



Fisher Engineering

99000, 99001, 99005, 99009

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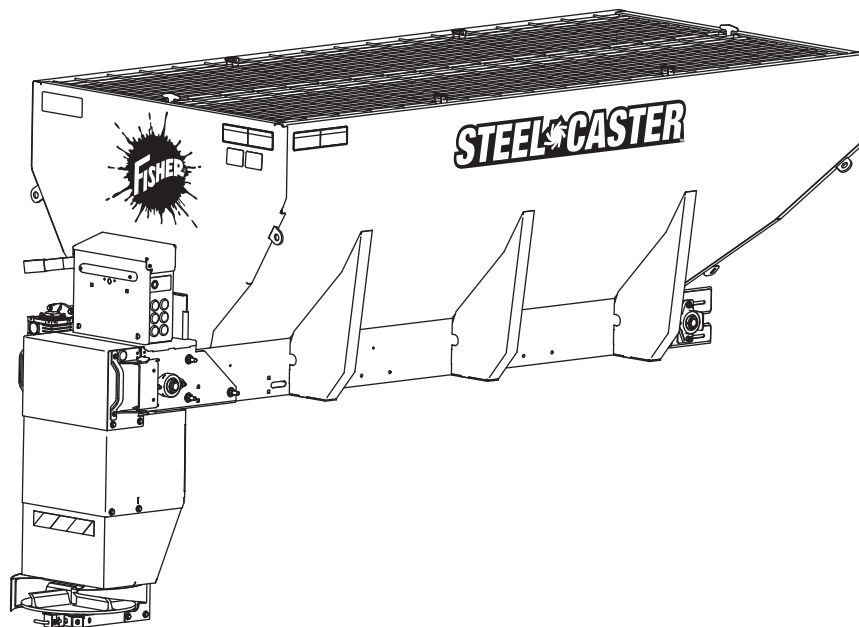
STEEL-CASTER™

STEEL-CASTER™ Hopper Spreader

with Electric Motors

#99000, 99001, 99005, 99009

Installation Instructions



⚠ CAUTION

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

This manual is for FISHER® STEEL-CASTER Hopper Spreaders
with serial numbers beginning with 150515 through 170628.

This document supersedes all editions with an earlier date.

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.

Warning Label – Rear Camera

WARNING

Vehicles <10,000 lb 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.

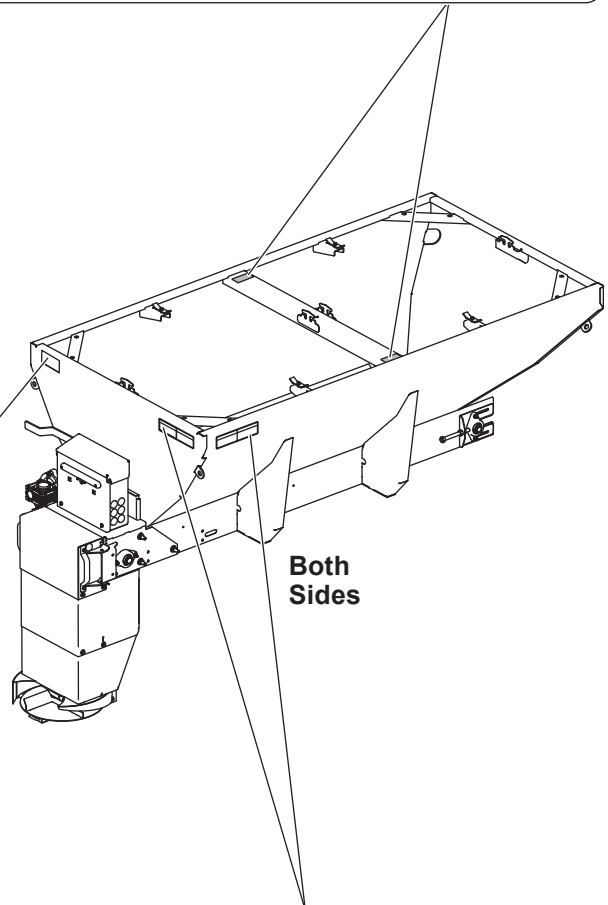
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Caution Label – Lifting

CAUTION

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

67272



Warning/Caution Label



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.

