

**READ AND SAVE THESE INSTRUCTIONS**  
**INSTALLATION, OPERATING INSTRUCTIONS & PARTS MANUAL**  
**Centrifugal Downblast Exhaust Fan**  
**Belt Driven for Roof & Wall Mounting**

Electrical wiring and connections should be done in accordance with local ordinances and the National Electric Code, NFPA70. Be sure the voltage and phase of the power supply and the wire amperage capacity is in accordance with the motor nameplate. For additional safety information refer to AMCA publication 410-96, *Recommended Safety Practices for Users and Installers of Industrial and Commercial Fans*.

**Receiving and Inspection**

Upon receiving unit, check for any damage and report it immediately to the carrier. Also check that all accessory items are accounted for.



**GENERAL SAFETY INFORMATION**

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment and other potential hazards. Special considerations resulting from high winds or seismic activity may be required. Consult with a licensed professional engineer for more information if necessary.

1. Wheel must be free to rotate and should not strike or rub any stationary object.
2. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and the National Fire Protection Association (NFPA), where applicable.
3. Motor must be securely and adequately grounded.
4. Fan wheel should not run at speeds higher than specified for motor furnished (see product catalog) with the ventilator at any given HP. Adjustments to fan speed significantly effect motor load. If the fan RPM is changed, the motor current should be checked to be sure it is not exceeding the motor nameplate amps.
5. Always disconnect power before working on or near a fan. Lock and tag the disconnect switch or breaker to prevent accidental power up.
6. Caution-when servicing fan, motors may be hot enough to cause pain or injury. Allow motor to cool before servicing.
7. Secure the power cable to prevent contact with sharp objects.
8. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces or chemicals.
9. Make certain that the power source is compatible with the requirements of your equipment.

## INSTALLATION

### **WARNING: DISCONNECT POWER BEFORE INSTALLING OR SERVICING.**

Caution: Do not raise ventilator by the apron, motor or bearings – use a sling or platform.

#### **Roof Mounting**

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. If a backdraft damper is required, it should be secured within the curb using sheet metal screws, to the bottom of a damper box or damper support flanges located below the roof deck.
3. Normally the power cord is brought through the conduit tube located between the curb cap and the bottom of the motor compartment.
4. Secure ventilator curb through vertical portion of the ventilator base assembly flange using a minimum of eight (8) lug screws, anchor bolts, or other suitable fasteners (not furnished). Shims may be required depending upon curb installation & roofing material.
5. Before connecting fan motor to power source verify power line wiring is de-energized.
6. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
7. Before powering up fan check ventilator wheel for free rotation. Re-center if necessary.
8. Check all fasteners for tightness.
9. Re-install motor dome.

#### **Wall Mounting**

1. The same instructions, warnings and notes found under Roof Mounting section will apply. Refer to steps 2 and 3, and steps 5 through 8.
2. Masonry Wall:  
Around the wall opening install an angle iron frame at least 2" x 2" x 1/4". Frame should be approximately 1/4" smaller than the inside base dimension of the ventilator. Secure the lead cinch type anchors with non-ferrous bolts (3 per side). The ventilator should be mounted to the mounting angle with self-taping sheet metal screws (3 per side).
3. Wood Sidings:  
Around the wall opening install a wooden frame 2" high x 2" wide. Frame should be approximately 1/4" smaller than the inside base dimension of the ventilator. Secure with counter-sunk expansion type lag bolts (3 per side). The ventilator should then be mounted to the mounting frame with the square head wood screws (3 per side) 3/8" minimum.
4. The mounting flange connections should be coated with a suitable caulking compound or an approved waterproof mastic sealer.
5. Wall mount application is not recommended from fans 30" or larger.

