



INSTALLATION GUIDE

HPF 300 & 600 SERIES

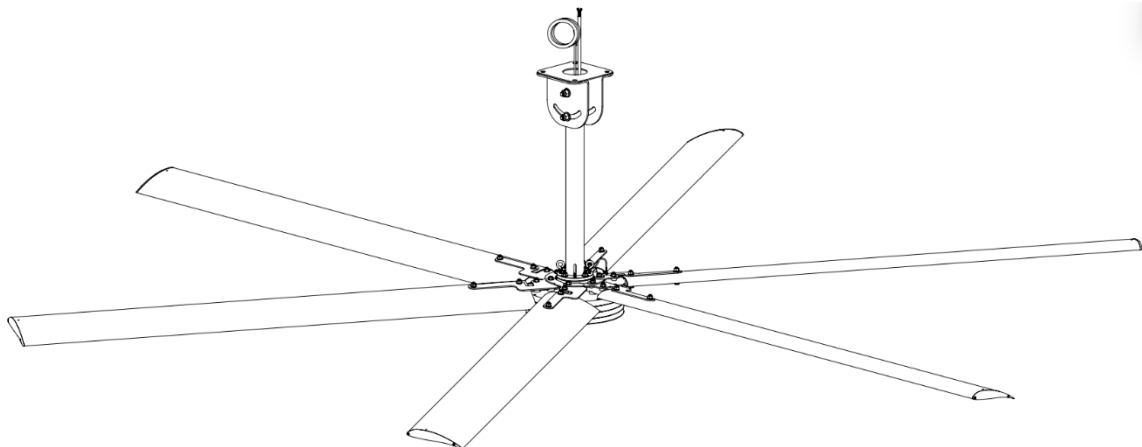
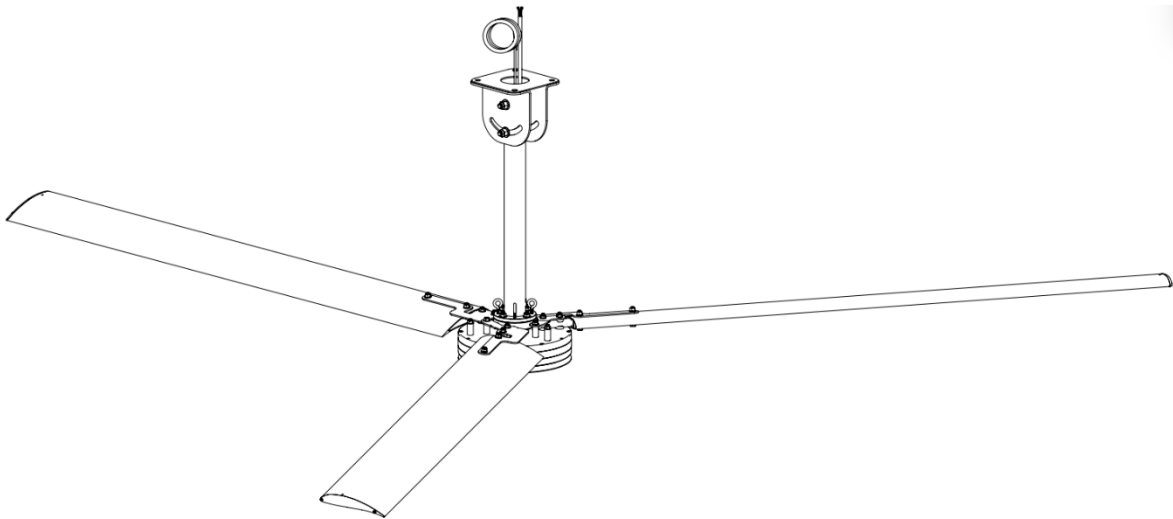


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Section 1:

Installation Checklist

- ☐ Have you read and understood this manual before starting installation? (check box if the answer is yes for all the questions on this page)

CAUTION: IF YOU DO NOT UNDERSTAND ANY PART OF THIS INSTALLATION GUIDE, DO NOT PROCEED WITH INSTALLATION OF THE FAN. INSTALLING THE FAN WITHOUT UNDERSTANDING AND FOLLOWING THESE GUIDELINES, COULD RESULT IN SERIOUS INJURY OR DEATH!

- ☐ Does your building allow you to safely install the fan?

CAUTION: IF THE FAN CANNOT BE MOUNTED BY ANY OF THE METHODS DESCRIBED WITHIN THIS GUIDE OR YOU ARE NOT SURE ABOUT THE STRENGTH OF THE MOUNTING STRUCTURE, YOU SHOULD CONSULT A STRUCTURAL ENGINEER!

- ☐ If your fan is 8 ft. (2.4 m) in diameter or larger, will the fan blades be at least 10 ft. (3 m) above the floor?

CAUTION: IN ADDITION TO THE MINIMUM FLOOR CLEARANCE, THE FAN MUST MEET CLEARANCE GUIDELINES AS DESCRIBED IN SECTION 5, MOUNTING GUIDELINES!

- ☐ Have you verified that the required power supply for the fan you have purchased is available?

- ☐ Do you have the necessary “customer supplied” hardware required to install your fan(s) (Refer to Page 8)?

- ☐ Do you have the necessary tools on hand to perform the installation?

IF ALL ABOVE BOXES ARE CHECKED, PROCEED TO SECTION 2.

Section 2:

Safety Precautions

PLEASE OBSERVE THE FOLLOWING PRECAUTIONS TO MINIMIZE THE RISK OF PERSONAL INJURY OR PROPERTY DAMAGE:**Electrical Installation:**

- Ensure that all fan power circuits are disconnected prior to beginning fan/controller installation
- All electrical work must be performed by qualified personnel and in accordance with applicable local and national wiring codes and standards.
- Incorrect assembly can cause electrical shock or damage to the fan motor or controller
- Before working on the VFD, ensure isolation of the mains supply at the VFD or fan controller disconnect. Wait at least three minutes for the VFD high voltage capacitor to discharge to safe voltage levels (a darkened display is NOT an indication of safe levels). Failure to do so may result in death or injury.
- Power must be supplied by means of a dedicated circuit breaker, properly fused disconnect, or other means of protection, following local and national electrical codes.

Mechanical Installation:

- To prevent accidental injury, do not allow personnel to stand beneath the fan during installation.
- The structure to which the fan is mounted must be sound and undamaged and capable of supporting the weight of the fan and its mounting. A structural engineer should be consulted if needed.
- The fan must be installed only using parts from High Performance Fan Co. unless specified otherwise in the manual.
- When cutting or drilling into a wall or mounting surface, proper eye protection is required
- Before cutting or drilling, check to be sure there are no hidden utilities.
- Be sure all safety cables and any needed guy-wires are in place before operating the fan.

Maintenance:

- Before performing any maintenance on the fan, switch off power at the main service panel or breaker, lock-out/tag-out breaker to prevent power from being switched back on during maintenance.
- If removal or disconnection of any safety device is required during maintenance, the safety must be re-installed properly prior to fan operation.
- Recommended periodic maintenance in effect at the time of fan shipment should be followed, and written maintenance records should be kept.

Operation:

- Do not bend the airfoils when installing or performing maintenance on the fan. If an airfoil is bent, do not operate the fan.
- Do not impede the rotation of the airfoils. Inserting a foreign object between rotating airfoils may result in severe damage to the fan and possible injury.
- The fan must be used for its intended purpose only.
- If the fan begins oscillating, stop the fan immediately and contact High Performance Fan Co. or your local service provider for assistance
- Do not operate the fan if there is any visible damage to the fan or controller.
- The fan should only be operated by a responsible person who understands its operation and risks of improper use. Children should never operate the fan.
- Nameplates, cautions, warnings, and instructions should not be obscured from the view of operating or maintenance personnel.
- Modifications or alterations to a High Performance Fan Co. fan should only be made after receipt of written permission from High Performance Fan Co.

Disclaimers:

- Prior to installation, verification of the stability of the mounting structure is the sole responsibility of the user, and High Performance Fan Co. hereby expressly disclaims any liability arising therefrom or arising from the use of any materials or hardware not supplied by High Performance Fan Co.
- Product failure caused by improper installation or use will not be covered by the High Performance Fan Co. warranty.
- The above information and information within this manual is provided only as a guide for proper installation and use of a High Performance Fan Co. fan. High Performance Fan Co. accepts no responsibility for the compliance or non-compliance to local or national codes for the proper installation of the fan or its controls.

Section 3:

Power Supply Guide & Technical Specs

CAUTION: BEFORE OPENING THE BOX TO START YOUR FAN INSTALLATION, DEFINE THE MINIMUM INPUT POWER AND THE REQUIRED BREAKER FOR YOUR FAN(S) USING THE TECHNICAL SPECIFICATIONS TABLE BELOW!

TECHNICAL SPECIFICATIONS								
300 SERIES								
FAN DIAMETER			10 Ft. (3 m)	12 Ft. (3.6 m)	14 Ft. (4.2 m)	16 Ft. (4.8 m)	18 Ft. (5.4 m)	20 Ft. (6 m)
WEIGHT*			59 lb (26.8 kg)	69 lb (31.4 kg)	74 lb (33.7 kg)	90 lb (40.1 kg)	95 lb (43.2 kg)	100 lb (45.5 kg)
MAXIMUM SPEED			108 RPM	94 RPM	80 RPM	63 RPM	53 RPM	44 RPM
MOTOR HORSEPOWER	0.5 HP (0.37 kW)				0.75 HP (0.56 kW)	1 HP (0.75 kW)		
MAXIMUM POWER CONSUMPTION			450 Watts	534 Watts	645 Watts	918 Watts	855 Watts	748 Watts
AIRFOIL CLEARANCES	2 Ft. (0.6 m) on sides 2 Ft. (0.6 m) below ceiling				3 Ft. (0.9 m) on sides 3 Ft. (0.9 m) below ceiling		3 Ft. (0.9 m) on sides 4 Ft. (1.2 m) below ceiling	
COVERAGE AREA**	3 to 5 Times Diameter							
INPUT POWER AND REQUIRED BREAKER	110-125 VAC, 1 Ph., 50/60 Hz., 20 A 200-240 VAC, 1 Ph., 50/60 Hz., 10 A							

600 SERIES								
FAN DIAMETER		8 Ft. (2.4 m)	10 Ft. (3 m)	12 Ft. (3.6 m)	14 Ft. (4.2 m)	16 Ft. (4.8 m)	18 Ft. (5.4 m)	20 Ft. (6 m)
WEIGHT*		71 lb (32.3 kg)	86 lb (39.1 kg)	96 lb (43.7 kg)	107 lb (48.6 kg)	127 lb (57.7 kg)	138 lb (62.7 kg)	148 lb (67.3 kg)
MAXIMUM SPEED		130 RPM	100 RPM	81 RPM	58 RPM	47 RPM	37 RPM	30 RPM
MOTOR HORSEPOWER	0.5 HP (0.37 kW)		0.75 HP (0.56 kW)			1 HP (0.75 kW)		
MAXIMUM POWER CONSUMPTION		520 Watts	613 Watts	671 Watts	567 Watts	807 Watts	697 Watts	602 Watts
AIRFOIL CLEARANCES	2 Ft. (0.6 m) on sides 2 Ft. (0.6 m) below ceiling				3 Ft. (0.9 m) on sides 3 Ft. (0.9 m) below ceiling		3 Ft. (0.9 m) on sides 4 Ft. (1.2 m) below ceiling	
COVERAGE AREA**	3 to 5 Times Diameter							
INPUT POWER AND REQUIRED BREAKER	110-125 VAC, 1 Ph., 50/60 Hz., 20 A 200-240 VAC, 1 Ph., 50/60 Hz., 10 A							

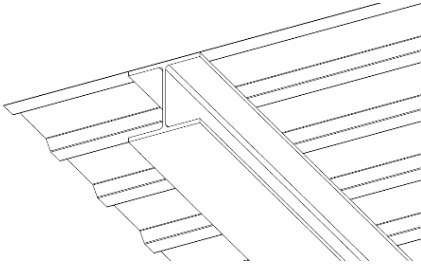
* Weight includes standard upper mount and 1 ft. extension tube ** Dependent upon obstructions within the flow path

Fan wiring must satisfy requirements below:

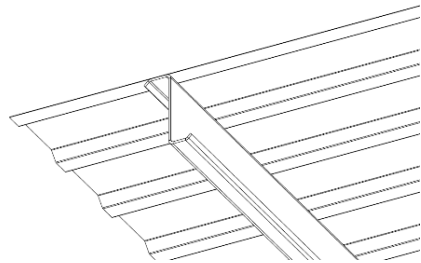
- 1- Wiring of fan(s) must be performed by a qualified electrician.
- 2- Install a local/manual disconnect if required by local/national codes.

Section 4:

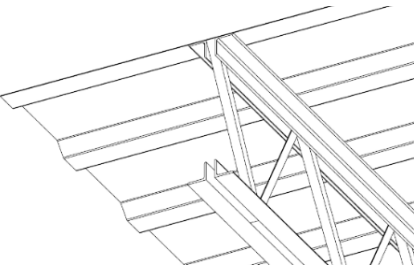
Mounting Guidelines

I-BEAM

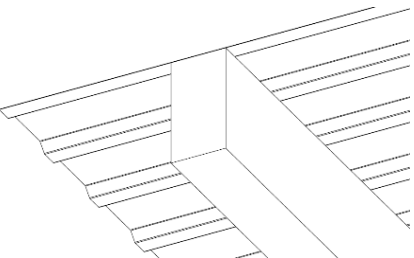
- **Do not Direct Mount Fan on I-Beam**
- **Do not mount fan on fabricated (welded) I-Beam**
- I-Beam must be rolled (not fabricated)
- I-Beam must be part of the existing structure
- Use spacers if I-Beam flange thickness exceeds 3/8"
- The I-Beam Mount Kit is for use with I-Beams up to 9.625" wide
- For I-Beams wider than 9.625" consult factory

PURLIN

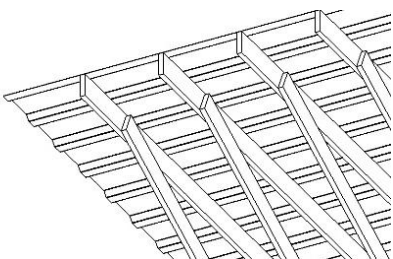
- **Customer to supply 2 1/2" (W) x 2 1/2" (H) x 1/4" (T) angle irons for Purlin mounting**
- **Do not mount fan on single Purlin**
- **Do not mount fan on Purlin that is less than 16-gauge steel**
- **Do not mount fan on Purlin that has an unsupported length greater than 30 FT.**
- The Purlin Mount Kit is good for roof slopes of up to 5/12
- **Do not mount fan on Purlin if Purlin spacing is more than 5 FT.**

BAR JOIST

- **Customer to supply 2 1/2" (W) x 2 1/2" (H) x 1/4" (T) angle irons for Bar Joist mounting**
- **Do not mount fan on single Bar Joist**
- Span between Bar Joists should not exceed 12 FT.
- Angle iron must be fastened to Bar Joists on both ends
- **Do not use beam clips to secure angle irons**

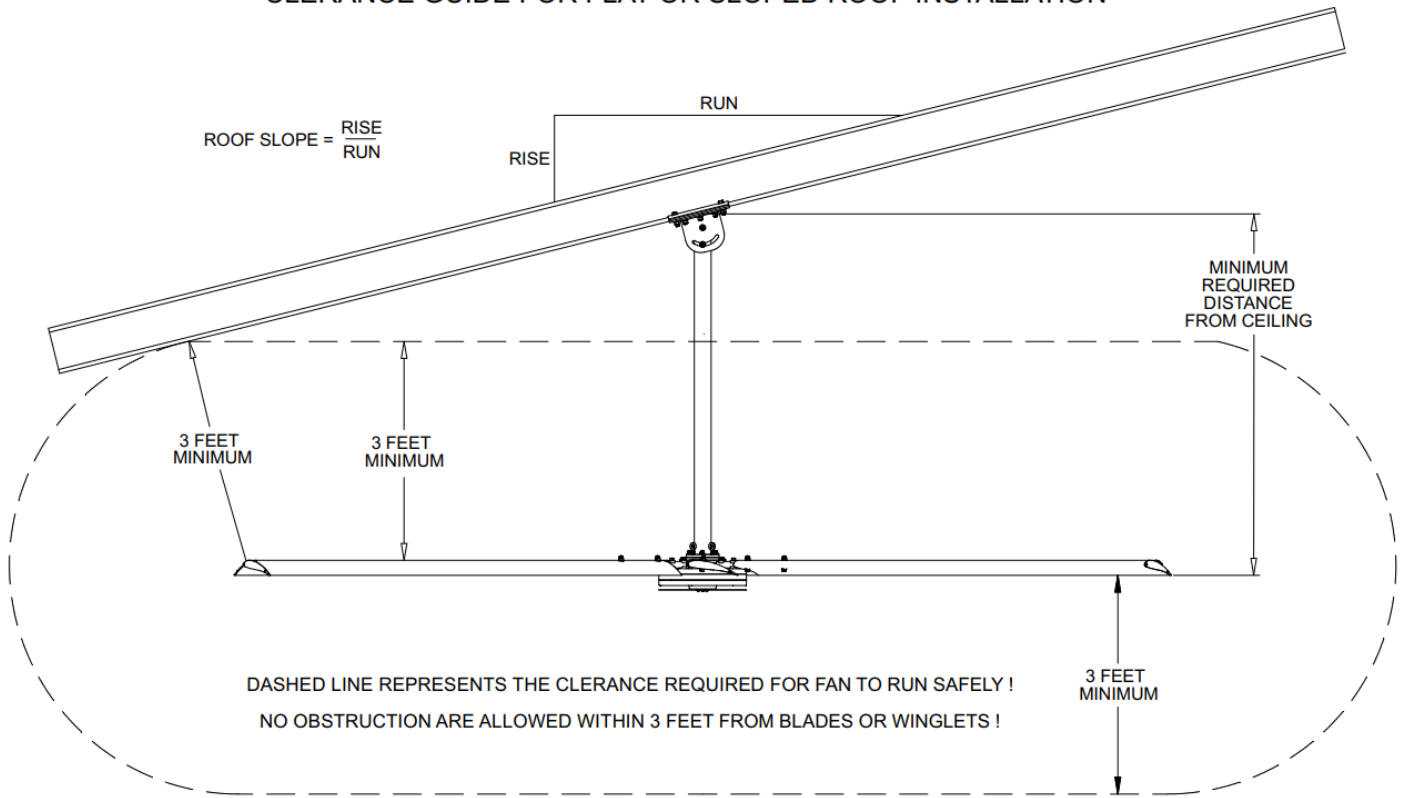
SOLID BEAM

- **Customer to supply 1/2"-13 Grade 8 mounting hardware for installation of Solid Beam Kit**
- The Solid Beam Mount Kit is for beam thicknesses up to 9.625"
- For Beam thicknesses greater than 9.625" consult factory

WOOD FRAME

- **Customer to supply 2 1/2" (W) x 2 1/2" (H) x 1/4" (T) angle irons for Wood Frame mounting**
- For use when mounting fan(s) to floor or ceiling joists

CLERANCE GUIDE FOR FLAT OR SLOPED ROOF INSTALLATION



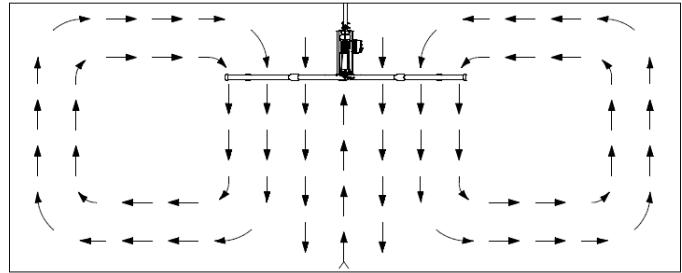
ROOF SLOPE	0	1 / 12	2 / 12	3 / 12	4 / 12
ROOF ANGLE (DEG.)	0	4°	9.5°	14°	18.5°
FAN DIA. (FT.)	SUGGESTED MINIMUM DISTANCE FROM CEILING (FT.)				
8	4	4	4	4	4
10	4	4	4	4	4
12	5	5	5	5	5
14	5	5	5	5	5
16	6	6	6	6	6
18	6	6	6	6	6
20	6	6	6	6	6

Note: For angles above 18.5°, or if you need assistance with above table, please contact the factory.

