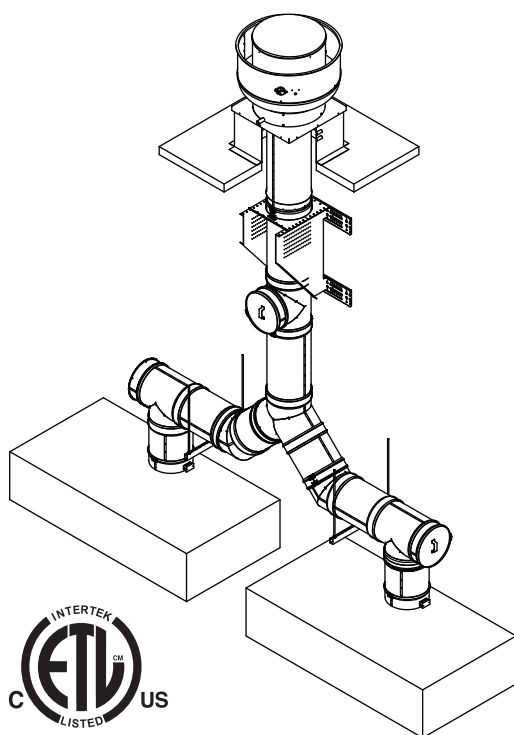
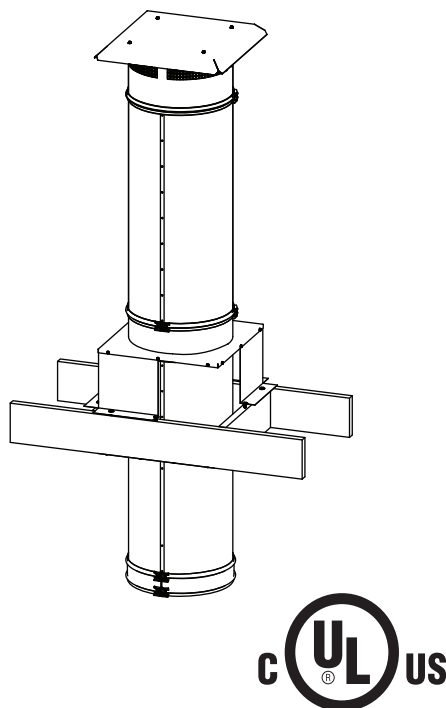


Non-Welded Double Wall Grease Duct/Type HT Chimney Systems Installation, Operation, and Maintenance Manual

Grease Duct



Chimney



FOR YOUR SAFETY

TWO MAJOR CAUSES OF GREASE DUCT RELATED FIRES: (1) FAILURE TO MAINTAIN REQUIRED CLEARANCE (AIR SPACE) TO COMBUSTIBLE MATERIALS AND (2) FAILURE TO CLEAN GREASE LADEN DUCTS. IT IS OF UTMOST IMPORTANCE THAT THIS GREASE DUCT BE INSTALLED ONLY IN ACCORDANCE WITH THESE INSTRUCTIONS. DO NOT INSTALL GREASE DUCT WITHOUT FIRST READING THESE INSTRUCTIONS VERY CAREFULLY.

RECEIVING AND INSPECTION

EXAMINE ALL COMPONENTS FOR POSSIBLE SHIPPING DAMAGE PRIOR TO INSTALLATION. DIFFERENT MANUFACTURERS HAVE DIFFERENT JOINT SYSTEMS AND ADHESIVES. DO NOT MIX PIPE, FITTINGS, OR JOINING METHODS FROM DIFFERENT MANUFACTURERS.

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

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WARRANTY

This ductwork and chimney system is warranted to be free from defects in material and workmanship, under normal use and service, for a period of 20-years from the date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per this installation guide; this guide should be kept with the equipment once installation is complete.
2. The equipment is not installed in accordance with Federal, State, and Local codes and regulations.
3. The equipment design or sizing is not approved per MANUFACTURER'S specifications.
4. The equipment is misused, neglected, or not maintained per the MANUFACTURER'S maintenance instructions.
5. The equipment is exposed to elevated temperatures due to a fire originating in the building, hood, fan, duct, chimney, or kitchen appliances.
6. The equipment is not operated within its published capacity.
7. The equipment is operated, tested, or stored in the presence of chlorines, solvents, refrigerant vapors, caustic substances, halogenated compounds, or other conditions that could cause condensation of corrosive materials within or on the system.
8. The equipment is substituted or connected with parts not manufactured per Original Equipment Manufacturer.
9. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 20-year warranty period, upon examination by the MANUFACTURER, such parts will be repaired or replaced by the MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization, and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

LISTINGS

This Grease Duct has been tested and is listed to UL1978, UL2221, CAN/ULC-S115, and CAN/ULC-S144. Testing has been extended to recognize ASTM E2336, ASTM E814, and AC101 Standards due to similar testing criteria.

Models 2R, 3R and 3Z are used for grease duct applications when installed in accordance with these instructions and National Fire Protection Association "NFPA 96"; Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

This Factory Built Chimney has been tested and is listed to UL103 and UL103HT. Testing has been extended to recognize CAN/ULC-S629-M87, and ULC/ORD-C959-1993, unenclosed installation and is for commercial use only. For use in applications where the flue gas temperature not exceeding 1000°F (540°C), under continuous operating conditions, intermittent operation (less than one hour) at temperatures not exceeding 1400°F (760°C), and brief (maximum 10 minute) operation at temperatures not exceeding 2100°F (1125°C).

Model 2R Type HT chimney system has been tested and is listed for installations in positive pressure applications where the chimney is subject to positive pressure rather than negative or neutral pressures. The chimney system is rated for use at maximum 60 inch water column internal pressure when used in Positive Pressure Applications.

Factory Built Chimney Model 2R has been tested and is listed to UL2561. Testing has been extended to recognize ULC/ORD-C959-1993, unenclosed installation and is for commercial use only. For use in applications where the flue gas temperature not exceeding 1000°F (540°C), under continuous operating conditions, intermittent operation (less than one hour) at temperatures not exceeding 1400°F (760°C), and brief (maximum 10 minute) operation at temperatures not exceeding 2100°F (1125°C).

This chimney system is intended for installation within commercial/industrial applications and is not intended for use in family dwellings. When installed in accordance with these instructions and National Fire Protection Association "NFPA 211"; Standard for Chimneys.

CLASSIFICATIONS

UL 2221: Standard for Fire Resistive Grease Duct Enclosure Assemblies. Chapter 7 of this standard references a test labeled Internal Fire Test. Section 7.1.1 references two installation conditions, Condition A and Condition B. Condition A represents all installation conditions except for installation within non-ventilated combustible enclosures. Condition B represents installation within a non-ventilated combustible enclosure.

UL 2561: Standard for 1400 Degree Fahrenheit Factory-Built Chimneys.

UL 103: Standard for Factory Built Chimneys for Residential Type and Building Heating Appliances.

Model 3Z is classified under UL2221 (Test of Fire Resistive Duct Enclosure Assemblies) as an alternate to 2-Hr. fire resistive shaft enclosures with a minimum zero clearance to combustibles (sizes 5" to 36" diameter). Model 3Z is listed in accordance with the requirements for duct enclosure Condition A and B.

Model 3R is classified under UL2221 (Test of Fire Resistive Duct Enclosure Assemblies) as an alternate to 2-Hr. fire resistive shaft enclosures with a reduced clearance to combustibles (sizes 5" to 24" diameter). Model 3R is listed in accordance with the requirements for duct enclosure Condition B.

Model 2R is classified under UL2221 (Test of Fire Resistive Duct Enclosure Assemblies) as an alternate to 2-Hr. fire resistive shaft enclosures with a reduced clearance to combustibles (sizes 5" to 18" diameter). Model 2R is listed in accordance with the requirements for duct enclosure Condition B.

Model 2R Type HT is listed under UL103 (Building Heating Appliance Chimney). Insulated double wall building heating appliance Chimney / Type HT Factory Built Chimney intended for commercial and industrial applications in sizes 5" through 16" ID.

Model 2R is listed under UL2561 (Building Heating Appliance Chimney for coverage as a Medium Heating Appliance 1400°F Chimney System). Insulated double wall Factory Built Chimney intended for commercial and industrial applications in sizes 5" through 16" ID.

APPLICATION

Grease Ducts

NOTE: For caustic environments, duct systems will be constructed of 444 stainless steel (SS) parts. The duct and joint connections (V bands) will be constructed of 444 SS and supplied with 316 SS hardware.

Double wall grease ducts are listed for a continuous internal temperature of 500°F and intermittent temperatures of 2000°F. Double wall grease duct is ideally suited for use in commercial cooking installations for the removal of smoke and grease laden vapors. Grease duct system size and capacity information may be obtained from the *ASHRAE Handbook – Fundamentals* or from the *Air Pollution Engineering Manual* of the US Environmental Protection Agency. Grease duct installations require provisions for cleaning the interior of the duct. NFPA 96 clean-out requirements are as follows:

1. A clean-out must be provided at each change of direction, except where the entire length of duct can be inspected and cleaned from either the hood or the discharge end.
2. On horizontal duct runs, at least one 20" diameter opening must be provided. Where the opening is smaller than 20" diameter, openings large enough to permit cleaning must be provided at intervals of no more than 12'.
3. Openings must be at the side or the top, whichever is more accessible. When the opening is on the side of the duct, the lower edge of the opening must be at least 1-1/2" above the bottom of the duct. For the listed grease duct, this is accomplished by the use of the grease manifold tee and clean-out cap.
4. On vertical duct runs where personnel entry is possible, access must be from the top of the riser. Where entry is not possible, access must be provided at each floor.

NOTE: Access requirements are subject to change in accordance with local code. Local authorities should be consulted for exact requirements. Grease duct may be connected only to hoods in a single fire zone on one floor. Do not connect grease ducts to any other part of the building ventilation or exhaust system.

When the grease duct is installed in accordance with these installation instructions and the joints are sealed properly with the recommended sealant, the system will contain a fire within the duct. A fire can burn at extremely high temperatures. The system should be dismantled and inspected after any exposure to a fire. Any section that is distorted or discolored should be replaced. All joints in the system should be examined.

The sealant expands to ensure a positive seal in the case of a fire, and any sealant that has been exposed to high temperature must be replaced. This will ensure that the system maintains its integrity against fire conditions in the future. The manufacturer of this grease duct cannot be responsible for grease duct systems that are not properly maintained or have been subjected to one or more fire conditions.

Chimneys

NOTE: For caustic environments, chimney systems will be constructed of 444 stainless steel (SS) parts. The chimney and joint connections (V bands) will be constructed of 444 SS and supplied with 316 SS hardware.

Factory Built Chimney Model 2R Type HT is listed for continuous internal temperatures of 1000°F US & 600°F Canada, intermittent temperatures of 2100°F. Factory Built Chimney Model 2R is listed for continuous internal temperatures of 1400°F US & Canada, intermittent temperature of 1800°F. This system is ideally suited for commercial and industrial application for the removal of smoke and heat, and is rated for use at a maximum 60 inch water column internal pressure when used in positive pressure applications. Chimney system size and capacity information may be obtained from the *ASHRAE Handbook – Fundamentals* or from the *Air Pollution Engineering Manual* of the US Environmental Protection Agency.

NOTE: Model 2R Chimney & Model 2R Type HT Chimney Systems used for positive pressure applications must be sealed with the recommended sealant listed in this manual. NO SEALANT SUBSTITUTES MAY BE USED. Model 2R & Model 2R Type HT Chimney Systems used for neutral or negative pressure applications do not require joints to be sealed.

When wood is burned slowly, it produces tar and other organic vapors which combine with expelled moisture to form creosote. The creosote vapors condense in a relatively cool chimney flue of a slow burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

Chimney installations require provisions for cleaning the interior of the chimney. Creosote and soot formations need to be removed. The chimney should be inspected once every two months during the heating season to determine if creosote or soot buildup has occurred. If creosote or soot has accumulated, it should be removed to reduce the risk of fire. Clean-out requirements are as follows:

1. A clean-out must be provided at each change of direction, except where the entire length of chimney can be inspected and cleaned from either the equipment or the chimney cap.
2. Openings must be at the side or the top, whichever is more accessible.
3. The chimney inspection should be done every two months during the heating season.
4. If creosote or soot has accumulated it should be removed to reduce the risk of fire.
5. Insert the chimney cleaning brush and brush in a downward motion, be sure to scrub all sides of the chimney thoroughly and remove all debris.
6. Contact local building or fire officials about restrictions and inspections in your area.

NOTE: Model 2R & Model 2R Type HT Factory Built Chimney Systems are intended for commercial and industrial applications. This system is not intended for family dwellings. Chimney Systems should be sized in accordance with the appliance manufacturer's instructions.

When the chimney system is installed in accordance with these installation instructions and the joints are sealed properly with the recommended sealant, the system will contain a fire within the chimney. A fire can burn at extremely high temperatures. The system should be dismantled and inspected after any exposure to a fire. Any section that is distorted or discolored should be replaced. All joints in the system should be examined.

The sealant expands to ensure a positive seal in the case of a fire, and any sealant that has been exposed to high temperature must be replaced. This will ensure that the system maintains its integrity against fire conditions in the future. The manufacturer of this chimney system cannot be responsible for chimney systems that are not properly maintained or have been subjected to one or more fire conditions.

Clearances

In all buildings more than one story in height and in buildings where the roof/ceiling assembly is required to have a fire resistance rating, the duct must be enclosed in a continuous enclosure from the lowest fire-rated ceiling or floor above the hood, through any concealed spaces, to or through the roof to maintain the integrity of the fire separations required by the applicable building code provisions. If the building is less than 4 stories in height, the enclosure shall have a fire resistance rating of not less than 1 hour. If the building is 4 stories or more in height, the enclosure shall have a fire resistance rating of not less than 2 hours. Single wall grease duct is primarily intended for use in non-combustible surroundings. When installed in an open room where an enclosure is not required, double wall grease duct or chimney systems may be located near combustible material to reduce clearance in accordance with Table 1. When combining double wall and single wall grease duct for the purpose of clearance reduction, a Double Wall End Cap Assembly is required.

Table 1 - Grease Duct and Building Heating Appliance Chimney Clearances

Duct Model	Inner Diameter (ID)	Outside Diameter	Clearance to Combustibles	Clearance to Non-Combustibles
DW	5"-36"	= ID	18" (1)	0"
DW - 2R	5"-16"	ID + 4	3/4" (2)	0"
	18"	ID + 4	1" (3)	0"
DW - 2R TYPE HT	5"-16"	ID + 4	2" (4)	0"
DW - 3R	5"-24"	ID + 6	3/4" (5)	0"
DW - 3Z	5"-36"	ID + 6	0" (6)	0"

The information in **Table 1** represents air space, in inches, to surroundings.

Refer to the latest edition of NFPA 96, Chapter 3 Definitions. This chapter explains the definitions on combustible, non-combustible and limited combustible material.

- (1) Single Wall duct clearance to combustibles from the surface of the duct; refer to single wall grease ductwork manual for more information.
- (2) DW - 2R Grease Duct: 3/4" clearance to combustibles from the surface of the duct outer shell; zero inch clearance from combustibles from the tip of the outer V-band.
- (3) DW - 2R Grease Duct: 1" clearance to combustibles from the surface of the duct outer shell; zero inch clearance from combustibles from the tip of the outer V-band.
- (4) DW-2R & DW - 2R TYPE HT Chimney: unenclosed, 2" clearance to combustibles from the surface of the chimney outershell.
- (5) DW - 3R: 3/4" clearance to combustibles from the surface of the duct outer shell; zero inch clearance from combustibles from the tip of the outer V-band.
- (6) DW - 3Z: 0" clearance to combustibles from the surface of the duct outer shell.

NOTE: Double wall grease duct systems with reduced clearance "R" have been tested using condition B – installed within non-ventilated unenclosed combustible enclosure. See Figure 1 for representation of reduced clearance note, the V-band may be in contact with a combustible surface.

Figure 1 - Grease Duct Reduced Clearance

1. Combustible Surface
2. Duct
3. Double V-band
- A. Reduced Clearance
 - 2R sizes 5"-16" = 3/4"
 - 2R size 18" = 1"
 - 3R = 3/4"
 - 3Z = 0"

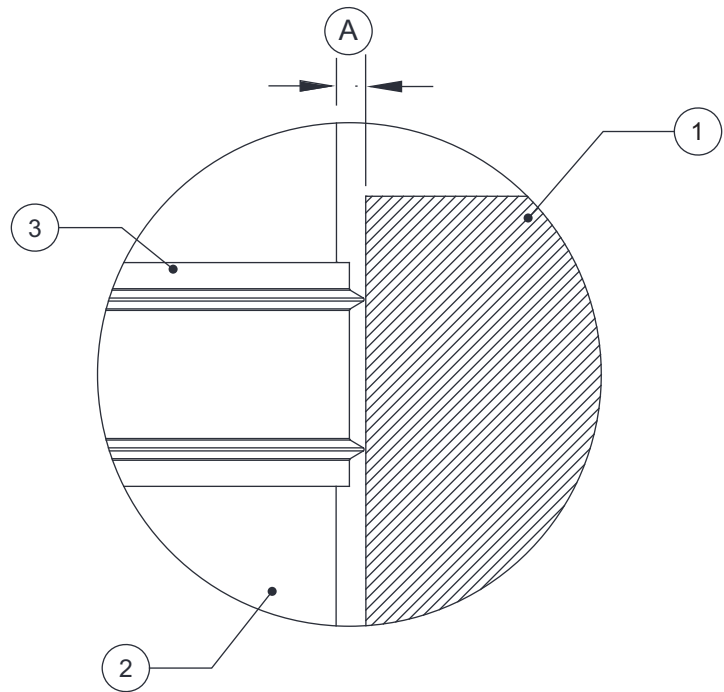
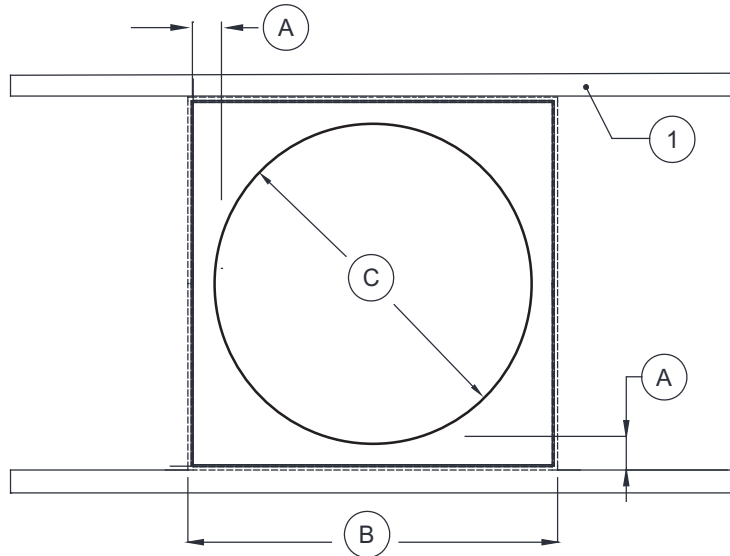


Figure 2 - 2R Type HT Chimney Reduced Clearance

1. Combustible Surface
- A. 2" Reduced Clearance
- B. 2R Type HT Shell + 4-1/2"
- C. Duct Diameter



MECHANICAL

Joint Sealant

Proper joint assembly is essential for safe installation. Follow these instructions exactly as written. Check severeness of joints upon completion of assembly.

The joint sealant used to seal all joint assemblies is 3M Fire Barrier 2000+ Silicone Sealant. This sealant is a ready-to-use, gun-grade, one-component silicone elastomer that cures upon exposure to atmospheric humidity to form a flexible seal. 3M Fire Barrier 2000+ Silicone Sealant, when installed properly, will control the spread of a fire before, during, and after exposure to open flames. It will stop the spread of noxious gas, smoke, and water, and maintain the integrity of fire-rated assemblies and construction. All grease ducts must be liquid-tight per NFPA 96. Model 2R & Model 2R Type HT chimney used in positive pressure applications must be liquid-tight per UL103 and UL103HT listing. When Model 2R & Model 2R Type HT chimney is used in neutral or negative pressure applications, the system does not require the joints to be sealed with the 3M Fire Barrier 2000+ Silicone Sealant per the listing report. But 3M Fire Barrier 2000+ Silicone Sealant is recommended for commercial cooking appliances where grease is present. **Table 2** provides tube usage per duct diameter.

NO SEALANT SUBSTITUTES MAY BE USED.

Sealant Features

1. Superior adhesion. Applied with a standard caulk gun.
2. Class 25 sealant, per ASTM C920. Capable of withstanding 2000°F + temperatures.
3. Re-enterable/repairable. Provides up to 4-hours fire-rating.
4. Cures upon exposure to atmospheric humidity. Working time 30 minutes. Full cure time: 14 to 21 days.
5. The duct/chimney can be placed in operation 7 days after installation, before full cure.

