



Rigging and Assembly Instructions



8' WIDE UBT INDUCED DRAFT COOLING TOWERS

EVAPCO Products are Manufactured in 13 Different Facilities Worldwide

EVAPCO, INC. (World Headquarters) P.O. Box 1300, Westminster, Maryland 21158 USA
Phone (410) 756-2600 Fax (410) 756-6450

EVAPCO, INC.
5151 Allendale Lane
Taneytown, Maryland 21787
Phone (410) 756-2600
Fax (410) 756-6450

EVAPCO MIDWEST
1723 York Road
Greenup, Illinois 62428
Phone (217) 923-3431
Fax (217) 923-3300

EVAPCO WEST
1900 Almond Avenue
Madera, California 93637
Phone (559) 673-2207
Fax (559) 673-2378

**REFRIGERATION VALVES
AND SYSTEMS CORP.**
1520 Crosswind Drive
Bryan, Texas 77808
Phone (409) 778-0095
Fax (409) 778-0030

EVAPCO ASIA, LTD.
Unit 1 G/F, Cloud Nine, Plunkett's Road
The Peak, Hong Kong S.A.R., P.R. China
Phone (852) 2849-4100
Fax (852) 2849-5233

EVAPCO EUROPE, S.R.L.
Via Ciro Menotti 10, I-20017
Passirana di Rho, Milano, Italy
Phone (39) 02-939-9041
Fax (39) 02-935-00840

EVAPCO EUROPE, S.R.L.
Via Dosso, 2, Pieteda
I-23020 Sondrio, Italy
Phone (39) 03-4237-0175
Fax (39) 03-4237-0575

EVAPCO EUROPE, N.V.
Heersterveldweg 19
Industriezone Tongeren-Oost
B-3700 Tongeren, Belgium
Phone (32) 12-395-029
Fax: (32) 12-238-527

EVAPCO EUROPE, INC.
Falcon House - Unit B Caswell Road
Brackmills Industrial Estate
Northampton NN47PL
England, United Kingdom
Phone (441) 604-766-188
Fax (441) 604-766-151

**SHANGHAI HE ZHONG-
EVAPCO REFRIGERATION, LTD.**
855 Yang Tai Road, Bao Shan Area
Shanghai, P.R. China, P. Code: 201901
Phone (86) 21-5680-5298
Fax (86) 21-5680-1545

**BEIJING EVAPCO REFRIGERATION
EQUIPMENT COMPANY, LTD.**
Yan Qi Industrial Development District
Huai Rou County, Beijing
P.R. China, P. Code: 101407
Phone (86) 10-6166-7238
Fax (86) 10-6166-7395

EVAPCO (S.A.) PTY, LTD.
18 Quality Road
Isando 1600
Johannesburg, Republic of South Africa
Phone (27) 11-392-6630
Fax (27) 11-392-6615

AQUA-COOL TOWERS, PTY, LTD.
34-42 Melbourne Street
P.O. Box 436, Riverstone
New South Wales, Australia
Phone (61) 29-627-3322
Fax: (61) 29-627-1715

AIR EVAPCO, LTD.
92 Asma Fami Street
ARD El-Golf-Heliopolis
Cairo, Egypt
Phone (20) 2-290-7483
Fax (20) 2-290-0892

UBT Cooling Towers

Method of Shipment

Models UBT 8-56B through 8-936B are shipped with the top section(s) separate from the bottom section(s). These sections have mating flanges and will join together in a waterproof joint when sealed and bolted together as described in the following instructions. Miscellaneous items, such as sealer, self-tapping screws and any other required materials, are packaged and placed inside the pan for shipment. For units consisting of multiple cells, drip channels and splash guards will ship loose in the basin for field installation. Also, in most cases the motors and belts are shipped inside the pan for mounting during installation.

Storage

Do not place tarps or other coverings over the top of the units if the units are to be stored before installation. Excessive heat can build up if the units are covered, causing possible damage to the PVC eliminators, PVC louvers, or PVC fill. For extended storage beyond six months rotate the fan and fan motor shaft(s) monthly. Also, the fan motor and fan shaft bearings should be purged and greased prior to start-up.

