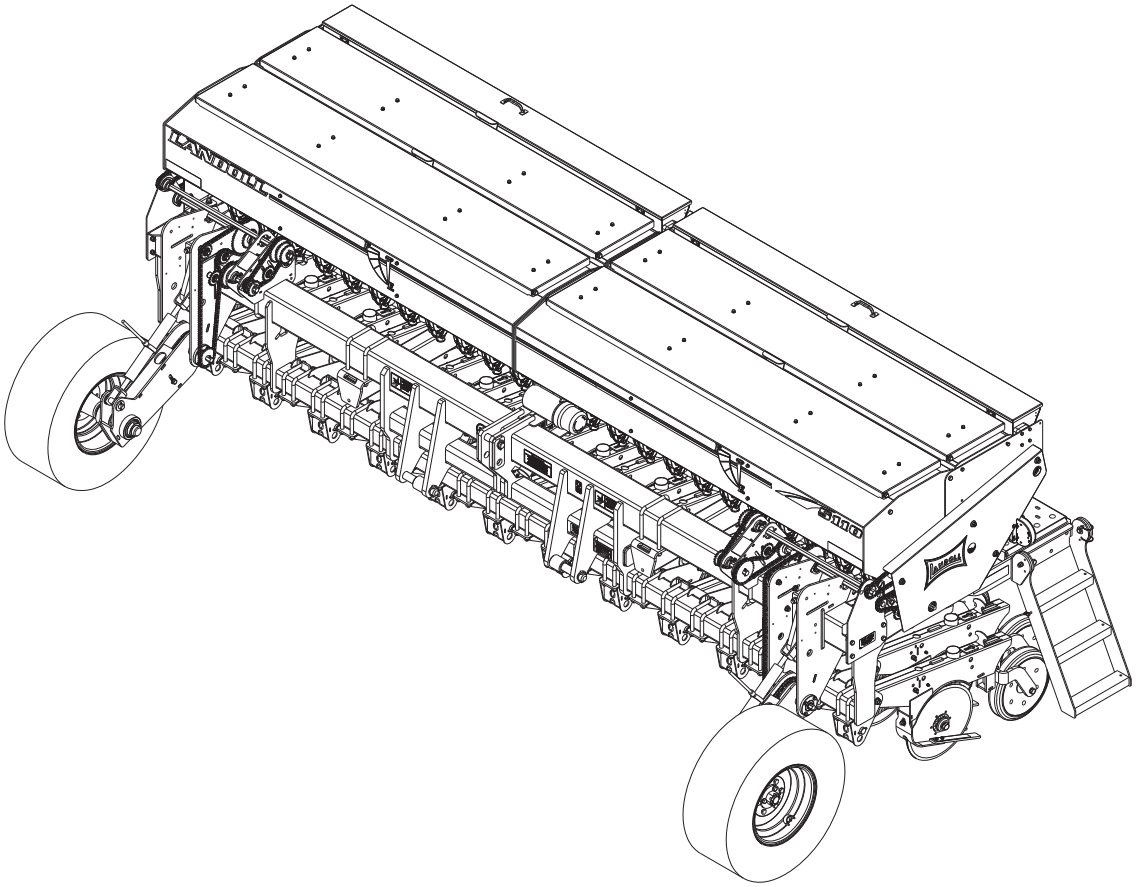
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Model 5110NG
Native Grass Drill
Operator's Manual



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F-1058-0820 **08/2020-Present**

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Manuals for the 5110NG GD	
MANUAL NUMBER	**MANUAL NAME**
F-1058	5110NG GD Operator's Manual
F-1059	5110NG GD Parts Manual

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Chapter 1

Introduction and Safety

The Landoll Model 5110 Native Grass Drill is a quality product designed to give years of trouble free performance. By following each section of this manual, your system will perform as designed for you and your operation

CHAPTER 1 Gives basic instructions on the use of this manual and understanding the safety statements.

CHAPTER 2 Gives product specifications. These specifications supply lengths and measures for your equipment. A Standard Bolt Torque Table is provided to give guidelines for bolt torques to be used when servicing this product.

CHAPTER 3 Contains assembly instructions for your Model 5110 Native Grass Drill. When these procedures are correctly followed, your equipment should provide you years of trouble-free operation and service.

CHAPTER 4 Instructs how to operate your equipment before using it, and describes adjustments needed. It also gives practical advice for the care and maintenance of your Landoll equipment. Drawings in this section locate adjustment points on the equipment.

IF YOU HAVE ANY QUESTIONS CONTACT:
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OR
FAX # (888) 527-3909

CHAPTER 5 Is a troubleshooting guide to aid in diagnosing and solving problems with the equipment.

PARTS MANUAL Is a separate manual showing the various assemblies, subassemblies, and systems. Refer to that manual when ordering Landoll replacement parts. Order parts from your Landoll dealer.

WARRANTY The Warranty Registration form is included with the product documents. Fill it out and mail it within 15 days of purchase

NOTE: IMPROPER ASSEMBLY, MODIFICATION, OR MAINTENANCE OF YOUR LANDOLL MACHINE CAN VOID YOUR WARRANTY.

COMMENTS Address comments or questions regarding this publication to:

LANDOLL COMPANY, LLC
1900 NORTH STREET
MARYSVILLE, KANSAS 66508
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Understanding Safety Statements

You will find various types of safety information on the following pages and on the machine signs (decals) attached to the machine. This section explains their meaning.



The Safety Alert Symbol means ATTENTION! YOUR SAFETY IS INVOLVED!

NOTE

Means that failure to follow these instructions could cause damage to the equipment or cause it to operate improperly.

NOTICE

Special notice - read and thoroughly understand.

CAUTION

Caution means serious equipment or other property damage can occur if instructions on this label are not properly followed.

WARNING

Warning means serious injury or death can occur if safety measures or instructions on this label are not properly followed.

DANGER

Danger means a life-threatening situation exists. Death can occur if safety measures or instructions on this label are not properly followed.

NOTE

Make sure you read and understand the information contained in this manual and on the machine signs (decals) before you attempt to operate or maintain this machine.

The safety statements contained in this manual relate to the operation of the Model 5110 Native Grass Drill.

1. Examine safety decals and be sure you have the correct safety decals for the implement.
2. Keep these signs clean so they can be observed readily. It is important to keep these decals cleaned more frequently than the implement. Wash with soap and water or a cleaning solution as required.
3. Replace decals that become damaged or lost. Also, be sure that any new implement components installed during repair include decals which are assigned to them by the manufacturer.
4. When applying decals to the implement, be sure to clean the surface to remove any dirt or residue. Where possible, sign placement should protect the sign from abrasion, damage, or obstruction from mud, dirt, oil etc.

DANGER

- **Do not allow anyone to ride on the tractor or implement. Riders could be struck by foreign objects or thrown from the implement.**
- **Never allow children to operate equipment.**
- **Keep bystanders away from implement during operation.**

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Transporting Safety

IMPORTANT

It is the responsibility of the owner/operator to comply with all state and local laws.

1. When transporting the implement on a road or highway, use adequate warning symbols, reflectors, lights and slow moving vehicle sign as required. Slow moving tractors and towed implements can create a hazard when driven on public roads. They are difficult to see, especially at night.





2. Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of the towing vehicle.
3. Carry reflectors or flags to mark the tractor and implement in case of breakdown on the road.
4. Do not transport at speeds over 20 MPH under good conditions. Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.
5. Avoid sudden stops or turns because the weight of the implement may cause the operator to lose control of the tractor.
6. Use caution when towing behind articulated steering tractors; fast or sharp turns may cause the implement to shift sideways.
7. Keep clear of overhead power lines and other obstructions when transporting. Know the transport height and width of your implement.

Attaching, Detaching, and Storage

1. Do not stand between the tractor and implement when attaching or detaching implement unless both are not moving.
2. Chock the tires of the implement so it will not roll when unhitched from the tractor.
3. Store in an area where children normally do not play.

Maintenance Safety

1. Understand the procedure before doing the work. Use proper tools and equipment.
2. Make sure all moving parts have stopped.
3. Do not make adjustments or lubricate implement while it is in motion.
4. Block the implement so it will not roll when working on or under it to prevent injury.
5. Install transport locks and parking stands or lower the drill to the ground to relieve system pressure before servicing drill.

High Pressure Fluid Safety

1. Escaping fluid under pressure can be nearly invisible and have enough force to penetrate the skin causing serious injury. Use a piece of cardboard, rather than hands, to search for suspected leaks.
2. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.
3. Avoid the hazard by relieving pressure before disconnecting hydraulic lines.

Protective Equipment

1. Wear protective clothing and equipment.
2. Wear clothing and equipment appropriate for the job. Avoid loose fitting clothing.





3. Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection, such as earmuffs or earplugs.

Chemical Safety

1. Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.
2. Read chemical manufactures instructions and store or dispose of unused chemicals as specified.
3. Handle chemicals with care and avoid inhaling smoke from any type of chemical fire.

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4. Store or dispose of unused chemicals as specified by the chemical manufacturer.

Prepare for Emergencies

1. Keep a First Aid Kit and Fire Extinguisher handy.
2. Keep emergency numbers for doctor, ambulance, hospital, and fire department near the phone.

Tire Safety

1. Tire changing can be dangerous and should be performed by trained personnel using correct tools and equipment.
2. When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side, not in front of or over the tire assembly. Use a safety cage if available.
3. When removing and installing wheels use wheel-handling equipment adequate for the weight involved.

Safety Chain

1. Use a chain with a strength rating equal to or greater than the gross weight of towed machinery, which is 10,100 pounds minimum in accordance with ASAE S338.2 specifications. If two or more implements are pulled in tandem, a larger chain may be required. Chain capacity must be greater then the TOTAL weight of all towed implements.
2. A second chain should be used between each implement.
3. Attach the chain to the tractor drawbar support or specified anchor location. Allow only enough slack in the chain to permit turning. The distance from hitch pin to attachment point or intermediate support point should not exceed 9 inches.
4. Replace the chain if any links or end fittings are broken, stretched or damaged.
5. Do not use a safety chain for towing.

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Model Specifications

5110NG 3-POINT GRAIN DRILL SPECIFICATIONS							
Model Number	Working Width	Row Spacing	No. of Openers	Transport Width	Tire and Wheels	Estimated Weight W\Out Markers (Empty)	Estimated Weight W/Markers (Empty)
5110-12-1/2’ NG	12-1/2’	7-1/2”			(2) 280/70R15	6,500 LBS.	7,100 LBS.
5110-15’ NG	15’	7-1/2”			(2) 280/70R15	7,500 LBS.	8,100 LBS.

NOTE: Specifications Are Subject To Change Without Prior

5110NG GRAIN DRILL PULL HITCH WEIGHTS		
Model	Weight W/Out Markers (Empty)	Weight W/Markers (Empty)
5110-12-1/2’ NG	12,800 LBS.	13,400 LBS.
5110-15’ NG	13,800 LBS.	14,400 LBS.

NOTE: Specifications Are Subject To Change Without Prior

5110NG GRAIN DRILL CAPACITIES			
Model	Seed Box Capacity	NG Box Capacity	Small Seed Box Capacity
5110-12-1/2’ NG	25 Bushels (2.0 Box) 30 Bushels (2.4 Box)	15.6 Bushels	3.1 Bushels
5110-15’ NG	30 Bushels (2.0 Box) 36 Bushels (2.4 Box)	18.8 Bushels	3.8 Bushels

NOTE: Specifications Are Subject To Change Without Prior

Tire Inflation			
Tire Size	Tire Manufacturer	Ply/Load Rating	Inflation Pressure (Psi) (Max.)
IF 280/70R15	Firestone	LOAD INDEX 134/4680 LBS. @ 40MPH	64 psi

Recommended Torque Specification For Lug Bolts and Nuts	
Bolt Size	**Torque (FT. LBS.)**
9/16-18	70 - 80 FT. LBS.

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General Torque Specifications (rev. 4/97)

TORQUE SPECIFIED IN FOOT POUNDS - This chart provides tightening torques for general purpose applications when special torques are not specified on process or drawing. Assembly torques apply to plated nuts and cap-screws assembled without supplemental lubrication (as received condition). They do not apply if special graphite moly-disulfide or other extreme pressure lubricants are used. When fasteners are dry (solvent cleaned) add 33% to as received condition torque. Bolt head identification marks indicate grade and may vary from manufacturer to manufacturer. Thick nuts must be used on grade 8 cap-screws. Use value in [ ] if using prevailing torque nuts.

UNC SIZE	SAE Grade 2	SAE Grade 5	SAE Grade 8	UNF SIZE	SAE Grade 2	SAE Grade 5	SAE Grade 8
1/4-20	4 [5]	6 [7]	9 [11]	1/4-28	5 [6]	7 [9]	10 [12]
5/16-18	8 [10]	13 [13]	18 [22]	5/16-24	9 [11]	14 [17]	20 [25]
3/8-16	15 [19]	23 [29]	35 [42]	3/8-24	17 [21]	25 [31]	35 [44]
7/16-14	24 [30]	35 [43]	55 [62]	7/16-20	27 [34]	40 [50]	60 [75]
1/2-13	35 [43]	55 [62]	80 [100]	1/2-20	40 [50]	65 [81]	90 [112]
9/16-12	55 [62]	80 [100]	110 [137]	9/16-18	60 [75]	90 [112]	130 [162]
5/8-11	75 [94]	110 [137]	170 [212]	5/8-18	85 [106]	130 [162]	180 [225]
3/4-10	130 [162]	200 [250]	280 [350]	3/4-16	150 [188]	220 [275]	320 [400]
7/8-9	125 [156]	320 [400]	460 [575]	7/8-14	140 [175]	360 [450]	500 [625]
1-8	190 [237]	408 [506]	680 [850]	1-14	210 [263]	540 [675]	760 [950]
1-1/8-7	270 [337]	600 [750]	960 [1200]	1-1/8-12	300 [375]	660 [825]	1080 [1350]
1-1/4-7	380 [475]	840 [1050	1426 [1782]	1-1/4-12	420 [525]	920 [1150]	1500 [1875]
1-3/8-6	490 [612]	1010 [1375]	1780 [2225]	1-3/8-12	560 [700]	1260 [1575]	2010 [2512]
1-1/2-6	650 [812]	1460 [1825]	2360 [2950]	1-1/2-12	730 [912]	1640 [2050]	2660 [3325]
1-3/4-5	736 [920]	1651 [2063]	2678 [3347]	1-3/4-12	920 [1150]	2063 [2579]	3347 [4183]

METRIC:

Coarse thread metric class 10.9 fasteners and class 10.0 nuts and through hardened flat washers, phosphate coated, Rockwell “C” 38-45. Use value in [ ] if using prevailing torque nuts.

Nominal thread diameter (mm)	Newton Meters (Standard Torque)	Foot Pounds (Standard Torque)	Nominal Thread Diameter (mm)	Newton Meters (Standard Torque)	Foot Pounds (Standard Torque
6	10 [14]	7 [10]	20	385 [450]	290 [335]
7	16 [22]	12 [16]	24	670 [775]	500 [625]
8	23 [32]	17 [24]	27	980 [1105]	730 [825]
10	46 [60]	34 [47]	30	1330 [1470]	990 [1090]
12	80 [125]	60 [75]	33	1790 [1950]	1340 [1450]
14	125 [155]	90 [115]	36	2325 [2515]	1730 [1870]
16	200 [240]	150 [180]	39	3010 [3210]	2240 [2380]
18	275 [330]	205 [245]	----------	----------	----------

Table 2-1: General Torque Specifications

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Hydraulic Fitting Torque Specifications

TORQUE IS SPECIFIED IN FOOT POUNDS- 37° JIC, ORS, & ORB (REV. 10/97)

This chart provides tightening torques for general purpose applications when special torques are not specified on process or drawing. Assembly torques apply to plated nuts and capscrews assembled without supplemental lubrication (as received condition). They do not apply if special graphite moly-disulfide or other extreme pressure lubricants are used. When fasteners are dry (solvent cleaned) add 33% to as received condition torque. Bolt head identification marks indicate grade and may vary from manufacturer to manufacturer. Thick nuts must be used on grade 8 capscrews. Use value in [ ] if using prevailing torque nuts.

Parker Brand Fittings

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-13	15-17	13-15
-5	14-16	----------	21-23
-6	20-22	34-36	25-29
-8	43-47	58-62	40-44
-10	55-65	100-110	58-62
-12	80-90	134-146	75-85
-16	115-125	202-218	109-121
-20	160-180	248-272	213-237
-24	185-215	303-327	238-262
-32	250-290	----------	310-340

Gates Brand Fittings

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	10-11	10-12	14-16
-5	13-15	----------	----------
-6	17-19	18-20	24-26
-8	34-38	32-40	37-44
-10	50-56	46-56	50-60
-12	70-78	65-80	75-83
-14	----------	65-80	----------
-16	94-104	92-105	111-125
-20	124-138	125-140	133-152
-24	156-173	150-180	156-184
-32	219-243	----------	----------

Aeroquip Brand Fittings

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-12	10-12	14-16
-5	15-16	----------	16-20
-6	18-20	18-20	24-26
-8	38-42	32-35	50-60
-10	57-62	46-50	75-80
-12	79-87	65-70	125-135
-14	----------	----------	160-180
-16	108-113	92-100	200-220
-20	127-133	125-140	210-280
-24	158-167	150-165	270-360
-32	245-258	----------	----------

Table 2-2: Hydraulic Fitting Torque Specifications

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Table provided for general use.

NOTES:

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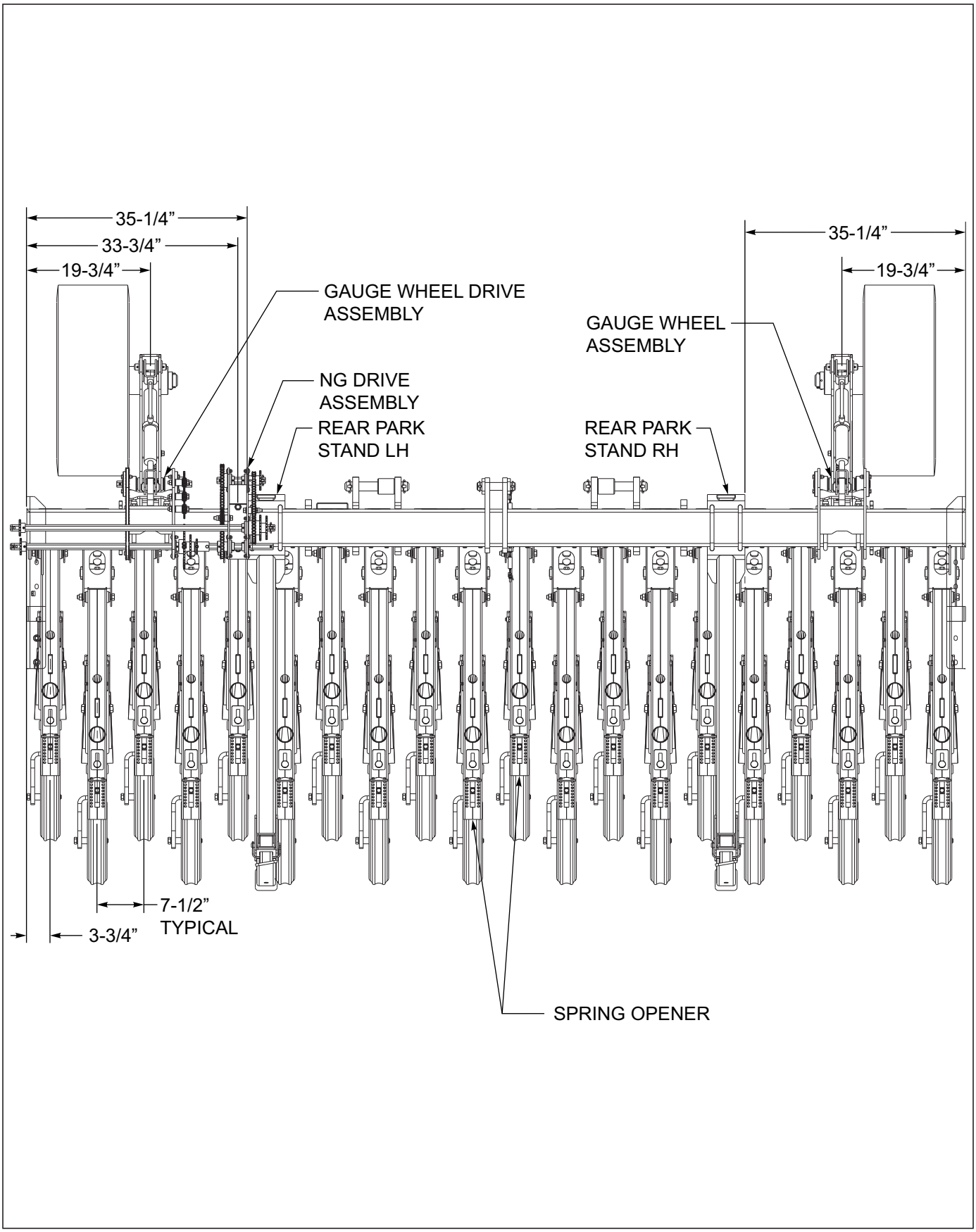


Figure 2-1: 5110-12-1/2’ 3-Point Placement

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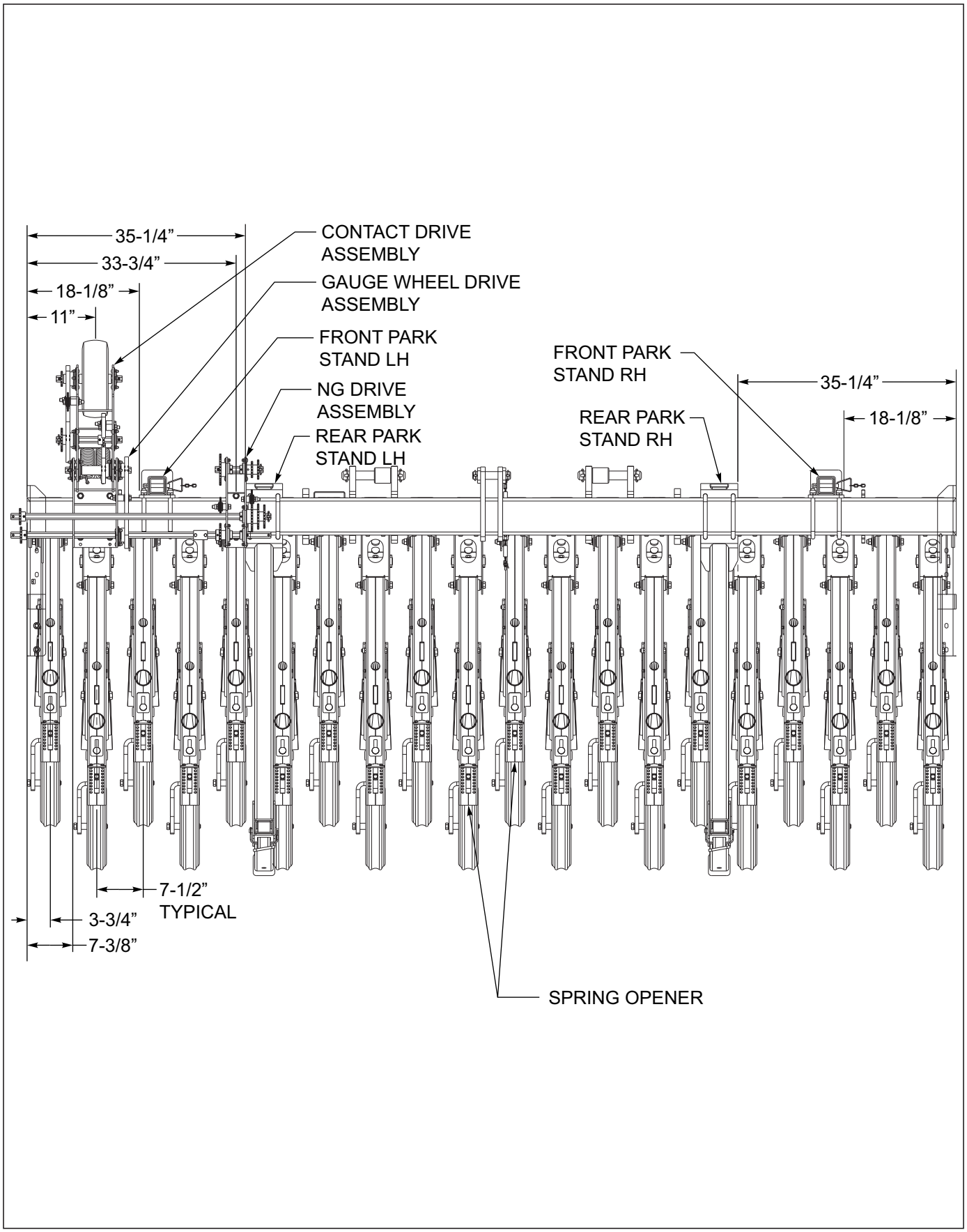


Figure 2-2: 5110-12-1/2’Pull Hitch Placement

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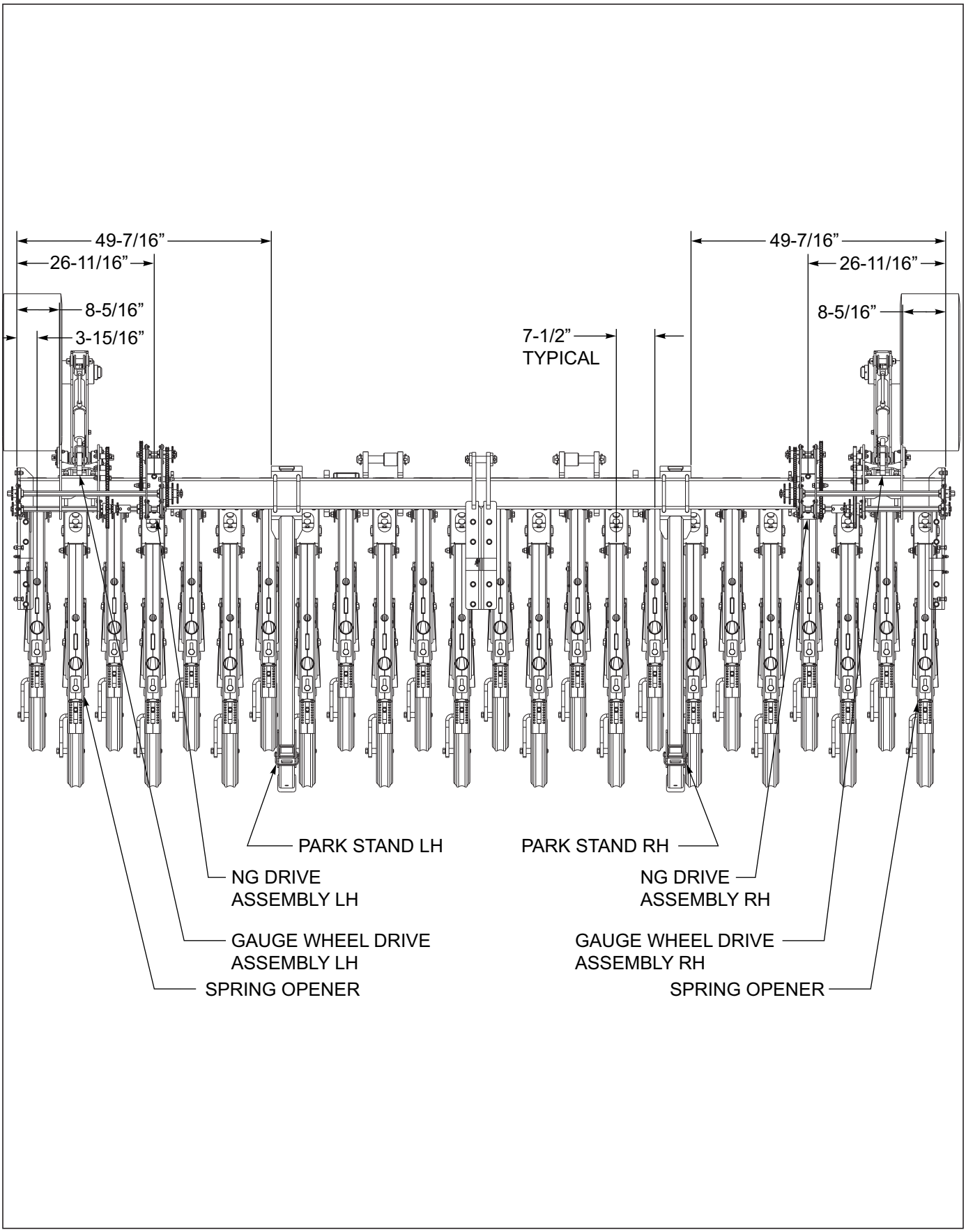


Figure 2-3: 5110-15’ Placement

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Assembly Instructions

Assembly Safety

Your new 5110NG Native Grass Drill comes nearly completely assembled from the factory and ready to go to the field. This section includes option assembly procedures.

