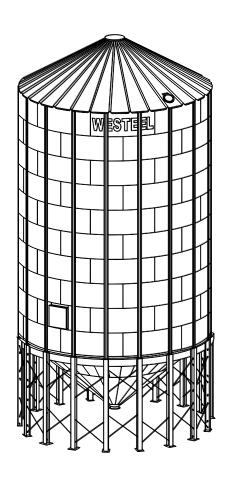


# 15' – 36' Commercial Hopper Tank Series

Wide-Corr® Centurion® Grain Bin Installation and Storage Instructions





Part Number: 198824 R41

Revised: January, 2025

**Original Instructions** 

### **New in this Manual**

The following changes have been made in this revision of the manual:

Description	Section
All roof related contents are removed from this revision.	All sections

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# 1. Introduction

Before assembling, please read this manual. Familiarize yourself with the process and the necessary precautions for efficient and safe assembly of this AGI 15' – 36' Commercial Hopper Tank Series.

Everyone present at the assembly site is required to be familiar with all safety precautions.

Keep this manual available for frequent reference and review it with new personnel. Call your local distributor or dealer if you need assistance or additional information.

# 2. Safety

# 2.1. Safety Alert Symbol and Signal Words



This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

**Signal Words:** Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.

**⚠ WARNING** 

Indicates a hazardous situation that, if not avoided, could result in serious injury or death.

**⚠ CAUTION** 

Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

NOTICE

Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

# 2.2. General Safety Information

Read and understand all safety instructions, safety decals, and manuals and follow them when assembling the equipment.

 Only experienced personnel who are familiar with this type of assembly and installation should perform this work. Untrained assemblers/installers expose themselves and bystanders to possible serious injury or death.



- Do not modify the grain bin in any way or deviate from the instructions in this manual without written
  permission from the manufacturer. Unauthorized modification or methods may impair the function and/or
  safety. Any unauthorized modification will void the warranty.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.
- Contact your local representative or AGI if you need assistance or additional information.
- Always follow applicable local codes and regulations.

# 2.3. Personal Protective Equipment

The following Personal Protective Equipment (PPE) should be worn when installing the equipment.

### Safety Glasses



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

### Coveralls



Wear coveralls to protect skin.

### Hard Hat



Wear a hard hat to help protect your head.

### Steel-Toe Boots



Wear steel-toe boots to protect feet from falling debris.

### Work Gloves



Wear work gloves to protect your hands from sharp and rough edges.

# 2.4. Safety Equipment

The following safety equipment should be kept on site.

### First-Aid Kit



Have a properly-stocked first-aid kit available for use should the need arise, and know how to use it.

# 2.5. Auxiliary Equipment Safety

Unapproved auxiliary equipment could cause performance issues or structural failure, and is not covered by warranty.

- Do not install auxiliary equipment if the grain bin is not designed for use with it. Refer to the specific information provided in this manual for auxiliary equipment or check with AGI or your dealer for written approval, if necessary.
- Obtain, read, and understand the instructions and safety warnings of the auxiliary equipment manufacturer.
- Attach auxiliary safety decals to the grain bin as applicable.
- Store auxiliary operations/maintenance manuals in a safe place available for future use.

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# 2.6. Working At Height Safety

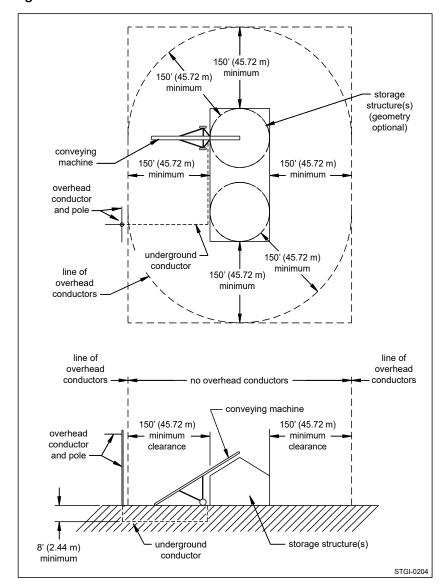
- Ensure that all work at height is properly planned, organized and carried out by a competent person.
- Use appropriate work equipment and make sure that they are inspected to ensure safety.
- Select collective measures to prevent falls (such as guard rails and working platforms) before other measures which may only reduce the distance and consequences of a fall (such as nets or air bags) or may only provide fall-arrest through personal protection equipment.
- Ensure that those persons working at height are trained in how to avoid falling and how to avoid or minimise any injuries should they fall.
- Check the weather condition. Postpone any work at height until there is no risk to the health and safety of any person working at height.
- Ensure that nothing is thrown or tipped from height if it is likely to injure a person.

# 2.7. Overhead Power Lines

### **MARNING**

- Keep grain bins a horizontal distance of at least 150 ft (45.7 m) from power lines. Increase distance to meet electrical code requirements where required.
- Do not load or unload the grain bin if there is a chance of any loading or unloading equipment contacting power lines.
- Do not locate grain bins on both sides of a power line or under a power line.
- Electrocution can occur without direct contact.

Figure 1. Power Lines and Conductor Clearance





# 2.8. Safety Decals

- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available free of charge from your distributor, dealer, or factory as applicable.

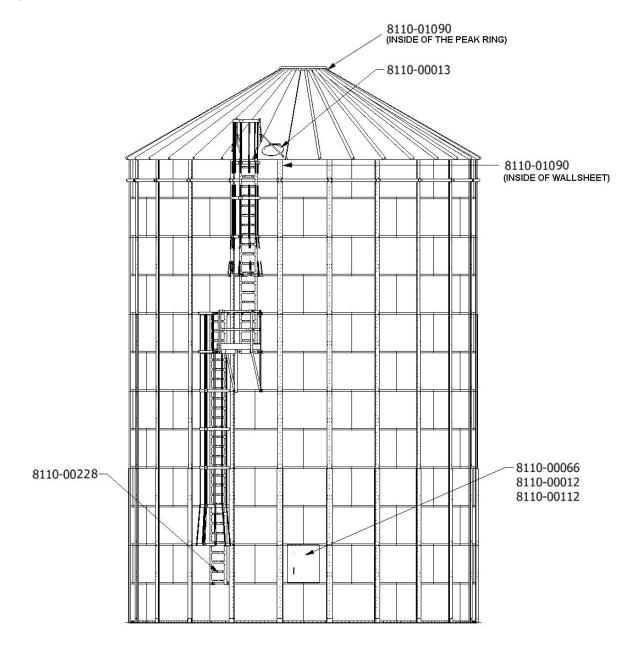
# 2.9. Decal Installation/Replacement

- 1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
- 2. Decide on the exact position before you remove the backing paper.
- 3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
- 4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
- 5. Small air pockets can be pierced with a pin and smoothed out using the decal backing paper.

# 2.10. Safety Decal Locations and Details

Replicas of the safety decals that are attached to the grain bin and their messages are shown in the figure(s) that follow. Safe operation and use of the grain bin requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.

**Safety Decal Locations** 



### Safety Decals and Part Numbers

### 8110-00013

# **WARNING**

### **ENTRAPMENT HAZARD**

Never enter the bin when loading or unloading grain.

- 1. Shut off and lock out all power
- 2. Use a lifeline, safety harness, and have an observer outside before entering the bin.
- 3. Wear proper breathing equipment or a respirator.
- 4. Avoid the center of the bin.

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

### 8110-00112

# WARNING

### Keep clear of all augers, DO NOT ENTER this bin!

- 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.

Failure to heed these warnings could result in serious injury or death

### 8110-00012



### SAFETY INSTRUCTIONS

- Read operator's manual and all safety decals before assembling, using, or servicing bin.
- Close/latch all access doors when not in use.
- · Do not alter or modify bin structure
- Replace any damaged components only with factory made components.
- This bin should only be used to store free flowing, granular material, unless specifically designed and marked otherwise.
- · When filling, use top filler cap and direct material to center of bin.
- · Do not over-fill bin. Material should not be in contact with or place pressure on roof sheets.
- · Unload grain only from the center of the bin. If equipped with an approved binsweep or sidedraw, refer to its instructions for proper use.

### 8110-00228

# **NARNING**

### **FALLING HAZARD**

To prevent serious injury or death:

- · Do not climb ladder if damaged, wet, icy, greasy, or slippery.
- Maintain good balance by having at least three points of contact at all times. Face the ladder while climbing.
- Safe working load is 350 lb (160 kg). Do not overload.
- · Do not carry items while climbing.

### 8110-00066

### **NOTICE** When equipped with aeration system, to

prevent roof and/or bin damage:

- Use a minimum 1 square foot (0.1m²) opening for each 1000ft³/min (30m³/min) of air.
- Ensure all roof vents are open and unobstructed.
- · Discontinue use of aeration fan if roof vents become obstructed with ice.

### 8110-01090



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# 3. Before You Begin

# 3.1. Bin Design and Capacity

Standard AGI Grain Bins are designed for:

- 1. Non-corrosive free-flowing materials up to 52 lbs/ft<sup>3</sup> (833 kg/m<sup>3</sup>) average compacted bulk density.
- 2. Maximum horizontal wind pressure based on 94 mph (151 km/h) as per NBCC 2015 and 105 mph (169 km/h) as per ASCE 7-16.
- 3. Zero seismic activity.

### Note

Seismic resistance in grain bins varies with height and diameter. Many standard designs have significant seismic capabilities. Designs can be reviewed and/or modified to reflect local seismic requirements.

- 4. Roof loading capabilities vary with diameter, peak load and snow load.
  - a. Peak Loads standard peak loads follow. Upgrades are available.

Table 1. Peak Loads for Various Roofs

Size	Type of Roof	Load (lbs)	Load (kg)
15' to 24'	non-structural	4000 lbs	1814 kg
27' to 48'	non-structural	5000 lbs	2268 kg
51' to 60'	non-structural	8000 lbs	3629 kg
48' to 108'	structural	20,000 lbs	9072 kg

b. Roof Snow Loads (RSL) – at the above stated standard peak loads, standard RSLs vary with diameter and range from 16 psf (78 kg/m²) to 45 psf (220 kg/m²). *Upgrades are available*.

### Note

The correlation between ground snow load (GSL) and roof snow load (RSL) for grain bin designs vary with jurisdictions. In the US GSL =  $2 \times RSL$ . In Europe GSL =  $1.25 \times RSL$ . In Canada the correlation between GSL and RSL varies and is site specific.

c. For maximum roof snow load capacities for various sizes and types of roofs, refer to the Roof Design Capacities sections that follow.

# 3.2. Foundation Design and Loads

The foundations for the stiffened bin models are based on 3000 lbs. per sq. ft. (144 kPa) soil bearing capacity. All foundation designs use 3000 lbs. per sq. in. (21 MPa) ultimate compressive strength (after 28 days) for concrete and 43,500 lbs. per sq. in. (300 MPa) re-bar. The foundation designs included in this manual are suggestions only, and will vary according to local soil conditions. AGI will not assume any liability for results arising from their use.

### **Important**

Foundation should be uniform and level. Level should not vary by more than ¼" over a span of four feet under the bottom ring angle. Any variance from level must be shimmed under upright base assembly. If being utilized to support a full floor aeration system, this levelness requirement should extend across the complete floor area.

# 3.3. Lifting with Bin Jacks

Use bin jacks to lift the bin safely during assembly and help prevent strength and functionality problems later, including alignment, tolerance, bin roundness, distortion, and twisting issues.



MARNING To prevent risk of serious injury or damage to the equipment:

- Prior experience is required. Do not use bin jacks if you are not properly trained or have never used them.
- Do not use bin jacks in windy conditions.
- Do not exceed lifting capacity of a bin jack.
- Powered bin jacks are recommended. If using manually operated chain jacks, lift carefully and evenly to prevent damage.

For important additional information, refer to:

- Specifications section in your manual, the sales order, or approval drawing of the bin's radius and total weight of the grain bin (including roof, fasteners, stiffeners, and all accessories).
- Bin jack manufacturer's instructions and bin jack lifting capacity.

### **Tools and Equipment**

Use the following to lift the bin:

- bin jacks (internal or external)
- scaffolding/ladders
- lifting lugs
- drift pin
- socket/impact set
- wrench set

Additional tools and equipment may be required.

