



MODEL NL4500G4 EDGE

UNIT SERIAL NO. _____

MULTIPLIER/MULTIBIN SERIAL NO. _____

MANUAL NUMBER: 311750-AA-E

EFFECTIVE 07/2016



Highway Equipment Company

Building the best since 1939.

1330 76TH AVE SW
CEDAR RAPIDS, IA 52404-7052
PHONE (319) 363-8281 | FAX (319) 286-3350
www.highwayequipment.com

For Additional information, please visit (Online users direct click links):

Service Videos: http://www.highwayequipment.com/customer_support/service-videosv2/

Warranty Registration and Claims Request: <http://www.highwayequipment.com/dealer-portal/unit>
(Dealer Use Only)

Copyright 2003 Highway Equipment Company, Inc.

Table of Contents.....	2
Interactive Features.....	4
Warranty.....	6
Preface.....	7
Safety.....	8
Safety Decals	10
Informational Decals	12
General Safety Rules-Operations.....	14
General Safety Rules-Maintenance	16
General Safety Rules-Installation.....	18
Installation Instructions.....	19
Hydraulic Requirements.....	19
Truck Requirements	19
Controller Requirements	20
Lifting the Spreader	20
Installing Body.....	21
Securing to Frame.....	22
Side Board Installation	22
Fender Installation	23
Fender Installation Video.....	24
Hydraulic Hose Installation	25
Hydraulic Pump Installation.....	25
Installation Guide	26
Filling Hydraulic System	27
Electrical Connections.....	27
ISOBUS Connections	27
Light Installation	28
Insert Installation Instructions.....	29
Hydraulic Requirements.....	29
Spreader Preparation.....	29
Feedgate Adjustment.....	30
Insert Installation	30
Lower Divider - Multibin	33
Hydraulics	34
Hydraulic Hose Installation	35
Hillside Divider & Conveyor Cover - MultApplier.....	36
Micro Cover Installation.....	37
Electrical Connections.....	38
Insert Removal/Endgate Installation.....	38
General Description.....	41
Introduction.....	42
Dimensions & Capacities	46
Initial Startup.....	52
General Operating Procedures	53
Lubrication and Maintenance	55
Preventative Maintenance Pays!	55
Hydraulic System.....	55
Service Schedule.....	55
Conveyor Chain.....	56
Conveyor Belt Maintenance	58
Bin Sensor	58
Conveyor Gearcase	60
Lubrication of Bearings	60
Fasteners.....	60
Clean Up	60



Lubrication & Hydraulic Oil Specifications.....	61
Hydraulic System.....	61
Gearcase Lubricant	61
Grease Gun Lubricant	61
Chain Oiler Mixture.....	61
Lubrication and Maintenance Chart	62
Troubleshooting	64
Standard Torques	67
Pre- & Post-Season Checklists	68
Hydraulics	69
Controller Operations.....	81
Introduction	81
How the ISOBUS Works	81
Terminologies	81
Cab to Enclosure Diagram	82
Modules to Function Diagram	83
Navigation.....	85
Navigation Control Buttons.....	86
Registration.....	87
Machine Configuration	87
Settings	91
Component Calibration.....	95
Operations/Features.....	99
Create New Job.....	99
Bin Fill	102
Feedgate Optimizer	104
Boundary Spreading	105
Diagnostics.....	106
Hydraulics	109
Bin Flush	110
Chain Oiler	112
Bin Sequencing	114
Alarm List.....	116
Default Settings.....	118
Configuration	118
Calibration	119
Alarms.....	119
Spread Pattern Testing.....	121
Crushing Strength	121
SGN	121
Product Setup Guidelines	122
Crush Test	123
SGN Scale Test	124
Performing a Spread Pattern Test	126
Spread Pattern Test Kit	126
Spinners.....	127
Spreader Preparation	127
Test Procedure	128
Data Recording	129
Driving Methods	130
Troubleshooting.....	131

NOTE:

This manual incorporates several interactive features to provide supplemental information and ease of navigation. The information below is to aid in the identification and use of these features.

Hyperlinks

Hyperlinks provide direct access to a specific destination when clicked. The entire Table of Contents of this manual is hyperlinked to provide quick access to all sections of this manual when viewing the electronic version.

Hyperlinks within the content are denoted by **blue, bold underlined text**. Electronic format viewers can click these links for direct access to New Leader online features. Internet access is required.

Quick Reference (QR) Codes

Quick reference codes provide direct access to a specific destination when activated. An example is provided below. In the printed version of this manual, viewers may scan the codes with a supporting mobile device for direct access to New Leader online features. Mobile data is required.

The electronic version of this manual provides the option to scan codes on-screen, or to click the code like a button. Internet access/mobile data is required.



Click or Scan - Highwayequipment.com



This page is intentionally left blank.

Insert Current New Leader
Warranty

PLEASE ! ALWAYS THINK SAFETY FIRST !!

The purpose of this manual is to familiarize the person (or persons) using this unit with the information necessary to properly install, operate, and maintain this system. The safety instructions indicated by the safety alert symbol in the following pages supersede the general safety rules. These instructions cannot replace the following: the fundamental knowledge that must be possessed by the installer or operator, the knowledge of a qualified person, or the clear thinking necessary to install and operate this equipment. Since the life of any machine depends largely upon the care it is given, we suggest that this manual be read thoroughly and referred to frequently. If for any reason you do not understand the instructions, please call your authorized dealer or our Product Sales and Support Department at 1-888-363-8006.

It has been our experience that by following these installation instructions, and by observing the operation of the spreader, you will have sufficient understanding of the machine enabling you to troubleshoot and correct all normal problems that you may encounter. Again, we urge you to call your authorized dealer or our Product Sales and Support Department if you find the unit is not operating properly, or if you are having trouble with repairs, installation, or removal of this unit.

We urge you to protect your investment by using genuine HECO parts and our authorized dealers for all work other than routine care and adjustments.

Highway Equipment Company reserves the right to make alterations or modifications to this equipment at any time. The manufacturer shall not be obligated to make such changes to machines already in the field.

This Safety Section should be read thoroughly and referred to frequently.

ACCIDENTS HURT !!!

ACCIDENTS COST !!!

ACCIDENTS CAN BE AVOIDED !!!



SAFETY



TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THAT OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

In this manual and on the safety signs placed on the unit, the words "DANGER," "WARNING," "CAUTION," and "NOTICE" are used to indicate the following:



DANGER

Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury. This signal word is to be limited to the most extreme situations and typically for machine components that, for functional purposes, cannot be guarded.



WARNING

Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.



CAUTION

Indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE!

Is used for informational purposes in areas which may involve damage or deterioration to equipment but generally would not involve the potential for personal injury.

NOTE:

Provides additional information to simplify a procedure or clarify a process.

The need for safety cannot be stressed strongly enough in this manual. At Highway Equipment Company, we urge you to make safety your top priority when operating any equipment. We firmly advise that anyone allowed to operate this machine be thoroughly trained and tested, to prove they understand the fundamentals of safe operation.

The following guidelines are intended to cover general usage and to assist you in avoiding accidents. There will be times when you will run into situations that are not covered in this section. At those times the best standard to use is common sense. If, at any time, you have a question concerning these guidelines, please call your authorized dealer or our Product Sales & Support Department at (888) 363-8006.



SAFETY DECAL MAINTENANCE INSTRUCTIONS

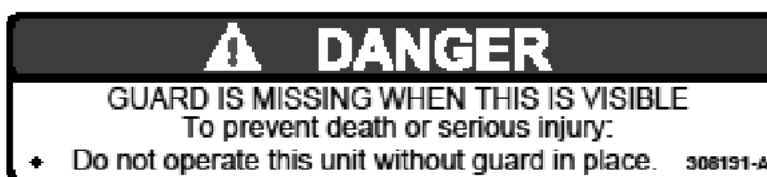
1. Keep safety decals and signs clean and legible at all times.
2. Replace safety decals and signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety decals or signs are available from your dealer's Parts Department or our Cedar Rapids factory.

SAFETY DECAL INSTALLATION INSTRUCTIONS

1. Clean Surface
Wash the installation surface with a synthetic, free-rinsing detergent. Avoid washing the surface with a soap containing creams or lotion. Allow to dry.
2. Position Safety Decal
Decide on the exact position before application. Application marks may be made on the top or side edge of the substrate with a lead pencil, marking pen, or small pieces of masking tape. NOTE: Do not use chalk line, china marker, or grease pencil. Safety decals will not adhere to these.
3. Remove the Liner
A small bend at the corner or edge will cause the liner to separate from the decal. Pull the liner away in a continuous motion at a 180-degree angle. If the liner is scored, bend at score and remove.
4. Apply Safety Decal
 - a. Tack decal in place with thumb pressure in upper corners.
 - b. Using firm initial squeegee pressure, begin at the center of the decal and work outward in all directions with overlapping strokes. NOTE: Keep squeegee blade even—nicked edges will leave application bubbles.
 - c. Pull up tack points before squeegeeing over them to avoid wrinkles.
5. Remove Pre-mask
If safety decal has a pre-mask cover remove it at this time by pulling it away from the decal at a 180 degree angle. NOTE: It is important that the pre-mask covering is removed before the decal is exposed to sunlight to avoid the pre-mask from permanently adhering to the decal.
6. Remove Air Pockets
Inspect the decal in the flat areas for bubbles. To eliminate the bubbles, puncture the decal at one end of the bubble with a pin (never a razor blade) and press out entrapped air with thumb moving toward the puncture.
7. Re-Squeegee All Edges.







NOTICE

Before spreading material, spread pattern tests must be conducted to properly adjust the spread pattern. Refer to the manual for adjustment instructions. A spread pattern test kit is available from your New Leader dealer.

Wind, humidity, rain and other adverse weather conditions can affect spread pattern, resulting in uneven crop growth and loss of yields.

THE MANUFACTURER OF THIS SPREADER WILL NOT BE LIABLE FOR MISAPPLIED MATERIAL DUE TO AN IMPROPERLY ADJUSTED SPREADER OR ADVERSE WEATHER CONDITIONS.

It is recommended that spread pattern tests be conducted prior to each spreading season, after any spreader maintenance, and periodically during the spreading season. Spread pattern tests must be conducted whenever a new product is to be applied.

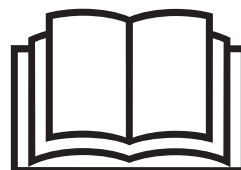
312276-A

NOTICE

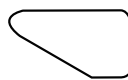
DO NOT SPREAD HERBICIDE

This unit is intended for dispensing micronutrients and seeds only--NOT HERBICIDES. The manufacturer is not liable for damage resulting from improper use.

304206-B



Conveyor Chain Tension (Top of Chain)



MAX

MIN

311828-B

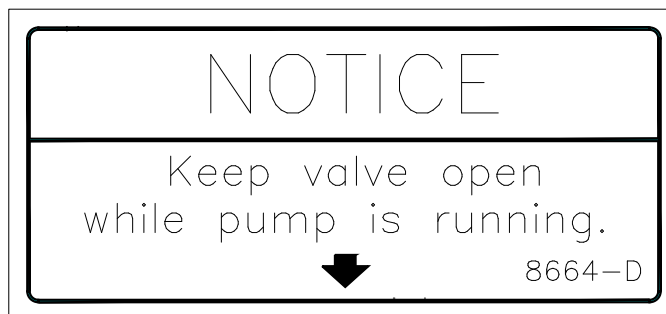
NOTICE

- Conveyor chain life will be noticeably extended by periodic lubrication.
- Use a 75% diesel fuel and 25% number 10 oil mixture on the links and rollers.
- Failure to keep the chain links loose and free running can result in severe damage to the conveyor chain, drag shaft, gear case, body structure, and is cause for voiding the warranty.

21476-E



NOTICE		
	No Cooler	With Cooler
Ideal Operating Temp	140 - 190°F	115 - 158°F
Recommended Lubricant	SAE 15W-40	Multi-Purpose Ag Hydraulic Oil
Lubricant Specifications:		
Viscosity Index	>130	>130
Viscosity at 40°C, cst	<115	<68
Viscosity at 100°C, cst	>14	>9
		304264-B



1. Before attempting to operate this unit, read and be sure you understand the operation and maintenance manual. Locate all controls and determine the use of each. Know what you are doing!



2. When leaving the unit unattended for any reason, be sure to:
 - a. Take power take-off out of gear.
 - b. Shut off conveyor and spinner drives.
 - c. Shut off vehicle engine and unit engine (if so equipped).
 - d. Place transmission of the vehicle in "neutral" or "park".
 - e. Set parking brake firmly.
 - f. Lock ignition and take keys with you.
 - g. Lock vehicle cab.
 - h. If on steep grade, block wheels.

These actions are recommended to avoid unauthorized use, runaway, vandalism, theft and unexpected operation during start-up.

3. Do not read, eat, talk on a mobile phone or take your attention away while operating the unit. Operating is a full-time job.

4. Stay out of the spreader. If it's necessary to enter the spreader, return to the shop, empty body, turn off all power, set vehicle brakes, lock engine starting switch and remove keys before entering. Tag all controls to prohibit operation. Tags should be placed, and later removed, only by person working in the body.



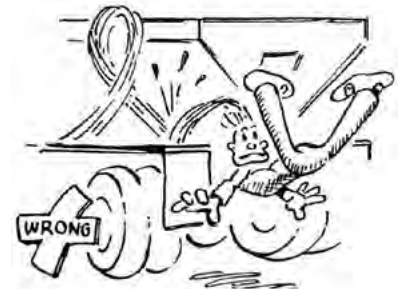
5. Guards and covers are provided to help avoid injury. Stop all machinery before removing them. Replace guards and covers before starting spreader operation.

6. Stay clear of any moving members, such as shafts, couplings and universal joints. Make adjustments in small steps, shutting down all motions for each adjustment.



7. Before starting unit, be sure everyone is clear and out of the way.

8. Do not climb on unit. Use the inspection ladder or a portable ladder to view the unit. Be careful in getting on and off the ladder, especially in wet, icy, snowy or muddy conditions. Clean mud, snow or ice from steps and footwear.



9. Do not allow anyone to ride on any part of unit for any reason.



10. Keep away from spinners while they are turning:
 - a. Serious injury can occur if spinners touch you.
 - b. Rocks, scrap metal or other material can be thrown off the spinner violently. Stay out of discharge area.
 - c. Make sure discharge area is clear before spreading.

11. Inspect spinner fins, spinner frame mounting and spinner fin nuts and screws every day. Look for missing fasteners, looseness, wear and cracks. Replace immediately if required. Use only new SAE grade 5 or grade 8 screws and new self-locking nuts.

12. Inspect all bolts, screws, fasteners, keys, chain drives, body mountings and other attachments periodically. Replace any missing or damaged parts with proper specification items. Tighten all bolts, nuts and screws to specified torques according to the torque chart in this manual.



13. Shut off engine before filling fuel and oil tanks. Do not allow overflow. Wipe up all spills. Do not smoke. Stay away from open flame. FIRE HAZARD!



14. Starting fluids and sprays are extremely flammable. Don't smoke. Stay away from flame or heat!



15. All vehicles should be equipped with a serviceable fire extinguisher of 5 BC rating or larger.



16. Hydraulic system and oil can get hot enough to cause burns. DO NOT work on system that is hot. Wait until oil has cooled. If an accident occurs, seek immediate medical assistance.

17. Wear eye protection while working around or on unit.
18. Read, understand and follow instructions and precautions given by the manufacturer or supplier of materials to be spread. Improper selection, application, use or handling may be hazardous to people, animals, plants, crops or other property.

**CAUTION**

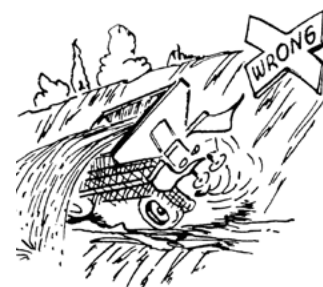
If spreader is used to transport chemicals, check with your chemical supplier regarding DOT (Department of Transportation) requirements.

19. Cover all loads that can spill or blow away. Do not spread dusty materials where dust may create



pollution or a traffic visibility problem.

20. Turn slowly and be careful when traveling on rough surfaces and side slopes, especially with a loaded spreader. Load may shift causing unit to tip.



21. Read and understand the precautionary decals on the spreader. Replace any that become defaced, damaged, lost or painted over. Replacement decals can be ordered from your dealer's parts department or from Highway Equipment Company by calling 1-888-363-8006.

1. Maintenance includes all lubrication, inspection, adjustments (other than operational control adjustments such as feedgate openings, conveyor speed, etc.) part replacement, repairs and such upkeep tasks as cleaning and painting.



2. When performing any maintenance work, wear proper protective equipment—always wear eye protection—safety shoes can help save your toes—gloves will help protect your hands against cuts, bruises, abrasions and from minor burns—a hard hat is better than a sore head!

3. Use proper tools for the job required. Use of improper tools (such as a screwdriver instead of a pry bar, a pair of pliers instead of a wrench, a wrench instead of a hammer) not only can damage the equipment being worked on, but can lead to serious injuries. **USE THE PROPER TOOLS.**



4. Before attempting any maintenance work (including lubrication), shut off power completely. **DO NOT WORK ON RUNNING MACHINERY!**
5. When guards and covers are removed for any maintenance, be sure that such guards are reinstalled before unit is put back into operation.
6. Check all screws, bolts and nuts for proper torques before placing equipment back in service. Refer to torque chart in this manual.

7. Some parts and assemblies are quite heavy. Before attempting to unfasten any heavy part or assembly, arrange to support it by means of a hoist, by blocking or by use of an adequate arrangement to prevent it from falling, tipping, swinging or moving in any manner which may damage it or injure someone. Always use lifting device that is properly rated to lift the equipment. Do not lift loaded spreader. **NEVER LIFT EQUIPMENT OVER PEOPLE.**



8. If repairs require use of a torch or electric welder, be sure that all flammable and combustible materials are removed. Fuel or oil reservoirs must be emptied, steam cleaned and filled with water before attempting to cut or weld them. **DO NOT** weld or flame cut on any tank containing oil, gasoline or their fumes or other flammable material, or any container whose contents or previous contents are unknown.
9. Keep a fully charged fire extinguisher readily available at all times. It should be a Type ABC or a Type BC unit.
10. Cleaning solvents should be used with care. Petroleum based solvents are flammable and present a fire hazard. Don't use gasoline. All solvents must be used with adequate ventilation, as their vapors should not be inhaled.



11. When batteries are being charged or discharged, they generate hydrogen and oxygen gases. This combination of gases is highly explosive. **DO NOT SMOKE** around batteries—**STAY AWAY FROM FLAME**—don't check batteries by shorting terminals as the spark could cause an explosion. Connect and disconnect battery charger leads only when charger is "off". Be very careful with "jumper" cables.



12. Batteries contain strong sulfuric acid—handle with care. If acid gets on you, flush it off with large amounts of water. If it gets in your eyes, flush it out with plenty of water immediately and get medical help.

13. Hydraulic fluid under high pressure leaking from a pin hole are dangerous as they can penetrate the skin as though injected with a hypodermic needle. Such liquids have a poisonous effect and can cause serious wounds. To avoid hazard, relieve pressure before disconnecting hydraulic lines or performing work on system. Any fluid injected into the skin must be treated within a few hours as gangrene may result. Get medical assistance immediately if such a wound occurs. To check for such leaks, use a piece of cardboard or wood instead of your hand. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to system. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.

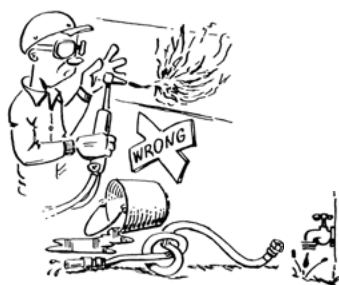


14. The fine spray from a small hydraulic oil leak can be highly explosive—**DO NOT SMOKE**—**STAY AWAY FROM FLAME OR SPARKS**.

1. The selection of the vehicle on which a spreader body is to be mounted has important safety aspects. To avoid overloading:
 - a. Do not mount spreader on a chassis which, when fully loaded with material to be spread, will exceed either the Gross Axle Weight Rating (GAWR) or the Gross Vehicle Weight Rating (GVWR) for the chassis.
 - b. Do install the spreader only on a vehicle with cab-to-axle dimension recommended for the spreader body length shown.



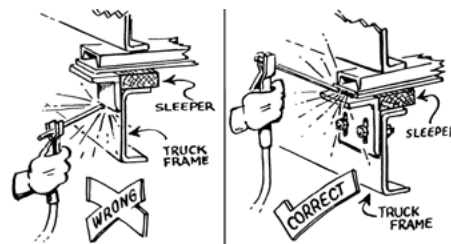
2. Follow mounting instructions in the Installation section of this manual. If mounting conditions require deviation from these instructions refer to factory.
3. When making the installation, be sure that the lighting meets Federal Motor Vehicle Safety Standard (FMVSS) No. 108, ASABE S279 and all applicable local and state regulations.
4. When selecting a PTO to drive hydraulic pump, do not use a higher percent speed drive than indicated in the Installation section of this manual. Too high a percent PTO will drive pump at excessive speed, which can ruin the pump, but more importantly, will overheat the hydraulic oil system and increase the possibility of fire.



5. When truck frame must be shortened, cut off only the portion that extends behind rear shackle in accordance with the truck manufacturer's recommendations. If a torch is used to make

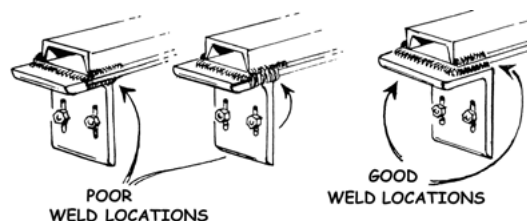
the cut, all necessary precautions should be taken to prevent fire. Cuts should not be made near fuel tanks and hydraulic oil reservoirs, fuel, brake, electric or hydraulic lines and such lines should be protected from flame, sparks or molten metal. Tires should be removed if there is any chance of their being struck by flame, sparks or molten metal. Have a fire extinguisher handy.

6. Do not weld on vehicle frame as such welding can lead to fatigue cracking and must be avoided.



When drilling holes in frame member, drill only through the vertical web portions do not put holes in top or bottom flanges. Refer to truck manufacturer's recommendations.

7. Be sure that welds between mounting bars and sill or between mounting angles and spreader cross sills are sound, full fillet welds. Center mounting angles so that good fillet welds can be made on three sides—an edge bead weld is not a satisfactory weld for this service. Use 309 rod/wire for carbon steel and 409 steel. On 304 stainless steel bodies use SAE grade 8 bolts—welding is recommended if type 308 welding rod is available.



8. Install controls so that they are located of convenient use. Position them so that they do not interfere with any vehicle control and that they do not interfere with driver or passenger or with access to or exit from the vehicle.
9. Check for vehicle visibility, especially toward the rear. Reposition or add mirrors so that adequate rearward visibility is maintained.
10. Add Caution, Warning, Danger and Instruction decals as required. Peel off any label masking which has not been removed.
11. Install all guards as required.
12. Check installation completely to be sure all fasteners are secure and that nothing has been left undone.

Recommended sequence of installation is:

1. Mounting of PTO and pump.
2. Installation of radar (if applicable)
3. Mounting of spreader.
4. Installation of controller.
5. Installation of chassis hydraulic hose and electrical wiring to spreader.
6. Installation of optional parts.
7. Filling of hydraulic reservoir and lubrication.
8. Checking for leaks and proper functioning.

NOTICE! Pump and truck requirements must be determined prior to installation of the spreader.

HYDRAULIC REQUIREMENTS

Hydraulics		GPM (LPM) (Gallons/Liters per Minute)	Maximum Pressure (PSI)
NL4500G4	Spinner & Conveyor	40 (151.4)	3100
	MULTAPPLIER	9 (34.1)	1500
NL4500G4 HP	Spinner	40 (151.4)	3100
	Conveyor/MULTAPPLIER	20 (75.7)	3400

HECO Pump Part Numbers	Pump CID	Theoretical Pump GPM (LPM) 100% Efficiency	Pump RPM
86665	4.38	40 (151.4)	2100
304424 (Front Section)	4.46	40 (151.4)	2100
304425 (Rear Section for Insert)	.93	9 (34.1)	
304426 (Rear Section for HP Conveyor)	2.17	20 (74.7)	

TRUCK REQUIREMENTS

Before mounting the spreader on a truck, the following major questions must be considered:

1. Is the CA (Cab to Axle) dimension of the truck correct for the length of the spreader?

The Dimensions and Capacities chart in the operator's manual will assist in matching spreader to truck.

2. Is the truck's GAWR (Gross Axle Weight Rating) and the GVWR (Gross Vehicle Weight Rating) adequate to carry the fully loaded spreader?

Refer to your New Leader dealer to find the GAWR and GVWR for most trucks, and how to calculate the weight distribution on each axle and total loaded vehicle weight.

Truck Frame Length

Refer to "Dimensions & Capacities" section in the operator's manual for approximate length from the rear of the cab to the rear end of the frame. Shorten truck frame as necessary, making sure to follow truck manufacturer's specifications so as not to void truck warranty.

NOTICE! Do not weld to truck frame; it may void truck warranty.

A level top surface is necessary for mounting. Add steel shim bars or strips the same thickness as fish plates or other obstructions and as wide as the truck frame channel top flange. Shims must be drilled to clear any rivet or bolt heads.

CONTROLLER REQUIREMENTS

The NL4500G4 Edge is equipped with an ISO 11783 compatible control system and will connect to any ISO 11783 compliant virtual terminal with a task controller that supports multi-channel dry granular applicators.

LIFTING THE SPREADER



WARNING

Use only lifting devices that meet or exceed OSHA standard 1910.84 or ASME B30.20-2006. Never lift equipment over people. Never lift unit with anything or anybody in the body. Loads may shift or fall if improperly supported, causing damage to unit, injury or even death.



CAUTION

Do not use lifting device to free unit from a chassis, storage stands or frozen ground, or to lift the chassis in any way. Shock loading is prohibited and sudden accelerations should be avoided. Lifting in such a manner could result in damage to unit or injury.

Always inspect unit lift points for signs of wear, cracking, corrosion, gouges, alterations, or distortion.

Always use a sling, spreader bar, or lifting bar that attaches to the lifting points with a minimum of 60 degrees from horizontal. It is preferable to use an "H" style lifting bar that keeps the attaching chains in a near vertical orientation as shown in Figure 1. Operators of lifting devices must be qualified and knowledgeable in their use and application.

Position the chassis with adequate room around the unit. Work in an environment that permits clear communication to others nearby. Keep area clear of persons when loads are to be lifted and suspended. Do not allow the lifted load to come in contact with any obstruction.

Store units on a solid surface using appropriate storage stands when not installed.

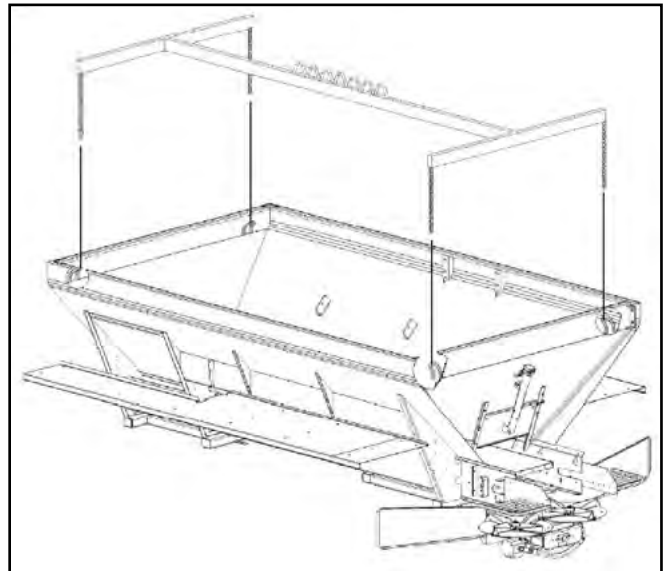


Figure 1 - Lifting Bar

INSTALLING BODY**CAUTION**

Be careful when drilling so as to not damage truck frame, gas tank, or any other important components.

NOTICE!

DO NOT WELD ON VEHICLE FRAME! Such welding can lead to fatigue cracking and must be avoided.

NOTICE!

DO NOT PUT HOLES INTO TOP OR BOTTOM FLANGES—to do so may void truck manufacturer's warranty. When drilling holes in frame member, drill only through vertical web portions.

NOTICE!

Connect welders ground directly to one of the items being welded anytime an arc welder is used on the vehicle or anything connected to the vehicle. Refer to Manufacturer's instructions.

IMPORTANT!

Disconnect electrical components from electrical system when welding on equipment to prevent component damage due to power surges or excessive current.

Front Mount Angles

Assemble two front mounting angle springs and hardware. Use a 3/8" (10mm) shim between cross tube mounting plate and truck frame mounting angle. Position assembly under second cross tube from front and against truck frame, make sure springs do not contact cross tube. Mark position of mounting angle holes on truck frame. Drill 9/16" (14mm) holes where marked and install mounting assembly using 1/2" hardware supplied. Weld mounting plate to bottom of cross tube on three sides, and remove 3/8" (10mm) shim (Figure 2). Tighten spring assembly until spring compressed height is 4" (102cm). There should be a 3/8" (10mm) space between cross tube mounting plate and truck frame mounting angle (Figure 2). Repeat this procedure on other side of truck frame, on same cross tube.

NOTE: It may be necessary to mount front mounting angle springs on first cross tube on some vehicles due to obstructions such as spring shackles, etc.

Center Mount Plates

Position center mounting plates at second cross tube from rear with slotted faces against truck frame and mark location of slots on truck frame. Drill 9/16" (14mm) diameter holes through truck frame, approximately (19mm) from bottom of slots (Figure 2). Weld mounting angle to bottom of cross tube on 3 sides (Figure 4). Install hardware and tighten to recommended torque.

Rear Mount Angles

Position rear mounting angles with the slotted faces against the side of the truck frame and centered on rear cross sill. Mark slot locations on truck frame. Drill 9/16" (14mm) diameter holes through truck frame at bottom end of slots (Figure 3). Weld mounting angle to bottom of cross tube on three sides (Figure 4). Install hardware and tighten to recommended torque.

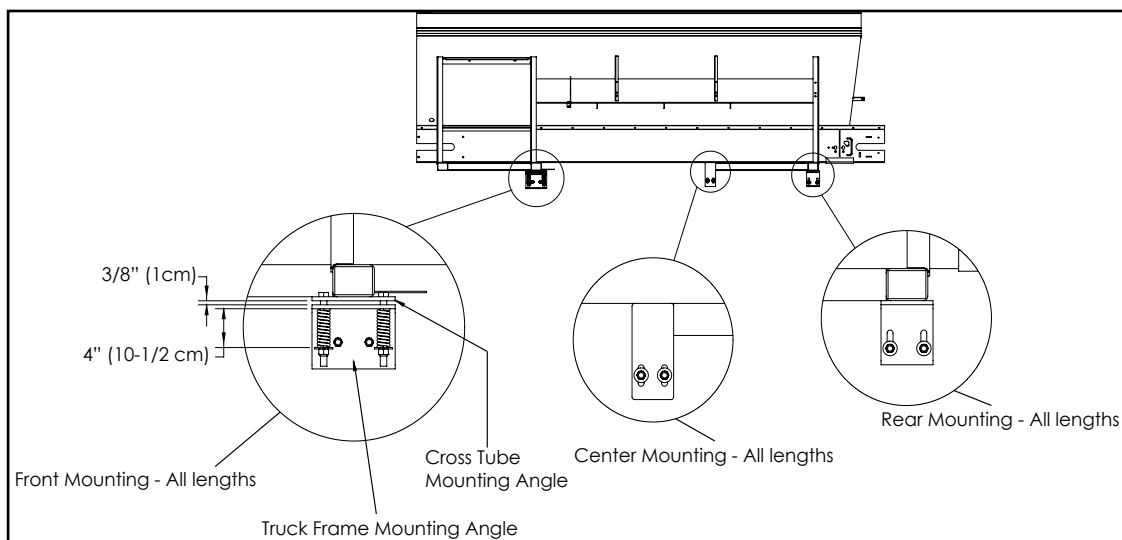


Figure 2 - Mounting Angle Installation - NL4500G4 Edge

SECURING TO FRAME

Install mounting angles and tighten mounting bolts to recommended torque. Weld mounting angles to spreader cross tubes by welding on front, outer and rear sides (Figure 3). Make sure welds between mounting angles and spreader cross tubes are sound full fillet welds. Center mounting angles on tubes (as shown in Figure 3) so full fillet welds can be made on three sides. An edge bead weld is not a satisfactory weld for this service. Use E70S rod/wire for carbon steel to carbon steel and 309 rod/wire for carbon steel to stainless steel. Use 309 rod/wire to weld stainless steel to stainless steel.