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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 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 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.

⚠ CAUTION

During the hopper spreader 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.
- 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.

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.

SAFETY

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/s² to the hand-arm or 0.5 m/s² to the whole body.

TORQUE CHART

⚠ CAUTION

Read instructions before assembling. Fasteners should be finger tight until instructed to tighten according to 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

This document covers vehicles that have been recommended for carrying the hopper spreader. Please see your local dealer for proper vehicle applications.

⚠ 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 Material Safety Data Sheet requirements.

MATERIAL WEIGHTS

Material	Density		
	(lb/ft ³)	(lb/yd ³)	(kg/m ³)
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.

CERTIFICATION

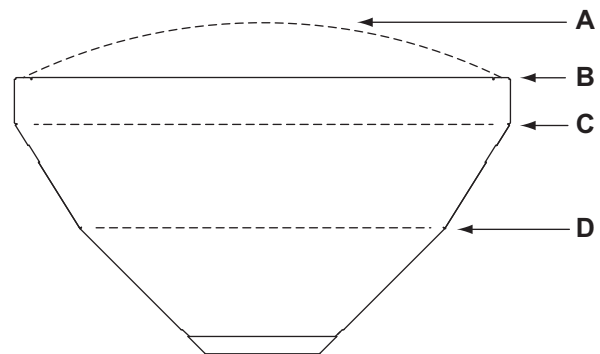
⚠ WARNING

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.

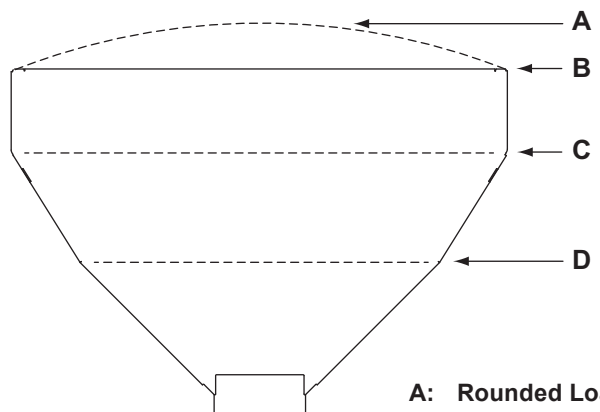
LOAD VOLUME

Hopper Model	Load Volume (yd ³)			
	A	B	C	D
7 ft (1.7 yd ³)	2.1	1.7	1.3	0.5
8 ft (2.0 yd ³)	2.4	1.9	1.5	0.6
9 ft (3.0 yd ³)	3.5	3.0	1.7	0.7
9 ft (4.5 yd ³)	4.8	4.2	3.4	1.5

7' Hopper



8' and 9' Hoppers



A: Rounded Load
B: Struck Load
C: Second Bump
D: First Bump

SPREADER SPECIFICATIONS

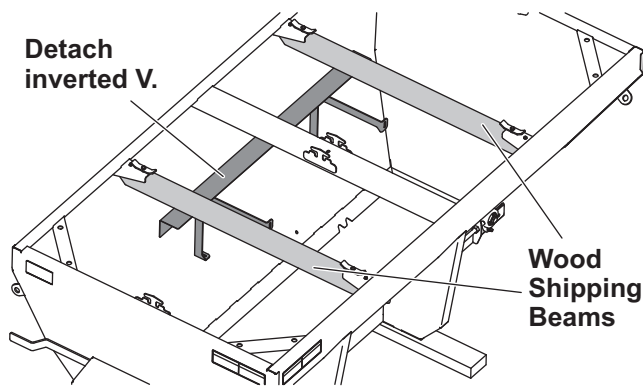
Hopper Model	Overall Length (in)	Bed Length (in)	Empty Weight (lb)	Overall Width (in)	Bed Height (in)	Capacity Struck (yd ³)
7 ft (1.7 yd ³)	106	86.5	640	50	37.5	1.7
8 ft (2.0 yd ³)	119	96	761	50	39.5	1.9
9 ft (3.0 yd ³)	149	108	846	50	40.6	3.0
9 ft (4.5 yd ³)	130	115	960	70	47	4.2

