

INSTALL & OWNER'S MANUAL 2015

- *1/3 Yard to 6.0 yard capacities
- *2' to 10' hopper lengths
- *Electric, Gas, Gas over hydraulic & direct hydraulic drives



Materials Recommended	
Materials	(# per cubic yard)
Sand - Dry	2,750
Sand - Wet	3,300
Salt - Bulk	2,160
Sand/Salt mix 50 / 50	2,320

⚠ CAUTION

Do not overload vehicle beyond the vehicle's Gross Vehicle Weight Rating (GVWR) or Gross Axle Weight Ratings (GAWR). Check the vehicle's load rating certification sticker for maximum vehicle capacity.

D					
Hopper material	Capacity (yards) ex: 5.0	Hopper length, (feet)	Motor	Controls	Chute
S stainless			B gas (Briggs)	B box control	1 short reg
P painted			D direct (hydraulic)	W wireless	2 long ext.
M molded (poly)			H gas (Honda)	S standard elec on/off	3 short flip
			E 1/2 hp electric	V variable speed	4 long flip
			EX 3/4 hp electric		
			SH sc hydraulic (Honda)		

Spreader Model # Breakdown

Owner's Information:

Owner's Name : _____ Dealer : _____

Purchase Date : ____ / ____ / ____ Phone : (____) ____ - ____

Spreader Part # : _____ Serial # _____ Weight # : _____

14" CONVEYOR SPREADER SERIES, ALL DRIVES

Contact your local dealer or distributor for replacement parts and technical support or visit

www.downeastermfg.com

CONTENTS

Contents	Page	Parts Guide	Page
Introduction	2	Conveyor	32
Specifications	3	Chutes	33 - 34
Material Chart	4	Gas platform drive	35
Safety	5	Hydraulic platform drive	36
Warnings	6	Electric platform drives	37 - 38
Warning Labels	7	Electric & Wireless Wiring	39
Shipping block warning	8	Feed gate & screens	40
Wireless controller warning	8	Modular extension parts	41
Installation & Mounting	9 - 12.	Notes	42
Chute Adjustments	13	Warranty	43
Gas Drive wiring	14 - 16	Back Page	44
Electric Drive wiring	17 - 18		
Pre checks & lubrication	19 - 20		
Operation, Gas drive models	21		
Operation, Electric drive models	22		
Operation, Hydraulic drive models	23 - 24		
Motor Feed Rates & flow chart	25		
Troubleshooting guide	26-28		
Maintainence guide	29		
Wireless controller programming	30 - 31		

Introduction

Thank you for purchasing a DownEaster Salt and Sand Spreader. This Owners Manual provides easy to follow instructions, for installing, operating and servicing the spreader. Read the entire manual, carefully, to learn the proper procedures for each operation. Follow all of the instructions, described, to keep the sander in top condition and it will provide years of, trouble-free, performance. In the event that a problem should arise or if you have any questions about the spreader, please contact your, DownEaster, dealer.

All information, illustrations and specifications in this manual are based on the latest, DownEaster salt- and sand spreader, information available, at the time of publication. The manufacturer reserves the right to make changes and improvements without notice.

***** NOTE: Read this manual and fully understand the information, presented, before starting or operating the equipment.**

DownEaster

120 Old Lisbon RD. PH (207) 729-5101
Topsham, ME 04086 Fax (207) 729-8782

SPECIFICATIONS

ELECTRIC SPREADER SPECIFICATIONS, 50" WIDE HOPPERS

SPECIFICATIONS	<i>(Baby)</i>	<i>(Gator)</i>	<i>(JR.)</i>			
Model #	0302E	0304E	0604E	1006E	1207E	1408E
Capacity: <i>(yards)</i>	0.3	0.3	0.6	1.0	1.2	1.4
Hopper size: <i>(LxWxH)</i>	24" x 50" x 26"	48" x 35" x 18"	48" x 50" x 26"	72" x 50" x 26"	84" x 50" x 26"	96" x 50" x 26"
Hopper construction: <i>(SS)</i>	16GA			14GA		
Conveyor Rail: <i>(SS)</i>	12GA			14GA	14GA	14GA
Conveyor bed: <i>(SS)</i>	12GA					
Top screens: <i>(3" openings)</i>	n/a	Optional	Optional	2	2	2
Side gussets: (per side)	n/a	n/a	n/a	2	2	2
Ship weight: lbs. <i>(est. . avg.)</i>	250	310	340	650	760	870
Loaded weight: <i>(2900# per yard)</i> <i>90/10% sand/salt mix. lbs.</i>	1120	1180	2080	3550	4240	4930
Loaded weight: <i>(1460# per yard)</i> <i>100% coarse salt lbs.</i>	688	748	1216	2110	2512	2914

GAS, ELECTRIC & HYDRAULIC, SPREADER SPECIFICATIONS, 50" WIDE HOPPERS

SPECIFICATIONS	1707	2008	2209	2508
Capacity: <i>(yards)</i>	1.7	2.0	2.2	2.5
Hopper size: <i>(LxWxH)</i>	84" x 50.5" x 32"	96" x 50.5" x 32"	108" x 50.5" x 32"	96" x 50.5" x 37"
Hopper construction: <i>(SS/HR)</i>	16GA/12GA			
Conveyor Rail: <i>(SS/HR)</i>	14GA/12GA			
Conveyor bed: <i>(SS/HR)</i>	12GA/10GA			
Top screens: <i>(3" openings)</i>	2			
Side gussets: (per side)	2	3	3	3
Ship weight: lbs. <i>(est. . avg.)</i>	750	800	850	835
Loaded weight: <i>(2900# per yard)</i> <i>90/10% sand/salt mix. lbs.</i>	5680	6600	7230	8085
Loaded weight: <i>(1460# per yard)</i> <i>100% coarse salt lbs.</i>	3232	3720	4062	4485

**(ship weight based on gas engine drive & standard chute)*

GAS, ELECTRIC & HYDRAULIC, SPREADER SPECIFICATIONS, 71" WIDE HOPPERS

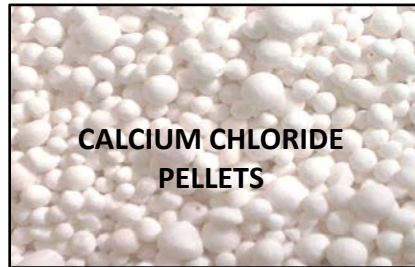
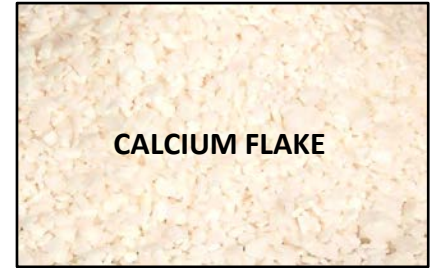
SPECIFICATIONS	All units 71" wide								
Model #	3009	3410	3308	3709	4210	4008	4509	5010	6010
Capacity: <i>(yards)</i>	3.0	3.4	3.3	3.7	4.2	4.0	4.5	5.0	6.0
Hopper Length:	9'	10'	8'	9'	10'	8'	9'	10'	10'
Hopper Height: <i>(@ center)</i>	44.5"		49"		52.5"			57.5"	
Ship weight: lbs. <i>(est. . avg.)</i>	1030	1090	1060	1120	1180	1000	1060	1130	1200
Loaded weight: <i>(2900# per yard)</i> <i>90/10% sand/salt mix lbs</i>	9730	10950	10630	11850	13360	12600	14110	15630	18600
Loaded weight: <i>(1460# per yard)</i> <i>100% coarse salt lbs.</i>	5410	6054	5878	6522	7312	6840	7630	8430	9960

**(ship weight based on gas engine drive & standard chute)*

DO NOT EXCEED VEHICLE GVWR

MATERIAL CHART

Materials Recommended	
Materials	(# per cubic yard)
Sand - Dry	2,750
Sand - Wet	3,300
Salt - Bulk	2,160
Sand/Salt mix 50 / 50	2,320



Determining Vehicle Payload Worksheet					
Example:					
Material Type	Bulk Salt				
Equipment installed when vehicle was weighed	7' Stainless 1.7 yard				
Weight of Spreader (empty) lb.	750				
Vehicle Make / Model	2006 Ford F350 SRW, short bed				
Front Gross Axle Weight Rating (FGAWR) lbs.	4800				
Rear Gross Axle Weight Rating (RGAWR) lbs.	6900				
Gross Vehicle Weight Rating (GVWR) lbs.	11000				
Curb Weight w/ driver & accessories (empty) lb.	6750				
Payload Available lbs. w/spreader installed (GVWR minus Curb Weight)	<u>3500</u>				
Material Density lb/cu yd	2160				
Maximum Volume cu yd (Payload divided by Material density above)	<u>1.62</u>				

SAFETY



THIS SIGN SHOULD ALERT YOU:

The Society of Automotive Engineers has adopted this SAFETY ALERT SYMBOL to pinpoint characteristics that, if NOT carefully followed, can create a safety hazard. When you see this symbol in this manual or on the machine itself, BE ALERT! Your personal safety and the safety of others is involved.



DANGER

Identifies the most serious hazards



WARNING

Failure to obey a safety warning can result in injury to yourself and others



CAUTION

Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.

*** NOTE - Advises of general information or instructions important to the operation or maintenance**

Carefully read this manual. Learn how to safely operate the DownEaster Spreader and how to use the controls properly. Do not allow anyone to operate the DownEaster spreader without proper training and instruction. Unauthorized modification to the DownEaster Spreader may impair the function and/or safety of the machine.

Follow safety instructions

Read all safety messages in the manual and on the DownEaster spreader safety labels. Follow recommended precautions and safe operating practice. Maintain all safety labels on the DownEaster spreader in good condition. Replace missing or damaged safety labels, with new labels, available through your DownEaster dealer.

Pre Operation

Thoroughly inspect the DownEaster Spreader, for loose or damaged parts, before each use. Do not use until adjustments or repairs are made.

Keep all bystanders, especially children and pets, well away from the area, where the machine will be operated.

Keep all bystanders, a minimum or 40 feet away when unit is operational.

Operation

Wear safety glasses or goggles at all times, when operating the spreader. Keep hands, face and feet away from all moving parts. Do not attempt to stop the machinery, when it is moving or rotating. Do not wear loose fitting articles of clothing, such as scarves, strings, chains, ties, etc.; because they could get drawn into moving machinery, associated with this equipment. Long hair should be tied back or protected from entanglement.

Always remain alert . To prevent serious injury to yourself and to others do not operate this equipment, if you are fatigued.

!WARNING Gasoline is extremely flammable and its vapors can explode if they are ignited. Always stop the engine and allow it to cool before filling fuel tank. Keep sparks and open flame away from the area.

Do not touch the muffler . Engine and exhaust parts get extremely hot during operation and remain hot for a period of time after the engine is turned off.

WARNINGS



Before attempting any procedure in this book, these safety instructions must be read and understood by all workers, who have any part in the preparation or use of this equipment.



For your safety, warning and information decals have been placed on this product to remind the operator of safety precautions. If anything happens to mark or destroy the decals, please request new ones from DownEaster.



Unit must be pinned, locked or tied down into position before operating.



Never exceed the Gross Vehicle Weight Rating of your vehicle. Failure to do so may limit handling characteristics.



Never attempt to lift a spreader with material in it.



Always inspect spreader, for defects such as broken, worn or bent parts, weakened areas on spreader or mount.



Always disconnect power source before attempting to attach or detach or service spreader unit. Be sure vehicle/power source is properly braked or chocked.



Always keep hands, feet and clothing away from power-driven parts. Remember, it is the owner's responsibility to communicate information on safe usage and proper maintenance, of all equipment.



Always make sure personnel are clear of areas of danger, when using equipment. Maintain 50' distance from all bystanders, when operating the spreader.



Inspect the unit periodically for defects. Parts that are broken, missing, or worn out must be replaced immediately. The unit, or any part of it can not be altered without prior written permission from the manufacturer.



Never use with foreign debris in the spreader. These units are designed to handle clean, flowing material.



Always inspect straps, chains, pins and/or latches, whenever attaching or detaching spreader and before traveling.



Never leave material in hopper for long periods of time. Be aware that all ice melters are hygroscopic and will attract atmospheric moisture and harden up.



Remember, most accidents are preventable and caused by human error. Exercising of care and precautions must be observed, to prevent the possibility of injury to operator or others!



Never operate equipment when under the influence of alcohol, drugs or medication that might alter your judgment and /or reaction time.



Before working with the spreader, secure all loose clothing and unrestrained hair.



Always wear safety glasses with side shields when servicing spreader. Failure to do so could result in serious injury, to the eyes.



*Never climb into the hopper, while the engine is operating or capable of being operated. **SERIOUS INJURY or DEATH MIGHT OCCUR.***

WARNING LABELS

⚠ WARNING

It is **YOUR RESPONSIBILITY** to **READ, UNDERSTAND,** and **FOLLOW** safe operating practices defined in the **OPERATORS MANUAL** shipped with the unit. **FAILURE** to do so may result in **PERSONAL INJURY** to you or others. If the manual is missing, obtain a replacement from your dealer or the company.

DANGER

STAY AWAY FROM THIS AREA WHILE MACHINE IS RUNNING.
DO NOT MAKE ANY ADJUSTMENTS UNTIL MOTOR IS OFF,
CONVEYOR AND SPINNER STOPS.
DO NOT RISK INJURY OR DEATH.

WARNING

**KEEP THIS COVER CLOSED
WHEN MACHINE IS
IN OPERATION**

Your unit may or may not have the following labels below

⚠ CAUTION

VALVE COIL MAY GET EXTREMELY HOT!:
The coil assembly is an electromagnet that opens the valve stem. Dirty hydraulic fluid may contaminate stem and cause coil to overheat and fail. When replacing coil, it is **HIGHLY** recommended to replace valve stem, flush & change hydraulic fluid & filter. Apply dielectric grease to stem when replacing and every 50 hours of operation.(arrow)



DownEaster Mfg. LBL144

⚠ CAUTION

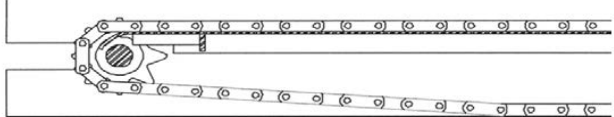
TURN CONTROL BOX OFF AFTER DAILY USE:
Failure to do so, may result in a drained or dead battery. Control box constantly draws amperage when ON. Do not subject control box to direct water, pressured spray or cleaning chemicals.

DownEaster Mfg. LBL142

⚠ WARNING

FEED GATE SALT FLAP MUST BE INSTALLED:
Electric models **MUST** have flap installed and gate **MUST** be open a minimum of 2.5" to decrease amperage draw and motor strain. Failure to do so may result in premature wear on motor and vehicle charging system.

DRIVE AND CONVEYOR CHAINS MUST HAVE PROPER SLACK:
Chains that are too tight will cause loss of power, excessive amperage draw and premature motor failure or seizure.



INVERTED V HOPPER DEFLECTOR MUST BE INSTALLED:
Failure to have deflector in installed **WILL** result in loss of power, excessive amperage draw and premature motor wear and/or failure.

DUAL MOTOR MODELS MUST HAVE PROPER SPINNER SHAFT ALIGNMENT:
Misalignment **WILL** cause excessive coupler and motor bearing wear, along with extra strain on spinner motor.

DownEaster Mfg. LBL143

WARNING! SHIPPING BLOCKS & MOUNTING

ATTENTION

The 4 x 4 wood blocks that are attached to the bottom of the gussets, on any spreader unit, are for **SHIPPING PURPOSES ONLY!**

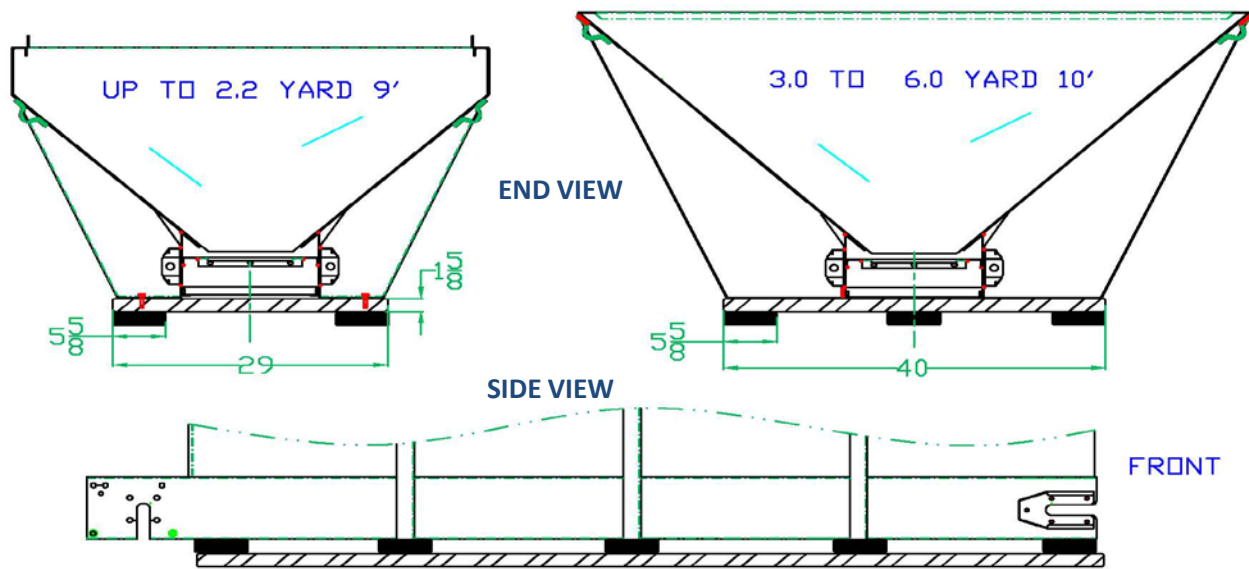
DO NOT install spreader, onto any vehicle or implement, using these wood blocks as base supports.

The spreaders are designed to have equal weight distribution on **ALL** gussets, at the same time, on an even and flat surface.

If off the floor mounting is required or desired, please use the diagram below, for wood installation.

USE ONLY, pressure treated 2x6, cut to length of dimensions shown for your application. Fasten using 3/8" lag bolts 1 1/2" long. Pre drill a 1/4" pilot hole to avoid cracking of wood.

Longitudinal runners **MUST SPAN** from **FRONT TO BACK**



Longitudinal runners are optional.

WARNING! WIRELESS CONTROL BOX NOTICE

The *DownEaster* wireless control box is **NOT** designed or intended to send or receive power from any other auxiliary device or supply.

DO NOT splice, cut, modify or change fuse size, in the wireless control harness.

