



THE NEW YORK BLOWER COMPANY
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INSTALLATION MAINTENANCE, OPERATING INSTRUCTIONS

IM-210

HOODED ROOF VENTILATORS UPBLAST ROOF VENTILATORS

A WORD ABOUT SAFETY

Air moving equipment involves electrical wiring, moving parts, sound, and air velocity or pressure which can create safety hazards if the equipment is not properly installed, operated and maintained. To minimize this danger, follow these instructions as well as the additional instructions and warnings on the equipment itself.

All installers, operators and maintenance personnel should study AMCA Publication 410, "Recommended Safety Practices for Air Moving Devices". Additional copies can be obtained by writing to The New York Blower Company, 7660 Quincy Street, Willowbrook, IL 60527.

ELECTRICAL DISCONNECTS

Every ventilator should have an independent disconnect switch to isolate the unit from the electrical supply. It should be near the unit and must be capable of being locked by maintenance personnel while servicing, in accordance with OSHA procedures.

MOVING PARTS

All moving parts must have guards to protect personnel. Safety requirements vary, so the number and type of guards needed to meet company, local and OSHA standards must be determined and specified by the user. Never start a ventilator without having all safety guards installed. Check regularly for damaged or missing guards and do not operate with guards removed. Ventilator propellers can also become dangerous because of potential "windmilling", even though all electrical power is disconnected. Always block the rotating assembly before working on any moving parts.

SOUND

Some fans can generate sound that could be hazardous to exposed personnel. It is the responsibility of the system designer and user to determine sound levels of the system, the degree of personnel exposure, and to comply with applicable safety requirements to protect personnel from excessive noise. Consult **nyb** for fan sound power level ratings.

AIR PRESSURE AND SUCTION

In addition to the normal dangers of rotating machinery, ventilators present another hazard from the suction created at the inlet. This suction can draw materials into the propeller where they become high velocity projectiles at the outlet. It can also be extremely dangerous to persons in close proximity to the inlet, as the forces involved can overcome the strength of most individuals. Inlets that are not ducted should be screened to prevent entry and discharge of solid objects.

RECEIVING AND INSPECTION

The roof ventilator and accessories should be inspected on receipt for any shipping damage. Turn the propeller by hand to see that it rotates freely and does not bind. If a back draft damper is provided, check this accessory for free operation of all moving parts.

F.O.B. factory shipping terms require that the receiver be responsible for inspecting the equipment upon arrival. Note damage or shortages on the Bill of Lading and file any claims for damage or loss in transit. **nyb** will assist the customer as much as possible; however, claims must be originated at the point of delivery.

HANDLING AND STORAGE

Ventilators should be lifted by the base using a platform or with a sling. Never lift the unit by the propeller, shaft, motor, motor bracket, housing inlet, outlet, or any part not designed for lifting. A spreader should always be used to avoid damage.

Whenever possible, ventilators and accessories should be stored in a clean, dry location to prevent damage. If outdoor storage is necessary, protection should be provided. Cover the inlet and outlet to prevent the accumulation of dirt and moisture in the housing. Cover motors with waterproof material. Refer to the bearing section for further storage instructions.

Check back draft dampers for free operation and lubricate moving parts prior to storage. Inspect the stored unit periodically. **Rotate the propeller by hand every two weeks to redistribute grease on internal bearing parts.**

VENTILATOR INSTALLATION

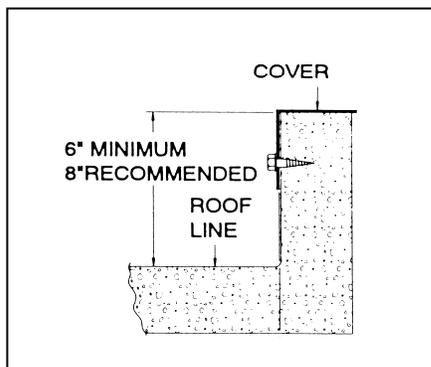
nyb propellers are dynamically balanced when fabricated. Complete units are test run at the operating speed to check the entire assembly for conformance to nyb vibration limits. Nevertheless, all units must be adequately supported for smooth operation. Ductwork should be independently supported, as excess weight may distort the housing and cause contact between moving parts.

