



THE NEW YORK BLOWER COMPANY
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INSTALLATION MAINTENANCE, OPERATING INSTRUCTIONS

IM-230

AIR KITS



WORD ABOUT SAFETY

Beginning in June 2012, the above **WARNING** signage has been placed on all **nyb** fans, as specified by ISO and recommended by the European Union. 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", which is included as part of every shipment. Additional copies can be obtained by writing to New York Blower Company, 7660 Quincy St., Willowbrook, IL 60527.

ELECTRICAL DISCONNECTS

Every motor driven fan should have an independent disconnect switch to isolate the unit from the electrical supply. It should be near the fan and must be capable of being locked by maintenance personnel while servicing the unit, 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 fan without having all safety guards installed. Check regularly for damaged or missing guards and do not operate any fan with guards removed. Fans 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, fans present another hazard from the suction created at the fan inlet. This suction can draw materials into the fan 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 and outlets that are not ducted should be screened to prevent entry and discharge of solid objects.



Danger: Do Not Enter/Confined Space

ACCESS DOORS

The above DANGER decal is placed on all **nyb** cleanout doors. These doors, as well as access doors to the duct system, should never be opened while the fan is in operation. Serious injury could result from the effects of air pressure or suction. Quick-opening doors must have the door handle bolts securely tightened to prevent accidental or unauthorized opening. Bolted doors must be tightened for the same reason.

RECEIVING AND INSPECTION

The fan and accessories should be inspected on receipt for any shipping damage. Turn the wheel by hand to see that it rotates freely and does not bind. If dampers or shutters are provided, check these accessories 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

Air Kit components should be lifted carefully. A spreader should be used as necessary to avoid damage to wheels and housings. Fabric slings should be used to handle shafting to avoid causing nicks and burrs.

Whenever possible, components should be stored in a clean, dry location to prevent rust and corrosion. If outdoor storage is necessary, protection should be provided. Cover the entire fan to prevent accumulation of dirt and moisture in the housing. **Bearings should not be stored outside.** Refer to the bearing section for further storage instructions. Inspect the stored unit periodically.

INSTALLATION

Air Kit wheels are dynamically balanced when fabricated. Nevertheless, Air Kits must be adequately supported for smooth operation. **Ductwork or plenums should be independently supported as excess weight may distort the fan housing and cause contact between moving parts.**

Air Kits are designed for smooth operation throughout the cataloged speed range. Vibration levels are dependent upon the rigidity of the support structure on which the fan is mounted. The optimum installation is one in which the Air Kit bearings are bolted directly to the main supporting structural of the particular system (see Figure 1 on page 7). By doing so, the entire machine provides the mass and rigidity necessary to insure smooth operation.

ASSEMBLY

Before assembling the Air Kit check the shaft to be sure it is straight. Slide the bearings on each end of the shaft (do not tighten any set screws). Place the assembly on a clean flat surface. Locate a dial indicator at the center of the shaft and check the run out. It should be less than 0.002.

Prepare the wheel(s) and shaft. **THE SHAFT AND WHEEL HUBS MUST BE CLEAN.** Remove the grease used to protect these parts during shipping. Remove any burrs using a file being careful not to damage the shaft. Remove surface rust and any rough spots using emery cloth. Check that the key fits easily into the shaft and wheel keyway but is snug. Finally remove **all** dirt and filings.

Check the wheel to shaft fit **before** installing the Air Kit. Carefully slide the wheel(s) onto the shaft. **DO NOT FORCE THE WHEEL(S) ONTO THE SHAFT.** Work the wheels back and forth slowly through any rough spots.

Place the wheel(s) into the housing(s) being sure that the rotation is correct. The wheels must rotate in the direction that the forward curved blades are cupped. On a double Air Kit the hubs of each wheel should face each other.

Slide the bearings into place but do not tighten set screws. Note that the expansion bearing requires a floating key. (See Expansion Bearings.) The floating key floats free in the shaft keyway. No other set screw should be used in this bearing which would bind the bearing to the shaft.