Table 2 - 3M Fire Barrier 2000 Plus Usage Chart

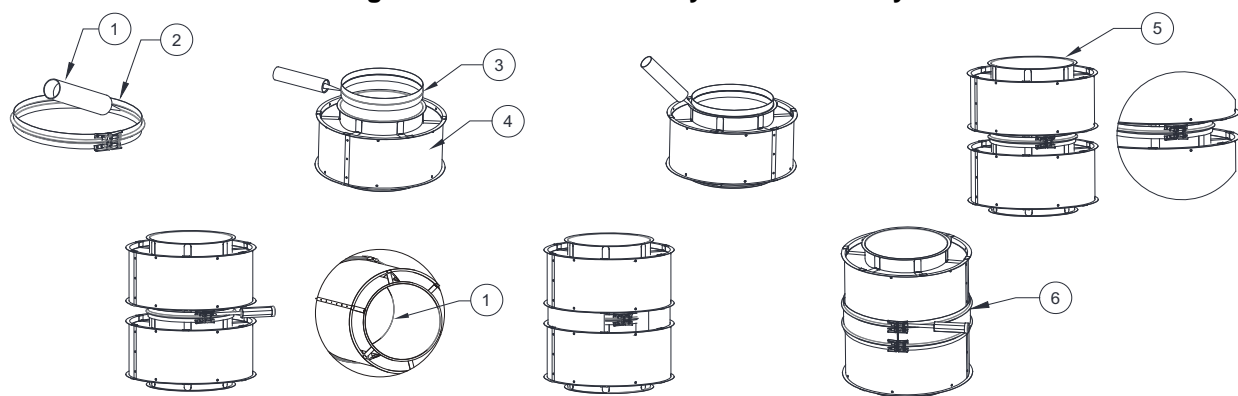
Diameter	Duct Perimeter Feet	Average Feet Per Tube	Number of Joints Per Tube
5"	1.43	30	10.5
6"	1.70	30	9
7"	1.96	30	7.5
8"	2.16	30	7
10"	2.68	30	6
12"	3.21	30	5
14"	3.73	30	4
16"	4.25	30	3.5
18"	4.78	30	3
20"	5.30	30	3
22"	5.83	30	2.5
24"	6.35	30	2.5
26"	6.93	30	2
28"	7.46	30	1.5
30"	7.98	30	1.5
32"	8.39	30	1.5
34"	8.91	30	1
36"	9.55	30	1

Grease Duct and Chimney Joint Assembly

All grease ducts are to be liquid tight per NFPA 96. Model 2R & Model 2R Type HT chimney used in positive pressure applications must be liquid tight per UL103, UL103HT, and UL2561 listings. When a chimney system is used in a positive pressure application, it must be fitted with an internal joint collar and sealed as shown in **Figure 3** (positive pressure only). When a chimney system is used in a negative or neutral pressure application, it does not need to be sealed per the listing report; although, sealing the system is recommended for commercial cooking appliances where grease is present.

1. Fill the V-band with 3M Fire Barrier 2000+ Silicone. The bead should be continuous. Refer to “**Joint Sealant**” on page 10 for sealant details. For neutral and negative chimney or grease duct applications, proceed to step 4.
2. For positive pressure chimney applications: Apply a 1/4” wide continuous bead of 3M Fire Barrier 2000+ Silicone around the formed bead on the internal joint collar. Push down into the chimney section being assembled.
3. For positive pressure chimney applications: The internal joint collar should be pushed down into the chimney section until the bead sits on the chimney flange.
4. Place the loose V-band over the duct flange. Apply a continuous bead of 2000+ Silicone 1/4” wide to the flange that will be joined.
5. Join the two flanged ends of the inner duct sections together and rotate slightly to ensure complete coverage of sealant on flanges.
6. For horizontal duct runs, the V-band hardware should be located on the top side of the duct and orientated between the 3 and 9 o’clock position on the duct.
7. NEVER install the V-band with hardware orientated on the bottom side of the duct on horizontal runs.
8. Install the V-band around the duct flanges making sure the flanges are located within the V-band. Tap the outside of the V-band while tightening V-band hardware to make sure the flanges are aligned and have been pulled together. Secure the 1/4”-20 hardware between **40-60 in-lbs**. Smooth out any excess sealant from inside of the duct surface.
9. Insulation must be minimum of 4-1/2” wide, and the same type and number of layers as the base duct. Tightly pack and completely fill all voids between the inner duct and the outer shell.
10. Install the double V-band ensuring the outer shell flanges are positively engaged in the V-bands before tightening the 1/4”-20 hardware between **40-60 in-lbs**. The double V-band can be sealed using 3M Fire Barrier 2000+ Silicone when being installed outside.

Figure 3 - Duct and Chimney Joint Assembly



1. 3M Fire Barrier Silicone
2. V-band

3. Internal Joint Collar
(Positive Pressure
Chimney)

4. First Duct Section
5. Second Duct Section
6. Double V-band

IMPORTANT: THE HARDWARE USED TO ASSEMBLE THIS DUCTWORK/CHIMNEY IS SPECIFICALLY DESIGNED FOR THIS APPLICATION. NO SUBSTITUTE HARDWARE IS ALLOWED. ALL REPLACEMENT HARDWARE MUST BE PURCHASED FROM THE FACTORY.

Double Wall Adjustable Duct, Chimney and Transition Plate

Adjustable duct sections may be used in conjunction with transition plates when they terminate at the fan. The adjustable duct section is fully welded to the transition plate, and then connected to the standard duct length using non-welded connections. Double wall adjustable duct sections are assembled in the field, as the exact length needed for the application is not known. Components for outer shell and insulation ship loose. Once fully assembled, the transition plate is secured to the curb using the method referenced in **Figure 16**. When a Model 2R & Model 2R Type HT chimney system is used in positive pressure applications, it must be fitted with an internal joint collar and sealed as shown in **Figure 3**. When a chimney system is used in a negative or neutral pressure application, it does not need to be sealed per the listing report; although, sealing the system is recommended for commercial cooking appliances where grease is present. Refer to **Figure 4** for assembly details.

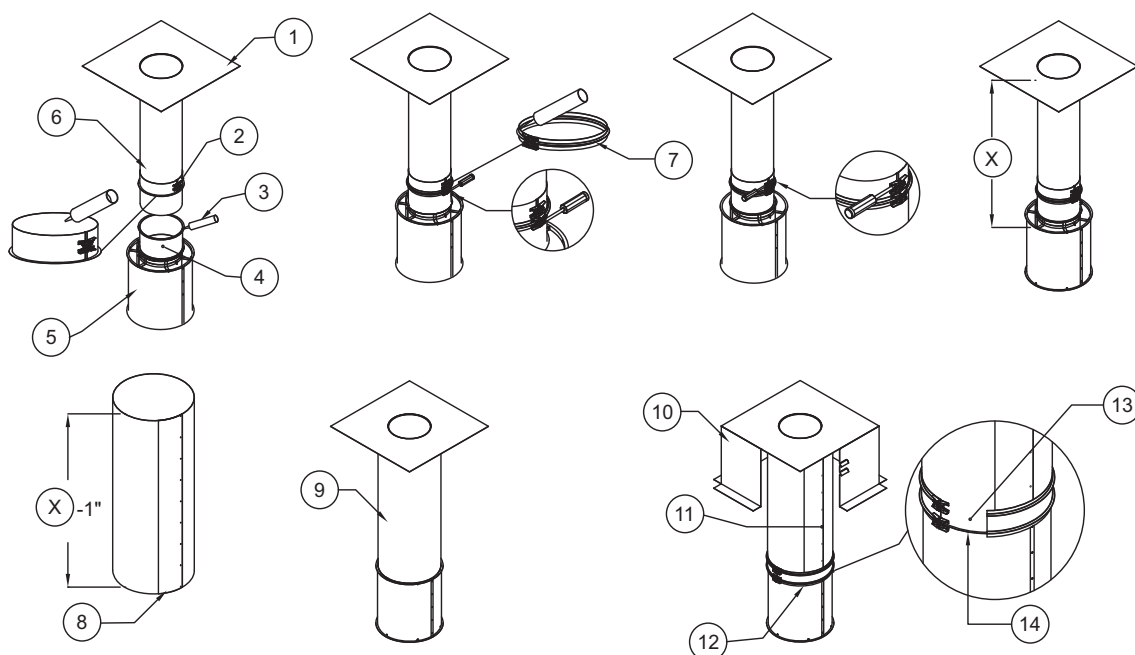
1. The 7" standard duct section in the adjustable assembly is installed the same as the **"Grease Duct and Chimney Joint Assembly" on page 11**.
2. When adjustable duct assemblies are used with transition plates, the 7" standard section is connected to the mating duct section. The adjustable duct with single flange is welded to the transition plate.
3. The adjustable collar is slipped onto the adjustable section. Make sure the adjustable collar flanges are opposite the adjustable duct section flange. Apply 3M Fire Barrier 2000+ Silicone to the collar.
4. The adjustable section is pushed inside the 7" standard section. Verify the minimum overlap is set correctly, refer to **Table 3**.
5. If the protruding section interferes with mating parts in the duct run, you will need to cut the adjustable section that is interfering with mating parts, refer to **Figure 5 on page 13**.

NOTE: For Positive Pressure Applications - If the adjustable section is used in a positive pressure chimney application, the adjustable section may need to be cut to length. This will prevent interference with the internal joint collar. Refer to Figure 4 for adjustable section installation.

6. Once the overlap is set correctly, apply 3M Fire Barrier 2000+ Silicone to the flanges of the duct section and the adjustable collar.
7. Apply 3M Fire Barrier 2000+ Silicone to the single V-band groove. Install single V-band around adjustable collar flange and standard duct flange. Tighten the single V-band hardware to **40-60 in-lbs**.
8. Once the single V-band has been installed, tighten the adjustable collar hardware to **40-60 in-lbs**.
9. Measure the distance between mating duct flange and transition plate prior to installing insulation and outer shell cover.
10. Subtract 1" from the measured distance and cut the pre-rolled shell to this dimension.
11. After the single wall adjustable section has been installed, wrap the assembly using blanket insulation provided. Make sure all voids are adequately filled.
12. Wrap the pre-rolled outer shell cover around the insulation. Ratchet strap(s) may be used around outer shell to aid in compressing insulation.
13. Install the double wall V-band on either end of the assembly. Make sure the double wall V-band is secured onto the mating duct flange and overlapping onto the shell before tightening hardware.
14. The double wall V-band will close the pre-rolled shell as they are tightened. Once closed, secure the outer shell cover along the seam using the 1" sheet metal screws that have been provided.
15. Use 3M Fire Barrier 2000+ Silicone to seal the outer shell, if required or installed outside.

NOTE: Outer Shell Must Extend Behind the Double Wall V-band.

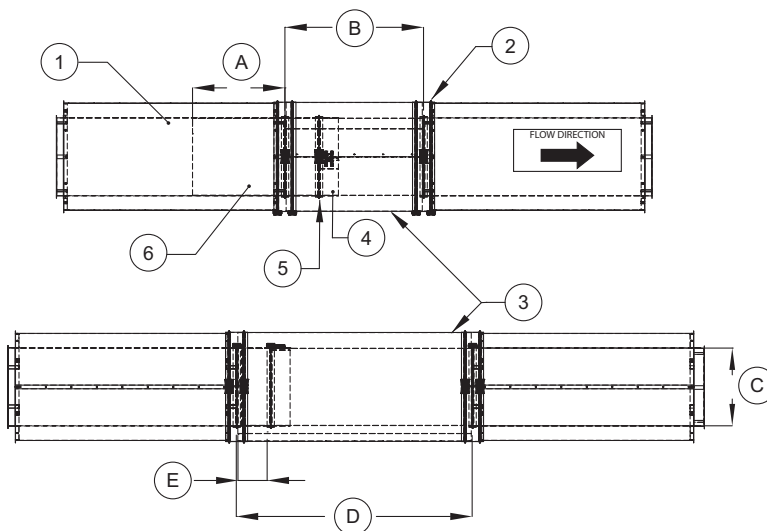
Figure 4 - Adjustable Duct, Chimney and Transition Plate



- | | | |
|------------------------------|----------------------------|------------------------|
| 1. Transition Plate | 6. Adjustable Duct Section | 11. Sheet Metal Screws |
| 2. Adjustable Collar | 7. Single V-band | 12. Double Wall V-band |
| 3. 3M Fire Barrier 2000 Plus | 8. Outer Shell Cover | 13. Shell Overlap |
| 4. 7" Standard Duct Section | 9. Insulation | 14. Mating Duct Flange |
| 5. Mating Duct Section | 10. Curb | X. Measured Distance |

Figure 5 - Adjustable Duct and Chimney Overlap

1. Duct Section
2. Double Wall V-band
3. Outer Shell Cover - Cut to size
4. Adjustable Collar
5. Single V-band
6. Adjustable Duct Section
- A. Adjustable Section Protrusion - May need to be cut
- B. Minimum Length
- C. Diameter
- D. Maximum Length
- E. Minimum Overlap



NOTE: Protruding section may need to be cut in the field if there is interference with mating parts in the duct run.

NOTE: When installing duct, verify directional label is in the correct direction of airflow. (Exception: When grease is draining in a downward slope, the arrow should be opposite of airflow).

Double Wall Adjustable Duct, Chimney Standard Installation

Adjustable duct lengths are used to make up variable lengths in the duct system(s). Adjustable sections should always be installed with the overlap to the inside of the standard duct section. Overlap should always be opposite the direction of airflow. This will allow grease/water to run back to the hood/appliance when the system is shut down. If the inner adjustable section is too long to fit into the adjacent section of duct without interfering with the flow path, it should be trimmed to the desired flange to flange length. Flange to flange length of adjustment can range from 5" to 26". When a Model 2R & Model 2R Type HT chimney system is used in positive pressure applications, it must be fitted with an internal joint collar and sealed as shown in **Figure 3**. When a chimney system is used in a negative or neutral pressure application, it does not need to be sealed per the listing report; although, sealing the system is recommended for commercial cooking appliances where grease is present.

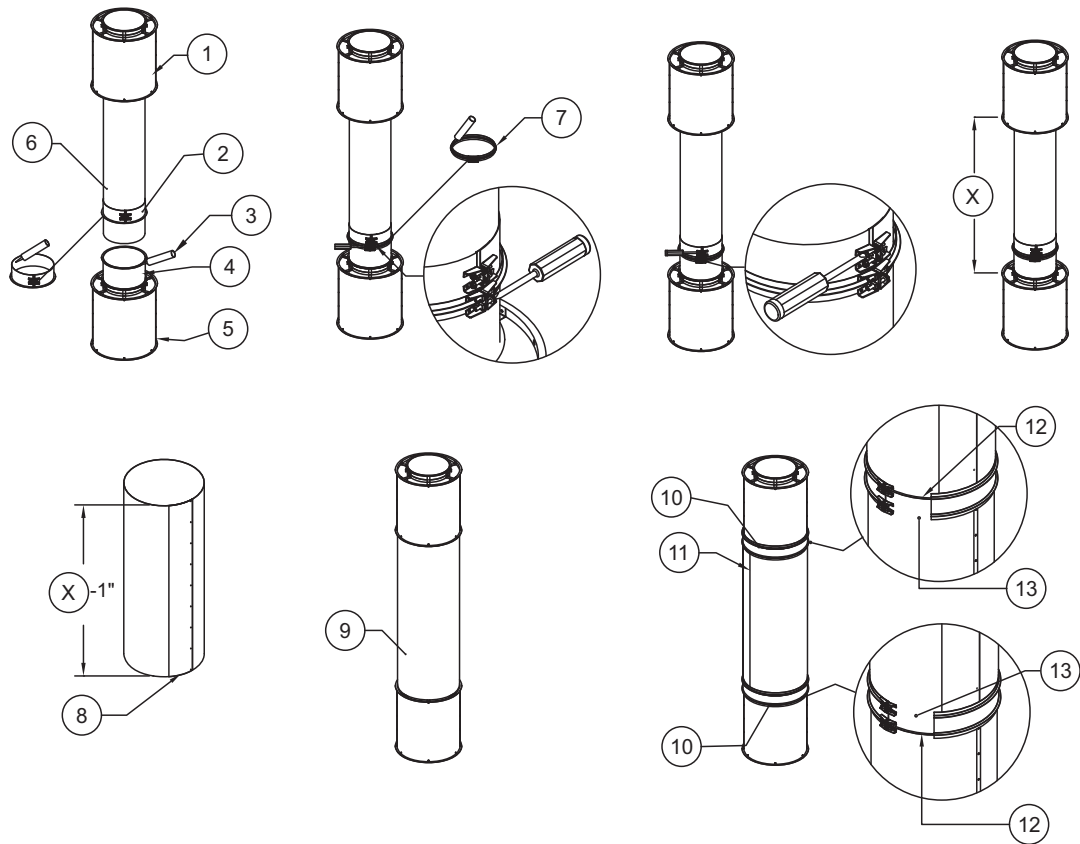
1. The 7" standard duct section in the adjustable assembly is installed the same as the **"Grease Duct and Chimney Joint Assembly" on page 11**.
2. The adjustable collar is slipped onto the adjustable duct section. Make sure the adjustable collar flanges are opposite the adjustable duct section flange.
3. The adjustable section is pushed inside the 7" standard duct section. Verify the minimum overlap is set correctly, refer to **Table 3**.
4. If the protruding section interferes with mating parts in the duct run, you will need to cut the adjustable section that is interfering with mating parts, refer to **Figure 5**.
5. Once the overlap is set correctly, apply 3M Fire Barrier 2000+ Silicone to the flanges of the duct section and the adjustable collar.

NOTE: For Positive Pressure Applications - If the adjustable section is used in a positive pressure chimney application, the adjustable section may need to be cut to length. This will prevent interference with the internal joint collar. Refer to Figure 6 for adjustable section installation.

6. Apply 3M Fire Barrier 2000+ Silicone to the single V-band groove. Install single V-band around adjustable collar flange and standard duct flange. Tighten the single V-band hardware to **40-60 in-lbs**.
7. Once the single V-band has been installed, tighten the adjustable collar hardware to **40-60 in-lbs**.
8. Measure the distance between mating duct flanges prior to installing insulation and outer shell cover.
9. Subtract 1" from the measured distance and cut the pre-rolled shell to this dimension.
10. After the single wall adjustable section has been installed, wrap the assembly using blanket insulation provided. Make sure all voids are adequately filled.
11. Wrap the pre-rolled outer shell cover around the insulation. Ratchet strap(s) may be used around outer shell to aid in compressing insulation.
12. Install the double wall V-band on either end of the assembly. Make sure the double wall V-band is secured onto the mating duct flange and overlapping onto the shell before tightening hardware.
13. The double wall V-band will close the pre-rolled shell as they are tightened. Once closed, secure the outer shell cover along the seam using the 1" sheet metal screws that have been provided.
14. Use 3M Fire Barrier 2000+ Silicone to seal the outer shell, if required or installed outside.

NOTE: Outer Shell Must Extend Behind the Double Wall V-band.

Figure 6 - Collar and Adjustable Duct, Chimney Installation



1. Duct Section 1
2. Adjustable Collar
3. 3M Fire Barrier 2000 Plus
4. 7" Standard Duct Section
5. Duct Section 2

6. Adjustable Duct
7. Single V-band
8. Outer Shell Cover
9. Insulation
10. Double Wall V-band

11. Sheet Metal Screws
12. Mating Duct Flange
13. Shell Overlap
- X. Measured Distance

Table 3 - Minimum Overlap

Diameter	Minimum Overlap for Adjustable Sections
5", 6", 7", 8"	4"
10"	5"
12", 14", 16", 18", 20", 22", 24", 26", 28", 30", 32", 34", 36"	6"

Double Wall Offset Distance

Refer to **page 16** through **page 18** for double wall offset details.

Table 4 - Offset Center Line Distance 15 Degree Elbows

Diameter	Flange Diameter	Part Number	HT 1	CL 1
5"	6"	DW0515DWASY	19"	2-1/2"
6"	7"	DW0615DWASY	19-1/4"	2-1/2"
7"	8"	DW0715DWASY	19-1/2"	2-1/2"
8"	9"	DW0815DWASY	19-3/4"	2-1/2"
10"	11"	DW1015DWASY	20-3/8"	2-5/8"
12"	13"	DW1215DWASY	20-7/8"	2-3/4"
14"	15"	DW1415DWASY	21-3/8"	2-7/8"
16"	17"	DW1615DWASY	21-7/8"	2-7/8"
18"	19"	DW1815DWASY	22-3/8"	3"
20"	21"	DW2015DWASY	22-7/8"	3"
22"	23"	DW2215DWASY	23-3/8"	3-1/8"
24"	25"	DW2415DWASY	23-7/8"	3-1/8"
26"	27"	DW2615DWASY	28-1/4"	3-1/4"
28"	29"	DW2815DWASY	28-7/8"	3-1/4"
30"	31"	DW3015DWASY	25-1/2"	3-3/8"
32"	33"	DW3215DWASY	26"	3-1/2"
34"	35"	DW3415DWASY	26-1/2"	3-1/2"
36"	37"	DW3615DWASY	27-1/8"	3-1/2"

Figure 7 - 15 Degree Offset Details

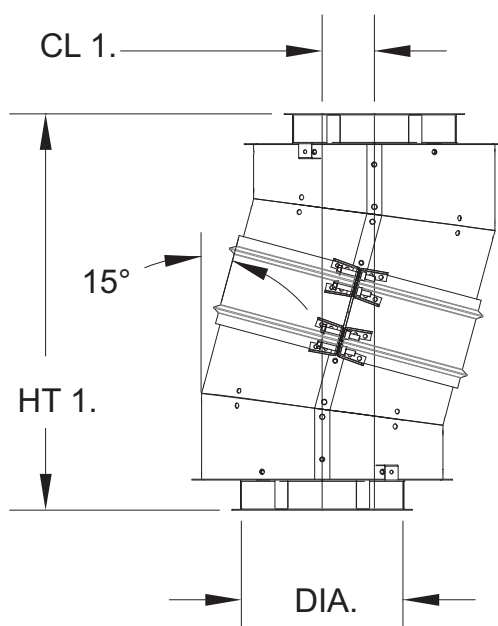


Table 5 - Offset Center Line Distance 30 Degree Elbows

Diameter	Flange Diameter	Part Number	HT 1	CL 1
5"	6"	DW0530DWASY	19-3/8"	5-1/8"
6"	7"	DW0630DWASY	19-7/8"	5-3/8"
7"	8"	DW0730DWASY	20-3/8"	5-1/2"
8"	9"	DW0830DWASY	20-7/8"	5-1/2"
10"	11"	DW1030DWASY	21-7/8"	5-7/8"
12"	13"	DW1230DWASY	22-7/8"	6-1/8"
14"	15"	DW1430DWASY	23-7/8"	6-3/8"
16"	17"	DW1630DWASY	24-7/8"	6-5/8"
18"	19"	DW1830DWASY	25-7/8"	7"
20"	21"	DW2030DWASY	26-7/8"	7-1/8"
22"	23"	DW2230DWASY	27-3/8"	7-3/8"
24"	25"	DW2430DWASY	28-7/8"	7-3/4"
26"	27"	DW2630DWASY	29-7/8"	8"
28"	29"	DW2830DWASY	30-7/8"	8-1/4"
30"	31"	DW3030DWASY	31-7/8"	8-1/2"
32"	33"	DW3230DWASY	32-7/8"	8-3/4"
34"	35"	DW3430DWASY	33-7/8"	9"
36"	37"	DW3630DWASY	34-7/8"	9-3/8"

