



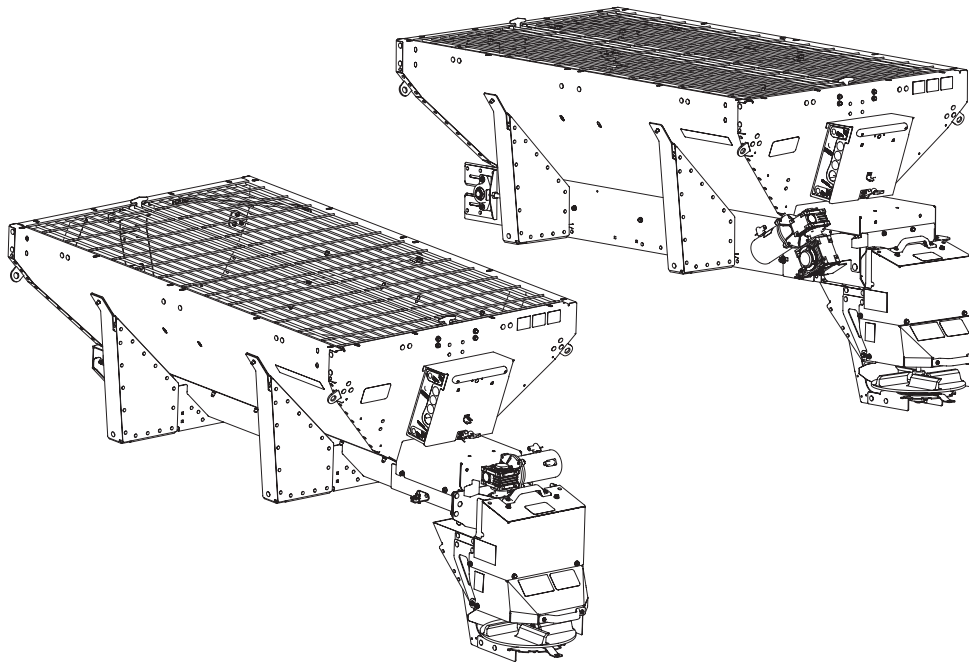
***MARAUDER™***

## **MARAUDER™ Hopper Spreader**

**#S150A, S220A, S300A, S400A, S500A**

**S150C, S220C, S300C, S400C, S500C**

### **Installation Instructions**



#### **⚠ CAUTION**

**Read this document before installing  
or operating the spreader.**

These Installation Instructions are for WESTERN® MARAUDER hopper spreaders  
with serial numbers beginning with 230301 and higher.

# SAFETY

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## SAFETY DEFINITIONS

### **WARNING**

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

### **CAUTION**

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**NOTE:** Indicates a situation or action that can lead to damage to your spreader and vehicle or other property. Other useful information can also be described.

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## WARNING/CAUTION LABELS

Become familiar with and inform users about the warning and caution labels on the spreader.

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**NOTE:** If labels are missing or cannot be read, see your sales outlet.

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**NOTE:** Translated safety labels are available. Please contact your sales outlet.

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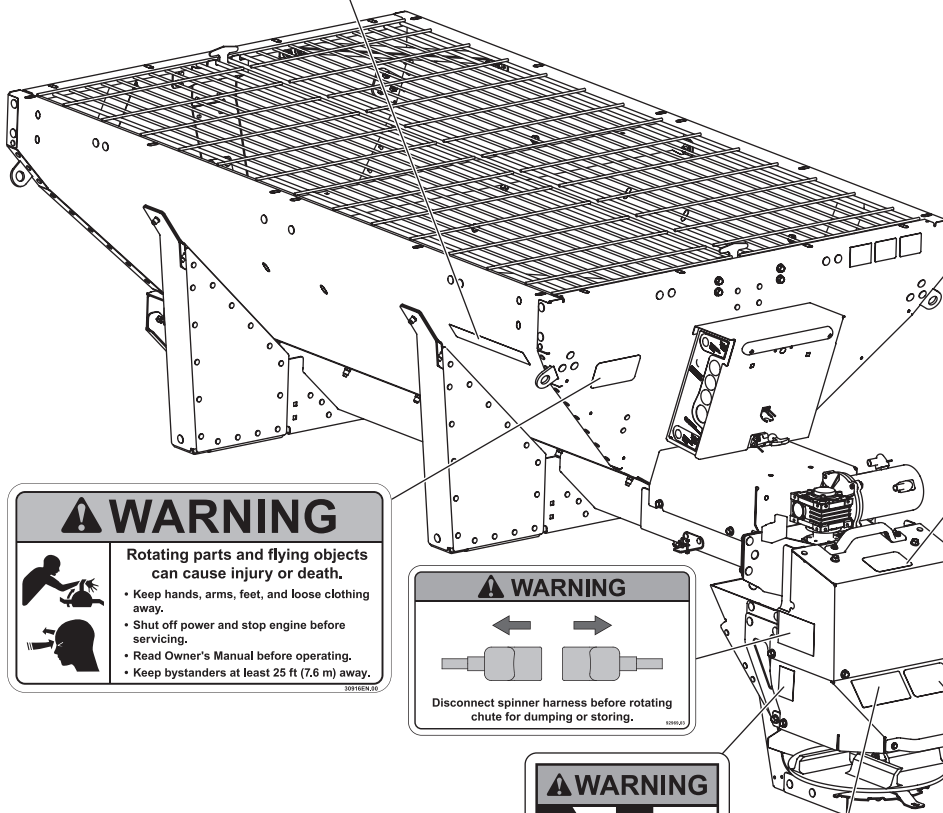
# SAFETY

## SAFETY LABELS – AUGER UNITS

### Warning/Caution Label (both sides of hopper)

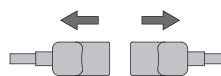
	<b>⚠ WARNING</b>		<b>⚠ CAUTION</b>
<ul style="list-style-type: none"> <li>• DO NOT exceed vehicle weight ratings (including GVWR &amp; GAWR) with spreader and load.</li> <li>• Turn spreader OFF before filling, adjusting, or cleaning.</li> <li>• Bystanders to stay a minimum of 25 feet (7.6 m) away from operating spreader.</li> <li>• DO NOT climb into or ride on spreader.</li> <li>• Keep hands, feet, and clothing away from moving conveyor/auger and spinner.</li> </ul>		<ul style="list-style-type: none"> <li>• Read Owner's Manual before operating or servicing spreader.</li> <li>• Empty and clean spreader after every use.</li> </ul>	

31584EN.01



	<b>⚠ WARNING</b> <b>Rotating parts and flying objects can cause injury or death.</b> <ul style="list-style-type: none"> <li>• Keep hands, arms, feet, and loose clothing away.</li> <li>• Shut off power and stop engine before servicing.</li> <li>• Read Owner's Manual before operating.</li> <li>• Keep bystanders at least 25 ft (7.6 m) away.</li> </ul>
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30910EN.01

<b>⚠ WARNING</b> 
<b>Disconnect spinner harness before rotating chute for dumping or storing.</b>


30902.01

<b>⚠ WARNING</b> 
<b>Multiple Pinch Points</b>

32803EN.02

<b>⚠ WARNING</b> 	<b>No Step</b> <b>Slippery surface when wet.</b> <b>Falls may cause severe injury.</b>
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30910EN.01

<b>⚠ WARNING</b> 
<ul style="list-style-type: none"> <li>• DO NOT exceed GVWR or GAWR with spreader and load.</li> <li>• DO NOT overload spreader.</li> <li>• Load spreader evenly.</li> </ul>

30910EN.01



<b>⚠ WARNING</b> <b>Vehicles &lt;10,000 lb GVWR</b> <b>Obstructing the visibility from the vehicle's rear camera could result in serious injury or damage. An auxiliary camera system shall be installed if the vehicle's rear camera is removed or blocked.</b>
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11002.01