Roof ventilators are designed for mounting on curbs. Curbs should be constructed to support the weight of the unit and accessories. Roof curbs supplied by nyb are recommended. Curb tops should be level with ample material for fastening to the unit.

Move the ventilator to its mounting location and lower it over the curb. Tap the base until the unit rests flat on the curb.

A minimum of eight (8) lag screws - two on each side - near corners, are required to fasten the ventilator to the curb. Neoprene washers and flat washers are recommended for leak integrity. Tighten all screws securely.

Guy wire bracing must be provided when necessary on large units to prevent side sway.



V-BELT DRIVE

Installation - Non-packaged Units/Replacement

1. Remove all foreign material from the ventilator and motor shafts. Coat shafts with machine oil for easier mounting.
2. Mount sheaves on shafts after checking sheave bores and bushings for nicks or burrs. Avoid using force. If resistance is encountered, lightly polish the shaft with emery cloth until the sheave slides on freely.
3. Adjust the motor on its base to a position closest to the ventilator shaft. Install belts by working each one over the sheave grooves until all are in position. Never pry the belts into place. Sufficient motor adjustment is provided for easy installation of the proper size belts.
4. Adjust the sheaves and the motor shaft angle so that the sheave faces are in the same plane. Check this by placing a straightedge across the faces of the sheaves. Any gap between the edge and sheave faces indicates misalignment.

Important: This method is only valid when the width of the surface between the belt edge and the sheave face is the same for both sheaves. When they are not equal, or when using adjustable-pitch sheaves, adjust so that all belts have approximately equal tension. Both shafts should be at right angles to the center belt.

Belt Tensioning

1. Check belt tension with a tensioning gage and adjust using the motor slide base. Insufficient tension shortens belt life, can reduce unit performance and may cause vibration. Excess tension shortens bearing life. The lowest allowable tension is that which prevents slippage under full load. Belts may slip during start-up, but slipping should stop as soon as the ventilator reaches full speed. For more precise tensioning methods, consult the drive manufacturer's literature.
2. Recheck setscrews, rotate the drive by hand and check for rubbing, then complete the installation of all guards.
3. Belts tend to stretch somewhat after installation. Recheck tension after several days of operation. Check sheave alignment, as well as setscrew and/or bushing bolt tightness.

START-UP

Safe operation and maintenance includes the selection and use of appropriate safety accessories for the specific installation. This is the responsibility of the system designer and requires consideration of equipment location and accessibility as well as adjacent components. All safety accessories must be installed properly prior to start-up. Safe operating speed is a function of system temperature and propeller design. Do not under any circumstances exceed the maximum safe unit speed.

Procedure

1. If the drive components are not supplied by nyb, verify with the manufacturer that the starting torque is adequate for the speed and inertia of the propeller.
2. Inspect the installation prior to starting. Check for any loose items or debris that could be drawn into the ventilator or dislodged by the discharge. Check the interior of the housing as well. Turn the propeller by hand to check for binding.
3. Check the drive installation and belt tension.
4. Check the tightness of all setscrews, nuts and bolts. When furnished, tighten hub setscrews.
5. Install all remaining safety devices and guards. Verify that the supply voltage is correct and wire the motor. "Bump" the starter to check for proper rotation.
6. Setscrews should be rechecked after a few minutes, eight hours and two weeks of operation (see Table 1 for correct tightening torques).

NOTE: Shut the ventilator off immediately if there is any sudden increase in vibration.

PROPELLER SETSCREW TORQUES

Setscrew Size Diameter (in.)	Carbon Steel Setscrew Torque	
	lb.-in.	lb.-ft.
1/4	75	6.2
5/16	144	12
3/8	252	21
7/16	396	33
1/2	600	50

Table 1

VENTILATOR MAINTENANCE

nyb ventilators are manufactured to high standards with quality materials and components. Proper maintenance will ensure a long and trouble-free service life.

Do not attempt any maintenance on a ventilator unless the electrical supply has been completely disconnected and locked. In many cases, the propeller can windmill despite removal of all electrical power. The rotating assembly should be locked securely before attempting maintenance of any kind.

The key to good maintenance is regular and systematic inspection of all parts. Inspection frequency is determined by the severity of the application and local conditions. Strict adherence to an inspection schedule is essential.

