



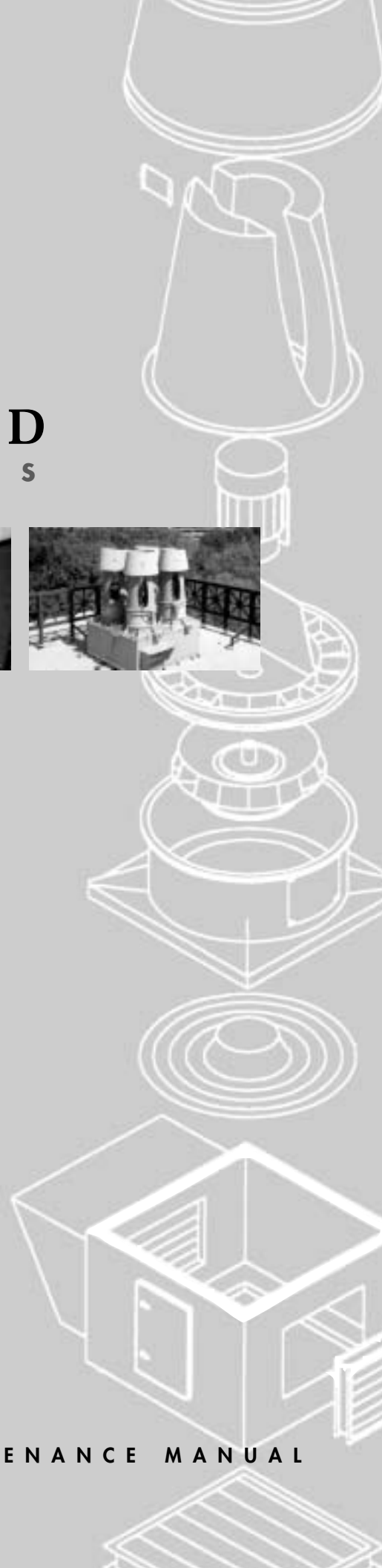
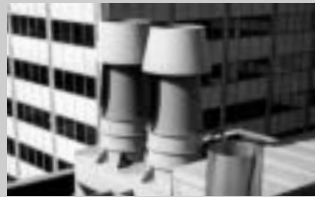
**Strobic Air Corporation**

A SUBSIDIARY OF MET-PRO CORPORATION

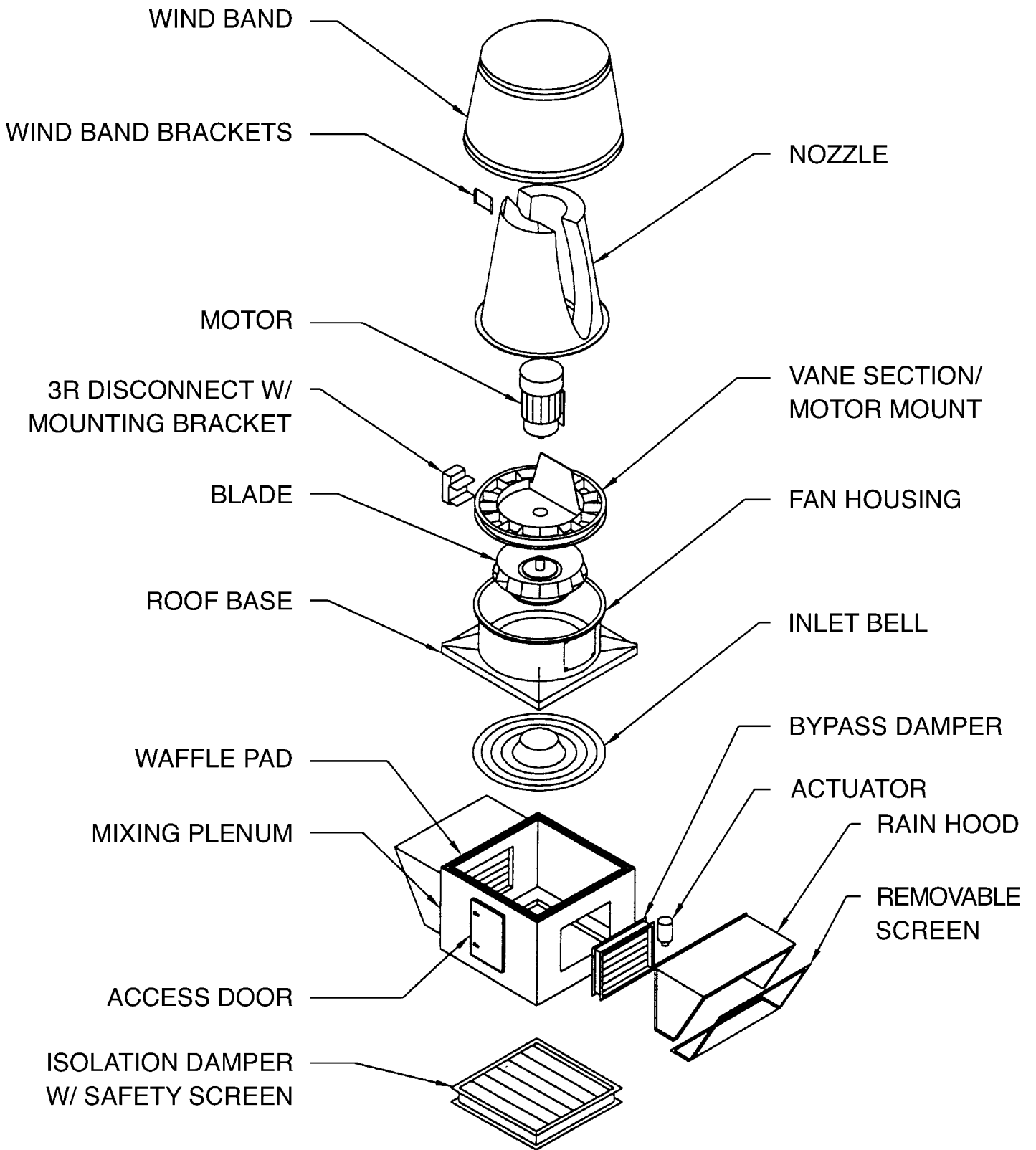
Generation III

# TRI-STACK™ FUME HOOD

e x h a u s t   s y s t e m s



INSTALLATION, OPERATION AND MAINTENANCE MANUAL



## **FACTORY TESTED**

Your fan has been factory tested to insure proper balance, alignment, air delivery, correct motor load, and correct working of all moving parts.

## **CUSTOMER INSPECTION**

**Prior to installing your fan**, inspect the equipment to determine if any damage has been incurred through mishandling during shipment. Notify the trucker immediately to claim for damages.

**Prior to installing your fan**, the name plate should be checked against the packing slip and job order for correctness. Some fans must be shipped in components due to trucker's height limitations. When this occurs and more than one fan of similar size are on the same project, carefully match and assemble components by the "line-up" tag (serial) numbers placed on each part. **It is the contractor's responsibility** to insure the **motor horsepower and speed** are correct when comparing the **fan name-plate** to the **motor name plate**, and to the specification **fan schedule** prior to placing the fan on the respective roof mount.

**NEMA 3R disconnect switches** will be wired to the fan, wrapped in bubble wrap and placed inside the well of the fan. Larger switches on fans shipped by common carrier may be bolted in place on the disconnect mount provided with the fan. **It will be necessary for the installer to un-bolt the disconnect and feed it through the opening in the nozzle.** The disconnect is then bolted on the switch mount provided.

**NOTE: It is not necessary to disconnect the wiring to the switch or motor in the terminal box, to do so will void your warranty.**

**Weep holes** in the motor cavity should be kept clean during site storage to prevent water build-up around the motor.

## INSTALLATION INSTRUCTIONS

The TRI-STACK fan has been constructed in modules so it may be disassembled and installed in sections to minimize installation equipment requirements. Be sure all parts are aligned correctly per "line-up" tags and all PTFE gasketing is in place. (See customer inspection above).

Once the fan is in place, before the power has been connected, check the alignment of the blade and inlet bell. If power is already connected, be sure the power has been locked out. Remove the fan housing access door and spin the blade by hand. Check that the blade spins freely and does not rub the inlet bell. If the blade rubs the inlet bell, reference the Tri-Stack Field Blade Alignment Procedure drawing # 123098C-1. Also, check that no foreign materials such as loose nuts or bolts are inside the housing. Once the blade and the housing have been checked, bolt the access door back on to the housing before starting the fan.

### CURB

Curbs shall be a minimum of 14 gauge steel and anchored directly into the roof structure.

### CURB CAP/PLENUM BASE

A three inch, square housing base has been constructed for ease of installation to any frame opening. Refer to your certified drawing for other dimensions. Insure that proper support is provided to support the weight of your fan. Insure air leaks, if any, are properly sealed upon start-up. If the curb or structural base is not supplied by Strobic Air, consult the factory to avoid "soft base" vibration problems. Be sure the curb top or structural base is plumb and level to provide for proper drainage. The curb cap shall be appropriately lagged to the curb by means of 3/8" lag screws or 1/4" bolts and nuts supplied by the contractor. (Heavier fasteners may be required by code in your area). A 316 stainless steel fastener is recommended for corrosion resistance. (See drawing # 061599L-1 for various base configurations).

### MOTOR CONNECTIONS

Unless specified differently, the motor on your fan has been wired to a NEMA 3R disconnect switch mounted on the side of the fan housing. Check the fan nameplate for proper voltage and amperage. If fans are stored for an extended period of time (180 days or more), all connections should be checked for looseness and corrosion.

### ISOLATION AND BY-PASS DAMPERS

Actuate the dampers slowly at start-up to observe they are free of binding and to ensure they open fully and close tightly. Adjust linkage accordingly.

### ACTUATORS

See separate instructions by the pneumatic actuator manufacturer. Electrical schematics for typical actuators are shown on drawing # 021099K-1 (isolation dampers) and drawing # 021099K-2 (bypass dampers).

### EXTERNAL WIRING

**This equipment must be installed with remote, motor-overload protection.** When connecting to a circuit protected by fuses, use time-delay fuses. Starting and over-load control devices must be matched to motor rating. Follow the control manufacturer's instructions to make proper installation and connections.

Connect electrical power supply to conform with National Electrical Code and any local regulations. Line voltage and wire capacity must match motor rating stamped on the nameplate.

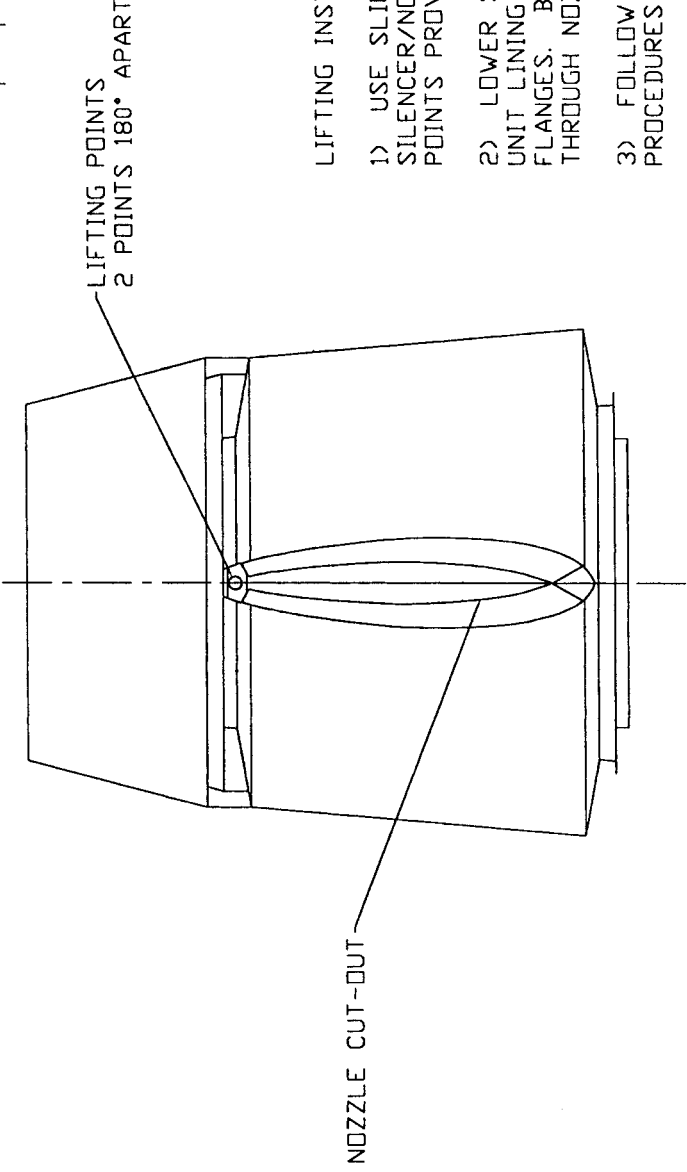
### VIBRATION ISOLATION

A 1-1/2" wide strip of 1/4" neoprene pad has been factory installed on top of the mixing box. When the fan base must be shipped separately from the mixing box (due to transportation height requirements) care should be taken not to disturb this pad during installation. Check this point for air leaks upon start-up. Take necessary corrective measures to seal this joint properly.

