

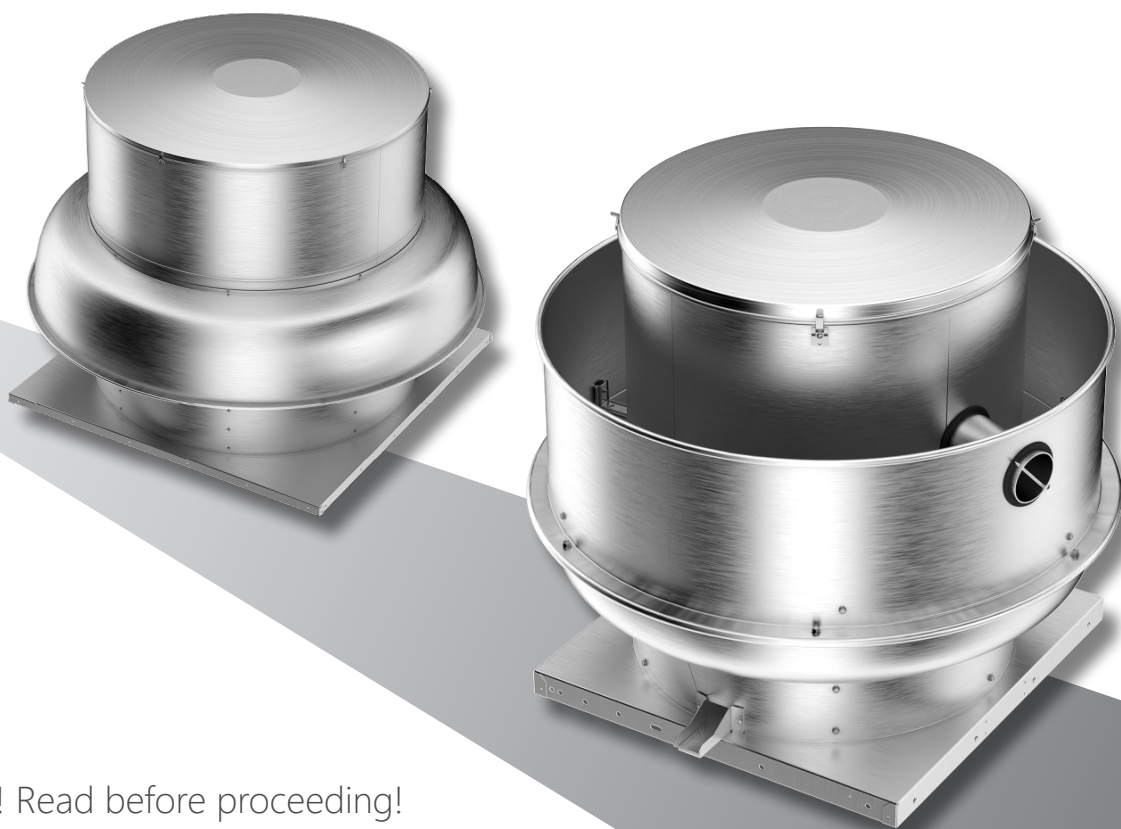
# PRD-PRU

## Power Roof Ventilator - Direct and Belt Drive

OPERATION AND MAINTENANCE MANUAL



PENNBARRY™



### IMPORTANT! Read before proceeding!

The information contained herein is, to the best of our knowledge, accurate and applicable for proper operation and installation of the specified equipment at the time this document entered service. Before proceeding, it is recommended that you check for a more current version of this Installation Operation Manual (IOM) on our website at [www.pennbarry.com](http://www.pennbarry.com). Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

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# GENERAL SAFETY INFORMATION

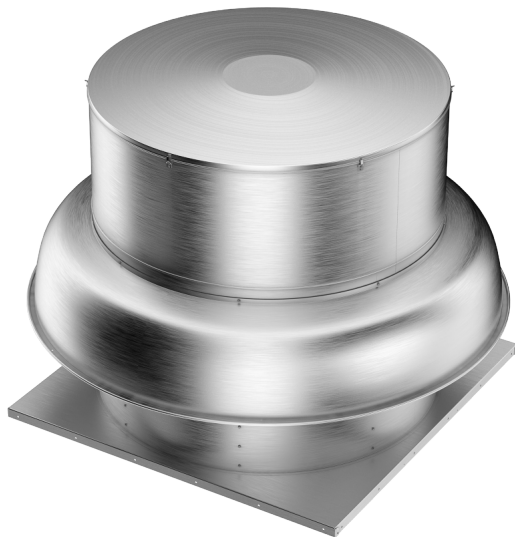


Figure 1 - Power Roof Ventilator Downblast

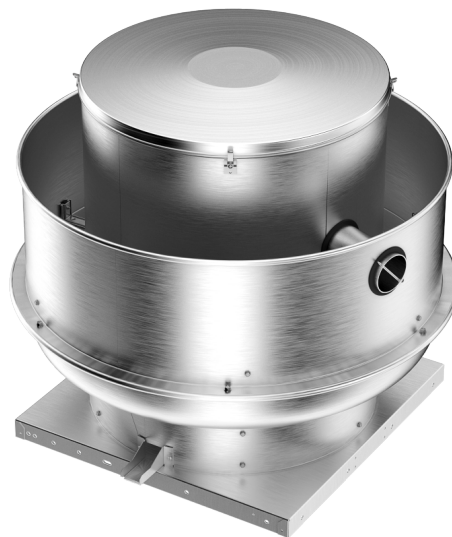


Figure 2 - Power Roof Ventilator Upblast

Only qualified trained personnel should install or maintain equipment described in this document. Improper installation can result in electric shock, possible injury due to high speed moving parts, or other potential hazards. Special circumstances such as high winds or wet surfaces must be considered when installing the unit. Contact a PennBarry engineer if any questions or issues arise or if any other information is needed before installing or maintaining the fan.

- Follow all local, state and federal electrical and safety codes, as well as the National Electrical Code (NEC) and the National Fire Protection Agency (NFPA) where applicable. Follow the Canadian Electrical Code (CEC) in Canada.
- Make sure that the wheel spins freely without hitting or rubbing on any parts or objects.
- The motor must be grounded; failure to ground a motor can result in a serious safety hazard.
- The fan impeller should not be operated at RPM's exceeding the rated RPM. If fan speed is higher than rated, the motor may over amp, causing serious damage to the motor and other moving parts of the fan.
- Power cord must be free of any kinks or pinches and must not come into contact with grease, oil or other liquids, flammable or otherwise.
- Verify that incoming power to the unit is of the correct voltage stated on the unit and/or motor nameplate.
- Turn unit off before opening any access panels.



*Always disconnect power before working on or near a fan. Look and tag the service switch or breaker to prevent accidental power up.*



*When servicing the fan, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.*



*Precaution should be taken in explosive atmospheres.*

# RECEIVING AND UNPACKING

## Receiving

PennBarry fans are carefully inspected before leaving the factory. When the unit is received, inspect the carton for any signs of tampering. Inspect the unit for any damage that may have occurred during transit and check for loose, missing or damaged parts. Mishandled units can void the warranty provisions. If units are damaged in transit, it is the responsibility of the receiver to make all claims against the carrier. PennBarry is not responsible for damages incurred during shipment.

Avoid severe jarring and/or dropping. Handle units with care to prevent damage to components or finishes. If the unit is scratched due to mishandling, the protective coating may be damaged. Incorrect lifting may damage the fan and void the warranty.

## Unpacking

### Size 60 to 182

Place the carton in an upright position and remove the staples or use a sharp (knife edge) tool to carefully cut or scribe the sealing tape on both sides at the top of the carton. Open carton flaps. Remove any cardboard and wooden filler pieces, as well as loose components or accessories shipped with the unit.

Carefully strip down carton around the unit. Inspect the unit for any damage that may have occurred during transit and check for loose, missing or damaged parts.

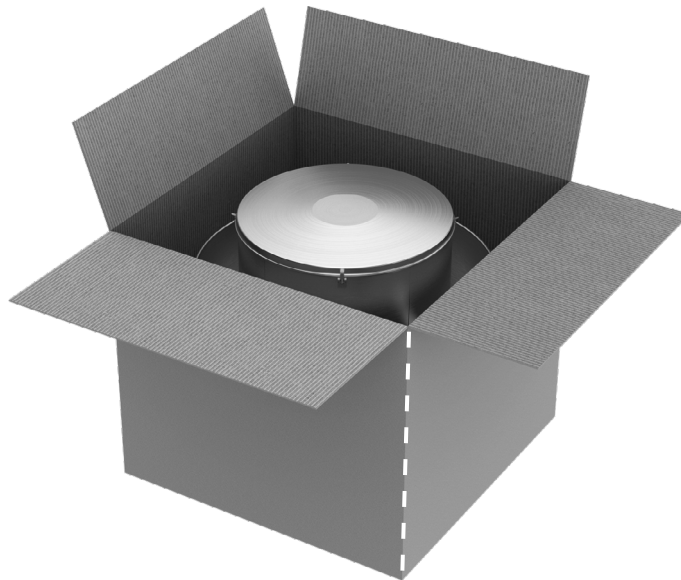


Figure 3 - Unpack Unit 60 to 182



*Please refrain from lifting the fan by hood or windband to avoid cause bending or distortion of the fan parts. Do not pass slings or timbers through the venturi of fan. Fans featuring special coatings or paints should be handled with care to avoid any potential damage.*

### Size 200 to 542

Carefully inspect the pallet for any visible damage to the packaging and ensure it is stable and not leaning. Use a forklift or pallet jack to move the pallet to an open and clear area with enough space to unpack the unit safely. Use a utility knife or box cutter to carefully cut the plastic wrap or shrink wrap around the pallet, avoiding cutting too deep to prevent damaging the unit. Identify and cut any metal or plastic straps securing the unit to the pallet, ensuring the straps do not snap back and cause injury. Remove the wooden top cover of the pallet and carefully take down each side panel, disposing of them. Look for any additional securing materials inside the packaging, remove these materials carefully, and dispose of them. Use a forklift or a crane with appropriate lifting straps or chains to lift the unit smoothly and place it gently on the ground or its intended location. Properly dispose of all packaging materials in accordance with local regulations.

# HANDLING AND STORAGE

Avoid severe jarring and/or dropping. Handle units with care to prevent damage to components or finishes. If the unit is scratched due to mishandling, the protective coating may be damaged. Incorrect lifting may damage the fan and void the warranty.

## Handling for roof mounting

To lift fan unit on the roof, unclamp the motor hood cover as shown in the Figure 4. Please keep this cover protected from the strong winds. Use lifting holes on the drive frame. Evenly space the hooks using at least four lifting straps. Make sure straps do not touch the unit using spreader bar. One of the possible arrangements is shown in Figure 5.



Figure 4 - Unclamped Motor Hood Cover



Figure 5 - Lifting of Roof Mount Unit

## Handling for Wall Mounting

During wall mounted installation, please refrain from supporting the unit by the winband or motor hood. Utilize the lifting locations displayed in Figure 6, and make sure to employ at least four lifting straps to evenly distribute the lifting load. Adhere to all local safety regulations when handling the units.



Figure 6 - Lifting of Wall Mount Unit



Figure 7 - Lifting Lugs of Wall Mount Unit

# HANDLING AND STORAGE

## Storage

Factory packing is done to ensure the safety of fans during shipping. It is important to take precautions to prevent any damage or deterioration if the unit cannot be immediately installed and operated. While the fan and accessories are in storage, the user will be responsible for any damage incurred, and the manufacturer offers these suggestions as a convenience only. If the unit will be stored for an extended time, remove belts. Belts which remain under tension in a stationary position for extended periods are likely to have a reduced operating life.

## Warehouse storage

It is recommended the fan and accessories are stored indoors in a clean, dry, and sealed environment to avoid dust, rain, or snow. Placing storage above ground is recommended as a precaution against flooding. If on the ground, it must be stored at a minimum height of 4 inches (102 mm) above the floor on wooden blocks that are protected with moisture-proof paper or polyethylene sheathing. Maintain temperatures within the range of 30° to 110°F (-1° to 43°C) to prevent condensation and sweating of metal parts due to wide temperature swings. Prior to indoor storage, it is important to remove any dirt, water, ice, or snow accumulations and thoroughly dry parts & packages. To prevent metal parts from "sweating," it is recommended to allow cold components to reach room temperature. Use a portable electric heater to remove any moisture buildup and leave coverings loose to allow for air circulation and periodic inspection when drying parts and packages. Adequate aisles must be maintained between parts and along all walls to allow for proper air circulation and inspection.

## Outside storage

Fans intended for outdoor use may be kept outside if absolutely required. To prevent water from leaking into the fan, it is important to place the fan on a level surface. The fan must be raised using an appropriate number of wooden blocks to ensure it is above water and snow levels and has sufficient support to prevent it from sinking into soft ground. Position the parts at a sufficient distance from each other to allow for proper air circulation, sunlight, and room for periodic inspection. To prevent water buildup, place all fan parts on supporting blocks to allow rainwater to drain off. Refrain from using plastic film or tarps to cover parts as they can lead to condensation of moisture from the air during heating and cooling cycles. It is recommended to block the fan wheel to avoid spinning that may be caused by strong winds.

## Inspection and Maintenance while in Storage

During storage, fans should be inspected monthly and a detailed record of the inspections and maintenance should be kept. If any moisture or dirt accumulations are discovered on parts, it is important to locate and eliminate the source. During each inspection, manually rotate the wheel ten to fifteen times to evenly distribute the lubricant in the motor. In the event of paint deterioration, it is advisable to consider touch-up or repainting. Special coatings on fans may necessitate special techniques for touch-up or repair.

## Rust Mitigation

In the event of rust appearing on machined parts that have been coated with rust preventive, it is important to promptly restore them to good condition. Remove the original rust preventive coating using a petroleum solvent and clean with lint-free cloths. Remove any remaining rust from the surface with crocus cloth or fine emery paper and oil, being careful not to damage the surfaces. Afterward, thoroughly clean with solvent based corrosion preventive compound. For hard-to-reach internal areas or occasional use, consider spray of corrosion preventive compound.

# PRE-INSTALLATION CHECKS

As fans are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion until the fan equipment goes into operation.

## Hardware Inspection

Make sure all the fasteners and set screws for fan, accessories, motor, bearings and fan mounting are tightened as per the recommended torque in below Table.

**Table 1 - Recommended Torque for Screws & Bolts**

Setscrews		Mounting Bolts	
Size	Recommended Torque (ft-lbs.)	Size	Recommended Torque (ft-lbs.)
#10	6	5/16	17
1/4	9	3/8	31
5/16	15	1/2	75
3/8	30	-	-
1/2	60	-	-

## Wheel Inspection

Ensure that the wheel is aligned and centered with the correct spacing in relation to the inlet venturi. If adjustment is needed, loosen the inlet venturi bolts and shift the inlet venturi until the radial gap is the same at every point across the circumference of the inlet venturi. If adjustment of the overlap between the wheel and inlet venturi is needed, loosen the taper lock bushing (refer wheel replacement section for additional details on the bushing), slide the wheel forwards or backwards until the correct overlap is achieved, and then tighten the set screws back down.

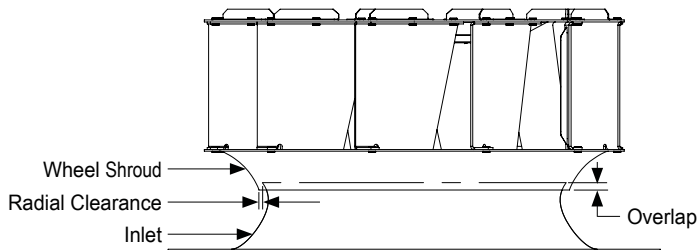


Figure 8 - Wheel & Venturi Overlap

**Table 2 - Recommended Wheel & Venturi Overlap**

Fan Size	Overlap (in.)	Radial Clearance (in.)
60 to 100	0.22	0.015
122	0.27	0.031
135	0.30	0.039
150	0.33	0.049
165	0.36	0.059
182	0.40	0.071
200	0.44	0.083
222	0.49	0.098
245	0.54	0.114

Fan Size	Overlap (in.)	Radial Clearance (in.)
270	0.59	0.130
300	0.66	0.150
330	0.72	0.171
365	0.80	0.192
402	0.88	0.219
445	0.98	0.247
490	1.07	0.278
542	1.19	0.313

# INSTALLATION



Only individuals with the necessary qualifications should undertake this task. The manufacturer will not be held liable for any damages caused by improper installation.



The installation guidelines for seismic ratings are advisory only, and the definitive design specifications need to be established by the Structural Engineer of Record (SEOR), encompassing criteria for curb construction, unit mounting on the curb, and curb attachment to the structure.

