November, 2008

INSTALLATION INSTRUCTIONS

CAS-2B Field Control AIRBOOT™ outside combustion air kit for model POR with Beckett Model AF burner

⚠ WARNING

Fuel supply shall be shut-off and the electrical power disconnected before proceeding with the installation. Failure to do so could result in fire, explosion, electrical shock, or the unit starting suddenly resulting in injury.

IMPORTANT

1. The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of these kits must be performed by a qualified installation and service agency.
2. These instructions must also be used in conjunction with the Installation and Service manual originally shipped with the appliance being converted, in addition to any other accompanying component supplier literature.
3. This product is specifically designed for use with Beckett Model AF burners for ducting outside combustion air directly to the burner.

Model Application

The outside combustion air kit for Model POR units is designed to provide a means of ducting combustion air to Modine Model POR units that feature the Beckett AF burner in applications where the supply of combustion air from the conditioned space is inadequate. Examples include tight buildings with inadequate makeup air or buildings with negative pressure. The combustion air would come from outside the space being conditioned.

Kit Components

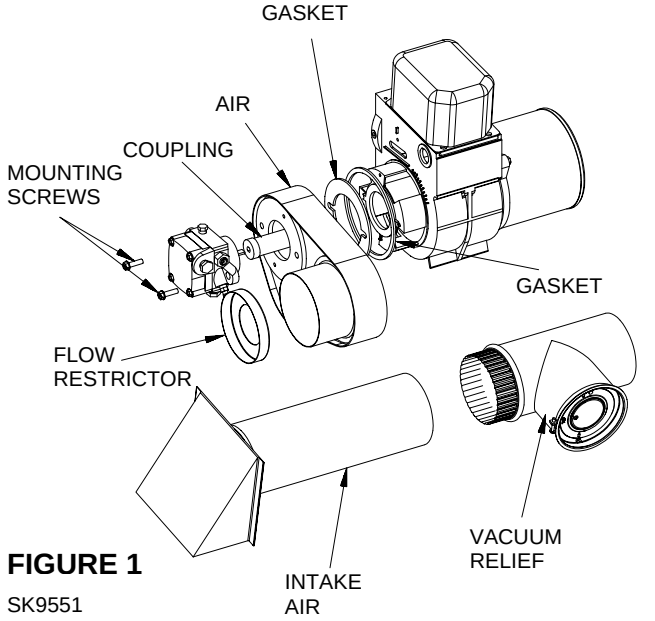
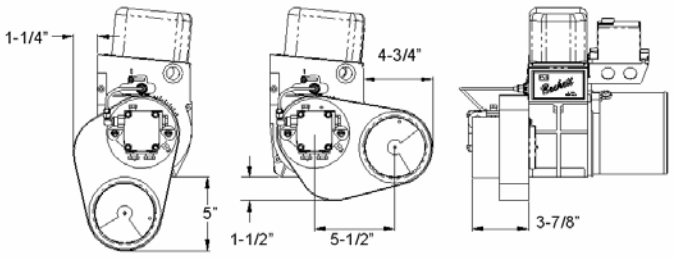


FIGURE 1
SK9551

(1) AIRBOOT™.....31988
(1) Burner Housing Gasket Set.....31989
(2) Mounting Screws 1/4-20 x 1-1/4.....4226
(1) Extended Coupling.....21775
(1) Flow Restrictor.....31990*
(1) 4" Vacuum Relief Valve (VRV).....31991**
(1) 4" Intake Air Hood (IAH).....31992**

* Not used with Modine model POR units.
** These components MUST be installed in conjunction with the CAS-2B Field Control AIRBOOT™ to meet U/L requirements.



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INSTALLATION – CAS-2B Field Control AIRBOOT™ Outside Combustion Air Kit

Assembly/Installation

The recommended procedure for assembly and installation is described as follows:

Step 1 - AIRBOOT™ Installation

A. Remove the fuel pump, air shutter, and air band from the burner housing.

B. Remove the original shaft coupling (or inlet air shutoff if applicable; the inlet air shutoff cannot be used with the boot) and install the extended coupling, part #21775.

C. Install both sealing gaskets to burner housing, part #31989. (Figure 1, Page 1).

D. Position the AIRBOOT™ over the burner housing on the air intake side.

E. Align the holes in the AIRBOOT™ with the holes in the housing. Guide the pump shaft into the extended coupling and secure the fuel pump with the 1/4-20 x 1-1/4 mounting screws (do NOT over tighten pump bolts)

NOTE: *The AIRBOOT™ may be oriented either vertically or horizontally as space allows (Figure 2). The round spacer ring attached to the AIRBOOT™ can be detached by removing the two (2) plastic fasteners, rotating the spacer plate 90° (from vertical mounting), and reinstalling the plastic fasteners. (Figure 3, Page 2)*