Review Figure 1 to determine the correct positioning of the shaft and wheel(s). Keep in mind that Air Kits and plenums are typically custom designed and dimensions/tolerances vary. Some guidelines:

1. On a shaft that is turned down at the bearings, the top of the turndown is typically 1" inside the plenum wall.
2. The entire length of the wheel-hub keyway must be over the shaft keyway.
3. Check wheel/cone gap (see Figure 1). To calculate shaft expansion multiply $0.0000067 \times$ temperature rise in degrees F. \times distance in inches from the wheel hub to the fixed bearing. Double it for stainless steel shafts. Note that the wheel must be offset in the housing to account for this expansion.
4. Check the gap between the expansion bearing and the shaft turndown (see Figure 1). Calculate the expansion using the same method as above except use the distance in inches from the hi-heat bearing to the fixed bearing.
5. Be sure there is enough room for the sheave on the drive end of the shaft.

When all parts are positioned, tighten wheel set screws (Table 1) and the fixed bearing set screws (Table 2). **DO NOT AT ANY TIME TIGHTEN SET SCREWS ON THE EXPANSION BEARING.**

Replace housing heat slinger and cooler guards. **CAUTION:** over tightening the heat slinger may cause it to crack.

DISASSEMBLY

1. First remove the v-belt drive sheave from the shaft.
2. Support the shaft while removing the bearings. The drive end bearing is "fixed" and is secured to the shaft using set screws. The opposite drive end may have a fixed bearing but more likely has a high heat bearing which allows the shaft to expand through the bearing (see Expansion Bearings). This bearing should slide easily off the end of the shaft.
3. If the air kit has shaft cooler assemblies remove the guards and heat slingers.
4. Loosen the set screws which secure the wheel(s) to shaft. Look for skip welds which may have been placed on the shaft adjacent to both sides of the hub. If they exist grind them smooth so that the shaft can slide through the hubs.
5. While securing the wheel(s) slide the shaft out. This may be a tedious process as the wheel(s) may bind along the shaft.
6. Remove the wheel(s) from the housing(s) if they are being replaced. The wheel(s) on fans up to size 22" may be removed through the housing discharge after removing the cutoff sheet from the discharge – on fans 24" and larger, the wheels will need to be removed through the housing side after removing one of the inlet cones. Alternatively the wheel(s) can be removed through an access door in the housing(s) if one has been provided. If necessary an access door can be cut in the housing.

V-BELT DRIVE

Installation

1. Remove all foreign material from the Air Kit shaft. Coat the shaft with machine oil for easier mounting. Mount all guards at this time if partial installation is required prior to sheave 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. Tighten tapered bushing bolts sequentially so that equal torque is applied to each.
3. Adjust the motor on its base to a position closest to the fan shaft. Install belts by working each one over the sheave grooves until all are in position. Never pry the belts into place.
4. Sheave alignment is very important in minimizing Air Kit vibration. Adjust 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. Excess tension shortens bearing life while insufficient tension shortens belt life, can reduce fan performance and may cause vibration. 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 fan 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 the belt guard.
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 wheel design. Do not under any circumstances exceed the maximum safe speed published in the **nyb** bulletin, which is available from your **nyb** field sales representative.

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 fan.
2. Inspect the installation prior to starting the fan. Check for any loose items or debris that could be drawn into the fan or dislodged by the fan discharge. Check the interior of the fan as well. Turn the wheel by hand to check for binding.

3. Check drive installation and belt tension.
4. Check the tightness of all setscrews, nuts and bolts. When furnished, tighten hub setscrews with the wheel oriented so that the setscrew is positioned underneath the shaft.
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 wheel rotation.
6. Use extreme caution when testing the fan with plenum ducting disconnected. Apply power and check for unusual sounds or excessive vibration. If either exists, see the section on Common Fan Problems. To avoid motor overload, do not run the fan for more than a few seconds if plenum is not fully installed. Without plenum ductwork, normal operating speed may not be obtained without motor overload. Once plenum ductwork is complete, check for correct fan speed and complete installation. Plenum ductwork and guards must be fully installed for safety. Listen for any rubbing noises through the entire heat-up period. If there are any, turn the power off and check any gaps where expansion may occur.
7. Setscrews should be rechecked after a few minutes, eight hours and two weeks of operation (see Tables 1 & 2 for correct tightening torques).

NOTE: Shut the fan down immediately if there is any sudden increase in fan vibration.

8. After several hours of operation the wheel and fixed bearing set screws should be re-tightened. If desired, weld tacks can be placed on the shaft adjacent to the wheel hubs to prevent wheel movement should the wheel set screws fail. Proceed as follows:
 - a) Connect ground to the shaft or wheel to prevent current flow through the bearings.
 - b) Place two small tacks 180° apart on each side of the hub. Tacks should be as close to the hub as possible but not welded to it.