## General Ventilation Roof Mount Installation

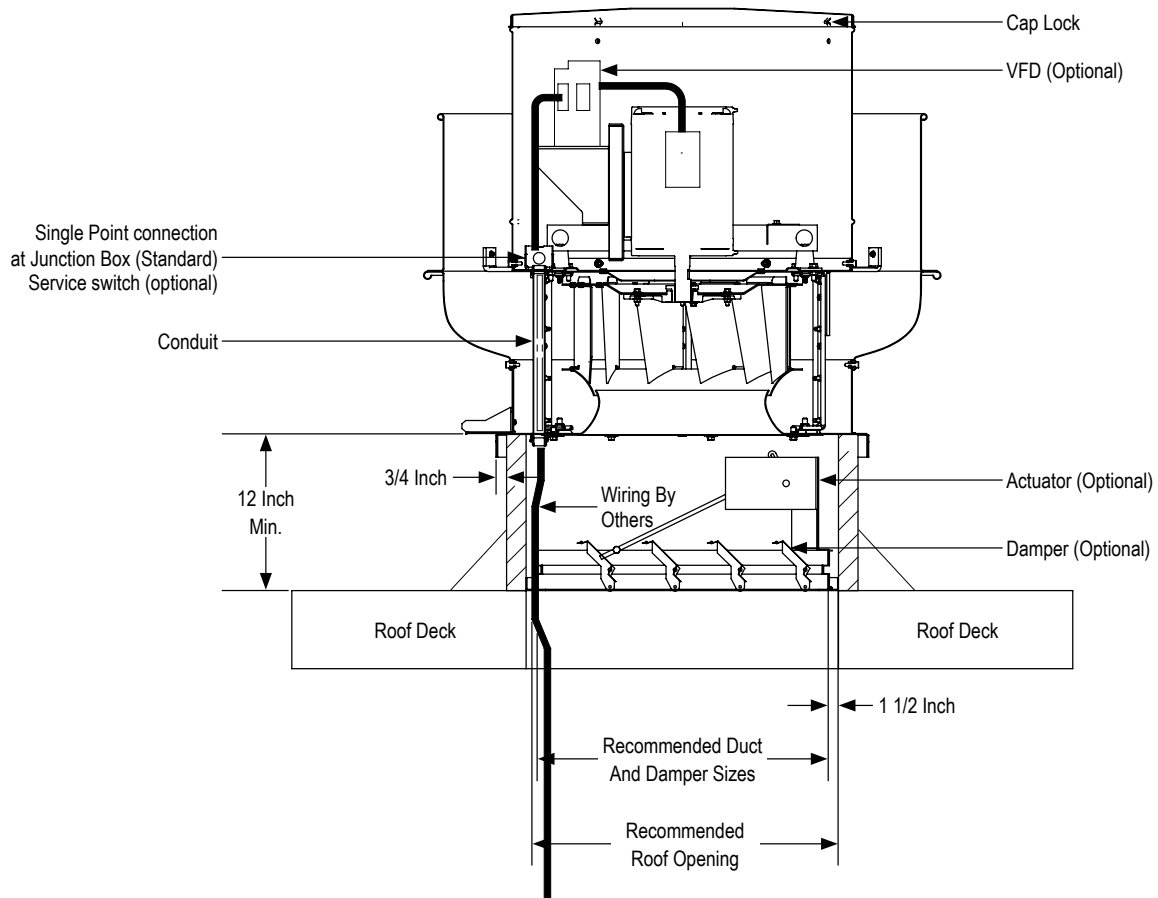


Figure 9 - Typical Roof Mounting Installation

Cut an adequately sized hole on the roof surface and adhere to the manufacturer's guidelines for installing the curb, ensuring a watertight seal by caulking and flashing the curb.

If backdraft damper is selected with the unit, it should be installed before fan. If the hinged kit is included with the unit, please refer the accessory installation instructions section for the necessary steps before installing the fan.

To lift fan unit on the roof, unclamp the motor hood cover as shown in the Figure 4. Please keep this cover protected from the strong winds. Use lifting holes on the drive frame. Evenly space the hooks using at least four lifting straps. Make sure straps do not touch the unit using spreader bar.

Fasten the fan to the curb using at least eight lag screws, metal screws, or other appropriate fasteners, and use shims if necessary, based on the curb installation and roofing material.

# INSTALLATION

Prior to connecting the fan motor to the power source, it is imperative to confirm that the power line wiring has been de-energized.

For non-flammable application, the electrical cable can be routed through the conduit pipe shown in the Figure 12.

Connect the power supply wiring to the motor following the instructions on the motor nameplate or terminal box cover and ensure that the power source is compatible with the equipment requirements. Also, refer to the wiring manual for detailed electrical connections for variety of motors and controllers.

Reattach motor hood cover using clamps.

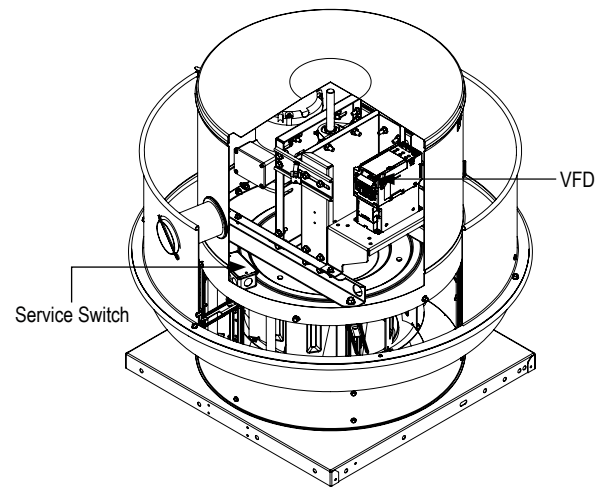


Figure 10 - Optional service switch & VFD inside the fan unit.

## Wall Mounted Installation

Cut an adequately sized hole in the wall for surface mounting. Mount wall bracket with a minimum twelve 3/8-inch fasteners around the flange. Ensure a watertight seal by caulking and flashing.

If backdraft damper is selected with the unit, it should be installed before fan.

Lift the fan into place using lifting locations & following handling instruction refer Figure 6 and 7.

Position the fan in such a way that the drain spout is facing downward, and then fasten the fan to the bracket using the provided fasteners.

Prior to connecting the fan motor to the power source, it is imperative to confirm that the power line wiring has been de-energized.

For non-flammable application, the electrical cable can be routed through the conduit pipe similar as shown in Figure 12.

Connect the power supply wiring to the motor following the instructions on the motor nameplate or terminal box cover and ensure that the power source is compatible with the equipment requirements. Also, refer wiring manual for detailed electrical connections for variety of motors and controllers.

Reattach motor hood cover using clamps.

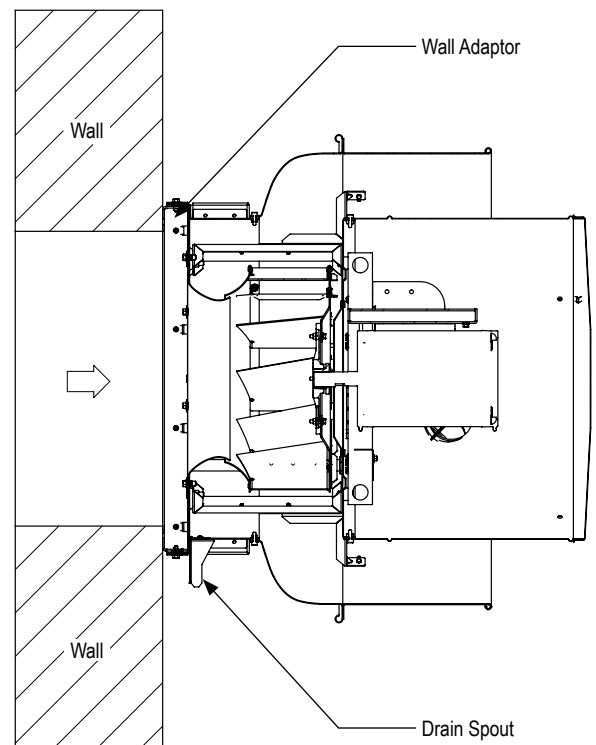


Figure 11 - Typical Wall Mounted Installation

# INSTALLATION



Commercial kitchen installations are required to adhere to NFPA 96 guidelines, and it is important to review both local and national codes for these installations, as well as to seek advice from local code authorities for any additional specific requirements.

## Restaurant Kitchen Installation (UL Listed)

Cut an adequately sized hole on the roof surface and adhere to the manufacturer's guidelines for installing the curb, ensuring a watertight seal by caulking and flashing the curb.

Note that backdraft damper is not recommended for commercial kitchen application. **DO NOT INSTALL DAMPER.** If the hinged kit is included with the unit, please refer to the accessory installation instructions section for the necessary steps before installing the fan.

If optional vented/non-vented pedestal is purchased, please refer accessory section for installation instructions.

To lift fan unit on the roof, unclamp the motor hood cover as shown in the Figure 4. Please keep this cover protected from the strong winds. Use lifting holes on the drive frame. Evenly space the hooks using at least four lifting straps. Make sure straps do not touch the unit using spreader bar.

Fasten the fan to the curb using at least eight lag screws, metal screws, or other appropriate fasteners, and use shims if necessary, based on the curb installation and roofing material.

Prior to connecting the fan motor to the power source, it is imperative to confirm that the power line wiring has been de-energized.

For non-flammable application, the electrical cable can be routed through the conduit pipe shown in the Figure 12.

Connect the power supply wiring to the motor following the instructions on the motor nameplate or terminal box cover and ensure that the power source is compatible with the equipment requirements. Also, refer to the wiring document for detailed electrical connections for variety of motors and controllers.

Reattach motor hood cover using clamps.

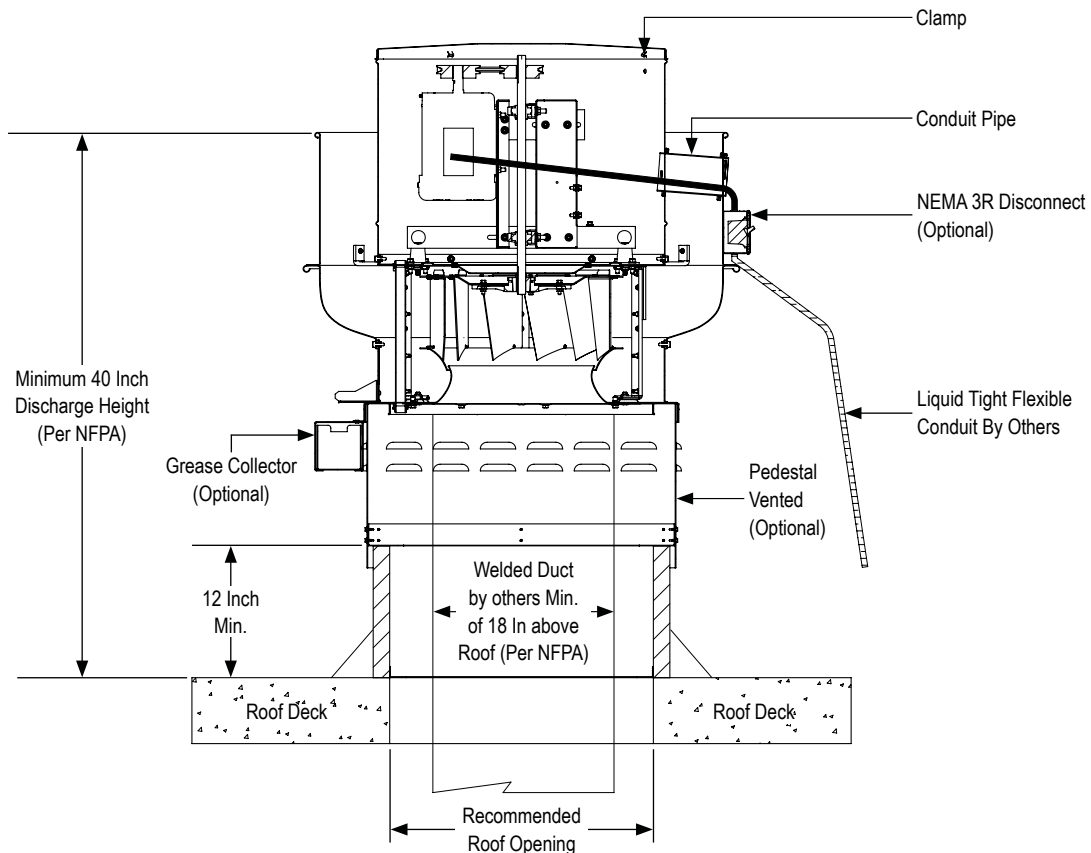


Figure 12 - Typical Restaurant Kitchen Installation



# INSTALLATION

## Heat & Smoke Control Unit Installation (UL Listed)

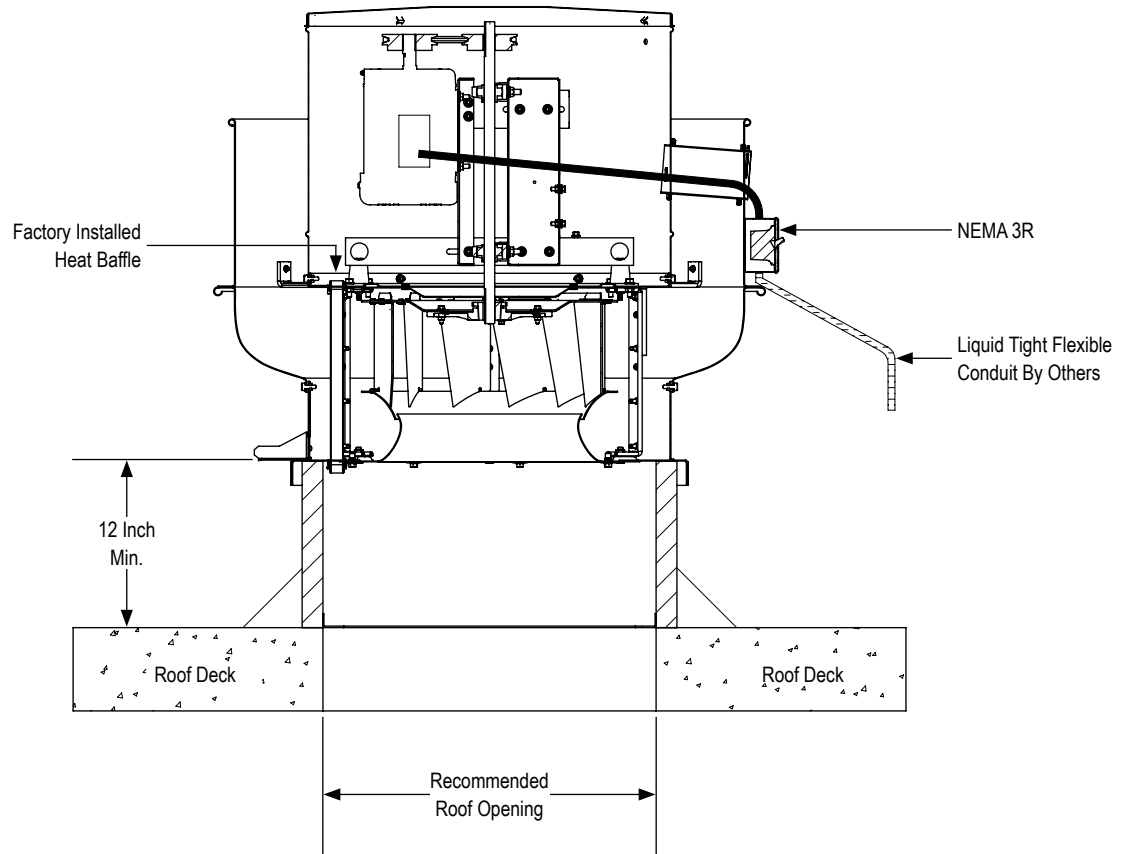


Figure 13 - Heat & Smoke Control Installation

All the mechanical assembly to be done similar to roof mounted kitchen installation.

**Electrical Connection** - Prior to the final electrical connection, it is essential to verify that the motor's amperage and voltage ratings are compatible with the supply voltage for belt drive units used in emergency smoke removal installations. Additionally, the motor should not be equipped with thermal overload protection.

The electrical supply must be routed into the motor compartment through the cooling tube, and the disconnect should be installed outside the fan's motor compartment. Emergency smoke removal fans may also necessitate a dedicated power supply to ensure continuous operation during a power outage in the event of a fire. It is advisable to review both local and national electrical codes pertaining to emergency smoke removal fans and seek guidance from local code authorities to address specific requirements.

# INSTALLATION

## Curb Installation



Please check the Miami Dade submittal drawings for information regarding high wind and certification.

All roof mounted fans are required to be installed on a curb. Adhere to the manufacturer's guidelines for installing the curb. Curb installation can be carried out on various roof types such as concrete, steel, and timber, with fasteners required on all four sides of the curb. Refer to the Figures 14, 15 and 16 below for typical installations and utilize the specified type of fasteners as well as the minimum number indicated in the Table 3. Which are equally spread. Curbs are available in 18 gauge galvanized steel minimum 12" maximum 24".

