JetStream

Tube Axial Fans/Jet Tunnel Fan

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

This publication contains the installation, operation and maintenance instructions for standard unit of the JetStream *Tube Axial Fans/Jet Tunnel Fan.*

Carefully read this publication and any supplemental documents prior to any installation or maintenance procedure.

Loren Cook catalog, *JetStream,* provides additional information describing the equipment, fan performance, available accessories and specification data.

For additional safety information, refer to AMCA Publication 410-96, *Safety Practices for Users and Installers of Industrial and Commercial Fans*.

All of the publications listed above can be obtained from:

- lorencook.com
- *info@lorencook.com*
- 417-869-6474 ext. 166

For information and instructions on special equipment, contact Loren Cook Company at 417-869-6474.

Receiving and Inspection

Carefully inspect the fan and accessories for any dam-age and shortage immediately upon receipt of the fan.

- Turn the propeller by hand to ensure it turns freely and does not bind
- Record on the *Delivery Receipt* any visible sign of damage

Handling

Lift JetStream fans by placing a sling around the fan housing or through lifting eyes.

NOTICE! Never lift by the motor or inlet/outlet silencers.

Storage

If the fan is stored for any length of time prior to installation, rotate the propeller several revolutions every three to five days. This keeps a coating of grease on all internal bearing parts. Block propeller to prevent natural rotation and store it in its original shipping crate and protect it from dust, debris and weather.

JetStream

⚠WARNING

Rotating Parts & Electrical Shock Hazard:

Fans should be installed and serviced by qualified personnel only.

Disconnect electric power before working on unit (prior to removal of guards or entry into access doors).

Follow proper lockout/tagout procedures to ensure the unit cannot be energized while being installed or serviced.

A disconnect switch should be placed near the fan in order that the power can be swiftly cut off, in case of an emergency and in order that maintenance personnel are provided complete control of the power source.

Grounding is required. All field-installed wiring must be completed by qualified personnel. All field installed wiring must comply with National Electric Code (NFPA 70) and all applicable local codes. Ensure the power supply (voltage, frequency and current carrying capacity of wires) is in accordance with the motor nameplate.

Fans and blowers create pressure at the discharge and vacuum at the inlet. This may cause objects to get pulled into the unit and objects to be propelled rapidly from the discharge. The discharge should always be directed in a safe direction and inlets should not be left unguarded. Any object pulled into the inlet will become a projectile capable of causing serious injury or death.

When air is allowed to move through a non-powered fan, the impeller can rotate, which is referred to as windmilling. Windmilling will cause hazardous conditions due to unexpected rotation of components. Impellers should be blocked in position or air passages blocked to prevent draft when working on fans.

Friction and power loss inside rotating components will cause them to be a potential burn hazard. All components should be approached with caution and/or allowed to cool before contacting them for maintenance.

Under certain lighting conditions, rotating components may appear stationary. Components should be verified to be stationary in a safe manner, before they come into contact with personnel, tools or clothing.

Failure to follow these instructions could result in death or serious injury.

The attachment of roof mounted fans to the roof curb as well as the attachment of roof curbs to the building structure must exceed the structural requirements based on the environmental loading derived from the applicable building code for the site. The local code official may require variations from the recognized code based on local data. The licensed engineer of record will be responsible for prescribing the correct attachment based on construction materials, code requirements and environmental effects specific to the installation.

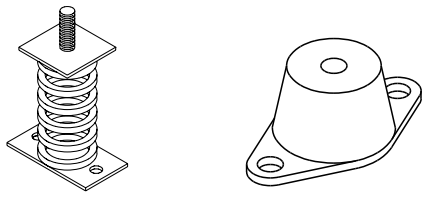
Installation

Isolation Installation

To help prevent vibration and noise from being transferred to the building, isolators are recommended.