Explanation of Airflow Patterns

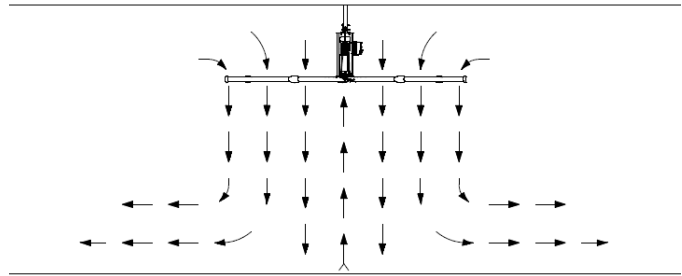
Enclosed Area Airflow:

The floor jet radiates outward, upon reaching the wall, the jet is deflected upwards. At the ceiling the flow is directed inward to the low-pressure area above the fan where it is then pulled down towards the floor. This pattern creates a convection-like air current that gathers momentum. Once this current is established, the fan entrains air from outside the current, increasing its cooling effects.



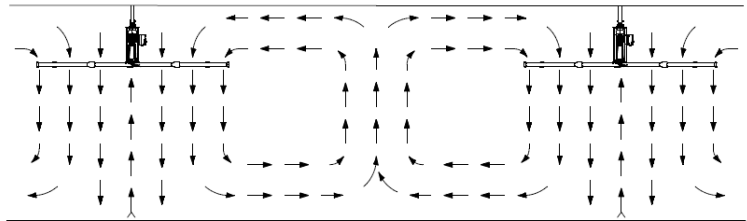
Open Area Airflow:

Airflow moves from the fan towards the floor. Once at the floor, it moves outward in all directions. The deflection of air across the floor is referred to as "floor jet".



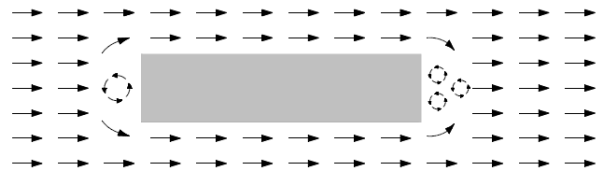
Multiple Fan Airflow:

When there are multiple fans properly spaced, the fan jets created by the fans meet to create a virtual wall, causing each fan to create the same airflow pattern as seen in the enclosed area airflow scenario. Typically, multiple fan installations further enhance the performance of each individual fan as they work together.



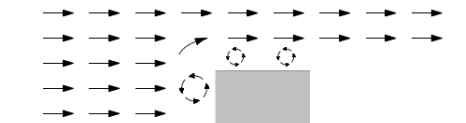
Airflow with Streamlined Obstructions:

Obstructions on the floor tend to block horizontal air movement. Thin or streamlined obstructions tend to be less intrusive. Air tends to move freely around such obstructions, losing little momentum, and leaving a very small area behind the obstruction that remains stagnant.



Airflow with Wide, Blunt Obstructions:

Wide, blunt, or flat-faced obstructions block air flow and cause the air to change direction. Behind these obstructions there is a stagnant area that is higher and wider than the obstructions themselves.

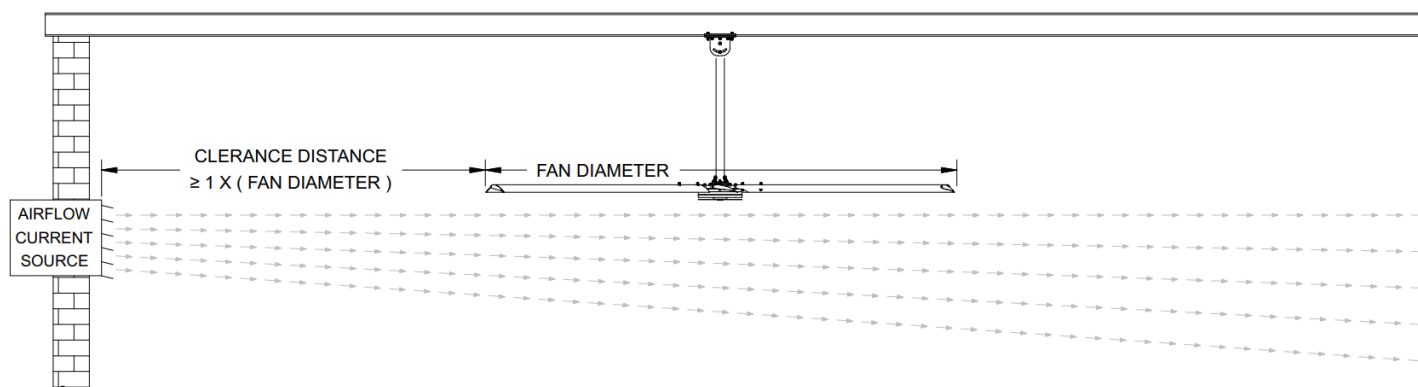


Airflow Currents Clearance Guide

For any equipment (such as HVAC, ventilators, etc....) and/or other building windows or vent openings that might generate airflow currents, follow the clearance guidelines below.

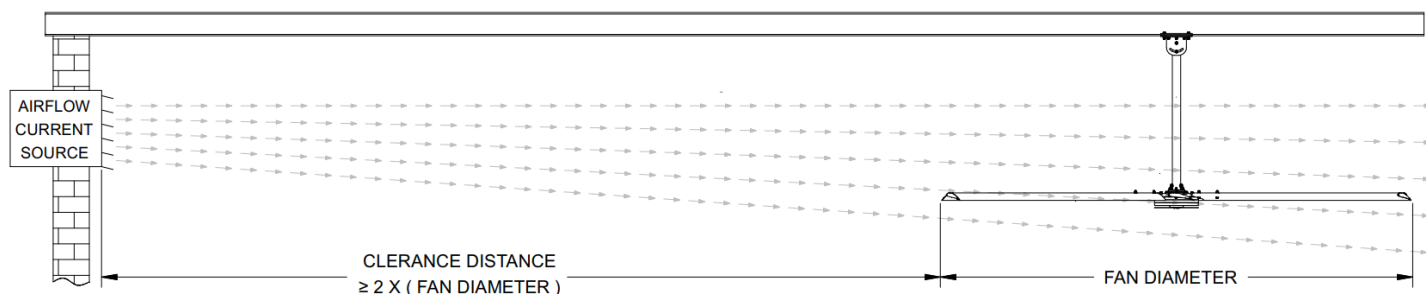
If the airflow current is below the fan (as shown below), the distance from the fan to the airflow current source must be greater than or equal to 1X the fan diameter.

For example: If the fan diameter is 20 ft. then the distance between the fan and the airflow current source must be greater than or equal to 20 ft.



If the airflow current source is above the fan (as shown below), the distance from the fan to the airflow current source must be greater than or equal to 2X the fan diameter.

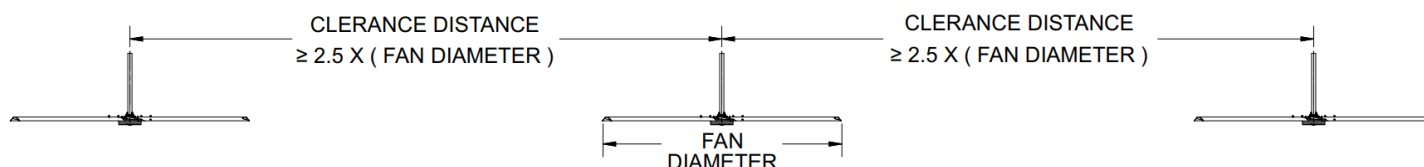
For example: If the fan diameter is 20 ft. then the distance between the fan and the airflow current source must be greater than or equal to 40 ft.



Clearance Guide for Multiple Fans

For multiple fan installation, the distance between the centerlines of the fans (as shown below) should be greater than or equal to 2.5X the fan diameter.

For example: If the fan diameter is 20 ft. then the distance between fans must be greater than or equal to 50 ft.



Section 5: Equipment, Personnel & Tools Requirements

Required Equipment & Personnel for Fan Installation

- Mechanical lift, such as a scissor lift, for lifting the fan assembly and personnel
- Two people (recommended)
- Qualified electrician for wiring the fan

Required Tools

- | | |
|--|--|
| ▪ 7/16", 1/2", 9/16" & 3/4" Combination wrenches | ▪ Cable Ties |
| ▪ 7/16", 1/2", 9/16" & 3/4" Sockets with ratchet | ▪ Tape measure |
| ▪ Torque wrench capable of 40 FT-LB | ▪ Level |
| ▪ Phillips and flat head screwdrivers | ▪ Cable cutter |
| ▪ Wire strippers & Crimpers | ▪ Gloves & safety glasses |
| ▪ Utility knife | ▪ 9/16" & 7/16" drill bit and hand drill |

Section 6:**Unpacking Fan & Checking Parts**

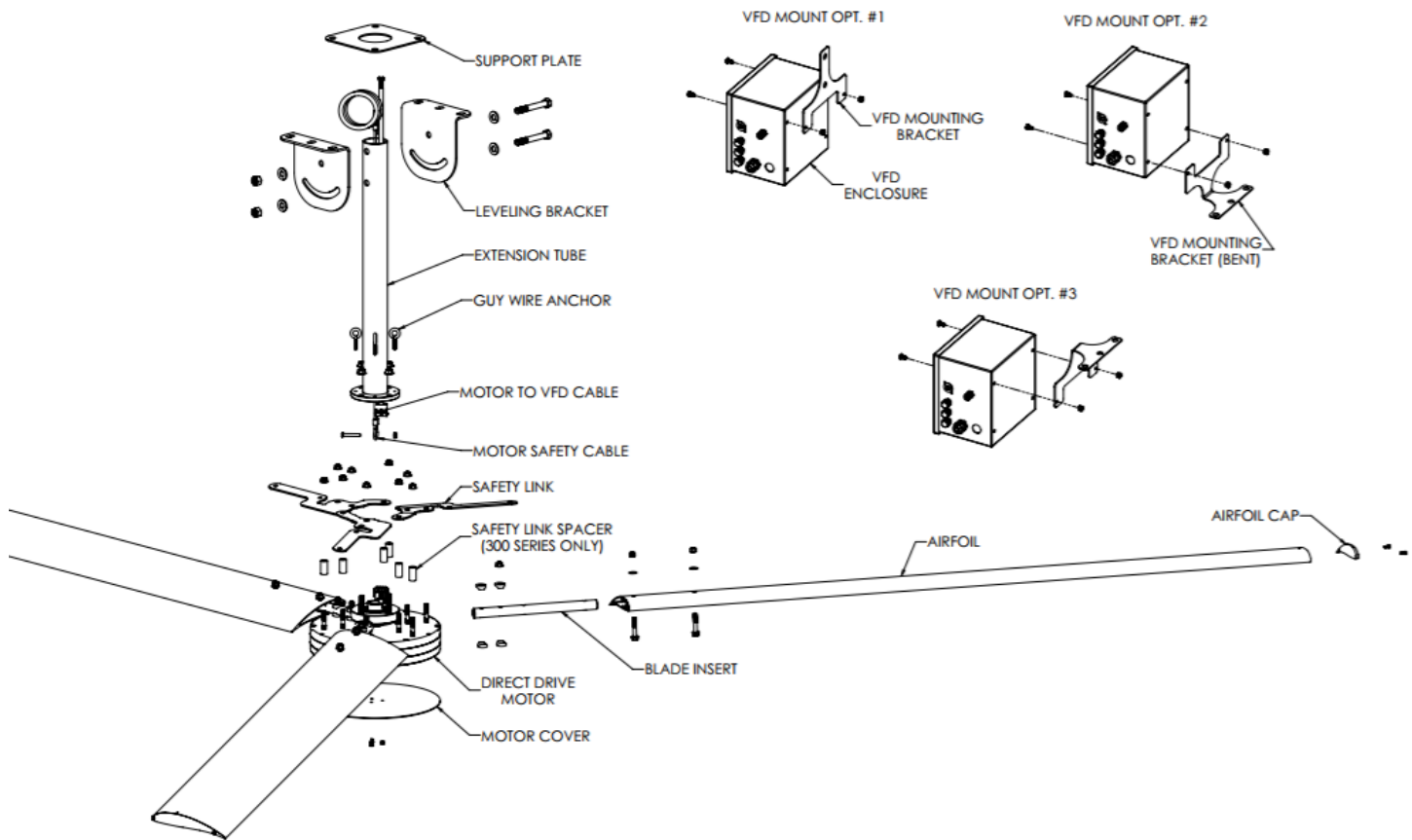
Each fan will arrive on a single skid containing multiple parcels, smaller parcels will include the motor, assembly hardware, mounting hardware, and the fan controls, a large parcel will contain the airfoils. If multiple fans have been purchased a single skid may contain parcels for multiple fans.

Carefully open each package and inspect the contents to ensure no damage occurred during transit.

If damage is visible contact High Performance Fan Co. immediately and please share photos of the damage with us via email at info@highperformancefan.com.

If all items have arrived in good condition you may proceed.

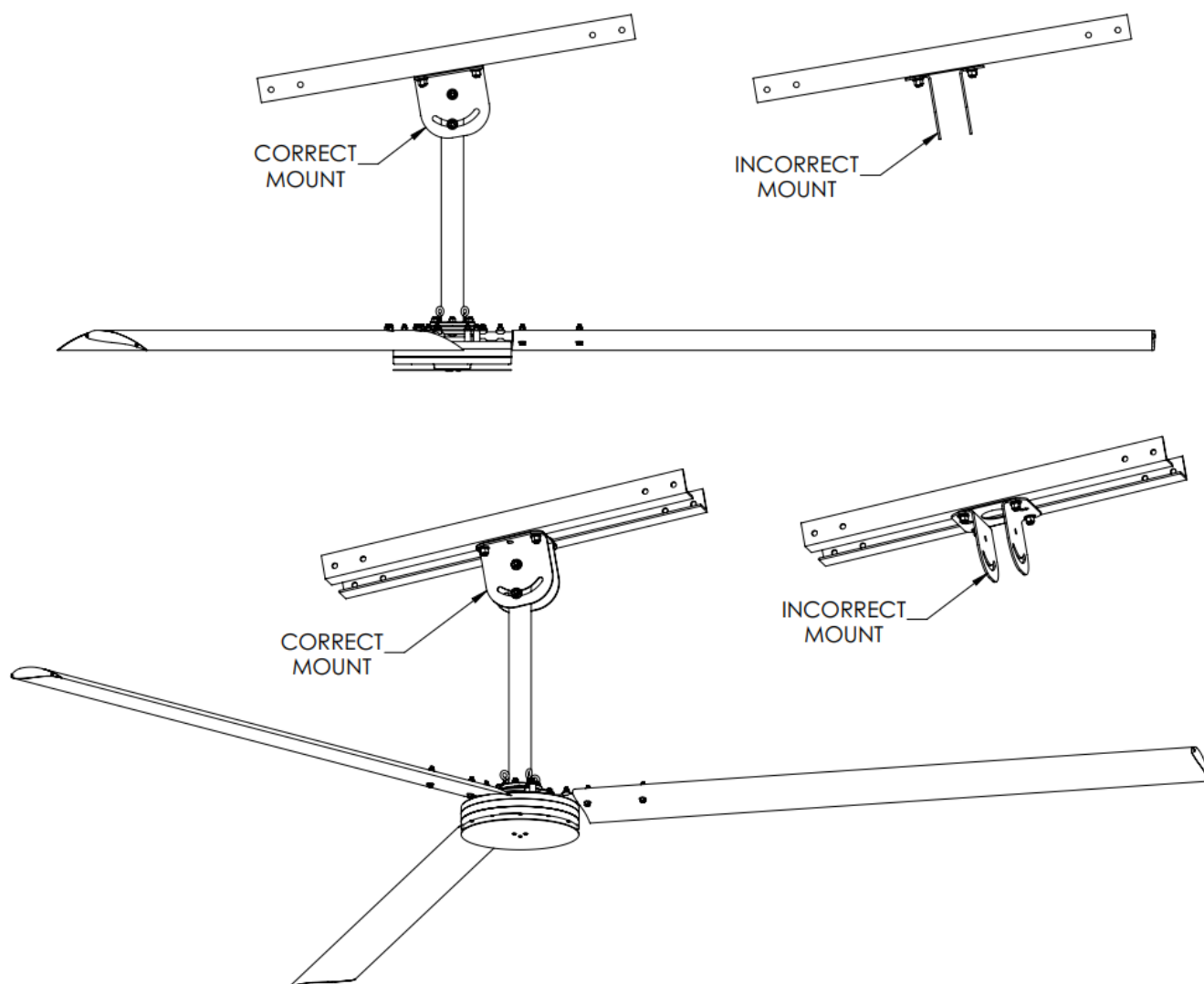
Fan Assembly Exploded View



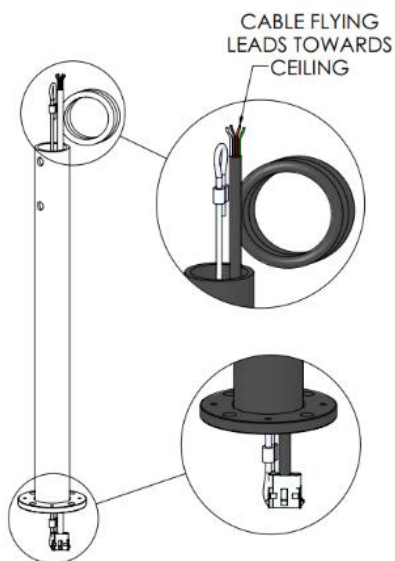
Section 8:

Basic Fan Installation Guide

All 300 & 600 Series HVLS fans require a pair of Top Leveling Brackets and a minimum 1 foot long Extension Tube for basic installation to 2 ½" x 2 ½" x ¼" thick angle iron or 12 gauge strut channel. Before starting your installation, it is important to note the correct orientation of the Top Leveling Brackets when installing your fan with a sloped roof. Please note the correct orientation for installing the Top Leveling Brackets below. Incorrect installation of the Top Leveling Brackets will not allow for proper angle adjustment of your fan(s). Optional mounting kits are available for structure specific mounting, if mounting to a specific type of structure, please refer to the structure specific mounting instructions within this guide to begin your installation.