Figure 8 - 30 Degree Offset Details

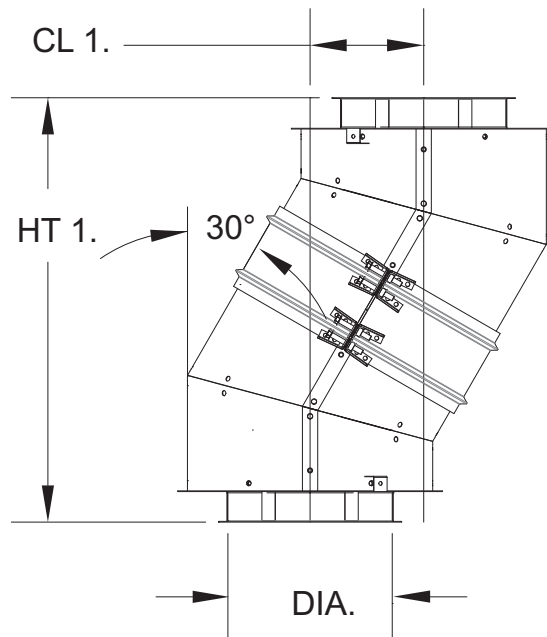
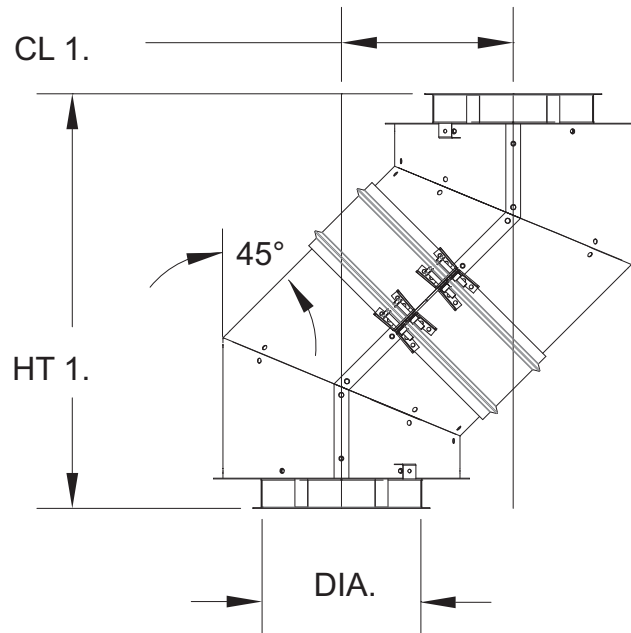


Table 6 - Offset Center Line Distance 45 Degree Elbows

Diameter	Flange Diameter	Part Number	HT 1	CL 1
5"	6"	DW0545DWASY	18-7/8"	7-7/8"
6"	7"	DW0645DWASY	19-5/8"	8-1/8"
7"	8"	DW0745DWASY	20-3/8"	8-1/2"
8"	9"	DW0845DWASY	21"	8-3/4"
10"	11"	DW1045DWASY	22-1/2"	9-3/8"
12"	13"	DW1245DWASY	23-7/8"	9-7/8"
14"	15"	DW1445DWASY	25-3/8"	10-1/2"
16"	17"	DW1645DWASY	26-3/4"	11"
18"	19"	DW1845DWASY	28-1/8"	11-5/8"
20"	21"	DW2045DWASY	29-1/2"	12-1/4"
22"	23"	DW2245DWASY	30"	12-7/8"
24"	25"	DW2445DWASY	32-3/8"	13-3/8"
26"	27"	DW2645DWASY	33-7/8"	14"
28"	39"	DW2845DWASY	35-1/4"	14-1/4"
30"	31"	DW3045DWASY	36-5/8"	15-1/4"
32"	33"	DW3245DWASY	38"	15-3/4"
34"	35"	DW3445DWASY	39-1/2"	16-3/8"
36"	37"	DW3645DWASY	40-7/8"	17"

Figure 9 - 45 Degree Offset Details



Factory and Field (Bolted and Welded) Risers

There are two options for the riser, this is the connection to hood plenum. There may be welded (factory or field) or bolted.

Dimensional data identifying the size and location of the riser must be provided for factory installation. The riser is fully welded to the hood plenum.

When field installed, the riser is shipped loose allowing the installer at the jobsite to decide on the final location of the riser. Field installed risers help when the final location is not known, or adjustments may need to be made due to grease duct/chimney misalignments. Field installed risers may be welded or bolted in place. Refer to **Figure 10** for assembly details.

1. Locate the specific position at which the riser needs to be installed.
2. Use the riser as a guide when marking the hood.

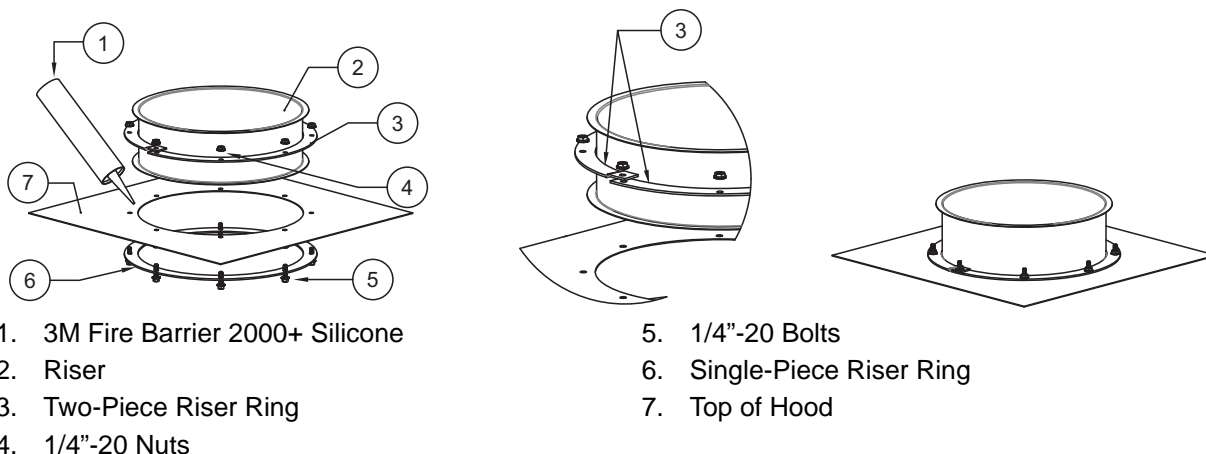
NOTE: Verify the hole location is inside the plenum area before cutting any holes.

3. Use the single-piece riser ring as a template to mark the bolt hole locations. Align the inner circles of the hole in the plenum with the single-piece riser ring. Mark the bolt hole circle. Make sure the bolt hole circle is inside the plenum area before cutting.
4. Use 3M Fire Barrier 2000+ Silicone to seal around the riser hole. Apply sealant to the top and bottom of the hole. Make sure the silicone bead is a minimum of 1/4" thick and is continuous inside and outside of the bolt hole circle.
5. Center the riser over the hole in the plenum and push down. Make sure the riser flange is positively sealed. Make sure the two-piece riser ring on the riser is pushed down into the sealant. Sealant should come through the holes on the ring.
6. Align the single-piece riser ring to the hole on the inside of the plenum and push into the silicone.
7. Align the two-piece riser ring above the hood and bolt the rings together using 1/4"-20 bolts and nuts.
Make sure the tabs are on top.

NOTE: The bolt head must be installed on the plenum side. This is the bottom side of the hood plenum.

8. Excess silicone should be removed, and the connection should be inspected for gaps and loose hardware.
9. When joining duct to the riser, refer to **"Double Wall Connection to Riser"** on page 20.

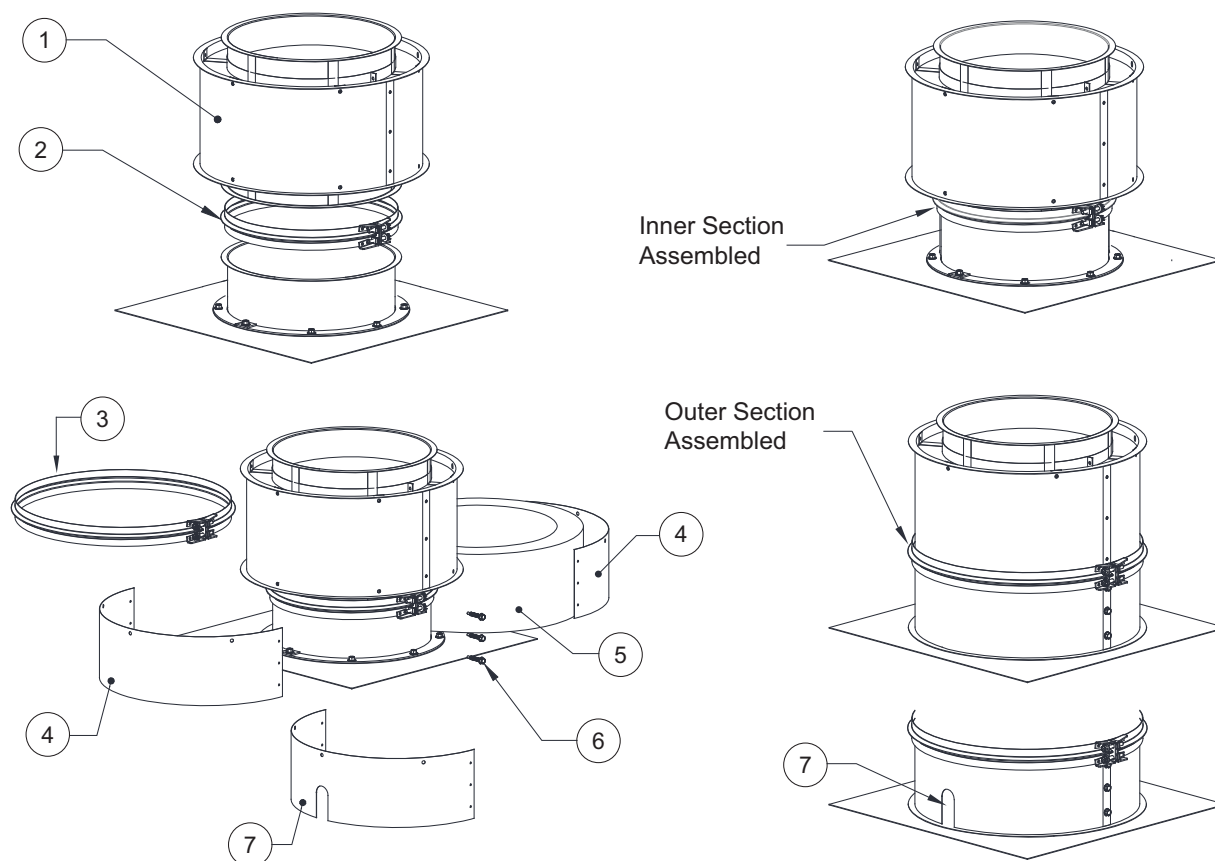
Figure 10 - Field Installed Riser (Bolted)



Double Wall Connection to Riser

1. After the riser has been installed, see “**Factory and Field (Bolted and Welded) Risers**” on page 19, connect the double wall section to the riser.
2. Connect the duct/chimney section to the riser, refer to steps 1 through step 3 in “**Grease Duct and Chimney Joint Assembly**” on page 11.
3. After the riser and inner section(s) have been connected, install the provided insulation. Make sure all voids are filled.
4. Install the riser covers by pushing the two halves together and secure with provided sheet metal screws. Use only hardware provided, longer screws may penetrate the inner section(s).
5. Place the outer V-band around the double wall duct/chimney shell flange and riser cover. Make sure the V-band engages the outer shell flange and overlaps the riser before tightening.
6. For installations that require a duct stat sensor, use riser cover with duct stat opening. For outside installations, use riser cover without duct stat opening.

Figure 11 - Duct to Riser Connection



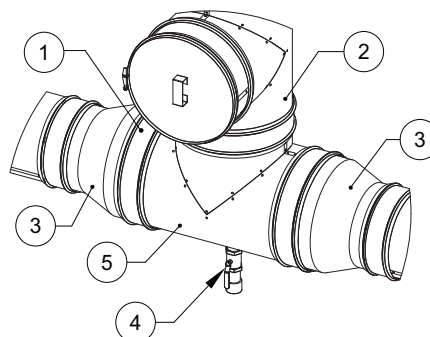
- | | |
|---|--|
| 1. Double Wall Duct/Chimney | 4. Riser Cover |
| 2. Inner V-band - Connecting riser to inner section | 5. Insulation |
| 3. Outer V-band - Connecting riser cover to double wall section | 6. Sheet Metal Screws |
| | 7. Riser Cover with Opening for Duct Stat Installation |

Duct/Chimney Drains

Drains are used to provide a point at which low points in the duct/chimney system can be drained. Condensation and low lying water leftover from cleaning can be drained easily with the installation of a ball valve drain. Drains are designed to aid in cleaning and can be used to drain accumulation into an approved collection reservoir. When an access door cannot be fitted directly to a tee/drain, the mating part should be a tee with an access door. Adapters and/or other components should be used to create a low point in the system, not less than 1". Drains can be hard piped to an approved collection reservoir, remove the cap and connect to the 1-1/2" NPT threads.

Figure 12 - Duct Drain

1. V-band
2. Tee Section with Access Door
3. Adapter Section
4. Drain
5. Tee

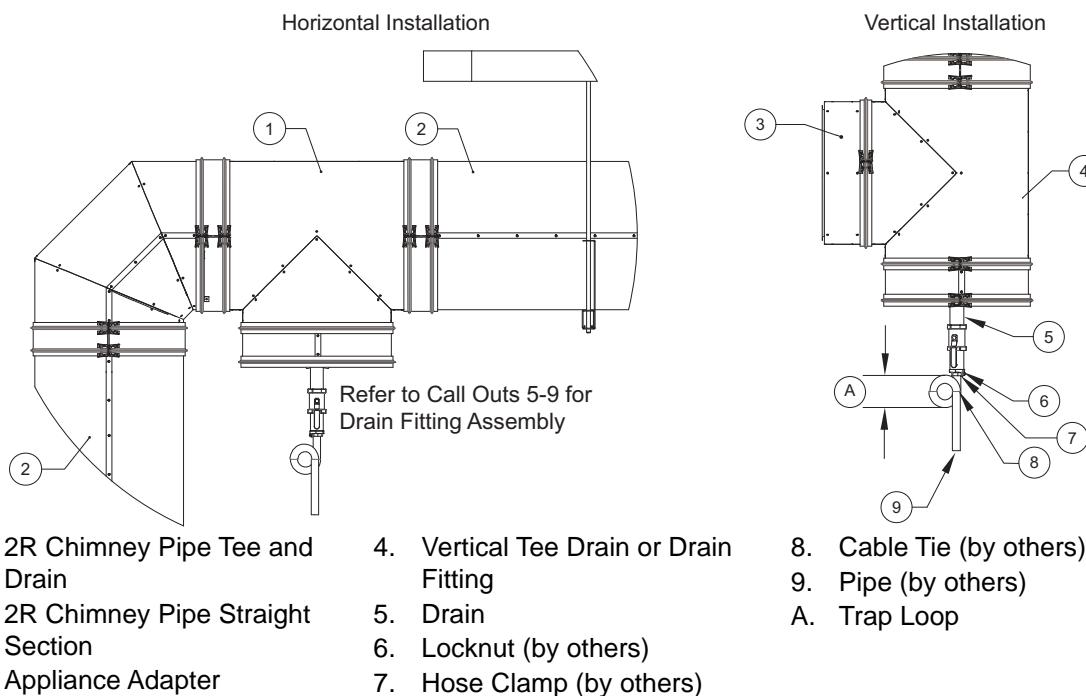


Chimney Drain Trap Loop

A trap loop must be formed into the drain hose. The trap loop diameter must be at least four times the appliance's rated stack pressure in inches of water column (w.c.) or 3 inches, whichever is greater. Refer to **Figure 13** callout (A).

Route drain hose to drain system to dispose of condensate according to local code. Do not install a condensate drain on the exterior of the building in cold climate areas. This may result in dangerous icy conditions on surfaces near the drain and may cause damage to the vent system and/or the exterior of the building.

Figure 13 - Chimney Drain Details

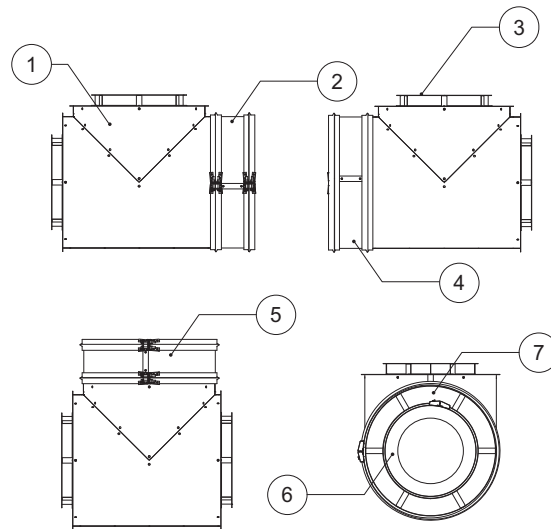


Manifold Tee

The manifold tee is used to provide access for clean-out to comply with NFPA 96 requirements. It is equipped with an internal blank that acts as a grease dam and gasket. The access port is then closed with a clean-out cap or tee cap. The tee cap is then covered with layers of insulation that is covered in an outer shell called the access door collar. The location of the access port in the tee is dependent on the orientation of the tee in the final installation. The access port location in the manifold tee can be orientated as required. Access ports should never be located where grease can build up and fall out once the clean-out cap is removed or where the access door collar cannot be removed to gain access to the inner duct.

Figure 14 - Tee Position

1. Outer Duct Shell
2. Access Door - Right Side
3. Inner Duct Shell
4. Access Door - Left Side
5. Access Door - Top Side
6. Grease Dam and Gasket
7. Insulation



Access Door (Tee Cap) Assembly

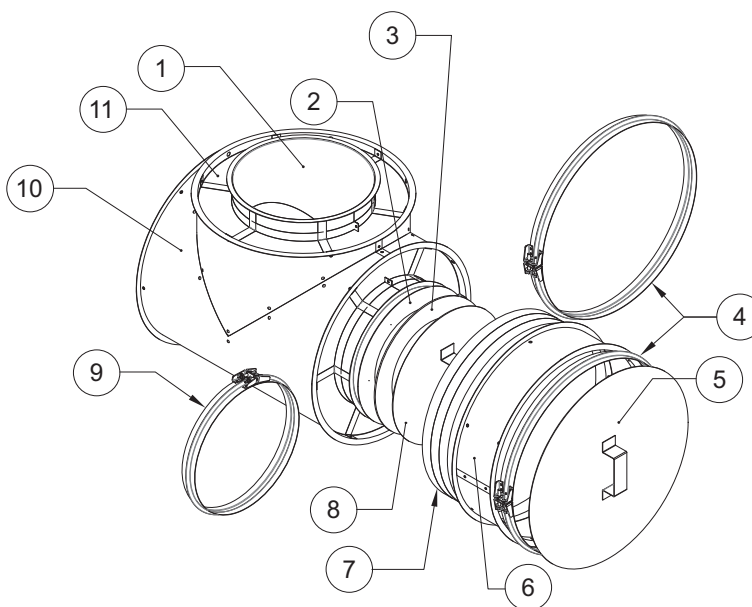
Access doors (tee caps) are available 5" to 36". They work in conjunction with the manifold tee as shown on **"Manifold Tee" on page 22**. The tee joint connection is the same as the joint assembly method, refer to **"Grease Duct and Chimney Joint Assembly" on page 11**; however, the installation of the access door is slightly different. Read the following instructions very carefully. Consult NFPA 96, Chapter 7, Section 7.3.1 *"Openings shall be provided at the sides or at the top of the duct, whichever is more accessible, and at change of directions"*.

The Manufacturer will accept the grease duct's installation in a vertical chaseway without cleanouts along the enclosed vertical section as specified in NFPA 96, Chapter 7 - Exhaust Systems, 7.3.3 – "Openings shall not be required in portions of the duct accessible from the duct entry or discharge." The duct run must be readily accessible from the top and bottom of the run, and it is acceptable to the Authority Having Jurisdiction (AHJ).

1. Select the location and the position of the access door.
2. All tee joints will be connected as shown in **"Grease Duct and Chimney Joint Assembly" on page 11**, except for the access door.
3. Apply the proper sealant to the flange of the tee that will be used for access door to the duct system.
4. Apply a 1/4" continuous bead around the tee flange.
5. Center the grease dam (inside blank) over the opening of the tee and apply pressure. Pushing the inside blank down onto the tee flange sealant, securing the inside blank to the tee flange.
6. Apply enough pressure to create a positive bond between the tee flange and the inside blank. Remove excess sealant after making parts concentric (centered).
7. Apply a 1/4" continuous bead around the inside blank 1" from the outside edge.
8. Center the listed gasket over the inside blank and push the gasket down into the sealant securing the gasket to the inside blank.
9. Sealant will begin to cure upon exposure to atmospheric humidity. It will form a flexible seal.
10. Once the sealant is dry attach the access door using a V-band. Verify flanges are in the "V" before tightening 1/4"-20 hardware. Tighten between **40 - 60 in-lbs**.
11. Once the inner access door assembly is complete, install the outer access door or access door shell.
12. The outer access door shell is used to seal the inner access door with insulation.

