Model 5211
Grain Drill
Operator’s Manual

LANDOLL CORPORATION
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The Landoll Model 5211 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.

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 5211 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.

NOTE: IF THE EQUIPMENT IS IMPROPERLY ASSEMBLED OR MAINTAINED, THE WARRANTY IS VOID. IF YOU HAVE ANY QUESTIONS CONTACT:

LANDOLL CORPORATION
1900 NORTH STREET
MARYSVILLE, KANSAS 66508
or phone: (785) 562-5381 or (800) 428-5655
or FAX: (888) 527-3909

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

PARTS LIST 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 CORPORATION
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 vehicle. This section explains their meaning.

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

**DANGER**

Danger means a life-threatening situation exists. Death can occur if safety measures or 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.

**CAUTION**

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

**NOTE**

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

**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 vehicle.

The safety statements contained in this manual relate to the operation of the Model 5211 Grain Drill.
# Standard Specifications

## 5211 SERIES GRAIN DRILL

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>WORKING WIDTH</th>
<th>ROW SPACING</th>
<th>NO. OF OPENERS</th>
<th>TRANSPORT WIDTH</th>
<th>ESTIMATED WEIGHT (LBS.)</th>
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Specifications are subject to change without prior notification.

## 5211 SERIES GRAIN DRILL W/ SMALL SEED ATTACHMENT

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Specifications are subject to change without prior notification.

## 5211 SERIES GRAIN DRILL W/ DRY FERTILIZER

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Specifications are subject to change without prior notification.
**STANDARD SPECIFICATIONS**

**5211 SERIES GRAIN DRILL CAPACITIES**

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<th>MODEL NO.</th>
<th>SEED BOX (BU) (3.25 BU/FT) W/O FERTILIZER</th>
<th>SEED BOX (BU) (2 BU/FT) W/ FERTILIZER</th>
<th>DRY FERTILIZER (LBS.)</th>
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<td>1011</td>
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**TIRE INFLATION**

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<th>TIRE MANUFACTURER</th>
<th>PLY/LOAD RATING</th>
<th>INFLATION PRESSURE (psi) (max.)</th>
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<td>11L x 15</td>
<td>Goodyear</td>
<td>12 Ply/3860 lbs</td>
<td>52 psi</td>
</tr>
<tr>
<td>11L-15 Fl</td>
<td>Goodyear</td>
<td>F Load 4750 lbs. (30 mph)</td>
<td>90 psi</td>
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<td>Firestone</td>
<td>Load Index 134 4680 lbs. (40 mph)</td>
<td>64 psi</td>
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**IMPORTANT**

Check tire pressure often. Operating tires on low pressure will not allow the tire to carry its maximum capacity and can lead to tire failure. Avoid excess speed.
**STANDARD SPECIFICATIONS**

**LANDOLL CORPORATION**

**GENERAL TORQUE SPECIFICATIONS (REV. 4/97)**

This chart provides tightening torques for general purpose applications when special torques are not specified on process or drawing.

Assembly torques apply to plated nuts and capscrews assembled without supplemental lubrication (as received condition). They do not apply if special graphite moly-disulfide or other extreme pressure lubricants are used.

When fasteners are dry (solvent cleaned), add 33% to as received condition torque.

Bolt head identification marks indicate grade and may vary from manufacturer to manufacturer.

Thick nuts must be used on grade 8 capscrews.

Use value in [ ] if using prevailing torque nuts.

**TORQUE IS SPECIFIED IN FOOT POUNDS**

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<tr>
<th>UNC Size</th>
<th>SAE Grade 2</th>
<th>SAE Grade 5</th>
<th>SAE Grade 8</th>
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<td>[812]</td>
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<td>[1825]</td>
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<td>[2950]</td>
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</table>

**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.

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<th>Nominal Thread Diameter mm</th>
<th>Standard Torque</th>
<th>Nominal Thread Diameter mm</th>
<th>Standard Torque</th>
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<td>Foot-Pounds</td>
<td>Newton-Meters</td>
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<td>46 [60]</td>
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<td>30</td>
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<td>18</td>
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</tr>
</tbody>
</table>

**Table 2-1: General Torque Specifications**
### Standard Specifications

**LANDOLL CORPORATION**

**HYDRAULIC FITTING TORQUE SPECIFICATIONS**

37° JIC, ORS, & ORB (REV. 10/97)

This chart provides tightening torques for hydraulic fitting applications when special torques are not specified on process or drawing. Assembly torques apply to plated carbon steel and stainless steel fittings assembled without supplemental lubrication (as received condition). They do not apply if special graphite moly-disulfide or other extreme pressure lubricants are used. Brass fittings and adapters - 65% of the torque value for steel. Stainless steel, aluminum and monel - threads are to be lubricated.