### SEAL FLANGES

Fully caulk the outside edge of all the flanges with silicone caulk provided by Strobic. Be sure to caulk the seam where the 2" slip flange fits into the inner dish of the vane section.

| REVISION |             |       |         |
|----------|-------------|-------|---------|
| L.T.R.   | DESCRIPTION | DRAWN | CHECKED |
|          |             |       |         |



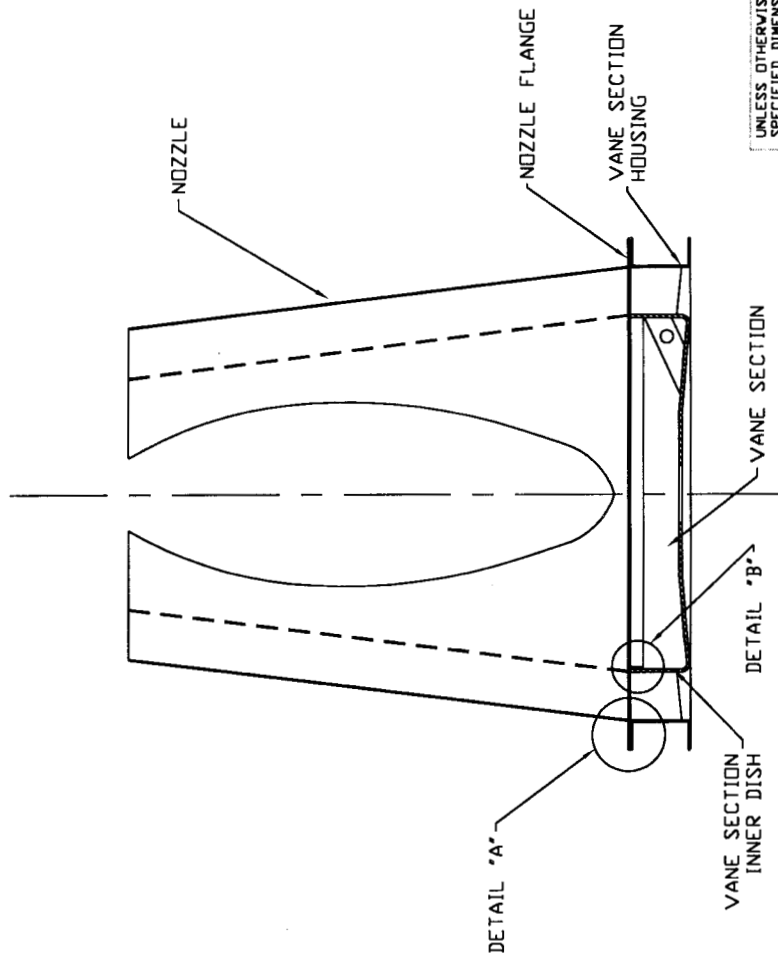
LIFTING INSTRUCTIONS:

- 1) USE SLING OR CHAIN TO LIFT SILENCER/NOZZLE FROM TWO LIFTING POINTS PROVIDED.
- 2) LOWER SILENCER/NOZZLE ONTO FAN UNIT LINING UP HOLE PATTERNS ON FLANGES. BE SURE TO RUN CONDUIT THROUGH NOZZLE CUT-OUT.
- 3) FOLLOW STANDARD CAULKING PROCEDURES FOR TRI-STACK NOZZLES.

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|   |                               |   |                             |
|---|-------------------------------|---|-----------------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES | CONTRACT NO.                  | SILENCER NOZZLE LIFTING DETAIL  |                             |
| SCALE: 1" = 4" ± 0.005"                             | APPROVALS                     | STROBIC AIR CORPORATION<br>A SUBSIDIARY OF MET-PRO CORPORATION<br>180 CASSELL ROAD, BOX 144<br>HARLEYSVILLE, PA 19438 |                             |
| MATERIAL  | DRAWN C.A.G.                  | DATE  | SIZE                        |
| FINISH  | CHECKED                       | 5/18/01   | B                           |
| NONE  | APPROVED                      |   | CODE IDENT. NO. DRAWING NO. |
|   | U.S. PATENT NO. 4,806,706     |   | TS4LSILNOZVB LIFT 051801C-1 |
|   | CANADIAN PATENT NO. 1,277,171 |   | SCALE: N.T.S.               |
|   |                               |   | SHEET 1 OF 1                |

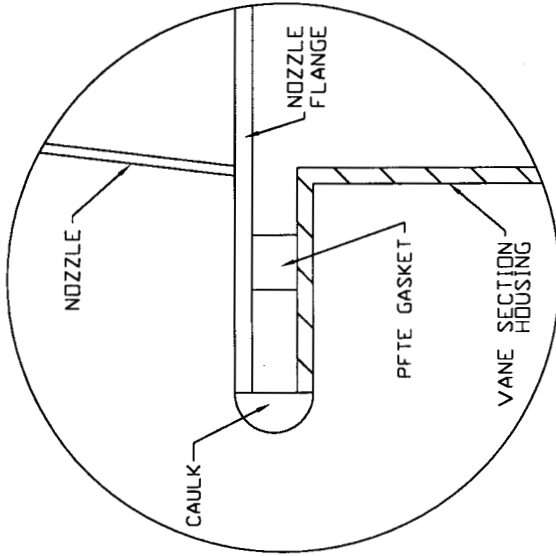
| REVISION |             |      |
|----------|-------------|------|
| LTR.     | DESCRIPTION | DATE |
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|          |             |      |



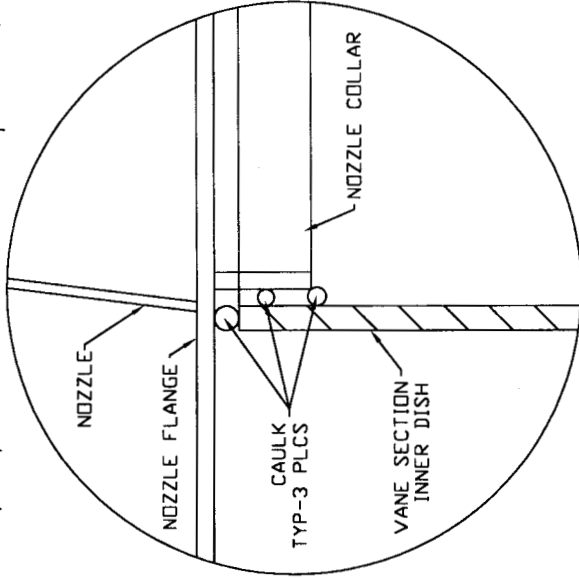
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|   |                               |          |  |                             |
|---|-------------------------------|----------|--|-----------------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES<br><small>TOLERANCES ARE:</small> | CONTRACT NO.                  |          | NOZZLE TO VANE SECTION CAULKING DETAIL |                             |
|   | APPROVALS                     | DATE     | STROBIC AIR CORPORATION                |                             |
|   | DRAWN A.B.B.                  | 10/24/00 | A SUBSIDIARY OF MET-PRO CORP.          |                             |
| MATERIAL  | CHECKED                       | LAYOUT   | HARLEYSVILLE, PA 19438                 |                             |
| FINISH  | U.S. PATENT NO. 6,112,850     |          | SIZE                                   | CODE IDENT. NO. DRAWING NO. |
|   | U.S. PATENT NO. 4,806,706     |          | B                                      | NTVCULKDET 102400A-1        |
|   | CANADIAN PATENT NO. 1,277,171 |          | SCALE: N.T.S.                          |                             |
|   |                               |          | SHEET 1 OF 2                           |                             |

| REVISION |             | DATE | APPROVED |
|----------|-------------|------|----------|
| L.T.R.   | DESCRIPTION |      |          |



DETAIL "A"  
EXPLODED VIEW



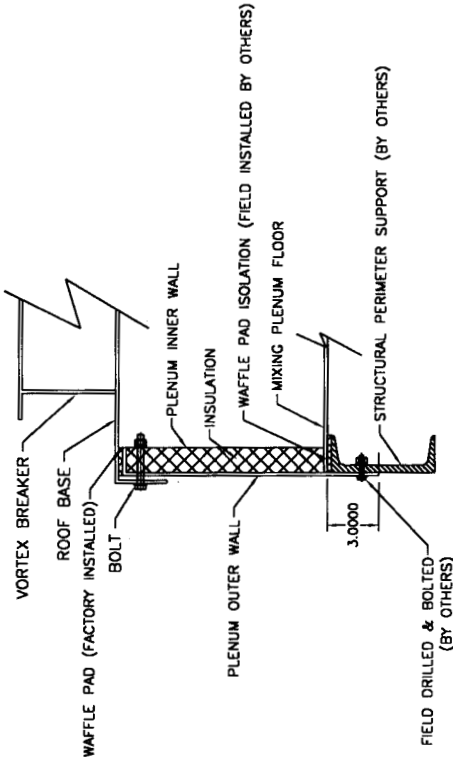
DETAIL "B"  
EXPLODED VIEW

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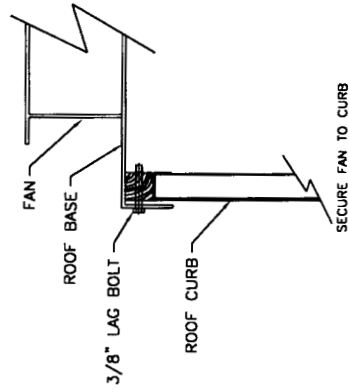
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| TOLERANCES ARE:                                     |                 | APPROVALS                              | DATE     |
| FRACTIONS   |                 | DRAWN A.B.B.                           | 10/24/00 |
| DECIMALS  |                 | CHECKED                                |          |
| MATERIAL  |                 | LAYOUT                                 |          |
| FINISH  |                 | U.S. PATENT NO. 6,112,850              |          |
|   |                 | U.S. PATENT NO. 4,906,706              |          |
|   |                 | CANADIAN PATENT NO. 1,277,171          |          |
|   |                 | NOZZLE TO VANE SECTION CAULKING DETAIL |          |
|   |                 | STROBIC AIR CORPORATION                |          |
|   |                 | A SUBSIDIARY OF MET-PRO CORP.          |          |
|   |                 | HARLEYSVILLE, PA 19438                 |          |
| SIZE  | CODE IDENT. NO. | DRAWING NO.                            |          |
| B   | NTVCULKDET      | 102400A-2                              |          |
| SCALE: N.T.S.                                       |                 | SHEET 1 OF 2                           |          |

# TRI-STACK MOUNTING INSTRUCTIONS

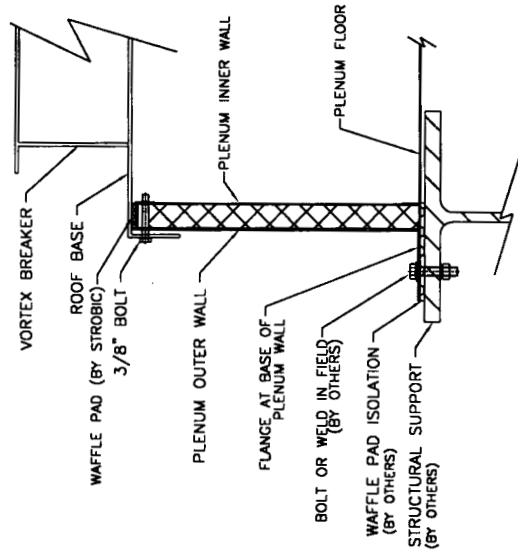
## MULTIPLE PLENUM TO C-CHANNEL BASE (OR CONCRETE CURB)



