



6', 7' and 9' Bulk Feed Tank BFT Series and GHT Series

Assembly Manual

PNEG-1460

Date: 02-17-15



PNEG-1460

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

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READ THIS MANUAL carefully to learn how to properly use and install equipment. Failure to do so could result in personal injury or equipment damage.

INSPECT the shipment immediately upon arrival. The customer is responsible for ensuring that all quantities are correct. The customer should report and note any damage or shortage on the bill of lading to justify their claim to the transport company.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your equipment and should be easily accessible when needed.

This warranty provides you the assurance that the company will back its products when defects appear within the warranty period. In some circumstances, the company also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the factory specifications, the warranty will become void and field improvements may be denied.

Safety Guidelines

This manual contains information that is important for you, the owner/operator, to know and understand. This information relates to protecting **personal safety** and **preventing equipment problems**. It is the responsibility of the owner/operator to inform anyone operating or working in the area of this equipment of these safety guidelines. To help you recognize this information, we use the symbols that are defined below. Please read the manual and pay attention to these sections. Failure to read this manual and its safety instructions is a misuse of the equipment and may lead to serious injury or death.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



This symbol indicates an imminently hazardous situation which, if not avoided, **will result in serious injury or death**.



This symbol indicates a potentially hazardous situation which, if not avoided, **may result in serious injury or death**.



This symbol indicates a potentially hazardous situation which, if not avoided, **may result in minor or moderate injury**.



This symbol indicates a potentially hazardous situation which, if not avoided, **may result in property damage**.

General Safety Statement

Our foremost concern is your safety and the safety of others associated with grain handling equipment. This manual is to help you understand safe operating procedures and some problems that may be encountered by the operator and other personnel.

As owner and/or operator, you are responsible to know what requirements, hazards, and precautions exist and inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment, which may produce a very dangerous situation, where **SERIOUS INJURY** or **DEATH** may occur.

You should consider the location of the bin site relative to power line locations or electrical transmission equipment. Contact your local power company to review your installation plan or for information concerning required equipment clearance. Clearance of portable equipment that may be taken to the bin site should also be reviewed and considered. Any electrical control equipment in contact with the bin should be properly grounded and installed in accordance with National Electric Code provisions and other local or national codes.

This product is intended for the use of grain storage only. Any other use is a misuse of the product.



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

Sidewall bundles or sheets must be stored in a safe manner. The safest method of storing sidewall bundles is laying horizontally with the arch of the sheet upward, like a dome. Sidewall sheets stored on edge must be secured so that they cannot fall over and cause injury. Use care when handling and moving sidewall bundles.

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

2. Safety

Safety Instructions

Our foremost concern is your safety and the safety of others associated with this equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems that may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards, and precautions exist, and to inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation where **SERIOUS INJURY** or **DEATH** may occur.

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

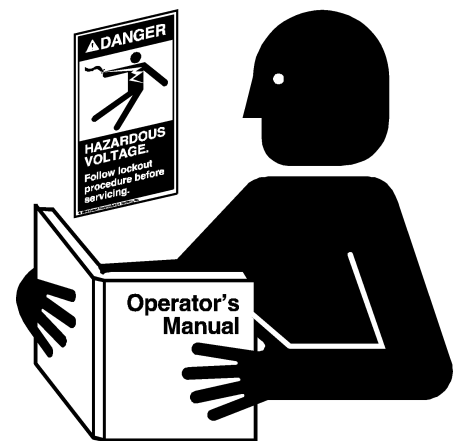
Follow Safety Instructions

Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machinery in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual or need assistance, contact your dealer.



Read and Understand Manual

Practice Safe Maintenance

Understand service procedures before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is in operation. Keep hands, feet, and clothing away from rotating parts.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any built-up grease, oil, and debris.



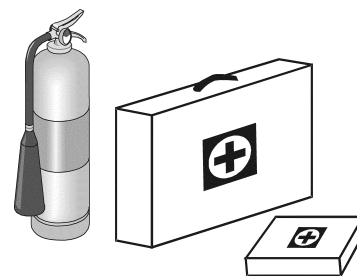
Maintain Equipment and Work Area

Prepare for Emergencies

Be prepared if fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



Keep Emergency Equipment Quickly Accessible

Wear Protective Clothing

Wear close-fitting clothing and safety equipment appropriate to the job.

Remove all jewelry.

Tie long hair up and back.

Wear safety glasses at all times to protect eyes from debris.

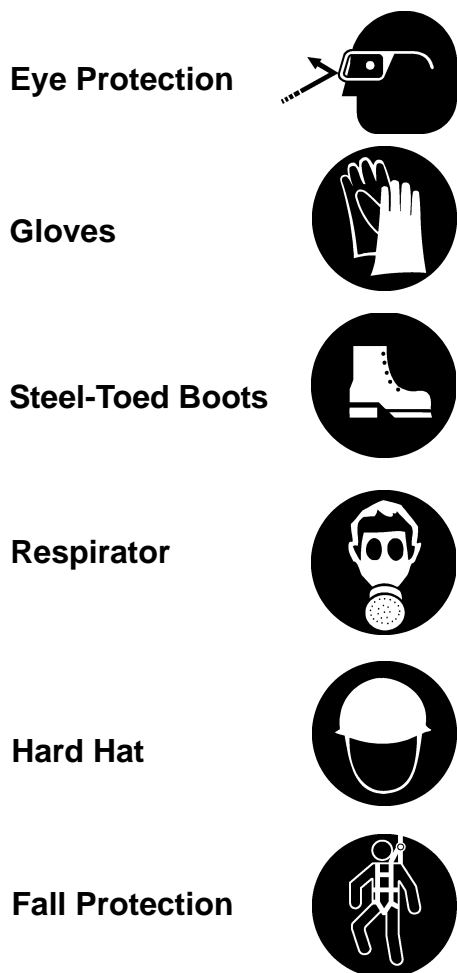
Wear gloves to protect your hands from sharp edges on plastic or steel parts.

Wear steel toed-boots to help protect your feet from falling debris. Tuck in any loose or dangling shoestrings.

A respirator may be needed to prevent breathing potentially toxic fumes and dust.

Wear a hard hat to help protect your head.

Wear appropriate fall protection equipment when working at elevations greater than six feet (6').



Eye Protection

Gloves

Steel-Toed Boots

Respirator

Hard Hat

Fall Protection

Proper Storage of Grain Bin/Silo Materials Prior to Construction

Wet storage stain (rust) will develop when closely packed bundles of galvanized material, such as sidewall and roof sheets, have moisture present. Inspect roof and sidewall bundles on arrival for any moisture. If moisture is present, it must not be allowed to remain between the sheets. Separate the sheets or panels immediately and wipe them down. Spray with a light oil or diesel fuel.

If possible, sidewall bundles, roof sheets and other closely packed galvanized materials should be stored in a dry, climate controlled building. If outdoor storage is unavoidable, the materials should be stored so that they are raised above the ground and vegetation. Any stacking and spacing materials should not be corrosive or wet. Be sure to protect materials from the weather, but permit air movement around the bundles if possible.

Storing roof bundles and sidewall sheets at a slight incline can also help minimize the presence of moisture. Storing the bundles with the center of the dome up (like an arch) is one option for minimizing moisture during storage. Sidewall bundles can also be stored on edge but must be secured so that they do not fall over and cause injury.

If “white rust” or “wet storage stain” occurs, contact the manufacturer immediately about ways to minimize the adverse effect upon the galvanized coating.

3. Decals



For replacement decals, contact:

GSI Decals
 1004 E. Illinois St.
 Assumption, IL. 62510
 Phone: 1-217-226-4421

! DANGER

Rotating flighting will kill or dismember.
 Flowing material will trap and suffocate.
 Crusted material will collapse and suffocate.

Keep clear of all augers. DO NOT ENTER this bin!

Failure to heed these warnings will result in serious injury or death.

If you must enter the bin:

1. Shut off and lock out all power.
2. Use a safety harness and safety line.
3. Station another person outside the bin.
4. Avoid the center of the bin.
5. Wear proper breathing equipment or respirator.

DC-2123

! DANGER

**> 300 lbs
(136 kg)**

**DO NOT EXCEED LADDER
 LOAD LIMIT**
Load limit = 300 LBS (136 kg)
 Excessive load will damage
 ladder resulting in injury or death.

GSI Group, 217-226-4421 DC-2307



Bulk Feed Tank Assembly Manual General Instructions

This product is intended for the use of storing feed only. Any other use is a misuse of the product.

While every effort has been made to keep the edges from being sharp, please wear the proper protective clothing while erecting the Bulk Feed Tank.

Our company recommends that you contact the local power company and have a representative review the installation so the wiring will be compatible with their system and so that you will have adequate power supplied to the unit.

A Bulk Feed Tank weighs a minimum of 444 lbs. (201kg). All precautions should be taken when raising the tank to its feet. Follow the instructions given later in this manual.

The safety pages show you where you can find the safety decals. The photographs show exactly where the decals should be. If a decal has been damaged or is missing contact our company for a free replacement.

First, read the assembly manual completely before starting to assemble your Bulk Feed Tank. Check the shipment with the packing list to be sure there are no shortages.

1. Decal protective mask must be removed when assembling tank. Mask may become difficult to remove if left exposed to sunlight.
2. Vertical seams **must be staggered** on all sidewall rings.
3. When legs extend up 2 rings, the leg holes must be in **alignment** in the bottom 2 rings.
4. All hopper seams and the hopper collar use truss head bolts. The heads of the bolts must be on the **inside** of the tank.
5. Hex head bin bolts are used on all sidewall and roof seams with the bolt heads on the **outside** of the bin.
6. Hex head bolts are to be used on all leg to sidewall connections with the bolt heads on the inside of the tank.
7. All bolts are to be tightened from the **nut side only. Do not allow bolt heads to spin.**
8. 7' Diameter sidewall sheets **must** be bolted together so there is 65-5/8" between leg holes.
(See Page 88.)
9. Drift punches can be used to align holes.
10. All vertical sidewall sheet seams must be overlapped in the same direction.
11. A hole spacing of 3-1/8" is used at the top of all top sidewall sheets and at the bottom of all bottom sidewall sheets.

Selecting the Proper Site

The selected site should be level, firm and free from underlying debris. The tank can be installed satisfactorily on slopes, but as the slope increases, additional labor and materials are required for the foundation. The concrete foundation surfaces must be level. If some fill is required, it should be watered and tamped thoroughly to prevent uneven settling from the weight of the tank. Good water drainage should be provided to prevent water collecting under or around the tank. The site must allow convenient access for loading and unloading and provide additional space for future units. Also, consider the positioning of handling equipment, availability of electricity, etc.

4. General Information

Tools

Tools recommended for assembly of Bulk Feed Tanks.

1. Assorted sizes of combination wrenches
2. Hammer
3. 3-12" Long drift punches
4. 1 Large flathead screwdriver
5. 1 Pair of slip joint pliers
6. Two (2) adjustable wrenches
7. Ratchet and sockets
8. Impact wrenches and sockets (if available)

All instructions shall be construed as recommendations only. The actual installation may vary according to local conditions. The GSI Group assumes no liability for results arising from the use of such recommendations.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-5	11"	2.2 Cu. Yards	60 Sq. Ft.	4
6	13"	2.6 Cu. Yards	60 Sq. Ft.	4
7	15"	3.0 Cu. Yards	60 Sq. Ft.	4
8	18"	3.6 Cu. Yards	60 Sq. Ft.	4

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-5	279 mm	1.68 Cu. Meters	5.57 Sq. Meters	4
6	330 mm	1.99 Cu. Meters	5.57 Sq. Meters	4
7	381 mm	2.29 Cu. Meters	5.57 Sq. Meters	4
8	457 mm	2.75 Cu. Meters	5.57 Sq. Meters	4

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 28 days.
3. The foundation site must be well drained and free of vegetation and debris.
4. The foundation should be level within 1/4" overall and within ± 1/8" in any 10' length along the anchor bolt circle.
5. Material estimates do not include allowance for shrinkage and waste.
6. These layouts are recommendations for GSI tanks only. Consult GSI engineering for special tank foundations.

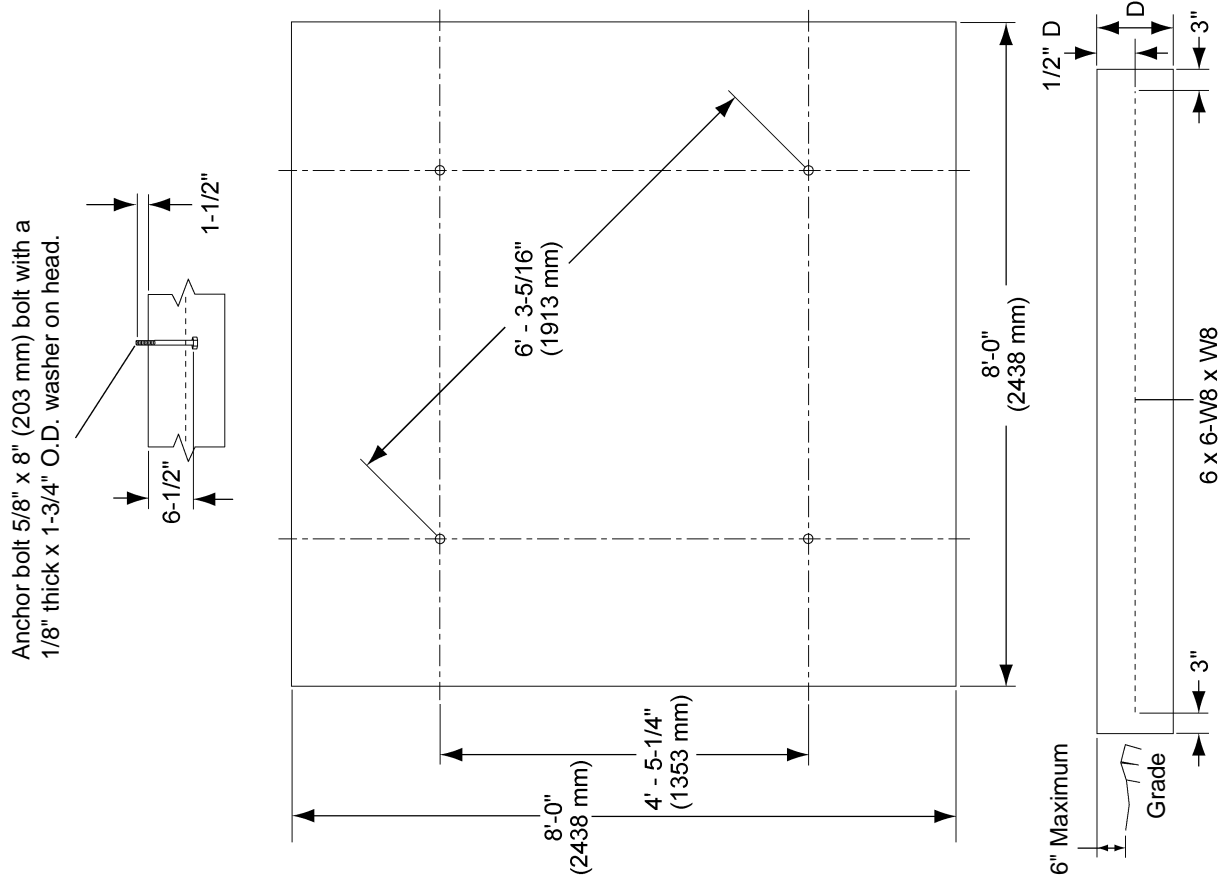


Figure 5A 6' 1-8 Rings Square Pad

5. Foundation

All instructions shall be construed as recommendations only. The actual installation may vary according to local conditions. The GSI Group assumes no liability for results arising from the use of such recommendations.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-5	11"	1.7 Cu. Yards	55 Sq. Ft.	4
6	13"	2.0 Cu. Yards	55 Sq. Ft.	4
7	15"	2.4 Cu. Yards	55 Sq. Ft.	4
8	18"	2.8 Cu. Yards	55 Sq. Ft.	4

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-5	279 mm	1.31 Cu. Meters	5.11 Sq. Meters	4
6	330 mm	1.54 Cu. Meters	5.11 Sq. Meters	4
7	381 mm	1.78 Cu. Meters	5.11 Sq. Meters	4
8	457 mm	2.13 Cu. Meters	5.11 Sq. Meters	4

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 28 days.
3. The foundation site must be well drained and free of vegetation and debris.
4. The foundation should be level within 1/4" overall and within ± 1/8" in any 10' length along the anchor bolt circle.
5. Material estimates do not include allowance for shrinkage and waste.
6. These layouts are recommendations for GSI tanks only. Consult GSI engineering for special tank foundations.

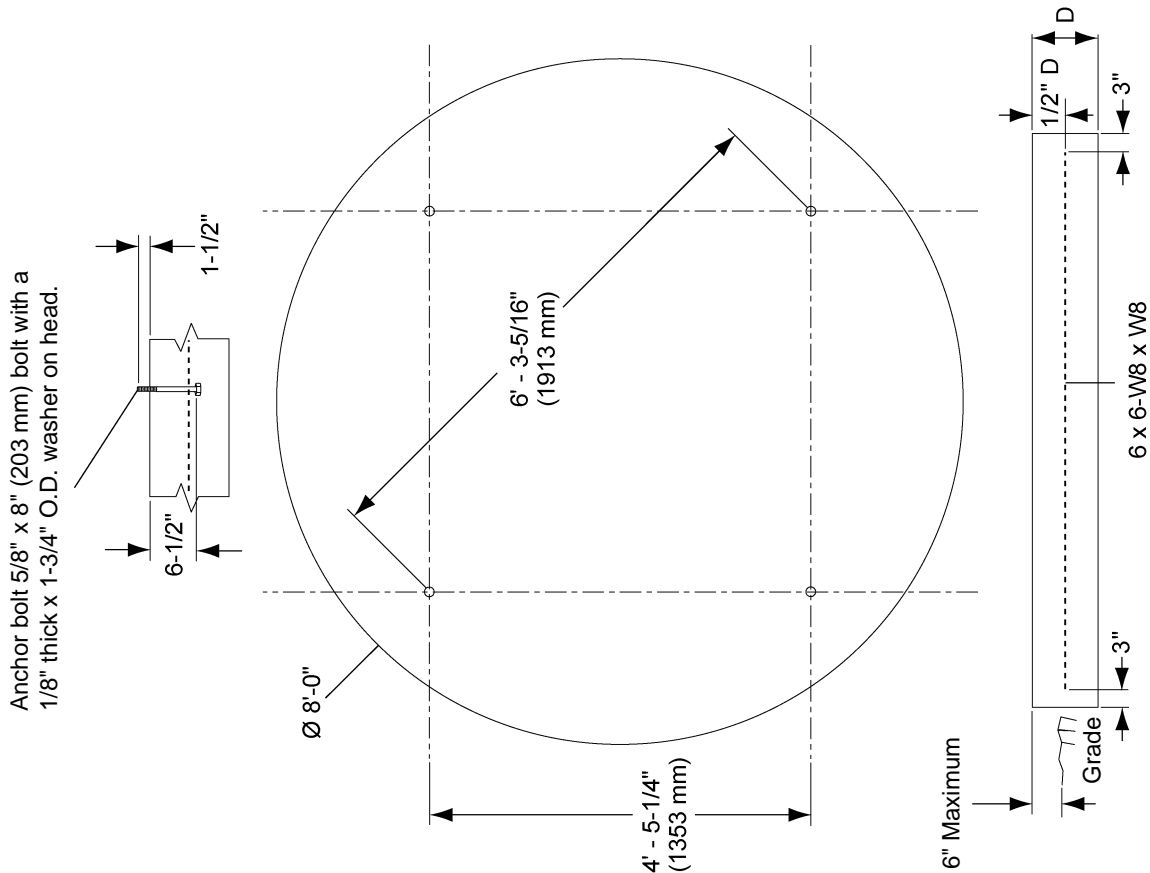


Figure 5B 6' 1-8 Rings BFT/ GHT Round Pad

All instructions shall be construed as recommendations only. The actual installation may vary according to local conditions. The GSI Group assumes no liability for results arising from the use of such recommendations.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-6	13"	3.3 Cu. Yards	80 Sq. Ft.	4
7	14"	3.5 Cu. Yards	80 Sq. Ft.	4
8	17"	4.3 Cu. Yards	80 Sq. Ft.	4

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-6	330 mm	2.52 Cu. Meters	7.43 Sq. Meters	4
7	356 mm	2.68 Cu. Meters	7.43 Sq. Meters	4
8	432 mm	3.29 Cu. Meters	7.43 Sq. Meters	4

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 28 days.
3. The foundation site must be well drained and free of vegetation and debris.
4. The foundation should be level within 1/4" overall and within ± 1/8" in any 10' length along the anchor bolt circle.
5. Material estimates do not include allowance for shrinkage and waste.
6. These layouts are recommendations for GSI tanks only. Consult GSI engineering for special tank foundations.

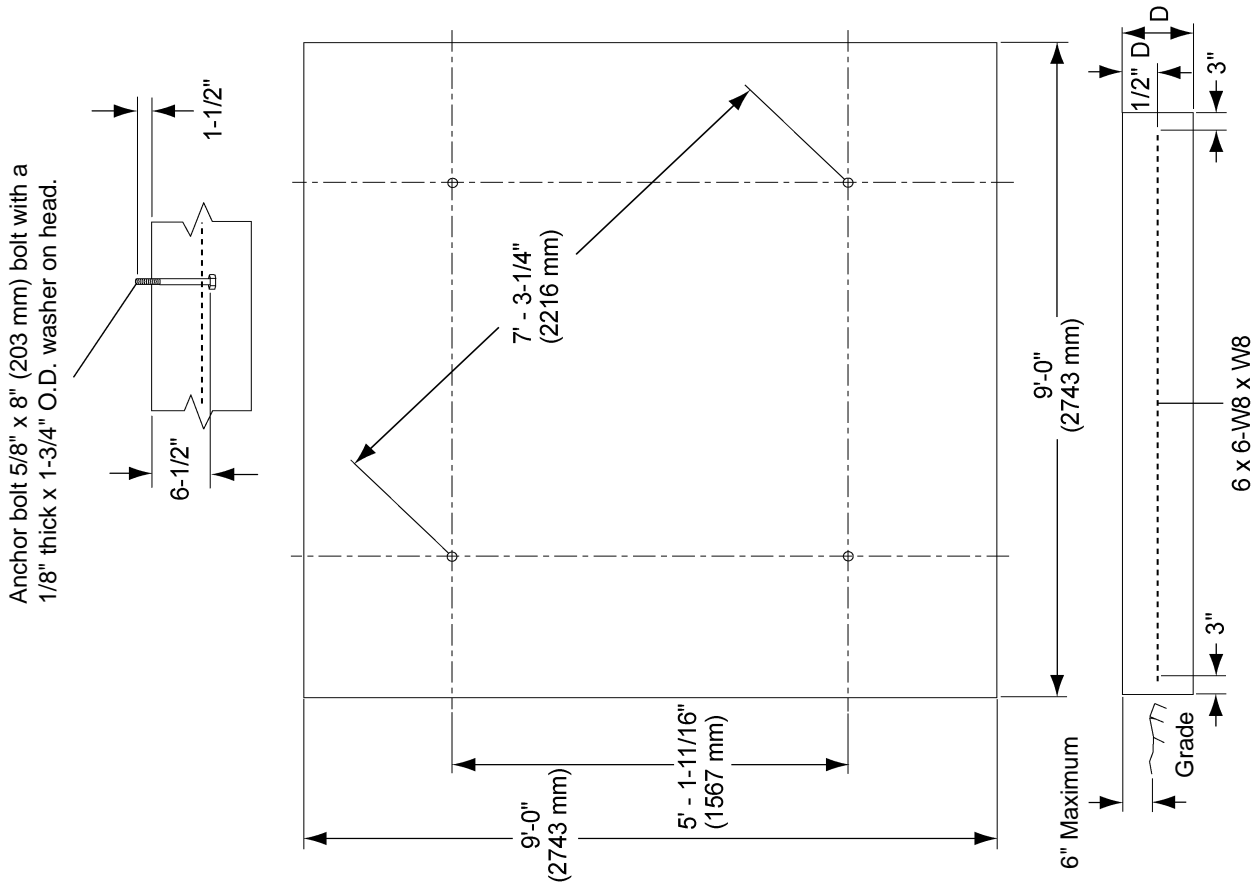


Figure 5C 7' 1-8 Rings BFT/ GHT 45° and 67° Square Pad

5. Foundation

All instructions shall be construed as recommendations only. The actual installation may vary according to local conditions. The GSI Group assumes no liability for results arising from the use of such recommendations.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-6	13"	2.6 Cu. Yards	65 Sq. Ft.	4
7	14"	2.8 Cu. Yards	65 Sq. Ft.	4
8	17"	3.4 Cu. Yards	65 Sq. Ft.	4

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-6	330 mm	1.91 Cu. Meters	6.04 Sq. Meters	4
7	356 mm	2.10 Cu. Meters	6.04 Sq. Meters	4
8	432 mm	2.55 Cu. Meters	6.04 Sq. Meters	4

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 28 days.
3. The foundation site must be well drained and free of vegetation and debris.
4. The foundation should be level within 1/4" overall and within ± 1/8" in any 10' length along the anchor bolt circle.
5. Material estimates do not include allowance for shrinkage and waste.
6. These layouts are recommendations for GSI tanks only. Consult GSI engineering for special tank foundations.

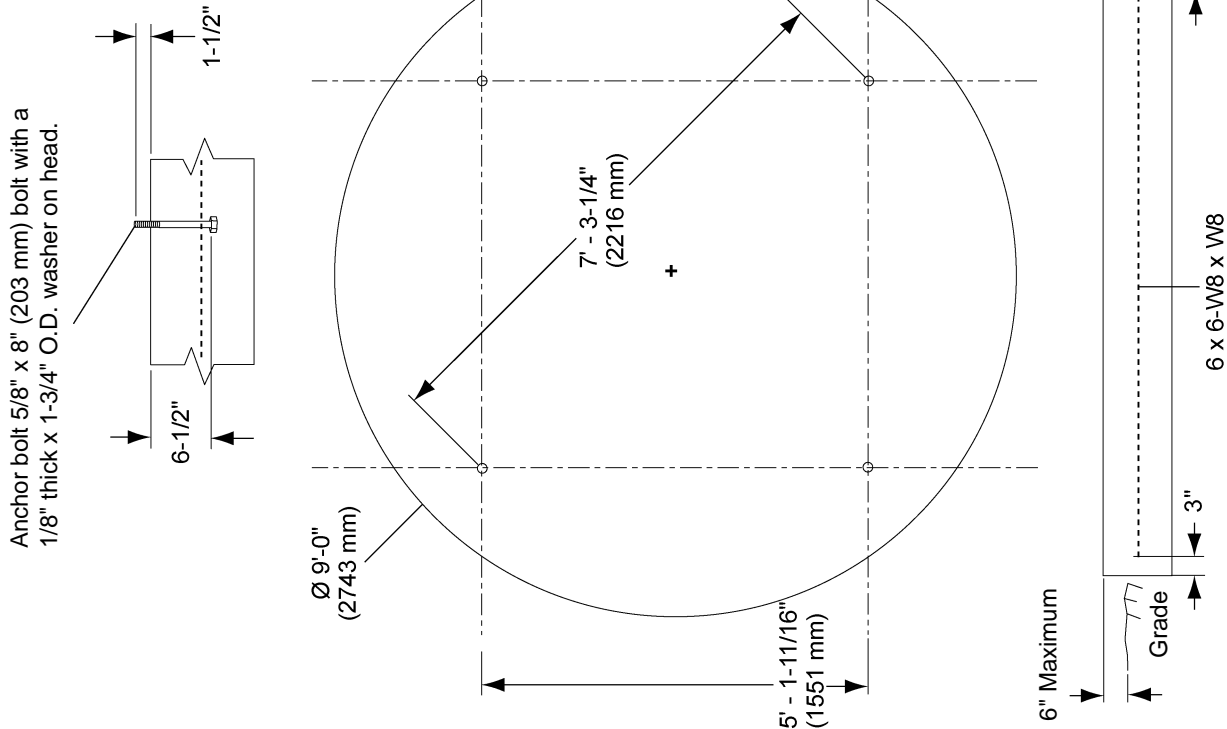


Figure 5D 7' 1-8 Rings BFT/ GHT 45° and 67° Round Pad

All instructions shall be construed as recommendations only. The actual installation may vary according to local conditions. The GSI Group assumes no liability for results arising from the use of such recommendations.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
2-6	13"	4.9 Cu. Yards	125 Sq. Ft.	6
7	16"	6.0 Cu. Yards	125 Sq. Ft.	6
8	17"	6.4 Cu. Yards	125 Sq. Ft.	6
9	17"	6.4 Cu. Yards	125 Sq. Ft.	6

*

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
2-6	330 mm	4.85 Cu. Meters	11.61 Sq. Meters	6
7	406 mm	4.85 Cu. Meters	11.61 Sq. Meters	6
8	432 mm	5.14 Cu. Meters	11.61 Sq. Meters	6
9	432 mm	5.14 Cu. Meters	11.61 Sq. Meters	6

*

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 28 days.
3. The foundation site must be well drained and free of vegetation and debris.
4. The foundation should be level within 1/4" overall and within ± 1/8" in any 10' length along the anchor bolt circle.
5. Material estimates do not include allowance for shrinkage and waste.
6. These layouts are recommendations for GSI tanks only. Consult GSI engineering for special tank foundations.

* Applies to 45° hopper Tank only.

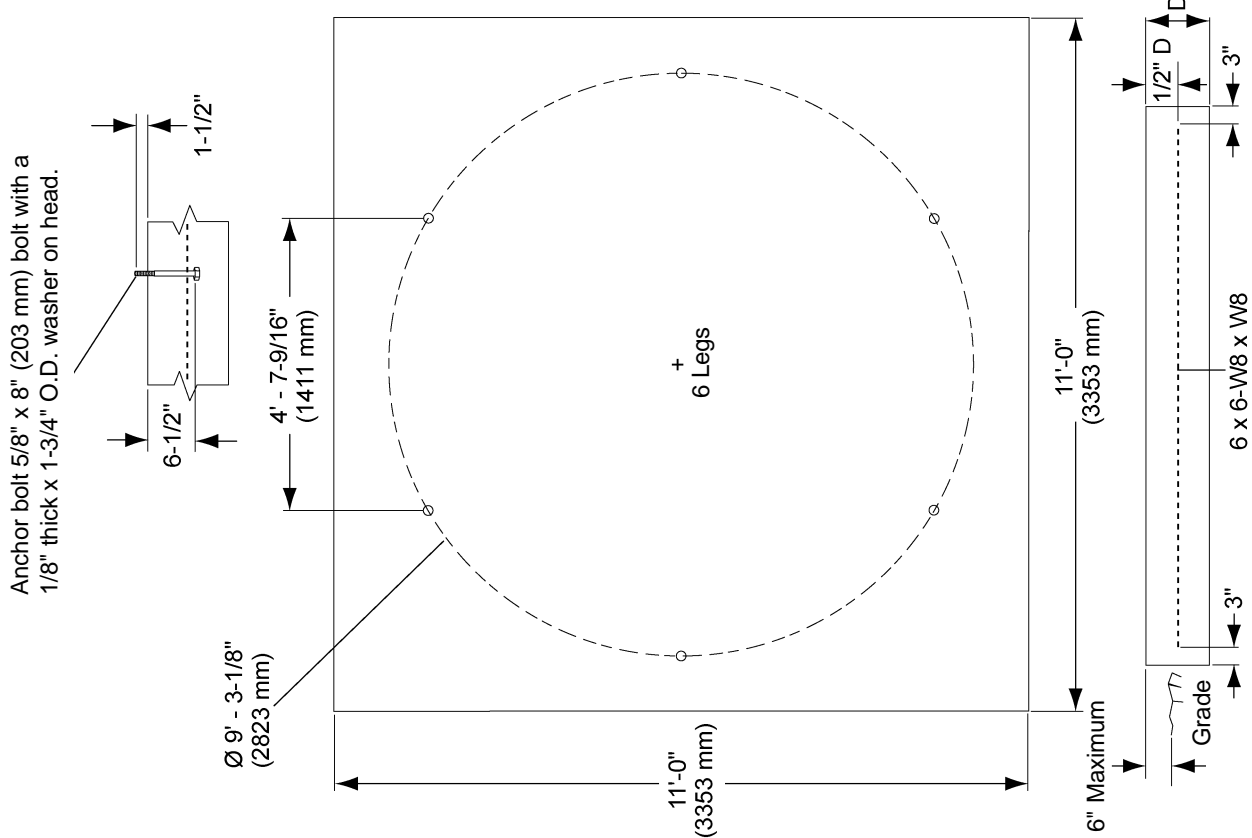


Figure 5E 9' 2-9 Rings BFT/ GHT 45° and 60° Square Pad

5. Foundation

All instructions shall be construed as recommendations only. The actual installation may vary according to local conditions. The GSI Group assumes no liability for results arising from the use of such recommendations.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
2-6	13"	3.8 Cu. Yards	100 Sq. Ft.	6
7	16"	4.7 Cu. Yards	100 Sq. Ft.	6
8	17"	5.0 Cu. Yards	100 Sq. Ft.	6
9	17"	5.0 Cu. Yards	100 Sq. Ft.	6

*

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
2-6	330 mm	2.91 Cu. Meters	9.29 Sq. Meters	6
7	406 mm	3.59 Cu. Meters	9.29 Sq. Meters	6
8	432 mm	3.82 Cu. Meters	9.29 Sq. Meters	6
9	432 mm	3.82 Cu. Meters	9.29 Sq. Meters	6

*

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 28 days.
3. The foundation site must be well drained and free of vegetation and debris.
4. The foundation should be level within 1/4" overall and within ± 1/8" in any 10' length along the anchor bolt circle.
5. Material estimates do not include allowance for shrinkage and waste.
6. These layouts are recommendations for GSI tanks only. Consult GSI engineering for special tank foundations.

* Applies to 45° hopper tank only.

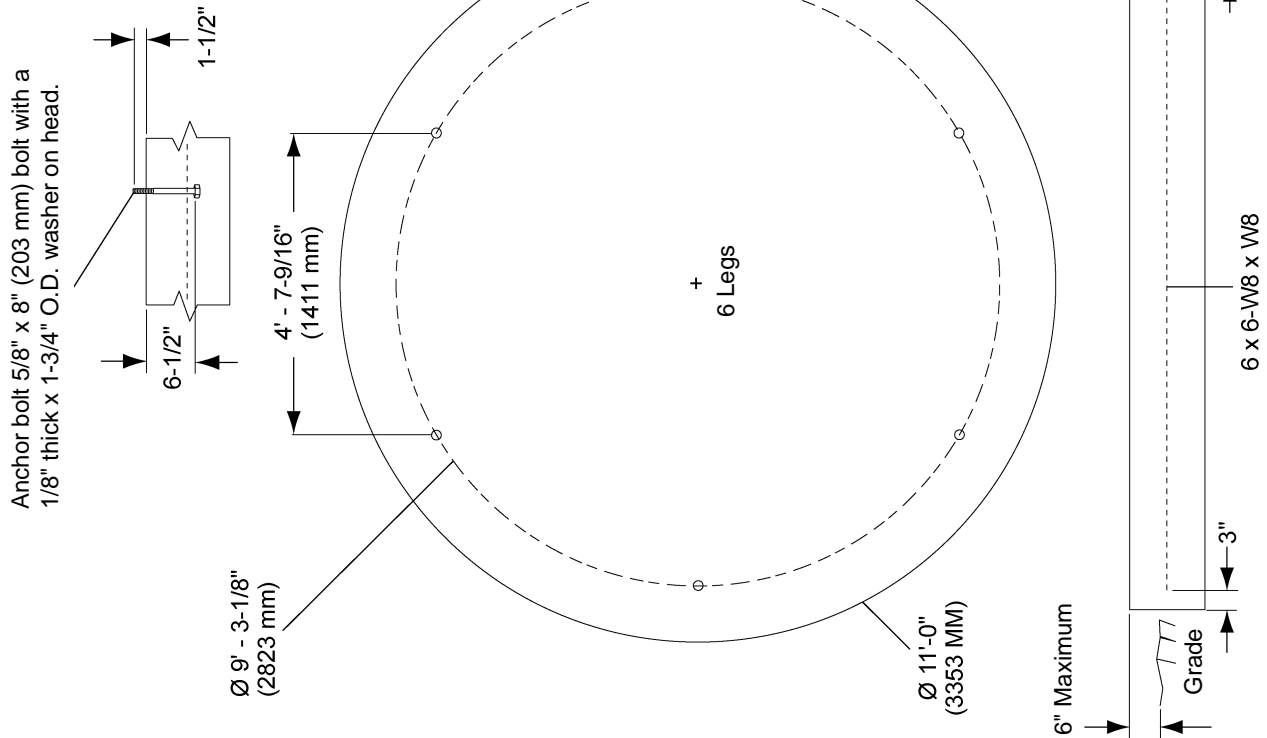


Figure 5F 9' 2-9 Rings BFT/ GHT 45° and 60° Round Pad

Tank Sidewalls

Sidewall Sheet Gauge Chart

Model	Gauge
BFT 6'-1 Ring	20
BFT 6'-2 Ring	20-20
BFT 6'-3 Ring	18-20-20
BFT 6'-4 Ring	18-20-20-20
BFT 7'-1 Ring	20
BFT 7'-2 Ring	18-20
BFT 7'-3 Ring	18-20-20
BFT 7'-4 Ring	18-18-20-20
BFT 7'-5 Ring	17-17-18-20-20
BFT 7'-6 Ring	15-15-17-18-20-20
BFT 9'-1 Ring	20
BFT 9'-2 Ring	20-20
BFT 9'-3 Ring	20-20-20
BFT 9'-4 Ring	18-18-20-20
BFT 9'-5 Ring	17-17-18-20-20
BFT 9'-6 Ring	15-15-17-18-20-20

How to use charts on this page:

The chart labeled “Sidewall Sheet Gauge Chart” is for the reference when building the tank. This chart tells you what gauges your rings of the specific tank must have. To read the chart find the tank size you are build. For example, a 7' diameter tank with 4 rings is referred to as BFT 7'-4 ring. The side labeled “Gauge” will indicate which sidewall sheets to use. The sheets are color coded, simply match the gauge number with the color. (Use “Sheet Gauge Color Code Chart” [below](#).)

NOTE: Sidewall sheets are color coded on edges for gauge identification.

Sheet Gauge Color Code Chart

Code #	Color Code
20	Red
18	Orange
17	Pink/Light Blue
16	Blue
15	Brown/Red
14	Green
13	Yellow/Blue
12	Black
11	Pink
10	Light Blue

Caulking Detail

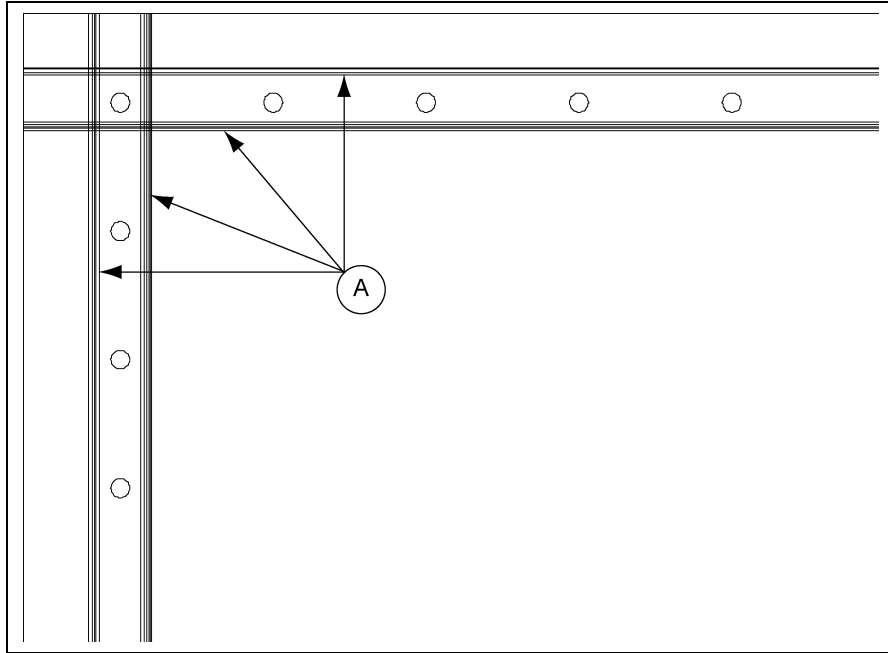
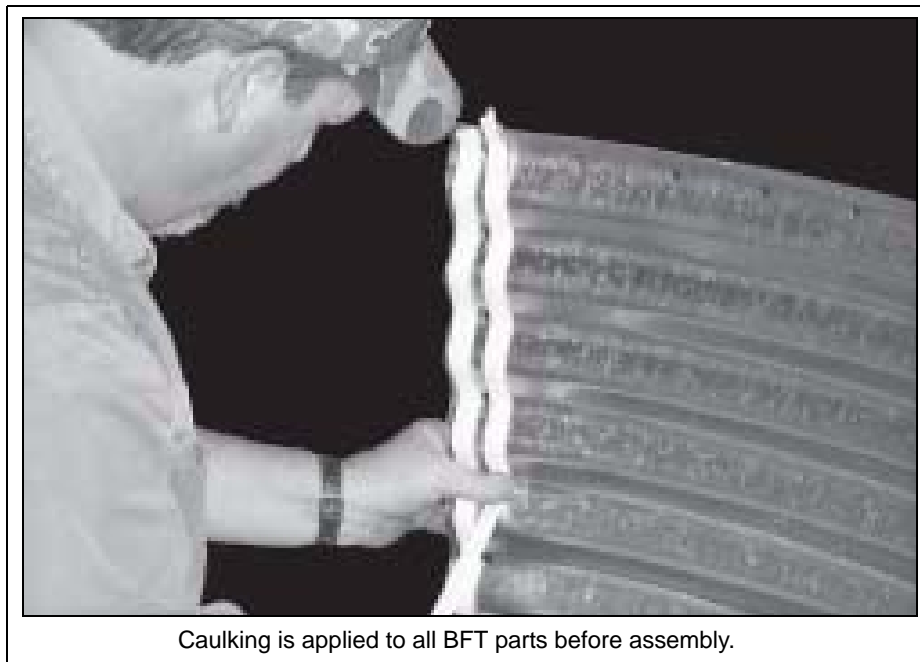


Figure 6A *Caulking Detail*

Ref #	Description
A	Caulking

NOTE: *Rope caulking is applied before each sheet is assembled. Wipe sheet clean where it will be applied. Apply caulking on each side of the holes of the vertical seams and on each side of the horizontal row of holes.*



Caulking is applied to all BFT parts before assembly.

