

Operator's Manual

PT6030 and PT8030

Pull-Type Planter

Model	Serial No.
PT6030	U1048 and Earlier
PT8030	V1012 and Earlier

Great Plains

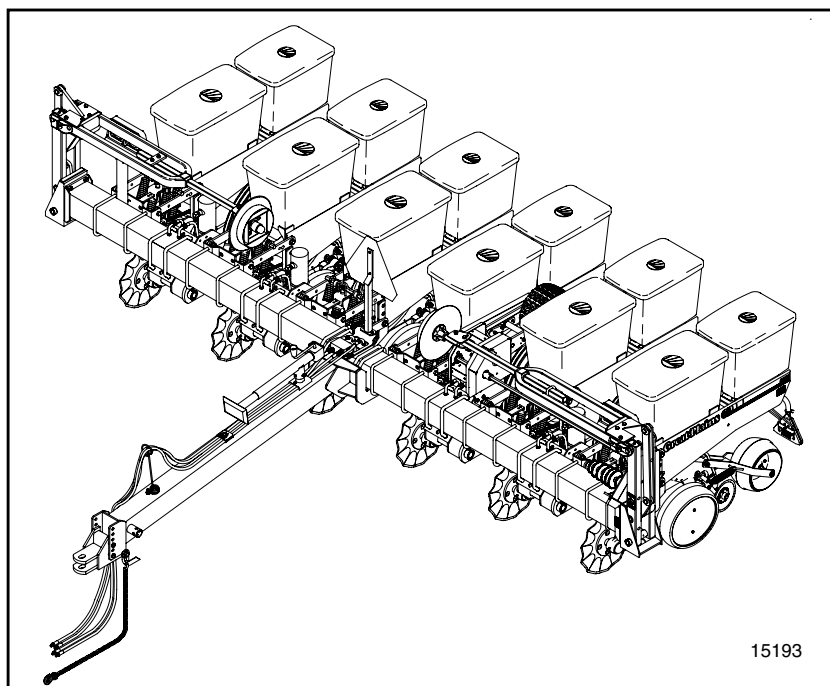
Manufacturing, Inc.

P.O. Box 5060 • Salina, Kansas 67402-5060



Read the operator's manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!

Great Plains



Cover illustration may show optional equipment not supplied with standard unit.

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Important Safety Information

For your safety and to develop a better understanding of your equipment, thoroughly read the Operator's Sections of this manual before operation.

Safety Notations

The SAFETY ALERT SYMBOL indicates that there is a potential hazard to personal safety involved and extra safety precautions must be taken. When you see this symbol, be alert and carefully read the message that follows it. In addition to design and configuration of equipment; hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

Watch for the following Safety Notations throughout your Operator's Manual:

DANGER!

*Indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury. This signal word is limited to the most extreme situations.*

WARNING!

*Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.*

CAUTION!

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

Safety Rules

These rules and instructions must be reviewed at least annually by all operators!

Most accidents are the result of negligence and carelessness, caused by failure of the operator to follow safety precautions. Even though your implement is designed with many built-in safety features, the following precautions are mandatory to prevent such accidents.

Make sure everyone that uses this machine has read the Operator's Manual and understands how to operate it safely.

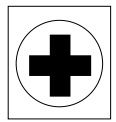
This Operator's Manual is considered a part of the implement and should remain so when loaned or sold.

Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

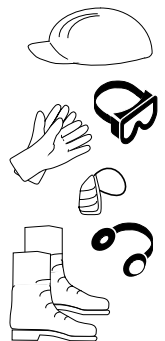


Wear Protective Equipment

Wear clothing and safety equipment appropriate for the job. Avoid loose fitting clothing

Prolonged exposure to loud noise can cause hearing impairment or hearing loss. Wear suitable hearing protection such as earmuffs or earplugs.

Operating equipment safely requires the full attention of the operator. Avoid wearing radio headphones while operating machinery.



Handle Chemicals Properly

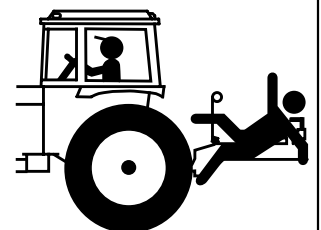
Agricultural chemicals can be dangerous. Improper selection or use can seriously injure persons, animals, plants, soil or other property. **BE SAFE.** Handle all chemicals with care. Follow the instructions on the container label. Precautions should be taken to prevent exposure. Protective clothing and equipment is to be worn



Keep Riders Off Machinery

A rider on machinery is subject to injury such as being struck by foreign objects or being thrown off the machine. A rider obstructs the operator's view, resulting in unsafe machine operation.

Keep riders off any machinery while in operation. Allow only skilled persons to operate machinery.



Prior To Operation

- 1. Practice safety by always thinking before acting.*
- 2. Make sure safety rules are understood before operating machine or tractor.*
- 3. Loose fitting clothing should not be worn as it may catch in moving parts.*
- 4. Never attempt to operate the implement unless you are in the driver's seat.*
- 5. Never dismount from a moving tractor.*

Important Safety Information

6. Do not leave the tractor or the implement unattended with the engine running.
7. Do not stand between the tractor and the implement during hitching.

During Operation

1. Never allow the planter to be operated by anyone who is unfamiliar with the operation of all functions of the unit. All operators should read and thoroughly understand the instructions given in this manual prior to moving the unit.
2. Never permit any persons other than the operator to ride on the tractor.
3. Regulate your speed to the field conditions, maintaining complete control at all times.
4. Always lower the implement and shut off the tractor engine before making any adjustments.
5. Do not grease or oil machine while it is in operation.
6. Always make sure there are no persons near the planter when the marker assemblies are in operation.
7. Watch for obstructions such as wires, tree limbs etc., when folding markers.
8. If a hydraulic leak develops, correct it immediately. Escaping hydraulic oil can have extremely high pressure. A stream of high pressure oil may easily penetrate the skin as with modern needless vaccination equipment - but with the exception that hydraulic fluid may cause blood poisoning. It is imperative that the connections are tight and that all lines and pipes are in good condition. If an injury is caused by the escaping hydraulic fluid, see a doctor at once!

After Operation

1. Detach and store implements in an area where children normally do not play. Stabilize implements by using suitable supports and block wheels.

During Maintenance

1. After repairing or adjusting, make sure all tools and parts are removed from the implement before attempting to operate it.
2. Never work under a raised planter.
3. Disk edges are sharp! Be careful when working in this area.
4. Use a piece of cardboard or wood to detect leaks of hydraulic oil under pressure.
5. Be sure to relieve all hydraulic pressure before disconnection any lines or pipes between the implement and the tractor hydraulic system. Keep all guards and shields in place.

Transporting

1. Before transporting make sure the hitch is securely attached to the draw bar of the tractor and the safety chain is connected.
2. Be alert to traffic when crossing or operating near roadways. Always maintain complete control of the machine. Know your state and local laws concerning highway safety and regulations. Comply with these laws when transporting machinery.
3. Do not exceed 20 mph when transporting. Transport only with a farm tractor of sufficient size and horse power. See Tractor Preparation in "Section 2 Planter Operation" on page 13.
4. Always make sure flashing safety lights, slow moving vehicle emblem, and reflectors are in place and visible prior to transporting the machine on public roads, when required.
5. Do not transport at night or during other periods of poor visibility.

Tire Handling & Repair

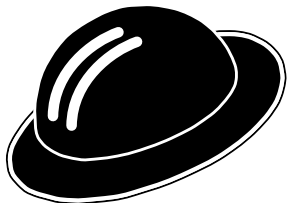
1. Tire changing can be dangerous and should be preformed by trained personnel using the correct tools and equipment.
2. Do not re-inflate a tire that has been run flat or seriously under inflated. Have it checked by qualified personnel.
3. When removing and installing wheels, use wheel handling equipment adequate for the weight involved.

Agricultural Chemicals

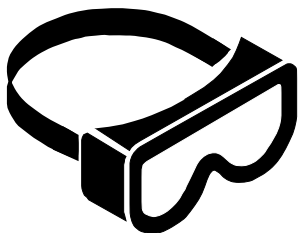
1. Agricultural chemicals can be dangerous. Always select the correct chemical for the job. Improper usage of fertilizers, fungicides, herbicides, insecticides, and pesticides could cause injury to all living things.
2. Always read instructions supplied by the manufactures before opening chemical containers. Read and follow instructions supplied by the chemical manufacturer carefully before each use.
3. Apply the same precautions when adjusting, servicing, cleaning, or storing this implement as you would when putting chemicals into it.
4. Inform anyone who may come in contact with chemicals, or an implement with chemicals, of any potential hazard or safety precaution that should be observed.
5. Avoid inhaling smoke from any type of chemical fire.
6. Store or dispose of all unused chemicals as specified by the chemical manufacturer.

Important Safety Information**Personal Safety Equipment**

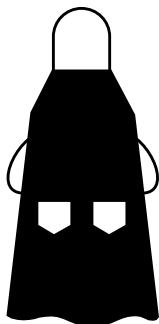
Great Plains advises all users of chemical pesticides or herbicides to use the following personal safety equipment. Always follow the chemical label instructions, your safety and the effectivity of the product depends upon your actions.



Waterproof, wide-brimmed hat



Face shield, goggles or full face respirator. Goggles with side shields or a full face respirator is required if handling or applying dusts, wettable powders, or granules or if being exposed to spray mist.



Waterproof apron



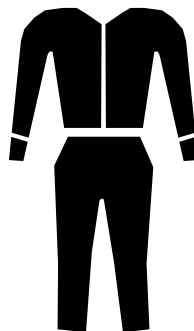
Waterproof boots or foot coverings



Waterproof, unlined gloves. Neoprene gloves are recommended.



Cartridge-type respirator approved for pesticide vapors unless label specifies another type of respirator.



Cloth coveralls/outer clothing changed daily; waterproof items if there is a chance of becoming wet with spray

Important Safety Information

Safety Labels

Your implement comes equipped with all safety labels in place. They were designed to help you safely operate your implement.

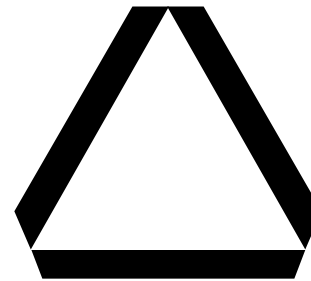
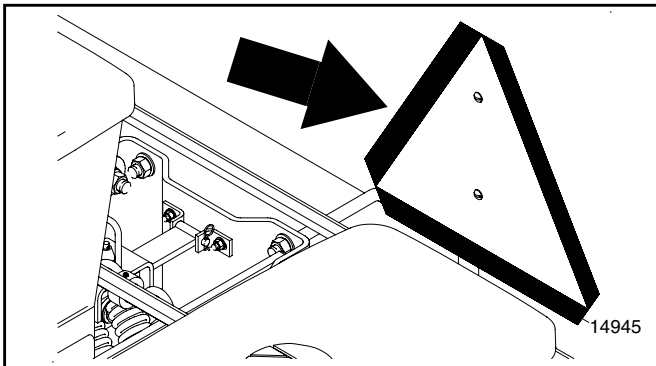
1. Read and follow label directions.
2. Keep all safety labels clean and legible.
3. Replace all damaged or missing labels.
4. Some new equipment installed during repair require safety labels to be affixed to the replaced component as specified

by the manufacturer. When ordering new components make sure the correct safety labels are included in the request. To order new labels go to your **Great Plains** dealer.

5. Refer to this section for proper label placement.

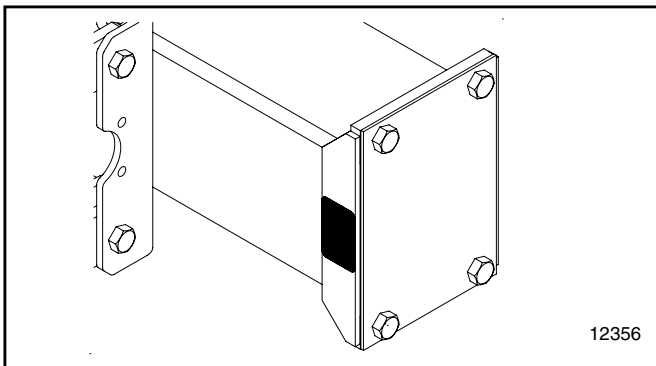
To install new labels:

- a. Clean the area the label is to be placed.
- b. Peel backing from label. Press firmly on surface being careful not to cause air bubbles under label.



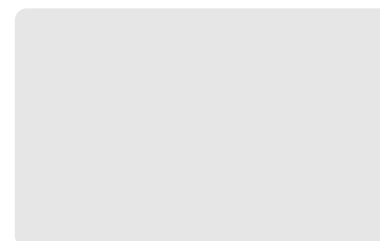
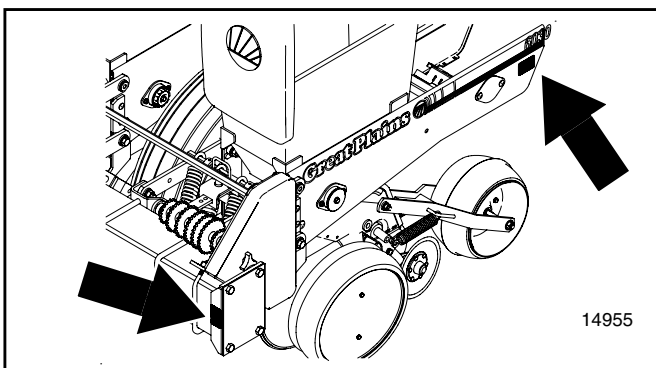
818-003C

Slow Moving Vehicle Label



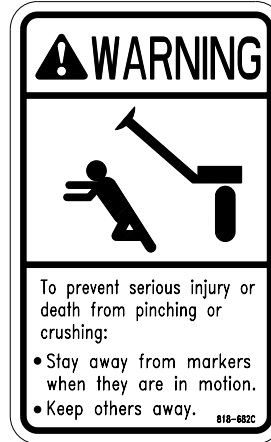
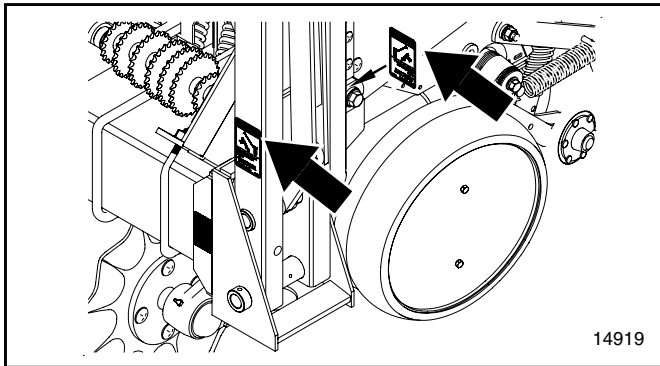
818-230

Red Reflector

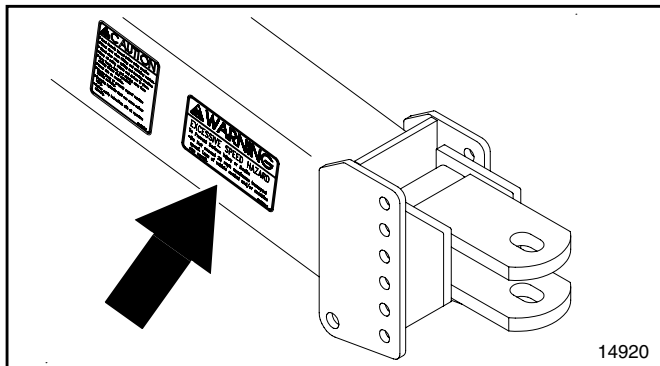


818-229C

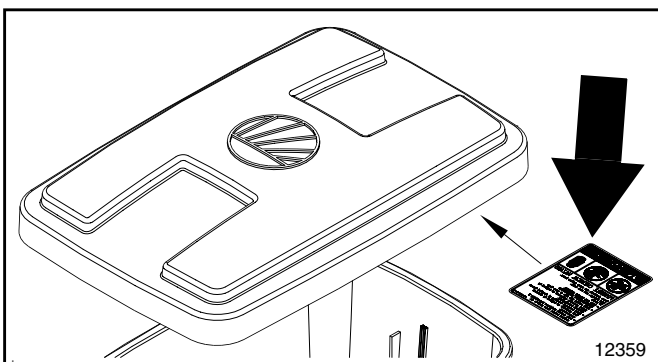
Amber Reflector

Important Safety Information

818-682C
Pinch/Crush Warning

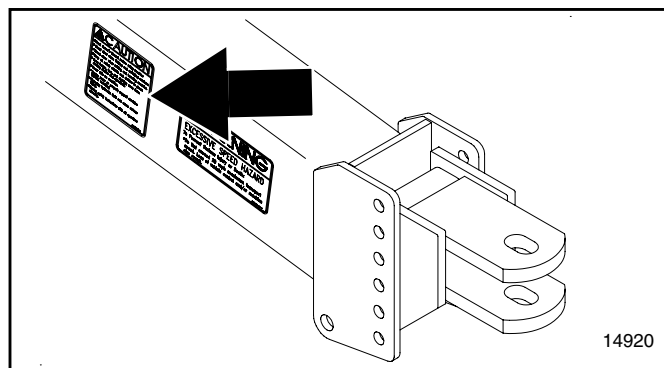


818-188C
Transport Speed Warning

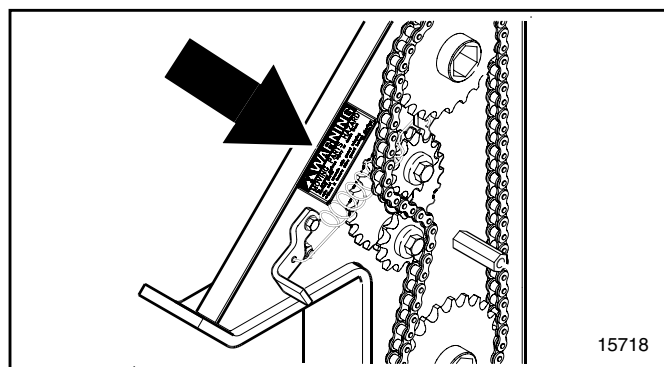


818-323C
Ag Chemicals Caution
Located inside the chemical lid

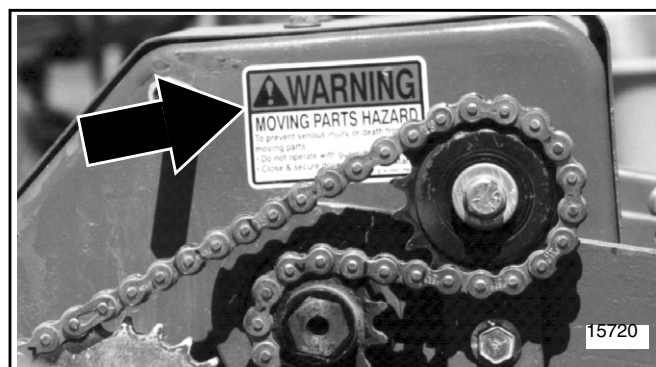
Important Safety Information



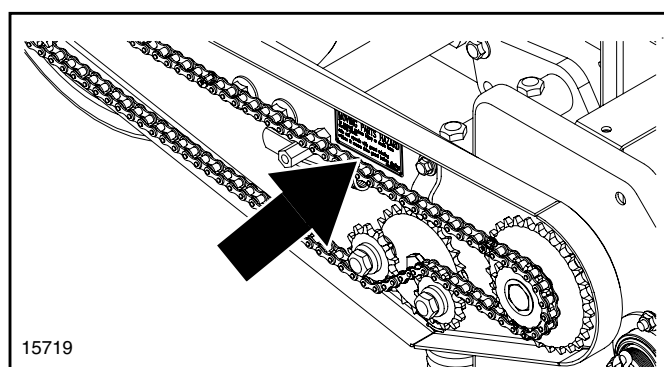
818-587C
Operational Caution



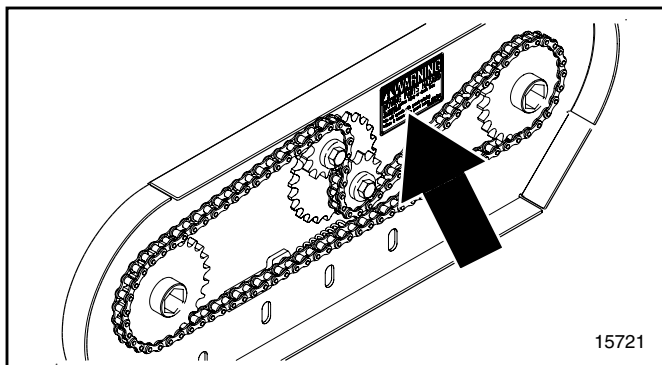
818-205C
Moving Parts Warning



818-205C
Moving Parts Warning

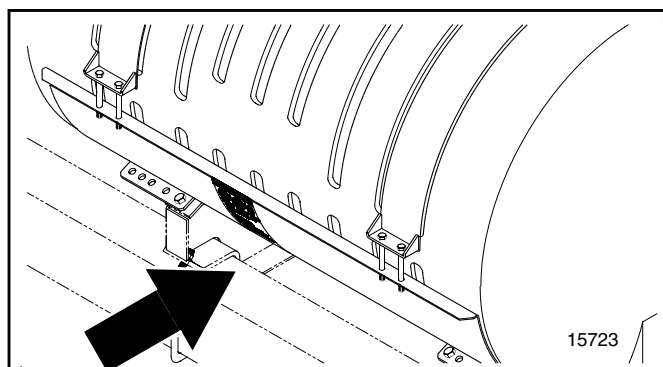


818-205C
Moving Parts Warning

Important Safety Information**818-205C**

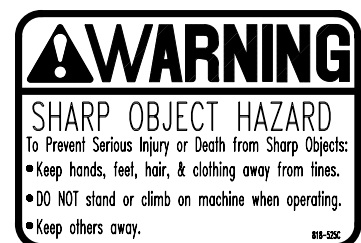
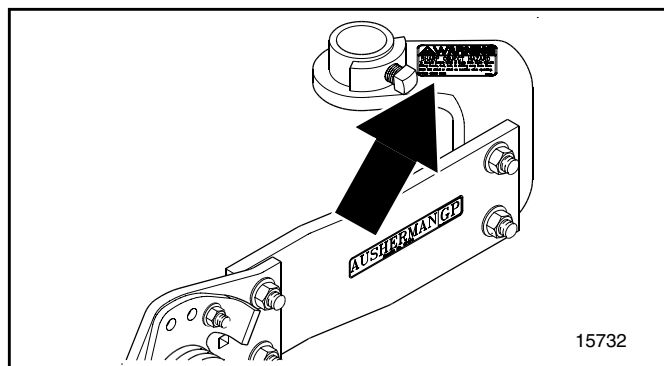
Moving Parts Warning

