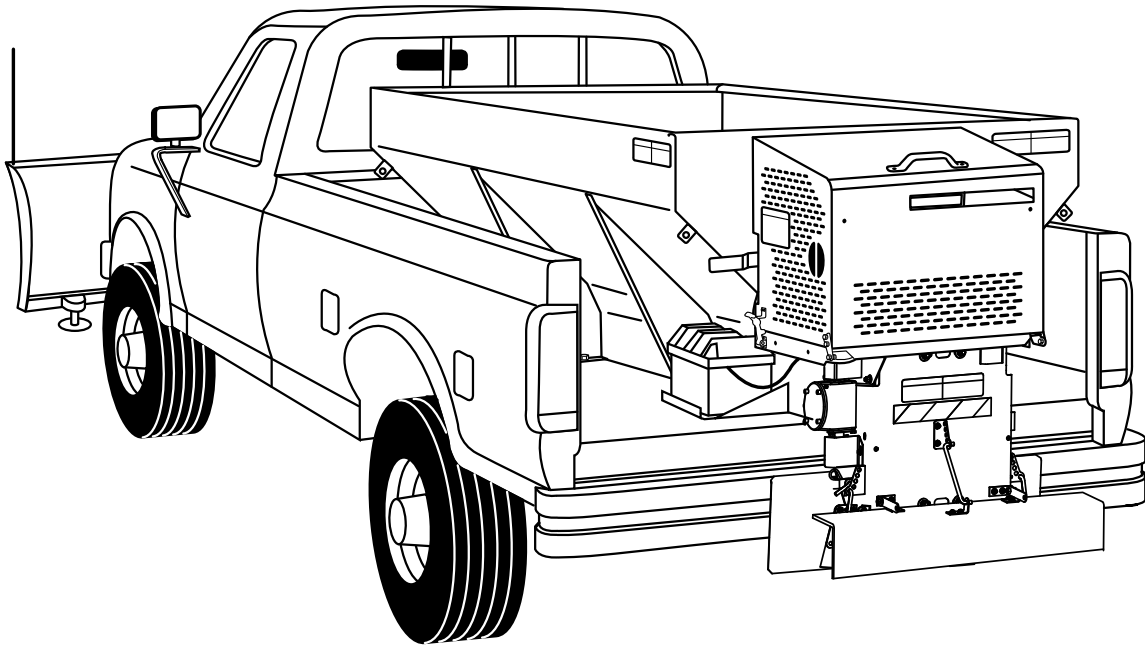




Regular and High Capacity ICE BREAKER™ Hopper Spreader Owner's Manual



⚠ CAUTION

Read this manual and engine owner's manual
before installing or operating the spreader.

This manual is for WESTERN® ICE BREAKER Hopper Spreaders with serial numbers
beginning with 0806 and higher.

This document supersedes all editions with an earlier date.

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PREFACE

This manual has been prepared to acquaint you with the safety information, operation and maintenance of your new hopper spreader. Please read this manual carefully and follow all recommendations. This will help ensure profitable and trouble-free operation of your hopper spreader. Keep this manual accessible. It is a handy reference in case minor service is required.

When service is necessary, bring your hopper spreader to your local outlet. They know your spreader best and are interested in your complete satisfaction.

NOTE: This spreader is designed to spread snow and ice control materials only. Do not use it for purposes other than those specified in this manual.

OWNER'S INFORMATION

Owner's Name: _____

Date Purchased: _____

Outlet Name: _____ Phone: _____

Outlet Address: _____

Vehicle Model: _____ Year: _____

Spreader Type (Model): _____ Serial #: _____

Length: _____ Weight: _____ lb/kg: _____

SAFETY INFORMATION

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 to 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.

SAFETY PRECAUTIONS

Park the vehicle on a level surface, place shift lever in PARK or NEUTRAL and set the parking brake. Turn OFF the engine and remove keys.

⚠ 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 all safety guards are in place.
- Before servicing the spreader, wait for conveyor or spinner to stop, then lock out power.
- 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 could cause skin injection injury. If you are injured by hydraulic fluid, get medical attention immediately.

⚠ 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.
- 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.

SAFETY INFORMATION

FUSES

The electrical system contains automotive blade-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 Replacement, including fuse ratings and locations, is located in the Maintenance Section of this Owner's Manual.

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

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

- Batteries contain sulfuric acid that 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.

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 (ft-lb)			
Size	 SAE Grade 2	 SAE Grade 5	 SAE Grade 8
1/4-20	6	9	13
5/16-18	11	18	28
3/8-16	19	31	46
3/8-24	24	46	68
7/16-14	30	50	75
1/2-13	45	75	115
9/16-12	66	110	165
5/8-11	93	150	225
3/4-10	150	250	370
7/8-9	150	378	591
1-8	220	583	893
Metric Grade 8.8 (ft-lb)			
Size	Torque	Size	Torque
M 6	7	M 12	60
M 8	17	M 14	95
M 10	35	M 16	155
These torque values apply to fasteners except those noted in the instruction.			

