



Fisher Engineering

50 Gordon Drive, Rockland, Maine 04841-2139 • www.fisherplows.com

**99002-1, 99003-1, 99004-1
99006-1, 99007-1, 99008-1
99010-1 through 99018-1**

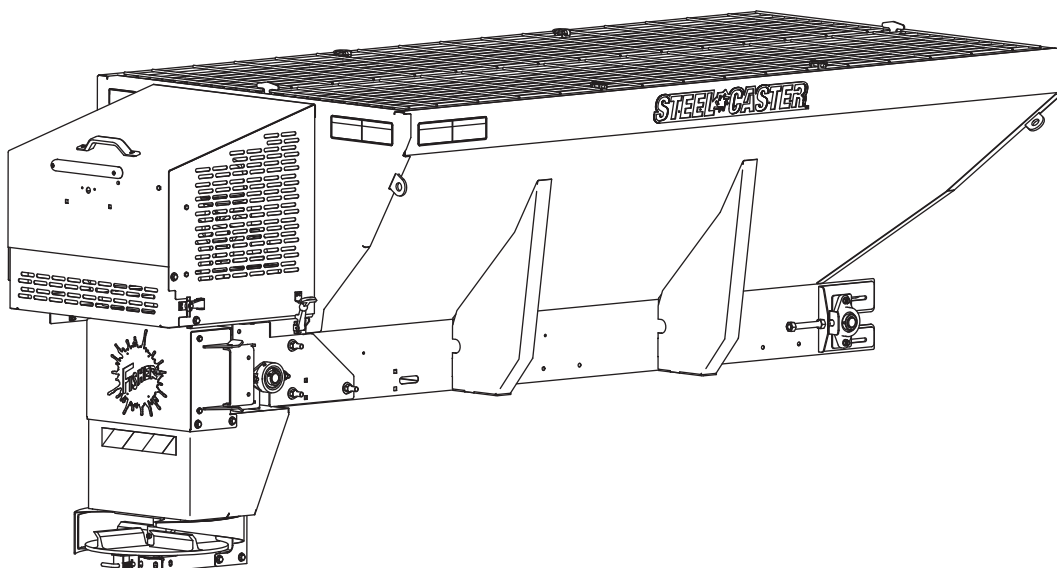
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STEEL-CASTER™

STEEL-CASTER™ Hopper Spreader

with Gasoline Engine or Dual Hydraulic Drive

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 170711 and higher.

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 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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Warning Label – Gasoline

WARNING

Gasoline is flammable.

- Turn off engine and allow it to cool before filling gas tank.
- DO NOT smoke or use open flame within 25 feet of spreader.
- Allow spilled gas to evaporate completely before starting engine.
- Gasoline engine produces poisonous gases while running. DO NOT operate in an enclosed area.
- Gasoline engine has hot and moving parts that can cause injury. Use care when working with or near the gasoline engine and its parts.
- DO NOT climb into or ride on spreader.
- Shut off engine when not in use, even for short periods of time, to avoid damage to equipment or property.

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WARNING/CAUTION LABELS

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

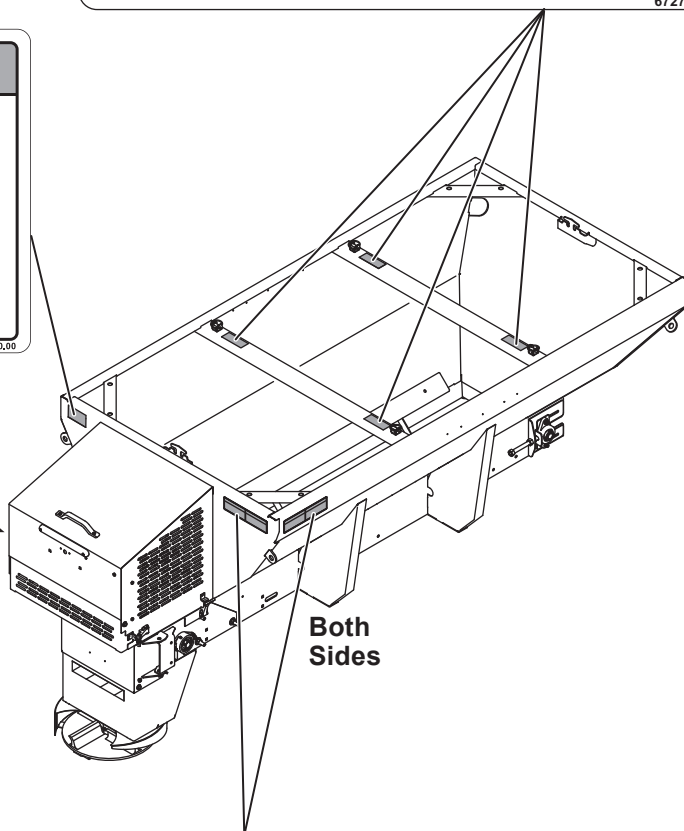
NOTE: If labels are missing or cannot be read, see your sales outlet.

Caution Label – Lifting

CAUTION

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

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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

Hydraulic fluid under pressure can cause skin injection injury. If you are injured by hydraulic fluid, get medical attention immediately.

⚠ 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.

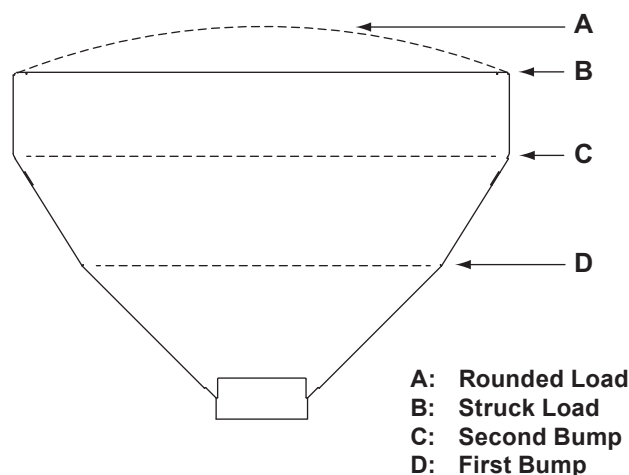
CERTIFICATION

⚠ 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
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
10 ft (4.5 yd ³)	5.3	4.5	3.7	1.4
10 ft (6.0 yd ³)	6.7	5.7	3.5	1.3



