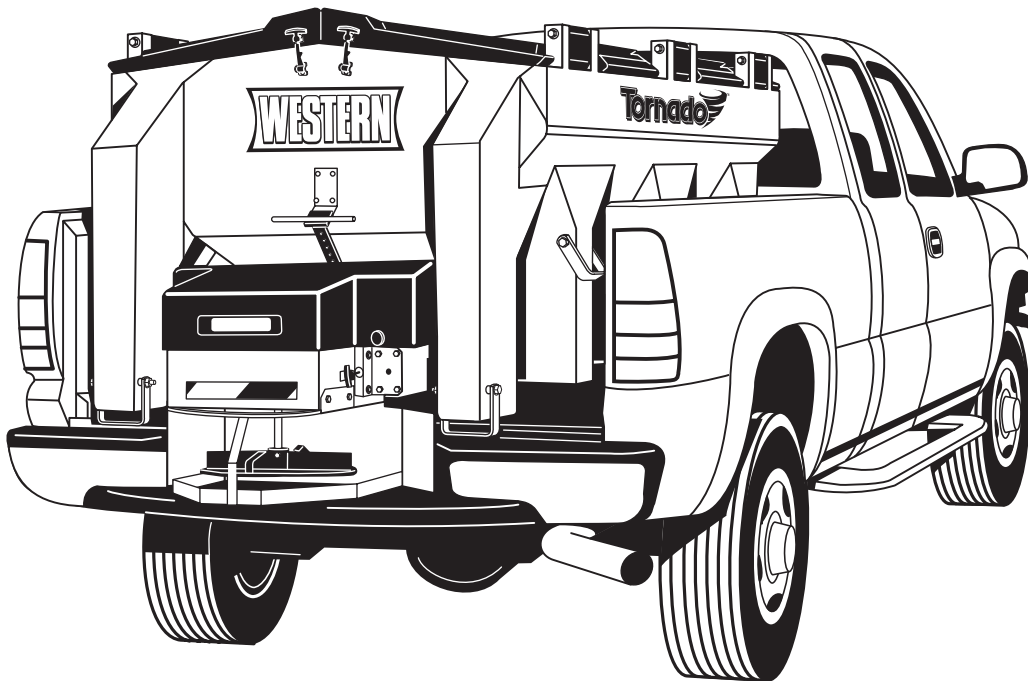


January 15, 2017  
Lit. No. 95741, Rev. 03



## Tornado™ Hopper Spreader

### Installation Instructions



#### **⚠ CAUTION**

Read this document before installing  
or operating the spreader.

These Installation Instructions are for WESTERN® Tornado Hopper Spreaders with serial numbers beginning with 0607-0903.