Regular maintenance should include the following:

1. Check the propeller for any wear or corrosion, as either can cause catastrophic failures. Check also for the build-up of material which can cause imbalance resulting in vibration, bearing wear and serious safety hazards. Clean or replace the propeller as required.
2. Check the V-belt drive for proper alignment and tension (see section on V-belt drives). If belts are worn, replace them as a set, matched to within manufacturer's tolerances.
3. Ventilators with standard captured bearings in formed housing require no service. Units with optional pillow block bearings have grease fittings. These bearings should be lubricated as specified in the bearing section. Do not over lubricate.
4. During any routine maintenance, all setscrews and bolts should be checked for tightness. See the table for correct torques.
5. When installing a new propeller, it should be positioned in the housing with equal spacing between the edge of the orifice and the propeller blade tips.

PROPELLER BALANCE

Airstreams containing particulate or chemicals can cause abrasion or corrosion of ventilator parts. This wear is often uneven and can lead to significant propeller unbalance over time. When such wear is discovered, the decision must be made to rebalance or to replace the propeller.

The soundness of all parts should be determined if the original thickness of components is reduced. Be sure there is no hidden structural damage. The airstream components should also be cleaned to remove any build-up of foreign material. Specialized equipment can be used to rebalance a cleaned propeller that is considered structurally sound.

Balance weights should be rigidly attached at a point that will not interfere with the housing nor disrupt airflow. Remember that centrifugal forces can be extremely high at the outer radius of a propeller blade.

BEARINGS

Storage

Any stored bearing can be damaged by condensation caused by temperature variations. Therefore, **nyb** bearings are filled with grease at the factory to exclude air and moisture. Such protection is adequate for shipment and subsequent immediate installation. **Rotate the propeller by hand at least every two weeks to redistribute grease on internal bearing parts.**

Ventilators with standard captured bearings in formed metal housing require no service.

Ventilators with optional pillow block bearings should be purged with new grease to remove condensation, since even a filled bearing can accumulate moisture. Use caution when purging, as excessive pressure can damage the seals. Rotate the shaft while slowly adding grease.

Operation - Optional Pillow block bearings

Check setscrew torque before start-up. Since bearings are completely filled with grease at the factory, they may run at an elevated temperature during initial operation. Surface temperatures may reach 180°F. and grease may bleed from the bearing seals. This is normal and no attempt should be made to replace lost grease. Bearing surface temperatures will decrease when the internal grease quantity reaches a normal operating level. Relubrication should follow the recommended schedule.

Lubrication - Optional pillow block bearings

Use the table for relubrication scheduling according to operating speed and shaft diameter. Bearings should be lubricated with a premium quality lithium-based grease conforming to NLGI Grade 2. Examples are:

Mobil	-	Mobilgrease XHP
Texaco	-	Premium RB
Chevron	-	Amolith #2
Shell	-	Alvania #2

Do not use "high temperature" greases, as many are not formulated to be compatible with fan bearings. Add grease to the bearing while rotating the shaft by hand. Add just enough grease to cause a slight purging at the seals. Do not over lubricate. **Disposal of material should be made in accordance to local government regulations.**

BEARING LUBRICATION INTERVAL [months]

Shaft	RPM	
	1-1 000	1001 -2000
5/8" - 1"	6	5-6

Sealmaster, McGill, Link-Belt and SKF.

NOTE:

1. **These are general recommendations only; specific manufacturer's recommendations may vary slightly.**
2. **Assumes clean environment, -20°F. to 120°F.**
 - a. **Consult The New York Blower Company for operation below -20°F. ambient.**
 - b. **Ambient temperatures greater than 120°F. will shorten bearing life.**
 - c. **Under extremely dirty conditions, lubricate more frequently.**
3. **Assumes horizontal mounting configuration. For vertically mounted applications, lubricate twice as frequently.**

Replacement

If captured bearings need replacement, install new bearings into neoprene rings, check correct position of propeller with orifice, position bearings in die-formed recess and tighten setscrews. Replace die-formed bearing cap and tighten four bolts.

If locking collar type bearing is used, collar must first be positioned against inner race on bearing nearest propeller and turned in direction of propeller rotation with drift pin and hammer until it locks. Locking collars must be on inboard (facing) sides of the bearings. Secure bearing to shaft with setscrew. Lock and secure other bearing to shaft in same manner.