Figure 6B

Sidewall Sheet Orientation

IMPORTANT: Please note sheet orientation when assembling the bin sidewall. The upper right corner will have a slot or identifying sticker. This corner should be on the inside of the tank when assembled. (See Figure 6C.)

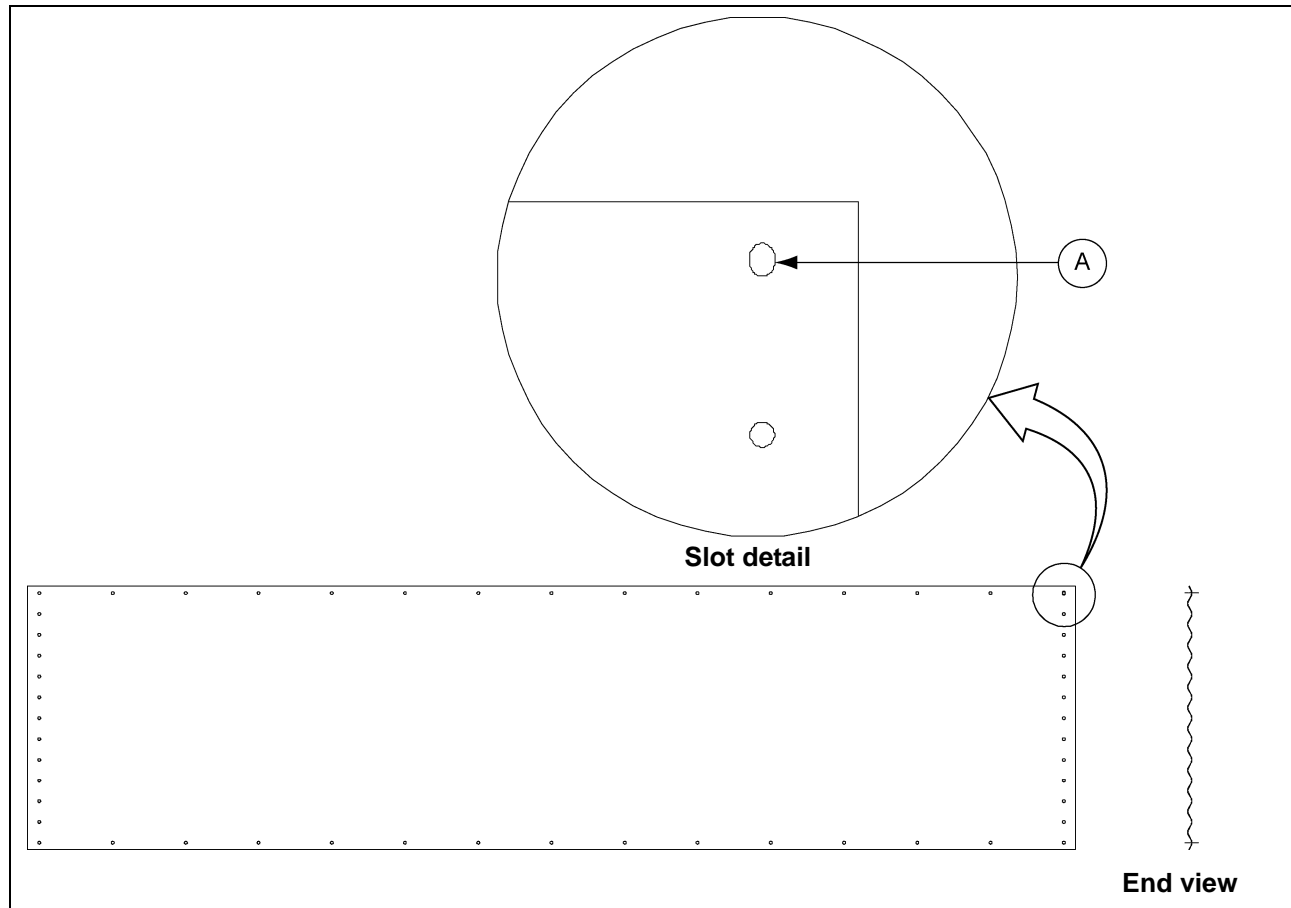


Figure 6C Viewed from Inside (Sheet orientation effects how sheet overlap.)

Ref #	Description
A	3/8" x 1/2" Slot (One per Sheet)

Sidewall Assembly

Start by assembling the top ring of the Bulk Feed Tank. The top row of bolt holes has 3-1/8" spacing in the top ring. Before bolting the sidewall sheets together, check that you have the proper gauge steel for the top ring. The higher gauge number denotes thinner material. For example, 20 gauge material is thinner than 14 gauge. In assembling all Bulk Feed Tanks the thinnest material always go on top. The heaviest corrugated sidewall sheets will be located on the bottom of the tank. Check the various gauges of the tank with the "Sheet Gauge Color Code Chart" and "Sidewall Sheet Gauge Chart", on [Page 21](#). Begin by putting the rings together on the edge of the sheets. On 7'-1 ring tanks ensure vertical leg seams are spaced equally around tank. (See [Page 88](#).) After the first ring is complete, the roof must be assembled as described on [Pages 24-25](#). After the roof is assembled, the tank can be rolled on its side for easier sidewall assembly. (See [Figure 6F on Page 25](#).)

Tighten all bolts from the nut side only.

6. Sidewall Assembly

Continue to add rings with lighter gauges first, then heavier gauges. Each subsequent row of sidewall sheets goes to the inside of the previous row of sidewall panels. Remember to place the caulking between every ring. *See Figure 6D* for illustration of proper sidewall overlap and caulking detail.

Be sure to stagger all vertical seams between rows.

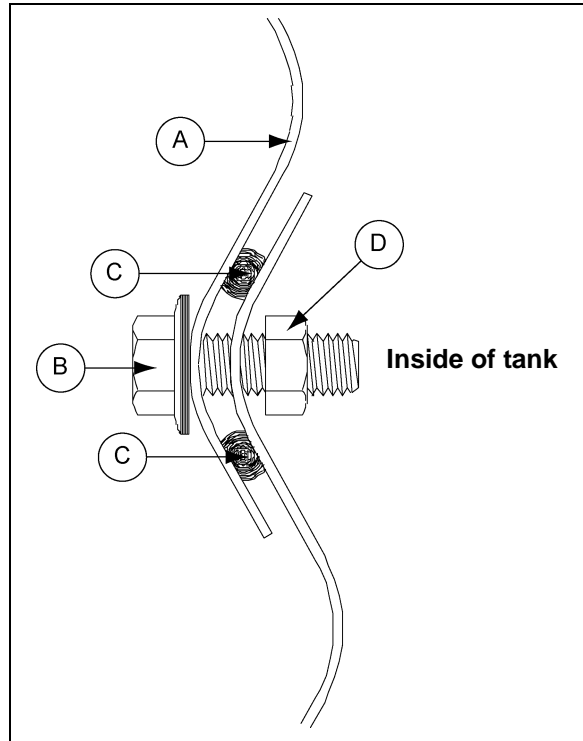


Figure 6D Ring Overlap Detail

Ref #	Description
A	Upper Ring
B	5/16" x 1" Bolt

Ref #	Description
C	Caulking Two (2) Strips
D	5/16" Nut



First ring assembly. Tighten bolts from the nut side only.

Figure 6E

IMPORTANT: *Begin bolting in the center of sheets when connecting sidewall rings to one another.*

When bolting sidewall rings to one another, always begin bolting in the center of the sheet and work toward the outside edges (horizontal seams). This allows the sidewall to draw up evenly.



Figure 6F *Sidewall Assembly*

It is easier to add more sidewall sheets with the tank on its side. It can be rolled easily from side-to-side to allow the bolts and nuts to be put in the proper holes. **NOTE:** *The roof must be assembled on the first ring before rolling it over to its side.*

Sealed Roof Panels Installation

NOTE: *The roof and sidewall ladders are centered between seams. When placing the roof panel, the outside edge is bent down. This edge is to be placed on the outside of other roof panel to form a tight seal. (See Figure 7C on Page 27.)* Be sure to apply two (2) strips of caulking on all seams. Assemble roof panels in a counterclockwise manner.

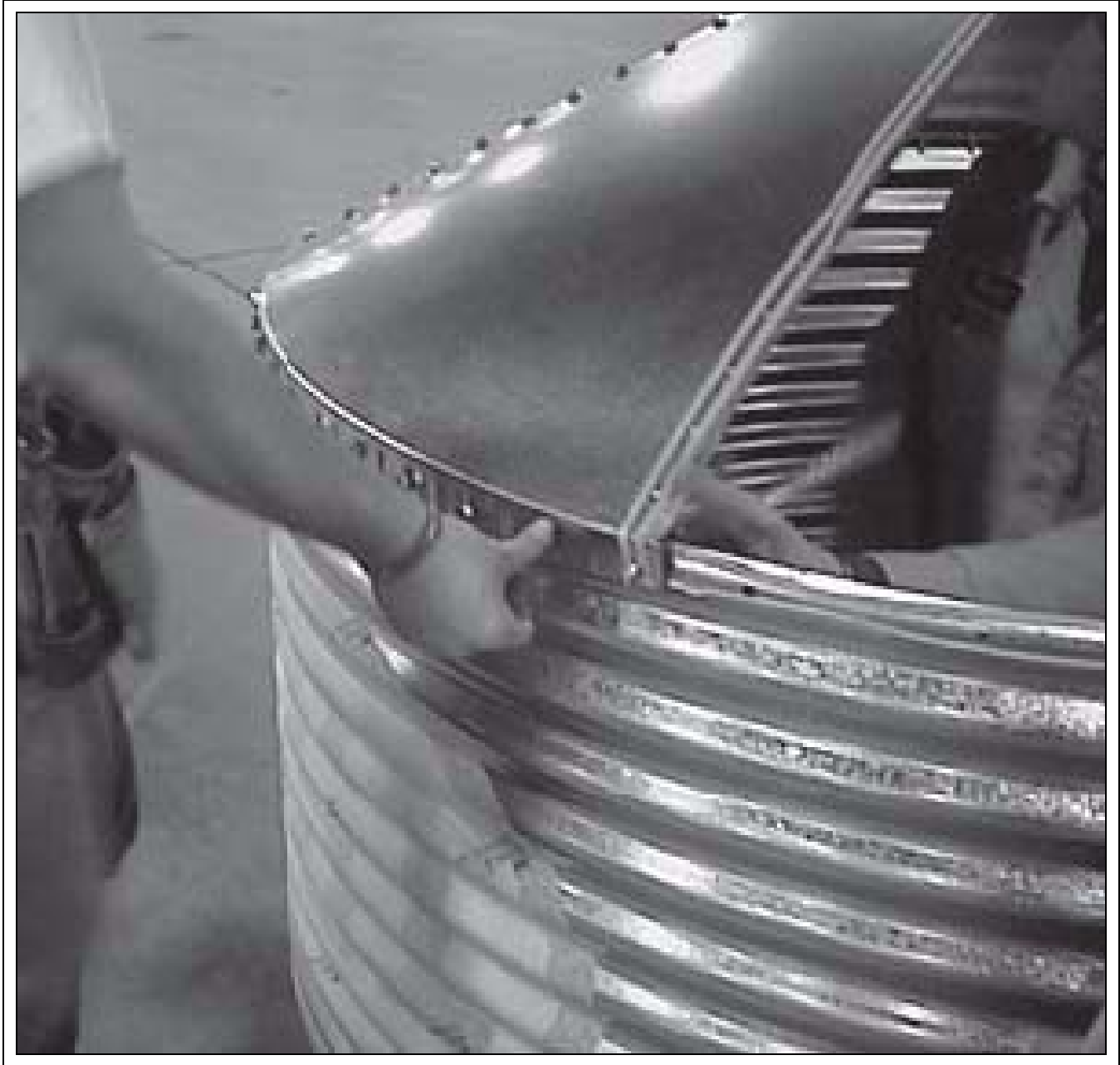


Figure 7A

On bins that will be equipped with a pneumatic fill system (See Page 81), the two (2) roof panels with fill hole and exhaust hole must be located opposite each other on the Bulk Feed Tank.

Sealed Roof Panels Installation (Continued)

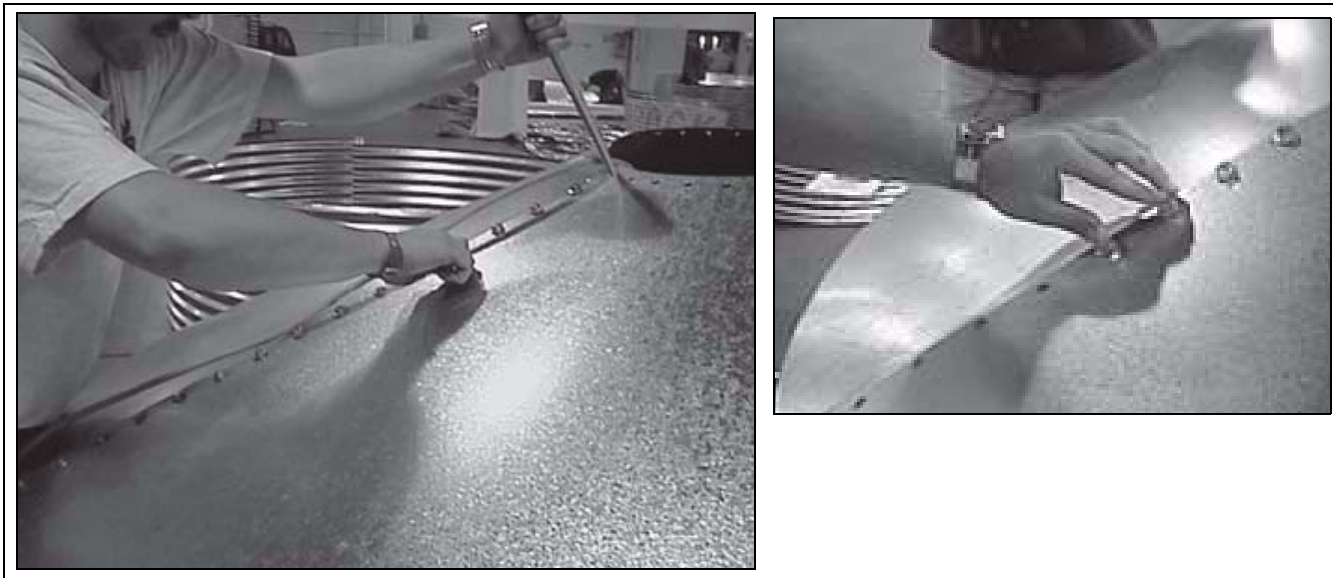


Figure 7B *Lining Up Holes and Placing Bolts*

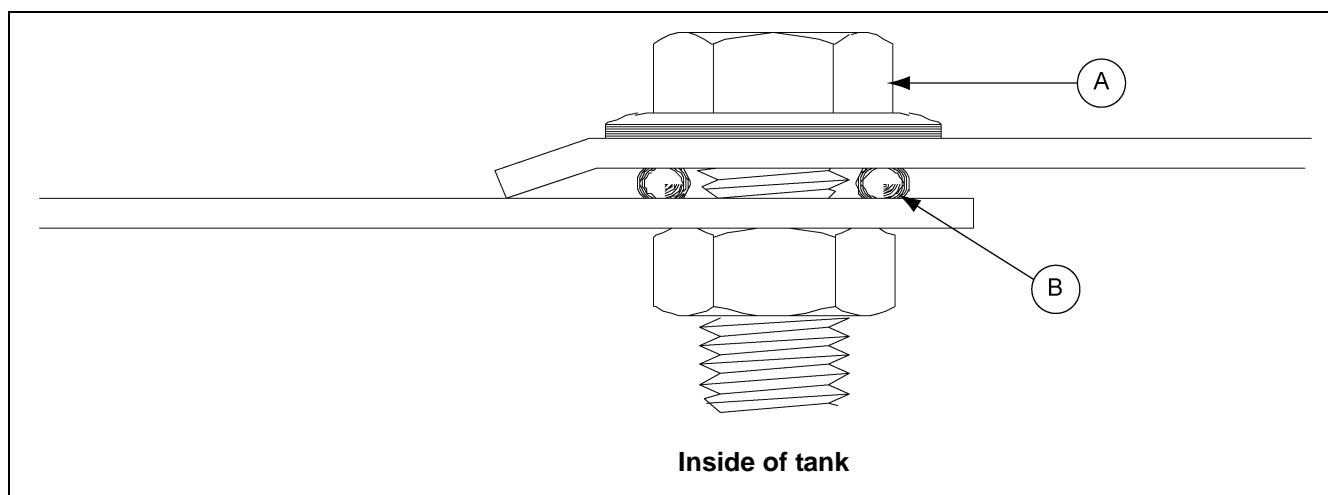


Figure 7C *Roof Sheet Overlap Detail*

Ref #	Description
A	5/16" x 1" Bin Bolt
B	Caulking Two (2) Strips

Peak Ring Collar to Roof Panels

Apply two (2) strips of caulking between peak ring and roof panels, *See Figure 7D*. Note that the peak ring goes on the outside of the roof panels.

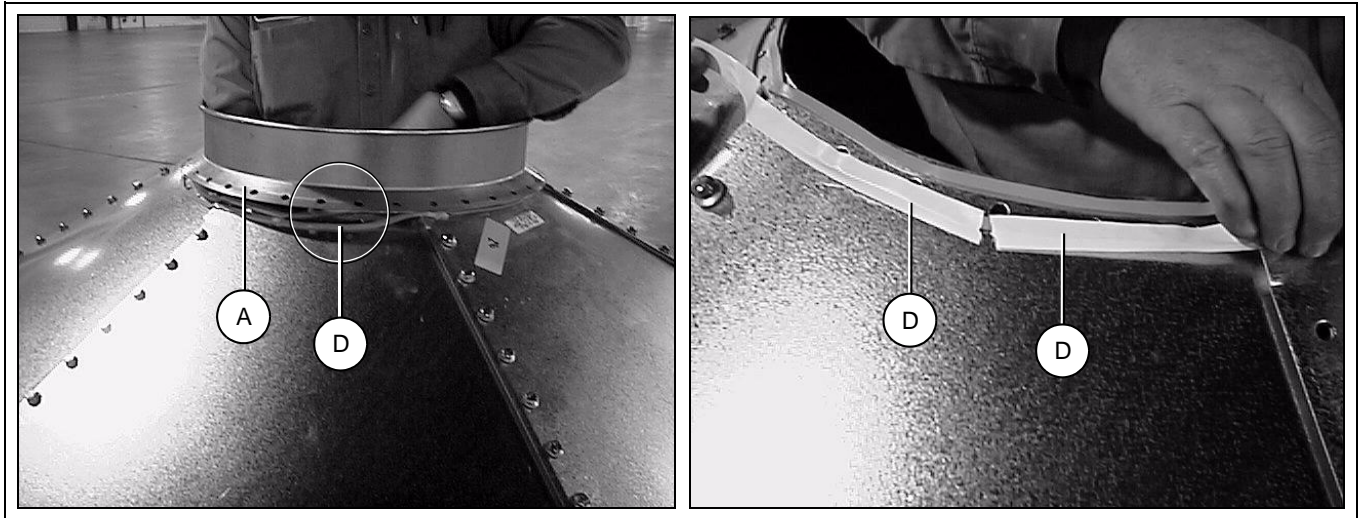


Figure 7D

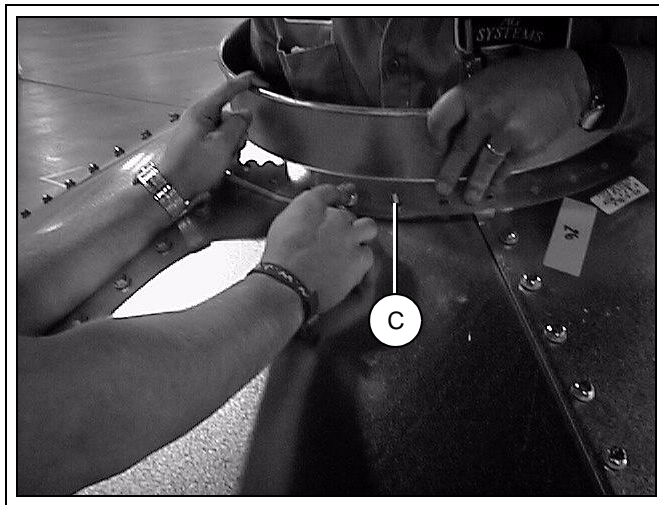


Figure 7E

Ref #	Description
A	Peak Ring Collar
B	Roof Sheet
C	5/16" x 1" Bin Bolt
D	Caulking Two (2) Strips

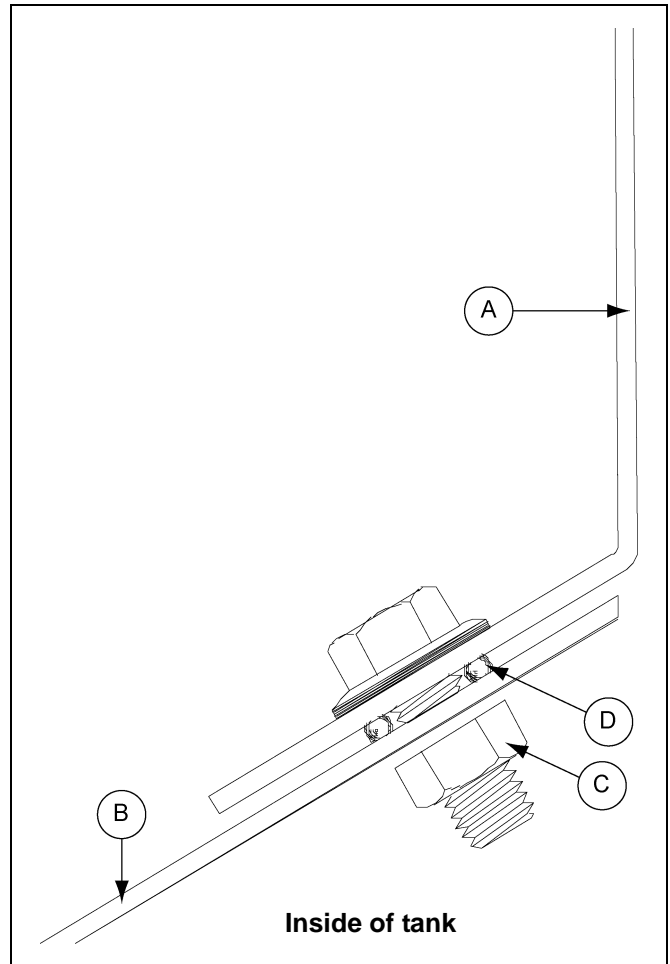


Figure 7F Peak Ring Collar Detail

Optional BFT Ladder Assembly

The components needed to complete the eave ladder assembly are listed in the chart *below* and are numbered in the order of assembly. Review the installation instructions for each component before beginning. Failure to do so may complicate the installation and cause unnecessary field drilling. (See Figure 8A.)

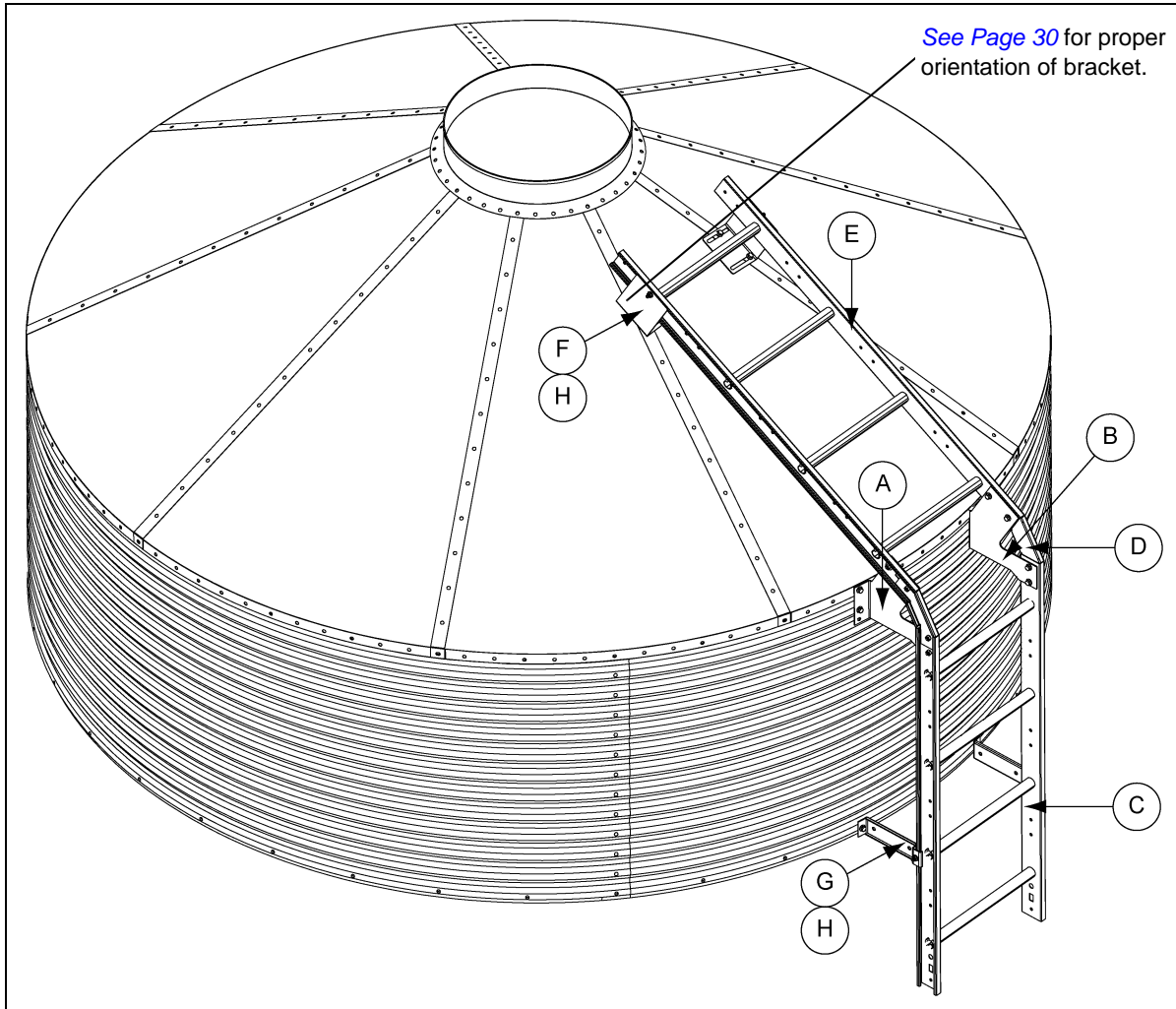


Figure 8A

Ref #	Description	Qty
A	L.H. Starter Bracket	1
B	R.H. Starter Bracket	1
C	Top 4' Ladder Section	1
D	Connector Bracket	2
E	Roof Ladder Section	1
F	Roof Ladder Support Bracket	2
G	Standoff Bracket	2
H	Wedge	4

8. Optional BFT Ladder Assembly

Starter Bracket Installation

The starter brackets must be centered in the roof sheet to ensure proper installation of the roof ladder support brackets. Before the starter brackets can be installed, two (2) 3/8" holes must be drilled. The holes must be 2.66" below and directly in line with the top row of pre-punched horizontal holes 18-3/4" apart. Refer to [Figure 8B](#) for additional clarification of hole locations. Use 5/16" and 1" bin bolts for connections.

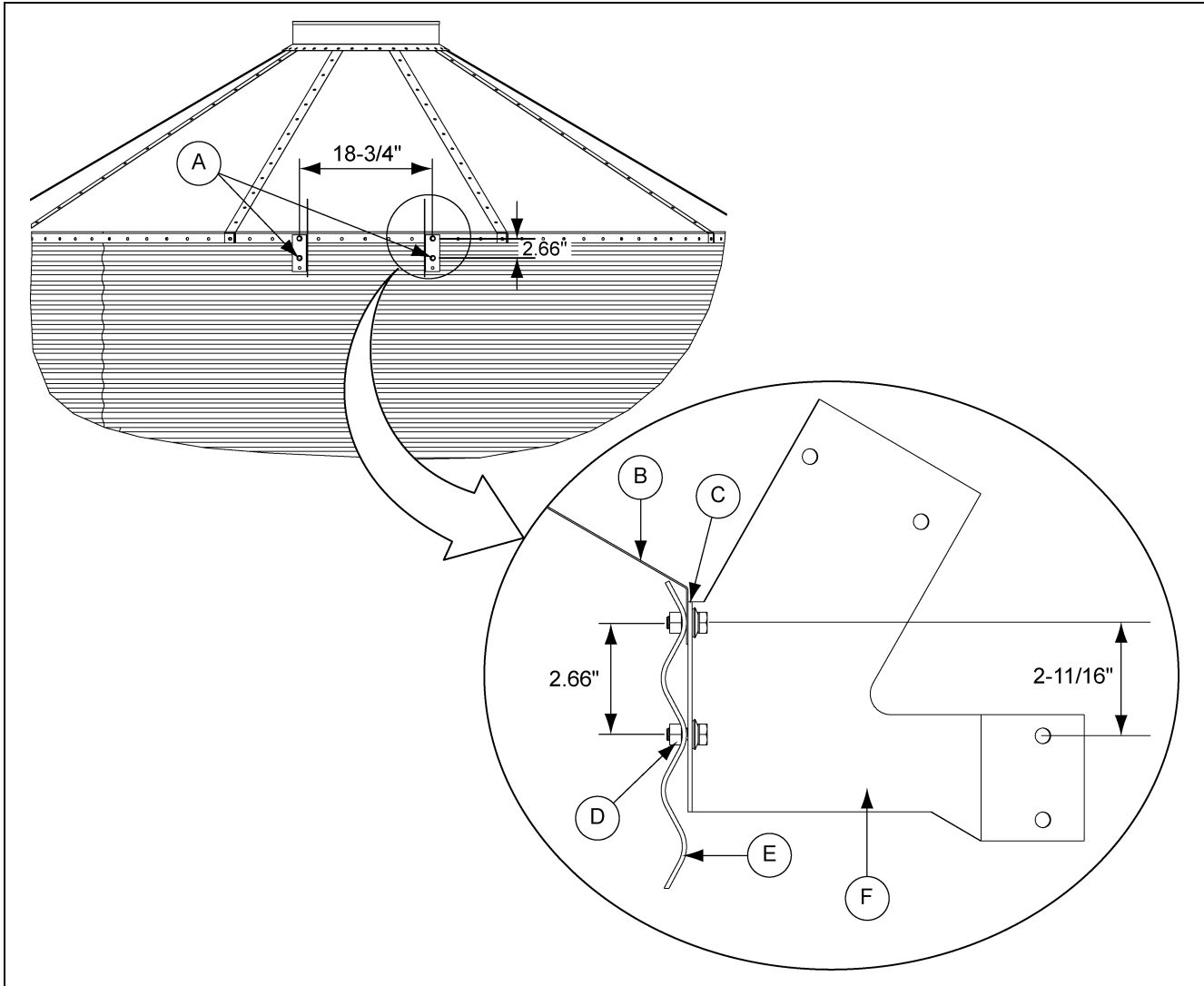


Figure 8B

Ref #	Description
A	Two (2) 3/8" Field Drilled Holes
B	Roof Panel
C	Top Horizontal Seam
D	3/8" Field Drilled Holes
E	Sidewall Sheet
F	L.H. 30° Roof (LDR-5405) and R.H. 30° Roof (LDR-5406)
	L.H. 40° Roof (LDR-5407) and R.H. 40° Roof (LDR-5408)

Sidewall and Roof Ladder Installation

Check the sidewall ladder to make sure the ladder rung dimples face upward. Attach the ladder to the sidewall with the starter brackets to the inside of the ladder and the connector brackets to the outside as shown in [Figure 8C](#). Once the sidewall ladder is installed, attach the roof ladder to the other end of the connector brackets. All bolts should be installed with the head of the bolt to the inside of the ladder. Use 5/16" x 1" bin bolts for all connections.

NOTE: The roof ladder must be one continuous ladder section. The roof ladder cannot be assembled from two (2) or more smaller ladder sections spliced together. See chart [below](#) for required roof ladder lengths vs bin diameter and roof angle.



Failure to follow instructions may cause damage or failure of the equipment.

Bin Diameter	Roof Ladder Length	
	30° Roof	40° Roof
6'	3'	3'
7'	3'	3'
9'	4'	5'

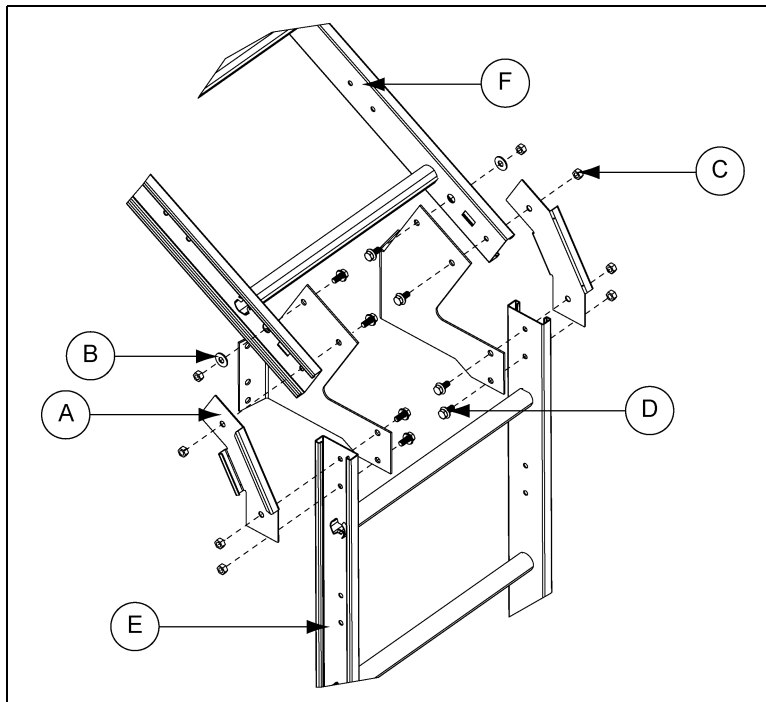


Figure 8C

Ref #	Part #	Description
A	LDR-4318	30° Connector Bracket
	LDR-4367	40° Connector Bracket
B	S-845	5/16" Flat Washer
C	S-7484	5/16" Nut

Ref #	Part #	Description
D	S-10260	5/16" x 1" Bin Bolt
E		Sidewall Ladder
F		Roof Ladder

8. Optional BFT Ladder Assembly

Roof Ladder Support Bracket Installation

The roof ladder requires support brackets at the top of the ladder. These upper ladder support brackets either bend in towards the center of the ladder or bend out away from the ladder depending on the diameter and roof angle of the tank being assembled. See [Figure 8D below](#) and [Figure 8H on Page 35](#) that show brackets for the 6' 30°, 9' 30° and 9'-40° roofs. See [Figure 8E on Page 33](#) and [Figure 8I on Page 35](#) that show brackets for 6' 40°, 7' 30° and 7' 40° roofs. Assemble the wedge and support brackets to the ladder rail as shown in [Figure 8F and Figure 8G on Page 34](#). Then, slide the support bracket assemblies along the ladder rails as shown in [Figure 8D below](#) and [Figure 8E on Page 33](#) until the slots match up with the pre-punched holes in the roof panel and attach using the existing bolts.

NOTE: The roof ladder supports must be assembled so that the maximum distances are not exceeded. See [Figure 8J on Page 36](#) and the “maximum distances chart” to determine maximum allowable spacing of support brackets.



Failure to follow instructions may cause damage or failure of the equipment.