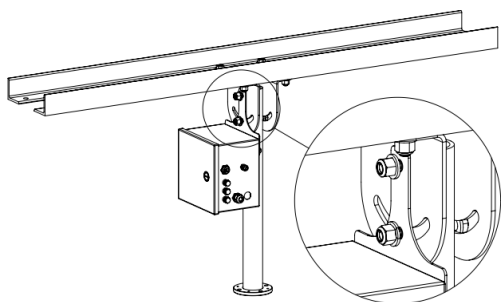


Step # 1 - Insert Safety Cable and Motor to VFD Cable thru Extension Tube as shown below:

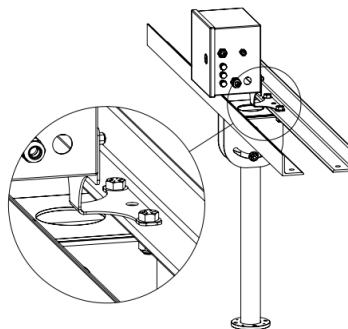


Step # 2 - Determine the mounting position of the Variable Frequency Drive (VFD) Enclosure. There are three mounting options for mounting the VFD Enclosure as shown below:

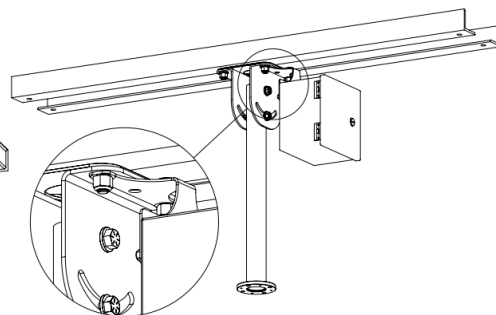
VFD MOUNT OPT. #1



VFD MOUNT OPT. #2



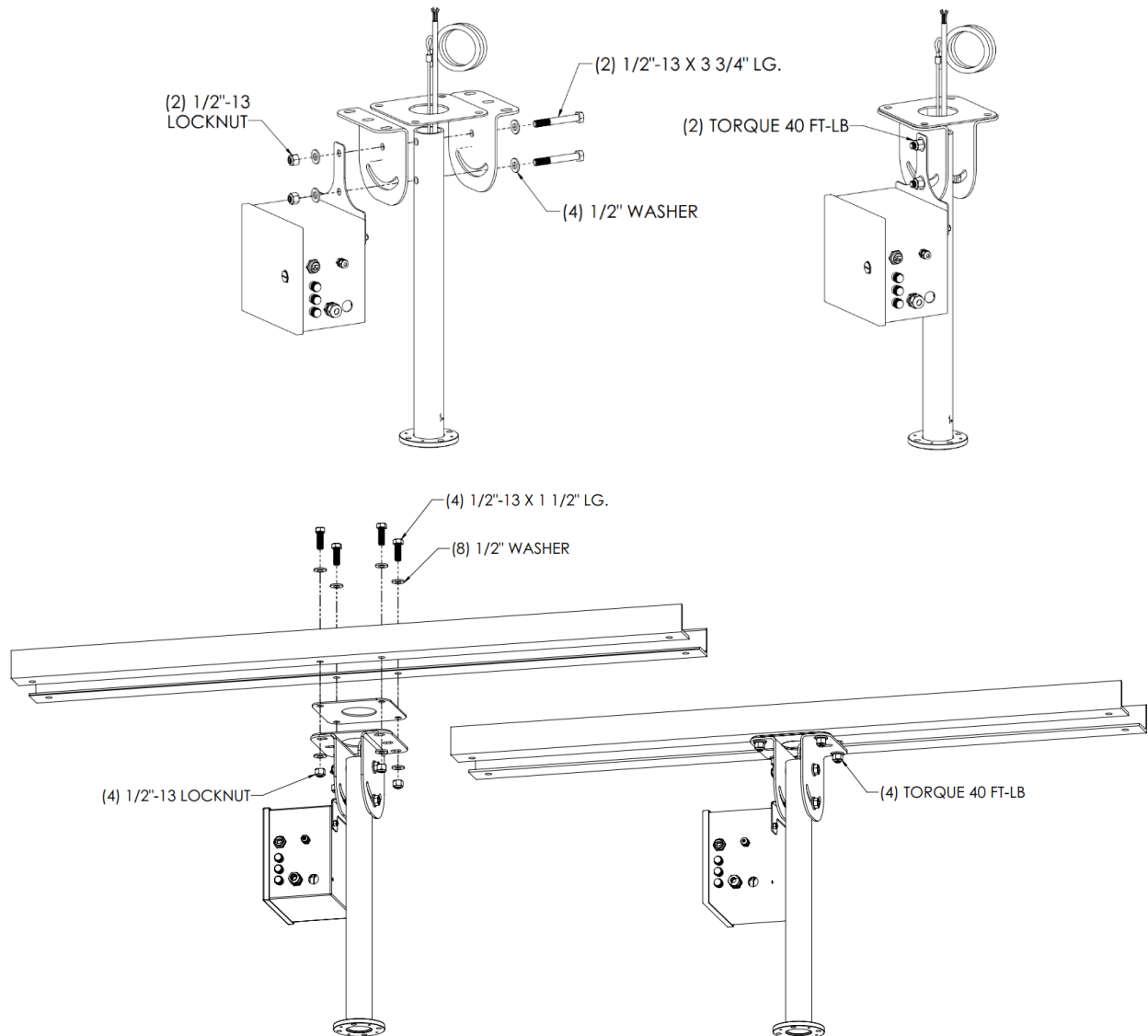
VFD MOUNT OPT. #3



Step # 3 – Mount the VFD Enclosure and Extension Tube using the selected mounting option.

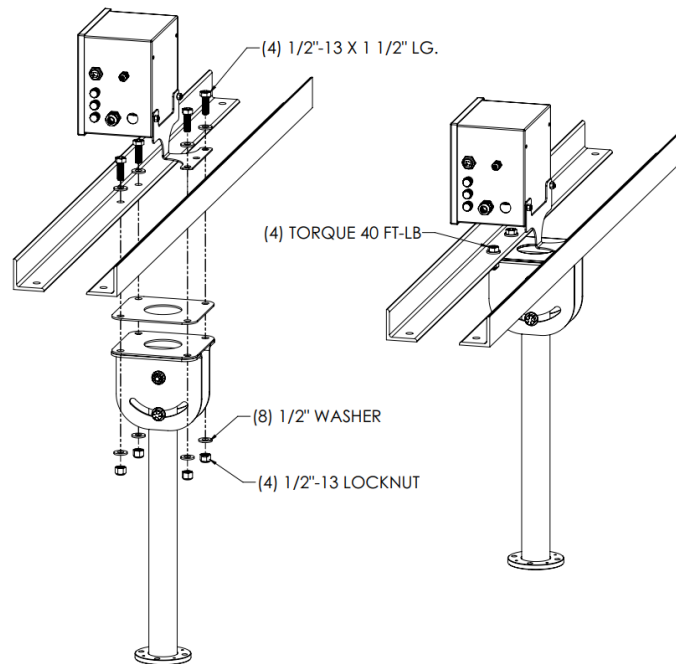
VFD MOUNTING OPTION #1

This VFD mounting option can be used for all types of installations where an extension tube that is at least 2 feet long is used. See below for assembling the VFD Enclosure, Top Leveling Brackets, and Extension Tube to angle iron supports (supplied by customer) or (if applicable) other specialized High Performance Fan Co. structure specific mounting kit brackets.

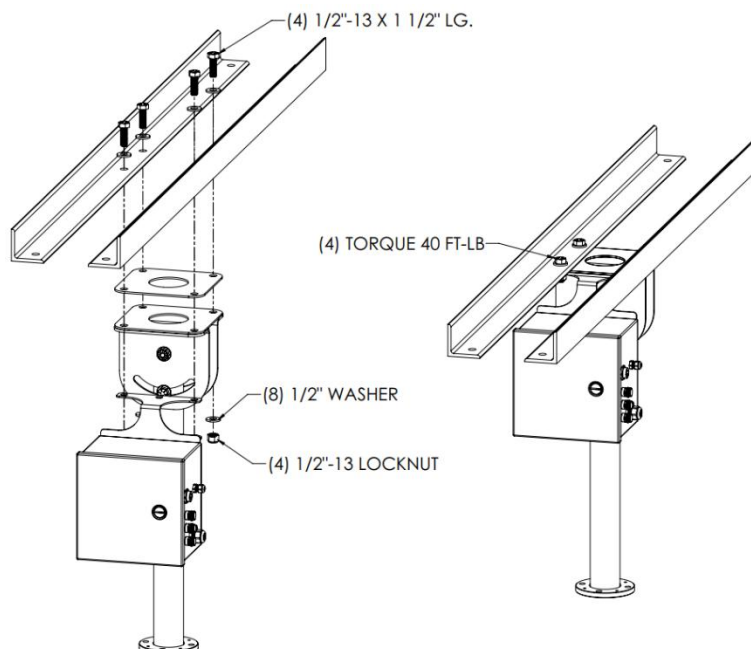


VFD MOUNTING OPTION #2

This VFD mounting option can be used for installations where overhead clearance allows for it. See below for assembling the VFD Enclosure, Top Leveling Brackets, and Extension Tube to angle iron supports (supplied by customer) or (if applicable) other specialized High Performance Fan Co. structure specific mounting kit brackets.

**VFD MOUNTING OPTION #3**

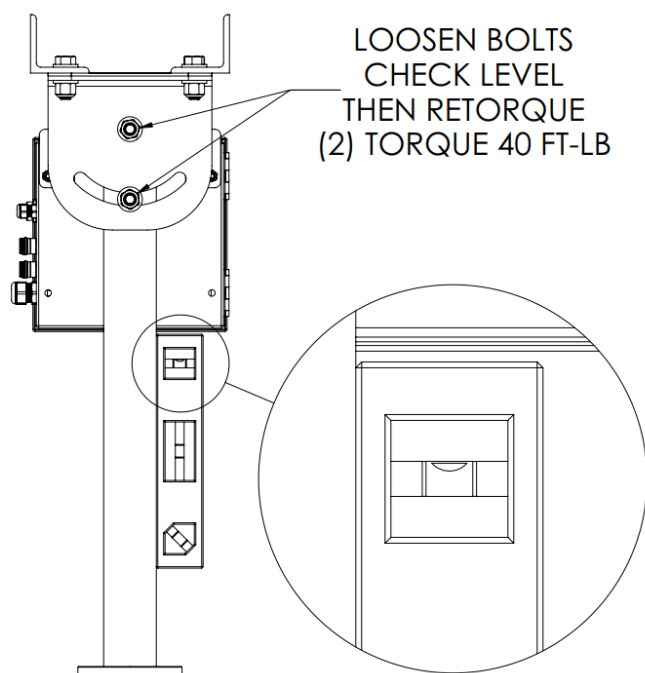
This VFD mounting option can be used for all types of installations. See below for assembling the VFD Enclosure, Top Leveling Brackets, and Extension Tube to angle iron supports (supplied by customer) or (if applicable) other specialized High Performance Fan Co. structure specific mounting kit brackets.



Step # 4 – Torque (4) Top Leveling Bracket bolts to 40 FT-LB

Step # 5 – Torque all bolts holding angle iron to mounting brackets or bar joists at this time to 40 FT-LB.

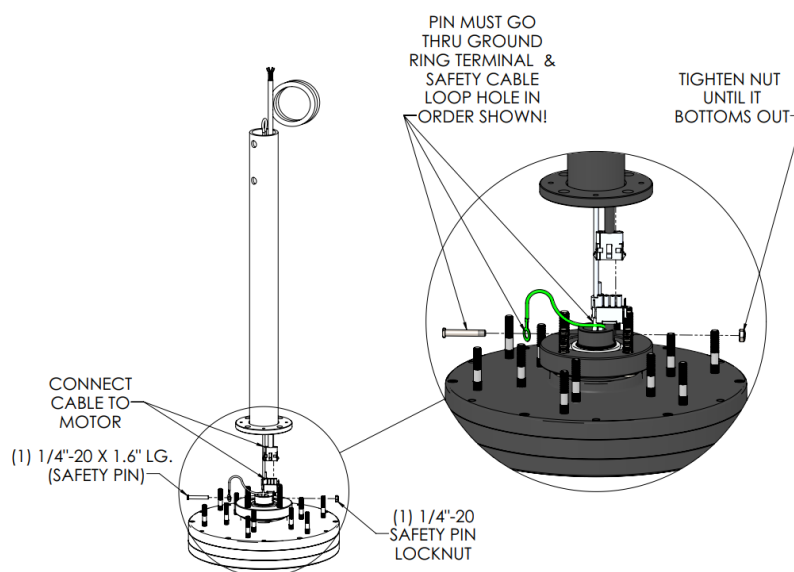
Step # 6 – Level Extension Tube as shown below.



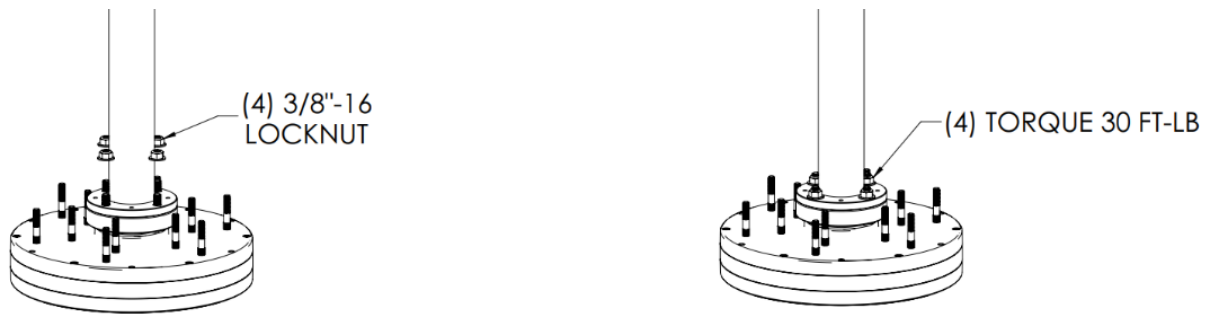
Step # 7 – Connect motor cable, secure ground wire and safety cable using motor safety pin.

- a) Connect motor cable to motor as shown below:
- b) Secure ground wire and safety cable as shown below, First insert the safety pin thru ring terminal of the ground wire, then thru the hole on the motor shaft, then thru the loop on the safety cable, then thru the other side of the motor shaft, fasten the nut and tighten it.

CAUTION: MAKE SURE THE SAFETY PIN IS PROPERLY INSERTED THRU THE SAFETY CABLE!!!

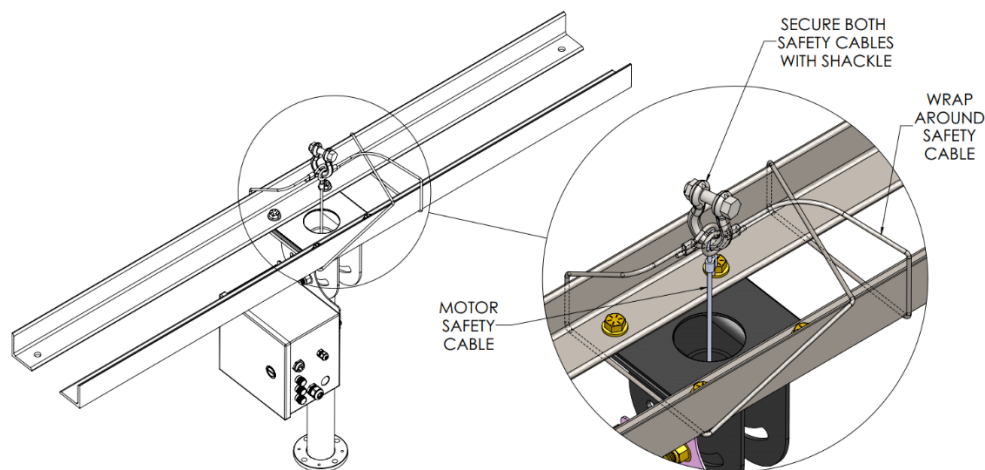


Step # 8 – Raise motor to flange on Extension Tube as shown below, being careful not to pinch the grounding wire, safety cable, or motor cable in the process. Install flanged locknuts and torque as shown below.

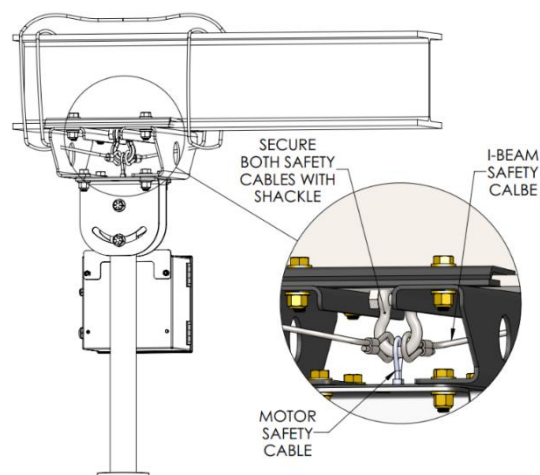


Step # 9 – Next, install the main safety cable making sure to secure the motor safety cable too as shown below. Wrap the main safety cable as tight as possible around your mounting structure leaving as little slack as possible. When finished the main safety cable and motor safety cable should both be secured with the supplied shackle as shown below.

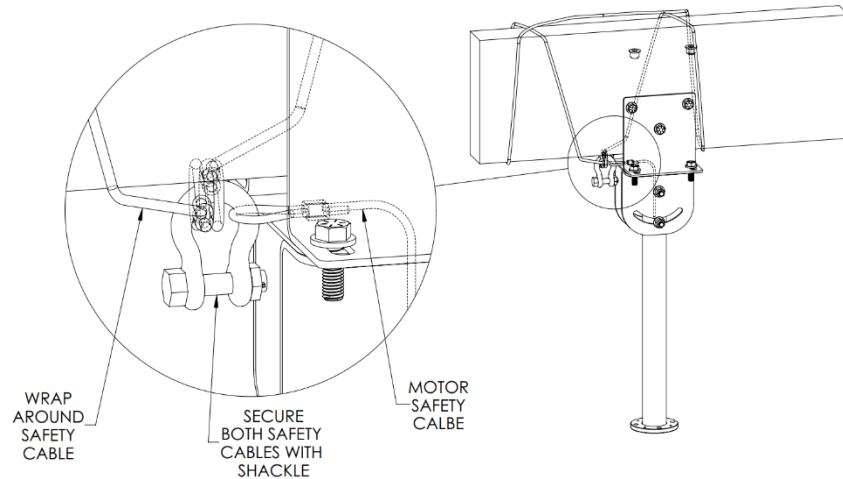
Safety cable installation for ANGLE IRON, BAR JOIST, PURLIN, & WOOD FRAME MOUNTING