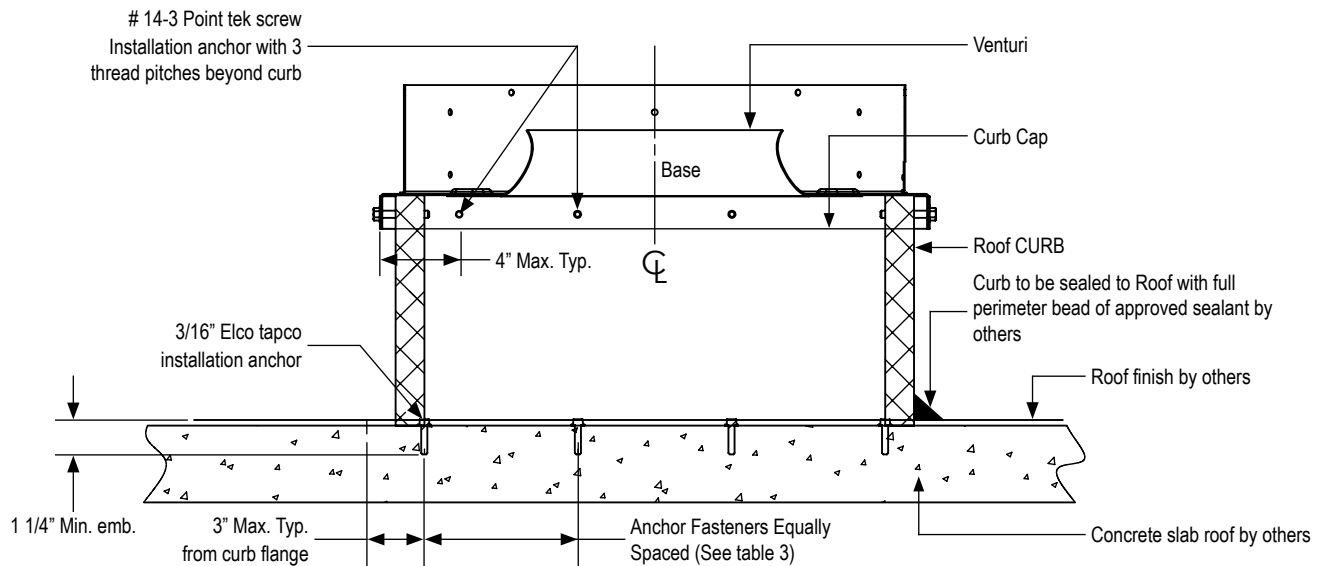


Figure 14 - Typical Concrete Slab Roof Installation

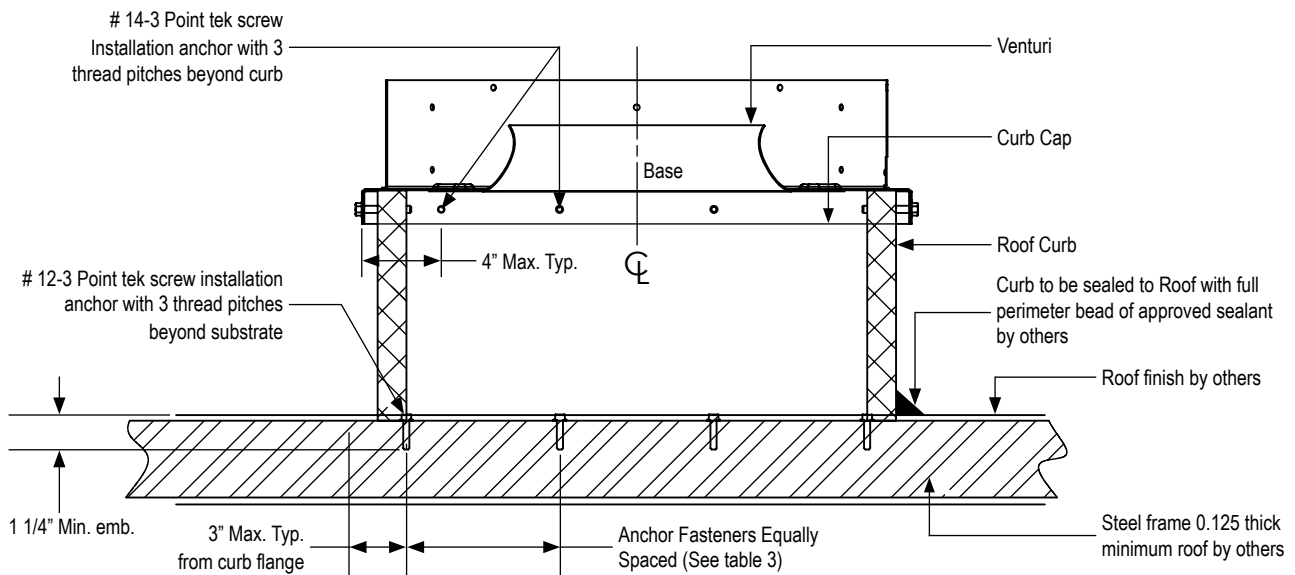


Figure 15 - Typical Steel Framed Roof Installation

# INSTALLATION

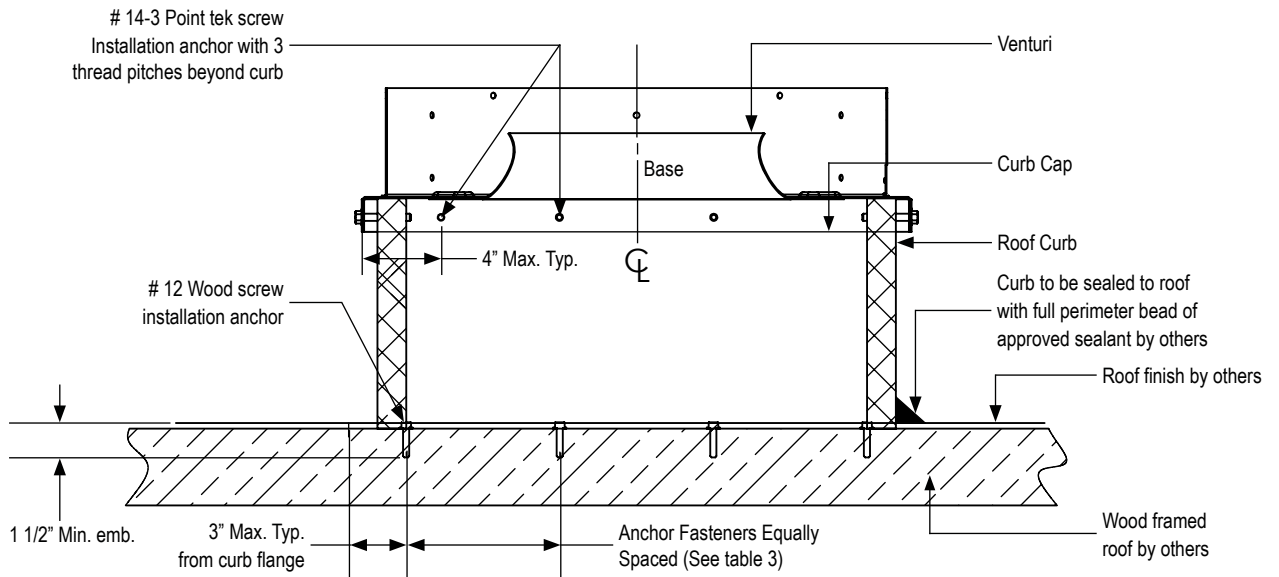


Figure 16 - Typical Wood Framed Roof Installation

Table 3 - Fasteners Per Side of Curb

Size	Minimum number of fasteners per side of curb		
	Concrete Slab Roof	Steel Framed Roof	Wood Framed Roof
060 to 165	3	3	4
182 to 245	5	5	6
270	7	7	8
300	8	8	9
330 to 402	9	9	10
445 to 542	10	10	12



For high wind application & certification, refer to Miami Dade submittal drawings. Anchor fasteners spacing shall not exceed 12".

## Fan to Curb Mounting

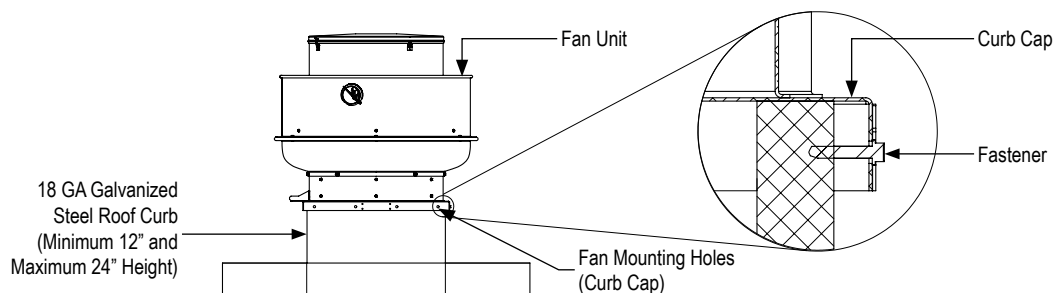


Figure 17 - Fan to Curb Mounting

Before mounting fan to curb, make sure curb installation is done correctly in accordance with the roof type mentioned earlier in this document. Use factory drilled holes on the curb cap to fasten fan to the curb. Use 3/8 inch self-drilling fasteners on all sides of the fan, the minimum number of fasteners are governed with the holes available on the curb cap.

# INSTALLATION

## Accessories Installation - Grease collector installation

### A. For Roof Mount -

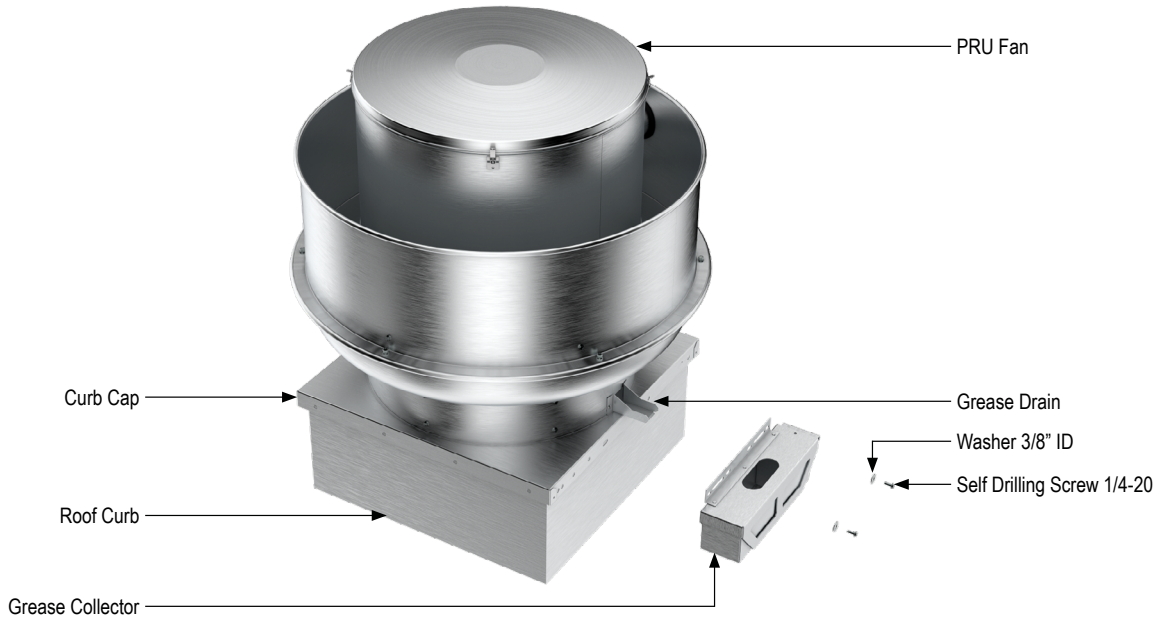


Figure 18 - Grease collector for Roof Mounted Fan

Locate the mounting holes on the curb cap for the grease box. Ensure that the sorbent sock is placed inside the grease box and use the provided 1/4-20 self-drilling screw to attach the grease box on to the curb cap side. If the pedestal base is vented, allow the vent projections to hold the trap away from the curb. Fill the grease box with water until it flows out through the drain. Remember to replace the sorbent sock after each cleaning and refill the grease box with water.

Grease box assembly will be similar even if fan is equipped with hinged base.

### B. For Wall Mount -

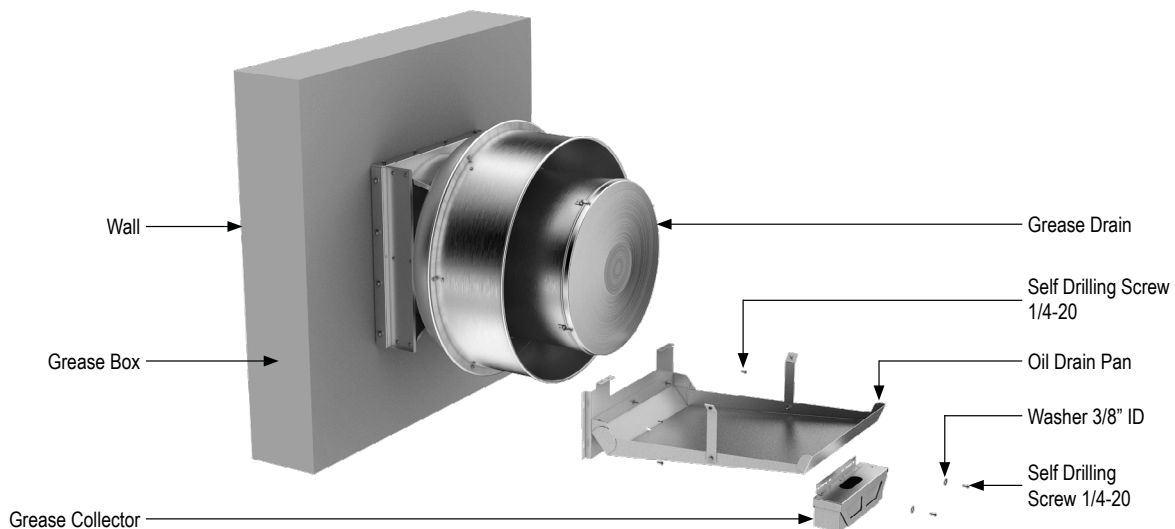


Figure 19 - Grease collector for Wall Mounted Fan

# INSTALLATION

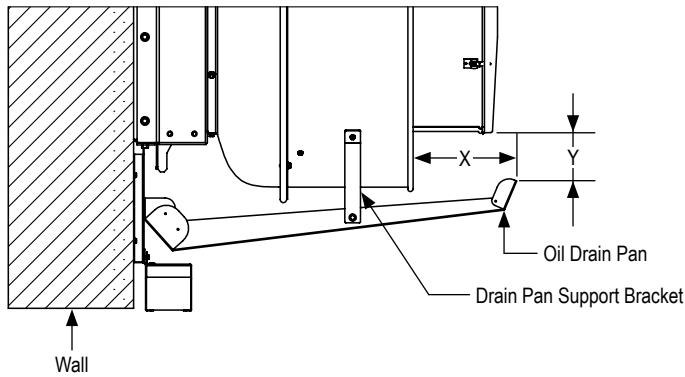


Figure 20 - Position of Grease Collector

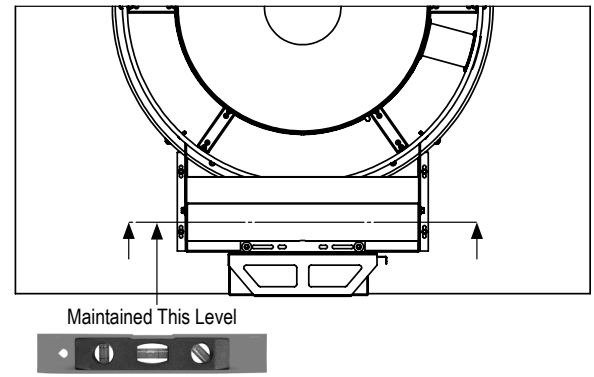


Figure 21 - Alignment of Grease Collector

Table 4 - Position of Grease Collector

Fan Size	X (in.)	Y (in.)
60 to 100	8 1/4	2 5/8
122	8 1/8	3 3/8
135	7 3/4	3 3/8
150	7 3/16	3 3/4
165	9	4 1/4
182	10 3/16	4 7/8
200	10 1/2	5 1/4
222	9 5/8	5 7/8
245	9	6
270	8 3/8	6 1/2
300	9 3/8	7 1/4

Please ensure that the wall-mounted fan is positioned with the grease tap facing downward. Refer to the dimensions shown in Figure 20 to locate the oil drain pan assembly. Utilize the available leveler to mount the drain pan horizontally as shown in the Figure 21 and use the provided 1/4-20 self-drilling screw to attach it to the wall. Position the grease box below the drain pan so that the drain pan hole aligns with the grease box slot. Place the sorbent sock inside the grease box and use the provided 1/4-20 self-drilling screw to attach the grease box to the wall.

# INSTALLATION

## Accessories Installation - Hinge Kit Installation

The hinge kit is specifically designed to allow for tilting of the fan unit to facilitate inspection, cleaning, and maintenance. It is recommended to order the hinge kit along with the hinged-sub-base, although the hinge kits can be mounted on regular curbs, curb adapters and pedestals.

Refer the hole pattern dimensions depicted in Figures 22, 23 & 24 and drill them on the curb/adaptor/pedestal. Only attach the bottom hinge brackets using the provided hex bolts & nuts.

Fasten top hinge brackets to the curb cap using flat headed studs provided.

Please ensure all fan installation steps are followed according to the specific application requirements and verify that the hinge brackets align properly when positioning the fan unit on the curb/adaptor/pedestal.

Align the pivot holes on both brackets and fasten them with the provided bolts, and confirm that the hinge operates smoothly. The quick release pin provided remains attached to the hinge.