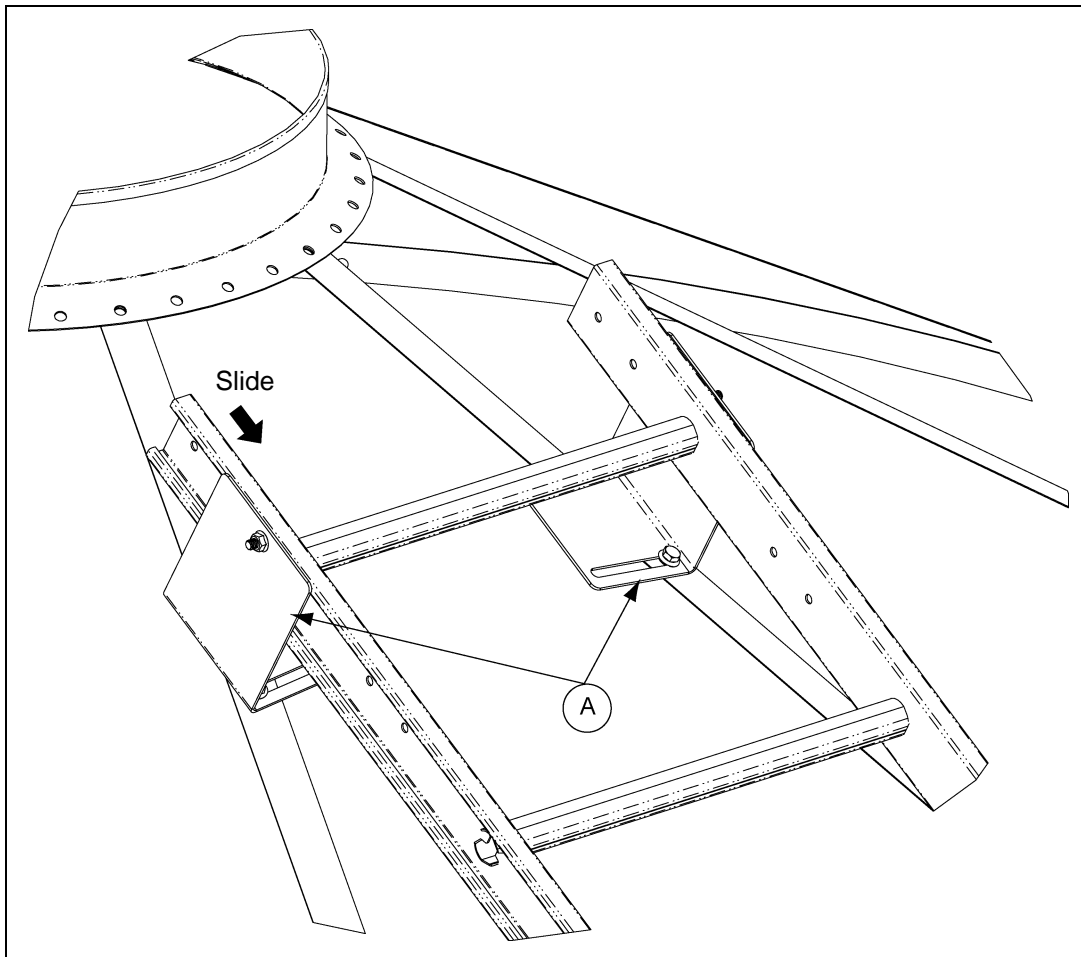


Figure 8D

Ref #	Part #	Description
A	LDR-5403	30° Support Bracket
	LDR-5404	40° Support Bracket

Roof Ladder Support Bracket Installation (Continued)

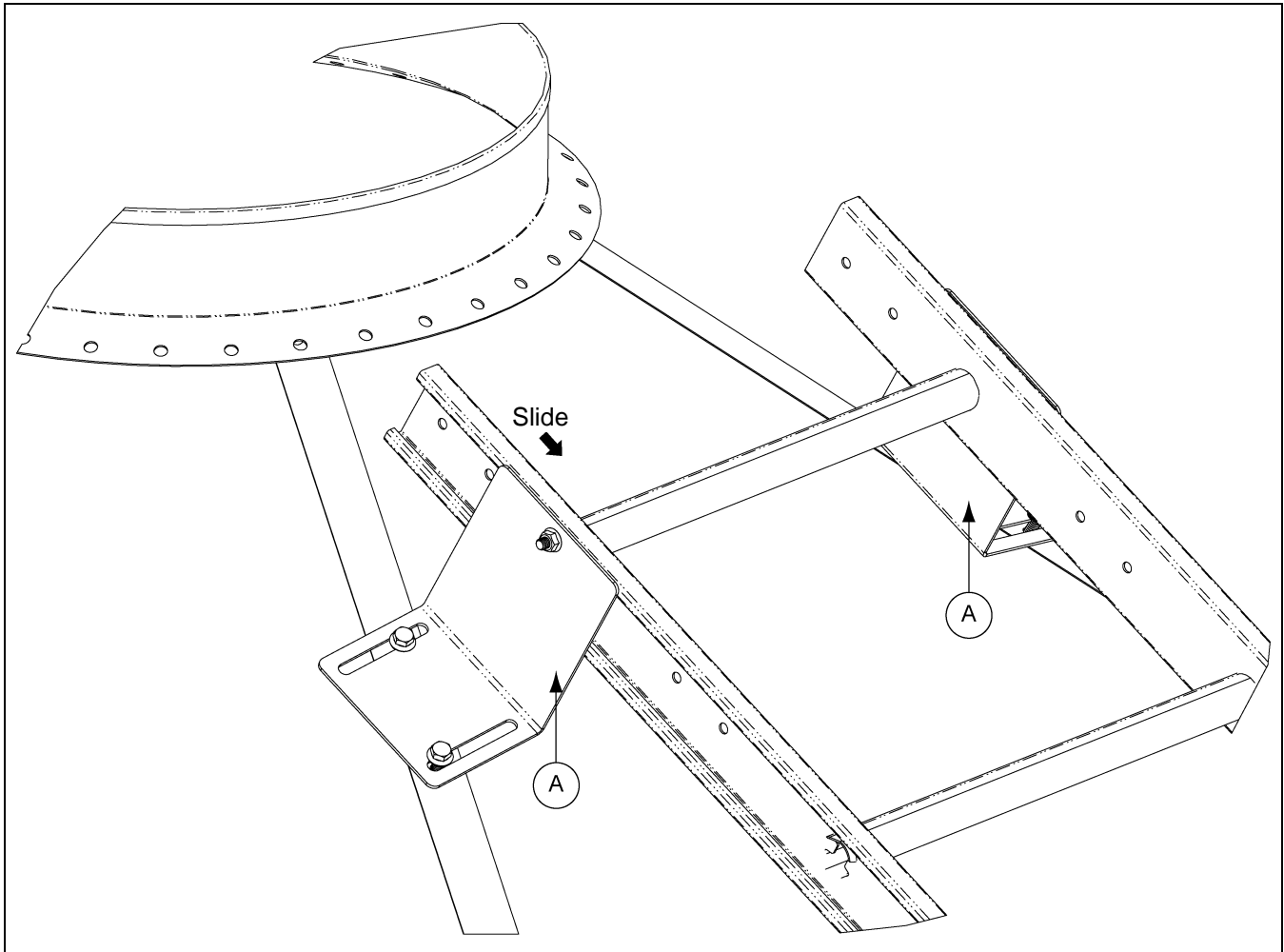


Figure 8E

Ref #	Part #	Description
A	LDR-4386	30° Support Bracket
	LDR-4387	40° Support Bracket

Roof Ladder Support Bracket Installation (Continued)

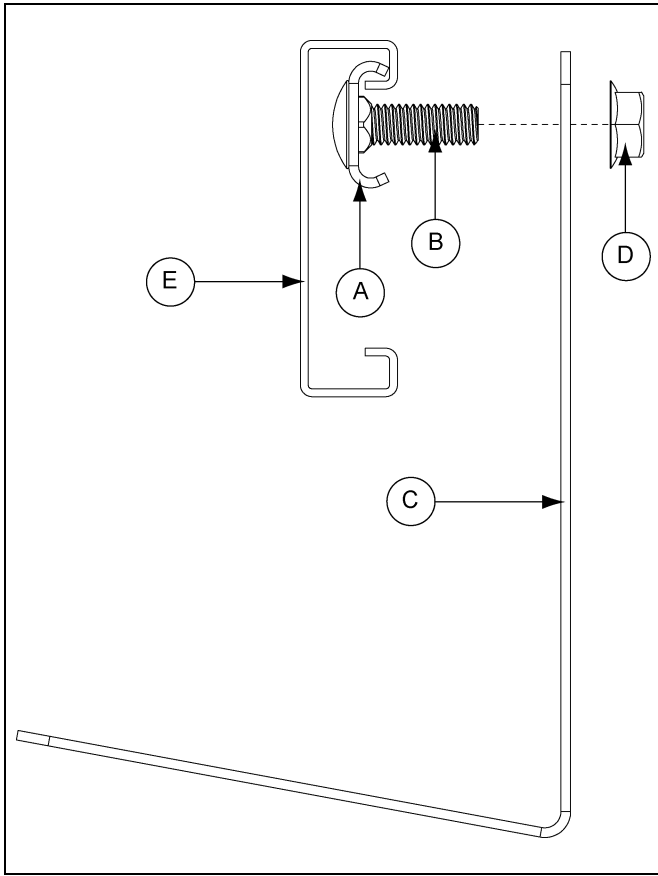


Figure 8F

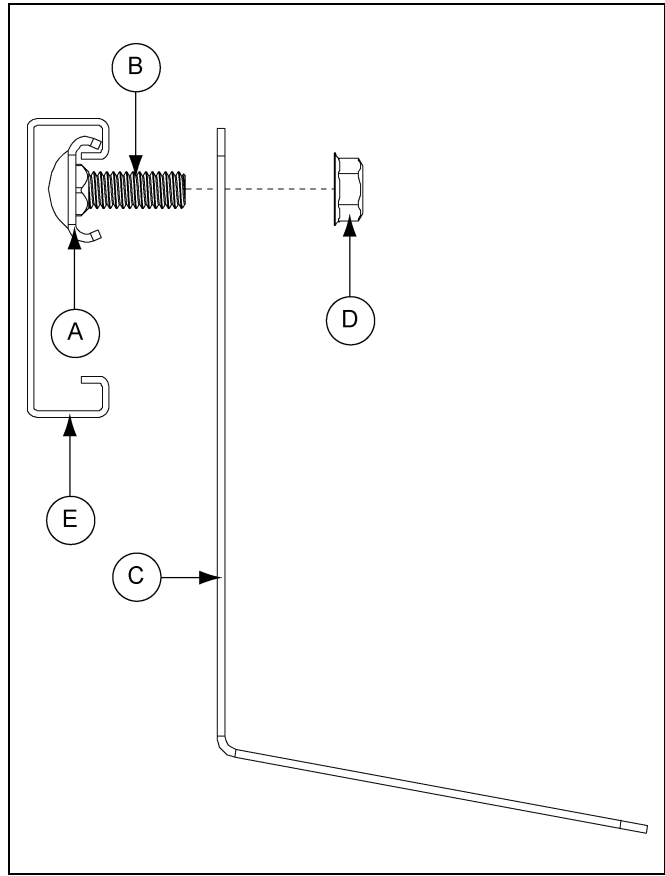


Figure 8G

Ref #	Part #	Description
A	LDR-4198	Wedge
B	S-3550	5/16" x 1" Carriage Bolt
C	LDR-5403	30° Support Bracket
	LDR-5404	40° Support Bracket
D	S-10268	Flange Nut 5/16"-18 JS Grade 5
E		Ladder

Roof Ladder Support Bracket Installation (Continued)

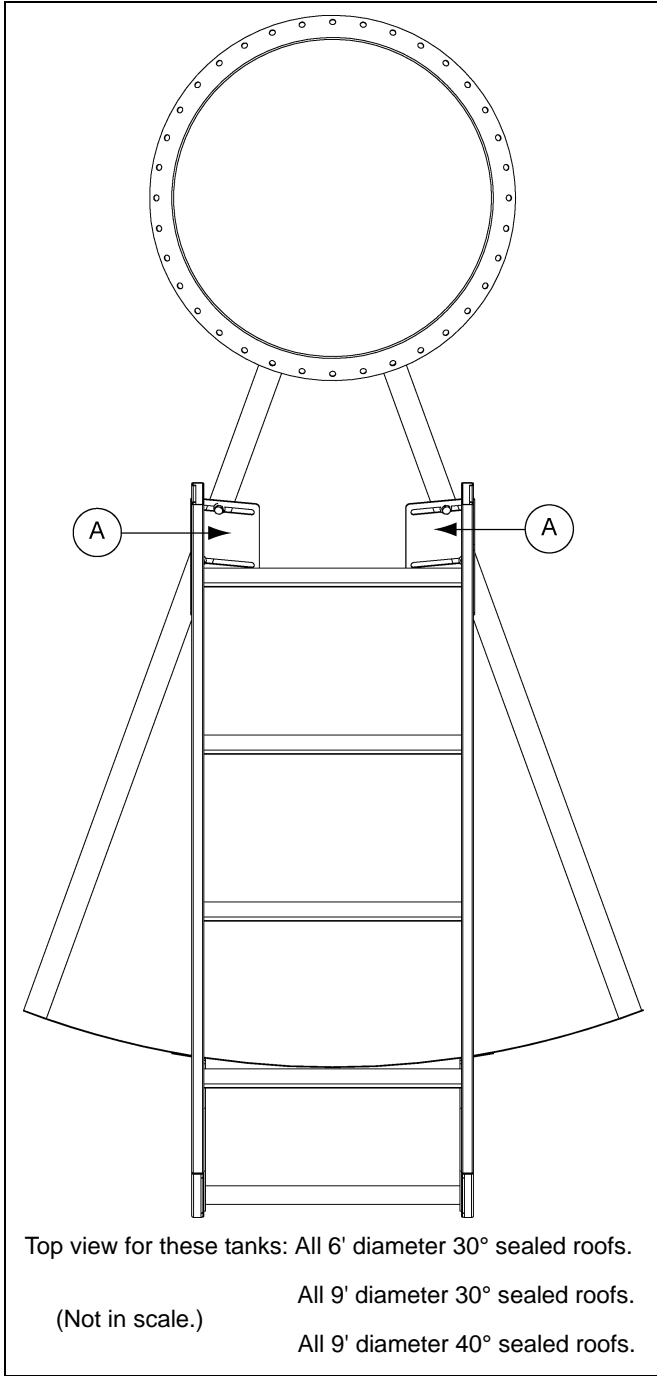


Figure 8H

Ref #	Part #	Description
A	LDR-5403	30° Support Bracket
	LDR-5404	40° Support Bracket

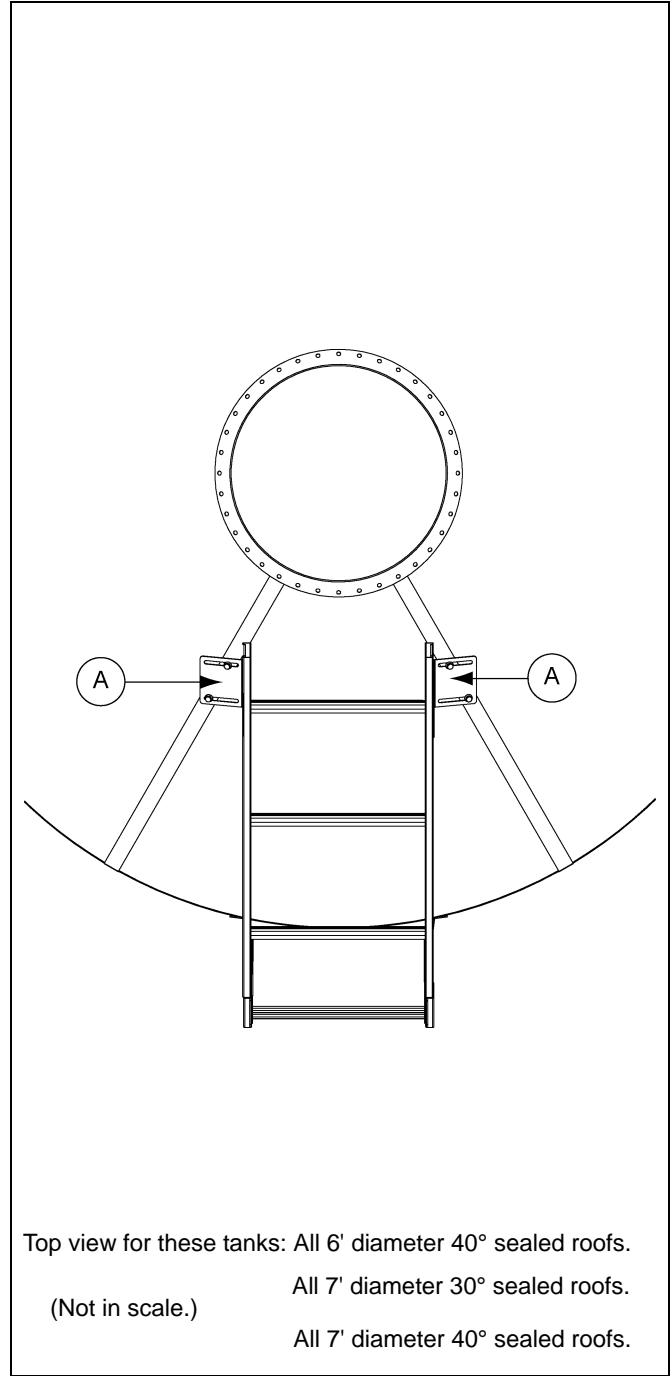


Figure 8I

Ref #	Part #	Description
A	LDR-4386	30° Support Bracket
	LDR-4387	40° Support Bracket

Roof Ladder Support Bracket Installation (Continued)

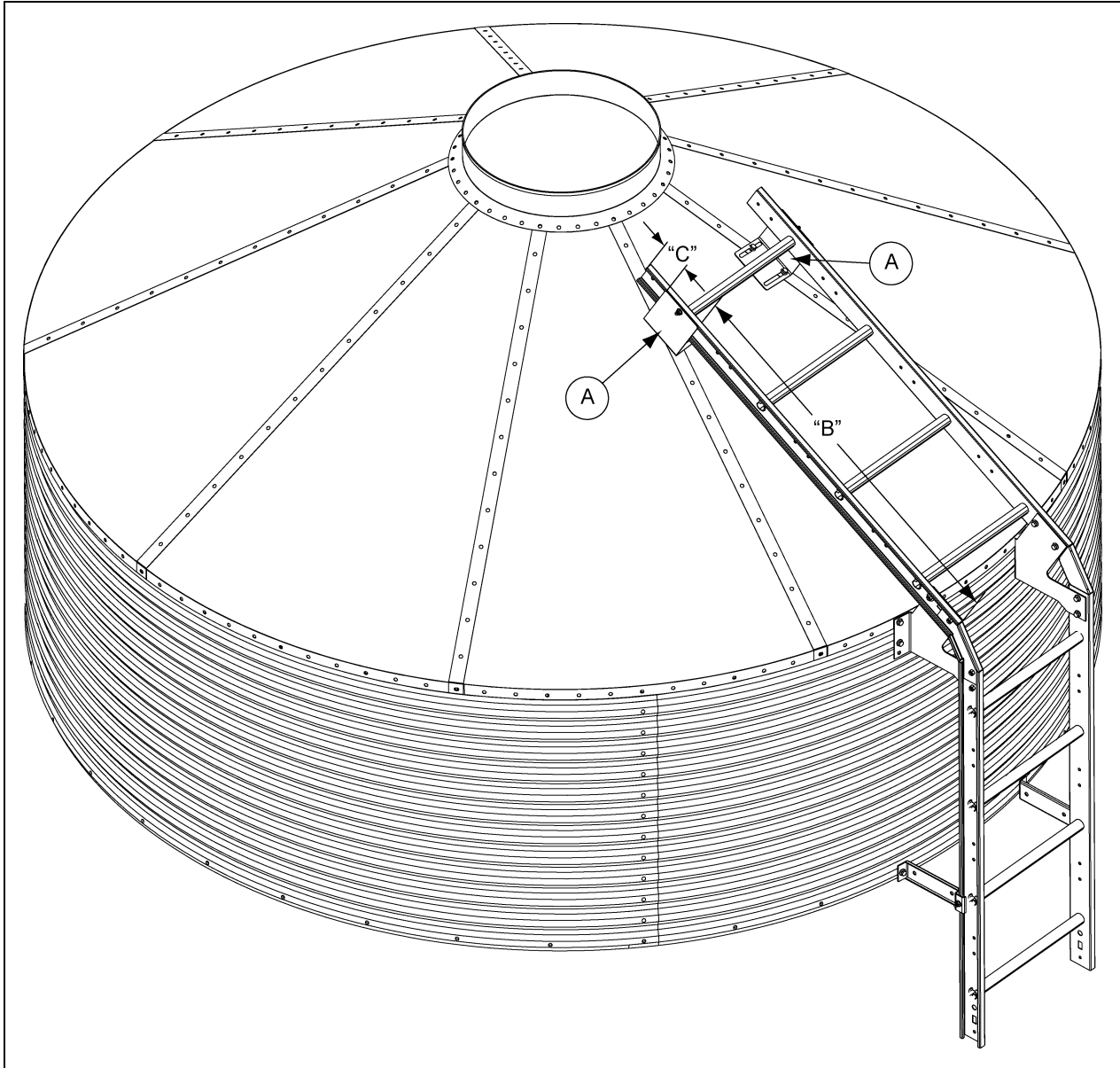


Figure 8J Maximum Allowable Distance

Ref #	Part #	Description
A	LDR-5403	30° Support Bracket
	LDR-5404	40° Support Bracket

Maximum Distances Chart	"B"	"C"
Maximum allowable distance between ladder support bracket and the edge of the ladder at the eave.	50 Inches	
Maximum allowable distance between ladder support bracket and edge of ladder at peak.		10 Inches

Ladder Standoff Installation

With the sidewall ladder in place, standoff brackets must be installed on the ladder and attached to the sidewall at each horizontal seam (every 32"). Start by assembling the standoff bracket and wedge to the ladder rail as shown in *Figure 8K*. Then, slide the standoff assembly along the ladder rail until the standoff is in line with the pre-punched hole in the horizontal seam and attach to the sidewall using 5/16" x 1" bin bolts.

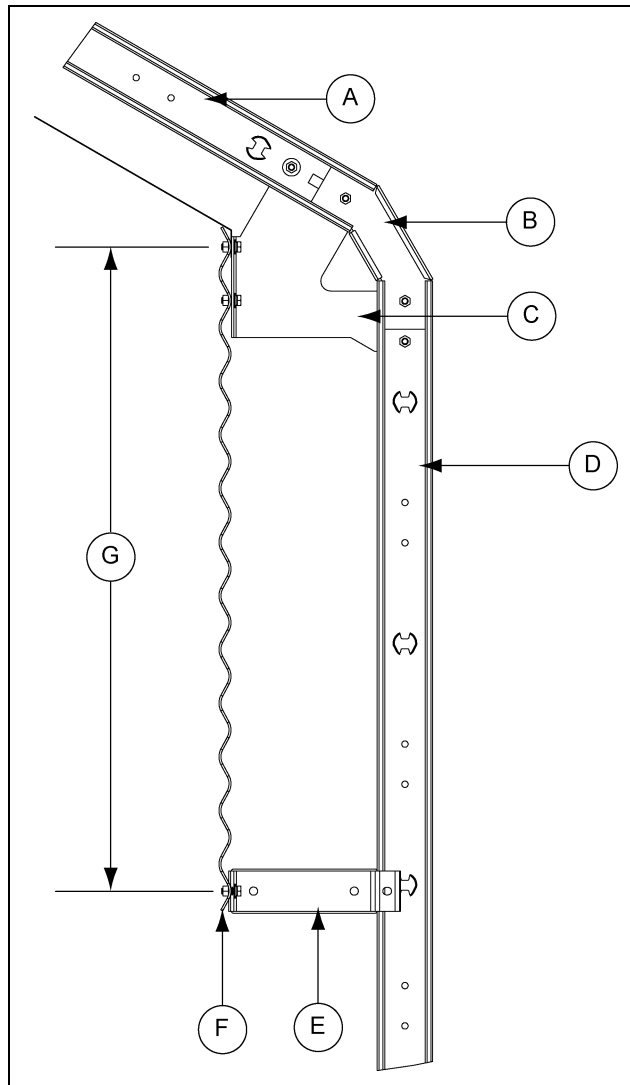


Figure 8K

Ref #	Description
A	Roof Ladder
B	Connector Bracket
C	Starter Bracket
D	Sidewall Ladder
E	Standoff Bracket (Two (2) per Seam) (LDR-4314)
F	Horizontal Seam
G	32" Typical

8. Optional BFT Ladder Assembly

Ladder Section Assembly

Two (2) splice plates are required to attach each additional ladder section. The head of the bolt should be to the inside of the ladder with the splice plate on the outside as shown in *Figure 8L*. Use 5/16" x 1" bolts for all connections.

NOTE: With most installations, the last ladder section to reach the concrete will need to be cut to fit.

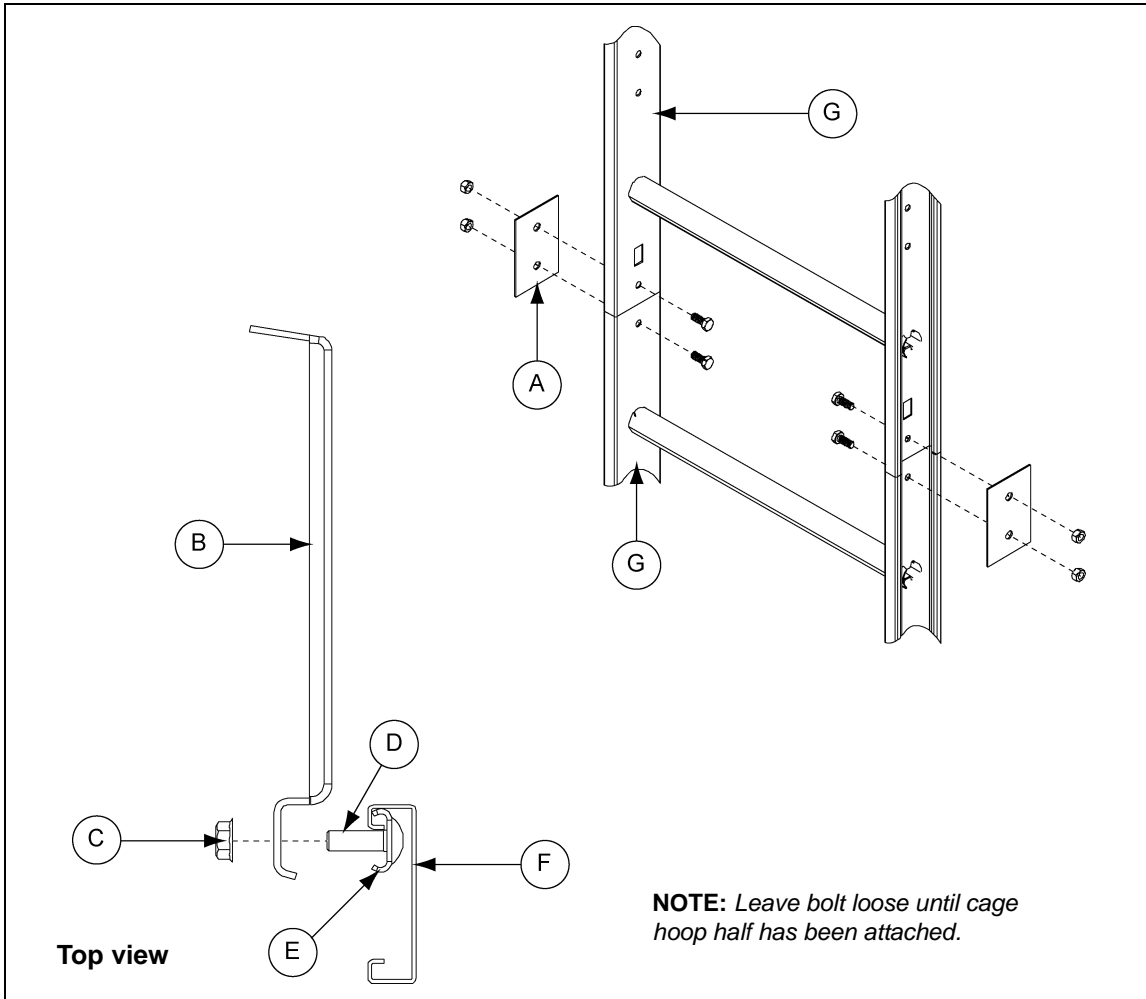


Figure 8L

Ref #	Part #	Description
A	LDR-4317	Splice Plate (Two (2) Per Connection)
B	LDR-4314	Standoff Bracket
C	S-10268	Flange Nut 5/16"-18 JS Grade 5
D	S-3550	5/16" x 1" Carriage Bolt
E	LDR-4198	Wedge
F		Ladder
G		Ladder Sections

Ladder Support Detail

The ladder must be secured to the leg assembly with standoff brackets using support channels as shown in *Figure 8M*.

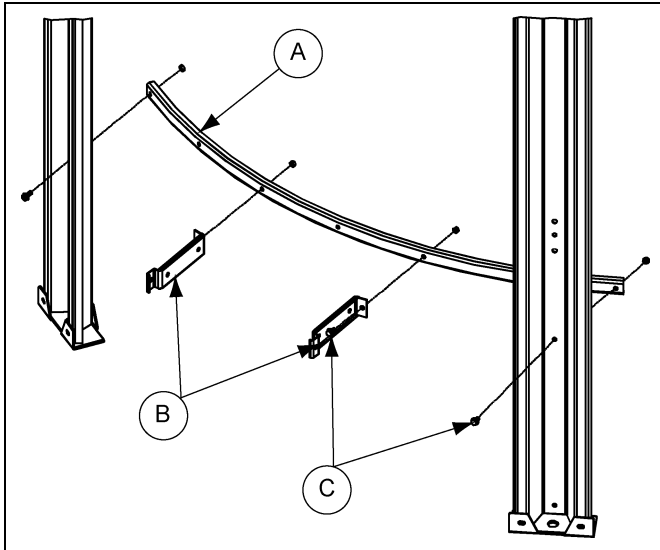


Figure 8M

Ref #	Description
A	Support Channel
B	Ladder Standoff Bracket (LDR-4314)
C	5/16" x 1" Hardware

Diameter	Support Channel	Qty
6'	BLK-10147	1
7'	BLK-10148	2
9'	BLK-10149	2

Ladder Decal Application

Apply the ladder load limit decal (DC-2307) at eye level on the inside of the ladder rail. Make sure the ladder surface is clean and dry before application. (See *Figure 8N*.)



Figure 8N

Handrail Installation for Ladder System without Safety Cage

Handrail Gusset and Handrail Installation

For ladder systems without safety cages, handrails are required. Begin installation by sliding a handrail bar assembly through the top rung of the sidewall ladder and another handrail bar assembly through the second rung of the roof ladder as shown in [Figure 9A](#). All four (4) pieces of LDR-5421, LDR-5414 (2) and LDR-5422 must be assembled as shown in [Figure 9B on Page 41](#) and [Figure 9C on Page 42](#) and installed through the ladder rungs. The handrail bar assembly pieces will be bolted together when the handrail gussets and handrails are installed. Position the left hand bottom handrail gusset so that outer most hole lines up with the outer most hole of the handrail bar assembly. Clamp in place using the wedges, 5/16" x 1" carriage bolt and 5/16" flange nuts as shown in [Figure 9D on Page 43](#). Bolt the handrail gusset to the handrail bar assembly as shown. Position the left hand top handrail gusset so that the outer most hole lines up with the outer most hole of the handrail bar assembly. Clamp in place using the wedges and hardware as shown in [Figure 9E on Page 44](#). It will be necessary to loosen the wedge hardware slightly to allow proper installation of the handrail tubes. Repeat handrail gusset and wedge installation for the opposite side of the ladder. Install the handrail tubes using the 5/16" hardware as shown in [Figure 9F on Page 45](#) loosening the wedge hardware when necessary to obtain the proper fit of the handrail tubes. Tighten all hardware to complete the assembly. [See Figure 9G on Page 46](#) and [Figure 9H on Page 47](#) for detail.



Failure to follow instructions may cause damage or failure of the equipment.

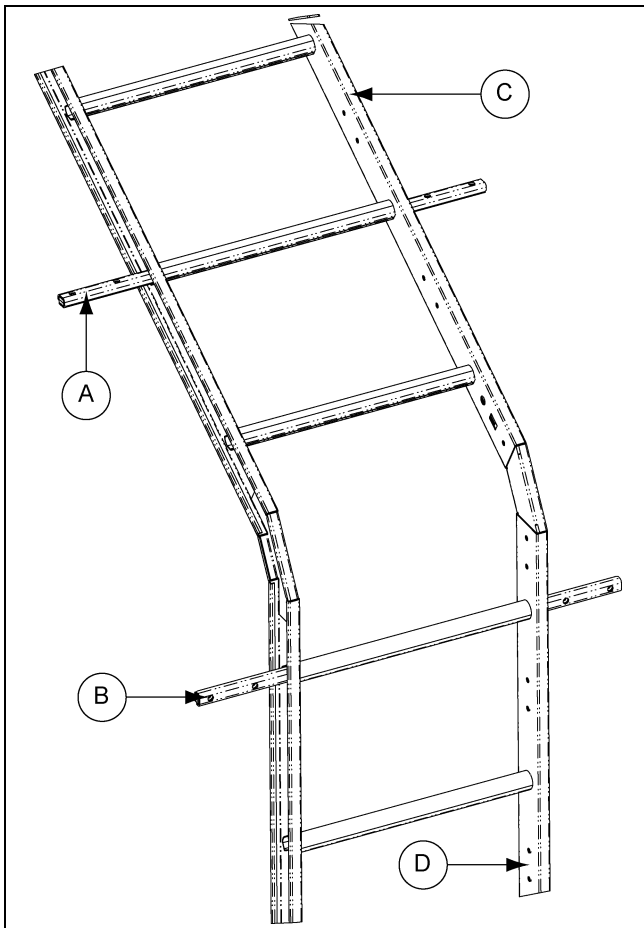


Figure 9A

Ref #	Part #	Description	Qty
A	LDR-5421	Handrail Bar Assembly <i>(See Figure 9B on Page 41.)</i>	1
	LDR-5414		2
	LDR-5422		1
B	LDR-5421	Handrail Bar Assembly <i>(See Figure 9C on Page 42.)</i>	1
	LDR-5414		2
	LDR-5422		1
C		Roof Ladder	
D		Sidewall ladder	

Handrail Installation for Ladder System without Safety Cage (Continued)

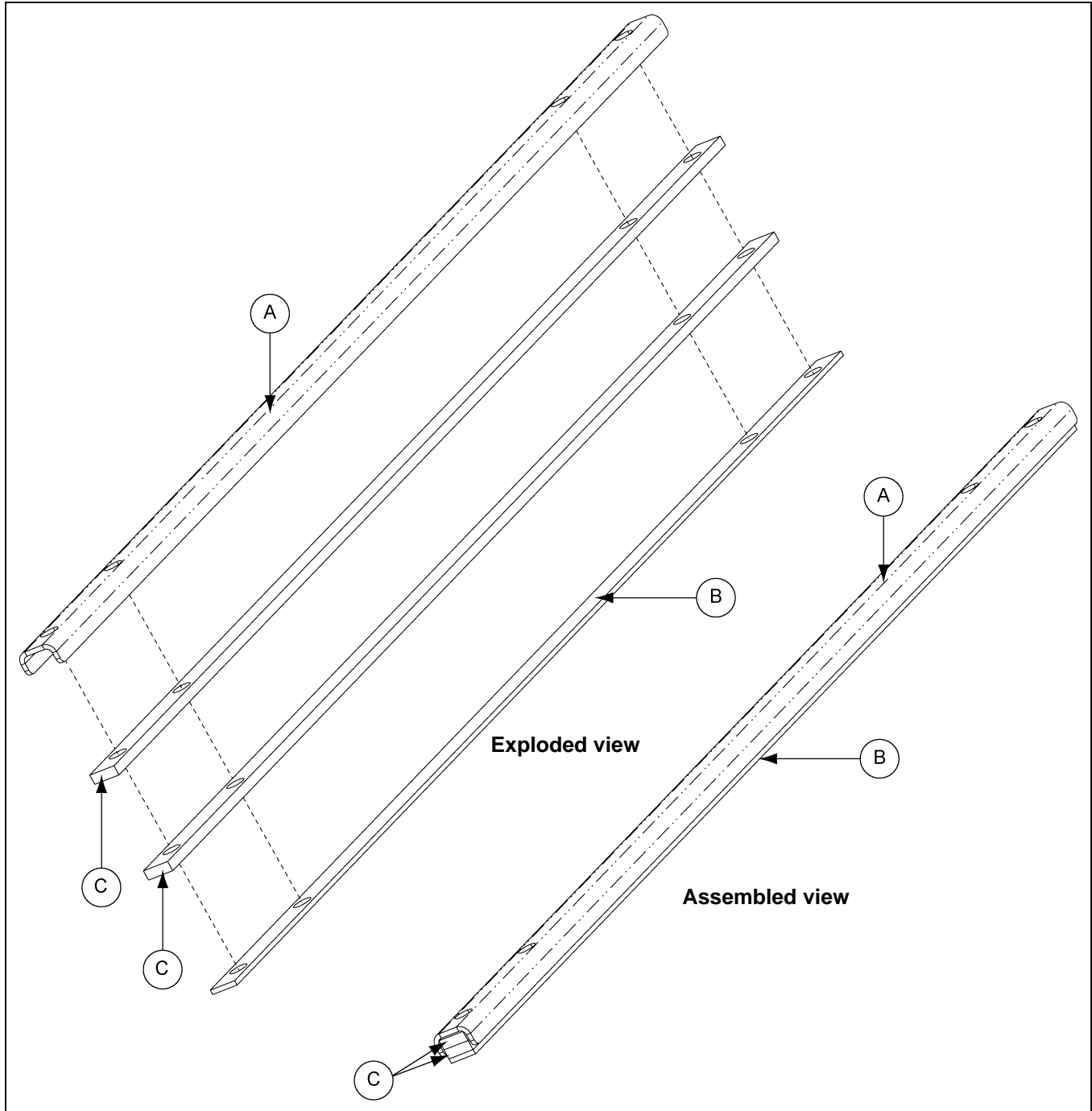


Figure 9B

Ref #	Part #	Description
A	LDR-5421	BFT Handrail Support Channel
B	LDR-5422	BFT Handrail Support Channel Reinforcement 12 Gauge
C	LDR-5414	BFT Handrail Support Channel Reinforcement

9. Ladder Handrails

Handrail Installation for Ladder System without Safety Cage (Continued)

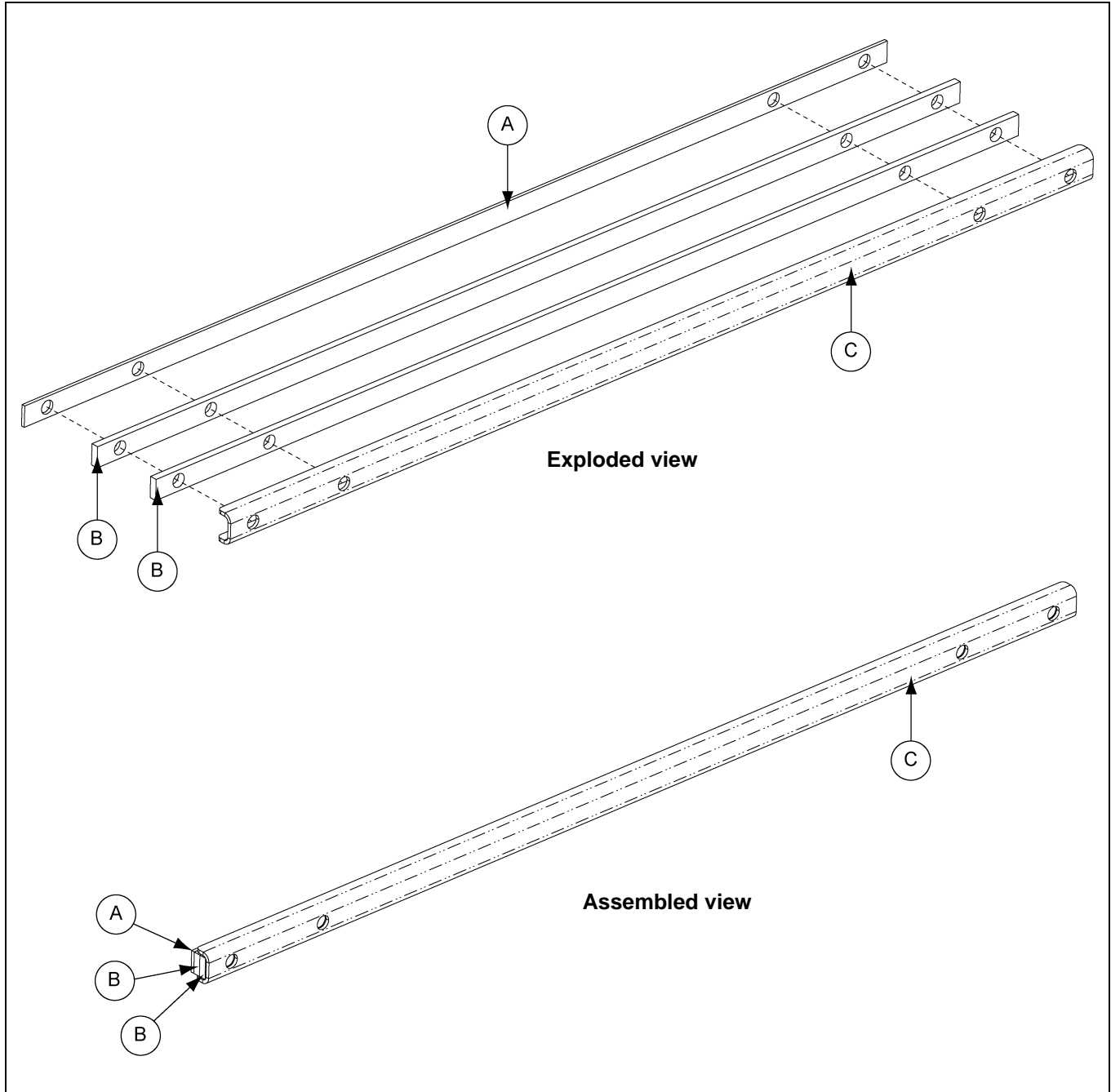


Figure 9C

Ref #	Part #	Description
A	LDR-5422	BFT Handrail Support Channel Reinforcement 12 Gauge
B	LDR-5414	BFT Handrail Support Channel Reinforcement
C	LDR-5421	BFT Handrail Support Channel

Handrail Installation for Ladder System without Safety Cage (Continued)

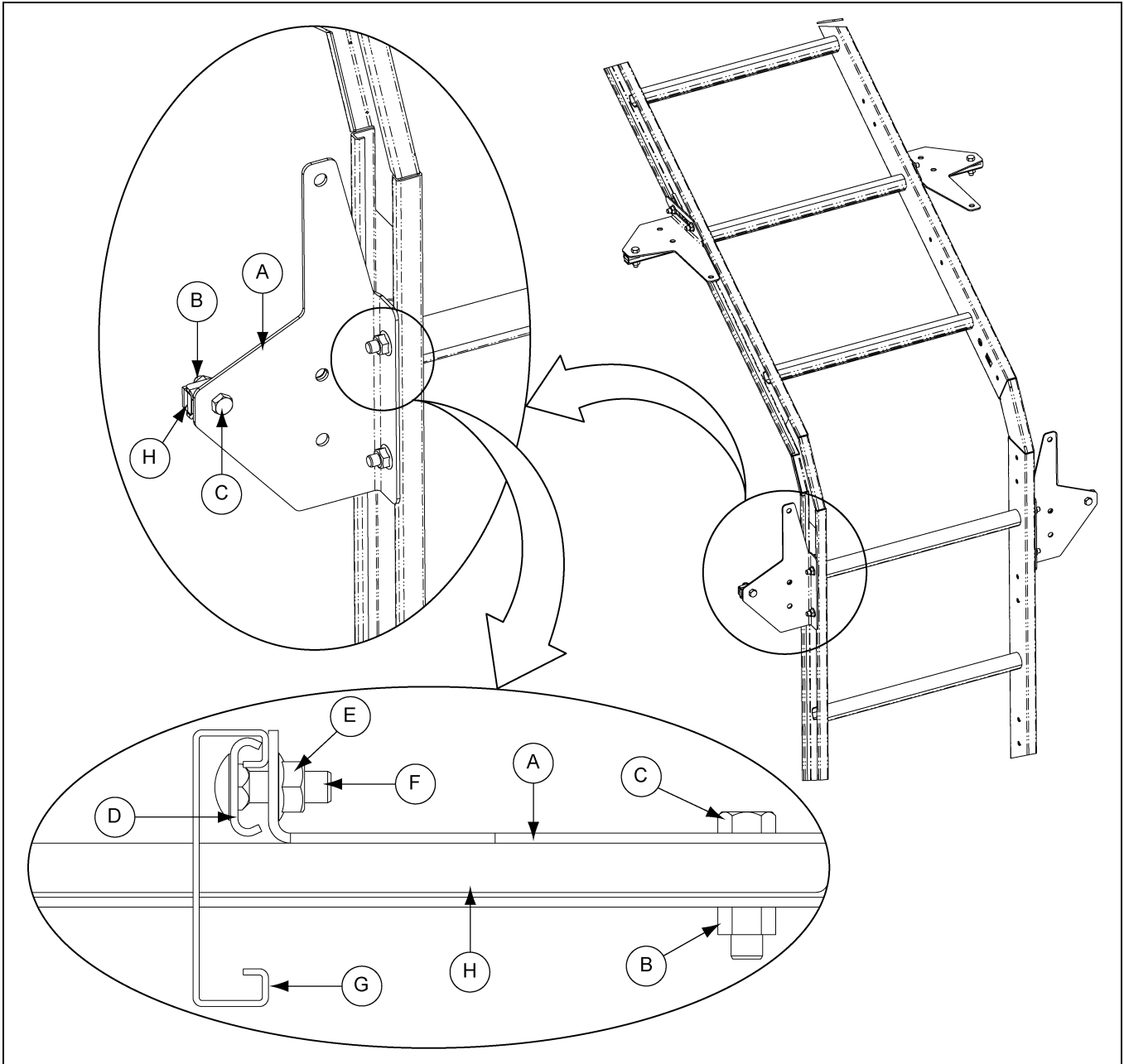


Figure 9D

Ref #	Part #	Description
A	LDR-5417	Bottom Handrail Gusset L.H.
	LDR-5418	Bottom Handrail Gusset R.H.
B	S-7484	5/16" Nut
C	S-4276	5/16" x 1-1/4" Hex Head Bolt
D	LDR-4198	Ladder Standoff Wedge