SPREADER SPECIFICATIONS

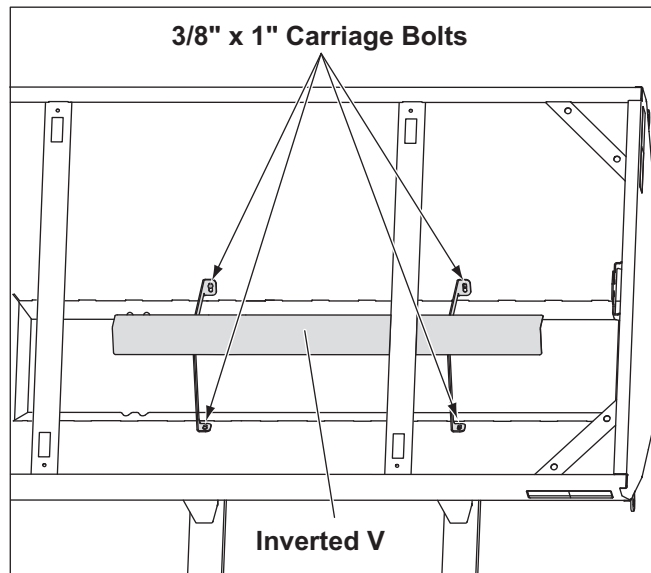
Hopper Model	Overall Length (in)	Bed Length (in)	Empty Weight (lb)	Overall Width (in)	Bed Height (in)	Capacity Struck (yd ³)
8 ft (2.0 yd ³)	119	96	761	50	39.5	1.9
9 ft (3.0 yd ³)	149	108	846	50	40.6	3.0
9 ft (4.5 yd ³)	130	115	960	70	47	4.2
10 ft (4.5 yd ³)	144	122	987	70	47	4.5
10 ft (6.0 yd ³)	147	125	1035	70	53.75	5.67

MOUNTING THE SPREADER

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

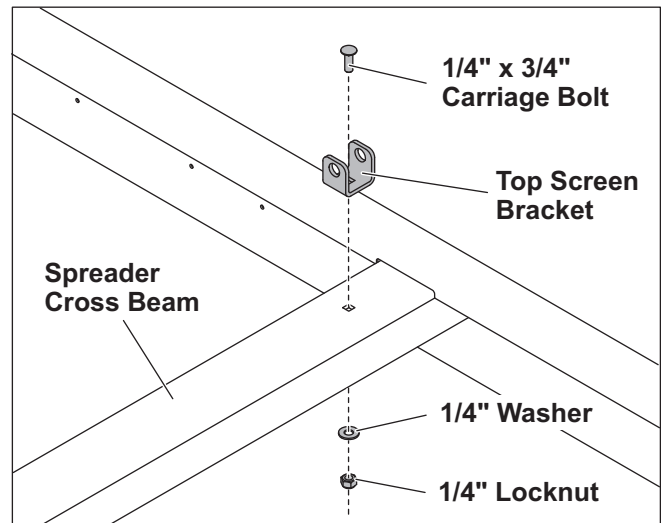
INSTALL INVERTED V

1. Remove and retain the linch pins securing the top screens. Remove the 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 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 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 linch pins supplied with the top screen brackets. The top screens and linch pins will be installed later.

MOUNTING THE SPREADER

INSTALL HOPPER IN TRUCK BED

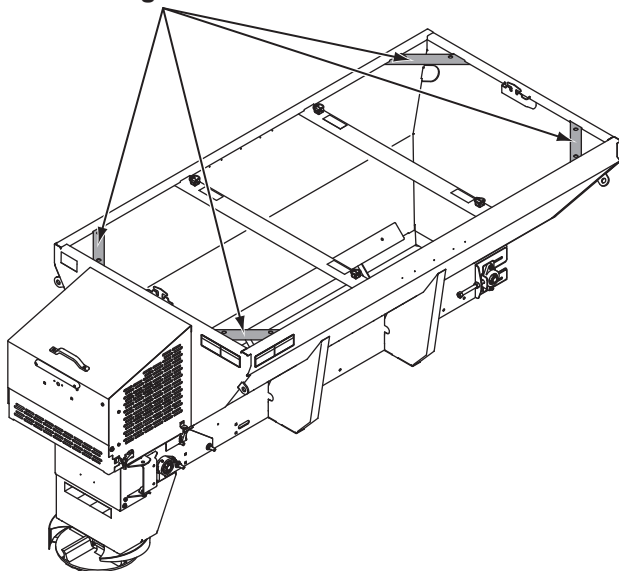
1. Remove the vehicle tailgate.
2. Remove the wood shipping rails from the hopper legs.

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

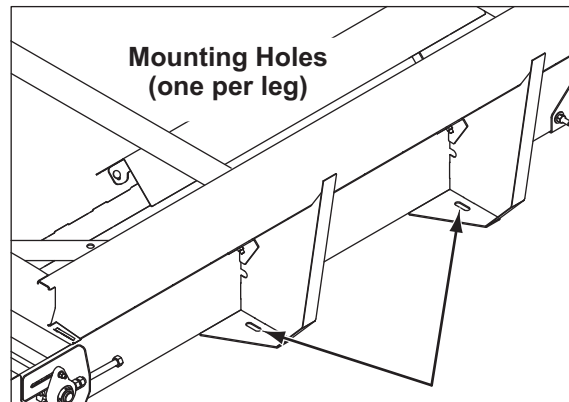
Use all four rails when lifting.



⚠ CAUTION

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

5. 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.

MOUNTING THE SPREADER

⚠ 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 the installer.)