Sizes : 100 - 135

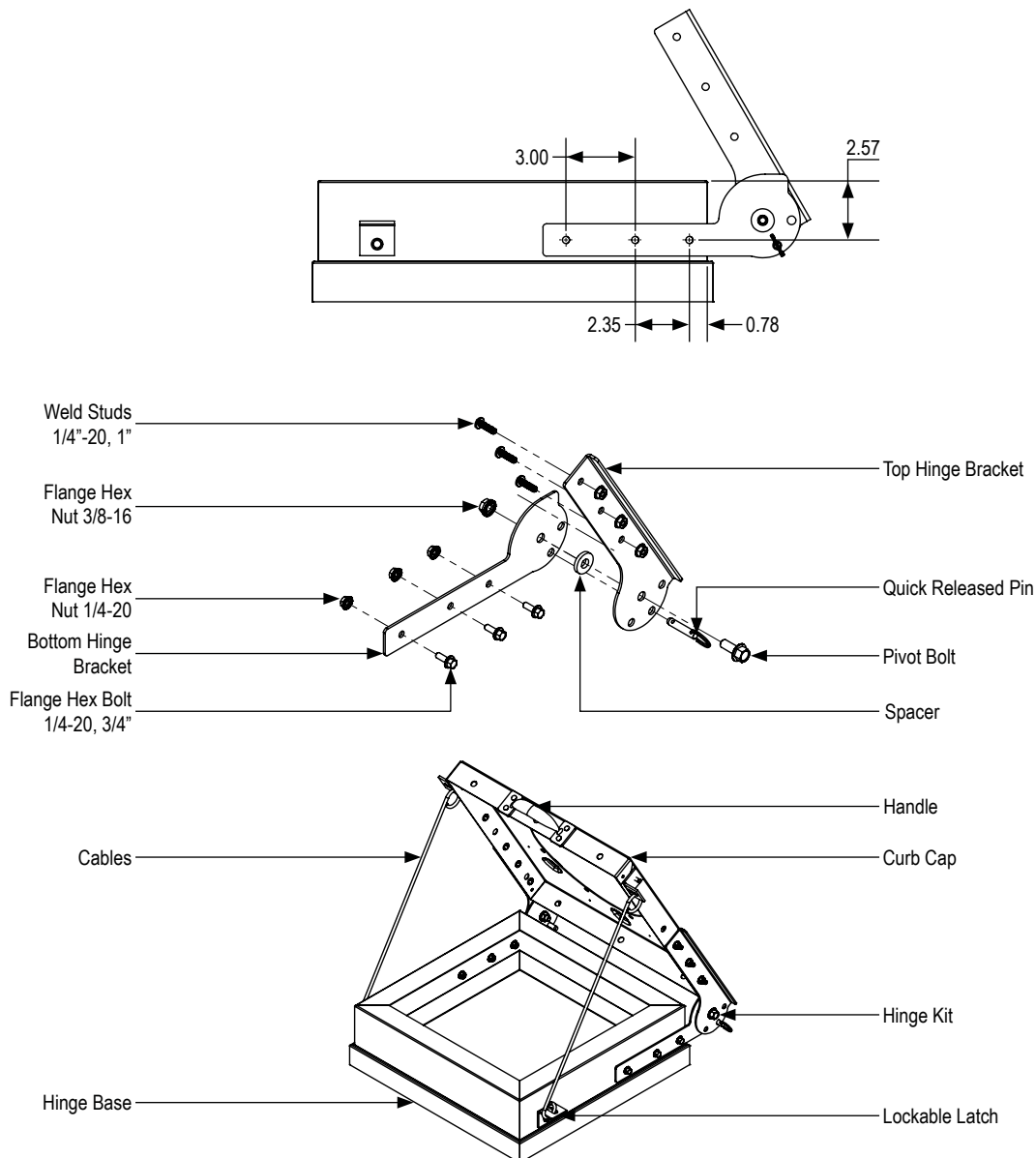


Figure 22 - Hinge Kit size 100 to 135

# INSTALLATION

## Accessories Installation - Hinge Kit Installation

Sizes : 150 - 222

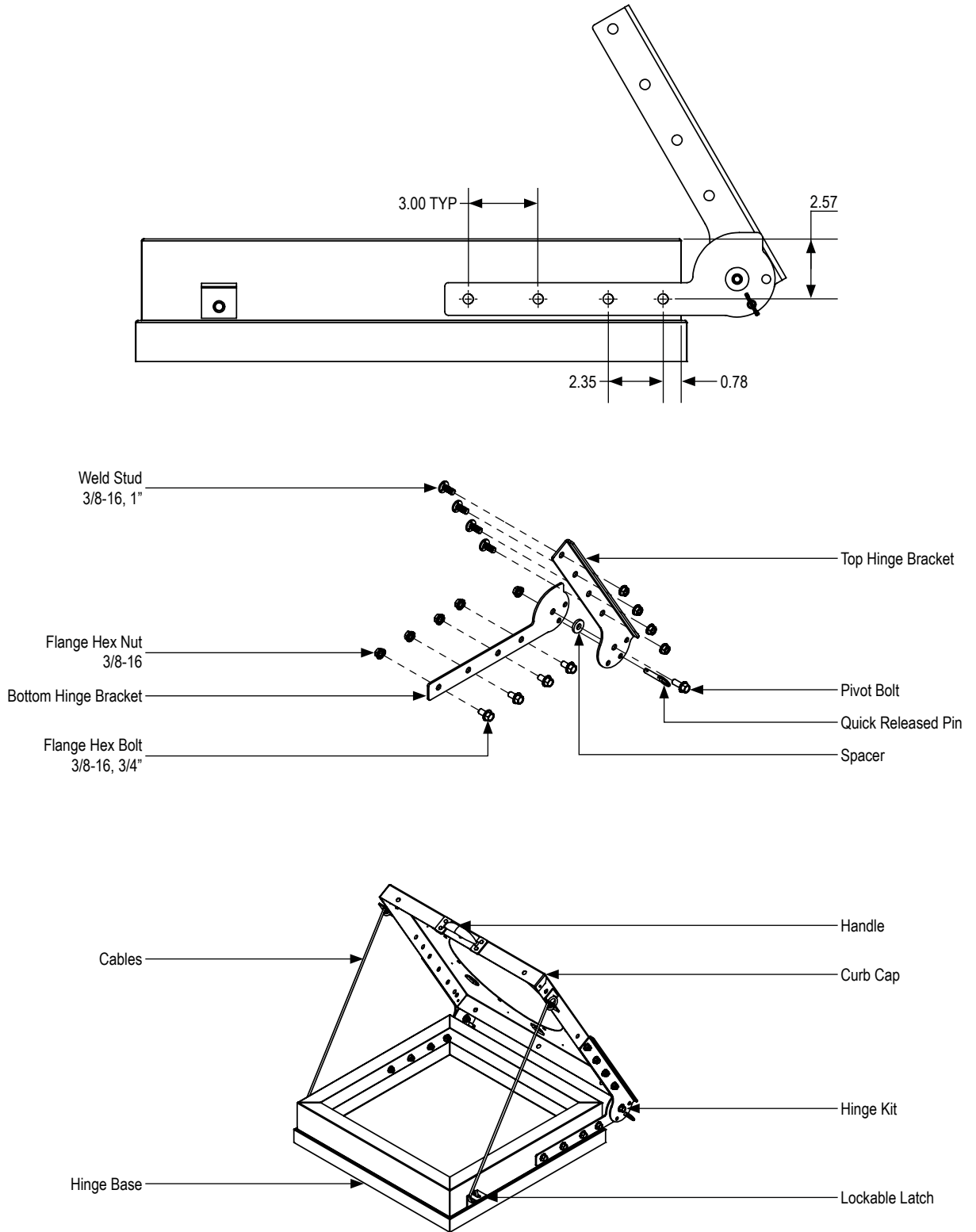


Figure 23 - Hinge Kit size 150 to 222

# INSTALLATION

## Accessories Installation - Hinge Kit Installation

Sizes : 245 - 365

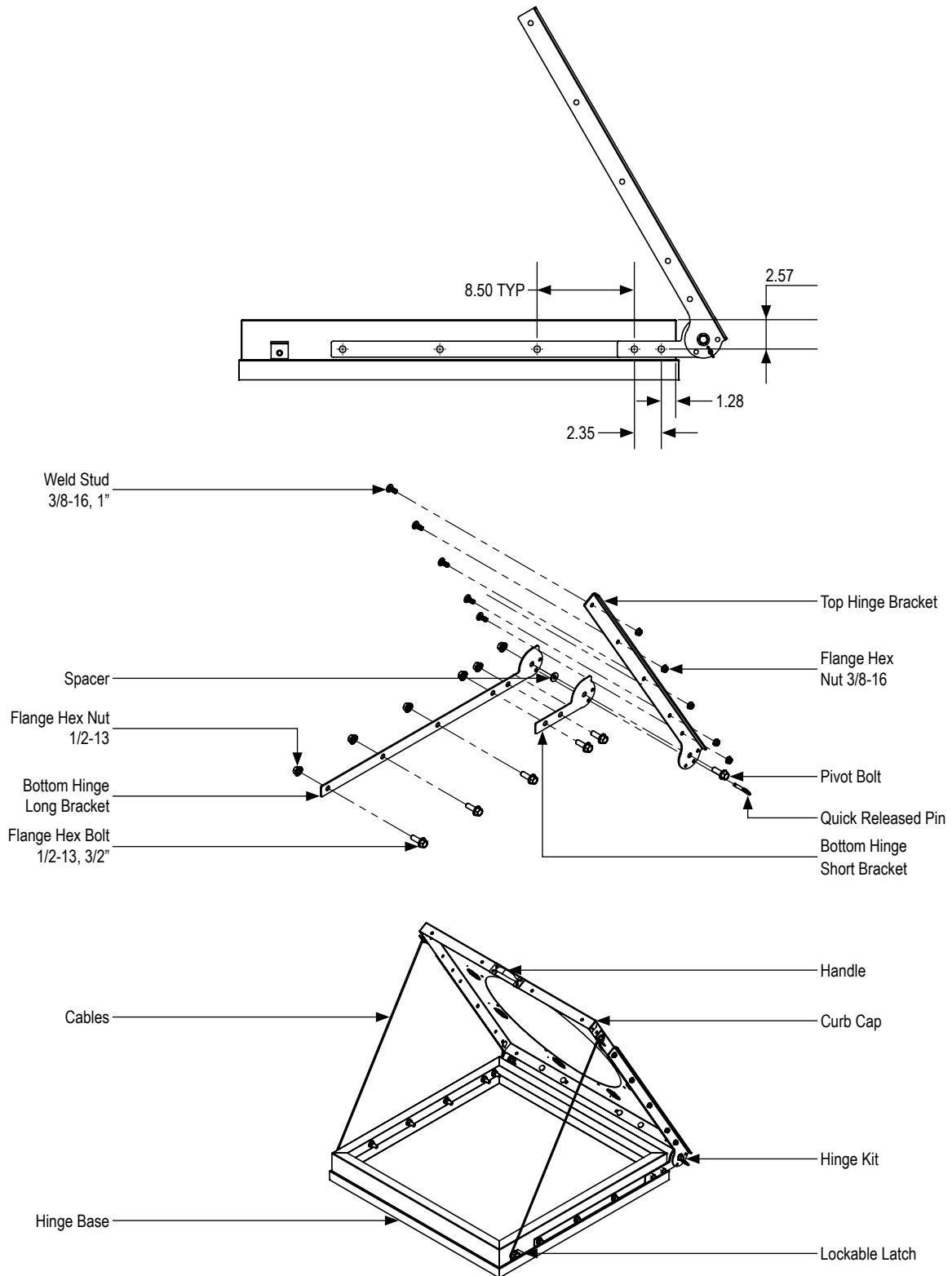


Figure 24 - Hinge Kit size 245 to 365



# INSTALLATION

## Accessories Installation - Hinged Sub-Base

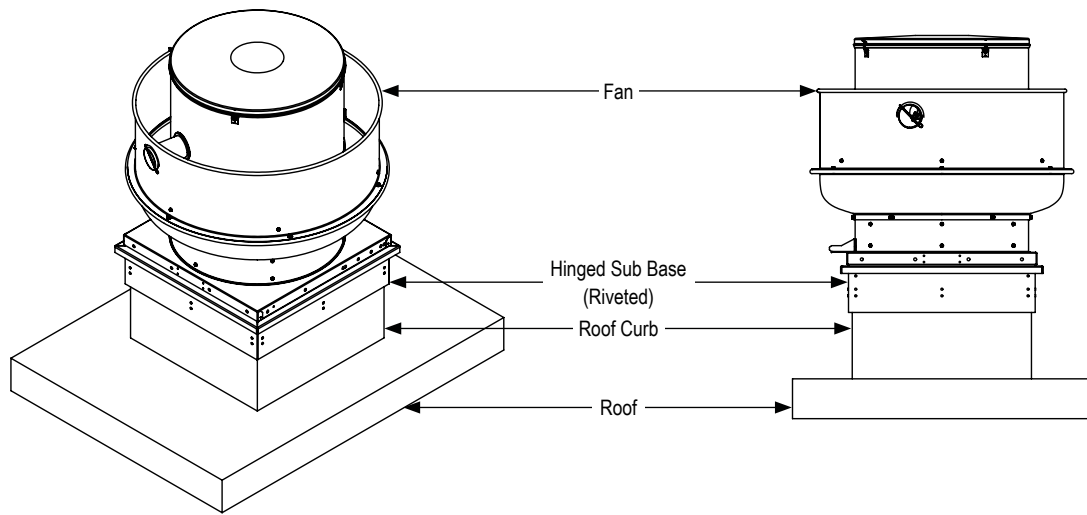


Figure 25 - Hinged Sub Base (Riveted)

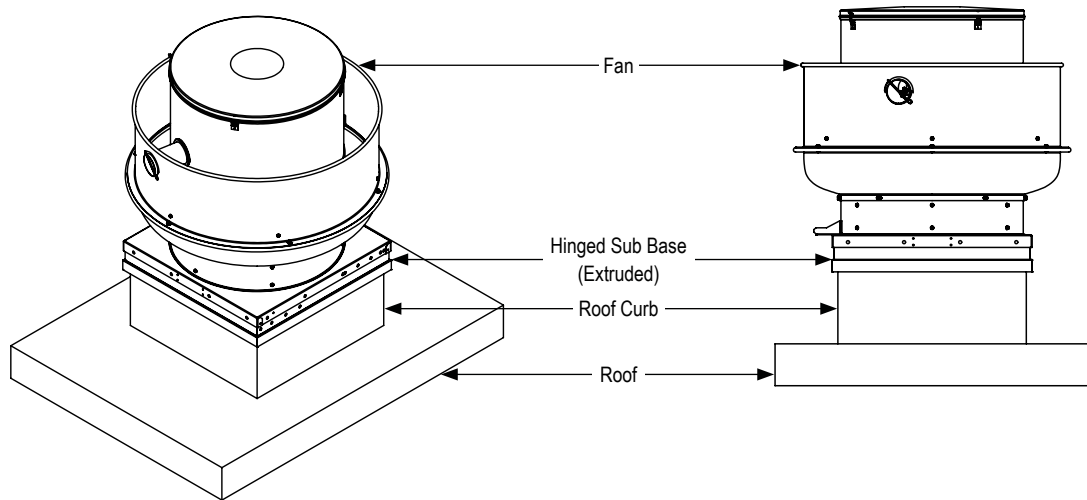


Figure 26 - Hinged Sub Base (Extruded)

Fasten the hinged subbase to the curb using at least eight lag screws, metal screws, or other appropriate fasteners, and use shims, if necessary, based on the curb installation and roofing material. It is recommended to use the same number of fasteners as what is used to fasten the curb cap.

Note that hinged sub-base are available in aluminum & galvanized, installation instructions are identical for both options.

Refer the hole pattern dimensions depicted in Figures 22, 23 & 24 and drill them on the hinged sub base. Only attach the bottom hinge brackets on sub-base using the provided hex bolts & nuts.

Fasten top hinge brackets to the curb cap using flat headed studs provided.

Place fan unit on the hinged sub-base and make sure that hinge bracket align properly.

Align pivot holes on both brackets and fasten it with provided bolt. Keep quick released pin attached. Confirm smooth operation of the hinge. Fasten curb cap to hinged sub-base.

# INSTALLATION

## Accessories Installation - Curb Adapter

If the fan base does not match the preinstalled curb on the roof, an adapter can be used. Curb adapters are available for size-up & size -down as well. For available sizes of curb adapters, please contact a sales representative or visit the PennBarry website.

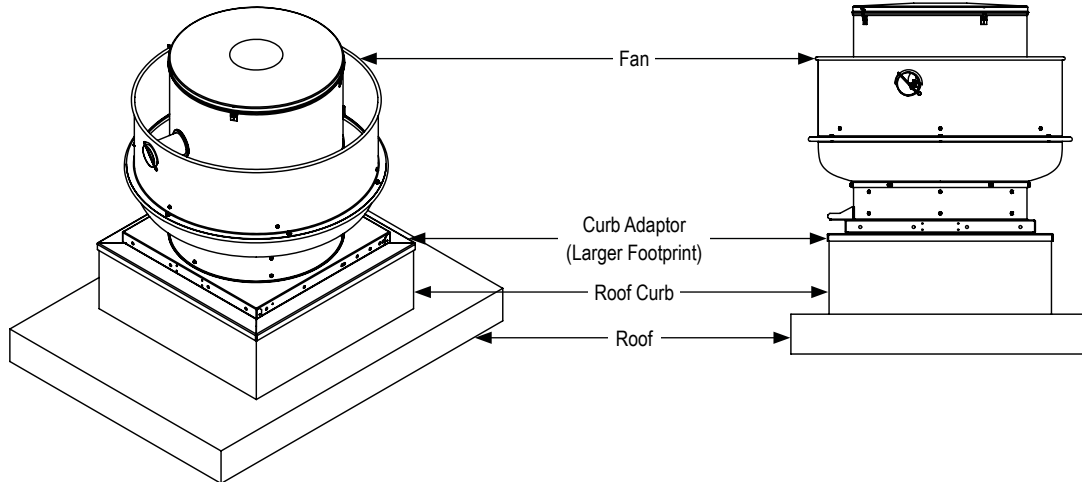


Figure 27 - Curb Adapter (Larger Footprint)

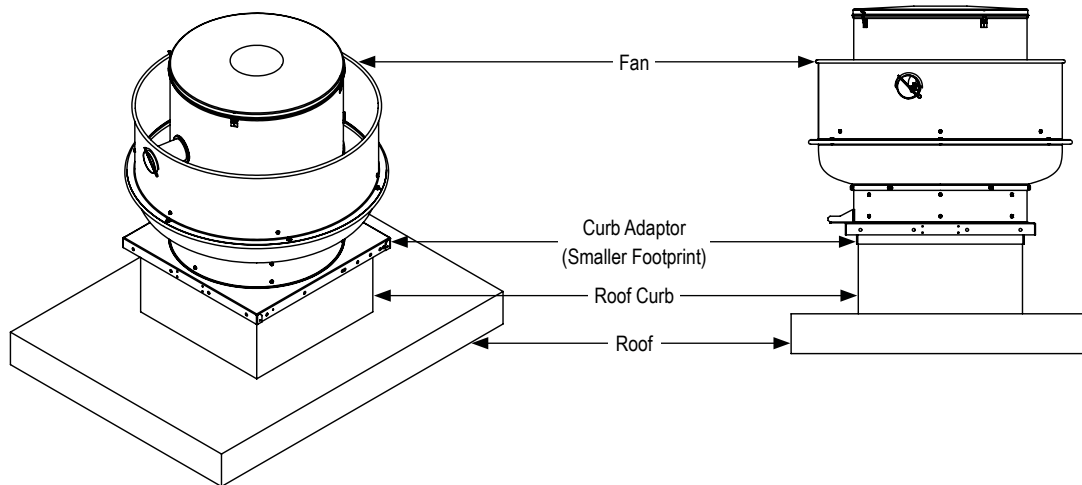


Figure 28 - Curb Adapter (Smaller Footprint)

Secure the chosen adapter to the curb using a minimum of eight lag screws or metal screws, then proceed to mount the fan onto the adapter with similar precision. It is recommended to use the same number of fasteners as what is used to fasten the curb cap.