### **General Bin Jacking Instructions**

Refer to the bin jack manufacturer's instructions in addition to the following to safely lift the bin during assembly:

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- Use one bin jack per wall sheet.
- Confirm that the number of bin jacks can support at least 5X the weight of the bin.
- Fabricate lifting lugs to match the hole spacing on the bin.
- Assemble the top 1-2 wall sheet rings directly on the foundation.
- Layout and space the bin jacks evenly at each stiffener/seam according to the bin's radius.
- Anchor the bin jacks securely to the concrete.
- Connect the bin jacks securely to the stiffeners/seams.
- Lift using the bin jacks at an even and slow pace.
- Align the stiffener/seam holes with the wall sheet holes using a drift pin.
- When not actively assembling, lower the bin fully and secure it to the foundation to protect against wind gusts and other conditions.

# 3.4. Site and Assembly

Unless otherwise specifically provided in writing, AGI does not take responsibility for any defects or damages to any property, or injury to any persons, arising from or related to any site or assembly considerations, including but not limited to:

- Bin location and bin siting
- Soil conditions and corresponding foundation requirements
   (Note that the examples provided in manuals are for specifically stated soil conditions.)
- Bin assembly (AGI recommends the use of qualified bin installers. Contact AGI for information on installers in your area.)
- Field modifications or equipment additions that affect the bin structure
- Interconnections with neighboring structures
- Have the builder make all non-bin equipment in excess of AGI's recommendations. All such equipment including: LEGS, WALKWAYS, SPOUTING, and CONVEYORS must be self supporting.
- Compliance with all applicable safety standards, including but not limited to fall restraint systems (ladders or other systems). Contact local safety authorities as the standards vary between jurisdictions.

# 3.5. Methods of Installation

The recommendations for assembling and installing AGI grain bins must be closely followed to achieve the full strength of the bin and to achieve adequate weather sealing. The product warranty is void if:

- 1. Wall sheets and/or uprights not specified for a given tier are used.
- 2. Foundations are found to be inadequate or out-of-level.
- 3. Anchor bolts (cast-in-place, drill-in, chemical type or other) are found to be inadequate.
- 4. Off-center loading or unloading is used. (This does not apply to the use of approved side unloading systems).
- 5. Materials stored are not free-flowing or have a compacted bulk density greater than 52 lbs/ft³ (833 kg/m³).

If using bin jacks during assembly, always lift on an upright. Choose a hoist with an adequate capacity for the expected empty bin deadload. Make sure the rated capacity of the hoist is not exceeded.

# 3.6. Cutting Openings in Wide-Corr® Grain Bins

This section provides instructions for cutting openings to accommodate fan transitions, unloading augers and roof vents.

### **General Rules for Cutting openings**

- 1. Never cut any uprights, roof ribs, or wall sheet bolted vertical seams to create an opening.
- 2. Openings shall be located so equipment being installed won't interfere with any bin components/ accessories.
- 3. Openings shall be minimized as much as possible for structural integrity of grain bins.
- 4. Corners in openings shall be cut with minimum radius of 1/8" to reduce stress concentration.
- 5. Openings shall be sealed all the way around for all weather conditions.
- 6. Instructions shall be followed closely to avoid damage to bin structure.
- 7. Except cutting openings described below, any other modification to AGI bins shall be approved by a professional engineer.

### **Openings for Fan Transitions of Aeration Floors**

- 1. Consult aeration floor installation instructions for information on Planning floor layout.
- 2. Openings shall be centered to a wall sheet in horizontal direction.
- 3. Opening shall be cut as tight as it can be for the transition to go through and shall have no more than 1/4" gap on any side to the section of a fan transition going through a bin wall.
- 4. Opening height for fan transition shall be limited to 12.5" inches from bottom edge of a bottom wall sheet.
- 5. Opening width shall not exceed 46.5" for stiffened bins and 72.5" for unstiffened bins.
- 6. Vertical support shall be required to support load above opening.
- 7. Bottom angles may be cut flush to the sides of an opening to form part of opening.

### Openings for Unloading Augers of Wide-Corr® Bins with Full Floor Aeration

- 1. Consult aeration floor installation instructions for information on Planning floor layout.
- 2. Openings shall be centered to a wall sheet in horizontal direction.
- 3. Openings shall be cut as tight as it can be for unloading auger to go through and shall have no more than 1/4" gap to auger flange section on any side.
- 4. Opening height for any auger shall be limited to 12.5" from the bottom edge of a bottom wall sheet.
- 5. Vertical flange of a bottom angle may be cut flush to sides of an opening to form part of opening.

### **Openings for Roof Vents in Roof Sheets**

- 1. Openings shall be centered between roof ribs and have 2.5" minimum distance between edge of opening and base of a roof rib.
- 2. Openings can be square, rectangular, or round.
- 3. Openings shall be the same size as the inlet opening of a vent being installed.

4. Any side of a square/rectangular opening shall have a maximum length of 18" and a circular opening shall have a maximum diameter of 24".

# 3.7. Critical Assembly Requirements

To ensure a successful, safe and reliable outcome you must comply with the following assembly techniques and practices:

- 1. Comply with all local code and jurisdictional requirements applicable to your grain bin installation.
- 2. Design and build foundations with the necessary strength for the loads they must support, and for local soil conditions. AGI foundation guidelines are based on specific stated conditions and may not be applicable to local conditions.
- 3. Your foundation must provide uniform and level support to the structure being supported. Surface imperfections causing gapping must be remedied. This may involve, but not be limited to a) grouting under the bottom ring of a non-stiffened bin or tank, and b) shimming under the uprights of a stiffened bin or tank, or under the legs of a hopper.
- 4. Make sure that the proper hardware is utilized for all bolted connections. If a shortage occurs, do not substitute. Take the necessary steps to obtain the proper hardware. Make sure nuts are tightened to the required torque values as specified in the appropriate assembly manual.
- 5. Comply with all assembly instructions provided in the appropriate assembly manual to make sure your whole grain bin is constructed safely. Important: Do not deviate from the wall sheet and upright layouts provided.
- 6. Before anchoring your structure to its foundation, make sure the structure is round. The maximum variation from perfect roundness is 3/4" on the radius. Locate anchor bolts toward the outside of the anchor bolt holes (away from the circle) to permit the incremental expansion that can occur with the initial filling.
- 7. When installing roof stiffening rings, if it is necessary to shorten the stiffening ring tubes, shorten them as little as possible. Initially the nuts on the expanders should be centered and as close together as possible. When tightening, share the amount of take-up between expanders such that the nuts remain centered, and the amount of engagement between all expanders on the same ring is equalized.
- 8. If extending an existing bin or tank, ensure that the foundation is adequate for the increased loads it must support.
- 9. If installing an existing bin on a hopper, make sure the bin is designed for a hopper application, and that the foundation is capable of withstanding the substantial point loads that the hopper legs apply. If uprights are present, make sure that they are supported.
- 10. Make sure that an integral end-to-end connection exists between all mating uprights. Successive uprights must not overlap.
- 11. Vertical tolerances between uprights and wall sheets are tight. This can be affected by "jacking" techniques, which can allow the tolerance to grow or shrink depending on the technique used. The gapping between successive uprights must be monitored to ensure that upright holes align with wall sheet holes.
- 12. If catwalks are being installed on the structure, upright catwalk upgrades are likely required. The upgraded stiffeners must be installed in the correct locations to support the intended catwalk loads. Also, the structure must be properly oriented to ensure the eventual correct alignment between the catwalks and the supporting uprights. Finally, the connectors that tie into the uprights and support the catwalks are best installed during assembly of the structure. See the catwalk assembly manual for additional details.

# 3.8. Product Storage

If you won't be assembling the bin right away, store the bundles and boxes inside a building with good ventilation to prevent white or red rust from forming.

### Note

White rust can be removed and does not cause permanent damage.



Red rust causes permanent structural damage.

Do not assemble any part containing red rust.

If you can't store the bundles and boxes inside, follow the instructions below for outdoor storage.

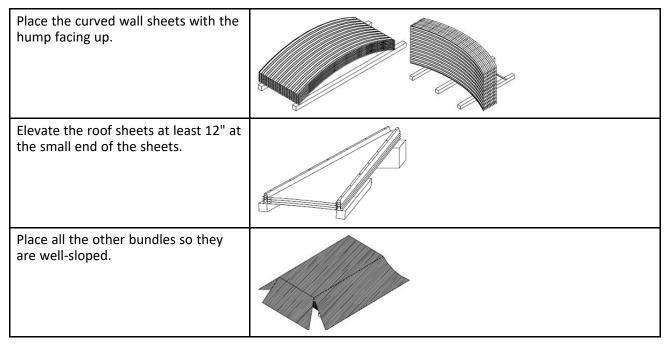
### **Storing Bin Bundles and Boxes Outdoors**

**Required Materials:** 

- Wood blocks
- Waterproof tarp

Storage Procedure:

1. First, place the bundles and boxes on wood blocks about 6"-8" off the ground.



2. For the bin boxes, ladder boxes, and hardware boxes: build a simple framework to support, cover with a waterproof tarp, and secure.

### Note

The boxes are not waterproof and will deteriorate in normal weather conditions, allowing moisture to contact the parts inside.

### If Parts Become Wet

- 1. Open the bundles as soon as possible.
- 2. Separate and dry the bin sheets or parts. Keep the parts separated until assembly.

# **⚠ WARNING**

### Risk of injury or damage.

Brace parts securely to avoid damage or injury from material falling when in storage.

- 3. Dry any boxed parts that are wet and store them in a new, dry box.
- 4. After drying the wall sheets, apply a food-grade oil with a clean, lint-free cloth.

### Note

Applying oil will help prevent moisture to contact with the dried wall sheets.

# MARNING Risk of slipping.

Do not use oil on roof sheets, ladders, or other parts where a person may walk or stand after the bin is assembled.

### 3.9. Grain Bin Use

- Fill the bin through the center roof opening only.
- Do not overfill the bin roof area! This may cause roof damage or failure.
- Do not off-center unload a grain bin. It is imperative to unload from the center of the bin first, until as much grain as possible has been removed, and only then proceed to unload from the next closest unload gate to the center. Continue utilizing the unload gates in succession from the center towards the outside. Gate control mechanisms should be clearly marked and interconnected to prevent an external gate from being opened first.
- The only exception to center unloading is when a properly designed and installed side draw system is utilized. However, as bins tend to go out of round when employing side draws, the bin must be completely emptied before refilling.
- When unloading a bin with a mobile auger through a properly designed auger chute, the entry end of the auger should be pushed into the center of the bin before the auger is engaged. Slower rates of flow are preferable and should not exceed the capacity of an 8" auger.
- Ensure that the inner door panels of grain bin doors are completely closed and latched before filling the grain bin.
- Never enter a loaded grain bin for any reason. Grain can be a killer.

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# 3.10. Important Notes

- AGI does not provide a foundation design for this product, and is not liable for any damages or injuries
  related to inadequately designed or constructed foundations. Customers must contract professional services
  for all foundation design and construction work.
- In order to maintain your wall sheets in good condition separate sheets and allow air circulation between them. Store sheets in a dry place. Do not store sheets with sheet ends pointing upwards.
- To keep an even pressure on walls, the bin must always be unloaded from the center.
- Contact local power officials for minimum power line clearance.
- See Section 3.7 Critical Assembly Requirements on page 17 for mandatory siting and assembly requirements.
- Store only non-corrosive, free-flowing materials up to 55 lbs/ft³ (880 kg/m³) average compacted density in AGI .
- Tighten all bolts to the recommended torque settings.
- Do not locate grain bins close to high buildings, which might cause snow to fall onto or build up on the roof
  of the grain bin. Consider future expansion and allow space for loading and unloading of the bin. Your dealer
  and local government agricultural consultants can help you plan your storage system for maximum
  efficiency.

# 4. Preparation

# 4.1. Check the Shipment

Unload the parts at the assembly site and compare the packing slip to the shipment. Ensure that all items have arrived and that none are damaged.

Report damaged parts or shortages immediately to your dealer. Your dealer will order replacement parts immediately to ensure that assembly will not be held up by missing parts. All parts will be charged for and credit will be issued by party at fault. No credit will be issued if freight bills are signed as received in good condition.