Safety cable installation for I-BEAM MOUNTING

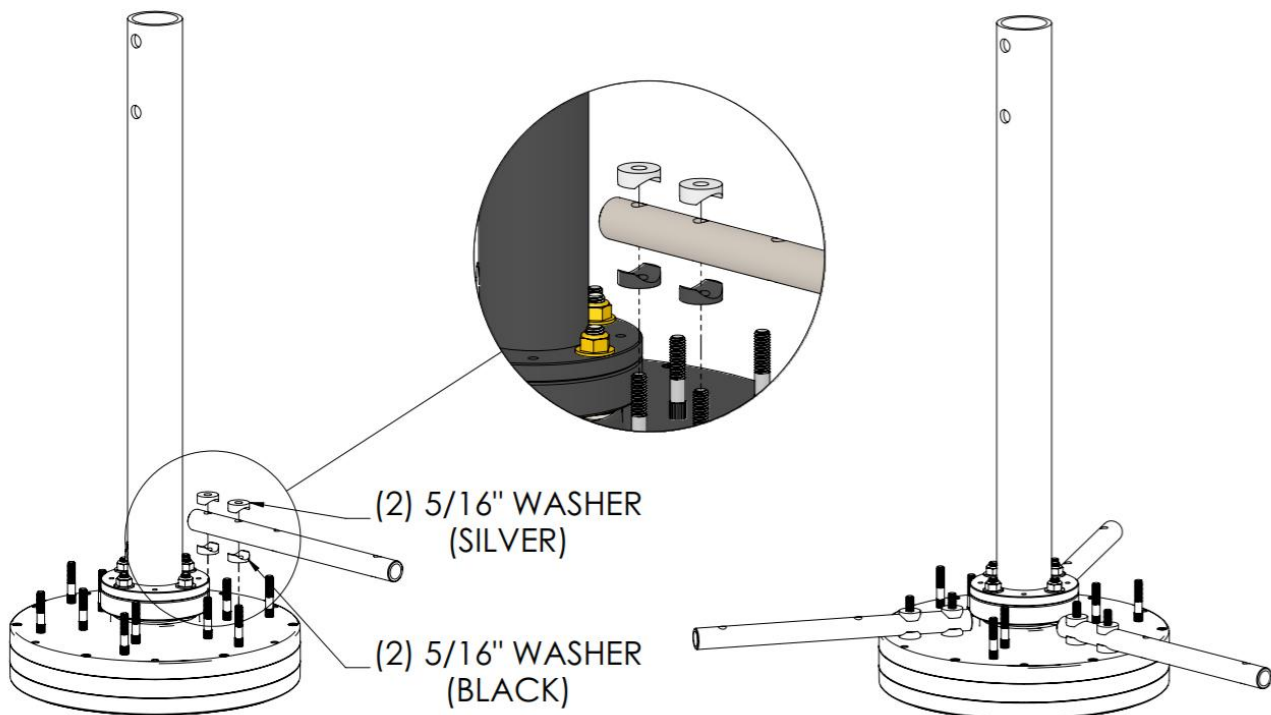


Safety cable installation for SOLID BEAM MOUNTING

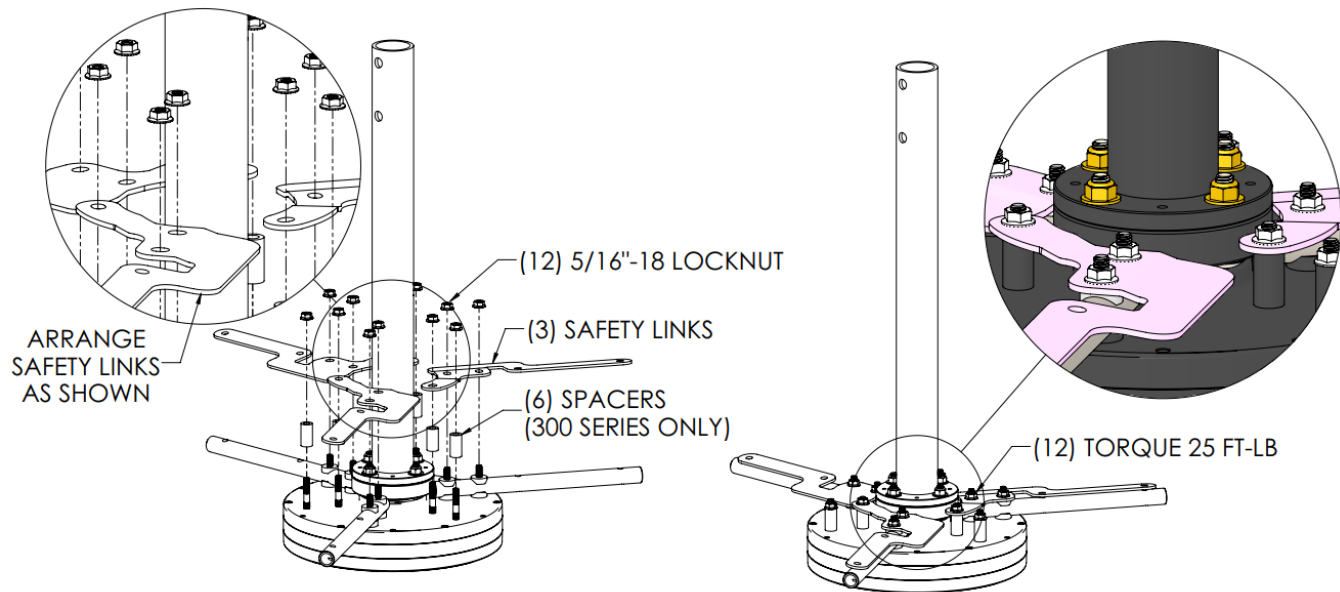


Step # 10 – Install Blade Inserts as shown below on the left and on the right.

NOTE: HPF 300 Series fans have (3) Blade Inserts (shown below) and HPF 600 Series have (6) Blade Inserts (not shown below), the assembly procedure is the same.

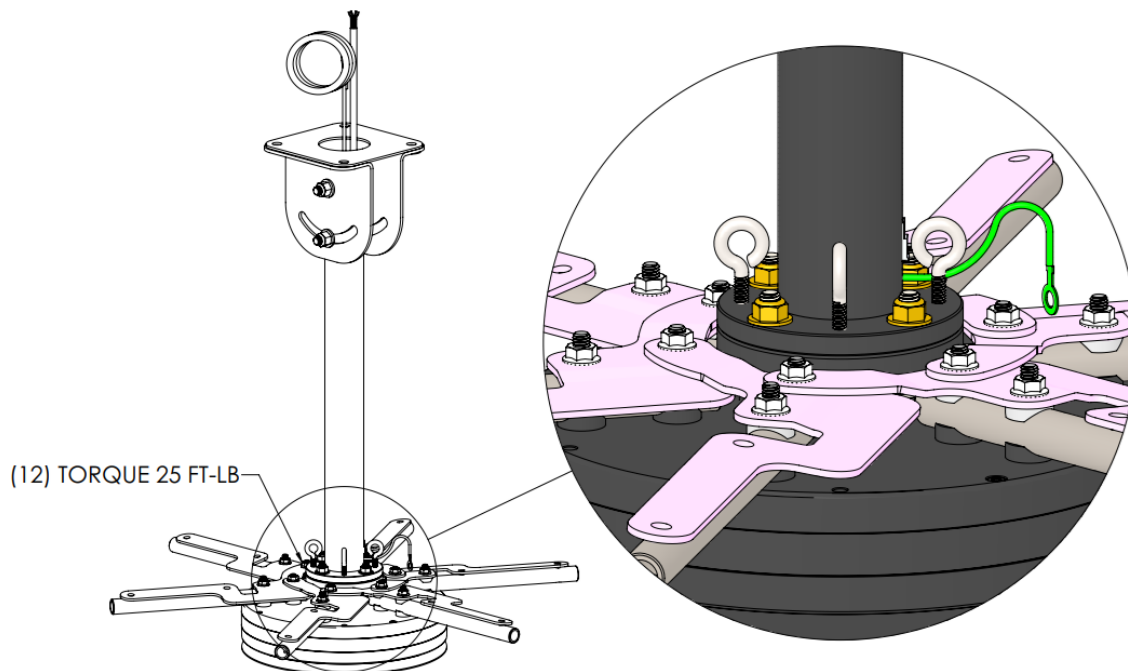


Step # 11 – Install spacers (300 Series ONLY) and safety links as shown below on the left, then torque all nuts to 25 FT-LB as shown below on the right.

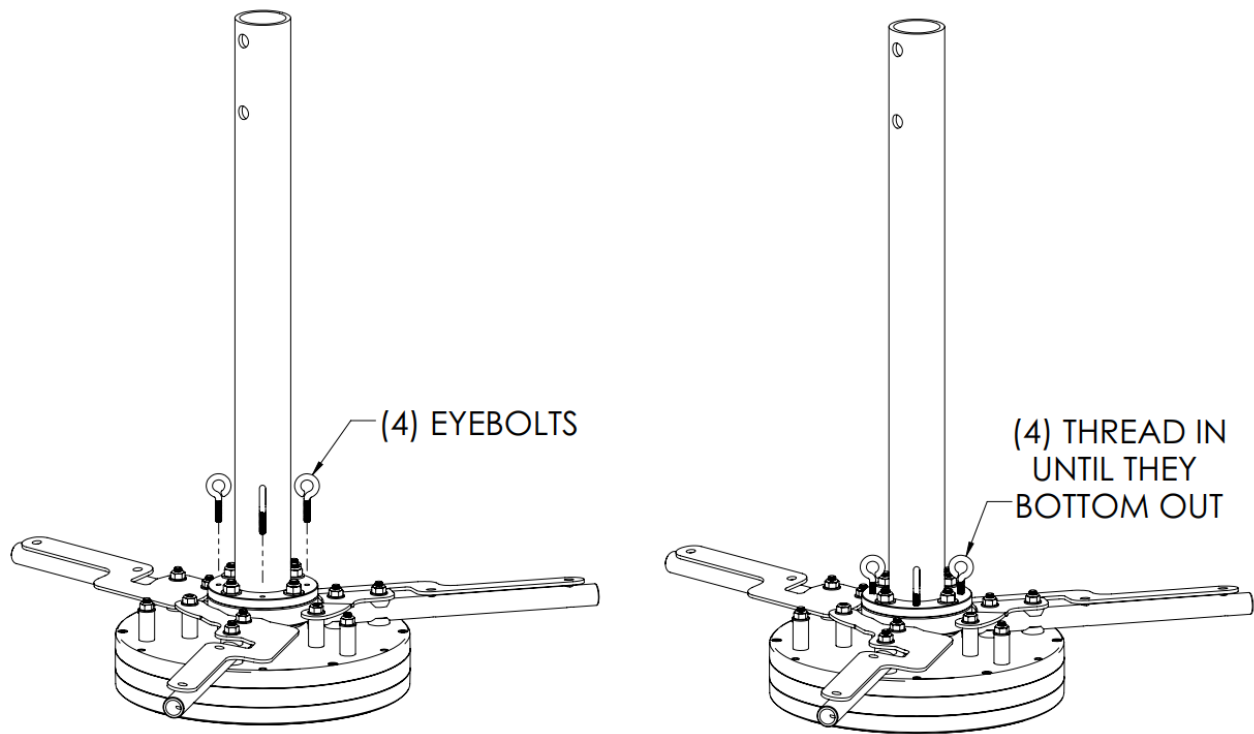


PRO TIP: PRIOR to torquing 5/16"-18 Serrated Locknuts to 25 FT-LB, insert all 5/16"-18 x 1 3/4" Lg. blade bolts (see page 30) through top of safety links and into the blade insert to ensure holes are aligned, this will help make blade installation easier later on in the installation process.

6 BLADE FANS SAFETY LINKS ARRANGEMENT



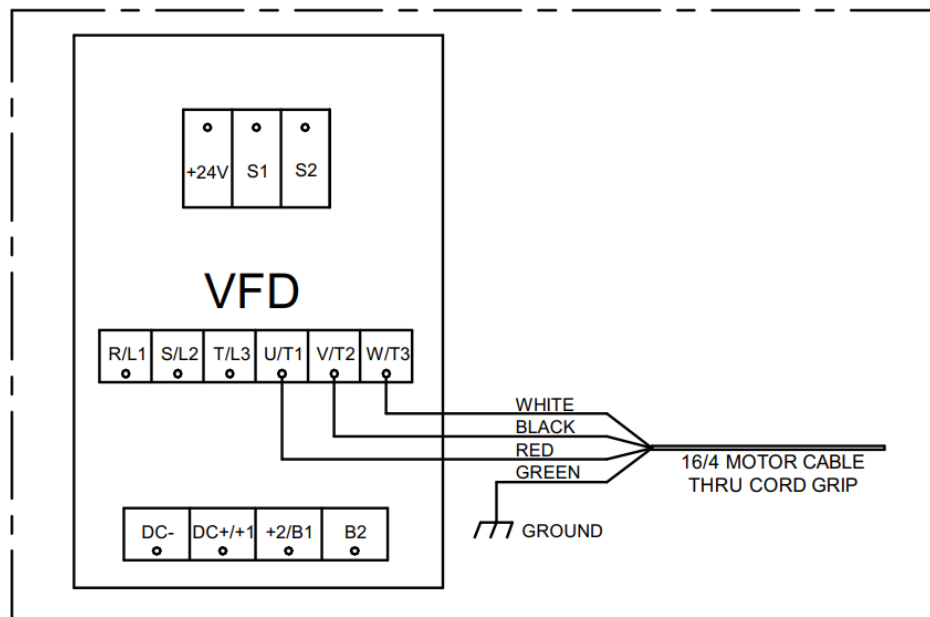
Step # 12 – If your fan came with a guy wire kit, install the eyebolts into the Extension Tube flange as shown below, these will serve as anchor points on the fan for the guy wires.



WARNINGS:

- Ensure that all fan power circuits are disconnected prior to beginning fan/controller installation
- All electrical work must be performed by qualified personnel and in accordance with applicable local and national wiring codes and standards.
- Incorrect assembly can cause electrical shock or damage to the fan motor or controller
- Before working in the VFD Enclosure, ensure isolation of the mains supply at the VFD or fan controller disconnect. Wait at least three minutes for the VFD high voltage capacitor to discharge to safe voltage levels (a darkened display is NOT an indication of safe levels). Failure to do so may result in death or injury.
- Power must be supplied by means of a dedicated circuit breaker, properly fused disconnect, or other means of protection, following local and national electrical codes.

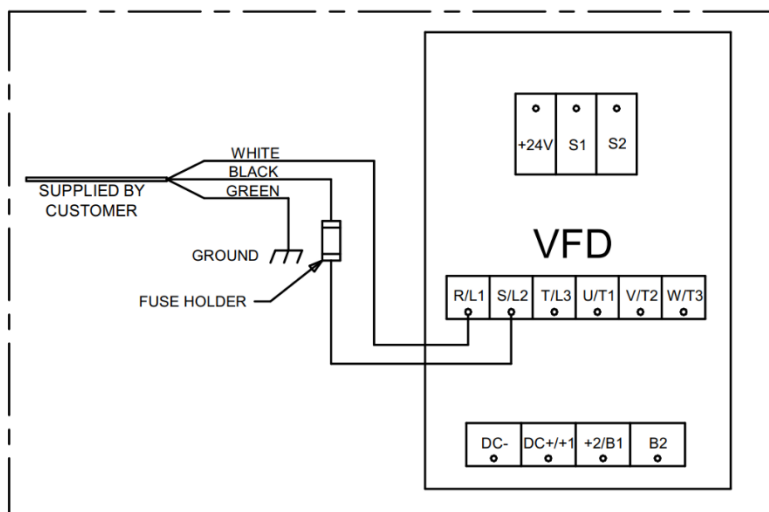
Step # 1 – Feed motor cable into VFD Enclosure thru cord grip labeled “MOTOR” and connect wiring to the “U”, “V”, and “W” terminals on the VFD as shown below. Connect ground wire to identified grounding point in VFD Enclosure. Tighten cord grip to secure motor cable.

MOTOR WIRING

Step # 2 – Making the Incoming Power Connection

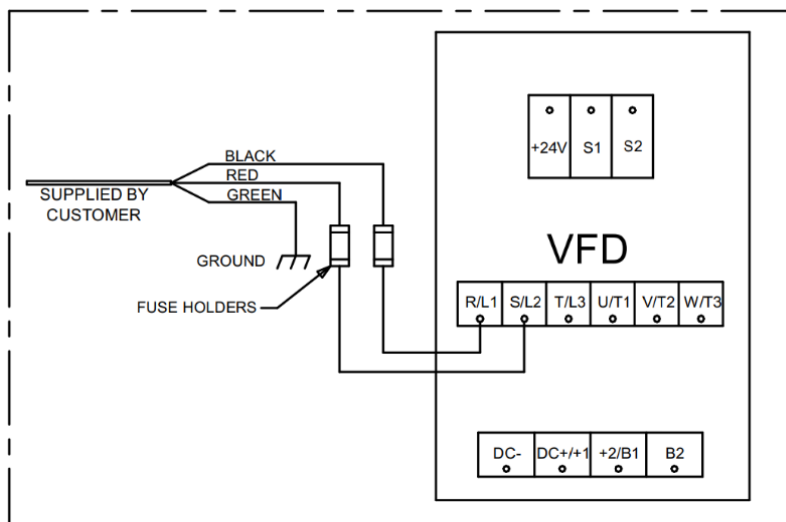
- For **110-125 VAC single phase supply**, the hot wire should be connected to the inline fuse holder terminal, the neutral wire should be connected to the R/L1 terminal of the VFD, the ground wire should be connected to the identified grounding point in the VFD Enclosure as show below.
- A fixed installation is required with a suitable disconnecting device installed between the VFD and AC Power Source. The disconnecting device should conform to the local/national safety code/regulations.
- The cables should be dimensioned according to any local codes or regulations.

110V SINGLE PHASE



- For **208-240 VAC single phase supply**, each hot wire should be connected to an inline fuse holder terminal, the ground wire should be connected to the identified grounding point in the VFD Enclosure as show below.
- A fixed installation is required with a suitable disconnecting device installed between the VFD and AC Power Source. The disconnecting device should conform to the local/national safety code/regulations.
- The cables should be dimensioned according to any local codes or regulations.

208V SINGLE PHASE



Step # 3 – Fire Relay Wiring (OPTIONAL)

NATIONAL FIRE PROTECTION ASSOCIATION STANDARD

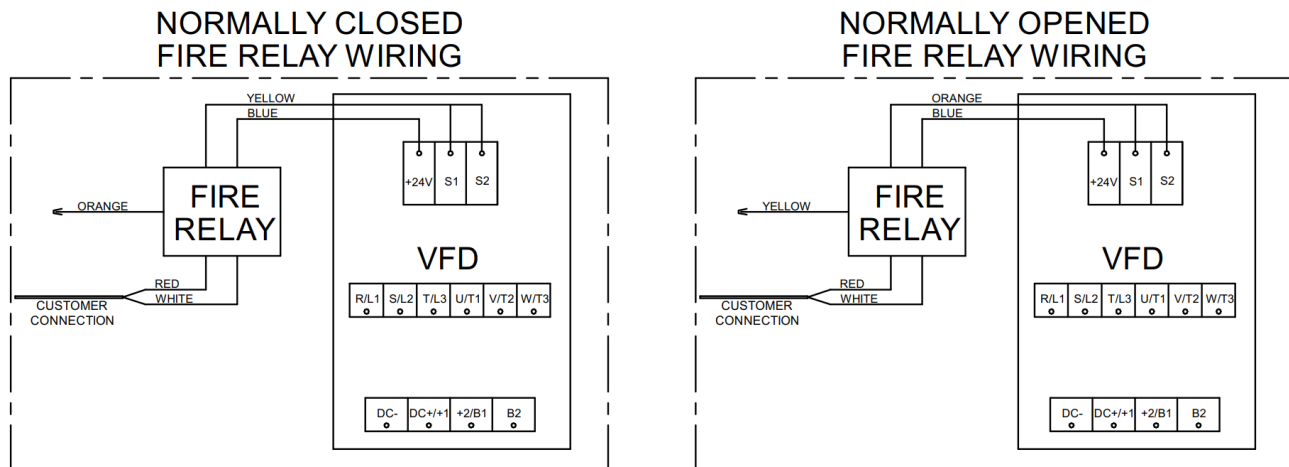
In accordance with NFPA 13 Standard from the National Fire Prevention Association as referenced in sections 12.1.4 and 11.1.7: High Volume Low Speed (HVLS) Fans: **The installation of HVLS fans in buildings equipped with sprinklers, including ESFR sprinklers, shall comply with the following:**

- The maximum fan diameter shall be 24 feet (7.3 m).
- The fan shall be approximately centered between four adjacent sprinklers.
- The vertical clearance from the fan to sprinkler deflector shall be a minimum of 3 feet (0.9 m).
- All fans shall be interlocked to shut down immediately upon receiving a water flow signal from the alarm system in accordance with the requirements of NFPA 72- National Fire Alarm and Signaling Code.

Per NFPA 13, all HVLS fans being installed within a building equipped with a sprinkler system **MUST** install a fire relay that integrates the fan with the sprinkler system so that when the sprinkler system is activated the fan shuts down.

An open contact across VFD digital input terminals +24V, S1, and S2 will result in a fan shutdown. When supplied, the fire relay can be configured to be normally open or normally closed. For this fan installation, the relay will be configured to work in the normally closed state. When configured as normally closed, the relay will remain closed until the Fire Alarm Control Panel (FACP) energizes it, once energized the fan(s) would shut off. This would be considered a fail open wiring arrangement. Two additional relay coil leads are available for additional monitoring where required.

When selected as an option during the initial purchase, the fire relay will come factory installed leaving only the two wire connections from the FACP to be made during fan installation as shown below.



NOTE: If a normally open configuration is preferred, simply swap the yellow wire from the fire relay with the orange wire from the fire relay. Once the FACP connection has been made secure the VFD Enclosure door.