# INSTALLATION

## Accessories Installation - Pedestal

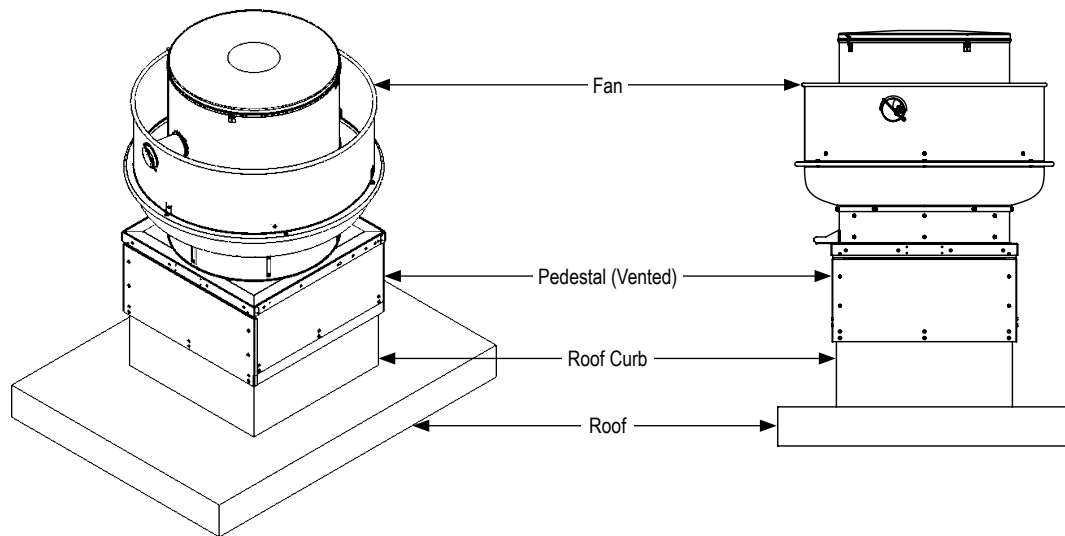


Figure 29 - Pedestal (Vented)

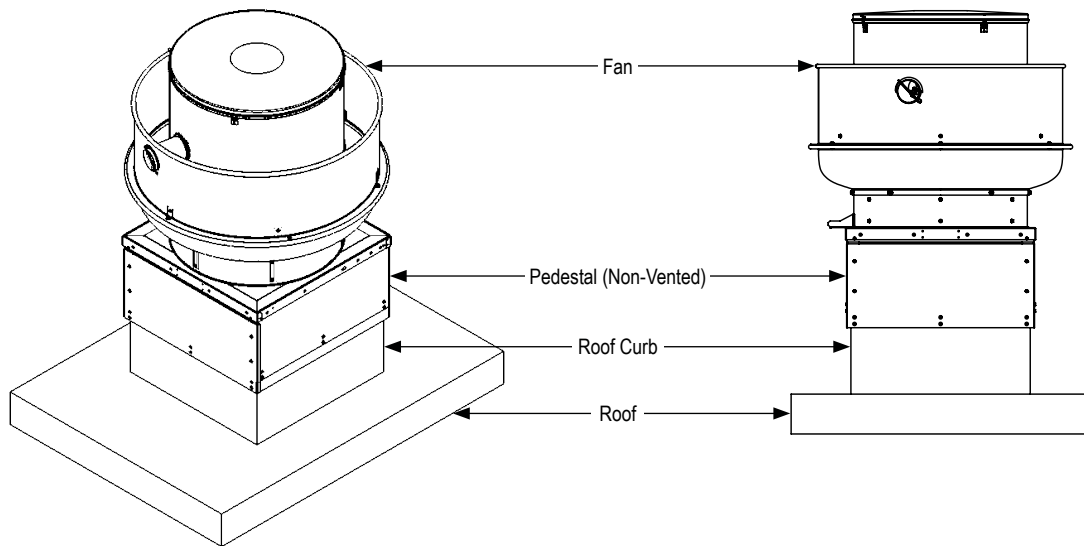


Figure 30 - Pedestal (Non-Vented)

To comply with NEFA 96, local & national codes, it is necessary to maintain fan discharge above a specific minimum height. In such cases, curb extension pedestals are offered, which can be ordered in either aluminum or galvanized material, with both vented and non-vented designs available.

Secure the chosen adapter to the curb using a minimum of eight lag screws or metal screws, then proceed to mount the fan onto the pedestal with similar precision. It is recommended to use the same number of fasteners as what is used to fasten the curb cap.

# INSTALLATION

## Accessories Installation - Pedestal

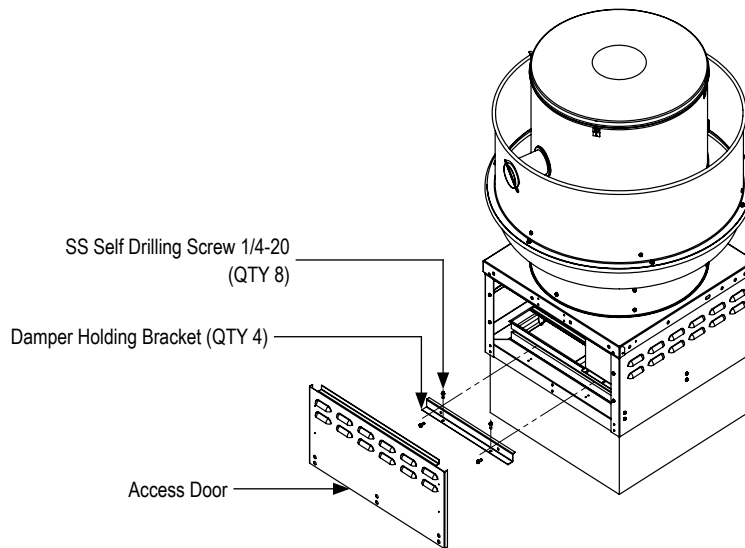


Figure 31 - Optional Damper Inside the Pedestal

PennBarry pedestals are designed to accept an internally mounted backdraft damper. It is recommended to install the damper prior to mounting the fan on the pedestal. Use the provided damper holding brackets. Access to the damper for inspection and maintenance can be achieved by detaching the removable panel of the pedestal as indicated in figure 31.

## Accessories - Piezo Ring

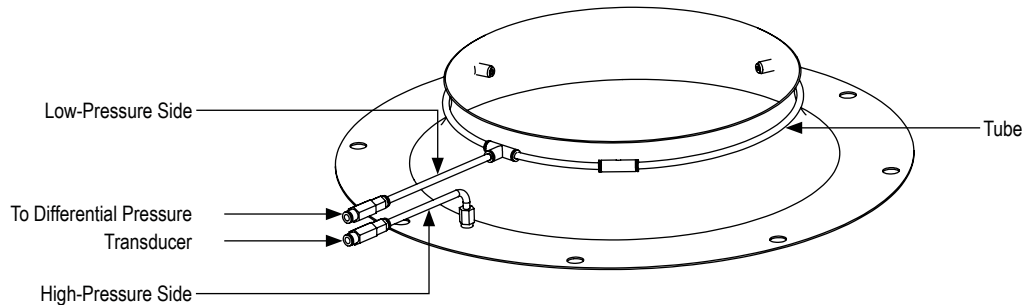


Figure 32 - Piezo Ring

If ordered piezo ring will be factory fitted on the fans. It can be configured with PennBarry iQ-IPCM intelligent pressure control module. Please identify low pressure & high pressure connection as shown in the figure 32. Difference in the cone surface pressure and fan inlet pressure ( $\Delta p$ ) can be correlated to the volumetric air flow rate (Q) with which fan is moving, using equation shown below and can be analyzed to read out the real time fan performance accurate to 5%.

$$Q = K * \sqrt{\Delta p}$$

Q = Volumetric flow rate (CFM)

$\Delta p$  = Differential Pressure (inWC)

K = Fan constant, as noted in Table:

# INSTALLATION

Table 5 - Fan Constants

Fan Size	K
100	756
122	1404
135	1787
150	2229
165	2672
182	3173
200	3704
222	4352
245	5031

Fan Size	K
270	5768
300	6652
330	7537
365	8568
402	9659
445	10927
490	12254
542	13787

## Field Calculate K-Value

Occasionally, pressure readings can vary significantly, when using a Piezo Ring, while the fan is performing at desired CFM, in this case, the K-Value may need to be field calculated.

### To calculate K-Value -

Measure CFM (typically from a Test & Balance Report) and  $\Delta P$  ((Measured Total Pressure(High Side)) - (Measured Total Pressure(Low Side))).

Next solve for  $K = ((\text{Measured CFM})/(\sqrt{\Delta \text{ Measured Total Pressure}}))$ .

Field Calculated K-Values go be as high as 35,000 - 60,000.

Note, Measured Total Pressure readings can exceed System Pressure, but the  $\Delta$  should not exceed the fan capability.

## Accessories Installation - Automatic Belt Tensioner (size 135 to 542)

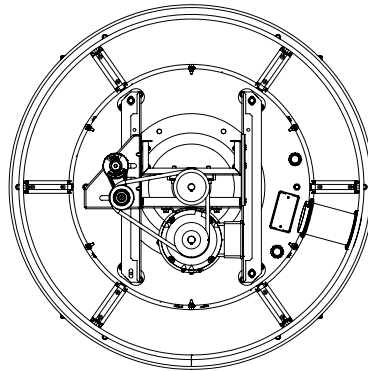


Figure 33 - Automatic Belt Tensioner

Belt tensioner bracket has multiple mounting slots, place the tensioner on the top flange of the bracket. Make sure all the three pulleys (driver, driven & belt tensioner) are in the same plane. Refer belt & pulley replacement instructions if any adjustment is required. Bring 3/8-16 bolt thru the bracket and thread it into the bottom of the tensioner, hand tighten it allowing tensioner assembly to rotate freely. Install belt around all pulleys and rotate tensioner away until belt feels tight and there is light spring pressure.

While holding tensioner at this position, use a marking pencil to make an alignment mark on the tensioner and the bracket so that the tensioner can be rotated back to the same position after removing the belt.

Remove the belt and then realign the marks on the tensioner and the bracket. Now rotate the tensioner arm approximately 1/2" past the mark on the bracket. While holding tensioner at this position, tighten mounting bolt fully.

Install belt by wrapping belt around tensioner idler pulley then use both thumbs to hold belt in idler pulley groove and push tensioner idler pulley against spring towards driver pulley then slip the belt over the driver pulley & driven pulley.

# START UP CHECKS

**Before putting fan into operation, complete the following checklist:**

1. LOCK OUT all the primary and secondary power sources.
2. Make sure all the fasteners and set screws for fan, accessories, motor, bearings and fan mounting are tightened
3. Check belt tension & pulley alignment. Refer to maintenance section for adjustments. Ensure the belt is only in contact with the pulleys.
4. Turn the fan wheel by hand to check free rotation. Make sure it is not striking the venturi or any obstacle.
5. Make sure there is no foreign or loose material in ductwork leading to and from fan or in the fan itself.
6. Conduct an inspection of the motor wiring to ensure that the correct gauge of wire has been used, and refer to the Wiring Installation for guidance.
7. Ensure that the motor is connected to the low voltage (200-240) when connecting a three-phase output VFD to a single-phase fan. (See Wiring document for instructions)
8. Properly secure all safety guards.
9. Secure all access doors to fan and ductwork.
10. Restore power to fan. Momentarily energizing the unit.
11. Inspect direction of the rotation matches rotation sticker on the unit.
12. Pay attention to excessive vibration, bearing noise, squealing noise from belt or any other unusual noise.
13. With the system in full operation along with ductwork attached, measure current input to the motor and compare with the Fan tag rating to determine if the motor is operating under safe load conditions.



*Do not allow the fan to run in the wrong direction. Reversed rotation will result in poor air performance, motor overloading and cause serious damage. For 3-phase motors, if the fan is running in the wrong direction, check the control switch. It is possible to interchange two leads at this location so that the fan is operating in the correct direction of rotation.*



*If a problem is discovered, immediately shut the fan off. Lock out all electrical power and determine the source of the problem. Refer to the Troubleshooting section.*

# INSPECTION



*Prior to inspection, it is essential to disconnect and secure all electrical power to the fan in the "off" position. Non-compliance with this safety measure could lead to severe injury or death.*

The fan should be inspected at 30-minute, 8-hour, and 24-hour intervals during satisfactory operation, and during these inspections, the fan should be stopped and inspected as directed.

## 30 Minute Interval

Examine the bolts, setscrews, and motor mounting bolts and make necessary adjustments and tighten as needed.

## 8 Hour Interval

Examine the alignment and tension of the belt and make any necessary adjustments and tighten as required.

## 24 Hour Interval

Inspect the belt tension and make any necessary adjustments and tightening.

Within the initial month of operation it is necessary to inspect fans that are expelling corrosive or contaminated air. Subsequently fans responsible for exhausting contaminated air should undergo inspection every three months. During the first few months of operation check bearing set screws periodically to ensure tightness on all units.

Establish a regular inspection schedule for all parts of the fan, taking into account the operating conditions and location. It may be necessary to conduct inspections according to local codes; for specific inspection requirements, please reach out to the local code authority.

It is advised that the specified inspections be carried out semi-annually.

- Examine the bolts and setscrews for proper tightness and adjust as needed, referencing the Recommended Torque chart as necessary (refer Table 1).
- Conduct an inspection to check belt wear and alignment, and replace any worn belts with new ones while adjusting alignment as required. For further details, please refer to the Belt and Pulley maintenance guidelines.
- The inspection of bearings should be conducted in accordance with the guidelines provided by manufacturer.
- Conduct an inspection to ensure cleanliness, focusing on cleaning only the exterior surfaces. It is essential to remove dust and grease from the motor housing to maintain proper motor cooling.

# MAINTENANCE



*Prior to servicing, it is essential to disconnect and secure all electrical power to the fan in the "off" position. Non-compliance with this safety measure could lead to severe injury or death.*



*During wheel or housing cleaning, it is important to render this unit non-functional by removing the fuses and locking off the disconnect.*



*Unequal cleaning of the wheel will result in an imbalance that can lead to fan vibration.*

Only qualified personnel with knowledge of local codes and regulations and experience with this equipment should perform installation and maintenance.

Wheels for clean air application need minimal maintenance, but occasional buildup of oil and dust may lead to imbalance, requiring cleaning of the wheel and housing to ensure safe and smooth operation.

In restaurant exhaust applications, it is essential to adhere to NFPA 96 guidelines for fan cleaning. Containers for grease should be regularly emptied to avoid overflowing. A well-executed maintenance program will ensure that these units provide reliable service for many years.

## Motor Maintenance

Motor maintenance typically involves only cleaning and lubrication, where necessary, with cleaning being restricted to exterior surfaces. It is important to remove dust buildup from the motor housing to ensure proper motor cooling.

## Motor Bearing Maintenance

Motors come equipped with prelubricated bearings, and any lubrication guidelines displayed on the motor nameplate take precedence over the instructions provided below.

Lubrication of motors should only occur when there are fittings present. Many small motors are already lubricated and should not be lubricated again after installation. Motors with grease fittings should be lubricated according to the manufacturer's instructions. For motors with temperatures below 104°F (40°C), the grease should be replaced after 2,000 hours of operation as a general guideline.

## Fan Bearing Maintenance



*Excessive grease can damage seal and reduce life through excess contamination and/or loss of lubricant.*

The standard cast pillow block bearings on belt drive fans come pre-lubricated from the factory and include external grease fittings. Annual lubrication should be carried out as per the recommendations in Table 4, or more frequently if required. Use only a moderate amount of lubricant. For best results, lubricate the bearing while the fan is in operation. Gradually pump grease until a small bead appears around the bearing seals, ensuring not to over-grease. After lubrication, it is important to wipe clean the grease fittings.

Extreme caution must be exercised in the vicinity of moving components.

Units located in hot, humid, or dirty environments necessitate the use of specialized bearings, which will need more frequent lubrication.



# MAINTENANCE

Table 6 - Suggested Fan Bearing Lubrication Intervals

Interval (Months)	Operation Per Day (Hours)	Operation Duty	Dirt / Dust	High Temperature	Moisture in Atmosphere
1 to 3	12 to 24	Heavy	✓	✓	✓
3 to 6	12 to 24	Heavy	X	X	✓
6 to 12	8 to 16	Light	X	X	X
12 to 18	4 to 8	Light	X	X	X

## Belt Alignment Maintenance

Misalignment consists of three types (Figure 34) : Axial Twist, Axially Angled, Axial offset, all of which can coexist in any combination. There are multiple sheave alignment techniques, with the most prevalent being the string and straightedge approach depicted in Figure 35. The string must make contact with each sheave at two diametrically opposite points at the same time (for a total of four contact points) and the pulleys need to be rotated by half a turn and re-checked.