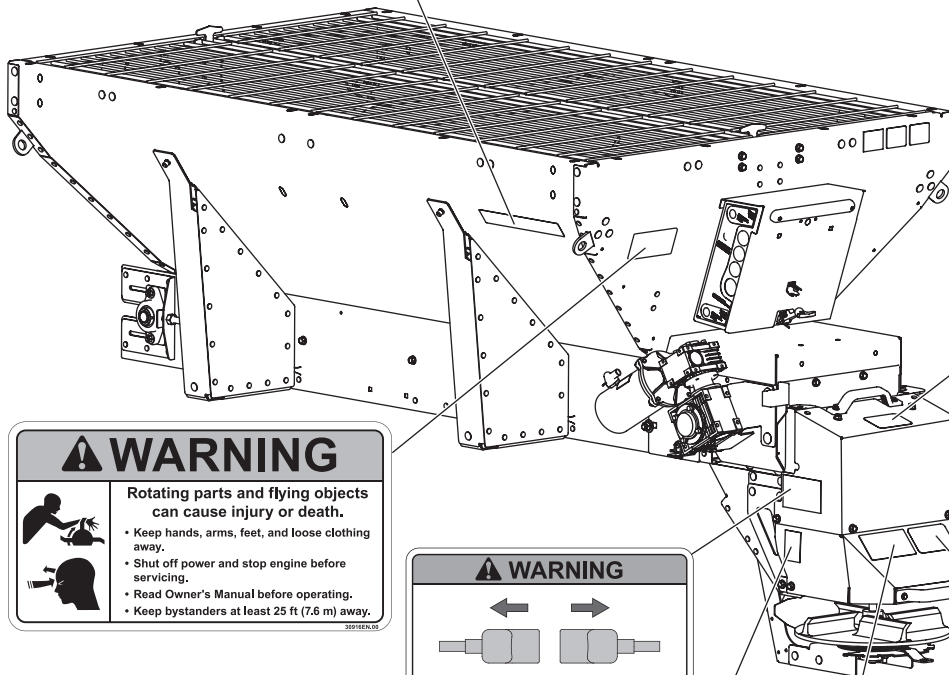
# SAFETY

## SAFETY LABELS – CHAIN DRIVE UNITS

### Warning/Caution Label (both sides of hopper)


	<b>⚠ WARNING</b>		<b>⚠ CAUTION</b>
<ul style="list-style-type: none"> <li>• DO NOT exceed vehicle weight ratings (including GVWR &amp; GAWR) with spreader and load.</li> <li>• Turn spreader OFF before filling, adjusting, or cleaning.</li> <li>• Bystanders to stay a minimum of 25 feet (7.6 m) away from operating spreader.</li> <li>• DO NOT climb into or ride on spreader.</li> <li>• Keep hands, feet, and clothing away from moving conveyor/auger and spinner.</li> </ul>		<ul style="list-style-type: none"> <li>• Read Owner's Manual before operating or servicing spreader.</li> <li>• Empty and clean spreader after every use.</li> </ul>	

31594EN.01




<b>⚠ WARNING</b>	
	<p style="text-align: center;"><b>No Step</b></p> <p>Slippery surface when wet. Falls may cause severe injury.</p>

30911EN.05

<b>⚠ WARNING</b>	
	<p><b>Rotating parts and flying objects can cause injury or death.</b></p> <ul style="list-style-type: none"> <li>• Keep hands, arms, feet, and loose clothing away.</li> <li>• Shut off power and stop engine before servicing.</li> <li>• Read Owner's Manual before operating.</li> <li>• Keep bystanders at least 25 ft (7.6 m) away.</li> </ul>


30910EN.05

<b>⚠ WARNING</b>	
	
<p>Disconnect spinner harness before rotating chute for dumping or storing.</p>	

30910EN.05

<b>⚠ WARNING</b>	
	
<p><b>Multiple Pinch Points</b></p>	

32593EN.00

<b>⚠ WARNING</b>	
	
<ul style="list-style-type: none"> <li>• DO NOT exceed GVWR or GAWR with spreader and load.</li> <li>• DO NOT overload spreader.</li> <li>• Load spreader evenly.</li> </ul>	

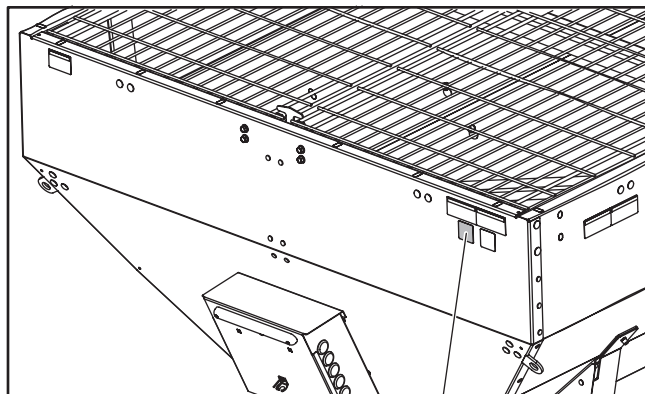
30910EN.05

<b>⚠ WARNING</b>	
<p><b>Vehicles &lt;10,000 lb GVWR</b></p>	
<p>Obstructing the visibility from the vehicle's rear camera could result in serious injury or damage. An auxiliary camera system shall be installed if the vehicle's rear camera is removed or blocked.</p>	

11100.05

# SAFETY

## SERIAL NUMBER LABEL



XXXXXXXXXXXXXXXXXXXXXXXXXXXX

**YYMMDDLLXXXXZZZZZZ**



Code	Definition
YY	2-Digit Year
MM	2-Digit Month
DD	2-Digit Day
LL	2-Digit Location Code
XXXX	4-Digit Sequential Number
ZZZZZ	5- to 7-Digit Assembly PN

## SAFETY PRECAUTIONS

Improper installation and operation could cause personal injury and/or equipment and property damage. Read and understand labels and the Owner's Manual before installing, operating, or making adjustments.

### ⚠ WARNING

- Driver to keep bystanders minimum of 25 feet (7.62 m) away from operating spreader.
- Before working with the spreader, secure all loose-fitting clothing and unrestrained hair.
- Before operating the spreader, verify that all safety guards are in place.
- Before servicing the spreader, wait for conveyor or auger, and spinner to stop.
- Do not climb into or ride on spreader.

### ⚠ WARNING



Overloading could result in an accident or damage. Do not exceed GVWR or GAWR ratings as found on the driver-side vehicle door cornerpost. See Loading section to determine maximum volumes of spreading material.

### ⚠ WARNING

Do not install the control for this product in the deployment path of an air bag. Refer to vehicle manufacturer's manual for air bag deployment area(s).

### ⚠ WARNING

Vehicles <10,000 lb (4536 kg) GVWR: Obstructing the visibility from the vehicle's rear camera could result in serious injury or damage. An auxiliary camera system shall be installed if the vehicle's rear camera is removed or blocked.

### ⚠ CAUTION

If rear directional, CHMSL light, or brake stoplights are obstructed by the spreader, the lights shall be relocated, or auxiliary directional or brake stoplights shall be installed.

# SAFETY

## ⚠ CAUTION

During the hopper installation we recommend the addition of an OSHA compliant Backup Alarm. This alarm is required for OSHA governed employers.

## ⚠ CAUTION

- Do not operate a spreader in need of maintenance.
- Before operating the spreader, reassemble any parts or hardware removed for cleaning or adjusting.
- Before operating the spreader, remove materials such as cleaning rags, brushes, and hand tools from the spreader.
- Before operating the spreader, read the engine owner's manual, if so equipped.
- While operating the spreader, use auxiliary warning lights, except when prohibited by law.
- Tighten all fasteners according to the Torque Chart. Refer to Torque Chart for the recommended torque values.

## ⚠ CAUTION

Disconnect electric power and tag out if required before servicing or performing maintenance.

## ⚠ CAUTION



DO NOT leave unused material in hopper. Material can freeze or solidify, causing unit to not work properly. Empty and clean after each use.

**NOTE:** Lubricate grease fittings after each use. Use a good quality multipurpose grease.

## FUSES

The electrical system contains several automotive-style fuses. If a problem should occur and fuse replacement is necessary, the replacement fuse must be of the same type and amperage rating as the original. Installing a fuse with a higher rating can damage the system and could start a fire. Fuse ratings and locations are shown in the Vehicle Harness Diagram in the Electrical Components section of these Instructions.

## PERSONAL SAFETY

- Remove ignition key and put the vehicle in PARK or in gear to prevent others from starting the vehicle during installation or service.
- Wear only snug-fitting clothing while working on your vehicle or spreader.
- Do not wear jewelry or a necktie, and secure long hair.
- Wear safety goggles to protect your eyes from battery acid, gasoline, dirt, and dust.
- Avoid touching hot surfaces such as the engine, radiator, hoses, and exhaust pipes.
- Always have a fire extinguisher rated BC handy, for flammable liquids and electrical fires.

## FIRE AND EXPLOSION

### ⚠ WARNING

**Gasoline is highly flammable and gasoline vapor is explosive. Never smoke while working on vehicle. Keep all open flames away from gasoline tank and lines. Wipe up any spilled gasoline immediately.**

Be careful when using gasoline. Do not use gasoline to clean parts. Store only in approved containers away from sources of heat or flame.

# SAFETY

## CELL PHONES

A driver's first responsibility is the safe operation of the vehicle. The most important thing you can do to prevent a crash is to avoid distractions and pay attention to the road. Wait until it is safe to operate Mobile Communication Equipment such as cell phones, text messaging devices, pagers, or two-way radios.

## VENTILATION

### ⚠ WARNING

Vehicle exhaust contains lethal fumes. Breathing these fumes, even in low concentrations, can cause death. Never operate a vehicle in an enclosed area without venting exhaust to the outside.

## BATTERY SAFETY

### ⚠ CAUTION

Batteries normally produce explosive gases which can cause personal injury. Therefore, do not allow flames, sparks, or lit tobacco to come near the battery. When charging or working near a battery, always cover your face and protect your eyes, and also provide ventilation.

- Batteries contain sulfuric acid, which burns skin, eyes, and clothing.
- Disconnect the battery before removing or replacing any electrical components.

## NOISE

Airborne noise emission during use is below 70 dB(A) for the spreader operator.

## VIBRATION

Operating spreader vibration does not exceed 2.5 m/s<sup>2</sup> to the hand-arm or 0.5 m/s<sup>2</sup> to the whole body.





## TORQUE CHART

### ⚠ CAUTION





Read instructions before assembling. Fasteners should be finger tight until instructed to tighten according to the Torque Chart. Use standard methods and practices when attaching spreader, including proper personal protective safety equipment.