Step # 4 – Connecting the Remote Control

Two different remote control options are offered, a rotary switch, or a digital keypad.

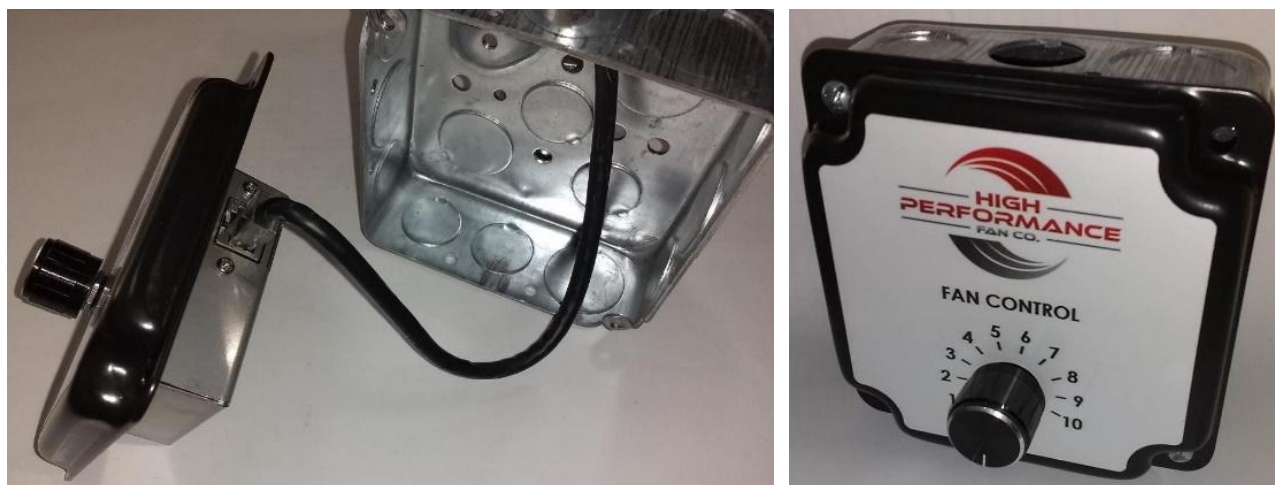
The **Rotary Switch Control** provides the user with the ability to turn the fan on/off, adjust the speed of the fan, and select the direction in which the fan rotates.

The **Digital Keypad Control** is an advanced control which allows for complete control of the fan and configuration/monitoring of the VFD.

CONNECTING THE ROTARY SWITCH CONTROL

The **Rotary Switch** control mounts directly to a standard 4" x 4" electrical box (supplied by customer) as shown below.

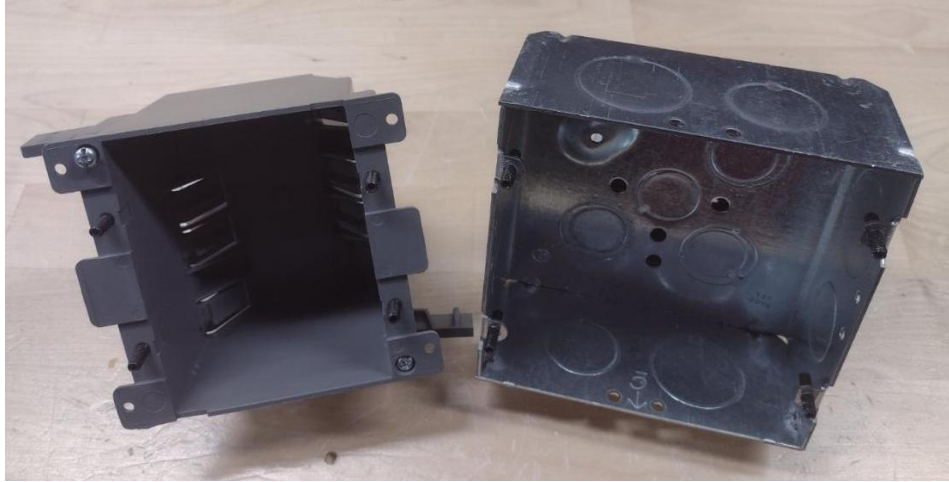
To connect the controller to the VFD Enclosure, simply route the supplied ethernet control cable from the VFD Enclosure connection point labeled "COMM" to the remote control installation point, plug the ethernet control cable into the supplied controller and secure the controller face plate to the electrical box as shown.



The toggle switch on the back of the control is used to select the rotation direction of the fan ("F" = Forward, "R" = Reverse), it should only be switched when the fan is stopped completely.

CONNECTING THE DIGITAL KEYPAD CONTROL

The **Digital Keypad** control mounts directly to a standard 4 11/16" x 4 11/16" metal electrical box (supplied by customer) or to a standard 2-Gang Old Work Electrical Switch/Outlet Box (supplied by customer) using the supplied #8-32 set screws as shown below. The cover plate for the digital keypad control will press onto the #8-32 set screws, securing it in place.

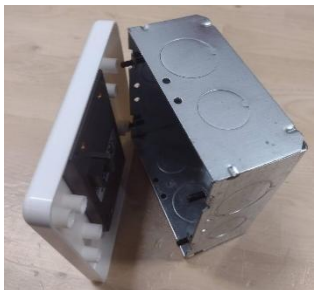


NOTE # 1: If using a metal electrical box, remove the (2) faceplate mounting screws that come with the metal box and use them to tap the two mounting tabs that did not have screws in them in preparation for the installation of the supplied #8-32 set-screws. You may discard these two screws afterwards. Install the (4) #8-32 set screws so that ~3/8" of thread is showing.

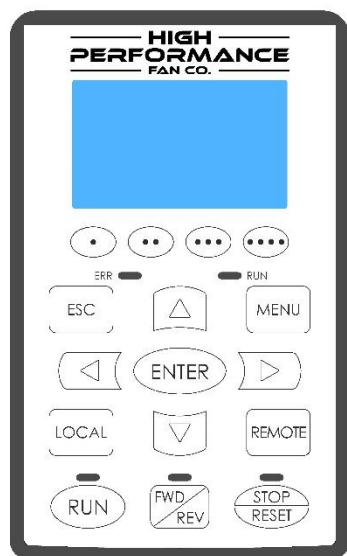
NOTE # 2: If using a plastic OLD WORK BOX, you may need to drill out the set-screw mounting holes using a 0.136"-0.140" drill bit if you cannot thread the supplied #8-32 set-screws into the box. Install the (4) #8-32 set screws so that ~3/8" of thread is showing.

NOTE # 3: If using a plastic OLD WORK BOX, you will want to install the work box so that the switch/outlet mounting holes are horizontal instead of the typical vertical orientation.

To connect the controller to the VFD Enclosure, simply route the supplied ethernet control cable from the VFD Enclosure connection point labeled "COMM" to the remote control installation point, plug the ethernet control cable into the supplied controller and secure the controller face plate to the electrical box by pressing the face plate onto the (4) #8-32 set screws as shown.



The **Digital Keypad** Control is an advanced control which allows for complete control of the fan and configuration/monitoring of the VFD. The following is a brief explanation of the keypad buttons that you will use frequently. In depth keypad instructions can be found within the full VFD manual here: <https://www.deltaacdrives.com/Delta-VFD-MS300-User-Manual.pdf>.



KEY	Description/Function
	Used to start a stopped fan, a GREEN LED light will illuminate when the run signal has been initiated
	Used to stop a fan that is running or reset a faulted drive, a RED LED light will illuminate when the fan is not running or when the stop signal has been initiated
	Used to change the rotational direction of the fan, the direction of the fan can only be changed when the fan is completely stopped, a GREEN LED light will illuminate when the fan is spinning in the forward direction, a RED LED light will illuminate when the fan is spinning in the reverse direction
	The ARROW buttons are used to navigate menus, move the cursor, or adjust values up and down, the ENTER button is used to go to the next menu level or if at the last level pressing the enter button will execute the command
	Used to leave the current menu to return to the previous menu; also functions as a return key or cancel key in a sub-menu
	Returns user to main menu

Using the Digital Keypad to Change the Speed of the Fan



The images shown to the left is the main display screen of the Digital Keypad. **F** = The fan speed commanded, this is where you will change the speed of the fan, **H** = the current speed the fan is operating at, **r** = current RPM the fan is spinning at, and if you scroll down you will see **A** = the current the fan is using to operate in amps



To Change the fan speed, make sure the up/down arrows are on the "F" line of the display, hit the "ENTER" button on the control pad, you will now see the indicator on the right that you have unlocked this setting for editing and you will see one of digits flashing. The flashing digit is the digit that is selected for editing, using the right/left arrows on the control pad you can select any digit to edit. Edit the values using the up/down arrows on the control pad. Below is a list of maximum values that can be entered for all of the fans we offer. The minimum "F" value should not be below 10% of the maximum "F" value.

FAN SERIES/SIZE			310	312	314	316	318	320
"F" MAXIMUM			54 Hz	47 Hz	40 Hz	42 Hz	35 Hz	29 Hz

FAN SERIES/SIZE		608	610	612	614	616	618	620
"F" MAXIMUM		65 Hz	50 Hz	40.5 Hz	29 Hz	31 Hz	24.5 Hz	20 Hz

After installation of the remote control is complete, turn on power to the fan to verify function of the controller and rotation of the fan. The fan should rotate counter-clockwise when looking up at it from the floor when operating in the forward direction. **ONCE YOU HAVE COMPLETED THE FUNCTIONALITY TEST, DISCONNECT THE POWER FROM THE FAN TO CONTINUE THE FAN INSTALLATION.**

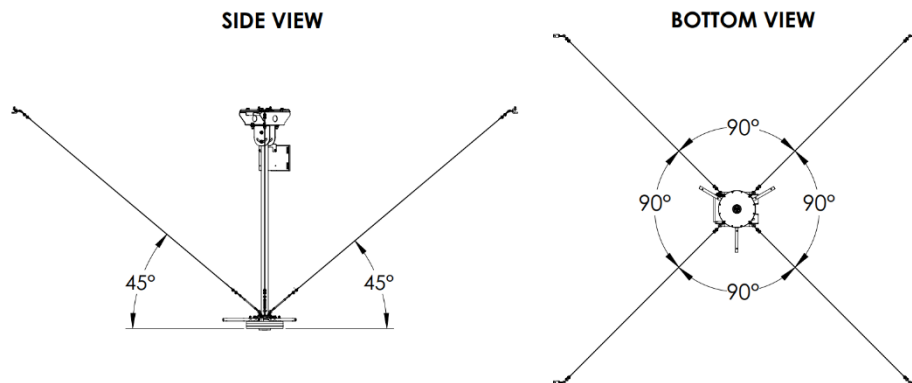
Section 10:

Guy Wires

CAUTION: ALL FANS WITH EXTENSION TUBES GREATER THAN OR EQUAL TO 4 FT. MUST USE GUY WIRES TO PREVENT LATERAL MOVEMENT OF THE FAN. IN SOME CASES, FANS WITH EXTENSION TUBES THAT ARE LESS THAN 4 FT. MAY REQUIRE GUY WIRES IF THE FAN MOUNTING STRUCTURE IS NOT RIGID ENOUGH. REGARDLESS OF THE EXTENSION TUBE LENGTH, IF ANY OSCILLATION IS OBSERVED DURING FAN OPERATION GUY WIRES SHOULD BE INSTALLED.

WARNING: IF A GUY WIRE KIT WAS NOT PURCHASED INITIALLY AND THE FAN HAS LATERAL MOVEMENT AFTER INSTALLATION, CONTACT HIGH PERFORMANCE FAN CO. IMMEDIATELY TO ORDER A GUY WIRE KIT FOR YOUR FAN INSTALLATION!

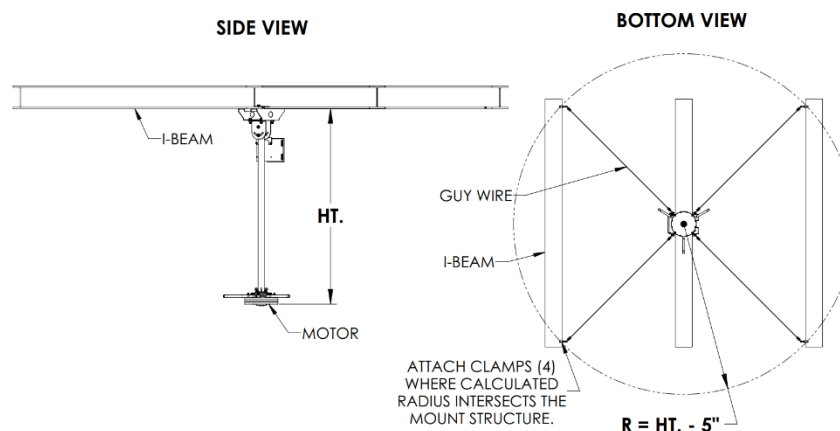
Step # 1 – First determine the mounting location of the Guy Wire Clamps on your mounting structure. The clamps should be spaced evenly and such that the Guy Wires end up at approximately a 45 degree slope to the fan (when looking at the fan from the side) and 90 degrees from one another (when looking the fan from the floor) as shown below.



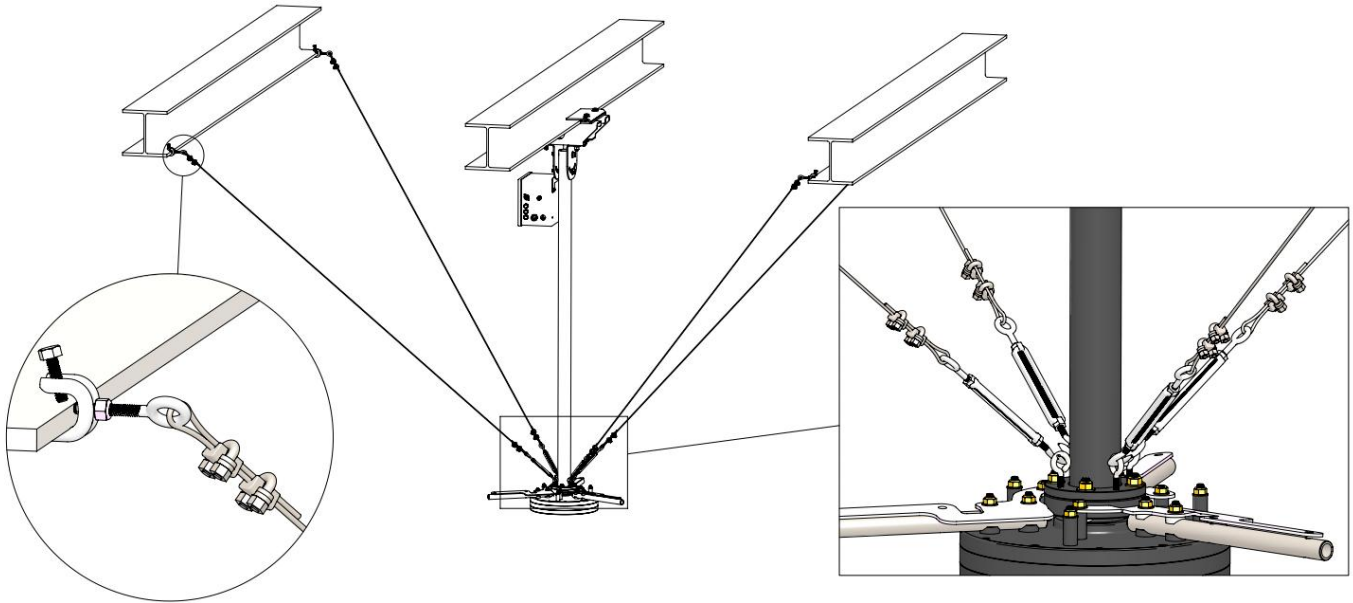
If the recommended angles are not possible, a slope deviation of up to 15 degrees is acceptable and a spacing deviation of up to 30 degrees is acceptable. If the required deviation(s) are beyond these limits, contact High Performance Fan Co. for additional guidance.

An easy way to determine the clamp locations is to measure from the bottom of the fan hub up to the mounting structure (dimension "HT.", see SIDE VIEW below). Once the height "HT." has been determined, apply formula $R = HT. - 3"$ to find the radius of the circle that determines the location where to mount the clamps as shown below on the BOTTOM VIEW.

NOTE: The example shown below is for I-Beam mounting structures, however the same procedure applies to other mounting structures as well.



Step # 2 – Attach clamps to mounting structure, then tighten the screw as shown below on the left. Then, add the Eye Bolt on the Clamp and secure by tightening the jam nut. Feed supplied cable/wire thru Eye Bolt then tighten the loop with Wire Clamps provided.



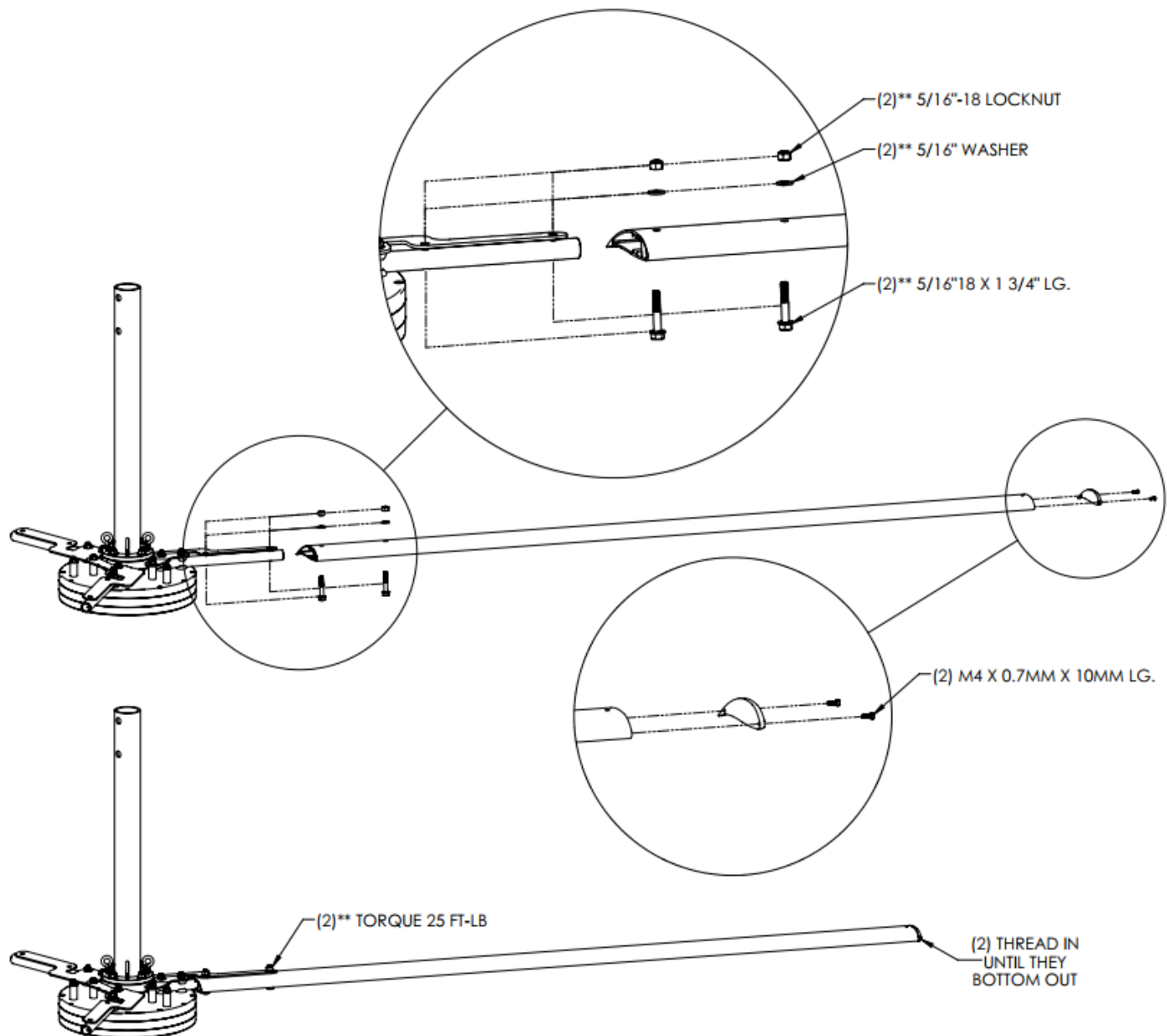
Next, pull the cable to the fan chassis and hook the Turnbuckle on the eyebolts as shown above on the right, then feed the cable/wire thru eye bolt on the Turnbuckle and secure with Wire Clamps (2). Next, cut the extra cable then tighten the turnbuckle as needed to remove any slack, being careful not to overtighten the turnbuckle. Overtightening of the turnbuckles may cause the fan to become unlevel. Repeat the same steps for the other (3) Guy Wires. With all guy wires installed, recheck the levelness of the fan and re-adjust the guy wires as needed to ensure the fan is level in all directions.

