CP-BK Information

- A custom Cook CP continuously welded steel, arrangement 10 utility set.
- Exhaust fan package is factory assembled, balanced and test run.
- Curb mounted inlet plenum designed for maximum efficiency and minimal static pressure loss.
- Discharge stack to assure high velocity exhaust plume.
- Tested for continuous operation at 500°F.
- Listed for both UL 705 (Safety Standard for Power Ventilators) and UL 762 (Power Roof Ventilators for Restaurant Exhaust Appliances).
- Features an “Easy Clean” finish utilizing a durable, high temperature, non-stick cookware coating.
- Easy access for cleaning to inlet plenum and ductwork with quick release latches and large removable panel.
- Easy access to fan wheel with hinged discharge stack quick release latch.
- Aluminum grease trough is positioned directly under fan drain and is easily removable for cleaning. Grease trough includes rainwater overflow feature.
- Adjustable aluminum legs to support fan at NFPA 96 required discharge height.
- Curb cap and support legs designed to fit existing BK curb.
- All bolted connections sealed with a durable silicone adhesive material rated for 600°F continuous operation.
- Quick release inspection panels on power assembly housing allow inspection of motor and belts without removing weather cover.
- Lifting lugs are provided for safe installation.
- Roof penetration is sealed from the elements.

![Counter Clockwise Rotation Shown, Rectangular Base with Curb Cap, Inlet Plenum, Discharge Stack and Stand](image)

Data 120 CP-BK

<table>
<thead>
<tr>
<th>Flow (CFM)</th>
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<th>802</th>
<th>1950</th>
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<td>1000</td>
<td>1100</td>
<td>1200</td>
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<td>0.75</td>
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<td>1.5</td>
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</table>

**Wheel Diameter** - 12”
**Wheel Type** - Flatblade
**Tip Speed (FPM)** = 3.21 x RPM
**Max. BHP** = 0.068 x (RPM/1000)^2
**Plenum Inlet Area** = 1.95 Sq. Ft.
**Outlet Area** = 0.52 Sq. Ft.
**Outlet Velocity** (FPM) = CFM/.52
**Max. Motor Frame** - 184T, Arr. 10
**Approx. Ship Wt.** - 270 lbs. with motor and drives as complete unit.

**Wheel Diameter** - 12”
**Wheel Type** - Flatblade
**Tip Speed (FPM)** = 3.21 x RPM
**Max. BHP** = 0.068 x (RPM/1000)^2
**Plenum Inlet Area** = 1.95 Sq. Ft.
**Outlet Area** = 0.52 Sq. Ft.
**Outlet Velocity** (FPM) = CFM/.52

**Max. Motor Frame** - 184T, Arr. 10
**Approx. Ship Wt.** - 270 lbs. with motor and drives as complete unit.

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**Wheel Type** - Flatblade
**Tip Speed (FPM)** = 3.21 x RPM
**Max. BHP** = 0.068 x (RPM/1000)^2
**Plenum Inlet Area** = 1.95 Sq. Ft.
**Outlet Area** = 0.52 Sq. Ft.
**Outlet Velocity** (FPM) = CFM/.52

**Max. Motor Frame** - 184T, Arr. 10
**Approx. Ship Wt.** - 270 lbs. with motor and drives as complete unit.
Troubleshooting

### Low Capacity or Pressure
- Incorrect direction of rotation. Make sure the fan rotates in same direction as the arrows on the motor or belt drive assembly.
- Poor fan inlet conditions. There should be a straight clear duct at the inlet.

### Excessive Vibration and Noise
- Damaged or unbalanced wheel.
- Belts too loose; worn or oily belts.
- Speed too high.
- Incorrect direction of rotation. Make sure the fan rotates in same direction as the arrows on the motor or belt drive assembly.
- Bearings need lubrication or replacement.
- Fan surge or incorrect inlet or outlet condition.