**torque is specified in foot pounds**

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<table>
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<th>AERQUIP BRAND FITTINGS</th>
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</thead>
<tbody>
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<td>-20</td>
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<tr>
<td>-24</td>
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<tr>
<td>-32</td>
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</table>

Table 2-2: Hydraulic Fitting Torque Specifications
Figure 2-1: 5211-10 Small Seed Placement (7.5" Spacing Shown)
Figure 2-2: 5211-10 x 10 Placement (10" Spacing Shown)
Figure 2-3: 5211-12-1/2 Marker and Small Seed Placement (7.5” Spacing Shown)
Figure 2-4: 5211-12-1/2 Fertilizer Placement (10” Spacing Shown)
Figure 2-5: 5211-12-1/2 3 Point Placement (7.5” Spacing Shown)
Figure 2-6: 5211-15 Marker and Small Seed Placement (7.5" Spacing Shown)
Figure 2-7: 5211-15 Fertilizer Placement (10” Spacing Shown)
Figure 2-8: 5211-15 3 Point Placement (7.5” Spacing Shown)
Figure 2-9: 5211-20 Marker and Small Seed Placement (7.5” Spacing Shown)
Figure 2-10: 5211-20 x 10 Fertilizer Placement (10” Spacing Shown)
Figure 2-11: 5211-20 3 Point Placement (7.5” Spacing Shown)
Figure 2-12: Small Seed Attachment Drilling Placement

7-1/2' SEED BOX (P/N 154842)

10' SEED BOX (P/N 143932)

12-1/2' SEED BOX (P/N 159102)
Your new 5211 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 2-1 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.
Figure 3-1: Press Wheel Assembly

AIR OPENER ASSEMBLY
3/4-10 HEX LOCK NUT
PRESS WHEEL ASSEMBLY
PRESS WHEEL ARM PIN
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.
EXISTING MAIN SEED BOX ASSEMBLY
EXISTING SMV BRACKET
SMALL SEED BOX ASSEMBLY
RELOCATED SMV BRACKET

BEARING ASSEMBLY
CHAIN ADJUSTMENT BRACKET
BEARING ASSEMBLY AND MOUNT

Figure 3-2: Small Seed Assembly Overview
Small Seed Attachment Installation (Option)

Refer to 3-2 for small seed attachment overview.

Use these instructions to install the optional small seed attachment to the rear main seed box of 5211 Grain Drill.

1. Attach the drill to the tractor and lower the unit to the ground. Leave the drill attached to the tractor while assembling the small seed attachment. This will prevent tipping of the drill while support stands are removed.

2. Remove the SMV sign from the rear of the existing seed box. Reinstall the mounting screws in the seed box to plug the holes.

3. Determine whether the existing drill boxes have mounting holes for the small seed attachment. See Figure 2-12 for hole locations. If the mounting holes do not exist, these holes must be drilled in existing boxes before installing the attachment.
   a. First locate and mark the center of the existing seed box along the top rear box edge. Base all dimensions from this mark.
   b. Mark and center punch hole placement per drawing.
   c. Using a 13/32” diameter drill bit, drill the mounting holes.

4. Remove the 3/8” hex lock nuts and 2-hole mounting plates from the front of the small seed box assembly.

5. Carefully raise the small seed attachment and insert the mounting screws through the holes drilled in the rear of the main seed box. Install the 2-hole mounting plates and 3/8” hex lock nuts on the inside of the main drill box to secure the small seed attachment.

6. Remove the three outer locking nuts on the seed shaft bearing assembly. Slide the bearing assembly over the small seed square meter shaft. Insert the bearing assembly mounting screws into the small seed drive mount located on the end of the small seed box assembly. Loosely install the three locking nuts to hold the bearing assembly in place.

7. Just in front of the small seed bearing assembly, remove the rear 1/2-13 x 1-1/4 hex head cap screw from the existing seed box bracket (See Figure 3-3.)

Figure 3-3: Removal of Rear Screw from Existing Seed Box Bracket
8. Attach the front of the chain adjustment bracket to the seed box bracket with the 1/2-13 x 1-1/4 hex head cap screw.

9. Attach the slotted rear hole of the chain adjustment bracket to the outer hole of the small seed bearing assembly with a 5/16-18 x 1-1/2 round head square neck screw, 1” OD spacer and hex flange nut (See Figure 3-4.)

10. Remove rear walkboard and right and left mounting brackets. Using existing screws, install new extended walkboard mounts to the rear of the drill frame. Reattach walkboard to new extended mounts.

**NOTE**

For 10 & 12-1/2 drills – If the drill has the optional dry fertilizer attachment, the grass seed bracket and bearing will not be used, go to step 12.

For 15’ & 20’ drills – If the drill is a 3PT model, the grass seed bracket and bearing will not be used, go to step 12.

11. Remove existing 7/8 hex drive shaft above the drill 7 x 7 frame tube. Install the grass seed bracket and bearing to the rear of the main drill 7 x 7 frame. See page 2-16 for proper placement. Reinstall the hex drive shaft, see placement dimensions.

