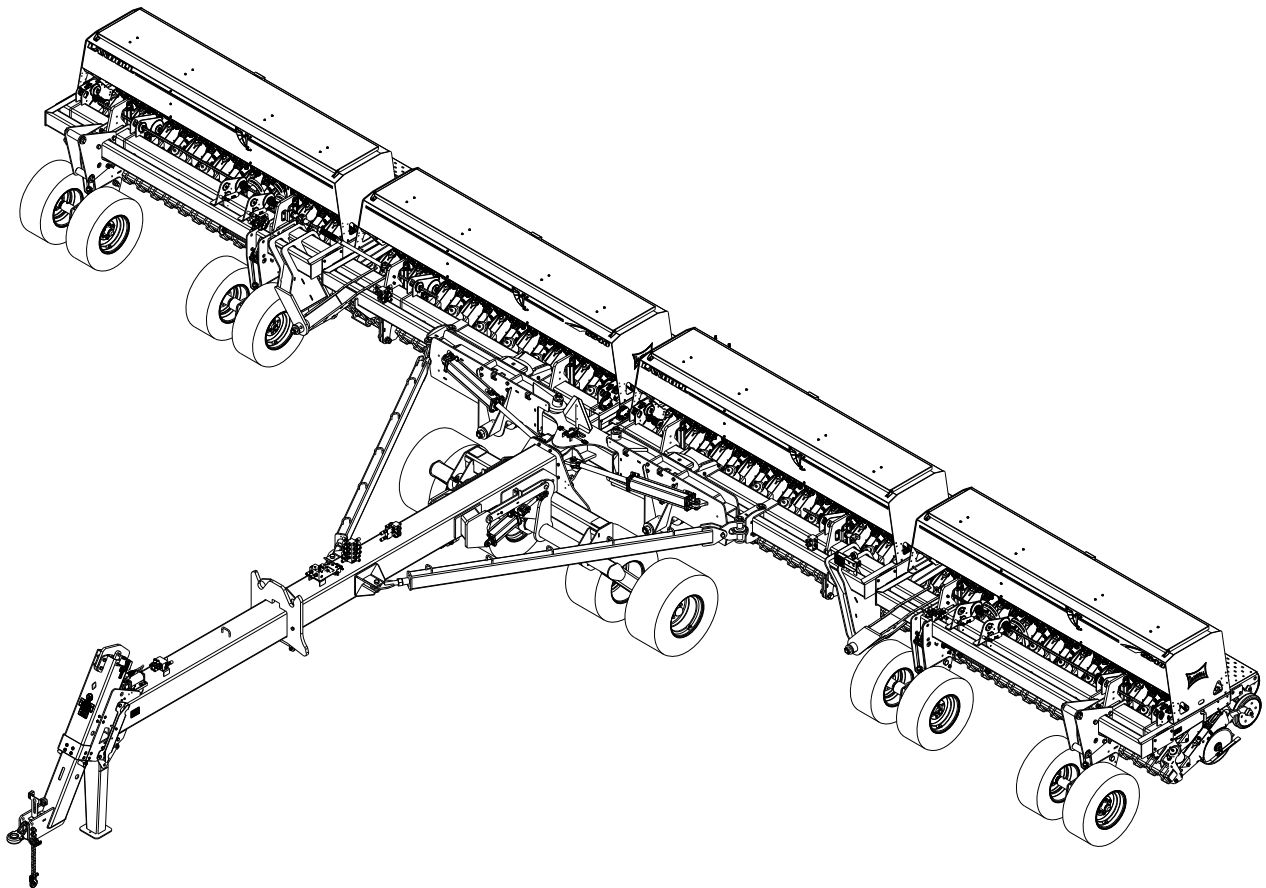




# Model 5540-50 Folding Grain Drill Operator's Manual



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## Manuals for the 5540-50 Grain Drill

MANUAL NUMBER	MANUAL NAME
F-975	5540-50 GD Operator's Manual
F-976	5540-50 GD Parts Manual

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## 5 Troubleshooting Guide

## Introduction and Safety

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The Landoll Model 5540 Grain 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 5540 Grain 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  
ATTENTION: PUBLICATIONS -DEPT. 55**

# 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 5540 Grain 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.

## 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.

## 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.
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 than 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.



# Standard Specifications

## Model Specifications

5540 SERIES GRAIN DRILL SPECIFICATIONS							
Model Number	Working Width	Row Spacing	No. of Openers	Transport Width	Tire and Wheels	Estimated Weight W/Out Fertilizer (Empty)	Estimated Weight W/Fertilizer (Empty)
5540-50X7.5	50' - 0"	7-1/2"	80	16' - 1"	(4) 480/45R17 (Center) (8) 280/70R16 (Wings)	34,480LBS.	36,030 LBS
5540-50X10	50' - 0"	10"	60	16' - 1"		31,980 LBS.	34,775 LBS

**NOTE: Specifications Are Subject To Change Without Prior**

5540 SERIES GRAIN DRILL CAPACITIES			
Model	Seed Box Capacity	Fertilizer Box Capacity	Grass Seed Box Capacity
5540-50 (W/Out Fertilizer)	162.5 Bushels	5250 LBS.	N/A

**NOTE: Specifications Are Subject To Change Without Prior**

5540 SERIES GRAIN DRILL HITCH WEIGHTS		
Model	Hitch Weight W/Out Markers (Empty)	Hitch Weight W/Markers (Empty)
5540-50	7500 LBS.	N/A

**NOTE: Specifications Are Subject To Change Without Prior**

Tire Inflation			
Tire Size	Tire Manufacturer	Ply/Load Rating	Inflation Pressure (Psi) (Max.)
VF 480/45R17	BKT	LOAD INDEX 167A8B 12,015 LBS. @ 25MPH	78 psi
IF 280/70R16	Firestone	LOAD INDEX 134/4680 LBS. @ 40MPH	64 psi
380/55R 16.5 IMP	Goodyear	LOAD INDEX 1508/B 7400 LBS. @ 30 MPH	74 psi

<b>Recommended Torque Specification For Lug Bolts and Nuts</b>	
<b>Bolt Size</b>	<b>Torque (FT. LBS.)</b>
5/8-18	85 - 100 FT. LBS.
3/4-16	250-265 FT. LBS.

# 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]	-----	-----	-----

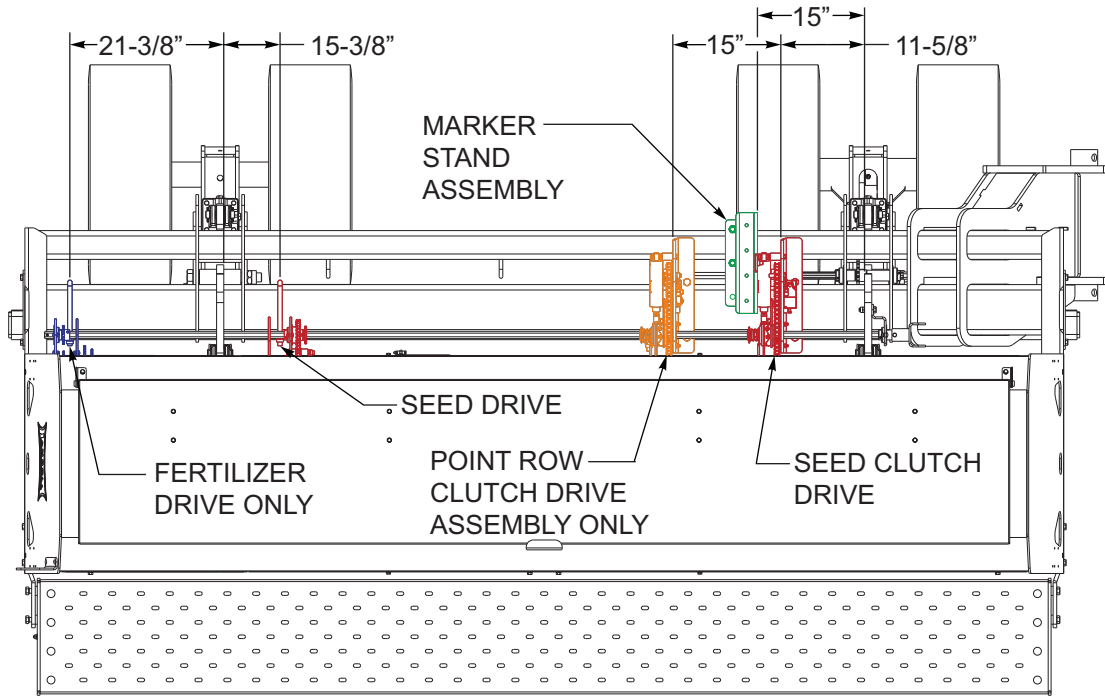
Table 2-1: General Torque Specifications

# Hydraulic Fitting Torque Specifications

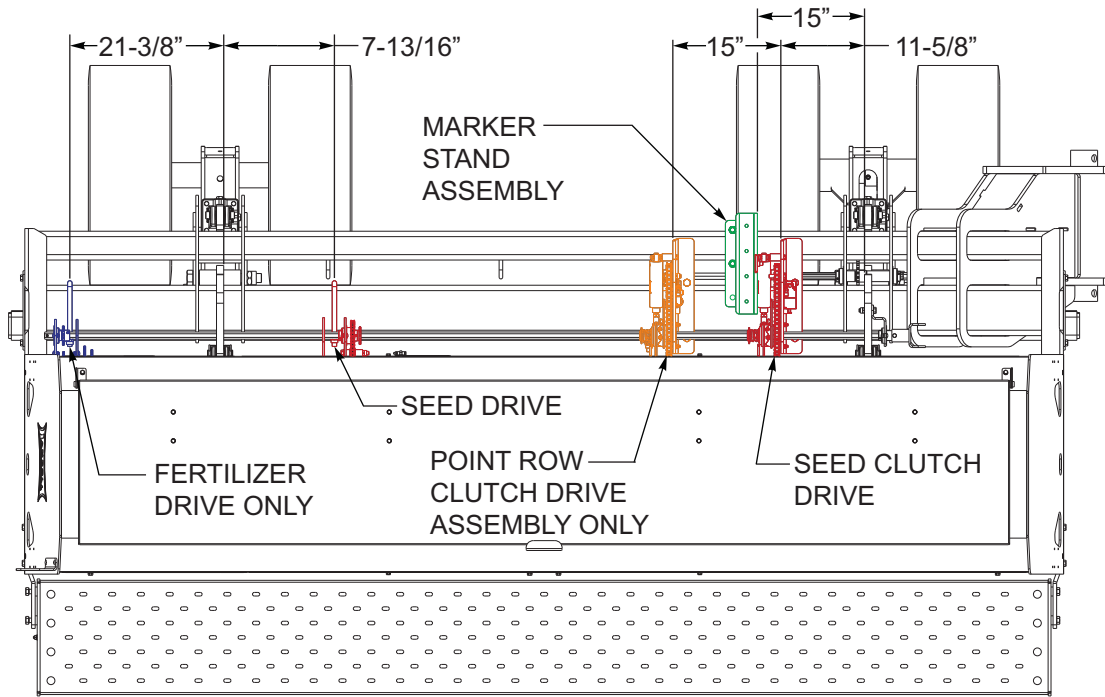
<b>TORQUE IS SPECIFIED IN FOOT POUNDS- 37° JIC, ORS, &amp; ORB (REV. 10/97)</b>			
This chart provides tightening torques for general purpose applications when special torques are not specified on process or drawing. Assembly torques apply to plated nuts and capscrews assembled without supplemental lubrication (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.			
<b>Parker Brand Fittings</b>			
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
<b>Gates Brand Fittings</b>			
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	-----	-----
<b>Aeroquip Brand Fittings</b>			
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