To insure alignment of assemblies, **leave the nuts loose until completion** of final assembly. Use lock washers or flat washers as specified. Spread all cotter pins.

After completion of final assembly, tighten all nuts evenly to prevent misalignment, distortion or binding. Tighten all screws and nuts to the recommended torques *See Table on page 2-3*.

DANGER

Opener blades are extremely sharp. Exercise extreme care when working on or near opener blades. Do not allow opener blades to roll over or fall onto any body part. Do not allow wrenches to slip when working near blades. Never push wrenches toward opener blades. Do not climb over machine above opener blades. Failure to stay clear of opener blade edges can cause serious personal injury or death.

WARNING

Do not attempt to lift heavy parts (such as the frame, wheel lift, and pull hitch) manually. Use a hoist or a forklift to move these parts into position.

DANGER

To prevent accidental lowering:

- **All hydraulically elevated equipment must be locked out using the cylinder lockouts.**
- **Lower equipment to the ground while servicing or when it is idle.**
- **Failure to take measures to prevent accidental lowering may result in serious personal injury or death.**

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Pull Hitch Assembly

1. Carefully raise the pull axle hitch assembly and install tire/wheel assemblies with lug nuts. Place support jacks under the front of the hitch axle to hold the axle level ***See Figure 3-1*** model 5510-12.5' or ***See Figure 3-2*** for model 5510-15'.
2. Carefully position the hitch assembly over the axle assembly and lower to the axle. Install the 3/4-10 x 3-1/2 hex screws, 3/4 flat washes on top side, secure with the 2-hole plates and lock nuts on bottom side.
3. Remove jack from storage position and attach in the parking position to support front of hitch assembly.
4. Carefully move the fully assembled hitch assembly in front of drill.
5. Remove the lower and upper hitch pins, lower hitch spacers.
6. Align the holes in the rear of the drawbar hitch with the holes on inside of lower 3 point plates. Align the lower hitch spacers against inside lower plates, secure with the lower hitch pins and lynch pins.
7. Raise or lower jack to align hole in top link weldment to top holes in the upper plates on front of drill frame. Secure with upper link pin and quick hitch pins.
8. Be sure the 396" light harness is routed through the hitch, hose support clamps on top link and plug into the ag flasher plug.
9. Connect the drill pull hitch to the tractor before attempting to lift the drill or remove the parking stands.

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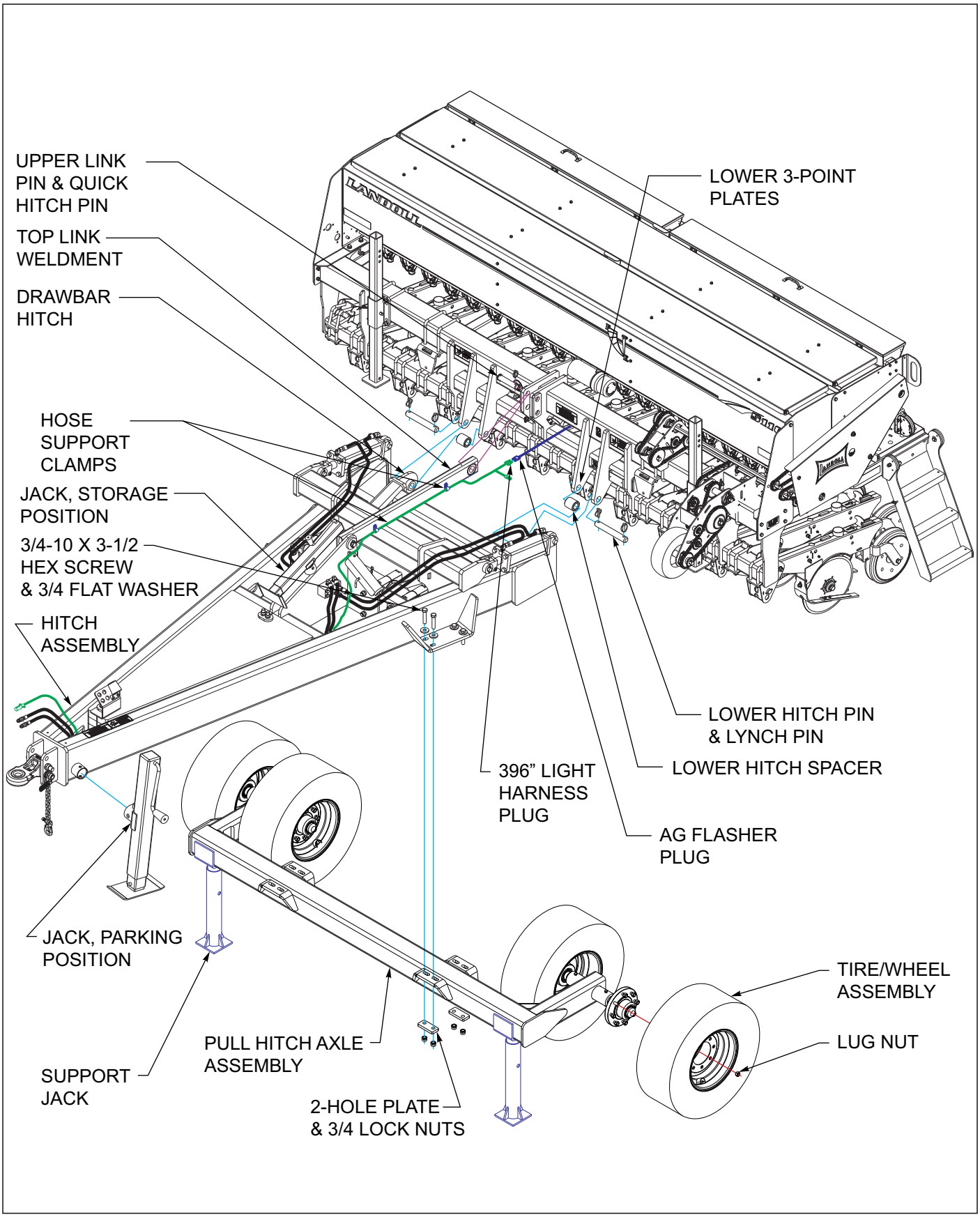


Figure 3-1: 5110-12.5' Pull Hitch Assembly

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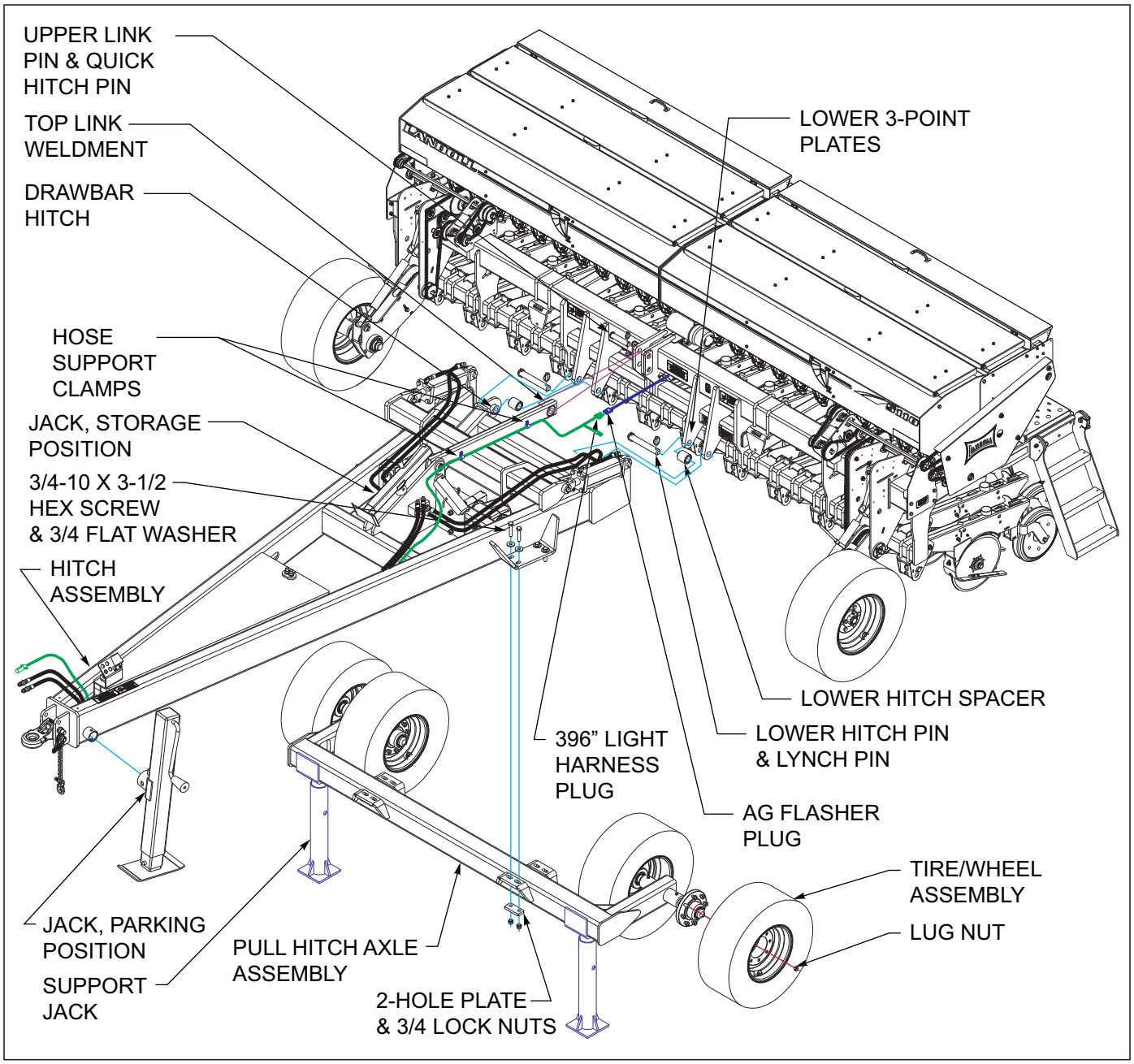


Figure 3-2: 5110-15' Pull Hitch Assembly

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Operation Safety Statements

DANGER

Never allow anyone to ride on the 5110NG Drill at any time. Allowing a person to ride on the machine can inflict serious personal injury or death to that person.

DANGER

Opener blades are extremely sharp. Exercise extreme care when working on or near opener blades. Do not allow opener blades to roll over or fall onto any body part. Do not allow wrenches to slip when working near blades. Never push wrenches toward opener blades. Do not climb over machine above opener blades. Failure to stay clear of opener blade edges can cause serious personal injury or death.

WARNING

All hydraulically adjusted equipment must have cylinder lockouts installed or be lowered to the ground when servicing or when equipment is idle. Failure to take preventive measures against accidental lowering can result in serious personal injury.

DANGER

Keep all bystanders away from the machine when folding/unfolding, raising/lowering openers, and transporting.

DANGER

Always lock the tractor drawbar in the center position when transporting the unit. Failure to do so can result in serious injury or death and cause damage to the machine.

DANGER

When transporting the unit, place cylinder lockouts in the transport lock position after fully extending the cylinders. Insert the lockout pins to secure the cylinder lockouts. Failure to lockout the cylinders can allow the unit to settle during transport, which can result in serious injury or death and cause damage to the equipment.

CAUTION

When transporting farm implements on public roads, it is the responsibility of the operator to abide by state and local laws concerning wide loads, speed, safety emblems and safety lighting equipment. Drive at safe speeds, particularly when rounding corners, crossing rough ground or driving on hillsides, to prevent tipping the tractor and implement.

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Tractor Preparation

The Landoll 5110NG Native Grass Drill requires a Tractor with Category II, III or IIIN three-point hitch and adequate weight.

1. Before attaching the Grain Drill, prepare the tractor as follows:
2. Inflate the rear tractor tires equally and add ballast according to the tractor operator's manual.
3. To safely raise or lower the three-point drill the Tractor must weigh more that the drill. Weight should be properly distributed to insure the front wheels maintain contact with the ground. Refer to the Tractor operating manual and weights as needed.

Grain Drill Preparation

1. Prior to operating the 5110NG Native Grass Drill, read and understand the operator's manual and all decals.
2. Inspect the machine thoroughly for good operating condition, working parts move freely, bolts are tight, all pins installed, etc.
3. Replace worn or missing parts.
4. When the machine is new, check the bolt tightness after a few hours of operation. Tighten any loose nuts or bolts. Check the lift wheel lug nuts daily.
5. Check the lift wheel tire inflation. Follow the tire manufacturer's recommended pressures listed on the sidewall of the tires.
6. Check opener scrapers for proper adjustment to the disc blades *(See "Opener Scraper Adjustment" on page 4-37.)*
7. Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. Verify that all warning lights are clearly visible and functioning correctly.
8. Check all drive chains for proper tension.
9. Rotate each ground drive wheel to verify all seed meters are working and turning freely.

Attaching Grain Drill To The Tractor - Three-Point



1. Raise or lower the tractor three-point links as needed.
2. Carefully back the tractor into position.
3. Install the lower hitch pins and spacers *See Figure 4-1*.

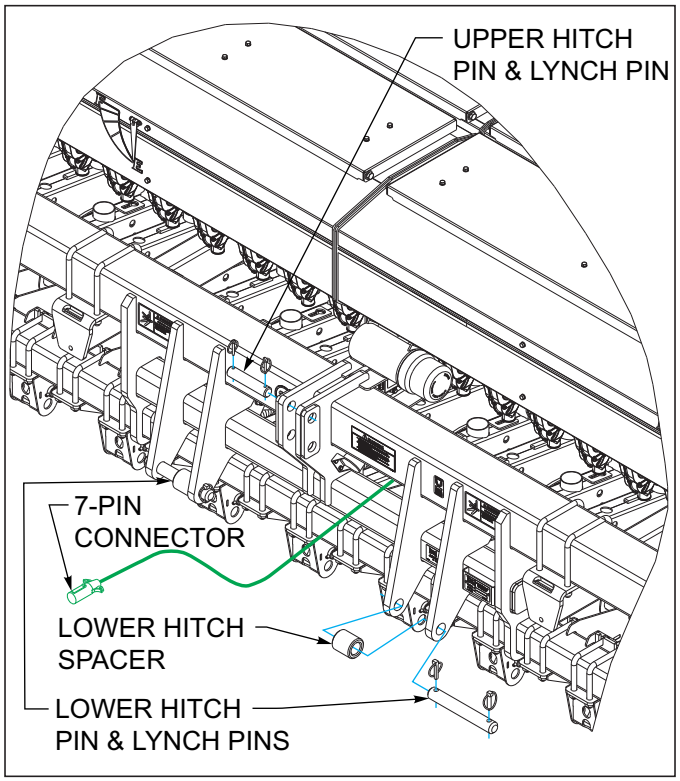


Figure 4-1: Attaching Drill to Tractor

4. Connect the upper three-point link to the drill.
5. Verify that all three-point links are securely pinned and retainers installed.
6. Plug the safety lights into the seven pin connector on the tractor *See Figure 4-1*.
7. Slowly raise the drill and check clearances.

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8. Fully raise the Grain Drill and remove both rear parking stands and place in transport position ***See Figures 4-2*** and ***See Figure 4-3***.

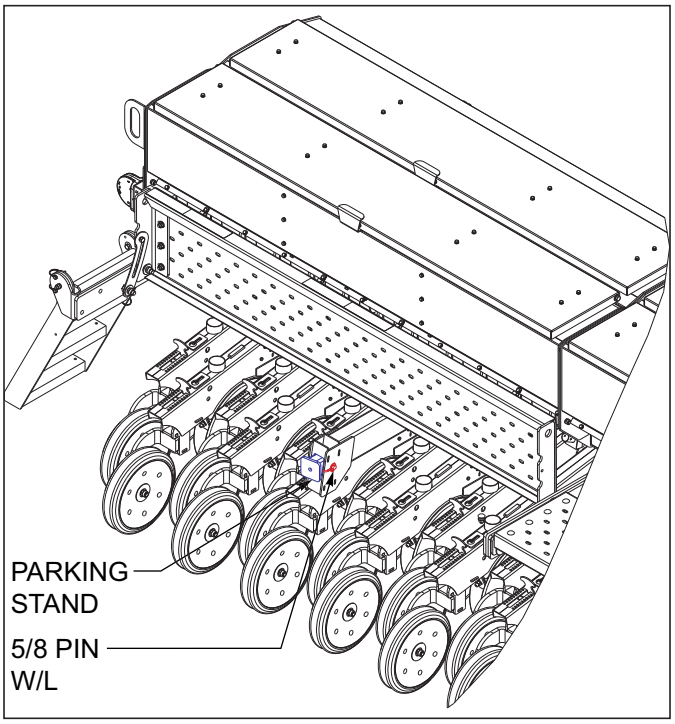


Figure 4-2: Rear Parking Stand Location During Transport/Planting

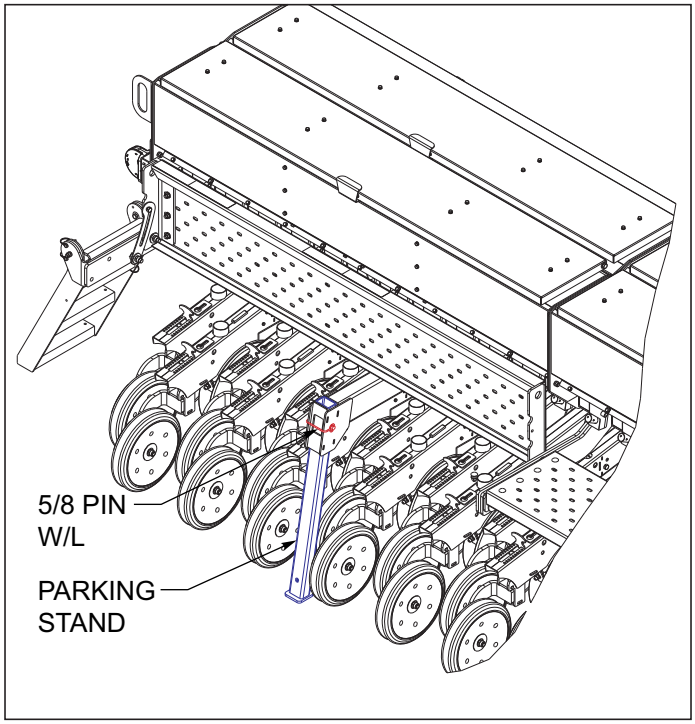


Figure 4-3: Rear Parking Stand Location During Storage

9. On the 5110-12-1/2' drills fully raise the Grain Drill and adjust both front parking stands and place in transport position ***See Figures 4-4*** and ***See Figure 4-5***.

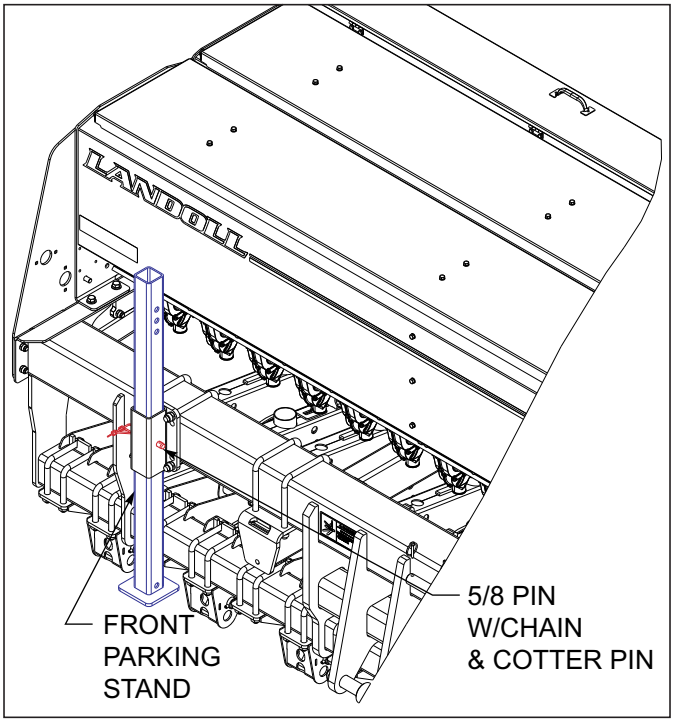


Figure 4-4: Front Parking Stand Location During Transport/Planting

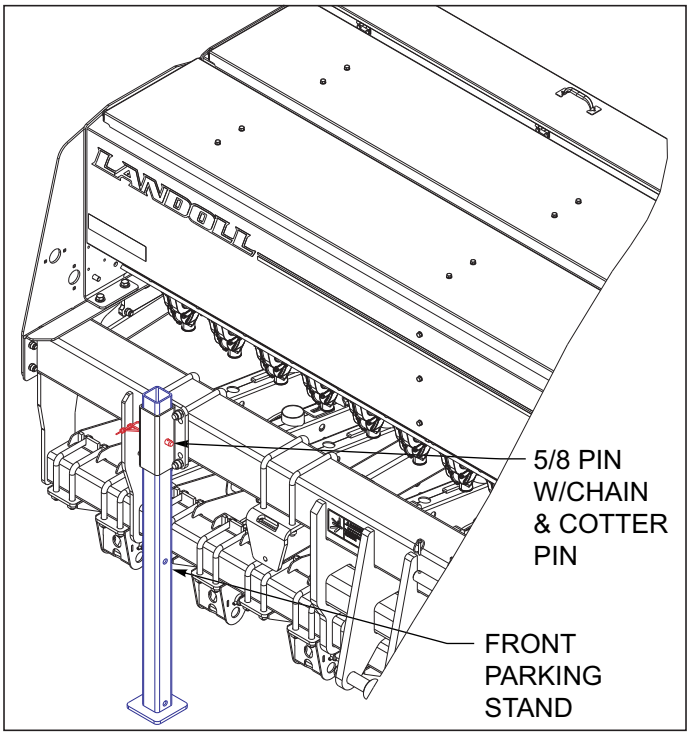


Figure 4-5: Front Parking Stand Location During Storage

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Attaching Grain Drill To The Tractor - Pull Hitch (Optional)

WARNING

The Grain Drill has positive and negative tongue weight. Use a locking-style hitch pin that is properly sized for the tractor drawbar and implement hitch.

1. Make sure the tractor drawbar is rated and adjusted properly for the weight of the drill hitch.
2. Measure the tractor drawbar and adjust the hitch clevis to the appropriate hitch mounting holes.
3. Carefully back the tractor into position. Raise or lower the hitch with the jack to achieve the proper hitch height.

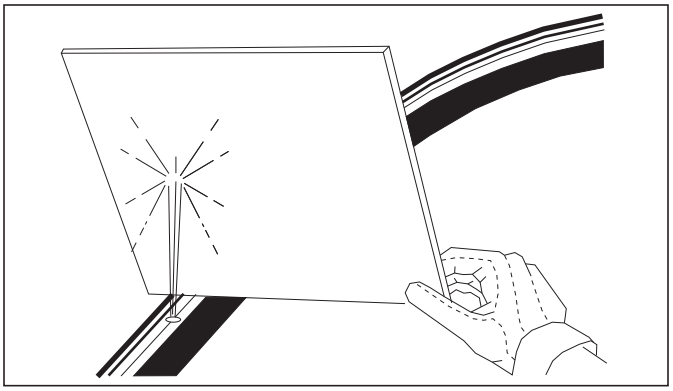


Figure 4-6: Hydraulic Leak Detection

4. Back the tractor into final position, and install the hitch pin.
5. Lower and remove the jack. Place jack in the storage location in the middle of the hitch ***See Figure 4-7***.
6. Plug the safety lights into the seven-pin connector on the tractor.
7. Attach the safety chain to an anchor on the tractor. Refer to tractor manual for proper placement.
8. Connect the hydraulic hoses to the tractor.

WARNING

Escaping fluid under pressure can penetrate the skin causing serious personnel injury. Avoid the hazard by relieving system pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes which eject fluid under high pressure. Wear protective gloves and safety glasses when working with hydraulics. Use a piece of cardboard or paper, not body parts to search/check for leaks. If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

9. Fully raise the Grain Drill and install the transport locks. Place parking stands in Transport/Planting position ***See Figures 4-2*** and ***See Figures 4-4***.

Transport Locks - Pull Hitch

1. Transport lock pins are provided to secure the Grain Drill in raised position. Do not depend on hydraulics when working beneath raised equipment or when transporting.