12. Install the 24 tooth drive sprocket and locking set screw on the end of the hex drive shaft (See page 2-16 for proper placement.)

13. Remove the rear safety shield from the seed shaft bearing assembly. Loosen the rear mounting screws, then lift up and remove the shield and screws.

14. Install the connecting link in the roller chain, and install between the front 24 tooth drive sprocket and outer bearing on the seed shaft bearing assembly. Loosen the 5/16-18 flange head serrated nut through the chain adjustment bracket. Pull the lower end of the seed shaft bearing assembly rearward to tighten the drive chain. Re tighten the 5/16-18 flange head serrated nut and the three hex lock nuts that attach the seed shaft bearing assembly to the mount on the end of the small seed box. Verify drive chain alignment, and adjust front 24 tooth sprocket if necessary.

15. Reinstall the safety shield over the seed shaft bearing assembly.

16. For 15’ & 20” drills – Screw the threaded coupler drive into the open end of the seed shaft bearing assembly. Slide the square end of the drive tube over the square seed shaft of the left small seed box. Connect the drive tube and threaded coupler drive with the 6” shaft coupler using 1/4-20 x 1-3/4 hex head cap screws and hex lock nuts.

17. Install the metal small seed tubes in the mounting holes in each drill opener frame using 1/4-20 x 1 round head square neck screws and nuts. Note the lower end of the small seed tube points rearward towards the press wheels. The seed tube has two sets of mounting holes. Initially slide the seed tube forward. The tube may be positioned farther back for shallower planting depth if desired.

18. Attach the telescoping seed tube assemblies to the small seed box and small seed tubes on the opener. The larger OD telescoping seed tube attaches to the opener, while the smaller tube attaches to the small seed box.

19. Attach the SMV sign to the SMV mounting bracket with 1/4-20 x 3/4 hex head cap screws and hex lock nuts. Using 1/4-20 x 1-1/4 hex head cap screws and hex lock nuts, attach the SMV and bracket to the seed box mounting bracket extending below the small seed boxes in the center of the machine. For 15’ & 20’ drills, install the seed shaft shield under the SMV mounting bracket.
Notes:
Never allow anyone to ride on the 5211 Grain Drill at any time. Allowing a person to ride on the machine can inflict serious personal injury or death to that person.

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.

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.

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.

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.

Keep all bystanders away from the machine when folding/unfolding, raising/lowering openers, and transporting.
Tractor Preparation
The Landoll 5211 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 5211 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 screw tightness after a few hours of operation. Tighten any loose nuts or screws. Check the lift wheel lug screws 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 4-27.)
7. Lubricate the machine (See “Lubrication Maintenance” on page 4-40 and Figure 4-36 on page 4-39).
8. Check that all safety decals and reflectors are correctly located and legible. Replace if damaged.
Attaching Grain Drill To The Tractor

**WARNING**

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

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

**WARNING**

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

4. Back the tractor into final position, and install the hitch pin.
5. Lower and remove the jack. Place jack in the storage location in the middle of the hitch.
6. Plug the safety lights into the seven-pin connector on the tractor.
7. Attach the safety chain to an anchor on the tractor sufficient to pull the drill.
8. Connect the hydraulic hoses to the tractor.
9. Fully raise the Grain Drill main lift and install the transport locks.
10. Remove both parking stands and place in transport position.
Transport Locks

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

   ![Figure 4-2: Storage and Transport Position of Transport Locks](image)

   TRANSPORT LOCK STORAGE POSITION

   TRANSPORT LOCK INSTALLED FOR TRANSPORT

   S211 transport lock locations

   **WARNING**

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

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

   **IMPORTANT**

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

3. To remove the transport locks:
   a. Fully raise the Grain Drill to remove any weight setting on the transport locks.
   b. Remove the L-pins, hairpin clips, and transport locks from both cylinder shafts.
   c. Return the transport locks, L-pins, and hairpin clips to the storage locations on the hitch.
Leveling the Hitch Clevis

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

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.
Transporting the Grain Drill

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

2. The Grain Drill should be transported only by a tractor required for field operation. The implement weight should not exceed more than 1.5 times the tractor weight. 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 4-4.)

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.

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.

CAUTION
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 4-4.) 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.

---

**DANGER**

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

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.

**WARNING**

Failure to use transport lock pins during transport may result in permanent equipment damage, serious injury, or death.

f. Fully raise the Grain Drill lift, hitch, and openers.

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

---

**CAUTION**

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

h. Raise the implement parking jacks.

i. Check all tires for proper inflation, and that lug nuts are properly torque.

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.

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**CAUTION**

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.
Compressor Operation

1. The Grain Drill is equipped with a small air compressor to make minor adjustments in system air pressure. When making large adjustments in system pressure, use shop or alternate air source.

2. Power to the electric air compressor is supplied through the main lighting harness. 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. A pressure switch will automatically turn off the air compressor off when maximum system pressure has been reached.