DO NOT power any type of auxiliary lighting with control box, harness or the battery for starting the spreader. The alternators on the spreader drive engines are **not** designed to power any auxiliary amperage.

DO NOT use self grounding, or ground any auxiliary lights or electrical devices directly to the spreader hopper or motor platform. Any back feed or amperage spikes from other devices may cause the control box to overheat, and / or not function properly due to damaged internal relays.

Any lighting or other electrical implement **MUST** be powered by the host vehicle's electrical system and **MUST** be grounded to the vehicle as well. Failure to do so may result in control box damage.



INSTALLATION

Hopper

*****NOTE:** The DownEaster Sand and Salt Spreader may be installed into the bed of a pickup truck. It is the responsibility of the owner to determine the suitability, of any installation configuration, relative, to the load carrying capacity of a particular vehicle. The weight allowance of the empty DownEaster spreader can be found in the chart of specifications on page 3.

WARNING

Do not drill holes into fuel tanks, fuel lines, through electrical wiring, etc that may be damaged by drilling.

WARNING




Do not install control box in the vehicle's airbag deployment area. Refer to the vehicle's manual for airbag deployment area.

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.

Recommended Fastener Torque Chart ft-lb (N·m)

Size	Torque		
	 SAE Grade 2	 SAE Grade 5	 SAE Grade 8
1/4-20	6 (8)	9 (12)	13 (18)
5/16-18	11 (15)	18 (24)	28 (38)
3/8-16	19 (26)	31 (42)	46 (62)
3/8-24	24 (33)	46 (62)	68 (92)
7/16-14	30 (41)	50 (68)	75 (102)
1/2-13	45 (61)	75 (102)	115 (156)
9/16-12	66 (89)	110 (149)	165 (224)
5/8-11	93 (126)	150 (203)	225 (305)
3/4-10	150 (203)	250 (339)	370 (502)
7/8-9	150 (203)	378 (512)	591 (801)
1-8	220 (298)	583 (790)	893 (1211)

Metric Grade 8.8 ft-lb (N·m)

Size	Torque	Size	Torque
M 6	7 (9)	M 12	60 (81)
M 8	17 (23)	M 14	95 (129)
M 10	35 (47)	M 16	155 (210)

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

- 1 Remove the tailgate and/or any other obstructions, from the bed of the truck.
- 2 Remove or open the hopper screen and/or any loose parts, which may have been shipped with or stored in the hopper, during storage or shipping.



- 3 Remove any wood skids or shipping pallet attached to bottom of spreader.

SEE SHIPPING WARNING PAGE.

- 4 Lift the hopper assembly by attaching your lifting device to the factory installed lifting eye, located inside the top of the hopper. This may be a welded rod or a recessed U bolt.



!WARNING: Empty the hopper before lifting. Do not attempt to lift the spreader with the hopper containing any leftover sand or salt.



WARNING

The lifting device must be adequately rated to lift a payload equal to or greater than the spreader weight. See page 3 for spreader weights. Empty spreader before lifting.

Continue on next page

INSTALLATION - CHUTE & SPINNER SHAFT

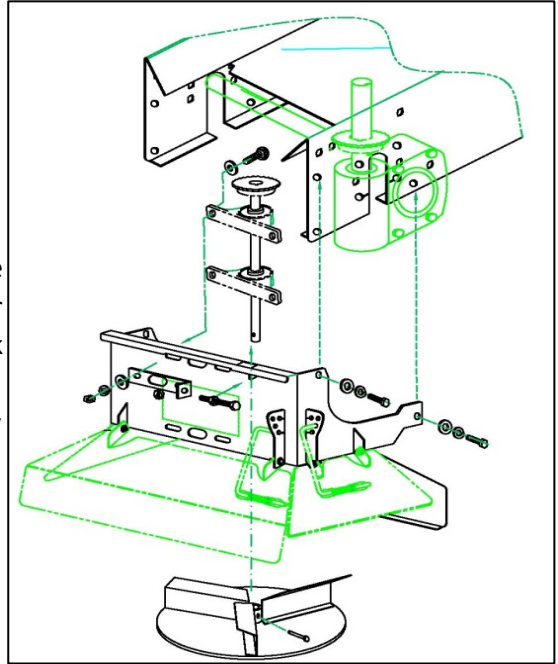
Continued from previous page

- 5 Place the spreader onto the bed, of the truck, sliding it forward to the point that the rear of the conveyor rails extends approximately one foot, beyond the rear bumper of the truck. This temporary location will allow for installation, of the chute and spinner assembly.

Note: Keeping the spreader elevated off the vehicle, with lumber, helps with removal of material, that accumulates, under the spreader, during operation. Place lumber under the side gussets and central rails of the spreader as seen on page 9.

Chute Assembly

- 6 Install the chute assembly onto the spreader using (4) 3/8" x 1" bolts, with lock washers under the heads, followed by flat washers, into the welded nuts at the bottom rear of conveyor rails.
- 7 Install the Spinner shaft assembly, aligning the bearing holes into the chute slots, using the (4) 3/8" x 1-1/2" bolts, through the spinner bearing pillow blocks, from the inside to the outside of the chute; including a flat washer under the head of the bolt and flat washer under the lock washer, before adding nuts, on the exterior of the chute. Do not tighten nuts at this time, only hand tight. The very top bearing, or any chute assembly, standard or flip, shall have the chain tensioner bracket on the exterior surface of the chute; w/ bend facing right. Loosely install 5/16" tap bolt into tab on right side. This will be used to put tension on the chain in a later step.



- 8 Install the spinner drive roller chain, from the spinner sprocket, to the gearbox sprocket, using the master link provided. Install master link with pins facing downward.
- 9 Adjust the spinner shaft location in the adjustment slots by aligning the two sprockets to be in the same plane. Tension the roller chain to have 5/16" deflection. Tighten the adjusting bolts and recheck the chain tension.

CAUTION

Do not over-tension either roller chain. Over-tensioning can cause damage to bearings, roller chain, sprockets, or the engine.

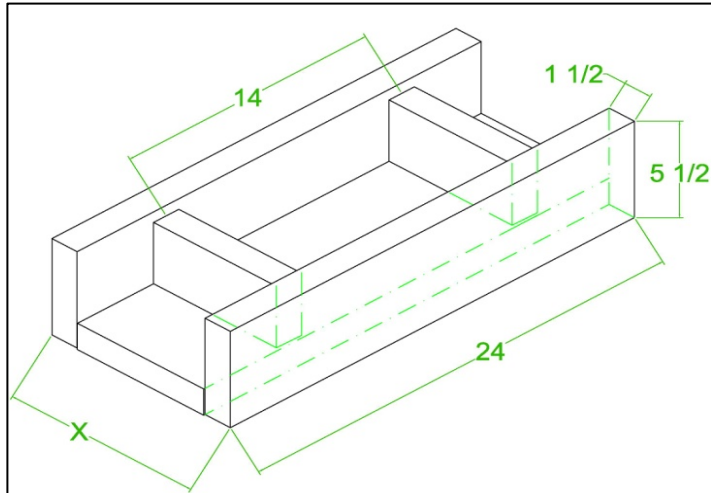
- 10 Install the spinner disc, onto the spinner shaft, using the clevis and cotter pin, to fasten the assembly. *Spinner flaps must be facing upwards.*
- 11 Install the center chain guard using (2) 1/4" x 3/4" carriage bolts, thru the platform down, flat washers and locknuts. Install the right side, gearbox chain guard, using (3) 1/4" x 3/4" carriage bolts, thru the platform down, flat washers and locknuts.

INSTALLATION - TRUCK BED / PLATFORM

Tie Down Ratchet strap installation

- 12 After completing installation and adjustment of spinner and chute, reposition spreader forward on truck bed, so that chute clears the rear bumper or dump bed edge by 1". Rear end of hopper must not exceed past the rear edge of vehicle bed or platform by more than 3", or adverse affects on handling and/or steering may occur, due to improper weight distribution over rear axle(s)

ATTENTION: It is highly recommended to use a spacer block, in front of the conveyor, between the front rail and front panel of truck bed. This will ensure proper spacing for weight distribution and in the event of an abrupt emergency stop, provide a bump stop, to lessen stress on tie downs or ratchet straps. See drawing for reference. 2" x 6" Pressure treated wood is recommended, with Dimension "X" spaced for your mounting distance.



Applications & mounting distances vary, so a few 2 x 6 's laminated together may be all that is required.

- 13 Attach the hook end from each ratchet through the welded eye at each of the top outside corners of the hopper. Attach the opposite end of each strap to an appropriate anchor point on the truck. A tie down or anchor point that is closet to the truck bed floor is preferred. **DO NOT** attach straps to pick up truck bed stake pocket locations! Damage to truck bed may occur. Tighten ratchets accordingly. Unit may also be bolted to vehicle chassis or an adequately supported floor or platform body, using supplied holes in side gusset bottoms.

If body requires tie down points to be added, by means of bolting or welding, position tie down points so ratchet strap is far outwards away from the hopper as possible. (strap should be 45 degrees up from bed/platform surface.) Verify with the vehicle's manufacturer that the factory installed anchor points are designed for tie-down of such load. Avoid having straps completely vertical; as side shifting of unit and load may occur. Periodically check that the spreader mounting hardware is securely tightened

(See pic to the right)

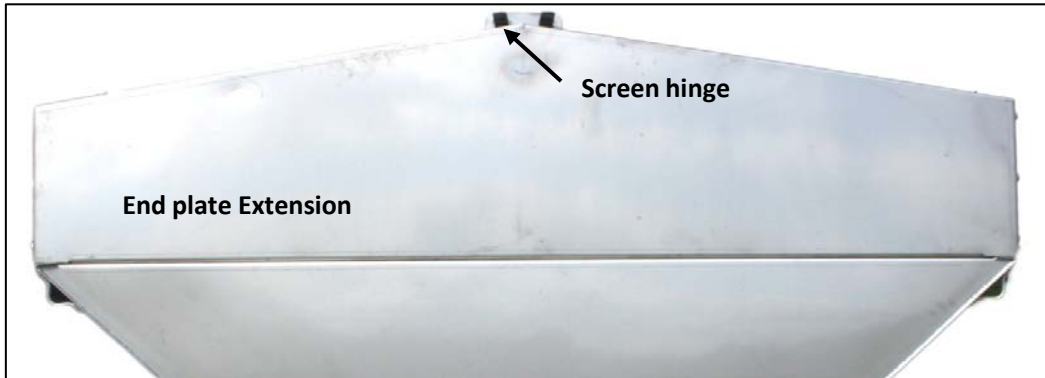


WARNING

Damaged, frayed, malfunctioning or twisted straps should **NEVER** be used. Replace broken straps or binders. Failure to do so may result in load shifting, property damage or injury.

INSTALLATION - HOPPER EXTENSIONS

- 1 Verify all contents are accounted for. 2 - endplate extensions, 2 - side plate extensions, 1 - middle spreader bar, and 1 - hardware kit.
- 2 Mount the end plate extensions first, with hardware only finger tight.



- 3 Mount the side plate extensions, making sure the lower acute angle slides over the hopper horizontal top bend. The end plate extension outer mounting flanges, MUST be on the outside. (see pic to right) Fasten on finger tight with hardware.



- 4 Install the middle spreader bar, bend flange up, with supplied hardware.
- 5 Tighten all hardware to torque specs, starting with the endplate extensions to hopper. This will ensure a tight seal.
- 6 Tighten all other hardware to torque specs



- 7 Install top screens, with 90 deg. flange on the outside of the screen hinges.

WARNING

DO NOT MODIFY, CUT OR EXTEND HOPPER EXTENSIONS. MODIFICATIONS MAY RESULT IN SPREADER OR PROPERTY DAMAGE, UNWATED OPERATING RESULTS, UNSAFE LOAD BALANCE OR INJURY.

INSTALLATION - BATTERY CABLES / CONTROL BOX

Battery & Cables (gas powered spreaders only)

- 14 If your unit is equipped with a driver's side battery box, a battery must be supplied to start and operate your spreaders gasoline engine. The marine style box w/ vented lid will accommodate a 24 group battery.

Make sure control box or wireless controller is in the **OFF** position! Loosen the nylon strap supplied and remove lid. Take tray out of the mounted tray and install battery with the negative terminal facing RIGHT. Remount the box into the tray. Attach and tighten the POSITIVE, (red) cable, to the positive terminal on the battery. Attach and tighten the NEGATIVE, (Black) cable, to the negative terminal on the battery. Close lid, with cable through their respective outlets. Reinstall nylon strap and tighten.



Use dielectric grease on all electrical connections, before an electrical connection is made or after a connector is disconnected.

Control box, in cab (gas powered spreaders only)

- 15 The in cab control box supplied with your unit, dependent on model, may need to be internally wired. Remove from package and **do not** plug unit in at this time. Find a suitable mounting location in the vehicle, where the operator can safely reach the controls, without stretching body or over extending operator's reach.

WARNING

Do not install control box in the vehicle's airbag deployment area. Refer to the vehicle's manual for airbag deployment area.

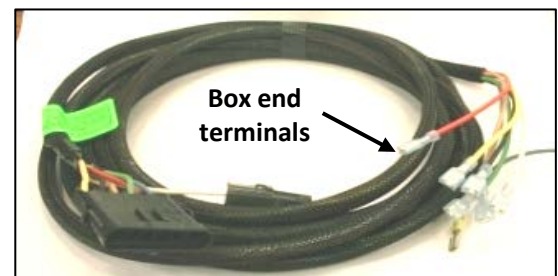


Flange bolt

Mark location and if the aluminum bracket is attached, to the control box, loosen flange bolts and remove. Mount bracket using suitable hardware.

WARNING

Do not drill holes into fuel tanks, fuel lines, through electrical wiring, etc that may be damaged by drilling.



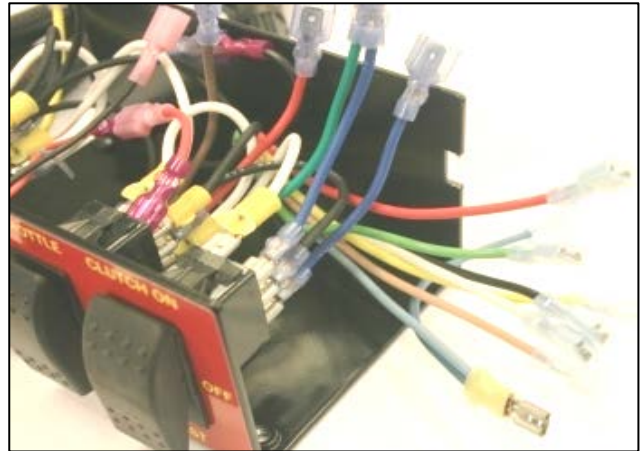
- 16 Route the 6-wire cab harness into the cab of the vehicle to the control panel console. Entry into the rear of the cab may be made by drilling a 3/4" hole and installing the grommet provided or through a split rear window if so equipped. Then route the cable under the seat and along the floor to the console.

Care should be taken so that the harness is not chaffed by any sharp edges or burrs on drilled holes.

INSTALLATION - GAS CONTROL BOX WIRING

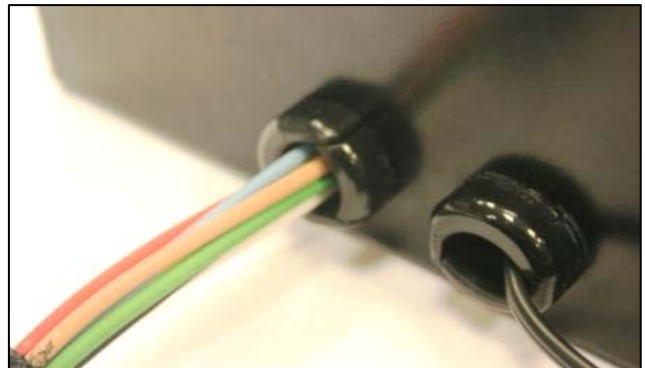
Note: The following instructions show how to install the spreader, so that the engine will draw power to start the engine, from a dedicated battery located on the spreader.

- 17 Install wire connections, from cab wiring harness, to rear of switches, as shown in the appropriate wiring diagram and pictures, on the next page.
- 18 Open control box, by removing screws on bottom and sliding cover off. Take all loose connections and make them easily accessible, by pointing upwards.



- 19 Carefully, insert cab harness connections, one at a time, into rear hole opening on backside of control box. **Care should be taken so that the harness is not chaffed by sharp edges**

Make all the connections, routing them away from other wires, without tangling. Connections are color matched, **except the black wire** from the indicator light, which will connect to the white wire, on the cab harness.



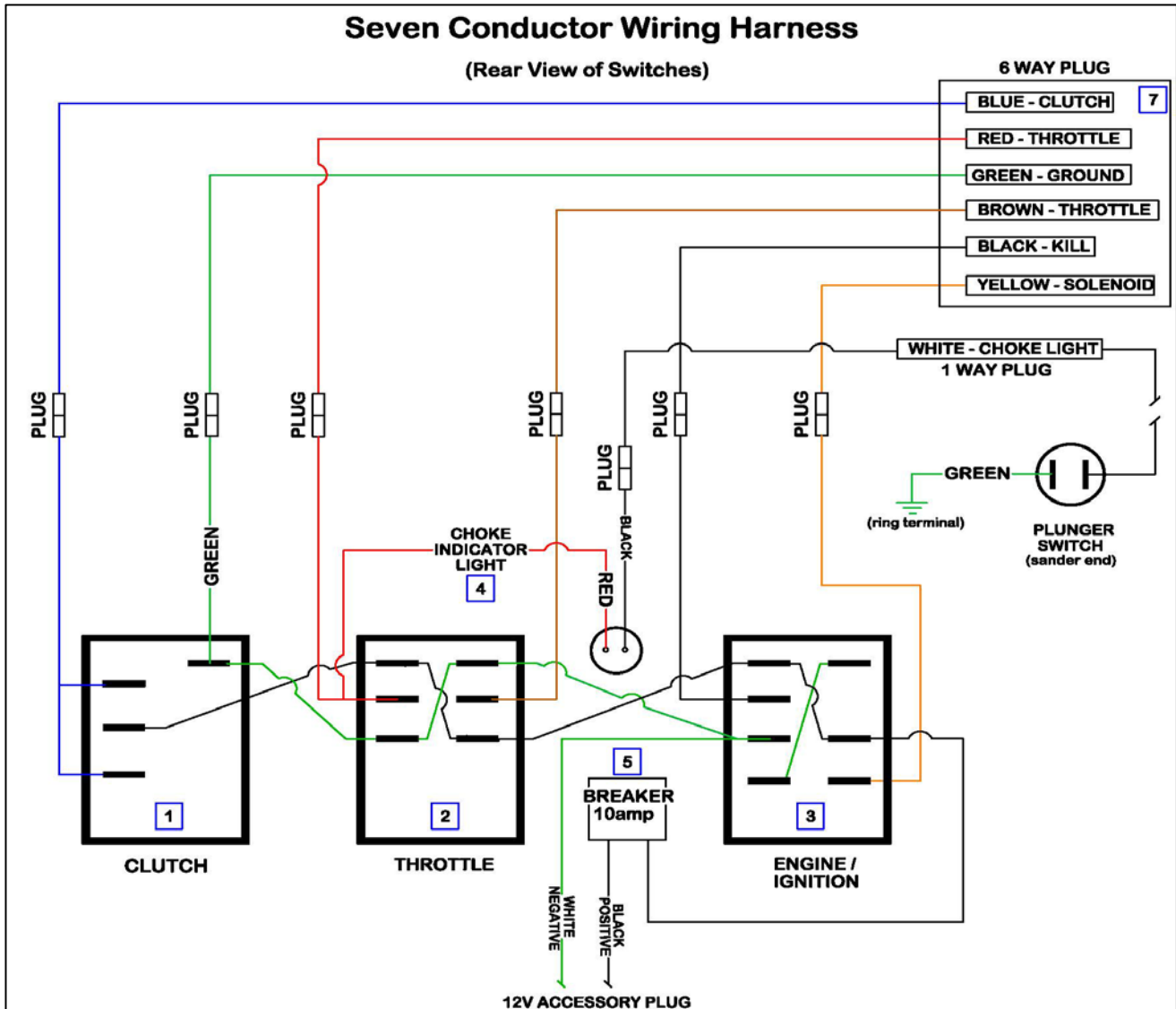
- 20 Install the wire strain relief bushing, as shown, tapered end toward box and snap into hole. Reinstall cover and unit can be mounted in aluminum bracket. Secure the wiring harness to the vehicle, behind the control panel, using the plastic cable ties, so that no pressure is on the wire terminals and the wire will not slip
- 21 Connect the cab wire harness, to the sander wire harness, at the 7-way plug.