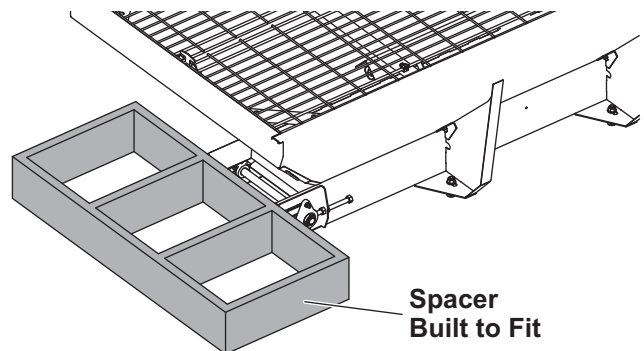
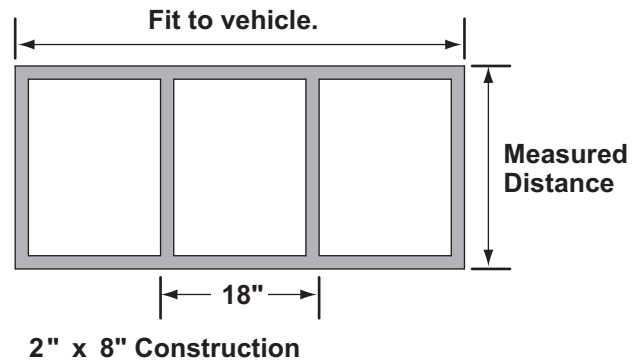
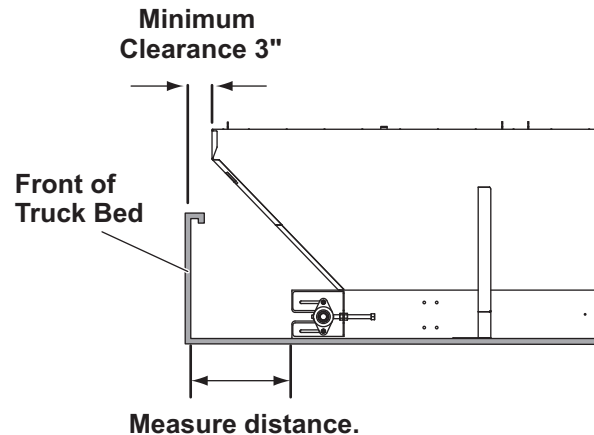
If the mounting holes are not directly over the truck box supports, the truck bed must be braced to the frame to prevent buckling or deforming the truck bed. Accessory mounting bars are available for installations that require additional bracing. Contact your authorized dealer.

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

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

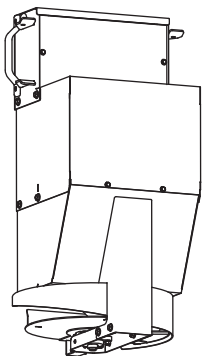
CHUTE INSTALLATION – GAS MODELS

Chute Length Adjustment

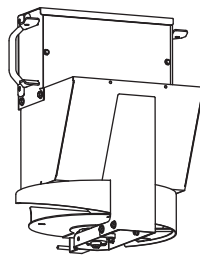
The material chute for hopper spreaders with gasoline engine comes in two lengths.

- **8' Hoppers:** Short chute configuration is standard. The chute extends 14.75" below the truck bed and will fit most pickup trucks.
- **9' and 10' Hoppers:** Long chute configuration is standard. The chute extends 26.75" below the truck bed. The long chute configuration is required for flat bed and dump truck installations.

Long Chute



Short Chute



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 chute length adjustment is required, go to "Install Chute to Spreader – Gas Models."

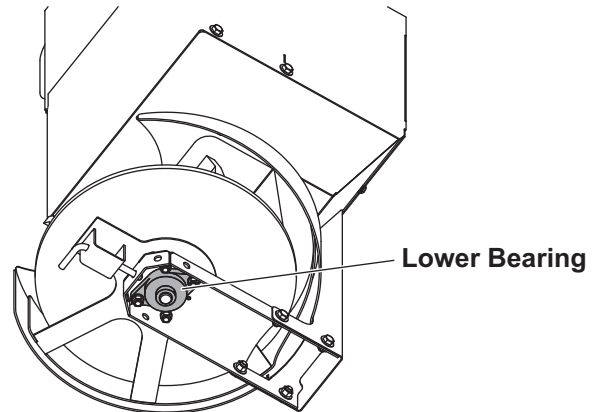
Changing Short Chute to Long Configuration

Extending a short chute requires installation of the Chute Extension Kit – Long, Gas (available from your authorized dealer).

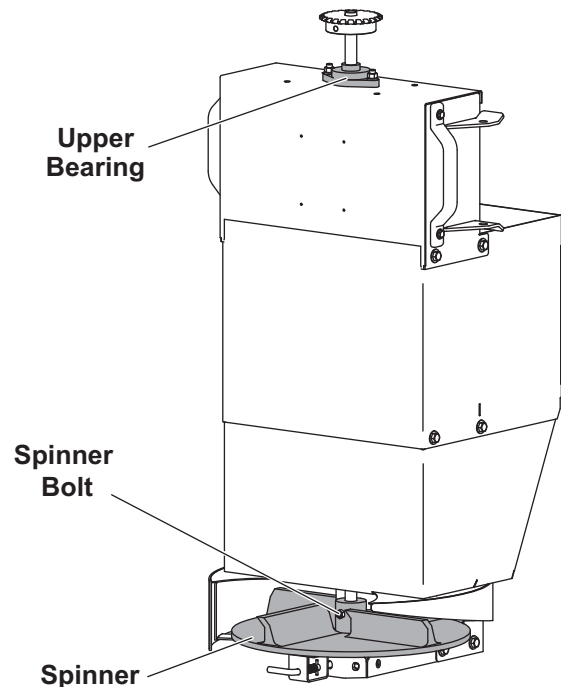
Changing Long Chute to Short Configuration

A short spinner shaft is shipped with the 9' and 10' hoppers so that the chute can be reconfigured if necessary. The chute must be separate from the hopper for this procedure.

1. Remove the long spinner shaft.
 - a. Loosen the set screws on the lower bearing collar.

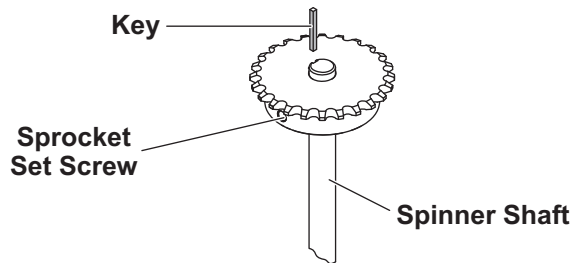


- b. Loosen the set screws on the upper bearing collar. Remove the spinner bolt. Set the bolt and spinner aside.

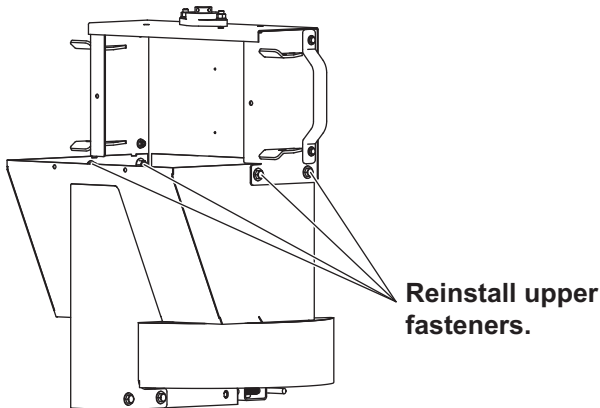


MOUNTING THE SPREADER

- c. Slide the spinner shaft out of the chute. Remove the sprocket and key from the top of the shaft by loosening the sprocket set screw.



