AIRCONDITIONING FAN DIVISION

OPERATING AND MAINTENANCE INSTRUCTIONS FOR CENTRIFUGAL FANS

1 FOREWORD

All Comefri Fans are produced according to our Quality Assurance Program.
All fans are thoroughly tested before leaving the factory.
The fans must be installed, operated and maintained by trained personnel and not used in non-approved applications.

All personnel working with fans must read this manual.

These operating instructions, together with the industrial and national Standards, Regulations and Directives, must be followed closely to avoid damage caused by misapplication or improper maintenance.

Comefri does not accept responsibility for damages or failures related to any disregard of the Operating Instructions. The manufacturer's warranty is voided by any unauthorized modification or application of the fan.

2 TECHNICAL DESCRIPTION

2.1 Description of the product

Comefri fans DWDI and SWSI depending on the fan model are fitted with forward-curved blades, backward-curved blades or airfoil backward-curved blades.

The characteristics and performances of the different fan models are specified in the technical catalogues, which must be consulted to verify the suitability of the fan for the application.

Comefri USA centrifugal fans, double or single inlet, can be completed with a wide range of accessories, according to application and installation requirements.

Particular attention is requested when operating with moving and rotating parts. Protection devices are available to protect the operators from the fan rotating parts.

Comefri declines all responsibilities for damages to persons or things caused by the absence of protective devices.

2.2 Technical Data

The technical specifications of the fans and permissible limits are listed in the fan nameplate as well as in the product technical catalogue. It's absolutely not permitted to exceed the product limits. Please contact *Comefri*, *U.S.A*. for information not listed in the catalogue.

2.3 Use

The fans are intended to move dust-free or slightly dirty air. They are not suitable for corrosive gases, steam or air which is heavily particle-laden. Improper application may cause damages to the bearings, to the impeller, to the housing. Permissible air temperatures for all fan types is -4 °F to +176 °F (-20 °C to + 80 °C).

2.4 Receiving and Handling

When receiving a fan it is necessary to check the conformity of the fan with the order (execution, rotation, power and polarity of installed motor, fittings, etc.); it is necessary to verify that it has not been damaged during the transportation. In case of damages, they must be immediately reported.
Special care must be taken to ensure that the fan is never lifted by the shaft, motor, bearing supports and inlet or outlet flanges.
Lifting points of the fans are the baseframe, housing frames or lifting eyes, if available.
Improper handling of the fans, can damage the fan, and may require repairs and re-balance of the impeller.

2.5 Storage

Adequate storage must be provided to protect the fans from dirt and moisture. Corrosive atmosphere is to be avoided. Use of a tarpaulin to cover the fans can keep the fan clean and dry. Do not use plastic sheets, as they will promote condensation, especially in hot and humid environments. Permissible storage temperature range is 68°F to 113°F (20 °C to +45 °C).
For long time storage (more than 1 month), release the tension of the belts and rotate manually the shaft monthly in order to allow a better distribution of the grease inside the bearings. Keep the fan far from machinery producing vibrations, as the bearings could be damaged by the induced vibrations.

3 INSTALLATION

The installation may only be carried out by trained personnel in accordance with these Operating Instructions.

Before installing the fan, check the direction of rotation of the impeller. Verify the fan model and ensure that the operating limits printed in the fan nameplate are not exceeded during the operation of the fan. Verify the tightness of bolts. Rotate manually the impeller to make sure the impeller rotates freely without touching the inlet cone. Check also for excessive resistance and noise generated in the bearings.
The fans can be installed on a supporting structure or baseframe. The installation must not produce deformation in the fan. Shims can be used to avoid distortions of the fan.

No forces and vibrations should be transferred to the fan. Use adequate vibration isolators to properly isolate the baseframe from the supporting structure. Use inlet/outlet flex-connections to properly isolate the fan from the inlet/outlet duct.

Incorrect installation of the fan may affect the operation of the fan and the safety. Any safety device removed during the installation must be reinstalled before starting the fan.

In belt driven fans, make sure that the pulleys are properly aligned and that the belts are tensioned according to the indication printed in the drive kit label.