MOUNTING THE SPREADER

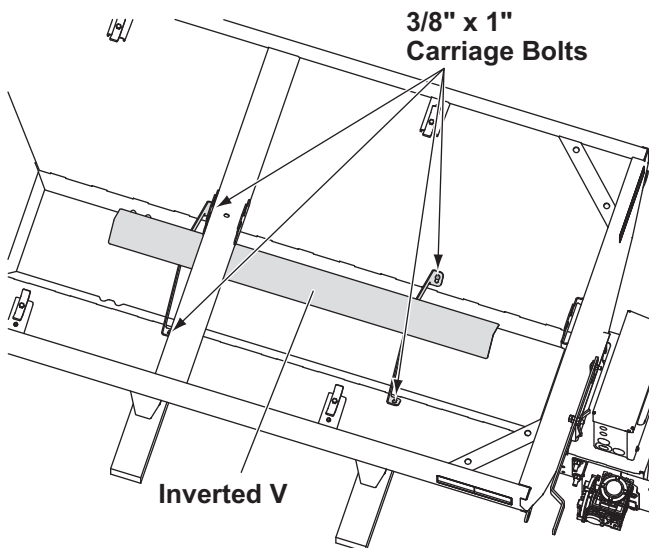
NOTE: Periodically throughout the snow and ice control season, verify that mounting devices are secure.

INSTALL INVERTED V

1. Unbolt the screen retention bolts. Remove the screens and set them aside.
2. Detach the inverted V from the wood shipping beams. Remove the wood shipping beams from the hopper.



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 70 pounds.
4. Align the holes in the legs of the inverted V with the holes in the hopper sides. Install the inverted V to the hopper using the supplied 3/8" x 1" carriage bolts, *inserting the bolts from the inside*.



INSTALL HOPPER IN TRUCK BED

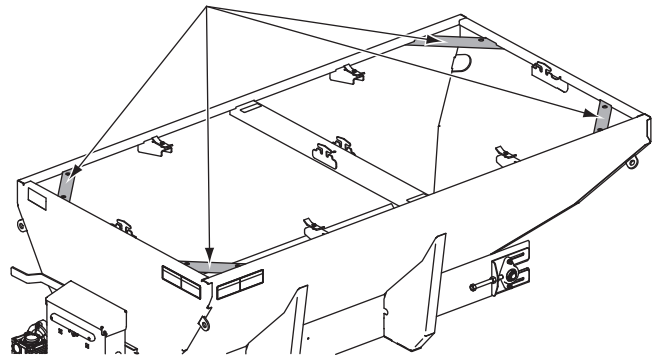
1. Remove the vehicle tailgate.
2. Remove the wood shipping rails from the hopper legs.

⚠ 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.

3. Lift the spreader by the four diagonal corner rails, using slings or chains. Move the spreader into the truck bed.

Use all four rails when lifting.



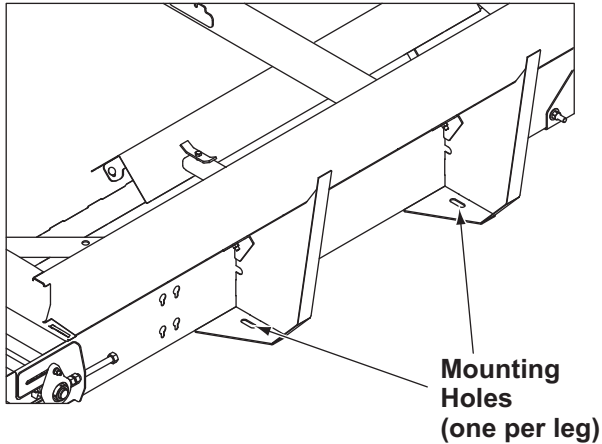
4. Center the spreader from side to side. Shift the spreader forward or backward to a position that will allow the chute, once installed, to overhang the rear of the truck and the bumper. With two people, trial-fit the chute to check for clearance.

MOUNTING THE SPREADER

⚠ CAUTION

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

- Using the holes in the four 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.

- 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.)