Figure 15 - Access Door Assembly

1. Inner Duct Tee
2. Grease Dam (Inside Blank)
3. Gasket
4. Outer V-band
5. Outer Access Door
6. Outer Shell
7. 3-Layer Access Door Insulation
8. Inner Access Door
9. Inner V-band
10. Outer Duct Shell
11. Insulation



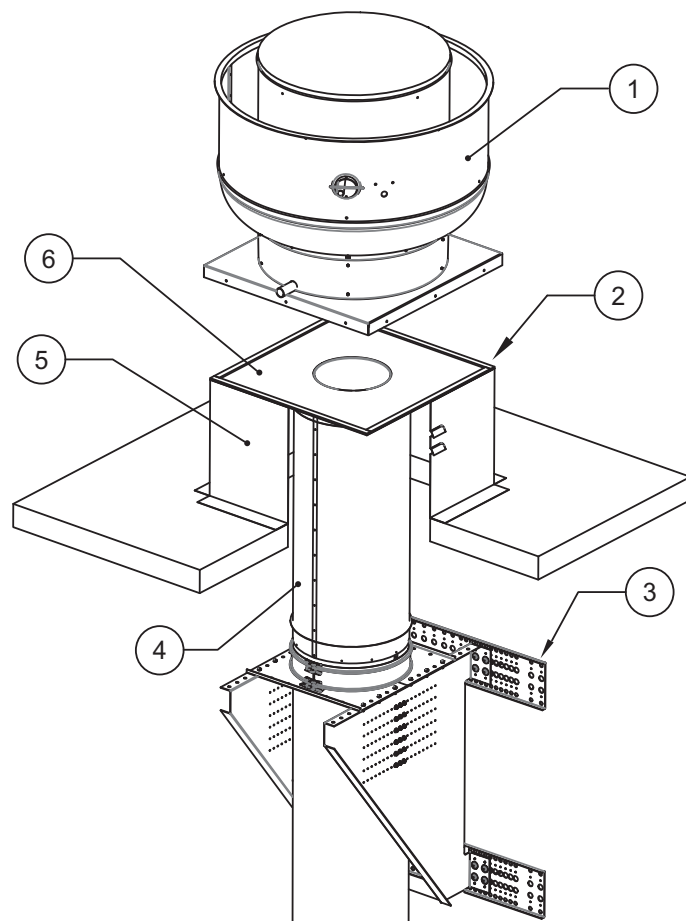
Transition Plate

The transition plate is designed to connect to a roof curb. The duct section is welded to the underside of the plate. The plate is formed to provide a slope to allow grease deposits to flow back towards the duct. When connected, the plate mounts on top of the fan curb that supports the fan housing. The plate may be positioned off-center within the curb provided that the minimum distance to combustibles is maintained. In the event that the plate is positioned off-center, trim off excess plate material to allow for fan placement. Secure the plate to the curb using a minimum of three fasteners per side. A suitably sized fastener provided by others is used. The plate can be used to maintain distance to combustibles and also for vertical support.

See “**Double Wall Adjustable Duct, Chimney and Transition Plate**” on page 12 for adjustable duct section assembly. The top collar is installed upside down to seal the insulation at the fan termination/transition plate. A maximum of 24' can be supported by the curb and transition plate combination. Refer to **Table 8 on page 28** for vertical support spacing.

Figure 16 - Transition Plate

1. Exhaust Fan
2. Ceramic Gasket
3. Vertical Support
4. Adjustable Duct Section
5. Vented Curb
6. Transition Plate



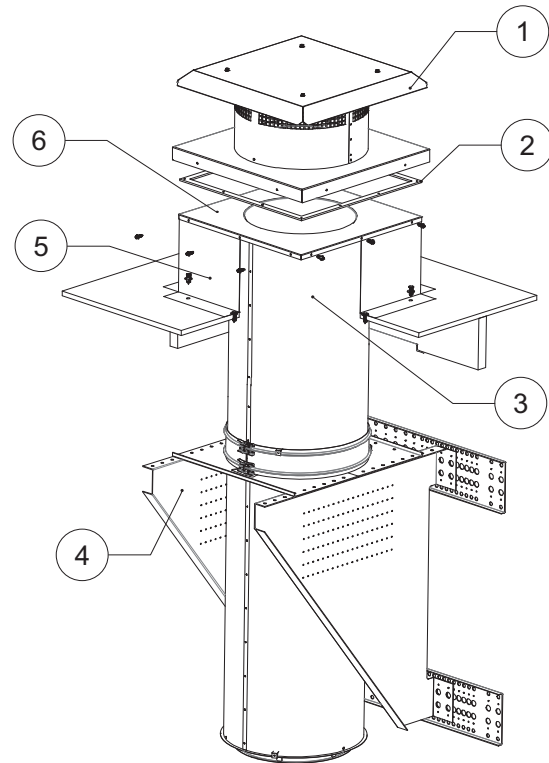
Chimney Transition Plate

The transition plate is designed to connect to a roof curb. The chimney section is welded to the underside of the plate. When connected, the plate mounts on top of the curb that supports the chimney cap. The plate may be positioned off-center within the curb provided that the minimum distance to combustibles is maintained. In the event that the plate is positioned off-center, trim off excess plate material to allow for chimney cap placement. Secure the plate to the curb using a minimum of three fasteners per side. A suitably sized fastener provided by others is used. The plate can be used to maintain distance to combustibles and also for vertical support. A ceramic gasket is used to seal the adapter plate to the underside of the chimney cap. A maximum of 24' can be supported by the curb and transition plate combination. Refer to **Table 8 on page 28** for vertical support spacing.

WARNING: NO INSULATION SHALL BE PLACED WITHIN THE REQUIRED CLEARANCE SPACE.

Figure 17 - Chimney Adapter Plate

1. Base Cap
2. Ceramic Gasket
3. 2R-103 Straight Chimney Section
4. Vertical Support
5. Vented Curb
6. Transition Plate



Prevention of Grease Accumulation in Horizontal Grease Duct

In some areas, the local authority will require horizontal duct runs to be sloped. The duct referenced in this manual is listed, 1/16" per foot slope for horizontal runs less than 75 feet. For installations with horizontal runs greater than 75 feet, the duct referenced in this manual is listed, 3/16" per foot slope. In such cases, a short "Slope Transition" section is available from the factory. For correct installation, two slope transitions are generally required - one at the beginning and end of the horizontal duct run. Consult with local code authorities if unsure about local requirements. Offset collars have been designed to meet the above specification. The collar is used in conjunction with other accessories such as tees and elbows to maintain the above listed slope in horizontal duct runs. The "V" band hardware should be located on the top side of the duct and be orientated between the 3 and 9 o'clock position on the duct. Never install the V-band with the hardware orientated on the bottom side of the duct on horizontal runs.

Alignment & Bracing of Grease Duct/Chimney

The grease duct/chimney has characteristics of a continuous stainless steel pipe and will expand and contract along its entire length with changes in temperature. For this reason, conventional methods of attaching guides and braces to the outer wall of the grease duct/chimney cannot be used. Correctly installed support rings, saddles and wall guide assemblies will serve to keep the duct/chimney aligned, provide for adequate resistance to lateral loads and allow the free axial expansion and contraction movement. A simplified rule for duct/chimney expansion is that the axial growth will be approximately 1 inch per 100 feet of pipe length for each 100 degrees Fahrenheit the exhaust vapor temperature is above the surrounding air temperature.

Double Wall Horizontal Support and Support Spacing

Horizontal grease duct/chimney runs are supported using 2" x 2" x 1/8" angle, Unistrut and saddle combination, or Unistrut only. B12 Unistrut is recommended. Refer to **Table 7** for horizontal support spacing. When cutting the angle or Unistrut to length, there must be a minimum of 2" on either side of the duct/chimney shell to allow for rod attachment. Once the angle has been cut to length it is suspended using 1/2" threaded rod (minimum). Appropriately sized holes are drilled/punched in either end of the angle. The 1/2" threaded rod is secured to the angle or Unistrut using 1/2" grade 5 hex nuts and 1/2" hardened washers, see **Figure 18**.

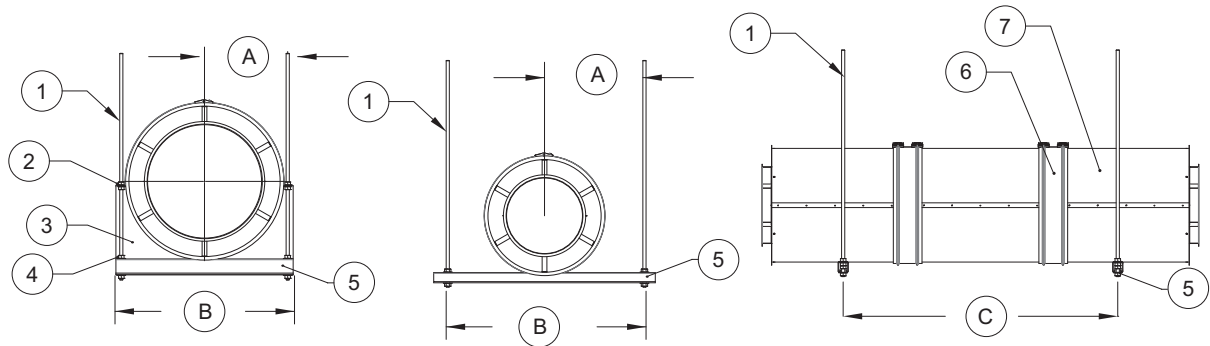
NOTE: Double hex nuts are used as locking nuts to make sure hardware does not come loose over time.

Table 7 - Double Wall Grease Duct/Chimney Horizontal Support Spacing

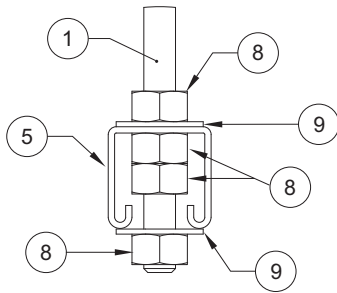
Diameter (Inches)	Horizontal Support Spacing (Feet)
5", 6", 7", 8", 10", 12", 14", 16"	7'
18", 20", 22", 24", 26", 28", 30", 32", 34", 36"	5'

IMPORTANT: HORIZONTAL SUPPORTS REFERRED TO IN THIS MANUAL ARE REQUIRED. SUPPORTS BY OTHERS MUST BE APPROVED BY THE MANUFACTURER AND AHJ, GREASE DUCT ONLY. CHIMNEY SYSTEMS MUST USE THE SUPPORTS LISTED IN THE MANUAL, SUPPORTS BY OTHER ARE NOT ALLOWED. SUPPORT SPACING MUST BE AS STATED IN THIS MANUAL.

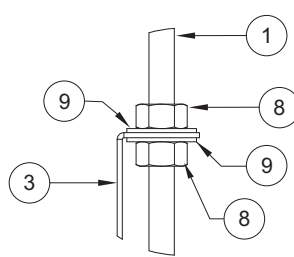
Figure 18 - Horizontal Support Details



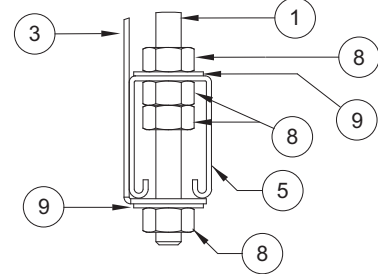
Unistrut - Bottom Connection



Saddle Top Connection



Saddle Bottom Connection



1. 1/2" Threaded Rods
2. Saddle Top Connection
3. Saddle
4. Saddle Bottom Connection
5. B12 Unistrut
6. Double Wall V-band
7. Double Wall Duct
8. 1/2" Hex Nuts (Grade 5)
9. 1/2" Hardened Washers

- A. Center of Duct
- B. Duct Diameter plus 4"
- C. Horizontal Support Spacing, refer to **Table 7**

Vertical Support & Vertical Support Spacing

Duct and chimney system(s) require supports along vertical runs. There are multiple vertical supports used for duct and chimney system(s). Each support assembly is designed for a specific type of installation. Review installation site before selecting supports. There are three different types of hardware supplied depending on the type of wall that the duct and chimney are being supported on. There are three types of wall construction; gypsum with wooden studs, gypsum with 25 gauge steel studs and concrete/masonry. Each wall construction type requires different hardware to be used when installing the support assembly. Refer to **Table 8** for maximum vertical support spacing. Do not exceed this listed vertical spacing.

The Manufacturer will accept the grease duct's installation in a vertical chaseway without cleanouts along the enclosed vertical section as specified in NFPA 96, Chapter 7 - Exhaust Systems, 7.3.3 – “Openings shall not be required in portions of the duct accessible from the duct entry or discharge.” The duct run must be readily accessible from the top and bottom of the run, and it is acceptable to the Authority Having Jurisdiction (AHJ).

Table 8 - Vertical Support Spacing

Diameter (Inches)	3R, 3Z Duct Vertical Wall Support Spacing (Feet)	3R, 3Z Duct Vertical Curb/Floor Support Spacing (Feet)
5", 6", 7", 8", 10", 12", 14", 16", 18", 20", 22", 24"	10'	24'
26" ^{**} , 28" ^{**} , 30" ^{**} , 32" ^{**} , 34" ^{**} , 36" ^{**}	10' ^{**}	20'

***Sizes 26", 28", 30", 32", 34", 36" model 3Z only.**

****Sizes 26", 28", 30", 32", 34", 36" double wall vertical support spacing must be 5 feet when installed on gypsum walls with 25 gauge steel studs.**

Diameter (Inches)	2R Wall Support Spacing (Feet)	2R Duct Vertical Curb/Floor Support Spacing (Feet)
5", 6", 7", 8", 10", 12", 14", 16"	20'	24'
18"	18'	24'

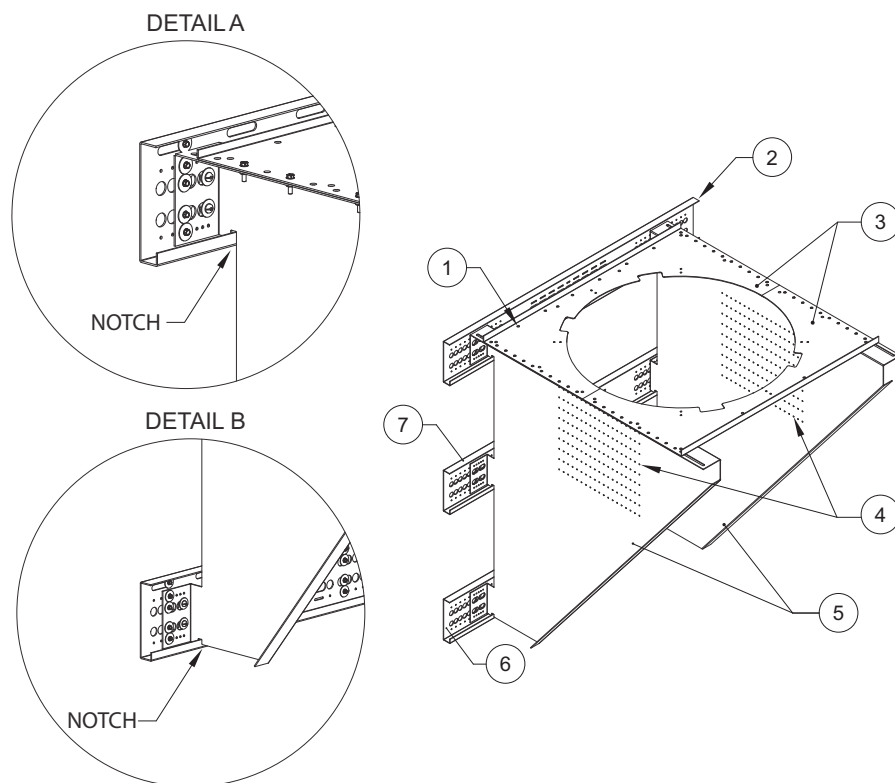
Diameter (Inches)	2R & 2R Type HT Chimney Vertical Wall Support Spacing (Feet)	2R & 2R Type HT Chimney Vertical Support/Floor Support Spacing (Feet)
5", 6", 7", 8", 10", 12", 14", 16"	20'	24'

Vertical support systems must be attached only to the building structure or supported with rigid structural members. Refer to Table 8 for maximum support spacing. It is recommended that vertical support systems are attached to block, concrete, or steel with clearance that is adequate for installation and access.

IMPORTANT: VERTICAL SUPPORTS REFERRED TO IN THIS MANUAL ARE REQUIRED. SUPPORTS BY OTHERS MUST BE APPROVED BY THE MANUFACTURER AND AUTHORITY HAVING JURISDICTION (AHJ), GREASE DUCT ONLY. CHIMNEY SYSTEMS MUST USE THE SUPPORTS LISTED IN THE MANUAL, SUPPORTS BY OTHER ARE NOT ALLOWED. SUPPORT SPACING MUST BE AS STATED IN THIS MANUAL.

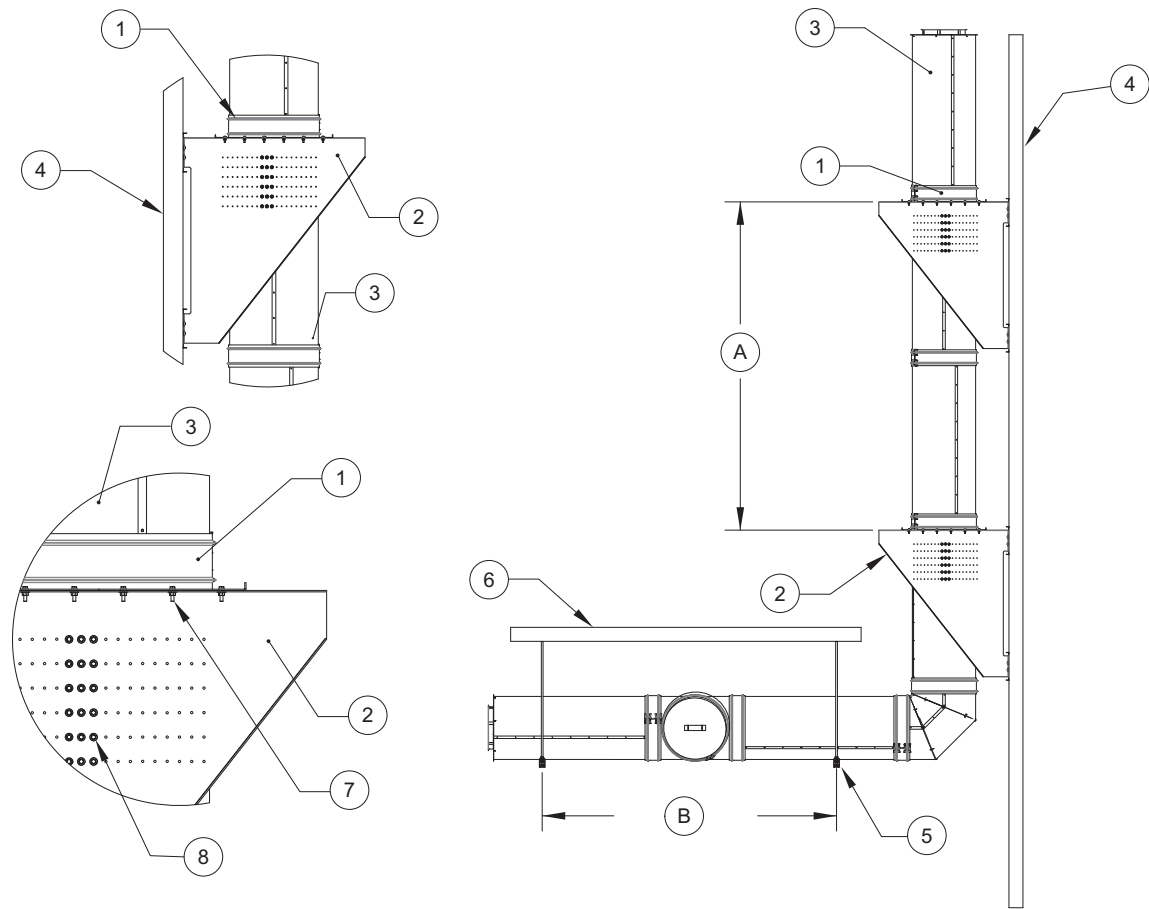
NOTE: Figure 19 illustrates the vertical wall support kit installation. When installing side support plates, verify the support plate hook is secured into the top and bottom wall support plates.

Figure 19 - Vertical Wall Support Kit



- | | |
|--|---|
| 1. 5/16" Whiz Nuts and Bolts | 5. Side Support Plates |
| 2. Wall Support Plate (Top) | 6. Wall Support Plate (Bottom) |
| 3. Flat Support Plates | 7. Wall Plate Support (Middle) - Used for |
| 4. 5/16"-18 x 1-1/2" Self Drilling Screws. Used to | addition support on 26"-36" Duct |
| secure double wall duct shell. | |

Figure 20 - Vertical Support Details

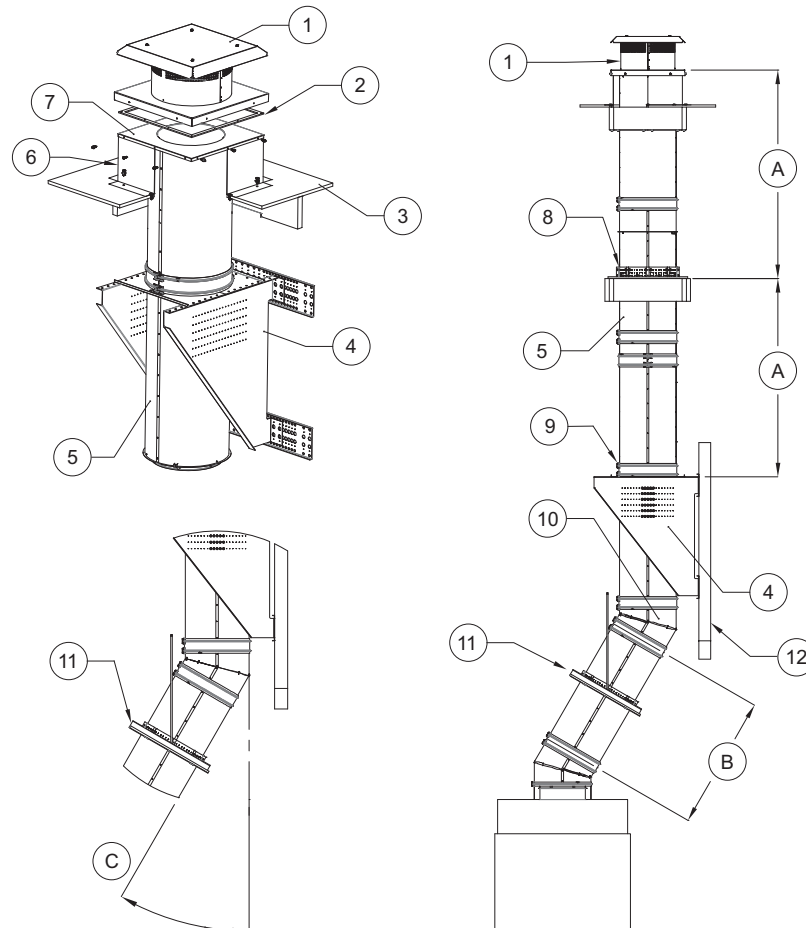


1. Double V-band - The V-band is located above vertical support.
2. Vertical Support
3. Duct System
4. Types of Wall Construction: 2" x 4" Wood Studs, 2" x 4" (25) Gauge Studs, Concrete/ Masonry
5. Horizontal Support
6. Ceiling
7. 5/16" Whiz Nuts and Bolts. Used to secure top plate.
8. 5/16"-18 x 1-1/2" Self-Drilling Screws
- A. Vertical Support Spacing, refer to **Table 8**
- B. Horizontal Support Spacing, refer to **Table 7**

There is no limit on the angle or slope of an offset for gas or liquid fuel burning appliances, but with a solid fuel burning appliance the slope must not be greater than 30 degrees (USA) or 45 degrees (Canada) from vertical.