Section 11:

Final Assembly

Step # 1 – Assemble the first fan Blade as shown below, then torque (2) screws to 25 FT-LB. Repeat the same steps for the rest of the blades. The through-holes in the blades and the blade inserts are tight tolerance holes, some bolts may require turning for installation.

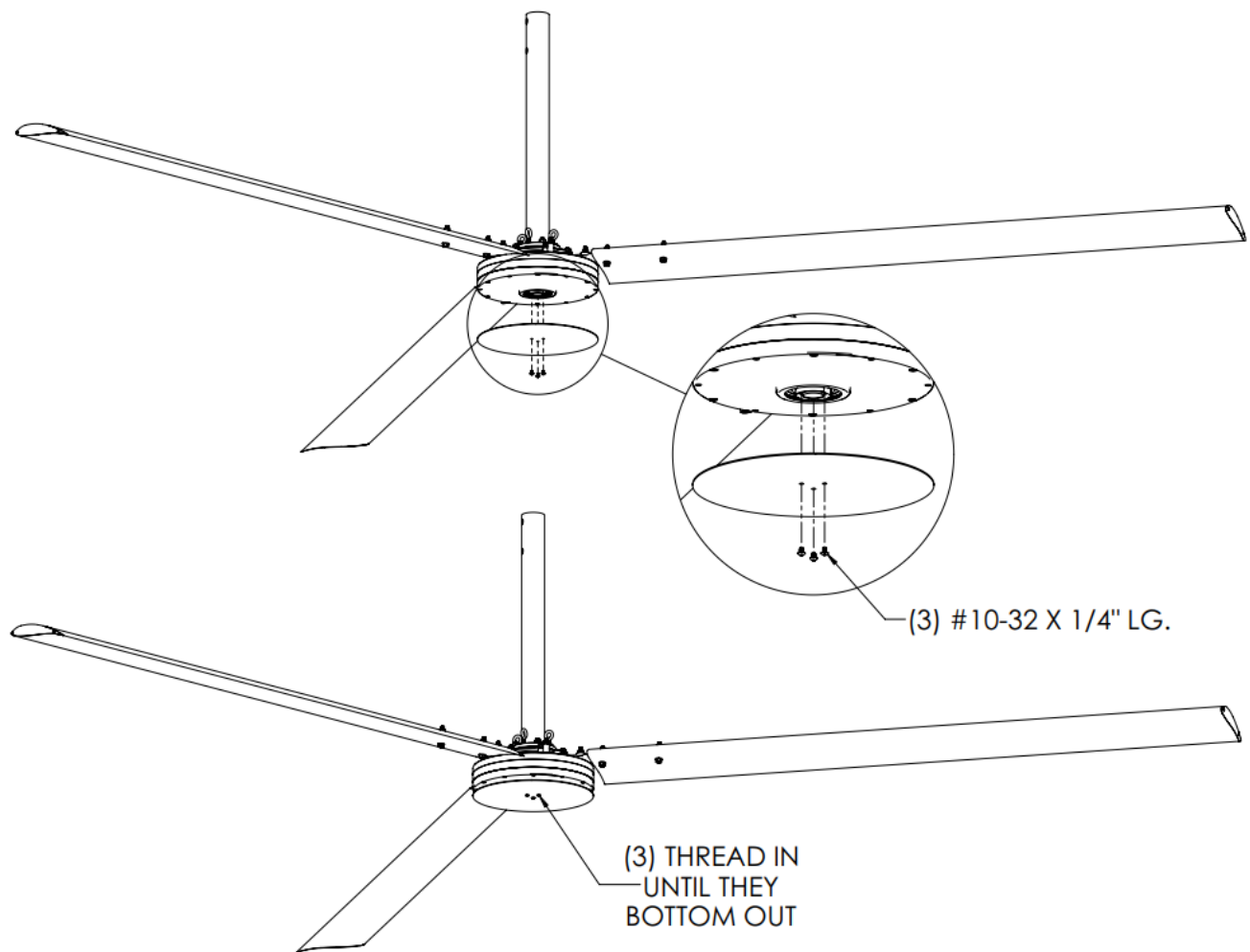
NOTE: HPF 300 series fans have (3) Blade Inserts (shown below) and HPF 600 series fans have (6) Blade Inserts (not shown below), the assembly procedure is the same.



CAUTION: DOUBLE-CHECK TORQUE ON EACH SCREW TO ENSURE PROPER INSTALLATION OF EACH BLADE!

****Fans up to 14 ft. in diameter have (2) bolts, washers & locknuts per blade (as shown above), Fans larger than 14 ft. in diameter have (3) bolts, washer & locknuts per blade (not shown).**

Step # 2 – Install motor cover plate as shown below.



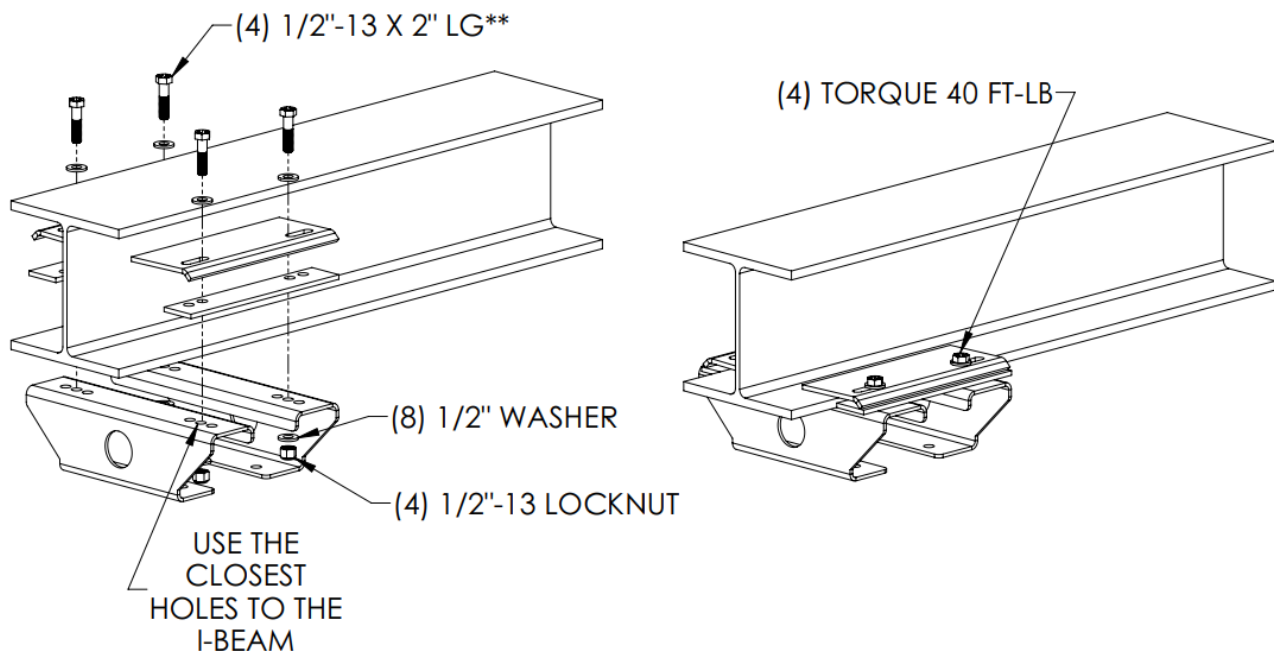
Section 12:

I-Beam Mounting Instruction

WARNINGS:

- **DO NOT** Direct Mount fan on I-Beams (An I-Beam Mount Kit must be used)!
- **DO NOT** mount fan on fabricated I-Beams (fabricated I-Beams are welded I-Beams)!
- I-Beams must be rolled (not fabricated) and part of building structure!
- For I-Beams larger than 9.625" consult factory for additional mounting options.

Step # 1 – Secure the I-Beam Mount brackets to the I-Beam using the supplied hardware as shown below. Tighten the bolts to 40 FT-LB as shown below. Refer to the basic fan installation guide for attaching the Top Leveling Brackets to the I-Beam Mount brackets and the remainder of the fan installation.



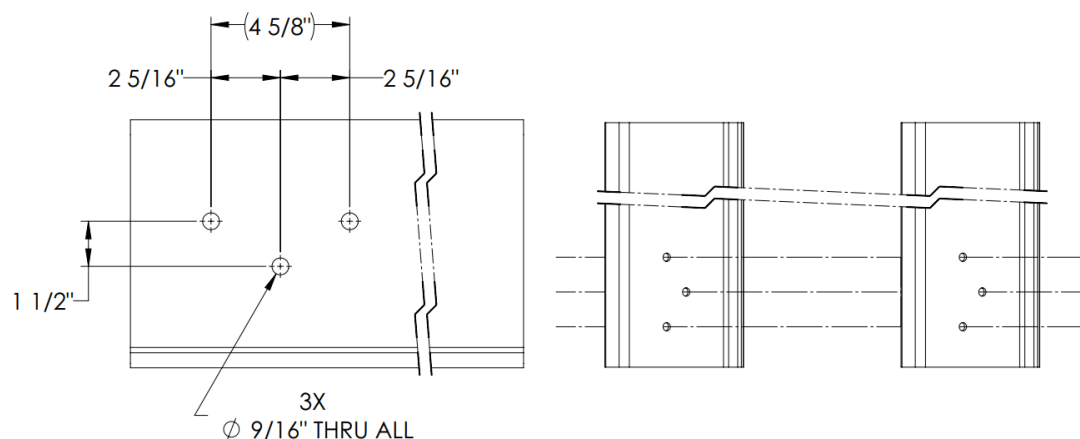
Section 13:

Purlin Mounting Instruction

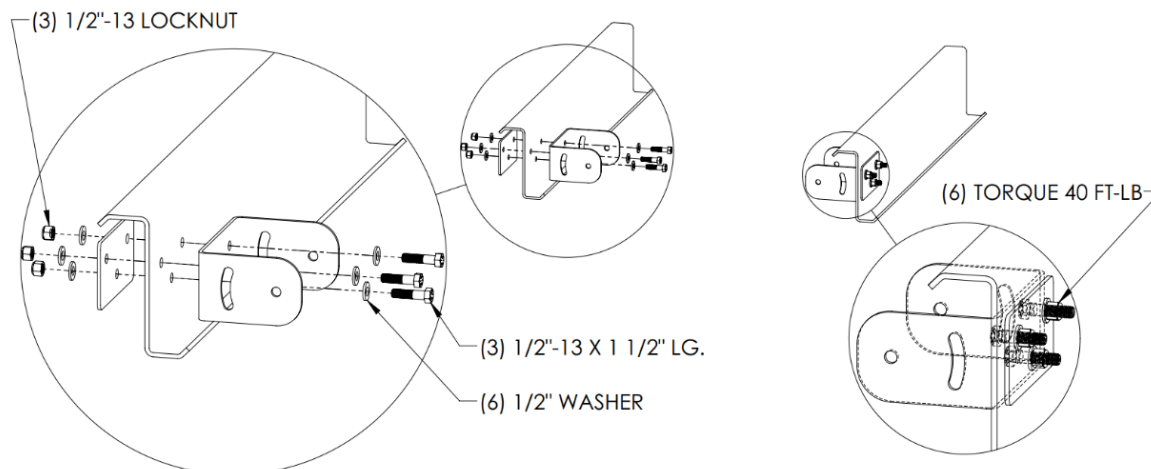
WARNINGS:

- **DO NOT** mount fan on a single Purlin!
- **When mounting fan to Purlins, an Extension Tube must be used!**
- **DO NOT** mount fan on Purlins that are less than 14-gauge steel (.078" thick)!
- **DO NOT** mount fan on Purlins if unsupported Purlin length is greater than 30 FT!
- **DO NOT** mount fan using Purlins Purlin spacing is greater than 5 FT!
- **The Z-Purlin mount kit is good for roof slopes up to 5/12!**
- **Customer to supply (2) Pieces of angle irons, 2.5" W x 2.5" H x 0.25" T (length to be determined based on span of Purlins)**
- **If there is any doubt regarding the strength of the mounting structure, consult a structural engineer!**

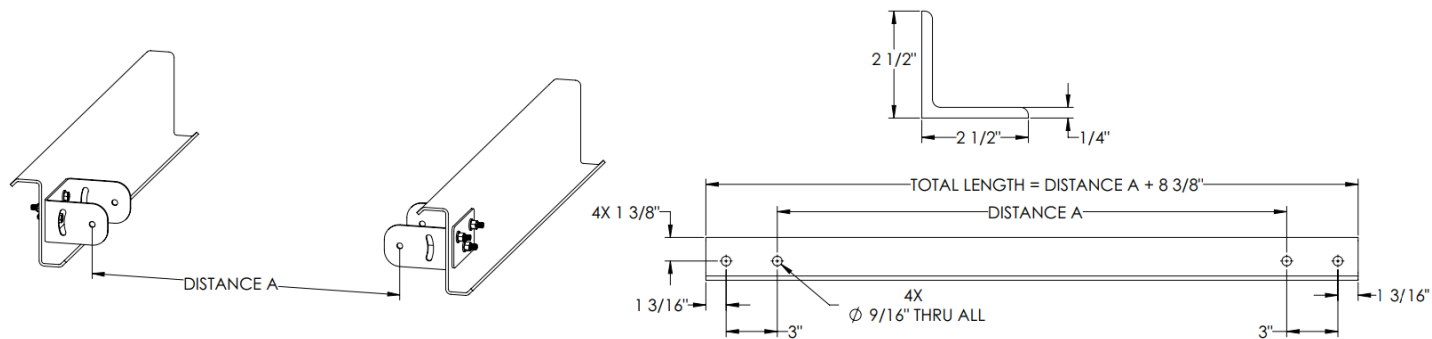
Step # 1 – Drill (3) holes in the center of the first Purlin as shown below on the left (you could use the Purlin support plate as a template to mark the holes). Then, locate and drill the same holes on the second Purlin, making sure the second set of holes are aligned with the first set of holes as shown below on the right!



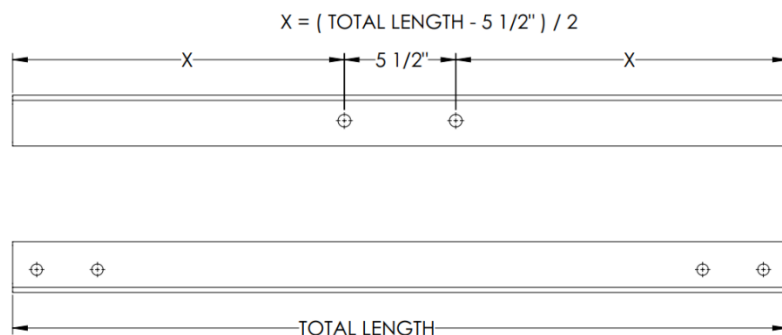
Step # 2 – Assemble both Purlin Brackets, facing each other, as shown below, then torque (6) screws to 40 FT-LB.



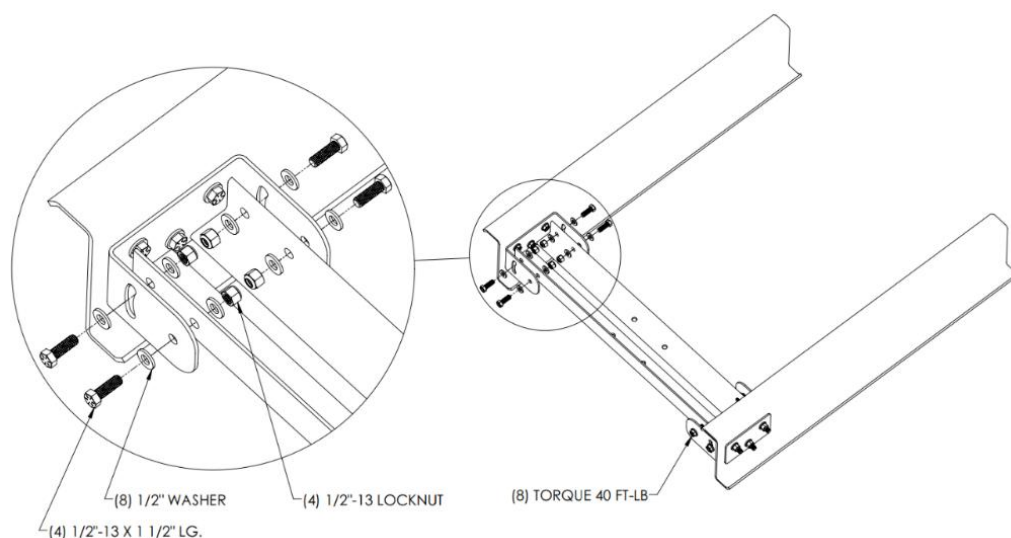
Step # 3 – Measure the span between the holes in the mounting brackets as shown below on the left, this measurement will be “Distance A” and will be used to determine the total length of the angle iron needed to mount the fan using the formula provided below on the right. With the (2) angle iron pieces cut to length (total length should be less than 5 FT.), drill the holes as shown below on the right.



Step # 4 – Next, drill the holes for mounting the Top Leveling Brackets as shown below (qty. 2). Notice, the holes are centered as shown.



Step # 5 – Install angle irons as shown below on both sides as shown below, but do not tighten yet. Refer to the basic fan installation guide for attaching the Top Leveling Brackets to the angle iron and the remainder of the fan installation.