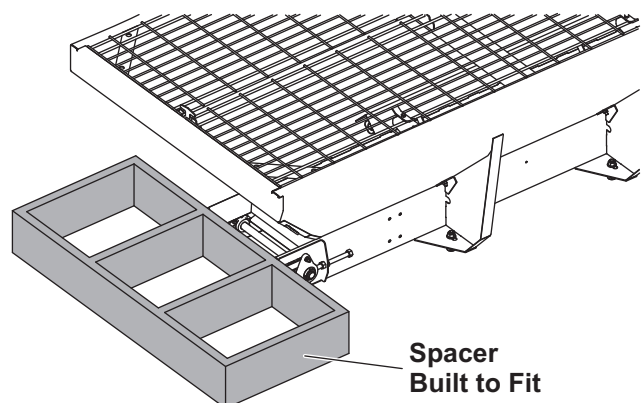
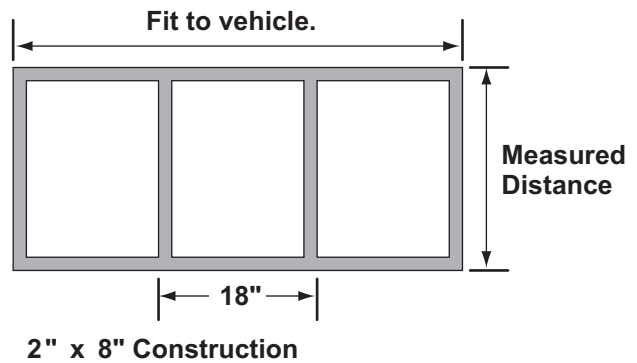
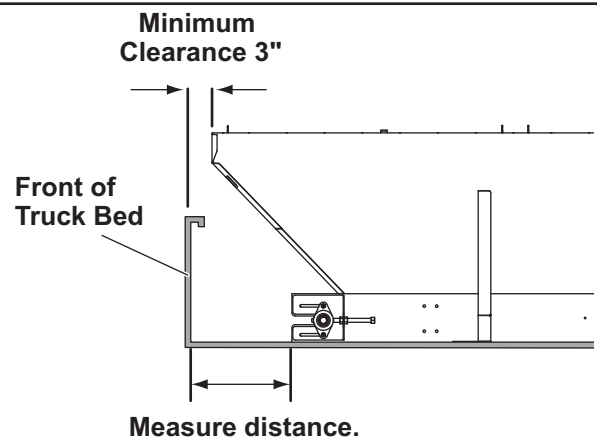
If the mounting holes are not directly over the truck box supports, the truck bed must be braced to the frame to prevent buckling or deforming the truck bed. Accessory mounting bars are available for installations that require additional bracing. Contact your authorized dealer.

- Remove the cable tie holding the wiring harness to the conveyor chain. Connect the vehicle-side harness to the hopper-side harness.
- Reinstall the top screens.

Construct Sill Spacer

Measure the distance from the front end of the hopper sill to the front of the truck bed and make a spacer from 2" x 8" lumber to fit that area.

IMPORTANT: Failure to install this spacer could result in damage to the spreader.



MOUNTING THE SPREADER

INSTALL CHUTE

The chute comes in two lengths.

- **7' and 8' Hoppers:** Short chute configuration is standard. The chute extends 14.75" below the truck bed and will fit most pickup trucks.
- **9' Hoppers:** Long chute configuration is standard. The chute extends 26.75" below the truck bed. Required for flat bed and dump truck installations.

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."

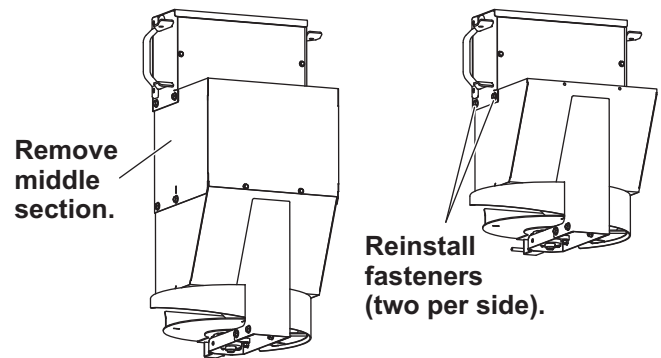
Changing Short Chute to Long Configuration

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

Changing Long Chute to Short Configuration

The chute must be separate from the spreader for this procedure.

