over the top of the mounting frame and back down the left side. Use the two hooks on the top corners of the mounting frame to secure the cord. Attach a star washer, the ground wire ring terminal, a second star washer, the ring terminal from the ground wire jumper to the bottom stud of the left surround panel. Using a pliers, compress the cord clamp and push it into the hole.

⚠ WARNING

ROUTE POWER CORD AWAY FROM THE APPLIANCE. DO NOT RUN THE CORD UNDER OR IN FRONT OF THE APPLIANCE.

D. Control Board Installation

The control board is packaged in a static resistant bag. Use care when handling, hold the control board only by the edges.

Connecting Wiring Harness

Follow these steps;

- Feed the harness wires and the ESP wire through the opening in the mounting frame and out through the control opening in the surround panel.
- Holding the control board outside the opening in the surround panel, attach the 11 pin connector plug, ESP wire, ground wire and silicon draft tube, reference Figure 5.5.
- After determining the location of the Room Sensor (See Section E), Attach it to the two male spade terminals near the top of the control board.

NOTE: These connections are not polarity specific.

- From the power cord, attach the green ground wire to the grounding post located on the left wing.
- The black wire from the power cord gets attached to the short brown wire from the control harness
- The white wire from the power cord will attach to the short white wire on the control harness.
- Tie wrap wiring to circuit board assembly, reference Figure 5.5 for hole location.
- Install the control panel into the surround; Right side first, then tilt in the left side.
- Secure using the four black machine screws included with the surround.

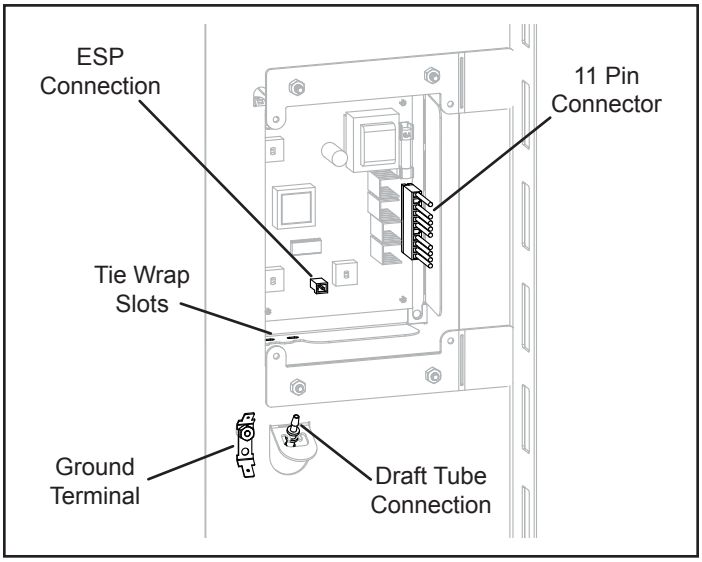


Figure 5.5 - Connect wiring and Draft Hose.

Using (4) #10 sheet metal screws located in the hardware pack, install the control door hinge and control board assembly to the left side wing surround, Figure 5.6.

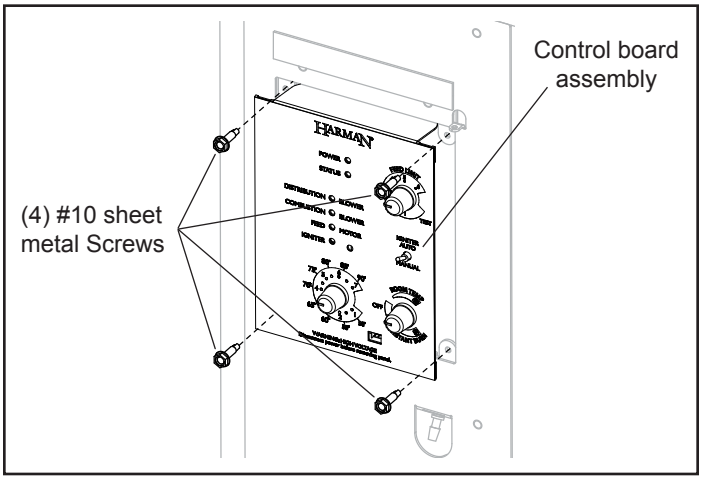


Figure 5.6 - Install control board assembly.

