



Installing the Vent/Explosion Panels

Twelve (12) roof panels (four (4) groups of three (3) panels) are installed onto the roof for release during increased internal bin pressure resulting from an explosion. This procedure illustrates the installation of these twelve (12) special roof vent/explosion panels.

Before you begin:

Install all the standard roof panels leaving four (4) locations (bays) (approximately 90° apart) open as shown, to install three (3) vent/explosion panels in each open location (bay). (See Figure 1.)

What you should know:

The existing holes in the standard panels, eave angle, purlins and the roof panel clips cannot be used for installing the pressure relief screws. The holes for the pressure relief screws will need to be field drilled/tapped only during the installation.

During explosion, the three (3) roof vent/explosion panels release together.

NOTE: Refer to 40-Series 54' Alpha Construction Manual for the installation procedure of the standard roof panels.

NOTE: Do not tighten the bolts on the standard roof panels until all vent/explosion panels have been installed.

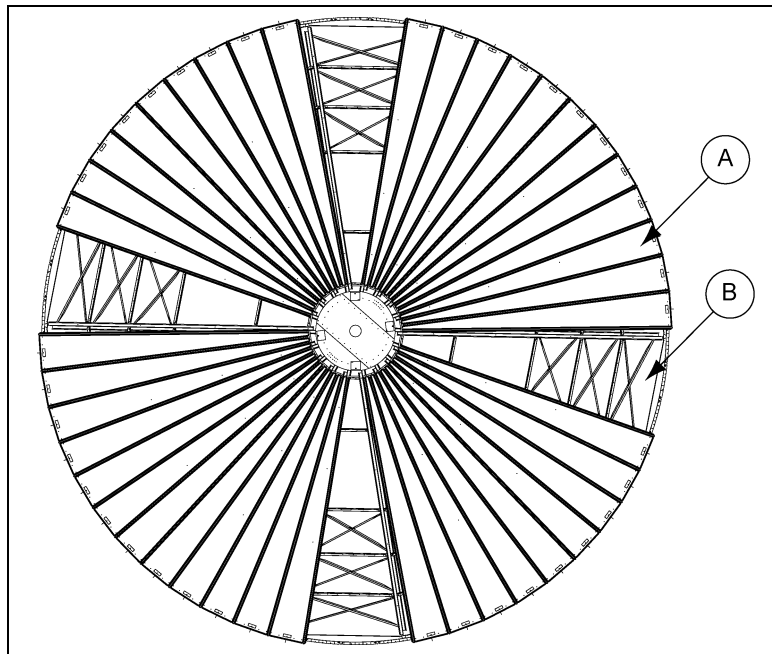


Figure 1 Location to Installing the Vent Panels

Ref #	Description
A	Standard Roof Panels
B	Locations of the Bays (4)



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1. Position the first of the three (3) vent/explosion panels (C) on top of the adjacent standard panel (D) in any one of the four (4) open locations (bays) and secure it with the clamps. *(See Figure 2.)*

NOTE: Make sure to position the rib of the vent/explosion panel on top of the rib of the adjacent standard roof panel (D).