## SINGLE FAN TO ROOF CURB



## MULTIPLE PLENUM TO STRUCTURAL STEEL (OR CONCRETE PAD)



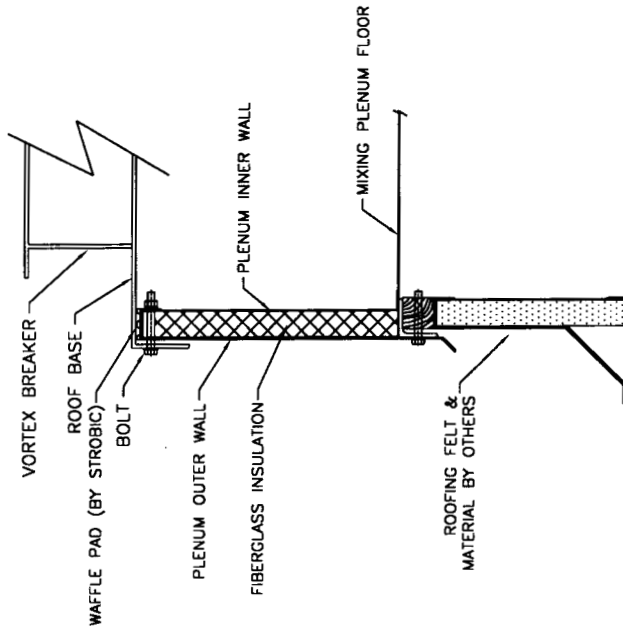
|  |                     |                                 |                                  |
|--|---------------------|---------------------------------|----------------------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES<br><small>TELEPHONE NO. 484-3300</small> | CONTRACT NO.        | TRI-STACK MOUNTING INSTRUCTIONS |                                  |
|  | APPROVALS           | DATE                            |                                  |
| MATERIAL   | DRAWN L.D.C.        | 6/16/89                         |                                  |
| FINISH   | CHECKED             |                                 |                                  |
|  | LAYOUT A.B.B.       | 2/28/01                         |                                  |
|  | U.S. PATENT NO.     | 6,112,850                       | SIZE CODE IDENT. NO. DRAWING NO. |
|  | U.S. PATENT NO.     | 4,806,706                       | B MTDATAIL 022801A-1             |
|  | CANADIAN PATENT NO. | 1,277,171                       | SCALE: N.T.S.                    |
|  |                     |                                 | SHEET 1 OF 1                     |

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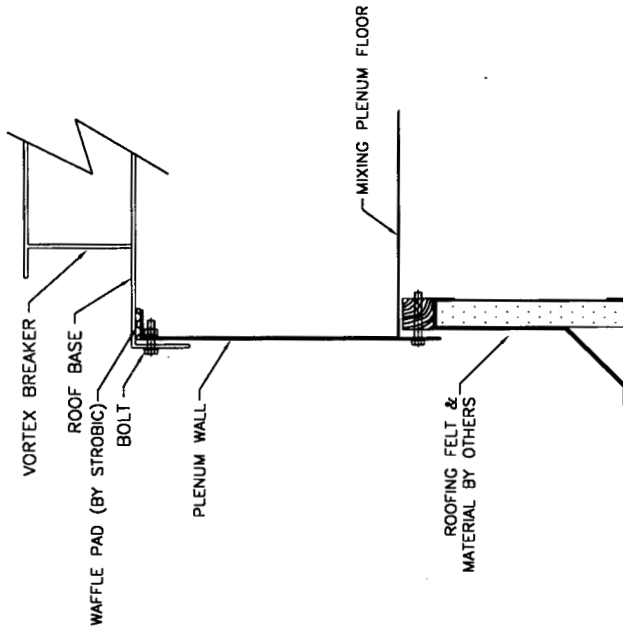


# TRI-STACK MOUNTING INSTRUCTIONS CONT'D

MULTIPLE PLENUM TO ROOF CURB

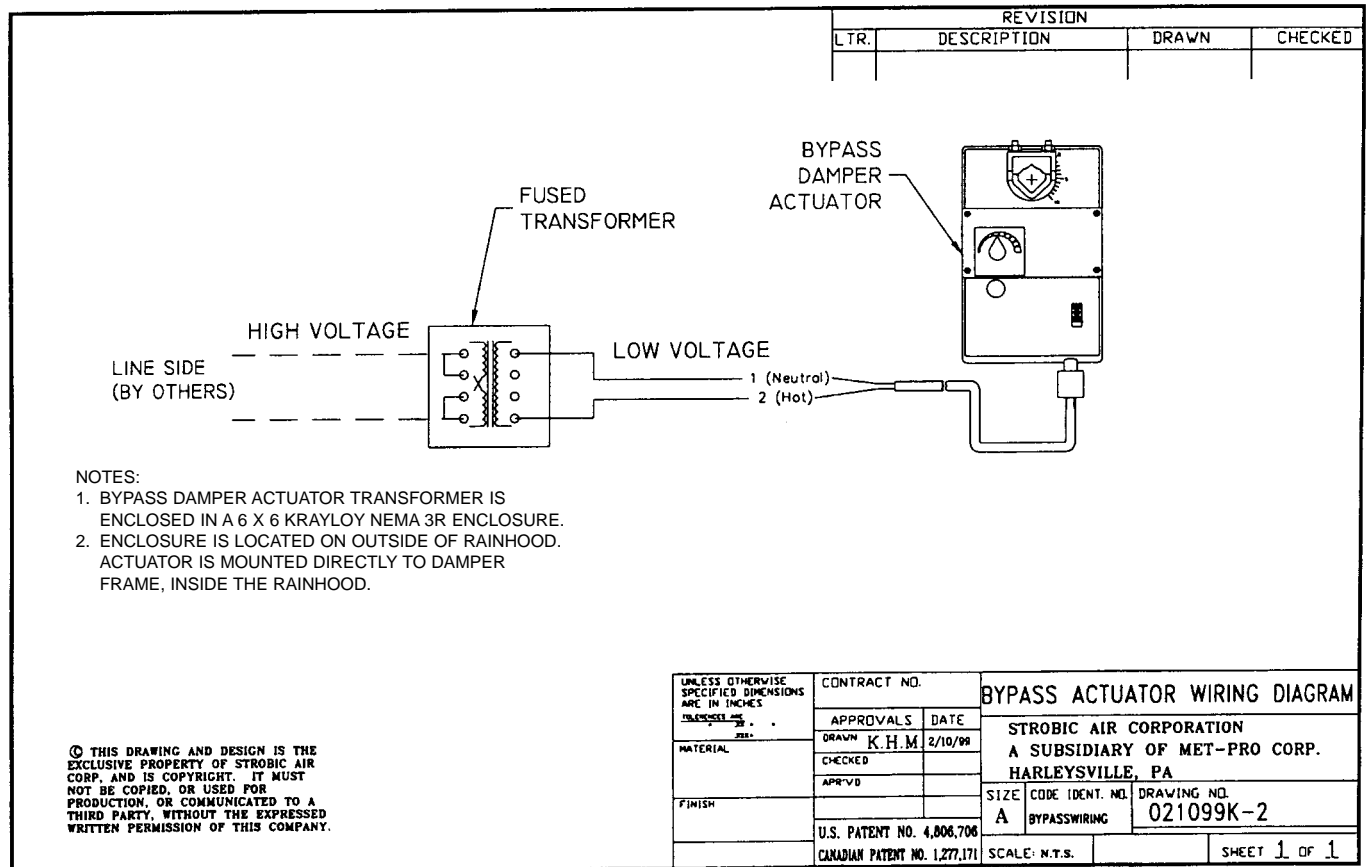
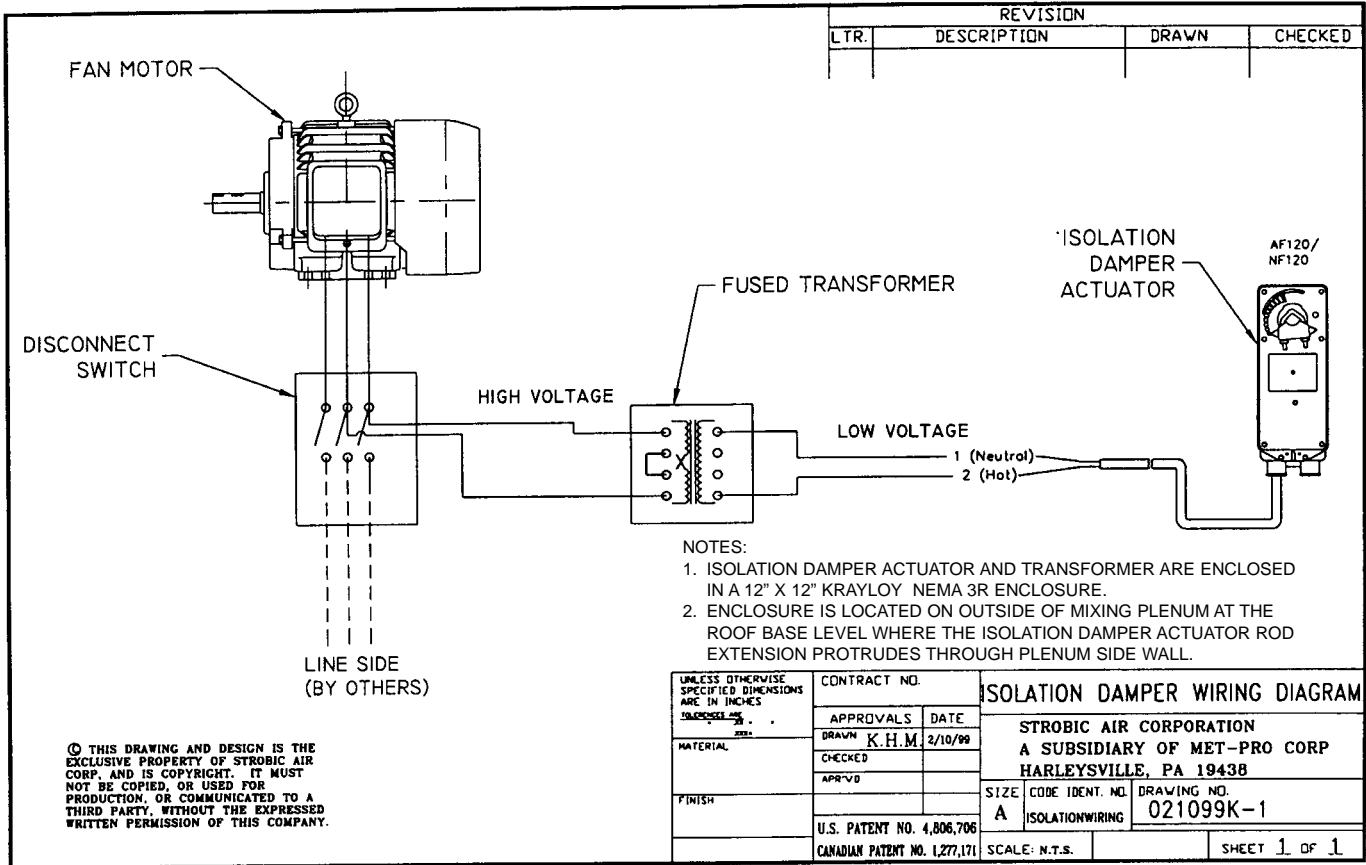


SINGLE PLENUM TO ROOF CURB



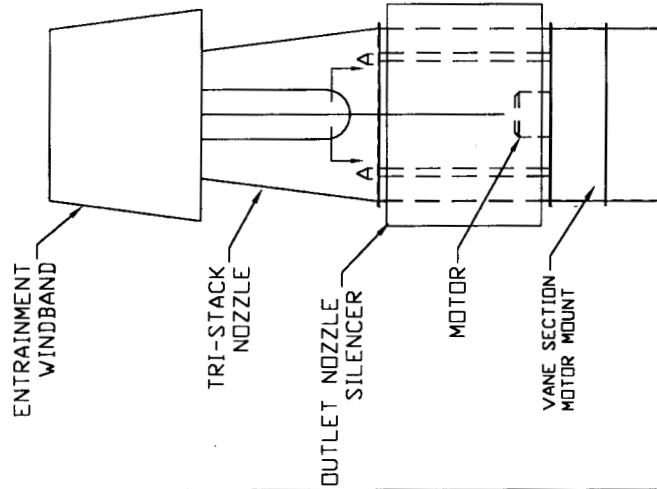
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|  |              |                                 |  |
|--|--------------|---------------------------------|--|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES<br>TOLERANCES ARE:<br>FRACTIONS DECIMALS<br>.0005" .0005" .0005" | CONTRACT NO. | TRI-STACK MOUNTING INSTRUCTIONS |  |
|  | APPROVALS    | DATE                            | STROBIC AIR CORPORATION<br>A SUBSIDIARY OF MET-PRO CORP.<br>HARLEYSVILLE, PA 19438<br>SIZE CODE IDENT. NO. DRAWING NO.<br>B MTDATAIL 022801A-2 |
| DRAWN L.D.C.   | 6/16/89      |                                 |  |
| CHECKED  |              |                                 |  |
| LAYOUT A.B.B.  | 2/28/01      |                                 |  |
| U.S. PATENT NO. 6,112,850  |              |                                 |  |
| U.S. PATENT NO. 4,806,706  |              |                                 |  |
| CANADIAN PATENT NO. 1,277,171  |              | SCALE: N.T.S. SHEET 1 OF 1      |  |

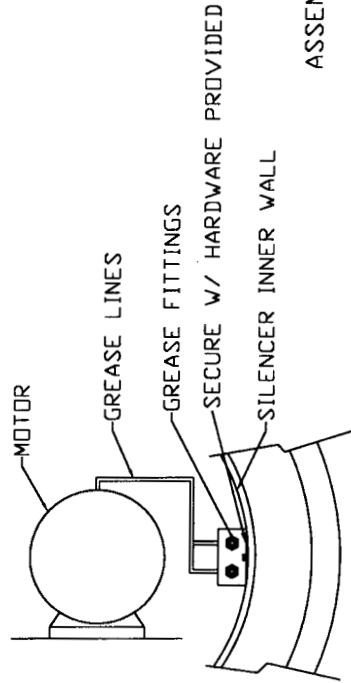


| REVISION    |               |
|-------------|---------------|
| L.T.R.      | DATE APPROVED |
| DESCRIPTION |               |

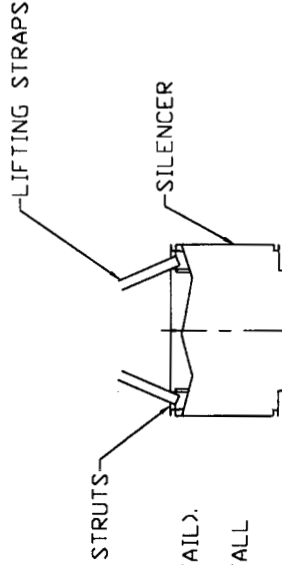
ASSEMBLY DETAIL



GREASE LINE DETAIL



ASSEMBLY/LIFTING DETAIL



NOTES:

1. LIFT SILENCER USING 2 OPPOSING STRUTS WITH INDIVIDUAL STRAPS (SEE LIFTING DETAIL).
2. DO NOT LIFT FAN USING SILENCER STRUTS.
3. FILL GREASE LINES WITH GREASE AND INSTALL ON MOTOR PRIOR TO INSTALLING SILENCER.
4. WIRE DISCONNECT SWITCH TO MOTOR PRIOR TO INSTALLING SILENCER.