Chimney for combination fuel heating appliances which are capable of burning solid fuel or are convertible to solid fuel are limited to the same 30 degrees (USA) or 45 degrees (Canada) slope even if the current choice of fuel is gas or oil.

Figure 21 - Vertical Floor Details for Chimney Applications



1. Base Cap
2. Ceramic Gasket
3. Floor
4. Vertical Wall Support Kit
5. Chimney/Duct Section
6. Vented Curb
7. Transition Plate
8. Vertical Floor Support Kit

9. Double V-band - Located above wall support kit.
10. Elbow
11. Vertical Floor Support with Threaded Rod
12. Wall
- A. Vertical Support Spacing, refer to **Table 8**
- B. Maximum Straight Length = 8 Feet
- C. Maximum angle not to exceed when being used with solid fuel chimney applications - 30° USA / 45° Canada

Double Wall Vertical Support (Wood, Steel, Concrete)

The V-band will sit on top of the flat support plates after the wall support kit installation is complete.

1. Verify wall construction and hardware kit.
 - For wood wall construction, the wall must be constructed of 2" x 4" wooden studs with a maximum spacing of 24" on center and covered with 5/8" gypsum. Use hardware kit DWVESU-HARDWARE-W. Refer to **Figure 22 on page 33** for wood/steel installation details.
 - For steel stud wall construction, the wall must be constructed of 2" x 4" 25 gauge (minimum) with a maximum spacing of 24" on center and covered with 5/8" gypsum. Use hardware kit DWVESU-HARDWARE-S. Refer to **Figure 22 on page 33** for wood/steel installation details.
 - For concrete/masonry construction, use hardware kit DWVESU-HARDWARE-CM. Refer to **Figure 23 on page 34** for concrete/masonry installation details.
2. The wall support plate has specific holes that locate the side plates so that when installed, they will match the outer shell diameter. Measure the shell diameter, then measure from the wall plate center holes to the radius of the opening to locate the first side plate.

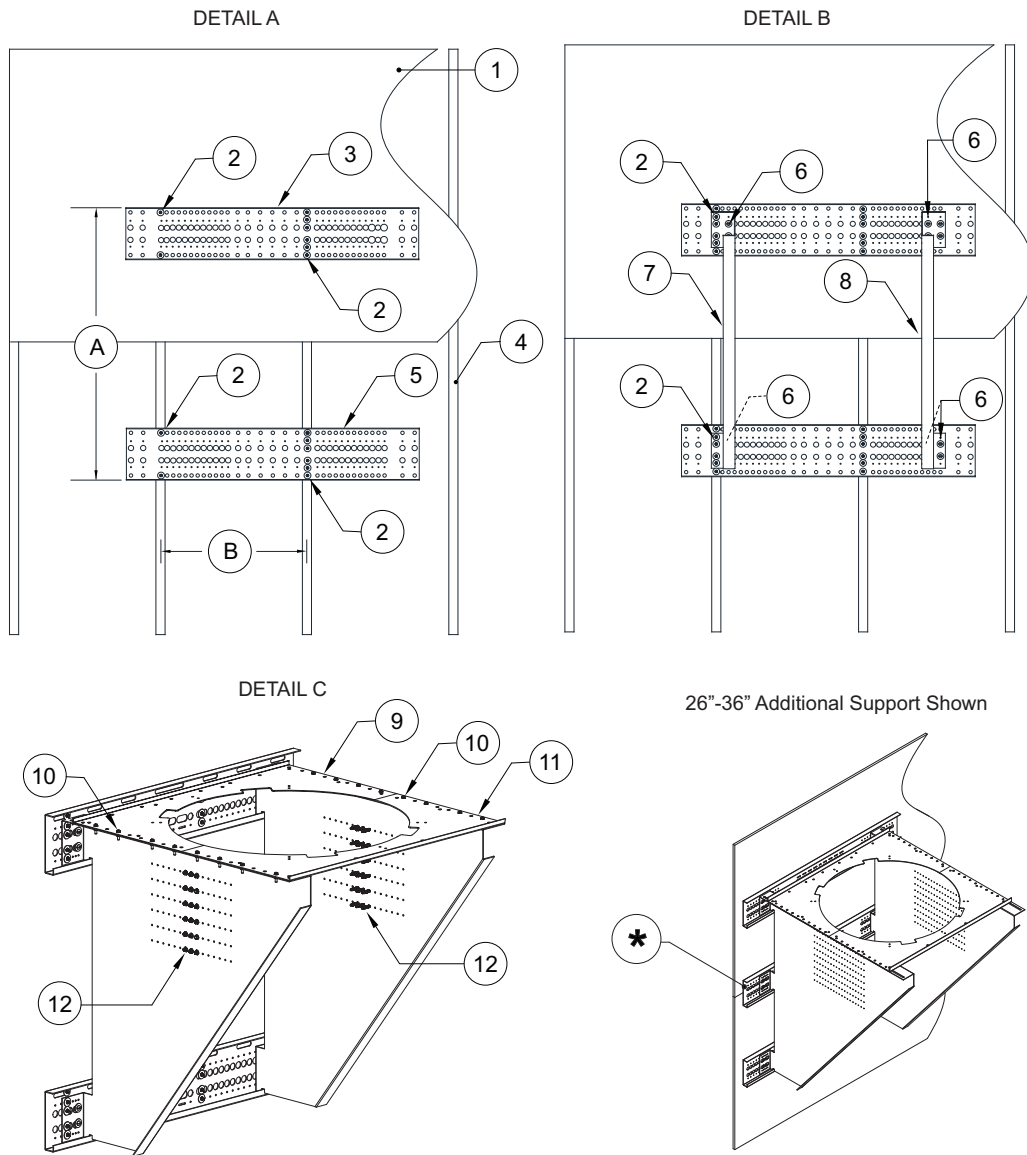
For example: If the shell being installed has a 30" outside diameter, measure from the center of the wall plate 15". This will locate the inside of the side support plate to the wall plate. Side support plate mounting holes should be on the outside.

3. Once the first wall support plate is located, use the 7/8" holes that are 24" on center from the side plate mounting holes to secure the first support plate. In some cases, the mounting holes may have to be drilled to align with studs.
4. Follow the instructions above and mount the second wall support plate. Measurement will be 44" from the top of the first wall support to the bottom of the second wall support.

NOTE: For steel studs, alternate self-drilling screws and toggle bolts when installing side plates into stud locations.

5. Install one of the side support plates. Use the notches on the side plates to mount to the wall plates. This will allow for adjustment before hardware installation. Refer to Detail A and B in **Figure 19 on page 29**.
6. Measure from the center of the wall support plate to locate the first side support plate. Measure 24" from the hardware installed in step 3. Secure wall support plates to the wall.
7. Measure from the center and install the second side plate.
8. Repeat the installation process so that both wall supports and side plates are installed and secure.
9. Install the rear flat support plate using nuts and bolts. Mount the shell so the V-band is above the flat support plates. Secure by installing the front flat support plate. The V-band should be sitting on top of the flat plate. A cutout is provided in the flat plate, align the V-band bracket with the cutout so it does not interfere with the top of the plate.
10. Use self-drilling screws to secure the side support left and right plates to the outer duct shell. Use the guide holes to locate the shell center and fill all holes at the center, center left and center right.

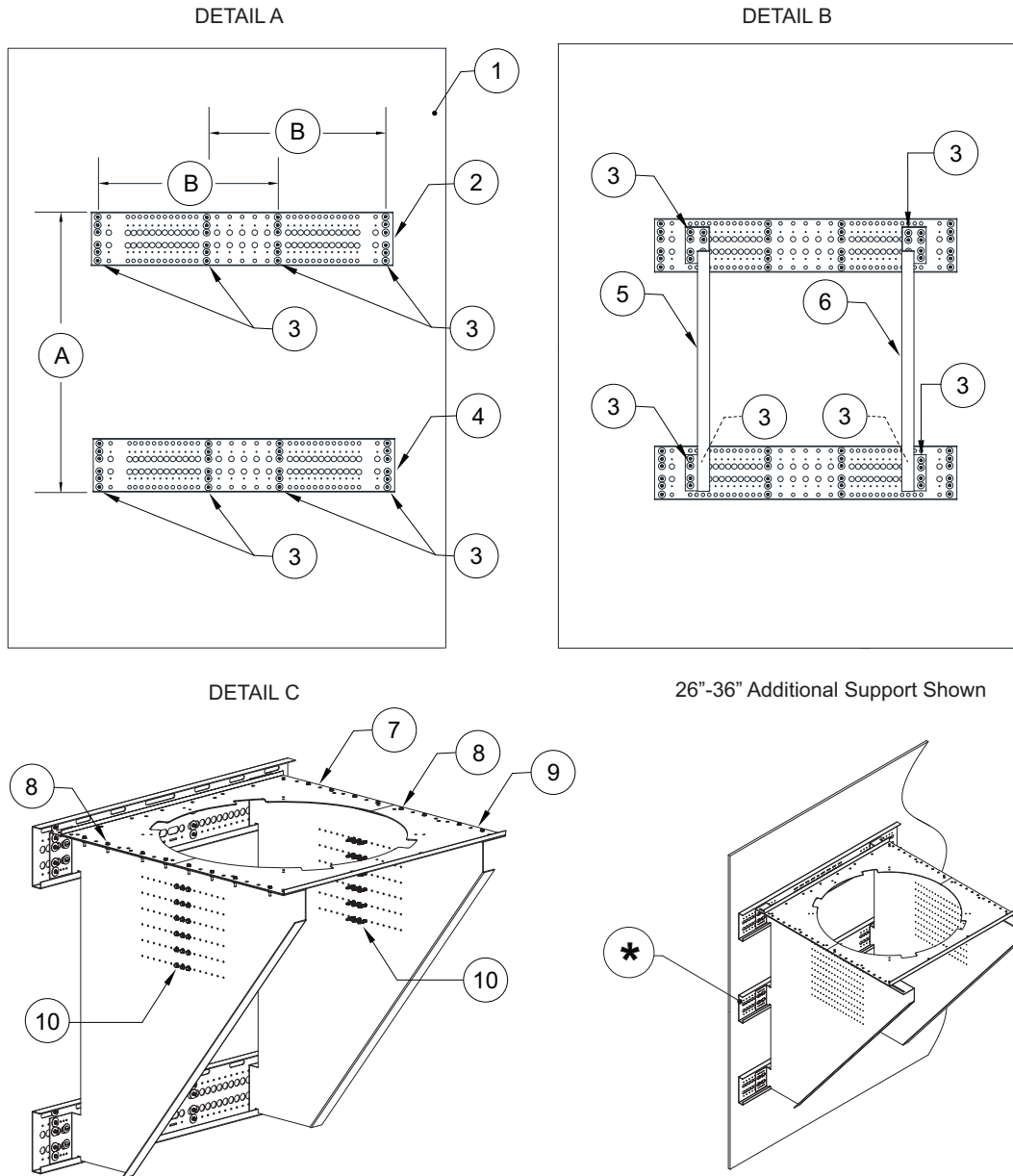
Figure 22 - Vertical Support (Wood, Steel)



1. Wall Substrate (Wood, Steel)
2. Hardware for Stud Installation - Wood/Steel
 - Wood - 5/16" x 3-1/2" Lag Bolts and Washers
 - Steel - 5/16" x 1-1/2" Self-Drilling Screws and 5/16" x 4" Toggle Bolts
3. Wall Support Plate #1
4. Stud (Wood/Steel)
5. Wall Support Plate #2
6. 5/16" x 4" Toggle Bolts
7. Side Support Plate #1
8. Side Support Plate #2
9. Rear Flat Support Plate
10. 5/16"-18 Hardware, secures flat plates to the side plates.
11. Front Flat Support Plate
12. 5/16"-18 x 1-1/2" Self-Drilling Screws
- A. 44" Spacing Distance
- B. 24" Centered Spacing Distance

* Third wall support plate used for 26"-36" duct.

Figure 23 - Vertical Support (Concrete)



1. Wall Substrate (Concrete)
2. Wall Support Plate #1
3. Hardware from Mounting Kit for Concrete - 5/16" x 2-1/4" Concrete/Masonry Screws and Washers
4. Wall Support Plate #2
5. Side Support Plate #1
6. Side Support Plate #2
7. Rear Flat Support Plate
8. 5/16"-18 Hardware, secures flat plates to the side plates.
9. Front Flat Support Plate
10. 5/16"-18 x 1-1/2" Self-Drilling Screws
- A. 44" Spacing Distance
- B. 24" Centered Spacing Distance

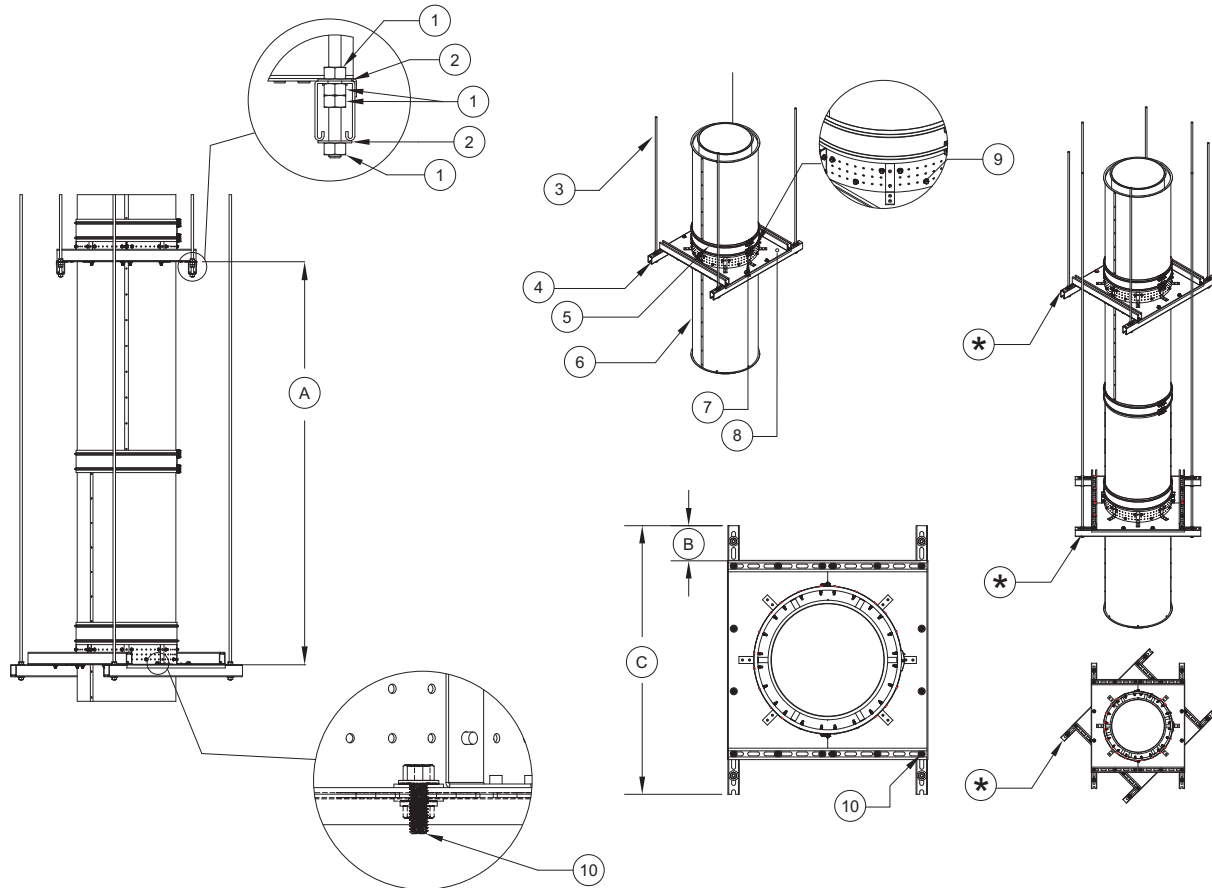
* Third wall support plate used for 26"-36" duct.

Double Wall Vertical Ceiling Support

1. The vertical ceiling support system is used when a wall support cannot be used or installed.
2. After all-thread has been installed, install Unistrut with provided 1/2" hardware. Install floor support plates to Unistrut with 3/8" hardware. B12 Unistrut is recommended.
3. When installing duct/chimney, make sure that the floor support fastener band and floor support are located under the V-band. Refer to **Table 8 on page 28** for vertical spacing specifications.
4. Secure the floor support fastener band to the outer shell using the 5/16"-18 x 1-1/2" self-drilling screws. Use the guide holes to locate the shell center. Install screw into center, center left and center right. A minimum of 18 screws must be used on each side of the duct/chimney.

NOTE: Supports must be rotated so that all-thread is attached directly to the ceiling. DO NOT ATTACH ALL-THREAD FROM ONE UNISTRUT TO ANOTHER.

Figure 24 - Vertical Ceiling Support



- | | |
|---|---|
| 1. 1/2" Nut | 8. Floor Support |
| 2. 1/2" Washer | 9. 5/16"-18 x 1-1/2" Self-Drilling Screws |
| 3. 1/2" All-Thread - Supplied by others | 10. 3/8" Hardware - 18 pieces |
| 4. B12 Unistrut | A. Vertical Support Spacing, refer to Table 8 on page 28 |
| 5. Double Wall V-band | B. 5" Maximum Distance |
| 6. Double Wall Shell | C. 60" Maximum Distance |
| 7. Floor Support Fastener Band | |

* Supports must be rotated so that all-thread is attached directly to the ceiling. DO NOT ATTACH ALL-THREAD FROM ONE UNISTRUT TO ANOTHER.

Double Wall Vertical Floor Support (Wood, Concrete, Steel)

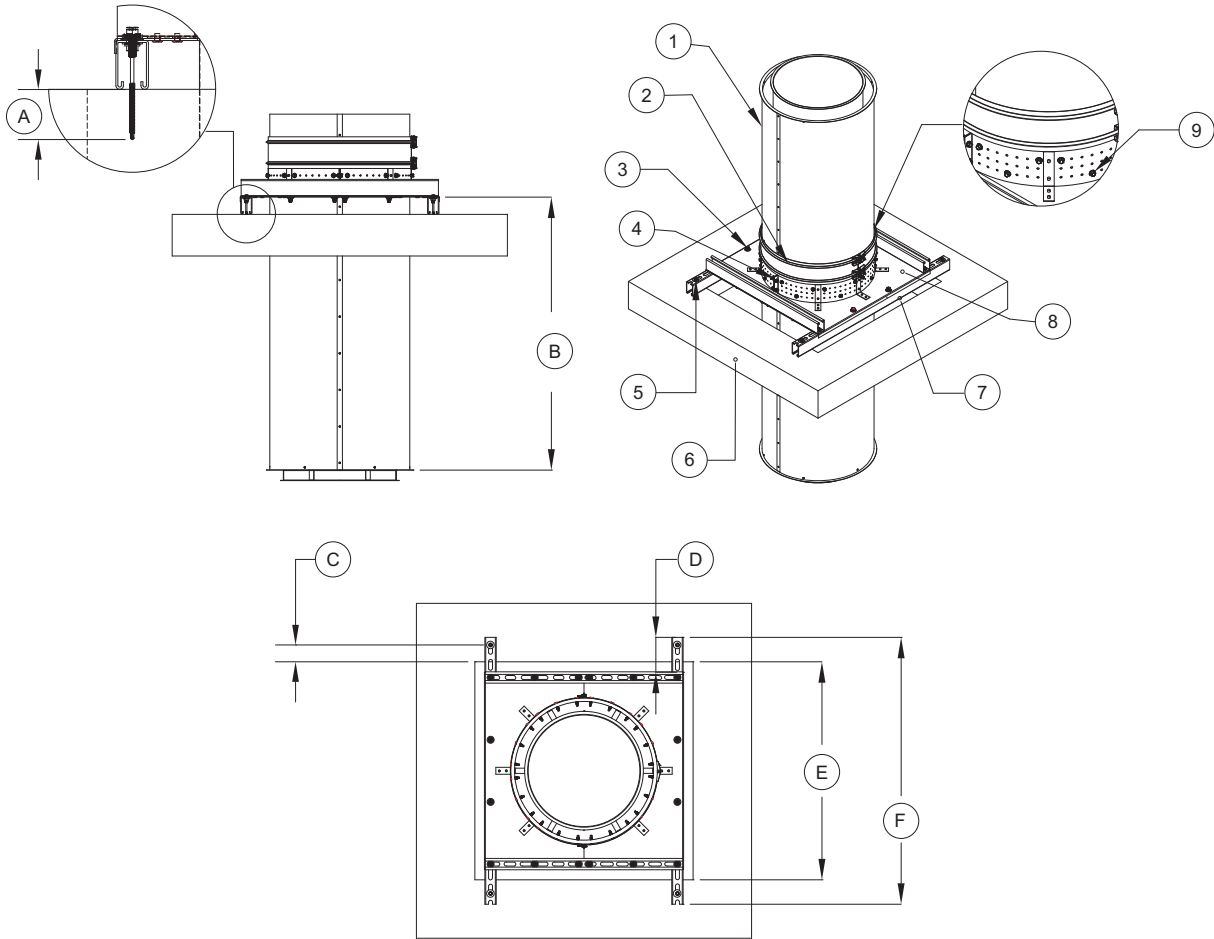
1. Vertical floor supports are used when the duct system is passing through a floor opening. Vertical floor support assemblies consist of two floor support plates and support bands. The support plates are used to span the floor opening, the support bands connect the floor plates to the outer shell of the double wall duct shell.
2. The floor opening is sized per the double wall duct outer shell. Verify the floor opening, refer to **Table 10 on page 41** (grease duct) or **Table 11 on page 43** (chimney).
3. If there is an existing opening in the floor or chase, you must verify the opening. If the opening is larger than the dimension referenced in **Table 10** (grease duct) or **Table 11** (chimney), you must re-frame the opening or change to a chase support. Refer to **Figure 25 on page 37** for chase support details.
4. Chase supports are used when the floor opening is larger than the floor support plates and the floor support plates cannot be secured to the floor.
5. Unistrut is bolted to the floor support plates (chase support). Refer to **Figure 25 on page 37** for details. B12 Unistrut is recommended.
6. Unistrut is designed to span larger opening in floors when the opening cannot be changed.