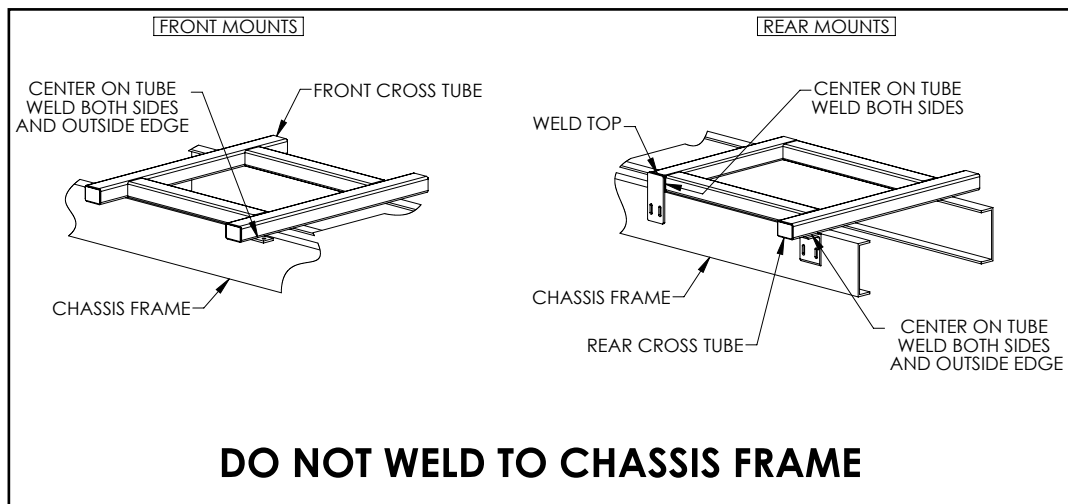


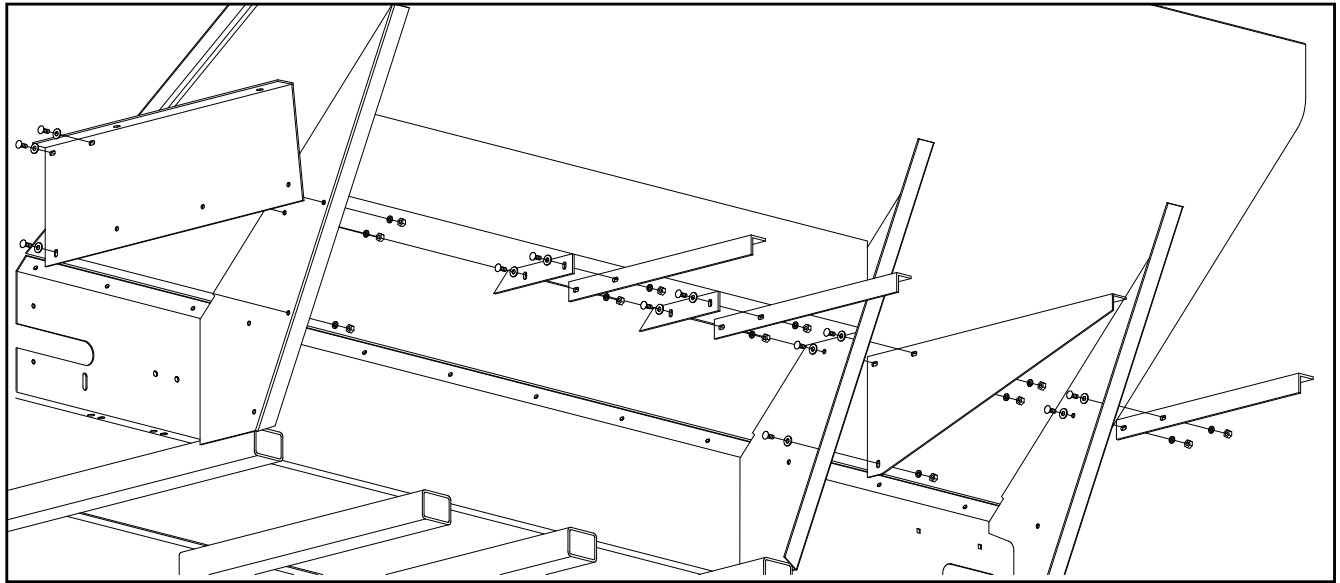
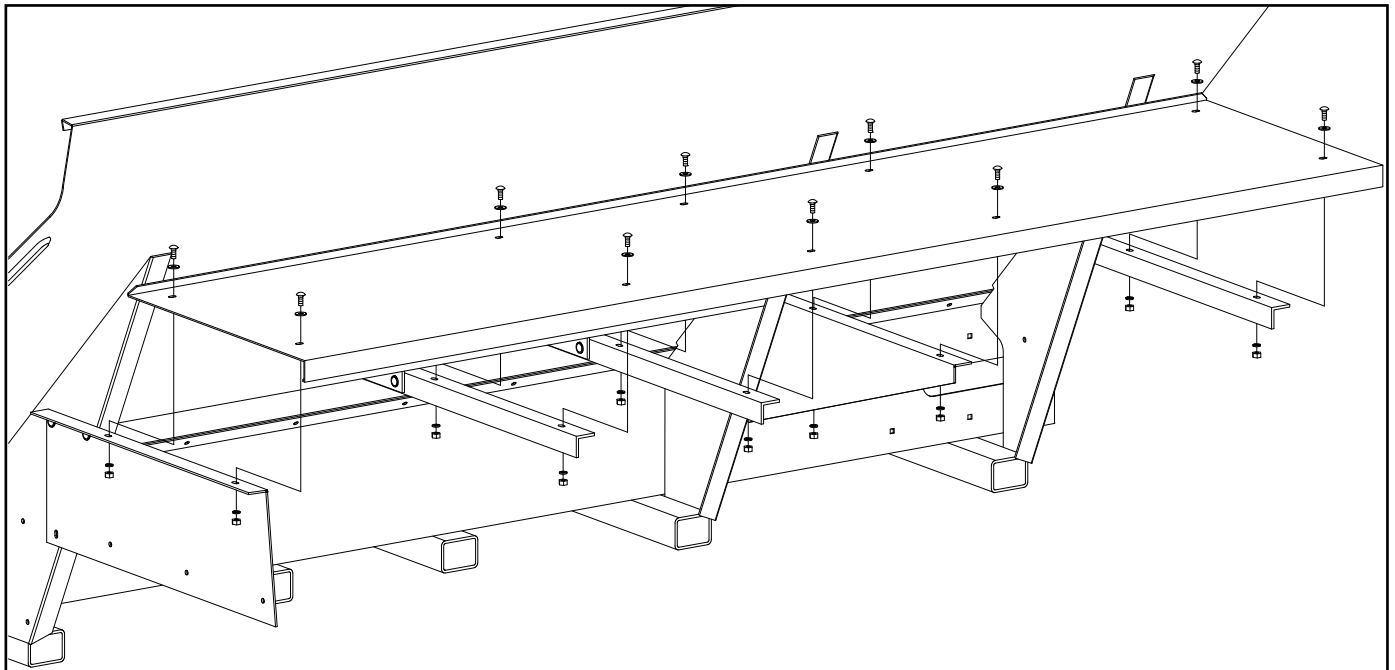
Figure 3 - Welding Instructions

SIDE BOARD INSTALLATION

NOTICE! Sideboards are for use with fertilizer only.

See "Side Boards" parts list in the parts manual for availability and illustrations.



FENDER INSTALLATION***Figure 4 - Fender Angle Installation*****Figure 5 - Fender Installation**

* - Fenders may not be as shown

Attach fender angles and panels on spreader body stakes as shown in Figure 4. Do not tighten hardware at this time.

Attach fenders on top of angles/panels as shown in Figure 5. Tighten all hardware.

FENDER INSTALLATION VIDEO

Click the image below to play video instructions.

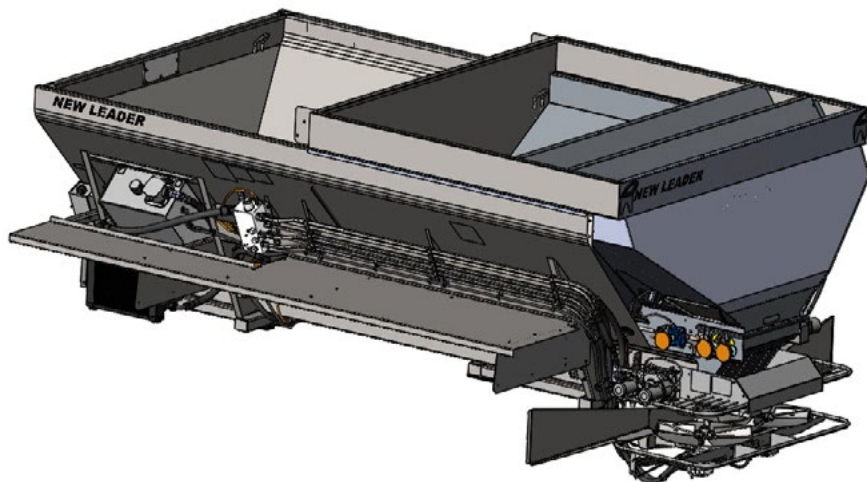


Figure 6 - Fender Installation Video

HYDRAULIC HOSE INSTALLATION**CAUTION**

If a threaded connection is tightened too tightly, the fitting or housing into which the fitting is placed could be distorted and an unstoppable leak could occur.

**WARNING**

Do not use one manufacturer's hose with another manufacturer's fittings! Such will void any warranty and may cause premature burst or leak of hydraulic fluids! Severe injury and/or fire could result!

Determine pressure port of pump. Install pressure hose into this port as shown in Figure 7. Connect suction hose to opposite port and to tank outlet on hydraulic tank. Use plastic tie straps as necessary to support hoses so they will not catch on field obstructions or contact hot or moving parts.

HYDRAULIC PUMP INSTALLATION

HECO pumps are direct mount. See "Pump Hydraulics" in the spreader parts manual for assembly instructions.

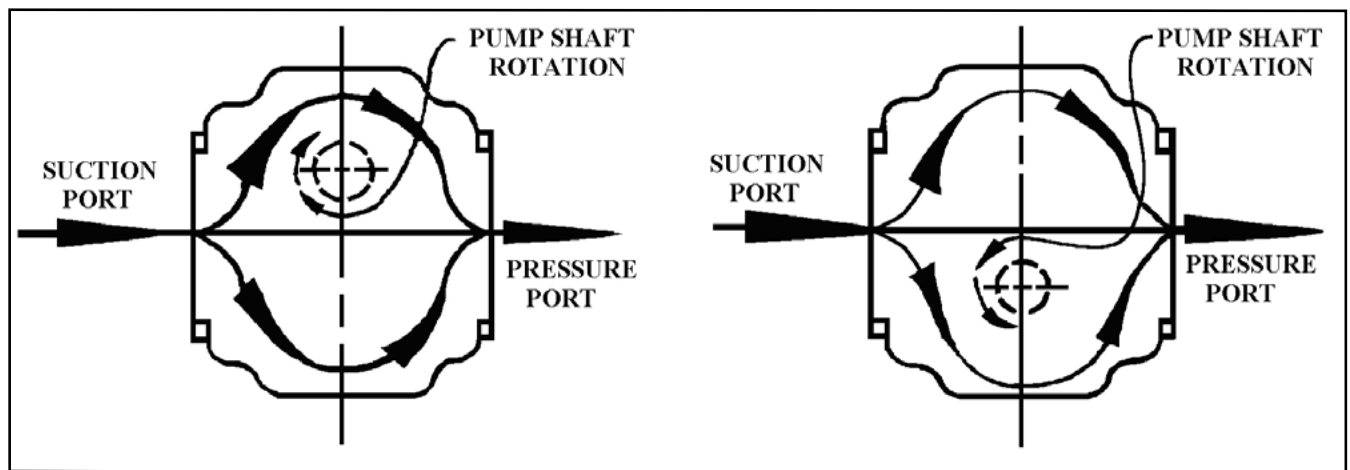


Figure 7 - Hydraulic Pump Installation

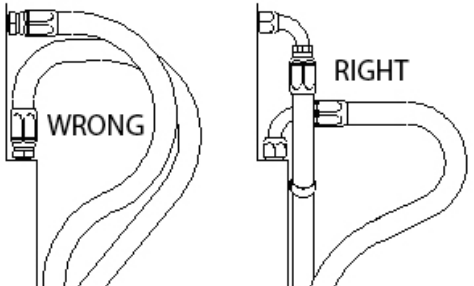
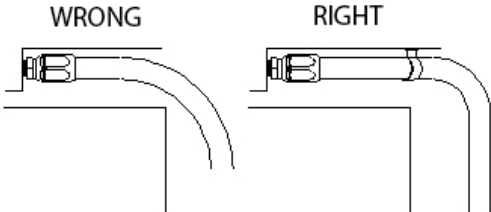
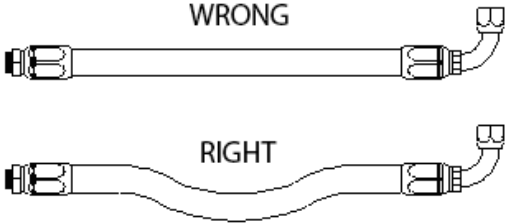
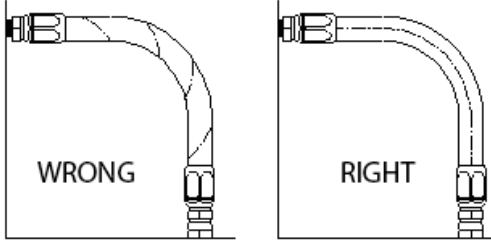
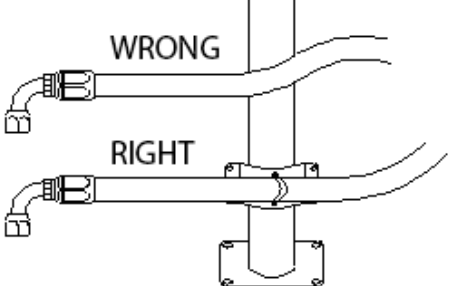
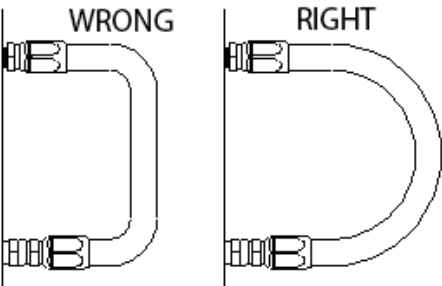
Use thread sealer on all NPT fittings. When using thread sealer, do not put it on the first three threads of the fitting. Too much on the fitting or on the first three threads will force it into the oil stream where it could damage the system.

Assemble system as shown in "Hydraulics" parts list in the parts manual. Place hose clamps as needed to keep hoses away from hot or moving parts. Do not let hoses hang so low as to be snagged. Do not stretch hoses tight.

Hydraulic hoses are as follows:

- Pressure Line: High pressure hose supplied by dealer. Hose must have minimum pressure rating that corresponds to the maximum pressure setting of the hydraulic system. Refer to "Hydraulic Requirements" on page 19.
- Suction Line: Suction hose supplied by dealer. Hose must meet or exceed SAE 100R4 requirements.

INSTALLATION GUIDE

	
<p>1. Use elbows and adapters in the installation to relieve strain on the assembly, and to provide easier and neater installations that are accessible for inspection and maintenance. Remember that metal end fittings cannot be considered as part of the flexible portion of the assembly.</p>	<p>2. Install hose runs to avoid rubbing or abrasion. Clamps are often needed to support long runs of hose or to keep hose away from moving parts. It is important that the clamps be of the correct size. A clamp that is too large will allow the hose to move in the clamp causing abrasion at this point.</p>
	
<p>3. In straight hose installations allow enough slack in the hose line to provide for changes in length that will occur when pressure is applied. This change in length can be from +2% to -4%.</p>	<p>4. Do not twist hose during installation. This can be determined by the printed layline on the hose. Pressure applied to a twisted hose can cause hose failure or loosening of the connections.</p>
	
<p>5. Keep hose away from hot parts. High ambient temperature will shorten hose life. If you cannot route it away from the heat source, insulate it.</p>	<p>6. Keep the bend radii of the hose as large as possible to avoid hose collapsing and restriction of flow. Follow catalog specs on minimum bend radii.</p>

(Used with the permission of The Weatherhead Company.)

FILLING HYDRAULIC SYSTEM

NOTICE!

DO NOT attempt to run pump without first filling hydraulic oil tank and opening suction line valve, or damage to pump may occur.

Fill hydraulic reservoir with hydraulic oil as specified in the "Lubrication and Maintenance" section in the operator's manual. Be sure oil is clean, free from dirt, water and other contaminants.

Lubricate all points necessary per Lubrication Chart in "Lubrication and Maintenance" section of operator's manual.

ELECTRICAL CONNECTIONS

Connect all electrical control circuits. All wiring should be approved automotive insulated wire, supported adequately with insulating ties or straps, and located where it will not interfere with any control or access. Make sure wiring does not contact any moving parts or sharp edge and is kept away from any hydraulic line or any heated part.

ISOBUS CONNECTIONS

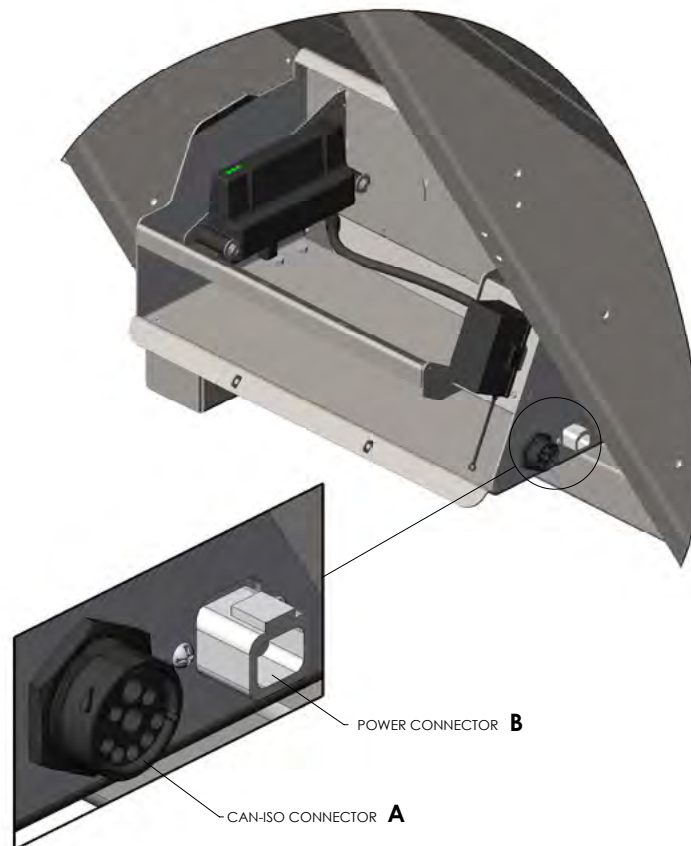


Figure 8

A: Factory Supplied CAN-ISO Connector - (P/N) Deutsch HDP24-24-91PN-P064

Connects to: Dealer Supplied Mating Connector - (P/N) Deutsch HDP26-24-91SN

- Pin 1 - Battery Ground
- Pin 2 - ECU Return (ECU Ground)
- Pin 3 - 60-amp fused power
- Pin 4 - ECU Power (Switched)
- Pin 5 - N/C
- Pin 6 - TBC Power
- Pin 7 - TBC Return
- Pin 8 - ISO-BUS Can High
- Pin 9 - ISO-BUS Can Low

60-amp power on pin 3 needs to be fused at battery

B: Factory Supplied Power Connector - (P/N) DTP04-4P-L012

Connects to: Dealer Supplied Mating Connector - (P/N) DTP06-4S

- Pin 1 - Hydraulic cooler fan power (Switched)
- Pin 2 - Hydraulic cooler fan ground
- Pin 3 - Body and lighting module ground
- Pin 4 - Body and lighting module power (Battery)

30-amp power on pins 1 & 3 need to be fused at battery.

LIGHT INSTALLATION



CAUTION

All holes in truck cab walls, floor and firewall are to be grommeted, plugged and sealed to prevent entrance of engine fumes, dust, dirt, water and noise.

Light installation must comply with all applicable requirements prescribed by FMVSS/CMVSS 108, ASABE S279, state and local regulations. See "Lights" parts page in the operator's manual for illustrations if applicable.

Recommended sequence of installation is:

1. Spreader preparation.
2. Insert preparation.
3. Mounting of insert.
4. Connecting hydraulic hoses.
5. Installation of hillside divider and conveyor cover.
6. Checking installation.
7. Checking for leaks and proper functioning.

HYDRAULIC REQUIREMENTS

Refer to "Hydraulic Requirements" on page 19 for hydraulic pump part numbers and specifications required for insert installation.

SPREADER PREPARATION



WARNING

Use only lifting devices that meet or exceed OSHA standard 1910.184. Never exceed work load limits or lift equipment over people. Empty spreader before lifting. Loads may shift or fall if improperly supported, causing injury.

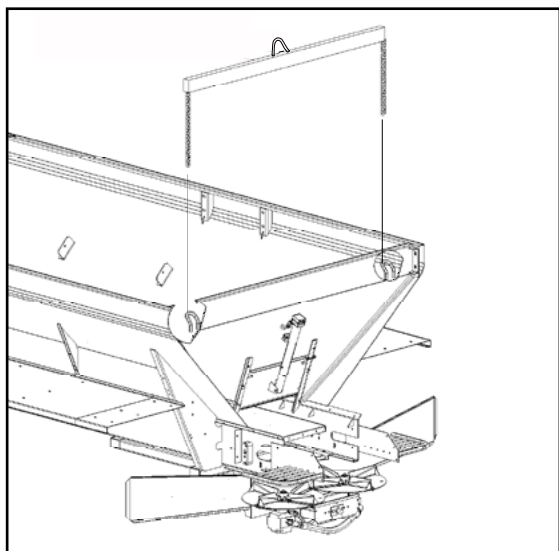


Figure 1

Remove the Inverted "V" and Hillside Divider from the spreader, if so equipped, and set hardware aside.

Remove Feedgate Jack Handle and set aside. Support endgate by attaching a hoist to the lift hooks. Remove hardware from both sides of the endgate and carefully remove from the spreader as shown in Figure 1.

NOTE: Always use a sling, spreader bar, or lifting bar that attaches to the lifting points with a minimum of 60 degrees from horizontal. It is preferable to use a straight style lifting bar that keeps the attaching chains in a near vertical orientation.

NOTE: Always inspect unit lift hooks for signs of wear, cracking, corrosion, gouges, alterations, or distortion before use.

FEEDGATE ADJUSTMENT**WARNING**

Stay out of the spreader. If it's necessary to enter the spreader, return to the shop, empty body, turn off all power, set vehicle brakes, lock engine starting switch and remove keys before entering. Tag all controls to prohibit operation. Tags should be placed, and later removed, only by person working in the body.

Adjust the insert's front feedgate prior to installation.

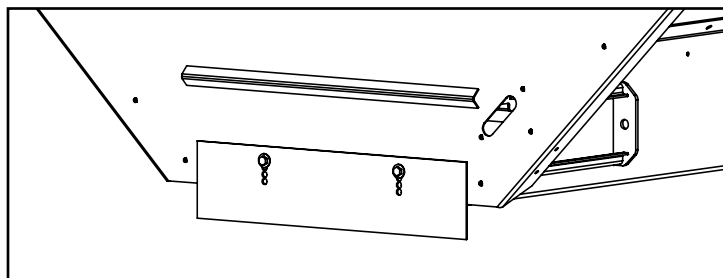


Figure 2

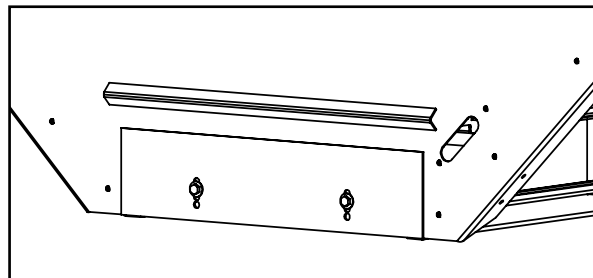


Figure 3

To adjust main bin's feedgate opening, position front feedgate on MULTAPPLIER/MULTIBIN as necessary to achieve a 1 1/2 inch (3.81 cm) (Figure 2) to 4 inch (10.16 cm) (Figure 3) opening in 1/2 inch increments.

NOTE:

Visit www.newleadervip.com and enter parameters to determine minimum and maximum application rates and feedgate openings for optimal performance of your spreader.

INSERT INSTALLATION**WARNING**

Use only lifting devices that meet or exceed OSHA standard 1910.184. Never exceed work load limits or lift equipment over people. Empty spreader before lifting. Loads may shift or fall if improperly supported, causing injury.

Before installing the insert:

Parts Needed:

<u>Description</u>	<u>Qty</u>
MULTAPPLIER/MULTIBIN	1
Capscrew - 1/2 x 1 1/4 Grade 8	8
Flat Washer - 1/2 Grade 8	16
Lock Washer - 1/2 Grade 8	8
Hex Nut - 1/2 Grade 8	8





Figure 5A (uninstalled)

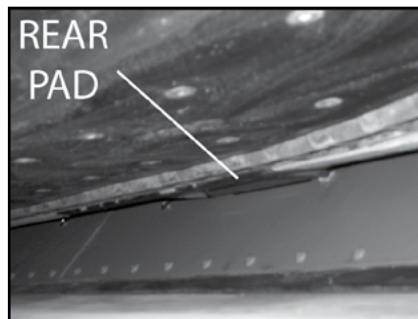


Figure 5B (shown installed)
View from rear of unit.

3. Figures 5A-5B - Visually make sure insert is centered from side to side in main bin and rear pads are resting on main bin.

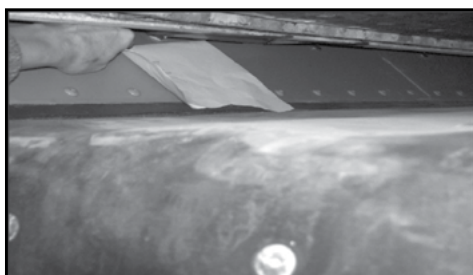


Figure 6



Figure 7

4. Figure 6 - There must be contact between rear pads and main unit. Check for contact by trying to slide paper between pads and main bin. If no contact, adjust insert.
5. Figure 7 - Inside main unit, locate front pads by lifting rubber sealers on front endgate.



Figure 8A

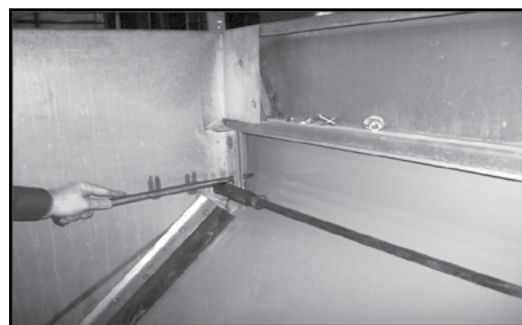


Figure 8B

6. Figures 8A-8B - There must be contact between front pads and main bin. Check for contact by trying to slide paper between pads and main bin. If no contact, adjust insert.
- NOTE: Pry insert at mount brackets if necessary.



Figure 9



Figure 10



Figure 11

7. Figure 9 - Once both front pads make contact, insert hardware in front mount brackets' lower holes. Shim between main bin and insert brackets if distance is larger than 1/8" (.32cm). Tighten hardware per torque recommendations in this manual.
8. Figure 10 - Make sure front feedgate is level. Lower endgate sealers so flush with chain shields and tighten hardware.

NOTICE!

Leakage of material may occur if the sealer belts are not set properly on the front of the insert. Highway Equipment Company is not liable for lost material due to improperly installed sealer belts.

9. Figure 11 - Make sure there is a complete seal covering the gap between the insert and the main bin's side sheets. Tighten all hardware on rubber sealers at front of insert.
10. Make sure rear pads are still in place against main bin. Install hardware in lower holes of rear mount brackets. Shim between main bin and insert brackets if distance is larger than 1/8" (.32cm). Tighten hardware per torque recommendations in this manual.
11. Make sure insert's side sheets are not resting on top of main bin's side sheets.
12. Install hardware in all four mount brackets' upper holes. Tighten hardware per torque recommendations.
13. Remove hoist.
14. Inspect unit for foreign debris in conveyor area.

LOWER DIVIDER - MULTIBIN

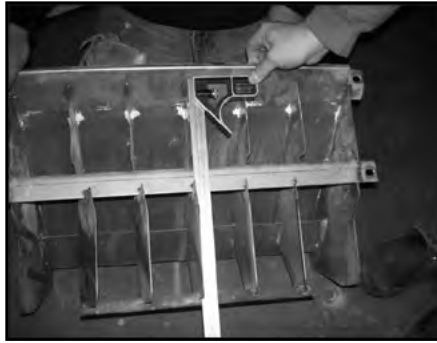
The following steps apply to MULTIBIN units only. Continue to "Hydraulics" for MULTAPPLIER units.

NOTICE!

Highway Equipment Company will not be liable for misapplied material due to an improperly adjusted divider, spreader or both.

Parts Needed:

<u>Description</u>	<u>Qty</u>
Divider - Lower Weldment	1
Capscrew - 5/16 x 1	4
Washer - Flat 5/16	8
Nut - Lock 5/16 SS	4

**Figure 12****Figure 13****Figure 14**

1. Figure 12 - Make sure center fin is square to rear panel.
2. Figure 13 - Measure distance between Lower Divider fins to make sure they are all 3" (8cm) apart. Adjust top of fin as necessary.
3. Figure 14 - Slide Lower Divider between bottom of MULTIBIN and Spinner Divider as shown.

**Figure 15****Figure 16**

4. Figure 15 - Lift Lower Divider to bottom of MULTIBIN, align holes and loosely install front and rear hardware.

5. Figure 16 - Verify Lower Divider is square by measuring from each side to main bin's chain shields. Make sure distances are equal.
6. Make sure Lower Divider is centered over Material Divider. Contact Highway Equipment Company if they cannot be aligned.
7. Tighten front and rear hardware per torque recommendations. Refer to "Standard Torques" in the "Lubrication and Maintenance" section of the spreader manual.

HYDRAULICS

Attach insert hoses to spreader hoses as shown in Figures 17A - 17C as applicable. Plug in rate sensor.

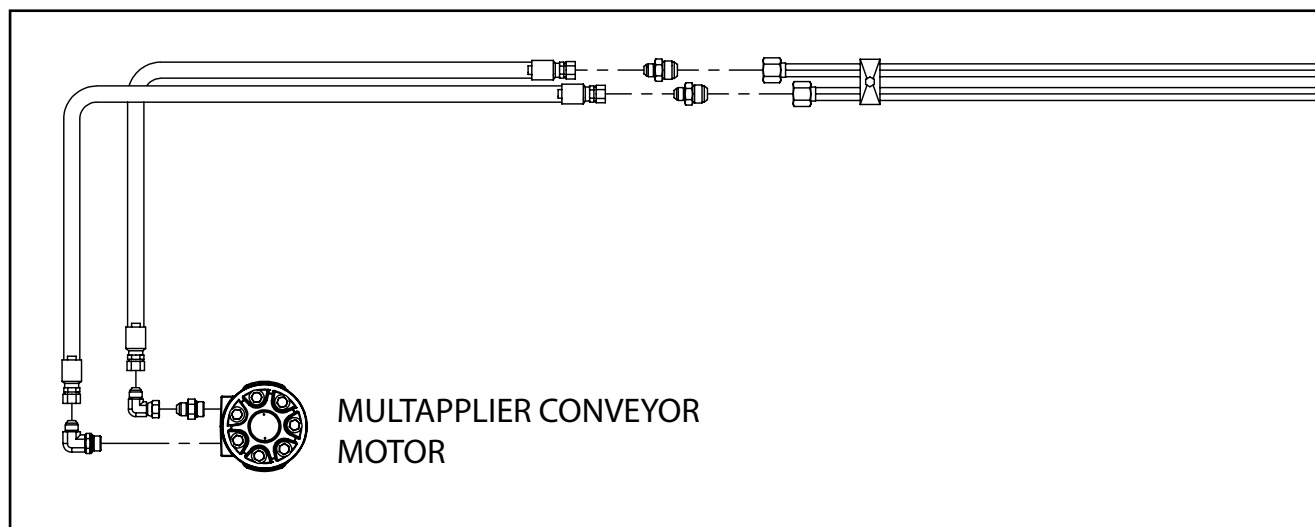


Figure 17A - MULTAPPLIER Operation

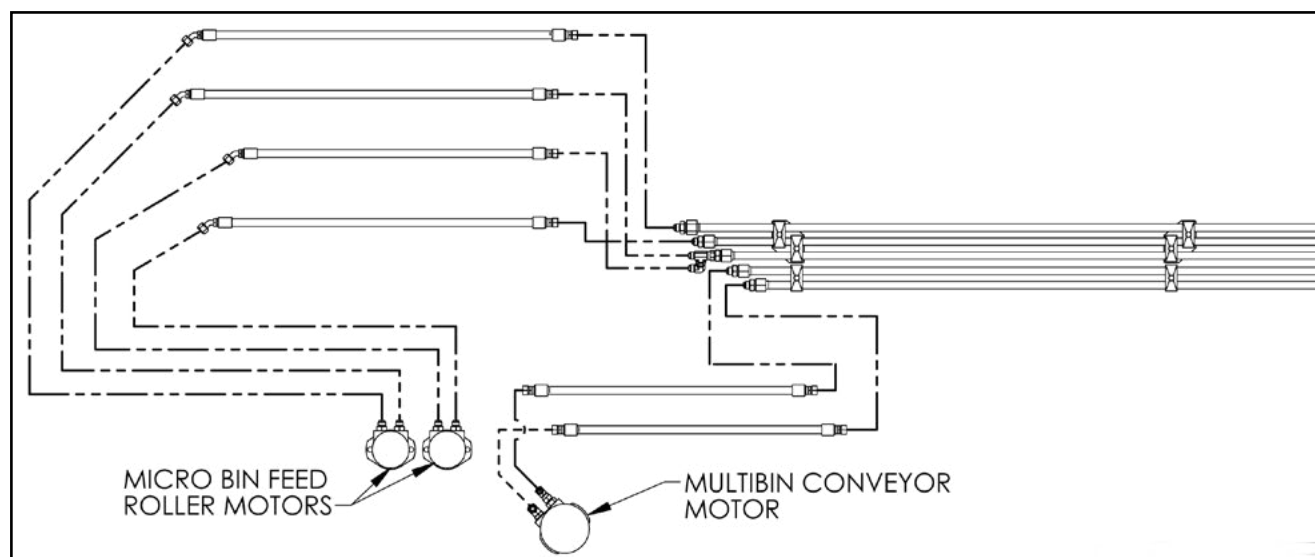


Figure 17B – MULTIBIN Operation Dual Micro

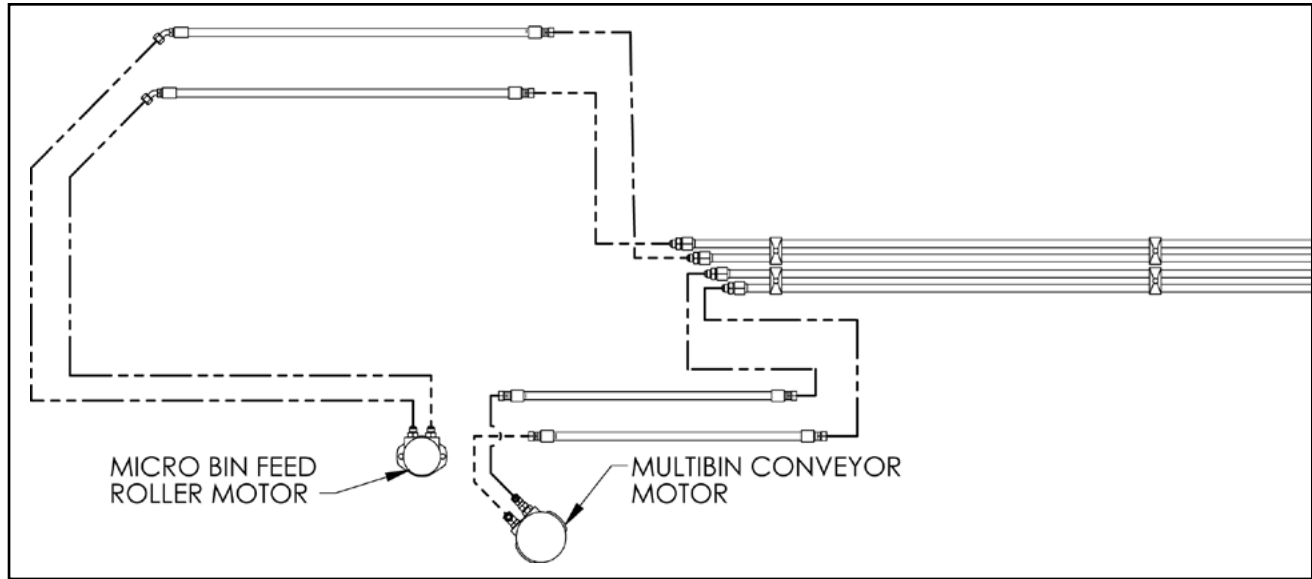


Figure 17C – MULTIBIN Operation Single Micro

HYDRAULIC HOSE INSTALLATION

Refer to "Installation Guide" for proper hydraulic hose installation guidelines.

If insert was purchased separately from spreader, refer to parts pages for hydraulic installation. Install valve mounting bracket on two right hand front stakes as shown in Figure 18 (MULTIBIN installation shown).

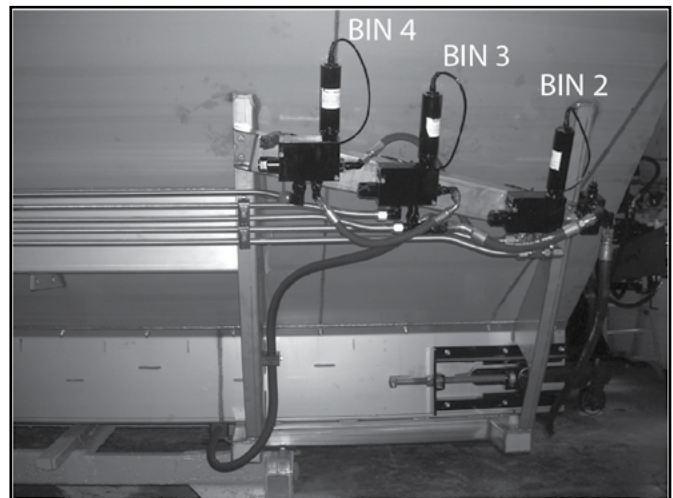


Figure 18 - Hydraulic Installation

HILLSIDE DIVIDER & CONVEYOR COVER - MULTAPPLIER

The following steps apply to MULTAPPLIER units only. Continue to "Micro Cover Installation" for MULTIBIN units.

NOTICE!

