



Better Air is Our Business®

AmericanAirFilter® Type K Exhauster

Standard and High Pressure

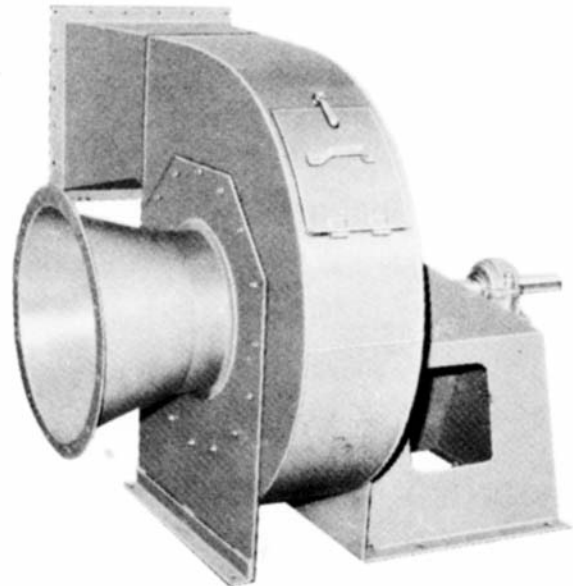
Installation, Operation and Maintenance Instructions

Table of Contents

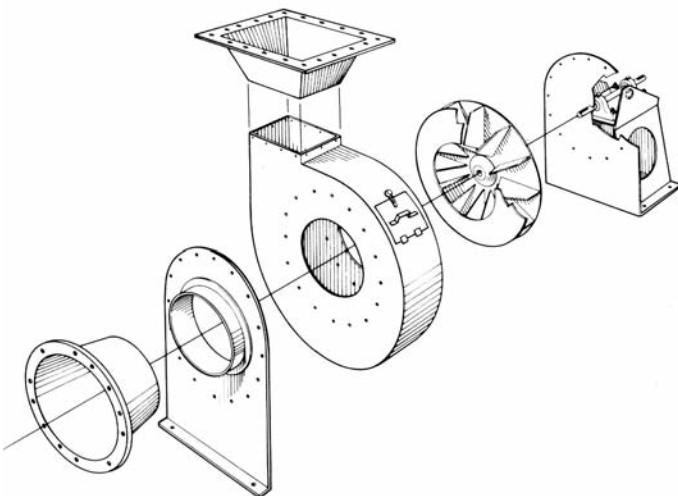
- 1.0 Inspection
- 2.0 Lifting
- 3.0 Storage
- 4.0 Installation
 - 4.1 Installation Procedures for Standard A,B,C, and D
Section V-Belt Drives
- 5.0 Operation Start Up
- 6.0 Maintenance
- 7.0 Bearings
- 8.0 Impeller Removal and Installation
- 9.0 Split Taper Bushings
 - 9.1 Removal
 - 9.2 Installation
- 10.0 Spare Parts and Service
- 11.0 Troubleshooting Guide



AAF Type K Exhauster, Arrangement 1



AAF Type HPK Exhauster, Arrangement 1



1.0 Inspection

All equipment should be carefully inspected for damage when received. Any shortage, damage, or breakage should be noted and a claim filed immediately with the carrier. All AAF shipments are F.O.B. factory.

2.0 Lifting

The Type K Exhauster is equipped with either lifting lugs or eyes. The exhauster must NEVER be lifted by the shaft or housing. Caution must be used during handling and mounting. Dropping the unit just a few inches can imprint the bearing balls or rollers into the inner and outer races. This will result in vibration and premature bearing failure.

3.0 Storage

Type K Exhausters should be stored in a dry, protected area where bearings, wheels, fan shaft motors, and starters are not exposed to moisture, dust, or corrosion. If it is necessary to store the unit outdoors, special care should be taken to eliminate the accumulation of moisture, dust, and corrosive materials and other contaminants. The motor, bearings, and shaft should be covered with a protective lubricant and/or weather resistant cover.

In addition, "Puddle Corrosion" may occur within a bearing when water from moisture laden air comes in contact with the unprotected steel surfaces of the bearing races. Water collects in voids caused by the lubricant level dropping.

Grease-lubricated bearings should be re-lubricated upon arrival at the storage site, and periodically during storage. The impeller should be manually rotated and the bearings greased at frequent intervals, depending on the environment, but normally every 4–6 weeks of the storage period should be sufficient.

4.0 Installation

1. Remove any protective covering on the bearings and motor shaft, and remove shipping skids.
2. The exhauster should be mounted on a flat, level, rigid foundation. If vibration isolators are used, a sub-base must be used to support the exhauster with the isolators located at each corner of the sub-base. Connecting ductwork requires flexible connections when vibration isolators are used.
3. Carefully line up unit with the anchor bolts in the foundation and shim if necessary for leveling. Secure the exhauster in place by tightening all nuts on anchor bolts.