NOTE: If there is an existing opening in the floor that exceeds 5" maximum clearance, then re-frame the opening or use "Double Wall Vertical Ceiling Support" on page 35.

Table 9 - Substrate Hardware

Decking Material	Hardware	Minimum Thread Penetration	Minimum Edge Distance
Wood - Minimum G.42	Zinc Plated Steel Hex Head Lag Screw 3/8" x 2-1/2" with 3/8" washer	2"	1-1/2"
Concrete - 2500 Minimum PSI	Hilti Kwik Bolt 3/8" Diameter TZ Expansion Anchor with 3/8" washer	2-5/16"	3"
Steel Roof Truss	Dril-Flex Self-Drilling Screws 1/4"-14 Min. 1/2" Through with 1/4" washer	12 Gauge or 1/8" Thick	3/8"

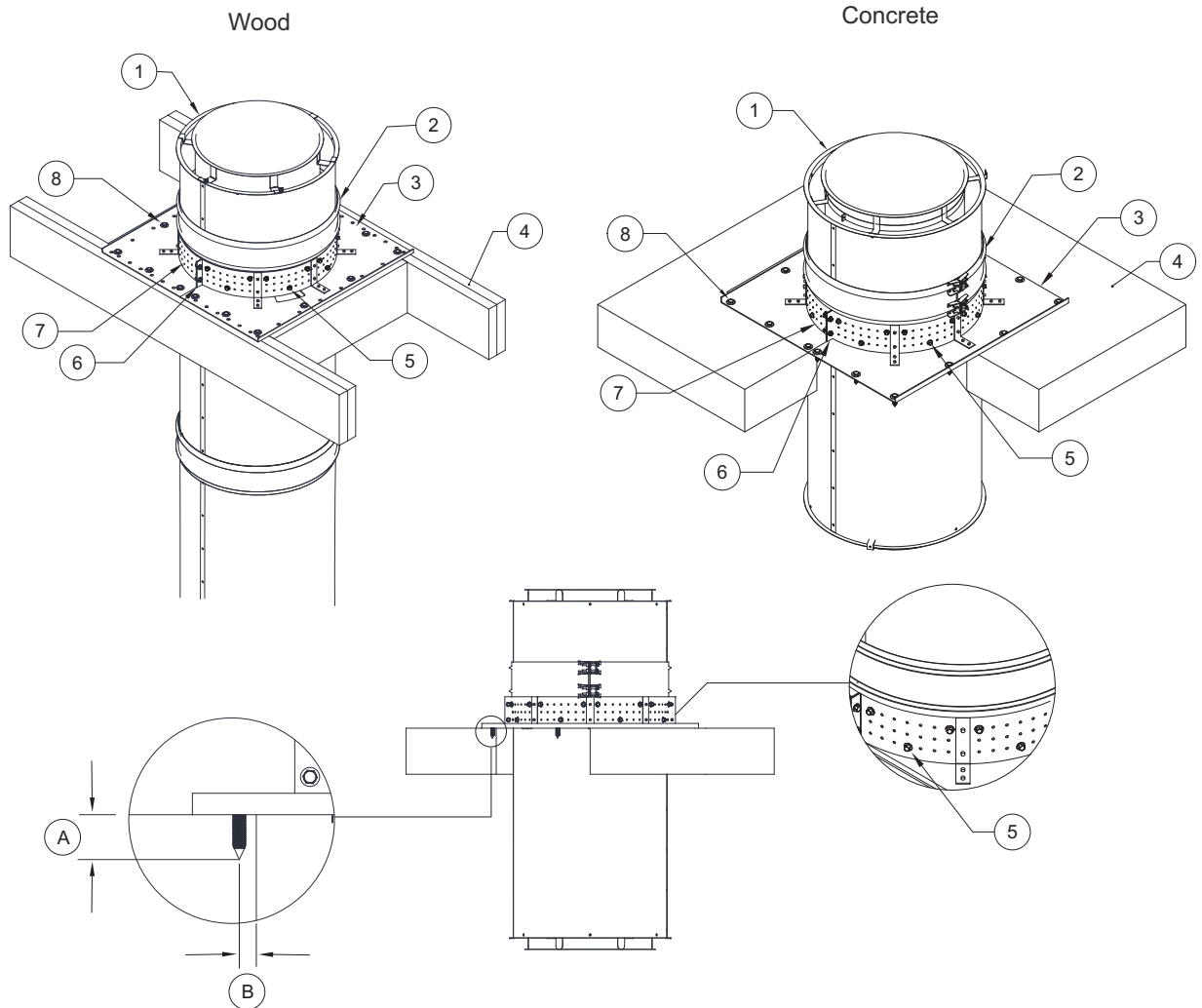
Figure 25 - Chase Floor



1. Double Wall Shell
2. Double Wall V-band
3. 3/8" Hardware
4. Floor Support Fastener Band
5. Substrate Fastener - Supplied by others
6. Substrate
7. B12 Unistrut
8. Floor Support
9. 5/16"-18 x 1-1/2" Self-Drilling Screws (Use minimum 3 screws per opening in the band)

- A. Minimum Thread Penetration, refer to **Table 9 on page 36**
- B. Vertical Support Spacing, refer to **Table 8 on page 28**
- C. Minimum Edge Distance, refer to **Table 9 on page 36**
- D. 5" Maximum Distance
- E. Open Area Chase
- F. 60" Maximum Distance

Figure 26 - Floor Support



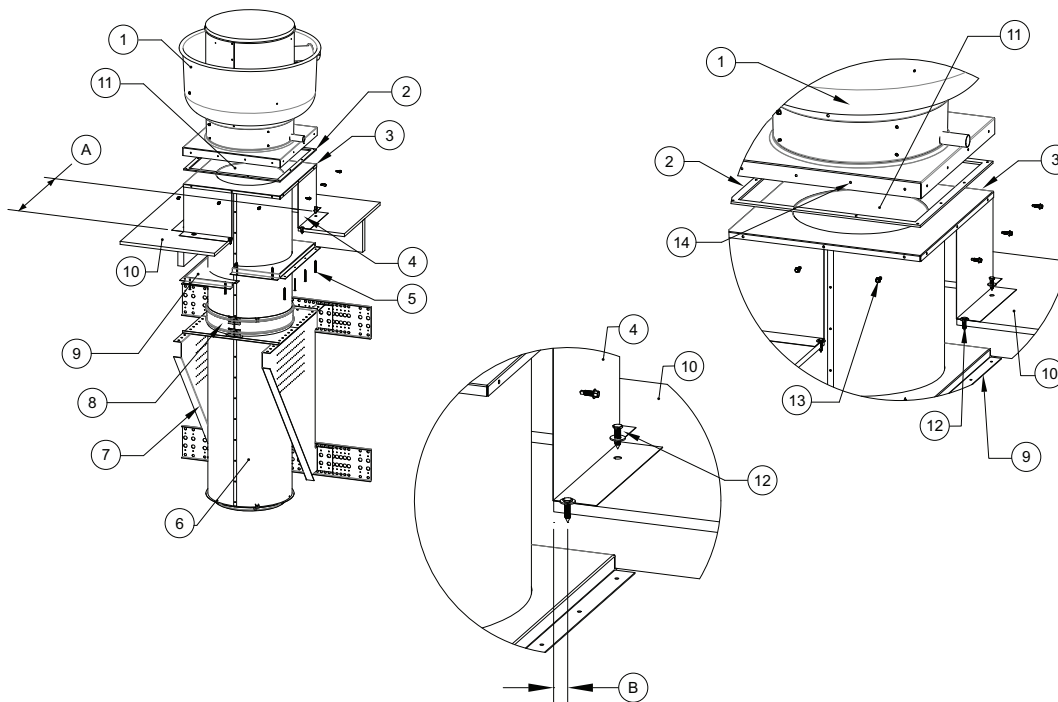
- | | |
|---|---|
| 1. Double Wall Shell | 7. Floor Support Fastener Band |
| 2. Double Wall V-band | 8. Substrate Hardware, refer to Table 9 on page 36 |
| 3. Floor Support | A. Minimum Thread Penetration, refer to Table 9 on page 36 |
| 4. Substrate | B. Minimum Edge Distance, refer to Table 9 on page 36 |
| 5. 5/16"-18 x 1-1/2" Self-Drilling Screws (Use a minimum of 3 screws per opening in the band) | |
| 6. 1/4"-20 Whiz Nuts and Bolts | |

Vertical Installation Roof Termination

Model 2R & Model 2R HT Chimney Systems require 2" clearance to combustibles, the clearance is maintained by the correct installation of the transition plates. Clearance plates shown below may be used with grease ducts (2R, 3R, 3Z) to help center grease duct when going through a floor/ceiling.

A high temperature gasket is used to seal the transition plate to the exhaust fan/vent cap. The transition plate is secured to the curb using 1/4"-20 x 1-1/2" zinc plated self-drilling screws. The fan is secured to the vented curb using 1/4"-20 x 2" zinc plated self-drilling screws.

Figure 27 - Roof Termination Installation Details



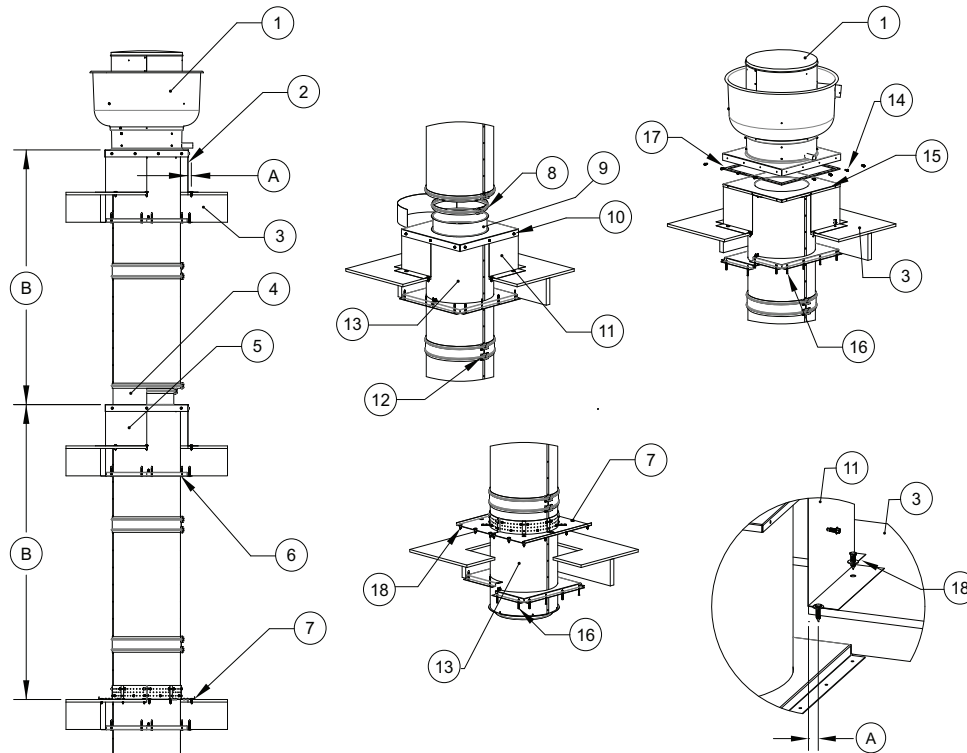
- | | |
|---|---|
| 1. Exhaust Fan | 9. 2" Clearance Plates may be used with grease duct 2R, 3R and 3Z (optional). |
| 2. High Temperature Gasket | 10. Substrate - Wood, Concrete or Steel |
| 3. Transition Plate - Welded to inner duct/chimney | 11. Inner Duct/Chimney |
| 4. Vented Curb | 12. Substrate Hardware, refer to Table 9 on page 36. |
| 5. Clearance Plate Mounting Screws - Secures clearance plates to combustible surface. | 13. 1/4"-20 x 1-1/2" Zinc Plated Self Drilling Screws |
| 6. Double Wall Duct/Chimney | 14. 1/4"-20 x 2" Zinc Plated Self Drilling Screws |
| 7. Vertical Wall Support Assembly | A. Refer to Table 10 on page 41 for grease duct or Table 11 on page 43 for chimney. |
| 8. Double V-band | B. Edge Distance, refer to Table 9 on page 36. |

Vertical Support Floor and Curb

Model 2R & Model 2R HT Chimney Systems require a 2" clearance to combustibles, the clearance is maintained by the correct installation of the transition plates. Clearance plates shown below may be used with grease ducts (2R, 3R, 3Z) to help center grease duct when going through a floor/ceiling

A high temperature gasket is used to seal the transition plate to the exhaust fan/vent cap. The transition plate is secured to the curb using 1/4"-20 x 1-1/2" zinc plated self-drilling screws. The fan is secured to the vented curb using 1/4"-20 x 2" zinc plated self-drilling screws.

Figure 28 - Floor and Curb Support Installation Details



- | | |
|--|---|
| 1. Exhaust Fan | 12. Double V-band |
| 2. Vented Curb - Roof Termination | 13. Double Wall Duct/Chimney |
| 3. Substrate - Wood, Concrete or Steel | 14. 1/4"-20 x 1-1/2" Zinc Plated Self Drilling Screws |
| 4. Riser Cover | 15. Transition Plate - Welded to inner duct/chimney |
| 5. Through Curb Support with TPDB | 16. Clearance Plate Mounting Screws - Secures clearance plates to combustible surface (optional). |
| 6. Clearance Plates may be used with grease duct 2R, 3R, and 3Z. | 17. High Temperature Gasket |
| 7. Floor Support Assembly | 18. Substrate Hardware, refer to Table 9 on page 36 . |
| 8. Single V-band - Inner | A. Edge Distance, refer to Table 9 on page 36 . |
| 9. Riser | B. Vertical Support Spacing, refer to Table 8 on page 28 . |
| 10. 1/4"-20 x 2" Zinc Plated Self Drilling Screws | |
| 11. Through Curb Support with TPDB | |

Through Penetration and Fire Stops

Through floor fire stop support assemblies are used to support duct sections that penetrate a fire resistant floor(s). The full support ring is installed under the double V-band; the struts are connected to the support ring with supplied 5/16"-18 hardware. Once the struts have been connected, they are secured to the floor using appropriate type and size fasteners supplied by others. The fire stop support is designed to support the penetrating duct section and maintain annular distance, see **Figure 29 on page 42**.

When duct systems penetrate a fire resistance rated floor, ceiling and/or a wall, a fire stop kit is used to retain the fire resistance rating on the floor and/or wall. The double wall grease duct (2R, 3R and 3Z) and the fire stop assemblies detailed below have achieved 2-hour ratings for integrity, insulation and stability. Testing was conducted in accordance with the applicable requirements UL 2221, Test of Fire Resistive Grease Duct Enclosure Assemblies.

The fire engulfment test conducted per UL 2221 exposes the firestop system to the same furnace condition, uses the same instrumentation for the evaluation of the firestop on the unexposed side of the furnace, and exposes the firestop to a post-fire test hose stream as in ASTM E814 and UL 1479. The UL 2221 fire engulfment test is more severe on the firestop than ASTM E814 or UL 1479. Intertek considers the through penetration firestop system referenced in this manual complies with a 2-hour F and T rating per ASTM E814-13a and UL 1479, 4th edition, September 25, 2014.

Table 10 - Opening Size through Penetrations Grease Duct

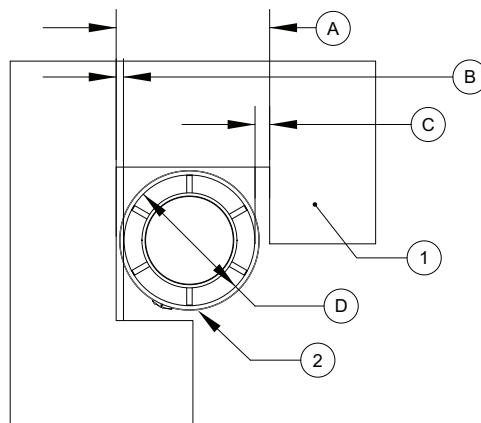
Duct Model	Inner Diameter	Outer Diameter	Square/Round Opening Min/Max
DW - 2R	5"	9"	11" - 12"
DW - 2R	6"	10"	12" - 13"
DW - 2R	7"	11"	13" - 14"
DW - 2R	8"	12"	14" - 15"
DW - 2R	10"	14"	16" - 17"
DW - 2R	12"	16"	18" - 19"
DW - 2R	14"	18"	20" - 21"
DW - 2R	16"	20"	22" - 23"
DW - 2R	18"	22"	24" - 25"
DW - 3R / 3Z	5"	11"	13" - 14"
DW - 3R / 3Z	6"	12"	14" - 15"
DW - 3R / 3Z	7"	13"	15" - 16"
DW - 3R / 3Z	8"	14"	16" - 17"
DW - 3R / 3Z	10"	16"	18" - 19"
DW - 3R / 3Z	12"	18"	20" - 21"
DW - 3R / 3Z	14"	20"	22" - 23"
DW - 3R / 3Z	16"	22"	24" - 25"
DW - 3R / 3Z	18"	24"	26" - 27"
DW - 3R / 3Z	20"	26"	28" - 29"
DW - 3R / 3Z	22"	28"	30" - 31"
DW - 3R / 3Z	24"	30"	32" - 33"
DW - 3Z	26"	32"	34" - 35"
DW - 3Z	28"	34"	36" - 37"
DW - 3Z	30"	36"	38" - 39"
DW - 3Z	32"	38"	40" - 41"
DW - 3Z	34"	40"	42" - 43"
DW - 3Z	36"	42"	44" - 45"

Annular Distance – Fire Stop

Grease ducts are to be installed eccentrically or concentrically within the fire stop system. The annular space between the grease duct and the periphery of the opening shall be a minimum of 1" to a maximum of 2" for 1 and 2-hour fire rated floor and wall assemblies. Grease duct will be rigidly supported on both sides of the floor and or wall assembly. The F and T rating for the fire stop systems shown below are rated for 2 hours. The fire stop ratings are applicable only when Specified Technologies Series SSS Latex Intumescent (**STI Triple S**) Sealant is used. Annular distance is measured perpendicular from the outside of the grease duct to the periphery of the opening.

Figure 29 - Annular Distance

- 1. Floor/Ceiling
- 2. Duct
- A. Outer Diameter Opening Plus 3" Maximum
- B. 1" Minimum Distance
- C. 2" Maximum Distance
- D. Duct Outer Diameter



Annular Distance – 2R & 2R Type HT Clearance

Transition plates are used to maintain a 2" clearance to combustibles for Model 2R & 2R Type HT listed chimney systems. Transition plates are not a substitute for through penetration and fire stop plates. Chimney transition plates are designed to center the chimney in the recommend opening and maintain 2" clearance to combustibles, refer to **Figure 30**. Frame or cut the opening in the floor, refer to **Table 11 on page 43**. Chimney transition plates are welded to the section of chimney at the curb. The welded assembly is dropped down through the curb, the chimney transition plate has down-flanges that overlap the side of the curb, locking it in place. The chimney transition plate is secured to the curb using appropriate type and size hardware, refer to **Figure 31 on page 43**. Once the chimney transition plate is secure, the chimney will be centered in the opening with a 2" clearance to combustibles. Model 2R & Model 2R Type HT chimney requires a 2" minimum annular distances in an undisclosed installation.

WARNING: Clearance (air space) to combustibles must be free from any type of insulation.

Figure 30 - Clearance Plates

- 1. Combustible Surface
- A. 2R Shell plus 4-1/2"
- B. 2R Shell Outer Diameter

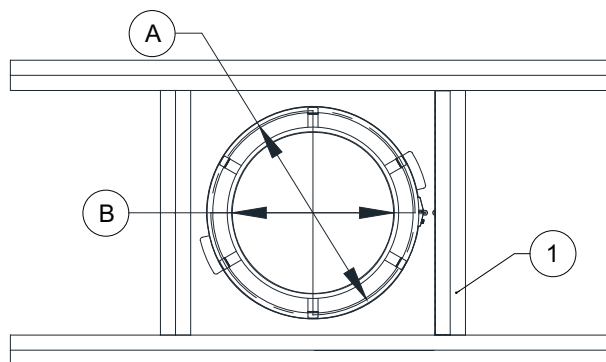
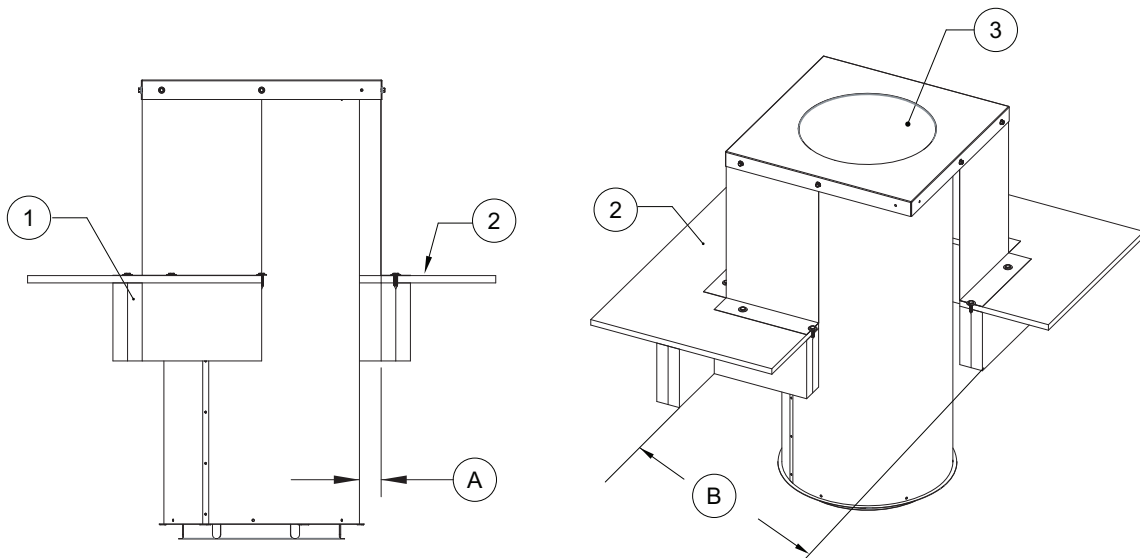


Table 11 - Chimney Annular Space

Chimney Model	Inner Diameter	Outer Diameter	Square/Round Opening Min/Max	Square Opening 2R Type HT
DW 2R & 2R Type HT	5"	9"	11" - 12"	13-1/2"
DW 2R & 2R Type HT	6"	10"	12" - 13"	14-1/2"
DW 2R & 2R Type HT	7"	11"	13" - 14"	15-1/2"
DW 2R & 2R Type HT	8"	12"	14" - 15"	16-1/2"
DW 2R & 2R Type HT	10"	14"	16" - 17"	18-1/2"
DW 2R & 2R Type HT	12"	16"	18" - 19"	20-1/2"
DW 2R & 2R Type HT	14"	18"	20" - 21"	22-1/2"
DW 2R & 2R Type HT	16"	20"	22" - 23"	24-1/2"

Figure 31 - Chimney Clearances



1. Joist
2. Floor
3. Inside Chimney

- A. Clearance to Combustibles, refer to **Table 1 on page 8**
- B. Opening 2R Shell plus 4". Refer to **Table 11** for floor opening details.