Ref #	Part #	Description
E	S-10268	Flange Nut 5/16"-18 JS Grade 5
F	S-3550	5/16" x 1" Carriage Bolt
G		Ladder
H		Handrail Bar Assembly

9. Ladder Handrails

Handrail Installation for Ladder System without Safety Cage (Continued)

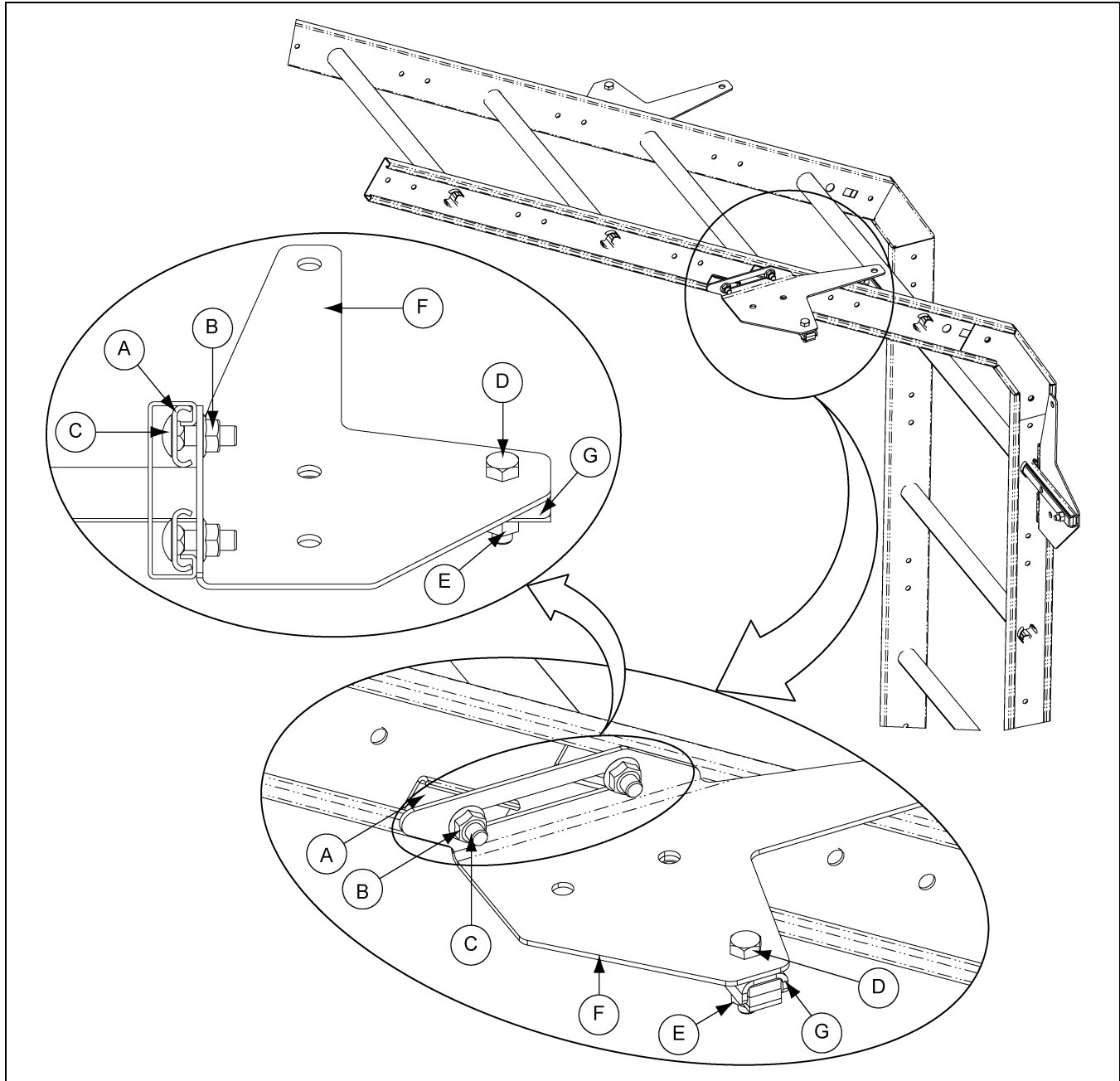


Figure 9E

Ref #	Part #	Description
A	LDR-4198	Wedge (Two (2) per Side)
B	S-10268	5/16" Flange Nut (Two (2) per Side)
C	S-3550	5/16" x 1" Carriage Bolt (Two (2) per Side)
D	S-4276	5/16" x 1-1/4" Hex Head Bolt (One per Side)

Ref #	Part #	Description
E	S-7484	5/16" Nut (One Per Side)
F	LDR-5415	Top Handrail Gusset L.H.
	LDR-5416	Top Handrail Gusset R.H.
G		Handrail Bar Assembly

Handrail Installation for Ladder System without Safety Cage (Continued)

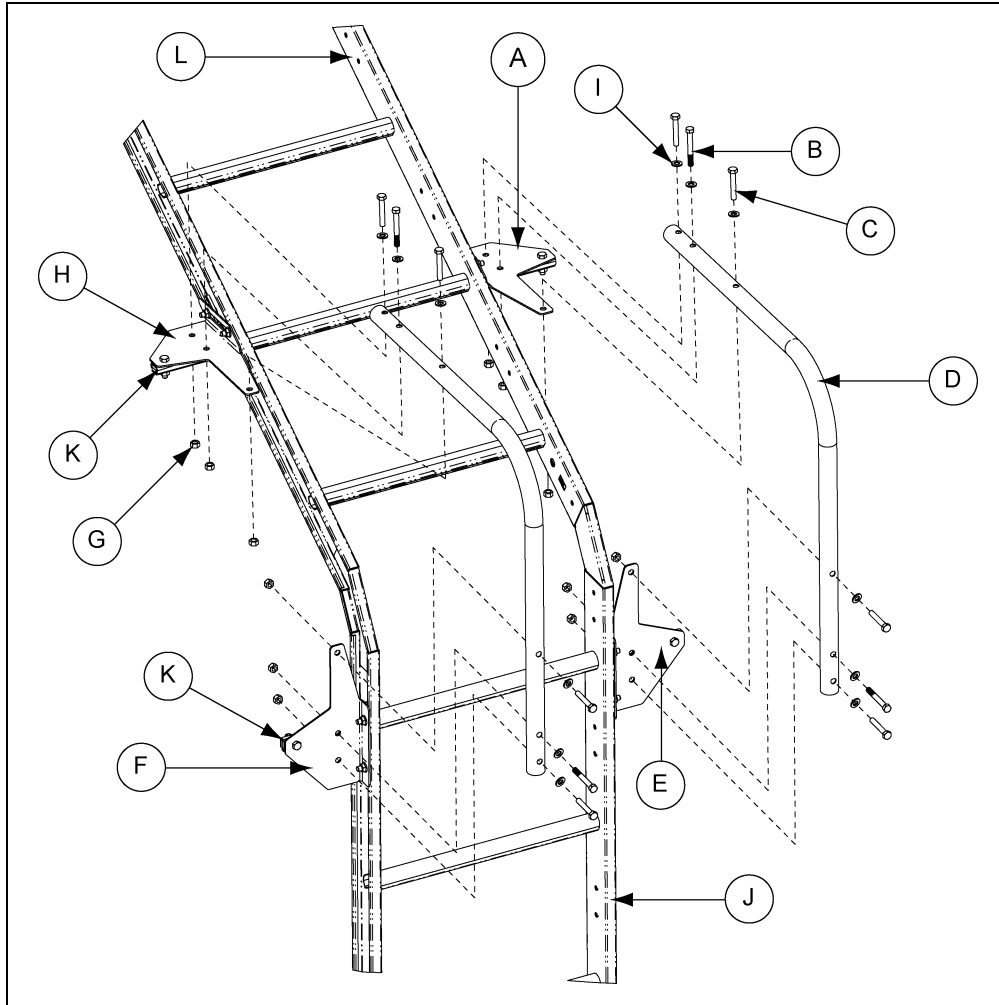


Figure 9F

Ref #	Part #	Description
A	LDR-5416	Top Handrail Gusset R.H.
B	S-7076	5/16" x 2-1/2" Hex Head Bolt (4)
C	S-7877	5/16" x 2" Hex Head Bolt (8)
D	LDR-5423	30° Handrail
	LDR-5424	40° Handrail
E	LDR-5418	Bottom Handrail Gusset R.H.
F	LDR-5417	Bottom Handrail Gusset L.H.
G	S-7484	Hex Nut 5/16"-18 JS Grade 5 (12)
H	LDR-5415	Top Handrail Gusset L.H.
I	S-1937	Flat Washer 5/16" ZN SAE Grade 2 (12)
J		Sidewall Ladder
K		Handrail Bar Assembly
L		Roof Ladder

9. Ladder Handrails

Handrail Installation for Ladder System without Safety Cage (Continued)

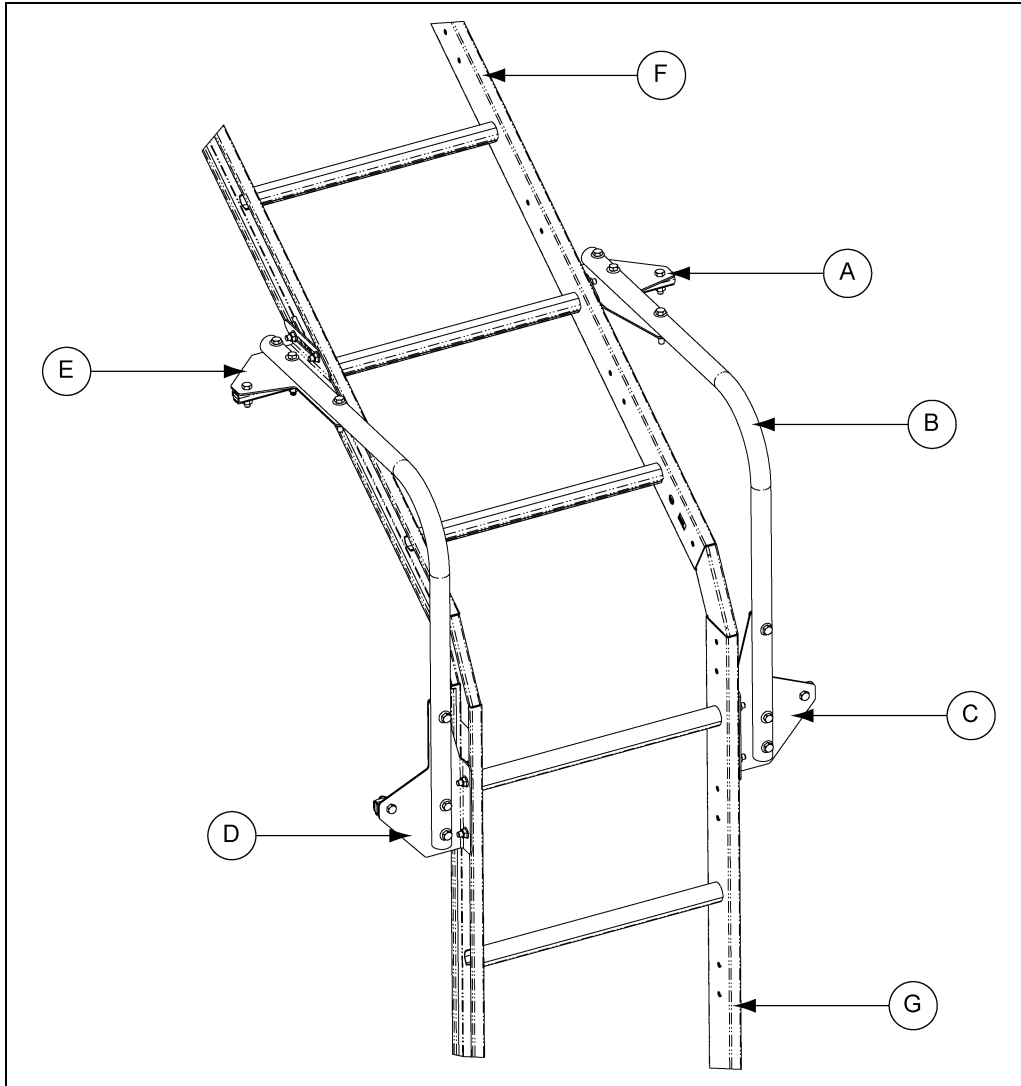


Figure 9G Handrails Fully Assembled

Ref #	Part #	Description
A	LDR-5416	Top Handrail Gusset R.H.
B	LDR-5423	30° Handrail
	LDR-5424	40° Handrail
C	LDR-5418	Bottom Handrail Gusset R.H.
D	LDR-5417	Bottom Handrail Gusset L.H.
E	LDR-5415	Top Handrail Gusset L.H.
F		Roof Ladder
G		Sidewall Ladder

Handrail Installation for Ladder System Without Safety Cage (Continued)

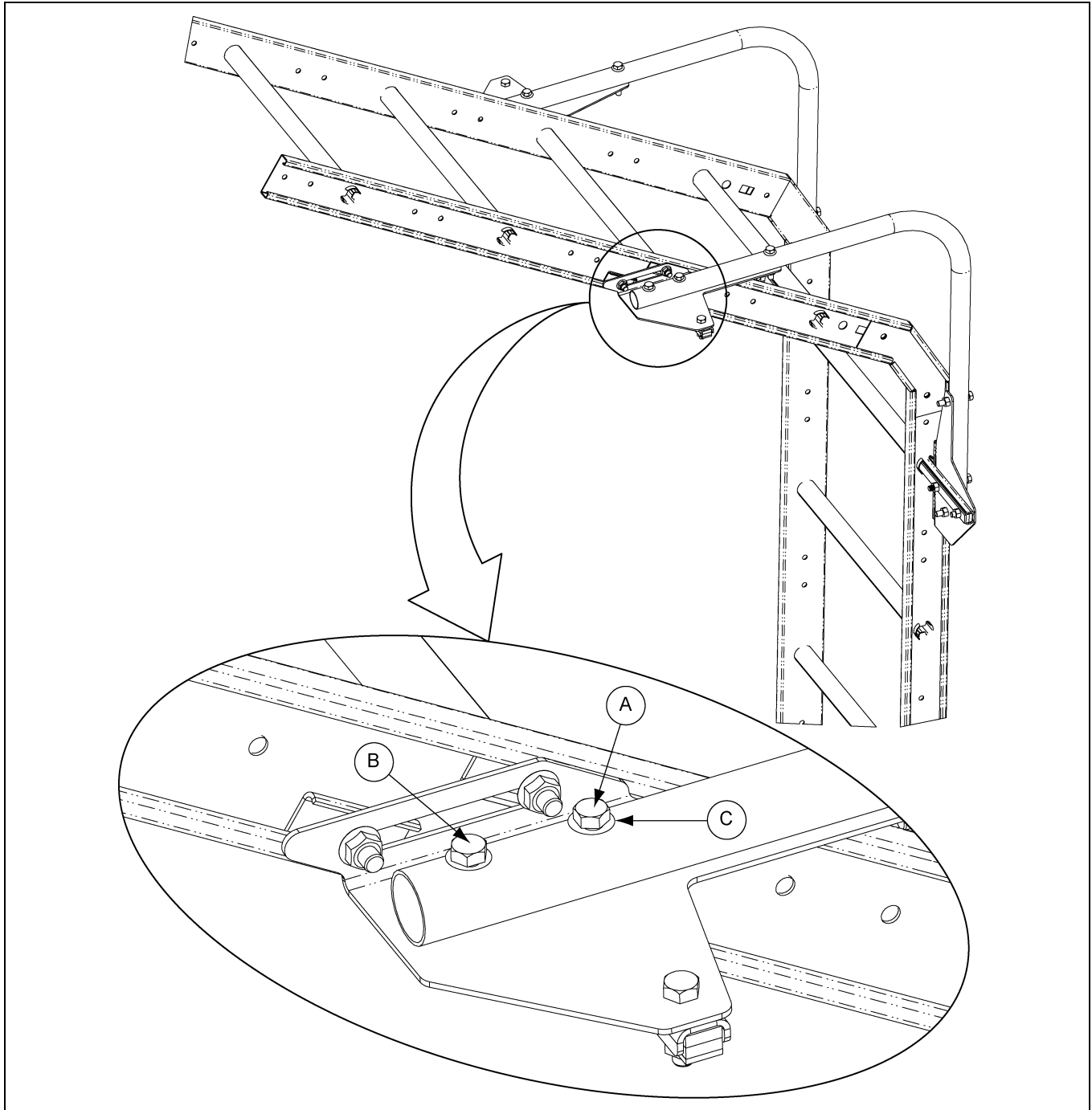


Figure 9H

Ref #	Part #	Description
A	S-7076	5/16" x 2-1/2" Hex Head Bolt
B	S-7877	5/16" x 2" Hex Head Bolt
C	S-1937	Flat Washer 5/16" ZN SAE Grade 2

Ladder System with Safety Cage

Extension Rail Installation

Before the safety cage can be installed, the ladder extension rails must be attached. Start by bolting the spacer brackets through the top and bottom set of holes in the top ladder section. Then, attach the extension rail to the spacer brackets as shown in [Figure 10A](#). When installed correctly, the bottom of the extension rail should be flush with the bottom of the top ladder section. Use 5/16" x 1" bin bolts for all connections.

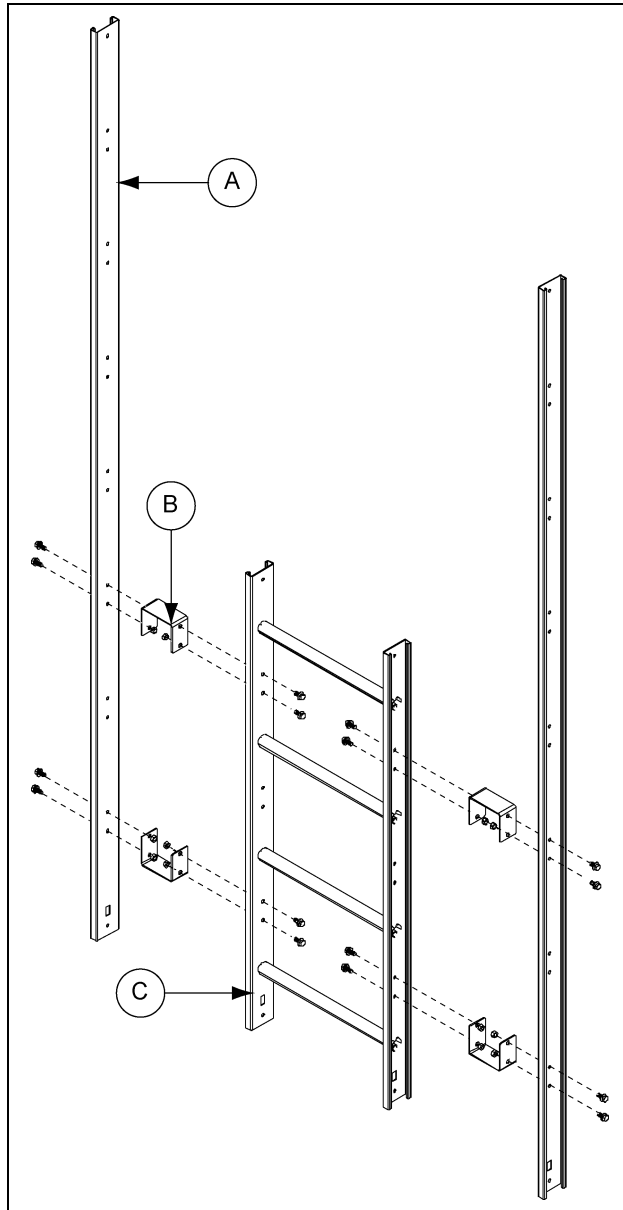


Figure 10A

Ref #	Description
A	8' RFB Extension Rail
B	Spacer Bracket (LDR-4403)
C	Top Ladder Section

Eave Adjustable Braces

The adjustable braces must be attached at this time. A large diameter tube and two (2) smaller tubes are used to make up one adjustable brace. Slip the smaller tubes inside the larger tubes and attach one smaller tube to the top of the ladder extension rail. Adjust the other smaller tube so the bottom of the flattened tube reaches the roof panel. Field drill four (4) 5/16" holes through both large and small tubes and bolt together using 1/4" x 1-1/2" bolts and nuts. This prevents the adjustable braces from slipping. (See Figure 10B.)

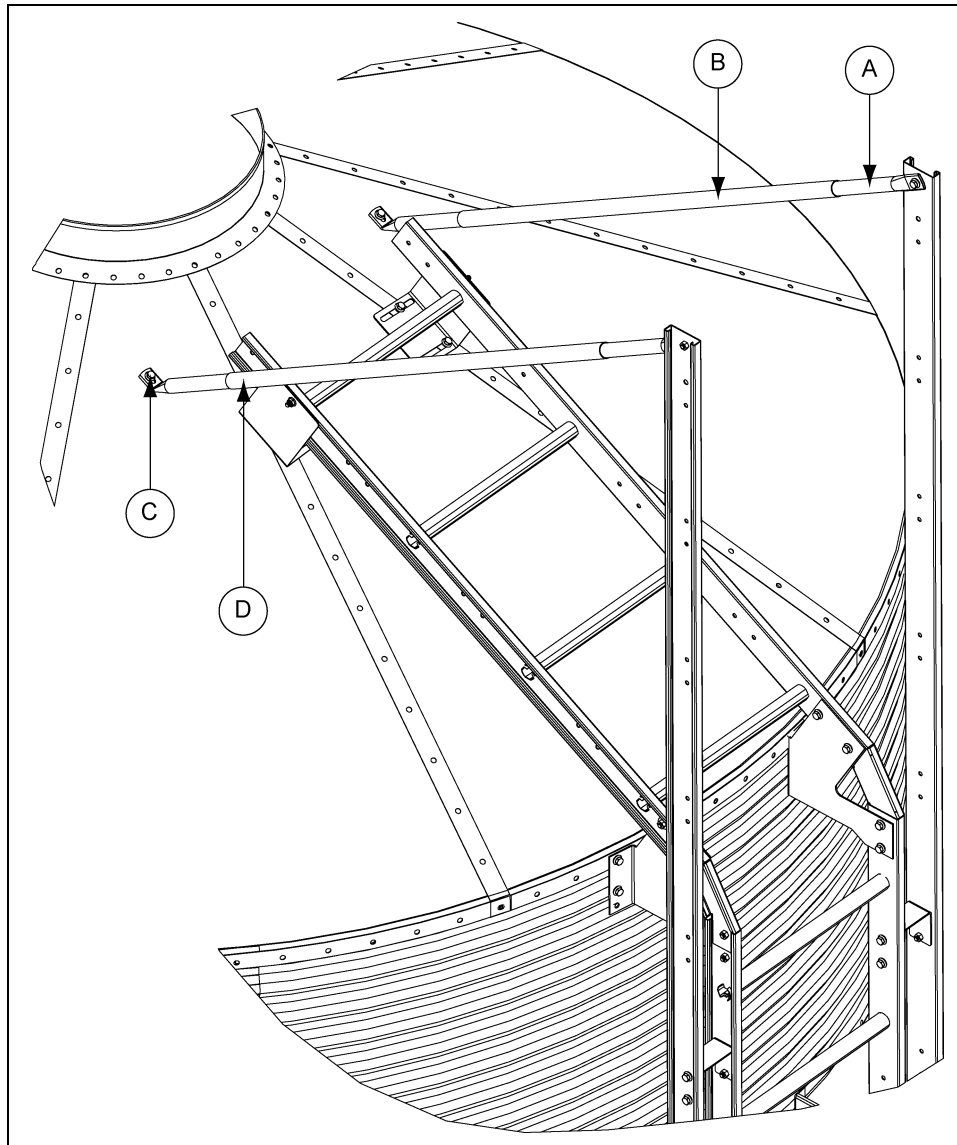


Figure 10B

Ref #	Description
A	End Tube (LS-6616)
B	Field Drill 5/16" Holes Four (4) per Brace
C	3/8" Field Drilled Hole. One per Brace
D	Center Tube (LS-6615)

10. Safety Cage

Safety Cage Hoop Assembly

To complete the safety cage hoop installation, some pre-assembly is required. Attach four (4) safety cage brackets to the extension rails and two (2) safety cage brackets to the second 4' ladder section as shown in [Figure 10C](#). See cage hoop bracket detail [on Page 51](#) for proper installation. Next, bolt each set of safety cage hoop halves together using 5/16" x 1" bolts with the head of the bolt to the inside of the safety cage. You may now bolt these assemblies to the safety cage brackets. Tighten bolts as you go.

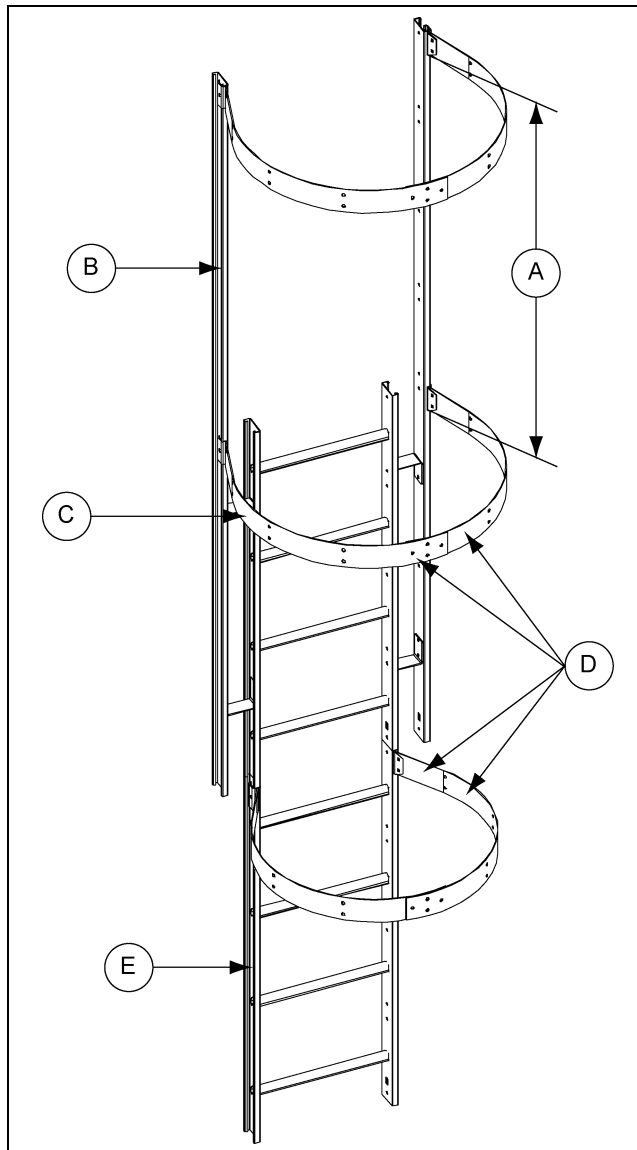


Figure 10C

Ref #	Description
A	48" Typical Bottom to Bottom
B	Extension Rail
C	Cage Hoop Bracket
D	Safety Cage Hoop Halves (LDR-4201)
E	Ladder Section

Cage Hoop Bracket Detail

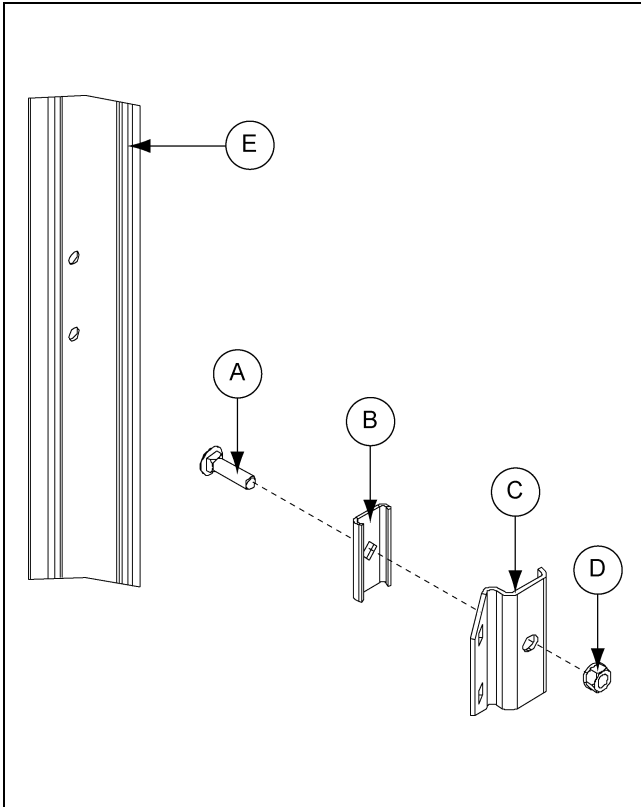


Figure 10D

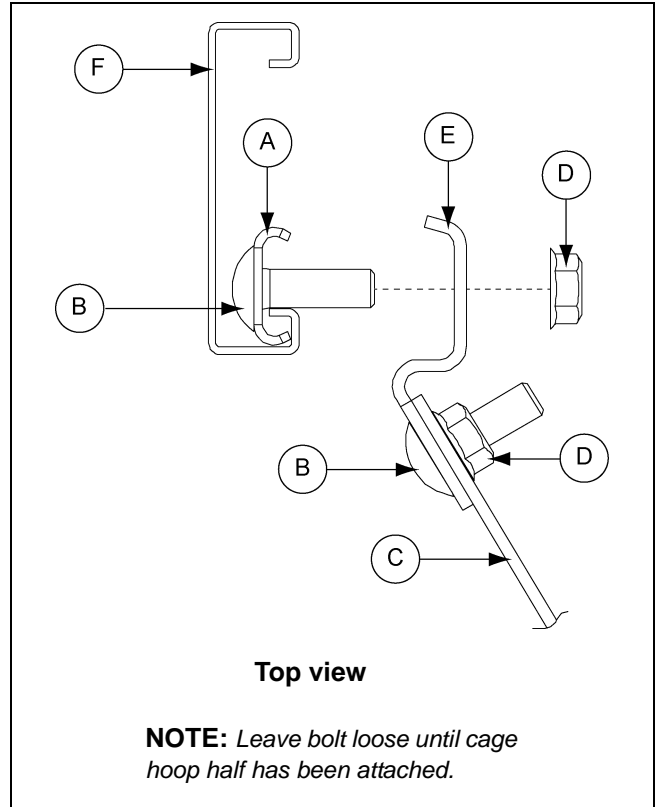


Figure 10E

Ref #	Part #	Description
A	S-3550	5/16" x 1" Carriage Bolt
B	LDR-4198	Wedge
C	LDR-4199	Cage Hoop Bracket
D	S-10268	Flange Nut 5/16"-18 JS Grade 5
E		Extension Rail/Ladder

Ref #	Part #	Description
A	LDR-4198	Wedge
B	S-3550	5/16" x 1" Carriage Bolts
C	LDR-4201	Safety Cage Hoop Half
D	S-10268	Flange Nut 5/16"-18 JS Grade 5
E	LDR-4199	Cage Hoop Bracket
F		Extension Rail/Ladder

10. Safety Cage

Safety Cage Installation

Vertical Supports

After all three (3) hoop assemblies are in place, attach the 48" vertical supports from hoop assembly to hoop assembly as shown in [Figure 10F](#). This requires fourteen (14) supports, seven (7) between each set of hoops. The second set of vertical supports must be bent at the flat area to allow for the tapering of the bottom hoop assembly. Use 5/16" x 1" bolts with the head of the bolt to the inside of the safety cage.

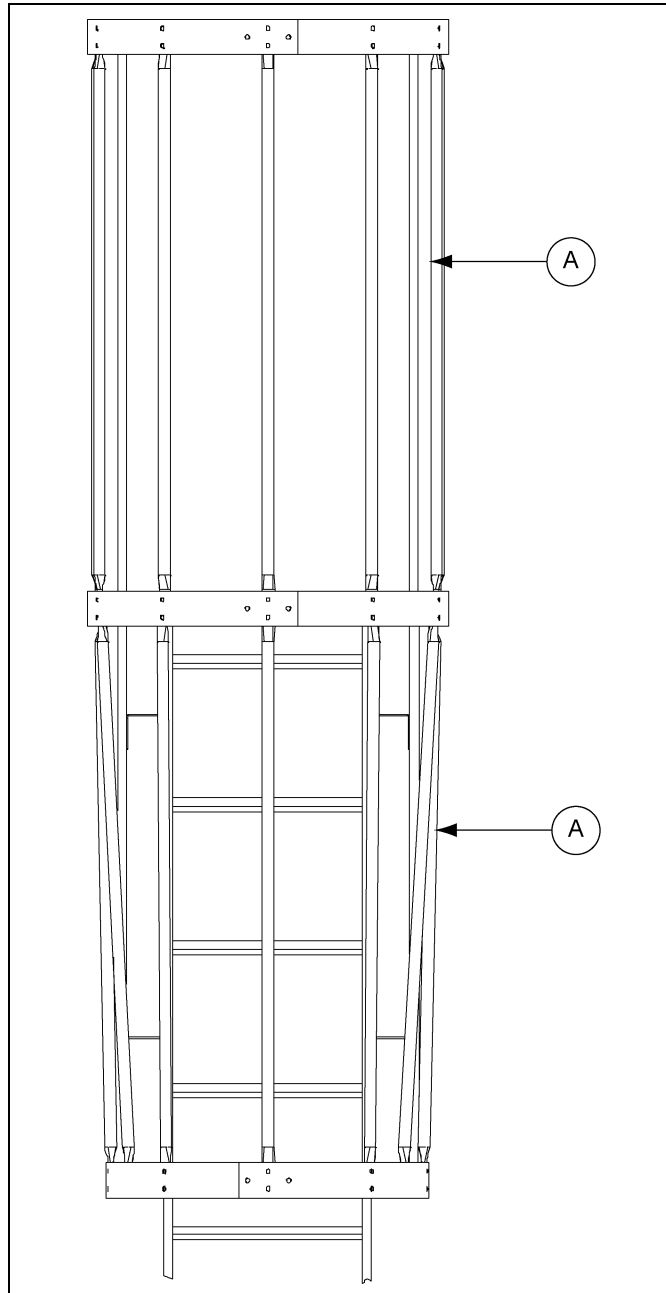


Figure 10F

Ref #	Part #	Description
A	LS-6713	Safety Cage 48" Vertical Supports

48" Safety Cage

Attach the vertical support pieces to the existing hoop halves above using 5/16" x 1" bolts and nuts with the head of the bolt to the inside of the safety cage. Fasten two (2) hoop halves together and bolt to other end of vertical supports. Attach cage hoop bracket to ladder. See cage hoop bracket detail [on Page 51](#). Once cage hoop brackets are installed, attach cage hoop halves and tighten bolts. Repeat installation for each safety cage required.

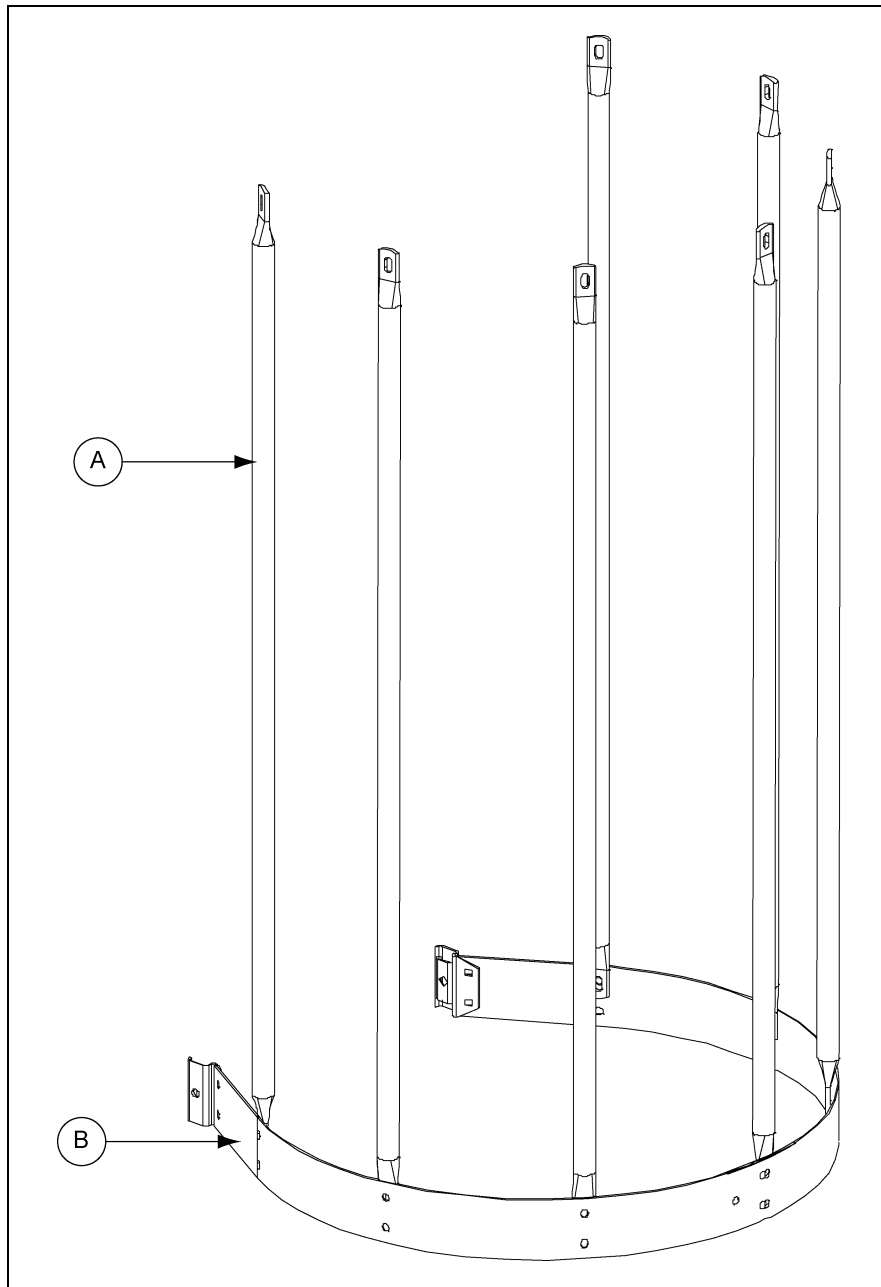


Figure 10G

Ref #	Part #	Description
A	LS-6713	Safety Cage 48" Vertical Support
B	LDR-4201	Safety Cage Hoop Half

10. Safety Cage

24"-48" Safety Cage Bell Section

Attach the vertical supports to the hoop half assembly from the final safety cage installation using 5/16" x 1" bolts and nuts with the head of the bolt to the inside of the safety cage. Assemble the special bell hoop halves and attach to the other end of the vertical supports. The vertical supports must be bent at the flat area to allow for the angle of the bell section. Attach the safety cage brackets to the ladder as shown *in Figure 11A on Page 55*. Once the safety cage brackets are installed, attach the bell safety cage hoop half assembly to the safety cage brackets. Tighten bolts as you go.