3. The air compressor is designed for oilless operation. There are no fluid levels to check or maintain. A replaceable air filter element is located at the front of the air compressor. Check and service the air filter element regularly to insure free flow of air and protect the compressor.
Air System Pressure

1. The air system pressure on the Grain Drill can safely operate in a range from 15 psi to 100 psi. A system pressure gauge is located at the front of the hitch and is used to monitor system pressure. It is normal for the system air pressure to vary while working in the field. As the openers raise and lower over ground conditions, so will the system pressure vary.

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

3. 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 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.

4. To adjust the air system pressure, use the on board HD air compressor to increase system pressure. Turn the switch on to the compressor until the desired pressure setting is reached, then turn off the compressor. To lower or drain system pressure, pull and hold the ring located at the bottom of the relief valve on the front of the hitch.

5. Initial settings – When beginning planting operations, use a system 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.

6. Maintenance – Relieve air system pressure before attempting to adjust or service any air spring. Do not pressurize the air system unless all row unit components are in place. Repair any system air leaks to avoid excessive compressor use. Use a spray bottle with soap and water solution to check for leaks. 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.

7. Storage – Store the drill inside when not in use. Leave the air system charged. It is not necessary to bleed the system for storage.

**NOTE**

Excessive air pressure can raise the drive wheels and openers off the ground.
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 4-7.) Keep all components (cylinders, hoses, fittings, etc.) in good repair.

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

Figure 4-7: Hydraulic Leak Detection
Loup II Drill Monitor Operation

1. The 5211 Grain Drill is equipped with a Loup II drill monitor. The drill monitor will monitor population from two sensors on each box, seed box levels on each seed box, as well as acres planted.

2. Population readings are 95% accurate for soybeans. When planting smaller seeds the population accuracy will be reduced. This does however give you a reliable indication that all sections are planting. The monitor may be adjusted to set high/low population alarms. Do not use the monitor to calibrate the seeding population. To calibrate the drill either by weight or seed count, see “Seed Rate Calibration” on page 4-16.

3. Bin level sensors are installed in each seed box. When the sensor is submerged in seed, no alarm will sound. As the seed level falls below the sensor eye, an alarm will be indicated on the drill monitor. The bin level sensor is mounted to an adjustable bracket. The bracket may be raised or lowered to the desired level in the seed box.

4. The drill monitor will also monitor field and total acres.

5. Pulses are preset for the drill monitor. Initially the pulses are set at 68. The pulse setting may vary depending on the conditions the drill is planting in. Worked or loose sandy soils will have a different setting than firm no till conditions. For greater accuracy on the pulse setting, calibrate the drill monitor in the desired working conditions. This is done by driving a known distance (400 ft) and recording the number of pulses in that distance. Refer to the Loup manual for instructions.

6. The drill monitor is operated on a 12-volt dc negative ground system. The monitor may be connected using the existing connection, or may be hard-wired to the appropriate connections. Connect the red wire to a positive terminal that is on when the tractor switch is on. Connect the black wire to a chassis ground on the tractor maintaining good metal-to-metal contact.

7. The signal cable attaches to the monitor and connects to the drill. The cable may be plugged/unplugged at the front of the drill hitch when hooking/unhooking the drill. This allows the monitor to stay in the tractor if so desired.

8. For service or setup questions, please refer to the Loup II Drill Monitor manual, or contact Loup Electronics:

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

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

1. Use the top seed gate position when planting small seeds such as alfalfa, oats, barley, rice, or wheat (See Figure 4-8.)

2. The second from top seed gate position is for peas, small soybeans, etc. If excess cracking occurs, move the handle to the third position.

3. Use the third seed gate position for large peas, large soybeans, etc.

4. Use the fourth seed gate position when planting extra large/irregular seeds such as garbanzo beans.

NOTE

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 4-8.) 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.
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 4-9.)

   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 4-10.)

   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 4-9: Seed Rate Adjustment
Meter/Seed Rate Adjustment

1. If the seed meter shaft is disassembled for maintenance or repair the seed meters and adjustment handle will need to be reset or zeroed to set the meters equally across the section.

2. To reset the meters, loosely reassemble the shaft, meters, spacers, locking collars etc. but leave the locking collars loose.

3. Tighten the locking nut on the threaded seed shaft adjustment to hold the shaft in place.

4. Start with the end meter(s) next to the threaded adjustment (See Figure 4-9.) Slide the feed roll and cut-off to the right until the indicator reads zero on the end meter. Remove any remaining slack between the spacers, washers, feed rolls etc. and secure the lock collars on each end of that group of meters. Continue to work across the drill section sliding the meter feed rolls to the right, removing any slack, and securing the lock collars for each group of meters.