E. Room Sensor Installation

Although not required, it is recommended that the room sensor be connected in every installation. Using a minimum size 18 gauge wire, you may splice in an additional length, to extend the room sensor. The following are typical locations for the room sensor;

- On an interior wall next to or in place of a typical wall thermostat.
- On the leg of a coffee table or end table in your favorite sitting location.
- Sticking out through the punched hole at the lower right corner of the control panel.

Note: When installing the room sensor externally, limit the distance from the stove to 25 feet or less.

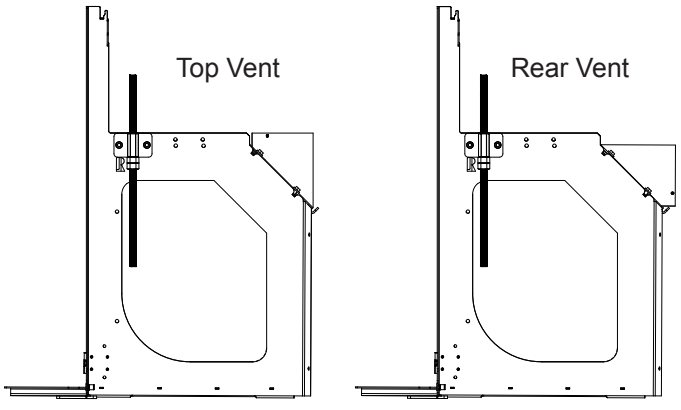
Once the location has been decided, run the wiring to the control panel. You'll need to remove the two terminals from the end of the sensor cable and replace them with the two smaller terminals from the hardware bag. Plug the terminals into the control board. These connections are not polarity specific.

Note: If the room sensor is located too close to the appliance, or in a direct path of the distribution air, You may need to elevate the temperature setting to maintain a comfortable temperature level throughout the heated space.

See Section "E. Draft Test Procedure" under Operating Instructions.

E. Installing the Venting

The flue collar on the rear of the mounting frame is designed to pivot. Loosen the four mounting bolts and adjust the angle of the collar as needed, Figure 5.7.



Note: When installed in a rear vent configuration, the maximum BTU may be reduced due to elevated ESP temperatures associated with the horizontal exhaust stream.

Figure 5.7

F. Installing the Body into the Mounting Frame

Attach the female terminal of the ground jumper wire to the ground tab located next to the air intake, Figure 5.8.

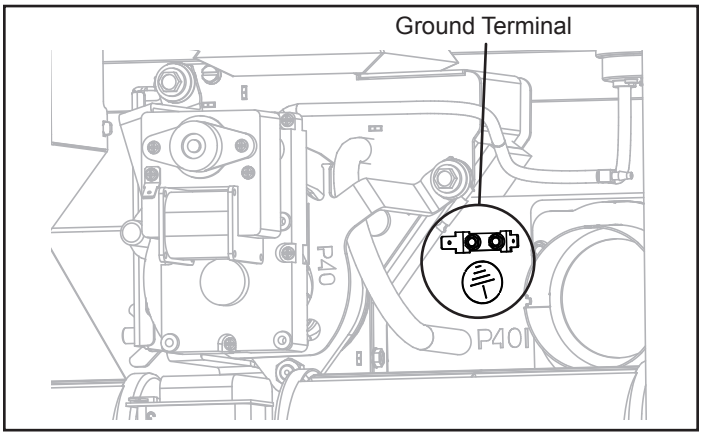


Figure 5.8

The rollers on either side of the insert body will ride on the rails of the mounting frame, Figure 5.9.

