Fireplace Products International Ltd.

Project # 015-S-072-1
Model: F1500/I1500
Type: Residential Catalytic Wood Fired Heater
November 18, 2016
Revised: May24, 2021, June 9, 2022

EPA Test Method 28R for Certification and Auditing of Wood Heaters

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Revisions:

Original submitted November 18, 2016

Revision 1: May 24, 2021

- Average CO emissions results were added to the summary section on page 8.
- Changed table reporting 1st hour emissions from mg of catch to g/hr, see page 14.
- Added a note to the Settings and Run Notes table, clarifying the air setting used for the Low Burn Rate, see page 24.
- Added a drawing of the firebox volume to the report on page 19.
- Added train precision table to page 14.
- Added fuel loading density information to Test Conditions table on Page 18.
- Added revised owner's manuals to the report which provided greater detail on appliance start-up and operation procedures, see pages 28 and 24, of F1500 and I1500 manuals, respectively.

Revision 2: June 9, 2022

- Updated results table for clarity.
- Added reference to Method 28 use of 2 category II runs in lieu of a Category 1 per Section 8.1.1.3.2 Note in Method 28.
- Added statement that no negative catch weights recorded.
- Modified Train precision calculation table to include requirements in % and g/kg.
- Reviewed and approved addition of insulation on bottom of unit between pedestal and underside of firebox. Drawings added.

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Affidavit:

Dirigo Laboratories, Inc. was contracted by Fireplace Products International to provide testing services for the F1500/I1500 – wood fired heater per EPA Method 28R for Certification and Auditing of Wood Heaters. All testing and associated procedures were conducted at Dirigo Laboratories, Inc. beginning on 10/25/2016 and ending on 10/27/2016. Dirigo Laboratories is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed EPA Method 28R and ASTM E2780-10. Particulate sampling was performed per ASTM E2515-10 *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.*

Dirigo Laboratories is accredited by the U.S. Environmental Protection Agency for the certification and auditing of wood heaters pursuant to subpart AAA of 40 CFR Part 60, New Source Performance Standards for Residential Wood Heaters and subpart QQQQ of 40 CFR Part 60, Standards of Performance for New Hydronic Heaters and Forced Air Furnaces, Methods 28R, 28WHH, 28 WHH-PTS, and all methods listed in Sections 60.534 and 60.5476. Dirigo holds EPA Accreditation Certificate Numbers 4 and 4M (mobile). Dirigo Laboratories, Inc. is accredited by A2LA to ISO 17020:2012 “Criteria for Bodies Performing Inspections, ISO 17025:2005 “Requirements for Testing Laboratories”, and ISO 17065:2012 “Requirements for Bodies Operating Product Certification Systems”. Dirigo holds A2LA Certificate Numbers 3726.01, 3726.02, and 3726.03. See Appendix E for Accreditations.

The following people were associated with the testing, analysis and report writing associated with this project.

Gary Nelke, CMfgE

Ben Nelke, Test Technician

Doug Towne, QA Manager

Introduction:

Fireplace Products International of Delta, BC, contracted with Dirigo Laboratories, Inc. to perform EPA certification testing on their Model F1500 free standing/I1500 insert catalytic wood heater. All testing was performed at Dirigo Laboratories, Inc. Testing was performed by Mr. Ben Nelke and Mr. Gary Nelke CMfgE.

Notes:

- A 50 hour break-in was performed on the appliance by the manufacturer prior to the test series. Data is provided in separate electronic folder.
- Prior to testing, the dilution tunnel was cleaned with a steel brush.
- Run #'s 1, 2, 3, and 4 were performed with the convection blower in operation. Run #5 was the blower confirmation run and was performed with the convection blower off.
- Front filters were changed on sample train A at one hour for all runs.

Wood Heater Identification and Testing:

- Appliance Tested: ***F1500/I1500***
- Serial Number: ***00001***
- Manufacturer*:* ***FPI Fireplace Products International Ltd.***
- Catalyst: ***Yes***
- Heat exchange blower: ***Optional***
- Type: ***Wood Stove***
- Style: ***Free Standing/Insert***
- Date Received: ***Monday, October 24, 2016***
- Wood Heater Aging: ***October 11-October 15, 2016***
- Testing Period – Start: ***Tuesday, October 25, 2016*** Finish: ***Thursday, October 27, 2016***
- Test Location: ***Dirigo Laboratories, Inc. 11785 SE HWY 212 - Suite 305, Clackamas, OR 97015***
- Elevation: **≈131** ***Feet above sea level***
- Test Technician(s): **Ben Nelke, Gary Nelke**
- Observers: ***Dave Lal***

Test Procedures and Equipment:

All Sampling and analytical procedures were performed by Ben Nelke and Gary Nelke. All procedures used were directly from EPA Method 28R, ASTM E2780-10 and ASTM E2515-10. See the list below for equipment used. See Appendix D for calibration data.

Equipment List:

1. Analyzer -California Analytical ZRE CO2/CO/O2 IR ANALYZER
2. Delmhorst J-2000 Wood Moisture Meter
3. Dayton 4c121 Blower for dilution tunnel -Emissions Booth #1
4. ScienTech Balance Scale
5. 10 lb Calibration Weight
6. DigiWeigh Bench Shipping Scale
7. APEX XC-60 Digital Emissions Sampling Box A
8. APEX XC-60 Digital Emissions Sampling Box B
9. APEX Ambient sampling box
10. Gast MOA-P122-AA Vacuum Pump
11. Rice Lake 3'x3' floor scale w/digital weight indicator

Results:

The weighted average emission rate is **1.0 g/hr** with a weighted average efficiency of **77.7%** and averaged CO emissions of **0.32 g/min**.The Fireplace Products International Model F1500/I1500 catalytic wood heater meets the 2020 PM emission standard of ≤ 2.0 g/hr per CFR 40 part 60, §60.532 (b).

Detailed individual run data can be found in separate digital folders supplied with this report.

Emissions:

EPA Method 28 - Weighted Average

DIRIGO LABORATORIES INC.

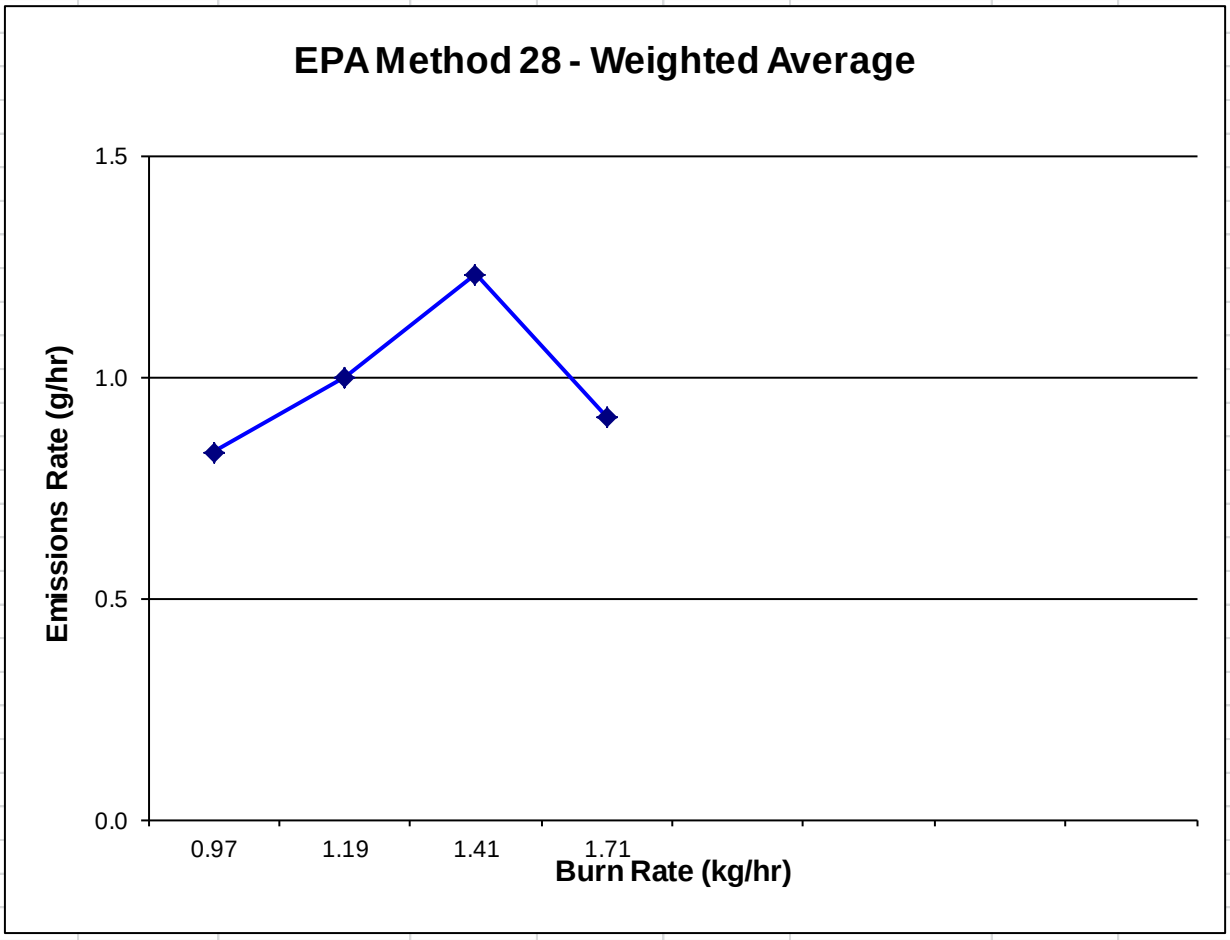
Weighted Average: 1.0 (g/hr)

Client:	FPI
Model:	F1500/I1500
Tracking No.:	72
Project No.:	015-S-072-1
Test Dates:	10/25/16 - 10/27/16

Burn Rate Category	2		Burn Rate Category	2
Burn Rate (kg/hr-dry)	0.97		Burn Rate (kg/hr-dry)	1.19
Emissions Rate (g/hr)	0.8		Emissions Rate (g/hr)	1.0
Emissions Rate Cap (g/hr)	15		Emissions Rate Cap (g/hr)	15
Weighting Factor	36.00%		Weighting Factor	23.52%
Run Number	1		Run Number	2
Burn Rate Category	3		Burn Rate Category	3
Burn Rate (kg/hr-dry)	1.41		Burn Rate (kg/hr-dry)	1.71
Emissions Rate (g/hr)	1.2		Emissions Rate (g/hr)	0.9
Emissions Rate Cap (g/hr)	15		Emissions Rate Cap (g/hr)	18
Weighting Factor	20.43%		Weighting Factor	20.05%
Run Number	3		Run Number	4

EPA Method 28 - Weighted Average

Client:	FPI
Model:	F1500/I1500
Tracking No.:	72
Project No.:	015-S-072-1
Test Dates:	10/25/16 - 10/27/16



Efficiency:

All efficiency values use the HHV.

CSA B415.1-10 Weighted Average

Weighted Average: 77.7 %

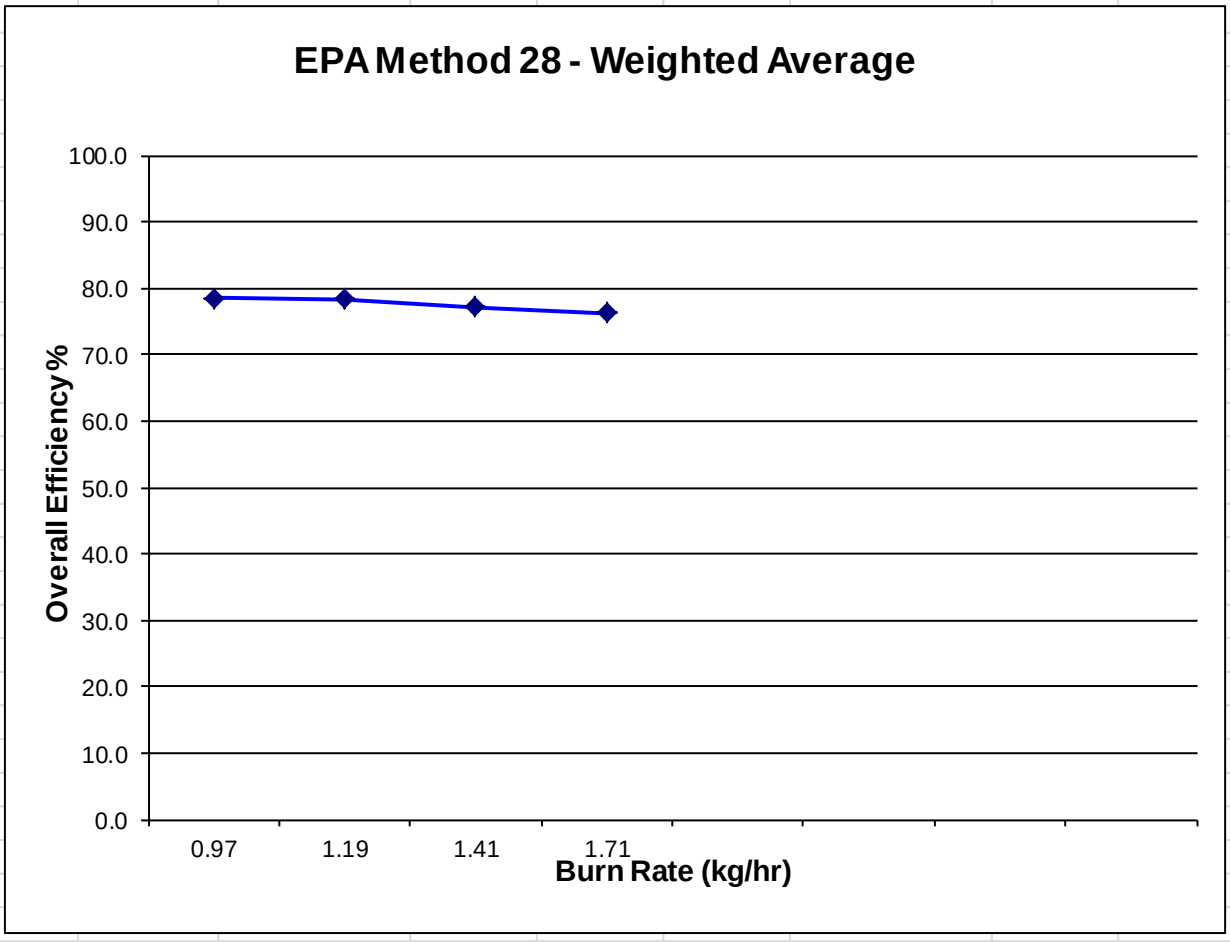
Client:	FPI
Model:	F1500I1500
Tracking No.:	72
Project No.:	015-S-072-1
Test Dates:	10/25/16 - 10/27/16

Burn Rate Category	2		Burn Rate Category	2
Burn Rate (kg/hr-dry)	0.97		Burn Rate (kg/hr-dry)	1.19
OA Efficiency %	78.5		OA Efficiency %	78.3
Emissions Rate Cap (g/hr)	15		Emissions Rate Cap (g/hr)	15
Weighting Factor	36.00%		Weighting Factor	23.52%
Run Number	1		Run Number	2
Burn Rate Category	3		Burn Rate Category	3
Burn Rate (kg/hr-dry)	1.41		Burn Rate (kg/hr-dry)	1.71
OA Efficiency %	77.2		OA Efficiency %	76.3
Emissions Rate Cap (g/hr)	15		Emissions Rate Cap (g/hr)	18
Weighting Factor	20.43%		Weighting Factor	20.05%
Run Number	3		Run Number	4

CSA B415.1-10 - Weighted Average

DIRIGO LABORATORIES INC.

Client:	FPI
Model:	F1500I1500
Tracking No.:	72
Project No.:	015-S-072-1
Test Dates:	10/25/16 - 10/27/16



Summary Table:

	Run 1	Run 2	Run 3	Run 4
Date	*10/25/2016*	*10/25/2016*	*10/26/2016*	*10/26/2016*
Run Number	*1*	*2*	*3*	*4*
Emission Rate (g/hr)	*0.83*	*1.00*	*1.23*	*0.91*
Burn Rate (kg/hr)	*0.97*	*1.19*	*1.41*	*1.71*
Heat Output (Btu/hr)	*14244*	*17527*	*20386*	*24488*
Overall Efficiency (% HHV)	*78.50*	*78.30*	*77.20*	*76.30*
CO Emissions (g/MJ Output)	*1.15*	*0.66*	*1.07*	*0.92*
CO Emissions (g/kg Dry Fuel)	*17.33*	*12.25*	*22.93*	*23.67*
CO Emissions (g/min)	*0.29*	*0.20*	*0.38*	*0.39*
Emissions Rate – First Hour (g/hr)	*0.90*	*1.60*	*1.10*	*0.50*
Particulate emission average of 4 test runs: 1.0 grams per hour.				
Weighted average HHV efficiency of 2 test runs: 77.7%.				
Average CO emissions of 4 test runs: 0.32g/min.				

Run 1:

Run #1 was a category II burn rate performed on 10/25/16. The test duration was 2 hours 40 minutes. The fuel weight was 6.8 lbs. There was an average particulate emissions rate of 0.83 g/hr. The run had an overall efficiency of 78.5%. The A filter was changed at 1 hr. The 1-hour filter catch was 1.8 mg. All test results were appropriate and valid. The burn rate category was achieved. There were no anomalies and all criteria were met.

Run 2:

Run 2 was a category II burn rate performed on 10/25/16. The test duration was 2 hours 10 minutes. The fuel weight was 6.8 lbs. There was an average particulate emissions rate of 1.0 g/hr. The run had an overall efficiency of 78.3%. The A filter was changed at 1 hr. The 1-hour filter catch was 1.5 mg. All test results were appropriate and valid. The burn rate category was achieved. There were no anomalies and all criteria were met.

Run 3:

Run 3 was a category III burn rate performed on 10/26/16. The test duration was 1 hour 50 minutes. The fuel weight was 6.8 lbs. There was an average particulate emissions rate of 1.23 g/hr. The run had an overall efficiency of 77.2%. The A filter was changed

at 1 hr. The 1-hour filter catch was 2.2 mg. All test results were appropriate and valid. The burn rate category was achieved. There were no anomalies, and all criteria were met.

Run 4:

Run 4 was a category IV burn rate performed on 10/26/16. The test duration was 1 hour 30 minutes. The fuel weight was 6.9 lbs. There was an average particulate emissions rate of 0.91 g/hr. The run had an overall efficiency of 76.3%. The A filter was changed at 1 hr. The 1-hour filter catch was 1.0 mg. All test results were appropriate and valid. The burn rate category was achieved. There were no anomalies and all criteria were met.

Run 5:

Run 5 was the fan confirmation run performed on 10/27/16. The test duration was 2 hours 20 minutes. The fuel weight was 6.8 lbs. There was an average particulate emissions rate of 0.63 g/hr. Per Method 28 & ASTM E2515-10 a category II run was performed with the fan in the off position. The emission rate resulting from this test run without the blower operating is equal to or less than the emissions rate plus 1.0 g/h for the test run in the medium burn rate category with the blower operating. Because of this, the wood heater is considered to have the same average emissions rate with or without the blower operating. Additional test runs without the blower operating are unnecessary.

Note:

Per Method 28 section 8.1.1.3.2 Note, a total of 2 category II runs were performed with Run 1 being between 0.80 kg/hr and 1.0kg/hr per the method.

Precision:

Dual Train Comparison (ASTM E2515 11.7 - If either criterion (7.5% of average or 0.5 g/kg difference) is met, the run is valid.									
Run #	Train A % of avg.	Train B % of avg.	Max difference	<7.5% of average?		Train A g/kg	Train B g/kg	Difference	<0.5 g/kg from each other?
1	94	106	6	✓		0.809	0.912	0.10	✓
2	99	101	1	✓	Or	0.833	0.849	0.02	✓
3	105.96	94.1	5.93	✓		0.927	0.823	0.10	✓
4	91.4	108.6	8.6	**No**		0.485	0.577	0.09	✓
5	102.6	97.4	2.6	✓		0.59	0.56	0.03	✓

All runs are valid per the requirements of ASTM E2515 11.7

Filter Catch:

Run 1:

	Project #	015-S-072-1				MFG	FPI										
	Run #	1				Model	F1500/I1500										
	Date	10/28/16															
	Train A	Front	Rear	Filter #	Tare	Final	Net		**Train B**	Front	Rear	Filter #	Tare	Final	Net		
	First Hour	☑		2950	0.1198	0.1216	0.0018			☑	☐	2952					
		☐	☑	2951						☐	☑	2953	0.2382	0.2404			
		☑	☐	2955	0.2370	0.2370				☑	☐	O ring					
		☑	☐	O Ring						☐	☑	O ring	3.5633	3.5634	0.0023		
		☐	☑	O Ring	3.5787	3.5787	0.0000										
							1.8	mg								2.3	mg
	Nozzle								Nozzle								
	#	TARE		FINAL		Net			#	TARE		FINAL		Net			
	13A	117.4544		117.4547		0.0003	0.3		13B	117.0649		117.0649		0.0000	0.0		
	Train A Total Catch						2.1		Train B Total Catch						2.3		
	Ambient ☑	Filter #		Tare	Final	Net	Vol (liter)										
		2954		0.1194	0.1196	0.0002	874.364										
		O ring		1.6665	1.6665	0.0000											
					Total	0.0002	mg										
Notes:	Train A Total: 2.1mg		Train B Total: 2.3mg		Ambient Total: 0.2mg		1 Hour Catch: 1.8mg										

Run 2:

	Project #	015-S-072-1				MFG	FPI										
	Run #	2				Model	F1500/I1500										
	Date	10/28/16															
	Train A	Front	Rear	Filter #	Tare	Final	Net		**Train B**	Front	Rear	Filter #	Tare	Final	Net		
	First Hour	☑		2956	0.1185	0.1200	0.0015			☑	☐	2958					
		☐	☑	2957						☐	☑	2959	0.2377	0.2393			
		☑	☐	2961	0.2383	0.2384				☑	☐	O ring					
		☑	☐	O Ring						☐	☑	O ring	3.5930	3.5931	0.0017		
		☐	☑	O Ring	3.5415	3.5418	0.0004										
							1.9	mg								1.7	mg
	Nozzle								Nozzle								
	#	TARE		FINAL		Net			#	TARE		FINAL		Net			
	2A	116.2365		116.2366		0.0001	0.1		2B	116.3297		116.3300		0.0003	0.3		
	Train A Total Catch						2.0		Train B Total Catch						2.0		
	Ambient ☑	Filter #		Tare	Final	Net	Vol (liter)										
		2960		0.1196	0.1196	0.0	711.411										
		O ring		1.6890	1.6890	0.0											
					Total	0.0	mg										
Notes:	Train A Total: 2.0mg		Train B Total: 2.0mg		Ambient Total: 0.0mg		1 Hour Catch: 1.5mg										

Run 3:

	Project #	015-S-072-1				MFG	FPI										
	Run #	3				Model	F1500/I1500										
	Date	11/1/16															
	Train A	Front	Rear	Filter #	Tare	Final	Net		**Train B**	Front	Rear	Filter #	Tare	Final	Net		
	First Hour	☑		2962	0.1184	0.1206	0.0022			☑	☐	2964					
		☐	☑	2963						☐	☑	2965	0.2367	0.2388			
		☑	☐	2967	0.2379	0.2379				☑	☐	O ring					
		☑	☐	O Ring						☐	☑	O ring	3.5486	3.5485	0.0020		
		☐	☑	O Ring	3.5423	3.5423	0.0000										
							2.2	mg							2.0	mg	
	Nozzle								Nozzle								
	#	TARE		FINAL		Net			#	TARE		FINAL		Net			
	3A	116.0717		116.0718		0.0001	0.1		3B	116.3407		116.3407		0.0000	0.0		
	Train A Total Catch						2.3		Train B Total Catch						2.0		
	Ambient ☑	Filter #		Tare	Final	Net	Vol (liter)										
		2966		0.1197	0.1197	0.0	597.11										
		O ring		1.6859	1.6859	0.0											
					Total	0.0	mg										
Notes:	Train A Total: 2.3			Train B Total: 2.0mg			Ambeint Total: 0.0mg		1 Hour Catch: 2.2mg								

Run 4:

	Project #	015-S-072-1				MFG	FPI										
	Run #	4				Model	F1500/I1500										
	Date	11/1/16															
	Train A	Front	Rear	Filter #	Tare	Final	Net		**Train B**	Front	Rear	Filter #	Tare	Final	Net		
	First Hour	☑		2968	0.1190	0.1200	0.0010			☑	☐	2970					
		☐	☑	2969						☐	☑	2971	0.2393	0.2407			
		☑	☐	2973	0.2368	0.2368				☑	☐	O ring					
		☑	☐	O Ring						☐	☑	O ring	3.5460	3.5460	0.0014		
		☐	☑	O Ring	3.5812	3.5813	0.0001										
							1.1	mg							1.4	mg	
	Nozzle								Nozzle								
	#	TARE		FINAL		Net			#	TARE		FINAL		Net			
	4A	116.1847		116.1848		0.0001	0.1		4B	116.3976		116.3976		0.0000	0.0		
	Train A Total Catch						1.2		Train B Total Catch						1.4		
	Ambient ☑	Filter #		Tare	Final	Net	Vol (liter)										
		2972		0.1187	0.1187	0.0000	490.026										
		O ring		1.6880	1.6879	0.0000											
					Total	0.0000	mg										
Notes:	Train A Total: 1.2mg			Train B Total: 1.4mg			Ambient Total: 0.0mg		1 Hour Catch: 1.0mg								

Run 5 – Fan Confirmation:

	Project #	015-S-072-1				MFG	FPI										
	Run #	5				Model	F1500/I1500										
	Date	11/1/16															
	Train A	Front	Rear	Filter #	Tare	Final	Net		**Train B**	Front	Rear	Filter #	Tare	Final	Net		
	First Hour	☑		2974	0.1191	0.1207	0.0016			☑	☐	2976					
		☐	☑	2975						☐	☑	2977	0.2375	0.2390			
		☑	☐	2979	0.2375	0.2375				☑	☐	O ring					
		☑	☐	O Ring						☐	☑	O ring	3.5208	3.5208	0.0015		
		☐	☑	O Ring	3.5852	3.5852	0.0000										
							1.6	mg							1.5	mg	
	Nozzle								Nozzle								
	#	TARE		FINAL		Net			#	TARE		FINAL		Net			
	5A	116.7743		116.7743		0.0000	0.0		5B	116.8844		116.8844		0.0000	0.0		
	Train A Total Catch						1.6		Train B Total Catch						1.5		
	Ambient ☑	Filter #		Tare	Final	Net	Vol (liter)										
		2978		0.1196	0.1198	0.0002	757.172										
		O ring		1.6597	1.6596	0.0000											
					Total	0.0002	mg										
Notes:	Train A Total: 1.6mg			Train B Total: 1.5mg			Ambient Total: 0.2mg		1 Hour Catch: 1.6mg								

Catch Weight Discussion:

There were no negative catch weights recorded on any filters, o-rings or probes.

Test Condition Summary:

All testing conditions for all runs fell within allowable specifications of EPA Method 28R, ASTM E2780-10 and ASTM E2515-10. A summary of facility conditions, temperature averages, fuel burned and run times is listed below.

Runs	Ambient (Deg. F)		Barometric Pressure (In. Hg.)	Test Fuel Burned (Lbs.)	Fuel Loading Density (lbs/ft3)	Test Fuel Moisture (Dry Basis)	Run Time (Min.)
	Pre	Post					
1	71	74	29.94	6.8	6.93	19.8	160
2	74	75	29.94	6.8	6.93	19.5	130
3	74	75	29.82	6.8	6.93	19.7	110
4	76	76	29.82	6.9	7.04	22.2	90

Heater Specifications:

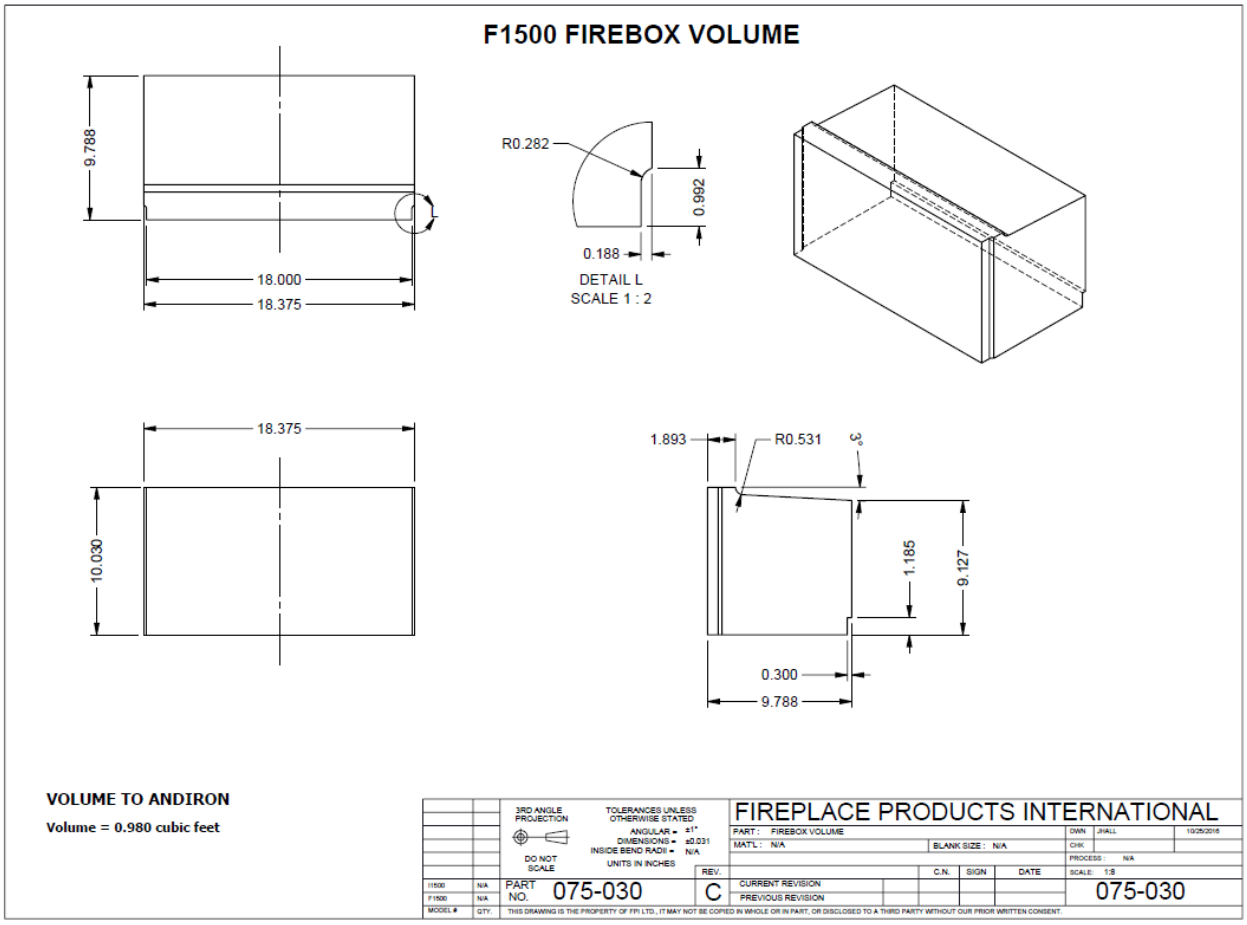
Dimensions, firebox configuration, air supply locations, air introduction locations, and baffle locations of the wood heater are referenced below and on the following page.

Heater Dimensions

Heater Dimensions				
Height	Width	Depth	Firebox Volume	Weight
9.127”	18.375”	9.788”	0.98 ft^3	239.4 lbs

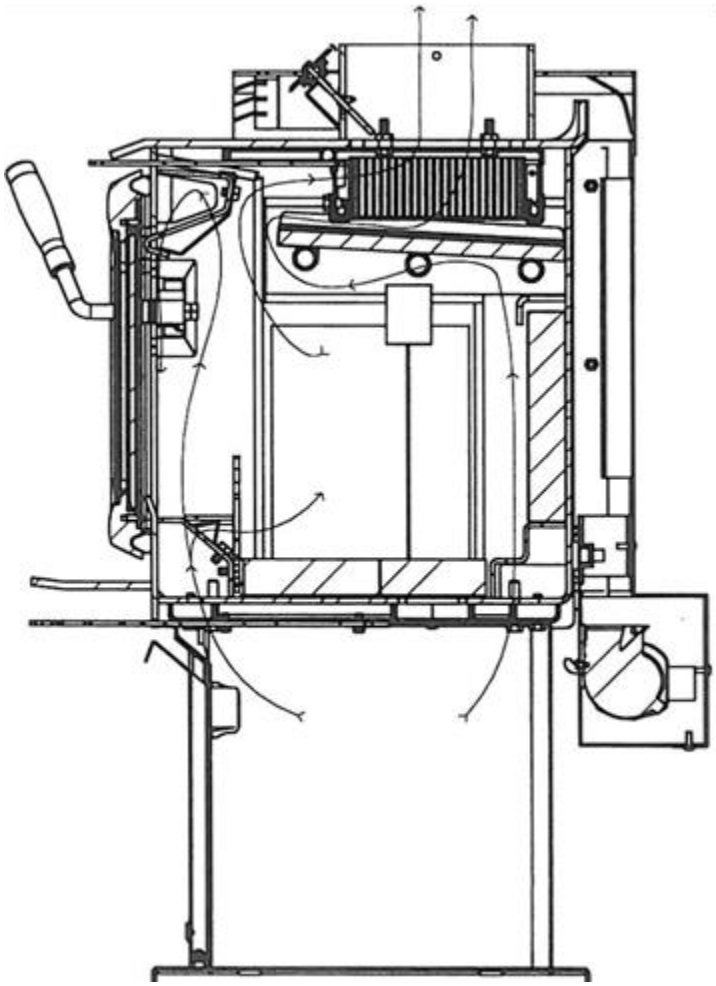
Actual firebox volume calculated using 3D CAD.

Firebox Volume:



Useable Fire Box Volume = 0.98 Cubic Feet

Air Flow Schematic



Pictures:

Front

Left

Right

Rear

Process Operations and Description:

The appliance was operated according to procedures as described in the Operations Manual. Detailed run information can be found in corresponding digital folders submitted with this report.

Settings & Run Notes

	Run Notes	
	Pre-Burn	**Test Run**
Run 1	Primary set to position #10. Start at 1029	Category II: Test start: 1130 - Door open 1 minute, Primary fully open. By-pass open at 1 minute, by-pass closed at 3 minutes, 50 seconds. At 5 mins Primary air set to position #10, fan off. Fan set to low at 1200. Front Filter change at 1230. END test: 1410 – Run time 2 hours, 40 minutes.
Run 2	Primary set to position #13. Start at 1546	Category II: Test start: 1647 – Door open 1 minute 10 seconds, Primary fully open. By-pass open at 1 minute, 10 seconds, by-pass closed at 4 minutes. At 5 mins Primary set to position #13, fan off. Fan set to low at 1717. Front filter change at 1747. END Test: 1857 - Run time 2 hours, 10 mins.
Run 3	Primary set to position #19. Start at 1036	Category III: Test start: 1137 - Door open 1 minute 28 seconds, Primary fully open. By-pass closed entire time. At 5 mins Primary set to position #19, fan off. Fan on high at 1207. Front filter changed at 1237. END test: 1327 - Run time 1 hour, 50 minutes.
Run 4	Primary fully open. Start at 1354	Category IV(maximum): Test start: 1455. Door Open 1 minute. Primary air fully open. By-pass closed entire time. Fan on high at 1525. Front filter changed at 1555. END test: 1625. Run Time: 1 hour, 30 minutes.
Run 5	Primary set to position #11. Start at 1045	Fan Confirmation - Fan OFF. Category II: Test start: 1145. Door open 1 minute 10 seconds, Primary fully open. By-pass open at 1 minute, 10 seconds, closed at 3 minutes, 40 seconds. At 5 mins Primary air set to position #11. Fan remained off for entire test. Changed front filter at 1245. END test: 1405 - Run time: 2 hours 20 minutes.

*Testing was performed on a prototype model with a wider air setting range than is available on production models. Production models utilized fixed openings with the same overall air inlet area as that used in testing. This test data represents use of the lowest possible burn setting available to consumers, see drawings appendix for further detail.

Primary Air Control

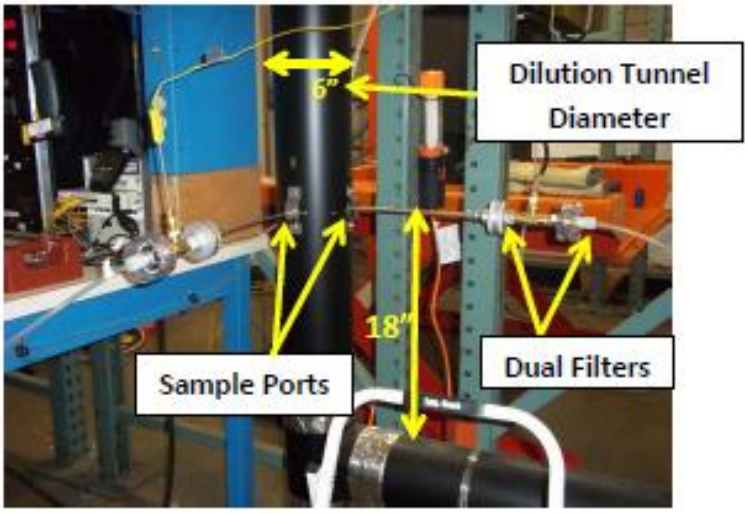
Test Fuel Properties:

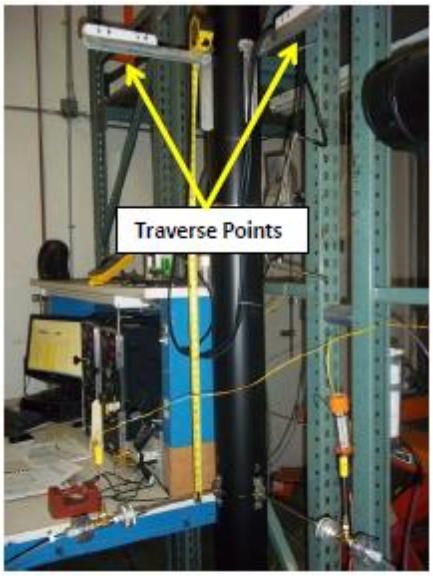
Fuel consisted of 2”x4”x16” Green, Douglas fir. Detailed fuel load specifications for each run can be found in the corresponding digital folders submitted with this report.

Sampling Locations and Descriptions:

Sample ports are located 16.5 feet downstream from any disturbances and 1 foot upstream from any disturbances. Flow rate traverse data was collected 12 feet downstream from any disturbances and 5.5 feet upstream from any disturbances. (See below)

Sample Points





Sampling Methods:

EPA ASTM E2515-11 was used in collecting particulate samples. The dilution tunnel is 6 inches in diameter. All sampling conditions per ASTM E2515-11 were followed. No alternate procedures were used.

Analytical Methods Description:

All sample recovery and analysis procedures followed EPA ASTM E2515-11 procedures. At the end of each test run, filters and probes were removed from their housings, dessicated for 24 hours, and then weighed at 6 hour intervals to a constant weight per ASTM E2515-11 section 11.0.

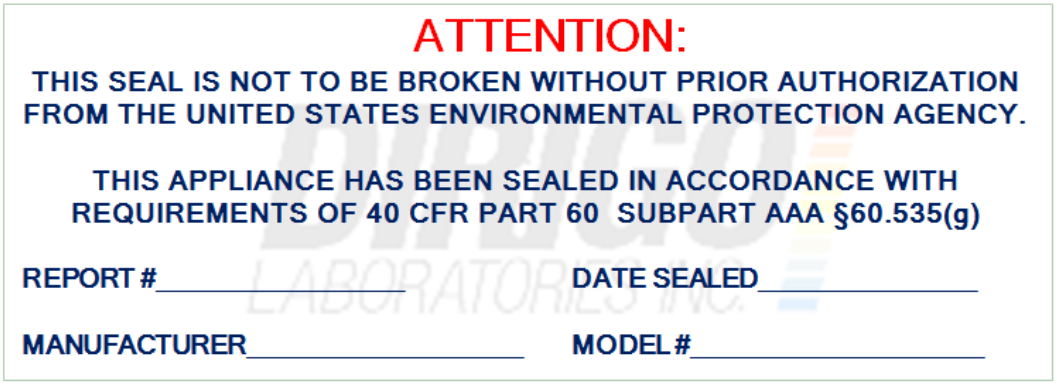
Calibration, Quality Control and Assurances:

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E2780-10. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

Appliance Sealing and Storage:

Following securing with metal strapping and the seal below, the appliance was placed into storage at client facilities located at: 6988 Venture Street, Delta, BC V4G 1H4, Canada.

Sealing Label



Sealed Unit


ATTENTION:
TO BE BROKEN WITHOUT PRIOR AUTHORIZATION
STATES ENVIRONMENTAL PROTECTION AGENCY.
HAS BEEN SEALED IN ACCORDANCE WITH
OF 40 CFR PART 60 SUBPART AAA §60
072-1
FPI
DATE SEALED 11/1/16
MODEL # F1500

Sampling and Analytical Procedures

All Sampling and analytical procedures were performed by Ben Nelke and Gary Nelke, CMfgE. All procedures used were directly from EPA Method 28R, ASTM 2515-11 and ASTM E2780-10. No alternative procedures were used for this test series.

Participants

The following personnel performed all testing:

- Ben Nelke, Gary Nelke, CMfgE

Analysis and Report Writing

The following people were involved with analysis and report writing:

- Ben Nelke, Gary Nelke, CMfgE, Doug Towne

Observers:

The following people were observers during testing:

- Dave Lal

Appliance Updates

No updates to the appliance were made.

Test Equipment Calibration Audit:

- Calibrations for the platform scale and bench scale were performed with Certified Class F weights
- Moisture meter calibration was performed with Delmhorst moisture meter calibrator
- Gas Analyzer calibration performed with certified EPA Protocol gases
- 47mm filters weighed to a constant weight with calibrated analytical balance

All equipment calibration data submitted in separate digital file along with this report.

Accreditations:

CERTIFICATE OF ACCREDITATION

This certifies that:

Dirigo Laboratories, Inc.

Has satisfied the requirements for laboratory accreditation for the certification of wood heaters pursuant to subpart AAA of 40 CFR Part 60, New Source Performance Standards For Residential Wood Heaters and subpart QQQQ of 40 CFR Part 60, Standards of Performance for New Hydronic Heaters and Forced Air Furnaces.

October 21, 2015 - October 21, 2020
EFFECTIVE DATE

MEASUREMENT TECHNOLOGY GROUP
GROUP LEADER

Methods 28R, 28 WHH, 28 WHH-PTS,
All Methods listed in Sections 60.534 and 60.5476
METHODS

4
CERTIFICATE NUMBER

American Association for Laboratory Accreditation

Accredited Inspection Body

A2LA has accredited

DIRIGO LABORATORIES, INC.

Clackamas, OR

for technical competence as an

Inspection Body

This inspection body is accredited in accordance with the recognized International Standard ISO/IEC 17020:2012 *Conformity Assessment – Requirements for the operation of various types of bodies performing inspection.* This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.

Presented this 17th day of October 2014.

President & CEO
For the Accreditation Council
Certificate Number 3726.03
Valid to December 31, 2016

For the inspections to which this accreditation applies, please refer to the organization's Inspection Body Scope of Accreditation.

American Association for Laboratory Accreditation

Accredited Laboratory

A2LA has accredited

DIRIGO LABORATORIES, INC.

Clakamas, OR

for technical competence in the field of

Mechanical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 17th day of October 2014.

President & CEO
For the Accreditation Council
Certificate Number 3726.01
Valid to December 31, 2016

For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Mechanical Scope of Accreditation.

American Association for Laboratory Accreditation

Accredited Product Certification Body

A2LA has accredited

DIRIGO LABORATORIES, INC.

Clackamas, OR

for technical competence as a

Product Certification Body

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC 17065:2012 *Conformity Assessment – Requirements for Bodies Certifying Products, Processes and Services.* This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.

Presented this 17th day of October 2014.

President & CEO
For the Accreditation Council
Certificate Number 3726.02
Valid to December 31, 2016

For the product certification schemes to which this accreditation applies, please refer to the organization's Product Certification Scope of Accreditation

List of Appendices:

The following appendices have been submitted electronically in conjunction with this report:

Appendix A – Test Run Data, Technician Notes, and Sample Analysis

Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

DIRIGO LABORATORIES INC.

Client:	FPI
Model:	F1500I1500
Tracking No.:	72
Project No.:	015-S-072-1
Test Dates:	10/25/16 - 10/27/16

Run Number	(kg/hr) Burn Rate	% Overall Efficiency
1	0.97	78.5
2	1.19	78.3
3	1.41	77.2
4	1.71	76.3

Total Runs: 4

CSA B415.1-10 Weighted Average

DIRIGO LABORATORIES INC.

Weighted Average: 77.7 %

Client:	FPI
Model:	F1500I1500
Tracking No.:	72
Project No.:	015-S-072-1
Test Dates:	10/25/16 - 10/27/16

Burn Rate Category	2	Burn Rate Category	2
Burn Rate (kg/hr-dry)	0.97	Burn Rate (kg/hr-dry)	1.19
OA Efficiency %	78.5	OA Efficiency %	78.3
Emissions Rate Cap (g/hr)	15	Emissions Rate Cap (g/hr)	15
Weighting Factor	36.00%	Weighting Factor	23.52%
Run Number	1	Run Number	2

Burn Rate Category	3	Burn Rate Category	3
Burn Rate (kg/hr-dry)	1.41	Burn Rate (kg/hr-dry)	1.71
OA Efficiency %	77.2	OA Efficiency %	76.3
Emissions Rate Cap (g/hr)	15	Emissions Rate Cap (g/hr)	18
Weighting Factor	20.43%	Weighting Factor	20.05%
Run Number	3	Run Number	4

DIRIGO LABORATORIES INC.

Test No.	Burn Rate	Pi	Ei	Ki	KiEi
1	0.97	0.349	78.5	0.538	42.23
2	1.19	0.538	78.3	0.352	27.53
3	1.41	0.700	77.2	0.305	23.58
4	1.71	0.843	76.3	0.300	22.86
0	5.00	1.000	0.0	0.000	0.00
0	5.00	1.000	0.0	0.000	0.00
0	5.00	1.000	0.0	0.000	0.00
0	5.00	1.000	0.0	0.000	0.00
		1.000		1.495	116.20

Nomenclature:
Pi = Probability for burn rate during test run
Ei = Emissions Rate for test run
Ki = Test run weighting factor

Burn Rate (kg/hr-dry)	Cum. Probability (P)
0.00	0.0000
0.01	0.0004
0.02	0.0008
0.03	0.0012
0.04	0.0016
0.05	0.0020
0.06	0.0030
0.07	0.0040
0.08	0.0050
0.09	0.0060
0.10	0.0070
0.11	0.0080
0.12	0.0090
0.13	0.0100
0.14	0.0110
0.15	0.0120
0.16	0.0128
0.17	0.0136
0.18	0.0144
0.19	0.0152

VERSION: 2.4 4/15/2010

lanufacturer: FPI
Model: F1500
Date: 11/1/2016
Run: 5
Control #: 015-S-072-1
est Duration: 140
urn Category 2

Appliance Type: Cat (Cat, Non-Cat, Pellet)

Temp. Units F (F or C)
Weight Units lb (kg or lb)

Wood Moisture (% DRY): 20.3
Wood Moisture (% wet): 16.87
Load Weight (lb wet): 6.80
Burn Rate (dry kg/h): 1.10
Total Particulate Emissions: 1.47 g

Fuel Data

	D. Fir	
HHV	19,810	kJ/kg
%C	48.73	
%H	6.87	
%O	43.90	
%Ash	0.50	

(●) Dougla ( ) Oak

Averages		**351.4**	**72.5**	**11.18**	**9.56**	**0.19**
		Temp. (F)				
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas**	**Room Temp**	**Flue Gas Composition (%) O2**	**CO2**	**CO**
0	6.8	342.0	73.0	13.87	6.34	0.26
10	5.9	375.0	73.0	13.04	7.95	0.14
20	4.9	380.0	73.0	7.94	13.47	0.08
30	3.8	397.0	73.0	5.33	15.97	0.21
40	2.7	432.0	73.0	3.31	17.56	0.55
50	1.9	398.0	73.0	7.24	13.77	0.03
60	1.4	362.0	73.0	10.56	10.15	0.05
70	1.1	345.0	73.0	12.09	8.41	0.12
80	0.9	332.0	72.0	12.55	8.03	0.16
90	0.7	323.0	72.0	12.75	7.87	0.18
100	0.6	321.0	72.0	13.07	7.53	0.20
110	0.4	320.0	72.0	13.41	7.23	0.23
120	0.2	319.0	72.0	13.73	6.86	0.24
130	0.1	316.0	72.0	14.23	6.34	0.24
140	0.0	309.0	72.0	14.62	5.96	0.23

Manufacturer:	FPI
Model:	F1500
Date:	11/1/2016
Run:	5
Control #:	015-S-072-1
Test Duration:	140 min

	HHV	LHV
Eff	77.7%	84.0%
Comb Eff	98.9%	98.9%
HT Eff	78.6%	85.0%
Output	16,925	kJ/h
Burn Rate	1.10	kg/h
Grams CO	47	g
Input	21,774	kJ/h
MC wet	16.87	

Overall Heating Efficiency:
Combustion Efficiency:
Heat Transfer Efficiency:

Heat Output:	16,055	
Heat Input:	20,655	
	Ultimate CO2	
CO2-ult	19.64	
	F0	
	1.062	
Burn Duration:	2.333333333	
Burn Rate:	2.4	
Stack Temp:	352.1	

Averages	0.19	9.56	125.0%	20.30	10.64	177.4	22.5	98.5%	77.6%

INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat
Elapsed Time	**Weight Remaining (kg)**	**% CO [e]**	**% CO2 [d]**	**Excess Air EA**	**Total O2**	**Calc. % O2 [g]**	**Flue Gas (ºC)**	**Room Temp (ºC)**	**Eff %**	**Transfer %**
0	3.09	0.26	6.34	197.6%	20.50	14.03	172.2	22.8	97.3%	74.1%
10	2.68	0.14	7.95	142.8%	20.41	12.39	190.6	22.8	99.0%	75.4%
20	2.22	0.08	13.47	45.0%	20.05	6.54	193.3	22.8	99.6%	80.4%
30	1.72	0.21	15.97	21.4%	19.87	3.80	202.8	22.8	99.0%	81.1%
40	1.23	0.55	17.56	8.5%	19.74	1.91	222.2	22.8	97.5%	80.8%
50	0.86	0.03	13.77	42.3%	20.03	6.24	203.3	22.8	99.9%	80.1%
60	0.64	0.05	10.15	92.6%	20.27	10.09	183.3	22.8	99.9%	78.7%
70	0.50	0.12	8.41	130.3%	20.38	11.91	173.9	22.8	99.2%	77.5%
80	0.41	0.16	8.03	139.8%	20.40	12.29	166.7	22.2	98.8%	77.5%
90	0.32	0.18	7.87	144.0%	20.41	12.45	161.7	22.2	98.6%	77.7%
100	0.27	0.20	7.53	154.1%	20.43	12.80	160.6	22.2	98.3%	77.3%
110	0.18	0.23	7.23	163.3%	20.45	13.10	160.0	22.2	97.9%	76.9%
120	0.09	0.24	6.86	176.7%	20.47	13.49	159.4	22.2	97.7%	76.4%
130	0.05	0.24	6.34	198.5%	20.51	14.05	157.8	22.2	97.5%	75.6%
140	0.00	0.23	5.96	217.3%	20.53	14.46	153.9	22.2	97.5%	75.2%

	Air Fuel Ratio (A/F)		
77.7%	Dry Molecular Weight (Md)	29.96	
98.9%	Dry Moles Exhaust Gas (Nr):	399.54	%HC
78.6%	Air Fuel Ratio (A/F)	11.46	0.88

Combustion Efficiency:	98.9%
Total Input (kJ):	50,806
Total Output (kJ):	39,492
Efficiency:	77.7%
Total CO (g):	47.40

Btu/h	16,925	kJ/h
Btu/h	21,774	kJ/h
h		
lb/h	1.1	kg/h
Deg. F	177.8	Deg. C

76.5%	13.5	0.95	69.22	0.01	69.22	51180	4.06	6.87	2.74	19810.00	16.87
Net Eff %	**Air Fuel Ratio**	**Wet Wt Now Wt**	**% Wet Consumed x**	**Dry Wt. Now Wtdn**	**% Dry Comsumed y**	**Fuel Properties**					**Mw Moisture Fuel Burnt**
						Total Input	**Carbon /12= [a]**	**Hydrogen /1= [b]**	**Oxygen /16= [c]**	**Calorific Value**	
72.1%	17.9	3.09	0.00	2.56	0.00	0	4.06	6.87	2.74	19810.00	16.87
74.6%	14.6	2.68	13.24	2.23	13.24	10460	4.06	6.87	2.74	19810.00	16.87
80.2%	8.8	2.22	27.94	1.85	27.94	7845	4.06	6.87	2.74	19810.00	16.87
80.3%	7.4	1.72	44.12	1.43	44.12	8219	4.06	6.87	2.74	19810.00	16.87
78.7%	6.5	1.23	60.29	1.02	60.29	7098	4.06	6.87	2.74	19810.00	16.87
80.0%	8.6	0.86	72.06	0.72	72.06	4856	4.06	6.87	2.74	19810.00	16.87
78.6%	11.6	0.64	79.41	0.53	79.41	2989	4.06	6.87	2.74	19810.00	16.87
76.9%	13.9	0.50	83.82	0.41	83.82	1868	4.06	6.87	2.74	19810.00	16.87
76.6%	14.5	0.41	86.76	0.34	86.76	1494	4.06	6.87	2.74	19810.00	16.87
76.6%	14.7	0.32	89.71	0.26	89.71	1121	4.06	6.87	2.74	19810.00	16.87
76.0%	15.3	0.27	91.18	0.23	91.18	1121	4.06	6.87	2.74	19810.00	16.87
75.3%	15.8	0.18	94.12	0.15	94.12	1494	4.06	6.87	2.74	19810.00	16.87
74.6%	16.6	0.09	97.06	0.08	97.06	1121	4.06	6.87	2.74	19810.00	16.87
73.7%	17.9	0.05	98.53	0.04	98.53	1121	4.06	6.87	2.74	19810.00	16.87
73.3%	19.1	0.00	100.00	0.00	100.00	374	4.06	6.87	2.74	19810.00	16.87

				Moisture Content MCwb:	16.87
		Moisture of Wood (wet basis):	16.87	Dry kg :	2.56
48,187	(Btu)	Initial Dry Weight Wtdo (kg):	2.56	CA:	48.73
37,456	(Btu)	Moisture Content Dry	20.30	HY:	6.87
				OX:	43.90

Load Weight (kg):	3.09					
Fuel Heating:	HHV	LHV		HHV	LHV	
Value in kJ/kg - CV:	19810.00	18328.69	Btu/lb	8522.48	7885.21	

79.61	21.12	2.41	8.24	0.01	0.24	39.86	54.75	0.90	0.04	371.35	34.43
Mass Balance (moles/100 mole dry flue gas)					**kg Wood per 100 mole dfp**	**Moles per kg of Dry Wood**					
[h]	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO2**	**O2**	**CO**	**HC**	**N2**	**H2O**
79.37	21.05	1.63	5.57	0.02	0.16	39.11	86.58	1.60	0.09	489.64	34.33
79.52	21.09	1.99	6.84	0.00	0.20	40.10	62.48	0.71	0.00	401.16	34.52
79.91	21.20	3.34	11.46	0.00	0.33	40.57	19.68	0.24	0.00	240.68	34.52
80.02	21.23	3.99	13.66	0.02	0.40	40.22	9.56	0.53	0.06	201.55	34.40
79.98	21.22	4.48	15.23	0.08	0.45	39.41	4.28	1.23	0.17	179.48	34.18
79.96	21.21	3.40	11.68	-0.01	0.34	40.74	18.47	0.09	-0.02	236.56	34.56
79.71	21.14	2.51	8.64	-0.01	0.25	40.65	40.41	0.20	-0.04	319.21	34.59
79.56	21.10	2.10	7.22	0.00	0.21	40.25	56.98	0.57	-0.01	380.75	34.54
79.52	21.09	2.02	6.92	0.00	0.20	40.00	61.21	0.80	0.02	396.10	34.49
79.50	21.09	1.98	6.80	0.01	0.20	39.87	63.06	0.91	0.03	402.75	34.46
79.47	21.08	1.91	6.53	0.01	0.19	39.71	67.50	1.05	0.05	419.12	34.43
79.44	21.07	1.84	6.30	0.01	0.18	39.49	71.56	1.26	0.07	433.87	34.39
79.41	21.06	1.75	5.99	0.01	0.17	39.36	77.41	1.38	0.08	455.61	34.37
79.37	21.05	1.62	5.55	0.01	0.16	39.25	86.95	1.49	0.08	491.39	34.37
79.35	21.05	1.53	5.22	0.01	0.15	39.23	95.16	1.51	0.07	522.33	34.39

11.28	450.59	6258.77	4671.31	4532.95	4484.71	6110.14	5421.36	295.67	3745.66	3599.10	3900.57
Moisture Present	Stack Temp K	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp K	Energ		
		CO2	O2	CO	N2	CH4	H2O		CO2	O2	CO
11.28	445.37	6020.94	4500.95	4369.40	4322.54	5862.32	5226.33	295.93	235.50	389.70	460.86
11.28	463.71	6804.17	5066.95	4914.04	4862.34	6667.61	5876.24	295.93	272.87	316.58	203.33
11.28	466.48	6923.70	5152.97	4996.72	4944.32	6791.27	5974.88	295.93	280.88	101.42	69.39
11.28	475.93	7331.74	5445.96	5278.18	5223.38	7214.93	6310.58	295.93	294.90	52.08	152.47
11.28	495.37	8179.98	6051.71	5859.21	5799.65	8102.91	7003.33	295.93	322.33	25.93	356.51
11.28	476.48	7355.83	5463.22	5294.75	5239.81	7240.01	6330.34	295.93	299.68	100.92	25.59
11.28	456.48	6494.47	4843.62	4699.26	4649.44	6348.13	5619.99	295.93	263.99	195.75	57.61
11.28	447.04	6091.74	4552.28	4418.84	4371.52	5934.75	5285.33	295.93	245.17	259.39	165.05
11.28	439.82	5806.70	4346.38	4220.74	4175.18	5641.46	5048.95	295.37	232.25	266.06	228.90
11.28	434.82	5595.59	4192.79	4072.69	4028.49	5426.66	4872.19	295.37	223.09	264.41	261.77
11.28	433.71	5548.78	4158.69	4039.81	3995.92	5379.12	4832.93	295.37	220.36	280.73	302.76
11.28	433.15	5525.38	4141.65	4023.37	3979.63	5355.37	4813.31	295.37	218.19	296.38	360.55
11.28	432.59	5502.00	4124.60	4006.93	3963.35	5331.64	4793.68	295.37	216.55	319.27	395.20
11.28	430.93	5431.89	4073.49	3957.63	3914.51	5260.56	4734.81	295.37	213.20	354.20	426.35
11.28	427.04	5268.64	3954.33	3842.66	3800.62	5095.30	4597.52	295.37	206.69	376.28	434.25

SUMS				AVERAGE	SUMS					
24131.00	589.17	25511.25	8355.27	4655.47	11314	569	10745.47	39866	569	47.40
y Losses (kJ/kg of Dry Fuel)				**Total**						
Flue Gas Constituent				**Loss**	**Total**	**Chemical**	**Sensible and**	**Total**	**Chem**	**Grams Pr**
N2	**CH4**	**H2O Comb**	**H2O Fuel MC**	**Rate**	**Loss**	**Loss 1**	**Latent Loss**	**Output**	**Loss 2**	**CO**
2116.47	84.69	1689.05	554.82	5531.10	0	0	0.00	0	0	0.00
1950.58	2.17	1720.55	562.15	5028.23	2655	107	2548.34	7805	107	10.44
1190.01	3.10	1723.85	563.26	3931.90	1557	28	1528.88	6288	28	2.67
1052.75	55.38	1729.58	567.05	3904.19	1620	85	1534.86	6599	85	6.14
1040.92	155.41	1742.06	574.86	4218.02	1511	180	1330.99	5587	180	12.38
1239.54	-15.06	1738.15	567.27	3956.09	970	2	967.35	3887	2	0.61
1484.15	-32.12	1715.50	559.26	4244.12	640	4	636.54	2348	4	0.85
1664.46	-7.14	1701.17	555.48	4583.59	432	15	417.53	1436	15	1.52
1653.77	15.85	1690.49	552.82	4640.14	350	18	331.81	1144	18	1.68
1622.48	28.18	1683.05	550.82	4633.80	262	16	245.97	859	16	1.44
1674.76	40.43	1680.36	550.38	4749.78	269	19	249.55	852	19	1.67
1726.63	60.88	1677.46	550.16	4890.24	369	31	337.50	1125	31	2.65
1805.73	68.23	1675.98	549.94	5030.90	285	26	258.73	836	26	2.18
1923.57	68.67	1673.91	549.28	5209.18	295	28	267.05	826	28	2.35
1985.20	60.51	1670.08	547.73	5280.74	100	9	90.37	274	9	0.80

1.61

oduced HC
0.00
0.02
0.02
0.41
0.99
-0.07
-0.09
-0.01
0.02
0.03
0.04
0.08
0.07
0.07
0.02

Dirigo Laboratories, Inc.