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|   |              |                     |  |                    |
|---|--------------|---------------------|--|--------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES<br>TOLERANCES ARE .005" | CONTRACT NO. |                     | FIGURE 2 - OUTLET NOZZLE SILENCER INSTALLATION |                    |
|   | APPROVALS    | DATE                | STROBIC AIR CORPORATION                        |                    |
| MATERIAL  | DRAWN        | D.W.G.              | A SUBSIDIARY OF MET-PRO CORP.                  |                    |
| FINISH  | CHECKED      |                     | HARLEYSVILLE, PA 19438                         |                    |
|   | APR'VD       |                     | SIZE CODE IDENT. NO. DRAWING NO.               |                    |
|   |              | C.A.G.              | B  | TS3INSIL 073098C-1 |
|   |              | U.S. PATENT NO.     | 4,806,706                                      | SCALE: N.T.S.      |
|   |              | CANADIAN PATENT NO. | 1,277,171                                      | SHEET -- OF --     |

## TRI-STACK INLINE DISCHARGE SILENCERS INSTALLATION INSTRUCTIONS

The Tri-Stack fan has been constructed in modules so it may be assembled and installed in sections to minimize installation requirements. The Inline Discharge Silencer has been supplied as a separate bolt on module that will be located between the vane section/motor mount and the nozzle.

Pre-Installation Inspection - Inspect the silencer and the fan components to ensure that they are free from damage. Report any damage to your freight carrier immediately. Insure that the silencer matches the fan size and the schedule length before installation.

The outer flanges on the silencer bolt to flanges on the vane section and nozzle. PTFE gasket was factory mounted on the vane section and on the top flange of the silencer. Mounting hardware was mounted on these flanges. Inspect the gasket and remove the hardware before installation. Insure that the motor electrical leads and grease leads (when applicable) will not interfere with the silencer installation. Fill the grease leads with grease, supplied by Strobic, before connecting leads to fittings on motor. Unless otherwise specified, the fan has been factory equipped with a NEMA 3R disconnect switch mounted and wired. **It is not necessary to disconnect this wiring to install the unit.** The disconnect switch is connected to the motor with metallic liquid tight conduit and the switch is bolted to the fan. Remove the switch bolts and temporarily place the switch on the back end of the motor.

**CAUTION: All work at the motor junction box and grease lead connections must be completed at the motor before the silencer is installed. This includes filling the grease leads with grease supplied by Strobic before the leads are connected to the fittings on the motor. Access to the motor becomes severely limited with silencer in place.**

After the fan is installed, the silencer can be mounted on the vane section flange. When mounting the silencer, ensure that the airflow sticker is pointing up. The silencer has 4 struts that connect the inner and outer sections. These struts may be used for lifting the silencer only. **Do not attempt to lift the fan using the silencer struts.** Use any 2 opposing struts with slings to lift the silencer. Mount the silencer so that the outer flanges line up and the inner slip flange on the silencer slips inside the vane section. Align the bolt holes and bolt the silencer to the vane section with the hardware provided. (See drawing # 073098C-1).

Mount the discharge nozzle to the outlet silencer ensuring that the inner flange on the nozzle slips inside the silencer. Ensure that the cutout section on the nozzle permits reattachment of the disconnect switch at the proper location. Align the bolt holes and bolt the nozzle to the silencer with the hardware provided. Seal any external joints as required with the sealant provided.

Mount and secure the disconnect switch to the bracket provided. If the motor is provided with re-greasable bearings, the grease leads have been extended for ease of maintenance. The extended grease fittings have been mounted on a clip. This clip must be attached near the top of the silencer near a cutout in the nozzle for ease of access. Fasten retaining straps to the conduit and attach to the outer wall of the silencer.

## RETROFIT APPLICATIONS

On retrofit installations, the instructions above apply with the following additions:

Turn off the disconnect and lock out the power supply leading to the roof. Disconnect the wires between the motor and the roof mounted disconnect switch. Remove the nozzle and wind band.

The electrical leads between the motor and the disconnect switch must be extended to allow travel over the silencer. The longer leads must be attached to the motor after the nozzle is removed and before the silencer is installed. Connect the extended grease lead lines (as necessary, typically on motor frames 284T and larger) to the motor before the silencer is installed.

Check the junction box and the motor supports on the fan to ensure clearance for the inner wall of the silencer. Contact the factory if an interference is suspected.

# OPERATION INSTRUCTIONS

## INITIAL START

After installation is completed, but before fan is put in regular service, make an initial start as follows:

- a. Hand turn the impeller to determine that the motor has not shifted in shipment and/or erection. The impeller should turn freely, should not touch other fan components and should be free of foreign materials.
- b. Check that motor, starting and control device connections agree with wiring diagrams.
- c. Check that voltage, phase, and frequency of line circuit (power supply) agree with fan nameplate.
- d. Check that all bolts on your fan supports are tight, and that no objects are left in the fan housing.
- e. Check motor service record and tag accompanying motor to be certain that bearings have been properly lubricated. When shipped from the factory, the bearings have been lubricated to give six (6) months satisfactory service except for sealed ball bearings which are lubricated for life and require no maintenance.
- f. Momentarily energize the motor to check that rotation is in the proper direction. **Observe the arrow markings on the fan housing for correct fan rotation.**

**WARNING: Fans running in a reverse rotation can cause damage to the fan.**

- g. If motor is three-phase type, reverse rotation (if required) by inter-changing any two of the three power leads. If two-phase, inter-change stator leads of either phase, being careful not to change leads from one phase to the other. If motor is single-phase, refer to the instructions on the motor nameplate.
- h. While the fan is running, check the mixing box, curb cap, inlet connections and fan/nozzle flanges for air flow leaks and make appropriate repairs/adjustments. Check with the factory if any leaks cannot be stopped.
- i. Turn off fan and open access door on mixing box to observe proper full closure of isolation dampers. Make appropriate damper linkage adjustments. If adjustments are not easily implemented, consult the factory. If “fan staging” or a stand-by fan is employed, observe that the isolation damper

under the “off” fan is fully closed while the other fans are in operation, and that no reverse “wind-milling” is occurring. Make appropriate adjustments to the damper linkage.

- j. Check the by-pass dampers for proper operation. Be sure pilot positions are connected to the controls, when applicable.
- k. Make appropriate linkage adjustments as outlined above.

**WARNING: Repeated trial starts can overheat the motor (particularly for across the line starting) or increase the resistance of external starting equipment. If repeated trial starts are made, allow sufficient time between trials to permit heat to be dissipated from windings or external resistance and prevent overheating. Starting currents are several times running currents, and heating varies as the square of the current.**

## VARIABLE FREQUENCY DRIVES

It is recommended that a start-up service technician from the drive manufacturer be employed. The full load amperage of the drive may differ from that of the motor. The lower limit of the electrical equipment should be observed.

As a rule of thumb, the motor lead lengths to the VFD should not exceed 200 feet on a 460 V system, and 100 feet at 575 volts. If the motor is to be run above 60 Hz, close attention needs to be paid to the full load amperage (FLA). Even though the motors can maintain constant horsepower up to 90 Hz, the torque capability of the motor will begin to drop off linearly to the increase of the speed. Therefore, if the torque drops off and the motor is expected to put out its rated horsepower, the current (FLA) will start to increase linearly with the speed in order to meet the demand of the load. If this FLA increases higher than the rated FLA of the VFD, the VFD will begin to “Trip-Out” on an overload/over current condition. (Note: According to the “Affinity Laws” the torque should drop off by the square of the speed. This is fortunately the worst case and it is not true for most motors used on TRI-STACK). See specific drive manufacturer’s installation, operation and maintenance manual for exact running condition details.

## TRI-STACK FANS-SEQUENCE OF OPERATION

The following is a recommended sequence of operation for multiple Tri-Stack fans mounted on a common system.

System Start-up and Increasing System Demand:

- Before starting the system, ensure that all bypass dampers are fully open and all isolation dampers are fully closed. Failure to open the bypass dampers could result in excessive pressure in the system and may result in damage to ductwork or other system components. Failure to close all isolation dampers could result in excessive bypass into the system. This condition may also result in windmilling of non-energized fans which could result in damage to the fans.
- Energize the first fan. At the same time, send a signal to the isolation damper actuator to begin opening the damper.
- After the fan has achieved full speed and the isolation damper is fully open, begin to close the bypass dampers as required in order to increase the system pressure to the design set point.
- As the system demand increases, (an) additional fan(s) may be required. The fans should be started one at a time. As each additional fan is energized, the isolation damper to that fan should begin to open. Opening the isolation damper of a fan before it is energized could make system control unstable.

Decreasing System Demand:

- As the system demand decreases, the controls should open the bypass dampers to increase bypass flow.
- When the bypass dampers reach the full open position and more turndown is required in the system, de-energize 1 fan. At the same time, close the isolation damper for this fan. Allow time for the system to stabilize before starting or stopping additional fans.

In addition to the above comments, the sequence of the fans should be varied so that all fans operate approximately equal hours. It is recommended that the fans should be sequenced so that any fan does not remain idle for more than one or two consecutive days.

The above sequence is recommended for multiple fan systems utilizing bypass dampers. For fan systems using variable frequency drives, a similar approach can be taken. However, additional steps are required to ensure that all operating fans are running at the same speed and the outlet velocity of the system does not fall below safety/design requirements.

## MAINTENANCE INSTRUCTIONS

### SAFETY ALERT

This unit has been shipped in new and clean condition. However, it is designed to handle fumes from a research laboratory hood or other unknown source. These fumes may be hazardous to your health. Therefore, we recommend that you:

**DO NOT OPEN ANY ACCESS DOORS ON A FAN OR MIXING BOX without first consulting your Facilities Safety Officer. Special cleaning procedures may be necessary prior to working on the internal components of this unit.**

Without knowledge of the composition of the fumes exhausted through this unit, Strobic Air Corporation makes no general recommendation as to the cleaning procedure to be used. However, we are willing to consult with the Facilities Safety Officer and offer suggestions based on our field experience.

### INTERNAL DRAINAGE SYSTEM

Weep holes are located in the motor cavity, in the fan housing near the inlet bell and in the mixing box/plenum. These holes should be checked periodically for possible clogging, especially when the fan is off. Should excessive pooling of water occur on the floor of the mixing box/plenum, it may be necessary to install an external drain (p-trap) on the weep holes. Drawing # 060799C-1 details the recommended construction for a p-trap drain.

### REGULAR MOTOR MAINTENANCE

Maintenance of your STROBIC fan is limited primarily to the motor. Each motor should be inspected at regular intervals. The frequency and thoroughness will depend on the amount of operation, nature of service, and the environment. The motor exterior should be kept free of oil, dust, water, and chemicals. For fan-cooled motors, it is particularly important to keep the air intake opening free of foreign material. Do not block air outlet.