# 4.2. List of Tools and Equipment

Use quality tools and equipment. Use them safely, and correctly, for their intended use. Tools for this application should include:

### **Tools**

- Electric or pneumatic (air) impact tools
- Power drill and drill bits
- Sockets (multiple 9/16" and 1/2" sockets recommended)
- Large-pocket carpenter pouch
- 8" (20 cm) metal punches (for aligning bolt holes)
- Step and extension ladders, construction grade
- 6-point wrenches (Imperial, box end)
- Metal-cutting saw suitable for cutting roof rings and wind rings
- Scaffolding
- Centre-post bin stand
- Crane and/or bin jacks

### Minimum Recommended Safety Equipment

- · A properly-stocked first-aid kit
- Eye, foot, head, and hand protection (safety glasses, steel-toed boots, hard hat, work gloves)
- Cable, chain, or rope to tie-off bin or jacks in case of wind
- Body harness and lifeline (for use where falling hazard exists)
- Ground fault interrupt protected electrical hook-ups

# 4.3. Order Optional Equipment

Optional equipment such as unloading augers, aeration equipment, anchor bolts, foundation sealant, external ladders, safety cage and platforms, etc., should all be on site and checked before assembly starts. Plan your installation in advance. For details, see assembly instruction supplied with optional equipment.

# 4.4. Pre-Plan Assembly

### Before assembling:

- 1. Read and understand this manual.
- 2. Develop an assembly plan, with consideration given to the layout of accessories and auxiliary equipment.
- 3. Predetermine the locations for access doors, anchor bolts, ladders, manways, side draws, roof steps, roof vents, fans, and other auxiliary equipment.
- 4. Plan your construction in accordance with your assembly and layout plan.

### **Important**

Installation of accessories or equipment on grain systems equipment/structures that overstresses the bin in any manner will void the warranties.

In cases where additional loading is involved, if you do not already have specific recommendations from AGI, contact AGI engineering department in Grand Island, NE (USA) before installation begins.

Do not install 15' – 36' Commercial Hopper Tank Series controls or the like near anything having a strong electromagnetic field such as large power transmission lines or transformers.

## 4.4.1 Pre-Planning: Side Draw Discharge, Aeration, and Unload Equipment

Side draw discharge pre-planning: Make certain side draw discharge does not fall on a vertical sidewall seam.

Figure 2. Never Position a Side Draw Opening at a Sidewall Seam

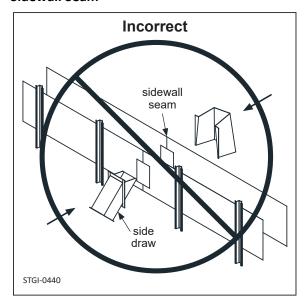
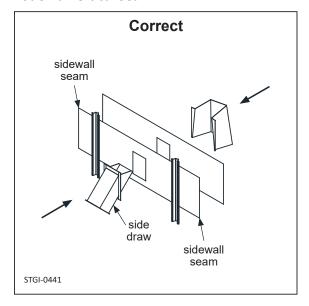
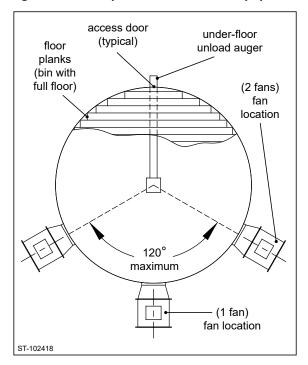


Figure 3. Position Midway Between Stiffeners and Not on a Vertical Seam



The following Figure 4 is one suggested guide for locating aeration fans and floor unload equipment.

Figure 4. Example Fan and Unload Equipment Layout



# 5. Assembly

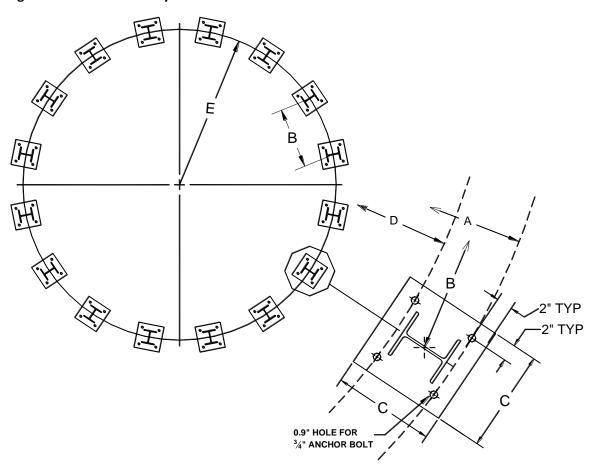
# 5.1. Assembly Safety

- Always use the proper tools, rated lifting equipment, and lifting points for the job.
  - Do not stand on, under, or near any component that is not secured.
  - Carry out assembly in a large open area with a level surface.
  - Always have two or more people assembling the grain bin.
  - Make sure you have sufficient lighting for the work area.
  - Tighten all fasteners according to their specifications. Do not replace or substitute bolts, nuts, or other hardware that is of lesser quality than the hardware supplied by the
  - · Stay away from overhead power lines and other obstructions during assembly. Contact with power lines can cause electrocution.
  - Do not work in high winds.
  - The equipment shall be installed in accordance with applicable local codes and regulations.

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# 5.2. Anchor Bolt Layout

Figure 5. Anchor Bolt Layout



Tank Size	No. of Legs	Dimensions(inches)				No. of Anchor	Anchor Bolt Size	Non-factor	ed Leg Load	s (kips/leg)	
	1093	A (Radius)	В	С	D (Radius)	E (Radius)	Bolts	(inches)	Vertical	Shear	Uplift
15	10	96.83	57.32	12	88.84	92.75	40	3/4	52	1.9	14.2
18	12	114.82	57.30	12	106.83	110.75	48	3/4	63	1.9	12.1
21	14	132.71	57.23	12	124.72	128.65	56	3/4	74	1.9	10.6
24	16	150.56	57.16	12	142.55	146.50	64	3/4	92	2.1	10.6
27	18	168.65	57.16	12	160.65	164.60	72	3/4	103	2.0	8.7
30	20	186.69	57.15	12	178.69	182.65	80	3/4	116	2.1	7.8
33	22	207.56	57.64	14	197.56	202.50	88	3/4	128	2.0	6.3
36	24	225.46	57.53	14	215.46	220.40	96	3/4	141	2.1	5.7

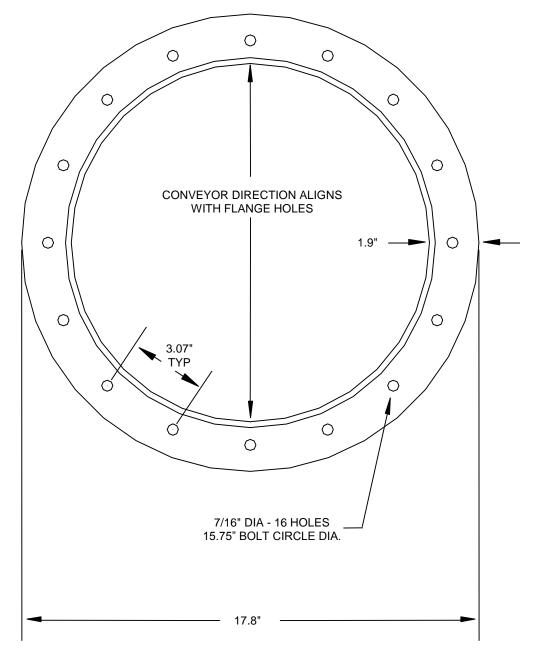
Legs loads are based on the following:

- 1. Non-corrosive, free-flowing materials up to 55 lbs/ft3 (880 kg/m3) bulk density
- 2. Maximum horizontal wind speed of 94 mph (151 km/h) = 24 lb/ft2 (1.15 kPa) wind pressure
- 3. Maximum roof snow load of 24 lb/ft2 (1.15 kPa)
- 4. Maximum roof cap load of 4,000 lbs (17.8 kN) for 15'-24' bins and 5,000 lbs (22.2 kN) for 27'-36' binsevenly distributed on peak ring
- 5. 15'-21' leg loads are for 13 tier tanks; 24'-36' leg loads are for 14 tier tanks

# 5.3. Bottom Flange Detail

14" diameter discharge cone

Figure 6. Detail of Bottom Flange of Discharge Cone



The 14" diameter discharge cone comes standard with all Wide-Corr® Commercial Hopper Tank Series bins. Other options are available at time of order, please contact AGI in more information is needed.

# 5.4. Hopper Assembly

### **Assembly Instructions**

- 1. Install the support columns, compression rings and tie rods.
- 2. Caulk the compression ring seams to prevent moisture penetration.

### **Important**

Ensure that the complete support structure is circular before installing the hopper sheets. Sealing strip outside diameter should be as noted in Detail A or B. Measure the diameter at several locations.

3. Before lowering the bin onto the completed hopper structure, loosely attach the base assembly to the bottom upright.

Bolts in the vertical seam of the bottom wall sheets may have to be loosened or removed to facilitate connection to the compression ring.

Refer to the following pages for additional instructions, detail views and parts lists for various sizes of hoppers:

- Assembling 15' and 18' Hoppers on page 28
- Assembling 21' and 24' Hoppers on page 29
- Assembling 27' and 30' Hoppers on page 30
- Assembling 33' and 36' Hoppers on page 31

### Assembling 15' and 18' Hoppers

### Note

Ensure all bolts installed into hopper sheets are oriented so that the bolt head is on the inside of the hopper.

Figure 7. 15' and 18' Hoppers

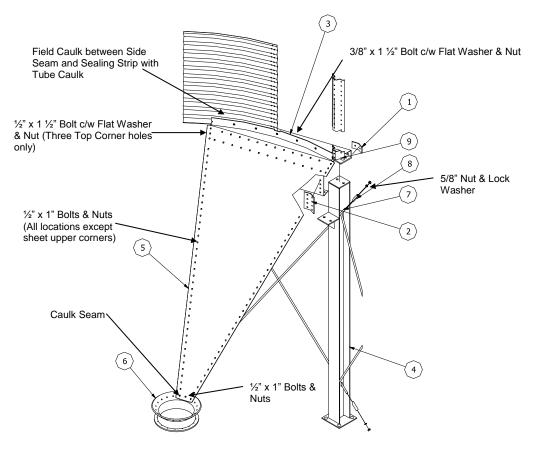


Table 2. 15' and 18' Hoppers Parts List

Item	Description	Series 15	Series 18
1	Splice Angle 3" x 6"	195290	195292
2	Splice Angle 6" x 8"	195291	195293
3	Compression Ring Assembly	195280	195282
4	Support Column Assembly	195300	195302
5	Hopper Sheet	197040	197041
6	Discharge Cone 14'	197046	197047
7	Tie Rod (15' = 112", 18' = 128")	195326	195328
8	Bevelled Tie Rod End	195313	195313
9	Upright Base Assembly	232777	232777

### Assembling 21' and 24' Hoppers

### Note

Ensure all bolts installed into hopper sheets are oriented so that the bolt head is on the inside of the hopper.

Figure 8. 21' and 24' Hoppers

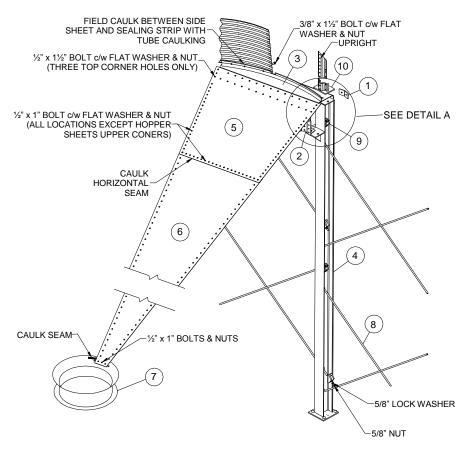


Table 3. 21' and 24' Hoppers Parts List

Item	Description	Series 21	Series 24
1	Splice Angle 3" x 6"	195294	195296
2	Splice Angle 6" x 8"	195295	195297
3	Compression Ring Assembly	195284	195286
4	Support Column Assembly	195304	195306
5	Upper Hopper Sheet	197042	197044
6	Lower Hopper Sheet	197043	197045
7	Discharge Cone 14'	197049	197052
8	Tie Rod (21' = 152", 24' = 89")	195312	195314
9	Bevelled Tie Rod End	195313	195315
10	Upright Base Assembly	232777	232777

### Assembling 27' and 30' Hoppers

### Note

Ensure all bolts installed into hopper sheets are oriented so that the bolt head is on the inside of the hopper.