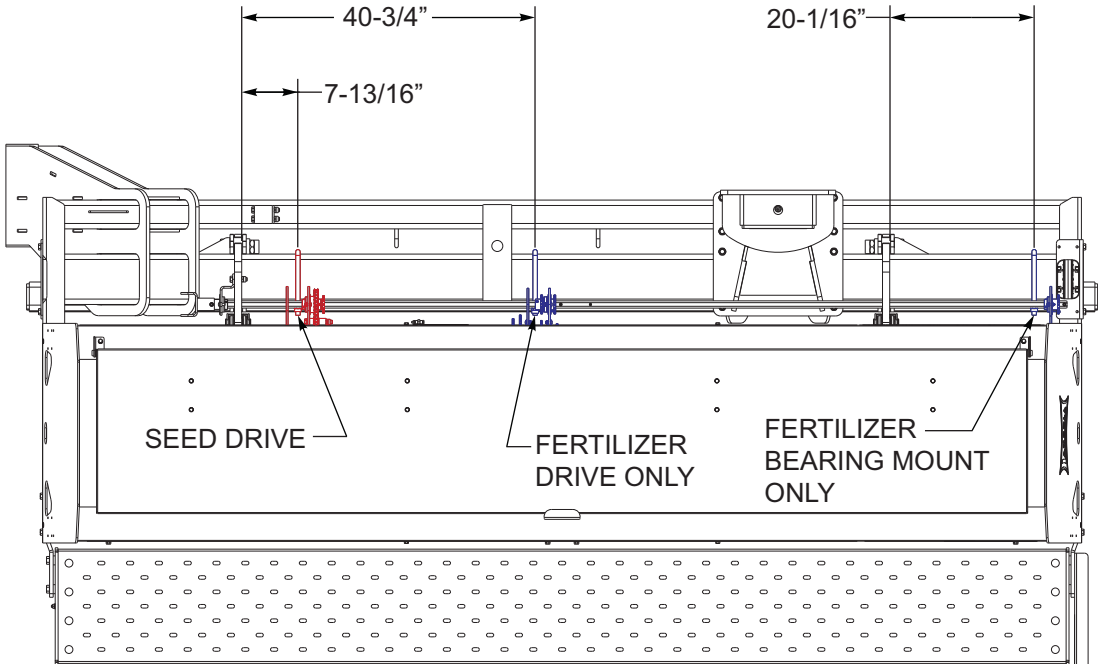


5540-50'  
LEFT OUTER SEED BOX  
7-1/2" SPACING

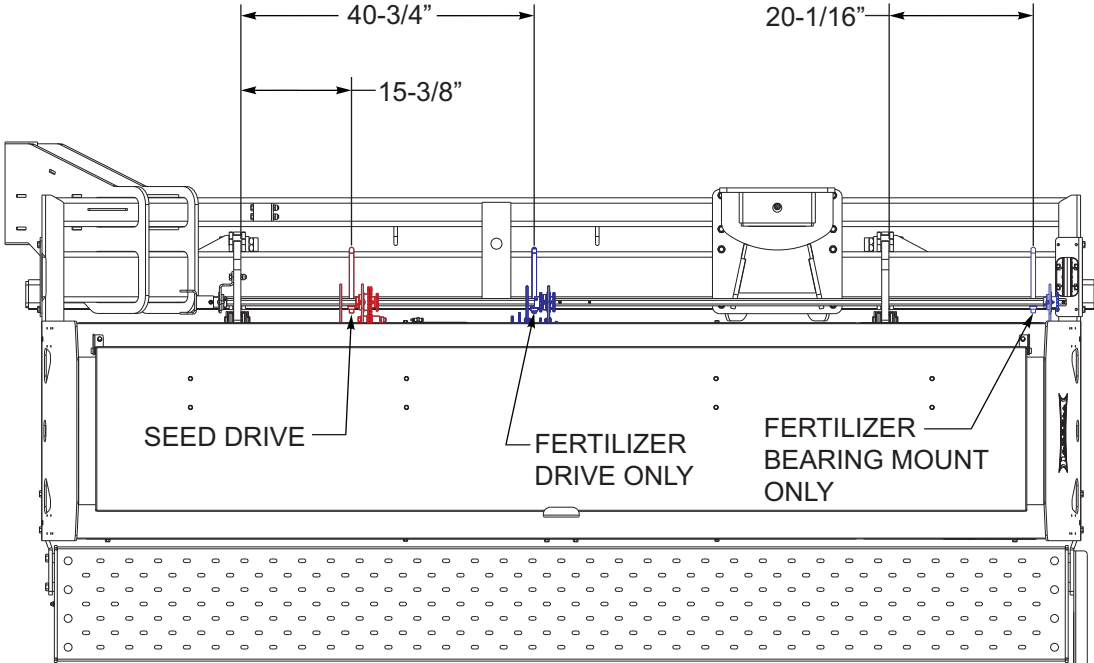


5540-50'  
LEFT OUTER SEED BOX  
10" SPACING

Figure 2-1: 5540-50 Left Outer Seed Drive Placement



5540-50'  
LEFT INNER SEED BOX  
7-1/2" SPACING



5540-50'  
LEFT INNER SEED BOX  
10" SPACING

Figure 2-2: 5540-50' Left Inner Seed Drive Placement

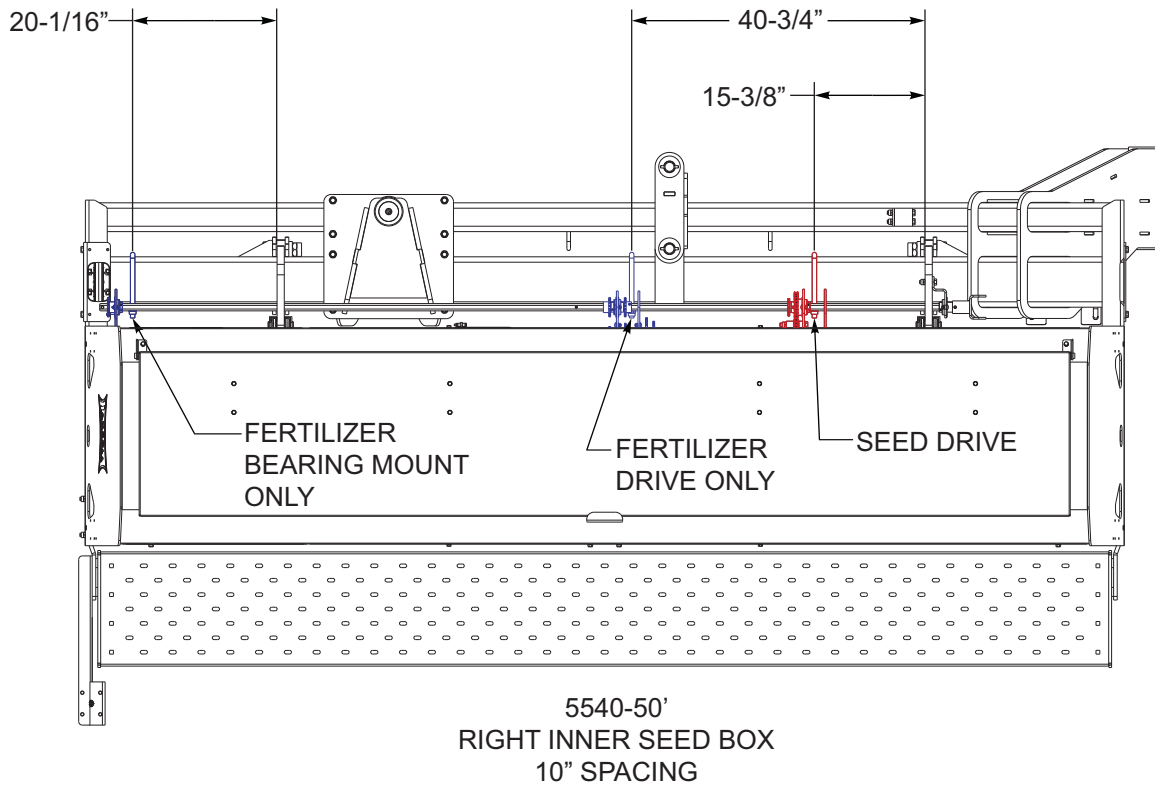
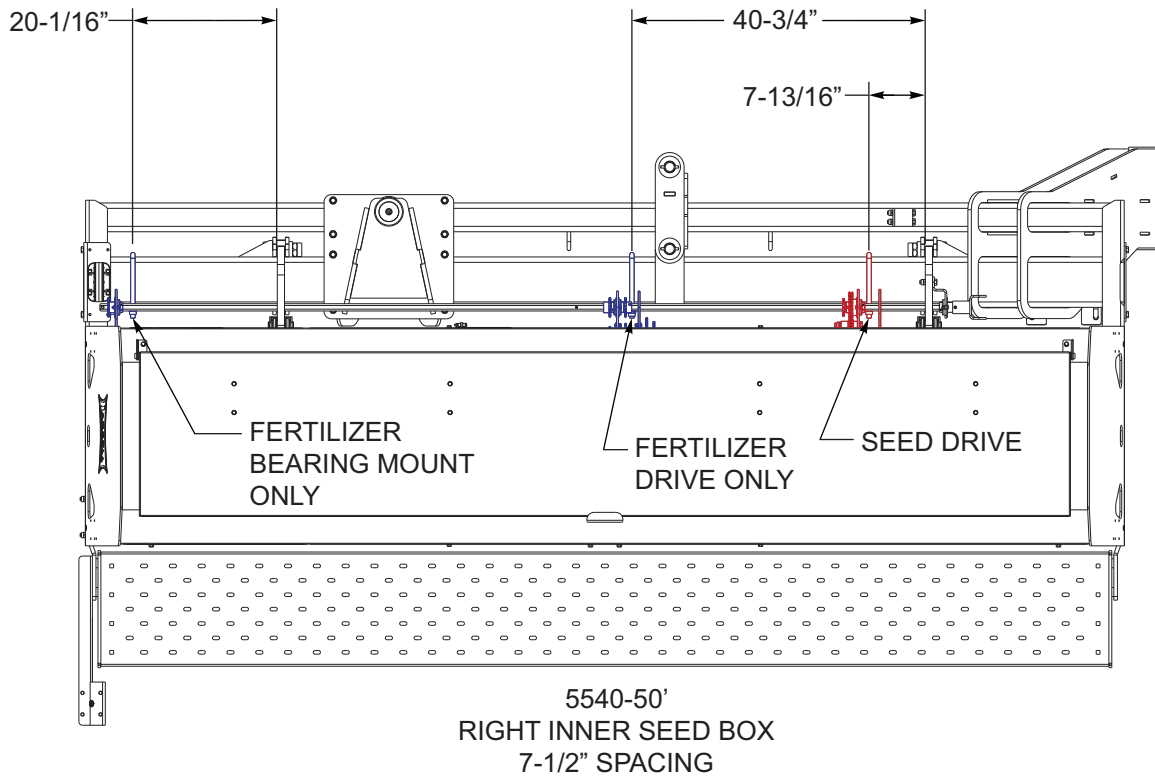
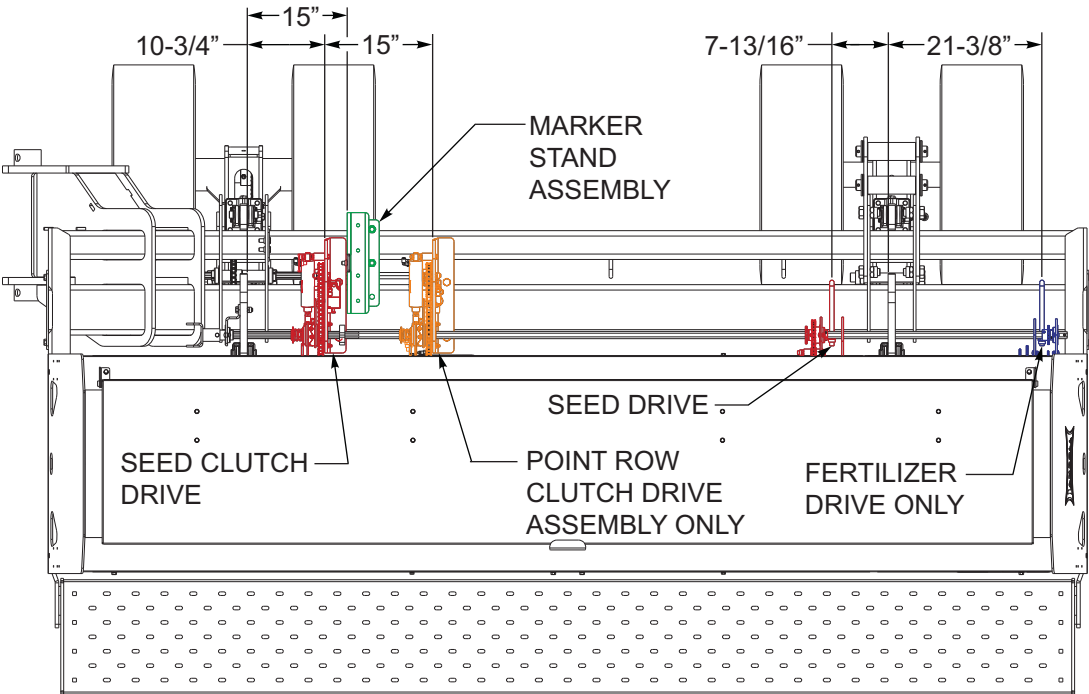
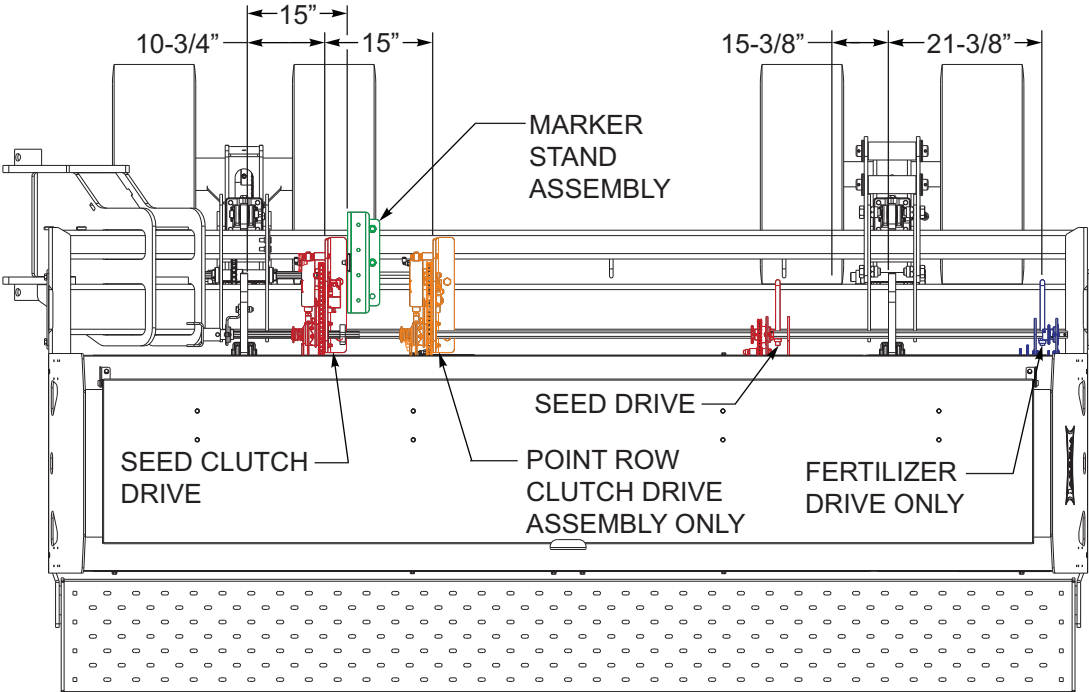


Figure 2-3: 5540-50' Right Inner Seed Drive Placement





5540-50'  
RIGHT OUTER SEED BOX  
7-1/2" SPACING



5540-50'  
RIGHT OUTER SEED BOX  
10" SPACING

Figure 2-4: 5540-50' Right Outer Seed Drive Placement



# Assembly Instructions

## Assembly Instructions

### Assembly Safety

Your new 5540 Grain Drill comes nearly completely assembled from the factory and ready to go to the field. This section includes press wheel and 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.



#### CAUTION

Be sure to bleed the hydraulic system of all air in lines after installation. Failure to bleed the system of all air can result in improper machine operation.

## Press Wheel Assembly

1. Attach each press wheel assembly to each air opener assembly on the Grain Drill using press wheel arm pin and 3/4-10 hex lock nut (See [Figure 3-1.](#))



**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.

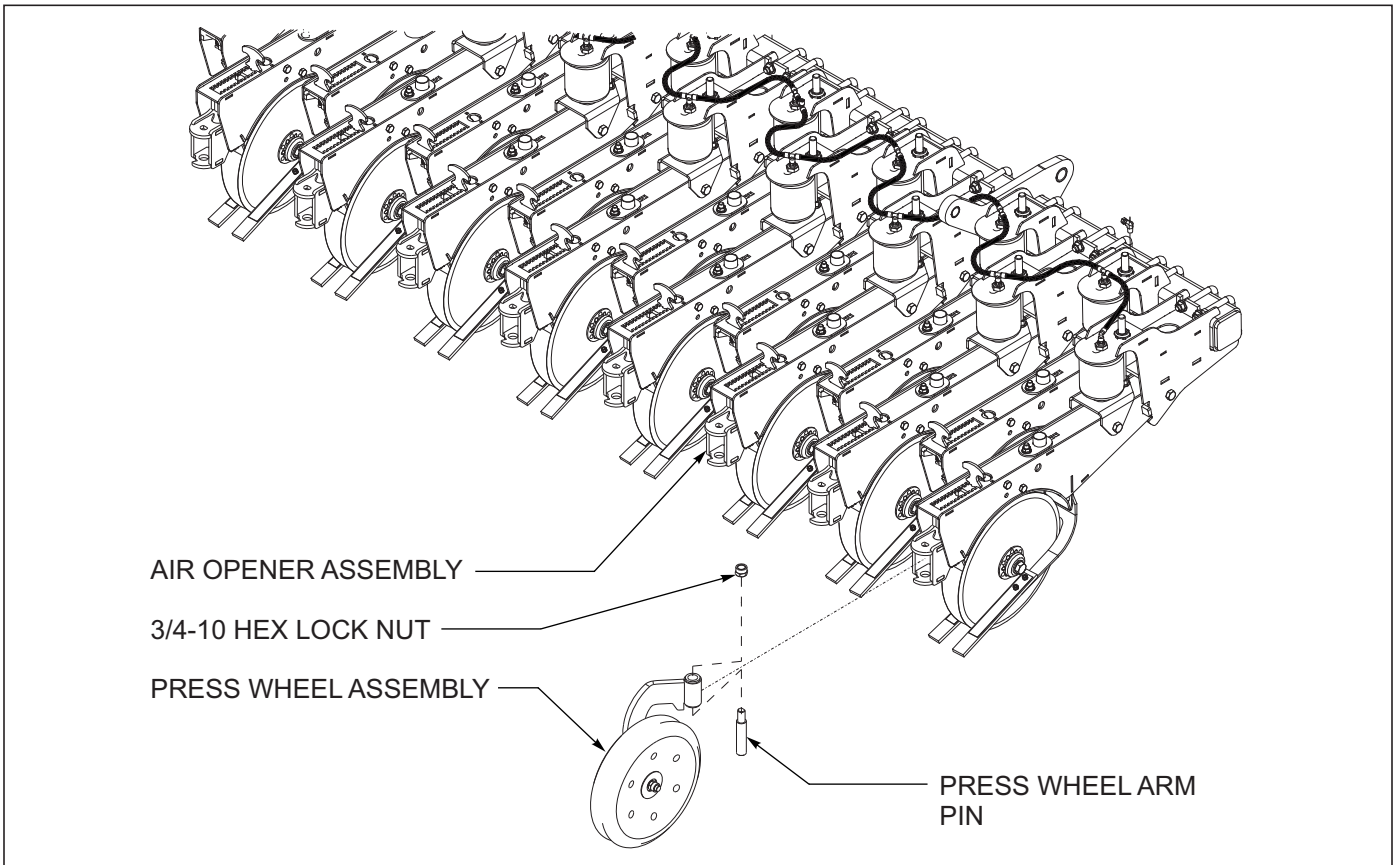


Figure 3-1: Press Wheel Assembly

# Operation and Maintenance

## Operation and Maintenance

### Operation Safety Statements



#### DANGER

Never allow anyone to ride on the 5540 Grain 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 cause 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.



#### CAUTION

Relieve system air pressure before attempting to adjust or service any air spring component. Make sure all components are in place and secure before charging the system.

### Tractor Preparation

The Landoll 5540 Grain Drill is designed to be pulled by tractor equipped with a double lip or clevis type hitch. If your tractor is not equipped as such, you need to purchase the hitch from your local tractor dealer.

Before attaching the Grain Drill, prepare the tractor as follows:

1. Inflate the rear tractor tires equally and add ballast according to the tractor operator's manual.
2. Lock the tractor drawbar in the center position.

### Grain Drill Preparation

1. Prior to operating the 5540 Grain Drill, read and understand the operator's manual and all decals.
2. Inspect the machine thoroughly for good operating condition.
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 bolts daily.
5. Check the lift wheel tire inflation. Inflate all tires equally to avoid side draft. 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 4-30.*)
7. Lubricate the machine (*See "Storage" on page 4-44 and Figure 4-37 on page 4-43.*)
8. Check that all safety decals and reflectors are correctly located and legible. Remove any dust, mud, or residue covering lights, smv, and reflectors. Verify that all lighting is on and functions correctly. Replace if damaged.

## Attaching Grain Drill To The Tractor



### WARNING

The Grain Drill has positive and negative tongue weight depending on wing fold position. 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. If the draw bar is too high or too low, attach the hydraulic hoses to the tractor. Slowly extend or retract the telescoping hitch until the hitch is in line with the tractor clevis.



Figure 4-1: Hydraulic Leak Detection



### 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 (*See Figure 4-1.*) 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.

4. Back the tractor into final position, and install the hitch pin.
5. Plug the safety lights into the seven-pin connector on the tractor.
6. Attach the safety chain to an anchor on the tractor sufficient to pull the drill.
7. Fully raise the hitch and install the transport lock pin in the hitch.
8. Rotate the parking jack stand into storage position and pin in place.

## Transport Locks

1. Transport lock pins are provided to secure the Grain Drill in raised and folded positions. Do not rely totally on hydraulics when working beneath raised equipment.



### WARNING

Install transport lock pins before attempting to service, adjust, or transport raised equipment.

2. To install the telescoping hitch transport lock, fully raise the main lift and hitch. Remove the pin from the storage position and install through the hole in the telescoping hitch (*See Figure 4-2.*) Leave the weight of the drill on the hydraulic system while transporting. The pin will prevent any uncontrolled dropping of the hitch.
3. Wing locks will latch automatically when the drill wings are folded for transport and wing wheels are retracted.

### NOTE

Be sure jack stand is in Field Position before pulling drill (*See Figure 4-2.*)

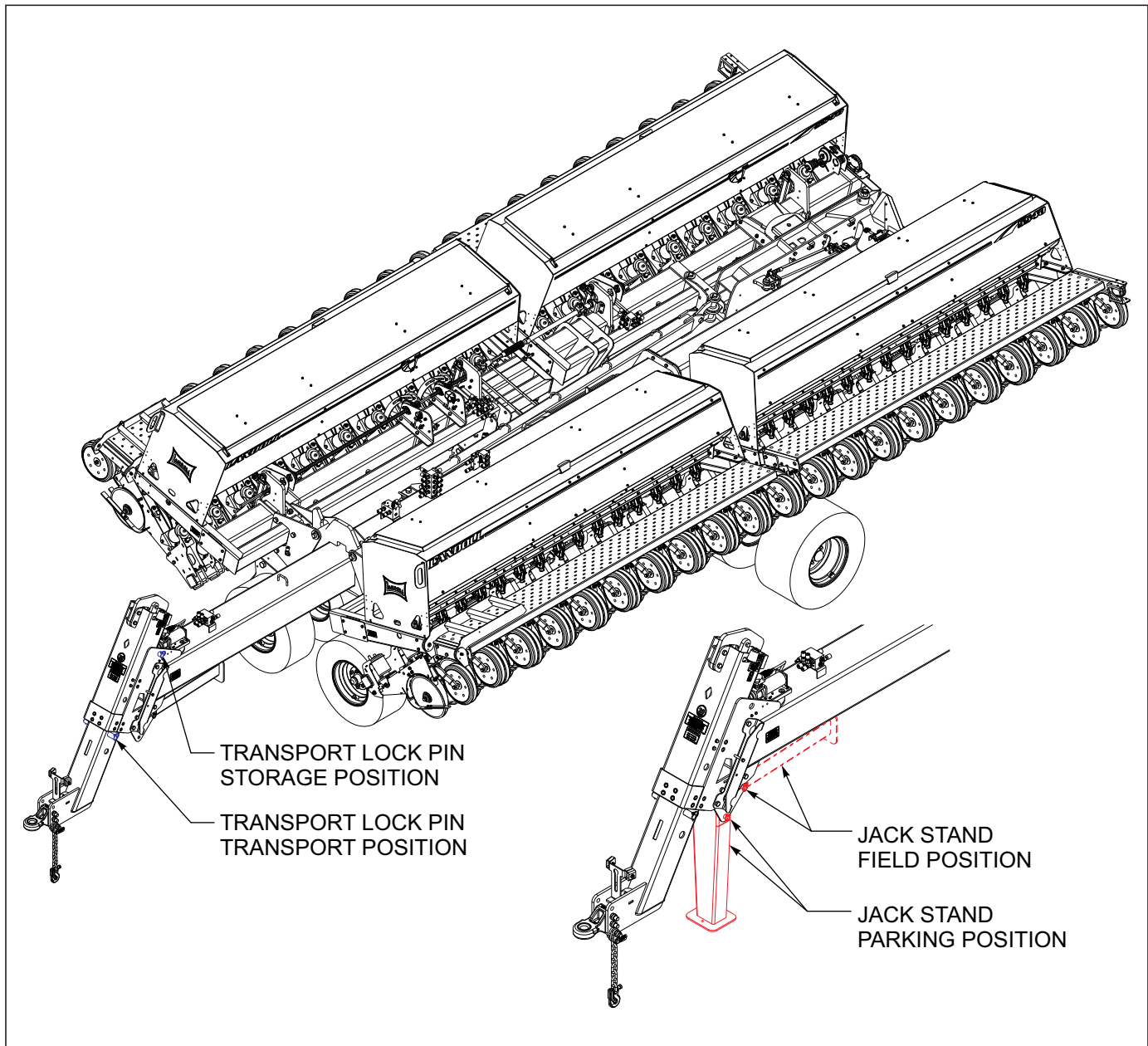


Figure 4-2: Telescoping Hitch Transport Locks





### Folding/Unfolding the Grain Drill

The Grain Drill is equipped with hydraulic cylinders to fold and unfold the drill from transport to field position. A combination of both the fold and lift hydraulics will be used to fold/unfold the drill.