Motors 256 frame and under are sealed bearings. For frames above 256, the motor bearing should be lubricated with a general purpose grease as recommended by the motor manufacturer, or Mobilplex #47. For most general applications where the nature of service and environment is not severe, we recommend two (2) ounces of grease be supplied on each bearing in accordance with the following schedule:

| SCHEDULE FOR LUBRICATION * |                   |
|----------------------------|-------------------|
| 900 RPM Fan Speeds         | Every 1 1/2 Years |
| 1200 RPM Fan Speeds        | Every 1 1/2 Years |
| 1800 RPM Fan Speeds        | Every 3 Years     |

\* May vary with motor manufacturer's requirements, consult motor manufacturer's instructions.

**NOTE:** The fan nameplate will show direct drive operating speeds and/or the actual motor speed. If there is difficulty with locating a proper acceptable equal to this grease or the specific grease mentioned above, please do not hesitate to consult the factory or your local agent. It is important to remember that a **standard duty grease could cause shortened life to these bearings if used in lieu of the above mentioned grease or its equal.** It is not necessary to open any access doors or remove any unit components to grease the motor bearings. **We recommend a grease gun be used, with a flexible nozzle, capable of being pressed onto a zerk type fitting.**

### STORAGE OR DOWN TIME

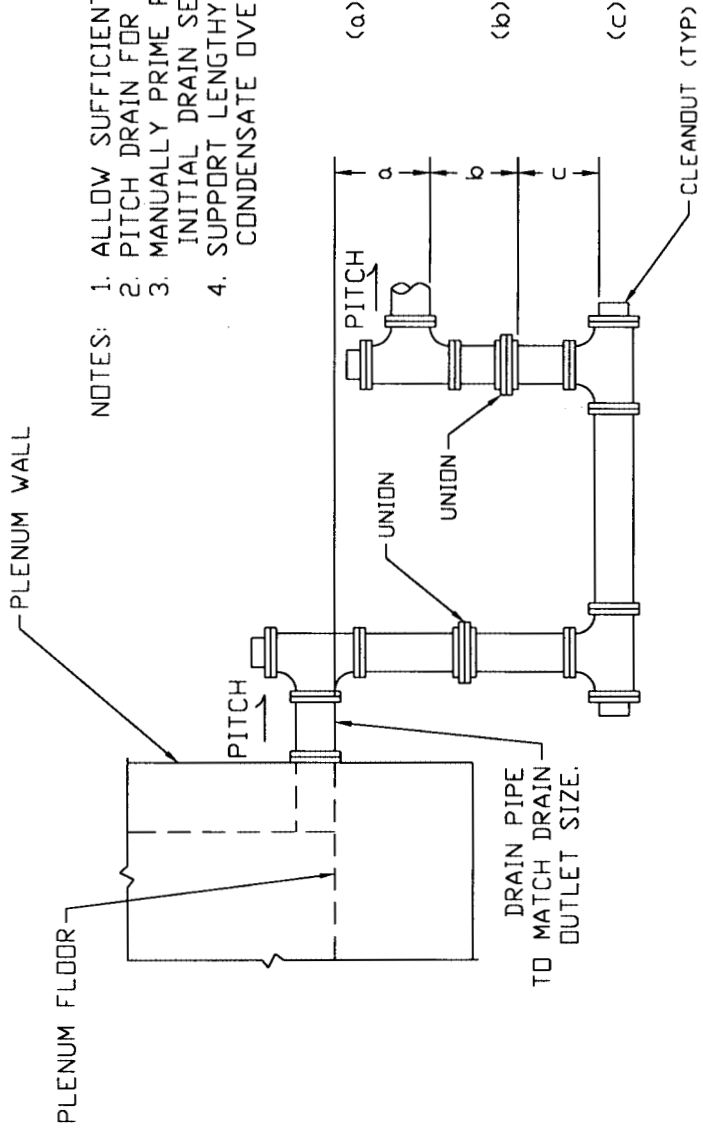
If your fan is to sit idle for more than 21 consecutive days during start-up or shut-down, **especially in extreme cold and icy weather** care should be taken to hand spin or, if electricity is available, bump the fans to prevent "Peening" or "Brinelling" of the bearings. If the fan is outside, exposed to the elements, care should be taken to step up this procedure. Under no circumstances should a fan be exposed to a hostile environment without adequate protection. Common sense should prevail. When fans are to be placed in service after an extended shutdown or delayed start-up, motors should be meggered every 6 months in accordance with the motor manufacturer's start-up procedure. A minimum of 10 megaohms are recommended. In addition, all electrical connections should be checked for looseness and corrosion. The procedure for initial start-up should then be followed.

### IMPELLER

Regular cleaning of the impeller is essential to maintain proper balance. The frequency of this cleaning depends upon the type of air you are moving. An improper balance condition due to accumulated dirt on your impeller can cause an overloaded condition in your motor or unnecessary vibration resulting in loose mountings, bad bearings, or broken blades and housing.

| REVISION |             |         |
|----------|-------------|---------|
| LTR.     | DESCRIPTION | CHECKED |
|          |             |         |
|          |             |         |

- NOTES:
1. ALLOW SUFFICIENT SPACE BELOW THE PLENUM FLOOR FOR TRAP.
  2. PITCH DRAIN FOR PROPER RUNOFF.
  3. MANUALLY PRIME FILL TRAP BEFORE START-UP TO FORM INITIAL DRAIN SEAL.
  4. SUPPORT LENGTHY DRAIN LINES TO PREVENT SAG AND CONDENSATE OVERFLOW.



- (a) THIS DIMENSION IN INCHES MUST BE GREATER THAN THE MAXIMUM FAN SUCTION STATIC PRESSURE IN INCHES WC (WITH DIRTY FILTERS, COILS, AND MAXIMUM AIR FLOW).
- (b) THIS DIMENSION IN INCHES MUST BE GREATER THAN 1/2 OF THE SAME MAXIMUM FAN SUCTION STATIC PRESSURE IN INCHES WC.
- (c) 1" WATER SEAL.

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|   |                               |  |
|---|-------------------------------|--|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES<br>TOLERANCES ARE:<br>FRACTIONS .005" .015" .030"<br>DECIMALS .005" .015" .030" | CONTRACT NO.                  | RECOMMENDED TRI-STACK P-TRAP DRAIN DETAIL<br>(NOT SUPPLIED BY STROBIC AIR) |
|   | APPROVALS                     | DATE   |
| MATERIAL  | DRAWN C.A.G.                  | 9/7/09   |
| FINISH  | CHECKED                       |  |
|   | APR'VD                        |  |
|   | U.S. PATENT NO. 4,806,706     | SIZE CODE IDENT. NO. DRAWING NO.   |
|   | CANADIAN PATENT NO. 1,277,171 | B DRAIN 060799C-1  |
|   |                               | SCALE: N.T.S.  |
|   |                               | SHEET 1 OF 1   |



## VIBRATION MONITORING

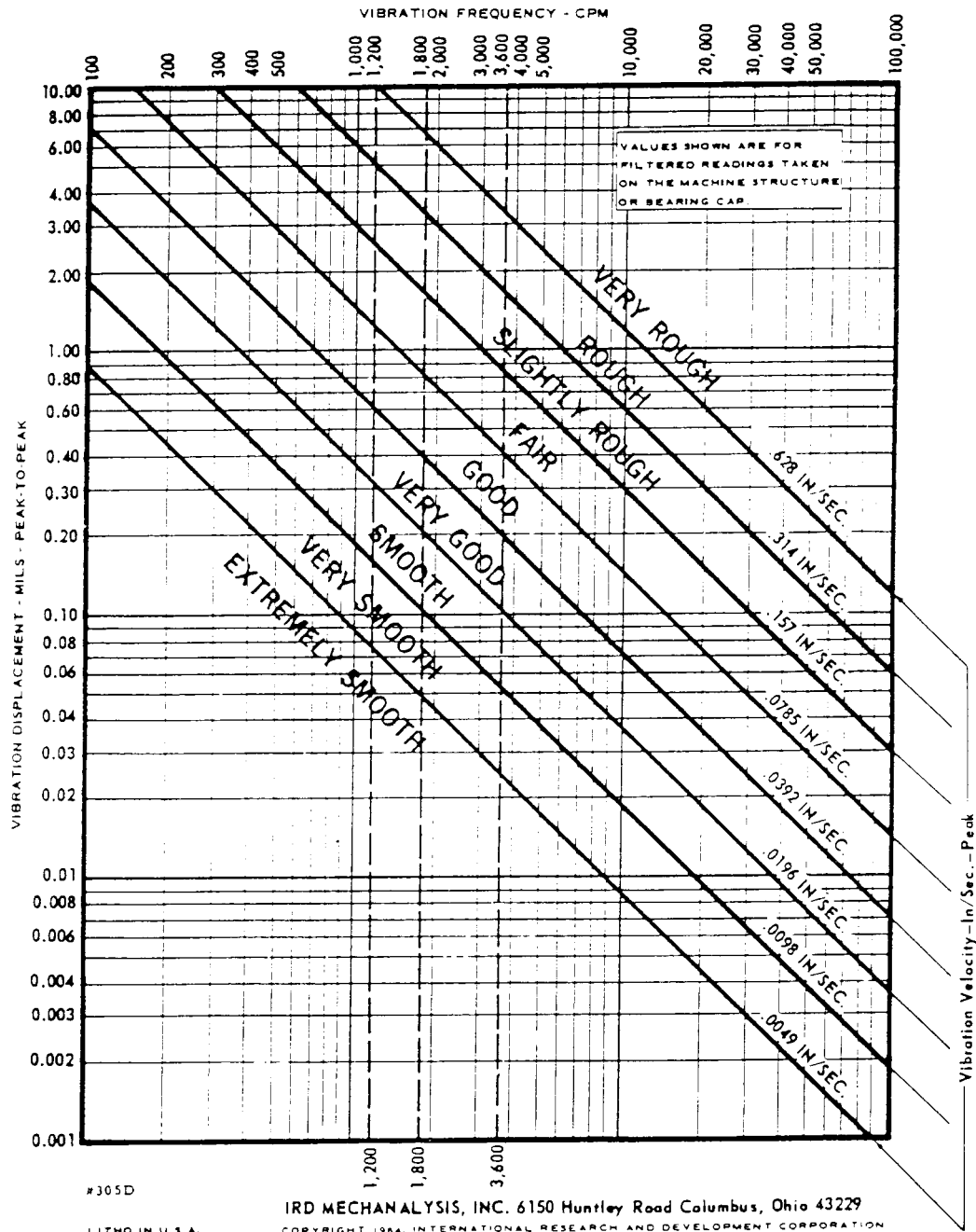
We recommend that the fan be monitored for vibration on a periodic or continual basis. Periodic checks by portable vibration equipment are recommended for non-critical installations with minimal system effects. The lubrication schedule could serve as a timely vibration monitoring schedule. A significant change in vibration levels will serve as notice for scheduling preventive maintenance.

CONTINUOUS VIBRATION MONITORING can best be accomplished by installing a vibration switch on the side

of the fan housing. Inexpensive switches can provide both a warning system (remote indicator light), and a trip-out system in case of bearing failure. This system is recommended for critical installations or where adverse system effects are present. For commercial installations, we recommend a warning setting of "slightly rough" for a period of twenty (20) seconds, and a trip-out setting of "rough" for a period of five (5) seconds, as shown on the "General Machinery Vibration Severity Chart", Figure B-1.

## APPENDIX B - VIBRATION SEVERITY CHARTS

For use as a GUIDE in judging vibration as a warning of impending trouble.



GENERAL MACHINERY VIBRATION SEVERITY CHART IN ENGLISH

## PROCEDURE FOR MOTOR CHANGE OUT ON TRI-STACK FANS

The following are the standard instructions as recommended by Strobic Air Corporation for the rare event when a motor change of a TRI-STACK fan is required. These guidelines utilize standard lifting, rigging, and assembly procedures.

- 1) Isolate the electrical power supply with use of the disconnect switch and lockout device. Disconnect the electric supply between the fan motor and disconnect switch.
- 2) Remove the stainless steel nuts, bolts, flat, and lock washers holding the fiberglass stack to the vane section. Mark mating flanges for proper fit up upon assembly.
- 3) Remove the fiberglass stack leaving the wind band attached to the stack.
- 4) Remove the stainless steel nuts, bolts, flat, and lock washers holding the vane section to the blade housing.
- 5) Remove the motor, vane section, and fan blade **as one unit**.
- 6) Stand fan blade assembly in a horizontal position with the motor base resting on the floor. Block the unit with wood under the motor base and outside the vane section to secure the unit, and keep it from rolling.
- 7) Remove the keeper bolt's locking tab and plate that attach the fan blade to the motor shaft.
- 8) Remove the impeller and motor key.
- 9) Remove the four c-face bolts.
- 10) Remove the four motor foot bolts.
- 11) Remove motor.
- 12) Install new motor by securing the four c-face bolts. Place bolts in foot mount, but do not tighten.
- 13) Re-install the impeller, motor shaft key, keeper plate and associated hardware.
- 14) Scrape old gasketing from mating surfaces and lift vane section assembly onto the blade housing with new gasketing pre-installed on blade housing mating flange.
- 15) Align holes to maintain the correct orientation of the motor junction box. Place hardware into holes but **do not tighten**. Check that the blade spins freely without interfering with the inlet bell. After positive confirmation of clear blade path, tighten all hardware.
- 16) Install new gasketing on vane section and stack mating surfaces. Maintain correct orientation between the cutout of the fiberglass nozzle and the junction box of the motor. Tighten associated hardware.
- 17) With use of feeler gauges, check for soft bases between the motor foot and the motor base.
- 18) Shim accordingly with paper shims to maintain a 0.002-0.005 tolerance. Tighten the four foot mount bolts.
- 19) Using silicone caulk, seal all mating surfaces that have been separated including the connection of inner vane section and the fiberglass stack.
- 20) Re-connect the electrical wiring and conduit from the motor box and disconnect switch.
- 21) Unlock the isolated disconnect switch and "bump" the motor to verify proper fan blade and motor rotation.
- 22) If rotation is correct start the fan. When the unit is up to speed, check amp, voltage, and vibration readings. Consult the factory if unit is not performing to specification.

