AXIAL FANS

12” Through 28” Axial
14” and 18” Two Stage
20” and 24” Roof Exhauster
20” Through 40” Vertical Exhauster

312 SOUTH HWY. 73, PO BOX 398
FALLS CITY, NE 68355-0398
800-500-9777

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CAUTION

This machine has moving parts that can cause serious bodily injury. The following precautions must be taken before operating or performing maintenance.

1. Make sure all moving parts are shielded from personnel and falling objects.
2. Read the installation and maintenance instructions.
3. Do not operate at speeds or temperatures higher than published for the specific operating conditions for which the machine was purchased.

A failure to take these precautions could result in serious bodily injury and property damage

A Word About Safety

Air moving equipment involves electrical wiring, moving parts, and air velocity or pressure that can create safety hazards if the equipment is not properly installed, operated and maintained. Follow these instructions as well as the additional instructions and warnings on the equipment itself to minimize this danger. Refer to AMCA Publication 410, “Recommended Safety Practices For Air Moving Devices” for additional information.

Electrical Disconnects

Every motor driven fan should have an independent disconnect switch to isolate the unit from the electrical supply. The switch should be near the fan and must be capable of being locked out 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.

Air Pressure and Suction

Fans present a hazard from the suction created at the fan inlet in addition to the normal dangers of rotating machinery. This suction can draw materials into the fan where they become high velocity projectiles at the outlet. Suction 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.
Receiving and Inspection

The fan 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.

FOB 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. AIRLANCO will assist the customer as much as possible; however, claims must be originated at the point of delivery.

Fan Installation

AIRLANCO propellers are dynamically balanced. Fully assembled fans are test run at operating speeds to check the entire assembly for conformance to AIRLANCO vibration limits. Nevertheless, all units must be adequately supported for smooth operation. **Ductwork should be independently supported as excess weight may distort the fan housing and cause contact between moving parts.** Duct connections at the fan inlet or outlet should be flexible to isolate the fan from a different duct diameter, from vibration and from noise. Electrical installation shall be in accordance with NFPA 70 “National Electrical Code” and all applicable local codes.

Handling

Fans should only be lifted by the base, mounting supports, or lifting rings. Never lift a fan by the propeller, motor, motor bracket, or any fan part not designed for lifting. A spreader should always be used to avoid damage.
Storage

Check dampers for free operation and lubricate moving parts prior to storage if fan is not to be placed immediately into service. Inspect the stored unit periodically. **Rotate the propeller by hand every two to four weeks to redistribute grease on internal bearing parts.**

Elevated Units

When an elevated or suspended structural steel platform is used, it must have sufficient bracing to support the unit load and prevent side sway. The platform should be of welded construction to maintain permanent alignment of all members.

**DO NOT** hang fan with cables. Flanges are not designed for long term load bearing.

**DO NOT** attempt to support fan with ducting.

**PROPER INSTALLATION**

- Fan is fully supported by a welded angle iron frame, which is anchored to the bin wall.
Slab-Mounted Units

A correctly designed and level concrete foundation provides the best means of installing floor-mounted fans. The mass of the base must maintain the fan/driver alignment, absorb normal vibration, and resist lateral loads. The overall dimensions of the concrete base should extend at least six inches beyond the base of the fan. The foundation requires firmly anchored fasteners such as the anchor bolts shown below. Hammer-drilled expansion fasteners can be used.

Move the fan to the mounting location and lower it over the anchor bolts, leveling the fan with shims around the bolts. Fasten the fan securely.

When grout is used: Shim the fan at least 3/4-inch from the concrete base.

When isolation is used: Check the Airlanco certified drawing for installation instructions.
Roof Mounted Fans

Vertical Exhaust fans are typically installed in new concrete bin construction. The double-flanged roof construction ring is placed on the roof deck prior to concrete being poured. The exhaust fan is bolted to the upper flange. The lower flange is welded to the construction ring and concrete is poured around it. This second flange promotes strength and stability.

After the roof is poured, the fan is bolted to the construction ring, and a rainhood is then bolted to the fan.

SE panel fans are designed for steel bin roofs, and are easy to install for both new construction and retrofits.

SE fans come in two configurations: flat bottom and notched bottom. The flat bottom fan is designed to fit between the ridges of a steel bin roof, while the notched bottom fan is designed to straddle a roof ridge.