#### DANGER

The Grain Drill should be folded/unfolded on a large level area large enough to accommodate the drill when unfolded. Be sure other people and pets are a safe distance away. Tractor should be stopped and not moving, with the engine at a slow idle.

1. Before folding/unfolding the drill, pin the drill hitch to the tractor drawbar (See *“Attaching Grain Drill To The Tractor”* on page 4-3).



#### WARNING

The wings will generate negative tongue weight when the unit is unfolded causing the hitch to rise suddenly, possibly resulting in serious injury or death. Be sure the drill hitch and safety chain are securely attached to the tractor before fold/unfolding the Grain Drill.

2. Connect the hydraulic hoses to the tractor remote.

3. When unfolding:
  - a. Remove transport lock pins from telescoping hitch and place in storage locations (See *Figure 4-2.*)
  - b. Fully raise the opener tool bars for maximum opener clearance.
  - c. Engage the lift hydraulics, to fully raise all wheel lifts and fully lower the front hitch.
  - d. With the tractor in neutral, slowly unfold the Grain Drill until the wing cylinders are fully extended.
  - e. Completely lower all wheel lifts, then the hitch will start to raise.
  - f. Raise the Grain Drill hitch until the visual reference indicator is centered in the diamond-shaped hole at the front top of the hitch.

#### NOTE

*If the hitch is raised past the center position, fully lower the hitch, and re-raise the front of the hitch. This will insure the wing brace locks are fully engaged before planting.*

4. When folding:
  - a. Raise the opener tool bar for maximum opener clearance.
  - b. Fully lower the hitch., and extend all lift cylinders.

#### NOTE

*Wings will not fold unless all lift cylinders are fully extended.*

- c. With the tractor in neutral, slowly engage the wing fold cylinders and fold the wings forward.
- d. Fully raise hitch. Watch to make sure the wing locks have fully engaged as the hitch begins to raise. Wing locks will latch automatically.
- e. Install transport lock pins in the telescoping hitch to secure the Grain Drill (See *Figure 4-2.*)

## Leveling the Hitch

### Hitch Clevis Adjustment

1. The hitch clevis height should be adjusted to match the drawbar height of the tractor. This will allow the telescoping hitch to operate through its most efficient range and level throughout the field (*See Figure 4-3.*)
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.

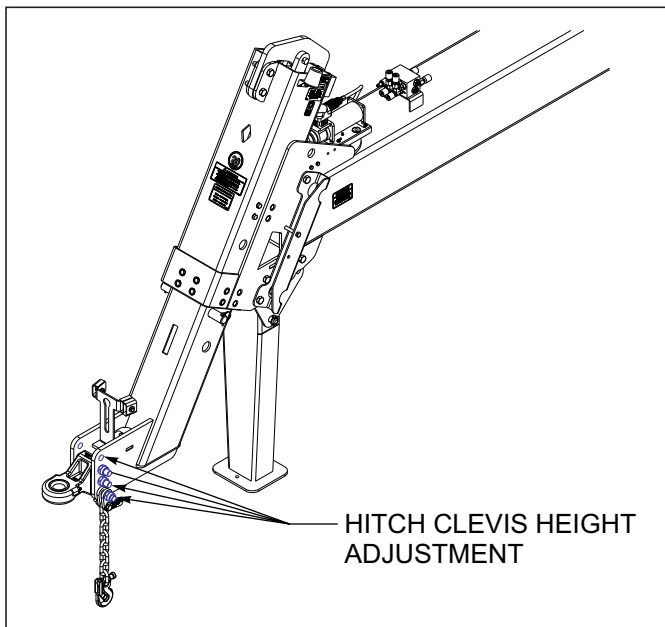


Figure 4-3: Hitch Clevis Height

### Hitch Leveling Field Position

1. When unfolding the Grain Drill the hitch is lowered to its lowest point to allow the wing fold locks to unhook and clear. Before starting to plant, the hitch should be leveled to insure proper opener depth and full opener travel.
2. Make sure the hitch clevis is adjusted for the proper tractor drawbar height (*See Figure 4-3.*)
3. Use the diamond shaped hole at the front of the hitch as a guide to level the hitch for planting operations (*See Figure 4-4.*) The wear pad (inside the hitch tube) will be visible from the tractor seat as it slides by the reference hole. When the reference line on the wear pad is centered in the diamond shaped hole, the hitch should be level. Do not insert any objects in the reference holes as the wear pad slides over these holes and could damage the hitch.

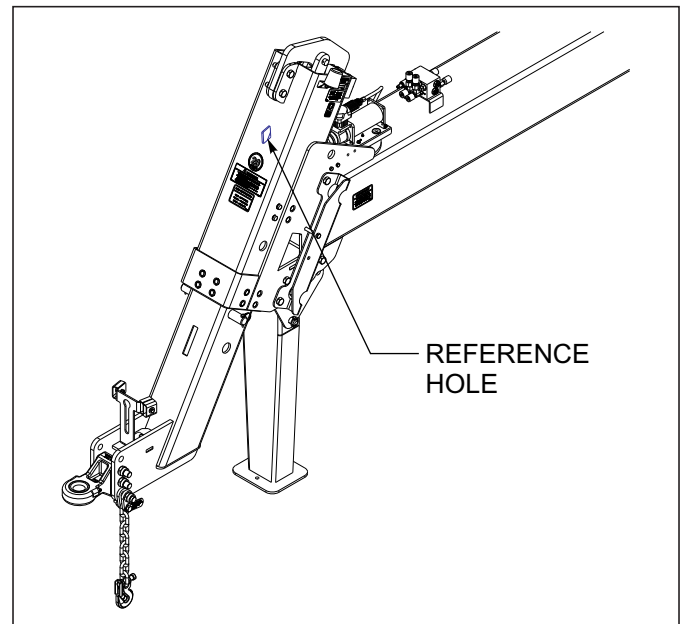


Figure 4-4: Leveling the Hitch

## Transporting the Grain Drill

### Transporting the Grain Drill

1. Check and follow all federal, state, and local requirements before transporting the Grain Drill.

**NOTE**

Before transporting the 5540 grain drill be sure the 41,000 safety chain is fastened properly to tractor drawbar, the red/amber led ag lamps are working properly, the smv and reflectors are free of dirt and clearly visible [See Figure 4-5.](#)

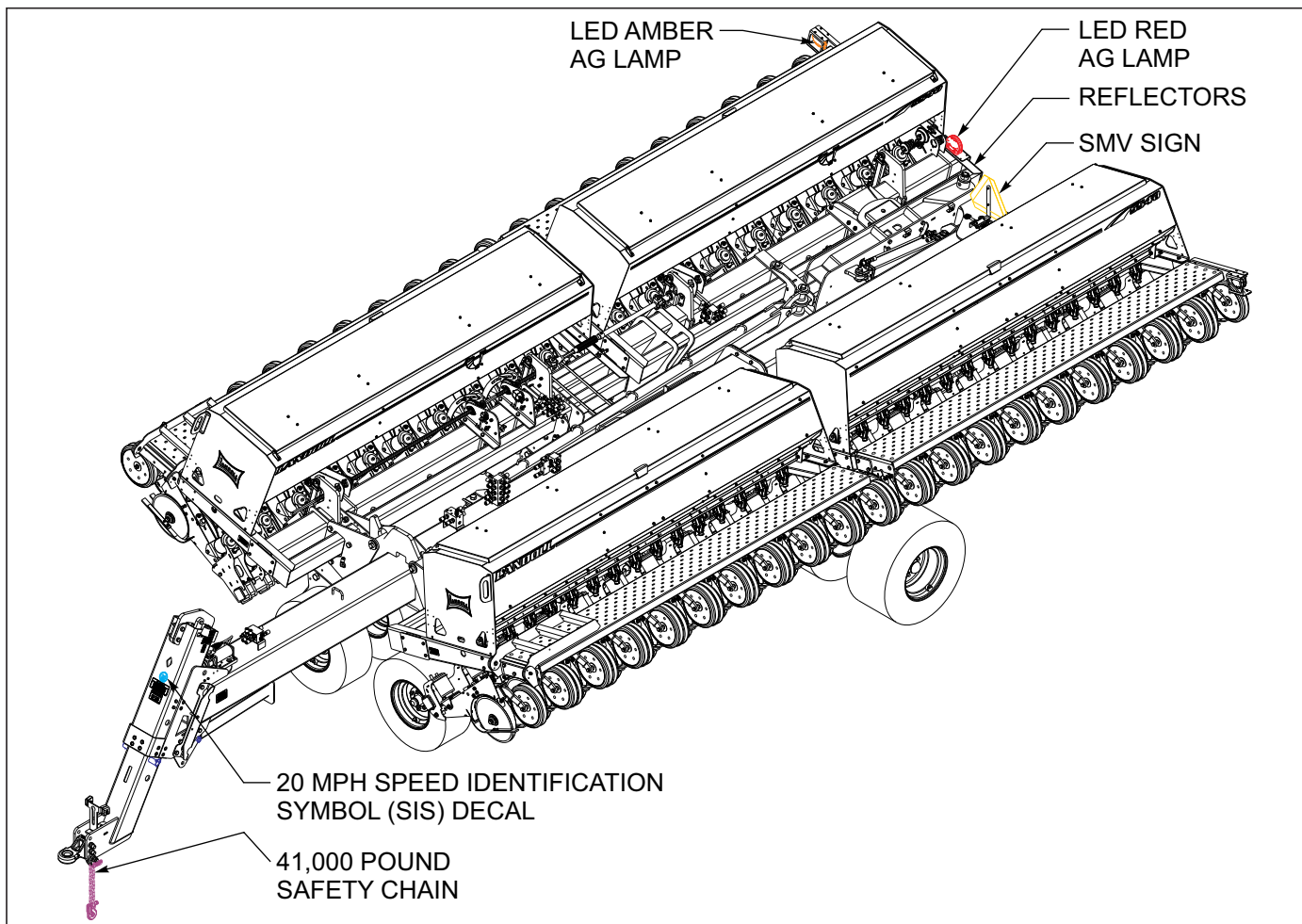
2. The Grain Drill should be transported only by a tractor required for field operation. The implement weight should not exceed more than 1.5 times the tractor weight. Unless noted on the implement, maximum transport speed is 20 mph for the implement and is designated on the speed identification symbol (SIS) located on the front of the implement ([See Figure 4-5.](#))



**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.

3. When towing equipment in combination, the maximum equipment ground speed shall be the limited to the lowest specified ground speed of any of the towed implements.
4. Maximum transport speed shall be the lesser of travel speed specified in the operators manual, speed identification symbol, information sign of towed implement, or limit of road condition.



**Figure 4-5: Folded Transport Position**


5. Slow down when driving on rough roads. Reduce speed when turning, or on curves and slopes to avoid tipping. Equipment altered other than the place of manufacture may reduce the maximum transport speed. Additional weight, added tanks, markers, harrow attachments, etc. may reduce the implements carrying capabilities.
6. A safety chain is provided with the implement 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.
  - b. Attach the safety chain to the tractor drawbar (**See Figure 4-5.**) 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.
  - c. 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 properly.
  - d. Regularly inspect the safety chain for worn, stretched, or broken links and ends. Replace the safety chain if it is damaged or deformed in any way.
7. Before transporting:
  - a. Know the height and width of the implement being towed. Markers, tanks, attachments, etc. can increase the height and width of the implement.

 <b>DANGER</b>
<p><b>Stay away from power lines when transporting, extending or folding implement. Electrocutation can occur without direct contact.</b></p>

- b. Check to see that the tractor drawbar is rated to carry the weight of the Grain Drill hitch.
- c. Use a locking style hitch pin that properly fits the holes in the tractor drawbar and implement hitch.
- d. Attach safety chain.
- e. Plug in the safety lights to the tractor seven-pin connector.
- f. Fully raise the Grain Drill lift, hitch, and openers.
- g. Make sure all transport locks and pins are installed.

 <b>WARNING</b>
<p><b>Failure to use transport lock pins during transport may result in permanent equipment damage, serious injury, or death.</b></p>

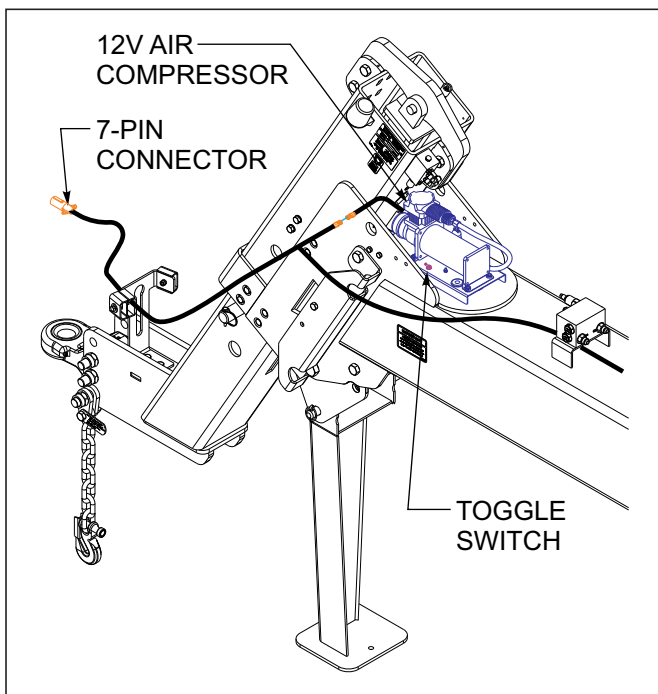
- h. Raise the implement parking jack stand.
- i. Check all tires for proper inflation, and that lug nuts are properly torqued.
- j. Verify that all warnings lights, SMV sign, reflectors, and safety decals are clearly visible and functioning properly.
- k. Transport during daylight hours whenever possible. Always use flashing warning lights, except where such use is prohibited by law. Make sure lights, reflectors and SMV emblem are clearly visible and operating. Remove any obstructions such as dirt, mud, stalks or residue that restricts view before transporting.
- l. DO NOT transport the drill with seed or fertilizer in the box.

 <b>CAUTION</b>
<p><b>Do not transport the Grain Drill with seed or fertilizer in the boxes. Seed, fertilizer, additional weight, markers, etc. can quickly exceed the carrying capabilities of the drill hitch and tractor drawbar.</b></p>

## Air System Operation

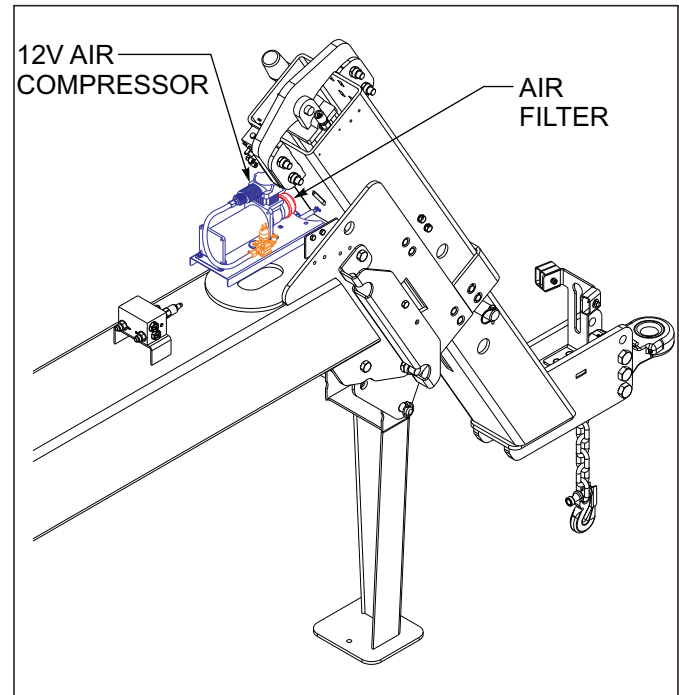
### Compressor Operation

1. The 5540 drill is equipped with a heavy-duty electric air compressor (*See Figure 4-6.*) to charge and adjust the pressure in the opener air springs.
2. Power is supplied to the air compressor through the seven-pin electrical connector to the tractor. The tractor should be equipped with a minimum 30 amp connection to the center terminal of the connector and operate only when the tractor switch is on to prevent the compressor from running down the tractor battery. Connect the seven-pin connector to the tractor. It is recommended that the tractor be running while operating the compressor to insure full system voltage to the compressor. A toggle switch is located next to the compressor to turn the compressor on and off.



**Figure 4-6: Air Compressor Connection**

3. The drill compressor will operate much like a regular air compressor. Plug the seven-pin connector into the tractor and turn the compressor switch on. The compressor will charge the entire system and fill the main air tank in the center opener tool bar. A pressure switch (*See Figure 4-7.*) will automatically turn the compressor off when the system has reached full pressure.



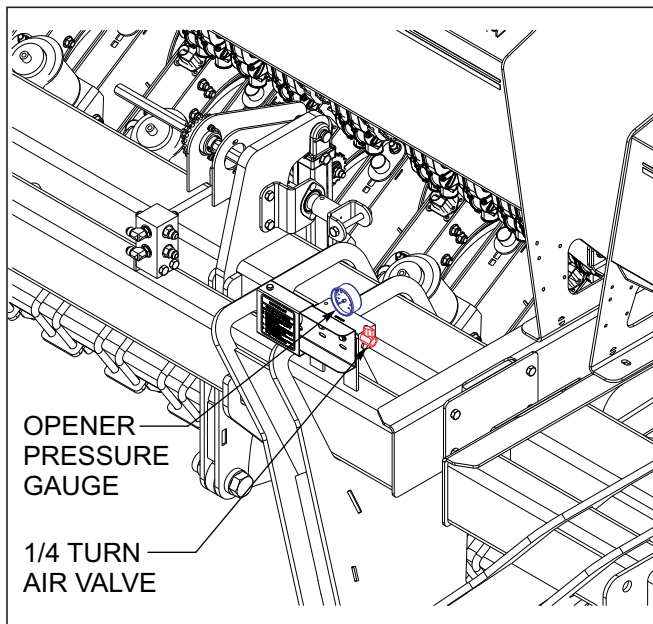
**Figure 4-7: Air Compressor Pressure Switch**

4. The air compressor is designed for oilless operation. There are no fluid levels to check or maintain.
5. The compressor is equipped with a replaceable air filter *See Figure 4-7.* Service the filter regularly and replace each season with a new filter. Be sure to install the filter cover with intake pointing downward to prevent collecting dust and water.