Structural Steel Support

Two structural "I" beams running the length of the unit are all that is required for support of the units. These beams should be located underneath the outer flanges of the unit (see Figure 1). Mounting holes, 3/4" in diameter, are located in the bottom flange of the unit to provide for bolting it to the structural steel (see certified print for exact bolt hole location). Bolt the bottom section to the steel support before rigging the top section.

NOTE: Unit must be anchored per EVAPCO's certified steel support drawings to meet seismic and windload design criteria.

Beams should be sized in accordance with accepted structural practices. Maximum deflection of the beam under the unit to be 1/360 of the unit length, not to exceed 1/2". Deflection may be calculated by using 55% of the operating weight as a uniform load on each beam (see certified print for operating weight).

The supporting "I" beams should be level to within 1/8" in 6' before setting the unit. Do not level the unit by shimming between the bottom flange and the beams as this will not provide proper longitudinal support.

Support beams and anchor bolts are to be furnished by others. Always refer to certified print for unit weights, dimensions and technical data.

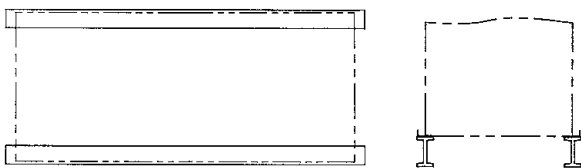


Figure 1 - Structural Steel Support.

Rigging Bottom Section

Lifting Bottom Section

Lifting devices are located in the upper corners of the bottom section for lifting and final positioning purposes as shown in Figure 2. The hook of the crane must be a minimum dimension of "H" above the top of the section being lifted to prevent undue strain on the lifting devices. See Table 1 for the minimum "H" dimension. These lifting devices should not be used for extended lifts or where any hazard exists unless safety slings are employed under the section. (See "Extended Lifts" on page 5 for proper arrangement.) Bolt the bottom section to the steel support before rigging the top section.

UNIT NO.	MIN. H
UBT 8-56B to 96B	9 Feet
UBT 8-29B to 99B	10 Feet
UBT 8-012B to 912B	12 Feet
UBT 8-318B to 918B	19 Feet
UBT 8-324B to 924B	12 Feet
UBT 8-536B to 936B	12 Feet

Table 1 - Minimum H Dimension for Bottom Sections.

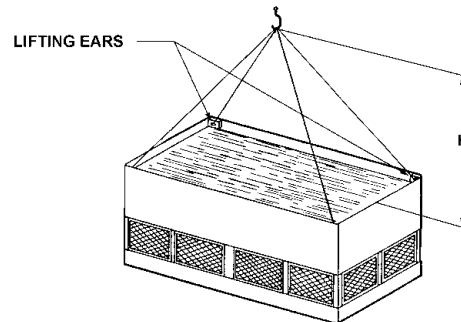


Figure 2a -Bottom Section, UBT 8-56B through UBT 8-912B.

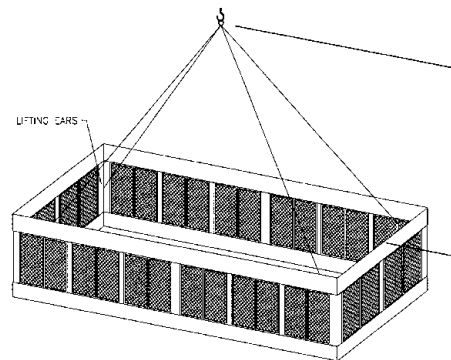


Figure 2b -Bottom Section, UBT 8-318B through UBT 8-936B.

UBT Cooling Towers

Joining Multi-Cell Units

Bottom Sections - Models UBT 8-324B through UBT 8-936B

On models UBT 8-324B through UBT 8-924B, the two bottom sections are shipped separately and are furnished with a connecting equalizer flume between them. On models UBT 8-536B through UBT 8-936B the three bottom sections are shipped separately and are furnished with two connecting equalizer flumes between them. In addition to the equalizer flumes, these units are provided with drip channels and splash guards to keep water from exiting between the cells.