# SAFETY

## 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.

## WARNING/CAUTION LABELS

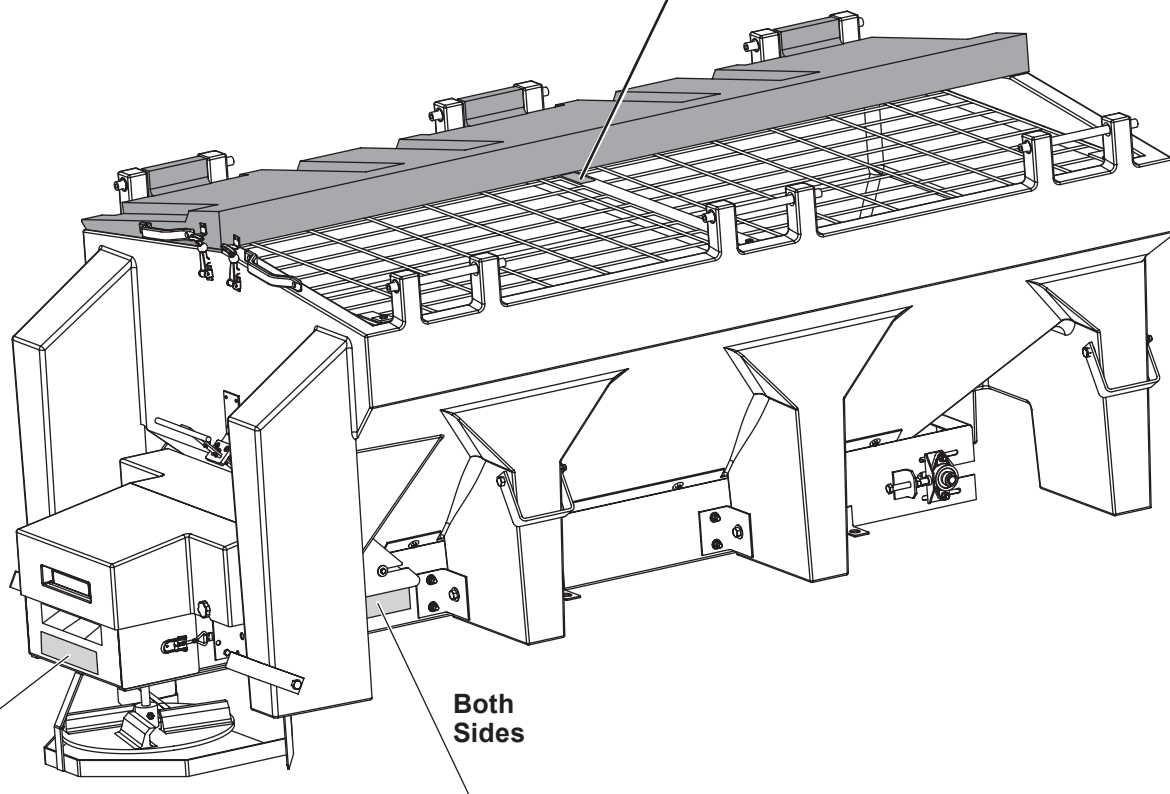
Become familiar with and inform users about the warning and caution labels on the spreader.

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

### CAUTION

Do not lift spreader by this member.  
Lifting here could cause personal injury and property damage.

67272



### WARNING

- DO NOT exceed GVWR or GAWR with spreader and load.
- Turn spreader OFF before filling, adjusting or cleaning.
- Bystanders to stay a minimum of 25 feet away from operating spreader.
- DO NOT climb into or ride on spreader.
- Keep hands, feet and clothing away from moving conveyor and spinner.



### CAUTION

- Read Owner's Manual before operating or servicing spreader.
- Empty and clean spreader after every use.

68584

# SAFETY

## 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 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, 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).

### 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.

### 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 and/or hydraulic 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 blade-style automotive 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 Replacement, including fuse ratings and locations, is located in the Maintenance section of the Owner's Manual.

# SAFETY

## 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.

## 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.

# SAFETY





## 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 instructions cover vehicles which 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