### Opener Air Pressure

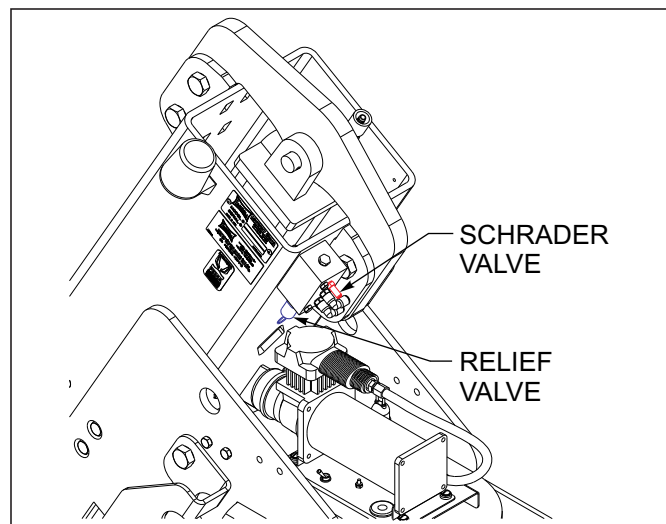
1. Air to the openers is supplied by the drill air compressor (*See Figure 4-9*). System air pressure is adjusted at the front of the left wing with the pressure regulator. Check valves have been installed to hold air pressure at each opener tool bar. This will prevent transfer of air between the opener tool bars and air tank. True opener operating air pressure is read at the gauge located on the air manifold. Determine the opener pressure with the drill openers in the ground in working position on level ground.
2. The air system pressure on the Grain Drill can safely operate in a range from 15 psi to 100 psi. A opener pressure gauge is located on the left wing to monitor air pressure. It is normal for the opener air pressure to vary while working in the field. As the openers raise and lower over ground conditions, so will the opener pressure vary.



**Figure 4-8: Air System Pressure**

3. Do not at any time operate the air pressure below 15 psi. The air springs must maintain a minimum air pressure for proper inflation. Too low of pressure will cause the air springs to rub internally and lead to failure.

4. System pressure should not exceed 100 psi. This is the maximum recommended working pressure the air springs are rated for. This will provide maximum down pressure for the row units. A system relief valve (*See Figure 4-8*) is installed at the front of the hitch to protect the system from excessive pressure. Do not remove or adjust the relief valve or damage to the air system may occur.
5. A schrader valve is located on the air manifold at the front of the drill (*See Figure 4-8*). This allows air to be added to the system from an external air source (shop air). This is helpful when initially charging the air system, or when making large changes in system pressure.



**Figure 4-9: Schrader Valve**

#### NOTE

*The regulated air supply will compress in the air springs when the drill is lowered in the ground to working position. Thus the true opener gauge air pressure will always be greater than the regulated air setting by approximately 10-15 psi.*

6. **To increase opener air pressure** – raise the openers out of the ground. With the tractor engine running, turn on the air compressor on the drill hitch. Open the regulator cover on the left wing, and turn the outer dial of the regulator to the desired higher pressure setting. Lower the drill openers and plant a short distance, then check the opener pressure at the gauge on the opener manifold. Close the regulator cover.

#### NOTE

*It may take several minutes for the air to equalize when making large adjustments.*



7. **To decrease opener air pressure** – raise the openers out of the ground. Open the regulator cover and turn the outer dial of the regulator to the desired lower pressure setting. Open the 1/4 turn air valve on the air manifold to bleed off excess opener air. Continue to bleed off air pressure until the air pressure gauge matches the regulator setting, then close the 1/4 valve. Close the regulator cover. Lower the drill openers, and plant a short distance.
8. **Initial settings** – When beginning planting operations, use an opener air pressure of 20-50 psi for light or sandy soils, 40-60 psi for medium or conventional tilled soils, and 70-100 psi for heavy and no-till planting. These are initial settings. Operator must verify seed placement and adjust air system pressure as required.

**NOTE**

*Excessive air pressure can raise the drill out of the ground, particularly with low seed levels in the seed box.*

### Resetting Opener Air Pressure

1. System air pressure is supplied equally to all drill sections and held at each section. Under normal operating conditions the air pressure can change across the each of the sections and should be reset to equalize the air pressure across the drill. This is similar to a hydraulic rephasing lift system that needs reset over time.
2. A good way to visually see this is to look at the amount of spring rod sticking above the openers for each section, while the openers are in the ground. Varying planting depths for each section may also indicate the system air pressure needs reset.
3. To reset the system air pressure, first raise the openers so there is no load on the openers. Then open the 1/4 turn valve at the manifold at the rear of the drill (*See Figure 4-8.*) Bleed off approximately 10 psi of system air pressure. With the compressor on, allow the air system to refill normally to the desired air pressure settings. This may take several minutes to refill and equalize. Bleeding system air pressure before filling the drill boxes or transporting the drill will generally allow sufficient time to refill before planting.
4. Resetting the opener air pressure daily should keep the system equally charged. If the drill has set for several days, it may be necessary to bleed off more than 10 psi to equalize the system.

**NOTE**

*This procedure is for a normal operating air system. If any air leaks have developed in the drill section(s), they should be repaired immediately to insure equal consistent planting depths.*

### Maintenance

1. Relieve air system pressure before attempting to adjust or service any air spring. Open the ¼ air valve at the air manifold on the left wing of the drill to relieve all system air pressure. Do not pressurize the air system unless all row unit components are in place. When charging the system, verify that all air springs are filling properly. If the air spring buckles or rolls off to the side, relieve system pressure, and work or roll the air spring over the lower piston by hand. Slowly begin charging the system and verify proper filling.



**CAUTION**

**Relieve system air pressure before attempting to adjust or service any air spring component. Make sure all components are in place and secure before charging the system.**

### Openers – Hydraulic Operation

1. The Grain Drill openers are raised and lowered through a hydraulic lift system. Fully retract all cylinders to raise the openers. Likewise fully extend all cylinders to lower the openers. The cylinders must be fully extended to insure consistent planting depth and engage seed drive clutches. Do not operate the opener hydraulics in the “float” position.
2. Raise the openers when transporting.
3. During planting operation, always raise the openers before turning. Failure to raise the openers while turning can generate enormous side loading which could damage the openers.
4. Never back up the Grain Drill with the openers in the ground. This can plug and possibly damage the openers.
5. The drill openers will only lower when the drill is fully unfolded.

## 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 4-10.). 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.

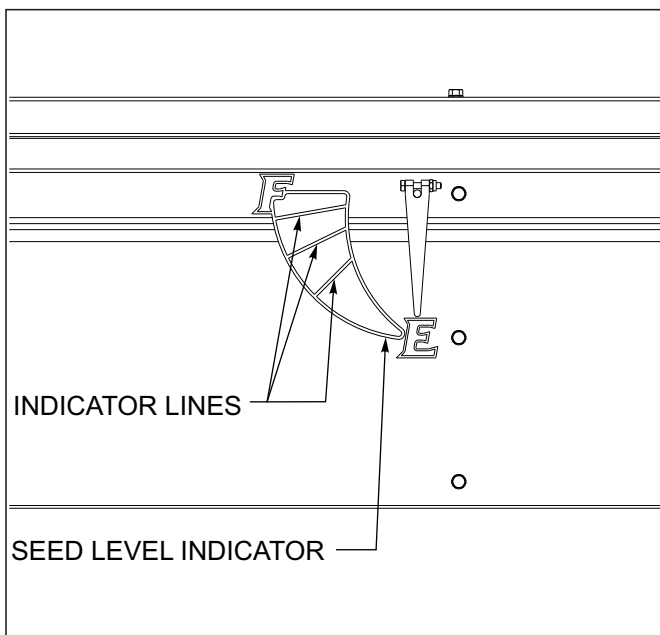


Figure 4-10: Seed Level Indicator

## Hydraulic Lift System

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 4-11.) Keep all components (cylinders, hoses, fittings, etc.) in good repair.

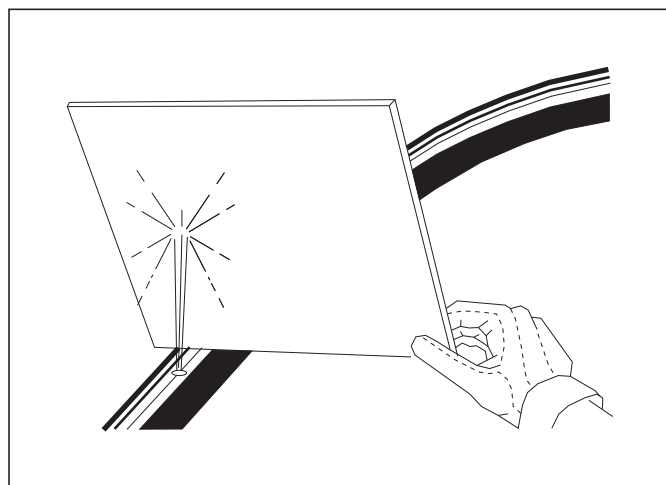


Figure 4-11: Hydraulic Leak Detection

1. The hydraulic lift system contains cylinders plumbed together.
2. The main lift cylinders and telescoping hitch are connected together on the same hydraulic circuit. Before transporting make sure both lift cylinders and hitch cylinders are fully extended for maximum transport height. Fully extend the lift cylinders and retract the front hitch before folding/unfolding the drill.

### NOTE

The drill will not fold unless the lift cylinders are fully extended.

3. Before planting slowly raise the front hitch until the drill is level front-to-rear (See “Leveling the Hitch” on page 4-7.). The weight of the drill on the main lift will allow the front hitch to raise first.
4. The main lift is equipped with an automatic transport lock, that engages when the units is folded and fully raised. Verify that the locks are engaged before attempting to adjust, service, or work beneath the raised Grain Drill. The telescoping hitch is secured by a locking pin (See “Transport Locks” on page 4-4.)

## Loup Elite Drill Monitor Operation

1. The 5540 Grain Drill is equipped with a Elite drill monitor. The drill monitor will monitor population from two sensors on each box, seed box levels, 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 **“Seed Rate Calibration” on page 4-20.**
3. Bin level sensors are installed in the seed boxes. 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 convenience plug connection, or may be hard-wired to the appropriate connections. Connect the orange wire to a positive terminal that is on when the tractor switch is on. Connect the red wire to a +12volt connection. 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. A 4-pin radar connection is provided as an optional connection for the speed sensor. The speed signal may be determined by either the tractor radar or the speed sensor located on the drill. Refer to Loup Elite Drill manual for instructions.
9. For service or setup questions, please refer to the Loup Elite Drill Monitor manual, or contact Loup Electronics:

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

## Seed Adjustments

### 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, barley, rice, or wheat (**See Figure 4-12.**)
2. The second 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. A fourth notch is for extremely large seeds such as garbanzo beans.

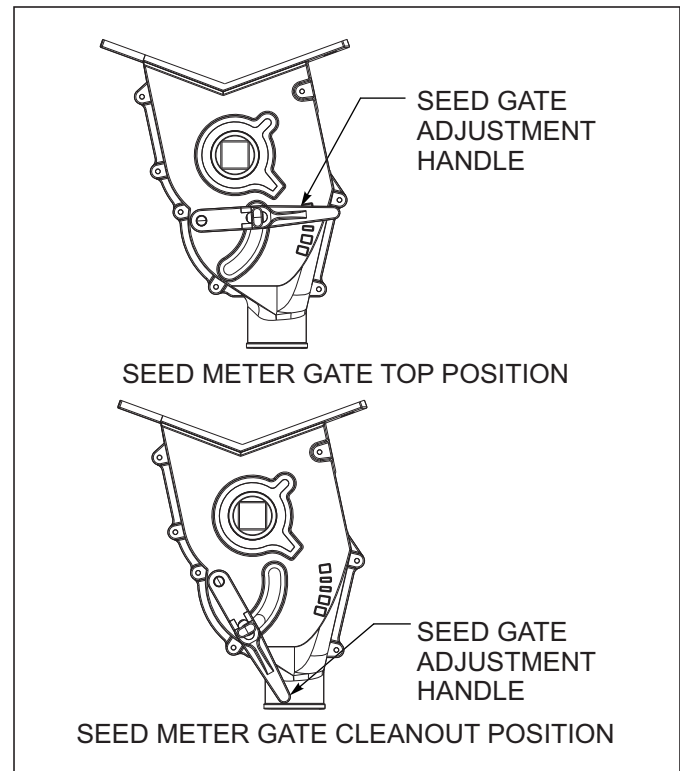
#### NOTE

*Before planting, make sure all seed gate settings are the same for all meters.*

5. The seed gate may also be completely lowered to clean out the meter and seed box (**See Figure 4-12.**) 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 4-12: Seed Meter Gate Adjustment**

## 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 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 4-13.*)
  - 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 4-14.*)
  - b. Loosen the locking nut on the square seed shaft from the end bushing.
  - c. Using a ratchet wrench extension, and 3/4" socket, insert the socket through the hole in the end box support to the hex-head adjustment bushing. Turn the hex-head adjustment bushing in or out, until the desired rate setting is obtained along the **OUTSIDE EDGE** of the seed 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.*

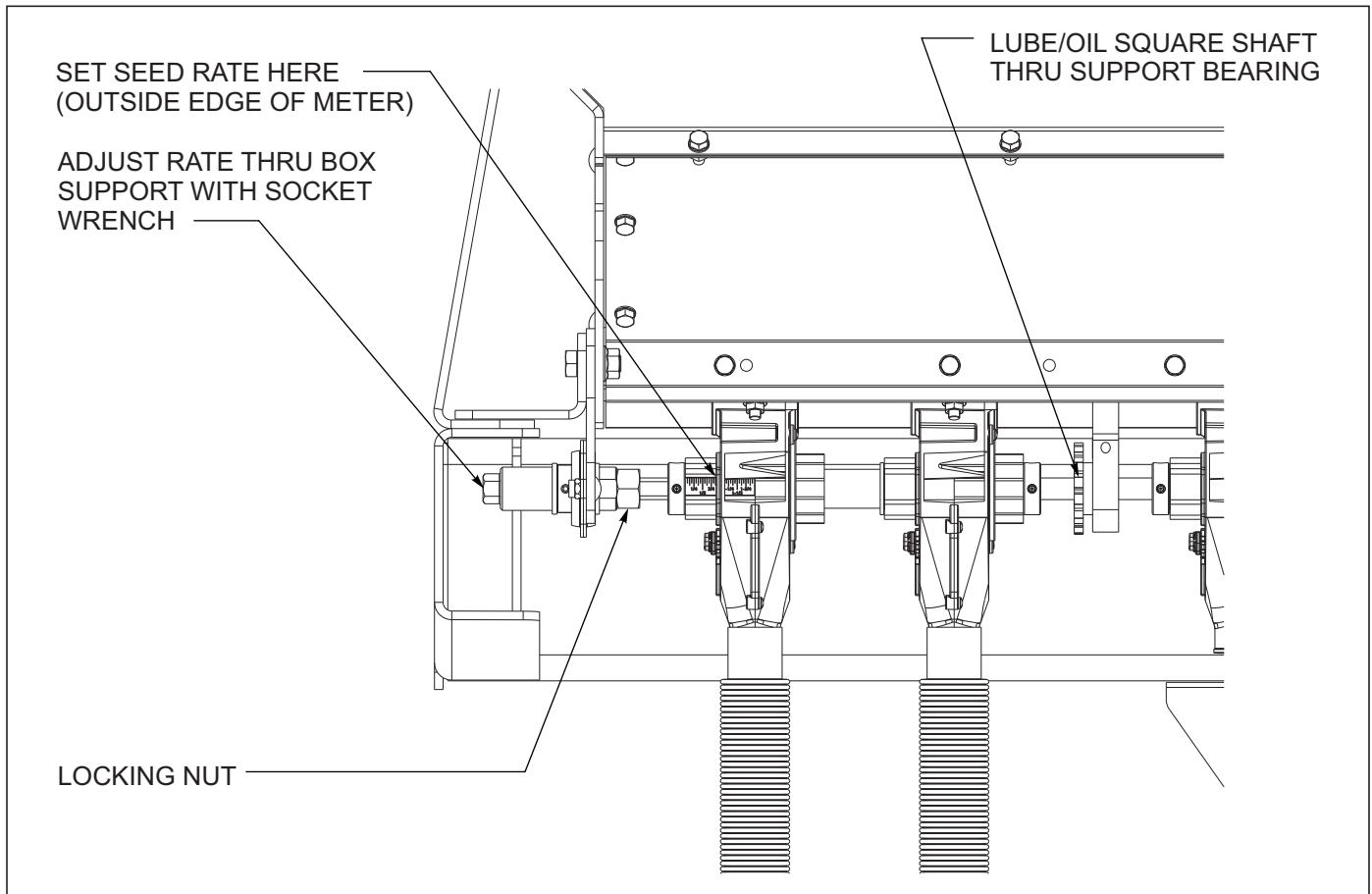


Figure 4-13: Seed Rate Adjustment

### Meter/Seed Rate Adjustment

1. If the seed meter shaft is disassembled for maintenance or repair the seed meters and adjustment will need to be reset or zeroed to set the meters equally across the section.
2. Remove any remaining seed from the seed box.
3. To reset the meters, loosely reassemble the shaft, meters, spacers, locking collars etc. but leave the locking collars loose.
4. Tighten the threaded seed shaft adjustment to hold in place.
5. Start with the end meter(s) next to the threaded adjustment (**See Figure 4-13.**) 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.
6. 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.
7. Set the seed rate adjustment to the desired rate (**See Figure 4-14.**)

**NOTE**

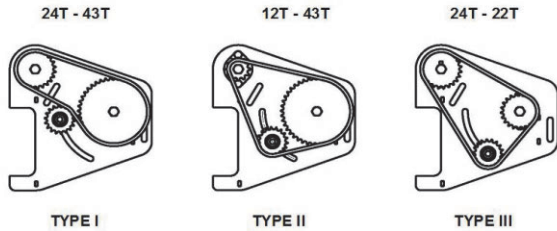
*Do not force the seed meter shaft, damage will occur.*



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



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

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**SEED RATE = (AVG SEED WEIGHT) X 65896 / (NO. OF ROTATIONS) X (ROW SPACING)**

EXAMPLE = (.1707 LBS.) X 65896 / (20 ROTATIONS) X (7.5") = **75 LBS./ACRE**

**# SEEDS per ROW = (SEED RATE) X (SEEDS/LB) X (NO. OF ROTATIONS) X (ROW SPACING) / 65896**

EXAMPLE = (60 LBS./ACRE) X (2500 SEEDS/LBS.) X (20 ROTATIONS) X (7.5") / 65896 = **341 SEEDS PER ROW**

**# SEEDS per ROW = (POPULATION) X (NO. OF ROTATIONS) X (ROW SPACING) / 65896**

EXAMPLE = (50,000 POPULATION) X (20 ROTATIONS) X (7.5") / 65896 = **114 SEEDS per ROW**

Figure 4-14: Seed Rate Chart and Calibration Formulas

### Seed Rate Calibration

1. The seed rate charts are in pounds per acre and based on an average seed size (**See Figure 4-14.**) 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.**

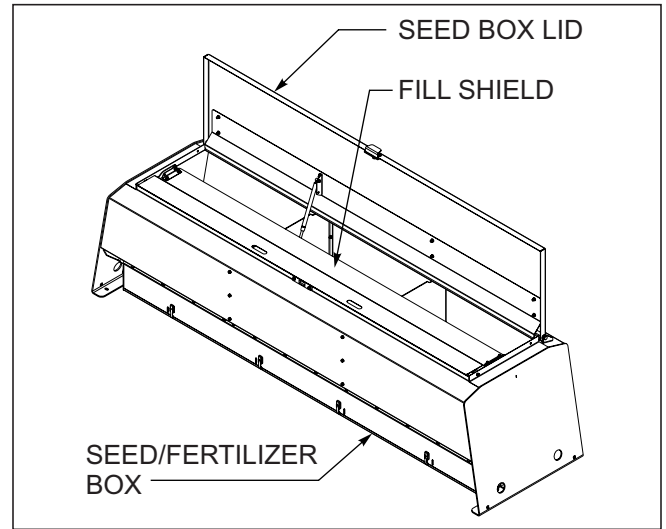
2. If the specific seed is not listed on the seed chart, pick a similar seed size and check the seed calibration for the desired rate.
3. To check the seeding rate:
  - a. Adjust the seeding rate handle and drive type to the desired rate from the seed chart (**See Figure 4-14.**)
  - b. Select three 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. Lower the openers to planting position to engage the seed clutch.
  - e. Place a jack under the appropriate drive wheel and raise off the ground so the drive wheel may be rotated by hand.
  - f. 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.
  - g. Weigh (in pounds) the total amount of seed and divide by 3 for an average amount of seed per meter. **See Figure 4-14** 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 Figure 4-14** for number of seeds per row formula.