The equalizer flume is factory installed on one section for field connection to the other. It is important to connect the equalizer flume to balance the water level in the pans for the proper pump suction operation. The following procedures are to be performed in sequence.

1. Install the bottom section with the factory installed flume on it as described earlier.
2. Clean the flanges on the equalizer flume on the end to be field connected. Apply a layer of sealer tape on the flange centered between the hole centers and the outside edge. Remove paper backing strip from the sealer tape (see Figure 3).
3. Clean the mating surface of the equalizer opening of any dirt, grease or moisture.
4. Rig the second bottom section adjacent to the equalizer flume on the steel support as shown in Figure 4.
5. Align the bolt holes in the equalizer flume and equalizer opening with drift pins (drift pins shall be provided by others) while drawing the second bottom section against the flanged connection.
6. Install 3/8" bolts, nuts and washers in every hole around the equalizer opening and tighten.
7. Bolt the second bottom section to the steel support.
8. Place the drip channel over the adjoining pan section flanges. Secure by installing 5/16" self-tapping screws through the retaining clips into the end panels. On all stainless UBT's, secure by installing 1/4" stainless steel bolts.
9. Place the vertical splash guard in the bend of the vertical supports. Attach the vertical splash guard using 5/16" tappers, or 1/4" stainless steel bolts on all stainless steel UBT's.

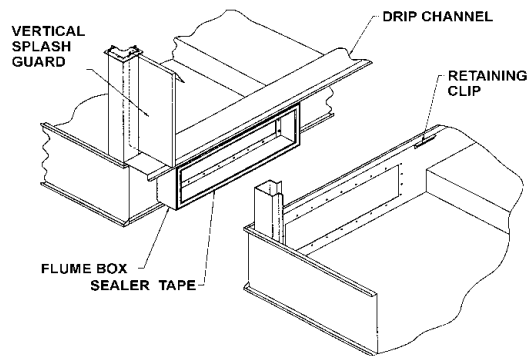


Figure 3 - Equalizer Flume Connection, Models UBT 8-324B through 8-936B.

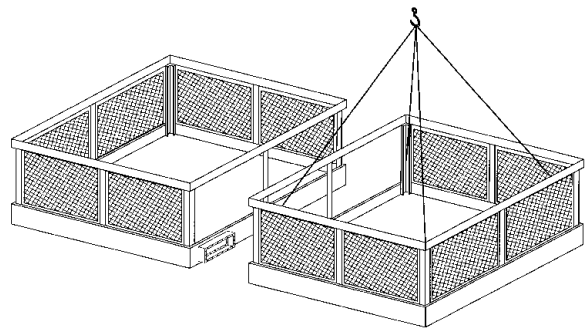


Figure 4 - Equalizer Flume Rigging Detail. Models UBT 8-324B through 8-924B. Models UBT 8-536B through 8-936B have three bottom sections and two equalizer flumes.

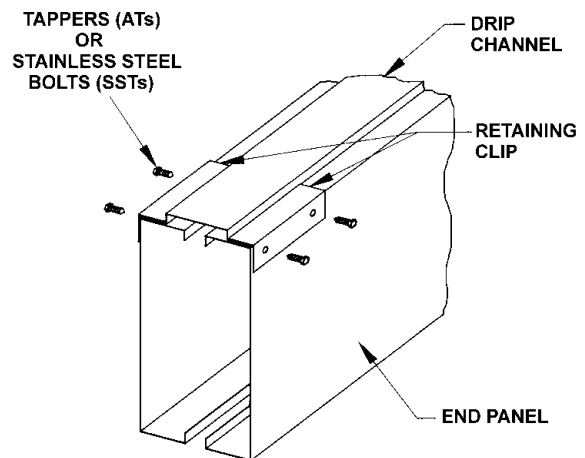


Figure 5 - Drip Channel Installation.