### Recommended Fastener Torque Chart

#### Inch Fasteners Grade 5 and Grade 8

Size	Torque (ft-lb)		Size	Torque (ft-lb)	
	 Grade 5	 Grade 8		 Grade 5	 Grade 8
1/4-20	8.4	11.9	9/16-12	109	154
1/4-28	9.7	13.7	9/16-18	121	171
5/16-18	17.4	24.6	5/8-11	150	212
5/16-24	19.2	27.3	5/8-18	170	240
3/8-16	30.8	43.6	3/4-10	269	376
3/8-24	35.0	49.4	3/4-16	297	420
7/16-14	49.4	69.8	7/8-9	429	606
7/16-20	55.2	77.9	7/8-14	474	669
1/2-13	75.3	106.4	1-8	644	909
1/2-20	85.0	120.0	1-12	704	995

#### Metric Fasteners Class 8.8 and 10.9

Size	Torque (ft-lb)		Size	Torque (ft-lb)	
	 Class 8.8	 Class 10.9		 Class 8.8	 Class 10.9
M6 x 1.00	7.7	11.1	M20 x 2.50	325	450
M8 x 1.25	19.5	26.9	M22 x 2.50	428	613
M10 x 1.50	38.5	53.3	M24 x 3.00	562	778
M12 x 1.75	67	93	M27 x 3.00	796	1139
M14 x 2.00	107	148	M30 x 3.50	1117	1545
M16 x 2.00	167	231	M33 x 3.50	1468	2101
M18 x 2.50	222	318	M36 x 4.00	1952	2701

These torque values apply to fasteners except those noted in the instructions.



## LOADING

These Installation Instructions cover vehicles that have been recommended for carrying the hopper spreader. Please see your local dealer for proper vehicle applications.

### CERTIFICATION

#### WARNING

New untitled vehicle installation of a spreader requires National Highway Traffic Safety Administration altered vehicle certification labeling. Installer to verify that struck load of snow or ice control material does not exceed GVWR or GAWR rating label and complies with FMVSS.

#### WARNING

Overloading could result in an accident or damage. Do not exceed GVWR or GAWR as found on the driver-side cornerpost of vehicle.

#### CAUTION

Never use wet materials or materials with foreign debris with any of these spreaders. These units are designed to handle dry, clean, free-flowing material.

#### CAUTION



Read and adhere to manufacturer's ice-control material package labeling, including Safety Data Sheet requirements.

### MATERIAL WEIGHTS

Material	Density		
	(lb/ft <sup>3</sup> )	(lb/yd <sup>3</sup> )	(kg/m <sup>3</sup> )
Salt	80	2160	1282
Sand	100	2700	1602

Material densities are approximate and are based on dry, loose material. It is the responsibility of the operator to know the weight of the material to be spread and the vehicle carrying capacity.

### SPREADER SPECIFICATIONS

Hopper Model	Overall Length (in)	Hopper Length (in)	Overall Width (in)	Bed Height (in)	Bed Length (in)	Empty Weight (lb)
S150C	107	84	50	32	76	587
S150A	111.5	84	50	32	76	580
S220C	119.25	96	50	36	90	641
S220A	123	96	50	36	90	633
S300C	120.5	96	70	41	90	811
S300A	123	96	70	41	90	794
S400C	126.25	108	70	44	96	854
S400A	129	108	70	44	96	836
S500C	126.25	108	70	51	96	900
S500A	129	108	70	51	96	881

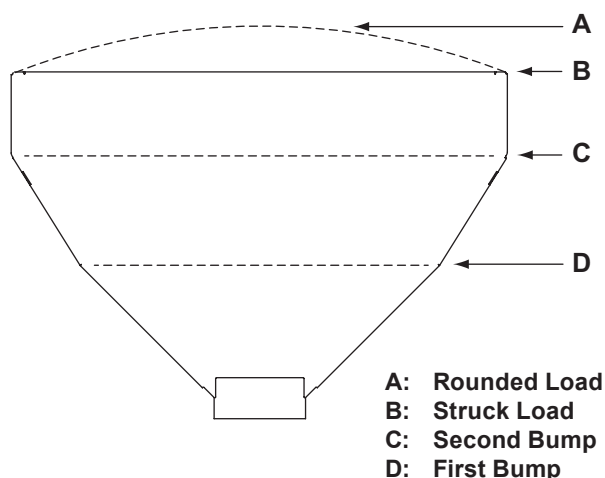
C = Chain Drive; A = Auger



# LOADING

## LOAD VOLUME

Hopper Model	Load Volume (yd <sup>3</sup> )			
	A	B	C	D
S150	1.9	1.6	1.1	0.7
S220	2.5	2.2	1.2	0.8
S300	3.4	3.1	2.5	1.0
S400	4.4	4	2.6	1.1
S500	5.4	5	2.6	1.1



## DETERMINING VEHICLE PAYLOAD

### ⚠ WARNING

Overloading could result in an accident or damage. Do not exceed GVWR or GAWR ratings as found on the driver-side door cornerpost of the vehicle. See Loading section to determine maximum volumes of spreading material.

1. Install the hopper spreader and optional equipment according to the Installation Instructions.
2. Install or attach any other equipment that will be on the vehicle while the hopper spreader will be in use (step bumper, trailer hitch, snowplows, etc.). Fill gas tanks.
3. Obtain the Gross Vehicle Weight Rating (GVWR), Front Gross Axle Weight Rating (FGAWR), and Rear Gross Axle Weight Rating (RGAWR) from the certification label located inside the driver-side door jamb or door.
4. With the occupants in the truck for normal hopper spreader operation, weigh the vehicle to obtain gross vehicle weight (GVW).
5. Subtract the GVW from the GVWR to determine the available material payload.
6. Obtain the weight per cubic yard (lb/yd<sup>3</sup>) of the desired material. Divide the weight into the payload to determine the maximum volume of material that can be carried.
7. Refer to the Load Volume table and diagrams to determine the maximum fill level for the material.
8. Fill the hopper with material to the calculated level. Reweigh the vehicle with occupants and verify that the Loaded Gross Vehicle Weight, Front Gross Axle Weight, and Rear Gross Axle Weight are less than the vehicle's ratings.
9. Repeat Steps 6–8 for each type of material.

The worksheet for Determining Vehicle Payload (next page) includes an example.

# LOADING

## Determining Vehicle Payload Worksheet

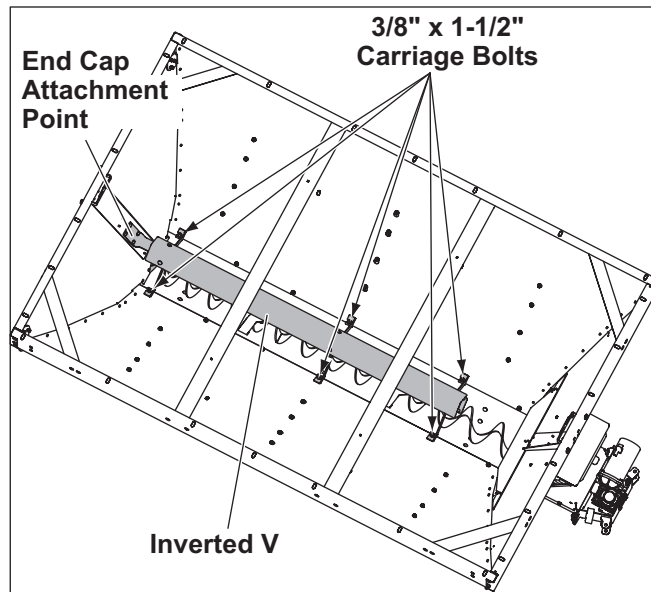
	<b>Material Type</b>	<i>Example:</i> Dry Salt				
<b>A</b>	<b>Equipment installed when vehicle was weighed</b>	8' Stainless Steel Hopper Spreader				
<b>B</b>	<b>Front Gross Axle Weight Rating [FGAWR] (lb)</b>	6000				
<b>C</b>	<b>Rear Gross Axle Weight Rating [RGAWR] (lb)</b>	7000				
<b>D</b>	<b>Gross Vehicle Weight Rating [GVWR] (lb)</b>	11,000				
<b>E</b>	<b>Gross Vehicle Weight [GVW], empty (lb)</b>	- 7402				
<b>F</b>	<b>Payload Available (lb)</b>	= 3598				
<b>G</b>	<b>Material Density (lb/yd<sup>3</sup>)</b>	÷ 2160				
<b>H</b>	<b>Maximum Volume (yd<sup>3</sup>)</b>	= 1.67				
<b>I</b>	<b>Maximum Material Fill Level, approx. Refer to Load Volume table and diagrams.</b>	C				
<b>J</b>	<b>Loaded Front Gross Axle Weight (lb) Must be less than weight in Row B.</b>					
<b>K</b>	<b>Loaded Rear Gross Axle Weight (lb) Must be less than weight in Row C.</b>					
<b>L</b>	<b>Loaded Gross Vehicle Weight [GVW] (lb) Must be less than weight in Row D.</b>					