**Recommended Installation**

- Unbolt and remove the top panel.
- Place the fan in the desired position and mark the roof opening by tracing around the inside of the base flange.
- Remove the fan and cut a hole in the bin roof, following the marked opening.
- Place the fan over the opening and secure to the roof using the predrilled holes in the base flange. Replace the top panel.
Startup

Safe operation and maintenance includes the selection and use of appropriate safety accessories for the specific installation. This is the responsibility of the customer and requires consideration of equipment location and accessibility as well as adjacent components. All safety accessories must be installed properly prior to start up.

Procedure

1. 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 propeller by hand to check for binding.
2. Check the tightness of all nuts and bolts (see Split Taper™ Bushing Information below).
3. 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 propeller rotation. See “Fan Orientation/Rotation” page.
4. Use extreme caution when testing the fan with ducting disconnected. Apply power and check for unusual sounds or excessive vibration. See the section on Common Fan Problems if either exists.
5. Bolts and nuts should be rechecked after eight hours and two weeks of operation.

Axial Fan Bushings - Torque Recommendations

<table>
<thead>
<tr>
<th>Dia.</th>
<th>Bushing</th>
<th>H.P.</th>
<th>Torque*</th>
</tr>
</thead>
<tbody>
<tr>
<td>12”</td>
<td>“H” Bushing .625”</td>
<td>0.75</td>
<td>95 Inch/Lbs</td>
</tr>
<tr>
<td>14”</td>
<td>N/A .625”</td>
<td>1.00</td>
<td>75 Inch/Lbs (setscrew)</td>
</tr>
<tr>
<td>14”</td>
<td>N/A .875”</td>
<td>1.50</td>
<td>75 Inch/Lbs (setscrew)</td>
</tr>
<tr>
<td>16”</td>
<td>N/A .625”</td>
<td>1.50</td>
<td>75 Inch/Lbs (setscrew)</td>
</tr>
<tr>
<td>16”</td>
<td>N/A .875”</td>
<td>1.50</td>
<td>75 Inch/Lbs (setscrew)</td>
</tr>
<tr>
<td>18”</td>
<td>“H” Bushing .875”</td>
<td>1.50</td>
<td>72 Inch/Lbs</td>
</tr>
<tr>
<td>18”</td>
<td>“H” Bushing .875”</td>
<td>3.00</td>
<td>72 Inch/Lbs</td>
</tr>
<tr>
<td>24”</td>
<td>“H” Bushing 1.125”</td>
<td>5.00</td>
<td>95 Inch/Lbs</td>
</tr>
<tr>
<td>24”</td>
<td>“P” Bushing 1.125”</td>
<td>7.50</td>
<td>192 Inch/Lbs</td>
</tr>
<tr>
<td>28”</td>
<td>“P” Bushing 1.375”</td>
<td>10.00</td>
<td>192 Inch/Lbs</td>
</tr>
</tbody>
</table>

Panel Fan Bushings - Torque Recommendations

<table>
<thead>
<tr>
<th>Model</th>
<th>Bushing</th>
<th>H.P.</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE20</td>
<td>N/A .625”</td>
<td>0.75</td>
<td>75 Inch/Lbs (setscrew)</td>
</tr>
<tr>
<td>SE24</td>
<td>“H” Bushing .875”</td>
<td>2.00</td>
<td>72 Inch/Lbs</td>
</tr>
</tbody>
</table>

*Divide by 12 to convert to Foot/Lbs.

DO NOT OVERTIGHTEN BUSHINGS OR SETSCREWS.

WARNING: SHUT THE FAN DOWN IMMEDIATELY IF THERE IS ANY SUDDEN INCREASE IN FAN VIBRATION AND/OR NOISE.
Fan Maintenance

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

WARNING: Do not attempt any maintenance on a fan unless the electrical supply has been completely disconnected and locked out. A fan can frequently 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.

Periodic Fan Maintenance

1. Check the fan propeller for any wear or corrosion as either can cause catastrophic failures. Check also for the build up of material that can cause unbalance resulting in vibration, bearing wear and serious safety hazards. Clean or replace the propeller as required.
2. Lubricate the motor bearings, but do not over lubricate. See below.
3. All nuts and bolts should be checked for tightness during any routine maintenance.