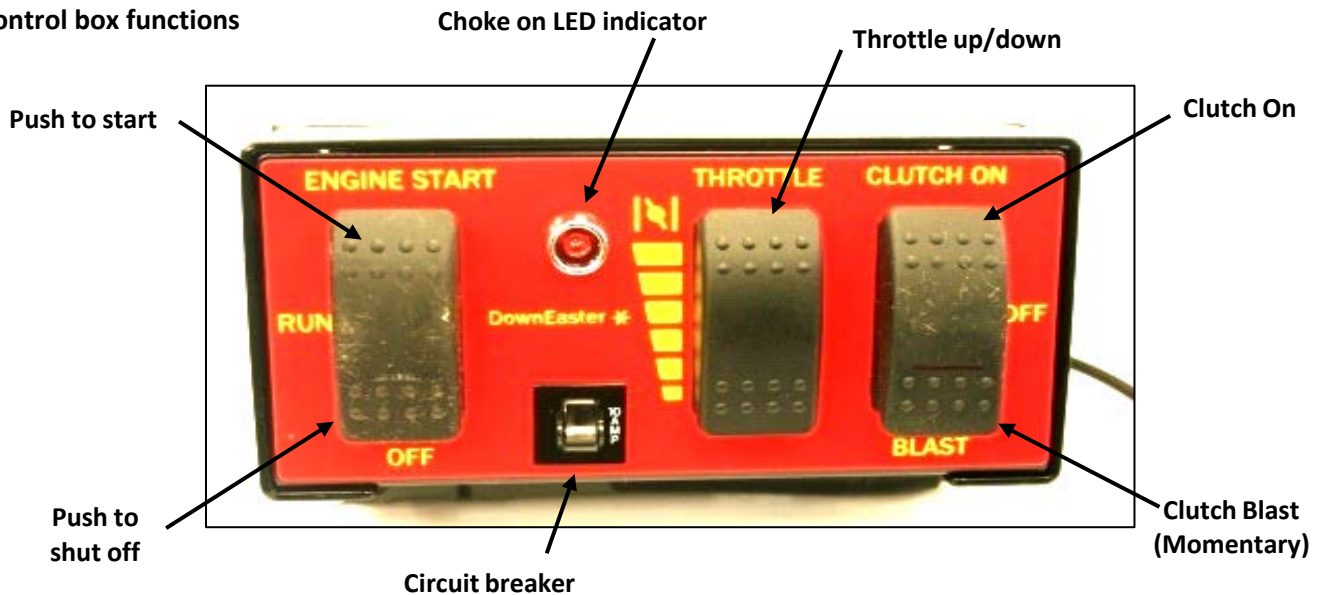
WARNING
Make sure control box is UNPLUGGED, before making connection at spreader.

INSTALLATION - GAS CONTROL BOX WIRING

Note: When spreader is not in use, or not installed onto vehicle, disconnect the 12 volt power cord from the vehicle. This will prevent a short or grounding out of harness.



Control box functions

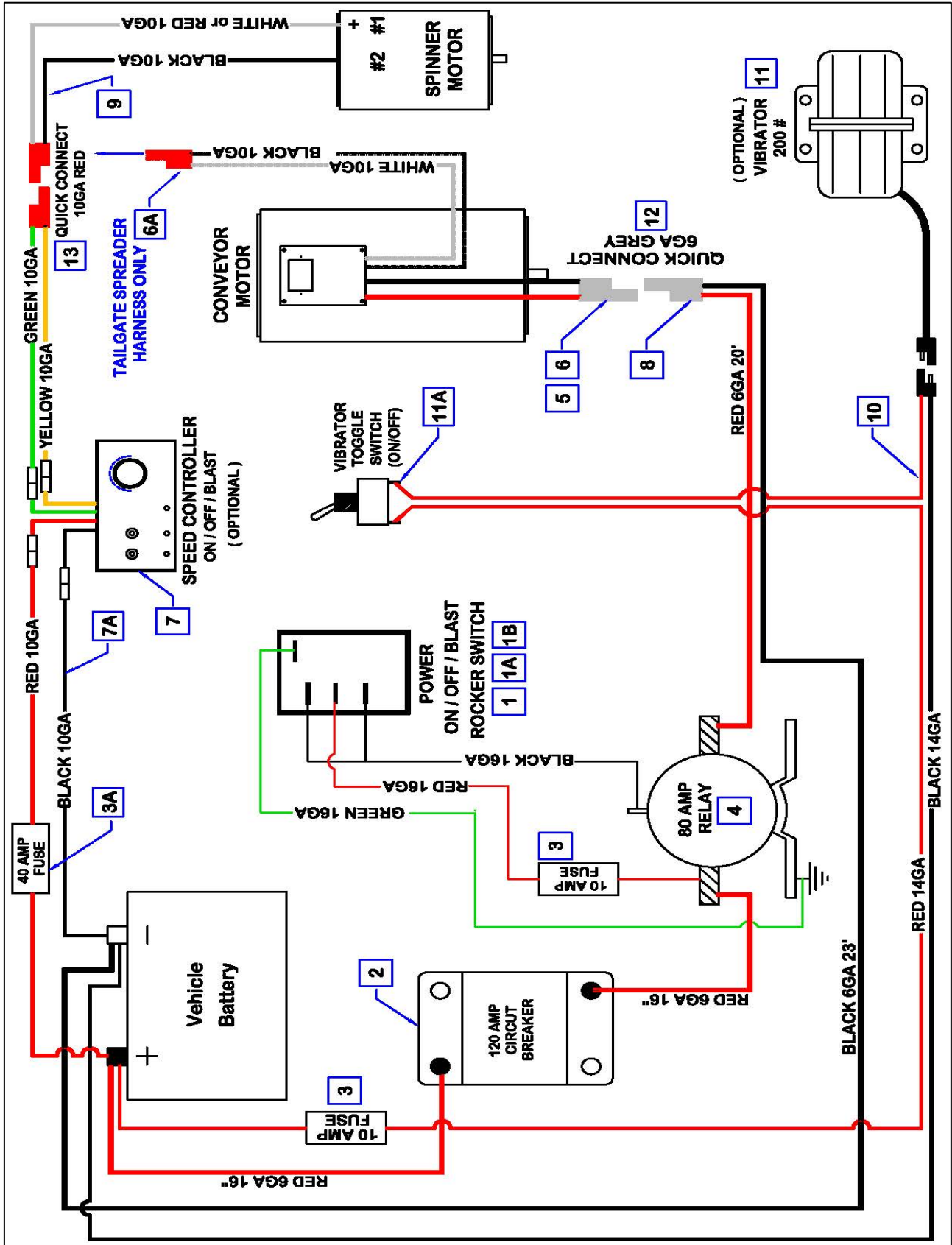


1/2 & 3/4 HP ELECTRIC (single/dual motor) WIRING



CAUTION

ALWAYS DISCONNECT BATTERY BEFORE ATTEMPTING TO INSTALL ELECTRICAL COMPONENTS ON YOUR VEHICLE.



INSTALLATION - ELECTRIC CONTROL BOX WIRING

WARNING

Do not drill holes into fuel tanks, fuel lines, through electrical wiring, etc that may be damaged by drilling.

WARNING

Do not install control box in the vehicle's airbag deployment area. Refer to the vehicle's manual for airbag deployment area.

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.

- 1 To insure good performance of your spreader, check the condition of truck's electrical system. Using a digital voltmeter, check alternator and battery voltage. The voltage reading should fall between 13.6 and 15.3 volts with engine running, head lights and heater fan turned on. If voltage reading falls out of this range check and adjust your electric system.

Lay out a wiring path for the Vehicle Wiring Harness.

- 2 Mount the Controller and/or rocker switch, in a convenient location in the truck cab. Do not mount controller directly in front of the heat vents. Allow ample air space around controller and away from water, dirt and dust.
- 3 Lay out path for the controller and switch wires, in the truck's engine compartment. Drill a hole in the firewall or use an existing one, to pass the wire harness through. Make sure to use a grommet or other anti chafe protection, as to not fray the wires. Passing the power cables (x4) and the rocker switch wires (x3), from inside of the cab, to the engine compartment is recommended. Do not route any wires or cables close to exhaust system or other high heat sources.
- 4 Connect all wire connectors to controller and/or switch.
- 5 **DO NOT connect the controller wires to the battery at this time!**
- 6 **Thoroughly clean battery terminals. Make sure battery terminals have no tarnish or corrosion. DO NOT CONNECT WIRE HARNESS TO DAMAGED OR CORRODED TERMINALS! IT MAY RESULT IN OVERHEATING, LOST POWER AND POTENTIAL CONTROLLER DAMAGE!**
- 7 Lay out all the 6 Gauge cables to their respective routes, in the engine compartment, making sure the short cables can reach the battery terminals, from the circuit breaker and relay mounting locations.

Choose clean, dry and cool areas, away from the exhaust, for the 120 Amp circuit breaker and relay. Mount with the self tapping screws supplied in the install kit, unless other means of mounting with bolt style fasteners is more suitable.

- 8 Lay out all the 6 Gauge cables, to the sender end, to their respective routes, in the engine compartment and along side the vehicle frame.
Choose areas, away from the exhaust and moving components and brake cables. Fasten the cables to the frame with wire ties. **(not supplied)**
- 9 Connect all the power cables and wire ring terminals, to the truck battery, white-positive and black-negative.

PRE CHECKS & OPERATIONS

Lubrication

1. Use Cold Weather Multipurpose Grease to lubricate grease fittings at the idler bearings (2), the the rear drive shaft bearings (2) and gearbox shaft bearing(x1). Lubricate grease fittings after each increment of 10 hours of use or weekly. Consult the maintenance guide for other fluid checks, dependent on your model.

Pre Starting Checks

1. Lubricate bearings according to the maintenance schedule.
2. Check tension adjustments on drive chains, adjust accordingly.
3. Visually inspect the complete spreader for damage or loose fastenings.
4. Set hopper feed gate flap to desired tension & feed rate.
5. Make sure screen is in place, and no foreign objects are in hopper that will damage components.
Screen must be in closed position.
6. Set internal and external chute adjustments to desired pattern.



WARNING

Never adjust external spinner deflectors while spinner is in



WARNING

NEVER PLACE ARMS, HANDS, OR OTHER BODY PARTS INSIDE THE HOPPER WHILE RUNNING, OR WITH HYDRAULIC LINES CONNECTED TO VEHICLE OR TRACTOR. DISCONNECT LINES WHEN ATTEMPTING TO DISLodge ANY FOREIGN OBJECTS FROM HOPPER.



Adjusting Feed

NEVER adjust feed while machine is running!

Loosen tension knob and adjust gate accordingly to desired feed.



ADJUSTMENTS AND LUBRICATION

Adjusting Chain



WARNING

Never make chain adjustments while unit is running or in operation.

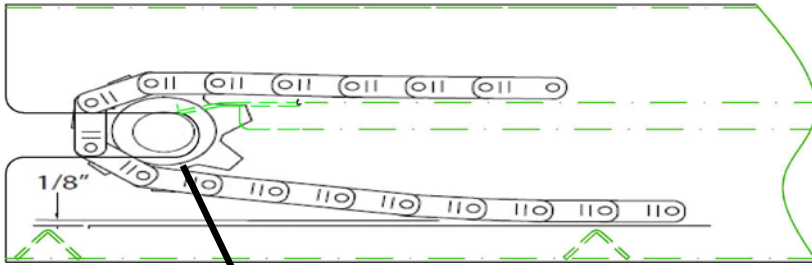
Pintle drive chain clearance above sills or crossmembers should be as follows. (see diagram below)

DRIVE AND CONVEYOR CHAINS MUST HAVE PROPER SLACK: Chains that are too tight will cause loss of power, excessive amperage draw and premature motor failure or seizure.

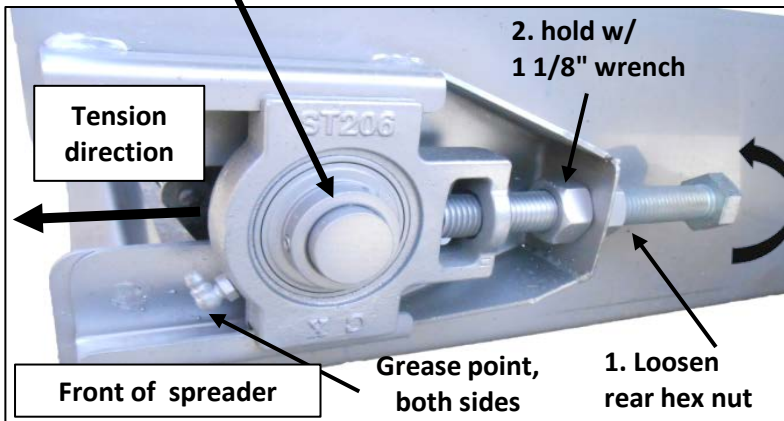
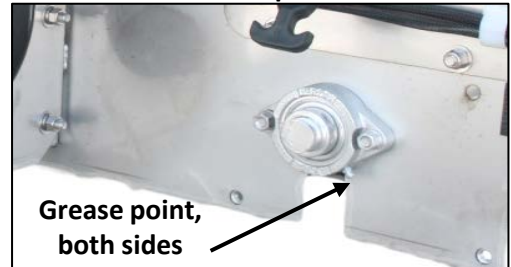


WARNING

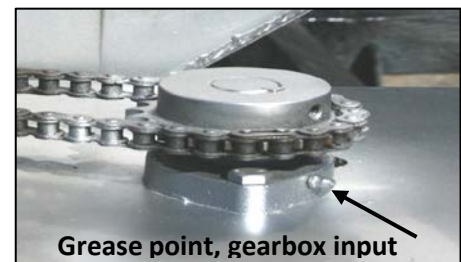
BOTH SIDES OF CHAIN TAKEUP MUST BE ADJUSTED EVENLY.



Rear of spreader

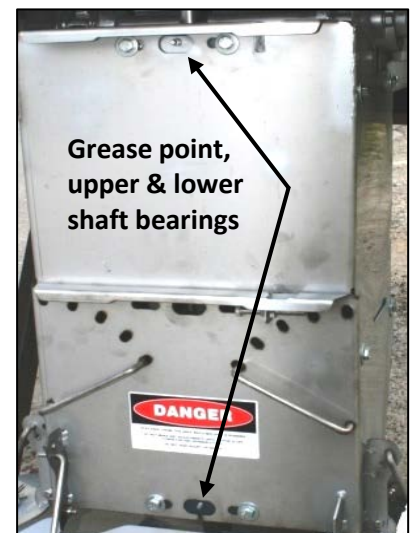


3. Turn clockwise to tighten, no more than 2 complete turns per side, one at a time. Binding and bearing damage may occur if sides are unevenly tensioned



Check gearbox oil level periodically and maintain the oil level by adding appropriate lubricant.

The gearbox is designed to only accept torque from the input shaft. Therefore, **DO NOT ATTEMPT TO FREE THE FEED CHAIN BY USING A PIPE OR SIMILAR TOOL TO MOVE OR DISLodge THE CHAIN**. If the feed chain is moved, the gears within the gearbox will strip. This action will void all warranties.

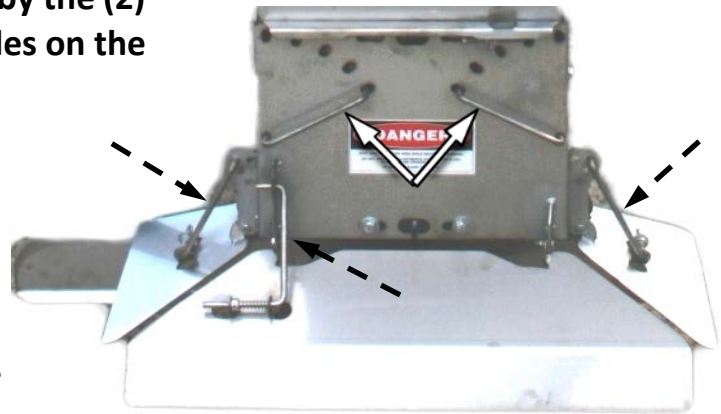


CAUTION

The engine crankcase and gearbox must be filled and maintained with oil. The engine crankcase oil must be of the correct viscosity for the intended spreader operating conditions. Refer to the engine's owner manual to determine the correct viscosity. Operating the engine or gearbox without oil (or without a sufficient amount of oil) can cause permanent damage to the engine or crankcase.