Finally, recheck set screws after a few heat cycles.

Table 1 - WHEEL 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 |
| 5/8 | 1164 | 97 |
| 3/4 | 2016 | 168 |
| 7/8 | 3204 | 267 |
| 1 | 4800 | 400 |

* Stainless Steel setscrews are not hardened and should not be tightened to more than 1/2 the values shown.

Table 2 - BEARING SETSCREW TORQUE, lb.-in.

| Setscrew Diameter | Manufacturer | | | | |
|-------------------|--------------|------------|------|--------|-------|
| | Link-Belt | Sealmaster | SKF | McGill | Dodge |
| #10 | 40 | -- | 35 | 35 | -- |
| 1/4 | 90 | 65 | 50 | 85 | -- |
| 5/16 | 185 | 125 | 165 | 165 | 160 |
| 3/8 | 325 | 230 | 290 | 290 | 275 |
| 7/16 | 460 | 350 | 350 | -- | -- |
| 1/2 | 680 | 500 | 620 | -- | 600 |
| 5/8 | 1350 | 1100 | 1325 | -- | 1200 |
| 3/4 | 2350 | -- | -- | -- | 2000 |

AIR KIT MAINTENANCE

nyb Air Kits 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 unless the electrical supply has been completely disconnected and locked. In many cases, a fan can windmill despite removal of all electrical power. The rotating assembly should be blocked securely before attempting maintenance of any kind.

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

Regular Air Kit maintenance should include the following:

1. Check the wheel for any wear or corrosion, as either can cause catastrophic failures. Check also for the build-up of material which can cause unbalance resulting in vibration, bearing wear and serious safety hazards. Clean or replace the wheel 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. Lubricate the bearings, but do not over lubricate (see the bearing section for detailed specifications).
4. During any routine maintenance, all setscrews and bolts should be checked for tightness. See tables for torques.
5. When installing a new wheel or cone, the proper wheel-to-inlet cone clearance must be maintained.

WARNING: Do not remove or loosen the fan hub from the fan wheel. Removing or loosening the fan hub from the fan wheel will cause imbalance and void the warranty.

WHEEL BALANCE

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

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 wheel 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 fan wheel. Welding is the preferred method of balance

weight attachment. Be sure to ground the welder directly to the fan wheel. Otherwise, the welding current could pass through the fan bearings and damage them.

BEARINGS

Storage

Any stored bearing can be damaged by condensation caused by temperature variations. Therefore, **nyb** Air Kit bearings are filled with grease at the factory to exclude air and moisture. Such protection is adequate for shipment and subsequent immediate installation. Bearings should not be stored outside.

For long term storage, bearings should be regreased and wrapped with plastic for protection. **Rotate the bearing collar by hand at least every two weeks to redistribute grease on internal bearing parts.** Each month the 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 bearing collar while slowly adding grease.

Operation

Check the setscrew torque before start-up (see Table 2 for correct values). 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

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 running the fan or rotating the shaft by hand. Be sure all guards are in place if lubrication is performed while the fan is operating. 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.

EXPANSION BEARING

The expansion bearing for New York Blower Air Kits is designed so that the shaft will slide within the collar of the bearing as the shaft lengthens due to temperature. The bearing near the drive of the Air Kit is a standard bearing secured to the shaft with a set screw. The bearing opposite the drive is the "hi-heat" or expansion bearing and is designed with a floating key which allows the shaft to move axially, but not rotationally, relative to the bearing.

Characteristics of the Expansion Bearing:

The Floating Key is free and non-binding within the shaft keyway. **NO OTHER SET SCREW SHOULD BE USED IN THIS BEARING WHICH WOULD BIND BEARING TO SHAFT.**

The tolerance of the shaft at the hi-heat bearing must be .0015 inches below nominal.

As the shaft turns, the wall of the keyway makes contact with the floating key preventing the shaft from sliding in the collar of the bearing. As the shaft grows due to heat, it moves axially within the bearing collar.

Avoiding Problems:

Over lubrication is a common cause of premature failure for any bearing. Follow the bearing manufacturers recommended lubrication schedule to prevent excessive or inadequate lubrication.