COMMON VENTILATOR PROBLEMS

Excessive Vibration

A common complaint regarding industrial ventilators is "excessive vibration". **nyb** is careful to ensure that each unit is precisely balanced prior to shipment; however, there are many other causes of vibration including:

1. Loose mounting bolts, setscrews, or bearings.
2. Misalignment or excessive wear of bearings.
3. Misaligned or unbalanced motor.
4. Bent shaft due to mishandling or material impact.
5. Accumulation of foreign material on the propeller.
6. Excessive wear or erosion of the propeller.
7. Excessive system pressure or restriction of airflow due to closed dampers.
8. Inadequate structural support, mounting procedures or materials.
9. Externally transmitted vibration.

Inadequate Performance

1. Incorrect testing procedures or calculations.
2. Ventilator running too slowly.
3. Propeller rotating in wrong direction.
4. Propeller not properly centered relative to inlet.
5. Poor system design, closed dampers, air leaks, clogged filters, or bird screens, snow.
6. Obstructions or sharp elbows near inlets.
7. Sharp deflection of airstream at outlet.

Excessive Noise

1. Ventilator operating near "stall" due to incorrect system design or installation.
2. Vibration originating elsewhere in the system.
3. System resonance or pulsation.
4. Improper location or orientation of intake and discharge.
5. Inadequate or faulty design of supporting structures.
6. Nearby sound reflecting surfaces.
7. Loose accessories or components.
8. Loose drive belts.
9. Worn bearings.

Premature Component Failure

1. Prolonged or major vibration.
2. Inadequate or improper maintenance.
3. Abrasive or corrosive elements in the airstream or surrounding environment.
4. Misalignment or physical damage to rotating components or bearings.
5. Bearing failure from incorrect or contaminated lubricant.
6. Excessive speed.
7. Extreme ambient or airstream temperatures.
8. Improper belt tension.
9. Improper tightening of propeller setscrews.

LIMITED PRODUCT WARRANTY

All products are warranted by **nyb** to be free from defects in materials and workmanship for a period of one (1) year after shipment from its plant, provided buyer demonstrates to satisfaction of **nyb** that the product was properly installed and maintained in accordance with **nyb's** instructions and recommendations and that it was used under normal operating conditions.

This warranty is limited to the replacing and/or repairing by **nyb** of any part or parts which have been returned to **nyb** with **nyb's** written authorization and which in **nyb's** opinion are defective. Parts not manufactured by **nyb** but installed by **nyb** in equipment sold to the buyer shall carry the original manufacturer's warranty only. All transportation charges and any and all sales and use taxes, duties, imports or excises for such part or parts shall be paid for by the buyer. **nyb** shall have the sole right to determine whether defective parts shall be repaired or replaced.

This warranty does not cover any customer labor charges for replacement of parts, adjustments or repairs, or any other work unless such charges shall be assumed or authorized in advance, in writing, by **nyb**.

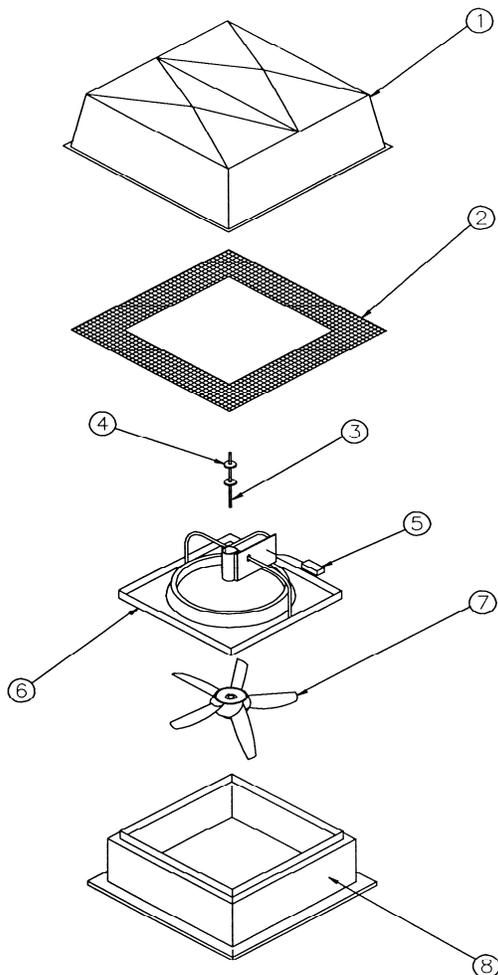
This warranty does not cover any product which, in the judgement of **nyb**, has been subject to misuse or neglect, or which has been repaired or altered outside **nyb's** plant in any way which may have impaired its safety, operation or efficiency, or any product which has been subject to accident.