SAFETY INFORMATION

Gasoline Warning Label

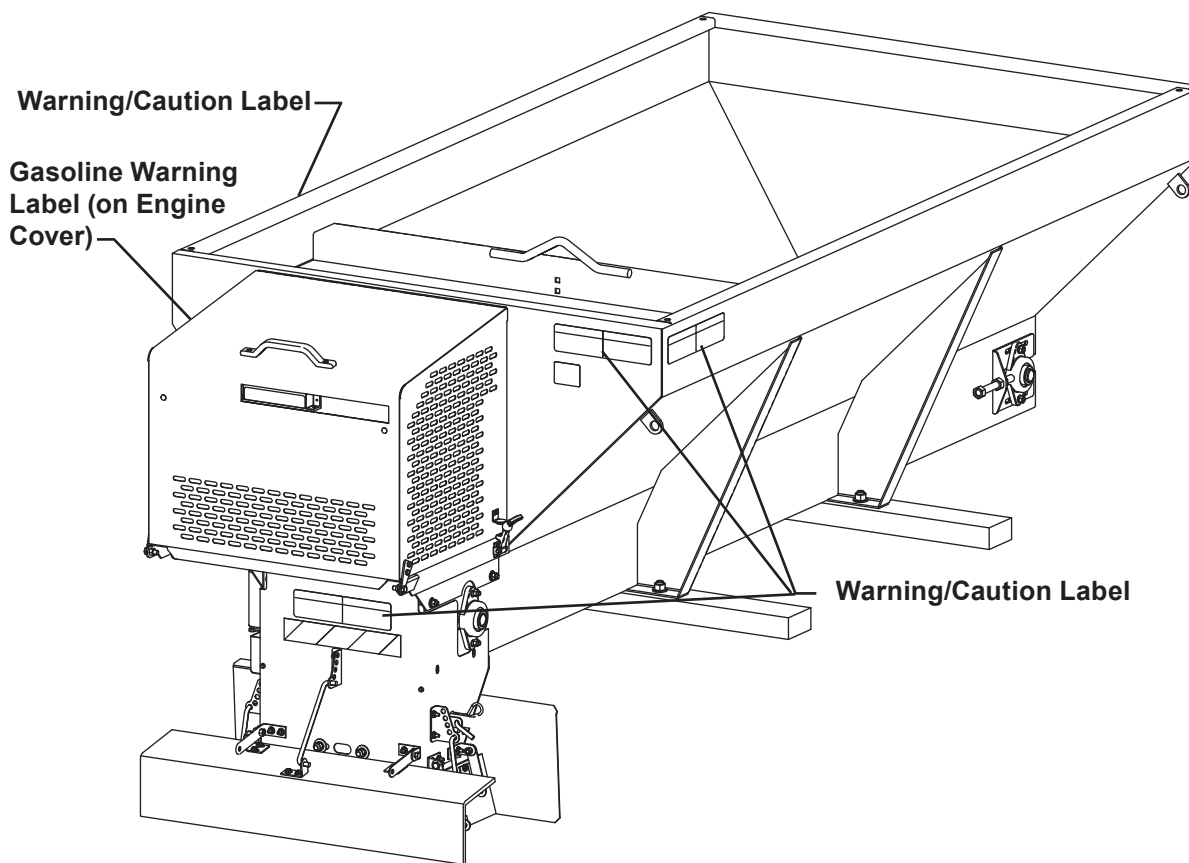
⚠ WARNING

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.
- Shut off engine when not in use, even for short periods of time, to avoid damage to equipment or property.

Please become familiar with the Warning and Caution labels on the spreader!

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



Warning/Caution Label

⚠ WARNING	⚠ CAUTION
<ul style="list-style-type: none"> • DO NOT EXCEED GVWR OR GAWR WITH SPREADER AND LOAD. • TURN OFF SPREADER 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, CLOTHING AWAY FROM MOVING CONVEYOR AND SPINNER. 	<ul style="list-style-type: none"> • READ OWNER'S MANUAL AND ENGINE MANUAL BEFORE OPERATING OR SERVICING SPREADER. • EMPTY AND CLEAN SPREADER AFTER EACH USE.

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LOADING

This manual covers vehicles which 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.

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.

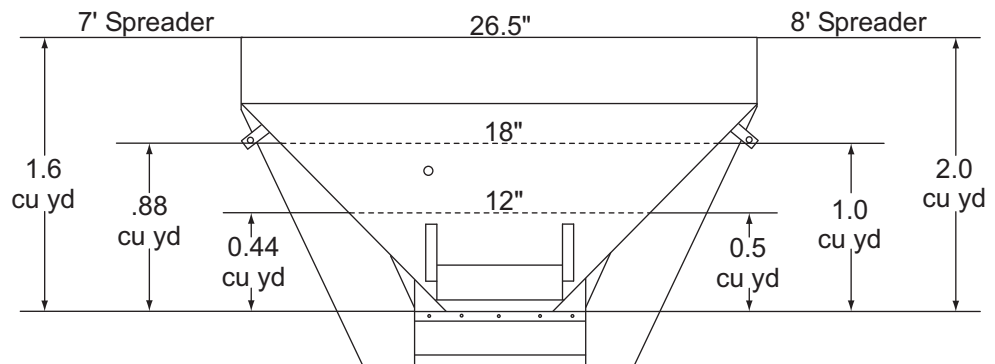
Material Weights

⚠ CAUTION

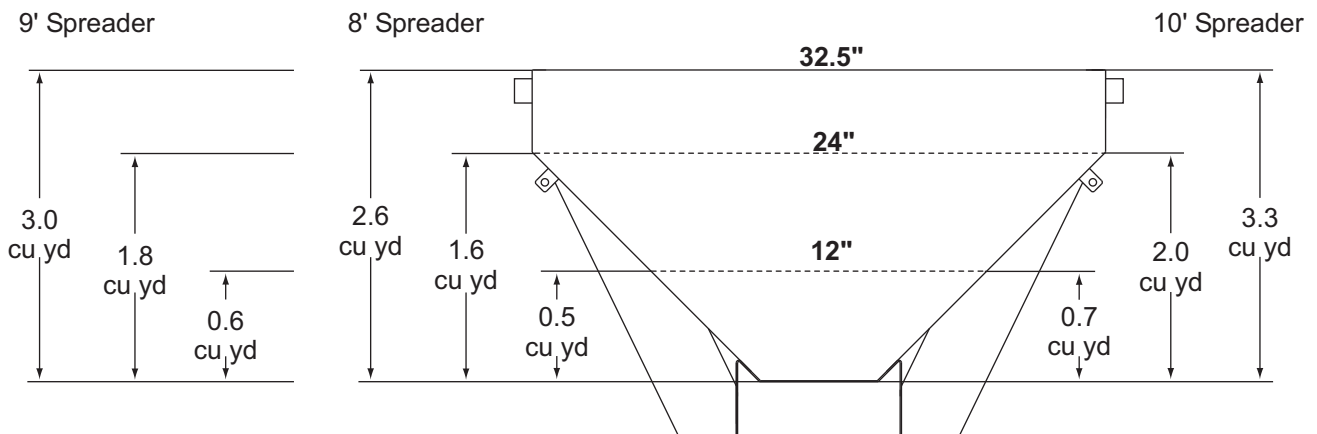
Read and adhere to manufacturer's ice control package labeling including Material Safety Data Sheet requirements.