Highway Equipment Company will not be liable for misapplied material due to an improperly adjusted divider, spreader or both.

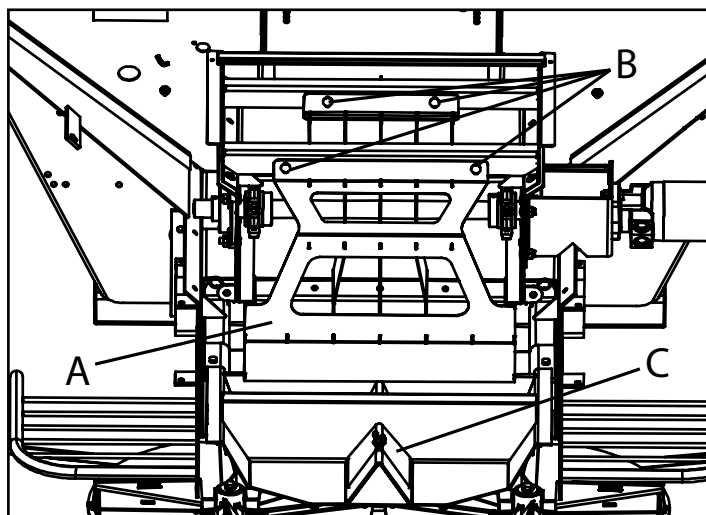


Figure 19 - MULTAPPLIER Hillside Divider

Loosen hardware from rear two chain shield holes on each side of MULTAPPLIER. Install MULTAPPLIER Hillside Divider (A) and fasten to Support using single bin Hillside Divider hardware removed before MULTAPPLIER installation (B). Adjust Hillside Divider so that the middle divider is centered over both conveyors and the Material Divider (C) as shown in Figure 19. Tighten all hardware to recommended torque.

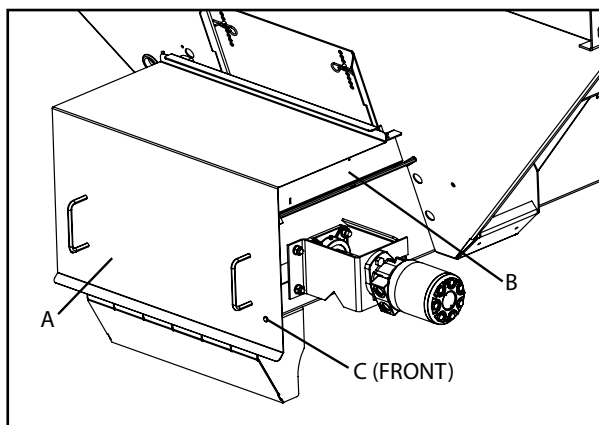


Figure 20 - MULTAPPLIER Dual Conveyor Cover

Parts Needed:

<u>Description</u>	<u>Qty</u>
Cover	1
Hair Pin	2

MICRO COVER INSTALLATION

Air Supply and Electrical Requirements

Auxiliary Supply Line	Electrical Connections
Dry Air - 85 PSIG (5.86 Bar)	Red = 12 V (+) Black = Ground (-)

Refer to "MultiBin Lid Pneumatics" in the spreader parts manual for air line connections.

Make sure all hardware on insert is torqued before installing cover.



WARNING

Pressurized air may cause sudden movement of parts. Do not service cover components until safety precautions have been performed.

- Take preventative measures to prevent falling or runaway of cylinder or mechanism before maintenance and restart of spreader.
- Exhaust all residual air and cut the pressure supply for components before servicing.
- Injury can occur if precautions are not taken.



WARNING

Open cover lid with air prior to removing actuator pin and block cover lid to prevent closing. Unintentional closing could cause injury.

Fasten a three-point lifting device to two lift hooks and one hole in guide mount as shown in Figure 21. Hoist cover onto MULTIBIN as shown in Figure 22. Align slots and attach hardware. Tighten to recommended torque. Secure fittings and airline tubing on MULTIBIN with wire ties as shown in Figure 23. Connect to air and electrical systems. Open lid and install additional hardware inside cover. Install screens.

Refer to "Air Schematic" page in the *Troubleshooting* section for air supply requirements.

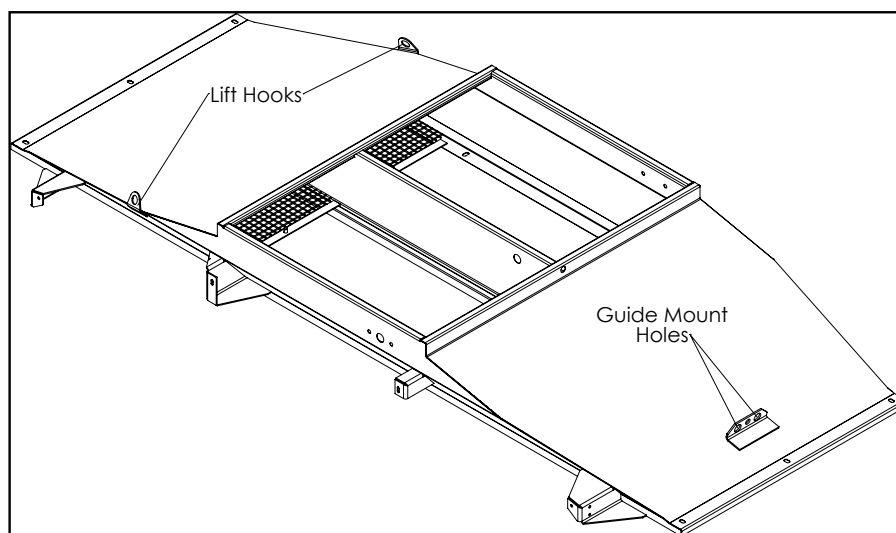


Figure 21 - Lift Hooks & Guide Mount

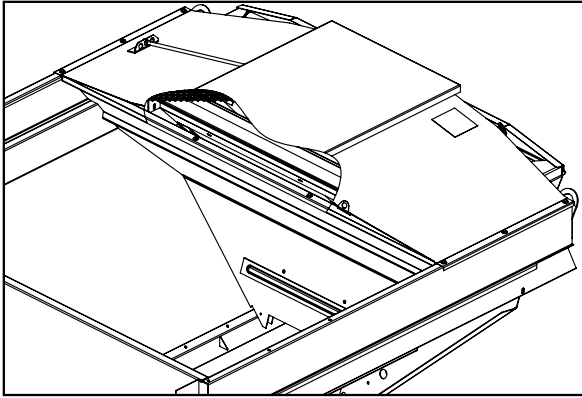


Figure 22 - Cover Placement

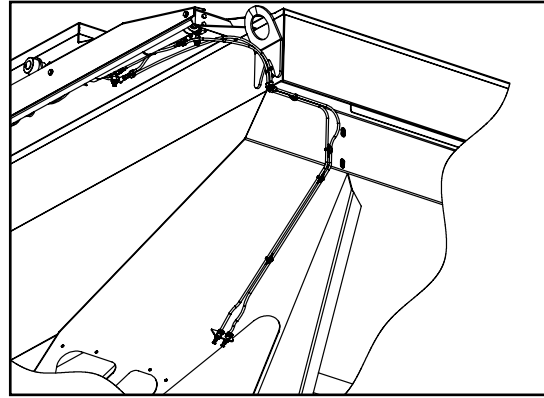


Figure 23 - Cover Airline Tubing

ELECTRICAL CONNECTIONS

Connect all electrical control circuits. The supply conductor should be connected directly to the battery. All wiring should be approved automotive insulated wire, supported adequately with insulating ties or straps, and located where it will not interfere with any control or access. Make sure wiring does not contact any moving parts or sharp edges and is kept away from hydraulic lines and heated parts.

Refer to "Controller" parts pages for illustrations of master/slave control modules.

INSERT REMOVAL/ENDGATE INSTALLATION

Remove insert and reinstall endgate, Inverted "V", single conveyor Hillside Divider, etc. by following applicable installation instructions in reverse order. Make sure the insert hydraulics, electrical connections and air lines are disconnected from the spreader before removal. See "Inverted V" in spreader parts manual.

Hydraulics Removal

Route hydraulic hoses on the spreader and the insert as shown in Figures 24A - 24C as applicable.

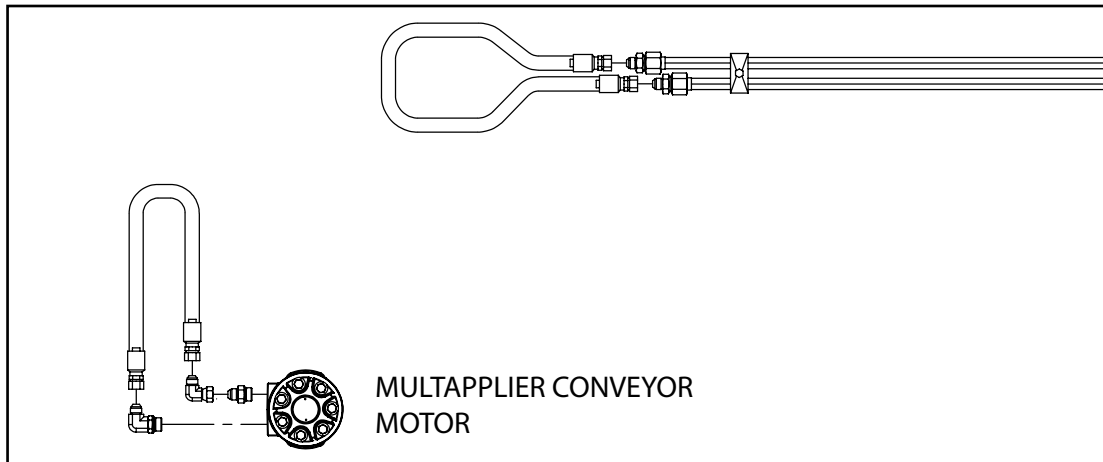


Figure 24A - Detach MULTAPPLIER

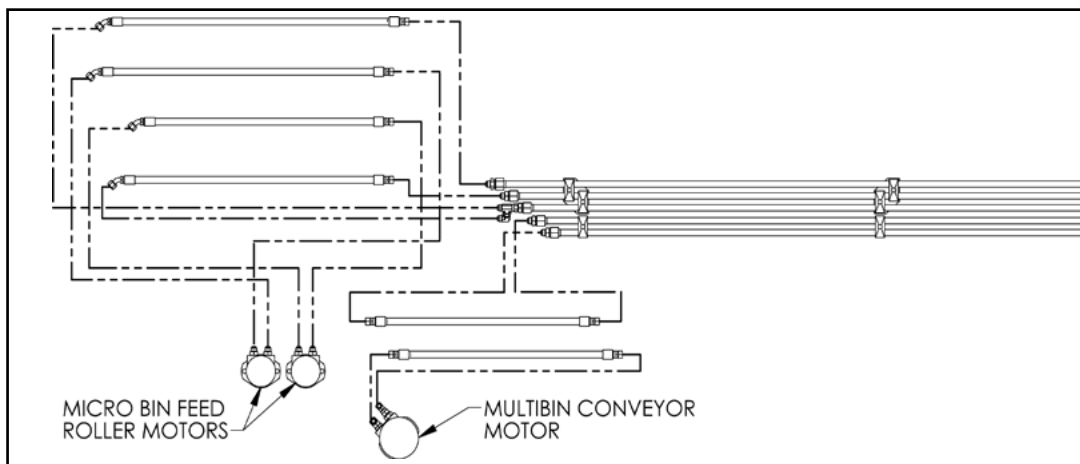


Figure 24B - Detach MULTIBIN Dual Micro

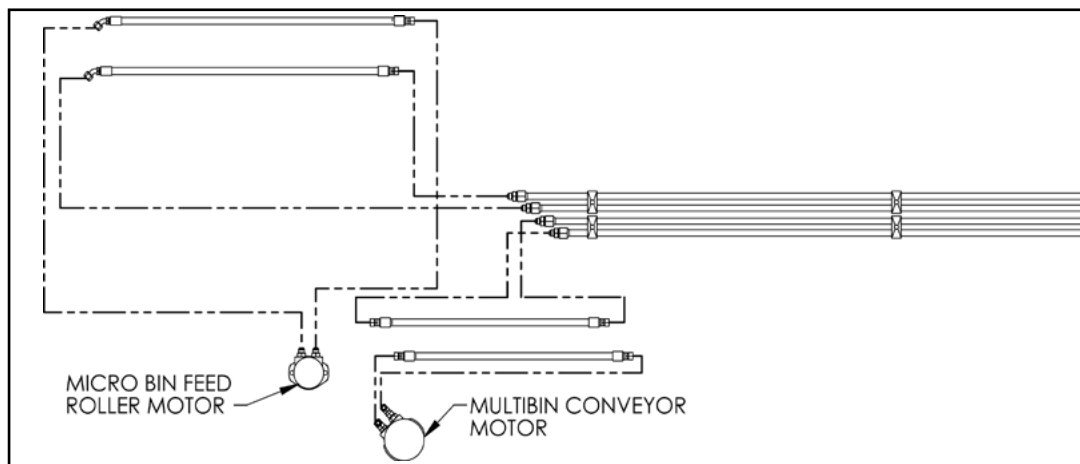


Figure 24C - Detach MULTIBIN Single Micro

This page is intentionally left blank.

NOTES



The Model NL4500G4 EDGE is a hopper type spreader intended for spreading free flowing granular agricultural materials, such as chemical fertilizers, agricultural limestone, and gypsum. It is intended for agricultural vehicle mounting.

The unit is powered hydraulically and provides independent variable speed control for the spinner and full automatic ground speed control for the conveyor.

The conveyor delivers material to the spinners through an adjustable metering gate at the rear of the hopper body. Orbital type hydraulic motors mounted to 6 to 1 ratio spur gear case drive the conveyor. The conveyor options include a pintle type chain joined by cross bars every (#3) link or a belt-over-chain type having parallel strands of pintle type (#4) chain joined by cross bars every other link.

The spinner assembly has two 24-inch (60.96 cm) diameter dished discs. Each disc has four formed and heat treated fins that are adjustable to radial angle. The spinner is fully adjustable by means of a rotating handle.

The optional 304 stainless steel hopper style spreader MULTAPPLIER or MULTIBIN may be insterted in the main bin.

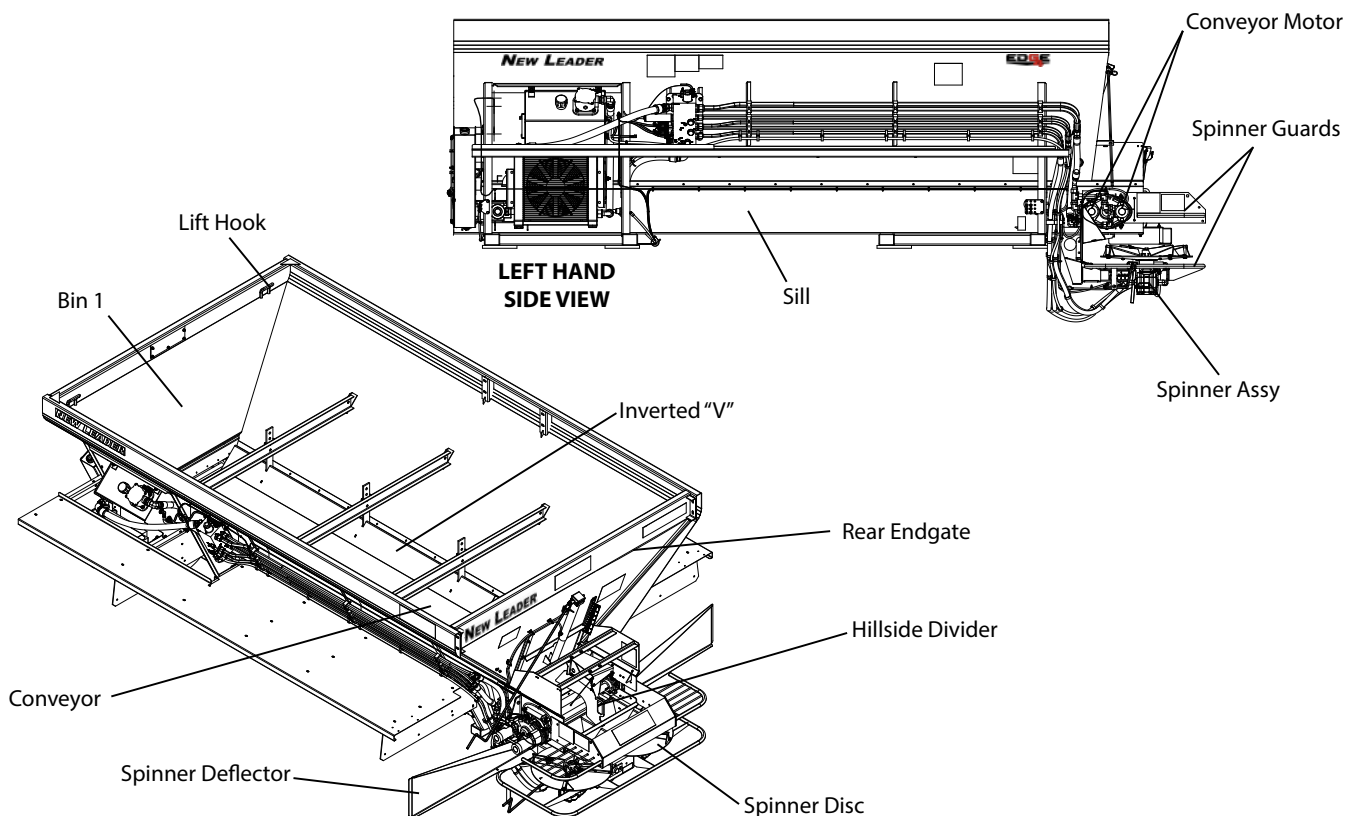
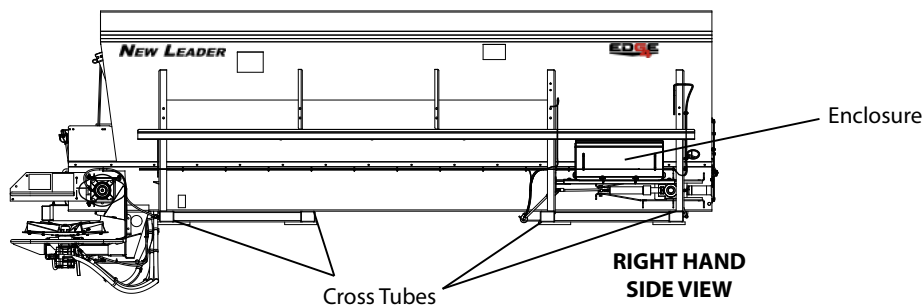
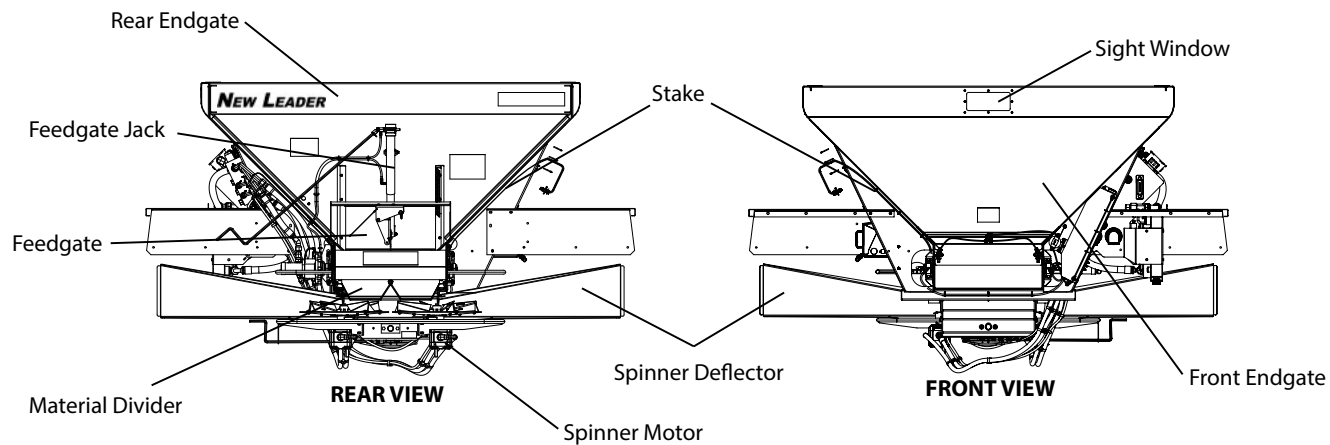
- Inserting the MULTAPPLIER allows for two materials to be spread simultaneously. It features a 24-inch (60.96 cm) belt-over-chain type conveyor having parallel strands of pintle type (#4) chain joined by cross bars every other link. The direct driven conveyor is also controlled independently enabling the delivery of material at variable rates through the adjustable gate at the rear of the hopper body. The hillside divider improves material placement on the spinner for a more effective spread pattern.
- Inserting the MULTIBIN will convert the spreader to a 3 or 4 hopper unit, which can be used independently or together for straight and variable rate applications. The front two hoppers dispense fertilizer products while the single or dual hopper at the rear dispense(s) micronutrients or seeding products. The rear bin(s) are sloped forward to improve chassis weight distribution. Material is delivered from the front bin by conveyor and from the rear bin(s) by passing through a meter wheel, material dividers and main spinner assembly with 24-inch (60.96 cm) diameter dished discs. Bin sensors are installed to warn when materials are low in each micronutrient bin.

The MULTIBIN also comes equipped with an upper and lower material divider which improves material placement on the spinner for a more effective spread pattern.

An optional micronutrient stainless steel cover which opens and closes with a stainless steel air cylinder is available.

Screens installed on micronutrient bins keep large chunks of material out of the bins by breaking the material up as it enters the bins.

This product is intended for commercial use only.



Stake: Side support for machine walls.

Rear Endgate: Welded or bolt-in endgate (depending on model) furthest from chassis cab (Rear based on direction of travel). Holds mounted Feedgate, allowing for rear release of material from bin.

Bin 1: Main holding bin for material or Insert. MultApplier and MultiBin inserts (shown on following pages) are configured as Bins 2-4 depending on type used.

Feedgate: Adjustable gate mounted into Rear Endgate. Allows for variable rates of material flow by adjusting jack to desired height.

Conveyor: Conveys material to rear of unit.

Inverted "V": Mounted inside Main Hopper when Insert not installed. Distributes weight pressure across conveyor, allowing for consistent material flow to Feedgate, and promotes an improved blend when spreading fertilizer.

Material Divider: Ensures uniform spread pattern by directing material off of conveyor onto spinner discs.

Hillside Flow Divider: Ensures balanced flow of material across conveyor when on hillsides or uneven terrain.

Sill: Base of Main Hopper side walls. Contains Conveyor and supports machine walls.

Cross Tubes: Supports body, attaches to Chassis frame. Transfers weight from Main Hopper to Chassis.

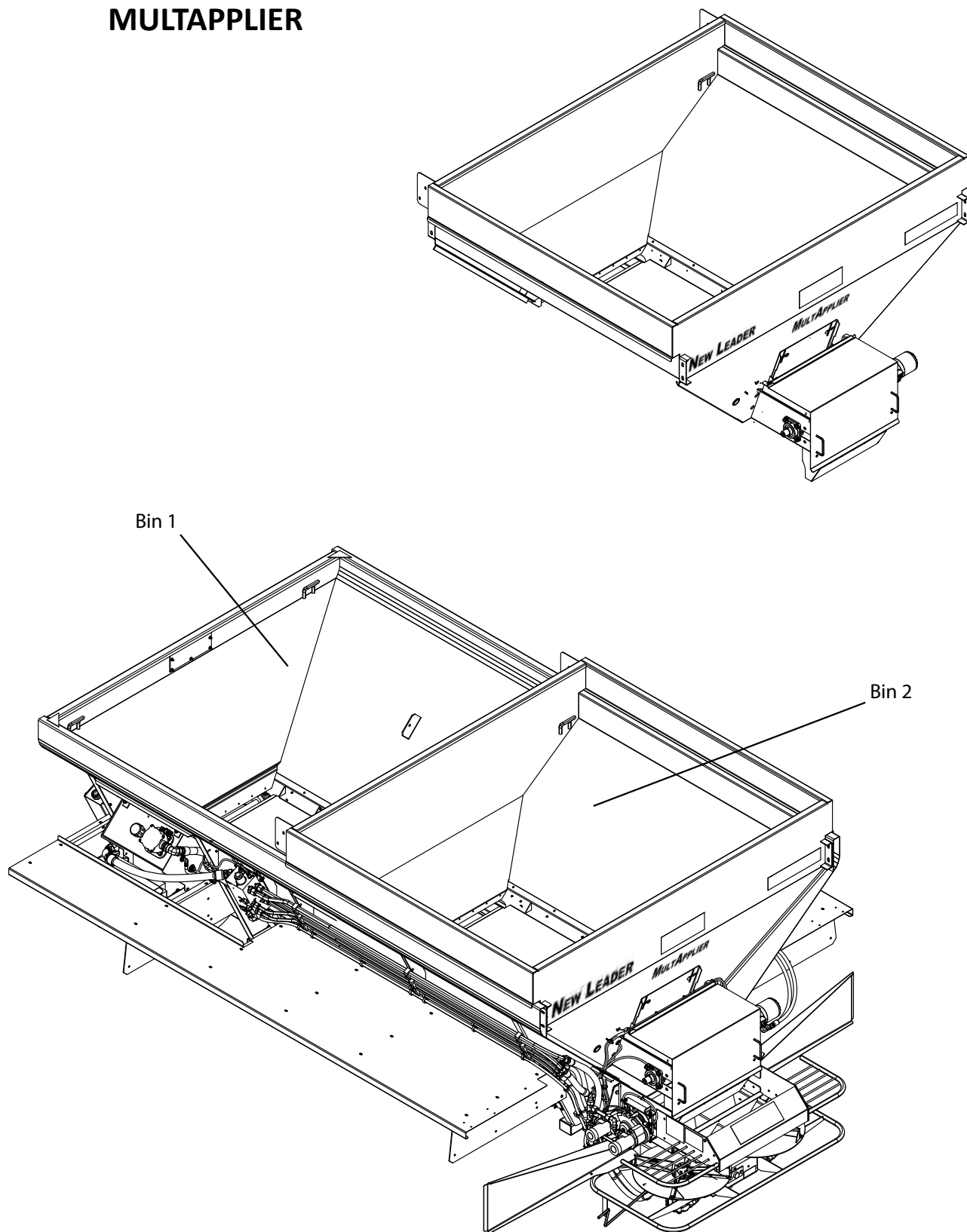
Spinner Assembly: Contains adjustable G4 Spreader system, consisting of hydraulic spinners used for dispersal of various materials at different positioned settings allowing for consistent, even spread patterns across a wide variety of material with a high rate of accuracy.

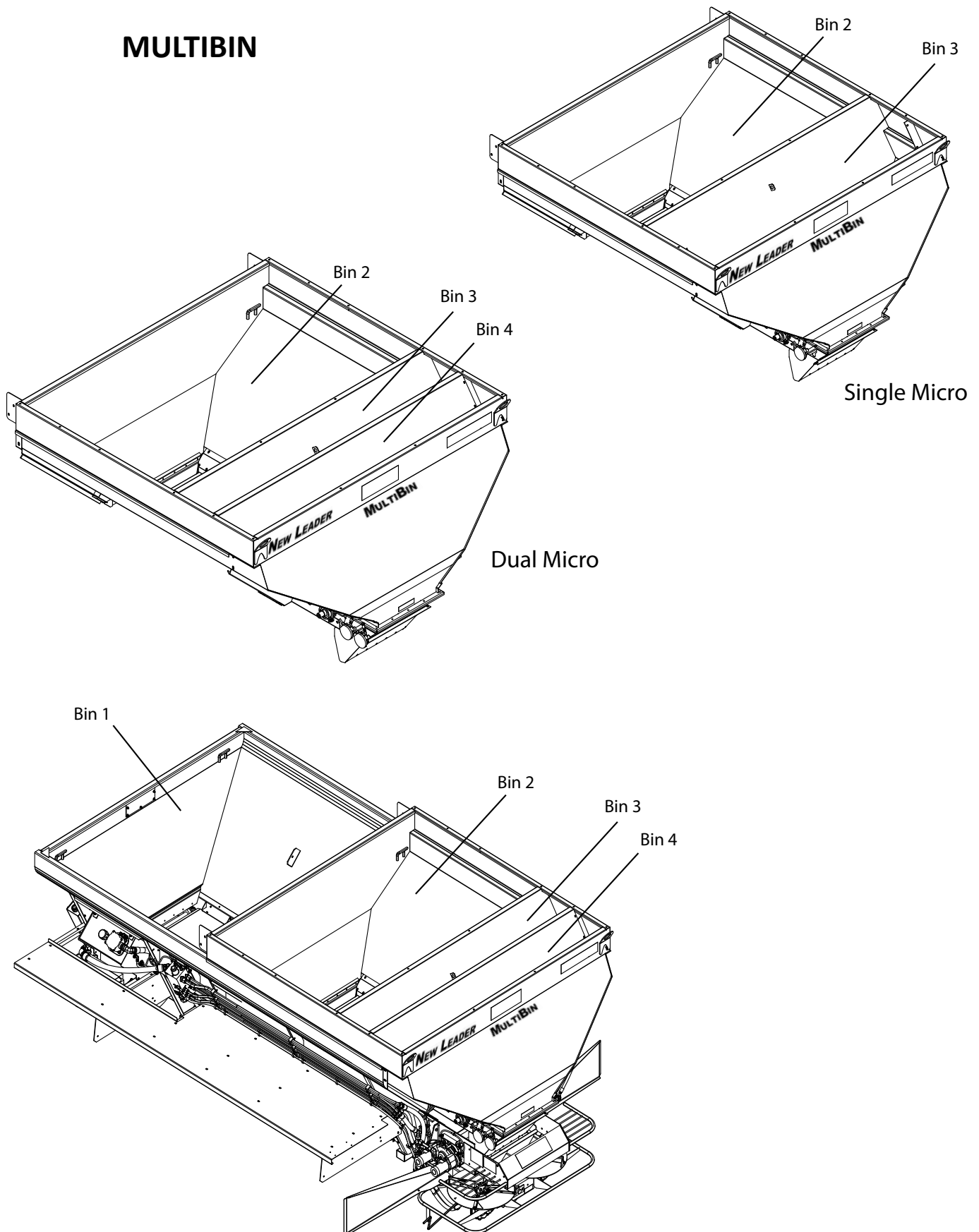
Spinner Guards: Upper and Lower guards, protects operators from spinner discs. Must be in place during any operation.

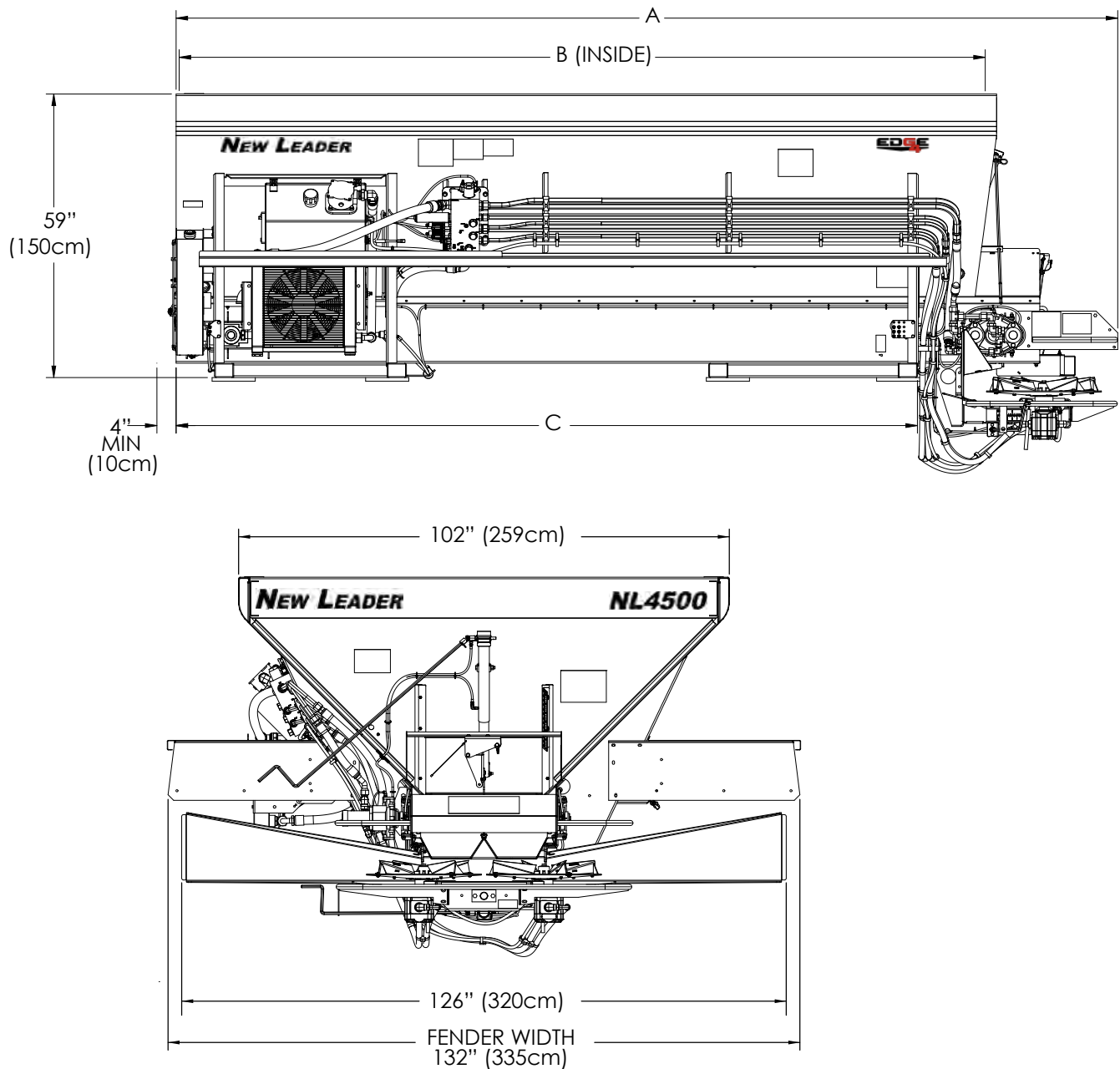
Spinner Deflectors: Deflect material away from machine.

Lift Hooks: Used to lift unit or insert with appropriately rated lifting device.