WARNING

Install both transport locks before attempting to service, adjust, or transport raised equipment.

2. The transport locks are installed on the holders located on the hitch when not in use ***See Figure 4-7***. To install the transport locks:
   a. The hitch clevis must be attached to the tractor. Then fully raise the hitch of the Grain Drill.
   b. Remove the L-pins and hairpin clips from the stored transport locks.
   c. Slide the transport locks over the extended cylinder shafts.
   d. Reinstall the L-pins and hairpin clips to secure the transport locks to the cylinder shafts.

IMPORTANT

Failure to install/remove BOTH transport locks will result in damage to the grain drill.

3. To remove the transport locks:
   a. The hitch clevis must be attached to the tractor.
   b. Fully raise the Grain Drill to remove any weight setting on the transport locks.

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c. Remove the L-pins, hairpin clips, and transport locks from both cylinder shafts.

d. Return the transport locks, L-pins, and hairpin clips to the storage locations on the hitch.

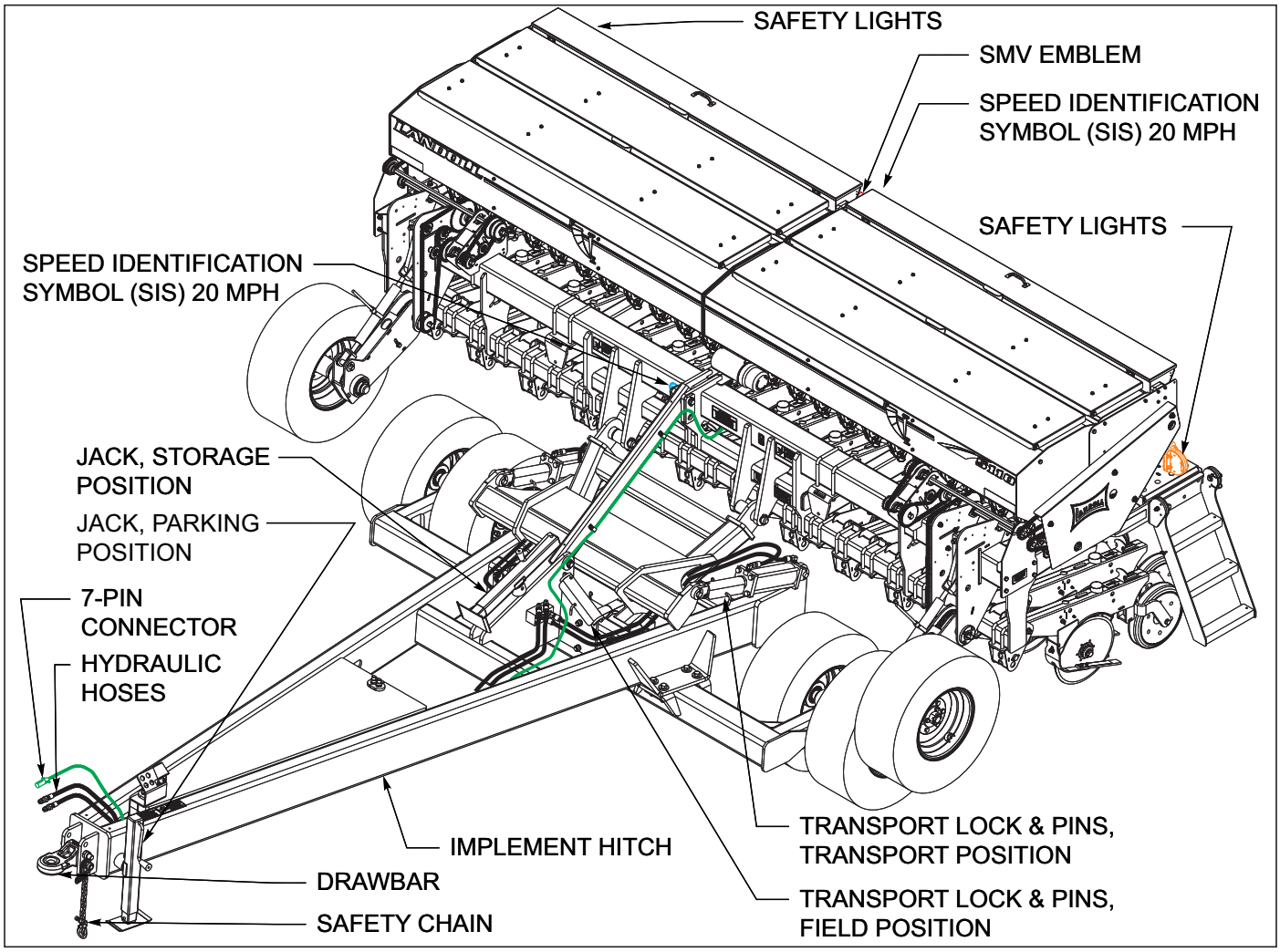


Figure 4-7: Attaching Pull Hitch to the Tractor (Optional)

Leveling the Hitch Clevis

1. The hitch clevis height should be adjusted to match the drawbar height of the tractor. This will allow the hitch to operate through its most efficient range and level throughout the field *See Figure 4-8*
2. On a level surface, measure from the ground to the top side of the tractor drawbar. For drawbar heights 18” or lower use the lower hitch clevis holes. For drawbars 20” tall use the middle hitch clevis holes, and for 22” or greater use the top mounting holes.

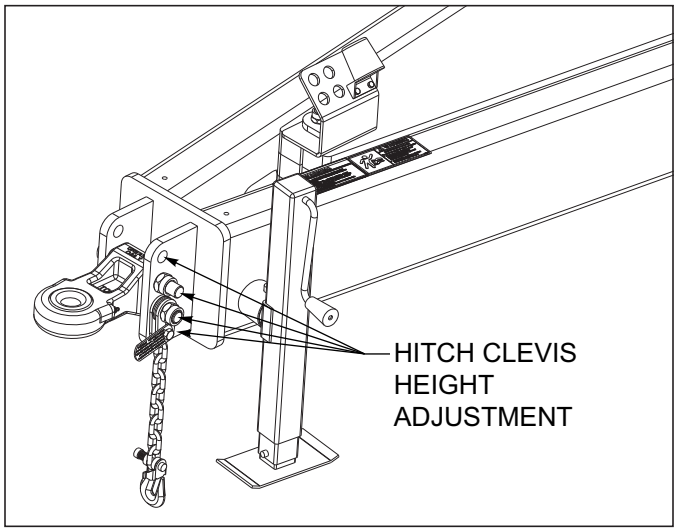


Figure 4-8: Hitch Clevis Height

Parking - Pull Hitch

1. When unhitching the grain drill from the tractor, park the drill on a level area to prevent rolling and shifting. The Grain Drill has negative hitch weight and will need to lowered to the ground for parking. Any seed left in the drill will increase the negative hitch weight. It is best to park the drill without any seed left in the box.

⚠ WARNING

The Grain Drill can have negative hitch weight. Use a properly sized locking style hitch pin for the tractor drawbar and drill hitch. Stand clear of hitch when pinning/unpinning the drill hitch.

2. To park the drill:
   a. Fully raise the drill extending the main lift cylinders
   b. Remove the transport locks from the cylinder shafts and place in the storage location.
   c. Remove the parking stands from transport position and install in parking position ***See Figures 4-9*** **and** ***See Figure 4-10*****.)** If storing on soft ground, place board/plate under the stands for a wider footprint.
   d. Lower the Grain Drill to the ground.
   e. Block tires to prevent rolling or shifting of drill.
   f. Move the jack from the storage position and place in the parking position at the front of the hitch ***See Figure 4-11*** **I**f storing on soft ground, place board/plate under the jack for a wider foot print.
   g. Disconnect the hydraulic hoses and place in holes on the hose holder mount on front of implement hitch
   h. Unplug the seven-pin electrical connector and store in the stor-a-way, harness on the hose holder mount on front of implement hitch.
   i. Disconnect the safety chain from the tractor. Attach the chain hook close to the chain attaching point to keep the hook off the ground.
   j. Carefully remove the hitch pin.

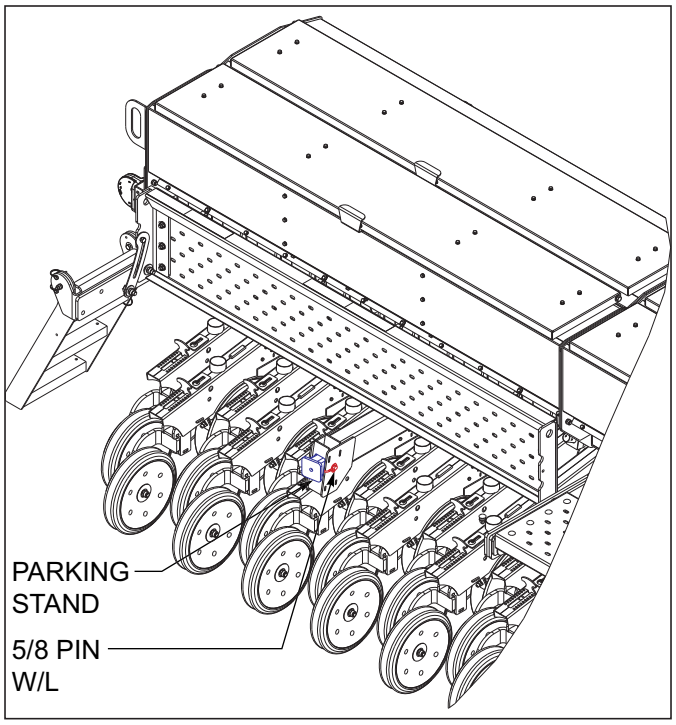


Figure 4-9: Parking Stand Location During Transport/Planting

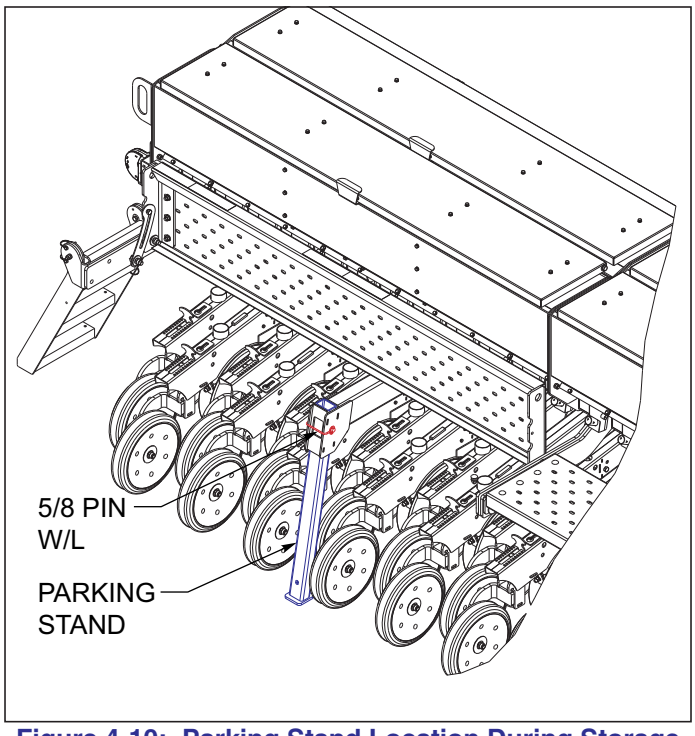


Figure 4-10: Parking Stand Location During Storage

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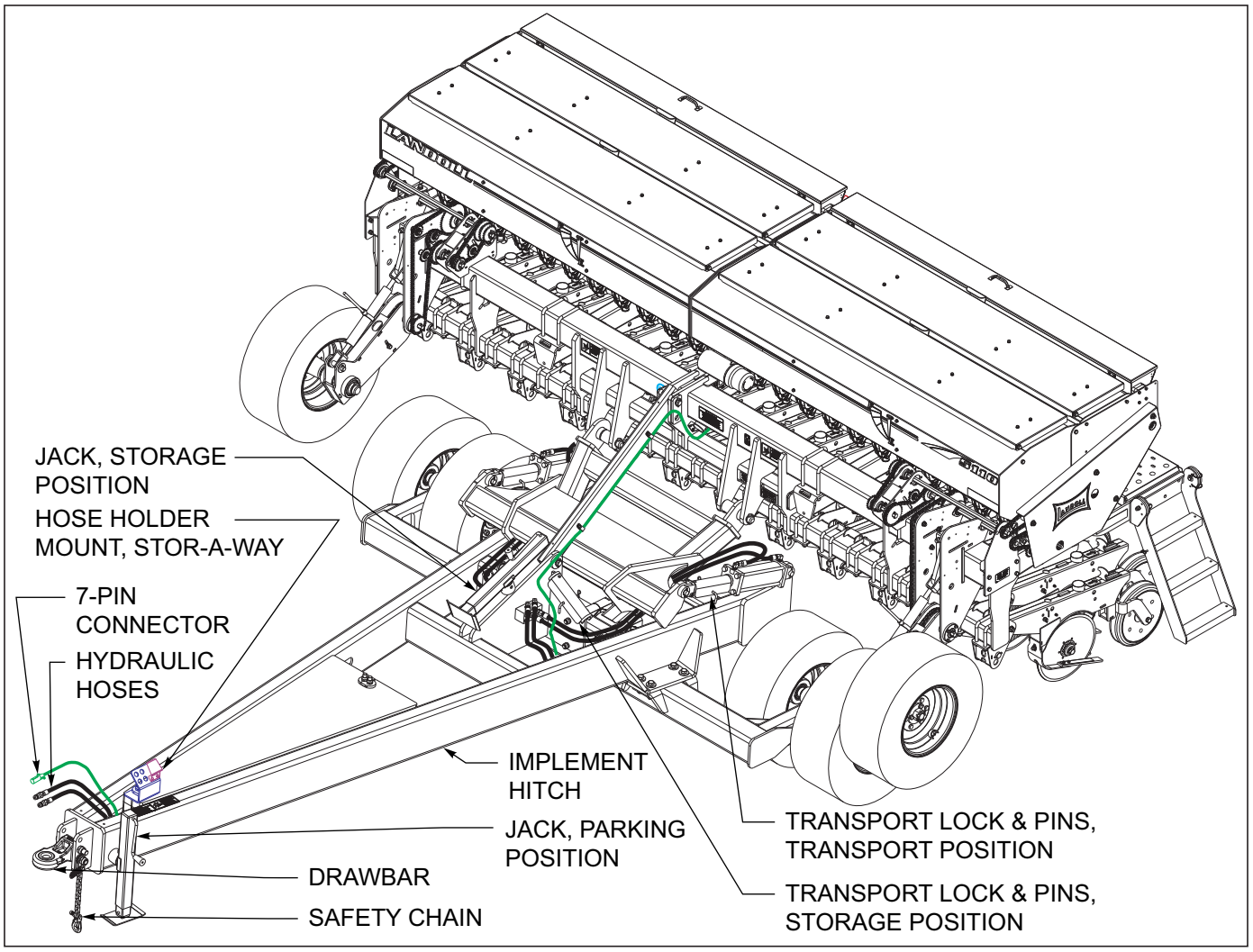


Figure 4-11: Jack Parking and Storage Position - Pull Hitch

Removing Drill from Pull Hitch

1. When removing the grain drill from the pull hitch, park the drill on a level area to prevent rolling and shifting. The Grain Drill has negative hitch weight and will need to lowered to the ground for parking. Any seed left in the drill will increase the negative hitch weight. It is best to park the drill without any seed left in the box.

WARNING

The Grain Drill can have negative hitch weight. Use a properly sized locking style hitch pin for the tractor drawbar and drill hitch. Stand clear of hitch when pinning/unpinning the drill hitch.

2. To park the drill and remove pull hitch, model 5110-12-1/2' ***See Figures 4-12*** or model 5110-15' ***See Figures 4-13***:
   - **a.** Fully raise the drill extending the main lift cylinders
   - **b.** Remove the transport locks from the cylinder shafts and place in the storage location.
   - **c.** Remove both rear parking stands **(5110-12-1/2' & 5110-15')** from transport position and install in parking position ***See Figures 4-2*** **and** ***See Figure 4-3*****.** If storing on soft ground, place board/plate under the stands for a wider footprint.
   - **d.** Adjust both front parking stands **(12-1/2' model only)** from transport/planting position to storage position ***See Figures 4-4*** and ***See Figures 4-5***.
   - **e.** Unplug the light harness at the front of the drill frame.
   - **f.** Unplug any optional drill monitor harnesses.
   - **g.** Loosen any optional marker hoses from the hitch, and leave with the drill.
   - **h.** Slowly lower the drill to the ground until weight is relieved from the top link. Unpin the top link from the drill.
   - **i.** Continue to lower the drill to the ground until weight is relieved from the lower 3-point arms and remove pins.
   - **j.** With all hoses, wires and pins disconnected from the drill slowly pull the hitch away from the drill.
   - **k.** Select a large level area to park the pull hitch.
   - **l.** Move the jack from the storage position and place in the parking position at the front of the hitch. **I**f storing on soft ground, place board/plate under the jack for a wider foot print.
   - **m.** Disconnect the hydraulic hoses and place in holes on the hose holder mount on front of implement hitch
   - **n.** Unplug the seven-pin electrical connector and store in the stor-a-way, harness on the hose holder mount on front of implement hitch.
   - **o.** Disconnect the safety chain from the tractor. Attach the chain hook close to the chain attaching point to keep the hook off the ground.
   - **p.** Carefully remove the hitch pin.

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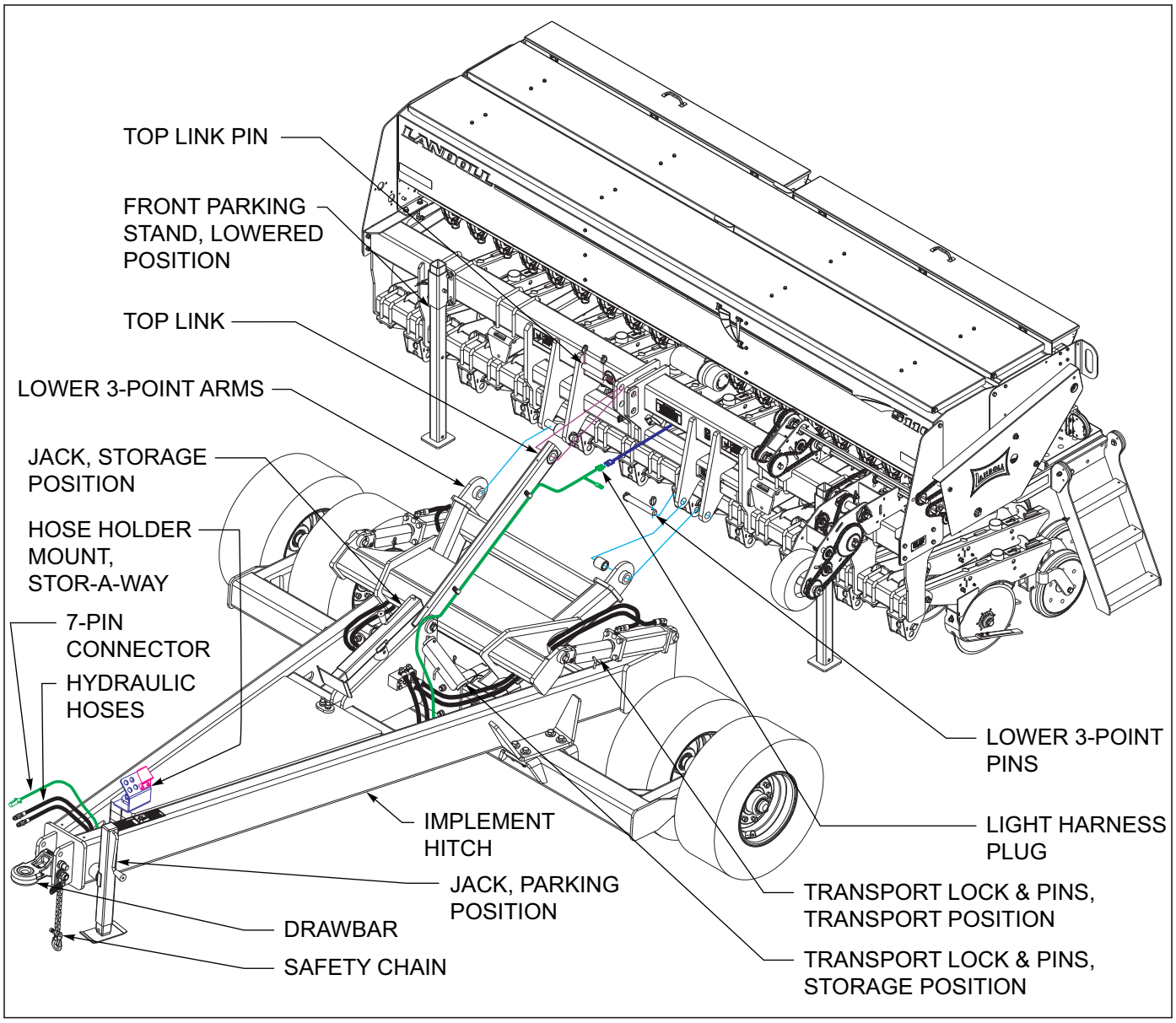


Figure 4-12: Removing Drill from Pull Hitch 5110-12-1/2'

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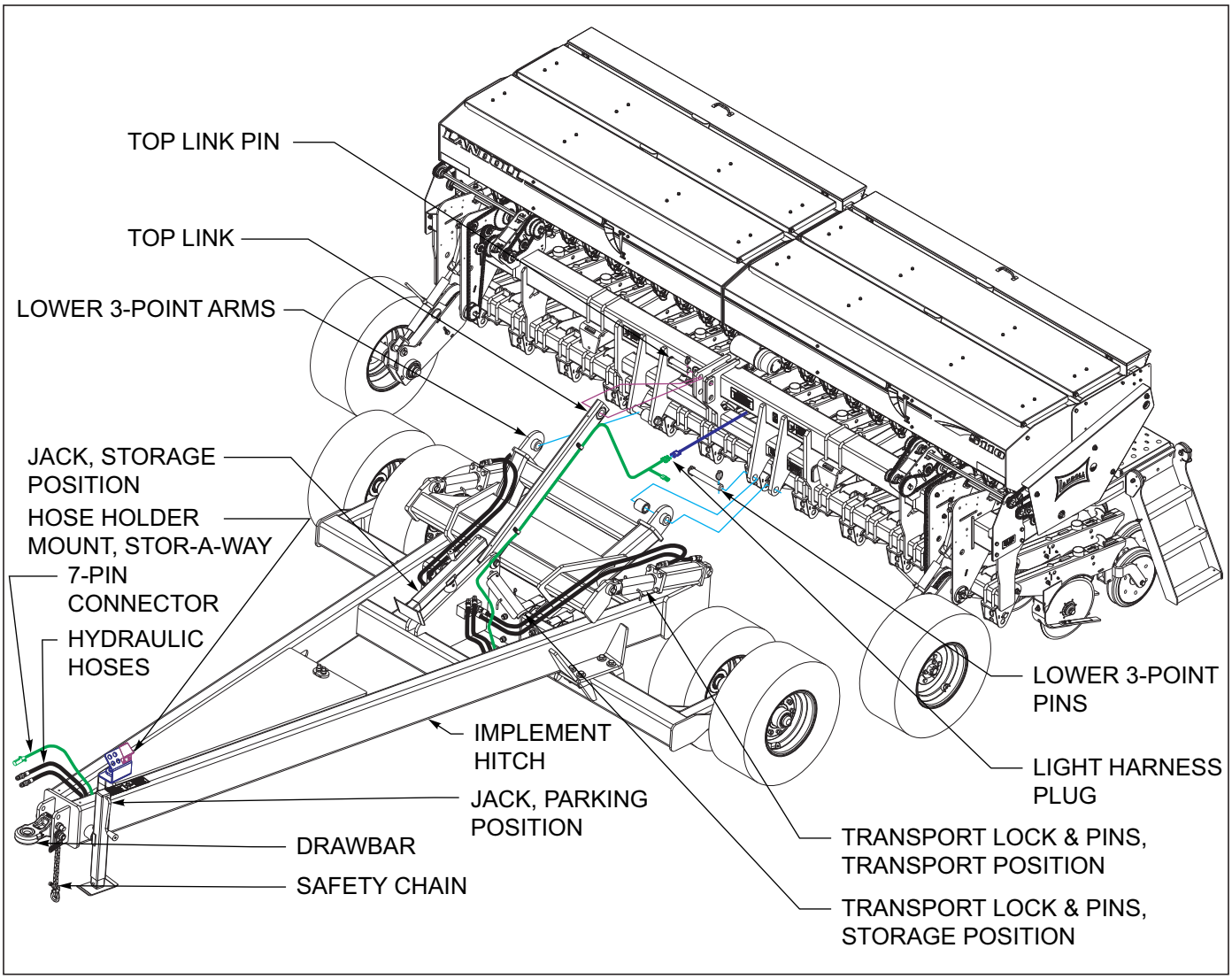


Figure 4-13: Removing Drill from Pull Hitch 5110-15'

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Table provided for general use.

NOTES:

5110NG Transporting the Grain Drill (Three-Point Hitch)

Before transporting the grain drill, check the following:

1. Check and follow all federal, state and local requirements before transporting the grain drill.
2. Verify that the tractor is adequate size and weight for carrying/transporting the drill. Additional ballast may need to be added to the front of the tractor. There must always be ample weight on the steering wheels.
3. Verify that all three-point links are securely pinned to the tractor and retainers in place.
4. Remove drill parking stands and place in storage locations
5. Plug in the safety lights to the tractor seven-pin connector ***See Figure 4-14***. Make sure lights, reflectors, and SMV emblem are clearly visible and functioning properly. Remove any obstructions such as dirt, mud, stalks or residue that restricts view before transporting.
6. Connect the hydraulic hoses (optional markers). Route and secure the hydraulic hoses to avoid interference with the drawbar or three-point hitch. Do not allow the hydraulic hoses to drag on the ground.
7. Whenever possible do not transport the drill loaded with seed. Additional weight increases braking distances, reduces steering, raises the center of gravity, and reduces stability.
8. Do not transport the drill with seed in the native grass box. The seed can settle packing in around drive components and causing uneven distribution while transporting.
9. Transport during daylight hours whenever possible. Always use flashing warning lights except where such use is prohibited by law.
10. Fully raise the drill for transport.

DANGER

Stay away from power lines when transporting, extending, or folding implement. Electrocution can occur without direct contact

11. Know the height and width of the implement being towed. Markers, tanks, attachments, etc. can increase the height and width of the implement.