# INSTALLING INVERTED V & MOUNTING THE SPREADER

**NOTE:** Periodically throughout the snow and ice control season, verify that mounting devices are secure.

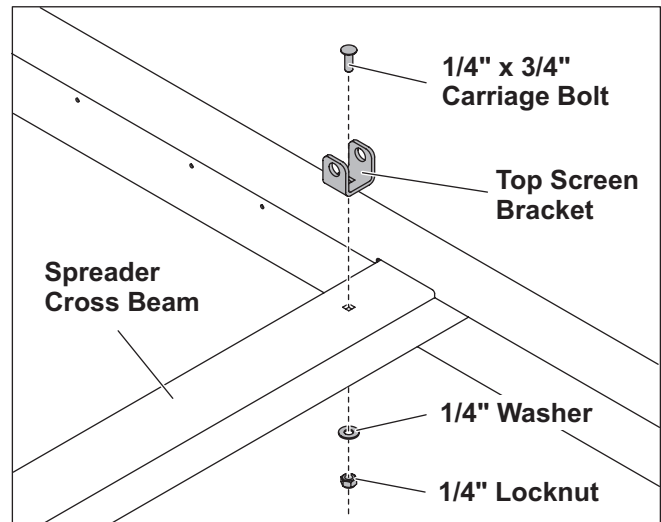
## INSTALL INVERTED V

1. Remove and retain the linchpins securing the top screens. Remove the top screens and set them aside.
2. The inverted V is mounted underneath the hopper cross beams for shipping. Detach the inverted V from the cross beams and set it aside.
3. Remove the chute from the hopper and set it on its side. Two people are recommended for this step, as the chute weighs more than 60 lb.
4. Remove the nuts from the cab-end leg that is already attached to the inverted V. Install the supplied end cap bracket. Reinstall and tighten the nuts.
5. Loosen the appropriate bolts, slide the inverted V into position, then re-tighten the bolts. Secure the inverted V to the end cap with four 3/8" x 1-1/2" carriage bolts, 3/8" washers, and 3/8" locknuts from the parts bag. Install the carriage bolts from inside the hopper, with the washers and locknuts on the outside.



## INSTALL TOP SCREEN BRACKETS

1. Install a top screen bracket at each end of the spreader cross beams using the supplied 1/4" x 3/4" carriage bolts, 1/4" washers, and 1/4" locknuts.



2. Retain the linchpins supplied with the top screen brackets. The top screens and linchpins will be installed later.

## INSTALL HOPPER IN TRUCK BED

**NOTE:** Periodically throughout the snow and ice control season, verify that mounting devices are secure.

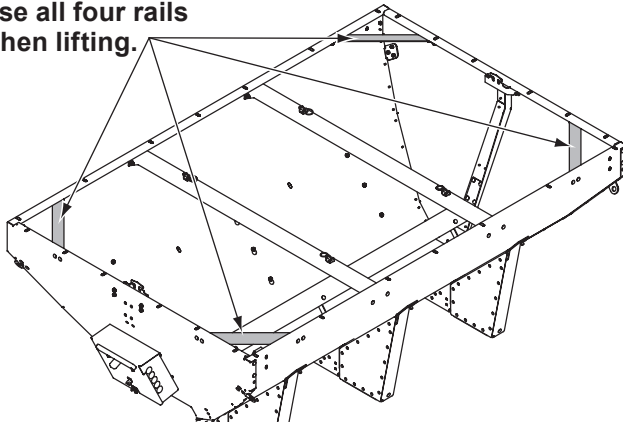
1. Remove the vehicle tailgate.

### ⚠ CAUTION

Before lifting, verify that the hopper is empty of material. The lifting device must be able to support the spreader's weight as shown in the spreader specifications table.

2. Remove the wooden dunnage from the hopper legs.
3. Using slings or chains, lift the spreader by the four diagonal corner rails and move it into the truck bed.

Use all four rails when lifting.

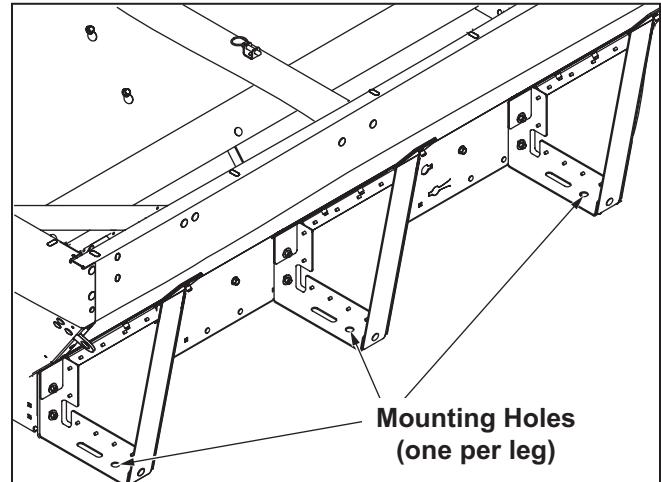


4. Center the spreader from side to side. Shift the spreader forward or backward to a position that will allow the chute, once installed, to overhang the rear of the truck and the bumper. With two people, trial-fit the chute to check for clearance.

### ⚠ CAUTION

Before drilling holes, check to be sure that no vehicle wiring or other components could be damaged.

5. Using the holes in the hopper support legs as a template, mark mounting hole positions on the truck bed. Move the spreader temporarily to allow access, and drill 5/8" holes as marked.



**NOTE:** Pay special attention when drilling or clamping dissimilar metals to aluminum bodies. Galvanic corrosion can occur if not handled properly. Contact vehicle manufacturer for recommended attachment practices.

### ⚠ WARNING

Spreader shall be bolted to vehicle frame. Do not rely on the tie-down chains or straps alone to hold spreader in vehicle.

6. Move the spreader back into position. Install the spreader to the truck bed using four 5/8" Grade 5 bolts as required by the vehicle application, 5/8" flat washers on both sides, and 5/8" locknuts. (Fasteners supplied by installer.)

**If the mounting holes are not directly over the truck box supports, the truck bed must be braced to the frame to prevent buckling or deforming the truck bed.** Accessory mounting bars are available for installations that require additional bracing. Contact your authorized dealer.

7. Remove the cable tie holding the wire harness to the conveyor chain. Connect the vehicle-side harness to the hopper-side harness.
8. Install the top screens, using the retained linchpins to secure the screens to the previously installed brackets.

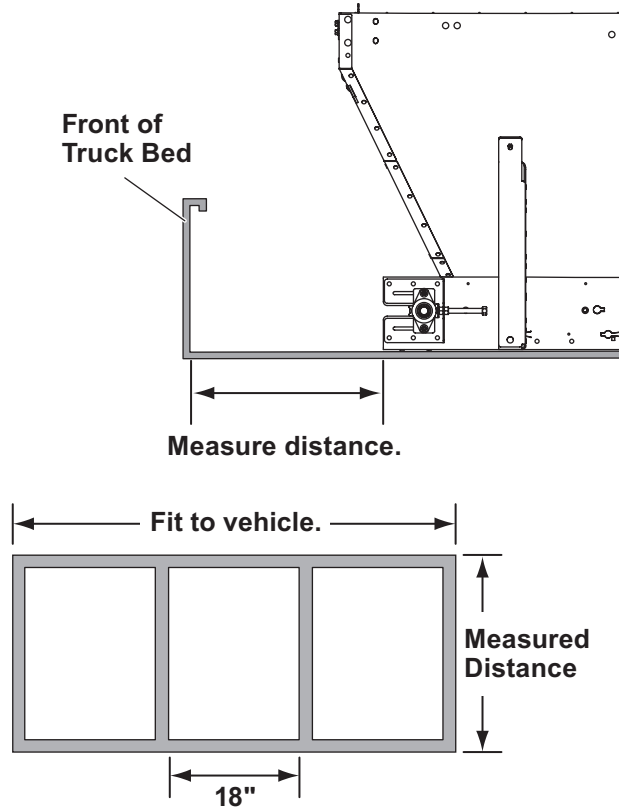
# MOUNTING THE SPREADER

## Construct and Install Sill Spacer

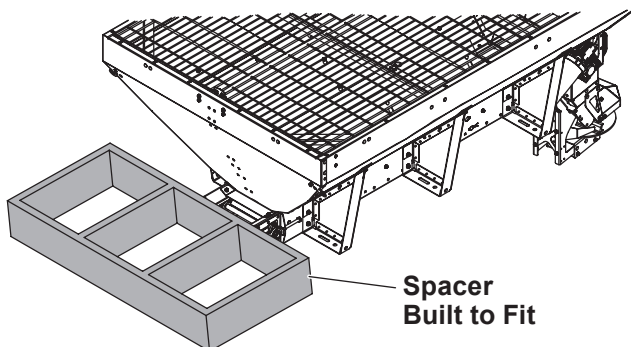
### ⚠ CAUTION

Failure to install the frame spacer could result in damage to the spreader and/or vehicle.

1. Measure the distance from the hopper drive line end to the front of the vehicle bed. Construct a frame spacer from 2" x 8" lumber to fit that area.



