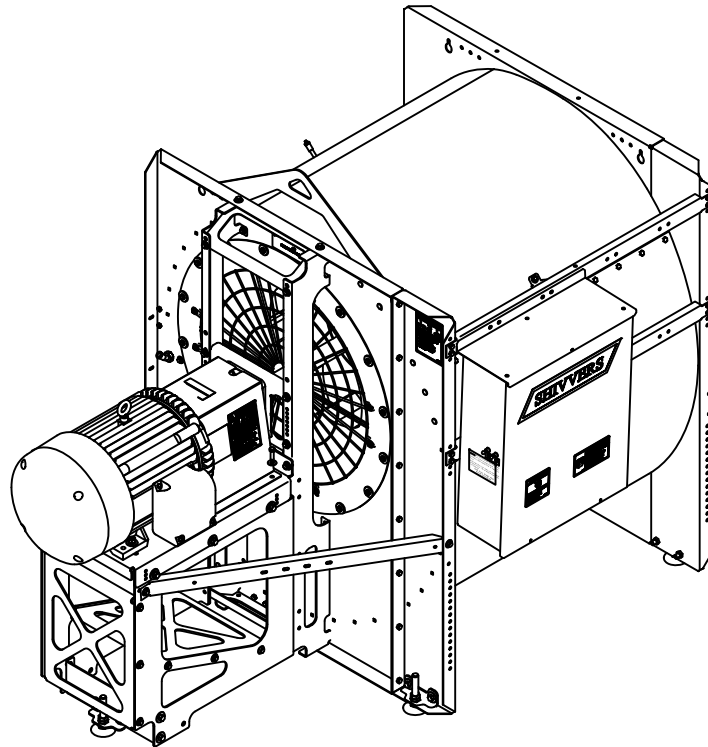




# CENTRIFUGAL FAN

## Double Width, Double Inlet (DWDI)



### INSTALLATION & OPERATING INSTRUCTIONS

FOR MODELS:

- |   |   |
|---|---|
| 689A-001A * 30 Hp, 460V, 3 PHASE          | 689L-001A * 50 Hp, No Motor / No Controls |
| 689B-001A * 30 Hp, 208/230V, 3 PHASE      | 689Q-001A * 30 Hp, 460V Soft Start        |
| 689C-001A * 30 Hp, No Controls            | 689R-001A * 30 Hp, 208/230V, Soft Start   |
| 689D-001A * 40 Hp, 460V, 3 PHASE          | 689S-001A * 40 Hp, 460V Soft Start        |
| 689E-001A * 40 Hp, 208/230V, 3 PHASE      | 689T-001A * 40 Hp, 208/230V, Soft Start   |
| 689F-001A * 40 Hp, No Controls            | 689U-001A * 50 Hp, 460V Soft Start        |
| 689G-001A * 50 Hp, 460V, 3 PHASE          | 689V-001A * 50 Hp, 208/230V, Soft Start   |
| 689H-001A * 50 Hp, 208/230V, 3 PHASE      |   |
| 689I-001A * 50 Hp, No Controls            |   |
| 689J-001A * 30 Hp, No Motor / No Controls |   |
| 689K-001A * 40 Hp, No Motor / No Controls |   |

SHIVERS MANUFACTURING, INC.  
614 W. English Street  
Corydon, IA 50060  
Ph. (641) 872-1005 \*\* Fax (641) 872-1593  
[www.shivers.com](http://www.shivers.com)

P-12571  
Rev. F  
10/17/2022

Manual subject to  
change without notice.

# SHIVERS WARRANTY

## **Two Year Pro-Rated Warranty:**

SHIVERS' Circu-Lator, Dri-Flo and related equipment and accessories manufactured by SHIVERS Manufacturing, Inc. are guaranteed under this limited warranty for the first season of harvest operation, regardless of purchase date, when installed in accordance with the applicable installation manuals, and operated as directed in the SHIVERS "Operator's Safety Manual", the "Circu-lator or Dri-Flo Operating Instructions", the SHIVERS "CompuDry Command Center Operating Instructions", if so equipped, and other applicable operating manuals. Under this warranty, SHIVERS will repair or replace such parts as are returned to us and found defective.

During the second season of harvest operation, SHIVERS will repair or replace at 50% of the retail price, such parts which are returned to us and found defective.

V-Belts are not covered by this warranty.

Electric Motors (including Spreader Motors) are under Warranty of the motor Manufacturers and are not covered by the SHIVERS Warranty. Warranty for motors must be handled through an authorized motor service center for that Manufacturer.

SHIVERS makes no Warranty of any kind, expressed or implied, except as stated herein and buyer assumes all risk and liability resulting from the use of products manufactured by SHIVERS, whether used singly or in combination with other products.

## **ATTENTION:**

Circu-Lator and Dri-Flo will set up flow patterns of grain which exert extra stress on the walls and floor of your bin. Additional floor supports are required for your drying floor. Bin-side wall stiffeners are required. You should consult the bin and floor Manufacturers for their recommendations before using Circu-Lator or Dri-Flo. SHIVERS will not be responsible for structural failure of your drying floor or bin, or for any loss, damage or injury relating to use of Circu-Lator or Dri-Flo.

For purposes of this Warranty, "Season of Harvest" is defined as the period of time between June 1st and December 31st of a calendar year.

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# INTRODUCTION

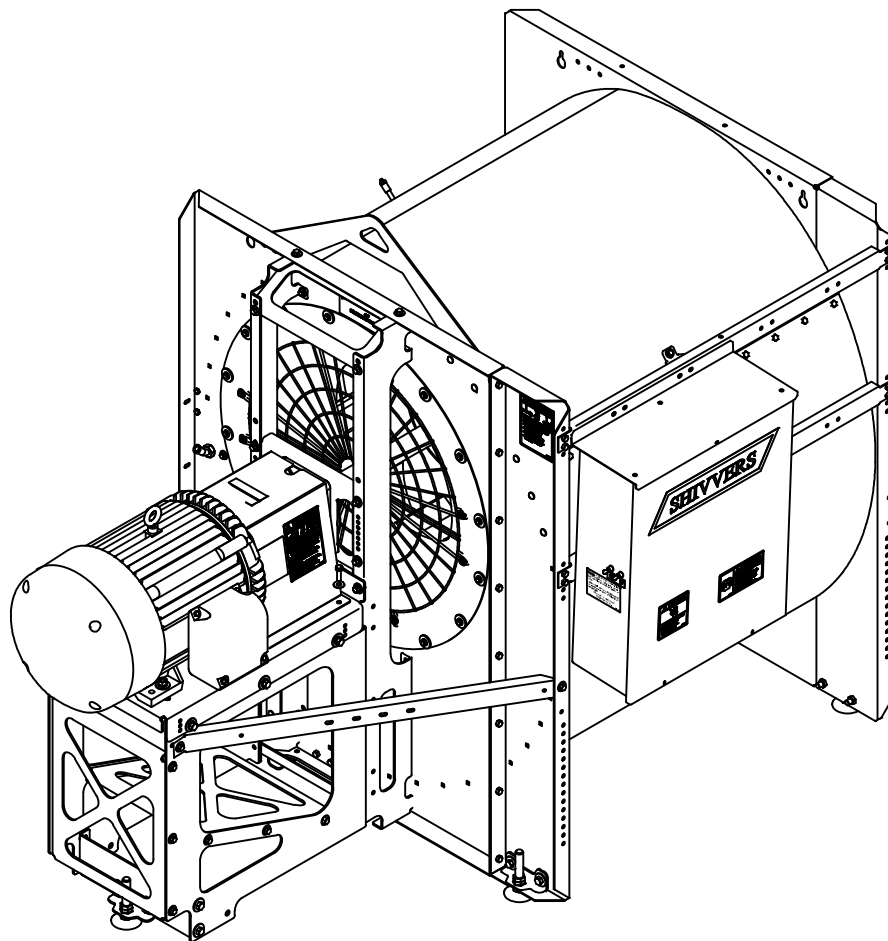
COMPLETELY READ THIS MANUAL AND THE OPERATOR'S SAFETY MANUAL (P-10001) BEFORE INSTALLING OR USING THE SHIVERS CENTRIFUGAL FAN.

This manual is intended for use with a Shivers DWDI Centrifugal fan connected to a Shivers Blue Flame II MAX burner. The fan may be used with other manufacturer's burners, but care should be taken to insure proper hook-up.

The Shivers DWDI, galvanized, 30 Hp Centrifugal Fan was first put into production in 2009.

The Shivers DWDI, galvanized, 40 Hp Centrifugal Fan was first put into production in 2011.

The Shivers DWDI, galvanized, 50 Hp Centrifugal Fan was first put into production in September 2011.



# SAFETY INFORMATION

The operator of this equipment must assume responsibility for his own safety and for the safety of those working with him. He must also make sure the equipment was installed properly. Factors that contribute to the overall safety of operation are: proper use, maintenance, and frequent inspection of the equipment. All of these are the operator's responsibility.

If any items covered in this manual are not completely understood, or there is a concern with the safety of the product, contact Shivvers at the address shown on the front cover. Shivvers is genuinely interested in providing the safest practical equipment to our customers. If you have a suggestion which you believe will enhance the safety of this product, please write us and let us know.

Read and understand the Operator's Safety Manual (P-10001), and all applicable operator's manuals, before working on Shivvers equipment.

Read and understand this manual completely before using this equipment.



**Take note anytime this safety alert symbol appears. Your safety, and that of persons around you, is at stake.**

The safety alert symbol will be accompanied by one of three signal words whose definitions are given as:

**DANGER:** Red and white. Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

**WARNING:** Orange and black. Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

**CAUTION:** Yellow and black. Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

See the Operator's Safety Manual (P-10001) for definitions, proper use of safety locks and disconnects, and for proper bin unloading procedures.

# SAFETY INFORMATION

Be sure to observe these common sense rules when working with the dryer equipment:

- 1) All units must be equipped with a main power disconnect switch. This disconnect switch must shut power off to the complete drying system. It must have the capability of being locked into the OFF or OUT position. Disconnect and **LOCK OUT** this main power disconnect switch before conducting any inspection, maintenance, repair, adjustment, or cleaning of the drying system. When you must have the electrical power on to troubleshoot equipment, do it from a safe distance, and always from outside the bin.
- 2) Keep the bin entrances locked at all times. To unlock the bin, first lower the Level-Dry (if so equipped), then shut the main power disconnect off. Take the safety lock off the bin entrance and place it on the main power disconnect before opening the bin entrance. **Never enter the drying bin unless the Level-Dry (if so equipped), is completely lowered, and all power is disconnected and locked out.**
- 3) Always keep all shields and guards in place. If shields or guards must be removed for inspection or maintenance, replace them before unlocking and turning the power back on.
- 4) Be sure everyone is clear of all the drying and transferring equipment, and outside of all bins, before unlocking and turning the power on. Some equipment may run upon re-application of power.
- 5) Make sure that all decals are in place and are easy to read. Do not operate the equipment with missing or illegible decals. If replacements are needed, contact SHIVVERS Incorporated or your dealer.
- 6) Prior to use, inspect all equipment to insure that it is in good operating condition. Do not operate with missing, damaged, or worn parts. Use only SHIVVERS approved replacement parts.
- 7) Metal edges can be sharp. Wear protective clothing and handle equipment and parts with care.
- 8) Keep children and bystanders away from drying and transferring equipment at all times.

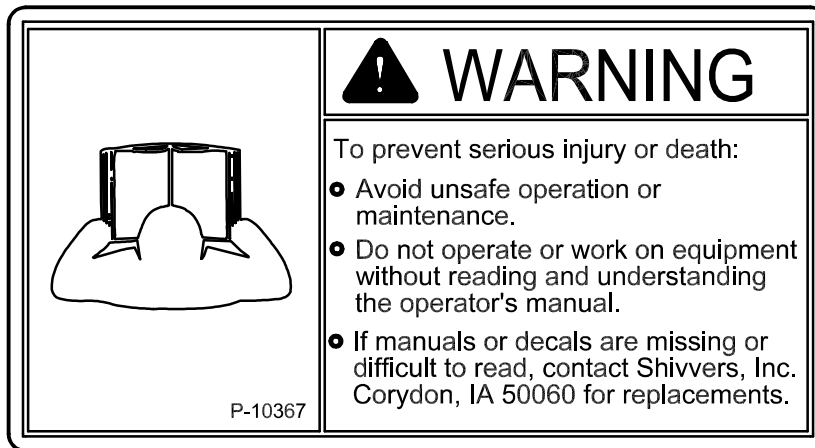
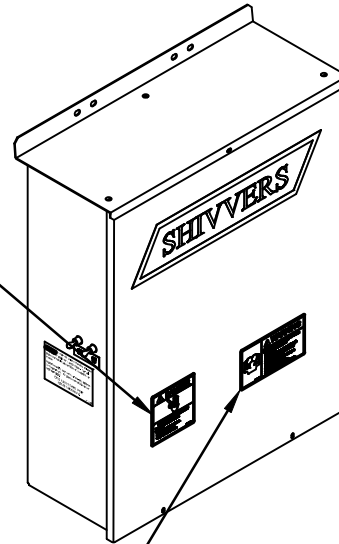
# SAFETY INFORMATION

- 9) If going up the bin ladder and/or performing maintenance on the top of the bin, take precautions to prevent accidental falls. When on top of the bin, wear a safety harness or other safety device.
- 10) At least annually, review all operating and safety manuals with any personnel working with this equipment. Always train new employees before they operate the drying equipment. Insist that they read and understand the operating and safety manuals.

# LOCATION OF SAFETY DECALS



P-11146  
Located on outside of Control Box, lower left corner



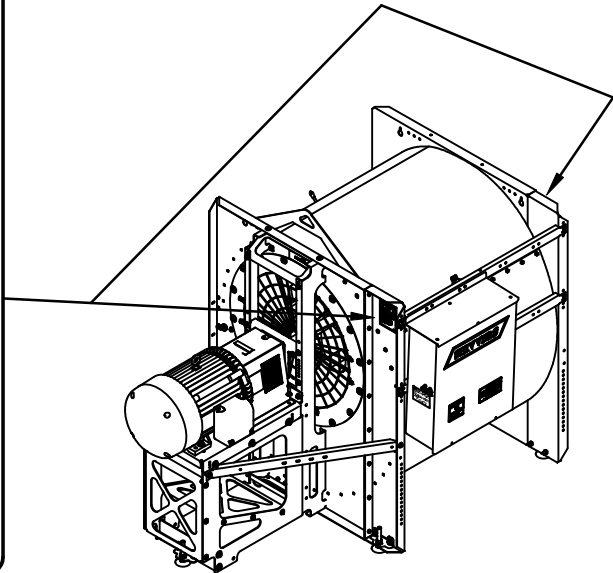
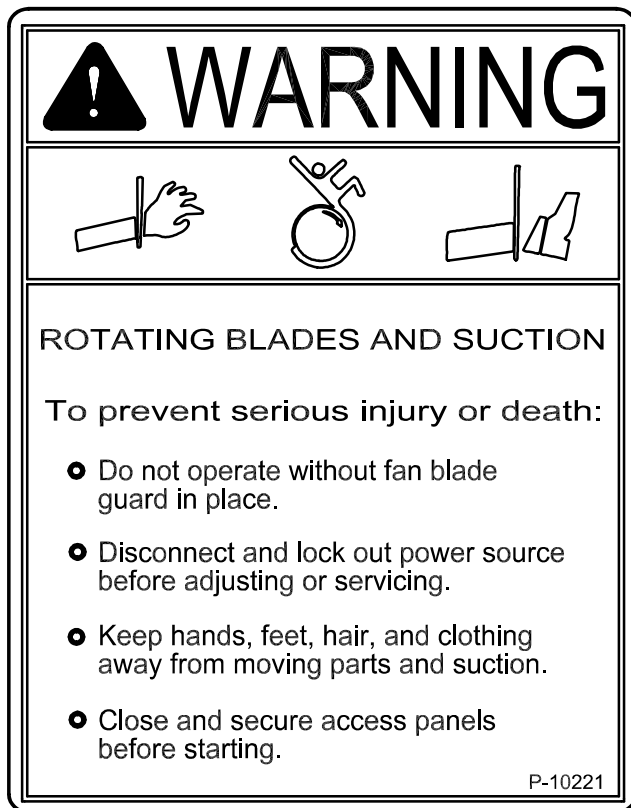
P-10367  
Located on outside of Control Box, lower right corner.