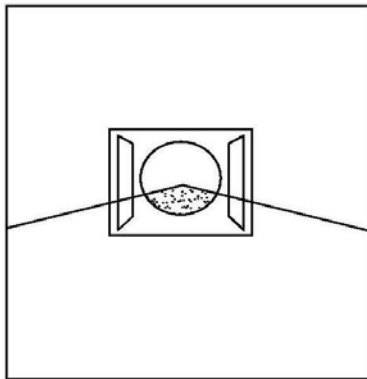
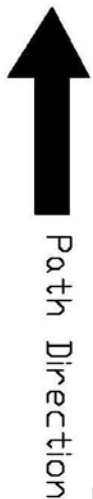
CHUTE ADJUSTMENTS

The internal baffles can be adjusted by the (2) looped handles, indexed into the holes on the rear face of the chute. (solid arrows)

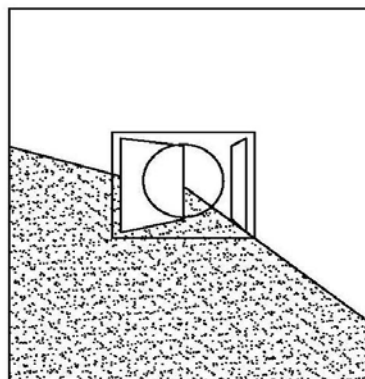


The external deflectors can be adjusted by the (3) looped handles, indexed into the holes on the 3 sides of the chute. (dashed arrows)

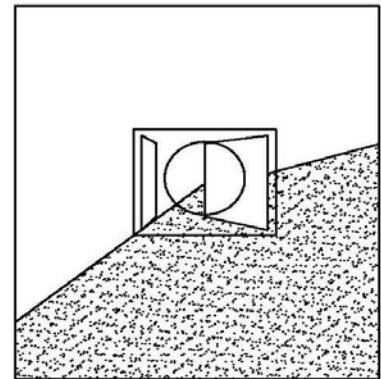
INTERNAL BAFFLES (looking down)



BOTH INTERNAL

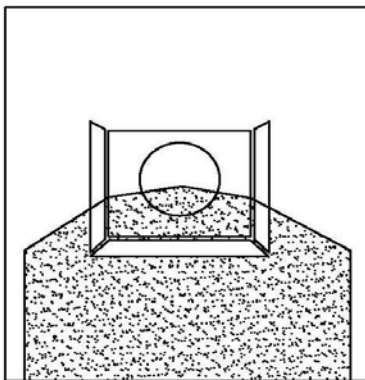


LEFT BAFFLE DOWN,

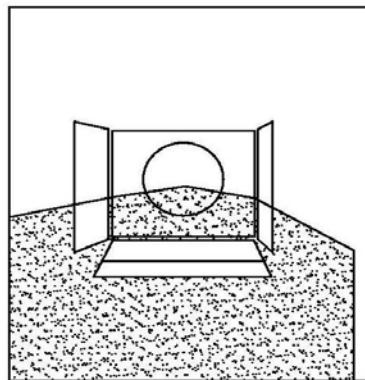


RIGHT BAFFLE

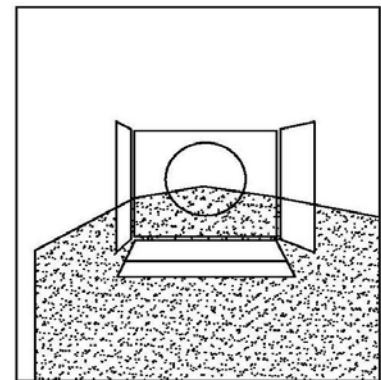
EXTERNAL DEFLECTORS



**ALL DEFLECTORS
DOWN, FOR A
CONFINED SPREAD
PATTERN**



**RIGHT BAFFLE
DEFLECTS MATERIAL
DOWN, HEAVY ON
LEFT SIDE.**



**LEFT BAFFLE DEFLECTS
MATERIAL DOWN,
HEAVY ON RIGHT SIDE.**

OPERATION - GAS DRIVE MODELS

Note: Before starting the gas spreader engine follow all safety precautions. Refer to page 14 for control box functions list

- 1 . **Clutch Switch** : The clutch switch is a three position switch with the following functions:
 - "OFF" position: While in this position, with the engine running, the spreader feed chain and the spinner disk will not rotate and therefore the spreader will not spread ice control material.
 - "ON" position: While in this position, the spreader feed chain and the spinner disk will rotate and material will be dispensed when the engine is running.
 - "BLAST" position: While in this position with the engine running, the spreader feed chain and the spinner disk will spin. The switch must be held down in the "BLAST" position to activate this function.
- 2 **Ignition Switch** : The ignition switch is a three position switch with the following functions:
 - "OFF" position: While in this position, 12V DC power is shut off to the spreader. To turn off the spreader, turn the switch to this position.
 - "ON" position: While in this position, 12V DC power is turned on to the spreader.
 - "START" position: While holding in this position, the spreader's engine starter is activated.
- 3 **Throttle Switch** : The throttle switch is a two position switch with the following functions:
 - "CHOKE/FAST" position: While in this position, the engine speed will gradually increase until the engine linkage reaches its choke position.
 - "IDLE" position: While in this position, the engine speed will gradually decrease.
- 4 **Starting the Gas Engine**
 - Verify that the clutch switch and ignition switch on the cab control box are in the "OFF" position.
 - Turn the vehicle's ignition to the "ON" position.
 - Press and hold the throttle switch to the "CHOKE/FAST" position.
 - Hold the ignition switch in the "START" position and release the ignition and throttle switches when the engine starts.
 - After the engine starts, press and hold the throttle switch to the "IDLE" position, to release the choke (hold switch for 1/2-1 seconds).
- 5 **Stopping the Engine**
 - Reduce engine RPM by holding throttle switch to the "IDLE" position for 2-3 sec.
 - To stop the engine, press the ignition switch to the "OFF" position.
- 6 **Clutch Operation**
 - Start the engine & adjust the speed to slightly above idle.
 - Push the clutch switch into the "ON" position.
 - Increase the engine RPM by pressing the throttle switch to the "CHOKE/FAST" position.
 - It is recommended that the clutch only be engaged at the lowest possible speed, without stopping the engine. This practice will prevent premature spinner chain failure and chain tension loss.
 - Do not repeatedly use the "Blast" function. Using this function often, will prematurely wear the clutch and flex coupler and promote component failure.

Material must never be left in hopper for an extended period of time. Material will absorb moisture, bind, harden and could prevent spreader from proper operation or may damage the spreader.

OPERATION - ELECTRIC DRIVE MODELS

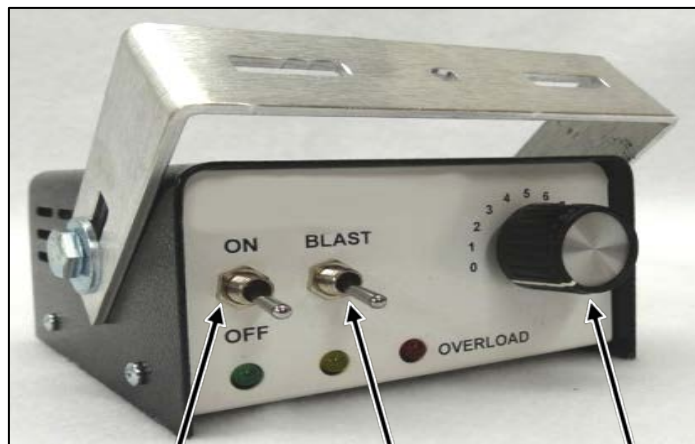
Note: Before starting the Electric spreader motor, follow all safety precautions. Different materials absorb moisture at different rates and some materials may not perform as desired. Substitution of an alternative material may be necessary, for optimum performance.

- 1 For single motor drive units, to turn on/off, press rocker switch to the up position. It will stay on constant w/ an orange LED indicator light. To use the momentary "blast" feature, press and hold the rocker switch in the down position and release to turn off.
- 2 For "**DUAL**" motor drive units, to turn on/off, press rocker switch to the up position to activate the conveyor only. It will stay on constant w/ an orange LED indicator light. To turn on the spinner drive, turn the toggle switch on the controller to on. The switch will illuminate.

The speed controller is designed to run single-stage salt spreaders, with positive and negative wires from the controller to the spreader motor. The controller comes with special features like "Jackhammer" start-up, to make sure that your spinner starts even, if you're running bulk salt or salt/sand mix. "Guardian" current management protects your vehicle, from dangerous current spikes.

- 3 Use the spinner rotary dial to adjust the spinner to the desired speed.
- 4 To stop the spreader, push the ON-OFF power switch to the OFF position, on both the controller and rocker switch.

The OVERLOAD light will be illuminated when the conveyor is clogged and the controller will shut-off



Spinner On

Blast On

Speed dial

Material must never be left in hopper for an extended period of time. Material will absorb moisture, bind, harden and could prevent spreader from proper operation or may damage the spreader.

INSTALL/OPERATION - HYDRAULIC DRIVE MODELS

DownEaster uses two hydraulic motors on each spreader, one for the gearbox driving the conveyor and one for the spinner. The spreaders are furnished with the motors, but otherwise are unplumbed, i.e. the customer must supply the hoses and fittings. All the motors have two W' NPT female ports. To drive the spreader, the user should have a clutch-pump hydraulic system on the vehicle. A power take-off (PTO) system may not deliver acceptable results, because the engine RPM at low idle may not drive the motors enough to get adequate material flow.

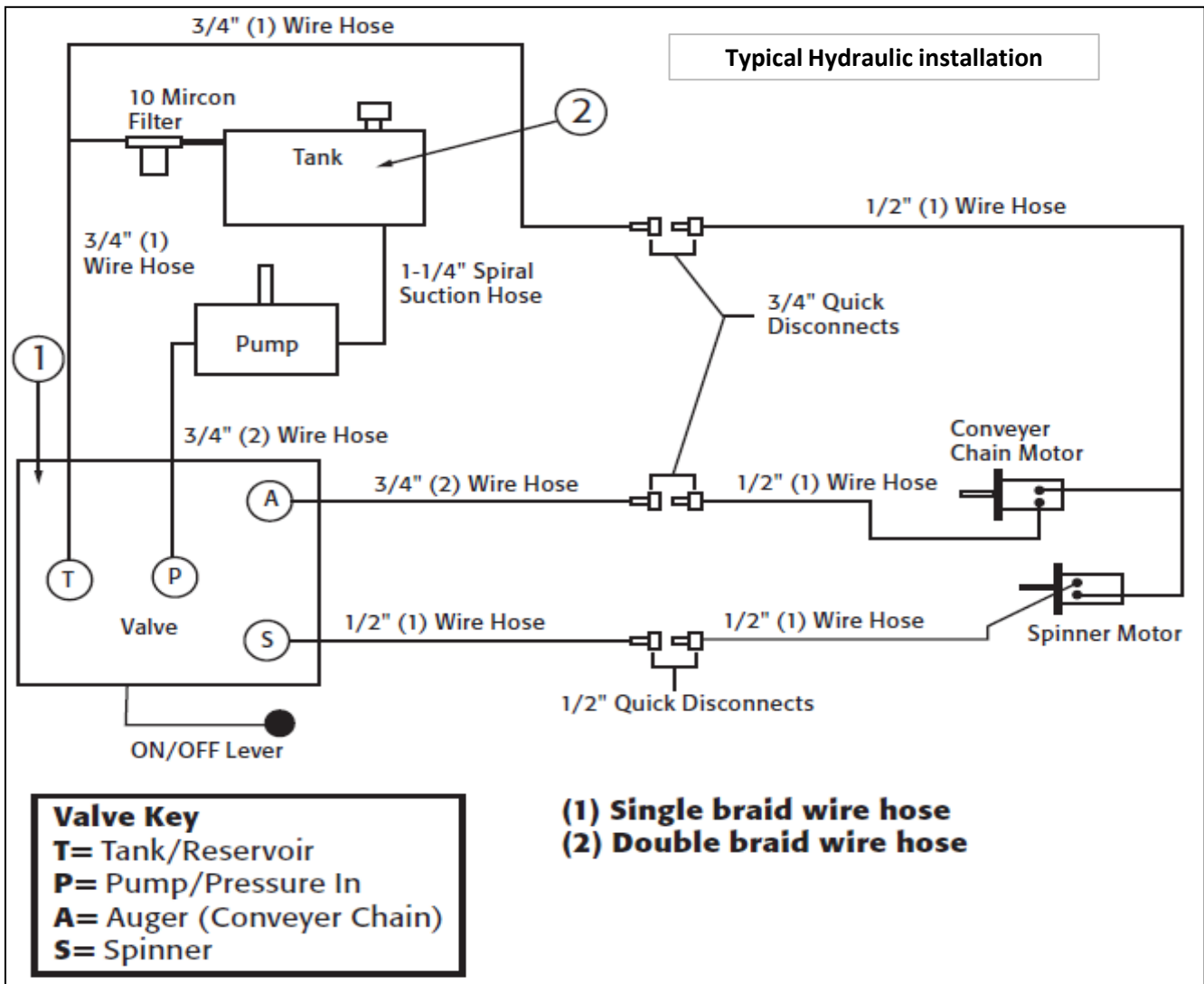
The system should deliver 16 gallons per minute at an engine speed of 1000 rpm. The hydraulic reservoir tank should be 15 gallons, and the operating pressure will be about 1500-1800 psi.

HYDRAULIC MOTORS MLHP

These units provide high output torque from relatively small packages. The MLHP motors are fixed displacement, gerotor type units that are known for compactness and economy. All MLHP motors have built-in check valves assuring pressure on the shaft seal never exceeds pressure levels seen in the return line.

HYDRAULIC MOTORS MLHM

The MLHM type is equipped with plain teeth for use over long periods at moderate pressure or over short periods at high pressure.



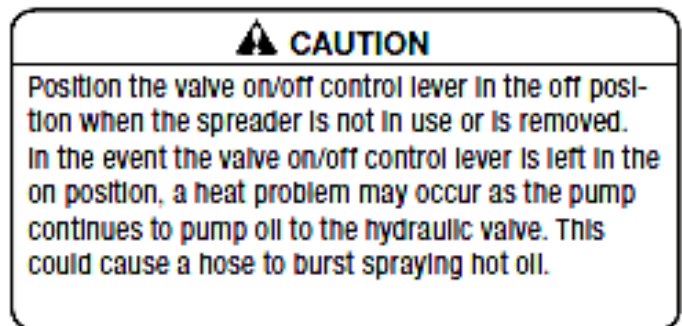
INSTALL/OPERATION - HYDRAULIC DRIVE MODELS

- 1 During assembly take precautions to keep all hydraulic components as clean as possible.
- 2 Allow enough hose length to prevent kinking and stretching of the hoses and to permit raising the dump body. Support long hoses with wire ties or clamps. Protect hoses from wear caused by sliding and/or vibration.
- 3 For proper rotation of conveyor chain and spinner motors, hoses may be reversed. The spinner rotates clockwise when looking down from the top.
Note: Use of a pipe joint sealant compatible with hydraulic oil is recommended for all screw fittings.
- 4 Use swivel type hose ends to connect hoses to flow valve. Damage to valve body may occur if the fittings in flow valve are over tightened.
- 5 A 10 micron return line filter is recommended to protect the pump, valve, and motors from wear causing contamination.
- 6 Use high grade non-foaming hydraulic oil to fill reservoir about 3/4 full.
- 7 Position valve on/off lever to off.
- 8 Move auger (conveyor chain) and spinner knobs on the valve to the open position.
- 9 Engage PTO and circulate hydraulic oil for several minutes to warm up.
- 10 Move valve on/off lever to on and check for leaks
- 11 Check conveyor chain and spinner to see if they are working properly and rotating the correct direction. To reverse rotation, switch the hydraulic lines at the motor.
- 12 Refill reservoir to 3/4 full.



Spreader Start-up

- 13 Check feed gate opening and baffle positions for desired material flow and spread pattern. See chute section.
- 14 Shut off spinner and auger (conveyor chain) knobs and position the on/off lever to on. Engage the PTO and allow the hydraulic system to warm up.
- 15 After the system is warm turn the spinner and conveyor chain knobs to the desired settings.
- 16 Changing the conveyor chain and spinner speeds as well as adjusting the baffle positions will produce various spread patterns
- 17 Valve setting changes may be made with truck in motion. By moving on/off lever to the off position, spinner and conveyor chain may be stopped at the same time without changing their valve settings.



TROUBLE SHOOTING GUIDE, DOWNEASTER SPREADERS

ENGINE, BRIGGS & STRATTON / HONDA TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	
Engine Will Not Crank, or is hard to start	Battery lead connections are loose. Battery charge low or discharged. Battery amperage too low.	Fuse in wiring harness blown. Starting cable connectors loose. Connectors corroded or worn. Starter/Solenoid malfunctioning.
Crank - Will Not Start	Air cleaner wet, or clogged. Fuel tank empty. Fuel hose kinked, pinched. Fuel filter clogged. Fuel valve shut off Water in fuel, stale fuel. Wrong type fuel (Diesel).	Choke on, flooding hot engine. Spark plug wire disconnected. Wrong type of spark plug. Electrical clutch engaged Cranking speed too slow to start. Spark plug loose. Low or no compression.
Runs Rough On Low & Will Not Accelerate and/or lacks power	Air cleaner wet, or clogged. Bad Spark plug or gapped incorrect. Engine not properly warmed up. Running out of fuel. Old gas Choke is partially closed. Carburetor needs adjustment or service. Low idle set too low	Low idle fuel setting too lean. Electric clutch dragging. Air filter is clogged. Valves are not sealing properly. Piston rings are not sealing properly. Head loose or head gasket blown or damaged. Water in fuel
Backfires on Full Throttle	Air cleaner wet, or clogged. Water contaminated fuel. Running out of fuel. Fuel mixture too rich or too lean.	Throttle or choke improperly set. Dirty carburetor needs cleaning. Leaking, worn valves in engines.
Blowing fuses	Regulator-Rectifier burned out. Leads pinched causing shorting.	Alternator stator shorted.
Electric clutch will not engage	Wrong Regulator-Rectifier used. Wiring wrong or not grounded.	Faulty clutch Low or no voltage to clutch
Stops on High Idle	Running out of fuel. Running out of oil in crankcase. Key switch malfunctioning.	Spark plug lead loose. Carburetor out of adjustment
Hot - Will Not Restart	Air cleaner wet, or clogged. Closed choke flooding engine. Fouled spark plug.	Kill lead shorting out. Ran out of fuel. Lost compression.
Cannot Reach High Idle RPM (No Load)	Air cleaner wet, or clogged. Choke not completely opened. Throttle control cable clip loose. Throttle control improperly installed. Fuel filter or line clogged. Fuel inlet line too small.	Fuel running low. Foreign material in carburetor. Carburetor out of adjustment. Spark plug gapped wrong causing intermittent firing. Drive system binding.
Engine knocks.	Carburetor is set too lean. Engine has overheated. Carbon buildup in combustion chamber.	Flywheel is loose. Connecting rod is loose or worn. Cylinder is excessively worn.
Engine vibrates excessively.	Engine is not mounted securely.	Check platform and engine mounting fasteners