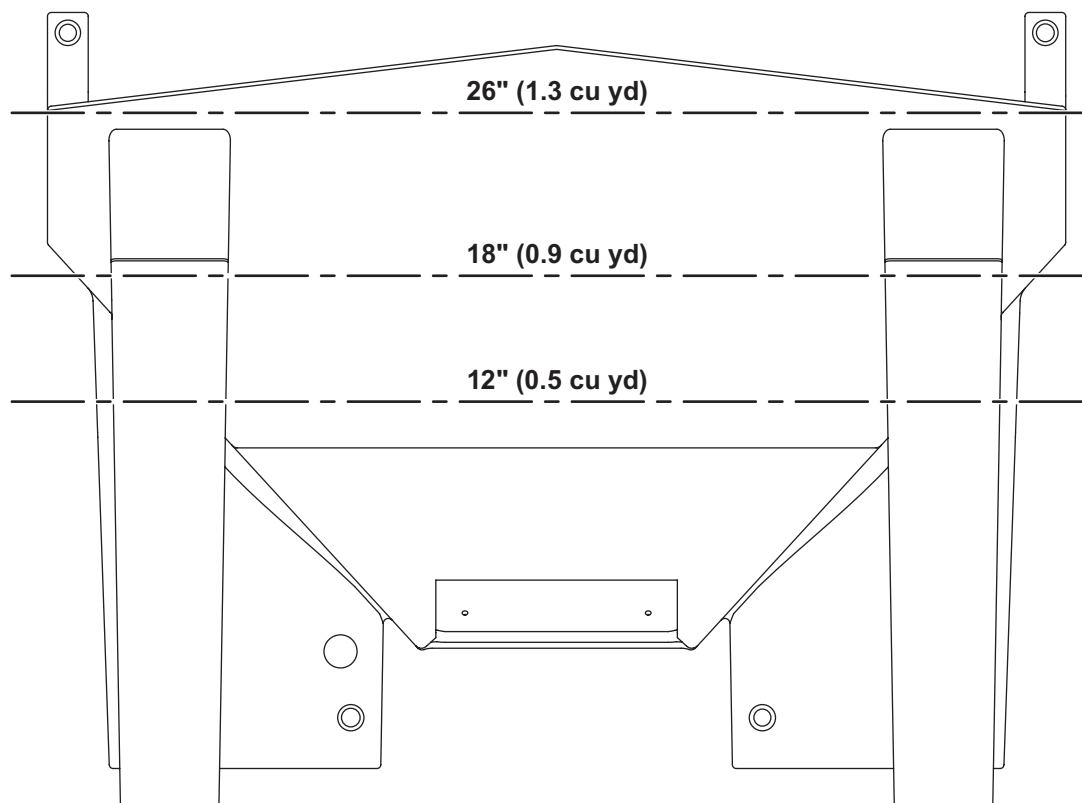
Read and adhere to manufacturer's ice-control material package labeling, including Material Safety Data Sheet requirements.

### 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.

### LOAD VOLUME



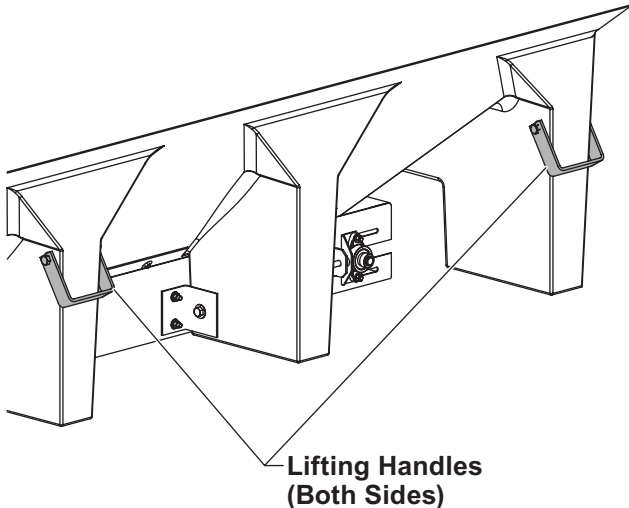
## MOUNTING THE SPREADER

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

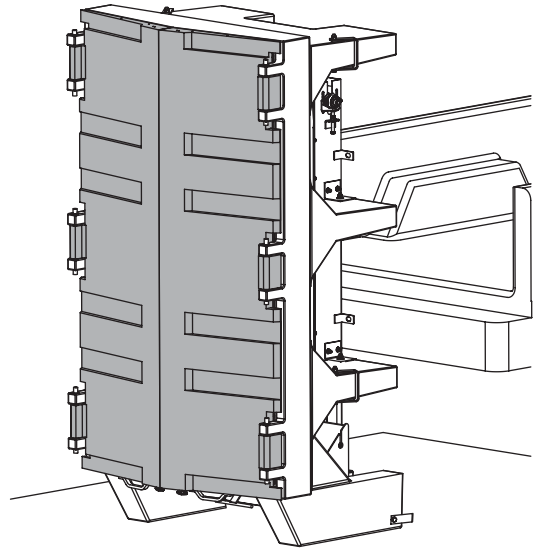
### **⚠ CAUTION**

Before lifting, verify hopper is empty of material. The lifting device must be able to support the spreader's weight.