### 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.

### Overheated Bearings
- Improper bearing lubrication.
- Excessive belt tension.
- Missing seal from inside pedestal.

---

**CP-BK Parts List**

<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>INLET CONE - ALUMINUM (W/O FLANGE)</td>
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<tr>
<td>2</td>
<td>WHEEL (STEEL W/ALUMINUM HUB)</td>
</tr>
<tr>
<td>3</td>
<td>WEATHER COVER FRONT</td>
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<td>4</td>
<td>SIDE PEDESTAL COVER</td>
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<td>5</td>
<td>PEDESTAL WELDMENT</td>
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<td>6</td>
<td>WEATHER COVER CAP</td>
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<td>7</td>
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<td>9</td>
<td>MOTOR MOUNT</td>
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<td>BEARINGS (2)</td>
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<td>HOUSING COVER PLATE</td>
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<td>17</td>
<td>BRACKETS</td>
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<tr>
<td>18</td>
<td>MOTOR BASE PLATE</td>
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</table>

---

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 in any way 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.

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**LOREN COOK COMPANY**

Corporate Offices: 2015 E. Dale Street • Springfield, MO 65803 417.869.6474

www.lorencook.com

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**Installation, Operation, and Maintenance Manual**

This publication contains the installation, operation and maintenance instructions for standard units of the CP-BK Kitchen Exhaust Fan.

- **CP-BK**

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

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

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

All of the publications listed above can be obtained from Loren Cook Company by phoning 417/869-6474, extension 166; by FAX at 417/832-9431; or by e-mail at info@loren-cook.com.

For information on special equipment, contact Loren Cook Company Customer Service Department at 417/869-6474.

**Receiving and Inspection**

Carefully inspect the fan and accessories for any damage and shortage immediately upon receipt of the fan.

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

**WARNING**

This unit has rotating parts. Safety precautions should be exercised at all times during installation, operation, and maintenance. ALWAYS disconnect power prior to working on fan.

**Handling**

Lift the fan by the lifting eyes. Never lift by the shaft, motor, or housing.

**Storage**

If the fan is stored for any length of time prior to installation, completely fill the bearings with grease or moisture-inhibiting oil (refer to Lubricants on page 5). Rotate the wheel several revolutions every three to five days to keep a coating of grease on all internal bearing parts.

Store the fan in its original crate and protect it from dust, debris and the weather.

**Outdoor Storage**

To maintain good working condition of the fan when it is stored outdoors, follow the additional instructions below.

- Coat the shaft with grease or a rust preventative compound.
- Wrap bearings for weather protection.
- Cover the inlet and outlet to prevent the accumulation of dirt and moisture in the housing.

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**Personal Safety**

Disconnect switches are recommended. Place the disconnect switch 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.

**Installation**

Most motors are shipped mounted on the fans with belts and drives installed. However, extremely heavy motors and drives are shipped separately. These motors and drives will require field installation. Please refer to pages 4.
Wheel-to-Inlet Clearance
The correct wheel-to-inlet clearance is critical to proper fan performance. This clearance should be verified before initial start-up since rough handling during shipment could cause a shift in fan components. Refer to wheel/inlet drawing for correct overlap.

Adjust the overlap by loosening the wheel hub and moving the wheel along the shaft to obtain the correct value.

A uniform radial gap (space between the edge of the cone and the edge of the inlet) is obtained by loosening the inlet cone bolts and repositioning the inlet cone.

Wiring Installation
All wiring should be in accordance with local ordinances and the National Electrical Code, NFPA 70. Ensure the power supply (voltage, frequency, and current carrying capacity of wires) is in accordance with the motor nameplate.

Lock off all power sources before unit is wired to power source.

Leave enough slack in the wiring to allow for motor movement when adjusting belt tension. Some fractional motors have to be removed in order to make the connection with the terminal box at the end of the motor. To remove motor, remove bolts securing motor base to power assembly. Do not remove motor mounting bolts.

Units with Arrangement 10 have a hole provided at the base of the bearing pedestal to accommodate wiring.