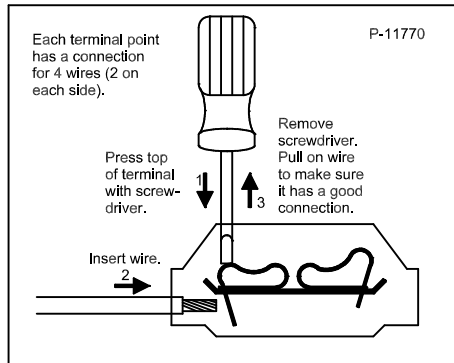
# LOCATION OF SAFETY DECALS

P-10221

Located on Frame Side (Inlet), upper corner by Grill Guard, both sides of fan.

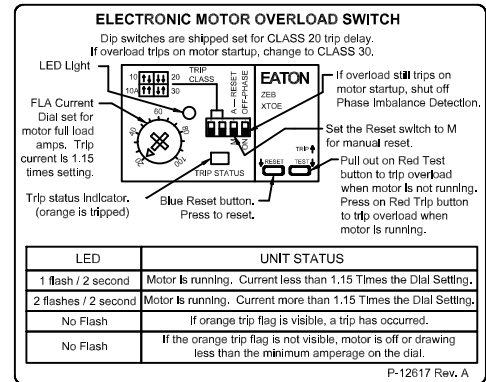


# OTHER IMPORTANT DECAL LOCATIONS



**P-11770 (if used)**  
 Located on inside of Control Box,  
 left corner (top).

**P-12617 (if used)**  
 Located on inside of Control Box,  
 left corner (bottom).



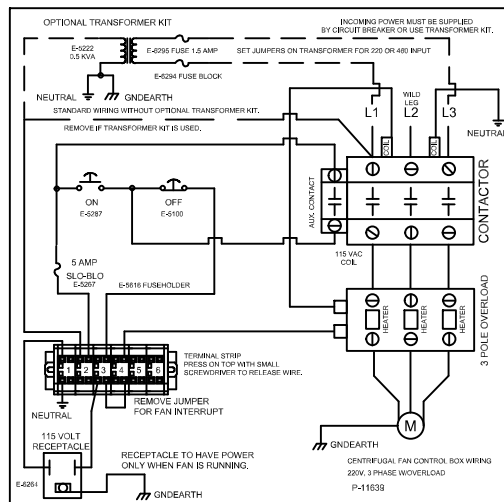
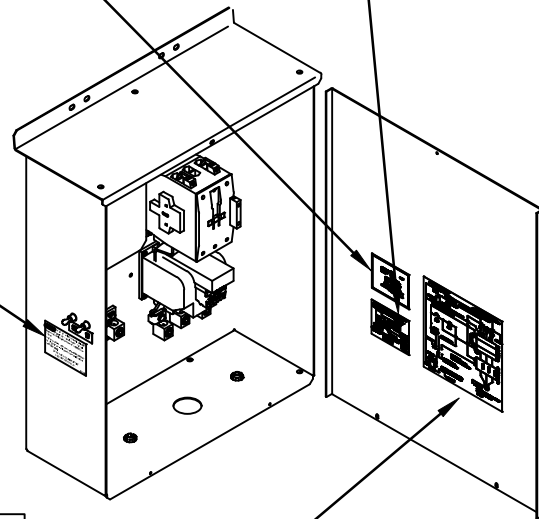
**DO NOT** turn fan on unless there is at least one foot of grain on the bin floor. Fan air pressure could cause floor or supports to move.

Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage.

**ONE FAN START PER HOUR MAXIMUM.**

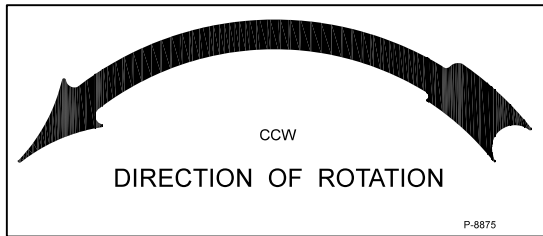
P-12568

**P-12568** Located on outside of  
 Control Box, below switches.



**Wiring Decal P-11639,  
 P-13194, or P-13637**  
 Located on inside of Control Box  
 Cover.

# OTHER IMPORTANT DECAL LOCATIONS



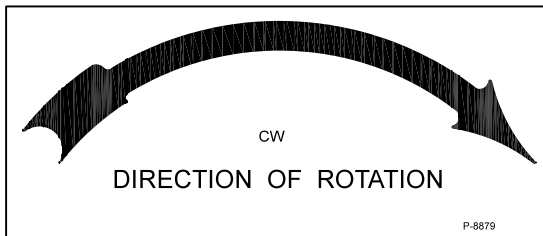
**P-8875**

Located on top center above Grill Guard (opposite motor)

**IMPORTANT**  
Before each drying season, give bearing  
1-2 shots of grease. P-12569

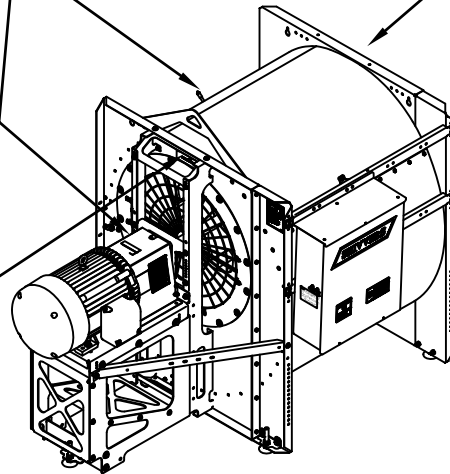
**P-12569**

Located on fan housing (opposite control box) under grease zerk and on coupler guard by motor



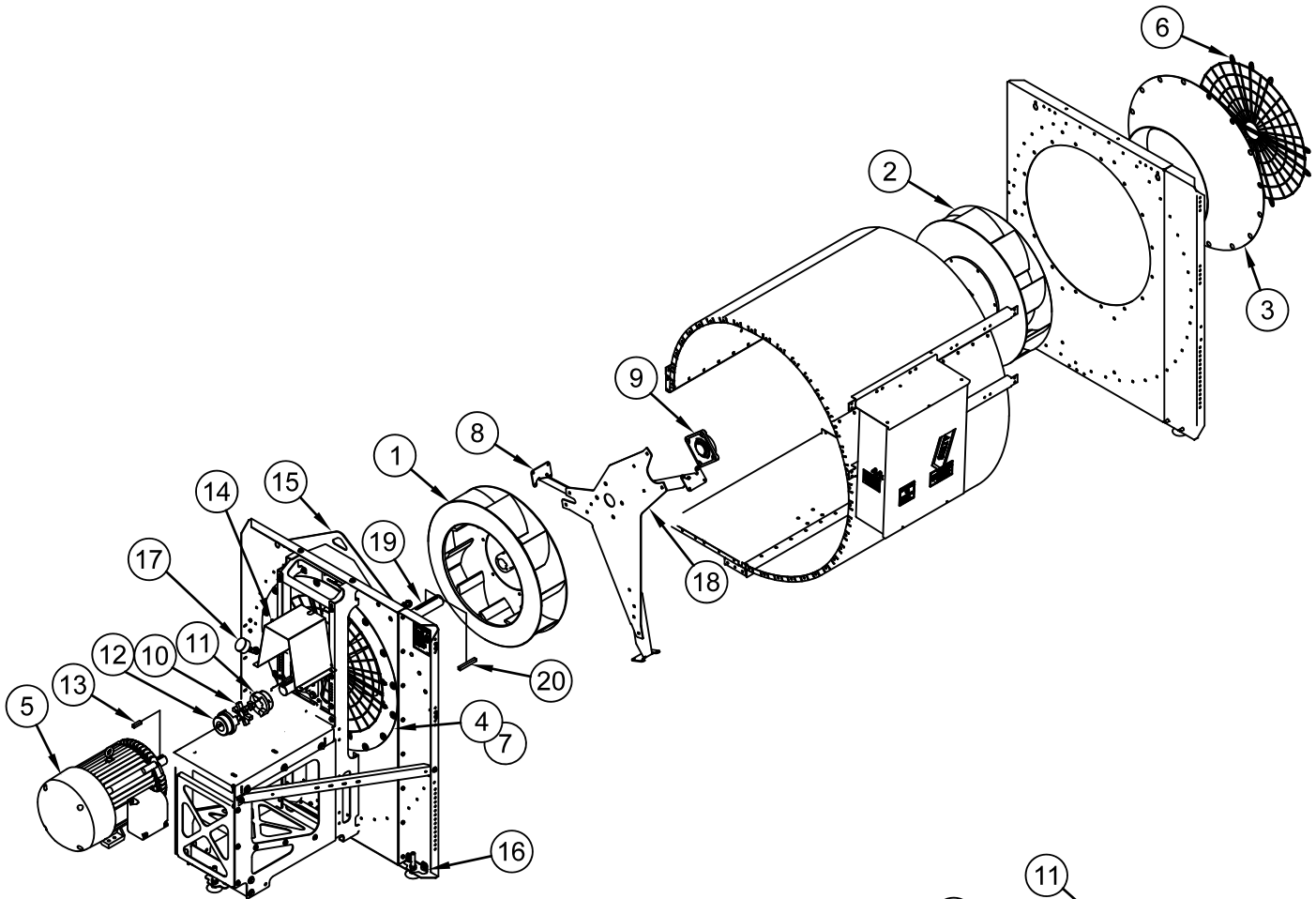
**P-8879**

Located on top center above Grill Guard, (motor side)

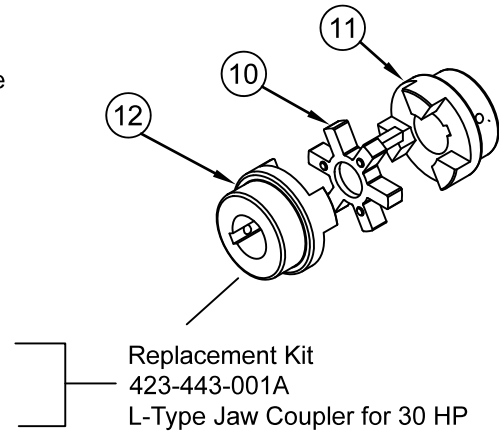


# IDENTIFICATION OF PARTS

## Shivvers DWDI 30 Hp Centrifugal Fan



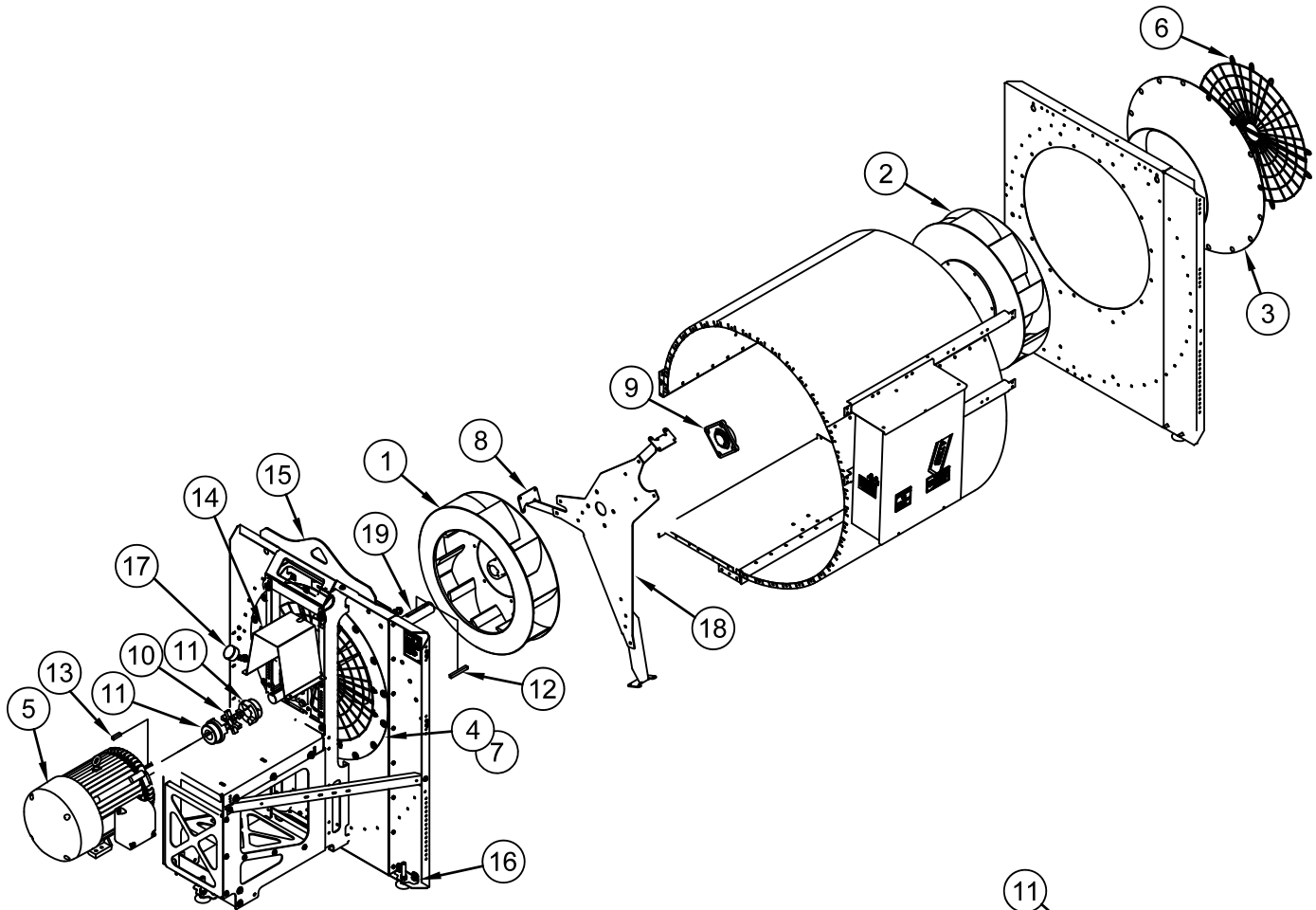
- |     |          |  |
|-----|----------|--|
| 1.  | A-5236   | Impeller, CCW, 30", Weldment, Motor Side                                       |
| 2.  | A-5237   | Impeller, CW, 30", Weldment  |
| 3.  | A-5228   | Inlet, 30" CW w/ Diverter  |
| 4.  | A-5238   | Inlet, 30" CCW w/ Diverter, Motor Side   |
| 5.  | M-5374   | Motor, 30 Hp, 3 Phase  |
| 6.  | A-5235   | C-Fan Grill Guard  |
| 7.  | 689-043P | Grill Guard Half (2) Motor Side  |
| 8.  | 689-081P | Center Bearing Support Arm (3)   |
| 9.  | D-3830   | Bearing, 4 Bolt Flange, 2.125" I.D. (2)  |
| 10. | D-3988   | Spider, L-Type Jaw Coupling  |
| 11. | D-3986   | Coupler, L-Type Jaw Coupling, 2-1/8" I.D.                                      |
| 12. | D-3987   | Coupler, L-Type Jaw Coupling, 1-7/8" I.D.                                      |
| 13. | 689-025P | Motor Key, 1/2" Sq X 2" (comes with motor)                                     |
| 14. | 689-131P | Coupler Guard  |
| 15. | 689-091P | Lift Bracket, 30 Hp C-Fan Dual Inlet   |
| 16. | 689-085A | Leveling Foot (5)  |
| 17. | 689-116A | Pressure Gauge Assembly, 0-15" Back Mount, 0-7" Green Zone                     |
| 18. | 689-080P | Center Bearing Support (Re-designed to fit in both 30" and 33" wheel housings) |
| 19. | 689-039P | Shaft, Impeller, 2-1/8" OD X 44-1/2" (was 42-11/32")                           |
| 20. | 689-079P | Impeller Key, 1/2" Sq X 4-3/8" (2)   |



Replacement Kit  
423-443-001A  
L-Type Jaw Coupler for 30 HP

# IDENTIFICATION OF PARTS

## Shivvers DWDI 40 Hp Centrifugal Fan

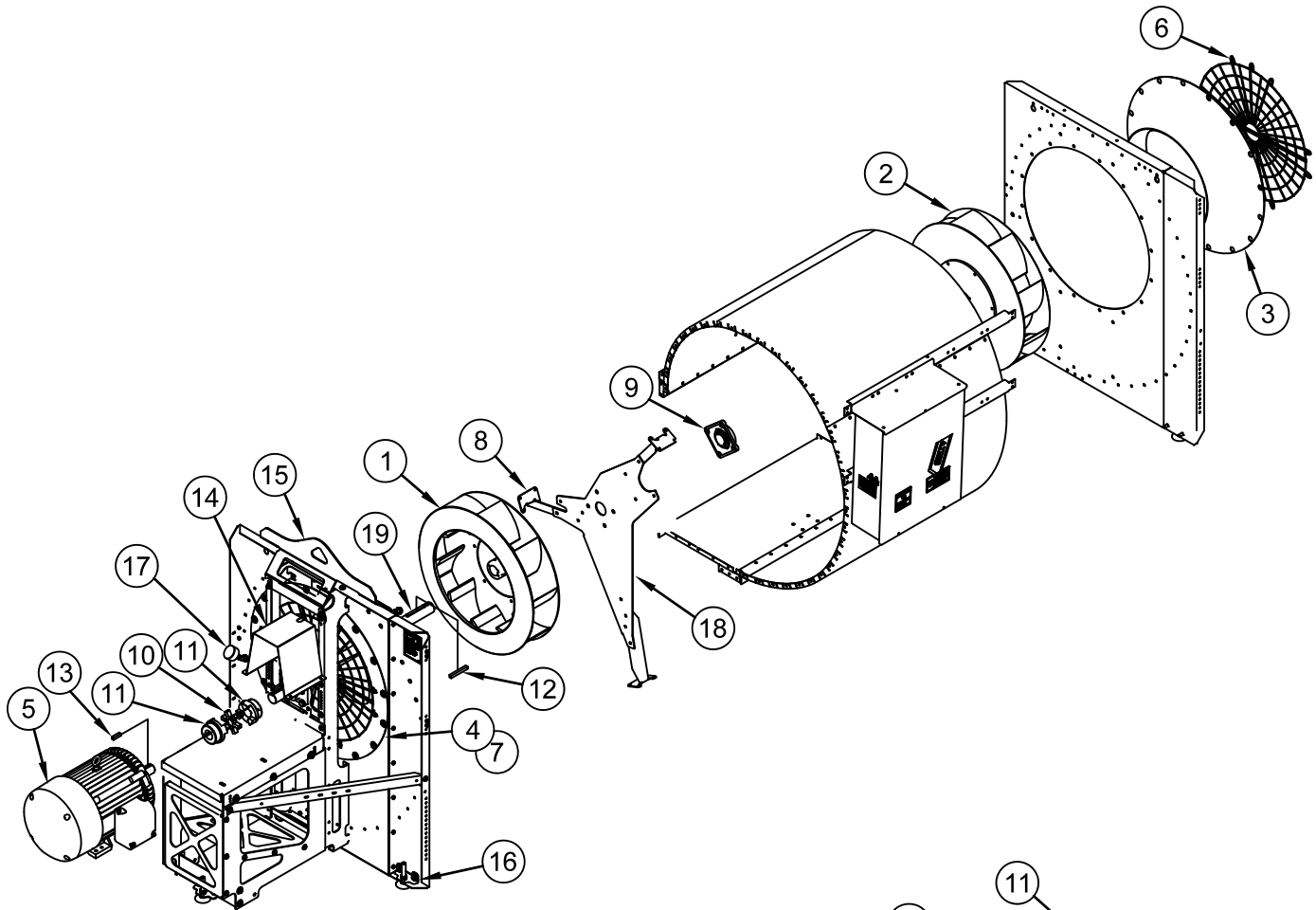


- |     |          |  |
|-----|----------|--|
| 1.  | A-5241   | Impeller, CCW, 33", Weldment, Motor Side                                       |
| 2.  | A-5242   | Impeller, CW, 33", Weldment  |
| 3.  | A-5231   | Inlet, 33" CW w/ Diverter  |
| 4.  | A-5246   | Inlet, 33" CCW w/ Diverter, Motor Side   |
| 5.  | M-5382   | Motor, 40 Hp, 3 Phase  |
| 6.  | A-5235   | C-Fan Grill Guard  |
| 7.  | 689-043P | Grill Guard Half, 40 Hp, Motor Side (2)  |
| 8.  | 689-081P | Center Bearing Support Arm (3)   |
| 9.  | D-3830   | Bearing, 4 Bolt Flange, 2.125" I.D. (2)  |
| 10. | D-3988   | Spider, L-Type Jaw Coupling  |
| 11. | D-3986   | Coupler, L-Type Jaw Coupling (2)   |
| 12. | 689-079P | Impeller Key, 1/2" Sq X 4-3/8" (2)   |
| 13. | 689-099P | Motor Key, 1/2" X 3-1/4"   |
| 14. | 689-131P | Coupler Guard  |
| 15. | 689-117P | Lift Bracket, 40 & 50 Hp C-Fan Dual Inlet                                      |
| 16. | 689-085A | Leveling Foot (5)  |
| 17. | 689-113A | Pressure Gauge Assembly, 0-15" Back Mount, 0-9" Green Zone                     |
| 18. | 689-080P | Center Bearing Support (Re-designed to fit in both 30" and 33" wheel housings) |
| 19. | 689-039P | Shaft, Impeller 2-1/8" OD X 44-1/2"  |

Replacement Kit  
423-444-001A  
L-Type Jaw Coupler for 40 HP

# IDENTIFICATION OF PARTS

## Shivvers DWDI 50 Hp Centrifugal Fan

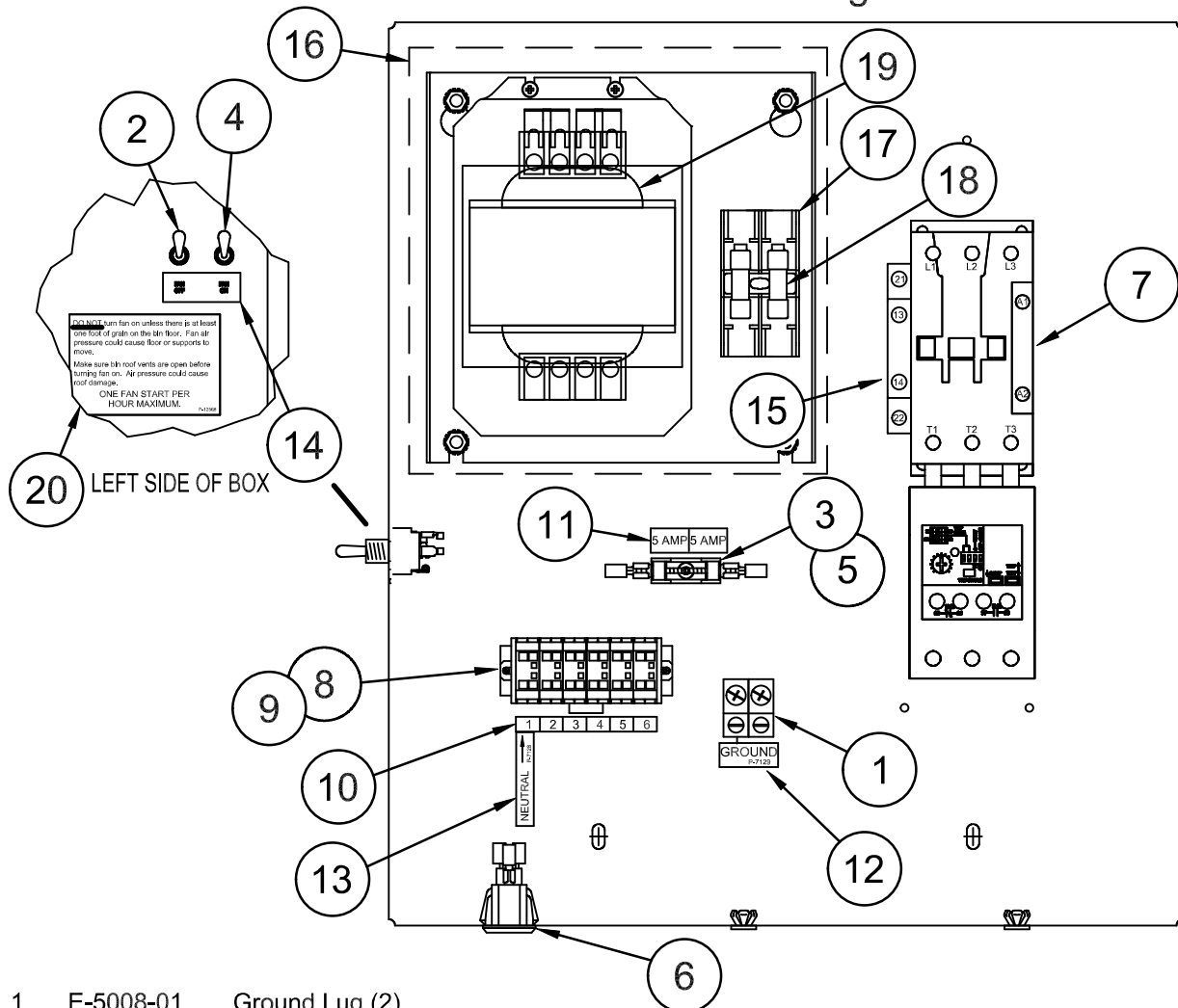


- |     |          |  |
|-----|----------|--|
| 1.  | A-5244   | Impeller, CCW, 33", Weldment, Motor Side                                       |
| 2.  | A-5245   | Impeller, CW, 33", Weldment  |
| 3.  | A-5231   | Inlet, 33" CW w/ Diverter  |
| 4.  | A-5246   | Inlet, 33" CCW w/ Diverter, Motor Side   |
| 5.  | M-5383   | Motor, 50 Hp, 3 Phase  |
| 6.  | A-5235   | C-Fan Grill Guard  |
| 7.  | 689-043P | Grill Guard Half, 40 Hp, Motor Side (2)  |
| 8.  | 689-081P | Center Bearing Support Arm (3)   |
| 9.  | D-3830   | Bearing, 4 Bolt Flange, 2.125" I.D. (2)  |
| 10. | D-3985   | Spider, L-Type Jaw Coupling  |
| 11. | D-3984   | Coupler, L-Type Jaw Coupling (2)   |
| 12. | 689-079P | Impeller Key, 1/2" Sq X 4-3/8" (2)   |
| 13. | 689-099P | Motor Key, 1/2" X 3-1/4"   |
| 14. | 689-131P | Coupler Guard  |
| 15. | 689-117P | Lift Bracket, 40 & 50 Hp C-Fan Dual Inlet                                      |
| 16. | 689-085A | Leveling Foot (5)  |
| 17. | 689-113A | Pressure Gauge Assembly, 0-15" Back Mount, 0-9" Green Zone                     |
| 18. | 689-080P | Center Bearing Support (Re-designed to fit in both 30" and 33" wheel housings) |
| 19. | 689-039P | Shaft, Impeller 2-1/8" OD X 44-1/2"  |

Replacement Kit  
423-445-001A  
L-Type Jaw Coupler for 50 HP

# IDENTIFICATION OF PARTS

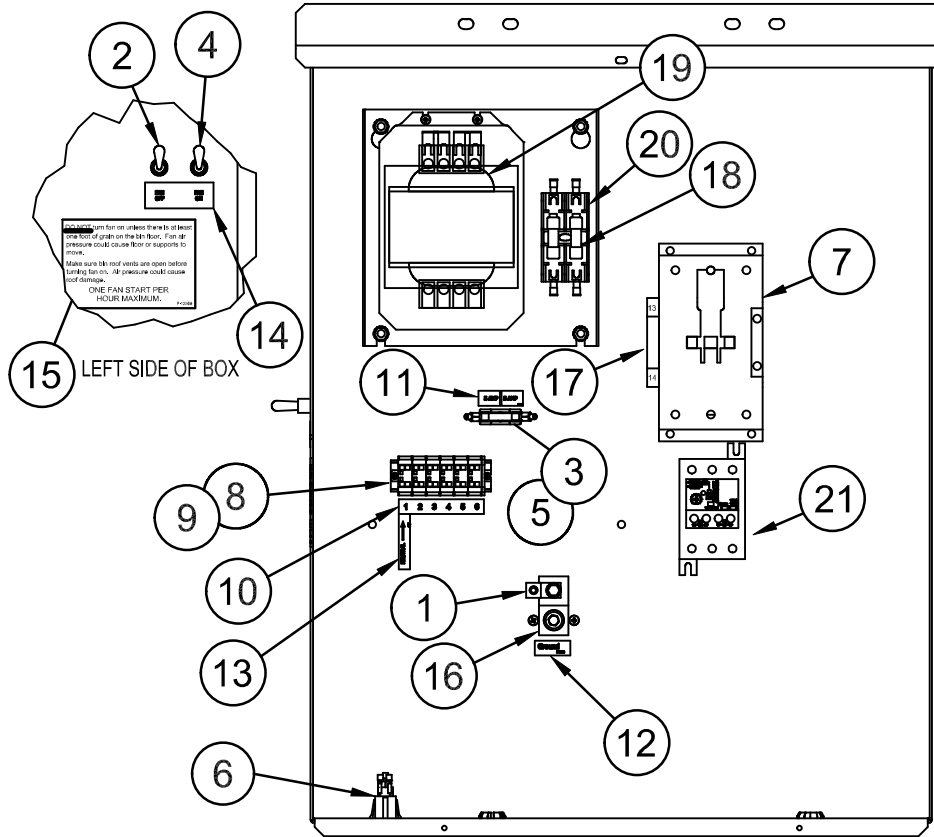
118-140A Control Box, 3 Phase, C-Fan, 460 V  
"Across the Line" Starting



- |     |           |  |
|-----|-----------|--|
| 1.  | E-5008-01 | Ground Lug (2)                               |
| 2.  | E-5100    | Switch, MOM, OFF                             |
| 3.  | E-5267    | Fuse, 5 Amp Slo-Blo                          |
| 4.  | E-5287    | Switch, DPST, MOM, ON                        |
| 5.  | E-5616    | Fuseholder                                   |
| 6.  | E-6264    | Appliance Inlet                              |
| 7.  | E-6482    | Starter, 65A, 120 VAC Coil, 20-100 O.L Range |
| 8.  | E-6367    | Terminal End Plate                           |
| 9.  | E-6368    | Terminal, Block Section, 4 Conductor (6)     |
| 10. | P-11601   | Decal, 1-12 Terminal Strip                   |
| 11. | P-7266    | Decal, "5 AMP / 5AMP"                        |
| 12. | P-7129    | Decal, "Ground"                              |
| 13. | P-7128    | Decal, "Neutral" Horizontal                  |
| 14. | P-8381    | Decal, Burner Fan OFF - Fan ON               |
| 15. | E-6484    | Auxiliary Contact                            |
| 16. | 118T-001A | Transformer Kit, C-Fan, 460/230V             |
| 17. | E-6294    | Fuse Block                                   |
| 18. | E-6295    | 1-1/2 Amp Fuse (2)                           |
| 19. | E-5222    | Transformer, 230-460V, 0.5 KVA               |
| 20. | P-12568   | Decal, One Start Per Hour                    |

# IDENTIFICATION OF PARTS

689-059A Control Box, 3 Phase, C-Fan, 208/230 V, 30 HP  
 689-114A Control Box, 3 Phase, C-Fan, 208/230 V, 40 & 50 HP  
 "Across the Line" Starting



## 30 HP

- |     |           |                                       |
|-----|-----------|---------------------------------------|
| 1.  | E-5008-01 | Ground Lug TA-2, #2-12 Wires          |
| 2.  | E-5100    | Switch, MOM, OFF                      |
| 3.  | E-5267    | Fuse, 5 Amp Slo-Blo                   |
| 4.  | E-5287    | Switch, DPST, MOM, ON                 |
| 5.  | E-5616    | Fuseholder                            |
| 6.  | E-6264    | Appliance Inlet                       |
| 7.  | E-6523    | Contactor, 115A, 120 VAC Coil, 3 Pole |
| 8.  | E-6367    | Terminal End Plate                    |
| 9.  | E-6368    | Terminal, Block Section, 4 Cond. (6)  |
| 10. | P-11601   | Decal, 1-12 Terminal Strip            |
| 11. | P-7266    | Decal, "5 AMP / 5AMP"                 |
| 12. | P-7129    | Decal, "Ground"                       |
| 13. | P-7128    | Decal, "Neutral" Horizontal           |
| 14. | P-8381    | Decal, Burner Fan OFF - Fan ON        |
| 15. | P-12568   | Decal, One Start Per Hour             |
| 16. | E-5008-02 | Ground Lug TA-250                     |
| 17. | E-6484    | Auxiliary Contact                     |
| 18. | E-6295    | 1-1/2 Amp Fuse (2)                    |
| 19. | E-5222    | Transformer, 230-460 V                |
| 20. | E-6294    | Fuse Block                            |
| 21. | E-6524    | O.L. Relay Switch, 3 Pole, 20-100 Amp |

## 40 & 50 HP

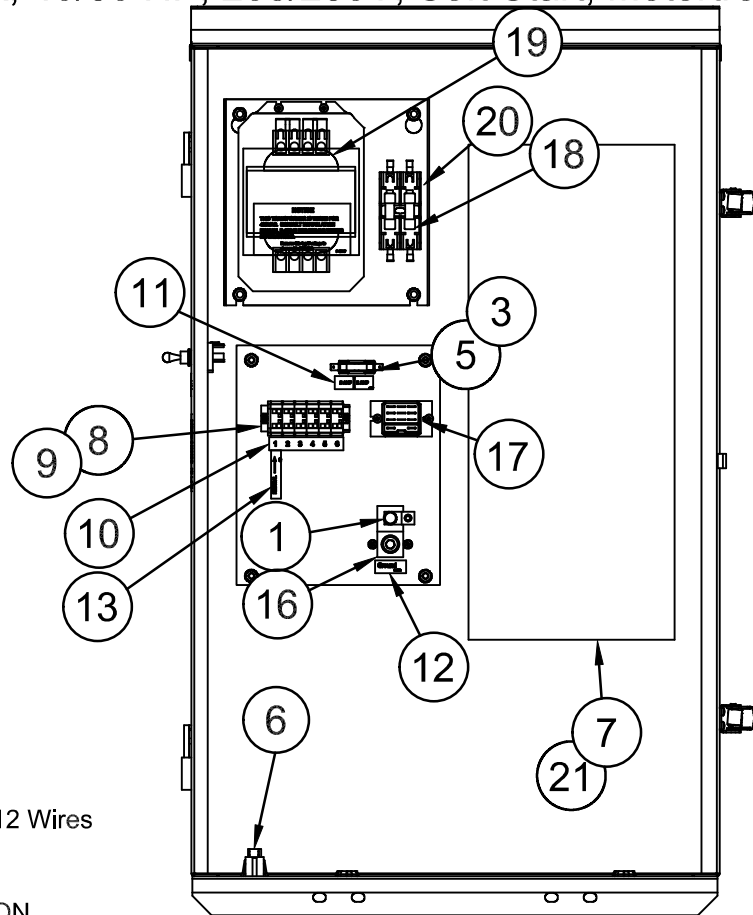
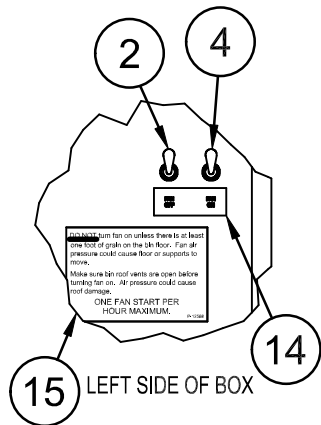
- |     |           |                                       |
|-----|-----------|---------------------------------------|
| 1.  | E-5008-01 | Ground Lug TA-2, #2-12 Wires          |
| 2.  | E-5100    | Switch, MOM, OFF                      |
| 3.  | E-5267    | Fuse, 5 Amp Slo-Blo                   |
| 4.  | E-5287    | Switch, DPST, MOM, ON                 |
| 5.  | E-5616    | Fuseholder                            |
| 6.  | E-6264    | Appliance Inlet                       |
| 7.  | E-6538    | Contactor, 150A, 120 VAC Coil, 3 Pole |
| 8.  | E-6367    | Terminal End Plate                    |
| 9.  | E-6368    | Terminal, Block Section, 4 Cond. (6)  |
| 10. | P-11601   | Decal, 1-12 Terminal Strip            |
| 11. | P-7266    | Decal, "5 AMP / 5AMP"                 |
| 12. | P-7129    | Decal, "Ground"                       |
| 13. | P-7128    | Decal, "Neutral" Horizontal           |
| 14. | P-8381    | Decal, Burner Fan OFF - Fan ON        |
| 15. | P-12568   | Decal, One Start Per Hour             |
| 16. | E-5008-02 | Ground Lug TA-250                     |
| 17. | E-6484    | Auxiliary Contact                     |
| 18. | E-6295    | 1-1/2 Amp Fuse (2)                    |
| 19. | E-5222    | Transformer, 230-460 V                |
| 20. | E-6294    | Fuse Block                            |
| 21. | E-6539    | O.L. Relay Switch, 3 Pole, 35-175 Amp |

**Note: 30 HP Control Box was used on  
 40 HP Fans until January 2013.**



# IDENTIFICATION OF PARTS

- 689-121A Control Box, 30HP, 460V, Soft Start, Motortronics
- 689-122A Control Box, 30HP, 208/230V, Soft Start, Motortronics
- 689-123A Control Box, 40/50 HP, 460V, Soft Start, Motortronics
- 689-124A Control Box, 40/50 HP, 208/230V, Soft Start, Motortronics



- 1. E-5008-01 Ground Lug TA-2, #2-12 Wires
- 2. E-5100 Switch, MOM, OFF
- 3. E-5267 Fuse, 5 Amp Slo-Blo
- 4. E-5287 Switch, DPST, MOM, ON
- 5. E-5616 Fuseholder
- 6. E-6264 Appliance Inlet
- 7. E-6596 Soft Start Motortronics VMX-62-BP, 30HP, 460V - Used in 689-121A Only
- E-6598 Soft Start Motortronics VMX-92-BP, 30HP, 230V - Used in 689-122A Only
- E-6597 Soft Start Motortronics VMX-78-BP, 40/50HP, 460V - Used in 689-123A Only
- 8. E-6599 Soft Start Motortronics VMX-160-BP, 40/50HP, 230V - Used in 689-124A Only
- 9. E-6367 Terminal End Plate
- 10. E-6368 Terminal, Block Section, 4 Cond. (6)
- 11. P-11601 Decal, 1-12 Terminal Strip
- 12. P-7266 Decal, "5 AMP / 5AMP"
- 13. P-7129 Decal, "Ground"
- 14. P-7128 Decal, "Neutral" Horizontal
- 15. P-8381 Decal, Burner Fan OFF - Fan ON
- 16. P-12568 Decal, One Start Per Hour
- 17. E-5008-02 Ground Lug TA-250
- 18. E-6143 Relay, DPDT, 20AMP, 120VAC Coil
- 19. E-6295 1-1/2 Amp Fuse (2)
- 20. E-5222 Transformer, 230-460 V
- 21. E-6294 Fuse Block
- E-6601 Lug, 125A, #8-1/0 - Used in 689-122A and 689-123A Soft Start
- E-6603 Lug, #6250 KCMIL - Used in 689-124A Soft Start

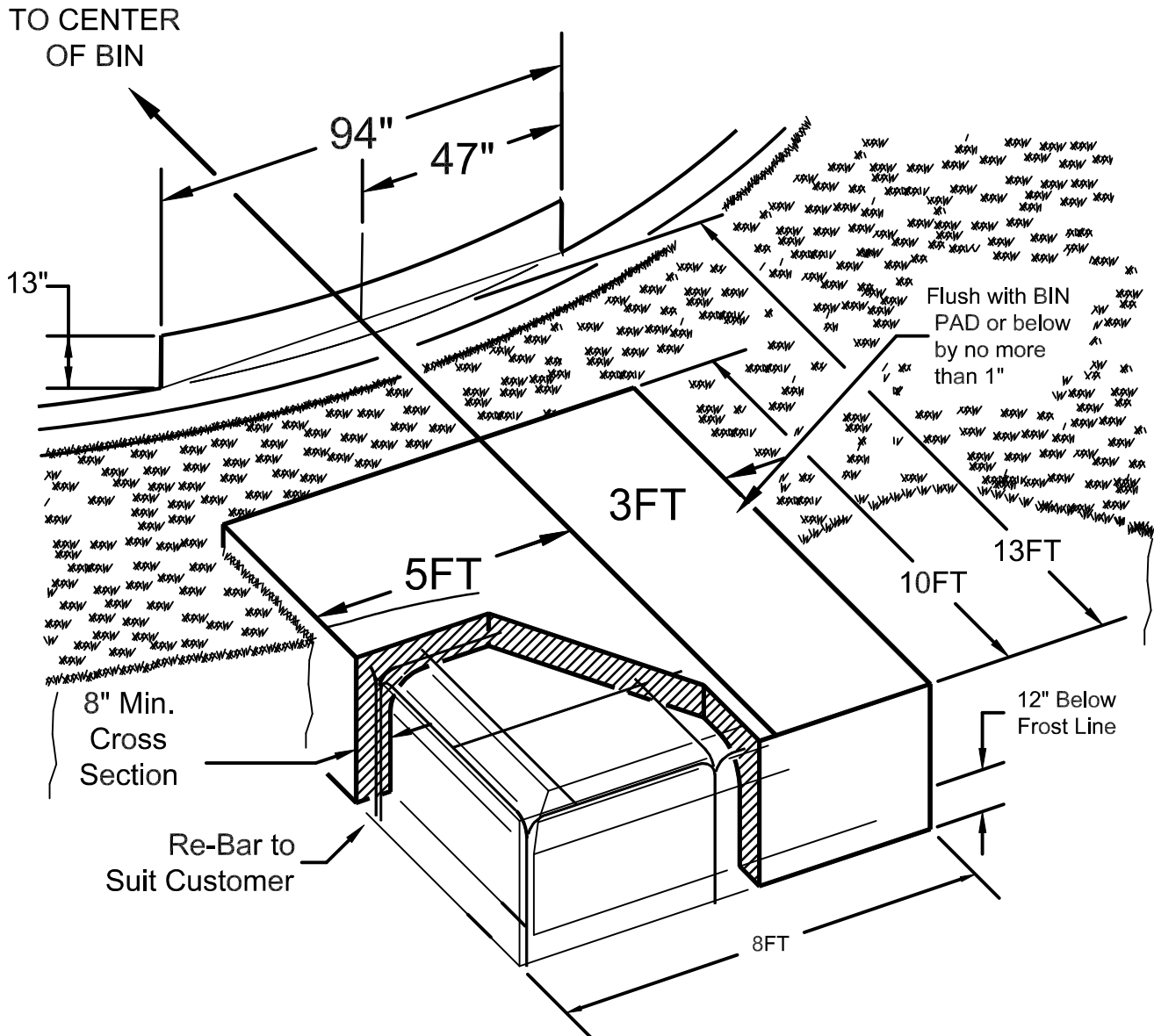
# MECHANICAL INSTALLATION

## DRYING BIN LAYOUT

- A) The horizontal unloader must come out of the bin near the main entrance door.
- B) The Compudry Command Center, (or installed controller), must be within line of sight of the bin's main entrance door. The plenum temperature sensing device of the Compudry Command Center (or installed controller) must be at least 12 feet from the nearest burner.
- C) There must be a main electrical disconnect switch. This switch must shut off all electrical power to the drying system. It must have the capability of being locked in the OFF position. It must be located near the bin's main entrance and within line of sight of the Compudry Command Center, (or installed controller).
- D) The Centrifugal Fan(s) should be located as shown in the following drawings whenever possible. They must be installed as shown for certified performance systems.
- E) It is recommended to use only Shivvers entrance collars, transitions, and burners. Follow instructions provided with transitions for their installation. For drying bins with more than one burner, air dampers are required to prevent reverse airflow.
- F) Keep the floor space in front of the entrance collar as free of obstructions as possible. Concrete blocks are not recommended for floor supports. They block too much airflow. Floor supports should be at least 15" tall. Shorter supports do not allow even heat under the floor.
- G) Concrete pads for Shivvers Centrifugal Fans, transitions, and burners should be 13 feet long by 8 feet wide. This size pad should accommodate fans up to 50 Hp. Note that the pad is not centered on the entrance collar. It is offset to the fan motor side. The pad may be made smaller if you carefully measure your transition, burner and fan, and offset the pad to the motor side of the fan. Pads should be flush and level with the top of the bin concrete. Place footers under the pads and use re-rod to keep the pads from cracking and moving.

# MECHANICAL INSTALLATION

## SUGGESTED SHIVVERS DUAL INLET C-FAN / HEATER FOUNDATION LAYOUT

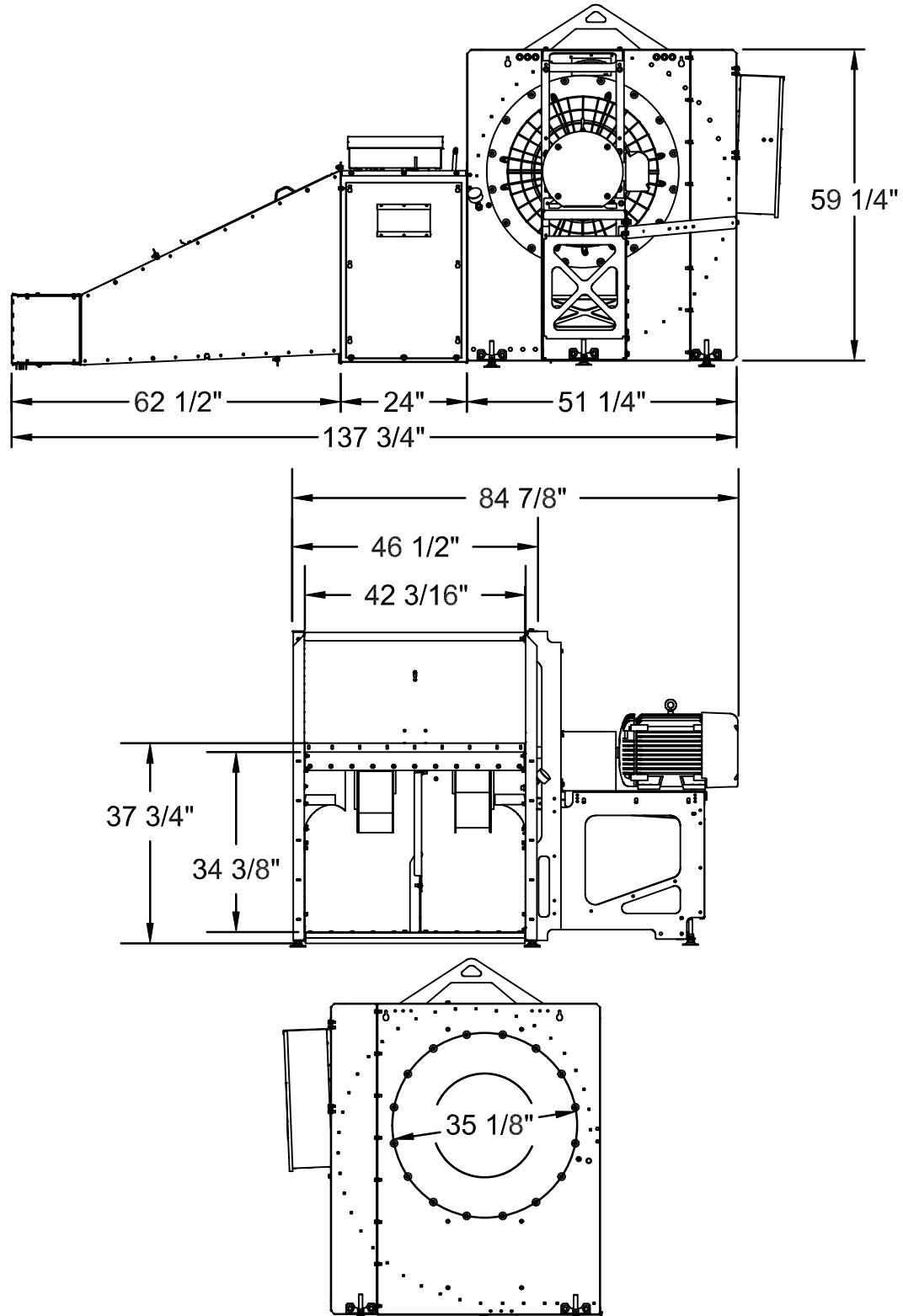


Note: The above drawing is what we suggest as a Foundation for your new Shivvers Dual Inlet Centrifugal Fan and Heater combination. We also suggest the foundation(s) of the Fan/Heater(s) extend below the Frost Line.

We leave details about the configuration of the foundations up to the discretion of the Customer and/or his Dealer. Every effort needs to be made to minimize Shifting, Eroding, and Cracks.

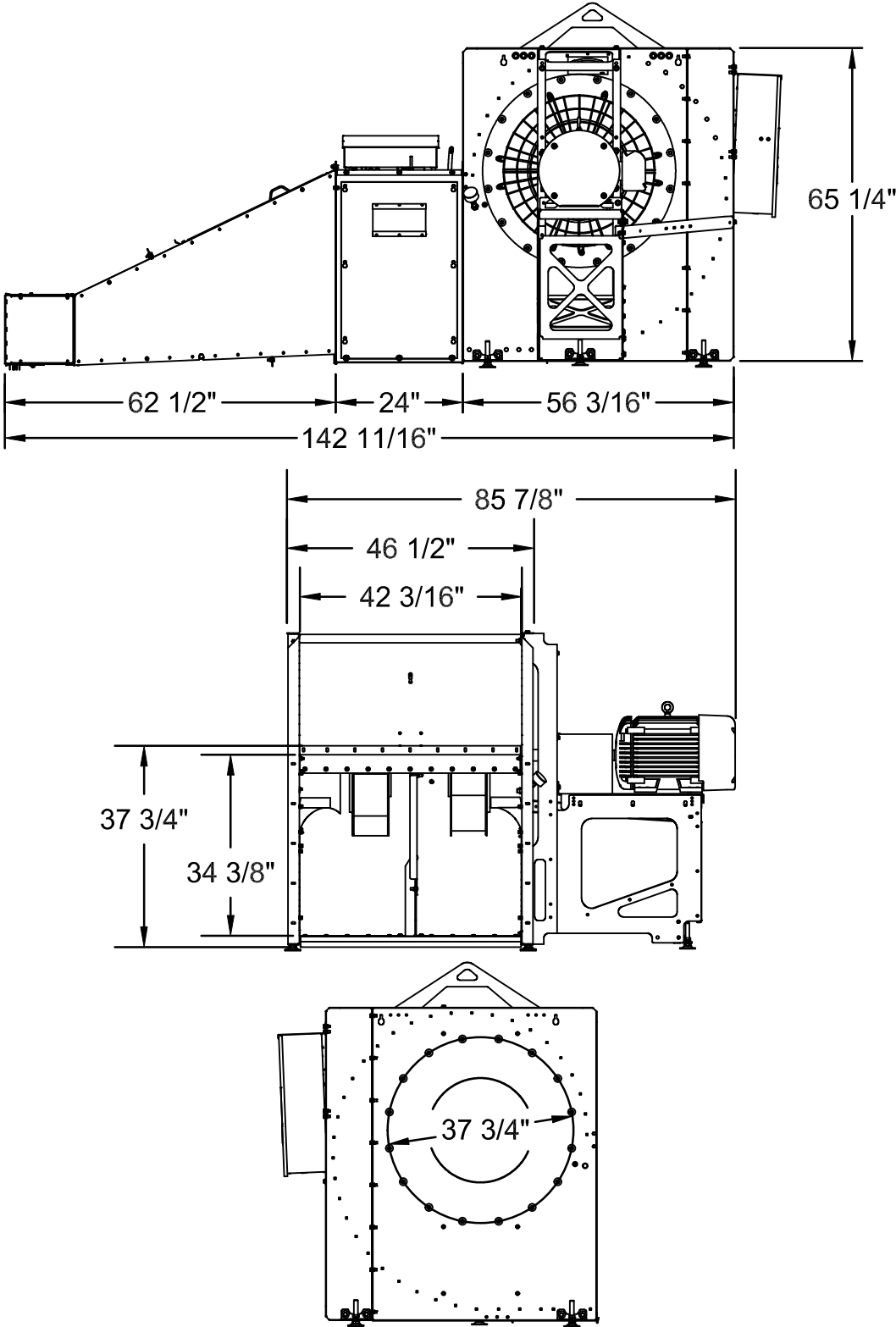
# MECHANICAL INSTALLATION

## 1750 RPM Centrifugal Fan Dimensions - 30 Hp



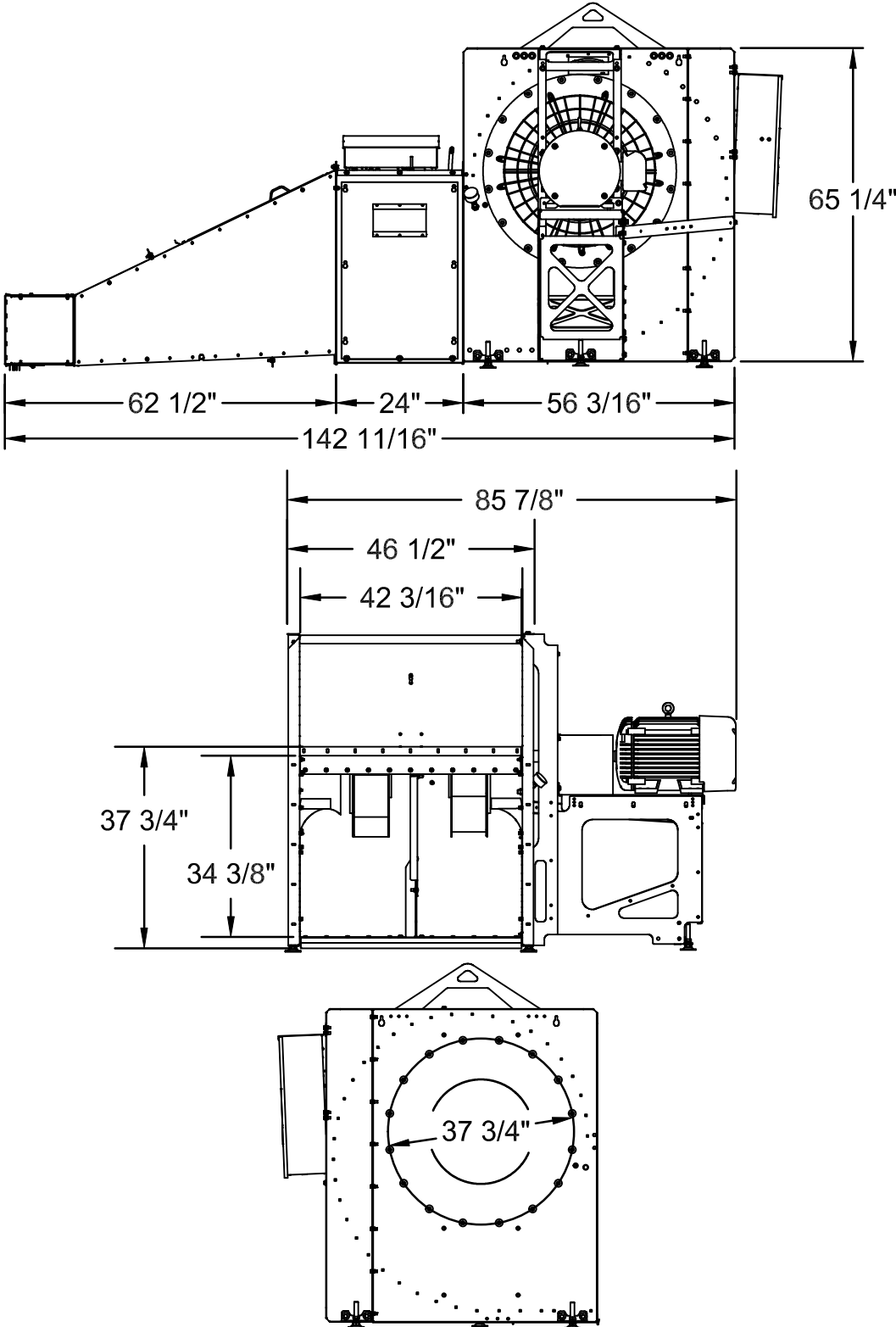
# MECHANICAL INSTALLATION

1750 RPM Centrifugal Fan Dimensions - 40 Hp

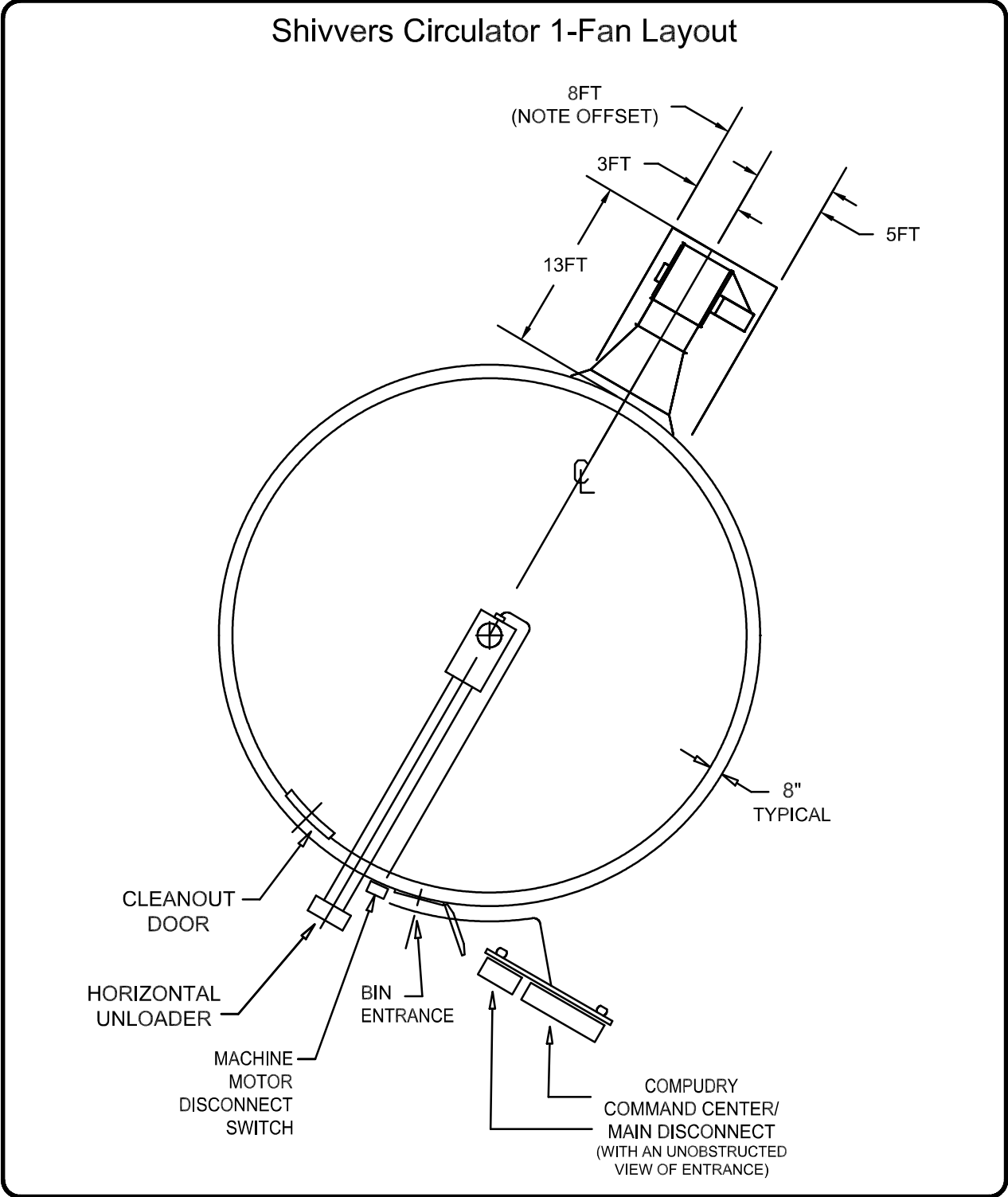


# MECHANICAL INSTALLATION

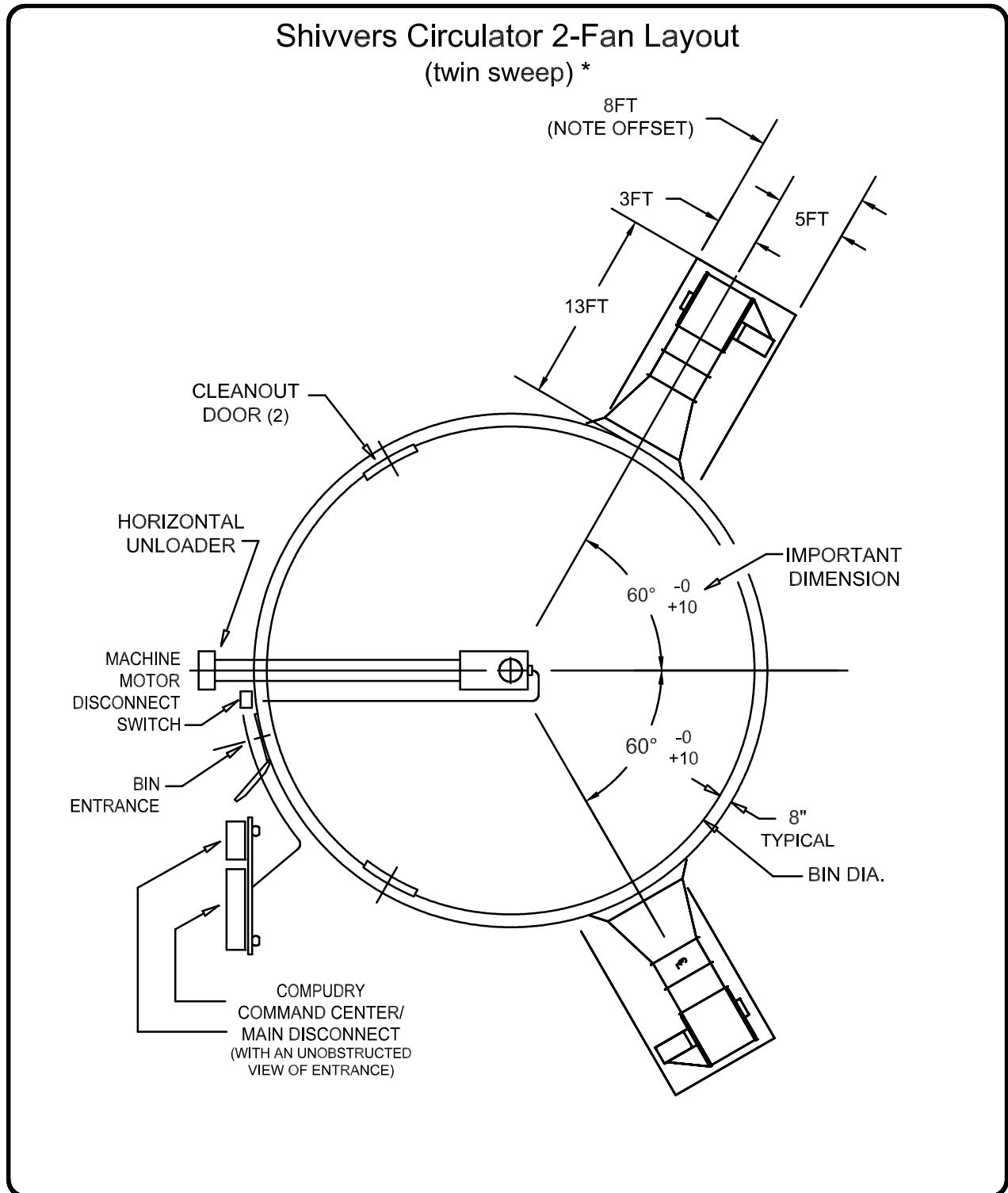
1750 RPM Centrifugal Fan Dimensions - 50 Hp



# MECHANICAL INSTALLATION



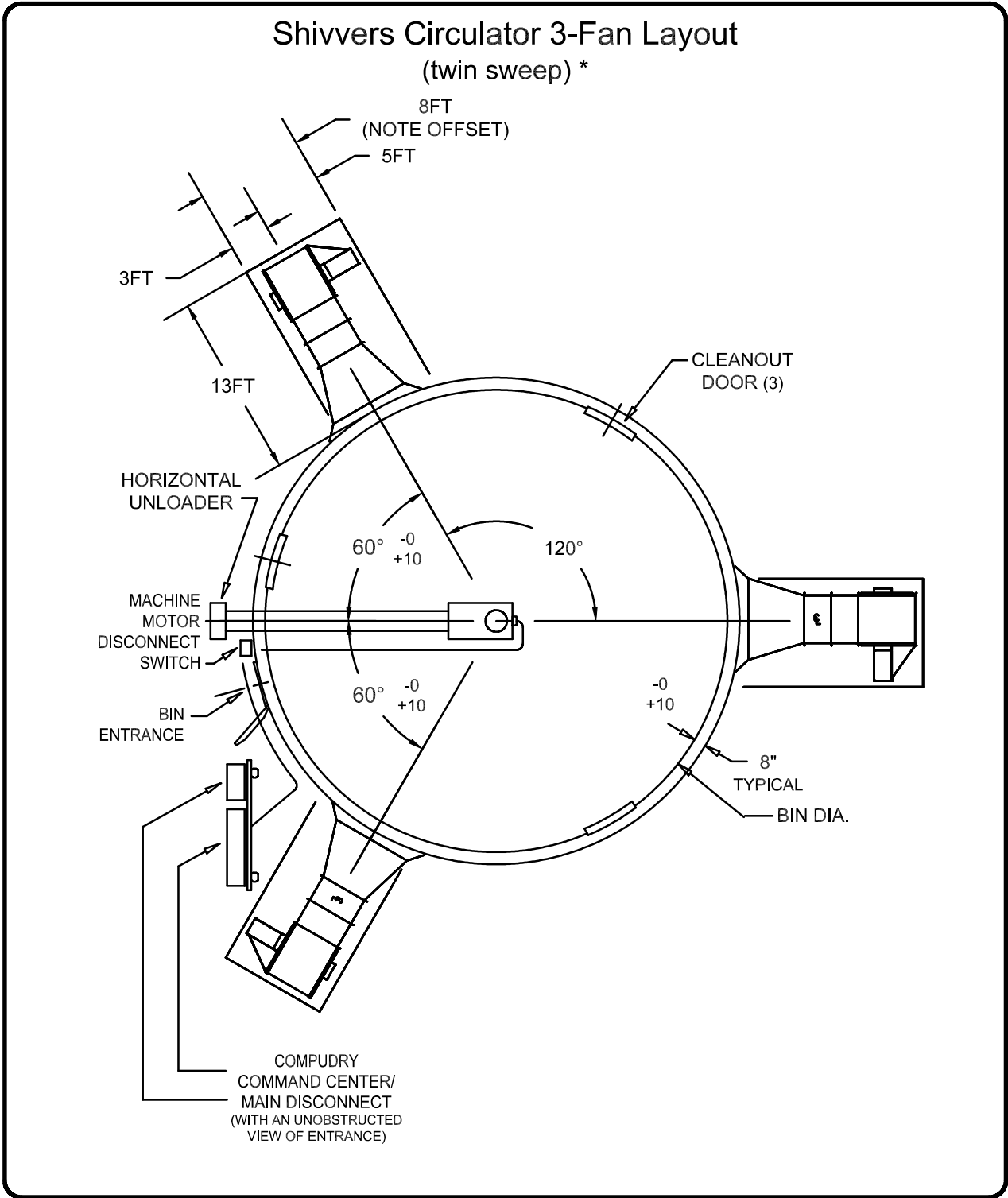
# MECHANICAL INSTALLATION



\* 3 sweep Circulator layout may be different. Consult Factory.



# MECHANICAL INSTALLATION

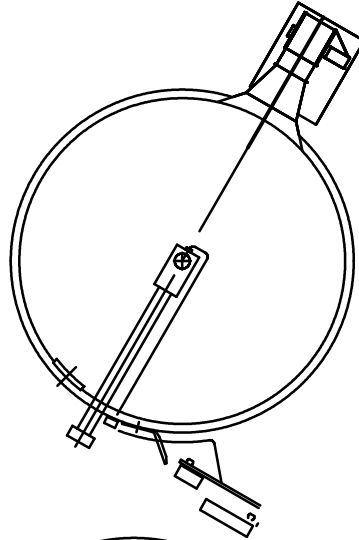


\* 3 sweep Circulator layout may be different. Consult Factory.

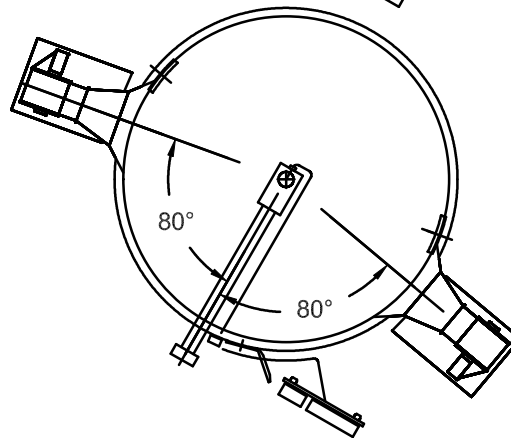
# MECHANICAL INSTALLATION

Recommended Fan Lay-outs for 3-Sweeps Systems  
(For New Installations)

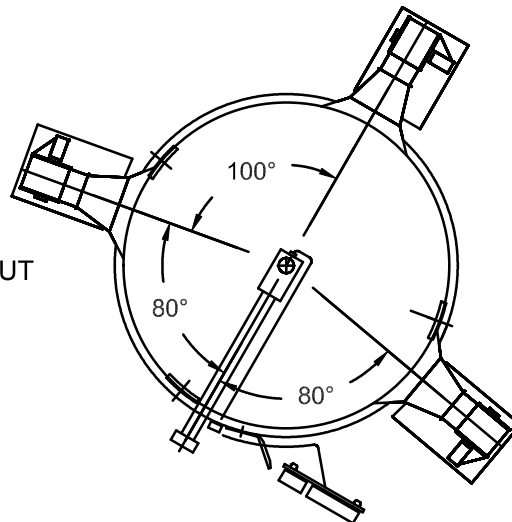
1-FAN LAYOUT



2-FAN LAYOUT



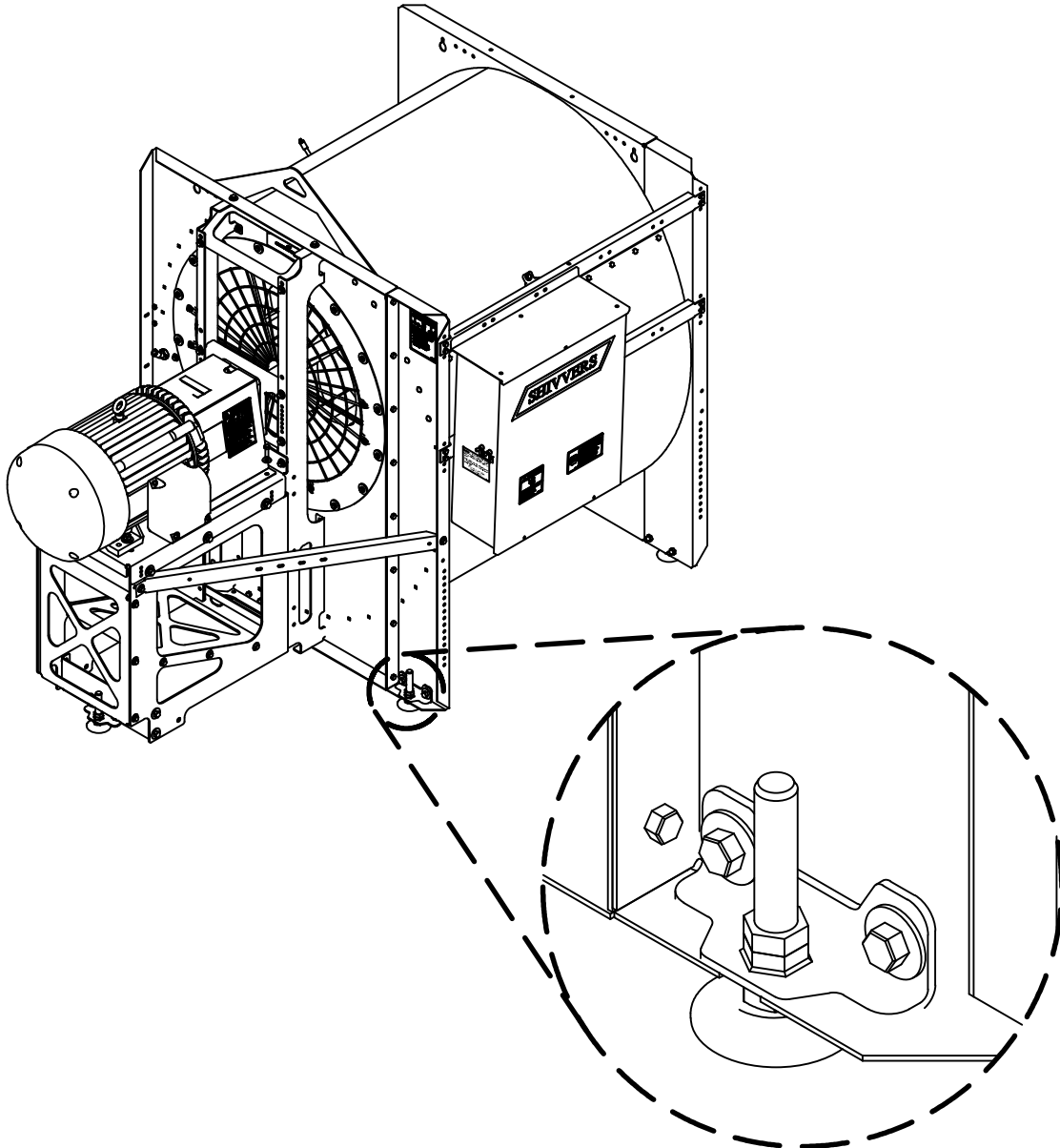
3-FAN LAYOUT



# MECHANICAL INSTALLATION

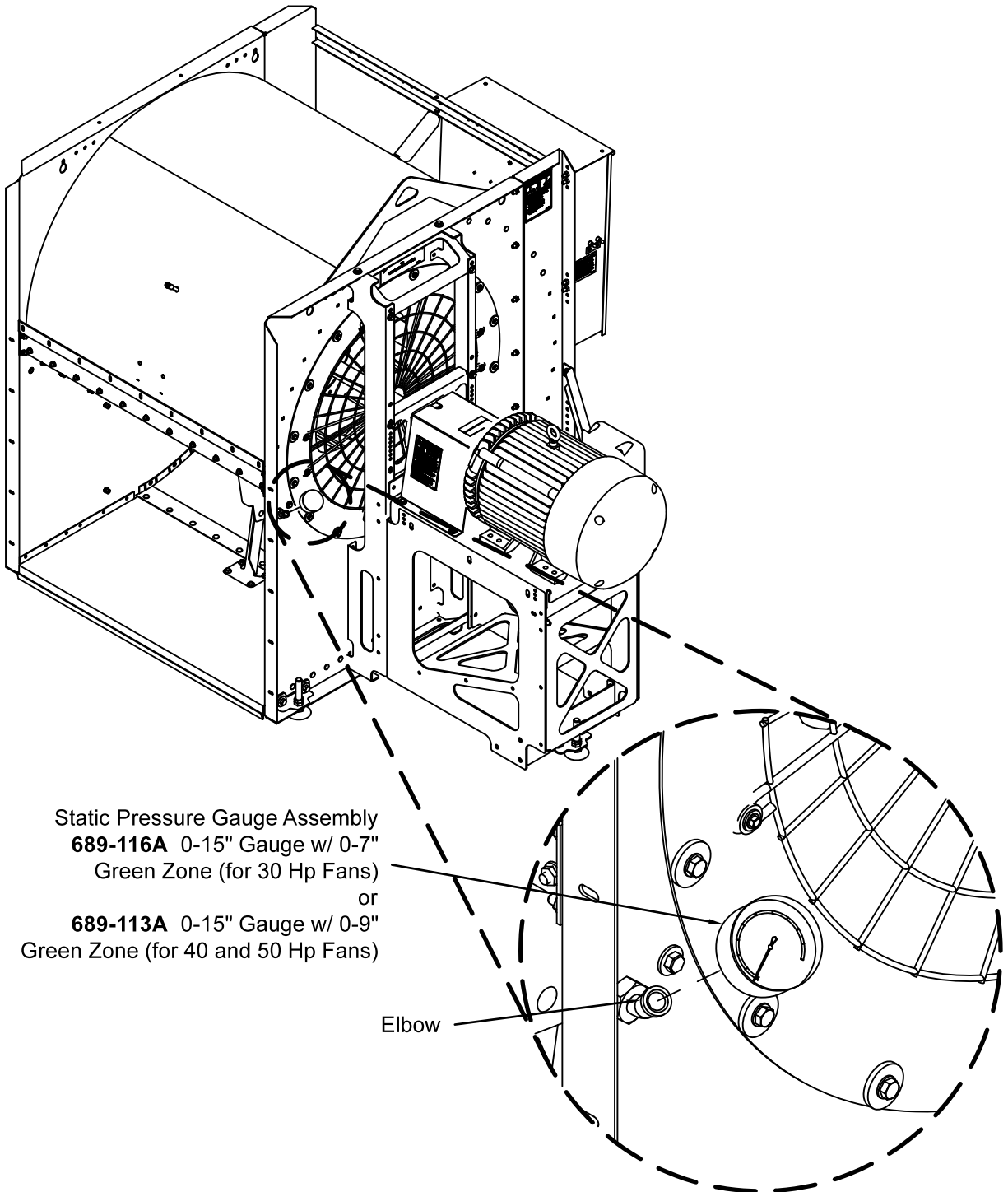
## C-FAN

- 1) Install entrance collar, transition, and burner according to instructions supplied with each of them.
- 2) Put fan up to burner. Adjust leveling legs for a good fit to burner.
- 3) Bolt fan to burner using hardware from 691-042A Hardware Sack, located with the Transition Assembly and Hardware. Caulk any air gaps.
- 4) Lock (5) leveling legs in place.



# MECHANICAL INSTALLATION

- 5) Locate the static pressure gauge in the C-Fan control box. If your fan was delivered without controls, the pressure gauge will be wired on the motor side of the fan, in a burlap bag. Install the static pressure gauge to the elbow on the left of the motor side, as shown below.



# ELECTRICAL INSTALLATION

ALL ELECTRICAL WIRING SHALL BE INSTALLED IN COMPLIANCE WITH THE LATEST EDITION OF THE ANSI/NFPA STANDARD 70, NATIONAL ELECTRICAL CODE, AS A MINIMUM REQUIREMENT, AND IN COMPLIANCE WITH LOCAL WIRING CODES AS APPLICABLE.

WIRING MUST BE DONE BY A COMPETENT ELECTRICIAN. A LICENSED ELECTRICIAN IS RECOMMENDED, AND MUST BE USED WHEN REQUIRED BY LOCAL OR STATE STATUTES.



**Disconnect and lock out all power before wiring.**

## INCOMING POWER HOOKUP

- 1) The 30, 40, and 50 Hp Centrifugal fans are built for 208-230, or 460 volt three phase input. They use 115 Volt control voltage. A 0.5 kVA control voltage transformer is installed for the control voltage.
- 2) A circuit breaker must be installed in line with the incoming power to the C-Fan control box. The circuit breaker should break all lines if an overload occurs on any single line. An inverse time delay circuit breaker is recommended to handle the motor inrush current while starting the fan. The breaker can be up to 2.5 times the motor nameplate full load amps. Aluminum wire is not recommended, but if used, the wire size must be increased. If the distance from the power company transformer, or the C-Fan circuit breaker, is greater than 100 feet, it may be necessary to increase the wire sizes.
- 3) Route incoming wiring conduit into the bottom of the control box. If the conduit is attached to the bin wall, keep it at least 3 feet above the foundation to keep the ambient temperature lower. If the bin side wall will be covered with insulating foam, make sure the electrical conduit is not under the foam. When running the conduit from the bin wall to the C-Fan, make sure it does not interfere with air damper operation. Make sure it does not block access through the transition lid. Make sure it does not touch the entrance collar or transition as these can get hot.

# ELECTRICAL INSTALLATION

It is recommended to use a flexible conduit to the C-Fan. Leave enough flex in the conduit so the Fan can be moved to allow servicing or replacement of the burner.

## 30 Hp C-FAN INCOMING POWER WIRING

<u>VOLTAGE</u>	<u>PHASE</u>	<u>MAX FULL LOAD AMPS</u>	<u>MIN. BREAKER SIZE</u>	<u>MAX. BREAKER SIZE</u>	<u>MIN. COPPER WIRE SIZE</u>	<u>RECOMMENDED CONDUIT SIZE</u>
208V	3	88	175	225	2 AWG	1-1/2 INCH
230V	3	79	150	200	3 AWG	1-1/2 INCH
460V	3	40	70	100	8 AWG	1 INCH

## 40 Hp C-FAN INCOMING POWER WIRING

<u>VOLTAGE</u>	<u>PHASE</u>	<u>MAX FULL LOAD AMPS</u>	<u>MIN. BREAKER SIZE</u>	<u>MAX. BREAKER SIZE</u>	<u>MIN. COPPER WIRE SIZE</u>	<u>RECOMMENDED CONDUIT SIZE</u>
208V	3	114	200	300	1/0 AWG	1-1/2 INCH
230V	3	104	200	250	1 AWG	1-1/2 INCH
460V	3	52	100	150	6 AWG	1 INCH

## 50 Hp C-FAN INCOMING POWER WIRING

<u>VOLTAGE</u>	<u>PHASE</u>	<u>MAX FULL LOAD AMPS</u>	<u>MIN. BREAKER SIZE</u>	<u>MAX. BREAKER SIZE</u>	<u>MIN. COPPER WIRE SIZE</u>	<u>RECOMMENDED CONDUIT SIZE</u>
208V	3	143	300	350	3/0 AWG	2 INCH
230V	3	130	250	350	2/0 AWG	2 INCH
460V	3	65	125	175	4 AWG	1-1/4 INCH

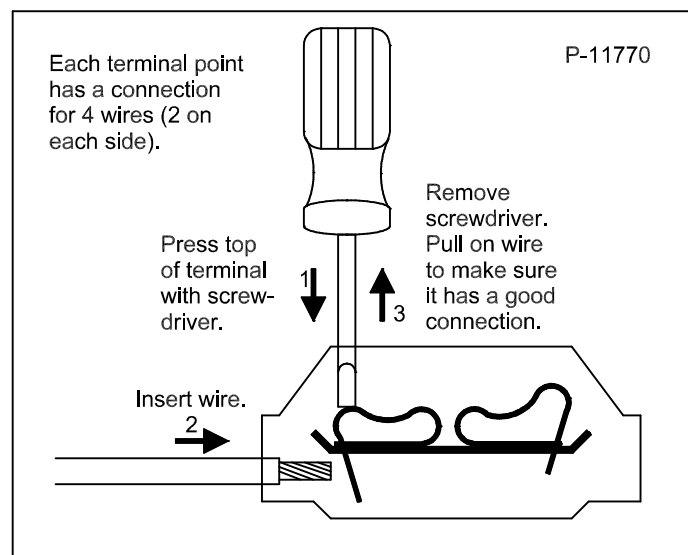
# ELECTRICAL INSTALLATION

- 4) It is necessary to have an incoming ground wire (marked green) with the incoming power leads. Consult the National Electrical Code, Table 250.122, for minimum size of the equipment grounding conductor. It should be connected to earth ground at the breaker panel and at the grounding terminal in the C-Fan control box.
- 5) For "Across the Line" Starting:  
The incoming power leads are connected to the top of the motor starter in the C-Fan control box. For Soft Starts, connect to L1, L2, L3.

If fan is purchased without controls, follow the installation instructions which came with the control panel.

For "Across the Line" Starting and Soft Starts until Mid-2022

The C-Fan 6 pole terminal strip is a spring cage clamp type. The following diagram shows how to properly connect the wires. Make sure the wire is lined up to go straight into the terminal before pressing on the spring.

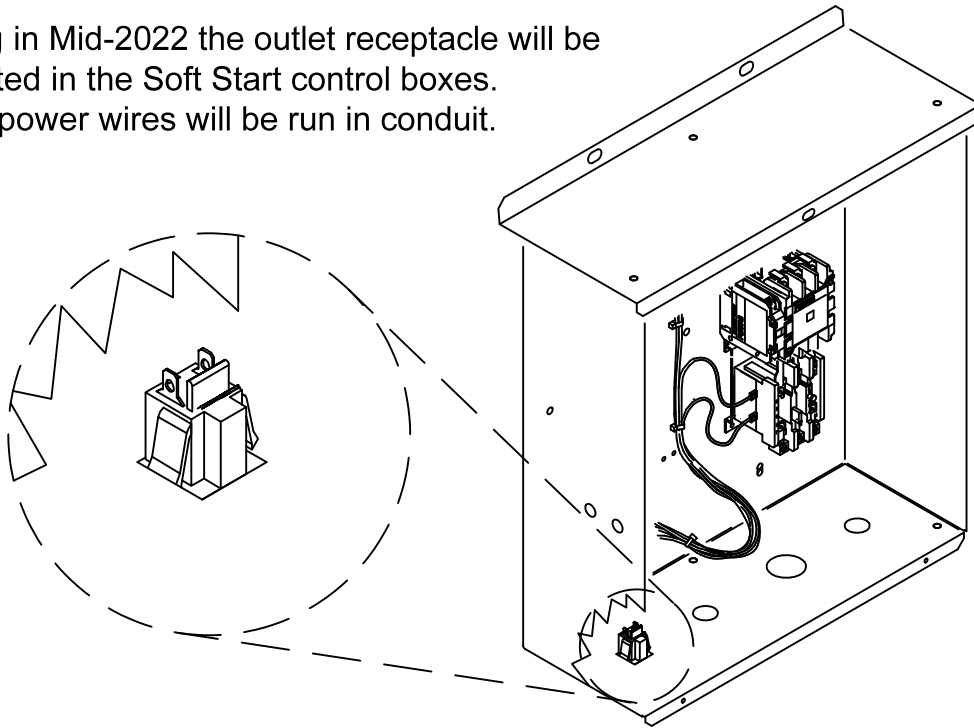


# ELECTRICAL INSTALLATION

For "Across the Line" Starting or Motortronics Soft Start before Mid-2022:

An outlet is provided in the bottom of the C-Fan Control Box for supplying 115VAC to a Shivers Blue Flame II MAXX Burner. It will only have power when the C-Fan is running.

Starting in Mid-2022 the outlet receptacle will be eliminated in the Soft Start control boxes. Burner power wires will be run in conduit.



## DWDI C-FANS WITH SOFT START

The Benshaw/LS soft start panels do not have a receptacle for burner power.

A receptacle can be obtained and added locally, or the burner power wires (Black, White, and Green) can be pulled in the same conduit as the two Fan Interrupt wires.

If the wires are added to the conduit, the burner power cord can be removed.

Do not plug the burner power cord into a regular outlet. The burner can only have power when the fan is running at full speed.

See the P-13637 or P-13648, wiring decal, on the inside front cover for more details.

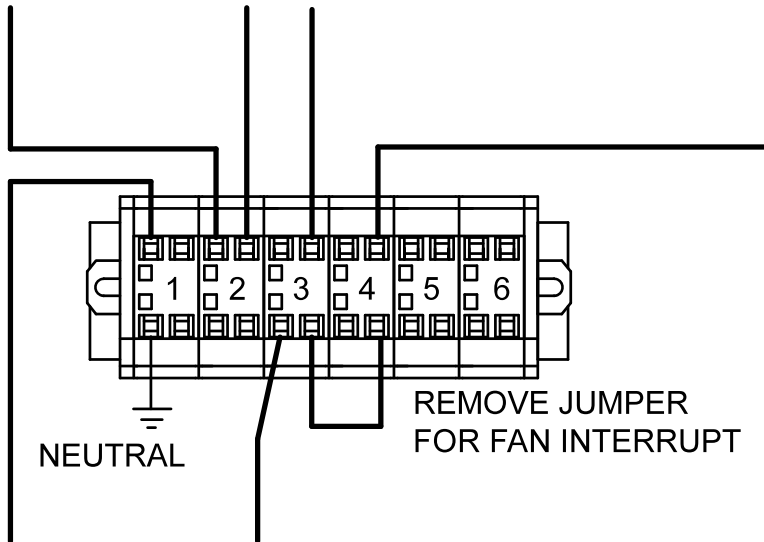
Contact Shivers Mfg, Inc. at 800-245-9093 if there are any questions.



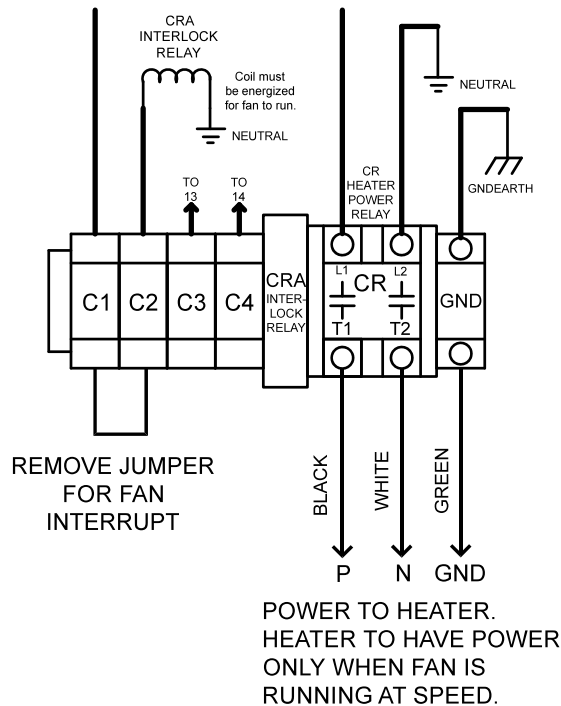
# ELECTRICAL INSTALLATION

CONTROL WIRING: For "Across the Line" Starting or Motortronics Soft Start before Mid-2022:

For Fan Interrupt or Shutdown, remove the jumper between terminals #3 and #4 in the fan control panel. Connect a normally closed, non-powered, circuit to terminals #3 and #4. When the circuit opens, even briefly, the fan will shut down. The fan will need to be manually re-started.

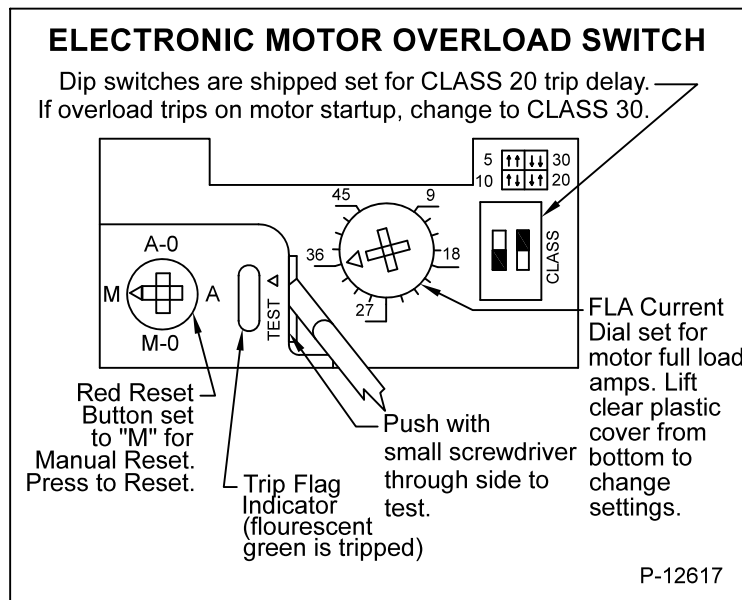


CONTROL WIRING: After Mid-2022 with Benshaw Soft Start:  
SEE PAGE 39.



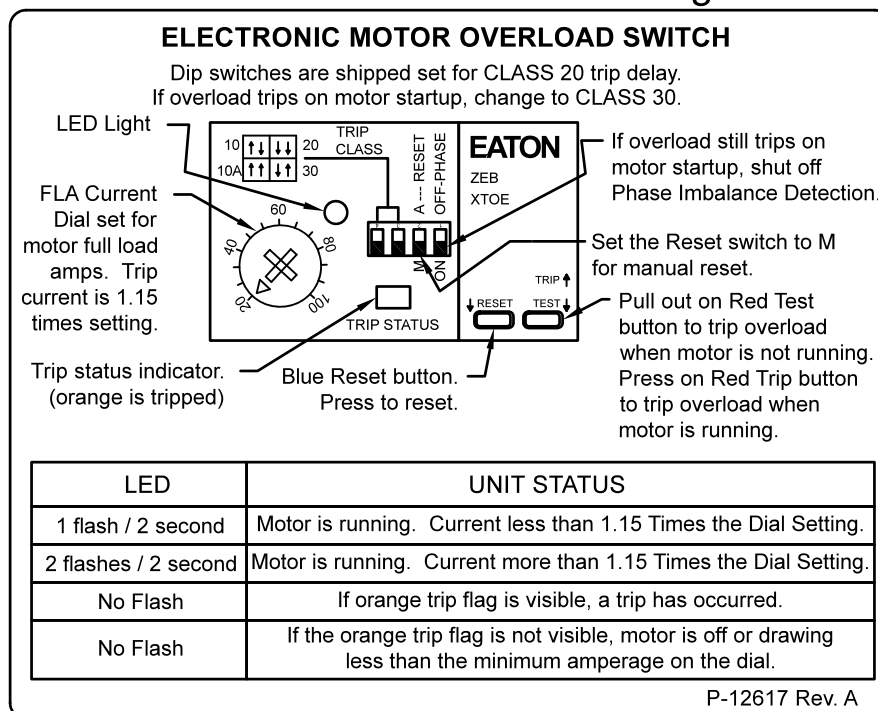
# ELECTRICAL INSTALLATION

Before Approx. 2011



Check to make sure the FLA current dial is set for motor full load amps. Make sure the Red Reset button is pointing to "M" for Manual Reset.

After Approx. 2011  
For "Across the Line" Starting



Check to make sure the DIP switches are set for Manual Reset.

# INITIAL CHECKOUT

- 1) Once the wiring is completed, make sure the burner power switch is off or is unplugged from the C-Fan. Make sure everyone is out of the grain bin and are safely away from all drying equipment, then unlock the main power. Lock the bin entrances shut, then turn on the main power.
- 2) Measure the control voltage from Neutral (Terminal #1) to the 5, 7, or 8 Amp fuse. It should be between 110 and 125 volts AC. If it is not, disconnect and lock out the power, and recheck the wiring.
- 3) Make sure there is at least one foot of grain on the bin floor. Fan air pressure could cause floor or supports to move. Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage.
- 4) Press the fan start switch. The fan should start. For "Across the Line" starting, if the fan starter overload kicks out before the fan gets up to speed, it may be necessary to change the dip switches to class 30 Delay. If that doesn't work, change back to class 20 delay and turn off the phase imbalance switch.
- 5) Press the fan off switch. The fan should slow down and stop.
- 6) Check for proper rotation of the fan. Looking into the fan venturi on the motor side, rotation should be clockwise. Air should be blowing into the bin. Both sides of the fan should be drawing in air.
- 7) Check fan interrupt circuit. For standard controls and Motortronics soft starts, the jumper between terminals 3 & 4 should be removed. For Benshaw soft starts, the jumper between C1 & C2 should be removed.
- 8) If it isn't hard-wired, plug the burner into the outlet on the bottom of the C-Fan Control Box. Re-start the fan and test the burner, following instructions provided with it. Make sure the burner doesn't have power until the fan is at speed.
- 9) Disconnect and lock out the main power.

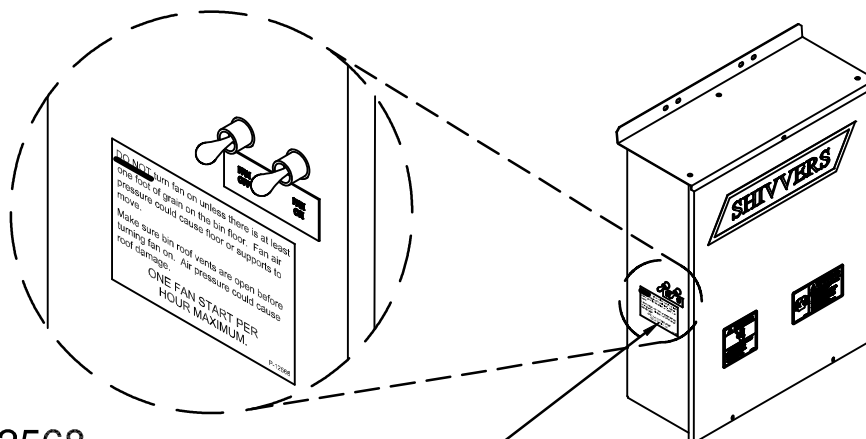
# OPERATION

## TO OPERATE

- 1) Make sure the fan blade is not turning backwards.
- 2) Make sure there is at least one foot of grain on the bin floor. Fan air pressure could cause the floor supports to move. Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage. Press the Fan ON momentary switch.
- 3) The fan should start and come up to full speed. The burner will now have power. Fan static pressure gauge maximum and the burner maximum may be different. Operation of system above 8" static pressure for the 30 Hp fan will reduce or stop grain drying capacity. Operation of system above 10" static pressure for the 40 Hp or 50 Hp fan will reduce or stop grain drying capacity.

## TO STOP

- 1) Turn off the burner, or turn off the gas and allow the gas in the lines to burn out. (See burner manual for more instructions.)
- 2) Press the Fan OFF momentary switch. The fan should coast down and stop.



P-12568

**DO NOT** turn fan on unless there is at least one foot of grain on the bin floor. Fan air pressure could cause floor or supports to move.

Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage.

**ONE FAN START PER HOUR MAXIMUM.**

P-12568

The decal shows "ONE FAN START PER HOUR MAXIMUM." This is a very conservative recommendation as far as the fan motor is concerned. The motor itself can be started at least 4 times per hour. The actual limiting factor may be the switch gear feeding the control. The bottom of the decal can be cut off if the statement is deemed too restrictive.

# MAINTENANCE



**Disconnect and lock out all power before opening any control boxes or removing any shields. Make sure everyone is clear of all drying equipment before restoring power.**

- 1) Once every month, start the fan to circulate the grease in the motor bearings. Make sure there is at least one foot of grain on the bin floor. Fan air pressure could cause floor or supports to move. Make sure bin roof vents are open before turning fan on. Air pressure could cause roof damage. Follow motor manufacturer's recommendations for re-lubricating motor bearings.
- 2) Prior to each drying season, grease the two bearings (center bearing in fan and bearing at coupler) with high temp grease (Shivvers Part #C-6188, Chevron Ulti-Plex or equivalent). Make sure the fan blades rotate freely. Make sure the blade is not coated by any foreign material which could unbalance it or block airflow. If blades require cleaning, make sure power is disconnected and locked out first!
- 3) Prior to each drying season, check to be sure all wiring connections are tight and that the insulation is good. Make sure there isn't any foreign material inside the magnetic motor starter.
- 4) Maintain a clean operation. Clean up spilled corn, clean out fines under the bin floor (contact Shivvers about clean-out doors), keep all control boxes shut and replace seals if required. Control the rodent population. Control weeds and tall grasses around the C-Fan. They can get sucked in and block airflow or start a fire. They can interfere with damper operation.
- 5) During the drying season, check the transition dampers for free movement and proper operation.
- 6) At the end of the season, make sure the main power is disconnected and locked off. There will be fewer problems with lightning damage with all switches and breakers open.
- 7) Use only factory approved replacement parts.

# TROUBLESHOOTING



**Disconnect and lock out all power before opening any control boxes or removing any shields. Make sure everyone is clear of all drying equipment before restoring power.**

**Only qualified personnel should perform troubleshooting on energized circuits.**

All terminal strip numbers refer to the 6 pole terminal strip in the C-Fan control box unless otherwise noted.

## C-FAN WILL NOT START

- 1) Make sure the circuit breaker for the C-Fan is turned on.
- 2) Press the Reset button on the overload heater or soft start. (Do **not** press the trip button.)
- 3) Check the transformer primary fuses.
- 4) Check 5, 7, or 8 amp slow blow fuse.

### Before Mid-2022:

- 5) Check for power on terminal #3 with the fan start switch held down. If no power, it could be a bad start switch or stop switch.
- 6) Check for power on terminal #4 with the fan start switch held down. If there is no power, there is a problem with the fan interrupt. This could be a Gearbox or Grain Hi-Limit problem. Make sure the controller has the Fan(s) Enabled switch in the Enabled position and the light is on.
- 7) If there is power on terminal #1 when the fan start switch is held down, there is an open neutral. Make sure terminal #1 is connected to a neutral.
- 8) If there is power at the black wire on the fan motor starter coil, and not at the white neutral wire on the starter coil, when holding down the fan start switch, then the starter coil is open and will need to be replaced.

# TROUBLESHOOTING

## Before Mid-2022 and "Across the Line" Starting.

FAN WILL RUN ONLY WHILE START SWITCH IS HELD DOWN  
(stops when start switch is released)

- 1) Defective (open) auxiliary switch on starter.

FAN WILL STOP ONLY WHILE STOP SWITCH IS HELD DOWN  
(starts back up when stop switch is released)  
(starts when circuit breaker is turned on)

- 1) Defective (shorted) auxiliary switch on starter.
- 2) Defective (shorted) fan start switch.

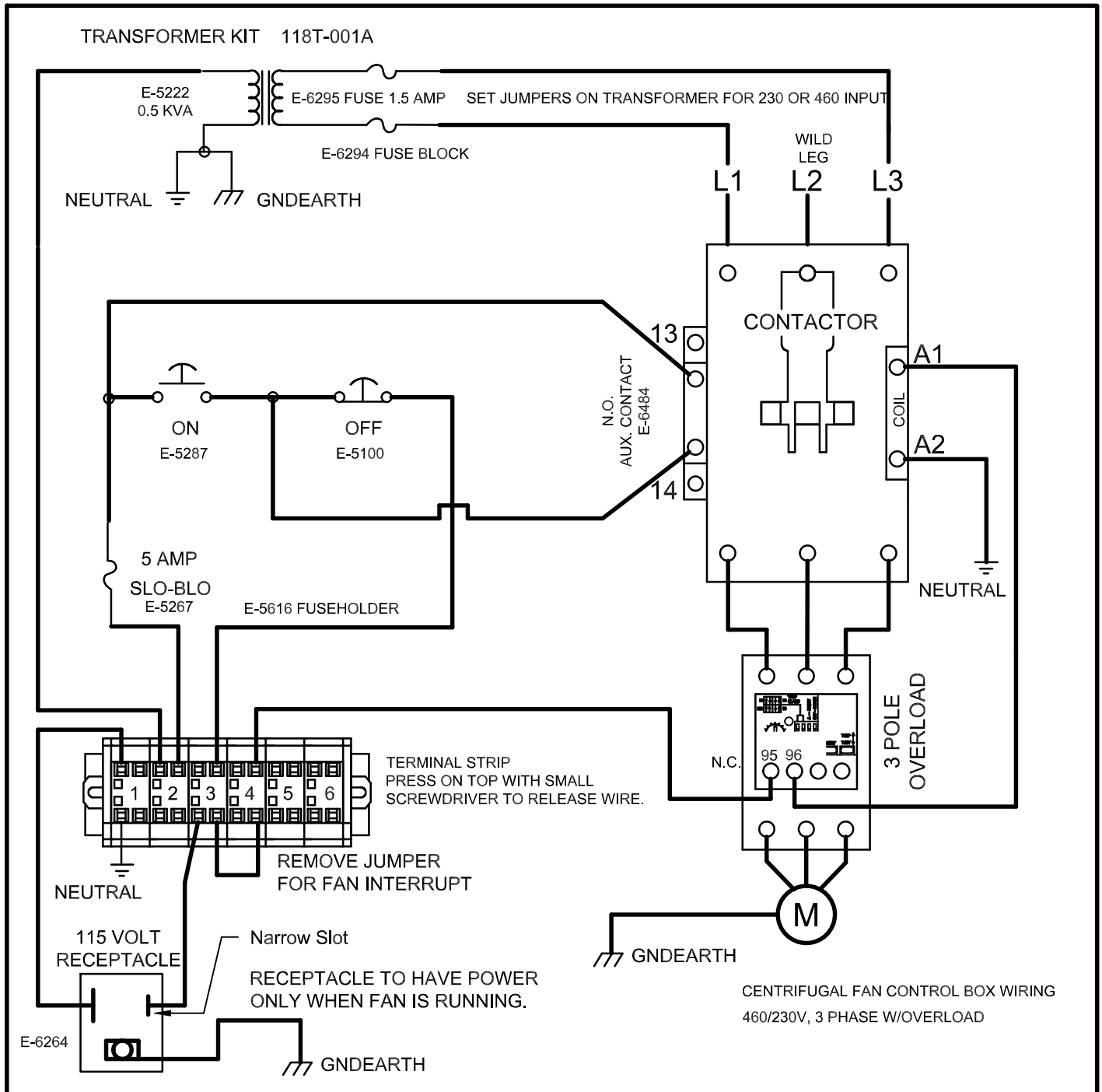
FAN OVERLOAD SWITCH WILL TRIP OUT BEFORE FAN GETS TO SPEED, OR  
WHEN ANOTHER FAN IS STARTED

- 1) Change overload CLASS setting to 30 or shut off phase imbalance DIP switch.
- 2) Check all power wiring connections.
- 3) Check wire sizes. It may be necessary to increase size.
- 4) Check for low incoming voltage, or phase imbalance.

# SCHEMATIC

FOR 118-140A, 689-059A, 689-114A

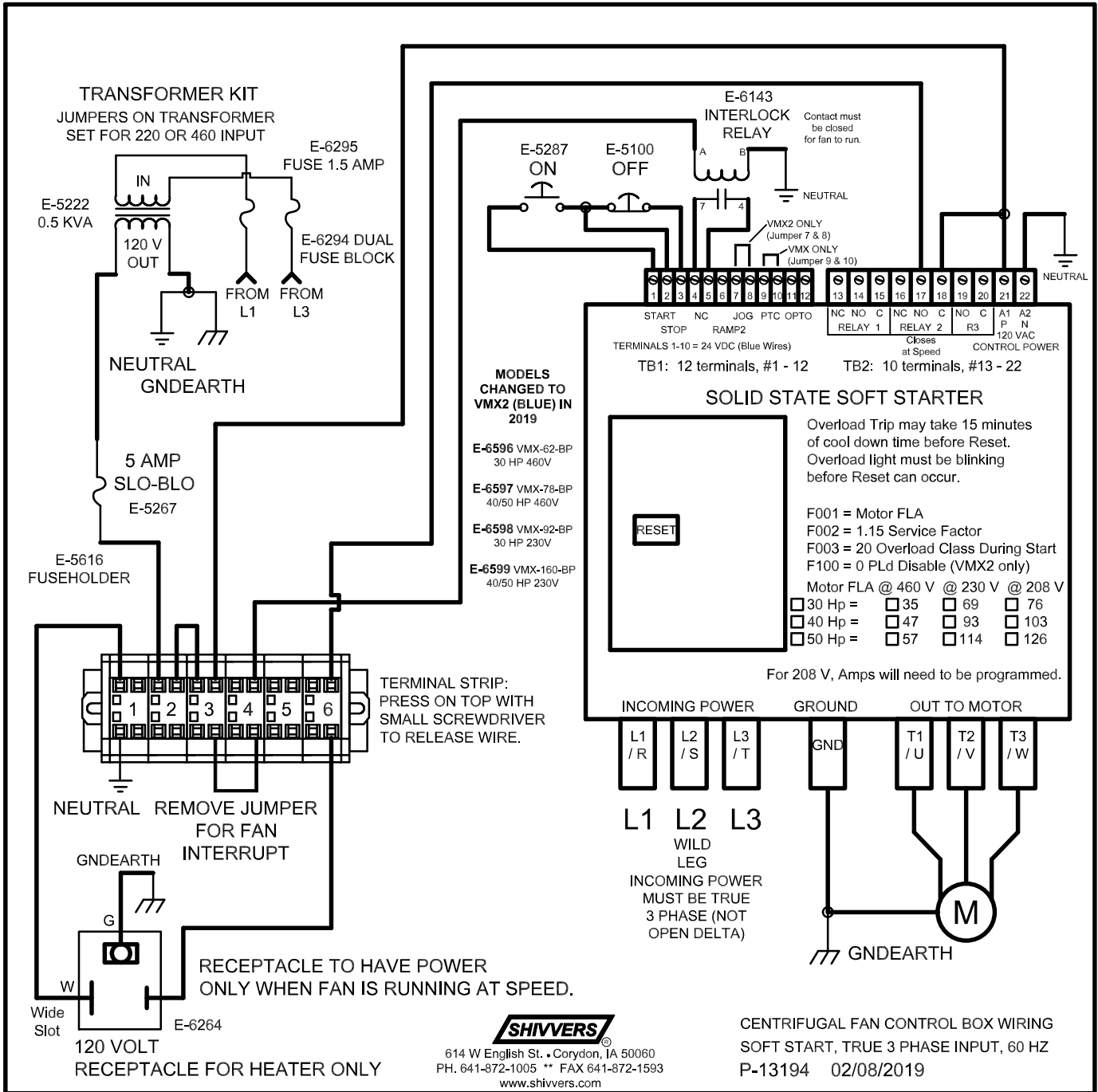
## "Across the Line" Starting





# SCHEMATIC

## FOR 689-121A, 689-122A, 689-123A, 689-124A MOTORTRONICS SOFT START



# SCHEMATIC

## FOR E-6812, E-6813, E-6814

### LS OR BENSCHAW SOFTSTART