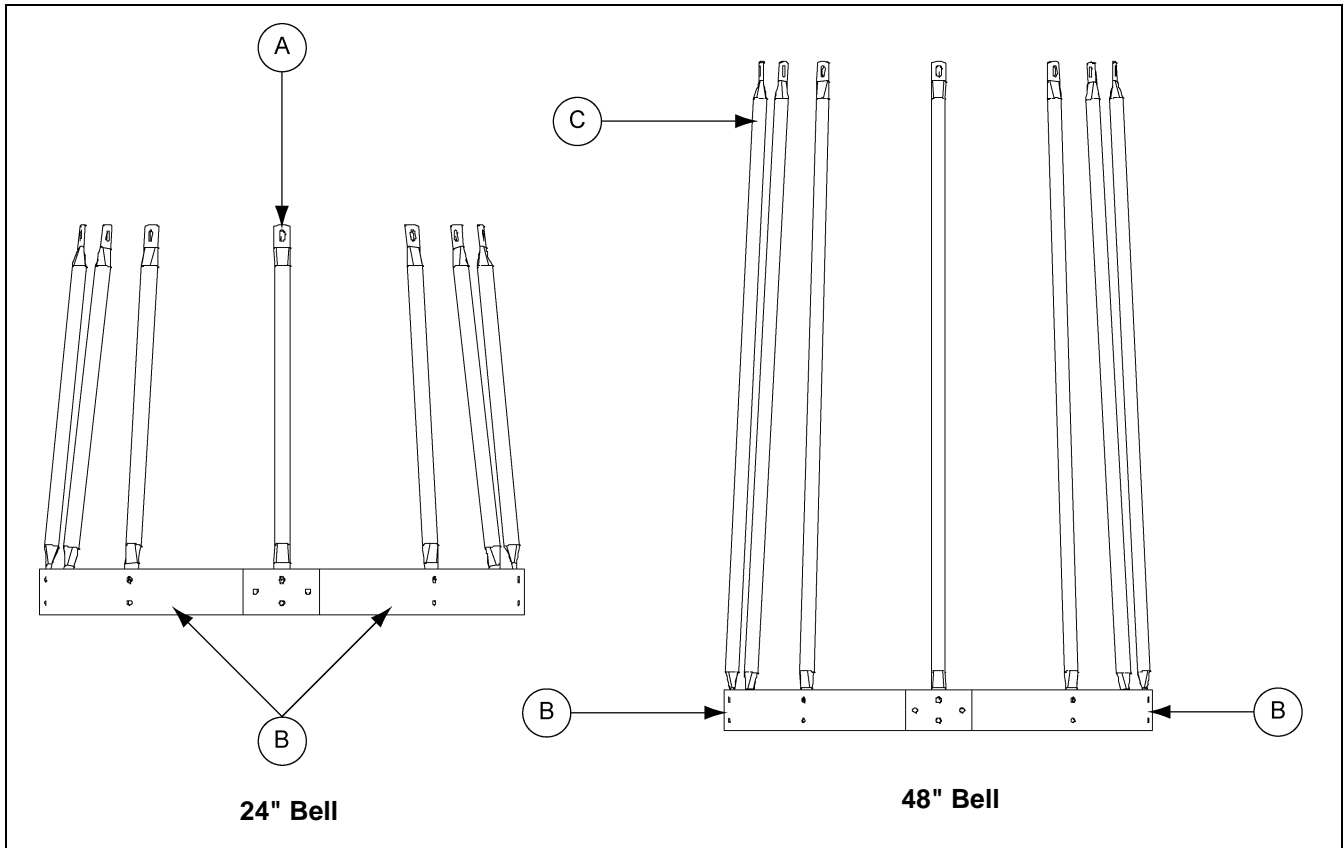


Figure 10H

Ref #	Part #	Description
A	LS-6714	24" Vertical Support
B	LS-4202	Safety Cage Bell Hoop Halfs
C	LS-6713	48" Vertical Support

Roof Cap and Ground Control Instructions

Additional Tools and Materials Needed:

- Clamp
- Assorted Wrench Set
- Ratchet and Socket Set

NOTE: Roof cap ground control comes standard on 6'-60°, 7'-67° and 9'-60° Bulk Feed Tanks. Roof cap ground control is optional on all 45° Bulk Feed Tanks. (See Figure 11A.)

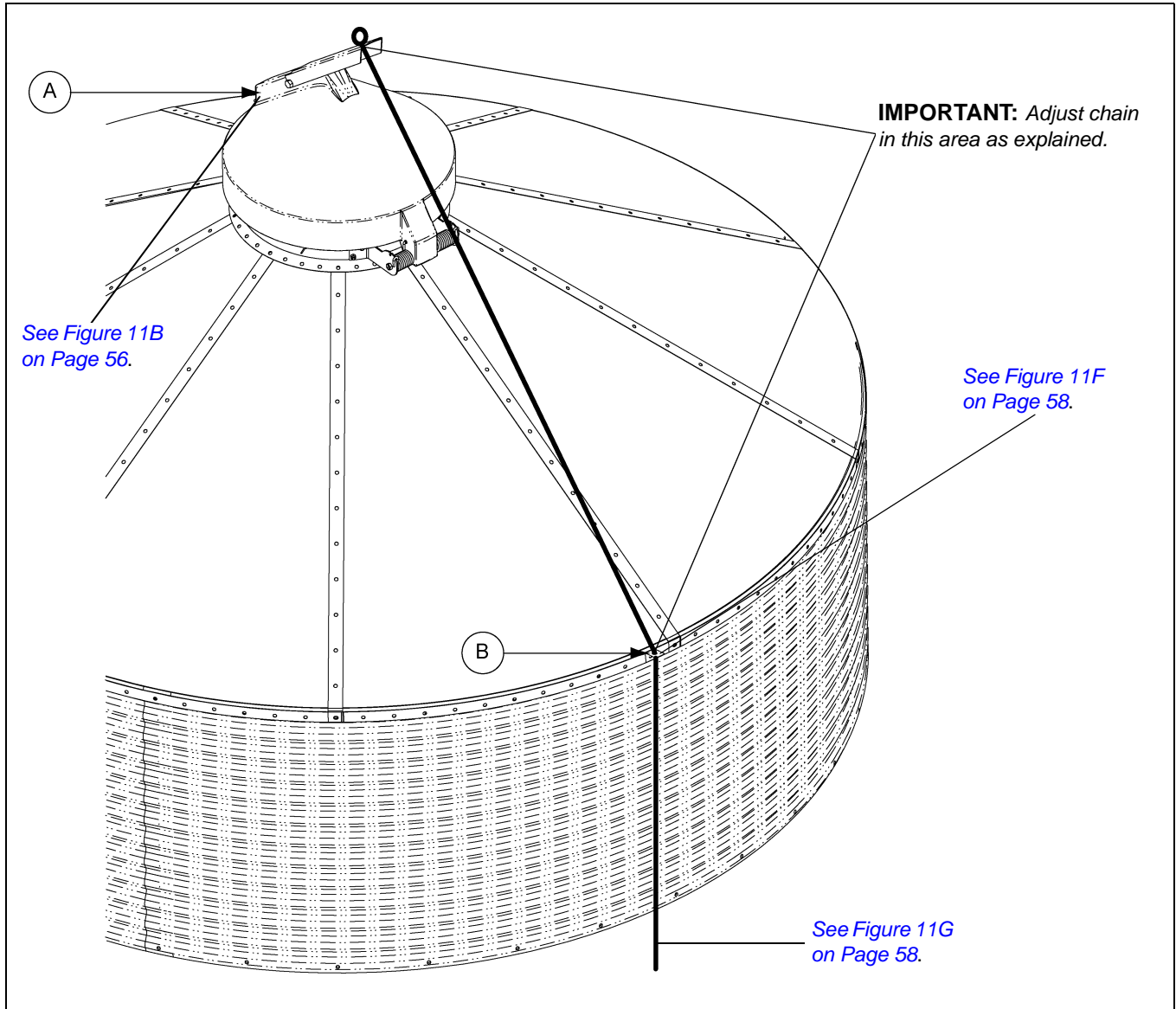
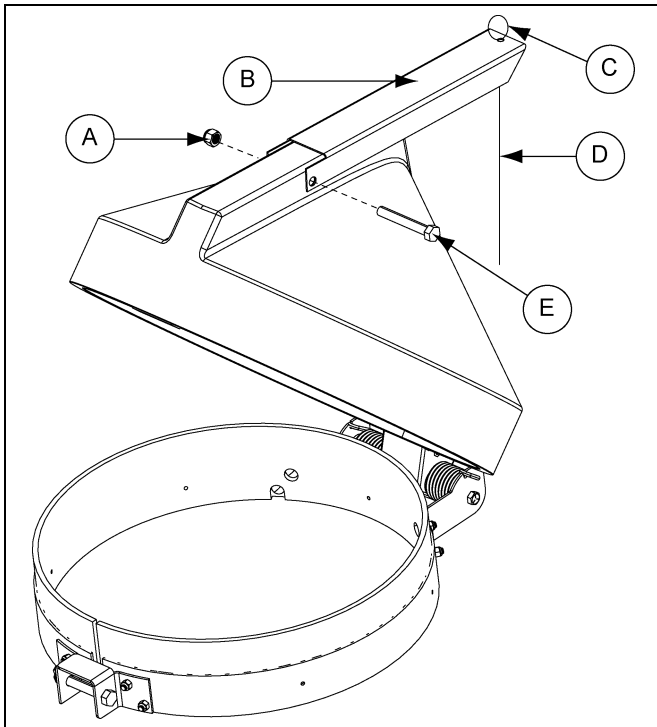


Figure 11A

Ref #	Description
A	Lever Arm
B	Roof Eave Bracket

11. Roof Cap and Ground Control

1. **With the lid closed**, align the hole in the lever arm with the hole in the bin lid. Insert 1/2" bolt through the hole and fasten with the nylock nut using 3/4" wrench and ratchet. **NOTE: DO NOT over tighten.** This is a pivot bolt and the lever arm must be able to pivot freely.



Ref #	Description
A	Nut
B	Lever Arm
C	Key Ring
D	Chain
E	Bolt
F	Mounting Brackets
G	Clamp
H	Bracket should extend over flange.

Figure 11B Install Lever Arm and Chain

2. Place the lid assembly over the existing peak ring collar and rotate lid assembly such that the lever arm and spring hinge line up with the roof eave bracket, [See Figure 11A on Page 55](#). Use a clamp to pull the mounting brackets together. Slide the 3/8" carriage bolt supplied through the mounting bracket and loosely fasten with nut, [See Figure 11C](#). Remove clamp and tighten the bolt with 9/16" ratchet, ensuring that the vertical flange tightens past the left edge of the top, horizontal flange, [See Figure 11E on Page 57](#).

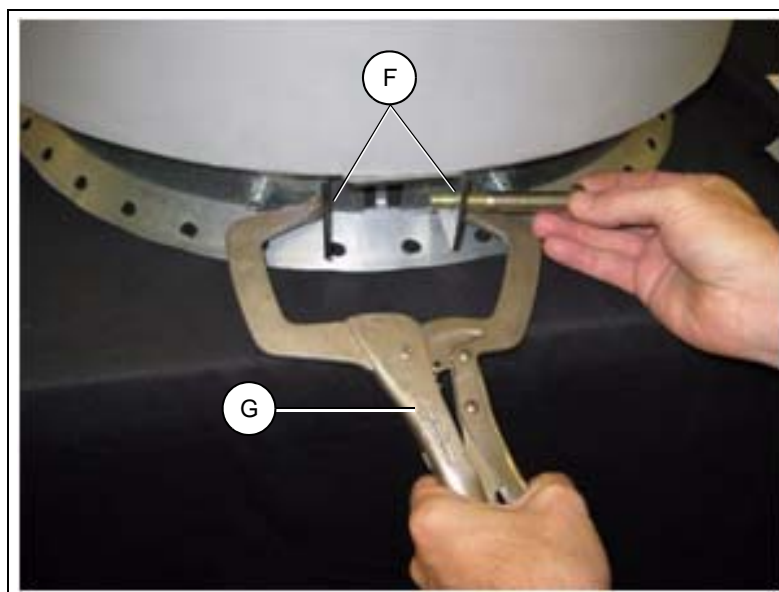


Figure 11C Mount Lid to Peak Ring

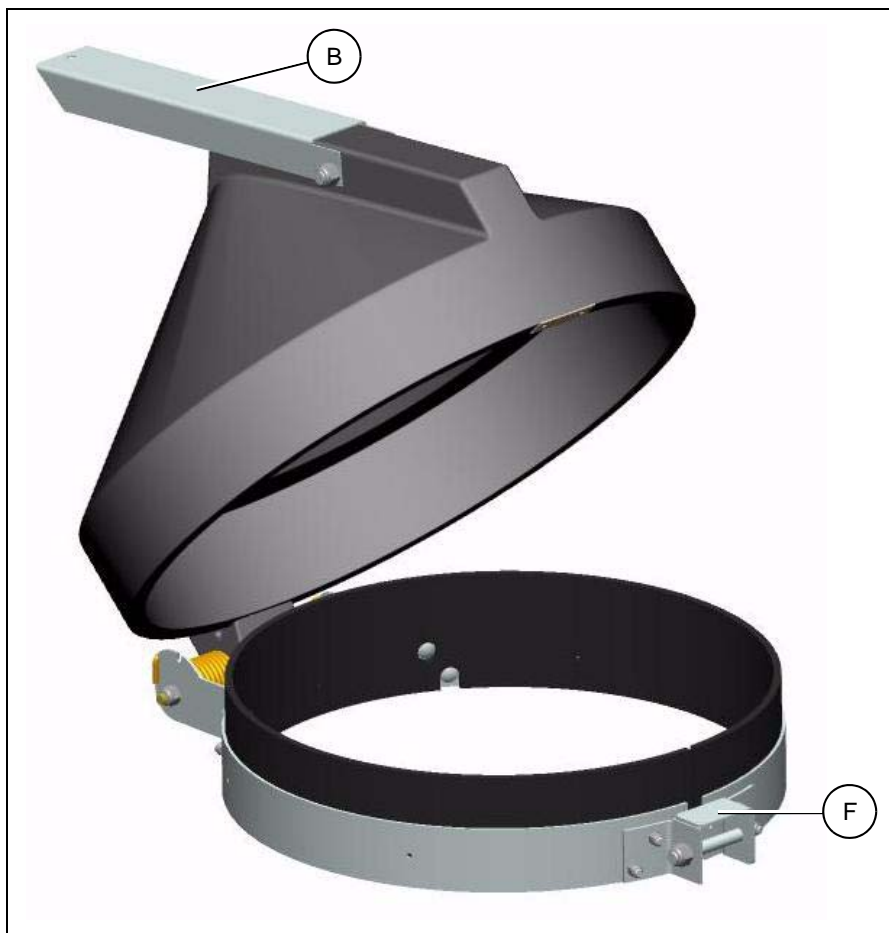


Figure 11D

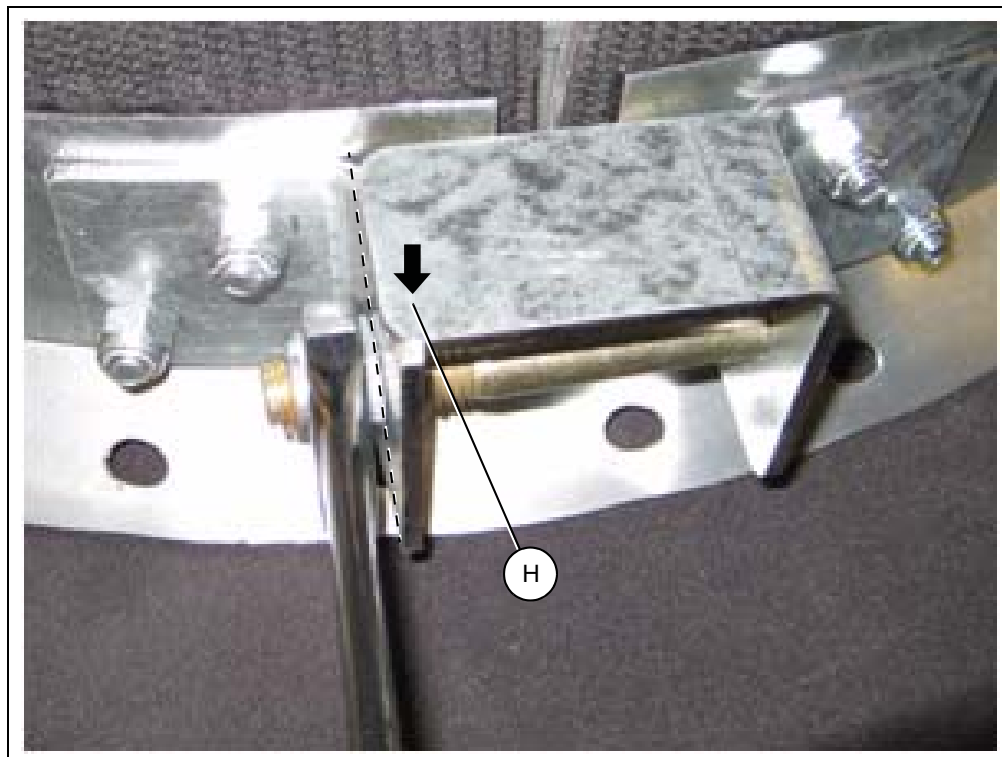


Figure 11E Tighten Bolts Until Flush with Bracket

11. Roof Cap and Ground Control

- Thread the existing chain through the hole on the end of the lever arm and fasten it to the provided key ring. (See Figure 11B on Page 56.) Ensure that the ground control chain is freely looped through the roof eave bracket and chain holder. After removing the slack in the chain while the lid is fully closed and in latched position, re-position the key ring 2" below the roof eave bracket. (See Figure 11F.) Re-adjust the existing handle and key ring so the handle is positioned for easy access from ground. (See Figure 11G.) Check to make sure that the key rings allow the cap to fully close, but will not allow the chain enough slack on top of the cap to become wrapped around the lever arm in a high wind condition.

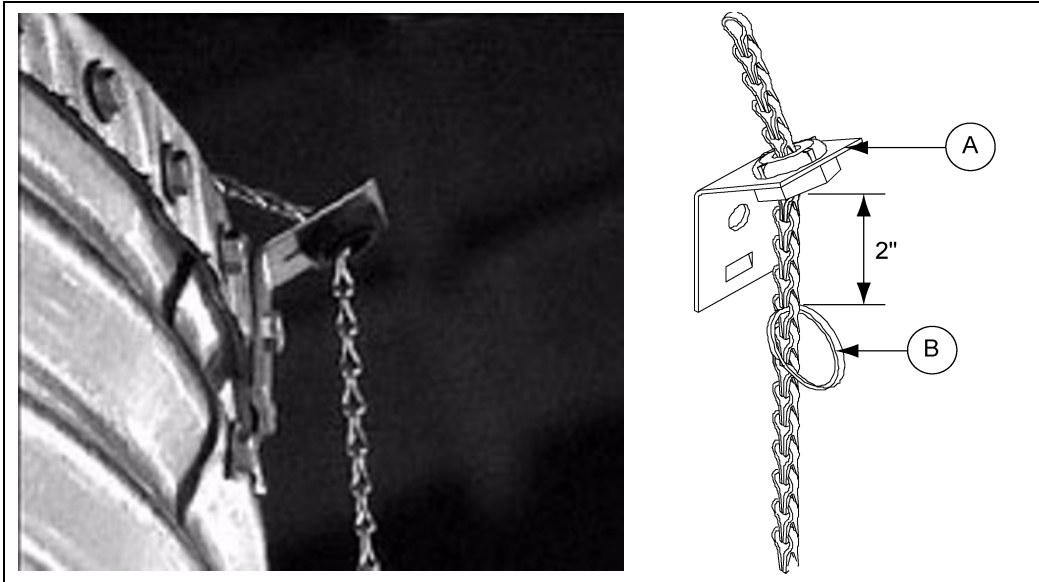


Figure 11F

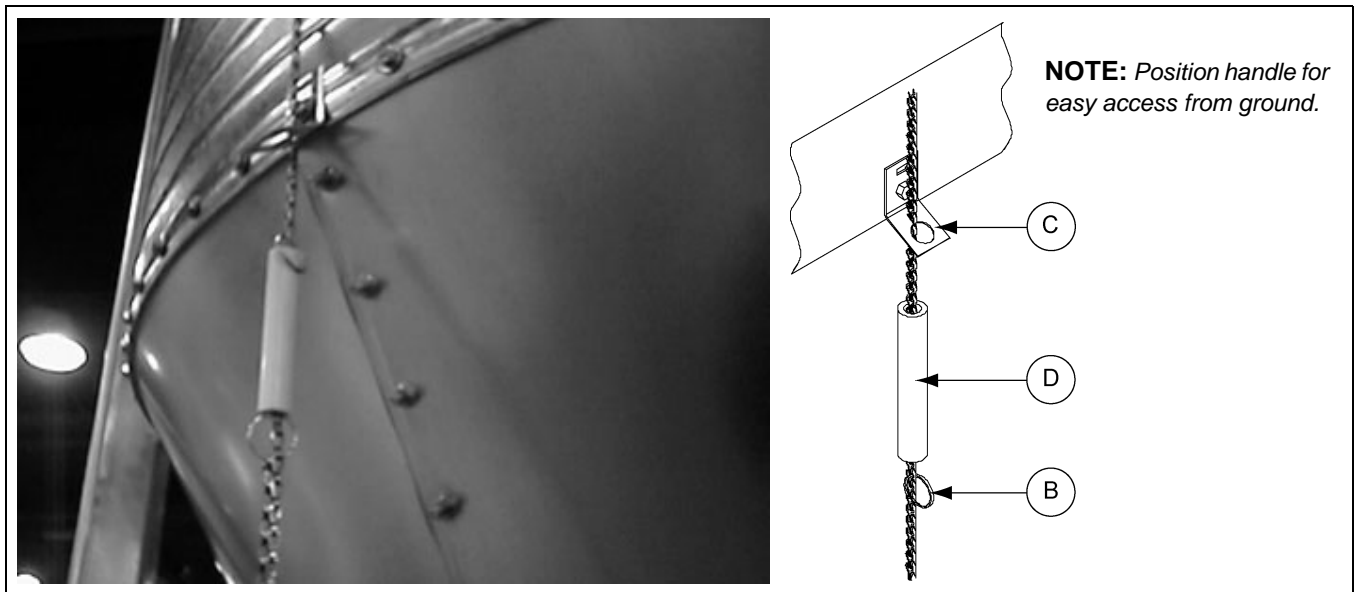


Figure 11G

Ref #	Description
A	Roof Eave Bracket (BLK-11950)
B	Key Ring

Ref #	Description
C	Chain Holder (BLK-11949)
D	Handle

4. Install the decal DC-2123 to the inside of peak ring on the hinge side of the lid as shown in [Figure 11H](#). Decal should be clearly visible when lid is open.



Figure 11H

11. Roof Cap and Ground Control

BFT Collar Assembly (BLK-13062)

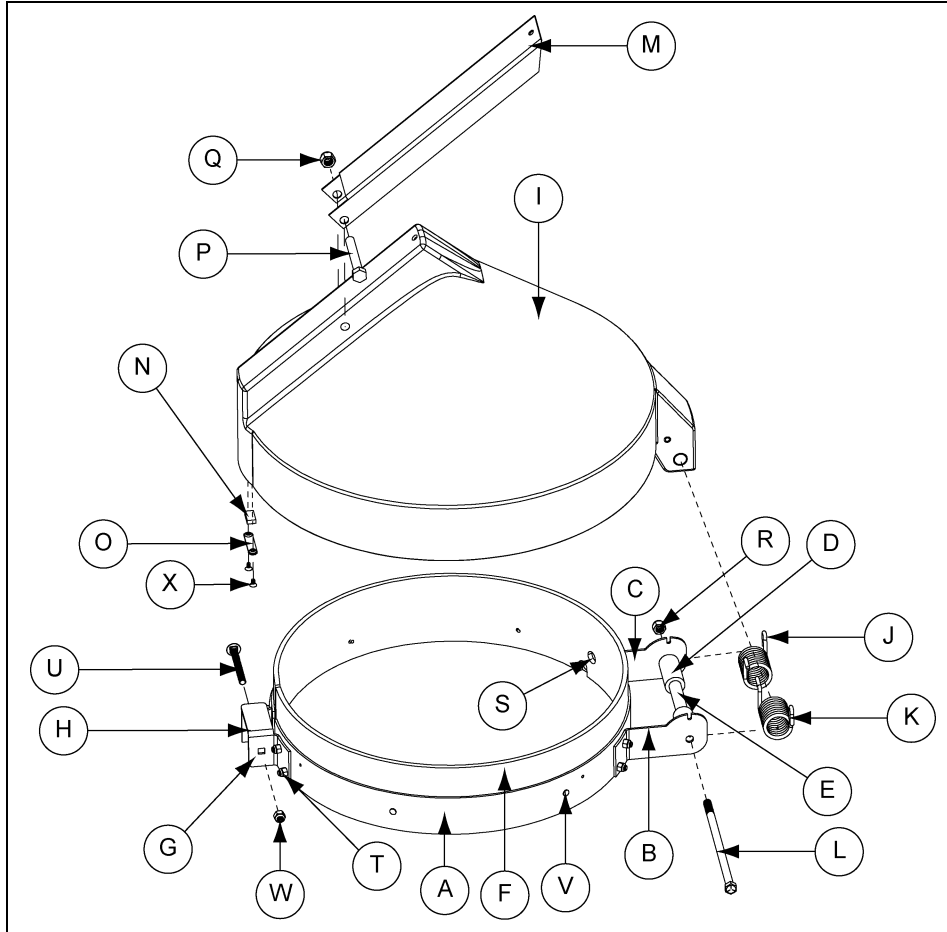


Figure 111

BFT Collar Assembly (BLK-13062) Parts List

Ref #	Part #	Description	Qty
A	BLK-13059	BFT, Lid Clamp Band	1
B	BLK-13061	BFT, Lid Clamp Band Bracket - Right	1
C	BLK-13065	BFT, Lid Clamp Band Bracket - Left	1
D	BLK-13038	Support, Spring BFT	2
E	BLK-13064	BFT, Lid Pivot Tube	1
F	BLK-13053	Bumper, Reinforced Rubber Belting	1
G	BLK-13066	BFT, Lid Clamp Band Bracket - Right	1
H	BLK-13067	BFT, Lid Clamp Band Bracket - Left	1
I	BLK-13070	BFT, Lid	1
J	BLK-13027	Spring, L.H. Rear	1
K	BLK-13028	Spring, R.H. Rear	1
L	S-10121	Bolt, HHCS 7/16"-14 x 9" ZN Grade 5	1

Ref #	Part #	Description	Qty
M	BLK-13048	Leverage Arm - BFT Lid	1
N	BLK-13068	BFT, Lid Magnet	1
O	BLK-13058	Retainer, Magnet, BFT Lid	1
P	S-8314	Bolt, HHCS 1/2"-13 x 3-1/2" YDP Grade 8	1
Q	S-8260	Nylock Nut 1/2"-13 ZN Grade 5	1
R	S-8234	Nylock Nut 7/16"-14 ZN Grade 2	1
S	S-7645	Carriage Bolt 5/16"-18 x 3/4" ZN Grade 5	8
T	S-7382	Nylock Nut 5/16"-18 ZN Grade 5	8
U	S-9085	Carriage Bolt 3/8"-16 x 3-1/2" ZN Grade 5	1
V	S-7236	Rivet, POE 3/16" Diameter x 0.565" Long ARSM	7
W	S-7383	Nylock Nut 3/8"-16 ZN Grade 5	1
X	S-10138	Bolt, FHSCS #10-32 x 3/8" ZN	2

Hopper Sheets

When starting to attach hopper sheets to sidewall it is recommend that the first hopper sheet seam be positioned halfway between leg positions. Lap the hopper sheets as shown in [Figure 12B on Page 62](#). Apply two (2) strips of caulking on all seams at sidewall to hopper and hopper sheet to hopper sheet. Be sure to place the head of the truss bolt on the **inside** of hopper. Leave one hopper sheet out to allow room to install hopper collar. Be sure to use two (2) strips of caulking between hopper collar and hopper sheets, then put last hopper sheet in place.



All 9' diameter 60° 3-6 ring and 7' diameter 67° 5 and 6 ring tanks require hopper reinforcement angles. Angle covers entire seam (including hopper collar).

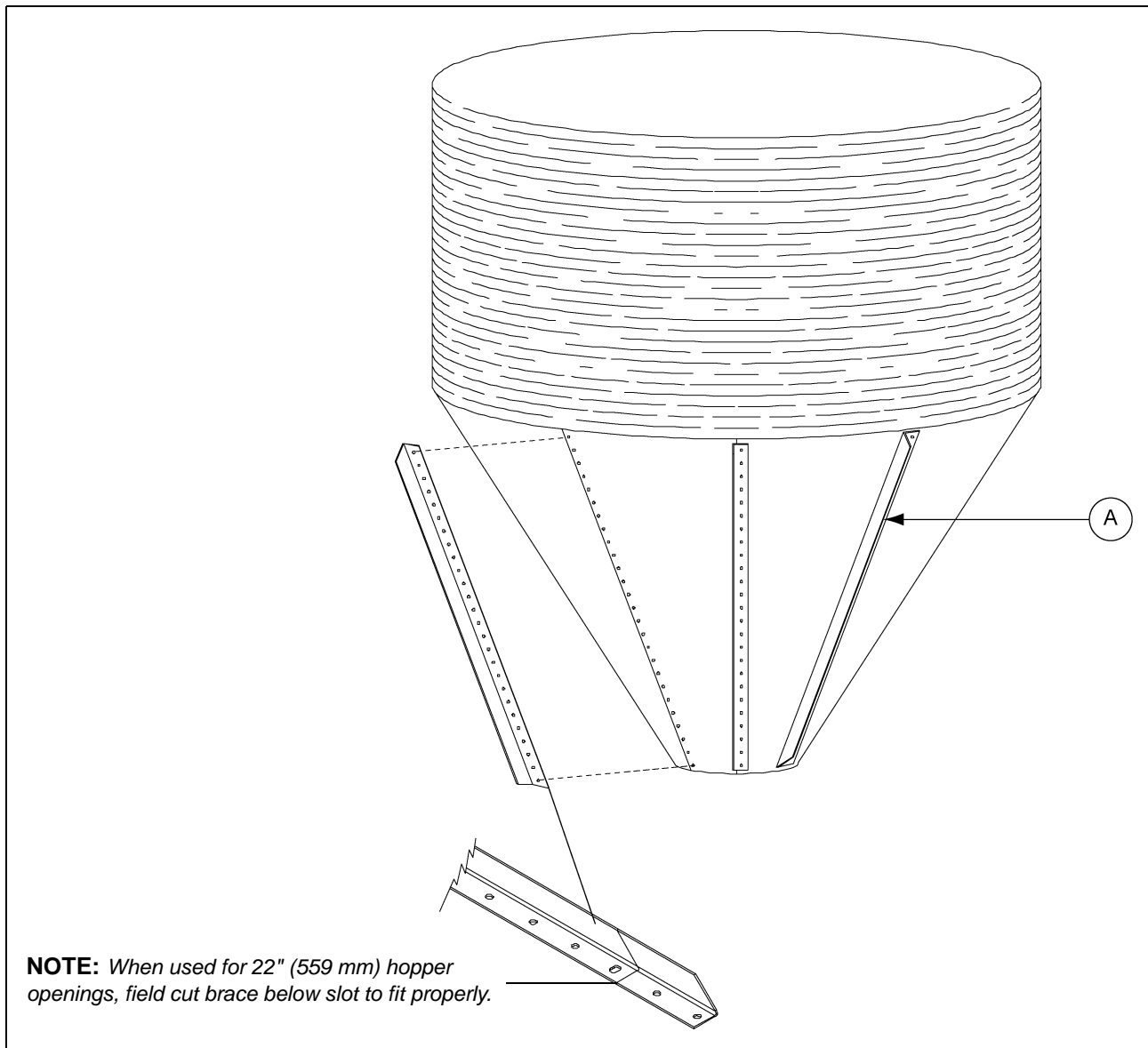
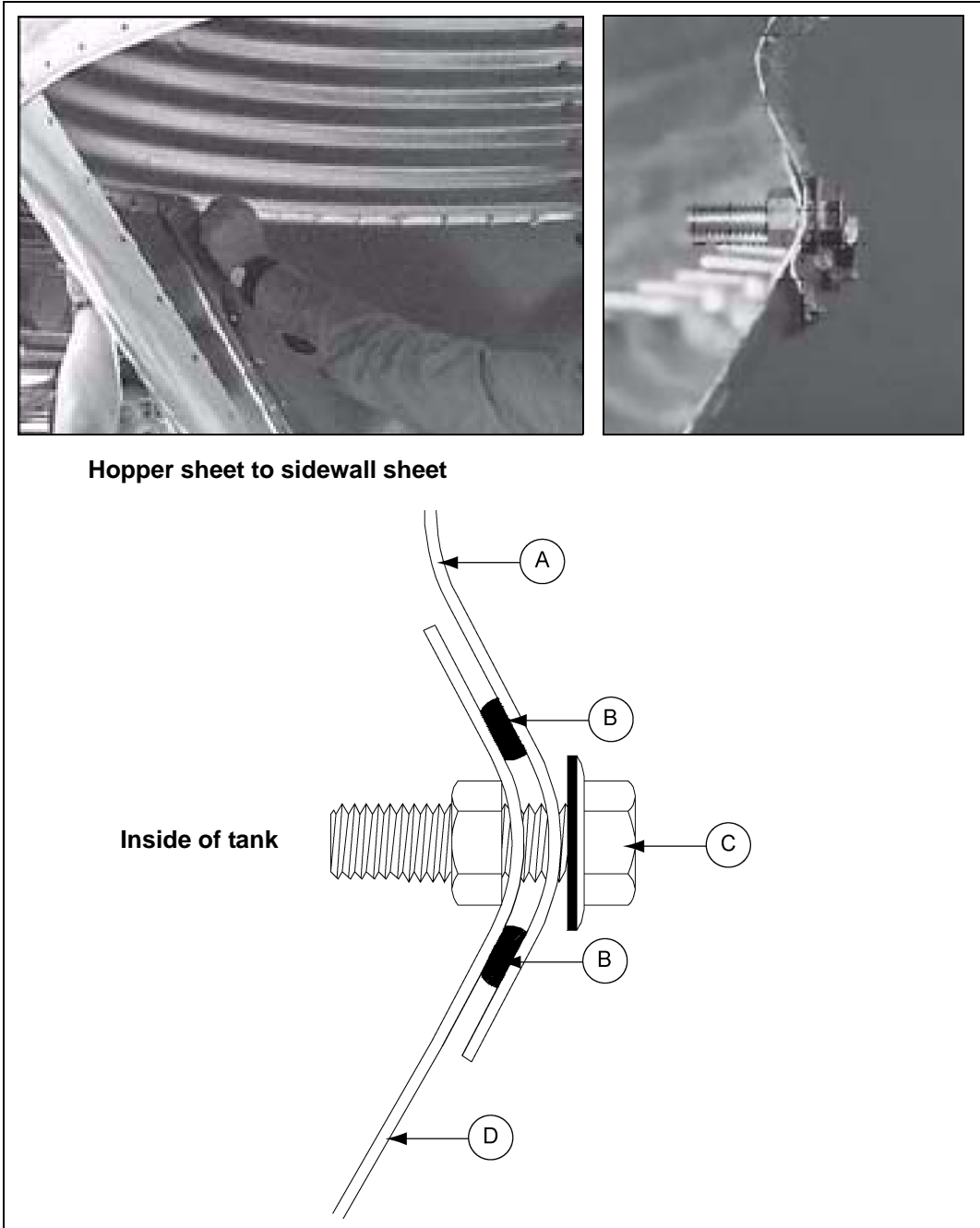


Figure 12A

Ref #	Description
A	Hopper Reinforcement Angle

Hopper Sheets (Continued)



Hopper sheet to sidewall sheet

Figure 12B

Ref #	Description
A	Sidewall Sheet
B	Use Two (2) Strips of Caulking
C	Use 5/16" x 1" Bin Bolts
D	Hopper Sheet

9' 60° Leg Attachment (for 9' 60° Tanks Only)

Curved washers are supplied in the hardware packages. These washers must be installed at the bottom leg to sidewall bolt connection, to the inside of the hopper panel as shown in *Figure 12C*.

Apply caulking between the hopper panel and the sidewall sheet.

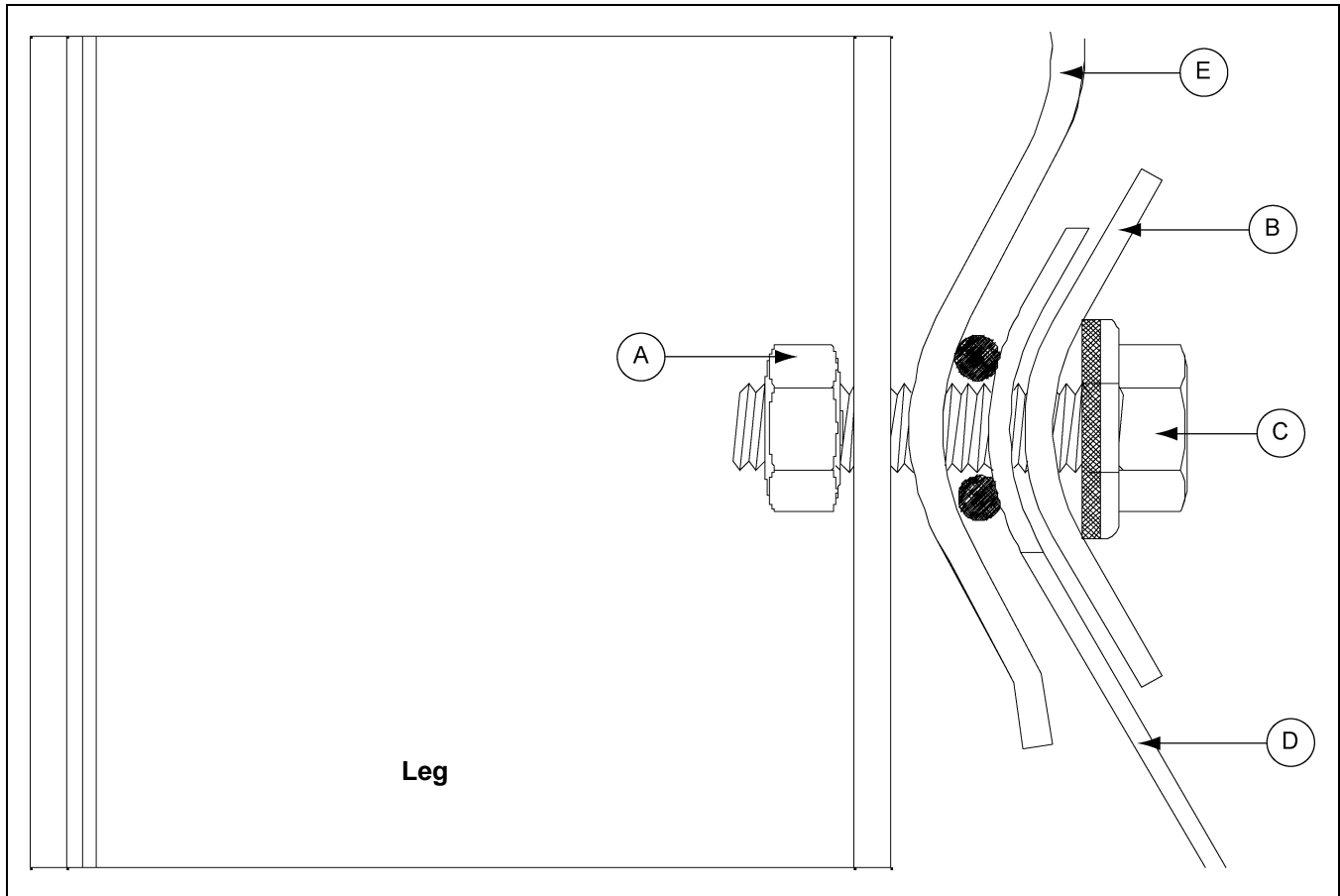


Figure 12C

Ref #	Part #	Description
A	S-7484	Hex Nut 5/16"-18 JS Grade 5
B	BLK-12483	10 Gauge Curved Washer
C	S-10260	5/16" x 1" Bin Bolt
D		Hopper Panel
E		Sidewall Sheet

12. Hopper Assembly

Reinforcement Angles

NOTE: Every hole in the hopper sheet will be utilized. Use 5/16" x 3/4" truss head bolt on hopper seams. (Truss head goes on inside of hopper.)

Only the 9' 3-6 ring, 60° and 7' 5-6 ring, 67° ring tanks use reinforcement angles.

NOTE: Last (bottom) bolt in reinforcement angle goes through hopper collar also.