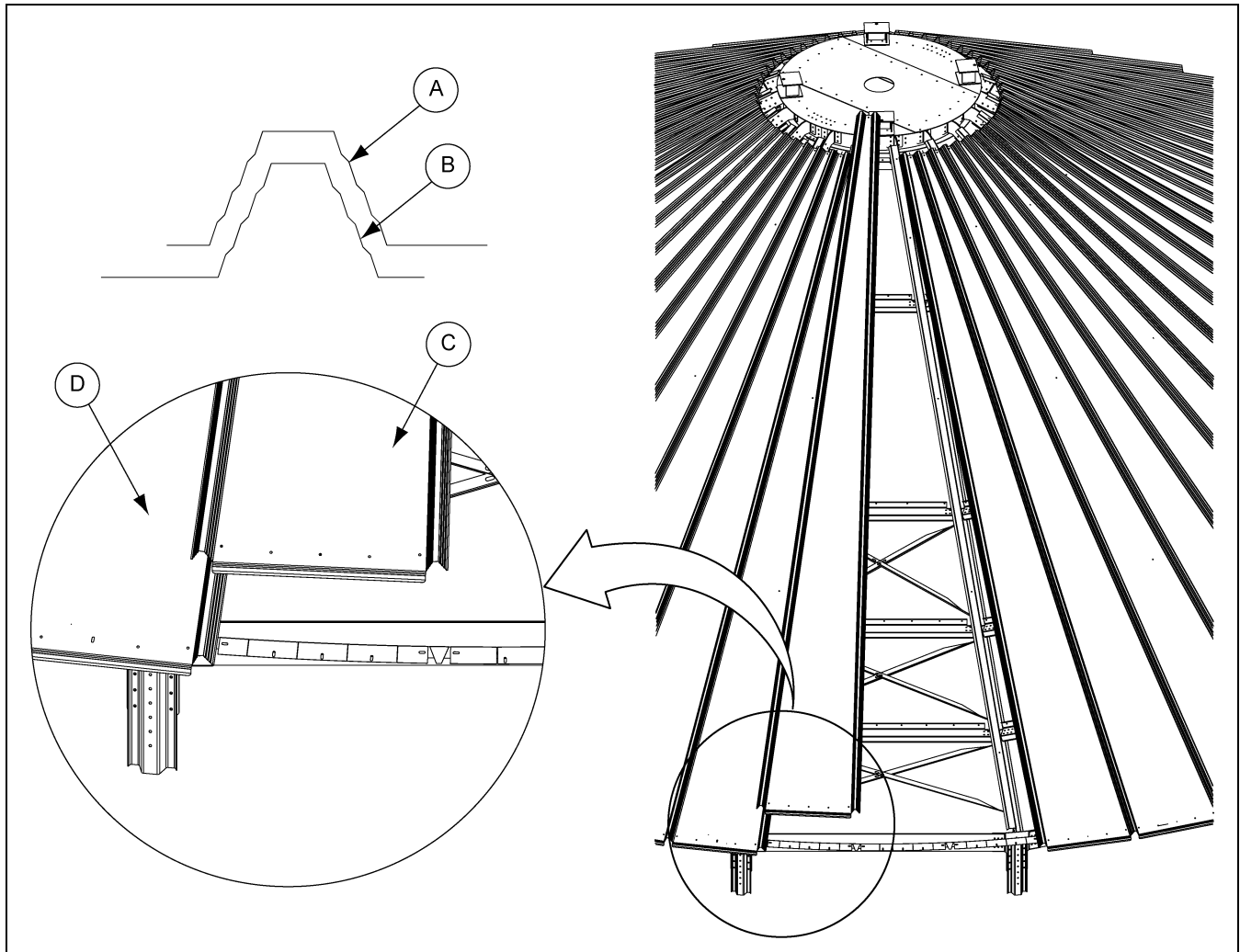


Figure 2 Installing the First Vent/Explosion Panel

Ref #	Description
A	Vent/Explosion Panel Rib
B	Standard Panel Rib
C	Vent/Explosion Panel (CTR-1471)
D	Standard Panel (CTR-0391)

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2. Field drill 3/16" pilot holes at all pressure release fasteners (S-10366) (175# - Tan) in the adjacent standard and the vent/explosion panels to install the pressure release self-tapping screws at the following locations: (See Figure 3.)

IMPORTANT: Refer to the below table for spacing the 3/16" holes on the roof vent/explosion panels and the connecting members.

- Upper rib to upper rib (drill through both the ribs).
- Flat of the panel to the eave angle (drill through both the panel and the eave angle).
- Flat of the panel to the purlin (drill through the panel and the purlin).