Enclosure: Houses spreader control modules, protects them from the elements

MULTAPPLIER

MULTIBIN

NL4500G4 EDGE, SINGLE BIN**IMPORTANT!**

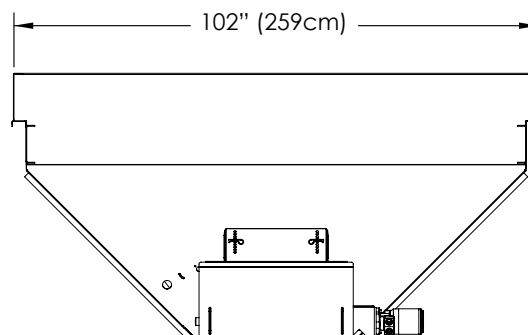
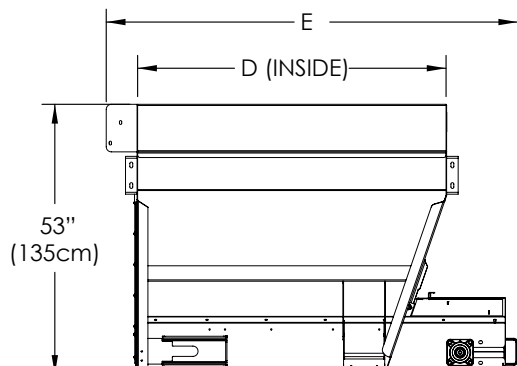
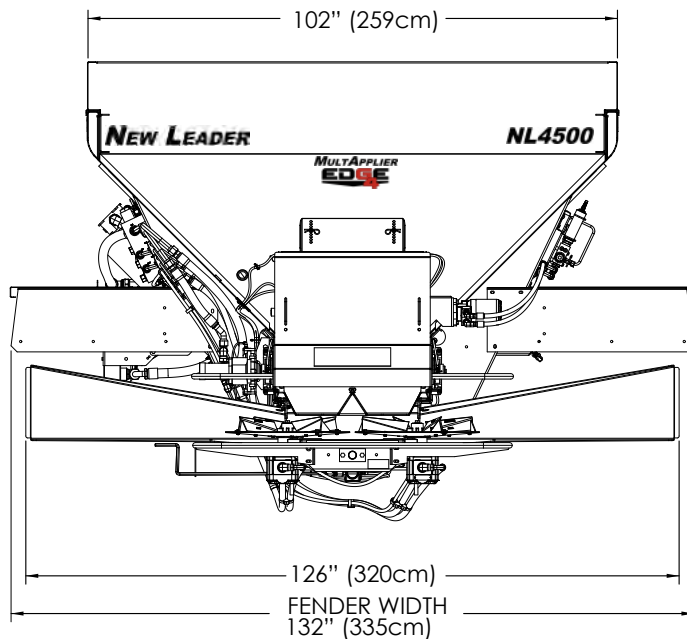
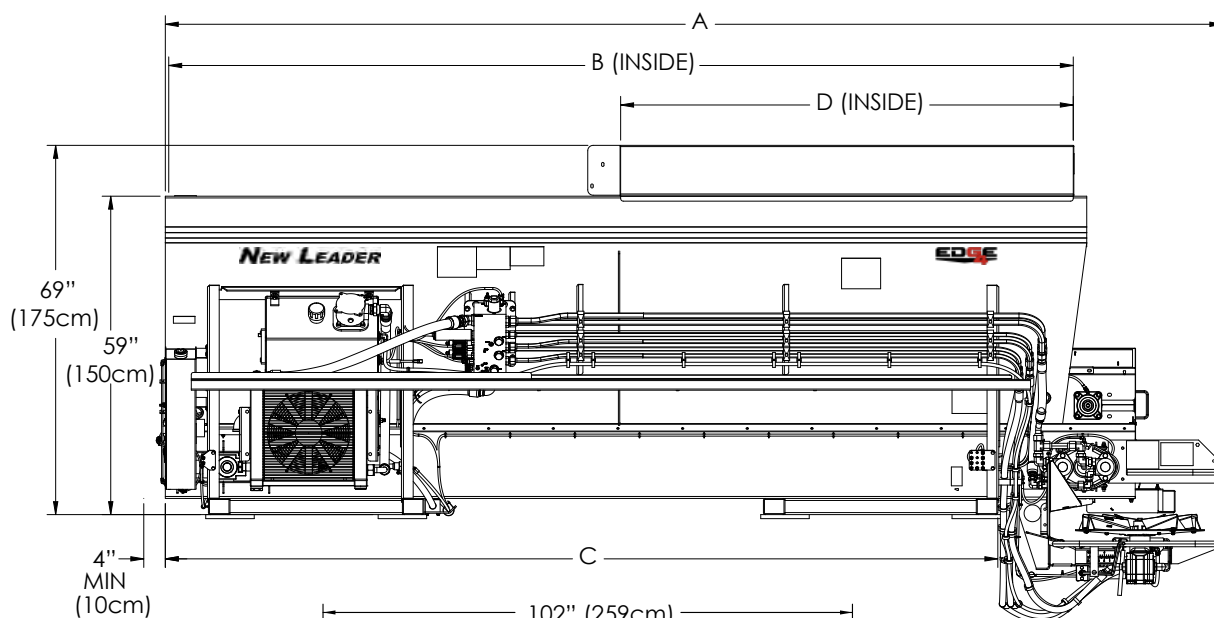
Please consult federal, state, and local weight laws and chassis manufacturer's ratings to ensure neither government weight restrictions nor GVWR and GAWR's are exceeded. Tire and tandem axle size may require mounting modification of optional mud flaps.



NL4500G4 EDGE, SINGLE BIN WEIGHTS & CAPACITIES

Unit Length	Overall Length A	Body Length B	Frame Length C	Approximate Weight Lbs (Kg)	Struck Capacity Cu Yd (Cu M) Cu Ft
12' (3.66m)	172" (437cm)	144" (366cm)	131" (333 cm)	4324 (1961.3)	9.3 (7.11) 251
13' (3.96m)	184" (467cm)	156" (396cm)	143" (363cm)	4544 (2061.1)	10.11 (7.73) 273
14' (4.27m)	196" (498cm)	168" (427cm)	155" (394cm)	4720 (2141.0)	10.93 (8.35) 295
15' (4.57m)	208" (528cm)	180" (457cm)	167" (424cm)	4911 (2227.6)	11.74 (8.98) 317
16' (4.88m)	220" (559cm)	192" (488cm)	179" (455cm)	5202 (2359.6)	12.56 (9.60) 339



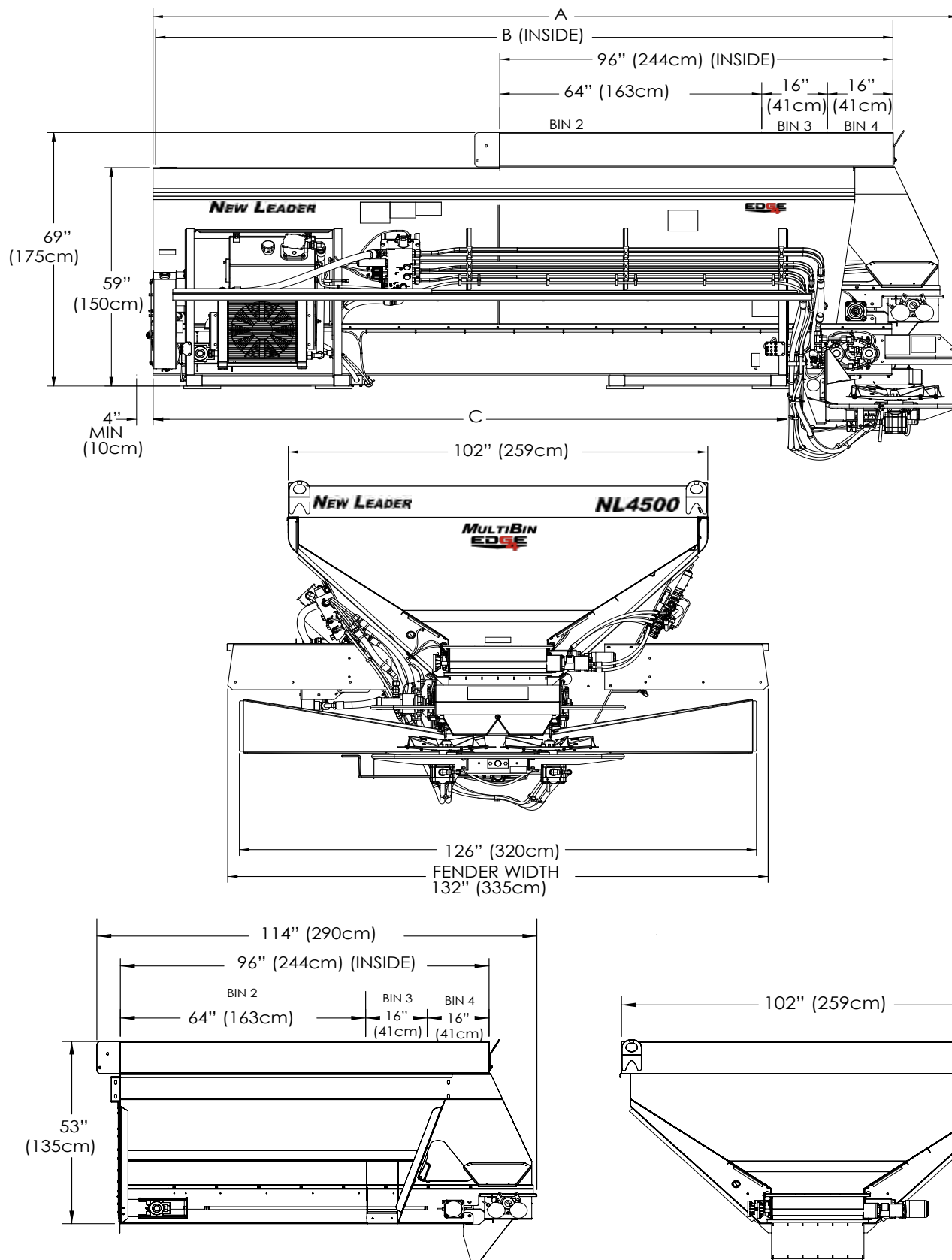
NL4500G4 EDGE WITH MULTAPPLIER

NL4500G4 EDGE WITH MULTAPPLIER WEIGHTS & CAPACITIES

	With 5' MultApplier	With 5' MultApplier	With 7' MultApplier	With 7' MultApplier or Mul- tiBin
Unit Length	Approximate Weight Lbs (Kg)	Struck Capacity Cu Yd (Cu M) Cu Ft	Approximate Weight Lbs (Kg)	Struck Capacity Cu Yd (Cu M) Cu Ft
12' (3.66m)	5052 (2291.6)	5.52 (4.22) 149	5267 (2389.1)	3.89 (2.97) 105
13' (3.96m)	5228 (2371.4)	6.33 (4.84) 171	5443 (2468.9)	4.70 (3.60) 127
14' (4.27m)	5404 (2451.2)	7.19 (5.50) 194	5610 (2544.7)	5.52 (4.22) 149
15' (4.57m)	5580 (2531.1)	8.00 (6.12) 216	5795 (2628.6)	6.33 (4.84) 171
16' (4.88m)	5871 (2663.1)	8.81 (6.74) 238	6086 (2760.6)	7.15 (5.47) 193

MULTAPPLIER ALONE DIMENSIONS & CAPACITIES

Insert Unit Length	Inside Length D	Overall Length E	Approximate Weight Lbs (Kg)	Struck Capacity Cu Yd (Cu M) Cu Ft
5' (1.52m) MultApplier	60" (152cm)	80" (203.2cm)	1,088 (493.5)	4.26 (3.25) 115
7' (2.13m) MultApplier	84" (213cm)	104" (264.2cm)	1,303 (591.0)	5.96 (4.60) 161

NL4500G4 EDGE WITH MULTIBIN

NL4500G4 EDGE WITH MULTIBIN DIMENSIONS & CAPACITIES

Unit Length	Approximate Weight Lbs (Kg)	Struck Capacity Cu Yd (Cu M) Cu Ft
12' (3.66m)	5659 (2566.9)	3.89 (2.97) 105
13' (3.96m)	5835 (2646.7)	4.70 (3.60) 127
14' (4.27m)	6011 (2726.5)	5.52 (4.22) 149
15' (4.57m)	6187 (2806.4)	6.33 (4.84) 171
16' (4.88m)	6478 (2938.4)	7.15 (5.47) 193

MULTIBIN ALONE DIMENSIONS & CAPACITIES

	Overall Length	Inside Length	Approximate Weight Lbs (Kg)	Struck Capacity Cu Yd (Cu M) Cu Ft
MultiBin	114" (289.6cm)	96" (244cm)	1695 (768.8)	
MultiBin (Bin 2)		64" (162.2cm)		5.30 (4.05) 143
Single Micro (Bin 3)		32" (82cm)		1.63 (1.24) 44
Dual Micro (Bin 3)		16" (41cm)		.78 (.59) 21
Dual Micro (Bin 4)		16" (41cm)		.78 (.59) 21



WARNING Stand clear of moving machinery.

NOTE: Do not load spreader with material.

1. Check entire unit to make sure all fasteners are in place and properly tightened per "Standard Torques" section in this manual.
2. Make sure no other persons are in vicinity of spreader.
3. Make sure no loose parts are in unit or on conveyor or spinner.
4. Check oil level in hydraulic reservoir; fill as necessary. Refer to "Lubricant & Hydraulic Oil Specifications" section of this manual for proper oil. Completely open reservoir valves.
5. Start engine and turn on hydraulics. Allow hydraulics to circulate until oil is warm.
6. Run spinner at 300 RPM. Allow to run until spinner is operating smoothly and all air has been purged from system.
7. Run conveyor at 20 RPM and spinner at 300 RPM. Run until conveyor is operating smoothly.
8. Run conveyor at 20 RPM and spinner at 700 RPM. Allow both conveyor and spinner to run until operating smoothly.
9. Enable boundary left and right and verify that RPM adjust accordingly.
10. Run conveyor at 0RPM and spinner at 0RPM. Make sure both conveyor and spinner do not move.
11. Calibrate spreader as defined in the manual for the controller that is supplied with your machine.
12. Complete spread pattern test per "Spread Pattern" section in this manual.
13. Shut system down.



WARNING

DO NOT check leaks with hands while system is operating as high pressure oil leaks can be dangerous! If skin is pierced with hydraulic fluid at high pressure seek immediate medical attention as fluid injected into the skin could cause gangrene if left untreated. Relieve pressure before disconnecting hydraulic lines or working system. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.



WARNING

DO NOT check for leaks adjacent to moving parts while system is operating as there may be danger of entanglement!

14. Check all connections in hydraulic system to make sure there are no leaks.
15. Check hydraulic oil tank and refill to maintain level at mid-point of gauge.
Unit is now ready for field testing.

1. Make sure unit has been properly serviced and is in good operating condition. It is recommended to run the spreader prior to loading material to ensure acceptable operation.
2. Set manual machine settings in controller per *Controller* section in this manual.
3. Program controller with correct data for material and application.
4. Adjust feedgate to appropriate setting.
5. Adjust spinner to give spread pattern desired. See "Spread Pattern" and "Controller" sections for details. Calibrate and spread pattern test for any new material.
6. Fill unit with material to be spread.
7. Engage hydraulics.
8. Begin spreading.



CAUTION Drive only at speeds which permit good control of vehicle!

NOTICE!

CHANGE HYDRAULIC OIL FILTER AFTER FIRST WEEK (OR NOT MORE THAN 50 HOURS) OF OPERATION ON A UNIT.

*Visit www.newleadervip.com for interactive tools to calculate yield, proper feedgate opening, conveyor revolutions per minute, and mph to maximize the performance of your spreader.



This page intentionally left blank.

NOTES



PREVENTATIVE MAINTENANCE PAYS!

The handling and spreading of commercial fertilizers is a most severe operation with respect to metal corrosion. Establish a frequent, periodic preventative maintenance program to prevent rapid damage to spreading equipment. Proper cleaning, lubrication and maintenance will give you longer life, more satisfactory service and more economical use of your equipment.

**WARNING**

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.

HYDRAULIC SYSTEM

Proper oil in the hydraulic system is one of the most important factors for satisfactory operation. Utmost cleanliness in handling the oil cannot be stressed enough. Keep hydraulic oil in original closed containers, clean top of container before opening and pouring, and handle in extremely clean measures and funnels.

Refer to *Lubricant and Hydraulic Oil Specifications* section for selection of the proper hydraulic fluid for use in the hydraulic system.

SERVICE SCHEDULE**WARNING**

DO NOT check leaks with hands while system is operating as high pressure oil leaks can be dangerous! If skin is pierced with hydraulic fluid at high pressure seek immediate medical attention as fluid injected into the skin could cause gangrene if left untreated. Relieve pressure before disconnecting hydraulic lines or working system. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.

**WARNING**

DO NOT check for leaks adjacent to moving parts while system is operating as there may be danger of entanglement!

Check hydraulic oil daily by means of sight gauge on hydraulic tank. Add oil as necessary to maintain level around mid-point of sight gauge. Periodically inspect hoses and fittings for leaks.

NOTICE!

Change hydraulic oil filter after first week (or not more than 50 hours) of operation on a unit.

Controller will warn when filter is restricted. Change filter when warning sounds.

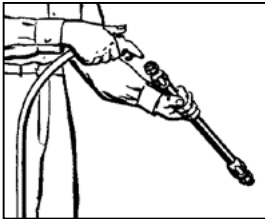
Drain hydraulic tank through drain plug (not through suction outlet), flush, and refill and change filter element annually. Oil and filter should also be changed whenever oil shows any signs of breaking down under continued high-pressure operation. Discoloration of oil is one sign of breakdown.

HYDRAULIC HOSE

Hose assemblies in operation should be inspected frequently for leakage, kinking, abrasion, corrosion or other signs of wear or damage. Worn or damaged hose assemblies should be replaced immediately. When replacing, use hoses of same or better rating and construction.

**WARNING**

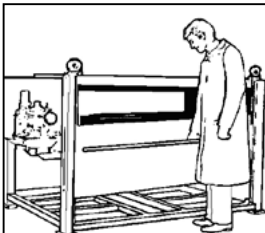
Testing should be conducted in approved test stands with adequate guards to protect the operator.

**Clean**

Clean assembly by blowing out with clean compressed air. Assemblies may be rinsed out with mineral spirits if the tube stock is compatible with oil, otherwise hot water at 150°F (65.55° C) maximum may be used. Ensure all are dry before assembly.

**Inspect**

Examine hose assembly internally for cut or bulged tube, obstructions, and cleanliness. For segment style fittings, be sure that the hose butts up against the nipple shoulder; band and retaining ring are properly set and tight, and segments are properly spaced. Check for proper gap between nut and socket or hex and socket. Nuts should swivel freely. Check the layline of the hose to be sure the assembly is not twisted. Cap the ends of the hose with plastic covers to keep clean.

**Test**

The hose assembly should be hydrostatically tested at twice the recommended working pressure of the hose.

Test pressure should be held for not more than one minute and not less than 30 seconds. When test pressure is reached, visually inspect hose assembly for: 1. Any leaks or signs of weakness. 2. Any movement of the hose fitting in relation to the hose. Any of these defects are cause for rejection.

Storage and Handling

Hose should be stored in a dark, dry atmosphere away from electrical equipment, and the temperature should not exceed 90° F (32.22° C).

CONVEYOR CHAIN**WARNING**

Stay out of the spreader. If it's necessary to enter the spreader, return to the shop, empty body, turn off all power, set vehicle brakes, lock engine starting switch and remove keys before entering. Tag all controls to prohibit operation. Tags should be placed, and later removed, only by person working in the body.

Hose down unit and remove any material build-up on sprockets and under chain.

NOTICE!

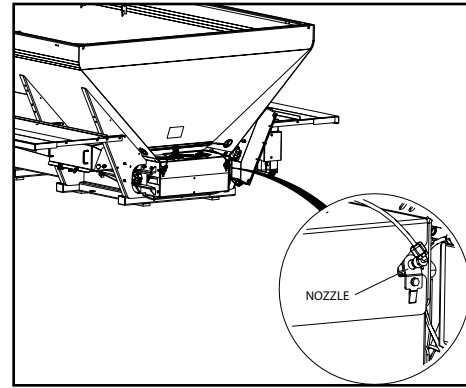
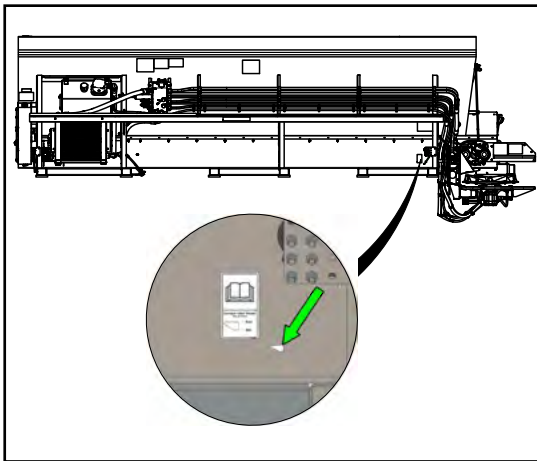
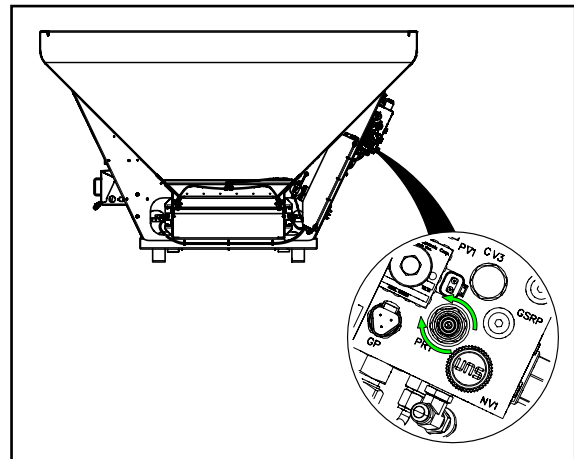
The conveyor will move away from the bottom panel if material accumulates under the conveyor or on the sprockets. The more material that accumulates, the closer the chain will come to the chain shields. If the conveyor should catch a chain shield, it could permanently damage the conveyor, the chain shields or the unit. Do not remove material while conveyor or spinner is running!

Lubrication

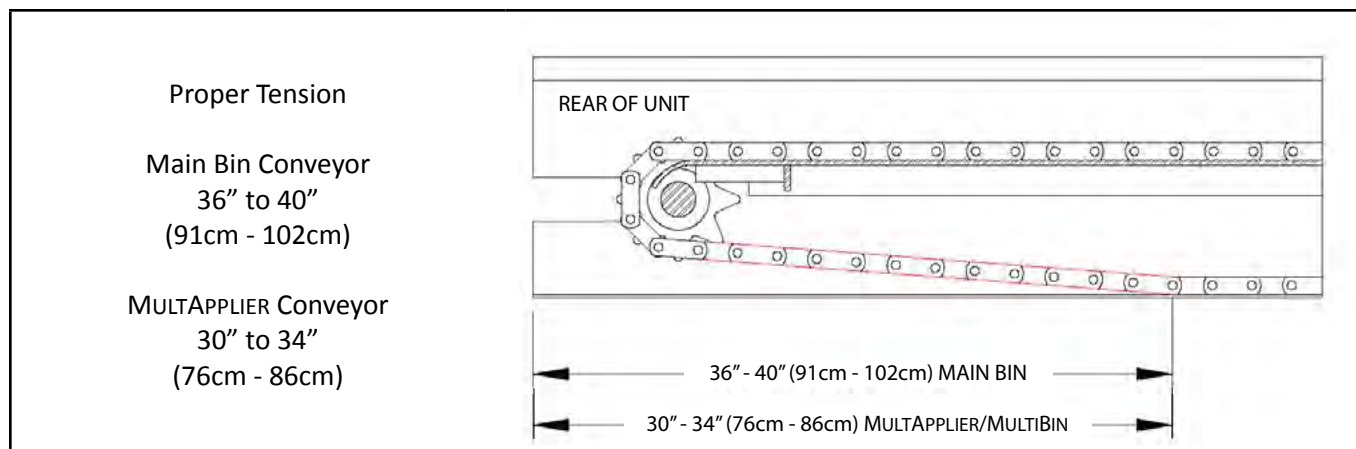
Make sure unit is clean and completely dry. Lubricate conveyor chain at an interval of 10 hours of spreading, or at the end of each day of usage.

Tension

Proper chain tension is a factor in chain and sprocket life. Measuring from rear of unit, conveyor should touch at 36" - 40" (91 - 102cm) mark, and top of chain should appear between MIN and MAX lines in sight window (Figure 1). If manual adjustments need to be made, on valve block, loosen jam nut, turn counterclockwise to lower tension, or turn clockwise to increase tension (Figure 2). All tension adjustments must be made when machine is unloaded and conveyor running 15-20 RPM.

**Figure 1****Figure 2A****Figure 2B**

Over-tensioning of conveyor chain will lead to excessive load on the system which will cause excessive chain and sprocket wear and can cause extremely high starting pressures. Under-tensioning allows conveyor chain to "wrap" around drive sprockets and not exit sprocket freely, causing excessive excessive chain stretch and surging of the conveyor which will result in interrupted flow of material to the spinners.



CONVEYOR BELT MAINTENANCE

Standard belt for the #4 chain is moderate oil resistant that is impervious to moisture, weathering, or normal action which can be used with chemical impregnated fertilizer or oil based additives.

- Inspect belt fastener occasionally for wear or "raveling" of belt grip area.
- Make sure belt connecting pin is positioned correctly as shown in Figure 3.

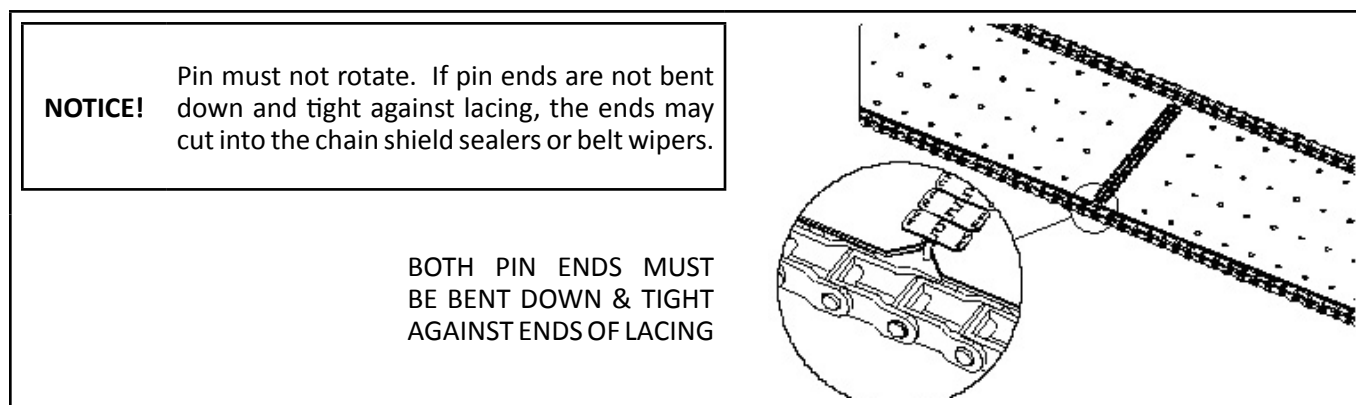


Figure 3 - Conveyor Belt Pin Installation

BIN SENSOR



WARNING

Stay out of the spreader. Do not climb on spreader. Use a portable ladder to inspect, clean and maintain the bin sensor from outside the spreader. Failure to do so could result in injury from falling.

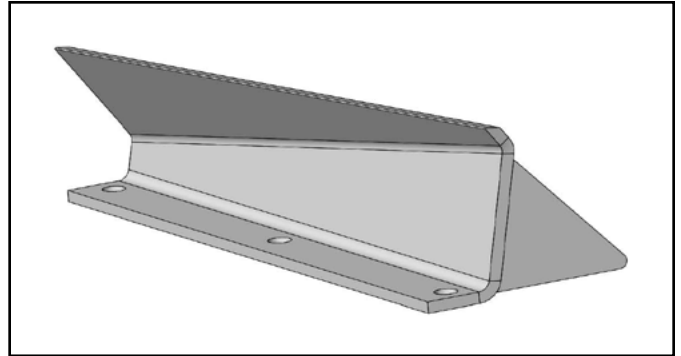
NOTICE!

Wipe sensor clean periodically to prevent accumulation of product. Avoid wet material as it may stick to sensor. If material sticks to sensor it won't warn user when bin is low.

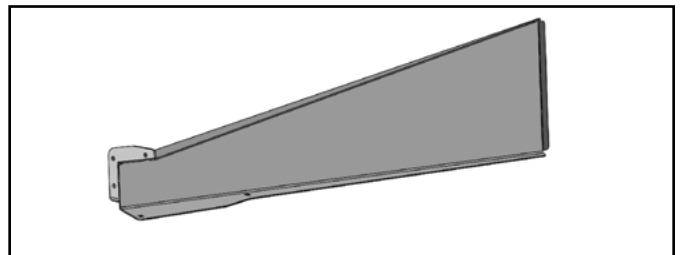
Clean sensor with long handled brush or hose from outside of spreader. Do not aim high pressure sprayer directly at sensor—it could damage the components.

Spinner Fins

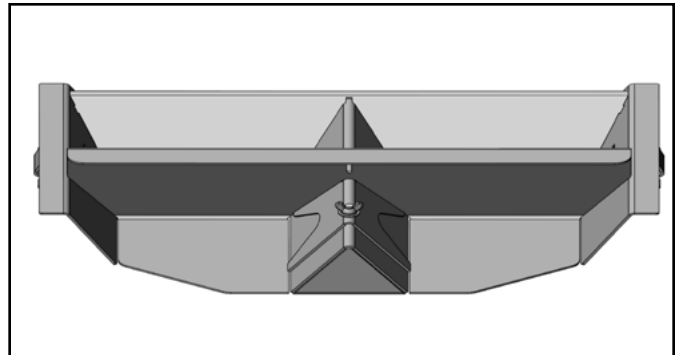
Visually inspect spinner fins (Figure 4) daily for build-up of material and wear. Spinner discs and fins must be kept clean and polished. Even a small build-up of material on a spinner can significantly affect the spread pattern. Rough, bent or worn fins will produce bad spread patterns. Replace worn fins or discs as needed. See *Fin Kit Installation Instructions* for replacement part numbers and instructions.

**Figure 4 - Spinner Fin****Spinner Deflectors**

Visually inspect spinner deflectors (Figure 5) daily for build-up of material and damage. Clean as needed. Even a small build-up of material on a spinner deflector can affect the spread pattern. If damaged, bent or otherwise, replace. See *Parts List* in this manual for replacement part numbers.

**Figure 5 - Spinner Deflector****Material & Hillside Flow Dividers**

Visually inspect material divider (Figure 6) and hillside flow dividers (as equipped) daily for build-up of material and wear. Any build-up of material on divider components can affect performance. Clean as needed. Replace worn or damaged parts as necessary. See *Parts List* in this manual for replacement part numbers.

**Figure 6 - Material Divider**

CONVEYOR GEARCASE

Drain oil in a new unit after first two weeks (or not more than 100 hours) of operation, and flush gear case thoroughly with light oil. Refer to "Lubricant and Hydraulic Oil Specifications" section for proper grade oil and recommended amounts of lubricant. After initial change, oil should be changed every 2,000 hours of operation or annually, whichever occurs first.

Check gearcase oil level monthly.

LUBRICATION OF BEARINGS

Grease in a bearing acts to prevent excessive wear of parts, protects ball races, and balls from corrosion and aids in preventing excessive heat within the bearing. It is very important the grease maintain its proper consistency during operation. It must not be fluid and it must not channel.

Make sure all fittings are thoroughly cleaned before grease is injected. Points to be lubricated by means of a grease gun have standard grease fittings.

Lubricate bearings by pumping grease slowly until it forms a slight bead around the seals. This bead indicates adequate lubrication and also provides additional protection against the entrance of dirt.

FASTENERS

Tighten all screws fasteners to recommended torque's after first week of operation and annually thereafter. If loose fasteners are found at anytime, tighten to recommended torque. Replace any lost or damaged fasteners or other parts immediately. Check body mounting hardware every week.

CLEAN UP

NOTICE!

High pressure wash can inject water and/or fertilizer into control components, causing damage. Use caution when cleaning these areas.

Thoroughly wash unit every two to three days during the operating season to maintain minimal maintenance operation. Hose unit down under pressure to free all sticky and frozen material.

It is important the unit be thoroughly cleaned at the end of each operating season. All lubrication and maintenance instructions should be closely followed. Repaint worn spots to prevent formation of rust.

NOTICE!

The lubricant distributor and/or supplier is to be held responsible for results obtained from their products. Procure lubricants from distributors and/or suppliers of unquestionable integrity, supplying known and tested products. Do not jeopardize your equipment with inferior lubricants. No specific brands of oil are recommended. Use only products qualified under the following oil viscosity specifications and classification recommended by reputable oil companies.

HYDRAULIC SYSTEM

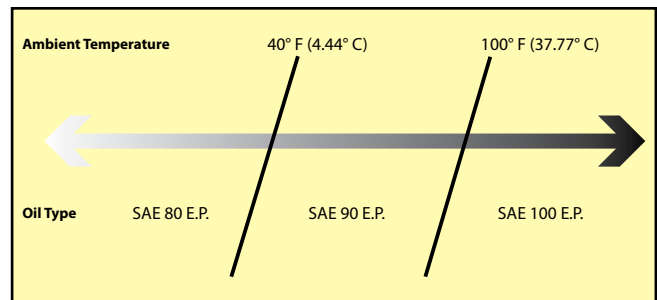
Use premium quality lubricants with 100-200 SUS or 20-43 cSt viscosity at operating temperatures. The hydraulic fluid's specifications in the table below are for normal operating conditions. Extreme environments or dirty conditions may require the use of different oils. Consult your New Leader dealer or the Product Support Department at Highway Equipment Company for systems operating outside normal conditions.

Ideal Oil Operating Temperature	115-158°F (46.11-70° C)
Recommended Premium Lubricant	Multi-Purpose Agriculture Hydraulic & Transmission Oil
Lubricant Specifications	
Viscosity Index	Greater than 130
Viscosity at 40°C, cst	Less than 68
Viscosity at 100°C, cst	Greater than 9
Acceptable Fluid Example	Mobil 424

GEARCASE LUBRICANT

Lubricate these assemblies with non-corrosive type extreme pressure (E.P.) gear oil conforming to MIL-L2105 B multi-purpose gear lubricating oil requirements (API Service GL 4) based on ambient temperatures listed below. Refill gearcase with one and a half (1-1/2) pints (.70 liters) of recommended lubricant.

Ambient Temperature	Oil Type
Below 40°F (4.4°C)	SAE 80 E.P.
40° - 100° F (4.4° - 38° C)	SAE 90 E.P.
Above 100° F (38° C)	SAE 140 E.P.

**GREASE GUN LUBRICANT**

Use a waterproof ball and roller bearing lithium base lubricant with a minimum melting point of 300°F (148.8° C). This lubricant should have a viscosity which assures easy handling in the pressure gun at prevailing atmospheric temperatures. The grease should conform to NLGI No. 2 consistency.

CHAIN OILER MIXTURE

Use a mixture of 75% diesel fuel mixed with 25% SAE 10 engine oil (use clean oil, not pre-used oil).

**WARNING**

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.

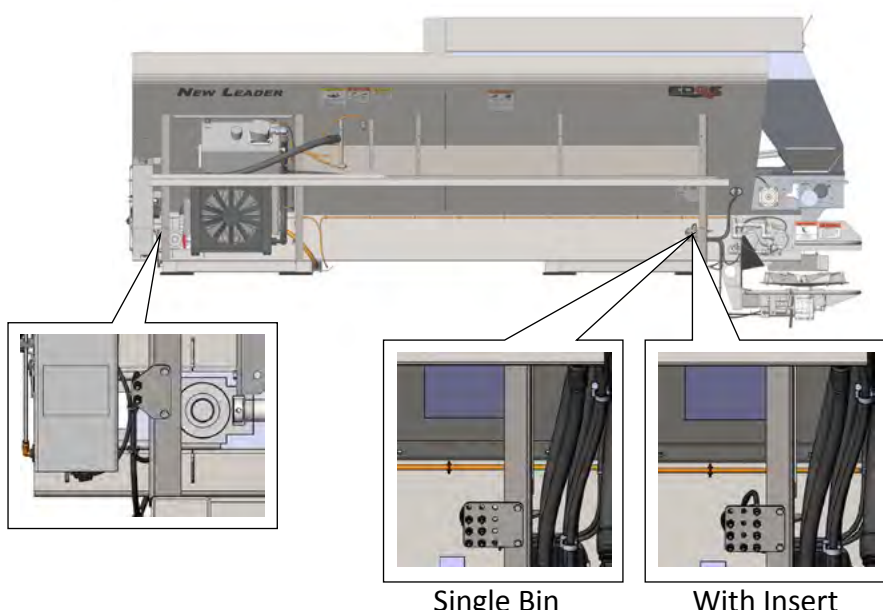
The spreader should be regularly lubricated with the lubricants recommended in this manual in accordance with the following chart:

Location	Places	Method	Frequency
Hydraulic System			
Hydraulic Reservoir	1		Check Daily. Change Annually
Filter	1	Check daily; Change when indicated by controller	
Conveyor			
Driveshaft Bearings (A)	2	Grease Gun	Weekly
Idler Shaft Bearings (B)	2	Grease Gun	Weekly
Chain (MultiApplier/MultiBin)	2 Strands	Spray Oil	Daily
Chain Oiler	1	Oil Mixture	Daily, After first 10 hours spreading
Gearcase	1	Gear Oil	Check Monthly; Change Annually
Jack Assembly			
Grease Zerks - Jack (C)	2	Grease Gun	Weekly
Spinner			
Grease Zerks - Jack (D)	2	Grease Gun	Weekly

NOTE: Unusual conditions, such as excessive dust, temperature extremes or excessive moisture may require more frequent lubrication of specific parts.

