

FANS & BLOWERS

Installation, Maintenance and Operating Instructions

RECEIPT AND INSPECTION

Your Dynamic Fan Corporation unit has been carefully designed so that with the proper installation and maintenance, many years of satisfactory, trouble-free service will be attained.

Upon receipt of the DFC unit, check the Packing List to insure all items shipped have been received.

If a shortage or damaged containers are noticed, immediately call this to the trucker's attention, so that it can be noted on the delivery receipt.

The above also applies to skidded units too large to package.

STORAGE

If installation of the unit is delayed the unit should be stored in a finished building or a heated warehouse. Storage in this type of facility requires no special preservation of the equipment. If stored out-of-doors special care must be taken to protect against dirt, moisture, corrosion, etc. Cover the entire unit with tarpaulin, and inspect periodically to make sure that no damage is developing.

Fill the bearing completely with grease to prevent rust formation in the bearing housing and corrosion of the balls, rolls and races. Use a good grade of bearing grease and apply with a handgun opposed to a pneumatic gun to avoid bearing seal damage. Clean grease fitting and gun before lubricating to avoid forcing foreign particles into the bearings. Add grease slowly until a slight bead is noticed around the bearing seal. Avoid storage in temperature below -10 deg. F, which could cause a breakdown of the lubricant.

Cover all bearings with water repellent, lint-free material and seal with tape. Block the wheel to prevent wheel rotation (over spin) from the wind.

If units are stored for more than 60 days, the wheel must be rotated every 30 to 45 days to prevent false brinelling of the fan bearings. False brinelling is caused by vibration of the balls of rolls between the races in the stationary bearing. This vibration may be either axial or oscillating. As the ball or rolls vibrates between the races, the lubricant is forced out of the contact area between the ball and race, causing met-

al-to-metal contact and localized wear of ball and races, which result in a rough and noisy bearing operation.

It is strongly recommended that records be kept on wheel rotation and inspections while in storage.

After the units are installed, follow the lubrication instructions provided on page 2.

Upon start-up of the equipment caution should be taken to run-in the bearings for a short period of time so excessive bearing temperatures are not encountered. This should be repeated until the bearings hit a normal temperature range "cool to warm" up to a point "too hot to touch for more than a few seconds;" depending on bearing size and speed and surrounding conditions.

If the fans are not put in service prior to one year after shipment, the lubricant should be changed. Grease has a tendency to become hard and deteriorate, losing its lubricating qualities.

NOTE: Storage surface must be level to prevent distortion.

INSTALLATION

CENTRIFUGAL FANS: The fan should be mounted on a rigid, flat, level foundation. If vibration isolators are used, they should be installed in position and leveled, using large surface shims if necessary, before positioning the fan. The fan should be checked to be sure ALL bolts are tightened. The fan can then be lifted into position on the vibration base. Be sure the air flow is correct for the duct connection.

Bolt the fan securely into position. When the motor and drive are furnished separately, they should be mounted next. If the unit is mounted on an integral, structural steel base or on a reinforced concrete inertia base, adjust the base, using the leveling bolts.

Recheck the interior of the fan housing to be sure it is free of debris. Rotate the wheel to insure that it is not rubbing or binding. Check the clearance of the wheel and the inlet cone. If rubbing exists, loosen the bolts on the cone and shift the cone until clearance is obtained. If still rubbing, loosen the set screws on the wheel and shift the wheel rearward to obtain clearance. Retighten the set screws.

(See V-Belt drive section on opposite page.)

BEARINGS

Bearings of any unit that has been stored for any period of time **MUST** be lubricated before startup.

All bearing and wheel set screws should be checked and tightened, and rechecked after the first 50 to 100 hours of operation.

Bearings have been factory pre-lubricated with high quality grease.

Bearings can be relubricated either while stationary or running. However, for the safety aspects, relubrication is suggested while the units are stationary (when the fan is shutdown). Always follow plant safety procedures and OSHA requirements.

Apply a good grade ball bearing

grease with a hand gun until a slight bead of grease is noticeable around the bearing. Stop lubricating when the bead is formed. **DO NOT OVERLUBE.**

If the unit is furnished with sleeve bearings, bronze lined, fill oil reservoir with a good grade of SAE-10 lubricating oil. If bearings are ring oil type, use SAE-30 oil. Lubrication of motor bearings should also be followed as outlined for both ball and sleeve type.