2. Install the frame spacer between the drive line end of the hopper and the front of the vehicle bed.

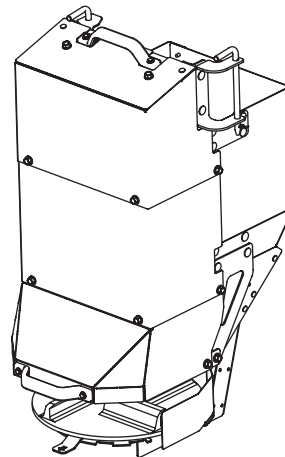


## INSTALL CHUTE

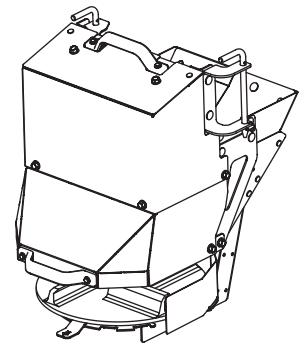
The chute comes in two lengths.

- **Models S150C and S220C:** Short chute configuration is standard. The chute extends 14-3/4" below the truck bed and will fit most pickup trucks.
- **Models S300C, S400C, and S500C:** Long chute configuration is standard. The chute extends 26-3/4" below the truck bed. Required for flat bed and dump truck installations.

Long Chute for  
S300C, S400C & S500C Models



Short Chute for  
S150C & S220C Models



Chain versions of chute shown.

# INSTALL CHUTE

## Confirm/Adjust Chute Length

Ideal spinner height is 12"–18" above the ground. For some installations the chute length may need to be adjusted to achieve the desired spinner height. If no length adjustment is required, go to "Install Chute to Spreader."

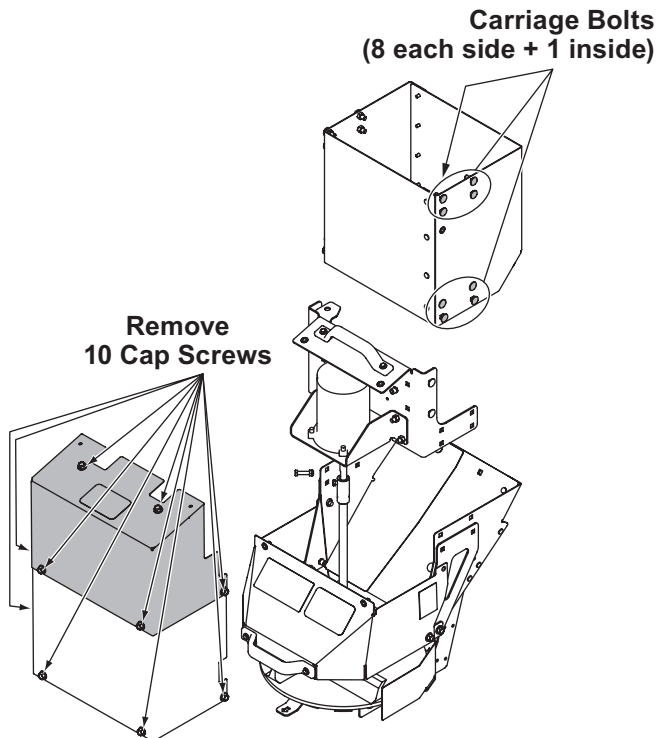
## Changing Short Chute to Long Configuration

Extending a short chute requires installation of a Chute Extension Kit (available from your authorized dealer).

## Changing Long Chute to Short Configuration

The chute must be separate from the spreader.

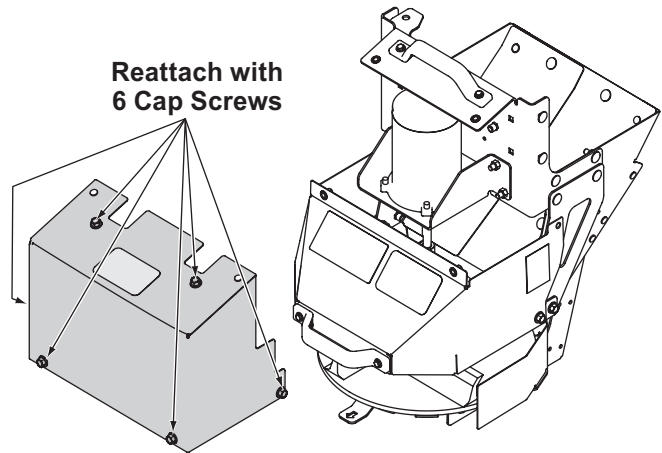
1. Remove the ten cap screws from the middle and top cover (as shown in illustration below), then remove the covers. Retain the top cover and six cap screws for reassembly.
2. Remove seventeen carriage bolts from the chute extension. Set aside nine carriage bolts and locknuts that will be used later during reassembly.



3. Measure/mark the amount of shaft stick out from the bearing (on the bottom of the chute). Then unbolt the shaft from the shaft coupler and loosen the set screws and remove the shaft and spinner disc.
4. The shaft will need to be cut down to 5/8" above the middle hole or a short shaft purchased from an authorized dealer.
5. Reinstall nine of the carriage bolts into the short chute configuration. Install the cut shaft into the bearing with set screws and tighten fasteners with the correct amount of the shaft stick out as measured in Step 3.

If a new shaft is purchased, install it so that the spinner shaft is contacting the motor shaft; then tighten the set screw.

6. Reinstall the top cover with six cap screws



## Install Tie-Down Straps

Install tie-down straps (to be provided by the installer) from the tie-down loops on the spreader body to the truck frame. Use one strap per loop, pulling diagonally away from the hopper body.

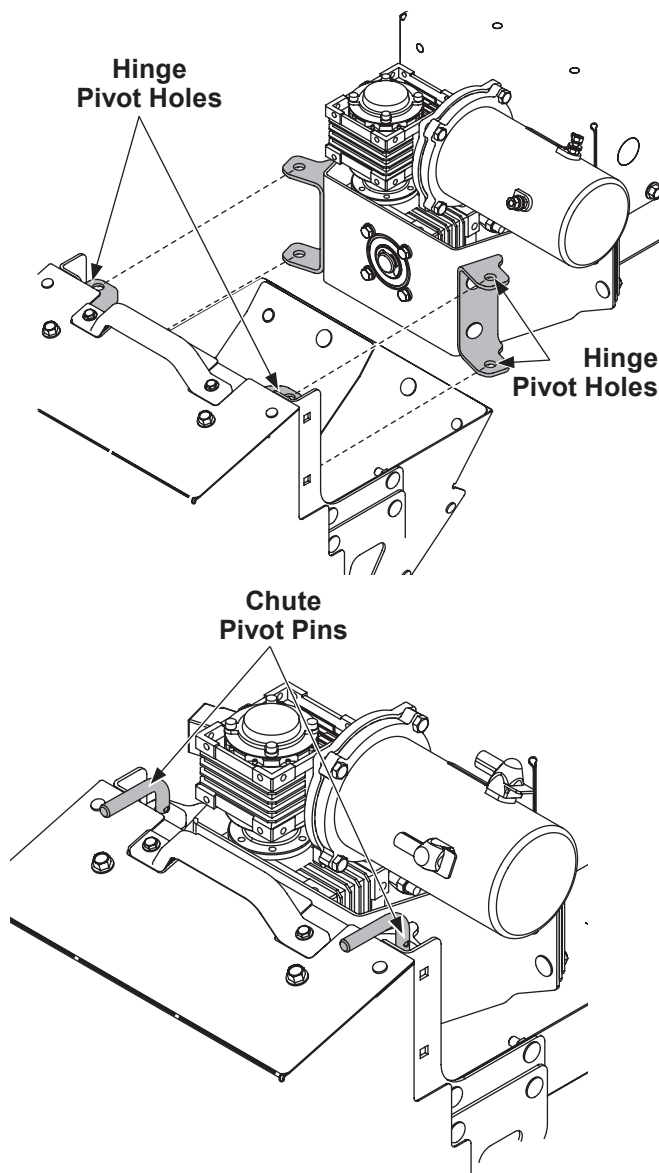
**NOTE: Periodically throughout the snow and ice control season, verify that mounting devices are secure.**