Floor Mounted Spring Isolators

1. Mount fan on isolation base or rails (if supplied).
2. Elevate fan (or isolation base) to operating height and insert blocks to hold in position.
3. Position isolators under the fan and vertically align by inserting leveling bolt through mounting holes in the fan or the base. The isolator must be installed on a level surface.
4. Adjust the isolators by turning the leveling nut counterclockwise several turns at a time alternately on each isolator until the fan weight is transferred onto the isolators and the fan raises uniformly off the blocks. Then remove the blocks.
5. Turn lock nut onto leveling bolt and secure firmly in place against the top of the mounting flange or frame.
6. Secure isolators to mounting surface.



Spring Isolator Rubber-in-Shear Isolator

Figure 1 - Floor Mount Isolators

Floor Mounted Rubber-In-Shear (RIS) Isolators

1. Mount fan on isolation base or rails (if supplied).
2. Elevate fan to provide room to insert isolators between the fan and foundation and block in position.
3. Position isolators under fan and secure bolts.
4. Remove blocks and allow fan to rest on floor. Isolators must be installed on a level surface (leveling should not be required).
5. Secure isolators to mounting surface.

Ceiling Mounted Spring and Rubber-in-Shear (RIS)Isolators

1. Elevate fan to operating height and brace.
2. Attach threaded rod to overhead support structure directly above each mounting hole. Rod should extend to within a few feet of fan.
3. Attach isolator to end of threaded rod using a nut on each side of isolator bracket.
4. Insert another section of threaded rod through the fan mounting hole and isolator.
5. Attach two nuts to threaded rod in isolator.
6. Place adjusting nut and locking nut on threaded rod near fan mounting bracket.
7. Alternately rotate adjusting nut at each mounting location until the fan weight is uniformly transferred to the isolators. Remove bracing.

Ceiling Mounted Spring Isolator Rubber-in-Shear Ceiling Isolator

Figure 2 - Ceiling Mount Isolators

Wiring Installation

Some fractional motors have to be removed in order to make the connection with the terminal box at the end of the motor.

NOTICE! Follow the wiring diagram in the disconnect switch and the wiring diagram provided with the motor. Correctly label the circuit on the main power box and always identify a closed switch to promote safety (i.e., red tape over a closed switch).

Direct Drive Fans

1. Pull the wire into the motor wiring box. Restrain the wire to prevent it from being pulled into the shaft.
2. For final connections, follow the wiring diagram provided on the motor.

Final Installation Steps

1. Inspect fasteners and setscrews, particularly fan mounting and then tighten according to *Recommended Torque for Setscrews/Bolts*.
2. Inspect for correct voltage with voltmeter.
3. Ensure all silencers, wire guards and accessories are installed.
4. Check the fan to see if it is a directional or reversible prop.
5. For directional fans: Test the fan to be sure the rotation is the same as indicated by the arrow marked Rotation. For Reversible fans: Test the fan to ensure proper rotation for the correct airflow direction.

NOTICE! Do not allow the fan to run in the wrong direction. This will overheat the motor and cause serious damage. For 3-phase motors, if the fan is running in the wrong direction, check the control switch. It is possible to interchange two leads at this location so that the fan is operating in the correct direction.

Operation

Pre-Start Checks

1. Lock out all the primary and secondary power sources.
2. Inspect fasteners and setscrews, particularly those used for mounting the unit, and tighten if necessary.
3. Inspect motor wiring.
4. Rotate the propeller to ensure it does not rub against the housing.
5. Ensure fan, silencers, and wire guard are clean and free of debris.
6. For directional fans: Test the fan to be sure the rotation is the same as indicated by the arrow marked Rotation. For Reversible fans: Test the fan to ensure proper rotation for the correct airflow direction.Restore power to unit.