Section 14:

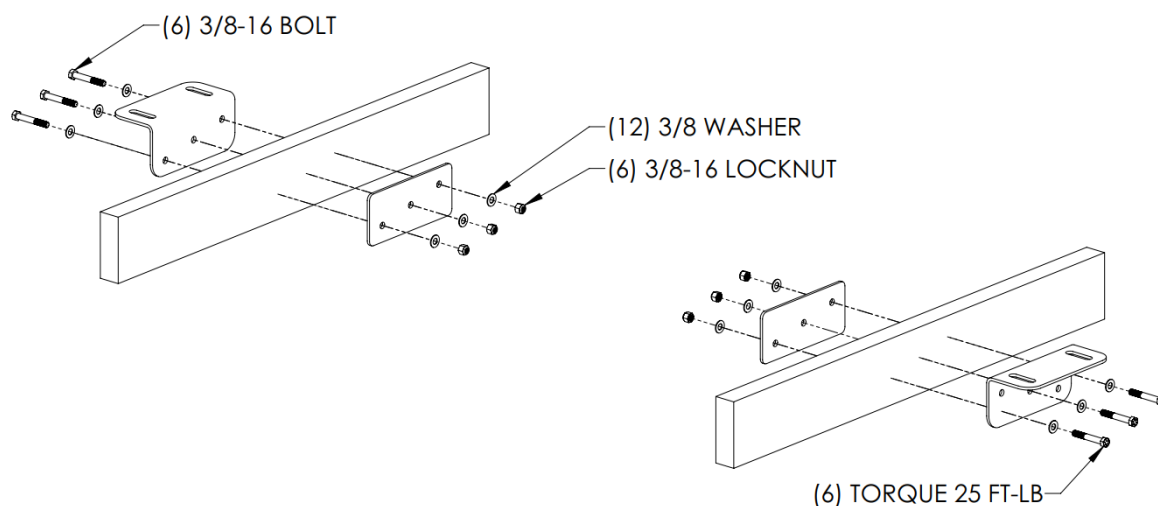
Wood Frame Mounting Instruction

WARNINGS:

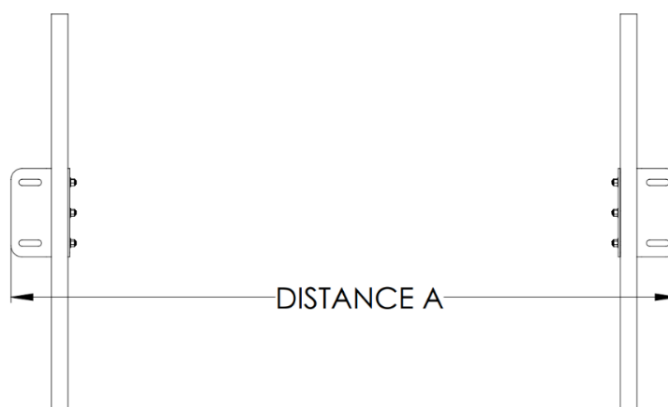
- DO NOT mount fan on a single wood framing member!
- When mounting fan to wood framing, an Extension Tube must be used!
- DO NOT mount fan on wood framing that is less than a 2" x 4" dimensional lumber!
- DO NOT mount fan using wood framing spacing that is greater than 24 inches on center!
- The Wood Frame Mount Kit is good for roof slopes up to 5/12!
- Customer to supply (2) Pieces of angle irons, 2.5" W x 2.5" H x 0.25" T (length to be determined based on span of wood framing)
- If there is any doubt regarding the strength of the mounting structure, consult a structural engineer!

Open Ceiling Joist Mount

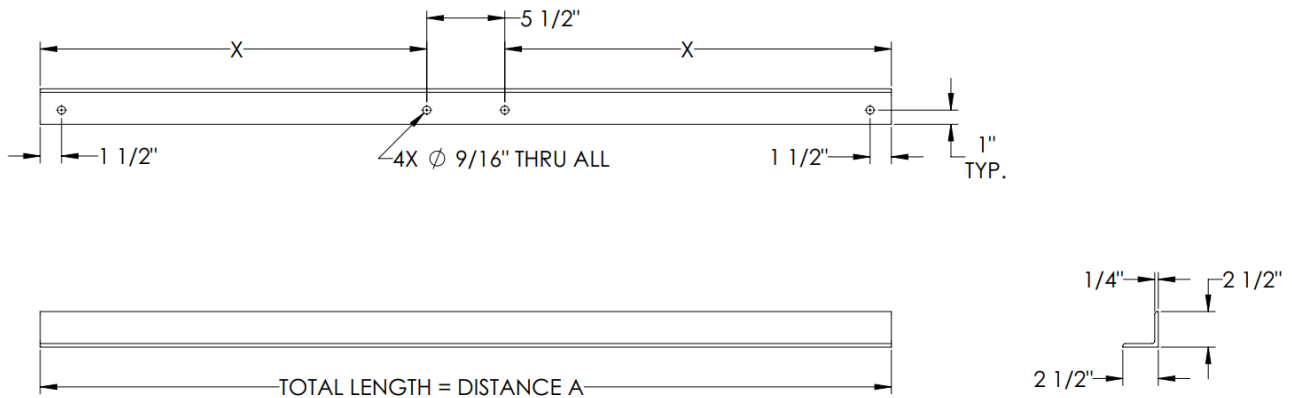
Step # 1 – Align first angle mounting bracket so that it is flush with the top of the wood frame, mark and drill (3) holes in the wood frame, install hardware and torque to 25 FT-LB. Then, locate and mount the second angle mounting bracket on the second wood frame joist as shown below, making sure the second bracket is aligned with the first bracket!



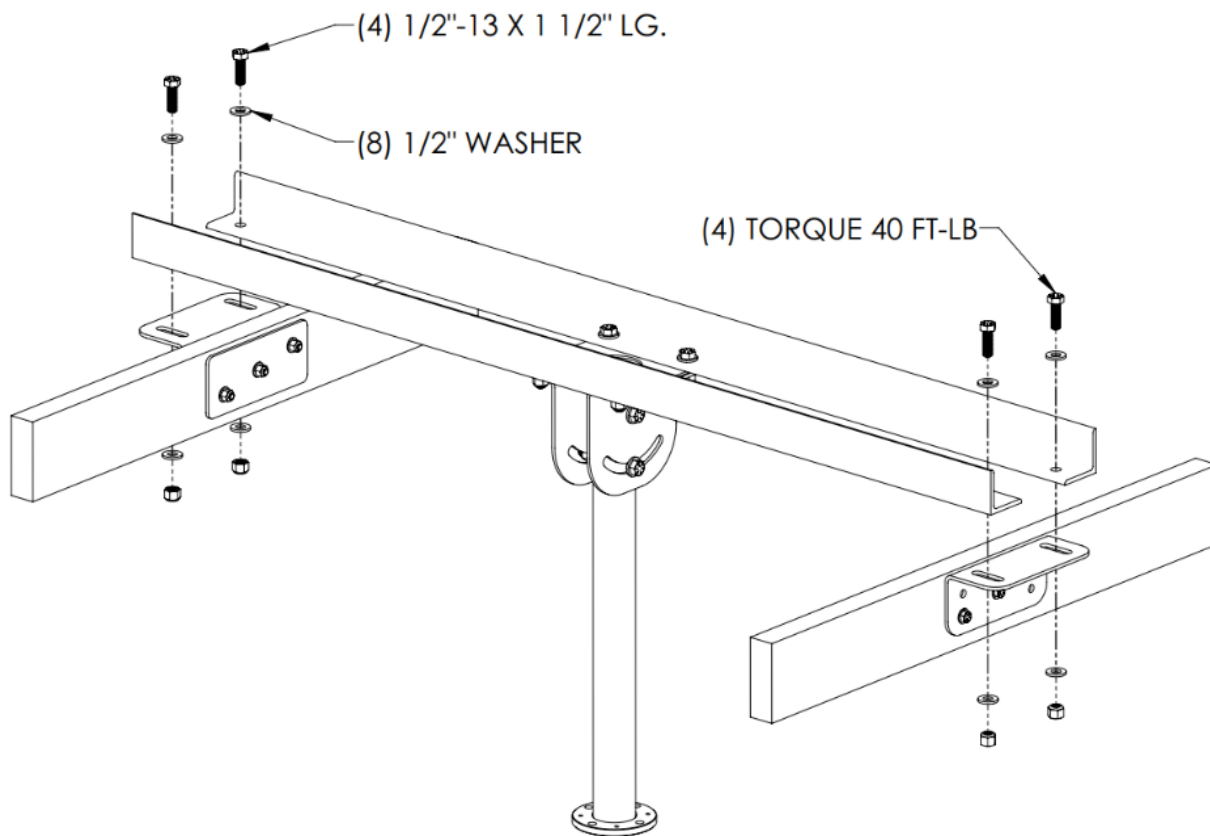
Step # 2 – Measure the total distance from the edge of the first bracket to the edge of the second bracket (Distance A), you will need two pieces of 2 1/2" x 2 1/2" x 1/4" angle iron this length.



Step # 3 – Drill two pieces of 2 ½" x 2 ½" x ¼" angle iron as shown below.

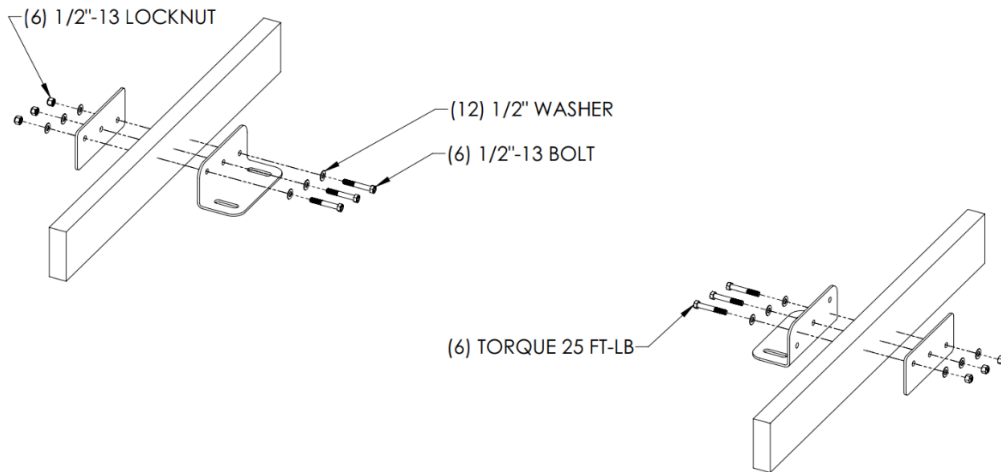


Step # 4 – Install angle irons on both sides as shown below, but do not tighten yet. Refer to the basic fan installation guide for attaching the Top Leveling Brackets to the angle iron and the remainder of the fan installation.

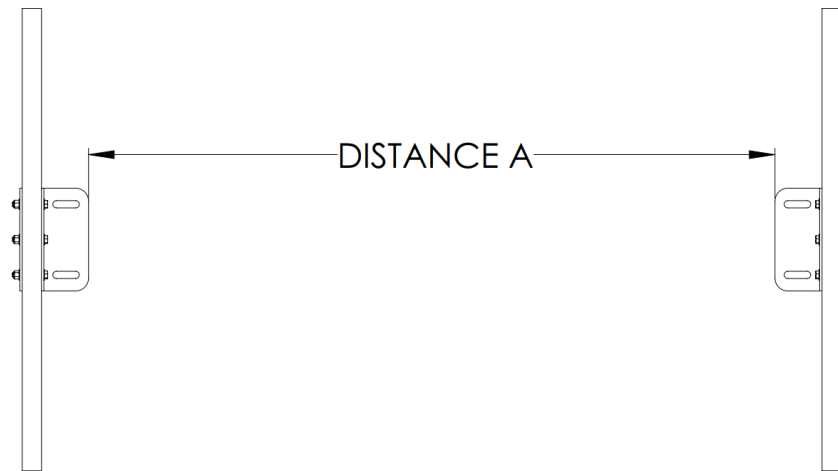


Floor Joist Mounting

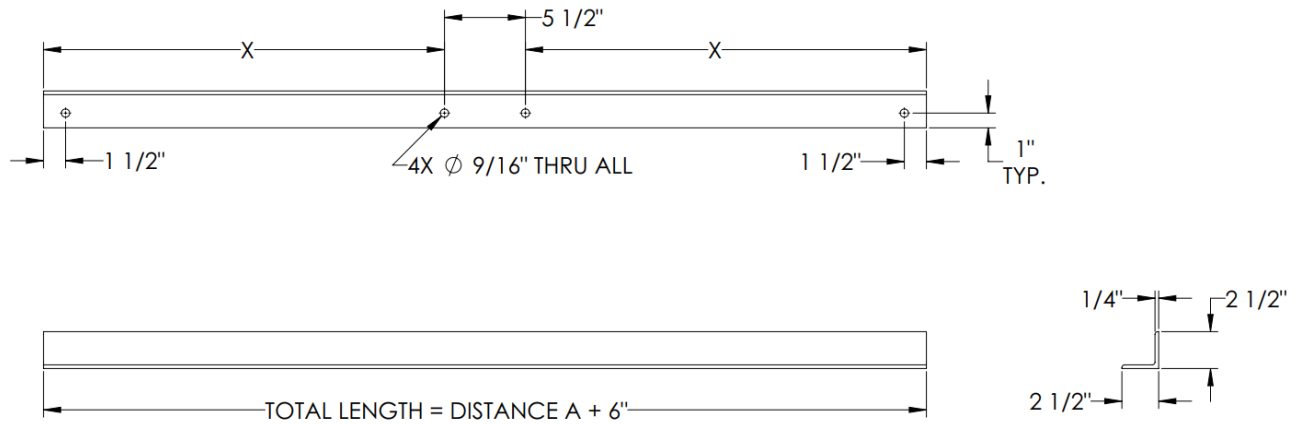
Step # 1 – Align first angle mounting bracket so that it is centered top to bottom on the wood frame, mark and drill (3) holes in the wood frame, install hardware and torque to 25 FT-LB. Then, locate and mount the second angle mounting bracket on the second wood frame joist as shown below, making sure the second bracket is aligned with the first bracket!



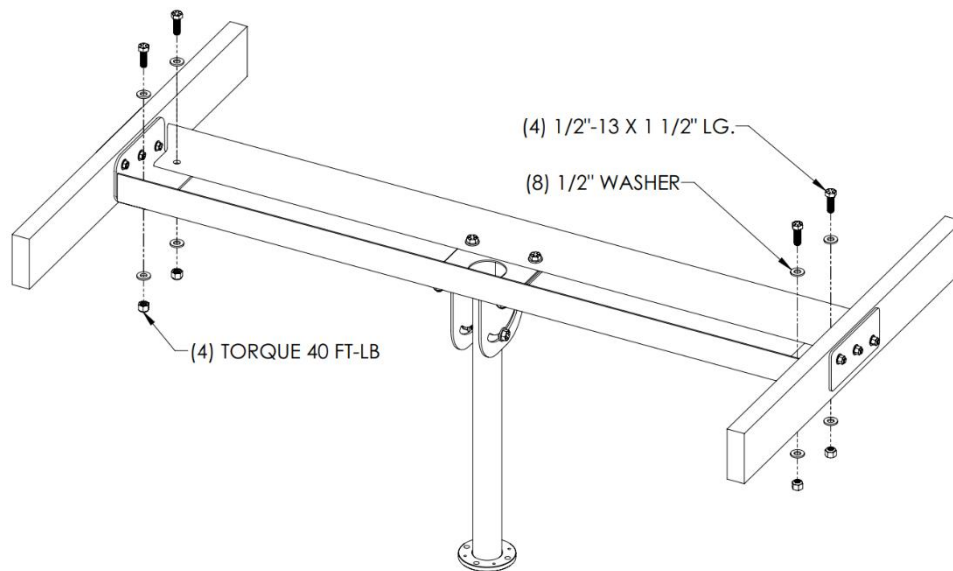
Step # 2 – Measure the total distance from the edge of the first bracket to the edge of the second bracket (Distance A), this distance will be used in the next step to determine the length of angle irons needed.



Step # 3 – Figure out the length of angle iron needed and drill two pieces of 2 ½" x 2 ½" x ¼" angle iron as shown below.



Step # 4 – Install angle irons on both sides as shown below, but do not tighten yet. Refer to the basic fan installation guide for attaching the Top Leveling Brackets to the angle iron and the remainder of the fan installation.

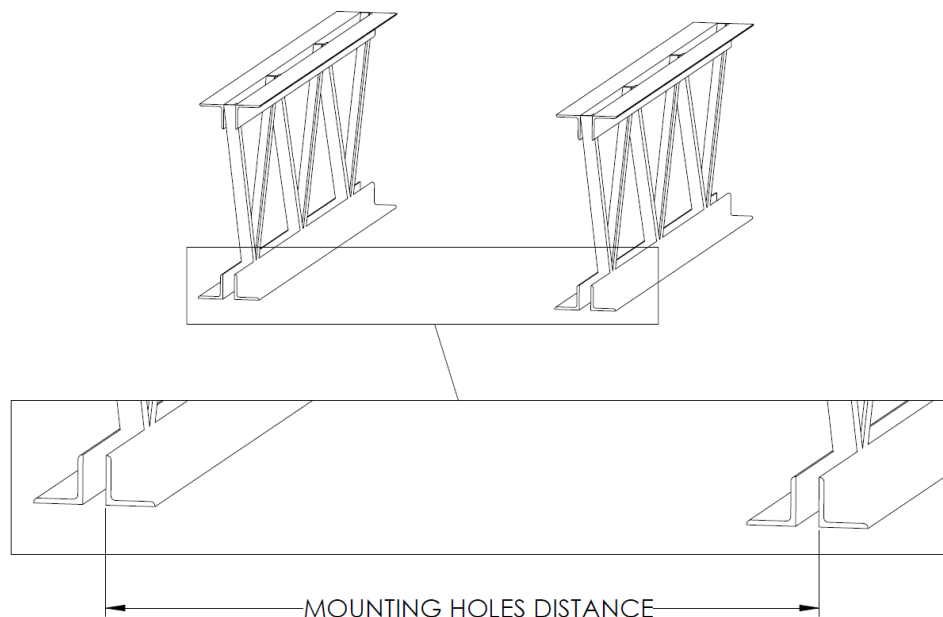


Section 15: Bar-Joist Mounting Instruction (Direct or with Extension)

WARNINGS:

- Customer to supply either (2) or (4) pieces of angle iron (size and length to be determined below)!
- DO NOT mount fan on single Bar-Joist!
- Distance between Bar-Joists should not exceed 12 FT.!
- Angle iron must be fastened on roof structure on both ends!
- DO NOT use beam clips to secure angle irons to Bar-Joists!

Step # 1 – Measure Bar-Joist span to define Mounting Holes Distance as shown below.



Step # 2 – Based on Mounting Holes Distance, define the angle iron size (W X H X T) and quantity (2 or 4) needed by using the table below.

MOUNTING HOLES DISTANCE ¹	ANGLE IRON DIMENSIONS ² (W X H X T)	QUANTITY OF ANGLE IRON NEEDED
≤ 8 FT.	2 ½" X 2 ½" X ¼"	2
> 8 FT. UP TO 12 FT.	2 ½" X 2 ½" X ¼"	4 ³
>12 FT.	DO NOT USE ⁴	DO NOT USE ⁴

¹ – Based on measurement from Step # 1, determine your range on the table.