3.1 Electrical connections

The electrical installation of the fans and components must be carried out only by trained personnel in accordance with all installation and operating instructions, and any regulation in force. Connection of the motor terminal box must be made according to the motor manufacturer's directions.

4 START-UP

4.1 Safety checks

Make sure all mechanical and electrical safety devices have been installed correctly.
Before starting the fan check the ducts and the fan for debris, tools, small components, and other items left that could be drawn into the fan or blown from the fan.
Rotate the impeller by hand checking for lose parts and verifying that the impeller can rotate freely.
Verify the motor and supply voltage, amperage and frequency.

Attention: the fan may only be started-up if all safety devices are in place.

4.2 Test run

Run the fan for a short time and check the direction of rotation of the impeller. The rotation must match the direction of the arrow applied in the fan housing. Should the motor/fan run in the wrong direction, the motor rotation may be changed as specified by the motor manufacturer.

4.3 Check the amperage draw

Reaching the operating speed of the fan, measure the motor Amps and compare it with the nominal current indicated on the motor plate. If the absorbed amps exceed the motor nominal amps switch the motor off immediately.

4.4 Check the fan operation

The fan should operate quietly and without vibration.
Check for abnormal bearing noises.

4.5 Check the V-belt drive

During the first week of operation the belt tension should be checked regularly.

5 MAINTENANCE

5.1 Safety notes

Before doing any maintenance operation in the fan ensure that:
The motor is disconnected from all terminals.
The impeller has come to rest.
The fan cannot be started accidentally during the maintenance.

Any disregard of safety rules may endanger the life of maintenance personnel.

5.2 Fan housing and impeller

Over time dust, rubber debris from belts and dirt can accumulate on the housing and impeller. Regular inspection and cleaning should take place depending on the fan operating conditions and environment.
No high pressure cleaners (steam rod cleaners) should be used.

5.3 Belt tension

In belt driven fans the belt tension should be checked regularly according to instruction provided with the drive kit.

5.4 Belts replacement

The center distance between motor sheave and fan sheave should be reduced until the old belts can be removed and the new installed. The re-tensioning of the belts should be done in accordance with the instruction provided with the drive kit.
In multiple belt drives, all belts should be changed at the same time, and is recommended to use matched-length belts.
Make sure the motor pulley and the fan drive pulley are accurately aligned.

5.5 Bearings

Bearings must be periodically checked and if required cleaned and re-lubricated.
Unless otherwise specified, use the chart in fig 1 to calculate the relubrication frequency for the fan ball bearings and the chart in fig 2 to calculate the relubrication frequency for the fan spherical roller bearings.
The grease type is indicated in the label placed on the fan housing.