5. With all lock collars secure on the seed shaft and all slack removed from between the spacers, verify that each meter is actually zeroed out. The feed roll should not be protruding or recessed inside any of the meters. To fine tune each meter, if necessary, loosen the two bolts holding the meter housing to the bottom of the seed box. Slide the meter housing to the right or left, until the meter is zeroed out. Re tension the meter housing to the bottom of the seed box. The meter housing should be square with the seed shaft and not twisted when tightening the meter housing bolts.
### Seed Rate Chart and Calibration Formulas

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

**SEED RATE** = \((\text{AVG SEED WEIGHT}) \times 65896\) 
\((\text{NO. OF ROTATIONS}) \times (\text{ROW SPACING})\)

**# SEEDS per ROW** = \((\text{SEED RATE}) \times (\text{SEEDS/LB}) \times (\text{NO. OF ROTATIONS}) \times (\text{ROW SPACING})\) 
\(65896\)

**# SEEDS per ROW** = \((\text{POPULATION}) \times (\text{NO. OF ROTATIONS}) \times (\text{ROW SPACING})\) 
\(65896\)

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**Figure 4-10: 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 4-10.)** 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 4-10.)**
   b. Select three seed meters next to each other, and disconnect the rubber seed tubes to be able to catch the seed.
   c. Fill the box with a sufficient amount of seed over the three meters.
   d. Collect the seed from the three seed meters as you rotate the drive wheel by hand. Count the total number of rotations. Twenty rotations would be a good starting point; more rotations will produce more accurate results.
   e. Weigh (in pounds) the total amount of seed and divide by 3 for an average amount of seed per meter. **See Figure 4-10** for seed rate formula.

4. Adjust the seed meter rate handle to compensate for any variation, and repeat the seed calibration until the desired seeding rate is achieved.

5. **See Figure 4-10** 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 4-11.) 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 4-12.)

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.

Figure 4-11: Top View of Fertilizer Box w/ Cover Openings to Rear

Figure 4-12: Top View of Fertilizer Box w/ Cover Openings Forward
3. When using both seed and dry fertilizer, fill the seed box keeping fill shield in closed position over fertilizer box (See Figure 4-13.)

4. When using both seed and dry fertilizer, open fill shield up shielding the seed box and fill with dry fertilizer (See Figure 4-14.)

5. 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 4-15.)
Fertilizer Box – Clean Out

1. 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 4-16.)

2. 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.

3. Dry fertilizer is very corrosive and absorbs moisture. Clean out any fertilizer as soon as possible after using the drill.

4. 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.
Fertilizer – Rate Adjustment

1. The dry fertilizer rate is adjusted by changing sprocket ratios for each section. See Figure 4-17 for desired settings. For best results use clean dry fertilizer, free of clumps, or foreign material.

**IMPORTANT**
The operator must verify actual fertilizer output before planting.

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.)

### Table 4-1: Dry Fertilizer Density Conversion Chart

<table>
<thead>
<tr>
<th>Density</th>
<th>50</th>
<th>55</th>
<th>60</th>
<th>65</th>
<th>70</th>
<th>75</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion Factor</td>
<td>1.30</td>
<td>1.18</td>
<td>1.08</td>
<td>1.00</td>
<td>.93</td>
<td>.87</td>
<td>.75</td>
</tr>
</tbody>
</table>

Example: using a dry fertilizer with a density of 70 lbs/ft³ 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/ft³ 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. Rotate the drive wheel several times, until the three meters begin to deliver fertilizer evenly.
   f. 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.
   g. Weigh (in pounds) the total amount of fertilizer (less the container) and divide by 3 for an average amount of fertilizer per meter.

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

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 15' & 20' drills there will be two adjustments to be made.

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 4-18.)
   b. Loosen the large locking nut on the right side of the seed shaft bearing (See Figure 4-19.)
   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.*
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 inside of the seed shaft bearing. The two smaller 1/2” locking nuts should be tight against the threaded adjusting screw as well (See Figure 4-20.)
   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 large locking nut.

Figure 4-20: Small Seed Meter Adjustment
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 4-21.).

**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. Re tighten 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.
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.

2. With a proper pinch point, you should be able to rotate the blades in opposite directions and maintain contact at the pinch point with a slight drag. The blades should slide past each other without binding. If the contact is too high and both blades try to bind or drag excessively, the pinch point is too tight. Likewise, if the blades do not contact at the pinch point or there is still a gap between the blades, the pinch point is too loose.

3. A properly maintained pinch point will allow the opener to penetrate better and create a smoother seed trench for better seed placement. A pinch point that is too wide will allow soil/mud to build up between the opener blades regardless of how the scraper may be adjusted. A pinch point that is too wide or too narrow can excessively preload the opener bearings and lead to premature bearing failure, particularly in heavy soils or no till applications.

4. The pinch point is adjusted by adding/removing shims from between the opener blade and opener casting (See Figure 4-22.) 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 4-23.) 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 presswheel is carrying weight, the seeding depth is regulated by the press wheel adjustment. An increase in down pressure does not change the depth of seed placement.