Recommended Torque for Setscrews/Bolts (IN-LB)

Setscrews				Hold Down Bolts	
Size	Key Hex Across Flats	Recommended Torque		Size	Recommended Torque
		Min.	Max.		
#8	5/64”	15	21	3/8”-16	324
#10	3/32”	27	33	1/2”-13	780
1/4	1/8”	70	80	5/8”-11	1440
5/16	5/32”	140	160	3/4”-10	2400
3/8	3/16”	250	290	7/8”-9	1920
7/16	7/32”	355	405	1”-8	2700
1/2	1/4”	560	640	1-1/8”-7	4200
5/8	5/16”	1120	1280	1-1/4”-7	6000
3/4	3/8”	1680	1920	-	-
7/8	1/2”	4200	4800	-	-
1	9/16”	5600	6400	-	-

Start-Up

Ensure free rotation of the prop. Turn on the fan. In variable speed units, set fan to its lowest speed and inspect for the following:

- Direction of rotation
- Excessive vibration
- Unusual noise
- Bearing noise
- Improper motor amperage or voltage

NOTICE! If a problem is discovered, immediately shut off the fan. Lock out all electrical power and check for the cause of the trouble. Refer to Troubleshooting.

Inspection

Inspection of the fan should be conducted at the first **30 minute**, **8 hour** and **24 hour** intervals of satisfactory operation. During the inspections, stop the fan and inspect as per the following:

30 Minute Interval

Inspect bolts, setscrews and motor mounting bolts. Adjust and tighten as necessary.

8 Hour Interval

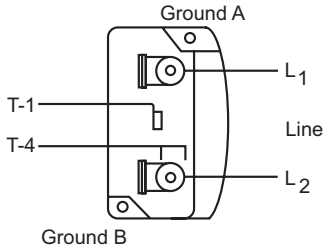
Inspect bolts, setscrews and motor mounting bolts. Adjust and tighten as necessary.

24 Hour Interval

Inspect bolts, setscrews and motor mounting bolts. Adjust and tighten as necessary.

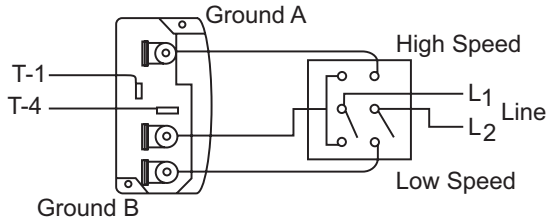
Wiring Diagrams

Single Speed, Single Phase Motor



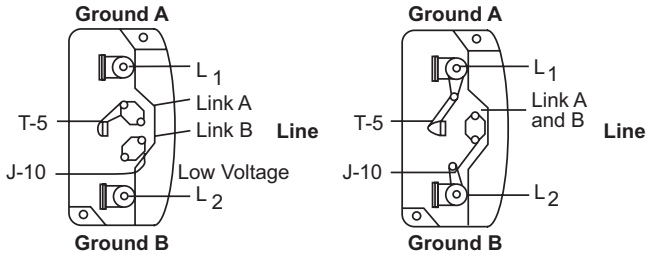
When ground is required, attach to ground A or B with No. 6 thread forming screw. To reverse, interchange T-1 and T-4.

2 Speed, 2 Winding, Single Phase Motor



When ground is required, attach to ground A or B with No. 6 thread forming screw. To reverse, interchange T-1 and T-4 leads.

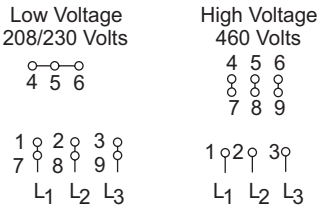
Single Speed, Single Phase, Dual Voltage



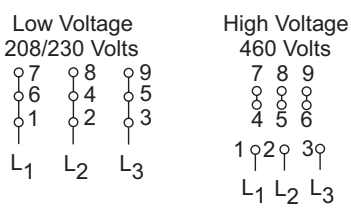
When ground is required, attach to ground A or B with No. 6 thread forming screw. To reverse, interchange T-5 and J-10 leads.