Liquid-Dry Fertilizer Option

**818-323C**

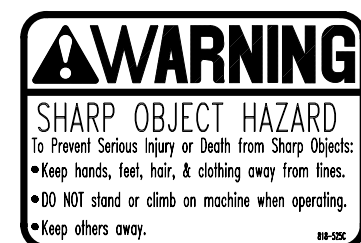
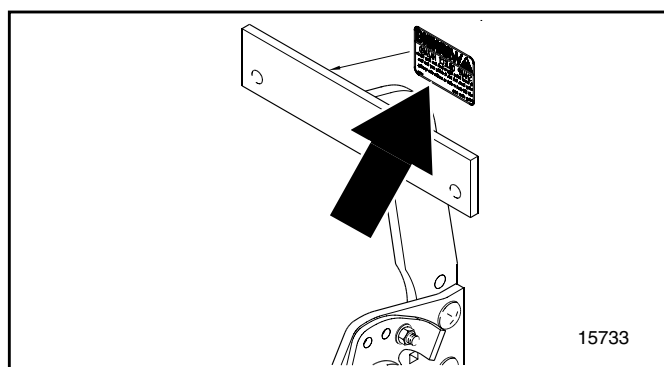
Chemical Hazard Warning

Liquid Fertilizer Option

**818-525C**

Sharp Object Warning

Terra-Tine

**818-525C**

Sharp Object Warning

Terra-Tine

Introduction

Great Plains welcomes you to the growing family of new product owners. This implement has been designed with care and built by skilled workers using quality materials. Proper assembly, maintenance, and safe operating practices will help you get years of satisfactory use from the machine.

Using This Manual

This Operator's Section is designed to help familiarize you with safety, assembly, operation, adjustments, troubleshooting, and maintenance. Read this manual and follow the recommendations to help ensure safe and efficient operation.

The warranty sheet should be filled out by the owner and dealer at the time of purchase. After completion give the dealer the white copy and send the pink copy to Great Plains. Keep your copy in the manual for use when corresponding with the dealer.

To order a new Operator or Parts Manual contact your authorized dealer or write to the address listed below in the *Owner Assistance* paragraph. Include the model and serial numbers of your unit.

The information contained within this manual was current at the time of printing. Some parts may change slightly to assure you of the best performance.

Terminology:

"Right " or "Left" as used in this manual is determined by facing the direction the machine will travel while in use unless otherwise stated.

Definitions:

NOTE: A special point of information related to it's preceding topic. The author's intention is that you read and note this information before continuing.

IMPORTANT: Information, related to it's proceeding topic, that the author feels would be of use.

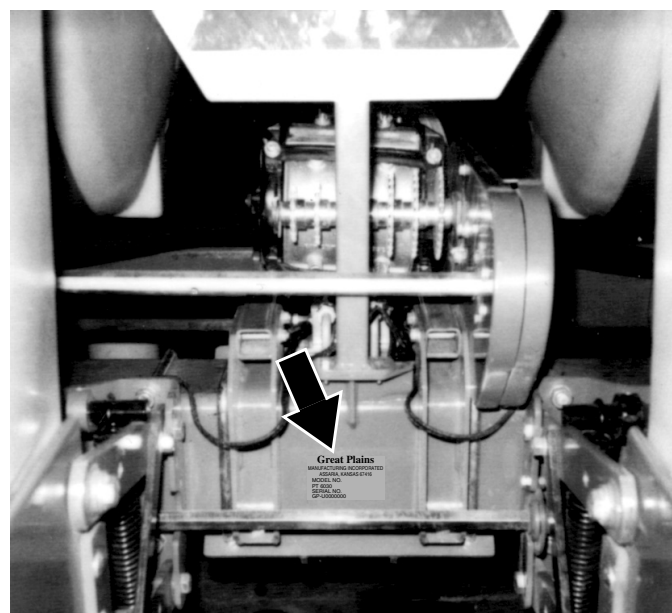
Owner Assistance

If customer service or repair parts are required contact your local **Great Plains** dealer. He has trained personnel, repair parts, and the equipment needed to service your implement.

These parts have been specially designed and should only be replaced with genuine **Great Plains** parts.

Serial Number Plate

Refer to the Figure 1 for the location of your serial number plate.



Serial Number Plate Location
Figure 1

14921

For prompt service always use the serial number and model number when ordering parts from your **Great Plains** dealer. Be sure to include your serial and model numbers in correspondence also.

Your dealer wants you to be satisfied with your new machine. If for any reason you do not understand any part of this manual or are not satisfied with the service received, the following actions are suggested:

1. Discuss the matter with your dealership Service Manager make sure he is aware of any problems you may have and that he has had the opportunity to assist you.
2. If you are still not satisfied, seek out the Owner or General Manager of the dealership, explain the problem and request assistance.
3. For further assistance write to:

Product Support

Great Plains Mfg. Inc., Service Department
P.O. Box 245
Assaria, Ks. 67416

Section 1 *Assembly and Setup*

Planter Setup

Lift frame as shown. Attach chain for safety.



15059

2. Lower and back up slowly as shown below.



15061

Follow these steps for setting the planter in planting position:

1. With stands on the ground, back up fork truck. Chain should become taut.



15060



15062



15063

Block to a level position and remove chain.

Section 1 Assembly and Setup

3. Attach hitch to frame.



15072

4. Install markers.
5. Remove shipping stands and brackets.

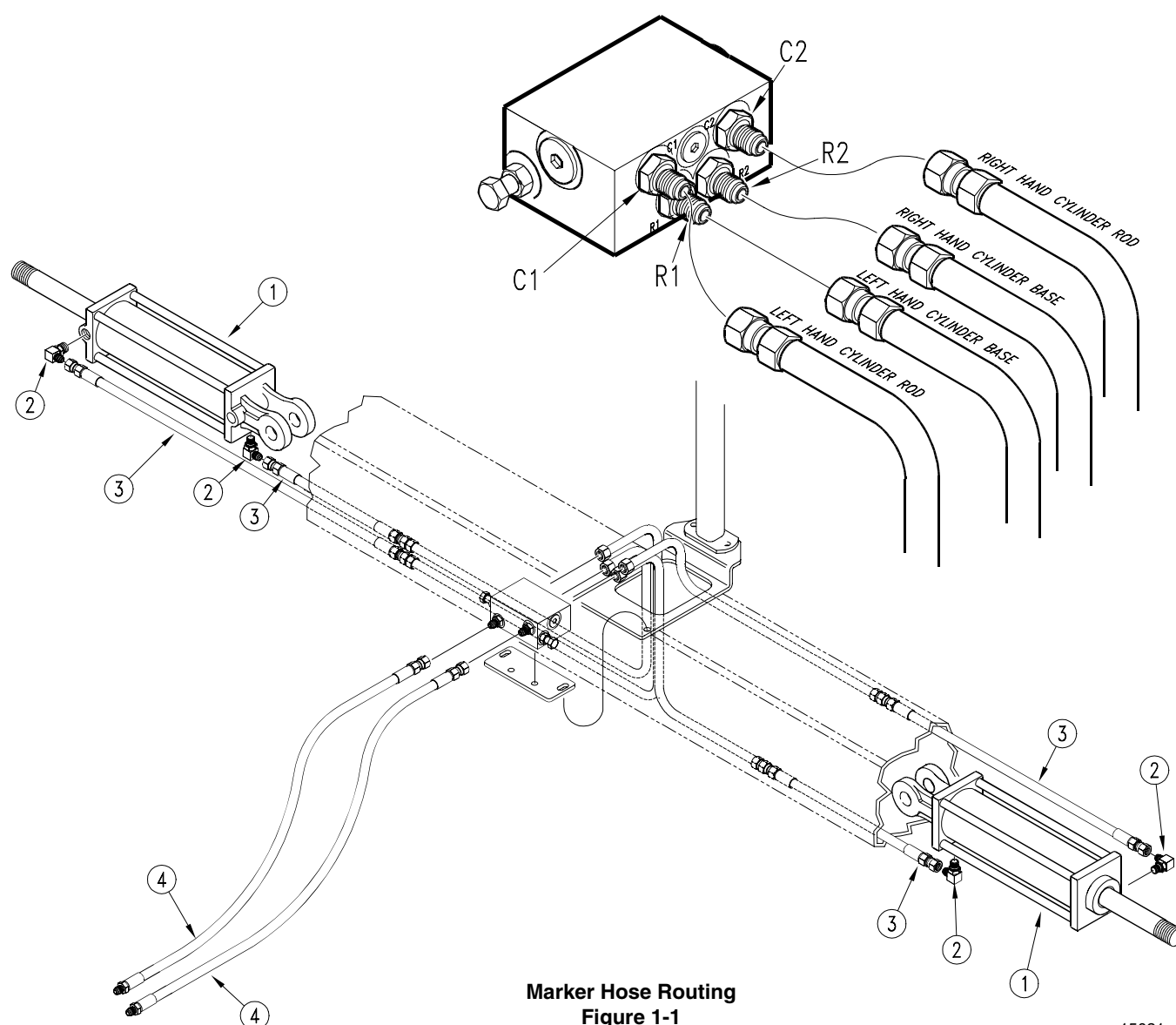
Marker Installation

Lower the planter to the planting position. Remove the frame end cap if applicable.

Refer to Figure 1-1 for hose routing.

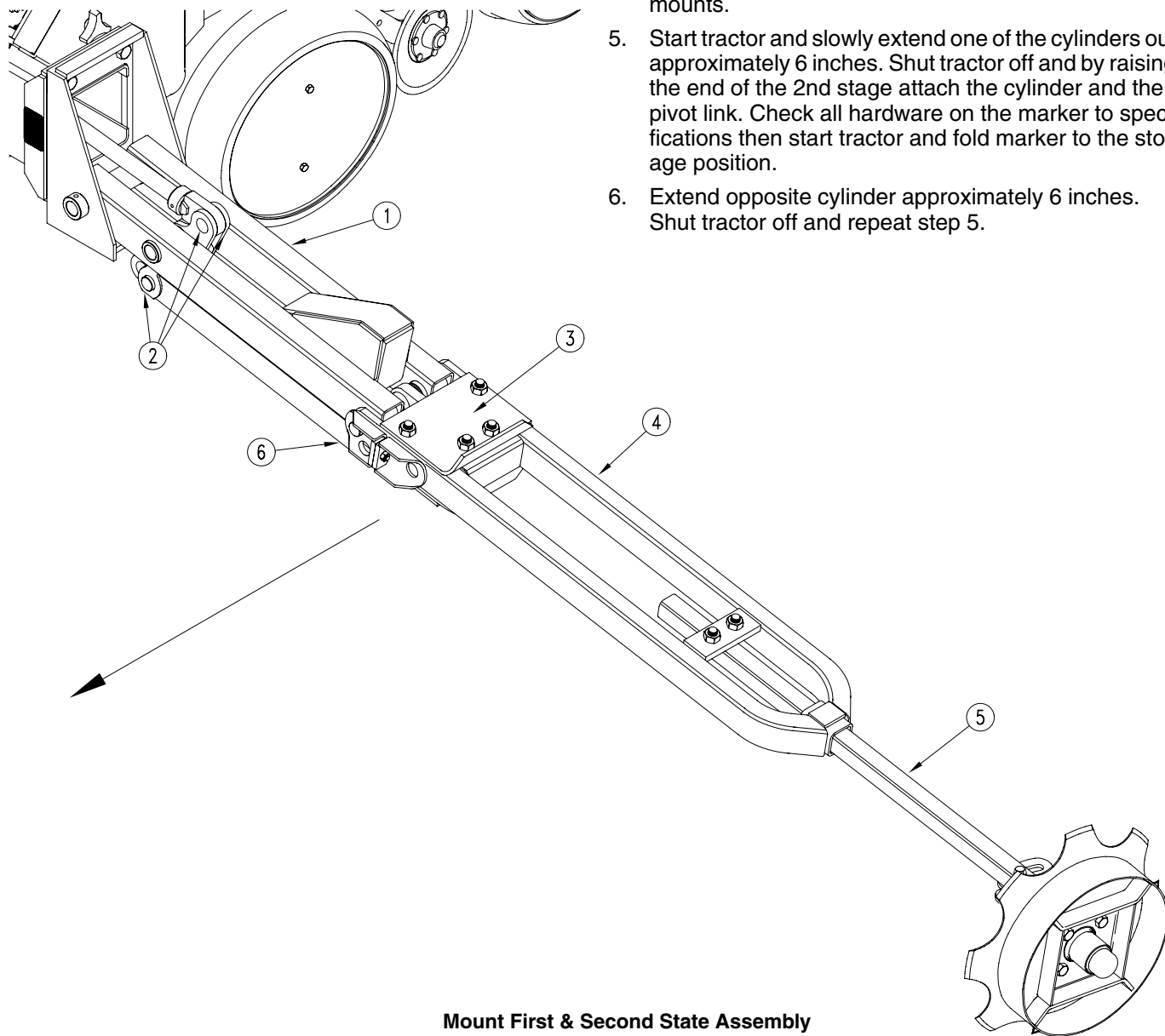
Refer to Figure 1-2:

1. Install the 1st stage arms(#1). Leave arms resting on the down stops.
2. Install pivot links (#2). Refer to Illustration for proper orientation.
3. Install the 2nd stage mount, 2nd stage, and the extension tube (#3, 4, & 5) onto the end of the 1st stage arms.



Marker Hose Routing
Figure 1-1

15021

Section 1 Assembly and Setup

4. Install transfer links (#6) to pivot links and 2nd stage mounts.
5. Start tractor and slowly extend one of the cylinders out approximately 6 inches. Shut tractor off and by raising the end of the 2nd stage attach the cylinder and the pivot link. Check all hardware on the marker to specifications then start tractor and fold marker to the storage position.
6. Extend opposite cylinder approximately 6 inches. Shut tractor off and repeat step 5.

Mount First & Second State Assembly
Figure 1-2

12486

Section 2 Planter Operation

Section 2 Planter Operation

The following section was written to provide general information on the planter and tractor operation.

Initial Preparation of the Planter

- Lubricate the planter as indicated in the *Lubrication* portion of “**Section 7 Maintenance and Lubrication**” on page 45.
- Check the tires for proper inflation, see the *Tire Inflation Chart* in “**Section 10 Appendix**” on page 62.
- Check the chains for proper tension and alignment as shown in “**Section 7 Maintenance and Lubrication**” on page 45.
- Perform all beginning of season and daily planter service as discussed in “**Section 7 Maintenance and Lubrication**” on page 45.
- Check over the planter and replace worn or damaged parts before going to the field.
- All nuts, bolts and screws should be checked. Refer to the *Torque Value Chart* in “**Section 10 Appendix**” on page 62.
- The legs of the cotter pins should be spread.

Tractor Preparation

Recommended Tractor Horsepower

Minimum required draw bar horsepower for field work

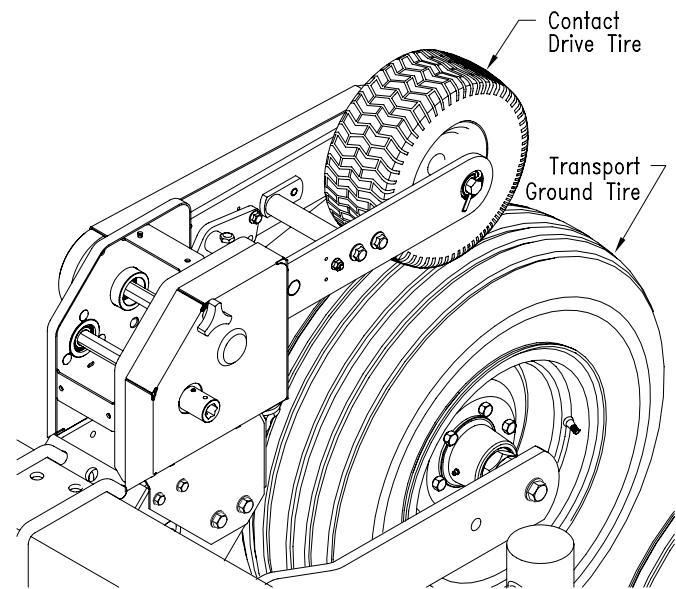
6-row planter	80-120 HP
8-row planter	100-140 HP

Consult your dealer for information on horsepower requirements and tractor compatibility. Requirements will vary with planter options, tillage and terrain. One dual remote hydraulic outlet (SCV) is required on models equipped with the standard single valve hydraulic system. Two dual remote hydraulic outlets (SCV) are required on models equipped with the optional dual valve hydraulic system.

Tire Pressure

Tire pressure should be checked regularly and maintained as follows:

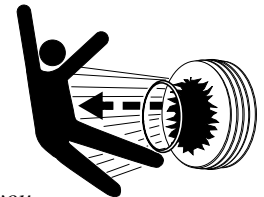
Transport/Ground Drive 9.5L X 15-8 ply.....	44 psi
Contact Drive 13-6.50 X 6	40 psi



Contact Drive
Transport/Ground Drive
Figure 2-1

DANGER!

Rim and tire servicing can be dangerous. Explosive separation of a tire and rim parts can cause serious injury or death.



Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. This should only be done by persons properly trained and equipped to do the job.

Always maintain the correct tire pressure. Do not inflate tires above recommended pressure.

When inflating tires, use a clip-on air chuck and extension hose long enough to allow you to stand to one side and not in front of or over tire assembly. Use a safety cage to enclose tire and rim assembly when inflating.

Inspect tires and wheels daily. Do not operate with low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

Transporting



CAUTION!

The planter should never be transported faster than 20 miles per hour!

Before transporting the planter, check and practice the following items:

- The planter can be transported with full hoppers of seed. It is best NOT to because the extra weight increases the chances for problems on the road. **Do not exceed 20 miles per hour.**
- Check to see that the gauge tires on the planter have the proper inflation, see the *Tire Inflation Chart* in “**Section 10 Appendix**” on page 62.
- Comply with all Federal, State and Local Safety Laws when traveling on public roads.
- Remember, the planter is wider than the tractor and extreme care must be taken to allow for safe clearance.
- Make sure the safety chain is properly attached with enough slack in the chain to permit turning.

Leveling the Planter

IMPORTANT: For proper planter operation, it is important that the planter frame be fully lowered into the correct planting position. Achieving this position can be difficult with some attachment combinations, especially when planting in hard to penetrate soil conditions. If this situation is encountered, the following action may be warranted.

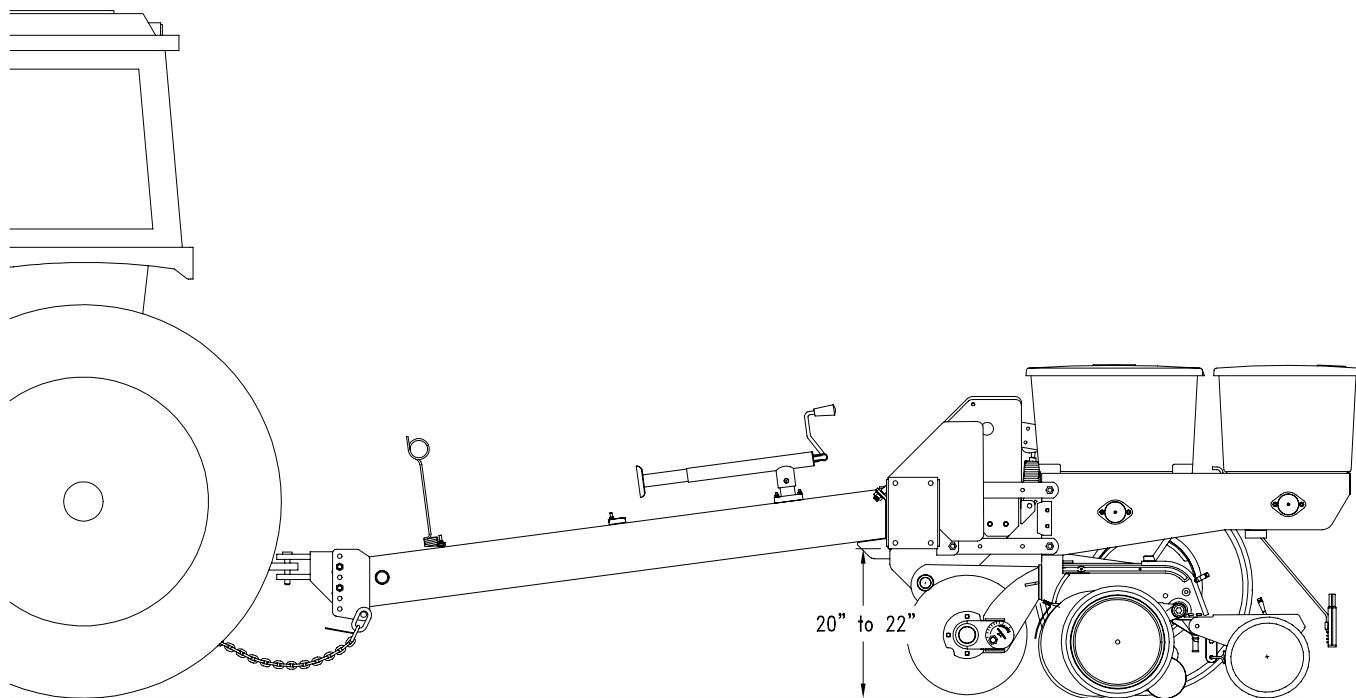
Reduce attachment down force levels. Avoid using more attachment down force than is required.

Periodically check the planter to be certain the planting units are running level.

Lower planter to planting position with the bottom of main frame tube approximately 20 to 22 in. above level ground. Refer to Figure 2-2.

When planting, the top of the hopper support panel should be parallel to the ground.

Position tractor drawbar as required to obtain the proper planter hitch height.



Leveling the Planter
Figure 2-2

14956

Section 2 Planter Operation

Rephasing the Hydraulic System



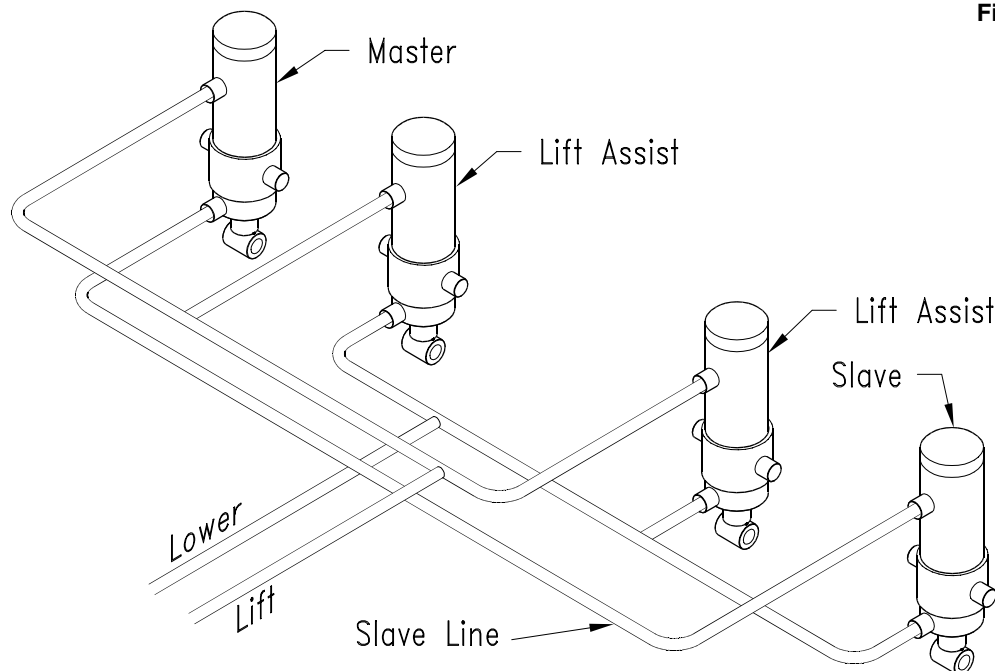
WARNING!

Escaping fluid under pressure can have sufficient pressure to penetrate the skin. Check all hydraulic lines and fittings before applying pressure. Fluid escaping from a very small hole can be almost invisible. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. If injured, seek medical assistance from a doctor that is familiar with this type of injury. Foreign fluids in the tissue must be surgically removed within a few hours or gangrene will result.

Refer to Figure 2-3:

The lift system on your Great Plains Pull-Type Planter is a master/slave system. All cylinders in the system are 2/way cylinders. Rephasing the system is accomplished each time the planter is lowered to the planting position. If un-level lifting occurs, lower the planter to the ground and hold the remote lever momentarily. This time will allow oil to go from the tractor to the master; bypass to the slave, then return to the tractor.

If following this procedure does not level the planter, refer to “**Section 7 Maintenance and Lubrication**” on page 45.

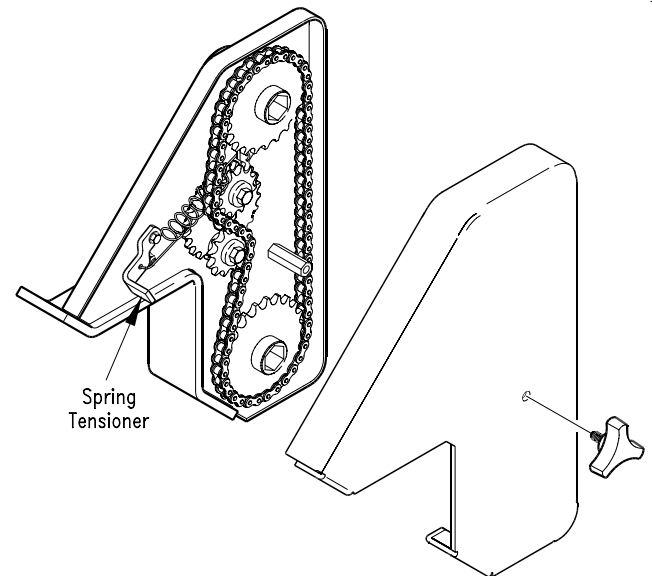


Rephasing the Hydraulic System
Figure 2-3

Planting Rates

Transmission Adjustment

Planting population changes are accomplished by setting the sprocket transmission. By changing the combination of sprockets the desired planting populations can be achieved. For more information on this, refer to “**Section 5 Adjusting Planting Rates**” on page 28.

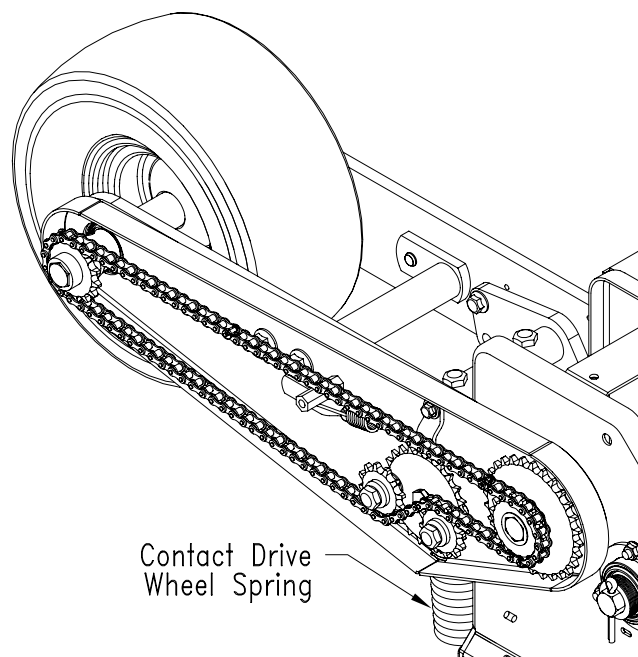


Spring Tensioner on Transmission
Figure 2-4

12349

14951

2 to 1 Drive Reduction



2 to 1 Drive Reduction
Figure 2-5

The 15/28 tooth drive sprocket located on the inner side of the contact drive wheel assembly will give you a 2 to 1 drive reduction, and will reduce the planter transmission speed to reduce planting rates by approximately 1/2.

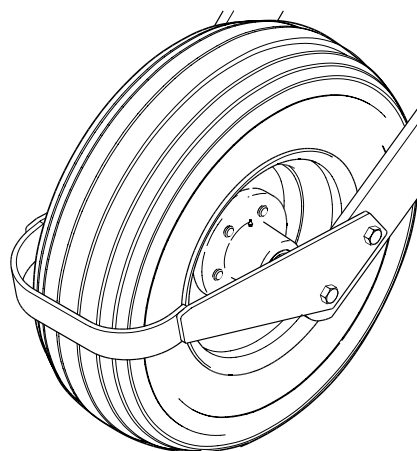
IMPORTANT: After each sprocket combination adjustment, make a field check to be sure you are planting at the desired rate.

Contact Drive Wheel Spring Adjustment

There are two down pressure springs, see Figure 2-5, on each contact drive wheel. The down pressure is factory preset and should need no further adjustment.

Tire Scraper (Optional)

Some soil types may require the use of the optional tire scraper. The scraper prevents an excess of mud from building up on lift tire that may hamper the contact drive tire. Adjust the scraper so it does not contact the tire. See Figure 2-7.



Tire Scraper
Figure 2-7

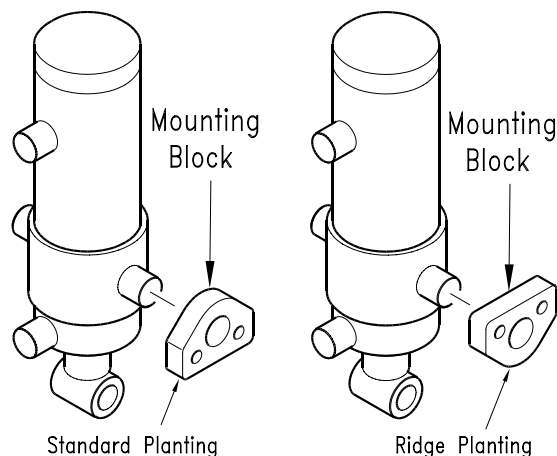
15027

Ridge Planting

Refer to Figure 2-8:

Lowering the wheel for ridge planting is accomplished by inverting the cylinder mounting blocks.

To invert, first block under the frame to remove weight from tires, remove the four 5/8" cap screws. Invert mounting blocks and install cap screws. Torque per specifications, see "Section 10 Appendix" on page 62.



Ridge Planting Adjustment
Figure 2-8

14958

Section 2 Planter Operation

Marker Hydraulics



DANGER!

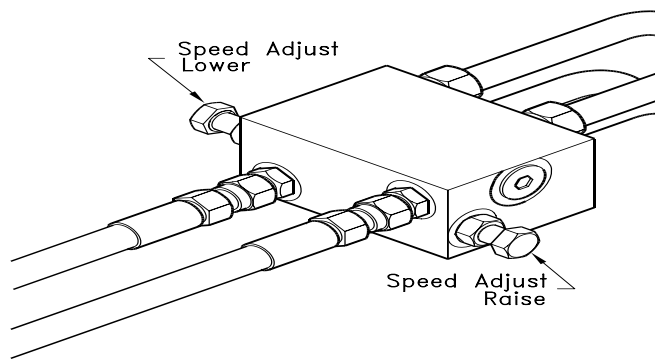
Never allow anyone near the planter when cycling the markers. Excessive travel speed of the markers can be dangerous and/or damage the marker assembly. The flow controls should be properly adjusted before the marker assembly is first put into use.

The marker hydraulic system is equipped with needle valves to control how fast each marker operates. The needle valves are built into the sequence valve body. There are two hex adjustment heads, one for controlling marker speed up and one for controlling marker speed down. To adjust the speed of each marker, loosen jam nut, screw the needle valve clockwise to adjust the marker speed to a low setting. Fold the marker up and down a few times and recheck for pinching and kinking of hoses. With the tractor engine at an operating rpm, adjust the needle valve to limit the marker to a safe operating speed. Excessive folding speeds can cause marker damage.



WARNING!

Escaping Fluid under pressure can have sufficient force to penetrate the skin. Check all hydraulic lines and houses before applying pressure. Fluid escaping from a very small hole can be almost invisible. Use paper or cardboard, not body parts, to check for suspected leaks. If injured, seek medical assistance from a doctor that is familiar with this type of injury. Foreign fluids in the tissue must be surgically removed within a few hours or gangrene will result.



Flow Control Raise/Lower
Figure 2-9

15029

NOTE: JIC fittings do not require high torque. JIC and O-Ring fittings do not require sealant. Always use liquid pipe sealant when adding or replacing pipe thread fittings. To avoid possible danger of cracking hydraulic fittings from over tightening, **DO NOT** use plastic sealant tape.

General Notes

- If both markers are required down at the same time run one marker down, momentarily start to raise it, reverse the hydraulic lever and lower the opposite marker. Holding the lever down then will force both markers down.

If the markers are down they can both be raised simultaneously but they can only be lowered one at a time alternating from one side to the other.

- When oil is cold, hydraulics operate slowly. Make sure all adjustments are made with warm oil.
- On a tractor where the oil flow cannot be controlled, the rate of flow of oil from the tractor may be greater than the rate at which the marker cylinder can accept it. The tractor hydraulic control lever will have to be held until the cylinder reaches the end of its stroke. This occurs most often on tractors with an open center hydraulic system.

On tractors with a closed center hydraulic system, the tractor's hydraulic flow control can be set so the tractor's detent will function properly.

Marker Transporting

Always transport the marker with it folded in the flat fold position.

Liquid Fertilizer Attachment



WARNING!

Agricultural chemicals can be dangerous if not selected and handled with care. Always read and follow directions supplied by the chemical manufacturer.

Squeeze Pump

Specifications:

Maximum output per hose @ 125 rpm

5/16 Diameter hose-.58 GPM

1/2 Diameter hose-1.4 GPM

Maximum speed - 125 RPM

Maximum pressure - 5 PSI

Horsepower required per hose

5/16 Diameter hose - 0.03 HP

1/2 Diameter hose - 0.05 HP

Pump Mounting and Hose Arrangement

The pump should always be mounted even with or lower than the fertilizer tank and for accurate metering, the speed should not exceed 125 RPM.

An important consideration for efficient operation of the pump is the hose arrangement. If fewer than the standard number of hoses are to be used, that is, using 4 or 5 hoses on a 6 hose pump or 10 hoses on a 12 hose pump, the reduction in the number of hoses may be made by:

1. Removing the hoses from near the center of the intake manifold and capping the intake ports.

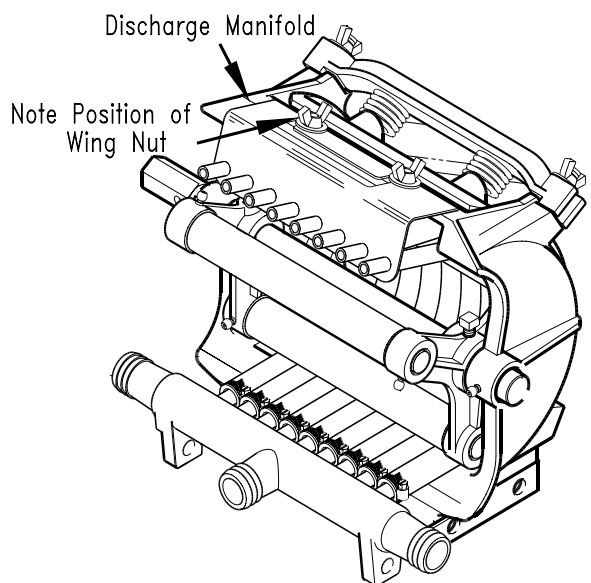
Section 2 Planter Operation

- Running the unneeded hoses back into the solution tank or tanks with the hoses still connected to the pump.

CAUTION!

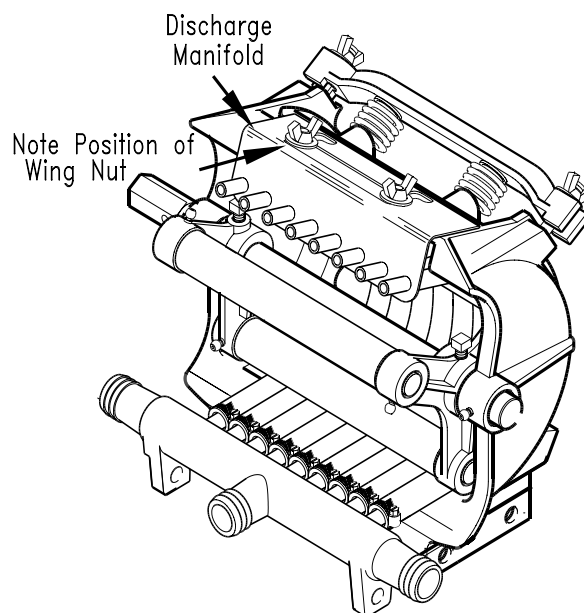
Avoid pressure when using the quick fill attachment. The rubber plugs installed in the manifold may be forced out under pressure.