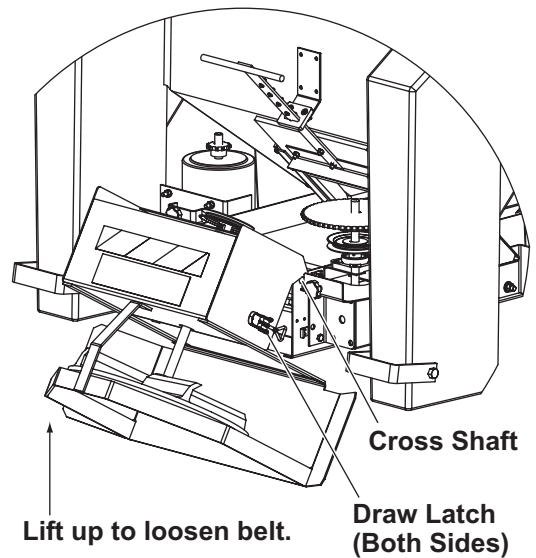
1. Remove the tailgate from the truck:
2. The spreader can be moved into the truck bed either by lifting the spreader by the four lifting handles located on the corner legs or by sliding the spreader into the truck bed from the ground.



3. To lift the spreader into the truck bed from the ground, stand the spreader up on the feet at the rear of the spreader. The chute must be removed and the knobs that secure the chute cover screwed all the way in.



4. To remove chute:
  - a. Release the two draw latches that hold the chute to the sill; rotate the bottom of the chute up to loosen the drive belt.
  - b. Remove the belt from the spinner shaft pulley and lift the chute off the cross shaft.

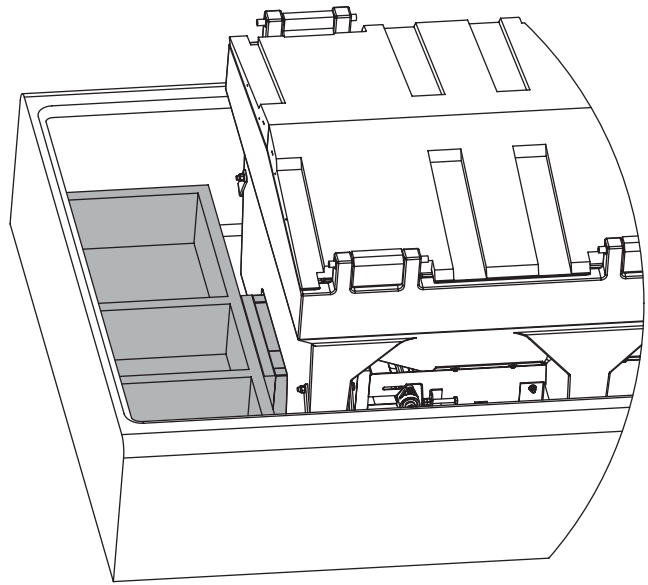
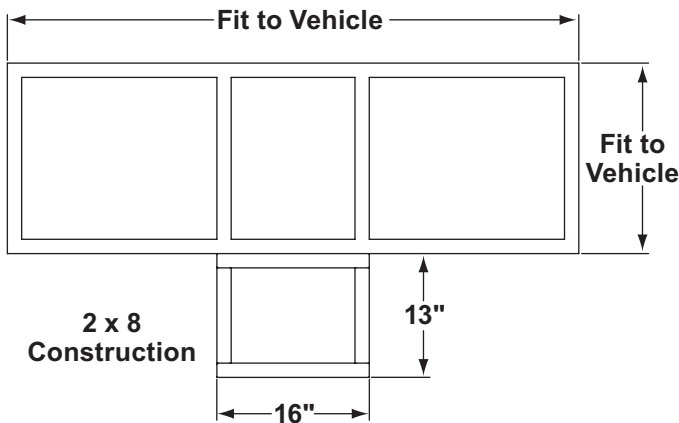


5. Position spreader on its feet at the rear of the truck.
6. Tip the spreader toward the truck until the sill rests on the rear edge of the truck bed.