Wheel Rotation
Test the fan to ensure the rotation of the wheel is the same as indicated by the arrow marked Rotation.

115 and 230 Single Phase Motors
Fan wheel rotation is set correctly at the factory. Changing the rotation of this type of motor should only be attempted by a qualified electrician.

208, 230, and 460, 3 Phase Motors
These motors are electrically reversible by switching two of the supply leads. For this reason, the rotation of the fan cannot be restricted to one direction at the factory. See Wiring Diagrams above for specific information on reversing wheel direction.

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.

Wheel-to-Inlet Clearance
Backward Inclined

Belt and Pulley Installation
Belt tension is determined by the sound the belts make when the fan is first started. Belts will produce a loud squeal which dissipates after the fan is operating at full capacity. If the belt tension is too tight or too loose, lost efficiency and possible damage can occur.

Do not change the pulley pitch diameter to change tension. This will result in a different fan speed than desired.

a. Loosen motor plate adjustment nuts on bolts and move motor plate in order that the belts can easily slip into the grooves on the pulleys. Never pry, roll, or force the belts over the rim of the pulley.

b. Adjust the motor plate until proper tension is reached. For proper tension a deflection of approximately 1/4" per foot of center distance should be obtained by firmly pressing the belt. Refer to Figure 3.

c. Lock the motor plate adjustment nuts in place.

d. Ensure pulleys are properly aligned. Refer to Figure 4.

Changing Shaft Speed
All belt driven fans with motors up to and including 5 HP (184T max.) are equipped with variable pitch pulleys. To change the fan speed, perform the following:

a. Loosen setscrew on driver (motor) pulley and remove key, if equipped.

b. Turn the pulley rim to open or close the groove facing.

If the pulley has multiple grooves, all must be adjusted to the same width.

c. After adjustment, inspect for proper belt tension.

Speed Reduction
Open the pulley in order that the belt rides deeper in the groove (smaller pitch diameter).

Speed Increase
Close the pulley in order that the belt rides higher in the groove (larger pitch diameter). Ensure that the RPM limits of the fan and the horsepower limits of the motor are maintained.

Wheel-to-Inlet Clearance

Pulley and Belt Replacement
a. Remove pulleys from their respective shafts.

b. Clean the motor and fan shafts.

c. Clean bores of pulleys and coat the bores with heavy oil.

d. Remove grease, rust, or burrs from the pulleys and shafts.

e. Remove burrs from shaft by sanding.

f. Place fan pulley on fan shaft and motor pulley on its shaft. Damage to the pulleys can occur when excessive force is used in placing the pulleys on their respective shafts.

g. Tighten in place.

h. Install belts on pulleys and align as described in the Belt and Pulley Installation section.

Bearing Replacement
The fan bearings are pillow block ball bearings. An emery cloth or file may be needed to remove imperfections in the shaft left by the setscrews.

Arrangement 10
a. Mark the position on the shaft of both bearing races, setscrews, and the wheel and pulley. Mark the location and orientation of the inlet cone. Note the clearance between the wheel and inlet cone.

b. Remove the fan pulley.

c. Remove the inlet cone.

d. Remove the wheel from the shaft. A 2-jaw puller may be needed.

e. Remove bearing hold-down bolts. Remove shaft and bearings as one unit.

f. Remove the anti-corrosion coating from the shaft with a suitable solvent.

g. Remove the bearing from the shaft using a bearing puller. If a bearing puller is not available, tap on the bearing with a wood block and hammer to remove it.

h. Smooth and clean the shaft and bearing bore thoroughly.

i. Place the bearings into position making sure they are not on a worn section of the shaft. Tapping the inner ring face with a soft driver may be required. Do not hammer on the housing.

j. The outer ring of the bearing is spherical and swivels in the housing to compensate for misalignment. Secure hold-down bolts, but do not fully tighten.

k. Align the setscrews on the bearings and tighten one setscrew on each bearing.

l. Rotate the shaft to allow the bearing outer rings to find their center of free movement.

m. Install the wheel on the shaft. Install the inlet cone in its original location. And adjust bearing position and inlet cone to center the wheel in the inlet cone.

n. Tighten hold-down bolts to proper torque.

o. Turn the shaft by hand. Resistance should be the same as it was before hold-down bolts were fully tightened.

p. Tighten bearing setscrews to specified torque. Refer to Torque chart.

q. Re-install the pulley and adjust the belt tension.

r. Test run and retighten all setscrews and bolts; trim balance as necessary (.0785 in/sec max.).