# INSTALL CHUTE

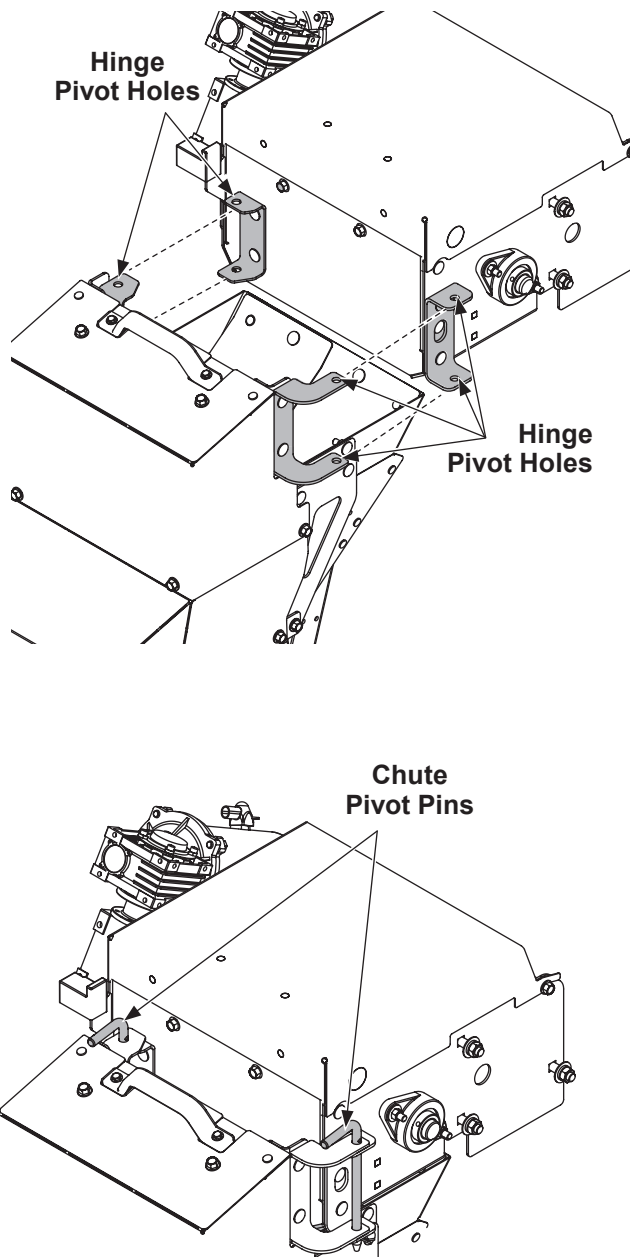
## Install Chute to Spreader

1. Two people are recommended for this step. Pick up the chute from each side and slide the chute hinges over the hopper hinges. Line up the hinge pivot holes.
2. Insert a 1/2" x 8-1/2" chute pin on each side and secure with a 3/32" x 2-1/4" cotter pin. The chute can pivot on either pin to provide access to the feed area of the hopper. The chute is designed to swing open in one direction only. It cannot be opened without disconnecting the hopper harness cable.
3. Connect the chute motor plug to the hopper harness plug.

### Auger Spreaders



### Chain Spreaders





# WIRING AND HARNESS INSTRUCTIONS

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## WIRING INSTRUCTIONS

Spreaders are shipped from the factory with the spreader harness wired to the motor and spreader module.

To properly wire the hopper spreader, follow this recommended installation sequence:

1. Install the vehicle battery cable and control harness included with the spreader.
2. Install the cab control as described under "Cab Control Installation."

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**NOTE: Use dielectric grease on all electrical connections.**

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## Vehicle Battery Cable Installation

1. Before beginning this installation, remove the battery cables from the vehicle battery.
2. Using the 1/4" x 3/4" cap screws, 1/4" flat washers, and 1/4" locknuts, mount the fuse holder near the vehicle battery so that the 22" battery cable can be installed from the POSITIVE (+) battery terminal to the fuse holder. Install the fuse into the fuse holder and hand tighten the nuts.

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**NOTE: Accessory 50" or 90" cables may be installed in place of the standard 22" cable for applications requiring a longer vehicle battery cable.**

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3. Attach one end of the 22" battery cable to the fuse holder so that the ring terminal is on top of the fuse. Replace the lock washer and nut.
4. Lay out a path for routing the vehicle battery cable from the rear of the vehicle bed to the vehicle

battery. Make sure that the path avoids any hot, sharp, or moving parts of the vehicle. Routing will vary from vehicle to vehicle.

5. Route the vehicle battery cable as laid out in Step 4.
6. Using cable ties, secure the battery cable to the vehicle. Verify that the harness cannot drop onto the road when it is disconnected from the spreader.
7. Attach the vehicle battery cable red wire to the other fuse holder stud so that the ring terminal is on top of the fuse. Replace the lock washer and nut.
8. Torque the fuse holder nuts to 106–159 in-lb and snap the fuse holder cover into place.
9. Attach the other end of the 22" battery cable to the POSITIVE (+) battery post.
10. Attach the vehicle battery cable black wire to the NEGATIVE (–) battery terminal.

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**NOTE: When using the accessory 50" or 90" battery cables, connect the black wire from the vehicle battery cable to a ground bolt on the vehicle frame or the engine. Clean away any paint or dirt to ensure a good ground connection**

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# WIRING AND HARNESS INSTRUCTIONS

## Vehicle Control Harness Installation

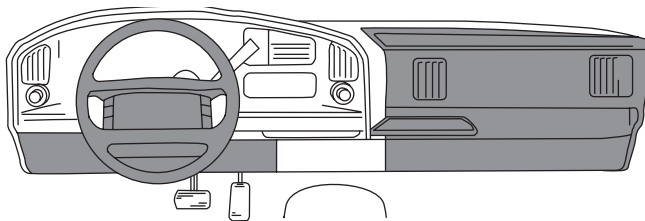
1. Plug the vehicle harness into the spreader harness.
2. Lay out a path for routing the vehicle control harness from its attachment point on the vehicle battery cable into the cab of the vehicle. Make sure that the path avoids any hot, sharp, or moving parts of the vehicle. Routing will vary from vehicle to vehicle.
3. Choose a cab control mounting location that can be reached by the harness. The location must be within easy reach of the vehicle operator without restricting access to vehicle controls or instrumentation.

Do not mount the control in areas prohibited by the vehicle manufacturer for reasons of crashworthiness. See the vehicle's body builder's book, owner's manual, or service manual for details. The shaded portions in the illustration below show the most commonly restricted areas.

4. Drill a 5/8" hole in the fire wall so that the vehicle

### **⚠ CAUTION**

Do not alter, modify, or install additional components in shaded areas shown below. Failure to comply may interfere with airbag deployment or cause injury to operator in an accident.



### **⚠ CAUTION**

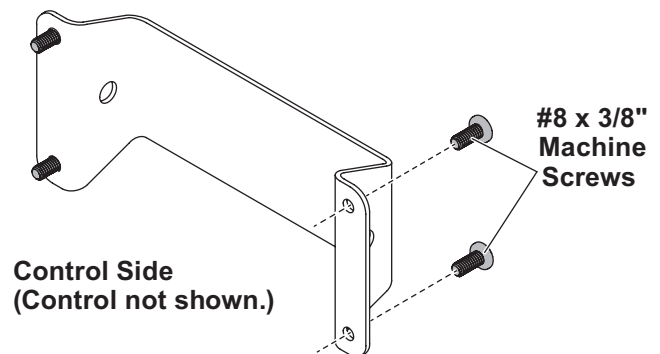
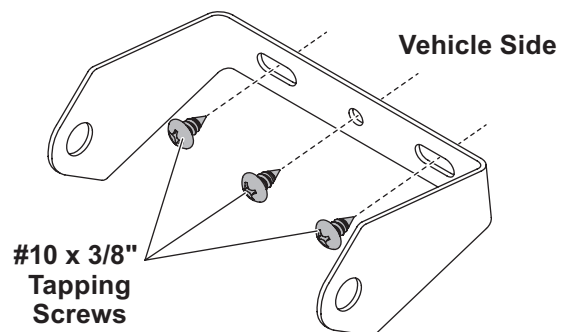
Before drilling any holes, check both sides of the material for any wires, fuel lines, fuel tanks, etc., that may be damaged by drilling.

control harness can reach the desired cab control location.

5. Insert a rubber grommet into the hole.
6. Route the harness as laid out in Step 2.
7. Secure the vehicle control harness to the vehicle.
8. Attach the red wire to a switched accessory circuit.

## Cab Control Installation

1. Confirm that the chosen cab control mounting position will not interfere with other equipment or allow unintentional starting of the spreader.
2. Install the vehicle side of the mounting bracket using three #10 x 3/8" Phillips head tapping screws.
3. Install the control side of the bracket to the control using four #8 x 3/8" Phillips head machine screws.

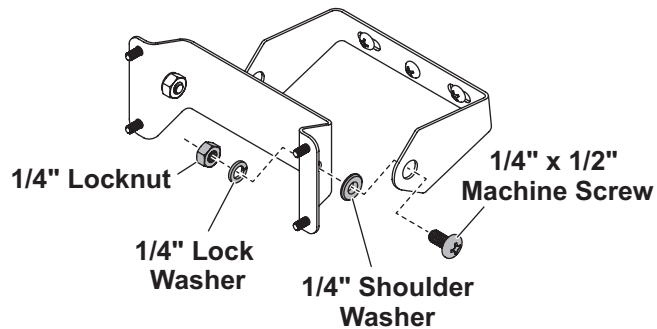


# WIRING AND HARNESS INSTRUCTIONS

## Install Control Harness

1. Install the control side of the bracket to the vehicle side using 1/4" x 1/2" Phillips head machine screws, 1/4" nylon shoulder washers, 1/4" lock washers, and 1/4" locknuts.

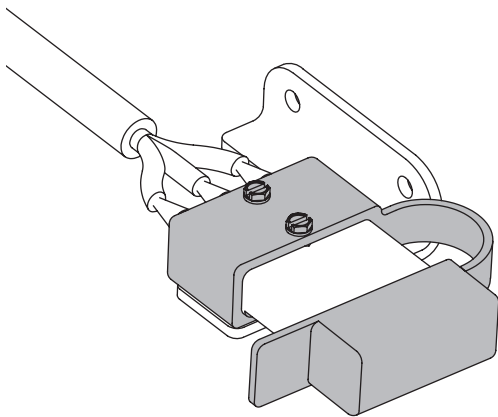
(Control not shown.)