It is recommended that all bearings be examined periodically for lubrication. The relubrication interval depends on the bearing operating conditions: speed, temperature, and environment, for a typical relubrication schedule see the table below.

At the time of each examination, check alignment of the drives and tightness of the set screws and bolts.

NORMAL SERVICE is considered as operation in a clean, dry atmosphere at temperatures between 20 deg. F. and 180 deg. F. and at shaft surface speeds up to 1900 ft. per minute. This corresponds to a 1" shaft at 7300 RPM, a 2" shaft at 3600 RPM or a 3" shaft at 2400 RPM.

Where service is **ABNORMAL** with respect to speed, temperature, exposure to moisture, dirt or corrosive chemicals, or where extremely long life is required, more frequent relubrication may be advisable. The bearing manufacturer will advise suitable greases for abnormal service on request.

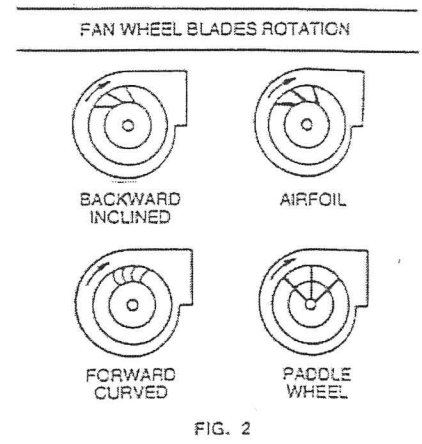
ELECTRICAL CONNECTIONS

Before connecting the motor to the electrical supply check the electrical characteristics as indicated on the motor nameplate.

Inspect for any damage resulting from shipment and turn the shaft by hand to insure free rotation. If the motor has been in storage or subject to adverse moisture conditions, dry it thoroughly before operating. After drying, run the motor not connected to the load for a short time for further drying and as

a check on the bearings.

If a controller is furnished, the wiring diagram in the controller must be followed. Special attention should be given to see that a single phase motor is connected only to a single phase supply of proper voltage, and that a three phase motor is connected only to a three phase supply. Electric motors will burn out and fail immediately if improperly connected. It is also recommended that in every motor connection, an overload device be installed between the current supply and the motor to protect the motor from under-voltage conditions and motor overloads.



After electrical connections are completed, apply just enough power to start the unit. Be sure that the rotation of the motor and the unit are turning as indicated by directional arrows on the unit. Refer to Figure 2 for wheel type and their rotation. If the unit is turning in the wrong directions, it will not deliver the rated capacity and the motor connections must be altered to make the correct rotation.

Full electrical power can now be applied and special attention given to determine if the motor, bearings, etc. are working properly. At this time, with the air system in full operation and all ducts attached, it is well to measure current input to the motor and compare with the nameplate rating to determine if the motor is operating under safe load conditions.

If the unit is mounted outside, the drive cover should now be installed to protect the motor and drive from the elements.

AMCA Standard 400:67 Electrical Safety Code for Air Moving Devices should be followed.

SPEED	TEMPERATURE	CLEANLINESS	GREASING INTERVALS
100 RPM	Up to 120F	Clean	6 to 12 months
500 RPM	Up to 150F	Clean	2 to 6 months
1000 RPM	Up to 210F	Clean	3 weeks to 2 months
1500 RPM	Over 211F	Clean	Weekly
Any Speed	Up to 150F	Dirty	1 week to 1 month
Any Speed	Over 150F	Dirty	Daily to 2 weeks
Any Speed	Any Temp.	Very Dirty	Daily to 1 week
Any Speed	Any Temp.	Extreme Cond.	Daily to 1 week

ACCESSORIES

INLET VANES: Manually controlled vanes are to be adjusted to obtain the required airflow. Secure operating arm to quadrant with locking bolt.

MAINTENANCE AND REPAIR

Regular inspection and lubrication is a must for trouble free operation.

Before attempting any repair work, be certain that all power to the motor and electrical accessories is turned off and, where possible, locked in the OFF position.

BEARING REPLACEMENT: Wheel and shaft must be supported before any dismantling is attempted. Remove drives; loosen and remove bearing bolts. Next loosen the remaining set screws on the bearing collars. Remove

the bearings from the shaft only after insuring that the shaft and wheel are securely supported.