After 24 hours of operation, retighten the setscrews to the appropriate torque. This assures full locking of the inner race to the shaft. Make sure 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 rounding out of the setscrew socket when applying maximum torque.
Current Switch Set-UP

General Notes:
1. The current sensor is preset at factory.
2. The sensor is designed to shut down the broiler in the event that the motor current drops below normal. This will reflect a problem such as a broken belt.
3. Current sensor shall be enclosed in a (UL Listed for Outdoor Use) conduit box. Wire shall be ran through (UL Listed for Outdoor Use) conduit and connectors.

Notes for Current Sensor:
1. Typical operation: Line voltage applied continuously. After seven seconds of fault, relay trips. If current is below set point, red LED will light. Current window is adjustable between 1-10 amps. Adjustments are independent.
2. Typical setup: Adjust undercurrent pot to minimum, clockwise is maximum. Apply current. Once current has stabilized, adjust undercurrent pot by turning up until red LED lights. Then turn down within seven seconds until red light turns off. If a light remains on for more than ten seconds, disconnect supply voltage to reset. Fault window varies from on for more than ten seconds, disconnect supply voltage to reset. Fault window varies by how far the pots are adjusted. Now if a fault occurs for greater than seven seconds, the relay will trip until supply voltage is removed.

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 (airborne abrasives) should be inspected every three months.

Conditions Chart

1. Typical operation: Line voltage applied continuously. After seven seconds of fault, relay trips. If current is below set point, red LED will light. Current window is adjustable between 1-10 amps. Adjustments are independent.
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Lubricants

Loren Cook Company uses petroleum lubricant in a lithium base. Other types of grease should not be used unless the bearings and lines have been flushed clean. If another type of grease is used, it should be a lithium-based grease conforming to NLGI grade 2 consistency.

A NLGI grade 2 grease is a light viscosity, low-torque, rust-inhibiting lubricant that is water resistant. Its temperature range is from -30°F to +200°F and capable of intermittent highs of +250°F.

Motor Bearings

Motor bearings are pre-lubricated and sealed. Under normal conditions they will not require further maintenance for a period of ten years. However, it is advisable to have your maintenance department remove and disassemble the motor, and lubricate the bearings after three years of operation in excessive heat and or in a contaminated airstream consisting of airborne abrasives.

Fan Bearings

Greaseable fan bearings are lubricated through a grease fitting on the bearing and should be lubricated by the schedule in the Conditions Chart.

For best results, lubricate the bearing while the fan is in operation. Pump grease in slowly until a slight bead forms around the bearing seals. Excessive grease can burst seals thus reducing bearing life.

In the event the bearing cannot be seen, use no more than three injections with a hand-operated grease gun.

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.

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### 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 required, attach to ground A or B with no. 6 thread forming screw. To reverse, interchange T-6 and J-10 leads.

#### Single Speed, Single Phase, Dual Voltage

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

#### 2 Speed, 2 Winding, 3 Phase Motor

To reverse: High Speed-interchange leads T\_11 and T\_12. Low Speed-interchange leads T\_1 and T\_2. Both Speeds-interchange any 2 line leads.

### Current Switch Set-Up Diagram (Sensor Wiring ONLY)

- **At the Machine on the Roof**
  - 208/230 Volts
  - 120-277 Volt, 20 AMP
  - NEMA 4, Junction Box, 4" x 4" x 2" Grey, PVC (OUTDOOR USE UL APPROVED)

- **Inside the Store**
  - 208 Volts, 10 AMP
  - NEMA 3, Disconnect Switch Cover

### Item List

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
<th>P/N</th>
<th>DESCRIPTION</th>
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</table>
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 required, attach to ground A or B with No. 6 thread forming screw. To reverse, interchange T-5 and J-10 leads.