## MOUNTING THE SPREADER

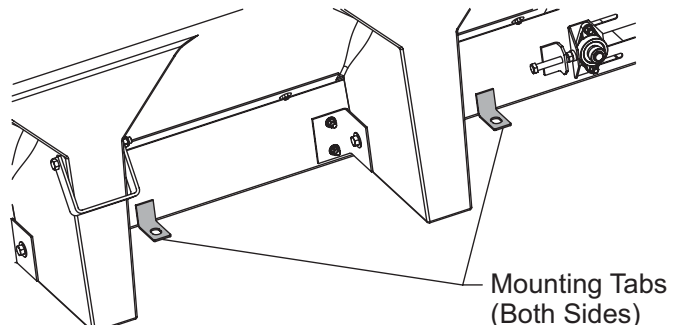
7. Lift the rear of the spreader and slide it into the truck bed. Two or more people are recommended for this task.
8. Center the spreader in the truck.
9. To assemble the chute to the spreader:
  - a. Hook the chute hooks over the cross shaft.
  - b. Rotate the chute up, position the V-belt over the two pulleys.
  - c. Lower the chute and fasten it to the sill by connecting the draw latches. (Refer to the illustration in Step 4.)
10. Measure the distance from the front of the truck bed to the end of the front of the sill and make a spacer to place between the end of the sill and the front of the truck bed. **Failure to install this spacer could result in damage to the spreader.**



### ⚠ WARNING

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

11. Bolt the spreader to the truck frame through the tabs on the sill. Use 1/2" hardware as required by vehicle applications. If the tabs 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.



**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.**

12. Install the chute cover prior to operating the spreader.

# WIRING AND HARNESS INSTRUCTIONS

---

## WIRING INSTRUCTIONS

To properly wire the hopper spreader, please adhere to the following recommended installation sequence.

1. Install the vehicle cable assembly and control harness included with the spreader per the following instructions.
2. Install the cab control using the instructions included with the cab control.

### Vehicle Cable Assembly Installation

1. Before beginning this installation, remove battery cables from vehicle battery.
2. Using the 1/4" x 3/4" cap screws, flat washers, and locknuts, mount the fuse holder near the vehicle battery so 22" battery cable can be installed from the POSITIVE (+) battery terminal to the fuse holder. Install fuse into fuse holder and hand tighten the nuts.
3. Attach one end of the 22" battery cable to the fuse holder so the ring terminal is on top of the fuse; replace the lock washer and nut.
4. Lay out a path for routing the vehicle cable assembly from the rear of the truck bed to the vehicle battery. Make sure the cable assembly avoids any hot, sharp, or moving parts of the truck. Routing may vary from truck to truck.
5. Route the harness as laid out in Step 4.
6. Using cable ties, secure the cable assembly to the truck. Verify the harness cannot drop onto the road when it is disconnected from the spreader.
7. Attach vehicle cable assembly red wire to other fuse holder stud so 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 cable assembly black wire to the NEGATIVE (–) battery terminal.

## Vehicle Control Harness Installation

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

---

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

---

1. Lay out a path for routing the vehicle control harness from its attachment point on the vehicle cable assembly into the cab of the truck. Make sure the path avoids any hot, sharp, or moving parts on the truck. Routing will vary from truck to truck.
2. Identify a convenient location for the cab control that can be reached by the harness.