### Note

Column assemblies are not symmetrical - locate the top plate so that 3" dimension faces toward inside (see Detail B).

Figure 9. 27' and 30' Hoppers

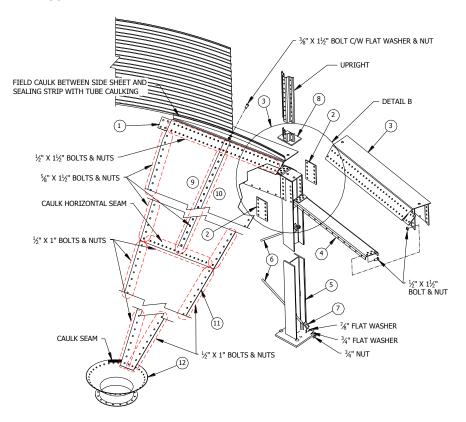


Table 4. 27' and 30' Hoppers Parts List

Item	Description	Series 27	Series 30	Figure 10. Model 3014 ONLY
1	Splice Angle 5" x 10"	195378	195358	Figure 10. Model 3014 ONLY Installation of lower compression
2	Splice Angle 6" x 10"	195346	195346	ring channel
3	Compression Ring Assembly	195360	195338	5/8" X 1-1/2" BOLT
4	Upper Channel	195365	195345	
5	Support Column Assembly	195370	195348	
6	Tie Rod 79"	195349	195349	6
7	Tie Rod Casting	193807	193807	
8	Upright Base Assembly	232777	232777	3/4" NUT
9/10	Upper Hopper Sheet L & R	195375/6	195355/6	
11	Lower Hopper Sheet	195377	195357	TIE ROD CASTING / L3/4" FLAT WASHER
12	Discharge Cone 14"	197056	197060	7/0 TEAT WASHER

### Assembling 33' and 36' Hoppers

### Note

Ensure all bolts installed into hopper sheets are oriented so that the bolt head is on the inside of the hopper.

### Note

Column assemblies are not symmetrical - locate the top plate so that 3" dimension faces toward inside (see Detail B).

Figure 11. 33' and 36' Hoppers

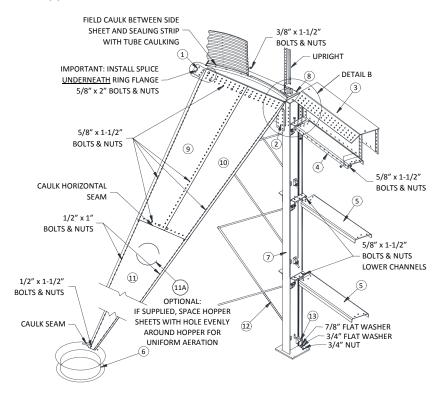
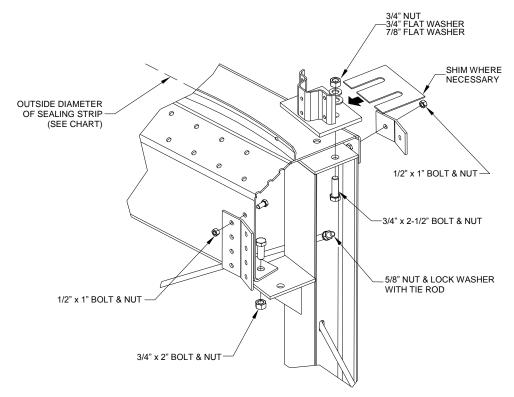


Table 5. 33' and 36' Hoppers Parts List

Item	Description	Series 33	Series 36
1	Splice Angle 6" x 15"	197015	197015
2	Splice Angle 6" x 15"	197014	197014
3	Compression Ring Assembly	197032	197007
4	Upper Channel	197012	197012
5	Lower Channel	197013	197013
6	Discharge Cone 14"	197025	197020
7	Support Column Assembly	197030	197001
8	Upright Base Assembly	232777	232777
9/10	Upper Hopper Sheet L & R	197035/6	197017/8
11	Lower Hopper Sheet	197037	197019
11A	Aeration Hopper Sheet c/w Hole	197037AER	197019AER
12	Tie Rod 79"	195349	195349
13	Tie Rod Casting	193807	193807

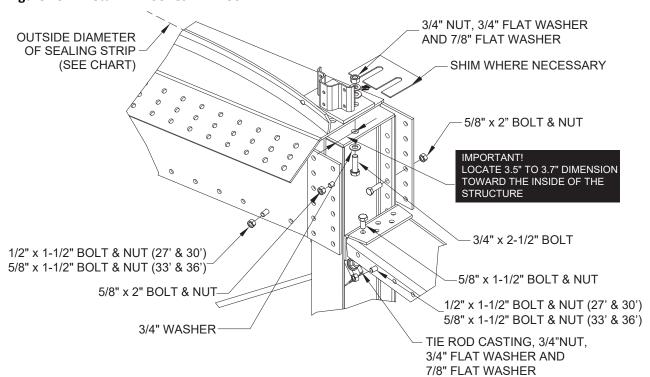
# 5.5. Compression Ring and Support Assembly Details

Figure 12. Detail A — Series 15 — 24



Bin Series	O/S Dia. of Sealing Strip (in)
15'	178.5 ± 1.0
18'	214.3 ± 1.0
21'	250.1 ± 1.0
24'	285.1 ± 1.0

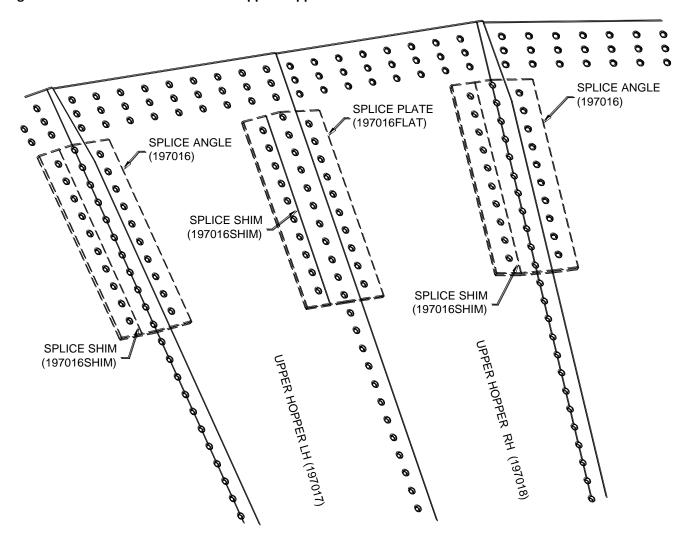
Figure 13. Detail B − Series 27 − 36



Bin	O/S Dia. of Sealing
Series	Strip (in)
27'	321.7 ± 1.0
30'	357.5 ± 1.0
33'	393.0 ± 1.0
36'	429.1 ± 1.0

# 5.6. Connection Detail for 36' Upper Hopper Sheets

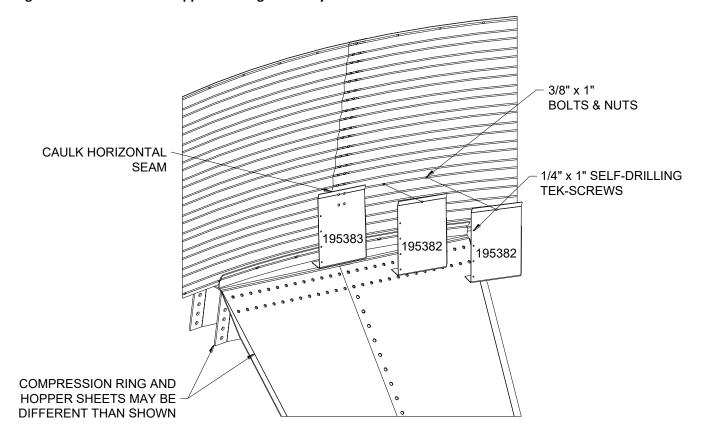
Figure 14. Connection Detail for 36' Upper Hopper Sheets



- Shims are used between splice and hopper sheet (one side only) to all for thickness of overlapping hopper sheet
- Splices and shims are installed **under** the hopper sheets
- Each 36' hopper uses:
  - 24 splice angles
  - 24 splice plates
  - 48 shims

# 5.7. Commercial Hopper Flashing Instructions

Figure 15. Commercial Hopper Flashing Assembly



1. After the bin wall is bolted to the hopper compression ring, install the hopper flashing (195382 & 195383) to the bottom wall sheet as shown in Figure 15 on page 35.

For each wall sheet, 12 pieces of flashing are required. 11 pcs (195382) have 1 hole at the top and 1 pce (195383) has 4holes at the top. 195383 is used at the vertical wall seam.

- 2. Install 3/8" x 1' bolts in the horizontal row of holes, 12-3/4" from the bottom of the wall sheet.
- 3. Caulk the horizontal seam on the flashing panel to ensure the seal.
- 4. Place the next panel, working in a clockwise pattern. Fasten using 1/4" x 1" self drilling TEK screws.
- 5. Caulk the vertical seams, if required.

# 5.8. External Sign Sheet Installation (For Stiffened Bin)

### **Example Sign Sheet**

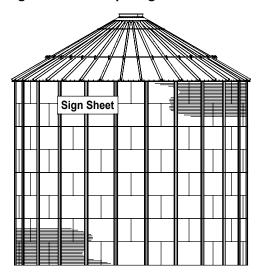


### **Selecting the Sign Sheet Location**

### Note

Choose a location to install the sign sheet somewhere in the top three rings.

Figure 16. Example Sign Sheet Location



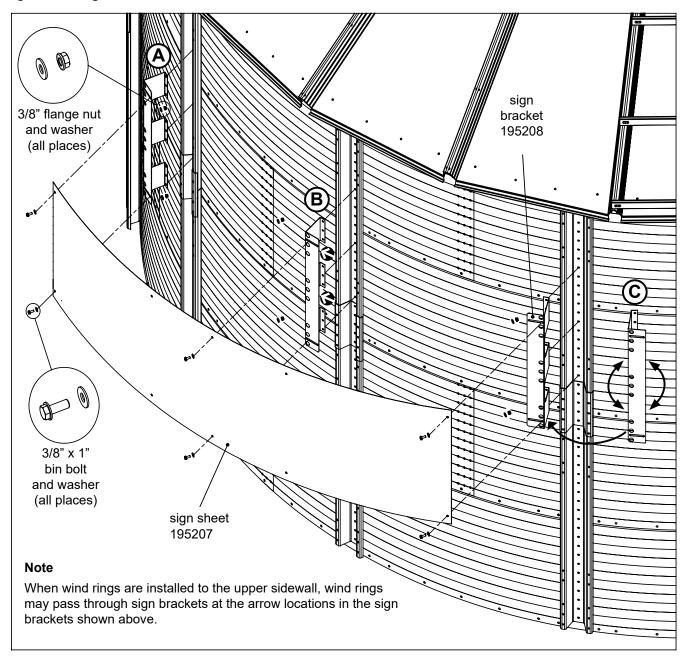
### Note

It may not be possible to locate the sign sheet on this bin in the exact location shown in Figure 16. Possible sign sheet locations will vary based on available sign bracket mounting hole locations.

### **Installing the Sign Sheet**

- 1. Install the sign brackets to the stiffeners.
- 2. Make certain to use the correct intermediate stiffener bolt pattern no matter which location is selected for sign brackets installation.
  - Each bracket is exactly the same. Brackets A and B flanges face right.
- 3. Install bracket C with the flanges facing either right or left depending on which orientation enables connection to the sign sheet.
- 4. Use the supplied stiffener bolts, nuts, and flat washers to make the connection.
- 5. Install the sign sheet to the sign brackets slotted holes.
- 6. Use the 3/8" x 1" bin bolts, 3/8" flat washers, and 3/8" flange nuts supplied with the sign sheet.
- 7. Install flat washers on the both the bolt and nut sides. Tighten all bolts.

Figure 17. Sign Sheet Installation



### 5.9. Bin Entry Anchor System: Non-Structured Roof

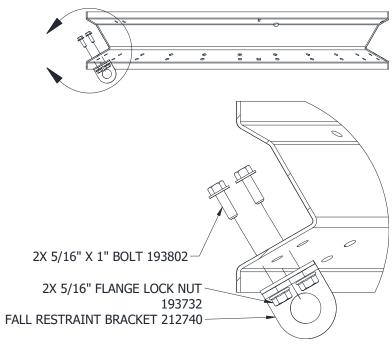
#### **Important**

The fall restraint bracket is rated for a maximum load of 2,000 lbs. The bin owner and user are responsible for correctly installing, using, and operating the Bin Entry Anchor System. The rope, pulley, and harness are not supplied by AGI.