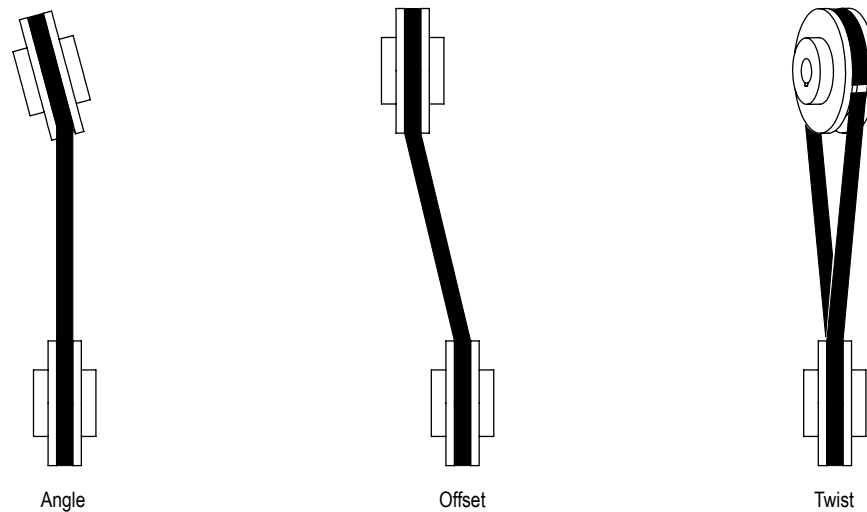


Figure 34 - Belt Misalignments

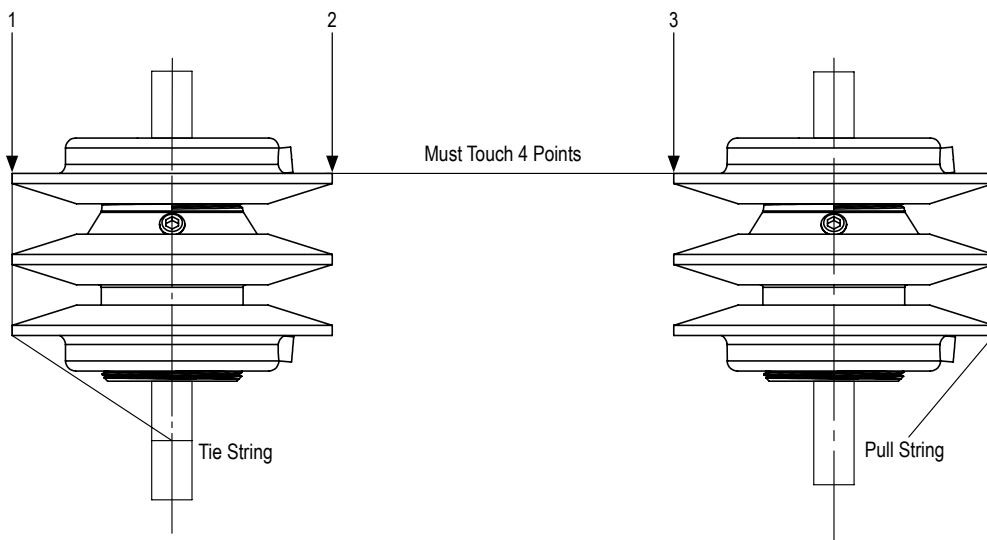


Figure 35 - Belt alignment with string & straightedge method

# MAINTENANCE

The most common type of misalignment is offset, and the ideal method for correction involves loosening the pulley set screw and adjusting the pulley on the shaft. Axial misalignment may occur if the motor plate is not perfectly parallel with the bearing plate; in this case, loosen the motor mounting bolts and ensure proper alignment. To eliminate any twisting, check the tightness of the motor mounting bolts.

## Belt Tension Maintenance



*Please refrain from applying excessive force when installing or removing the belt, as doing so can lead to cord breakage and ultimately result in belt failure.*

When the fan is first started, the belts will generate a loud squeal that diminishes once the fan is operating at full capacity; however, if the loud noise persists, please inspect the belt tension. If the tension of the belt is either too tight or too loose, it can lead to a decrease in efficiency and potential damage.

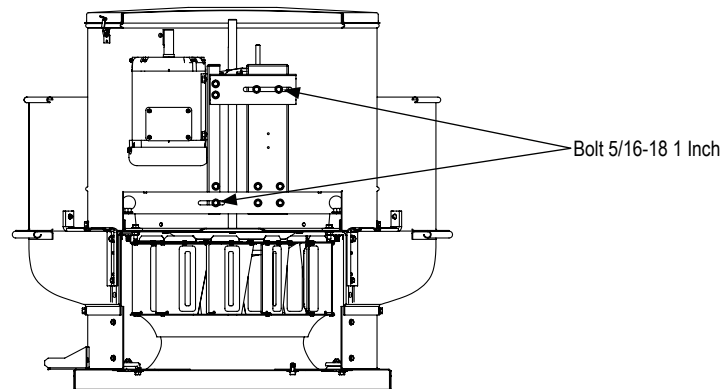


Figure 36 - Belt Tension Adjustment



*Before making any adjustments for belt tension, ensure that the pulley alignment is correct.*

Tension in the belt can be adjusted by loosening the six fasteners on the drive frame, see Figure 36. Identical fasteners on opposite side must also be loosened. Motor frame be slides away or towards for tightening or loosening the belt respectively.

The belt tension needs to be precisely adjusted in order to achieve a deflection of 1/64 inch per inch of belt span. Belt deflection to be observed with moderate thumb pressure at the mid-point between pulleys see Figure 37. Once optimal tightness is insured lock the motor plate bolts in place.

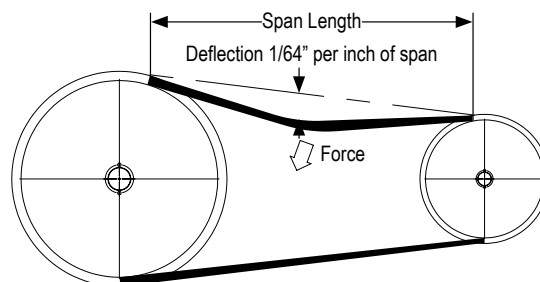


Figure 37 - Belt Deflection

Do not change the pulley diameter to change belt tension, it will result in a different fan speed.

# MAINTENANCE

## Lubrication Of Anti-Friction Bearings



*Lubrication lines installed at the factory are not filled with grease at the factory. Caution must be used when first greasing the bearings to purge air from the lines without blowing bearing seals or over greasing a bearing.*

Bearings on assembled fans receive their initial lubrication from the bearing manufacturer. Bearings shipped separate from the fan or as a replacement may not be lubricated before shipment. When there is the slightest doubt, the safe practice is to assume that the bearing has not been lubricated. Always turn fan off before lubricating.

For grease lubricated ball or roller bearing pillow block, a good grade of grease, free from chemically or mechanically active material should be used. These greases are a mixture of lubricating oil and a soap base to keep the oil in suspension. They have an upper temperature limit where oil and soap base oxidize and thermally decompose into a gummy sludge.

Mixing of different lubricants is not recommended. If it is necessary to change to a different grade, make or type of lubricant, flush bearing thoroughly before changing. Regreasing will vary from 3 months to a year depending on the hours of operation, temperature and surrounding conditions. Special greases may be required for a dirty or wet atmosphere (consult your lubricant supplier).

When grease is added, use caution to prevent any dirt from entering the bearing. The pipe plug or grease relief fitting should be open when greasing to allow excess grease to flow out. The pillow block should be about 1/3 full, as excess grease may cause overheating. Use a low pressure gun.

Recommended ball bearing greases or equivalent:  
 Chevron SRIU #2 (Standard Oil of California)  
 Chevron BRB #2 (Standard Oil of California)  
 Premium RB (Texaco, Inc.)  
 Alvania No. 2 (Shell Oil Company)

### Frequency of lubrication

The bearings are lubricated at predetermined intervals and the condition of the grease established as it is purged out of the seals or by examination of the grease in the housing. An average installation where the environmental conditions are clean and room temperatures prevail may only require bearing lubrication every 3 to 6 months, while operation in a dirty atmosphere at high temperatures will require much more frequent intervals.

**Table 7 - Frequency of Lubrication**

Shaft Size	Operating Speed (RPM)									
	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
	Lubrication Frequency (Months)									
.50" - 1.00"	6	6	6	6	6	6	4	4	2	2
1.06" - 1.44"	6	6	6	6	6	6	4	4	2	1
1.50" - 1.75"	6	6	6	4	4	2	2	2	1	1
1.88" - 2.19"	6	6	4	4	2	2	1	1	1	
2.25" - 2.44"	6	4	4	2	2	1	1	1		
2.50" - 3.00"	6	4	4	2	1	1	1			
3.06" - 3.50"	6	4	2	1	1	1				
3.56" - 4.00"	6	4	2	1	1					

# MAINTENANCE

## Belt & Pulley Replacement

Loosen the mounting bolts of the motor plate (see Figure no. 36) to release the tension from the belt. Then, remove the belt and proceed to loosen the setscrews of the pulleys in order to remove them from the shaft. If significant effort is required to remove the pulleys, you may want to use a three-jaw puller, but be cautious as this tool can potentially distort the pulley. Should you use the puller, carefully examine the accuracy of the pulley once it's off the shaft. If the pulley deviates by more than 0.020 inch, it will need to be replaced.

Clean the pulley bores and apply a light coat of oil to the bores, removing any grease, rust, or burrs. Next, position the fan pulley on the fan shaft and the motor pulley on the motor shaft. Utilize gentle force when placing the pulleys on their respective shafts to avoid causing any damage. Once the pulleys are correctly positioned, proceed to tighten the setscrews.



*Never force belts over pulleys without loosening motor first to relieve belt tension which removing or installing belt.*

## Wheel Replacement



*When replacing a damaged wheel with a new one, ensure that the correct wheel is ordered from PennBarry.*

### For size 060 to 222

#### Wheel Removal

1. Remove the inlet venturi to access the wheel.
2. Loosen & remove the bolts from the center of the hub (refer to Figure 38).
3. Screw them into the removal holes which are threaded in the wheel hub.
4. Alternate tightening to remove wheel hub from bushing.
5. Do not remove bushing from the shaft.

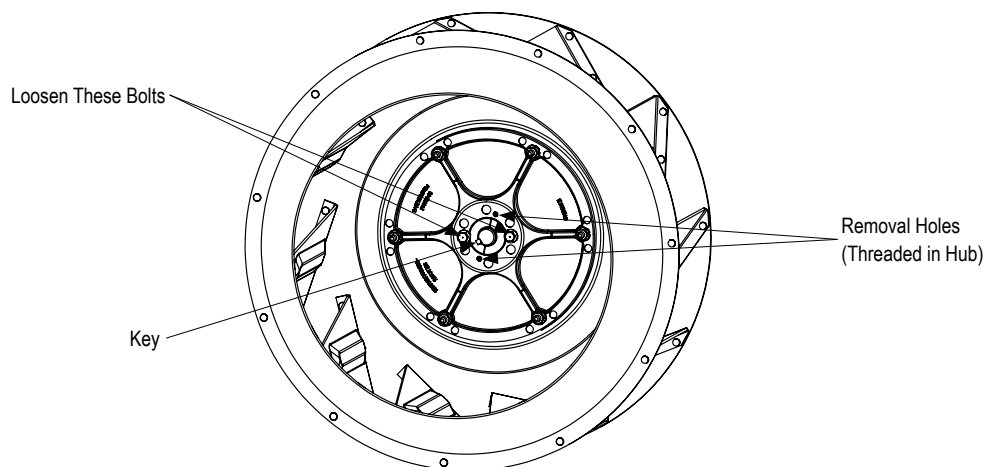


Figure 38 - Wheel Hub size 060 to 222

# MAINTENANCE

## Wheel Installation

1. Clean wheel hub bushing & shaft. Remove of any burs on shaft.
2. Ensure correct positioning of the bushing on the shaft.
3. Place impeller such to align the non-threaded holes of the hub with the corresponding threaded holes of bushing.
4. Insert bolts in the threaded holes of bush. Hand tighten the bolts to hold hub & bushing together.
5. Make sure recommended wheel venturi overlap is achieved (refer to the pre-installation checks section) by bringing venturi in place.
6. Once the final drive alignment is complete, gradually and alternately tighten the bushing cap screws to the appropriate torque values given in the Table 8.
7. Assemble venturi in place

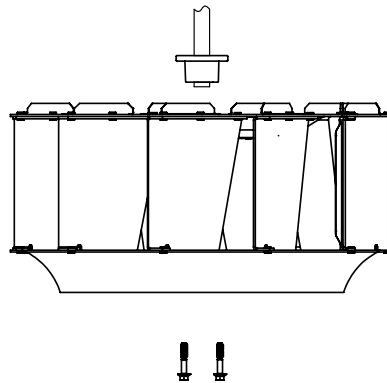


Figure 39 - Wheel Bushing Size 060 to 222

## For size 245 to 542

### Wheel Removal

1. Remove the inlet venturi to access the wheel.
2. Loosen & remove the bolts from the center of the hub (refer to Figure 40).
3. Screw them into the removal holes which are threaded in the wheel hub.
4. Alternate tightening to remove bushing from wheel hub.
5. Remove bushing & wheel from the shaft.

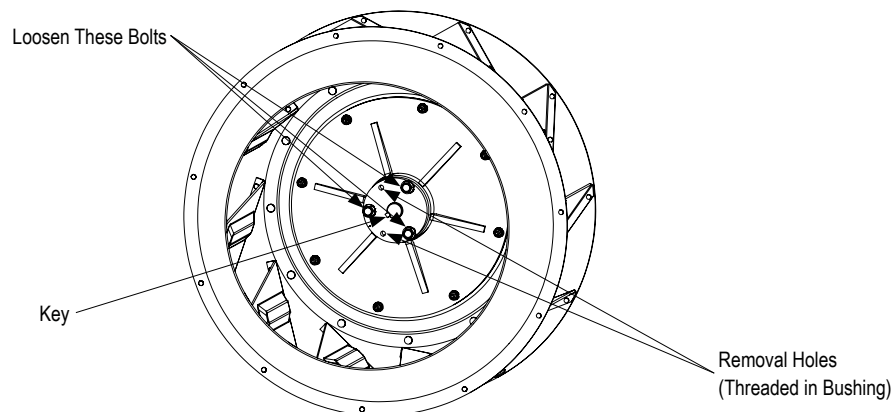


Figure 40 - Wheel Hub Size 245 to 542

# MAINTENANCE

## Wheel Installation

1. Clean wheel hub bushing & shaft. Remove of any burrs on shaft.
2. Insert the bushing into the hub and align the non-threaded holes of the hub with the corresponding threaded holes of bushing.
3. Insert bolts in the threaded holes of hub. Hand tighten the bolts to hold hub & bushing together.
4. Make sure recommended wheel venturi overlap is achieved (refer to the pre-installation checks section) by bringing venturi in place.
5. Once the final drive alignment is complete, gradually and alternately tighten the bushing cap screws to the appropriate torque values given in the Table 8.
6. Assemble venturi in place.

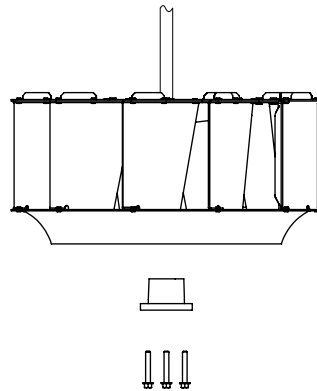


Figure 41 - Wheel Bushing Size 245 to 542

Table 8 - Bushing Torque Table

Fan Size	Bushing Type	Tightening Torque (in-lbs.)
060 to 222	H Type	95
245 to 542	Q1 Type	348

## Bearing Replacement

### Bearing Removal

1. To get better access of the bearing move motor plate to the farthest position (refer Figure 36).
2. Mark the position on the shaft of both bearing races, setscrews, and the wheel & pulley.
3. Note the clearance between the wheel and inlet cone.
4. Remove lube lines, if supplied.
5. Remove the wheel (refer to the Wheel Replacement section).
6. Before bearing bolts are removed, make sure the fan shaft is supported.
7. Remove bearing hold-down bolts.
8. Remove the shaft and bearings as one unit.
9. Loosen the setscrews on the bearing locking collars and slide the bearings off the fan shaft.
10. Clean the shaft with a suitable degreaser and remove any burrs with an emery cloth, or suitable file.
11. Removing the bearing from the shaft may require a bearing puller. If a bearing puller is not available, tap on the bearing with a wood block and hammer to remove it.

# MAINTENANCE

## Bearing Installation

Any instruction from the bearing manufacturer supersedes below instruction, please refer those before installing the bearing.

1. Oil the shaft for protection.
2. Slide new bearings on the fan shaft.
3. Align bearings on shaft where the bearing positions were marked, prior to removal. Secure bearings to the shaft at those positions.
4. Put bolts into new bearing mount. Do not tighten the bolts.
5. Remove any supports used to hold the shaft.
6. Set bearings into place on bearing mount. Ensure bearings are level, alignment, and square.
7. Manually rotate the shaft so bearings can set in. Listen and inspect for and rubbing or sounds from the bearings.
8. If supplied, reattach lube lines to the new bearings.
9. Reinstall drives and belts, taking care for alignment and tightness.



*Before securing the bearing mounting bolts, it is important not to tighten both pairs of setscrews simultaneously as it could lead to shaft damage.*

## Fan Mechanical Balancing

Fan impellers are balanced statically and dynamically by the factory, but may require further trim balancing. The final installed vibration level of the fan is also dependent upon its installation and foundation. Fans shipped completely assembled have been trim balanced at the factory. Before any attempt is made at balancing, check for any other causes of vibration or unbalance as listed in the TROUBLESHOOTING CHECKLIST. A fan handling clean air should not need rebalancing after original balance. Dust build-up on fan blades or wear can cause fan unbalance. Periodic inspection of the fan should be made to determine the amount of dirt build-up or wear. Portable instruments are available that will indicate vibration in mils (1 mil = 0.001 inches). Each fan has a Quality Assurance label affixed to the fan. All pertinent information on factory balance is recorded on the label for the owner's information and use.

# TROUBLESHOOTING

## Troubleshooting Checklist

In the event trouble is experienced in the field. Listed below are the most common fan difficulties.