FOLLOW RECOMMENDED RELUBING INTERVALS FOR PROPER MOTOR OPERATION.

Refer to the following pages for motor manufacturer's maintenance guidelines for your particular motor.
Lubrication Guidelines for WEG™ Motors

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Motors up to frame 215T do not normally have grease fittings. In these cases the regreasing shall be done observing the following guidelines:

- Carefully disassemble the motor.
- Remove grease from bearing.
- Wash the bearing with kerosene or diesel.
- Regrease the bearing immediately.

When regreasing, use only special bearing grease that is compatible with Polyrex® EM grease. Polyrex® EM grease is compatible with other types of grease that contain:

- Lithium base or complex of lithium or polyurea and highly refined mineral oil;
- Inhibitor additive against corrosion, rust and anti-oxidant additive.

Notes:

- Although Polyrex® EM is compatible with the types of grease listed above, it is not recommended to mix Polyrex® EM with other greases.
- If you intend to use a type of grease different than those recommended above, contact WEG prior to use.
- For special applications (high or low temperatures, speed variation, etc.) the type of grease and relubrication interval are given on an additional nameplate attached to the motor.

For motors up to 10 H.P. and frame size 215T, WEG™ recommends a relube interval of 15,700 hours for 3600 RPM motors, and 20,000 hours for 1800 RPM motors.

Consult WEG™ or the grease manufacturer regarding the use of standard motors for special applications.
Lubrication Guidelines for Baldor™ Motors

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Bearing grease will lose its lubricating ability over time, not suddenly. The lubricating ability of a grease (over time) depends primarily on the type of grease, the size of the bearing, the speed at which the bearing operates and the severity of the operating conditions. Good results can be obtained if the following recommendations are used in your maintenance program.

**Type of Grease**

A high grade ball or roller bearing grease should be used. Recommended grease for standard service conditions is Polyrex® EM. Equivalent and compatible greases include:

- Texaco Polystar
- RykonPremium#2
- Pennzoil Pen 2 Lube
- Chevron SRI

**Relubrication Intervals**

Recommended relubrication intervals are shown in the table below. It is important to realize that the recommended intervals are based on average use.

### BALDOR™ MOTORS SEVERITY OF SERVICE TABLE

<table>
<thead>
<tr>
<th>Severity of Service</th>
<th>Hrs/Day of Operation</th>
<th>Ambient Temp. Maximum</th>
<th>Atmospheric Contamination</th>
<th>Relubrication Interval Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>8</td>
<td>40°C</td>
<td>Clean, Little Corrosion</td>
<td>1.0</td>
</tr>
<tr>
<td>Severe</td>
<td>16 Plus</td>
<td>50°C</td>
<td>Moderate dirt, Corrosion</td>
<td>0.5</td>
</tr>
<tr>
<td>Extreme</td>
<td>16 Plus</td>
<td>&gt;50°C* or Class H Insulation</td>
<td>Severe dirt, Abrasive dust, Corrosion, Heavy Shock or Vibration</td>
<td>0.1</td>
</tr>
<tr>
<td>Low Temperature</td>
<td></td>
<td>&lt;29°C**</td>
<td></td>
<td>1.0</td>
</tr>
</tbody>
</table>

### BALDOR™ MOTORS RECOMMENDED RELUBE INTERVAL

<table>
<thead>
<tr>
<th>HP</th>
<th>FRAME</th>
<th>3600 RPM</th>
<th>1800 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 5</td>
<td>215T</td>
<td>5500</td>
<td>12000</td>
</tr>
<tr>
<td>7.5 to 10</td>
<td>215T</td>
<td>3600</td>
<td>9500</td>
</tr>
</tbody>
</table>
Lubrication Guidelines for Leeson™ Motors

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Lubrication

Leeson™ motors are supplied with pre-lubricated ball bearings. No lubrication is required before startup.