MARNING Failure to install correctly as instructed below may result in serious injury or death.

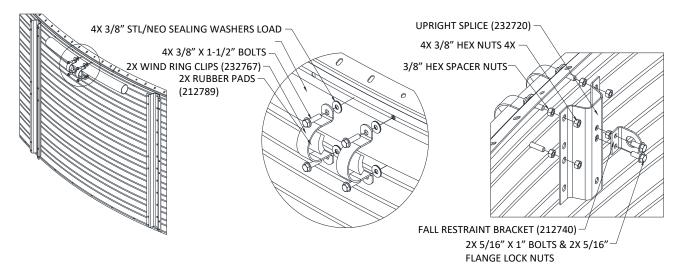
1. Install fall restraint bracket under peak ring as shown. Make sure to bolt the fall restraint bracket to the roof sheet with the inspection hatch cut out. (See Figure 18 on page 38.)

Figure 18. Installing the fall restraint bracket



- 2. Bolt the second fall restraint bracket to the upright splice. Then bolt the upright splice along the top wall sheet horizontal seam with the wind ring clips, sandwiching the load spreader tube and rubber pads as shown. (See Figure 19 on page 39.)
  - a. Field drill holes as needed on the wall sheet and top angle for the wind ring clip connections. Washers must be sandwiched between the wind ring clips and the wall sheet for sealing. (See Figure 19 on page 39.)
  - b. The load spreader tube and upright splice can be installed off center on the wallsheet (between the uprights on stiffened bins), for better reachability from the inspection hatch. Do not install the load spreader tube over a vertical wall sheet seam. (See Figure 19 on page 39.)

Figure 19. Installing the load spreader tube



3. Place the Fall Restraint Anchor Point Decals (PN 8110-01090) on the bin, see Section 2.9 – Decal Installation/Replacement on page 10 and Section 2.10 – Safety Decal Locations and Details on page 11 for installation instructions and placement.

#### 5.10. Wall Sheets

#### Note

Proper bolt tightening sequence must be followed at all times.

- 1. Loosely assemble the top tier overlapping sheets.
- 2. Be sure to wipe all areas of the sidewall sheets to remove excess oil in order to ensure that the caulking will adhere properly.
- 3. Always install the caulking strip on the weather side of every vertical seam to avoid moisture penetration. (See Section 5.16 Wall Sheet Caulking Detail on page 46.)
- 4. Bolt all horizontal and vertical seams using 3/8" bolts.

#### Note

The bolt heads go on the outside of the bin on the roof and sidewall sheets, but on the inside of the bin for stiffeners and at outside sidewall ladder connections.

- 5. DO NOT tighten any bolts until the roof is completely assembled and the peak ring is level.
- 6. Lift the bin and assemble the second tier, overlapping the sheets.
- 7. The horizontal bolts between the first and second tier may now be tightened. Start from the center of a sheet and work towards a vertical seam.
- 8. After these bolts are tightened, the vertical seams on the first tier may now be tightened, working from the center outwards.
- 9. Assemble the third tier:
  - a. Tighten the horizontal bolts between the second and third tier.
  - b. Work from the center of a sheet toward the vertical seams.
- 10. The vertical seam bolts on the second tier may now be tightened working from the center of the sheet outward.
- 11. Install stiffeners and sidewall ladders as you proceed with the assembly of the bin

The bolting sequence mentioned above is extremely important. Failure to tighten the bolts in this manner may cause a bubbling effect on the horizontal seams. These areas, if severe enough, may cause grain leakage.

## 5.11. Centurion Wall Sheet Part Number Matrix

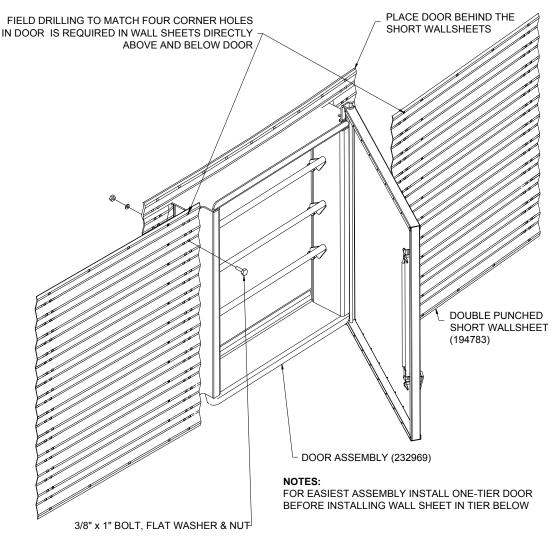
Table 6. Wall Sheet Part Number Table

		Corrugated	Wall Sheets			Punched Wa	II Sheets
Thickness nom (min)	Gauge	Label Colour	Weight lbs	Length (overall)	Flat	Regular	Bottom
					194654	194660 Stencil	
.040 (.036)	20	Yellow	58.3		194657	194663 Stencil	
					194679	194730	
					194655	194661 Stencil	
.050 (.045)	18	Orange	72.8		194658	194664 Stencil	
					194680	194731	194771
.057 (.052)	17	Red	83.0	116.5"	194681	194732	194772
.066 (.061)	15	Pink	97.7		194682	194733	194773
					194656	194662	
.076 (.070) 14	14	Lime	112.2		194659	194665	
				194683	194734	194774	
.096 (.088)	13	Green	141.1		194684	194735	194775
.116 (.107)	12	Blue	171.4		194685	194736	194776
.126 (.117)	11	Purple	189.0	447.0"	194606	194737	194777
.139 (.130)	10	Black	209.4	117.0"	194607	194738	194778
		S	hort Sheets Insta	alled Beside the Door			
.057 (.052)	17	Red	66.3	93.0"		194780	
.037 (.032)	17	Red	26.2	36.8"			194783
.076 (.070)	14	Lime	89.6	93.0"		194781	
.096 (.088)	13	Green	44.6	36.8"			194784
116 ( 107)	10	Dlue	136.8	93.0"		194782	
.116 (.107)	.107) 12	Blue	54.1	36.8"			194785

Bottom wall sheets are punched for full floor aeration flashing. Use bin bolts provided to plug unused holes if a full floor aeration system is not being used.

# 5.12. One-Tier Light Duty Door (15' - 27') Installation

Figure 20. One-Tier Light Duty Door (15' - 27') Detail

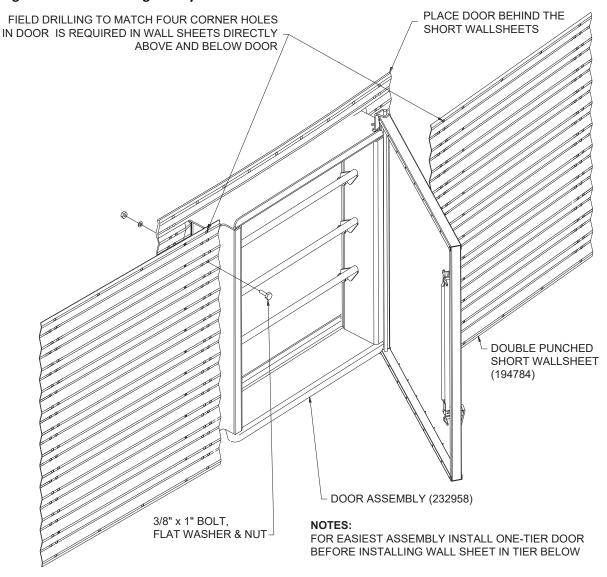


#### **Important**

The inner door board must be closed and latches completely engaged before filling. Failure and collapse of the bin could result if the bin is filled without properly closing the inner door board.

## 5.13. One-Tier Light Duty Door Installation

Figure 21. One-Tier Light Duty Door Detail

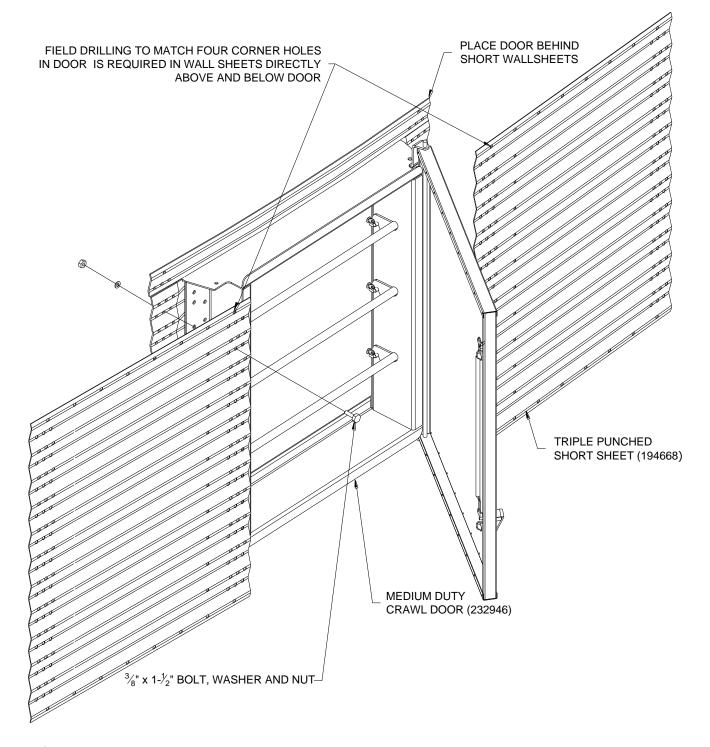


#### **Important**

Inner door board must be closed and latches completely engaged before filling. Failure and collapse of the bin could result if bin is filled without properly closing inner door board.

## 5.14. One-Tier Medium Duty Door Installation

Figure 22. One-Tier Medium Duty Door Detail



#### **Important**

The inner door board must be closed and latches completely engaged before filling. Failure and collapse of the bin could result if the bin is filled without properly closing the inner door board.

### 5.15. Door Cover Sidewall Latch Installation

Install the door cover sidewall latch (236783) on the swing side of the door cover.

- When possible, re-use the bin bolt on the horizontal wall sheet seam that lines up with the door cover.
- If existing bin bolt cannot be used, drill a 7/16" hole on top of a wall sheet corrugation approximately halfway up the door cover and install latch with a 3/8" bin bolt and nut. Use the door cover swing to help position the field drill hole.

#### **Important**

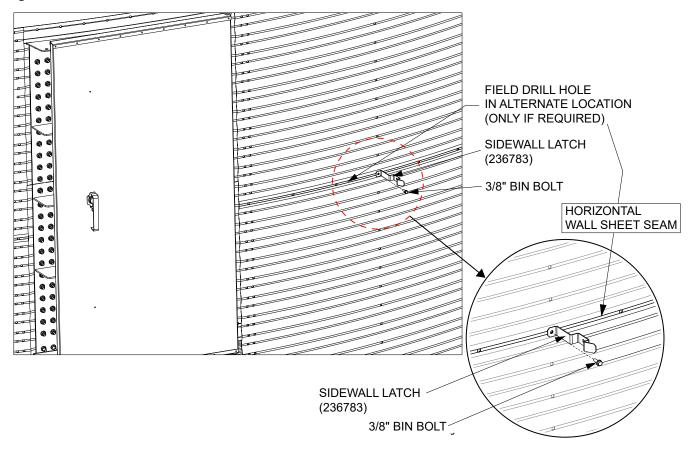
The door cover should snap shut and sit within the channel on the latch once installation is complete.

Figure 23. Door Sidewall Latch (236783)

(Supplied with the door frame and not included in the parts box.)