Symptom	Possible Cause(s)	Corrective Action
Excessive Noise	Impeller hitting inlet	Adjust wheel and/or inlet venturi. Center wheel on inlet Tighten the wheel hub and/or bush. Tighten bearing collars on shaft.
	Impeller unbalance	Clean all the dirt on the wheel.
	Belt too tight or too loose	Adjust belt tension
	Misaligned pulleys or shaft	Correct alignment
	Fan base not securely anchored	Secure properly
	Bearings are worn out	Replace bearings. Lubricate.
	Loose motor hood	Properly secure loose covers and/or accessories.
	Impeller running in wrong direction	Correct the direction of the rotation.
Fan inoperative	Defective or loose motor bearing	Replace motor with same frame size, RPM, HP.
	Blown fuse or open circuit breaker	Shut off power and check wiring for proper connections
	Loose or disconnect wiring	Adjust drive
	Defective motor	Repair or replace motor
	Broken belts	Replace belts
High horsepower	No 0-10v signal going into the motor (direct driven model only)	Make sure the included pot is not in the off position
	Belt losses higher than anticipated	Correct alignment & tension in belt
	Seized bearing	Replace bearing(s)
Insufficient Airflow	Motor wired incorrectly or wrong voltage.	Correct input voltage & wiring.
	Operation in wrong direction	Correct rotation of impeller
	Insufficient make-up air	Add make-up fan or louver opening
	Damper (if installed) in the wrong position	Adjust damper opening
	Clogged filters and/or blocked duct	Clean duct and /or filters. Replace filter
	Dirt buildup on impeller	Clean impeller, insure proper wheel alignment
Motor Overheating	Fan running too slow	Check fan RPM
	Belt Slippage (belt drive units only)	Adjust tension or replace belts
	Over voltage or under voltage	Contact power supply company
	Operation in wrong direction	Reverse direction of motor
	Fan speed too high	Slow down fan to rated RPM
	Incorrect motor (service factor 1.0, low ambient temp.)	Replace motor with correct one, NEMA service factors (1.15 or higher) with 400 ambient
Insufficient make-up air	Check airflow into the system	



# LIMITED WARRANTY

## What Products Are Covered

PennBarry Commercial and Industrial Fans (each, a “PennBarry Product”)

## One Year Limited Warranty For PennBarry Products

PennBarry warrants to the original commercial purchaser that the PennBarry Products will be free from defects in material and workmanship for a period of one (1) year from the date of shipment.

## Exclusive Remedy

PennBarry will, at its option, repair or replace (without removal or installation) the affected components of any defective PennBarry Product; repair or replace (without removal or installation) the entire defective PennBarry Product; or refund the invoice price of the PennBarry Product. In all cases, a reasonable time period must be allowed for warranty repairs to be completed.

## What You Must Do

In order to make a claim under these warranties:

1. You must be the original commercial purchaser of the PennBarry Product.
2. You must promptly notify us, within the warranty period, of any defect and provide us with any substantiation that we may reasonably request.
3. The PennBarry Product must have been installed and maintained in accordance with good industry practice and any specific PennBarry recommendations.

## Exclusions

These warranties do not cover defects caused by:

1. Improper design or operation of the system into which the PennBarry Product is incorporated.
2. Improper installation.
3. Accident, abuse or misuse.
4. Unreasonable use (including any use for non-commercial purposes, failure to provide reasonable and necessary maintenance as specified by PennBarry, misapplication and operation in excess of stated performance characteristics).
5. Components not manufactured by PennBarry.

## Limitations

1. In all cases, PennBarry reserves the right to fully satisfy its obligations under the Limited Warranties by refunding the invoice price of the defective PennBarry Product (or, if the PennBarry Product has been discontinued, of the most nearly comparable current product).
2. PennBarry reserves the right to furnish a substitute or replacement component or product in the event a PennBarry Product or any component of the product is discontinued or otherwise unavailable.
3. PennBarry's only obligation with respect to components not manufactured by PennBarry shall be to pass through the warranty made by the manufacturer of the defective component.

## General

The foregoing warranties are exclusive and in lieu of all other warranties except that of title, whether written, oral or implied, in fact or in law (including any warranty of merchantability or fitness for a particular purpose).

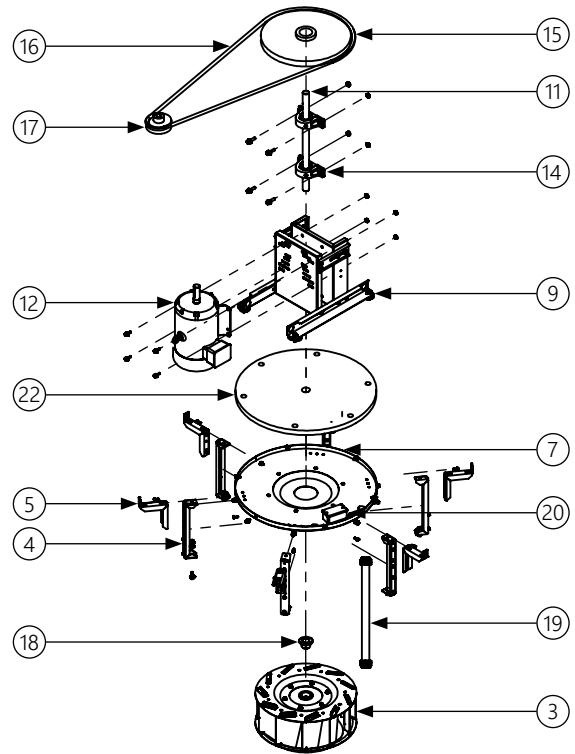
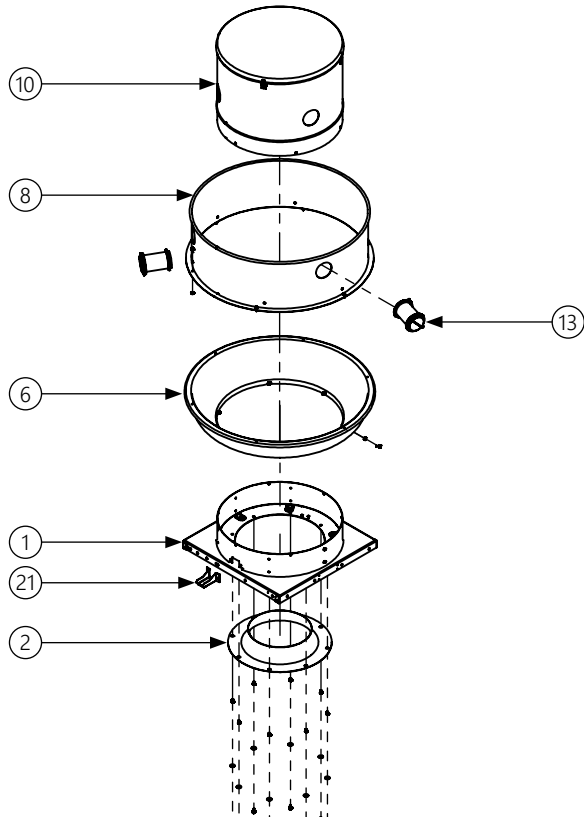
PennBarry hereby disclaims any liability for special, punitive, indirect, incidental or consequential damages, including without limitation lost profits or revenues, loss of use of equipment, cost of capital, cost of substitute products, facilities or services, downtime, shutdown or slowdown costs.

The remedies of the original commercial purchaser set forth herein are exclusive and the liability of PennBarry with respect to the PennBarry Products, whether in contract, tort, warranty, strict liability or other legal theory shall not exceed the invoice price charged by PennBarry to its customer for the affected PennBarry Product at the time the claim is made.

# PARTS LIST

## PRU Parts Reference | Belt Drive

Models: UL705, Grease Exhaust, Heat & Smoke



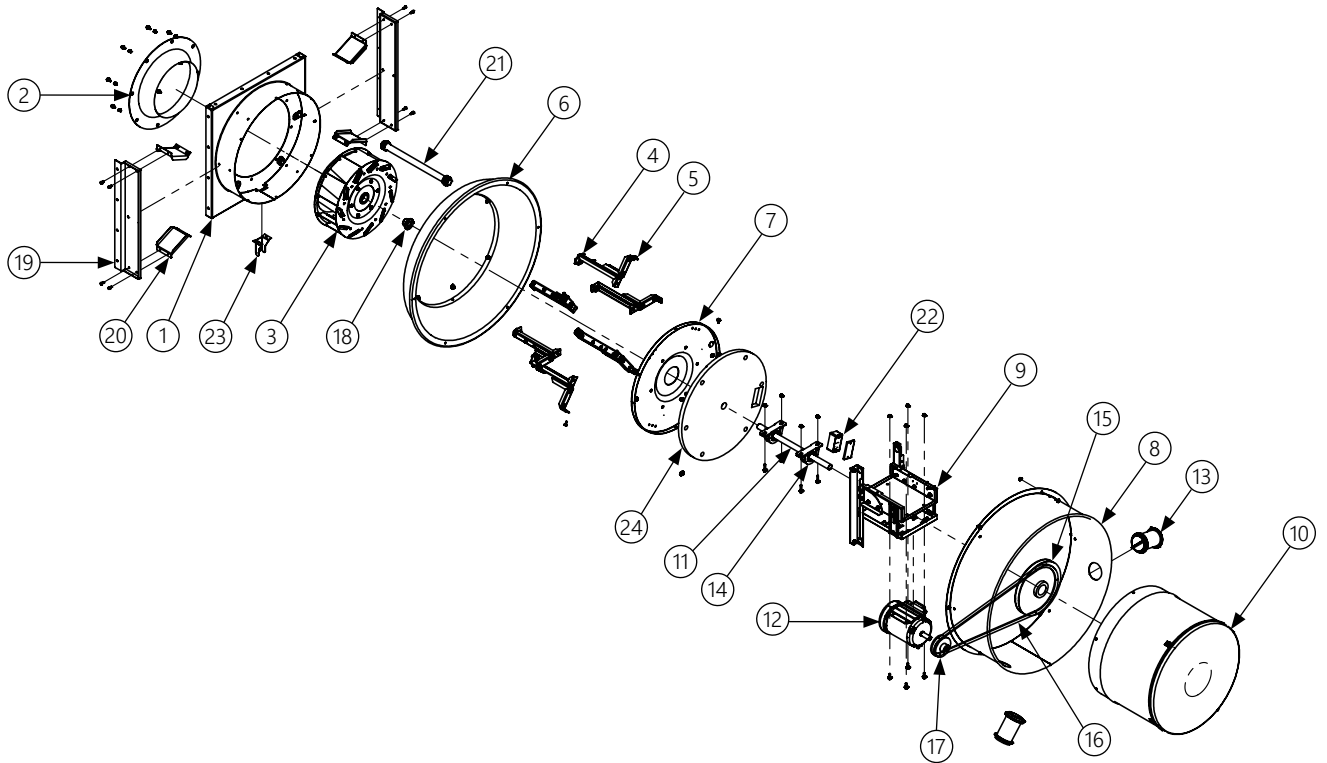
Item #	UL705	Grease Exhaust	Heat & Smoke
1	Curb Cap/Lower Windband Weldment		
2	Venturi		
3	Wheel		
4	Vertical Support		
5	Horizontal Support		
6	Discharge Apron		
7	Top Plate		
8	Upper Windband		
9	Motor Structure Assembly		
10	Motor Dome		
11	Shaft		

Item #	UL705	Grease Exhaust	Heat & Smoke
12	Motor		
13	Cooling Tube Assembly		
14	Bearings		
15	Fan Pulley		
16	Belt		
17	Motor Pulley		
18	Bushing		
19	Conduit Sub Assembly	-	-
20	Junction Box		Disconnect Switch (Optional)
21	Drain	Drain Weldment	
22	-	Top Plate Insulation	

# PARTS LIST

## PRU Parts Reference | Belt Drive

Models: UL705 (Wall Mount), Grease Exhaust (Wall Mount)



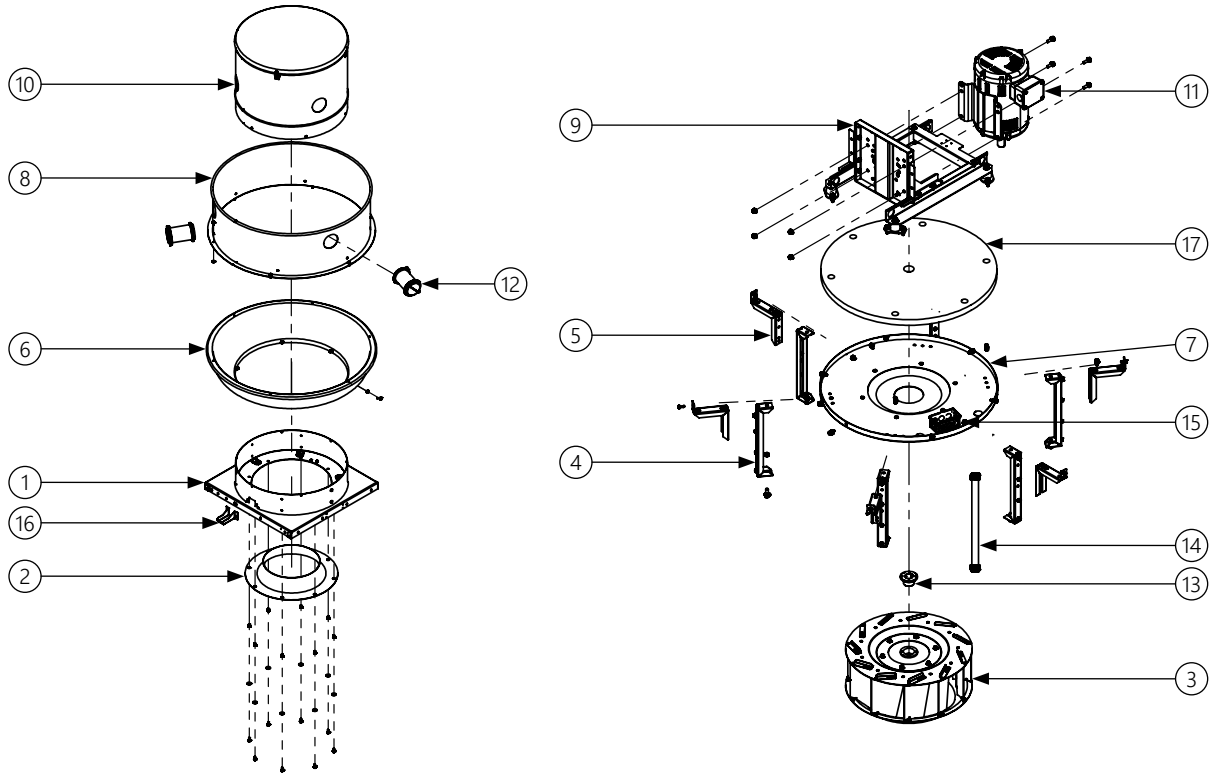
Item #	UL 705 (Wall Mount)	Grease Exhaust (Wall Mount)
1	Curb Cap/Lower Windband Weldment	
2	Venturi	
3	Wheel	
4	Vertical Support	
5	Horizontal Support	
6	Discharge Apron	
7	Top Plate	
8	Upper Windband	
9	Motor Structure Assembly	
10	Motor Dome	
11	Shaft	
12	Motor	

Item #	UL 705 (Wall Mount)	Grease Exhaust (Wall Mount)
13	Cooling Tube Assembly	
14	Bearings	
15	Fan Pulley	
16	Belt	
17	Motor Pulley	
18	Bushing	
19	Side Bracket	
20	Side Support Bracket	
21	Conduit Sub Assembly	-
22	Junction Box	Disconnect Switch (Optional)
23	Drain	Drain Weldment
24	-	Top Plate Insulation

# PARTS LIST

## PRU Parts Reference | Direct Drive

Models: UL705, Grease Exhaust

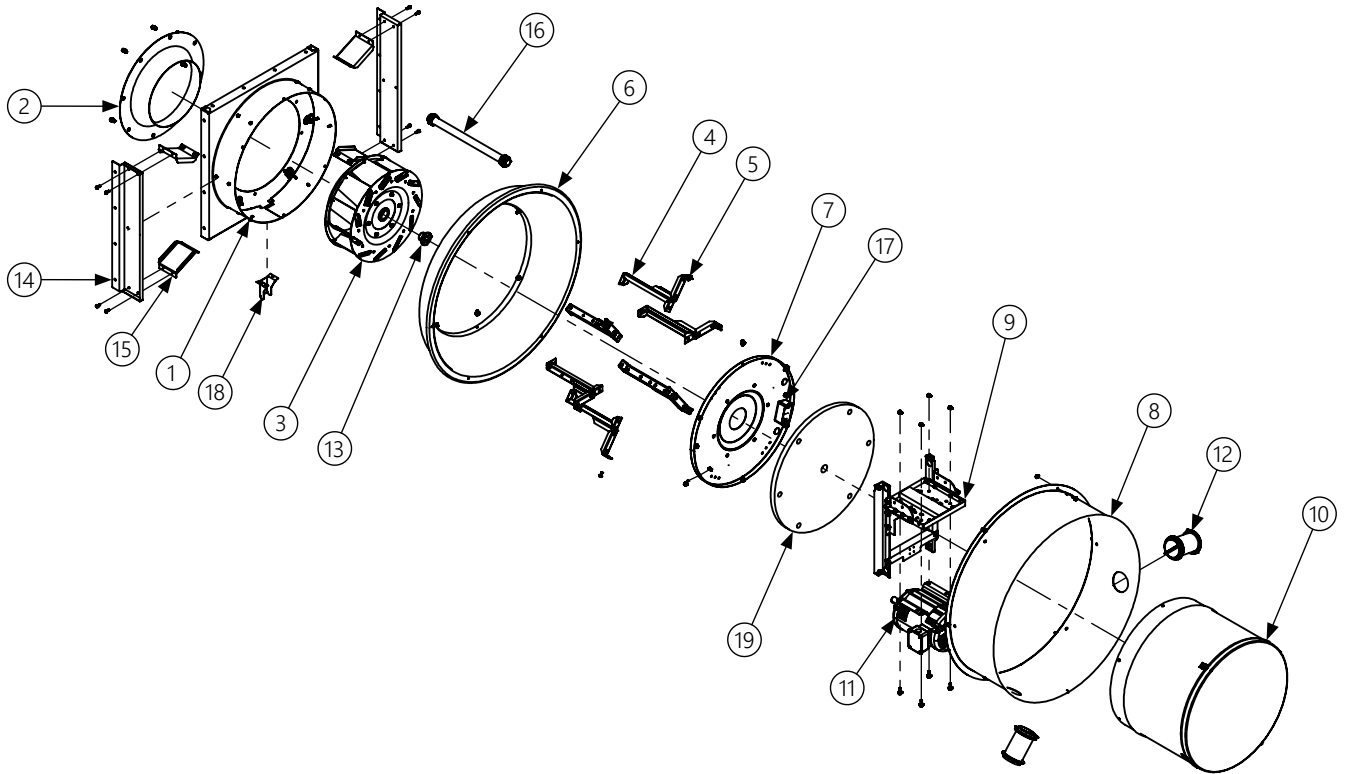


Item #	UL705	Grease Exhaust
1	Curb Cap/Lower Windband Weldment	
2	Venturi	
3	Wheel	
4	Vertical Support	
5	Horizontal Support	
6	Discharge Apron	
7	Top Plate	
8	Upper Windband	
9	Motor Structure Assembly	
10	Motor Dome	
11	Motor	
12	Cooling Tube Assembly	
13	Bushing	
14	Conduit Sub Assembly	-
15	Junction Box	Disconnect Switch (Optional)
16	Drain	Drain Weldment
17	-	Top Plate Insulation