*See *Lubricant and Hydraulic Oil Specifications* for types of lubricants and oil to be used.

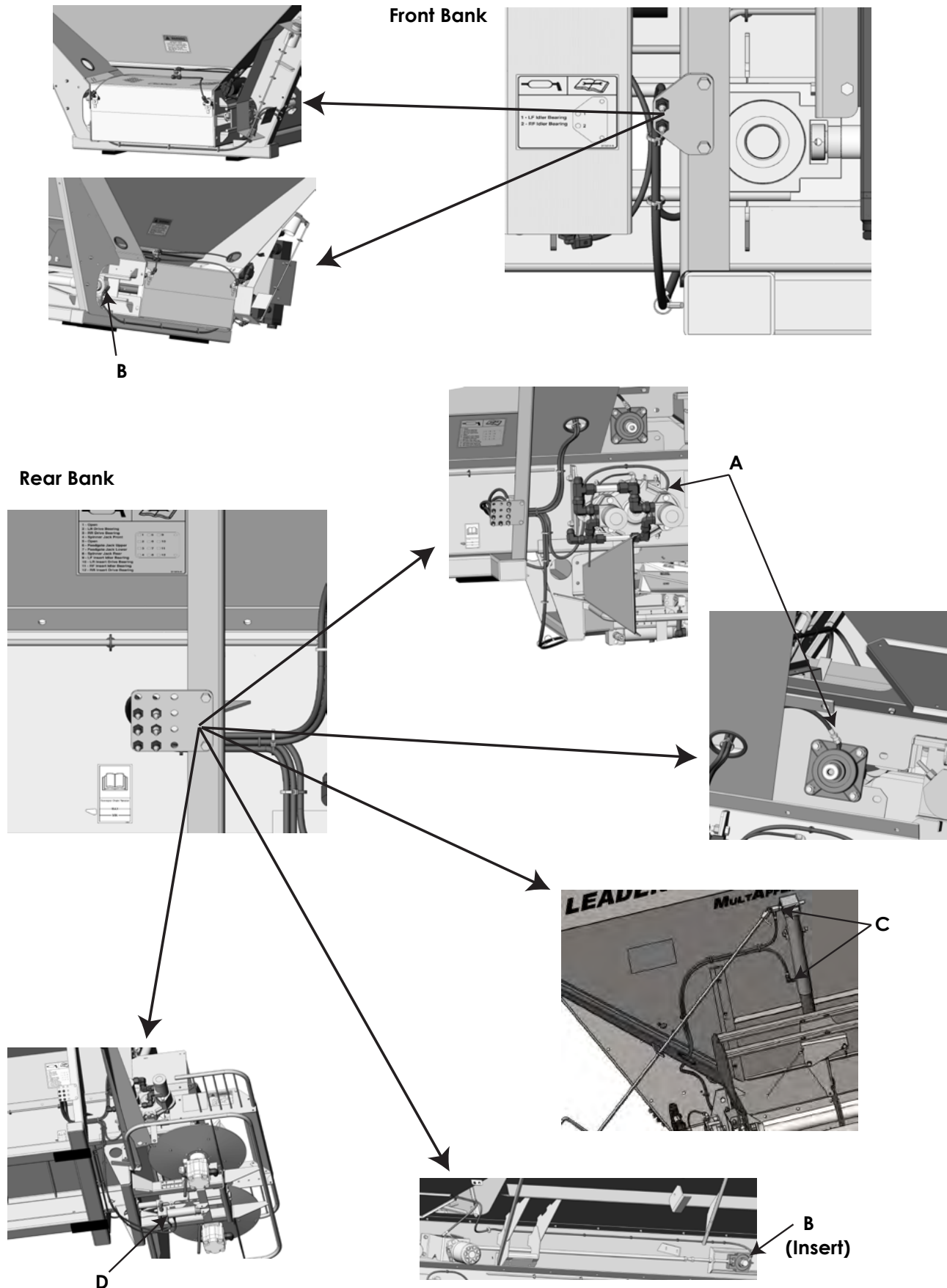
Grease Banks



Single Bin

With Insert





Symptom:	Reason:	Correction:
Spinner will not run	Defective Spinner Control Valve	Replace spinner control valve cartridge and coil.
	No voltage at valve	Verify spinner switch is on.
		Verify spinner enable is checked.
		Verify controller has a target spinner RPM entered.
		Check WSM 7.5 amp fuse is not blown.
		Verify spinner control harness is not damaged.
		Verify system was configured as Basic independent.
	No hydraulic flow	Verify hydraulics are on.
		Pressure test pump - replace as needed.
		System is going over relief - test & replace as needed.
Spinner will not shut off	Defective spinner control valve	Replace spinner control valve cartridge.
	Control valve is manually override	Loosen jam nut on control valve cartridge and back set screw out until spinner stops.
Spinner runs erratic	Defective spinner control valve	Replace spinner control valve cartridge.
	Spinner speed sensor harness failure	Replace sensor harness.
	Spinner speed sensor not properly installed	Adjust sensor so that gap between sensor and fin mounting bolt is less than 1/8".
Spinner speed drops off when turning around	Improper control settings	Verify PWM control is set properly (HOLD for gear pumps, CONTROL for variable displacement).
Spinner speed does not hit target	Defective spinner control valve	Replace spinner control valve cartridge.
	Pump failure	Flow and pressure test pump.
	Spinner speed sensor not properly installed	Adjust sensor so that gap between sensor and fin mounting bolt is less than 1/8".
	Hydraulic flow dropping off	Adjust settings and speed. Pressure test relief (adjust or replace as needed).
	Spinner speed sensor harness failure	Replace sensor harness.
	Spinner speed sensor failure	Replace spinner speed sensor.
Conveyor will not run	Defective conveyor control valve	Replace conveyor valve cartridge.
	No voltage at valve	Verify bin switch and master switches on.
		Verify in controller that target rate, density, ground speed and a CFR number are all entered.
		Check WSM 7.5 amp fuse is not blown.
		Verify conveyor control harness is not damaged.
	No hydraulic flow	Verify hydraulics are on.
		Pressure test pump - replace as needed.
		System is going over relief - test & replace as needed.
		Conveyor is going over relief - test & replace as needed.

Symptom:	Reason:	Correction:
Conveyor will not shut off	Defective conveyor cartridge	Replace conveyor control valve cartridge.
	Control valve is out of time	Adjust cartridge timing.
Conveyor runs erratic	Defective conveyor cartridge	Replace conveyor control valve cartridge.
	Encoder failure	Replace encoder.
	Encoder harness failure	Replace harness.
	Rates smooting is disabled	Enable rate smoothing.
Bin will not hit target rate	Defective conveyor cartridge	Replace conveyor control valve cartridge.
	Pump failure	Flow and pressure test pump.
	Going over relief	Adjust setting and speed. Pressure test relief (adjust or replace as needed).
	Encoder failure	Replace encoder.
	Encoder harness failure	Replace harness.
Hydraulics over-heating	Pump failure	Flow and pressure test pump.
	Too much flow	Flow test pump.
	System relief	Pressure test relief (adjust or replace as needed). Adjust settings and speed.
	Conveyor valve relief	Pressure test relief (adjust or replace as needed). Adjust settings and speed.
	Oil cooler fan failure	see cooler fan failures.
	Case drain on mono valve is plugged.	Case drain requires zero pressure line back to tank.
Cooler Fan failure	No power at fan	Verify FAN 30-amp fuse is not blown. Verify relay is working properly.
	Fan failure	Replace fan.
No warnings being displayed	Warnings are only shown when VT screen is active on monitor	Switch from viewing map to viewing VT.
Bin level sensors not working properly	Not enabled	Verify system was configured with bin level snesors installed.
	Bin level sensor failure	Replace sensor.
	Bin level sensor harness failure	Replace harness.
Not applying correct rate	Incorrect settings	Verify density, swath width, gate opening, encoder pulses, and CFR number are all adjusted as needed.
No ground speed	Manual speed is enabled, but set to 0	Enter correct speed or disable manual speed
	AUX broadcast speed is enabled but radar not installed	Disable broadcast AUX speed.
	Incorrect speed source is selected	Select correct speed source.
Conveyor tensioning incorrect	Cartridge isn't adjusted properly	Adjust valve to achieve correct tension.
	Cartridge has failed	Replace cartridge.

LED Light alerts - located on physical modules on machine**Power LED**

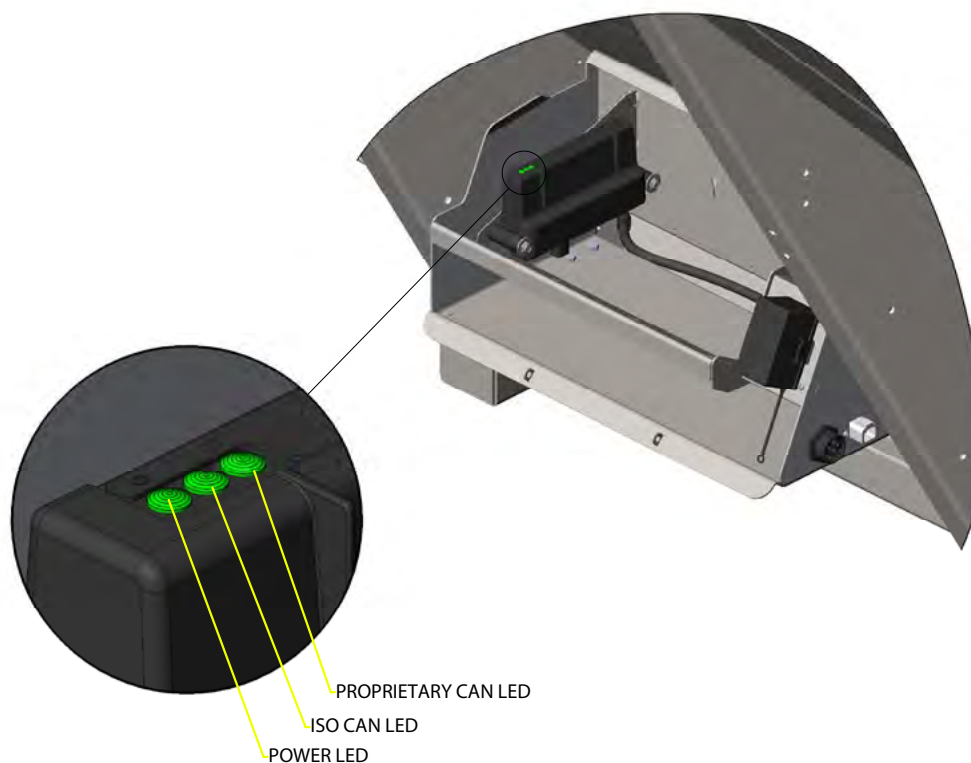
	Off	Solid Red	Flashing Red	Solid Amber	Flashing Amber	Solid Green	Flashing Green
Boot	No Power	N/A	No App	Running	N/A	N/A	N/A
Upgrade	No Power	N/A	N/A	N/A	Running	N/A	N/A
Main Application	No Power	High Current Power Low	N/A	N/A	N/A	Power OK	N/A

ISO CAN LED

	Off	Solid Red	Flashing Red	Solid Amber	Flashing Amber	Solid Green	Flashing Green
Boot	X	N/A	N/A	N/A	N/A	N/A	N/A
Upgrade	Idle	Bus Off	N/A	Bus Error Passive	Bus Error Active	N/A	TX/RX
Main Application	Idle	Bus Off	N/A	Bus Error Passive	Bus Error Active	N/A	TX/RX

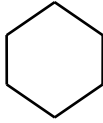
Proprietary CAN LED

	Off	Solid Red	Flashing Red	Solid Amber	Flashing Amber	Solid Green	Flashing Green
Boot	X	N/A	N/A	N/A	N/A	N/A	N/A
Upgrade	X	N/A	N/A	N/A	N/A	N/A	N/A
Main Application	Idle	Bus Off	N/A	Bus Error Passive	Bus Error Active	N/A	TX/RX



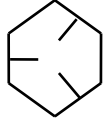
CAP SCREW GRADE IDENTIFICATION - MARKINGS ON HEAD

SAE GRADE 2



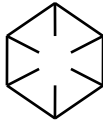
NO MARKINGS

SAE GRADE 5



THREE MARKS - 120 DEGREES APART

SAE GRADE 8



SIX MARKS - 60 DEGREES APART

USE GRADE 2 TORQUES FOR STAINLESS STEEL FASTENERS AND CARRIAGE BOLTS.

CAP SCREW SIZE	TORQUE - FOOT-POUNDS					
	GRADE 2		GRADE 5		GRADE 8	
	DRY	LUBE	DRY	LUBE	DRY	LUBE
1/4"	5	4	8	6	12	9
5/16"	11	8	17	13	25	18
3/8"	20	15	30	23	45	35
7/16"	30	24	50	35	70	55
1/2"	50	35	75	55	110	80
9/16"	65	50	110	80	150	110
5/8"	90	70	150	110	220	170
3/4"	100	120	260	200	380	280
7/8"	140	110	400	300	600	460
1"	220	160	580	440	900	650

IMPORTANT!

Do not operate or work on machine without reading and understanding the operator's manual.

Before starting engine/before starting machine operation

- | | |
|--|---|
| <input type="checkbox"/> Program rate controller and document settings | <input type="checkbox"/> Hydraulic hoses are secured properly |
| <input type="checkbox"/> All stop, tail, and turn lights function properly | <input type="checkbox"/> Gearcase oil level is correct |
| <input type="checkbox"/> Tire pressures are equal on each side of chassis | <input type="checkbox"/> All guards and shields in place |
| <input type="checkbox"/> Battery condition and connection | <input type="checkbox"/> Spinner assy moves through full range of operation |
| <input type="checkbox"/> Electrical connections are tight and secure | <input type="checkbox"/> Spinner discs and fins installed properly |
| <input type="checkbox"/> All fasteners are secure | <input type="checkbox"/> Spinner discs and fins are in acceptable condition |
| <input type="checkbox"/> Inverted V is secure and installed properly | <input type="checkbox"/> Material Divider assembly is square and secure |
| <input type="checkbox"/> Sensor(s) are functioning properly | <input type="checkbox"/> Material Divider is clean of build-up |
| <input type="checkbox"/> Lubricate all grease fittings | <input type="checkbox"/> Feedgate assembly is level and clean of build-up |
| <input type="checkbox"/> Hydraulic oil level and line connections are tight | <input type="checkbox"/> Encoder installed and secured |
| <input type="checkbox"/> Hydraulic filters are current and gauge is functional | <input type="checkbox"/> Spinner sensor adjusted to proper gap |
| <input type="checkbox"/> Chain oiler tank is full and operates correctly | |

Start engine/Start and run to operational temperatures

- | | |
|---|---|
| <input type="checkbox"/> Hydraulic fittings are tight and no leaks * | <input type="checkbox"/> Conveyor control valve is operating correctly |
| <input type="checkbox"/> All pressure transducers are operating correctly | <input type="checkbox"/> Calibrate radar/ground speed input |
| <input type="checkbox"/> Check operation of all alarms | <input type="checkbox"/> Test maximum conveyor RPM's |
| <input type="checkbox"/> Hydraulic flow test: ____ GPM @ operating engine RPM | <input type="checkbox"/> Test right and left hand spinner speed; ensure difference is less than 5 RPM (when at operating RPM) |
| <input type="checkbox"/> Check main relief valve setting : ____ PSI | |

Stop operation/Turn off engine and engage parking brake

- | | |
|---|--|
| <input type="checkbox"/> Visually check for leaks | <input type="checkbox"/> All oil levels full |
| <input type="checkbox"/> Check belt/chain tension and alignment | |

Perform Calibrations

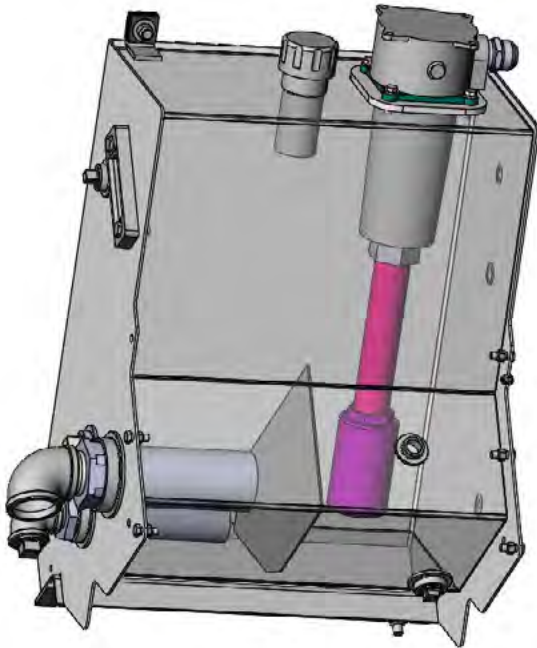
- ☐ Product density testing, crush strength, and SGN scale (See *Spread Pattern Calibration* section for instructions).
- ☐ Catch tests of all products and at least 1 blend for conveyor calibration and document settings and product characteristics
- ☐ Spread pattern tests of all products and at least 1 blend and document settings and product characteristics

End of Season

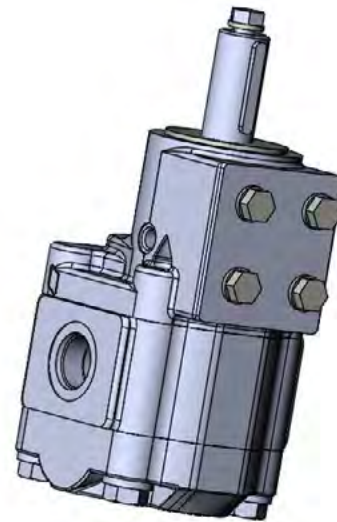
- | | |
|--|--|
| <input type="checkbox"/> Empty unit of all material | <input type="checkbox"/> Clean unit inside and out |
| <input type="checkbox"/> Sand and touch-up paint as necessary | <input type="checkbox"/> Check for leaks |
| <input type="checkbox"/> Wash chain conveyor, lube thoroughly when dry | <input type="checkbox"/> Lubricate all grease fittings |
| <input type="checkbox"/> Check spinner discs and fins for wear | <input type="checkbox"/> Ensure all fasteners are secure |

The following pages contain representative hydraulic schematics and flow diagrams for the NL4500G4 EDGE model spreader.

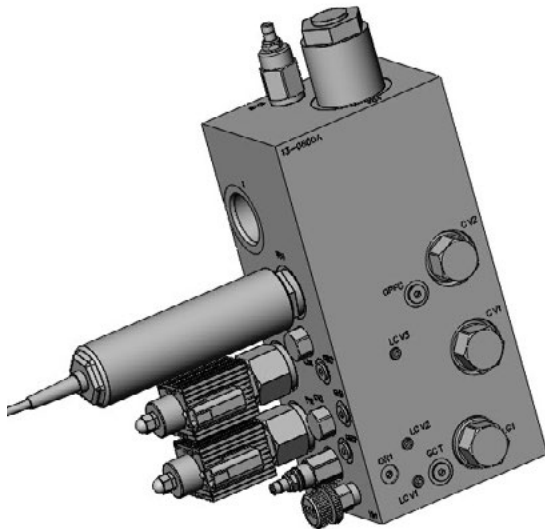
Hydraulic Components



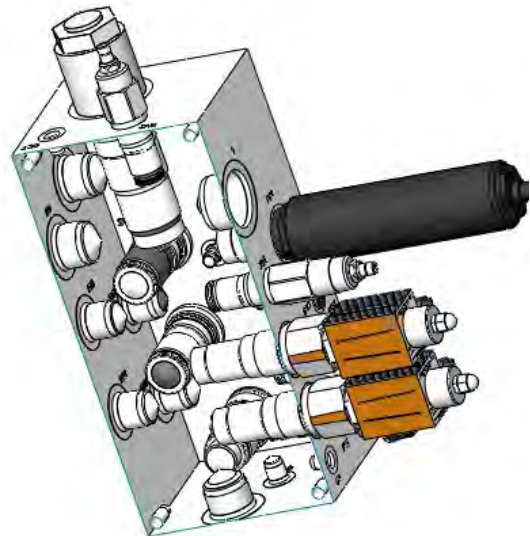
Hydraulic Reservoir



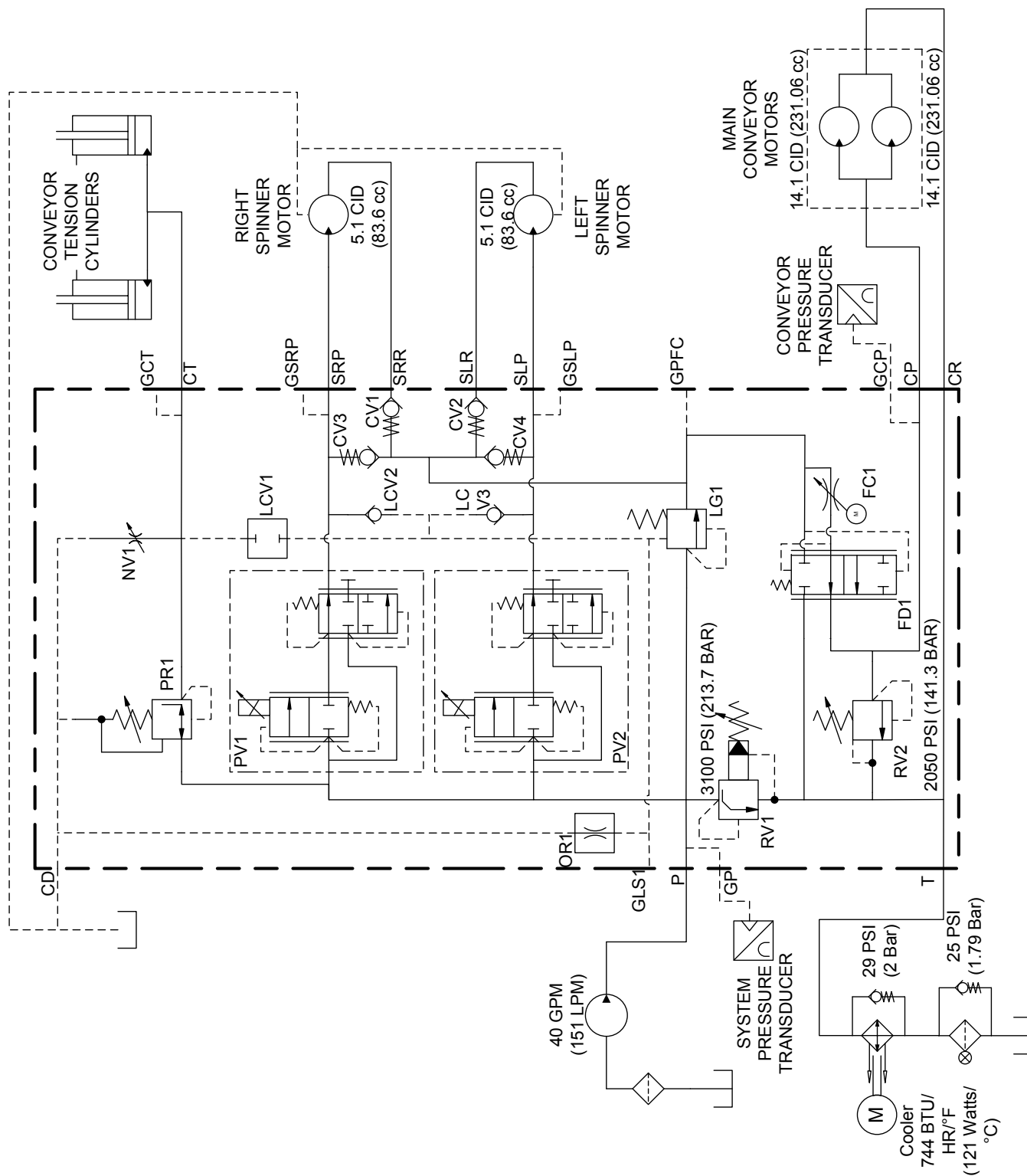
Spinner Motor

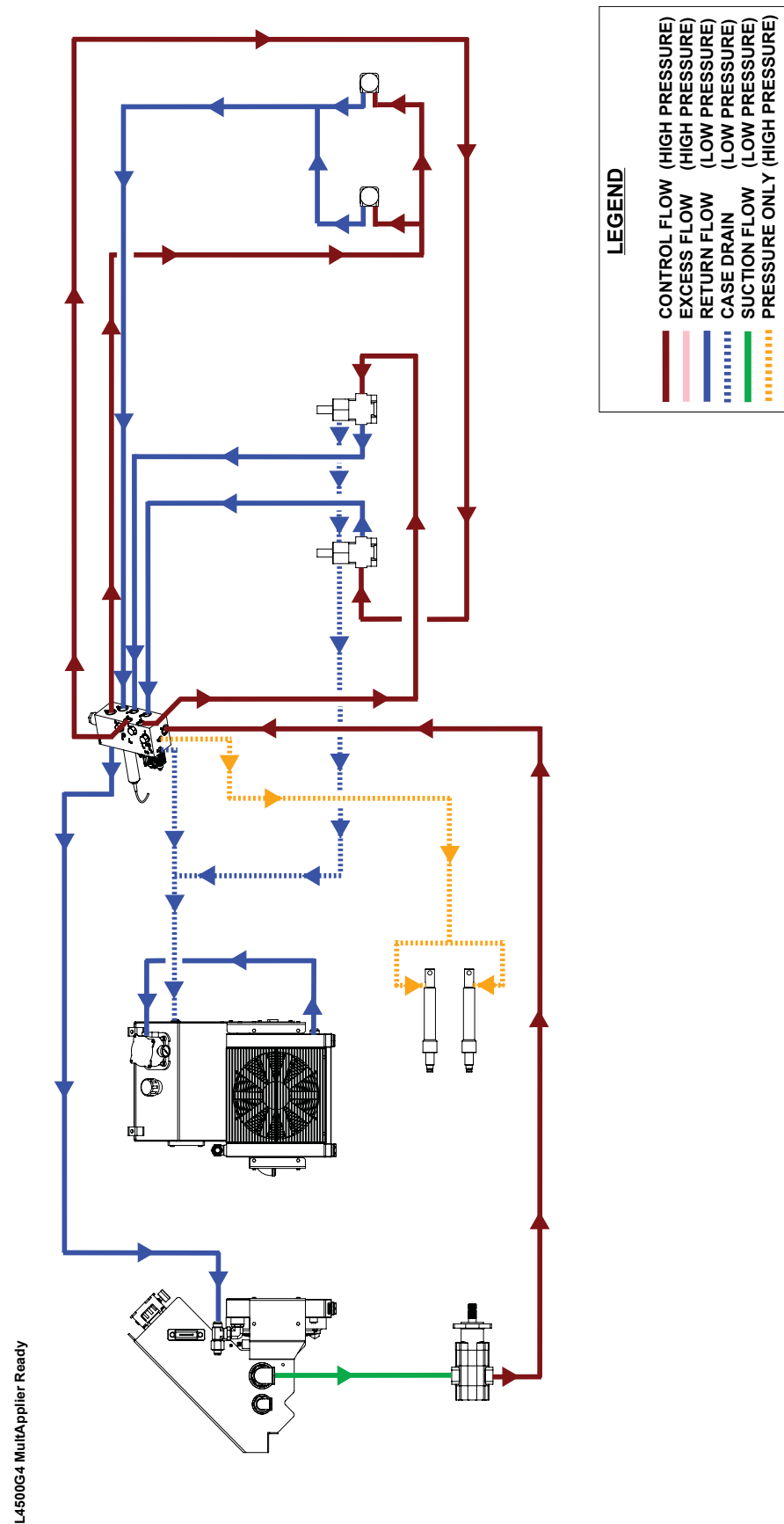


Valve Block - Face
Standard Hydraulics

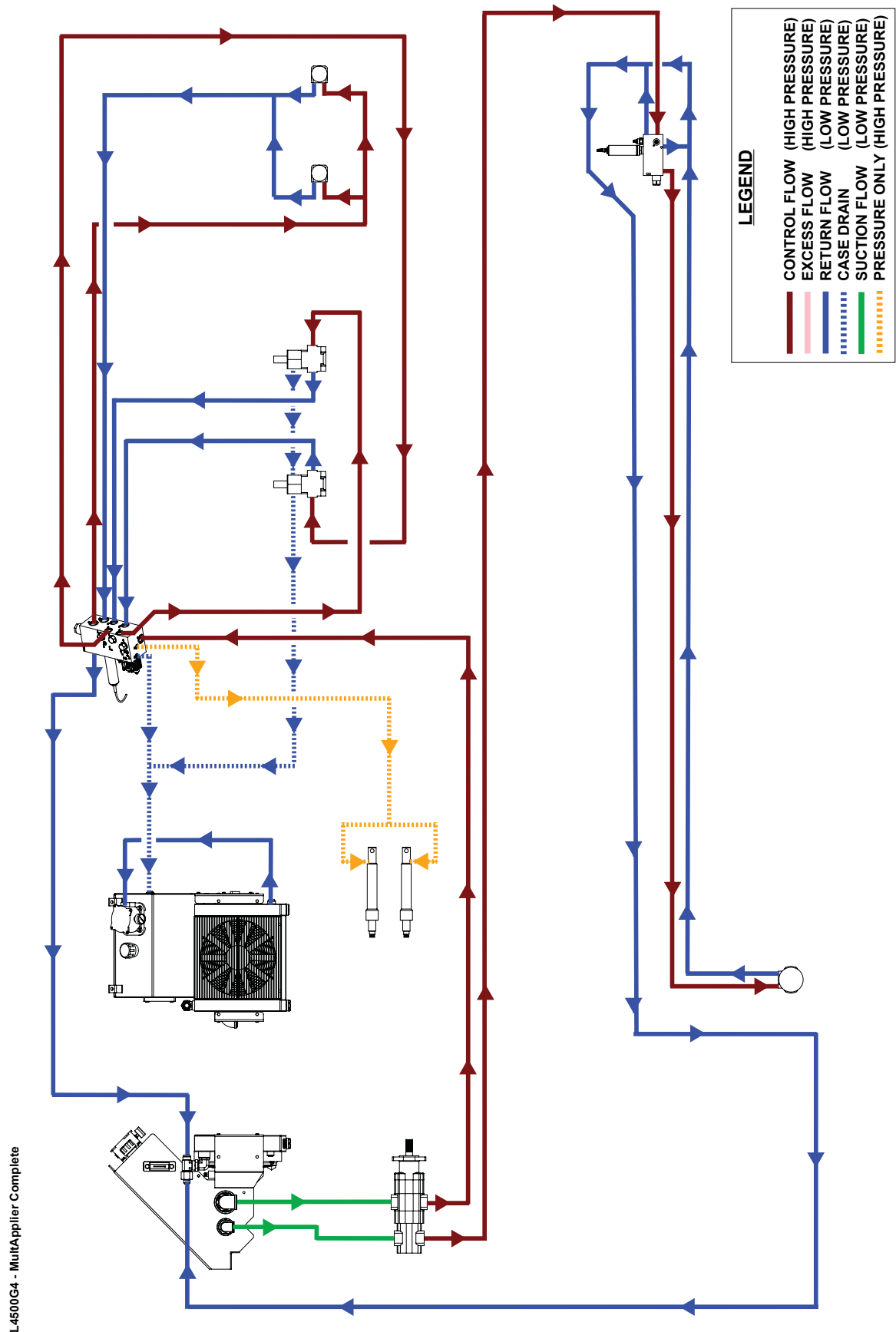


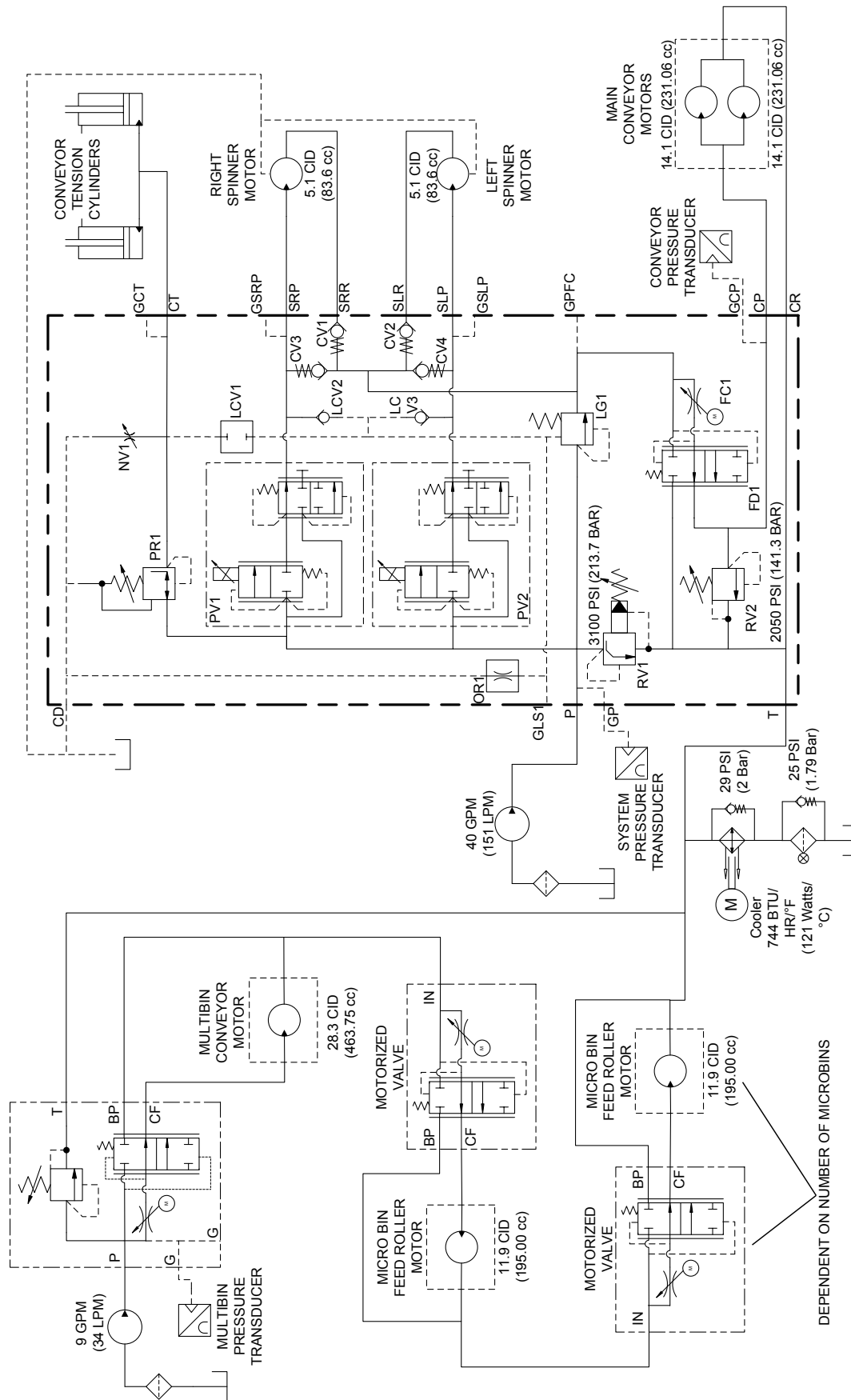
Valve Block - Rear (cut-away)
Standard Hydraulics