UBT Cooling Towers

Optional Equalizer Blank-Off Plate For All Multi-Cell Units

An accessory is available to isolate the bottom sections for individual cell operation, periodic cleaning or maintenance. **Consult the factory when independent cell operation is required.** This optional equalizer blank-off plate is factory installed on the equalizer flume inside of the pan and secured by wing nuts (See Figure 6).

For units not requiring the blank-off plate under normal operating conditions, remove the wing nuts, washers, plate and gasket. Reinstall washers and wing nuts for proper leak-free operation of the flume.

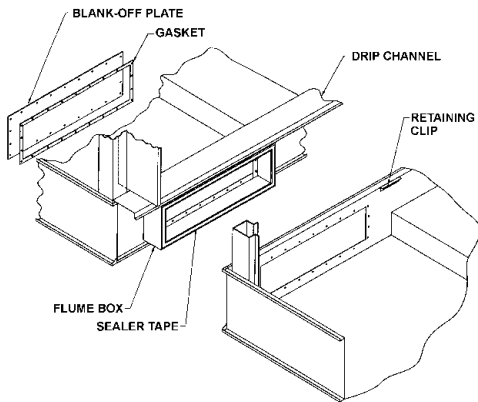


Figure 6 - Optional Blank-Off Plate on the Equalizer Flume.

Application of Sealer Tape

Once the bottom section has been set on the supporting steel and bolted in place, the top flanges should be wiped down to remove any dirt or moisture. Sealer Tape should be placed over the mounting hole centerline on the side flanges. **Apply two strips of sealer tape**, one partially overlapping the other, on the end flanges.

The sealer tape should overlap on the corners as shown in Figure 7. Do not splice the sealer tape along the end flanges and preferably not on the side flanges if it can be avoided. **Always remove the paper backing from the sealer tape.**

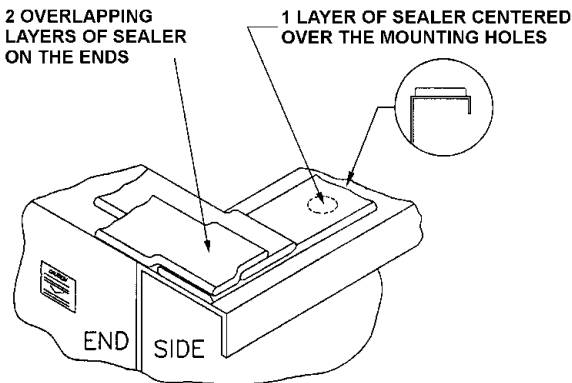


Figure 7 - Sealer on flange of Bottom Section.

Models UBT 8-324B through 8-936B have two or more top sections. In these cases, sealer must be applied to all internal flanges as shown in Figure 8.

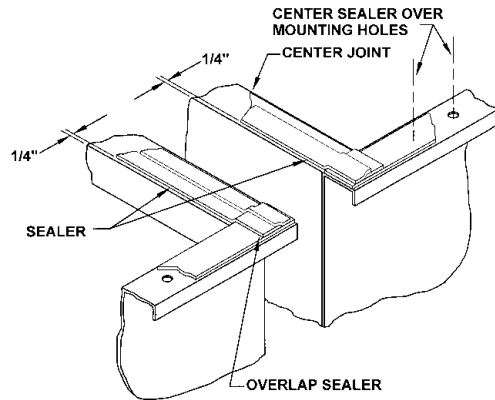


Figure 8 - Sealer Detail for Center Joint of Units with two or more Top Sections.

Top Section

“U” bolts are provided in the four corners of the top section for lifting and final positioning (See Figure 9). On units with two fans per top section, models UBT 8-318B through 8-918B, spreader bars must always be used between the cables at the top of the unit to prevent damage to the fan cylinders. See Figure 10 for proper arrangement of cables on fan sections with dual fans. The hook of the crane must be a minimum dimension “H” above the top section being lifted to prevent undue strain on the “U” bolts. See Table 2 for the minimum “H” dimension.