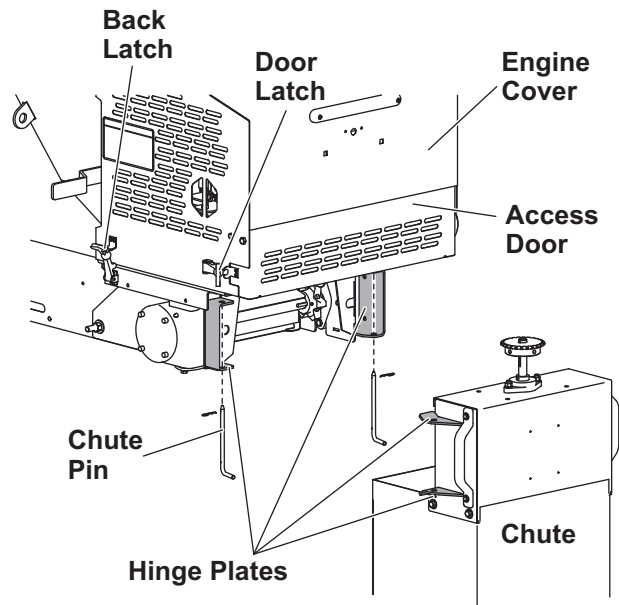
2. Shorten the chute.
 - a. Remove the six fasteners that attach the middle and lower sections of the chute and the four fasteners that attach the middle and upper sections. Remove the middle section.
 - b. Install the lower chute section to the upper section using the four upper fasteners removed in the previous step.



3. Install the short spinner shaft supplied with the hopper.
 - a. Install the sprocket and key to the short shaft. The top of the spinner shaft should be flush with the top face of the sprocket.
 - b. Feed the shaft through the top bearing, spinner, and lower bearing. Tighten the set screws on the upper and lower bearings.
 - c. Reinstall the spinner bolt and tighten the locknut.
 - d. Check that the spinner shaft spins freely.

Install Chute to Spreader – Gas Models

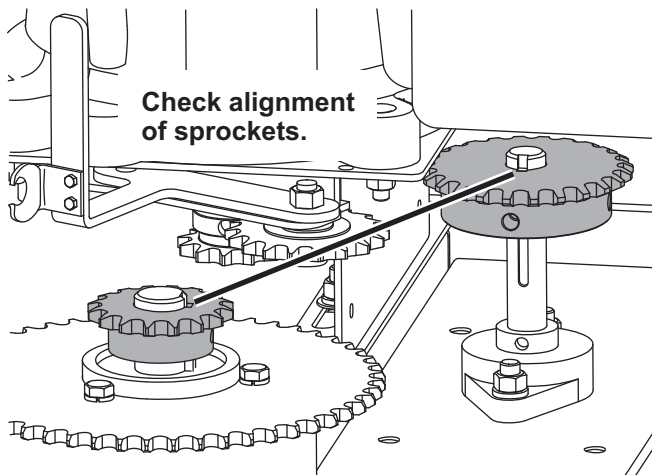
1. Unlatch the access door on both sides. Lift the door and slide it inward to hold it open.
2. Pick up the chute from each side and slide the chute-side hinge plates over the hopper-side hinge plates. Two people are recommended for this step.



3. Line up the hinge pivot holes. Insert a 1/2" x 8-1/4" chute pin on each side, with the passenger-side pin inserted from below. Secure the chute pins with 3/32" x 2-1/4" cotter pins.
4. Release both back latches and lift the engine cover.

MOUNTING THE SPREADER

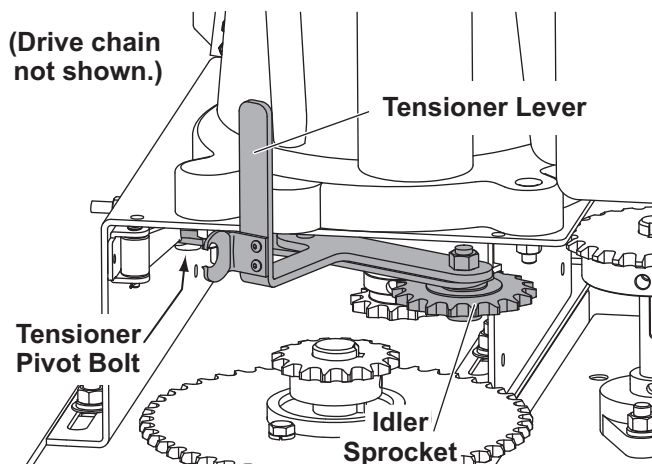
- Using a straight edge, check the alignment of the spinner shaft and spinner drive sprockets.



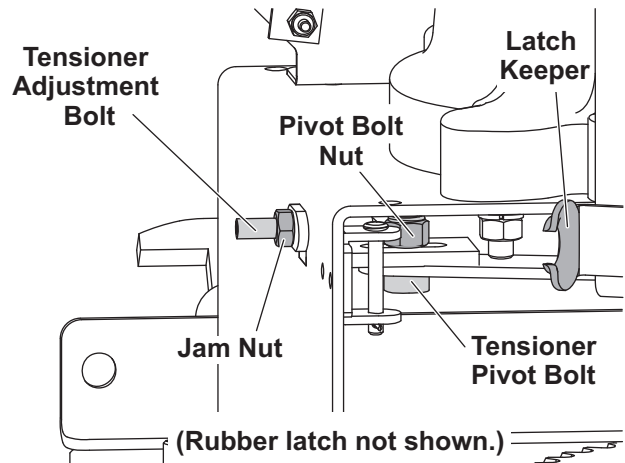
- To adjust sprocket alignment, loosen the spinner sprocket set screw, adjust the sprocket position up or down as required, and retighten the set screw.
- Install the drive chain over the spinner shaft and spinner drive sprockets.

Adjust Spinner Drive Chain Tension

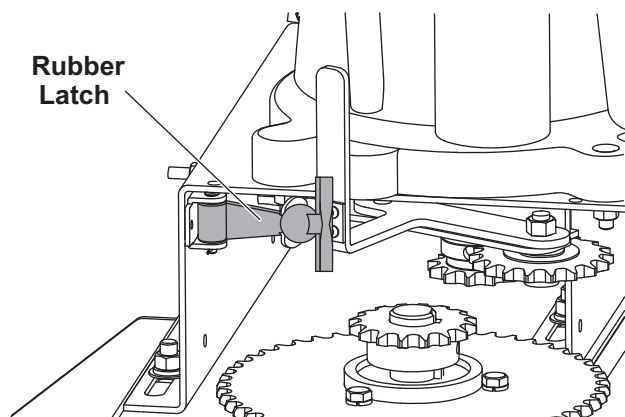
- Position the tensioner so that it is fully extended, with the idler sprocket engaged with the chute drive chain.
- Loosen the pivot bolt and nut.
- Slide the tensioner toward the chain until the chain is tight.
- Tighten the tensioner pivot bolt nut.