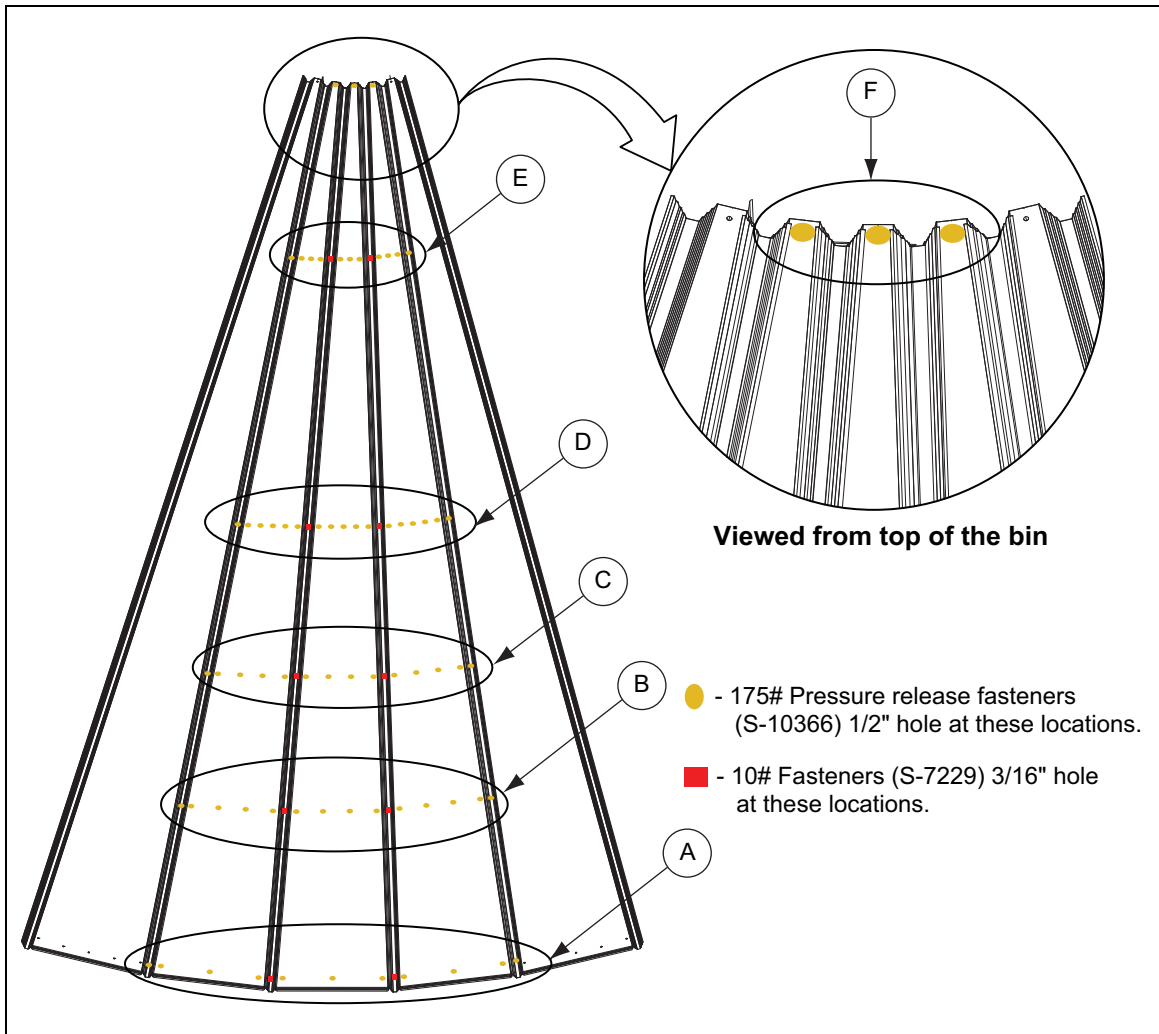


Figure 3

Location	Fastener Spacing (in.)	# of Fasteners on Panel Flat
Eave (A)	14	3
Purlin 1 (B)	6.77	4
Purlin 2 (C)	6.12	4
Purlin 3 (D)	4.14	5
Purlin 4 (E)	3.91	3
Roof Panel Clip (F)	8.63	1

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3. Enlarge the 3/16" holes (only in the roof vent/explosion panels) to 1/2" holes **(to allow the deformation of the aluminum pressure release washers as and when the release occurs)** using 1/2" drill bit at the following locations:

- "Over" vent/explosion panel to "under" standard roof panel; "Under" panel only has 3/16" hole for self-tapping screws.
- Flat of the vent/explosion panel above the eave angle; eave angle only has 3/16" hole for self-tapping screws.
- Flat of vent/explosion panel above the purlin; purlin only has 3/16" hole for self-tapping screws.

