

Alignment

V-Belt Drive

Proper alignment and balance of the V-belt is as important as a well-balanced impeller. To insure smooth fan operation, the following should be checked:

1. Fan and motor sheave must be in axial alignment. Shafts are parallel in both the vertical and horizontal planes (Figure 1).

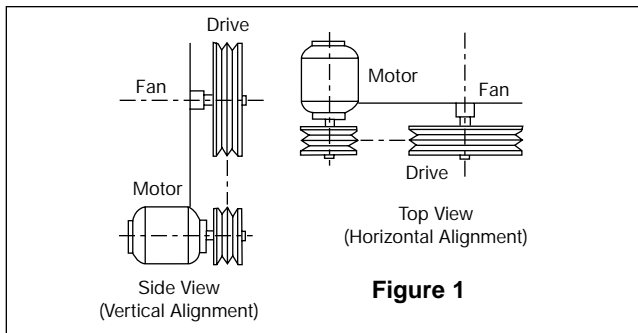


Figure 1

2. Fan motor sheave must be in radial alignment. When sheaves are of equal width, align with straightedge (Figure 1a). When sheaves are of unequal width, align center of sheaves (Figure 1b).

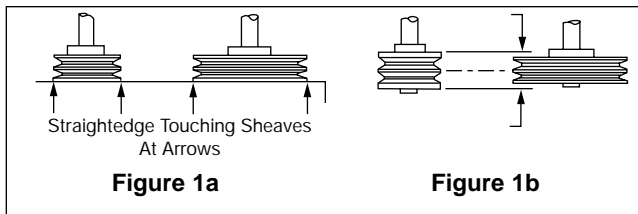


Figure 1a

Figure 1b

3. Sheaves must have no noticeable eccentricity.
4. Belts must have the proper tension. Belts either too loose or too tight cause vibration and excessive wear (Figure 2). See IM-100 for belt tension adjustment procedure.

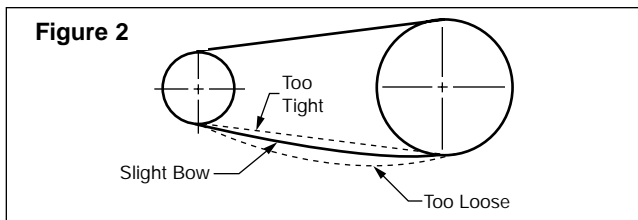


Figure 2

5. After proper installation of drives, recheck complete assembly for smoothness of operation. Recommended vibration limits shown on page 2 of IM-100.

Flexible Couplings

Direct-coupled fans, which are received factory assembled, on a common base plate, are accurately aligned before shipment. However, base plates are flexible to some extent and therefore must not be relied upon to maintain the factory alignment. Realignment is necessary after the fan has been leveled, grouted, and the foundation bolts tightened. Also, check lubricant, where applicable, following manufacturer's recommendations for type and amount of lubricant.

For field installation, the coupling should be mounted as follows:

1. Remove dirt or rust from fan and motor shafts and coat with grease or oil for ease of mounting.
2. Check fan and fan shaft alignment, making sure that bearings are secure. Mount fan shaft coupling half flush to end of shaft and secure.
3. Mount motor shaft coupling half flush to end of shaft and secure.
4. Move motor into position, with the coupling faces separated by the coupling manufacturer's specified gap.
5. With a straightedge, tapered wedge, or a feeler gauge, check for parallel and angular alignment (Figure 2a).

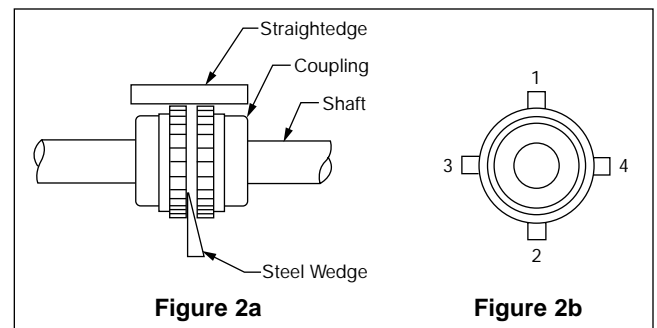


Figure 2a

Figure 2b

6. Align the shafts until a straightedge appears to be parallel to the shafts. Repeat at three additional points at approximately 90° from each other (Figure 2b). Recheck hub separation gap.
7. For more accurate alignment, use a dial indicator clamped on one hub. With the dial button resting on the other hub, rotate the hub on which the indicator is clamped and observe the indicator reading. Take readings at four locations, 90° apart. With correct

alignment, the faces of the couplings should be parallel within .002".