Figure 24. Install the Sidewall Latch



# 5.16. Wall Sheet Caulking Detail

Figure 25. Wall Sheet Caulking Detail (inside view) — Imperial

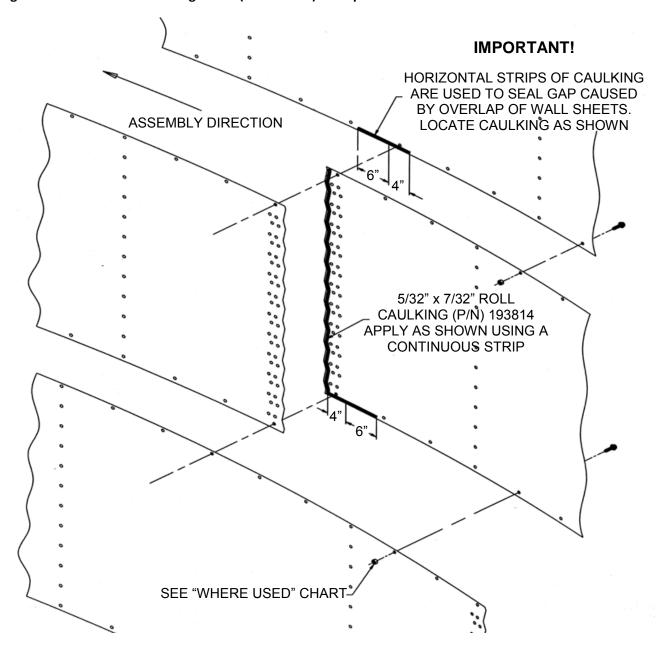
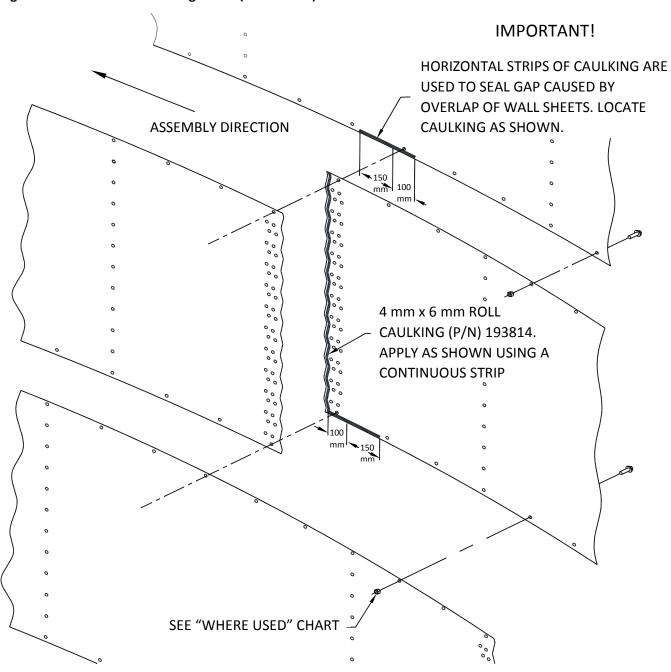


Figure 26. Wall Sheet Caulking Detail (inside view) — Metric



### 5.17. Commercial Bin Upright Assembly

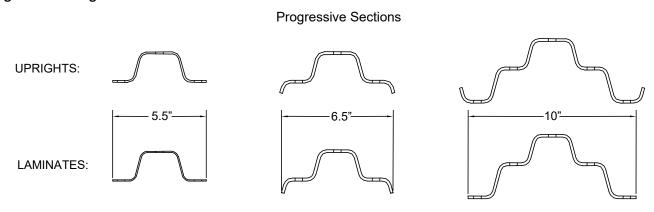
This section provides information needed to assemble uprights for commercial bins.

#### Introduction

The AGI Commercial upright system consists of uprights and laminates. Single uprights, joined by splice plates, are used at the top of bins. Laminate sections are introduced when vertical load requirements dictate. Once introduced the laminates continue to be utilized for the balance of the assembly.

A unique feature of the AGI upright system is the progressive section. Not only do the uprights and laminates increase in gauge from the top to the bottom of the bin, they also increase in section.

Figure 27. Progressive Sections



#### NOT ALL SECTIONS ARE USED ON ALL BINS

Both upright and laminate sections measure 88" long. In the center of each there are vertical holes spaced at 4" centers. This permits use on externally stiffened bins. There are two locations on each wall sheet for attachment of the uprights. The wall sheet holes that mate with the uprights are spaced at 4" centers. All center upright holes must be filled with bolts.

#### **Upright/Laminate Identification**

In order to properly erect the bin it is necessary to distinguish uprights from laminates, it is necessary to determine the gauge of the part, and it is necessary to determine the width of the section. The various combinations are provided in the upright/ laminate table. It is also necessary to determine the orientation of the parts as there is a distinct top and bottom. All the information that is required for assembly is contained on the label.

The label, is the easiest means of identification. It contains all of the necessary information. For assembly purposes, the label is placed on the bottom of both uprights and laminates.

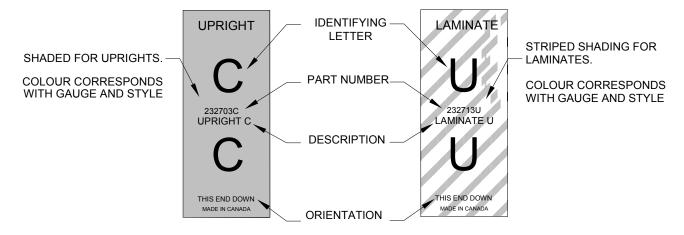
Upright labels have solid colours and laminate labels are striped. For both uprights and laminates, the colour corresponds with gauge and style.

Each upright and laminate has a unique identifying letter. This is prominently displayed on the label, and corresponds with the respective assembly charts provided (see Figure 28).

#### Tip

For error free installation, make sure that the identifying letter on the label coincides with the wall sheet/upright layout for the bin being assembled, and that the labels on both uprights and laminates remain on the bottom. There is a definite top and bottom orientation for uprights and laminates. It is imperative that they are oriented correctly.

Figure 28. Upright and Laminate Labels



#### **Short Upright**

There is one short upright measuring 44" long for use in odd tier bins. The alpha character for this part is "S". There is no corresponding laminate as it is used at the top of the bin before the laminates are introduced. The short upright always goes in the top tier.

#### Tip

The short "S" upright is located in the top tier of odd-tiered bins.

#### **Upright/Laminate Assembly**

Use the wall sheet/upright layout provided for the bin in question, to determine the proper order of the various upright and laminate components. The identifying letter on the label is the easiest means of identification. In addition to the identifying letter, every upright and laminate is also identified by gauge and width. If for some reason the label is missing from a part, the following table contains information that will aid in the identification of the various parts.

#### Tip

In all cases laminates nest inside uprights. The uprights are placed against the bin wall sheets and the laminates are away from the wall sheets.

It is important to get the first uprights started correctly. The top hole in the top upright bolts into the top horizontal wall sheet seam (see Figure 29).

#### Tip

For proper upright orientation align the bottom of the first upright with the bottom edge of a wall sheet.

Figure 29. Upright Orientation Detail

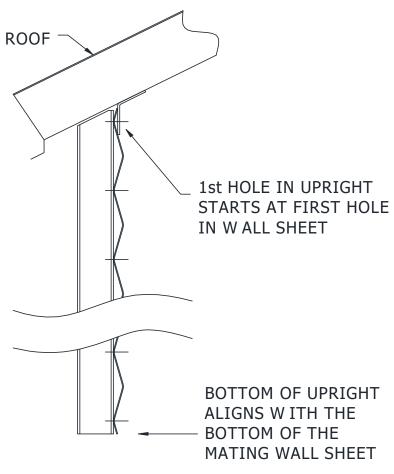


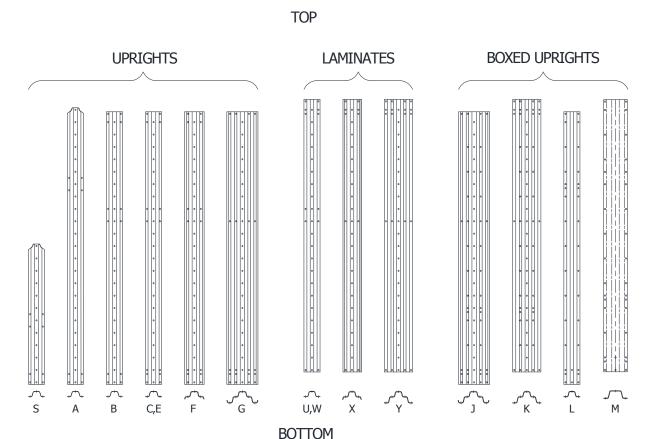
Table 7. Upright/Laminate Identification Table

	Identifying Letter	Part Number	Description	Gauge	Label Colour	Width of Section (in)
	S	232700S	Upright S .076" Short	14	Light green	5.5"
	Α	232701A	Upright A .076" x 5.5"	14	Yellow	5.5"
	В	232702B	Upright B .076" x 5.5"	14	Light green	5.5"
Uprights	С	232703C	Upright C .116" x 5.5"	12	Blue	5.5"
	E	232705E	Upright E .168" x 5.5"	8	Brown	5.5"
	F	232706F	Upright F .168" x 6.5"	8	Silver	6.5"
	G	232707G	Upright G .168" x 10"	8	Gold	10"
	U	232713U	Laminate U .116" x 5.5"	12	Blue striped	5.5"
	W	232715W	Laminate W .168" x 5.5"	8	Brown striped	5.5"
Laminates	Х	232716X	Laminate X .168" x 6.5"	8	Silver Striped	6.5"
	Υ	232717Y	Laminate Y .168" x 10"	8	Gold striped	10"
	J	232709J	Upright Boxed J .168" x 10"	8	Red	10"
Boxed	K	232710K	Laminate Boxed K .168" x 10"	8	Red Striped	10"
	L	232711L	Laminate Boxed L .168" x 5.5"	8	Red Striped	5.5"

#### Note

Not all sections are used on all bins.

Figure 30. Upright and Laminate Components



#### **Catwalk Support Uprights**

The upright/laminate requirements under catwalk support locations are likely different from the normal upright/laminate order. Consult your AGI representative for specifications.

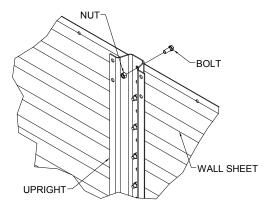
#### **Bolt/Nut Orientation**

To allow for a good seal install the bolts from the inside of the bin as shown for externally stiffened bins.

#### **Upright/Splice Pre-Assemblies**

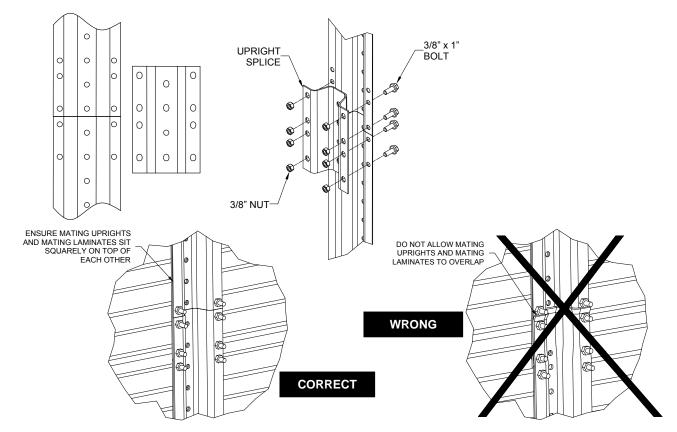
At the top of a bin, laminates are not utilized and a splice is required to make the connection between mating uprights. The splice nests inside the upright similar to a laminate. When pre-assembling uprights to splices, insure that the splice goes on the top end of the upright, such that the label on the bottom of the upright remains visible. Keeping the label visible will help prevent subsequent errors. This practice will also prevent ground interference when adjusting jack locations.

Figure 31. Upright / Wall Sheet Bolt and Nut Orientation



**Tip**It may be advantageous to conduct pre-assemblies during the installation process. This can be a real time saver.

Figure 32. Pre-Assembling Uprights/Splices



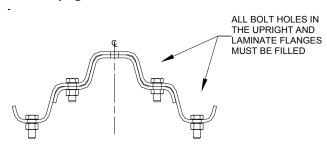
#### **Upright and Laminate Assembly**

Uprights and laminates are designed to transfer vertical loads through an end to end, butt connection. Ensure that mating uprights sit squarely on top of each other and do not overlap. Ensure that mating laminates sit squarely on top of each other and do not overlap. Secure the joints with the nuts and bolts provided. Failure to do so can result in structural failure.