Note: Motors should be mounted prior to lifting the top section as shown in the “External Motor Installation” section, page 7.

UNIT NO.	MIN H.
UBT 8-56B to 96B	7 Feet
UBT 8-29B to 99B	9 Feet
UBT 8-012B to 912B	10 Feet
UBT 8-318B to 918B	14 Feet
UBT 8-324B to 924B	10 Feet
UBT 8-536B to 936B	10 Feet

Table 2 - Minimum H Dimension for Top Sections.

UBT Cooling Towers

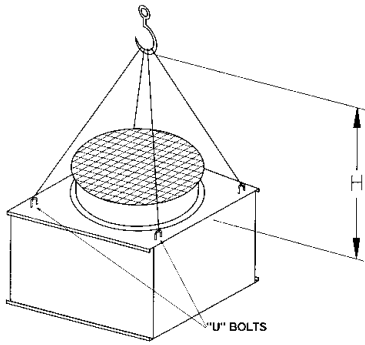
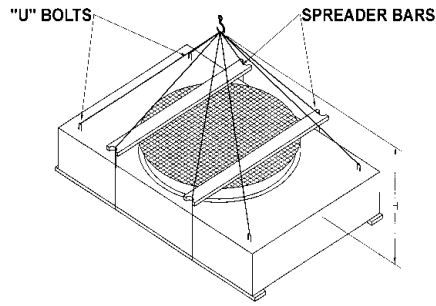
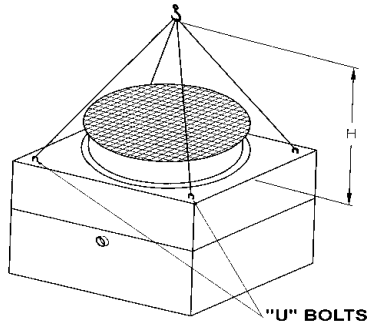


Figure 9a - UBT Top Section(s), Models UBT 8-56B through UBT 8-912B



Top Section, UBT 8-56B through UBT 8-912B

Figure 9b - UBT Top Section(s), Models UBT 8-324B through UBT 8-936B



Top Section, UBT 8-318B through UBT 8-936B

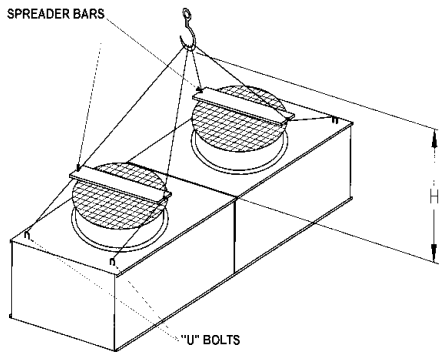
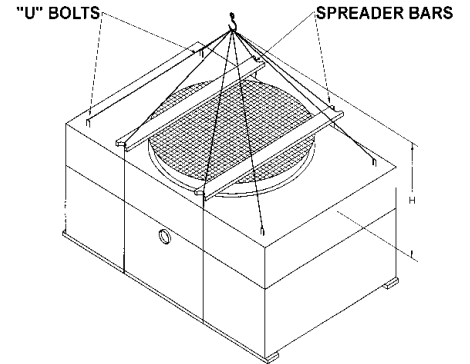
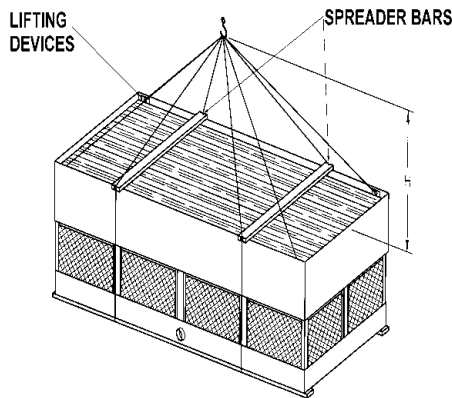


Figure 10 - UBT Top Sections, Models UBT 8-318B through 8-918B.