CAUTION

Excessive speed may result in loss of control of the tractor and implement, reduced braking, or failure of the implement tires or structure. Do not exceed the implement maximum specified ground speed regardless of the capability of the maximum tractor speed.

12. Unless noted on the grain drill, maximum specified ground speed for the grain drill is 20 mph and is designated on the speed identification symbol (SIS) located on the front of the grain drill.
    a. Maximum travel speed for the drill is the lesser of
        i. The limit of the road conditions
        ii. The maximum specified ground speed
            1. For towing operations as indicated in the operator's manual or SIS.
            2. Of the towed vehicle as indicated in its operator' manual, SIS, or information sign.
    b. The maximum ground speed of the towed equipment combination shall be limited to the lowest specified ground speed of any of the towed machines. This is the ground speed limitation.
13. Slow down when driving on rough roads. Reduce speed when turning, or on curves and slopes to avoid tipping.
14. Equipment altered other than the place of manufacture may reduce the maximum transport speed. Additional weight, added tanks, markers, harrow attachments, tow hitches, etc. may reduce the implements carrying capabilities.

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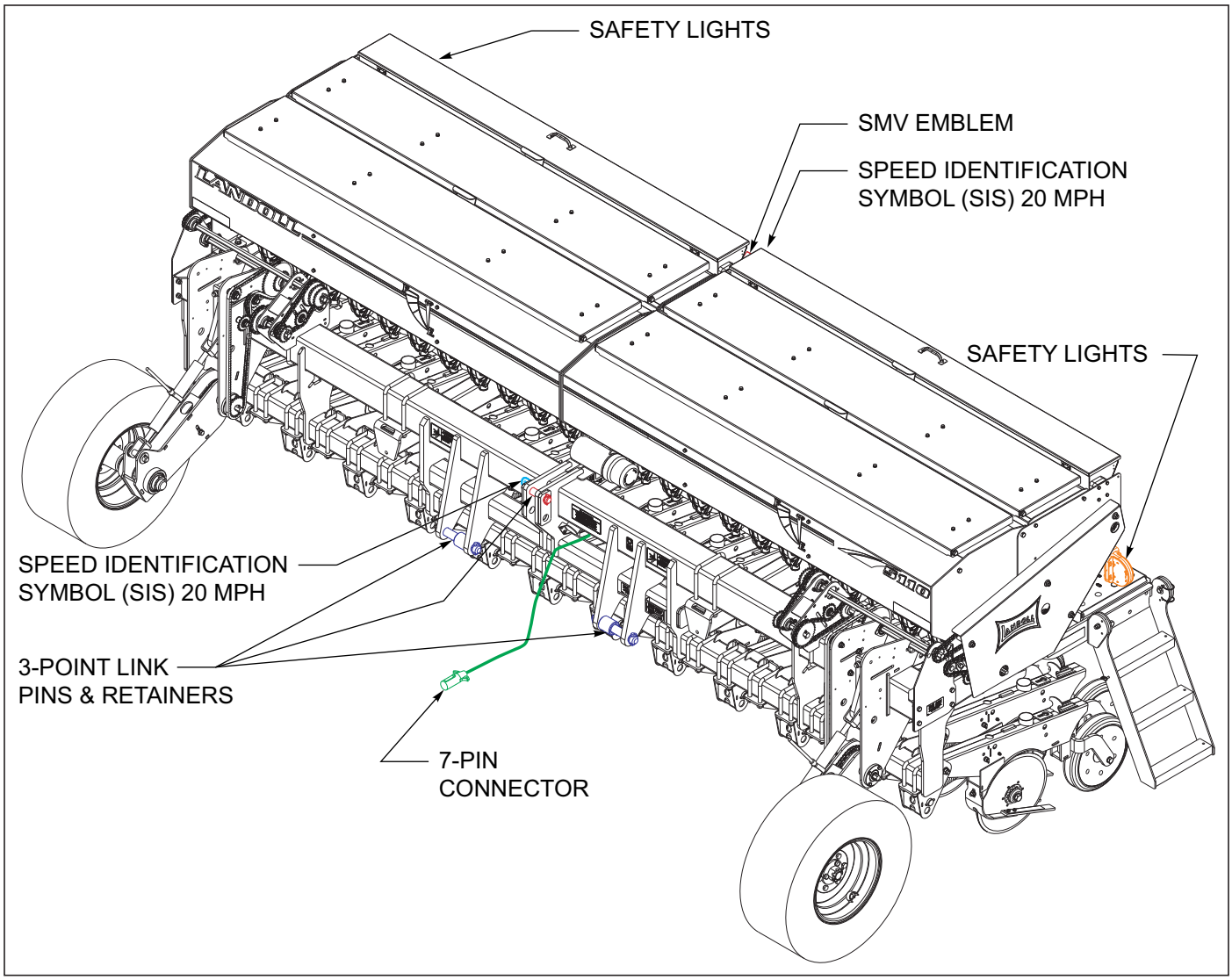


Figure 4-14: Transporting Grain Drill (Three - Point Hitch)

5110 Transporting the Grain Drill (Pull Hitch)

Before transporting the grain drill, check the following:

1. Check and follow all federal, state and local requirements before transporting the grain drill.
2. The grain drill should be transported only by a tractor required for field operation. The implement weight should not exceed more than 1.5 times the tractor weight.
3. Check to see that the tractor drawbar is rated to carry the weight of the grain drill hitch
4. Use a locking style hitch pin that properly fits the holes in the tractor drawbar and implement hitch.
5. Attach the safety chain to insure safe transport.
   a. The safety chain should have a tensile strength equal to or greater than the gross weight of the implement. The chain is attached to the lower hitch clevis hole with two flat washers between the clamp plates to assure a tight connection. Always use a 1” diameter Grade 8 bolt for this connection.
   a. Attach the safety chain to the tractor drawbar ***See Figure 4-15***. Provide only enough slack in the chain for turning. Do not use an intermediate chain support as the attaching point for the chain on the tractor. Do not pull the implement by the safety chain.
   a. When unhitching from the tractor, attach the hook end of the chain to a free link close to the hitch clevis for storage. This will keep the hook off the ground, reducing corrosion, and keep the hook functioning correctly.
   a. Regularly inspect the safety chain for worn, stretched, of broken links and ends. Replace the safety chain if damaged or deformed in any way.
6. Raise the implement parking jack, and place in storage location.
7. Plug in the safety lights to the tractor seven-pin connector. Make sure lights, reflectors, and SMV emblem are clearly visible and functioning properly. Remove any obstructions such as dirt, mud, stalks or residue that restricts view before transporting.
8. Connect the hydraulic hoses. Route and secure the hydraulic hoses to avoid interference with the drawbar or three-point hitch. Do not allow the hydraulic hoses to drag on the ground.
9. Whenever possible do not transport the drill loaded with seed. Additional weight increases braking distances, reduces steering, raises the center of gravity, and reduces stability.
10. Do not transport the drill with seed in the native grass box. The seed can settle packing in around drive components and causing uneven distribution while transporting.
11. Transport during daylight hours whenever possible. Always use flashing warning lights except where such use is prohibited by law.
12. Fully raise the drill for transport.
13. Raise the drill and place the rear parking stands in the storage position ***See Figure 4-2***.

WARNING

Failure to use transports locks and pins during transport may result in equipment damage, serious injury, or death.

14. Make sure all transport locks and pins are installed.

DANGER

Stay away from power lines when transporting, extending, or folding implement. Electrocution can occur without direct contact

15. Know the height and width of the implement being towed. Markers, tanks, attachments, etc. can increase the height and width of the implement.

CAUTION

Excessive speed may result in loss of control of the tractor and implement, reduced braking, or failure of the implement tires or structure. Do not exceed the implement maximum specified ground speed regardless of the capability of the maximum tractor speed.

16. Maximum specified ground speed for the grain drill is 20 mph and is designated on the speed identification symbol (SIS) located on the front of the grain drill.
   a. Maximum travel speed for the drill is the lesser of
      i. The limit of the road conditions
      ii. The maximum specified ground speed
         1. For towing operations as indicated in the operator’s manual or SIS.
         2. Of the towed vehicle as indicated in its operator’ manual, SIS, or information sign.
   b. The maximum ground speed of the towed equipment combination shall be limited to the lowest specified ground speed of any of the towed machines. This is the ground speed limitation.

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17. Slow down when driving on rough roads. Reduce speed when turning, or on curves and slopes to avoid tipping.

18. Equipment altered other than the place of manufacture may reduce the maximum transport speed. Additional weight, added tanks, markers, harrow attachments, tow hitches, etc. may reduce the implements carrying capabilities.

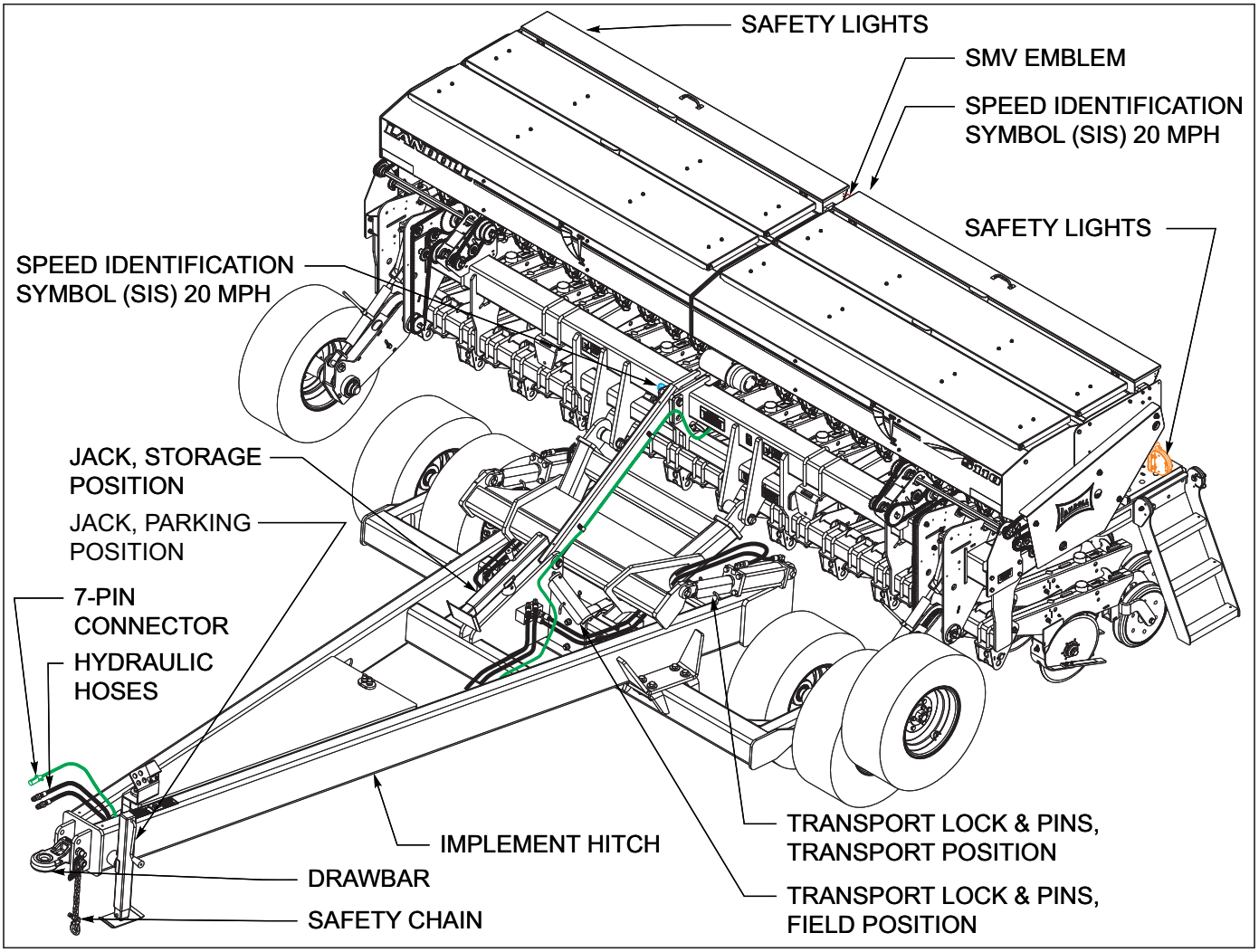


Figure 4-15: Transporting Grain Drill (Pull Hitch)

Hydraulic Lift System - Three-Point Hitch

The three- point drill is equipped with a three-point hitch, so the Tractor may raise and lower the grain drill from transport to planting position.

1. Field Operation
   - **a.** Lower the drill completely when planting to insure consistent depth.
   - **b.** Gauge wheels must be in contact with the ground to properly drive the drill.
   - **c.** Gauge wheels must be in contact with the ground to properly drive the drill.
   - **d.** Raise the drill when making sharp turns to prevent side load/damage to the openers.
   - **e.** Never back up the Grain Drill with the openers in the ground. This can plug and possibly damage the openers. Always fully raise the drill before backing.

WARNING

Fully lower the drill to the ground before attempting to service, maintain, unplug or park the drill. Do not rely on Tractor hydraulics to hold the drill in the raised position. Failure to lower the drill can result in serious personal injury.

Hydraulic Lift System - Pull Hitch

The Grain Drill is equipped with a hydraulic lift system to raise and lower the unit from transport to planting position.

WARNING

Escaping hydraulic fluid can cause serious personnel injury. Relieve system pressure before repairing, adjusting, or disconnecting. Wear proper hand and eye protection when searching for leaks. Use cardboard instead of hands *See Figure 4-16* Keep all components (cylinders, hoses, fittings, etc.) in good repair.

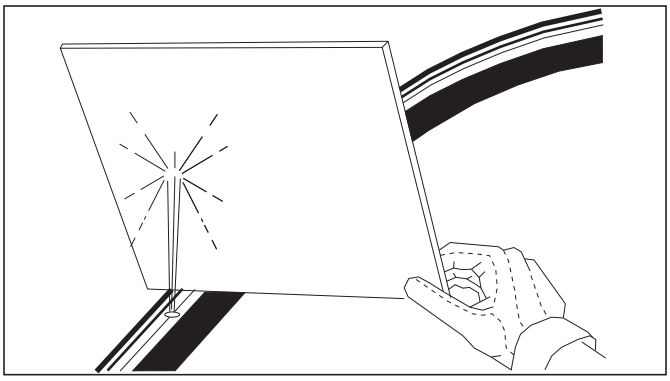


Figure 4-16: Hydraulic Leak Detection

1. The hydraulic lift system contains cylinders plumbed together.
2. The Grain Drill can have both positive and negative hitch weight. Attach the drill to the tractor before attempting to raise or lower the drill hydraulically.
3. Before transporting make sure lift cylinders are fully extended for maximum transport height. Install transport locks ***See Figures 4-15***.
4. Field Operation
   - **a.** Before starting field operation, fully raise the drill and remove transports locks ***(See "Transport Locks - Pull Hitch" on page 4-4.)***
   - **b.** Lower the drill completely when planting to insure consistent depth.
   - **c.** Gauge wheels must be in contact with the ground to properly drive the drill.
   - **d.** Raise the drill when making sharp turns to prevent side load/damage to the openers.
   - **e.** Never back up the Grain Drill with the openers in the ground. This can plug and possibly damage the openers. Always fully raise the drill before backing.
   - **f.** Fully raise the drill and install the transport locks before transporting or working beneath the drill ***(See "Transport Locks - Pull Hitch" on page 4-4.)*.**

WARNING

Fully raise the drill and install both transport locks, or fully lower the drill to the ground and relieve system pressure before servicing, maintaining, unplugging or parking the drill. Failure to lower the drill can result in serious personal injury.

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Three-Point Hitch

The 5110NG may be equipped with a 3 point hitch versus a pull hitch. The 3 point hitch is a standard width CAT III hitch and will attach to any tractor with a CAT III hitch or quick hitch.

Drills equipped with the 3 point hitch will be equipped with drive wheels at each end of the main frame. The drive wheels will be used to gauge the depth of the grain drill openers when in the field. For initial adjustment, the bottom of the 4x 4 toolbar should be approximately 20" above the ground ***See Figure 4-17***. Seeding depth and ground conditions can vary this measurement. Raise or lower the seeding depth by extending/retracting the ratchet jack assembly on each drive wheel ***See Figure 4-18***. Measure the pin-to-pin length of both ratchet jacks and set them the same so the unit depth will be even.

Some drills will drive the seed boxes from both drive wheels, other drills will only drive from one end. It is important to keep the drive wheels in contact with the ground while seeding. Failure to maintain ground contact will result in seeding skips. Raise the drill when turning to prevent side loading and damage to the openers and drive wheels.

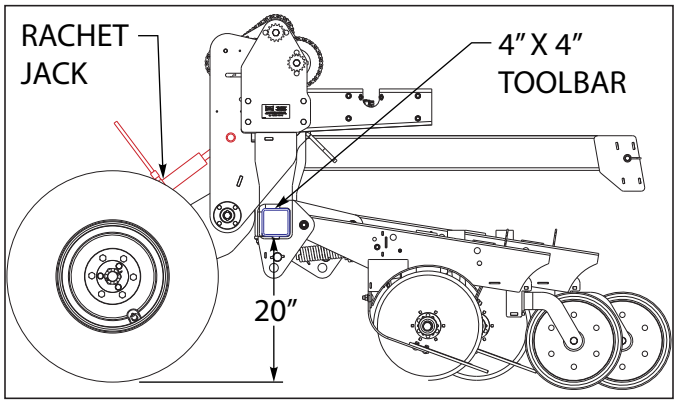


Figure 4-17: Drill Depth Adjustment

The 3 point drill should be level front-to-rear, when in the planting position. Adjust the top 3 point link on the tractor to level the drill front-to-rear.

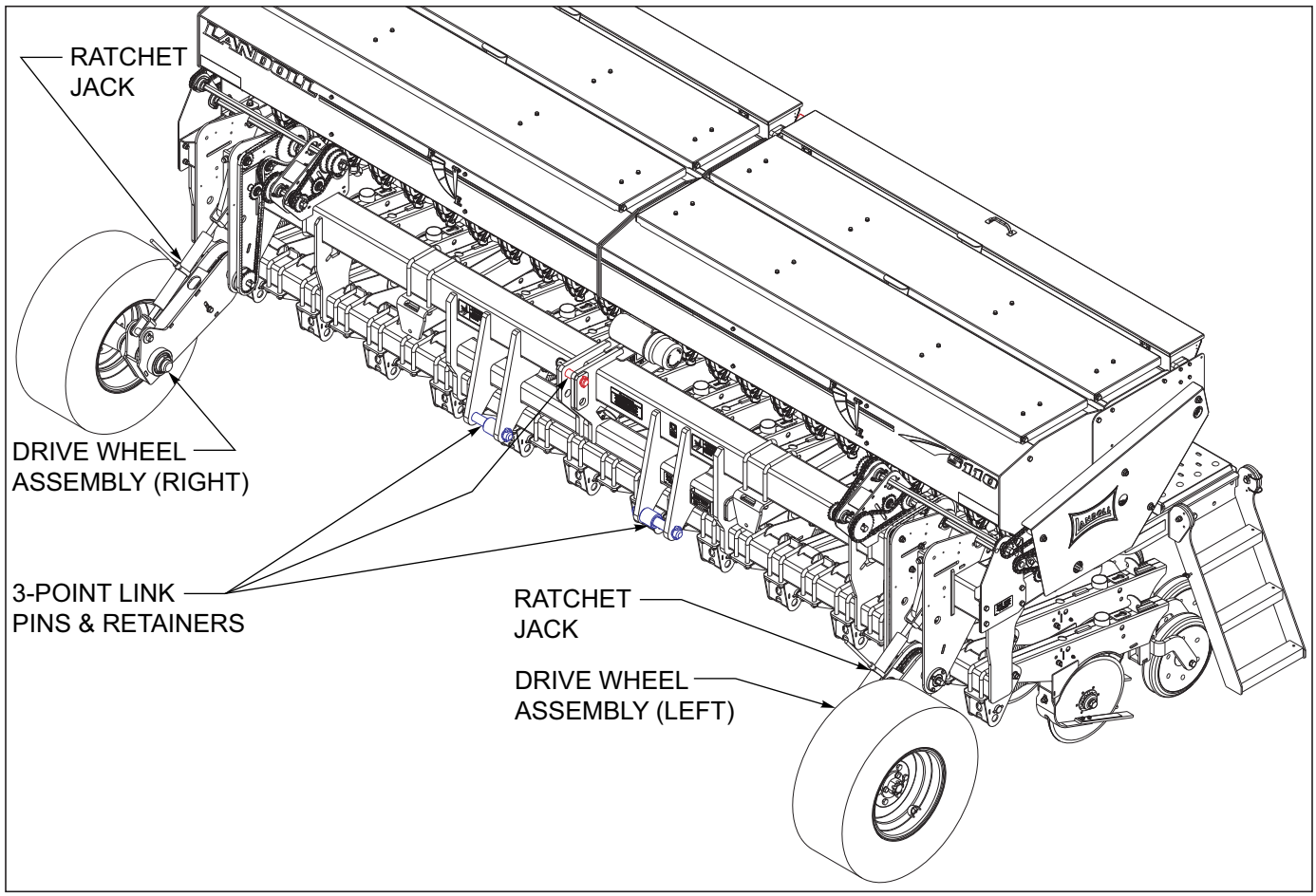
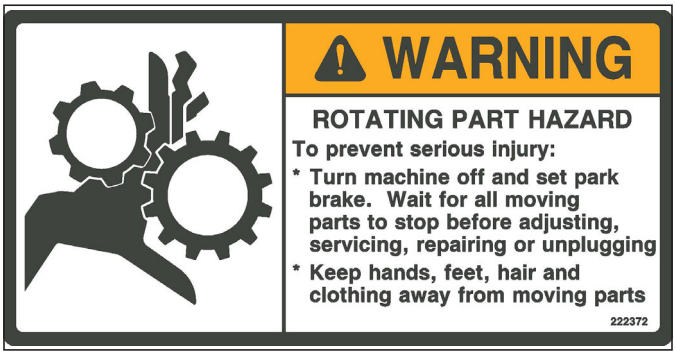


Figure 4-18: Three-Point Hitch

Filling Seed Boxes

Attach the grain drill hitch to the tractor before attempting to fill with seed. This will safely secure the drill and prevent the drill from tipping *(See "Attaching Grain Drill To The Tractor - Three-Point" on page 4-2.)* or *(See "Attaching Grain Drill To The Tractor - Pull Hitch (Optional)" on page 4-4.)*.



The grain drill should be lowered to the ground, with the tractor in park. Do not attempt to fill the drill with the tractor moving.

DANGER

Chemical Hazard - to prevent serious injury or death, do not meter chemicals through the grain drill, only seed. Wear protective gear as required by manufacturer when handling treated seed.

The grain drill seed boxes are for metering seed only. Do not attempt to meter chemicals through any of the seed boxes.

Wear proper protective gear when handling treated seed according to the manufacturer's label.

WARNING

Falling Hazard - to prevent serious injury or death, No riders on drill. Watch your step climbing on ladder and walk board.

Main Seed Box (Capacities are 2.0 or 2.4 bushels/ft)

1. Open the main seed box lid
2. Clean and remove any unwanted seed or debris from the seed box
3. Close the seed meter gate to the desired setting for all seed meters.
4. Install optional seed meter plugs for desired row spacing.
5. Adjust the seed rate adjustment to the desired rate setting. Run a calibration test if seeding rate is unknown.
6. Load the seed evenly in the seed box(es).
7. Close the main seed box lid.

Native Grass Seed Box (Capacity 1.25 bushels/ft)

1. Open the native grass box lid
2. Clean and remove any unwanted seed or debris from the seed box

NOTE

Adjust the native grass seed drive to the desired rate. Verify rate with calibration test.

3. Load the seed evenly in the seed box(es)
4. Adding powdered graphite to the native grass seed will improve seed flow and even metering. Apply approximately 1 cup per 15' drill width across the top of the native grass seed. Graphite rates may need doubled or tripled in humid seeding environments.
5. Close the native grass seed box lid.

NOTE

To prevent damage to the native grass seeder/agitator, do not transport with native grass box full of seed.

Small Seed Box (Capacity .25 bushels/ft)

1. Open the small seed box lid
2. Clean and remove any unwanted seed or debris from the seed box
3. Adjust the seed rate adjustment to the desired rate setting. Run a calibration test if seeding rate is unknown.
4. Load the seed evenly in the seed box(es).
5. Close the small seed box lid.

When finished seeding, clean and remove all seed from the seed boxes. Open the seed gate handles completely on the main seed box to empty any remaining seed. Store the drill inside if possible. Cover the drill with a tarp if it must be stored outside.

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Seed Level Indicator

1. Each seed box has a visual seed level indicator to show the approximate volume of seed available in the seed box ***See Figure 4-19***. A float inside the box sets upon the top level of seed to indicate the seed level. The float will raise when the seed box lid is open to allow for filling.
2. There are indicator lines on the decal showing approximate 1/4, 1/2 and 3/4 seed box levels.

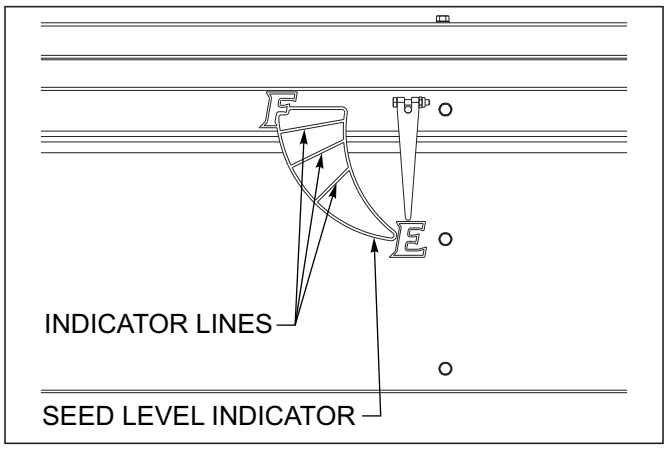


Figure 4-19: Seed Level Indicator

Seed Meter Gate Adjustment

The seed meter has an adjustable seed gate to accommodate various seed sizes for planting. The seed gate is adjusted by the handle on the outside of each seed meter.

1. Use the top seed gate position when planting small seeds such as alfalfa, oats, barley, rice, or wheat ***See Figure 4-20***
2. The second from top seed gate position is for peas, small soybeans, etc. If excess cracking occurs, move the handle to the third position.
3. Use the third seed gate position for large peas, large soybeans, etc.
4. Use the fourth seed gate position when planting extra large/irregular seeds such as garbanzo beans.

NOTE

Adjust the seed gate to the desired setting before filling the seed box. Before planting make sure all seed gate settings are the same.