TROUBLE SHOOTING GUIDE, DOWNEASTER SPREADERS

GENERAL TROUBLESHOOTING, GASOLINE ENGINE SERIES

SYMPTOM	POSSIBLE CAUSE	
Controller has no power	Controller internal fuse blown (faulty / damaged valve coil on gas-hydraulic models, causing blown fuse)	Power supply harness connections loose or corroded
Controller has power but conveyor or spinner does not operate	Faulty clutch faulty ground in harness, or platform loose of corroded power wire faulty rocker switch	keyway missing at gearbox shaft roller chain not attached (faulty / damaged valve coil on gas-hydraulic models)
Noisy operation	Bent shaft, drive or idler Bearings need lubrication Foreign object in conveyor	Faulty bearings Spinner disc unbalanced engine mounting loose, causing vibration
Material not exiting discharge chute	Conveyor discharge clogged Material bridging inside hopper	feed gate malfunction, or not open enough Inverted Vee not installed
Conveyor does not operate	Auger is jammed by a foreign object, or frozen material Shear bolts broken on shaft coupler	Damaged gearbox Shaft key missing from gearbox/auger coupling (faulty / damaged valve coil on gas-hydraulic models)
Conveyor operates erratically	Shaft key missing from gearbox/auger coupler Shear bolts broken on shaft coupler Bent shaft, drive or idler	Electric motor defective (faulty / damaged valve coil on gas-hydraulic models)
Noisy operation	Bent shaft, drive or idler Bearings need lubrication Foreign object in conveyor	Faulty bearings Spinner disc unbalanced
Spinner disc not turning	Chain disconnected or loose Spinner disc jammed faulty bearings bearings need grease	Keyway missing roller chain binding/faulty (faulty / damaged valve coil on gas-hydraulic models)

GENERAL TROUBLESHOOTING, GAS/HYDRAULIC SERIES

<p><i>No engagement of hydraulic valve on self contained models.</i></p>	<p style="text-align: center;"><i>Controller internal fuse blown (faulty / damaged valve coil on gas-hydraulic models, causing blown fuse) Faulty valve coil / overheating.</i></p>	<p style="text-align: center;"><i>Coil should not draw over 5 amps, replace if does. When replacing coil, do not over tighten! <u>Replace coil YEARLY.</u></i></p>
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GENERAL TROUBLESHOOTING, WIRELESS CONTROLLER (ALSO SEE PAGES 63, 64)

SYMPTOM	POSSIBLE CAUSE	
No power to wireless box.	check fuse and on / off switch	Bad connection at battery.
LED light on, but wireless box does not work.	Remote battery dead.	Remote box is faulty
Program Remote	<p>1. Using a paper clip, press create button on rear of transmitter. Blue light will flash. Press START, STOP, THROTTLE UP, THROTTLE DOWN, CLUTCH, in that order, and wait until blue light stops blinking before proceeding.</p> <p>2. Press and hold button in upper left side of box until light goes out. Press same button for 1 sec., light will begin to blink. Push START button on remote for 1 sec., then push button in upper left of wireless box to lock remote to the box.</p>	
Engine will not start	Using a voltmeter, test the yellow wire to the solenoid for power while holding the START button	
Engine will not turn off	Test black wire for ground, while holding STOP button.	
Throttle not working	Using a voltmeter, test the red & brown wires for ground, then push THROTTLE UP button and test brown wire for pos (+), then push THROTTLE DOWN button and test red wire for pos (+)	
Clutch not working	Using a voltmeter, test the wire wires pos (+), while holding the CLUTCH button. Make sure no other electrical components, such as work lights, or strobes, are spliced into this circuit. This will cause box to overheat under the additional amperage.	

TROUBLE SHOOTING GUIDE, DOWNEASTER SPREADERS

VARIABLE SPEED CONTROLLER & ELECTRIC CONVEYOR SERIES

ATTENTION: The Dual speed controller is designed to operate single stage salt spreaders with positive and negative wires from the controller, to the spreader motor. This controller features "Jackhammer" start-up, to make sure the spreader starts, in the case of a jam or frozen material. This cycle is 5 seconds and is normal, every cycle, operation along with "Guardian" current management, to protect your vehicle from dangerous current spikes. The "Blast" feature will send full voltage (top speed) to spinner for _ seconds.

SYMPTOM	POSSIBLE CAUSE	
Controller has no power	Controller not turned ON Controller internal or external fuse blown	Power supply harness connections loose or corroded
Controller has power but conveyor does not operate	Conveyor harness is not connected to controller Spinner harness connection at rear bumper or electric motor is loose or corroded	Conveyor speed setting is set too low Conveyor harness damaged
Controller has power but spinner does not operate	Spinner harness is not connected to controller Spinner harness connection at rear bumper or electric motor is loose or corroded	Spinner speed setting is set too low Controller internal fuse blown Spinner harness damaged
Conveyor operates erratically	Loose or corroded conveyor harness connections Conveyor speed setting is set too low Shaft key missing from gearbox/auger coupler Electric motor defective	Shear bolts broken on shaft coupler Defective electric motor Conveyor harness damaged Bent shaft, drive or idler
Conveyor turns on and off	Circuit breaker / Fuse overheating or faulty. Loose chain or bad link.	Shear bolts broken on shaft coupler Broken or missing crossbars
Spinner operates erratically	Circuit breaker / Fuse overheating or faulty. Loose or corroded spinner harness connections Spinner speed setting is set too low	Defective electric motor Spinner harness damaged
Conveyor does not operate	Shear bolts broken on shaft coupler Variable speed controller not functioning properly Auger is jammed by a foreign object, or frozen material	Damaged gearbox Electric motor defective Shaft key missing from gearbox/auger coupling
Noisy operation	Bent shaft, drive or idler Bearings need lubrication Foreign object in conveyor	Faulty bearings Spinner disc unbalanced
Material not exiting discharge chute	Conveyor discharge clogged Material bridging inside hopper	feed gate malfunction, or closed Inverted Vee not installed
Spinner disc not turning	Electric motor faulty Spinner disc jammed faulty bearings bearings need grease	Variable speed controller not functioning properly Keyway missing roller chain binding/faulty
Speed Control overload light on	Grease spinner bearings, using only wheel bearing viscosity grease, while spinner is turned on.	Love joy (coupler) and spinner shaft are misaligned
Circuit breaking tripping and/or motor is drawing too many amps	Feed gate door not open enough, causing build up pressure (open door and install salt flap) Inverted V deflector not installed Conveyor pintle chain and / or Roller chains too tight, causing strain. (<i>chain should be 1/2" above center crossbar</i>)	Drive bearings not properly greased or seized. Spinner shaft bent or spinner bearings seized Flip chute shaft misaligned, causing drive strain on motor(s) Faulty motor and/or motor internal bearings.

MAINTAINENCE SCHEDULE, DOWNEASTER SPREADERS

<u>MAINTAINENCE TASK TO BE COMPLETED</u>	<i>Pre-Season</i>	<i>Daily</i>	<i>10 Hours or Weekly</i>	<i>40 Hours or Monthly</i>	<i>Post-Season</i>
Inspect spreader for loose, missing, or damaged parts or hardware	X	X			X
Verify spreader is securely attached to vehicle	X	X			
Inspect electrical/battery connections and apply dielectric grease	X		X		X
Adjust drag chain tension & chain wiper position	X			X	
Check gearbox oil level	X		X		
Inspect & clean gearbox breather	X		X		
Grease gearbox input shaft bearing	X			X	X
Flush and refill gearbox oil	X				
Lubricate drag chain	X		X		X
Adjust roller chain tension	X			X	
Lubricate roller chain	X		X		X
Grease idler, drive shaft, and spinner shaft bearings	X		X		X
Oil or paint rusty surfaces, such as screens, and shafts.	X				X
Replace wireless remote transmitter battery	X				
Clutch maintenance	X				X
Check Hydraulic Fluid Level	X	X			
Replace hydraulic filter	X			X	
Flush and refill hydraulic reservoir	X				
Pressure wash hopper, conveyor and shafts,			X		X
Add gas stabilizer to gas tank of engine.				X	X
Spray painted, cast, or bare surfaces and chains with rust inhibitor such as "Fluid Film"				X	X
Drain carburetor float bowl.				X	X
Apply antisieze to all removable hardware such as chute bolts, spinner bearing bolts.					X
Engine Maintenance	<i>As required per engine manufacturer</i>				

End of Season Maintenance & Summer Storage

1. Wash spreader. Make sure no material or residue is left in and outside the hopper.
2. Lubricate bearings using marine grease.
3. Lubricate pintle chain, roller chains and drive gears, entirely, with rust inhibitor or other type of moisture prevention oil.
4. Inspect wire harness, connectors for broken insulation, missing components. Replace if necessary.
5. Apply dielectric grease on all electrical connectors & protect them with caps before storage.
6. Remove controller from truck. Store controller indoors, in a dry, cool place.
7. Clean and repaint any rusty surfaces, such as screens, shafts, gearbox case and bearing housings.
8. Remove the battery, (if equipped) and check electrolyte level and store in a cool dry place.
9. Store hopper in a dry, cool place out of the elements of the sun and rain off the ground. Cover with a weatherproof tarp if stored outdoors.

DownEaster Orange paint code: DuPont Burnt Orange, 7624-23EX8

WIRELESS TRANSMITTER PROGRAMMING

NOTE : *If spreader and unit were purchased together, installed from factory, controller is preset and does NOT need to be programmed, for initial use.*

Wireless Controller for gas spreaders

Operating instructions:

1. Open fuel shut *off* valve, on engine.

Move Wireless Control Box ON/OFF switch, to the **ON** position.

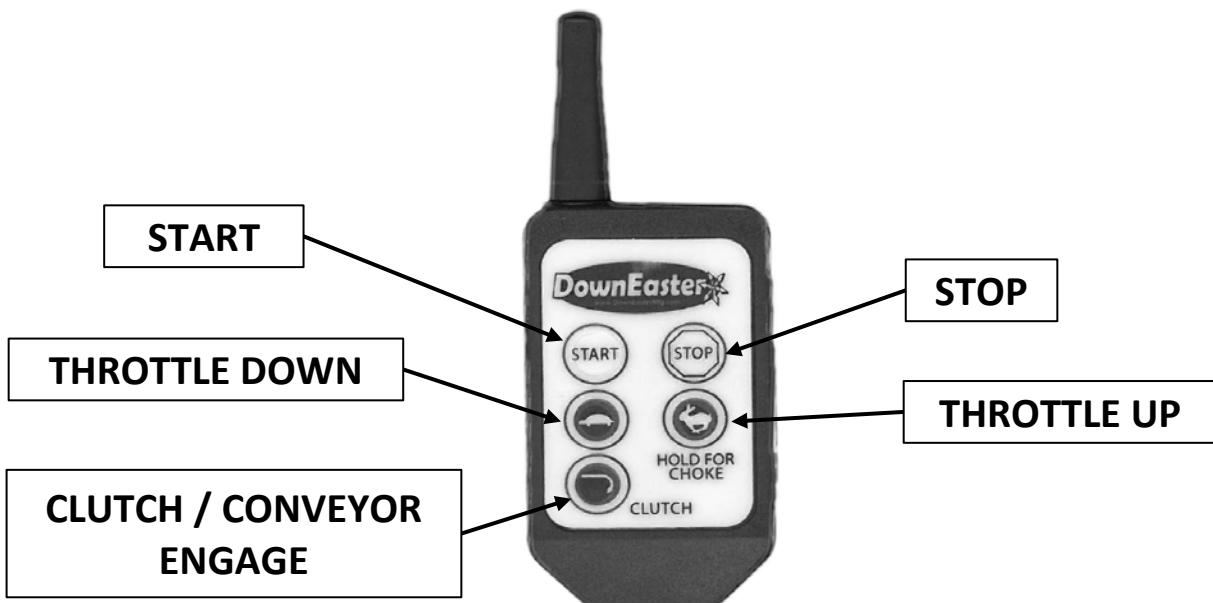
(NOTE: When the spreader is not in use, ensure that this switch is in the **OFF** position. Keeping this switch in the OFF position will avoid any risk of accidental operation and will avoid unnecessarily draining the spreader's battery.)

2. Depress the Throttle *UP* button and hold until Choke Indicator Light on spreader turns on. (Choking a warm engine may not be necessary.)

Depress the Start button and hold until the engine starts.

Press the Throttle *DOWN* button to decrease the throttle speed; this will turn off the choke. Adjust the engine speed down to idle by pressing and holding the throttle *DOWN* button.

6. **WARNING:** *Ensure that the spread area is clear of people and objects that could be damaged prior to engaging the conveyor!*
In order to engage the conveyor and spinner, press the Conveyor/Clutch button.
7. Adjust the conveyor and spinner speed as appropriate, using the Throttle UP and Throttle DOWN buttons. ***(Do not hold the Throttle UP button once the desired RPM level is achieved or you will choke and stall the engine.)***
8. In order to disengage the conveyor and spinner, press the Conveyor/Clutch button.
9. To turn off the engine, press and hold the Throttle DOWN button to move the engine to idle speed, then press and hold the Stop button until engine has turned off completely.



WIRELESS TRANSMITTER PROGRAMMING

Trouble shooting Wireless Control system

If Transmitter is not communicating with the wireless control box.

1. Ensure the wireless control box On / Off switch is properly connected and is in the on position.
2. Check or replace battery in transmitter. (See Battery Replacement section for more information.)
3. Remove cover from Wireless Control Box and press any button on the transmitter; red LED in Wireless Control Box should light. If red LED does not light:
 - a. Check battery connections in spreader to ensure that Wireless Control Box is getting power;
 - b. Check to make sure that spreader battery is fully charged; Wireless Control box will operate correctly if battery voltage is too low.
 - c. Reprogram Transmitter to Wireless Control Box. (See Programming instructions section for more information.)
4. If red LED lights when Transmitter button is pressed, then the Transmitter and Wireless Control Box are communicating properly.
 - a. Check connections in Wireless Control Box wire harness to insure that they haven't come loose.
 - b. Check spreader battery connections to make sure they are clean and secure.
 - c. Follow spreader troubleshooting steps as described in the spreader manual.

Programming instructions

The remote control Transmitter has been preprogrammed at the factory to communicate with the Wireless Control Box. Reprogramming should only be required in order to use a second Transmitter or if you replace the battery in the Transmitter.

Programming instructions are shown below.

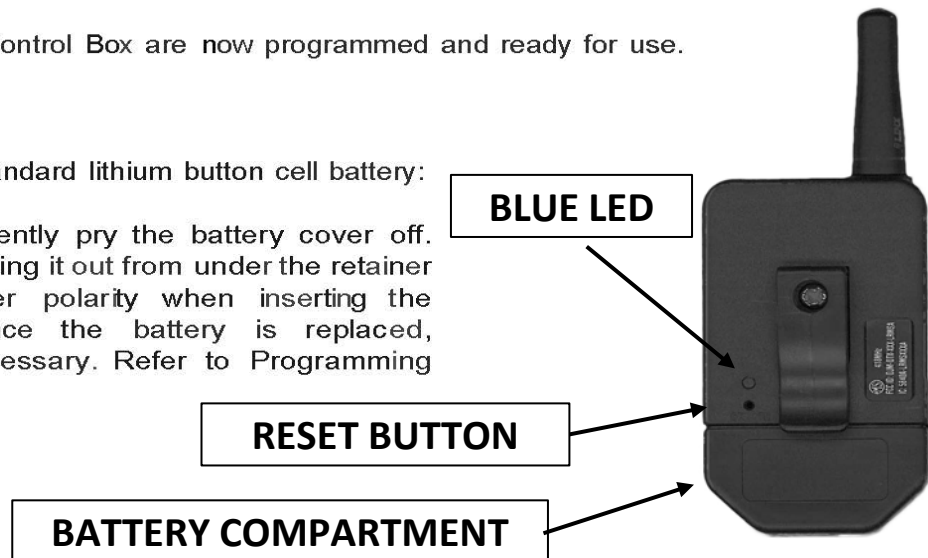
1. Turn ON the Wireless Control Box.
2. Using a paperclip, depress the recessed button on the rear of the Transmitter. (If working properly, a blue LED above the button will begin to blink)
3. Push each button on the Transmitter individually to send the address to the Wireless Control Box.
4. Wait until the blue LED stops blinking before proceeding.
5. Take the *cover* off of the Wireless Control Box and push the "learn address" button inside. (If working properly, the red LED will begin to blink.)
6. Push each button on the Transmitter individually. Save that unique address.
7. Push the learn address button to end the programming mode. (The red LED will stop blinking.)

Transmitter and Wireless Control Box are now programmed and ready for use.

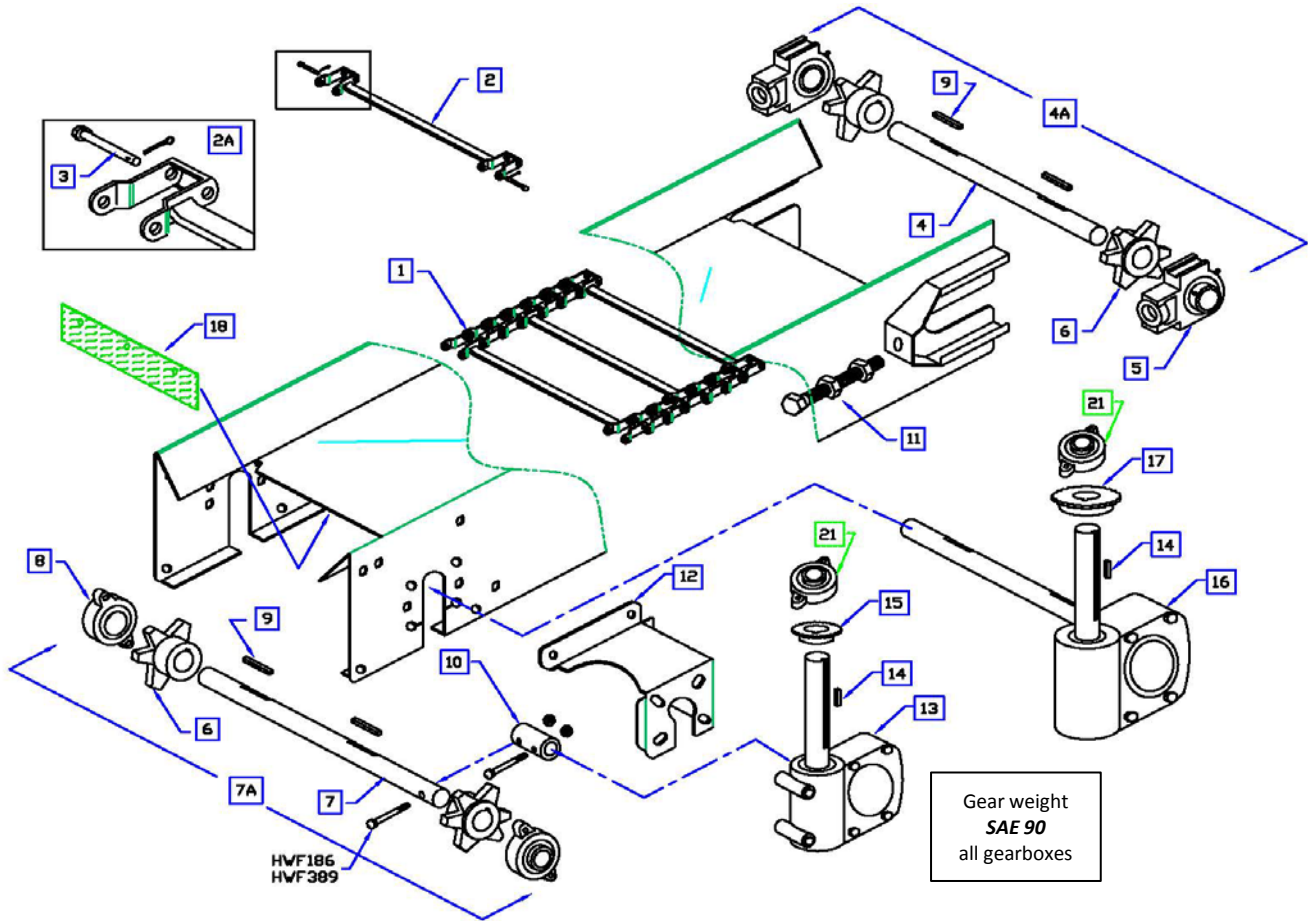
Battery Replacement

The Transmitter uses a standard lithium button cell battery:
3VCR2032.