The discharge manifold must be in the forward position when the pump is in operation. Squeeze Pumps are shipped with the discharge manifold in the rearward or non-operating position. To reposition the manifold, loosen the wing nuts and slide the manifold forward and sideways or rearward as required and retighten nuts. See Figure 2-10.



Discharge Manifold Forward Position
Figure 2-10

14949



Discharge Manifold Rearward Position
Figure 2-11

14950

Shut-off valves provided at various locations should be closed to shut off flow when the planter sets overnight or for extended periods of time. It is also important to close the tank valves whenever service on the pump or hoses is being performed. To prolong the life of the hoses in the squeeze pump, the discharge manifold must be repositioned to the rearward position when not in use to prevent hose distortion. See Figure 2-11.

Section 3 Row Unit Operation

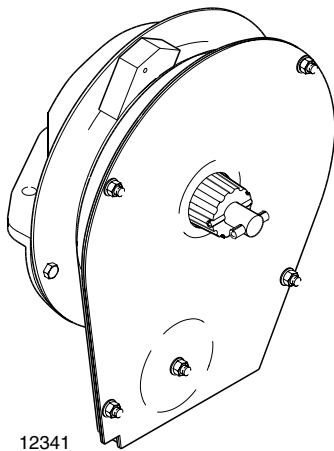
Section 3 Row Unit Operation

Finger Pickup Meter

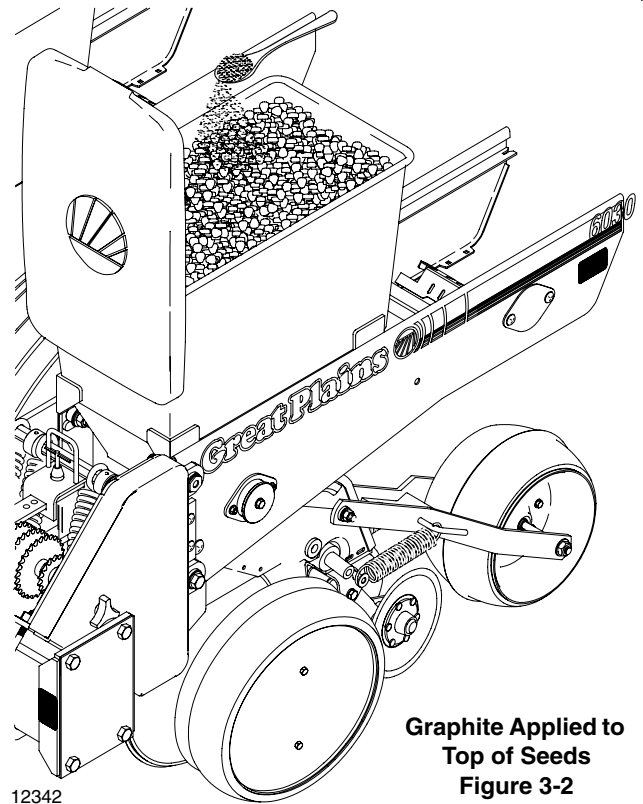
This planter is equipped with a 12 finger mechanical corn meter see Figure 3-1. Refer to the Planter Rate for Finger Pickup Corn Meter chart in “**Section 5 Adjusting Planting Rates**” on page 28 for adjusting the planting rates and sprocket combinations.

IMPORTANT: To extend the life and maximize efficiency of the finger pickup meter, sprinkle 1 teaspoon of powdered graphite on top of the seeds in the hopper, see Figure 3-2. The graphite will work its way down to lubricate the meter mechanism.

For more information on the meter, see “**Section 6 Troubleshooting**” on page 42 & “**Section 7 Maintenance and Lubrication**” on page 45.



Finger Pickup Meter
Figure 3-1

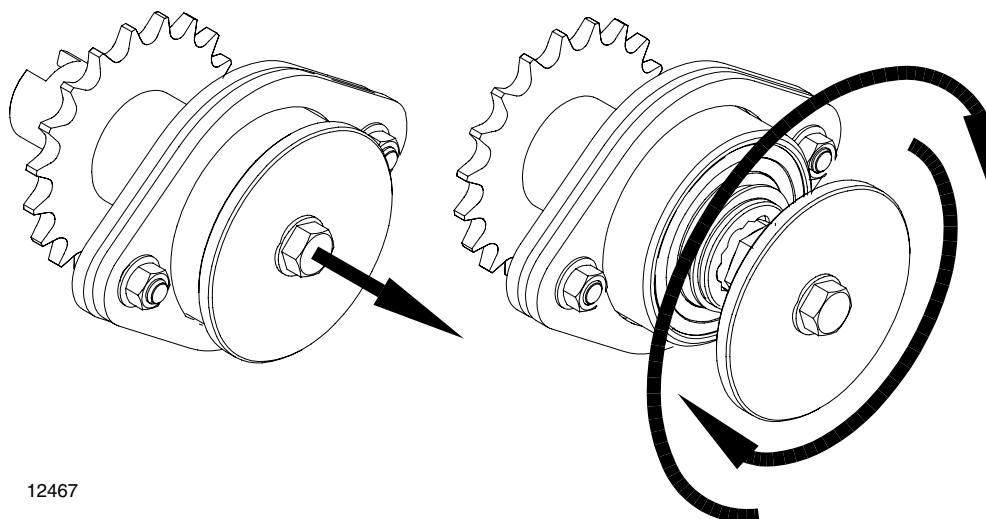


Graphite Applied to
Top of Seeds
Figure 3-2

Meter Clutches

To disengage either the seed hopper clutch or the chemical hopper clutch pull the knob and rotate 30 degrees clockwise or counter-clockwise until the points on the hex shaft align with the indentations in the end of the drive hub then release knob. See Figure 3-3.

To engage the clutches, pull and rotate the knob until the shaft aligns with the drive hub then release.



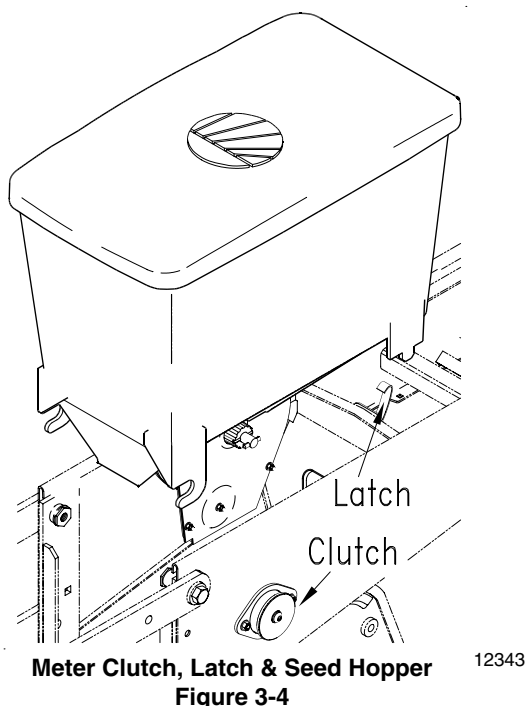
Disengage Meter Clutch
Figure 3-3

Seed Hopper

The row unit is equipped with one 2-bushel translucent seed hopper.

Before filling the seed hopper, clear it of foreign objects. After filling the hopper with clean seeds always replace the hopper lid. Operating with the lids attached prevents objects from entering the hopper and also aids in keeping out moisture.

Empty the contents of the hopper periodically to avoid the collection of dirt and other materials. To remove the hopper, disengage the meter drive clutch and the hopper latch, see arrows Figure 3-4.



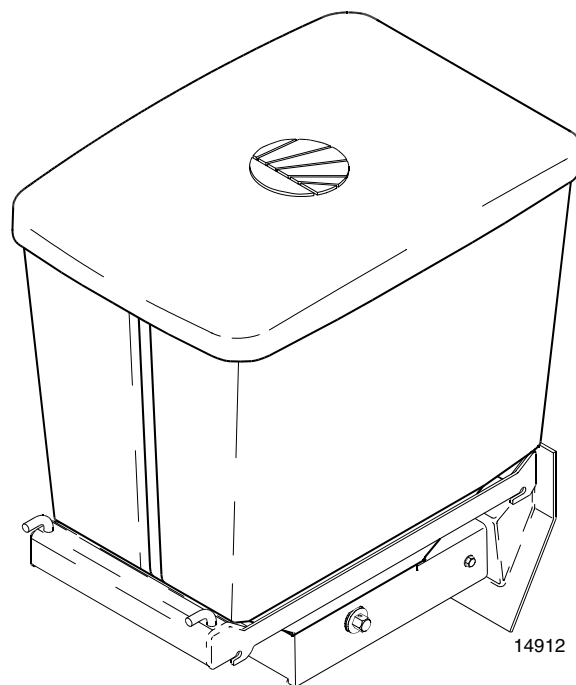
Meter Clutch, Latch & Seed Hopper
Figure 3-4

Chemical Hopper

The optional chemical hopper comes in 2 versions:

- 1 chemical meter and an 80 lb. capacity translucent hopper
- 2 chemical meters and 1 divider that separates the 80 lb. hopper into 2 compartments - approximately 40 lbs. each.

Before filling the chemical hopper(s) clear it/them of foreign objects. After filling the hopper(s) replace the hopper(s) lid(s). Operating with the lids attached prevents objects from entering the hopper and also aids in keeping out moisture.



Chemical Hopper
Figure 3-5

The application rate is determined by:

1. The size of the opening on the meter housing assembly.
2. The travel speed.

The size of the opening is adjustable by turning the knobs on the rear of the granular hoppers. There are 99 increments which indicate the relative application rate. The delivery rate will increase from 1 through 99. Setting 00 closes the opening completely. A fluted roller delivers the granular chemical to the adjustable opening.

The granular chemical flows through a given opening size at a nearly uniform rate regardless of rotor rpm. Therefore, SPEED has the greatest impact on application rate and resulting chemical concentration in the row.

For example, if planting speed is reduced from 6 to 3 mph, chemical concentration will nearly double since the delivery rate through the orifice remains nearly the same while the distance traveled in a given period of time has been cut in half. Therefore, twice as much chemical is placed on the ground due to the decrease in ground speed.

Rotor rpm will not change the chemical meter delivery rate unless the seed population is changed significantly (i.e. ± 25 percent or more from the original setting).

Section 3 Row Unit Operation

The rate charts in “**Section 5 Adjusting Planting Rates**” on page 28 are approximate, and are based on a planting speed of 5 mph. They are to be used only as a guide to determine a starting point for the meter dial setting.

Always check your rate of application as outlined in this section to be sure you are getting the desired rate.

Use the application rate and meter setting recommended by the chemical manufacturer as a starting point for the meter dial setting.

If the meter setting is not available from the chemical manufacturer, use the charts in “**Section 5 Adjusting Planting Rates**” on page 28 as a starting point for the meter dial setting.

IMPORTANT: Because the available chemical materials vary widely in consistency and composition, their “flowability” is affected by temperature and humidity conditions. It is important to calibrate each individual meter to the particular chemical being used.

To determine the application rate and starting meter setting, proceed as follows:

The chemical manufacturer may recommend the rate of application for granular chemicals in the following ways:

1. Ounces per 1000 linear row feet.
2. Pounds per acre for a given band width and row spacing.
3. Pounds per acre for complete (broadcast) coverage.

When the chemical manufacturer recommends ounces per 1000 linear row feet or pounds per acre for a given band width and row spacing, proceed to the chemical manufacturer's recommended meter setting or to the meter setting recommended in the rate charts.

When the chemical manufacturer recommends pounds per acre for complete (broadcast) coverage only, it is necessary to reduce the pounds per acre to apply for your band width and row spacing. This will give you the same chemical concentration in the band area as the chemical manufacturer recommends for complete (broadcast) coverage.

Use the following formula to find the pounds per acre for your band width and row spacing.

NOTE: We recommend you actually measure the band width applied in your conditions and use this width in your application rate calculations.

$A \times B/C$ = Delivery rate per acre for a given band width and row spacing.

A - Chemical manufacturers recommended rate in pounds per acre for complete (broadcast) coverage.

B - Band width in inches.

C - Row spacing in inches.

Example: The chemical manufacturer recommends 20 lb/acre for complete broadcast coverage. The band width is 14 inches. The row spacing is 30 inches.

$20 \times 14/30 = 9.3$ lb. per acre.

The required delivery rate for 14 inch bands and 30 inch row spacing would be 9.3 lb/acre. Set meter setting recommended for 9.3 lb/acre broadcast coverage.

Delivery of 9.3 lb/acre of chemical in a 14 inch band will provide the same chemical concentration on the soil surface as delivery of 20 lb/acre broadcast coverage.

Proceed to chemical manufacturer's recommended meter setting or to the meter setting recommended in the rate charts in this section which will deliver 9.3 lb/acre.

To check the exact number of lb/acre of chemical that will be delivered, attach a plastic bag to each chemical diffuser, lower the planter, and proceed as follows:

Drive 500 feet at planting speed. Weigh the chemical in oz. that was caught in one bag. Multiply that amount by the factor shown to determine lb. per acre.

Check the chemical caught in each bag in the same manner.

Lb. Per Acre Factor for Given Row Width

Row Width	Factor
38 inch	1.7
36 inch	1.8
30 inch	2.2

Example: Assume you are planting 38 inch rows and you caught 5.6 ounces in one bag (one row).

5.6 ounces times 1.7 (factor for 38 inch rows) equals 9.5 lb. per acre.

If the desired amount is not obtained for each unit with the first setting, turn the metering knob and repeat the check until desired amount is delivered.

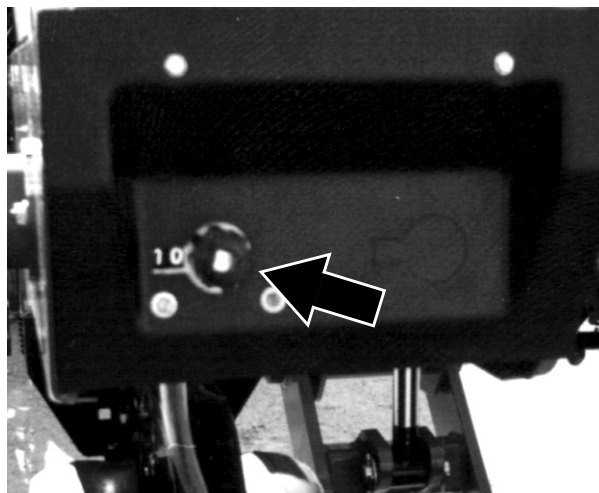
NOTE: If a significant difference in rate is observed between rows, the meter dial mechanism may require recalibration.

Empty the contents of the hopper(s) periodically to avoid the collection of dirt and other materials. To remove the hopper(s), disengage the meter drive clutch and the 2 latch pins at the front of the hopper.

Recalibrating Insecticide/Herbicide Meter

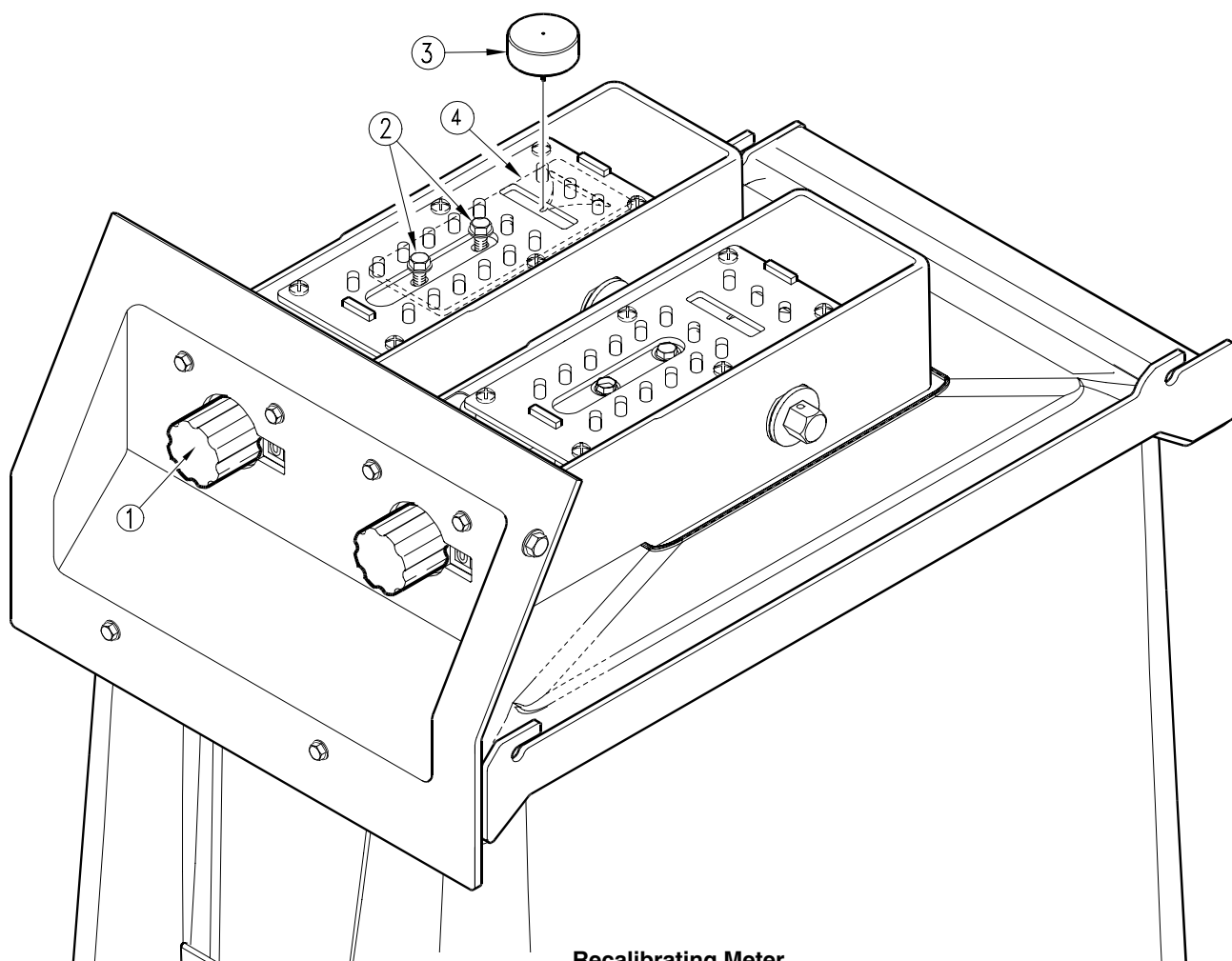
If it should ever become necessary to recalibrate the granular meter on the insecticide/herbicide hopper, proceed as follows:

1. Remove and empty hopper and turn hopper upside down.
2. Turn hopper knob to "10". See Figure 3-6.
3. See Figure 3-7. Loosen screws (#1) in metering gate.
4. Insert calibration tool (#2).
5. Readjust dial to "04".
6. Slide gate (#3) to tool.
7. Retighten screws.
8. Reinstall hoppers, refill and check per previous instructions.



Hopper Knob
Figure 3-6

14947



Recalibrating Meter
Figure 3-7

15051

Section 4 Adjustments

Section 4 Adjustments

Marker Disk Adjustments

The aggressiveness and the mark left by the disk may be changed by two methods:

Refer to Figure 4-1:

1. Disk Angle

To change the angle of cut, loosen the two bolts (1), rotate the disk assembly and retighten.

2. Direction of Cut

The disk may be mounted to throw dirt either in or out which will give different marks in different soil conditions. To change the direction of cut:

- Reverse the blade and depth band by remounting the four lug bolts on the disk hub.
- Reverse the angle of the assembly by removing the adjustment bolts (2) and turning the spindle assembly one half turn. Reinstall and tighten all bolts.

Marker width adjustments are made by loosening the marker tube u-bolt #2 and sliding it in or out to the desired width and by tightening the u-bolt.

Dimension (A) is measured from the center line of the planting unit to the marker disk.