5. The seed gate may also be completely lowered to clean out the meter and seed box ***See Figure 4-20*** Fully open all seed meter gates at the end of planting season to clean out any remaining seed.

NOTE

Do not attempt to fully open the seed meter gate unless you are ready to empty the seed box.Once the gate is open, it may be difficult to close the seed meter gate until the seed box is empty.

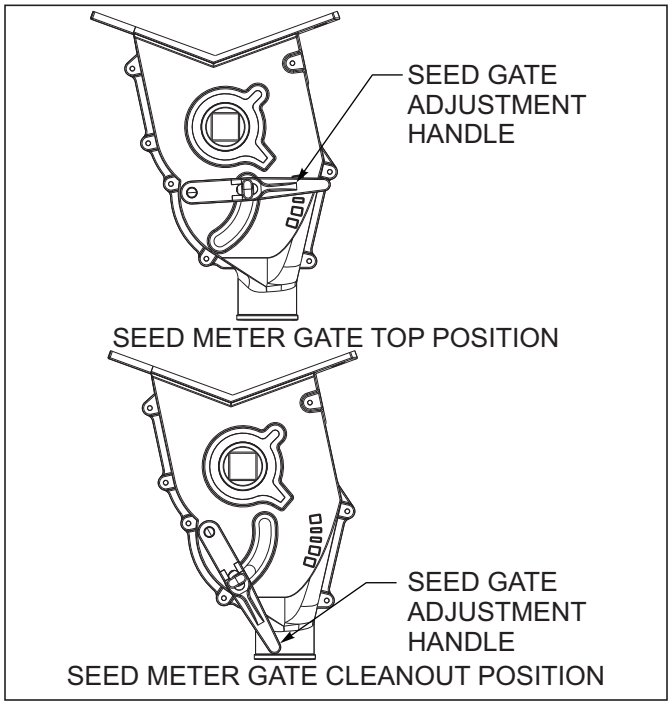


Figure 4-20: Seed Meter Gate Adjustment

Seed Plug Installation (Optional)

Seed Plugs may be installed inside main seed boxes for different row spacings ***See Figure 4-21***. Seed plugs snap into seed meter opening to keep seed from being planted in certain rows.

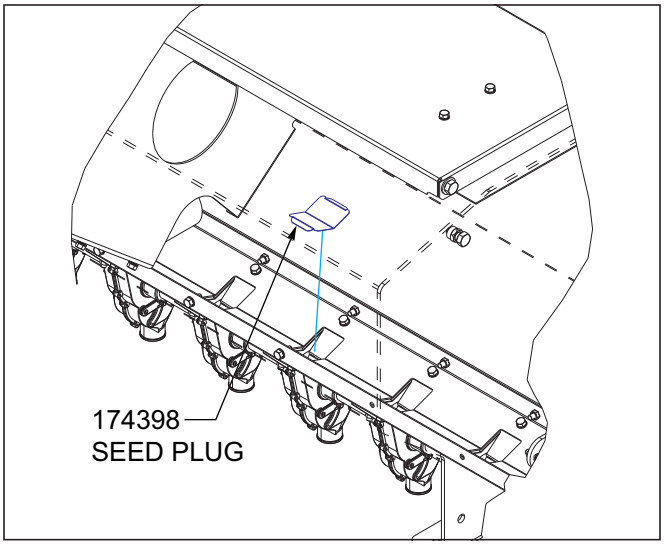


Figure 4-21: Seed Plug Installation

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Seed Rate Adjustment

1. The seeding rate is adjusted for each section with the threaded seed rate adjustment at one end of each drill section. The end seed meter next to the adjustment has an indicating scale (visible from the front) for reference. Read the scale along the outside edge of the seed meter to determine the setting. The seeding rate should be set the same for all sections ***See Figure 4-22***.

NOTE

The 15' drill has two adjustments, one on each box.

   a. To set the seeding rate, first determine from the seed rate chart the meter opening for the desired seed rate. The seed rate chart is located inside the lid of the center seed box ***See Figure 4-26***.

   b. Loosen the locking nut on the square seed shaft on the outer end of drill.

   c. Adjust the nuts on the inside and outside of the square shaft until the desired rate setting is obtained, along the outside of the meter.

   d. Re-tighten the locking nut to secure the seed rate setting.

NOTE

Do not force the seed meter shaft, damage will occur. The meter will not be able to fully close if there is seed in the box. Lube/oil the square seed shaft so that it will easily slide through the support bearing while adjusting.

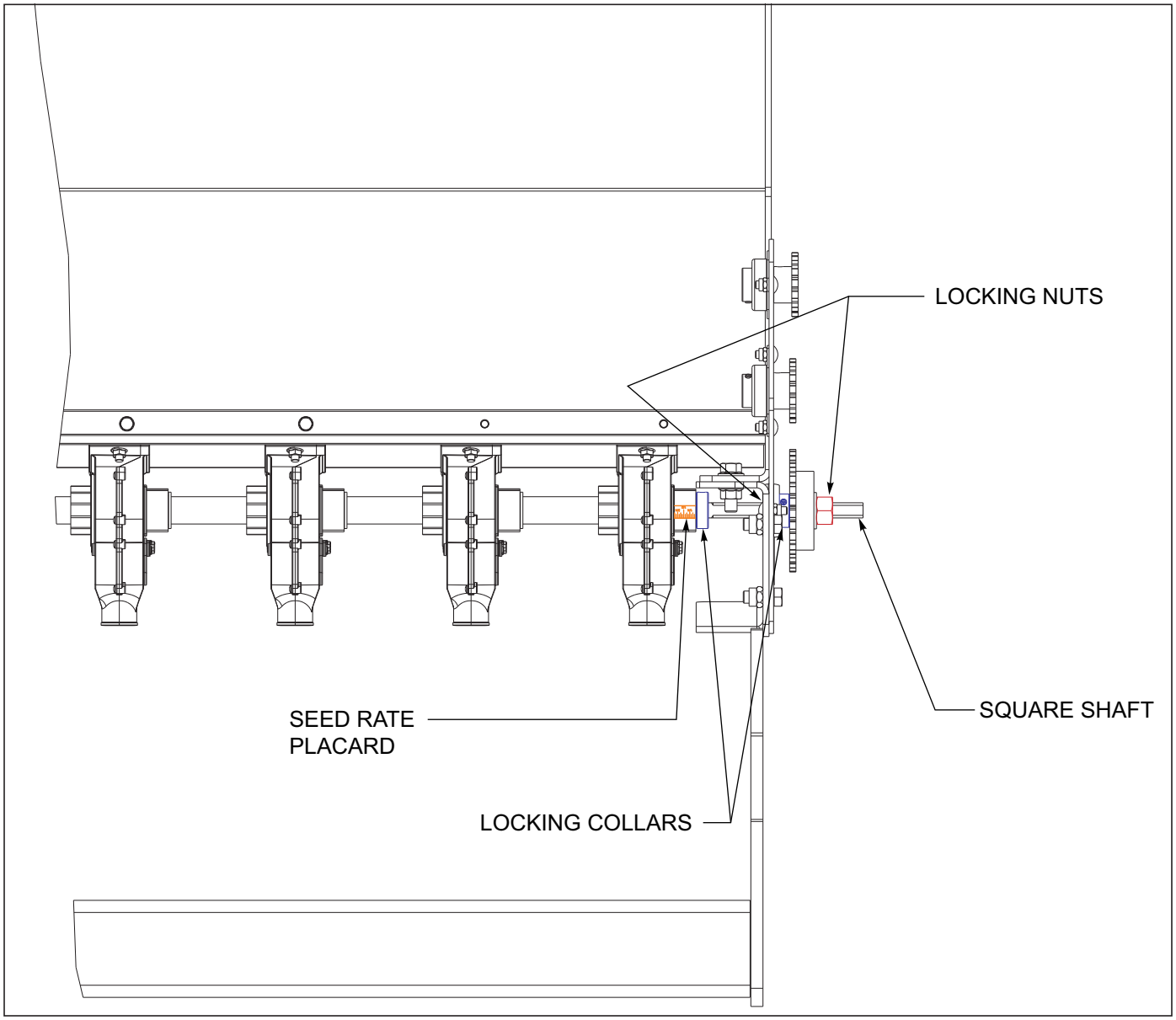


Figure 4-22: Seed Rate Adjustment

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Meter/Seed Rate Adjustment

1. If the seed meter shaft is disassembled for maintenance or repair the seed meters and adjustment handle will need to be reset or zeroed to set the meters equally across the section.
2. To reset the meters, loosely reassemble the shaft, meters, spacers, locking collars, etc. but leave the locking collars loose.
3. Tighten the locking nut on the threaded seed shaft adjustment to hold the shaft in place.
4. Start with the end meter(s) next to the threaded adjustment *See Figure 4-22*. Slide the feed roll and cut-off to the right until the indicator reads zero on the end meter. Remove any remaining slack between the spacers, washers, feed rolls etc. and secure the lock collars on each end of that group of meters. Continue to work across the drill section sliding the meter feed rolls to the right, removing any slack, and securing the lock collars for each group of meters.
5. With all lock collars secure on the seed shaft and all slack removed from between the spacers, verify that each meter is actually zeroed out. The feed roll should not be protruding or recessed inside any of the meters. To fine tune each meter, if necessary, loosen the two bolts holding the meter housing to the bottom of the seed box. Slide the meter housing to the right or left, until the meter is zeroed out. Re tighten the meter housing to the bottom of the seed box. The meter housing should be square with the seed shaft and not twisted when tightening the meter housing bolts.

Seed Rate Calibration

1. The seed rate charts are in pounds per acre and based on an average seed size ***See Figure 4-26*****.** Several factors can influence seeding rates: seed varieties, seed size, seed weight, seed treatment, seed cleanliness, tire pressure, tire slippage, and tire size.

IMPORTANT

The operator must verify actual seed output before planting to insure the desired seeding rate.

2. If the specific seed is not listed on the seed chart, pick a similar seed size and check the seed calibration for the desired rate.
3. To check the seeding rate:
   a. Adjust the seeding rate and drive type to the desired rate from the seed chart ***See Figure 4-26***.
   b. Select three seed meters next to each other, and disconnect the rubber seed tubes to be able to catch the seed.
   c. Fill the box with a sufficient amount of seed over the three meters.
   d. Collect the seed from the three seed meters as you rotate the drive wheel by hand. Count the total number of rotations. Twenty rotations would be a good starting point; more rotations will produce more accurate results.
   e. Weigh (in pounds) the total amount of seed and divide by 3 for an average amount of seed per meter. ***See Figures 4-26*** for seed rate formula.
4. Adjust the seed meter rate to compensate for any variation, and repeat the seed calibration until the desired seeding rate is achieved.
5. ***See Figures 4-26*** for rate and number of seeds per row formulas.

Drive Type Setting

Drive type setting allows the grain drill a wider range of seeding rates increasing/decreasing the seeding shaft speed. The drive types may be changed for either the gauge wheel drive or the contact drive ***See Figure 4-25***.

NOTE

Changing the drive type will affect the seeding rates of ALL boxes, the main seed, native grass seed, and small seed boxes.

The Type I is standard speed setting, the Type II is half speed setting, and Type III is a double speed setting.

Contact Drive

To change the drive type setting, loosen the adjustable idler sprocket to relieve the slack in the drive chain ***See Figures 4-23***. Remove the drive chain. Remove the pins holding the drive sprockets in place and select the sprockets for the desired seeding rate. Install the selected sprockets on the shafts. Place the extra sprockets on the shafts and reinstall the pins. Note: if using the 12-tooth drive sprocket, move the 24-tooth sprocket to the other side of the contact drive wheel for drive chain clearance. Route the drive chain as shown and readjust the idler sprocket to hold in place.

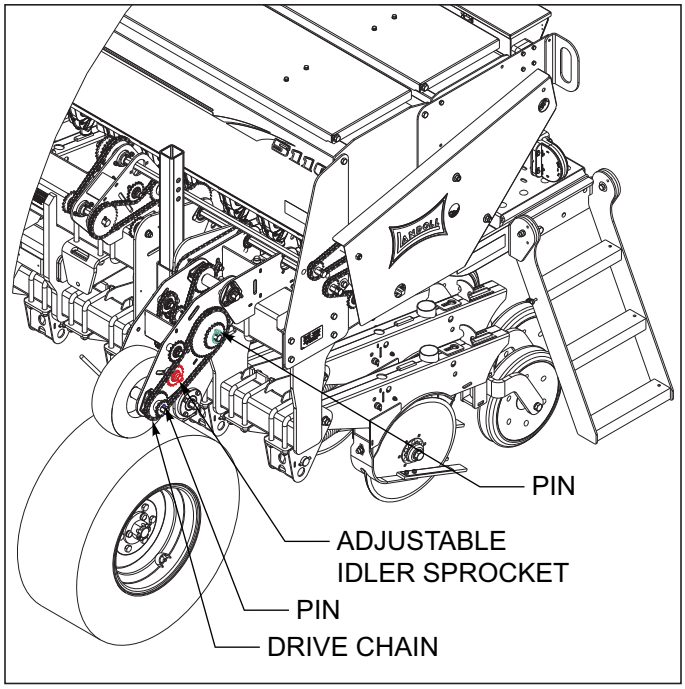


Figure 4-23: Contact Drive

Gauge Wheel Drive

Remove the 1/4x2 bolt through the hex shaft coupler next to the upper gauge wheel sprockets ***See Figure 4-24***. Slide the coupler and short drive shaft through the native grass drive towards the middle of the drill. Loosen the adjustable idler and remove the drive chain. Remove the pin through the lower hex drive shaft if changing the lower sprocket. Select the sprockets required for the desired seeding rate and install on the upper and lower hex shafts. Place the extra sprockets on the upper shaft. Route the drive chain as shown and readjust the idler sprocket to hold in place. Reinstall the lower hex shaft pin and the 1/4x2 bolt through the shaft coupler to secure the sprockets.

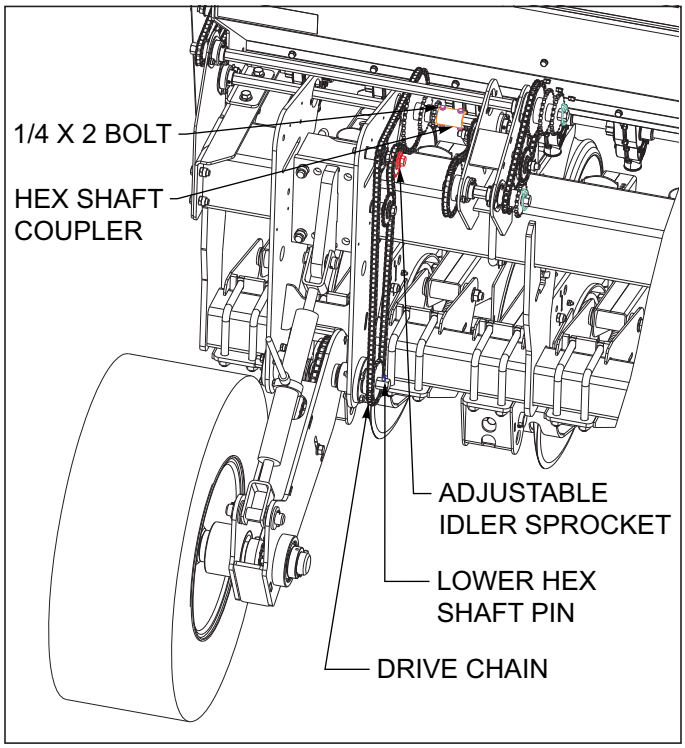
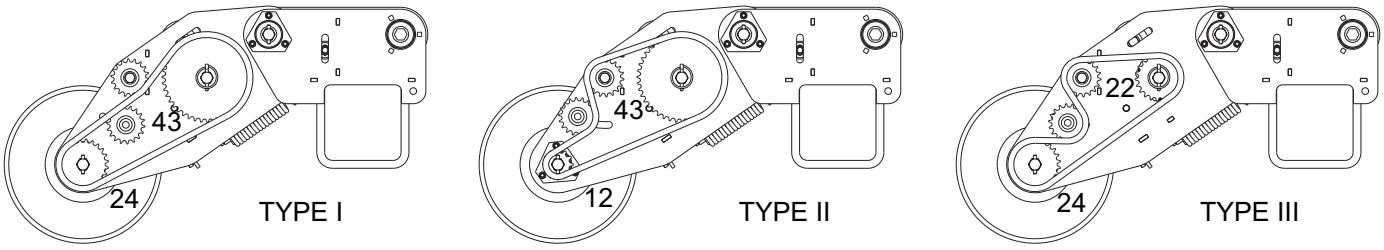
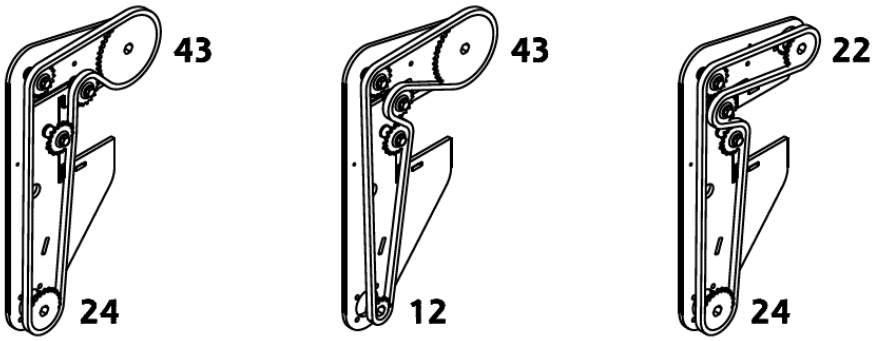


Figure 4-24: Gauge Wheel Drive

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CONTACT DRIVE TYPES



GAUGE WHEEL TYPES

NOTE:
DRIVE TYPE I IS STANDARD SPEED
DRIVE TYPE II IS HALF SPEED
DRIVE TYPE III IS DOUBLE SPEED

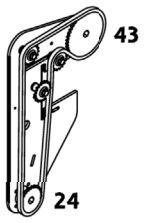
Figure 4-25: Drive Type Settings

SEEDING RATE CHART

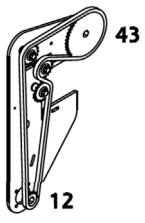
Seeding rates are in pounds per acre, based on average seed size.
Rates are approximate, operator must verify actual seeding output.

SEED	ALFALFA				BARLEY				FESCUE				MILLET				MILO				OATS				RICE				SOYBEAN				WHEAT				SEED
ROW	7-1/2		10		7-1/2		10		7-1/2		10		7-1/2		10		7-1/2		10		7-1/2		10		7-1/2		10		7-1/2		10		7-1/2		10		ROW
DRIVE	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	DRIVE
1/8	8	4	6	3					4	2	3	1	8	4	6	3	9	4	6	3													10	5	7	4	1/8
1/4	16	8	12	6	14	7	10	5	8	4	6	3	15	7	11	6	16	8	12	6													19	9	14	7	1/4
3/8	24	12	18	9	21	10	15	8	11	6	9	5	23	11	17	9	26	13	19	10					17	9	13	7	26	13	19	7	29	14	21	11	3/8
1/2	32	16	24	12	28	14	21	10	16	8	12	6	31	15	23	11	37	18	28	14					23	12	18	9	38	19	28	14	38	19	29	14	1/2
5/8	40	20	30	15	36	18	27	13	19	9	14	7	39	20	29	15	48	24	36	18					30	15	23	11	53	26	40	20	50	25	37	19	5/8
3/4	49	25	36	19	44	22	33	16	23	12	18	9	48	24	36	18					30	15	23	11	37	19	29	14	66	33	50	25	61	31	46	23	3/4
7/8	58	29	43	22	52	26	39	20	28	14	21	11	58	29	43	22					36	18	27	13	44	22	33	17	82	41	61	31	73	36	54	27	7/8
1	66	33	49	25	60	30	45	23	31	16	23	12	67	33	50	25					41	20	31	16	51	26	38	19	94	47	70	35	84	42	63	32	1
1-1/8					70	35	52	26	36	18	27	14									48	24	36	18	59	30	44	22	112	56	84	42	97	49	73	36	1-1/8
1-1/4					79	39	59	30	40	20	30	15									54	27	40	20	67	33	50	25	131	65	98	49	110	55	83	41	1-1/4
1-3/8					89	44	67	33	44	22	33	17									61	30	46	23	75	38	56	28	152	76	114	57	124	62	93	46	1-3/8
1-1/2					100	50	75	38	47	24	35	18									69	34	51	26	85	42	64	32	162	81	122	61	140	70	105	52	1-1/2
1-5/8					113	56	84	42	52	26	39	20									77	39	58	29	95	48	71	36	182	91	137	68	157	78	118	59	1-5/8
1-3/4					122	61	91	46	55	28	41	21									84	41	62	31	103	52	77	39	185	95	140	70	170	85	127	64	1-3/4

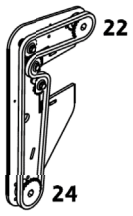
METER OPENING (INCHES)



TYPE I



TYPE II



TYPE III

Note:

Drive type I is standard speed
Drive type II is half speed
Drive type III is double speed

222377

SEED RATE = $\frac{\text{(AVG SEED WEIGHT) X 65896}}{\text{(NO. OF ROTATIONS) X (ROW SPACING)}}$

EXAMPLE = $\frac{\text{(.1707 LBS.) X 65896}}{\text{(20 ROTATIONS) X (7.5")}}$ = 75 LBS./ACRE

SEEDS per ROW = $\frac{\text{(SEED RATE) X (SEEDS/LB) x (NO. OF ROTATIONS) x (ROW SPACING)}}{65896}$

EXAMPLE = $\frac{\text{(60 LBS./ACRE) X (2,500 SEEDS/LB) x (20 ROTATIONS) x (7.5")}}{65896}$ = 341 SEEDS PER ROW

SEEDS per ROW = $\frac{\text{(POPULATION) X (NO. OF ROTATIONS) X (ROW SPACING)}}{65896}$

EXAMPLE = $\frac{\text{(50,000POPULATION) X (20 ROTATIONS) X (7.5")}}{65896}$ = 114 SEEDS PER ROW

Figure 4-26: Seed Rate Chart and Calibration Formulas

ALFALFA

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	8	16	24	32	40	49	58	66						
10 inch	6	12	18	24	30	36	43	49						

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	4	8	12	16	20	25	29	33						
10 inch	3	6	9	12	15	18	22	25						

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	16	32	48	64	80	98	116	122						
10 inch	12	24	36	48	60	72	86	98						

BARLEY

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch		14	21	28	36	44	52	60	70	79	89	100	113	122
10 inch		10	15	21	27	33	39	45	52	59	67	75	84	91

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch		7	10	14	18	22	26	30	35	39	44	50	56	61
10 inch		5	8	10	13	16	20	23	26	30	33	38	42	46

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch		28	42	56	72	88	104	120	140	158	178	200	226	244
10 inch		20	30	42	54	66	78	90	104	118	134	150	168	182

FESCUE

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	4	8	11	16	19	23	28	31	36	40	44	47	52	55
10 inch	3	6	9	12	14	18	21	23	27	30	33	35	39	41

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	2	4	6	8	9	12	14	16	18	20	22	24	26	28
10 inch	1	3	5	6	7	9	11	12	14	15	17	18	20	21

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	8	16	22	32	38	46	56	62	72	80	88	94	104	110
10 inch	6	12	18	24	28	36	42	46	54	60	66	70	78	82

Figure 4-27: Seed Drive Chart (1 of 3)

MILLET

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	8	15	23	31	39	48	58	67						
10 inch	6	11	17	23	29	36	43	50						

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	4	7	11	15	20	24	29	33						
10 inch	3	6	9	11	15	18	22	25						

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	16	30	46	62	78	96	106	134						
10 inch	12	22	34	46	58	72	86	100						

MILO

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	9	16	26	37	48									
10 inch	6	12	19	28	36									

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	4	8	13	18	24									
10 inch	3	6	10	14	18									

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	18	32	52	74	96									
10 inch	12	24	38	56	72									

OATS

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch						30	36	41	48	54	61	69	77	84
10 inch						23	27	31	36	40	46	51	58	62

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch						15	18	20	24	27	30	34	39	41
10 inch						11	13	16	18	20	23	26	29	31

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch						60	72	82	96	108	122	138	154	168
10 inch						46	54	62	72	80	92	102	116	124

Figure 4-28: Seed Drive Chart (2 of 3)

RICE

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch			17	23	30	37	44	51	59	67	75	85	95	103
10 inch			13	18	23	29	33	38	44	50	56	64	71	77

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch			9	12	15	19	22	26	30	33	38	42	48	52
10 inch			7	9	11	14	17	19	22	25	28	32	36	39

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch			34	46	60	74	88	102	118	134	150	170	190	206
10 inch			26	36	46	58	66	76	88	100	112	128	142	154

SOYBEAN

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch			26	38	53	66	82	94	112	131	152	162	182	185
10 inch			19	28	40	50	61	70	84	98	114	122	137	140

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch			13	19	26	33	41	47	56	65	76	81	91	95
10 inch			7	14	20	25	31	35	42	49	57	61	68	70

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch			52	76	106	132	164	188	124	261	304	324	364	390
10 inch			38	56	80	100	122	140	168	196	228	244	274	280

WHEAT

Drive Type	METER OPENING													
I	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	10	19	29	38	50	61	73	84	97	110	124	140	157	170
10 inch	7	14	21	29	37	46	54	63	73	83	93	105	118	127

Drive Type	METER OPENING													
II	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	5	9	14	19	25	31	36	42	49	55	62	70	78	85
10 inch	4	7	11	14	19	23	27	32	36	41	46	52	59	64

Drive Type	METER OPENING													
III	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
7.5 inch	20	38	58	76	100	122	146	168	194	220	228	280	314	340
10 inch	14	28	42	58	74	92	108	126	146	166	186	210	236	254

Figure 4-29: Seed Drive Chart (3 of 3)

Native Grass Seeding

The native grass seed box is used for seeding large fluffy type seeds and blends such as Big and Little Bluestem, Side Oats Grama.

The native grass box sits behind the front main seeding box of the drill. Seeding rates for the native grass is controlled by 1) the Drive Type of the drill ground drive, and 2) the native grass seed drive driver\driven sprocket combinations ***See Figures 4-31*** and ***See Figures 4-32***.

NOTE

Native grass and blends will vary in density, seed weight and type. Rate charts will be variable per individual conditions, seed types, temperature, humidity, etc. For best results a calibration test should be done with each seed prior to planting.