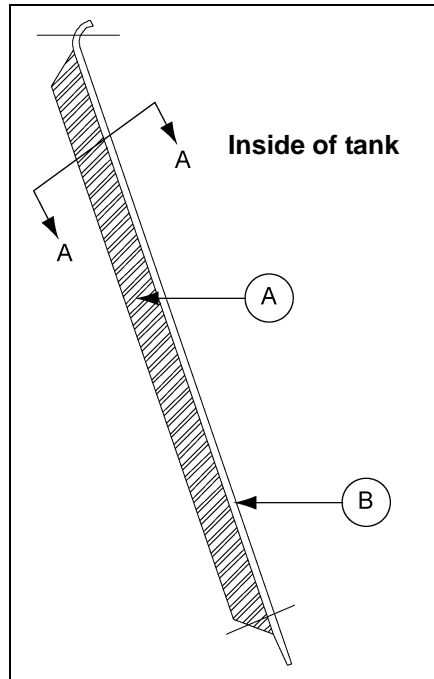


Figure 12D

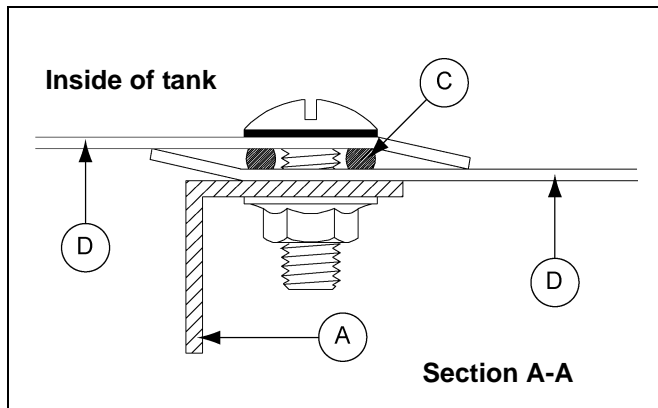


Figure 12E Hopper Overlap and Bolt Detail with Reinforcement Angle

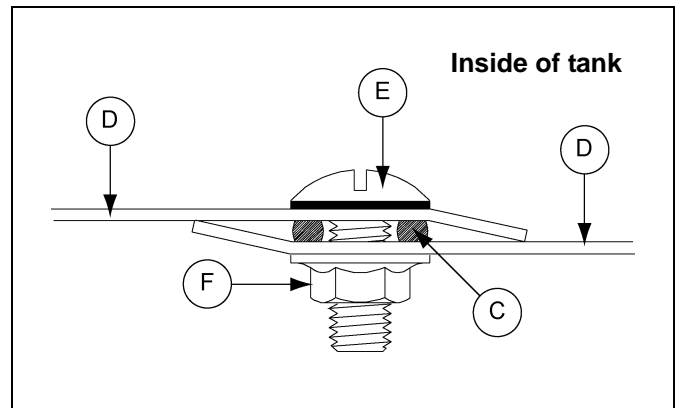


Figure 12F Hopper Overlap and Bolt Detail for Tanks without Reinforcement Angle

Ref #	Description
A	Reinforcement Angle
B	Hopper Panel
C	Caulking Two (2) Strips

Ref #	Description
D	Hopper Sheet
E	5/16" x 3/4" Truss Head Bolt
F	Flange Nut

Hopper Collar

Prior to attaching the final hopper panel, assemble the hopper extensions (if utilized) on the hopper collar. Use 5/16" truss head bolts and caulk all joints on the assembly. Attach to the hopper panels using 5/16" truss head bolts. Be sure to caulk between hopper extensions and hopper panels. (See Figure 12G and Figure 12H.)



Figure 12G

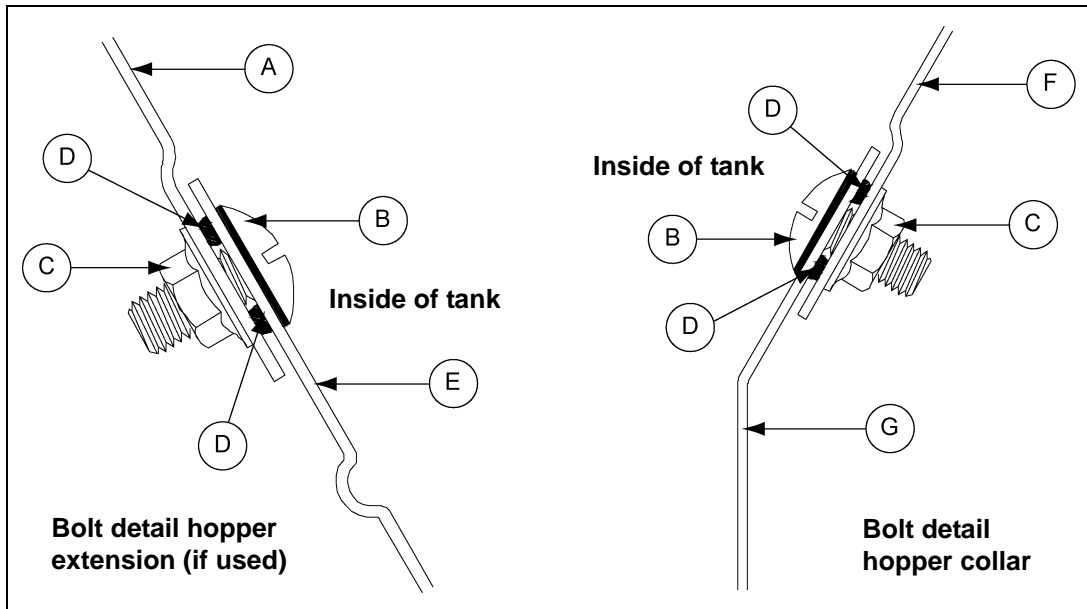


Figure 12H

Ref #	Description
A	Hopper Panel
B	5/16" x 3/4" Truss Head Bolt
C	Flange Nut
D	Caulking

Ref #	Description
E	Hopper Extension
F	16" or 22" Hopper or Hopper Extension (if Used)
G	16" or 22" Hopper Collar

12. Hopper Assembly

22" Hopper Collar

45° 22" Hopper Collar (BLK-10854)

60° 22" Hopper Collar (BLK-10342)

67° 22" Hopper Collar (BLK-10341)

Install hopper collar before all hopper panels are assembled. Use 5/16" truss head bolts on all hopper seams as shown in [Figure 12I](#). Be sure to caulk between the hopper collar and hopper panels. (See [Figure 12I](#).)

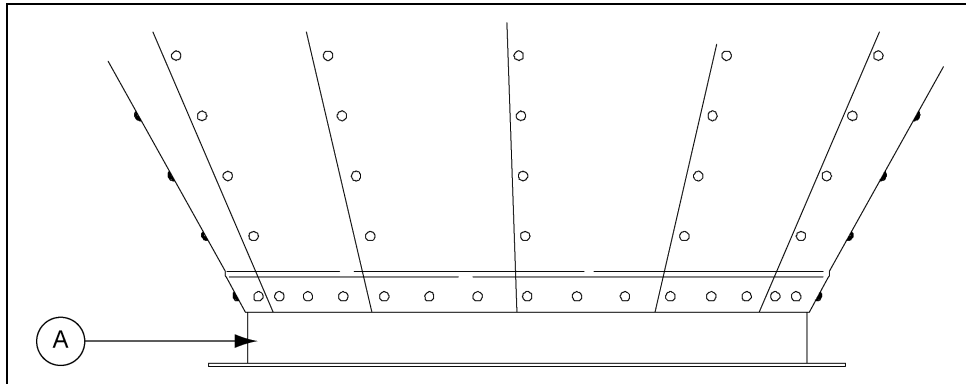


Figure 12I

Ref #	Description
A	22" Hopper Collar

16" Hopper Collar

6'-16" Hopper Collar 60° (BLK-10489) (24 Holes)

7'-16" Hopper Collar 67° (BLK-10488) (24 Holes)

* 9'-16" Hopper Collar 60° (BLK-11463) (27 Holes)

* **NOTE:** 9'-16" 60° Hopper collar (BLK-11463) is used with a 9'-16" 60° tank only. (27 Holes.)

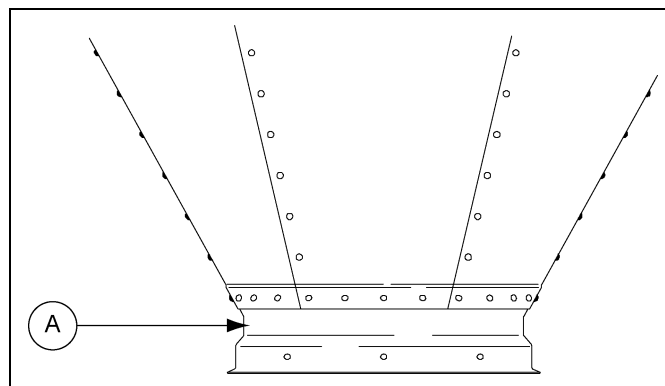


Figure 12J

Ref #	Description
A	16" Hopper Collar

Hopper Extension Kits

16" 45° Hopper Extension and Collar (BLK-10847) (Standard on 7' and 9' 45°)

16" 60° Hopper Extension and Collar (BLK-10587) (Optional)

16" 67° Hopper Extension and Collar (BLK-10591) (Optional)

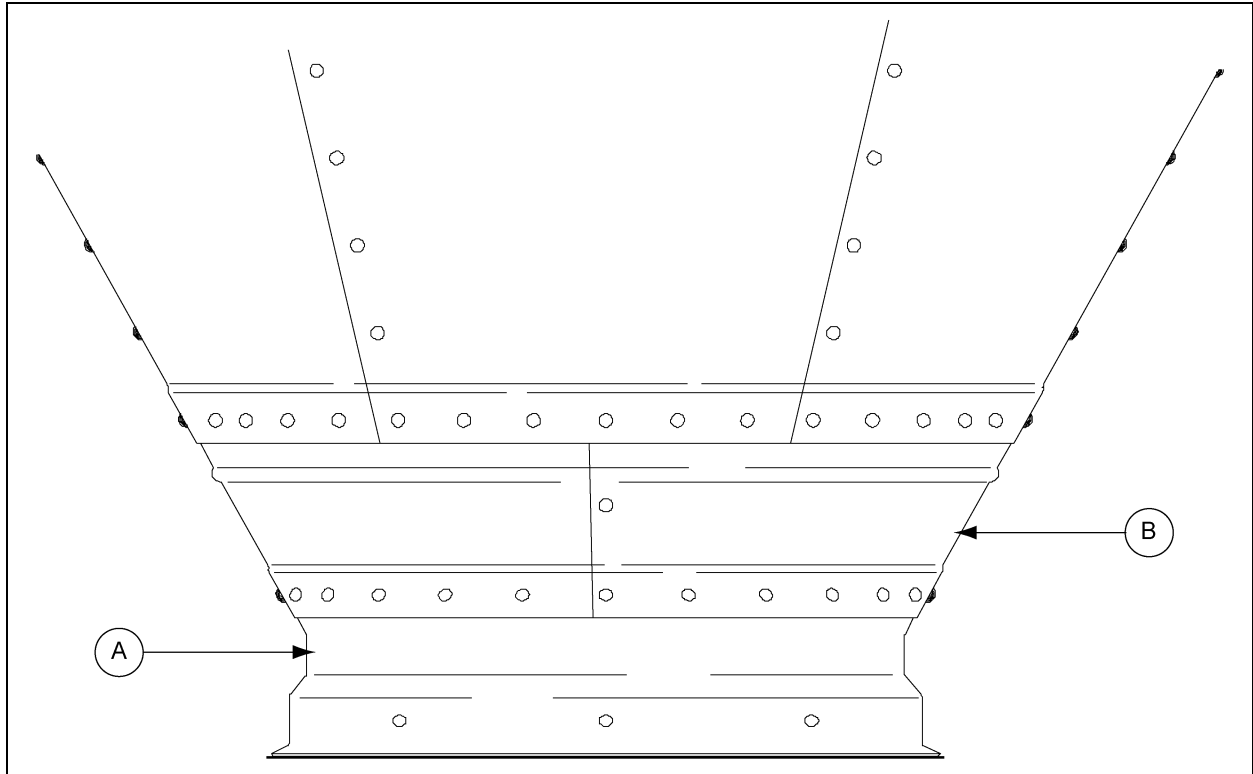


Figure 12K

Ref #	Description
A	16" Hopper Collar
B	22"-16" Hopper Extension

13. Legs and Leg Bracing

Tank Legs and Leg Braces

When installing legs to sidewall, reverse the normal insertion procedure for bolts. Place hex head and neoprene washer to inside of sidewall, leaving threaded portion of bolt protruding outward. This provides for a weather-tight seal at the leg attachment location. [See Pages 68-72](#) for leg attachment to sidewall sheet details.

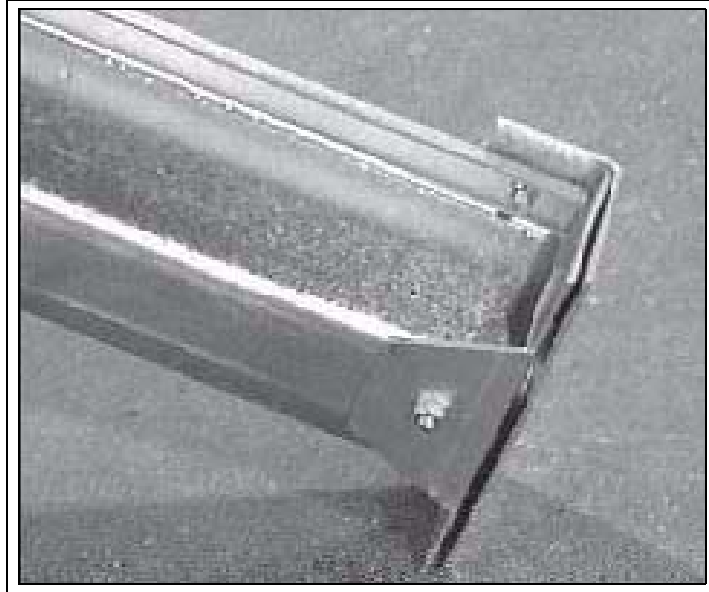


Figure 13A

Use 5/16" x 1" bin bolts and nuts when attaching the leg to base. Make sure the washer is used on the slot side of the leg.

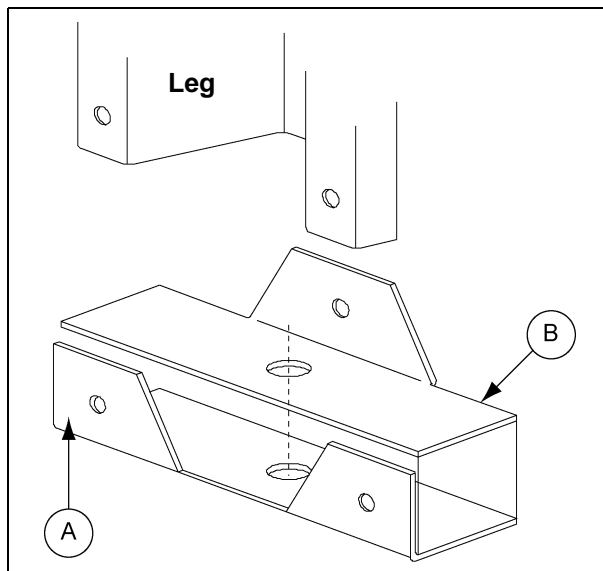


Figure 13B

Ref #	Part #	Description
A	BLK-10057	Back Leg Anchor Plate (One Tab)
B	BLK-10058	Front Leg Anchor Plate (Two (2) Tabs)

Tank Legs and Leg Braces (Continued)

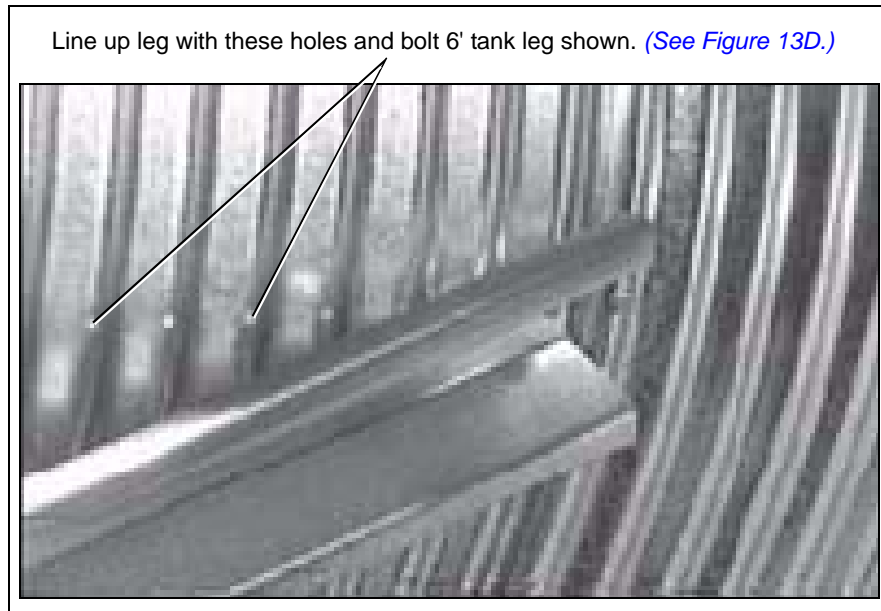


Figure 13C

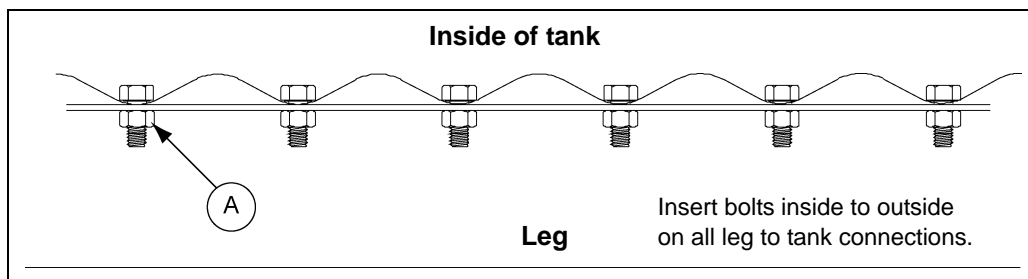


Figure 13D

Ref #	Description
A	5/16" x 1" Bin Bolt

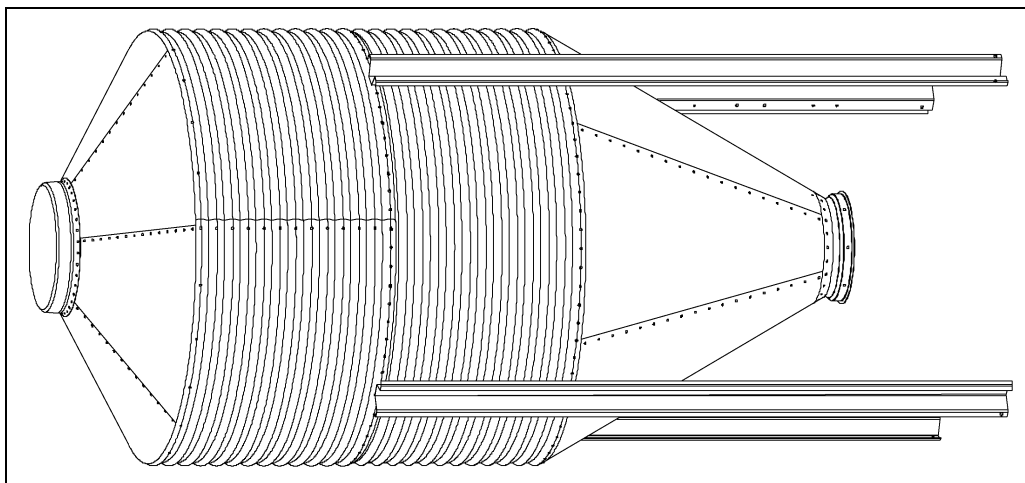


Figure 13E

13. Legs and Leg Bracing

Leg Size Chart

Tank Size	Hopper	# of Rings	Length	Leg Coverage
6' Diameter	60°	1-4 Rings	106-3/8"	1 Ring
7' Diameter	67°	1-4 Rings	140-1/2"	1 Ring
7' Diameter	67°	5-6 Rings	164-1/2"	1-3/4 Rings (56")
7' Diameter	45°	1-4 Rings	94-1/8"	1 Ring
7' Diameter	45°	5-6 Rings	120-3/4"	1-3/4 Rings (56")
9' Diameter	60°	1-5 Rings	140-1/2"	1 Ring
9' Diameter	60°	6 Rings	164-1/2"	1-3/4 Rings (56")
9' Diameter	45°	1-5 Rings	106-1/8"	1 Ring
9' Diameter	45°	6 Rings	132-3/4"	1-3/4 Rings (56")

* **NOTE:** 9' 5 Ring tanks must utilize 2 ring coverage legs if raising 8" (203.2 mm).



Failure to follow instructions may cause damage or failure of the equipment.

Depending on the size of the Bulk Feed Tank you are assembling, the leg will cover either the bottom ring or 1-3/4 rings (56"). Refer to this chart to find the correct number of rings the legs will cover. **Put all legs on, but do not tighten bolts until all braces are in place.** Be sure to put leg braces on properly. (See Pages 72-75.)

1 Ring Leg 140-1/2" (3569 mm)

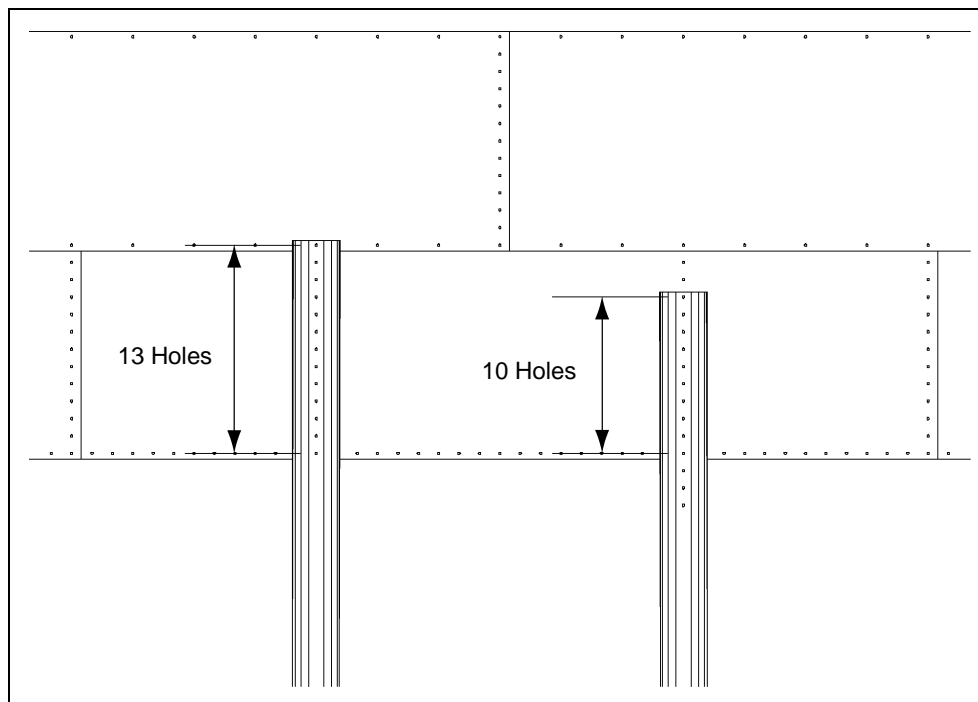


Figure 13F Leg Adjustment (7' (1-4 Ring) 67° and 9' (1-5 ring) 60° Only)

Extra Clearance Leg Adjustment

In cases where extra clearance is required (on 7' 67° and 9' 60° tanks only), you may raise the tank up to 8" when installing the legs. *See Figure 13G* for proper positioning. Call company's engineering for any other special requirements.

* **NOTE:** *If 7'-4 ring and 9'-4 ring 60° tanks are raised, they will require a safety cage ladder package.*

2 Ring Leg 164-1/2" (4178 mm)

* **NOTE:** *9'-5 Ring tanks must utilize 2 ring coverage legs if raising 8" (203.2 mm).*



Failure to follow instructions may cause damage or failure of the equipment.

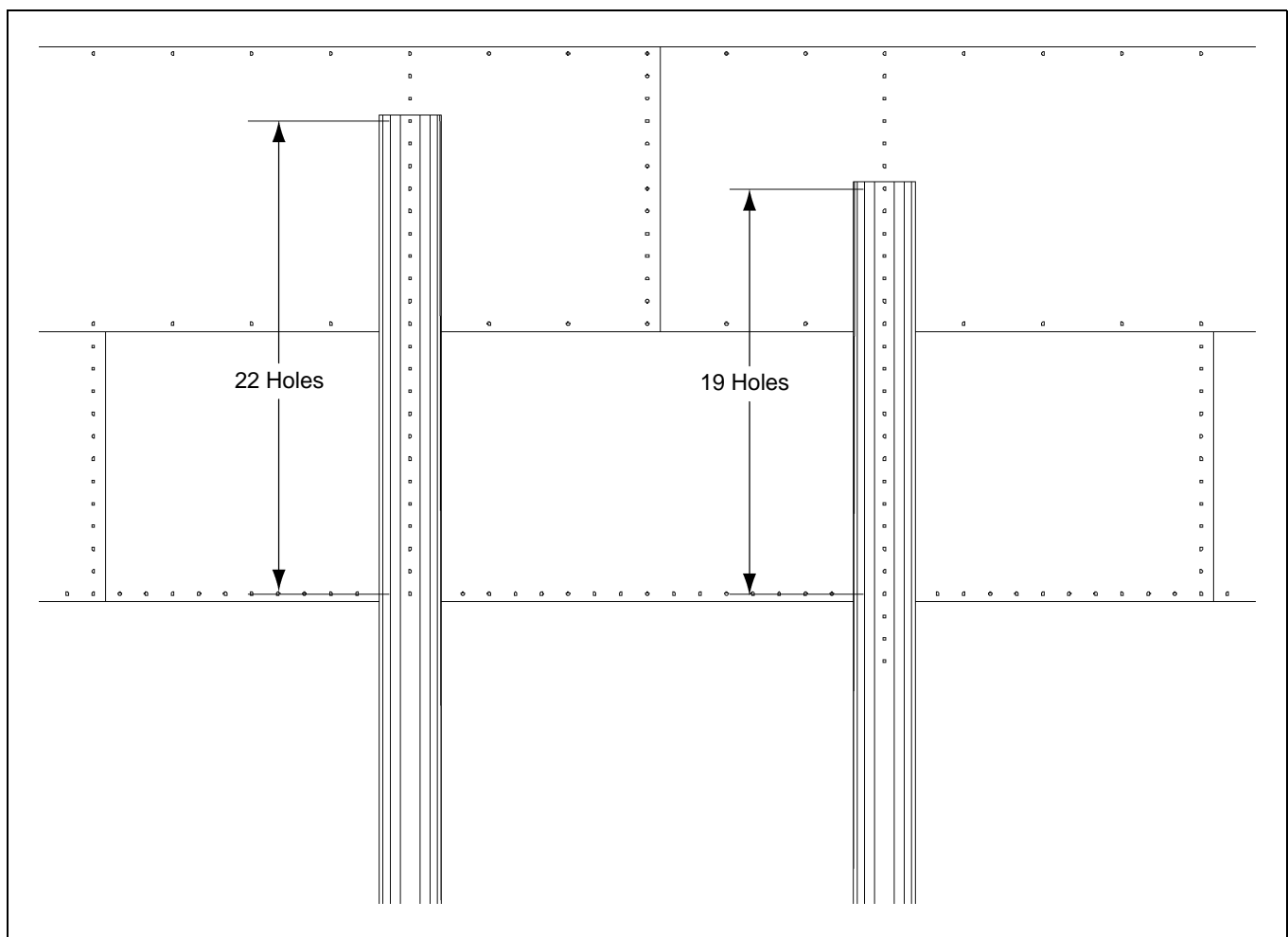


Figure 13G *Leg Adjustment (7' (5-6 Ring) 67° and 9' (6 Ring) 60° Only)*

13. Legs and Leg Bracing

Bracing Hole Layout

For 7' 67° and 9' 60° feed tank bracing layout, [See Pages 73-74](#).

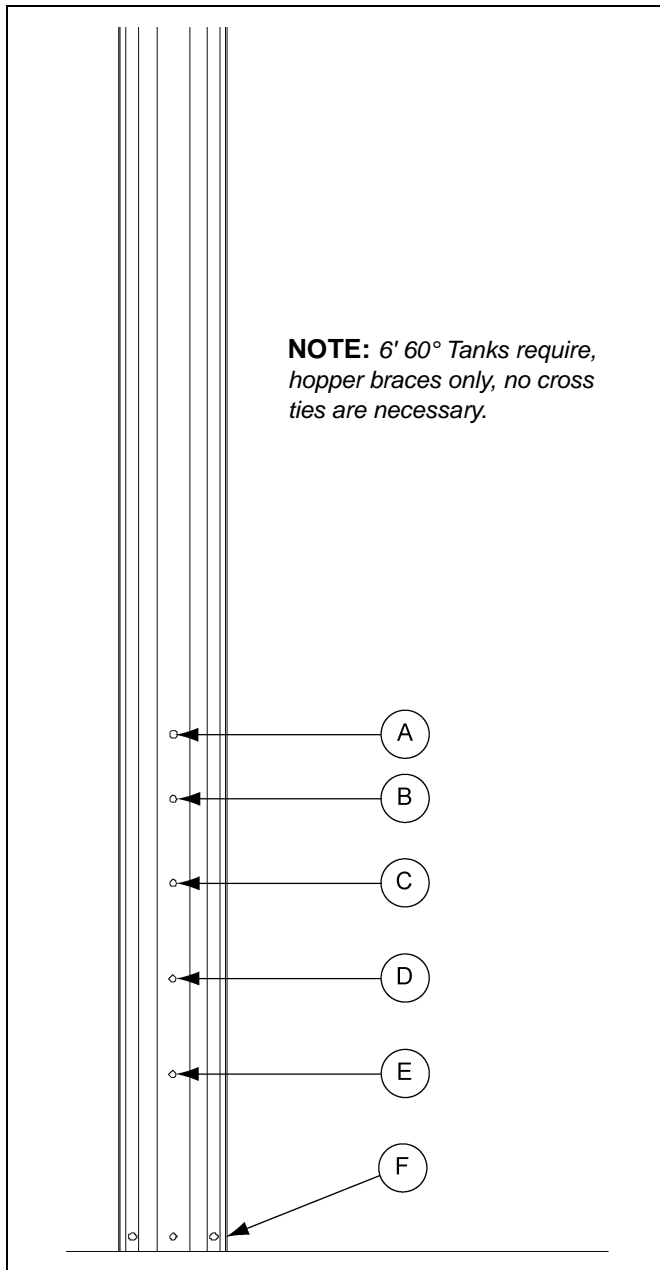


Figure 13H 6' Leg 60°

Ref #	Description
A	Ladder Standoff 3 Ring Tank
B	22" Hopper Brace
C	16" Hopper Brace
D	Ladder Standoff 4 Ring Tank
E	Ladder Standoff 1-2 Ring Tank
F	Anchor

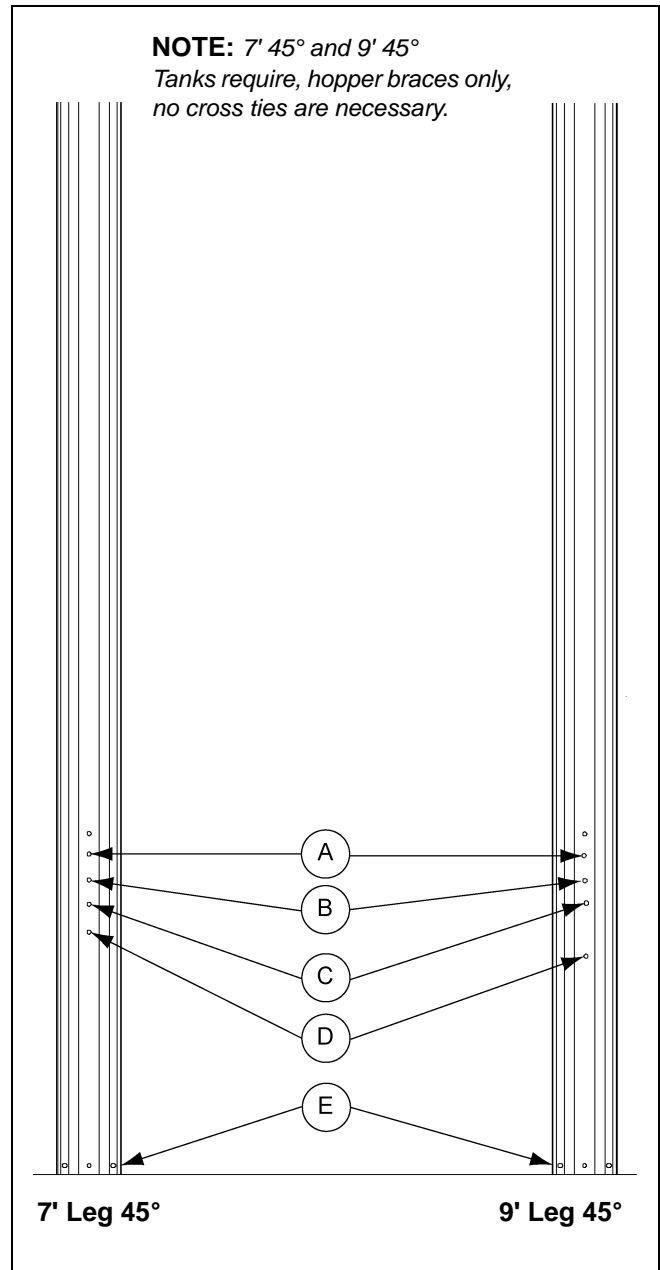


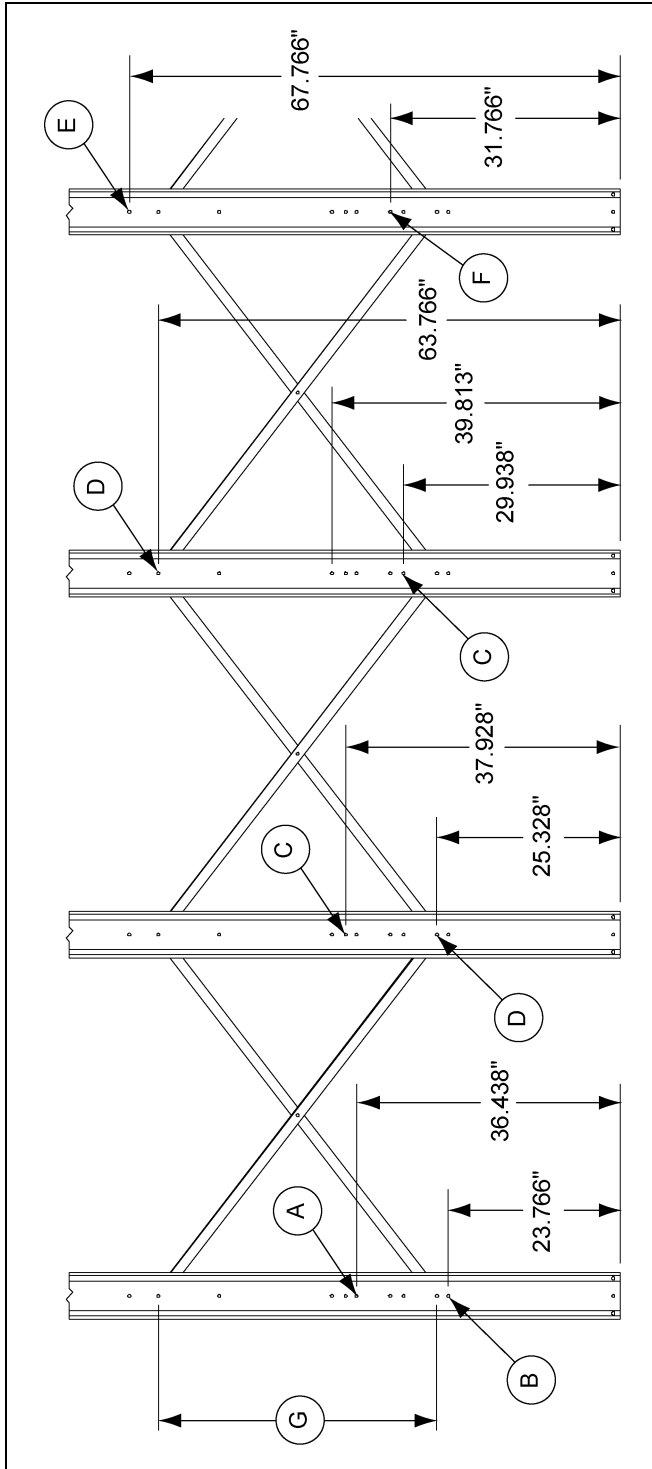
Figure 13I 7' and 9' 45° Legs

Ref #	Description
A	Ladder Standoff
B	22" Hopper Brace
C	16" Hopper Brace
D	Ladder Standoff
E	Anchor

7' 67° 1-6 Ring

Figure 13J has been modified for clarity (not to scale). For 7' and 9' bracing notes, See Page 72.

Dimensions shown are measured from center of attachment holes in legs to bottom of leg. Use 3/8" nuts and bolts to attach cross ties to each other and to leg. Hopper braces are attached to legs with 3/8" nuts and bolts and to hopper collar with 5/16" hardware. Ladder standoffs are attached to legs with 5/16" nuts and bolts. Do not tighten hardware until all bracing is in place.



Ref #	Description
A	22" Hopper Brace 7/16" Diameter Hole
B	Ladder Standoff 1-3-5 Rings 3/8" Diameter Hole
C	16" Hopper Brace (Raising Tank 8") 7/16" Diameter Hole
D	Cross Tie Brace 7/16" Diameter Hole
E	Ladder Standoff (All) 3/8" Diameter Hole
F	Ladder Standoff 2-4-6 Rings 3/8" Diameter Hole
G	38.483" Between Hopper Braces

Figure 13J

13. Legs and Leg Bracing

9' 60° 2 Through 6 Ring Tank

Figure 13K has been modified for clarity (not to scale). For 7' and 9' bracing notes, See Page 72.

NOTE: 9' 5 Ring tanks must use 6 ring legs when raising 8" (203.2 mm).

Dimensions shown are measured from center of attachment holes in legs to bottom of leg. Use 3/8" nuts and bolts to attach cross ties to each other and to leg. Hopper braces are attached to legs with 3/8" nuts and bolts and to hopper collar with 5/16" hardware. Ladder standoffs are attached to legs with 5/16" nuts and bolts. Do not tighten hardware until all bracing is in place.

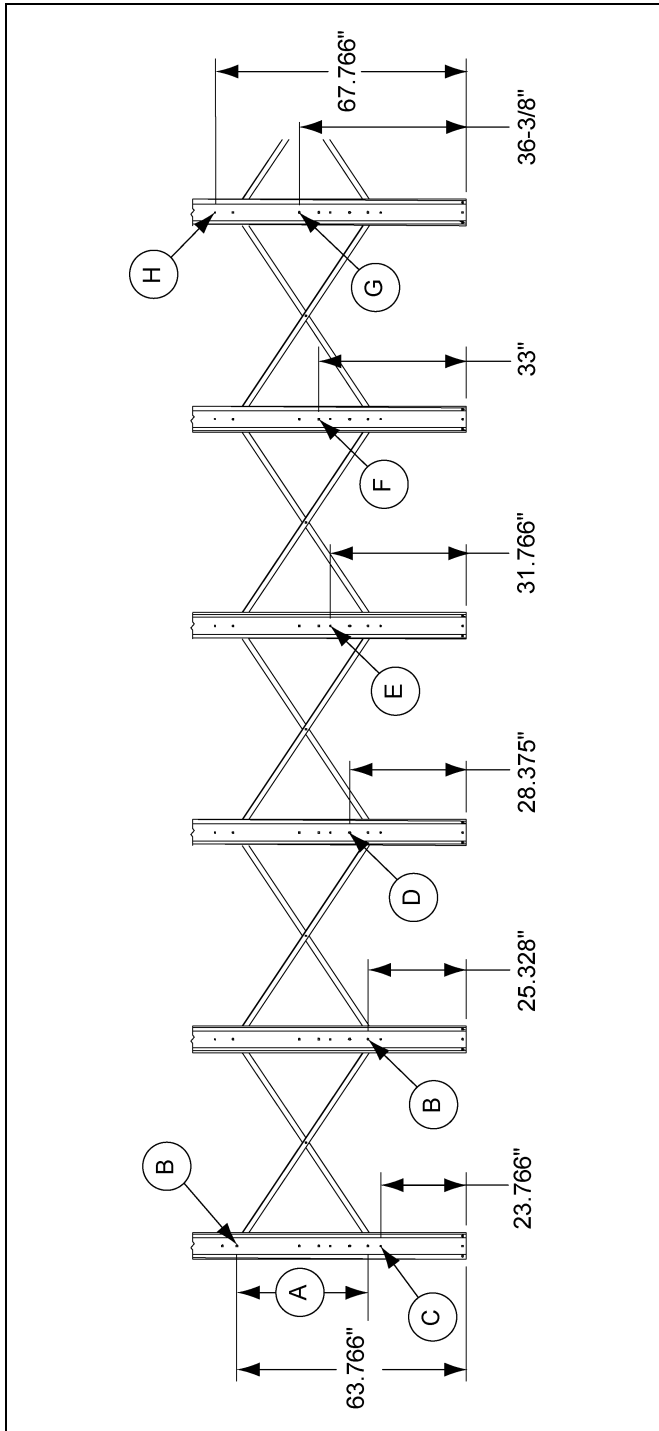


Figure 13K

Ref #	Description
A	38-7/16" Between Hopper Braces
B	Cross Tie Brace 7/16" Diameter Hole
C	Ladder Standoff 1-3-5 Rings 3/8" Diameter Hole
D	16" Hopper Brace 3/8" Diameter Hole
E	Ladder Standoff 2-4-6 Rings 3/8" Diameter Hole
F	22" Hopper Brace 7/16" Diameter Hole
G	16" Hopper Brace (Raising Tank 8") 7/16" Diameter Hole
H	Ladder Standoff (All) 3/8" Diameter Hole

Hopper to Leg Horizontal Bracing

BFT Brace Quantity

Tank	Hopper	Inside Cross	Outside Cross
Description	Brace	Tie Brace	Tie Brace
6' Diameter 60° Hopper	4	0 **	0 **
7' Diameter 67° Hopper	4	4	4
7' Diameter 45° Hopper	4	0 **	0 **
9' Diameter 60° Hopper	6	6	6
9' Diameter 45° Hopper	6	0 **	0 **

**** NOTE:** 6' 60°, 7' 45° and 9' 45° Tanks do not require cross tie braces.

All 6' 60°, all 7' 67° and all 9' 60° tanks utilize hopper bracing. Braces attach horizontally to the legs with 3/8" hardware and to the hopper with 5/16" hardware. (See Figure 13L and Figure 13M.)