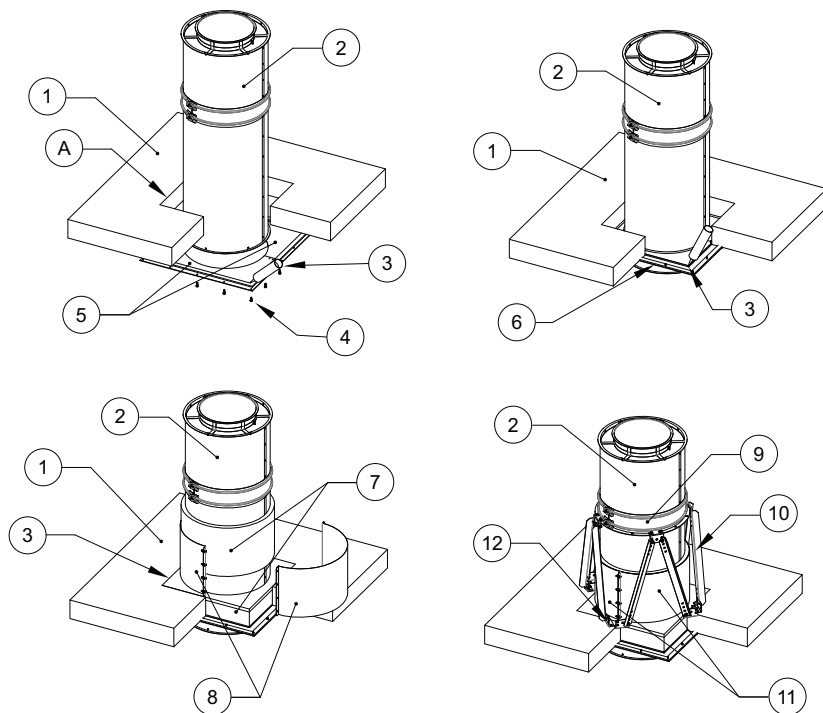
WARNING: Clearance (air space) to combustibles must be free from any type of insulation.

Floor and Ceiling Fire Stop Installation

1. Cut an opening in the floor/ceiling that is a minimum of 2" and maximum of 3" larger than the outside diameter of the duct being installed, refer to **Table 10 on page 41**.
2. The grease duct can be installed eccentrically or concentrically within the opening. The distance from the outside of the grease duct to the periphery of the opening cannot exceed 2". The maximum annular distance allowed is 2", refer to **Figure 29 on page 42**.
3. Apply a continuous 1/2" bead of STI Triple S intumescent around the fire plates. The fire plates are designed to fit around the duct and overlap by 1".
4. The fire plates are installed on the bottom side of the floor/ceiling. Push the plates up to the floor/ceiling so the intumescent seals the plates against the floor/ceiling. Then secure using 1/4"-20 x 1-1/2" long concrete fasteners where the plates overlap, secure using 1/4"-20 x 1" sheet metal screws.
5. Seal the topside using the intumescent seal around the duct and fire plates. Seal the edge of the opening to the fire plates.
6. Fill the cavity using four layers of insulation, make sure that all voids are filled. The insulation is fully compressed into the opening until it is 3/4" from the top of the opening.
7. Cover the compressed insulation with intumescent. Continue until the intumescent is level with the top of the opening. The intumescent should overlap on to the floor/ceiling, ensuring there are no gaps between the edges of the opening or the duct outer shell.
8. Wrap one layer of 1" x 12" provided insulation around the base of the duct and enclose with the half enclosure bands. The insulation and bands should be touching the intumescent, do not disturb or compromise the intumescent when installing. The enclosure bands are assembled using 1/4"-20 x 3/4" hardware.
9. Install the vertical fire stop support; ensuring the full support ring is installed under the double V-band. Once in place, the legs are secured to the floor/ceiling using appropriate type and size fasteners.

Figure 32 - Floor and Ceiling Fire Stop Installation

1. Top Side
2. Duct Section
3. Intumescent Sealant
4. Concrete Screws
5. Fire Plates
6. Fire Plate - Shown secured to substrate
7. Insulation
8. Half Closure Bands
9. Double V-band
10. Vertical Support
11. Half Closure Bands - Shown secured
12. Concrete Anchors
- A. Floor Opening, refer to **Table 10**.

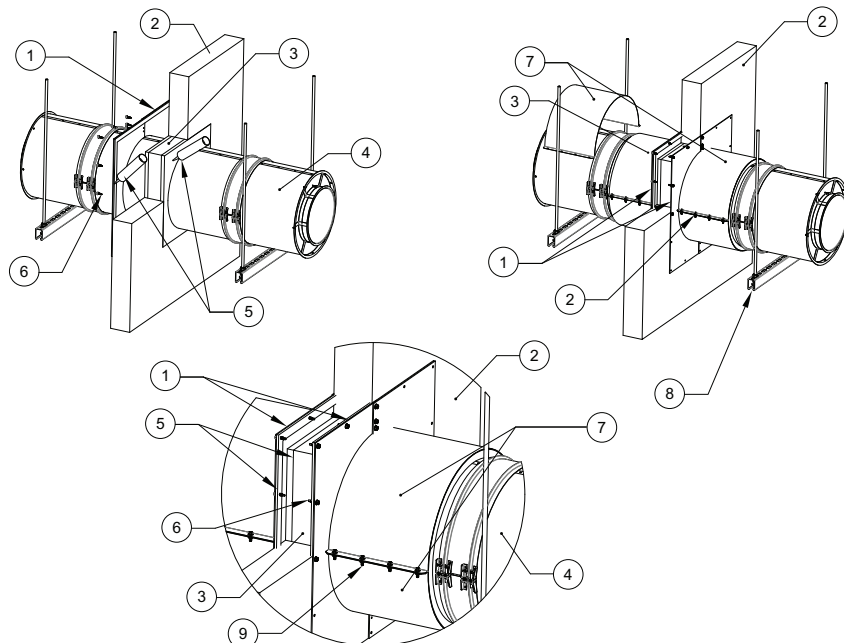


Wall Fire Stop Installation

1. Cut an opening in the wall that is a minimum of 2" and maximum of 3" larger than the outside diameter of the duct being installed, refer to **Table 10 on page 41**.
2. The grease duct can be installed eccentrically or concentrically within the opening. The distance from the outside of the grease duct to the periphery of the opening cannot exceed 2". The maximum annular distance allowed is 2", refer to **Figure 29 on page 42**.
3. Apply a continuous 1/2" bead of STI Triple S intumescent around the fire plates. The fire plates are designed to fit around the duct and overlap by 1".
4. The fire plates are installed on the backside of the wall. Push the plates up to the wall so the intumescent seals the plates against the wall. Then secure using 1/4"-20 x 1-1/2" long concrete fasteners where the plates overlap, secure using 1/4"-20 x 1" sheet metal screws.
5. Apply a 3/4" covering of intumescent sealant to the inside of the fire plates installed on backside of the wall. The sealant should be smooth and without any gaps on the edges of the opening or outside of duct.
6. Fill the cavity using the insulation provided, ensuring that all voids are filled. The insulation is fully compressed into the opening until it is 3/4" from the edge of the opening in the wall.
7. Cover the compressed insulation with intumescent. Continue until the intumescent is flush with the edge of the wall opening. The intumescent should overlap on to the wall, ensuring there are no gaps between the edges of the opening or the duct outer shell.
8. Install the fire plates on the front side of the wall. Push the plates up to the wall so the intumescent seals the plates against the wall. Then secure using 1/4"-20 x 1-1/2" long concrete fasteners where the plates overlap secure using 1/4"-20 x 1" sheet metal screws.
9. Wrap one layer of 1" x 12" provided insulation around the base of the duct and enclose with the half enclosure bands. The insulation and bands should be touching the intumescent. The enclosure bands are assembled using 1/4"-20 x 1" hardware. This is done on the front and back of the wall.
10. Horizontal supports are used to support the duct on either side of the wall. Refer to **Figure 18 on page 27** for details.

Figure 33 - Wall Fire Stop Installation

1. Fire Plates
2. Wall
3. Insulation
4. Duct Section
5. Intumescent
6. Concrete Screws
7. Half Closure Bands
8. Horizontal Support
9. 1/4"-20 Hardware

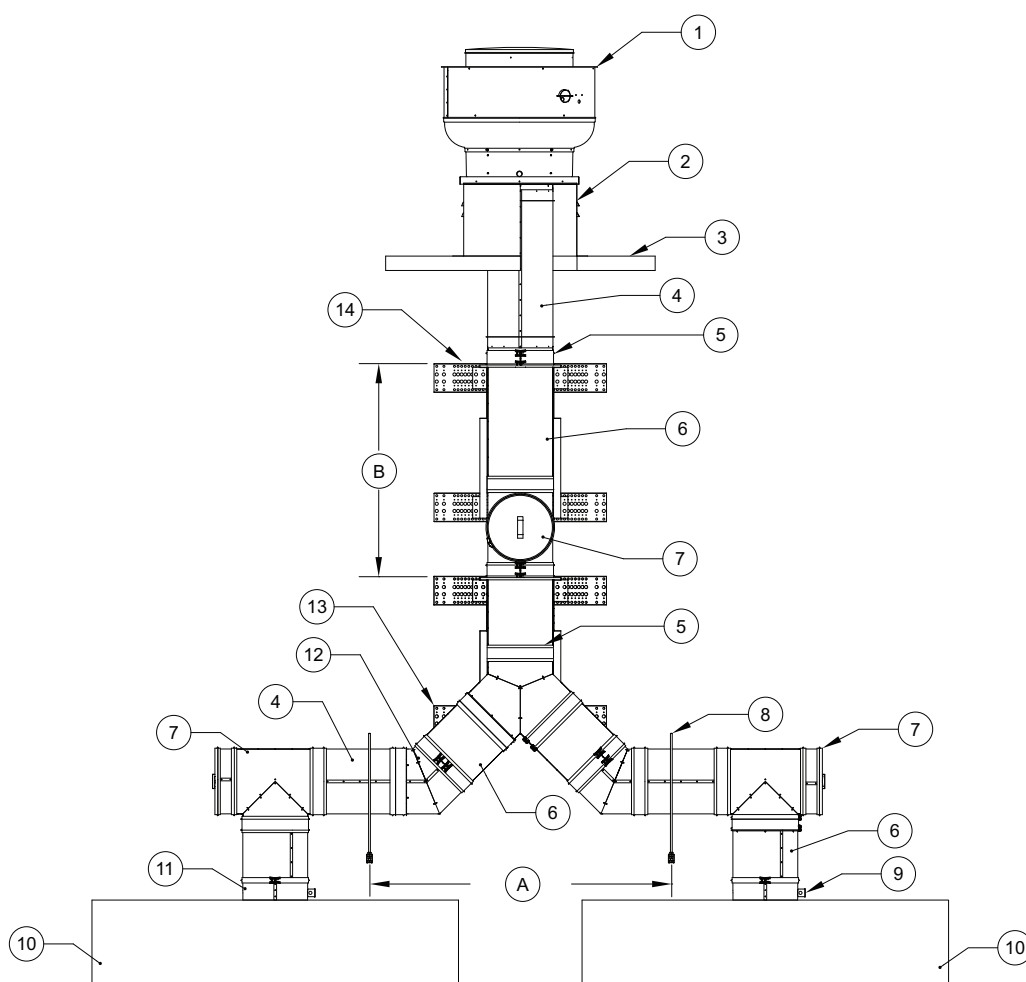


Grease Duct Assembly

The illustrations shown provide useful information on the installation of grease duct systems. Each installation is specific to the application and the job site. If you encounter a situation not covered by this illustration, refer to the guide or consult the factory. The grease duct systems illustrated in this manual have been tested to and comply with UL 2221, Tests of Fire Resistive Grease Duct Enclosure Assemblies.

Adjustable duct and standard ducts are used to terminate at the transition plate. The duct section is fully welded to the transition plate at the factory.

Figure 34 - Grease Duct Installation Guide Details View 1



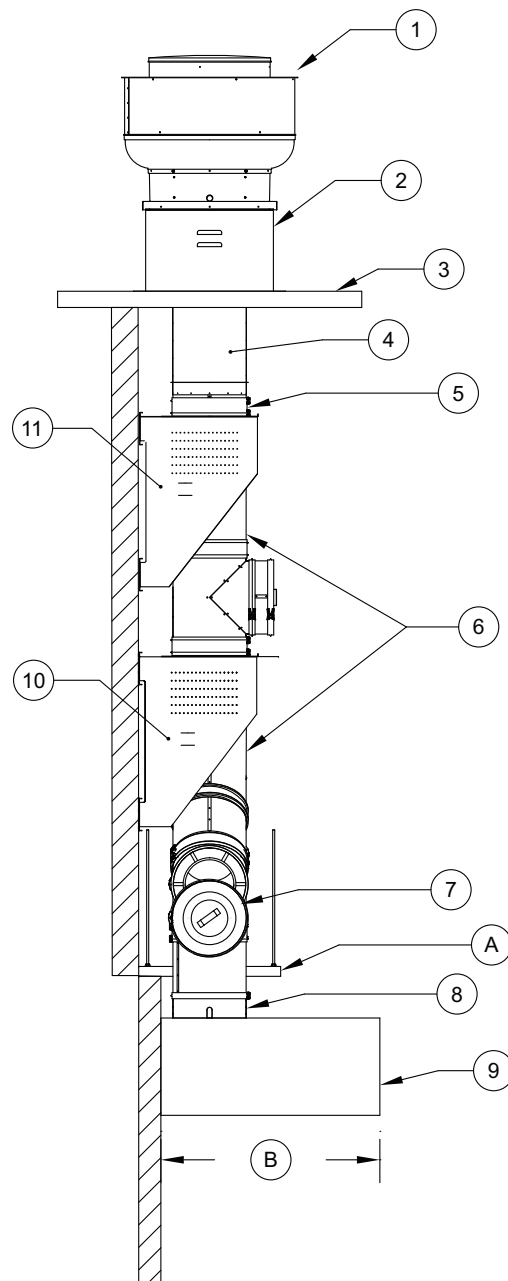
- | | |
|--|---|
| 1. Exhaust Fan | 11. Riser Cover |
| 2. Vented Curb | 12. 45 Degree Elbow |
| 3. Roof | 13. First Vertical Support - Located at joint #1, after a change in direction. Installed under the double V-band. |
| 4. Adjustable Duct | 14. Second Vertical Support - Installed under the double V-band. |
| 5. Double V-band | A. Horizontal Support Spacing, refer to Table 7 on page 26 |
| 6. Standard Duct Length | B. Vertical Support Spacing, refer to Table 8 on page 28 |
| 7. Insulated Access Door Cover/Tee - Provided when there is a change in direction. | |
| 8. 1/2" Threaded Rod - Minimum size | |
| 9. Duct Sensor | |
| 10. Exhaust Hood | |

The illustrations shown provide useful information on the installation of grease duct systems. Each installation is specific to the application and the job site. If you encounter a situation not covered by this illustration, refer to the guide or consult the factory. The grease duct systems illustrated in this manual have been tested to and comply with UL 2221, Tests of Fire Resistive Grease Duct Enclosure Assemblies.

Adjustable duct and standard ducts are used to terminate at the transition plate. The duct section is fully welded to the transition plate at the factory.

Figure 35 - Grease Duct Installation Guide Details View 2

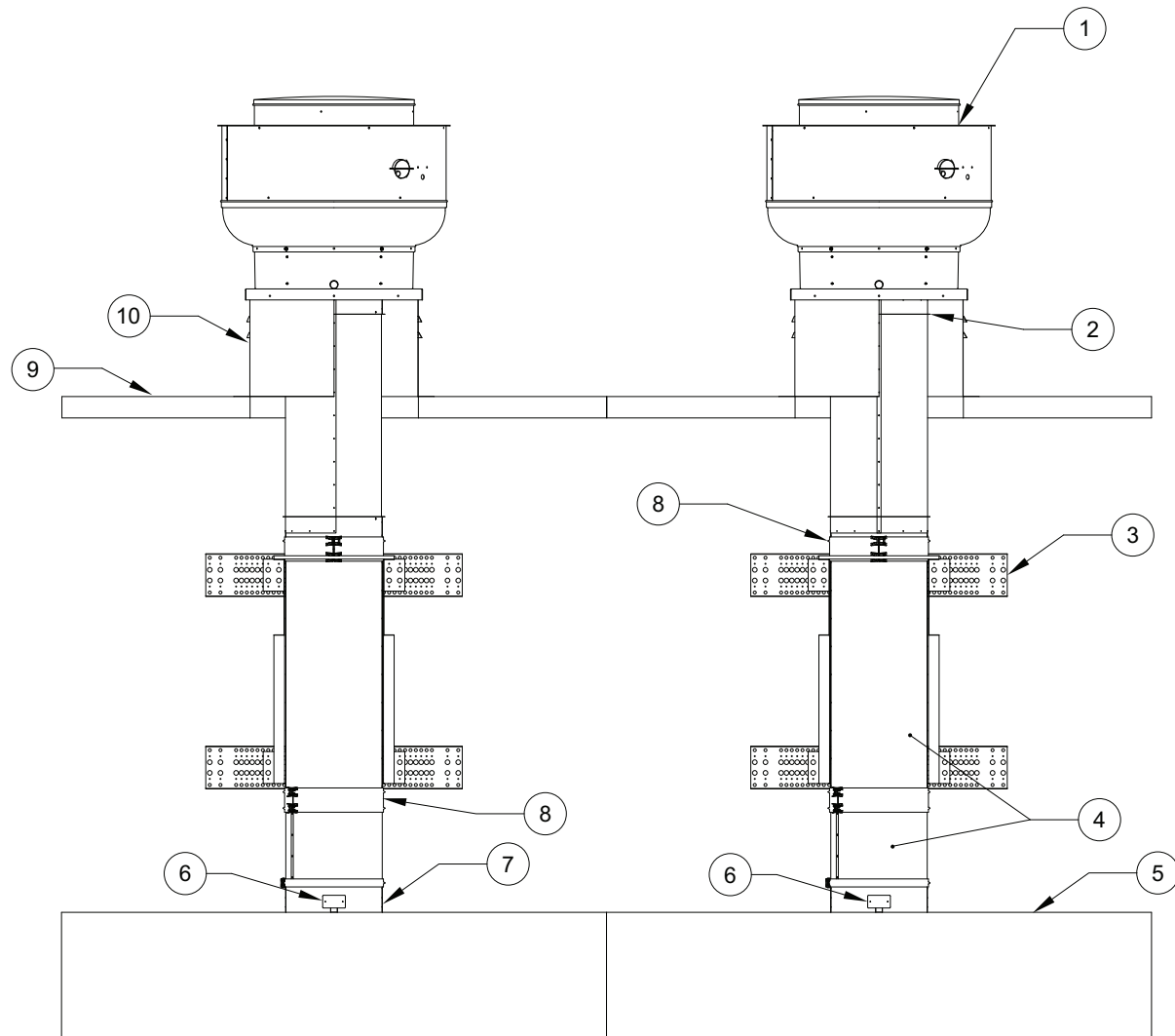
1. Exhaust Fan
2. Vented Curb
3. Roof
4. Adjustable Duct
5. Double V-band
6. Standard Duct Length
7. Insulated Access Door Cover/Tee - Provided when there is a change in direction.
8. Riser Cover
9. Exhaust Hood
10. First Vertical Support - Located at joint #1, after a change in direction. Installed under the double V-band.
11. Second Vertical Support - Installed under the double V-band.
- A. Horizontal Support Spacing, refer to **Table 7 on page 26**
- B. Hood Width



The illustrations shown provide useful information on the installation of grease duct systems. Each installation is specific to the application and the job site. If you encounter a situation not covered by this illustration, refer to the guide or consult the factory. The grease duct systems illustrated in this manual have been tested to and comply with UL 2221, Tests of Fire Resistive Grease Duct Enclosure Assemblies.

Adjustable duct and standard ducts are used to terminate at the transition plate. The duct section is fully welded to the transition plate at the factory.