1. Remove the six fasteners that attach the lower and middle chute sections and the four fasteners that attach the middle and upper sections. Remove the middle section.
2. Install the lower chute section to the upper section using the four upper fasteners removed in Step 1.



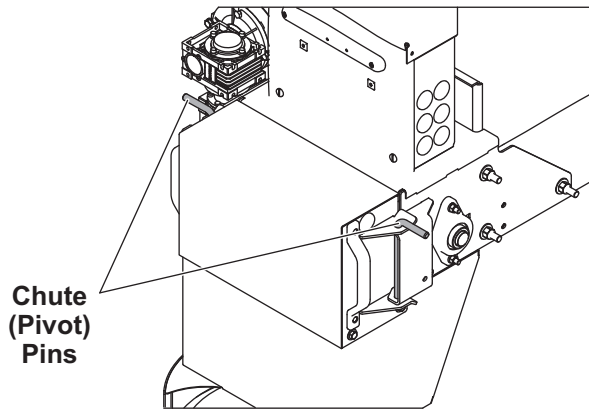
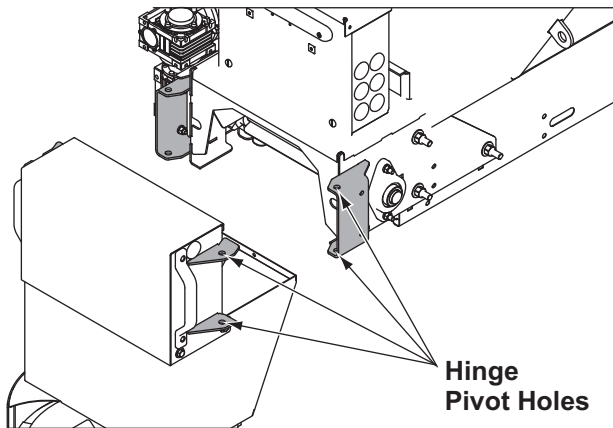
3. Remove the back cover of the upper chute section to access the spinner power cable. Loop up the excess length of the cable and secure it to the corner bracket using cable ties.

MOUNTING THE SPREADER

Install Chute to Spreader

Before installing the chute to the hopper, confirm that the spinner turns freely. If it does not, refer to "Spinner Belt Alignment" in the Final Adjustments section of these instructions.

1. Pick up the chute from each side and slide the chute-side hinges over the hopper-side hinges. Two people are recommended for this step.
2. Line up the hinge pivot holes. Insert a 1/2" x 8-1/4" chute pin on each side and secure with a 3/32" x 2-1/4" cotter pin.



3. Connect the chute motor plug to the hopper harness plug.

The chute can pivot on either pin to provide access to the feed area of the hopper. An interlock prevents the feed system from running when the chute is rotated to either side or removed.

INSTALL TIE-DOWN STRAPS

Install tie-down straps 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.

WIRING AND HARNESS INSTRUCTIONS

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, following the steps given below.
2. Install the cab control as described under "Cab Control Installation."

NOTE: Use dielectric grease on all electrical connections.

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.

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

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 truck bed to the vehicle battery. Make sure that the path avoids any hot, sharp, or moving parts of the truck. Routing will vary from truck to truck.
5. Route the vehicle battery cable as laid out in Step 4.
6. Using cable ties, secure the battery cable to the truck. 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.

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.