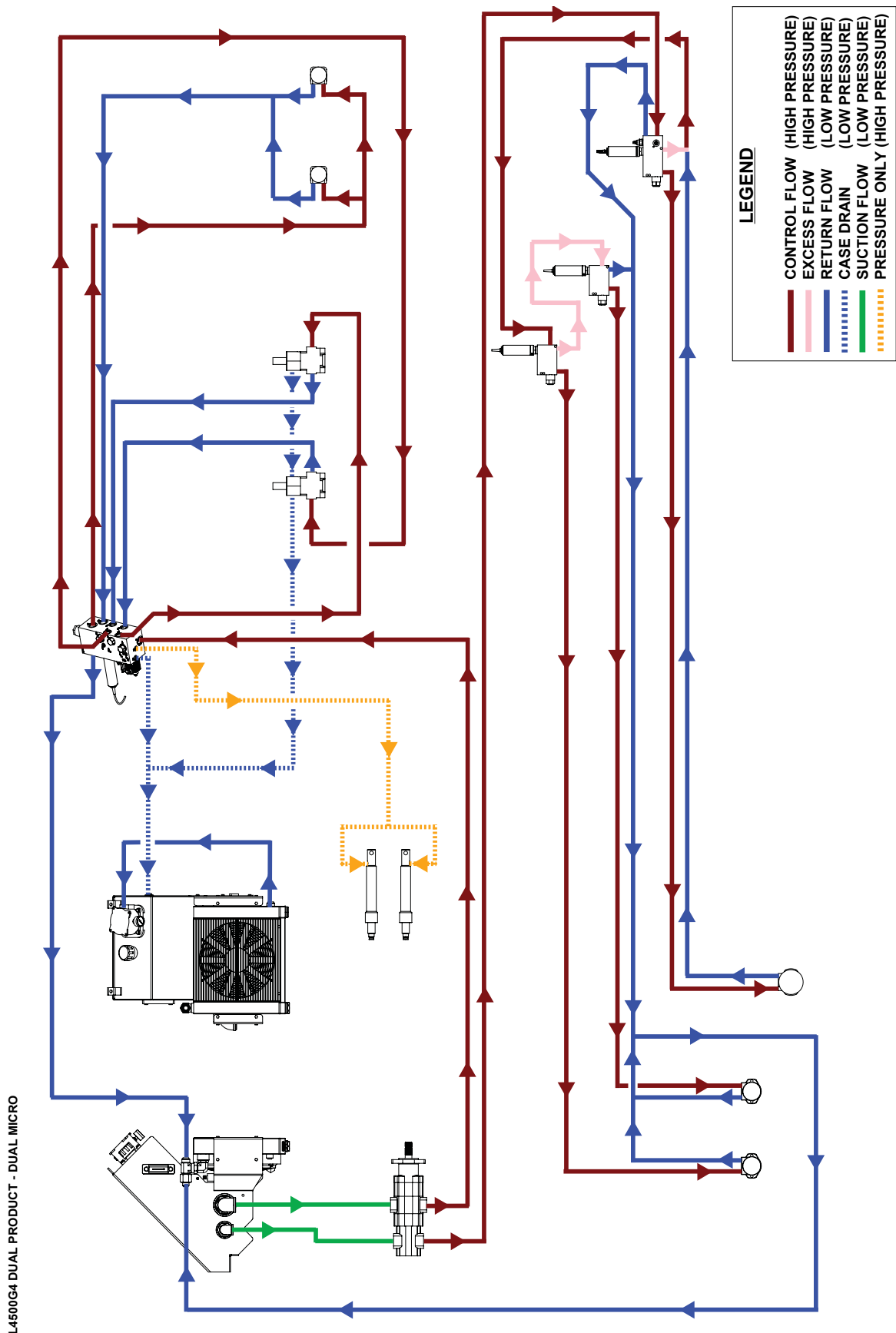


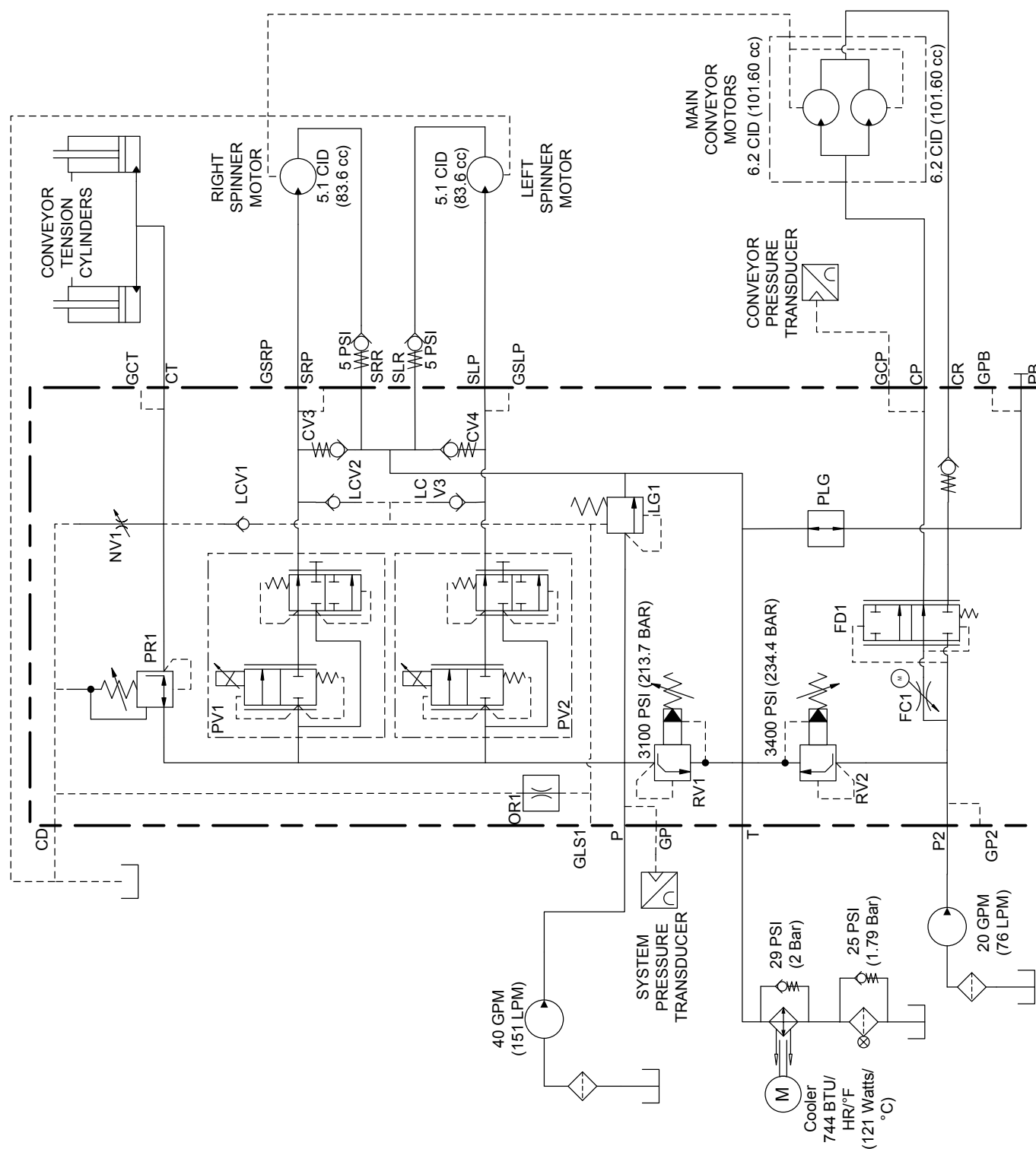




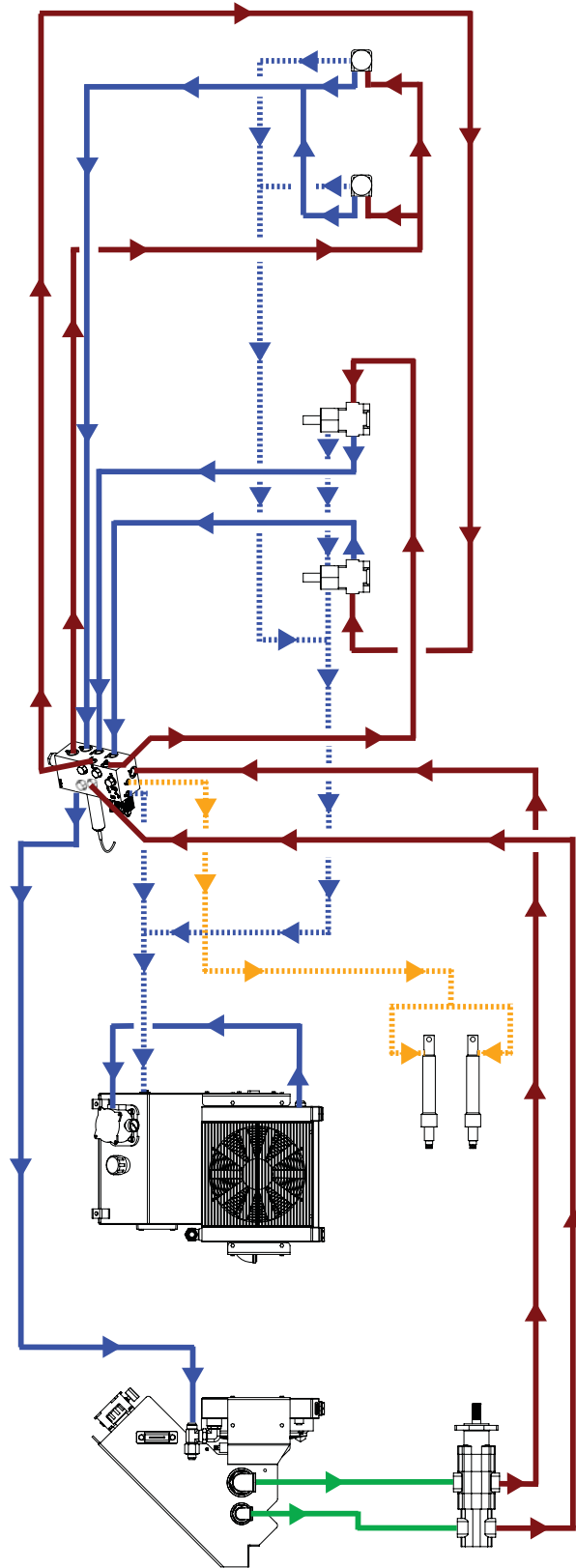






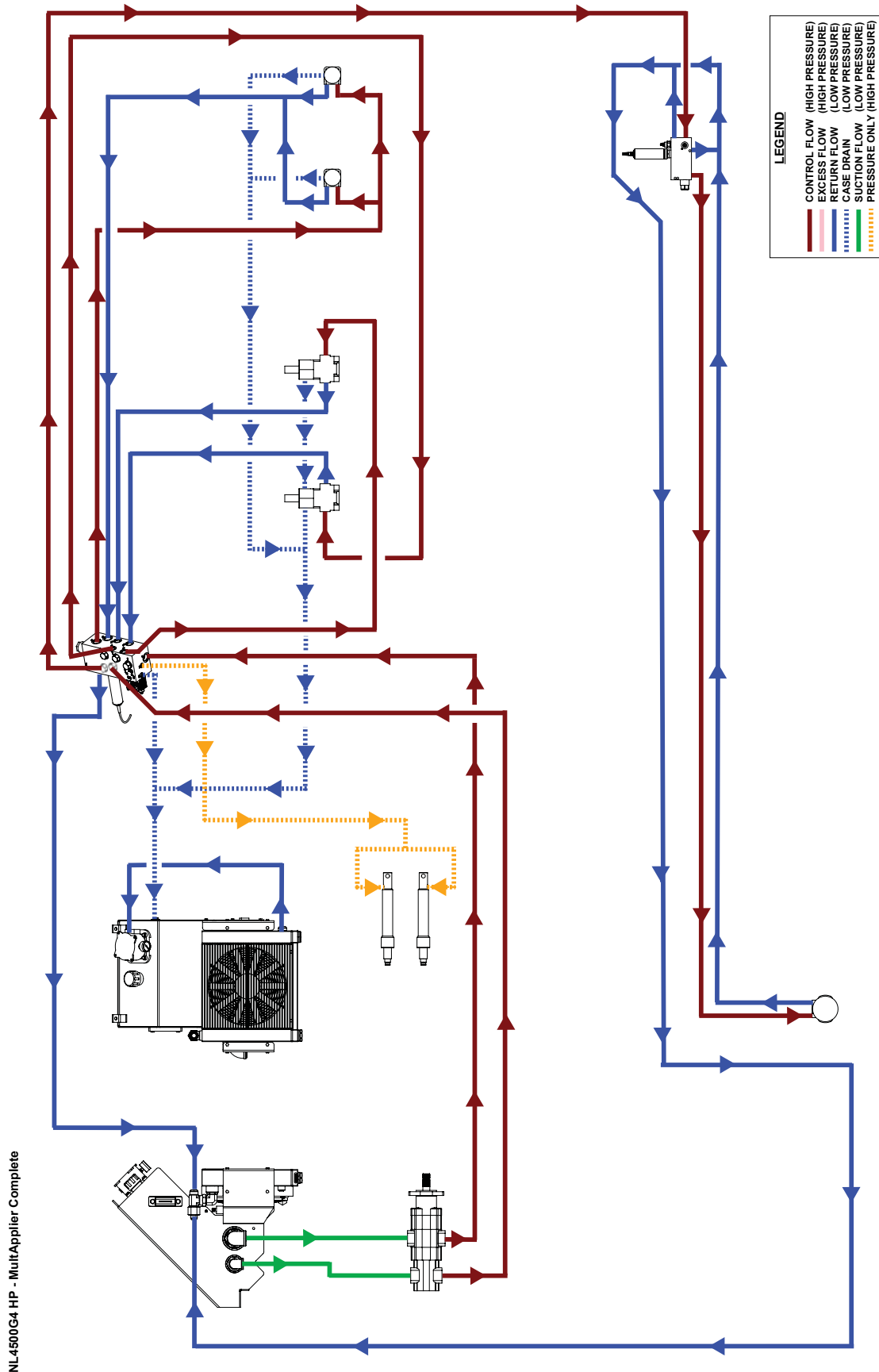


NL4500G4 HP - MultApplier Ready

**LEGEND**

- CONTROL FLOW (HIGH PRESSURE)
- EXCESS FLOW (HIGH PRESSURE)
- RETURN FLOW (LOW PRESSURE)
- ... CASE DRAIN (LOW PRESSURE)
- SUCTION FLOW (LOW PRESSURE)
- ... PRESSURE ONLY (HIGH PRESSURE)





This page is intentionally left blank.

NOTES



INTRODUCTION

ISOBUS is a protocol standardizing communication between chassis, displays, farm management software, and implements. Adhering to ISO 11783 standards, ISOBUS allows chassis and implements of different colors to share information through a common display. The use of ISOBUS technology allows the end user to minimize the number of necessary monitors in the cab of the chassis, while still enabling full functionality of the implements. The data displays the same way on any monitor.

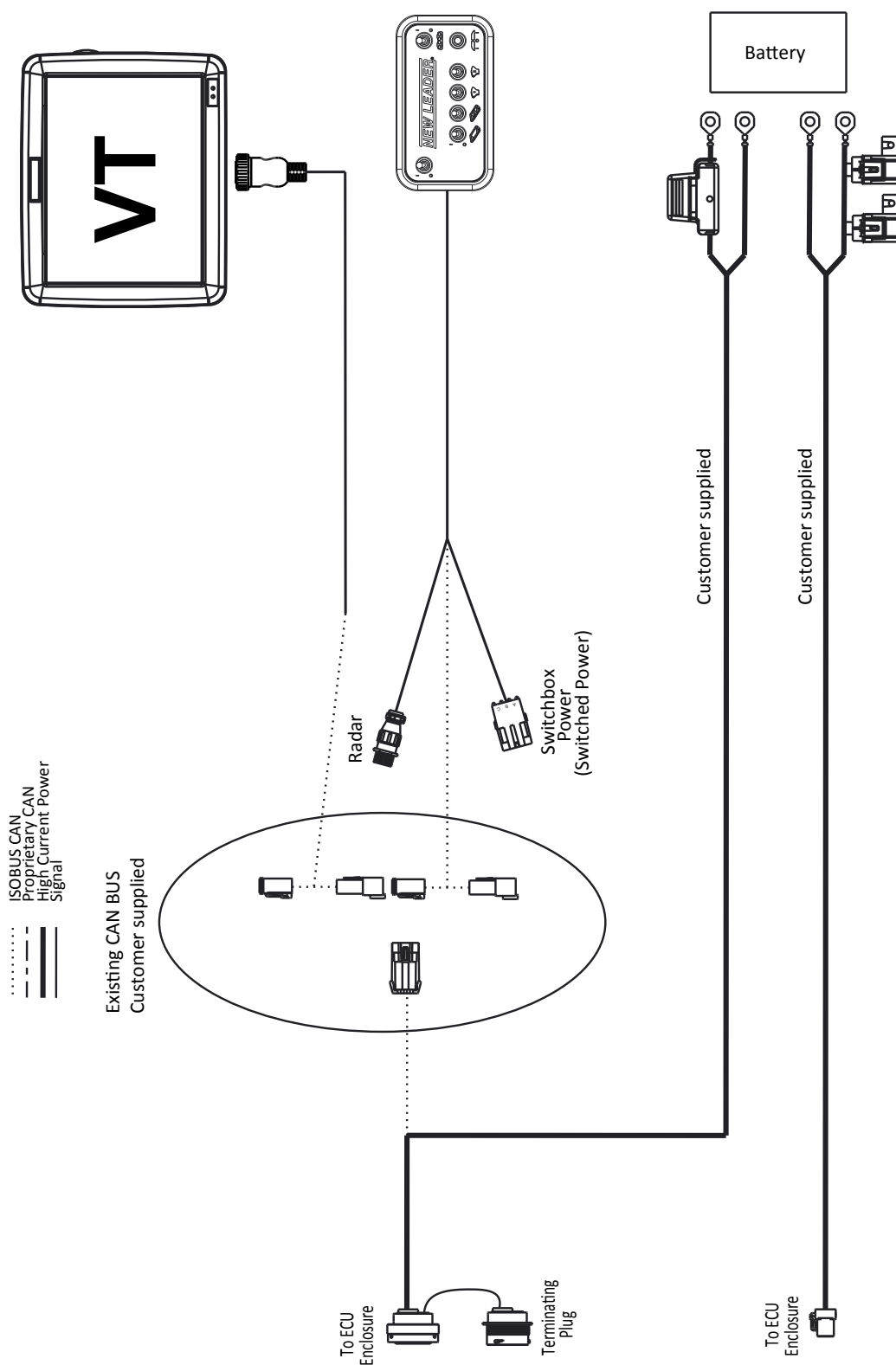
HOW THE ISOBUS WORKS

The BUS is a distinct set of conductors designed to carry data and control signals within a system of parallel connected equipment. Information from the equipment modules is transmitted through the BUS to a Virtual Terminal (VT) in the cab. The Virtual Terminal (VT) uploads a User Interface (UI) which feeds into any Display Monitor. From one Display Monitor, the user can read information and make control changes to the implement(s). Since everything is virtual, multiple implements can be controlled with one monitor by switching back and forth between different VT's.

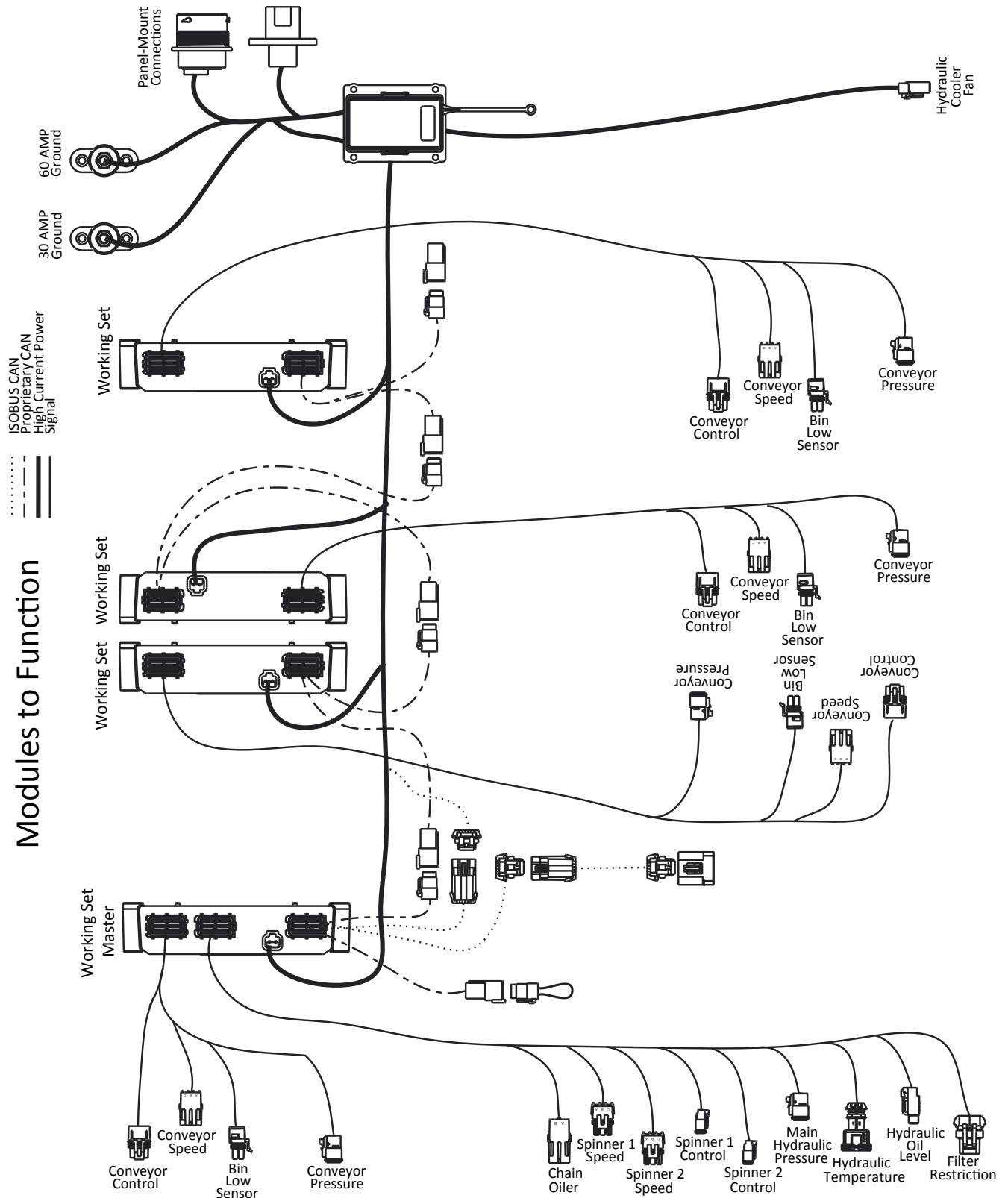
TERMINOLOGIES

- ISOBUS - An electronic communications network used on agricultural and forestry equipment that adheres to the ISO 11783 standards.
- VT (Virtual Terminal) - The electronic interface that resides within the system, rather than on the Display Monitor. By being virtual, the information will display consistently the same on any monitor being used.
- UI (User Interface) - The displayed information and controls the user interacts with on the Display Monitor to make any necessary changes to implement performance.
- ECU (Electronic Control Unit) - New Leader module that controls specific functions of the implement and is attached to the BUS.
- Task Controller - A crucial software component that resides within the Virtual Terminal and is required to provide support for Data Logging, Variable rate application via prescription maps, and on/off implement section control via AutoSwath.
- CANBUS - A CAN (Controller Area Network) BUS system is a vehicle bus standard that allows microcontrollers and devices to communicate with each other within a vehicle without a host computer.
- Display Monitor - The physical monitor used in the cab that communicates with the VT to run the implement(s) and display data from the operations.

Cab to Enclosure



MODULES TO FUNCTION DIAGRAM



REQUIREMENTS**System Requirements:**

- Virtual Terminal version 3 that supports AUX-N functionality
- Task Control (Multi-product up to 4 bins)
 - TC-BAS
 - TC-GEO
 - TC-SC

Function:

- VT will load New Leader UI and support the New Leader switch-box
- Ability to track totals.
- Ability to log as-applied maps and load prescription maps.
- Ability to activate section control or AutoSwath.



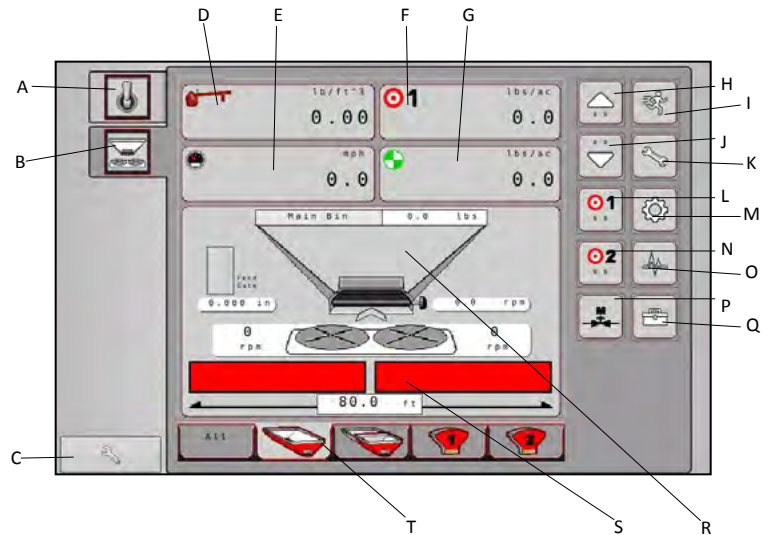
NAVIGATION

To activate the New Leader Controller Interface, power up the monitor and activate the VT settings. For instructions on how to activate the VT, see the Manufacturer's Operations Manual for the specific monitor being used. For reference, John Deere and AgLeader are shown in Figure 1.



Figure 1 - Virtual Terminal activation examples

Activation of VT will bring up the New Leader Home Screen (also called the "Run Screen"), as shown in Figure 2.



A		Axillary Input	K		Settings
B		Spreader Operations	L		Target Rate 1
C		Virtual Terminal Settings	M		Calibration
D		Density	N		Target Rate 2
E		Speed Source	O		Diagnostics
F		Target Rate	P		Manual Conveyor Mode
G		Actual Rate	Q		Tools
H		Increase Rate Value	R		Bin/Gate settings
I		Run Screen	S		Spinner Settings
J		Decrease Rate Value	T		Bin Selection

Figure 2 - New Leader Home Screen

An on-screen Numeric Keypad is made available for changing configuration settings and calibration numbers. Press the keypad button to access the on-screen numeric entry screen. Keypads may look different depending on VT being used.



Figure 3 - Numeric Keypad

NAVIGATION CONTROL BUTTONS


	Back Button
	Forward Button
	Return to Previous Screen
	Accept Entry
	Cancel

REGISTRATION**NOTE:**

Before regular use, Controller must be registered by Dealer. Controller may be used for a maximum of ten (10) conveyor-run hours before registering. Once "Remaining Hours" reaches 0, the system can no longer be accessed and must be registered for use. Contact local dealer to register.

1. Power up Display Monitor and activate VT by pressing appropriate button:



2. Alert screen appears identifying that system is in Demonstration Mode. Press  to continue operating in Demonstration Mode.

**MACHINE CONFIGURATION****NOTE:**

Refer to default settings table at end of controller section for factory setup defaults.


NOTE:

Before use, Display Monitor must be setup to enable VT connection and a machine configuration may need to be built. See Manufacturer's Operations Manual for detailed instructions on these processes.

1. Perform initial configuration/Factory Setup:
(Only seen on first boot, or if system is reset/reconfigured)


- Power up Display Monitor and activate VT by pressing appropriate button:



- Alert screen appears identifying that system is not configured. Press  to continue.





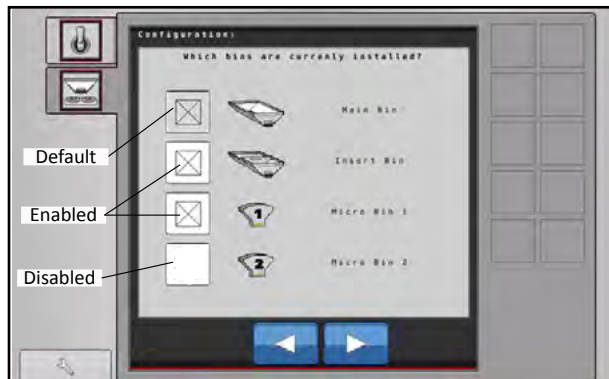
Overview of attached modules:

- Number of spreader modules will be shown along with any add on modules. Press  to continue.





- Enable installed bins (Select which bins are installed)

- Enable all bins that are installed on the unit by pressing the button next to each. A  will appear next to enabled bins as shown. Press  to continue.




- Enter Bin Settings:


Bin settings include Name, Capacity, Bin Sensor, Feedgate enabled/disabled, and Pressure Transducer calibration.

- Enter Capacity for Main Bin using keypad. Enable or disable bin level sensor as required. Press  to edit pressure transducer settings. If standard transducers are being used, press  to continue.




- Enable transducers and set calibration settings as necessary (adjust only if standard HECO provided transducers are not being used). Press  to continue.




- Repeat step 3 for MultiApplier or MultiBin Bin 2 as necessary. Press  to continue.




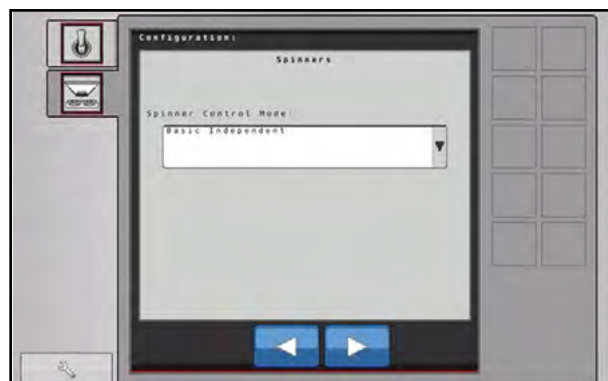
- Repeat step 3 for MultiBin Micro 1 as necessary. Press  to continue.




- Repeat step 3 for MultiBin Micro 2 as necessary. Press  to continue.

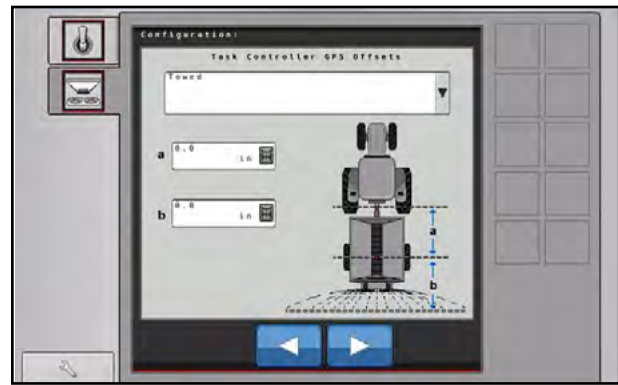


- Select Spinner Control Mode:
Determines how spinners are controlled: Basic single, Basic independent, or Monitor.
- Select Basic Independent for L4500 (two PWM)
Press  to continue.

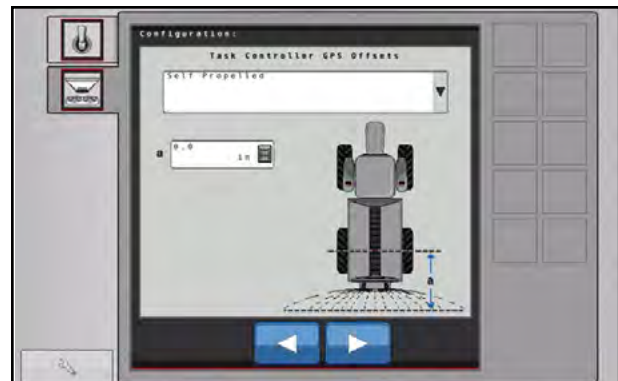


5. Input Task Controller GPS Offsets:
Editing these settings will determine drop point of material behind chassis.

- Select Towed or Self Propelled and enter GPS Offset using keypad. Press  to continue.





Towed



Self Propelled

6. Review System Setup Summary:


- Verify all settings are correct. Press  to continue or  to go back and adjust as necessary.



7. Configure Auxiliary Switches:

- Switches must be configured before calibration.
- Switchbox switches need to be mapped. Use the Display Monitor's operations manual to map all switches as necessary.

SETTINGS

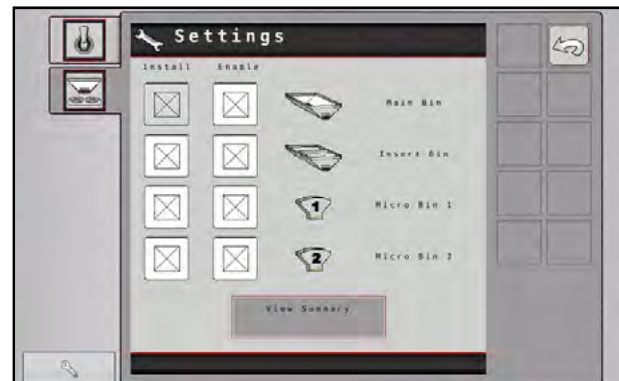
Changing machine calibrations allows operator to enable/disable bins, adjust valve calibration numbers, change alarm settings and reset modules. Press  to change these settings:

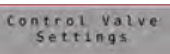
Press  to to enable/disable bins.

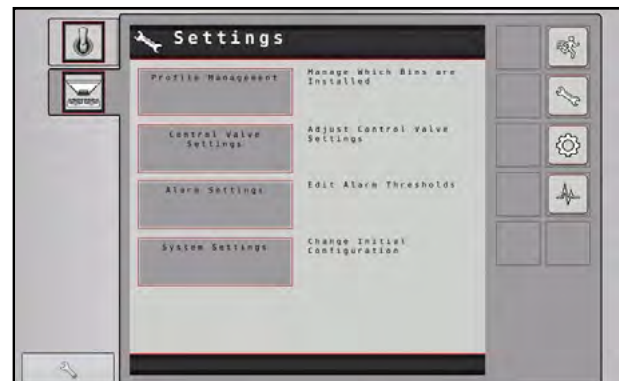


1. Enable/Disable bins:

- Each Installed Bin (as set up in Step 4) will appear. Press each "Enable" button to enable or disable each bin as appropriate for the current job.



2. Press  to adjust valve calibration numbers.



NOTE:

Default settings from the factory should **ONLY** be changed if absolutely necessary. Changing defaults without researching the specific component may result in erratic behavior of unit.

This page is intentionally left blank.

NOTES



- Set Conveyors by selecting each bin at bottom of screen.

NOTE:

If using PWM valves instead of Servo valved, select "PWM" from "Control Valve Type" list and enter settings as per notes on Spinner valves and test for accuracy.

Enter appropriate settings:

- Valve Response 1 - Determines speed of servo valve when product control error exceeds Response Threshold setting. Represents fast speed of servo valve. Decreasing value will cause servo valve to run slower. Default setting is 40%.
- Valve Response 2 - Determines speed of servo valve when product control error is less than Response Threshold setting. Represents slow speed of servo valve. Decreasing value causes servo valve to run slower. Default setting is 8%.
- Response Threshold - Determines where control channel switches between using Valve Response 1 and Valve Response 2 speed setting. Leaving all other valve control settings at default value and making small adjustments to this setting is usually all that is required to fine-tune system performance. Default setting is 4.