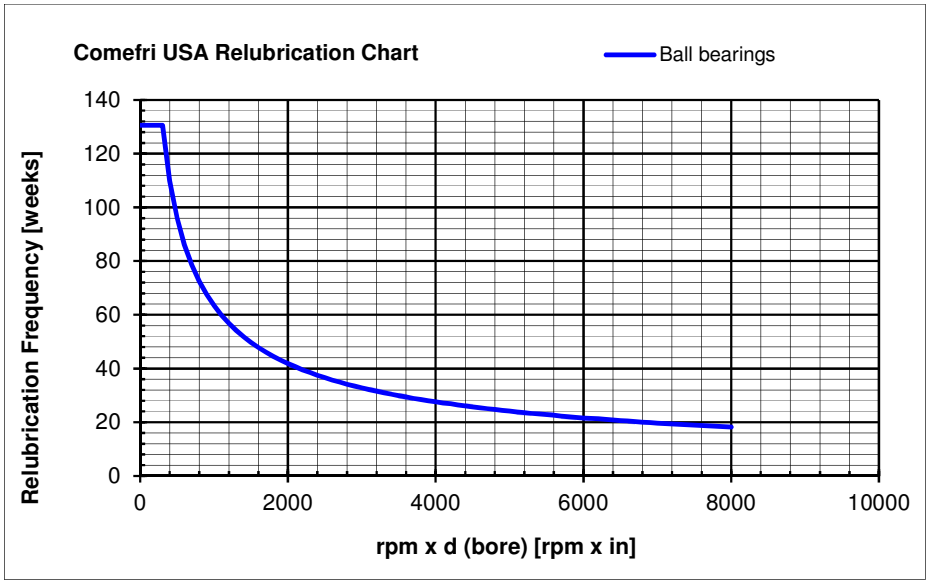

fig 1

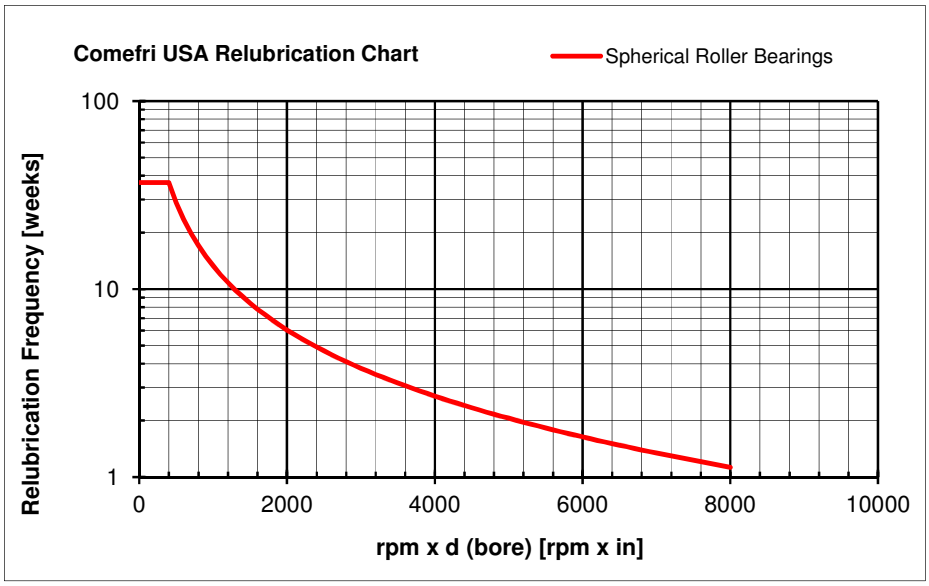

fig. 2

6 TROUBLESHOOTING

Problem	*Cause*	*Corrective action*
Excessive noise	Wheel rubbing Inlet or housing	Adjust wheel and/or inlet cone Tighten wheel hub or bearing collars on shaft
	V-belt drive	Tighten pulleys on motor / fan shaft. Adjust belt tension Align pulleys properly Replace worn belts or pulleys
	Bearings	Replace defective bearings. Lubricate bearings Tighten collars and fasteners
	Wheel unbalance	Clean all dirt off wheel Check wheel balance Rebalance in-place if necessary
Low Airflow	Fan	Check wheel for correct rotation Check outlets and inlets for obstructions Increase fan speed.
	Duct system	Check system losses calculations
High Airflow	Fan	Decrease fan speed
	Duct system	Resize ductwork Access door, filters grills not installed
Wrong Static Pressure	Duct system has more or less restrictions than anticipated	Change obstructions in system. Use correction factor to adjust for temperature / altitude. Resize ductwork. Clear filters / coils
High Horsepower	Fan	Check rotation of wheel. Reduce fan speed
	Duct System	Resize ductworks. Check proper operations of dampers, coils, bypass Check filters and access doors
Fan doesn't Operate	Electrical Supply	Check fuses / circuit breakers. Check for switches off Check for correct supply voltage
	Drive	Check for broken belts Tighten loose pulleys
	Motor	Assure motor is correct horsepower and not tripping overload protectors.
Overheated Bearings	Lubrication	Check for excessive or insufficient grease in the bearing
	Mechanical	Replace damaged bearings Relieve excessive belt tension Align Bearing Check for bent shaft

Comefri USA declines any responsibility for damages caused by actions performed not in full conformance with the instructions given in this document.
Comefri USA reserves the right to modify and update this document without any notice.
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