- Loosen the tensioner adjustment bolt jam nut and advance the adjustment bolt until it contacts the tensioner pivot bolt nut. This will keep the pivot bolt from moving.



- Tighten the tensioner adjustment bolt jam nut.
- Check the chain tension. Correct tension allows the chain to move 1/4" when pressed midway between the sprockets. To adjust the tension, repeat Steps 2–6 as required.
- Tighten the tensioner pivot bolt nut to 30 ft-lb. Tighten the tensioner adjustment bolt jam nut.
- Hook the rubber latch into the latch keeper on the tensioner lever.



- Close the engine cover and secure the back latches. Close and latch the access door.

MOUNTING THE SPREADER

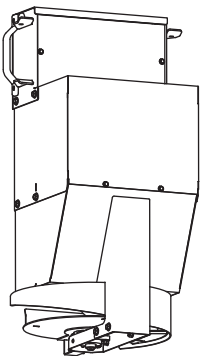
CHUTE INSTALLATION – HYDRAULIC MODELS

Chute Length Adjustment

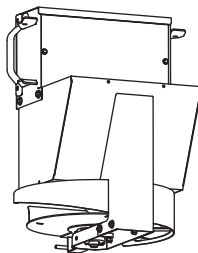
The material chute for hopper spreaders with hydraulic drive comes in two lengths.

- **8' Hoppers:** Short chute configuration is standard. The chute extends 14.75" below the truck bed and will fit most pickup trucks.
- **9' and 10' Hoppers:** Long chute configuration is standard. The chute extends 26.75" below the truck bed. The long chute configuration is required for flat bed and dump truck installations.

Long Chute



Short Chute



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 chute length adjustment is required, go to "Install Chute to Spreader – Hydraulic Models."

Changing Short Chute to Long Configuration

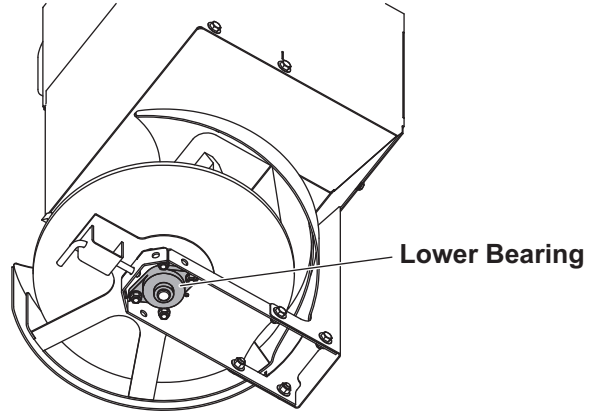
Extending a short chute requires installation of the Chute Extension Kit – Long, Hydraulic (available from your authorized dealer).

Changing Long Chute to Short Configuration

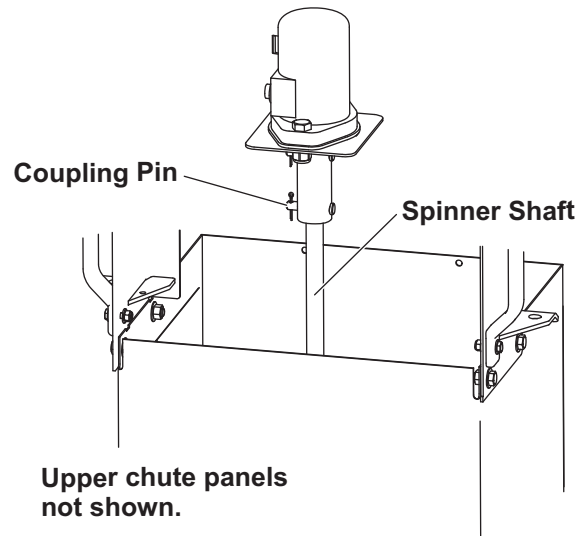
A short spinner shaft is shipped with the 9' and 10' hoppers so the chute can be reconfigured if necessary. The chute must be separate from the hopper for this procedure.

1. Remove the long spinner shaft.

- a. Loosen the lower bearing collar set screws.

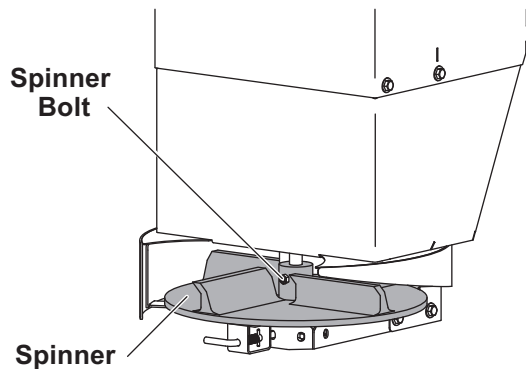


- b. Remove and retain the coupling pin from the top of the spinner shaft.



MOUNTING THE SPREADER

- c. Remove the spinner bolt. Set the bolt and spinner aside.



- d. Slide the shaft out of the chute. Remove the shaft from the hydraulic motor coupler.

2. Shorten the chute.

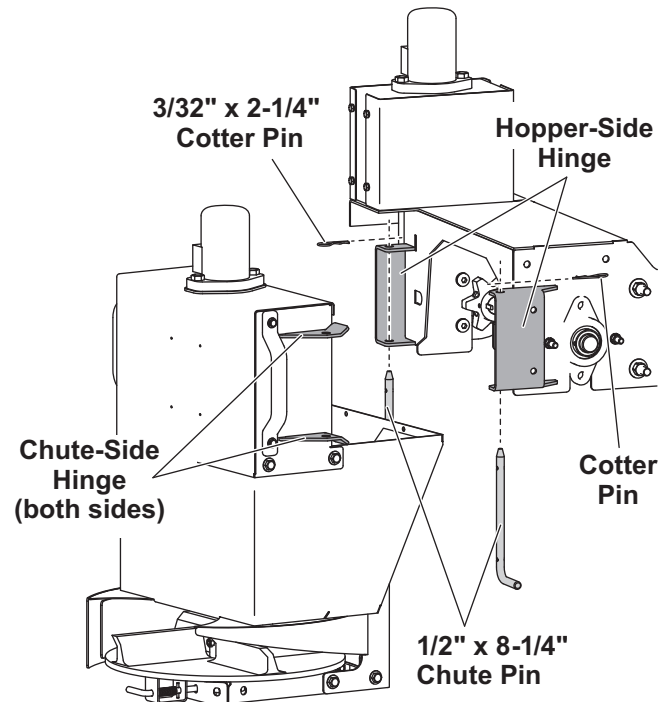
- a. Remove the six fasteners that attach the middle and lower sections of the chute and the four fasteners that attach the middle and upper sections. Remove the middle section.
- b. Install the lower chute section to the upper section using the four upper fasteners removed in the previous step.