#### **Upright/Laminate Pre-assemblies**

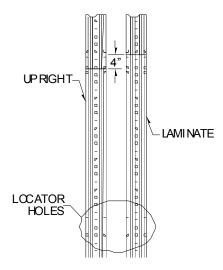
Laminates nest inside of uprights and are offset 4" above the uprights.

Figure 33. Nesting Laminates and Uprights



For proper orientation, ensure that the labels on the upright and laminate are both towards the bottom and that the locator holes in the middle portion of the upright and laminate line up. Bolts can be placed in these locator holes to create a pre-assembly. All locator holes, located in the middle of the upright and laminate flanges, need to be filled with bolts. These include holes in flanges that may only have one thickness of material.

Figure 34. Upright/Laminate Orientation



When properly assembled, both the upright label and the laminate label will remain visible during the preassembly phase. Once assembled on the bin the upright label will be covered.

In the assembly layouts, the combination of an upright and a laminate is called an assembly. For example, the combination of a "C" upright and a "U" laminate would be called a "CU Assembly". Both the "C" on the upright label and the "U" on the laminate label, would remain visible, and would therefore remain distinguishable from other pre-assemblies.

#### Tip

When creating pre-assemblies, ensure that the labels on both the upright and the laminate are on the same end, and that the locator holes align with each other in the middle of the parts. Once pre-assembled, both labels should remain visible.

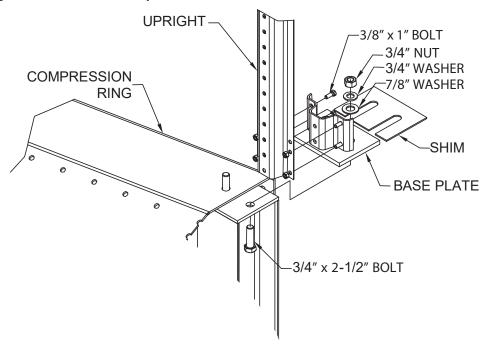
#### Note

Once completely assembled onto the bin, all visible holes in the upright and laminate flanges must be filled. All mating wall sheet/upright holes must be filled.

### 5.17.1 Base Assembly

Using 3/4" x 2-1/2" bolts attach the base plate to the compression ring. A 7/8" washer, 3/4" washer and 3/4" nut secure the base plate to the compression ring. At the bottom of an assembled bin that has laminates, there will be a 4" gap between the bottom laminate and the base plate. It is imperative that this area is filled with the 4" laminate section that protrudes from the base plate. In many cases this part can also be added to the bottom upright/laminate assembly during pre-assembly.

Figure 35. Base Assembly



#### Tip

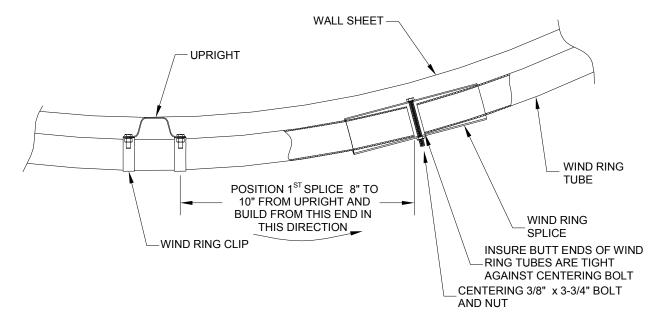
Depending on the assembly procedure, it may be convenient to bolt on the base plates to the compression ring.

### 5.18. Wind Ring Assembly

Wind rings fulfill their function when the bin is empty or partially filled. In high winds, the wind rings provide extra stiffness and help keep the bin round. Not all bins require wind rings. Bin diameter and height determine the location and the quantity of wind rings required.

Wind ring locations are identified by an O placed beside the relevant uprights within the wall sheet and upright layouts for the bin in question. At these locations wind ring tubes are secured to the upright flanges with a series of clips that bolt into the upright locator holes that are located in the flanges of the 5.5" wide upright and upright/laminate combinations. Adjacent tubes are aligned and secured to each other with wind ring splices. A 3/8" x 3-3/4" bolt through the splice keeps it centered on the connection.

Figure 36. Wind Ring Assembly

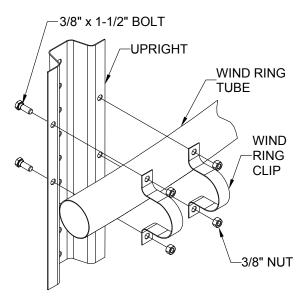


#### **Externally Stiffened Bins**

Once the uprights have been secured to the bin walls, position the first wind ring tube and secure it to the upright using the wind ring clips provided. Two clips are required per upright, one on each flange. Position the wind ring such that a wind ring splice (with bolt inserted) can be slipped onto the end of the tube without interfering with the upright or the wind ring clips. The splice should be orientated such that the bolt is horizontal.

Insert the end of the next wind ring tube into the open end of the wind ring splice. Insure that the ends of both tubes are tight against the centering bolt. Secure the wind ring tube to the uprights with the wind ring clips. Continue around the bin.

Figure 37. Wind Ring Mounting Detail (externally stiffened bins)



All wind ring splice connections should be made in the space between uprights, and should not encroach into the area where the wind ring clips are securing the wind ring tube to the uprights. To avoid interference with uprights and the need to make multiple cuts, position an end of the first tube relatively close to an upright, such that the space between the end of the tube and the next upright is maximized, and build from that end. Insure that both ends of the tube are far enough away from the closest uprights to avoid interference with the splice. When progressing around the bin, this space between the end of the tube and the next uprights may shrink with each additional tube that is installed. On large diameter bins, if this space shrinks to the point where the wind ring splice interferes with the upright, then the tube will need to be cut. Make the cut such that the space that is created between the end of the tube and the next upright is similar to the identical space on the first tube that was installed. In this manner, there will not be a shortage of tube.

#### Note

Assembly Tip: When putting the first wind ring tube in place, locate one end close to an upright with a 8" to 10" overhang, and continue building from that end. This will reduce the need for multiple cuts.

The final wind ring tube in a circle will need to be cut to length. Secure one end of the last tube in the previously installed wind ring splice as described above. Hold the tube in place and mark the cut-line relative to the previously installed tube at the other end. Insure that allowance is made for the 3/8" diameter bolt. Once the tube has been cut, install one end of the tube as described above. On the other end slide the wind ring splice completely onto the free end. Position this end relative to the previously installed tube, and slide the splice onto the second tube until it is centered. Insert the centering bolt. Install all wind ring clips. Tighten all bolts.

#### Note

Assembly Tip: When tightening wind ring clips, always tighten in sequence starting at the spliced end of the tube, which has already been secured, and work towards the free, and as yet unspliced, end.

# 6. Specifications

# **6.1. Wide-Corr® Hopper Tank Specifications**

Figure 38. Wide-Corr® Hopper Tank Specifications Diagram

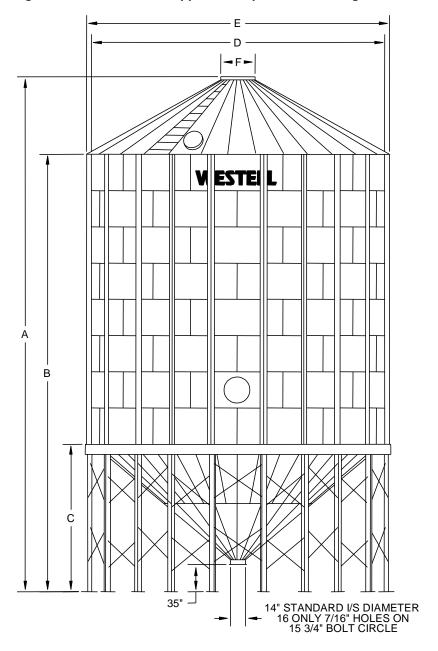


Table 8. Wide-Corr® Hopper Tank Specifications Table

iameter
15' 11" 33" 18' 11" 33"
18' 11" 33"
18' 11" 33"
18' 11" 33"
21' 11" 33"
21' 11" 33"
21' 11" 33"
21' 11" 33"
21' 11" 33"
21' 11" 33"
24' 11" 33"
27' 10" 33"
17 10 33
30' 10" 33"
33' 10" 52"
36' 10" 52"
333

#### **Table 8 Wide-Corr® Hopper Tank Specifications Table (continued)**

Madel		Capacity		Estimated Weight (lbs)		Overall	Eaves	Hopper	Number of	Hopper	Bin	Overall Diameter	Peak
Model	Bushels	m³	tonnes	Total	Tank Only	Height A	height B	Height C	Legs	Angle	Diameter D	E	Opening F
3611H37	40,980	1,379	1,112	59,900	18,900	66' 3"	56' 9"						
3612H37	44,100	1,484	1,197	62,800	21,800	69' 11"	60' 5"						
3613H37	47,210	1,589	1,281	66,200	25,200	73' 7"	64' 1"						
3614H37	50,330	1,693	1,366	69,300	28,300	77' 3"	67' 9"						

Capacities are based on:

- 1. 28° roof cone
- 2. 1 bushel = 1.244 ft3
- 3. 1 m3 = 35.3 ft<sup>3</sup>
- 4. 770 kg/m<sup>3</sup> bulk density
- 5. 6% compaction in hopper and cylinder (bushels and tonnes)

# 7. Appendix

# 7.1. Parts Identification (Bin) - Parts Box



232736 - Shim (4-1/2" x 6") 232737 - Shim (2-3/4" x 6")



236595 – Shim 7.5 x 3.4 for "F" Profile



232836 - Base Plate



232735 - Anchor Bracket



235372 – Bottom Angle Sealing Clip



236583 - SSK Shim (6" x 2")

# 7.2. Hardware Usage

Table 9. Bin Hardware

	3/8" x 1" Flanged Hex Bolt (Washer)	3/8" x 1" Round Head Bolt	3/8" x 1-1/2" Flanged Hex Bolt (Washer)	3/8" x 3-3/4" Hex Bolt	3/8" Flanged Lock Nut	3/8" Hex Nut	3/8" Wingnut	3/8" Flat Washer	3/8" STL/NEO Sealing Washer	7/16" x 1-1/2" Flanged Hex Bolt (Washer)	7/16" x 1-3/4" Flanged Hex Bolt (Washer)	7/16" Hex Nut	1/2" Flat Washer
BOLT	232850 (700) 235941 (325) 235943 (50)	150594	232852 (500) 235946 (100)	235949 (10)	235954 (300) 235955 (50)	232850 (700) 232852 (500) 235950 (300) 235951 (100)	154208	235956 (200) 235957 (75)	235975 (100)	232855 (400)	232856 (300)	232855 (400) 232856 (300)	154981
INSIDE ROOF CONNECTOR UPRIGHT to WALL SHEET to OUTSIDE UPRIGHT (DOUBLE NUT)			•		•	•			•				
WALL SHEETS 194679 to 194685, and 194606 to 194607 (0.040" to 0.139")	•					•		• 🌣					
WALL SHEET 194608 (0.168")			•			•		• 🌣					
UPRIGHT to WALL SHEETS 194679 to 194685 (0.040" to 0.116")	•					•							
UPRIGHT to WALL SHEETS 194606 to 194608, and 194604 to 194618 (0.126" to 0.168", AND 0.096" LAM to 0.139" LAM)			•			•							
WALL SHEETS 194604 to 194605, and 194616 to 194617 (0.096" LAM to 0.139" LAM)										•		•	••
WALL SHEET 194618 (0.168" LAM)											•	•	••
UPRIGHT to WALL SHEET AT HORIZONTAL SEAMS			•			•							
UPRIGHT to LAMINATE to CAP PLATE to WALL SHEET (FOR BINS WITH BOXED UPRIGHTS ONLY)			•			•							
UPRIGHT to UPRIGHT SPLICE	•					•							
UPRIGHT to LAMINATE	•					•							
UPRIGHT to LAMINATE to BOXED UPRIGHT			•			•							
WALL SHEET to UPRIGHT to LAMINATE to CAP PLATE (FOR BINS			•			•							

**Table 9** Bin Hardware (continued)

	3/8" x 1" Flanged Hex Bolt (Washer)	3/8" x 1" Round Head Bolt	3/8" x 1-1/2" Flanged Hex Bolt (Washer)	3/8" x 3-3/4" Hex Bolt	3/8" Flanged Lock Nut	3/8" Hex Nut	3/8" Wingnut	3/8" Flat Washer	3/8" STL/NEO Sealing Washer	7/16" x 1-1/2" Flanged Hex Bolt (Washer)	7/16" x 1-3/4" Flanged Hex Bolt (Washer)	7/16" Hex Nut	1/2" Flat Washer
BOLT	232850 (700) 235941 (325) 235943 (50)	150594	232852 (500) 235946 (100)	235949 (10)	235954 (300) 235955 (50)	232850 (700) 232852 (500) 235950 (300) 235951 (100)	154208	235956 (200) 235957 (75)	235975 (100)	232855 (400)	232856 (300)	232855 (400) 232856 (300)	154981
WITH BOXED UPRIGHTS)													
WIND RING CLIP to UPRIGHT			•			•							
WIND RING SPLICE				•		•							
WALL SHEET to BOTTOM RING ANGLE	•				•	•		•					
DRYING FLOOR FLASHING HOLES in BOTTOM WALL SHEET	•					•							
WALL SHEET to DOOR			•			•		• 🌣					
DOOR TIE-BACK to WALL SHEET	•					•							
AUGER CHUTE HOOD to AUGER DOOR BOARD		•				•							
AUGER CHUTE BLOCK-OFF PLATE to AUGER DOOR BOARD			•			•	•						
BIN WALL to HOPPER ASSEMBLY			•			•		•					

#### Note

☼ — Use washers only at wall sheet to bottom ring angle, non-laminated to laminated wall sheet horizontal seam and wall sheet vertical seams to door (non-laminated sheets only; 3/8" bolts).