## Dry Fertilizer Combination Box

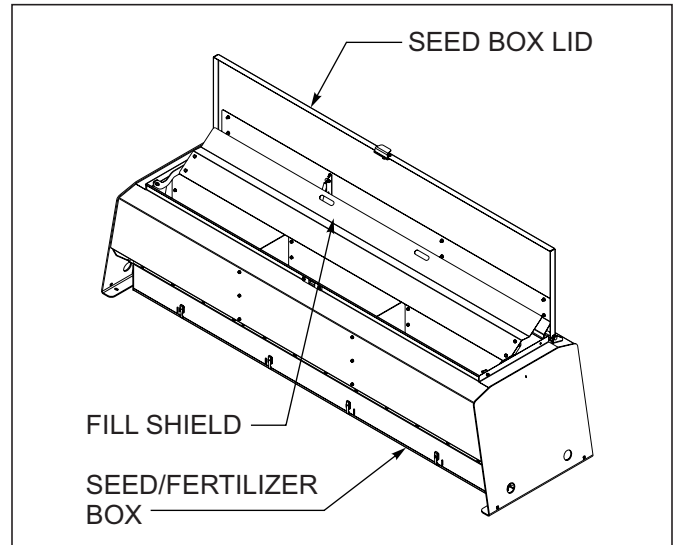
1. If the Grain Drill is equipped with the dry fertilizer option, it will have a combination seed/fertilizer box. The seed/fertilizer box is split for approximately 60% (2 bu/ft) seed and 40% (1.25 bu/ft) fertilizer. The box may be used for applying both seed and fertilizer, or converted to use both compartments entirely for seed.
  - a. To use the dry fertilizer option, the covers in the bottom of the rear fertilizer compartment must have the openings to the rear (*See Figure 4-15.*) This will close off openings to the seed compartment and allow dry fertilizer to enter the fertilizer meters.
  - b. For increased seed capacity and non fertilizer use, the covers should be reversed with the openings to the front of the seed box, and the solid portion covering the fertilizer meters (*See Figure 4-16.*)
2. To change the fertilizer covers, remove the plastic knobs holding each of the covers in place at the bottom of the rear fertilizer compartment. Lift the cover out, and reposition the cover with the openings to the front or rear as desired. Insure the cover is slid down to the bottom and reinstall the plastic knobs to retain the covers.

3. When using both seed and dry fertilizer, fill the seed box keeping fill shield in closed position over fertilizer box (*See Figure 4-17.*)

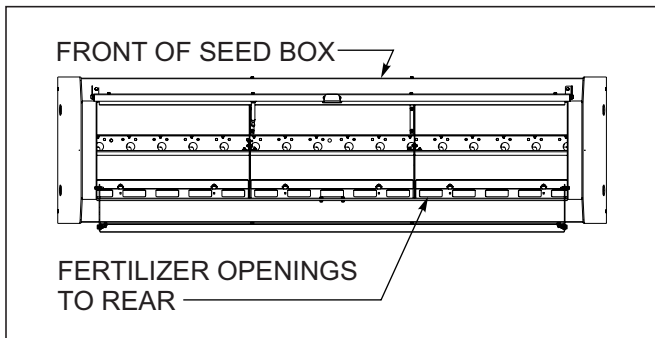


**Figure 4-17: Fill Shield in the Closed Position**

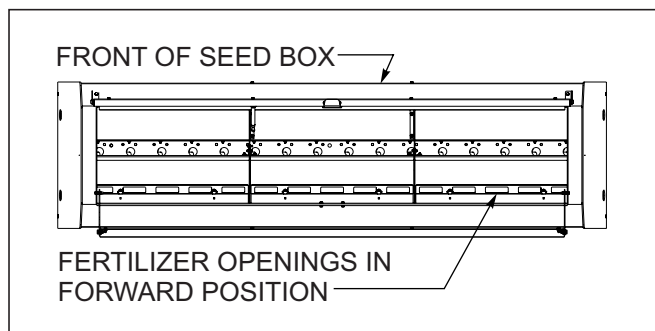
4. When using both seed and dry fertilizer, open fill shield up shielding the seed box and fill with dry fertilizer (*See Figure 4-18.*)



**Figure 4-18: Fill Shield in Raised Position**



**Figure 4-15: Fertilizer Box w/Cover Opening to Rear**



**Figure 4-16: Fertilizer Box w/Cover Opening Forward**

- When both compartments are being used for seed, open seed box lids and lift and rotate the fill shield over the rear of the seed box. This allows the compartments to be filled at the same time. This also improves access for maintenance and cleaning (See Figure 4-19.)

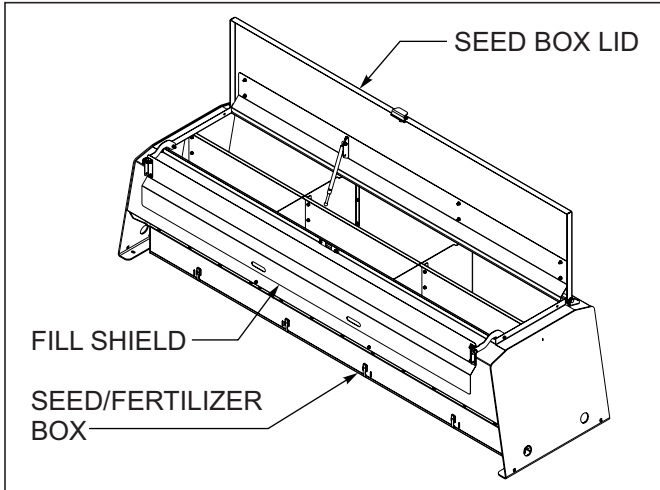


Figure 4-19: Both Compartments Filled w/ Seed

## Fertilizer Box – Clean Out

- The fertilizer meters may be accessed for maintenance or cleaning by removing the door located at the bottom of the fertilizer meter assembly (See Figure 4-20.)
- Remove any remaining dry fertilizer from inside the fertilizer compartment. Be prepared to catch the remaining fertilizer before opening the door. Position the drill over a smooth, clean, dry surface, or spread out a tarp below the box. Release and unhook the latches and allow the door to swing forward.
- Dry fertilizer is very corrosive and absorbs moisture. Clean out any fertilizer as soon as possible after using the drill.
- Storage – before storing the drill for extended periods, clean out any remaining seed and fertilizer from the boxes. Remove the fertilizer doors on the outside of the box and fertilizer covers on the inside of the box. Use water to wash out any remaining fertilizer within the boxes and in the fertilizer meter assemblies.

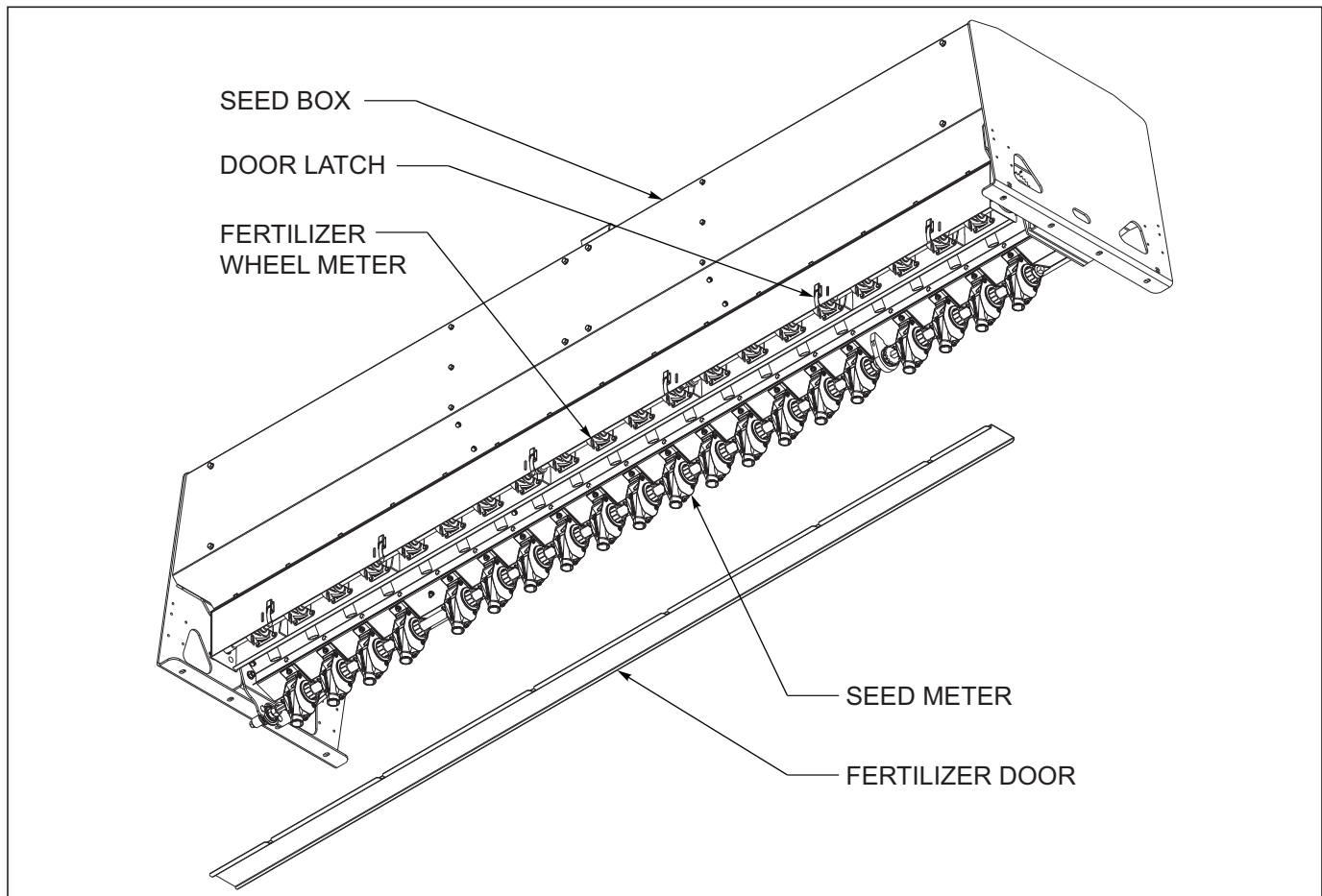


Figure 4-20: Fertilizer Box Clean Out

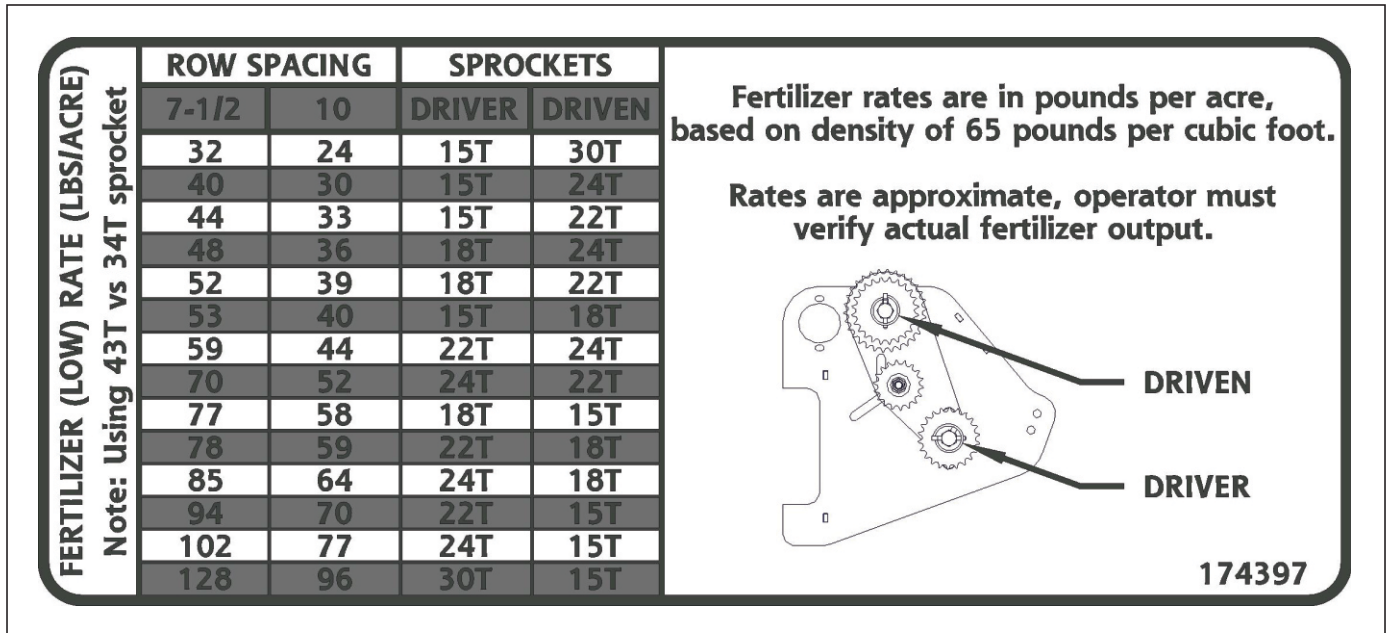


Figure 4-21: Fertilizer Box Chart

### Fertilizer – Rate Adjustment

1. The dry fertilizer rate is adjusted by changing sprocket ratios for each section. See Figure 4-21 for desired settings. For best results use clean dry fertilizer, free of clumps, or foreign material.

2. The fertilizer chart is based upon average size dry fertilizer with a density of 65 lbs per cubic foot. If using a fertilizer with a different density, apply the following conversion factors, and use the closest rate for application (See Table 4-1.)
- 3.

**IMPORTANT**

The operator must verify actual fertilizer output before planting.

Dry Fertilizer Density Conversion Chart Based on Average Density of 65 lbs./ft.							
Density	50	55	60	65	70	75	80
Conversion Factor	1.30	1.18	1.08	1.00	.93	.87	.75

Example: using a dry fertilizer with a density of 70 lbs/ft<sup>3</sup> and a desired application rate of 50 lbs/acre.

50 x .93 = 46.5 (use a setting from the rate chart nearest 46.5 lbs/acre)

Table 4-1: Dry Fertilizer Density Conversion Chart

## Fertilizer – Rate Calibration

1. Dry fertilizer can be affected by type, density, size, humidity, and field conditions. Operator should verify actual fertilizer rate output before planting.
2. To check the fertilizer rate:
  - a. With a desired fertilizer rate and known density apply the above conversion factor and select rate from chart. If density is not known, use desired rate based on 65 lbs/ft<sup>3</sup> from the chart.
  - b. Adjust the sprocket ratio to the desired rate.
  - c. Select three fertilizer meters next to each other and disconnect the rubber tubes from these meters to be able to collect fertilizer.
  - d. Fill the fertilizer box with a sufficient amount of fertilizer over the top of the three meters.
  - e. Lower the openers so the drive wheel clutch will engage.
  - f. Place a jack under the appropriate drive wheel and raise off the ground so the drive wheel may be rotated by hand.
  - g. Rotate the drive wheel several times, until the three meters begin to deliver fertilizer evenly.
  - h. With an empty container begin collecting the fertilizer from the three 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.
  - i. Weigh (in pounds) the total amount of fertilizer (less the container) and divide by 3 for an average amount of fertilizer per meter.

$$\text{FERTILIZER RATE} = \frac{(\text{AVG FERTILIZER WT}) \times 65896}{(\text{NO. OF ROTATIONS}) \times (\text{ROW SPACING})}$$

$$\text{EXAMPLE} = \frac{(.1138 \text{ LBS.}) \times 65896}{(20 \text{ ROTATIONS}) \times (7.5" \text{ SPACING})} = 50 \text{ LBS./ACRE}$$

3. Compare the actual fertilizer rate with the starting rate and compensate for any variation. Repeat the calibration until the desired fertilizer rate is achieved. Adjust the sprocket ratios on the other sections to match the calibrated setting.
4. Continue to monitor the fertilizer rate while planting. Note the amount of acres planted versus the amount of fertilizer added to the drill. If you are applying more or less fertilizer than desired, adjust the metering rate to compensate for field conditions and fertilizer.