Manufacturer:	**FPI**
Model:	**F1500**
Date:	**11/1/2016**
Run:	**5**
Control #:	**015-S-072-1**
Test Duration:	**140**
Output Category:	**2**

	HHV Basis	LHV Basis	
Overall Efficiency	77.7%	84.0%	
Combustion Efficiency	98.9%	98.9%	
Heat Transfer Efficiency	78.6%	85.0%	

HHV Output Rate (kJ/h)	16,925	16,055	**(Btu/h)**
Burn Rate (kg/h)	1.10	2.42	**(lb/h)**
Input (kJ/h)	21,774	20,655	**(Btu/h)**

Test Load Weight (dry kg)	2.6	5.7	**dry lb**
MC wet (%)	16.87		
MC dry (%)	20.30		
Particulate (g)	1.47		
CO (g)	47		
Test Duration (h)	2.333333333		

Emissions	**Particulate**	**CO**
g/MJ Output	0.04	1.20
g/kg Dry Fuel	0.57	18.48
g/h	0.63	20.31
lb/MM Btu Output	0.09	2.79

Air/Fuel Ratio (A/F)	11.46

Test Results in Accordance with CSA B415.1-10

Default Fuel Values

	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

VERSION: 2.4 4/15/2010

Manufacturer: FPI
Model: F1500
Date: 11/1/2016
Run: 4
Control #: 015-S-072-1
Test Duration: 90
Burn Category 3

Appliance Type: Cat

Temp. Units F
Weight Units lb

Wood Moisture (% DRY):	22.2	
Wood Moisture (% wet):	18.17	
Load Weight (lb wet):	6.90	
Burn Rate (dry kg/h):	1.71	
Total Particulate Emissions:	1.36	g

Fuel Data

	D. Fir
HHV	19,810
%C	48.73
%H	6.87
%O	43.90
%Ash	0.50

Averages		**446.7**	**76.0**	**9.60**	**10.91**
		Temp. (F)			
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas**	**Room Temp**	**Flue Gas Compositi O2**	**CO2**
0	6.9	396.0	76.0	15.93	4.09
10	5.8	473.0	76.0	4.36	16.43
20	4.0	539.0	76.0	2.88	17.91
30	2.6	551.0	76.0	1.97	18.63
40	1.5	508.0	76.0	6.77	13.62
50	0.9	442.0	76.0	11.21	9.26
60	0.7	407.0	76.0	12.66	7.79
70	0.5	393.0	76.0	13.08	7.42
80	0.2	383.0	76.0	13.39	7.12
90	0.0	375.0	76.0	13.73	6.82

(Cat, Non-Cat, Pellet)

(F or C)
(kg or lb)

kJ/kg

Dougla
Oak

0.17

on (%)

CO
0.24
0.16
0.18
0.39
0.02
0.04
0.11
0.16
0.19
0.20

Manufacturer:	FPI
Model:	F1500
Date:	11/1/2016
Run:	4
Control #:	015-S-072-1
Test Duration:	90 min

	HHV	LHV
Eff	76.3%	82.5%
Comb Eff	99.1%	99.1%
HT Eff	77.0%	83.2%
Output	25,815	kJ/h
Burn Rate	1.71	kg/h
Grams CO	36	g
Input	33,834	kJ/h
MC wet	18.17	

Overall Heating Efficiency:
Combustion Efficiency:
Heat Transfer Efficiency:

Heat Output:	24,488
Heat Input:	32,096
Burn Duration:	1.5
Burn Rate:	3.8
Stack Temp:	452.3

Ultimate CO2	
CO2-ult	19.64
F_0	
	1.062

Averages	0.17	10.91	119.5%	20.21	9.22	230.4	24.4	98.8%	74.1%

INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat
Elapsed Time	**Weight Remaining (kg)**	**% CO [e]**	**% CO2 [d]**	**Excess Air EA**	**Total O2**	**Calc. % O2 [g]**	**Flue Gas (ºC)**	**Room Temp (ºC)**	**Eff %**	**Transfer %**
0	3.13	0.24	4.09	353.6%	20.65	16.44	202.2	24.4	96.4%	61.7%
10	2.63	0.16	16.43	18.4%	19.84	3.33	245.0	24.4	99.2%	79.1%
20	1.81	0.18	17.91	8.6%	19.75	1.75	281.7	24.4	99.2%	78.1%
30	1.18	0.39	18.63	3.3%	19.68	0.86	288.3	24.4	98.3%	78.0%
40	0.68	0.02	13.62	44.0%	20.04	6.41	264.4	24.4	100.0%	76.4%
50	0.41	0.04	9.26	111.2%	20.33	11.05	227.8	24.4	100.0%	74.2%
60	0.32	0.11	7.79	148.6%	20.42	12.57	208.3	24.4	99.3%	73.4%
70	0.23	0.16	7.42	159.1%	20.44	12.94	200.6	24.4	98.7%	73.4%
80	0.09	0.19	7.12	168.7%	20.46	13.24	195.0	24.4	98.3%	73.4%
90	0.00	0.20	6.82	179.8%	20.48	13.56	190.6	24.4	98.1%	73.2%
0										

	Air Fuel Ratio (A/F)		
76.3%	Dry Molecular Weight (Md)	30.11	
99.1%	Dry Moles Exhaust Gas (Nr):	355.41	%HC
77.0%	Air Fuel Ratio (A/F)	10.19	0.88

Combustion Efficiency:	99.1%
Total Input (kJ):	50,752
Total Output (kJ):	38,722
Efficiency:	76.3%
Total CO (g):	35.51

Btu/h	25,815	kJ/h
Btu/h	33,834	kJ/h
h		
lb/h	1.7	kg/h
Deg. F	233.5	Deg. C

73.2%	13.2	1.05	66.52	0.01	66.52	51487	4.06	6.87	2.74	19810.00	18.17
Net Eff %	**Air Fuel Ratio**	**Wet Wt Now Wt**	**% Wet Consumed x**	**Dry Wt. Now Wtdn**	**% Dry Comsumed y**	**Fuel Properties**					**Mw Moisture Fuel Burnt**
						Total Input	**Carbon /12= [a]**	**Hydrogen /1= [b]**	**Oxygen /16= [c]**	**Calorific Value**	
59.5%	27.2	3.13	0.00	2.56	0.00	0	4.06	6.87	2.74	19810.00	18.17
78.5%	7.2	2.63	15.94	2.15	15.94	14711	4.06	6.87	2.74	19810.00	18.17
77.4%	6.6	1.81	42.03	1.49	42.03	11769	4.06	6.87	2.74	19810.00	18.17
76.7%	6.3	1.18	62.32	0.97	62.32	9194	4.06	6.87	2.74	19810.00	18.17
76.4%	8.7	0.68	78.26	0.56	78.26	6252	4.06	6.87	2.74	19810.00	18.17
74.2%	12.8	0.41	86.96	0.33	86.96	2942	4.06	6.87	2.74	19810.00	18.17
72.9%	15.0	0.32	89.86	0.26	89.86	1471	4.06	6.87	2.74	19810.00	18.17
72.5%	15.6	0.23	92.75	0.19	92.75	1839	4.06	6.87	2.74	19810.00	18.17
72.1%	16.2	0.09	97.10	0.07	97.10	2574	4.06	6.87	2.74	19810.00	18.17
71.8%	16.8	0.00	100.00	0.00	100.00	736	4.06	6.87	2.74	19810.00	18.17
				0.00							

				Moisture Content MCwb:	18.17
		Moisture of Wood (wet basis):	18.17	Dry kg :	2.56
48,136	(Btu)	Initial Dry Weight Wtdo (kg):	2.56	CA:	48.73
36,726	(Btu)	Moisture Content Dry	22.20	HY:	6.87
				OX:	43.90

Load Weight (kg):	3.13					
Fuel Heating:	HHV	LHV		HHV	LHV	
Value in kJ/kg - CV:	19810.00	18328.69	Btu/lb	8522.48	7885.21	

79.71	21.14	2.73	9.36	0.01	0.27	40.01	52.36	0.78	0.03	362.68	34.46
Mass Balance (moles/100 mole dry flue gas)					**kg Wood per 100 mole dfp**	**Moles per kg of Dry Wood**					
[h]	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO2**	**O2**	**CO**	**HC**	**N2**	**H2O**
79.23	21.01	1.07	3.65	0.01	0.11	38.47	154.69	2.26	0.08	745.28	34.36
80.08	21.24	4.09	14.01	0.02	0.41	40.38	8.19	0.39	0.04	196.78	34.43
80.16	21.26	4.46	15.28	0.02	0.44	40.35	3.93	0.41	0.05	180.62	34.42
80.12	21.25	4.70	16.02	0.06	0.47	39.86	1.84	0.83	0.12	171.42	34.29
79.95	21.21	3.36	11.55	-0.01	0.33	40.77	19.19	0.06	-0.02	239.35	34.57
79.65	21.13	2.29	7.88	-0.01	0.23	40.69	48.54	0.18	-0.05	350.01	34.63
79.53	21.09	1.94	6.69	0.00	0.19	40.27	64.99	0.57	-0.02	411.06	34.57
79.48	21.08	1.87	6.41	0.00	0.19	39.94	69.65	0.86	0.01	427.80	34.50
79.45	21.07	1.80	6.18	0.01	0.18	39.72	73.87	1.06	0.04	443.18	34.45
79.42	21.07	1.73	5.93	0.01	0.17	39.61	78.73	1.16	0.04	461.26	34.44

12.33	503.54	8493.88	6263.62	6059.30	5998.78	8458.34	7240.87	297.59	3402.63	2882.40	2244.75
	Stack	**Heat Content Change - Ambient to Stack Temperature**						**Room**			**Energ**
Moisture	**Temp**	**Flue Gas Constituent**						**Temp**			
Present	**K**	**CO2**	**O2**	**CO**	**N2**	**CH4**	**H2O**	**K**	**CO2**	**O2**	**CO**
12.33	475.37	7244.09	5379.62	5213.57	5159.50	7131.39	6233.24	297.59	278.71	832.17	650.55
12.33	518.15	9124.01	6716.55	6494.50	6430.25	9111.56	7760.00	297.59	368.38	55.04	113.82
12.33	554.82	10777.60	7875.59	7600.60	7528.50	10890.41	9076.95	297.59	434.92	30.97	117.86
12.33	561.48	11082.44	8087.63	7802.51	7729.08	11221.92	9317.22	297.59	441.74	14.87	242.64
12.33	537.59	9996.06	7329.68	7080.13	7011.62	10045.51	8457.43	297.59	407.59	140.64	17.37
12.33	500.93	8360.78	6176.32	5977.57	5917.29	8302.02	7144.07	297.59	340.19	299.78	50.79
12.33	481.48	7509.40	5569.60	5395.93	5340.34	7408.00	6450.71	297.59	302.37	361.97	163.97
12.33	473.71	7171.92	5327.86	5163.87	5110.22	7056.31	6173.96	297.59	286.43	371.07	248.16
12.33	468.15	6931.94	5155.53	4998.32	4946.08	6807.19	5976.50	297.59	275.32	380.83	305.23
12.33	463.71	6740.60	5017.86	4866.00	4814.90	6609.13	5818.66	297.59	266.98	395.06	334.36

SUMS				AVERAGE	SUMS					
20338.94	261.99	17648.83	6315.94	5309.55	12030	457	11572.85	39457	457	35.51
y Losses (kJ/kg of Dry Fuel)				**Total**						
Flue Gas Constituent				**Loss**	**Total**	**Chemical**	**Sensible and**	**Total**	**Chem**	**Grams Pr**
N2	**CH4**	**H2O Comb**	**H2O Fuel MC**	**Rate**	**Loss**	**Loss 1**	**Latent Loss**	**Output**	**Loss 2**	**CO**
3845.25	71.98	1725.06	619.17	8022.89	0	0	0.00	0	0	0.00
1265.33	39.68	1781.25	638.00	4261.51	3165	112	3052.74	11546	112	8.18
1359.82	47.57	1825.68	654.24	4471.06	2656	96	2560.02	9112	96	6.75
1324.92	106.97	1826.93	657.20	4615.27	2142	159	1983.40	7052	159	10.84
1678.24	-19.93	1812.22	646.60	4682.72	1478	-1	1478.74	4774	-1	0.53
2071.08	-47.14	1769.92	630.40	5115.02	760	0	759.22	2182	0	0.73
2195.22	-19.46	1742.81	621.85	5368.72	399	11	388.16	1072	11	1.18
2186.15	12.10	1729.71	618.43	5452.05	506	24	482.34	1333	24	2.24
2191.98	31.98	1720.69	616.00	5522.02	718	43	674.50	1857	43	3.86
2220.94	38.24	1714.55	614.05	5584.20	207	14	193.72	528	14	1.21

1.76

oduced HC
0.00
0.52
0.50
0.88
-0.11
-0.12
-0.03
0.02
0.07
0.03

Dirigo Laboratories, Inc.

Manufacturer:	**FPI**
Model:	**F1500**
Date:	**11/1/2016**
Run:	**4**
Control #:	**015-S-072-1**
Test Duration:	**90**
Output Category:	**3**

	HHV Basis	LHV Basis	
Overall Efficiency	76.3%	82.5%	
Combustion Efficiency	99.1%	99.1%	
Heat Transfer Efficiency	77.0%	83.2%	
HHV Output Rate (kJ/h)	25,815	24,488	**(Btu/h)**
Burn Rate (kg/h)	1.71	3.76	**(lb/h)**
Input (kJ/h)	33,834	32,096	**(Btu/h)**
Test Load Weight (dry kg)	2.6	5.6	**dry lb**
MC wet (%)	18.17		
MC dry (%)	22.20		
Particulate (g)	1.36		
CO (g)	36		
Test Duration (h)	1.5		

Emissions	**Particulate**	**CO**
g/MJ Output	0.04	0.92
g/kg Dry Fuel	0.53	13.86
g/h	0.91	23.67
lb/MM Btu Output	0.08	2.13

Air/Fuel Ratio (A/F)	10.19

Test Results in Accordance with CSA B415.1-10

Default Fuel Values

	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

VERSION: 2.4 4/15/2010

lanufacturer: FPI
Model: F1500
Date: 11/1/2016
Run: 3
Control #: 015-S-072-1
est Duration: 110
urn Category 3

Appliance Type: Cat (Cat, Non-Cat, Pellet)

Temp. Units F (F or C)
Weight Units lb (kg or lb)

Wood Moisture (% DRY): 19.7
Wood Moisture (% wet): 16.46
Load Weight (lb wet): 6.80
Burn Rate (dry kg/h): 1.41
Total Particulate Emissions: 2.26 g

Fuel Data

	D. Fir	
HHV	19,810	kJ/kg
%C	48.73	
%H	6.87	
%O	43.90	
%Ash	0.50	

Dougla
Oak

Averages		405.6	74.5	10.34	10.21	0.17
		Temp. (F)				
Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas	Room Temp	Flue Gas Composition (%) O2	CO2	CO
0	6.8	377.0	74.0	15.87	4.29	0.23
10	5.9	416.0	75.0	8.71	12.23	0.14
20	4.6	478.0	74.0	4.84	16.10	0.26
30	3.2	507.0	74.0	3.59	16.97	0.50
40	2.1	489.0	74.0	4.12	16.53	0.05
50	1.3	447.0	74.0	8.92	11.66	0.01
60	0.9	404.0	75.0	11.50	8.89	0.07
70	0.6	367.0	75.0	12.58	7.86	0.12
80	0.4	355.0	74.0	12.81	7.74	0.16
90	0.2	346.0	75.0	13.18	7.35	0.18
100	0.1	344.0	75.0	13.73	6.75	0.17
110	0.0	337.0	75.0	14.28	6.18	0.16

Manufacturer:	FPI
Model:	F1500
Date:	11/1/2016
Run:	3
Control #:	015-S-072-1
Test Duration:	110 min

	HHV	LHV
Eff	77.2%	83.4%
Comb Eff	99.0%	99.0%
HT Eff	78.0%	84.3%
Output	21,490	kJ/h
Burn Rate	1.41	kg/h
Grams CO	42	g
Input	27,851	kJ/h
MC wet	16.46	

Overall Heating Efficiency:	
Combustion Efficiency:	
Heat Transfer Efficiency:	
Heat Output:	20,386
Heat Input:	26,420
Burn Duration:	1.833333333
Burn Rate:	3.1
Stack Temp:	408.2

Ultimate CO2	
CO2-ult	19.64
F_0	
	1.062

Averages	0.17	10.21	123.4%	20.25	9.96	207.5	23.6	98.8%	75.8%

INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat
Elapsed Time	**Weight Remaining (kg)**	**% CO [e]**	**% CO2 [d]**	**Excess Air EA**	**Total O2**	**Calc. % O2 [g]**	**Flue Gas (ºC)**	**Room Temp (ºC)**	**Eff %**	**Transfer %**
0	3.09	0.23	4.29	334.6%	20.64	16.24	191.7	23.3	96.7%	64.7%
10	2.68	0.14	12.23	58.8%	20.12	7.82	213.3	23.9	99.2%	78.6%
20	2.09	0.26	16.10	20.1%	19.86	3.63	247.8	23.3	98.7%	79.1%
30	1.45	0.50	16.97	12.4%	19.79	2.57	263.9	23.3	97.6%	78.7%
40	0.95	0.05	16.53	18.5%	19.85	3.29	253.9	23.3	99.8%	79.1%
50	0.59	0.01	11.66	68.3%	20.17	8.50	230.6	23.3	100.1%	77.0%
60	0.41	0.07	8.89	119.2%	20.35	11.42	206.7	23.9	99.7%	75.6%
70	0.27	0.12	7.86	146.2%	20.41	12.49	186.1	23.9	99.2%	75.8%
80	0.18	0.16	7.74	148.6%	20.42	12.60	179.4	23.3	98.7%	76.2%
90	0.09	0.18	7.35	160.9%	20.44	13.00	174.4	23.9	98.5%	76.0%
100	0.05	0.17	6.75	183.9%	20.48	13.65	173.3	23.9	98.5%	75.1%
110	0.00	0.16	6.18	209.8%	20.52	14.26	169.4	23.9	98.5%	74.3%
0										

	Air Fuel Ratio (A/F)		
77.2%	Dry Molecular Weight (Md)	30.03	
99.0%	Dry Moles Exhaust Gas (Nr):	377.33	%HC
78.0%	Air Fuel Ratio (A/F)	10.82	0.88

Combustion Efficiency:	99.0%
Total Input (kJ):	51,061
Total Output (kJ):	39,398
Efficiency:	77.2%
Total CO (g):	42.03

Btu/h	21,490	kJ/h
Btu/h	27,851	kJ/h
h		
lb/h	1.4	kg/h
Deg. F	209.0	Deg. C

74.9%	13.5	0.99	68.01	0.01	68.01	51436	4.06	6.87	2.74	19810.00	16.46
Net Eff %	**Air Fuel Ratio**	**Wet Wt Now Wt**	**% Wet Consumed x**	**Dry Wt. Now Wtdn**	**% Dry Comsumed y**	**Fuel Properties**					**Mw Moisture Fuel Burnt**
						Total Input	**Carbon /12= [a]**	**Hydrogen /1= [b]**	**Oxygen /16= [c]**	**Calorific Value**	
62.6%	26.1	3.09	0.00	2.58	0.00	0	4.06	6.87	2.74	19810.00	16.46
78.0%	9.6	2.68	13.24	2.24	13.24	11639	4.06	6.87	2.74	19810.00	16.46
78.1%	7.3	2.09	32.35	1.74	32.35	10137	4.06	6.87	2.74	19810.00	16.46
76.8%	6.8	1.45	52.94	1.21	52.94	9386	4.06	6.87	2.74	19810.00	16.46
78.9%	7.2	0.95	69.12	0.80	69.12	7133	4.06	6.87	2.74	19810.00	16.46
77.1%	10.2	0.59	80.88	0.49	80.88	4505	4.06	6.87	2.74	19810.00	16.46
75.4%	13.2	0.41	86.76	0.34	86.76	2628	4.06	6.87	2.74	19810.00	16.46
75.2%	14.8	0.27	91.18	0.23	91.18	1877	4.06	6.87	2.74	19810.00	16.46
75.2%	15.0	0.18	94.12	0.15	94.12	1502	4.06	6.87	2.74	19810.00	16.46
74.9%	15.7	0.09	97.06	0.08	97.06	1126	4.06	6.87	2.74	19810.00	16.46
73.9%	17.1	0.05	98.53	0.04	98.53	1126	4.06	6.87	2.74	19810.00	16.46
73.2%	18.6	0.00	100.00	0.00	100.00	375	4.06	6.87	2.74	19810.00	16.46
				0.00							

				Moisture Content MCwb:	16.46
		Moisture of Wood (wet basis):	16.46	Dry kg :	2.58
48,429	(Btu)	Initial Dry Weight Wtdo (kg):	2.58	CA:	48.73
37,367	(Btu)	Moisture Content Dry	19.70	HY:	6.87
				OX:	43.90

Load Weight (kg):	3.09					
Fuel Heating:	HHV	LHV		HHV	LHV	
Value in kJ/kg - CV:	19810.00	18328.69	Btu/lb	8522.48	7885.21	

79.66	21.13	2.56	8.77	0.01	0.25	40.01	54.06	0.77	0.03	369.13	34.47
Mass Balance (moles/100 mole dry flue gas)					**kg Wood per 100 mole dfp**	**Moles per kg of Dry Wood**					
[h]	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO2**	**O2**	**CO**	**HC**	**N2**	**H2O**
79.24	21.02	1.11	3.81	0.01	0.11	38.67	146.36	2.07	0.07	714.34	34.39
79.81	21.17	3.05	10.45	0.01	0.30	40.32	25.79	0.46	0.03	263.14	34.47
80.01	21.22	4.04	13.80	0.03	0.40	40.09	9.04	0.65	0.08	199.21	34.36
79.96	21.21	4.32	14.70	0.07	0.43	39.49	5.97	1.16	0.16	186.07	34.20
80.13	21.25	4.08	14.02	0.00	0.41	40.68	8.10	0.12	0.00	197.22	34.51
79.83	21.17	2.87	9.89	-0.01	0.29	40.82	29.77	0.04	-0.04	279.46	34.61
79.62	21.12	2.20	7.59	-0.01	0.22	40.53	52.08	0.32	-0.04	362.98	34.60
79.53	21.09	1.96	6.75	0.00	0.20	40.21	63.91	0.61	-0.01	406.86	34.55
79.50	21.09	1.95	6.68	0.00	0.19	39.97	65.06	0.83	0.02	410.56	34.49
79.47	21.08	1.86	6.36	0.01	0.18	39.81	70.43	0.97	0.03	430.41	34.47
79.43	21.07	1.70	5.85	0.00	0.17	39.79	80.46	1.00	0.02	468.28	34.49
79.40	21.06	1.56	5.36	0.00	0.16	39.78	91.80	1.03	0.00	511.08	34.52

10.94	480.70	7522.34	5574.43	5399.42	5344.05	7431.20	6454.50	296.76	3614.85	3233.93	2671.12
	Stack	**Heat Content Change - Ambient to Stack Temperature**						**Room**			**Energ**
Moisture	**Temp**	**Flue Gas Constituent**						**Temp**			
Present	**K**	**CO2**	**O2**	**CO**	**N2**	**CH4**	**H2O**	**K**	**CO2**	**O2**	**CO**
10.94	464.82	6830.77	5084.99	4931.10	4879.32	6697.55	5896.50	296.48	264.16	744.26	596.86
10.94	486.48	7748.48	5741.65	5561.31	5504.29	7655.38	6647.99	297.04	312.46	148.11	133.20
10.94	520.93	9290.31	6836.66	6610.06	6544.79	9282.69	7897.89	296.48	372.40	61.78	187.47
10.94	537.04	10013.38	7344.85	7095.39	7026.61	10057.54	8475.86	296.48	395.42	43.86	337.52
10.94	527.04	9563.69	7029.14	6793.98	6727.36	9574.89	8116.95	296.48	389.09	56.92	35.66
10.94	503.71	8525.69	6296.00	6092.86	6031.53	8470.48	7281.69	296.48	348.02	187.45	10.12
10.94	479.82	7458.14	5534.12	5362.19	5306.82	7351.86	6410.57	297.04	302.28	288.22	92.03
10.94	459.26	6571.03	4896.73	4749.81	4699.66	6431.69	5680.12	297.04	264.23	312.97	176.65
10.94	452.59	6307.14	4707.19	4567.72	4519.13	6157.83	5462.93	296.48	252.10	306.25	237.60
10.94	447.59	6072.99	4536.67	4403.29	4356.23	5919.95	5266.61	297.04	241.76	319.50	280.18
10.94	446.48	6025.76	4502.44	4370.33	4323.57	5871.62	5227.27	297.04	239.79	362.27	288.00
10.94	442.59	5860.75	4382.73	4255.02	4209.30	5702.97	5089.63	297.04	233.14	402.33	295.84

SUMS				AVERAGE	SUMS					
22302.08	276.42	20857.37	6622.34	4964.84	11663	533	11129.66	39774	533	42.03
y Losses (kJ/kg of Dry Fuel)				**Total**						
Flue Gas Constituent				**Loss**	**Total**	**Chemical**	**Sensible and**	**Total**	**Chem**	**Grams Pr**
N2	**CH4**	**H2O Comb**	**H2O Fuel MC**	**Rate**	**Loss**	**Loss 1**	**Latent Loss**	**Output**	**Loss 2**	**CO**
3485.50	59.86	1714.83	545.75	7411.23	0	0	0.00	0	0	0.00
1448.40	23.15	1744.82	553.98	4364.12	2564	90	2473.79	9075	90	7.59
1303.77	71.79	1782.30	567.66	4347.18	2225	130	2094.42	7913	130	9.28
1307.47	144.03	1793.75	573.98	4596.03	2178	223	1954.16	7209	223	15.44
1326.76	4.42	1797.63	570.06	4180.55	1505	14	1491.28	5628	14	1.24
1685.57	-38.46	1773.69	560.91	4527.31	1030	-6	1036.05	3476	-6	0.22
1926.27	-33.45	1742.99	551.38	4869.72	646	8	638.47	1982	8	1.19
1912.11	-11.96	1715.34	543.39	4912.73	466	15	450.20	1412	15	1.63
1855.36	14.14	1704.96	541.01	4911.41	372	19	353.54	1129	19	1.75
1874.95	25.81	1696.91	538.86	4977.96	283	17	265.89	843	17	1.55
2024.63	14.91	1696.75	538.43	5164.77	294	17	276.69	833	17	1.60
2151.29	2.18	1693.39	536.92	5315.10	101	6	95.17	275	6	0.55

1.94

oduced HC
0.00
0.24
0.65
1.21
0.03
-0.16
-0.08
-0.02
0.02
0.03
0.02
0.00

Dirigo Laboratories, Inc.

Manufacturer:	**FPI**
Model:	**F1500**
Date:	**11/1/2016**
Run:	**3**
Control #:	**015-S-072-1**
Test Duration:	**110**
Output Category:	**3**

	HHV Basis	LHV Basis
Overall Efficiency	77.2%	83.4%
Combustion Efficiency	99.0%	99.0%
Heat Transfer Efficiency	78.0%	84.3%

HHV Output Rate (kJ/h)	21,490	20,386	**(Btu/h)**
Burn Rate (kg/h)	1.41	3.10	**(lb/h)**
Input (kJ/h)	27,851	26,420	**(Btu/h)**

Test Load Weight (dry kg)	2.6	5.7	**dry lb**
MC wet (%)	16.46		
MC dry (%)	19.70		
Particulate (g)	2.26		
CO (g)	42		
Test Duration (h)	1.833333333		

Emissions	**Particulate**	**CO**
g/MJ Output	0.06	1.07
g/kg Dry Fuel	0.88	16.31
g/h	1.23	22.93
lb/MM Btu Output	0.13	2.48

Air/Fuel Ratio (A/F)	10.82

Test Results in Accordance with CSA B415.1-10

Default Fuel Values

	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

VERSION: 2.4 4/15/2010

lanufacturer: FPI
Model: F1500
Date: 10/28/2016
Run: 2
Control #: 015-S-072-1
est Duration: 130
urn Category 2

Appliance Type: Cat (Cat, Non-Cat, Pellet)

Temp. Units F (F or C)
Weight Units lb (kg or lb)

Wood Moisture (% DRY): 19.5
Wood Moisture (% wet): 16.32
Load Weight (lb wet): 6.80
Burn Rate (dry kg/h): 1.19
Total Particulate Emissions: 2.17 g

Fuel Data

	D. Fir	
HHV	19,810	kJ/kg
%C	48.73	
%H	6.87	
%O	43.90	
%Ash	0.50	

Dougla
Oak

Averages		363.1	74.8	10.78	9.84	0.12
		Temp. (F)				
Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas	Room Temp	Flue Gas Composition (%) O2	CO2	CO
0	6.8	337.0	74.0	14.02	6.19	0.21
10	5.8	384.0	74.0	10.61	10.41	0.10
20	4.7	412.0	74.0	6.24	14.93	0.08
30	3.6	452.0	75.0	4.28	16.69	0.18
40	2.5	441.0	75.0	4.93	15.90	0.03
50	1.7	402.0	75.0	8.30	12.49	0.01
60	1.3	362.0	75.0	11.11	9.44	0.04
70	1.0	353.0	75.0	12.34	7.99	0.09
80	0.8	329.0	75.0	12.42	8.02	0.11
90	0.7	322.0	75.0	12.64	7.80	0.14
100	0.5	321.0	75.0	13.00	7.52	0.16
110	0.3	324.0	75.0	13.26	7.26	0.18
120	0.2	323.0	75.0	13.62	6.80	0.19
130	0.0	321.0	75.0	14.09	6.34	0.20

Manufacturer:	FPI
Model:	F1500
Date:	10/28/2016
Run:	2
Control #:	015-S-072-1
Test Duration:	130 min

	HHV	LHV
Eff	78.3%	84.6%
Comb Eff	99.5%	99.5%
HT Eff	78.7%	85.1%
Output	18,477	kJ/h
Burn Rate	1.19	kg/h
Grams CO	27	g
Input	23,606	kJ/h
MC wet	16.32	

Overall Heating Efficiency:
Combustion Efficiency:
Heat Transfer Efficiency:

Heat Output:	17,527	
Heat Input:	22,393	
	Ultimate CO2	
CO2-ult	19.64	
	F_0	
	1.062	
Burn Duration:	2.166666667	
Burn Rate:	2.6	
Stack Temp:	365.1	

Averages	0.12	9.84	118.7%	20.28	10.38	183.9	23.8	99.1%	77.8%

INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat
Elapsed Time	**Weight Remaining (kg)**	**% CO [e]**	**% CO2 [d]**	**Excess Air EA**	**Total O2**	**Calc. % O2 [g]**	**Flue Gas (ºC)**	**Room Temp (ºC)**	**Eff %**	**Transfer %**
0	3.09	0.21	6.19	206.9%	20.52	14.22	169.4	23.3	97.9%	74.2%
10	2.63	0.10	10.41	86.9%	20.25	9.79	195.6	23.3	99.5%	78.2%
20	2.13	0.08	14.93	30.9%	19.95	4.98	211.1	23.3	99.6%	80.4%
30	1.63	0.18	16.69	16.4%	19.83	3.05	233.3	23.9	99.1%	80.1%
40	1.13	0.03	15.90	23.3%	19.89	3.97	227.2	23.9	99.9%	80.1%
50	0.77	0.01	12.49	57.1%	20.11	7.62	205.6	23.9	100.1%	79.3%
60	0.59	0.04	9.44	107.2%	20.31	10.85	183.3	23.9	100.0%	78.2%
70	0.45	0.09	7.99	143.1%	20.41	12.37	178.3	23.9	99.5%	76.7%
80	0.36	0.11	8.02	141.6%	20.40	12.33	165.0	23.9	99.3%	77.9%
90	0.32	0.14	7.80	147.4%	20.42	12.55	161.1	23.9	99.0%	78.0%
100	0.23	0.16	7.52	155.8%	20.43	12.83	160.6	23.9	98.7%	77.6%
110	0.14	0.18	7.26	164.0%	20.45	13.10	162.2	23.9	98.5%	77.1%
120	0.09	0.19	6.80	181.0%	20.48	13.58	161.7	23.9	98.3%	76.3%
130	0.00	0.20	6.34	200.4%	20.51	14.07	160.6	23.9	98.0%	75.6%
0										

	Air Fuel Ratio (A/F)		
78.3%	Dry Molecular Weight (Md)	29.99	
99.5%	Dry Moles Exhaust Gas (Nr):	391.91	%HC
78.7%	Air Fuel Ratio (A/F)	11.24	0.88

Combustion Efficiency:	99.5%
Total Input (kJ):	51,146
Total Output (kJ):	40,033
Efficiency:	78.3%
Total CO (g):	26.54

Btu/h	18,477	kJ/h
Btu/h	23,606	kJ/h
h		
lb/h	1.2	kg/h
Deg. F	185.0	Deg. C

77.1%	13.2	0.97	68.59	0.01	68.59	51898	4.06	6.87	2.74	19810.00	16.32
Net Eff %	**Air Fuel Ratio**	**Wet Wt Now Wt**	**% Wet Consumed x**	**Dry Wt. Now Wtdn**	**% Dry Comsumed y**	**Fuel Properties**					**Mw Moisture Fuel Burnt**
						Total Input	**Carbon /12= [a]**	**Hydrogen /1= [b]**	**Oxygen /16= [c]**	**Calorific Value**	
72.7%	18.4	3.09	0.00	2.58	0.00	0	4.06	6.87	2.74	19810.00	16.32
77.8%	11.3	2.63	14.71	2.20	14.71	11658	4.06	6.87	2.74	19810.00	16.32
80.1%	7.9	2.13	30.88	1.78	30.88	8274	4.06	6.87	2.74	19810.00	16.32
79.5%	7.1	1.63	47.06	1.37	47.06	8274	4.06	6.87	2.74	19810.00	16.32
80.0%	7.5	1.13	63.24	0.95	63.24	7145	4.06	6.87	2.74	19810.00	16.32
79.4%	9.5	0.77	75.00	0.65	75.00	4513	4.06	6.87	2.74	19810.00	16.32
78.1%	12.5	0.59	80.88	0.49	80.88	2633	4.06	6.87	2.74	19810.00	16.32
76.4%	14.7	0.45	85.29	0.38	85.29	1880	4.06	6.87	2.74	19810.00	16.32
77.4%	14.6	0.36	88.24	0.30	88.24	1128	4.06	6.87	2.74	19810.00	16.32
77.2%	14.9	0.32	89.71	0.27	89.71	1128	4.06	6.87	2.74	19810.00	16.32
76.6%	15.4	0.23	92.65	0.19	92.65	1504	4.06	6.87	2.74	19810.00	16.32
75.9%	15.9	0.14	95.59	0.11	95.59	1128	4.06	6.87	2.74	19810.00	16.32
75.0%	16.9	0.09	97.06	0.08	97.06	1880	4.06	6.87	2.74	19810.00	16.32
74.1%	18.1	0.00	100.00	0.00	100.00	752	4.06	6.87	2.74	19810.00	16.32
				0.00							

				Moisture Content MCwb:	16.32
		Moisture of Wood (wet basis):	16.32	Dry kg :	2.58
48,510	(Btu)	Initial Dry Weight Wtdo (kg):	2.58	CA:	48.73
37,969	(Btu)	Moisture Content Dry	19.50	HY:	6.87
				OX:	43.90

Load Weight (kg):	3.09				
Fuel Heating:	HHV	LHV		HHV	LHV
Value in kJ/kg - CV:	19810.00	18328.69	Btu/lb	8522.48	7885.21

79.66	21.13	2.45	8.43	0.00	0.24	40.19	51.94	0.61	0.01	361.59	34.51
Mass Balance (moles/100 mole dry flue gas)					**kg Wood per 100 mole dfp**	**Moles per kg of Dry Wood**					
[h]	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO2**	**O2**	**CO**	**HC**	**N2**	**H2O**
79.38	21.06	1.58	5.40	0.01	0.16	39.43	90.59	1.34	0.05	505.58	34.42
79.70	21.14	2.59	8.89	0.00	0.26	40.43	38.01	0.39	0.00	309.54	34.53
80.01	21.22	3.70	12.69	0.00	0.37	40.59	13.53	0.22	0.01	217.50	34.50
80.08	21.24	4.16	14.25	0.02	0.41	40.33	7.36	0.43	0.05	193.50	34.42
80.10	21.25	3.92	13.48	0.00	0.39	40.74	10.18	0.08	-0.01	205.23	34.53
79.88	21.19	3.08	10.59	-0.01	0.31	40.82	24.90	0.03	-0.04	261.03	34.59
79.67	21.13	2.33	8.03	-0.01	0.23	40.69	46.79	0.17	-0.05	343.39	34.62
79.55	21.10	1.99	6.84	-0.01	0.20	40.39	62.54	0.45	-0.03	402.14	34.59
79.54	21.10	2.00	6.88	0.00	0.20	40.28	61.92	0.55	-0.02	399.48	34.56
79.51	21.09	1.96	6.72	0.00	0.19	40.09	64.48	0.72	0.00	408.70	34.52
79.49	21.08	1.89	6.49	0.00	0.19	39.95	68.17	0.85	0.01	422.26	34.49
79.46	21.08	1.83	6.29	0.01	0.18	39.80	71.80	0.99	0.03	435.59	34.47
79.43	21.07	1.72	5.91	0.01	0.17	39.67	79.24	1.11	0.03	463.36	34.45
79.39	21.06	1.61	5.52	0.01	0.16	39.52	87.70	1.25	0.04	494.95	34.44

10.83	457.08	6491.25	4835.63	4690.13	4640.70	6357.23	5608.62	296.92	3657.39	3233.01	2464.82
Moisture Present	Stack Temp K	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp K	Energ		
		CO2	O2	CO	N2	CH4	H2O		CO2	O2	CO
10.83	442.59	5881.94	4399.09	4271.03	4225.12	5722.47	5108.83	296.48	231.90	398.50	384.17
10.83	468.71	6998.29	5205.48	5046.89	4994.11	6871.03	6034.63	296.48	282.93	197.84	111.86
10.83	484.26	7672.75	5688.79	5510.92	5454.25	7573.42	6588.02	296.48	311.40	76.99	62.74
10.83	506.48	8627.24	6366.66	6160.15	6098.38	8580.86	7361.77	297.04	347.90	46.86	125.76
10.83	500.37	8357.50	6175.30	5976.93	5916.59	8295.70	7143.43	297.04	340.49	62.87	22.21
10.83	478.71	7409.87	5499.57	5329.03	5273.93	7301.52	6371.03	297.04	302.43	136.94	9.42
10.83	456.48	6452.09	4810.89	4667.24	4617.82	6309.16	5581.60	297.04	262.54	225.08	49.60
10.83	451.48	6238.56	4656.55	4518.71	4470.61	6089.69	5404.36	297.04	251.99	291.23	130.81
10.83	438.15	5672.70	4246.08	4123.34	4078.83	5511.28	4932.44	297.04	228.49	262.90	158.62
10.83	434.26	5508.63	4126.66	4008.21	3964.77	5344.45	4794.98	297.04	220.85	266.11	206.52
10.83	433.71	5485.23	4109.61	3991.77	3948.48	5320.69	4775.35	297.04	219.12	280.16	243.93
10.83	435.37	5555.46	4160.77	4041.10	3997.35	5392.03	4834.25	297.04	221.09	298.76	283.22
10.83	434.82	5532.04	4143.71	4024.65	3981.05	5368.23	4814.62	297.04	219.46	328.36	318.14
10.83	433.71	5485.23	4109.61	3991.77	3948.48	5320.69	4775.35	297.04	216.80	360.43	357.82

SUMS				AVERAGE	SUMS					
22480.01	72.20	23953.77	7519.33	4527.18	11113	277	10836.59	40785	277	26.54
y Losses (kJ/kg of Dry Fuel)				**Total**						
Flue Gas Constituent				**Loss**	**Total**	**Chemical**	**Sensible and**	**Total**	**Chem**	**Grams Pr**
N2	**CH4**	**H2O Comb**	**H2O Fuel MC**	**Rate**	**Loss**	**Loss 1**	**Latent Loss**	**Output**	**Loss 2**	**CO**
2136.11	44.10	1689.46	531.68	5415.92	0	0	0.00	0	0	0.00
1545.88	-4.07	1726.71	541.71	4402.86	2591	62	2528.82	9067	62	6.40
1186.29	8.91	1744.36	547.71	3938.40	1645	29	1615.48	6629	29	2.54
1180.01	46.33	1766.78	556.09	4069.73	1700	71	1629.16	6574	71	5.09
1214.28	-4.65	1765.06	553.72	3953.99	1426	6	1420.01	5719	6	0.78
1376.68	-31.68	1741.42	545.35	4080.57	930	-5	934.64	3583	-5	0.21
1585.72	-44.95	1715.58	536.80	4330.37	575	1	574.91	2057	1	0.64
1797.81	-30.74	1707.88	534.88	4683.86	445	9	435.27	1436	9	1.21
1629.43	-17.09	1690.07	529.77	4482.19	255	8	247.33	873	8	0.88
1620.40	1.03	1683.35	528.28	4526.54	258	12	246.14	870	12	1.15
1667.27	12.73	1681.40	528.07	4632.68	352	19	332.56	1153	19	1.81
1741.18	25.35	1682.05	528.71	4780.37	272	17	254.92	856	17	1.57
1844.66	30.52	1680.81	528.49	4950.44	470	33	437.24	1410	33	2.95
1954.28	36.40	1678.82	528.07	5132.63	195	15	180.11	557	15	1.33

0.15

oduced HC
0.00
-0.04
0.07
0.34
-0.03
-0.13
-0.11
-0.05
-0.02
0.00
0.02
0.03
0.05
0.02

Dirigo Laboratories, Inc.

Manufacturer:	**FPI**
Model:	**F1500**
Date:	**10/28/2016**
Run:	**2**
Control #:	**015-S-072-1**
Test Duration:	**130**
Output Category:	**2**

	HHV Basis	LHV Basis	
Overall Efficiency	78.3%	84.6%	
Combustion Efficiency	99.5%	99.5%	
Heat Transfer Efficiency	78.7%	85.1%	
HHV Output Rate (kJ/h)	18,477	17,527	**(Btu/h)**
Burn Rate (kg/h)	1.19	2.63	**(lb/h)**
Input (kJ/h)	23,606	22,393	**(Btu/h)**
Test Load Weight (dry kg)	2.6	5.7	**dry lb**
MC wet (%)	16.32		
MC dry (%)	19.50		
Particulate (g)	2.17		
CO (g)	27		
Test Duration (h)	2.166666667		

Emissions	**Particulate**	**CO**
g/MJ Output	0.05	0.66
g/kg Dry Fuel	0.84	10.28
g/h	1.00	12.25
lb/MM Btu Output	0.13	1.54

Air/Fuel Ratio (A/F)	11.24

Test Results in Accordance with CSA B415.1-10

Default Fuel Values

	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

VERSION: 2.4 4/15/2010

lanufacturer: FPI
Model: F1500
Date: 10/28/2016
Run: 1
Control #: 015-S-072-1
est Duration: 160
urn Category 2

Appliance Type: Cat (Cat, Non-Cat, Pellet)

Temp. Units F (F or C)
Weight Units lb (kg or lb)

Wood Moisture (% DRY): 19.8
Wood Moisture (% wet): 16.53
Load Weight (lb wet): 6.80
Burn Rate (dry kg/h): 0.97
Total Particulate Emissions: 2.22 g

Fuel Data

	D. Fir	
HHV	19,810	kJ/kg
%C	48.73	
%H	6.87	
%O	43.90	
%Ash	0.50	

(•) Dougla ( ) Oak

Averages		**317.4**	**72.9**	**11.29**	**9.36**	**0.16**
		Temp. (F)				
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas**	**Room Temp**	**Flue Gas Composition (%) O2**	**CO2**	**CO**
0	6.8	328.0	71.0	15.48	5.01	0.15
10	6.1	326.0	72.0	14.90	5.66	0.15
20	5.5	345.0	72.0	11.34	9.74	0.19
30	4.5	338.0	72.0	9.64	11.64	0.04
40	3.6	389.0	72.0	4.79	16.15	0.57
50	2.7	379.0	73.0	6.35	14.83	0.04
60	1.9	355.0	73.0	7.44	13.24	0.03
70	1.5	327.0	73.0	10.69	9.76	0.04
80	1.1	302.0	73.0	11.09	9.43	0.06
90	1.0	291.0	73.0	11.69	8.74	0.12
100	0.8	283.0	73.0	11.81	8.73	0.14
110	0.7	282.0	73.0	12.11	8.36	0.17
120	0.5	284.0	74.0	12.46	8.05	0.19
130	0.3	286.0	74.0	12.87	7.64	0.20
140	0.2	293.0	74.0	12.92	7.54	0.24
150	0.1	294.0	74.0	12.97	7.54	0.24
160	0.0	293.0	74.0	13.43	7.06	0.22

Manufacturer:	FPI
Model:	F1500
Date:	10/28/2016
Run:	1
Control #:	015-S-072-1
Test Duration:	160 min

	HHV	LHV
Eff	78.5%	84.8%
Comb Eff	99.0%	99.0%
HT Eff	79.3%	85.7%
Output	15,015	kJ/h
Burn Rate	0.97	kg/h
Grams CO	46	g
Input	19,132	kJ/h
MC wet	16.53	

Overall Heating Efficiency:
Combustion Efficiency:
Heat Transfer Efficiency:

Heat Output: 14,244
Heat Input: 18,149

Ultimate CO2
CO2-ult 19.64
F_0
1.062

Burn Duration: 2.666666667
Burn Rate: 2.1
Stack Temp: 316.7

Averages	0.16	9.36	125.1%	20.31	10.87	158.5	22.7	98.8%	79.1%

INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat
Elapsed Time	**Weight Remaining (kg)**	**% CO [e]**	**% CO2 [d]**	**Excess Air EA**	**Total O2**	**Calc. % O2 [g]**	**Flue Gas (ºC)**	**Room Temp (ºC)**	**Eff %**	**Transfer %**
0	3.09	0.15	5.01	280.7%	20.60	15.51	164.4	21.7	98.4%	71.4%
10	2.77	0.15	5.66	238.1%	20.56	14.82	163.3	22.2	98.6%	73.5%
20	2.50	0.19	9.74	97.8%	20.28	10.45	173.9	22.2	98.7%	78.9%
30	2.04	0.04	11.64	68.2%	20.17	8.51	170.0	22.2	99.9%	80.8%
40	1.63	0.57	16.15	17.5%	19.84	3.40	198.3	22.2	97.2%	81.4%
50	1.23	0.04	14.83	32.1%	19.96	5.11	192.8	22.8	99.9%	81.3%
60	0.86	0.03	13.24	48.0%	20.06	6.81	179.4	22.8	100.0%	81.2%
70	0.68	0.04	9.76	100.4%	20.29	10.51	163.9	22.8	100.0%	79.8%
80	0.50	0.06	9.43	107.0%	20.31	10.85	150.0	22.8	99.8%	80.5%
90	0.45	0.12	8.74	121.7%	20.35	11.55	143.9	22.8	99.2%	80.3%
100	0.36	0.14	8.73	121.5%	20.35	11.55	139.4	22.8	99.0%	80.7%
110	0.32	0.17	8.36	130.3%	20.38	11.93	138.9	22.8	98.7%	80.4%
120	0.23	0.19	8.05	138.4%	20.40	12.25	140.0	23.3	98.5%	80.0%
130	0.14	0.20	7.64	150.5%	20.42	12.68	141.1	23.3	98.3%	79.4%
140	0.09	0.24	7.54	152.5%	20.43	12.77	145.0	23.3	97.9%	78.9%

150	0.05	0.24	7.54	152.5%	20.43	12.77	145.6	23.3	97.9%	78.9%
160	0.00	0.22	7.06	169.8%	20.46	13.29	145.0	23.3	98.0%	78.3%
0										

	Air Fuel Ratio (A/F)		
78.5%	Dry Molecular Weight (Md)	29.93	
99.0%	Dry Moles Exhaust Gas (Nr):	408.49	%HC
79.3%	Air Fuel Ratio (A/F)	11.72	0.88

Combustion Efficiency:	99.0%
Total Input (kJ):	51,018
Total Output (kJ):	40,041
Efficiency:	78.5%
Total CO (g):	46.22

Btu/h	15,015	kJ/h
Btu/h	19,132	kJ/h
h		
lb/h	1.0	kg/h
Deg. F	158.2	Deg. C

78.2%	13.6	1.00	67.73	0.01	67.73	51393	4.06	6.87	2.74	19810.00	16.53
Net Eff %	**Air Fuel Ratio**	**Wet Wt Now Wt**	**% Wet Consumed x**	**Dry Wt. Now Wtdn**	**% Dry Comsumed y**	**Fuel Properties**					**Mw Moisture Fuel Burnt**
						Total Input	**Carbon /12= [a]**	**Hydrogen /1= [b]**	**Oxygen /16= [c]**	**Calorific Value**	
70.2%	22.9	3.09	0.00	2.58	0.00	0	4.06	6.87	2.74	19810.00	16.53
72.4%	20.3	2.77	10.29	2.31	10.29	7503	4.06	6.87	2.74	19810.00	16.53
77.9%	11.9	2.50	19.12	2.08	19.12	6002	4.06	6.87	2.74	19810.00	16.53
80.7%	10.2	2.04	33.82	1.70	33.82	7128	4.06	6.87	2.74	19810.00	16.53
79.1%	7.1	1.63	47.06	1.36	47.06	6752	4.06	6.87	2.74	19810.00	16.53
81.1%	8.0	1.23	60.29	1.02	60.29	6377	4.06	6.87	2.74	19810.00	16.53
81.2%	9.0	0.86	72.06	0.72	72.06	4502	4.06	6.87	2.74	19810.00	16.53
79.8%	12.1	0.68	77.94	0.57	77.94	3001	4.06	6.87	2.74	19810.00	16.53
80.4%	12.5	0.50	83.82	0.42	83.82	1876	4.06	6.87	2.74	19810.00	16.53
79.7%	13.4	0.45	85.29	0.38	85.29	1125	4.06	6.87	2.74	19810.00	16.53
79.9%	13.4	0.36	88.24	0.30	88.24	1125	4.06	6.87	2.74	19810.00	16.53
79.3%	13.9	0.32	89.71	0.27	89.71	1125	4.06	6.87	2.74	19810.00	16.53
78.8%	14.4	0.23	92.65	0.19	92.65	1501	4.06	6.87	2.74	19810.00	16.53
78.1%	15.1	0.14	95.59	0.11	95.59	1125	4.06	6.87	2.74	19810.00	16.53
77.2%	15.2	0.09	97.06	0.08	97.06	750	4.06	6.87	2.74	19810.00	16.53

77.2%	15.2	0.05	98.53	0.04	98.53	1125	4.06	6.87	2.74	19810.00	16.53
76.7%	16.2	0.00	100.00	0.00	100.00	375	4.06	6.87	2.74	19810.00	16.53
				0.00							

				Moisture Content MCwb:	16.53
		Moisture of Wood (wet basis):	16.53	Dry kg :	2.58
48,388	(Btu)	Initial Dry Weight Wtdo (kg):	2.58	CA:	48.73
37,977	(Btu)	Moisture Content Dry	19.80	HY:	6.87
				OX:	43.90

Load Weight (kg):	3.09					
Fuel Heating:	HHV	LHV		HHV	LHV	
Value in kJ/kg - CV:	19810.00	18328.69	Btu/lb	8522.48	7885.21	

79.61	21.12	2.35	8.05	0.01	0.23	40.03	54.79	0.76	0.02	371.92	34.48
Mass Balance (moles/100 mole dry flue gas)					**kg Wood per 100 mole dfp**	**Moles per kg of Dry Wood**					
[h]	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO2**	**O2**	**CO**	**HC**	**N2**	**H2O**
79.33	21.04	1.27	4.37	0.00	0.13	39.65	122.78	1.19	-0.02	627.79	34.57
79.37	21.05	1.43	4.92	0.00	0.14	39.77	104.15	1.05	-0.01	557.72	34.55
79.62	21.12	2.45	8.39	0.01	0.24	39.99	42.90	0.78	0.04	326.88	34.43
79.81	21.17	2.87	9.89	-0.01	0.29	40.70	29.75	0.14	-0.03	279.07	34.58
79.88	21.19	4.14	14.05	0.08	0.41	39.24	8.26	1.38	0.19	194.08	34.15
80.02	21.23	3.66	12.58	0.00	0.36	40.71	14.02	0.11	-0.01	219.66	34.54
79.92	21.20	3.27	11.23	-0.01	0.32	40.74	20.95	0.09	-0.02	245.92	34.56
79.69	21.14	2.41	8.30	-0.01	0.24	40.69	43.83	0.17	-0.05	332.23	34.62
79.66	21.13	2.33	8.04	-0.01	0.23	40.59	46.72	0.26	-0.04	342.88	34.60
79.59	21.11	2.18	7.50	0.00	0.22	40.26	53.23	0.55	-0.01	366.64	34.53
79.58	21.11	2.18	7.50	0.00	0.22	40.16	53.15	0.64	0.01	366.07	34.51
79.54	21.10	2.10	7.21	0.01	0.21	39.97	57.05	0.81	0.03	380.31	34.47
79.51	21.09	2.03	6.96	0.01	0.20	39.83	60.62	0.94	0.04	393.42	34.44
79.48	21.08	1.93	6.62	0.01	0.19	39.73	65.95	1.04	0.05	413.27	34.43
79.45	21.08	1.92	6.56	0.01	0.19	39.48	66.85	1.26	0.08	416.03	34.37

79.45	21.08	1.92	6.56	0.01	0.19	39.48	66.85	1.26	0.08	416.03	34.37
79.43	21.07	1.80	6.15	0.01	0.18	39.52	74.39	1.23	0.06	444.64	34.40

11.00	431.68	5448.57	4082.70	3965.76	3922.72	5283.94	4744.28	295.90	3709.33	3660.23	3702.86
Moisture Present	Stack Temp K	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp K	Energ		
		CO2	O2	CO	N2	CH4	H2O		CO2	O2	CO
11.00	437.59	5733.95	4294.45	4170.93	4125.77	5565.27	4989.57	294.82	227.35	527.28	340.84
11.00	436.48	5665.88	4243.97	4122.02	4077.37	5498.11	4931.10	295.37	225.34	442.00	302.63
11.00	447.04	6112.92	4568.63	4434.85	4387.33	5954.21	5304.52	295.37	244.44	195.99	224.21
11.00	443.15	5947.84	4448.90	4319.52	4273.06	5785.44	5166.87	295.37	242.08	132.36	40.18
11.00	471.48	7160.57	5324.34	5161.67	5107.79	7034.40	6171.73	295.37	280.97	44.00	399.07
11.00	465.93	6899.77	5135.76	4980.18	4927.92	6766.50	5955.15	295.93	280.88	72.01	31.62
11.00	452.59	6328.33	4723.55	4583.73	4534.94	6177.31	5482.13	295.93	257.82	98.96	26.55
11.00	437.04	5668.15	4244.67	4122.46	4077.86	5502.50	4931.54	295.93	230.65	186.05	47.88
11.00	423.15	5084.64	3818.94	3711.76	3671.02	4911.44	4441.12	295.93	206.39	178.42	74.05
11.00	417.04	4829.67	3632.16	3531.39	3492.38	4654.79	4225.68	295.93	194.46	193.35	158.40
11.00	412.59	4644.92	3496.54	3400.35	3362.62	4469.46	4069.13	295.93	186.54	185.85	184.45
11.00	412.04	4621.86	3479.60	3383.98	3346.40	4446.37	4049.57	295.93	184.75	198.51	232.78
11.00	413.15	4646.80	3497.12	3400.71	3363.02	4473.09	4069.50	296.48	185.09	211.99	269.25
11.00	414.26	4692.95	3531.02	3433.47	3395.45	4519.35	4108.63	296.48	186.44	232.86	297.88
11.00	418.15	4854.77	3649.74	3548.16	3509.03	4681.82	4245.64	296.48	191.67	243.97	360.09

11.00	418.71	4877.92	3666.71	3564.55	3525.27	4705.10	4265.22	296.48	192.58	245.10	360.11
11.00	418.15	4854.77	3649.74	3548.16	3509.03	4681.82	4245.64	296.48	191.87	271.51	352.89

SUMS				AVERAGE	SUMS					
24290.46	343.02	28551.61	9109.46	4315.70	10977	521	10455.53	40416	521	46.22
y Losses (kJ/kg of Dry Fuel)				**Total**						
Flue Gas Constituent				**Loss**	**Total**	**Chemical**	**Sensible and**	**Total**	**Chem**	**Grams Pr**
N2	**CH4**	**H2O Comb**	**H2O Fuel MC**	**Rate**	**Loss**	**Loss 1**	**Latent Loss**	**Output**	**Loss 2**	**CO**
2590.13	-21.94	1692.58	538.55	5894.79	0	0	0.00	0	0	0.00
2274.01	-12.46	1689.52	537.91	5458.95	2067	108	1959.20	5435	108	11.18
1434.15	40.04	1696.65	542.01	4377.49	1326	79	1247.38	4676	79	6.62
1192.46	-24.62	1699.00	540.50	3821.96	1375	5	1369.68	5752	5	1.41
991.31	169.19	1712.08	551.55	4148.17	1414	191	1223.13	5338	191	13.22
1082.49	-5.88	1724.17	549.17	3734.46	1202	8	1194.08	5175	8	0.99
1115.24	-18.15	1709.18	543.97	3733.57	848	2	846.57	3653	2	0.59
1354.81	-41.39	1692.69	537.91	4008.60	607	1	606.36	2394	1	0.71
1258.73	-33.58	1674.88	532.52	3891.40	368	4	364.69	1507	4	0.68
1280.46	-4.53	1664.29	530.15	4016.59	228	9	219.55	897	9	0.88
1230.94	7.48	1657.60	528.42	3981.28	226	11	215.40	899	11	1.02
1272.66	23.89	1655.16	528.21	4095.96	233	14	218.27	893	14	1.29
1323.09	35.35	1654.62	528.43	4207.83	319	23	295.91	1182	23	1.99
1403.25	40.70	1655.39	528.86	4345.37	247	19	227.84	879	19	1.65
1459.85	67.68	1657.20	530.37	4510.82	171	16	154.82	579	16	1.33

1466.60	67.68	1657.87	530.58	4520.53	257	24	232.78	869	24	2.00
1560.27	53.54	1658.73	530.37	4619.16	87	8	79.86	288	8	0.65

0.98

oduced HC
0.00
-0.08
0.22
-0.16
1.03
-0.03
-0.07
-0.11
-0.06
0.00
0.01
0.02
0.05
0.04
0.05

0.07
0.02

Dirigo Laboratories, Inc.

Manufacturer:	**FPI**
Model:	**F1500**
Date:	**10/28/2016**
Run:	**1**
Control #:	**015-S-072-1**
Test Duration:	**160**
Output Category:	**2**

	HHV Basis	LHV Basis	
Overall Efficiency	78.5%	84.8%	
Combustion Efficiency	99.0%	99.0%	
Heat Transfer Efficiency	79.3%	85.7%	

HHV Output Rate (kJ/h)	15,015	14,244	**(Btu/h)**
Burn Rate (kg/h)	0.97	2.13	**(lb/h)**
Input (kJ/h)	19,132	18,149	**(Btu/h)**

Test Load Weight (dry kg)	2.6	5.7	**dry lb**
MC wet (%)	16.53		
MC dry (%)	19.80		
Particulate (g)	2.22		
CO (g)	46		
Test Duration (h)	2.666666667		

Emissions	Particulate	CO
g/MJ Output	0.06	1.15
g/kg Dry Fuel	0.86	17.95
g/h	0.83	17.33
lb/MM Btu Output	0.13	2.68

Air/Fuel Ratio (A/F)	11.72

Test Results in Accordance with CSA B415.1-10

Default Fuel Values

	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

Project #	015-S-072-1	MFG	FPI
Run #	5	Model	F1500/I1500
Date	11/1/16		

Train A
First Hour

Front	Rear	Filter #	Tare	Final	Net
☑		2974	0.1191	0.1207	0.0016
☐	☑	2975			
☑	☐	2979	0.2375	0.2375	
☑	☐	O Ring			
☐	☑	O Ring	3.5852	3.5852	0.0000
					1.6 mg

Train B

Front	Rear	Filter #	Tare	Final	Net
☑	☐	2976			
☐	☑	2977	0.2375	0.2390	
☑	☐	O ring			
☐	☑	O ring	3.5208	3.5208	0.0015
					1.5 mg

Nozzle

#	TARE	FINAL	Net	
5A	116.7743	116.7743	0.0000	0.0

Nozzle

#	TARE	FINAL	Net	
5B	116.8844	116.8844	0.0000	0.0

Train A Total Catch	1.6
Train B Total Catch	1.5

Ambient ☑

Filter #		Tare	Final	Net	Vol (liter)
2978		0.1196	0.1198	0.0002	757.172
O ring		1.6597	1.6596	0.0000	
			Total	0.0002	mg

Notes: Train A Total: 1.6mg Train B Total: 1.5mg Ambient Total: 0.2mg 1 Hour Catch: 1.6mg

Project #	015-S-072-1	MFG	FPI
Run #	4	Model	F1500/I1500
Date	11/1/16		

Train A
First Hour

Front	Rear	Filter #	Tare	Final	Net
☑		2968	0.1190	0.1200	0.0010
☐	☑	2969			
☑	☐	2973	0.2368	0.2368	
☑	☐	O Ring			
☐	☑	O Ring	3.5812	3.5813	0.0001
					1.1 mg

Train B

Front	Rear	Filter #	Tare	Final	Net
☑	☐	2970			
☐	☑	2971	0.2393	0.2407	
☑	☐	O ring			
☐	☑	O ring	3.5460	3.5460	0.0014
					1.4 mg

Nozzle

#	TARE	FINAL	Net	
4A	116.1847	116.1848	0.0001	0.1

Nozzle

#	TARE	FINAL	Net	
4B	116.3976	116.3976	0.0000	0.0

Train A Total Catch	1.2	Train B Total Catch	1.4

Ambient ☑

Filter #		Tare	Final	Net	Vol (liter)
2972		0.1187	0.1187	0.0000	490.026
O ring		1.6880	1.6879	0.0000	
			Total	0.0000	mg

Notes: Train A Total: 1.2mg Train B Total: 1.4mg Ambient Total: 0.0mg 1 Hour Catch: 1.0mg

Project #	015-S-072-1	MFG	FPI
Run #	3	Model	F1500/I1500
Date	11/1/16		

Train A
First Hour

Front	Rear	Filter #	Tare	Final	Net
☑		2962	0.1184	0.1206	0.0022
☐	☑	2963			
☑	☐	2967	0.2379	0.2379	
☑	☐	O Ring			
☐	☑	O Ring	3.5423	3.5423	0.0000
					2.2 mg

Train B

Front	Rear	Filter #	Tare	Final	Net
☑	☐	2964			
☐	☑	2965	0.2367	0.2388	
☑	☐	O ring			
☐	☑	O ring	3.5486	3.5485	0.0020
					2.0 mg

Nozzle

#	TARE	FINAL	Net	
3A	116.0717	116.0718	0.0001	0.1

Nozzle

#	TARE	FINAL	Net	
3B	116.3407	116.3407	0.0000	0.0

Train A Total Catch	2.3

Train B Total Catch	2.0

Ambient ☑

Filter #		Tare	Final	Net	Vol (liter)
2966		0.1197	0.1197	0.0	597.11
O ring		1.6859	1.6859	0.0	
			Total	0.0	mg

Notes:

Train A Total: 2.3 Train B Total: 2.0mg Ambeint Total: 0.0mg 1 Hour Catch: 2.2mg

Project #	015-S-072-1	MFG	FPI
Run #	2	Model	F1500/I1500
Date	10/28/16		

Train A
First Hour

Front	Rear	Filter #	Tare	Final	Net
☑		2956	0.1185	0.1200	0.0015
☐	☑	2957			
☑	☐	2961	0.2383	0.2384	
☑	☐	O Ring			
☐	☑	O Ring	3.5415	3.5418	0.0004
					1.9 mg

Train B

Front	Rear	Filter #	Tare	Final	Net
☑	☐	2958			
☐	☑	2959	0.2377	0.2393	
☑	☐	O ring			
☐	☑	O ring	3.5930	3.5931	0.0017
					1.7 mg

Nozzle

#	TARE	FINAL	Net	
2A	116.2365	116.2366	0.0001	0.1

Nozzle

#	TARE	FINAL	Net	
2B	116.3297	116.3300	0.0003	0.3

Train A Total Catch	2.0	Train B Total Catch	2.0

Ambient ☑

Filter #		Tare	Final	Net	Vol (liter)
2960		0.1196	0.1196	0.0	711.411
O ring		1.6890	1.6890	0.0	
			Total	0.0	mg

Notes: Train A Total: 2.0mg Train B Total: 2.0mg Ambient Total: 0.0mg 1 Hour Catch: 1.5mg

Project #	015-S-072-1	MFG	FPI
Run #	1	Model	F1500/I1500
Date	10/28/16		

Train A
First Hour

Front	Rear	Filter #	Tare	Final	Net
☑		2950	0.1198	0.1216	0.0018
☐	☑	2951			
☑	☐	2955	0.2370	0.2370	
☑	☐	O Ring			
☐	☑	O Ring	3.5787	3.5787	0.0000
					1.8 mg

Train B

Front	Rear	Filter #	Tare	Final	Net
☑	☐	2952			
☐	☑	2953	0.2382	0.2404	
☑	☐	O ring			
☐	☑	O ring	3.5633	3.5634	0.0023
					2.3 mg

Nozzle

#	TARE	FINAL	Net	
13A	117.4544	117.4547	0.0003	0.3

Nozzle

#	TARE	FINAL	Net	
13B	117.0649	117.0649	0.0000	0.0

Train A Total Catch	2.1

Train B Total Catch	2.3

Ambient ☑

Filter #		Tare	Final	Net	Vol (liter)
2954		0.1194	0.1196	0.0002	874.364
O ring		1.6665	1.6665	0.0000	
			Total	0.0002	mg

Notes:

Train A Total: 2.1mg Train B Total: 2.3mg Ambient Total: 0.2mg 1 Hour Catch: 1.8mg

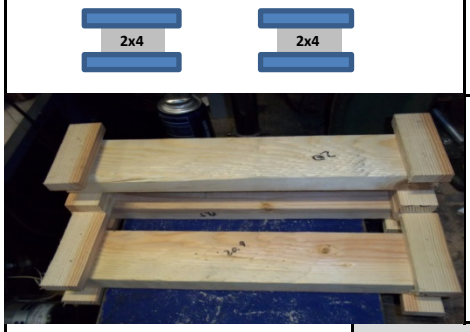
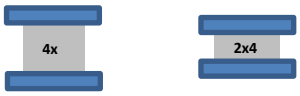
Fuel Load Information

Project Number	Client	Date
015-S-072-1	FPI	10/27/2016

Firebox Volume (ft^3)	0.98	Assessment	No

Longest useable measurement parallel or perpendicular to front of unit.	18''

Test Fuel Charge Range	**6.2** - **7.6**
Coal bed range (lbs)	**1.40** - **1.70**

Vol ≤ 1.5 ft^3	**Vol > 1.5 ≤ 3.0 ft^3**	**Vol > 3.0 ft^3**
		

Fuel Piece Length	**16.00 Inches**

Run # 5

Test Run Fuel Moisture (db)

Weight Without Cleats (Lbs)

Piece	S1	S2	S3	S4	Hydronic Heater S5	S6	AVG (%)		Fuel	
1	19.0	19.0	19.5					**19.2**		**1.87**
2	20.9	22.6	22.4					**22.0**		**1.79**
3	20.0	22.1	20.8					**21.0**		**1.85**
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
Spacer Average	19				Fuel Average			**20.3**	**Total:**	**6.8lbs**

Signature

Date

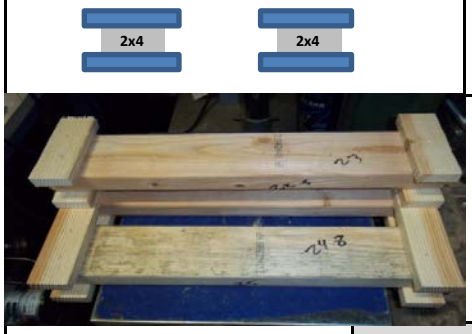
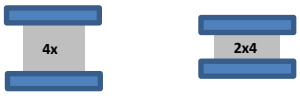
Fuel Load Information

Project Number	Client	Date
015-S-072-1	FPI	10/26/2016

Firebox Volume (ft^3)	0.98	Assessment	No

Longest useable measurement parallel or perpendicular to front of unit.	18''

Test Fuel Charge Range	**6.2** - **7.6**
Coal bed range (lbs)	**1.40** - **1.70**

Vol ≤ 1.5 ft^3	**Vol > 1.5 ≤ 3.0 ft^3**	**Vol > 3.0 ft^3**
		

Fuel Piece Length	**16.00 Inches**

Run # 4

Test Run Fuel Moisture (db)

Weight Without Cleats (Lbs)