# PARTS LIST

## PRU Parts Reference | Direct Drive

Models: UL705 (Wall Mount), Grease Exhaust (Wall Mount)



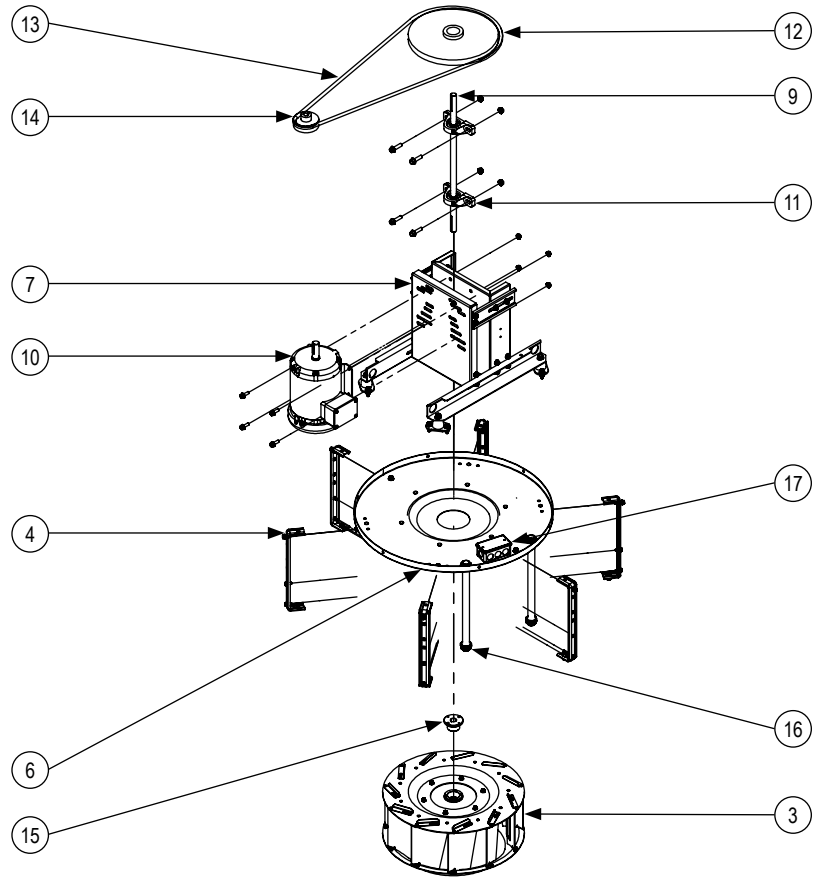
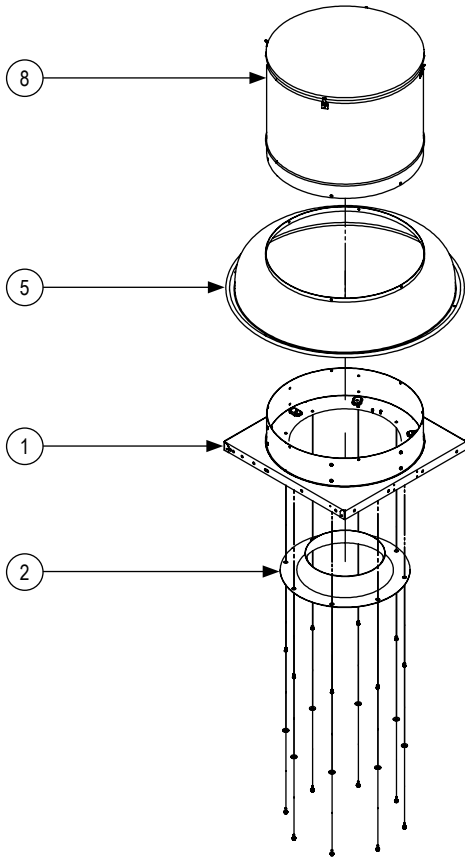
Item #	UL705(Wall Mount)	Grease Exhaust(Wall Mount)
1	Curb Cap/Lower Windband Weldment	
2	Venturi	
3	Wheel	
4	Vertical Support	
5	Horizontal Support	
6	Discharge Apron	
7	Top Plate	
8	Upper Windband	
9	Motor Structure Assembly	
10	Motor Dome	

Item #	UL705(Wall Mount)	Grease Exhaust(Wall Mount)
11	Motor	
12	Cooling Tube Assembly	
13	Bushing	
14	Side Bracket	
15	Side Support Bracket	
16	Conduit Sub Assembly	-
17	Junction Box	Disconnect Switch (Optional)
18	Drain	Drain Weldment
19	-	Top Plate Insulation

# PARTS LIST

## PRD Parts Reference | Belt Drive

Models: UL705



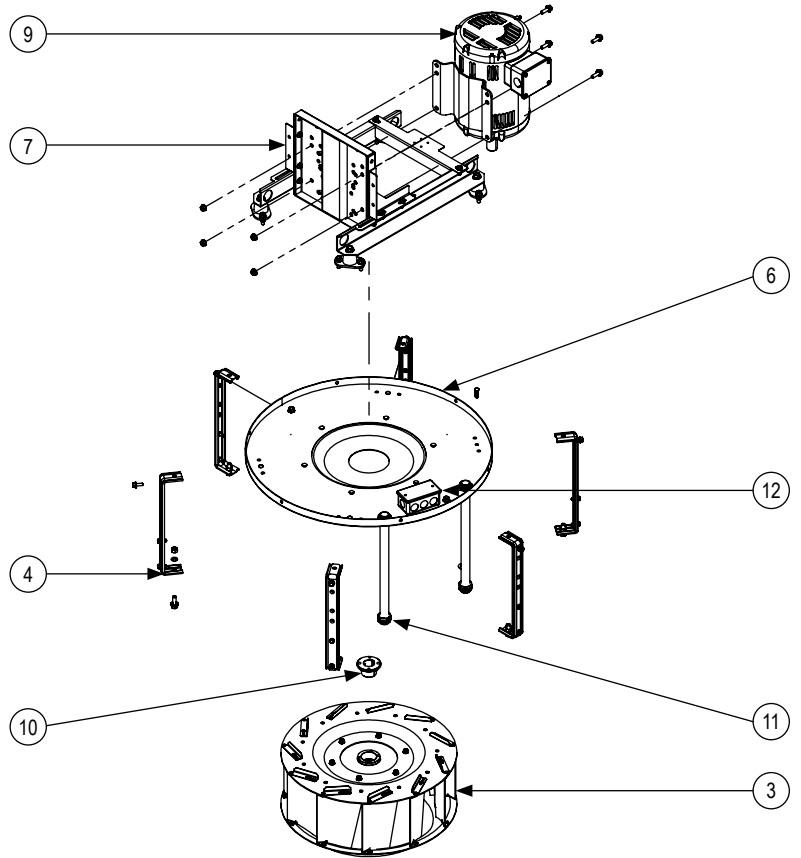
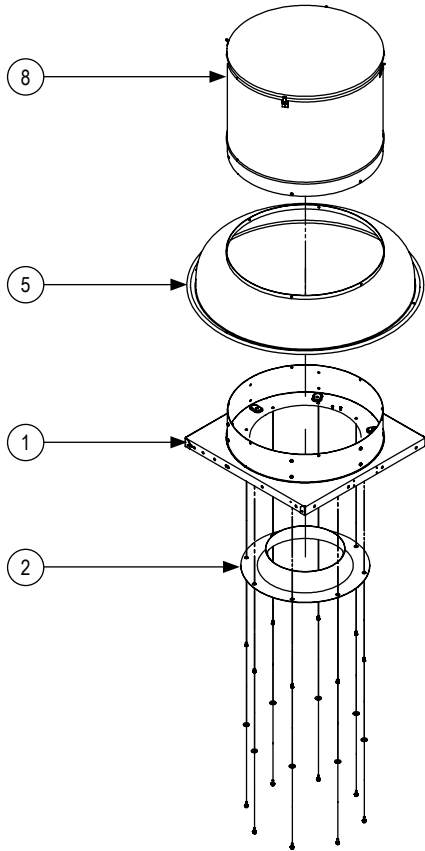
Item #	UL705
1	Curb Cap/Lower Windband Weldment
2	Venturi
3	Wheel
4	Vertical Support
5	Discharge Apron
6	Top Plate
7	Motor Structure Assembly
8	Motor Dome
9	Shaft

Item #	UL705	
10	Motor	
11	Bearings	
12	Fan Pulley	
13	Belt	
14	Motor Pully	
15	Bushing	
16	Conduit Sub Assembly	
17	Junction Box	Disconnect Switch(Optional)

# PARTS LIST

## PRD Parts Reference | Direct Drive

Models: UL705

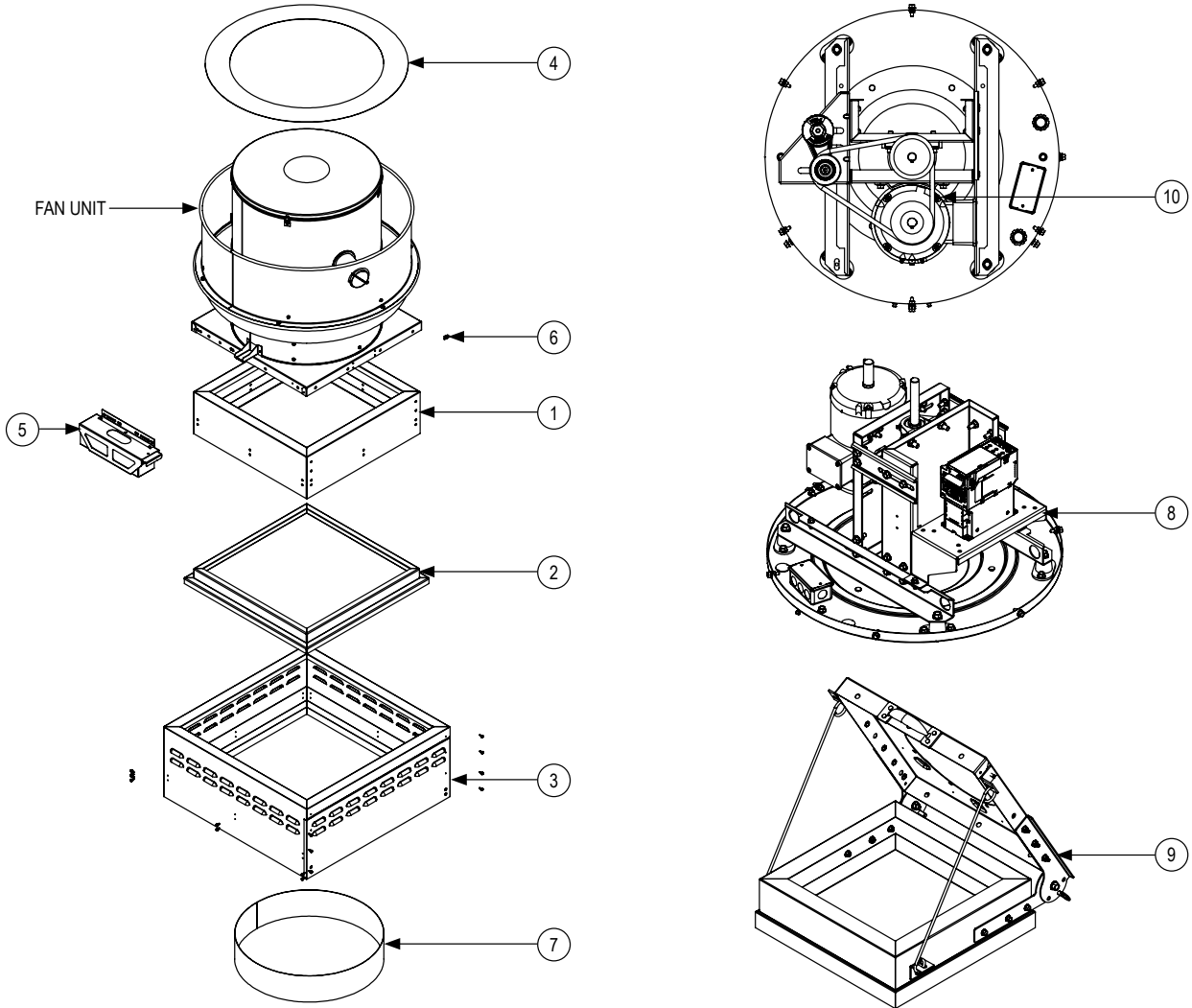


Item #	UL705	
1	Curb Cap/Lower Windband Weldment	
2	Venturi	
3	Wheel	
4	Vertical Support	
5	Discharge Apron	
6	Top Plate	
7	Motor Structure Assembly	
8	Motor Dome	
9	Motor	
10	Bushing	
11	Conduit Sub Assembly	
12	Junction Box	Disconnect Switch (Optional)

# PARTS LIST

## Accessories Parts Reference

Models: UL705, Grease Exhaust, Heat & Smoke, Downblast-UL705



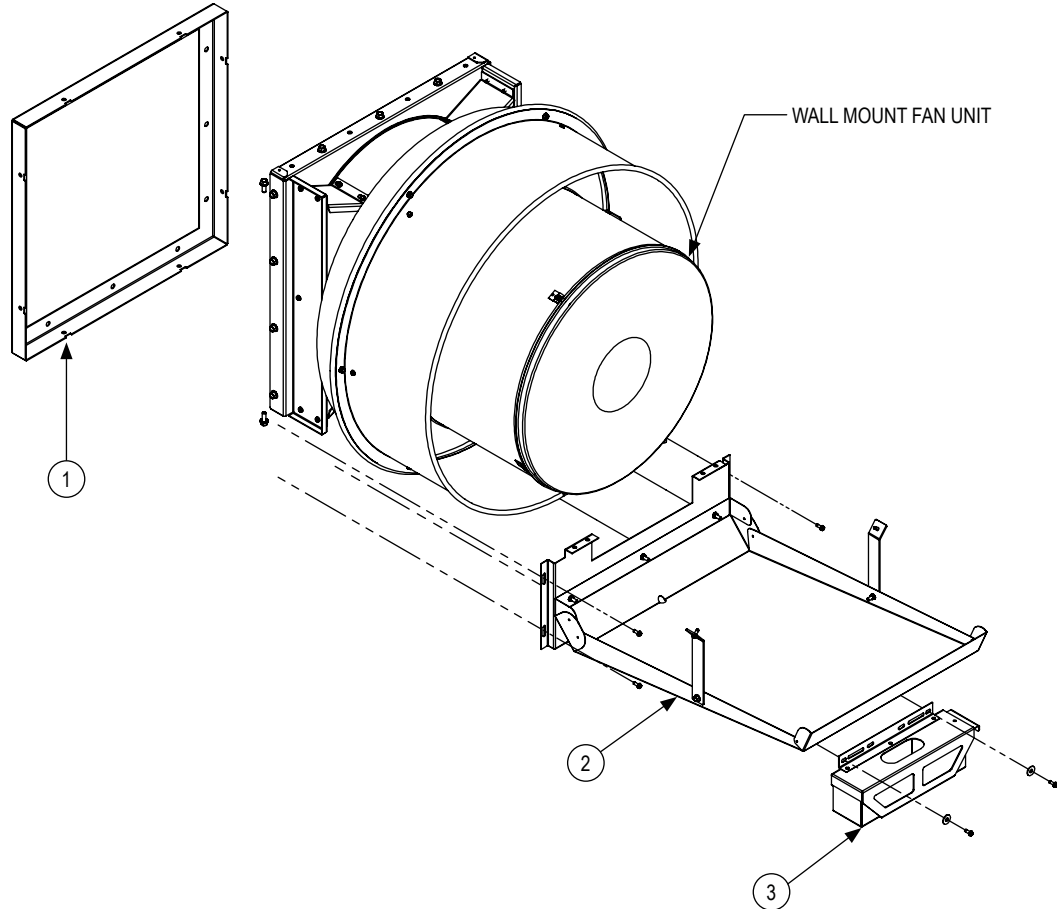
Item #	BELT DRIVE			DIRECT DRIVE	
	UL705	Grease Exhaust	Heat & Smoke	UL705	Grease Exhaust
1	Hinged Sub Base				
2	Curb Adapter				
3	Pedestal				
4	Outlet Guard				
5	Grease Collector				
6	Tie Down Bracket				
7	Bird Screen (Only Downblast Fan)				
8	Vfd Bracket				
9	Hinge Kit				
10	Belt Tensioner			N/A	



# PARTS LIST

## Accessories Parts Reference

Models: UL705, Grease Exhaust (Wall Mount)



Item #	BELT DRIVE		DIRECT DRIVE	
	UL705	Grease Exhaust	UL705	Grease Exhaust
1			Wall Adapter	
2			Oil Drain Pan	
3			Grease Collector	



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