Where ground support is not feasible, overhead support is possible. The foundation can be hung from suspension rods, or, where conditions permit, the exhauster can be rotated 180° and bolted. However, the same precautions must be taken in order to ensure the fan is level and securely fastened to the support.

4.1 Installation Procedures for Standard A, B, C, and D Section V-Belt Drives*

Step 1: The K Exhauster is supplied with drives of various manufacturers. Detailed installation instructions supplied by the manufacturers are included in the instruction envelope.

Step 2: After placing the set of matched belts in the sheave grooves, take up the slack in the belts and start the drive. Tension the drive until the belts have only a **slight bow** in the slack side of the drive while it is operating under load.

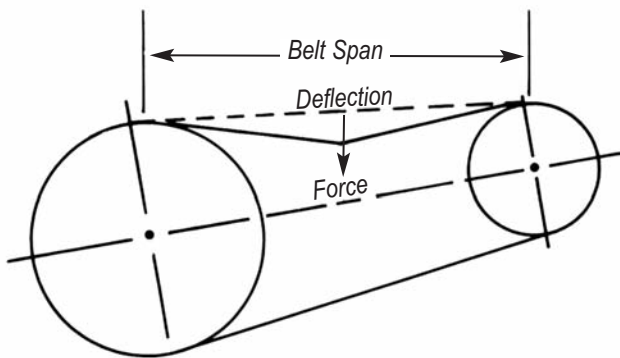
Step 3: Stop the drive and measure the belt span (see sketch on the following page). Using a spring scale, apply a force to any one of the belts in the center span. The force should be perpendicular to the span and toward the center of the drive. Measure the force required to deflect any one of the belts $\frac{1}{64}$ inch for every inch of span length. For example, the deflection of a 32 inch span would be $\frac{1}{64}$ inch multiplied by 32, or $\frac{1}{2}$ inch.

Step 4: The amount of force required to deflect the belt should compare with the recommended values listed in the table on the following page. Initially, you should tighten the belts to the values listed in Column A. There will normally be a drop in tension during the first 24 to 48 hours of operation. During this "run-in" period, the belts seat themselves in the sheave grooves, and the initial stretch is removed. After a day or two, the drive should be stopped again and another check made for the correct amount of tension. The tension should now compare with the values in Column B. If the force is below the low value in Column B, the belts are too loose and should be tightened. If the force is greater than the high value in Column B, the bolts should be loosened so that the force is between the high and low value in Column B.

5.0 Operation Start Up

1. Insure wheel is tight on shaft and the foundation bolts, sheaves, and bearings are secured.
2. Turn fan rotor manually to insure there is no rubbing or binding.
3. Make certain the rotation of the fan wheel is the same as that indicated on the fan housing.
4. After exhauster has operated for a few hours, retighten all bolts.
5. V-belt drives should be checked to determine if proper alignment and belt tension are correct. All V-belt drives require an initial run-in period during which initial stretch is removed from the belt and seating of the belts in grooves takes place. To compensate for this loss in tension, the drive is installed with greater tension than required for normal operation.
6. See planograph 88P-108381. Remove one for correct lubrication system. After bearing equilibrium temperature has been reached, adjust the lubrication system as required.

* For belts other than standard A, B, C or D section, see manufacturer's instructions included with drive.



Belt Deflection Force

6.0 Maintenance

1. A time schedule should be established for inspection of rotating parts in the exhauster. The frequency of inspection must be determined by the severity of operation and the locality.

Proper bearing lubrication is of major importance in the continued, efficient operation of the AAF Type K Exhauster. Generally, the following should be taken into consideration when lubricating fan or motor bearings.

- a. A reasonable periodic lubrication schedule should be instituted after some maintenance experience on the unit is gained. Frequency of lubrication will depend upon air temperature, amount of dust in the air, and moisture or corrosive content of the environment.
 - b. The proper type lubricant should be particularly noted. See specific instructions in service envelope. The factory grease is Chevron SRI #2 or equal.
 - c. Care should be taken not to over lubricate the bearing as this will cause high temperature operation. When lubricating bearings with a pressure grease gun, care should also be taken so bearing seals are not damaged.
2. Housing and wheel should be inspected periodically, through the inspection door, for wear and possible accumulation of dust. Various methods of cleaning may be employed depending on the particular installation.

Two most common methods are:

- a. Steam, water, or air under high pressure.
- b. Manual wire brush cleaning or scraping.

This cleaning is necessary where dust has accumulated to prevent unbalanced conditions. Precautions should be taken to make sure bearings and motor are protected when any high pressure method of cleaning is used.

All bolts should be periodically inspected and tightened.

Belt	Small Sheave Diameter	Deflection Force (lbs.)	
		A "Run-in" Period	B Normal Period
3V	2.65 to 3.35	6	3 to 4 ^{1/2}
	4.75 to 6.00	8	4 to 6
5V	7.1 to 9.00	16	8 to 12
	12.5 to 16.00	20	10 to 15
8V	18.0 to 22.4	40	20 to 30

3. Belt Driven Units—V-belt drives should be checked on a regular basis to determine if proper alignment and tension are being maintained. It is recommended that belts be replaced in matched sets when necessary.