Piece	S1	S2	S3	S4	Hydronic Heater S5	S6	AVG (%)		Fuel	
1	24.8	25.0	24.7					**24.8**		**2.23**
2	22.7	22.0	22.4					**22.4**		**1.59**
3	22.5	23.0	22.2					**22.6**		**1.65**
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
Spacer Average	19				Fuel Average			**22.2**	**Total:**	**6.9lbs**

Signature

Date

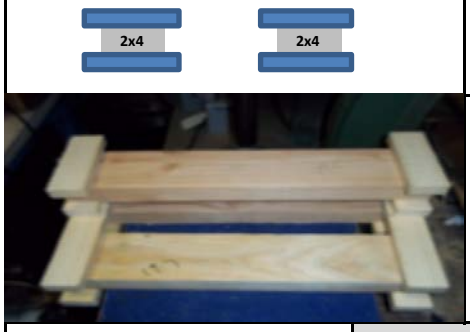
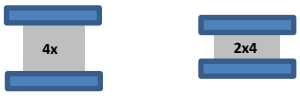
Fuel Load Information

Project Number	Client	Date
015-S-072-1	FPI	10/26/2016

Firebox Volume (ft^3)	0.98	Assessment	No

Longest useable measurement parallel or perpendicular to front of unit.	18''

Test Fuel Charge Range	**6.2** - **7.6**
Coal bed range (lbs)	**1.40** - **1.70**

Vol ≤ 1.5 ft^3	**Vol > 1.5 ≤ 3.0 ft^3**	**Vol > 3.0 ft^3**
		

Fuel Piece Length	**16.00 Inches**

Run # 3

Weight Without Cleats (Lbs)

Test Run Fuel Moisture (db)

Piece	S1	S2	S3	S4	Hydronic Heater S5	S6	AVG (%)		Fuel	
1	19.5	21.0	19.2					**19.9**		**1.96**
2	19.3	19.2	20.2					**19.6**		**1.97**
3	19.9	19.5	21.3					**20.2**		**1.85**
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
Spacer Average	19				Fuel Average			**19.7**	**Total:**	**6.8lbs**

Signature

Date

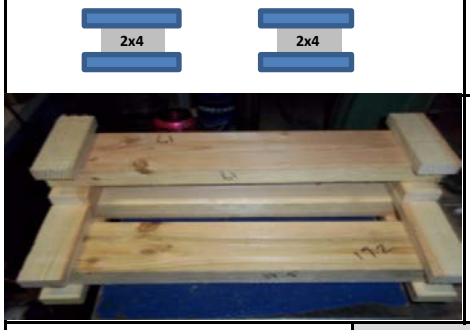
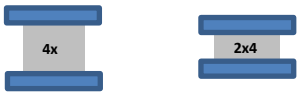
Fuel Load Information

Project Number	Client	Date
015-S-072-1	FPI	10/25/2016

Firebox Volume (ft^3)	0.98	Assessment	No

Longest useable measurement parallel or perpendicular to front of unit.	18''

Test Fuel Charge Range	**6.2** - **7.6**
Coal bed range (lbs)	**1.40** - **1.70**

Vol ≤ 1.5 ft^3	**Vol > 1.5 ≤ 3.0 ft^3**	**Vol > 3.0 ft^3**
		

Fuel Piece Length	**16.00 Inches**

Run # 2

Weight Without Cleats (Lbs)

Test Run Fuel Moisture (db)

Piece	S1	S2	S3	S4	Hydronic Heater S5	Hydronic Heater S6	AVG (%)		Fuel	
1	19.5	23.8	19.2					**20.8**		**1.68**
2	19.0	19.0	19.0					**19.0**		**1.90**
3	19.0	19.2	19.2					**19.1**		**1.98**
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
Spacer Average	19				Fuel Average			**19.5**	**Total:**	**6.8lbs**

Signature

Date

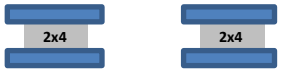
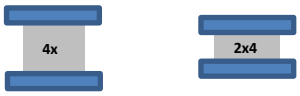
Fuel Load Information

Project Number	Client	Date
015-S-072-1	FPI	10/25/2016

Firebox Volume (ft^3)	0.98	Assessment	No

Longest useable measurement parallel or perpendicular to front of unit.	18''

Test Fuel Charge Range	**6.2** - **7.6**
Coal bed range (lbs)	**1.40** - **1.70**

Vol ≤ 1.5 ft^3	**Vol > 1.5 ≤ 3.0 ft^3**	**Vol > 3.0 ft^3**
		
		
Fuel Piece Length	**16.00 Inches**	

Run # 1

Weight Without Cleats (Lbs)

Test Run Fuel Moisture (db)

Piece	S1	S2	S3	S4	Hydronic Heater S5	Hydronic Heater S6	AVG (%)		Fuel	
1	20.2	20.1	20.2					**20.2**		**1.72**
2	20.6	20.5	20.5					**20.5**		**1.79**
3	19.0	19.9	19.3					**19.4**		**1.98**
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
Spacer Average	19				Fuel Average			**19.8**	**Total:**	**6.8lbs**

Signature

Date

PREBURN

JOB # 015-S-072-1
TECHNICIA BTNGEN
DATE: 10_25_16
RUN #: 1
READING INTERVAL: 10
.
Run Time: 60

Model Designation F1500

	Tunnel Traverse Information								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.038	0.042	0.042	0.038	0.036	0.036	0.044	0.030	0.038
Temperature	80	80	80	80	80	80	80	80	80.000

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T
0	3.9	-0.06	504	495	405	720	251	475
10	3.2	-0.044	485	476	323	615	272	434.2
20	2.5	-0.043	476	476	304	639	276	434.2
30	2	-0.038	465	479	299	596	275	422.8
40	1.8	-0.034	438	450	290	505	275	391.6
50	1.6	-0.034	410	419	275	434	272	362
60	1.5	-0.047	389	397	264	389	268	341.4

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Tunnel Velocity:	13.1657	ft/sec.
Intial Tunnel Flow:	147.459	scfm
Average Tunnel Flow:	146.102	scfm

Notes:

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T

Run #	1
Date:	10/25/16

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Dilution Tunnel Traverse Data									
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.038	0.042	0.042	0.038	0.036	0.036	0.044	0.030	0.038
Temperature	80	80	80	80	80	80	80	80	80.000

Tunnel Velocity:	13.166	ft/sec.
Intial Tunnel Flow:	147.46	scfm
Average Tunnel Flow	146.1	scfm

JOB #	015-S-072-1															
TECHNICIA	BTNGEN							ROOM TEMP (F)	73.0				BEG	MID	END	AVG
DATE:	10_25_16							BAROMETRIC					29.94	29.94	29.94	29.94
RUN #:	1															
READING INTERVAL:	10															
SAMPLE BOX :	A	METER Y FACTOR:	1.007						PROBE MATERIAL:				SS			
FRONT FILTER #:	2950&2955				REAR FILTER #	REAR FILTER #:	2951									
FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM)	<0.01		@	5	IN-HG					
Run Time:	160	AMBIENT FILTER #:				2954	VOLUME	874.364	LITERS	FUEL MOISTURE DB				19.8	%	
		FINAL LEAK RATE (CFM):				<0.01	@	5	IN-HG							
TEST START TIME:	11:30								1	2	3	4	5	6		
									TEMPERATURES							
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
0	0.000	0.000	0.038	0	-0.1		NA	6.8	0	89	328	72	291	639.68	74	71
10	1.376	0.138	0.038	2.01	-1.13	13.149	101	6.1	0.7	91	326	75	325	681.75	75	72
20	2.761	0.139	0.038	2	-1.5	13.149	101	5.5	0.6	91	345	76	308	764.4	78	72
30	4.147	0.139	0.038	2	-0.72	13.149	101	4.5	1	91	338	76	311	705.37	81	72
40	5.541	0.139	0.038	2.01	-1.39	13.149	101	3.6	0.9	91	389	76	251	970.31	85	72
50	6.945	0.140	0.038	2	-0.93	13.161	101	2.7	0.9	92	379	76	264	872.11	88	73
60	8.348	0.140	0.038	2.01	-1.46	13.149	100	1.9	0.8	91	355	77	277	795.61	90	73
70	9.758	0.141	0.038	2.02	-0.84	13.126	100	1.5	0.4	89	327	77	285	726.44	92	73
80	11.173	0.142	0.038	2.02	-0.64	13.114	100	1.1	0.4	88	302	77	288	656.28	93	73
90	12.586	0.141	0.038	2.03	-1.47	13.090	100	1	0.1	86	291	76	282	653.58	95	73
100	14.007	0.142	0.038	2.02	-1.07	13.078	100	0.8	0.2	85	283	76	272	649.35	96	73
110	15.424	0.142	0.038	2.04	-0.72	13.090	100	0.7	0.1	86	282	76	267	655.3	97	73
120	16.846	0.142	0.038	2.02	-1.26	13.090	100	0.5	0.2	86	284	76	262	662.99	97	74
130	18.267	0.142	0.038	2.03	-1.5	13.078	100	0.3	0.2	85	286	76	256	675.61	98	74
140	19.691	0.142	0.038	2.01	-1.19	13.090	100	0.2	0.1	86	293	76	251	699.04	98	74
150	21.117	0.143	0.038	2	-1.34	13.090	100	0.1	0.1	86	294	76	247	700.03	99	74
160	22.538	0.142	0.038	2.05	-1.38	13.090	99	0	0.1	86	293	76	242	679.83	99	74

TEST START TIME:	11:30								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP

TEST START TIME:	11:30								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
	22.538		0.038	2.02		13.115	100.2			88	317				90	73

JOB #	015-S-072-1										
TECHNICIA	BTNGEN										
DATE:	10_25_16										
RUN #:	1										
READING INTERVAL:	10										
SAMPLE BOX :	*B*	METER Y FACTOR:		1.002			PROBE MATERIAL:	**SS**			
FRONT FILTER #:	2952					REAR FILTER #:	2953				
FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG	

Run Time: 160 **Firebox Delta T** **29.6**

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
0	0	0	NA	0	0	1	387	397	72	382	266	73	345
10	1.353	0.135	101	-0.04	1.98	1.67	355	350	75	389	248	75	333
20	2.715	0.136	101	-0.05	1.96	1.37	334	315	76	401	250	77	322
30	4.080	0.137	101	-0.04	1.98	1.85	341	329	76	500	245	81	345
40	5.457	0.138	101	-0.05	1.98	1.87	363	358	76	629	237	84	368
50	6.834	0.138	101	-0.05	1.97	1.92	398	399	76	669	232	87	392
60	8.218	0.138	101	-0.05	1.98	1.86	429	427	76	648	232	89	403
70	9.604	0.139	100	-0.04	1.98	1.65	431	439	76	583	235	91	395
80	10.994	0.139	100	-0.03	1.98	1.64	421	430	76	514	241	93	379
90	12.386	0.139	100	-0.03	1.98	1.63	413	418	76	457	247	94	363
100	13.779	0.139	100	-0.03	1.98	1.26	406	412	76	424	253	95	353
110	15.172	0.139	100	-0.03	1.98	1.9	398	405	76	403	258	96	346
120	16.570	0.140	100	-0.03	1.99	1.41	389	398	76	389	261	97	340
130	17.969	0.140	100	-0.03	1.99	1.86	380	391	76	376	262	98	333
140	19.365	0.140	99	-0.04	1.96	1.54	370	383	76	364	261	98	326
150	20.764	0.140	99	-0.03	1.97	1.74	363	376	76	357	258	99	320
160	22.167	0.140	100	-0.03	1.96	1.66	357	370	76	351	255	99	315

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
	22.167	0.139	100.191	-0.035	1.97625	1.63706	384	388	76	461	249	90	30
	TOTAL	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	**DT**

Ambient Sample Results:

JOB NUMBER: 015-S-072-1
TECHNICIAN: BTNGEN
DATE: 10_25_16
RUN NUMBER: 1

METER Y FACTOR: **1.003**

	Sample Volume (L)	Meter Temp °F	ΔH	ΔP
Start	0	84	0	0
End	874.364	99	0	0

	SAMPLE INFORMATION	
Total Sample Volume - Vm	874.364	Liters
Total Sample Volume - Vm	30.878	ft^3
Average Sample Rate	0.19	ft^3/min
Sample Time	160.00	Minutes
Average Meter Temperature	91.5	°F
Total Sample Volume (Standard Conditions) - Vmstd	29.671	dscf
Total Particulates	0.2	mg
Particulate Concentration (dry-standard)	0.000006741	grams/dscf
Particulate Emission Rate	0.000075000	grams/hour

JOB NUMBER 015-S-072-1

RUN # 1

DATE: 10_25_16

BURN RATE 0.97 KG/HR DRY

FILTER A PARTICULATE 2.1 mg

FILTER B PARTICULATE 2.3 mg

	SAMPLE A INFORMATION		SAMPLE B INFORMATION	
Total Sample Volume - Vm	22.54		22.17	
Average Gas Velocity in Dilution Tunnel - vs	13.17	feet/second	13.17	feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8766.10	dscf/hour	8766.10	dscf/hour
Total Sample Volume (Standard Conditions) - Vmstd	21.90	dscf	21.45	dscf
Average Tunnel Temperature	88.2	F	88.2	F
Average Delta p	0.038		0.038	
Average Gas Meter Temperature	90	F	90	F
Average Delta H	2.02	in-h20	1.98	in-h20
Total Time of Test	160	min	160	min
Total Particulates	2.1	mg	2.3	mg
Particulate Concentration (dry-standard)	0.00010	grams/dscf	0.00011	grams/dscf
Ambient Train (dry-standard)	0.000006741	grams/dscf	0.000006741	grams/dscf
Net (dry-standard)	0.000089155	grams/dscf	0.00010049	grams/dscf
Particulate Emission Rate	0.78	grams/hour	0.88	grams/hour
Total PM Emissions	2.08	grams	2.35	grams
Average Total PM Emissions		2.22		grams
AVERAGE PARTICLATE EMISSIONS RATE		0.83		grams/hour
% OF AVERAGE	94.0		106.0	
Emissions Factor	0.809	g/Kg -Dry	0.912	g/Kg -Dry

PREBURN

JOB # 015-S-072-1
TECHNICIA BTNGEN
DATE: 10_25_16
RUN #: 2
READING INTERVAL: 10
.
Run Time: 60

Model Designation F1500

	Tunnel Traverse Information								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.036	0.042	0.040	0.038	0.038	0.038	0.044	0.035	0.039
Temperature	90	90	90	90	90	90	90	90	90.000

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T
0	4.5	-0.06	484	490	385	729	244	466.4
10	3.6	-0.053	482	492	310	667	257	441.6
20	2.6	-0.048	488	504	302	701	262	451.4
30	2.1	-0.042	487	509	310	616	265	437.4
40	1.8	-0.045	470	487	309	528	267	412.2
50	1.6	-0.039	448	459	298	461	268	386.8
60	1.4	-0.046	426	437	287	417	269	367.2

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Tunnel Velocity:	13.4189	ft/sec.
Intial Tunnel Flow:	147.434	scfm
Average Tunnel Flow:	147.118	scfm

Notes:

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T

Run #	2
Date:	10/25/16

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Dilution Tunnel Traverse Data									
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.036	0.042	0.040	0.038	0.038	0.038	0.044	0.035	0.039
Temperature	90	90	90	90	90	90	90	90	90.000

Tunnel Velocity:	13.419	ft/sec.
Intial Tunnel Flow:	147.43	scfm
Average Tunnel Flow	147.12	scfm

JOB #	015-S-072-1															
TECHNICIA	BTNGEN						ROOM TEMP (F)		74.8			BEG	MID	END	AVG	
DATE:	10_25_16						BAROMETRIC					29.94	29.94	29.94	29.94	
RUN #:	2															
READING INTERVAL:	10															
SAMPLE BOX :	A	METER Y FACTOR:	1.007						PROBE MATERIAL:			SS				
FRONT FILTER #:	2956&2961				REAR FILTER #	REAR FILTER #:	2957									
FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM)	<0.01		@	5	IN-HG					
Run Time:	130	AMBIENT FILTER #:				2960	VOLUME	711.411	LITERS	FUEL MOISTURE DB			19.5	%		
		FINAL LEAK RATE (CFM):				<0.01	@	5	IN-HG							
TEST START TIME:	16:47								1	2	3	4	5	6		
									TEMPERATURES							
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
0	0.000	0.000	0.039	0.01	-0.06		NA	6.8	0	94	337	75	314	656.35	81	74
10	1.387	0.139	0.039	2.01	-0.89	13.418	101	5.8	1	99	384	78	346	769.95	81	74
20	2.781	0.139	0.039	2	-0.95	13.442	101	4.7	1.1	101	412	79	347	859.24	83	74
30	4.180	0.140	0.039	2.03	-1.36	13.478	101	3.6	1.1	104	452	80	360	993.28	86	75
40	5.582	0.140	0.039	2.01	-1.53	13.430	101	2.5	1.1	100	441	80	301	956.58	89	75
50	6.991	0.141	0.039	2.03	-0.68	13.406	100	1.7	0.8	98	402	80	302	852.4	92	75
60	8.405	0.141	0.039	2.03	-0.73	13.382	100	1.3	0.4	96	362	80	295	753.79	94	75
70	9.822	0.142	0.039	2.05	-1.5	13.358	100	1	0.3	94	353	80	283	731	95	75
80	11.244	0.142	0.039	2.04	-1.45	13.333	100	0.8	0.2	92	329	80	277	688.94	97	75
90	12.665	0.142	0.039	2.03	-1.49	13.321	100	0.7	0.1	91	322	79	273	681.85	98	75
100	14.090	0.143	0.039	2.03	-1.4	13.309	100	0.5	0.2	90	321	79	265	684.42	98	75
110	15.518	0.143	0.039	2.04	-1.52	13.309	100	0.3	0.2	90	324	78	258	691.16	99	75
120	16.942	0.142	0.039	2.02	-0.72	13.309	99	0.2	0.1	90	323	78	250	684.21	99	75
130	18.373	0.143	0.039	2.05	-1.38	13.297	100	0	0.2	89	321	78	243	679.03	99	75

TEST START TIME:	16:47								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP

TEST START TIME:	16:47								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
	18.373		0.039	2.03		13.369	100.2			95	363				92	75

JOB #	015-S-072-1										
TECHNICIA	BTNGEN										
DATE:	10_25_16										
RUN #:	2										
READING INTERVAL:	10										
SAMPLE BOX :	*B*	METER Y FACTOR:		1.002			PROBE MATERIAL:	**SS**			
FRONT FILTER #:	2958					REAR FILTER #:	2959				
FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG	

Run Time: 130 **Firebox Delta T** **49.4**

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
0	0	0	NA	0	0	1	425	437	75	412	268	81	371
10	1.367	0.137	101	-0.05	1.97	1.37	390	394	78	482	256	81	374
20	2.739	0.137	101	-0.05	1.97	1.49	379	399	79	624	255	84	401
30	4.116	0.138	101	-0.06	1.99	1.43	402	420	80	730	248	86	432
40	5.507	0.139	101	-0.06	1.99	1.96	432	448	80	771	244	89	439
50	6.899	0.139	101	-0.05	1.99	1.55	458	459	80	708	244	91	434
60	8.292	0.139	100	-0.05	1.98	2	455	455	80	585	247	93	407
70	9.688	0.140	100	-0.04	1.99	1.59	440	444	80	505	249	95	384
80	11.089	0.140	100	-0.04	1.97	1.87	425	424	79	453	250	96	366
90	12.490	0.140	100	-0.04	1.98	1.26	416	414	79	423	250	97	355
100	13.890	0.140	99	-0.04	1.98	1.24	410	406	79	404	249	98	347
110	15.297	0.141	100	-0.04	1.98	2.02	402	398	78	390	247	99	339
120	16.699	0.140	99	-0.03	1.99	1.86	393	391	78	375	243	99	330
130	18.105	0.141	100	-0.04	1.99	1.5	381	384	78	362	239	99	322

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
	18.105	0.139	100.236	-0.042	1.98231	1.58143	415	420	79	516	249	92	49
	TOTAL	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	**DT**

Ambient Sample Results:

JOB NUMBER: 015-S-072-1
TECHNICIAN: BTNGEN
DATE: 10_25_16
RUN NUMBER: 2

METER Y FACTOR: **1.003**

	Sample Volume (L)	Meter Temp °F	ΔH	ΔP
Start	0	83	0	0
End	711.411	100	0	0

	SAMPLE INFORMATION	
Total Sample Volume - Vm	711.411	Liters
Total Sample Volume - Vm	25.123	ft^3
Average Sample Rate	0.19	ft^3/min
Sample Time	130.00	Minutes
Average Meter Temperature	91.5	°F
Total Sample Volume (Standard Conditions) - Vmstd	24.141	dscf
Total Particulates	0.0	mg
Particulate Concentration (dry-standard)	0.000000000	grams/dscf
Particulate Emission Rate	0.000000000	grams/hour

JOB NUMBER 015-S-072-1

RUN # 2

DATE: 10_25_16

BURN RATE 1.19 KG/HR DRY

FILTER A PARTICULATE 2 mg

FILTER B PARTICULATE 2 mg

	SAMPLE A INFORMATION		SAMPLE B INFORMATION	
Total Sample Volume - Vm	18.37		18.11	
Average Gas Velocity in Dilution Tunnel - vs	13.42	feet/second	13.42	feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8827.06	dscf/hour	8827.06	dscf/hour
Total Sample Volume (Standard Conditions) - Vmstd	17.79	dscf	17.45	dscf
Average Tunnel Temperature	94.9	F	94.9	F
Average Delta p	0.039		0.039	
Average Gas Meter Temperature	92	F	92	F
Average Delta H	2.03	in-h20	1.98	in-h20
Total Time of Test	130	min	130	min
Total Particulates	2	mg	2	mg
Particulate Concentration (dry-standard)	0.00011	grams/dscf	0.00011	grams/dscf
Ambient Train (dry-standard)	0.000000000	grams/dscf	0.000000000	grams/dscf
Net (dry-standard)	0.000112421	grams/dscf	0.00011462	grams/dscf
Particulate Emission Rate	0.99	grams/hour	1.01	grams/hour
Total PM Emissions	2.15	grams	2.19	grams
Average Total PM Emissions		2.17		grams
AVERAGE PARTICLATE EMISSIONS RATE		1.00		grams/hour
% OF AVERAGE	99.0		101.0	
Emissions Factor	0.833	g/Kg -Dry	0.849	g/Kg -Dry

PREBURN

JOB # 015-S-072-1
TECHNICIAN BTNGEN
DATE: 10_26_16
RUN #: 3
READING INTERVAL: 10
.
Run Time: 60

Model Designation F1500

	Tunnel Traverse Information								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.032	0.035	0.038	0.038	0.038	0.041	0.041	0.033	0.037
Temperature	100	100	100	100	100	100	100	100	100.000

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T
0	5.7	-0.063	475	471	377	711	242	455.2
10	4.4	-0.064	469	484	284	699	242	435.6
20	3.1	-0.06	490	504	283	731	239	449.4
30	2.2	-0.053	516	526	294	690	241	453.4
40	1.8	-0.045	512	518	291	573	244	427.6
50	1.6	-0.047	484	486	275	469	252	393.2
60	1.4	-0.049	457	457	279	415	257	373

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Tunnel Velocity:	13.20304	ft/sec.
Intial Tunnel Flow:	142.218	scfm
Average Tunnel Flow:	141.8547	scfm

Notes:

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T

Run #	3
Date:	2/9/11

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Dilution Tunnel Traverse Data									
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.032	0.035	0.038	0.038	0.038	0.041	0.041	0.033	0.037
Temperature	100	100	100	100	100	100	100	100	100.000

Tunnel Velocity:	13.203	ft/sec.
Intial Tunnel Flow:	142.22	scfm
Average Tunnel Flow	141.85	scfm

JOB #	015-S-072-1															
TECHNICIA	BTNGEN						ROOM TEMP (F)		74.5			BEG	MID	END	AVG	
DATE:	10_26_16							BAROMETRIC				29.82	29.82	29.82	29.82	
RUN #:	3															
READING INTERVAL:		10														
SAMPLE BOX :		A	METER Y FACTOR:		1.007				PROBE MATERIAL:			SS				
FRONT FILTER #:		2962&2967				REAR FILTER #	REAR FILTER #:		2963							
FINAL LEAK RATE (CFM):		<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM)		<0.01	@	5	IN-HG				
Run Time:		110		AMBIENT FILTER #:				VOLUME		LITERS	FUEL MOISTURE DB			19.7	%	
				FINAL LEAK RATE (CFM):			<0.01	@	5	IN-HG						
TEST START TIME:		11:37								1	2	3	4	5	6	
										TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	FB	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	INT	TEMP	TEMP
0	0.000	0.000	0.037	0.01	-0.1		NA	6.8	0	102	377	75	301	680.55	80	74
10	1.389	0.139	0.037	2.02	-1.13	13.177	101	5.9	0.9	106	416	80	329	777.83	81	75
20	2.794	0.141	0.037	2.01	-0.99	13.224	102	4.6	1.3	110	478	81	334	979.52	84	74
30	4.194	0.140	0.037	2.03	-0.76	13.258	101	3.2	1.4	113	507	82	357	1095.82	87	74
40	5.605	0.141	0.037	2.01	-1.45	13.224	101	2.1	1.1	110	489	82	280	1011.18	90	74
50	7.016	0.141	0.037	2	-0.8	13.189	100	1.3	0.8	107	447	82	282	877.55	93	74
60	8.433	0.142	0.037	2.01	-1.47	13.154	100	0.9	0.4	104	404	82	280	773.71	95	75
70	9.857	0.142	0.037	2.02	-1.37	13.119	100	0.6	0.3	101	367	82	270	695.51	97	75
80	11.284	0.143	0.037	2.03	-0.65	13.107	100	0.4	0.2	100	355	81	259	683.1	98	74
90	12.711	0.143	0.037	2.02	-1.5	13.084	99	0.2	0.2	98	346	81	252	668.34	100	75
100	14.143	0.143	0.037	2.02	-0.79	13.084	100	0.1	0.1	98	344	81	244	656.57	100	75
110	15.577	0.143	0.037	2.02	-0.91	13.084	100	0	0.1	98	337	81	235	634.35	101	75

TEST START TIME:	11:37								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	FB	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	INT	TEMP	TEMP

TEST START TIME:	11:37								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	FB	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	INT	TEMP	TEMP
	15.577		0.037	2.02		13.155	100.2			104	406				92	75

JOB #	015-S-072-1										
TECHNICIAN	BTNGEN										
DATE:	10_26_16										
RUN #:	3										
READING INTERVAL:	10										
SAMPLE BOX :	*B*	METER Y FACTOR:		1.002			PROBE MATERIAL:			**SS**	
FRONT FILTER #:	2964					REAR FILTER #:					
FINAL LEAK RATE (CFM):	<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM):	<0.01	@	5	IN-HG	

Run Time: 110 **Firebox Delta T** **22.00**

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
0	0	0	NA	0	0	1	455	456	75	415	257	80	377
10	1.369	0.137	101	-0.05	2	1.63	399	399	79	478	256	81	372
20	2.748	0.138	101	-0.06	1.97	1.64	398	408	81	671	255	84	413
30	4.133	0.139	102	-0.06	2.01	1.76	426	445	82	771	251	87	450
40	5.522	0.139	101	-0.06	1.97	1.71	459	480	82	755	250	90	445
50	6.915	0.139	100	-0.06	1.97	1.62	486	500	82	659	252	93	436
60	8.308	0.139	100	-0.04	1.97	1.85	490	492	81	550	255	95	413
70	9.706	0.140	100	-0.05	1.96	1.59	473	469	81	467	256	97	416
80	11.108	0.140	100	-0.05	1.97	1.8	458	447	81	420	255	98	395
90	12.510	0.140	99	-0.04	1.97	1.48	446	432	80	389	253	99	380
100	13.913	0.140	99	-0.04	1.96	1.92	431	418	80	368	250	100	367
110	15.329	0.142	100	-0.04	2	1.99	417	405	80	353	244	101	355

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
	15.329	0.139	100.202	-0.046	1.977273	1.665833	445	446	80	525	253	92	22
	TOTAL	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	DT

Ambient Sample Results:

JOB NUMBER: 015-S-072-1
TECHNICIAN: BTNGEN
DATE: 10_26_16
RUN NUMBER: 3

METER Y FACTOR: **1.003**

	Sample Volume (L)	Meter Temp °F	ΔH	ΔP
Start	0	91.5	0	0
End	597.11	103	0	0

	SAMPLE INFORMATION	
Total Sample Volume - Vm	597.110	Liters
Total Sample Volume - Vm	21.087	ft^3
Average Sample Rate	0.19	ft^3/min
Sample Time	110.00	Minutes
Average Meter Temperature	97.25	°F
Total Sample Volume (Standard Conditions) - Vmstd	19.973	dscf
Total Particulates	0.0	mg
Particulate Concentration (dry-standard)	0.000000000	grams/dscf
Particulate Emission Rate	0.000000000	grams/hour

JOB NUMBER 015-S-072-1

RUN # 3

DATE: 10_26_16

BURN RATE 1.41 KG/HR DRY

FILTER A PARTICULATE 2.3 mg

FILTER B PARTICULATE 2 mg

	SAMPLE A INFORMATION		SAMPLE B INFORMATION	
Total Sample Volume - Vm	15.58		15.33	
Average Gas Velocity in Dilution Tunnel - vs	13.20	feet/second	13.20	feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8511.28	dscf/hour	8511.28	dscf/hour
Total Sample Volume (Standard Conditions) - Vmstd	15.02	dscf	14.71	dscf
Average Tunnel Temperature	103.9	F	103.9	F
Average Delta p	0.037		0.037	
Average Gas Meter Temperature	92	F	92	F
Average Delta H	2.02	in-h20	1.98	in-h20
Total Time of Test	110	min	110	min
Total Particulates	2.3	mg	2	mg
Particulate Concentration (dry-standard)	0.00015	grams/dscf	0.00014	grams/dscf
Ambient Train (dry-standard)	0.000000000	grams/dscf	0.000000000	grams/dscf
Net (dry-standard)	0.000153091	grams/dscf	0.00013594	grams/dscf
Particulate Emission Rate	1.30	grams/hour	1.16	grams/hour
Total PM Emissions	2.39	grams	2.12	grams
Average Total PM Emissions		2.26		grams
AVERAGE PARTICLATE EMISSIONS RATE		1.23		grams/hour
% OF AVERAGE	105.9		94.1	
Emissions Factor	0.927	g/Kg -Dry	0.823	g/Kg -Dry

PREBURN

JOB # 015-S-072-1
TECHNICIA BTNGEN
DATE: 10_26_16
RUN #: 4
READING INTERVAL: 10
.
Run Time: 60

Model Designation F1500

	Tunnel Traverse Information								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.036	0.035	0.038	0.036	0.038	0.041	0.041	0.035	0.038
Temperature	115	115	115	115	115	115	115	115	115.000

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T
0	7.3	-0.058	457	453	333	615	239	419.4
10	6.1	-0.062	450	435	259	646	237	405.4
20	4.6	-0.065	463	458	251	700	231	420.6
30	3	-0.07	505	493	266	774	230	453.6
40	2	-0.06	537	521	288	736	235	463.4
50	1.6	-0.052	523	506	281	549	244	420.6
60	1.5	-0.05	486	455	252	440	249	376.4

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Tunnel Velocity:	13.2845	ft/sec.
Intial Tunnel Flow:	141.362	scfm
Average Tunnel Flow:	140.984	scfm

Notes:

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T

Run #	4
Date:	10/26/16

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Dilution Tunnel Traverse Data									
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.036	0.035	0.038	0.036	0.038	0.041	0.041	0.035	0.038
Temperature	115	115	115	115	115	115	115	115	115.000

Tunnel Velocity:	13.285	ft/sec.
Intial Tunnel Flow:	141.36	scfm
Average Tunnel Flow	140.98	scfm

JOB #	015-S-072-1															
TECHNICIA	BTNGEN							ROOM TEMP (F)	76.0			BEG	MID	END	AVG	
DATE:	10_26_16							BAROMETRIC				29.82	29.82	29.82	29.82	
RUN #:	4															
READING INTERVAL:	10															
SAMPLE BOX :	A	METER Y FACTOR:	1.007						PROBE MATERIAL:			SS				
FRONT FILTER #:	2968&2973				REAR FILTER #	REAR FILTER #:	2969									
FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG						
Run Time:	90	AMBIENT FILTER #:				2972	VOLUME	490.026	LITERS	FUEL MOISTURE DB			22.2	%		
		FINAL LEAK RATE (CFM):				<0.01	@	5	IN-HG							
TEST START TIME:	14:55								1	2	3	4	5	6		
									TEMPERATURES							
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
0	0.000	0.000	0.037	0.02	-0.15		NA	6.9	0	107	396	78	279	692.97	89	76
10	1.398	0.140	0.037	1.99	-0.68	13.270	100	5.8	1.1	114	473	83	321	947.92	88	76
20	2.803	0.141	0.037	2	-0.9	13.328	101	4	1.8	119	539	84	345	1110.58	89	76
30	4.209	0.141	0.037	2	-1.28	13.351	101	2.6	1.4	121	551	85	374	1166.79	92	76
40	5.623	0.141	0.037	2.01	-0.85	13.293	101	1.5	1.1	116	508	85	299	992.65	94	76
50	7.040	0.142	0.037	2.02	-1.42	13.235	100	0.9	0.6	111	442	84	289	815.8	96	76
60	8.466	0.143	0.037	2	-1.51	13.200	100	0.7	0.2	108	407	84	274	742.15	98	76
70	9.895	0.143	0.037	2.02	-1.13	13.177	100	0.5	0.2	106	393	84	260	731.59	99	76
80	11.319	0.142	0.037	2.02	-1.56	13.154	99	0.2	0.3	104	383	83	250	716.31	100	76
90	12.754	0.144	0.037	2.02	-1.49	13.142	100	0	0.2	103	375	83	243	699.44	101	76

TEST START TIME:	14:55								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP

TEST START TIME:	14:55								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
	12.754		0.037	2.01		13.239	100.3			111	447				95	76

JOB #	015-S-072-1
TECHNICIA	BTNGEN
DATE:	10_26_16
RUN #:	4
READING INTERVAL:	10

SAMPLE BOX :	*B*	METER Y FACTOR:		1.002		PROBE MATERIAL:		**SS**		
FRONT FILTER #:	2970				REAR FILTER #:	2971				
FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG	FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG	

Run Time: 90 **Firebox Delta T** **31**

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
0	0	0	NA	0	0	1	485	452	78	441	248	89	381
10	1.384	0.138	101	-0.06	1.98	1.51	428	417	82	575	246	88	397
20	2.771	0.139	101	-0.06	1.97	1.75	439	441	84	739	241	89	441
30	4.159	0.139	101	-0.07	1.97	1.58	471	482	85	818	240	92	477
40	5.553	0.139	101	-0.06	1.98	2.06	503	519	85	753	242	94	463
50	6.953	0.140	100	-0.05	1.99	1.54	520	522	84	607	245	96	437
60	8.359	0.141	100	-0.05	1.99	2	502	500	84	503	247	97	405
70	9.765	0.141	100	-0.05	1.99	1.38	479	477	83	445	244	99	381
80	11.178	0.141	100	-0.04	1.99	2.03	458	459	83	412	240	100	364
90	12.588	0.141	99	-0.04	1.99	1.89	439	444	82	389	235	101	350

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
	12.588	0.140	100.308	-0.048	1.98333	1.674	472	471	83	568	243	95	31
	TOTAL	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	**DT**

Ambient Sample Results:

JOB NUMBER: 015-S-072-1
TECHNICIAN: BTNGEN
DATE: 10_26_16
RUN NUMBER: 4

METER Y FACTOR: **1.003**

	Sample Volume (L)	Meter Temp °F	ΔH	ΔP
Start	0	90.8	0	0
End	490.026	103	0	0

	SAMPLE INFORMATION	
Total Sample Volume - Vm	490.026	Liters
Total Sample Volume - Vm	17.305	ft^3
Average Sample Rate	0.19	ft^3/min
Sample Time	90.00	Minutes
Average Meter Temperature	96.9	°F
Total Sample Volume (Standard Conditions) - Vmstd	16.401	dscf
Total Particulates	0.0	mg
Particulate Concentration (dry-standard)	0.000000000	grams/dscf
Particulate Emission Rate	0.000000000	grams/hour

JOB NUMBER 015-S-072-1

RUN # 4

DATE: 10_26_16

BURN RATE 1.71 KG/HR DRY

FILTER A PARTICULATE 1.2 mg

FILTER B PARTICULATE 1.4 mg

	SAMPLE A INFORMATION		SAMPLE B INFORMATION	
Total Sample Volume - Vm	12.75		12.59	
Average Gas Velocity in Dilution Tunnel - vs	13.28	feet/second	13.28	feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8459.07	dscf/hour	8459.07	dscf/hour
Total Sample Volume (Standard Conditions) - Vmstd	12.25	dscf	12.03	dscf
Average Tunnel Temperature	110.9	F	110.9	F
Average Delta p	0.037		0.037	
Average Gas Meter Temperature	95	F	95	F
Average Delta H	2.01	in-h20	1.98	in-h20
Total Time of Test	90	min	90	min
Total Particulates	1.2	mg	1.4	mg
Particulate Concentration (dry-standard)	0.00010	grams/dscf	0.00012	grams/dscf
Ambient Train (dry-standard)	0.000000000	grams/dscf	0.000000000	grams/dscf
Net (dry-standard)	0.000097985	grams/dscf	0.00011639	grams/dscf
Particulate Emission Rate	0.83	grams/hour	0.98	grams/hour
Total PM Emissions	1.24	grams	1.48	grams
Average Total PM Emissions		1.36		grams
AVERAGE PARTICLATE EMISSIONS RATE		0.91		grams/hour
% OF AVERAGE	91.4		108.6	
Emissions Factor	0.485	g/Kg -Dry	0.577	g/Kg -Dry

PREBURN

JOB # 015-S-072-1
TECHNICIA BTNGEN
DATE: 10_27_16
RUN #: 5
READING INTERVAL: 10
.
Run Time: 60

Model Designation F1500

	Tunnel Traverse Information								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.034	0.036	0.038	0.036	0.036	0.038	0.042	0.036	0.037
Temperature	90	90	90	90	90	90	90	90	90.000

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T
0	4.2	-0.056	514	497	368	740	261	476
10	3.5	-0.046	496	480	362	640	282	452
20	2.6	-0.049	494	484	360	669	286	458.6
30	2	-0.043	492	501	368	611	287	451.8
40	1.8	-0.04	472	486	376	525	288	429.4
50	1.6	-0.035	452	461	374	462	288	407.4
60	1.4	-0.048	434	441	355	426	289	389

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Tunnel Velocity:	13.1191	ft/sec.
Intial Tunnel Flow:	143.767	scfm
Average Tunnel Flow:	142.762	scfm

Notes:

			1	2	3	4	5	
			TEMPERATURES					
ET	SCALE READING	FLUE DRAFT	LEFT SIDE	RIGHT SIDE	BACK	TOP	BOTTOM	STOVE AVG T

Run #	5
Date:	10/27/16

Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Dilution Tunnel H2O:	2.00	%
Dilution Tunnel Static:	-0.400	In H20
Tunnel Area:	0.196	ft^2
Pitot Tube Cp:	0.99	

Dilution Tunnel Traverse Data									
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
dP	0.034	0.036	0.038	0.036	0.036	0.038	0.042	0.036	0.037
Temperature	90	90	90	90	90	90	90	90	90.000

Tunnel Velocity:	13.119	ft/sec.
Intial Tunnel Flow:	143.77	scfm
Average Tunnel Flow	142.76	scfm

JOB #	015-S-072-1															
TECHNICIA	BTNGEN							ROOM TEMP (F)	72.5			BEG	MID	END	AVG	
DATE:	10_27_16							BAROMETRIC				29.9	29.9	29.9	29.9	
RUN #:	5															
READING INTERVAL:	10															
SAMPLE BOX :	A	METER Y FACTOR:	1.007						PROBE MATERIAL:			SS				
FRONT FILTER #:	2974&2979				REAR FILTER #	REAR FILTER #:	2975									
FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG						
Run Time:	140	AMBIENT FILTER #:				2978	VOLUME	757.172	LITERS	FUEL MOISTURE DB			20.3	%		
		FINAL LEAK RATE (CFM):				<0.01	@	5	IN-HG							
TEST START TIME:	11:45								1	2	3	4	5	6		
									TEMPERATURES							
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
0	0.000	0.000	0.037	0	-0.03		NA	6.8	0	98	342	74	355	698.23	79	73
10	1.385	0.139	0.037	2	-1.46	13.090	101	5.9	0.9	100	375	78	334	810.55	80	73
20	2.777	0.139	0.037	1.99	-1.44	13.101	101	4.9	1	101	380	79	320	781.62	82	73
30	4.173	0.140	0.037	1.99	-1.5	13.113	101	3.8	1.1	102	397	80	327	878.72	86	73
40	5.581	0.141	0.037	2.02	-0.92	13.136	101	2.7	1.1	104	432	80	347	1025.95	89	73
50	6.991	0.141	0.037	2.03	-1.05	13.125	100	1.9	0.8	103	398	80	367	866.87	92	73
60	8.408	0.142	0.037	2.01	-1.5	13.101	100	1.4	0.5	101	362	80	374	781.75	94	73
70	9.826	0.142	0.037	2.03	-1.29	13.078	100	1.1	0.3	99	345	80	365	774.47	96	73
80	11.253	0.143	0.037	2.02	-0.86	13.054	100	0.9	0.2	97	332	79	351	740.09	97	72
90	12.677	0.142	0.037	2.03	-0.74	13.043	100	0.7	0.2	96	323	79	341	721.1	98	72
100	14.107	0.143	0.037	2.03	-1.42	13.031	100	0.6	0.1	95	321	79	332	723.61	99	72
110	15.537	0.143	0.037	2.03	-1.09	13.031	100	0.4	0.2	95	320	78	325	718.38	99	72
120	16.965	0.143	0.037	2.04	-1.3	13.031	100	0.2	0.2	95	319	78	321	716.83	100	72
130	18.400	0.144	0.037	2.05	-0.98	13.019	100	0.1	0.1	94	316	78	318	691.71	100	72
140	19.829	0.143	0.037	2.03	-0.98	13.019	99	0	0.1	94	309	78	316	667.93	101	72

TEST START TIME:	11:45								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP

TEST START TIME:	11:45								1	2	3	4	5	6	
									TEMPERATURES						
	GAS METER	SAMPLE	TUNNEL	ORIFICE	FILTER	TUNNEL VEL	Proportional	Scale	Weight	TUNNEL	FLUE	FILTER	FB REAR	CAT	METER	AMBIENT
ET	VOLUME	RATE(FT3/MIN)	DELTA P	DELTA H	VAC	FT/SEC	Rate (%)	Weight	Chg	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
	19.829		0.037	2.02		13.069	100.2			98	351				93	73

JOB #	015-S-072-1										
TECHNICIA	BTNGEN										
DATE:	10_27_16										
RUN #:	5										
READING INTERVAL:	10										
SAMPLE BOX :	*B*	METER Y FACTOR:		1.002			PROBE MATERIAL:	**SS**			
FRONT FILTER #:	2976					REAR FILTER #:	2977				
FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG		FINAL LEAK RATE (CFM)	<0.01	@	5	IN-HG	

Run Time: 140 **Firebox Delta T** **53.8**

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
0	0	0	NA	0	0	1	434	440	74	424	288	78	388
10	1.363	0.136	101	-0.05	1.99	1.58	394	404	78	471	273	79	375
20	2.733	0.137	101	-0.05	1.98	1.95	367	399	78	556	272	82	383
30	4.108	0.138	100	-0.05	1.97	1.79	382	414	79	660	264	85	409
40	5.496	0.139	101	-0.06	2	1.25	410	438	79	739	258	88	438
50	6.891	0.140	101	-0.05	1.99	1.95	442	471	80	692	257	91	446
60	8.290	0.140	101	-0.04	1.99	1.5	451	481	80	616	260	93	436
70	9.690	0.140	100	-0.04	1.99	1.45	445	463	79	525	265	95	413
80	11.092	0.140	100	-0.04	1.99	1.62	431	441	79	468	269	96	392
90	12.501	0.141	100	-0.04	1.99	1.98	419	428	78	435	271	98	379
100	13.905	0.140	100	-0.04	1.99	1.44	408	416	78	414	270	98	368
110	15.315	0.141	100	-0.04	1.98	1.29	398	405	78	399	268	99	359
120	16.724	0.141	100	-0.04	2	1.18	388	395	78	385	265	100	351
130	18.133	0.141	100	-0.04	1.98	1.7	376	386	78	372	260	100	342
140	19.546	0.141	100	-0.04	1.99	1.87	365	380	78	357	254	100	334

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T

							1	2	3	4	5	6	
							TEMPERATURES						
ET	GAS METER VOLUME	SAMPLE RATE(FT3/MIN)	PROPORTIONAL RATE	FLUE DRAFT	ORIFICE DELTA H	FILTER VAC	LEFT SIDE	RIGHT SIDE	FILTER	FB TOP	FB BOT	METER	STOVE AVG T
	19.546	0.140	100.202	-0.041	1.98786	1.57	407	424	78	501	266	92	54
	TOTAL	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	**DT**

Ambient Sample Results:

JOB NUMBER: 015-S-072-1
TECHNICIAN: BTNGEN
DATE: 10_27_16
RUN NUMBER: 5

METER Y FACTOR: **1.003**

	Sample Volume (L)	Meter Temp °F	ΔH	ΔP
Start	0	93.8	0	0
End	757.172	101.7	0	0

	SAMPLE INFORMATION	
Total Sample Volume - Vm	757.172	Liters
Total Sample Volume - Vm	26.739	ft^3
Average Sample Rate	0.19	ft^3/min
Sample Time	140.00	Minutes
Average Meter Temperature	97.75	°F
Total Sample Volume (Standard Conditions) - Vmstd	25.372	dscf
Total Particulates	0.2	mg
Particulate Concentration (dry-standard)	0.000007883	grams/dscf
Particulate Emission Rate	0.000085714	grams/hour

JOB NUMBER 015-S-072-1

RUN # 5

DATE: 10_27_16

BURN RATE 1.10 KG/HR DRY

FILTER A PARTICULATE 1.6 mg

FILTER B PARTICULATE 1.5 mg

	SAMPLE A INFORMATION		SAMPLE B INFORMATION	
Total Sample Volume - Vm	19.83		19.55	
Average Gas Velocity in Dilution Tunnel - vs	13.12	feet/second	13.12	feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8565.72	dscf/hour	8565.72	dscf/hour
Total Sample Volume (Standard Conditions) - Vmstd	19.15	dscf	18.81	dscf
Average Tunnel Temperature	98.3	F	98.3	F
Average Delta p	0.037		0.037	
Average Gas Meter Temperature	93	F	92	F
Average Delta H	2.02	in-h20	1.99	in-h20
Total Time of Test	140	min	140	min
Total Particulates	1.6	mg	1.5	mg
Particulate Concentration (dry-standard)	0.00008	grams/dscf	0.00008	grams/dscf
Ambient Train (dry-standard)	0.000007883	grams/dscf	0.000007883	grams/dscf
Net (dry-standard)	0.000075651	grams/dscf	0.00007187	grams/dscf
Particulate Emission Rate	0.65	grams/hour	0.62	grams/hour
Total PM Emissions	1.51	grams	1.44	grams
Average Total PM Emissions		1.47		grams
AVERAGE PARTICLATE EMISSIONS RATE		0.63		grams/hour
% OF AVERAGE	102.6		97.4	
Emissions Factor	0.590	g/Kg -Dry	0.560	g/Kg -Dry

DIRIGO LABORATORIES INC.

Client:	FPI
Model:	F1500/I1500
Tracking No.:	72
Project No.:	015-S-072-1
Test Dates:	10/25/16 - 10/27/16

Run Number	(kg/hr) Burn Rate	(g/hr) Emmisions Rate
1	0.97	0.8
2	1.19	1.0
3	1.41	1.2
4	1.71	0.9

Total Runs: 4

EPA Method 28 - Weighted Average

DIRIGO LABORATORIES INC.

Weighted Average: 1.0 (g/hr)

Client:	FPI
Model:	F1500/I1500
Tracking No.:	72
Project No.:	015-S-072-1
Test Dates:	10/25/16 - 10/27/16

Burn Rate Category	2	Burn Rate Category	2
Burn Rate (kg/hr-dry)	0.97	Burn Rate (kg/hr-dry)	1.19
Emissions Rate (g/hr)	0.8	Emissions Rate (g/hr)	1.0
Emissions Rate Cap (g/hr)	15	Emissions Rate Cap (g/hr)	15
Weighting Factor	36.00%	Weighting Factor	23.52%
Run Number	1	Run Number	2

Burn Rate Category	3	Burn Rate Category	3
Burn Rate (kg/hr-dry)	1.41	Burn Rate (kg/hr-dry)	1.71
Emissions Rate (g/hr)	1.2	Emissions Rate (g/hr)	0.9
Emissions Rate Cap (g/hr)	15	Emissions Rate Cap (g/hr)	18
Weighting Factor	20.43%	Weighting Factor	20.05%
Run Number	3	Run Number	4

Test No.	Burn Rate	Pi	Ei	Ki	KiEi
1	0.97	0.349	0.8	0.538	0.45
2	1.19	0.538	1.0	0.352	0.35
3	1.41	0.700	1.2	0.305	0.38
4	1.71	0.843	0.9	0.300	0.27
0	5.00	1.000	0.0	0.000	0.00
0	5.00	1.000	0.0	0.000	0.00
0	5.00	1.000	0.0	0.000	0.00
0	5.00	1.000	0.0	0.000	0.00
		1.000		1.495	1.45

Nomenclature:
Pi = Probability for burn rate during test run
Ei = Emissions Rate for test run
Ki = Test run weighting factor

Burn Rate (kg/hr-dry)	Cum. Probability (P)
0.00	0.0000
0.01	0.0004
0.02	0.0008
0.03	0.0012
0.04	0.0016
0.05	0.0020
0.06	0.0030
0.07	0.0040
0.08	0.0050
0.09	0.0060
0.10	0.0070
0.11	0.0080
0.12	0.0090
0.13	0.0100
0.14	0.0110
0.15	0.0120
0.16	0.0128
0.17	0.0136
0.18	0.0144

REGENCY
FIREPLACE PRODUCTS

Cascades™ Series Freestanding Woodstove

Owners & Installation Manual

MODEL: F1500

Tested by:
Tested & Listed By OTL Portland Oregon USA
OMNI-Test Laboratories, Inc.
0219WS021S

Installer: Please complete the details on the back cover and leave this manual with the homeowner.
Homeowner: Please keep these instructions for future reference.

FPI FIREPLACE PRODUCTS INTERNATIONAL LTD. 6988 Venture St., Delta, BC Canada, V4G 1H4

Thank-you for purchasing a
REGENCY FIREPLACE PRODUCT.

The pride of workmanship that goes into each of our products will give you years of trouble-free enjoyment. Should you have any questions about your product that are not covered in this manual, please contact the **REGENCY DEALER** in your area.

"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." Failure to follow the manual details can lead to smoke and CO emissions spilling into the home. It is recommended to have monitors in areas that are expected to generate CO such as heater fueling areas.

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using crib wood." Model Regency F1500 – 1.0 g /hr.

"This manual describes the installation and operation of the Regency F1500 catalytic equipped wood heater. This heater meets the 2020 U.S. Environmental Protection Agency's crib wood emission limits for wood heaters. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 14,244 BTU/hr. to 20,386 BTU/hr." Efficiency is determined using the B415 method resulting in lower and higher heat values. This heater generates the best efficiency when operated using well-seasoned wood and installed in the main living areas where the majority of the chimney is within the building envelope. "This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation.

It is against federal regulation to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed."

CAUTION: BURN UNTREATED WOOD ONLY. OTHER MATERIALS SUCH AS WOOD PRESERVATIVES, METAL FOILS, COAL, PLASTIC, GARBAGE, SULPHUR OR OIL MAY DAMAGE THE CATALYST

"This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods."

DO NOT BURN:

- Treated wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash
- **Lawn clippings or yard waste**
- **Materials containing rubber including tires**
- **Materials containing plastic**
- **Waste petroleum products , paints or paint thinners or asphalt products**
- **Materials containing asbestos**
- **Construction or demolition debris**
- **Railroad ties**
- **Manure or animal remains**
- **Saltwater driftwood or other previously salt water saturated materials**
- **Unseasoned wood**
- **Paper products, cardboard, plywood or particle board. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in a wood heater.**

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

The authority having jurisdiction (such as Municipal Building Department, Fire Department, Fire Prevention Bureau, etc.) should be consulted before installation to determine the need to obtain a permit.

This unit must be connected to either a listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the United States of America. or code approved masonry chimney with flue liner.

F1500 is tested and certified to ULC-S627-00 and UL1482-2011 (R2015).

SAVE THESE INSTRUCTIONS

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We recommend that our products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) or in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training

WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov
919-874

table of contents

CAUTION: To avoid burns or wood splinters, when opening/closing the fuel door or adding wood to the fire, You should always wear appropriate protective gloves to protect your hands from the heat being emitted from this fireplace.

safety decal

This is a copy of the label that accompanies each Regency Freestanding Woodstove (F1500). We have printed a copy of the contents here for your review.

NOTE: Regency units are constantly being improved. Check the label on the unit and if there is a difference, the label on the unit is the correct one.

Safety Label for F1500

duplicate serial number 447

0219WS021S

LISTED SPACE HEATER, SOLID FUEL TYPE, ALSO SUITABLE FOR MOBILE HOME INSTALLATION / APPAREIL DE CHAUFFAGE AMBIANT HOMOLOGUÉ À COMBUSTIBLE SOLIDE, CONVENANT AUSSI POUR INSTALLATION DANS UNE MAISON MOBILE

DO NOT REMOVE THIS LABEL/ NE RETIREZ PAS CETTE ÉTIQUETTE

447

MODEL: REGENCY SMALL FREESTANDING STOVE - F1500

TESTED TO: ULC S627-00 / UL 1482-2011 (R2015)

U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD." TESTED TO METHOD 28R. MODEL REGENCY F1500 – 1.0G /HR. 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.
CERTIFIÉ CONFORME AUX NORMES 2020 DE L'AGENCE AMÉRICAINE DE L'ENVIRONNEMENT EN MATIÈRE D'ÉMISSION DE PARTICULES DE BOIS EN UTILISANT LE BOIS DE CORDE. HOMOLOGUÉ AVEC LA MÉTHODE 28R.. MODÈLE REGENCY F1500 – 1,0 G /H. CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ PÉRIODIQUEMENT ET RÉPARÉ POUR FONCTIONNER CORRECTEMENT. CONSULTER LE MANUEL D'INSTALLATION POUR PLUS D'INFORMATION. LA RÉGLEMENTATION FÉDÉRALE INTERDIT DE FAIRE FONCTIONNER UN TEL APPAREIL SI LES CONSIGNES D'UTILISATION CONTENUES DANS LE PRÉSENT MANUEL NE SONT PAS RESPECTÉES.
INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA. USE 150 MM (6 IN.) DIAMETER MINIMUM 24 MSG BLACK OR 26 MSG BLUED STEEL CONNECTOR WITH LISTED UL103 HT FACTORY-BUILT CHIMNEY SUITABLE FOR USE WITH SOLID FUELS OR MASONRY CHIMNEY.
SEE LOCAL BUILDING CODE AND MANUFACTURER'S INSTRUCTIONS FOR PRECAUTIONS REQUIRED FOR PASSING A CHIMNEY THROUGH A COMBUSTIBLE WALL OR CEILING. DO NOT PASS CHIMNEY CONNECTOR THROUGH COMBUSTIBLE WALL OR CEILING. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.
INSTALLER ET UTILISER SEULEMENT SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DU FABRICANT. CONTACTER LES RESPONSABLES DU BÂTIMENT OU DU SERVICE-INCENDIE DE VOTRE RÉGION POUR CONNAÎTRE LES RESTRICTIONS ET EXIGENCES D'INSPECTION DANS VOTRE RÉGION. UTILISER UN CONNECTEUR D'UN DIAMÈTRE MINIMAL DE 150 MM (6 PO) 24 MSG EN ACIER NOIR OU 26 MSG EN ACIER BRONZÉ AVEC CHEMINÉE PRÉFABRIQUÉE HOMOLOGUÉE UL103 HT CONÇUE POUR UTILISATION AVEC COMBUSTIBLES SOLIDES OU UNE CHEMINÉE DE MAÇONNERIE.
VOIR LE CODE DU BÂTIMENT LOCAL ET LES INSTRUCTIONS DU FABRICANT CONCERNANT LES PRÉCAUTIONS EXIGÉES POUR INSTALLER UNE CHEMINÉE TRAVERSANT UN MUR OU PLAFOND EN MATÉRIAUX COMBUSTIBLES. NE FAITES PAS TRAVERSER LE CONNECTEUR DE CHEMINÉE DANS UN MUR OU PLAFOND EN MATÉRIAUX COMBUSTIBLES. NE RACCORDEZ PAS CE POÊLE À BOIS À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL.
MINIMUM ALCOVE CEILING HEIGHT: 2109 MM / 83" MAXIMUM ALCOVE DEPTH 915 MM / 36 IN.
MINIMUM CLEARANCES FOR HORIZONTAL CONNECTOR TO CEILING: 455 MM / 18"
THE SPACE BENEATH THE HEATER MUST NOT BE OBSTRUCTED. OPERATE ONLY WITH FIREBRICKS IN PLACE.
FOR USE WITH SOLID WOOD FUEL ONLY. USE OF OTHER FUELS MAY DAMAGE HEATER AND CREATE A HAZARDOUS CONDITION. DO NOT OBSTRUCT COMBUSTION AIR OPENINGS. OPERATE ONLY WITH FIREBRICKS IN PLACE. RISK OF SMOKE AND FLAME SPILLAGE, OPERATE ONLY WITH DOORS FULLY CLOSED. IF INSTALLED IN A MOBILE HOME OPERATE ONLY WITH DOORS FULLY CLOSED - OPEN FEED DOOR TO FEED FIRE ONLY. DO NOT USE GRATE OR ELEVATE FIRE. BUILD WOOD FIRE DIRECTLY ON HEARTH. DO NOT OVERFIRE - IF HEATER OR CHIMNEY CONNECTOR GLOWS YOU ARE OVERFIRING. INSPECT AND CLEAN CHIMNEY AND CONNECTOR FREQUENTLY. UNDER CERTAIN CONDITIONS OF USE CREOSOTE BUILDUP MAY OCCUR RAPIDLY. KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIAL AWAY FROM HEATER. REPLACE GLASS ONLY WITH NEOCERAM GLASS. COMBUSTIBLE FLOOR MUST BE PROTECTED BY NON-COMBUSTIBLE MATERIAL EXTENDING BENEATH THE HEATER AND TO THE FRONT AND SIDES AS INDICATED OR TO THE NEAREST PERMITTED COMBUSTIBLE MATERIAL.
OPTIONAL COMPONENT: FAN PART #075-917, ELECTRICAL RATING: VOLTS 115, 60 HZ, 2 AMPS
DANGER: RISK OF ELECTRIC SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT. DO NOT ROUTE POWER CORD UNDER OR IN FRONT OF APPLIANCE.
COMPONENTS REQUIRED FOR MOBILE HOME INSTALLATION: OUTSIDE AIR KIT
IN CANADA: LISTED ULCS 629 CHIMNEY. USE CHIMNEY COMPONENTS AS SPECIFIED IN INSTALLATION/INSTRUCTIONS
WARNING: ONLY USE LISTED REGENCY OPTIONS SUCH AS LEGS, AIRMATE, FAN AS SHOWN IN THE INSTALLATION MANUAL.
CAUTION: BURNING OF MATERIALS OTHER THAN THE SPECIFIED FUEL MAY MAKE THE CATALYST IN THE COMBUSTOR INACTIVE.
CAUTION: THE COMBUSTOR IS FRAGILE, HANDLE CAREFULLY.
COMBUSTOR: PART #075-531.
CAUTION: MOVING PARTS MAY CAUSE INJURY.
CAUTION: BURNING OF MATERIAL OTHER THAN THE SPECIFIED FUELS MAY TAKE THE CATALYST IN THE COMBUSTOR INACTIVE. THE COMBUSTOR IS FRAGILE, HANDLE CAREFULLY, THE PERFORMANCE OF THE CATALYTIC DEVISE OR ITS DURABILITY HAS NOT BEEN EVALUATED AS PART OF THE CERTIFICATION.
IN USA: LISTED UL 103 HT CHIMNEY
HAUTEUR MINIMALE DU PLAFOND DE L'ALCÔVE : 2108 MM / 83 PO PROFONDEUR MAXIMALE DE L'ALCÔVE : 915 MM / 36 PO
DÉGAGEMENT MINIMAL DU PLAFOND POUR UN CONNECTEUR HORIZONTAL : 455 MM / 18 PO.
L'ESPACE AU-DESSOUS DU POÊLE NE DOIT PAS ÊTRE OBSTRUÉ. UTILISER SEULEMENT AVEC LES BRIQUES RÉFRACTAIRES EN PLACE.
POUR UTILISATION AVEC BOIS SOLIDE SEULEMENT. L'UTILISATION D'AUTRES COMBUSTIBLES PEUT ENDOMMAGER LE POÊLE ET CRÉER UNE CONDITION DANGEREUSE. NE PAS OBSTRUER LES OUVERTURES D'AIR DE COMBUSTION. UTILISER SEULEMENT AVEC LA PORTE FERMÉE – OUVRIR LA PORTE DE CHARGEMENT POUR ALIMENTER LE FEU SEULEMENT. NE PAS UTILISER DE GRILLE À BÛCHES NI SURÉLEVER LE FEU. MONTER LE FEU DE BOIS DIRECTEMENT SUR L'ÂTRE. NE PAS SURCHAUFFER – SI LE POÊLE OU LE CONNECTEUR DE CHEMINÉE SE MET À ROUGIR, VOUS SURCHAUFFEZ. INSPECTEZ ET NETTOYEZ FRÉQUEMMENT LA CHEMINÉE ET LE CONNECTEUREN CERTAINES CONDITIONS D'UTILISATION, UN DÉPÔT DE CRÉOSOTE PEUT SE FORMER RAPIDEMENT. GARDEZ LES MEUBLES ET AUTRES MATÉRIAUX COMBUSTIBLES ÉLOIGNÉS DU POÊLE. REMPLACEZ LA VITRE SEULEMENT PAR DU VERRE EN NEOCERAM. LE PLANCHER COMBUSTIBLE DOIT ÊTRE PROTÉGÉ PAR DES MATÉRIAUX NON COMBUSTIBLES DÉPASSANT DU DESSOUS, DU DEVANT ET DES CÔTÉS DU POÊLE, TEL QU'INDIQUÉ, OU JUSQU'AU MATÉRIAU COMBUSTIBLE LE PLUS PRÈS PERMIS.
COMPOSANTS EN OPTION : VENTILATEUR, ALIMENTATION ÉLECTRIQUE : 115 VOLTS, 60 HZ, 2 AMP.
DANGER : RISQUE D'ÉLECTROCUTION. DÉCONNECTER L'ALIMENTATION ÉLECTRIQUE AVANT DE FAIRE L'ENTRETIEN DU POÊLE. NE PAS INSTALLER LE CORDON ÉLECTRIQUE SOUS OU DEVANT L'APPAREIL.
COMPOSANTS EXIGÉS POUR INSTALLATION DANS UNE MAISON MOBILE : KIT DE PRISE D'AIR EXTÉRIEUR.
AU CANADA : CHEMINÉE HOMOLOGUÉE ULCS 629. UTILISER LES PIÈCES DE LA CHEMINÉE TEL QUE SPÉCIFIÉ DANS LES CONSIGNES D'INSTALLATION.
AUX ÉTATS-UNIS : CHEMINÉE HOMOLOGUÉE UL103HT.

MANUFACTURED BY/ FABRIQUÉ PAR :
FPI FIREPLACE PRODUCTS INTERNATIONAL LTD.
6988 VENTURE ST.
DELTA, BC V4G 1H4

REGENCY FIREPLACE PRODUCTS

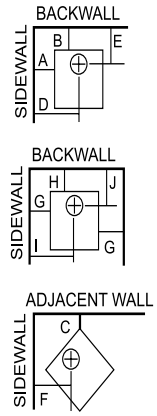
MADE IN CANADA / FABRIQUÉ AU CANADA

919-687

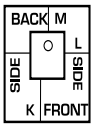
MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS
DÉGAGEMENTS MINIMUMS AUX MATÉRIAUX COMBUSTIBLES

F1500 WITH REAR DEFLECTOR OR AIRMATE

MEASURE FROM	HEATER	FLUE CENTER-LINE
RESIDENTIAL INSTALLATION USING SINGLE WALL CONNECTOR		
SIDEWALL	A 280 mm / 11 in	D 584 mm / 23 in
BACKWALL	B 267 mm / 10.5 in	E 445 mm / 17.5 in
CORNER	C 229 mm / 9 in	F 532 mm / 21 in
INSTALLATION USING LISTED DOUBLE WALL CONNECTOR - MOBILE HOME		
SIDEWALL	A 230 mm / 9 in	D 533 mm / 21 in
BACKWALL	B 125 mm / 5 in	E 294 mm / 11-9/16 in
CORNER	C 125 mm / 5 in	F 432 mm / 17 in
INSTALLATION USING LISTED DOUBLE WALL CONNECTOR - RESIDENTIAL CLOSE CLEARANCE		
SIDEWALL	A 230 mm / 9 in	D 535 mm / 21 in
BACKWALL	B 125 mm / 5 in	E 294 mm / 11-9/16 in
CORNER	C 125 mm / 5 in	F 432 mm / 17 in
INSTALLATION USING LISTED DOUBLE WALL CONNECTOR - ALCOVE		
SIDEWALL	G 229 mm / 9 in	I 585 mm / 21 in
BACKWALL	H 127 mm / 5 in	J 294 mm / 11-9/16 in



FLOOR PROTECTION*
PROTECTION DE PLANCHER*



K 405 mm / 16 in
L 200 mm / 8 in
M 200 mm / 8 in

* In Canada, floor protection must extend 18" (450mm) to the front and 8" (200mm) to each side and back of the stove.