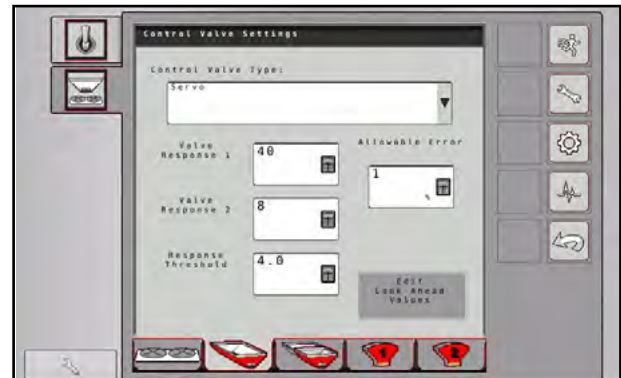
NOTE:

- Decreasing Response Threshold value will have overall effect of speeding up servo valve response.
- Increasing Response Threshold value will have overall effect of slowing servo valve response.

- Allowable Error - Determines the percent of error that is allowed prior to product control system making any flow rate changes. 2% - 3% is normal dead band setting range.

NOTE:

- Setting value too low can cause product control system to continually hunt for target application rate.
- Setting too high will cause excessive product application error and a delay in target rate being reached.



3. Adjust Alarm Settings:

- Press **Alarm Settings** to adjust alarm settings.

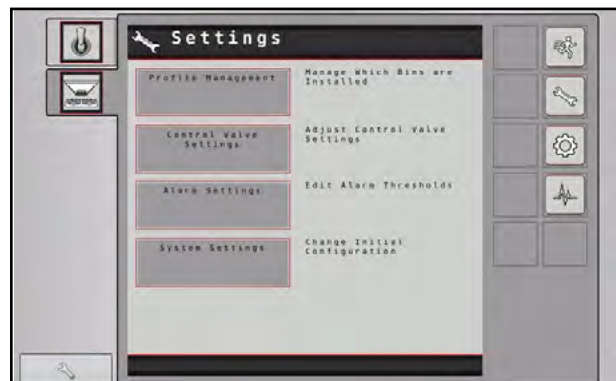


- Edit each Alarm setting as desired.

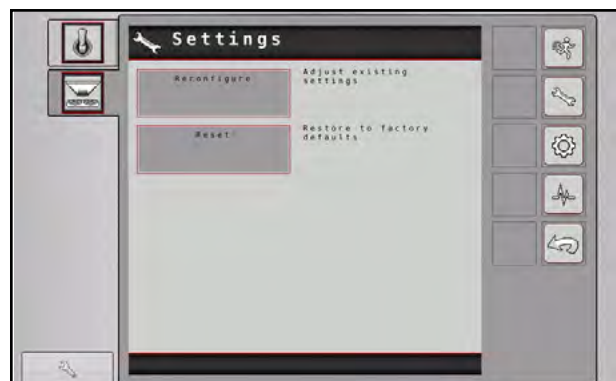


4. Reconfigure System:

- Press **System Settings** to reset/reconfigure system.



- "Reconfigure" allows the user to adjust any of the system settings made during first time start up ("Initial Configuration" steps 1-6). "Reset" will restore all settings to factory default and all calibration numbers will be lost. These should only be pressed if instructed to do so by service technician or New Leader product support.




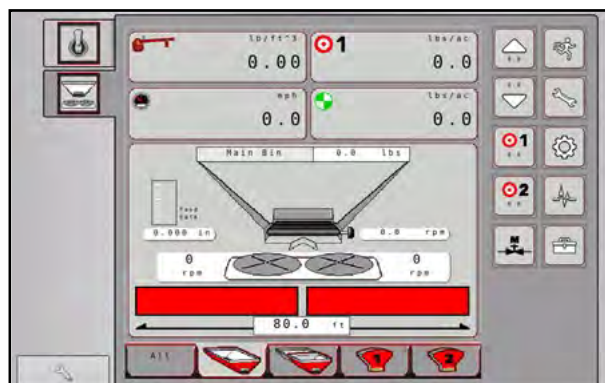
COMPONENT CALIBRATION

NOTE: Before regular use, system must be calibrated to ensure accurate spreading.

1. Power up Display Monitor and activate VT by pressing appropriate button:

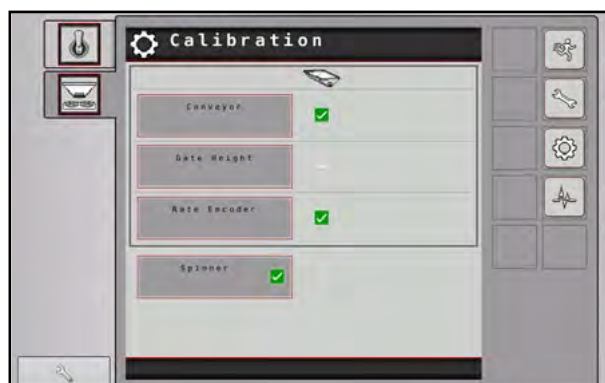




- The Run screen will appear. Press calibration button  to continue.



2. Calibrate Spinner:

- Press  to calibrate spinner.

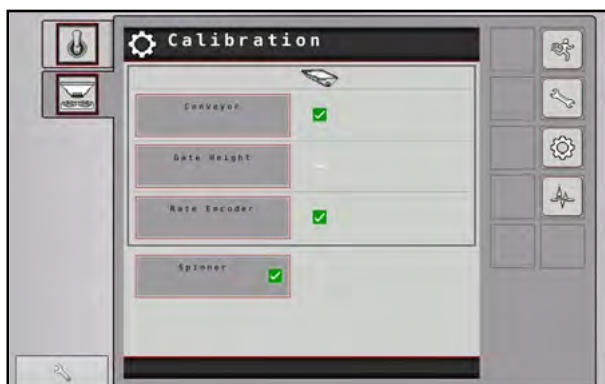



- Use keypad to edit numeric setting as necessary:
 - Standard spinner discs, set to 4.
 - If using 5 fin discs, set to 5.
 - If using 6 fin discs, set to 6.
 Press  to accept change and continue, or  to cancel.



3. Calibrate Rate Encoder

- Press **Rate Encoder** to calibrate encoder.

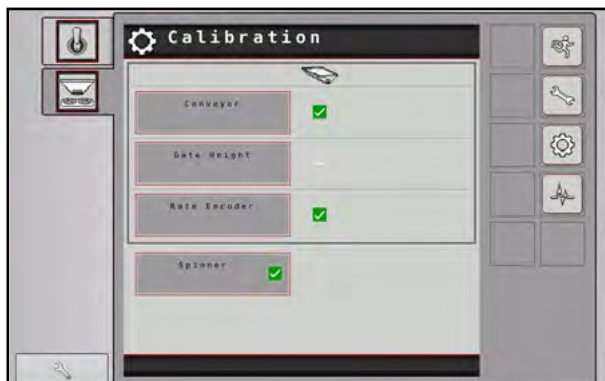


- Use keypad to edit setting as necessary. Enter 180 or 360 as labeled on back of encoder. Press  to continue.



4. Calibrate Conveyor

- Press **Conveyor** to calibrate conveyor.




- Manually cubic feet per revolution (CFR) rate using keypad.
- To begin catch test, press **Static Routine**.
- To perform in-field calibration, press

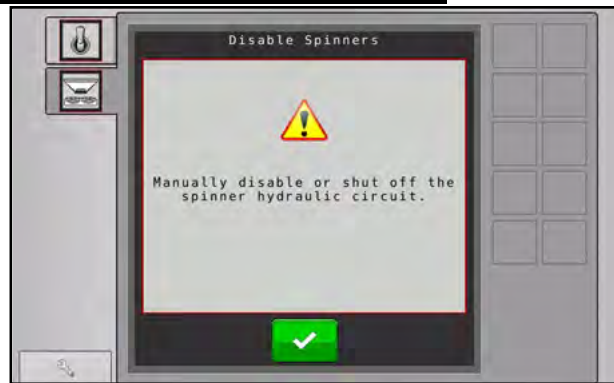
Field Routine




**WARNING**

Do not work near rotating spinners. Severe injury can result from contact with moving parts.







- Spinners will automatically shut off. For added safety, disconnect PWM valves. Press  to continue.




- Verify Feed Gate Height and Product Density are correct. Use keypad to edit as needed. Enter Dispense Amount using keypad. Press  to continue.

**IMPORTANT!**

For best results, a catch test must be done for each product to be spread before season begins, or any time a new supply of product is received. Refer to *SGN & Hardness Test Instructions* and *G4 Spread Pattern* manuals for instructions and more information.

- Using the control buttons   , run a catch test. If spreading product that has already been tested, press  to continue. To begin a test, press . Conveyor will run. Once controller dispenses specific amount, conveyor will stop. Weigh actual material dispensed and enter actual weight. Press  to continue.



- It is recommended a minimum of three (3) tests be done PER PRODUCT to ensure accuracy. Once each test is done, press "Repeat Calibration" to run a subsequent test. When finished, press .



- The main Calibration screen will appear. To calibrate with a known amount brought to a field, press **Field Routine**.

Note: Field totals can be reset from Summary Screen if needed.



- After dispensing product in field, screen displays system perceived total of dispensed product. To enter actual dispensed amount, press **▶**.



- Using keypad, enter actual weight of product dispensed. Press **▶** to continue.



- New cubic feet per revolution (CFR) rate will be displayed. Press **↶** when finished.



OPERATIONS/FEATURES**CREATE NEW JOB**

These steps are a guide in running system for first time.

1. Create Job in display.

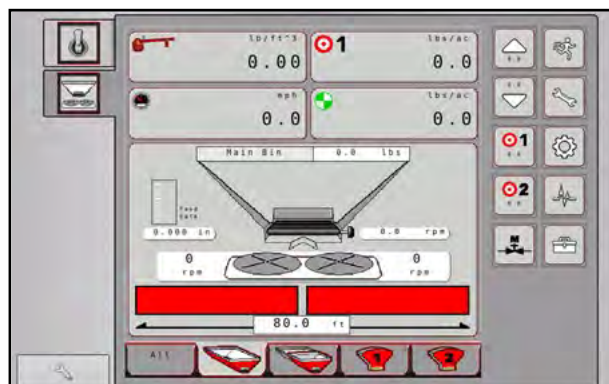
This operation will vary from display to display. Refer to display manual on how to create a job using Task Control. When finished, activate VT by pressing appropriate button:





2. Verify Product Density.

Material Density will vary from product to product. It is imperative that correct density is entered in controller for rates to come out correctly.

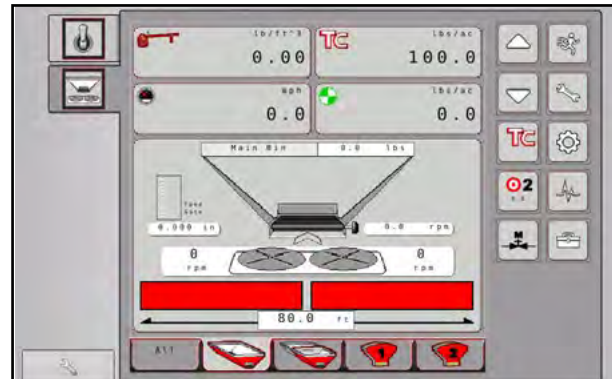
- To change product density, press Density button




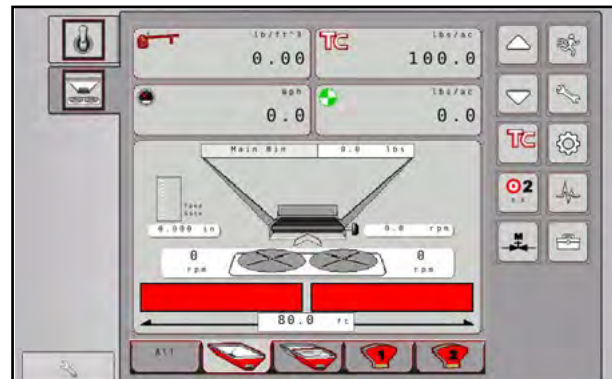
- Use keypad to enter density. Press  to accept change and continue, or  to cancel.



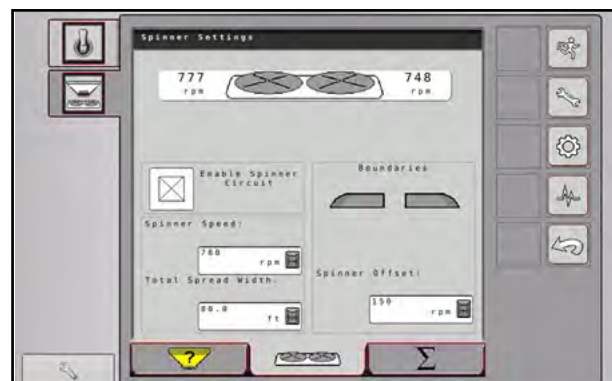
- Verify task control in Target Rate 1.
- Rate will be driven by job setup in display. To verify this, TC should show in place of target rate 1. If not, verify job has been created correctly. Refer to display manual.



- Verify total spread width and spinner speed:
- Different products may require different spread widths or spinner speeds. Always verify these settings are correct before applying product.
 - Press  to set spinner speed.

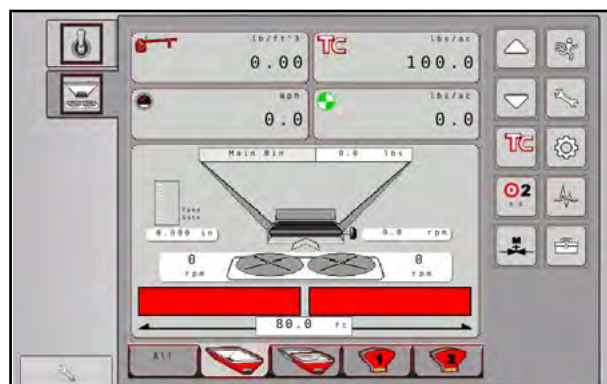


- Enable Spinner Circuit. Using keypads, enter Spinner Speed and Total Spread Width. If desired, enter Spinner Offset (see *Boundary Spreading* section of this manual for instructions).

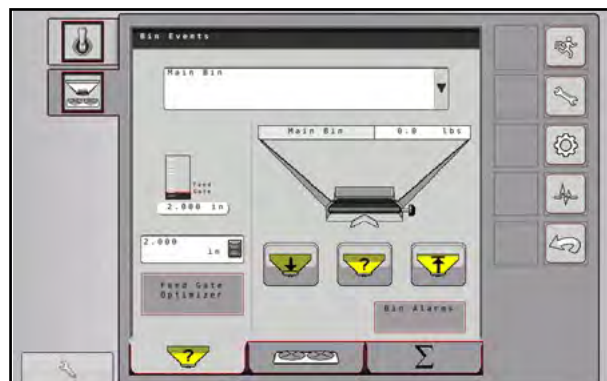


5. Verify gate opening:

- Press  to set bin levels and change gate opening.


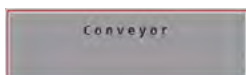


- Use keypad to set feedgate opening to correct reading.



6. Verify CFR number is correct:

Different products may require different calibration numbers. Verify the CFR number is correct before applying product.

- Press  then .
- Use keypad to change CFR number as needed.




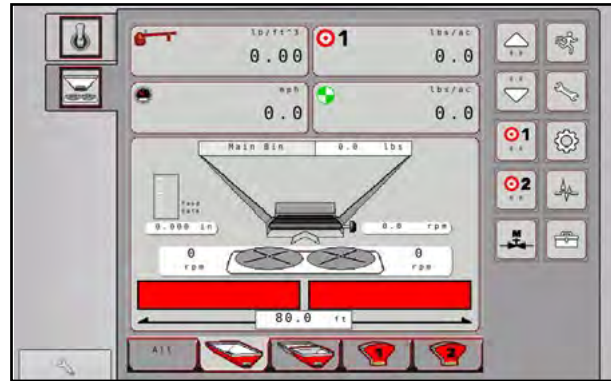
BIN FILL**NOTE:**

The interface will provide the operator with a visual representation of how much product is left in each bin, and will adjust accordingly as well as change color. If needed, it can be manually overridden.


1. Power up Display Monitor and activate VT by pressing appropriate button:

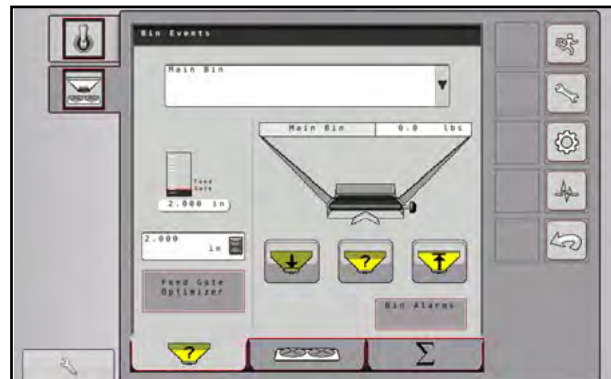



- The Run screen will appear. Select appropriate bin button at bottom of screen. Press  to continue.

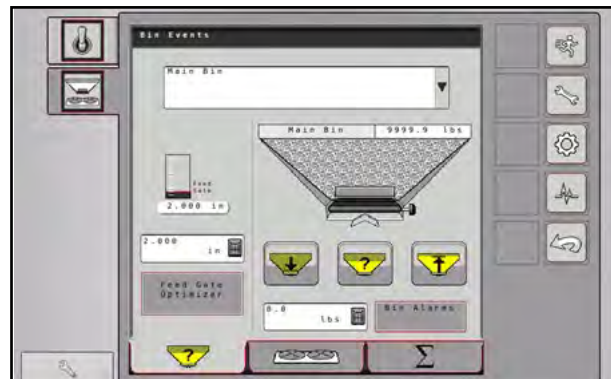



2. Set Bin Level as appropriate:

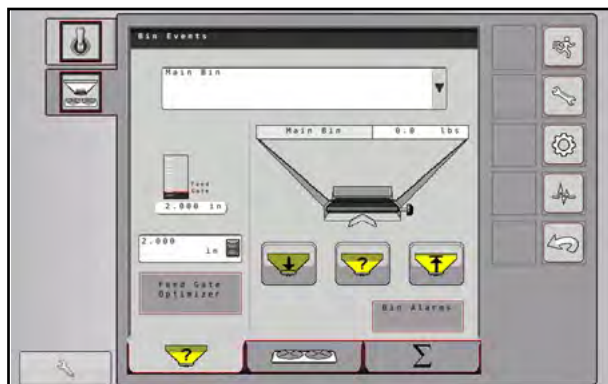
- The Bin Events screen will appear. If bin is filled to full capacity based on density, press .



- If bin is partially filled based on a known amount, press  and use keypad to enter weight.

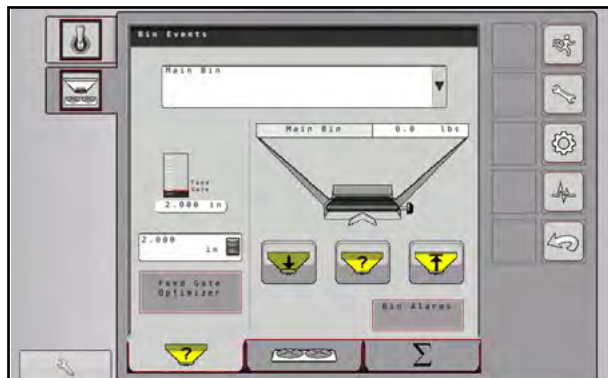




- If bin is emptied completely, press .



3. Set alarms:

- Press  to continue.



- Use keypad to set alarms.
 - “Low Bin Alarm Threshold” will set a weight limit based on total weight in bin and application rate.
 - “Low Bin Alarm Time Delay” will set a time (in seconds) for alarm to sound after the Bin Level Sensor is activated due to actual product reduction.
 - Press  to accept change and continue, or  to cancel.



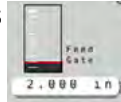
FEEDGATE OPTIMIZER**NOTE:**

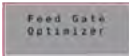
This program will help to determine the ideal gate position for each specific application, based on speed, swath width, density, and application rate.

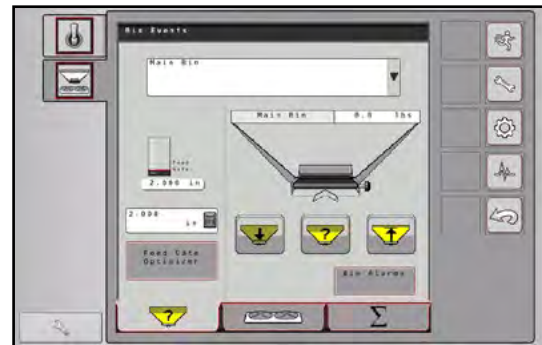
1. Power up Display Monitor and activate VT by pressing appropriate button:



- The Run screen will appear. Select appropriate bin button at bottom of screen. Press to continue.





- The Bin Events screen will appear. Press  to continue.



2. Enter average speed and target rate:
 - The Feedgate Optimizer screen will appear. Using keypads, enter Average Speed and Target Rate into appropriate fields for each bin.



3. Accept recommended settings:
 - Recommended feedgate opening will be displayed along with minimum and maximum rates. If  is selected, new feedgate setting will be saved and operator must manually adjust feedgate to proper height. If  is selected, new settings are ignored and system settings are kept.



BOUNDARY SPREADING**NOTE:**

This program allows the operator to independently modify spinner speeds to change the width of spread to either side, creating a "boundary" line to maximize spreading efficiency.

1. Power up Display Monitor and activate VT by pressing appropriate button:

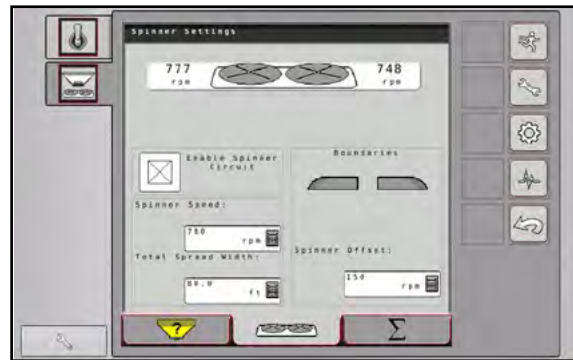


- The Run screen will appear. Press to continue.



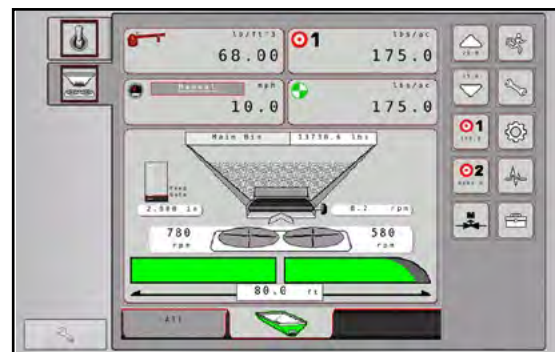
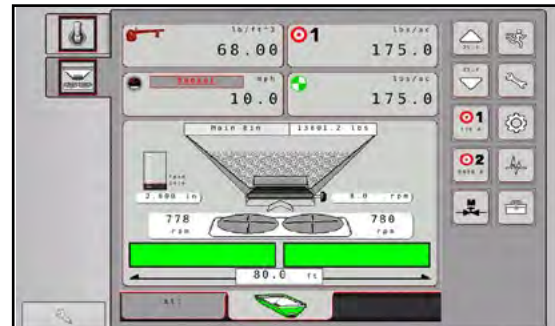
2. Enter spinner offset:

- The Spinner Settings screen will appear. To create a Boundary, use the keypad to enter a specific Spinner Offset. Spinner tests should be completed for each product (see *G4 Spread Pattern* section) to determine best offset settings for each product that might be run based on density/hardness and size. For density/hardness testing, see *SGN & Hardness Test Instructions Manual*. Press to save and return.



3. Enable boundary spreading:

- When running normally, Run Screen will display both spinners as full green bars. To activate the Boundary, flip the spinner switch on the switch box to the appropriate side.
- When Boundary is activated, Run Screen will display with boundary showing on the appropriate side (right hand boundary activation shown for reference).



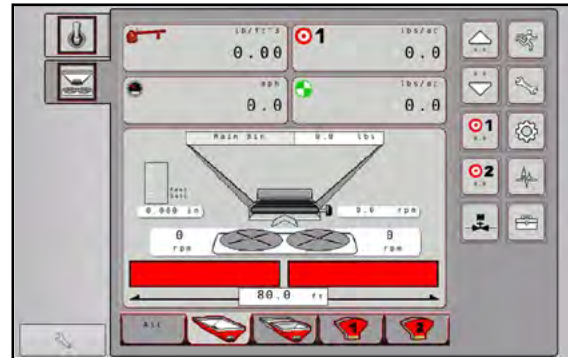
DIAGNOSTICS

NOTE: Advanced diagnostic features are available that allow the operator to quickly diagnose most issues that could occur.

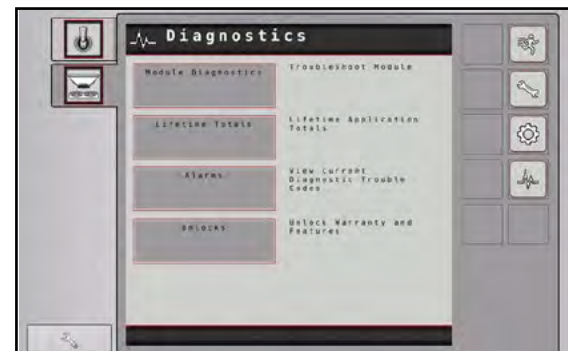
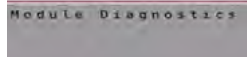
1. Power up Display Monitor and activate VT by pressing appropriate button:




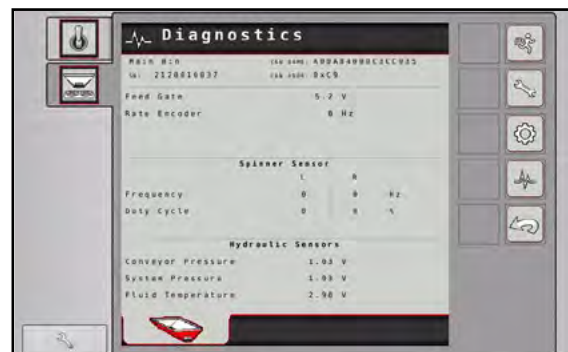
- The Run screen will appear. Press Diagnostics to continue.



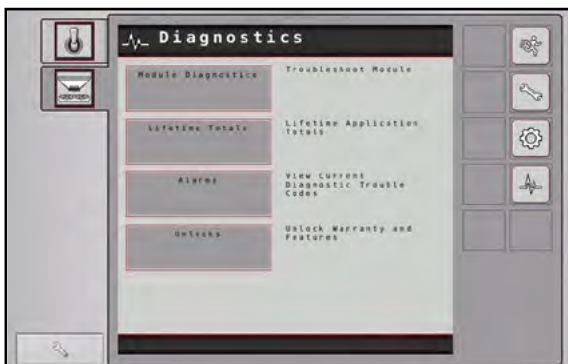
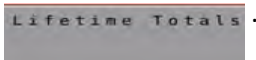
- The Diagnostics screen will appear. To view Bin Diagnostics, press




- Diagnostic information for each bin will display (these are used for troubleshooting). Press  to return to Diagnostics screen.



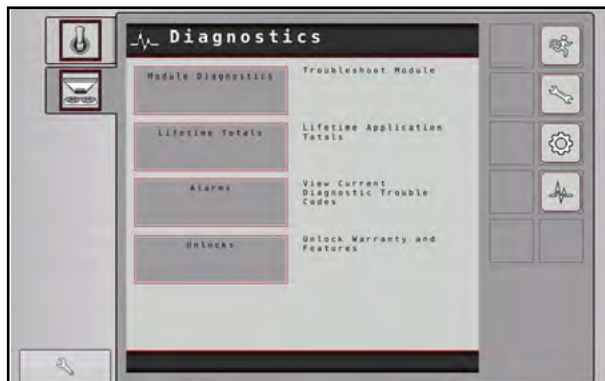
- To view machine lifetimes totals, press




- At top of screen, each bin's lifetime totals for acres and weight appears. At bottom of screen, cumulative Acres(ac) and Weight(lbs) will appear. Hours(hrs) will be on main bin only. Press  to return to Diagnostics screen.



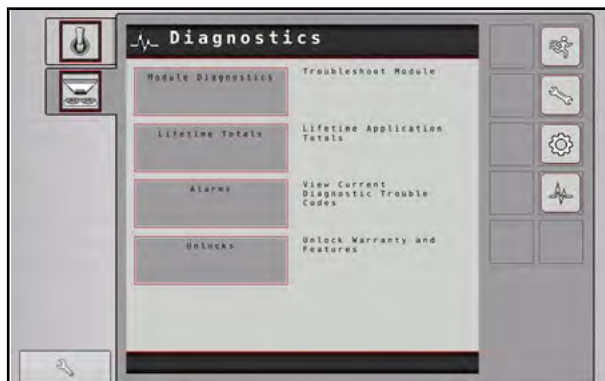
- To view active alarms, press




- Current active alarms will display. When an alarm code is highlighted, a description will appear at bottom of screen. This is used for troubleshooting. Press  to return to Diagnostics screen.



- To view unlocked features, press



- Current unlocked features will display. Press “Unlock” to display module serial number and registration number. Press  to return.



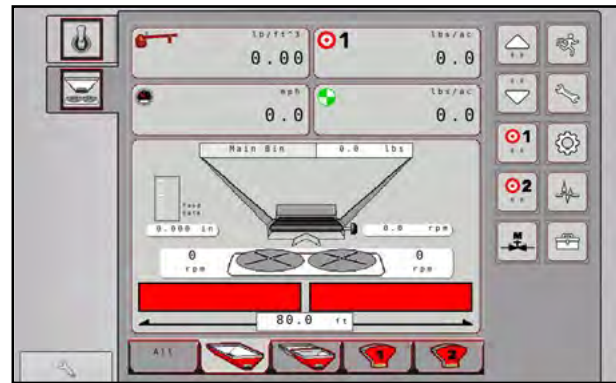
HYDRAULICS**NOTE:**

This program will show a visual representation of hydraulic monitoring, including system pressure, temperature, conveyor pressure, and indicators for low fluid level and filter restriction. Individual bins can be viewed by pressing the bin icons along the bottom of the screen.

1. Power up Display Monitor and activate VT by pressing appropriate button:



- The Run screen will appear. Press Tools to continue.



- The Tools main screen will appear. Press Hydraulics to continue.



2. View hydraulic monitoring:
 - Hydraulics - System pressure, Temperature, and status of Fluid Level and Filter Restrictions will show system wide. Conveyor Pressure will display for Bin 1, and cumulatively for Bins 2-4. Fluid Level and Filter Restriction warnings will display red with warning sign (as shown) if levels are low or if filter is restricted. If neither is at issue, they will display in green without warning sign.

Press to return to Tools Screen.



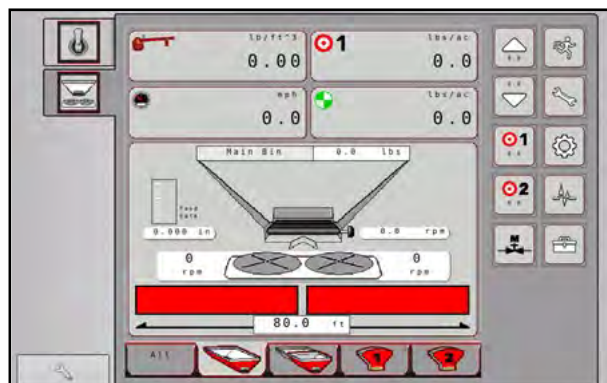
BIN FLUSH**NOTE:**

This program is used to quickly empty each bin. Spinners will automatically shut off and allow the operator to select which bins to empty.

1. Power up Display Monitor and activate VT by pressing appropriate button:



- The Run screen will appear. Press Tools to continue.




- The Tools main screen will appear. Press Bin Flush to continue.

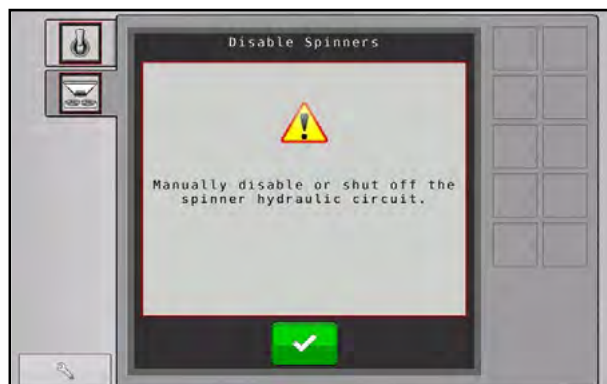
**WARNING**

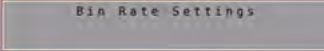
Do not work near rotating spinners. Severe injury can result from contact with moving parts.

**WARNING**

Unplug PWM valve to ensure spinners cannot run while in Bin Flush mode to avoid injury.

- Bin Flush will automatically disable spinners. Press  to continue.





2. Select bins:
 - Select bins to be flushed by pressing enable buttons next to each. To adjust conveyor RPM for flush, press 




3. Set conveyor RPM:
 - Use keypads to set conveyor RPM for each bin. 20 RPM is default.
 - Bin 1 Maximum = 50 RPM
 - Bin 2 Maximum = 60 RPM
 - Bins 3 & 4 Maximum = 85 RPM

Press  to continue.




4. Perform bin flush: . Conveyors will run until  is pressed.

When process completes, press  to continue.

**WARNING**

Do not work near rotating spinners. Severe injury can result from contact with moving parts.

- When exiting Bin Flush process, spinners will restart. Plug PWM valve back in if it was previously disabled. Press  to continue.



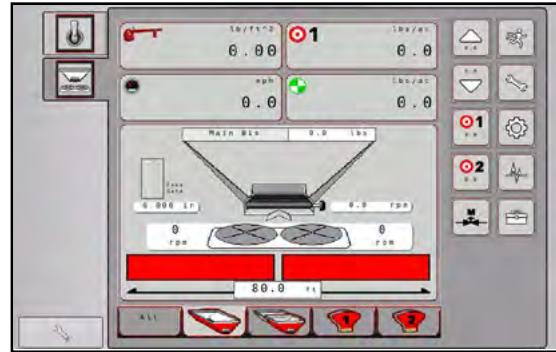
CHAIN OILER

NOTE: This program is used to manually oil the chain, set alarm frequency, and set auto-lube settings.

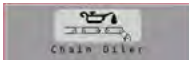
1. Power up Display Monitor and activate VT by pressing appropriate button:



- The Run screen will appear. Press Tools to continue.



- The Tools main screen will appear. Press Chain Oiler to continue.



2. Set duration:
 - Use keypads to set oil chain duration (recommended 1 revolution). Lube routine is not used at this time.




3. Set conveyor dimensions:
 - Press "Dimensions" to input conveyor dimensions. Use keypads to input conveyor length and sprocket diameter.


Press to return to Chain Oiler screen.

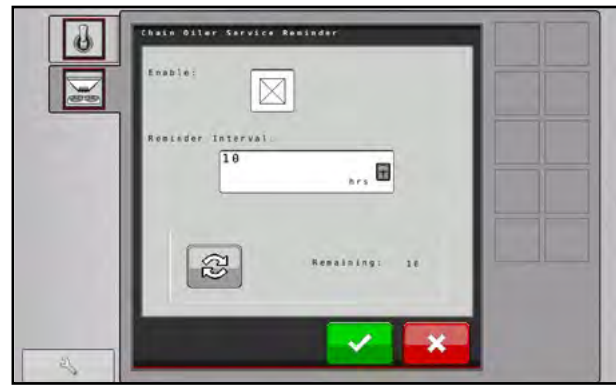
Press to return to Tools Screen.



4. Set service reminder:

- Press “Service Reminder” to set chain oiler reminder. Enable Reminder and use keypad to enter interval hours desired. To restart reminder after manually oiling conveyor, press .

Press  to return to Chain Oiler Screen.