## 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 40' drills there will be two adjustments to be made to each wing.
2. The small seeding rate is set independent of the seeding rate and drive type on the main seeding hopper.
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 4-23.](#))
  - b. Loosen the large locking nut on the right side of the seed shaft bearing ([See Figure 4-22.](#))
  - c. Turn the large seed rate adjusting nut on the left side of the seed shaft bearing in or out to the desired setting.
  - 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.

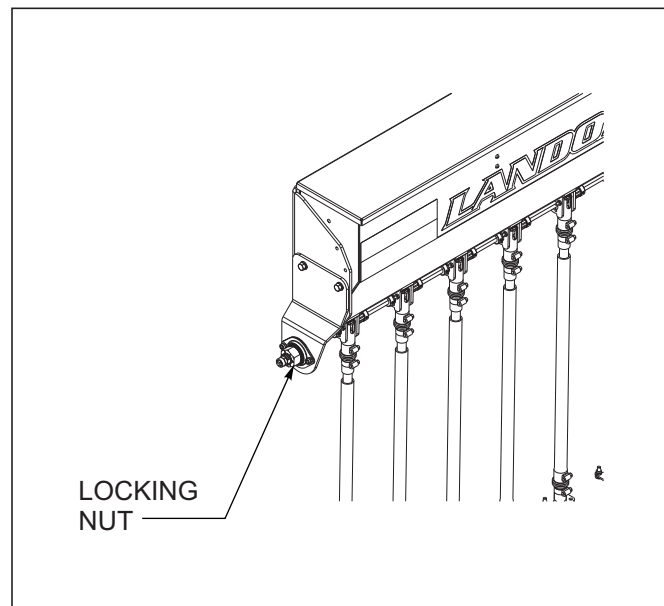


Figure 4-22: Seed Rate Locking Nut

## Seed Rate Calibration

- The seed rate charts are in pounds per acre and based on an average seed size (See Figure 4-23.) 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.

- 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.

- To check the seeding rate:
  - Select three seed meters next to each other, and disconnect the rubber seed tubes to be able to catch the seed.
  - Fill the box with a sufficient amount of seed over the three meters.
  - Lower the openers to planting position to engage the seed clutch.
  - Place a jack under the appropriate drive wheel and raise off the ground so the drive wheel may be rotated by hand.
  - 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.
  - Weigh (in pounds) the total amount of seed and divide by 3 for an average amount of seed per meter. See Figure 4-23 for seed rate formula.
- Adjust the seed meter rate handle to compensate for any variation, and repeat the seed calibration until the desired seeding rate is achieved.

SEED		ROW SPACING	INDICATOR SETTING								SEED		ROW SPACING	INDICATOR SETTING							
			1A	2A	3A	4A	5A	6A	7A	8A				1A	2A	3A	4A	5A	6A	7A	8A
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 4-23: Grass Seed Rate 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.
2. To reset the seed meters, remove all seed, chaff, and dirt from the seed box and seed meters. Reassemble the meters and drive shaft assembly, but leave the locking set collars, meter feed rolls and meter cut-offs loose on the shaft. Leave the drive chain disconnected as well.
  - a. Set the seed rate adjusting nut to "0A", and tighten the large locking nut against the right side of the seed shaft bearing. The two smaller 1/2" locking nuts should be tight against the threaded adjusting screw as well.
  - b. 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.
  - c. 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.
  - d. Rotate the square seed shaft by hand to verify the shaft is not binding and rotates freely.
  - e. Loosen the large locking nut against the seed shaft bearing. 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.
  - f. Reconnect the drive chain.
  - g. Set the seed rate adjustment to the desired rate and tighten the locking nut.
3. The seed meters should now be reset to zero, and match the zero indication on the adjusting screw.

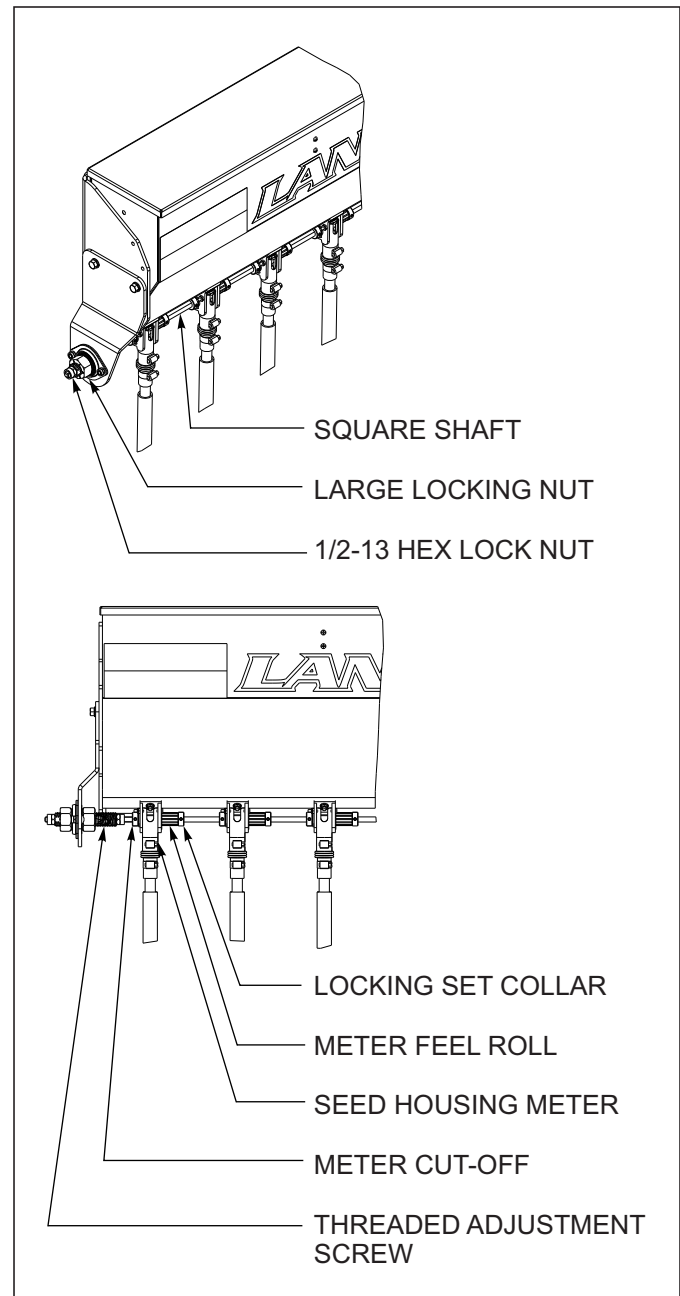


Figure 4-24: Small Seed Rate Adjustment

# Air Spring and Opener Adjustments

## Air Spring Adjustment

1. The air pressure delivered to the air springs is the same for all openers. To be able to increase the down pressure for specific row units such as in wheel track locations, the air spring has two mounting positions. The normal position is forward, with a heavier setting by sliding the air spring to the rear. The heavier setting will increase the down pressure by approximately ten percent.



### CAUTION

Relieve system air pressure before attempting to adjust or service any air spring component. Make sure all components are in place and secure before charging the system.

2. To adjust the air spring location, first relieve the system air pressure. Loosen, but do not remove the 3/4-16 hex jam nut at the top of the air spring and the 1/2-13 x 1 hex head cap screw below the air spring and air spring pivot. Slide the air spring forward or rearward to the desired location (*See Figure 4-25.*)

### IMPORTANT

Make sure the air spring has fully reached the ends of the top and bottom slots before retightening. If the air spring is not in the ends of the slot, it will be out of alignment and can rub internally wearing a hole. Also, be sure the air spring is not twisted when retightening the fasteners.

3. Retighten the top jam nut and bottom hex head cap screw to secure the air spring. Recharge the system with air to normal working pressure.

### NOTE

Maximum torque on the top jam nut is 30 ft. lbs.

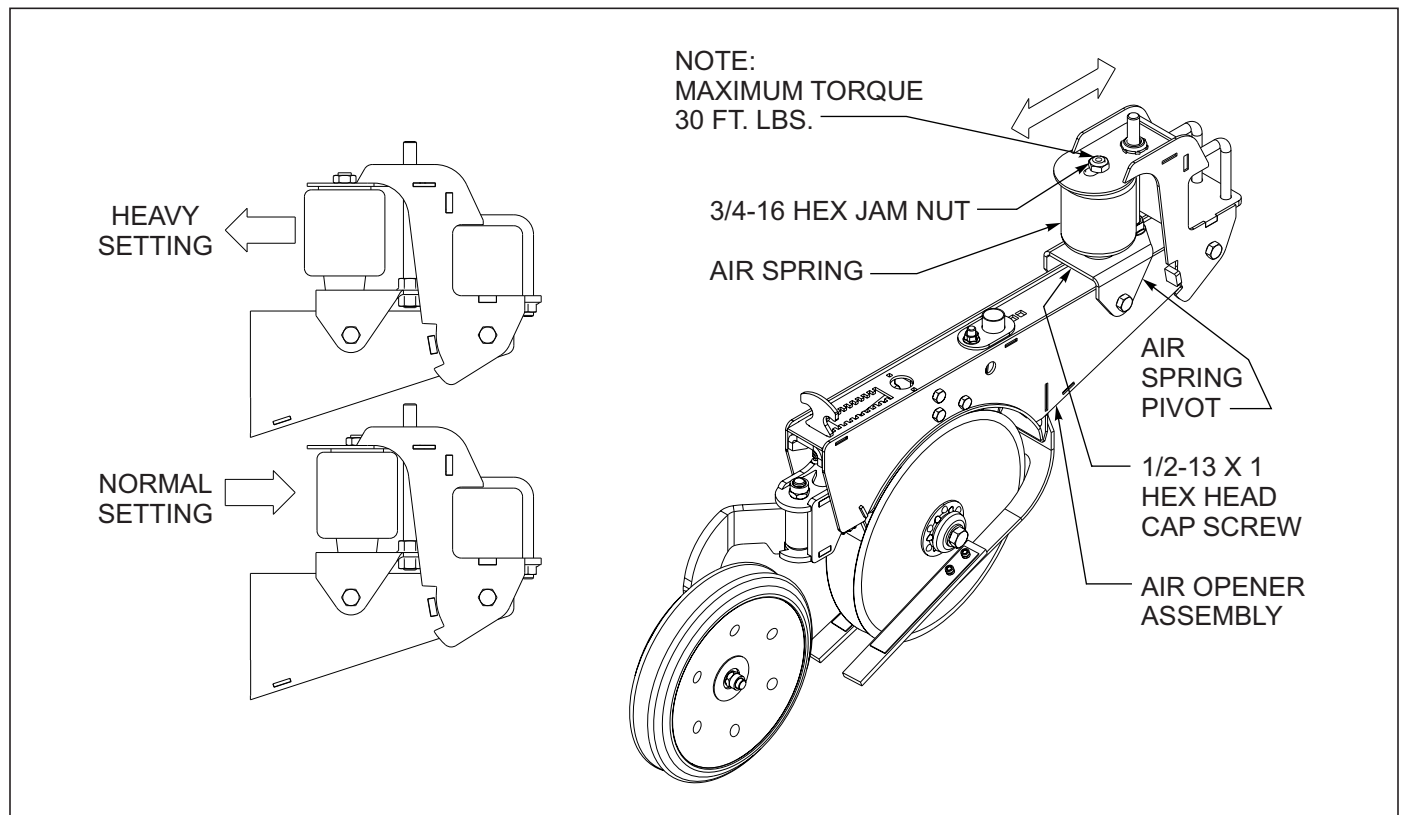


Figure 4-25: Air Spring Adjustment

## 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. 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.

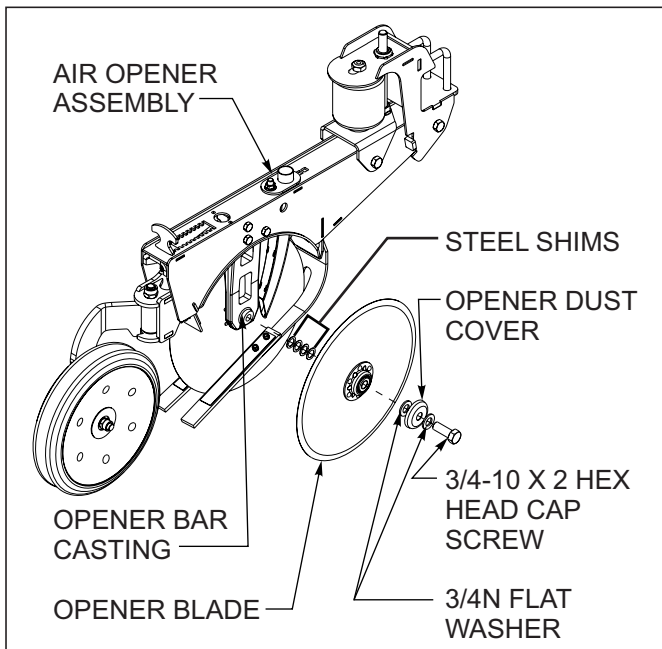


Figure 4-26: Opener Blade Adjustment

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 pre-load 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 4-26.**) 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.



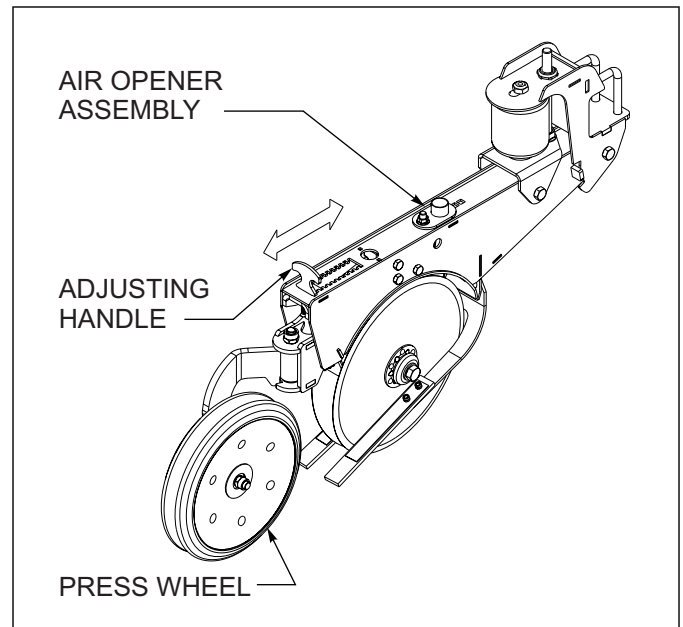
## Opener – Press Wheel Adjustment

1. The seeding depth of each individual opener is controlled by the press wheel depth adjustment (*See Figure 4-27.*) 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.



**Figure 4-27: 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 spirallock nut holding the blade, and slide the blade up or down to achieve the desired clearance (**See Figure 4-28.**) Re-tighten the 1/2-13 hex flange spirallock 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.

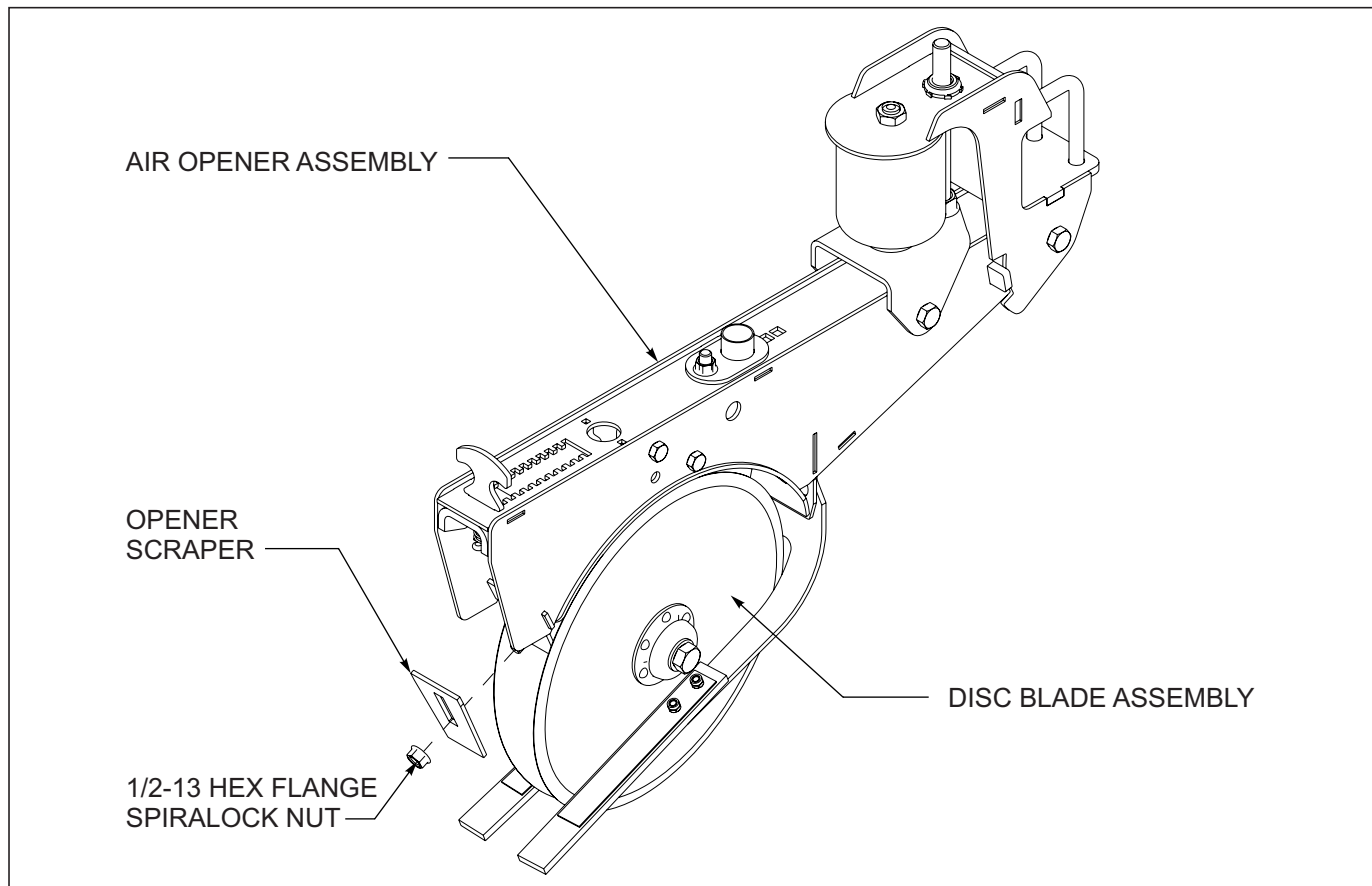


Figure 4-28: Opener Scraper Adjustment

## 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 soil strip should be set to run parallel with the opener 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 spirallock nut at the front of the soil strip bracket (See [Figure 4-29](#).) The bracket may be adjusted up or down to the desired height and side to side to center on the opener blades. Retighten the 1/2-13 hex flange spirallock nut.