* Au Canada, la protection de plancher doit dépasser de 18 po (457 mm) à l'avant et de 8 po (200 mm) de chaque côté du poêle et derrière le poêle.

CAUTION

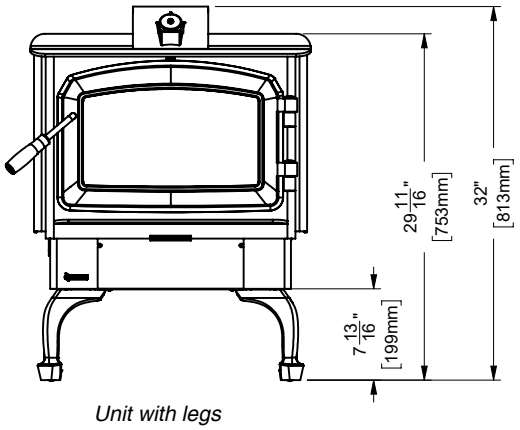
HOT WHILE IN OPERATION DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. READ NAMEPLATE AND INSTRUCTIONS.

ATTENTION

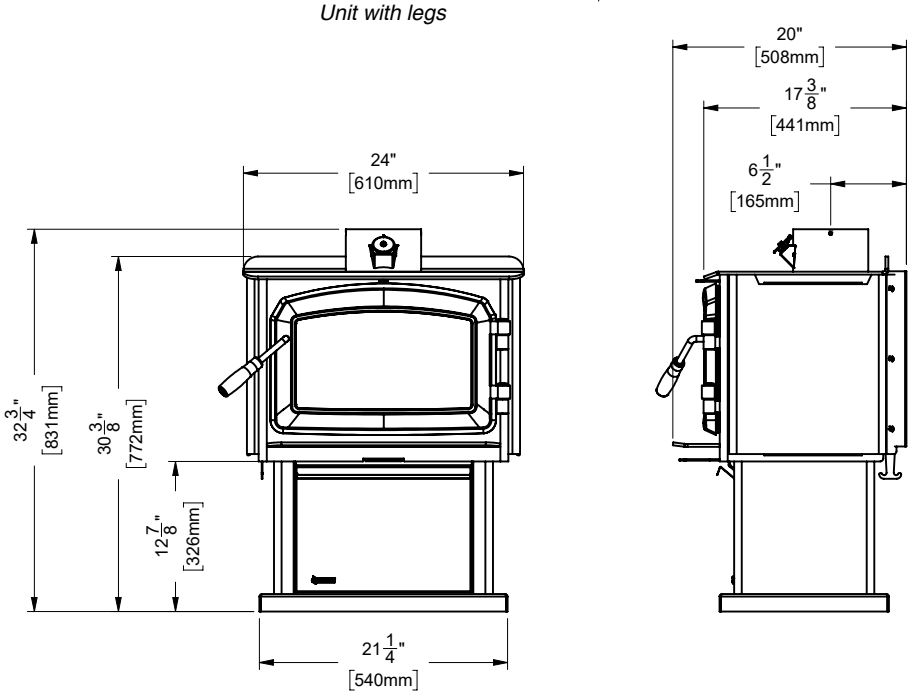
CHAUD EN COURS DE FONCTIONNEMENT. NE PAS TOUCHER. ÉLOIGNER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES DE L'APPAREIL. LE CONTACT AVEC L'APPAREIL PEUT OCCASIONNER DES BRÛLURES. LIRE CETTE ÉTIQUETTE ET LES CONSIGNES.

DATE OF MANUFACTURE
JAN FEB MAR APR MAY JUN JUL AUG SEPT OCT NOV DEC
2021 2022 2023 2024 2025

Unit Dimensions



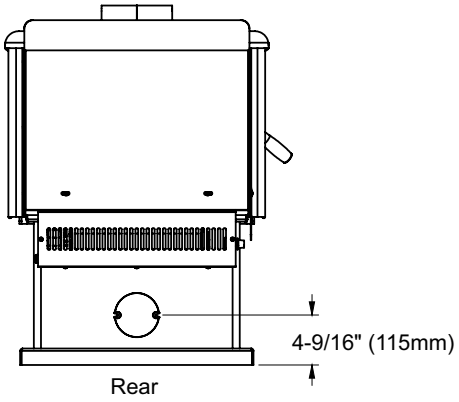
Unit with legs



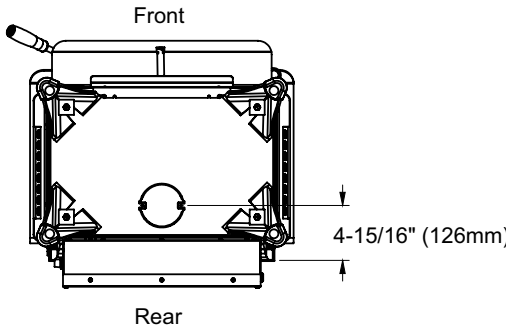
Unit with pedestal

Outside Air Dimensions

with pedestal



with bottom heat shield + legs



installation

1. Please read this entire manual before you install and use your new woodstove. Failure to follow instructions may result in property damage, bodily injury or even death. Be aware that local Codes and Regulations may override some items in this manual. Check with your local inspector.

2. Select a position for your Regency Stove. Consult the minimum clearance chart for your model and set the stove in place. For installation use listed double wall connector systems only.

3. To insure vertical alignment, suspend a plumb bob from the ceiling over the exact center of your stove flue and mark a spot on the ceiling to indicate the center of the chimney.

4. Check that the area above the ceiling is clear for cutting. Re-confirm the clearance from the stove to combustibles to insure that they are within the prescribed limits.

5. This woodstove must be connected to a UL 103 HT (ULC S629) listed chimney or a code approved masonry chimney with a flue liner.

   Space heater is to be connected to a factory built chimney conforming to CAN/ULC-5629 standard for 650C factory built chimneys. The chimney requirement is 6", refer to appropriate sections in this manual for specifics.

6. Install chimney according to chimney manufacturers instructions. The performance of your woodstove is governed to a very large part by the chimney system. Too short a chimney can cause difficult start-up, dirty glass, back smoking when door is open, and even reduced heat output.

   Too tall a chimney may prompt excessive draft which can result in very short burn times and excessive heat output. The use of an inexpensive flue pipe damper may be helpful in reducing excessive draft.

   CAUTION: The chimney should be the same size as the 6" flue outlet on the stove. The chimney must be listed as suitable for use with solid fuels. For other types of chimneys check with your local building code officials. Do not confuse a chimney with a type "B" Venting System used for gas appliances as suitable for a wood burning appliance. For Mobile Home installations refer to that section within this manual.

7. Mark the location of the pedestal base or legs on the floor, then move the stove aside and mark the position of the floor protector.

8. The floor protector must be of non-combustible material and must extend 16" (406mm) (USA)in front of the door opening and 8" (203mm) to the sides and rear of the unit. Some areas may require a larger size floor protector. See your local inspector. For outside air installation refer to Mobile Home installation instructions within this manual.

   NOTE: In Canada, floor protection must extend 18" (450mm) to the front and 8" (203mm) to each side and back of the stove.

9. When the floor protection is complete, position the stove with the flue collar centered under the installed chimney.

Room Air - Important

For installation using room air for combustion, remove knockout from the pedestal.
Mobile home installations require the use of outside air.
Fresh air is important - if heater is starved for air caused by exhaust fans or icing, the unit will not operate properly. Adequate air is required.

On pedestal units there are two locations where outside air may be adapted to the unit. If using the bottom of the pedestal, do not remove knockout from the rear of the pedestal. Only remove rear knockout if outside air will be brought in from the rear.

Note: Once the knockout is removed there are two tabs remaining. Bend both tabs out for ease of installation of outside air kit.

10. In areas with frequent seismic activity, Regency recommends that your unit is secured to the floor by using the bolt down holes inside the pedestal (the same ones used in Mobile Home installations).

11. For residential installations 6" (single wall OK) double wall chimney, the chimney connector must be at least 24 gauge steel. Do not use galvanized pipe. For Mobile Home installation refer to the Mobile Home installation instructions within this manual.

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

13. A chimney connector cannot pass through an attic or roof space, closet or similar concealed space, or a floor, ceiling, wall or partition of combustible construction. In Canada, if passage through a wall, or partition of combustible construction is desired, the installation shall conform to CAN/CSA-B365, Installation Code for Solid-Fuel-Burning Appliances and Equipment.

14. Your Regency Woodstove is not to be connected to any air distribution duct.

CAUTION:
Do not alter or makeshift chimney or install.
Install as per Manual.

Modular Installation Options - WARNING: ONLY USE SPECIFIED COMPONENTS.

The following items are required when assembling your Regency Stove. F1500 unit - the Rear Heat Deflector is supplied with the stove, but if you choose not to use it you must use the Airmate instead.

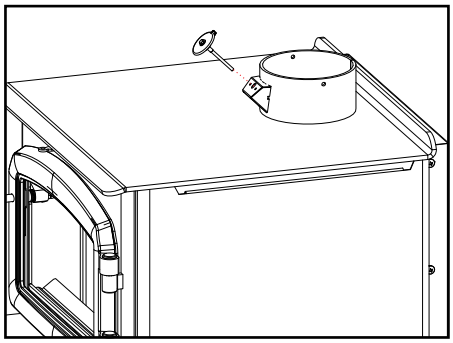
Modular Part	See the Minimum Clearance to Combustible Materials chart in the Installation section of this manual
F1500 Airmate OR Rear Heat Deflector	Convection heat with Airmate vs. Radiant Heat with Rear Heat Deflector. The Airmate pushes heat forward out into the room, the Rear Heat Deflector deflects the heat upward. Refer to the Installation sections within this manual.
OPTIONS:	
Blower/Fan	Adding the blower will increase the area heated by the stove, it can move warm air beyond the room where the stove
Ash Drawer Kit	Adding the Ash Drawer Kit makes cleaning ashes out of the stove easier and cleaner (refer to Bottom Shield Ash Drawer Kit, Installation section).
Airmate	The Airmate pushes heat forward out into the room.
Outside Air Kit	Draw combustion air from the outside of dwelling.
Bottom heat shield + legs	Used instead of pedestal
Pedestal	Used instead of heat shield and legs
Mobile Home Kit for Canada	The Mobile Kit ensures direct connection to the outside for positive air flow.

Stove Assembly Prior to Installation

The F1500 unit requires the pedestal (or heat shield and legs) to be attached to the base. The F1500 stove requires either the Airmate or Rear Heat Deflector on top of the stove. Clearances to combustible materials vary depending on whether the airmate or rear heat deflector is installed, so be sure to check the Minimum Clearances, Installation section.

Thermometer Installation F1500

Install the supplied thermometer by inserting it into the bracket located at the front of the flue collar as shown below.



Airmate Assembly for F1500

1) The airmate sits on top of the stove with the slots in the sides fitting over the curved deflector on the rear stove top. See diagram 1. Discard the Rear Heat Deflector that is supplied with the unit, it is not required if the airmate is installed.

2) Center the airmate and push it forward to the front of the stove. The back of the airmate should be level with the back and sides of the rear heat shield. See Diagrams 2 & 3.

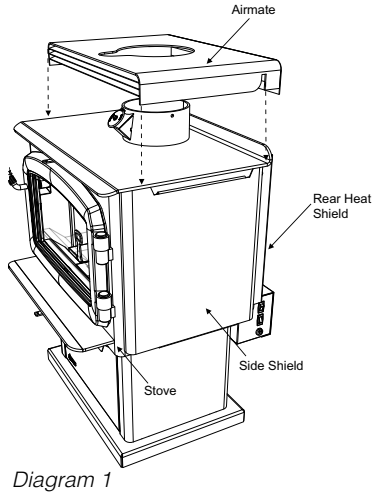


Diagram 1

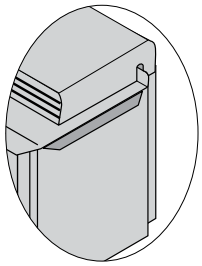


Diagram 2

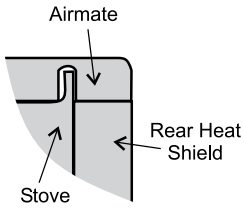


Diagram 3

Rear Heat Deflector Assembly for F1500

The rear heat deflector is supplied with the stove and must be installed unless the optional airmate has been selected. The left and right side shields are lowered for shipping and handling. The rear heat deflector is installed on top of the rear heat shield, as shown in Diagram 4.

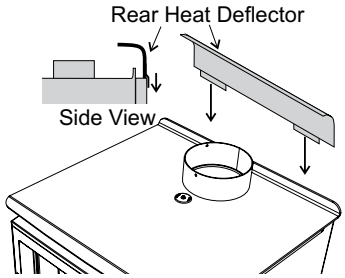
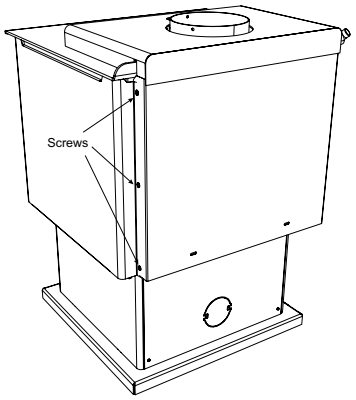


Diagram 4

Side Shield Adjustment

The left and right side shields are lowered for shipping and handling. It allows for a handhold on the top of the stove. Before placing the stove in its final position, the side shields must be raised.

Loosen the screws on the rear on the stove (3 per side), slide the side panel up as far as possible and then secure by tightening the screws.



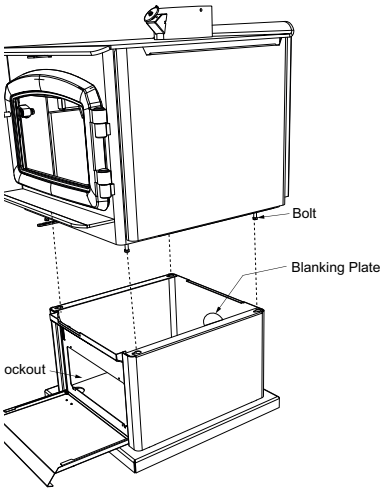
Pedestal Assembly Installation

1. For easier assembly, tip the stove on its back (onto a soft surface to prevent scratching) and remove the front cover.

   Hint: If you have chosen the Ash Drawer option, remove the ash dump cover plates before attaching the pedestal (refer to the Ashdrawer Kit Installation section).

2. Important: Remove the blanking plate if:
   a) you are not installing outside combustion air or
   b) outside air is to be brought in from the rear of the stove (see below).

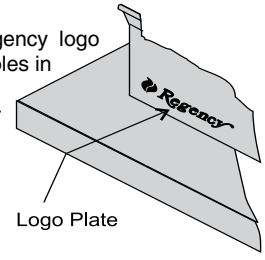
3. Using the 4 supplied 5/16" bolts in the underside of the stove, insert the bolts loosely onto the threads located at all 4 corners of the base of the unit. Align the holes in the corners of the pedestal top with the corresponding bolts in the base of the stove. Tighten each bolt from inside the pedestal.



Shown with Classic door

Logo Installation

1. Push the Regency logo into the two holes in the front bottom left corner of the pedestal cover plate.



Note: Any paint touch up should be done prior to placing logo on pedestal.

2. If not using ash drawer, then the front cover must remain in place. If using ash drawer, then remove the front cover.

Bottom Heat Shield and Legs Installation

The instructions below apply to the painted cast leg. It will be easier to attach the legs to the stove if the stove is tipped on its back (preferably on a soft surface to prevent scratching). Ensure to be extremely careful when tipping stove.

Important: Prior to installing the bottom heat shield, remove the 4 inch blanking plate. See below.
This must be removed for combustion air to enter the appliance.

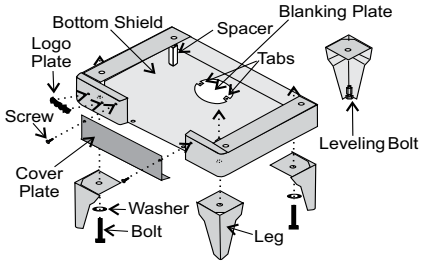
1. Remove the bolts from underside of the base of the pedestal (if installed) and discard. Also remove cover plate and put to the side.

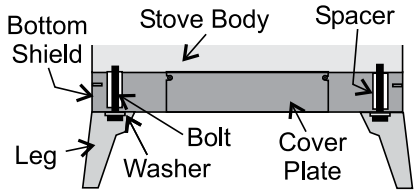
2. Line up the heat shield with the bottom of the unit.

3. Start threading the bolt and washer (washers may be square/round) (supplied with the bottom shield) for about 1/4 of the way through the leg with the washers being underneath the legs. Ensure that the legs are properly aligned with heat shield and tighten the bolts.

4. Level the stove by adjusting the levelling bolts in the bottom of each leg.

5. Reinstall cover plate if not using ash drawer option.





6. Install logo plate onto heat shield by placing in 2 holes as shown in diagram.

If you are installing outside combustion air, bend the tabs out 90 degrees. Pipe fresh air into the bottom shield by using a minimum 4" duct pipe with a mesh grill at the outside termination. Attach the pipe to the 2 tabs with screws.

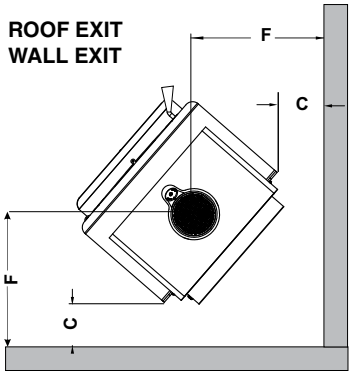
Minimum Clearance to Combustible Materials

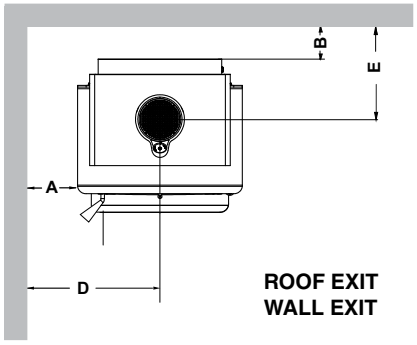
Please read the section below carefully as clearances depend on whether single wall or double wall pipe is installed on the stove.
Measurements "From Unit" are from the top plate of the stove to a side wall or to a corner, and from the rear heat shield to a back wall.

Clearances may only be reduced by means approved by the regulatory authority.

Note: Minimum ceiling height - 83" (2108mm)

Note: This clearance is also required for air space between the appliance and wall/ceiling.





NOTE: Be aware that local Codes and Regulations may override some clearances listed in this manual. Check with your local inspector.

NOTE: Clearances to combustibles are for the safety of the property. To avoid overheating and damaging the appliance these clearances should be maintained for non-combustibles also.

Residential Installation "C" Vent (Single Wall Pipe)

		A	B	C	D	E	F
F1500	with Airmate or Rear Deflector	11" **279**mm	10-1/2" 2**67**mm	9" 2**29**mm	23" **584**mm	17-1/16" **433**mm	21" **532**mm

Residential Close Clearance (To be installed with required pipe components) Listed Double Wall Pipe

When the stove is installed as a close clearance residential unit, a listed double wall connector is required from the stove collar to the ceiling level.

		A	B	C	D	E	F
F1500	with Airmate or Rear Deflector	9" 230mm	5" 127mm	5" 127mm	21" 533mm	11-9/16" 294mm	17" 431mm

Mobile Home Close Clearance (To be installed with required pipe components) Listed Double Wall Pipe

When the stove is installed as a close clearance residential unit, a listed double wall connector is required from the stove collar to the ceiling level.
Refer to Mobile Home Installation in this manual.

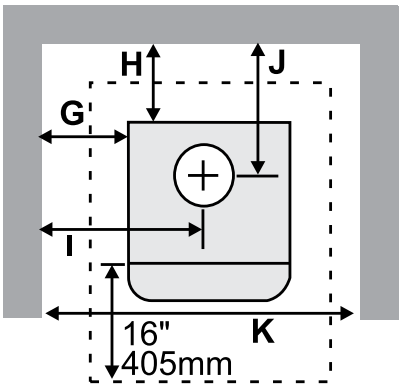
		A	B	C	D	E	F
F1500	with Airmate or Rear Deflector	9" 230mm	5" 127mm	5" 127mm	21" 533mm	11-9/16" 294mm	17" 431mm

Minimum Alcove Clearance and Clearance to Combustible Materials

The Regency Freestanding models have been alcove approved and must be installed with a listed double wall connector to the ceiling level. Single wall pipe (C Vent) is not approved for alcoves.

Note: Minimum alcove ceiling height - 83" (2108mm)
Maximum depth of alcove - 36" (914mm)

NOTE: This clearance is also required for air space between the appliance and wall/ ceiling.



Unit	From Unit		From Flue Center-Line		From Wall
	G	H	I	J	K
F1500 with Airmate or Rear Deflector	9" (229mm)	5" (127mm)	21" (533mm)	11-5/8" (295mm)	46" (1168mm)

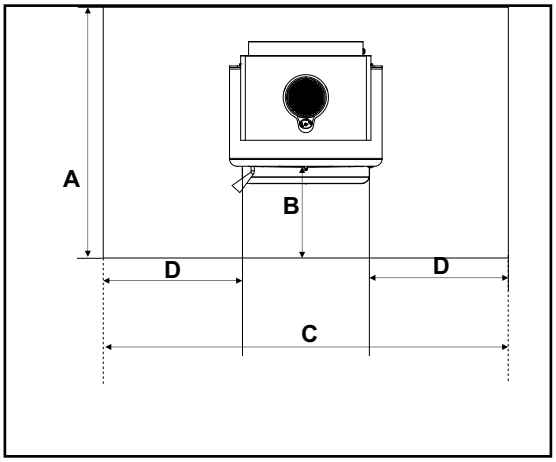
Floor Protection (Ember Protection Only Required)

A combustible floor must be protected by a non-combustible material (like tile, concrete board, or certified to UL-1618 Type 1 (or as defined by local codes).

Canada: Beneath the heater and extending to at least 18" (457mm) on the fuel loading side and at least 8" on the sides and back.

USA: Beneath the heater and extending to at least 16" (405mm) beyond the fuel loading side and ash removal opening and at least 8" (203mm) on the sides and back and under the chimney connector extending 2" (51mm) beyond each side for horizontal applications.

Where the appliance is installed less than 8" from a rear wall, the ember pad only needs to extend to the base of the wall based on the clearances noted in this manual.



Minimum Overall Depth of Floor Protector					
Unit		**Hearth Depth**	**Edge of Fuel door opening to edge of hearth**	**Hearth Width**	**Edge of Fuel Door Opening**
		A	**B**	**C**	**D**
F1500	Canada	42" (1067mm)	18" (457mm)	33-11/16" (932mm)	8" (203mm)
	USA	40" (1016mm)	16" (406mm)	33-11/16" (932mm)	8" (203mm)

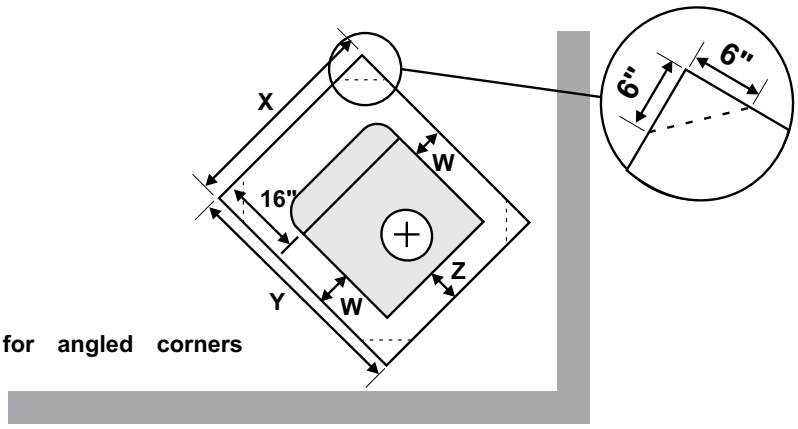
Floor Protection (Corner Installation)

A combustible floor must be protected by non-combustible material (like tile, concrete board, or certified to UL-1618 or as defined by local codes) extending beneath the heater and a minimum of 8" (203mm) from each side and minimum 16" (406mm)** from the front face of the stove and minimum 6" (152mm)** (or the rear clearance to combustibles whichever is smaller) from the rear of the stove.

When installed with horizontal venting, non-combustible floor protection must beneath the flue pipe and extend 2" (51mm) beyond each side.

Minimum Overall Width (X) of Floor Protector for all installations:

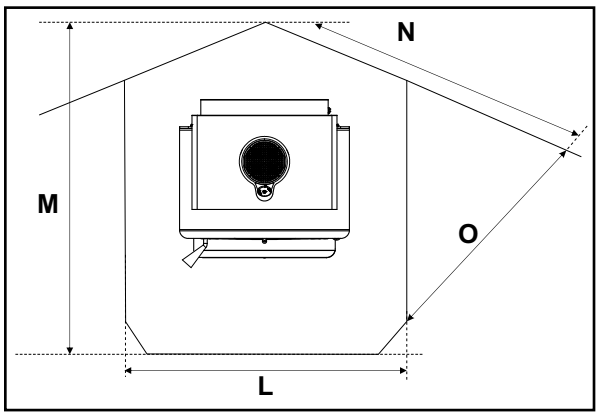
Stove	F1500	33-11/16"(856mm)



****NOTE: In Canada, floor protection must extend 18" (457mm) to the front and 8" (203mm) to back of the stove.**

Minimum Overall Depth (Y) of Floor Protector			
Unit	**Residential "C" Vent**		**From Edge of Fuel Door Opening**
	Y	**Z**	**W**
F1500	Canada - 42" (1067mm) USA - 40" (1016mm)	**6" (152mm)	8" (203mm)

Minimum Overall Depth (Y) of Floor Protector - Corner Hearth Reference only when hearth pad is installed to rear wall at minimum pipe clearances.				
	Hearth Depth			
F1500	**L**	**M**	**N**	**O**
Residential Installation "C" Vent (Single Wall)				
Canada	33-11/16" (856mm)	57-3/16" (1453mm)	48-1/16" (1221mm)	24-1/4" (616mm)
USA	33-11/16" (856mm)	55-3/16" (1402mm)	46-11/16 (1186mm)	22-7/8" (581mm)
Residential Close Clearance (To be installed with required pipe components)				
Canada	33-11/16" (856mm)	51-1/2" (1308mm)	44-1/16" (1119mm)	20-1/4" (514mm)
USA	33-11/16" (856mm)	49-1/2" (1257mm)	42-11/16" (1084mm)	18-7/8" (479mm)



This stove may be connected to a lined masonry chimney or a listed factory built chimney suitable for use with solid fuels and conforming to ULC629 in Canada or UL-103HT in the USA. Do not connect it to a chimney serving another appliance. To do so will affect the safe operation of both appliances, and will void the stove warranty. You must comply with the local authority having jurisdiction and/or in Canada, CSA installation standard B365-M87.

The chimney connector must be 6" diameter, 24 MSG Black/Blue steel. Do not use aluminum or galvanized steel, they cannot properly withstand the extreme temperatures of a wood fire. The chimney connector between the stove and the chimney should be as short and direct as possible.

The chimney connector must be attached to either an approved masonry chimney or one of the listed factory built chimneys suitable for use with solid wood fuel. All joints must be tight and fastened with sheet metal screws.

⚠ WARNING

THE CHIMNEY CONNECTOR IS TO BE USED ONLY WITHIN THE ROOM, BETWEEN THE STOVE AND CEILING/WALL. NEVER USE A CHIMNEY CONNECTOR TO PASS THROUGH AN ATTIC OR ROOF SPACE, CLOSET OR SIMILAR CONCEALED SPACE, OR A FLOOR, OR CEILING. AN EFFECTIVE VAPOR BARRIER MUST BE MAINTAINED AT THE LOCATION WHERE THE CHIMNEY OR COMPONENT PENETRATES TO THE EXTERIOR OF THE STRUCTURE. ALWAYS MAINTAIN THE MINIMUM CLEARANCES TO COMBUSTIBLES AS REQUIRED BY THE APPLICABLE BUILDING CODES.

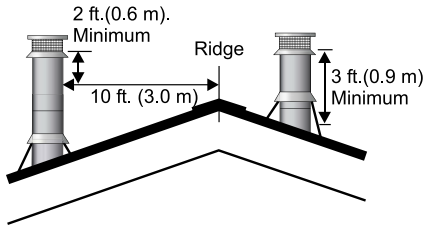
Step-by-Step Chimney and Connector Installation

Note: These are a generic set of chimney installation instructions. Always follow the manufacturers own instructions explicitly. Check the Minimum Recommended Flue Heights section (Table 1).

1. With your location already established, cut and frame the roof hole. It is recommended that no ceiling support member be cut for chimney and support box installation. If it is necessary to cut them, the members must be made structurally sound.

2. Install radiant shield and support from above.

3. Stack the insulated pipe onto your finish support to a minimum height of 3 feet above the roof penetration, or 2 feet above any point within 10 feet measured horizontally. There must be at least 3 feet of chimney above the roof level.



Note: Increasing the chimney height above this minimum level will sometimes help your unit to "breathe" better by allowing a greater draft to be created. This greater draft can decrease problems such as, difficult start-ups, back-smoking when door is open, and dirty glass. It might be sufficient to initially try with the minimum required height, and then if problems do arise add additional height at a later date.

4. Slide the roof flashing over your chimney and seal the flashing to the roof with roofing compound. Secure the flashing to your roof with nails or screws.

5. Place the storm collar over the flashing, sealing the joints with a silicone caulking.

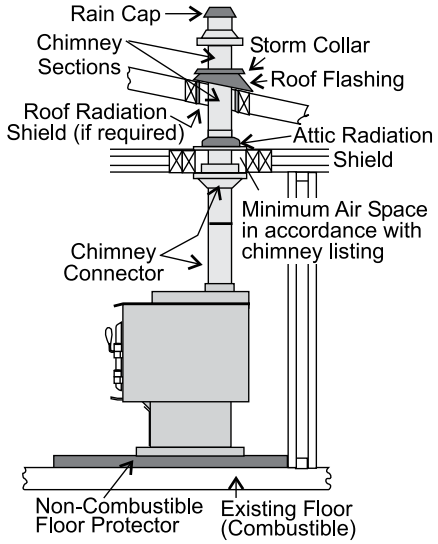
6. Fasten the raincap with spark screens (if required) to the top of your chimney.

7. To complete your chimney installation, install the double wall connector pipe from the stove's flue collar to the chimney support device.

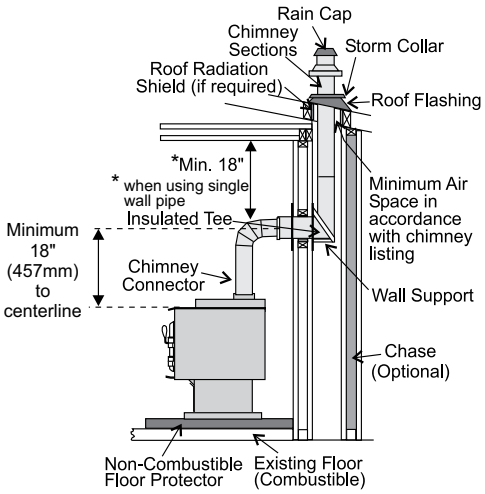
8. If you are using a horizontal connector, the chimney connector should be as high as possible while still maintaining the 18" (457mm) minimum distance from the horizontal connector to the ceiling.

9. **NOTE: Residential Close Clearance and Alcove installations require a listed double wall connector from the stove collar to the ceiling level.**

The diagrams below illustrate one way to install your unit into a standard ceiling or with a horizontal connector. Check with your dealer or installer for information on other options available to you.



Standard Ceiling Installation



Horizontal Installation

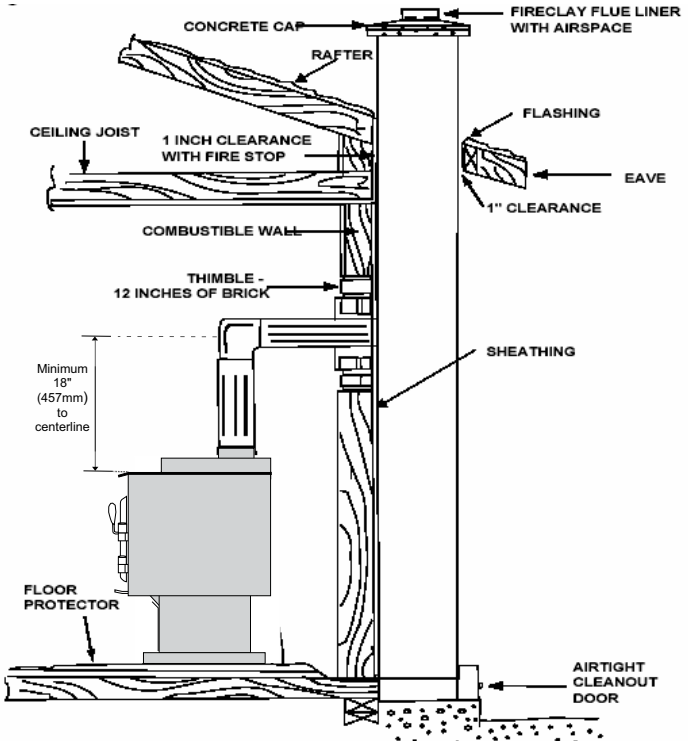
Masonry Chimney

Ensure that a masonry chimney meets the minimum standards of the National Fire Protection Association (NFPA) by having it inspected by a professional. Make sure there are no cracks, loose mortar or other signs of deterioration and blockage. Have the chimney cleaned before the stove is installed and operated. When connecting the stove through a combustible wall to a masonry chimney, special methods are needed.

Ensure that an effective vapour barrier at the location where the chimney or other component penetrates to the exterior of the structure.

When referencing installation or connection to masonry fireplaces or chimneys, the masonry construction must or shall be code complying.

This unit is designed to use either a 5.5" (140mm) or 6" (152mm) flue liner only in the confines of the masonry chimney.



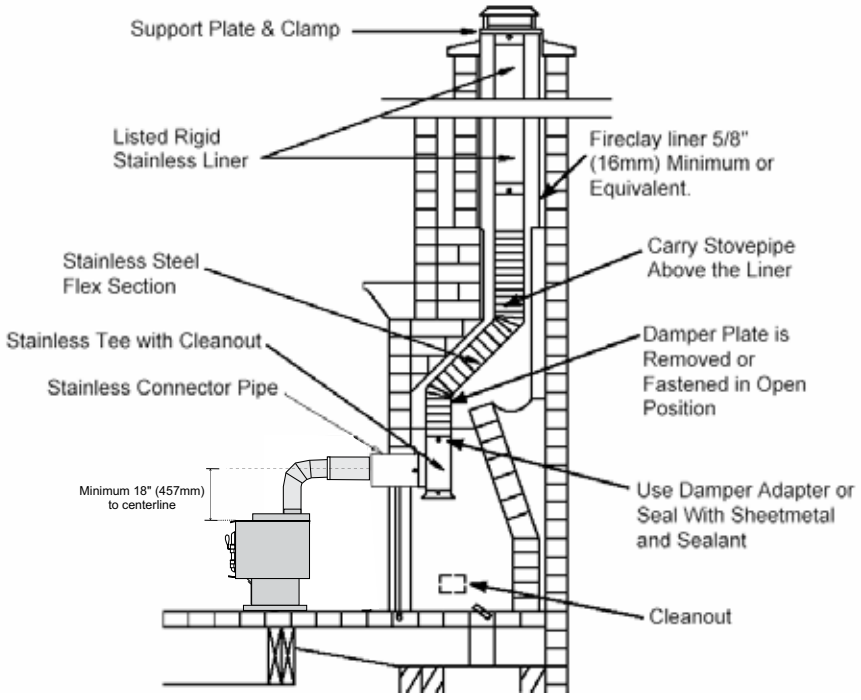
Masonry Fireplace

There are listed kits available to connect a stove to a masonry fireplace. The kit is an adapter that is installed at the location of the fireplace damper. The existing damper may have to be removed to allow installation.

Ensure that an effective vapour barrier at the location where the chimney or other component penetrates to the exterior of the structure.

This unit is designed to use either a 5.5" (140mm) or 6" (152mm) flue liner only in the confines of the masonry chimney as shown.

When referencing installation or connection to masonry fireplaces or chimneys, the masonry construction must or shall be code complying.



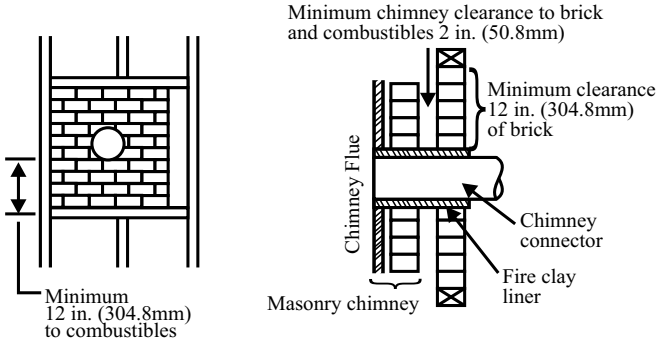
Factory Built Chimney

When a metal prefabricated chimney is used, the manufacturer's installation instructions must be followed. You must also purchase and install the ceiling support package or wall pass-through and "T" section package, firestops (where needed), insulation shield, roof flashing, chimney cap, etc. Maintain proper clearance to the structure as recommended by the manufacturer. The chimney must be the required height above the roof or other obstructions for safety and proper draft operation. The space heater is to be connected to a factory-built chimney conforming to CAN/ULC-S629, Standard for 650^{0}C Factory-Built Chimneys.

Combustible Wall Chimney Connector Pass-throughs

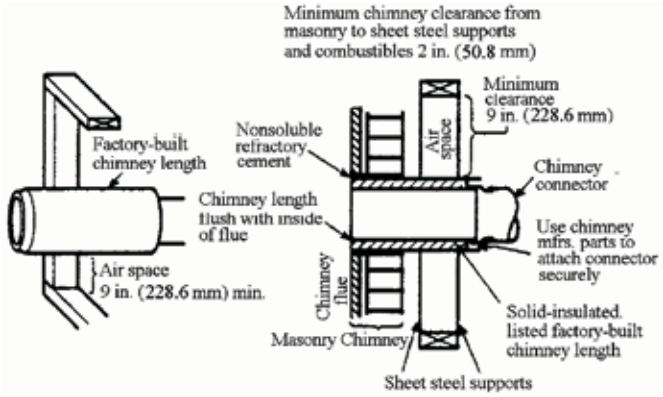
Method A: 12" (304.8 mm) Clearance to Combustible Wall Member:

Using a minimum thickness 3.5" (89 mm) brick and a 5/8" (15.9 mm) minimum wall thickness clay liner, construct a wall pass-through. The clay liner must conform to ASTM C315 (Standard Specification for Clay Fire Linings) or its equivalent. Keep a minimum of 12" (304.8 mm) of brick masonry between the clay liner and wall combustibles. The clay liner shall run from the brick masonry outer surface to the inner surface of the chimney flue liner but not past the inner surface. Firmly grout or cement the clay liner in place to the chimney flue liner.



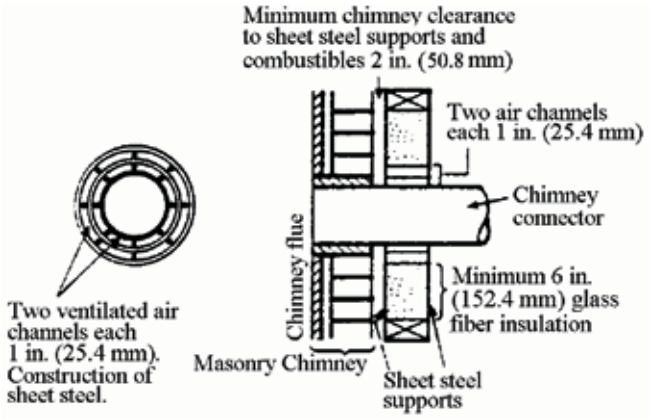
Method B: 9" (228.6 mm) Clearance to Combustible Wall Member:

Using a 6" (152.4 mm) inside diameter, listed, factory-built Solid-Pak chimney section with insulation of 1" (25.4 mm) or more, build a wall pass-through with a minimum 9" (228.6 mm) air space between the outer wall of the chimney length and wall combustibles. Use sheet metal supports fastened securely to wall surfaces on all sides, to maintain the 9" (228.6 mm) air space. When fastening supports to chimney length, do not penetrate the chimney liner (the inside wall of the Solid-Pak chimney). The inner end of the Solid-Pak chimney section shall be flush with the inside of the masonry chimney flue, and sealed with a non-water soluble refractory cement. Use this cement to also seal to the brick masonry penetration.



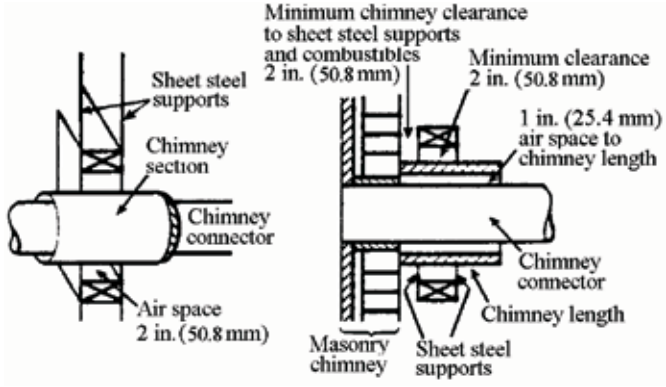
Method C: 6" (152.4 mm) Clearance to Combustible Wall Member:

Starting with a minimum 24 gage (.024" [.61 mm]) 6" (152.4 mm) metal chimney connector, and a minimum 24 gage ventilated wall thimble which has two air channels of 1" (25.4 mm) each, construct a wall pass-through. There shall be a minimum 6" (152.4 mm) separation area containing fiberglass insulation, from the outer surface of the wall thimble to wall combustibles. Support the wall thimble, and cover its opening with a 24-gage minimum sheet metal support. Maintain the 6" (152.4 mm) space. There should also be a support sized to fit and hold the metal chimney connector. See that the supports are fastened securely to wall surfaces on all sides. Make sure fasteners used to secure the metal chimney connector do not penetrate chimney flue liner.



Method D: 2" (50.8 mm) Clearance to Combustible Wall Member:

Start with a solid-pak listed factory built chimney section at least 12" (304 mm) long, with insulation of 1" (25.4 mm) or more, and an inside diameter of 6" (2 inches [51 mm] larger than the 6" [152.4 mm] chimney connector). Use this as a pass-through for a minimum 24-gage single wall steel chimney connector. Keep solid-pak section concentric with and spaced 1" (25.4 mm) off the chimney connector by way of sheet metal support plates at both ends of chimney section. Cover opening with and support chimney section on both sides with 24 gage minimum sheet metal supports. See that the supports are fastened securely to wall surfaces on all sides. Make sure fasteners used to secure the metal chimney connector do not penetrate chimney flue liner.



Mobile Home Installation

For Canadian Installations: see Outside Air Kit - Part # 846-502.
There are further requirements when installing this unit into a mobile home in Canada Only.

Once you have properly marked the position of your unit and the floor protection as outlined in the Residential Installation items #1 through #8, a supply of fresh air has to be supplied to your unit.

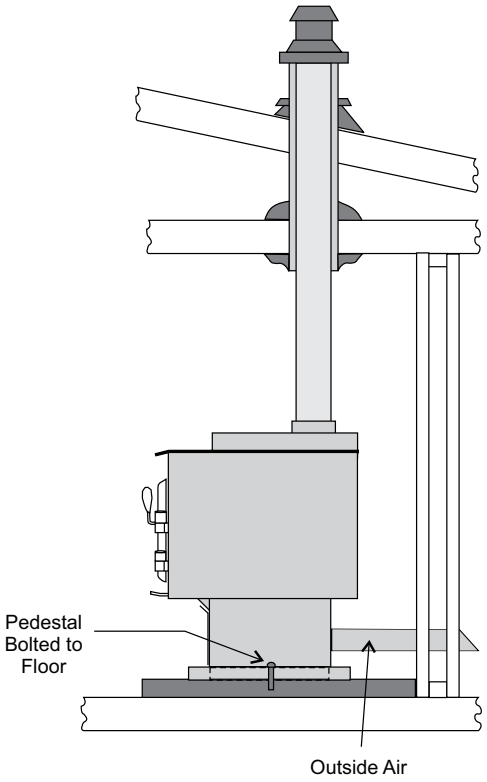
See Optional Outside Air Kit instructions in this manual.

Place your unit in position and secure it to the floor using two lag bolts 3/8" (10mm) x 3-1/2" (89mm) through the two holes inside the pedestal base. It is important to maintain the structural integrity of the Mobile Home floor, walls and roof when installing your unit.

For Mobile Home units installed in the U.S. the unit must be grounded using a #8 ground wire with approved termination and star washer.

CAUTION: At no time use unlabelled parts, or substitute parts made for another chimney system.

Install as per chimney manufacturer's installation instructions.



WARNING: Operate only with door fully closed - open feed door to feed fire only.

1. Identify the position of the outside air damper by the orientation of the metal handle that rests outside the galvanized pipe. The metal handle and the damper disc are in line with each other. This means that if the metal handle is in a horizontal position, the damper is flat and fully open.

2. Open the damper fully whenever you start a fire. This will allow the outside air to be drawn in the pedestal base eliminating any potential smoke escaping the stove and entering the room. (Negative air pressure)

In addition to standard installation instructions the following requirements are mandatory for installation in a mobile home.

1. The stove must be permanently bolted to the floor of the Mobile Home using the floor screws provided.

2. The stove must have a permanent outside air source for combustion.

3. The stove must be electrically grounded to the steel chassis of the Mobile Home.

4. A listed double-wall connector chimney system, roof thimble, spark arrestor and roof flashing kit suitable for use in Mobile Homes must be used.

5. If the chimney exits the Mobile Home at a location other than through the roof, and exits at a point 7ft. (2130mm) or less above the ground level on which the Mobile Home is positioned a guard or method of enclosing the chimney shall be fitted at the point of exit for a height up to 7ft. (2130mm).

6. The chimney shall be attached directly to the room heater and shall extend at least 3 ft. (914mm) above the part of the roof through which it passes. The top of the chimney should project at least 2ft. (610mm) above the highest elevation of any part of the Mobile Home within 10 ft. (3048mm) of the chimney.

7. The chimney system shall comply with Local Requirements.

8. Any openings in a chimney guard where required must not permit the entrance of 3/4" (19mm) diameter rod.

9. CAUTION: THE STRUCTURAL INTEGRITY OF THE MOBILE HOME ROOF, FLOOR, WALLS AND CEILING MUST BE MAINTAINED.

10. Check any other local building code as other local codes may apply.

11. WARNING: DO NOT INSTALL IN A SLEEPING ROOM OF A MOBILE HOME.

12. Use silicone to create an effective vapour barrier at the location where the chimney or other component penetrates to the exterior of the structure.

Mobile Home Kit - for Canada

Note: The optional ashdrawer cannot be used when using the Mobile Home Kit.

The Mobile Home kit contains:

1 Bottom metal cover - only used when air is drawn from the floor.
1 Flex
1 Collar
1 Mobile home box
1 Square transition box (used when installing bottom heat shield/ legs)
Screws

1. Lay unit on its back. Remove two front 7/16 bolts. Loosen rear two 7/16" bolts. See diagram 1.

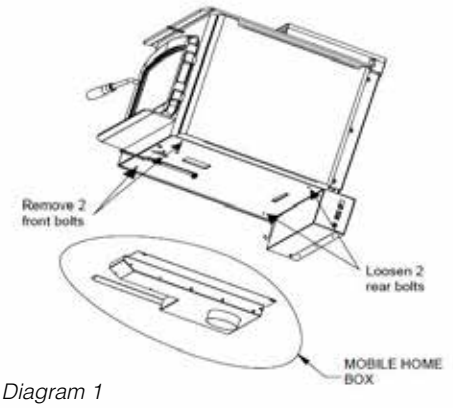


Diagram 1

2. If using outside air from the rear of the pedestal, follow instructions noted below. If using outside air from the pedestal base, follow instructions from step 10 to 16. For bottom heat shield/ legs, follow instructions from step 17 to 22. The Mobile Home Box is always mounted in between the firebox and pedestal or bottom heat shield.

3. Remove the 4" knock out from the rear pedestal.

4. Install rear collar to the rear pedestal using 4 screws.

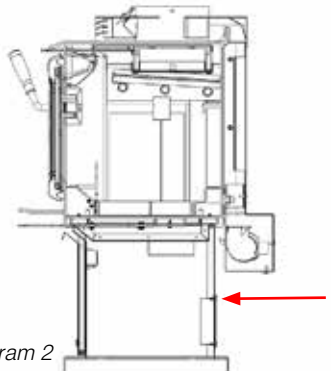


Diagram 2

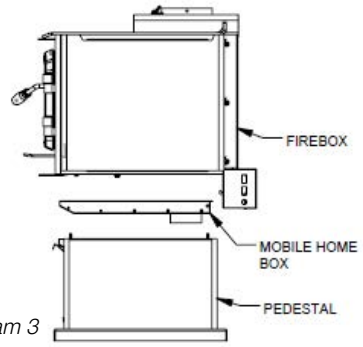


Diagram 3

5. Attach flex to rear pedestal using supplied screws or 4" clamp.

6. Bring pedestal base near the base of the firebox and secure flex to the Mobile Home box.

7. Secure pedestal base and Mobile Home Box to firebox as shown in diagram 3 using the screws that were previously removed/ loosened in step 1. See pedestal instructions.The Mobile Home Box and firebox use the same screws.

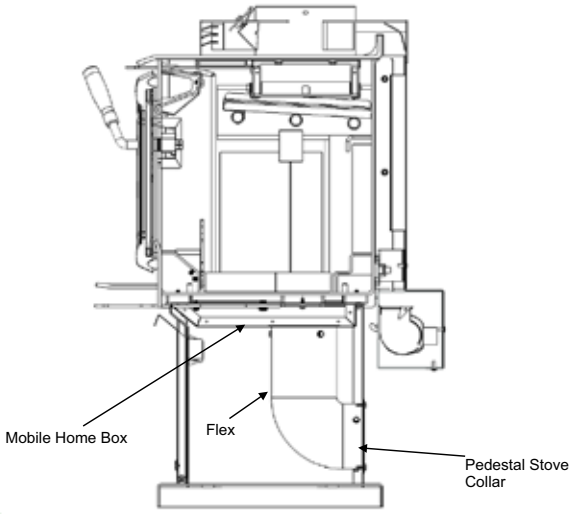


Diagram 4

8. Install blanking plate to the front of the pedestal with 4 screws.

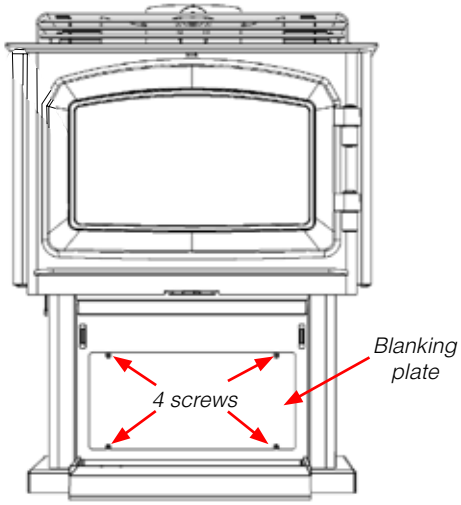
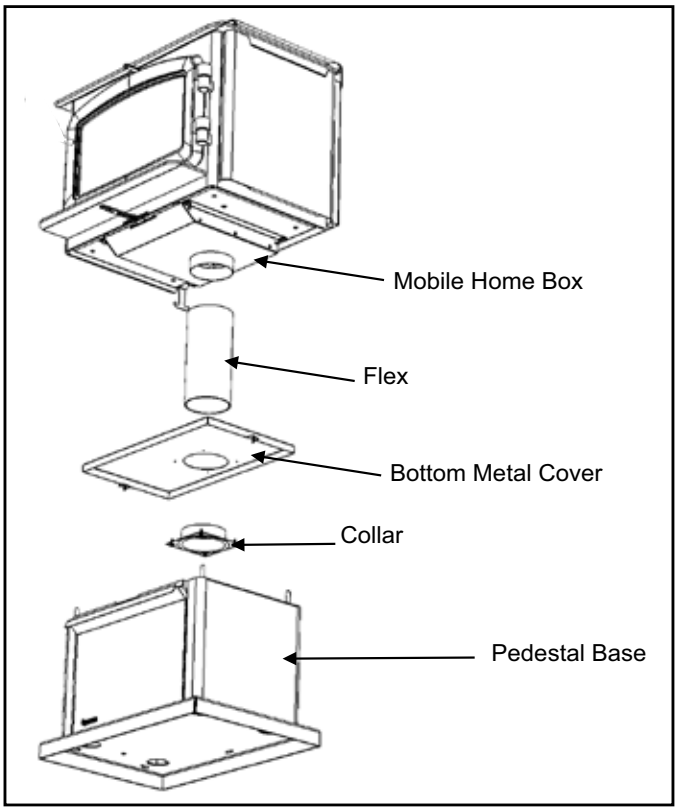


Diagram 5

9. Place unit into position and install the mandatory outside air kit. See «Mobile Home installation» section in this manual.

Installing Outside Air From Pedestal Base

If installing outside air from pedestal base, do not remove knock out from rear of pedestal. This must remain in place.



10. Secure collar to base of unit with 4 screws.

11. Install bottom metal cover over collar installed in step 10 and rest cover on pedestal base.

12. Secure flex to collar with supplied screws or 4" clamp.

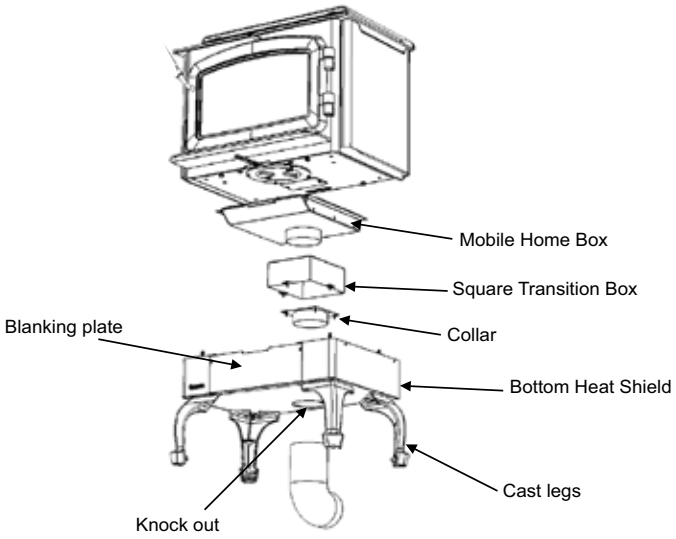
13. Bring pedestal base near the base of the firebox and secure flex to mobile home box with supplied screws.

14. Secure Mobile Home Box and pedestal to the firebox base using the screws that were previously removed in step 1. See pedestal instructions.

15. Install blanking plate to the front of the pedestal with 4 screws. Use picture from step 8.

16. Install the mandatory outside air kit. See «Mobile Home Installation» section in this manual. Place unit into its final position to complete install.

Installing Outside Air Using Bottom Heat Shield/Legs



17. Remove knock out from the bottom heat shield and bend tabs left over when the knock out was removed to the side.

18. Secure collar to base of bottom heat shield as shown with 4 screws.

19. Secure transition box on top of round collar installed in step 18 and secure with 3 screws.

20. Install blanking plate if not already installed.

21. Secure Mobile Home Box and bottom heat shield. See bottom heat shield/leg instructions.

22. Install the mandatory outside air kit. See «Mobile Home Installation» section in this manual. Place unit into its final position to complete install.

TABLE 1

MINIMUM RECOMMENDED FLUE HEIGHTS IN FEET (Measured from the top of the unit)							
ELEVATION (FT) ABOVE SEA LEVEL	# OF ELBOWS						
	0	2 x 15°	4 x 15°	2 x 30°	4 x 30°	2 x 45°	4 x 45°
0-1000	12.0	13.0	14.0	15.0	18.0	16.0	20.0
1000-2000	12.5	13.5	14.5	15.5	19.0	16.5	21.0
2000-3000	13.0	14.0	15.0	16.0	19.5	17.0	21.5
3000-4000	13.5	14.5	15.5	17.0	20.0	18.0	22.5
4000-5000	14.0	15.0	16.0	17.5	21.0	18.5	23.0
5000-6000	14.5	15.5	17.0	18.0	21.5	19.0	24.0
6000-7000	15.0	16.0	17.5	18.5	22.5	20.0	25.0
7000-8000	15.5	16.5	18.0	19.0	23.0	20.5	25.5
8000-9000	16.0	17.0	18.5	20.0	24.0	21.0	26.5
9000-10000	16.5	17.5	19.0	20.5	24.5	22.0	27.0

NOTE: No more than two offsets (four elbows) allowed. Two 45° elbows equal one 90° elbow.

Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may cause damage. An uncontrollable burn or excessive temperature indicates excessive draft. Inadequate draft may cause back puffing into the room and plugging of the chimney. Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints. Ensure the heater is installed in areas that are not too close to neighbors or in valleys that would cause unhealthy air quality or nuisance conditions.

Recommended Heights For Woodstove Flue

Simple rules on draft. See Table 1.

1) At sea level minimum height is 12' straight.

2) Add the following vertical height to compensate for:
45 deg. elbow = 1 ft.
90 deg. elbow = 2 ft.
"T" = 3 ft.
Each foot of horizontal run = 2 ft.

3) Add 4% overall for each 1000' above sea level.

Example: a)
1-1/2 ft. of horizontal run = 3 ft.
one "T" = 3 ft.
Total Addition (at sea level) = 6 ft.

Example: b)
One 90 deg. elbow = 2 ft.
2 ft. of horizontal run = 4 ft.
one "T" = 3 ft.
Total Addition (at sea level) = 9 ft.

	Recommended Flue Height	
Elevation	**Example a)**	**Example b)**
0'	18'	21'
1000'	18.72'	21.84'
2000'	19.44'	22.68'
5000'	21.60'	25.20'
8000'	23.76'	27.72'

WARNING:
DO NOT INSTALL IN SLEEPING ROOM

CAUTION: The structural integrity of the mobile home floor, wall and ceiling/roof must be maintained.

Optional Outside Air Kit

The Outside Air Kit is an option for Freestanding Stoves. Outside air for combustion can be brought in either through the bottom of the pedestal or through the rear plate of the pedestal.

For both bottom and rear outside air the Pedestal Cover Plate must be installed. Loosen the 4 screws on the rear of the pedestal and slide the cover plate over them. Slide the plate to the left to center it and tighten down the 4 screws.

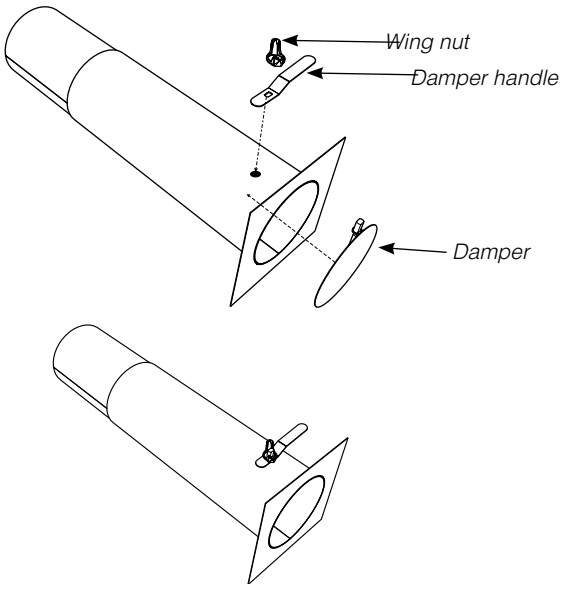
Damper Installation

NOTE: The damper cannot be installed if attaching outside air to the bottom of the appliance.

Supplied damper allows the combustion air to be closed off when unit is not in operation.

Install the damper within the round pipe in an easily accessible location.

1. Drill a 5/16" hole in the desired location.
2. Insert damper with threaded section out.
3. Install damper handle and secure with wing nut.

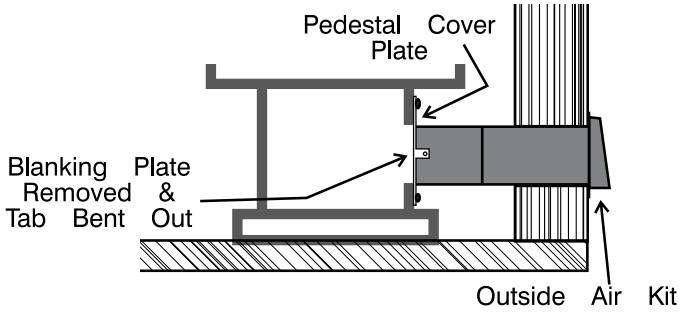


Completed Install

Outside Air Through Pedestal Rear

Remove the blanking plate from the rear of the pedestal and bend the two tabs out 90 degrees. Pipe fresh air into the pedestal area by using a minimum 4" metallic duct pipe with a mesh grill at the outside termination.

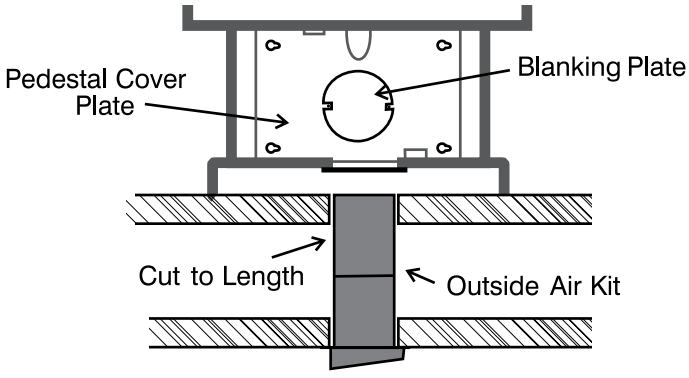
Fasten the pipe to the cover plate using the tabs and 2 screws.



Side View

Outside Air Through Pedestal Bottom

Mark the position of your unit as outlined in the "General Information" and "Clearances to Combustibles" section of the manual. Pipe fresh air into the pedestal area by using a minimum 4" duct pipe with a mesh grill at the outside termination.

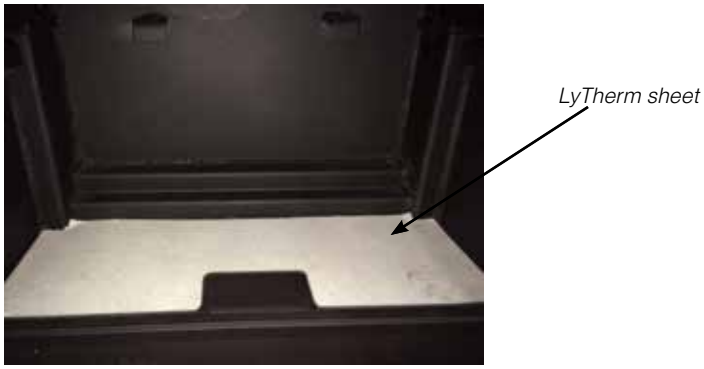


Rear View

Brick Installation

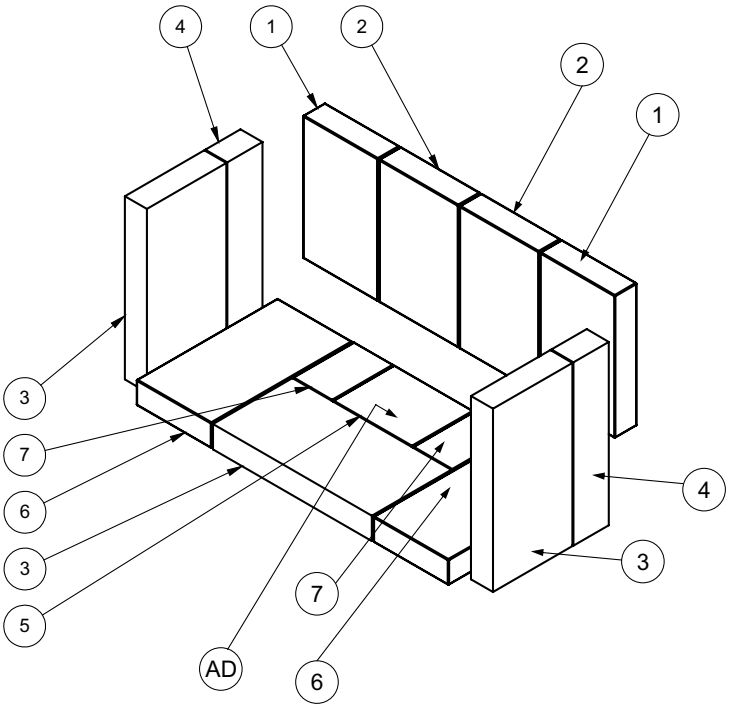
Firebrick is included to extend the life of your stove and radiate heat more evenly. Check to see that all firebricks are in their correct positions and have not become misaligned during shipping. Install all firebricks (if bricks were removed at install) per the diagram below and place in their correct positions.