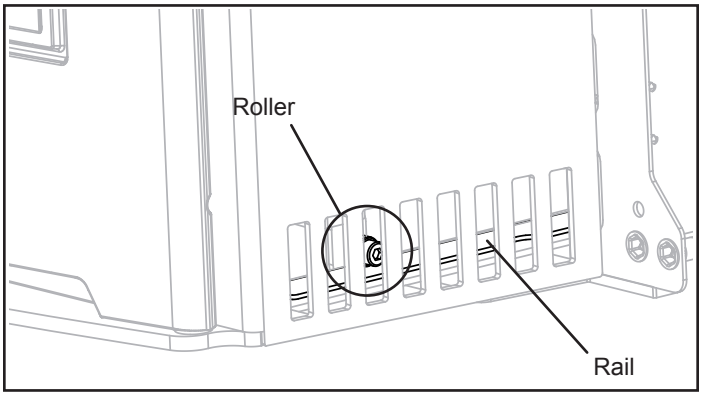


Figure 5.9

Place the body roughly 1" from the mounting frame, open the front door and insert the T-handle allen wrench into the holes located at the bottom right and left and corner of the stove front. Tighten the bolts to secure the stove body to frame.

Note: The bolts only need to be a snug fit as they are only used to hold the unit to the frame.

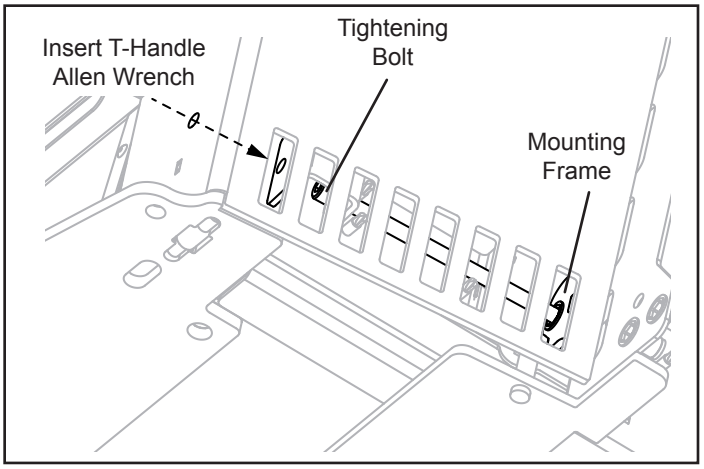


Figure 5.10

6 Reference Material

A. Safety Reminders

When installing the Harman® P40i Pellet Insert, respect basic safety standards. Read these instructions carefully before you attempt to install or operate the P40i Pellet Insert. Failure to do so may result in damage to property or personal injury and may void the product warranty.

Consult with your local building code agency and insurance representative before you begin your installation to ensure compliance with local codes, including the need for permits and follow-up inspections.

⚠ CAUTION

This appliance must be vented to the outside.

Due to high temperatures, this stove should be placed out of traffic and away from furniture and draperies.

Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burn to skin and/or clothing.

Young children should be carefully supervised when they are in the same room as the stove.

Clothing and other flammable materials should not be placed on or near this stove.

Installation and repair of this stove should be done by a qualified service person. The appliance should be inspected before use and at least annually by a qualified service person. More frequent cleaning will be required. It is imperative that control compartments, burners, and circulating air passageways of this stove be kept clean.

⚠ WARNING

MOBILE/MANUFACTURED HOME GUIDELINES DO NOT ALLOW INSTALLATION IN A SLEEPING ROOM.

⚠ CAUTION

THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

⚠ CAUTION

THE STOVE IS HOT WHILE IN OPERATION.

KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.

⚠ WARNING

KEEP COMBUSTIBLE MATERIALS SUCH AS GRASS, LEAVES, ETC. AT LEAST 3 FEET AWAY FROM THE POINT DIRECTLY UNDER THE VENT TERMINATION.

