

Procedure for Field Checking Duct Blaster® B Fans



Introduction

Minneapolis Duct Blaster® 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. These conditions are easily detected and should be reviewed on a regular basis.

Visual Inspection of Duct Blaster Fan

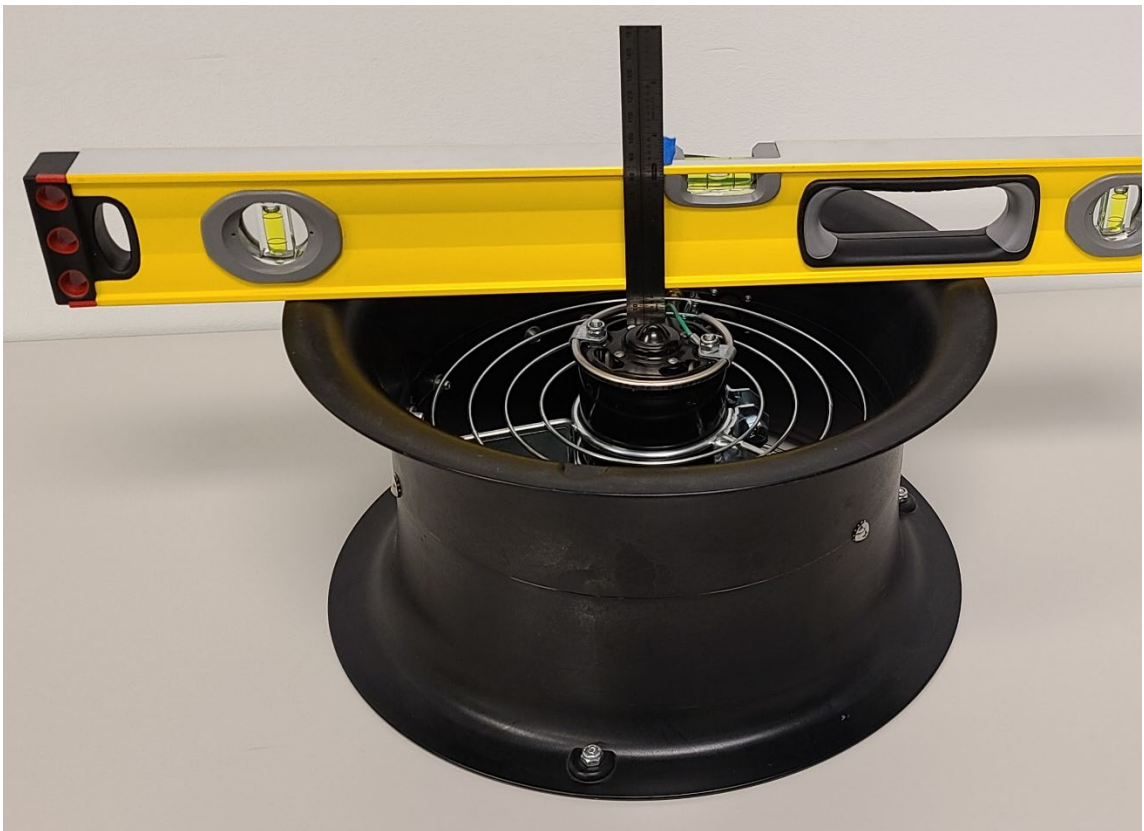
- Inspect the motor mount for cracked or broken parts. These are usually the result of the fan being dropped.
 - Broken Welds
 - Fan rubbing on the housing
 - Damaged fan blades
 - Inspect electrical wiring and electrical connections on the fan and the fan speed controller.
 - If the fan housing, fan guards, blade, controller, or cords become damaged, do not operate the fan until repairs have been made.
 - Examine the motor cooling holes for excessive dust build-up. Use a vacuum with a brush attachment to remove dust or blow out the dust with compressed air.
- **Note: The process of completing a field leak check of the flow sensor on a Duct Blaster is no longer recommended (as it is with a Model 3 Minneapolis Blower Door).** The Duct Blaster has a brazed sensor which is tested when built in the factory and in our experience, we do not observe leaky sensors from damage in the field, even dropped fans. False diagnosis of leaky sensors has caused users to sometimes send back a fan with no issues. The false leaky diagnosis is due to how difficult it is to properly cover the small sensor holes on a duct Blaster fan.
- To confirm operation and measurement of the Duct Blaster fan, the Field Calibration process using the optional field calibration plate can be used. This process is outlined in Appendix A.