Do not use a grate.



Order of firebrick install:

a) Rear Firebrick
b) Firebox floor - install brick over LyTherm Sheet
c) Right and left side Firebricks



Fire bricks	
#	Size
1	4-1/4" x 7"
2	4-1/2" x 7"
3	9" x 4-1/2"
4	9" x 2"
5	3-1/2" x 4-1/2" (AD)
6	4-1/4" x 8"
7	3-1/2" x 2-1/4"
AD	Ashdump brick

NOTE: The "AD" brick covers the Ash Dump hole that is used when the Ash Drawer Kit is installed.

Removing Wooden Handle

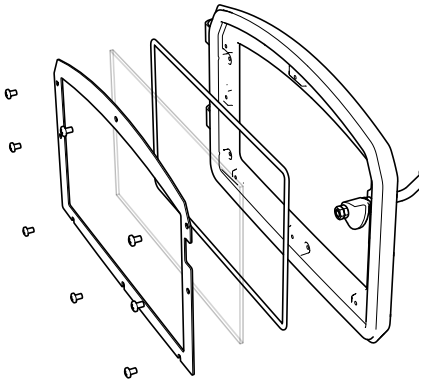
1. To remove the wooden door handle from unit, firstly locate 7/64” Allen key hole at the bottom of wooden handle.

2. Unscrew 7/64” Allen key screw counterclockwise. Once the screw is completely loose, remove and drop the handle down off the door handle shaft and replace with new handle.

Glass Installation

Your Regency stove is supplied with 5 mm Neoceram ceramic glass that will withstand the highest heat that your unit will produce. In the event that you break your glass by impact, purchase your replacement from an authorized Regency dealer only.

Remove the door from the stove and remove the screws securing the glass retainer. Position the glass in the door, make sure that the glass gasketing will properly seal your unit, and replace the retainer, it should rest on the gasket not the glass. Tighten securely, but do not wrench down on the glass as this may cause the glass to break.



Shown with classic door

Wood Door & Handle Assembly

1. In preparation of installing the door handle, the nuts, cam, washers and spacer must be removed as shown in Diagram 1.

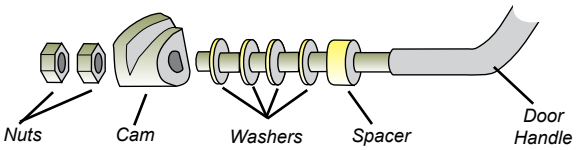


Diagram 1

LATCH ADJUSTMENT

The door latch may require adjustment as the door gasket material compresses over time. Removal of 1 or 2 washers will allow the latch to move closer to the door frame, causing a tighter seal. (Refer to Diagram 1)

2. Place the door onto the hinges and then place the door handle through the opening on the door, as shown in Diagram 2.

   Re-assemble and secure the door handle components in reverse order as removed in step 1, refer to Diagram 1.

3. Put the hinge cover caps on top of hinges to complete the door installation.

Note: The bottom of the door may scrape the ashlip. In this case place the spacers provided on the door hinges of the unit before placing the door.

4. Close door and ensure there is a tight seal. If door is too tight, a washer can be added. If the door is not creating a tight seal, a washer can be removed. Recheck door to ensure there is still a tight seal. Repeat steps if door seal is still not tight until a tight seal has been achieved. The handle should be approximately in the 8 o'clock position when door is fully closed.(Diagram 3)

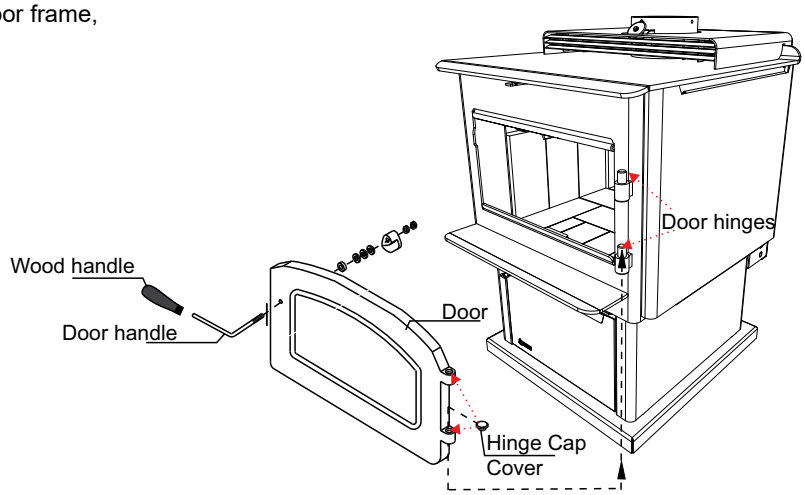


Diagram 2

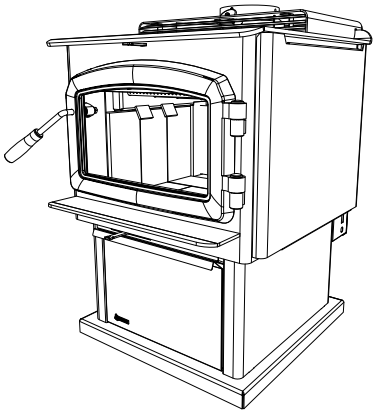


Diagram 3

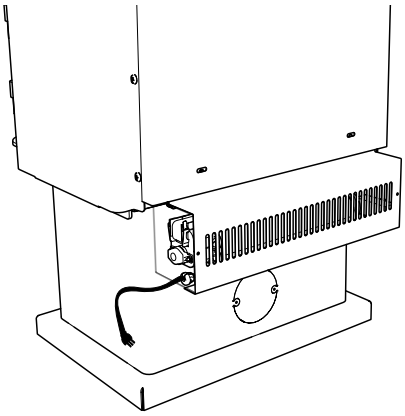
Fan Installation

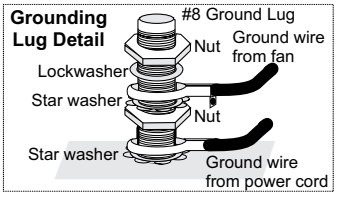
FAN INSTALLATION (120V FAN)

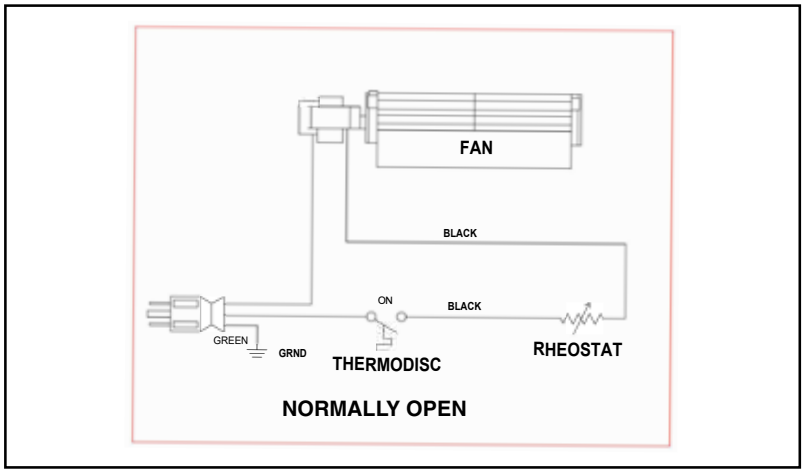
1. Remove the two screws from the top of the fan housing.
2. Slide the fan up into the rear heat shield.
3. After aligning holes, secure the fan to the rear heat shield using the two screws removed earlier.

Note: The connection cord should not be in contact with any hot surfaces.

WARNING: FAN ASSEMBLY MUST BE DISCONNECTED FROM THE SOURCE OF ELECTRICAL SUPPLY BEFORE ATTEMPTING THE INSTALLATION.







Wiring Diagram

FAN OPERATION

The fan is controlled by a rheostat which allows control of the heat output.

The fan will turn on as the stove has come up to operating temperature. It will also shut the fan system off after the fire has gone out and the unit cooled to below a useful heat output range.

If the fan cycles on and off continuously the thermo switch sensor is not making contact with the stove body. Remove the fan, bend the bracket closer to the stove and re-install the fan.

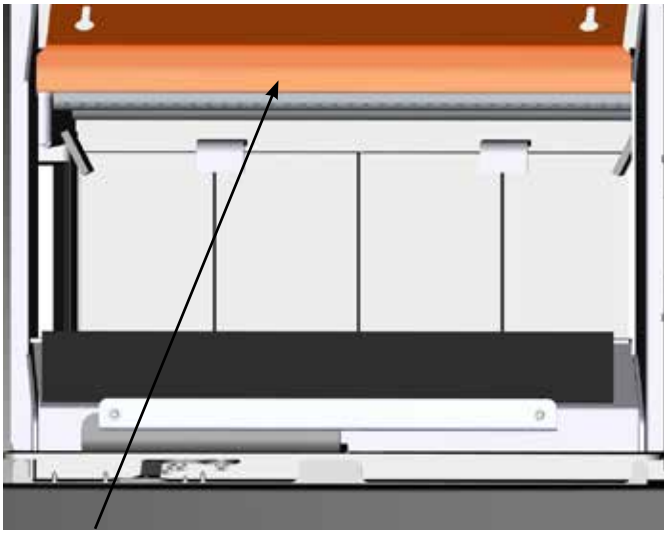
The fan is to be operated in the <LOW> position when burning in the LOW - MED LOW heat output setting and on <HIGH> when burning in the MED-HIGH settings.

WARNING: Electrical Grounding Instructions
This appliance is equipped with a three pronged (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug.

CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

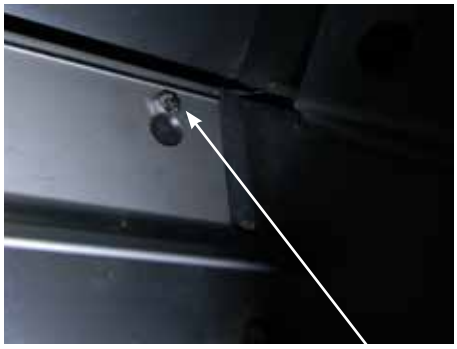
Stainless Steel Smoke Deflector Adjustment/Replacement

The stainless smoke deflector is located in the upper front area of the firebox. The deflector is held in place with 2 bolts Prior to the first fire, ensure deflector is seated properly and secured with 2 hand tightened bolts.



Smoke deflector

Smoke deflector is installed through the door opening in location shown in diagram



Ensure deflector is seated so bolts are situated at the top of the keyhole before tightening.

To replace the deflector, loosen off both bolts and slide defector upward and out. Install new defector and hand tighten bolts. Ensure positive location of the defector prior to hand tightening.

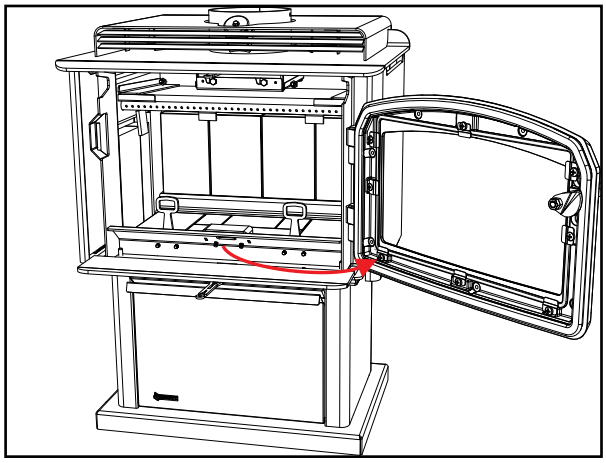
WARNING: Operation of the unit with out proper installation of smoke deflector will void warranty.

Brick Flue Baffle Removal/Installation

The flue baffle system located in the upper area of the firebox is removable to make cleaning your chimney system easier. The brick baffle must be installed prior to your first fire. **Smoke spillage and draft problems may occur if the baffle is improperly positioned.** Check the position of the brick baffle on occasion as it may get dislodged if too much fuel is forced into the firebox.

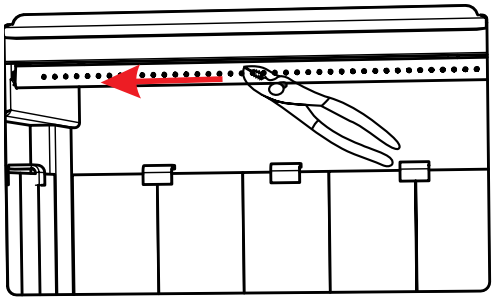
Note: Diagrams below are shown with front parts of the body as transparent to clearly show the install of the flue baffle.
It may be easier to complete this procedure if the smoke deflector is removed, if already installed see previous page for removal procedure.

1. Open the unit door.

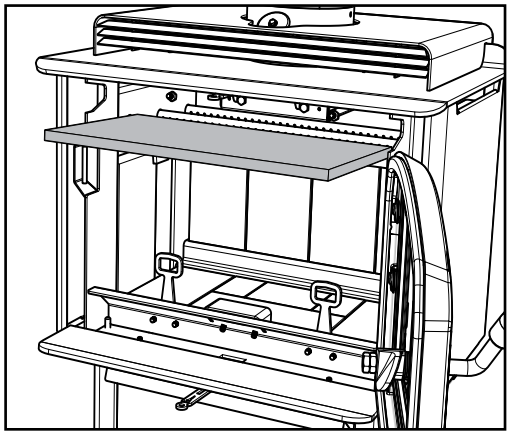


2. Remove front air tube if already installed.

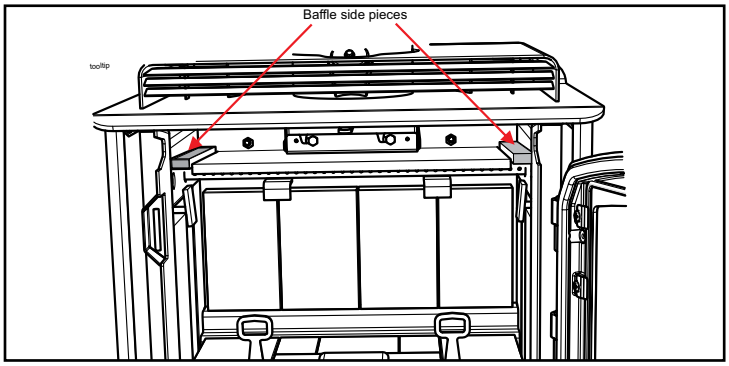
Note: to make it easier to remove the air tubes, first remove both the bottom right base brick and right side wall brick.



3. Install large centre baffle.

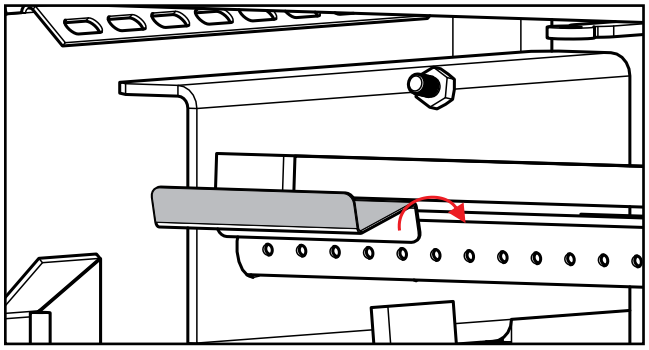


4. Install two smaller baffle pieces on either side.

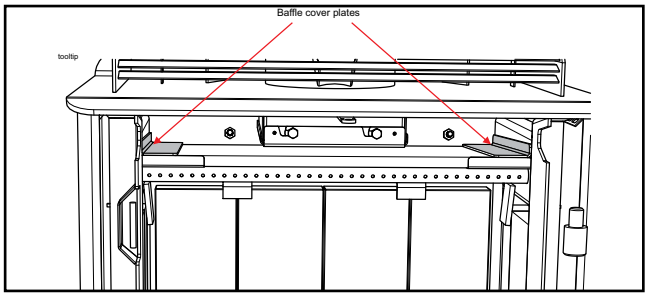


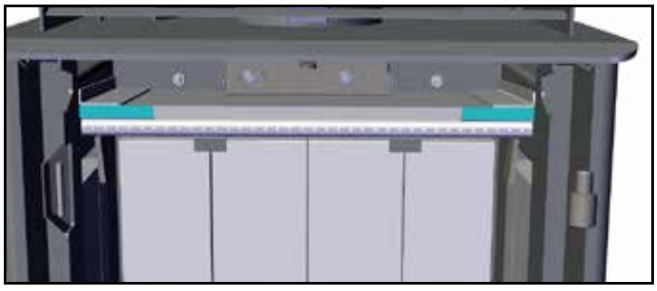
5. Reinstall front air tube.

6. Install baffle brackets on either side by slightly lifting baffles up and placing brackets in between baffles and the front air tube. The brackets will hold the baffles in position.



7. Slide left and right baffle cover plates on either side of baffles as shown.





Baffle brackets and cover plates in final position

8. Reinstall smoke deflector.

9. Reverse steps to un-install the baffles.

Seasoned Firewood

Whether you burn wood in a fireplace, stove or insert, good quality firewood is the key to convenience, efficiency and safety. Wet wood and pieces that are not the right size and shape for your wood burner can be frustrating, burn inefficiently and deposit creosote that can fuel a dangerous chimney fire. Good planning, seasoning and storage of the firewood supply are essential to successful wood burning.

- Stack the wood in separate rows in an open location where the summer sun can warm it and breezes can carry away the moisture. Do not stack unseasoned wood tightly in an unvented storage area.
- Do not allow firewood to lie on the ground for more than a couple of days before stacking. Mould and rot can set in quickly.
- Stack the wood up off the ground on poles, lumber rails or pallets.
- The top of the pile can be covered to keep off rain, but do not cover the sides.

Softer woods like pine, spruce and poplar/aspen that is cut, split and stacked properly in the early spring maybe be ready for burning in the fall. Extremely hard woods like oak and maple, and large pieces of firewood, may take a minimum of a full year to dry enough. Drying may also take longer in damp climates

There are a few ways to tell if wood is dry enough to burn efficiently. Use as many indicators as possible to judge the dryness of the firewood your are considering. Here are ways to judge firewood moisture.

- Using a moisture meter, select the species of fuel and then penetrate the pins into a split piece. Ideal moisture and seasoned firewood should be less than 20% moisture content.
- Checks or cracks in the end grain can be an indication of dryness, but may not be a reliable indicator. Some wet wood has checks and some dry wood has no checks.
- The wood tends to darken from white or cream colour to grey or yellow as it dries.
- Two dry pieces banged together sound hollow; wet pieces sound solid and dull.
- Dry wood weighs much less than wet wood.
- Split a piece of wood. If the exposed surface feels damp, the wood is too wet to burn.

Bypass Operating Handle

The F1500 is supplied with an air and bypass operating handle. The handle is used to open and close the by-pass and to adjust the air control for the desired heat output.

Install the operating handle storage bracket on the bottom right or left side screw that secures the side shield.

Loosen screw and insert storage bracket.

Hang operating handle after use

Using the operating handle:

Bypass

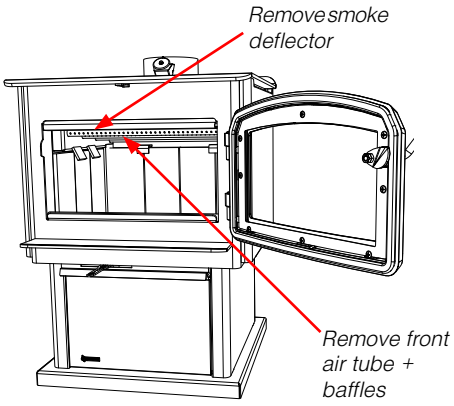
Air control for heat output

Bypass Rod Replacement

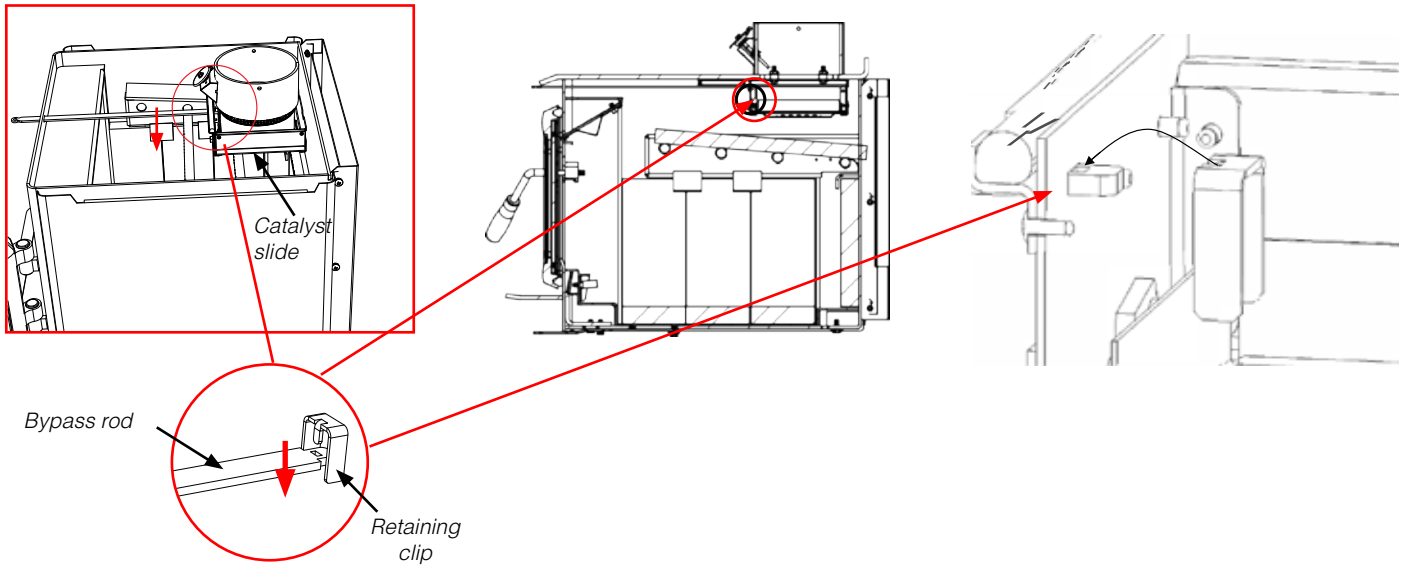
If the bypass rod becomes damaged it will need to be replaced.

1. Allow the stove to burn out and cool down, until cool to touch.

2. Open the door and remove the following from inside the unit, smoke deflector, front air tube, baffles and catalyst. See sections in this manual for details.



3. From inside the unit, manoeuver and slightly pull down on the bypass rod to release it from its retaining clip. This could also be removed by hand if reaching up into the catalyst slide and lifting up on the retaining clip.



4. Slide bypass rod out.

5. Replace with a new bypass rod.

6. Reverse Steps 3 and 2.

Operating Instructions

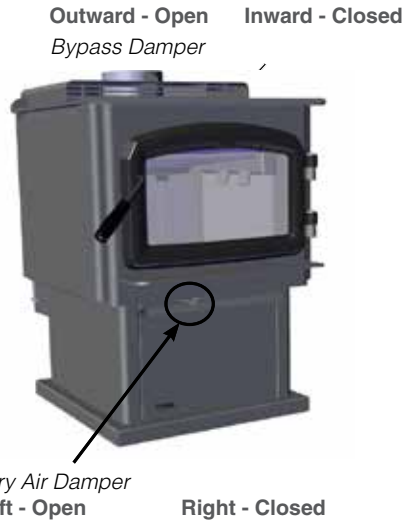
With your unit now correctly installed and safety inspected by your local authority, you are now ready to start a fire. Before establishing your first fire, it is important that you fully understand the operation of your Catalytic combustor and draft control.

WARNING
Fireplace Stoves equipped with doors should be operated only with doors fully closed. If doors are left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke.

Draft Control

Both the primary and air wash drafts are controlled by the control slide located on the front left side of the unit, below the ashlip. To increase your draft - slide to the left to open, and to decrease - slide to the right to close. The F1500 unit has a secondary draft system that continually allows combustion air to the induction ports at the top of the firebox, just in front of the catalytic combustor (see catalytic combustor instructions in this manual).

Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions, and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause back puffing into the room and plugging of the chimney or catalyst.



WARNING: To build a fire in ignorance or to disregard the information contained in this section can cause serious permanent damage to the unit and void your warranty!!

First Fire

When your installation is completed and inspected you are ready for your first fire.

THIS UNIT IS DESIGNED TO BURN SEASONED CORDWOOD ONLY. COAL, BRIQUETTES AND ALL OTHERS LISTED ON PAGE 2 ARE NOT APPROVED. SEASONED CORDWOOD SHOULD BE LESS THAN 20% MOISTURE CONTENT.

START UP AND OPERATING PROCEDURES:

1. For the first few days, the wood stove will give off an odour from the paint. This is to be expected as the high temperature paint becomes seasoned. Windows and/or doors should be left open to provide adequate ventilation while this temporary condition exists. Burning the wood stove at a very high temperature the first few times may damage the paint. During the first few fires, keep the combustion rate at a moderate level and avoid a large fire. Only after 5 or 6 such fires can you operate the wood stove at its maximum setting, and only after the metal has been warmed.
2. Do not place anything on the wood stove top during the curing process. This may result in damage to your paint finish.
3. When starting the fire, ensure the bypass is in the fully open position (pulled out) and air control is in the fully open position (far left).
   Crumble 2-5 pieces of newspaper and add approx. 1-1.5lb of kindling stacked in a manner that allows air flow on the firebrick hearth (Teepee style or other). DO NOT USE A GRATE TO ELEVATE THE FIRE.
   Light the newspaper and adjust the door if it is slightly ajar for less smoke roll out. Keep the door in that position for 2-3 minutes to establish a good fire.
4. Add additional 1lb of kindling along with few pieces of start up cord wood (startup cordwood is slightly larger than kindling but not full pieces of cordwood). Close the door and establish flame for 2-3 minutes.
   CAUTION: Never leave unit unattended if door is left open. This procedure is for fire start-up only, as unit may overheat if door is left open for too long.
5. Once flame has been established, open the door and add another 2-3lbs of start up cordwood. Hold door slightly ajar for 30-60 sec to establish flame, and then close the door and bypass.
6. After 5-10 minutes, go ahead and add another 2lbs of startup fuel and establish flame and close the door.
   NOTE: These steps are crucial to ensure proper charcoalization and coal bed prior to loading High, Med and Low fire loads.
7. Once this has burned down, open the door and the bypass, and rake the coals to create a uniform charcoal bed. Load 3-5 pcs of 16" long cordwood, East-West orientation, with the heaviest pieces at the back of the firebox, and ensure all pieces are behind the log retainers. Once loaded, close the door right away and bypass. Burn on high setting (air control to the far left when facing the unit) for 10-15 minutes. After the 10-15 minutes, adjust the air control to your desired position.
   High Fire: Air control to far left.
   Low Fire: Air control to far right.
8. IMPORTANT: The temperature in the wood stove and the gases entering the combustor must reach between 500ºF - 700ºF for catalytic activity to start. From the start up of a cold wood stove, a medium to high firing rate must be maintained for 30 min. This ensures that the wood stove, catalyst and fuel are all stabilized at proper operating temperatures. Even though it is possible to have temperatures at 600ºF within minutes after a fire has been started, if the fire is allowed to die down immediately it may go out or the combustor may stop working. Once the combustor starts working, heat generated in it by burning the smoke will keep it working. During re-fueling and rekindling of the cool fire, or a fire that has burned down to the charcoal phase, operate the wood stove at a medium to high firing rate for about 10 minutes to ensure that the catalyst reaches operating temperatures.
   WARNING: Never build a roaring fire in a cold wood stove. Always warm your wood stove up slowly!
9. When re-fueling, always open by-pass control, and primary air damper, load fuel, then wait for at least 10-15 minutes before closing the by-pass. Reason for the 10-15 min. is the fresh fuel and the opening of the door will cause the catalyst to drop in temperature as well as the moisture within the wood which is the first thing to be released. This will also minimize any smoking (spilling) back into the room.
10. During the first few days it may be more difficult to start the fire. As you dry out your firebrick and your masonry flue, your draft will increase.
11. For those units installed at higher elevations or into sub-standard masonry fireplaces, drafting problems may occur. Consult an experienced dealer or mason on methods of increasing your draft.
12. Some cracking and popping noises may be experienced during the heating up process. These noises will be minimal when your unit reaches temperature.
13. All fuel burning appliances consume oxygen during operation. It is important that you supply a source of fresh air to your unit while burning. A slightly opened window is sufficient for the purpose. If you also have another fireplace in your home, a downdraft may be created by your Regency wood stove causing a draft down your chimney. If this occurs, slightly open a window near your unit.

CAUTION: If the body of your wood stove, or any part of the chimney connector starts to glow, you are over firing. Stop loading fuel immediately and close the draft control until the glow has completely subsided.

14. Green or wet wood is not recommended for your unit. If you must add wet or green fuel, open the draft control fully until all moisture has been dispersed by the intense fire. Once all moisture has been removed, the draft control may be adjusted to maintain the fire.
15. The controls of your unit or the air supply passages should not be altered to increase firing for any reason.

16. If you burn the unit too slowly or at too low a setting your unit will not be operating as efficiently as it can. An easy rule of thumb says that if your glass is clean, catalytic thermostat is active, then your flue is clean and your exhaust is clean. Burn the stove hot enough to keep your glass clean and catalytic combustor ,you won't need to clean your flue as often.

Fan Operation

Automatic
To operate the fan - turn on the rheostat.

This will allow the fan to turn on as the stove has come up to operating temperature. It will also shut the fan system off after the fire has gone out and the unit cooled to below a useful heat output range.

Operate the fan in the low speed position when burning in the LOW-MED LOW heat output ranges and operate in the high setting for MED-HIGH to HIGH heat outputs.

Route power cord to either left or right behind unit.

Ash Disposal

During constant use, ashes should be removed every few days. The Ash Drawer option features a convenient ash dump for easy removal of ash, refer to Modular Installation Options section.

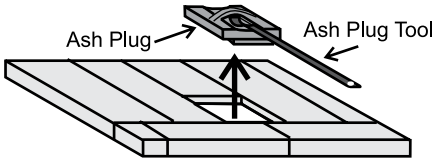
Safety Precautions

1. Do not allow ashes to build up to the loading doors! Only remove ashes when the fire has died down. Even then, expect to find a few hot embers.
2. Please take care to prevent the build-up of ash around the start-up air housing located inside the stove box, under the loading door lip.
3. Never start a fire if the ash plug and ash drawer are not in place. This will cause over firing which can cause excessive warping of the stove. Evidence of over firing can void the warranty on your stove.
4. The firebricks are brittle and can be damaged if the plug is replaced carelessly or pieces that are too large are forced through the hole.

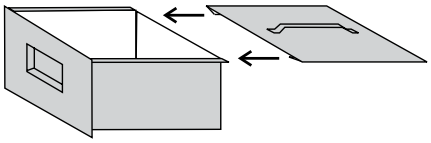
Ash Drawer Operating Guidelines

1. Only clean ashes out of the stove when the unit has cooled down. Remove the plug by lifting on the handle using the tool provided. The plug may still be warm, use caution. Push the ashes down the hole into the ash drawer, the large pieces can be left in the firebox and burned during the next fire or removed through the door opening.

2. Always leave 1/2 to 1 inch of ash in the bottom of the firebox. This helps in easier starting and a more uniform burn of your fire. Replace ash plug when ashes have been removed.



3. **Pedestal Units:**
   To remove the drawer, lift slightly and slide it out. When the drawer is completely out, slide the cover plate over the ash drawer and carry away.



CAUTION: HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.

4. When emptying the ash drawer, make sure the ashes are cold. Ashes should be placed in a metal 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 should not be placed in the ash container.
5. Before putting the ash drawer back into place, make sure the ash plug is back in place.

   Pedestal Units: make sure the cover lid is off.

Safety Guidelines and Warnings

CAUTION: Do not use chemicals for fluids to start fire.

1. **CAUTION:** Never use gasoline, gasoline type lantern fuels, kerosene, charcoal lighter fuel, or similar liquids to start or 'freshen up' a fire in your heater. Keep all such liquids well away from the heater while it is in use.
2. Keep the door closed during operation and maintain all seals in good condition.
3. Do not burn any quantities of paper, garbage, and never burn flammable fluids such as gasoline, naptha or engine oil in your stove.
4. If you have smoke detectors, prevent smoke spillage as this may set off a false alarm.
5. Do not overfire heater. If the chimney connector, flue baffle or the stove top begin to glow, you are over firing. Stop adding fuel and close the draft control. Over firing can cause extensive damage to your stove including warping and premature steel corrosion. Over firing will void your warranty.
6. Do not permit creosote or soot build-up in the chimney system. Check and clean chimney at regular intervals. Failure to do so can result in a serious chimney fire.
7. Your Regency stove can be very hot. You may be seriously burned if you touch the stove while it is operating, keep children, clothing and furniture away. Warn children of the burn hazard.
8. The stove consumes air while operating, provide adequate ventilation with an air duct or open a window while the stove is in use.
9. Do not connect this unit to a chimney flue serving another appliance.
10. Do not use grates or andirons or other methods for supporting fuel. Burn directly on the bricks.
11. Open the draft control fully for 10 to 15 seconds prior to slowly opening the door when refuelling the fire.
12. Do not connect your unit to any air distribution duct.
13. This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.

DO NOT BURN:

- Treated wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash
- Salt drift wood
- Cut lumber, plywood, mill ends.

Burning treated wood, garbage, solvents, colored paper or trash may result in release of toxic fumes and may poison or render ineffective the catalytic combustor. Burning coal, cardboard, or loose paper can produce soot, or large flakes of char or fly ash that can coat the combustor, causing smoke spillage into the room, and rendering the combustor ineffective.

14. Do not store any fuel closer than 2 feet from your unit. Do not place wood, paper, furniture, drapes or other combustibles near the appliance.
15. **WARNING: Do not operate without either the Ash Plug properly seated or the Ash Dump Plates screwed in place, excessive temperatures will result.**
16. **CAUTION: Do not operate with cracked/ broken, plugged, or glazing catalyst.**

IMPORTANT : It is against federal regulation to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed.

CAUTION: DO NOT BURN GARBAGE OR FLAMMABLE LIQUIDS SUCH AS GASOLINE, NAPTHA OR ENGINE OIL. SOME FUELS COULD GENERATE CARBON MONOXIDE AND ARE VERY DANGEROUS.

CAUTION: DO NOT CONNECT TO, OR USE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCT WORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATION.

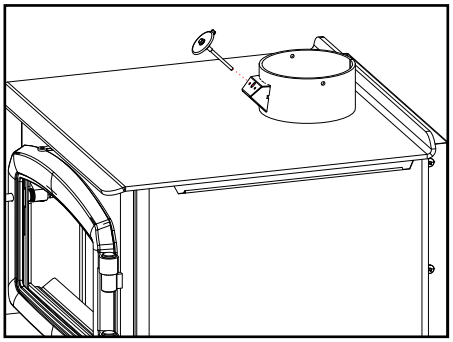
	Troubleshooting Guide	
PROBLEM	**POSSIBLE CAUSE**	**SOLUTION**
Crumbling Substrate	Extreme Thermal Shock Refueling with Wet Wood High Draft	Bypass combustor when the stove is running Use seasoned, dried wood. Do not exceed .06" of water draft. Install a manual damper and draft gauge or a barometric damper.
Fly-Ash Build-up **Fly-Ash Masking** **Fly-ash Plugging**	Combustor has not maintained light-off temperature. Combustor has not maintained light-off temperature. **Burning materials that produce a lot of char and fly-ash.** **Closing the bypass too soon**	Brush cold combustor with a soft bristled brush or vacuum lightly. Brush cold combustor with a soft bristled brush or vacuum lightly. Do not burn cardboard, gift wrap or garbage. Follow instructions for proper light-off.
Thermal Cracking	Uneven temperatures, flame impingement and heat spikes.	If cracking causes large pieces to fall out, replace combustor.
Mechanical Cracks	Combustor mishandled or abused. Distortion of combustor holder.	Handle combustor with care. Replace if necessary. Replace combustor if large pieces are missing, replace any warped stove parts as well.
Plugging (Creosote)	Burning wet, pitchy woods or burning large loads of small diameter wood with the combustor in the operating position without light-off ever occurring.	Burn dried seasoned wood. Make sure combustor has light-off before closing the bypass damper. It may be possible to burn off the soot or creosote accumulation by putting the combustor in a partially open and partially closed position after a hot fire has been started.
Masking (Soot)	Combustor has not maintained a light-off. Burning coal will cause a sulfur-based compound to coat the catalyst.	Place combustor in a partially open position after a hot fire has been started to burn off the soot accumulation. Revert to burning wood and fire the combustor to elevated temperatures for one hour.

Maintenance

It is very important to carefully maintain your fireplace stove, including burning seasoned wood and maintaining a clean stove and chimney system. Have the chimney cleaned before the burning season and as necessary during the season, as creosote deposits may build up rapidly. Moving parts of your stove require no lubrication.

Thermometer

The catalyst thermometer is only a indication of the flue gas temperature as they pass through the catalyst. The thermostat probe that is inserted into the opening in front of the flue collar, must be cleaned at least once a year. Use 220 sand paper to clean probe.



Creosote

When wood is burned slowly, it produces tar and other organic vapours combine with moisture to form creosote. The creosote vapours condense in the relatively cool chimney flue of a slow burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote can result in an extremely hot fire.

The chimney connector and chimney should be inspected at least once every two months during the heating season to determine if creosote build up has occurred. If creosote has accumulated it should be removed to reduce the risk of chimney fire.

CAUTION: Things to remember in case of a chimney fire:

1. Close all draft and damper controls.

2. CALL THE FIRE DEPARTMENT.

Ways to Prevent and Keep Unit Free of Creosote

1) Burn stove with the draft control wide open for about 10-15 minutes every morning during burning season.

2) Burn stove with draft control wide open for about 10 - 15 minutes every time you apply fresh wood. This allows the wood to achieve the charcoal stage faster and burns up any unburned gas vapours which might otherwise be deposited within the system.

3) **Only burn seasoned wood!** Avoid burning wet or green wood. Seasoned wood has been dried at least one year.

4) A small hot fire is preferable to a large smouldering one that can deposit creosote within the system.

5) The chimney and chimney connector should be inspected at least once every two months during the heating season to determine is a creosote buildup has occurred.

6) **Have chimney system and unit cleaned by competent chimney sweeps twice a year during the first year of use and at least once a year thereafter or when a significant layer of creosote has accumulated (3 mm/1/8" or more) it should be removed to reduce the risk of a chimney fire.**

Door Gasket

If the door gasket requires replacement 7/8" diameter material must be used. Regency uses a gasket rope 7/8" (Part #846-570). A proper high temperature gasket adhesive is required. See your Regency Dealer.
The door catch may require adjustment as the door gasket compresses after a few fires. The door latch compression may require adjustment to renew seal. Removal of a shim, (see section in this manual), will allow the latch to be moved closer to the door frame, causing a tighter seal.

Glass Maintenance

Your Regency stove is supplied with 5mm Neoceram ceramic glass (Part #846-306) that will withstand the highest heat that your unit will produce. In the event that you break your glass by impact, purchase your replacement from an authorized Regency dealer only, and follow our step-by-step instructions for replacement (refer to Glass Replacement section).

Allow the stove to cool down before cleaning the glass. Cleaning the glass will prevent build up of carbon and allow full view of the fire.

WARNING: Do not clean the glass when it is hot.

WARNING: Do not use abrasive cleaners, a damp cloth and glass cleaner is effective.

WARNING: Do not use substitute materials.

WARNING: Do not abuse the glass door, such as striking of slamming shut.

WARNING: Do not operate with broken glass.

Wood Storage

Store wood under cover, such as in a shed, or covered with a tarp, plastic, tar paper, sheets of scrap plywood, etc., as uncovered wood can absorb water from rain or snow, delaying the seasoning process.

Catalytic Combustor

ACHIEVING AND MAINTAINING CATALYST LIGHT-OFF:

The temperature in the stove and the gases entering the combustor must be raised to between 500F to 700F for catalytic activity to be initiated. During the start up of a cold stove a medium to high firing rate must be maintained for about 30 minutes. This ensures that the stove, catalyst and fuel are all stabilized at proper operating temperatures. Even though it is possible to have temperatures at 600F within minutes after a fire has been started, if the fire is allowed to die down immediately it may go out or the combustor may stop working. Once the combustor starts working, heat generated in it by burning the smoke will keep it working. During re-fueling and rekindling of the cool fire, or a fire that has burned down to the charcoal phase, operate the stove at a medium to high firing rate for about 10 minutes to ensure that he catalyst reaches operating temperatures.

CATALYST MONITORING: It is important to periodically monitor the operation of the catalytic combustor to ensure that it is functioning properly and to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency, and an increase in creosote and emissions. Following is a list of items that should be checked on a periodic basis.

- Combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred. Actual removal of the combustor is not recommended unless more detailed inspection is warranted because of decreased performance. If any of these conditions exist, refer to Catalyst trouble shooting section of this owner's manual.
- A good combustor is designed to withstand approximately 12,000 hours of continuous use. This will translate into five to ten years of use, depending on the length of your heating season and how often you use your stove. Proper maintenance will increase the combustor's effectiveness and prevent many problems. Inspect your combustor before each heating season, and during the season if your stove's performance seems to change.
- This catalytic heater is equipped with a temperature probe to monitor catalyst operation. Properly functioning combustors typically maintain temperatures in excess of 500F and often reach temperatures in excess of 1000F. If catalyst temperatures are not in within, refer to Catalyst trouble shooting section of this manual.
- You can get an indication of whether the catalyst is working by comparing the amount of smoke leaving the chimney when the smoke is going through the combustor and catalyst light – off has been achieved, to the amount of smoke leaving the chimney when the smoke is not routed (by-pass open) through the combustor.

Step 1: Light the stove in accordance with instructions within this manual.

Step 2: With smoke routed through the catalyst (by-pass closed) go outside and observe the emissions leaving the chimney.

Step 3: Engage the bypass mechanism and move to by-pass open position. And again observe the emission leaving the chimney. Significantly more smoke should be seen when the smoke is not routed through the combustor (by-pass open). Be careful not to confuse smoke with steam.

ACHIEVING PROPER DRAFT: Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause back puffing into the room and plugging of the chimney or catalyst.

CATALYTIC COMBUSTOR CLEANING:

Method #1
A vacuum cleaner may be used, but **never use high pressured air** to blow the cells free of any build-up. This can damage the cell walls. Any cell blockage can be removed with the use of a pipe cleaner or a cotton swab as well.
Method #2
Should the combustor's cells become covered with fly-ash, use a paint-brush or soft-bristled brush and dust the combustor gently. Never use anything abrasive to clean the combustor.
Method #3
Normally the catalytic combustor requires little or no maintenance, it generates such high temperatures and therefore is basically self-cleaning. However, should the combustor become covered with soot or creosote, it is possible to burn the accumulation off by opening the bypass and building a hot fire. Once the hot fire is created, close the bypass halfway and burn for 30 to 60 minutes with the bypass left in this position. **Never use cleaning solvents to clean it.** Check and clean the combustor, if necessary, before each burning season and inspect the flue system for any signs of creosote buildup. A clean flue helps prevent chimney flue fires.

Combustor Assembly Removal/Replacement

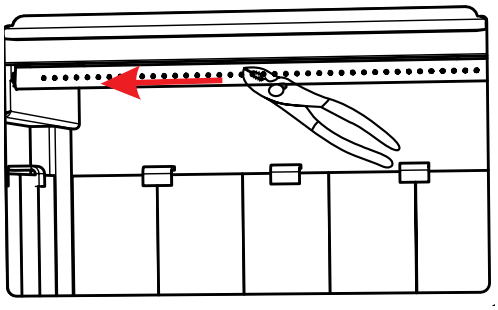
The catalytic thermometer on top of the stove should read in the active zone after the stove has been in operation for several hours. If the thermometer's indicator needle does not stay in the active zone, even with a hot fire, over a period of regular use, the catalyst may need to be cleaned. If this persists it may be necessary to replace it.

If the combustor must be examined or replaced, follow this procedure:

1. Allow the stove to burn out and cool down.

2. Remove stainless steel smoke deflector - See instructions in this manual.

3. Remove the front secondary air tube with pliers as shown below.



4. Remove left and right baffle brackets (removal of left baffle bracket shown below.

Baffle bracket

5. Remove the right and left side baffles (right side baffle shown below).

Baffle bracket

6. Remove the centre baffle.

Centre Baffle

7. Remove locking clip from the front face of the Catalyst assembly by sliding up and out.

8. Pull the flame shield forward and tilt down, be prepared to support catalyst assembly

9. Loosen bolts on catalyst retainer, slide the catalyst retainer to the right to remove.

Catalyst

10. Pull down catalyst assembly to remove.

11. Reverse steps to reinstall catalyst.

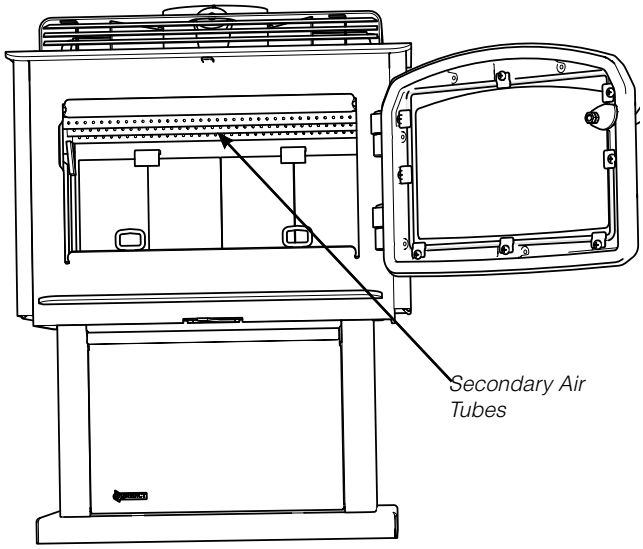
NOTE: Replacement combustors can be retrieved from Applied Ceramics or contact your local Regency Dealer—see warranty information at the back of this manual for details.

DO NOT OPERATE THE APPLIANCE IF COMBUSTOR BECOMES INACTIVE - DO NOT OPERATE WITHOUT COMBUSTOR.

Secondary Air Tube Removal/Installation

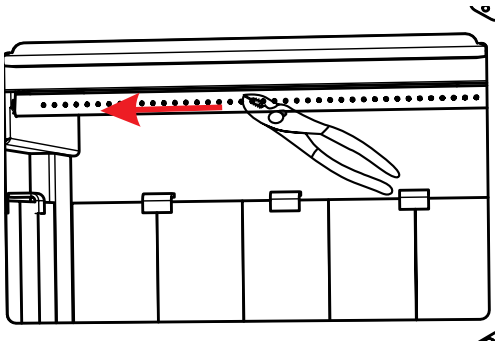
1. Allow the stove to burn out and cool down, until cool to touch.

2. Open stove door to access secondary air tubes.



3. Grasp secondary air tube firmly with vise grips, using a hammer tap vise grips from right to left until air tube is released from grip. Remove.

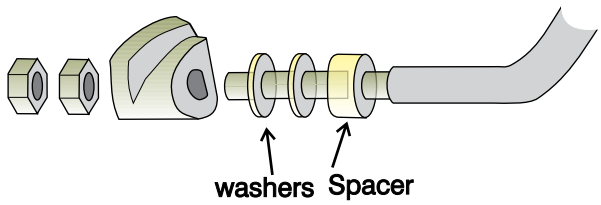
4. Remove top left and right metal retainers, followed by the fragile three piece C-Cast Baffles (see catalyst removal instructions for details), then remove the remaining 2 tubes.



5. To reinstall or replace, first slide left side of tube into hole on left side air channel. Align tab on right side air channel with notch on right hand end of air tube. Firmly grip center of air tube with vise grips, use hammer to tap vise grips from left to right until the tube bottoms out into the air channel on right.

Latch Adjustment

The door latch may require adjustment as the door gasket material compresses after a few fires. Removal of the spacer washer, shown in the diagram below, will allow the latch to be moved closer to the door frame, causing a tighter seal. Remove and replace the nuts, washer and spacer as shown.



Annual Maintenance	
Completely clean out entire unit	Annually
Inspect air tube, Catalytic Combustor and bricks	Replace any damaged parts.
Adjust door catch assembly	If unable to obtain a tight seal on the door - replace door gasket seal. Readjust door catch after new gasket installed.
Inspect condition and seal of: Glass Gasket Door Gasket	 Perform paper test - replace gasket if required
Paper Test	Test the seal on the loading door with a paper bill. Place a paper bill in the gasket area of the door on a cold stove. Close the door. Try to remove the paper by pulling. The paper should not pull out easily, if it does, try adjusting the door latch, if that doesn't solve the problem replace the door gasket.
Check and lubricate door hinge + latch	Use only high temperature anti seize lube. (ie. never seize)
Check glass for cracks	Replace if required.
Clean blower motor	Disconnect power supply. Remove and clean blower. ***DO NOT LUBRICATE***
Inspect and clean chimney	Annual professional chimney cleaning recommended.
Thermostat Probe	The thermostat probe that is inserted into the opening, must be cleaned at least once a year. Use 220 sand paper to clean probe.

NOTE:

Chimney Cleaning

When cleaning the chimney system the catalyst should be removed so this can also be cleaned at the same time following the guide lines found in this manual. The bypass should be open so any creosote will fall onto the firebox floor when being cleaned and door closed. The monitor should also be removed when cleaning is being done to prevent damage to the monitor.

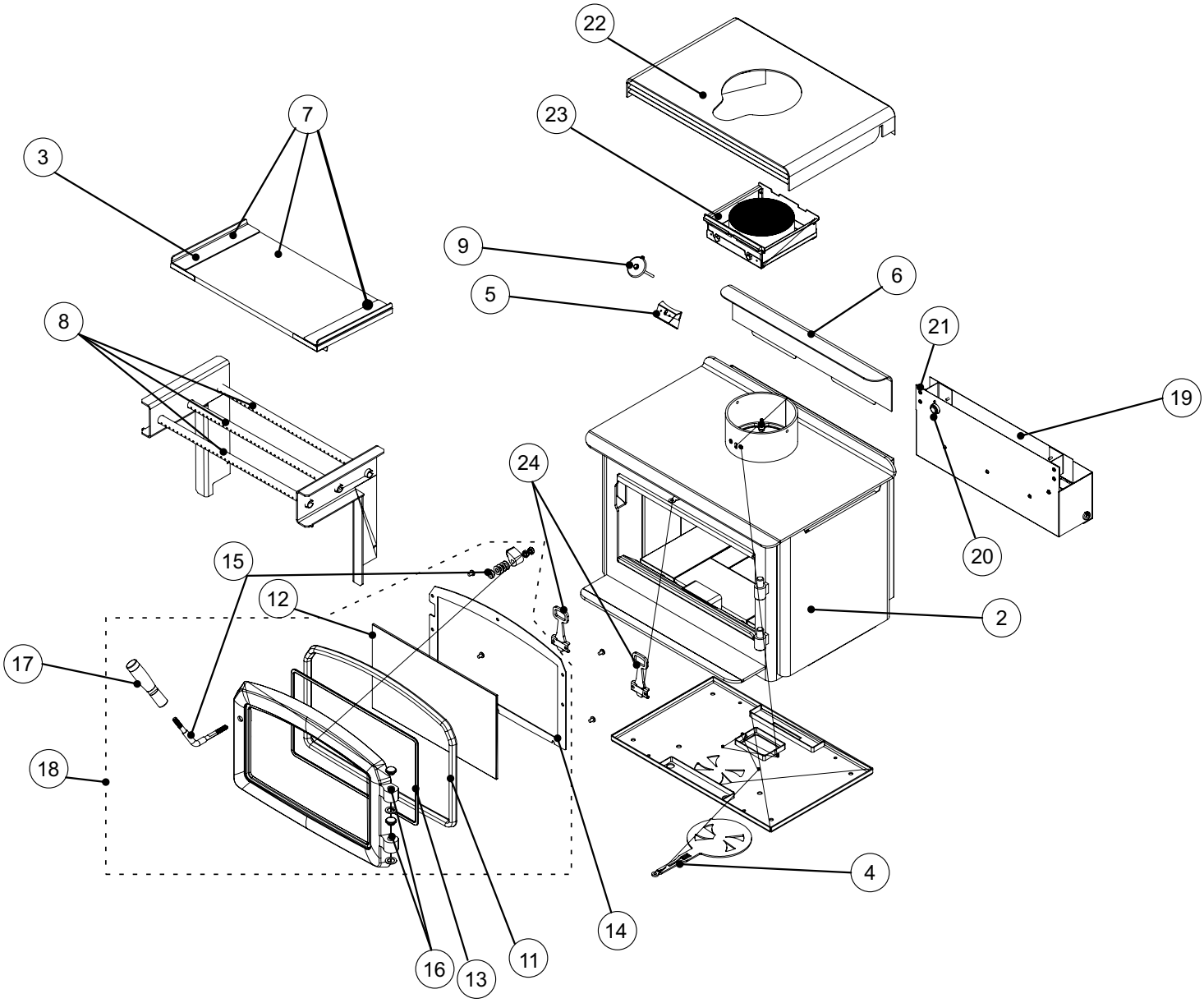
We highly recommend that the chimney cleaning be done by a professional as they will have the necessary tools such as a proper sized brush and special vacuum cleaner designed to deal with fine particles.

parts list

Main Assembly

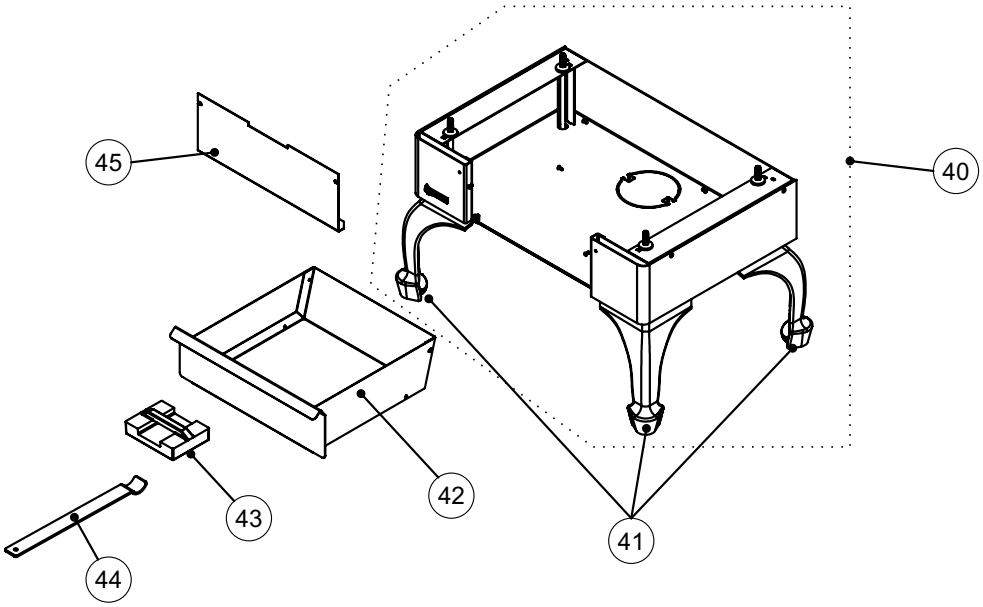
	Part #	Description
1	075-070	Left Side Heat Shield
2	075-071	Right Side Heat Shield
3	075-040	Side Baffle Cover (Each)
4	075-058F	Draft Control Lever
5	075-052	Bracket Probe
6	815-557	Rear Air Deflector
7	075-955	Baffle Complete Set (Center + Sides)
8	033-953	3/4 OD x 19-1/4 Airtube 3 Per Unit (Each)
9	075-028	Thermometer
11	846-570	7/8" Door Gasket Repair Kit
12	846-306	Replacement Glass - Small (Size :9 1/8" X 15 5/8")
13	936-241	Tape 7/8 Window Adhesive Sold per foot (4 Feet required)
14	075-077F	Glass Retainer
15	021-973	Door Handle Assembly Complete
16	948-079BN	Hinge Cap Brush Nickel (Each)
17	948-146	Long Black Handle
18	850-241	Black Door - Complete
18	850-243	Black with Nickel Accent Door - Complete
19	075-917	Fan Assembly Complete
20	910-142	Fan Thermodisc
21	910-330	Fan Speed Controller
21	904-586	Fan Speed Controller Knob
22	075-912	Airmate
24	075-063F	Andiron (Each)
N/S	075-041	Baffle Holder (Each)
N/S	075-037	SS Smoke Deflector
N/S	911-096	120 Volt Extension Cord
N/S	075-073F	Tool Hanger
N/S	948-223	Regency Logo Plate
N/S	911-221/P	Fan Motor Only With Squriell cage
N/S	075-064	Andiron Bracket (Each)
N/S	106-129	Control Tool
N/S	075-021	Firebox Floor White Gasket
N/S	075-097	Bypass Rod
N/S	075-051	SS Slide Holder

Main Assembly



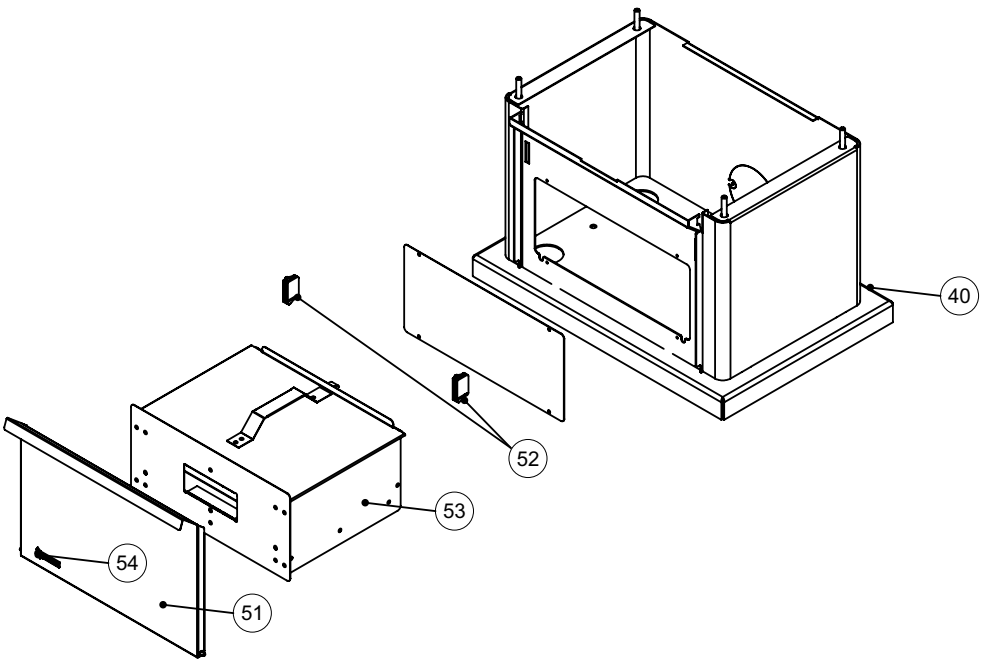
parts list

Bottom Shield and Legs



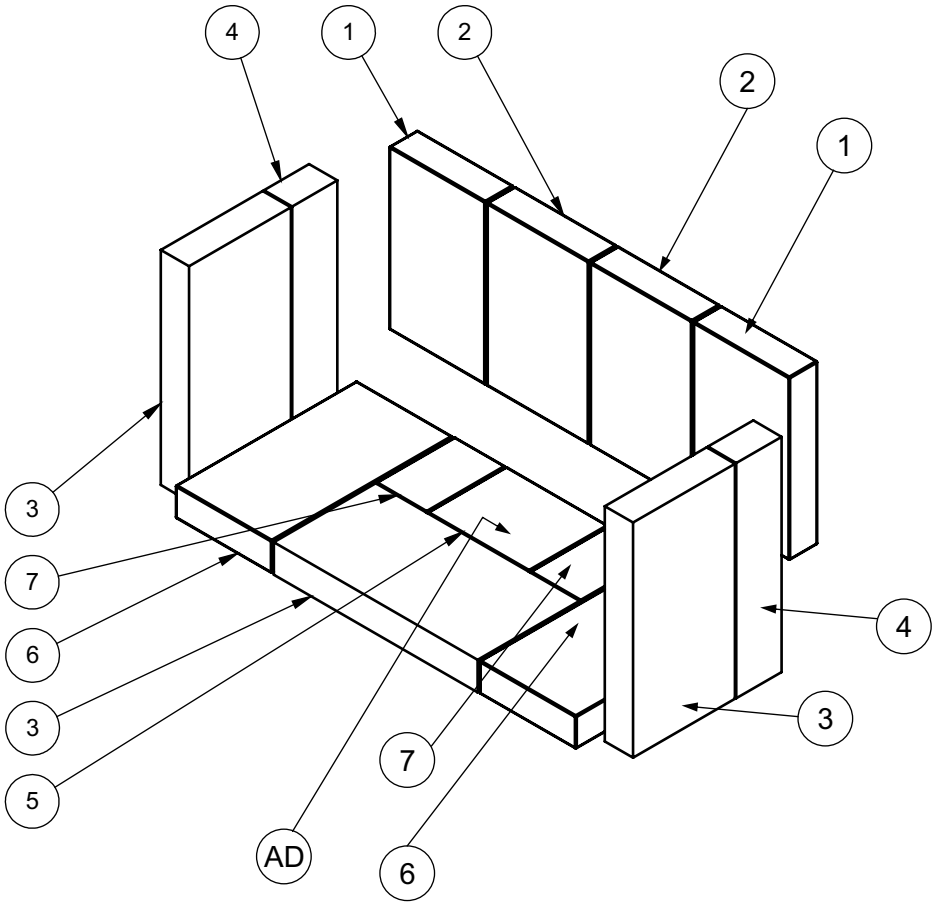
	part #	description
40	075-911	Bottom heat Shield
41	850-126	Black Cast legs (Set Of 4)
41	850-128	Nickel Cast legs (Set Of 4)
42	075-914	Ashdrawer Bottom Heat Shield
43	942-110	Ashplug
44	820-249	Ashplug Tool
45	075-079	Blanking Plate
N/S	905-008	5/16" x 6" Long Hex Head Bolt (Each)
N/S	820-468F	Metal Washer
N/S	820-456	Metal Spacer/Support Bracket (Each)

Pedestal Assembly



	part #	description
50	075-915	Pedestal Complete
51	075-069	Pedestal Door
52	904-257	Magnetic Catch (Each)
53	075-910	Ashdrawer
54	948-223	Regency Logo Plate
N/S	904-023	5/16 x 1-1/2 Hex Head Bolt (Each)

075-960 F1500S Complete Brick Kit

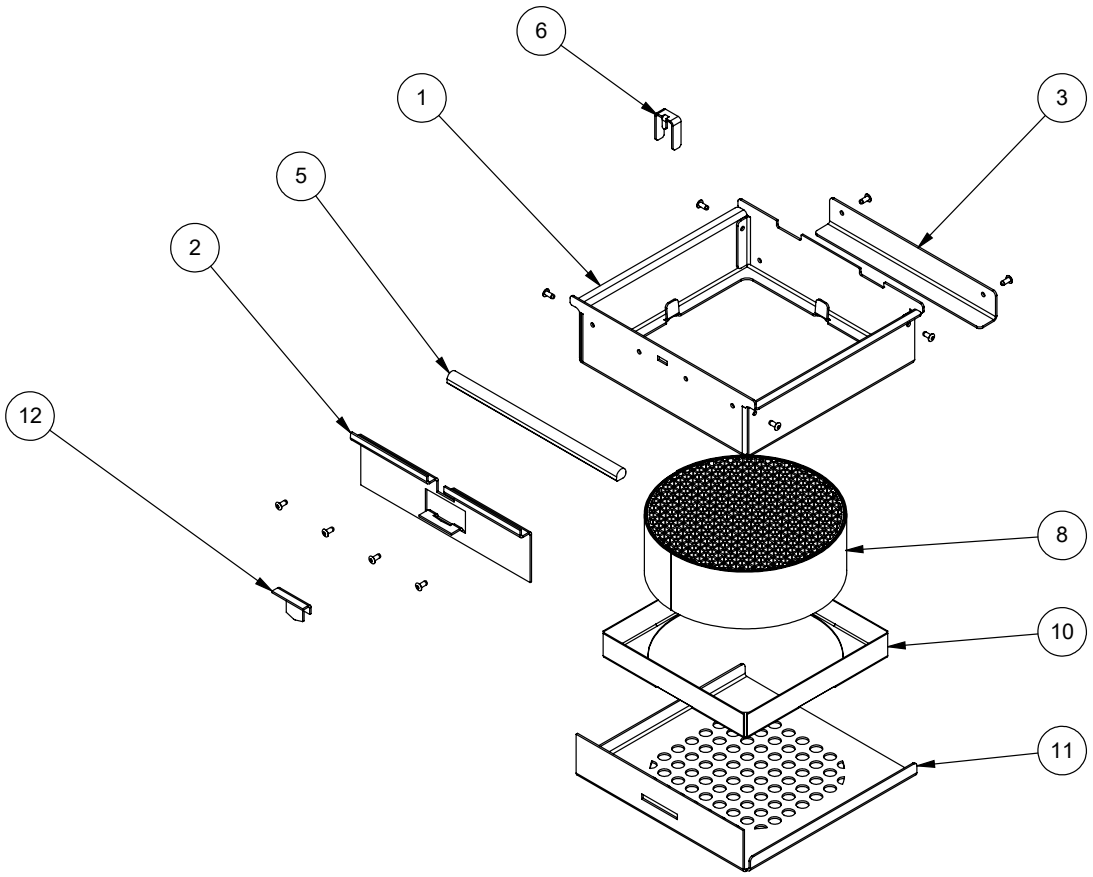


Fire bricks	
#	Size
1	4-1/4" x 7"
2	4-1/2" x 7"
3	9" x 4-1/2"
4	9" x 2"
5	3-1/2" x 4-1/2" (AD)
6	4-1/4" x 8"
7	3-1/2" x 2-1/4"
AD	Ashdump brick

parts list

Catalyst Assembly

	Part #	Description
1	075-101	Catalyst slide
2	075-102	Gasket bracket
3	075-104	Long shield bracket
5	936-236	Rope gasket 1/2" diameter
6	075-043	Rod lock
8	075-531	5.83 diameter combustor assembly
10	075-044	Cat cradle
11	075-105	Offset flame shield
12	075-103	Rod clip lock



Limited Lifetime Warranty

FPI Fireplace Products International Ltd. (for Canadian customers) and Fireplace Products U.S., Inc. (for U.S. customers) (collectively referred to herein as "FPI") extends this Limited Lifetime Warranty to the original purchaser of this appliance provided the product remains in the original place of installation. The items covered by this limited warranty and the period of such coverage is set forth in the table below.