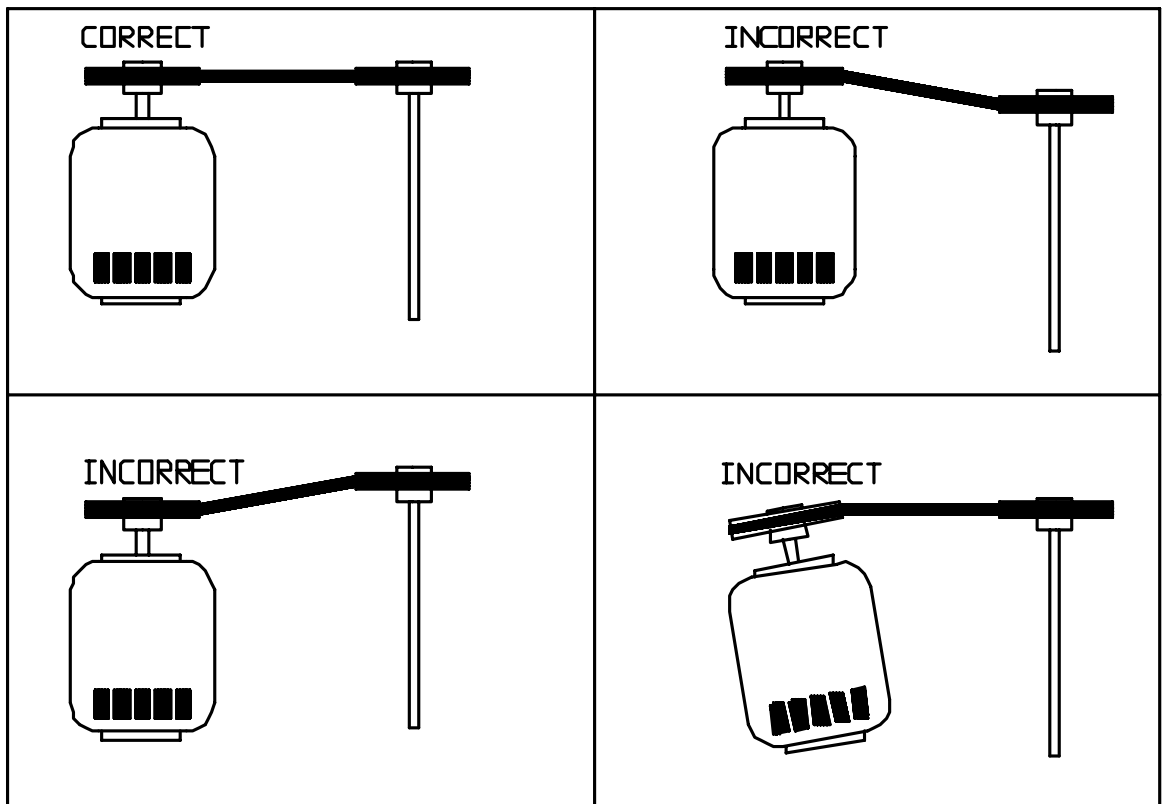
**IMPORTANT: OSHA REGULATIONS REQUIRE THE VENTILATOR TO BE MOUNTED AT LEAST SEVEN (7) FEET ABOVE GROUND OR FLOOR LEVEL, unless suitably guarded to prevent injury from rotating impeller.**

## OPERATION

1. Before starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.
2. Start the fan up and shut it off immediately to check rotation of the wheel with the directional arrow in the motor compartment. Fan wheel should rotate *counter-clockwise* when viewed from the *top*. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation.
3. When the fan is started up, observe the operation and check for any unusual noises.
4. Measure fan speed with a reliable tachometer. Motor sheave (pulley) is variable pitch, and allows for adjustment down from the RPM shown in the catalog. Excessive speed will result in motor overloading.
5. With the air system in full operation and all ducts attached, measure the current input to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.
6. Once the rpm of the ventilator has been properly set, disconnect power and recheck belt tension and pulley alignment as described below.
7. Keep inlets and approaches to the ventilator clean and free from obstruction.

## PULLEY ALIGNMENT

Pulley alignment is adjusted by loosening the motor pulley or driven pulley set screws and moving the pulley on the shaft. See Fig. 2. A straight edge should be used when aligning pulleys.



## BELT TENSION

Belt tension should be checked after the first 48 hours of fan operation. Do not tension belts by changing the setting of the motor pulley, this will change the fan speed and may damage the motor.