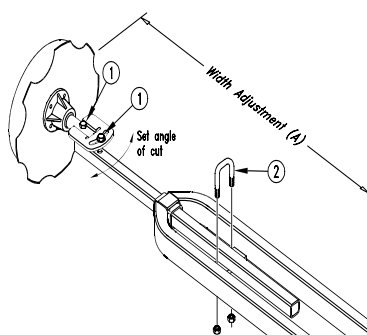
This are approximate dimensions and should be checked in the field.

For 6-row wide, 36 inch rows, A = 126 inches.

For 6-row wide, 38 inch rows, A = 133 inches.

For 8-row narrow, 30 inch rows, A = 135 inches.

After adjusting marker, tighten u-bolt.



Marker Disk Adjustments
Figure 4-1

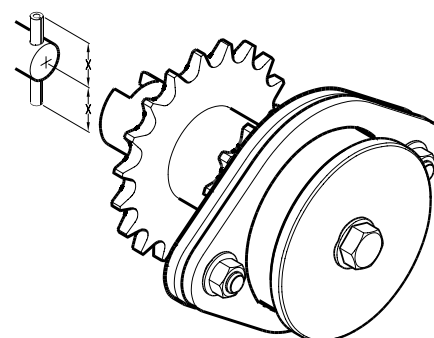
Meter Drive Adjustments

The alignment between the meter clutch and the input shaft is important. If there is misalignment the meter will not function properly. Excessive wear and damage can also occur to the meter housings. When replacing the meter the vertical and horizontal alignment should be checked.

Check for Vertical Alignment

Refer to Figure 4-2:

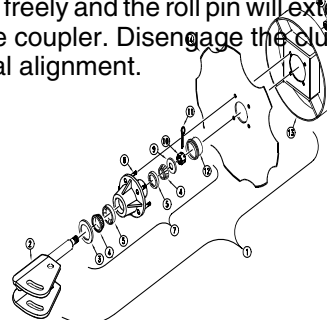
- Latch the appropriate hopper into place on the support.
- The roll pin in the end of meter input shaft should be centered (equal distances of the roll pin should protrude from both sides of the shaft).
- Rotate the input shaft so that the roll pin is vertical.
- Rotate the drive coupler so that the slots are vertical.
- Release the clutch to engage the drive coupler with the input shaft.



12417

Vertical Alignment
Figure 4-2

If the alignment is correct the coupler will engage with the shaft freely and the roll pin will extend equally on each side of the coupler. Disengage the clutch and check the horizontal alignment.



14963

Section 4 Adjustments

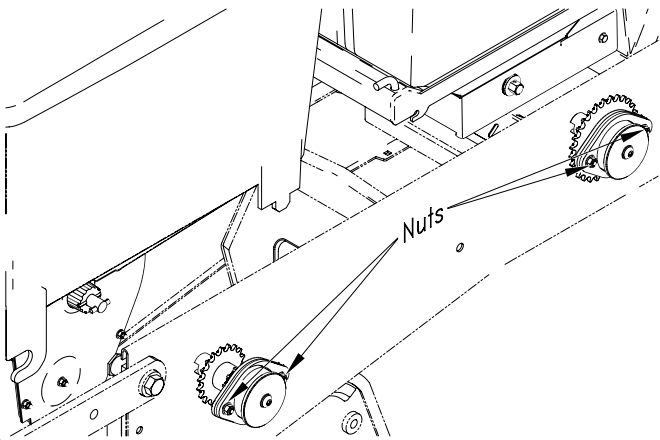
Check for Horizontal Alignment

Refer to Figure 4-3:

1. Latch the appropriate hopper into place on the hopper support.
2. The roll pin in the end of meter input shaft should be centered (equal distances of the roll pin should protrude from both sides of the shaft).
3. Rotate the input shaft so that the roll pin is horizontal.
4. Rotate the drive coupler so that the slots are horizontal.
5. Release the clutch to engage the drive coupler with the input shaft.

To adjust alignment:

- With the hopper in place loosen the two 5/16" nuts.
- Engage the clutch to the meter input shaft.
- Align clutch with shaft and tighten 5/16" nuts to torque values in the Specifications section.



Horizontal Alignment
Figure 4-3

12396

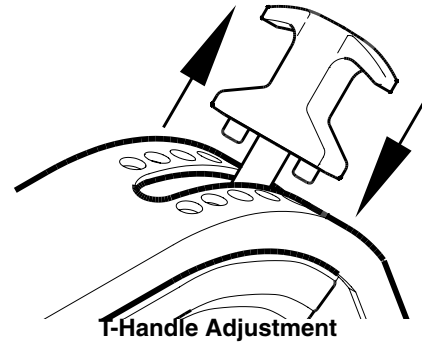
Depth Adjustment

The planting depth of the row unit is controlled by 2 walking gauge tires located next to the disks.

Adjust the planting depth as follows:

1. Raise the planter to remove weight from the gauge tires.

Raise the T-handle and move it forward to decrease the planting depth, see Figure 4-4. Moving the handle rearward increases the planting depth. Small increments of depth adjustment can be made by walking the T-handle from side to side.



T-Handle Adjustment
Figure 4-4

12345

After one row is set to the desired depth, move the T-handle on the other rows to the same location.

Down Force Row

Standard Spring Package

The standard down force spring package, consists of 2 non-adjustable springs applying approximately 90 lbs. of down force.

Optional Medium and Heavy Duty Spring Package

The medium and heavy duty spring packages consist of 2 or 4 adjustable springs, respectively. The medium duty package can be adjusted from approximately 100 to 200 lbs. down force. The heavy duty package can be adjusted from approximately 200 to 400 lbs. of down force.

Spring Adjustments

- All spring adjustments must be made with the planter in the fully raised position.

NOTE: The maximum down force stated before is reached when the parallel arms are all the way up.

- The spring package is adjustable from 90 lbs. to 325 lbs. of down force when the parallel arms are horizontal. Consult the "**Down Force Pressure Chart**" on page 25 to obtain the desired down force.

NOTE: To adjust the spring tension, lift the plunger by pulling up on the roll pin handle and sliding the handle adjustment assembly into the appropriate hole, see Figure 4-5.

- Two springs can be purchased at your Great Plains Dealer to make the medium duty package into a heavy duty package or two springs can be removed from the heavy duty package to make a medium duty package. Add or subtract springs by removing the cotter key at the end of the spring pivot rod. Slide the rod inward to add or remove a spring from each side. Then attach or remove

Section 4 Adjustments

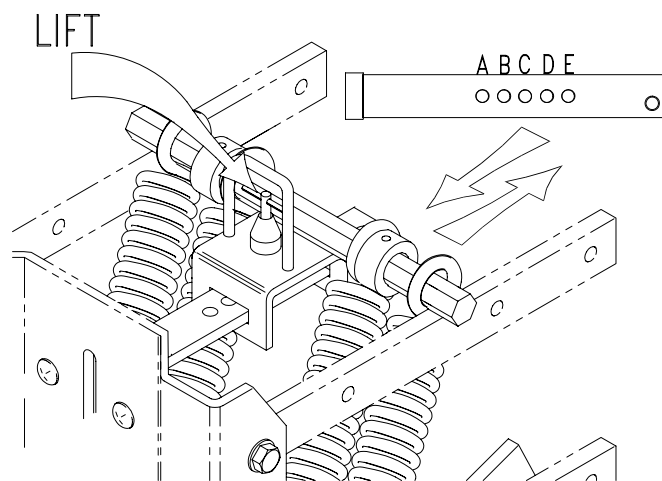
the other spring end on the hex bar support. Reinstall the spring rod and snap ring on each side.

Down Force Pressure Chart

Refer to Figure 4-5:

	Use This # of Springs	In This Hole
90 lbs.	2	A
105 lbs.	2	B
125 lbs.	2	C
140 lbs.	2	D
160 lbs.	2	E
185 lbs.	4	A
215 lbs.	4	B
245 lbs.	4	C
285 lbs.	4	D
325 lbs.	4	E

* Force when arms are parallel.



Adjustment Bar
Figure 4-5

12137

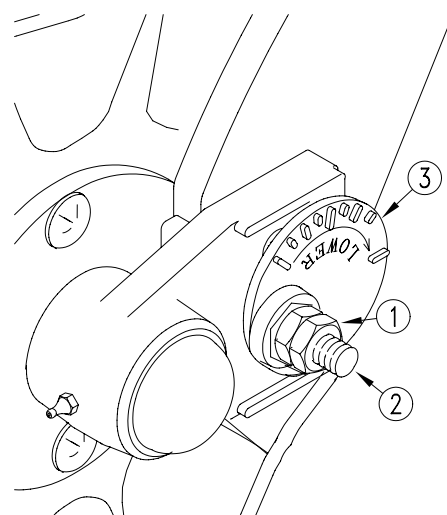
Row Unit Mounted Coulter Adjustment

The optional coulter allows the planter to penetrate tough ground conditions. It is recommended that either the medium duty or heavy duty spring package be used with this coulter.

Coulter Adjustments

Refer to Figure 4-7:

1. To adjust the coulter vertically, loosen the 3/4" jam nut (#1) and the 3/4" x 3" long hex bolt (#2).
2. By turning the cam hex (#3), rotate the cam casting to set the desired height. For wavy coulter blades, it is recommended that the coulter blade should be run even to 1" below the disks on the row unit.
3. Tighten the bolt and jam nut. Refer to *Torque Values Chart* in "Section 10 Appendix" on page 62.



15053

Coulter Adjustment
Figure 4-7

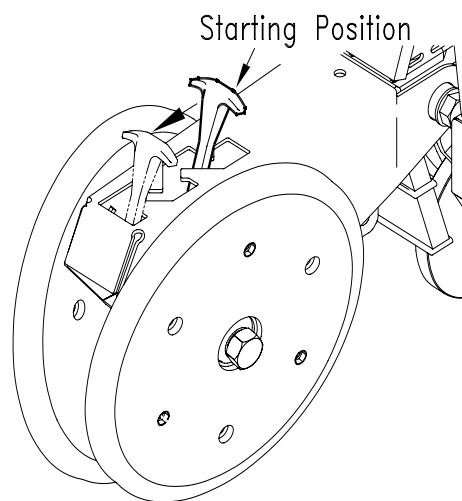
1 x 12 Closing Wheel Adjustments

The 1 X 12 closing wheel option can be adjusted for down force, alignment, and offset.

Closing Wheel Down Force Adjustment

Adjust the closing wheel down force to permit proper closing of the seed trench. It is recommended to start with the T-handle in the first of 4 notches, see Figure 4-8.

If the seed trench is not closing move the handle to the next notch back and try again. Keep moving the handle back until the seed trench is closing, by doing this eliminates unnecessary down force and compaction. In some field conditions, the T-handle can be left in the forward slot to minimize down force.



Closing Wheel Adjuster
Figure 4-8

12346

Section 4 Adjustments

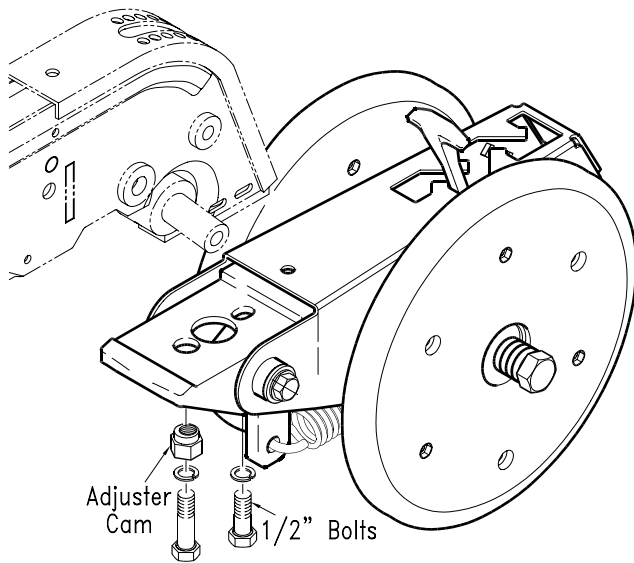
Closing Wheel Alignment

Refer to Figure 4-9:

If one closing wheel is running in the seed trench or the wheels are not centered over the seed trench, adjust the closing wheels as follows:

1. Raise the planter slightly to remove weight from the closing wheels.
2. Loosen the two 1/2" bolts.
3. Turn the press wheel adjuster left or right to center the wheels over the seed trench.

Tighten the 1/2" bolts to the correct torque values in the *Torque Value Chart* in "**Section 10 Appendix**" on page 62.



Closing Wheel Alignment
Figure 4-9

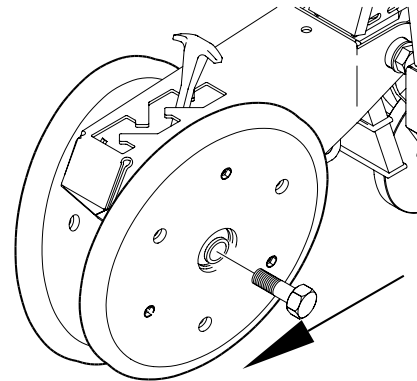
12418

Closing Wheel Offset

The 1x12 wheels can be offset to help prevent trash from plugging the closing wheels. If the closing wheels are not offset, the wheels should be located in the front holes of the press wheel arm.

To offset the wheels, do as follows:

1. Raise planter slightly to remove weight on the closing wheels.
2. Remove the 3/4" bolt holding the wheel, see Figure 4-10.
3. Move the wheel to the rear hole and attach with the 3/4" bolt. Tighten the bolt to the correct torque value listed in the *Torque Value Chart* in "**Section 10 Appendix**" on page 62.



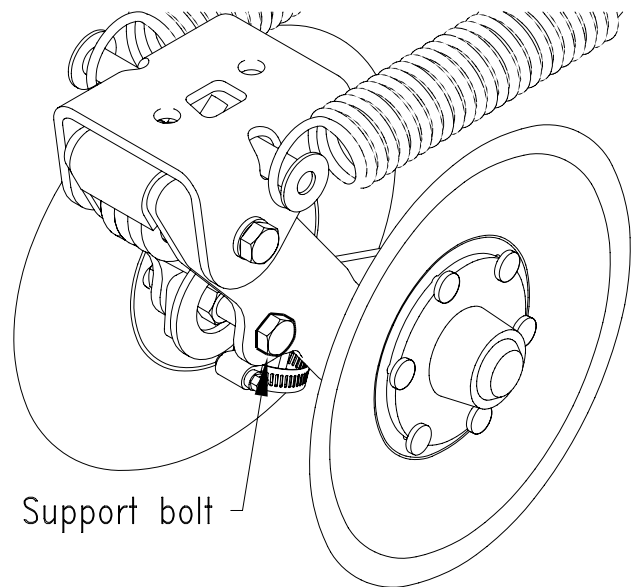
Closing Wheel & Offset
Figure 4-10

12347

Closing Disk Adjustments

The closing disk options consists of two disks and a 6 1/2 x 12 press wheel. The disk down pressure can be adjusted to provide closing of the seed trench.

To adjust the down pressure, ratchet the spring cam to the next cam height by turning the head of the support bolt clockwise. Refer to Figure 4-11.



Closing Disk & Tube Holes
Figure 4-11

14913

Closing Disk Tube Shield

To prevent clogging in insecticide hoses:

1. Clamp closing disk tube shield to closing disk.
2. Insert insecticide hose (#1) inside the closing disk tube shield (#2) as shown in Figure 4-12. When unit is picked up the insecticide hose should be about 1/4" above the bottom of the shield.

Section 4 Adjustments

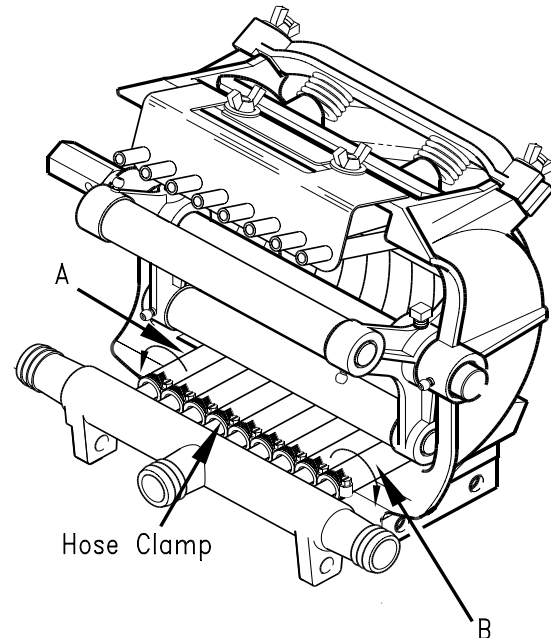
Liquid Fertilizer Adjustments

Squeeze Pump Hose Alignment

Refer to Figure 4-13:

If 'A' or 'B' hose (end hoses) should run off the back, re-align hoses as follows:

1. 'A' Hose - Loosen hose clamp on intake manifold and twist hose 1/4 turn in a counter-clockwise direction.
2. 'B' Hose - Loosen hose clamp on intake manifold and twist hose 1/4 turn in a clockwise direction.
3. Retighten hose clamp.



Hose Alignment
Figure 4-13

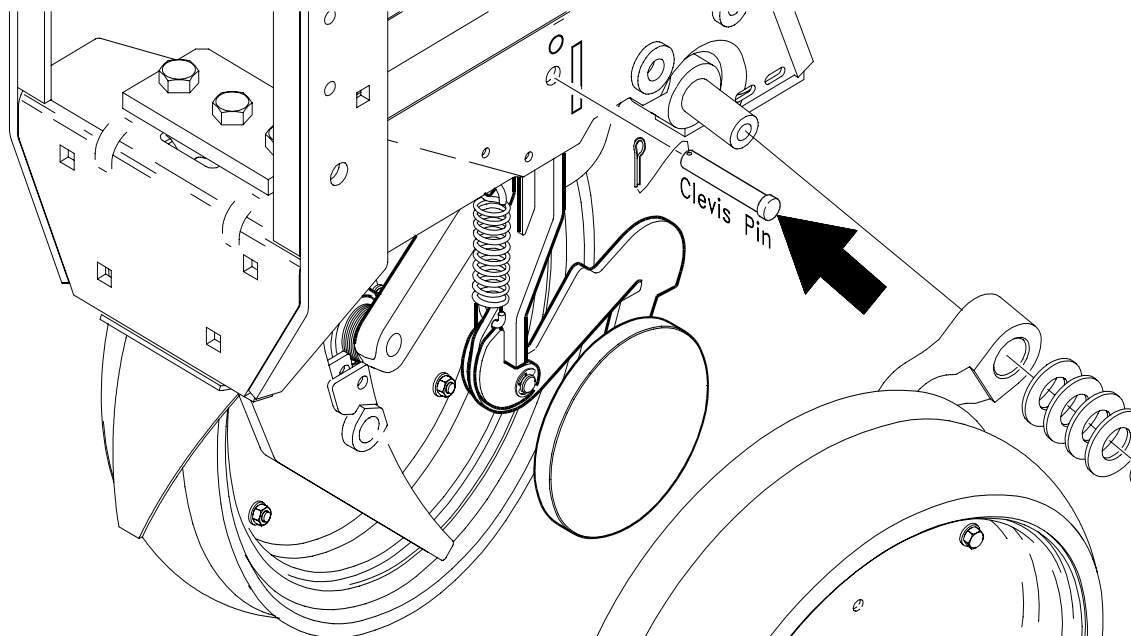
12402

Seed Lok

The seed lok option provides additional seed to soil contact. The seed lok is spring loaded and does not require adjusting. In some wet and sticky conditions the wheel may accumulate soil and may require removal of the seed lok until conditions improve.

The seed lok is attached to the shank with a 1/2" clevis pin, see Figure 4-14. To remove the seed lok, remove the clevis pin and pull down on the seed lok mount.

Reattach in the reverse order.



Seed Lok Assembly
Figure 4-14

12362

Section 5 Adjusting Planting Rates

This section discusses the adjustments and settings for seeding and chemical rates.