Current Switch Set-Up Diagram (Sensor Wiring ONLY)

Wiring Diagrams Continued

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
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<th>DESCRIPTION</th>
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<tr>
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<td>AS REQD</td>
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<td>2-POLE SINGLE CURRENT SWITCH, 120-277 VOLT, 20 AMP</td>
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<td>125312</td>
<td>SINGLE-WIRE FEMALE FLAG QUICK CONNECT</td>
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<td>7</td>
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<td>132115</td>
<td>CURRENT SENSOR, 208 VOLT, 10 AMP</td>
</tr>
<tr>
<td>6</td>
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<td>1/2&quot; 90° ELBOW FITTING, LIQUID TIGHT, ZINC PLATED, CAST METAL</td>
</tr>
<tr>
<td>5</td>
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<td>125645</td>
<td>1/2&quot; STRAIGHT FITTING, LIQUID TIGHT, ZINC PLATED, CAST METAL</td>
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<tr>
<td>4</td>
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<td>125105</td>
<td>LIQUID TIGHT, EP 1/2&quot;, FLEXIBLE CONDUIT (OUTDOOR USE UL APPROVED)</td>
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<td>3</td>
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<td>NEMA 4, JUNCTION BOX, 4&quot; X 4&quot; X 2&quot; GREY, PVC (OUTDOOR USE UL APPROVED)</td>
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<td>2</td>
<td>1</td>
<td>125416</td>
<td>NEMA 3, DISCONNECT SWITCH COVER</td>
</tr>
<tr>
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<td>1</td>
<td>125415</td>
<td>NEMA 3, DISCONNECT SWITCH, 1/2&quot; 3 HOLE, SINGLE GANG DEEP, CAST METAL</td>
</tr>
</tbody>
</table>
Current Switch Set-UP
General Notes:
1. The current sensor is preset at factory.
2. The sensor is designed to shut down the broiler in the event that the motor current drops below normal. This will reflect a problem such as a broken belt.
3. Current sensor shall be enclosed in a (UL Listed for Outdoor Use) conduit box. Wire shall be ran through (UL Listed for Outdoor Use) conduit and connectors.

Notes for Current Sensor:
1. Typical operation: Line voltage applied continuously. After seven seconds of fault, relay trips. If current is below set point, red LED will light. Current window is adjustable between 1-10 amps. Adjustments are independent.
2. Typical setup: Adjust undercurrent pot to minimum, clockwise is maximum. Apply current. Once current has stabilized, adjust undercurrent pot by turning up until red LED lights. Then turn down within seven seconds until red light turns off. If a light remains on for more than ten seconds, disconnect supply voltage to reset. Fault window varies by how far the pots are adjusted. Now if a fault occurs for greater than seven seconds, the relay will trip until supply voltage is removed.

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

It is recommended the following inspection be conducted twice per year.
- Inspect bolts and setscrews for tightness. Tighten as necessary. Worn setscrews should be replaced immediately.
- Inspect belt wear and alignment. Replace worn belts with new belts and adjust alignment as needed. See Belt and Pulley Installation, page 3.
- Bearings should be inspected as recommended in the Conditions Chart.
- Inspect springs and rubber isolators for deterioration and replace as needed.
- Inspect for cleanliness. Clean exterior surfaces only. Removing dust and grease on motor housing assures proper motor cooling. Removing dirt from the wheel and housing prevents imbalance and damage.

Lubricants
Loren Cook Company uses petroleum lubricant in a lithium base. Other types of grease should not be used unless the bearings and lines have been flushed clean. If another type of grease is used, it should be a lithium-based grease conforming to NLGI grade 2 consistency. A NLGI grade 2 grease is a light viscosity, low-torque, rust-inhibiting lubricant that is water resistant. Its temperature range is from -30°F to +200°F and capable of intermittent highs of +250°F.

