

Sheldons Engineering Limited have designed these fans for the class of duty for which they were sold and to provide satisfactory service with the minimum of attention. However, correct installation and proper operation with regular preventative maintenance is essential to keep these fans running satisfactorily.

This bulletin contains all the necessary information on the installation, operation and maintenance of Axial Flow Fans for most industrial and commercial applications.

RECEIVING

Each fan is inspected before leaving the factory, and is adequately prepared for shipping. All equipment should be carefully examined for any damage that may have occurred in transit. Any shortage or damage should be reported to the carrier. Also at assembly, when hidden parts may have been damaged, report to the carrier immediately before proceeding with any installation.

HANDLING

All fans should be handled carefully to avoid damage to bearing races, and to prevent misalignment. Fans must not be lifted by the wheels, or motor base, but by lifting lugs provided, or by bolts attached to flanges of fan case.

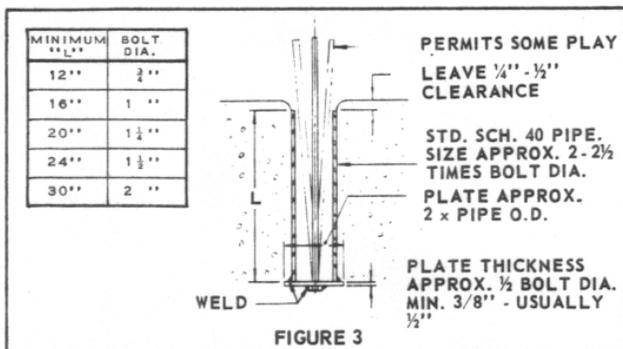
All Axial Flow Fans are assembled at the factory. For those few fans that are shipped knocked down, pre-assembly at the factory ensure easy erection.

FOUNDATION

Fans should be mounted on a rigid substantial support. Concrete foundations normally provide the most suitable base for any fan. Where a fan is mounted on a steel platform above the floor, or on a steel support located within the structural steel building frame, the fan platform **MUST** be thoroughly braced to eliminate all vibration.

Attention paid to holding down the fan securely, using all the manufacturers boltholes, will ensure a much smoother running fan. Poorly installed foundation bolts are difficult to replace once the fan is in position. Hold-down bolts in concrete must not be placed nearer than 6" from the edge of the concrete, preferably 8" to prevent spalling of concrete.

For large mine and tunnel fans, set foundation bolts in pipes in concrete to permit some play. See Fig. 3.



ERECTION PROCEDURE

Most Axial Flow Fans are pre-assembled at the factory and shipped in one piece. These units only need to be bolted down securely to be put into operation. On vertically mounted fans, it is customary to install a plate on the wheel end of the shaft. Check to ensure that the bolt holding this in place is secure before mounting the fan.

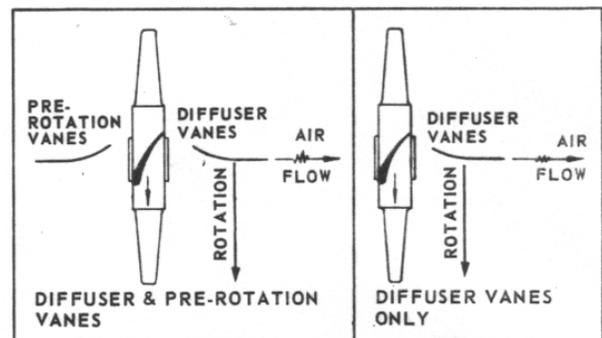
Some very large mine and tunnel fans may be shipped knocked down, but in these cases, fans are pre-assembled and match marked before being knocked down for shipping.

INSTALLATION NOTES

1. In general, on such shipment, Sheldons arrange to ship the lower half of fan case with wheel, shaft and bearings, or motor installed.
2. Upper half of fan casing should be installed after lower half is lowered into position.
3. Check radial clearance between tip of blades and inside of fan casing. Bearings and motor feet are spring dowelled into position at assembly and should not misalign during shipment. Uneven radial clearance between blades and casing is acceptable. On large fans 72" and larger, a minimum 1/8" radial clearance is necessary as some stretching of wheel and flexing of fan case takes place when fan is at full speed.

On some very large mine and tunnel fans, where the wheel is shipped loose, the wheel must be assembled correctly to the fan or motor shaft to obtain efficient fan performance.

A schematic view of vanes and blades of a typical high pressure Axial Fan is shown below.



BEARINGS

On all self-contained units, bearings have been pre-assembled at the factory, and greased.

On knocked-down shipments, loose bearings are shipped dry and grease **MUST** be added before start-up. For details of bearing installation see bearing bulletin attached.

V-BELT DRIVES

Drives are usually preset at the factory, with the motor mounted, and it should not be necessary to adjust the drive before start up. Drive should be checked after 2 or 3 days operation as belts tend to stretch slightly in this period.

To install new V-belts, slacken drive slightly with motor adjustment screws, to allow belts to slip over both sheaves without force.

When adjusting V-belt drive, raise and lower motor uniformly and ensure that motor sheave is in line with fan sheave.

Make SURE that jam nuts are re-tightened on motor adjusting screws.

COUPLINGS

Large mine fans are sometimes direct connected to the fan shaft through a flexible coupling. All coupling halves are shrunk on with an interference fit. It is recommended that all couplings be checked for correct alignment before starting the fan, even though motor and bearing feet are spring dowelled at assembly.

This simple precaution will save a lot of unnecessary trouble later on that could lead to costly breakdowns. Coupling manufacturers installation and maintenance information is attached.