3 Phase, 9 Lead Motor

Y-Connection

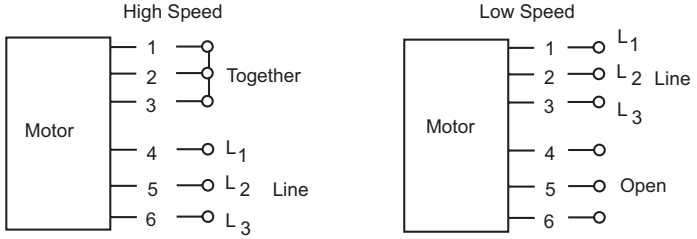


Delta-Connection



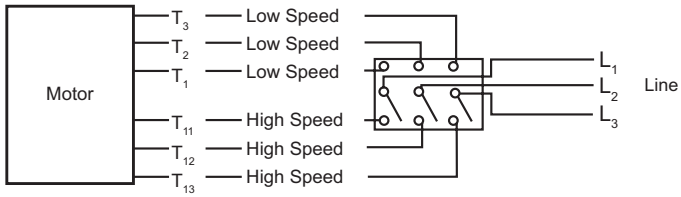
To reverse, interchange any two line leads.

2 Speed, 1 Winding, 3 Phase Motor



To reverse, interchange any two line leads. Motors require magnetic control.

2 Speed, 2 Winding, 3 Phase



To reverse, High Speed: interchange leads T11 and T12; Low Speed: interchange leads T1 and T2; Both Speeds: interchange any two line leads.

Maintenance

Establish a schedule for inspecting all parts of the fan. The frequency of inspection depends on the operating conditions and location of the fan.

Inspect fans exhausting corrosive or contaminated air within the first month of operation. Fans exhausting contaminated air (airborne abrasives) should be inspected every three months. Clean the propeller and air inlets if material build-up is excessive. Excessive build-up can cause imbalance and failure of the propeller. Always clean the entire propeller as partial cleaning will cause imbalance and fan failure.

Regular inspections are recommended for fans exhausting non-contaminated air.

It is recommended the following inspections be conducted twice per year:

- Inspect bolts and setscrews for tightness. Tighten as necessary
- Inspect for cleanliness and clean as necessary. Removing dust and grease on motor housing assures proper motor cooling and proper air performance. Clean using compressed air and/or dry rags. No liquid/solvent cleaners are to be used.
- Inspect Inlet/outlet guards and the silencers. Remove any build up or debris.

Motor Bearings

Motors are provided with prelubricated bearings. Any lubrication instructions shown on the motor nameplate supersede instructions below.

Motor bearings without provisions for relubrication will operate up to 10 years under normal conditions with no maintenance. In severe applications, high temperatures or excessive contaminates, it is advisable to have the maintenance department disassemble and lubricate the bearings after 3 years of operation to pre-vent interruption of service.

For motors with provisions for relubrication, follow intervals of the table below.

Relubrication Intervals						
Service Conditions	NEMA Frame Size					
	Up to and including 184T		213T–365T		404T and larger	
	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM
Standard	3 yrs.	6 months	2 yrs.	6 months	1 yr.	3 months
Severe	1 yr.	3 months	1 yrs.	3 months	6 months	1 month

Motors are provided with a polyurea mineral oil NGLI #2 grease. All additions to the motor bearings are to be with a compatible grease such as Exxon Mobil Polyrex EM and Chevron SRI.

The above intervals should be reduced to half for vertical shaft installations.

Motor Services

Should the motor prove defective within a one-year period, contact your local Loren Cook representative or your nearest authorized electric motor service representative.