Some conditions apply (see below).

The policy is not transferable, amendable, or negotiable under any circumstances.

Wood Products	Component Coverage					Labor Coverage
Components Covered	Limited Lifetime	5 years	2 years	1 year	Warranty	(Years)
Welded Firebox Steel	✓					5
All Stainless Steel Components, Smoke Deflectors, Heat Shields etc.	✓					3
Air Tubes	✓					3
Airmate	✓					3
Door handle and latch assembly, all hardware	✓					3
Glass Thermal Breakage Only	✓					3
Steel Faceplates, Accessory Housings	✓					3
All Plating	✓					3
Ash Drawer, Heatshields, Pedestal	✓					
All Baffles, Steel, Ceramic, Vermiculite C-Baffles	✓					
All castings, firebox, surrounds, doors, panels etc.		✓				3
All Electrical, Blower, wiring, switches etc.			✓			2
Glass - Crazing				✓		1
Catalyst Combustor					*10 Years Prorated	
Venting/Chimney				✓		1
Screens				✓		1

*See specific warranty details in regards to the catalyst combustor in unit manual.

Conditions:

Warranty protects against defect in manufacture or FPI factory assembled components only, unless herein specified otherwise.

Any part(s) found to be defective during the warranty period as outlined above will be repaired or replaced at FPI's option through an accredited distributor, dealer or pre-approved and assigned agent provided that the defective part is returned to the distributor, dealer or agent for inspection if requested by FPI. Alternatively, FPI may at its own discretion fully discharge all of its obligations under the warranty by refunding the verified purchase price of the product to the original purchaser. The purchase price must be confirmed by the original Bill of Sale.

The authorized selling dealer, or an alternative authorized FPI dealer if pre-approved by FPI, is responsible for all in-field diagnosis and service work related to all warranty claims. FPI is not responsible for results or costs of workmanship of unauthorized FPI dealers or agents in the negligence of their service work.
At all times FPI reserves the right to inspect reported complaints on location in the field claimed to be defective prior to processing or authorizing of any claim. Failure to allow this upon request will void the warranty.

All warranty claims must be submitted by the dealer servicing the claim, including a copy of the Bill of Sale (proof of purchase by you). All claims must be complete and provide full details as requested by FPI to receive consideration for evaluation. Incomplete claims may be rejected.

Replacement units are limited to one per warranty term. Airtube and baffle replacements are limited to one replacement per term.

Unit must be installed according to all manufacturers' instructions as per the manual.

All Local and National required codes must be met.

The installer is responsible to ensure the unit is operating as designed at the time of installation.

The original purchaser is responsible for annual maintenance of the unit, as outlined in the owner's manual. As outlined below, the warranty may be voided due to problems caused by lack of maintenance.

Repair/replacement parts purchased by the consumer from FPI after the original coverage has expired on the unit will carry a 90 day warranty, valid with a receipt only. Any item shown to be defective will be repaired or replaced at our discretion. No labor coverage is included with these parts.

Exclusions:
This Limited Lifetime Warranty does not extend to rust or corrosion of any kind due to: a lack of maintenance or improper venting, lack of combustion air provision, or exposure to corrosive chemicals (i.e. chlorine, salt, air, etc.).

This Limited Lifetime Warranty also does not extend to: paint, firebricks (rear, sides, or bottom), door gasketing, glass gasketing (or any other additional factory fitted gasketing), vermiculite floor bricks, andiron assemblies, and flue damper rods.

Malfunction, damage or performance based issues as a result of environmental conditions, location, chemical damages, downdrafts, installation error, installation by an unqualified installer, incorrect chimney components (including but not limited to cap size or type), operator error, abuse, misuse, use of improper fuels (such as unseasoned cordwood, mill-ends, construction lumber or debris, off-cuts, treated or painted lumber, metal or foil, plastics, garbage, solvents, cardboard, coal or coal products, oil based products, waxed cartons, compressed pre-manufactured logs, kiln dried wood), lack of regular maintenance and upkeep, acts of God, weather related problems from hurricanes, tornados, earthquakes, floods, lightning strikes/bolts or acts of terrorism or war, which result in malfunction of the appliance are not covered under the terms of this Limited Lifetime Warranty.

FPI has no obligation to enhance or modify any unit once manufactured (i.e. as products evolve, field modifications or upgrades will not be performed on existing appliances).

This warranty does not cover dealer travel costs for diagnostic or service work. All labor rates paid to authorized dealers are subsidized, pre-determined rates. Dealers may charge homeowner for travel and additional time beyond their subsidy.

Any unit showing signs of neglect or misuse will not be covered under the terms of this warranty policy and may void this warranty. This includes units with rusted or corroded fireboxes which have not been reported as rusted or corroded within three (3) months of installation/purchase.

Units which show evidence of being operated while damaged, or with problems known to the purchaser and causing further damages will void this warranty.

Units where the serial no. has been altered, deleted, removed or made illegible will void this warranty.

Minor movement, expansion and contraction of the steel is normal and is not covered under the terms of this warranty.

FPI is not liable for the removal or replacement of facings or finishing in order to repair or replace any appliance in the field.

Freight damages for products or parts are not covered under the terms of the warranty.

Products made or provided by other manufacturers and used in conjunction with the FPI appliance without prior authorization from FPI may void this warranty.

Limitations of Liability:
The original purchaser's exclusive remedy under this warranty, and FPI's sole obligation under this warranty, express or implied, in contract or in tort, shall be limited to replacement, repair, or refund, as outlined above. IN NO EVENT WILL FPI BE LIABLE UNDER THIS WARRANTY FOR ANY INCIDENTAL OR CONSEQUENTIAL COMMERCIAL DAMAGES OR DAMAGES TO PROPERTY. TO THE EXTENT PERMITTED BY APPLICABLE LAW, FPI 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. IF IMPLIED WARRANTIES CANNOT BE DISCLAIMED, THEN SUCH WARRANTIES ARE LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Some U.S. states do not allow limitations on how long an implied warranty lasts, or allow exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

Customers located outside the U.S. should consult their local, provincial or national legal codes for additional terms which may be applicable to this warranty.

How to Obtain Warranty Service:
Customers should contact the authorized selling dealer to obtain all warranty and service. In the event the authorized selling dealer is unable to provide warranty / service, please contact FPI by mail at the address listed on the next page. Please include a brief description of the problem and your address, email and telephone contact information. A representative will contact you to make arrangements for an inspection and/or warranty service, by an alternative dealer.

Product Registration and Customer Support:
Thank you for choosing a Regency Fireplace. Regency strives to be a world leader in the design, manufacture, and marketing of hearth products. To provide the best support for your product, we request that you complete a product registration form at http://www.regency-fire.com/Customer-Care/Warranty-Registration.aspx within ninety (90) days of purchase.

REGENCY
FIREPLACE PRODUCTS

Product Registration and Customer Support:

Thank you for choosing a Regency Fireplace. Regency strives to be a world leader in the design, manufacture, and marketing of hearth products. To provide the best support for your product, we request that you complete a product registration form found on our Web Site under Customer Care within ninety (90) days of purchase.

For purchases made in **CANADA or the UNITED STATES**:
http://www.regency-fire.com/Customer-Care/Warranty-Registration.aspx

For purchases made in AUSTRALIA:
http://www.regency-fire.com.au/Customer-Care/Warranty-Registration.aspx

You may also complete the warranty registration form below to register your Regency Fireplace Product and mail and/or fax it back to us, and we will register the warranty for you. It is important you provide us with all the information below in order for us to serve you better.

Warranty Registration Form (or Register online immediately at the above Web Site):

Warranty Details	
Serial Number (required):	
Purchase Date (required) (mm/dd/yyyy):	
Product Details	
Product Model (required):	
Dealer Details	
Dealer Name (required):	
Dealer Address:	
Dealer Phone #:	
Installer:	
Date Installed (mm/dd/yyyy):	
Your Contact Details (required)	
Name:	
Address:	
Phone:	
Email:	

For purchases made in CANADA:

FPI Fireplace Products International Ltd.
6988 Venture St.
Delta, British Columbia
Canada, V4G 1H4

Phone: 604-946-5155
Fax: 1-866-393-2806

For purchases made in the UNITED STATES:

Fireplace Products US, Inc.
PO Box 2189 PMB 125
Blaine, WA
United States, 98231

Phone: 604-946-5155
Fax: 1-866-393-2806

For purchases made in AUSTRALIA:

Fireplace Products Australia Pty Ltd
1- 3 Conquest Way
Hallam, VIC
Australia, 3803

Phone: +61 3 9799 7277
Fax: +61 3 9799 7822

For fireplace care and tips and answers to most common questions please visit our Customer Care section on our Web Site. Please feel free to contact your selling dealer if you have any questions about your Regency product.

CATALYTIC COMBUSTOR WARRANTY COVERAGE

IMPORTANT WARRANTY INFORMATION FOR CATALYTIC COMBUSTOR
Effective March 1 2019

Any and all claims for catalytic combustor must be filed **by the consumer** directly with their authorized Regency Dealer. FPI/Regency does not handle these claims directly with consumers.

Please follow the instructions below for your catalytic combustor under warranty. To learn more about the care and maintenance or the catalytic combustor, please visit our website: www.firecatcombustors.com.

Any warranty coverage before this date will be covered by the original warranty when the appliance was purchased.

(1) **10-year** coverage from Regency – not the supplier of the catalytic combustor.

(2) All claims must be made through the dealer where the appliance had been purchased.

(3) One no-charge replacement at any time within the **ten (10) year** period.

(4) Second replacement at 50% off retail* within the original **ten (10) years**.

(5) Subsequent replacements or if **ten (10)-year** coverage has expired at full retail* price.

(6) The catalytic combustor must not have been mechanically abused, nor must the wrong fuels have been used in the appliance.

(7) All claims must be accompanied by clear photos of the catalytic combustor showing all damage and also showing existing internal venting from the stove.

The consumer will be responsible for removal, any servicing. This warranty is REGENCY® exclusive warranty and REGENCY® disclaims any other express or implied warranty for the catalytic combustor, including any warranty or merchantability of fitness for a particular use.
NO LABOR WILL APPLY.

All warranty claims must be sent to: Regency Fireplace Products
By Authorized Regency Dealer

* Prices subject to change.
Regency reserves the right to reject any claim if it is determined the damage is a result of misuse, abuse or improper cleaning/ handling.

warranty

notes

Installer: Please complete the following information

Dealer Name & Address:_____

_____

Installer: _____

Phone #: _____

Date Installed: _____

Serial #:_____

Printed in Canada

safety decal

This is a copy of the label that accompanies each Regency Freestanding Woodstove (F1500). We have printed a copy of the contents here for your review.

NOTE: Regency units are constantly being improved. Check the label on the unit and if there is a difference, the label on the unit is the correct one.

Safety Label for F1500

duplicate serial number 447

0219WS021S

LISTED SPACE HEATER, SOLID FUEL TYPE, ALSO SUITABLE FOR MOBILE HOME INSTALLATION / APPAREIL DE CHAUFFAGE AMBIANT HOMOLOGUÉ À COMBUSTIBLE SOLIDE, CONVENANT AUSSI POUR INSTALLATION DANS UNE MAISON MOBILE

DO NOT REMOVE THIS LABEL/ NE RETIREZ PAS CETTE ÉTIQUETTE

447

MODEL: REGENCY SMALL FREESTANDING STOVE - F1500

TESTED TO: ULC S627-00 / UL 1482-2011 (R2015)

U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD." TESTED TO METHOD 28R. MODEL REGENCY F1500 – 1.0G /HR. 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.
CERTIFIÉ CONFORME AUX NORMES 2020 DE L'AGENCE AMÉRICAINE DE L'ENVIRONNEMENT EN MATIÈRE D'ÉMISSION DE PARTICULES DE BOIS EN UTILISANT LE BOIS DE CORDE. HOMOLOGUÉ AVEC LA MÉTHODE 28R.. MODÈLE REGENCY F1500 – 1,0 G /H. CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ PÉRIODIQUEMENT ET RÉPARÉ POUR FONCTIONNER CORRECTEMENT. CONSULTER LE MANUEL D'INSTALLATION POUR PLUS D'INFORMATION. LA RÉGLEMENTATION FÉDÉRALE INTERDIT DE FAIRE FONCTIONNER UN TEL APPAREIL SI LES CONSIGNES D'UTILISATION CONTENUES DANS LE PRÉSENT MANUEL NE SONT PAS RESPECTÉES.
INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA. USE 150 MM (6 IN.) DIAMETER MINIMUM 24 MSG BLACK OR 26 MSG BLUED STEEL CONNECTOR WITH LISTED UL103 HT FACTORY-BUILT CHIMNEY SUITABLE FOR USE WITH SOLID FUELS OR MASONRY CHIMNEY.
SEE LOCAL BUILDING CODE AND MANUFACTURER'S INSTRUCTIONS FOR PRECAUTIONS REQUIRED FOR PASSING A CHIMNEY THROUGH A COMBUSTIBLE WALL OR CEILING. DO NOT PASS CHIMNEY CONNECTOR THROUGH COMBUSTIBLE WALL OR CEILING. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.
INSTALLER ET UTILISER SEULEMENT SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DU FABRICANT. CONTACTER LES RESPONSABLES DU BÂTIMENT OU DU SERVICE-INCENDIE DE VOTRE RÉGION POUR CONNAÎTRE LES RESTRICTIONS ET EXIGENCES D'INSPECTION DANS VOTRE RÉGION. UTILISER UN CONNECTEUR D'UN DIAMÈTRE MINIMAL DE 150 MM (6 PO) 24 MSG EN ACIER NOIR OU 26 MSG EN ACIER BRONZÉ AVEC CHEMINÉE PRÉFABRIQUÉE HOMOLOGUÉE UL103 HT CONÇUE POUR UTILISATION AVEC COMBUSTIBLES SOLIDES OU UNE CHEMINÉE DE MAÇONNERIE.
VOIR LE CODE DU BÂTIMENT LOCAL ET LES INSTRUCTIONS DU FABRICANT CONCERNANT LES PRÉCAUTIONS EXIGÉES POUR INSTALLER UNE CHEMINÉE TRAVERSANT UN MUR OU PLAFOND EN MATÉRIAUX COMBUSTIBLES. NE FAITES PAS TRAVERSER LE CONNECTEUR DE CHEMINÉE DANS UN MUR OU PLAFOND EN MATÉRIAUX COMBUSTIBLES. NE RACCORDEZ PAS CE POÊLE À BOIS À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL.
MINIMUM ALCOVE CEILING HEIGHT: 2109 MM / 83" MAXIMUM ALCOVE DEPTH 915 MM / 36 IN.
MINIMUM CLEARANCES FOR HORIZONTAL CONNECTOR TO CEILING: 455 MM / 18"
THE SPACE BENEATH THE HEATER MUST NOT BE OBSTRUCTED. OPERATE ONLY WITH FIREBRICKS IN PLACE.
FOR USE WITH SOLID WOOD FUEL ONLY. USE OF OTHER FUELS MAY DAMAGE HEATER AND CREATE A HAZARDOUS CONDITION. DO NOT OBSTRUCT COMBUSTION AIR OPENINGS. OPERATE ONLY WITH FIREBRICKS IN PLACE. RISK OF SMOKE AND FLAME SPILLAGE, OPERATE ONLY WITH DOORS FULLY CLOSED. IF INSTALLED IN A MOBILE HOME OPERATE ONLY WITH DOORS FULLY CLOSED - OPEN FEED DOOR TO FEED FIRE ONLY. DO NOT USE GRATE OR ELEVATE FIRE. BUILD WOOD FIRE DIRECTLY ON HEARTH. DO NOT OVERFIRE - IF HEATER OR CHIMNEY CONNECTOR GLOWS YOU ARE OVERFIRING. INSPECT AND CLEAN CHIMNEY AND CONNECTOR FREQUENTLY. UNDER CERTAIN CONDITIONS OF USE CREOSOTE BUILDUP MAY OCCUR RAPIDLY. KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIAL AWAY FROM HEATER. REPLACE GLASS ONLY WITH NEOCERAM GLASS. COMBUSTIBLE FLOOR MUST BE PROTECTED BY NON-COMBUSTIBLE MATERIAL EXTENDING BENEATH THE HEATER AND TO THE FRONT AND SIDES AS INDICATED OR TO THE NEAREST PERMITTED COMBUSTIBLE MATERIAL.
OPTIONAL COMPONENT: FAN PART #075-917, ELECTRICAL RATING: VOLTS 115, 60 HZ, 2 AMPS
DANGER: RISK OF ELECTRIC SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT. DO NOT ROUTE POWER CORD UNDER OR IN FRONT OF APPLIANCE.
COMPONENTS REQUIRED FOR MOBILE HOME INSTALLATION: OUTSIDE AIR KIT
IN CANADA: LISTED ULCS 629 CHIMNEY. USE CHIMNEY COMPONENTS AS SPECIFIED IN INSTALLATION/INSTRUCTIONS
WARNING: ONLY USE LISTED REGENCY OPTIONS SUCH AS LEGS, AIRMATE, FAN AS SHOWN IN THE INSTALLATION MANUAL.
CAUTION: BURNING OF MATERIALS OTHER THAN THE SPECIFIED FUEL MAY MAKE THE CATALYST IN THE COMBUSTOR INACTIVE.
CAUTION: THE COMBUSTOR IS FRAGILE, HANDLE CAREFULLY.
COMBUSTOR: PART #075-531.
CAUTION: MOVING PARTS MAY CAUSE INJURY.
CAUTION: BURNING OF MATERIAL OTHER THAN THE SPECIFIED FUELS MAY TAKE THE CATALYST IN THE COMBUSTOR INACTIVE. THE COMBUSTOR IS FRAGILE, HANDLE CAREFULLY, THE PERFORMANCE OF THE CATALYTIC DEVISE OR ITS DURABILITY HAS NOT BEEN EVALUATED AS PART OF THE CERTIFICATION.
IN USA: LISTED UL 103 HT CHIMNEY
HAUTEUR MINIMALE DU PLAFOND DE L'ALCÔVE : 2108 MM / 83 PO PROFONDEUR MAXIMALE DE L'ALCÔVE : 915 MM / 36 PO
DÉGAGEMENT MINIMAL DU PLAFOND POUR UN CONNECTEUR HORIZONTAL : 455 MM / 18 PO.
L'ESPACE AU-DESSOUS DU POÊLE NE DOIT PAS ÊTRE OBSTRUÉ. UTILISER SEULEMENT AVEC LES BRIQUES RÉFRACTAIRES EN PLACE.
POUR UTILISATION AVEC BOIS SOLIDE SEULEMENT. L'UTILISATION D'AUTRES COMBUSTIBLES PEUT ENDOMMAGER LE POÊLE ET CRÉER UNE CONDITION DANGEREUSE. NE PAS OBSTRUER LES OUVERTURES D'AIR DE COMBUSTION. UTILISER SEULEMENT AVEC LA PORTE FERMÉE – OUVRIR LA PORTE DE CHARGEMENT POUR ALIMENTER LE FEU SEULEMENT. NE PAS UTILISER DE GRILLE À BÛCHES NI SURÉLEVER LE FEU. MONTER LE FEU DE BOIS DIRECTEMENT SUR L'ÂTRE. NE PAS SURCHAUFFER – SI LE POÊLE OU LE CONNECTEUR DE CHEMINÉE SE MET À ROUGIR, VOUS SURCHAUFFEZ. INSPECTEZ ET NETTOYEZ FRÉQUEMMENT LA CHEMINÉE ET LE CONNECTEUREN CERTAINES CONDITIONS D'UTILISATION, UN DÉPÔT DE CRÉOSOTE PEUT SE FORMER RAPIDEMENT. GARDEZ LES MEUBLES ET AUTRES MATÉRIAUX COMBUSTIBLES ÉLOIGNÉS DU POÊLE. REMPLACEZ LA VITRE SEULEMENT PAR DU VERRE EN NEOCERAM. LE PLANCHER COMBUSTIBLE DOIT ÊTRE PROTÉGÉ PAR DES MATÉRIAUX NON COMBUSTIBLES DÉPASSANT DU DESSOUS, DU DEVANT ET DES CÔTÉS DU POÊLE, TEL QU'INDIQUÉ, OU JUSQU'AU MATÉRIAU COMBUSTIBLE LE PLUS PRÈS PERMIS.
COMPOSANTS EN OPTION : VENTILATEUR, ALIMENTATION ÉLECTRIQUE : 115 VOLTS, 60 HZ, 2 AMP.
DANGER : RISQUE D'ÉLECTROCUTION. DÉCONNECTER L'ALIMENTATION ÉLECTRIQUE AVANT DE FAIRE L'ENTRETIEN DU POÊLE. NE PAS INSTALLER LE CORDON ÉLECTRIQUE SOUS OU DEVANT L'APPAREIL.
COMPOSANTS EXIGÉS POUR INSTALLATION DANS UNE MAISON MOBILE : KIT DE PRISE D'AIR EXTÉRIEUR.
AU CANADA : CHEMINÉE HOMOLOGUÉE ULCS 629. UTILISER LES PIÈCES DE LA CHEMINÉE TEL QUE SPÉCIFIÉ DANS LES CONSIGNES D'INSTALLATION.
AUX ÉTATS-UNIS : CHEMINÉE HOMOLOGUÉE UL103HT.

MANUFACTURED BY/ FABRIQUÉ PAR :
FPI FIREPLACE PRODUCTS INTERNATIONAL LTD.
6988 VENTURE ST.
DELTA, BC V4G 1H4

REGENCY FIREPLACE PRODUCTS

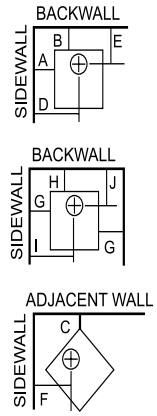
MADE IN CANADA / FABRIQUÉ AU CANADA

919-687

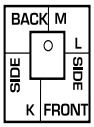
MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS
DÉGAGEMENTS MINIMUMS AUX MATÉRIAUX COMBUSTIBLES

F1500 WITH REAR DEFLECTOR OR AIRMATE

MEASURE FROM	HEATER	FLUE CENTER-LINE
RESIDENTIAL INSTALLATION USING SINGLE WALL CONNECTOR		
SIDEWALL	A 280 mm / 11 in	D 584 mm / 23 in
BACKWALL	B 267 mm / 10.5 in	E 445 mm / 17.5 in
CORNER	C 229 mm / 9 in	F 532 mm / 21 in
INSTALLATION USING LISTED DOUBLE WALL CONNECTOR - MOBILE HOME		
SIDEWALL	A 230 mm / 9 in	D 533 mm / 21 in
BACKWALL	B 125 mm / 5 in	E 294 mm / 11-9/16 in
CORNER	C 125 mm / 5 in	F 432 mm / 17 in
INSTALLATION USING LISTED DOUBLE WALL CONNECTOR - RESIDENTIAL CLOSE CLEARANCE		
SIDEWALL	A 230 mm / 9 in	D 535 mm / 21 in
BACKWALL	B 125 mm / 5 in	E 294 mm / 11-9/16 in
CORNER	C 125 mm / 5 in	F 432 mm / 17 in
INSTALLATION USING LISTED DOUBLE WALL CONNECTOR - ALCOVE		
SIDEWALL	G 229 mm / 9 in	I 585 mm / 21 in
BACKWALL	H 127 mm / 5 in	J 294 mm / 11-9/16 in



FLOOR PROTECTION*
PROTECTION DE PLANCHER*



K 405 mm / 16 in
L 200 mm / 8 in
M 200 mm / 8 in

* In Canada, floor protection must extend 18" (450mm) to the front and 8" (200mm) to each side and back of the stove.

* Au Canada, la protection de plancher doit dépasser de 18 po (457 mm) à l'avant et de 8 po (200 mm) de chaque côté du poêle et derrière le poêle.

CAUTION

HOT WHILE IN OPERATION DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. READ NAMEPLATE AND INSTRUCTIONS.

ATTENTION

CHAUD EN COURS DE FONCTIONNEMENT. NE PAS TOUCHER. ÉLOIGNER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES DE L'APPAREIL. LE CONTACT AVEC L'APPAREIL PEUT OCCASIONNER DES BRÛLURES. LIRE CETTE ÉTIQUETTE ET LES CONSIGNES.

DATE OF MANUFACTURE
JAN FEB MAR APR MAY JUN JUL AUG SEPT OCT NOV DEC
2021 2022 2023 2024 2025

REGENCY
FIREPLACE PRODUCTS

Cascades™ I1500 Wood Insert

Owners & Installation Manual

www.regency-fire.com

French Manual: https://bit.ly/2ykr3O7
Manuel en Français: https://bit.ly/2ykr3O7

Tested by:
0219WN025S

Installer: **Please complete the details on the back cover and leave this manual with the homeowner.**
Homeowner: **Please keep these instructions for future reference.**

FPI FIREPLACE PRODUCTS INTERNATIONAL LTD. 6988 Venture St., Delta, BC Canada, V4G 1H4

Thank you for purchasing a
REGENCY FIREPLACE PRODUCT.

The pride of workmanship that goes into each of our products will give you years of trouble-free enjoyment. Should you have any questions about your product that are not covered in this manual, please contact the **REGENCY DEALER** in your area.

"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." Failure to follow the manual details can lead to smoke and CO emissions spilling into the home. It is recommended to have monitors in areas that are expected to generate CO such as heater fueling areas.

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using crib wood." Model Regency I1500 – 1.0g/hr.

"This manual describes the installation and operation of the Regency I1500 catalytic equipped wood heater. This heater meets the 2020 U.S. Environmental Protection Agency's crib wood emission limits for wood heaters. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 14,244 BTU/hr to 20,386 BTU/hr." Efficiency is determined using the B415 method resulting in lower and higher heat values. This heater generates the best efficiency when operated using well-seasoned wood and installed in the main living areas where the majority of the chimney is within the building envelope. "This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation.

It is against federal regulation to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed."

CAUTION: BURN UNTREATED WOOD ONLY. OTHER MATERIALS SUCH AS WOOD PRESERVATIVES, METAL FOILS, COAL, PLASTIC, GARBAGE, SULPHUR OR OIL MAY DAMAGE THE CATALYST

"This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods."

DO NOT BURN:

- Treated wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash
- **Lawn clippings or yard waste**
- **Materials containing rubber including tires**
- **Materials containing plastic**
- **Waste petroleum products , paints or paint thinners or asphalt products**
- **Materials containing asbestos**
- **Construction or demolition debris**
- **Railroad ties**
- **Manure or animal remains**
- **Saltwater driftwood or other previously salt water saturated materials**
- **Unseasoned wood**
- **Paper products, cardboard, plywood or particle board. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in a wood heater.**

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

The authority having jurisdiction (such as Municipal Building Department, Fire Department, Fire Prevention Bureau, etc.) should be consulted before installation to determine the need to obtain a permit.

This unit must be connected to either a listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the United States of America. or code approved masonry chimney with flue liner.

I1500 is tested and certified to ULC S628-98, and UL1482-2011 (R2015).

SAVE THESE INSTRUCTIONS

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org
We recommend that our products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) or in Canada by Wood Energy Technical Training (WETT).
Wood Energy Technical Training

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We recommend that our products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) or in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training

CAUTION: To avoid burns or wood splinters, when opening/closing the fuel door or adding wood to the fire, You should always wear appropriate protective gloves to protect your hands from the heat being emitted from this fireplace.

Copy of the I1500 Safety Decal

This is a copy of the label that accompanies each **I1500 Wood Insert**. We have printed a copy of the contents here for your review.

NOTE: Regency units are constantly being improved. Check the label on the unit and if there is a difference, the label on the unit is the correct one.

(Duplicate Serial #) 450

LISTED FACTORY BUILT FIREPLACE INSERT CERTIFIED FOR USE IN CANADA AND U.S.A. DO NOT REMOVE THIS LABEL / NE PAS ENLEVER CETTE ÉTIQUETTE

0219WN022S

MODEL: I1500 REGENCY FIREPLACE PRODUCTS 450

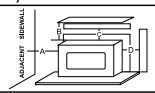
TESTED TO: ULC S628-M93 / UL 1482-2011 (R2015) REPORT NO.

U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD." TESTED TO METHOD 28R. MODEL REGENCY I1500 – 1.0G /HR. 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.

INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS. INSTALL AND USE ONLY IN MASONRY FIREPLACE OR FACTORY BUILT FIREPLACE.
CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS
(MEASURED FROM INSERT BODY)

ADJACENT SIDEWALL	A) 15in / 380mm
MANTEL	B) 20n / 510mm
TOP FACING	C) 14in / 355mm
SIDE FACING (to side surround)	D) 0.5in / 13mm



COMBUSTIBLE FLOOR MUST BE PROTECTED BY NON-COMBUSTIBLE MATERIAL EXTENDING (E) 16 IN / 405MM TO FRONT AND (G) 8IN / 205MM TO SIDES FROM FUEL DOOR. IN CANADA MUST EXTEND 18" TO FRONT.
THERMAL INSULATION WITH A R VALUE = 1.4 AT A DISTANCE OF 18" FROM FRONT OF DOOR OPENING FOR CANADA AND 16" FOR USA. IF UNIT RAISED 4.5" FROM FLOOR, NO THERMAL INSULATION IS REQUIRED.
COMBUSTOR PART #075-531

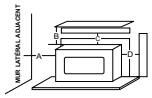
CAUTION: BURNING OF METAL FOILS, COAL, PLASTIC, GARBAGE, SULPHUR AND DIESEL OIL WILL RENDER THE CATALYST IN THE COMBUSTOR INACTIVE.
CAUTION: COMBUSTOR IS FRAGILE, HANDLE CAREFULLY
THE PERFORMANCE OF THE CATALYTIC DEVICE OR ITS DURABILITY HAS NOT BEEN EVALUATED AS PART OF THE CERTIFICATION.
COMPONENTS REQUIRED FOR INSTALLATION: 5.5" (140mm) or 6" (152mm)STAINLESS STEEL LINER LISTED CHIMNEY LINER.
OPTIONAL COMPONENT: FAN PART#172-917, ELECTRICAL RATING: VOLTS 115, 60 HZ, 0.6 AMPS
DANGER: RISK OF ELECTRIC SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT.
DO NOT REMOVE BRICKS OR MORTAR IN MASONRY FIREPLACE. FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT USE GRATE OR ELEVATE FIRE. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. BUILD WOOD FIRE DIRECTLY ON HEARTH. OPERATE WITH FEED DOOR CLOSED, OPEN TO FEED FIRE ONLY. REPLACE GLASS ONLY WITH CERAMIC GLASS (5MM). INSPECT AND CLEAN CHIMNEY FREQUENTLY. UNDER CERTAIN CONDITIONS OF USE CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT OVERFIRE, IF INSERT GLOWS YOU ARE OVER-FIRING.
CAUTION: MOVING PARTS MAY CAUSE INJURY. DO NOT OPERATE UNIT WITH A REMOVED PART OR PARTS.

CERTIFIÉ CONFORME AUX NORMES 2020 DE L'AGENCE AMÉRICAINE DE L'ENVIRONNEMENT EN MATIÈRE D'ÉMISSION DE PARTICULES DE BOIS LORSQUE DES PLANCHES DE BOIS ASSEMBLÉES (CRIB WOOD) SONT UTILISÉES. HOMOLOGUÉ AVEC LA MÉTHODE 28R. MODÈLE REGENCY I1500 – 1,0 G /H. CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ PÉRIODIQUEMENT ET RÉPARÉ POUR FONCTIONNER CORRECTEMENT. CONSULTER LE MANUEL D'INSTALLATION POUR PLUS D'INFORMATION. LA RÉGLEMENTATION FÉDÉRALE INTERDIT DE FAIRE FONCTIONNER UN TEL APPAREIL SI LES CONSIGNES D'UTILISATION CONTENUES DANS LE PRÉSENT MANUEL NE SONT PAS RESPECTÉES.

TEST : ULC S628-M93 / UL 1482-2011 (R2015) NO.DE RAPPORT
À INSTALLER ET À UTILISER UNIQUEMENT CONFORMÉMENT AUX CONSIGNES D'INSTALLATION ET D'UTILISATION DU FABRICANT. À INSTALLER ET À UTILISER UNIQUEMENT DANS UN FOYER EN MAÇONNERIE OU UN FOYER PRÉFABRIQUÉ.
CONTACTEZ LES AUTORITÉS LOCALES EN BÂTIMENT OU INCENDIE POUR CONNAÎTRE LES RESTRICTIONS D'INSTALLATION ET LES RÈGLES D'INSPECTION DANS VOTRE RÉGION.

(MESURES PRISES DEPUIS LE CAISSON DE L'ENCASTRABLE)
DÉGAGEMENTS MINIMAUX AUX MATÉRIAUX COMBUSTIBLES

MUR LATÉRAL ADJACENT	A) 15 po / 380 mm
MANTEAU	B) 20 po / 510 mm
PAREMENT SUPÉRIEUR	C) 14 po / 355 mm
PAREMENT LATÉRAL	D) 0,5 po / 13 mm



LE PLANCHER COMBUSTIBLE DOIT ÊTRE PROTÉGÉ PAR UN MATÉRIAU NON COMBUSTIBLE S'ÉTENDANT SUR (E) 16 PO / 405MM À L'AVANT ET SUR (G) 8 PO / 205MM ENTRE LES CÔTÉS ET LA PORTE DE CHARGEMENT DU COMBUSTIBLE. PROLONGEMENT SUR 18 PO À L'AVANT AU CANADA.
ISOLATION THERMIQUE AVEC UNE VALEUR R = 1,4 À UNE DISTANCE DE 18 PO DEPUIS L'AVANT DE L'OUVERTURE DE LA PORTE AU CANADA ET 16 PO AUX ÉTATS-UNIS. SI L'APPAREIL EST SURÉLEVÉ À 4,5 PO DU SOL, AUCUNE ISOLATION THERMIQUE N'EST REQUISE.
CATALYSEUR DE POSTCOMBUSTION PIÈCE N°075-531

ATTENTION : LA COMBUSTION DE FEUILLES DE MÉTAL, DE CHARBON, DE PLASTIQUE, DE DÉCHETS, DE SULFURE ET DE CARBURANT DÉSACTIVERA LE CATALYSEUR DE POSTCOMBUSTION.
ATTENTION : LE CATALYSEUR DE POSTCOMBUSTION EST FRAGILE, LE MANIPULER AVEC PRÉCAUTION.
LA PERFORMANCE DU CATALYSEUR AINSI QUE SA DURÉE DE VIE N'ONT PAS ÉTÉ ÉVALUÉES POUR L'ATTRIBUTION DE LA CERTIFICATION.
PIÈCES OBLIGATOIRES POUR L'INSTALLATION : GAINE DE CHEMINÉE HOMOLOGUÉE EN ACIER INOXYDABLE DE 5,5 PO (140mm) ou 6 PO (152mm).
PIÈCE EN OPTION : VENTILATEUR PIÈCE N°172-917
CARACTÉRISTIQUES ÉLECTRIQUES : 115 VOLTS, 60 HZ, 0,6 AMPS.
DANGER : RISQUE D'ÉLECTROCUTION. DÉBRANCHER LE COURANT AVANT DE PROCÉDER À L'ENTRETIEN DE L'APPAREIL.
NE PAS RETIRER LES BRIQUES OU LE MORTIER DU FOYER EN MAÇONNERIE. À UTILISER AVEC UN COMBUSTIBLE SOLIDE EN BOIS SEULEMENT. NE PAS UTILISER DE GRILLE NI SURÉLEVER LE FEU. NE PAS CONNECTER CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. FAIRE UN FEU DE BOIS DIRECTEMENT SUR L'ÂTRE. FAIRE FONCTIONNER L'APPAREIL AVEC LA PORTE DE CHARGEMENT FERMÉE, L'OUVRIR SEULEMENT POUR ALIMENTER LE FEU. REMPLACER LA VITRE SEULEMENT AVEC UNE VITRE EN CÉRAMIQUE (5MM). FAIRE INSPECTER ET RAMONER LA CHEMINÉE À INTERVALLES RÉGULIERS. ACCUMULATION RAPIDE DE CRÉOSOTE DANS CERTAINES CONDITIONS. NE PAS SURCHAUFFER : SI L'ENCASTRABLE EST ROUGEOYANT, L'APPAREIL SURCHAUFFE.
ATTENTION : LES PIÈCES AMOVIBLES PEUVENT ENTRAÎNER DES BLESSURES. NE PAS FAIRE FONCTIONNER L'APPAREIL SI UNE OU PLUSIEURS PIÈCES ONT ÉTÉ ENLEVÉES.

ATTENTION / DANGER

HOT WHILE IN OPERATION
DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
CONTACT MAY CAUSE SKIN BURNS.
READ ABOVE INSTRUCTIONS.

APPAREIL CHAUD LORSQU'IL FONCTIONNE.
NE PAS TOUCHER. GARDER À DISTANCE DES ENFANTS, DES VÊTEMENTS ET DU MOBILIER.
TOUT CONTACT PEUT CAUSER DES BRÛLURES.
LIRE LES INSTRUCTIONS CI-DESSUS.

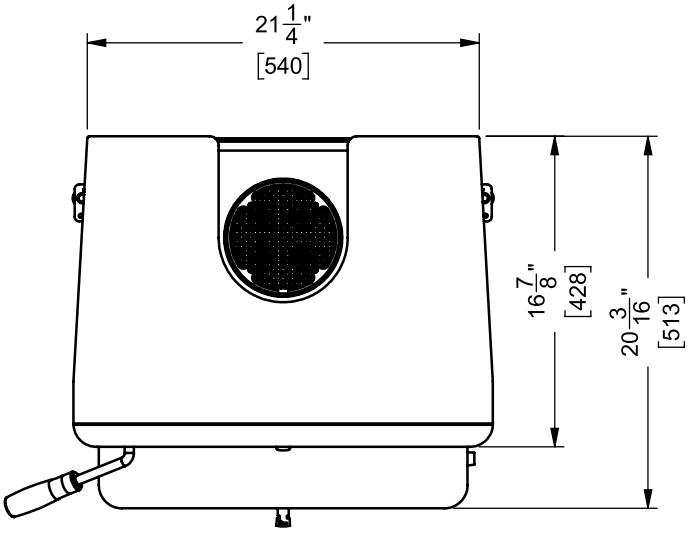
FABRIQUÉ PAR :
FPI FIREPLACE PRODUCTS INTERNATIONAL LTÉE.
6988 VENTURE ST.
DELTA, BC V4G 1H4

919-716a

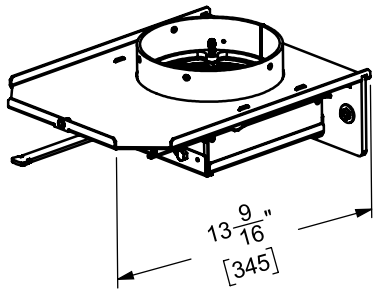
DATE OF MANUFACTURE / DATE DE FABRICATION
MADE IN CANADA / FAIT AU CANADA

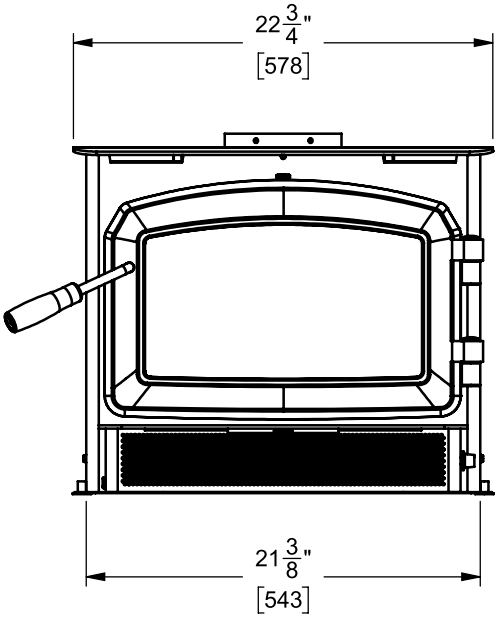
DEC ☐ NOV ☐ OCT ☐ SEPT ☐ AUG ☐ JUL ☐ JUN ☐ MAY ☐ APR ☐ MAR ☐ FEB ☐ JAN ☐ 2025 ◯ 2024 ◯ 2023 ◯ 2022 ◯ 2021 ◯

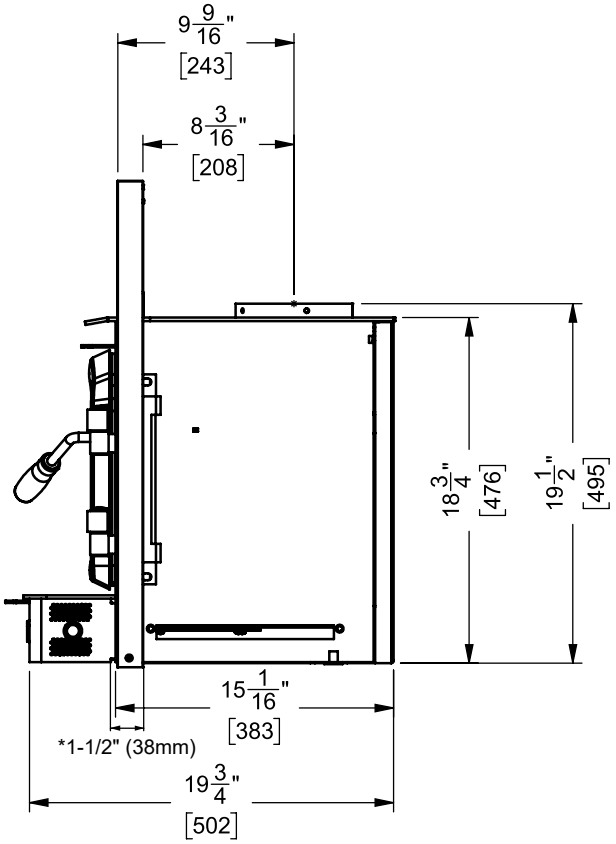
With Standard Flue Adaptor



6" (152mm) Diameter
STANDARD FLUE ADAPTOR



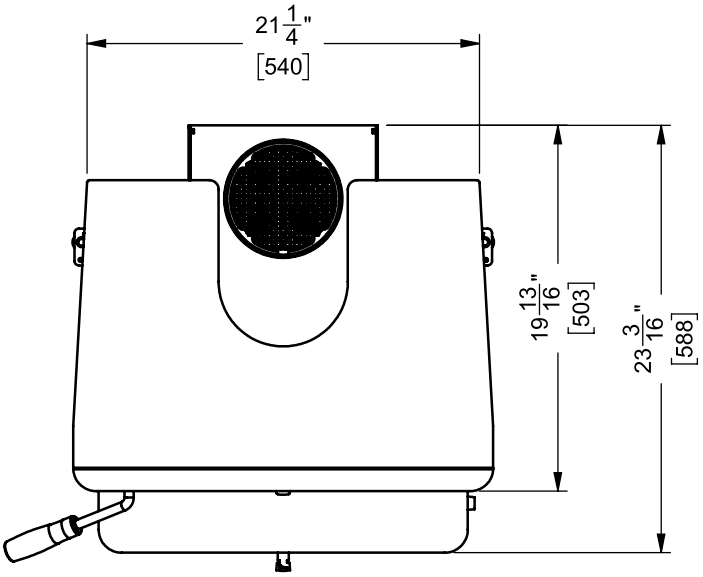




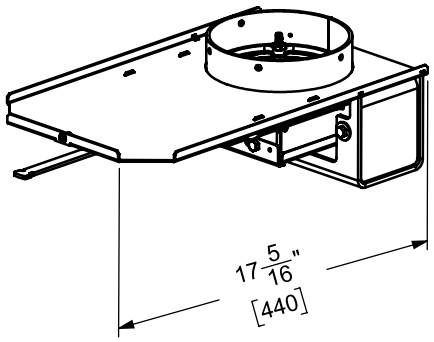
*Measurement from back of faceplate to fuel door opening

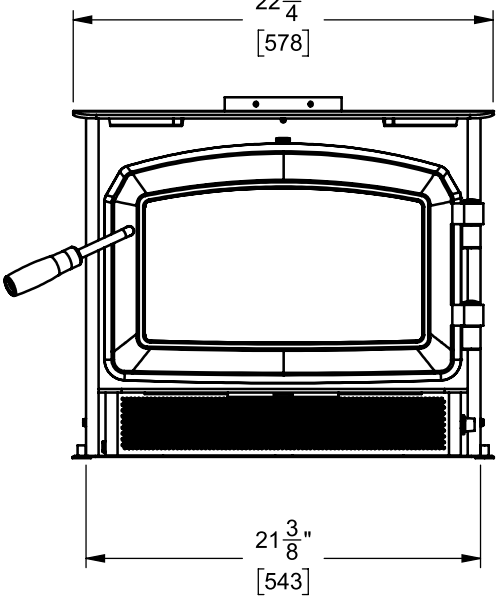
Regency Inserts are designed to use either a 5.5" (140mm) or 6" (152mm) flue.

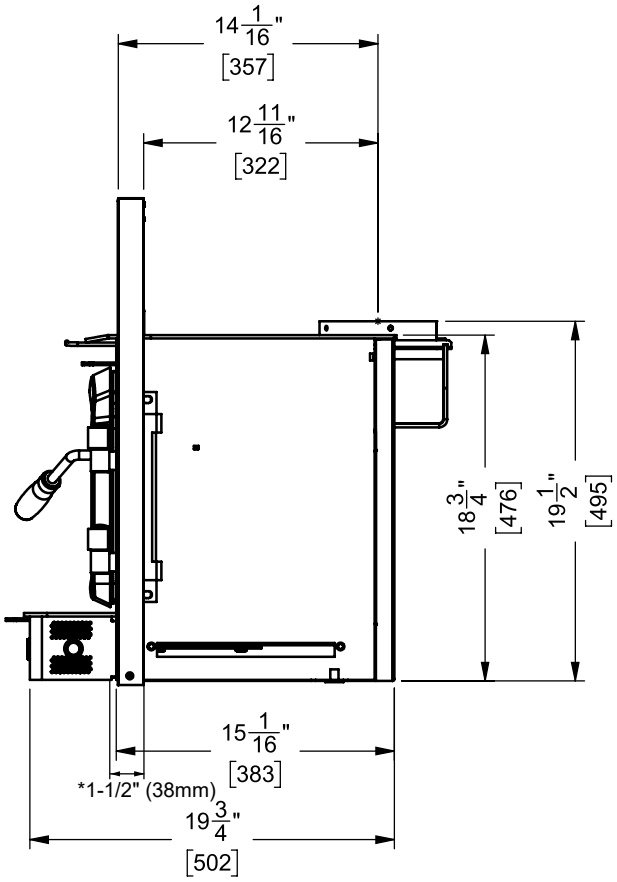
With Offset Flue Adaptor



6" (152mm) Diameter
OFFSET FLUE ADAPTOR







*Measurement from back of faceplate to fuel door opening

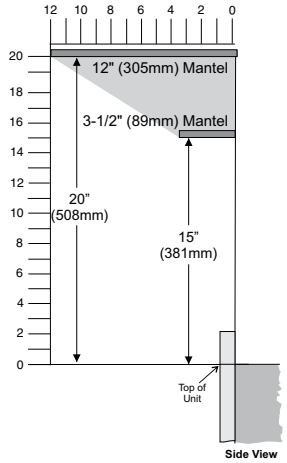
Regency Inserts are designed to use either a 5.5" (140mm) or 6" (152mm) flue.

Masonry and Factory Built Fireplace Clearances

The minimum required clearances to combustible materials when installed into a masonry or factory built fireplace are listed below.

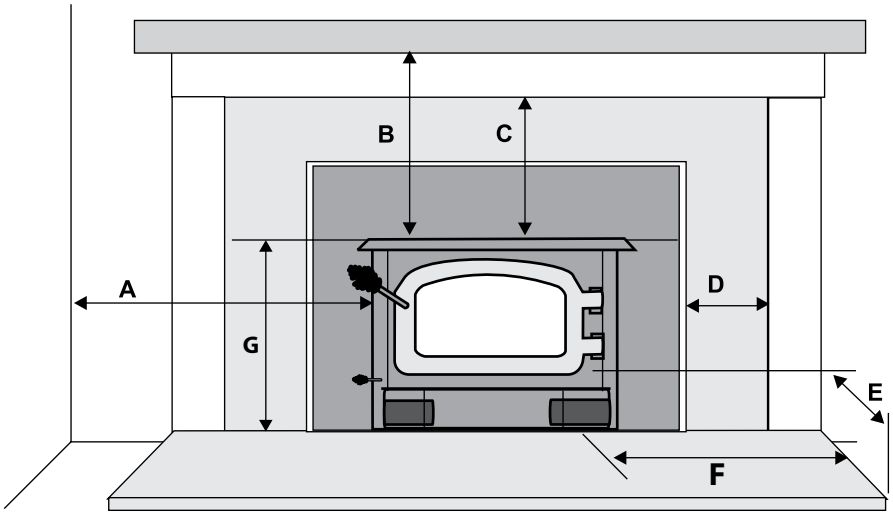
Unit I1500	Adjacent Side Wall (to Side) A	Mantel ** (to Top of Unit) B	Top Facing (to Top of Unit) C	Side Facing D	Minimum Hearth Extension* E	Minimum Hearth Side Extension* F	To Top of Unit G
	15" (381mm)	15" (381mm) for 3-1/2" (89mm) mantel	14" (355mm)	1/2"(13mm) to side surround	16" (406mm) USA 18"(457mm) Canada	8" (203mm)	18-3/4"(476mm)
		20" (508mm) for 12"(305mm) mantel					

Note: Side and Top facing is a maximum of 1.5" thick.



Clearances are critical.

****Mantel can be installed anywhere in shaded area or higher using the above scale.



Clearance diagram for installations

*Floor Protection

Thermal insulation/protection with a R value of 1.4 at a distance of 18" from door opening is required for Canada and 16" for USA.
If unit raised minimum 4.5" from hearth, no thermal protection is required.
Please check to ensure that your floor protection and hearth will meet the standards for clearance to combustibles. Your hearth extension must be made from a non-combustible material. Extending 16" for US and 18" for Canada—measured from the fuel loading door opening.

Fireplace Specifications

Your fireplace opening requires the following minimum sizes:

Height:	19" (483mm)
Width:	23" (584mm)
Depth:	
(w/ standard flue adaptor)	13-3/4" (349mm)
(w/ offset flue adaptor)	16-1/2" (419mm)

Two faceplates are available to seal the fireplace opening:

Standard 38" (965mm)W x 26-3/8" (670 mm)H

Oversize 44" (1118mm) W x 30-3/8" (771mm) H

Installation Into a Masonry Fireplace

Regency inserts are constructed with the highest quality materials and assembled under strict quality control procedures that ensure years of trouble free and reliable performance.

It is important that you read this manual thoroughly and fully understand the installation and operating procedures. Failure to follow instructions may result in property damage, bodily injury or even death. The more you understand the way your Regency Insert operates, the more enjoyment you will experience from knowing that your unit is operating at peak performance.

Before Installing Your Insert

1. Read all instructions before installing and using your fireplace insert. Install and use only in accordance with manufacturer's installation and operating instructions.

2. Check your local building codes - Building Inspection Department. You may require a **permit before installing your insert. Be aware that local codes and regulations may override some items in the manual.**

   WARNING: Careless installation is the major cause of safety hazard. Check all local building and safety codes before installation of unit.

3. Notify your home insurance company that you plan to install a fireplace insert.

4. Your fireplace insert is heavy and requires two or more people to move it safely. The insert and surrounding structure can be badly damaged by mishandling.

5. If your existing fireplace damper control will become inaccessible once you have installed your Regency Insert, you should either remove or secure it in the open position.

6. Inspect your fireplace and chimney prior to installing your insert to determine that it is free from cracks, loose mortar or other signs of damage. If repairs are required, they should be completed before installing your insert. Do not remove bricks or mortar from your masonry fireplace.

7. Do not connect the insert to a chimney flue servicing another appliance or an air distribution duct.

When referencing installation or connection to masonry fireplaces or chimneys, the masonry construction must or shall be code complying.

Chimney Specifications

Before installing, check and clean your chimney system thoroughly. If in doubt about its condition, seek professional advice. Your Regency Insert is designed for installation into a masonry fireplace that is constructed in accordance with the requirements of "The Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliance", N.F.P.A. 211, the National Building Code of Canada, or the applicable local code requirements.

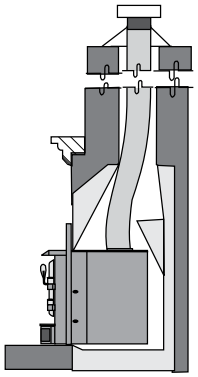
The appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, or the Canadian Electrical code, CSA C22.1.

Regency Inserts are designed to use either a 5.5" (140mm) or 6" (152mm) flue.

In Canada this fireplace insert must be installed with a continuous chimney liner of 5.5" (140mm) or 6" (152mm) 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 or CAN/ULC-S640, Standard for Lining Systems for New Masonry Chimneys.

In the U.S.A., a 5.5 inch (140 mm) or 6 inch (152 mm) diameter, stainless steel, full height chimney liner that meets type HT (2100^0 F) requirements per UL 1777 must be installed. The full liner must be attached to the insert flue collar and to the top of the existing masonry chimney.

Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may cause damage. An uncontrollable burn or excessive temperature indicates excessive draft. Inadequate draft may cause back puffing into the room and plugging of the chimney. Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints. Ensure the heater is installed in areas that are not too close to neighbors or in valleys that would cause unhealthy air quality or nuisance conditions.



Installation Into a Factory Built Fireplace

Regency inserts are constructed with the highest quality materials and assembled under strict quality control procedures that ensure years of trouble free and reliable performance.

It is important that you read this manual thoroughly and fully understand the installation and operating procedures. Failure to follow instructions may result in property damage, bodily injury or even death. The more you understand the way your Regency Insert operates, the more enjoyment you will experience from knowing that your unit is operating at peak performance.

Requirements for Installing Solid-fuel Inserts in Factory-built Fireplaces

1. A permit may be required for installations, final approval is contingent of the authority having local jurisdiction. Consult insurance carrier, local building, fire officials or authorities having jurisdiction about restrictions, installation inspection, and permits.
2. Inspect the existing fireplace and chimney for any damage or flaws such as burnouts, metal or refectory warping.
3. Inspection to a minimum of NFPA 211 Level II is recommended. All repairs must be made prior to installing an insert. The fireplace must be structurally sound and be able to support the weight of the solid-fuel insert.
4. The factory-built chimney must be listed per UL 127 or ULC 610-M87 for all installations. Install thermal protection as per this appliance listing requirements.
5. A full height 5.5 inch (140 mm) or 6 inch (152 mm) diameter stainless steel full height listed chimney liner must be installed meeting type HT (2100°F) requirements per UL 1777 (USA) or ULC S635 with "0" clearance to masonry (Canada). The full liner must be attached to the insert flue collar and to the top of the existing chimney.
6. The flue liner top support attachment must not reduce the air flow for the existing air-cooled chimney system. Reinstall original factory-built chimney cap only.
7. To prevent room air passage to the chimney cavity of the fireplace, seal either the damper area around the chimney liner or the insert surround. Circulating air chamber (i.e. in a steel fireplace liner or metal hearth circulatory) may not be blocked. The air flow within and around the fireplace shall not be altered, blocked by the installation of the insert (i.e. not louvers or cooling air inlet or outlet ports may be blocked by the insert or the insert surround).
8. Means must be provided for removal of the insert to clean the chimney flue.
9. Inserts that project in front of the fireplace must be supplied with appropriate supporting means.
10. Installer must mechanically attach the supplied label to the inside of the firebox of the fireplace into which the insert is installed.

⚠ WARNING

Fire Risk.
When lining air-cooled factory-built chimneys:
- Run chimney liner approved to **UL 1777 Type HT requirements (2100°F)**
- Reinstall original factory-built chimney cap ONLY
- DO NOT block cooling air openings in chimney
- Blocking cooling air will overheat the chimney

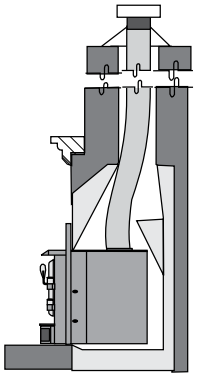
Altering the Fireplace

The following modifications of factory-built fireplaces are permissible:

The following parts may be removed:	
Damper	Smoke Shelf or Baffle
Ember Catches	Fire Grate
Viewing Screen/ Curtain	Doors

- The fireplace must be altered. Cutting any sheet metal parts of the fireplace in which the fireplace insert is to be installed is prohibited, except that the damper may be removed to accomodate a direct-connect starter pipe or chimney liner.
- External trim pieces which do not affect the operation of the fireplace may be removed providing they can be stored on or within the fireplace for reassembly if the insert is removed.
- The permanent metal warning label provided in the component pack must be attached to the back of the fireplace, with screws or nails, stating that the fireplace may have been altered to accomodate the insert, and must be returned to original condition for use as a conventional fireplace.
- If the hearth extension is lower than the fireplace opening, the portion of the insert extending onto the hearth must be supported.
- Manufacturer designed adjustable support kit can be ordered from your dealer.
- Final approval of this installation type is contingent upon the authority having jurisdiction.

WARNING: This fireplace may have been altered to accommodate an insert. It must be returned to its original condition before use as a solid fuel burning fireplace.



1. When installed in a factory built fireplace, a full stainless steel rigid or flexible flue liner is mandatory, for both safety and performance purposes. When a flue or liner is in use, the insert is able to breathe better by allowing a greater draft to be created. The greater draft can decrease problems such as, difficult start-ups, smoking out the door, and dirty glass.
2. In order to position the flue liner, the existing rain cap must be removed from your chimney system. In most cases the flue damper should also be removed to allow passage of the liner.
3. In most cases opening the existing spark screens fully should give enough room for the insert installation. If it does not, remove and store.
4. If the floor of your fireplace is below the level of the fireplace opening, adjust the insert's levelling bolts to accommodate the difference. When additional shimming is required, use non-combustible masonry or steel shims.
5. Measure approximately the alignment of the flue liner with the position of the smoke outlet hole on the insert to check for possible offset. If an offset is required, use the appropriate offset adaptor in your installation.

Draft

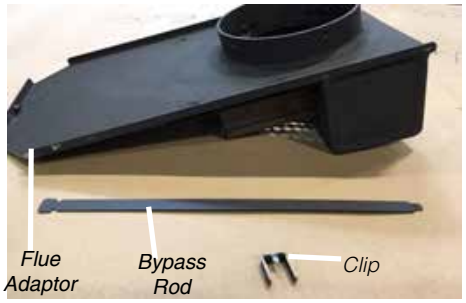
Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may cause damage. An uncontrollable burn or excessive temperature indicates excessive draft. Inadequate draft may cause back puffing into the room and plugging of the chimney. Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints. Ensure the heater is installed in areas that are not too close to neighbors or in valleys that would cause unhealthy air quality or nuisance conditions.

Installing Your Insert

SAFETY NOTE: The insert is very heavy and will require two people to move it into position. The door and bricks can be removed to help. Be sure to protect your hearth extension with a heavy blanket or cardboard during the installation.

NOTE: The unit requires to purchase either the standard or offset flue adaptor that is best suited for the specific installation.

Flue adaptor contents:
- Flue adaptor with catalyst cartridge housing installed
- Bypass rod
- Clip to secure the bypass rod

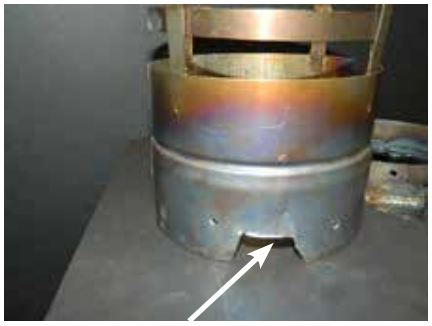


NOTE: The catalyst and the two bolts to secure the adaptor to the unit are packaged with the unit in the manual package.

List of Tools required:

- Tin snips
- Pull rod (supplied with unit)
- 1/2" socket / ratchet
- 3/8" open face wrench
- 7/16" socket/ratchet

1. Cut a notch into the adaptor approximately ¾" high by 1 " wide as shown. This is to accommodate the probe in the following steps.



2. Install flex liner into existing chimney as per liner manufacturer's specifications. Ensure that the notch on the adapter cut in the previous step is pointed forward at about the 6 o'clock position. See Diagram 1.

Diagram 1

3. Secure the adaptor to the flex liner with three screws. Ensure the adapter is level and aligned correctly. See Diagrams 2 & 2A.

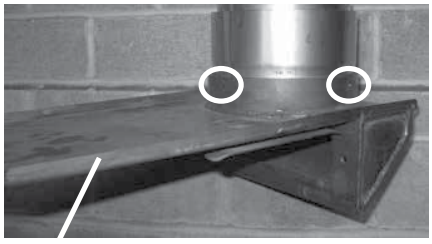


Diagram 2

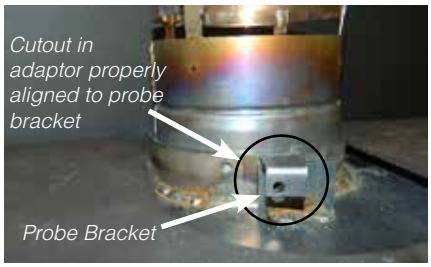


Diagram 2A

4. Fully insert the probe into the probe bracket as shown. See diagram 3.

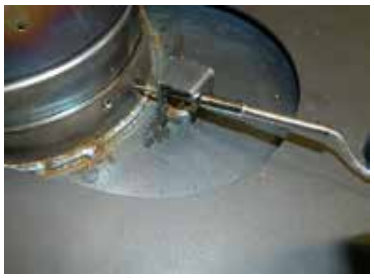


Diagram 3

5. Install the unit by first setting the rear of the unit into the fireplace. See Diagram 4. Ensure that the unit is centered in the existing fireplace and lined up with the flue adaptor.

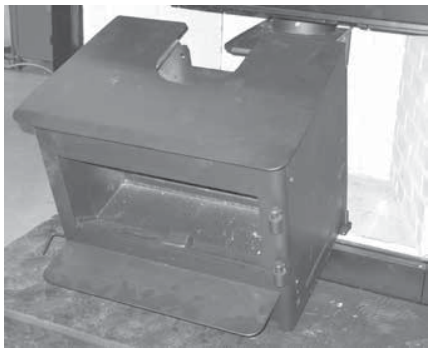


Diagram 4

6. Slide the unit back until the flue adaptor is slightly engaged. At this point it is recommended to level the unit. This will keep the adaptor from binding

7. Insert the provided pull rod through the hole in the top center of the unit. Secure the threaded end into the flue adaptor as shown in diagram 5. While sliding the unit into place pull on the rod to ensure that the flue adaptor is properly engaged. See Diagram 6. Double check the adaptor is seated properly and the pull rod in the firebox, locate the two holes lined up to the two holes on the adaptor. After sliding adaptor into position, make sure the flue adaptor is tight against the body, and no light is seen coming through between the adaptor and body of insert.

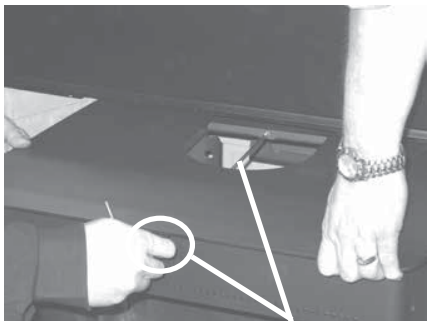
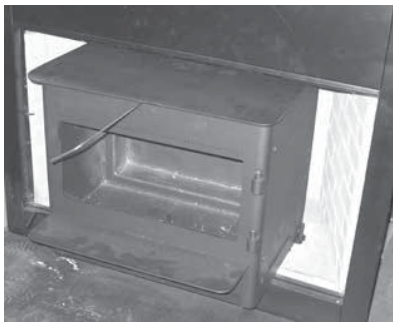


Diagram 5



Pull Rod in place

Diagram 6

8. To complete the install, use the two bolts, washers and lock washers (supplied in manual pack) and install them, tighten down using the 1/2" socket to ensure the adapter is positively secured to the unit. Once completed remove pull rod and place away for future re-install.