NOTE

Operator must verify actual seeding output

To calibrate the native grass seed box:

Use the native grass seed rate to find the rate for the desired seed or similar seed. Locate the desired seed setting for the ground drive type being used.

NOTE

Changing the ground Drive Type setting will affect the seeding rates of the main seed box and the optional small seed box as well See Figures 4-30.

Use the driver (front sprocket) and the driven (rear sprocket) combination for the desired seed rate. Loosen the idler sprocket and chain between the driver\driven sprockets. Remove the pins holding the sprockets in place and install the desired sprocket combination. Install the remaining sprockets on the shafts and secure with the pins.

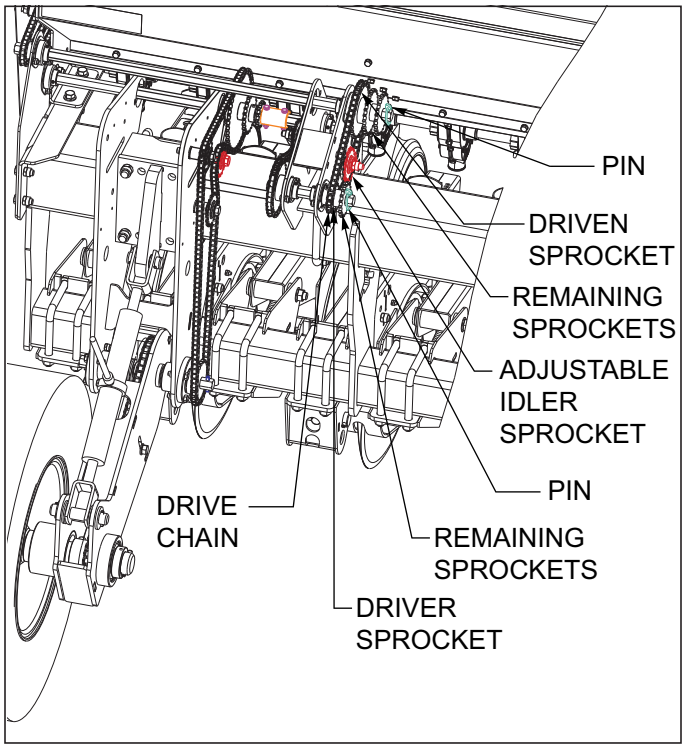


Figure 4-30: Drive Type Setting

NOTE

Adding powdered graphite to the native grass seed will improve seed flow and even metering. Apply approximately 1 cup per 15' drill width across the top of the native grass seed. Graphite rates may need to be double or tripled in humid seeding environments.

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Big Bluestem

Drive Type	SPROCKETS DRIVER/DRIVEN													
I	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	7	9	10	11	12	13	14	16	17	18	19	21	23	29
10 inch	5	7	7	8	9	9	10	12	13	13	14	16	17	21

Drive Type	SPROCKETS DRIVER/DRIVEN													
II	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	4	5	5	6	6	7	7	8	9	9	10	11	12	15
10 inch	3	4	4	4	5	5	5	6	7	7	7	8	9	11

Drive Type	SPROCKETS DRIVER/DRIVEN													
III	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	14	18	20	22	24	26	28	32	34	36	38	42	46	58
10 inch	10	14	14	16	18	18	20	24	26	26	28	32	34	42

Little Bluestem (bearded)

Drive Type	SPROCKETS DRIVER/DRIVEN													
I	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	1	1	1	2	2	2	2	2	2	2	3	3	3	4
10 inch	1	1	1	1	1	1	1	2	2	2	2	2	2	3

Drive Type	SPROCKETS DRIVER/DRIVEN													
II	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	1	1	1	1	1	1	1	1	1	1	2	2	2	2
10 inch	1	1	1	1	1	1	1	1	1	1	1	1	1	2

Drive Type	SPROCKETS DRIVER/DRIVEN													
III	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	2	2	2	4	4	4	4	4	4	4	6	6	6	8
10 inch	2	2	2	2	2	2	2	4	4	4	4	4	4	6

Brome Grass

Drive Type	SPROCKETS DRIVER/DRIVEN													
I	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	4	5	6	6	7	7	8	9	10	10	11	13	14	17
10 inch	3	4	4	5	5	5	6	7	8	8	9	9	10	13

Drive Type	SPROCKETS DRIVER/DRIVEN													
II	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	2	3	3	3	4	4	4	5	5	5	6	7	7	9
10 inch	2	2	2	3	3	3	3	4	4	4	5	5	5	7

Drive Type	SPROCKETS DRIVER/DRIVEN													
III	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	8	10	12	12	14	14	16	18	20	20	22	26	28	34
10 inch	6	8	8	10	10	10	12	14	16	16	18	18	20	26

Figure 4-31: Native Grass Drive Chart (1 of 2)

Dryland Pasture Mix (Buffalo Brand Seed)

Drive Type	SPROCKETS DRIVER/DRIVEN													
I	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	14	18	19	21	23	24	26	31	34	35	38	42	46	57
10 inch	11	13	15	16	17	18	20	23	25	26	28	31	34	43

Drive Type	SPROCKETS DRIVER/DRIVEN													
II	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	7	9	10	11	12	12	13	16	17	18	19	21	23	29
10 inch	6	7	8	8	9	9	10	12	13	13	14	16	17	22

Drive Type	SPROCKETS DRIVER/DRIVEN													
III	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	28	36	38	42	46	48	52	62	68	70	76	84	92	114
10 inch	22	26	30	32	34	36	40	46	50	52	56	62	68	86

Sandy Soil Mix (Buffalo Brand Seed)

Drive Type	SPROCKETS DRIVER/DRIVEN													
I	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	5	6	7	8	8	9	9	11	12	13	14	15	16	20
10 inch	4	5	5	6	6	6	7	8	9	9	10	11	12	15

Drive Type	SPROCKETS DRIVER/DRIVEN													
II	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	3	3	4	4	4	5	5	6	6	7	7	8	8	10
10 inch	2	3	3	3	3	3	4	4	5	5	5	6	6	8

Drive Type	SPROCKETS DRIVER/DRIVEN													
III	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	10	12	14	16	16	18	18	22	24	26	28	30	32	40
10 inch	8	10	10	12	12	12	14	16	18	18	20	22	24	30

Shortgrass Mix (Buffalo Brand Seed)

Drive Type	SPROCKETS DRIVER/DRIVEN													
I	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	6	7	8	8	9	9	10	12	13	14	15	16	18	22
10 inch	4	5	6	6	7	7	8	9	10	10	11	12	13	17

Drive Type	SPROCKETS DRIVER/DRIVEN													
II	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	3	4	4	4	5	5	5	6	7	7	8	8	9	11
10 inch	2	3	3	3	4	4	4	5	5	5	6	6	7	9

Drive Type	SPROCKETS DRIVER/DRIVEN													
III	15/30	15/24	15/22	18/24	18/22	15/18	22/24	24/22	18/15	22/18	24/18	22/15	24/15	30/15
7.5 inch	12	14	16	16	18	18	20	24	26	28	30	32	36	44
10 inch	8	10	12	12	14	14	16	18	20	20	22	24	26	34

Figure 4-32: Native Grass Drive Chart (2 of 2)

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Table provided for general use.

NOTES:

Small Seed Rate Adjustment

1. The seeding rate adjustment for the optional small seeding attachment is located at the outer rear of each seeding box. The seeding rate should be set the same for all seeding boxes. On 15' drills there will be two adjustments to be made.
2. The small seeding rate is set independent of the seeding rate on the main seeding hopper.

NOTE

Changing drive types will affect the small seed rate. Type II drive setting will cut the rate in half. Type III drive setting will double the small seed rate.

3. Adjustments to the small seeding attachment will be easier if the boxes are empty of seed before adjusting. The meters will not be able to be fully closed if there is seed in the hopper. Do not force the adjustment or damage may occur to the meters.
4. To set the seeding rate:
   a. First determine from the seeding rate chart the meter opening for the desired seed rate ***See Figure 4-34*** .
   b. Loosen the 1/2 locknut on the outer end of the small seed square shaft ***See Figure 4-33***.
   c. Adjust the inner and outer 1/2" nuts to the desired rate settings on the seed meter rate scale ***See Figure 4-36***.
   d. Re tighten the locking nut against the bearing.

NOTE

Seeding rate are based on clean untreated average size seed. Actual rates may vary, operator must verify actual seed output. If a specific seed is not listed, use a seeding rate for a similar sized seed, and verify output before planting.

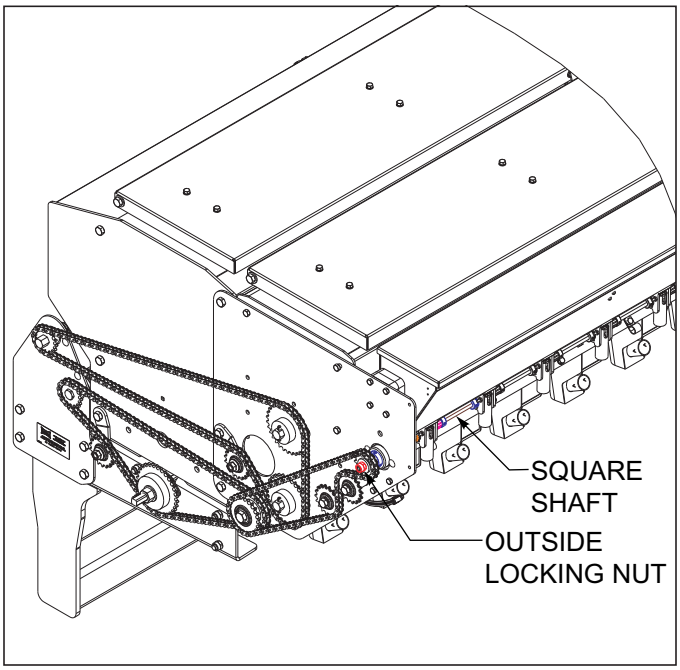


Figure 4-33: Seed Rate Locking Nut

SMALL SEED RATE CHART

SEEDING RATES ARE ARE IN POUNDS PER ACRE, BASED ON AVERAGE SEED SIZE.

RATES ARE APPROXIMATE, OPERATOR MUST VERIFY ACTUAL SEEDING OUTPUT.

222378

SEED	ROW SPACING	INDICATOR SETTING								SEED	ROW SPACING	INDICATOR SETTING							
		1/8	1/4	3/8	1/2	5/8	3/4	7/8	1			1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
ALFALFA (Uncoated)	7-1/2	2	5	10	14	17	22	25	29	LESPEDEZA (Hulled)	7-1/2	2	5	10	14	17	22	27	30
ANNUAL RYE GRASS	7-1/2	1	3	5	8	10	14	16	18	LESPEDEZA (Unhulled)	7-1/2	1	4	7	10	15	18	22	25
BIRDSFOOT TREFOIL	7-1/2	2	7	10	15	22	27	33	38	LOVE GRASS (Sand)	7-1/2	2	5	8	12	16	20	25	29
BLUEGRASS (Kentucky)	7-1/2	1	2	3	5	7	8	10	11	LOVE GRASS (Weeping)	7-1/2	1	7	10	14	18	23	28	33
BLUEGRASS (Park Kentucky)	7-1/2	1	3	5	8	10	14	16	18	MILLET	7-1/2	2	7	10	15	19	23	28	33
CANOLA	7-1/2	1	5	8	13	16	19	22	27	ORCHARD GRASS	7-1/2	-	1	2	3	4	5	6	7
CLOVER (Crimson)	7-1/2	2	5	8	13	18	21	25	32	RED TOP	7-1/2	1	2	4	5	7	8	9	10
CLOVER (Ladino,Sweet, Red)	7-1/2	2	7	10	14	18	22	25	30	REED CANARY GRASS	7-1/2	1	2	4	6	8	10	12	14
KLEIN GRASS	7-1/2	2	5	10	14	19	25	30	33	TIMOTHY	7-1/2	2	4	7	12	15	19	23	27

Figure 4-34: Small Seed Rate Chart (Type I Drive Type)

			METER OPENING							
ALFALFA	Drive Type	Spacing	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
	I	7.5	2	5	10	14	17	22	25	29
	II	7.5	1	3	5	7	9	11	13	15
	III	7.5	4	10	20	28	34	44	50	58

			METER OPENING							
ANNUAL RYE GRASS	Drive Type	Spacing	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
	I	7.5	1	3	5	8	10	14	16	18
	II	7.5	1	2	3	4	5	7	8	9
	III	7.5	2	6	10	16	20	28	32	36

			METER OPENING							
BIRDSFOOT TREFOIL	Drive Type	Spacing	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
	I	7.5	2	7	10	15	22	27	33	38
	II	7.5	1	4	5	8	11	14	17	19
	III	7.5	4	14	20	30	44	54	66	76

			METER OPENING							
BLUEGRASS (Kentucky)	Drive Type	Spacing	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
	I	7.5	1	2	3	5	7	8	10	11
	II	7.5	1	1	2	3	4	4	5	6
	III	7.5	2	4	6	10	14	16	20	22

			METER OPENING							
BLUEGRASS (Park Kentucky)	Drive Type	Spacing	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
	I	7.5	1	3	5	8	10	14	16	18
	II	7.5	1	2	3	4	5	7	8	9
	III	7.5	2	6	10	16	20	28	32	36

			METER OPENING							
CANOLA	Drive Type	Spacing	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
	I	7.5	1	5	8	13	16	19	22	27
	II	7.5	1	3	4	7	8	10	11	14
	III	7.5	2	10	16	26	32	38	44	54

			METER OPENING							
CLOVER (Crimson)	Drive Type	Spacing	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
	I	7.5	2	5	8	13	18	21	25	32
	II	7.5	1	3	4	7	9	11	13	16
	III	7.5	4	10	16	26	36	42	50	64

			METER OPENING							
CLOVER (Ladino, Sweet, Red)	Drive Type	Spacing	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
	I	7.5	2	7	10	14	18	22	25	30
	II	7.5	1	4	5	7	9	11	13	15
	III	7.5	4	14	20	28	36	44	50	60

Figure 4-35: Small Seed Drive Chart

Small Seed Meter Assembly/Adjustment

1. If the small seed meter shaft assembly is disassembled for maintenance or repair, the seed meters and seed rate adjustment will need to be reset or zeroed to set the meters equally across the seed box.Adjust the outer locking nut approximately flush with the end of the square shaft. Lock the inner nut to hold the shaft in place.
   - **a.** Remove the chain guard, disconnect the drive chain at the seed shaft.
   - **b.** Adjust the outer locking nut approximately flush with the end of the square shaft. Lock the inner nut to hold the shaft in place ***See Figure 4-36***.
   - **c.** For each seed meter, slide the meter feed roll and cut-off to the right to fully close each meter. Slide the locking collar on the left side of each meter against the meter cut-off and tighten the lock collar.
   - **d.** For each seed meter, slide the right locking set collar next to the meter feed roll (leaving.010”-.020”) of clearance and tighten the set collar. Make sure the flutes on the meter feed roll are lined-up and inserted in the meter housing.
   - **e.** Rotate the square seed shaft by hand to verify the shaft is not binding and rotates freely.
   - **f.** Loosen the inner locking nut against the hex seed shaft. Adjust the seed shaft in and out to make sure all meter feed rolls are properly aligned and not binding. Do not force the adjustment or damage will occur to the meter assembly.
   - **g.** Set the seed rate adjustment to the desired rate and tighten the locking nuts.
   - **h.** Reconnect the drive chain and install chain guard.

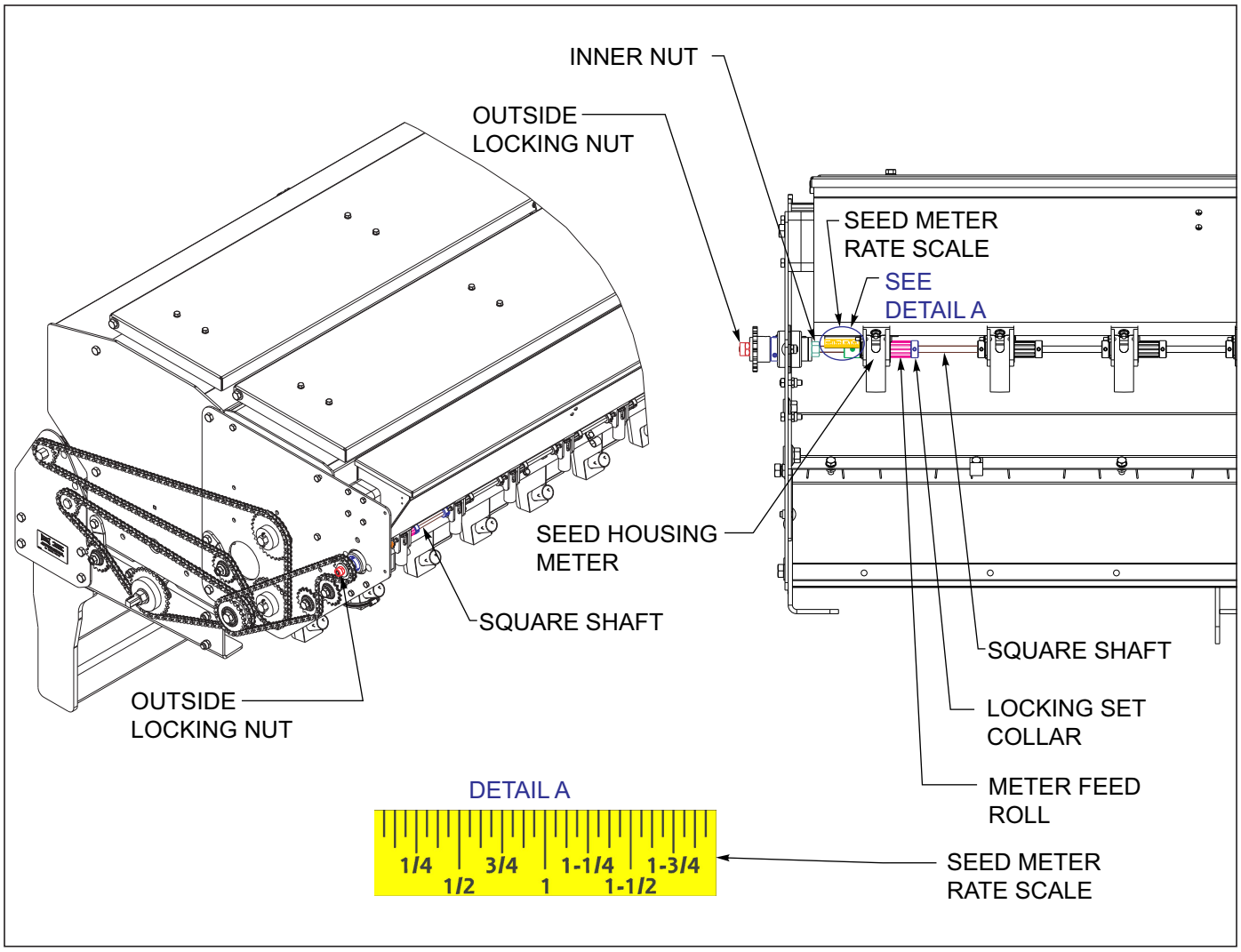


Figure 4-36: Small Seed Rate Adjustment

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Native Grass Spring Opener

The 5110 native grass drill is equipped with a spring opener. The opener has two 15.8” x.138” thick opener blades, a rigid scraper, and adjustable swivel press wheel.

The spring opener has two spring settings for light or heavy down pressure ***See Figure 4-37***. The lower spring mounting hole is the heavy down pressure setting, and the upper hole is the light pressure setting. To change the spring pressure setting, raise the opener slightly to relieve the spring pressure. Remove the 1/2-13 x 3-3/4 cross-bolt through the rear of the spring assembly. Move the spring to the desired setting and reinstall the cross-bolt.

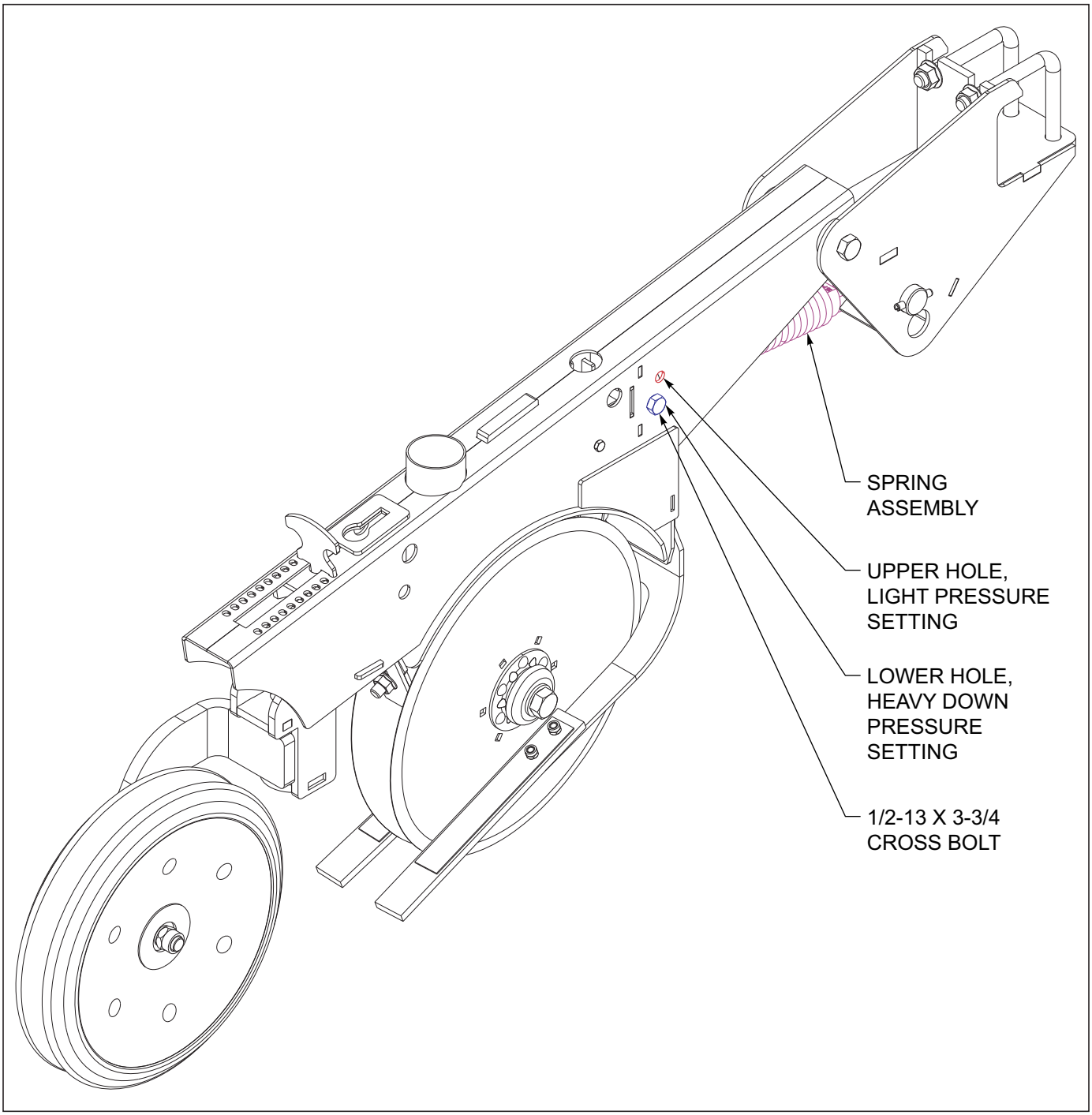


Figure 4-37: Opener Spring Settings

Opener Blade Adjustment

1. To insure peak performance of the opener assembly and maximum bearing life a proper opener blade pinch point should be maintained ***See Figure 4-38***. The pinch point of the blades is the lower front point where the right and left opener blade come in contact with each other.

DANGER

Opener blades are extremely sharp. Exercise extreme care when working on or near opener blades. Do not allow opener blades to roll over or fall onto any body part. Do not allow wrenches to slip when working near blades. Never push wrenches toward opener blades. Do not climb over machine above opener blades. Failure to stay clear of opener blade edges can cause serious personal injury or death.

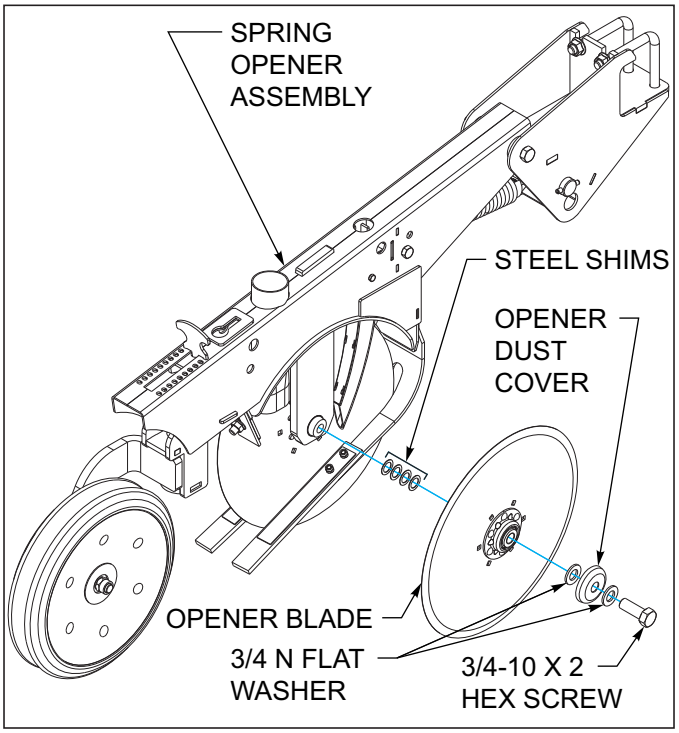


Figure 4-38: Opener Blade Adjustment

2. With a proper pinch point, you should be able to rotate the blades in opposite directions and maintain contact at the pinch point with a slight drag. The blades should slide past each other without binding. If the contact is too high and both blades try to bind or drag excessively, the pinch point is too tight. Likewise, if the blades do not contact at the pinch point or there is still a gap between the blades, the pinch point is too loose.
3. A properly maintained pinch point will allow the opener to penetrate better and create a smoother seed trench for better seed placement. A pinch point that is too wide will allow soil/mud to build up between the opener blades regardless of how the scraper may be adjusted. A pinch point that is too wide or too narrow can excessively preload the opener bearings and lead to premature bearing failure, particularly in heavy soils or no till applications.
4. The pinch point is adjusted by adding/removing shims from between the opener blade and opener casting ***See Figure 4-38.*** When removing shim(s) from between the blade and the casting, move them to the outside of the blade and place under the dust cap. This will keep track of the shims and not change the length of bolt required. Adjust the shims as equally as possible so there are the same number of shims under the right and left blades.
5. As the opener blades wear, it will be necessary to adjust the pinch point to maintain the pinch point. No till planting applications will generate more wear and more frequent pinch point adjustment.