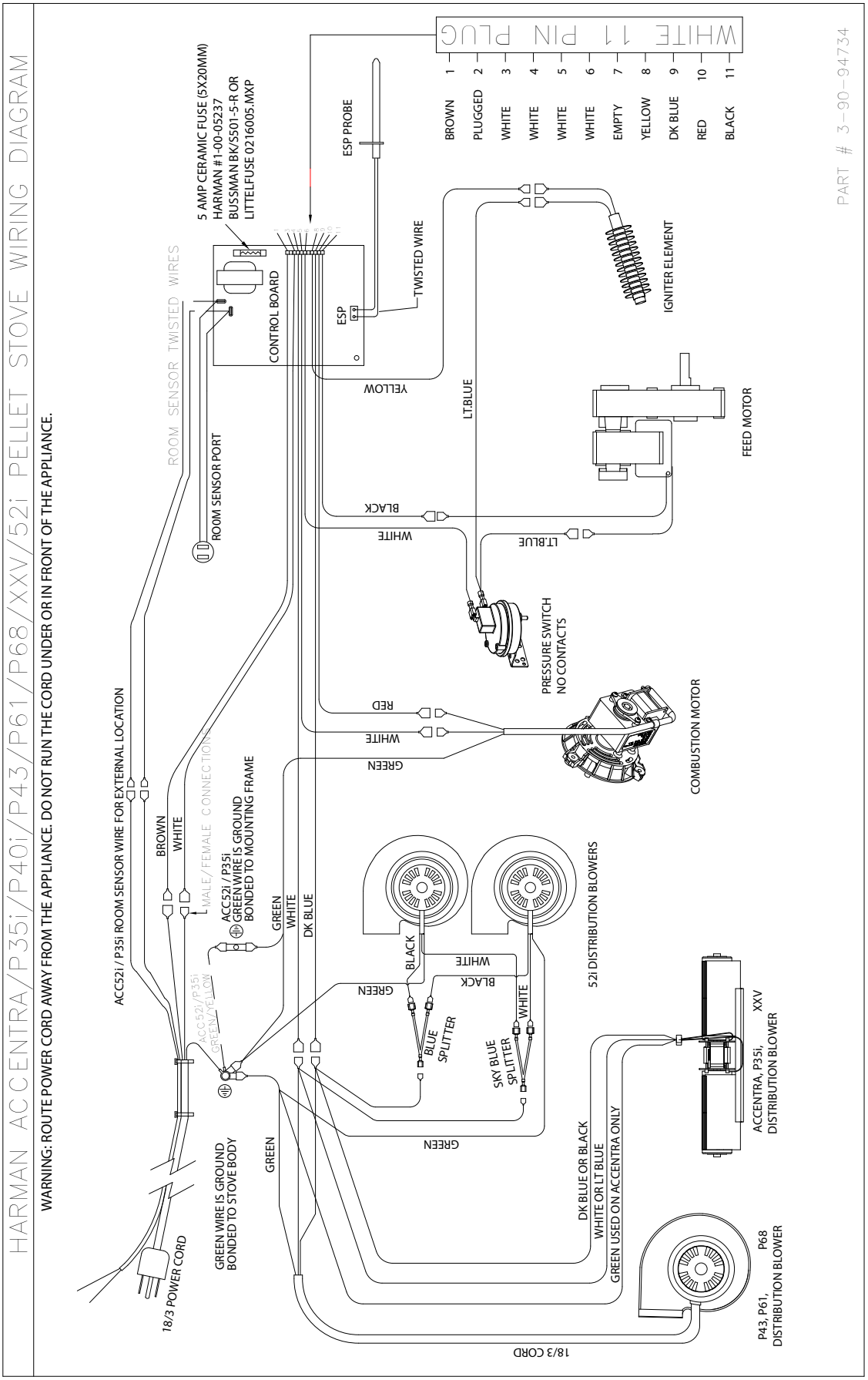
⚠ WARNING

USE OF IMPROPER FUELS, FIRE STARTERS OR ALTERING THE STOVE FOR HIGHER HEAT OUTPUT MAY CAUSE DAMAGE TO THE STOVE AND COULD RESULT IN A HOUSE FIRE. USE ONLY APPROVED FUELS AND OPERATION GUIDELINES

⚠ CAUTION

DO NOT USE MAKESHIFT COMPONENTS OR OTHER COMPROMISES WHEN INSTALLING THIS APPLIANCE.

B. Wiring Diagram



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