7.0 Bearings

The Type K Exhauster is furnished with a variety of bearings depending upon type duty, size, RPM, etc. Detailed information on the specific bearings furnished is supplied in the service and installation envelope attached to the exhauster at shipment. It is important that identical bearings be used when replacement is required. (Note: The shaft should be inspected for damage before installing new bearings. It is often economical to replace the shaft when installing new bearings.)

Type K Exhausters using ¹⁵/₁₆" and larger bearings are normally supplied with one fixed and one floating bearing. A slight improvement in bearing life is normally achieved by keeping the fixed bearing on the outboard position.

8.0 Impeller Removal and Installation

To remove the impeller, it is necessary to first remove the front plate. All K Exhausters are furnished with split taper hubs and bushings. Remove the hub and bushing according to the following directions. The impeller can then be removed through the inlet side of the scroll. Installation is the reverse of removal.

AmericanAirFilter® Type K Exhauster

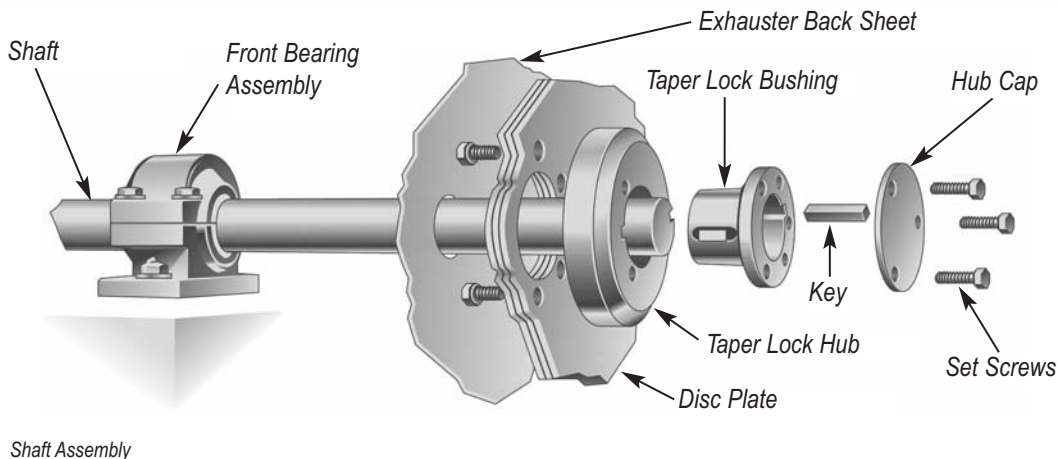
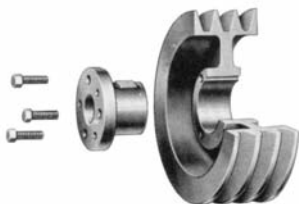
9.0 Split Taper Bushings

9.1 Removal

1. Remove all screws. To facilitate easier reinstallation, oil should be applied to all contact surfaces.
2. Insert screws in holes threaded in bushing flange. Tighten screws alternately until bushing is loose in hub. (Note: One screw will be unused.)

9.2 Installation

1. Place bushing in hub. Place screws loosely in holes threaded on hub side shown in diagram.
2. Place assembly on shaft and locate in desired position.
3. Tighten screws alternately until required torque is obtained. Tap bushing and retighten as required.



10.0 Spare Parts and Service

Spare parts may be ordered from your nearest American Air Filter representative or direct from the factory. In ordering, it is important that the **part name** and **serial number** be shown on the order. It is suggested that the following spare parts be kept on hand under normal operating conditions.

1. Bearings
2. V-belts

Where operating conditions are severe, continuous, critical, foreign, or remotely located, the following parts should also be stocked:

1. Shaft
2. Impeller

11.0 Troubleshooting Guide

Problem

Excessive vibration

Possible Causes

- Impeller imbalance—Check for dust build-up, wear, or missing balance weight.
- Bent shaft—Replace shaft.
- Worn or defective bearings—Replace.
- Loose impeller or sheave—Adjust.
- Incorrect operating range—Review and adjust as necessary.

Problem

Frequent Bearing failure

Possible Causes

- Improper or infrequent lubrication—Lubricate per manufacturer's directions.
- Lubricant contamination—Clean bearings and relubricate.
- Fan imbalance—See above.
- Drive belts too tight—Adjust belts per directions.

Problem

Improper fan performance

Possible Causes

- Worn impeller—Replace impeller.
- Incorrect RPM—Adjust RPM
- Loose drive belts—Adjust belts.
- System changes—Review system for design changes, obstructions, etc.
- Incorrect direction of rotation—Reverse direction