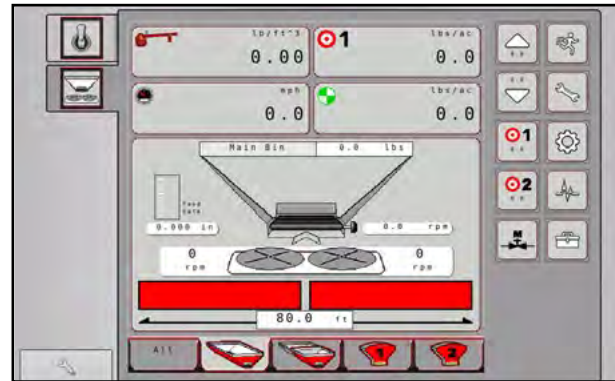
BIN SEQUENCING

NOTE: This program allows the operator to run same product out of two bins, chaining them together so bin 2 starts emptying immediately after bin 1 is empty.

1. Power up Display Monitor and activate VT by pressing appropriate button:



- The Run screen will appear. Press Tools to continue.



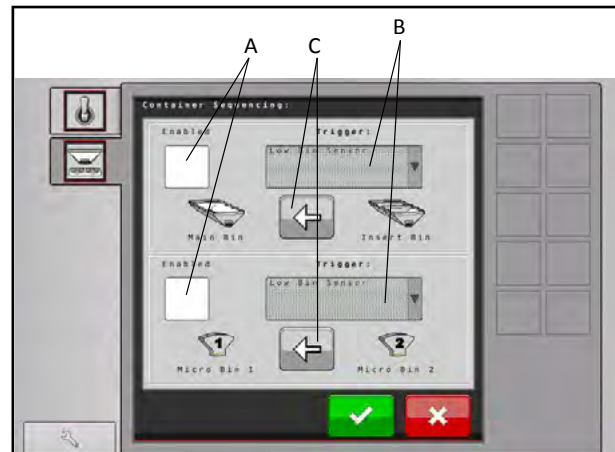
- The Tools main screen will appear. Press Sequencing to continue.



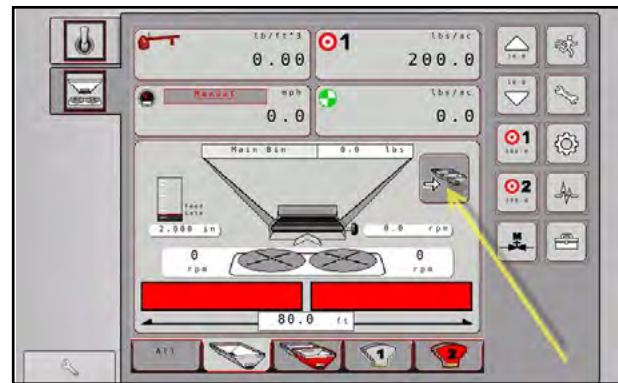
2. Setup Bin Sequencing (Chaining):

- Enable bin chaining for Bins 1 & 2, or Bins 3 & 4.
- Select trigger type (Manual Only, Low Bin Threshold, Low Bin Sensor, Container Reaches 0).
- Select which bin to empty first by pressing arrow button until arrow points to second bin to empty. Figure at right shows Insert Bin emptying first and Main Bin second; Micro Bin 2 emptying first and Micro Bin 1 second.

Press  to continue.



3. To manually switch bins:
 - When Bin Sequencing is enabled, Manual Override button appears on Run Screen to force switchover to next bin.



ALARM LIST

Warning	Message	Trigger
Rate sensor error during calibration	"Calibration error, lost or intermittent signal from rate sensor. Check sensor and related wiring prior to calibrating conveyor."	Rate sensor signal is lost for a period of two or more consecutive seconds during the Static Conveyor Calibration Routine.
Rate Sensor Error During Conveyor Flush	"Lost or intermittent signal from rate sensor. Check sensor and related wiring prior to continuing Conveyor Flush Routine."	Rate sensor signal is lost for a period of two or more consecutive seconds during the Conveyor Flush Routine.
Low Bin Sensor	"Low Bin Sensor." + channel name.	Bin Level Sensor is installed, metering circuit is commanded on, and the product in the bin does not cover the sensor for a consecutive period of time greater than current [Low Bin Time Delay] setting.
Disable Spinners	"Manually disable or shut off the spinner hydraulic circuit."	At the beginning of the Static Conveyor Calibration and Conveyor flush routine.
Enable Spinners	"Return the spinner hydraulic control to a field ready condition. The spinners will now restart."	At the end of the Static Conveyor Calibration routine and Conveyor flush routine.
Boundary Spinner Not Responding	"Boundary Spinner Not Responding." + Spinner Name.	Automatic control for spinners must be enabled. At least one conveyor must be commanded on. Perceived spinner speed is greater than 30RPM in error from the [Boundary Spreading Spinner RPM Offset].
CLF Basic Single Spinners Not Responding	"Spinners Not Responding."	Automatic control for spinners must be enabled. [CLF Mode] {Basic Single} must be selected. At least one product bin must be commanded on. Perceived spinner speed is greater than 30RPM in error from the [Target Spinner Speed] setting for a period of 5 or more consecutive seconds.
CLF Basic Independent Spinners Not Responding	"Spinner Not Responding." + Spinner Name.	Automatic control for spinners must be enabled. [CLF Mode] {Basic Independent} must be selected. At least one product bin must be commanded on. Perceived spinner speed is greater than 30RPM in error from the [Target Spinner Speed] setting for a period of 5 or more consecutive seconds.
Spinners Off	"Stop Application, Spinners Off!"	CLF is enabled, no spinner speed detected, one or more control channels is commanded on.
Spinners On	"Turn spinner switch off to prevent spinners from running!"	Upon system start up, [CLF Mode] enabled, spinner functionality switch detected in the ON position.
Disable Spinners	Manually disable or shut off the spinner hydraulic circuit.	The point the user selects to run the chain oiler routine.

Warning	Message	Trigger
Enable Spinners	Return the spinner hydraulic circuit to a field ready condition.	The point the user exits the chain oiler routine.
Conveyor Lubrication Required	Conveyor Chain Lubrication Is Required.	[Service Reminder On] setting is enabled and [Service Reminder Interval] has expired.
Rate Not Responding	"Rate Not Responding." + Channel Name.	Control channel is commanded on using automatic control mode. Application rate is +/- [Rate Not Responding Threshold] from target rate for a period of [Rate Not Responding Timeout] or more.
Maximum Conveyor Speed	Conveyor At Maximum RPM, Slow Down + Channel Name.	Product channel is commanded on and conveyor is run at or above maximum speed for a period of 5 or more consecutive seconds.
Minimum Conveyor Speed	Conveyor At Maximum RPM, Slow Down + Channel Name.	Product channel is commanded on and conveyor is run at or below minimum speed for a period of 5 or more consecutive seconds.
Conveyor Not Responding	Conveyor Running While Turned Off + Channel Name.	Product bin is commanded off and conveyor speed >0 and <1 RPM for a period of 30 or more consecutive seconds. Or conveyor speed is >=1 RPM for a period of 5 or more consecutive seconds.
Container Advance	Moving to next container in the sequence.	At the point when the [Container Advance] criteria has been met.
Containers Not Ready to Apply	Containers are not ready to apply check container settings.	At the point the user starts the container sequence and the system perceives all containers not to be in a ready to apply state.
End of Sequence	End of container sequence, do you wish to start the sequence from the beginning?	At the point the last container in the sequence has met the [Container Advance] criteria.

DEFAULT SETTINGS**CONFIGURATION**

Main Bin Capacities (Cu Ft)					
	Unit Length				
Configuration	12'	13'	14'	15'	16'
NL4500 MR	251	273	295	317	339
NL4500 MC 5'	149	171	194	216	238
NL4500 MC 5' Side Boards	196	224	254	283	311
NL4500 MC 7'	105	127	149	171	193
NL4500 MC 7' Side Boards	152	180	209	238	266
NL4500 MB	105	127	149	171	193
NL4500 MB Side Boards	152	180	209	238	266

Insert Bin Capacities (Cu Ft)		
Component	Bin No.	Capacity
5' MultApplier	2	115
7' MultApplier	2	161
MultiBin	2	143
Single Micro	3	44
Dual Micro	3	23
Dual Micro	4	21

Pressure Transducer Settings	
Min PSI	0
Max PSI	5000
Min voltage	1
Max voltage	5

Spinner Settings	
PWM Frequency	50 Hz
Zero Flow Offset	30
PWM Gain	20

CALIBRATION

CFR Values	
Bin	Value
Main Bin	0.256
Insert Bin	0.144
Yellow Micro Bin	0.038
Red Micro Bin	0.019

Control Valve Settings				
	Control Valve			
Control Variable	Main	Insert	Micro 1	Micro 2
Control Valve Type	Servo	Servo	Servo	Servo
Valve Response 1	40	40	40	40
Valve Response 2	8	8	8	8
Response Threshold	4.0	4.0	4.0	4.0
Allowable Error	1	1	1	1

Sensor Settings	
Encoder pulses	180 or 360 - verify by looking on encoder
Spinner pulses	4

ALARMS

Alarm Settings				
Alarm Variable	Bin			
	Main (PSI)	Insert (PSI)	Micro 1 (PSI)	Micro 2 (PSI)
Min Conveyor Speed	5	5	3	3
Max Conveyor Speed	50	60	85	85
Max Conveyor Pressure - Std Hydraulics	2000	1500	-	-
Max Conveyor Pressure - HP Hydraulics	3400	1500		
Rate Responding Time	5	5	5	5
Rate Responding Threshold	30	30	30	30
Max System Pressure - Spinner	3100	-	-	-

This page is intentionally left blank.

NOTES



The following information will guide you through using the SGN & Crush Strength Test Kit for your New Leader G4 Spreader. Refer to operator's manual for details on unit safety, operation and maintenance.

PART NUMBER	DESCRIPTION	QUANTITY
308907	Kit - SGN & Crush Strength Test Kit	1
308908	Tester - Crush Strength	1
308909	Scale - SGN	1

**WARNING**

Use great caution while working around the spreader. Contact with spinners and other moving parts is very dangerous. Do not adjust while machinery is moving, wear eye protection and avoid discharge from spinners. Do not ride on moving spreader.

It is highly recommended to perform a Catch Test, Crush Strength Test and SGN Scale Test prior to each season, before using a new product, or if a significant visible change has occurred with a product. Testing will define granular characteristics and help determine proper spinner settings for optimal product spread.

Conduct a G4 Spread Pattern test to check settings based on test results. Refer to *G4 Spreader Installation Instructions* and *G4 Spread Pattern Manual* for installation and adjustment instructions.

CRUSHING STRENGTH

Crushing strength is the minimum pressure needed to crush individual particles.

Testing and knowing the crushing strength of a particular product will help determine maximum spinner RPM. For example: Any granule with less than three (<3) crush strength should not be broadcast with spinner speeds over 700RPM. Verify granules are not pulverized before increasing spinner speed. Refer to *Product Setup Guidelines* for additional spinner speed settings with different crush strength.

SGN

SGN (Size Grade Number) is the measurement of granule size in millimeters multiplied by 100. A product's SGN will affect spread width.

Materials with poor uniformity (a significant percentage in 3 or more columns of scale device) may be difficult to spread accurately. Spread Pattern testing should ALWAYS be performed on any new or different material to determine actual spread width.

NOTE: SGN and Crush Strength together determine spread width.

General Rules:

A small product with low crush strength will have limited spread width capabilities. Spinner RPM must remain lower to keep from pulverizing the soft product, limiting your overall spread width. Additionally, a smaller product has less mass than that of a larger product, and in this case is another limiting factor for overall spread width.

A small product with high crush strength will have limited spread width capabilities. While spinner RPM can be increased with little worry of pulverizing the product, a smaller product has less mass than that of a larger product, which limits how far the product will carry in the spread pattern.

A large product with low crush strength will have limited spread width capabilities. While a larger product with more mass will carry farther, spinner RPM must remain lower to keep from pulverizing the soft product, limiting the overall spread width.

A large product with high crush strength has minimal spread width limitations. Spinner RPM can be increased with little worry of pulverizing the product. Additionally, a large product has more mass than that of a smaller product, allowing the product to carry farther, resulting in a wider spread width.

PRODUCT SETUP GUIDELINES

Granule Mesh	Crush Strength	Maximum Spinner RPM	Flotation Machine (Spinner Height 52") Spread Width ft(m)	Post Machine (Spinner Height 72") Spread Width ft(m)
140-200	1	600	60-65(18-20)	70-75(21-23)
	3	650-700	65-70(20-21)	75-80(23-24)
	6	750-800	70-75(21-23)	80-85(24-26)
	8	850-900	75-80(23-24)	85-90(26-27)
220-300	1	600	70-75(21-23)	80-85(24-26)
	3	650-700	75-80(23-24)	85-90(26-27)
	6	750-800	80-85(24-26)	90-95(27-29)
	8	850-900	85-90(26-27)	95-100(29-30)
320-400	1	600	80-85(24-26)	90-95(27-29)
	3	650-700	85-90(26-27)	95-100(29-30)
	6	750-800	90-95(27-29)	100-105(30-32)
	8	850-900	95-100(29-30)	105-110(32-33)
>400	1	600	90-95(27-29)	100-105(30-32)
	3	650-700	95-100(29-30)	105-110(32-33)
	6	750-800	100-105(30-32)	110-115(33-35)
	8	850-900	105-110(32-33)	115-120(35-37)

IMPORTANT!

Always check crush strength prior to selecting spinner speed. Pan testing should ALWAYS be performed on any new or different material to determine actual spread width. Verify granules are not pulverized by looking in the three center vials following a pan test before increasing spinner speed.

CRUSH TEST

Click or Scan -
Crush Test Procedure

**IMPORTANT!**

Select granules of the most typical size and uniform shape as determined by SGN scale. Crushing strength can significantly increase with particle size.

**Figure 1**

1. Figure 1 - Place individual granule on solid, smooth surface.
2. Place New Leader crush strength tester over granule, open end flush with surface.
Ensure marker is next to handle.

**Figure 2**

3. Figure 2 - With one hand on handle, press tester down until granule breaks.

**Figure 3**

4. Figure 3 - Release handle and note where marker rests on number scale. This is granule crushing strength.

For example, the marker in Figure 3 is between 3 and 4 on the scale. Thus, crushing strength is 3.5.
5. Repeat 10 times and average the values.

SGN SCALE TESTClick or Scan -
SGN Scale Test Procedure

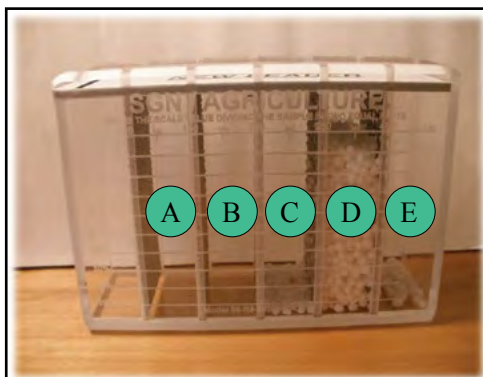
The SGN scale is an instrument designed for simple screen test of fertilizer samples. A small box fitted with five sieves, it directly produces a size histogram of the test sample. From this, the SGN can be estimated.

**Figure 4**

1. Figure 4 - To determine SGN, place scale on flat surface and open lid.
2. Fill end column with selected product to fill line.
3. Close lid securely.

**Figure 5**

4. Figure 5 - Rotate scale vertical and shake to separate material, usually less than two minutes.
5. When material finishes dispersing, turn scale to starting position.

**Figure 6**

6. Figure 6 - View level of material in each compartment and determine SGN level based on markings.

SGN

Size Grade Number

View each column for percentage

- Column A (120) = 0 material
- Column B (170) = 0 material
- Column C (240) = 5% of 240 equals 12
- Column D (340) = 90% of 340 equals 306
- Column E (400+) = 5% of 400 equals 20
- Total: 12+306+20 = 338 as average SGN

7. Figure 7 - Based on column headings and percent in each field, calculate overall SGN of the sample.

Figure 7

Using the above crush strength example of 3.5 and average SGN size of 338, we can now use the chart to determine our maximum spread width. In this case a maximum spinner speed of 650-700 RPM will produce a spread width of 85' to 100' depending on spinner height.

Granule Mesh	Crush Strength	Maximum Spinner RPM	Flotation Machine (Spinner Height 52") Spread Width ft(m)	Post Machine (Spinner Height 72") Spread Width ft(m)
320-400	1	600	80-85(24-26)	90-95(27-29)
	3	650-700	85-90(26-27)	95-100(29-30)
	6	750-800	90-95(27-29)	100-105(30-32)
	8	850-900	95-100(29-30)	105-110(32-33)

PERFORMING A SPREAD PATTERN TEST

Click or Scan -
Spread Pattern Test
Procedure

**WARNING**

Use great caution while working around the spreader. Contact with spinners and other moving parts is very dangerous. Do not adjust while machinery is moving, wear eye protection and avoid discharge from spinners. Do not ride on moving spreader.

It is recommended that spread pattern tests be conducted prior to each spreading season, after any spreader maintenance, and periodically during the spreading season. Spread pattern tests must be performed for each product and application rate.

Spread pattern is affected by many factors. Among the more significant of these are:

- Spinner speed
- Material density
- Material granule size
- Material flow characteristics
- Rate of material delivery
- Point of material delivery on spinner discs
- Angle of the distributor fins on the spinner discs
- Cleanliness of the spinner fins and discs
- Wind and humidity
- Spacing of swaths
- Wear on spinner fins

Since many of these factors will vary for each job, trial and experience must be used to determine the adjustments required to obtain the spread width and spread pattern desired. The following instructions outline the adjustments available and the effect that each will have on the spread pattern.

SPREAD PATTERN TEST KIT

300508 Spread Pattern Test Kit, includes the following:

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
70890	Collection Tray	21	99418	Data Sheets	100
87200	Divider	21	300503	Screw – #6-32 x 3/8	42
300506	Rack – Tube	1	300504	Nut – Lock #6-32	42
300507	Test Tubes	21	70897	Flags	5
300505	Clip – Molded	21	87199	Rope – 120' marked	1
87332	Funnel	1	87201	Stakes	2
58897	Scale – Density	1			



SPINNERS

NOTICE! Spinner discs and fins must be kept clean and polished. Even a small build-up on a spinner fin can significantly affect the spread pattern. Rusty, rough, bent or worn fins will produce poor spread patterns.

Spinner speed is adjustable from approximately 400 to 900 RPM. This is accomplished by changing the settings in the controller. Proper spinner speed adjustment is very important in obtaining optimal spread patterns. The best spinner speed to use will depend entirely on the material being spread, and must be determined by testing.

A major factor of maximum pattern width is particle size. Pattern width may vary anywhere from 25 feet (7.6 m) for very finely ground dry lime up to 120 feet (37 m) or more for extremely large fertilizer pellets.

For every material there is a critical spinner speed. In other words, there is a speed which will result in the maximum obtainable spread width. Going beyond this speed will not increase spread width, but will result in a poor pattern.

Too high of a spinner speed could result in a heavy deposit behind the truck due to break-down of material. This upper speed limit will be quite low for finely powdered material, and can be quite high for extremely coarse materials. In general, this critical speed will fall somewhere between 600 and 800 RPM for typical materials.

It is recommended that a spread pattern test be performed for each product and application rate you handle. Once initial testing is completed, testing should be repeated at the beginning of every season, or any time maintenance is performed on any component affecting spread patterns.

SPREADER PREPARATION

The spreader to be tested shall be in good mechanical condition and properly adjusted according to the Operation and Maintenance sections in this Manual.

All damaged and worn parts must be replaced. Spinner discs and fins must be free of any material build-up, rust or paint.

Fill the hopper with the material to be spread. Run the material out to the end of the conveyor.

Set the feedgate to deliver the required rate per acre. Make sure the feedgate is level and the indicator reflects the actual gate opening measured by standing a tape measure vertically in the fertilizer.

NOTE: Do not match slope of endgate when making this measurement.

Adjust the spinner assembly by turning the crank or, if an actuator is installed, change the setting in the controller. To begin testing, position the spinner according to the chart below.

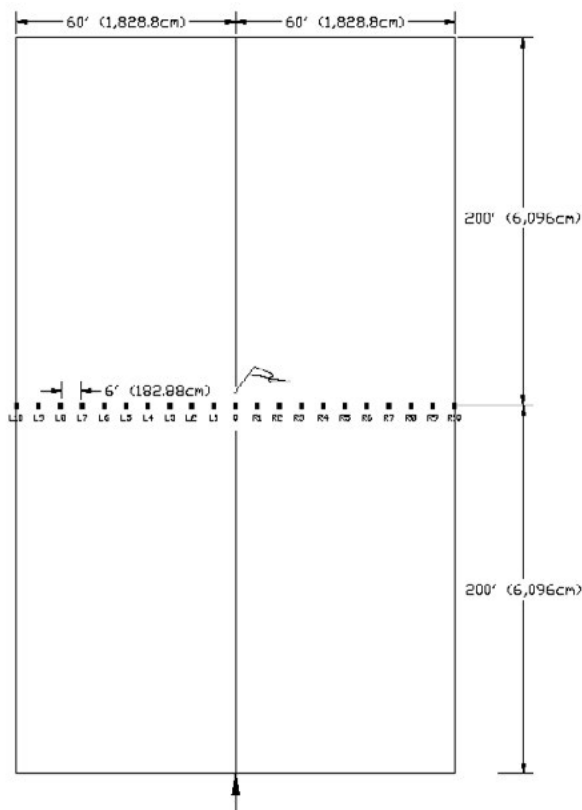
NOTE: This chart is to be used as a reference only to begin testing.

MATERIAL	DENSITY lbs/cu ft (kg/cu m)	SPINNER ASSEMBLY POSITION in (cm)
Lime	80-100 (1281-1601)	0 - 1 (0 - 2.5)
Fertilizer	65 (1040)	3.5 - 3.75 (9 - 9.5)
Urea, Light Rate - 50-200 lb/acre (56-224 kg/hectare)	48 (769)	3.5 - 3.75 (9 - 9.5)
Urea, Heavy Rate - >200 lb/acre (>224 kg/hectare)		2.0 - 2.5 (5 - 6.5)
Mixed Product, MultiApplier	65 (1040)	3.75 (9.5)

TEST PROCEDURE

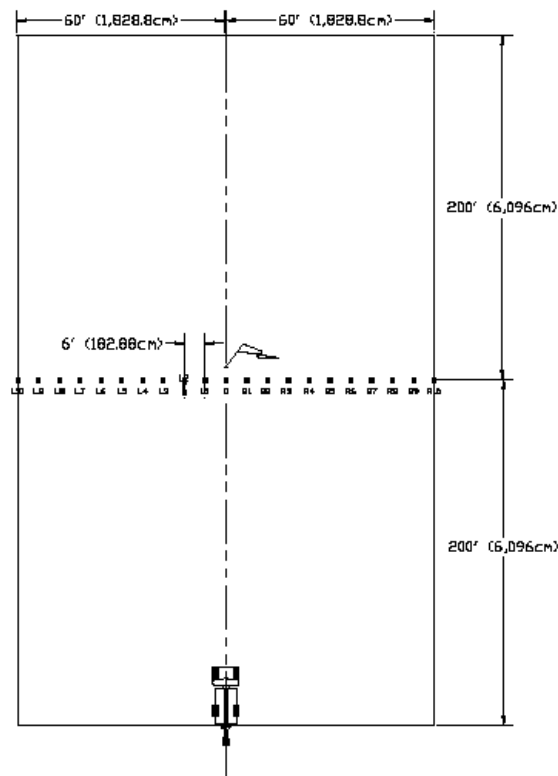
The area selected for testing, measuring 120 feet x 400 feet (37 m x 122 m), should have a slope of less than two degrees.

Insert a plastic grid into each of the 21 collection trays. Position the 21 collection trays on six-foot (6') (182.88cm) centers with the longest dimension of the tray parallel to the direction of travel. (Figure 1A)



DIRECTION OF TRAVEL
COURSE SET UP FOR PATTERN TEST

Figure 1A – Tray Positions



DIRECTION OF TRAVEL
COURSE SET UP FOR PATTERN TEST

Figure 1B – Spreader Position

All testing should be done when the wind velocity is less than 5 MPH (8.05 km). If wind is present, testing must be done with spreader traveling parallel (within ± 15 degrees) to the wind direction.

Do not allow loaded spreader to sit for more than four hours prior to testing.

Prior to driving the spreader through the test course, it should be driven at least 450 feet (137 m) at spreader test speeds.

Spreader must be driven over the collection trays in **ONLY ONE DIRECTION**.

Position spreader at the beginning of the course so that vehicle will straddle center collection tray. (Figure 1B) Set gate opening based on desired rate/acre according to theoretical application charts supplied with each unit.

Drive spreader completely through course at normal operating speeds.

DATA RECORDING

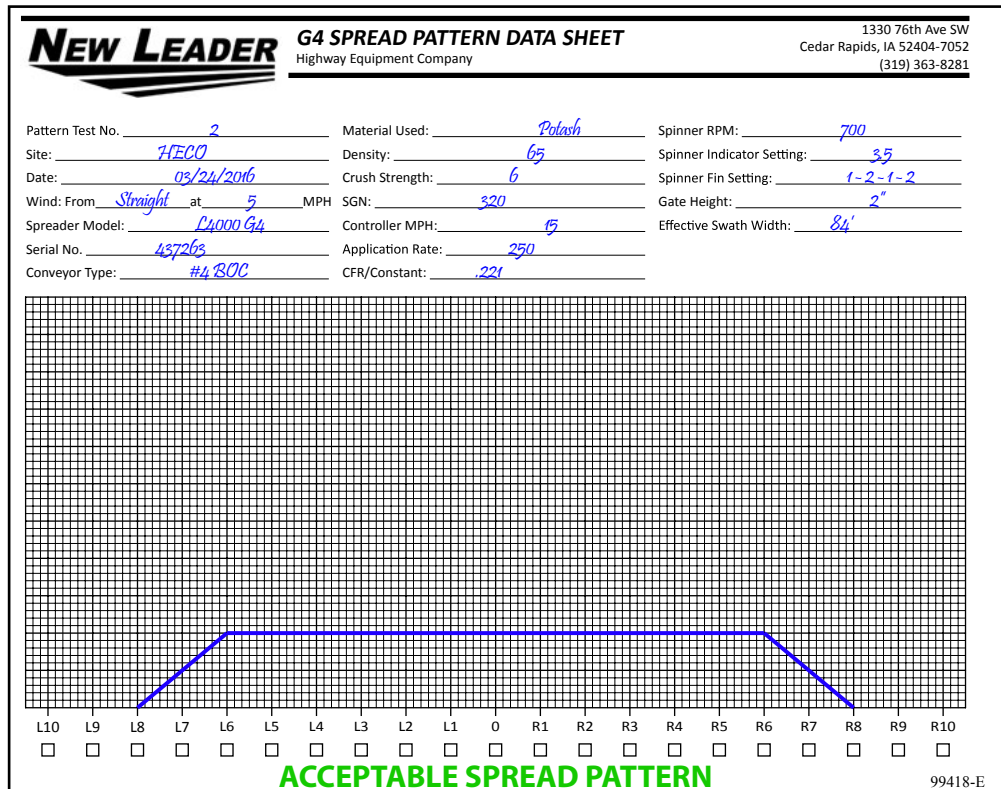
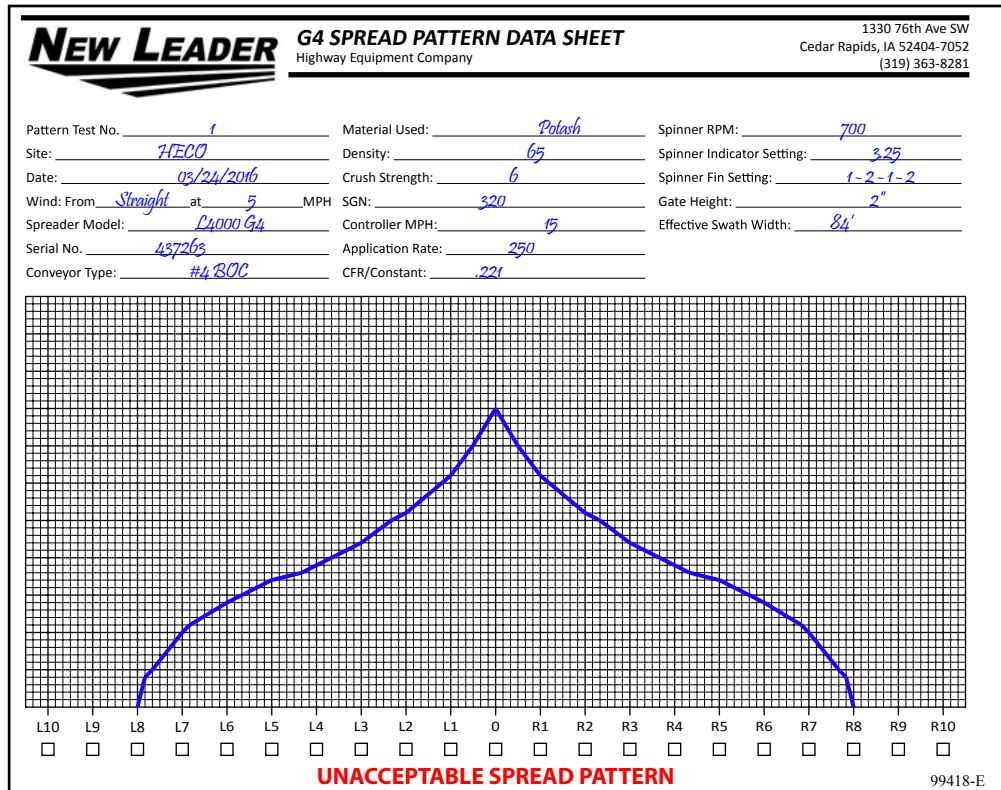


Figure 2 – Spread Pattern Data Sheet Example

Using the data sheets supplied with the kit, document all spreader adjustments required.

Using the funnel, transfer the contents of each collection tray into its corresponding test tube beginning at one end of the trays and working towards the opposite end.

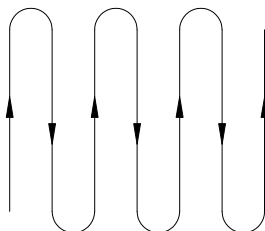
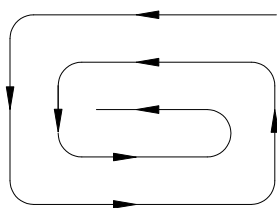
Record the volume in each test tube in the box on the data sheet under the corresponding tray position. (Figure 2) NOTE: It is highly recommended that **ONLY ONE ADJUSTMENT** be made between test samples taken. If more than one adjustment is made, it will be difficult to determine which adjustment was responsible for the change in pattern shape.

Once a desirable pattern is obtained (Figure 5), optimum driving centers can be determined. To determine optimum driving centers (effective swath width), locate the points on both the left and right side of the pattern where the amount of material applied is half the amount at the center of the pattern. The distance between these two points represents the driving centers to be used.

When blended fertilizers are being applied, a visual inspection of the samples should be made to determine whether the blend within the effective swath width is consistent with the desired blend. If the blend is not consistent, a narrower overall swath width should be used and a new optimum driving center (effective swath width) should be determined.

Once the effective swath width has been established, a change in the controller may be required.

DRIVING METHODS



The perimeter (Figure 3) and switch back (Figure 4) driving methods are both acceptable. NOTE: Utilizing the switch back method amplifies non-symmetrical patterns by blending right side on right and left side on left. The perimeter method compensates for non-symmetrical patterns by blending the right side of the pattern with the left side of the adjacent pattern or vice versa.

Figure 3 – Perimeter Method Figure 4 – Switch Back Method

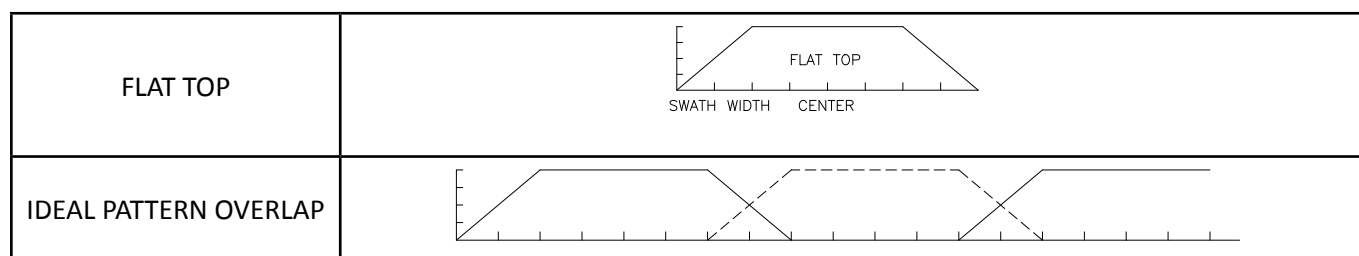
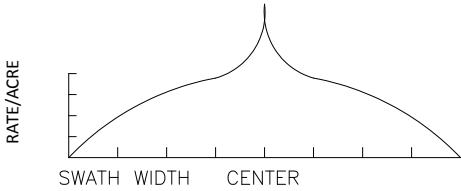
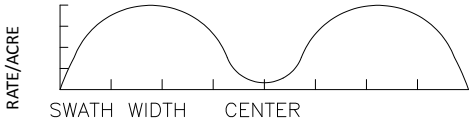
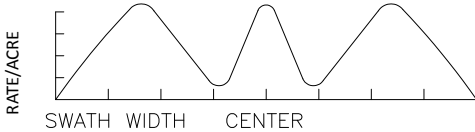
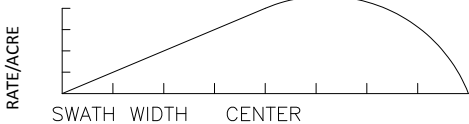


Figure 5 – Ideal Pattern

TROUBLESHOOTING

Problem	Pattern	Recommended Adjustments
Heavy Directly Behind the Vehicle	 <p>A line graph with 'RATE/ACRE' on the vertical axis and 'SWATH WIDTH' on the horizontal axis. A single, sharp peak is centered at the 'CENTER' mark.</p>	<ol style="list-style-type: none"> 1. Move the spinner forward (toward the conveyor). 2. Decrease spinner RPM. 3. Check spinner fin quality. 4. Move one or two spinner fins to a lower numbered hole.
Light Directly Behind the Vehicle	 <p>A line graph with 'RATE/ACRE' on the vertical axis and 'SWATH WIDTH' on the horizontal axis. The curve has two broad peaks at the 'SWATH' and 'WIDTH' marks, with a dip at the 'CENTER' mark.</p>	<ol style="list-style-type: none"> 1. Move the spinner rearward (away from conveyor). 2. Increase spinner RPM. 3. Check spinner fin quality. 4. Move one of two spinner fins to a higher numbered hole.
Light Outside Vehicle's Tire Tracks	 <p>A line graph with 'RATE/ACRE' on the vertical axis and 'SWATH WIDTH' on the horizontal axis. The curve shows three distinct peaks: one at the 'SWATH' mark, one between 'WIDTH' and 'CENTER', and one at the 'CENTER' mark.</p>	<ol style="list-style-type: none"> 1. Check spinner fin quality. 2. Decrease spinner RPM. 3. Move one or two spinner fins to a lower numbered hole.
Pattern Off Center	 <p>A line graph with 'RATE/ACRE' on the vertical axis and 'SWATH WIDTH' on the horizontal axis. A single broad peak is shifted to the right, centered between the 'CENTER' and the right edge of the graph.</p>	<ol style="list-style-type: none"> 1. Check to see feedgate is level and free of caked material. 2. Make sure hillside divider is mounted squarely and centered. 3. Check to be sure spinner assembly is mounted squarely and centered. 4. Make sure material divider is mounted squarely and centered. 5. Testing should be done parallel to wind.

This page is intentionally left blank.

NOTES