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.

Sensor Position Test for Each Fan

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 flow sensor (see photo below). This distance should be in the range of $5/8^{\text{th}}$ s to $7/8^{\text{th}}$ s of an inch (or about 16 – 22 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 $3/4$ " or about 19mm from the flow sensor to the straightedge; it's in the middle of the allowable range.

Appendix A- Duct Blaster B Field Calibration Check Procedure

The following procedure uses a Duct Blaster Field Calibration Plate to perform a field calibration check on your Series B Minneapolis Duct Blaster System (with DG-1000 gauge). The field calibration plate is designed to simulate a duct leakage test with a leakage rate of 106 CFM @ 25 Pascals.

1. Set up the Duct Blaster fan for depressurization testing, with **Ring 3** installed:

- Install the white foam flow conditioner inside the round transition piece (this must always be installed when depressurization testing).
- The round transition piece (with attached flex duct) should be connected to the inlet side of the Duct Blaster fan (using the fan connecting trim), with Ring 3 installed between the round transition piece and the fan inlet. Be sure the connecting trim is securely fastened all the way around the inlet flange of the Duct Blaster fan.
- Be sure the nozzle on Ring 3 is pointing toward the fan motor.



2. Connect the Duct Blaster speed controller to the fan, and plug the speed controller into a power outlet (the controller should be turned off).



3. Install the square transition piece into the open end of the flex duct. Tightly secure the square transition piece to the flex duct using the velcro strap on the end of the flex duct.





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4. Fully extend the flex duct away from the fan. Be sure the flex duct is straight, completely extended, and there are no kinks or bends in the flex.

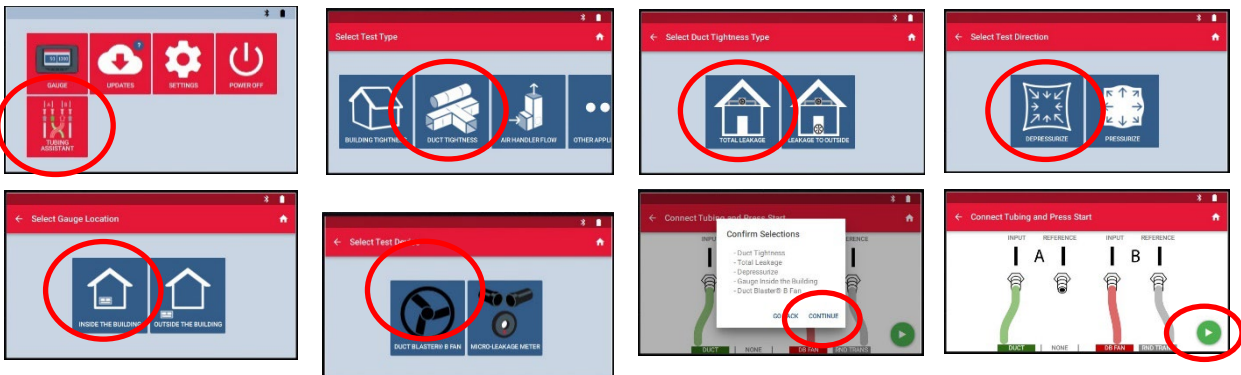


5. Tape the field calibration plate to the end of the square transition piece:

- Line up the outside edge of the calibration plate with the outside edge of the square transition piece.
- Orient the calibration plate so that the label side of the plate (textured surface) is facing out and the smooth side is facing toward the inside of the flex duct.
- Tape the calibration plate to the square transition piece along the entire seam.
- Make sure there are no obstructions in front of the calibration plate.