Figure 36 - Grease Duct Installation Guide Details View 3

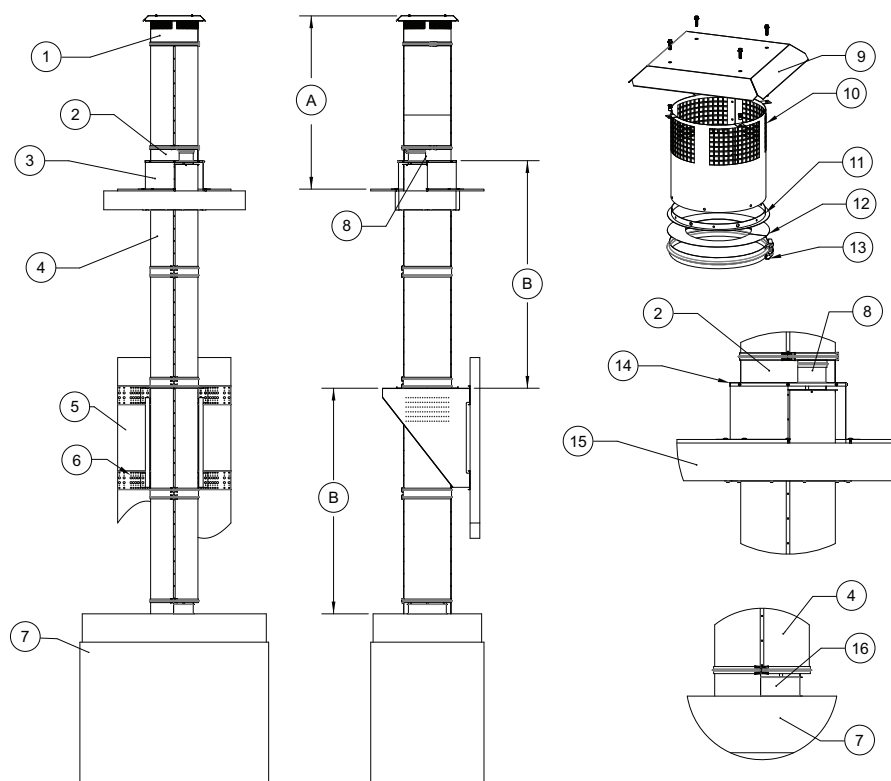


- | | |
|---|------------------|
| 1. Exhaust Fan | 6. Duct Sensor |
| 2. Adjustable Section - Terminates at transition plate. | 7. Riser Cover |
| 3. Vertical Support - Installed under V-band. | 8. Double V-band |
| 4. Standard Duct Length | 9. Roof |
| 5. Exhaust Hood | 10. Vented Curb |

Chimney Assembly

The illustrations shown provide useful information on the installation of a chimney system. Each installation is specific to the application and the job site. If you encounter a situation not covered by this illustration, refer to the guide or consult the factory. The chimney systems illustrated in this manual have been tested to and comply with UL 103 Type HT, Factory-Built Chimneys for Building Heating Appliances and UL2561 Factory-Built Chimney for Building and Heating Appliance coverage as a Medium Heating Appliance. Chimney needs to be installed additionally in accordance with NFPA 211.

Figure 37 - Chimney Installation Guide Details View 1



1. Vent Cap
2. Top Riser Cover and V-band
3. Vented Curb
4. Chimney Shell
5. Wall
6. Vertical Wall Support
7. Appliance
8. Top Riser Connection
9. Cap
10. Airshaft

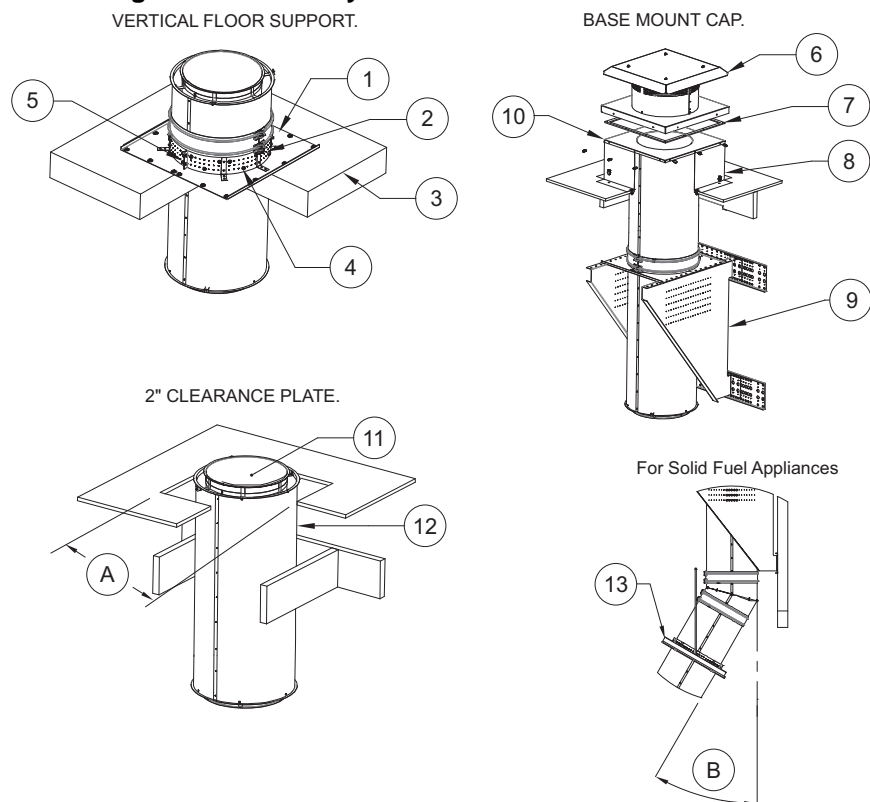
11. Flange Ring
12. End Cap
13. Single V-band
14. Transition Plate
15. Substrate Surface
16. Connection to Appliance - May be welded/ bolted or field installed
- A. Roof support assembly without support - Maximum Distance is 8'
- B. Vertical Support Spacing, refer to **Table 8** on **page 28**

The illustrations shown provide useful information on the installation of a chimney system. Each installation is specific to the application and the job site. If you encounter a situation not covered by this illustration, refer to the guide or consult the factory. The chimney systems illustrated in this manual have been tested to and comply with UL 103 Type HT, Factory-Built Chimneys for Building Heating Appliances and UL2561 Factory-Built Chimney for Building and Heating Appliance coverage as a Medium Heating Appliance. Chimney needs to be installed additionally in accordance with NFPA 211.

There is no limit on the angle or slope of an offset for gas or liquid fuel burning appliances, but with a solid fuel burning appliance the slope must not be greater than 30 degrees (USA) or 45 degrees (Canada) from vertical, even if a fan is providing ventilation to the system.

Chimney for combination fuel heating appliances which are capable of burning solid fuel or are convertible to solid fuel are limited to the same 30 degrees (US) or 45 degrees (Canada) slope even if the current choice of fuel is gas or oil.

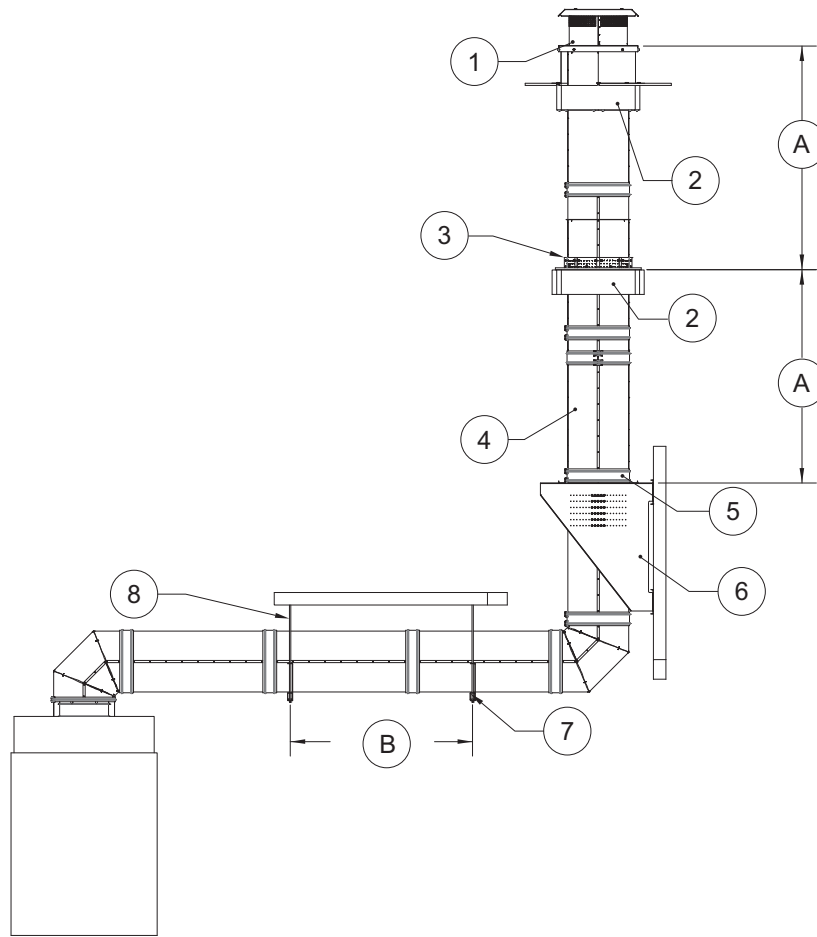
Figure 38 - Chimney Installation Guide Details View 2



1. Vertical Support Plate
2. Vertical Support Ring
3. Substrate
4. 5/16"-18 x 1-1/2" Self Drilling Screws
5. 1/4"-20 Whiz Nuts and Bolts
6. Base Cap
7. Ceramic Gasket
8. Vented Curb
9. Vertical Support

10. Transition Plate
11. Inside Shell
12. Chimney Shell
13. Vertical Floor Support with Threaded Rod
- A. Floor Opening, refer to **Table 11 on page 43**
- B. Maximum angle not to exceed when being used with solid fuel chimney applications - 30° USA (45°Canada)

Figure 39 - Chimney Installation Guide Details View 3



1. Base Cap
2. Combustible Surface
3. Support Fastener Band
4. Shell
5. Double V-band
6. Vertical Support
7. Horizontal Support
8. 1/2" Threaded Rod (Minimum)

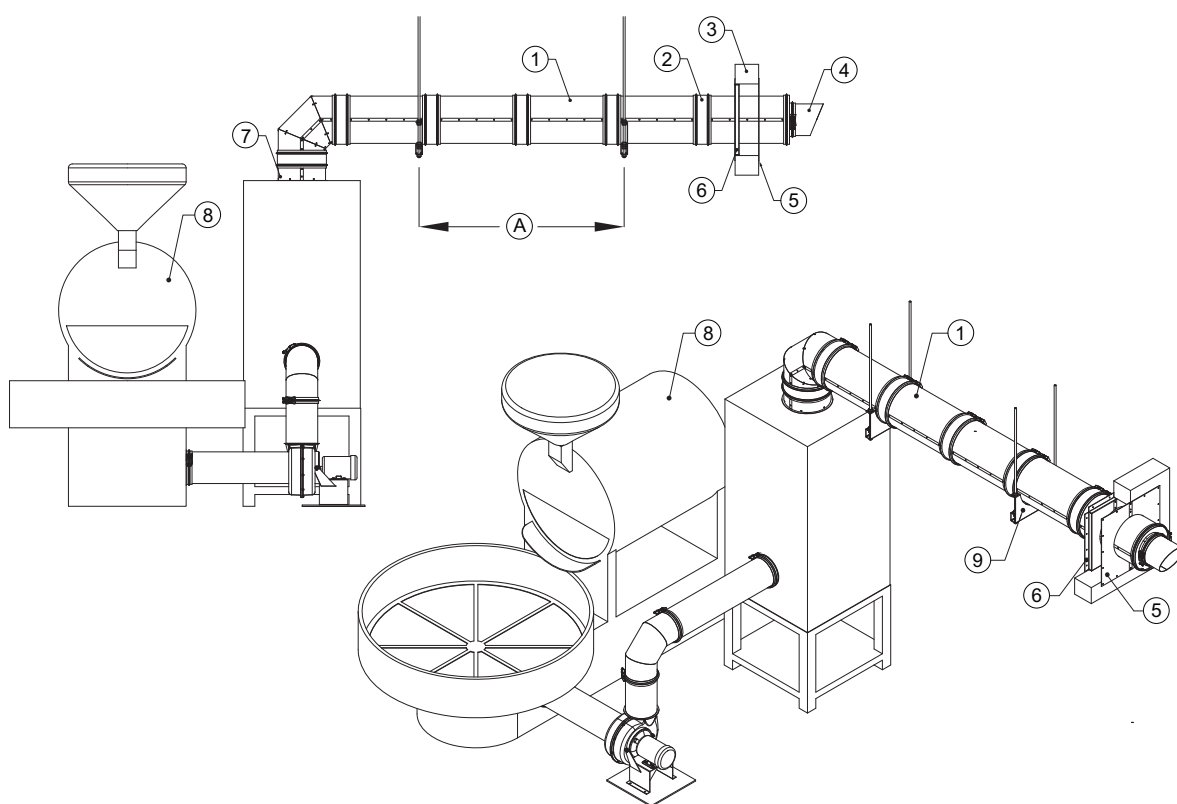
- A. Vertical Support Spacing, refer to **Table 8 on page 28**
- B. Horizontal Support Spacing, refer to **Table 7 on page 26**

Chimney Assembly for Direct Vent Applications

Figure 40 provides information on the installation of a chimney assembly system using a direct vent cap assembly. The chimney assembly for direct vent applications should only be used for gas or liquid fuel burning appliances. **DO NOT USE FOR SOLID FUEL APPLICATIONS.** Each installation is specific to the application and the job site. If you encounter a situation not covered by this illustration, refer to the guide or consult the factory. Direct Vent Chimney systems are listed to UL 103 HT and UL 2561, refer to **“LISTINGS”** on page 4 for listing details.

There is no limit on the angle or slope of an offset for gas or liquid fuel burning appliances. Clearance to combustibles must be always maintained, refer to **“Direct Vent Chimney Cap”** on page 53 for information. The direct vent cap assembly shown in **Figure 40** has a 3” clearance to combustibles that must be maintained at all times.

Figure 40 - Direct Vent Side Wall Installation



1. 2R Double Wall Section (5"-16")
2. Double Wall V-band*
3. Wall
4. Discharge Vent Section*
5. Outer Cover*
6. Clearance Plates*

7. Equipment Adapter
8. Direct Vent Equipment
9. Vent Support System

* Components included with Direct Vent Cap Assembly

A. Horizontal Support Spacing, refer to **Table 7**

Direct Vent Chimney Cap

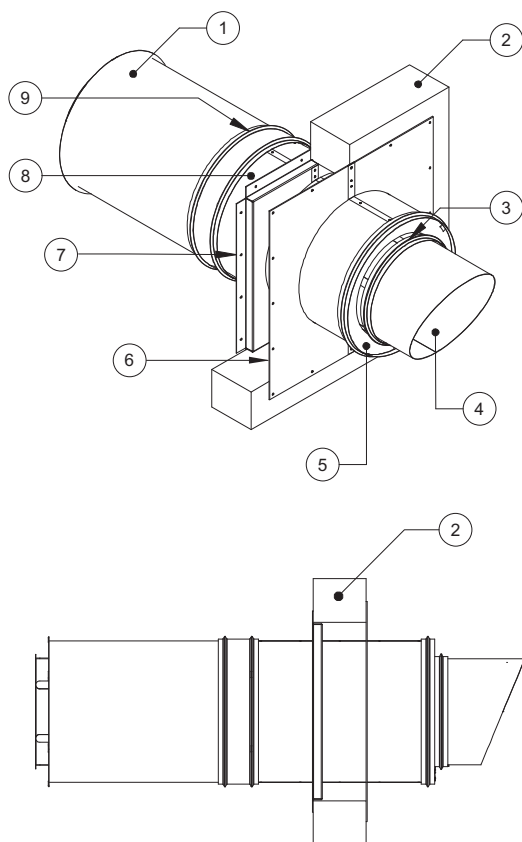
ATTENTION: Chimney assembly for direct vent systems cannot be used on solid-fuel applications.

Refer to **Figure 41** for clearance to combustibles and wall opening dimensions. Once the opening has been cut, install the 2R direct vent section provided with the kit. Center the clearance plate on the inside of the wall and the outer cover on the outside of the wall. Secure using the provided hardware kit.

Install the 2R direct vent section to the 2R double wall vent section mounted to the wall. Secure sections and double wall end cap with V-bands. Install the direct vent section to the double wall vent section. Secure sections and double wall end cap with V-bands.

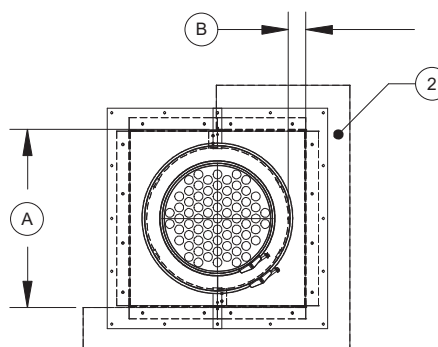
Verify clearance to combustibles for the insulated vent section coming through the wall, refer to “Shell Diameter” clearance in **Figure 41**. Inspect the thimble assembly to make sure all hardware is secure and clearance to combustibles is correct.

Figure 41 - Direct Vent Cap Assembly Details



Clearances for Direct Vent Chimney Cap

DIAMETER	SHELL DIAMETER	CLEARANCE TO COMBUSTIBLES	CLEARANCE TO NON-COMBUSTIBLES	WALL OPENING
5"	9"	3"	0"	15-1/2"
6"	10"	3"	0"	16-1/2"
7"	11"	3"	0"	17-1/2"
8"	12"	3"	0"	18-1/2"
10"	14"	3"	0"	20-1/2"
12"	16"	3"	0"	22-1/2"
14"	18"	3"	0"	24-1/2"
16"	20"	3"	0"	26-1/2"



1. 2R Double Wall Vent Section (5"-16")
2. Wall
3. Single Wall V-band*
4. Discharge Vent Section*
5. Single Wall V-band/Double Wall End Cap*
6. Outer Cover*
7. Clearance Plates*

8. 2R Vent Section (5"-16")*
 9. Double Wall V-band*
- * Components included with Vent Cap Assembly
- A. Wall Opening, refer to **Figure 41**
- B. Clearance to Combustibles, refer to **Figure 41**

Methods Used to Test Duct After Assembly

NOTE: The mentioned leakage tests are not specific to the listing(s) requirements of the system being tested. Local codes and regulations should be consulted before final inspection. In the absence of local codes and regulations, refer to the latest edition of the International Mechanical Code (IMC) Chapter 5, Exhaust Systems for inspection and testing requirements.

Method 1 - Light Test per IMC 506.3.2.5

Prior to the concealment of any portion of a duct system, a leakage test shall be performed. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the system from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary equipment and perform a system leakage test. A light test shall be performed to determine that all welded and brazed joints are liquid-tight.

A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire duct section to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A test shall be performed for entire duct system, including the hood-to-duct connection. The system shall be permitted to be tested in sections, provided that every joint is tested. For listed factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.

Method 2 - Smoke Test

NOTE: Materials or chemicals used for smoke testing should not be corrosive to stainless steel. Smoke generating equipment containing chlorine or chlorinated chemicals must not be used. Consult the factory for any questions regarding the smoke equipment and duct compatibility.

EXCEPTION: When performing a Capture and Containment (C&C) test on a ventilation hood, smoke candles (cartridges) are allowed. Only use non-toxic smoke with low chloride concentration <20%. Testing should be conducted with all exhaust fans running to dilute the air.

After installing the duct, allow the listed sealant to cure for a minimum of 24 hours. Place the smoke equipment at the bottom of the duct system. The natural upward draft will pull the smoke to the top of the duct system. Various length duct runs may require multiple smoke tests. Once the smoke has reached the top of the duct run, cap the duct securely. Inspect all joints for leakage.

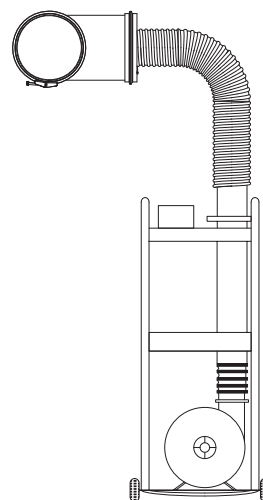
Method 3 - Pressure Testing per SMACNA's HVAC Air Duct Leakage

A pressure test shall be performed during initial installation by the permit holder or its testing agency using the appropriate local code testing procedure. This test must be performed as a rough inspection before being covered, concealed, insulated, or wrapped before final installation to the exhaust fan, kitchen exhaust hood, or other equipment.

All double wall joint connections have been tested to Seal Class A, Leakage Class 1 specifications per SMACNA's HVAC Air Duct Leakage Test Manual. In the absence of local code testing procedures, use SMACNA's HVAC Air Duct Leakage Test Manual for inspection and testing guidelines. Recommended Air Leakage Tester: Dalt Model 6900. Refer to **Figure 42**.

NOTE: If the duct system is modified or altered, the entire system will require re-testing.

Figure 42 - Leakage Test



[illegible]

GENERAL DUCT WEIGHTS

The average weight of the duct, per foot of length, can be calculated using the following formulas below. Duct design should provide adequate support to ensure duct components are not overloaded.

Weight – DW-2R

The following formula can be used to approximate the weight of total length of DW-2R double wall duct. Inner Shell + Outer Shell + Insulation or $(.0327 * L * D) + [.0218 * L * (D+4)] + [.0364 * L * (D+2)]$.

Weight – DW-3R

The following formula can be used to approximate the weight of total lengths of DW-3R double wall duct. Inner Shell + Outer Shell + Insulation or $(.0327 * L * D) + [.0218 * L * (D+6)] + [.0436 * L * (D+3)]$.

Weight – DW-3Z

The following formula can be used to approximate the weight of total lengths of DW-3Z double wall duct. Inner Shell + Outer Shell + Insulation or $(.0327 * L * D) + [.0218 * L * (D+6)] + [.0491 * L * (D+3)]$.

Weight – Example

The “D” value in the formulas above represents the inner duct diameter in inches. The “L” value in the formulas above represents the total length in inches. Duct system: DW-3Z, 12” inner duct, 100 FT long. Using the DW-3Z formula above, $(.0327 * 1200 * 12) + (.0218 * 1200 * 18) + (.0491 * 1200 * 15) = 1825$ lbs.

CLEANING & MAINTENANCE RECORD

Date	Service Performed

As a result of our dedication to constant improvements and quality, the MANUFACTURER reserves the right to update specifications without notice. Please refer to MANUFACTURER'S website for up to date documentation.

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