

Procedure for Field Checking the Model 4 Minneapolis Blower Door™ Fan

Introduction

Model 4 Minneapolis Blower Door™ fans maintain their calibration unless physical damage occurs to the fan. Conditions which could cause the fan calibration to change are primarily damaged flow sensors, leaks in the flow sensor tubing running from the flow sensor to the fan pressure tap, or improper positioning of the flow sensor relative to the fan housing. These conditions are easily detected and should be tested for on a regular basis.

You will Need

1. A 5-foot piece of tubing
2. A straightedge such as a carpenter's level or a heavy yardstick or long ruler on edge
3. A ruler that measures 16^{ths} of an inch or millimeters
4. A workbench or table (optional). All checks can be done on the floor, but they are easier on a workbench or table

A. Checking for Blockages or Disconnected Tubing in the Flow Sensor

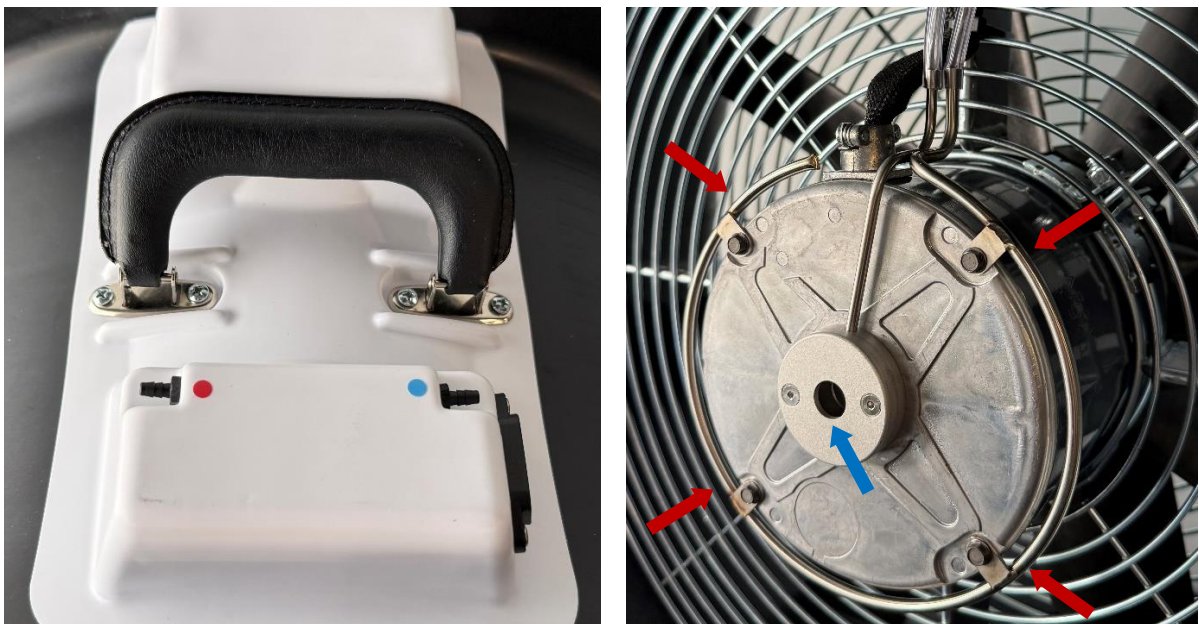
Model 4 Blower Door fans use a round metal sensor that is mounted on the end of the fan motor opposite the fan blades.

First visually confirm that the flow sensor is not broken or deformed due to impact. Check that the flow sensor is firmly attached to the motor using the 4 metal attachment clips.



B. Testing For Crimped or Disconnected Tubing

1. Connect a piece of tubing to the blue tap on the top of the fan and blow air through the tube while placing your hand near the opening at the center of the inlet side of the fan motor. You should feel air coming out of the total pressure tap opening.
2. Move the tubing to the red tap on the top of the fan and blow air through the tube while holding your hand behind the flow sensor. You should feel air coming out of 4 small holes on the back of the flow sensor. The sensor holes are roughly at the 2, 5, 8 and 11 o'clock positions.