NOTE: *Make sure to remove the vent/explosion panels from the roof before enlarging the holes.*

IMPORTANT: *All 1/2" holes should be made by using 3/16" pilot holes as a guide and simply enlarging the hole with a 1/2" drill bit. **DO NOT** drill the 1/2" hole without first drilling the 3/16" pilot holes through the connecting members. Be sure that the 1/2" enlarged hole is centered on the 3/16" pilot hole.*

4. Install the self-tapping screws to secure the panels in position.

IMPORTANT: *All fasteners must be handled/tightened with care to prevent the damage or distortion of the washers.*

NOTE: *Make sure to leave enough space to allow the remaining roof vent/explosion panels to be installed without damaging the panel. Allow adequate space so that the flashing can be easily installed without forcing the members to fit together.*

5. Repeat the [Steps 1-4](#) to position and secure the second roof vent/explosion panel over (on top) of the first roof vent/explosion panel.

IMPORTANT: *Note that the major rib of the second roof vent/explosion panel has the standard holes for 1/4" screws (**S-7229**) (**10# - Red**) in both the upper and the lower roof vent/explosion panel.*

NOTE: *Make sure that there are no pressure relief fasteners at the ribs of the interior roof vent/explosion panels.*

6. Repeat the [Steps 1-5](#) to position and secure the third roof vent/explosion panel over (on top) of the second roof vent/explosion panel. ([See Figure 4 on Page 5.](#))

IMPORTANT:

- *Note that the major rib of the second roof vent/explosion panel has the standard holes for 1/4" screws in both the upper and the lower roof vent/explosion panel at the interior; there are no pressure relief fasteners at the ribs of the interior roof vent/explosion panels.*
- *Overlap the third roof vent/explosion panel over the adjacent standard roof panel; pressure release self-tapping screws are used at the upper rib of the roof vent/explosion panels. Make sure to enlarge the 3/16" holes to 1/2" holes.*