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Opener – Press Wheel Adjustment

1. The seeding depth of each individual opener is controlled by the press wheel depth adjustment ***See Figure 4-39*** To change the depth of each press wheel, raise the openers so there is not any weight on the press wheel. Pull up on the adjusting handle and slide the depth stop forward or rearward to obtain the desired seeding depth. Each notch represents approximately 5/16” in depth. Slide the handle forward for shallower seed placement, and rearward for deeper seed placement.

IMPORTANT

Increasing opener down pressure does not increase seed placement depth.

2. As long as the press wheel is carrying weight, the seeding depth is regulated by the press wheel adjustment. An increase in down pressure does not change the depth of seed placement.
3. Make sure the hitch is level when planting to insure consistent planting depth. A hitch that is too high or too low can change how the press wheel contacts the ground and affect seeding depth.
4. When planting seeds shallow, or in loose/soft conditions, it may be necessary to install stroke control stops on the hydraulic cylinders on pull hitch. This will allow the drill transport tires to carry more weight, raising the drill, and keeping the openers from planting too deep. Adjusting the gauge wheel height on 3-point drills for shallower seed placement.

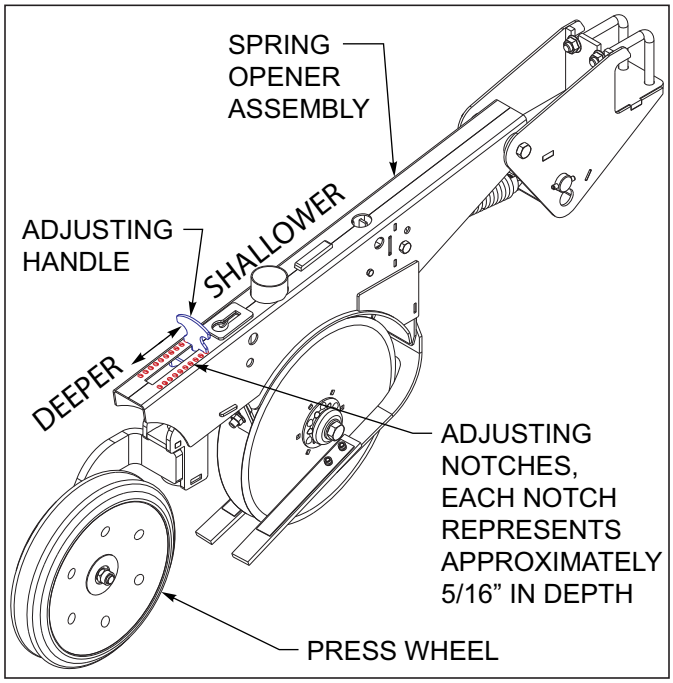


Figure 4-39: Press Wheel Adjustment

Opener Scraper Adjustment

1. The opener is equipped with a scraper to keep the inside surfaces of the opener blades clean. In dryer conditions, the scraper can be adjusted farther away from the opener blades for greater clearance. In wetter conditions, it will be necessary to adjust the scraper blade closer to the opener blade.

⚠ CAUTION

Opener blades are very sharp. Use gloves when working around opener blades.

2. To adjust the scraper blade, loosen the 1/2-13 hex flange lock nut holding the blade, and slide the blade up or down to achieve the desired clearance ***See Figure 4-40*** Re tighten the 1/2-13 hex flange lock nut. Carefully rotate the opener blades to make sure the blades will turn freely and not drag on the scraper.
3. A properly maintained opener blade pinch point will reduce the amount of soil that enters between the opener blades. This will in turn allow the scraper to operate in a cleaner environment and reduce scraper wear.

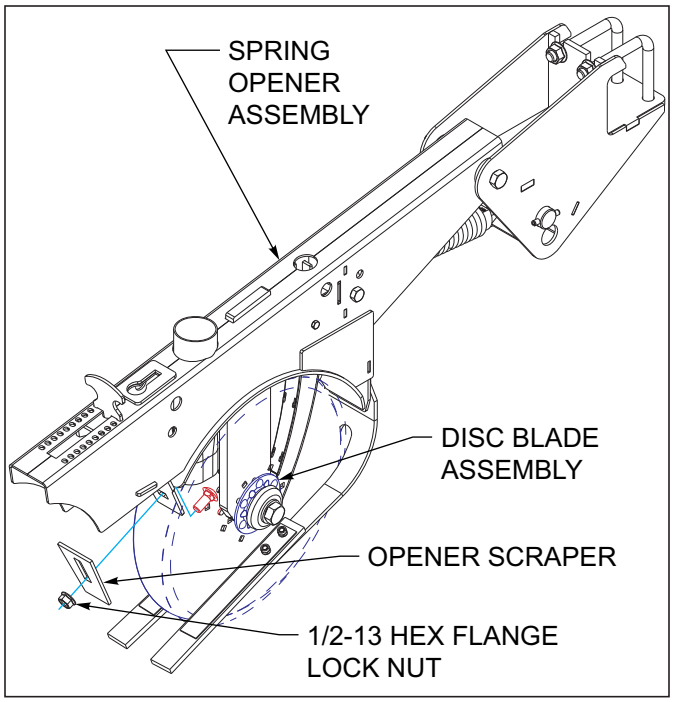


Figure 4-40: Opener Scraper Adjustment

Opener Soil Strip Adjustment

1. The soil strip runs along the side of the opener blade to reduce soil blow out of the seed trench. This will allow the soil to stay in position for more consistent filling of the seed trench and uniform coverage.
2. The opener should first be set for the desired planting depth and press wheel adjustment. The soil strip should then be adjusted for slight pressure with the ground where the opener blade is leaving the seed trench. Excessive down pressure on the soil strip will increase wear and can cause plugging issues. The soils strip should be set to run parallel with the opener blade with an approximate 1/16" gap. The soil strip should not be set so tight to the opener blade that will drag or prevent the opener blade from turning freely.
3. The metal backing strip should be centered over the soil strip. Do not allow the metal backing strip to rub against the opener blade or it will tend to trap residue.

CAUTION

Opener blades are very sharp. Use gloves when working around opener blades.

4. To adjust the soil strip, loosen the 1/2-13 hex flange lock nut at the front of the soil strip bracket ***See Figure 4-41.*** The bracket may be adjusted up or down to the desired height and side to side to center on the opener blades. Re tighten the 1/2-13 hex flange lock nut.

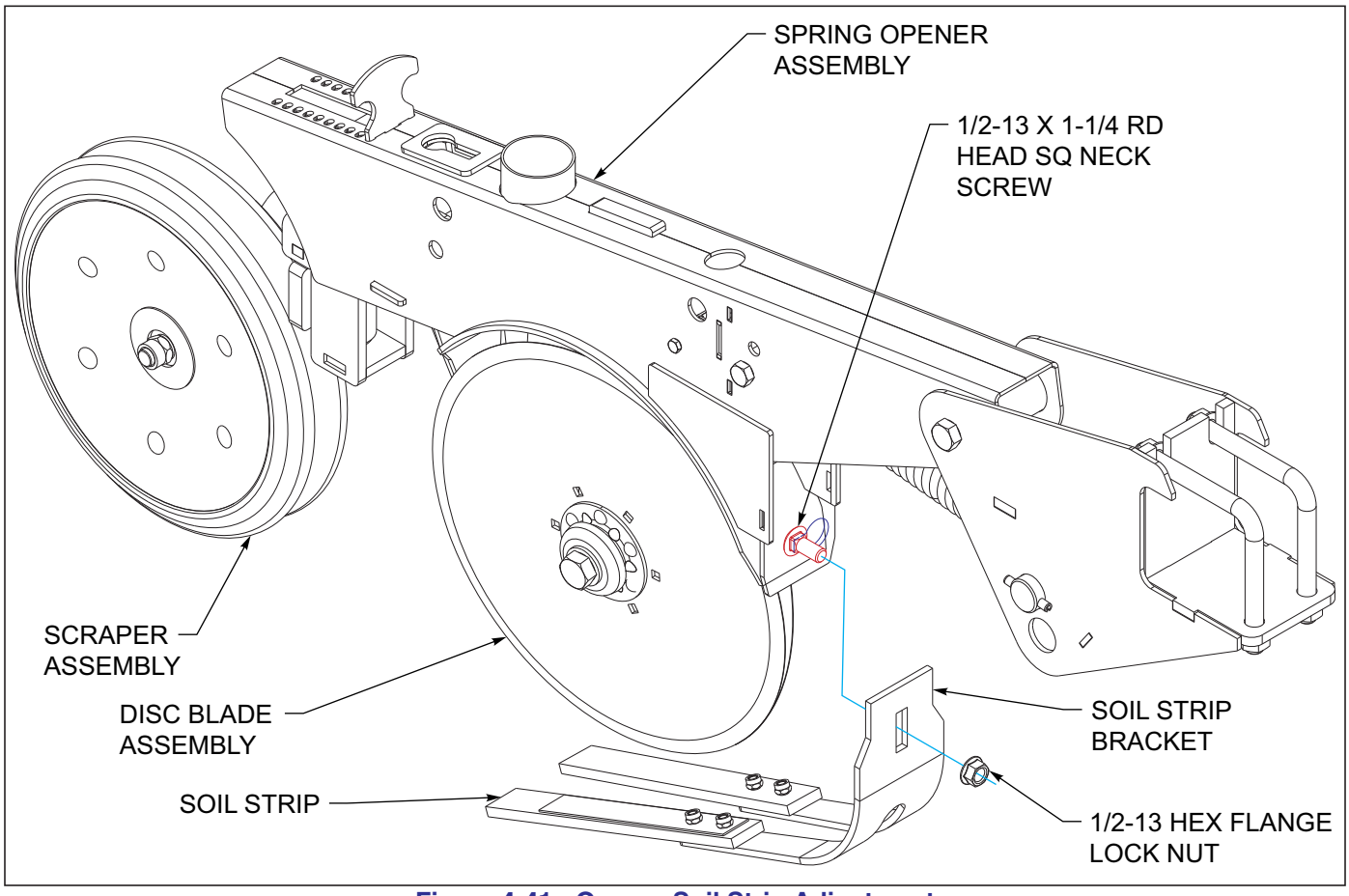


Figure 4-41: Opener Soil Strip Adjustment

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Walkboard

1. The walkboard on the Grain Drill provides a stable platform to work from while filling the seed box *See Figure 4-42*.

WARNING

Do not allow anyone to stand, ride, or climb on the walkboard while the drill is in motion.

2. The walkboard may be raised to allow easier service access to the openers. To raise the walkboard, lift at the center rear of the wallboard and rotate forward. A latch is provided to hold the walkboard in the raised position.
3. To lower the walkboard, release the latch at the end of the walkboard, and slowly lower to a level position.
4. Lower the walkboard before transporting to show lights and reflectors.

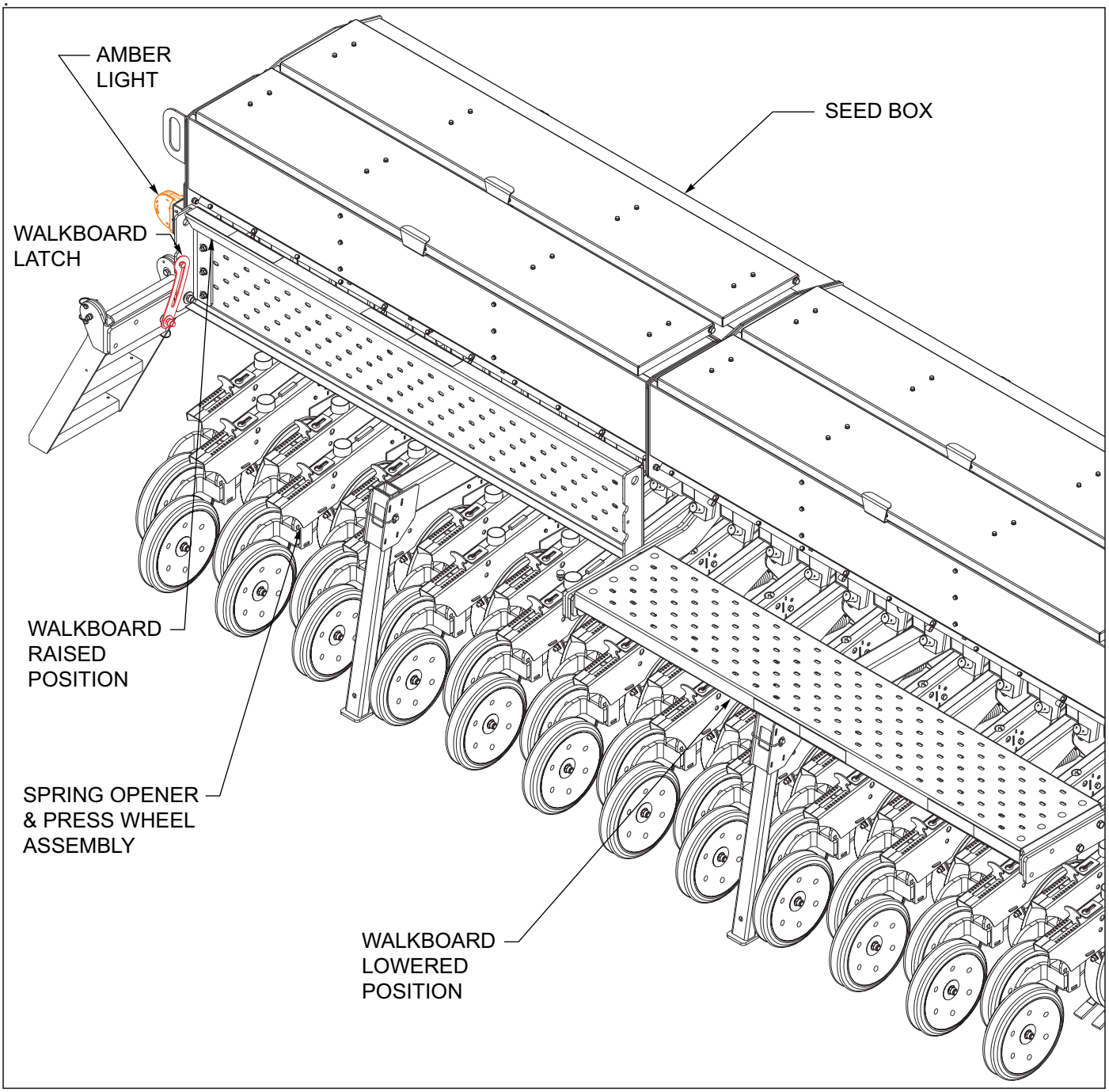


Figure 4-42: Walkboard Adjustment

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Ladder Use and Transport Requirements

1. When transporting the 5110NG Grain Drill:
   a. The ladder should be in the raised position (laying across the top of the walkboard) and secured with the pin ***See Figure 4-43***.
   b. The ladder should also be in the raised position when working in the field to prevent damage when working near trees, fences, power lines, etc.
2. When using the ladder:
   a. Lower ladder to the down position and place pin in the storage location to gain access to the seed boxes ***See Figure 4-44***
   b. The handle is located on the left end of the drill for access.

WARNING

Never allow riders on the ladders or walkboards while the drill is in operation or being transported.

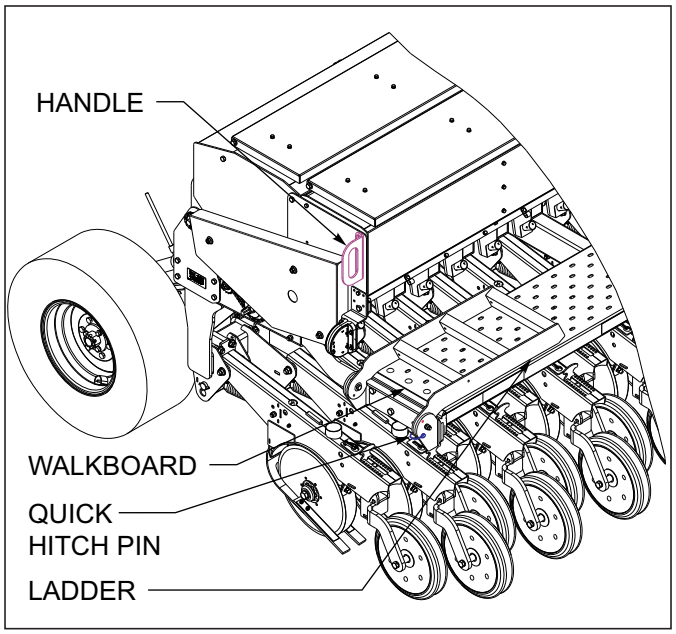


Figure 4-43: Ladder Transport/Planting Position

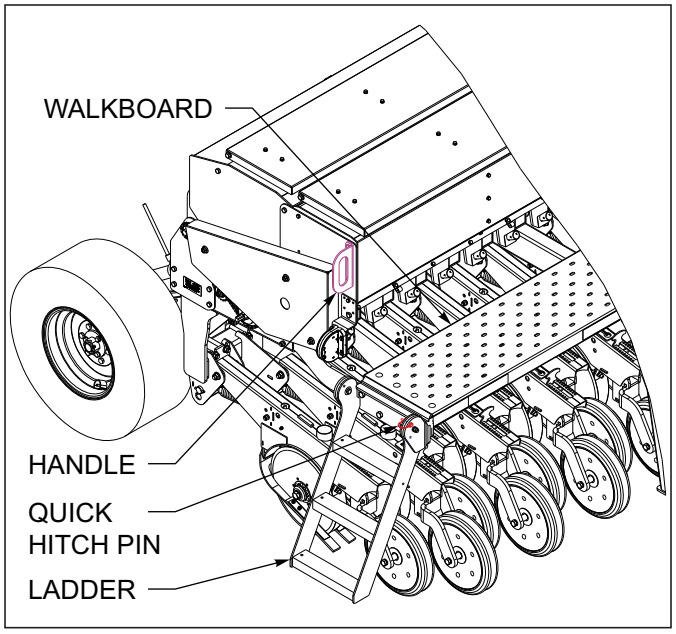


Figure 4-44: Ladder Down Position

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Loup Mini Drill Monitor Operation (Optional)

1. The 5110NG Grain Drill can be equipped with an optional Loup Mini drill monitor. The drill monitor will monitor population from two sensors on each box, seed box levels on each seed box, as well as acres planted.
2. Population readings are 95% accurate for soybeans. When planting smaller seeds the population accuracy will be reduced. This does however give you a reliable indication that all sections are planting. The monitor may be adjusted to set high/low population alarms. Do not use the monitor to calibrate the seeding population. To calibrate the drill either by weight or seed count, see ***"Small Seed Rate Adjustment" on page 4-32***.
3. Bin level sensors are installed in each seed box. When the sensor is submerged in seed, no alarm will sound. As the seed level falls below the sensor eye, an alarm will be indicated on the drill monitor. The bin level sensor is mounted to an adjustable bracket. The bracket may be raised or lowered to the desired level in the seed box.
4. The drill monitor will also monitor field and total acres.
5. Pulses are preset for the drill monitor. Initially the pulses are set at 68. The pulse setting may vary depending on the conditions the drill is planting in. Worked or loose sandy soils will have a different setting than firm no till conditions. For greater accuracy on the pulse setting, calibrate the drill monitor in the desired working conditions. This is done by driving a known distance (400 ft) and recording the number of pulses in that distance. Refer to the Loup manual for instructions.
6. The drill monitor is operated on a 12-volt dc negative ground system. The monitor may be connected using the existing connection, or may be hard-wired to the appropriate connections. Connect the red wire to a positive terminal that is on when the tractor switch is on. Connect the black wire to a chassis ground on the tractor maintaining good metal-to-metal contact.
7. The signal cable attaches to the monitor and connects to the drill. The cable may be plugged/unplugged at the front of the drill hitch when hooking/unhooking the drill. This allows the monitor to stay in the tractor if so desired.
8. For service or setup questions, please refer to the Loup Mini Drill Monitor manual, or contact Loup Electronics:

Loup Electronics Inc.
2960 N. 38th Street
Lincoln, NE 68504
877-489-LOUP(5687)
info@loupelectronics.com

Battery Operated Acre Counter Operation (Optional)

The battery operated acre counter operates in one of two modes. In sleep mode, the display is blank, and the counter is accumulating acres. Sleep mode will be entered if a button is not pressed for 20 seconds. In entry mode, the display is on, and the operator can enter values. To get into entry mode, press the **FUNC** button (designated by a * at the lower left side of the console). If you continue to press the **FUNC** button, the acre counter will cycle through the functions that it can perform. The LEDs above the display indicate which function is selected ***See Figure 4-45*****.**

The available functions are:

- **a.** Field Acres
- **b.** Total Acres
- **c.** Pulses per 400 ft (Distance Traveled)
- **d.** Width
- **e.** Password
- **f.** Low Battery

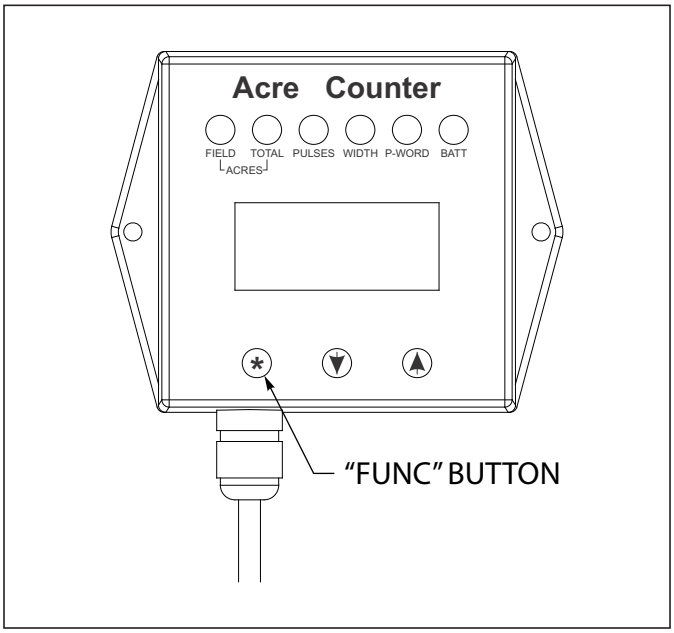


Figure 4-45: Acre Counter Console

Field Acres

1. Press the FUNC button until the "**FIELD**" LED is lit. The digits indicate the acres covered since the field acre counter was cleared ***See Figure 4-46*.**
2. To clear the field acre count, press the **UP** and **DOWN** buttons simultaneously for two seconds. If a password has been entered, you will not be able to clear the total acre count.
3. Field acres will count in tenths of an acre up to 9999.9 acres.

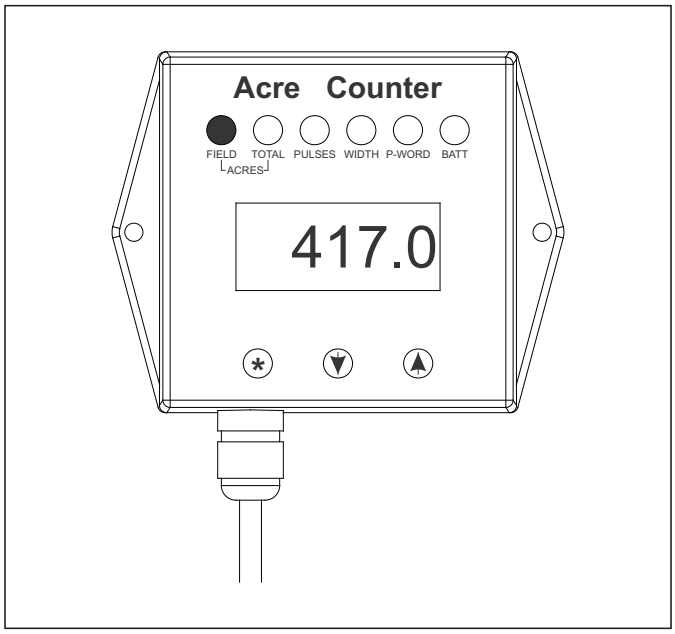


Figure 4-46: Field Acres Display

Total Acres

1. Press the **FUNC** button until the "**FIELD**" and "**TOTAL**" LEDs are lit. The digits indicate the acres covered since the total acre counter was cleared ***See Figure 4-47*.**
2. To clear the total acre count, press and hold the **UP** and **DOWN** buttons for two seconds. If a password has been entered, you will not be able to clear the total acre count.
3. Total acres will count from .1 to 99999 acres.

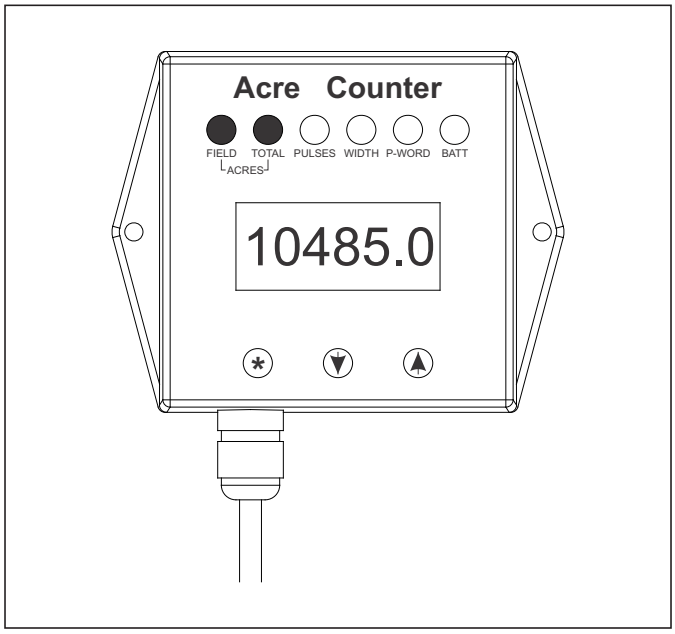


Figure 4-47: Total Acres Display

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Pulses per 400 Feet

Press the **FUNC** button until the "**PULSES**" LED is lit. The number in the display indicates how many pulses are generated for every 400 feet driven. ***See Figure 4-48*.**

1. For the 5110NG Grain Drill, set the pulses per 400 feet to 17 by using the **UP** and **DOWN** buttons. When you press the **FUNC** button, the Acre Counter will accept the number in the display as the new pulses per 400 feet.

NOTE

If a password is set, you will not be able to adjust the pulses per 400 feet.