♦ — Use washers only at wall sheet to bottom ring angle.

**Table 10.** Hopper Hardware (3/8" – 1/2")

BOLT	3/8" x 1" flanged hex bolt (washer)	3/8" x 1-1/2" flanged hex bolt (washer)	3/8" hex nut	3/8" flat washer	1/2" x 1" flanged hex bolt	1/2" x 1-1/2" flanged hex bolt	1/2" flanged lock nut	1/2" flat washer
	232850 (700) 235941 (325) 235943 (50)	232852 (500)	232850 (700) 232852 (500) 235950 (300) 235951 (100)	235956 (200) 235957 (75)	193781	193782	154201	154981
WALL SHEET to HOPPER COMPRESSION RING ASSEMBLY		•	•	•				
HOPPER COMPRESSION RING ASSEMBLY to UPRIGHT to WALL SHEET		•	•	•				
HOPPER FLASHING to WALL SHEET	•		•					
HOPPER SHEET to HOPPER SHEET (15' - 24')					•		•	
LOWER HOPPER SHEET to UPPER HOPPER SHEET (21' - 30')					•		•	
LOWER HOPPER SHEET to LOWER HOPPER SHEET (27' - 36')					•		•	
HOPPER SHEET to DISCHARGE CONE (15' - 30')					•		•	
HOPPER COMPRESSION RING ASSEMBLY to OUTSIDE and INSIDE SPLICE ANGLES (15' - 24')					•		•	
HOPPER COMPRESSION RING ASSEMBLY to TOP CORNER OF HOPPER SHEET (15' - 24')						•	•	•
HOPPER COMPRESSION RING ASSEMBLY to UPPER HOPPER SHEET (27' - 30')						•	•	
LOWER HOPPER SHEET to DISCHARGE CONE (33' - 36')						•	•	
HOPPER COMPRESSION RING ASSEMBLY to UPPER CHANNEL (27' - 30')						•	•	

**Table 11.** Hopper Hardware (5/8" – 7/8")

BOLT LENGTH	5/8" x 1-1/2" flanged hex bolt	5/8" x 2" flanged hex bolt	5/8" hex nut	5/8" lock washer	3/4" x 2" hex bolt	3/4" x 2-1/2" hex bolt	3/4" hex nut	3/4" flat washer	7/8" flat washer
	193793	193796	154216	154990	150038	150591	150041	154978	154979
HOPPER COMPRESSION RING ASSEMBLY to UPPER CHANNEL (33' - 36')	•		•						
UPPER CHANNEL to SUPPORT COLUMN ASSEMBLY	•		•						
LOWER CHANNEL to SUPPORT COLUMN ASSEMBLY	•		•						
UPPER HOPPER SHEET to UPPER HOPPER SHEET (27' - 36')	•		•						
UPPER HOPPER SHEET to UPPER HOPPER SHEET to SPLICE SHIM to SPLICE PLATE or SPLICE ANGLE (36')	•		•						
UPPER HOPPER SHEET AT CORNERS to LOWER HOPPER SHEET (27' - 30')	•		•						
LOWER HOPPER SHEET to UPPER HOPPER SHEET (33' - 36')	•		•						
HOPPER COMPRESSION RING ASSEMBLY to OUTSIDE and INSIDE SPLICE PLATES to SUPPORT COLUMN ASSEMBLY (27' - 36')		•	•						
HOPPER COMPRESSION RING ASSEMBLY to UPPER HOPPER SHEET to SPLICE ANGLE (27' - 36')		•	•						
TIE ROD ENDS (15' - 24')			•	•					
HOPPER COMPRESSION RING ASSEMBLY to SUPPORT COLUMN ASSEMBLY (15' - 24')					•		•		
UPRIGHT BASE ASSEMBLY to HOPPER COMPRESSION RING ASSEMBLY to SUPPORT COLUMN ASSEMBLY						•	•	•	•
TIE ROD ENDS (27' - 36')							•	•	•

### 7.3. Recommended Bolt Assembly

When tightening bolts, tighten the nut on the bolt until a "snug-tightened condition" has been achieved. A "snug-tightened condition" is defined in *Specification for Structural Joints Using ASTM A325 or A490 Bolts* (Research Council on Structural Connections: June 2004), which states:

"The snug-tightened condition is the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench to bring the connected plies into firm contact."

A properly tightened bolt will compress the sealing washer noticeably. All assembly crew members must be made aware of this requirement, and must know how to achieve a snug-tightened condition using common bin-building tools.

It is important that the bolts in the vertical wall sheet seams are tightened enough to squeeze the caulking and bring the wall sheet surfaces into firm contact with each other. This is especially important to monitor when installing bolts in temperatures approaching -10°C (14°F).

The following table shows the minimum impact gun torque capacity necessary to achieve a snug-tightened condition for bolts used in the assembly process.

Table 12. Recommended Impact Gun Torque Values Capacity to Achieve Snug-Tightened Bolts

Dalt Diameter	Dalt Crade	Grade Mark	Recommended Torque Capacity					
Bolt Diameter	Bolt Grade	Grade Wark	in-lb	ft-lb	N-m			
1/4"	Grade 8.2	<b>₹</b> ₽	75	6	8			
5/16"	Grade 8.2		215	18	24			
3/8"	Grade 8.2		370	31	42			
7/16"	Grade 8.2		600	50	68			
1/2"	Grade 8.2	₹	960	80	108			
5/8"	Grade 8.2	₹ <u>₽</u>	1800	150	203			
3/4"	Grade 5	€	3230	269	365			

For proper sealing, do not overtighten the wall seam connections. Sealing is not critical on stiffener splice connections; these connections should be tightened securely to prevent loosening.

Hold the bolt head securely when tightening the nut to prevent damage to the sealing washer.

#### **Important**

Always tighten the nut, not the bolt.

Avoid bin assembly at temperatures below -10°C (14°F) if possible. Erection in low temperatures does not ensure strong, well sealed connections. Do not substitute bolts in place of those supplied by AGI.

#### **Important**

Do not substitute any other bolts/fasteners for those supplied by the AGI factory.

# 8. Warranty

#### **AGI Grain Bin Products**

Ag Growth International, Inc. ("AGI") warrants that the goods and/or services being supplied (the "Goods") will be free from defects in materials and workmanship under normal conditions, use, service, and maintenance, for a period of twelve (12) months from the date of first operation of the Goods, but in no event more than eighteen (18) months from the date of delivery of the Goods to the end-user (or as otherwise set out in the chart below) (the "Warranty Term"). If the Goods are being used for rental purposes, the Warranty Term for the subject Goods shall be limited to 90 days.

Galvanized Bins	5 Years							
SureTrack	2 Years							
Easyflow2	2 Years							
Fans	3 Years							
Heaters	1 Year							
Side Draw	5 Year							
Transitions	3 Years							
Roof Exhauster	1 Year							
Floors	5 Years							
Catwalk	1 Year							
Bulk Feed Tanks	2 Years							
Hopper Tanks	5 Year							
SeedStor-K Cones								
Paint	1 Year							
Structural	10 Year							
Commercial HBB Hopper								
Paint	1 Year							
Structural	10 Year							
Welded Cone(s)								
Paint	1 Year							
Structural	10 Year							
Farm Smoo	othwall Bins							
Paint	1 Year							
Structural	10 Year							
Commercial Si	noothwall Bins							
Paint	1 Year							
Structural	10 Year							
	Accessories							
Trolley	1 Year							
Down Auger	1 Year							
Disconnected Box	1 Year							
Grain Spreader	1 Year							
EasyDry A	accessories							
Plenum	5 Year							
Controls	1 Year							
Blower Heater	1 Year							

Subject to AGI's sole discretion, if the Goods, or a component thereof, are found to have a default in materials and/or workmanship within the Warranty Term, AGI will, at its own option and expense, repair or replace the subject Goods or refund the purchase price for the applicable Goods. Any warranty related expenses incurred on behalf of or by the end-user without the prior written consent of AGI shall be the sole responsibility of the end-user. Expenses relating to travel, customs or import duties and tariffs, equipment rental, and any costs associated with accessing the Goods are the sole responsibility of the customer. Warranty shall be void in the event that the Goods are returned or disposed of without the written consent of AGI.

The customer shall not assert a claim that the Goods are defective unless the customer gives written notice to AGI of such defect within forty-eight (48) hours of discovering such defect. In the event of a warranty claim, the customer must complete any and all information

required by AGI in order to properly assess or investigate the claim. AGI shall be given a reasonable opportunity to inspect and test the Goods in question. Failure by the customer to notify AGI of such claim within 48 hours shall operate as a waiver of any and all such claims by the customer.

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This limited warranty extends solely to Goods manufactured by AGI and does not cover any third-party parts, components, or materials. To the extent permitted by the manufacturer, AGI will pass on applicable warranties on third-party parts, components or materials to the end-user. This warranty does not extend to any losses or damages due to misuse, use of a kind and/or to a degree not reasonably expected to be made of the Goods, any use of the Goods which is not an intended use as specified in AGI's published product literature or otherwise specified by AGI in writing, accident, acts of God, abuse, neglect, normal wear and tear (including corrosion and cosmetic issues), any equipment attached to or used in conjunction with the Goods, any field modifications or substitutions to original Goods, component damage incurred during shipping and handling, modification or alteration, used beyond rated capacity, or improper installation, maintenance or application.

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To the fullest extent permitted by law, Buyer, on behalf of itself, its suppliers, their agents, employees or any entity or person for which Buyer is or may be responsible ("Indemnitors") shall fully indemnify, save and hold AGI, its agents, employees, officers, directors, partners and related entities harmless from and against all liability, damage, loss, claims, demands, actions and expenses of any nature whatsoever, including, but not limited to reasonable attorney's fees which arise out of or are connected with: (a) any negligent act, error or omission by any Indemnitor in the performance of this agreement; (b) the failure of the Indemnitor to comply with the laws, statutes, ordinances or regulations of any governmental or quasi-governmental authority; or (c) the material breach of any term or condition of this agreement by any of the Indemnitors. Without limiting the generality of the foregoing, the indemnity hereinabove set forth shall include all liability, damage, loss, claims, demands, and actions on account of personal injury, death or property loss to any third party, any Indemnitee, any of Indemnitee's employees, agents, licensees or invitees. The indemnity set forth herein shall survive any termination of this agreement.

THIS WARRANTY IS NON-TRANSFERABLE AND APPLIES ONLY TO THE ORIGINAL END-USER AND SHALL BE CONSIDERED VOID IF NOT REGISTERED WITHIN 30 DAYS OF RECEIPT OF THE GOODS BY THE ORIGINAL END USER.

AGI is a leading provider of equipment solutions for agriculture bulk commodities including seed, fertilizer, grain, and feed systems with a growing platform in providing equipment and solutions for food processing facilities. AGI has manufacturing facilities in Canada, the United States, the United Kingdom, Brazil, South Africa, India and Italy and distributes its products globally.



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