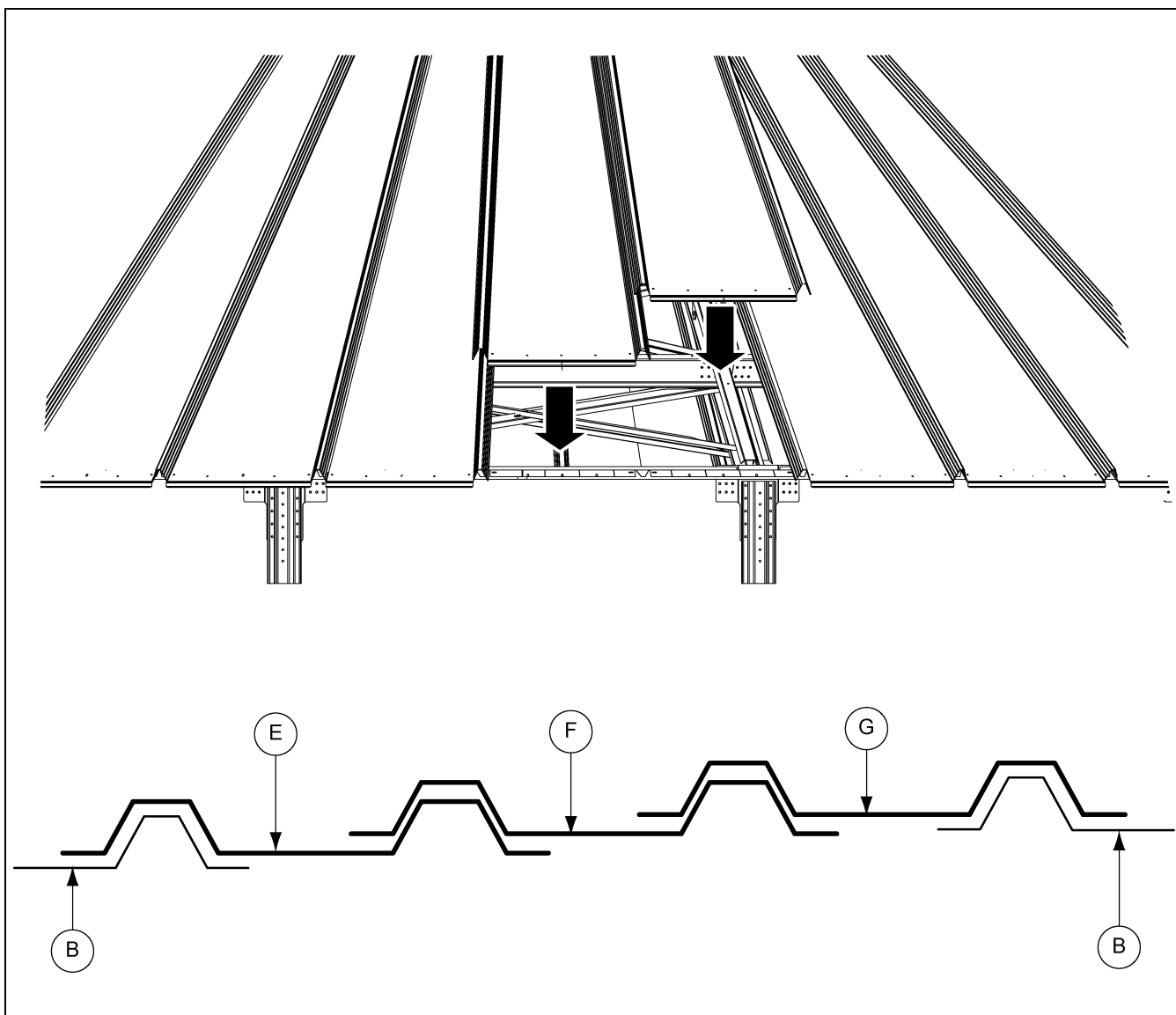


Figure 4 *Installing the Vent Panels*

Ref #	Description
B	Standard Panel Rib
E	1 st Set of Explosion Venting Panel
F	2 nd Set of Explosion Venting Panel
G	3 rd Set of Explosion Venting Panel

7. Install all the screws and tighten all the roof bolts once the flashing has been properly positioned.
8. Repeat the [Steps 1-7](#) to install the other three (3) groups of vent/explosion panels.

Installing the Vent/Explosion Flashing

Before you begin:

Install all the standard roof flashings under the cap plates with bolts installed, but not fully tightened.

What you should know:

The vent/explosion flashing is a two (2) piece design (top flashing piece (A) which is installed underneath the cap plate and the bottom vent/explosion flashing piece (B) which is installed over the top flashing piece and the three (3) roof vent/explosion panels.

The bottom vent/explosion flashing piece does not have any holes. The holes for the pressure relief screws will need to be field drilled/tapped only during the installation.

During the explosion, only the bottom vent/explosion flashing piece will release together with the roof vent/explosion panels.

NOTE: *Refer to 40-Series 54' Alpha Construction Manual for the installation procedure of the standard flashings.*

NOTE: *Do not tighten the bolts on the standard flashings until all vent/explosion flashing pieces have been installed.*

1. Install the top flashing piece (A) under the cap plate and over the standard flashings using the flange bolts and nuts.
2. Position the bottom vent/explosion flashing piece (B) over the top flashing piece and over the adjacent flashing pieces; tighten bolts on standard flashing pieces once the bottom vent/explosion flashing piece has been properly positioned.
3. Field drill 3/16" pilot holes for all pressure release fasteners **(S-8064) (70# - Green)** on the top flashing, vent/explosion flashing and the adjacent standard flashing.
4. Caulk (C) between the top flashing piece and the vent flashing piece to prevent water infiltration.