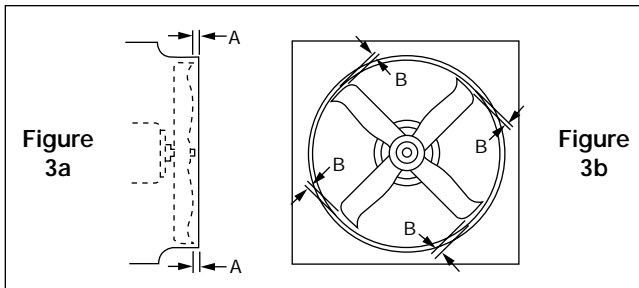
- Once proper alignment is assured, secure the motor, examine alignment, complete the assembly, and lubricate the coupling (when required) before putting the unit into operation.

Impellers

Fans, which are received factory assembled, have the impellers already aligned and in place before shipment. However, fans being flexible to some extent are sometimes subject to movement during shipment. To insure smooth operation and proper performance, the following impeller alignment should be checked before putting fan into operation.

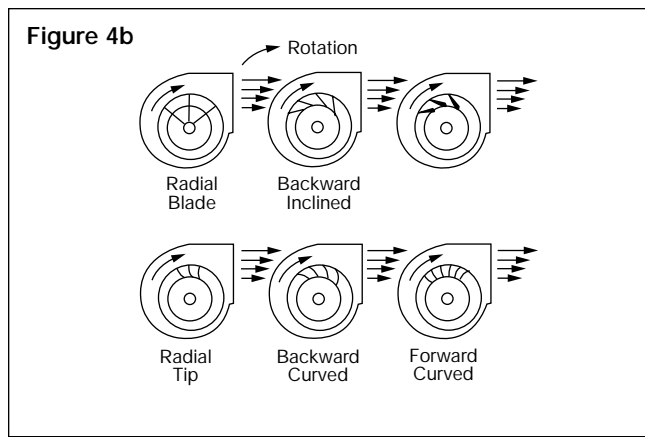
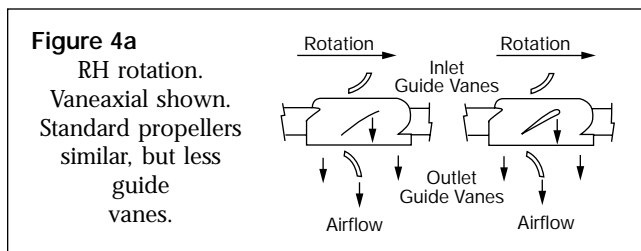
Propeller Fans

Fan shaft should be centered and parallel to fan casing. Center by checking gap (B) between propeller tip and fan casing. Repeat at three additional points at approximately 90° from each other (Figure 3b). Parallelism can be observed by measuring the axial distance (A) from one blade to the end of the fan casing at four points at approximately 90° from each other (Figure 3a).



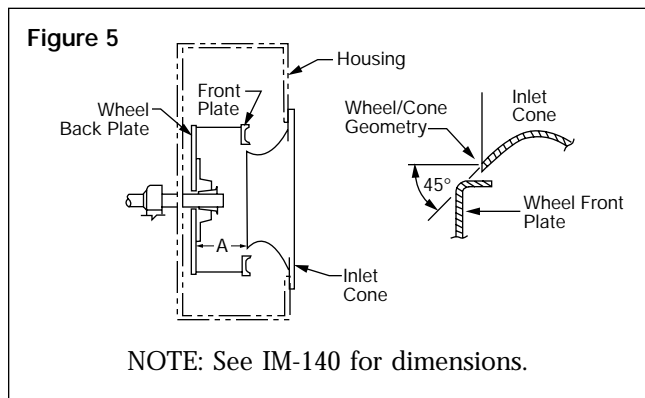
Do not confuse parallelism with blade track (axial deviation of one blade to another). Blade track can be checked by measuring the axial distance from one point on the fan casing to the same point on each blade as it passes by. (Some blades are mistracked for balancing.)

While checking the propeller alignment, it is good practice to check its rotation. Normally the fan rotation is marked by arrows on both the propeller and the fan casing. If omitted, obliterated, or misapplied, check for proper rotation in Figure 4a.



Centrifugal Fans

The fan shaft should be approximately centered in the clearance hole in the fan housing and perpendicular to the housing sides. Perpendicularity can be checked on BI and BIA fans by measuring dimension "A" (Figure 5) at four points approximately 90° apart.



Radial blade impellers, material handling, pressure blowers, and high pressure blowers are centered axially in the housing, and can be checked by measuring the axial distance from one blade or one point on the front plate to the side of the fan housing at four points approximately 90° from each other.

While checking the impeller alignment, it is good practice to check its rotation. Normally the fan rotation is marked by arrows on the housing. If omitted, obliterated, or misapplied, check for proper rotation in Figure 4b.



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