Never install a standard set screw in the hi-heat bearing, which would secure the bearing to the shaft. If the shaft is prevented from sliding axially it will bend or the bearing will be damaged as the shaft grows due to heat.

If binding is suspected or if bearings are being replaced, clean the shaft end with emery cloth and check the hi-heat end tolerance with a micrometer. It should be .0015 inches below nominal.

Periodically check the floating key for wear. Replace the floating key if it is starting to wear.

A clicking sound is sometimes heard as the floating key taps against the keyway wall. This is common and will not necessarily cause premature wear on the floating key. If a shaft cooler assembly is installed it may cause a clicking or rubbing noise, if the cooler contacts the cooler guard.

HEAT AND CONTROL

High temperature, rotating equipment such as Air Kits must be protected from "heat soaking". **Air Kits must be rotating whenever the airstream temperature is above 200°F. to prevent the shaft from "sagging" causing a permanent bend in the shaft.** Start-up and shut down procedures are required to prevent this. Also, if a power failure occurs, rotate the shaft manually if necessary.

If a shaft is bent due to heat soaking or binding a sudden increase in Air Kit vibration will occur. The shaft will need to be removed, checked for straightness and straightened or replaced.

COMMON AIR KIT PROBLEMS

Excessive Vibration

A common complaint regarding industrial fans in general 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, material impact or heat.

5. Accumulation of foreign material on the wheel.
6. Excessive wear or erosion of the wheel.
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. Fan running too slowly.
3. Fan wheel rotating in wrong direction.
4. Wheel not properly centered relative to inlet cones.
5. Poor system design, closed dampers, air leaks, clogged filters, or coils.
6. Obstructions or sharp elbows near inlets.
7. Sharp deflection of airstream at fan outlet.

Excessive Noise

1. Air Kit 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 fan 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 or grounding through the bearings while arc welding.
6. Excessive fan speed.
7. Extreme ambient or airstream temperatures.
8. Improper belt tension.
9. Improper tightening of wheel setscrews.

REPLACEMENT PARTS

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

When ordering replacement parts, specify the part name, **nyb** shop number and control number, fan size, type, rotation (viewed from drive end), arrangement and bearing size or bore. Most of this information is on the metal nameplate attached to the fan base.

For assistance in selecting replacement parts, contact your local **nyb** representative or visit: <http://www.nyb.com>.

Example: Part required: Wheel
Shop/control number: B-10106-100
Fan description: 18" Air Kit
Bearing: P3-U200, 2-7/16 Bore

Suggested replacement parts include:

| | |
|-----------------|--------------------------|
| Wheel | Component parts: Sheaves |
| Shaft | V-Belts |
| Inlet Cone | |
| Cooler Assembly | |

BEARING LUBRICATION INTERVAL (months)

| Shaft | RPM | | | | | | | | | |
|----------------------|----------|----------|-----------|------------|------------|------------|-----------|------------|-----------|-----------|
| | 1-500 | 501-1000 | 1001-1500 | 1501-2000 | 2001-2500 | 2501-3000 | 3001-3500 | 3501-4000 | 4001-4500 | 4501-5000 |
| 5/8 thru 1 | 6 | 6 | 5-6 | 5-6 | 4-6 | 4-6 | 3-4 | 3-4 | 2 | 2 |
| 1 3/16 thru 1 7/16 | 6 6 | 6 4 | 5-6 4 | 4-6 2 | 4-6 2 | 3-5 1 | 2-4 1 | 2-4 1 | 1-2 1 | 1 1/2 |
| 1 11/16 thru 1 15/16 | 6 6 | 6 4 | 4-6 2 | 4-6 1 | 2-4 1 | 2-4 1 | 2 1/2 | 1-2 1/2 | 1-2 | 1 |
| 2 3/16 | 6 6 | 5-6 4 | 4-6 2 | 3-4 1 | 2-4 1 | 1-2 1/2 | 1-2 | 1-2 | | |
| 2 7/16 | 6 4 | 4-6 2 | 4-6 1 | 3-4 1 | 2 1/2 | 1-2 1/2 | 1-2 | 1 | | |
| 2 11/16 & 2 15/16 | 5-6 4 | 4-6 2 | 2-4 1 | 2 1 | 1-2 1/2 | 1 | | | | |
| 3 3/16 | 6 | 6 | 4 | 2 | 2 | | | | | |
| 3 7/16 thru 4 3/16 | 4-6 4 | 3-5 2 | 2-4 1 | 1-2 1/2 | 1 | | | | | |

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.