Motor Replacement

1. Remove the propeller side silencer to gain access to the motor.
2. Mark the location of the propeller in the housing.
3. Remove the propeller retaining plate from the motor shaft.
4. Remove the propeller from the motor shaft.
5. Unhook the motor leads.
6. Remove motor from the motor mounting plate. Inspect all hardware and replace worn components.
7. Attach the replacement motor to the motor mounting plate. Tighten hold-down bolts to the proper torque.
8. See motor label for correct motor wiring.
9. Replace propeller on motor shaft in the location initially marked in step 2.
10. Check for proper rotation. To reverse, see previous wiring diagrams.
11. Replace the retaining plate and propeller side silencer that was initially removed to gain access to the motor.

After 24 hours of continuous operation, tighten the setscrews to the appropriate torque. This assures the full locking of the inner race to the shaft. Ensure the socket key or driver is in good condition with no rounded corners. The key should be fully engaged in the setscrew and held squarely to prevent the rounding out of the setscrew socket when applying maximum torque.

Motor Replacement Precautions

- If the shaft is dropped and bent, it may cause unbalanced operation of the fan
- When handling the propeller separately from the shaft, place a support through the hub for lifting, making sure not to injure the finished bore of the propeller
- Never allow the propeller to rest its entire weight on the blades. The propeller and shaft can be lifted by slings around the shaft on each side of the propeller so the propeller is supported by its hub
- If using a chain to lift the propeller, make sure there is sufficient padding on the shaft and propeller. This pre-vents the scoring of the shaft or injury to the propeller. The chain or cable should be spread with timbers, or braced by some other method to prevent damage to the propeller side plates