3. Make sure the hitch is level when planting to insure consistent planting depth. A hitch that is too high or too low can change how the press wheel contacts the ground and affect seeding depth.

4. When planting seeds shallow, or in loose/soft conditions, it may be necessary to install stroke control stops on the hydraulic cylinders. This will allow the drill transport tires to carry more weight, raising the drill, and keeping the openers from planting too deep.

![Figure 4-23: Press Wheel Adjustment](image_url)
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.

2. To adjust the scraper blade, loosen the 1/2-13 hex flange spiralock nut holding the blade, and slide the blade up or down to achieve the desired clearance (See Figure 4-24.) Re tighten the 1/2-13 hex flange spiralock 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.

CAUTION

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

1. The soil strip runs along the side of the opener blade to reduce soil blow out of the seed trench. This will allow the soil to stay in position for more consistent filling of the seed trench and uniform coverage.

2. The opener should first be set for the desired planting depth and press wheel adjustment. The soil strip should then be adjusted for slight pressure with the ground where the opener blade is leaving the seed trench. Excessive down pressure on the soil strip will increase wear and can cause plugging issues. The soils strip should be set to run parallel with the opener 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 spiralo lock nut at the front of the soil strip bracket (See Figure 4-25.) The bracket may be adjusted up or down to the desired height and side to side to center on the opener blades. Re tighten the 1/2-13 hex flange spiralo lock nut.
Walkboard

1. The walkboard on the Grain Drill provides a stable platform to work from while filling the seed box (See Figure 4-26.)

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 walkboard 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.
Ladder Use and Transport Requirements

1. When transporting the 5211 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 4-27.)
   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 4-28.)
   b. The handle is located on the left end of the drill for access.

WARNING

Never allow riders on the ladders or walkboards while the drill is in operation or being transported.
Hydraulic Row Markers (Option)

1. The Grain Drill may be equipped with optional hydraulic row markers. This will require an additional 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.

2. To operate the markers, lower the drill to the ground in planting 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 (Option)

**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 4-29.)
   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.
Coulter Hitch (Option)

The Grain Drill may be equipped with an optional coulter hitch (See Figure 4-30.). Coulters may be used to provide additional tillage in front of the openers. The coulters operate on a separate hydraulic remote which operates independently of drill. A reference depth gauge is located on the left side of the hitch for coulter depth.

Operation - The drill may be operated with or without the coulters lowered to the ground. When turning with the drill, the main drill lift hydraulics should allow the coulter gangs to clear when turning without having to operate the coulter hydraulics.

The amount of down pressure needed to operate the coulters will vary with soil conditions, moisture and residue. For accurate seeding depth you must adjust the drill and coulter depths to match the current soil conditions. Be careful not to operate the coulters too deep, particularly in wet conditions. Coulters can throw/remove too much soil in front of the opener that the opener may not be able to properly close the seed trench. Excessive coulter down pressure in dry/hard conditions can raise or limit the travel of the openers creating inconsistent planting depths.

Figure 4-30: Coulter Hitch
3 Point Hitch (Option)

The 5211 may be equipped with a 3 point hitch versus a pull hitch. The 3 point hitch is a standard width CAT III hitch and will attach to any tractor with a CAT III hitch or quick hitch.

Drills equipped with the 3 point hitch will be equipped with drive wheels at each end of the main frame. The drive wheels will be used to gauge the depth of the grain drill openers when in the field. For initial adjustment, the bottom of the 4x4 toolbar should be approximately 19" above the ground. Seeding depth and ground conditions can vary this measurement. Raise or lower the seeding depth by extending/retracting the ratchet jack assembly on each drive wheel (See Figure 4-31.) Measure the pin-to-pin length of both ratchet jacks and set them the same so the unit depth will be even.

Some drills will drive the seed boxes from both drive wheels, other drills will only drive from one end. It is important to keep the drive wheels in contact with the ground while seeding. Failure to maintain ground contact will result in seeding skips. Raise the drill when turning to prevent side loading and damage to the openers and drive wheels.
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. If the seals are properly installed (lips pointing away from hub), excess grease may pass under the seal without damage to the seal.
11. Install a new cotter pin and replace the hub cap.
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 “Hydraulic Lift System” on page 4-10 on how to purge the hydraulic systems.
Figure 4-32: Hitch Hose Clamps and Color Designations

Figure 4-33: Jack Parking and Storage Position
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 4-32.)