This warranty shall be null and void if any part not manufactured or supplied by **nyb** for use in any of its products shall have been substituted and used in place of a part manufactured or supplied by **nyb** for such use.

There are no warranties, other than those appearing on the acknowledgement form **INCLUDING NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**, given in connection with the sale of the goods sold hereunder. The buyer agrees that his sole and exclusive remedy, and the limit of **nyb's** liability for loss from any cause whatsoever, shall be the purchase price of the goods sold hereunder for which a claim is made.

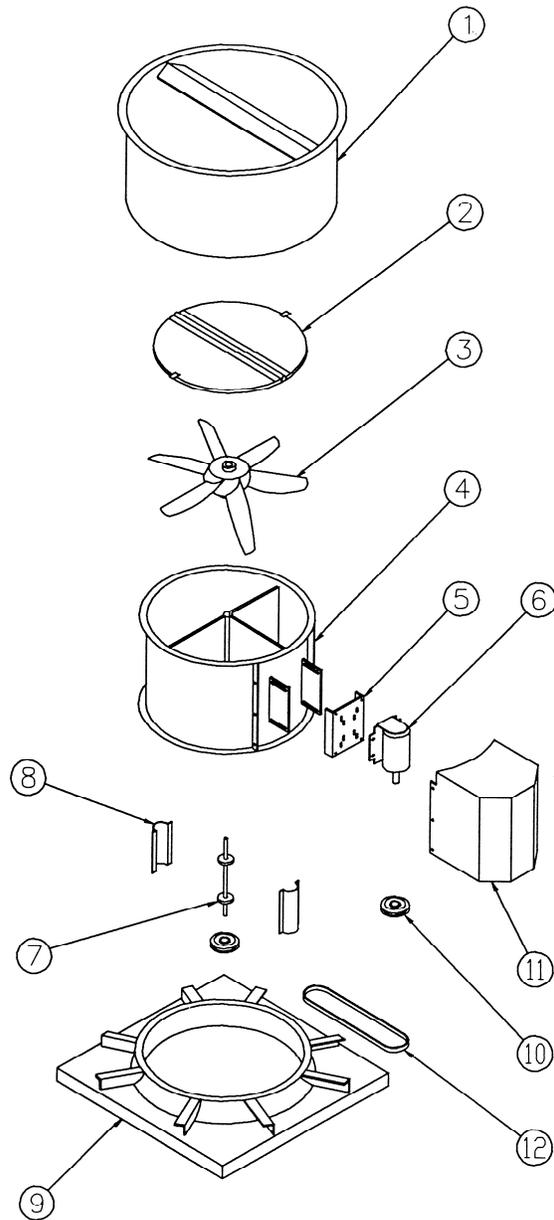
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HOODED ROOF VENTILATOR



Parts List	
1.	Hood
2.	Bird Screen
3.	Shaft
4.	Bearings
5.	Disconnect Switch
6.	Frame & Orifice Assembly
7.	Propeller
8.	Curb Cap Assembly

UPBLAST ROOF VENTILATOR MODEL L



REPLACEMENT PARTS

Parts List

1. Wind Band
2. Butterfly Damper
3. Propeller
4. Housing
5. Motor Base
6. Motor
7. Shaft and Bearing Assembly
8. Bearing Cap
9. Orifice
10. Sheaves
11. Motor Weather Cover
12. V-Belts

It is recommended that only factory-supplied replacement parts be used. nyb parts are built to be fully compatible with the original equipment, using specific alloys and tolerances. These parts carry a standard nyb warranty.

When ordering replacement parts, specify the part name, nyb shop control number, ventilator size, type, arrangement and bearing size or bore. Most of this information is on the nameplate attached to the ventilator base.

Example: Part required: Propeller
 Shop/control number: B-10106-100
 Description: Size L36

Suggested spare parts include:

Propeller	Component Parts: Motor
Shaft	Sheaves
Bearings	V-Belts