## PROCEDURE FOR TRI-STACK MOTOR CHANGE OUT USING BOLT-ON JIB CRANE

- 1) Disconnect all electric to the fan disconnect switch using standard lock out procedures.
- 2) Unbolt the disconnect switch from the vane section bracket and place it by the motor to allow for the nozzle to be removed without any obstruction.
- 3) Bolt jib post to the jib socket with 1/2 - 13x2" bolts. If the jib has a post instead of a plate, slide the post through the socket. (Figure 1)
- 4) Unbolt the nozzle from the vane section. Rotate the nozzle in place to break any adhesion to the vane section caused by caulk or gasket. Wrap the hook from the jib arm around one of the wind band brackets. (Figure 3)
- 5) Lift the nozzle away from the fan using the lifting arm and lower it to the side of the plenum. (Figure 4)
- 6) Use the two lugs near the motor and the hole at the top of the motor base as the three picking points.
- 7) The fan must be raised level, be sure that the chain at the hole in the motor base is short enough to provide a level and even lift. (Figure 3)
- 8) Unbolt the housing from the vortex breaker. (Figure 3)
- 9) Slowly raise the fan with the hoist. The fan only needs to be raised 2". Rotate the fan away from the plenum and lower it. (Figure 5)
- 10) Lower the fan onto plywood or a wooden pallet. (Figure 6)
- 11) When the fan has been fully lowered, unbolt the housing flange to the vane section. (Figure 6)
- 12) Raise the fan once more, pull the housing away and lower the fan back down. The fan is now resting on the inlet of the fan blade. (Figure 6)
- 13) Remove the chain from the lifting point on the motor base leaving two chains attached to the two lugs by the motor.
- 14) The fan needs to be tipped backwards and lean against the motor base. To do this, slowly lift the fan from the two lifting points. This can cause the fan to swing, be careful that the fan is clear of any objects.
- 15) Lower the fan and rest it on the motor base and the vane section top flange. The bottom of the motor should be facing the roof. (Figure 7)
- 16) The blade is secured to the motor shaft by a single bolt keeper plate. Remove this bolt and pull the blade. (The jib can be used to assist this step if needed.)
- 17) Secure the jib hook to the eye-bolt of the motor. Slowly rotate the jib crank just until the cable is tight.
- 18) Unbolt and remove the motor.
- 19) Bolt the new motor in place but do not fully tighten the bolts for the motor feet.
- 20) Use feeler gages to check the clearance between the motor base and the motor feet. Use paper shims to maintain a 0.002-0.005 tolerance. After shimming the motor base, tighten the bolts for the motor feet.
- 21) Line up the keyway in the shaft with the keyway in the blade hub and install the blade. *Be positive that the shaft key is in place prior to bolting on the keeper plate.*
- 22) Pick up the fan again using the two lifting points. Now rotate the fan and lower it so it rests on the inlet of the fan blade again.
- 23) Place new gasket on the vane section flange, vortex breaker flange and housing flange.
- 24) Now lift the fan again from the three pick points and install the housing. Be sure that the inlet bell is centered in the blade inlet and that the blade can spin freely before tightening the bolts on the flange. (The alignment of the bell and blade can be done with the use of drift pins in the flange holes.)
- 25) Any wiring that needs to be done to either the motor or the disconnect switch should be done now before the nozzle is in place.
- 26) Place the fan back onto the vortex breaker and bolt into place.
- 27) Bolt the nozzle and the disconnect switch back in place.
- 28) Using silicone caulk, seal all mating flanges.
- 29) Run wires to the fan disconnect switch and "bump" start the fan to check the blade rotation is correct.
- 30) Once the rotation is correct, and the fan is up to full speed, check amps, volts and the vibration readings. Consult the factory if the fan is not performing to specification.

## **PROCEDURE FOR TRI-STACK WITH ACOUSTICAL NOZZLE MOTOR CHANGE OUT USING BOLT-ON JIB CRANE:**

- 1) Disconnect all electric to the fan disconnect switch using standard lock out procedures.
- 2) Unbolt the disconnect switch from the vane section bracket and place it by the motor to allow for the nozzle to be removed without any obstruction.
- 3) Bolt jib post to the jib socket with 1/2-13x2" bolts. If this has a post instead of a plate, slide the post through the socket (Figure 1).
- 4) Remove the Wind band from the acoustical silencer nozzle.
- 5) Unbolt the housing from the vortex breaker, leaving the vane section, motor base and acoustical silencer nozzle bolted together. (Figure 4).
- 6) Attach the lifting chains to the two lugs near the motor and the hole at the top of the motor base as the three picking points. **\*\* DO NOT LIFT USING THE BRACKETS AT THE TOP OF THE ACOUSTICAL SILENCER NOZZLE \*\***
- 7) The fan must be raised level, be sure that the chain at the hole in the motor base is short enough to provide a level and even lift. (Figure 4).
- 8) Slowly raise the fan with the hoist. The fan only needs to be raised 2". Rotate the fan away from the plenum and lower it. (Figure 5).
- 9) Lower the fan onto plywood or a wooden pallet. (Figure 5A)
- 10) When the fan has been fully lowered, unbolt the acoustical silencer nozzle from the vane section. Rotate the nozzle in place to break any adhesion to the vane section caused by caulk or gasket. Ensure all bolts have been removed from the nozzle to vane section.
- 11) Use the brackets on the acoustical silencer nozzle to lift the nozzle from the vane and fan section (Figure 5A).
- 12) Lower acoustical silencer nozzle onto plywood or a wooden pallet. (Figure 6)
- 13) Unbolt the housing flange to the vane section. (Figure 6)
- 14) Raise the fan once more, pull the housing away and lower the fan back down. The fan is now resting on the inlet of the fan blade. (Figure 6)
- 15) Remove the chain from the lifting point on the motor base leaving two chains attached to the two lugs by the motor.
- 16) The fan needs to be tipped backwards and lean against the motor base. To do this, slowly lift the fan from the two lifting points. This can cause the fan to swing, be careful that the fan is clear of any objects.
- 17) Lower the fan and rest it on the motor base and the vane section top flange. The bottom of the motor should be facing the roof. (Figure 7)
- 18) The blade is secured to the motor shaft by a single bolt keeper plate. Remove this bolt and pull the blade. (The jib can be used to assist this step if needed.)
- 19) Secure the jib hook to the eye-bolt of the motor. Slowly rotate the jib crank just until the cable is tight.
- 20) Unbolt and remove the motor.
- 21) Bolt the new motor in place but do not fully tighten the bolts for the motor feet.
- 22) Use feeler gages to check the clearance between the motor base and the motor feet. Use paper shims to maintain a 0.002-0.005 tolerance. After shimming the motor base, tighten the bolts for the motor feet.
- 23) Line up the keyway in the shaft with the keyway in the blade hub and install the blade. Be positive that the shaft key is in place prior to bolting on the keeper plate.
- 24) Pick up the fan again using the two lifting points. Now rotate the fan and lower it so it rests on the inlet of the fan blade again.
- 25) Place new gasket on the vane section flange, vortex breaker flange and housing flange.
- 26) Now lift the fan again from the three pick points and install the housing. Be sure that the inlet bell is centered in the blade inlet and that the blade can spin freely before tightening the bolts on the flange. (The alignment of the bell and blade can be done with the use of drift pins in the flange holes.)
- 27) Any wiring that needs to be done to either the motor or the disconnect switch should be done now before the nozzle is in place.

- 28) Place new gasket on the acoustical nozzle, vane section flange. Lift the acoustical nozzle from the two lifting eyes and replace it onto the vane/fan housing.
- 29) Re-attach the lifting chains to the two lugs near the motor and the hole at the top of the motor base as the three picking points. **\*\* DO NOT LIFT USING THE BRACKETS AT THE TOP OF THE ACOUSTICAL SILENCER NOZZLE \*\***
- 30) Place the fan back onto the vortex breaker and bolt into place.
- 31) Bolt the wind band and the disconnect switch back in place.
- 32) Using silicone caulk, seal all mating flanges.
- 33) Run wires to the fan disconnect switch and "bump" start the fan to check the blade rotation is correct.
- 34) Once the rotation is correct, and the fan is up to full speed, check amps, volts and the vibration readings. Consult the factory if the fan is not performing to specification.

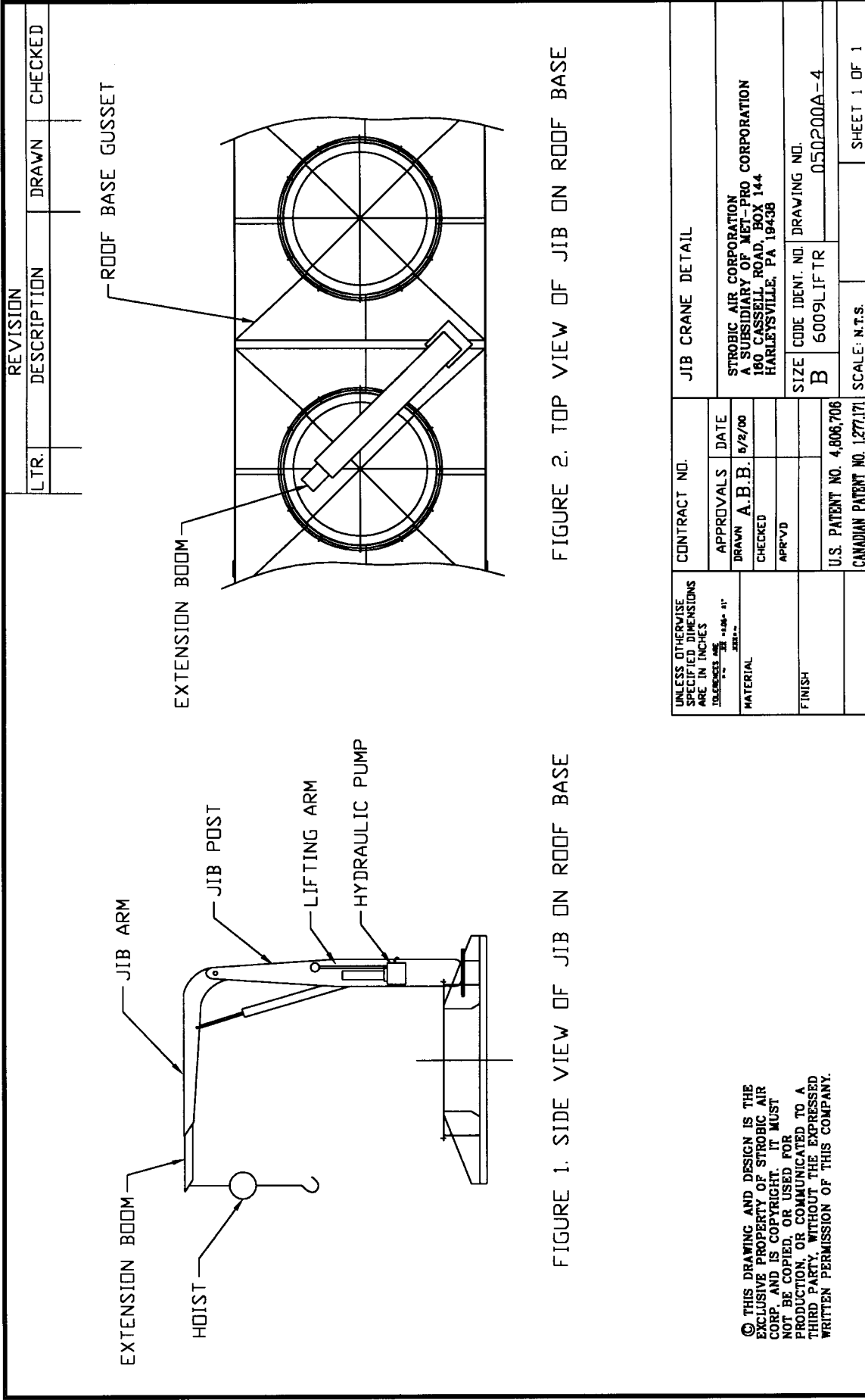


FIGURE 1. SIDE VIEW OF JIB ON ROOF BASE

FIGURE 2. TOP VIEW OF JIB ON ROOF BASE

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| L.T.R.   | DESCRIPTION | DRAWN | CHECKED |
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EXTENSION BOOM  
 HOIST  
 JIB ARM  
 JIB POST  
 LIFTING ARM  
 HYDRAULIC PUMP