### **⚠ 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.**

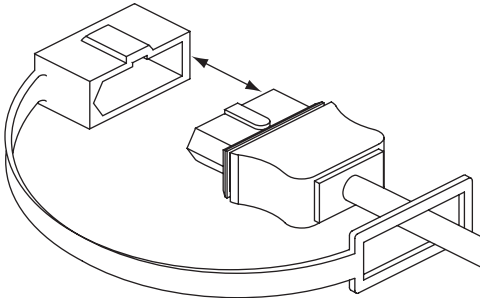
3. Drill a 5/8" hole in the fire wall so the vehicle control harness can reach the desired cab control location.
4. Insert a rubber grommet into the hole.
5. Route the harness to the desired location.
6. Secure the vehicle control harness to the truck.
7. Attach the red connector to a switch accessory circuit.

## WIRING AND HARNESS INSTRUCTIONS

---

### Harness Plug Cover

Install plug cover as shown.



### Center High-Mounted Stoplight (CHMSL) Installation

1. Lay out a path for routing the CHMSL vehicle harness from its point of attachment to the spreader to the location of the OEM tap. If no OEM tap is provided, make sure to tap in after the first OEM splice from the stoplight switch in the CHMSL circuit.

Always use the tap provided by OEM. **DO NOT** splice the white 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.

Check with the vehicle manufacturer or dealer to verify that the CHMSL circuit is capable of powering the extra 2-amp load and for location of the vehicle tap.

If the host vehicle CHMSL circuit is not capable of powering the additional 2-amp load, use CHMSL Isolation Harness Kit (PN 63632).

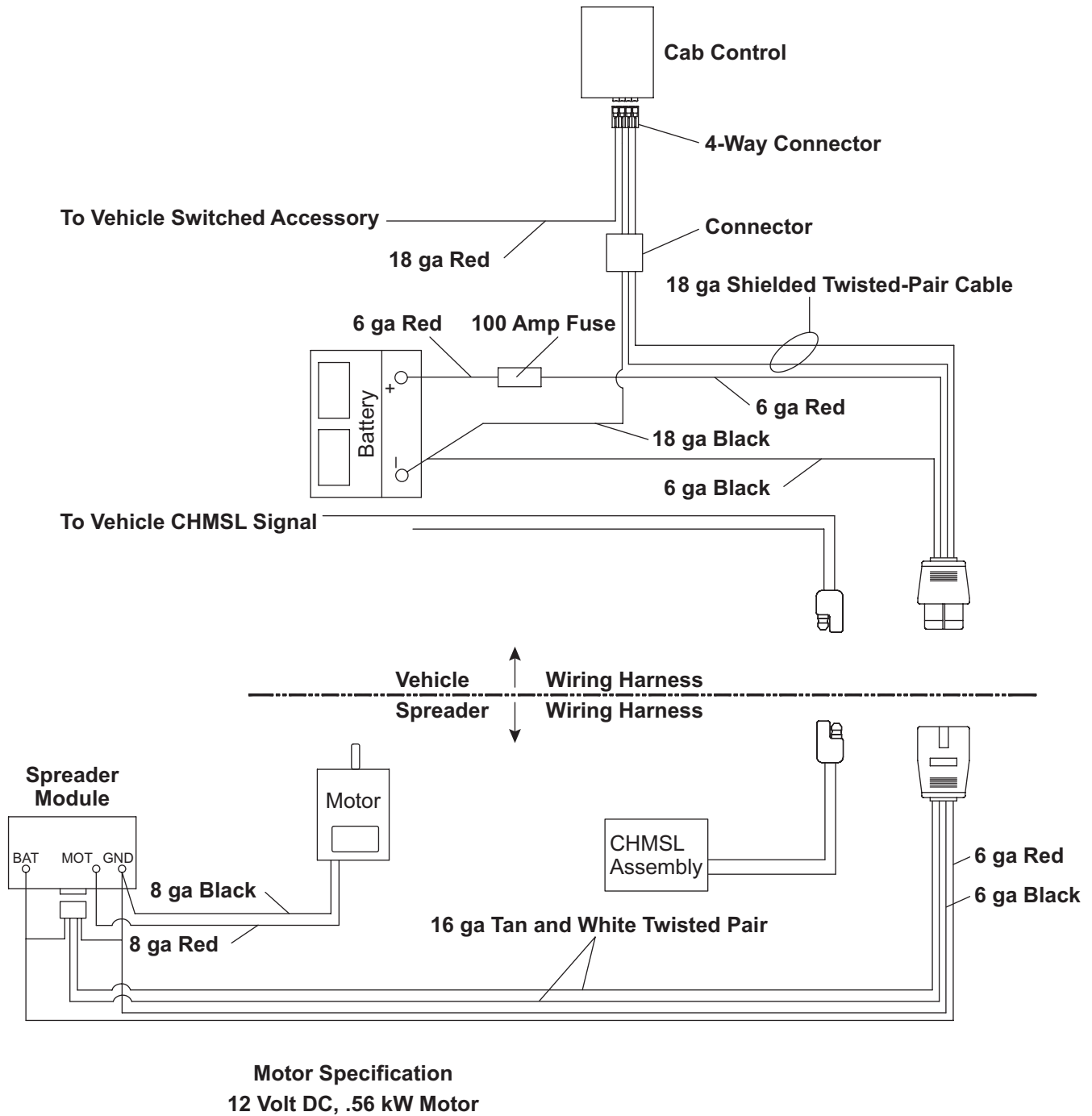
Make sure the CHMSL vehicle harness avoids any hot, sharp or moving parts of the truck. Routing will vary from truck to truck.