NOTE: *Since the vent/explosion flashing piece must be installed over the top flashing piece, without proper caulking, water infiltration is highly possible.*

5. Install all the screws to tighten the flashing pieces. [\(See Figure 5 on Page 7.\)](#)

IMPORTANT: *All fasteners must be handled/tightened with care to prevent the damage or distortion of the washers.*

Installing the Vent/Explosion Flashing (Continued)

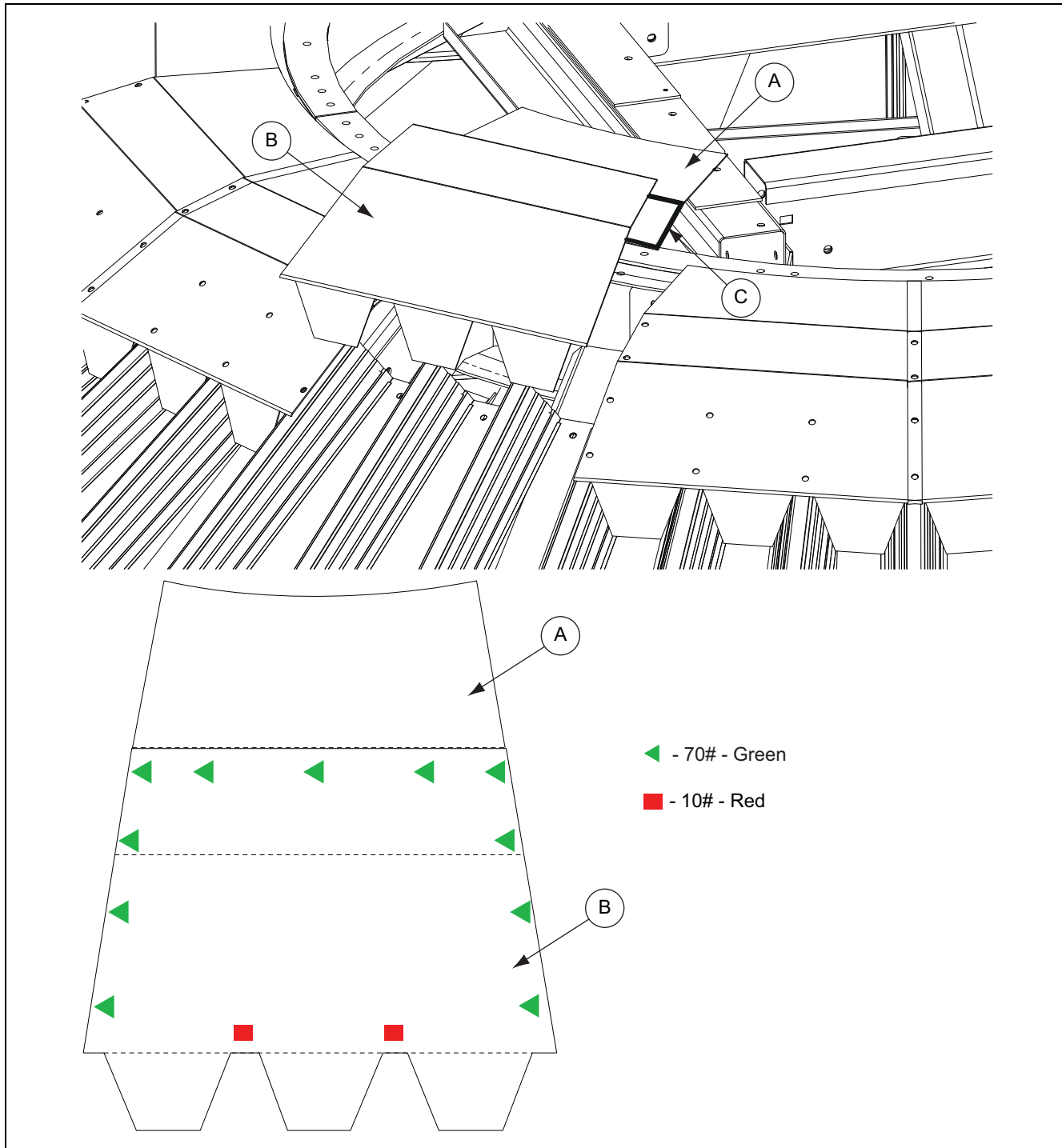


Figure 5 Installing the Vent Flashing

Ref #	Description
A	Top Flashing Piece (CTR-1479)
B	Vent/Explosion Flashing Piece (CTR-1478)
C	Caulking

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Restraint Chain Installation

The chain will ensure that the panels do not become flying objects during the explosion due to the internal bin pressure.

Before you begin:

All the vent/explosion panels and the vent/explosion flashings should be installed on the roof.