Planting Rates

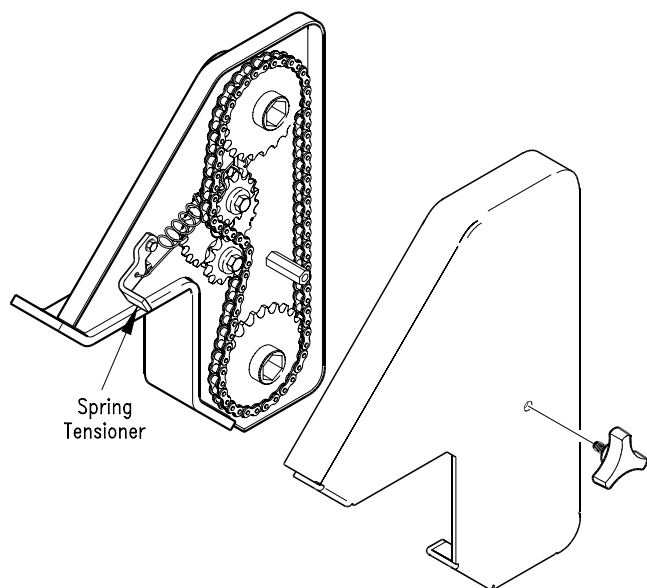
Please read the following sections. Complete understanding of this process will help to prevent problems.

Transmission Adjustment

Planting population changes are accomplished by setting the sprocket transmission. By changing the combination of sprockets the desired planting populations can be achieved.

To change the sprocket combination refer to “**Planting Rates for Finger Pickup Corn Meters**” on page 30:

1. Select the sprocket combination for your planting population.
2. Remove the cover from the transmission by loosening the knob on the cover.
3. Release the spring tensioner on the idler, see Figure 5-1.



Spring Tensioner on Transmission
Figure 5-1

4. Remove the chain and sprockets.
5. Exchange the sprockets with the desired sprockets, selected in step 1, on the storage bracket.

Note: When not in use, keep all extra sprockets on the storage bracket.

6. Place the sprockets on the drive/driven shafts.
7. Loop the chain over the sprockets and between the 2 idlers.

8. Turn the idler plate counter-clockwise (ccw) to take up the slack. Hook the spring onto the idler plate. Rotate the tensioner over center. If the chain is too loose, hook the spring onto the next notch in the plate.
9. Replace the transmission cover and hand tighten the knob.

Checking Planting Population

After setting the transmission, ALWAYS check the planting population in the field.

Follow these steps to check the planting population:

1. Tie up 1 or more closing disks and wheels with a chain or heavy wire to the hopper support. Releasing the spring pressure on the disks and wheels will make this easier. Adjust the planting depth to a shallow setting. It may be necessary to tie up the seed lok wheels so that the seeds are easier to find.
2. Plant at a normal speed for a short distance.
3. Measure 1/1000 of an acre. For 30" row planter 1/1000 of an acre is 17' 6".
4. Multiply the number of seeds counted by 1000. This gives you total population.

Example: (for one row)

- 30" row spacing
- 17' 6" of seed trench measured off
- 24 seeds counted in measured distance

$$24 \text{ Seeds Counted} \times 1000 = \\ \mathbf{24,000 \text{ Plant Population Per Acre}}$$

If the planting population is significantly different than the desired planting population, make the following checks:

- Check the sprocket combination in the transmission, refer to the “**Planting Rates for Finger Pickup Corn Meters**” on page 30.
- Check the tire pressure in the gauge wheels in “**Section 10 Appendix**” on page 62.
- Check for meter malfunction, see Finger Pickup Corn Meter in “**Section 6 Troubleshooting**” on page 42.

Planting Recommendations

To get the best planting results, follow these recommendations:

- Plant at 5 mph
- Add 1 teaspoon of graphite to each seed hopper.
- Maintain tire pressure in the gauge tires.
- Replace worn meter parts.

Section 5 Adjusting Planting Rates

Drive Wheel Slippage

Another item that may cause the actual rates of seed or fertilizer to differ from the delivery rates shown in the operator's manual is the amount of drive wheel slippage.

While a certain amount of wheel slippage is normal, excessive drive wheel slippage may cause undesirable changes in the actual rates.

Excessive drive wheel slippage may be caused by binding or poorly lubricated parts, misaligned bearings or caked material in the pesticide or fertilizer hoppers.

In addition, down pressure springs, coulters, tine tooth attachments, or any other attachment that removes frame weight from the drive wheels, may contribute to drive wheel slippage and lower than expected rates.

If in-field checks indicate that the planter is planting at a rate significantly different than the seed transmission rate chart indicates, investigate the following in the order listed:

- Ensure that ALL transmission sprockets are set according to the rate chart.
- Excessive unit bounce can cause low population and reduced spacing control. Reduce excessive unit bounce by increasing unit down force, or drive slower.
- Ensure that the planter drive wheel slippage is close to normal. Variations in drive wheel slippage can be caused by crop residue, tire inflation pressure, soil conditions and unit down force.

Adjusting Granular Chemical Rates

The optional chemical applicators are adjusted by varying the opening on the chemical meter housing. The field check is very important because temperature, humidity, speed, ground conditions, flowability of chemicals, and obstructions affect the application rate.

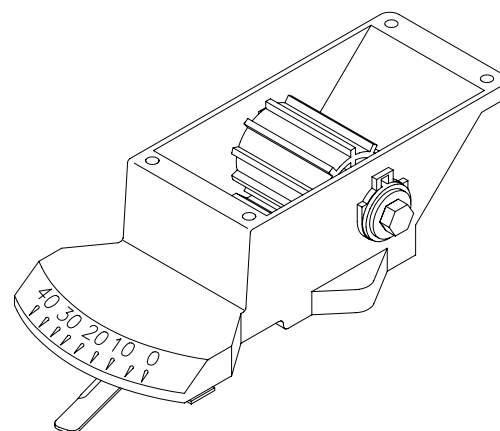
WARNING!

Agricultural chemicals can be dangerous if not selected and handled with care. Always read and follow directions supplied by the chemical manufacturer.

To adjust the chemical rate do as follows:

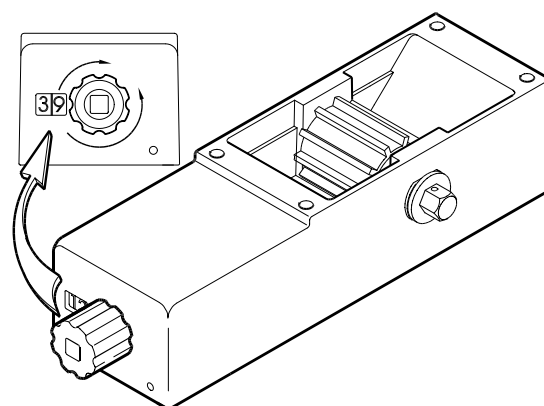
1. Select a setting from the “**Granular Chemical Rate Charts**” on page 33, as a starting point.
2. Slide the handle on the meter to the setting, see Figure 5-2.
3. If the meter has a knob, turn until the display shows the appropriate number, see Figure 5-3.
4. Fill the hoppers with chemical.
5. Attach a plastic bag to each chemical diffuser.
6. Drive 1320' at a normal planting speed.
7. Weigh the contents of the bag in ounces.
8. Multiply ounces by 0.83 to determine the pounds per acre.

9. If required, adjust the meter setting and repeat steps 4 through 7 until the desired rate is reached.



Chemical Meter with Handle
Figure 5-2

12350



Chemical Meter with Knob
Figure 5-3

14914

Liquid Fertilizer Attachment

WARNING!

Agricultural chemicals can be dangerous if not selected and handled with care. Always read and follow directions supplied by the chemical manufacturer.

On machines equipped with the squeeze pump option, the rate of liquid fertilizer application is determined by the combination of sprockets on the squeeze pump driven and drive shafts. When changing sprocket combinations, make sure sprockets are in alignment, sprocket retaining collars are tight and chain tension is sufficiently restored.

The “**Liquid Fertilizer Rates**” on page 40 provides an approximate application rate only. Actual delivery will vary with temperature and the particular fertilizer being used.

IMPORTANT: Certain analysis of fertilizer if placed too close to the seed may cause germination of seedling damage especially if used in amounts in excess of fertilizer manufacturer's recommendations. Check with your fertilizer dealer or manufacturer for the correct amount and placement.

Diagram illustrating a chain drive system. The system consists of a **Driver** gear (top) and a **Driven** gear (bottom), connected by a chain. The driver gear is mounted on a shaft, and the driven gear is mounted on another shaft. The chain is shown in a loop around both gears. The diagram is labeled with 'Driver' and 'Driven' pointing to their respective gears.

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Section 5 Adjusting Planting Rates

Planting Rates for Brush Meters

Planting Rates 30" Row Width

Transmission Sprockets		Speed Range (mph)	60 Cell Soybean or High Rate Milo/ Grain Sorghum		48 Cell Specialty Soybean or High Rate Acid-delinted Cotton		36 Cell Acid-delinted Large Cotton		30 Cell Milo/Grain Sorghum or Acid-delinted Cotton	
			Planting Population/ Acre	Average Seed Spacing (inches)	Planting Population/ Acre	Average Seed Spacing (inches)	Planting Population/ Acre	Average Seed Spacing (inches)	Planting Population/ Acre	Average Seed Spacing (inches)
Drive	Driven									
17	28	2 to 8	80,928	2.6	64,742	3.2	48,557	4.3	40,464	5.2
17	27	2 to 8	83,926	2.5	67,141	3.1	50,356	4.2	41,963	5.0
17	26	2 to 8	87,154	2.4	69,723	3.0	52,292	4.0	43,577	4.8
19	28	2 to 8	90,449	2.3	72,359	2.9	54,269	3.9	45,225	4.6
19	27	2 to 8	93,799	2.2	75,039	2.8	56,279	3.7	46,900	4.5
17	24	2 to 8	94,416	2.2	75,533	2.8	56,650	3.7	47,208	4.4
17	23	2 to 8	98,521	2.1	78,817	2.7	59,113	3.5	49,261	4.2
19	25	2 to 8	101,303	2.1	81,042	2.6	60,782	3.4	50,652	4.1
19	24	2 to 8	105,524	2.0	84,419	2.5	63,314	3.3	52,762	4.0
23	28	2 to 8	109,491	1.9	87,593	2.4	65,695	3.2	54,746	3.8
19	23	2 to 8	110,112	1.9	88,090	2.4	66,067	3.2	55,056	3.8
24	28	2 to 8	114,252	1.8	91,402	2.3	68,551	3.0	57,126	3.7
24	27	2 to 8	118,483	1.8	94,786	2.2	71,090	2.9	59,242	3.5
17	19	2 to 8	119,263	1.8	95,410	2.2	71,558	2.9	59,631	3.5
24	26	2 to 8	123,040	1.7	98,432	2.1	73,824	2.8	61,520	3.4
26	28	2 to 8	123,773	1.7	99,018	2.1	74,264	2.8	61,886	3.4
24	25	2 to 8	127,962	1.6	102,370	2.0	76,772	2.7	63,981	3.3
26	27	2 to 8	128,357	1.6	102,686	2.0	77,014	2.7	64,178	3.3
23	23	2 to 8	133,294	1.6	106,635	2.0	79,976	2.6	66,647	3.1
27	26	2 to 8	138,420	1.5	110,736	1.9	83,052	2.5	69,210	3.0
24	23	2 to 8	139,089	1.5	111,271	1.9	83,453	2.5	69,544	3.0
25	23	2 to 8	144,884	1.4	115,907	1.8	86,930	2.4	72,442	2.9
19	17	2 to 8	148,975	1.4	119,180	1.8	89,385	2.3	74,488	2.8
27	24	2 to 8	149,955	1.4	119,964	1.7	89,973	2.3	74,978	2.8
28	24	2 to 8	155,509	1.3	124,407	1.7	93,305	2.2	77,755	2.7
23	19	2 to 8	161,355	1.3	129,084	1.6	96,813	2.2	80,678	2.6
28	23	2 to 8	162,270	1.3	129,816	1.6	97,362	2.1	81,135	2.6
24	19	2 to 8	168,371	1.2	134,696	1.6	101,023	2.1	84,185	2.5
25	19	2 to 8	175,386	1.2	140,309	1.5	105,232	2.0	87,693	2.4
23	17	2 to 8	180,338	1.2	144,270	1.5	108,233	1.9	90,169	2.3
26	19	2 to 7	182,402	1.1	145,922	1.4	109,441	1.9	91,201	2.3
27	19	2 to 7	189,417	1.1	151,534	1.4	113,650	1.8	94,709	2.2
28	19	2 to 7	196,433	1.1	157,146	1.3	117,860	1.8	98,216	2.1
26	17	2 to 7	203,861	1.0	163,089	1.3	122,317	1.7	101,930	2.1
27	17	2 to 7	211,702	0.9	169,362	1.2	127,021	1.6	105,851	2.0
28	17	2 to 7	219,542	0.9	175,634	1.2	131,725	1.6	109,771	1.9

NOTE: See *Planting Rates* on page 15 for additional information. Always check seed population in the field to ensure planting rates are correct.

Section 5 Adjusting Planting Rates

Planting Rates for Brush Meters (continued)

Meters equipped with the 12 cell acid-delinted hill-drop cotton discs will plant from 3 to 6 seeds per cell because of variations in cotton seed size.

Determine which hill spacing is desired and select the transmission ratio that is closest to that hill spacing on the chart.

To determine the average seeds per hill and hills per acre do the following field check:

1. Measure 1/1000 of an acre. (1/1000 acre = length of row 17'5" for 30" widths).
2. Multiply the average seed per hill by hills per acre.

Example:

$$4 \text{ seeds per hill} \times (13 \text{ hills} \times 1000) = 52,000$$

Planting Rates 30" Row Width

Transmission Sprockets		Speed Range (mph)	12 Cell Hill-drop Cotton, Acid-delinted	
			Hills/Acre	Average Hill Spacing (inches)
Drive	Driven			
17	28	2 to 8	16,186	12.9
17	27	2 to 8	16,785	12.5
17	26	2 to 8	17,431	12.0
19	28	2 to 8	18,090	11.6
19	27	2 to 8	18,760	11.1
17	24	2 to 8	18,883	11.1
17	23	2 to 8	19,704	10.6
19	25	2 to 8	20,261	10.3
19	24	2 to 8	21,105	9.9
23	28	2 to 8	21,898	9.5
19	23	2 to 8	22,022	9.5
24	28	2 to 8	22,850	9.2
24	27	2 to 8	23,697	8.8
17	19	2 to 8	23,853	8.8
24	26	2 to 8	24,608	8.5
26	28	2 to 8	24,755	8.4
24	25	2 to 8	25,592	8.2
26	27	2 to 8	25,671	8.1
23	23	2 to 8	26,659	7.8

Planting Rates 30" Row Width

Transmission Sprockets		Speed Range (mph)	12 Cell Hill-drop Cotton, Acid-delinted	
			Hills/Acre	Average Hill Spacing (inches)
Drive	Driven			
27	26	2 to 8	27,684	7.6
24	23	2 to 8	27,818	7.5
25	23	2 to 8	28,977	7.2
19	17	2 to 8	29,795	7.0
27	24	2 to 8	29,991	7.0
28	24	2 to 8	31,102	6.7
23	19	2 to 8	32,271	6.5
28	23	2 to 8	32,454	6.5
24	19	2 to 8	33,674	6.2
25	19	2 to 8	35,077	6.0
23	17	2 to 8	36,068	5.8
26	19	2 to 7	36,480	5.7
27	19	2 to 7	37,883	5.5
28	19	2 to 7	39,287	5.3
26	17	2 to 7	40,772	5.1
27	17	2 to 7	42,340	4.9
28	17	2 to 7	43,908	4.8

NOTE: See *Planting Rates* on page 15 for additional information. Always check seed population in the field to ensure planting rates are correct.

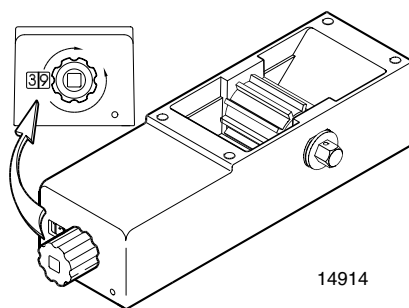
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Approximate Pounds/Acre at 5 mph
for a 30" Row Spacing

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Section 5 Adjusting Planting Rates

Insecticide/Herbicide Application Rates



14914

Clay Granules Herbicide Rate Chart

Approximate Rate in Lbs/Acre

Meter Setting	30 Inch Rows miles per hour			36 Inch Rows miles per hour			38 Inch Rows miles per hour			Ounces per 1000 Row Ft. miles per hour		
	4	6	8	4	6	8	4	6	8	4	6	8
10	0.9	0.6	0.5	1.1	0.8	0.6	1.2	0.8	0.6	0.87	0.58	0.43
11	1.1	0.7	0.6	1.3	0.9	0.7	1.4	0.9	0.7	1.03	0.69	0.51
12	1.3	0.9	0.7	1.6	1.1	0.8	1.7	1.1	0.8	1.22	0.82	0.61
13	1.6	1.1	0.8	1.9	1.3	0.9	2.0	1.3	1.0	1.45	0.97	0.72
14	1.9	1.2	0.9	2.2	1.5	1.1	2.3	1.6	1.2	1.70	1.13	0.85
15	2.1	1.4	1.1	2.6	1.7	1.3	2.7	1.8	1.4	1.97	1.32	0.99
16	2.5	1.6	1.2	3.0	2.0	1.5	3.1	2.1	1.6	2.27	1.51	1.14
17	2.8	1.9	1.4	3.4	2.3	1.7	3.6	2.4	1.8	2.59	1.72	1.29
18	3.2	2.1	1.6	3.8	2.5	1.9	4.0	2.7	2.0	2.92	1.94	1.46
19	3.6	2.4	1.8	4.3	2.8	2.1	4.5	3.0	2.2	3.26	2.17	1.63
20	3.9	2.6	2.0	4.7	3.2	2.4	5.0	3.3	2.5	3.62	2.41	1.81
21	4.3	2.9	2.2	5.2	3.5	2.6	5.5	3.7	2.7	3.99	2.66	1.99
22	4.8	3.2	2.4	5.7	3.8	2.9	6.0	4.0	3.0	4.37	2.91	2.18
23	5.2	3.4	2.6	6.2	4.1	3.1	6.5	4.4	3.3	4.75	3.17	2.37
24	5.6	3.7	2.8	6.7	4.5	3.4	7.1	4.7	3.5	5.14	3.43	2.57
25	6.0	4.0	3.0	7.2	4.8	3.6	7.6	5.1	3.8	5.53	3.69	2.77
26	6.5	4.3	3.2	7.7	5.2	3.9	8.2	5.4	4.1	5.93	3.95	2.96
27	6.9	4.6	3.4	8.3	5.5	4.1	8.7	5.8	4.4	6.33	4.22	3.16
28	7.3	4.9	3.7	8.8	5.9	4.4	9.3	6.2	4.6	6.72	4.48	3.36
29	7.8	5.2	3.9	9.3	6.2	4.7	9.8	6.5	4.9	7.12	4.75	3.56
30	8.2	5.5	4.1	9.8	6.6	4.9	10.4	6.9	5.2	7.52	5.01	3.76
31	8.6	5.7	4.3	10.3	6.9	5.2	10.9	7.3	5.5	7.92	5.28	3.96
32	9.1	6.0	4.5	10.9	7.2	5.4	11.5	7.6	5.7	8.31	5.54	4.16
33	9.5	6.3	4.7	11.4	7.6	5.7	12.0	8.0	6.0	8.71	5.80	4.35
34	9.9	6.6	5.0	11.9	7.9	5.9	12.5	8.4	6.3	9.10	6.06	4.55
35	10.3	6.9	5.2	12.4	8.3	6.2	13.1	8.7	6.5	9.48	6.32	4.74
36	10.7	7.2	5.4	12.9	8.6	6.4	13.6	9.1	6.8	9.87	6.58	4.93
37	11.2	7.4	5.6	13.4	8.9	6.7	14.1	9.4	7.1	10.25	6.83	5.12
38	11.6	7.7	5.8	13.9	9.3	6.9	14.6	9.8	7.3	10.62	7.08	5.31
39	12.0	8.0	6.0	14.4	9.6	7.2	15.2	10.1	7.6	11.00	7.33	5.50
40	12.4	8.3	6.2	14.9	9.9	7.4	15.7	10.5	7.8	11.37	7.58	5.69
41	12.8	8.5	6.4	15.3	10.2	7.7	16.2	10.8	8.1	11.74	7.83	5.87
42	13.2	8.8	6.6	15.8	10.5	7.9	16.7	11.1	8.3	12.11	8.07	6.05
43	13.6	9.1	6.8	16.3	10.9	8.2	17.2	11.5	8.6	12.47	8.32	6.24
44	14.0	9.3	7.0	16.8	11.2	8.4	17.7	11.8	8.8	12.84	8.56	6.42
45	14.4	9.6	7.2	17.2	11.5	8.6	18.2	12.1	9.1	13.20	8.80	6.60
46	14.8	9.8	7.4	17.7	11.8	8.9	18.7	12.5	9.3	13.56	9.04	6.78
47	15.2	10.1	7.6	18.2	12.1	9.1	19.2	12.8	9.6	13.92	9.28	6.96
48	15.6	10.4	7.8	18.7	12.4	9.3	19.7	13.1	9.8	14.28	9.52	7.14
49	16.0	10.6	8.0	19.1	12.8	9.6	20.2	13.5	10.1	14.65	9.76	7.32
50	16.3	10.9	8.2	19.6	13.1	9.8	20.7	13.8	10.3	15.01	10.01	7.51
51	16.7	11.2	8.4	20.1	13.4	10.0	21.2	14.1	10.6	15.38	10.25	7.69
52	17.2	11.4	8.6	20.6	13.7	10.3	21.7	14.5	10.9	15.75	10.50	7.87
53	17.6	11.7	8.8	21.1	14.0	10.5	22.2	14.8	11.1	16.12	10.75	8.06
54	18.0	12.0	9.0	21.6	14.4	10.8	22.8	15.2	11.4	16.50	11.00	8.25

Section 5 Adjusting Planting Rates

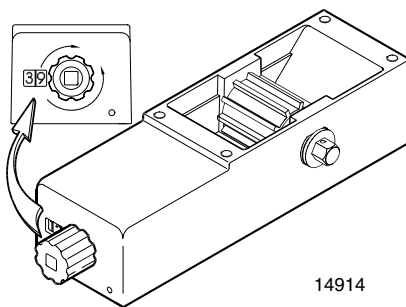
Clay Granules Herbicide Rate Chart (cont.)