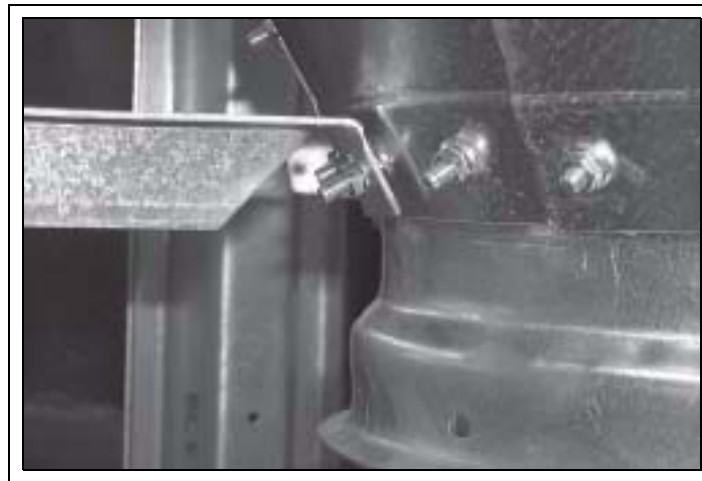


Figure 13L

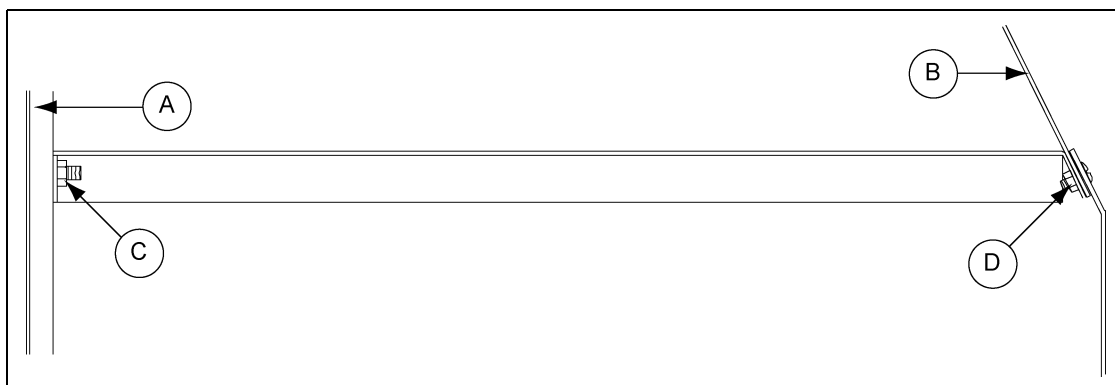


Figure 13M

Ref #	Description
A	Leg
B	Hopper

Ref #	Description
C	3/8" x 1" Bolt
D	5/16" x 3/4" Truss Head Bolt (Head to Inside)

Tank Legs and Leg Braces (Continued)



Figure 13N

Hopper braces are required on all hopper tanks and should be spaced equally around the tank. Refer to chart *below* for the quantities required the tank.

Tank	16" Hopper		22" Hopper	
Description	Brace Part #	Qty	Brace Part #	Qty
6' Diameter 60° Hopper	BLK-12146	4	BLK-12147	4
7' Diameter 67° Hopper	BLK-12107	4	BLK-12108	4
7' Diameter 45° Hopper	BLK-12105	4	BLK-12106	4
9' Diameter 60° Hopper	BLK-12109	6	BLK-12110	6
9' Diameter 45° Hopper	BLK-12111	6	BLK-12112	6

NOTE: Hopper braces attach between the legs and the collar/hopper horizontal seam. Never bolt the braces directly to the hopper seam above the collar. Use 16" braces with 16" collar and 22" braces with 22" collars.

Raising Bin to Set on Foundation

Preparing Bin

Just before standing the bin upright, peel protective mask off the decal while it is easy to reach. Mask may become difficult to remove if left exposed to sunlight.

Check for all possible overhead obstructions, power line, etc., BEFORE standing the bin on the foundation.

To prevent damage to legs when raising bin, brace them with 2" x 4" (50 mm x 100 mm) pieces of wood as shown in [Figure 14A](#). See the chart [below](#) for the correct length.



Do not raise tank near power lines. Electrocution could occur if the tank came into contact with live power lines.

Bin Size	2" x 4" Length
6' Diameter (1829 mm)	51-3/8" (1305 mm)
7' Diameter (2134 mm)	59-7/8" (1521 mm)
9' Diameter (2743 mm)	52-1/8" (1324 mm)

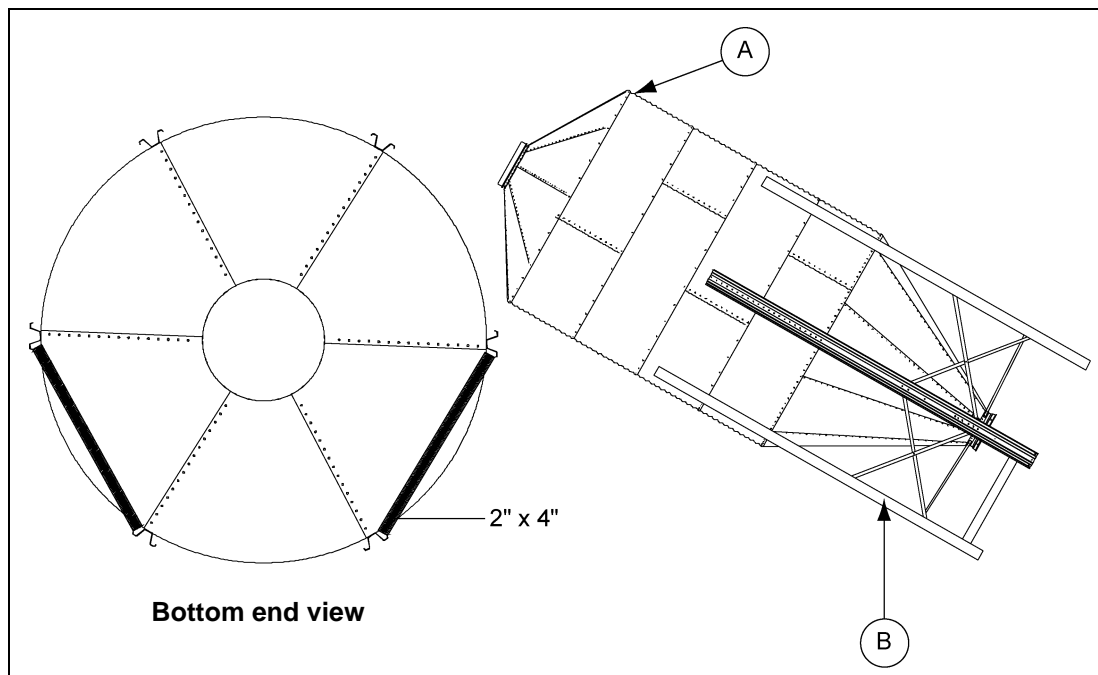


Figure 14A

Ref #	Description
A	Location of Cable or Sling Wrapped Around Tank
B	Anchor or Stabilize to Prevent Sliding when Raising

14. Raising Bin

Raising Bin to Set on Foundation (Continued)

Be sure that all bolts are tightened properly. Bulk Feed Tank can now be set up on foundation. Small Bulk Feed Tanks may be set up with manpower. As the tanks get taller and heavier, other means must be used to raise the Bulk Feed Tank. A small crane of adequate capacity attached to a cable or sling secured around the Bulk Feed Tank just above the legs will usually do the job. Refer any questions to a qualified rigger.

Standard Hopper Bin Anchoring

Measure between opposite legs to be sure they are an equal distance apart before securing the bin with anchor bolts. Follow the chart shown *below*. Failure to do so may cause damage to the bin.

Bin Size	Distance Between Opposite Legs
6' Diameter (1829 mm)	72-1/4" (1835 mm)
7' Diameter (2134 mm)	84-1/4" (2140 mm)
9' Diameter (2743 mm)	108-1/8" (2746 mm)

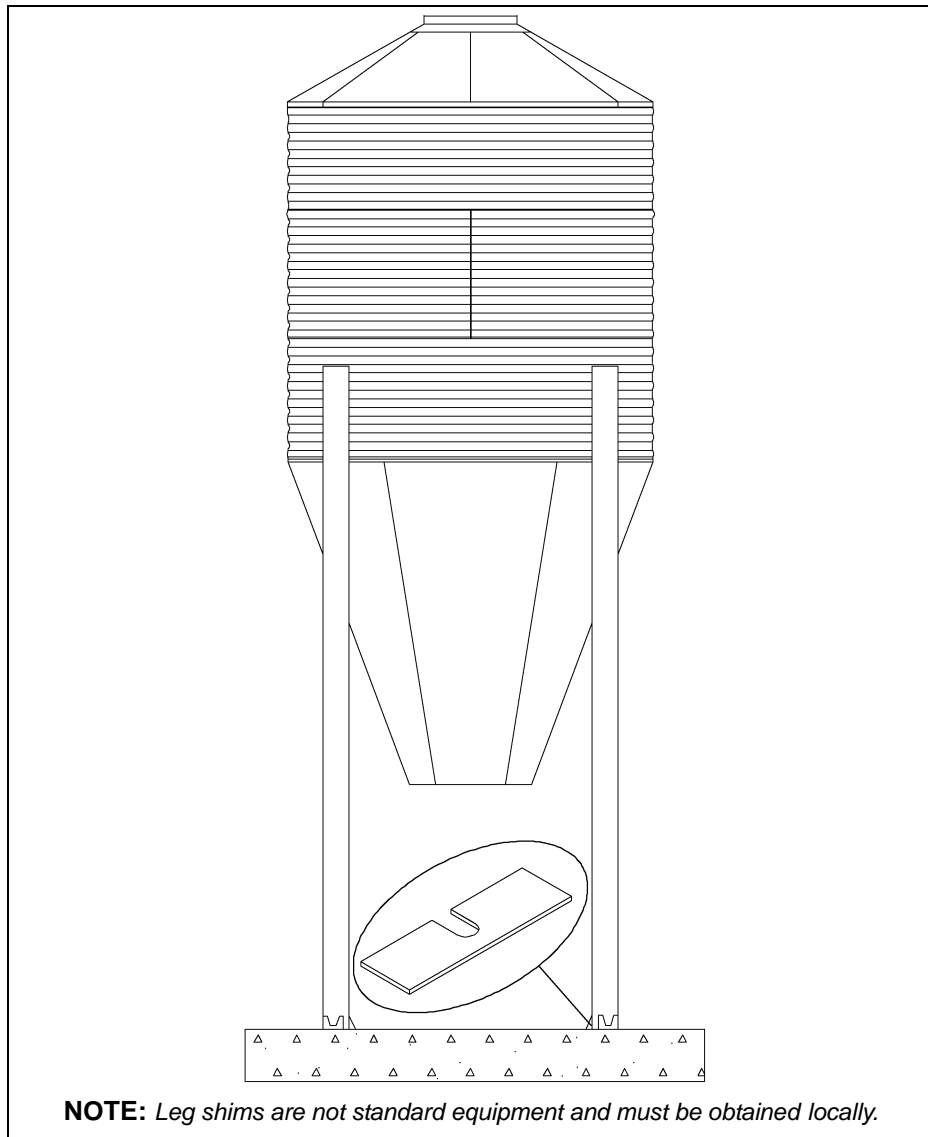


Figure 14B

Raising Bin to Set on Foundation (Continued)

Anchoring Tank

Check all legs to see if shims are necessary to level the tank properly. After Bulk Feed Tank is level and shimmed properly, anchor the tank down with 5/8" washers and nuts. (See Figure 14C.)

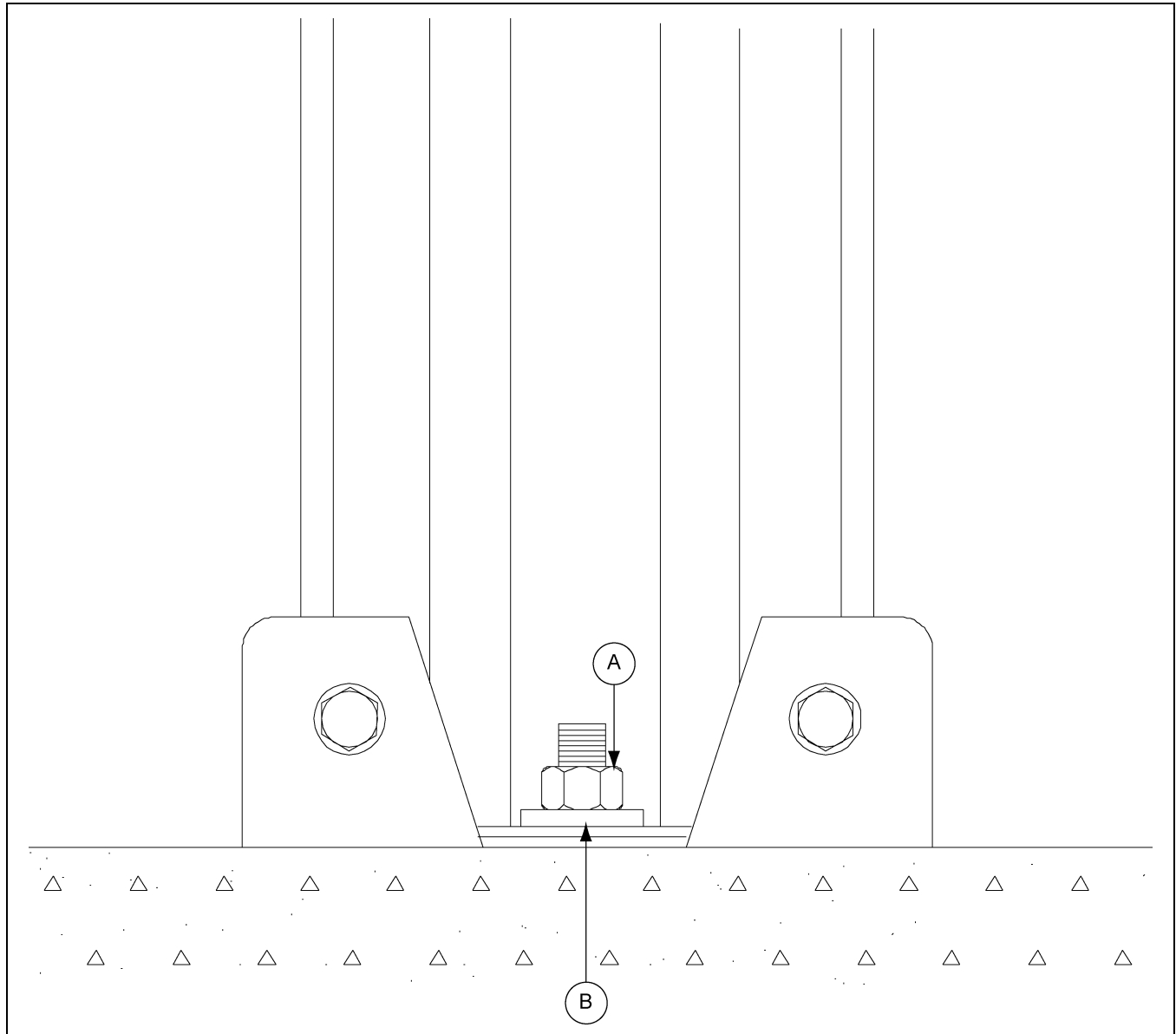


Figure 14C

Ref #	Part #	Description
A	S-836	5/8" Nut (Not Supplied)
B	S-858	5/8" Washer (Not Supplied)

14. Raising Bin

Bin Grounding Instructions

NOTE: Parts are not supplied by manufacturer. They should be purchased locally.

All bins shall have two (2) ground connections. Ground clamps must be placed at equal distances around the bin.

Alternate Installation: Cables may be placed in the foundation or through PVC sleeve inserted in the slab during construction.

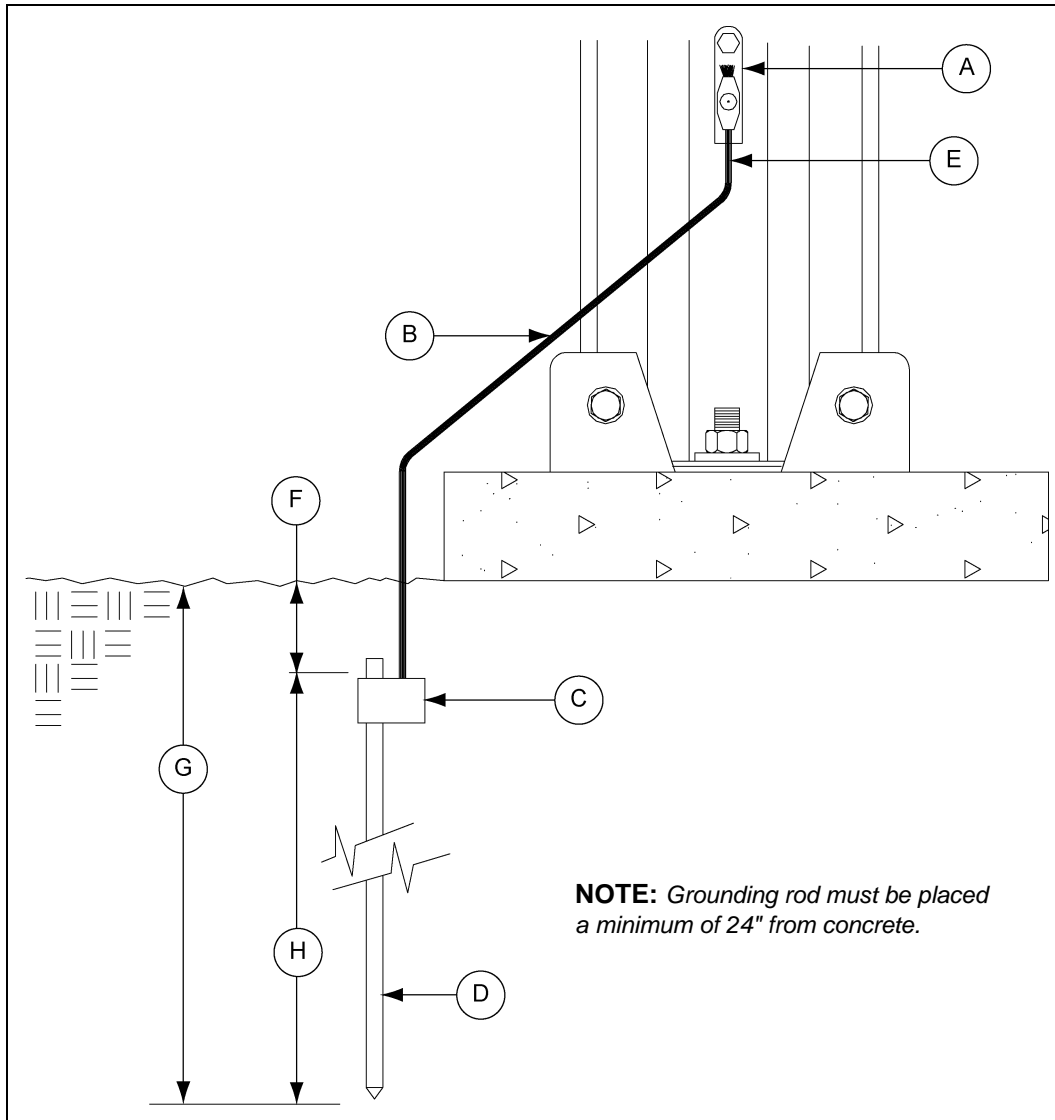


Figure 14D

Ref #	Description
A	Cable Clamp
B	5' (1524 mm) Copper Cable (Plain or Jacketed)
C	Ground Rod Clamp
D	Ground Rod 1/2" x 10' (3048 mm)

Ref #	Description
E	Number 2 Minimum (Typical)
F	12" (305 mm)
G	10'-0" Minimum (3048 mm)
H	9'-0" Minimum (2743 mm)

Pneumatic Fill Kit Assembly

NOTE: Inlet and exhaust parts from roof eave upward supplied with kit.

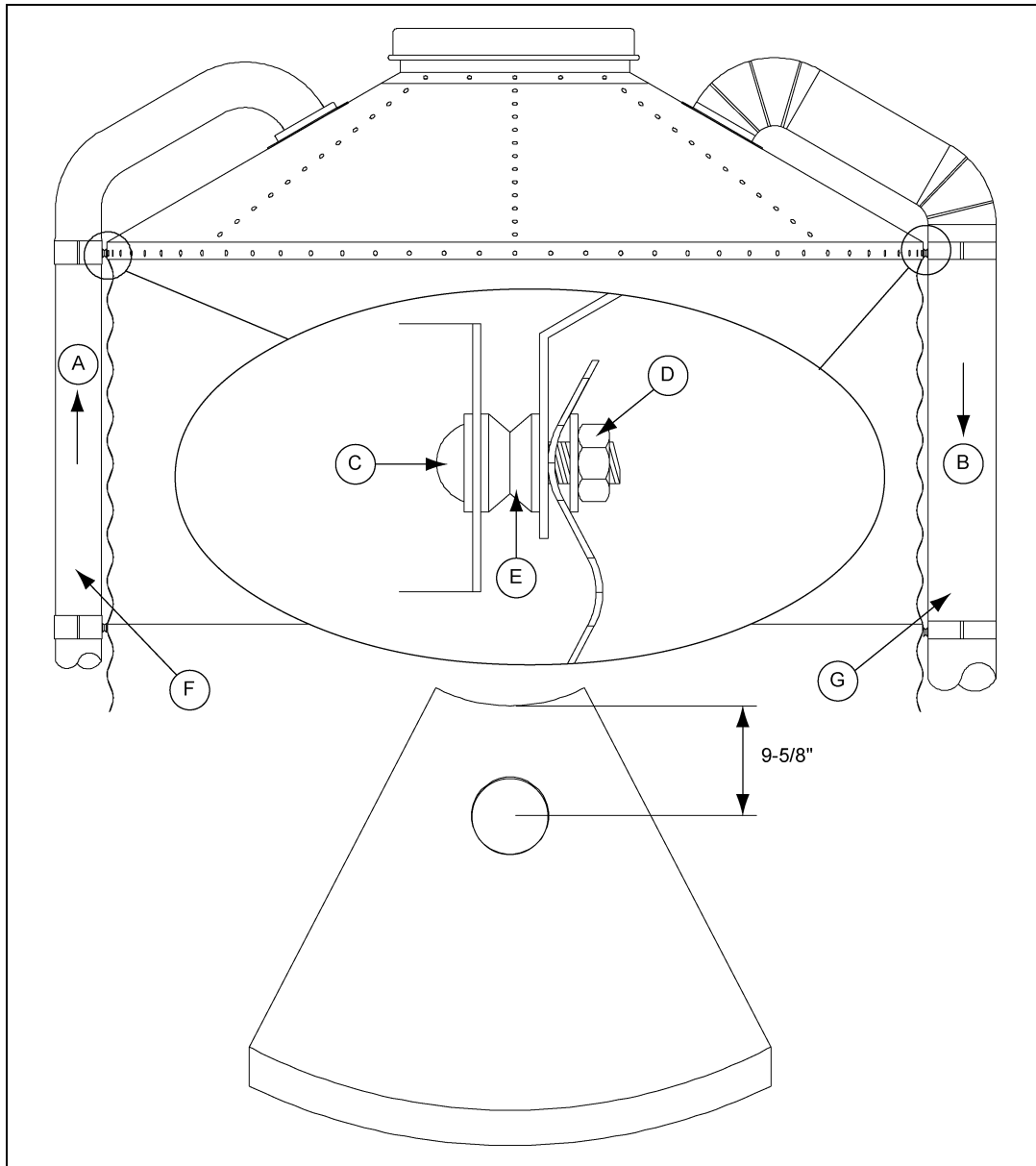


Figure 15A

Ref #	Description
A	Fill
B	Exhaust
C	5/16" Square Neck Bolt
D	Hex Nut 5/16"-18 JS Grade 5 (S-7484)
E	Cupped Washer
F	Fill Tube is 4" Diameter (Available)
G	Exhaust Tube is 6" Diameter

Roof Panel

Identical pre-punched roof panels are available from the manufacturer for inlet and outlet sections of pneumatic fill systems. Extruded lip of the panels provide for weather-tight installation. Caulking placed between angle rings virtually eliminates all leakage problems. Rubber seal must be utilized at roof cap area to prevent material “blow by” from pressurized systems.

To install fill kits in roof panels not pre-punched, cut 5-5/8" (143 mm) diameter holes in opposing roof panels as shown. Caulk sufficiently to provide weather-tight seal.

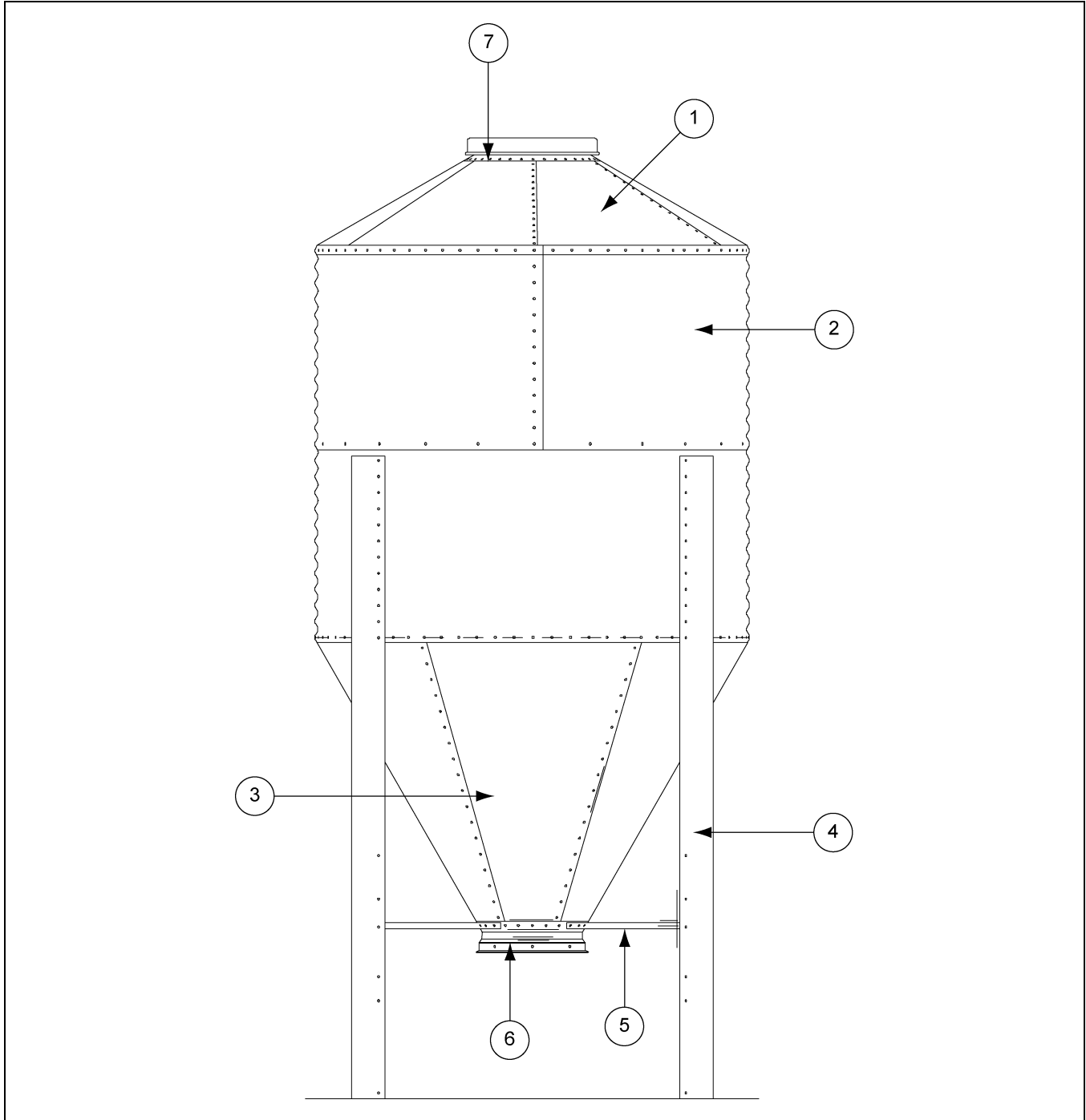
Refer to PNEG-1904, that is included in the pneumatic fill kits for information on installation of the cap latch and lid sealing components.



Figure 15B

1. **6' Diameter 60° Hopper Bin Specifications** - *(See Pages 84-85.)*
2. **6' Diameter 60° Hopper Bin Hardware Specifications** - *(See Pages 86-87.)*
3. **7' Diameter 67° Hopper Bin Specifications** - *(See Pages 88-89.)*
4. **7' Diameter 67° Hopper Bin Hardware Specifications** - *(See Pages 90-91.)*
5. **7' Diameter 45° Hopper Bin Specifications** - *(See Pages 92-93.)*
6. **7' Diameter 45° Hopper Bin Hardware Specifications** - *(See Pages 94-95.)*
7. **9' Diameter 60° Hopper Bin Specifications** - *(See Pages 96-97.)*
8. **9' Diameter 60° Hopper Bin Hardware Specifications** - *(See Pages 98-99.)*
9. **9' Diameter 45° Hopper Bin Specifications** - *(See Pages 100-101.)*
10. **9' Diameter 45° Hopper Bin Hardware Specifications** - *(See Pages 102-103.)*

6' Diameter 60° Hopper Bin Specifications



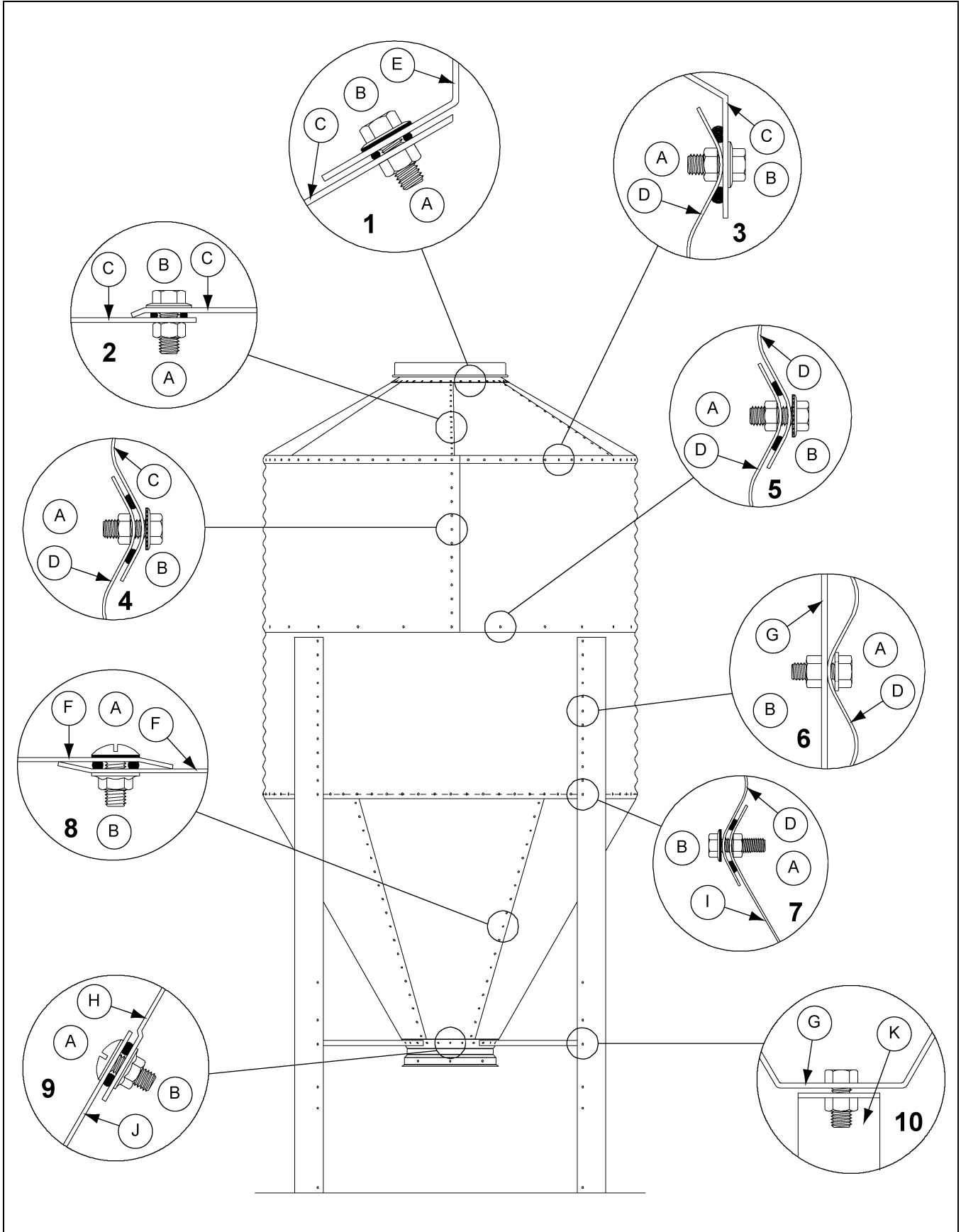
Under Collar Clearance	
16" Collar	28-5/16" (719 mm)
22" Collar	32-7/8" (837 mm)

IMPORTANT: Bolt heads are inside of bin at the leg to body attachment and on all vertical seams on hopper panels. All bolts to be tightened from the nut side only. Refer to detail on Page 22 for location of caulking. No cross tie bracing required.

6' Diameter 60° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12254	6' 30° Roof Panel (20 Gauge) (Shown)	6
1	BLK-12257	6' 40° Roof Panel (20 Gauge)	6
2		6' Sidewall Sheet	2 Per Ring
2	SS40682006	20 Gauge (Top Punched Sidewall Sheet)	
2	SS41632006	20 Gauge (Top Punched Decal Sidewall Sheet)	
2	SS40672006	20 Gauge (Bottom/Top Leg Sidewall Sheet)	
2	SS40692006	20 Gauge (Middle Punched Sidewall Sheet)	
2	SS41622006	20 Gauge (Bottom/Top Leg Decal Sidewall Sheet)	
2	SS40712006	20 Gauge (Bottom Leg Sidewall Sheet)	
2	SS40711806	18 Gauge (Bottom Leg Sidewall Sheet)	
3	BLK-11475	6' 60° Offset Hopper Panel 16" Opening (20 Gauge) (Shown)	6
3	BLK-10358	6' 60° Hopper Panel 22" Opening (20 Gauge)	6
4	BLK-12222	6' 60° Leg 106-1/16" (12 Gauge) (1-4 Ring)	4
5	BLK-12146	Hopper Brace for 16" Collar (Shown)	4
5	BLK-12147	Hopper Brace for 22" Collar	4
6	BLK-10489	16" 60° Hopper Collar (24 Holes) (Shown)	1
6	BLK-10342	22" 60° Hopper Collar (36 Holes)	1
7	BLK-11730	30° Bulk Tank Peak Ring (Shown)	1
7	BLK-12534	40° Bulk Tank Peak Ring	1

6' Diameter 60° Hopper Bin Hardware Specifications



* **NOTE:** Bolt listed first and nut second for each usage.

Hardware usage: Heads of bolts are on the outside of tank unless otherwise noted.

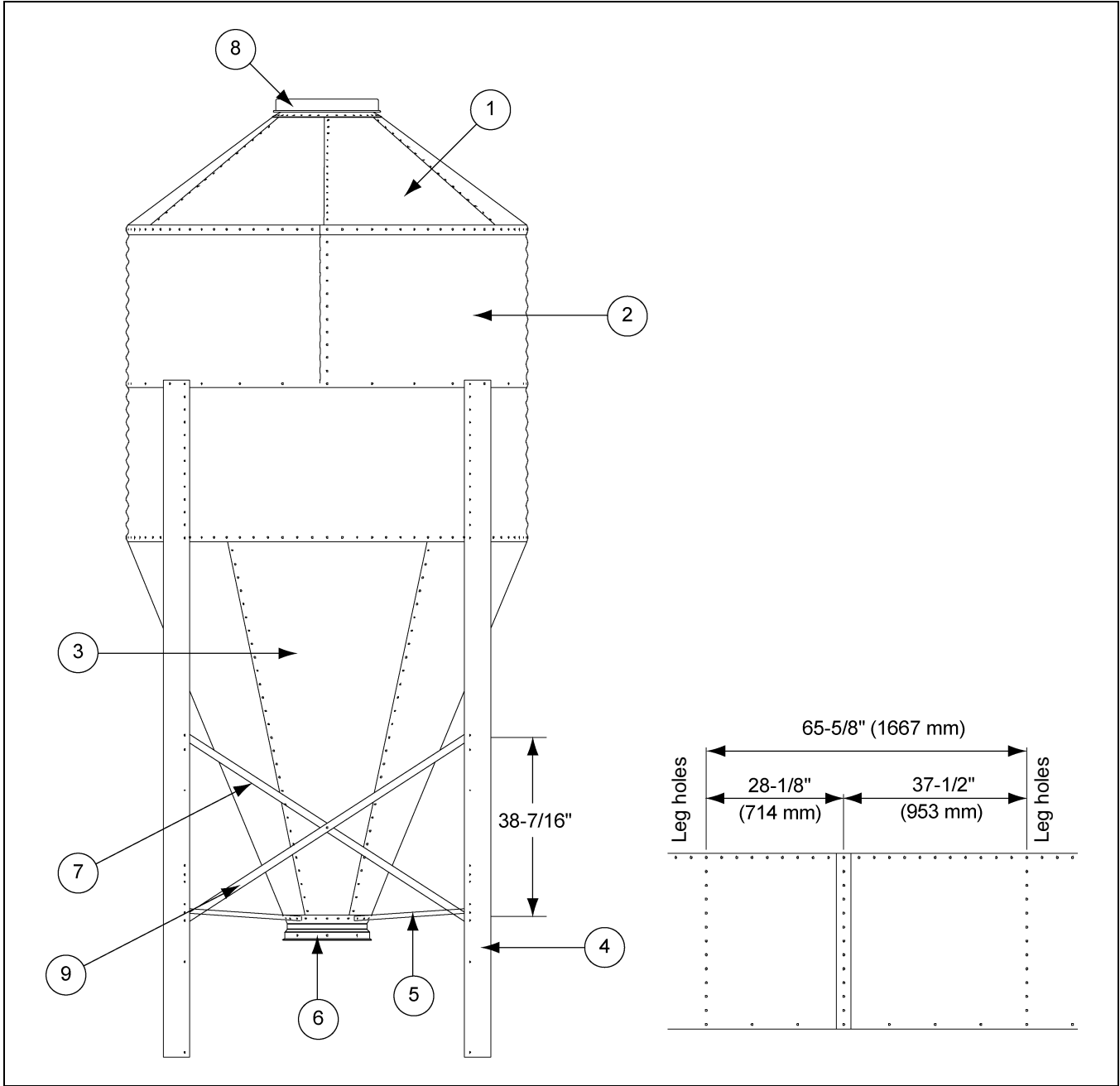
6' Diameter 60° Hopper Bin Hardware Specifications Parts List

Ref #	Part #	Description	Qty
1	S-10260	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
1	S-7484		36
2	S-10260	Roof Panel to Roof Panel (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	48
2	S-7484		48
3	S-10260	Roof Panels to Top Sidewall Sheets (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	72
3	S-7484		72
4	S-10260	Vertical Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
4	S-7484		Varies
5	S-10260	Horizontal Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
5	S-7484		Varies
6	S-10260	Leg to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank.)	48
6	S-7484		48
7	S-10260	Hopper Panels to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)	72
7	S-7484		72
8	S-10267	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)	108
8	S-10268		108
9	S-10267	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown.)	24 or 36
9	S-10268		24 or 36
10	S-7485	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	4
10	S-7489		4

Ref #	Description
A	Inside
B	Outside
C	Roof Sheet
D	Body Sheet
E	Peak Ring Collar
F	Hopper Panel

Ref #	Description
G	Leg
H	Offset Hopper Panel
I	Hopper Sheet
J	Hopper Collar
K	Hopper Brace

7' Diameter 67° Hopper Bin Specifications



Under Collar Clearance	
16" Collar	30-3/8" (771 mm)
22" Collar	36-1/2" (927 mm)

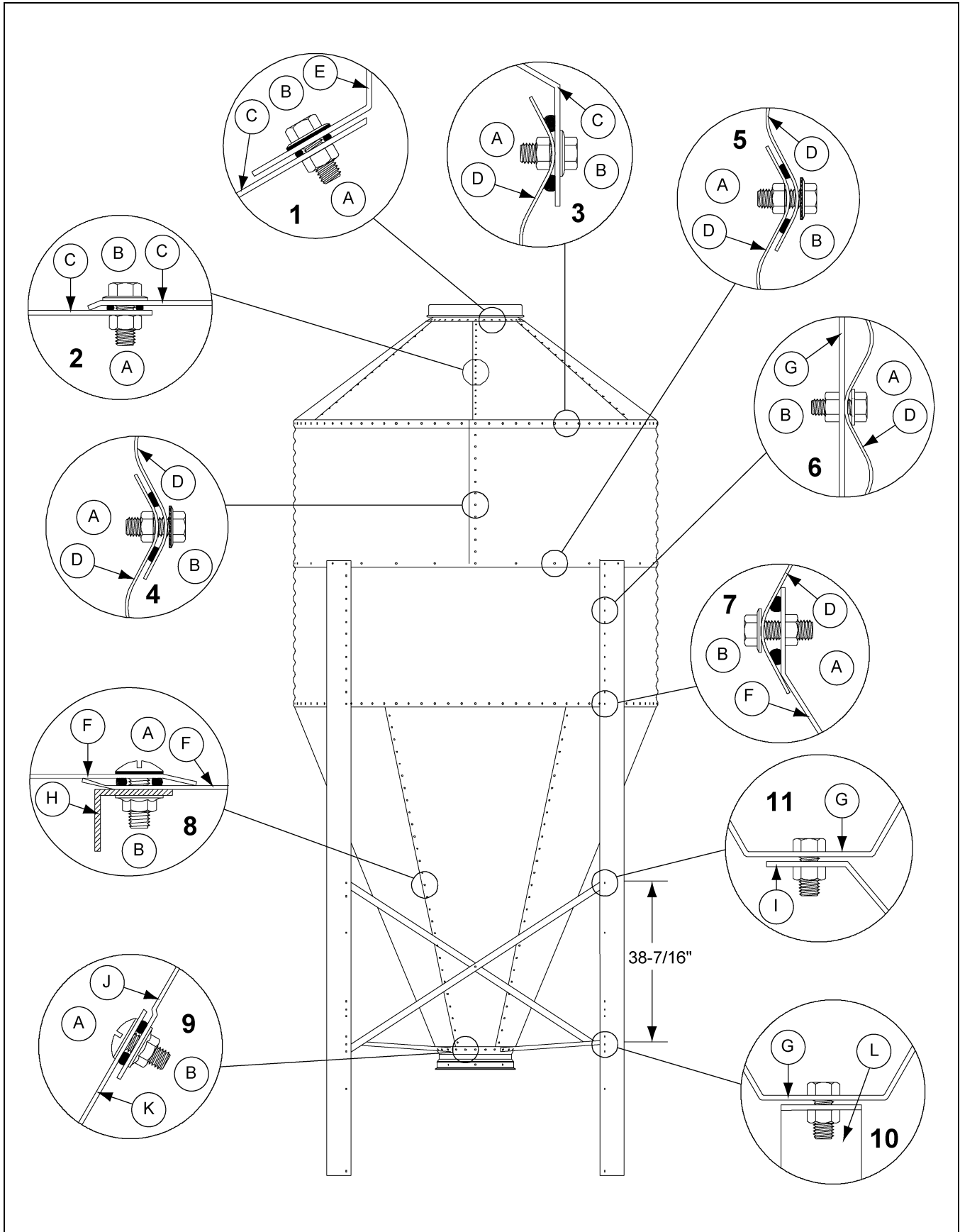
IMPORTANT: Vertical seams of body sheets with leg holes **MUST** be bolted together to provide 65-5/8" (1667 mm) between leg holes.

