

Throughout this manual, there are a number of HAZARD WARNINGS that must be read and adhered to in order to prevent possible personal injury and/or damage to equipment. Two signal words "WARNING" and "CAUTION" are used to indicate the severity of a hazard and are preceded by the safety alert symbol.

**⚠ WARNING**

Used when serious injury or death MAY result from misuse or failure to follow specific instructions.

**⚠ CAUTION**

Used when minor or moderate injury or product / equipment damage MAY result from misuse or failure to follow specific instructions.

It is the responsibility of all personnel involved in installation, operation and maintenance to fully understand the

⚠ Warning and ⚠ Caution procedures by which hazards are to be avoided.

## Introduction

The purpose of this manual is to provide instructions which supplement good general practices when installing or operating fans manufactured by Twin City Fan & Blower. It is the responsibility of the purchaser to provide qualified personnel experienced in the installation, operation and maintenance of air moving equipment.

Always follow good safety practices when installing, maintaining and operating your air moving equipment. A variety of safety devices are available. It is the user's responsibility to determine adequate safety measures and to procure the required safety equipment.

## Shipping and Receiving

All Twin City Fan & Blower products are carefully constructed and inspected before shipment to insure the highest standards of quality and performance. When received, all components should be compared to the bill of lading or packing list to verify that the proper unit was received. Each unit should be checked for any damage which may have occurred in transit. Any damage should be reported immediately to the carrier and the necessary damage report filed.

## Unit Storage

If fan installation is to be delayed, store the unit in a protected area. Protect the fan and motor bearings from moisture and vibration (or shock loading). For extended storage, wrap entire unit in plastic.

## Installation

### Panel Fans

Panel fans can be installed a number of different ways. See Figure 1 for typical installation arrangements. If dampers are used, they should be installed first. Then the panel can be mounted and the motor wired.

Figure 1. Typical Panel Fan Installation Arrangements

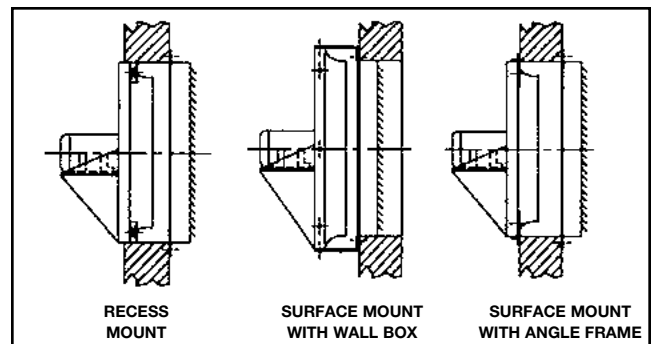


Figure 2. Typical Power Roof Ventilator Installation Arrangements

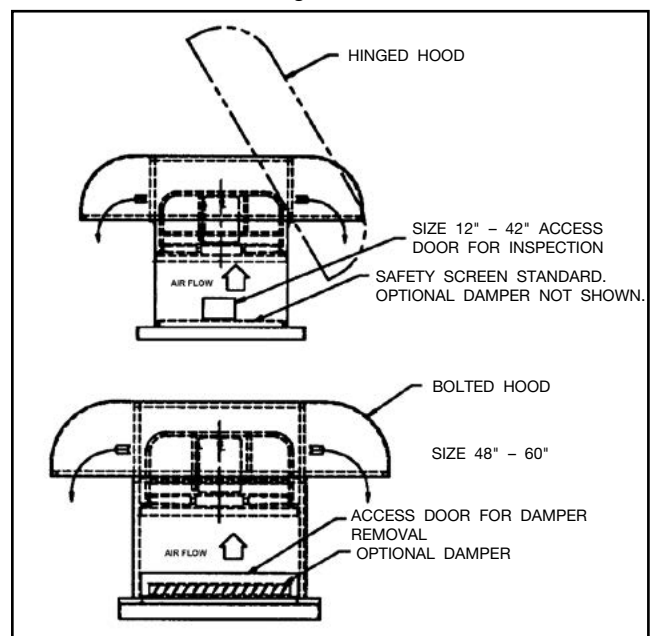
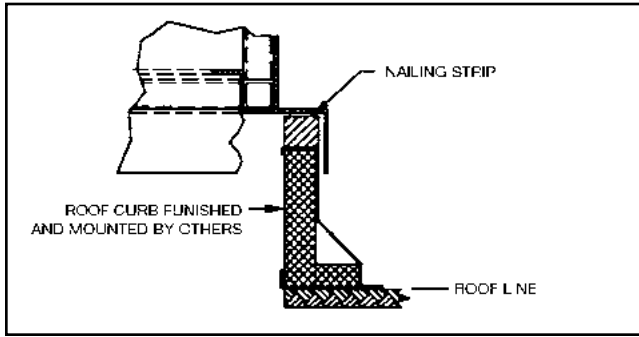


Figure 3. Mounting Roof Ventilator to Curb Cap



### Power Roof Ventilators

See Figure 2 for typical installation arrangements and Figure 3 for mounting to curb cap.