Bottom Section, UBT 8-56B through UBT 8-912B

Extended Lifts

Important: The lifting devices and "U" bolts should be used for final positioning only and for lifting where no danger exists. If they are used for extended lifts, safety slings should be provided under the sections.

The preferred method for extended lifts is to use slings under the unit (see Figure 11). Spreader bars should always be used between the cables at the top of the section to prevent damage to the upper flanges or fan cylinders.

Safety slings and skids should be removed before final positioning of the unit.

Bottom Section, UBT 8-318B through UBT 8-936B

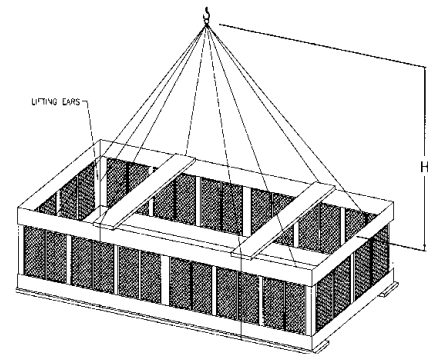


Figure 11 - Proper Rigging Method for Extended Lifts. UBT Models.

UBT Cooling Towers

Assembly of the Top Section to the Bottom Section

Before assembling the top section to the bottom section, remove any loose parts shipped in the pan. The fan motor and protective cover are shipped loose to avoid damage.

Wipe the flanges on the bottom of the top section. Check to see that the water distribution connection on the top section is in the correct position relative to the bottom section (see certified print). Units are also provided with match markings on each section (i.e. A1 of bottom section should match up with A1 of top section).

Then lower the top section to within several inches of the bottom section making sure the two sections do not touch and the sealer is not disturbed. Place drift pins (see Figure 12) in at least 3 of the corner mounting holes and gradually lower the top section into place using the drift pins to guide the section down accurately onto the mating flange.

Place self-tapping screws in all four corner bolt holes. Then continue to install the rest of the self-tapping screws working from the corners toward the center, using drift pins to align the holes. A self-tapper must be installed in every hole on the side flanges although none are required on the end flanges.

Note: 5/16" stainless steel nuts, bolts and washers are used on All Stainless Steel Models.

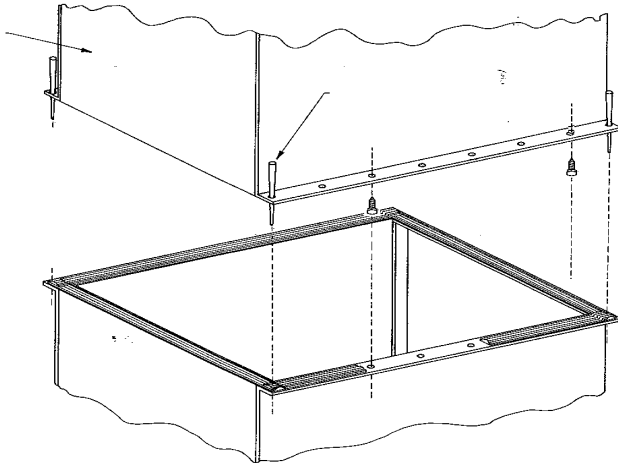


Figure 12 - Mating Upper Section to Bottom Section.

Rigging Fully Assembled Towers

Table 3 lists units which can be assembled prior to final positioning for rigging in one lift. The unit is assembled by the procedures described in the "Assembly of the Top Section to the Bottom Section" found above.

Note: On models UBT 8-56B through 8-912B, the motor and cover should be installed prior to lifting the fully assembled unit as described in the "External Motor Installation" section on page 7.

All "U" bolts on the top section are to be used for lifting and final positioning of the unit as shown in Figure 13. The hook of the crane must be a minimum dimension of "H" above the top of the unit being lifted to prevent undue strain on the "U" bolts. See Table 3 for minimum "H" dimension.