Relubrication Intervals

The following intervals are suggested as a guide:

SUGGESTED RELUBRICATION INTERVALS

<table>
<thead>
<tr>
<th>HOURS OF SERVICE PER YEAR</th>
<th>H.P. RANGE</th>
<th>RELUBE INTERVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>Sub Fractional to 7 ½ 10 to 40</td>
<td>5 Years</td>
</tr>
<tr>
<td>Continuous Normal Applications</td>
<td>Sub Fractional to 7 ½ 10 to 40</td>
<td>2 Years</td>
</tr>
<tr>
<td>Season Service Motor</td>
<td>All</td>
<td>1 Year</td>
</tr>
<tr>
<td>Idle 6 months or more</td>
<td></td>
<td>(Beginning of Season)</td>
</tr>
<tr>
<td>Continuous High Ambients</td>
<td>Sub Fractional to 40</td>
<td>6 Months</td>
</tr>
<tr>
<td>Dirty or Moist Locations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Vibrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where a Shaft End is Hot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Pumps-Fans)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lubrication

Use high quality ball bearing lubricant. Use a medium consistency Polyurea lubricant, such as Shell Dolum R and/or Chevron SR1-2 on all frames up to 447T.

Procedure

If motor is equipped with an Alemite fitting, clean tip of fitting and apply grease gun. Use 1 to 2 full strokes on motors in NEMA 215T frame and smaller. Use 2 to 3 strokes on NEMA 254T through NEMA 365T frames. Use 3 to 4 strokes on NEMA 404T frames and larger. On motors having drain plugs, remove the drain plug and operate the motor for 20 minutes before replacing the drain plug.

On motors equipped with a slotted head grease screw, remove the screw and apply a grease tube to the hole. Insert a 2 to 3 inch length string of grease into each hole on motors in NEMA 215T frame and smaller. Insert a 3 to 5 inch length on larger motors. For motors having drain plug, operate the motor for 20 minutes before replacing the drain plug.

CAUTION: Keep lubricant clean. Lubricate motors at standstill. Remove and replace drain plugs at standstill. Do not mix petroleum lubricant and silicone lubricant in motor bearings.
Propeller Balance

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

The soundness of all parts should be determined if the original thickness of components is reduced. Ensure no hidden structural damage exists. 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 or disrupt airflow. Remember that centrifugal forces can be extremely high at the outer radius of a fan propeller. Attach weights to aluminum propellers with bolts and self-locking nuts.

⚠️ WARNING:

WHEN USING A VARIABLE SPEED MOTOR DRIVE, DO NOT EXCEED MOTOR NAME PLATE SPEED. RUNNING FAN AT HIGHER SPEED THAN RECOMMENDED MAY CAUSE CATASTROPHIC FAILURE.
Fan Rotation/Orientation

Axial fans are designed to provide air flow in one direction. The fan’s air flow direction will be clearly labeled on the fan housing. Never attempt to reverse the air flow by reversing the fan’s wiring. Reversing the wiring to change the airflow will result in the airflow being significantly reduced.

To reverse the airflow:

✓ Physically turn the fan end to end.
✓ Relocate screen guard to exposed end.
✓ DO NOT reverse wiring.
Common Fan Problems

Excessive Vibration

A common complaint regarding industrial fans is “excessive vibration.” AIRLANCO is careful to ensure that each fan is precisely balanced prior to shipment; however, there are many other causes of fan vibration including:
1. Loose mounting bolts.
2. Misaligned or unbalanced motor.
3. Accumulation of foreign material on the propeller.
4. Excessive wear or erosion of the propeller.
5. Excessive system pressure or restriction of airflow due to closed dampers.
6. Inadequate structural support, mounting procedures or materials.
7. Externally transmitted vibration.

Inadequate Performance

1. Incorrect testing procedures or calculations.
2. Fan propeller rotating in wrong direction or installed backwards on shaft.
3. Closed dampers or air leaks.
4. Obstructions or sharp elbows near inlets.
5. Sharp deflection of airstream at fan outlet.

Excessive Noise

1. Fan 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.
7. Loose accessories or components.
8. Worn motor 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 motor bearings while arc welding.
6. Excessive fan speed when fan is connected to an aftermarket inverter control.
7. Extreme ambient or airstream temperatures.
8. Improper tightening of propeller bushing bolts may cause hubs to crack.
Replacement Parts

AIRLANCO recommends that only factory-supplied replacement parts be used. AIRLANCO fan parts are built to be fully compatible with the original fan, using specific alloys and tolerances. Replacement parts carry a standard AIRLANCO warranty.

Call AIRLANCO at 800-500-9777 to order replacement parts. Please have the following information available:

- Part name
- AIRLANCO serial number
- Fan size
- Fan type

All of this information is on the metal nameplate attached to the fan.