Motor Bearings
Motor bearings are pre-lubricated and sealed. Under normal conditions they will not require further maintenance for a period of ten years. However, it is advisable to have your maintenance department remove and disassemble the motor, and lubricate the bearings after three years of operation in excessive heat and or in a contaminated airstream consisting of airborne abrasives.

Fan Bearings
Greaseable fan bearings are lubricated through a grease fitting on the bearing and should be lubricated by the schedule, Conditions Chart.

For best results, lubricate the bearing while the fan is in operation. Pump grease in slowly until a slight bead forms around the bearing seal. Excessive grease can burst seals thus reducing bearing life.

In the event the bearing cannot be seen, use no more than three injections with a hand-operated grease gun.

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.

Final Installation Steps
a. Inspect fasteners and setscrews, particularly fan mounting and bearing fasteners, and tighten according to the recommended torque shown in the table Recommended Torque for Setscrews/Bolts.
b. Inspect for correct voltage with voltmeter.
c. Ensure all accessories are installed.

Operation
Pre-Start Checks
a. Lock out all the primary and secondary power sources.
b. Ensure fasteners and setscrews, particularly those used for mounting the fan, are tightened.
c. Inspect belt tension and pulley alignment.

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Wheel-to-Inlet Clearance

The correct wheel-to-inlet clearance is critical to proper fan performance. This clearance should be verified before initial start-up since rough handling during shipment could cause a shift in fan components. Refer to wheel/inlet drawing for correct overlap.

Adjust the overlap by loosening the wheel hub and moving the wheel along the shaft to obtain the correct value.

A uniform radial gap (space between the edge of the cone and the edge of the inlet) is obtained by loosening the inlet cone bolts and repositioning the inlet cone.

Wiring Installation

All wiring should be in accordance with local ordinances and the National Electrical Code, NFPA 70. Ensure the power supply (voltage, frequency, and current carrying capacity of wires) is in accordance with the motor nameplate.

Lock off all power sources before unit is wired to power source.

Leave enough slack in the wiring to allow for motor movement when adjusting belt tension. Some fractional motors cannot be restricted to one direction at the factory. See Wiring Diagrams above for specific information on reversing wheel direction.

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.

Wheel Rotation

Test the fan to ensure the rotation of the wheel is the same as indicated by the arrow marked Rotation.

115 and 230 Single Phase Motors

Fan wheel rotation is set correctly at the factory. Changing the rotation of this type of motor should only be attempted by a qualified electrician.

208, 230, and 460, 3 Phase Motors

These motors are electrically reversible by switching two of the supply leads. For this reason, the rotation of the fan cannot be restricted to one direction at the factory. See Wiring Diagrams above for specific information on reversing wheel direction.

Belt and Pulley Installation

Belt tension is determined by the sound the belts make when the fan is first started. Belts will produce a loud squeal which dissipates after the fan is operating at full capacity. If the belt tension is too tight or too loose, lost efficiency and possible damage can occur.

Do not change the pulley pitch diameter to change tension. This will result in a different fan speed than desired.

a. Loosen motor plate adjustment nuts on bolts and move motor plate in order that the belts can easily slip into the grooves on the pulleys. Never pry, roll, or force the belts over the rim of the pulley.

b. Adjust the motor plate until proper tension is reached. For proper tension a deflection of approximately 1/4" per foot of center distance should be obtained by firmly pressing the belt. Refer to Figure 3.

c. Lock the motor plate adjustment nuts in place.

d. Ensure pulleys are properly aligned. Refer to Figure 4.

Changing Shaft Speed

All belt driven fans with motors up to and including 5 HP (184T max.) are equipped with variable pitch pulleys. To change the fan speed, perform the following:

a. Loosen setscrew on driver (motor) pulley and remove key, if equipped.

c. After adjustment, inspect for proper belt tension.