3. Install the short spinner shaft.

- a. Feed the shaft through the spinner and lower bearing and into the hydraulic motor coupling joint. Pin the shaft to the coupling using the retained pin.
- b. Tighten the lower bearing set screws.
- c. Reinstall the spinner bolt.
- d. Confirm that the spinner shaft spins freely.

Install Chute to Spreader – Hydraulic Models

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 from below on each side and secure with a 3/32" x 2-1/4" cotter pin.



3. Once the chute is in place, install the hydraulic hoses.

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 – GAS MODELS

All spreaders are shipped from the factory with the spreader harness wired to the engine, clutch, and electric throttle.

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

1. Install either the Spreader Kit or Vehicle Battery Kit, following the instructions included with the kit.
2. Install the vehicle harness included with the spreader, following the steps given below.
3. Install the cab control according to the instructions included with the cab control.

NOTE: Use dielectric grease on all electrical connections.

Vehicle Control Harness Installation

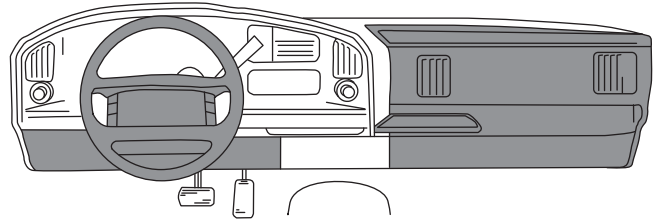
1. Plug the vehicle harness into the spreader harness.
2. Lay out a path for routing the vehicle control harness from its attachment point on the vehicle battery cable into the cab of the truck. Make sure that the path avoids any hot, sharp, or moving parts of the truck. Routing will vary from truck 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.



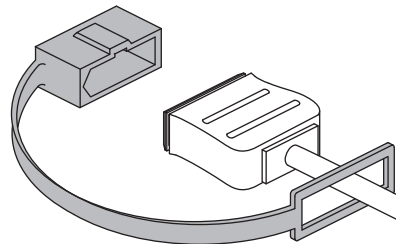
⚠ CAUTION

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 mounting 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. Use the red wire for the switched accessory circuit.

Harness Plug Cover

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



WIRING AND HARNESS INSTRUCTIONS

CENTER HIGH-MOUNTED STOPLIGHT (CHMSL) – GAS & HYDRAULIC MODELS

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

The orange wire from the 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.

Gas Engine Installations

1. Cut the tape holding the orange wire where it exits the convoluted tubing.
2. Pull out the orange wire to the location of the vehicle CHMSL tap. 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.

Hydraulic Drive Installations

1. Route the vehicle CHMSL/parking lights harness from the battery to the rear of the vehicle.
2. Attach the 5/16" ring terminal to the NEGATIVE (–) post of the battery.
3. Cable tie the harness away from any hot, sharp, or moving parts.
4. Tap the orange CHMSL wire into the vehicle's CHMSL circuit at either the rear or front of the vehicle.

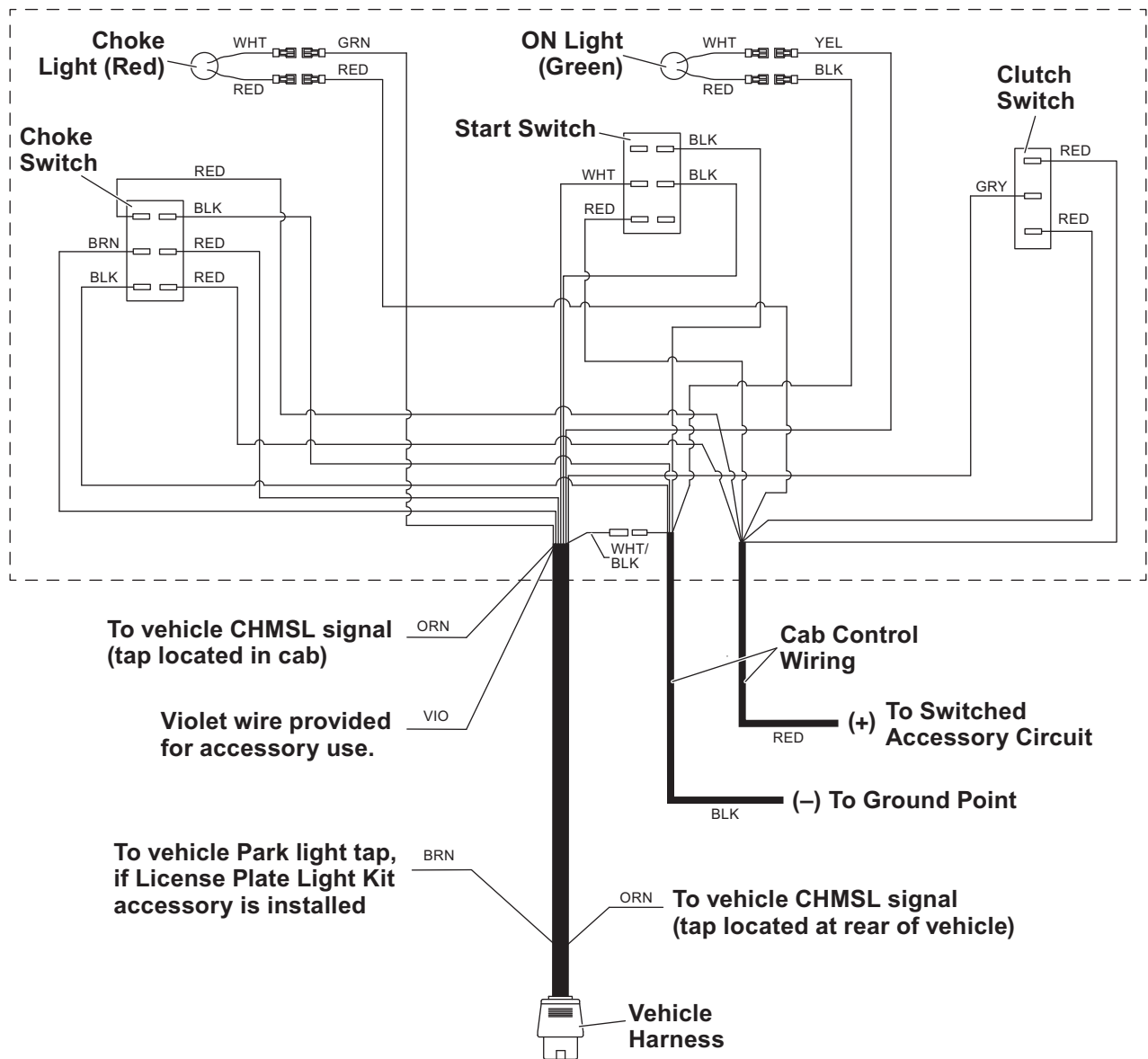
ACCESSORY LICENSE PLATE LIGHT

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.