SHAFT REPLACEMENT: After following the steps listed for the removal of the bearings, loosen the set screws in the wheel hub. With the wheel securely blocked, pull the shaft from the wheel.

WHEEL REMOVAL: After following the steps above for bearing and shaft removal, remove the inlet cone by removing the bolts, which permits the wheel to be lifted out through the inlet. This can also be done with the shaft in place.

To replace any of the above, reverse the procedure.

TROUBLE SHOOTING

Upon startup of your Dynamic Fan Corporation unit, a few minor problems may be encountered due to transporting the unit from our plant to its destination. These defects can easily be corrected in the field.

Always shut off all power to the unit before attempting any repairs.

1. **NOISE IN FAN:** Shut fan down and check for foreign objects and remove.

2. **WHEEL HITTING INLET CONE:** Turn wheel by hand to determine where wheel is hitting. Loosen bolts holding inlet cone and recenter.

3. **THUMPING NOISE:** When rotating the wheel by hand, if a sound like something dropping is present, check set screws in wheel hub and tighten.

4. **BEARING NOISE:** Check for alignment. Lubricate bearing. If noise persists contact DFC.

5. **DRIVE NOISE:** Check sheaves for alignment. Check set screws to be sure that they are tight. Check belt tension. Check the adjustable pulley to be sure that all belts are properly seated.

6. **FAN VIBRATION:** NOTE: All fan wheels are statically and dynamically balanced at our factory, and runout is checked. After final assembly, the unit is checked to insure vibration level is within tolerance.

If excessive vibration is noted, check the following:

- a. Bearing and drive alignment.
- b. Mismatched belts.
- c. Wheel or sheaves loose on shaft.
- d. Loose or worn bearings.
- e. Loose mounting bolts.
- f. Motor out of balance.
- g. Sheaves eccentric or out of balance.

h. Vibration base improperly balanced.

i. Worn or corroded wheel (replace if bad).

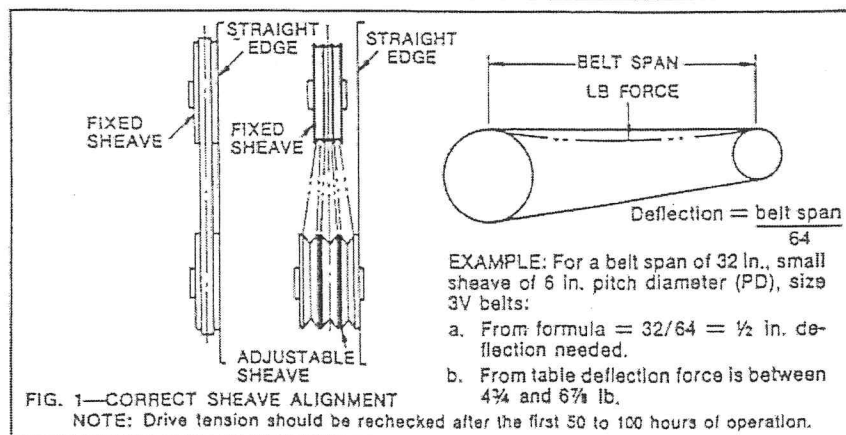
j. Accumulation of material on wheel (material accumulation should be scraped off).

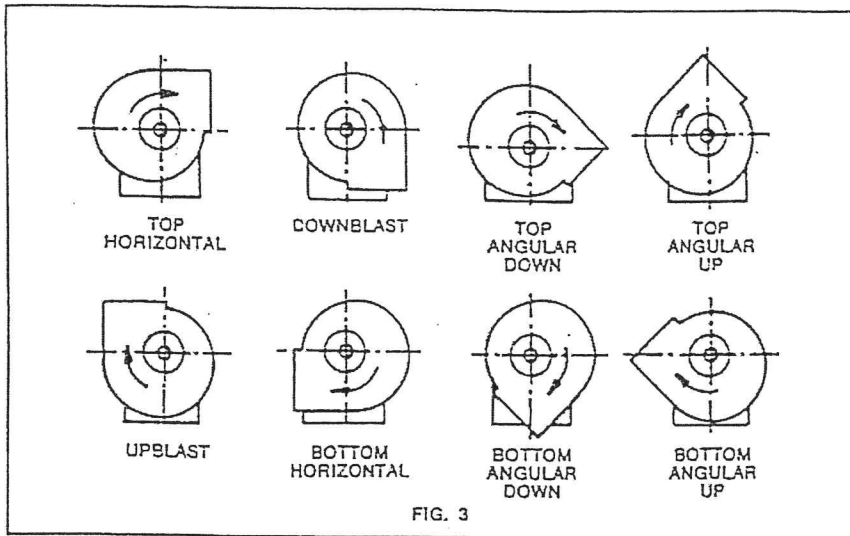
If the unit is furnished without the final drive components, it is strongly recommended that the final assembly be balanced to insure vibration level is within tolerance.