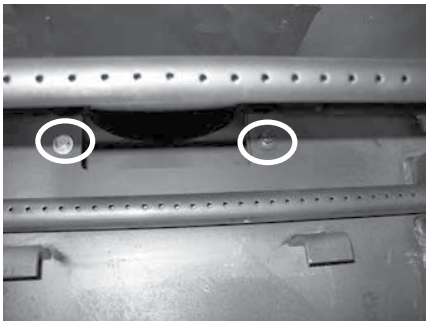
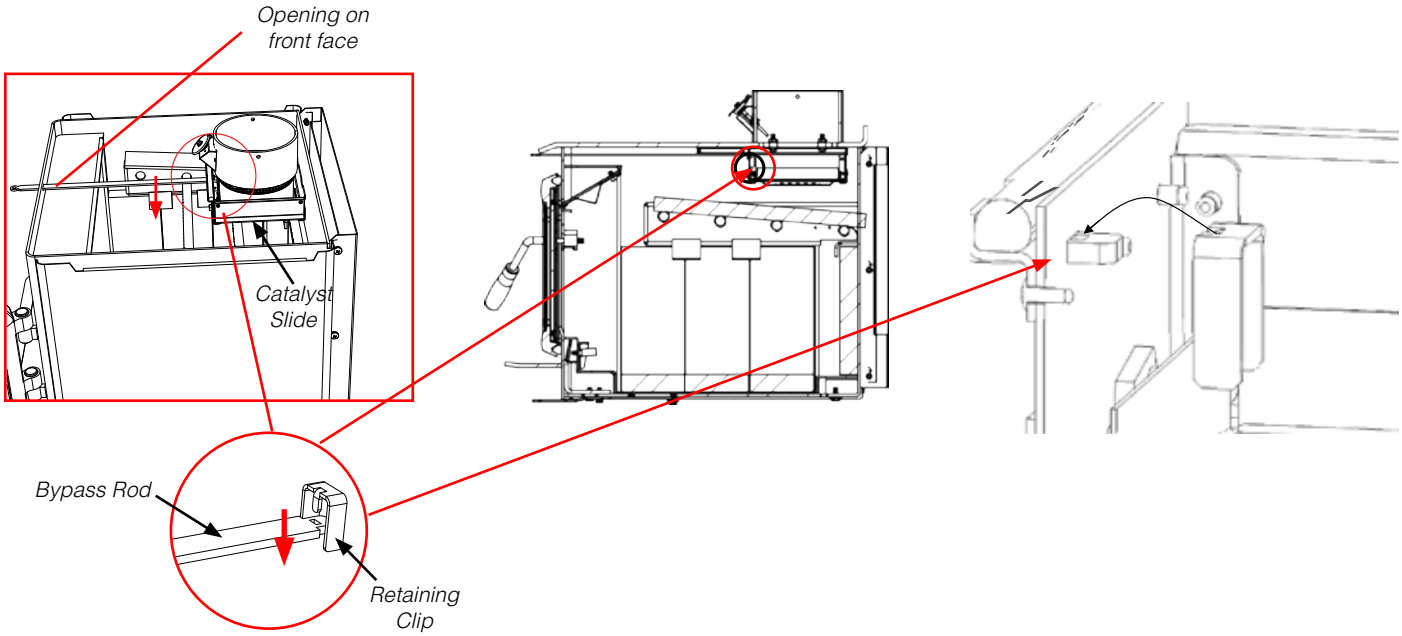


Diagram 7

Bypass Rod/Retaining Clip Installation

1. Slide bypass rod into opening on front face as shown below. Note : The opening will be located directly above the door. Once bypass is slid all the way back into flue adaptor, secure with retaining clip as shown below.



Note: Unit in images may not be identical to the I1500—they depict the process.

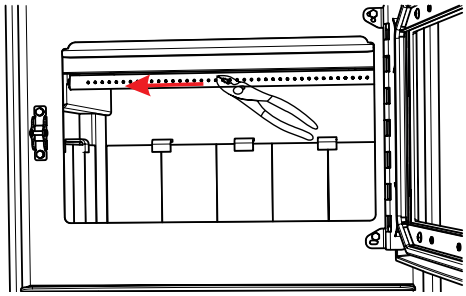
Baffle/Catalyst Installation

Note: unit in images may not be identical to the I1500—they depict the process.

1. Open the door.

2. Remove the front secondary air tube with pliers & hammer (hammer not shown) as shown below.

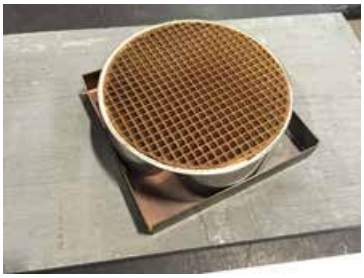
Note: Some force will need to be used by hammering onto the pliers to enable to unlock the air tube.
Note: It will be easier to remove the air tubes by removing both the bottom right base brick and right side wall brick.



3. Remove locking clip from the front face of the Catalyst assembly by sliding up and out.

4. Pull the flame shield forward and tilt down.

5. Take your new round catalyst and install it into the square support. See diagram below.



Catalyst in Square Support

6. Install catalyst and square support installed in previous step into the flue collar assembly as shown below.

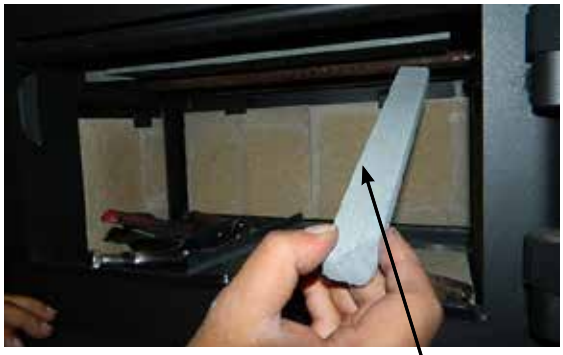
Catalyst

7. Repeat steps 3-4 to reinstall flame shield & locking clip.

8. Install the center baffle.

Centre Baffle

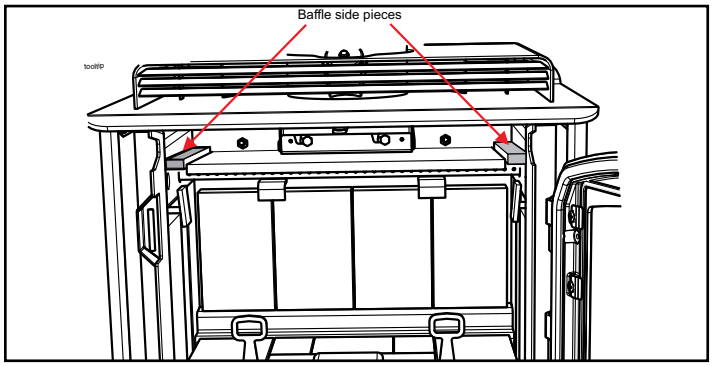
9. Install the right and left side baffles (right side baffle shown below).



Baffle Bracket

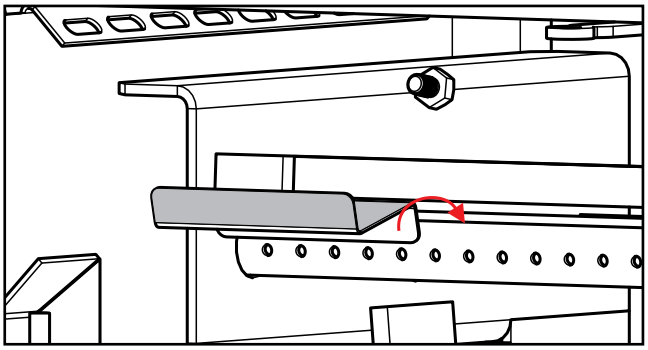
10. Install left and right baffle cover plate (installation of left baffle shown below).

Baffle Cover Plate



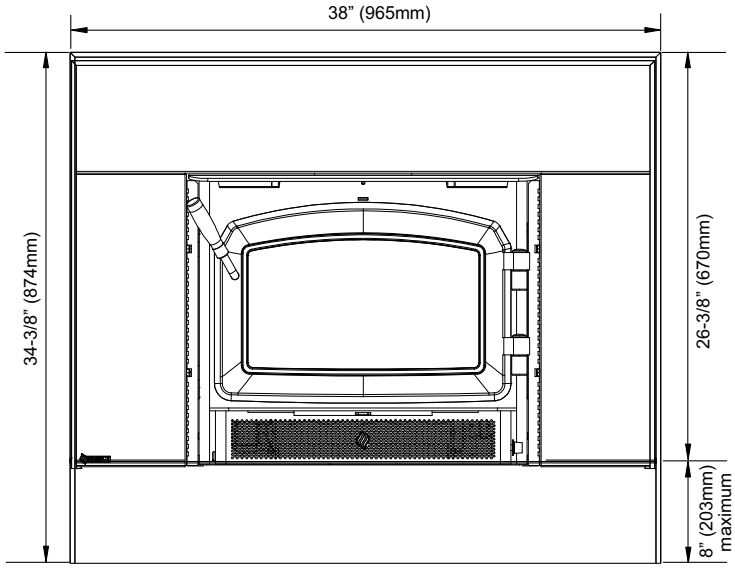
11. Reinstall air tube removed in step 2. Use pliers and a hammer to lock air tube back into place. Note: Ensure the key on the air tube lines up with the notch on the side air channel.

12. Install baffle brackets on either side by slightly lifting baffles up and placing brackets in between baffles and the front air tube. The baffle brackets hold the side and centre baffles in position. Installation of the left baffle bracket is shown below.

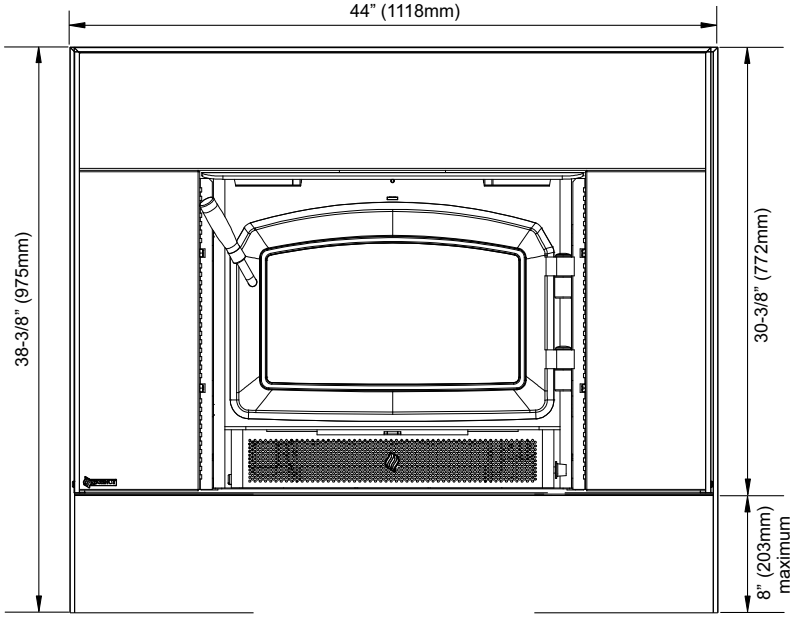


Faceplate, Trim & Optional Bottom Faceplate & Fan Support Installation

Regular Faceplate Dimensions (shown with bottom faceplate/fan support attached):



Oversize Faceplate Dimensions (shown with bottom faceplate/fan support attached):



Regular/Oversize Faceplate Installation:

1) Thread the black 1/4" x 3/4" long hex bolts into the faceplate mounting bracket as shown in Diagram 1, leaving them approximately 1/4" out.

2) Fasten the faceplate mounting bracket to the side of the insert using 2 bolts for the top and bottom, see Diagram 1. Repeat for other side.

NOTE: The bolt and washer come attached to the side of the insert and need to be removed and reused for fastening.

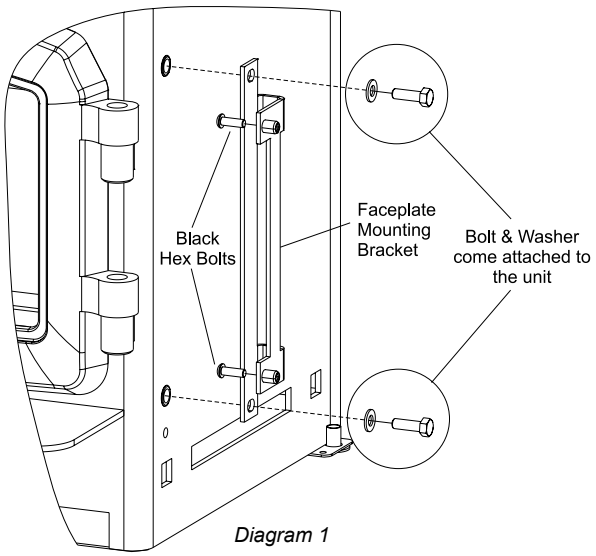


Diagram 1

3) Assemble the faceplate sides and top using the 1/4" x 1/2" long hex bolts, lock washers, and nuts provided. Do not tighten. See Diagram 2.
I1500s only: Install Digital Monitor Operating Tool Bracket as shown. See diagram 2A. Tighten all of the bolts. The tool holder can then be slid into the tool bracket as shown.

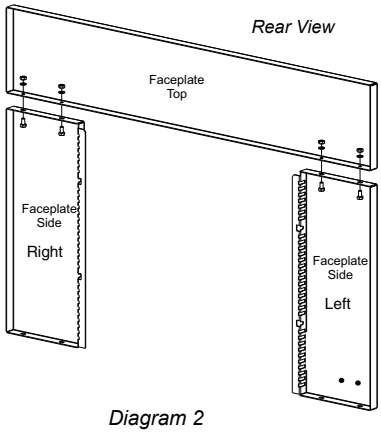


Diagram 2

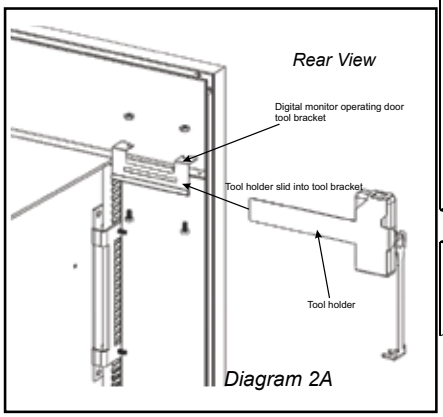


Diagram 2A

Optional Regular/Oversize Bottom Faceplate Installation:

4) Position the assembled faceplate side and top to the insert. Ensure to align the draft rod into the opening of the faceplate as well as the side faceplate slots with the bolts in the mounting brackets as shown in Diagram 3.

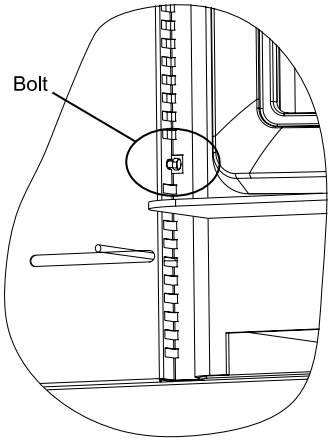


Diagram 3

5) Measure the height between the hearth and the bottom of the side faceplate.

6) Cut the bottom faceplate to the measured height using a metal cutting blade.

7) Remove the faceplate assembly from the insert and attach the cut bottom faceplate to the faceplate sides using the 1/4" x 1/2" long hex bolts, lock washers and nuts provided as shown in Diagram 4.

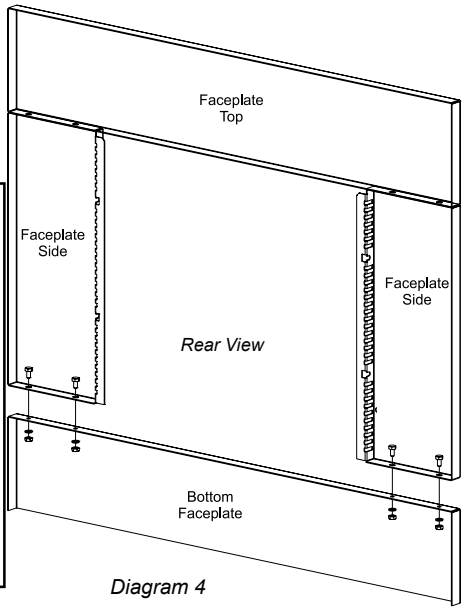


Diagram 4

If the insert is going to sit on the hearth proceed to "Faceplate Trim Installation" (step 8) otherwise continue on to "Bottom Faceplate Installation" (step 4).

Regular/Oversize Faceplate Trim Installation:

(Black Trim included with Regular/Oversize Faceplate or Bottom Faceplate)

8) Assemble the left and right side trim to the top trim using the trim clips provided as shown in Diagram 5.
NOTE: When using the optional bottom faceplate kit (part #171-928 for Regular or 171-930 for Oversize), the kit contains 2 long right/left black trims. These will need to be cut to size depending on the overall height of the faceplate prior to assembling the trims. Use a hack saw with a fine blade or cut off saw to cut the ends of the black trim. The right/left black trim that were supplied with the regular/oversize faceplate can be recycled as it is not required.

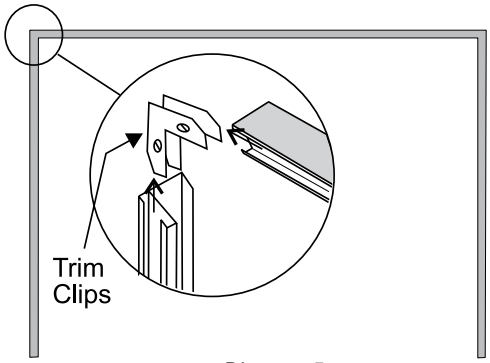


Diagram 5

9) Fit the trim assembly over the faceplate assembly. See Diagram 6.

10) Drill two 5/32" diameter holes through the trim and side panels and screw the trim to the panels using the self tapping screws provided as shown in Diagram 6.

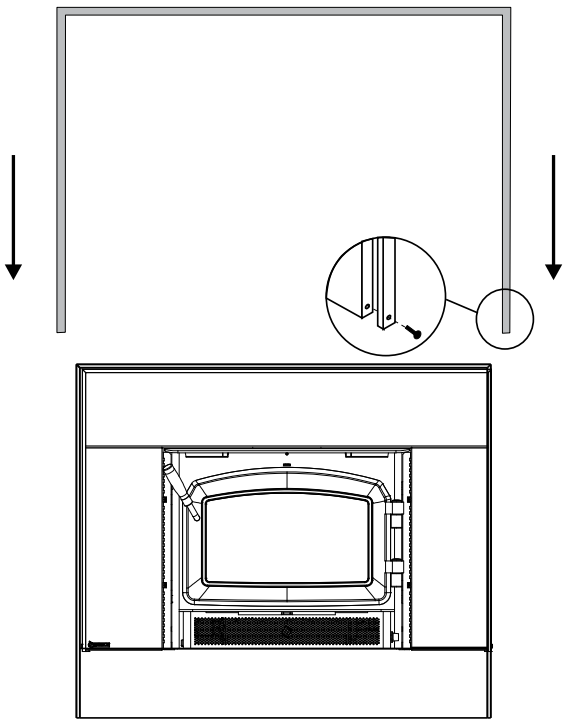


Diagram 6:
Shown with Optional Bottom Faceplate

11) Mount the completed faceplate / trim assembly to the insert. Ensure to align the side faceplate slots with the hex bolts in the mounting brackets and tighten to secure in place. Secure the Regency logo plate to the bottom of the faceplate.

Fan Installation:

12) Install the fan assembly to the ash lip of the insert as shown in Diagram 7.
- **a)** Align the fan with the offset clips on the bottom of the ash-lip.
- **b)** Slide the supports into the clips. The tension holding the clips in place may be adjusted by increasing or decreasing the offset spacing of the clips.
- **c)** Ensure that the power cord is not in contact with any hot stove surfaces.

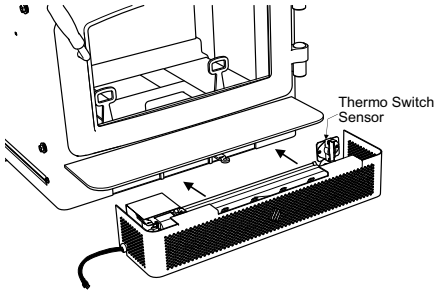


Diagram 7

Optional Fan Support / Bottom Faceplate Installation:

13) To install the optional fan support, measure the distance between the hearth and the bottom surface of the fan housing as shown in Diagram 8.

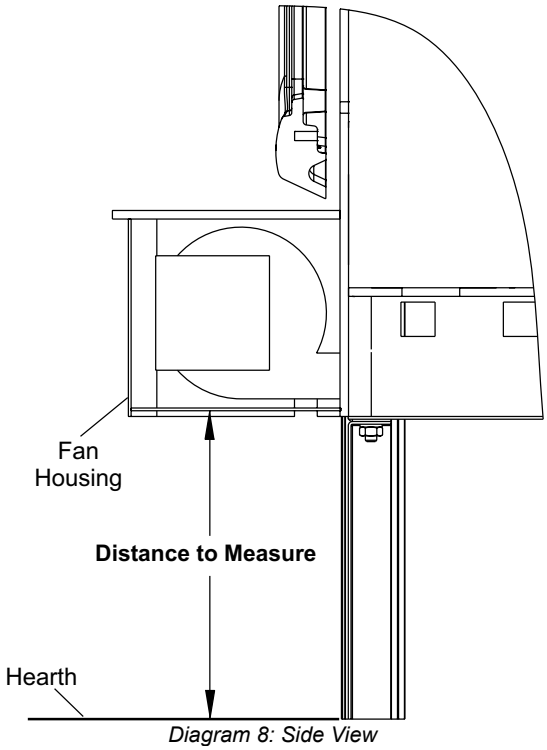


Diagram 8: Side View

14) Cut the bottom edge of the fan support and bottom faceplate (using a metal cutting blade) to the length measured in step 13.

15) Remove the fan assembly from the ash lip of the insert and position the fan support to the bottom of the fan assembly.

16) Drill 4 x 5/32" holes to the underside of the fan assembly using the holes in the fan support as a guide. See Diagram 9.

17) Secure the fan support to the fan assembly using 4 self tapping screws. See Diagram 9.

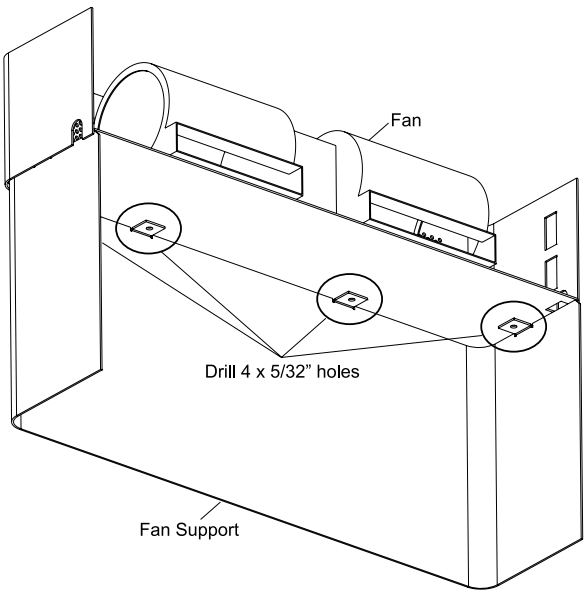


Diagram 9: Rear / Bottom View
Note: Fan not exactly as shown

18) Secure the bottom faceplate to the 3-sided faceplate using the 4 supplied bolts/washers.

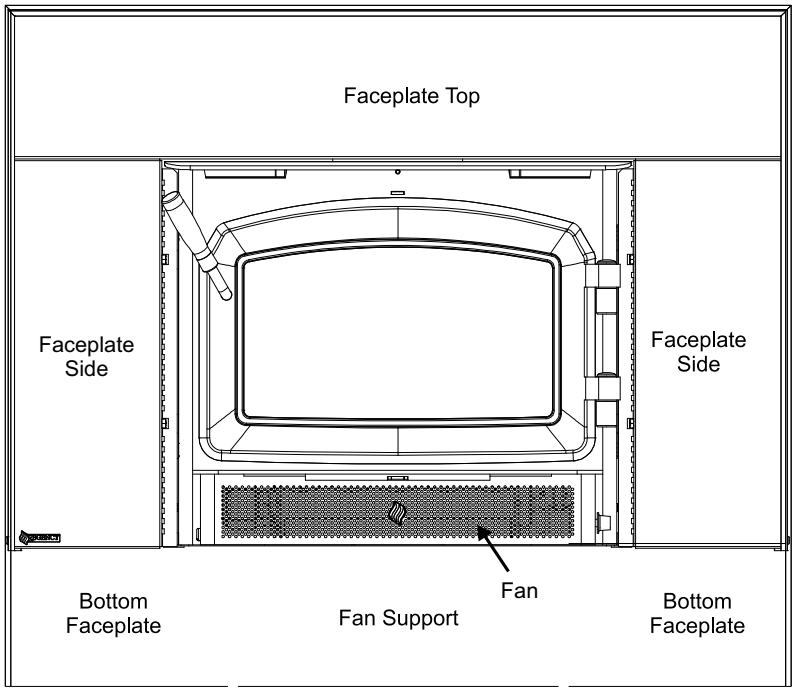
19) Discard both side trims that were included with the regular/oversize faceplate and replace with the new extended trims supplied with the fan support/bottom faceplate. Cut to desired length.

20) Fit the trim assembly over the faceplate assembly. See Diagram 6.

21) Drill two 5/32" diameter holes through the trim and side panels and screw the trim to the panels using the self tapping screws provided as shown in Diagram 6.

22) Re-attach the fan/fan support assembly to the ash lip of the insert.

Completed Faceplate Assembly



Fan / Blower

The fan should only be installed once the unit is in place in order to prevent any damage to the fan.

Installer: Please record unit serial number here before installing blower.

Serial No._____

Fan assembly for use only with the room heater marked to indicate such use.

FAN INSTALLATION (120V FAN)

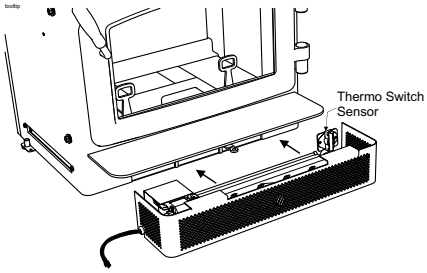
Your fan should only be installed once the unit is in place in order to prevent any damage to the fan.

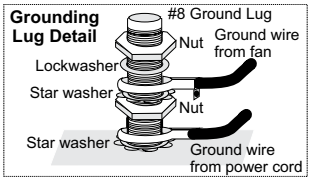
1) Align the fan support with the offset clip on the bottom of the ashlip.

2) Slide the supports into the clips. The tension holding the clips in place may be adjusted by increasing or decreasing the offset spacing of the clips.

3) Ensure that the power cord is not in contact with any hot stove surfaces.

WARNING: FAN ASSEMBLY MUST BE DISCONNECTED FROM THE SOURCE OF ELECTRICAL SUPPLY BEFORE ATTEMPTING THE INSTALLATION.





FAN OPERATION

The fan is controlled by a rheostat which allows control of the heat output.

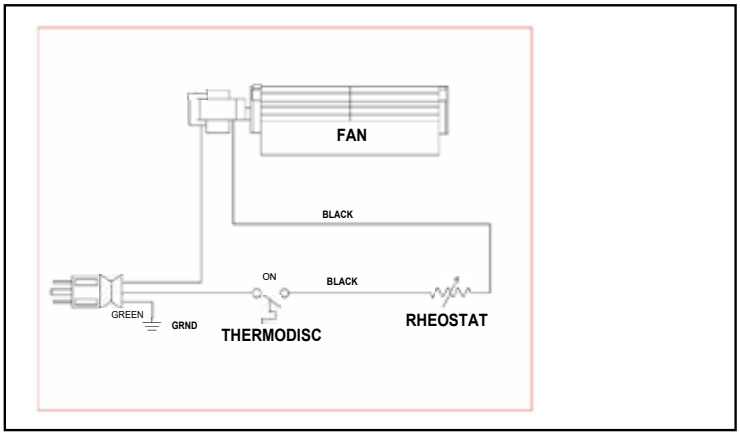
The fan will turn on as the stove has come up to operating temperature. It will also shut the fan system off after the fire has gone out and the unit cooled to below a useful heat output range.

If the fan cycles on and off continuously the thermo switch sensor is not making contact with the stove body. Remove the fan, bend the bracket closer to the stove and re-install the fan.

The fan is to be operated in the <LOW> position when burning in the LOW - MED LOW heat output setting and on <HIGH> when burning in the MED-HIGH settings.

WARNING: Electrical Grounding Instructions
This appliance is equipped with a three pronged (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug.

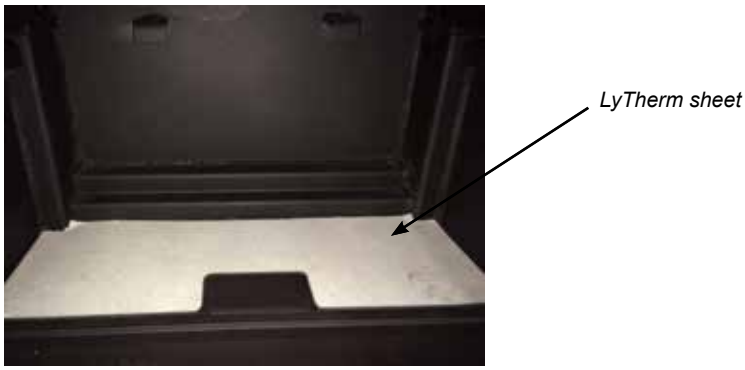
CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.



Wiring Diagram

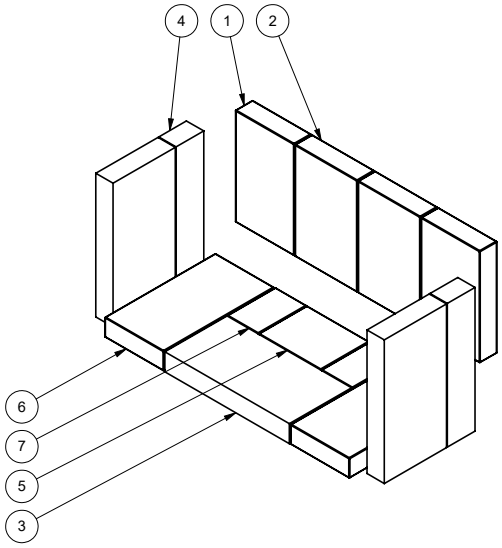
Brick Installation

Firebrick is included to extend the life of your stove and radiate heat more evenly. Check to see that all firebricks are in their correct positions and have not become misaligned during shipping. Install all firebricks (if bricks were removed at install) per the diagram below and place in their correct positions.
Do not use a grate.



Order of firebrick install:

a) Rear Firebrick
b) Firebox floor - install brick over LyTherm Sheet
c) Right and left side Firebricks

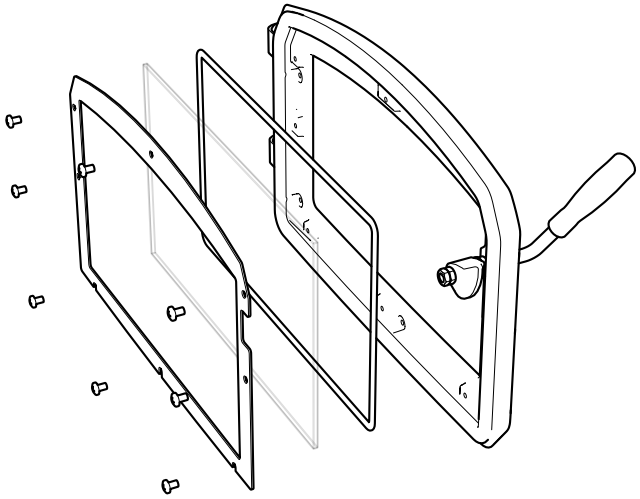


Fire bricks	
#	Size
1	4-1/4" x 7"
2	4-1/2" x 7"
3	9" x 4-1/2"
4	9" x 2"
5	3-1/2" x 4-1/2"
6	4-1/4" x 8"
7	3-1/2" x 2-1/4"

Glass Replacement

Your Regency stove is supplied with 5 mm Neoceram ceramic glass that will withstand the highest heat that your unit will produce. In the event that you break your glass by impact, purchase your replacement from an authorized Regency dealer only.

Remove the door from the stove and remove the screws securing the glass retainer. Position the glass in the door, make sure that the glass gasketing will properly seal your unit, and replace the retainer, it should rest on the gasket not the glass. Tighten securely, but do not wrench down on the glass as this may cause the glass to break.



Wood Door & Handle Assembly

1. In preparation of installing the door handle, the nuts, cam, washers and spacer must be removed as shown in Diagram 1.

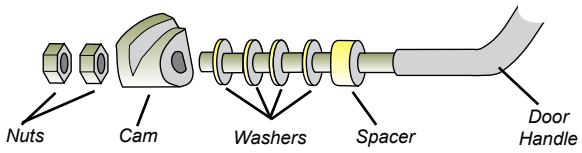


Diagram 1

LATCH ADJUSTMENT

The door latch may require adjustment as the door gasket material compresses over time. Removal of 1 or 2 washers will allow the latch to move closer to the door frame, causing a tighter seal. (Refer to Diagram 1)

2. Place the door onto the hinges and then place the door handle through the opening on the door, as shown in Diagram 2.

   Re-assemble and secure the door handle components in reverse order as removed in step 1, refer to Diagram 1.

3. Put the hinge cover caps on top of hinges to complete the door installation.

Note: The bottom of the door may scrape the ashlip. In this case place the spacers provided on the door hinges of the unit before placing the door.

4. Close door and ensure there is a tight seal. If door is too tight, a washer can be added. If the door is not creating a tight seal, a washer can be removed. Recheck door to ensure there is still a tight seal. Repeat steps if door seal is still not tight until a tight seal has been achieved. The handle should be approximately in the 8 o'clock position when door is fully closed.(Diagram 3)

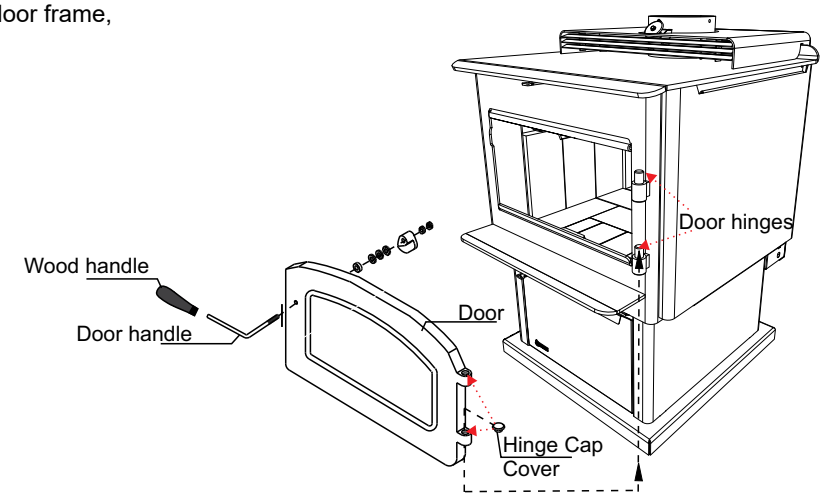


Diagram 2

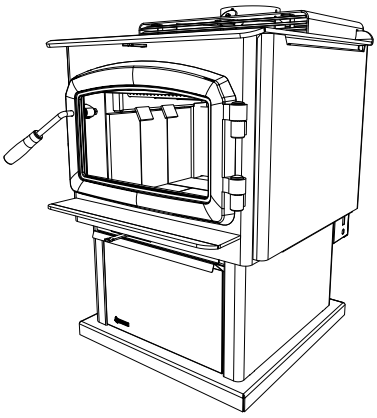
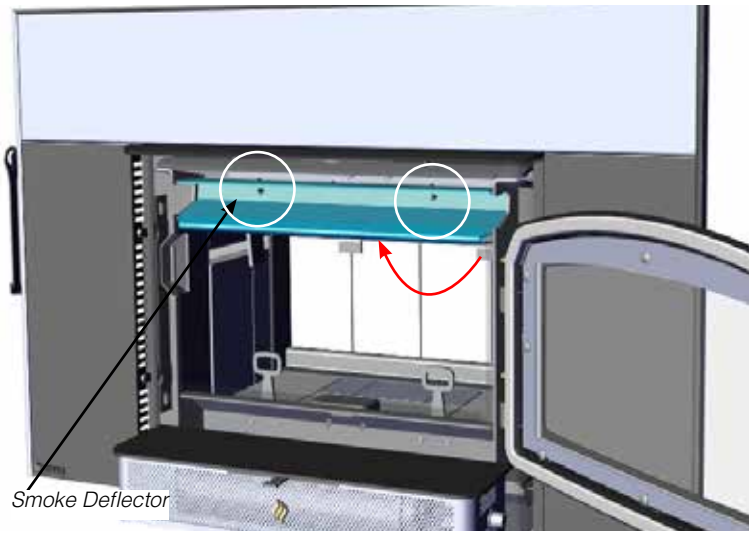


Diagram 3

Stainless Steel Smoke Deflector Installation

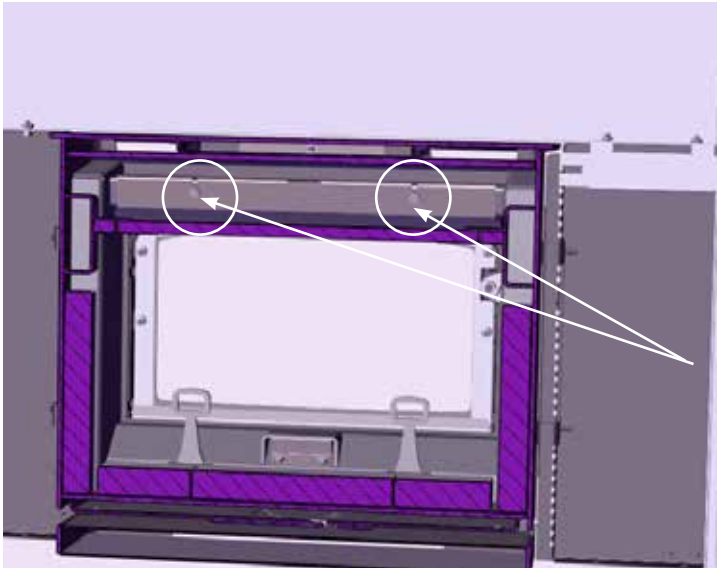
The stainless smoke deflector is located in the upper front area of the firebox. The deflector is held in place with 2 bolts
Prior to the first fire, ensure deflector is seated properly and secured with 2 hand tightened bolts which are accessible from behind the smoke deflector.



Smoke deflector is installed through the door opening in location shown in diagram

To replace the deflector, loosen off both bolts and slide deflector downward, push deflector to the back wall of the unit and manoeuver out.
Install new deflector and hand tighten bolts.
Ensure positive location of the deflector prior to hand tightening.

WARNING: Operation of the unit with out proper installation of smoke deflector will void warranty.



Ensure deflector is seated so bolts are seated at the bottom of the slot before tightening.

Smoke deflector installed with 2 bolts.

Note: *This is a cutaway view from the back of the unit*

Seasoned Wood

Whether you burn wood in a fireplace, stove or insert, good quality firewood is the key to convenience, efficiency and safety. Wet wood and pieces that are not the right size and shape for your wood burner can be frustrating, burn inefficiently and deposit creosote that can fuel a dangerous chimney fire. Good planning, seasoning and storage of the firewood supply are essential to successful wood burning.

- Stack the wood in separate rows in an open location where the summer sun can warm it and breezes can carry away the moisture. Do not stack unseasoned wood tightly in an unvented storage area.
- Do not allow firewood to lie on the ground for more than a couple of days before stacking. Mould and rot can set in quickly.
- Stack the wood up off the ground on poles, lumber rails or pallets.
- The top of the pile can be covered to keep off rain, but do not cover the sides.

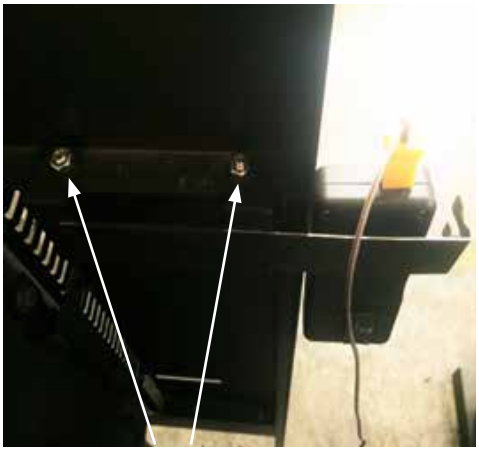
Softer woods like pine, spruce and poplar/aspen that is cut, split and stacked properly in the early spring maybe be ready for burning in the fall. Extremely hard woods like oak and maple, and large pieces of firewood, may take a minimum of a full year to dry enough. Drying may also take longer in damp climates

There are a few ways to tell if wood is dry enough to burn efficiently. Use as many indicators as possible to judge the dryness of the firewood your are considering. Here are ways to judge firewood moisture.

- Using a moisture meter, select the species of fuel and then penetrate the pins into a split piece. Ideal moisture and seasoned firewood should be less than 20% moisture content.
- Checks or cracks in the end grain can be an indication of dryness, but may not be a reliable indicator. Some wet wood has checks and some dry wood has no checks.
- The wood tends to darken from white or cream colour to grey or yellow as it dries.
- Two dry pieces banged together sound hollow; wet pieces sound solid and dull.
- Dry wood weighs much less than wet wood.
- Split a piece of wood. If the exposed surface feels damp, the wood is too wet to burn.

Bypass Operating Handle/Monitor

The I1500 is supplied with an air and bypass operating handle. The handle is used to open and close the by-pass and to adjust the air control for the desired heat output.
Install the operating handle storage bracket on the top left side of the faceplate. Loosen the two 7/16" bolts and slide bracket in and tighten. This bracket can also be used for the digital catalytic monitor.
Diagrams below show catalyst monitor and bracket already installed.



Loosen these two bolts and slide in the bracket.

Air and Bypass operating handle/monitor storage.

Operating Instructions

With your unit now correctly installed and safety inspected by your local authority, you are now ready to start a fire. Before establishing your first fire, it is important that you fully understand the operation of your Catalytic combustor and draft control.

WARNING
Fireplace Stoves equipped with doors should be operated only with doors fully closed. If doors are left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke.

Draft Control

Both the primary and air wash drafts are controlled by the control slide located on the front left side of the unit. To increase your draft - slide to the left to open, and to decrease - slide to the right to close. The I1500 unit has a secondary draft system that continually allows combustion air to the induction ports at the top of the firebox, just in front of the catalytic combustor.

Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause back puffing into the room and plugging of the chimney or catalyst.

Outward - Open **Inward - Closed**

Bypass Damper

Primary Air Damper

Left - Open **Right - Closed**

WARNING: To build a fire in ignorance or to disregard the information contained in this section can cause serious permanent damage to the unit and void your warranty!

First Fire

When your installation is completed and inspected you are ready for your first fire.

THIS UNIT IS DESIGNED TO BURN SEASONED CORDWOOD ONLY. COAL, BRIQUETTES AND ALL OTHERS LISTED ON PAGE 2 ARE NOT APPROVED. SEASONED CORDWOOD SHOULD BE LESS THAN 20% MOISTURE CONTENT.

START UP AND OPERATING PROCEDURES:

1. For the first few days, the wood insert will give off an odour from the paint. This is to be expected as the high temperature paint becomes seasoned. Windows and/or doors should be left open to provide adequate ventilation while this temporary condition exists. Burning the wood insert at a very high temperature the first few times may damage the paint. During the first few fires, keep the combustion rate at a moderate level and avoid a large fire. Only after 5 or 6 such fires can you operate the wood insert at its maximum setting, and only after the metal has been warmed.
2. Do not place anything on the wood insert top during the curing process. This may result in damage to your paint finish.
3. When starting the fire, ensure the bypass is in the fully open position (pulled out) and air control is in the fully open position (far left). Crumble 2-5 pieces of newspaper and add approx. 1-1.5lb of kindling stacked in a manner that allows air flow on the firebrick hearth (Teepee style or other). DO NOT USE A GRATE TO ELEVATE THE FIRE.
   Light the newspaper and adjust the door if it is slightly ajar for less smoke roll out. Keep the door in that position for 2-3 minutes to establish a good fire.
4. Add additional 1lb of kindling along with few pieces of start up cord wood (startup cordwood is slightly larger than kindling but not full pieces of cordwood). Close the door and establish flame for 2-3 minutes.
   CAUTION: Never leave unit unattended if door is left open. This procedure is for fire start-up only, as unit may overheat if door is left open for too long.
5. Once flame has been established, open the door and add another 2-3lbs of start up cordwood. Hold door slightly ajar for 30-60 sec to establish flame, and then close the door and bypass.
6. After 5-10 minutes, go ahead and add another 2lbs of startup fuel and establish flame and close the door.
   NOTE: These steps are crucial to ensure proper charcoalization and coal bed prior to loading High, Med and Low fire loads.
7. Once this has burned down, open the door and the bypass, and rake the coals to create a uniform charcoal bed. Load 3-5 pcs of 16" long cordwood, East-West orientation, with the heaviest pieces at the back of the firebox, and ensure all pieces are behind the log retainers. Once loaded, close the door right away and bypass. Burn on high setting (air control to the far left when facing the unit) for 10-15 minutes. After the 10-15 minutes, adjust the air control to your desired position.
   High Fire: Air control to far left.
   Low Fire: Air control to far right.
8. IMPORTANT: The temperature in the wood insert and the gases entering the combustor must reach between 500ºF - 700ºF for catalytic activity to start. From the start up of a cold wood insert, a medium to high firing rate must be maintained for 30 min. This ensures that the wood insert, catalyst and fuel are all stabilized at proper operating temperatures. Even though it is possible to have temperatures at 600ºF within minutes after a fire has been started, if the fire is allowed to die down immediately it may go out or the combustor may stop working. Once the combustor starts working, heat generated in it by burning the smoke will keep it working. During re-fueling and rekindling of the cool fire, or a fire that has burned down to the charcoal phase, operate the wood insert at a medium to high firing rate for about 10 minutes to ensure that the catalyst reaches operating temperatures.
   WARNING: Never build a roaring fire in a cold wood insert. Always warm your wood insert up slowly!
9. When re-fueling, always open by-pass control, and primary air damper, load fuel, then wait for at least 10-15 minutes before closing the by-pass. Reason for the 10-15 min. is the fresh fuel and the opening of the door will cause the catalyst to drop in temperature as well as the moisture within the wood which is the first thing to be released. This will also minimize any smoking (spilling) back into the room.
10. During the first few days it may be more difficult to start the fire. As you dry out your firebrick and your masonry flue, your draft will increase.
11. For those units installed at higher elevations or into sub-standard masonry fireplaces, drafting problems may occur. Consult an experienced dealer or mason on methods of increasing your draft.
12. Some cracking and popping noises may be experienced during the heating up process. These noises will be minimal when your unit reaches temperature.
13. All fuel burning appliances consume oxygen during operation. It is important that you supply a source of fresh air to your unit while burning. A slightly opened window is sufficient for the purpose. If you also have another fireplace in your home, a downdraft may be created by your Regency wood insert causing a draft down your chimney. If this occurs, slightly open a window near your unit.

CAUTION: If the body of your wood insert, or any part of the chimney connector starts to glow, you are over firing. Stop loading fuel immediately and close the draft control until the glow has completely subsided.

14. Green or wet wood is not recommended for your unit. If you must add wet or green fuel, open the draft control fully until all moisture has been dispersed by the intense fire. Once all moisture has been removed, the draft control may be adjusted to maintain the fire.

15. The controls of your unit or the air supply passages should not be altered to increase firing for any reason.

16. If you burn the unit too slowly or at too low a setting your unit will not be operating as efficiently as it can. An easy rule of thumb says that if your glass is clean, catalytic thermostat is active, then your flue is clean and your exhaust is clean. Burn the stove hot enough to keep your glass clean and catalytic combustor ,you won't need to clean your flue as often.

Fan Operation

Automatic
To operate the fan - turn on the rheostat.

This will allow the fan to turn on as the stove has come up to operating temperature. It will also shut the fan system off after the fire has gone out and the unit cooled to below a useful heat output range.

Operate the fan in the low speed position when burning in the LOW-MED LOW heat output ranges and operate in the high setting for MED-HIGH to HIGH heat outputs.

Route power cord to either left or right behind unit.

Ash Disposal

During constant use, ashes should be removed every few days. The Ash Drawer option features a convenient ash dump for easy removal of ash, refer to Modular Installation Options section.

Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. "

Safety Precautions

1. Do not allow ashes to build up to the loading doors! Only remove ashes when the fire has died down. Even then, expect to find a few hot embers.

2. Please take care to prevent the build-up of ash around the start-up air housing located inside the stove box, under the loading door lip.

3. Never start a fire if the ash plug and ash drawer are not in place. This will cause over firing which can cause excessive warping of the stove. Evidence of over firing can void the warranty on your stove.

4. The firebricks are brittle and can be damaged if the plug is replaced carelessly or pieces that are too large are forced through the hole.

Safety Guidelines and Warnings

CAUTION: DO NOT USE CHEMICALS FORFLUIDS TO START FIRE.

1. **CAUTION:** Never use gasoline, gasoline type lantern fuels, kerosene, charcoal lighter fuel, or similar liquids to start or 'freshen up' a fire in your heater. Keep all such liquids well away from the heater while it is in use.

2. Keep the door closed during operation and maintain all seals in good condition.

3. Do not burn any quantities of paper, garbage, and never burn flammable fluids such as gasoline, naptha or engine oil in your stove.

4. If you have smoke detectors, prevent smoke spillage as this may set off a false alarm.

5. Do not overfire heater. If the chimney connector, flue baffle or the stove top begin to glow, you are over firing. Stop adding fuel and close the draft control. Over firing can cause extensive damage to your stove including warping and premature steel corrosion. Over firing will void your warranty.

6. Do not permit creosote or soot build-up in the chimney system. Check and clean chimney at regular intervals. Failure to do so can result in a serious chimney fire.

7. Your Regency stove can be very hot. You may be seriously burned if you touch the stove while it is operating, keep children, clothing and furniture away. Warn children of the burn hazard.

8. The stove consumes air while operating, provide adequate ventilation with an air duct or open a window while the stove is in use.

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

10. Do not use grates or andirons or other methods for supporting fuel. Burn directly on the bricks.

11. Open the draft control fully for 10 to 15 seconds prior to slowly opening the door when refuelling the fire.

12. Do not connect your unit to any air distribution duct.

13. This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.

14. In the event of component failure, replace parts with only Regency listed parts.

15. Warning: do not abuse glass door such as striking or slamming shut.

16. Do not store any fuel closer than 2 feet from your unit. Do not place wood, paper, furniture, drapes or other combustibles near the appliance.

17. **WARNING: Do not operate without either the Ash Plug properly seated or the Ash Dump Plates screwed in place, excessive temperatures will result.**

18. **CAUTION: Do not operate with cracked/ broken, plugged, or glazing catalyst.**

IMPORTANT:
It is against federal regulation to operate this wood heater in a manner inconsistent with the operating instructions in this manual, or if the catalytic element is deactivated or removed.

CAUTION: HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.

DO NOT BURN:

- Treated wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash
- Salt drift wood
- Cut lumber, plywood, mill ends.

Burning treated wood, garbage, solvents, colored paper or trash may result in release of toxic fumes and may poison or render ineffective the catalytic combustor. Burning coal, cardboard, or loose paper can produce soot, or large flakes of char or fly ash that can coat the combustor, causing smoke spillage into the room, and rendering the combustor ineffective.

CAUTION: DO NOT BURN GARBAGE OR FLAMMABLE LIQUIDS SUCH AS GASOLINE, NAPTHA OR ENGINE OIL. SOME FUELS COULD GENERATE CARBON MONOXIDE AND ARE VERY DANGEROUS.

CAUTION: DO NOT CONNECT TO, OR USE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCT WORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATION.

	Troubleshooting Guide	
PROBLEM	**POSSIBLE CAUSE**	**SOLUTION**
Crumbling Substrate	Extreme Thermal Shock Refueling with Wet Wood High Draft	Bypass combustor when the stove is running Use seasoned, dried wood. Do not exceed .06" of water draft. Install a manual damper and draft gauge or a barometric damper.
Fly-Ash Build-up **Fly-Ash Masking** **Fly-ash Plugging**	Combustor has not maintained light-off temperature. Combustor has not maintained light-off temperature. **Burning materials that produce a lot of char and fly-ash.** **Closing the bypass too soon**	Brush cold combustor with a soft bristled brush or vacuum lightly. Brush cold combustor with a soft bristled brush or vacuum lightly. Do not burn cardboard, gift wrap or garbage. Follow instructions for proper light-off.
Thermal Cracking	Uneven temperatures, flame impingement and heat spikes.	If cracking causes large pieces to fall out, replace combustor.
Mechanical Cracks	Combustor mishandled or abused. Distortion of combustor holder.	Handle combustor with care. Replace if necessary. Replace combustor is large pieces are missing, replace any warped stove parts as well.
Plugging (Creosote)	Burning wet, pitchy woods or burning large loads of small diameter wood with the combustor in the operating position without light-off ever occurring.	Burn dried seasoned wood. Make sure combustor has light-off before closing the bypass damper. It may be possible to burn off the soot or creosote accumulation by putting the combustor in a partially open and partially closed position after a hot fire has been started.
Masking (Soot)	Combustor has not maintained a light-off. Burning coal will cause a sulfur-based compound to coat the catalyst.	Place combustor in a partially open and partially position after a hot fire has been started to burn off the soot accumulation. Revert to burning wood and fire the combustor to elevated temperatures for one hour.

Cleaning & Maintaining Your Wood Stove

Maintenance

It is very important to carefully maintain your fireplace stove, including burning seasoned wood and maintaining a clean stove and chimney system. Have the chimney cleaned before the burning season and as necessary during the season, as creosote deposits may build up rapidly. Moving parts of your stove require no lubrication.

Creosote

When wood is burned slowly, it produces tar and other organic vapours combine with moisture to form creosote. The creosote vapours condense in the relatively cool chimney flue of a slow burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote can result in an extremely hot fire.

The chimney connector and chimney should be inspected at least once every two months during the heating season to determine if creosote build up has occurred. If creosote has accumulated it should be removed to reduce the risk of chimney fire.

CAUTION: Things to remember in case of a chimney fire:

1. Close all draft and damper controls.

2. CALL THE FIRE DEPARTMENT.

Ways to Prevent and Keep Unit Free of Creosote

1) Burn stove with the draft control wide open for about 10-15 minutes every morning during burning season.

2) Burn stove with draft control wide open for about 10 - 15 minutes every time you apply fresh wood. This allows the wood to achieve the charcoal stage faster and burns up any unburned gas vapours which might otherwise be deposited within the system.

3) **Only burn seasoned wood!** Avoid burning kiln dried, wet or green wood. Seasoned wood has been dried at least one year.

4) A small hot fire is preferable to a large smouldering one that can deposit creosote within the system.

5) The chimney and chimney connector should be inspected at least once every two months during the heating season to determine is a creosote buildup has occurred.

6) **Have chimney system and unit cleaned by competent chimney sweeps twice a year during the first year of use and at least once a year thereafter or when a significant layer of creosote has accumulated (3 mm/1/8" or more) it should be removed to reduce the risk of a chimney fire.**

Door Gasket

If the door gasket requires replacement 5/8" diameter material must be used. Regency uses a gasket rope 7/8" (Part #846-570). A proper high temperature gasket adhesive is required. See your Regency Dealer.
The door catch may require adjustment as the door gasket compresses after a few fires. The door latch compression may require adjustment to renew seal. Removal of a shim, (see section in this manual), will allow the latch to be moved closer to the door frame, causing a tighter seal.

Glass Maintenance

Your Regency stove is supplied with 5mm Neoceram ceramic glass (Part #846-306) that will withstand the highest heat that your unit will produce. In the event that you break your glass by impact, purchase your replacement from an authorized Regency dealer only, and follow our step-by-step instructions for replacement (refer to Glass Replacement section).

Allow the stove to cool down before cleaning the glass. Cleaning the glass will prevent build up of carbon and allow full view of the fire. **WARNING:** Do not clean the glass when it is hot. **WARNING:** Do not use abrasive cleaners, a damp cloth and glass cleaner is effective.

Wood Storage

Store wood under cover, such as in a shed, or covered with a tarp, plastic, tar paper, sheets of scrap plywood, etc., as uncovered wood can absorb water from rain or snow, delaying the seasoning process.

Catalytic Combustor Part #075-531

ACHIEVING AND MAINTAINING CATALYST LIGHT-OFF:
The temperature in the stove and the gases entering the combustor must be raised to between 500F to 700F for catalytic activity to be initiated. During the start up of a cold stove a medium to high firing rate must be maintained for about 30 minutes. This ensures that the stove, catalyst and fuel are all stabilized at proper operating temperatures. Even though hit is possible to have temperatures at 600F within minutes after a fire has been started, if the fire is allowed to die down immediately it may go out or the combustor may stop working. Once the combustor starts working, heat generated in it by burning the smoke will keep it working. During re-fueling and rekindling of the cool fire, or a fire that has burned down to the charcoal phase, operate the stove at a medium to high firing rate for about 10 minutes to ensure that he catalyst reaches operating temperatures.

CATALYST MONITORING: It is important to periodically monitor the operation of the catalytic combustor to ensure that it is functioning properly and to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency, and an increase in creosote and emissions. Following is a list of items that should be checked on a periodic basis.

- Combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred. Actual removal of the combustor is not recommended unless more detailed inspection is warranted because of decreased performance. If any of these conditions exist, refer to Catalyst trouble shooting section of this owner's manual.

- A good combustor is designed to withstand approximately 12,000 hours of continuous use. This will translate into five to ten years of use, depending on the length of your heating season and how often you use your stove. Proper maintenance will increase the combustor's effectiveness and prevent many problems. Inspect your combustor before each heating season, and during the season if your stove's performance seems to change.

- This catalytic heater is equipped with a temperature probe to monitor catalyst operation. Properly functioning combustors typically maintain temperatures in excess of 500F and often reach temperatures in excess of 1000F. If catalyst temperatures are not in within, refer to Catalyst trouble shooting section of this manual.

- You can get an indication of whether the catalyst is working by comparing the amount of smoke leaving the chimney when the smoke is going through the combustor and catalyst light – off has been achieved, to the amount of smoke leaving the chimney when the smoke is not routed (by-pass open) through the combustor.

  Step 1: Light the stove in accordance with instructions within this manual.
  Step 2: With smoke routed through the catalyst (by-pass closed) go outside and observe the emissions leaving the chimney.
  Step 3: Engage the bypass mechanism and move to by-pass open position. And again observe the emission leaving the chimney. Significantly more smoke should be seen when the smoke is not routed through the combustor (by-pass open). Be careful not to confuse smoke with steam.

ACHIEVING PROPER DRAFT: Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause back puffing into the room and plugging of the chimney or catalyst.

CATALYTIC COMBUSTOR CLEANING:
Method #1
A vacuum cleaner may be used, but **never use high pressured air** to blow the cells free of any build-up. This can damage the cell walls. Any cell blockage can be removed with the use of a pipe cleaner or a cotton swab as well.
Method #2
Should the combustor's cells become covered with fly-ash, use a paint-brush or soft-bristled brush and dust the combustor gently. Never use anything abrasive to clean the combustor.
Method #3
Normally the catalytic combustor requires little or no maintenance, it generates such high temperatures and therefore is basically self-cleaning. However, should the combustor become covered with soot or creosote, it is possible to burn the accumulation off by opening the bypass and building a hot fire. Once the hot fire is created, close the bypass halfway and burn for 30 to 60 minutes with the bypass left in this position. **Never use cleaning solvents to clean it.** Check and clean the combustor, if necessary, before each burning season and inspect the flue system for any signs of creosote buildup. A clean flue helps prevent chimney flue fires.

Combustor Assembly Removal/Replacement

Note: unit in images may not be identical to the I1500—they depict the process.

The catalytic thermometer on top of the stove should read in the active zone after the stove has been in operation for several hours. If the thermometer's indicator needle does not stay in the active zone, even with a hot fire, over a period of regular use, the catalyst may need to be cleaned. If this persists it may be necessary to replace it.

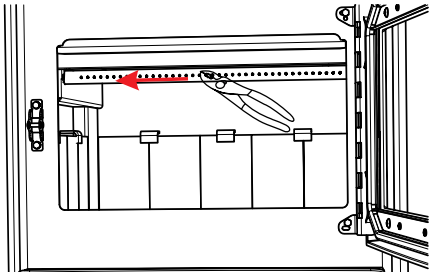
If the combustor must be examined or replaced, follow this procedure:

1. Allow the stove to burn out and cool down.

2. Remove stainless steel smoke deflector - See instructions in this manual.

3. Remove the front secondary air tube with pliers as shown below.

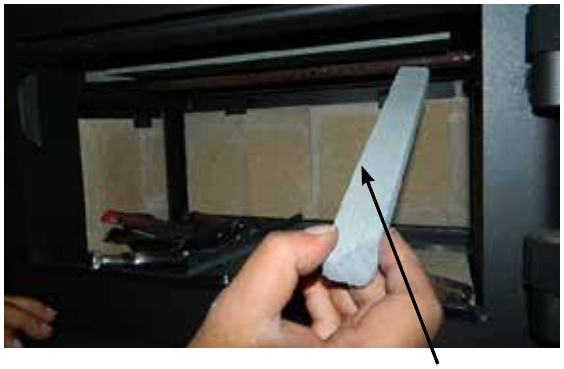
Note: to make it easier to remove the air tubes, first remove both the bottom right base brick and right side wall brick.



4. Remove left and right baffle brackets (removal of left baffle bracket shown below.

Baffle bracket

5. Remove the right and left side baffles (right side baffle shown below).



Baffle bracket

6. Remove the center baffle.

Centre baffle

7. Remove locking clip from the front face of the Catalyst assembly by sliding up and out.

8. Pull flame shield forward and tilt down, be prepared to support catalyst assembly.

9. Loosen bolts on catalyst retainer then, slide the catalyst retainer to the right to remove.

Catalyst

10. Reverse steps to reinstall catalyst.

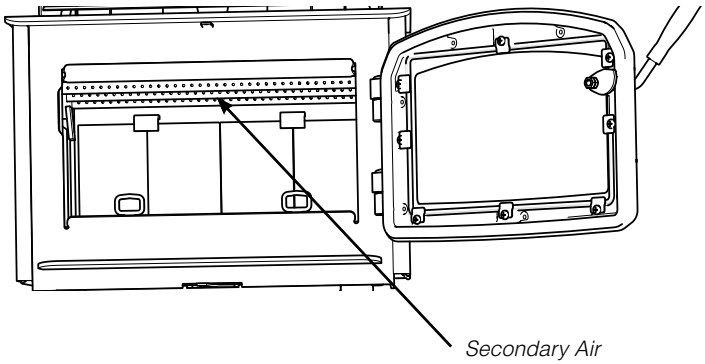
NOTE: Replacement combustors can be retrieved from Applied Ceramics or Contact your local Regency Dealer. See warranty information at the back of this manual for details.

DO NOT OPERATE THE APPLIANCE IF COMBUSTOR BECOMES INACTIVE - DO NOT OPERATE WITHOUT COMBUSTOR.

Secondary Air Tube Removal/Installation

1. Allow the stove to burn out and cool down, until cool to touch.

2. Open stove door to access secondary air tubes.

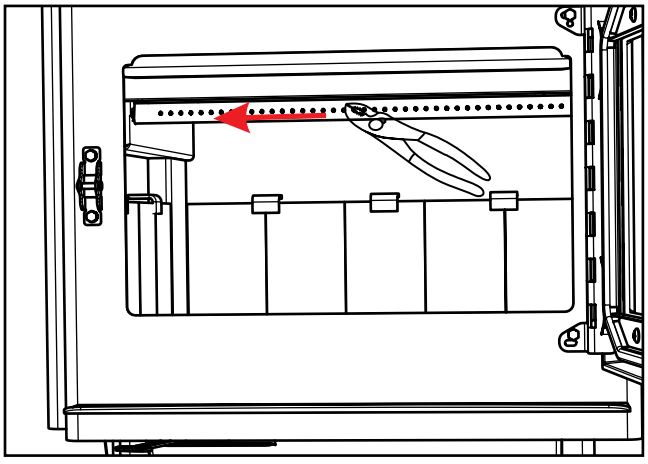


Secondary Air Tubes

3. Grasp secondary air tube firmly with vise grips, using a hammer tap vise grips from right to left until air tube is released from grip. Remove.

Note: to make it easier to remove the air tubes, first remove both the bottom right base brick and right side wall brick.