2. For the Grain Drill, hoses will be identified as follows:
   - Blue - Lift Wheels
   - Yellow - Wing Fold (Not Used)
   - Black - Auxiliary (Optional Coulters)
   - Black - Auxiliary (Optional Row Markers)

Parking

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

   **WARNING**

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

2. To park the drill:
   a. Fully raise the drill extending the main lift cylinders
   b. Remove the transport locks from the cylinder shafts and place in the storage location.
   c. Remove the parking stands from transport position and install in parking position (See Figures 4-34 and 4-35.) If storing on soft ground, place board/plate under the stands for a wider footprint.
   d. Lower the Grain Drill to the ground.
   e. Move the jack from the storage position and place in the parking position at the front of the hitch (See Figure 4-33.) If storing on soft ground, place board/plate under the jack for a wider footprint.
   f. Disconnect the hydraulic hoses and place in the storage slots on the sides of the hitch.
   g. Unplug the seven-pin electrical connector and store in the hole on the either side of the hitch.
   h. Disconnect the safety chain from the tractor. Attach the chain hook close to the chain attaching point to keep the hook off the ground.
   i. Carefully remove the hitch pin.
Figure 4-36: Lubrication Points
Table 4-2: Lubrication Table

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>NO. OF LUBE POINTS</th>
<th>INTERVAL (Hours Unless Stated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coulter Hitch Lift - Lower Rockshaft Bearing Cap</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Coulter Hubs</td>
<td>1 each</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Marker Arm</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Coulter Hitch Lift - Upper Rockshaft Bearing Cap</td>
<td>2</td>
<td>50</td>
</tr>
</tbody>
</table>

Lubrication Maintenance

1. **Table 4-2** specifies the lubrication points and intervals on the 5211 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 4-36.)*

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.

Storage

Preparation of 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 Maintenance” on page 4-40.)*
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. If the openers are lowered, disconnect the lower end of the rubber seed tube.
12. Store the drill inside if possible. If stored outside, cover with a tarp.
Notes
The Troubleshooting Guide, shown below, is included to help you quickly locate problems that can happen using your 5211 Grain Drill. Follow all safety precautions stated in the previous sections when making any adjustments to your machine.