Material	Density (lb per cubic yd)
Fine Salt – Dry	1,350
Coarse Salt – Dry	1,215
Coarse Sand – Dry	2,700
Coarse Sand – Wet	3,240
Cinders	1,080

Regular Capacity Load Volume



High Capacity Load Volume



LOADING

Spreader Specifications

Spreader Description	Overall Spreader Length (inches)	Empty Weight (lb) (No screen or battery)	Capacity Struck (cu yd)	Capacity Rounded (cu yd)	Overall Width (inches)	Overall Height (inches)	Recommended Use
Regular Capacity 7' Hopper Body 14 gauge Stainless Steel	104	600	1.7	2.2	50-3/4	32	3/4 or 1 Ton Pick-up Trucks above 8500 lb GVWR
Regular Capacity 7' Hopper Body 12 gauge Mild Steel	104	680	1.7	2.2	50-3/4	32	
Regular Capacity 8' Hopper Body 14 gauge Stainless Steel	116	660	2.0	2.5	50-3/4	32	3/4 or 1 Ton Pick-up Trucks above 8500 lb GVWR
Regular Capacity 8' Hopper Body 12 gauge Mild Steel	116	750	2.0	2.5	50-3/4	32	
High Capacity 8' Hopper Body 12 gauge Stainless Steel	116	830	2.6	3.2	58	37-1/2	Dump or Flat Bed Trucks Above 15,000 lb GVWR
High Capacity 9' Hopper Body 12 gauge Stainless Steel	128	890	3.0	3.7	58	37-1/2	
High Capacity 10' Hopper Body 12 gauge Stainless Steel	140	950	3.3	4.1	58	37-1/2	
High Capacity 8' Hopper Body 12 gauge Mild Steel	116	810	2.6	3.2	58	37-1/2	Dump or Flat Bed Trucks Above 15,000 lb GVWR
High Capacity 9' Hopper Body 12 gauge Mild Steel	128	870	3.0	3.7	58	37-1/2	
High Capacity 10' Hopper Body 12 gauge Mild Steel	140	930	3.3	4.1	58	37-1/2	
Regular Capacity – Hyd 8' Hopper Body 14 gauge Stainless Steel	116	510	2.0	2.5	50-3/4	32	3/4 or 1 Ton Pick-up Trucks Above 8500 lb GVWR
Regular Capacity – Hyd 8' Hopper Body 12 gauge Mild Steel	116	600	2.0	2.5	50-3/4	32	
High Capacity – Hyd 8' Hopper Body 12 gauge Stainless Steel	116	720	2.6	3.2	58	37-1/2	Dump or Flat Bed Trucks Above 15,000 lb GVWR
High Capacity – Hyd 10' Hopper Body 12 gauge Stainless Steel	140	840	3.3	4.1	58	37-1/2	
High Capacity – Hyd 8' Hopper Body 12 gauge Mild Steel	116	710	2.6	3.2	58	37-1/2	Dump or Flat Bed Trucks Above 15,000 lb GVWR
High Capacity – Hyd 10' Hopper Body 12 gauge Mild Steel	140	810	3.3	4.1	58	37-1/2	

LOADING

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 hopper spreader and optional equipment according to the 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 jam.
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/cu yd) of the desired material. Divide the weight into the payload to determine the maximum volume of material that can be carried.
7. Compare the maximum volume to determine the maximum height of the material in the hopper spreader.
8. Fill hopper with the material to the calculated height. Re-weigh vehicle with occupants and verify the GVW, Front Gross Axle Weight and Rear Gross Axle Weight are less than the vehicle's ratings.
9. Repeat steps 7 and 8 for each type of material.

Refer to "Determining Vehicle Payload" worksheet for an example and worksheet.

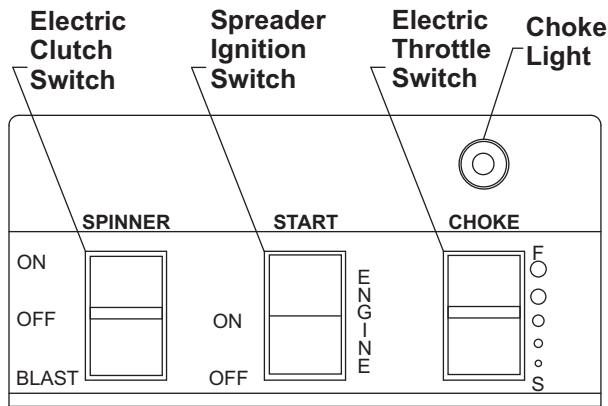
LOADING

Determining Vehicle Payload

Material Type	Example: Coarse Salt – Dry				
Equipment installed when vehicle was weighed	RC Mild Steel 8' Hopper Spreader				
Front Gross Axle Weight Rating (FGAWR)					
Rear Gross Axle Weight Rating (RGAWR)					
Gross Vehicle Weight Rating (GVWR) (lb)	8600				
Gross Vehicle Weight (lb) (empty)	- 6500				
Payload Available (lb)	= 2100				
Material Density (lb/cu yd)	÷ 1215				
Maximum Volume (cu yd)	= 1.73				
Maximum Height (approximate) (in)	24"				
Loaded Front Gross Axle Weight (FGAW) (lb)					
Loaded Rear Gross Axle Weight (RGAW) (lb)					
Loaded Gross Vehicle Weight (GVW)					

OPERATING THE SPREADER – CAB CONTROL

Cab Control Identification



NOTE: The conveyor and spinner will operate when the spinner switch is in the "ON" or "BLAST" position.

Engine Operation

Refer to above drawing as a reference for starting and stopping the engine.

Starting the Engine

⚠ CAUTION

Read Owner's and Engine Manual before operating or servicing spreader.

1. Turn the vehicle ignition switch to ON.
2. Verify the spinner switch is OFF.
3. Move the spreader ignition switch to START.
4. While the engine is cranking, move the throttle switch to CHOKE/FAST. (Choke light will come on when the choke begins to close. Hold in FAST for 1/2 second after light comes on.)
5. When the engine starts to fire, move the throttle switch towards the "SLOW" position. The engine will then start.
6. When the engine starts, release the ignition switch.
7. After the engine starts, move the throttle switch toward FAST to bring the engine up to maximum speed. Allow the engine to warm up to proper operating temperature before attempting to spread.

NOTE: Do not hold the throttle switch in the FAST position until the choke re-engages. The engine will not run with the choke 100% engaged. See Choke Adjustment Procedure for instructions for tuning the maximum choke point.

8. To control the engine speed:

- *Increase:* hold the throttle switch at CHOKE/FAST. Do not operate engine with choke light on.
- *Decrease:* hold the throttle switch at SLOW.

NOTE: If the engine does not start after 10 seconds of cranking, turn both vehicle and spreader ignition switches to OFF and see the engine manual that is shipped with the spreader.

NOTE: Maximum engine speed is obtained just prior to choking the engine.