2. Plug the vehicle control harness into the cab control.

## Harness Plug Cover

Install the supplied harness plug cover by slipping the loop end of the cover over the harness plug.



## CENTER HIGH-MOUNTED STOPLIGHT (CHMSL)

An LED center high-mounted stoplight is standard equipment on all stainless steel hopper spreaders.

The orange wire from the spreader vehicle harness is for the CHMSL. Splice the orange wire into an existing CHMSL circuit wire tap. Location of the tap varies according to specific vehicle model, and may be located either in the cab or in the rear of the vehicle.

**Always use the tap provided by the OEM.**

DO NOT splice the orange wire into the wire coming off the stoplight switch by the brake pedal. Splicing at the stoplight switch may affect transmission shifting, cruise control, or other vehicle functions.

**For vehicles with a tap along the frame rail or at the rear cross member:**

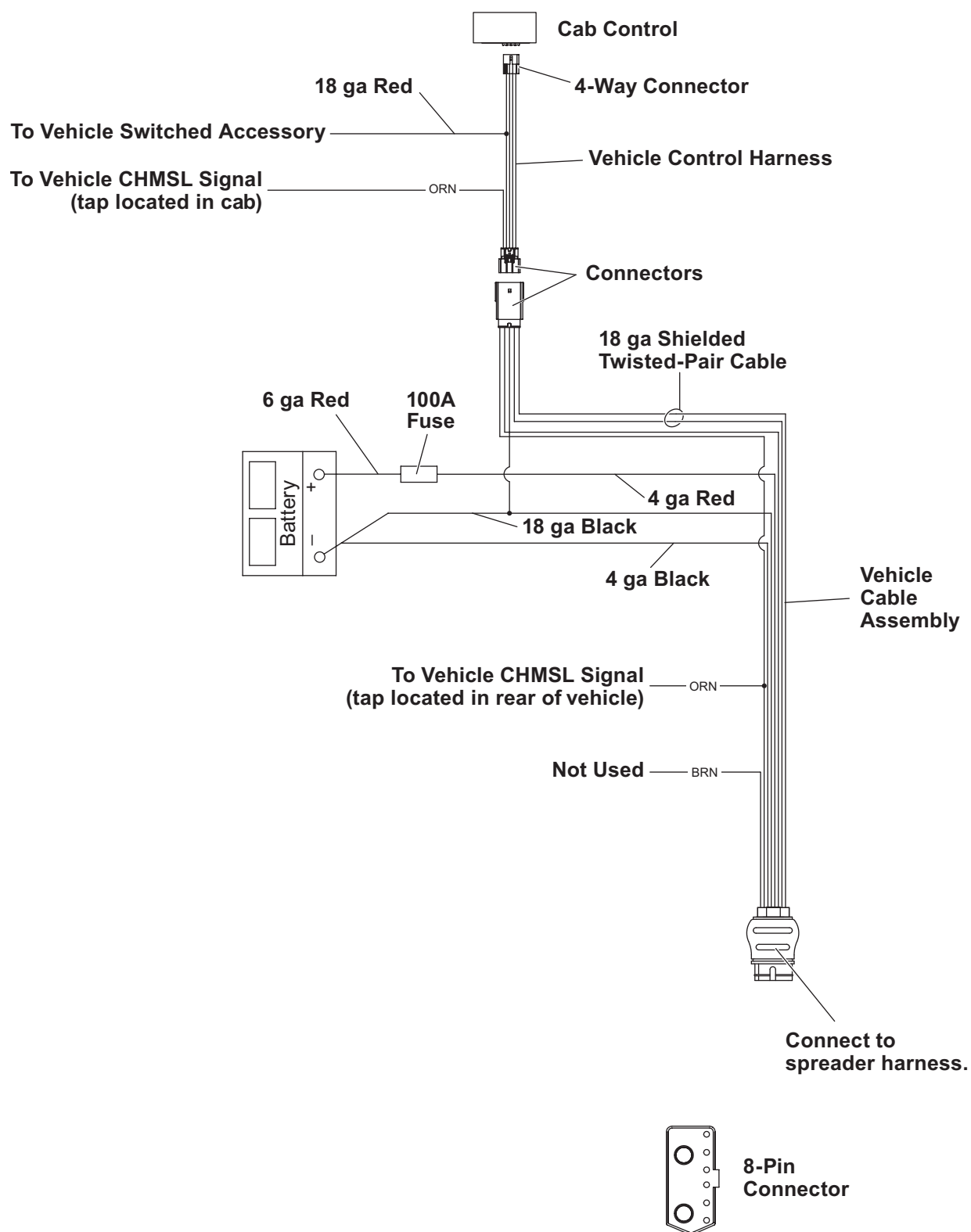
1. Cut the tape holding the orange wire where it exits the convoluted tubing.
2. Pull out the orange wire to the location where the vehicle CHMSL tap is located. Cut a small V notch in the tubing for the wire to exit. Pull the wire through the V notch and tape the tubing on each side of the exit point.
3. Trim any excess length from the orange wire and splice into the vehicle tap.

## INSTALL ACCESSORIES

To install any of the accessory kits that are available for the steel hopper spreaders, follow the instructions included with each kit.