WIRING AND HARNESS INSTRUCTIONS

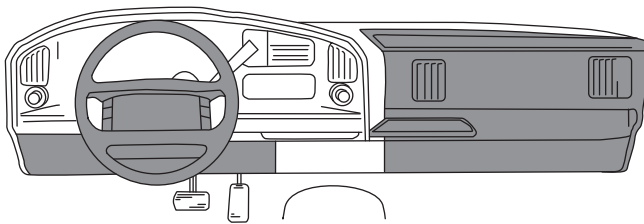
Vehicle Control Harness Installation

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

⚠ 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

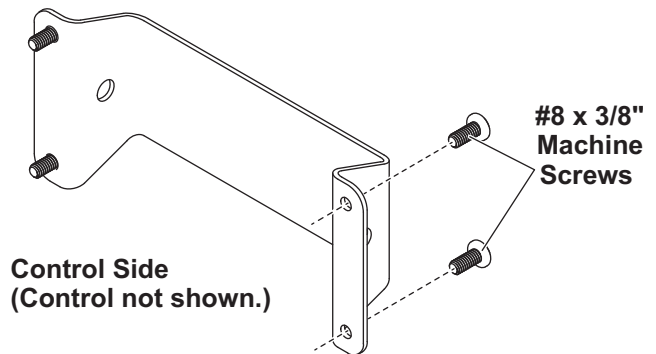
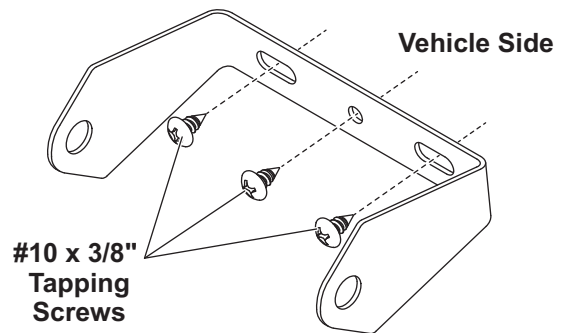
Before drilling any holes, check both sides of the material for any wires, fuel lines, fuel tanks, etc., that may be damaged by drilling.

4. Drill a 5/8" hole in the fire wall so the vehicle 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 truck.
8. Attach the red wire to a switched accessory circuit.

Cab Control Installation

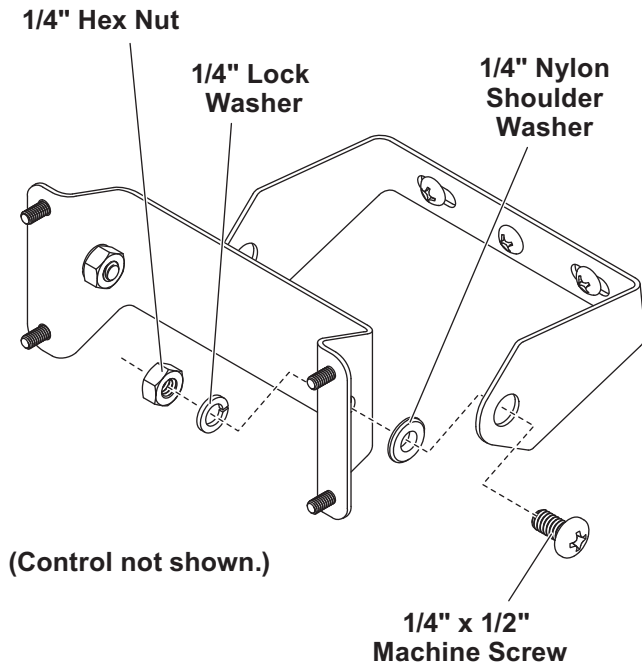
1. Confirm that the chosen cab control mounting position will not interfere with other equipment or allow unintentional starting of the spreader.
2. Install the vehicle side of the mounting bracket using three #10 x 3/8" Phillips head tapping screws.



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

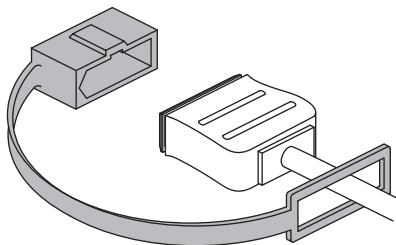
4. Install the control side of the bracket to the vehicle side using 1/4" x 1/2" Phillips head machine screws, 1/4" nylon shoulder washers, 1/4" lock washers, and 1/4" hex nuts.



5. 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 the wire into the vehicle tap.