Stopping the Engine

1. Move the throttle to SLOW and hold for two seconds.
2. Turn the spreader ignition switch to OFF.

⚠ CAUTION

When the engine will not be run for a period of 5 minutes or more, be sure to turn off the fuel supply valve, if the engine is equipped with a fuel shutoff. Refer to the engine Owner's Manual.

⚠ 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.

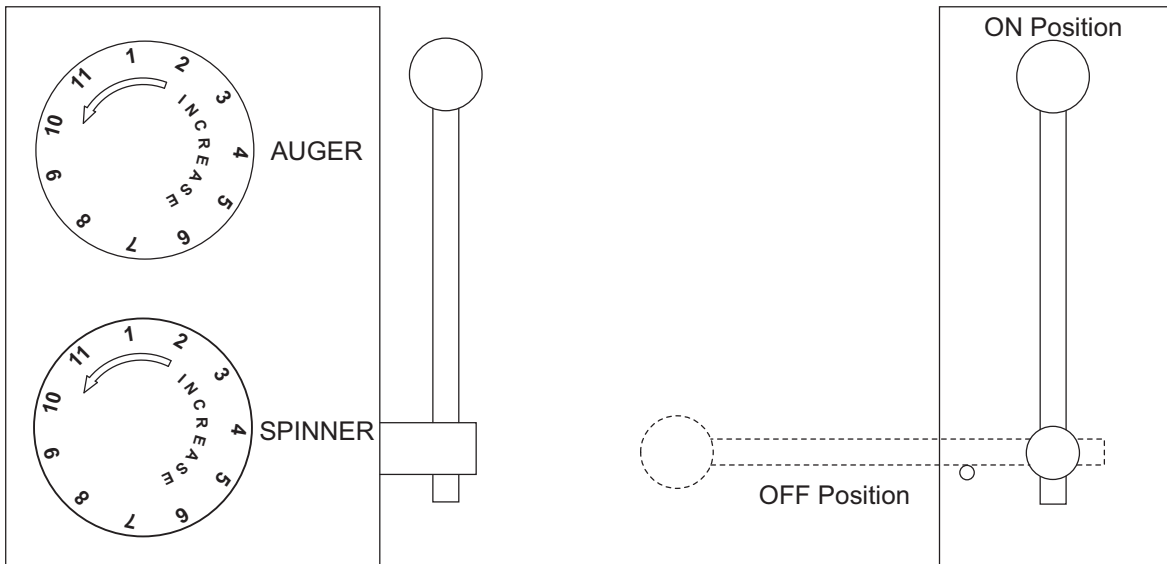
⚠ CAUTION

Do not attempt to free the chain by using a pipe wrench or any other tool on the output shaft of the gear case. The gear case is designed to accept torque from the input shaft only. Attempts to turn the output shaft will strip the gears and void any warranty.

OPERATING THE HYDRAULIC SPREADER – DUAL CAB CONTROL

Cab Control Identification

Typical Spreader Control Valve (Sold as an accessory)



⚠ 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 all safety guards are in place.
- Before servicing the spreader, wait for conveyor and spinner to stop, then lock out power.
- Do not climb into or ride on spreader.

⚠ 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 owner's manual.
- 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.

Operating the Cab Control

1. Engage the hydraulic system with the spreader lever in the "OFF" position.
2. To turn the spreader on, move the lever to the "ON" position. The spinner and conveyor should begin to turn.
3. The spinner and auger speeds are independently adjusted by rotating the detented adjustment knobs. The knobs can be adjusted either during operation or with lever in the "OFF" position. These speed settings will be maintained when the lever is placed in the "OFF" position.

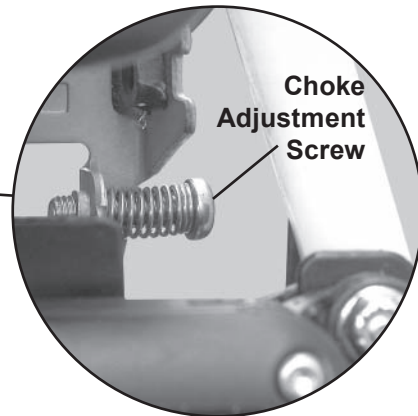
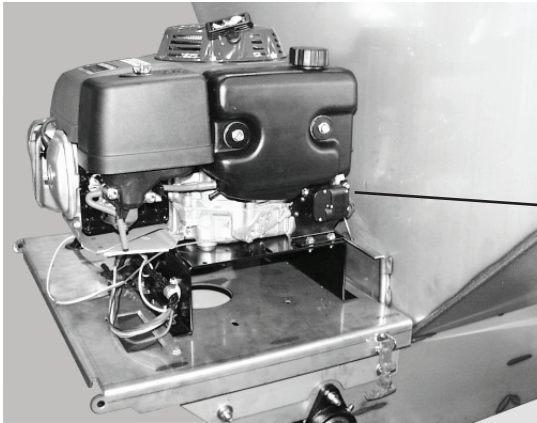
Clutch Operation (Gas Engine Only)

1. Start the engine.
2. Adjust the speed to slightly above idle.
3. Move the clutch switch to ON.
4. Increase the engine speed to the desired RPM.

OPERATING THE SPREADER

Honda Choke Adjustment Procedure

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 throttle control to full choke position.
3. Turn choke adjusting screw counterclockwise five to seven turns.
4. Attempt to move choke rod in the direction of the choke adjusting screw. If the rod has no movement, no adjustment is necessary.
5. Return the choke adjusting screw to its original position or clockwise until it touches choke lever.
6. If the choke rod has movement, bend engaging tab in the direction away from choke adjusting screw until there is no choke rod movement.
7. In the event 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.
8. The choke adjusting screw, when properly adjusted, stops excessive force from being exerted on the choke actuator.



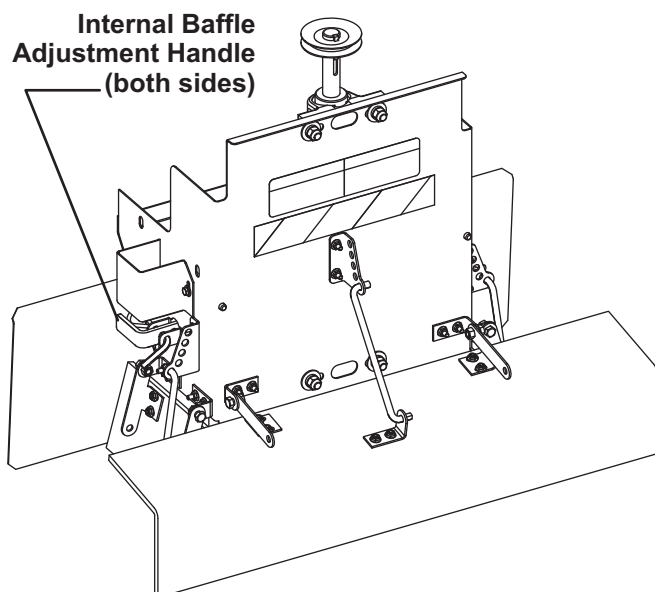
OPERATING THE SPREADER

Baffle Adjustment

Spread pattern and the amount of material dispensed depends on engine RPM, gate position and baffle settings.