2. Route the CHMSL vehicle harness as laid out in Step 1.
3. Secure CHMSL vehicle harness to truck.

If using the CHMSL Isolation Harness Kit, complete installation following instructions found in the kit. Otherwise, proceed to Steps 4 and 5.

4. At CHMSL wire tap on host vehicle, connect CHMSL vehicle harness white wire to host vehicle CHMSL tap wire using special butt splice provided.
5. Connect the CHMSL vehicle harness black wire to a good chassis ground.

# HARNESS WIRING DIAGRAM



## FINAL ADJUSTMENTS

---

### DRIVE BELT AND CHAIN TENSION

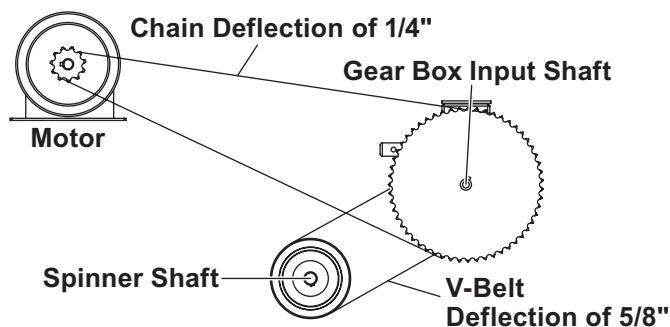
---

**NOTE:** Overtightening the belt or chain may result in damage to the motor or gear box bearing.

---

#### To adjust belt tension:

1. Loosen the carriage bolts that hold the spinner shaft.
2. Slide the spinner shaft to increase or decrease tension.
3. After adjusting the shaft, tighten the carriage bolts. Belt should deflect  $5/8$ " between the pulleys.



#### To adjust the chain tension:

1. Loosen the bolts that hold the motor.
2. Slide the motor to increase or decrease the chain tension.
3. After adjusting the motor, tighten the bolts. The chain should deflect  $1/4$ " between the sprockets.