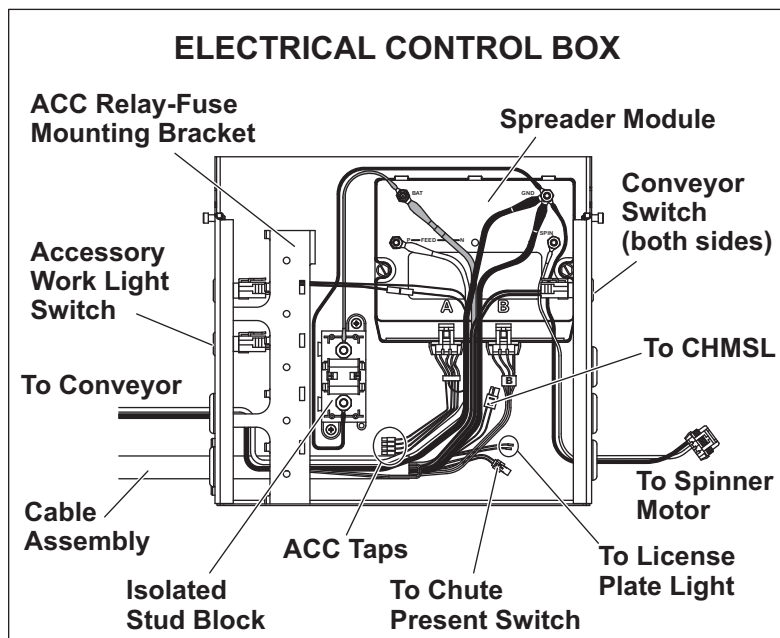
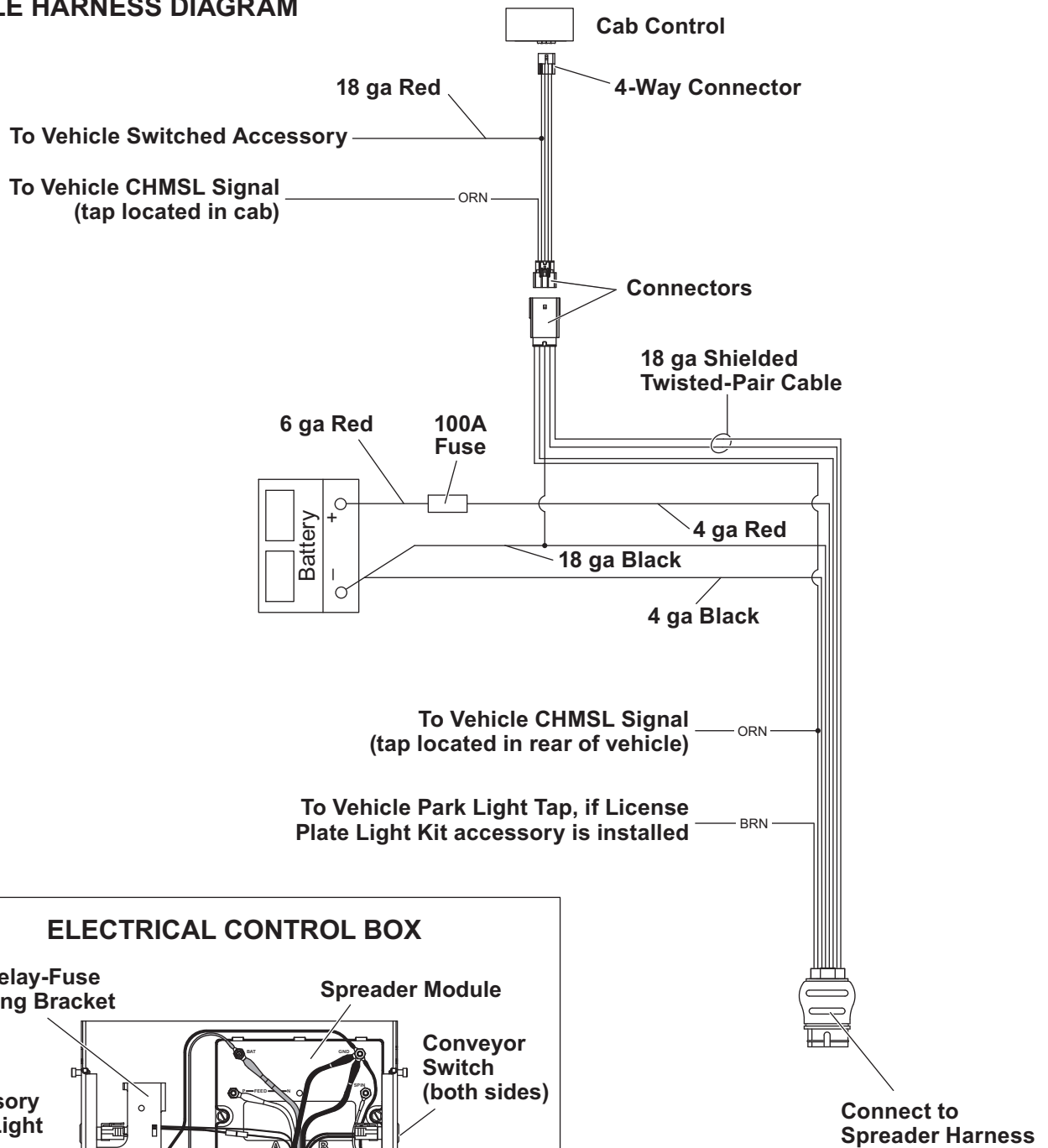
If the accessory License Plate Light Kit is not installed, coil and cable-tie the brown wire away from any hot, sharp, or moving parts.