To re-tension belts, with the power to the fan motor OFF. Loosen the fasteners that hold the motor to the motor mounting plate. Slide the motor to the left or right to adjust the belt tension. Belt tension should be adjusted to allow 1/64" of deflection per inch of belt span. See Fig. 3. Exercise extreme care when adjusting V-belts as not to misalign pulleys. Any misalignment will cause a sharp reduction in belt life and produce squeaky noises. Overtightening will cause excessive belt and bearing wear as well as noise. Too little tension will cause slippage at startup and uneven wear. **Whenever belts are removed or installed, never force belts over pulleys without loosening motor first to relieve belt tension.**

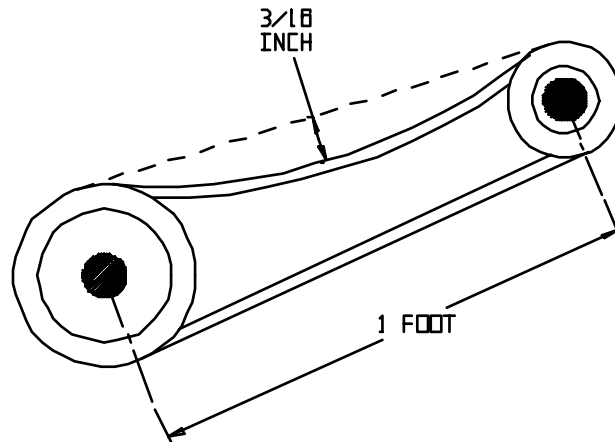


Fig. 3

## MOTOR PULLEY ADJUSTMENT

The adjustable motor pulley is factory set for the RPM specified. Speed can be increased by closing or decreased by opening the adjustable motor sheave. Two groove variable pitch pulleys must be adjusted an equal number of turns open or closed. Any increase in speed represents a substantial increase in horsepower required by the unit. Motor amperage should always be checked to avoid serious damage to the motor when the speed is varied.

## MAINTENANCE

**WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED.**

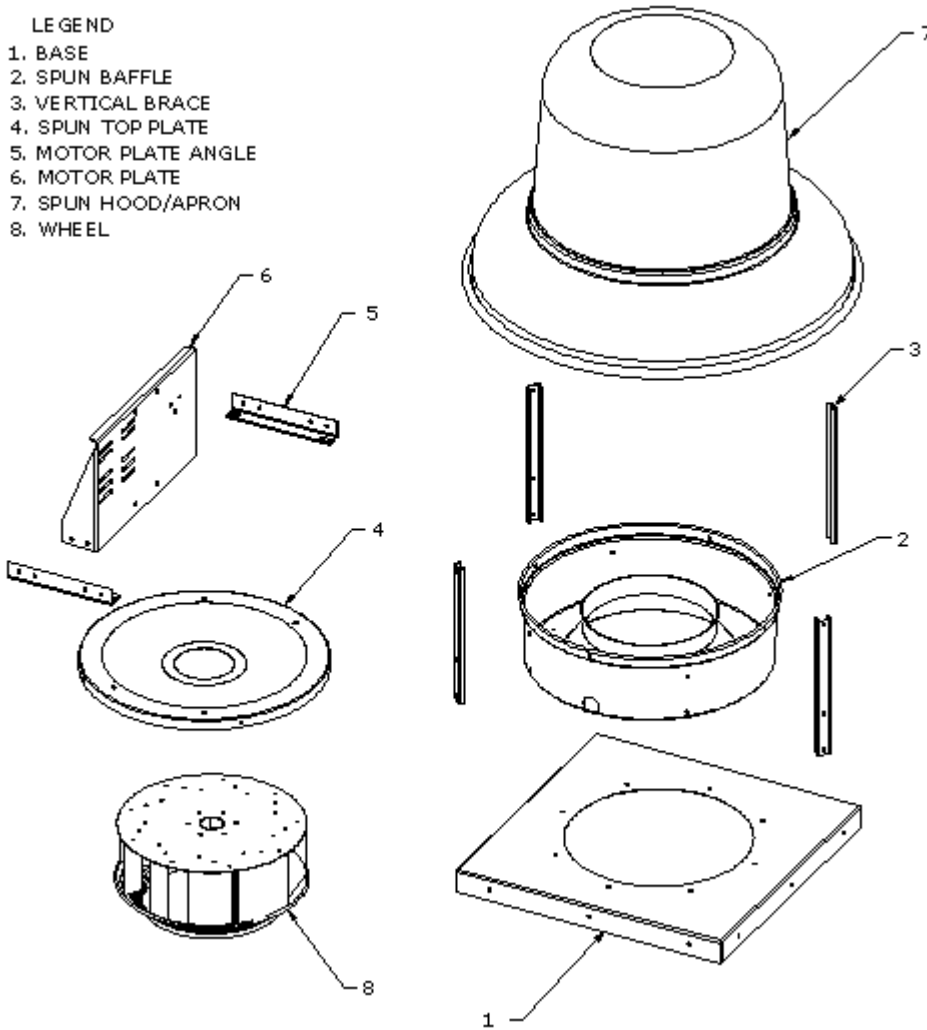
1. Fan inlet and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically, if they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. **Caution: Use care when touching the exterior of an operating motor. Motors normally run hot and may be hot enough to be painful or cause injury.**
3. Belt tension should be checked after two days of fan operation and each season thereafter. See instructions elsewhere in this manual. Over-tightening will cause excessive bearing wear and noise. Too little tension will cause slippage at startup and uneven wear.
4. To remove motor or Impeller:
  - a. Remove motor hood, and electric wire from switch or junction box.
  - b. Remove the fastening bolts and nuts that secure the top plate to the supporting braces and remove the entire assembly from the housing.
  - c. Loosen setscrew(s) on wheel hub to slip fan impeller from shaft.
  - d. To remove motor, remove retaining bolts and nuts on motor mounting plate.
5. Wheels require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.
6. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.