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.

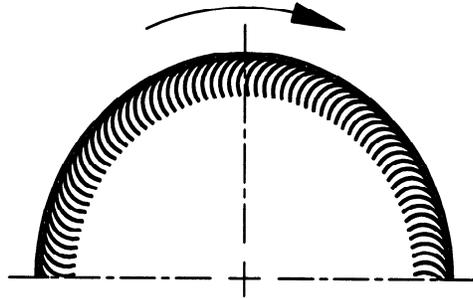
This warranty does not cover any customer labor charges for replacement of parts, adjustments or repairs, or any other work unless such charges shall be assumed or authorized in advance, in writing, by **nyb**.

This warranty does not cover any product which, in the judgment 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.

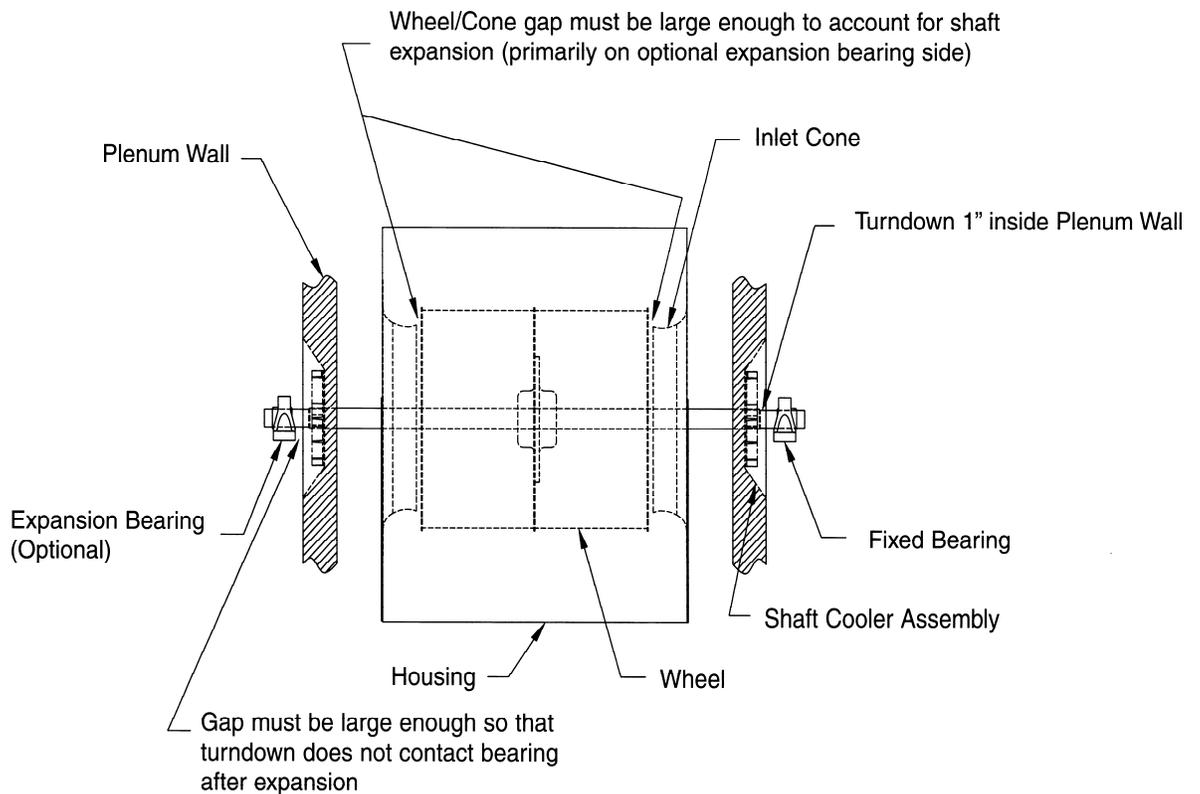
**WHEEL ROTATION AS VIEWED FROM DRIVE SIDE
(Clockwise)**