IMPORTANT: Bolt heads are inside of bin at the leg to body attachment and on all vertical seams on hopper panels. All bolts to be tightened from the nut side only. Refer to detail on [Page 22](#) for location of caulking. No cross tie bracing required.

7' Diameter 67° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12260	7' 30° Roof Panel (20 Gauge) (Shown)	6
1	BLK-12263	7' 40° Roof Panel (20 Gauge)	6
2		7' Sidewall Sheet	2 Per Ring
2	SS40602007	20 Gauge (Bottom/Top Leg Punched Sidewall Sheet)	
2	SS41642007	20 Gauge (Bottom/Top Leg Punched Decal Sidewall Sheet)	
2	SS40612007	20 Gauge (Top Punched Sidewall Sheet)	
2	SS41652007	20 Gauge (Top Punched Decal Sidewall Sheet)	
2	SS40462007	20 Gauge (Middle Punched Sidewall Sheet)	
2	SS40461807	18 Gauge (Middle Punched Sidewall Sheet)	
2	SS40461707	17 Gauge (Middle Punched Sidewall Sheet)	
2	SS40641707	17 Gauge (Middle Leg Punched Sidewall Sheet)	
2	SS40641507	15 Gauge (Middle Leg Punched Sidewall Sheet)	
2	SS40661807	18 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40661707	17 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40661507	15 Gauge (Bottom Leg Punched Sidewall Sheet)	
3	BLK-11476	7' 67° Offset Hopper Panel 16" Opening (18 Gauge) (Shown)	6
3	BLK-10569	7' 67° Hopper Panel 22" Opening (18 Gauge)	6
4	BLK-12039	7' Leg 140-1/2" (12 Gauge) (1-4 Rings) (Shown)	4
4	BLK-12040	7' Leg 164-1/2" (10 Gauge) (5-6 Rings)	4
5	BLK-12107	Hopper Brace for 16" Collar (Shown)	4
5	BLK-12108	Hopper Brace for 22" Collar	4
6	BLK-10488	16" 67° Hopper Collar (Shown)	1
6	BLK-10341	22" 67° Hopper Collar (36 Holes)	1
7	BLK-12056	7' Inside Cross Tie Brace (72.49") (12 Gauge)	4
7	BLK-12057	7' Outside Cross Tie Brace (72.49") (12 Gauge)	4
8	BLK-11730	30° Bulk Tank Peak Ring (Shown)	1
8	BLK-12534	40° Bulk Tank Peak Ring	1
9	BLK-12009	7' 67° Hopper Reinforcement Angle (5-6 Ring Tanks Only)	6

7' Diameter 67° Hopper Bin Hardware Specifications



* **NOTE:** Bolt listed first and nut second for each usage.

Hardware usage: Heads of bolts are on the outside of tank unless otherwise noted.

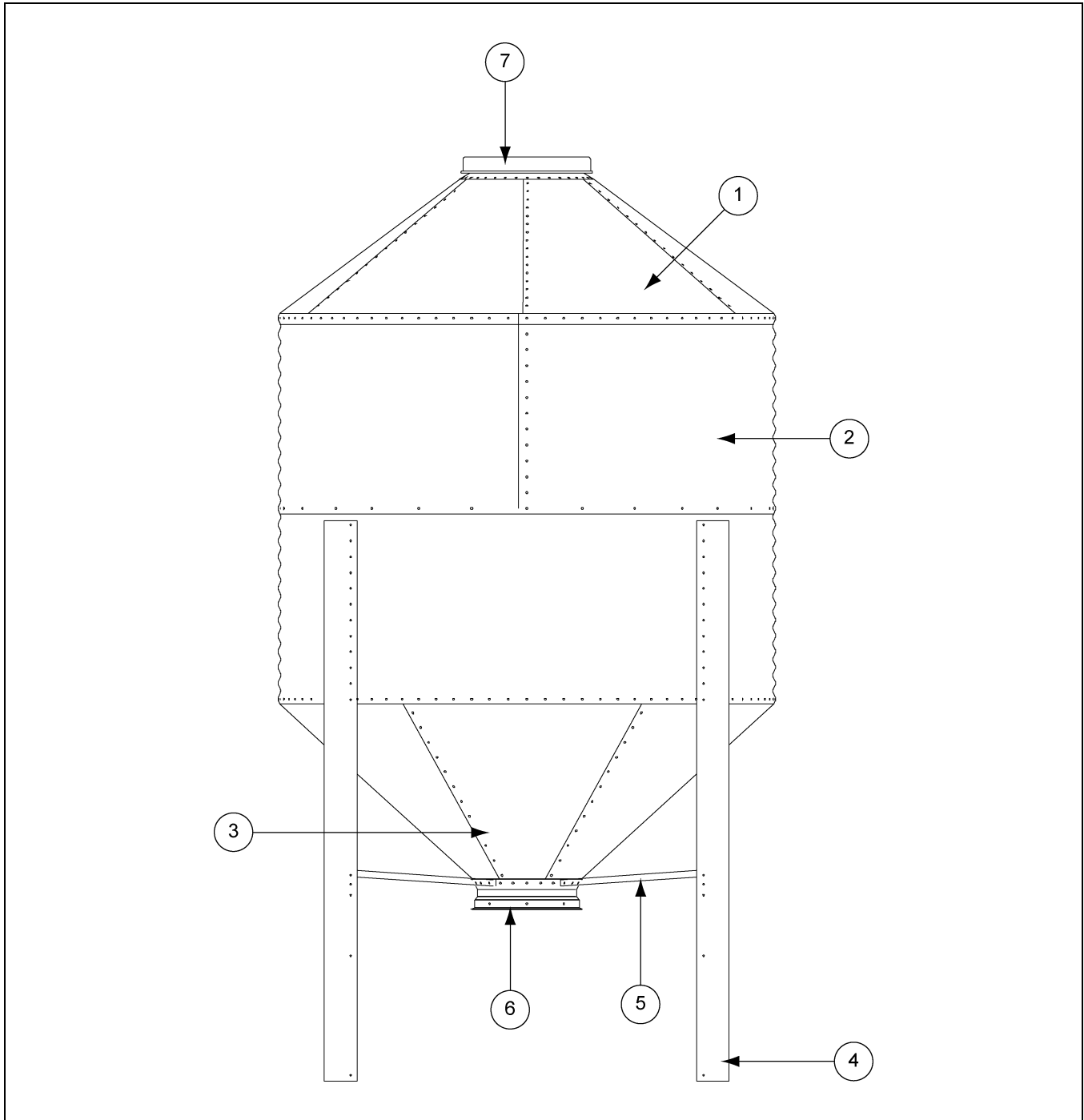
7' Diameter 67° Hopper Bin Hardware Specifications Parts List

Ref #	Part #	Description	Qty
1	S-10260	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
1	S-7484		36
2	S-10260	Roof Panel to Roof Panel (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	60
2	S-7484		60
3	S-10260	Roof Panels to Top Sidewall Sheets (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	84
3	S-7484		84
4	S-10260	Vertical Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
4	S-7484		Varies
5	S-10260	Horizontal Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
5	S-7484		Varies
6	S-10260	Leg to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank.)	52 or 88
6	S-7484		52 or 88
7	S-10260	Hopper Panels to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)	84
7	S-7484		84
8	S-10267	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)	162
8	S-10268		162
9	S-10267	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown.)	24 or 36
9	S-10268		24 or 36
10	S-7485	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	4
10	S-7489		4
11	S-7485	Cross Tie Brace (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	12
11	S-7489		12

Ref #	Description
A	Inside
B	Outside
C	Roof Sheet
D	Body Sheet
E	Peak Ring Collar
F	Hopper Panel

Ref #	Description
G	Leg
H	Hopper Reinforcement Angle (5-6 Rings Only)
I	Leg Cross Tie
J	Offset Hopper Panel
K	Hopper Collar
L	Hopper Brace

7' Diameter 45° Hopper Bin Specifications



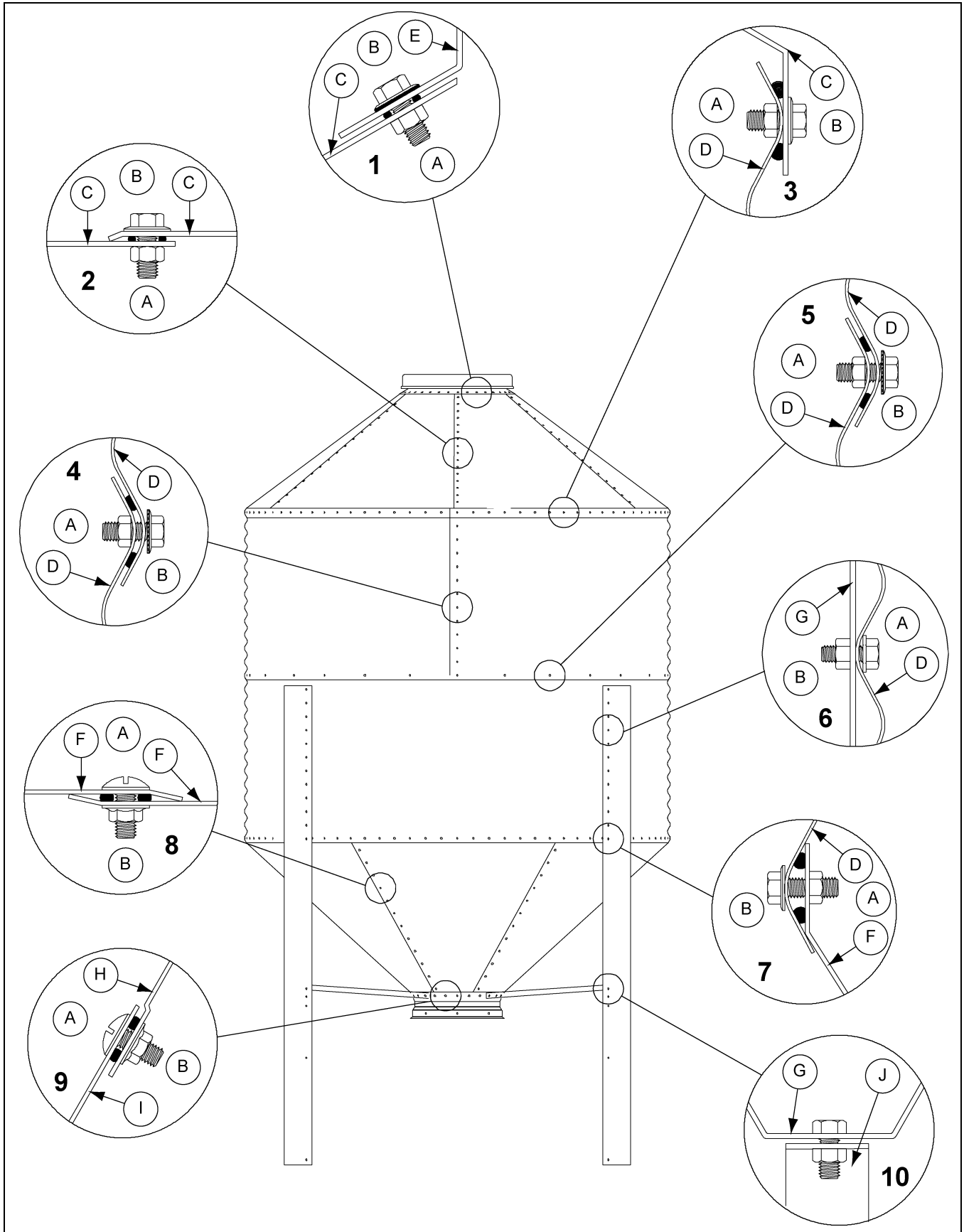
Under Collar Clearance	
16" Collar	29-3/4" (756 mm)
22" Collar	32-5/16" (821 mm)

IMPORTANT: Bolt heads are inside of bin at the leg to body attachment and on all vertical seams on hopper panels. All bolts to be tightened from the nut side only. Refer to detail on Page 22 for location of caulking. No cross tie bracing required.

7' Diameter 45° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12260	7' 30° Roof Panel (20 Gauge) (Shown)	6
1	BLK-12263	7' 40° Roof Panel (20 Gauge)	6
2		7' Sidewall Sheet	2 Per Ring
2	SS40602007	20 Gauge (Bottom/Top Leg Punched Sidewall Sheet)	
2	SS41642007	20 Gauge (Bottom/Top Leg Punched Decal Sidewall Sheet)	
2	SS40612007	20 Gauge (Top Punched Sidewall Sheet)	
2	SS41652007	20 Gauge (Top Punched Decal Sidewall Sheet)	
2	SS40462007	20 Gauge (Middle Punched Sidewall Sheet)	
2	SS40461807	18 Gauge (Middle Punched Sidewall Sheet)	
2	SS40461707	17 Gauge (Middle Punched Sidewall Sheet)	
2	SS40641707	17 Gauge (Middle Leg Punched Sidewall Sheet)	
2	SS40641507	15 Gauge (Middle Leg Punched Sidewall Sheet)	
2	SS40661807	18 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40661707	17 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40661507	15 Gauge (Bottom Leg Punched Sidewall Sheet)	
3	BLK-10693	7' 45° Offset Hopper Panel 22" Opening (18 Gauge) (Shown)	6
4	BLK-12041	7' Leg 94-1/8" (12 Gauge) (1-4 Rings) (Shown)	4
4	BLK-12042	7' Leg 120-3/4" (10 Gauge) (5-6 Rings)	4
5	BLK-12105	Hopper Brace for 16" Collar (Shown)	4
5	BLK-12106	Hopper Brace for 22" Collar	4
6	BLK-10696	16" 45° Hopper Collar (24 Holes) (Shown)	1
6	BLK-10854	22" 45° Hopper Collar (36 Holes)	1
7	BLK-11730	30° Bulk Tank Peak Ring (Shown)	1
7	BLK-12534	40° Bulk Tank Peak Ring	1

7' Diameter 45° Hopper Bin Hardware Specifications



* **NOTE:** Bolt listed first and nut second for each usage.

Hardware usage: Heads of bolts are on the outside of tank unless otherwise noted.

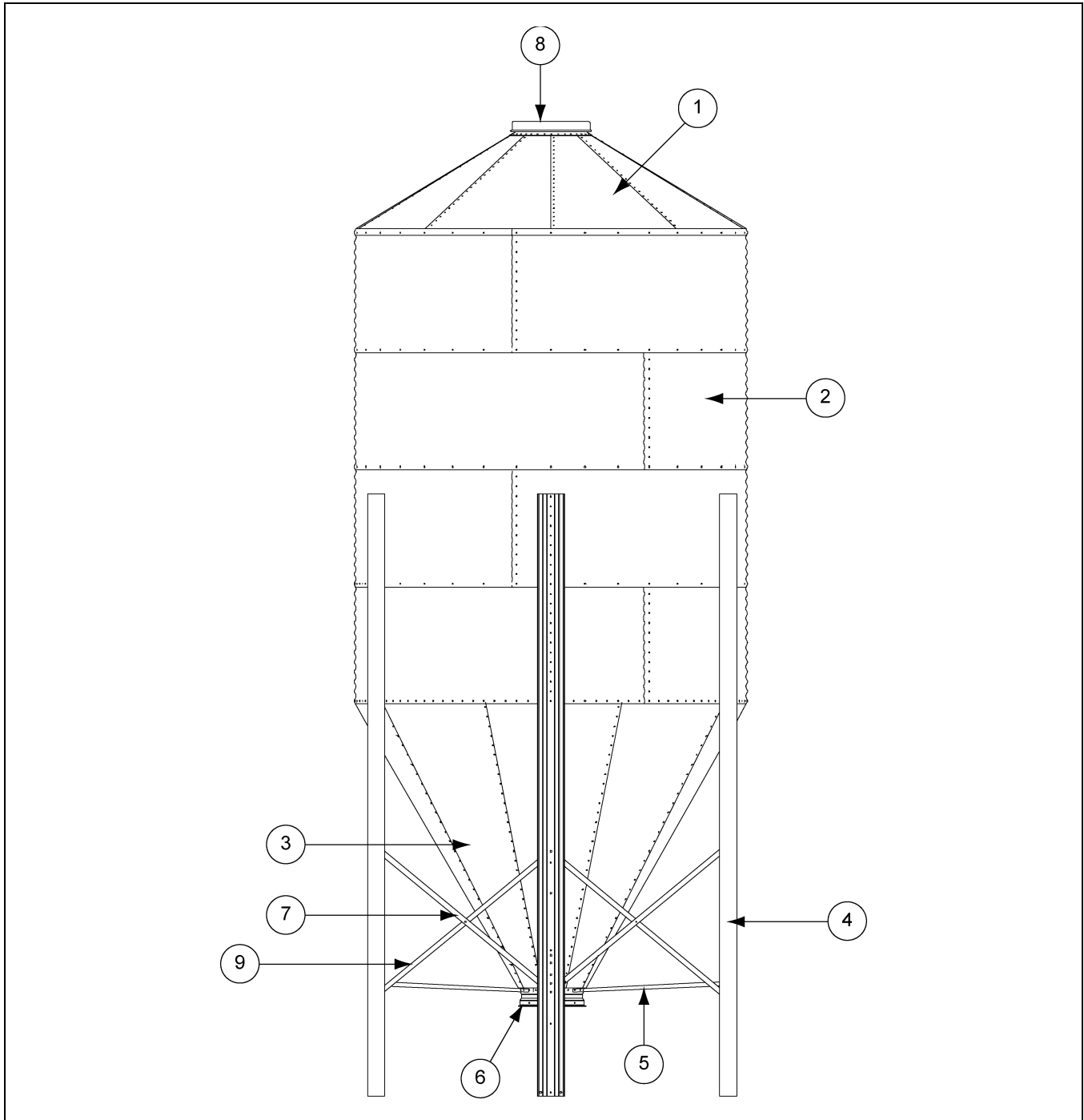
7' Diameter 45° Hopper Bin Hardware Specifications Parts List

Ref #	Part #	Description	Qty
1	S-10260	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
1	S-7484		36
2	S-10260	Roof Panel to Roof Panel (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	60
2	S-7484		60
3	S-10260	Roof Panels to Top Sidewall Sheets (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	84
3	S-7484		84
4	S-10260	Vertical Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
4	S-7484		Varies
5	S-10260	Horizontal Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
5	S-7484		Varies
6	S-10260	Leg to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank.)	48 or 88
6	S-7484		48 or 88
7	S-10260	Hopper Panels to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)	84
7	S-7484		84
8	S-10267	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)	102
8	S-10268		102
9	S-10267	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown.)	24 or 36
9	S-10268		24 or 36
10	S-7485	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	4
10	S-7489		4

Ref #	Description
A	Inside
B	Outside
C	Roof Sheet
D	Body Sheet
E	Peak Ring Collar

Ref #	Description
F	Hopper Panel
G	Leg
H	Offset Hopper Panel
I	Hopper Collar
J	Hopper Brace

9' Diameter 60° Hopper Bin Specifications



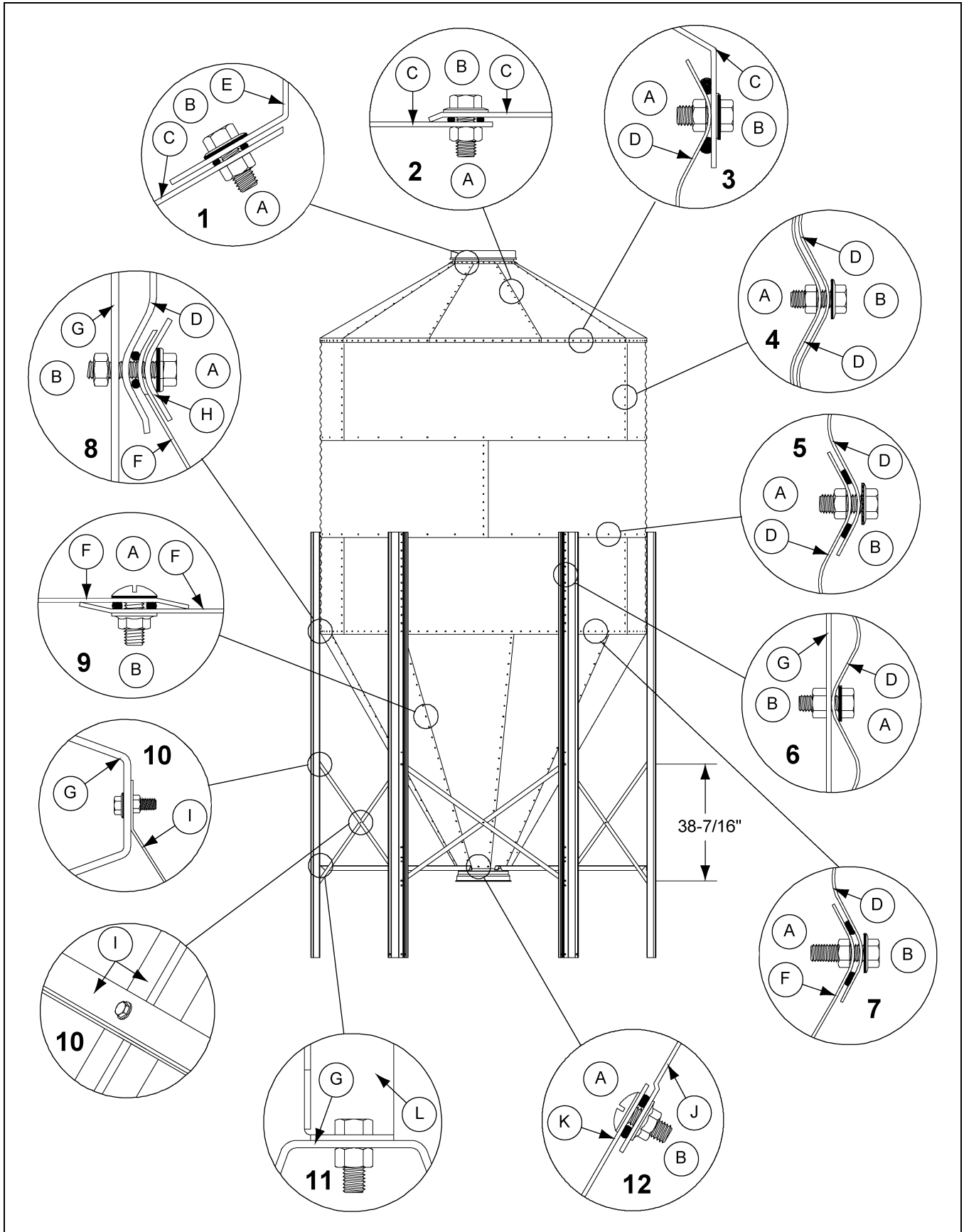
Under Collar Clearance	
16" Collar	28-1/16" (713 mm)
22" Collar	32-5/8" (829 mm)

IMPORTANT: Bolt heads are inside of bin at the Leg to Body attachment and on all vertical seams on hopper panels. All bolts to be tightened from the nut side only. Refer to detail on Page 22 for location of caulking.

9' Diameter 60° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12266	9' 30° Roof Panel (20 Gauge) (Shown)	9
1	BLK-12269	9' 40° Roof Panel (20 Gauge)	9
2		9' Sidewall Sheet	3 Per Ring
2	SS40682009	20 Gauge (Top Punched Sidewall Sheet)	
2	SS41662009	20 Gauge (Top Punched Decal Sidewall Sheet)	
2	SS40692009	20 Gauge (Middle Punched Sidewall Sheet)	
2	SS40691809	18 Gauge (Middle Punched Sidewall Sheet)	
2	SS40691709	17 Gauge (Middle Punched Sidewall Sheet)	
2	SS40701509	15 Gauge (Middle Leg Punched Sidewall Sheet)	
2	SS40712009	20 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40711809	18 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40711709	17 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40711509	15 Gauge (Bottom Leg Punched Sidewall Sheet)	
3	BLK-12311	9' 60° Offset Hopper Panel 16" Opening (18 Gauge) (Shown)	9
3	BLK-12313	9' 60° Hopper Panel 22" Opening (18 Gauge)	9
4	BLK-12036	9' Leg 140-1/2" (12 Gauge) (2-5 Rings) (Shown)	6
4	BLK-12037	9' Leg 164-1/2" (10 Gauge) (6 Rings)	6
5	BLK-12109	Hopper Brace for 16" Collar (Shown)	6
5	BLK-12110	Hopper Brace for 22" Collar	6
6	BLK-12342	16" 60° Hopper Collar (18 Holes) (Shown)	1
6	BLK-10342	22" 60° Hopper Collar (36 Holes)	1
7	BLK-12058	9' Inside Cross Tie Brace (67.788") (12 Gauge)	6
7	BLK-12059	9' Outside Cross Tie Brace (67.788") (12 Gauge)	6
8	BLK-11730	30° Bulk Tank Peak Ring (Shown)	1
8	BLK-12534	40° Bulk Tank Peak Ring	1
9	BLK-12730	9' 60° Hopper Reinforcement Angle (3-6 Ring Tanks Only)	9

9' Diameter 60° Hopper Bin Hardware Specifications



* **NOTE:** Bolt listed first and nut second for each usage.

Hardware usage: Heads of bolts are on the outside of tank unless otherwise noted.

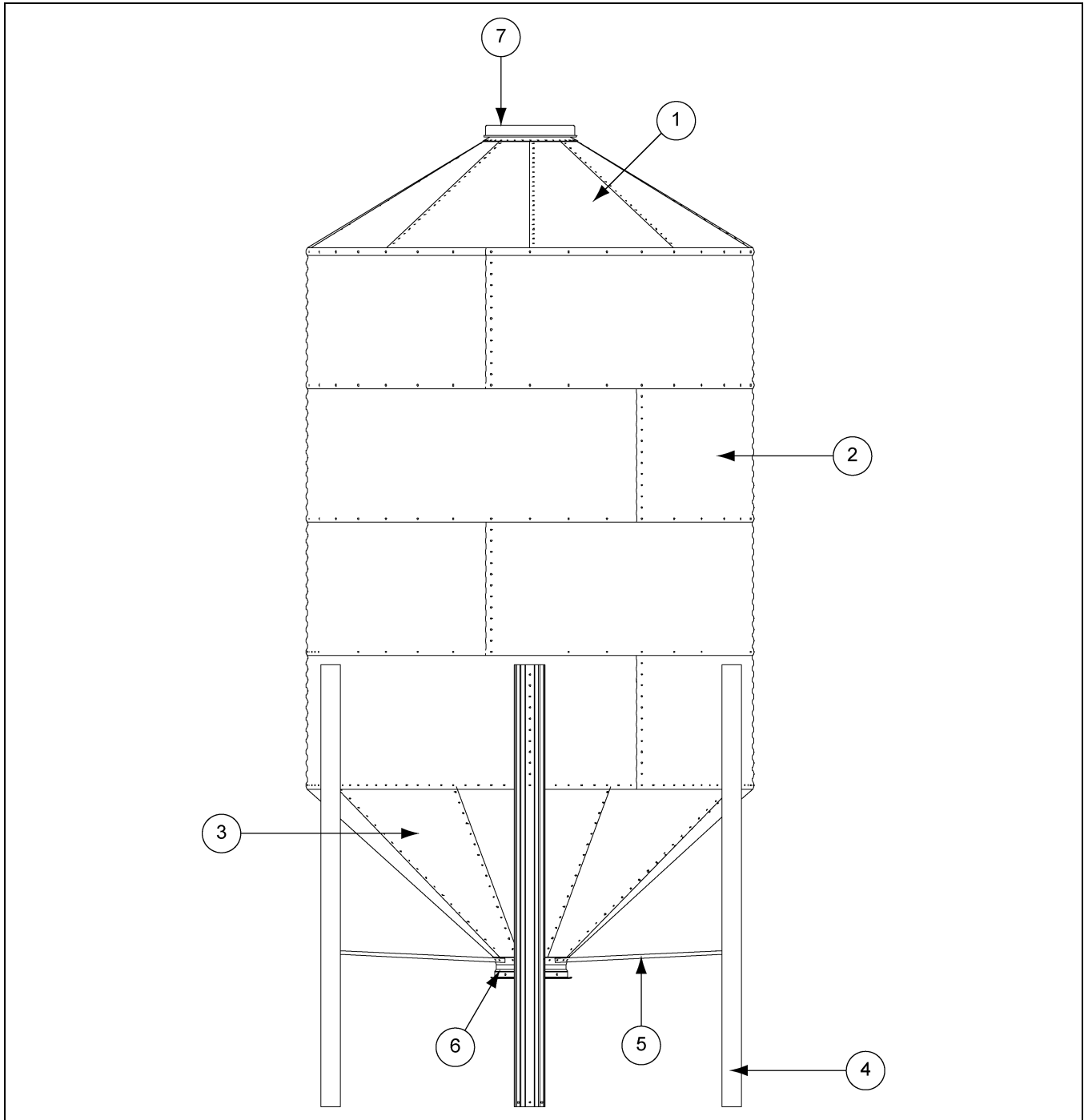
9' Diameter 60° Hopper Bin Hardware Specifications Parts List

Ref #	Part #	Description	Qty
1	S-10260	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
1	S-7484		36
2	S-10260	Roof Panel to Roof Panel (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	108
2	S-7484		108
3	S-10260	Roof Panels to Top Sidewall Sheets (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	108
3	S-7484		108
4	S-10260	Vertical Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
4	S-7484		Varies
5	S-10260	Horizontal Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
5	S-7484		Varies
6	S-10260	Leg to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank.)	78 or 132
6	S-7484		78 or 132
7	S-10260	Hopper Panels to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)	108
7	S-7484		108
8	S-10260	Leg to Body Sheet to Hopper Connection (Use 10 Gauge Washer under 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)	6
8	S-7484		6
8	BLK-12483		6
9	S-10267	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)	216
9	S-10268		216
10	S-7485	Cross Tie Brace (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	18
10	S-7489		18
11	S-7485	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	6
11	S-7489		6
12	S-10267	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown.)	27 or 36
12	S-10268		27 or 36

Ref #	Description
A	Inside
B	Outside
C	Roof Panel
D	Sidewall Sheet
E	Peak Ring Collar
F	Hopper Panel

Ref #	Description
G	Leg
H	Washer
I	Cross Tie
J	Offset Hopper Panel
K	Hopper Collar
L	Hopper Brace

9' Diameter 45° Hopper Bin Specifications



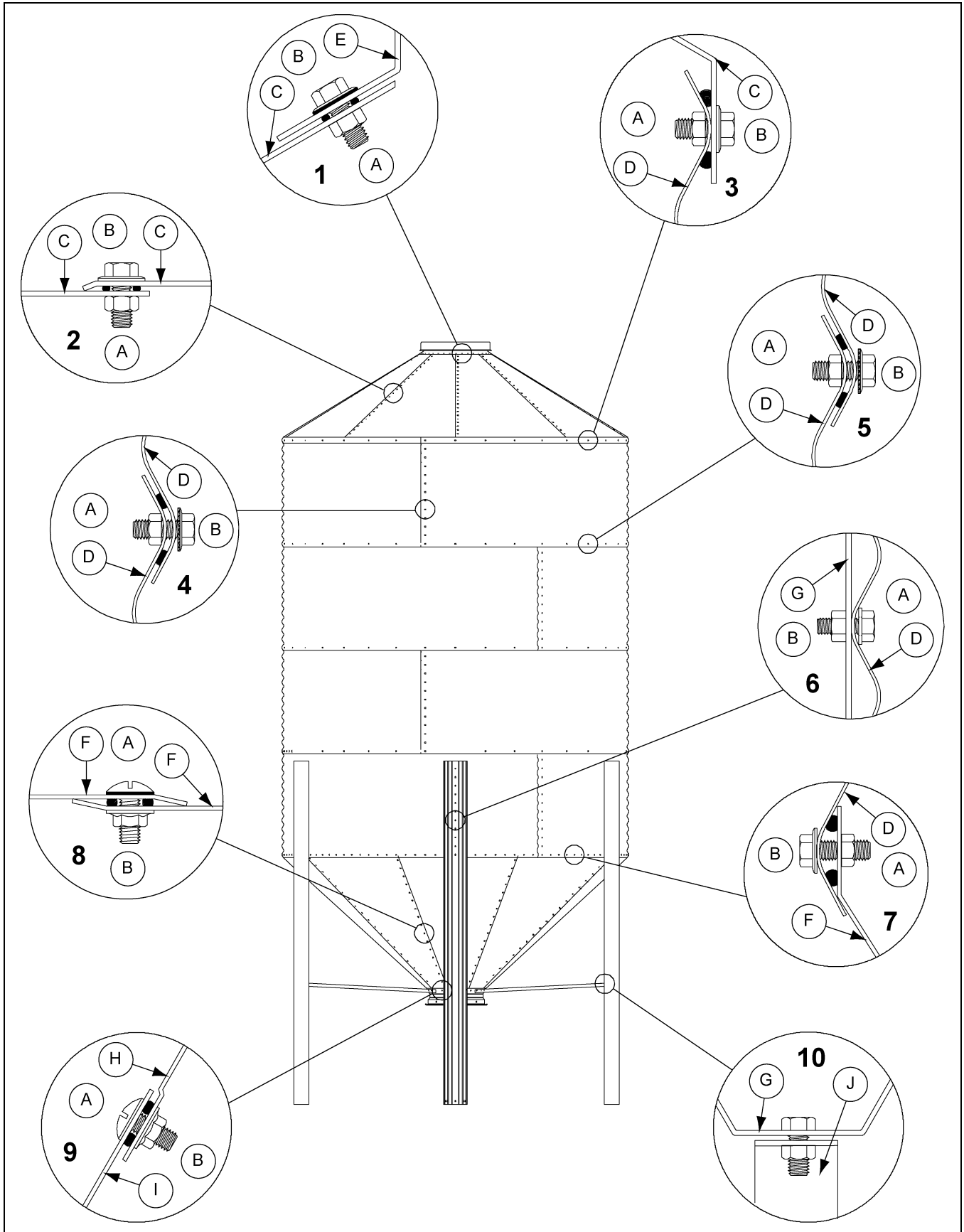
Under Collar Clearance	
16" Collar	30-11/16" (779 mm)
22" Collar	33-1/4" (844 mm)

IMPORTANT: Bolt heads are inside of bin at the leg to body attachment and on all vertical seams on hopper panels. All bolts to be tightened from the nut side only. Refer to detail on Page 22 for location of caulking. No cross tie bracing required.

9' Diameter 45° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12266	9' 30° Roof Panel (20 Gauge) (Shown)	9
1	BLK-12269	9' 40° Roof Panel (20 Gauge)	9
2		9' Sidewall Sheet	3 Per Ring
2	SS40682009	20 Gauge (Top Punched Sidewall Sheet)	
2	SS41662009	20 Gauge (Top Punched Decal Sidewall Sheet)	
2	SS40692009	20 Gauge (Middle Punched Sidewall Sheet)	
2	SS40691809	18 Gauge (Middle Punched Sidewall Sheet)	
2	SS40691709	17 Gauge (Middle Punched Sidewall Sheet)	
2	SS40701509	15 Gauge (Middle Leg Punched Sidewall Sheet)	
2	SS40712009	20 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40711809	18 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40711709	17 Gauge (Bottom Leg Punched Sidewall Sheet)	
2	SS40711509	15 Gauge (Bottom Leg Punched Sidewall Sheet)	
3	BLK-10694	9' 45° Offset Hopper Panel 22" Opening (16 Gauge) (Shown)	9
4	BLK-12043	9' 45° Leg 106-1/8" (12 Gauge) (2-5 Rings) (Shown)	6
4	BLK-12044	9' 45° Leg 132-3/8" (10 Gauge) (6 Rings)	6
5	BLK-12111	Hopper Brace for 16" Collar (Shown)	6
5	BLK-12112	Hopper Brace for 22" Collar	6
6	BLK-10696	16" 45° Hopper Collar Bundle (Shown)	1
6	BLK-10854	22" 45° Hopper Collar (36 Holes)	1
7	BLK-11730	30° Bulk Tank Peak Ring (Shown)	1
7	BLK-12534	40° Bulk Tank Peak Ring	1

9' Diameter 45° Hopper Bin Hardware Specifications



NOTE: Bolt listed first and nut second for each usage.

Hardware usage: Heads of bolts are on the outside of tank unless otherwise noted.

9' Diameter 45° Hopper Bin Hardware Specifications Parts List

Ref #	Part #	Description	Qty
1	S-10260	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
1	S-7484		36
2	S-10260	Roof Panel to Roof Panel (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	126
2	S-7484		126
3	S-10260	Roof Panels to Top Sidewall Sheets (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	108
3	S-7484		108
4	S-10260	Vertical Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
4	S-7484		Varies
5	S-10260	Horizontal Sidewall Sheet Seams (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
5	S-7484		Varies
6	S-10260	Leg to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank.)	28 or 132
6	S-7484		28 or 132
7	S-10260	Hopper Panels to Sidewall Sheet (Use 5/16" x 1" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)	108
7	S-7484		108
8	S-10267	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)	171
8	S-10268		171
9	S-10267	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown.)	27 or 36
9	S-10268		27 or 36
10	S-7485	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	6
10	S-7489		6

Ref #	Description
A	Inside
B	Outside
C	Roof Sheet
D	Body Sheet
E	Peak Ring Collar

Ref #	Description
F	Hopper Panel
G	Leg
H	Offset Hopper Panel
I	Hopper Collar
J	Hopper Brace

NOTES

GSI Group, LLC Limited Warranty

The GSI Group, LLC ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

Warranty Extensions:

The Limited Warranty period is extended for the following products:

	Product	Warranty Period	
AP Fans and Flooring	Performer Series Direct Drive Fan Motor	3 Years	* Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 25% 5 to 7 years - end-user pays 50% 7 to 10 years - end-user pays 75%
	All Fiberglass Housings	Lifetime	
	All Fiberglass Propellers	Lifetime	
AP and Cumberland	Flex-Flo/Pan Feeding System Motors	2 Years	** Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 50%
Cumberland Feeding/Watering Systems	Feeder System Pan Assemblies	5 Years **	
	Feed Tubes (1-3/4" and 2.00")	10 Years *	
	Centerless Augers	10 Years *	
	Watering Nipples	10 Years *	
Grain Systems	Grain Bin Structural Design	5 Years	† Motors, burner components and moving parts not included. Portable dryer screens included. Tower dryer screens not included.
Grain Systems Farm Fans Zimmerman	Portable and Tower Dryers	2 Years	
		Portable and Tower Dryer Frames and Internal Infrastructure †	5 Years

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12th) month from the date of purchase and continuing until the sixtieth (60th) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

Conditions and Limitations:

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

GSI shall not be liable for any direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction defects or unauthorized modifications to products which it manufactured. Modifications to products not specifically delineated in the manual accompanying the equipment at initial sale will void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.

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



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