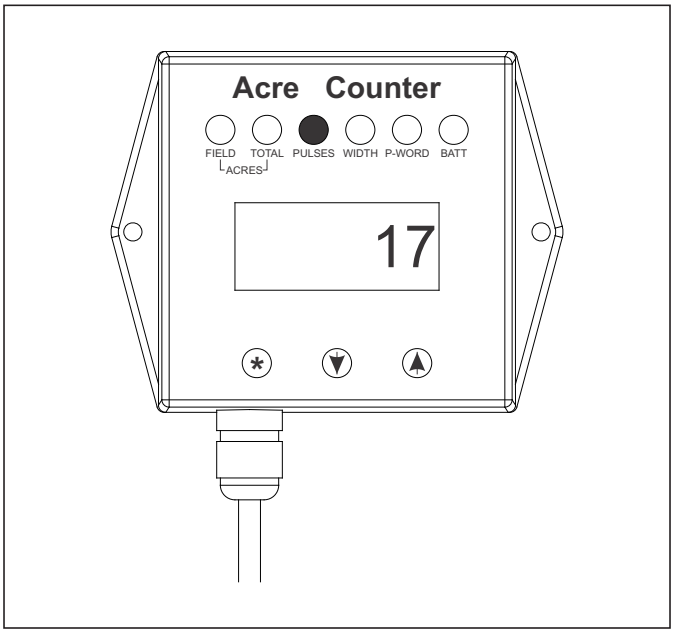


Figure 4-48: Pulses per 400 Feet Adjustment

Width

1. Press the **FUNC** button until the "**WIDTH**" LED is lit. The number displayed is the length of your implement in feet ***See Figure 4-49*.**
2. To adjust the width, press the **UP** and **DOWN** buttons. If a password has been entered, you will not be able to adjust the width.
3. The width can be adjusted from .1 to 99.9 feet, in tenths of a foot.

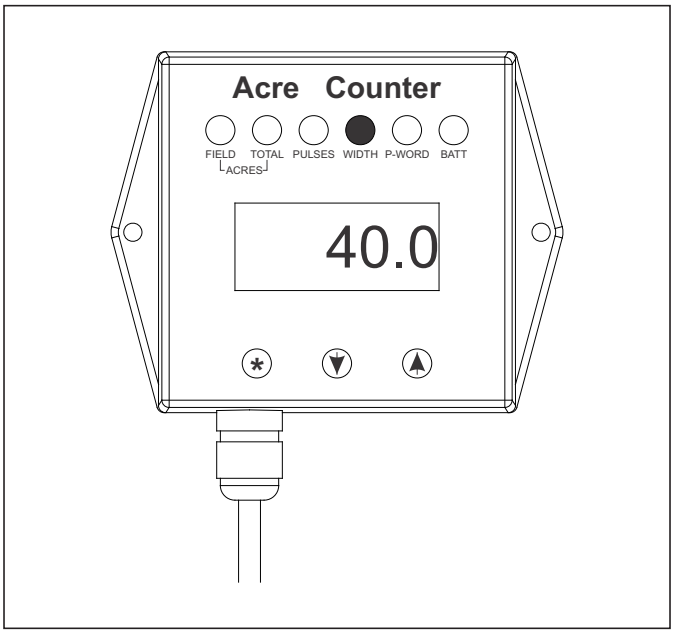


Figure 4-49: Drill Width

Password

The password function allows you to protect the total acre count, pulses per 400 feet, and width settings with a password. This stops anyone from accidentally changing those settings. When the acre counter is shipped, the password is disabled. You can modify the pulses per 400 feet and implement width at any time.

Press the **FUNC** button until the "**P-WORD**" LED is lit. The digits will display the word "**Ent**" or "**dIS**".

1. If the display shows "**dIS**" ***See Figure 4-50***.

   The password is disabled. The total acre count, pulses/400 ft, width, and password settings can be adjusted using the **UP** and **DOWN** buttons. The password can also be changed using the **UP** and **DOWN** buttons.

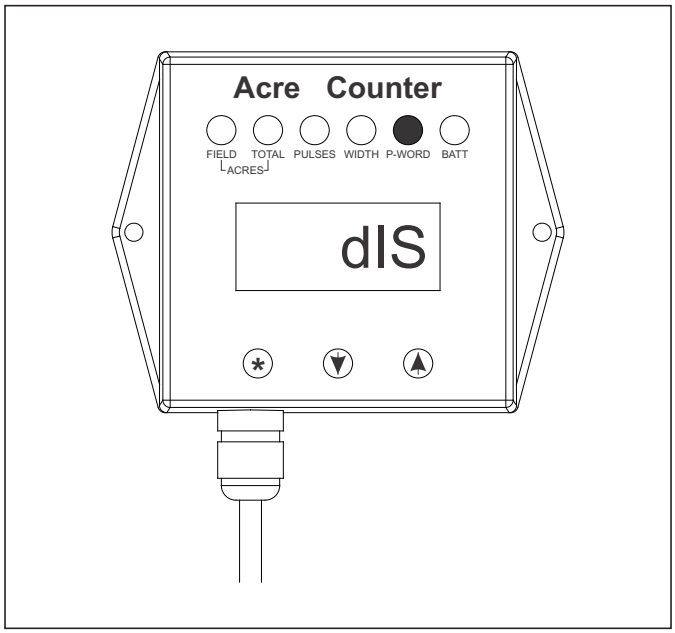


Figure 4-50: Password Disabled

2. If the display shows "**Ent**" ***See Figure 4-51***.

   a. You must enter your password using the **UP** and **DOWN** buttons. When your password is displayed, press the **FUNC** button to test the password. If the password is correct, you will be able to change the acre counter settings. The password will be viewable until the acre counter powers down. When the acre counter is powered up again, you will have to re-enter the password to change settings.

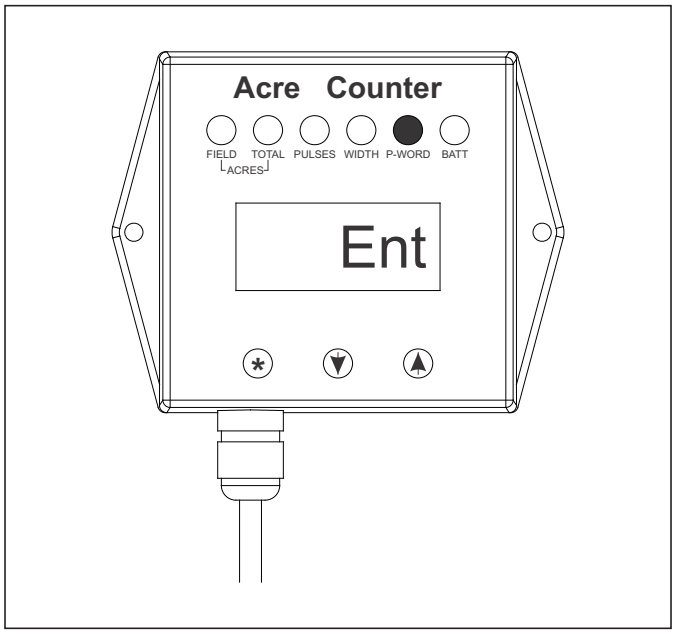


Figure 4-51: Enter Password

   b. If the password is not correct, you will not be able to change the acre counter settings. When the "**P-WORD**" function is selected again, "**Ent**" will appear in the display.

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Changing the Password

Select a new password using the **UP** and **DOWN** buttons. Press the **FUNC** button until the word "**SEt**" appears in the display ***See Figure 4-52*****.** Release the **FUNC** button. The number in the display is your new pass code. Make sure you write it down! Press and hold the **FUNC** button until the word "**dIS**" appears in the display.

NOTE

If the password is forgotten, it can be disabled by removing the batteries. The password is intended for rental units. It is recommended that a seal be affixed to the rear plate of the acre counter to determine if the settings have been tampered with.

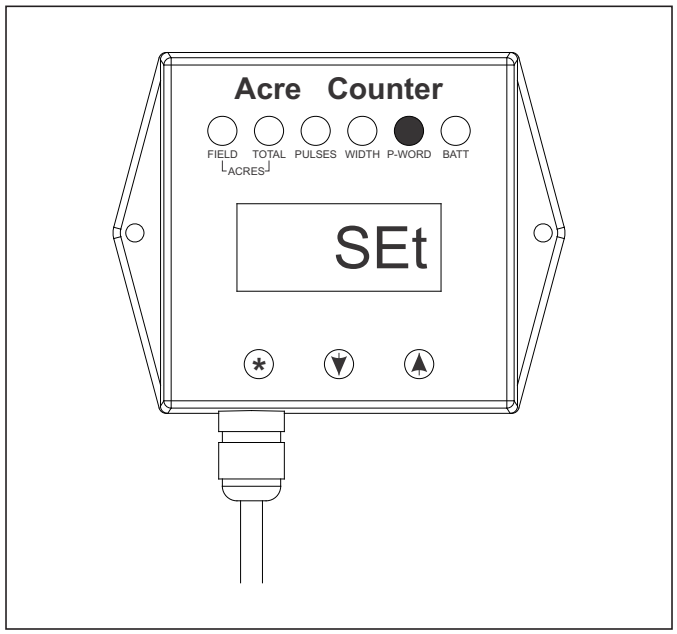


Figure 4-52: Set Password

Battery Replacement

The battery operated acre counter uses 3 AA batteries. The batteries should last between 5 and 10 years. The acre counter will last much longer than that. Eventually, you will have to replace the batteries. The "**BATT**" LED will light when the batteries require replacement ***See Figure 4-53*****.**

1. Remove the acre counter from the implement and undo the 4 screws on the back of the case. This will separate the housing from the rear plate.
2. Replace the batteries with 3 high quality AA alkaline batteries.

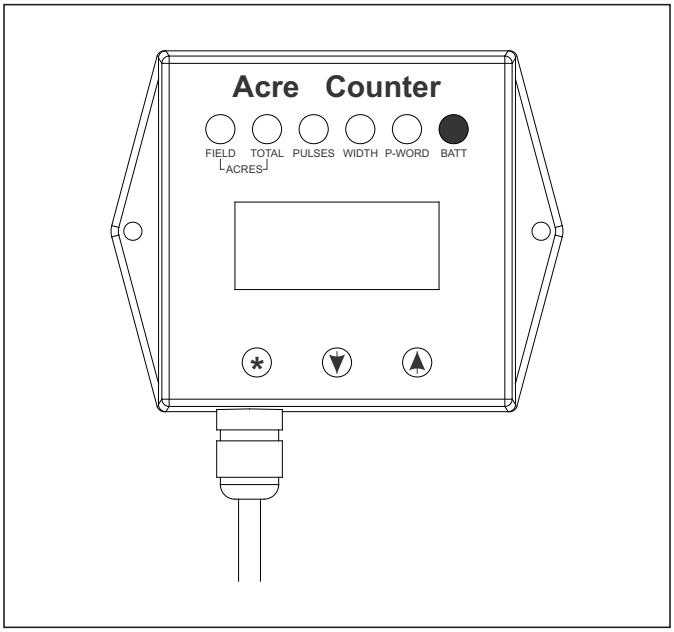


Figure 4-53: Battery Replacement Required

NOTE

This unit is dust and splash resistant, under no circumstances should this unit be submerged in any conductive, corrosive, or flammable liquid.

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Maintenance & Lubrication

Hydraulic Maintenance

1. Check the tractor hydraulic fluid level per tractor owner's manual and after any leakage. Check fluid level with the cylinders in the retracted position.

NOTE

Repair any cylinder, hose, or valve that is leaking.

2. Any time a cylinder is opened up, or whenever any seal replacement is necessary, it is advisable to clean all parts and replace all seals. Seal kits are available from your Landoll dealer.
3. Check all hydraulic hoses weekly. Look for binding or cracking. Replace all worn or defective parts immediately.

WARNING

Escaping hydraulic fluid can cause serious personnel injury. Relieve system pressure before repairing, adjusting, or disconnecting. Wear proper hand and eye protection when searching for leaks. Use cardboard instead of hands *See Figure 4-54*. Keep all components (cylinders, hoses, fittings, etc.) in good repair.

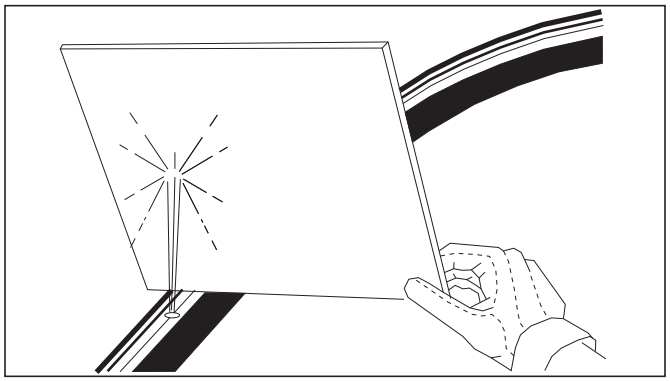


Figure 4-54: Hydraulic Leak Detection

WARNING

Lower the unit to the ground, and relieve hydraulic pressure before attempting to service any hydraulic component. Accidental lowering can result in serious personal injury.

4. Transport locks are provided to hold the implement in a raised position. Do not attempt to perform any service work under the implement without first installing the transport locks. Before servicing any hydraulic component, lower the implement to the ground and relieve all system pressure. If a hydraulic component is disconnected, repaired, or replaced, it will be necessary to purge the system of air before operation. **See *"Hydraulic Lift System - Pull Hitch" on page 4-16*** on how to purge the hydraulic systems.

Wheel Bearing Maintenance

Wheel bearing maintenance should be performed at the beginning of every season of use. Check the wheel bearings periodically for excessive end play. If needed, adjust or replace them using the following procedure:

1. Place the frame on blocks or stands sufficient to lift the tire clear of the ground.
2. Remove the tire.
3. Remove the hub cap, cotter pin, slotted nut and washer.
4. Remove the hub. Clean and inspect the bearings and hub cavity. Replace any worn or defective parts.
5. Repack the bearings using a high-quality wheel bearing grease.
6. Slide the triple-lip seal onto the spindle. Do not install the seal into the hub.
7. Slide the inner bearing cone and hub onto the spindle.
8. Install the outer bearing cone, washer and slotted nut.
9. Tighten the slotted nut while rotating the hub until there is a slight resistance to wheel rotation. Then, back the slotted nut off one notch, until the wheel rotates freely without end play.
10. Slide the triple-lip seal to the hub and install the seal in the hub.

NOTE

The triple-lip seals should point away from the hub to keep contaminants out and allow grease to pass (See Figure 4-55)

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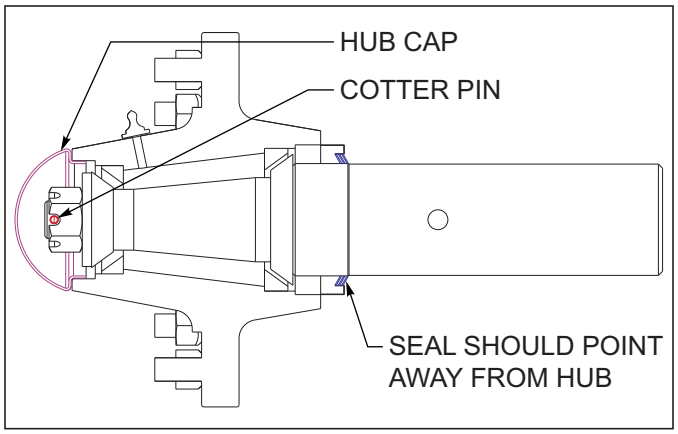


Figure 4-55: Triple Lip Seal

11. Install a new cotter pin and replace the hub cap. (***See Figure 4-55***)

Lubrication Maintenance

1. ***See Figure 4-56*** specifies the lubrication points and intervals on the Grain Drill. Proper maintenance of your machine will, under normal operating conditions, help to keep it operating at or near its peak performance for an extended period of time. Proper maintenance is also a condition of keeping your warranty in good status ***"Maintenance & Lubrication" on page 4-46***.
2. The drill should be lubricated after initial setup and prior to field operations. When lubricating the Grain Drill, SAE multi-purpose EP grease, or EP grease with 3-5% molybdenum sulfide is recommended. Wipe soil from fittings before greasing. Replace any lost or broken fittings immediately.

LUBRICATION TABLE

ITEM	DESCRIPTION	NO. OF LUBE POINTS	INTERVAL (Hours Unless Stated)
1	Hitch Clevis	2	50
2	Wheel Bearings-Pull Hitch	1 zerk per/hub - 4 Total	50
3	Ratchet Jack	1 zerk per/jack	50

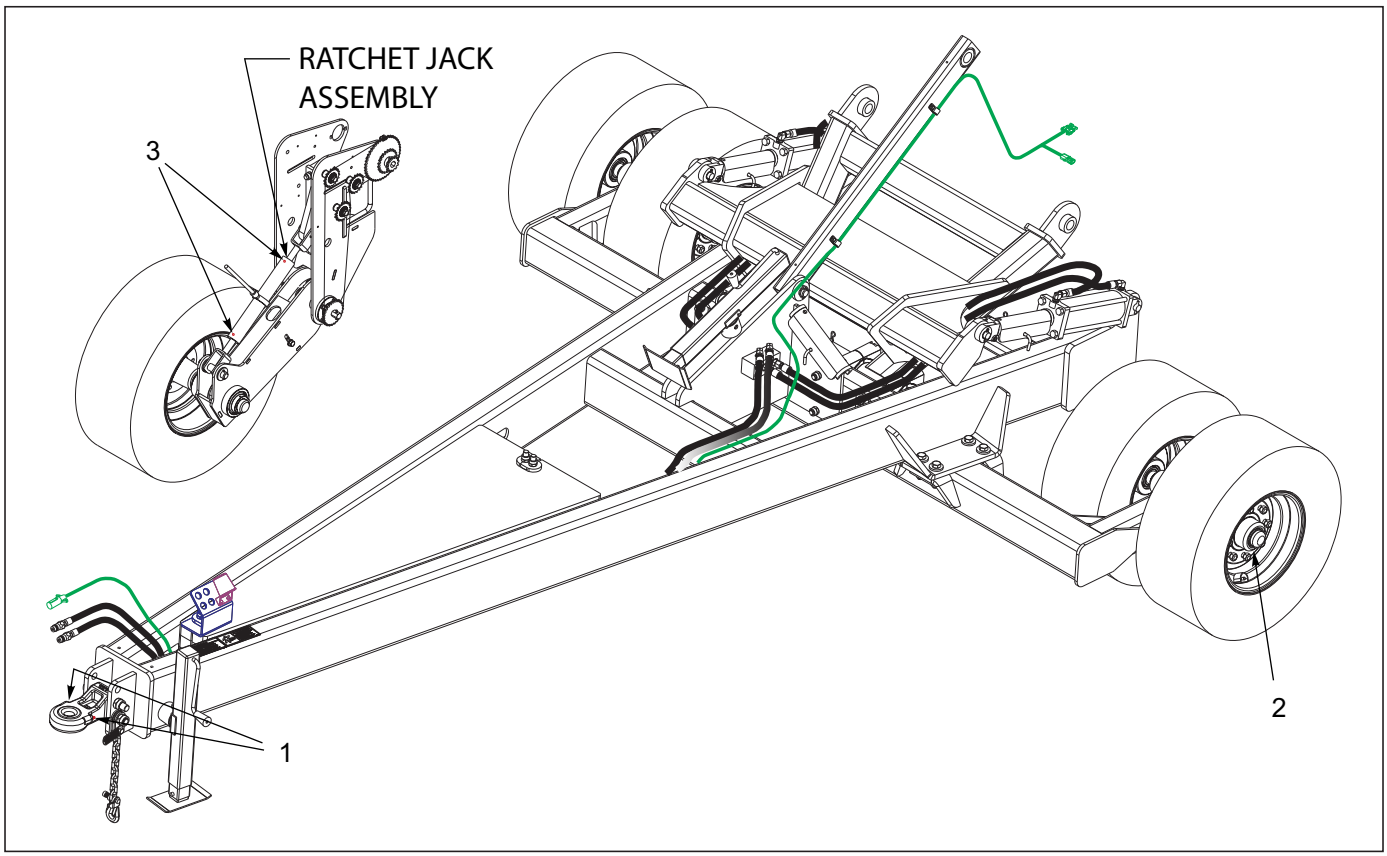


Figure 4-56: Lubrication Points

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Storage

Preparing the Grain Drill for storage during extended periods of time will not only help protect the drill, but insure that it will be maintained, serviced, and ready for the next planting season.

1. Clean out any remaining seed from the boxes and meters before storage.
2. Wash or blow off any remaining dirt, mud or residue from the drill.
3. Inspect the drill for worn or broken parts. Make repairs and service during the off season to prevent delays.
4. Check opener pinch point for proper adjustment ***(See "Opener Blade Adjustment" on page 4-36.)***.
5. Clean and repack the wheel bearings (pull hitch) ***(See "Wheel Bearing Maintenance" on page 4-46.)***.
6. Inspect all nuts and bolts for tightness.
7. Touch up any scratches or chips with spray paint to protect the metal.
8. Check and inflate tires to the proper air pressure.
9. Lubricate the drill at all points ***(See "Lubrication Maintenance" on page 4-47.)***.
10. Store the drill inside if possible. If stored outside, cover with a tarp.

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Chapter 5

Troubleshooting Guide

The Troubleshooting Guide, shown below, is included to help you quickly locate problems that can happen using your 5110NG Grain Drill. Follow all safety precautions stated in the previous sections when making any adjustments to your machine.

PROBLEM	PROBABLE CAUSE	SOLUTION
PLANTING TOO DEEP	Incorrect depth	Adjust gauge wheels to proper toolbar height.
	Incorrect depth	Adjust press wheel height ***(See "Opener – Press Wheel Adjustment" on page 4-37.)***
	Excessive down pressure	Adjust opener spring pressure to lighter setting.
	Drill not level front to rear, hitch too high	Adjust pull hitch height. Adjust 3 point top link.
PLANTING TOO SHALLOW	Incorrect depth	Adjust gauge wheels to proper toolbar height.
	Incorrect depth	Adjust press wheel height ***(See "Opener – Press Wheel Adjustment" on page 4-37.)***
	Insufficient down pressure	Adjust opener spring pressure to heavier setting.
	Drill not level front to rear, hitch too low	Adjust pull hitch height. Adjust 3 point top link.
	Pull Hitch	Lift cylinders not fully retracted.
UNEVEN SEED DEPTH	Row unit depth not set the same	Adjust press wheel height ***(See "Opener – Press Wheel Adjustment" on page 4-37.)***
	Drill not level front to rear	Adjust pull hitch height. Adjust 3 p0int link.
	Seed shallow in tire tracks	Adjust press wheel height and increase spring down pressure ***(See "Opener – Press Wheel Adjustment" on page 4-37.)***.)
	Excessive field speed	Reduce field speed.
	Plugged seed tube	Clean seed tube.
	Mud build up between opener blades	Adjust scraper ***(See "Opener Scraper Adjustment" on page 4-37.)*** Adjust blade pinch point ***(See "Opener Blade Adjustment" on page 4-36.)***
SECTIONS PLANTING AT DIFFERENT RATES	Seed rate adjustment not the same on all sections	Adjust seed rate.
	Drive types (sprocket ratio) not the same on all sections	Change to same drive type on all sections.
	Seed meter out of adjustment	Reset seed meters.
	Opener seed tube plugged	Clean out seed tube.
	Worn/Broken seed meter	Allows excessive seeding - repair seed meter.
	Seedbox plugged/Seed bridged	Clean/Agitate seed/Use seed lubricant/Excessive seed treatment.

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PROBLEM	PROBABLE CAUSE	SOLUTION
UNEVEN SEED SPACING	Excessive field speed	Reduce field speed.
	Unclean seed	Use clean seed
	Build up of seed treatment in seed cup	Clean out seed meters
	Seed tubes sagging	Replace seed tube
	Drive type (sprocket ratio) too slow	Use faster drive type and readjust seed meter opening.
	Plugged opener seed tube	Clean out bottom of seed tube.
OPENER DISCS NOT TURNING FREELY	Opener plugged with mud/dirt	Clean opener.
	Scraper set too tight	Adjust scraper *(See "Opener Scraper Adjustment" on page 4-37.)*
	Soil control strip set too tight against opener blades	Adjust soil strip
	Soil strip plugged with residue	Adjust soil strip closer to blade, move metal backing strip away from edge of soil strip *(See "Opener Soil Strip Adjustment" on page 4-38.)*
	Openers set too deep	Reduce depth.
PRESS WHEELS NOT COMPACTING THE SOIL AS DESIRED	Opener down pressure set too low	Increase spring pressure on row units *(See "Native Grass Spring Opener" on page 4-35.)*
	Incorrect press wheel depth adjustment	Reset press wheel depth adjustment *(See "Opener – Press Wheel Adjustment" on page 4-37.)*
	Openers set too deep	Reduce depth.
PRESS WHEEL OR OPENERS PLUGGING	Backed up with openers in the ground	Clean out opener and press wheels and check for damage.
	Scraper worn or not adjusted correctly	Replace or adjust scraper
	Opener blades worn, pinch point too wide	Reset pinch point, replace worn out blades.
	Planting conditions too wet	Wait until drier weather
	Opener bearing failure	Replace opener bearings

Native Grass Seed Troubleshooting Guide

PROBLEM	PROBABLE CAUSE	SOLUTION
UNEVEN SEED SPACING SEED RATE	Sprocket rate too low	Change sprockets and calibrate drill.
	Seed tube plugged	Clean out seed tube.
	Agitator set incorrect or not turning	Set agitator spacing and check drive chain.
	Seed bridging/Not flowing	Add seed lubricant such as graphite.
	Native grass seed can vary widely in weight, types and density. Seed treatments, temperature and humidity can also effect rate	Recommended to calibrate drill for each seed and mix.
SECTIONS PLANTING AT DIFFERENT RATES	Sprockets/Drive types not set the same for all sections	Change to same drive sprockets/Types.
	Plugged seed tube(s)	Clean out seed tube.
	Opener plugged	Clean opener.
	Broken seed meter or agitator	Repair seed meter/agitator.
EXCESSIVE SEEDING	Sprocket ratio too high	Change sprockets and calibrate drill
	Seed too fine/Small	Use main seed box or small seed box for planting fine seed.

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Document Control Revision Log:

Date	Form #	Improvement(s): Description and Comments
11/29/2019	F-1058	New manual.
08/11/2020	F-1058-0820	Initial Release.

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Equipment from Landoll Company, LLC is built to exacting standards ensured by ISO 9001 registration at all Landoll manufacturing facilities.

Model 5110NG

Native Grass Drill
Operator's Manual

Re-Order Part Number F-1058-0820

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