To replace the battery, gently pry the battery cover off. Remove the battery by sliding it out from under the retainer clip. Observe the proper polarity when inserting the replacement battery. Once the battery is replaced, programming will be necessary. Refer to Programming Instructions section.



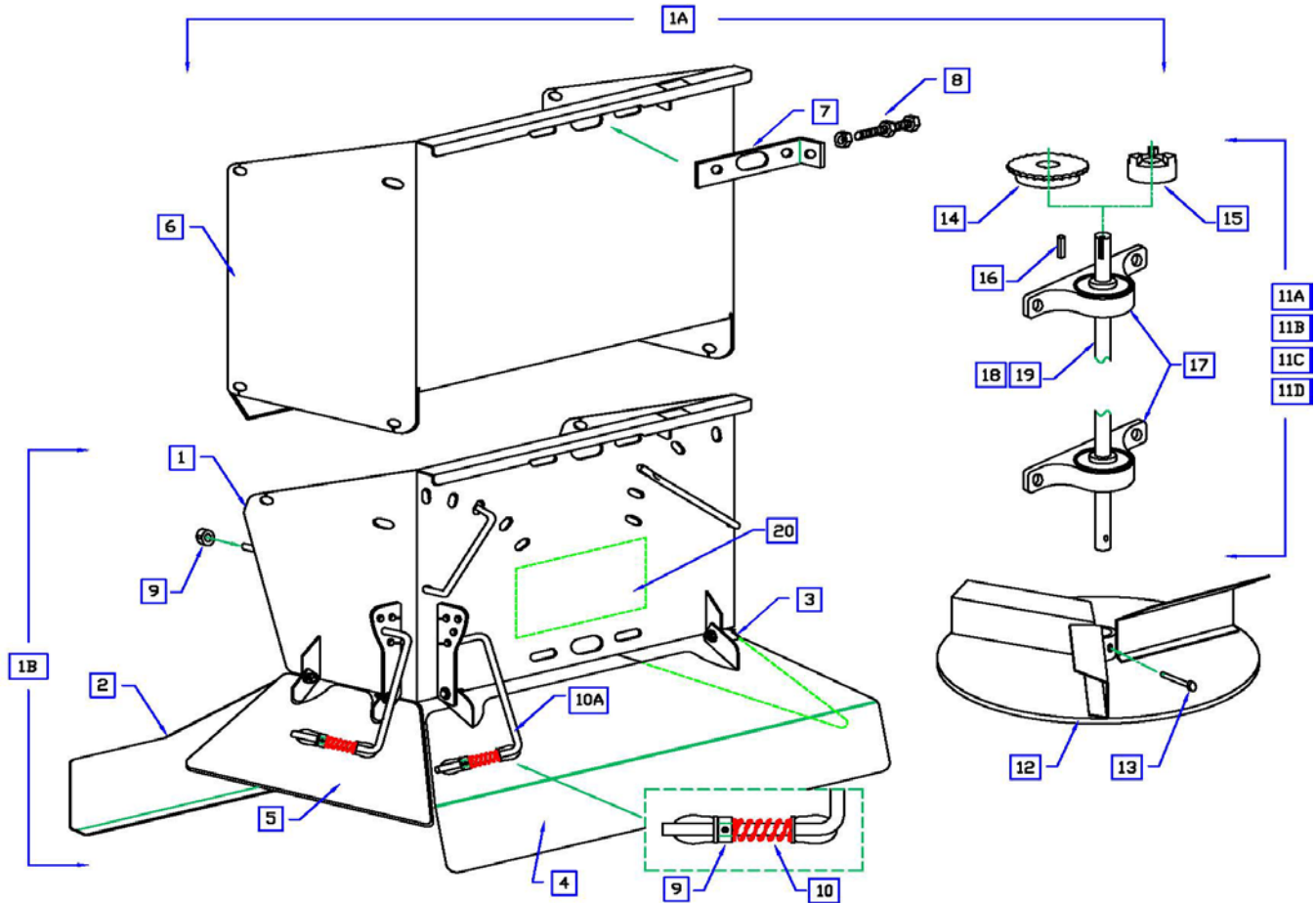
14" CONVEYOR ASSEMBLY - ALL LENGTHS



KEY	PART #	DESCRIPTION
1	SPV1402	14" x 2' conveyor chain
	SPV1404	14" x 4' conveyor chain
	SPV1406	14" x 6' conveyor chain
	SPV1407	14" x 7' conveyor chain
	SPV1408	14" x 8' conveyor chain
	SPV1409	14" x 9' conveyor chain
	SPV1410	14" x 10' conveyor chain
2	SPGV114	14" Conveyor chain crossbar
2A	SPV111	Single Master Link includes 2 pins w/ cotters,
3	SPV113	Pin w/ cotter
4A	SCA102	14" idler shaft assy
4	SPGV131	Idler shaft
5	SPV131	Bearing, idler
6	SPV118A	Conveyor drive / idler sprocket, D662, 6T x 1.125,

KEY	PART #	DESCRIPTION
7	SPGV116	14" Conveyor driveshaft
8	SPV132	Bearing, Driveshaft
9	HWF352	Key
10	SCA108	Driveshaft coupling
11	SCA112	Bolt, adjusting tap bolt, zinc plated
12	SKA410	Transmission Mount, bolt on
13	SPV121A	Gearbox Gas - Worm Gear Reducer 20:1
	HWF766	Hardware kit for gas gearbox mounting ONLY
14	HWF350	Key, square
15	SPV123A	Sprocket, 40B-16 x 1", (gas drive)
16	SPV121E	Gearbox, 14" electric, 50:1 reducer
	HWF767	Hardware kit for electric gearbox mounting
17	SPV123C	Sprocket, 40B-26 x 1", (electric drive)
18	DFH-3	Chain sweep flap 10-1/2" x 2-3/8"

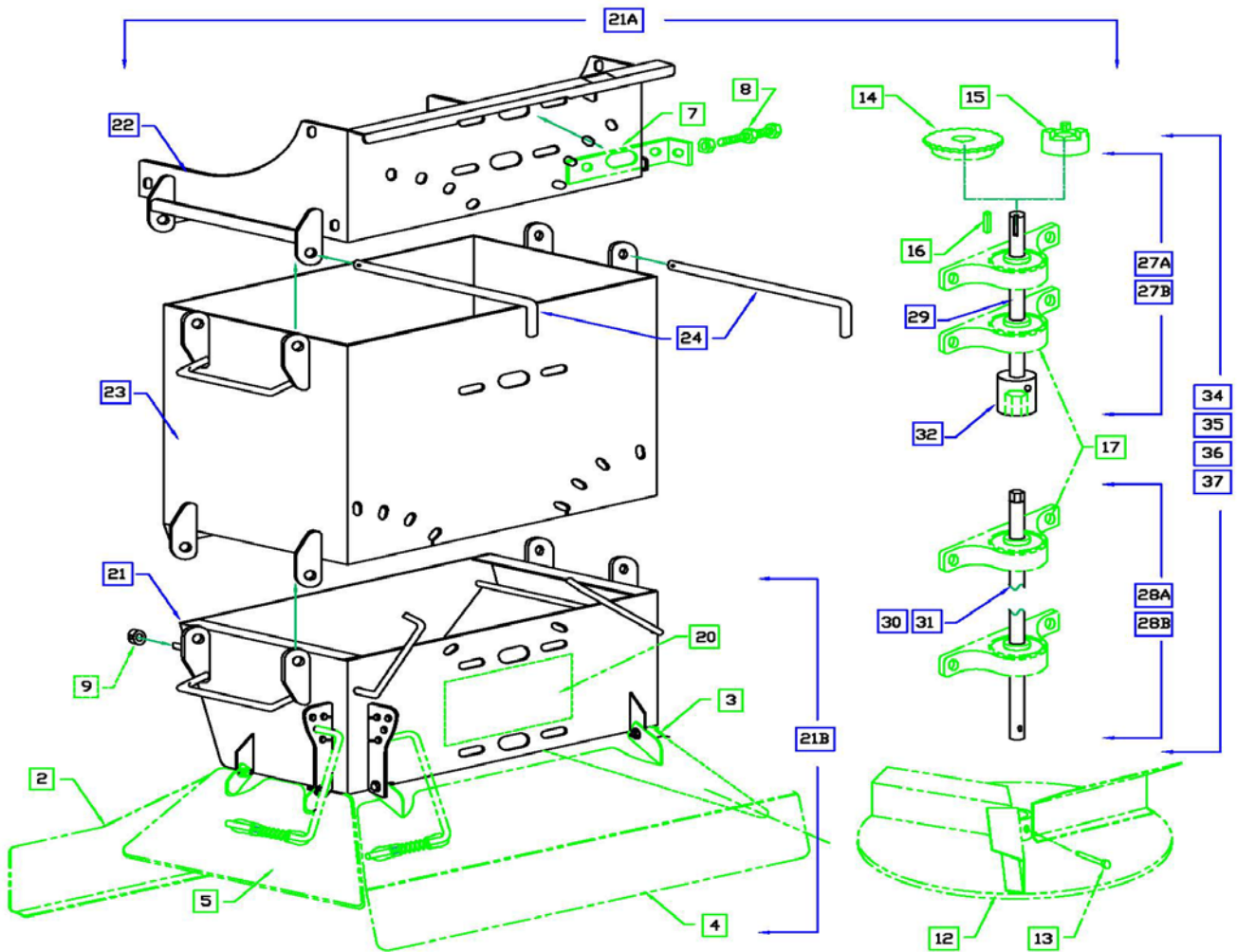
14" STANDARD CHUTE



KEY	PART #	DESCRIPTION
1A	SKC001P(G/H)	Complete SHORT chute assembly (w/ shaft, spinner)
	SKC002S(G/H)	Complete LONG chute assembly (w/ shaft, spinner)
1B	SKC510S	SHORT chute assembly only
1	SKC100S	Chute wrapper assembly, short 14"
2	SKC201S	Deflector assembly, front, bolt on
3	SKC202S	Deflector, Curb side, w/ adjustment rod & hardware
4	SKC203S	Deflector, Rear, w/ adjustment rod & hardware
5	SKC204S	Deflector, Road side, w/ adjustment rod & hardware
6	SKC112S	Chute extension, 12", w/ hardware
7	SKC302	Chain tensioner, stainless only
8	HWF165	Bolt, Tension adjustment
9	HWC100	Collar w/ set screw (5 per unit)
10	SPH128	Spring, compression (3 per unit)
10A	SKC330	Rod, for chute deflector adjustment. (3 per unit)
-	HWF565	Hardware/Bolt kit, for Gas Sanders

KEY	PART #	DESCRIPTION
11A	SPS107A	Complete short shaft assy, 23" long (gas & electric)
11B	SPS107F	Complete short shaft assy, 23" long (sc hyd. & dual elec.)
11C	SPS112A	Complete long shaft assy, 35" long (gas & electric)
11D	SPS112D	Complete long shaft assy, 35" long (sc hyd. & dual elec.)
18	SPS102A	Spinner shaft only, 7/8" x 23" (reg. chute)
19	SPS103	Spinner shaft only, 7/8" x 35" (long chute)
12	SKC314S	Spinner disc, 14" diameter, 3 fin, stainless only
	SPGS104D	Spinner disc, 14" polypropylene, 6 fin
13	HWF420	Shear pin
14	SPS110	Spinner shaft sprocket
15	SPN130	Lovejoy hub
-	SPN129C	Spider sox
16	HWF354	Key
17	SPS109B	Bearing and pillow block

14" FLIP CHUTE

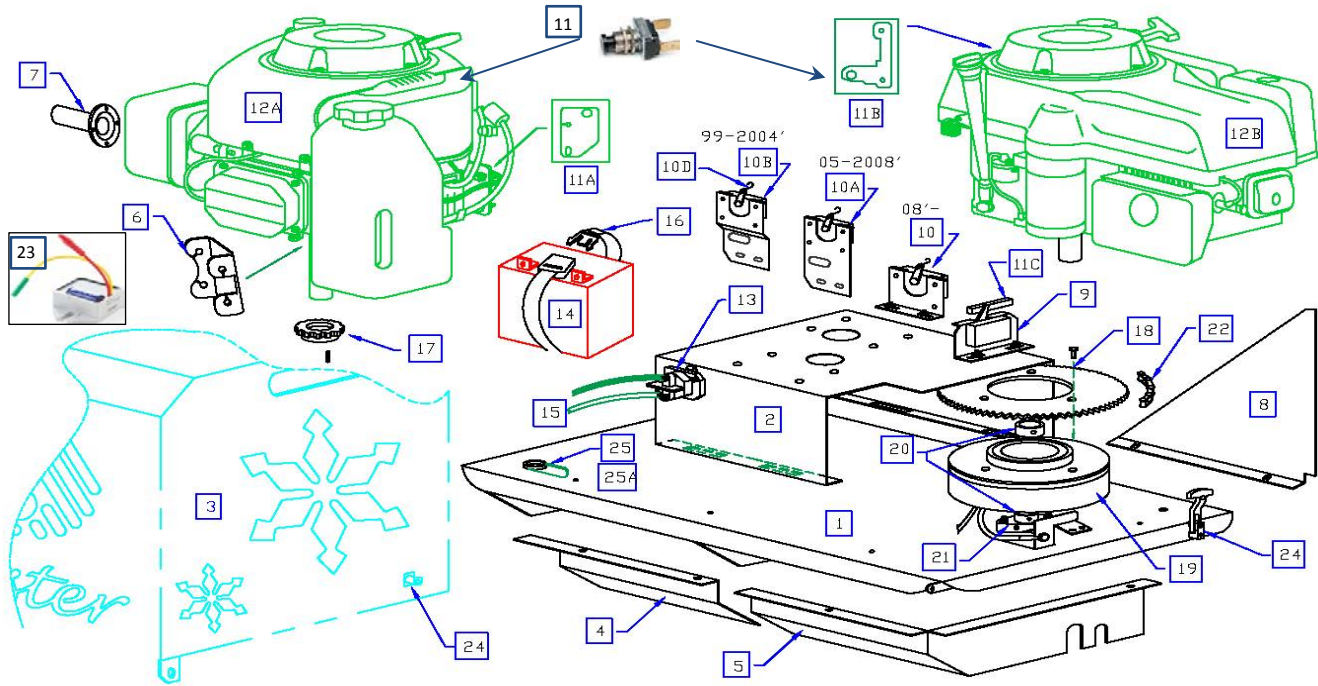


KEY	PART #	DESCRIPTION
21A	SKC003S(G/H)	Complete SHORT flip chute assembly
21A	SKC004S(G/H)	Complete LONG flip chute assembly
21B	SKC530S	SHORT Flip chute assembly only
21	SKC102S	Wrapper assembly, FLIP Chute, 14"
22	SKC101S	Upper flip chute rail bracket
23	SKC103S	Chute extension, FLIP 12", w/ hardware
24	SKC320	Pin, for flip chute pivot & retention. Stainless only.
-	HWF840	Hardware kit, for extension only.
	HWF569	Hardware kit, for Flip chute.
27A	SPS118	Upper flip shaft assembly (gas & electric)
27B	SPS125	Upper flip shaft assembly (hydraulic & DUAL elec.)

KEY	PART #	DESCRIPTION
28A	SPS117	Lower short flip shaft assembly 13"
28B	SPS121	Lower long flip shaft assembly 25"
29	SPS113	Upper shaft, (short or long), shaft only 9"
30	SPS114	Lower shaft, (short), shaft only 13"
31	SPS120	Lower shaft, (long), shaft only 25"
32	SPS112	Upper shaft receiver collar, (w/ pin)
34	SPS116	Short shaft complete assembly (gas & elec.)
35	SPS116H	Short shaft complete assembly (hydraulic & dual elec.)
36	SPS119	Long shaft complete assembly (gas & elec.)
37	SPS119H	Long shaft complete assembly (hydraulic & dual elec.)