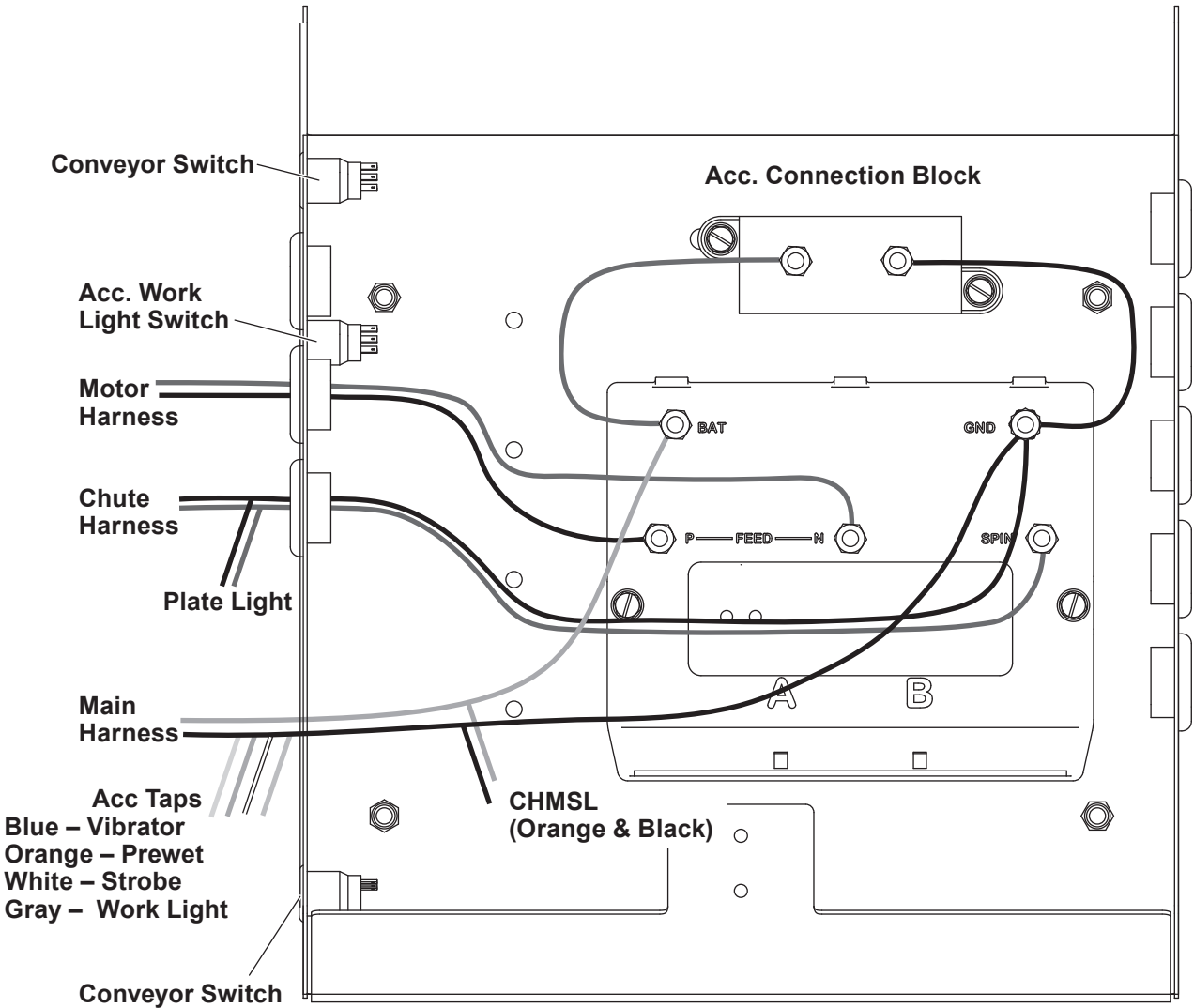
# ELECTRICAL COMPONENTS

## VEHICLE HARNESS DIAGRAM



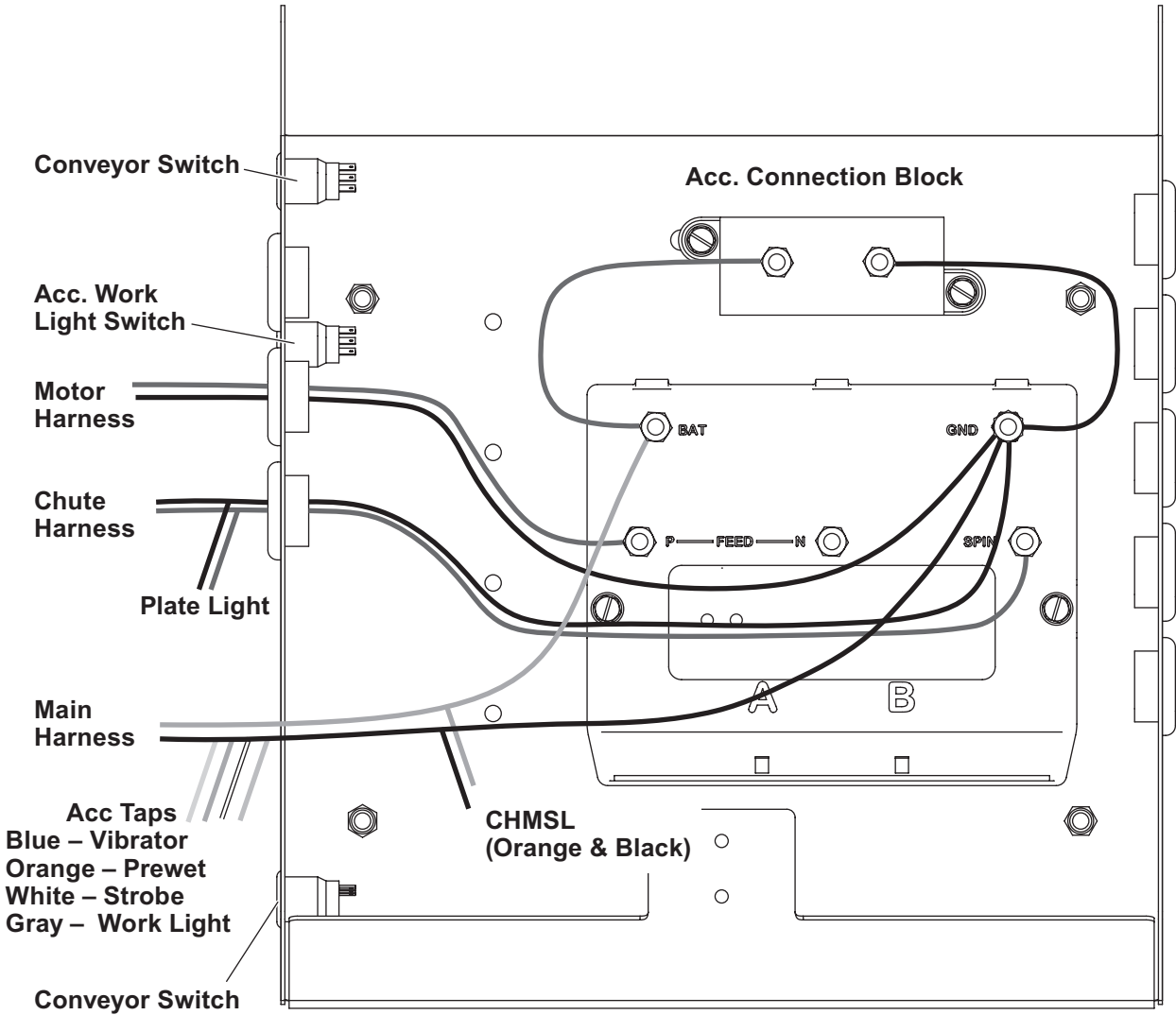
# ELECTRICAL COMPONENTS

## ELECTRICAL CONTROL BOX DIAGRAM – AUGER SPREADER



# ELECTRICAL COMPONENTS

## ELECTRICAL CONTROL BOX DIAGRAM – CHAIN SPREADER



## FINAL ADJUSTMENTS

### CONVEYOR PINTLE CHAIN TENSION – CHAIN-DRIVE SPREADERS ONLY

To check the conveyor chain tension, see whether the chain is visible in the chain tension port. If the chain is too tight, it will be above the port; if too loose, it will be below the port.

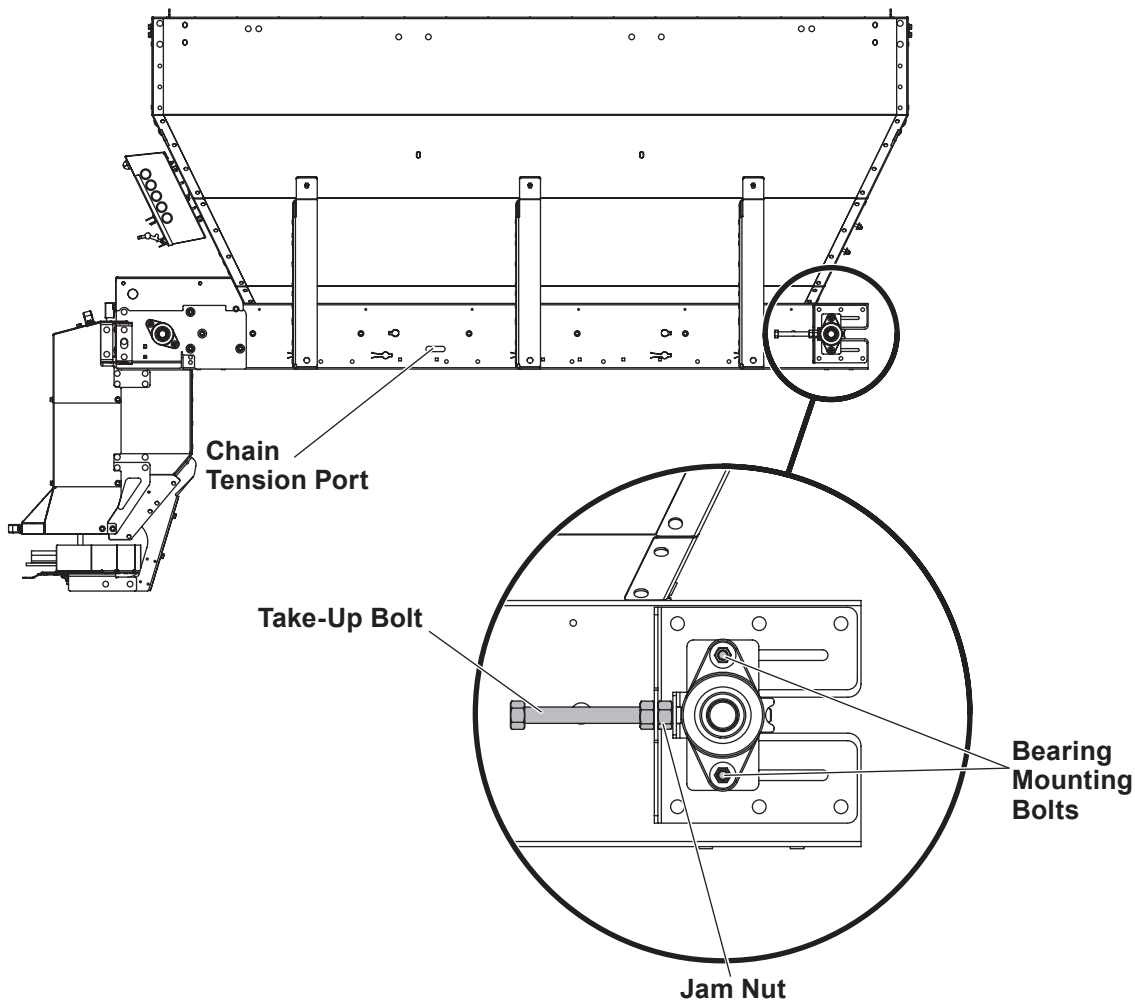
#### If Conveyor Chain Is Too Loose

1. Loosen the two bearing mounting bolts on each side of the conveyor idle roller at the cab end of the hopper.
2. Loosen the jam nut on one of the idler take-up bolts. Tighten the take-up bolt by turning it clockwise while holding the jam nut. Repeat with the opposite take-up bolt, tightening equally on both passenger's side and driver's side until the chain is in the middle of the chain tension port.

3. Tighten the bearing mounting bolts to 30 ft-lb. Tighten the tensioner jam nuts.

#### If Conveyor Chain Is Too Tight

1. Loosen the jam nuts on both sides. Back off the idler take-up bolt evenly on both sides. Then loosen the bearing mounting bolts.
2. Adjust the chain tension until the chain is visible in the chain tension port.
3. Tighten the jam nuts. Tighten the bearing mounting bolts to 30 ft-lb.





## FINAL ADJUSTMENTS

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### FINAL CHECKLIST

- ☐ Verify that the auger and spinner turn freely.
- ☐ Verify correct conveyor pintle chain tension and alignment (for chain drive spreaders only).
- ☐ Verify that dielectric grease is applied to all electrical connections.
- ☐ Verify that wire harnesses and battery cables are properly secured away from hot or moving parts.
- ☐ Verify that the vehicle battery cable has sufficient ground clearance when the spreader is removed from the vehicle.

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**NOTE: Periodically throughout the snow and ice control season, verify that mounting devices are secure.**

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