EXTENSION BOOM  
 ROOF BASE GUSSET

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|   |                               |                  |   |
|---|-------------------------------|------------------|---|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES<br>TOLERANCES ARE:<br>FRACTIONAL DECIMALS ±0.005" ±0.015" ±0.030" | CONTRACT NO.                  | JIB CRANE DETAIL |   |
|   | APPROVALS                     | DATE             | STROBIC AIR CORPORATION<br>A SUBSIDIARY OF MET-PRO CORPORATION<br>160 CASSELL ROAD, BOX 144<br>HARLEYSVILLE, PA 19438 |
| MATERIAL  | DRAWN A.B.B.                  | 5/2/00           | SIZE CODE IDENT. NO. DRAWING NO.  |
| FINISH  | CHECKED                       |                  | B 6009LIFTR 050200A-4   |
|   | APPROVED                      |                  |   |
|   | U.S. PATENT NO. 4,806,706     |                  |   |
|   | CANADIAN PATENT NO. 1,272,171 |                  | SCALE: N.T.S.   |
|   |                               |                  | SHEET 1 OF 1  |

|          |  |             |       |         |
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| REVISION |  | DESCRIPTION | DRAWN | CHECKED |
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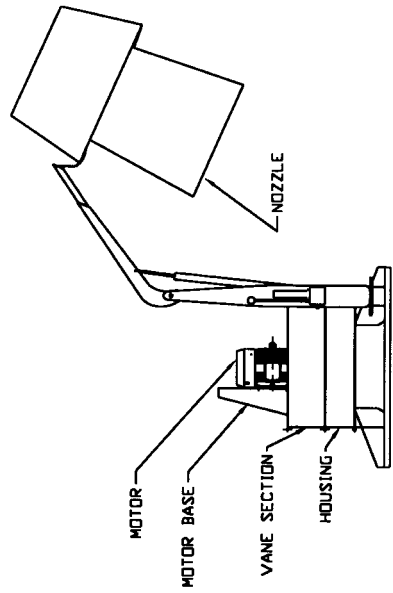


FIGURE 4

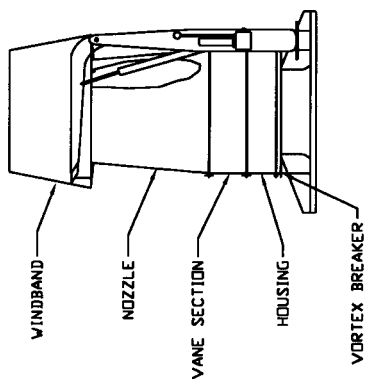


FIGURE 3

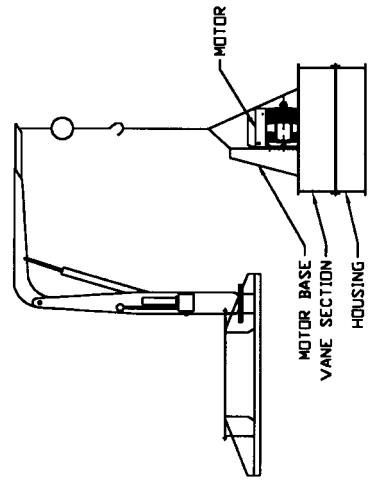


FIGURE 5

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|---|--------------|-------------------------------|---|-----------------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES | CONTRACT NO. |                               | JIB CRANE DETAIL  |                             |
|   | APPROVALS    | DATE                          |   |                             |
| TOLERANCES ARE:<br>FRACTIONS DECIMALS               | DRAWN A.B.B. | 5/4/00                        | STROBIC AIR CORPORATION<br>A SUBSIDIARY OF MET-PRO CORPORATION<br>180 CASSELL ROAD, BOX 144<br>HARLEYSVILLE, PA 18438 |                             |
| MATERIAL  | CHECKED      |                               | SIZE  | CODE IDENT. NO. DRAWING NO. |
| FINISH  | APR'VD       |                               | B   | 6009LIFTAR 050400A-1        |
|   |              | U.S. PATENT NO. 4,806,706     | SCALE: N.T.S.   |                             |
|   |              | CANADIAN PATENT NO. 1,277,171 | SHEET 1 OF 1  |                             |

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|----------|-------------|-------|--|---------|--|
| REVISION |             | DRAWN |  | CHECKED |  |
| LTR.     | DESCRIPTION |       |  |         |  |

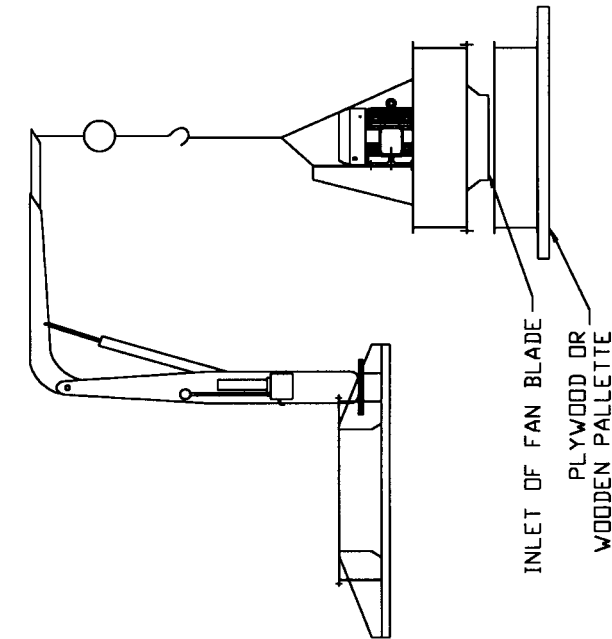


FIGURE 6

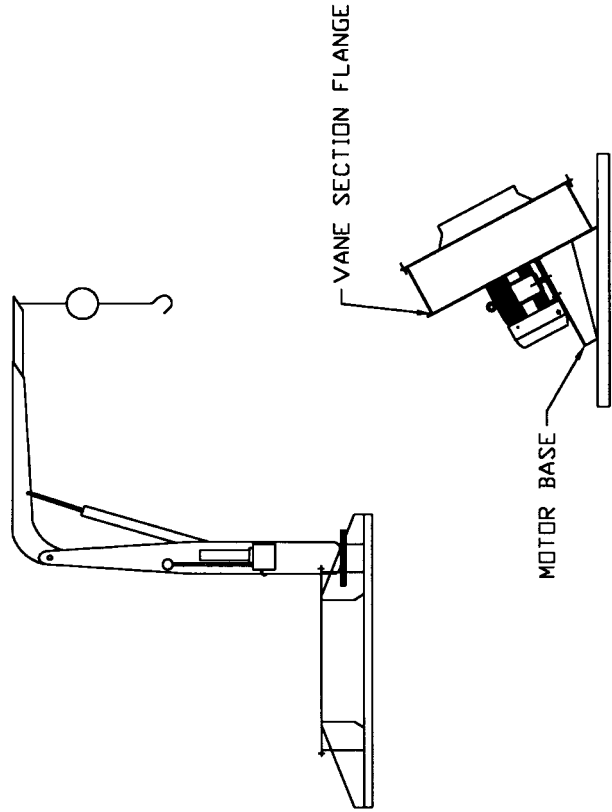


FIGURE 7

|  |                           |               |   |                             |
|--|---------------------------|---------------|---|-----------------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES<br>TOLERANCES ARE<br>±.000 - .015<br>SEE 2-2 | CONTRACT NO.              |               | JIB CRANE DETAIL  |                             |
|  | APPROVALS                 | DATE          | STROBIC AIR CORPORATION<br>A SUBSIDIARY OF MET-PRO CORPORATION<br>160 CASSELL ROAD, BOX 144<br>HARLEYSVILLE, PA 19438 |                             |
|  | DRAWN A.B.B.              | 6/2/00        | SIZE  | CODE IDENT. NO. DRAWING NO. |
| MATERIAL   | CHECKED                   | APPR'VD       | B   | 6009LFTBR                   |
| FINISH   | U.S. PATENT NO. 4,806,706 |               | 050.300A-5  |                             |
| CANADIAN PATENT NO. 1,277,171  |                           | SCALE: N.T.S. |   |                             |
| SHEET 1 OF 1   |                           |               |   |                             |

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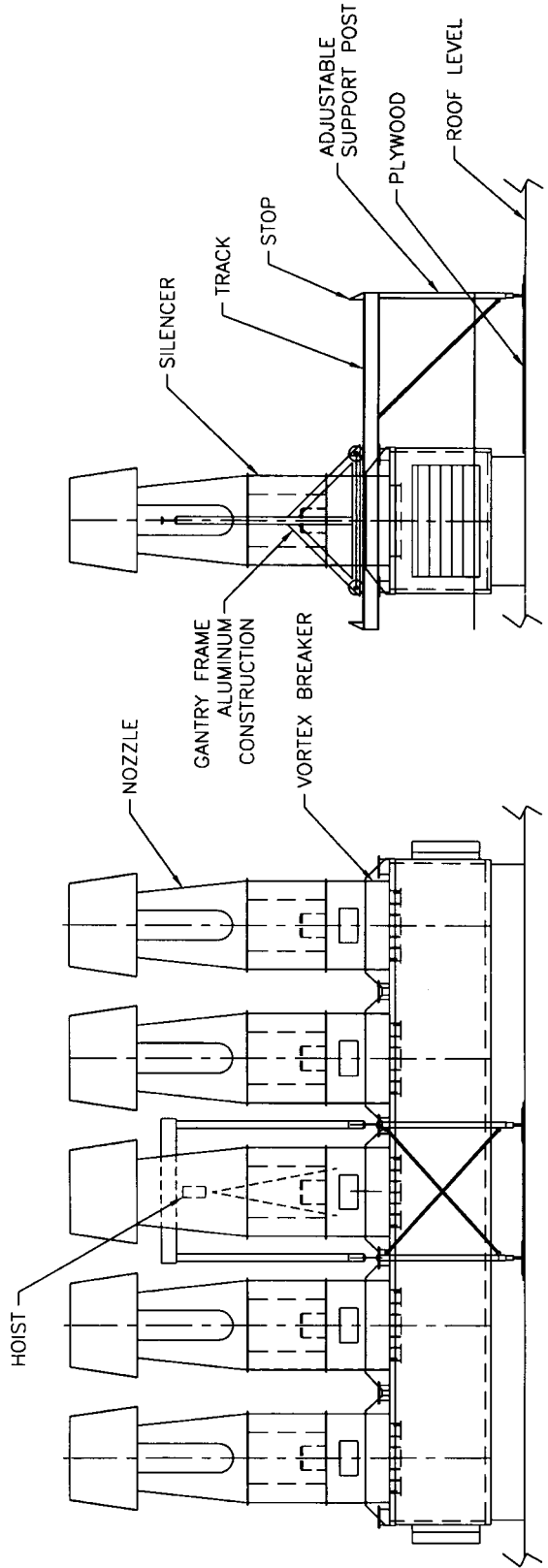
## TRI-STACK FAN A-FRAME GANTRY MOTOR CHANGE OUT PROCEDURE