ACCESSORY LICENSE PLATE LIGHT

To install the accessory License Plate Light, follow the instructions included with the kit.

ELECTRICAL COMPONENTS

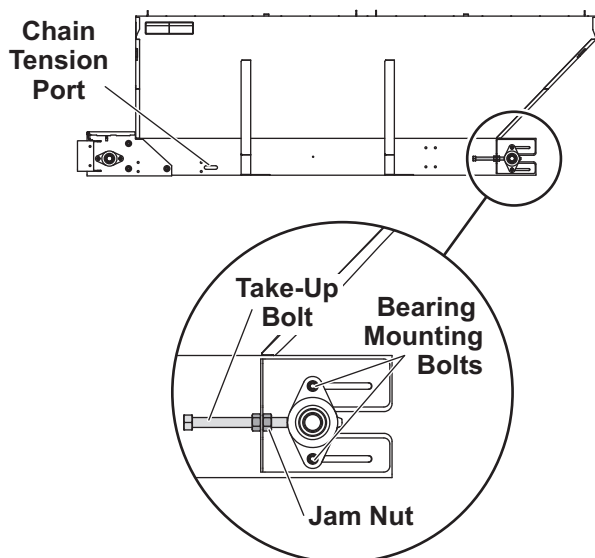
VEHICLE HARNESS DIAGRAM



FINAL ADJUSTMENTS

CONVEYOR PINTLE CHAIN TENSION

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.

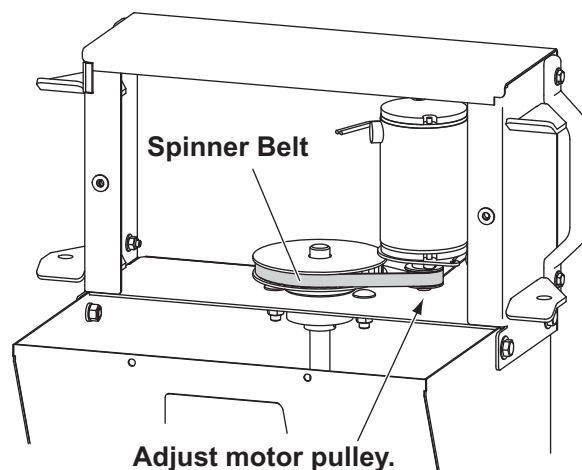
If Conveyor Chain Is Too Tight

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.

SPINNER BELT ALIGNMENT

If the spinner does not turn freely, check the spinner belt alignment. The chute must be separate from the hopper for this procedure.

1. Remove the back plate of the upper chute section.
2. Confirm that the spinner belt and pulleys are aligned and turn freely.
3. If the spinner belt alignment needs adjustment, loosen the set screw on the motor pulley and adjust the pulley up or down as required.



4. Retighten the set screw.
5. Reinstall the chute cover plate.

FINAL CHECKLIST

- Verify that the spinner turns freely.
- Verify correct conveyor pintle chain tension and alignment.
- 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 truck.



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Fisher Engineering 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. Fisher Engineering or the vehicle manufacturer may require or recommend optional equipment for spreaders. Do not exceed vehicle ratings with a spreader. Fisher Engineering 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: FISHER®, STEEL-CASTER™.

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