- *Decreasing* RPM and/or gate-opening will *decrease* the amount of material coming to the spinner.
- *Increasing* RPM and/or gate-opening will *increase* the amount of material coming to the spinner.

Center Belt Drive Chute

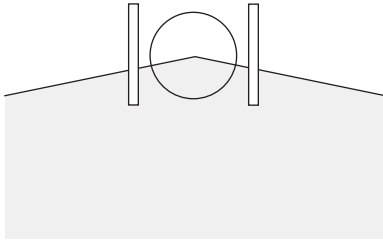


OPERATING THE SPREADER

Spread Patterns – Center Belt Drive

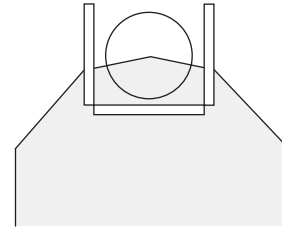
These figures are as viewed from the top of the spinner looking down.

Internal Baffles

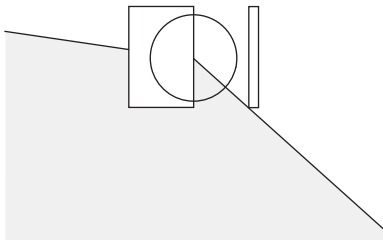


Both internal baffles out

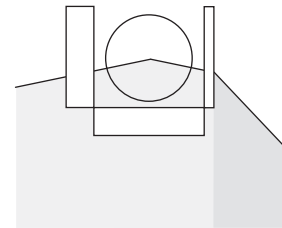
External Baffles



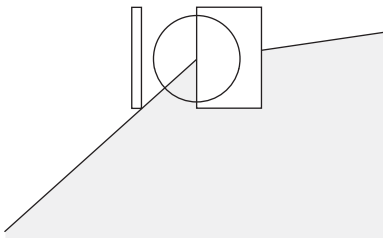
All baffles adjusted down for a confined spread pattern



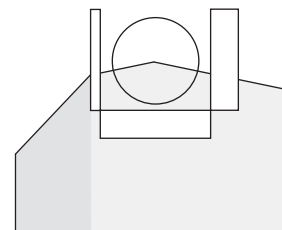
Driver-side baffle in, curb-side baffle out



Curb-side baffle deflects material down;
heavy on curb side



Driver-side baffle out, curb-side baffle in



Driver-side baffle deflects material down;
heavy on driver's side

MAINTENANCE

⚠ CAUTION

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

Grease

⚠ CAUTION

Over-greasing may cause seal damage. The gear case must be filled to the oil-level plug with Mobil SHC 632 or Exxon SHP 320 or equivalent synthetic gear-type lubricant. Keep the breather plug clean.

- Use dielectric grease on all electrical connections at the beginning and end of each season, and as required during the season.
- After every 10 hours of operation, grease the idler bearings on the idler shaft, flanged bearings on the drive shaft, and the spinner shaft bearings.
- After every 50 hours of operation, grease the input shaft bearing on the gear case and verify the oil level of the gear case is level with the fill hole.
- Change gear case oil once a year. Drain oil by removing the side cover of the gear case. Refill with Mobil SHC 632 or Exxon SHP 320 or equivalent synthetic gear oil. Oil level should be even with the bottom of the fill hole.

Gear Oil Specification

Use Mobil SHC 632 or Exxon SHP 320 or equivalent.

Drive Chain, Spinner Belt and Conveyor Chain Tension

- At the beginning of each season, and once a month during the season, verify the drive sprocket set screws and the clutch sprocket mounting bolts are tight.
- Visually inspect the drive chain for wear. If chain is worn, replace the chain.
- Visually inspect spinner belt for cracks and wear. If belt is cracked or worn, replace the belt.
- Maintain correct belt and chain tension. Correct tension allows for 1/4"–5/16" of deflection midway between the pulleys/sprockets.

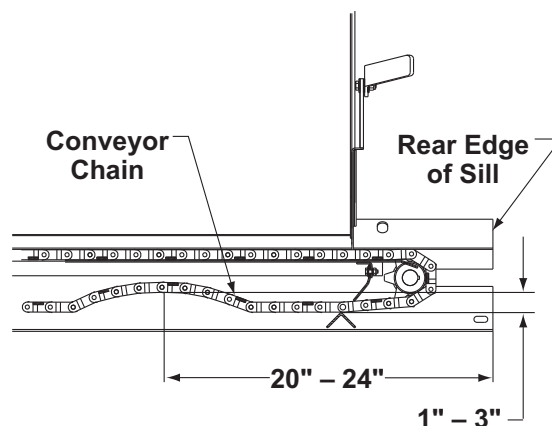
⚠ CAUTION

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.

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.

To increase spinner belt tension: Loosen spinner bearing bolts, and pull shaft assembly away from the clutch. After correct tension is achieved, retighten the bearing bolts.

- Periodically check the conveyor chain tension. To check the tension, measure in 20"–24" from the rear edge of the sills. Push up on the chain with your hand. The conveyor chain should lift up 1"–3" off the conveyor chain guide or cross angles.



MAINTENANCE

- Use the two 5/8" x 6" take-up bolts at the front of the spreader to adjust the conveyor chain tension. Loosen the locknuts before attempting to adjust the take-up bolts. Turn both sides equal amounts to ensure the tension is equally distributed across both sides of the conveyor chain.
- Always empty the spreader when it is not in use to prevent a frozen conveyor chain.

Electric Clutch

To minimize problems and extend the life of the electric clutch, do the following:

- At the end of each snow season, remove and clean the clutch.
- After cleaning the clutch, coat both mating surfaces of the clutch with oil or light grease.
- Remove oil and grease prior to using the clutch again.