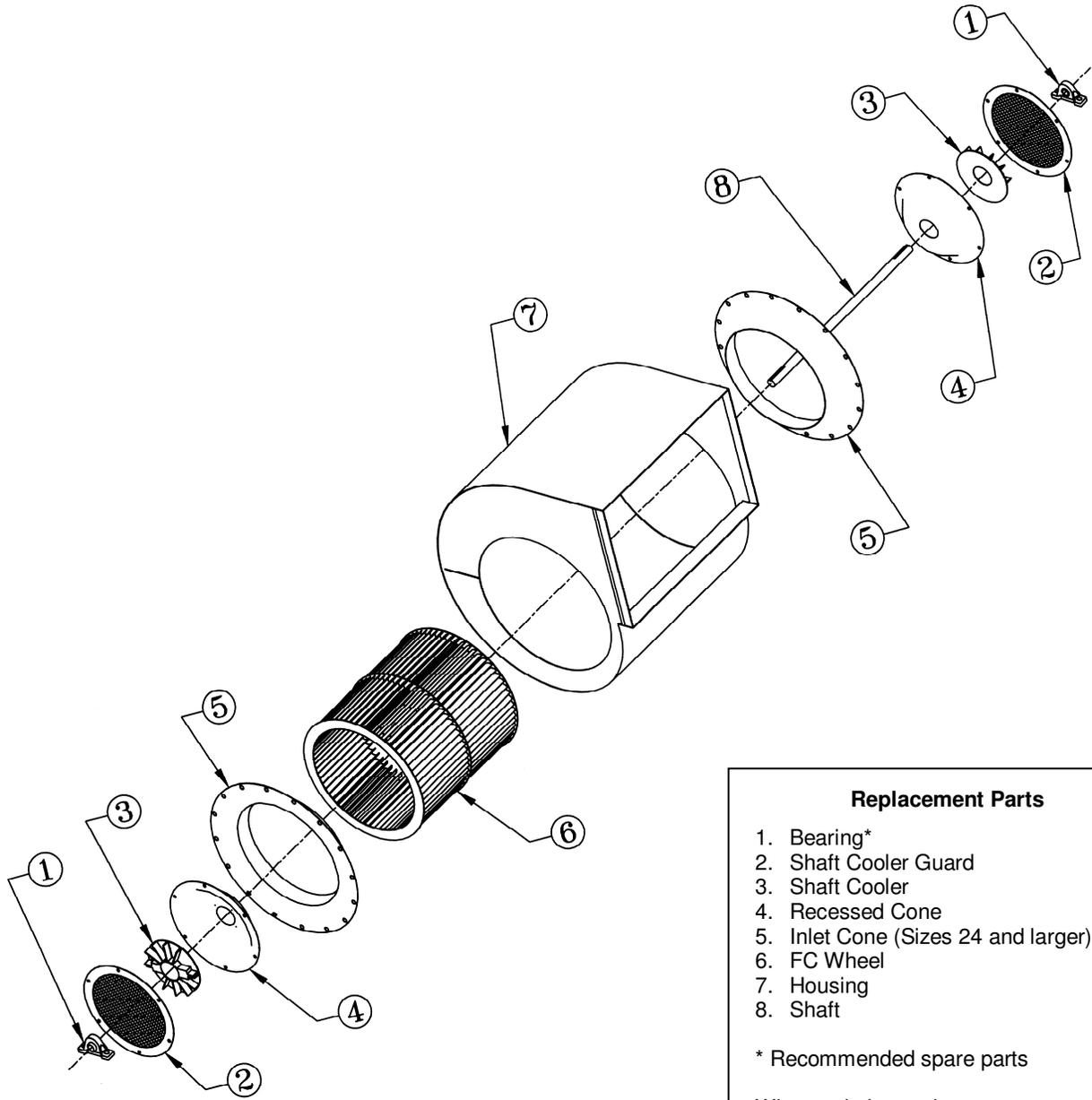
**AIR KIT
ARROW INDICATES CORRECT ROTATION**

TYPICAL AIR KIT ASSEMBLY

Figure 1



AIR KIT REPLACEMENT PARTS



Replacement Parts

1. Bearing*
2. Shaft Cooler Guard
3. Shaft Cooler
4. Recessed Cone
5. Inlet Cone (Sizes 24 and larger)
6. FC Wheel
7. Housing
8. Shaft

* Recommended spare parts

When ordering replacement parts, supply **nyb** shop number from nameplate and complete description of the parts required.