For items numbers not listed on this page, see previous page(s) All items in numerical order

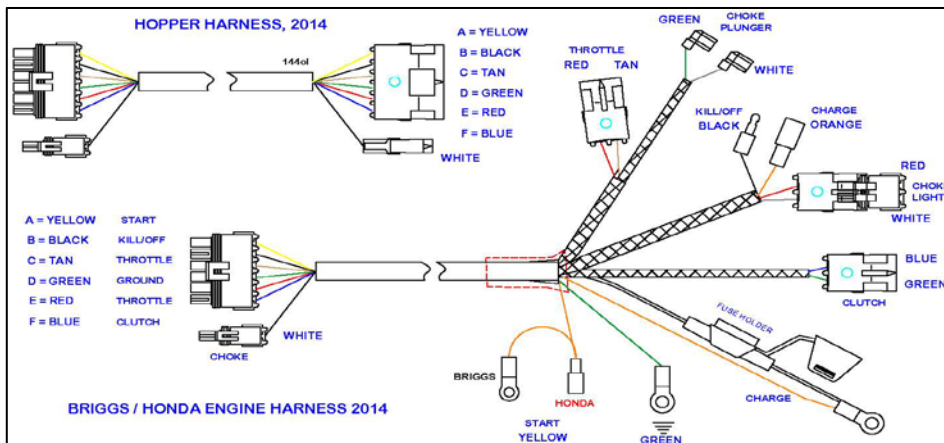
14" GAS DRIVE PLATFORM



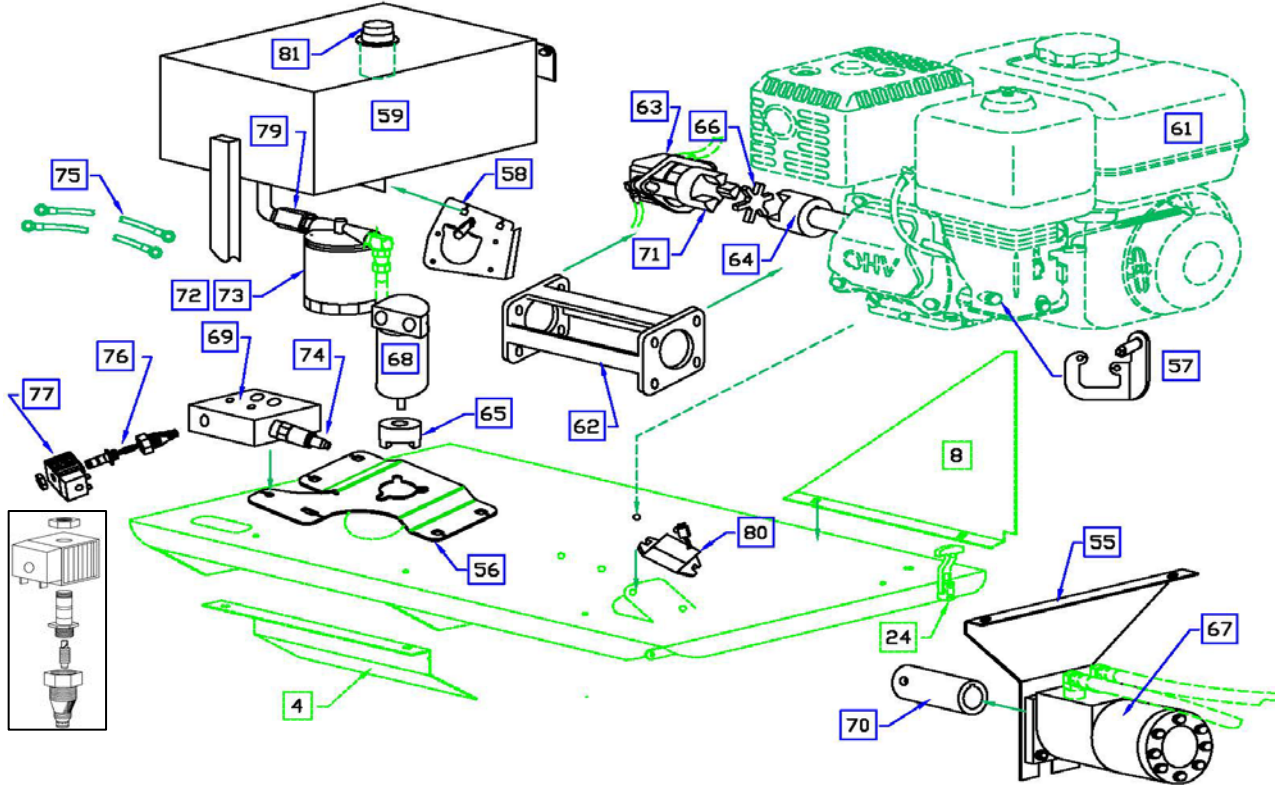
KEY	PART #	DESCRIPTION
1	SKA402S	Platform, gas & gas/hydraulic, multi use
2	SKA408	Motor mount, gas, Briggs & Honda, Stainless
3	SKA412S	Engine Cover
3A	SPN121	Hood gasket, 29"
4	SKA418	Chain guard, spinner, gas & electric platform,
	SKA419	Chain guard, spinner, (FLIP CHUTE ONLY)
5	SKA417	Chain guard, gearbox, gas platform,
6	SKA428	Relocation gas tank bracket, Briggs & Stratton only.
7	SKA400	Exhaust pipe assembly, Briggs & Stratton
8	SKA416	Splash guard
-	SPN122D	Throttle control motor
9	SKA420	Throttle control assembly, Briggs
10	SKA422	Throttle control assembly, Honda
10D	SKA423	Throttle linkage, Honda

KEY	PART #	DESCRIPTION
11	SPN125	Momentary switch
11A	SKA424	Choke plunger switch assembly w/ bracket, Briggs
11B	SKA426	Choke plunger switch assembly w/ bracket, Honda
11C	SPN123A	Throttle control Link, Nylon, Briggs & Stratton
12A	SPN100A	Briggs & Stratton 10.5 HP INTEK OHV
12B	SPN100B	ENGINE-HONDA 11 HP
13	SPN107	Solenoid for Briggs
17	SPN109	Sprocket
18	SPN111	Sprocket
19	SPN104B	Electric clutch
20	HWC110	Collar, locking
21	SPV124	Bearing, 2 bolt flange
22	SPN112C	#40 Roller chain
23	SPE156	Voltage regulator
24	SPN119 / SPN119A	Rubber hold down latch / keeper

-	SPE200	Briggs / Honda engine harness (length: 3')
-	SPE190	12' hopper wire harness, all gas 2014



HYDRAULIC DRIVE PLATFORM

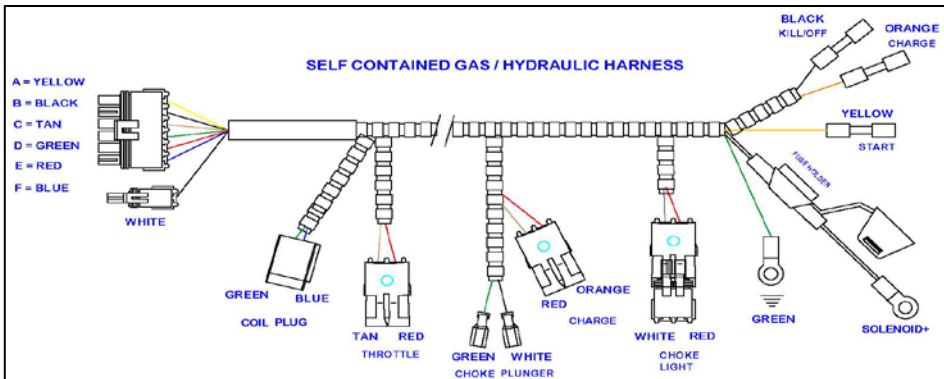


KEY	PART #	DESCRIPTION
55	SKA409	Motor support mount
56	SKA432	Spinner motor mount
57	SKA427	Choke switch assembly
58	SKA430	Throttle control motor
58B	SKA482	Throttle control bracket
59	SKA440	Reservoir tank, 4.5 gallon
	SKA200R	Motor Replacement kit Assembly, Honda
61	SPN100D	Honda engine 5.5 HP w/ electric start
62	SPH116	Hydra mount
63	SPH112	Hyd Pump
64	SPN130A	Lovejoy, 3/4"
65	SPN130B	Lovejoy 5/8"
66	SPN129C	Spider sox
67	SPHL104 KIT	Hydraulic motor
68	SPH114	Spinner Motor, Hyd.
69	SPH115	Valve block
70	SPGH104	Coupler

KEY	PART #	DESCRIPTION
71	SPN130C	Lovejoy
72	SPH117	Hydraulic filter assembly
73	SPH125	Hydraulic Filter only
74	N/A	Pressure relief valve
76	SPH122	Valve coil
77	SPH123	Coil w/ plug
78	SPH124	Valve screen
79	SPH120	Check valve
80	SPE156	Voltage regulator
81	SPH126	Filler cap & strainer assembly

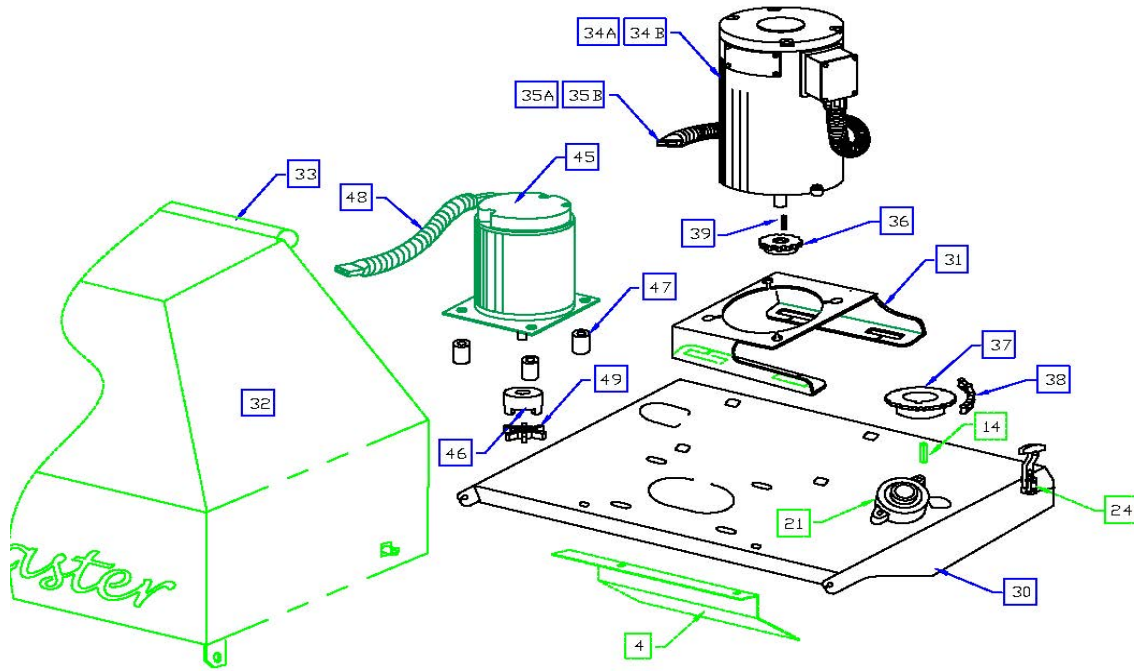
KEY	PART #	DESCRIPTION
Hoses	TPH201	Filter to spinner motor 12"
	TPH200	Valve block to motor pump 11"
	TPH202	Spinner motor to conveyor motor 30" length
	TPH203	Valve block to conveyor motor 32"
	TPH204	Reservoir tank to motor pump 12"
	TPH207	Valve block to spinner motor 3 1/2"

-	SPE175	Wire Harness, for self contained hydraulic only
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This platform used only on 1.4 yard and below.

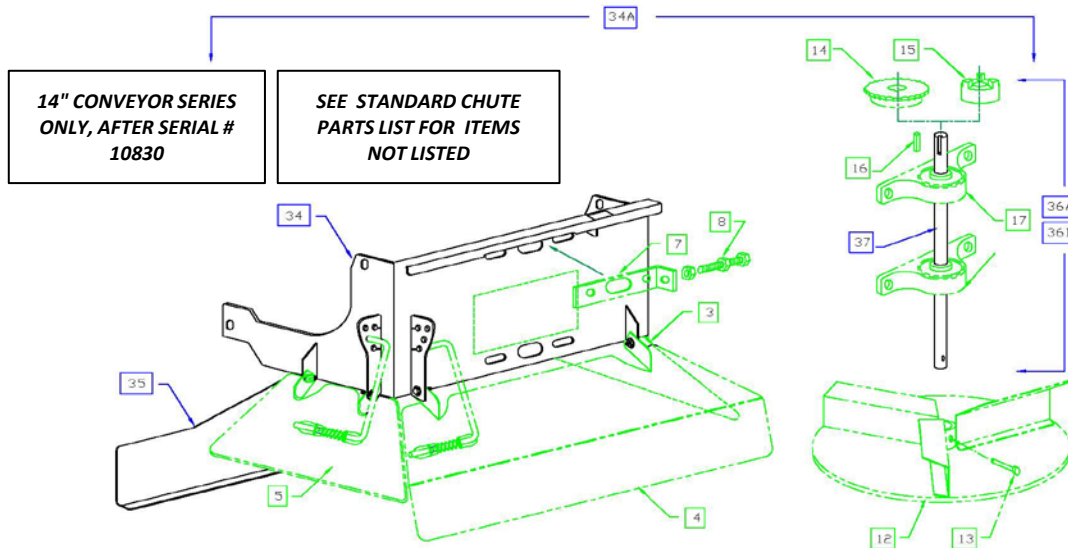
14" ELECTRIC DRIVE PLATFORM



KEY	PART #	DESCRIPTION
30	SKA404S	Platform, electric, for 14" conv.
31	SKA406	Motor mount, electric, Stainless w/ hardware.
32	SKA414S	Engine Cover, Electric, for 14" conv. only
33	SKA121	Hood Gasket, channel with bulb, 20"
34A	SPE121C	Electric motor, 12V, 1/2 hp,
34B	SPE154	Electric motor, stainless, 12V, 3/4 hp
35A	SPE127A	Pigtail assembly, 1/2 HP motor only, 6 GA wire
36	SPE138	Sprocket
37	SPV123B	Sprocket

KEY	PART #	DESCRIPTION
38	SPN112J	#40 Roller chain,
38A	SPN112L	#40 Roller chain, 63 pitch, w/ 26 tooth only
39	HWF354	Key
40	SPE135	Sander harness, Electric w/ gray connector
45	SPE122	Spinner motor .1/2 HP
46	SPN129B	Lovejoy, 1/2" hub with 1/8" keyway
47	SPE118	Spacer
48	SPE100B	Pigtail harness, for all spinner motors
49	SPN129C	Spider sox

14" 1/3 & 2/3 YARD ELECTRIC CHUTE



14" CONVEYOR SERIES ONLY, AFTER SERIAL # 10830

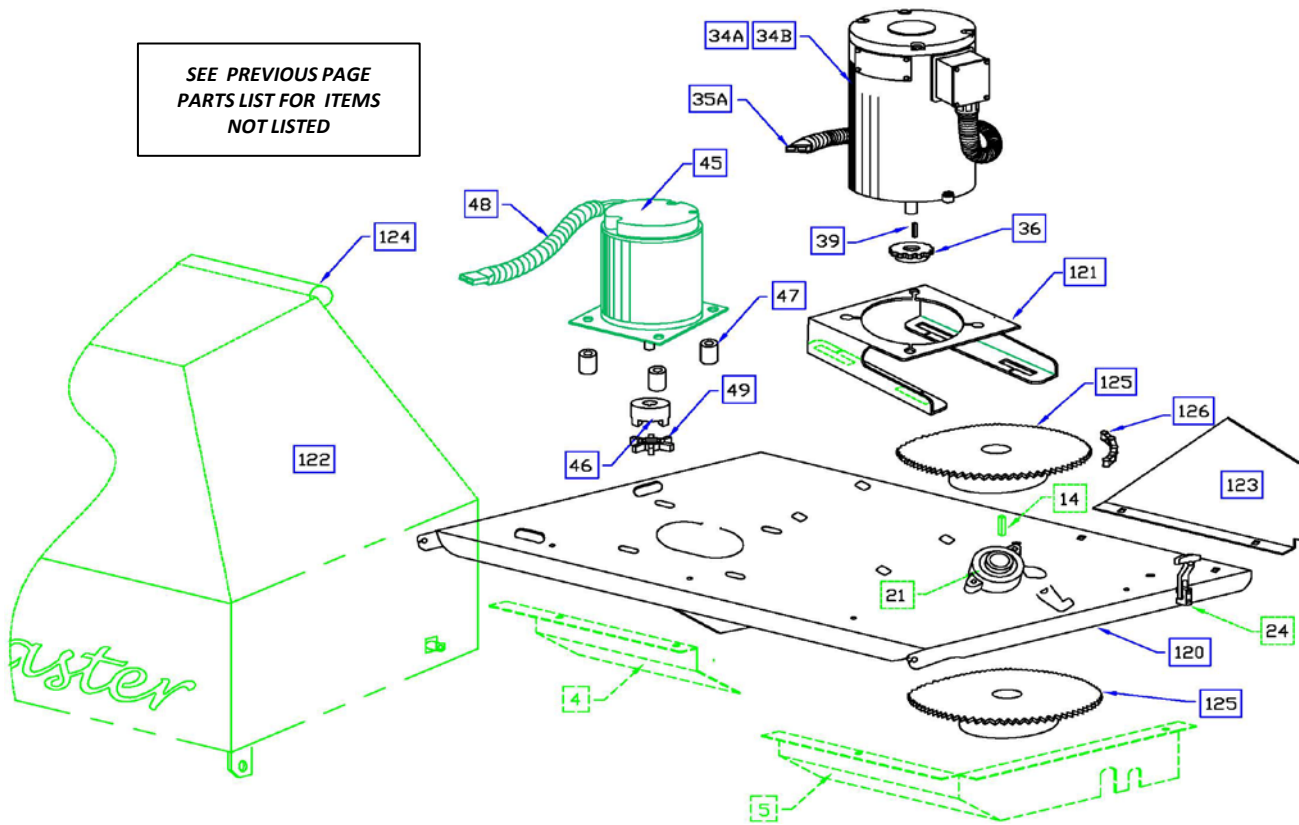
SEE STANDARD CHUTE PARTS LIST FOR ITEMS NOT LISTED

KEY	PART #	DESCRIPTION
34A	SKC009S(G/H)	Complete chute assembly, w/ shaft, spinner
-	SKC540S	Chute assembly, W/O shaft, spinner
34	SKC105S	Deflector bracket and bearing support
35	SKC209S	Deflector, front bolt on, Stainless, (post 2011)

KEY	PART #	DESCRIPTION
36A	SPS107C	Short shaft assy, for single motor only.
36B	SPS126	Short shaft assy, for dual elec. motor only
37	SPS102B	Spinner shaft, 16" for 1/3 yard - 2/3 yard
-	HWF565	Hardware/Bolt kit

This platform used only on 1.7 yard and above.