Engine Service and Repair

Maintain the spreader engine according to the engine Owner's Manual that is shipped with the spreader. Engine warranty is covered by the engine manufacturer and is described in the engine manual.

If service or repair is needed, contact an authorized engine manufacturer service center. To serve you promptly, the service center will need the make, model, type and code number for your engine.

Your nearest service center is listed in the "Yellow Pages" under "Engines, Gasoline" or "Gasoline Engines."

MAINTENANCE

Hydraulic Hopper Spreaders

1. Check hydraulic fluid level before every use. Add fluid as required.
 2. Periodically inspect the hoses and fittings for damage and possible leaks.
 3. Change the hydraulic fluid after the first 50 hours of operation of a new unit.
 4. Reservoir should be drained through the drain plug only, NOT through the suction outlet.
- Flush and refill reservoir annually, or sooner if fluid shows signs of break-down or contamination.
 - The use of proper hydraulic fluid in the system is critical to satisfactory performance. Only clean, new hydraulic fluid, of the proper type and viscosity as recommended by the pump manufacturer, should be used.
 - Keep all hydraulic fluids in original containers. Use only clean measuring containers and funnels when pouring fluids. Keep all containers closed when not in use.

To keep your spreader functioning properly, observe the following recommendations:

After each use:

- Wash out hopper and rinse off all external surfaces.
- Apply dielectric grease to all electrical connections to prevent corrosion.
- Lubricate all grease fittings. Use a good quality multi-purpose grease.
- Oil drive chain.

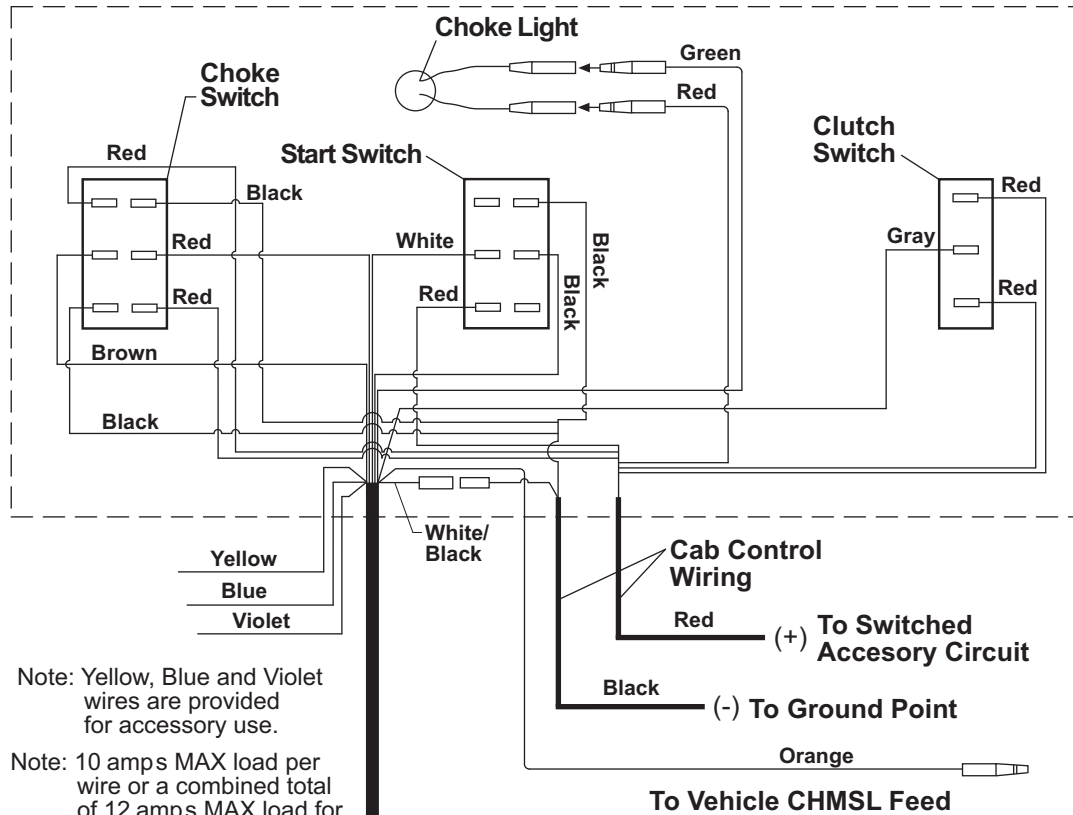
At the end of each season:

- Wash out hopper and all external surfaces.
- Apply dielectric grease to all electrical connections to prevent corrosion.
- Lubricate all grease fittings. Use a good quality multi-purpose grease.
- Oil or paint all bare metal surfaces.
- Oil drive chain.

Troubleshooting

PROBLEM	CORRECTION
1. Unit speed does not increase with the dial setting.	A. Increase the truck engine speed. B. Check condition of pump. C. Check for adequate PTO percent.
2. Unit stalls under load.	Check circuit pressure. 900-1200 PSI maximum with relief valve lifting at 1500 PSI.
3. Unit speed fluctuates momentarily when control is first turned ON.	A. Oil is cold. Wait until oil has warmed up. B. Change to lighter weight oil.
4. Pump blows seals at start up.	Pump installed backwards. Replace seals and reverse pump in driveline. (Note arrow on pump.)

WIRING DIAGRAM (SPREADER BATTERY KIT)



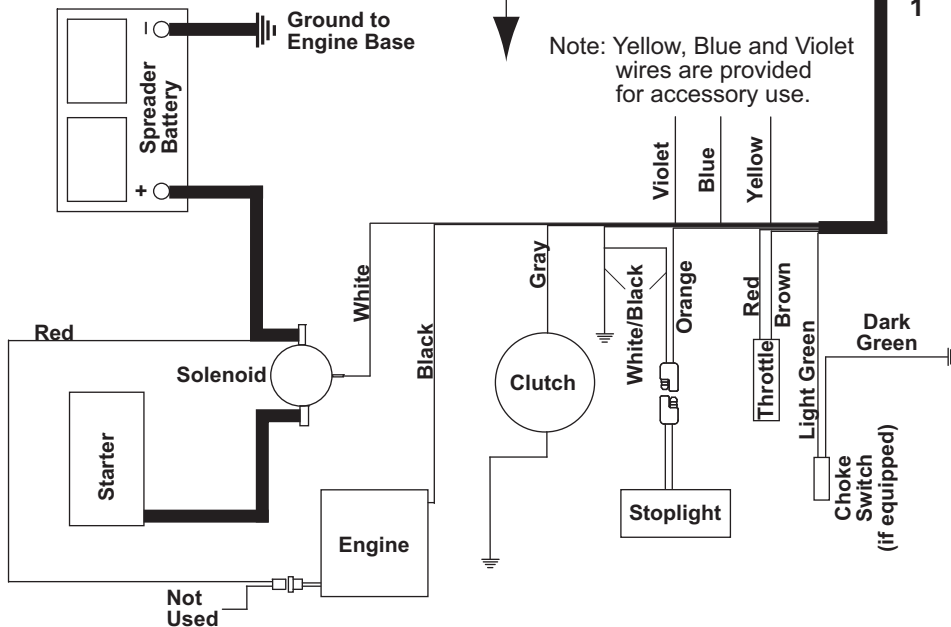
Note: Yellow, Blue and Violet wires are provided for accessory use.