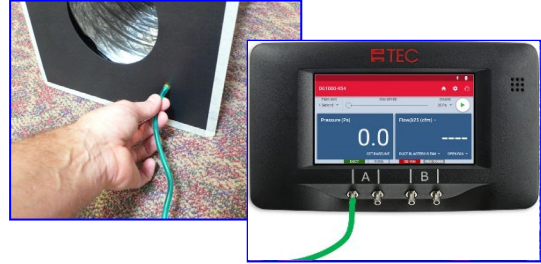


6. Turn on the DG-1000 and choose TUBING ASSISTANT:



7. Connect tubing to the DG-1000 gauge:

- Connect a piece of tubing from the pressure tap on the calibration plate to the Channel A Input tap.



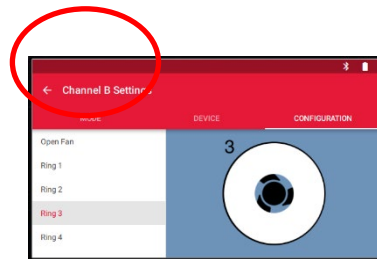
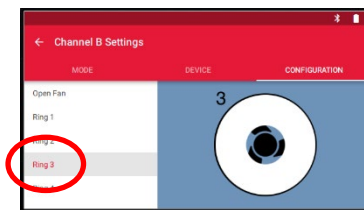
- Connect a 2nd piece of tubing from the brass tap on the Duct Blaster fan to the Channel B Input tap.



- Connect a 3rd piece of tubing from the plastic tap on the round transition piece to the Channel B Reference tap.



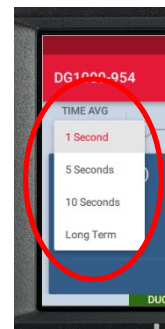
8. Touch the Ring Configuration area and select Ring 3.



- Make sure the DG-1000 is located away from the air flow that will be exiting the Duct Blaster fan.

9. Turn on the Duct Blaster fan and take a flow reading from the field calibration plate:

- Turn on the Duct Blaster fan by slowing turning the knob on the fan controller clockwise.
- Adjust the fan until the pressure displayed on **Channel A** is 25 Pa (between 24.5 Pa and 25.5 Pa is acceptable).
- Once the fan speed is adjusted appropriately, set the DG-1000 gauge to take 10 second average readings. This done by pressing **TIME AVG**.
- After 10 seconds, read the flow value displayed on **Channel B** and write it down on a recording form (a sample form is located at the end of this document). In the photo to the right, the flow reading is 105 CFM.



10. Determine if flow reading is within the acceptable range:

- If the flow reading is between 103 and 109 CFM (while Channel A is between 24.5 and 25.5 Pa), the Duct Blaster System (fan and gauge) passes the field calibration check. No additional calibration of the System is needed at this time.
- If the flow reading is less than 103 CFM, or greater than 109 CFM, then the Duct Blaster System fails the field calibration check, and the operator should consult the Troubleshooting Guide below.

Troubleshooting Guide (Duct Blaster System failed the field calibration check).

- a) Make sure the tubing connections are correct (see Item 6 above).
- b) Check tubing for leaks or blocked or pinched tubing. Replace pinched or leaky tubing.
- c) Make sure you have correctly installed Ring 3 on the Duct Blaster fan in the depressurization mode (see Item 1 above).
- d) Make sure you have the correct settings entered into the DG-1000 (see Item 7 above). Also be sure that air flow from the Duct Blaster fan is not blowing on the DG-1000 gauge.
- e) Make sure the flex duct is straight and fully extended (see Item 4 above).
- f) Make sure there are no obstructions in front of the calibration plate.
- g) If the flow reading is high (greater than 109 CFM), check for leaks in the flex duct. Seal flex duct leaks if found, or replace flex duct.

Repeat the field calibration check. If the Duct Blaster System still fails, send the Duct Blaster System (including the DG-1000 gauge) to The Energy Conservatory for repairs and/or calibration adjustment. Please include a letter indicating the flow value measured during your field calibration check, as well as billing, shipping and contact information.