Approximate Rate in Lbs/Acre

Meter Setting	30 Inch Rows miles per hour			36 Inch Rows miles per hour			38 Inch Rows miles per hour			Ounces per 1000 Row Ft. miles per hour		
	4	6	8	4	6	8	4	6	8	4	6	8
55	18.4	12.3	9.2	22.1	14.7	11.0	23.3	15.5	11.6	16.88	11.26	8.44
56	18.8	12.5	9.4	22.6	15.0	11.3	23.8	15.9	11.9	17.27	11.52	8.64
57	19.2	12.8	9.6	23.1	15.4	11.5	24.4	16.2	12.2	17.67	11.78	8.83
58	19.7	13.1	9.8	23.6	15.7	11.8	24.9	16.6	12.5	18.07	12.05	9.04
59	20.1	13.4	10.1	24.2	16.1	12.1	25.5	17.0	12.7	18.48	12.32	9.24
60	20.6	13.7	10.3	24.7	16.5	12.4	26.1	17.4	13.0	18.90	12.60	9.45
61	21.1	14.0	10.5	25.3	16.8	12.6	26.7	17.8	13.3	19.33	12.89	9.67
62	21.5	14.4	10.8	25.8	17.2	12.9	27.3	18.2	13.6	19.77	13.18	9.89
63	22.0	14.7	11.0	26.4	17.6	13.2	27.9	18.6	13.9	20.22	13.48	10.11
64	22.5	15.0	11.3	27.0	18.0	13.5	28.5	19.0	14.3	20.68	13.79	10.34
65	23.0	15.4	11.5	27.6	18.4	13.8	29.2	19.4	14.6	21.16	14.10	10.58
66	23.6	15.7	11.8	28.3	18.9	14.1	29.8	19.9	14.9	21.64	14.43	10.82
67	24.1	16.1	12.1	28.9	19.3	14.5	30.5	20.3	15.3	22.14	14.76	11.07
68	24.7	16.4	12.3	29.6	19.7	14.8	31.2	20.8	15.6	22.65	15.10	11.33
69	25.2	16.8	12.6	30.3	20.2	15.1	32.0	21.3	16.0	23.18	15.45	11.59
70	25.8	17.2	12.9	31.0	20.7	15.5	32.7	21.8	16.3	23.72	15.81	11.86
71	26.4	17.6	13.2	31.7	21.1	15.9	33.5	22.3	16.7	24.27	16.18	12.13
72	27.0	18.0	13.5	32.5	21.6	16.2	34.2	22.8	17.1	24.84	16.56	12.42
73	27.7	18.5	13.8	33.2	22.1	16.6	35.0	23.4	17.5	25.42	16.95	12.71
74	28.3	18.9	14.2	34.0	22.7	17.0	35.9	23.9	17.9	26.02	17.34	13.01
75	29.0	19.3	14.5	34.8	23.2	17.4	36.7	24.5	18.4	26.63	17.75	13.31
76	29.7	19.8	14.8	35.6	23.7	17.8	37.6	25.1	18.8	27.25	18.17	13.63
77	30.4	20.3	15.2	36.5	24.3	18.2	38.5	25.6	19.2	27.90	18.60	13.95
78	31.1	20.7	15.5	37.3	24.9	18.7	39.4	26.2	19.7	28.55	19.03	14.28
79	31.8	21.2	15.9	38.2	25.5	19.1	40.3	26.9	20.1	29.22	19.48	14.61
80	32.6	21.7	16.3	39.1	26.1	19.5	41.2	27.5	20.6	29.90	19.94	14.95
81	33.3	22.2	16.7	40.0	26.7	20.0	42.2	28.1	21.1	30.60	20.40	15.30
82	34.1	22.7	17.0	40.9	27.3	20.5	43.2	28.8	21.6	31.31	20.87	15.65
83	34.9	23.3	17.4	41.9	27.9	20.9	44.2	29.4	22.1	32.03	21.35	16.01
84	35.7	23.8	17.8	42.8	28.5	21.4	45.2	30.1	22.6	32.76	21.84	16.38
85	36.5	24.3	18.2	43.8	29.2	21.9	46.2	30.8	23.1	33.50	22.33	16.75
86	37.3	24.9	18.6	44.8	29.8	22.4	47.2	31.5	23.6	34.25	22.83	17.12
87	38.1	25.4	19.1	45.7	30.5	22.9	48.3	32.2	24.1	35.00	23.33	17.50
88	38.9	26.0	19.5	46.7	31.2	23.4	49.3	32.9	24.7	35.76	23.84	17.88
89	39.8	26.5	19.9	47.7	31.8	23.9	50.4	33.6	25.2	36.53	24.35	18.27
90	40.6	27.1	20.3	48.7	32.5	24.4	51.4	34.3	25.7	37.30	24.87	18.65

Section 5 Adjusting Planting Rates

Insecticide/Herbicide Application Rates



14914

Clay Granules Insecticide Rate Chart

Approximate Rate in Lbs/Acre

Meter Setting	30 Inch Rows miles per hour			36 Inch Rows miles per hour			38 Inch Rows miles per hour			Ounces per 1000 Row Ft. miles per hour		
	4	6	8	4	6	8	4	6	8	4	6	8
10	0.9	0.6	0.5	1.1	0.7	0.6	1.2	0.8	0.6	0.85	0.57	0.42
11	1.0	0.7	0.5	1.2	0.8	0.6	1.3	0.8	0.6	0.92	0.61	0.46
12	1.2	0.8	0.6	1.4	0.9	0.7	1.5	1.0	0.7	1.06	0.71	0.53
13	1.4	0.9	0.7	1.6	1.1	0.8	1.7	1.2	0.9	1.25	0.84	0.63
14	1.6	1.1	0.8	2.0	1.3	1.0	2.1	1.4	1.0	1.50	1.00	0.75
15	2.0	1.3	1.0	2.3	1.6	1.2	2.5	1.6	1.2	1.79	1.19	0.90
16	2.3	1.5	1.2	2.8	1.8	1.4	2.9	2.0	1.5	2.12	1.42	1.06
17	2.7	1.8	1.4	3.3	2.2	1.6	3.4	2.3	1.7	2.49	1.66	1.24
18	3.1	2.1	1.6	3.8	2.5	1.9	4.0	2.7	2.0	2.88	1.92	1.44
19	3.6	2.4	1.8	4.3	2.9	2.2	4.6	3.0	2.3	3.31	2.20	1.65
20	4.1	2.7	2.0	4.9	3.3	2.4	5.2	3.4	2.6	3.75	2.50	1.87
21	4.6	3.1	2.3	5.5	3.7	2.7	5.8	3.9	2.9	4.20	2.80	2.10
22	5.1	3.4	2.5	6.1	4.1	3.1	6.4	4.3	3.2	4.68	3.12	2.34
23	5.6	3.7	2.8	6.7	4.5	3.4	7.1	4.7	3.6	5.16	3.44	2.58
24	6.1	4.1	3.1	7.4	4.9	3.7	7.8	5.2	3.9	5.64	3.76	2.82
25	6.7	4.5	3.3	8.0	5.3	4.0	8.5	5.6	4.2	6.14	4.09	3.07
26	7.2	4.8	3.6	8.7	5.8	4.3	9.1	6.1	4.6	6.63	4.42	3.31
27	7.8	5.2	3.9	9.3	6.2	4.7	9.8	6.5	4.9	7.12	4.75	3.56
28	8.3	5.5	4.1	9.9	6.6	5.0	10.5	7.0	5.2	7.61	5.07	3.81
29	8.8	5.9	4.4	10.6	7.1	5.3	11.2	7.4	5.6	8.10	5.40	4.05
30	9.3	6.2	4.7	11.2	7.5	5.6	11.8	7.9	5.9	8.58	5.72	4.29
31	9.9	6.6	4.9	11.8	7.9	5.9	12.5	8.3	6.2	9.05	6.03	4.52
32	10.4	6.9	5.2	12.4	8.3	6.2	13.1	8.7	6.6	9.51	6.34	4.76
33	10.9	7.2	5.4	13.0	8.7	6.5	13.7	9.2	6.9	9.97	6.65	4.98
34	11.3	7.6	5.7	13.6	9.1	6.8	14.4	9.6	7.2	10.41	6.94	5.21
35	11.8	7.9	5.9	14.2	9.5	7.1	15.0	10.0	7.5	10.85	7.23	5.42
36	12.3	8.2	6.1	14.7	9.8	7.4	15.5	10.4	7.8	11.27	7.52	5.64
37	12.7	8.5	6.4	15.3	10.2	7.6	16.1	10.7	8.1	11.69	7.79	5.84
38	13.2	8.8	6.6	15.8	10.5	7.9	16.7	11.1	8.3	12.09	8.06	6.05
39	13.6	9.1	6.8	16.3	10.9	8.2	17.2	11.5	8.6	12.48	8.32	6.24
40	14.0	9.3	7.0	16.8	11.2	8.4	17.7	11.8	8.9	12.87	8.58	6.43
41	14.4	9.6	7.2	17.3	11.5	8.7	18.3	12.2	9.1	13.24	8.83	6.62
42	14.8	9.9	7.4	17.8	11.9	8.9	18.8	12.5	9.4	13.60	9.07	6.80
43	15.2	10.1	7.6	18.2	12.2	9.1	19.2	12.8	9.6	13.96	9.31	6.98
44	15.6	10.4	7.8	18.7	12.5	9.3	19.7	13.2	9.9	14.31	9.54	7.15
45	16.0	10.6	8.0	19.1	12.8	9.6	20.2	13.5	10.1	14.65	9.77	7.33
46	16.3	10.9	8.2	19.6	13.1	9.8	20.7	13.8	10.3	14.99	9.99	7.49
47	16.7	11.1	8.3	20.0	13.3	10.0	21.1	14.1	10.6	15.32	10.21	7.66
48	17.0	11.4	8.5	20.5	13.6	10.2	21.6	14.4	10.8	15.65	10.43	7.82
49	17.4	11.6	8.7	20.9	13.9	10.4	22.0	14.7	11.0	15.98	10.65	7.99
50	17.8	11.8	8.9	21.3	14.2	10.7	22.5	15.0	11.2	16.30	10.87	8.15
51	18.1	12.1	9.1	21.7	14.5	10.9	22.9	15.3	11.5	16.63	11.08	8.31
52	18.5	12.3	9.2	22.2	14.8	11.1	23.4	15.6	11.7	16.95	11.30	8.48
53	18.8	12.5	9.4	22.6	15.1	11.3	23.8	15.9	11.9	17.29	11.52	8.64
54	19.2	12.8	9.6	23.0	15.4	11.5	24.3	16.2	12.1	17.62	11.75	8.81

Section 5 Adjusting Planting Rates

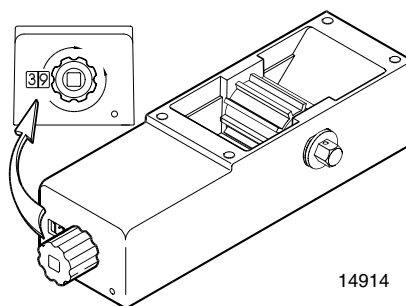
Clay Granules Insecticide Rate Chart (cont.)

Approximate Rate in Lbs/Acre

Meter Setting	30 Inch Rows miles per hour			36 Inch Rows miles per hour			38 Inch Rows miles per hour			Ounces per 1000 Row Ft. miles per hour		
	4	6	8	4	6	8	4	6	8	4	6	8
55	19.6	13.0	9.8	23.5	15.6	11.7	24.8	16.5	12.4	17.96	11.97	8.98
56	19.9	13.3	10.0	23.9	15.9	12.0	25.2	16.8	12.6	18.31	12.21	9.15
57	20.3	13.5	10.2	24.4	16.3	12.2	25.7	17.2	12.9	18.66	12.44	9.33
58	20.7	13.8	10.4	24.9	16.6	12.4	26.2	17.5	13.1	19.03	12.69	9.51
59	21.1	14.1	10.6	25.4	16.9	12.7	26.8	17.8	13.4	19.40	12.94	9.70
60	21.6	14.4	10.8	25.9	17.2	12.9	27.3	18.2	13.6	19.79	13.19	9.90
61	22.0	14.7	11.0	26.4	17.6	13.2	27.8	18.6	13.9	20.19	13.46	10.10
62	22.4	15.0	11.2	26.9	18.0	13.5	28.4	18.9	14.2	20.61	13.74	10.30
63	22.9	15.3	11.5	27.5	18.3	13.7	29.0	19.3	14.5	21.04	14.02	10.52
64	23.4	15.6	11.7	28.1	18.7	14.0	29.6	19.7	14.8	21.48	14.32	10.74
65	23.9	15.9	11.9	28.7	19.1	14.3	30.3	20.2	15.1	21.94	14.63	10.97
66	24.4	16.3	12.2	29.3	19.5	14.7	30.9	20.6	15.5	22.42	14.95	11.21
67	25.0	16.6	12.5	30.0	20.0	15.0	31.6	21.1	15.8	22.92	15.28	11.46
68	25.5	17.0	12.8	30.6	20.4	15.3	32.3	21.5	16.2	23.44	15.62	11.72
69	26.1	17.4	13.1	31.3	20.9	15.7	33.0	22.0	16.5	23.97	15.98	11.99
70	26.7	17.8	13.4	32.0	21.4	16.0	33.8	22.5	16.9	24.52	16.35	12.26
71	27.3	18.2	13.7	32.8	21.9	16.4	34.6	23.1	17.3	25.10	16.73	12.55
72	28.0	18.7	14.0	33.6	22.4	16.8	35.4	23.6	17.7	25.69	17.13	12.84
73	28.6	19.1	14.3	34.4	22.9	17.2	36.3	24.2	18.1	26.30	17.53	13.15
74	29.3	19.6	14.7	35.2	23.5	17.6	37.1	24.8	18.6	26.93	17.95	13.46
75	30.0	20.0	15.0	36.0	24.0	18.0	38.0	25.3	19.0	27.58	18.38	13.79
76	30.8	20.5	15.4	36.9	24.6	18.5	38.9	26.0	19.5	28.24	18.83	14.12
77	31.5	21.0	15.7	37.8	25.2	18.9	39.9	26.6	19.9	28.92	19.28	14.46
78	32.2	21.5	16.1	38.7	25.8	19.3	40.8	27.2	20.4	29.61	19.74	14.81
79	33.0	22.0	16.5	39.6	26.4	19.8	41.8	27.9	20.9	30.32	20.21	15.16
80	33.8	22.5	16.9	40.6	27.0	20.3	42.8	28.5	21.4	31.03	20.69	15.52
81	34.6	23.1	17.3	41.5	27.7	20.8	43.8	29.2	21.9	31.76	21.17	15.88
82	35.4	23.6	17.7	42.5	28.3	21.2	44.8	29.9	22.4	32.49	21.66	16.25
83	36.2	24.1	18.1	43.4	29.0	21.7	45.8	30.5	22.9	33.23	22.15	16.62
84	37.0	24.7	18.5	44.4	29.6	22.2	46.8	31.2	23.4	33.97	22.65	16.99
85	37.8	25.2	18.9	45.4	30.2	22.7	47.9	31.9	23.9	34.71	23.14	17.35
86	38.6	25.7	19.3	46.3	30.9	23.2	48.9	32.6	24.4	35.44	23.63	17.72
87	39.4	26.3	19.7	47.3	31.5	23.6	49.9	33.2	24.9	36.17	24.11	18.08
88	40.2	26.8	20.1	48.2	32.1	24.1	50.8	33.9	25.4	36.88	24.59	18.44
89	40.9	27.3	20.5	49.1	32.7	24.6	51.8	34.5	25.9	37.58	25.05	18.79
90	41.7	27.8	20.8	50.0	33.3	25.0	52.7	35.2	26.4	38.25	25.50	19.13