Note: 10 amps MAX load per wire or a combined total of 12 amps MAX load for all three wires combined.

Vehicle Harness

Vehicle Side Wiring Harness

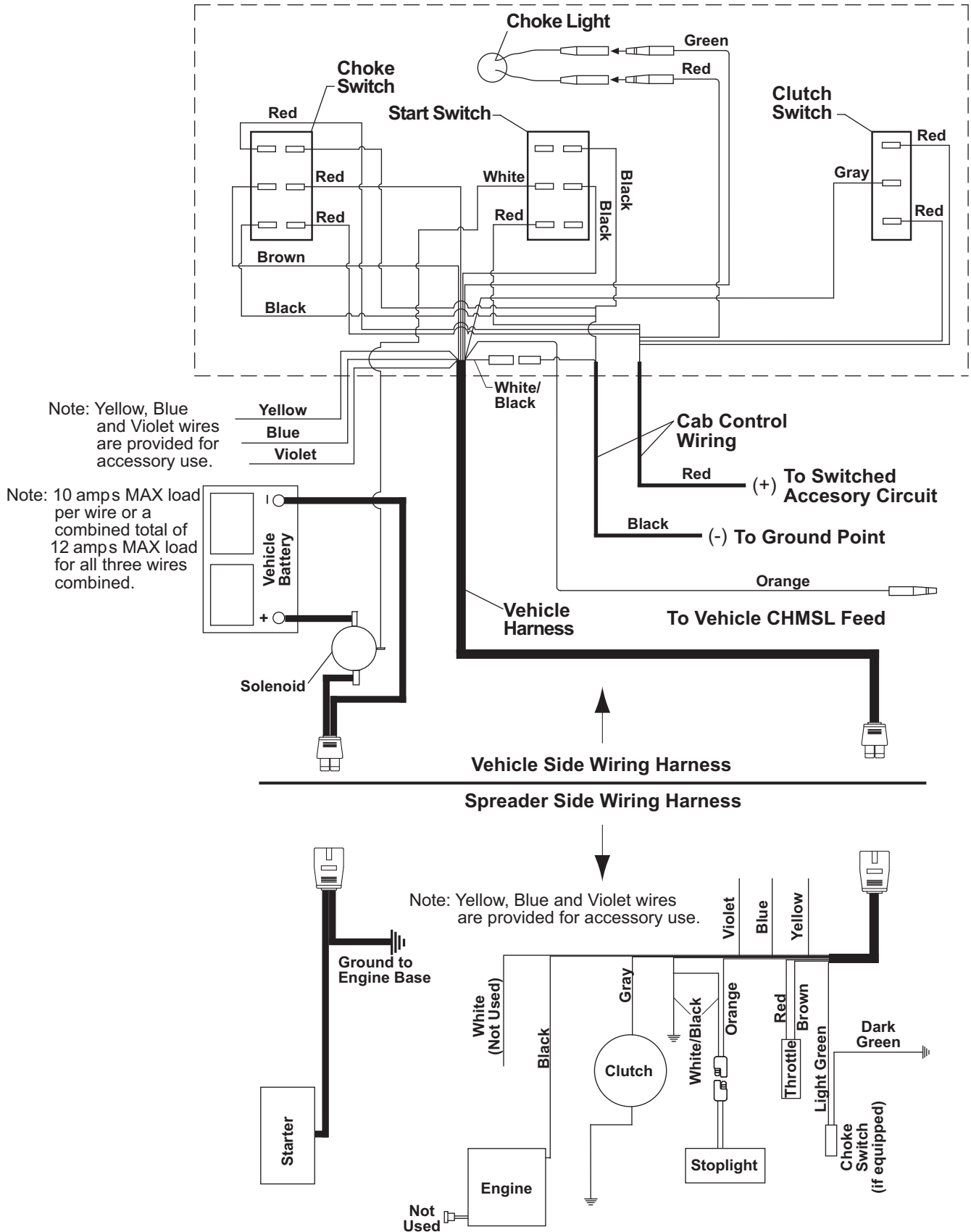
Spreader Side Wiring Harness



Note: Yellow, Blue and Violet wires are provided for accessory use.

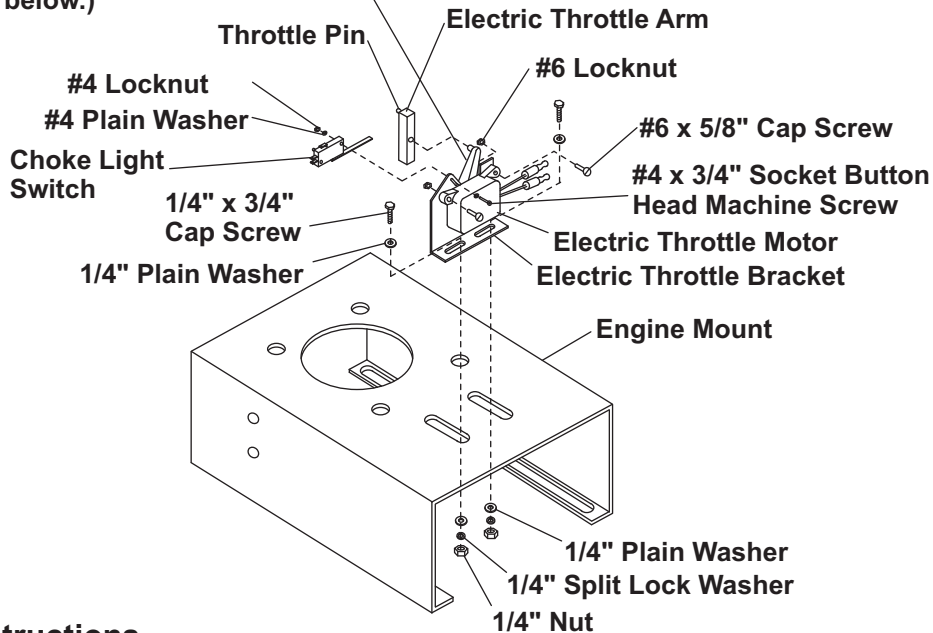
- 1. Black
- 2. Brown
- 3. Red
- 4. Orange
- 5. Yellow
- 6. Green
- 7. Blue
- 8. Violet
- 9. Gray
- 10. White
- 11. White/black

WIRING DIAGRAM (VEHICLE BATTERY KIT)



ELECTRIC THROTTLE MOTOR REPLACEMENT

Crank (shown against the Electric Throttle Bracket according to step 4 of the installation instructions below.)