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

VEHICLE HARNESS WIRING DIAGRAM

Gas Models



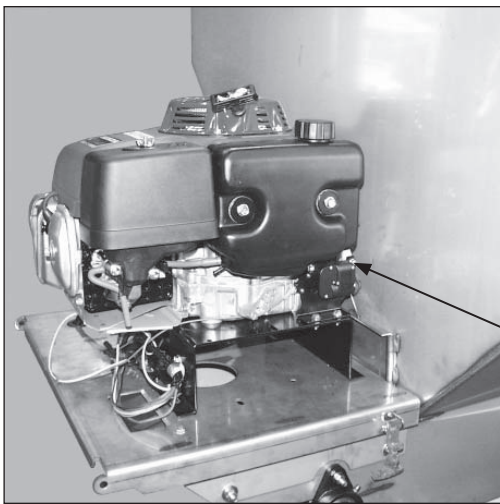
Dual Hydraulic Models:

A vehicle battery cable and CHMSL connection are provided.

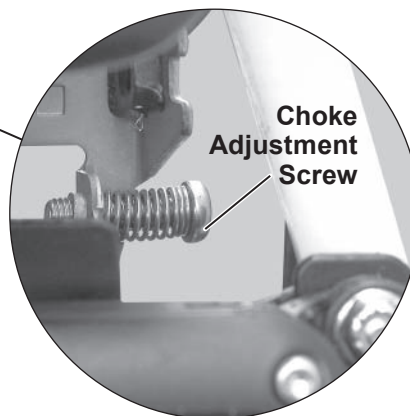
CHOKE ADJUSTMENT – GASOLINE ENGINE

CHOKE ADJUSTMENT (HONDA ENGINES ONLY)

1. Engines are shipped with choke adjusted to the completely closed position when the choke is engaged. The choke only requires adjusting if inspection reveals the choke is not fully closing.
2. Move the throttle control to full choke position.
3. Turn the choke adjustment screw counterclockwise five to seven turns.



4. Attempt to move the choke rod in the direction of the choke adjustment screw. **If the rod has no movement**, no adjustment is necessary.
5. Return the choke adjustment screw to its original position or clockwise until it touches the choke lever. **If the choke rod has movement**, bend the engaging tab in the direction away from the choke adjustment screw until there is no choke rod movement.
6. In the event that bending the tab fails to remove all choke rod movement, partially straighten out the bend in the choke rod. This bend is near the governor arm.
7. The choke adjustment screw, when properly adjusted, stops excessive force from being exerted on the choke actuator.



HYDRAULIC UNIT INSTALLATION

Hydraulic Unit Installation

Recommended installation sequence:

1. Install the pump (not provided).
2. Install the hydraulic reservoir.
3. Install the cab control valve (optional).
4. Install the hydraulic hoses (not provided).
5. Fill the reservoir and check the system.

Pump

Because of the wide range of possible installations for this hopper spreader, no pump is supplied with the unit. If your vehicle does not have a pump suitable to your application, one may be purchased from a local truck equipment supplier.

The pump should produce 9 gal/min at 1500 psi at normal operating speed and have 1" NPT suction and discharge ports.

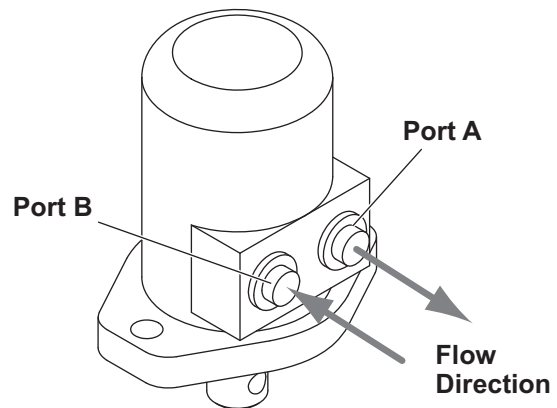
Hydraulic Reservoir Installation

Position the reservoir outlet as high as, or higher than, the pump inlet. Keep the hose distance as short as possible.

The reservoir should have a capacity of 1-1/2 to 2 times the pump maximum flow rate in gal/min.