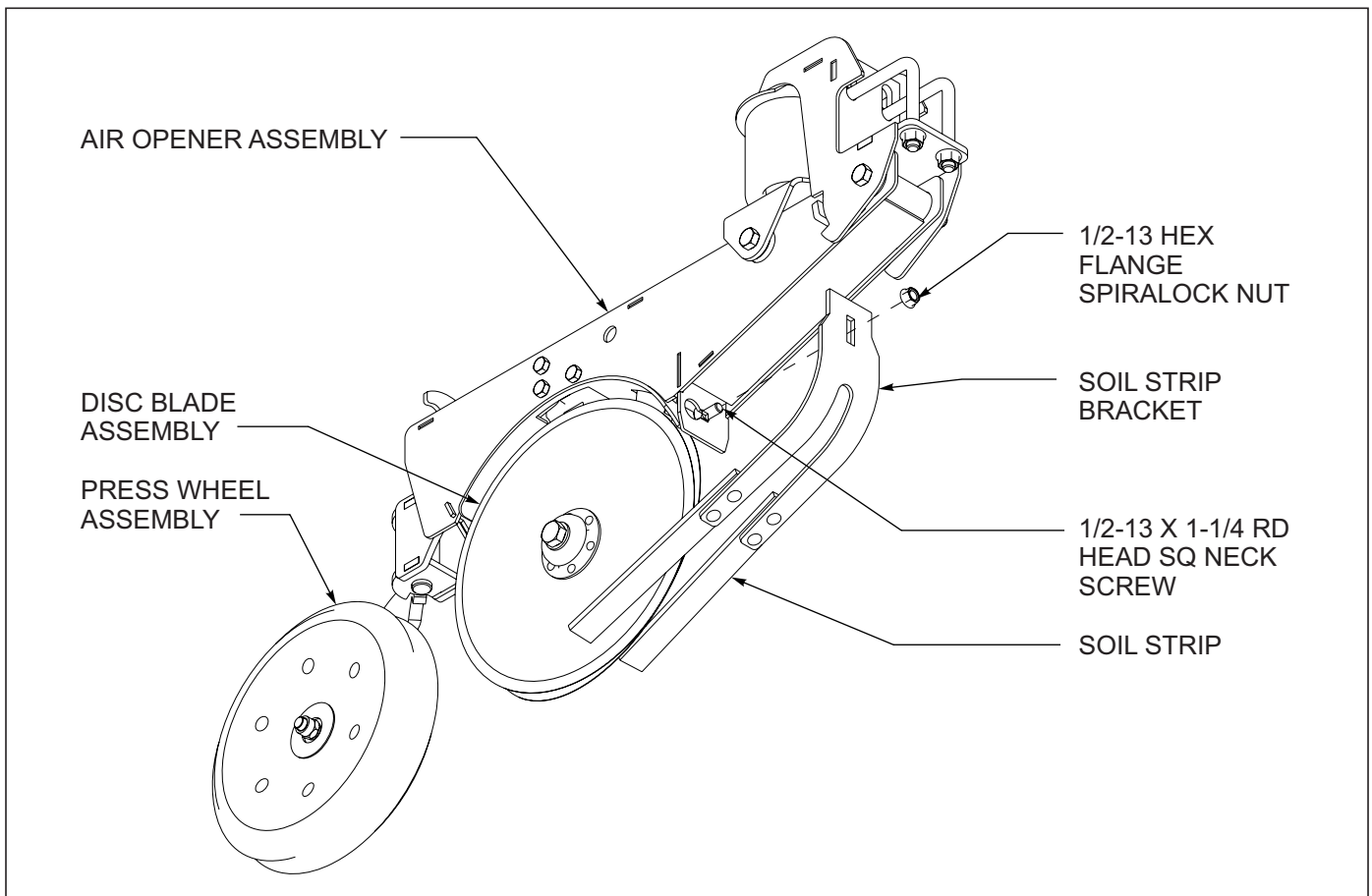


Figure 4-29: Opener Soil Strip Adjustment

# Walkboard and Ladder Positions

## Walkboard

1. The walkboard on the Grain Drill provides a stable platform to work from while filling the seed box (See Figure 4-30.)

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.



### WARNING

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

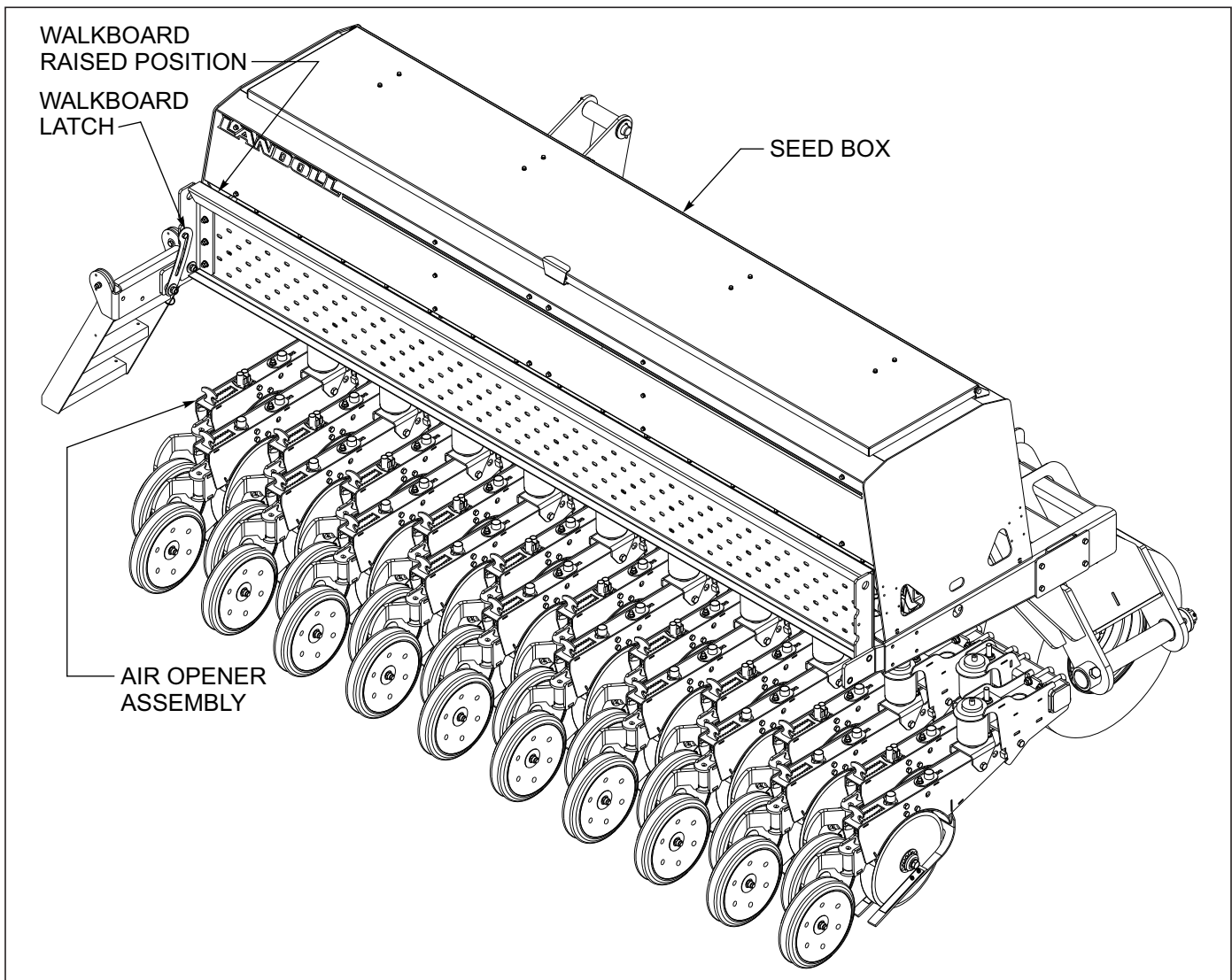


Figure 4-30: Walkboard Raised Position

## Ladder Use and Transport Requirements

1. When transporting the 5540 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 4-31.*)
  - 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 4-32.*)
  - b. Handles are provided on each end of the drill as well for access.



### WARNING

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

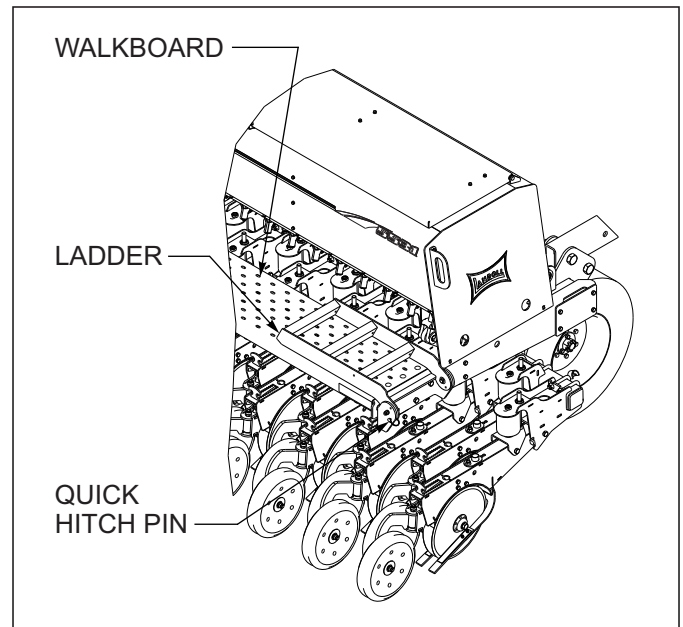


Figure 4-31: Ladder Location During Transport/Planting

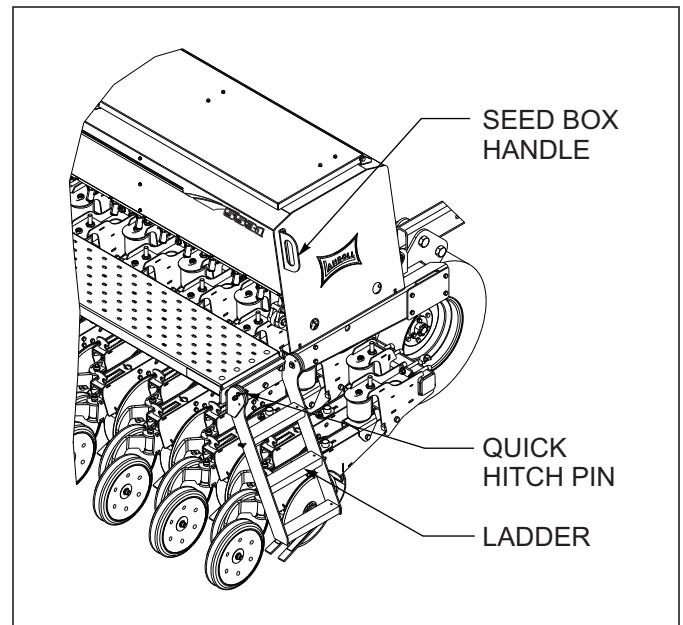


Figure 4-32: Using the Ladder

# Hydraulic Row Markers (Option)

## Row Marker Operation

1. The Grain Drill may be equipped with optional hydraulic row markers. This will require a fourth tractor remote to operate the markers.



### DANGER

To prevent injury or death, stay clear of markers while folding/unfolding. Hydraulic failure can allow markers to raise or fall suddenly.



### DANGER

To prevent injury or death from electrocution: stay away from power lines while transporting, folding, or unfolding markers. Electrocution can occur without direct contact of power lines.

2. To operate the markers, unfold the drill so that it is in planting position. Never attempt to fold/unfold the markers with the drill in folded or transport position.

3. With both markers in the raised position, slowly engage the marker hydraulics. One marker will extend. Reversing the hydraulic lever will raise that marker.
4. Slowly engage the marker hydraulics again and the opposite marker will extend.
5. Reverse the marker hydraulics again and that marker will rise.
6. The marker unfold/fold process will then repeat itself.



### CAUTION

Marker blades are very sharp, use gloves when working around marker blades.

7. Insure that the marker hydraulic system is full of oil before attempting to fold or unfold the markers. If a hydraulic component is removed, repaired, or replaced the system must be purged of air before folding/unfolding the markers. To purge the system of air, unpin the rod end of both marker cylinders. Align or prop the cylinders into position so that the rod will not interfere with anything during its travel. Slowly engage the tractor hydraulics fully extending and retracting both marker cylinders. Repeat several times until the action of both cylinders is positive and immediately responsive. Do not loosen or crack any fittings. Reconnect the rod end of both cylinders.

## Hydraulic Row Marker Disc Adjustment



### CAUTION

Marker blades are very sharp. Use gloves when working around marker blades.

1. The marker disc blade may be adjusted to vary the mark left in the field.
  - a. The disc angle may be adjusted to leave a wider or narrower cut. The steeper the angle the wider the cut will be ([See Figure 4-33](#)).
  - b. Loosen the 1/2-13 x 3-1/2" round head square neck screws that attach the spindle assembly to the extension tube marker weldment.
  - c. Rotate the marker blade assembly as desired and retighten the mounting bolts.
2. The disc blade may also be configured to push or pull soil towards the drill.
  - a. To change the direction of the disc blade, first remove the 4 bolts and dust cap retainer from each hub assembly.
  - b. Remove the two 1/2-13 x 3-1/2" round head square neck screws that attach the spindle assemblies to the extension tubes.
  - c. Swap the spindle and hub assemblies with the right and left markers.
  - d. Using the 1/2-13 x 3-1/2" round head square neck screws, attach the spindle assemblies to the bottom of the extension tubes.
  - e. Change the direction of the marker disc blade and reinstall the 4 mounting bolts and dust cap retainer.
3. To adjust the cutting width of the marker disc, loosen the u-bolt that secures the extension tube to the outer arm assembly.
4. Slide the extension tube in or out to the desired position and retighten the u-bolt.
5. Pull the drill a short distance and verify adjustment.

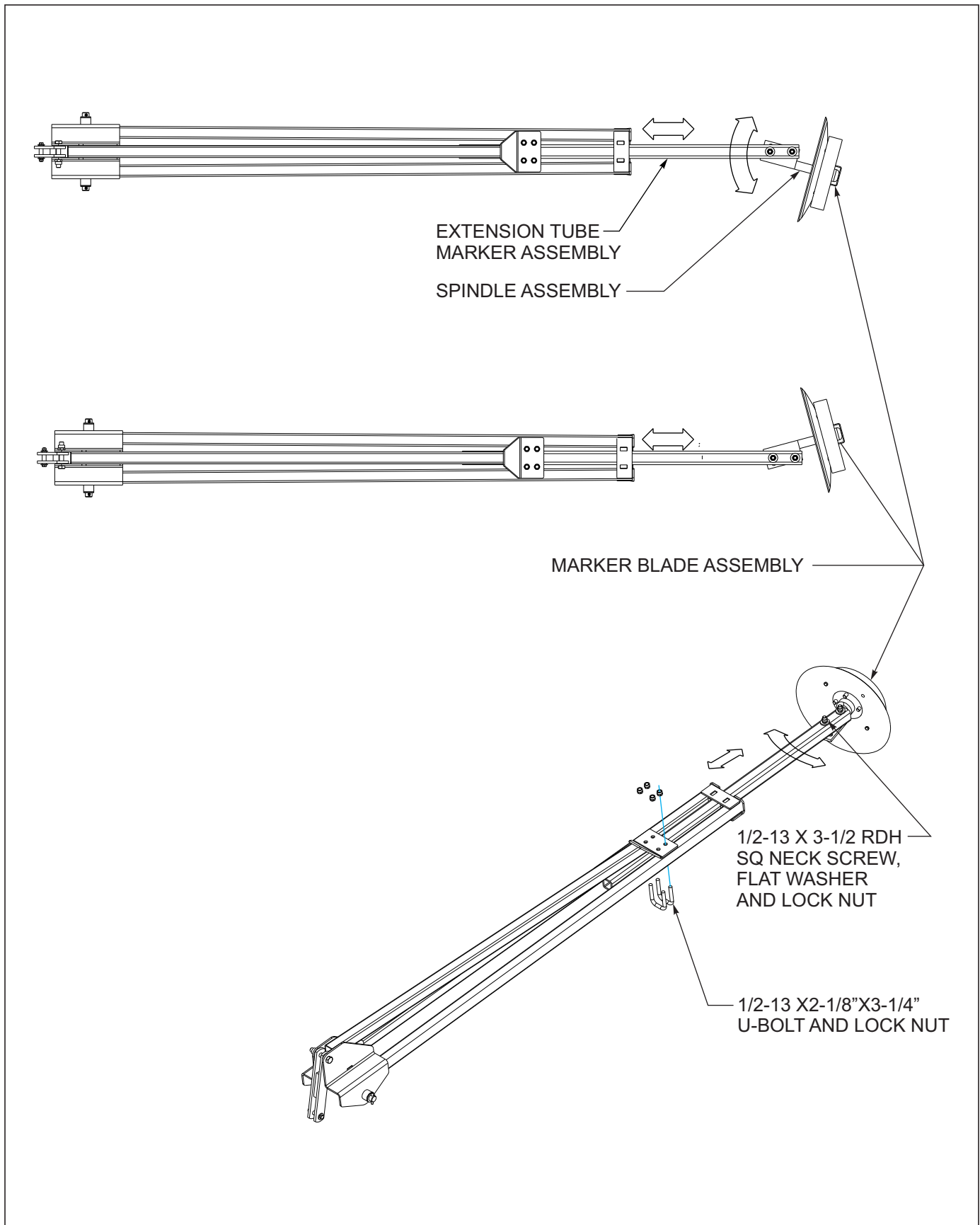


Figure 4-33: Hydraulic Row Marker Adjustment



## 5540 Point Row Clutch (Option)

The 5540 Grain Drill may be equipped with an optional point row clutch assembly. The clutch assembly allows the operator to turn off seeding of either the center or wing sections. This allows the operator to drill narrower swaths, reduce over seeding, and conserve seed.

1. A control box is located in the cab with the operator. The control box has four switches, one for each section.
  - a. To engage the clutch, the operator may turn on any or all switches to activate the clutches and stop the seeding of any section(s).
  - b. To resume seeding the operator must turn the switches off for the section(s) to begin seeding.