The "U" bolts should not be used for extended lifts or where any hazard exists unless used safety slings are employed under the section. (See "Extended Lifts" on page 5 for

UNIT NO.	MIN. H
UBT 8-56B to 96B	7 Feet
UBT 8-29B to 99B	9 Feet
UBT 8-012B to 912B	10 Feet

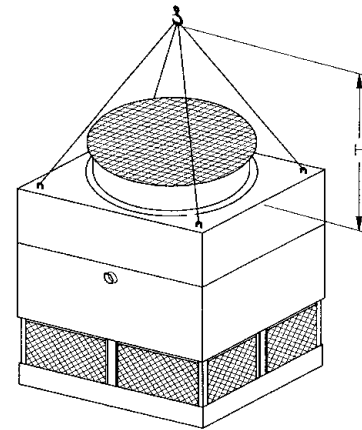


Figure 13 -Fully Assembled Unit, Models UBT 8-56B through 8-912B.

Caution: Remaining models not listed in Table 3 cannot be rigged fully assembled.

UBT Cooling Towers

External Motor Installation

1. Study Figure 14 before installing the motor base on the unit.
2. Insert the lifting device into "U" bolt **A** on motor base **B**.
3. Lift the motor base and insert the pivot pin **C** down into hole **E** and pivot pin **F** into hole **D**.
4. Install washer and nut (do not overtighten) on pivot pins. Install jam nut on pivot pin **C**.
5. Insert "J" bolts **G** into holes **H**. Install flat washers and cotter pins. Place nuts and washers on threaded portion of "J" bolts. These will be behind the motor base installed in the next step.
6. Insert "J" bolts into holes **J** in the motor base. Install flat washers, lock washer and nuts. Remove lifting device from the "U" bolt on the motor base. Position motor base toward casing of unit for belt installation.
7. Install Powerband belt **K** (Figure 15) around fan sheave and motor sheave. Tighten belt by adjusting nuts on "J" bolts. Do not over tighten the belts. The center of the belt should deflect approximately 3/4" with moderate hand pressure.
8. Measure to see that the top and bottom of the motor base are the same distance out from the casing of the unit. This should insure that the sheaves are properly aligned as they have been pre-set at the factory. As a final check, lay a straight edge from sheave to sheave. There should be four point contact (See Figure 16). Adjust the position of the motor sheave as necessary.
9. To install Motor Guard **L**, match up hinges and install hinge pins **M**. See Figure 15.
10. Close Motor Guard and install (2) wing bolts **N**.

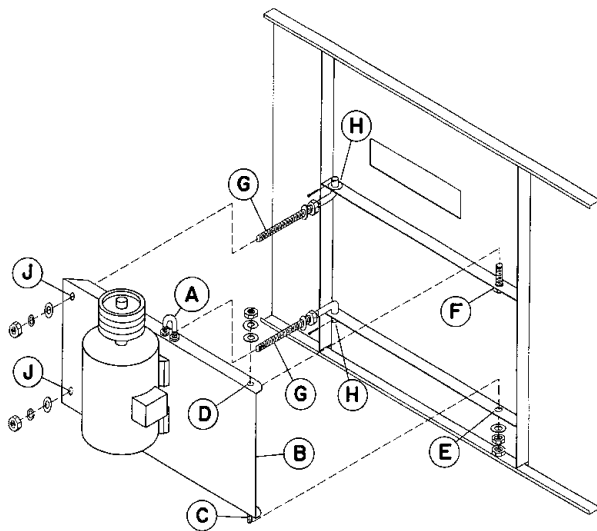


Figure 14 - External Motor Installation.