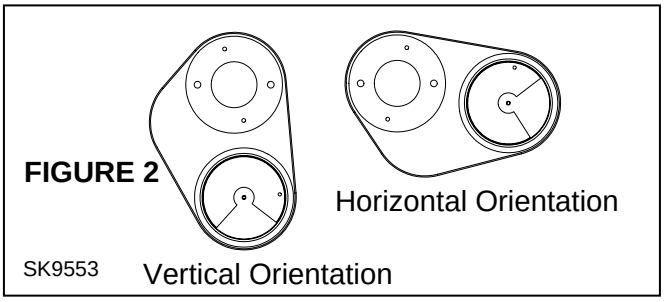

FIGURE 2

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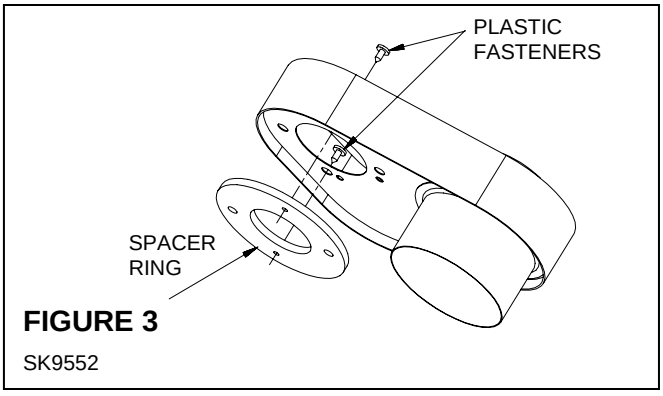

FIGURE 3

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NOTE: *If the fuel lines have been disconnected in order to remove the fuel unit, or if this is a new installation, the fuel unit may require bleeding before initial burner start-up (look under Burner Start-Up and Adjustment for bleeding procedures).*

Step 2. Assembly/Installation of the VRV

Purpose of the Vacuum Relief Valve (VRV)

The VRV is installed to provide a secondary opening for combustion air supply in the duct system. This is especially important in the event of damage or blockage to the Intake Air Hood.

VRV Operation

The VRV gate operates on changes in vacuum pressure generated between the intake and the oil burner. The VRV gate will remain closed during normal burner operation. During any abnormal operation created by blockage of the Intake Air Hood, duct pipe, or significant changes in external building pressures, an increased negative pressure on the intake of the burner causes a reduction in burner air flow. Under this condition, the VRV gate opens, stabilizing and maintaining proper air flow to the burner. The VRV gate closes again once the abnormal condition is corrected.

A. Mount VRV tee assembly or 90° elbow into the AIRBOOT™ intake. Fasten using three (3) sheet metal screws on all joints (Figure 4).

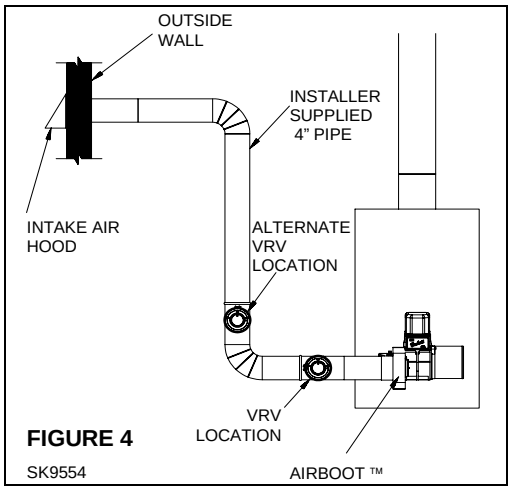

FIGURE 4

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B. Assemble VRV balance weight onto gate. Screw the weight all the way in, and then attach lock nut and knurled nut (Figure 5).

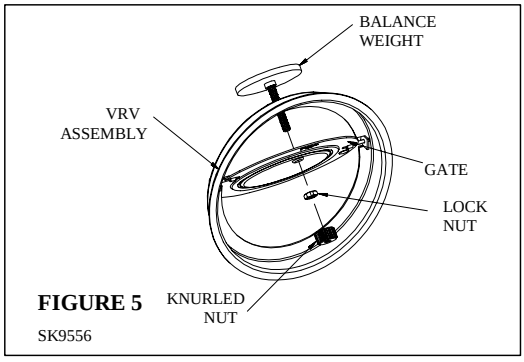

FIGURE 5

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C. Mount the VRV assembly into the tee and fasten with screw and nut in collar tabs. To ensure proper operation, check the gate for being plumb as well as being level across the pivot point (Figure 6).