Total Pressure Sensor tap (blue circle) and Flow Sensor tap (red circle). Total Pressure Sensor inlet (blue arrow) Flow Sensor inlet (red arrows).

C. Checking the Flow Sensor Position

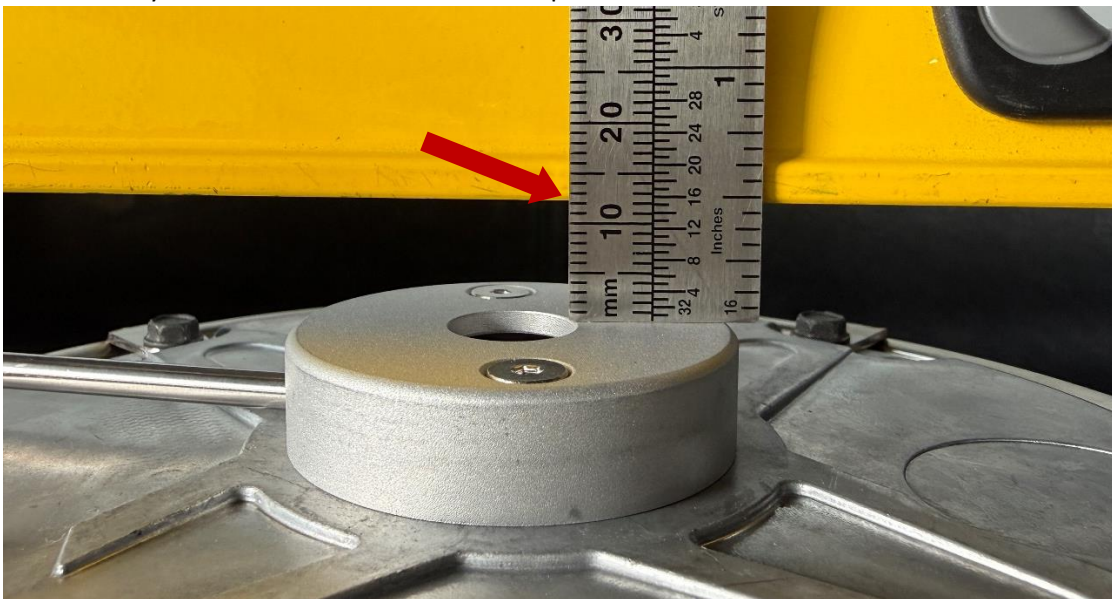
The position of the flow sensor relative to the inlet of the fan housing is an important component of the fan's air flow sensing system. Because the fan flow sensor is attached to end of the fan motor, the position of the flow sensor can change if the position of the motor changes. If a fan has been dropped, the motor may have shifted from its proper position in the motor mount, or the motor mount itself can sometimes bend. This movement of the motor and flow sensor can degrade the fan calibration.

1. Lay the fan on its side with the flow sensor facing up and all flow rings removed. Place a straightedge (such as a heavy yardstick on edge) across the inlet of the fan as shown in the photo.



A straightedge across the fan housing with a ruler to measure the gap.

2. Use a ruler to measure the distance from the bottom of the straightedge to the face of the total pressure tap (see photo below). This distance should be in the range of $3/8^{\text{th}}$ to $5/8^{\text{th}}$ of an inch (or about 10 – 15 mm). If the flow sensor is within this range, the fan passes this part of the field check procedure. If the flow sensor is not in the proper position, contact The Energy Conservatory for information about how to repair the fan.



This fan measures just under $1/2''$ or about 12 mm from the flow sensor to the straightedge; it's in the middle of the allowable range.

Visual Inspection

- Inspect the motor mount for cracked or broken parts. These are usually the result of the fan being dropped.
 - Broken Welds between the band clamp and the radial struts.



- Broken Between the motor vent tabs and the band clamp



- The same broken weld as seen from inside the housing



- Inspect housing, blades, and guards for broken or damaged parts.
- Inspect the clearance of blade tips relative to the fan housing. There should be about 1/4 inch of clearance.
- If the fan housing, fan guards, blade, controller, or cords become damaged, do not operate the fan until repairs have been made.