## FINAL ADJUSTMENTS

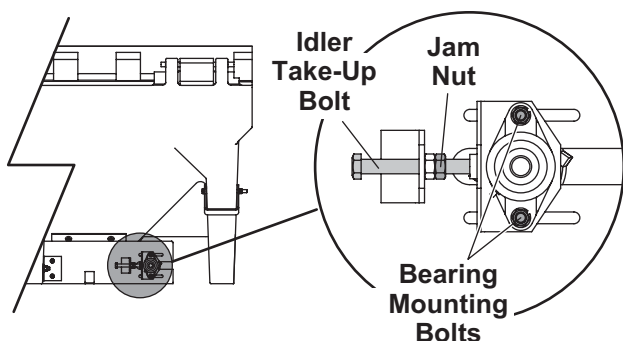
### Conveyor Belt Tension

The conveyor drive roller can slip inside the conveyor belt for a number of reasons, including (1) material trapped/frozen between the conveyor belt and the vehicle bed surface, (2) frozen material in the hopper, and (3) improper belt tension. Before adjusting conveyor belt tension, verify that material is not trapped/frozen between the conveyor belt and the vehicle bed surface and that frozen material is not preventing the belt from operating properly. In either of these situations, either the drive roller will slip or the spreader control will sense an overload and will shut down, signified by the diagnostic indicator light flashing three times. See Owner's Manual for details on the control and the diagnostic indicator light.

1. Fully load the hopper with the material that will be regularly used.
2. Briefly test the spreader. If the drive roller slips inside the conveyor belt or the conveyor belt does not move, immediately turn the spreader OFF. If the drive roller is not slipping and the conveyor belt is moving, the conveyor belt tension is correct.

**NOTE: Stop the spreader immediately if the drive roller is slipping inside the conveyor belt. Running the spreader when the drive roller is slipping can damage the conveyor belt.**

3. Loosen the two bearing mounting bolts on each side of the conveyor idler roller.



4. Loosen the jam nut on one of the take-up bolts, then tighten (clockwise) the take-up bolt one full revolution. Repeat evenly on the other side.

5. Start the unit to determine if conveyor tension is correct. If tension is not enough to restart the load or if the drive conveyor roller slips, immediately turn the spreader OFF and repeat the steps above until the load restarts and the drive conveyor roller does not slip.
6. Run the load for a few minutes and check the conveyor idler pulley to determine if the conveyor belt is running closer to one side than the other. If the belt tracking is centered and the belt is not rubbing on the side of the sills, retighten the jam nuts and the bearing mounting bolts on both sides of the conveyor idler roller.
7. If the conveyor belt is tracking off center, tighten the take-up bolt on the side that the belt is tracking towards. Sometimes it is necessary to overtighten this side to make the belt track back toward center, then loosen the take-up bolt slightly to maintain center tracking of the belt. Once the belt tracking is centered and the belt is not rubbing on the side of the sills, retighten the jam nuts and the bearing mounting bolts on both sides of the conveyor idler roller.

**NOTE: The conveyor belt may relax or stretch after the first few loads of material and may require readjustment. Check belt tension after the first few loads and adjust as necessary.**

## FINAL ADJUSTMENTS

---

### Final Checklist

- ☐ Verify gear case oil level is level with fill hole.
- ☐ Verify correct motor-to-gear box sprocket alignment and chain tension.
- ☐ Verify correct gear case output shaft to spinner shaft alignment and belt tension.
- ☐ Verify correct conveyor tension and alignment.
- ☐ Verify dielectric grease is applied to all electrical connections.
- ☐ Verify wire harnesses and cable assembly are properly secured away from hot or moving parts.
- ☐ Verify that the vehicle cable assembly has sufficient ground clearance when the spreader is removed from the truck.



Western Products  
PO Box 245038  
Milwaukee, WI 53224-9538  
[www.westernplows.com](http://www.westernplows.com)

 A DIVISION OF DOUGLAS DYNAMICS, LLC

Western Products reserves the right under its product improvement policy to change construction or design details and furnish equipment when so altered without reference to illustrations or specifications used. Western Products or the vehicle manufacturer may require or recommend optional equipment for spreaders. Do not exceed vehicle ratings with a spreader. Western Products offers a limited warranty for all spreaders and accessories. See separately printed page for this important information. The following are registered (®) or unregistered (™) trademarks of Douglas Dynamics, LLC: Tornado™, WESTERN®.

**Printed in U.S.A.**