#### Opening and Closing Hood

For sizes 12"–42", a one-piece hinged hood is standard. To lift the hood, remove the two bolts located under the mushroom cap and prop the hood up with the supplied safety rods. Push and lock into place. A screw is installed at the end of the pin side of the hinge in the hood angle to prevent accidental removal of the hood. To close the hood, replace the bolts to lock in place.

For size 48", a one-piece bolted hood connects directly to the fan stack. To lift the hood off the unit, remove the bolts located under the mushroom cap.

For sizes 54"–72", a two-piece bolted hood connects directly to the fan stack. To lift the hood off the unit, remove the sheet metal bolts that connect the right and left sides of the hood and then remove the bolts located under the mushroom cap.

#### Access To Dampers

A bolted access door is standard to provide access to dampers.

#### Access To Wheel

Depending on fan size, wheels can either be removed through the access door with the fan still mounted in the hood or the fan can be lifted out of the unit and the wheel removed.

### General Motor Maintenance

The three basic rules of motor maintenance are to keep the motor (1) clean, (2) dry, and (3) properly lubricated. Blow dust off periodically (with low pressure air) to prevent the motor from overheating.

Some smaller motors are lubricated for life. Motors less than 10 HP running about eight hours a day in a clean environment should be lubricated once every five years; motors 15 to 40 HP, every 3 years; and motors 50 to 150 HP, yearly. For motors in dusty or dirty environments or running 24 hours a day, divide the service interval by 2. If the environment is very dirty or high temperatures exist, divide the service interval by 4. Lubrication requirements are normally attached to the motor. Do not over-lubricate.

### Drive Maintenance

V-belt drives need periodic inspection and occasional belt replacement. When inspecting drives, look for dirt buildup, burrs or obstructions which can cause premature belt or drive replacement. If burrs are found, use fine emery cloth or a stone to remove the burr. Be careful that dust does not enter the bearings.

Check sheaves for wear. Excessive slippage of belts on sheaves can cause wear and vibration. Replace worn sheaves with new ones. Carefully align sheaves to avoid premature sheave failure.

Observe belts for wear. If fraying or other wear is observed to be mostly on one side of the belts, the drives may be misaligned. Re-install the drives according to the following instructions:

1. Slip (do not pound) the proper sheave onto the corresponding shaft.

 **CAUTION**

**Placing fan sheave on motor can overspeed wheel and cause structural failure.**

2. Align sheaves with a straightedge extended along the sheaves, just making contact in two places on the outside perimeters of both sheaves.
3. Tighten down sheave bolts.
4. Install a matched set of bolts. Slide the motor to obtain slack and tighten the belts. Using a pry will damage the belts.
5. Tighten the belts to the proper belt tension. Ideal tension is just enough tension so that belts do not slip under peak load. Recheck sheave alignment.
6. After initial installation of the belts, recheck the belt tension after a few days and adjust it if necessary. (New belts require a break-in period of operation.) Never use belt dressing on any belts.

### Bearing Maintenance

Proper lubrication of belt drive bearings helps assure maximum bearing life. All fans are equipped with decals indicating relubrication intervals for normal operating conditions. However, every installation is different and the frequency of relubrication should be established accordingly. Observation of the condition of the grease expelled from the bearings at the time of relubrication is the best guide as to whether regreasing intervals and amount of grease added should be altered.

Greases are made with different bases. There are synthetic base greases, lithium base, sodium base, etc. Avoid mixing greases with different bases. They could be incompatible and result in rapid deterioration or breaking down of the grease.

All bearings are filled with lithium grease before leaving the factory. When the fans are started, the bearings may discharge excess grease through the seals for a short period of time. Do not replace the initial discharge because leakage will cease when the excess grease has worked out. The bearings may run hotter during this period but temperatures should recede within 48 hours.

When relubricating, use a sufficient amount of grease to purge the seals. Rotate bearings by hand during relubrication.

## Operation Checklist



### WARNING

**Verify that proper safety precautions have been followed. Electrical power must be locked off.**

#### **Fan Mechanism Components Are Ready**

- Nuts, bolts and setscrews are tight.
- Mounting connections are properly made and tightened.
- Bearings are properly lubricated.
- Wheel, drives and fan surfaces are clean and free of debris.
- Rotating assembly turns freely by hand.
- Drives are on correct shafts, properly aligned, and properly tensioned.

#### **Fan Electrical Components Are Ready**

- Motor is wired for proper supply voltage.
- Motor was properly sized for power of rotating assembly.
- Motor is properly grounded.
- All leads are properly insulated.

#### **Trial "Bump": Turn on power just long enough to start assembly rotating.**

- Check rotation for agreement with rotation arrow.
- Listen for any unusual noise.
- Run unit up to speed.
- Bearing temperatures are acceptable after one to two hours of operation (< 150°F).
- Vibration levels are acceptable.

#### **After One Week of Operation**

- Check all nuts, bolts and setscrews and retighten if necessary.
- Readjust drive tension if necessary.

**Visit [www.tcf.com](http://www.tcf.com) to view all of Twin City Fan & Blower's  
Installation Manuals and Fan Engineering Topics.**



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