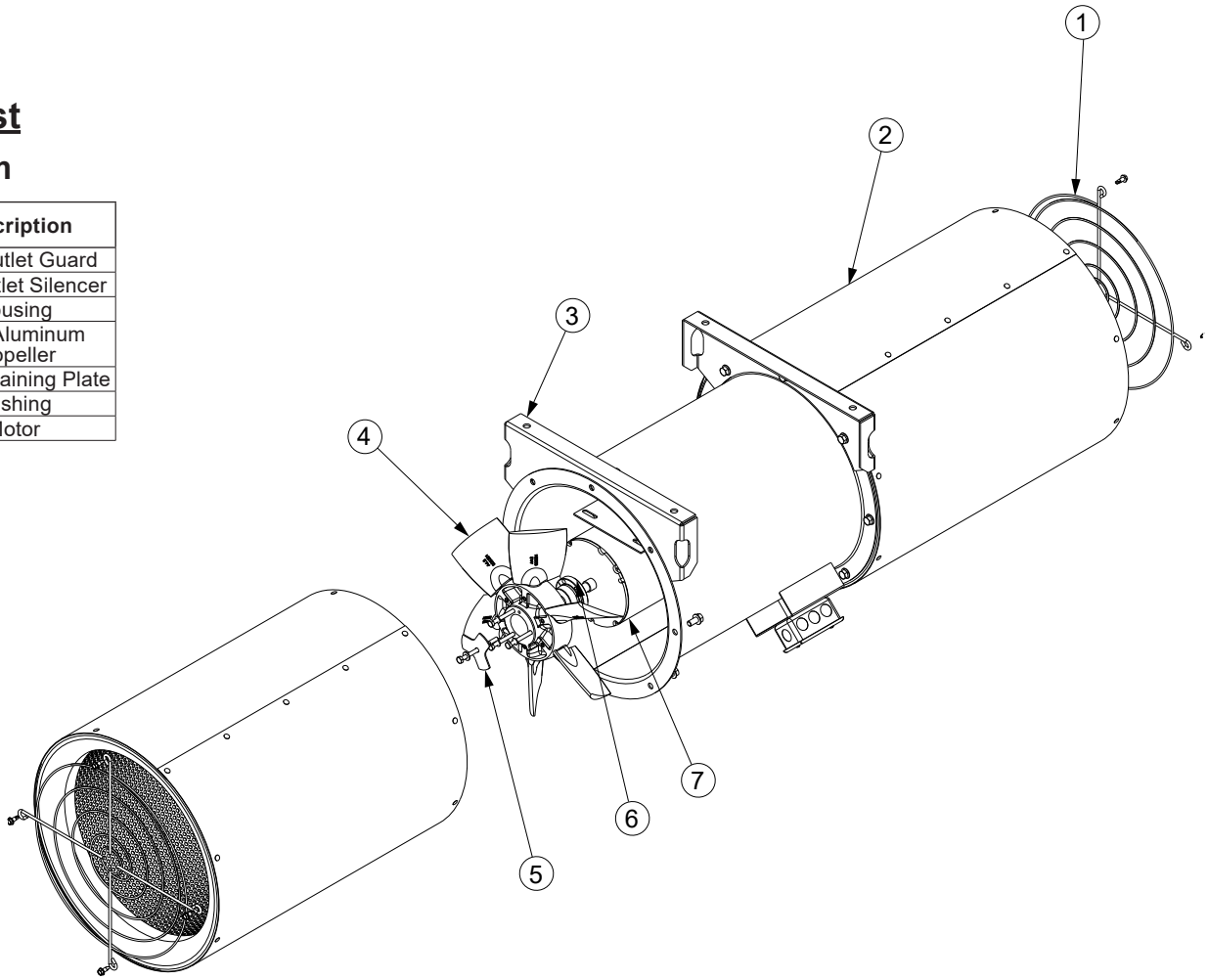
Troubleshooting

Problem and Potential Cause
Low Capacity or Pressure: • Incorrect direction of rotation. Make sure the fan rotates in same direction as the arrows on the rotation label • Poor fan inlet conditions. • Improper propeller alignment
Excessive Vibration and Noise: • Damaged or unbalance propeller • Speed too high • Incorrect direction of rotation. Make sure the fan rotates in same direction as the arrows on the rotation label • Fan surge
Overheated Motor: • Motor improperly wired • Incorrect direction of rotation. Make sure the fan rotates in same direction as the arrows on the motor or belt drive assembly • Cooling air diverted or blocked • Improper inlet clearance • Incorrect fan RPMs • Incorrect voltage

Parts List

JetStream

Part No.	Description
1	Inlet/Outlet Guard
2	Inlet/Outlet Silencer
3	Housing
4	Cast Aluminum Propeller
5	Prop Retaining Plate
6	Bushing
7	Motor



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Limited Warranty

Loren Cook Company warrants that your Loren Cook fan was manufactured free of defects in materials and workmanship, to the extent stated herein. For a period of one (1) year after date of shipment, we will replace any parts found to be defective without charge, except for shipping costs which will be paid by you. This warranty is granted only to the original purchaser placing the fan in service. This warranty is void if the fan or any part thereof has been altered or modified from its original design or has been abused, misused, damaged or is in worn condition or if the fan has been used other than for the uses described in the company manual. This warranty does not cover defects resulting from normal wear and tear. To make a warranty claim, notify Loren Cook Company, General Offices, 2015 East Dale Street, Springfield, Missouri 65803-4637, explaining in writing, in detail, your complaint and referring to the specific model and serial numbers of your fan. Upon receipt by Loren Cook Company of your written complaint, you will be notified, within thirty (30) days of our receipt of your complaint, in writing, as to the manner in which your claim will be handled. If you are entitled to warranty relief, a warranty adjustment will be completed within sixty (60) business days of the receipt of your written complaint by Loren Cook Company. This warranty gives only the original purchaser placing the fan in service specifically the right. You may have other legal rights which vary from state to state. For fans provided with motors, the motor manufacturer warrants motors for a designated period stated in the manufacturer's warranty. Warranty periods vary from manufacturer to manufacturer. Should motors furnished by Loren Cook Company prove defective during the designated period, they should be returned to the nearest authorized motor service station. Loren Cook Company will not be responsible for any removal or installation costs.

LOREN COOK COMPANY

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