1. Field drill three (3) 3/8" holes at regular intervals in the front face of the top purlin.
2. Field drill a 3/16" hole in each roof vent/explosion panel (C) on top at some distance way from purlin (D).
3. Cut the chain link (E) to the required length.
4. Place a 5/16" bolt (A) with a washer to the hole in the purlin/panel clip and insert one end of the chain link with the washer on the other side to the bolt. Secure and tighten with a 5/16" nut (B).
5. Place a 5/16" bolt (A) bolt with a washer to the hole in the roof vent/explosion panel (C) and insert the other end of the chain link with washer to the bolt under the panel. Secure and tighten with a 5/16" nut (B). (See Figure 6.)

NOTE: Make sure to place the bolt from the top of the panel, thus ensuring the bolt head and the washer is on the outside of the panel for sealing purposes.

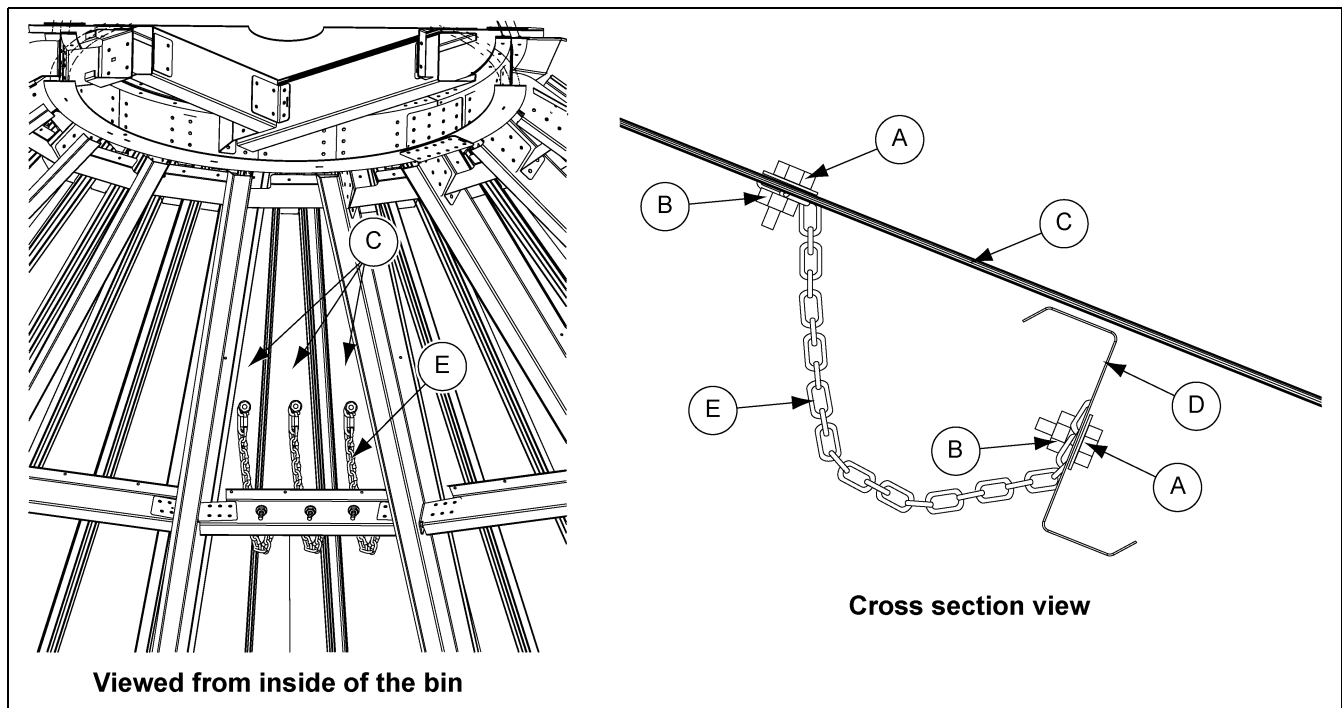


Figure 6 Restraint Chain Installation

Ref #	Description
A	5/16" Flange Bolt (S-10260)
B	5/16" Flange Nut (S-3611)
C	Vent/Explosion Panel (CTR-1471)
D	Purlin
E	Chain Links