V-BELT DRIVE

After the wheel is determined to rotate freely, align the v-belt drive. Refer to FIG. 1 and tighten the set screws or bolts in the case of sheaves with bushings, and adjust the belt tension using the following table and deflection formula below.

BELT CROSS SECTION	SMALL PD RANGE (in.)	DEFLECTION FORCE (lb.)					
		STANDARD		SUPER		TORQUE FLEX	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	3.0- 3.6	2½	3½	3	4¼	3¾	5½
	3.8- 4.8	3	4¼	3½	5	4½	6¼
	5.0- 7.0	3½	4¾	4	5½	5	6¾
B	3.4- 4.2	3¼	4¾	4	5½	5¼	8
	4.4- 5.6	4¾	6	5½	7¼	6½	9¼
	5.8- 8.6	5½	7¾	6¾	8¾	7¾	10¼
C	7.0- 9.4	9¾	12¼	11¼	14¾	13¼	17¾
	9.6-16.0	12¾	15¾	14¼	18½	15¼	20¼
D	12.0-16.0	20	25½	23¾	30¼	23¾	30½
	18.0-27.0	25¼	33¼	29¾	39½	30¾	39¾
E	20.0-32.0	34	45¼				
3V	2.65-3.65	3½	5				
	4.12-6.90	4¼	6¾				
5V	7.1-10.9	10½	15¾				
	11.8-16.0	13	19½				
8V	12.5-17.0	27	40½				
	18.0-22.4	30	45				





DYNAMIC FAN CORPORATION WARRANTY

The Company warrants to the Purchaser that the apparatus to be delivered hereunder will be free from defects in material, workmanship and title and will be of the kind and quality designated

IMPORTANT

Do not attempt to increase speed on any equipment before consulting DFC for brake horsepower for the particular unit so as not to overload the motor or place the fan in another class due to the tip speed of the wheel, which may result in damage to the fan or cause personal injury.

or described in the contract. The foregoing warranty is exclusive and in lieu of all other warranties whether written, oral or implied (including any warranty of merchantability or fitness for purpose). If it appears within 12 months from the date of shipment by the Company that the apparatus delivered hereunder does not meet the warranties specified above and the Purchaser notifies the Company promptly, the Company shall thereupon correct any defect, including non-conformance with the specifications, at its option, either by repairing any defective part or by making available at the Company's plant, a repair or replacement part.

The Company, under either option,

shall have the right to require the Buyer to deliver the apparatus and the Buyer shall pay all charges for inbound and outbound transportation and for services of any kind, diagnostic or otherwise, excepting only the direct and actual cost of apparatus repair or replacement as provided above.

The warranties of the Company do not cover, and the Company makes no warranty with respect to any defect, failure, deficiency or error which is:

a) not reported to the Company within the applicable warranty period, or
 b) due to misapplication, abuse, improper installation by others, abnormal conditions of temperature, dirt or corrosive matter; or

c) due to operation, either intentional or otherwise, above rated capacities or in an otherwise improper manner or

d) due to damage in shipment or otherwise without fault of the Company or which has been in any way tampered with or altered by anyone other than an authorized representative of the Company.

The Company's liability under the warranty or any other warranty whether expressed or implied in law or fact shall be limited to the repair or replacement of defective material and workmanship, and in no event shall it be liable for consequential or indirect damages.



Dynamic Fan Corporation
 690 S. Airport Road, Phillips, WI 54555; Phone (715) 339-2844; FAX (715) 339-6388