## TROUBLESHOOTING CHART

<b>Problems and Potential Cause</b>
<p><b>Fan Inoperative</b></p> <ul style="list-style-type: none"> <li>• Open circuit breaker or overload in starter set too low. Reset circuit breaker or check setting of overload.</li> <li>• Motor wired incorrectly. Check motor wiring to wiring diagram located on fan motor.</li> </ul>
<p><b>Insufficient Air or Pressure</b></p> <ul style="list-style-type: none"> <li>• Fan rotating in the wrong direction. Be sure fan is rotating counter clockwise looking down on drives.</li> <li>• Poor inlet conditions. There should be a straight clear duct at the inlet.</li> <li>• Be sure duct access doors are closed and dampers are operating properly.</li> </ul>
<p><b>Excessive Vibration and Noise</b></p> <ul style="list-style-type: none"> <li>• Belts too loose, worn or oily. Inspect and replace if needed.</li> <li>• Misaligned pulleys. Refer to “Pulley Alignment” section.</li> <li>• Fan speed is too high. Refer to “Motor Pulley Adjustment” section.</li> <li>• Fan rotating in the wrong direction. Be sure fan is rotating counter clockwise looking down on drives.</li> <li>• Bearings need lubrication or replacement.</li> <li>• Damaged or unbalanced wheel.</li> <li>• Fan is operating in the unstable region of the fan curve.</li> </ul>
<p><b>Motor Overload</b></p> <ul style="list-style-type: none"> <li>• Fan rotating in the wrong direction. Be sure fan is rotating counter clockwise looking down on drives.</li> <li>• Fan speed is too high. Refer to “Motor Pulley Adjustment”.</li> <li>• Motor wired incorrectly. Check motor wiring to wiring diagram located on fan motor.</li> <li>• Overload in starter set too low.</li> <li>• Louvers in motor cap blocked.</li> </ul>

## PARST LIST

- LEGEND
1. BASE
  2. SPUN BAFFLE
  3. VERTICAL BRACE
  4. SPUN TOP PLATE
  5. MOTOR PLATE ANGLE
  6. MOTOR PLATE
  7. SPUN HOOD/APRON
  8. WHEEL



### *Warranty*

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if 1) the equipment is not installed by a qualified installer per the SELLER'S installation instructions (a copy of which is shipped with the product), 2) the equipment is not installed in accordance with federal, state and local codes and regulations, 3) the equipment is misused or neglected, 4) the equipment is not operated within its published capacity, 5) the invoice is not paid within the terms of the sales agreement.

The SELLER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the SELLER, such part will be repaired or replaced by SELLER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without SELLER'S prior authorization and all returned equipment shall be shipped by the BUYER, F.O.B. manufacturer freight prepaid.

Rev 3 04/2003