Cab Control Valve Installation

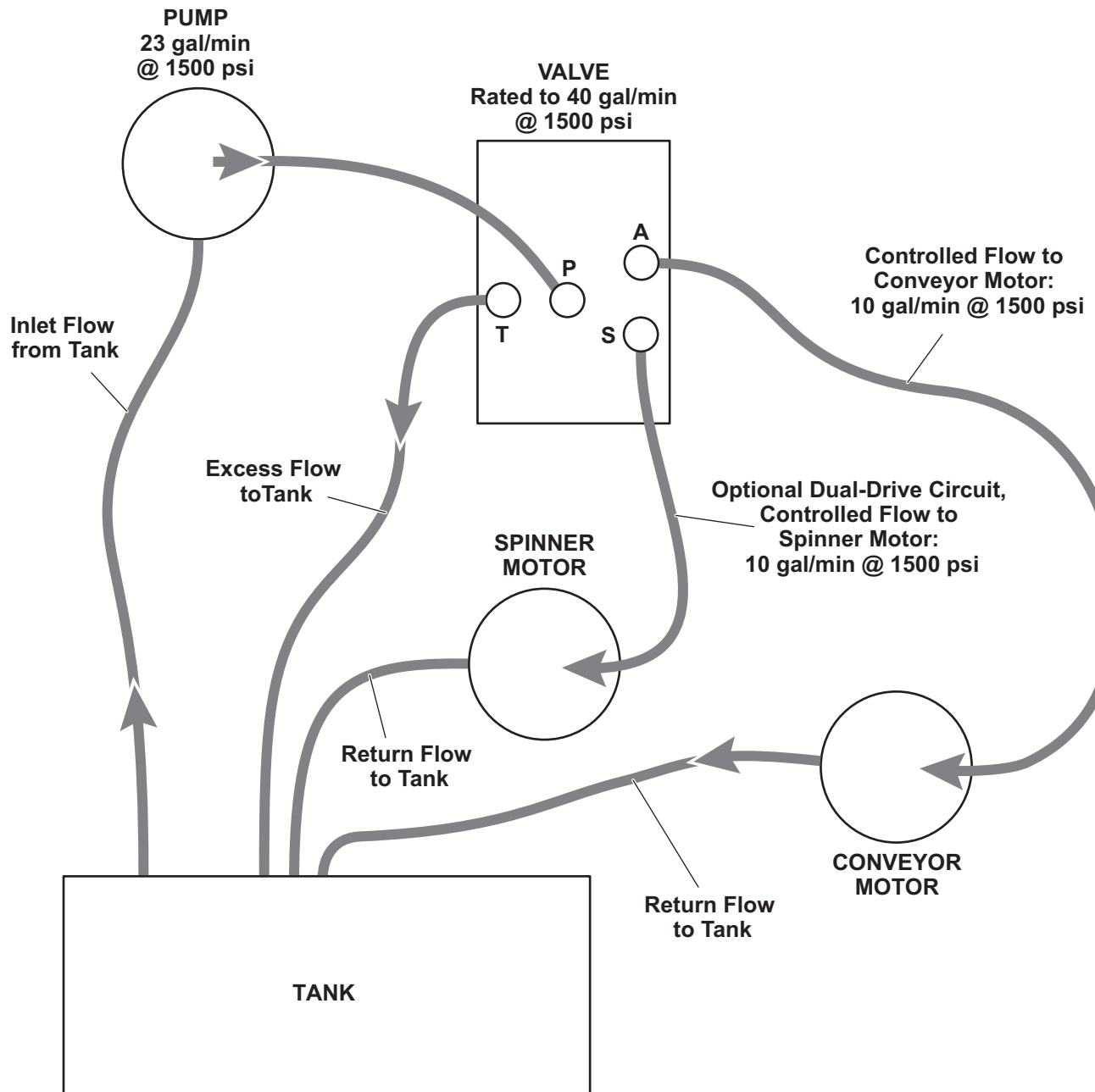
1. With the seat fully forward, select a suitable location to mount the cab control valve, allowing for the operator to adjust the control and to turn it ON and OFF.
2. Check for clearance with ALL controls in the cab.
3. Under the cab, check for interference with transmission, etc.
4. Check to see that the cab control valve location does not interfere with entering or leaving cab.
5. Fabricate a bracket to mount the cab control valve in the selected location.
6. Insert a grommet into each hole drilled for this installation.
7. Mount valve and plumb the pump and motor to the valve. Plumb Port "Auger" to Port "B" of the gear box motor, and Port "Spinner" to Port "B" of the spinner motor.



8. Confirm proper rotation of drive shafts. Spinner shaft should rotate clockwise. Check for hydraulic fluid leaks.

DUAL HYDRAULIC CIRCUIT DIAGRAM

Typical Hydraulic Circuit Dedicated Fixed Displacement Pump



FINAL ADJUSTMENTS

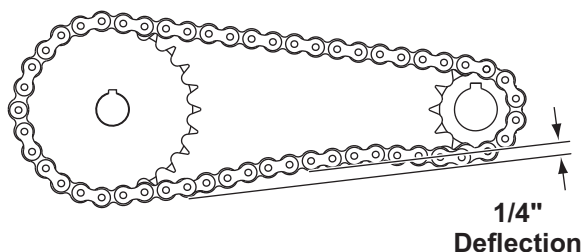
DRIVE CHAIN AND SPINNER CHAIN – GAS MODELS

- Verify that the drive sprocket set screws and the clutch sprocket mounting bolts are tight.

⚠ CAUTION

Overtightening the roller chains may damage the bearings on the gear case and the engine. Overtightening will also shorten the life of the roller chain and of the sprockets.

- Correct tension allows for 1/4" of deflection midway between the pulleys/sprockets.

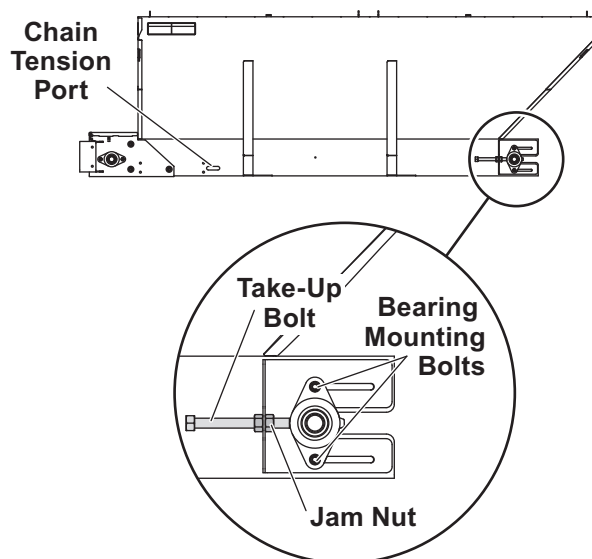


To increase engine chain tension: Loosen the four bolts that secure the engine mount to the engine base and pull the engine away from the clutch. After correct tension is achieved, retighten the engine mount bolts.

Spinner drive chain tension is maintained by the chain tensioner. Check the chain tensioner pivot point and lubricate as required for smooth tensioner movement. Full instructions on adjusting spinner drive chain tension are in the "Mounting the Spreader" section of these instructions. Under "Chute Installation – Gas Models" see "Adjust Spinner Drive Chain Tension."

CONVEYOR PINTLE CHAIN TENSION

Check the conveyor chain tension by confirming that 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

FINAL CHECKLIST

All Models

- ☐ Verify that the gear case oil level is level with the fill hole.
- ☐ Verify correct conveyor 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.

Gas Models

- ☐ Verify correct engine oil level. (See the engine manufacturer's owner's manual.)
- ☐ Verify correct engine-to-clutch sprocket alignment and chain tension.
- ☐ Verify correct clutch sprocket to spinner shaft sprocket alignment and spinner drive chain tension.
- ☐ Verify proper choke setting and choke light operation. For Honda engines, see the "Choke Adjustment" section of these instructions.

Hydraulic Models

- ☐ Verify correct shaft rotation for spinner and conveyor chain.



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