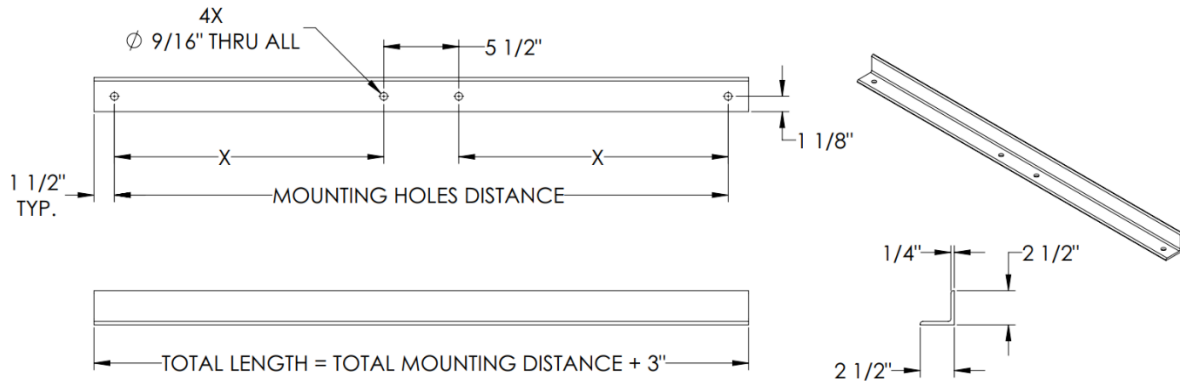
² - All angle iron dimensions must be greater than or equal to the corresponding size shown on the table

³ - Two pairs of Angle Iron are required

⁴ - If the Mounting Holes Distance is more than 12 FT. contact manufacturer or a structural engineer

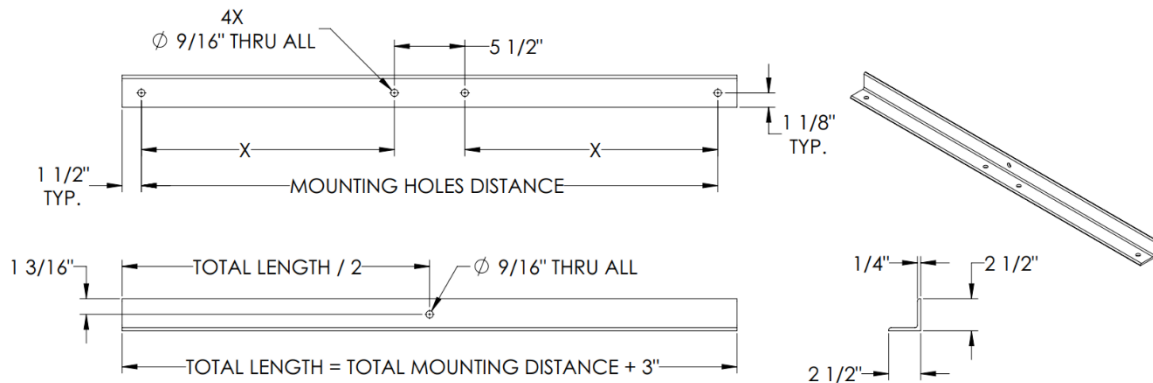
Step # 3 – Drill mounting holes as shown below according to **Angle Iron Quantity** and **Mount Type**.

a) For **(2) Angle Irons (Mounting Holes Distance ≤ 8 FT.)**, drill holes as shown below



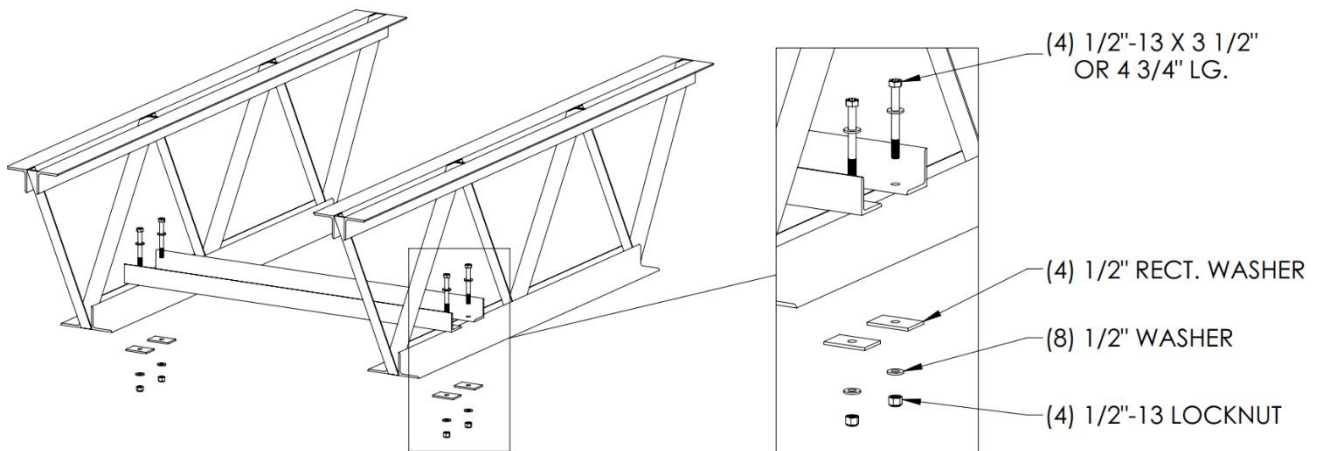
NOTE: Dimension $X = (\text{MOUNTING HOLES DISTANCE} - 5 \frac{1}{2}) / 2$

b) For **(4) Angle Irons (Mounting Holes Distance > 8 FT.)**, drill holes as shown below

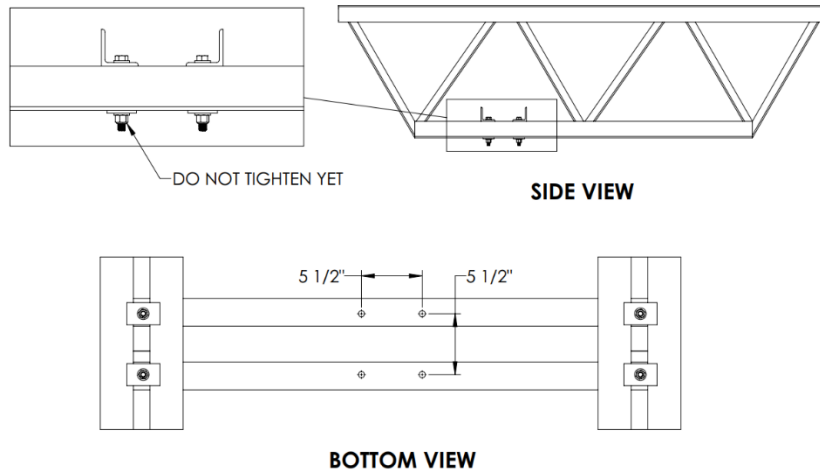


NOTE: Dimension $X = (\text{MOUNTING HOLES DISTANCE} - 5 \frac{1}{2}) / 2$

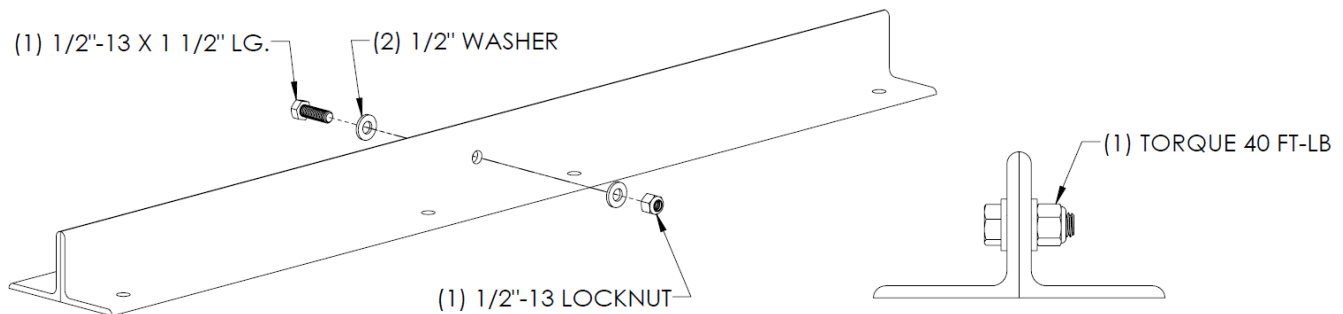
Step # 4 – For applications with **(2) Angle Irons (≤ 8 FT.)** assemble as shown below but do not tighten yet. For applications with **(4) Angle Irons (> 8 FT.)** skip to Step # 6.



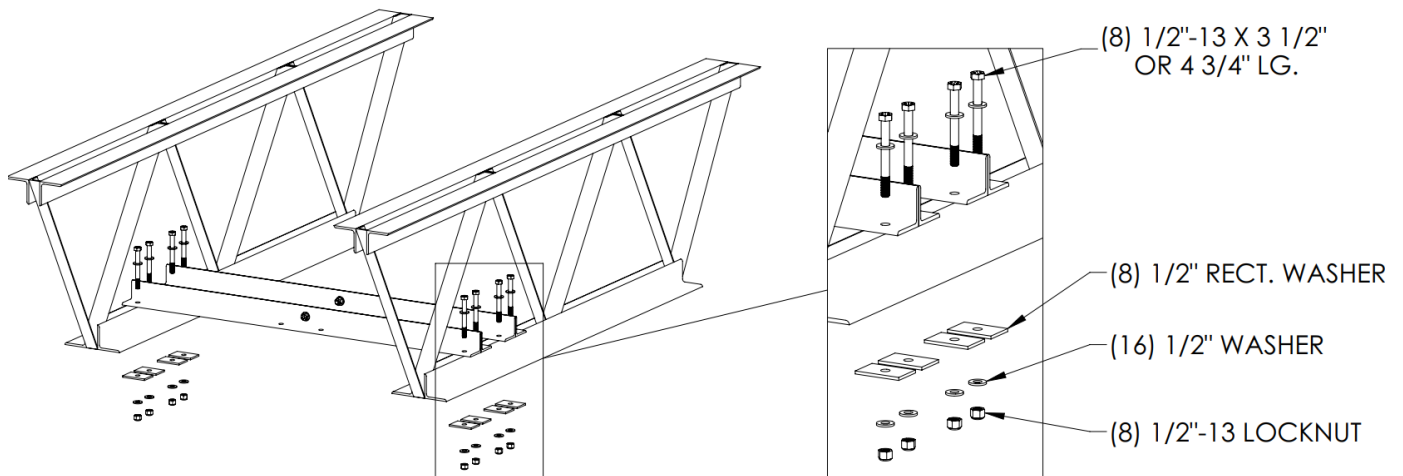
Step # 5 – Space Angle Irons so the mounting holes are 5 1/2" apart as shown below, but do not tighten yet. Refer to the basic fan installation guide for attaching the Top Leveling Brackets to the angle iron and the remainder of the fan installation.



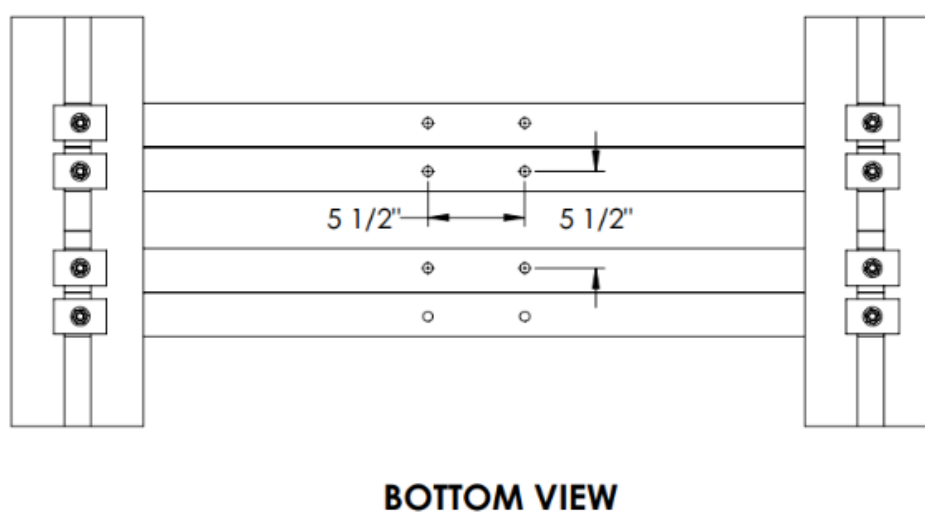
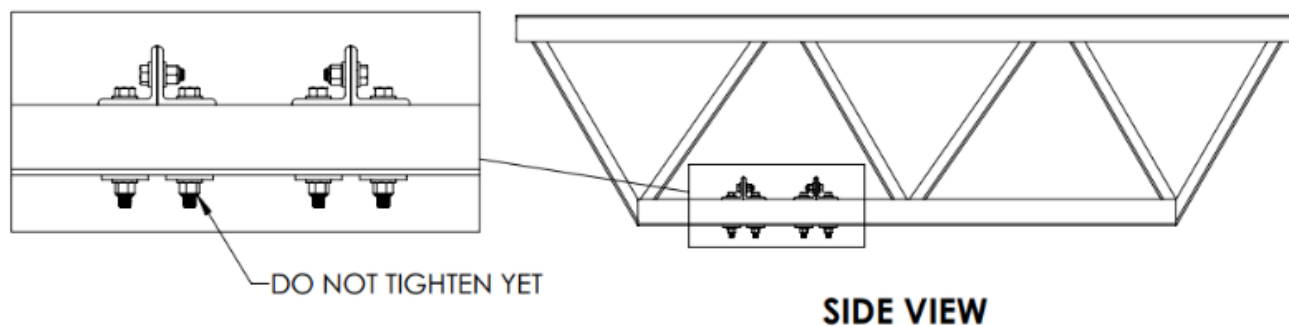
Step # 6 – For applications with (4) Angle Irons, first assemble them into two pairs as shown below and then torque total (2) screws to 40 FT-LB.



Step # 7 – Install two pairs of Angle Irons as shown below but do not tighten yet.



Step # 8 – Space Angle Irons so the mounting holes are $5\frac{1}{2}$ " apart as shown below, but do not tighten yet. Refer to the basic fan installation guide for attaching the Top Leveling Brackets to the angle iron and the remainder of the fan installation.



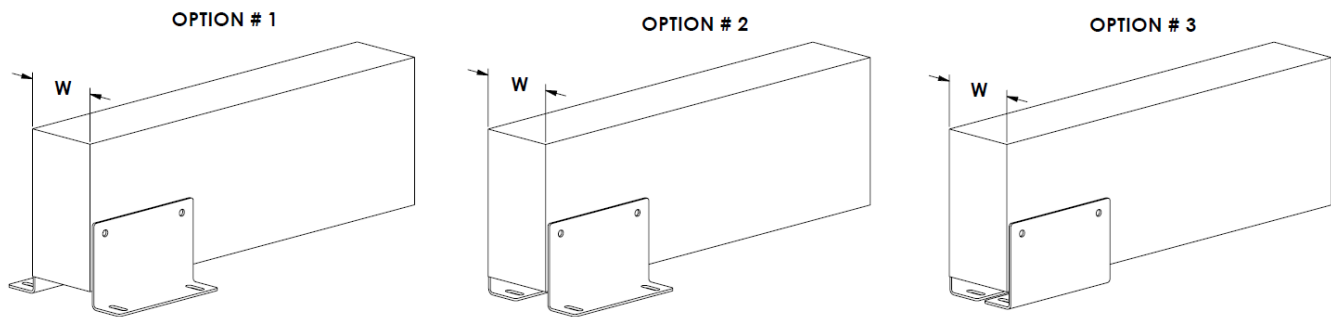
Section 16: Solid Beam Mounting Instruction

WARNINGS:

- **DO NOT Direct Mount fan on Solid Beams (A Solid Beam Mount Kit must be used)!**
- **Customer to supply 1/2"-13 Grade 8 mounting hardware required for Step # 2 below.**
- **For beams larger than 9 5/8" consult factory for additional mounting options.**

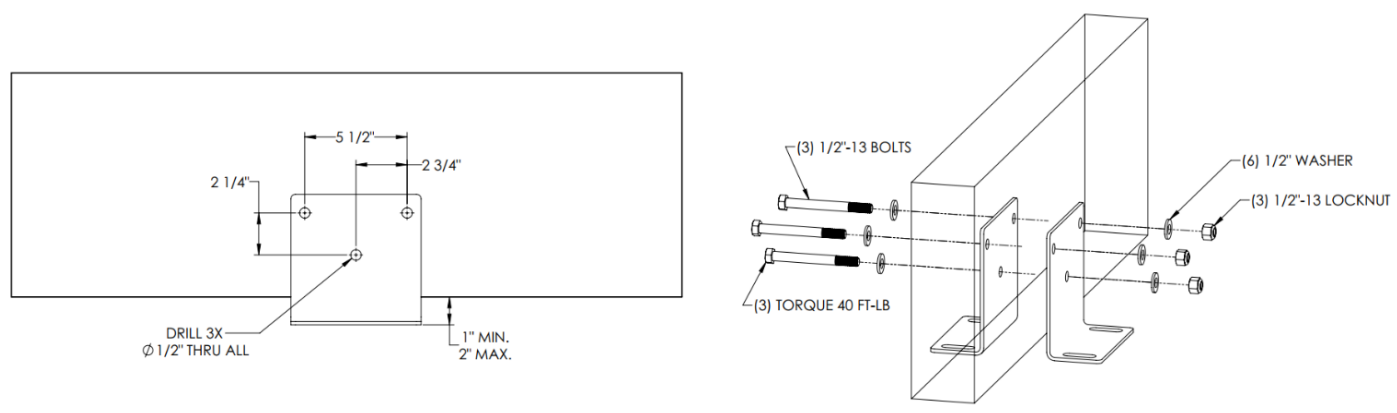
Step # 1 – The width of the Solid Beam “W” will determine the orientation in which the mounting brackets will be installed. After measuring the Solid Beam width, check the table below to identify which option is appropriate for your application.

Beam Width “W”	3 TO 3 1/2”	4” TO 5 1/4”	7 1/4” TO 9 5/8”
OPTION	# 1	# 2	# 3



Step # 2 – Use one of the mounting brackets to mark the hole locations of where to drill on the beam as shown below on the left, then drill thru 3X. Next, install the brackets using Grade 8 hardware (supplied by customer) as shown in the example below on the right. Last, torque (3) screws to 40 FT-LB. Refer to the basic fan installation guide for the remainder of the fan installation.

NOTE: The assembly procedure is the same for all 3 options, but the bracket orientation is different depending on “W”.



WARNINGS:

- **Ensure that all fan power circuits are disconnected/locked out prior to beginning fan/controller maintenance**
- **All electrical work must be performed by qualified personnel and in accordance with applicable local and national wiring codes and standards.**
- **Before working on the VFD, ensure isolation of the mains supply at the VFD or fan controller disconnect. Wait at least three minutes for the VFD high voltage capacitor to discharge to safe voltage levels (a darkened display is NOT an indication of safe levels). Failure to do so may result in death or injury.**

THE FOLLOWING IS A LIST OF ROUTINE MAINTENANCE CHECKS THAT SHOULD BE PERFORMED ANNUALLY:

- 1) Check and re-torque all structural mounting hardware to 40 FT-LB.
- 2) Check and re-torque blade mounting hardware to 25 FT-LB.
- 3) Verify all safety cables in place and properly secured.
- 4) Check guys wires for proper tension, adjust as needed.
- 5) Check the levelness of the fan, further adjust guy wires as needed to level fan.
- 6) Using dry compressed air, blow out any debris that may have accumulated from the top of the motor.
- 7) Clean fan blades of any dust that may have accumulated.

Section 18:

Warranty

High Performance Fan Co. Limited Warranty for 300, 500-D, and 600 Series HVLS Fans

THIS LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY OF HIGH PERFORMANCE FAN CO. WITH RESPECT TO HVLS FANS MANUFACTURED BY HIGH PERFORMANCE FAN CO. THIS WARRANTY CANNOT BE TRANSFERRED AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED.

Commencing on the date of shipment, and subject to the conditions and limitations below, the Warranty Period shall be as follows:

Mechanical Components (fan hub, frame, mounting brackets & hardware, airfoils, and winglets):	Lifetime
Powertrain Components (motor):	10 Years
Electrical Components (variable frequency drive, and any standard controller or accessories):	3 Years
Labor:	N/A

During the Warranty Period, the High Performance Fan Co. Warranty covers any defects in design, material, or workmanship, which adversely affect the operation of the fan under conditions of normal use and maintenance, and will repair or replace, at its sole discretion, any defective components at no charge to the Warranty holder.

For factory installed products, during the first 18 months of the Warranty Period, High Performance Fan Co. will pay reasonable labor and equipment rental costs for repairing or replacing a defective fan or any defective components of the fan at the installation location.

In the event of any of the following conditions, the Warranty shall become void:

1. Improper fan installation, including but not limited to failure to be in compliance with national and local building and electrical codes, failure to follow the procedures in the supplied manual, and use of mounting hardware not provided by High Performance Fan Co.
2. Modification of any of the supplied electrical or mechanical components, including factory control settings.
3. Use of incorrect voltage.
4. Abuse, introduction of foreign objects, or use for anything other than its intended purpose.
5. Accidents or Acts of God.
6. Failure to perform maintenance as described in the supplied manual.

The High Performance Fan Co. does not accept responsibility or liability for the following:

1. Consequential damages sustained as a result of the conditions listed above.
2. Specific airflow production.
3. Noise from the fan drive or blades in normal operation

NOTES