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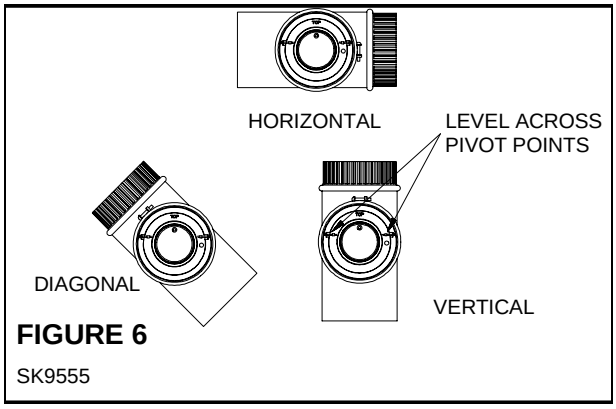

FIGURE 6

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Step 3. Intake Air Hood Location (Horizontal Ducting)

Mount Intake Air Hood 12 inches above finish grade. If mounting on the side of a building prone to drifting snow, mount 12 inches above the snow line.

NOTE: *For vertical or through-the-roof air ducting, use Field Star-Kap™ terminal model SK-4.*

Step 4. Installation of Intake Air Hood

A. Cut a 4-1/4" diameter hole through the side wall of the building.
B. Slide the Inlet Air Hood through the hole and fasten to wall with appropriate fasteners. Seal the edges of the mounting plate with silicone sealant or equivalent.
C. Always mount with the Intake Air Hood opening pointing down.

Step 5. Installation of Air Supply Duct

A. Duct length calculation: Do not exceed a **MAXIMUM** of 34 total equivalent feet (20' straight pipe + two 90° elbows at an equivalent straight pipe length of 7' per elbow). Multiply the number of elbows by 7 and subtract it from the total run length. Maximum linear footage will be less for flex duct. Consult flex duct manufacturer for equivalent lengths.
B. Route the duct work from the VRV tee to the Intake Air Hood using a minimum amount of elbows.
C. Secure and support the duct work for the design and weight of the material used to prevent physical damage and separation of joints.

   NOTE: *For guidelines, refer to recognized national building codes or any applicable local codes.*

D. To reduce uncontrolled air leakage into the duct, tape all joints and seams using standard foil or duct tape.
E. For cold climate conditions. To prevent sweating on the outside of the duct when operating in areas that have temperatures -10°F or below, insulate the duct work at least 10 feet from Intake Air Hood.

Step 6. Exhaust Termination Installation

For barometric damper and other exhaust system requirements, refer to the latest revision of Installation & Service Manual 4-522 (revision .4 or later).

Step 7. Burner Start-Up and Adjustment

Caution: DO NOT start the burner when excess oil has accumulated in the chamber, when the furnace or boiler is full of oil vapor, or when the combustion chamber is very hot.

A. After the installation is complete, set the initial AIRBOOT™ air dial setting at 250° for POR100 and 145 or 260° for POR185, as summarized in Chart 1.

Chart 1 – Approximate Air Dial Settings (See Notes)

	Setup Data		
Model Size	100	145	185
Head	F4	F4	F12
Static Plate	3-3/8R	3-3/8R	2-3/4U
G.P.H.	0.85	1.25	1.65
Approx. AIRBOOT™ Air Dial Setting	250°	250°	260°

Notes:
1. Chart based on 20 linear ft. of 4" duct, two 90° elbows, and an Air Intake Hood.
2. G.P.H. is the firing rate for that specific model size.
3. Air Dial Settings are **INITIAL** settings. Always use combustion test instruments for final adjustment settings.

B. Perform the initial startup and adjustment procedure for model POR oil fired unit heater per the unit heater Installation & Service Manual. When the burner air supply and draft are properly adjusted, the over-fire (combustion chamber) draft will be -.02" W.C.
C. Allow at least ten minutes for warm-up, or longer if the appliance is new, in order to burn-off the oil deposits on the heat exchanger and other surfaces.
D. Perform a smoke test. Reduce or increase the AIRBOOT™ air dial until a **TRACE OF SMOKE** is obtained. This is a reference point only, **DO NOT** leave the air dial setting here.
E. Measure the CO_2 in the flue gas at the TRACE of smoke level. Open the air dial and add reserve air until the CO_2 is lowered to 11.5% to 12.5%.
F. Perform a smoke test again. The smoke paper should now be clean (zero smoke).
G. After all final adjustments are made, tighten the lock screw on the AIRBOOT™ air dial.
H. Start and stop the unit several times to ensure there are no significant rumbles or pulsations.
I. Recheck the draft, smoke, and flue gas levels to verify nothing has changed.

Inspection Required During Servicing/Annual Maintenance

1. Check the Inlet Air Hood and air supply system for accumulation of any foreign material. Give special attention to the 1/4" mesh screen inside the Intake Air Hood. Thoroughly clean all material from the system.
2. Note any damage to components and re-place with exact system components.
3. Verify that the VRV is operating properly.
4. Using combustion test instruments, verify that the operating smoke level is "zero smoke" following procedure outlined in Step 7 section.
5. Securely tighten the lock screw on the AIRBOOT™ air dial after final testing or servicing.

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