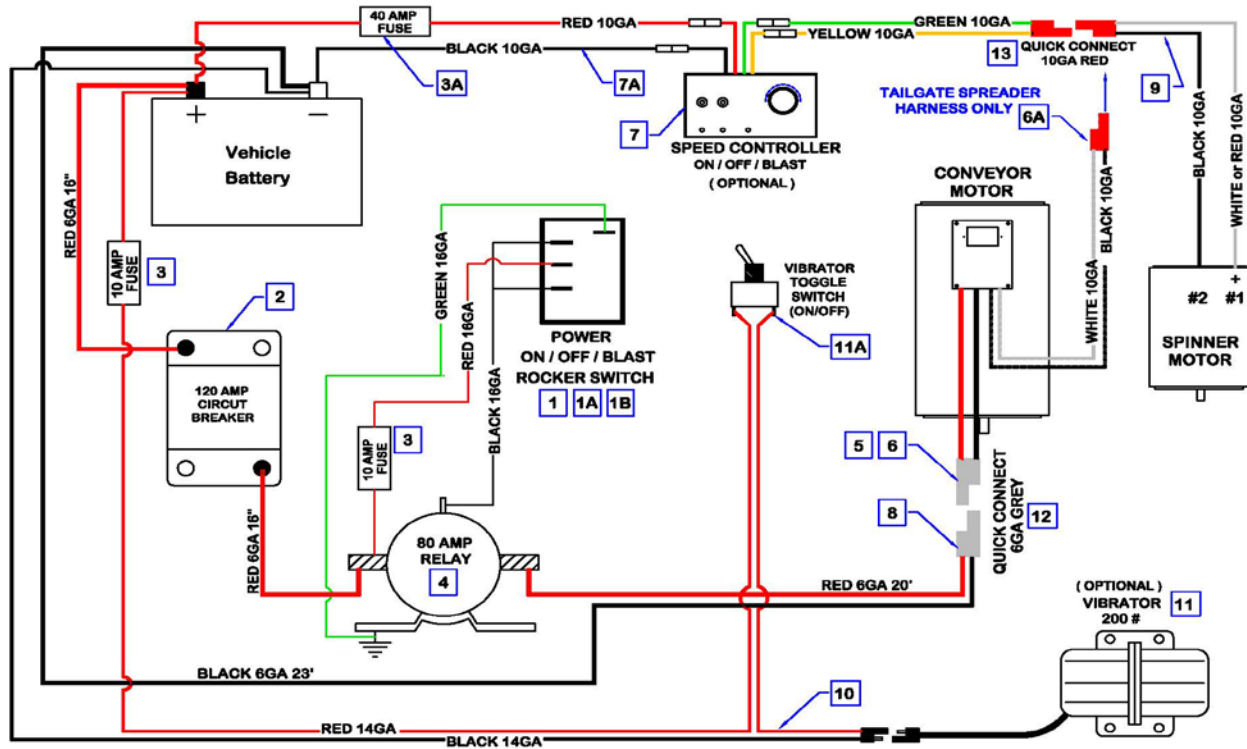
14" ELECTRIC DRIVE PLATFORM (after serial #12433)



KEY	PART #	DESCRIPTION
120	SKA452S	Platform, Multi unit drive, for 14" conv.
121	SKA407	Motor mount, electric, Stainless
122	SKA454S	Engine Cover, Electric, for multi platform only
123	SKA456S	Splash guard, electric only

KEY	PART #	DESCRIPTION
124	SKA---	Hood Gasket, channel with bulb, 24"
36	SPE138	Sprocket, 40B-11
125	SPV141	Sprocket, 40B-60
126	SPN112C	(top chain) motor to gearbox
-	SPN112A	(bottom chain) spinner shaft to gearbox

1/2 & 3/4 HP ELECTRIC (single/dual motor) WIRING

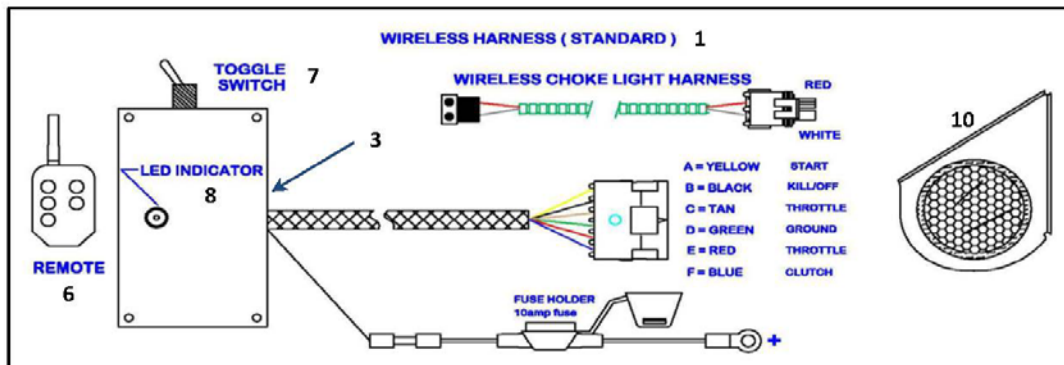


KEY	PART #	DESCRIPTION
		COMPLETE REPLACEMENT HARNESSES includes truck harness, switches, solenoid, circuit breaker
-	SKK003	Standard Electric On/Off control.
-	SKK004	Variable Speed Electric control, dual motor only.
-	VSC01	Variable Speed Control Kit

1	SPE161B	Harness switch assembly, switch, harness & bracket
1A	SPE107B	On /Off / Mom. engage switch,(orange) rocker
1B	SKA446	Mounting bracket, stainless, for one rocker switch
2	SPE132	Circuit breaker, 120 amp
4	SPE123	Solenoid, 12V Steel Case w/slots.

KEY	PART #	DESCRIPTION
5	SPE127A	Pigtail assembly
7	SPE144	Speed control for electric sander. (box w/ 4 wires)
8	SPE135	Sander harness, truck side (battery cables only)
9	SPE100B	Pigtail harness for all spinner motors
10	SPE144C	Wiring harness & on/off switch kit
11	SPE144B	Sure-FlowZ-200 vibrator
11A	HWE362	Toggle switch
12	HWE224	WeatherPak Housing, Gray
13	HWE224A	WeatherPak Housing, Red

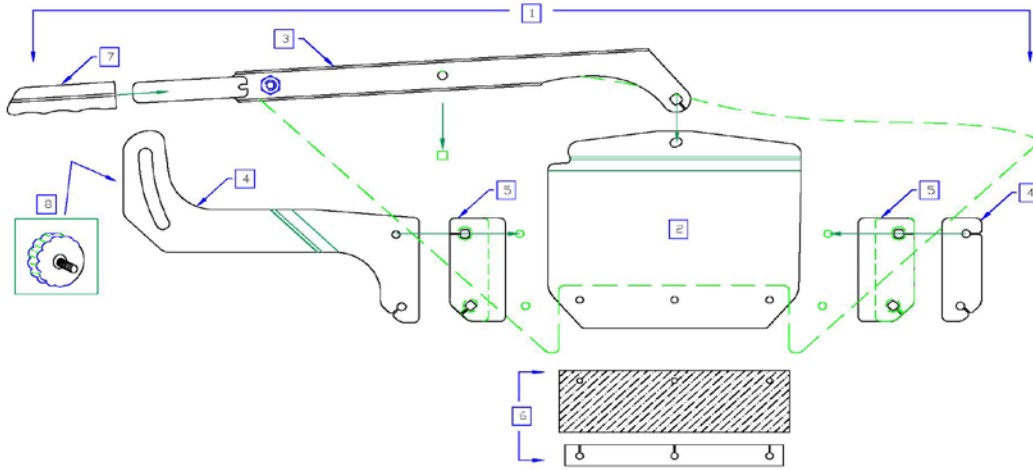
GAS PLATFORM / DRIVE - WIRELESS HARNESSES



	PART #	DESCRIPTION
1	SKK002B	Wireless Control assembly, complete
3	SKK210	Wireless Controller Receiver Box assembly w/ harness, switch & LED. DOES NOT INCLUDE REMOTE TRANSMITTER
6	SPE153	Replacement Remote Control Transmitter

7	HWE362	Toggle switch
8	HWE145	Indicator light, red
9	SKK520	Choke light power harness
10	SKK510	Choke light bracket and light (incandescent only)

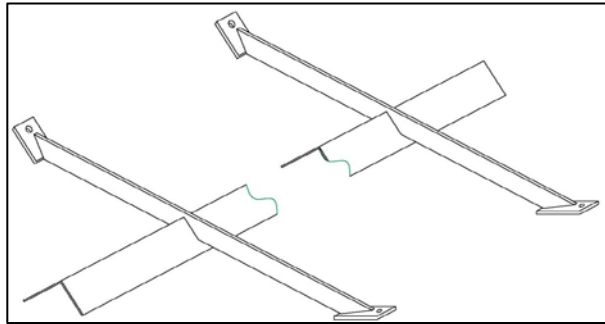
14" SERIES - FEED GATE / INVERTED DEFLECTOR / SCREENS



KEY	PART #	DESCRIPTION
1	SGA001	Feed gate assembly (COMPLETE)
2	SGA201	Feed gate
3	SGA203	Feed gate handle assembly
4	SGA205	Handle lock & shim

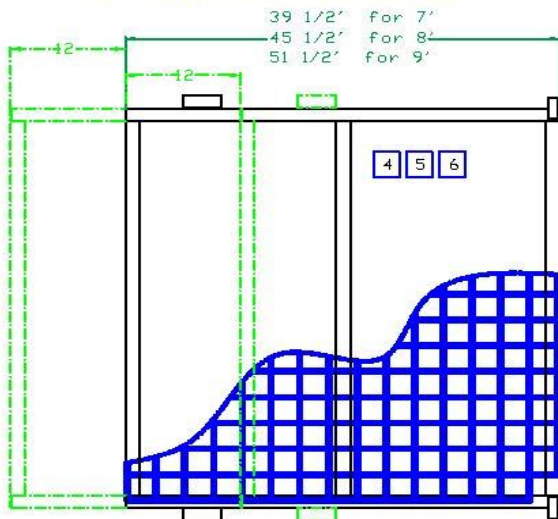
KEY	PART #	DESCRIPTION
5	SGA207	Feed gate keepers, (left & right)
6	SGA209	Feed gate salt flap assembly
	DFH-2	Salt flap only, 3 hole punch
7	SPG110	Handle grip
8	SPG103A	Gate lock knob, Male

Inverted Deflector



KEY	PART #	DESCRIPTION
-	SHAV606	Inverted V conveyor deflector, bolt in, stainless, 6' long, for 7' & 8' hopper
-	SHAV607	Inverted V conveyor deflector, bolt in, stainless, 7' long, for 9' hopper
-	SHAV608	Inverted V conveyor deflector, bolt in, stainless, 8' long, for 10' hopper

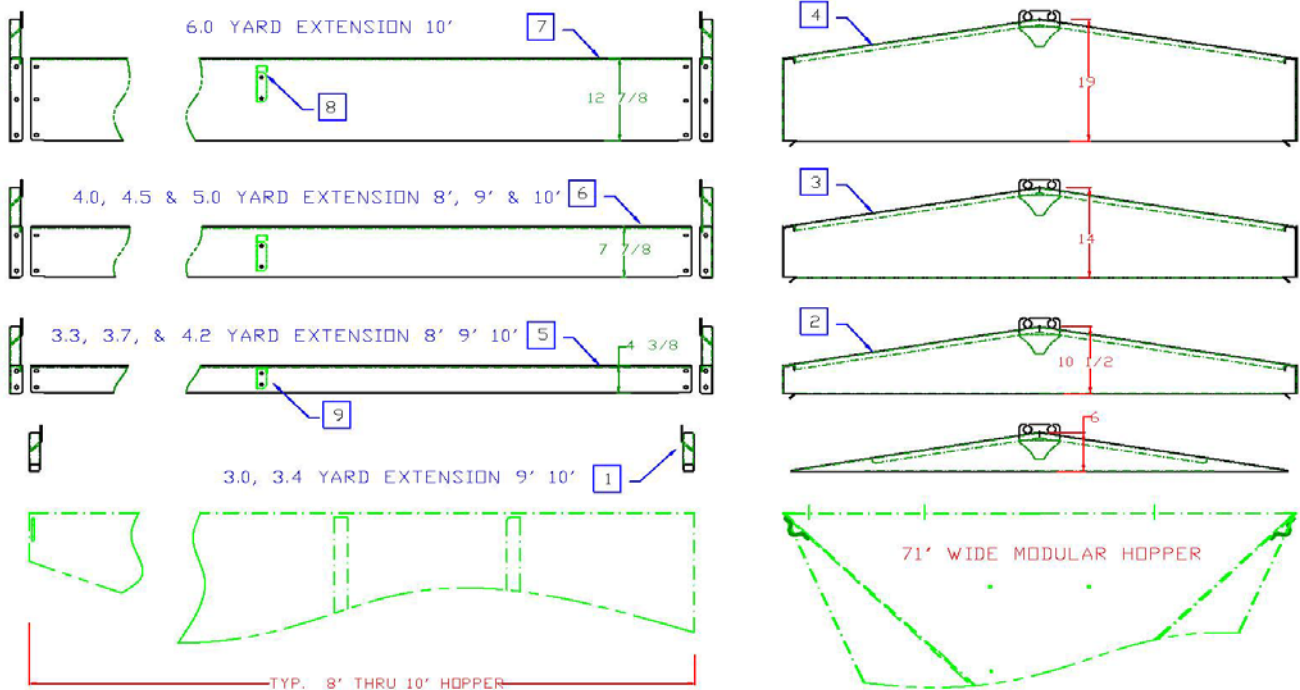
1.2 YARD to 2.5 YARD SCREEN ASSEMBLIES 50" WIDE HOPPER SERIES



Screens

KEY	PART #	DESCRIPTION
	SKS008	Screen assembly, 8' (3.3, 4.0 yard) (O.A. size 33 1/4 x 91 1/2)
	SKS009	Screen assembly, 9' (3.0, 3.7, 4.5 yard) (O.A. size 33 1/4 x 103 1/2)
	SKS010	Screen assembly, 10' (3.4, 4.0, 5.0, 6.0 yard) (O.A. size 33 1/4 x 115 1/2)
	SKS-30-HINGE	Screen hinge, Stainless only, weld on, 2 req. per unit
	SKS044	Screen assembly, 4' (.66 (JR.), 1.4, 2.0, 2.5 yard) (O.A. size 46 5/8 x 45 1/2)
	SKS004A	Screen assembly, 4' (.033 yard, Gator only, 1 req.) (O.A. size 30 5/8 x 45 1/2)
	SKS045	Screen assembly, 4.5' (2.2 yard) (O.A. size 46 5/8 x 51 1/2)

MODULAR HOPPER EXTENSION PARTS



Replacement parts only, separate pieces

KEY	PART #		DESCRIPTION
	Stainless	/ painted	
			71" WIDE HOPPER SERIES
1	SEE001S	SEE001P	Endplate extension, 0" High, (3.0, 3.4 yard)
2	SEE004S	SEE004P	Endplate extension, 4" High, (3.3, 3.7, 4.2 yard)
3	SEE008S	SEE008P	Endplate extension, 8" High, (4.0, 4.5, 5.0 yard)
4	SEE013S	SEE013P	Endplate extension, 13" High, (6.0 yard)

KEY	PART #		DESCRIPTION
	Stainless	/ painted	
			50" WIDE HOPPER SERIES
-	SEE505S	SEE505P	Endplate extension, 5" High, (2.5 yard)
-	SSE508S	SSE508P	Side plate extension, 5" High, 8' (2.5 yard)

5	SSE408S	SSE408P	Side plate extension, 4" High, 8' (3.3 yard)
	SSE409S	SSE409P	Side plate extension, 4" High, 9' (3.7 yard)
	SSE410S	SSE410P	Side plate extension, 4" High, 10' (4.2 yard)
6	SSE808S	SSE808P	Side plate extension, 8" High, 8' (4.0 yard)
	SSE809S	SSE809P	Side plate extension, 8" High, 9' (4.5 yard)
	SSE810S	SSE810P	Side plate extension, 8" High, 10' (5.0 yard)
7	SSE1310S	SSE1310P	Side plate extension, 13" High, 10' (6.0 yard)
8	SME571S	N/A	Spreader channel, 5" High, (8" & 13" side ext.)
9	SME371S	N/A	Spreader channel, 3" High, (4" side ext. only)
	HWF750		Hardware kit, 3.0 yard extensions
	HWF752		Hardware kit, 4.0, 5.0 yard extensions

WARRANTY

Coastal Metal Fab, Inc. Warranty

2016

General Provisions: Coastal Metal Fab, Inc. warrants its products to be free from manufacturing defects under normal use and service conditions and will repair or replace, at its option, any products or components thereof that are proven to be defective during the warranty period as specified below. This warranty extends to the original retail purchaser only and commences on the date of original purchase. Coastal Metal Fab's maximum liability under this warranty is limited to the cost of the repair or replacement of any defective products or components, and excludes any incidental or consequential damages. The warranty period is as follows:

DownEaster brand Dump Trailers and Dump Inserts -- 2 years from date of purchase

DownEaster brand Salt and Sand spreaders -- 1 year from date of purchase

DownEaster brand Dump Bodies -- 2 year from date of purchase or 24,000 miles

Items Warranted Separately: This warranty does not apply to certain components that are warranted separately by the original equipment manufacturers including, but not limited to, electric or gasoline motors, hydraulic pumps, hydraulic cylinders, tires, wheels, and axles.

Items not Covered: Coastal Metal Fab, Inc. is not responsible for the following:

- Premiums charged for overtime labor requested by the purchaser.
- Transportation to and from the dealership or service calls made by the dealer.
- Products purchased used.
- Products that have been altered or modified in ways not approved by Coastal Metal Fab.
- Depreciation or damage caused by normal wear and tear, lack of reasonable and proper maintenance, failure to follow operating or installation instructions, misuse, lack of proper protection during storage or accidents.
- Normal maintenance costs.

Parts Replaced under Warranty: If Coastal Metal Fab, Inc. elects to repair a defective product or component thereof, Coastal metal Fab will, at its discretion, utilize either new or remanufactured parts or components. If any such part or component proves to be defective within 12 months of installation or before expiration of this warranty, whichever is later, Coastal Metal Fab, Inc. will repair or replace, as it elects, such defective part or component.

Securing Warranty Services: To obtain service under this warranty, the original retail purchaser must request warranty service during the applicable period of warranty from a dealer authorized to sell the product being serviced. When making such a request, the purchaser must present evidence of the product's original purchase date, and make the product available for service at the dealer's place of business.

Limitations: The selling dealer has no authority to make any representation or promise on behalf of Coastal Metal Fab or to modify the terms or limitations of this warranty in any way. Coastal Metal Fab shall have sole discretion to determine whether a product or component is defective. Coastal Metal Fab reserves the right to discontinue or modify any of its products and, if Coastal Metal Fab elects to replace a defective product under this warranty which has been discontinued or modified, it may do so with a product deemed by Coastal Metal Fab to be of comparable quality and function.

THIS WARRANTY IS GRANTED IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCE SHALL COASTAL METAL FAB BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY NATURE RESULTING FROM ANY DEFECT IN THE PRODUCT OR ITS COMPONENT PARTS. SOME STATES DO NOT ALLOW LIMITATIONS ON OR EXCLUSION OF IMPLIED WARRANTIES OR INCIDENTAL AND CONSEQUENTIAL DAMAGES SO THE ABOVE EXCLUSIONS MAY NOT APPLY TO YOU.

Contact your local dealer or distributor for replacement parts and technical support or visit

www.downeastermfg.com