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>PROBABLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLANTING TOO DEEP</td>
<td>Incorrect depth</td>
<td>Adjust press wheel height (See “Opener – Press Wheel Adjustment” on page 4-26.)</td>
</tr>
<tr>
<td></td>
<td>Excessive down pressure</td>
<td>Reduce air system pressure on row units (See “Air System Pressure” on page 4-9.)</td>
</tr>
<tr>
<td></td>
<td>Drill not level front to rear, hitch too high</td>
<td>Adjust hitch height (See “Leveling the Hitch Clevis” on page 4-5.)</td>
</tr>
<tr>
<td>PLANTING TOO SHALLOW</td>
<td>Incorrect depth</td>
<td>Adjust press wheel height (See “Opener – Press Wheel Adjustment” on page 4-26.)</td>
</tr>
<tr>
<td></td>
<td>Insufficient down pressure</td>
<td>Increase air system pressure on row units (See “Air System Pressure” on page 4-9.)</td>
</tr>
<tr>
<td></td>
<td>Drill not level front to rear, hitch too low</td>
<td>Adjust hitch height (See “Leveling the Hitch Clevis” on page 4-5.)</td>
</tr>
<tr>
<td>UNEVEN SEED DEPTH</td>
<td>Row unit depth not set the same</td>
<td>Adjust press wheel height (See “Opener – Press Wheel Adjustment” on page 4-26.)</td>
</tr>
<tr>
<td></td>
<td>Drill not level front to rear</td>
<td>Adjust hitch height (See “Leveling the Hitch Clevis” on page 4-5.)</td>
</tr>
<tr>
<td></td>
<td>Seed shallow in tire tracks</td>
<td>Adjust press wheel height and increase down pressure (See “Air System Pressure” on page 4-9 and “Opener – Press Wheel Adjustment” on page 4-26)</td>
</tr>
<tr>
<td></td>
<td>Excessive field speed</td>
<td>Reduce field speed.</td>
</tr>
<tr>
<td></td>
<td>Plugged seed tube</td>
<td>Clean seed tube.</td>
</tr>
<tr>
<td></td>
<td>Mud build up between opener blades</td>
<td>Adjust scraper (See “Opener Scraper Adjustment” on page 4-27.) Adjust blade pinch point (See “Opener Blade Adjustment” on page 4-25.)</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>PROBABLE CAUSE</td>
<td>SOLUTION</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>----------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>SECTIONS PLANTING AT DIFFERENT RATES</td>
<td>Seed rate adjustment not the same on all sections</td>
<td>Adjust seed rate.</td>
</tr>
<tr>
<td></td>
<td>Drive types (sprocket ratio) not the same on all sections</td>
<td>Change to same drive type on all sections.</td>
</tr>
<tr>
<td></td>
<td>Seed meter out of adjustment</td>
<td>Reset seed meters.</td>
</tr>
<tr>
<td></td>
<td>Seed rate adjustment handle out of adjustment</td>
<td>Reset seed rate adjustment handle.</td>
</tr>
<tr>
<td></td>
<td>Opener seed tube plugged</td>
<td>Clean out seed tube.</td>
</tr>
<tr>
<td></td>
<td>Broken seed meter</td>
<td>Allows excessive seeding - repair seed meter.</td>
</tr>
<tr>
<td>UNEVEN SEED SPACING</td>
<td>Excessive field speed</td>
<td>Reduce field speed.</td>
</tr>
<tr>
<td></td>
<td>Unclean seed</td>
<td>Use clean seed.</td>
</tr>
<tr>
<td></td>
<td>Build up of seed treatment in seed cup</td>
<td>Clean out seed meters.</td>
</tr>
<tr>
<td></td>
<td>Seed tubes sagging</td>
<td>Replace seed tube.</td>
</tr>
<tr>
<td></td>
<td>Drive type (sprocket ratio) too slow</td>
<td>Use faster drive type and readjust seed meter opening.</td>
</tr>
<tr>
<td></td>
<td>Plugged opener seed tube</td>
<td>Clean out bottom of seed tube.</td>
</tr>
<tr>
<td>OPENER DISCS NOT TURNING FREELY</td>
<td>Opener plugged with mud/dirt</td>
<td>Clean opener.</td>
</tr>
<tr>
<td></td>
<td>Scraper set too tight</td>
<td>Adjust scraper (See “Opener Scraper Adjustment” on page 4-27.)</td>
</tr>
<tr>
<td></td>
<td>Soil control strip set too tight against opener blades</td>
<td>Adjust soil strip.</td>
</tr>
<tr>
<td></td>
<td>Soil strip plugged with residue</td>
<td>Adjust soil strip closer to blade, move metal backing strip away from edge of soil strip (See “Opener Soil Strip Adjustment” on page 4-28.)</td>
</tr>
<tr>
<td>PRESS WHEELS NOT COMPACTING THE SOIL AS DESIRED</td>
<td>Opener down pressure set too low</td>
<td>Increase air system pressure on row units (See “Air System Pressure” on page 4-9.)</td>
</tr>
<tr>
<td></td>
<td>Incorrect press wheel depth adjustment</td>
<td>Reset press wheel depth adjustment (See “Opener – Press Wheel Adjustment” on page 4-26.)</td>
</tr>
<tr>
<td>PRESS WHEEL OR OPENERS PLUGGING</td>
<td>Backed up with openers in the ground</td>
<td>Clean out opener and press wheels and check for damage.</td>
</tr>
<tr>
<td></td>
<td>Scraper worn or not adjusted correctly</td>
<td>Replace or adjust scraper</td>
</tr>
<tr>
<td></td>
<td>Opener blades worn, pinch point too wide</td>
<td>Reset pinch point, replace worn out blades.</td>
</tr>
<tr>
<td></td>
<td>Planting conditions too wet</td>
<td>Wait until drier weather</td>
</tr>
<tr>
<td></td>
<td>Opener bearing failure</td>
<td>Replace opener bearings</td>
</tr>
<tr>
<td>AIR SPRING LEAKING AIR</td>
<td>Air spring not set all the way forward or backward in adjustment slots</td>
<td>Replace and reposition air spring</td>
</tr>
<tr>
<td></td>
<td>Operating with too low air pressure</td>
<td>Minimum air system pressure is 15 psi (See “Air System Pressure” on page 4-9.)</td>
</tr>
<tr>
<td></td>
<td>Broken air spring stud</td>
<td>Replace air spring, maximum stud torque 30 ft-lbs.</td>
</tr>
<tr>
<td>AIR SYSTEM LEAK - FAST</td>
<td>Broken or pinched air line</td>
<td>Check hitch and wing hinge areas for broken or pinched air line.</td>
</tr>
<tr>
<td></td>
<td>Broken fitting</td>
<td>Repair fitting</td>
</tr>
<tr>
<td></td>
<td>Air line disconnected</td>
<td>Reconnect air line.</td>
</tr>
<tr>
<td></td>
<td>Air spring has hole</td>
<td>Replace air spring.</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>PROBABLE CAUSE</td>
<td>SOLUTION</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AIR SYSTEM LEAK - SLOW</td>
<td>Air leaking thru air compressor filter</td>
<td>Check valve leaking. Replace check valve</td>
</tr>
<tr>
<td></td>
<td>Air line/fitting connection leaking</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Air relief valve leaking</td>
<td>Clean or replace air relief valve.</td>
</tr>
<tr>
<td></td>
<td>Air manifold leaking</td>
<td>Check front and rear manifolds for leaks.</td>
</tr>
<tr>
<td></td>
<td>Air valve leaking</td>
<td>Tighten/replace Schrader air valve on front manifold.</td>
</tr>
<tr>
<td></td>
<td>End caps on center section opener bar (air reservoir) leaking.</td>
<td>Relief system air pressure, and repair leaking weld.</td>
</tr>
</tbody>
</table>

**NOTE**
Use a spray bottle with a soapy water solution to check for the following leaks.
Equipment from Landoll Corporation is built to exacting standards ensured by ISO 9001 registration at all Landoll manufacturing facilities.

Model 5211
Grain Drill
Operator’s Manual

Re-Order Part Number F-725-0317