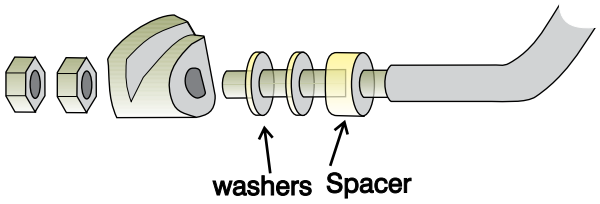
4. Remove top left and right metal retainers, followed by the fragile three piece C-Cast Baffles (see catalyst removal instructions for details), then remove the remaining 2 tubes.



5. To reinstall or replace, first slide left side of tube into hole on left side air channel. Align tab on right side air channel with notch on right hand end of air tube. Firmly grip center of air tube with vise grips, use hammer to tap vise grips from left to right until the tube bottoms out into the air channel on right.

Latch Adjustment

The door latch may require adjustment as the door gasket material compresses after a few fires. Removal of the spacer washer, shown in the diagram below, will allow the latch to be moved closer to the door frame, causing a tighter seal. Remove and replace the nuts, washer and spacer as shown.



Removing Wooden Handle

1. To remove the wooden door handle from unit, firstly locate 7/64" Allen key hole at the bottom of wooden handle.

2. Unscrew 7/64" Allen Key screw counterclockwise. Once the screw is completely loose, remove and drop the handle down off the door handle shaft and replace with new handle.

Bypass Rod Removal/Replacement

1. Remove locking clip from the front face of the Catalyst assembly by sliding up and out.

Diagram 1

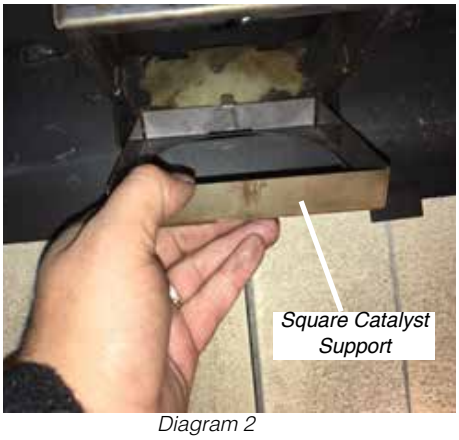


Diagram 2

2. Slide bypass rod through the horizontal opening above the door. As you slide the bypass rod in ensure it engages into the opening of the cartridge. Once penetrated, take your clip and install it from the inside of the cartridge. Move the bypass rod in and out to ensure the cartridge is moving and by pass rod is secured.

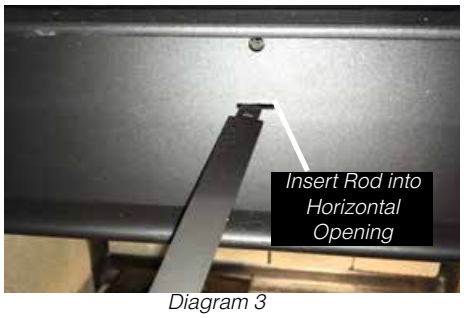
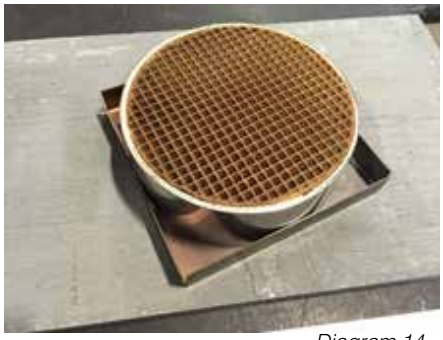


Diagram 3

Diagram 4

Diagram 5

3. Take your round catalyst and install it into the square support. Then take the catalyst and square support and insert it into the cartridge in the unit. Take the flame shield and slide back end into the opening. Then take retainer and slide into position securing the flame shield. Tighten the two 7/16" bolts. You have now completed the install of the catalyst, bypass rod and flue adaptor.



Catalyst in square support

Diagram 14

Diagram 6

Install square support and catalyst into cartridge

Diagram 7

Diagram 8

Install flame shield into rear flange and reinstall locking clip removed in Step 1

4. Now proceed with faceplate installation instructions. Re-install door/ bricks and install tubes and baffles. Also feed the probe wire to the left hand front of the appliance. This will make it easier to hook the monitor when installing the faceplate.

NOTE: If your cavity height is tall enough, you can install the adaptor onto the unit first and then connect to the liner.

NOTE: when cleaning chimney, remove tubes, baffles, retainer, flame shield and catalyst. After sweeping re-install.

Annual Maintenance	
Completely clean out entire unit	Annually
Inspect air tube, Catalytic Combustor and bricks	Replace any damaged parts.
Adjust door catch assembly	If unable to obtain a tight seal on the door - replace door gasket seal. Readjust door catch after new gasket installed.
Inspect condition and seal of: Glass Gasket Door Gasket	Perform paper test - replace gasket if required
Paper Test	Test the seal on the loading door with a paper bill. Place a paper bill in the gasket area of the door on a cold stove. Close the door. Try to remove the paper by pulling. The paper should not pull out easily, if it does, try adjusting the door latch, if that doesn't solve the problem replace the door gasket.
Check and lubricate door hinge + latch	Use only high temperature anti seize lube. (ie. never seize)
Check glass for cracks	Replace if required.
Clean blower motor	Disconnect power supply. Remove and clean blower. ***DO NOT LUBRICATE***
Inspect and clean chimney	Annual professional chimney cleaning recommended.
Thermostat Probe	The thermostat probe that is inserted into the opening above the insert must be cleaned at least once a year. Use 220 sand paper to clean probe. Access to the probe can be done in 2 ways. - by removing the catalyst as this will be exposed once the catalyst is removed. - by removing the faceplate. However, there must be clearance above the insert to be able to remove the probe from the top of the insert. See specific details in this manual.

NOTE:

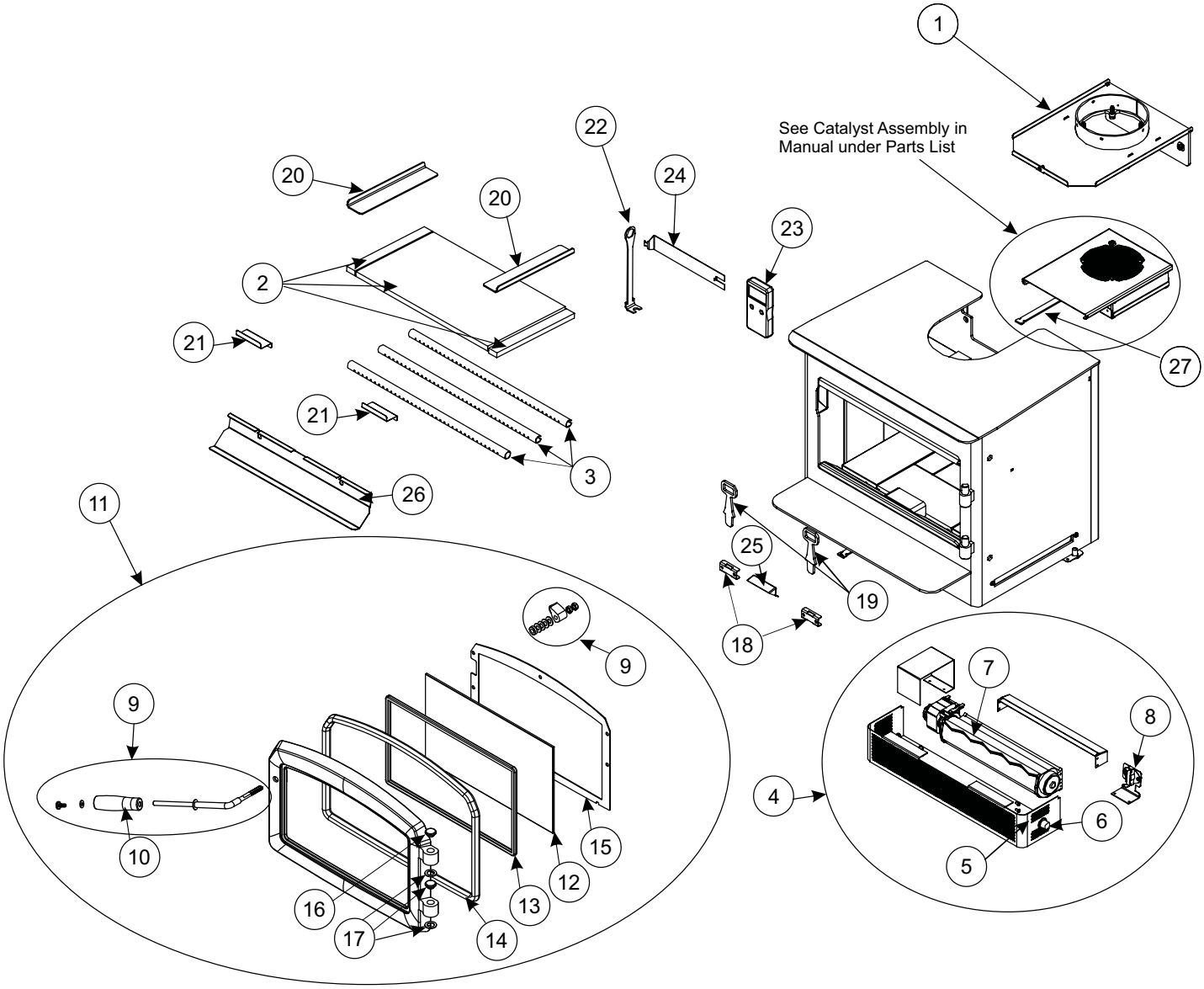
Chimney Cleaning

When cleaning the chimney system the air tubes, baffles should be removed for ease of cleaning. See manual for details on removal.
The bypass should be moved all the way outward so any creosote will fall onto the firebox floor when being cleaned.
Alternatively, the catalyst may be removed so this can also be cleaned at the same time following the guide lines found in this manual.
We highly recommend that the chimney cleaning be done by a professional as they will have the necessary tools such as a proper sized brush and special vacuum cleaner designed to deal with fine particles.

Main Assembly

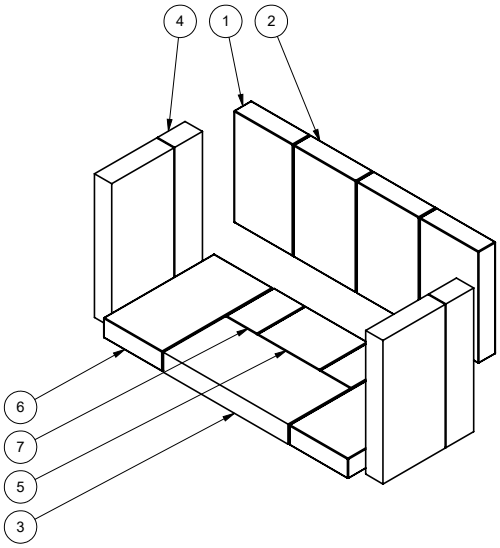
	Part #	Description
1	172-932	Flue Adapter Standard
1	172-936	Flue Adapter Offset
2	075-955	Baffle Set Complete
3	033-953	Air Tubes (Each)
4	172-917	Fan Kit Complete
5	910-330	Fan Speed Controller
6	910-586	Fan Control Knob
7	911-221/P	Replacement Fan Motor
8	910-142	Fan Thermodisc
9	021-973	Handle Assembly Complete
10	948-146	Wooden Door Handlle
11	850-241	Complete Door - Black
11	850-243	Complete Door - Black with Nickel Accent
12	846-306	Replacement Glass - Includes Gasket (Size: 9-1/8" X 15-5/8")
13	936-241	replacement Glass Gasket (Sold per foot - 4 Feet required)
14	846-570	Door Gasket Repair Kit
15	075-077F	Glass Retainer
16	948-920	Black Hinge Caps (Set of 2)
16	948-079BN	Nickel Hinge Cap (Each)
17	650-084	Door Spacer (Each)
18	075-064	Andiron Bracket (Each)
19	075-063F	Andiron (Each)
20	075-040	Side Baffle Cover (Each)
21	075-041	Baffle Holder (Each)
22	106-129	Control Tool
23	911-185	Digital Monitor
24	172-016	Control Tool Slide
25	075-062	Primary Air Cover Plate
26	075-037	SS Smoke Deflector
27	075-097	Bypass Rod (Standard Flue Adaptor)
27	172-027	Bypass Rod (Offset Flue Adaptor)
N/S	911-096	120 Volt Power Cord
N/S	948-444	Regency Flame Logo Silver
N/S	911-186	Digital Monitor Probe
N/S	075-021	Firebox Floor Gasket

Main Assembly



Brick Panels

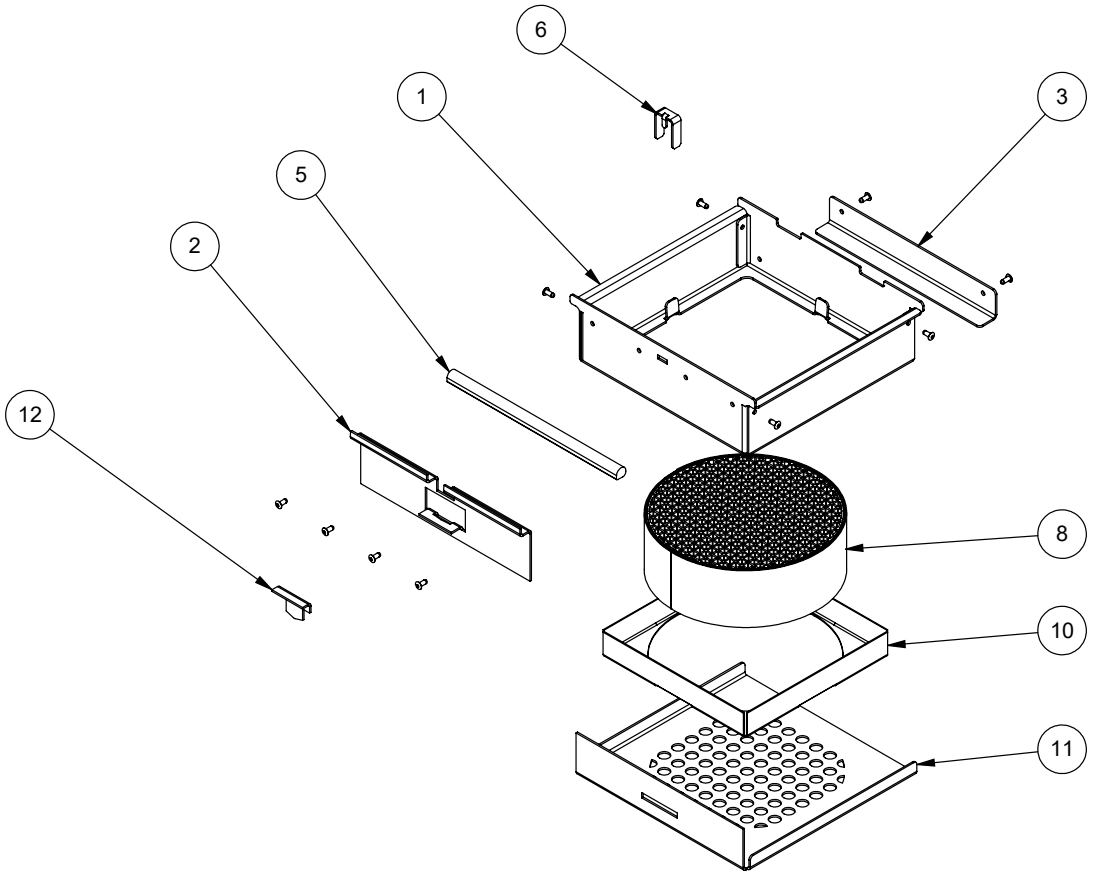
075-960 I1500 Brick Kit Complete



Fire bricks	
#	**Size**
1	4-1/4" x 7"
2	4-1/2" x 7"
3	9" x 4-1/2"
4	9" x 2"
5	3-1/2" x 4-1/2"
6	4-1/4" x 8"
7	3-1/2" x 2-1/4"

Catalytic Combustor Assembly

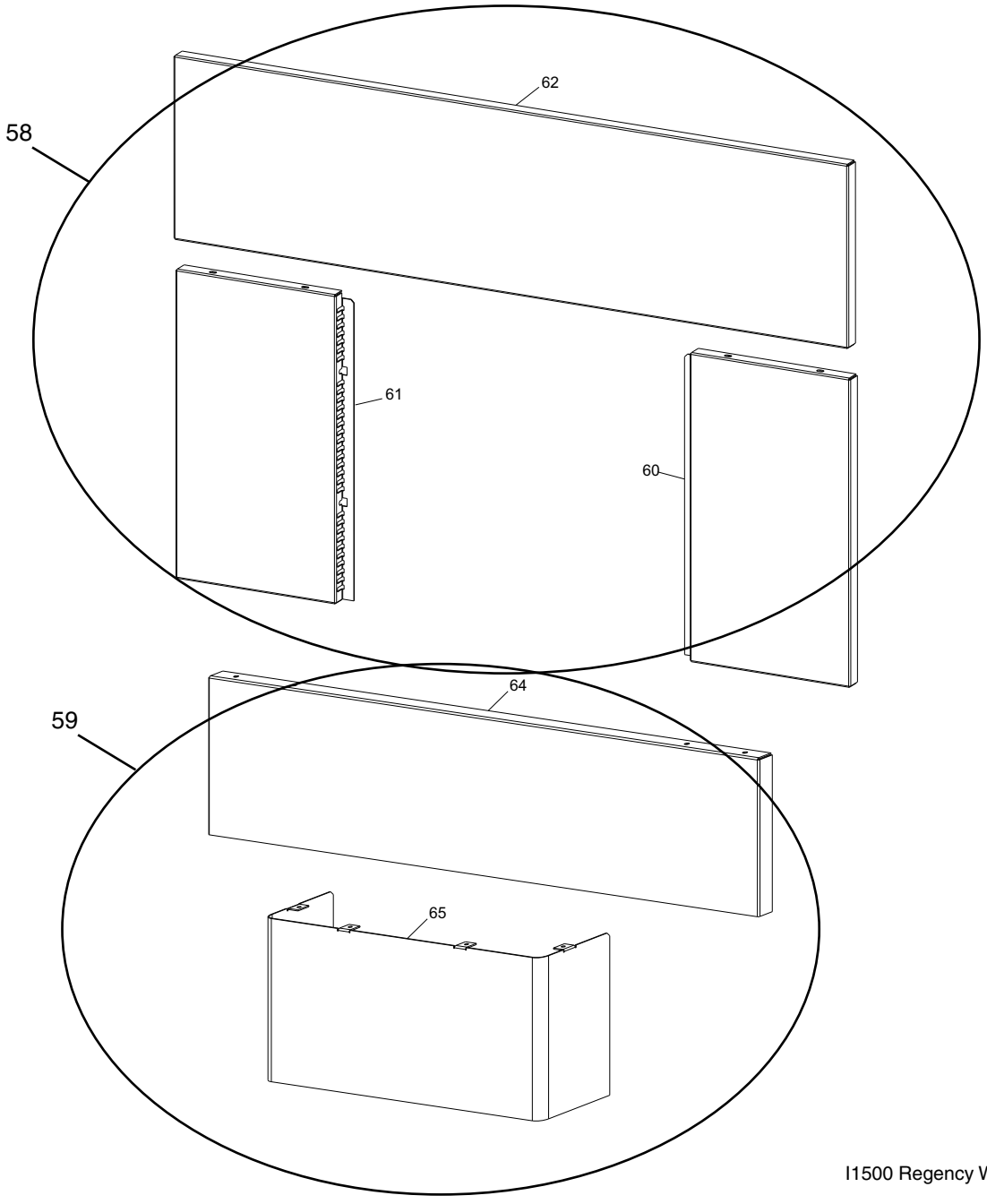
	Part #	Description
1	075-101	Catalyst slide
2	075-102	Gasket bracket
3	075-104	Long shield bracket
5	936-236	Rope gasket 1/2" diameter
6	075-043	Rod lock
8	075-531	5.83 diameter combustor assembly
10	075-044	Cat cradle
11	075-105	Offset flame shield
12	075-103	Rod clip lock



Faceplates

	Part #	Description
58)	172-920	Faceplate & Trim Set - Regular - Black
58)	172-922	Faceplate & Trim Set - Oversize - Black
59)	171-928	Bottom Piece and Fan Support - Regular
59)	171-930	Bottom Piece and Fan Support - Oversize
60)	*	Faceplate Right Side Regular / Oversize
61)	*	Faceplate Left Side Regular / Oversize
62)	*	Faceplate Top Regular / Oversize
64)	*	Bottom 1 Piece Faceplate
65)	*	Fan Support
N/S	171-570	Black Perimeter Trim Black Regular Faceplate
N/S	171-572	Black Perimeter Trim Black Oversize Faceplate
N/S	948-223	Regency Logo Plate
N/S	171-526	Faceplate Mounting Brackets (Each)
N/S	171-546	Faceplate Hardware Package

*Not available as a replacement part.



Limited Lifetime Warranty

FPI Fireplace Products International Ltd. (for Canadian customers) and Fireplace Products U.S., Inc. (for U.S. customers) (collectively referred to herein as "FPI") extends this Limited Lifetime Warranty to the original purchaser of this appliance provided the product remains in the original place of installation. The items covered by this limited warranty and the period of such coverage is set forth in the table below.

Some conditions apply (see below).

The policy is not transferable, amendable, or negotiable under any circumstances.

Wood Products	Component Coverage					Labor Coverage
Components Covered	Limited Lifetime	5 years	2 years	1 year	Warranty	(Years)
Welded Firebox Steel	✓					5
All Stainless Steel Components, Smoke Deflectors, Heat Shields etc.	✓					3
Air Tubes	✓					3
Airmate	✓					3
Door handle and latch assembly, all hardware	✓					3
Glass Thermal Breakage Only	✓					3
Steel Faceplates, Accessory Housings	✓					3
All Plating	✓					3
Ash Drawer, Heatshields, Pedestal	✓					
All Baffles, Steel, Ceramic, Vermiculite C-Baffles	✓					
All castings, firebox, surrounds, doors, panels etc.		✓				3
All Electrical, Blower, wiring, switches etc.			✓			2
Glass - Crazing				✓		1
Catalyst Combustor					*10 Years Prorated	
Venting/Chimney				✓		1
Screens				✓		1

*See specific warranty details in regards to the catalyst combustor in unit manual.

Conditions:

Warranty protects against defect in manufacture or FPI factory assembled components only, unless herein specified otherwise.

Any part(s) found to be defective during the warranty period as outlined above will be repaired or replaced at FPI's option through an accredited distributor, dealer or pre-approved and assigned agent provided that the defective part is returned to the distributor, dealer or agent for inspection if requested by FPI. Alternatively, FPI may at its own discretion fully discharge all of its obligations under the warranty by refunding the verified purchase price of the product to the original purchaser. The purchase price must be confirmed by the original Bill of Sale.

The authorized selling dealer, or an alternative authorized FPI dealer if pre-approved by FPI, is responsible for all in-field diagnosis and service work related to all warranty claims. FPI is not responsible for results or costs of workmanship of unauthorized FPI dealers or agents in the negligence of their service work.
At all times FPI reserves the right to inspect reported complaints on location in the field claimed to be defective prior to processing or authorizing of any claim. Failure to allow this upon request will void the warranty.

All warranty claims must be submitted by the dealer servicing the claim, including a copy of the Bill of Sale (proof of purchase by you). All claims must be complete and provide full details as requested by FPI to receive consideration for evaluation. Incomplete claims may be rejected.

Replacement units are limited to one per warranty term. Airtube and baffle replacements are limited to one replacement per term.

Unit must be installed according to all manufacturers' instructions as per the manual.

All Local and National required codes must be met.

The installer is responsible to ensure the unit is operating as designed at the time of installation.

The original purchaser is responsible for annual maintenance of the unit, as outlined in the owner's manual. As outlined below, the warranty may be voided due to problems caused by lack of maintenance.

Repair/replacement parts purchased by the consumer from FPI after the original coverage has expired on the unit will carry a 90 day warranty, valid with a receipt only. Any item shown to be defective will be repaired or replaced at our discretion. No labor coverage is included with these parts.

Exclusions:
This Limited Lifetime Warranty does not extend to rust or corrosion of any kind due to: a lack of maintenance or improper venting, lack of combustion air provision, or exposure to corrosive chemicals (i.e. chlorine, salt, air, etc.).

This Limited Lifetime Warranty also does not extend to: paint, firebricks (rear, sides, or bottom), door gasketing, glass gasketing (or any other additional factory fitted gasketing), vermiculite floor bricks, andiron assemblies, and flue damper rods.

Malfunction, damage or performance based issues as a result of environmental conditions, location, chemical damages, downdrafts, installation error, installation by an unqualified installer, incorrect chimney components (including but not limited to cap size or type), operator error, abuse, misuse, use of improper fuels (such as unseasoned cordwood, mill-ends, construction lumber or debris, off-cuts, treated or painted lumber, metal or foil, plastics, garbage, solvents, cardboard, coal or coal products, oil based products, waxed cartons, compressed pre-manufactured logs, kiln dried wood), lack of regular maintenance and upkeep, acts of God, weather related problems from hurricanes, tornados, earthquakes, floods, lightning strikes/bolts or acts of terrorism or war, which result in malfunction of the appliance are not covered under the terms of this Limited Lifetime Warranty.

FPI has no obligation to enhance or modify any unit once manufactured (i.e. as products evolve, field modifications or upgrades will not be performed on existing appliances).

This warranty does not cover dealer travel costs for diagnostic or service work. All labor rates paid to authorized dealers are subsidized, pre-determined rates. Dealers may charge homeowner for travel and additional time beyond their subsidy.

Any unit showing signs of neglect or misuse will not be covered under the terms of this warranty policy and may void this warranty. This includes units with rusted or corroded fireboxes which have not been reported as rusted or corroded within three (3) months of installation/purchase.

Units which show evidence of being operated while damaged, or with problems known to the purchaser and causing further damages will void this warranty.

Units where the serial no. has been altered, deleted, removed or made illegible will void this warranty.

Minor movement, expansion and contraction of the steel is normal and is not covered under the terms of this warranty.

FPI is not liable for the removal or replacement of facings or finishing in order to repair or replace any appliance in the field.

Freight damages for products or parts are not covered under the terms of the warranty.

Products made or provided by other manufacturers and used in conjunction with the FPI appliance without prior authorization from FPI may void this warranty.

Limitations of Liability:
The original purchaser's exclusive remedy under this warranty, and FPI's sole obligation under this warranty, express or implied, in contract or in tort, shall be limited to replacement, repair, or refund, as outlined above. IN NO EVENT WILL FPI BE LIABLE UNDER THIS WARRANTY FOR ANY INCIDENTAL OR CONSEQUENTIAL COMMERCIAL DAMAGES OR DAMAGES TO PROPERTY. TO THE EXTENT PERMITTED BY APPLICABLE LAW, FPI 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. IF IMPLIED WARRANTIES CANNOT BE DISCLAIMED, THEN SUCH WARRANTIES ARE LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Some U.S. states do not allow limitations on how long an implied warranty lasts, or allow exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

Customers located outside the U.S. should consult their local, provincial or national legal codes for additional terms which may be applicable to this warranty.

How to Obtain Warranty Service:
Customers should contact the authorized selling dealer to obtain all warranty and service. In the event the authorized selling dealer is unable to provide warranty / service, please contact FPI by mail at the address listed on the next page. Please include a brief description of the problem and your address, email and telephone contact information. A representative will contact you to make arrangements for an inspection and/or warranty service, by an alternative dealer.

Product Registration and Customer Support:
Thank you for choosing a Regency Fireplace. Regency strives to be a world leader in the design, manufacture, and marketing of hearth products. To provide the best support for your product, we request that you complete a product registration form at http://www.regency-fire.com/Customer-Care/Warranty-Registration.aspx within ninety (90) days of purchase.

REGENCY
FIREPLACE PRODUCTS

Product Registration and Customer Support:

Thank you for choosing a Regency Fireplace. Regency strives to be a world leader in the design, manufacture, and marketing of hearth products. To provide the best support for your product, we request that you complete a product registration form found on our Web Site under Customer Care within ninety (90) days of purchase.

For purchases made in **CANADA or the UNITED STATES**:
http://www.regency-fire.com/Customer-Care/Warranty-Registration.aspx

For purchases made in AUSTRALIA:
http://www.regency-fire.com.au/Customer-Care/Warranty-Registration.aspx

You may also complete the warranty registration form below to register your Regency Fireplace Product and mail and/or fax it back to us, and we will register the warranty for you. It is important you provide us with all the information below in order for us to serve you better.

Warranty Registration Form (or Register online immediately at the above Web Site):

Warranty Details	
Serial Number (required):	
Purchase Date (required) (mm/dd/yyyy):	
Product Details	
Product Model (required):	
Dealer Details	
Dealer Name (required):	
Dealer Address:	
Dealer Phone #:	
Installer:	
Date Installed (mm/dd/yyyy):	
Your Contact Details (required)	
Name:	
Address:	
Phone:	
Email:	

For purchases made in CANADA:

FPI Fireplace Products International Ltd.
6988 Venture St.
Delta, British Columbia
Canada, V4G 1H4

Phone: 604-946-5155
Fax: 1-866-393-2806

For purchases made in the UNITED STATES:

Fireplace Products US, Inc.
PO Box 2189 PMB 125
Blaine, WA
United States, 98231

Phone: 604-946-5155
Fax: 1-866-393-2806

For purchases made in AUSTRALIA:

Fireplace Products Australia Pty Ltd
1- 3 Conquest Way
Hallam, VIC
Australia, 3803

Phone: +61 3 9799 7277
Fax: +61 3 9799 7822

For fireplace care and tips and answers to most common questions please visit our Customer Care section on our Web Site. Please feel free to contact your selling dealer if you have any questions about your Regency product.

CATALYTIC COMBUSTOR WARRANTY COVERAGE

IMPORTANT WARRANTY INFORMATION FOR CATALYTIC COMBUSTOR
Effective March 1 2019

Any and all claims for catalytic combustor must be filed **by the consumer** directly with their authorized Regency Dealer. FPI/Regency does not handle these claims directly with consumers.

Please follow the instructions below for your catalytic combustor under warranty. To learn more about the care and maintenance or the catalytic combustor, please visit our website: www.firecatcombustors.com.

Any warranty coverage before this date will be covered by the original warranty when the appliance was purchased.

(1) **10-year** coverage from Regency – not the supplier of the catalytic combustor.

(2) All claims must be made through the dealer where the appliance had been purchased.

(3) One no-charge replacement at any time within the **ten (10) year** period.

(4) Second replacement at 50% off retail* within the original **ten (10) years**.

(5) Subsequent replacements or if **ten (10)-year** coverage has expired at full retail* price.

(6) The catalytic combustor must not have been mechanically abused, nor must the wrong fuels have been used in the appliance.

(7) All claims must be accompanied by clear photos of the catalytic combustor showing all damage and also showing existing internal venting from the stove.

The consumer will be responsible for removal, any servicing. This warranty is REGENCY® exclusive warranty and REGENCY® disclaims any other express or implied warranty for the catalytic combustor, including any warranty or merchantability of fitness for a particular use.
NO LABOR WILL APPLY.

All warranty claims must be sent to: Regency Fireplace Products
By Authorized Regency Dealer

* Prices subject to change.
Regency reserves the right to reject any claim if it is determined the damage is a result of misuse, abuse or improper cleaning/handling.

Installer: Please complete the following information

Dealer Name & Address:_____

_____

Installer: _____

Phone #: _____

Date Installed: _____

Serial #:_____

Printed in Canada

Copy of the I1500 Safety Decal

This is a copy of the label that accompanies each **I1500 Wood Insert**. We have printed a copy of the contents here for your review.

NOTE: Regency units are constantly being improved. Check the label on the unit and if there is a difference, the label on the unit is the correct one.

(Duplicate Serial #) 450

LISTED FACTORY BUILT FIREPLACE INSERT CERTIFIED FOR USE IN CANADA AND U.S.A. DO NOT REMOVE THIS LABEL / NE PAS ENLEVER CETTE ÉTIQUETTE

0219WN022S

MODEL: I1500 REGENCY FIREPLACE PRODUCTS 450

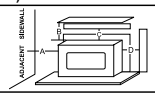
TESTED TO: ULC S628-M93 / UL 1482-2011 (R2015) REPORT NO.

U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD." TESTED TO METHOD 28R. MODEL REGENCY I1500 – 1.0G /HR. 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.

INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS. INSTALL AND USE ONLY IN MASONRY FIREPLACE OR FACTORY BUILT FIREPLACE.
CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS
(MEASURED FROM INSERT BODY)

ADJACENT SIDEWALL	A) 15in / 380mm
MANTEL	B) 20n / 510mm
TOP FACING	C) 14in / 355mm
SIDE FACING (to side surround)	D) 0.5in / 13mm



COMBUSTIBLE FLOOR MUST BE PROTECTED BY NON-COMBUSTIBLE MATERIAL EXTENDING (E) 16 IN / 405MM TO FRONT AND (G) 8IN / 205MM TO SIDES FROM FUEL DOOR. IN CANADA MUST EXTEND 18" TO FRONT.
THERMAL INSULATION WITH A R VALUE = 1.4 AT A DISTANCE OF 18" FROM FRONT OF DOOR OPENING FOR CANADA AND 16" FOR USA. IF UNIT RAISED 4.5" FROM FLOOR, NO THERMAL INSULATION IS REQUIRED.
COMBUSTOR PART #075-531

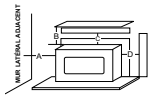
CAUTION: BURNING OF METAL FOILS, COAL, PLASTIC, GARBAGE, SULPHUR AND DIESEL OIL WILL RENDER THE CATALYST IN THE COMBUSTOR INACTIVE.
CAUTION: COMBUSTOR IS FRAGILE, HANDLE CAREFULLY
THE PERFORMANCE OF THE CATALYTIC DEVICE OR ITS DURABILITY HAS NOT BEEN EVALUATED AS PART OF THE CERTIFICATION.
COMPONENTS REQUIRED FOR INSTALLATION: 5.5" (140mm) or 6" (152mm)STAINLESS STEEL LINER LISTED CHIMNEY LINER.
OPTIONAL COMPONENT: FAN PART#172-917, ELECTRICAL RATING: VOLTS 115, 60 HZ, 0.6 AMPS
DANGER: RISK OF ELECTRIC SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT.
DO NOT REMOVE BRICKS OR MORTAR IN MASONRY FIREPLACE. FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT USE GRATE OR ELEVATE FIRE. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. BUILD WOOD FIRE DIRECTLY ON HEARTH. OPERATE WITH FEED DOOR CLOSED, OPEN TO FEED FIRE ONLY. REPLACE GLASS ONLY WITH CERAMIC GLASS (5MM). INSPECT AND CLEAN CHIMNEY FREQUENTLY. UNDER CERTAIN CONDITIONS OF USE CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT OVERFIRE, IF INSERT GLOWS YOU ARE OVER-FIRING.
CAUTION: MOVING PARTS MAY CAUSE INJURY. DO NOT OPERATE UNIT WITH A REMOVED PART OR PARTS.

CERTIFIÉ CONFORME AUX NORMES 2020 DE L'AGENCE AMÉRICAINE DE L'ENVIRONNEMENT EN MATIÈRE D'ÉMISSION DE PARTICULES DE BOIS LORSQUE DES PLANCHES DE BOIS ASSEMBLÉES (CRIB WOOD) SONT UTILISÉES. HOMOLOGUÉ AVEC LA MÉTHODE 28R. MODÈLE REGENCY I1500 – 1,0 G /H. CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ PÉRIODIQUEMENT ET RÉPARÉ POUR FONCTIONNER CORRECTEMENT. CONSULTER LE MANUEL D'INSTALLATION POUR PLUS D'INFORMATION. LA RÉGLEMENTATION FÉDÉRALE INTERDIT DE FAIRE FONCTIONNER UN TEL APPAREIL SI LES CONSIGNES D'UTILISATION CONTENUES DANS LE PRÉSENT MANUEL NE SONT PAS RESPECTÉES.

TEST : ULC S628-M93 / UL 1482-2011 (R2015) NO.DE RAPPORT
À INSTALLER ET À UTILISER UNIQUEMENT CONFORMÉMENT AUX CONSIGNES D'INSTALLATION ET D'UTILISATION DU FABRICANT. À INSTALLER ET À UTILISER UNIQUEMENT DANS UN FOYER EN MAÇONNERIE OU UN FOYER PRÉFABRIQUÉ.
CONTACTEZ LES AUTORITÉS LOCALES EN BÂTIMENT OU INCENDIE POUR CONNAÎTRE LES RESTRICTIONS D'INSTALLATION ET LES RÈGLES D'INSPECTION DANS VOTRE RÉGION.

(MESURES PRISES DEPUIS LE CAISSON DE L'ENCASTRABLE)
DÉGAGEMENTS MINIMAUX AUX MATÉRIAUX COMBUSTIBLES

MUR LATÉRAL ADJACENT	A) 15 po / 380 mm
MANTEAU	B) 20 po / 510 mm
PAREMENT SUPÉRIEUR	C) 14 po / 355 mm
PAREMENT LATÉRAL	D) 0,5 po / 13 mm



LE PLANCHER COMBUSTIBLE DOIT ÊTRE PROTÉGÉ PAR UN MATÉRIAU NON COMBUSTIBLE S'ÉTENDANT SUR (E) 16 PO / 405MM À L'AVANT ET SUR (G) 8 PO / 205MM ENTRE LES CÔTÉS ET LA PORTE DE CHARGEMENT DU COMBUSTIBLE. PROLONGEMENT SUR 18 PO À L'AVANT AU CANADA.
ISOLATION THERMIQUE AVEC UNE VALEUR R = 1,4 À UNE DISTANCE DE 18 PO DEPUIS L'AVANT DE L'OUVERTURE DE LA PORTE AU CANADA ET 16 PO AUX ÉTATS-UNIS. SI L'APPAREIL EST SURÉLEVÉ À 4,5 PO DU SOL, AUCUNE ISOLATION THERMIQUE N'EST REQUISE.
CATALYSEUR DE POSTCOMBUSTION PIÈCE N°075-531

ATTENTION : LA COMBUSTION DE FEUILLES DE MÉTAL, DE CHARBON, DE PLASTIQUE, DE DÉCHETS, DE SULFURE ET DE CARBURANT DÉSACTIVERA LE CATALYSEUR DE POSTCOMBUSTION.
ATTENTION : LE CATALYSEUR DE POSTCOMBUSTION EST FRAGILE, LE MANIPULER AVEC PRÉCAUTION.
LA PERFORMANCE DU CATALYSEUR AINSI QUE SA DURÉE DE VIE N'ONT PAS ÉTÉ ÉVALUÉES POUR L'ATTRIBUTION DE LA CERTIFICATION.
PIÈCES OBLIGATOIRES POUR L'INSTALLATION : GAINE DE CHEMINÉE HOMOLOGUÉE EN ACIER INOXYDABLE DE 5,5 PO (140mm) ou 6 PO (152mm).
PIÈCE EN OPTION : VENTILATEUR PIÈCE N°172-917
CARACTÉRISTIQUES ÉLECTRIQUES : 115 VOLTS, 60 HZ, 0,6 AMPS.
DANGER : RISQUE D'ÉLECTROCUTION. DÉBRANCHER LE COURANT AVANT DE PROCÉDER À L'ENTRETIEN DE L'APPAREIL.
NE PAS RETIRER LES BRIQUES OU LE MORTIER DU FOYER EN MAÇONNERIE. À UTILISER AVEC UN COMBUSTIBLE SOLIDE EN BOIS SEULEMENT. NE PAS UTILISER DE GRILLE NI SURÉLEVER LE FEU. NE PAS CONNECTER CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. FAIRE UN FEU DE BOIS DIRECTEMENT SUR L'ÂTRE. FAIRE FONCTIONNER L'APPAREIL AVEC LA PORTE DE CHARGEMENT FERMÉE, L'OUVRIR SEULEMENT POUR ALIMENTER LE FEU. REMPLACER LA VITRE SEULEMENT AVEC UNE VITRE EN CÉRAMIQUE (5MM). FAIRE INSPECTER ET RAMONER LA CHEMINÉE À INTERVALLES RÉGULIERS. ACCUMULATION RAPIDE DE CRÉOSOTE DANS CERTAINES CONDITIONS. NE PAS SURCHAUFFER : SI L'ENCASTRABLE EST ROUGEOYANT, L'APPAREIL SURCHAUFFE.
ATTENTION : LES PIÈCES AMOVIBLES PEUVENT ENTRAÎNER DES BLESSURES. NE PAS FAIRE FONCTIONNER L'APPAREIL SI UNE OU PLUSIEURS PIÈCES ONT ÉTÉ ENLEVÉES.

ATTENTION / DANGER

HOT WHILE IN OPERATION
DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
CONTACT MAY CAUSE SKIN BURNS.
READ ABOVE INSTRUCTIONS.

APPAREIL CHAUD LORSQU'IL FONCTIONNE.
NE PAS TOUCHER. GARDER À DISTANCE DES ENFANTS, DES VÊTEMENTS ET DU MOBILIER.
TOUT CONTACT PEUT CAUSER DES BRÛLURES.
LIRE LES INSTRUCTIONS CI-DESSUS.

FABRIQUÉ PAR :
FPI FIREPLACE PRODUCTS INTERNATIONAL LTÉE.
6988 VENTURE ST.
DELTA, BC V4G 1H4

919-716a

DATE OF MANUFACTURE / DATE DE FABRICATION
MADE IN CANADA / FAIT AU CANADA

DEC ☐ NOV ☐ OCT ☐ SEPT ☐ AUG ☐ JUL ☐ JUN ☐ MAY ☐ APR ☐ MAR ☐ FEB ☐ JAN ☐ 2025 ◯ 2024 ◯ 2023 ◯ 2022 ◯ 2021 ◯

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000085245

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE VANCOUVER WA
603 SE VICTORY AVE
VANCOUVER WA 986610

Praxair Order Number: 32589283
Customer P. O. Number: 05749997
Customer Reference Number:

Fill Date: 10/5/2015
Part Number: NI CD17CO8E-AS
Lot Number: 109527801
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 1290 psig 99 cu. ft.

Certified Concentration:

Expiration Date:		10/9/2023	NIST Traceable
Cylinder Number:		CC246162	Analytical Uncertainty:
16.76	**%**	**CARBON DIOXIDE**	± 0.2 %
4.26	**%**	**CARBON MONOXIDE**	± 0.4 %
17.04	**%**	**OXYGEN**	± 0.2 %
	Balance	**NITROGEN**	

Certifcation Information: *Certification Date:* 10/9/2015 *Term:* 96 Months *Expiration Date:* 10/9/2023

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

O2 resopnses have been corrected for CO2 interference.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON DIOXIDE

Requested Concentration: 17 %
Certified Concentration: 16.76 %
Instrument Used: Horiba VIA-510 S/N 2807014
Analytical Method: NDIR
Last Multipoint Calibration: 9/10/2015

First Analysis Data:						Date:	10/9/2015
Z:	0	R:	19.75	C:	16.71	Conc:	16.738
R:	19.75	Z:	0	C:	16.73	Conc:	16.758
Z:	0	C:	16.75	R:	19.77	Conc:	16.778
UOM:	%			Mean Test Assay:			16.758 %

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC158146
Ref. Std. Conc: 19.79%
Ref. Std. Traceable to SRM # : 2745
SRM Sample # : 9-C-36
SRM Cylinder # : CAL016135

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			0 %

2. Component: CARBON MONOXIDE

Requested Concentration: 4.25 %
Certified Concentration: 4.26 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 10/5/2015

First Analysis Data:						Date:	10/9/2015
Z:	0	R:	3.95	C:	4.26	Conc:	4.264
R:	3.96	Z:	0	C:	4.27	Conc:	4.274
Z:	0	C:	4.25	R:	3.96	Conc:	4.254
UOM:	%			Mean Test Assay:			4.264 %

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC257812
Ref. Std. Conc: 3.96%
Ref. Std. Traceable to SRM # : 2641a
SRM Sample # : 59-C-02
SRM Cylinder # : FF13690

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			0 %

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22015

DocNumber: 000085245

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

3 . Component: OXYGEN

Requested Concentration:	17 %
Certified Concentration:	17.04 %
Instrument Used:	OXYMAT 5E
Analytical Method:	PARAMAGNETIC
Last Multipoint Calibration:	10/8/2015

First Analysis Data:						**Date:**	10/9/2015
Z:	0	**R:**	20.04	**C:**	17.05	**Conc:**	17.036
R:	20.04	**Z:**	0	**C:**	17.05	**Conc:**	17.036
Z:	0	**C:**	17.05	**R:**	20.06	**Conc:**	17.036
UOM:	%			**Mean Test Assay:**			17.036 %

Reference Standard Type:	GMIS
Ref. Std. Cylinder # :	CC243259
Ref. Std. Conc:	20.03%
Ref. Std. Traceable to SRM # :	2659a
SRM Sample # :	71-E-19
SRM Cylinder # :	FF22331

Second Analysis Data:						**Date:**	
Z:	0	**R:**	0	**C:**	0	**Conc:**	0
R:	0	**Z:**	0	**C:**	0	**Conc:**	0
Z:	0	**C:**	0	**R:**	0	**Conc:**	0
UOM:	%			**Mean Test Assay:**			0 %

Analyzed by: Jacquelyne Fiero

Certified by: Jack Fu

PRAXAIR

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5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22016

DocNumber: 000091012

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE VANCOUVER WA
603 SE VICTORY AVE
VANCOUVER WA 986610

Praxair Order Number: 33855113
Customer P. O. Number: 05949702
Customer Reference Number:

Fill Date: 2/25/2016
Part Number: NI CD10CO33E-AS
Lot Number: 109605601
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	3/1/2024	NIST Traceable
Cylinder Number:	CC199294	Analytical Uncertainty:
9.91 %	CARBON DIOXIDE	± 0.5 %
2.51 %	CARBON MONOXIDE	± 0.8 %
10.50 %	OXYGEN	± 0.4 %
Balance	NITROGEN	

Certifcation Information: *Certification Date:* 3/1/2016 *Term:* 96 Months *Expiration Date:* 3/1/2024

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

O2 responses have been corrected for CO2 interference.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON DIOXIDE

Requested Concentration: 10 %
Certified Concentration: 9.91 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 2/26/2016

First Analysis Data: **Date:** 3/1/2016

Z:	0	R:	9.87	C:	9.91	Conc:	9.91
R:	9.87	Z:	0	C:	9.91	Conc:	9.91
Z:	0	C:	9.92	R:	9.87	Conc:	9.92

UOM: % **Mean Test Assay:** 9.913 %

Reference Standard Type: GMIS
Ref. Std. Cylinder # : SA17695
Ref. Std. Conc: 9.87%
Ref. Std. Traceable to SRM # : 1674b
SRM Sample # : 7-H-07
SRM Cylinder # : FF10631

Second Analysis Data: **Date:**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** 0 %

2. Component: CARBON MONOXIDE

Requested Concentration: 2.5 %
Certified Concentration: 2.51 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 2/26/2016

First Analysis Data: **Date:** 3/1/2016

Z:	0	R:	2.01	C:	2.5	Conc:	2.5
R:	2.02	Z:	0	C:	2.51	Conc:	2.51
Z:	0	C:	2.51	R:	2.02	Conc:	2.51

UOM: % **Mean Test Assay:** 2.507 %

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC103175
Ref. Std. Conc: 2.017%
Ref. Std. Traceable to SRM # : 2640a
SRM Sample # : 53-C-38
SRM Cylinder # : CAL013925

Second Analysis Data: **Date:**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** 0 %

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Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22016

DocNumber: 000091012

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

3. Component: OXYGEN

Requested Concentration:	10.5 %
Certified Concentration:	10.50 %
Instrument Used:	OXYMAT 5E
Analytical Method:	PARAMAGNETIC
Last Multipoint Calibration:	2/26/2016

First Analysis Data:					**Date:**	3/1/2016	
Z:	0	**R:**	20.04	**C:**	10.51	**Conc:**	10.501
R:	20.04	**Z:**	0	**C:**	10.51	**Conc:**	10.501
Z:	0	**C:**	10.51	**R:**	20.06	**Conc:**	10.501
UOM:	%			**Mean Test Assay:**			10.501 %

Analyzed by: King Yu

Reference Standard Type:	GMIS
Ref. Std. Cylinder # :	CC243259
Ref. Std. Conc:	20.03%
Ref. Std. Traceable to SRM # :	2659a
SRM Sample # :	71-E-19
SRM Cylinder # :	FF22331

Second Analysis Data:					**Date:**		
Z:	0	**R:**	0	**C:**	0	**Conc:**	0
R:	0	**Z:**	0	**C:**	0	**Conc:**	0
Z:	0	**C:**	0	**R:**	0	**Conc:**	0
UOM:	%			**Mean Test Assay:**			0 %

Certified by: Jose Vasquez

DIRIGO LABORATORIES INC.

EPA Method 5 Dry Gas Meter Calibration for γ and ΔH@

Average DGM γ factor = **1.003**

Average Meter Orifice ΔH@ = **32.449**

Manufacturer / Model:	Apex-AK-600
ID:	Ambient Box
Serial Number	810016
Equipment No.:	Dirigo 055
Calibration Date:	8/5/2016
Next Calibration Due:	2/5/2017
Barometric Pressure:	29.92 inHg
Signature/Date:	8/5/16

	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	179.160	160.699	149.637
Standard Ave. Meter Temperature (°F), (Tstd)	77.0	78.0	78.5
DGM Initial Volume (cuft)	0.000	0.000	0.000
DGM Final Volume (cuft)	6.354	5.658	5.231
DGM Average Temperature (°F), (T_{DGM})	80.0	81.0	83.5
Time (min)	30.0	30.0	33.0
Orifice ΔH ("H2O)	2.50	2.00	1.45
Vacuum ("H2O)	0.00	0.00	0.00
Total Volume for Standard DGM (Vstd) (cuft)	6.327	5.675	5.284
Total Volume for DGM (V_{DGM}) (cuft)	6.354	5.658	5.231

Dry Gas Meter γ Factor	0.993	1.002	1.014
γ Factor Deviation From Average	0.010	0.001	0.011
Meter Orifice ΔH@	32.516	32.315	32.517
Orifice ΔH@ Deviation From Average	0.067	0.135	0.067

Standard Meter Data

Date	2/4/2016
γ Factor	0.998
Model	SK25DA
Serial Number	1101001

Pre-Calibration Data

Date	1/9/2016
γ Factor	0.999
ΔH@	30.755
Tolerance (5%)	0.050
Deviation	0.004

Pass

DGM Calibration Data

γ Deviation Tolerance	0.020
Maximum γ Deviation	0.011
ΔH@ Deviation Tolerance	0.200
Maximum dH@ Deviation	0.135

Pass

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. γ = (Vstd x (Std γ factor) x (P_{bar}) x (T_{DGM} + 460) / (V_{DGM} x (Tstd + 460) x (Pbar + (dH / 13.6)))
3. ΔH@ = 0.0319 x ΔH ((((T_{DGM}+ 460) x (Time^2)) / (P_{bar} x (γ factor^2) x (V_{DGM}^2)))

Measurement of uncertainty = +/- 0.14 cfm

DIRIGO LABORATORIES INC.

EPA Method 5 Dry Gas Meter Calibration for γ and ΔH@

Average DGM γ factor = **1.002**

Average Meter Orifice ΔH@ = **59.911**

Manufacturer / Model:	XC-60-ED
ID:	Box B
Serial Number	1902133
Equipment No.:	Dirigo 054
Calibration Date:	9/7/2016
Next Calibration Due:	3/7/2017
Barometric Pressure:	30.15 inHg
Signature/Date:	9/8/16

	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	151.554	154.122	150.749
Standard Ave. Meter Temperature (°F), (Tstd)	79.0	75.2	80.0
DGM Initial Volume (cuft)	0.000	0.000	0.000
DGM Final Volume (cuft)	5.464	5.587	5.505
DGM Average Temperature (°F), (T_{DGM})	97.7	93.6	101.6
Time (min)	35.0	40.0	45.0
Orifice ΔH ("H2O)	2.50	2.00	1.51
Vacuum ("H2O)	0.00	0.00	0.00
Total Volume for Standard DGM (Vstd) (cuft)	5.352	5.443	5.324
Total Volume for DGM (V_{DGM}) (cuft)	5.464	5.587	5.505

Dry Gas Meter γ Factor	1.005	1.001	1.000
γ Factor Deviation From Average	0.003	0.001	0.002
Meter Orifice ΔH@	59.869	59.935	59.930
Orifice ΔH@ Deviation From Average	0.043	0.024	0.019

Standard Meter Data

Date	2/4/2016
γ Factor	0.998
Model	SK25DA
Serial Number	1101001

Pre-Calibration Data

Date	3/8/2016
γ Factor	1.001
ΔH@	59.917
Tolerance (5%)	0.050
Deviation	0.001

Pass

DGM Calibration Data

γ Deviation Tolerance	0.020
Maximum γ Deviation	0.003
ΔH@ Deviation Tolerance	0.200
Maximum dH@ Deviation	0.043

Pass

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. γ = (Vstd x (Std γ factor) x (P_{bar}) x (T_{DGM} + 460) / (V_{DGM} x (Tstd + 460) x (Pbar + (dH / 13.6)))
3. ΔH@ = 0.0319 x ΔH ((((T_{DGM}+ 460) x (Time^2)) / (P_{bar} x (γ factor^2) x (V_{DGM}^2)))

Measurement of uncertainty = +/- 0.14 cfm

DIRIGO LABORATORIES INC.

EPA Method 5 Dry Gas Meter Calibration for γ and ΔH@

Average DGM γ factor = **1.007**

Average Meter Orifice ΔH@ = **58.571**

Manufacturer / Model:	XC-60-ED
ID:	Box-A
Serial Number	1902130
Equipment No.:	Dirigo 053
Calibration Date:	9/7/2016
Next Calibration Due:	3/7/2017
Barometric Pressure:	30.15 inHg
Signature/Date:	9/7/16

	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	153.398	157.354	153.013
Standard Ave. Meter Temperature (°F), (Tstd)	76.1	77.3	78.3
DGM Initial Volume (cuft)	0.000	0.000	0.000
DGM Final Volume (cuft)	5.433	5.674	5.594
DGM Average Temperature (°F), (T_{DGM})	89.0	96.2	100.7
Time (min)	35.0	40.0	45.0
Orifice ΔH ("H2O)	2.49	2.03	1.53
Vacuum ("H2O)	0.00	0.00	0.00
Total Volume for Standard DGM (Vstd) (cuft)	5.417	5.557	5.404
Total Volume for DGM (V_{DGM}) (cuft)	5.433	5.674	5.594

Dry Gas Meter γ Factor	1.013	1.007	1.001
γ Factor Deviation From Average	0.006	0.000	0.006
Meter Orifice ΔH@	58.489	58.554	58.670
Orifice ΔH@ Deviation From Average	0.082	0.017	0.099

Standard Meter Data

Date	2/4/2016
γ Factor	0.998
Model	SK25DA
Serial Number	1101001

Pre-Calibration Data

Date	3/8/2016
γ Factor	1.002
ΔH@	58.685
Tolerance (5%)	0.050
Deviation	0.005

Pass

DGM Calibration Data

γ Deviation Tolerance	0.020
Maximum γ Deviation	0.006
ΔH@ Deviation Tolerance	0.200
Maximum dH@ Deviation	0.099

Pass

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. γ = (Vstd x (Std γ factor) x (P_{bar}) x (T_{DGM} + 460) / (V_{DGM} x (Tstd + 460) x (Pbar + (dH / 13.6)))
3. ΔH@ = 0.0319 x ΔH ((((T_{DGM}+ 460) x (Time^2)) / (P_{bar} x (γ factor^2) x (V_{DGM}^2)))

Measurement of uncertainty = +/- 0.14 cfm

Established 1974

QUALITY CONTROL SERVICES

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(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Material	Assumed Density	Range	Tolerance Class
Cast Iron	7.2 g/cm^3	20lb to 10lb	NIST HB 105-1 (F)

Method and Traceability
The procedure used for this calibration is NIST IR 6969 SOP 7 Single Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:
Avoirdupois Working Standards were calibrated: 06/18/2014 Due: 06/18/2016 Standards ID: 34AA
Mass Comparators Used: MET-09, 20 **Tested by:** D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" **(Previously known as "Apparent Mass vs. 8.0g/cm^3).**

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor K=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 01/15/16

Signature David S. Thompson

Established 1974

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ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.448	760.64	44.58

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
20lb #098	19.9995450	-206.4	6.4	910
10lb #097	10.0006510	295.3	5.1	450
10lb #051	10.0003421	155.2	5.1	450

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within NIST Handbook 105-1 Class F tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories.* This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 01/15/16

Signature David S. Thompson

Established 1974

QUALITY CONTROL SERVICES

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A2LA ACCREDITED
CERTIFICATE #1550.01

Report of Calibration

Firm: PFS Teco
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 08/27/18
Submitted By: John Steinert
Traceable Number: 20181772

Test Item: 5 lb Individual Grip Handle Weight
Serial No.: 10744

Manufacturer: Rice Lake

Material	Assumed Density	Range	Tolerance Class
Cast Iron	7.2 g/cm^3	5 lb	ASTM Class 7

Method and Traceability
The procedure used for this calibration is NIST IR 6969 SOP 7 Single Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:
20 kg to 200 g Working Standards Were Calibrated: 03/22/18 Due: 03/31/19 Standards ID: 75388
100 g to 1 mg Working Standards Were Calibrated: 04/04/18 Due: 04/30/19 Standards ID: 723318
Mass Comparators Used: MET-08 **Tested by:** D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" **(Previously known as "Apparent Mass vs. 8.0 g/cm^3).**

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 08/28/18

Signature David S. Thompson

Established 1974

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A2LA ACCREDITED
CERTIFICATE #1550.01

Report of Calibration

Firm: PFS Teco
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 08/27/18
Submitted By: John Steinert
Traceable Number: 20181772

Test Item: 5 lb Individual Grip Handle Weight
Serial No.: 10744

Manufacturer: Rice Lake

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.838	762.06	52.23

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
5 lb	5.0006085	276.0	2.0	760

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: This weight was new from the manufacturer and was within ASTM Class 7 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories.* This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 08/28/18

Signature David S. Thompson

Established 1974

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ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

Dirigo Laboratories
11785 SE Hwy 212, Ste 305
Clackamas, OR 97015

Report Number: DIRI0182484A0912013i161221

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 400x.01	82484A0912013i	N/A	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.01	QC033	12/21/16	6/27/16	6/2017

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 50 Tol: 0.05	Test Wt: HB44 Tol: HB44	Test Wt: 50 Tol: 0.01	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 16.7°C
As-Left: Pass:☐ Fail:☑	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	400.04	400.04	0.058
300	300.03	300.03	0.058
200	200.02	200.02	0.058
100	100.00	100.00	0.012
50	50.00	50.00	0.012
20	20.00	20.00	0.012

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/4/15	11/2017	20152112

Permanent Information Concerning this Equipment:

Comments/Information Concerning this Calibration

Report prepared/reviewed by: N. KILMER **Date:** 12.21.16

Technician: N Kilmer
Signature:

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Established 1974

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Certificate Number: 1550.01
Laboratory code: 115953

Dirigo Laboratories
11785 SE Hwy 212, Ste 305
Clackamas, OR 97015

Report Number: DIRI0182484A0912013i161221

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 400x.01	82484A0912013i	N/A	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.01	QC033	12/21/16	6/27/16	6/2017

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 50 Tol: 0.05	Test Wt: HB44 Tol: HB44	Test Wt: 50 Tol: 0.01	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 16.7°C
As-Left: Pass:☐ Fail:☑	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	400.04	400.04	0.058
300	300.03	300.03	0.058
200	200.02	200.02	0.058
100	100.00	100.00	0.012
50	50.00	50.00	0.012
20	20.00	20.00	0.012

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Clackamas, OR 97015

Report Number: DIRI0128095160627

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Scientech	ZSA 210	28095	N/A	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
g	0.0001	QC012	6/27/16	12/11/15	12/2016

FUNCTIONAL CHECKS

ECCENTRICITY
Test Wt: 100 Tol: 0.0004
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

LINEARITY
Test Wt: 50x4 Tol: 0.0003
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

STANDARD DEVIATION
Test Wt: 100 Tol: 0.0002

1. 100.0000	5. 100.0000	9. 100.0001
2. 100.0003	6. 100.0004	10. 100.0000
3. 99.9997	7. 100.0001	Result
4. 99.9999	8. 100.0002	0.00020

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 19.2°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	200.0129	199.9998	0.00041
100	100.0066	99.9999	0.00041
50	50.0029	50.0000	0.00041
10	10.0003	10.0000	0.00041
1	1.0001	0.9999	0.00041
0.1	0.0995	0.1000	0.00041

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20kg to 1mg	7133	4/29/16	4/2017	20160940

Permanent Information Concerning this Equipment:

Comments/Info Concerning this Calibration:
6/16 External span adjustment completed.

Report prepared/reviewed by: M. Murray **Date:** 6-27-16 **Technician:** N.Kilmer
Signature:

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

DICK MUNNS COMPANY
LIQUID & GAS FLOW CALIBRATION

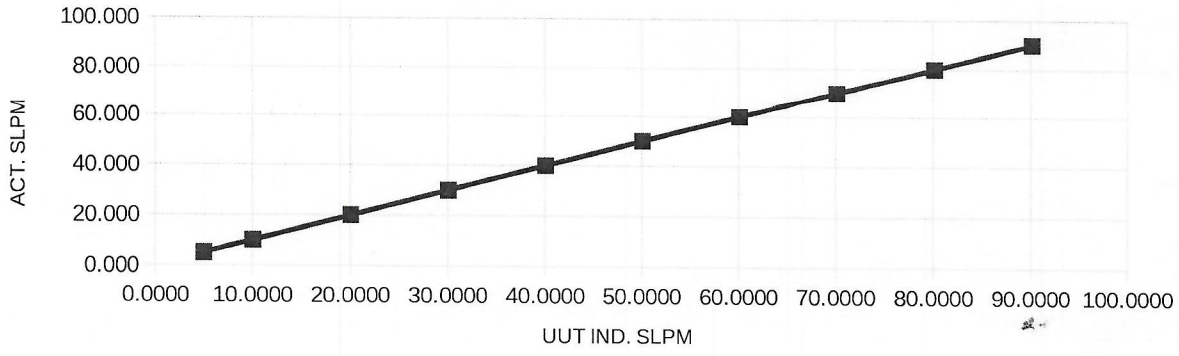
ISO 17025 IAS ACCREDITED
CL-122

CERTIFICATE OF CALIBRATION

CUSTOMER:	**DIRIGO LABORATORIES INC.** CLACKAMAS OR	**CALIBRATION DATE:**	02/04/16
PO NUMBER:	1009	**CALIBRATION DUE:**	02/04/17
INST. MANUFACTURER:	APEX	**PROCEDURE:**	NAVAIR 17-20MG-02
INST. DESCRIPTION:	DIGITAL DGM STANDARD	**CALIBRATION FLUID:**	AIR @ 14.7 PSIA 70 F
MODEL NUMBER:	SK25DA	**STANDARD(S) USED:**	A4, A24 DUE 06-2016
SERIAL NUMBER:	1101001	**NIST TRACE #' S:**	1331545884, 1390386562, 1424683640
RATED UNCERTAINTY:	+/- .5 % RD.	**AMBIENT CONDITIONS:**	769 mm HGA 34 % RH 68 F
UNCERTAINTY GIVEN:	TOTAL measurement uncertainty: +/- .190 % RD. K=2	**CERTIFICATE FILE #:**	449362.16

NOTES: AS RECEIVED/AS LEFT WITHIN SPECS. REFERENCE CONDITIONS ARE: 760 mm HGA 70 F

TEST POINT NUMBER	UUT INDICATED SLPM	DM.STD. ACTUAL SLPM	CORRECTION SLPM	K FACTOR
1	5.0128	5.008	0.99905	60.057
2	10.0236	9.997	0.99735	60.159
3	20.0431	20.003	0.99800	60.120
4	30.0586	30.013	0.99848	60.091
5	40.0721	40.009	0.99842	60.095
6	50.0826	49.972	0.99779	60.133
7	60.0911	59.993	0.99837	60.098
8	70.1133	70.012	0.99855	60.087
9	80.1376	80.028	0.99863	60.082
10	90.1653	89.984	0.99799	60.121
		AVERAGE (Y)=	0.99826376	



All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) used and the unit under test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed per the shown procedure number, in accordance with ISO 10012:2003, ISO 17025:2005, ANSI/NCSL-Z-540.3, and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

Dick Munns Company • 10572 Calle Lee #130 • Los Alamitos, CA 90720
Phone (714) 827-1215 • Fax (714) 827-0823

Date: 2/4/2016

Approved By:

Calibration Technician: AT

Established 1974

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Report Number: DIRI01A05026161221

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Rice Lake	IQ+355E-2A x 100(	A05026	N/A	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	1	QC033	12/21/16	6/27/16	6/2017

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 250 Tol: 1	Test Wt: HB44 Tol: HB44	Test Wt: 100 Tol: 1	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 16.9°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	999.8	999.8	0.5
700	699.8	699.8	0.5
500	500.0	500.0	0.5
300	300.0	300.0	0.5
100	100.0	100.0	0.5
50	50.0	50.0	0.5

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/4/15	11/2017	20152112

Permanent Information Concerning this Equipment:
2000lbs platform. Has a custom pan.

Comments/Information Concerning this Calibration

Report prepared/reviewed by: N.KILMER **Date:** 12.21.16

Technician: N.Kilmer
Signature:

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy.