



# 58" Composite Butterfly Fan/ Shutter Fan

Installation and Operation Manual

**PNEG-2126**

**Version 5.0**

**Date: 10-18-19**



PNEG-2126

Fan Models	
58" Composite Butterfly Fan	58" Composite HF Butterfly Fan (without Grill and Damper)
77-0183	-
77-0185	-
77-0188	-
77-0189	-
-	77-0192-LBD

All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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# 1 Safety Precautions

## Topics Covered in this Chapter

- Safety Guidelines
- Cautionary Symbol Definitions
- Safety Cautions
- Safety Decals
- Safety Sign-off Sheet

## Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Read and save these instructions.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in **SERIOUS INJURY** or **DEATH**.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.








Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001-4

## Cautionary Symbol Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.

**Table 1-1** Description of the different cautionary symbols








Symbol	Description
	This symbol indicates an imminently hazardous situation which, if not avoided, <b>will result in serious injury or death.</b>
	This symbol indicates a potentially hazardous situation which, if not avoided, <b>can result in serious injury or death.</b>
	This symbol indicates a potentially hazardous situation which, if not avoided, <b>can result in minor or moderate injury.</b>
	This symbol is used to address practices not related to personal injury.
	This symbol indicates a general hazard.
	This symbol indicates a prohibited activity.
	This symbol indicates a mandatory action.

ST-0005-2

## Safety Cautions

### Use Personal Protective Equipment

- Use appropriate personal protective equipment:

<b>Eye Protection</b>		<b>Respiratory Protection</b>		<b>Foot Protection</b>	
<b>Hearing Protection</b>		<b>Head Protection</b>		<b>Fall Protection</b>	
<b>Hand Protection</b>					

- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

### Follow Safety Instructions

- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.



ST-0002-1

## Chapter 1: Safety Precautions

### Lifting Hazard

- Single person lift can cause injury.
- Use a mechanical lifting device to lift or move the equipment during installation.



ST-0021-2

### Explosion Hazard

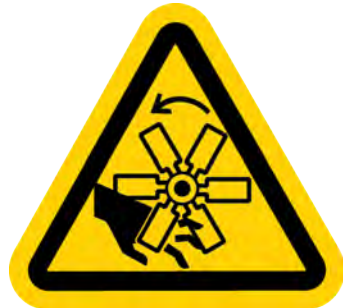
- The fan is not designed for use in atmospheres where the risk of explosion is present.
- Do not use the fan in enclosed areas of high dust concentrations, flammable gas, vapors or fumes.



ST-0022-1

### Keep Hands Away from Moving Parts

- Do not operate the fan with electrical or mechanical guards removed. Serious injury or death can result.
- Do not put hand or arm in fan. Rotating parts can crush and dismember.
- Do not put any kind of tool inside the fan to clear debris while the fan is operating. Damage to the equipment will result.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.



ST-0020-2

### Install and Operate Equipment Properly

- The fan described in this manual is designed solely for the purpose of ventilating agricultural buildings. Use of the fan in any other way is a misuse of the equipment and may endanger health and safety.



ST-0023-1



### Install and Operate Fan Properly

- Electrical controls and wiring must be installed by a qualified electrician and must meet the standards set by the National Electric Code, Canadian Electrical Code, and all local and state codes. The fan must be installed and maintained by a qualified person familiar with the use and function of ventilation fans.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Do not operate fan unless the motor is properly grounded. Grounding can be achieved by wiring with a grounded conduit or a separate ground wire attached to the motor ground lug.
- Do not operate the fan by bypassing any safety device on the unit.
- Do not kink power cables and do not allow cables to come into contact with oil, grease, hot surfaces or chemicals.
- Motor overload protection must be provided with each single phase fan. A circuit breaker or slow blow motor type fuse must be used. A safety cut-off switch must be located adjacent to each fan.
- Fans used to ventilate livestock buildings and other rooms where continuous air movement is essential must be connected to individual electrical circuits with a minimum of two (2) circuits per room.
- Installation of supplementary natural ventilation, back-up thermostat and an alarm system on at least one cooling stage is recommended. See diagram on motor nameplate and information provided with fan control (if used) for connection requirements.



ST-0018-2

### Sharp Edge Hazard

- This product has sharp edges, which can cause serious injury.
- To avoid injury, handle sharp edges with caution and always use proper protective clothing and equipment.



ST-0036-2

### Maintain Equipment and Work Area

- Do not attempt maintenance or repairs on the fan unless you are competent to do so. Understand service procedures before doing work.
- Use only genuine Cumberland parts when maintaining the fan. Use of other non-genuine parts is a misuse and can lead to dangerous situations.
- Be aware that the fan may operate under automatic control and may start without warning.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Keep area clean and dry.
- Keep hands, feet, and clothing away from moving parts.
- Keep the fan in proper working condition. Replace worn or broken parts immediately.
- Keep the fan clean. Do not allow debris to collect around motors, belts, pulleys or bearings.
- Make sure that all electrical enclosures and guards are closed and locked before re-starting the fan.



ST-0019-2

## Safety Decals

The safety decals on your equipment are safety indicators which must be carefully read and understood by all personnel involved in the installation, operation, service and maintenance of the equipment.

Location	Decal No.	Decal	Description
Left and right middle, inside and outside	DC-2180		Non-text fan Warnings
Left middle outside and right middle inside	DC-1540		Danger High Voltage Warning Stay Clear of Rotating Blade Warning Flying Objects Hazard
Left middle outside and right middle inside	DC-995		Warning Shear Point

To replace a damaged or missing decal, contact us to receive a free replacement.

### GSI Decals

1004 E. Illinois St.  
 Assumption, IL 62510  
 Tel: 1-217-226-4421

## **Safety Sign-off Sheet**

Below is a sign-off sheet that can be used to verify that all personnel have read and understood the safety instructions. This sign-off sheet is provided for your convenience and personal record keeping.

<b>Date</b>	<b>Employee Name</b>	<b>Supervisor Name</b>

ST-0007

# 2 General Information

## Topics Covered in this Chapter

- General Description
- Main Assemblies
- Specifications

## General Description

The structure of the butterfly shutter on the Composite Butterfly Fan improves fan stability and eliminates small blades that are prone to dust and build-up that reduce air flow. The butterfly shutter also provides protection against harsh weather conditions such as wind and moisture while the fan is not in use.

During operation, air from the fan forces the shutter doors to open. A magnetic capture is used to stop the shutters from moving when the fan is off.

The Composite Butterfly Fan is belt driven and has a spring loaded belt tensioner to ensure proper belt tension.

# Main Assemblies

Figure 2-1 58 in. Composite butterfly fan main assemblies

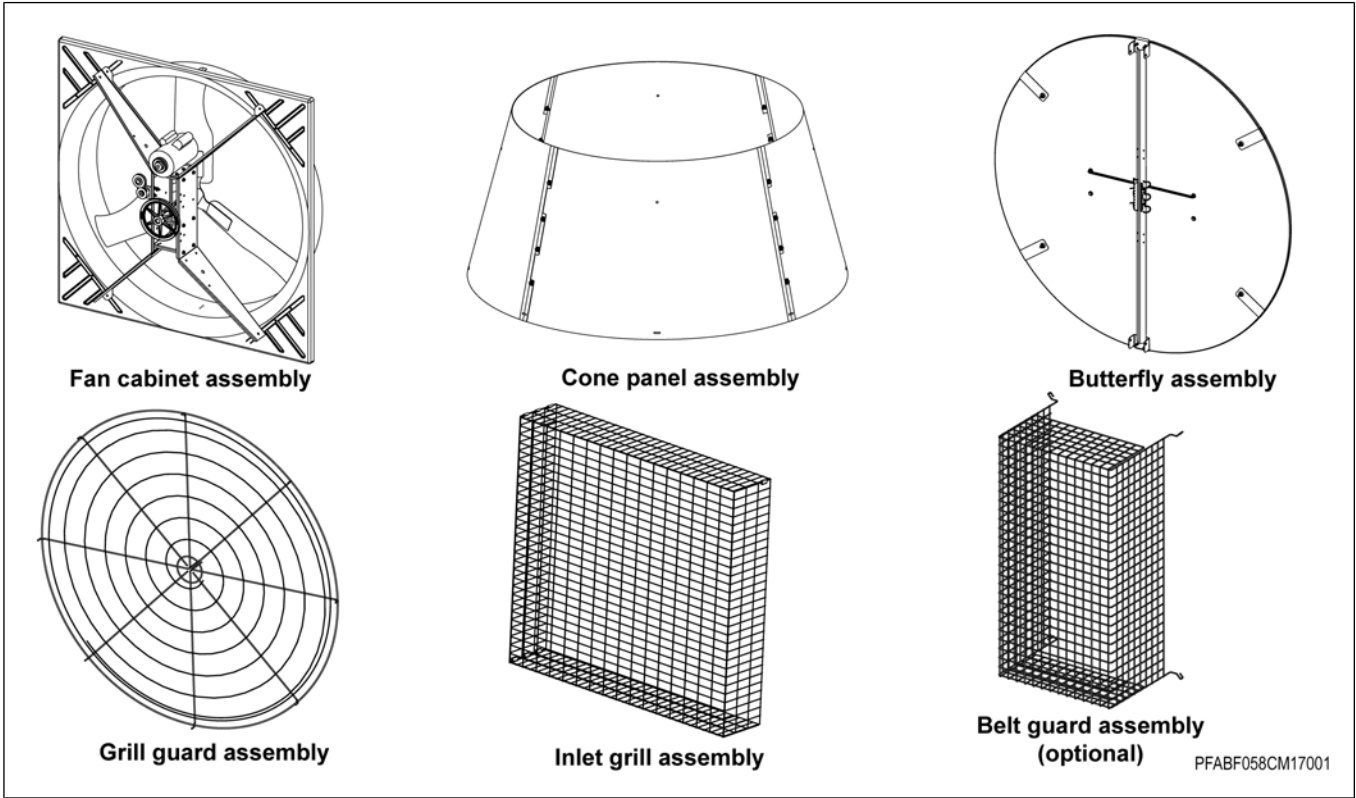
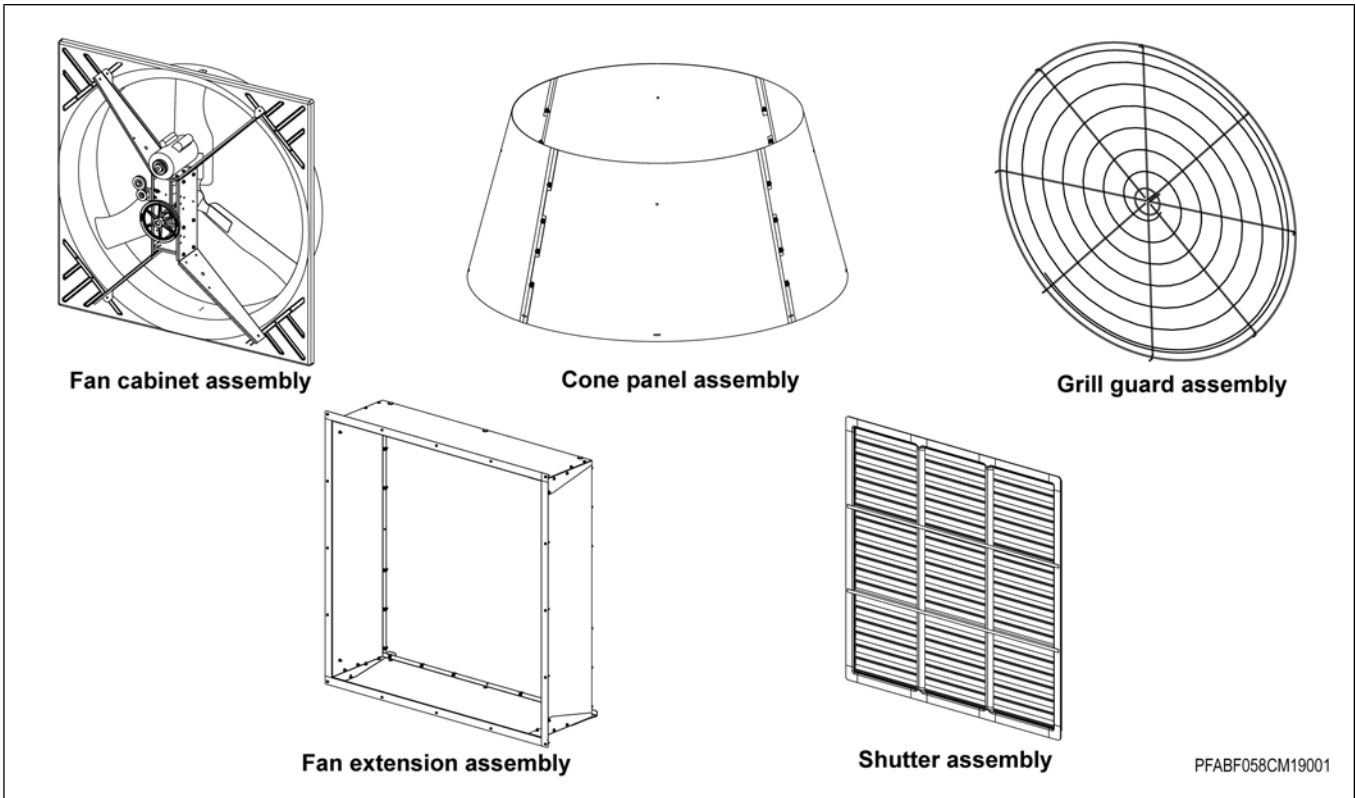


Figure 2-2 58 in. Shutter fan main assemblies



## Specifications

Before beginning installation, check the condition of the fan. Remove the overwrap and packing materials and examine all parts and components for shipping damage. Any damage incurred must be reported immediately to the freight carrier.

Models	HE Models	HF Models	HF Mega Flow Model
	77-0183	77-0185	77-0192-LBD
	77-0189	77-0188	
Size	58" Composite Butterfly Fan/58" Composite HF Fan (without Grill and Damper)		
Voltage	230V		
Amps	8.5		
Frequency	50/60 Hz Single Phase and Three Phase available		

New Fan Model Part Number	Cabinet Assembly Model Part Number	Description
77-0183	12-0672-HE	58" Composite HE Butterfly Fan (1 PH / 60 Hz-A)
77-0185	12-0672-HF	58" Composite HF Butterfly Fan (1 PH / 60 Hz-A)
77-0188	12-0672-HF-3	58" Composite HF Butterfly Fan (3 PH / 60 Hz-A)
77-0189	12-0672-HE-3	58" Composite HE Butterfly Fan (3 PH / 60 Hz-A)
77-0192-LBD	12-0672-HF-3-50-LD	58" Composite HF Fan (3 PH / 50 Hz-A) (without Grill and Damper)

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# NOTES



# 3 Installation Guide

Follow the steps below to install the 58 in. composite butterfly fan/shutter fan assembly.

## Framing and Positioning

Make sure that you have enough rough opening and there is enough space so that the fan flanges do not overlap.

1. Construct the frame opening of 66-1/8 in. x 66-1/8 in.

**NOTE:**

- a. For flush mount installations, construct the frame opening of 57-1/2 in. x 66-1/8 in.
- b. Remember that the framing must be able to support the weight of the fan assembly. Ensure the load bearing portion of the bottom sill is rigid and properly supported.

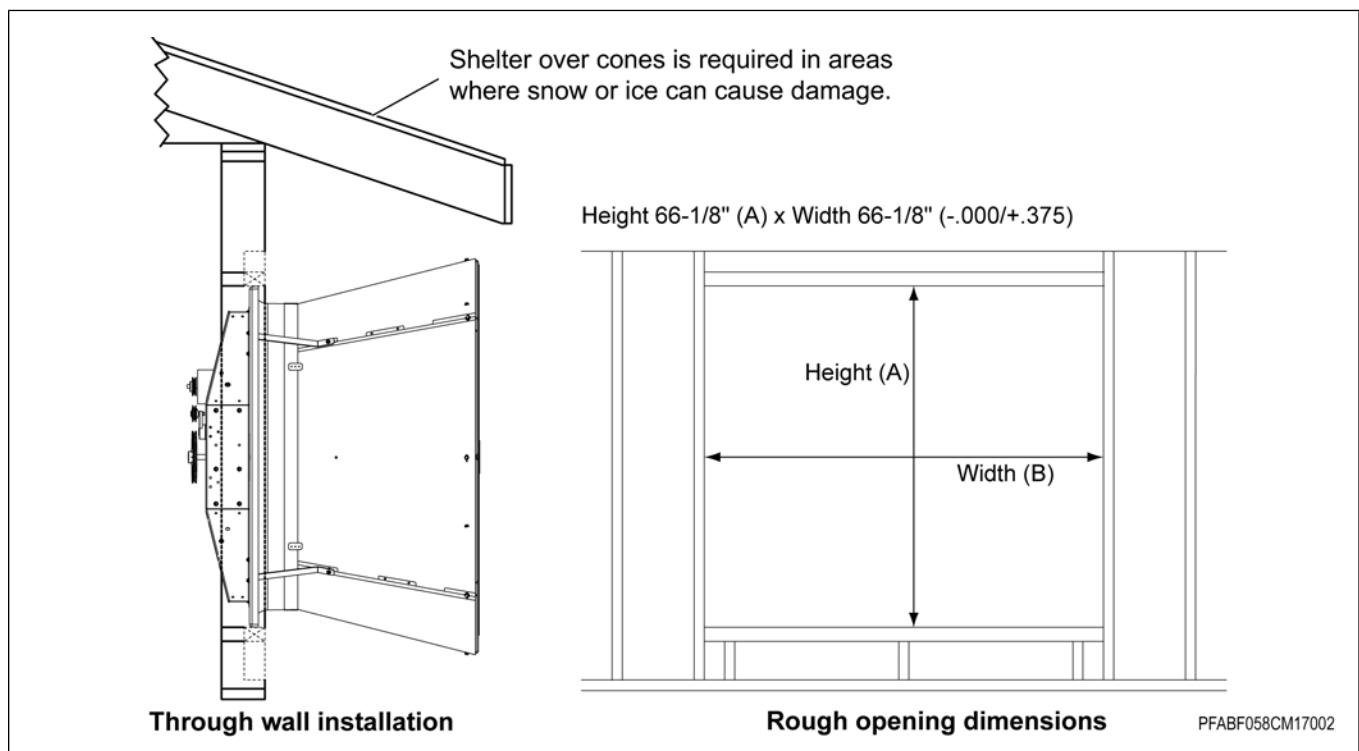
2. Plan the layout and spacing of fans with cones; spacing fans too close together will cause interference with the cones.

**NOTE:** The Cumberland 58 in. Composite Butterfly Fan does NOT have the collapsible side panels.



**You must provide shelter over cones in areas where snow or ice can cause damage to the fan. The warranty Does Not cover damage from external sources. See overhang example in [Figure 3-1, page 17](#).**

**Figure 3-1** Rough frame opening (58 in. Composite butterfly fan)



# Chapter 3: Installation Guide

Figure 3-2 Rough frame opening (58 in. Fan with shutter and extension)

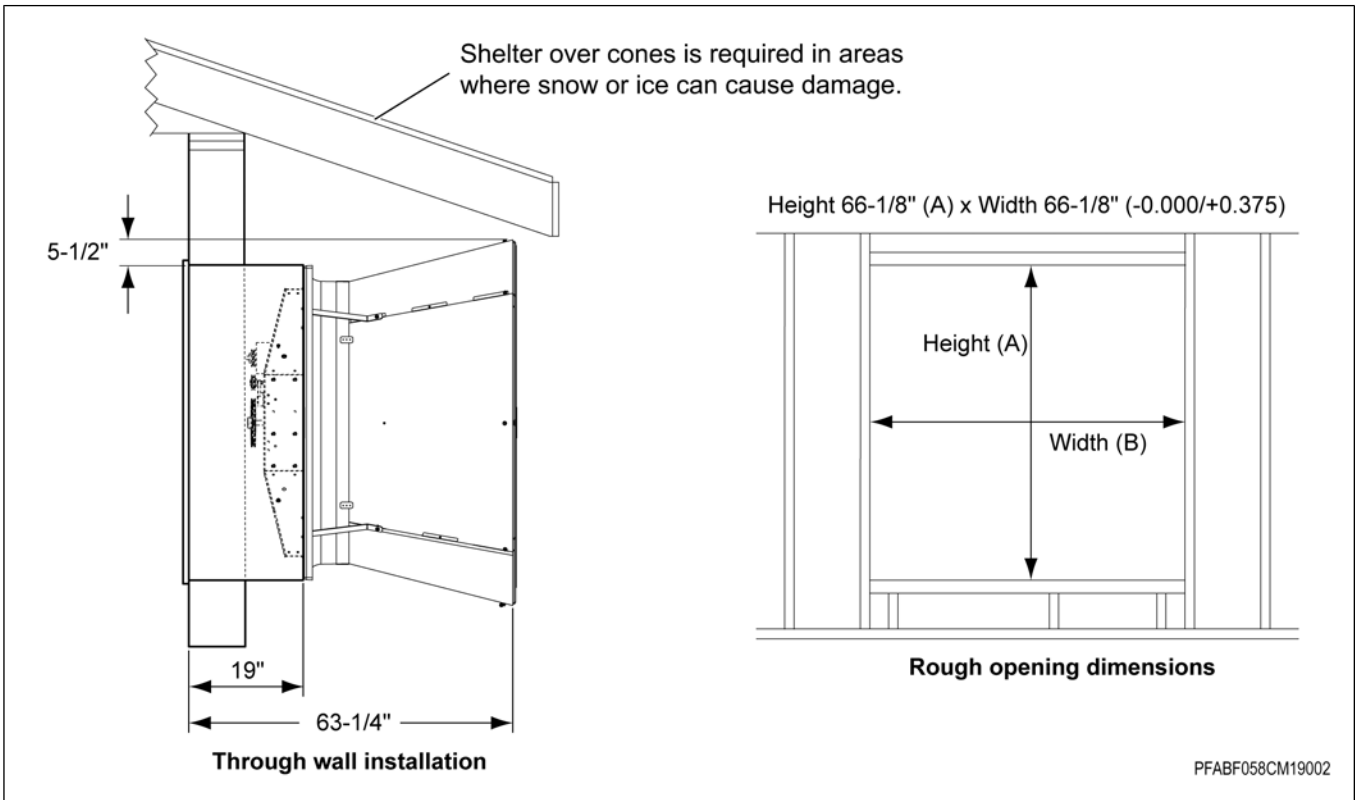


Figure 3-3 Center to center fan spacing with cone

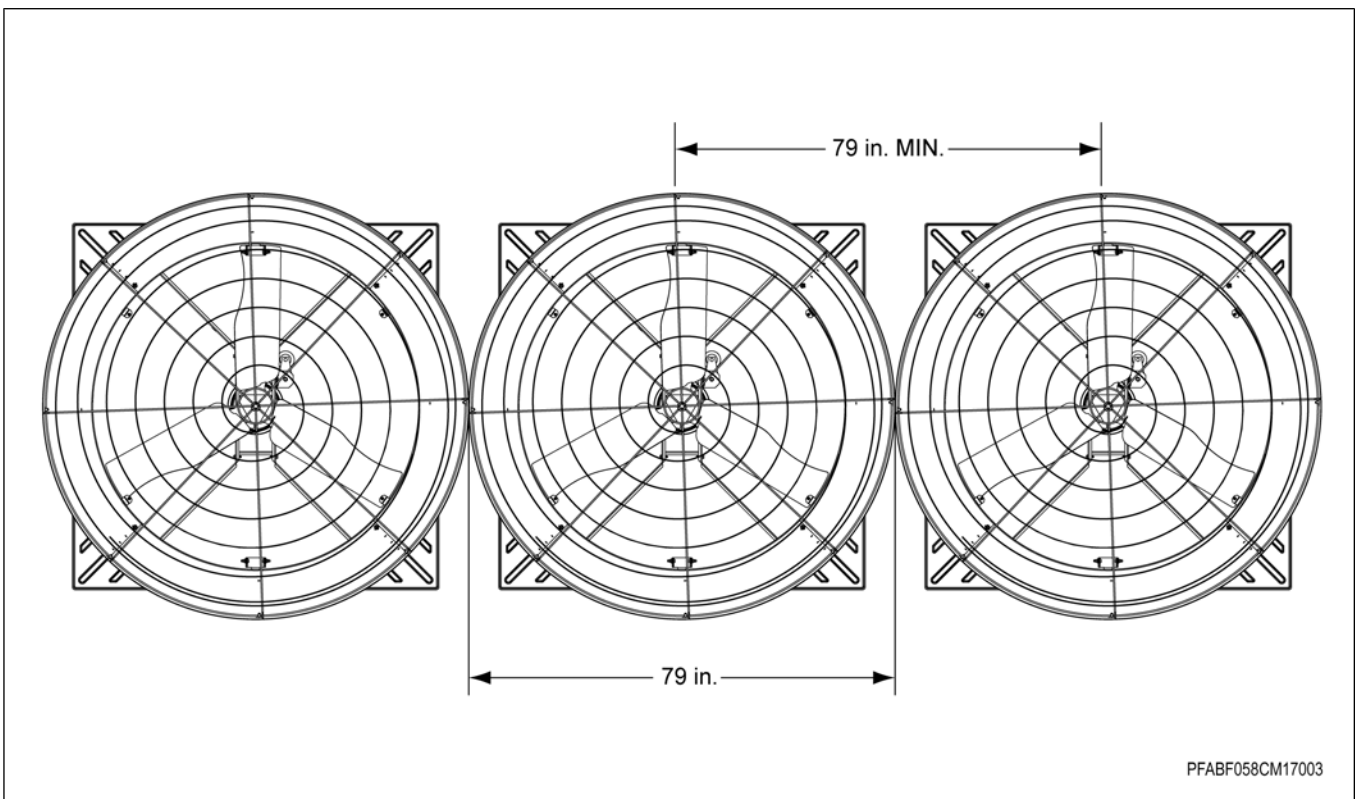
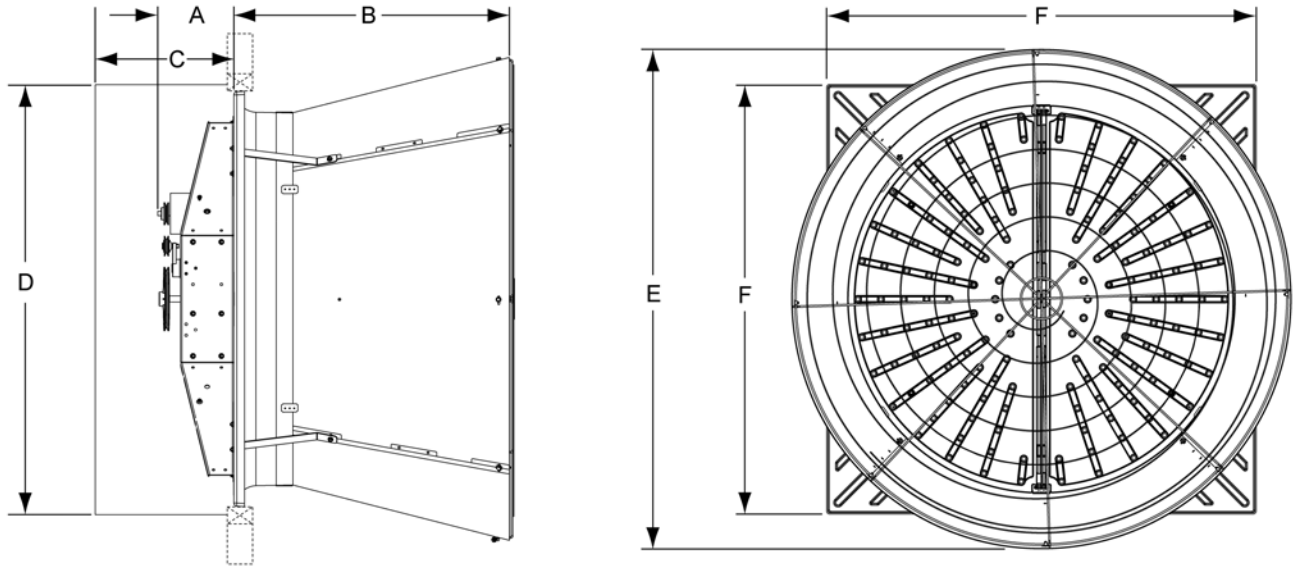


Figure 3-4 58 in. Fan dimensions



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A	B	C	D	E	F	Recommended Wall Opening
12.25 in.	45.00 in.	16.13 in.	68.13 in.	76.00 in.	65.75 x 65.75 in.	66.00 x 66.00 in. **

\* For flush mount installations, the Mega Flow 58 in. Composite Fan will accommodate openings from 57.5 in. to 63 in. square. Fan to fan spacing on wall with poly cone: 76 in.

\* Patent pending.

### Installing Fan Cabinet Assembly

Install the fan cabinet assembly to the wall using thirty two 1/4 in. x 1-1/2 in. screws.

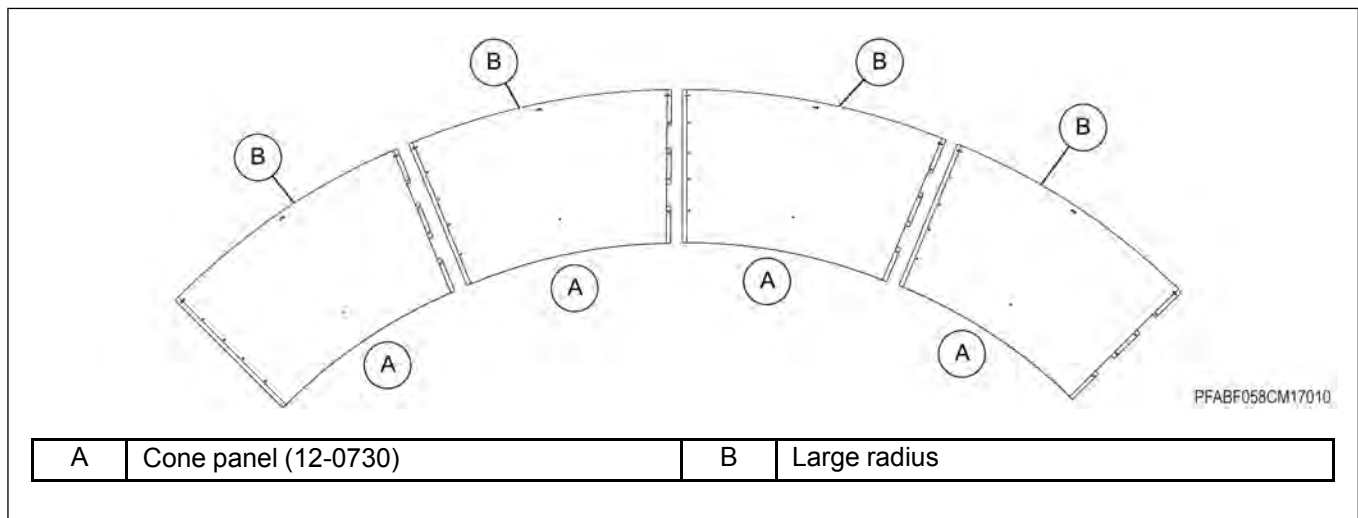
### Cone Panel Assembly

1. Lay the cone panels (A) on the ground as shown.
2. Attach the four (4) cone panels together using bolts (D), nuts (E) and washers (F). (The hardware are included in the hardware kit.)

**NOTE: Make sure that all the tabs are on the inside of the cone assembly for consistency purposes.**

3. Install the bolts and nuts through the holes where the panels overlap, to hold the four (4) cone panels together.
4. Once four (4) cone panels are assembled stand the assembly up with the large radius (B) side down.

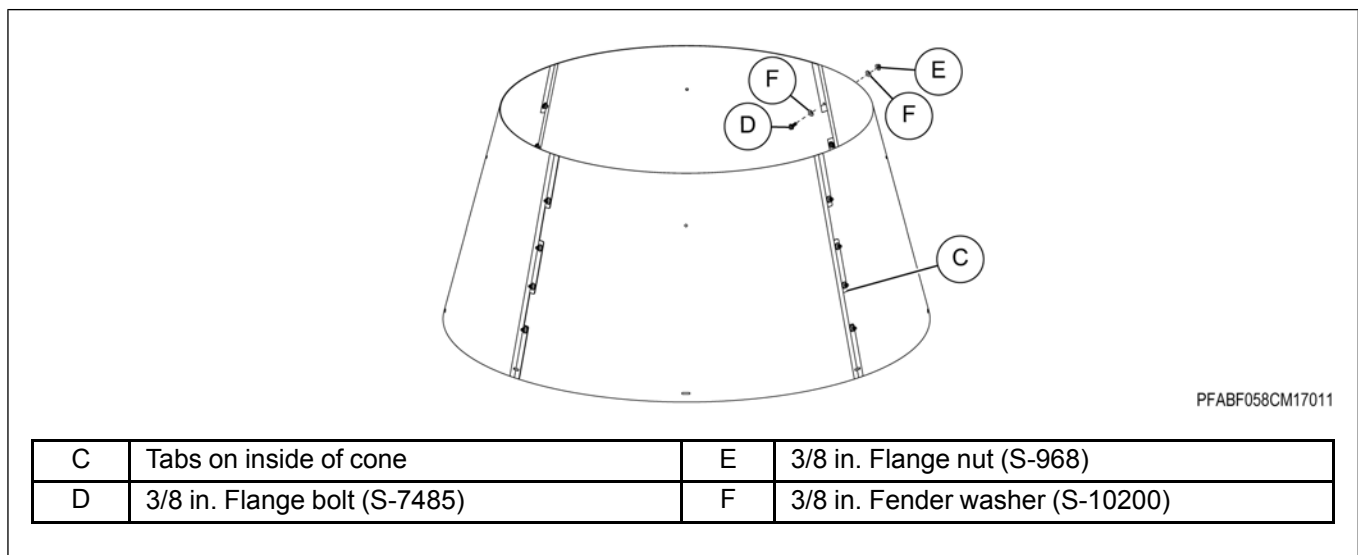
Figure 3-5 Cone panel assembly



5. Install the remaining bolts (D), nuts (E) and washers (F) into place to hold the cone together.

**NOTE: Install bolts (D) with bolt head on the inside of the cone assembly. Hand tighten the nuts (E).**

Figure 3-6 Cone assembly



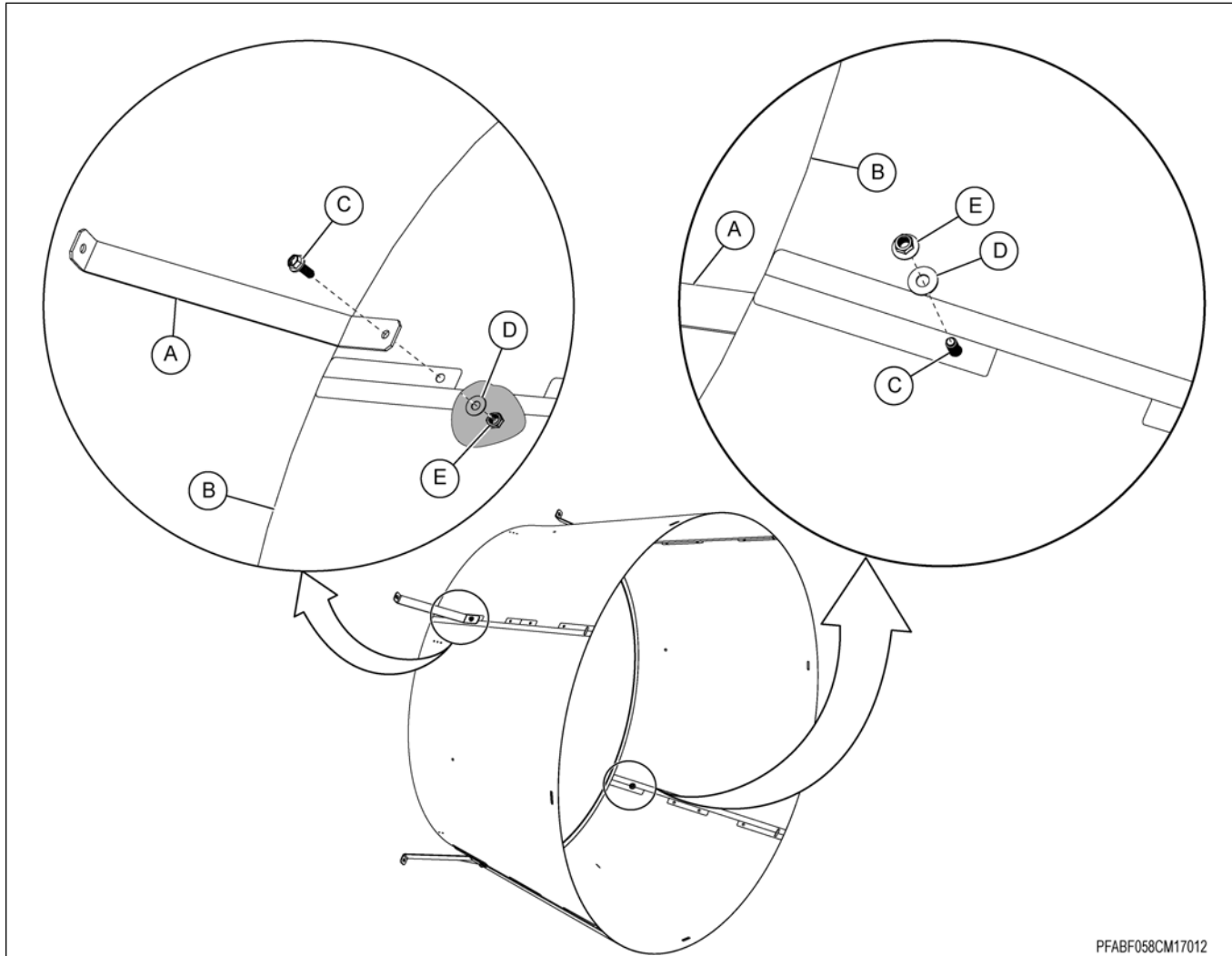
### Installing the Cone Panel Assembly

**IMPORTANT:** *It is important that this method of assembly be used when assembling the cone or the installer will struggle trying to slip the assembled cone over the door seal.*

1. Install the four cone brackets (A) to the cone (B) using two flange bolts (C), fender washers (D) and flange nuts (E).

**NOTE:** *The holes are already pre-drilled in the cone.*

**Figure 3-7** *Installing the cone brackets to the cone*



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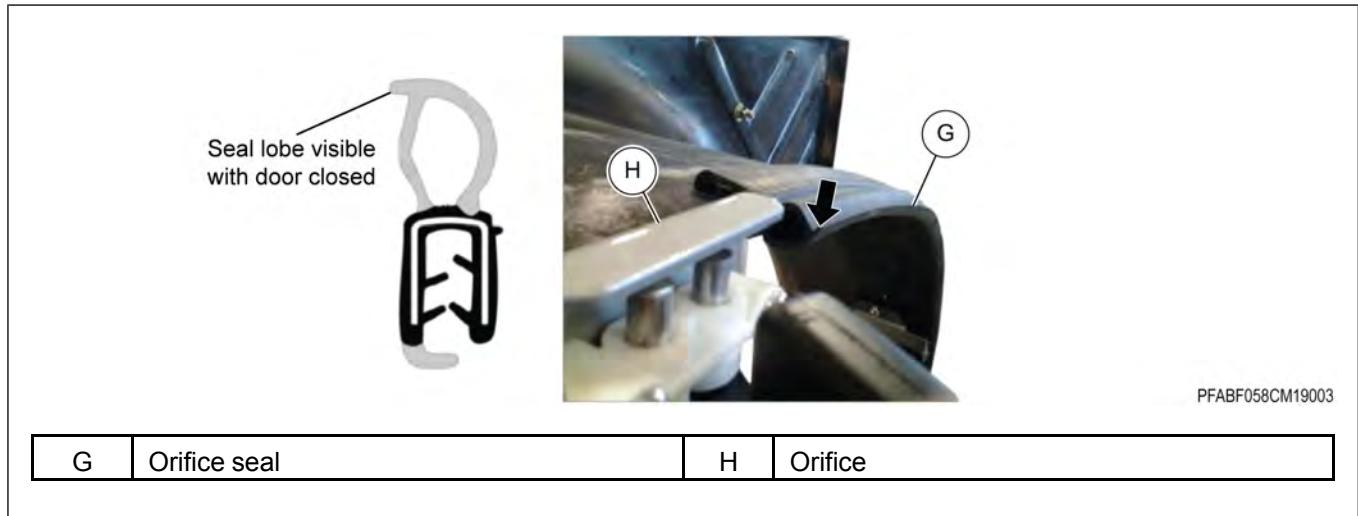
A	Cone brackets (12-0715)	D	3/8 in. Fender washers (S-10200)
B	Assembled cone	E	3/8 in. Flange nuts (S-968)
C	3/8 in. Flange bolts (S-7485)		

## Chapter 3: Installation Guide

2. Install the orifice seal (G) to the round orifice (H) on the housing.

**NOTE:** Make sure to install the orifice seal (G) so that the seal lobe is installed towards the intake side of the fan. This can be verified if the seal lobe is visible with the door closed.

**Figure 3-8** Installing the orifice seal

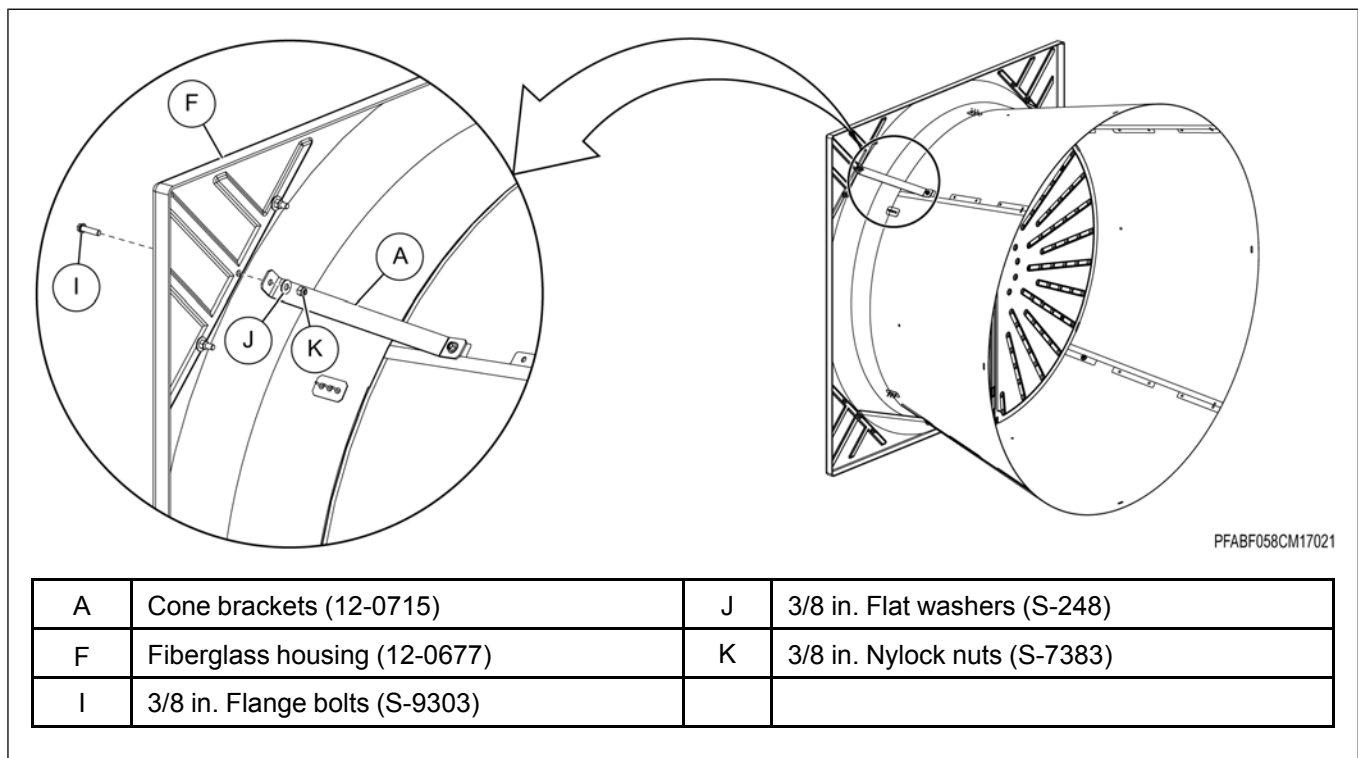


3. Starting at the top of the housing, install the cone over the housing and attach the two **TOP** cone brackets (A) to the fiberglass housing (F) using flange bolts (I), flat washers (J) and nuts (K).

**NOTE:** At this point, the bottom of the cone should easily slip over the bottom of the housing.

4. Install the bottom cone brackets (A) to the fiberglass housing (F) using flange bolts (I), flat washers (J) and nuts (K).

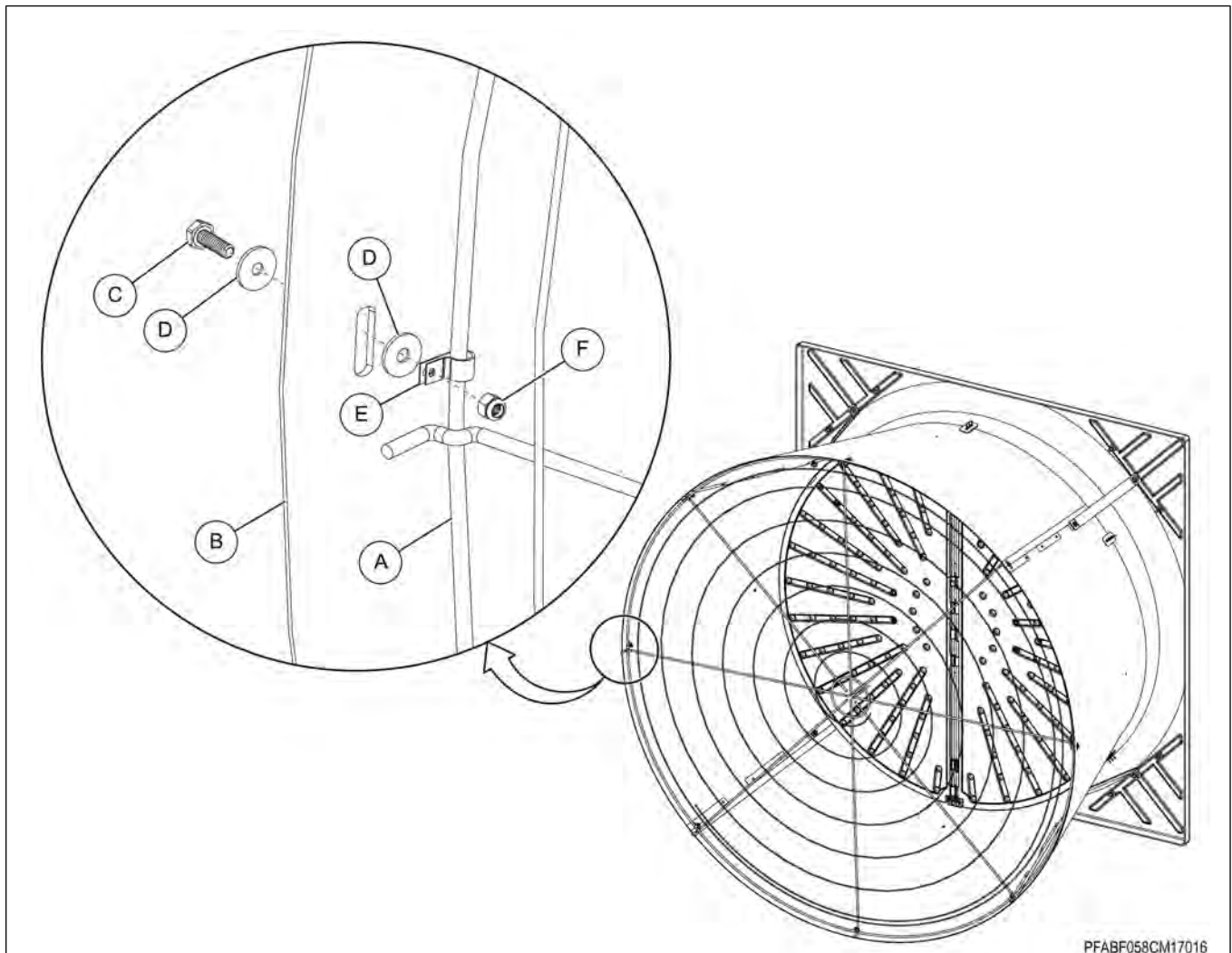
**Figure 3-9** Installing the cone brackets to the fiberglass housing



### Grill Guard Assembly

1. Place the grill guard (A) to the inside of the cone (B), making sure the bent ends of the straight grill pieces are facing outward.
2. Install the P-clip (E) around the grill guard (A) and align it with the slot in the cone (B).
3. Install the bolt (C) from the outside of the cone (B), through the outside fender washer (D), cone (B), inside fender washer (D), P-clip (E) and nut (F).
4. Continue installing the P-clips (E) to the grill (A) at all the slots around the cone (B).

Figure 3-10 Grill guard assembly



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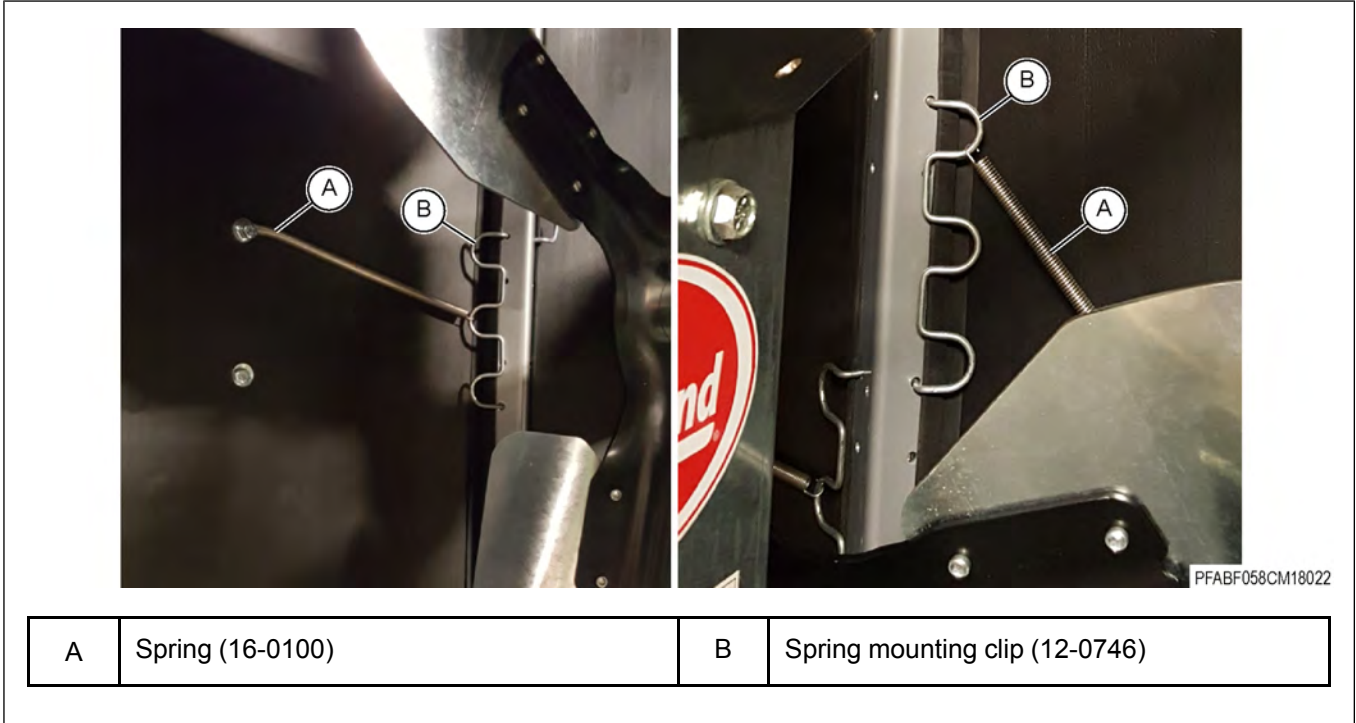
A	Grill guard (11-0533)	D	3/8 in. Fender washers (S-10200)
B	Cone panel (12-0730)	E	P-clip (D02-0023)
C	3/8 in. Flange bolt (S-7485)	F	3/8 in. Flange nut (S-968)

### Adjusting the Spring Tension on Doors

You can adjust the spring (A) tension by moving the adjustment brackets up or down the center bracket and also repositioning the spring (A) location on the adjustment bracket.

**NOTE:** For 58 in. PVC shutter fans, the butterfly door panels will not be used.

Figure 3-11 Adjusting the spring tension





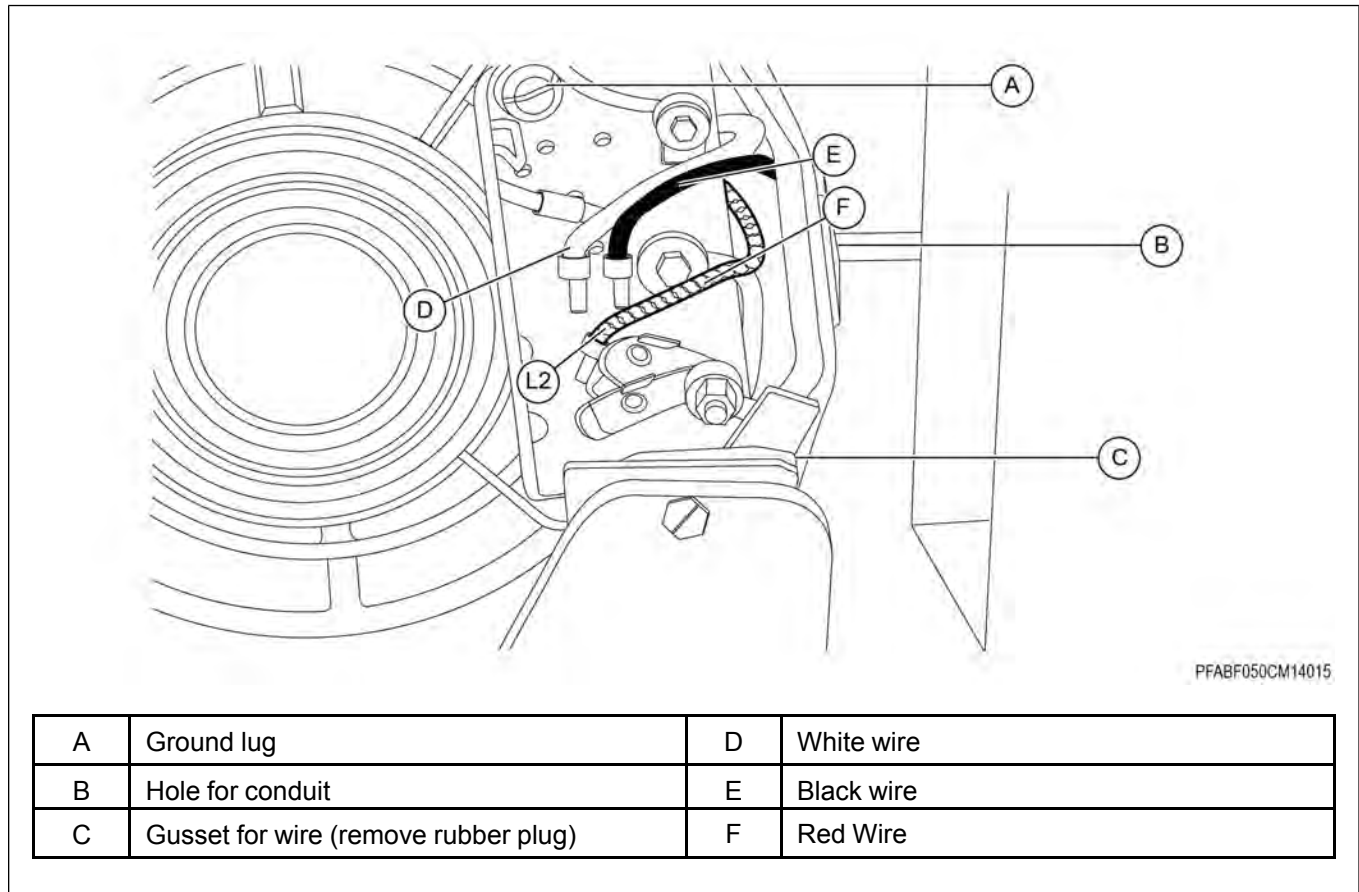
## Electrical Connection Hook Up

### Before You Begin

All wiring should be installed in accordance with National, State and Local electrical codes. A certified electrician should complete this portion of the installation to ensure safety and that the wiring is correct for the application.

1. First, remove the back cover of the motor exposing the wiring block.

Figure 3-12 Wiring connections

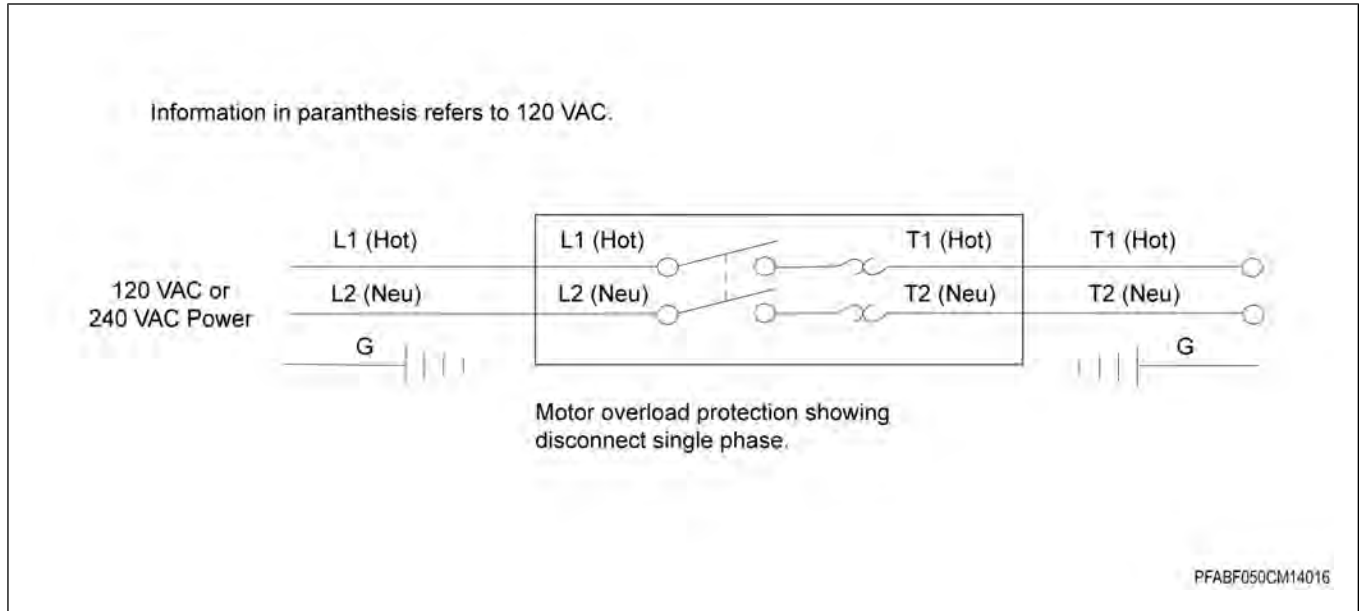


2. The motor is designed to use either a solid clamping conduit on the side of the motor or the supplied wire with a three-prong plug attached. In either case, it is important to attach the ground wire to the ground lug (A) as depicted.
3. For correct motor rotation (CCW), the Red wire (F) should be located on the L2 connection as depicted. If this is not the case, switch the Red (F) and Black (E) wires. Refer to wiring diagram on the side of the motor for correct wiring for 115V and 230V supply.
4. Fans used to ventilate livestock buildings or other rooms where continuous air movement is essential should be connected to individual electrical circuits with a minimum of two (2) circuits per room. For connection requirements refer to diagram on the motor nameplate.

## Chapter 3: Installation Guide

5. For single phase fans, motor overload protection should be provided for each fan.
6. A safety cut-off switch should be located next to each fan. A circuit breaker switch or slow blow motor type fuses must be used. 3 Phase fans require three (3) pole contactors with overload protection.

**Figure 3-13** *Electrical connections*



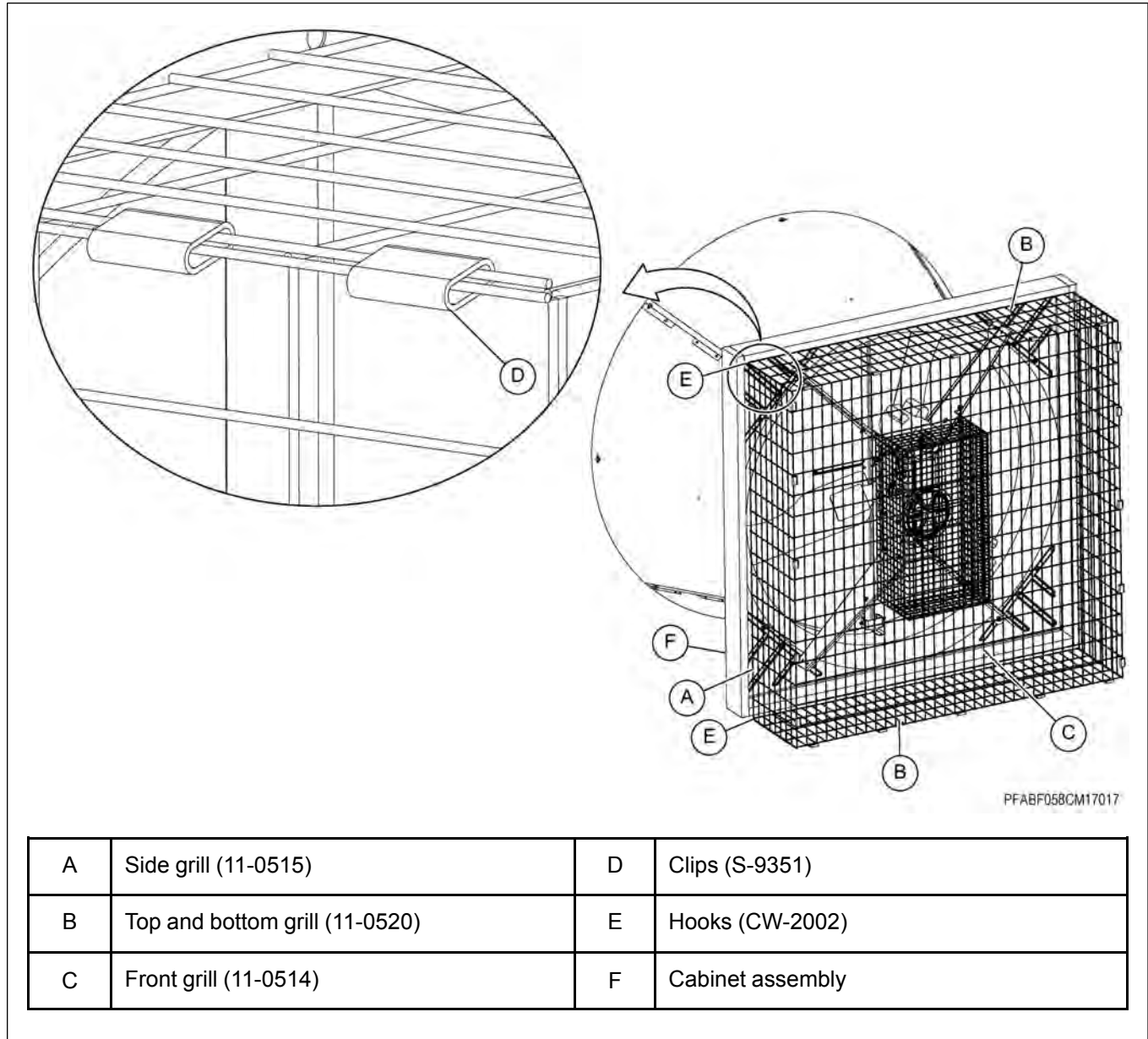
## Inlet Grill Assembly

**NOTE:** For 58 in. PVC shutter fans, the inlet grill will not be used.

1. Attach the side grills (A) to the top and bottom grills (B) together with clips (D). Crimp the clips.
2. Attach the front grill (C) to the sides using the clips (D). Crimp the clips.
3. Install the hanging hooks (E) on the four corners of the fan cabinet assembly (F).
4. Install the assembled front grill (C) to the hanging hooks (E).

**NOTE:** Use six hooks (E) to install the grill assembly to the cabinet assembly (F).

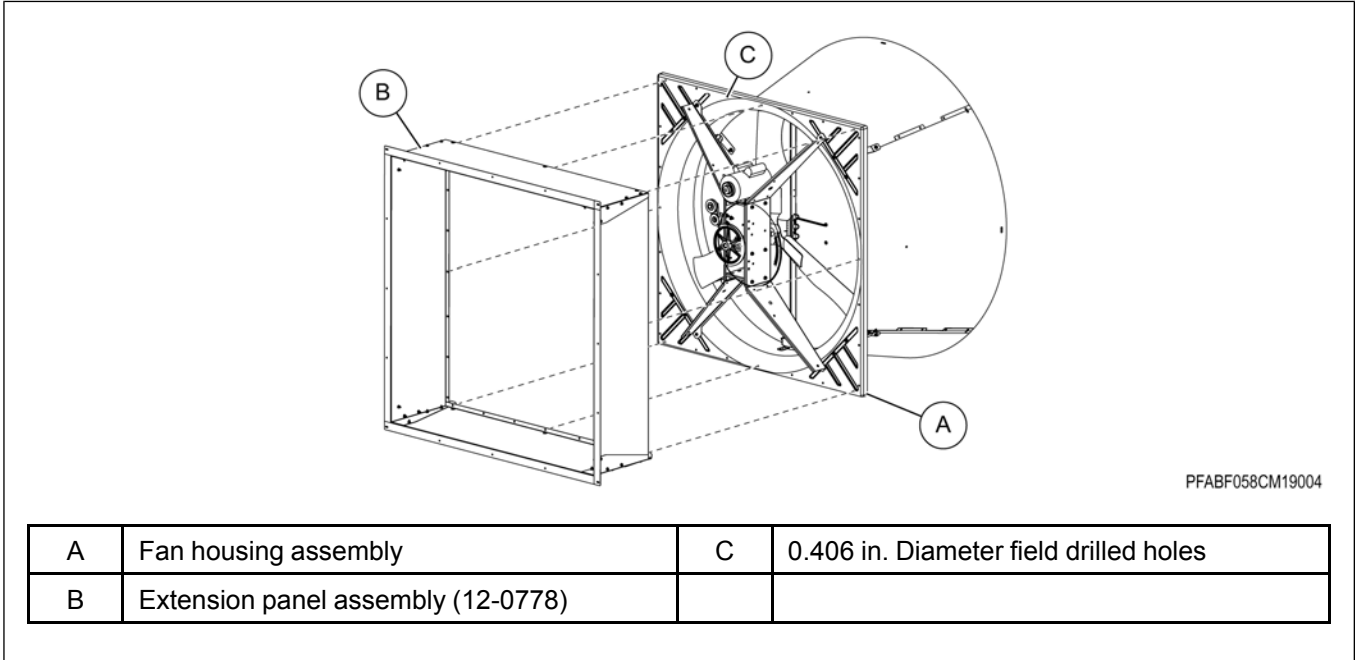
Figure 3-14 58 in. Inlet grill assembly



### Installing the Fan Extension for Shutter Fans

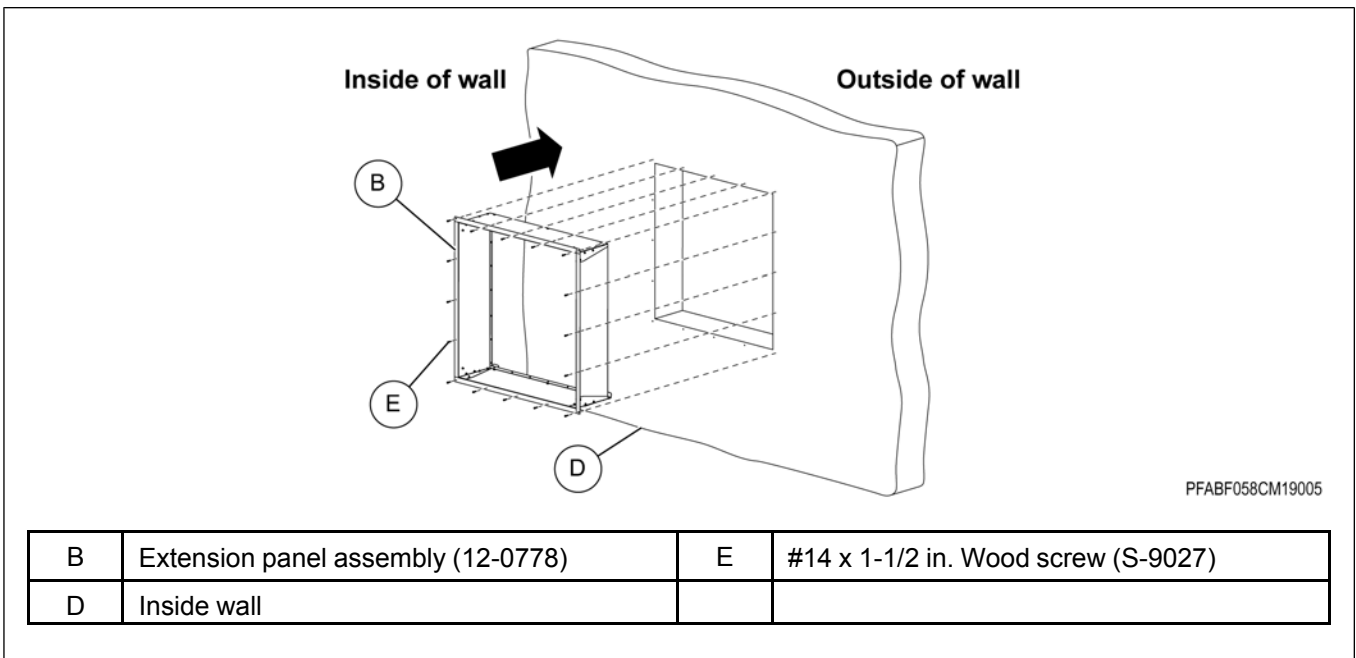
1. Align the fan housing assembly (A) to the front of the extension panel assembly (B) and mark the holes of the inside flanges on the fan housing assembly (A).
2. Field drill 0.406 in. diameter holes (C) in the fan housing where marked.

Figure 3-15 Marking the field drill holes



3. Install the extension panel assembly (B) to the inside wall (D) using #14 x 1-1/2 in. wood screws (E).

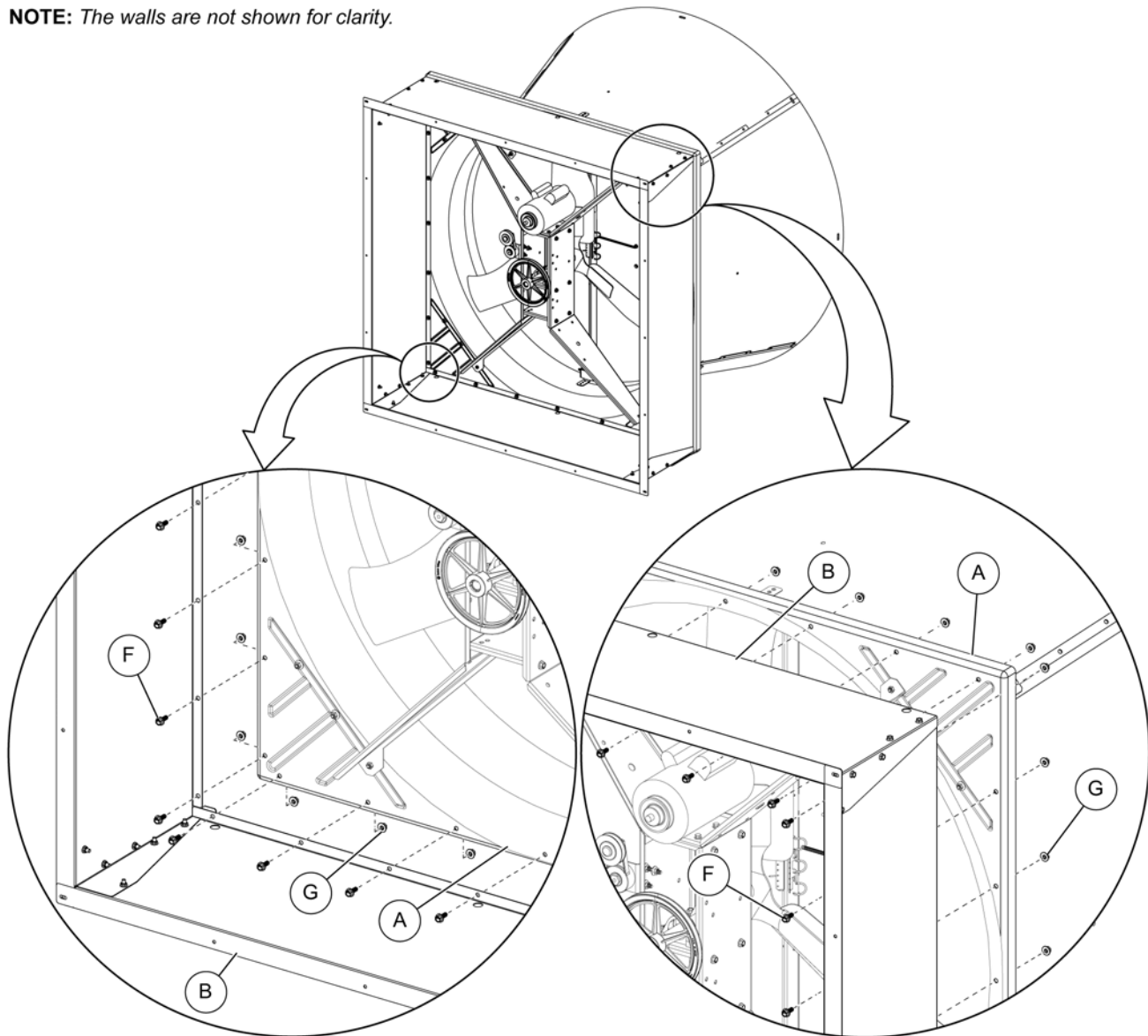
Figure 3-16 Installing the extension panel assembly to the inside wall



4. Position the fan housing assembly (A) to the front of the extension panel assembly (B) and align the field drilled holes on the fan housing assembly (A) with the holes in the inside flanges of the extension panel assembly (B).
5. Install the fan housing assembly (A) to the extension panel assembly (B) using 3/8 x 1 in. flange bolts (F) and 3/8 in. flange nuts (G).

Figure 3-17 Installing the fan housing to the extension panel assembly

**NOTE:** The walls are not shown for clarity.



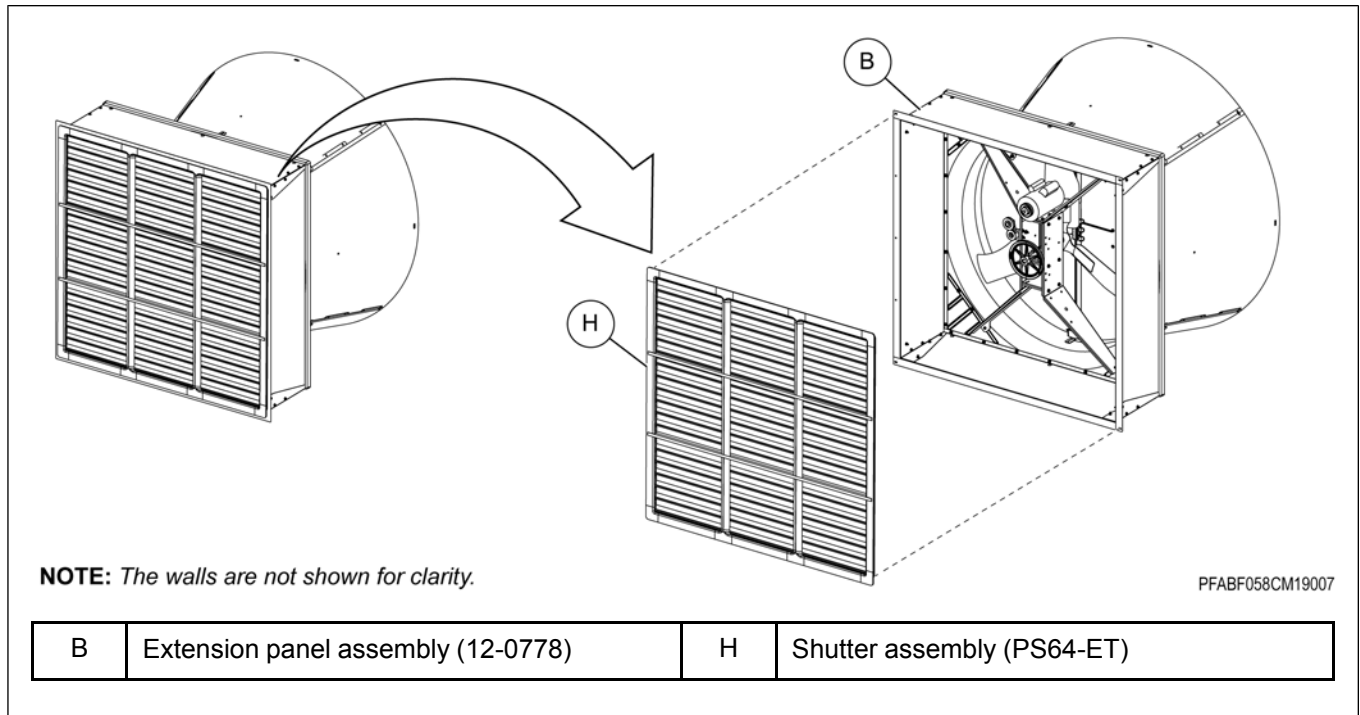
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A	Fan housing assembly	F	3/8 x 1 in. Flange bolt (S-7485)
B	Extension panel assembly (12-0778)	G	3/8 in. Flange nut (S-968)

## Chapter 3: Installation Guide

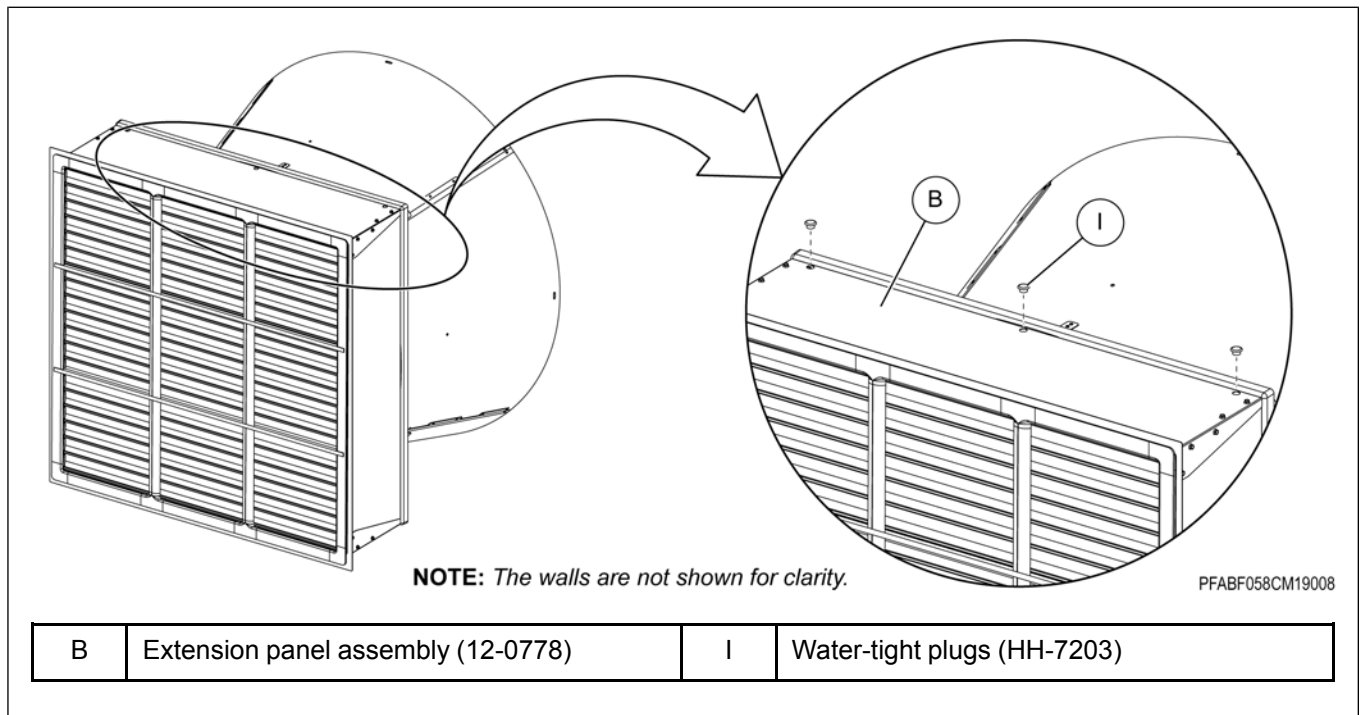
6. Insert the shutter assembly (H) into the extension panel assembly (B) and use the plastic shutter clips to lock down the shutters.

**Figure 3-18** *Installing the shutter to the extension panel assembly*



7. Install the three water-tight plugs (I) to the top of the extension panel assembly (B).

**Figure 3-19** *Installing the water-tight plugs to the top panel*



# 4 Knocked Down Assembly

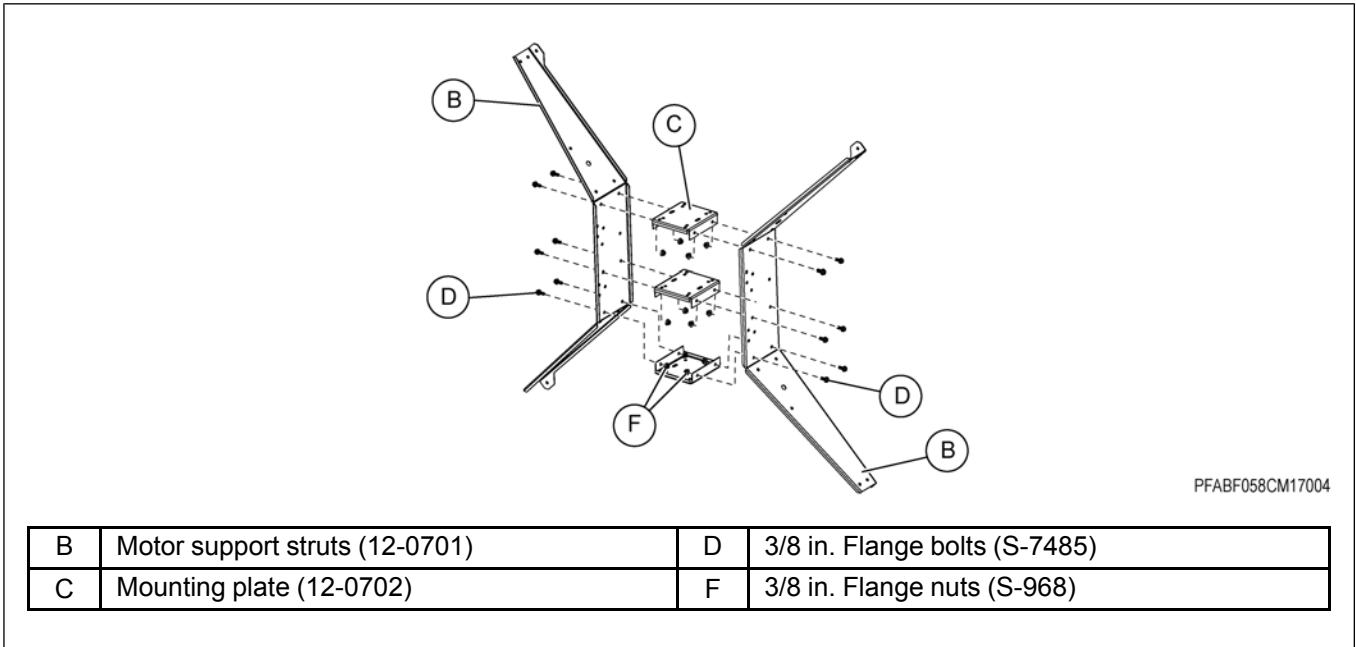
## Topics Covered in this Chapter

- Fan Cabinet Assembly
- Motor and Belt Installation
- Butterfly Assembly
- Cone Panel Assembly
- Installing the Cone
- Grill Guard Assembly
- Electrical Connection
- Inlet Grill Assembly
- Installing the Fan Extension for Shutter Fans

## Fan Cabinet Assembly

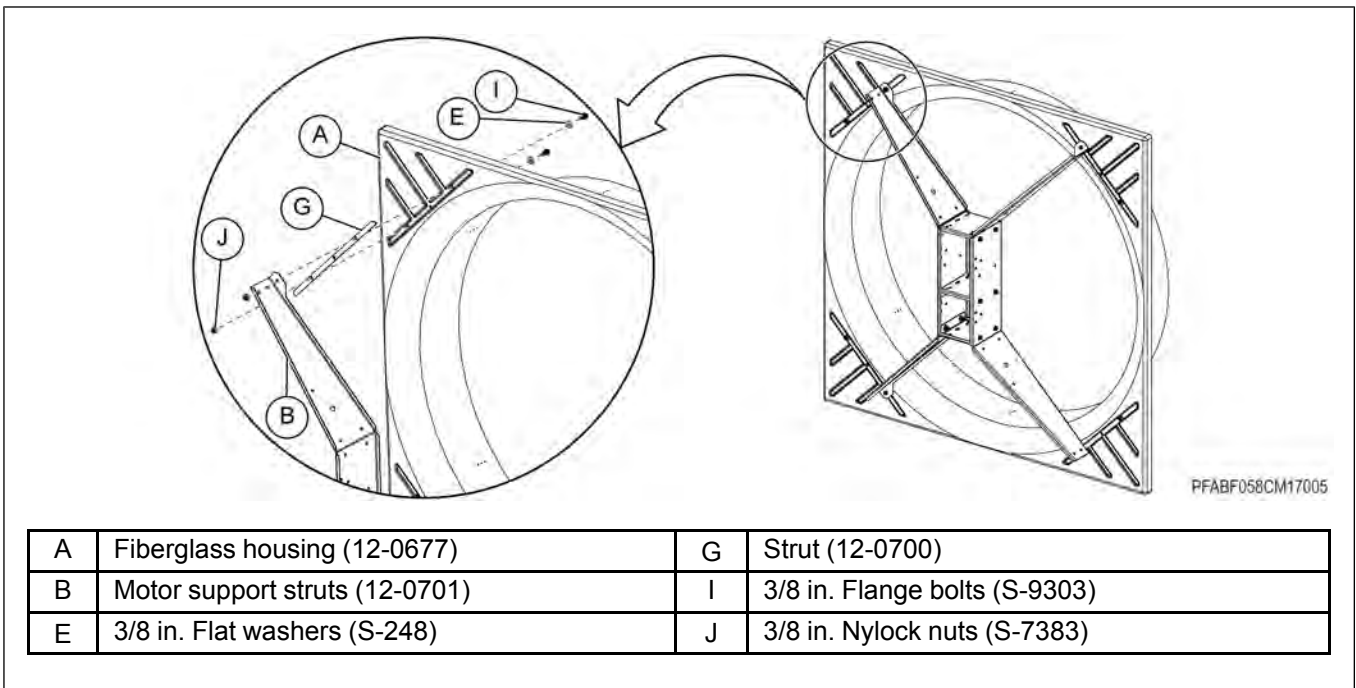
1. Assemble the two motor support struts (B) with three mounting plates (C) as shown using flange bolts (D) and flange nuts (F).

Figure 4-1 Assembling the support struts with mounting plates



2. Install the motor support struts (B) with strut (G) to the fiberglass housing (A) using flange bolts (I), flat washers (E) and flange nuts (J).

Figure 4-2 Installing the motor support struts



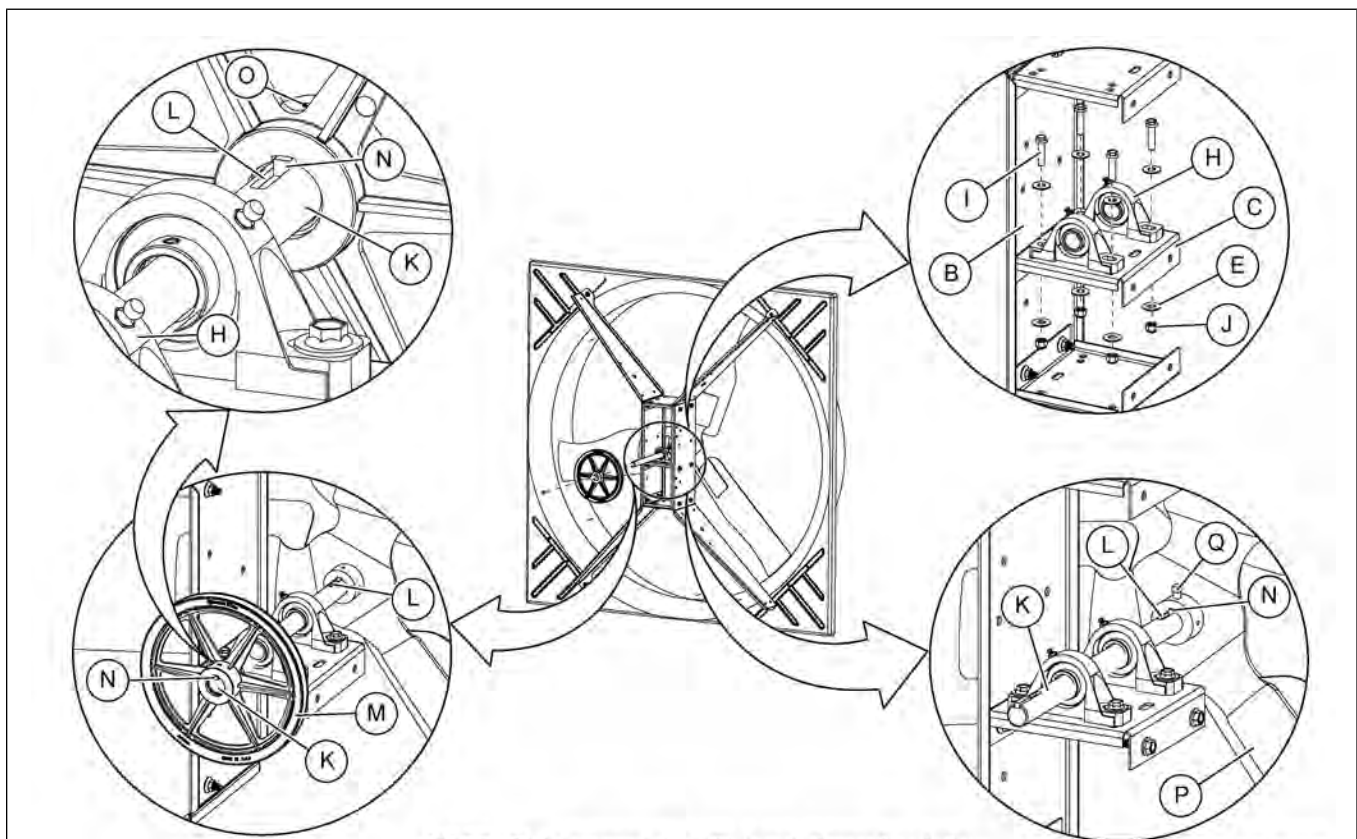


3. Install the bearings (H) to the middle mounting plate (C) of the motor support struts (B) using flange bolts (I), flat washers (E) and nuts (J).
4. Insert the shaft (K) through the bearings (H) and tighten the bearing set screw to 140 inch/pounds torque.
5. Align the keyways (L) and insert the pulley (M) on the shaft (K) with the key (N). Secure the pulley (M) to the shaft (K) with the set screw (O). (Torque set screw to 120 inch/pounds torque)

**NOTE:** Make sure that the propeller is installed on the inside of the venturi.

6. Align the keyway (L) and insert the propeller (P) on the other end of the shaft (K) with the key (N).
7. Secure the propeller (P) to the shaft (K) with the prop screw (Q). (Torque set screw to 120 inch/pounds torque)

**Figure 4-3** Installing the pulley and the propeller



**NOTE:** Right support strut (B) is not shown for clarity.

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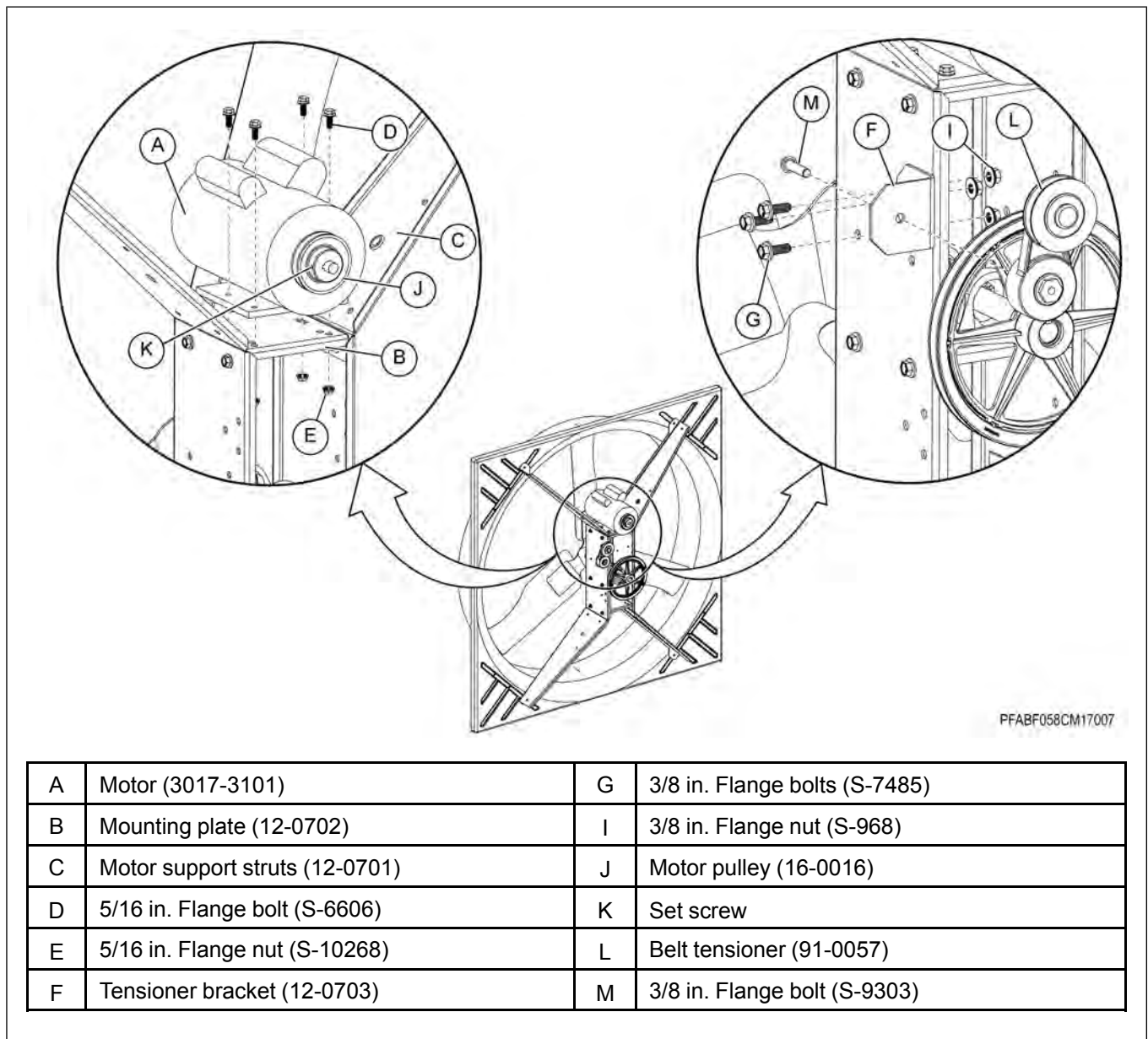
B	Motor support struts (12-0701)	L	Keyway
C	Mounting plate (12-0702)	M	Pulley (12-0493)
E	3/8 in. Flat washers (S-248)	N	Key (S-9168)
H	Bearings (13-0226)	O	Set screw
I	3/8 in. Flange bolts (S-9303)	P	Propeller (13-0238)
J	3/8 in. Nylock nuts (S-7383)	Q	Prop screw
K	Shaft (12-0707)		

## Motor and Belt Installation

1. Install the motor (A) to the top mounting plate (B) of the motor support struts (C) using flange bolts (D) and flange nuts (E).
2. Install the tensioner bracket (F) to the left side of the motor support bracket (C) using flange bolts (G) and flange nuts (I). (Torque set screw to 120 inch/pounds torque)
3. Align the keyway and insert the pulley (J) on the motor shaft. Secure the pulley (J) to the motor shaft using the set screw (K).
4. Install the belt tensioner (L) to the tensioner bracket (F) using flange bolt (M).

**NOTE:** Make sure to tighten the belt tensioner at 10 o'clock position before adding the belt.

Figure 4-4 Motor installation

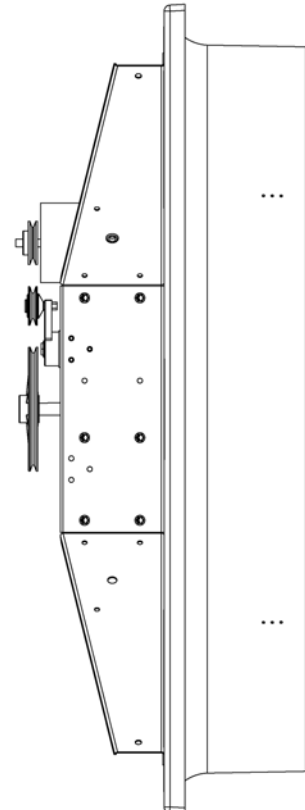
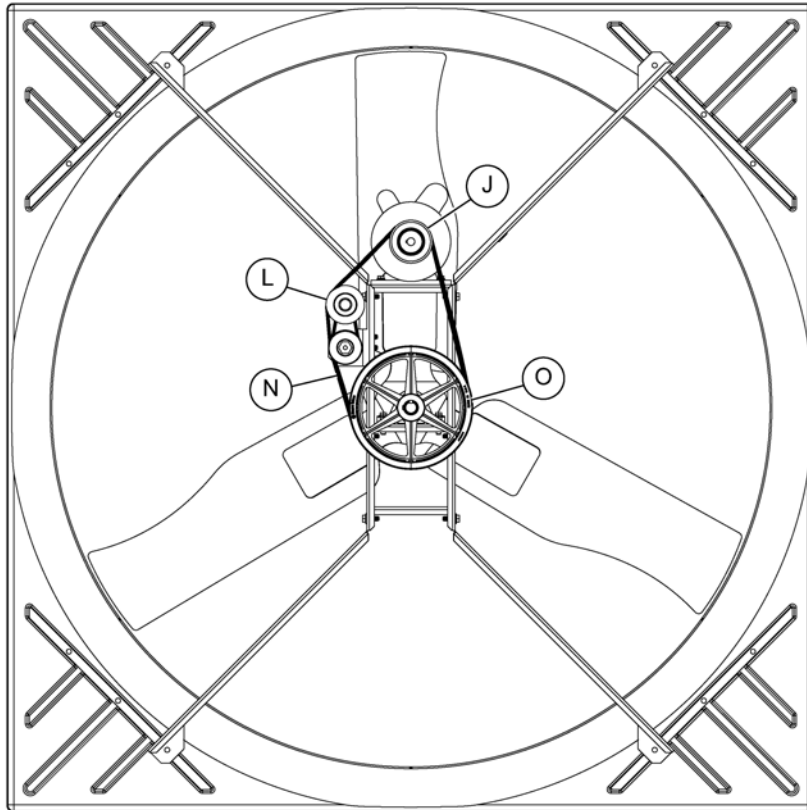


5. Wrap the belt (N) around the motor pulley (J), driven pulley (O) and tensioner arm pulley (K).

**NOTE:**

- Make sure all the three pulleys are aligned as shown below.
- Make sure the belt tensioner rests at 12 o'clock position after the belt is installed.

Figure 4-5 Belt installation



PFABF058CM17008

J	Motor pulley (16-0016)	N	Belt (1022-3107)
L	Belt tensioner (91-0057)	O	Driven pulley (12-0493)

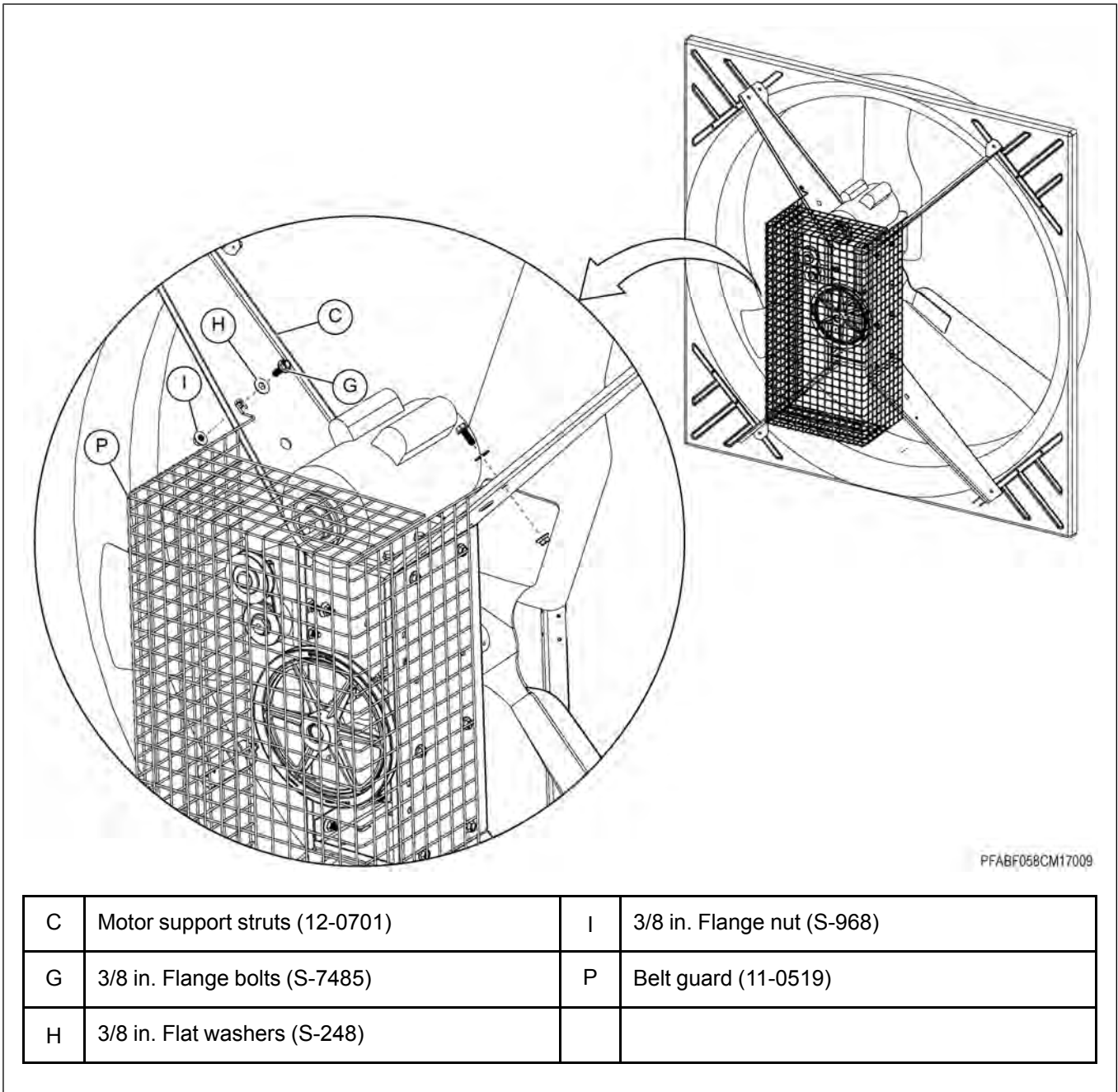
## Chapter 4: Knocked Down Assembly

6. Position the belt guard (P) to the pulley side of the motor support struts (C) and align the eyelets on the belt guard (P) with the holes in the motor support struts (C).
7. Install the belt guard (P) to the motor support struts (C) using flange bolts (G), flat washers (H) and flange nuts (I).

**NOTE:**

- a. *The 11-0519-KIT is used for secondary kit of UL and CSA fans.*
- b. *Belt guard is not used on fans with extension and shutters.*

**Figure 4-6** Belt guard installation

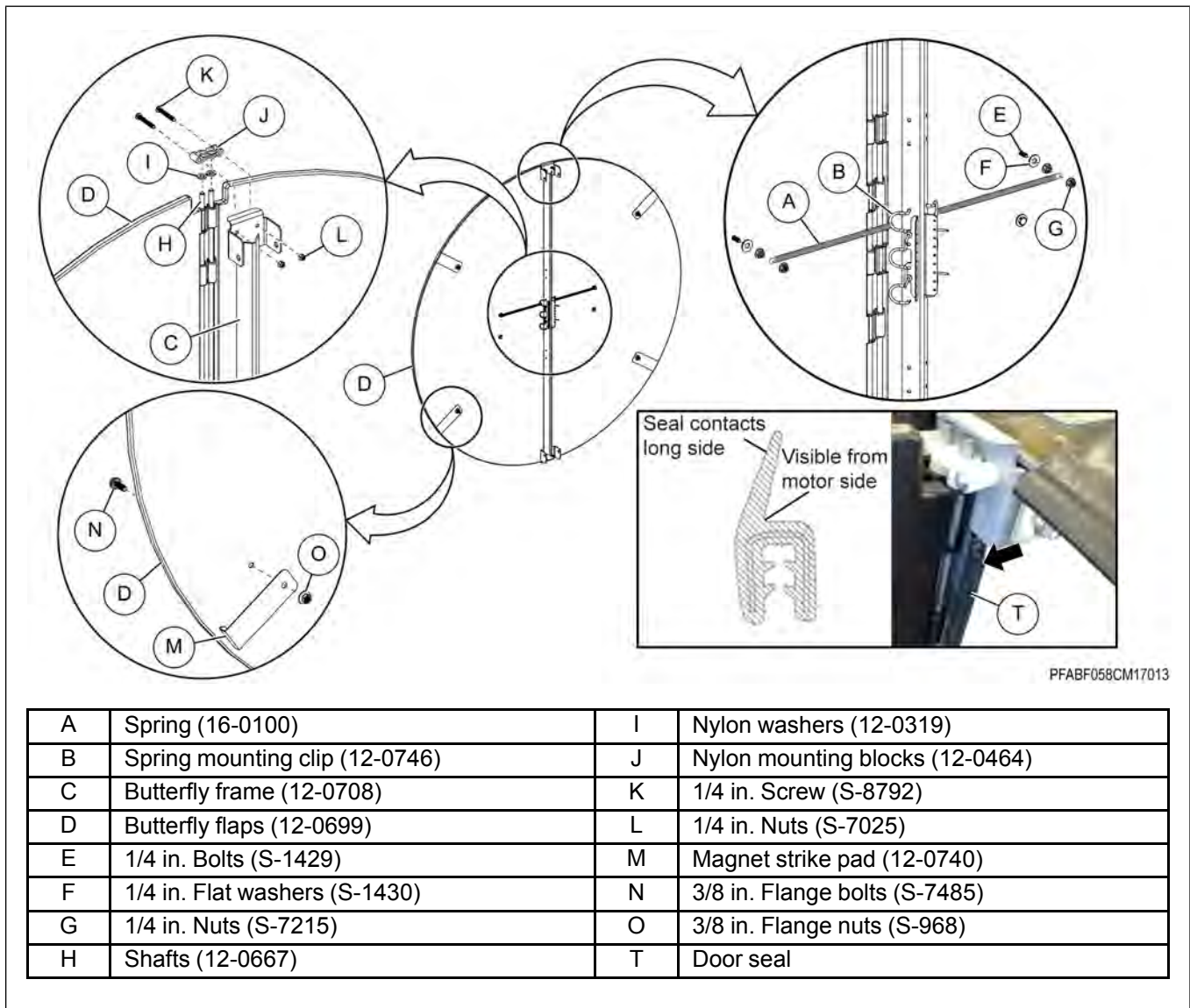


## Butterfly Assembly

**NOTE:** *Butterfly doors are not used on fans with extensions and shutters.*

1. Install the spring mounting clips (B) to the butterfly frame (C) as shown.
2. Install the vertical door seal (T) to the butterfly frame (C) making sure the long side of the seal (T) contacts the door. This can be verified if the step on the door seal is visible from the motor side of the fan. Refer to seal detail on [Figure 4-7, page 37](#).
3. Install one end of the spring (A) to the spring mounting clips (B) and other end to the butterfly flaps (D) using bolts (E), flat washers (F) and nuts (G).
4. Insert the shafts (H), washers (I), and mounting blocks (J) into the butterfly flaps (D) as shown.
5. Attach the mounting blocks (J) to the butterfly frame (C) using screws (K) and nuts (L).
6. Attach the four magnet strike pads (M) to the butterfly flaps (D) using flange bolts (N) and flange nuts (O).

**Figure 4-7** 58 in. Butterfly frame assembly

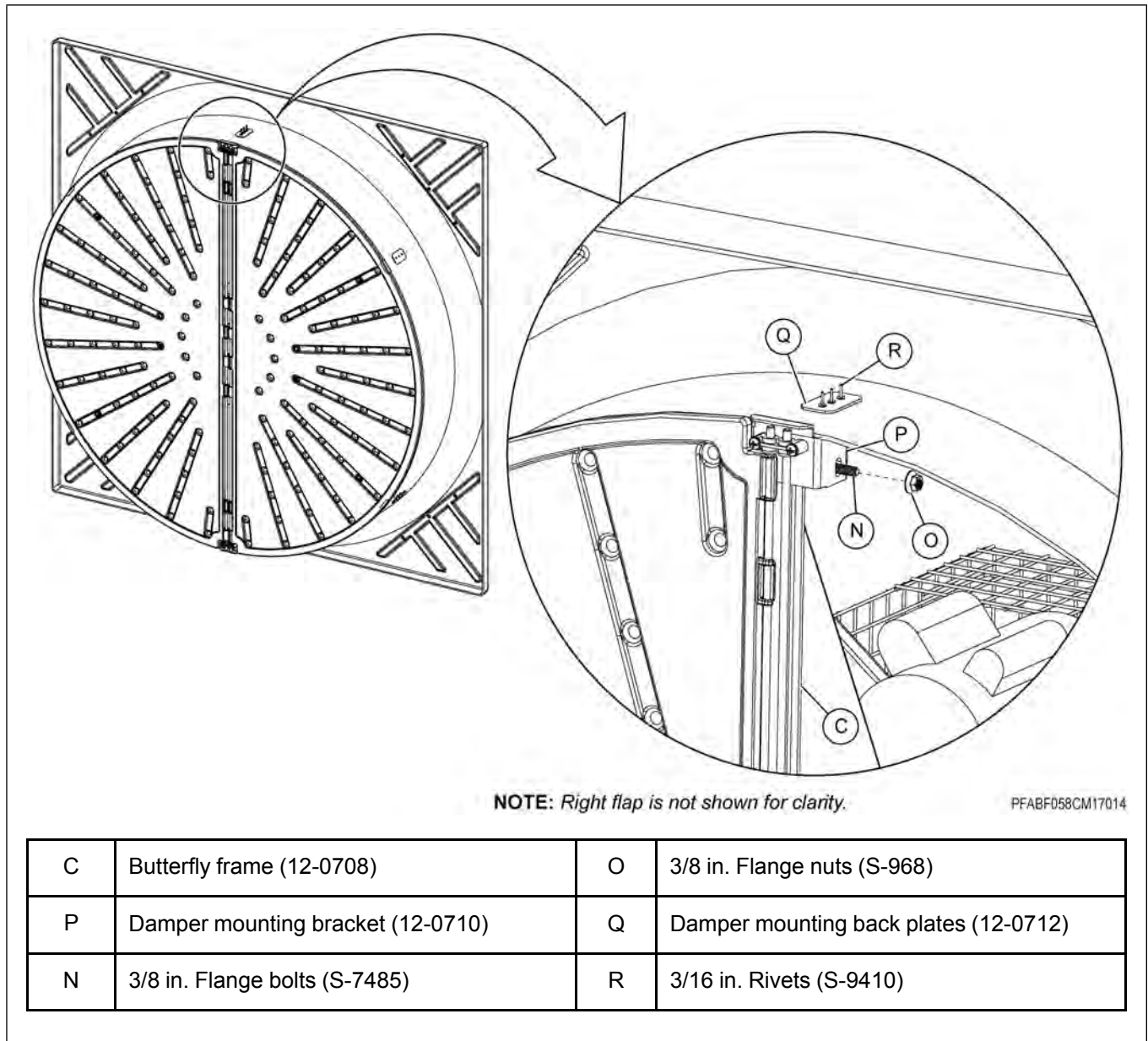


## Chapter 4: Knocked Down Assembly

7. Install the damper mounting bracket (P) to the butterfly frame (C) at the top and bottom using flange bolts (N) and flange nuts (O).
8. Align and install the damper mounting brackets (P) attached with the butterfly frame (C) to the damper mounting back plates (Q) using rivets (R).

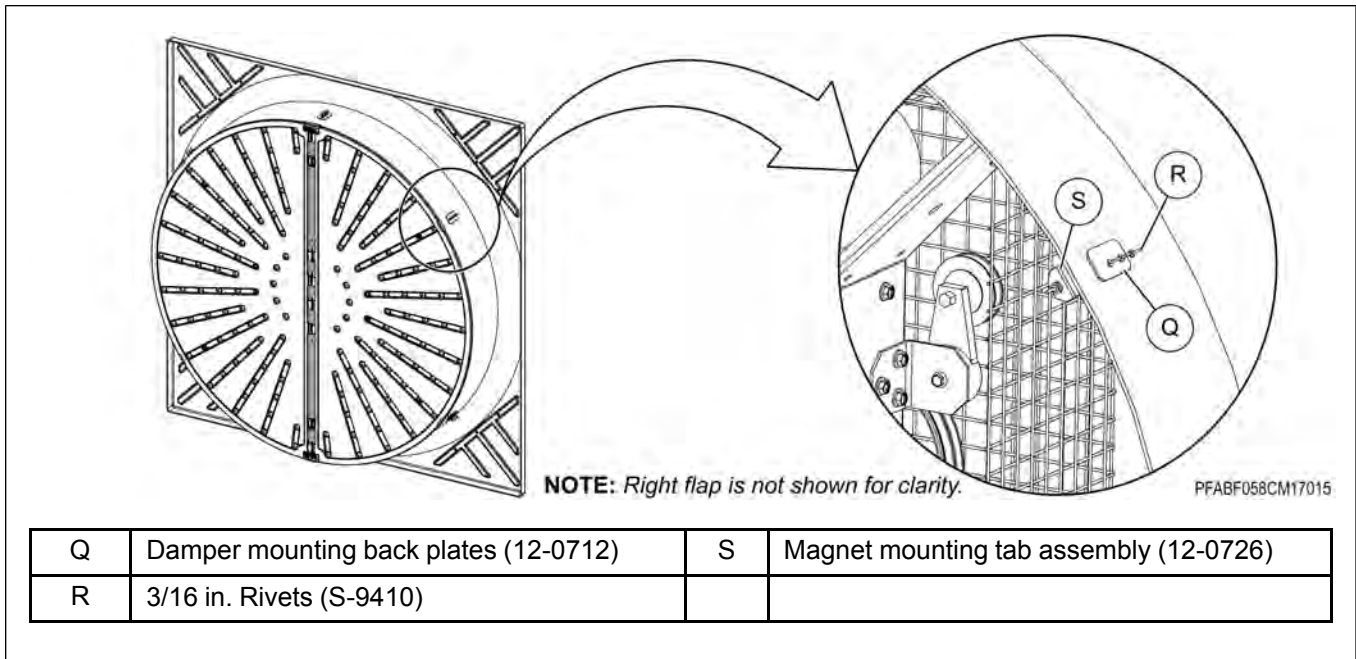
**NOTE:** Align the damper mounting brackets in such a way that the V-shaped center bar of butterfly frame is maintained vertical.

**Figure 4-8** Installing the damper mounting brackets



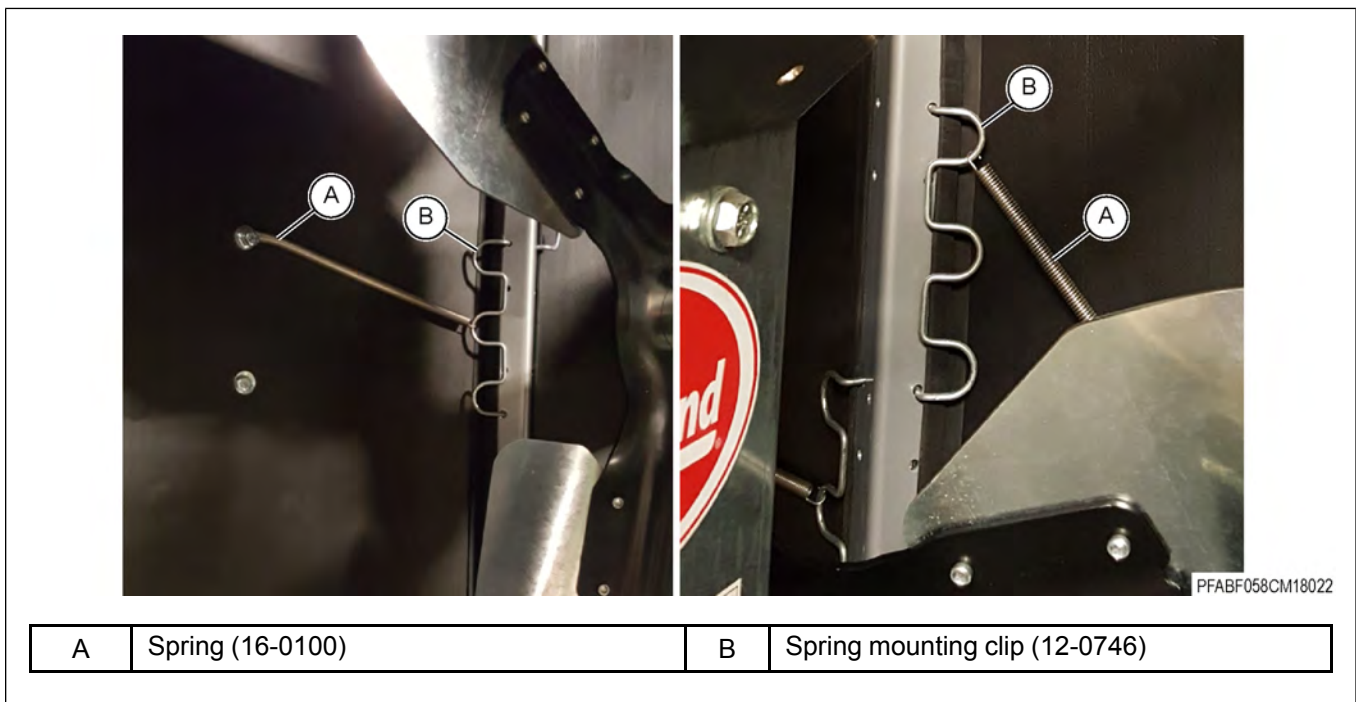
- Install the magnet mounting tabs (S) to the remaining four damper mounting back plates (Q) using rivets (R).

Figure 4-9 Installing the magnet mounting tabs



- You can adjust the spring (A) tension by moving the adjustment brackets up or down the center bracket and also repositioning the spring (A) location on the adjustment bracket .

Figure 4-10 Adjusting the spring tension



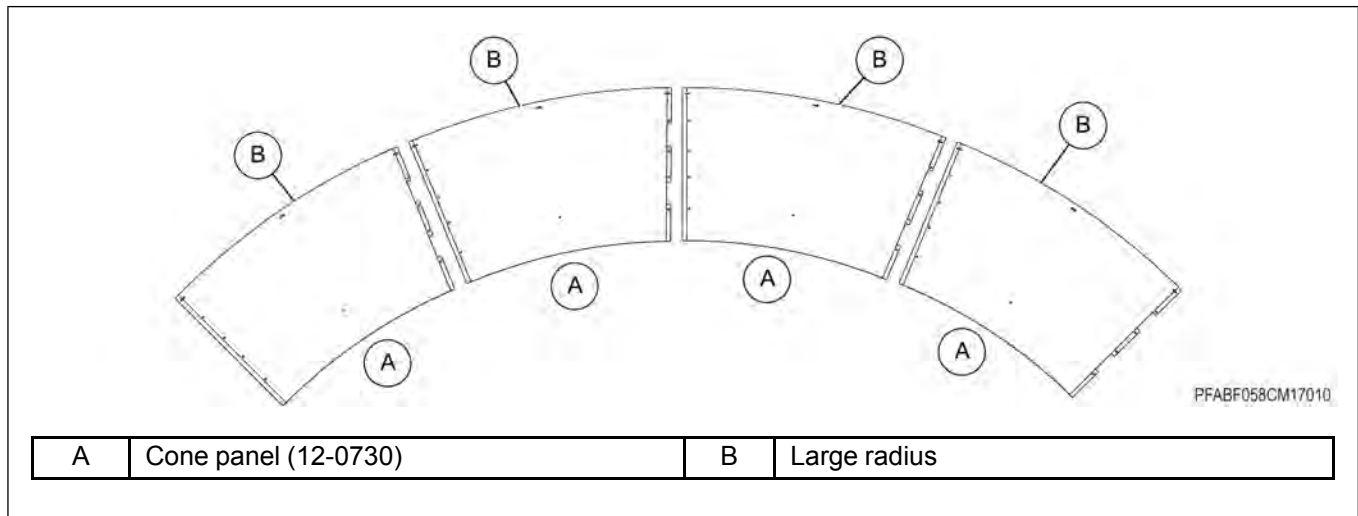
## Cone Panel Assembly

1. Lay the cone panels (A) on the ground as shown.
2. Attach the four (4) cone panels together using bolts (D), nuts (E) and washers (F). (The hardware are included in the hardware kit.)

**NOTE: Make sure that all the tabs are on the inside of the cone assembly for consistency purposes.**

3. Install the bolts and nuts through the holes where the panels overlap, to hold the four (4) cone panels together.
4. Once four (4) cone panels are assembled stand the assembly up with the large radius (B) side down.

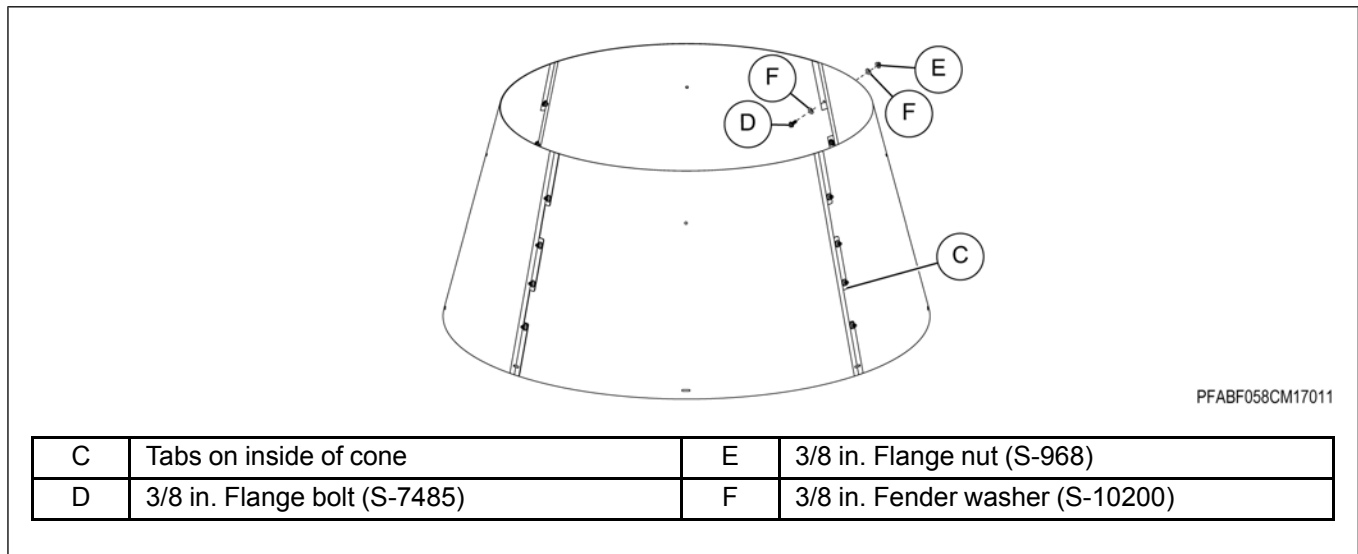
Figure 4-11 Cone panel assembly



5. Install the remaining bolts (D), nuts (E) and washers (F) into place to hold the cone together.

**NOTE: Install bolts (D) with bolt head on the inside of the cone assembly. Hand tighten the nuts (E).**

Figure 4-12 Cone assembly





## Installing the Cone

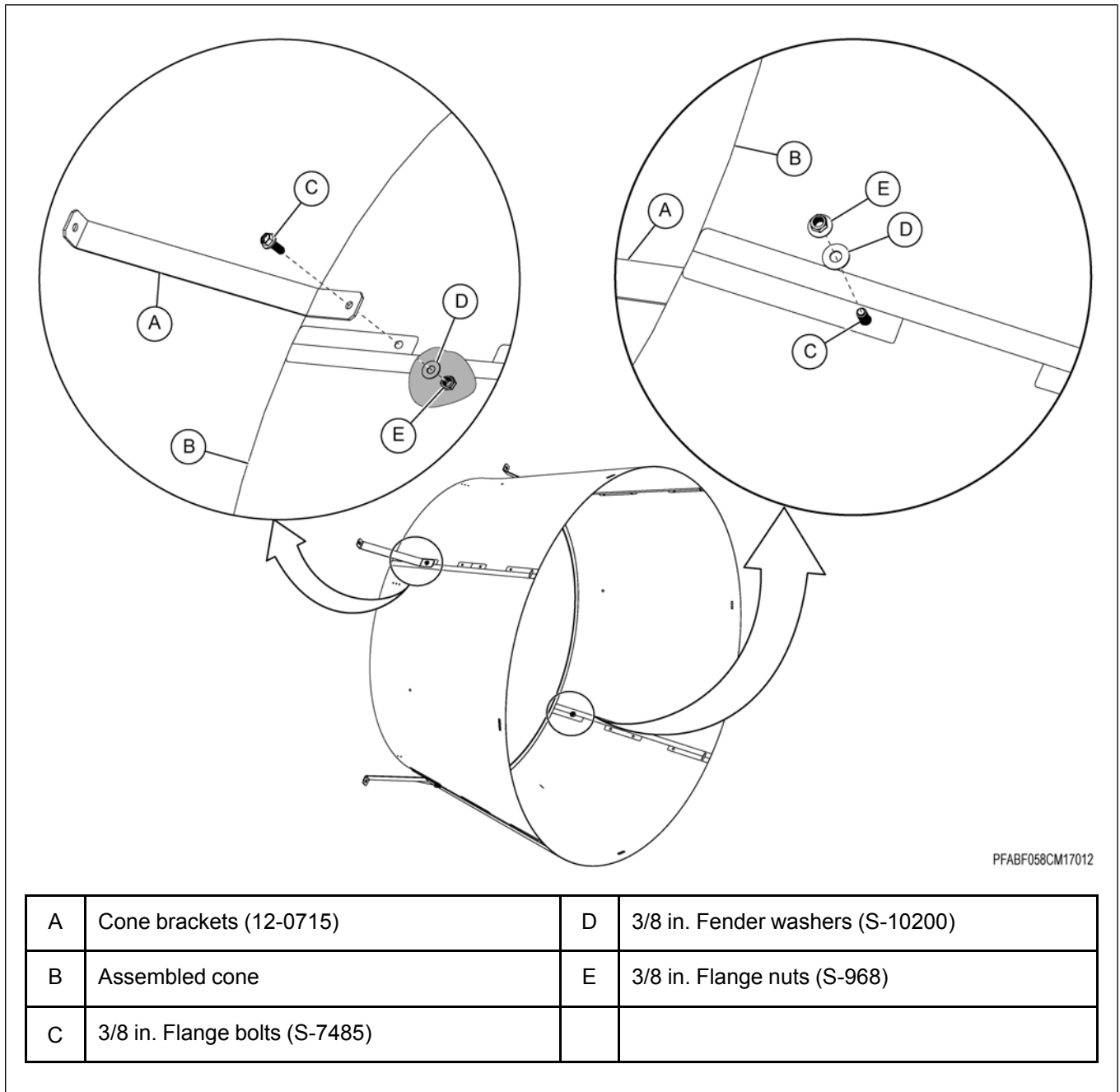
### What You Should Know

**IMPORTANT:** *It is important that this method of assembly be used when assembling the cone or the installer will struggle trying to slip the assembled cone over the door seal.*

1. Install the four cone brackets (A) to the cone (B) using two flange bolts (C), fender washers (D) and flange nuts (E).

**NOTE:** *The holes are already pre-drilled in the cone.*

**Figure 4-13** *Installing the cone brackets to the cone*

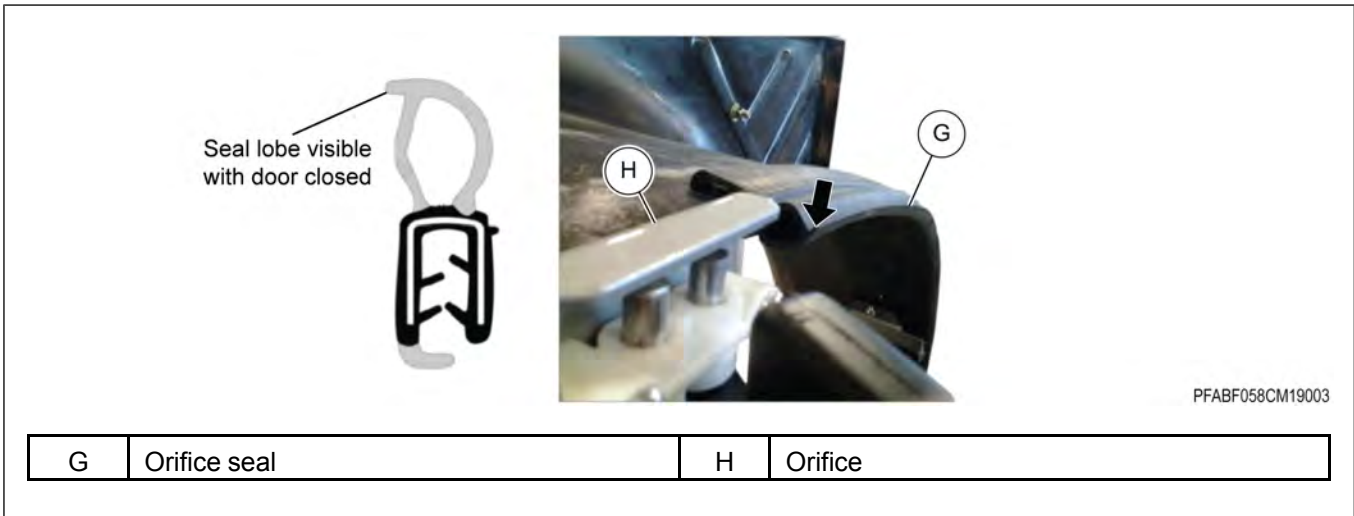


## Chapter 4: Knocked Down Assembly

2. Install the orifice seal (G) to the round orifice (H) on the housing.

**NOTE:** Make sure to install the orifice seal (G) so that the seal lobe is installed towards the intake side of the fan. This can be verified if the seal lobe is visible with the door closed.

Figure 4-14 Installing the orifice seal

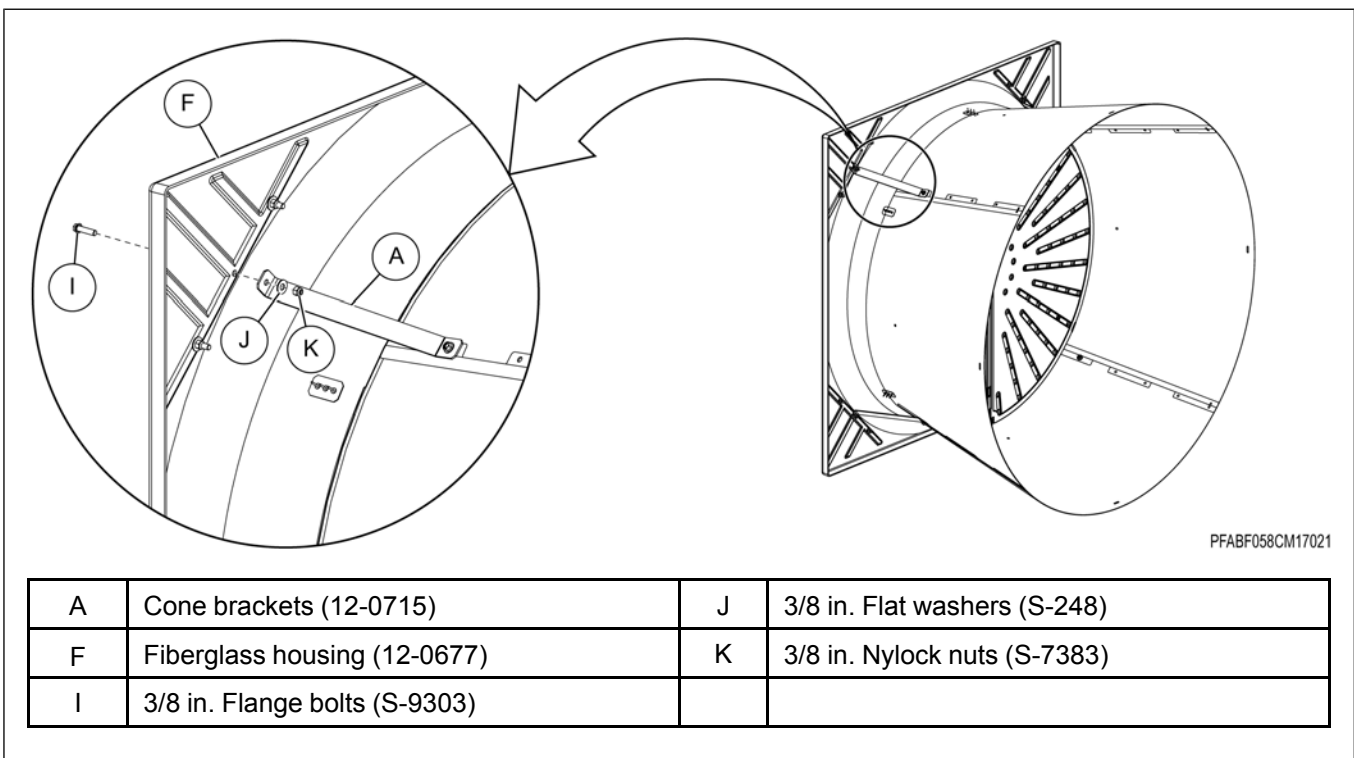


3. Starting at the top of the housing, install the cone over the housing and attach the two **TOP** cone brackets (A) to the fiberglass housing (F) using flange bolts (I), flat washers (J) and nuts (K).

**NOTE:** At this point, the bottom of the cone should easily slip over the bottom of the housing.

4. Install the bottom cone brackets (A) to the fiberglass housing (F) using flange bolts (I), flat washers (J) and nuts (K).

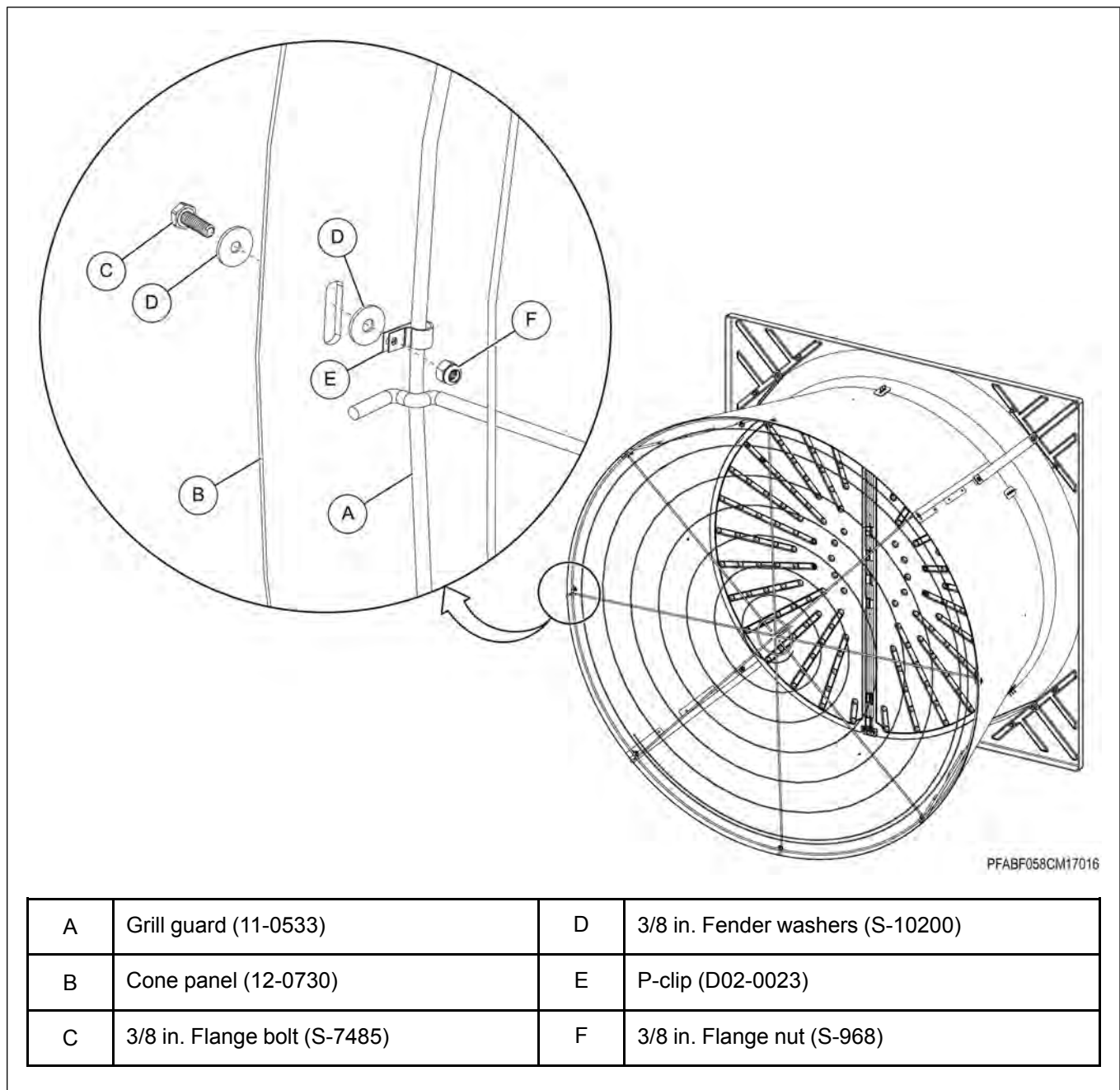
Figure 4-15 Installing the cone brackets to the fiberglass housing



## Grill Guard Assembly

1. Place the grill guard (A) to the inside of the cone (B), making sure the bent ends of the straight grill pieces are facing outward.
2. Install the P-clip (E) around the grill guard (A) and align it with the slot in the cone (B).
3. Install the bolt (C) from the outside of the cone (B), through the outside fender washer (D), cone (B), inside fender washer (D), P-clip (E) and nut (F).
4. Continue installing the P-clips (E) to the grill (A) at all the slots around the cone (B).

Figure 4-16 Grill guard assembly



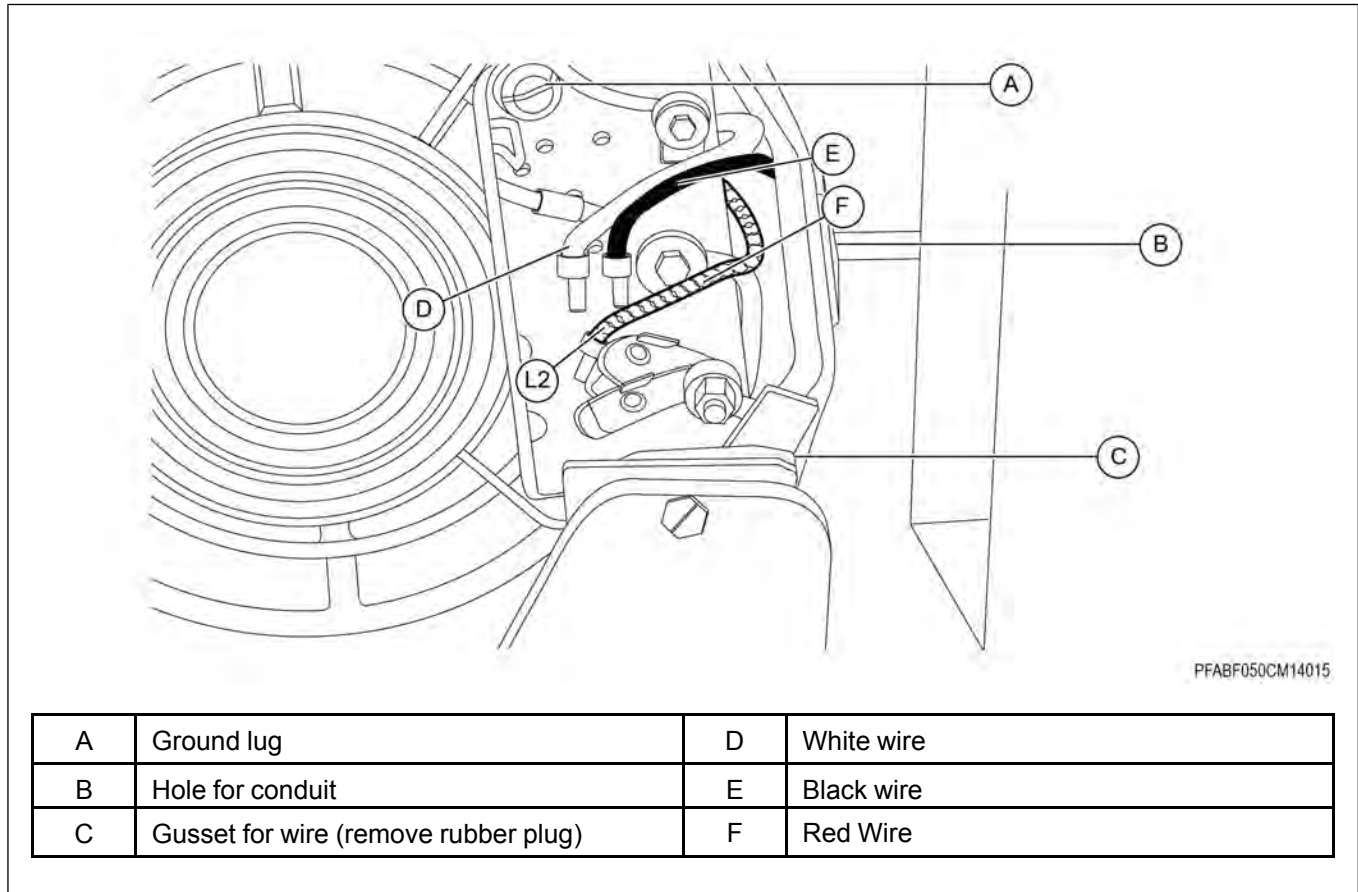
## Electrical Connection

### Before You Begin

All wiring should be installed in accordance with National, State and Local electrical codes. A certified electrician should complete this portion of the installation to ensure safety and that the wiring is correct for the application.

1. First, remove the back cover of the motor exposing the wiring block.

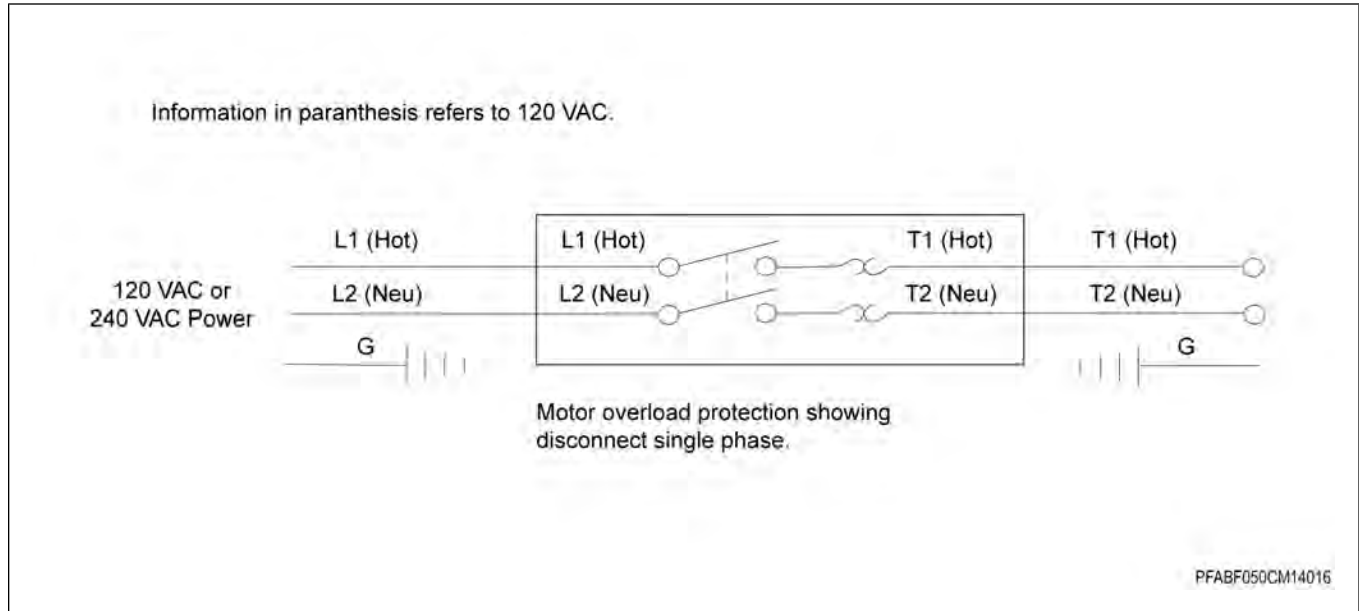
Figure 4-17 Wiring connections



2. The motor is designed to use either a solid clamping conduit on the side of the motor or the supplied wire with a three-prong plug attached. In either case, it is important to attach the ground wire to the ground lug (A) as depicted.
3. For correct motor rotation (CCW), the Red wire (F) should be located on the L2 connection as depicted. If this is not the case, switch the Red (F) and Black (E) wires. Refer to wiring diagram on the side of the motor for correct wiring for 115V and 230V supply.
4. Fans used to ventilate livestock buildings or other rooms where continuous air movement is essential should be connected to individual electrical circuits with a minimum of two (2) circuits per room. For connection requirements refer to diagram on the motor nameplate.

5. For single phase fans, motor overload protection should be provided for each fan.
6. A safety cut-off switch should be located next to each fan. A circuit breaker switch or slow blow motor type fuses must be used. 3 Phase fans require three (3) pole contactors with overload protection.

**Figure 4-18** *Electrical connections*



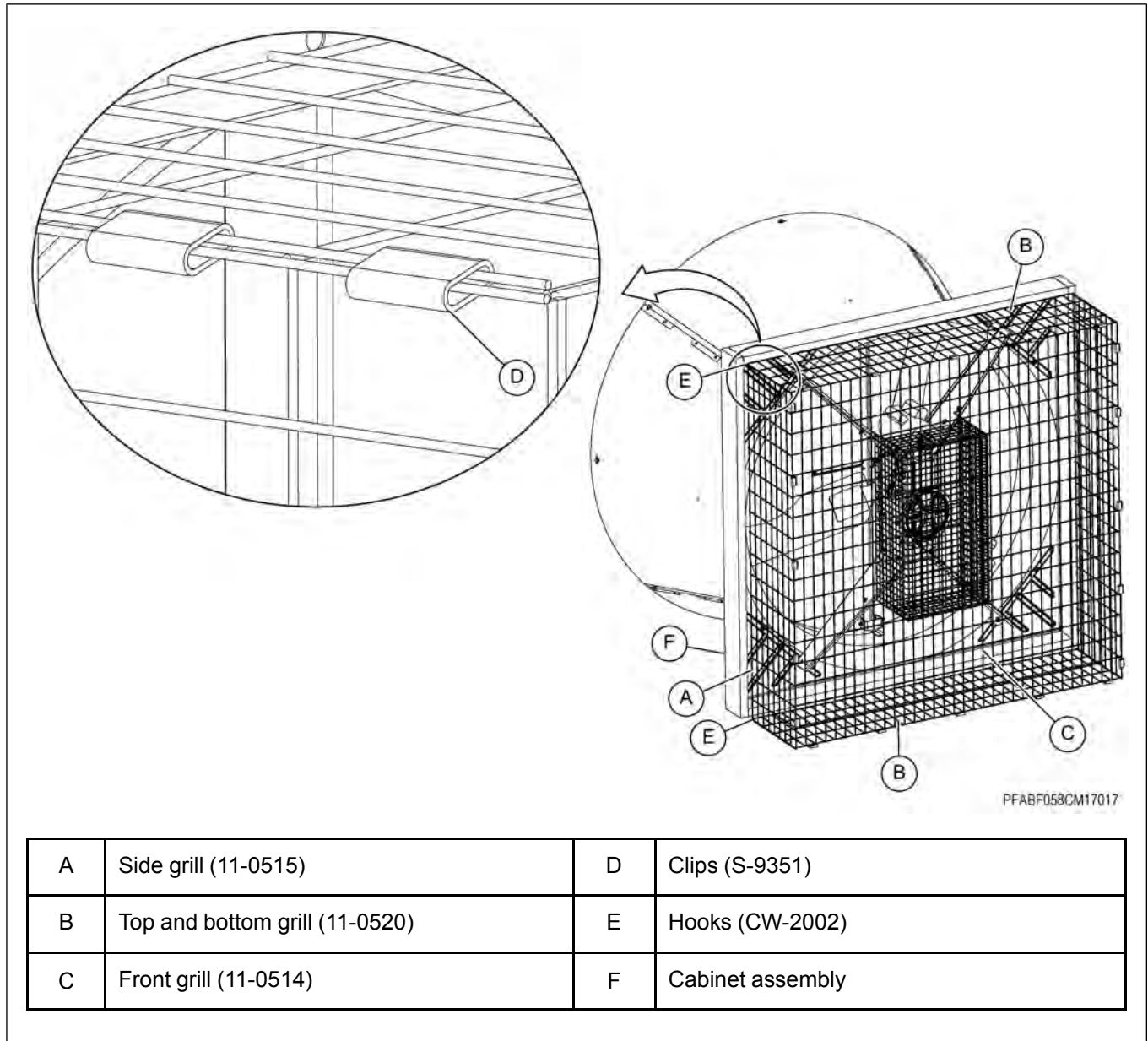
## Inlet Grill Assembly

**NOTE:** For 58 in. PVC shutter fans, the inlet grill will not be used.

1. Attach the side grills (A) to the top and bottom grills (B) together with clips (D). Crimp the clips.
2. Attach the front grill (C) to the sides using the clips (D). Crimp the clips.
3. Install the hanging hooks (E) on the four corners of the fan cabinet assembly (F).
4. Install the assembled front grill (C) to the hanging hooks (E).

**NOTE:** Use six hooks (E) to install the grill assembly to the cabinet assembly (F).

**Figure 4-19** 58 in. Inlet grill assembly

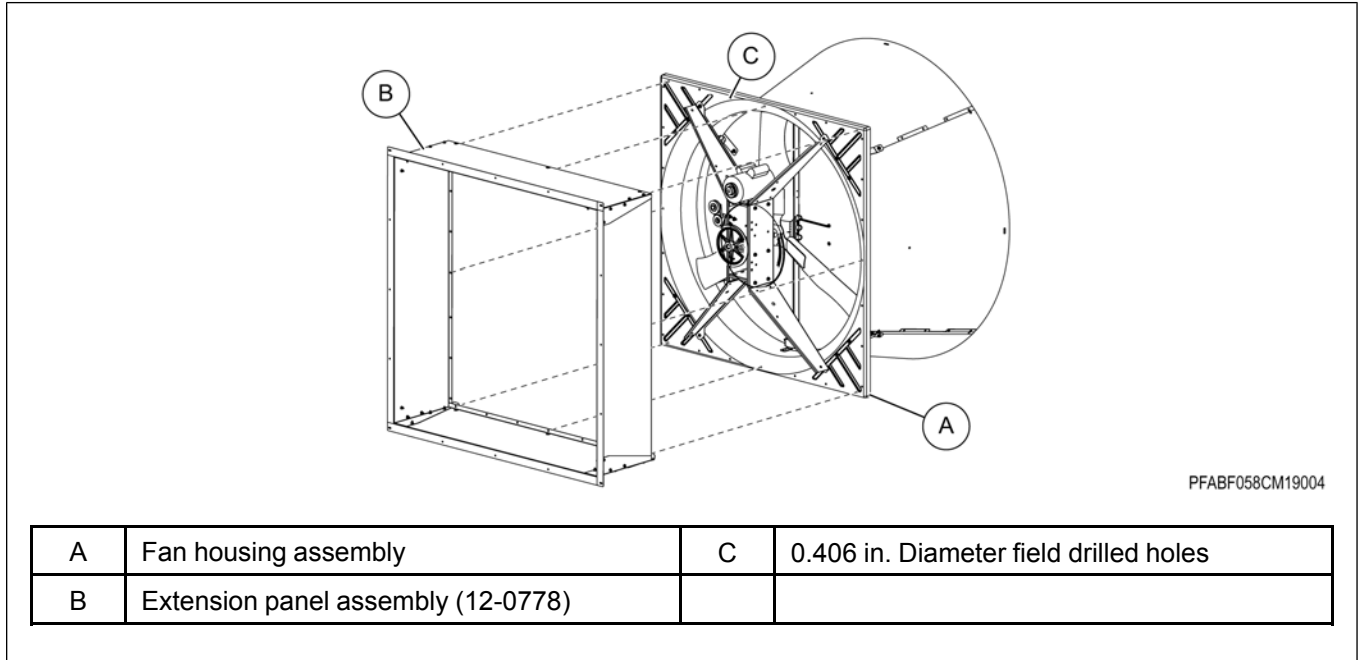


A	Side grill (11-0515)	D	Clips (S-9351)
B	Top and bottom grill (11-0520)	E	Hooks (CW-2002)
C	Front grill (11-0514)	F	Cabinet assembly

## Installing the Fan Extension for Shutter Fans

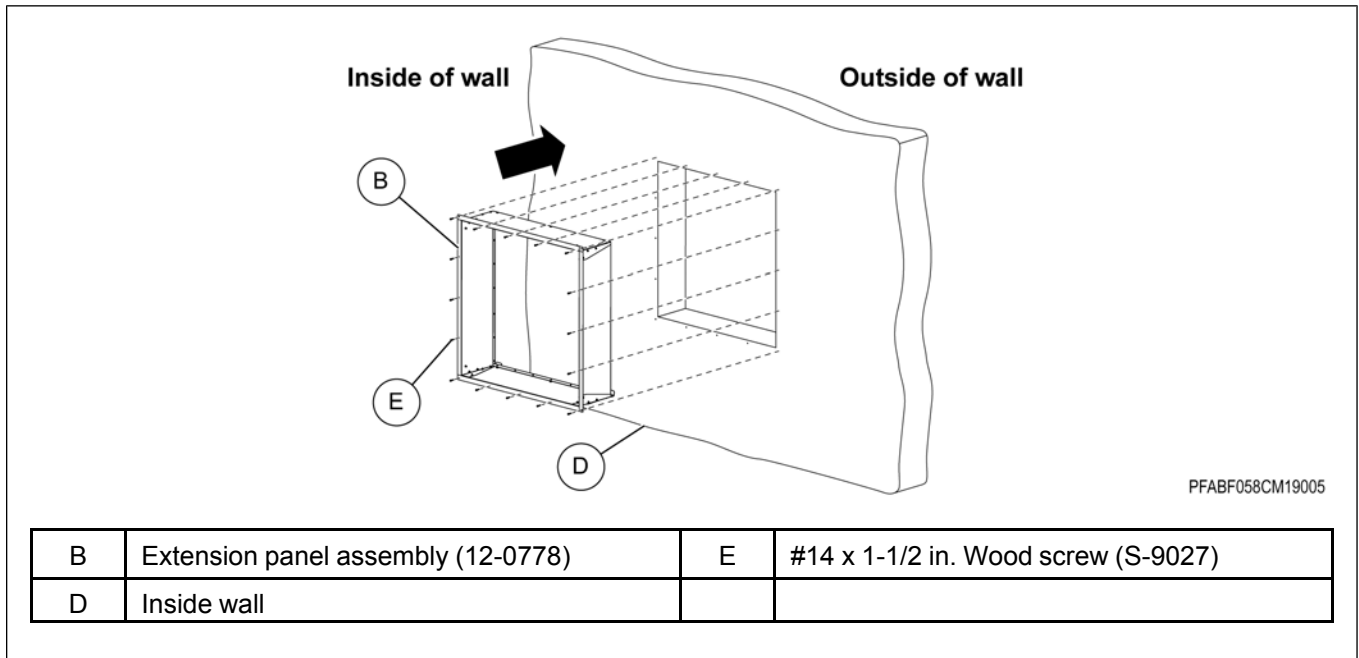
1. Align the fan housing assembly (A) to the front of the extension panel assembly (B) and mark the holes of the inside flanges on the fan housing assembly (A).
2. Field drill 0.406 in. diameter holes (C) in the fan housing where marked.

Figure 4-20 Marking the field drill holes



3. Install the extension panel assembly (B) to the inside wall (D) using #14 x 1-1/2 in. wood screws (6).

Figure 4-21 Installing the extension panel assembly to the inside wall

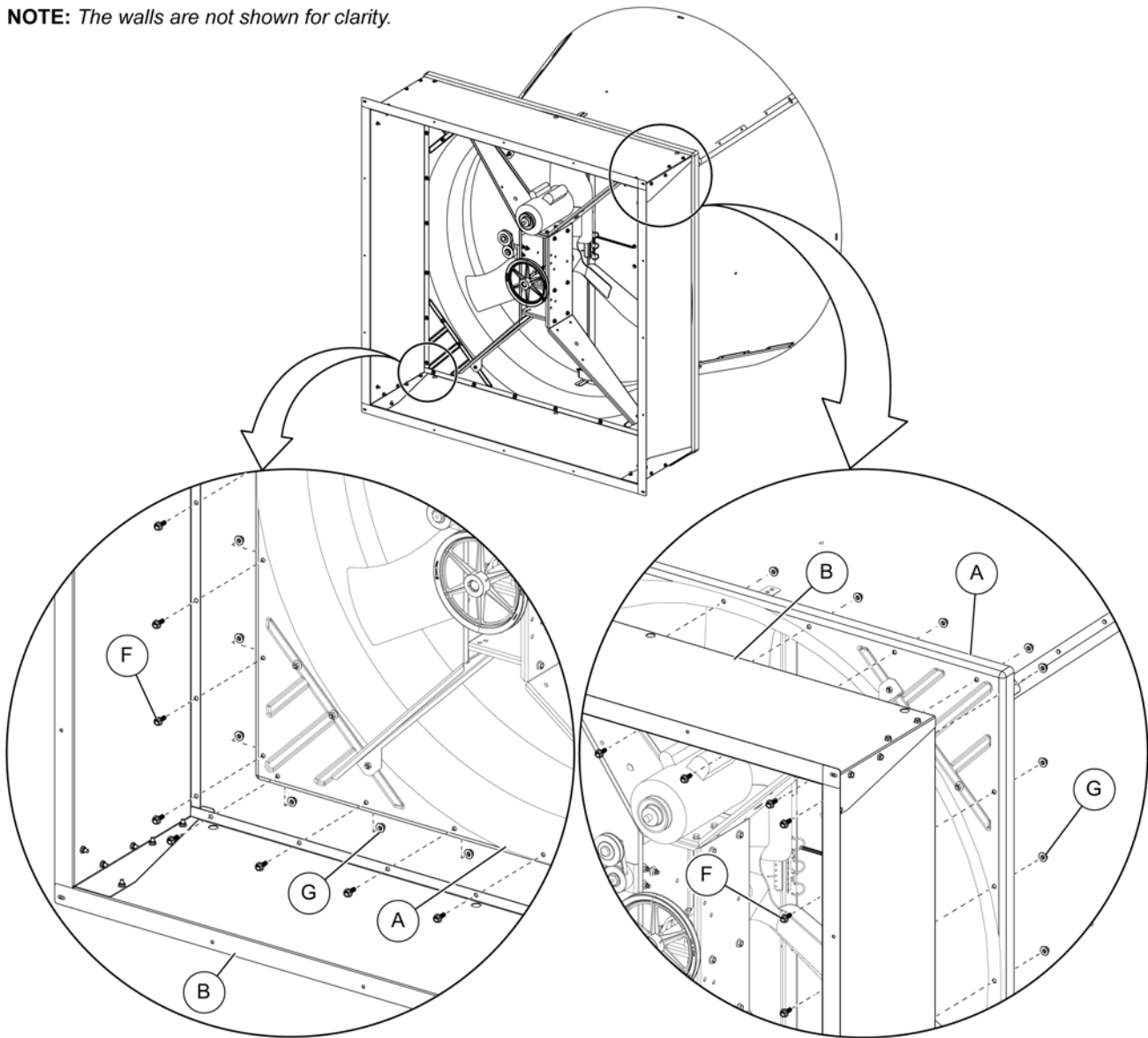


## Chapter 4: Knocked Down Assembly

4. Position the fan housing assembly (A) to the front of the extension panel assembly (B) and align the field drilled holes on the fan housing assembly (A) with the holes in the inside flanges of the extension panel assembly (B).
5. Install the fan housing assembly (A) to the extension panel assembly (B) using 3/8 x 1 in. flange bolts (F) and 3/8 in. flange nuts (G).

**Figure 4-22** *Installing the fan housing to the extension panel assembly*

**NOTE:** *The walls are not shown for clarity.*



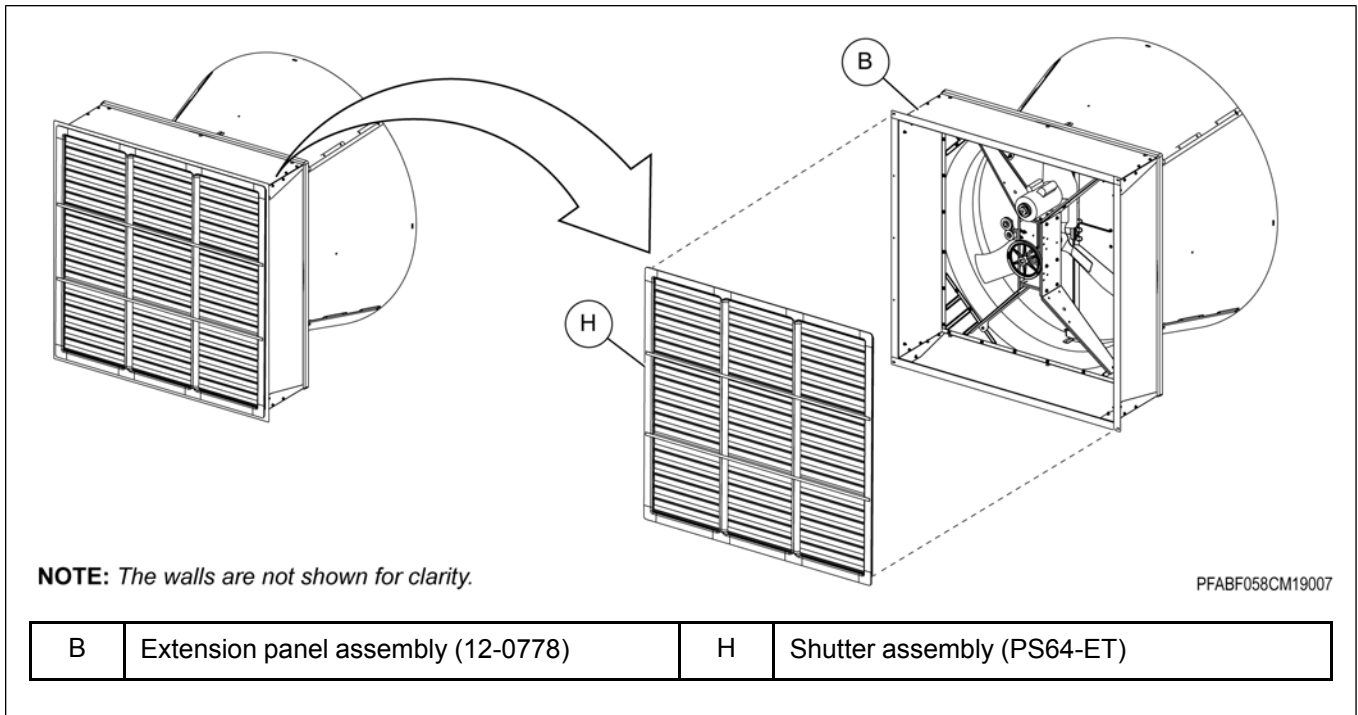
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A	Fan housing assembly	F	3/8 x 1 in. Flange bolt (S-7485)
B	Extension panel assembly (12-0778)	G	3/8 in. Flange nut (S-968)



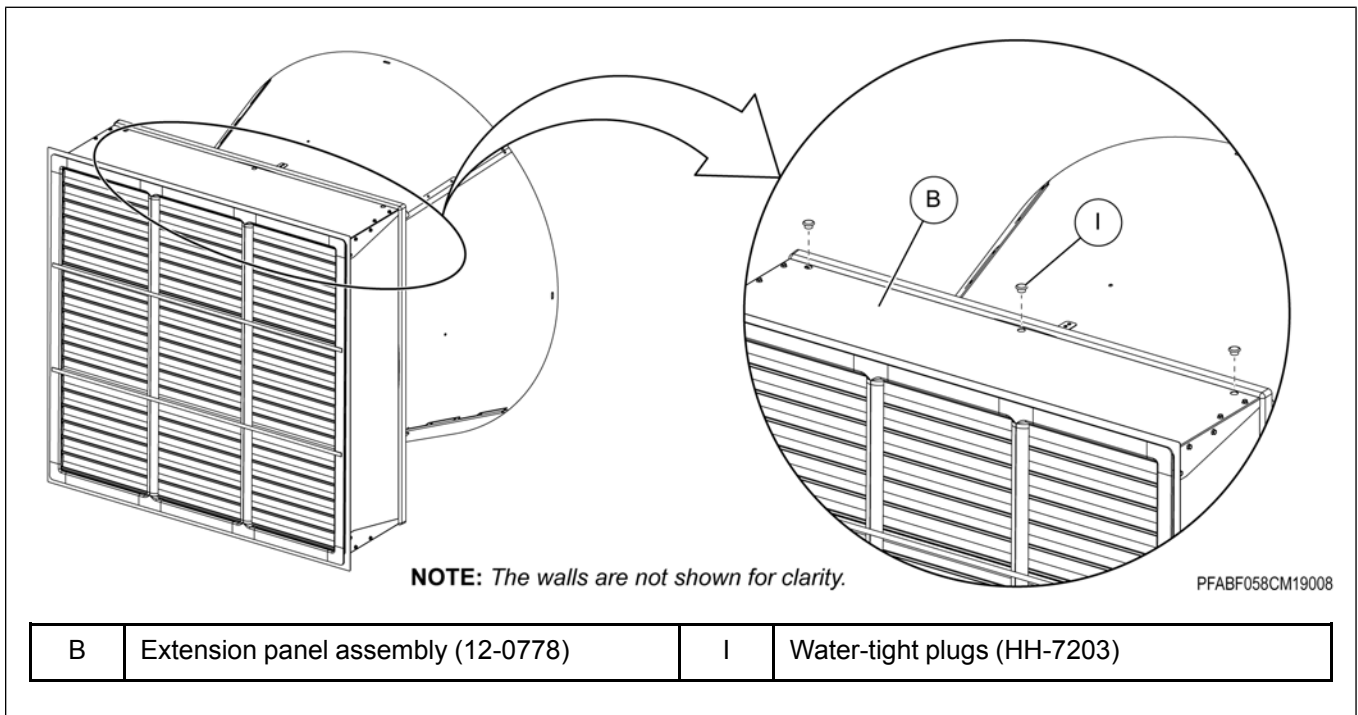
6. Insert the shutter assembly (H) into the extension panel assembly (B) and use the plastic shutter clips to lock down the shutters.

Figure 4-23 Installing the shutter to the extension panel assembly



7. Install the three water-tight plugs (I) to the top of the extension panel assembly (B).

Figure 4-24 Installing the water-tight plugs to the top panel



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# NOTES

# 5 Operation and Maintenance

## Topics Covered in this Chapter

- Start-Up Operation
- Maintenance

## Start-Up Operation



***Disconnect and lock out all power sources before servicing equipment.***

1. With the fan unplugged, rotate the propeller several complete revolutions by turning the fan pulley, look for clearance between the propeller tip and the housing.
2. Replace all guards and check all fasteners to ensure they are tight.
3. When satisfied, energize the fan and make note of direction of rotation.

**NOTE:** *Make sure the propeller turns counterclockwise when viewed from inside the house and the butterfly flaps should open completely.*

4. The butterfly flaps are designed to stay open during fan operation and close when the fan is de-energized.
5. If the propeller is turning backwards, the flaps will not open. If this is the case, refer to [Electrical Connection](#) and switch the black and red wires as noted after de-energizing the fan.
6. Re-check the operation and when satisfied the fan is operating properly, follow the instructions below.

## Maintenance



***Disconnect and lock out all power sources before servicing maintenance.***

1. Check the belt, pulleys and the bearings after every two (2) months of service.
2. The belt tensioner should be positioned between the second and the third notch as indicated by the mark on the body of the tensioner. Under tensioning will result in belt slippage, over tensioning will lead to premature belt and bearing failure.
3. The motor and shaft bearings are lubricated at the factory.
4. The motor bearings should never require lubrication over the life of the motor.

5. Pillow block bearings should be re-lubricated every 30 operating days and/or after each wash down cycle with 3-5 pumps on a standard hand operated grease gun.

**NOTE:** *Lithium or lithium-complex based #2 NLGI grease must be used. Other types of grease are incompatible with the factory lubricant and will damage the bearing. **Incompatible grease or lack of service will void bearing warranty.***



**DO NOT use a pneumatic or powered grease gun.**

6. **When cleaning the fans, Do Not Spray bearings, tensioner or motor directly with a pressure washer as this will lead to premature failure of these components.**
7. After cleaning the fan, simply wipe these parts with a clean rag to remove dirt and debris. Failure to follow these instructions will void the warranty on these components.

# 6 Troubleshooting

## Topics Covered in this Chapter

- Troubleshooting Guide

## Troubleshooting Guide

Symptom	Probable Cause(s)	Corrective Action(s)
<b>Excessive noise.</b>	Defective motor bearing.	Replace.
	Defective pillow block bearing.	Replace.
	Parts are not securely anchored.	Check all bolts, screws and fasteners.
	Damaged fan blade.	De-energize fan. Turn prop and check tip clearance. Do they appear to be approximately the same? <b>NOTE:</b> <i>They can be a little different without any problems.</i> If they are significantly different, contact your distributor for more information.
<b>Fan inoperative.</b>	Electricity is turned OFF.	Contact local utility supplier.
	Belt is broken.	Replace.
	Defective motor.	Replace.
	Open power supply circuit.	Replace fuse or reset circuit breaker. Check for disconnected, cut or damaged power cord.
<b>Insufficient airflow.</b>	Intake/exhaust shutter is jammed/ clogged.	Repair/replace/clean as necessary.
	Inlet/outlet guards clogged by dirt/ debris.	Repair/replace/clean as necessary.
	Voltage supplied is not correct (must be within $\pm 10\%$ of the nominal voltage).	Check line voltage at motor, verify wiring. Check with local utility supplier for possible line problems.
<b>Excessive vibration.</b>	Fan blade has excessive dirt build-up.	Clean unit.
	Motor/drive shaft is bent.	Replace.
	Fan blade is bent or otherwise damaged.	Replace blade. Apply anti-seize lubricant to the shaft.

## Chapter 6: Troubleshooting

Symptom	Probable Cause(s)	Corrective Action(s)
<b>Motor overheats and overload trips.</b>	Intake/exhaust shutter is jammed/clogged.	Repair/replace/clean as necessary.
	Inlet/outlet guards clogged by dirt/debris.	Repair/replace/clean as necessary.
	Motor has excessive dirt build-up.	Clean unit.
	Fan blade has excessive dirt build-up.	Clean unit.
	Building operating static pressure too high.	Adjust air inlets to lower static pressure.
	Power supply voltage is too low.	Check line voltage at motor; verify wiring is of sufficient gauge for load and length of conductor. Check with local utility supplier for possible line problems.

# 7 Parts List

## Topics Covered in this Chapter

- 58 in. Composite Butterfly Fan Parts
- 58 in. Shutter Fan Parts

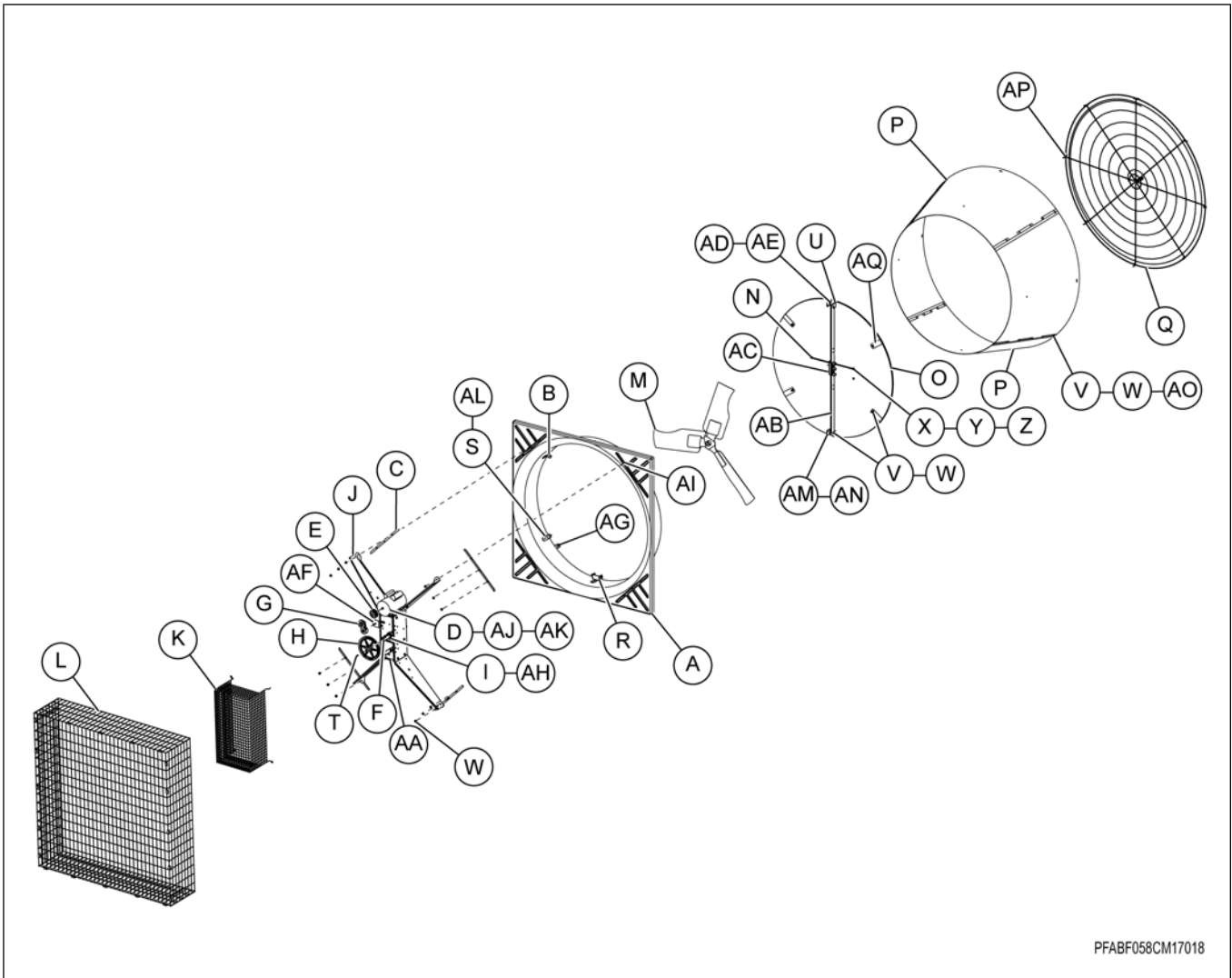
## 58 in. Composite Butterfly Fan Parts

Table 7-1 Motor part numbers

Model Number	Part Numbers		
	Motor Part Number (D)	Driven Pulley Part Number (H)	Motor Pulley Part Number (E)
77-0183	3017-3101	16-0099	017-1422-9
77-0185	3017-3101	16-0099	1011-2643
77-0188	3017-5109	16-0099	1011-2643
77-0189	3017-5109	12-0493	017-1422-9

58 in. Composite Butterfly Fan Parts

Figure 7-1 58 in. Composite butterfly fan parts



PFABF058CM17018

Table 7-2 58 in. Composite butterfly fan parts list

Callout	Part number	Description
A	12-0677	58 in. Fiberglass Fan Housing
B	12-0726	Bracket, Magnet Mounting Composite Fan
C	12-0700	Corner Strut 58 in. Composite Fan
D	3017-3101	Motor, 1.5 HP, 1 PH, 1725 RPM, 115/208-230V, 50/60 Hz
E	See table	Sheave
F	12-0707	Shaft, Belt Drive 58 in. Composite Fan
G	91-0057	Tensioner, Rotary Assembly with Splash Guards
H	See table	Pulley, Fenner Nylon 104 x 1 in.
I	13-0226	Bearing, Cast Pillow Block Assembly (1 in. Bore)
J	12-0701	Strut, Motor and Bearing Support 58 in. Composite Fan

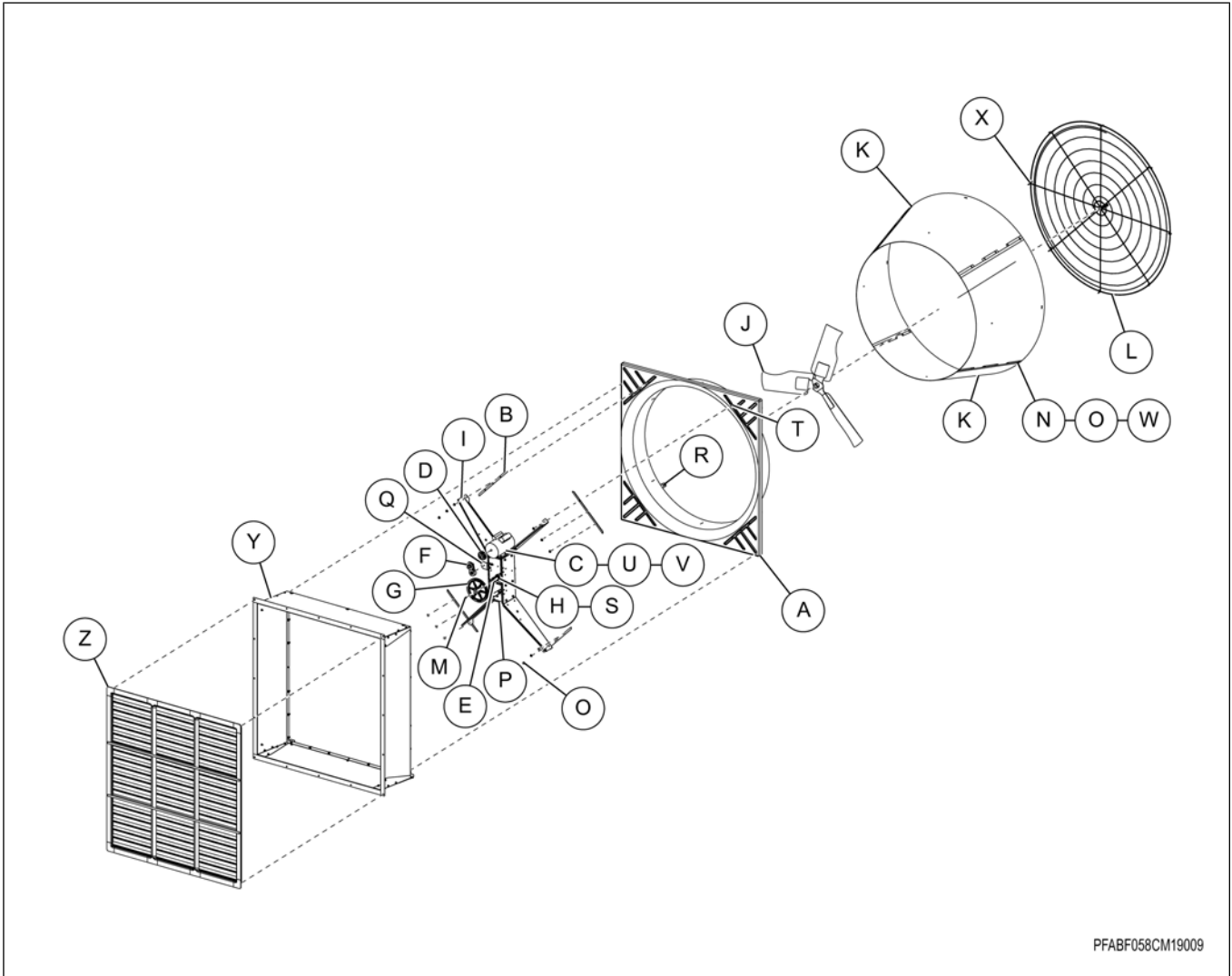


Table 7-2 58 in. Composite butterfly fan parts list (cont'd.)

Callout	Part number	Description
K	11-0519	Belt Guard 58 in. Composite Fan (Optional 11-0519-KIT)
L	11-0518	Inlet Grill Assembly
M	13-0238	Propeller, 58 in. Fan Mega Flow Galvanized (3 Blade)
N	16-0100	Spring, SS-8.70 in. LG - Butterfly Flap
O	12-0699	Panel, Hinged Butterfly Damper 58 in. Plastic Fan
P	12-0730	Cone, 58 in. HDPE Panel
Q	11-0533	Grill Guard 58 in. Plastic Fan
R	12-0710	Bracket, Butterfly Damper Mounting 58 in. Composite Fan
S	12-0712	Backplate Butterfly Damper Mounting, 58 in. Composite Fan
T	S-9168	Key, Square 1/4 in. x 1 in.
U	12-0464	Block, Nylon Mounting
V	S-7485	Bolt, Flange 3/8-16 x 1 in. JS500 Grade 8 or 8.2
W	S-968	Nut, Flange 3/8-16 in. Zinc Grade Wide Flange
X	S-1429	Bolt, HHCS 1/4-20 x 3/4 in. Zinc Grade 2
Y	S-1430	Washer, Flat 1/4 in. Zinc Grade 2 USS
Z	S-7215	Nut, Flange 1/4-20 in. Zinc
AA	12-0702	Plate, Motor and Bearing 58 in. Composite Fan
AB	12-0708	Center Post Weldment, 58 in. Composite Fan
AC	12-0746	Clip, Spring Mounting Adjustable, 58 in. Fan
AD	12-0667	Galvanized Flap Shaft 58 in. Composite Fan
AE	12-0319	Nylon Washer
AF	12-0703	Bracket, Tensioner Mount 58 in. Composite Fan
AG	12-0715	Cone Bracket, 58 in. Composite Fan
AH	S-9303	Bolt, Flange 3/8-16 x 1-1/2 in. YDP Grade 8
AI	S-7383	Nut, Nylock 3/8-16 in. Zinc Clear Grade 5
AJ	S-6606	Bolt, Flange 5/16-18 x 3/4 in. Zinc Clear Grade 5
AK	S-10268	Nut, Flange 5/16-18 in. JS500 Grade 5
AL	S-9410	Rivet, POE 3/16 in. Diameter
AM	S-8792	Screw, MS 1/4-20 x 1-3/4 in. RHP Zinc
AN	S-7025	Nut, Nylock 1/4-20 in. Zinc Grade 5
AO	S-10200	Washer, Fender 3/8 x 1-1/2 in. OD Zinc
AP	D02-0023	Holder, Cable 5/16 in. Dipped
AQ	12-0740	Strike Pad, Magnet

# 58 in. Shutter Fan Parts

Figure 7-2 58 in. Shutter fan parts



PFABF058CM19009

Table 7-3 58 in. Shutter fan parts list

Callout	Part number	Description
A	12-0677	58 in. Fiberglass Fan Housing
B	12-0700	Corner Strut 58 in. Composite Fan
C	15-0248	Motor, 1.5 HP, 1725/1425 RPM, 208-230/380/460V, 50/60 Hz, 3 PH
D	1011-2638	Sheave, AK39/MA38 x 5/8 in. Bore
E	12-0707	Shaft, Belt Drive 58 in. Composite Fan
F	91-0057	Tensioner, Rotary Assembly with Splash Guards
G	12-0493	Pulley, Finner Nylon AFD 9.93 in. (1 in. Keyed Bore)
H	13-0226	Bearing, Cast Pillow Block Assembly (1 in. Bore)
I	12-0701	Strut, Motor and Bearing Support 58 in. Composite Fan
J	13-0238	Propeller, 58 in. Fan Mega Flow Galvanized (3 Blade)
K	12-0730	Cone, 58 in. HDPE Panel
L	11-0533	Grill Guard 58 in. Plastic Fan
M	S-9168	Key, Square 1/4 in. x 1 in.
N	S-7485	Bolt, Flange 3/8-16 x 1 in. JS500 Grade 8 or 8.2
O	S-968	Nut, Flange 3/8-16 in. Zinc Grade Wide Flange
P	12-0702	Plate, Motor and Bearing 58 in. Composite Fan
Q	12-0703	Bracket, Tensioner Mount 58 in. Composite Fan
R	12-0715	Cone Bracket, 58 in. Composite Fan
S	S-9303	Bolt, Flange 3/8-16 x 1-1/2 in. YDP Grade 8
T	S-7383	Nut, Nylock 3/8-16 in. Zinc Clear Grade 5
U	S-6606	Bolt, Flange 5/16-18 x 3/4 in. Zinc Clear Grade 5
V	S-10268	Nut, Flange 5/16-18 in. JS500 Grade 5
W	S-10200	Washer, Fender 3/8 x 1-1/2 in. OD Zinc
X	D02-0023	Holder, Cable 5/16 in. Dipped
Y	12-0778	Fan Extension Assembly, 58 in. Butterfly Fan, Galvanized
Z	PS64-ET	Shutter, ECO PVC, 64.50 in. Tall x 64.50 in. Wide

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# NOTES

## Limited Warranty - Protein Products

The GSI Group, LLC. ("GSI") warrants products which it manufactures, to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months from the date of purchase (or, if shipped by vessel, 14 months from the date of arrival at the port of discharge). If, in GSI's sole judgment, a product is found to have a defect in materials and/or workmanship, GSI will, at its own option and expense, repair or replace the product or refund the purchase price. This Limited Warranty is subject to extension and other terms as set forth below.

**Warranty Enhancements:** The warranty period for the following products is enhanced as shown below and is in lieu of (and not in addition to) the above stated warranty period.

	Product	Warranty Period
<b>AP® Fans</b>	Performer Series Direct Drive Fan Motor	3 Years
<b>AP® and Cumberland®</b>	Flex-Flo/Pan Feeding System Motors	2 Years
<b>Electronic Controls</b>	All Protein controls manufactured by GSI	24 Months from date code on part
<b>Cumberland® Feeding and Watering Systems</b>	Feeder System Pan Assemblies	5 Years, prorated **
	Feed Tubes (1.75" and 2.00")	10 Years, prorated *
	Centerless Augers	10 Years, prorated *
	Watering Nipples	10 Years, prorated *

\* Warranty prorated from material list price:  
 0 to 3 years - no material cost to end user  
 3 to 5 years - end user pays 25%  
 5 to 7 years - end user pays 50%  
 7 to 10 years - end user pays 75%

\*\* Warranty prorated from material list price:  
 0 to 3 years - no material cost to end user  
 3 to 5 years - end user pays 75%

## Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH HEREIN; SPECIFICALLY, GSI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) ANY PRODUCT MANUFACTURED OR SOLD BY GSI, OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

The sole and exclusive remedy for any claimant is set forth in this Limited Warranty and shall not exceed the amount paid for the product purchased. This Warranty only covers the value of the warranted parts and equipment, and does not cover labor charges for removing or installing defective parts, shipping charges with respect to such parts, any applicable sales or other taxes, or any other charges or expenses not specified in this Warranty. GSI shall not be liable for any other direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Expenses incurred by or on behalf of a claimant without prior written authorization from the GSI warranty department shall not be reimbursed. This warranty is not transferable and applies only to the original end user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor. Prior to installation, the end user bears all responsibility to comply with federal, state and local codes which apply to the location and installation of the products.

This Limited Warranty extends solely to products sold by GSI and does not cover any parts, components or materials used in conjunction with the product, that are not sold by GSI. GSI assumes no responsibility for claims resulting from construction defects, unauthorized modifications, corrosion or other cosmetic issues caused by storage, application or environmental conditions. Modifications to products not specifically delineated in the manual accompanying the product at initial sale will void all warranties. This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained.

### Service Parts:

GSI warrants, subject to all other conditions described in this Warranty, Service Parts which it manufactures for a period of 12 months from the date of purchase, unless specified in Enhancements above. Parts not manufactured by GSI will carry the Manufacturer's Warranty.

(Protein Limited Warranty\_REV01\_06 November 2018)

**This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.**



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