### NOTE

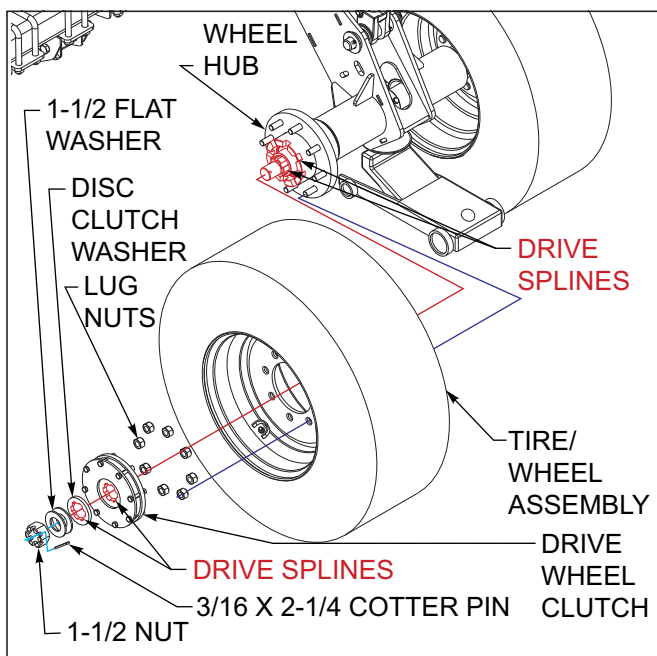
*When the right center section is turned off, the Loop drill monitor will turn off as well. The speed sensor pickup is located and driven by the right center section.*

2. The point row clutches are operated from a 12 volt source in the tractor. The clutches use an electric/air solenoid valve to engage clutches. Air is used from the air spring openers to operate the clutches. Although air usage is minimal, the clutches do consume air from the openers, and will occasionally need to add air to the opener system via the system compressor. Minimum air system pressure will be approximately 30 psi to effectively operate the point row clutches.
3. Connect the control box leads to a 12 volt power source within the tractor that can be controlled by the ignition switch. That will prevent the clutches from being left on and running down the tractor battery when the tractor is turned off.
4. Store the control box inside the cab to protect it from dirt and moisture. The control box may be disconnected at the front of the Grain Drill when unhitching the drill.
5. In the event of power failure to the point row clutch assembly, the mechanical clutches on the drill will still operate. The operator may continue planting, but will not have the ability to turn off the sections.

## Maintenance & Lubrication

### 5540 Tire Removal with Drive Clutch

1. With the grain drill attached to the tractor, unfold the drill on a large level area
2. Leave the drill in the raised position.
3. Block the outer wing wheels to prevent the wing from moving.
4. Insert a jack under the inner wing axle. Make sure the jack is sitting on stable ground to prevent shifting or sliding, preferably on a concrete surface.
5. Raise the inner wing tires just enough to remove the weight off the tires.
6. Remove the 3/16 x 2-1/4 cotter pin holding the 1-1/2 slotted nut on the axle (*See Figure 4-34.*)
7. Remove the 1-1/2 nut and flat washers holding the clutch on.
8. Slide off the disc clutch washer with splined hole.
9. Pull the drive wheel clutch assembly off the end of the spindle.
10. Remove the lug nuts holding the tire on the hub.
11. Remove the tire.



**Figure 4-34: Tire Removal with Drive Clutch**

12. When reassembling, install the tire and lug nuts. Slide the clutch on the end of the spindle.

#### NOTE

*Drive splines of the clutch assembly must align with splines in both the wheel hub and spindle. Rotate the tire/hub slightly until the splines are aligned and the spindle and hub are locked together.*

13. Continue to reassemble in reverse order.
14. Tighten the 1-1/2 nut securely and install a new 3/16 x 2-1/4 cotter pin.

### 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 4-35.*)*

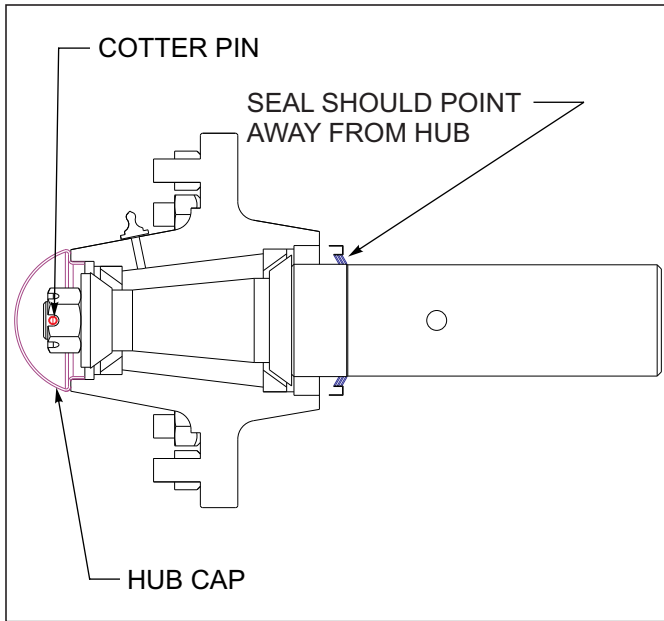


Figure 4-35: Triple Lip Seal

11. Install a new cotter pin and replace the hub cap. (See Figure 4-35.)

## 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.
2. If a cylinder or valve leaks, disassemble the parts to determine the cause of the leak. 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.

### IMPORTANT

**Lower the unit to the ground, and relieve hydraulic pressure before attempting to service any hydraulic component.**

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 *"Folding/Unfolding the Grain Drill"* on page 4-6 and *"Hydraulic Lift System"* on page 4-14 on how to purge the hydraulic systems.

## Hose Identification

1. The hydraulic hoses are color coded to help identify and match the attaching hoses on the Grain Drill. An identification decal is placed on the front of the hitch to help identify the hoses (See Figure 4-36.)
2. For the Grain Drill, hoses will be identified as follows:  
 Blue - Lift Wheels  
 Yellow - Wing Fold  
 Black - Auxiliary {Openers}  
 Black - Auxiliary (Optional Row Markers)

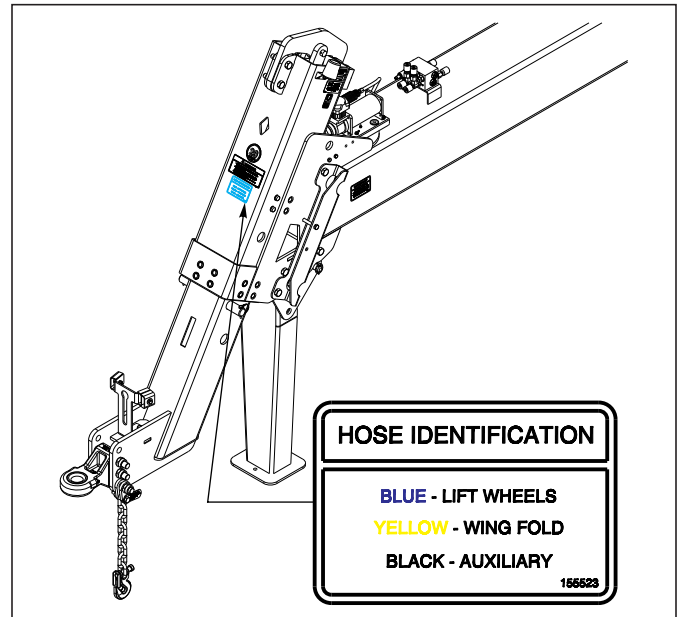


Figure 4-36: Hose Decal

### Parking

1. When unhitching the Grain Drill from the tractor, it is best to park in the folded position whenever possible. This gives the drill the smallest storage footprint, and keeps the openers off the ground. Park the drill on a level area to prevent rolling and shifting. If the drill must be parked unfolded, do so only temporarily as hydraulics and air systems may settle.
2. To park the drill with the wings in the folded position:
  - a. Fully raise the drill extending the main lift cylinders and the telescoping hitch.
  - b. Lower the front parking jack stand and pin in the parking position. If storing on soft ground, place board/plate under the jack stand for a wider footprint.
  - c. Remove the transport lock pin from the telescoping hitch and place in the storage position.
  - d. Slowly lower the front telescoping hitch until weight is relieved from the tractor drawbar.
  - e. Disconnect the safety chain and wiring.
  - f. Disconnect the hydraulic hoses and place in the storage bracket above the hitch.
  - g. Carefully remove the hitch pin.
3. To park the drill with the wings unfolded:



### WARNING

**The Grain Drill has negative tongue weight when the boxes are unfolded and openers are raised. Removing the hitch pin in the unfolded position can allow the hitch to raise suddenly causing personnel injury or death.**

- a. With the wings unfolded, make sure the main lift and hitch are fully lowered.
- b. Fully retract the lift cylinders to lower the drill.
- c. Lower the parking stand and pin in the storage position.
- d. Lower the openers to the ground to support the rear of the drill.
- e. Slowly extend or retract the telescoping hitch to relieve the weight on the tractor drawbar.
- f. Disconnect the safety chain and wiring.
- g. Disconnect the hydraulic hoses and place in the storage bracket above the hitch.
- h. Carefully remove the hitch pin.



**Lubrication Maintenance**

1. See "LUBRICATION TABLE" on [page 4-42](#) specifies the lubrication points and intervals on the 5540 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 ([See Figure 4-37.](#))

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.
3. The Grain Drill is equipped with maintenance-free bearings in the lifts. These areas require no lubrication.

<b>LUBRICATION TABLE</b>			
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>NO. OF LUBE POINTS</b>	<b>INTERVAL (Hours Unless Stated)</b>
1	Drive Shaft Center	2	10
2	Seed Drive Clutch	2 zerks per/clutch	10
3	Seed Clutch w/Point Row Option	2 zerks per/clutch	10
4	Wing Hinge	4	50
5	Inner Wing Pivot	2	50
6	Marker Arm	6	50
7	Marker Hub	2	50
8	Outer Wing Axle Weldment	2	50

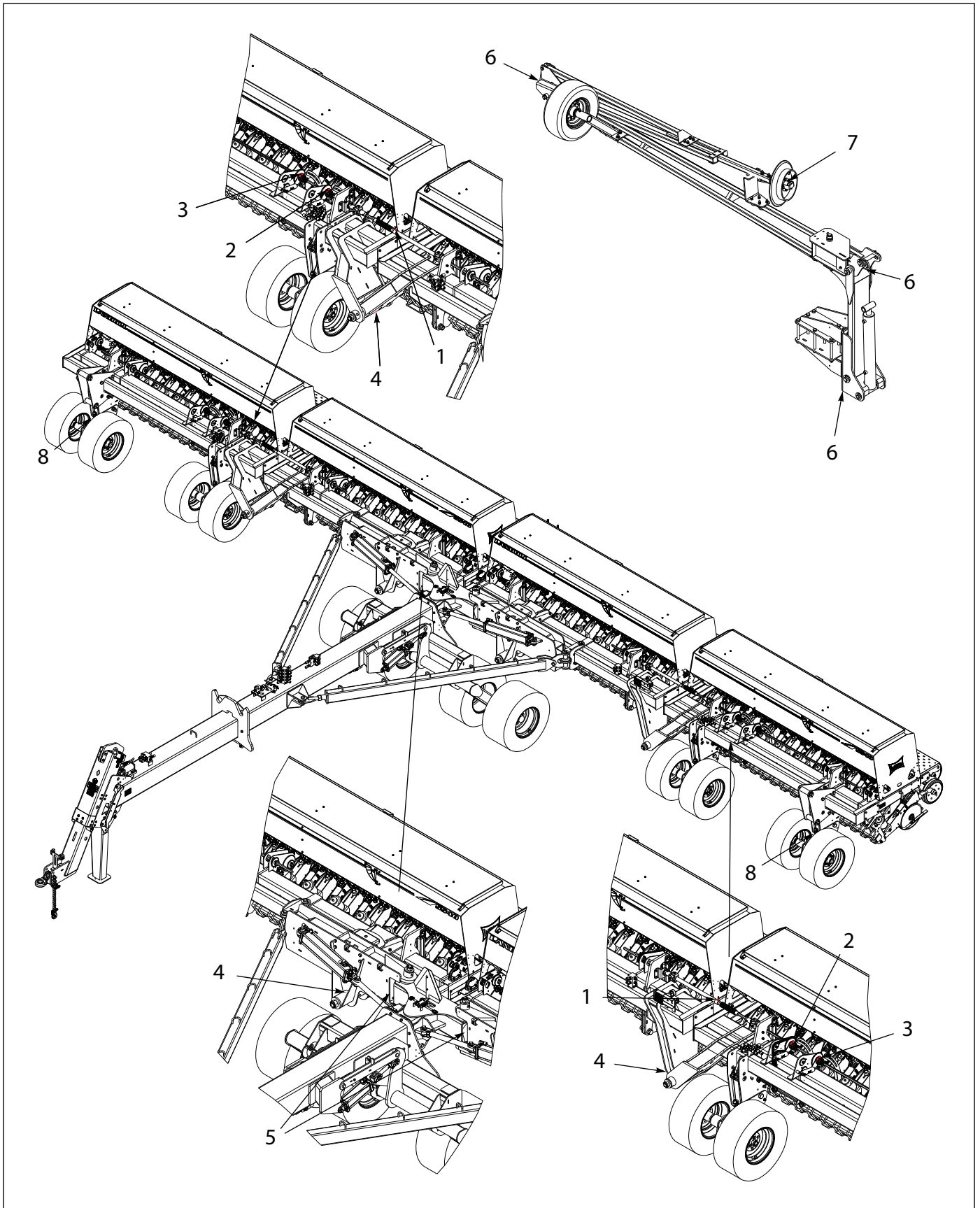


Figure 4-37: Lubrication Points

### 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 and fertilizer from the boxes and meters before storage. Thoroughly remove and wash out any dry fertilizer.
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. Lubricate the drill at all points See "LUBRICATION TABLE" on [page 4-42](#).
5. Check opener pinch point for proper adjustment.
6. Clean and repack the wheel bearings.
7. Inspect all nuts and bolts for tightness.
8. Touch up any scratches or chips with spray paint to protect the metal.
9. Check and inflate tires to the proper air pressure.
10. Maintain air system operating pressure on the openers.
11. Store unit with the openers raised, this will reduce tension on the rubber seed tubes.
12. Store the drill inside in the folded position if possible. If stored outside, cover with a tarp.



## Troubleshooting Guide

The Troubleshooting Guide, shown below, is included to help you quickly locate problems that can happen using your 5540 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 press wheel height ( <i>See “Opener – Press Wheel Adjustment” on page 4-29.</i> )
	Excessive down pressure	Reduce air system pressure on row units ( <i>See “Opener Air Pressure” on page 4-12.</i> )
	Drill not level front to rear, hitch too high	Adjust hitch height ( <i>See “Hitch Leveling Field Position” on page 4-7.</i> )
PLANTING TOO SHALLOW	Incorrect depth	Adjust press wheel height ( <i>See “Opener – Press Wheel Adjustment” on page 4-29.</i> )
	Insufficient down pressure	Increase air system pressure on row units ( <i>See “Opener Air Pressure” on page 4-12.</i> )
	Drill not level front to rear, hitch too low	Adjust hitch height ( <i>See “Hitch Leveling Field Position” on page 4-7.</i> )
	Opener cylinders not fully extended	Fully extend cylinders, do not operate cylinders in float position
UNEVEN SEED DEPTH	Row unit depth not set the same	Adjust press wheel height ( <i>See “Opener – Press Wheel Adjustment” on page 4-29.</i> )
	Drill not level front to rear	Adjust hitch height ( <i>See “Hitch Leveling Field Position” on page 4-7.</i> )
	Seed shallow in tire tracks	Adjust press wheel height and increase down pressure ( <i>See “Opener Air Pressure” on page 4-12.</i> ) and ( <i>See “Opener – Press Wheel Adjustment” on page 4-29.</i> )
	Excessive field speed	Reduce field speed.
	Plugged seed tube	Clean seed tube.
	Mud build up between opener blades	Adjust scraper ( <i>See “Opener Scraper Adjustment” on page 4-30.</i> ) Adjust blade pinch point ( <i>See “Opener Blade Adjustment” on page 4-28.</i> )

## TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	SOLUTION
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.
	Broken seed meter	Allows excessive seeding - repair seed meter.
	Seedbox plugged/Seed bridged	Clean/Agitate seed
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 ( <i>See "Opener Scraper Adjustment" on page 4-30.</i> )
	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 ( <i>See "Opener Soil Strip Adjustment" on page 4-31.</i> )
PRESS WHEELS NOT COMPACTING THE SOIL AS DESIRED	Opener down pressure set too low	Increase air system pressure on row units ( <i>See "Opener Air Pressure" on page 4-12.</i> )
	Incorrect press wheel depth adjustment	Reset press wheel depth adjustment ( <i>See "Opener - Press Wheel Adjustment" on page 4-29.</i> )
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
AIR SPRING LEAKING AIR	Air spring not set all the way forward or backward in adjustment slots	Replace and reposition air spring
	Operating with too low air pressure	Minimum air system pressure is 15 psi ( <i>See "Opener Air Pressure" on page 4-12.</i> )
	Broken air spring stud	Replace air spring, maximum stud torque 30 ft-lbs.
AIR SYSTEM LEAK - FAST	Broken or pinched air line	Check hitch and wing hinge areas for broken or pinched air line.
	Broken fitting	Repair fitting
	Air line disconnected	Reconnect air line.
	Air spring has hole	Replace air spring.

<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>SOLUTION</b>
<b>AIR SYSTEM LEAK - SLOW</b>  <b>NOTE</b> <i>Use a spray bottle with a soapy water solution to check for the following leaks.</i>	Air leaking thru air compressor filter	Check valve leaking. Replace check valve
	Air line/fitting connection leaking	Air lines ends must be cut square, and not scratched. Recut air line end if necessary. Push-in fitting lock ring when inserting or removing air lines.
	Air relief valve leaking	Clean or replace air relief valve.
	Air manifold leaking	Check front and rear manifolds for leaks.
	Air valve leaking	Tighten/replace Schrader air valve on front manifold.
	End caps on center section opener bar (air reservoir) leaking.	Relief system air pressure, and repair leaking weld.
<b>HYDRAULIC'S</b>		
<b>OPENERS WILL NOT LOWER</b>	Drill must be fully unfolded.	Unfold drill.
<b>CENTER LIFT WILL NOT LOWER</b>	Drill must be fully unfolded	Unfold drill
	Center transport locks not released.	Fully raise lift wheels to relieve weight on transport locks.
<b>DRILL WILL NOT FOLD</b>	Drill not fully raised.	Fully extend all lift cylinders.



**Document Control Revision Log:**

<b>Date</b>	<b>Revision</b>	<b>End Item #</b>	<b>Improvement(s) Description and Comments</b>
05/23/18	F-975-0518	New	Initial Release
07/23/18	F-975-0518	Update	Added fertilizer option
10/31/18	F-975-1018	Update	Added resetting opener air pressure and added document control log
08/14/19	F-975-1018	Update	Added 380/55R tire to Model Specifications, Added tire removal with drive clutch, Updated Lubrication for outer wing axle wheel weldment.
06/16/19	F-975-0620	Update	Added small seed rate adjustment. Updated Landoll name change.



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# Intertek

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## **Model 5540-50 Folding Grain Drill Operator's Manual**

Re-Order Part Number F-975-0620

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