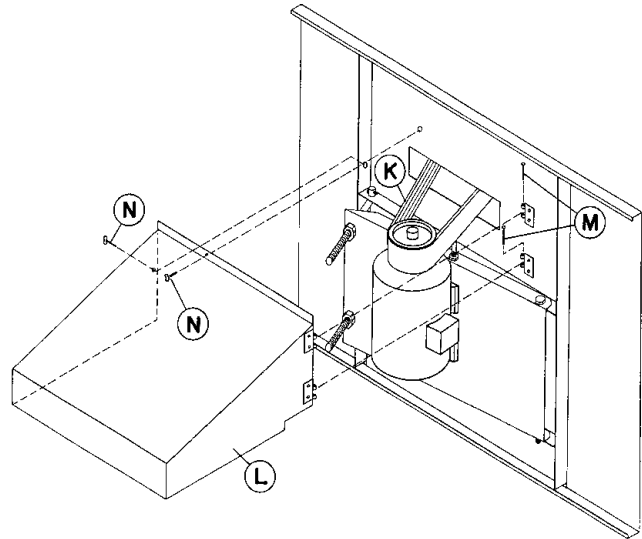


Figure 15 - Motor Guard and Powerband Belt Installation.

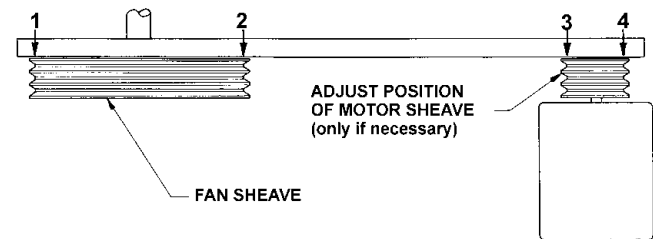


Figure 16 - Sheave Alignment Check.

Start-up Details

Shipping Chocks and Debris

Remove any chocks that have been placed inside the unit for shipping purposes. Clean all debris from the pan prior to start-up. Close and secure all access doors.

Bleed-off Line

Make sure a bleed line and valve are installed on the pump discharge side of the system piping to a convenient drain. The bleed-off valve should be open. For installation details, see the "Maintenance Instructions Bulletin."

Strainer

Check the strainer(s) in the pan to make sure they are in the proper location over the pump suction, alongside of the anticavitation hood. See Figure 17.

Screens

Protective fan screens are provided across the top of the fan cylinders of all models. Check and tighten all bolts.

General Information - Start-up & Maintenance

Adjustment of Float Valve

The float valve should be adjusted to maintain the proper water level as specified in the maintenance instructions. At start-up, the pan should be filled to the overflow level.

During operation, the water level will drop to no more than 5" below the overflow. The water level can be checked during operation by opening the removable louver section at the valve while the pump is running and the fans are off.

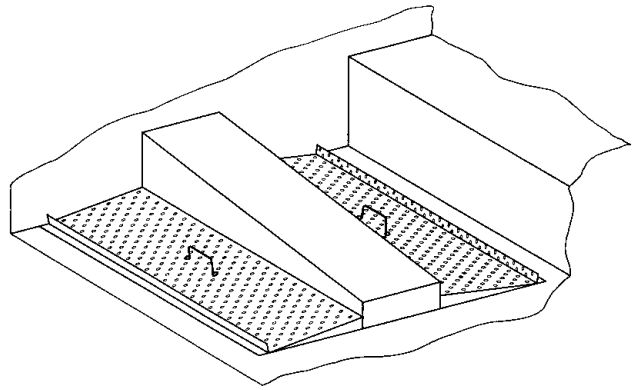


Figure 17 - Strainer Location.

Starting Sequence

Before starting the unit, check that all access openings, safety screens and covers are in place. Then start the unit as outlined below:

1. Fill the pan to the overflow level.
2. Start the water pumps. Check the water flow to the unit by checking the spray water pressure at the water inlet. It should be the same as the pressure indicated on the certified drawing.
3. Start the fans. Check the fans for proper rotation. Directional arrows are placed on the side of the fan cylinder.

NOTE: Do not operate the fans while the pump is off. Damage to the PVC fill can result during dry operation. Always start the water pumps first, with the fan motors following.

Maintenance

Once the installation is complete and the unit is turned on, it is important that it be properly maintained. Maintenance is not difficult or time-consuming but must be done regularly to assure full performance of the unit. Refer to the maintenance instructions enclosed with the unit for proper maintenance procedures.

Freeze Protection

Proper freeze protection must be provided if the unit is located in a cold climate. Refer to maintenance instructions as well as product bulletins for further information.