Removal Instructions

1. Disconnect the battery cables.
2. Carefully observe the existing installation. Mark the electric throttle position on the engine mount.
3. Disconnect the brown and red spreader harness wires from the electric throttle motor leads.
4. Remove the 1/4" fasteners that hold the electric throttle bracket to the engine mount.
5. Remove the #6 fasteners holding the electric throttle motor to the bracket. Remove the electric throttle motor.
3. Fasten the electric throttle motor to the bracket using the existing hardware.
4. Using the electric throttle control, run the new electric throttle motor until the crank is against the bracket as shown in above diagram.
5. Place the electric throttle arm on the crank as shown in the above diagram.
6. Place the electric throttle assembly onto the engine mount inserting the throttle pin into the engine choke/throttle linkage plastic slider (not shown).

Installation Instructions

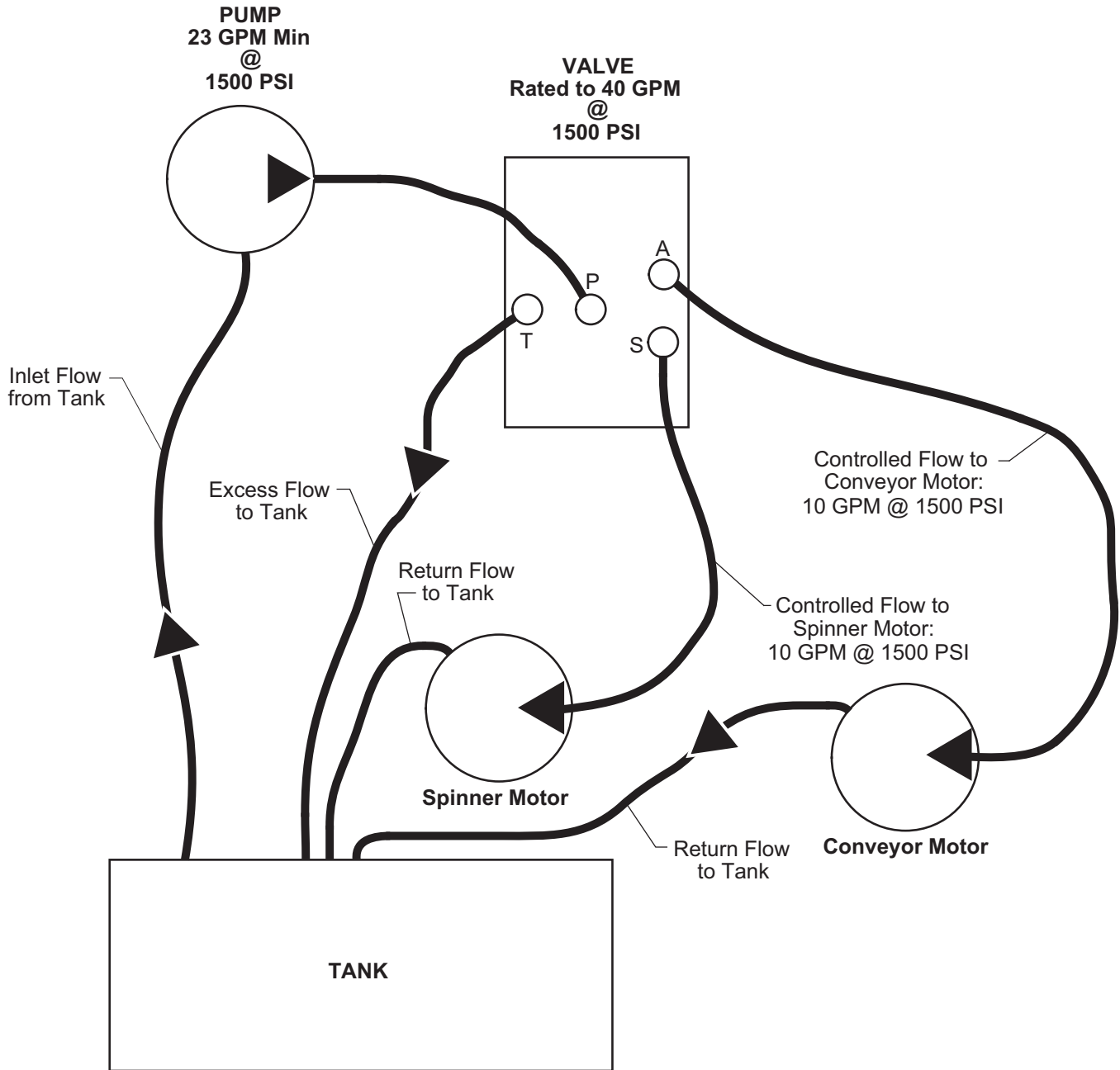
⚠ CAUTION

Improper installation can result in damage to the engine choke/throttle linkage.

1. Connect the brown and red spreader harness wires (not shown) to the corresponding colored electric throttle motor leads.
2. Using the electric throttle control, run the new motor until the crank reaches the 12 o'clock position. (A 9-volt battery can be used as a substitute for the control.)
7. Loosely bolt electric throttle assembly to the engine mount with the existing hardware.
8. Keeping the electric throttle arm parallel to and against the carburetor control bracket, move the electric throttle bracket forward putting the engine throttle into the full choke position.
9. Tighten the fasteners according to the Torque Chart.
10. Reconnect the battery cables.
11. Verify the crank is stopped in both directions by the bracket, not the carburetor linkage.

DUAL HYDRAULIC CIRCUIT DIAGRAM

Typical Hydraulic Circuit Dedicated Fixed Displacement Pump





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