Speed Reduction

Open the pulley in order that the belt rides deeper in the groove (smaller pitch diameter).

Speed Increase

Close the pulley in order that the belt rides higher in the groove (larger pitch diameter). Ensure that the RPM limits of the fan and the horsepower limits of the motor are maintained.

Maximum RPM

<table>
<thead>
<tr>
<th>CP-BK</th>
<th>Class</th>
<th>Maximum RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td></td>
<td>250</td>
</tr>
</tbody>
</table>

Pulley and Belt Replacement

a. Remove pulleys from their respective shafts.

c. Clean bores of pulleys and coat the bores with heavy oil.

e. Remove grease, rust, or burrs from the pulleys and shafts.

f. Place fan pulley on fan shaft and motor pulley on its shaft. Damage to the pulleys can occur when excessive force is used in placing the pulleys on their respective shafts.

g. Tighten in place.

h. Install belts on pulleys and align as described in the Belt and Pulley Installation section.

Bearing Replacement

The fan bearings are pillow block ball bearings. An emery cloth or file may be needed to remove imperfections in the shaft left by the setscrews.

Arrangement 10

a. Mark the position on the shaft of both bearing race keys, setscrews, and the wheel and pulley. Mark the location and orientation of the inlet cone. Note the clearance between the wheel and inlet cone.

b. Remove the fan pulley.

c. Remove the inlet cone.

d. Remove the wheel from the shaft. A 2-jaw puller may be needed.

e. Remove bearing hold-down bolts. Remove shaft and bearings as one unit.

f. Remove the anti-corrosion coating from the shaft with a suitable solvent.

g. Remove the bearing from the shaft using a bearing puller. If a bearing puller is not available, tap on the bearing with a wood block and hammer to remove it.
h. Smooth and clean the shaft and bearing bore thoroughly.

i. Place the bearings into position making sure they are not on a worn section of the shaft. Tapping the inner ring face with a soft driver may be required. Do not hammer on the housing.

j. The outer ring of the bearing is spherical and swivels in the housing to compensate for misalignment. Secure hold-down bolts, but do not fully tighten. k. Align the setscrews on the bearings and tighten one setscrew on each bearing.

l. Rotate the shaft to allow the bearing outer rings to find their center of free movement.

m. Install the wheel on the shaft. Install the inlet cone in its original location. And adjust bearing position and inlet cone to center the wheel in the inlet cone.

n. Tighten hold-down bolts to proper torque.

o. Turn the shaft by hand. Resistance should be the same as it was before hold-down bolts were fully tightened.

p. Tighten bearing setscrews to specified torque. Refer to Torque chart.

q. Re-install the pulley and adjust the belt tension.

r. Test run and retighten all setscrews and bolts; trim balance as necessary (.0785 in/sec max.).

After 24 hours of operation, retighten the setscrews to the appropriate torque. This assures full locking of the inner race to the shaft. Make sure 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 rounding out of the setscrew socket when applying maximum torque.
Troubleshooting

<table>
<thead>
<tr>
<th>Problem and Potential Cause</th>
<th>Action</th>
</tr>
</thead>
</table>
| Excessive Vibration and Noise | -Damaged or unbalanced wheel.  
-Too loose; worn or oily belts.  
-Improper wheel alignment.  
-Improper bearing lubrication or replacement.  
-Excessive or incorrect belt tension.  
-Missing heat shield from inside pedestal. |
| Overheated Motor | -Motor improperly wired.  
-Improper bearing lubrication.  
-Cooling air diverted or blocked.  
-Improper belt tension.  
-Improper direction of rotation.  
-Missing heat shield from inside pedestal. |
| Overheated Bearings | -Improper bearing lubrication.  
-Excessive belt tension.  
-Missing heat shield from inside pedestal. |

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 have no other legal rights which vary from state to state.

Loren Cook Company
Corporate Offices: 2015 E. Dale Street · Springfield, MO 65803 417.869.6474
www.lorencook.com

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