- 1) Always think of safety first, and use common sense.
- 2) Place two 48x96 plywood sheets on the roof to act as a work area and to distribute the load on the two track supports.
- 3) Bolt the frame to the support sockets provided.
- 4) Bolt the two track supports in place, *be sure the track is kept level and square.*
- 5) Bolt the cross supports to the frame.
- 6) Use proper lock-out procedures to be sure that the power to the fan disconnect switch is turned off.
- 7) Disconnect the wires at the disconnect switch at both the line and load sides.
- 8) Unbolt the fan nozzle and break the caulk/gasket seal by rotating the nozzle. (Do not remove the nozzle.)
- 9) Place the I-beam for the gantry, *with the trolley on*, through the nozzle cut-out. (I-beam weight is approximately 60 lbs.)
- 10) Rotate the nozzle 90 degrees, so the I-beam is perpendicular with the track.
- 11) Place the gantry side supports on the track underneath the I-beam and bolt in place.
- 12) Adjust the height of the gantry so the top of the I-beam just touches the top of the nozzle cut-out and lock in place.
- 13) Place the hoist onto the trolley on the I-beam and lock in place.
- 14) Hang 3-point lift chain off of the hoist and hook chain onto the three lugs provided by the motor.  
**Note:** One of the three legs of these chains will need to be adjustable in height to pick the point off of the fan motor base.
- 15) Unbolt the fan at the vortex breaker.
- 16) When lifting the fan be sure the fan is kept level. Lift the fan about 3 inches.
- 17) Roll the gantry on the track until the fan can be lowered clear of the plenum. (Be sure the nozzle is still unbolted from the fan. The I-beam will support the nozzle/wind band in the air while the fan is lowered.)
- 18) Lower the fan and silencer to the plywood.
- 19) Unbolt the silencer from the fan.
- 20) Lift the silencer up and place it back on the vortex breaker to keep it out of the way.
- 21) Unbolt the vane section from the fan housing.
- 22) Lift the motor/blade/vane section assembly and remove the fan housing.
- 23) Lower the assembly and pick it up again from the lifting lugs away from the motor base. This will tip the assembly over. Lower the assembly down and rest it on the back end of the motor base so the blade is pointing up.
- 24) Unbolt the one keeper plate bolt at the center of the blade hub only.
- 25) Pull the blade off of the motor shaft. (Use the lift if needed.)
- 26) Place the hook from the chain on the eye-bolt for the old motor. Unbolt the four motor c-face bolts from the vane section and the four bolts on the motor feet from the motor base and remove the old motor.
- 27) Bolt the c-face of the new motor to the vane section. Bolt the motor feet to the motor base. *Shim the motor feet to maintain 0.002-0.005 tolerance.*
- 28) Connect the wires to the motor junction box through the conduit. Be sure to properly wrap the wire connections.
- 29) Mount the blade onto the new motor be sure the key is in place and the keeper plate bolt is tight.

| Stainless Steel Bolt Size | Torque (ft-lbs) |
|---------------------------|-----------------|
| 1/4 - 20                  | 6               |
| 5/16 - 18                 | 11              |
| 3/8 - 16                  | 18              |
| 7/16 - 14                 | 32              |
| 1/2 - 13                  | 43              |
| 5/8 - 11                  | 92              |

- 30) Lift the assembly back onto the housing. Be sure the blade spins freely without rubbing the inlet bell before bolting in place.
- 31) Bolt the silencer back in place.
- 32) Lift the entire unit up and guide the nozzle/wind band back in place and bolt flanges together.
- 33) Lower the fan back onto the vortex breaker and bolt in place.
- 34) Run the wires from the motor back to the disconnect switch.
- 35) Run the wires from the power source back to the disconnect switch.
- 36) Bump start the fan and check for rotation.
- 37) Once rotation is correct, start the fan, then take amp and volt readings.
- 38) It is also recommended that vibration readings are taken around the fan and are within manufacturer's specifications.

| REVISION |             | DATE | APPROVED |
|----------|-------------|------|----------|
| L.T.R.   | DESCRIPTION |      |          |



|   |              |                                     |                     |
|---|--------------|-------------------------------------|---------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE .005" .010" .015" .030" .060" .125" .250" .500" 1.000" 1.500" 2.000" | CONTRACT NO. | (5) TS-3 FANS ON A COMMON PLENUM    |                     |
|   | APPROVALS    | DATE                                | A-FRAME LIFT DETAIL |
| MATERIAL  | DRAWN        | L.D.C.                              | 2/24/98             |
| FINISH  | CHECKED      | STROBIC AIR CORPORATION             |                     |
|   | APPROVED     | A SUBSIDIARY OF MET-PRO CORPORATION |                     |
|   |              | 160 CASSELL ROAD, BOX 144           |                     |
|   |              | HARLEYSVILLE, PA 19438              |                     |
|   |              | U.S. PATENT NO.                     | 4,806,706           |
|   |              | CANADIAN PATENT NO.                 | 1,277,171           |
|   |              | SCALE:                              | N.T.S.              |
|   |              | SHEET                               | OF                  |

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## PROCEDURE TO CHANGE OUT MOTOR STATOR ON TRI-STACK FAN

- 1) Disconnect and lock out electrical power to the fan disconnect switch.
- 2) Open the fan disconnect switch and disconnect the wires from the motor at the disconnect switch.
- 3) Once the wires have been disconnected, the liquidite conduit from the switch and pull the wires out of the switch.
- 4) Unbolt and remove the nozzle/wind band assembly.
- 5) Bolt the jib arm mounting base to flanges of the housing and vane section. Be sure to bolt the base in a position that will allow the stator swing on the jib arm out past the mixing plenum. Typically, the base is mount to the holes closest to the edge of the plenum. This will allow the old stator to be lowered down to roof level as well as let the new stator be picked up from roof level.
- 6) Bolt the jib arm to the mounting base and position the arm so the hook is centered over the motor.
- 7) Remove the fan guard, and cooling fan from the installed motor.
- 8) Unbolt the stator at the end bell and the c-face.
- 9) Carefully remove the end bell.
- 10) Unbolt the motor feet, taking note of the location of the shims between the motor feet and the motor base.
- 11) Bolt the lifting plate to the end of the installed stator and hook the plate to the jib crane.
- 12) **Slowly**, crank the jib to raise the stator.
- 13) Lower the old stator to the roof.
- 14) Attach the lifting plate to the new stator.
- 15) Be extremely careful lowering the new stator back on to the motor. The stator must be kept square as it is placed over the armature. Any nicks in the stator or armature will ruin the motor.
- 16) Bolt the stator on to the c-face.
- 17) Unbolt the lifting plate.
- 18) Bolt the end bell, cooling fan and fan guard back.
- 19) Shim the motor feet using the existing shims. Maintain a tolerance of 0.002-0.005 inches between the motor feet and the motor base.
- 20) Bolt the motor feet to the motor base.
- 21) Take the wiring, connectors and conduit from the old stator and wire to the new stator. When wiring to the motor junction box, use connectors supplied by Strobic.
- 22) Remove the jib crane and mounting base from the fan.
- 23) Clean the flanges on the nozzle and vane section of any old caulk and gasket.
- 24) Apply new gasket and caulk to the vane section flange.
- 25) Bolt the nozzle/windband assembly back on to the vane section.
- 26) Connect the conduit back to the disconnect switch and connect the wires to the switch.
- 27) Check that everything is wired correctly and unlock the lock out. "Bump start" the fan to check for correct rotation. If the rotation is incorrect, lock out the fan again and switch the position of two of the wire leads from the motor at the disconnect switch. "Bump start" the fan and check rotation.
- 28) Once rotation is correct, run the fan. Once the fan is at full speed, check amp, voltage, and vibration readings. If the unit is not performing to specification, shut down the unit and consult the factory.



# Strobic Air Corporation

A SUBSIDIARY OF MET-PRO CORPORATION

160 Cassell Road, Box 144, Harleysville, PA 19438  
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E-Mail: [tristack@strobicair.com](mailto:tristack@strobicair.com), Web Site: [www.strobicair.com](http://www.strobicair.com)

## MOTOR STATOR CHANGE OUT FOR TRI-STACK SYSTEM

*(approx. 2 hour operation)*



Remove stack and windband.



Attach jib to side of fan housing. Remove back endbell and stator.

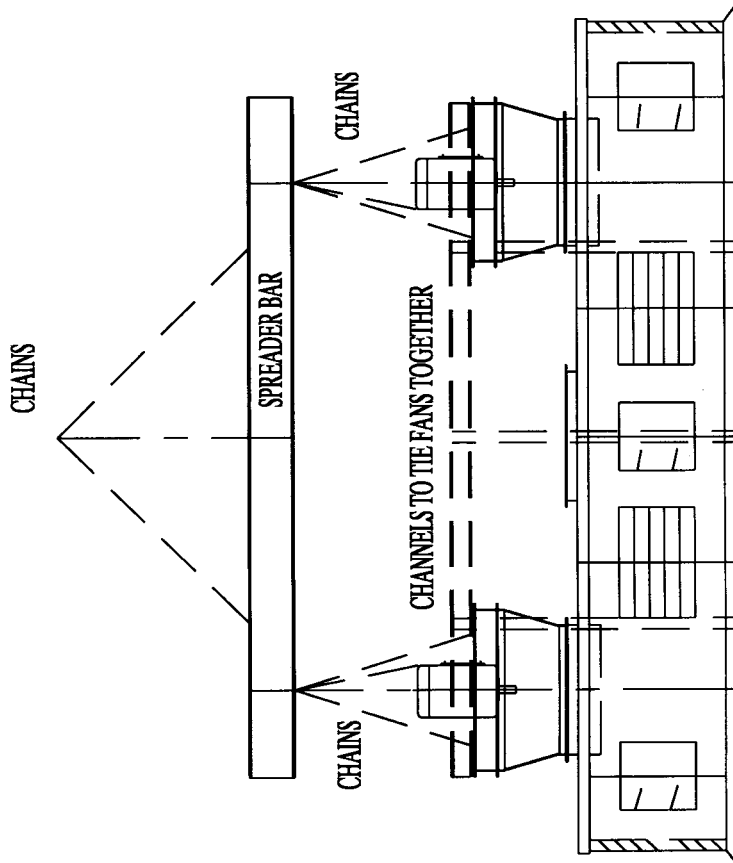


Lift new stator into place.



Align carefully over rotor. Replace shim and bolts. Rewire and test.

| REVISION |             |               |
|----------|-------------|---------------|
| LTR.     | DESCRIPTION | DATE APPROVED |
|          |             |               |



NOTES:

USE STANDARD LIFTING AND RIGGING PRACTICES.

- 1 CHAIN TO SPREADER BAR
- 2 SPREADER BAR WITH CHAINS AT CORRECT CENTERS
- 3 CHAINS TO INNER LIFTING LUGS AND TO MOTOR BASE
- 4 CHANNELS BOLTED TO VANE SECTION AND THREE STRAPS AROUND PLENUM

LIFTING STRAPS

SIDE ELEVATION

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|   |                |   |                                  |                          |
|---|----------------|---|----------------------------------|--------------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES<br>TOLERANCES ARE:<br>XXX-<br>XXXX-<br>MATERIAL | CONTRACT NO.   |   | RECOMMENDED LIFTING RIG FOR FANS |                          |
|   | APPROVALS DATE | STROBIC AIR CORPORATION (A DIVISION OF STI-PAC CORP.) |                                  |                          |
| FINISH  | DRAWN P.A.T.   | 1340 FORD ROAD  |                                  | DRAWING NO.<br>031197L-1 |
|   | CHECKED        | BENSALEM, PA. 19020                                   |                                  |                          |
| U.S. PATENT NO. 4,806,706   | APRVD          | SIZE  | CODE IDENT. NO.                  | BSRLIFT                  |
|   | LAYOUT L.D.C.  | B   |                                  |                          |
| CANADIAN PATENT NO. 1,277,171   | SCALE: N.T.S.  |   | SHEET ___ OF ___                 |                          |

## **STANDARD STATEMENT OF WARRANTY AND LIMITATION OF LIABILITY**

Equipment manufactured by Strobic Air Corporation is guaranteed for a period of 18 months from the date of shipment, or one year from the date of start-up, whichever comes first. Our warranty is that the equipment will operate in accordance with our proposals, specifications and name-plate data under proper conditions, installation, rated load, environment, and usage. Any defects in materials and/or workmanship will be repaired or replaced at our option, F.O.B. our plant, or at our option, in the field under straight-time conditions. All warranty work performed on Strobic Air's behalf must be authorized, on a written purchase order basis, prior to performing the work. Correction of defects by repairing or replacing shall constitute the fulfillment of Strobic Air's warranty. Strobic Air shall, in no event, be responsible for special, indirect, or consequential damages; nor for repairs or replacements made by others without the written authorization of Strobic Air.

Strobic Air's liability on any claim of any kind, including negligence, for any loss or damage arising out of, connected with, or resulting from the sale of Strobic Air's equipment shall in no case exceed the total price paid to Strobic Air for such equipment.

**THE WARRANTIES FURNISHED BY STROBIC AIR AS EXPRESSLY INCLUDED HEREIN CONSTITUTE STROBIC AIR'S SOLE OBLIGATIONS HEREUNDER AND ARE IN LIEU OF ANY OTHER WARRANTIES, GUARANTEES, PROMISES OR COMMITMENTS, EXPRESS OR IMPLIED, WRITTEN OR VERBAL, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY AND WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, EVEN IN THE EVENT OF A FUNDAMENTAL BREACH BY STROBIC AIR.**

It is expressly understood and agreed that Strobic Air makes no warranty with respect to any equipment not manufactured by Strobic Air, or with respect to any components of Strobic Air's equipment manufactured by others. In all such cases, the Buyer shall rely solely on the warranty of the manufacturers of such equipment or component, if any.

The terms, conditions and limitations set forth in this document supersede any other statement of Strobic Air's warranty, including without limitation the terms described in Strobic Air's standard Terms and Conditions of Sale.



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