OPERATION AND MAINTENANCE INSTRUCTIONS

Good fan maintenance depends on only three items:

1. Bearings
2. V-belt drive
3. Balance

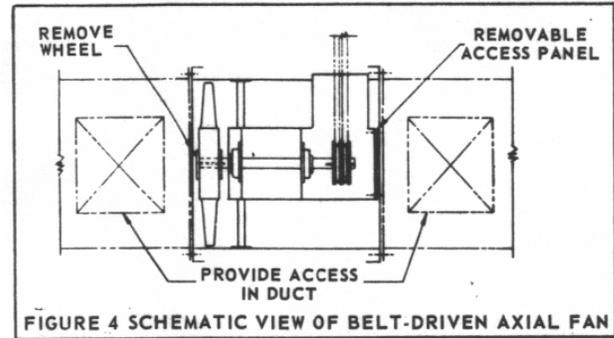
If these three items are carefully maintained, no major problems need ever arise with Sheldons Axial Fans.

BEARINGS MAINTENANCE

Bulletins are provided for each type of bearing normally used with Sheldons Axial Fans, showing lubricant, lubrication interval and method of changing bearings and all information necessary for good bearing maintenance. For lubrication of bearings supplied with this fan see the bearing maintenance instructions attached.

REMOVAL OF BEARINGS FROM AXIAL FANS

1. It will generally be necessary to remove the complete fan from the duct system in order to change bearings satisfactorily.
2. In those cases where it is impractical to remove the whole fan, it will be necessary to provide access to both ends of the fan. See Fig. 4. In all cases, ensure that the starter is locked-out by the person working on the fan.
3. Remove fan sheave and remove and replace bearings per maintenance bulletin attached.
4. At wheel end, remove wheel using wheel pullers if necessary. Remove and replace bearings per bearing maintenance bulletin attached.
5. In replacing the wheel, ensure that wheel is as concentric as possible in fan case. If wheel strikes, the bearings may be tapped over to one side to avoid this, after slackening bearing holding bolts, very slightly and retightening.



V-BELT DRIVE MAINTENANCE

Check tension of V-belts and alignment periodically.

Belts which are too slack will allow slippage, and side wall wear on sheaves, and can normally be detected by belt squeal on start-up, or overheating of the small sheave.

Belts which are too tight cause overload on the fan and motor bearings and reduce belt life.

Belt deflection, using standard V-belts should be approximately 12" per foot of belt between centers. e.g. — belts with 48" centers should deflect no more than 2" at center span, using reasonably firm finger pressure.

With Poly-V-belts or equivalent, much greater belt tension is required.

When installing new belts, install a complete set of belts, since mixing old with new belts will only overload the unscratched new belts causing early failure.

All belts should be kept free from dust or oil.

Where a V-belt drive is fitted with an adjustable pitch sheave, and a speed change is made, the final tensioning of the belt should be made by moving the motor. The adjustable pitch sheave should not be used to obtain belt tension.

VIBRATION ISOLATORS

Three major types of vibration isolators are used on fan equipment:

1. Steel spring isolators for maximum efficiency.
2. Rubber-in-shear isolators.
3. Rubber and cork pads.

Once these are installed correctly, no maintenance is required.

Only spring isolators are adjustable. Slacken off jam nut, and screw down the jack screw until spring is compressed sufficiently to carry the load, but not compressed enough to cause coils to touch.

Fan vibration cannot be cured with vibration isolation, but requires electronic field balancing. See "Fan Balance".

MOTORS

The maintenance and repair of electric motors is explained in the attached motor maintenance data sheet ED-6. Modern motors require very little lubrication. Greasing once every 10 years is good practice to prolong bearing life.

FAN BALANCE

All fans are accurately balanced before they leave the factory, and unless they have been subjected to rough handling, should be ready to put into immediate operation.

If vibration occurs at any time, check the following causes:

1. Check to see that wheel is completely clean and free of any build-up on blades.
2. Check that no abrasive wear has taken place on blades.
3. Check that wheel and sheaves are tight on shaft.
4. Check foundation hold-down bolts for tightness.
5. Check for worn or loose bearings.
6. Check that motor by itself is in balance.
7. Check alignment of coupling or drive.
8. Check for straight shaft.

The most frequent causes of fan unbalance is caused by dirt build-up and/or wear on blades. If an unbalanced fan is allowed to run for any length of time, the vibration will loosen bolts, ruin bearings, cause fatigue cracks in steel pedestals, and even spring the fan shaft.

Sheldons portable electronic balancing equipment can usually correct any residual unbalance once items 1 through 8 have been checked. It is done with fan on site, without dismantling, in an hour or so.

ADJUSTABLE PITCH BLADES - TYPE AF ADJUSTAFOIL ONLY

Changes in performance on Sheldons Adjustafoil fans may be made by changing the pitch of the blades. Note — Increasing the pitch will mean an increase in HP, and the existing direct connected motor should be large enough to take the increased load. For further information as to the suitability of the existing motor, consult Sheldons Engineering Limited, Galt, Ontario. Larger motors can often be readily mounted in the field. Access to the blades can either be made via the access door in the fan case or through an opening in duct ahead of the wheel.

SPARE PARTS

Spare parts should be ordered from Sheldons Engineering Limited, Galt, Ontario, quoting the serial number shown on name plate on the side of the fan case. It is a good practice to have spare bearings and V-belts stocked for any emergency breakdown.

CLEANING AND PAINTING

It is important that periodic checks be made of the wheel and fan case for build-up of dirt and grease. Build-up will cause unbalance and lead to early bearing and foundation failure. Accumulated build-up should be scraped, wire-brushed, or blown off at intervals.

When conducting regular inspection and cleaning of fan, it is a good practice to clean and paint the housing. Do not apply paint to shaft, as this makes bearing removal difficult. Use a rust inhibitor that will wipe off with a solvent.