Section 5 Adjusting Planting Rates

Insecticide/Herbicide Application Rates



14914

Sand Granules Chemical Rate Chart

Approximate Rate in Lbs/Acre

Meter Setting	30 Inch Rows miles per hour			36 Inch Rows miles per hour			38 Inch Rows miles per hour			Ounces per 1000 Row Ft. miles per hour		
	4	6	8	4	6	8	4	6	8	4	6	8
5	1.7	1.1	0.8	2.0	1.3	1.0	2.1	1.4	1.1	1.53	1.02	0.76
6	2.2	1.4	1.1	2.6	1.7	1.3	2.7	1.8	1.4	1.98	1.32	0.99
7	2.7	1.8	1.3	3.2	2.2	1.6	3.4	2.3	1.7	2.47	1.65	1.23
8	3.3	2.2	1.6	3.9	2.6	2.0	4.1	2.8	2.1	3.00	2.00	1.50
9	3.9	2.6	1.9	4.7	3.1	2.3	4.9	3.3	2.5	3.56	2.38	1.78
10	4.5	3.0	2.3	5.4	3.6	2.7	5.7	3.8	2.9	4.17	2.78	2.08
11	5.2	3.5	2.6	6.3	4.2	3.1	6.6	4.4	3.3	4.82	3.21	2.41
12	6.0	4.0	3.0	7.2	4.8	3.6	7.6	5.1	3.8	5.50	3.67	2.75
13	6.8	4.5	3.4	8.1	5.4	4.1	8.6	5.7	4.3	6.23	4.15	3.12
14	7.6	5.1	3.8	9.1	6.1	4.6	9.6	6.4	4.8	7.00	4.66	3.50
15	8.5	5.7	4.2	10.2	6.8	5.1	10.8	7.2	5.4	7.80	5.20	3.90
16	9.4	6.3	4.7	11.3	7.5	5.7	11.9	7.9	6.0	8.65	5.77	4.32
17	10.4	6.9	5.2	12.5	8.3	6.2	13.1	8.8	6.6	9.53	6.35	4.77
18	11.4	7.6	5.7	13.7	9.1	6.8	14.4	9.6	7.2	10.45	6.97	5.23
19	12.4	8.3	6.2	14.9	9.9	7.5	15.7	10.5	7.9	11.41	7.60	5.70
20	13.5	9.0	6.7	16.2	10.8	8.1	17.1	11.4	8.5	12.39	8.26	6.20
21	14.6	9.7	7.3	17.5	11.7	8.8	18.5	12.3	9.2	13.41	8.94	6.71
22	15.8	10.5	7.9	18.9	12.6	9.5	19.9	13.3	10.0	14.47	9.64	7.23
23	16.9	11.3	8.5	20.3	13.5	10.2	21.4	14.3	10.7	15.55	10.36	7.77
24	18.1	12.1	9.1	21.8	14.5	10.9	23.0	15.3	11.5	16.65	11.10	8.33
25	19.4	12.9	9.7	23.2	15.5	11.6	24.5	16.3	12.3	17.78	11.86	8.89
26	20.6	13.7	10.3	24.7	16.5	12.4	26.1	17.4	13.1	18.94	12.62	9.47
27	21.9	14.6	11.0	26.3	17.5	13.1	27.7	18.5	13.9	20.11	13.41	10.06
28	23.2	15.5	11.6	27.8	18.6	13.9	29.4	19.6	14.7	21.30	14.20	10.65
29	24.5	16.3	12.3	29.4	19.6	14.7	31.0	20.7	15.5	22.51	15.01	11.26
30	25.8	17.2	12.9	31.0	20.7	15.5	32.7	21.8	16.4	23.73	15.82	11.87
31	27.2	18.1	13.6	32.6	21.7	16.3	34.4	22.9	17.2	24.97	16.64	12.48
32	28.5	19.0	14.3	34.2	22.8	17.1	36.1	24.1	18.1	26.21	17.47	13.10
33	29.9	19.9	14.9	35.9	23.9	17.9	37.8	25.2	18.9	27.45	18.30	13.73
34	31.3	20.8	15.6	37.5	25.0	18.8	39.6	26.4	19.8	28.71	19.14	14.35
35	32.6	21.8	16.3	39.2	26.1	19.6	41.3	27.5	20.7	29.96	19.97	14.98
36	34.0	22.7	17.0	40.8	27.2	20.4	43.0	28.7	21.5	31.21	20.81	15.61
37	35.4	23.6	17.7	42.4	28.3	21.2	44.8	29.8	22.4	32.46	21.64	16.23
38	36.7	24.5	18.4	44.0	29.4	22.0	46.5	31.0	23.2	33.71	22.47	16.85
39	38.1	25.4	19.0	45.7	30.4	22.8	48.2	32.1	24.1	34.95	23.30	17.47
40	39.4	26.3	19.7	47.3	31.5	23.6	49.9	33.2	24.9	36.17	24.12	18.09
41	40.7	27.1	20.4	48.9	32.6	24.4	51.6	34.4	25.8	37.39	24.93	18.70
42	42.0	28.0	21.0	50.4	33.6	25.2	53.2	35.5	26.6	38.60	25.73	19.30
43	43.3	28.9	21.7	52.0	34.7	26.0	54.9	36.6	27.4	39.79	26.53	19.90
44	44.6	29.7	22.3	53.5	35.7	26.8	56.5	37.7	28.2	40.97	27.31	20.48
45	45.9	30.6	22.9	55.1	36.7	27.5	58.1	38.7	29.0	42.13	28.08	21.06
46	47.1	31.4	23.6	56.5	37.7	28.3	59.7	39.8	29.8	43.27	28.85	21.63
47	48.3	32.2	24.2	58.0	38.7	29.0	61.2	40.8	30.6	44.39	29.59	22.20
48	49.5	33.0	24.8	59.5	39.6	29.7	62.7	41.8	31.4	45.49	30.33	22.75
49	50.7	33.8	25.4	60.9	40.6	30.4	64.2	42.8	32.1	46.58	31.05	23.29

Section 5 Adjusting Planting Rates

Sand Granules Chemical Rate Chart (cont.)

Approximate Rate in Lbs/Acre

Meter Setting	30 Inch Rows miles per hour			36 Inch Rows miles per hour			38 Inch Rows miles per hour			Ounces per 1000 Row Ft. miles per hour		
	4	6	8	4	6	8	4	6	8	4	6	8
50	51.9	34.6	25.9	62.3	41.5	31.1	65.7	43.8	32.8	47.64	31.76	23.82
51	53.0	35.3	26.5	63.6	42.4	31.8	67.1	44.7	33.6	48.68	32.45	24.34
52	54.1	36.1	27.1	64.9	43.3	32.5	68.5	45.7	34.3	49.70	33.13	24.85
53	55.2	36.8	27.6	66.2	44.2	33.1	69.9	46.6	34.9	50.70	33.80	25.35
54	56.3	37.5	28.1	67.5	45.0	33.8	71.2	47.5	35.6	51.68	34.45	25.84
55	57.3	38.2	28.7	68.8	45.9	34.4	72.6	48.4	36.3	52.64	35.09	26.32
56	58.3	38.9	29.2	70.0	46.7	35.0	73.9	49.2	36.9	53.58	35.72	26.79
57	59.4	39.6	29.7	71.2	47.5	35.6	75.1	50.1	37.6	54.50	36.34	27.25
58	60.3	40.2	30.2	72.4	48.3	36.2	76.4	50.9	38.2	55.42	36.94	27.71
59	61.3	40.9	30.7	73.6	49.1	36.8	77.6	51.8	38.8	56.32	37.54	28.16
60	62.3	41.5	31.1	74.8	49.8	37.4	78.9	52.6	39.4	57.21	38.14	28.60
61	63.3	42.2	31.6	75.9	50.6	38.0	80.1	53.4	40.0	58.09	38.73	29.05
62	64.2	42.8	32.1	77.1	51.4	38.5	81.3	54.2	40.6	58.97	39.31	29.48
63	65.2	43.5	32.6	78.2	52.1	39.1	82.5	55.0	41.3	59.85	39.90	29.92
64	66.1	44.1	33.1	79.4	52.9	39.7	83.7	55.8	41.9	60.73	40.49	30.37
65	67.1	44.7	33.6	80.5	53.7	40.3	85.0	56.6	42.5	61.62	41.08	30.81
66	68.1	45.4	34.0	81.7	54.5	40.9	86.2	57.5	43.1	62.53	41.69	31.26
67	69.1	46.1	34.5	82.9	55.3	41.5	87.5	58.3	43.7	63.45	42.30	31.73
68	70.1	46.8	35.1	84.2	56.1	42.1	88.8	59.2	44.4	64.40	42.93	32.20
69	71.2	47.5	35.6	85.4	57.0	42.7	90.1	60.1	45.1	65.38	43.58	32.69
70	72.3	48.2	36.2	86.8	57.8	43.4	91.5	61.0	45.8	66.39	44.26	33.20
71	73.5	49.0	36.7	88.1	58.8	44.1	93.0	62.0	46.5	67.45	44.97	33.72
72	74.7	49.8	37.3	89.6	59.7	44.8	94.5	63.0	47.3	68.56	45.71	34.28
73	75.9	50.6	38.0	91.1	60.7	45.6	96.1	64.1	48.1	69.73	46.49	34.86
74	77.3	51.5	38.6	92.7	61.8	46.4	97.8	65.2	48.9	70.96	47.31	35.48
75	78.7	52.5	39.4	94.5	63.0	47.2	99.6	66.4	49.8	72.28	48.19	36.14
76	80.2	53.5	40.1	96.3	64.2	48.1	101.6	67.7	50.8	73.68	49.12	36.84
77	81.9	54.6	40.9	98.2	65.5	49.1	103.6	69.1	51.8	75.18	50.12	37.59
78	83.6	55.7	41.8	100.3	66.9	50.2	105.9	70.6	52.9	76.78	51.19	38.39
79	85.5	57.0	42.7	102.6	68.4	51.3	108.2	72.2	54.1	78.51	52.34	39.25
80	87.5	58.3	43.8	105.0	70.0	52.5	110.8	73.9	55.4	80.36	53.58	40.18
81	89.7	59.8	44.8	107.6	71.8	53.8	113.6	75.7	56.8	82.36	54.91	41.18
82	92.0	61.4	46.0	110.4	73.6	55.2	116.5	77.7	58.3	84.52	56.35	42.26
83	94.6	63.1	47.3	113.5	75.7	56.7	119.7	79.8	59.9	86.85	57.90	43.42
84	97.3	64.9	48.7	116.8	77.8	58.4	123.2	82.1	61.6	89.36	59.57	44.68
85	100.3	66.8	50.1	120.3	80.2	60.2	126.9	84.6	63.5	92.07	61.38	46.03

Section 5 Adjusting Planting Rates

Liquid Fertilizer Rates

Liquid Fertilizer Rate Chart

Transmission Combination		Hose Dia. at 5/16	Hose Dia. at 1/2
Driver	Driven	Gallons/Acre	Gallons/Acre
15	44	3.49	8.99
15	41	3.75	9.65
17	44	4.06	10.19
17	41	4.25	10.94
19	44	4.43	11.39
15	32	4.8	12.36
21	41	5.25	13.51
17	32	5.45	14.01
24	41	6.00	15.44
19	32	6.09	15.66
15	24	6.41	16.48
17	24	7.26	18.68
15	21	7.32	18.84
17	23	7.58	19.49
15	19	8.09	20.82
17	21	8.30	21.35
19	23	8.47	21.79
15	17	9.04	23.27
17	19	9.17	23.60
23	24	9.82	25.28
24	23	10.70	27.52

Liquid Fertilizer Rate Chart (con't.)

Transmission Combination		Hose Dia. at 5/16	Hose Dia. at 1/2
Driver	Driven	Gallons/Acre	Gallons/Acre
19	17	11.46	29.48
17	15	11.62	29.89
23	19	12.41	31.93
21	17	12.66	32.58
19	15	12.98	33.41
23	17	13.87	35.68
21	15	14.35	36.93
24	17	14.47	37.24
32	21	15.62	40.19
24	15	16.40	42.20
32	19	17.26	44.42
41	24	17.51	45.06

NOTE: The delivery rates are approximate and will vary with changes in temperature and the specific fertilizer being used.

Dry Fertilizer Attachment

NOTE: Fertilizer application rates can vary from the weights in the charts. Make field checks to assure you are applying fertilizer at the desired rate.

Use the following instructions to check the exact number of pounds your fertilizer attachment will actually deliver on a 30 inch row spacing.

1. Remove a hose from one of the fertilizer hoppers and attach a container under the opening.
2. Engage the fertilizer attachment and drive forward for 174 feet.
3. Weigh the amount of fertilizer caught in the container

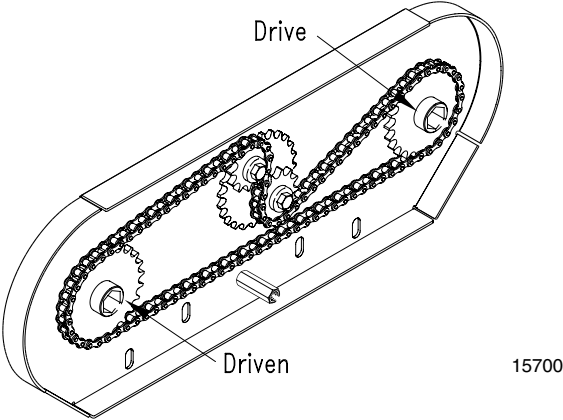
and multiply that amount by 100. The result will be the pounds of fertilizer delivered per acre when planting in 30 inch rows.

To assure proper application check the gauge tires and contact drive tire for proper inflation, see *Tire Inflation Chart* in “**Section 10 Appendix**” on page 62.

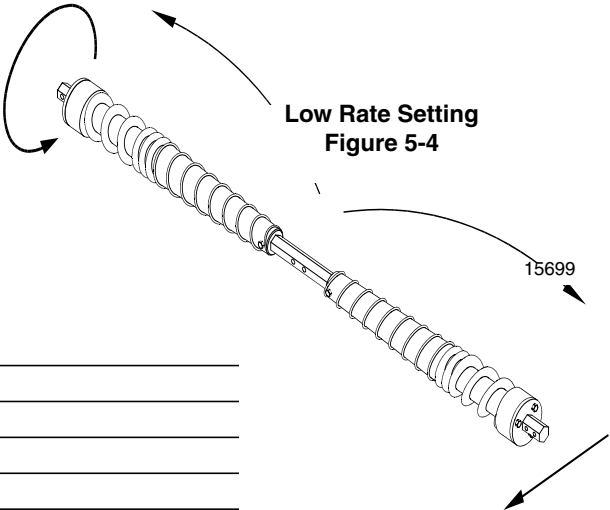
NOTE: Before applying fertilizer make sure that augers are rotating correctly and are positioned for your desired rate setting, see Figure 5-4 & Figure 5-5.

The following application charts were calculated with a bulk density of 65 pounds per cubic foot.

Section 5 Adjusting Planting Rates

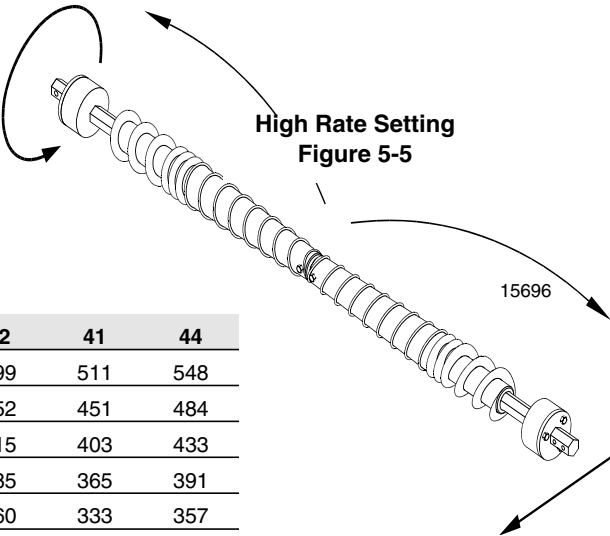


Dry Fertilizer Low Rate Setting
(Approximate rate in pounds/acre)



Dry Fertilizer High Rate Setting
(Approximate rate in pounds/acre)

Drive	15	17	19	21	23	24	32	41	44
15	n/a	212	237	262	286	299	399	511	548
17	165	187	209	231	253	264	352	451	484
19	148	167	187	207	226	236	315	403	433
21	133	151	169	187	205	214	285	365	391
23	122	138	154	171	187	195	260	333	357
24	117	132	148	163	179	187	249	319	343
32	88	99	111	123	134	140	n/a	239	257
41	68	77	87	96	105	109	146	n/a	201
44	64	72	81	89	98	102	136	174	n/a



Section 6 Troubleshooting

Problem	Possible Cause	Solution
One row not planting seed.	Drive clutch release not engaged.	Engaged clutch release mechanism.
	Foreign material in hopper.	Clean hopper and finger carrier mechanism.
	Seed hopper empty.	Fill seed hopper.
	Row unit drive chain off of sprocket or broken.	Repair or replace drive chain.
	Drive not functioning.	Inspect all drives.
Drive release does not engage properly.	Drive release shaft isn't aligned properly with meter drive shaft.	Align drive mechanism. See "Meter Drive Adjustment".
Unit is skipping.	Foreign material or obstruction in meter.	Clean out and inspect.
	Finger holder improperly adjusted.	Adjust to proper setting. (22 to 25 inch pounds torque)
	Loose finger holder.	Adjust tension of finger pickup.
	Broken fingers.	Replace fingers and/or springs as required.
	Planting too slowly.	Increase planting speed to within recommended range. See charts for correct speed.
Planting too many doubles.	Planting too fast.	Stay within recommended range.
	Lose finger holder.	Adjust to specifications (22 to 24 inch pounds torque)
	Worn brush in carrier plate.	Inspect and replace if necessary.
Over planting.	Worn carrier plate.	Inspect and replace if necessary.
Under planting.	Belt installed backwards.	Remove and install correctly.
	Weak springs.	Replace.
	Spring not properly installed.	Remove finger holder and correct.
	Seed belt catching or dragging.	Replace belt.
	Brush dislodging seed.	Replace brush.
Irregular or incorrect seed spacing.	Driving too fast.	Check chart for correct speed.
	Wrong tire pressure.	Inflate tires to correct air pressure.
	Drive wheels slipping.	Reduce down pressure on row unit down force springs.
	Wrong sprockets.	Check planting rate charts for correct sprocket combinations.
Seed spacing not as indicated in charts.	Wrong tire pressure.	Inflate tires to correct air pressure.
	Inconsistent seed size.	Do field check and adjust sprockets accordingly.
	Wrong sprockets.	Check chart for correct sprocket combination.
	Charts are approximate.	Slight variations due to wear may produce seed spacing variations.
Scattering of seeds.	Planting too fast.	Reduce planting speed.
	Seed tube improperly installed.	Check seed tube installation.
	Seed tube worn or damaged.	Replace seed tube.
Seed tubes and/or openers plugging.	Allowing planter to roll backward when lowering.	Lower planter only when tractor is moving forward.
	Turning tractor steering wheel when planter is down and stationary. (Four Wheel Drive tractors only.)	Avoid turning tractor when planter is down and stationary.

Section 6 Troubleshooting

Problem	Possible Cause	Solution
Inconsistent seed depth.	Rough seed bed.	Adjust down pressure springs
	Partially plugged or improperly installed seed tube.	Inspect and clean. Ensure seed tubes are hooked properly in unit shank.
	Seed tube improperly installed.	Install properly.
Planter will not lower.	Pressure and return hoses not fully engaged in SCV outlets	---
Planter frame raises or lowers slowly.	Lower tractor hydraulic pressure.	Tractor standby pressure must be a minimum of 15
	SCV not in hare position.	---
Erratic or uneven lift.	Air in hydraulic system.	Remove air.
Planter will not raise.	Tractor SCV bypassing oil.	Readjust SCV lever linkage. (See Tractor Operator's Manual.)
		Re-cut vacuum blower rubber stop.
All row units not planting on planter.	Bolt in countershaft sprocket to seed transmission sheared.	Repair cause of pin shearing and replace cotter pin.
Closing wheels leave severe imprint in soil.	Too much spring force.	Adjust closing wheel spring.
Closing wheels not firming soil around seed	Insufficient spring force.	Adjust closing wheel spring.
Closing wheel running on top of seed furrow.	Improper centering.	Realign.
Closing wheels not applying equal force.	---	Relevel.
Consistent shearing of drill shaft cotter pin.	Drill shaft not aligned properly.	Loosen bearing and align shaft.
Drive wheel chain consistently falls off.	Chain may be too long.	Remove offset link.
	Chain links stiff.	Oil or replace chain.
	Chain dislodged by trash.	Add trash guards.
No seed being planted.	Seed hopper empty.	Fill seed hopper.
Markers not alternating.	Marker hoses not connected to marker valve correctly.	---
	Air in marker valve.	Bleed marker hydraulic system.
	Marker valve defective.	Replace valve. See your Great Plains dealer.
Marker floats off ground.	Air in hydraulic system.	Bleed marker lift cylinder.
	Alternator valve defective.	Replace valve. (See your Great Plains dealer.)
	Leaking tractor SCV.	---
	Marker cylinder not dropping down into J-slot. (Hose loop too short.)	Lengthen marker hydraulic hose loops.
Hydraulic marker functioning improperly	Check all hose fittings and connections for air and oil leaks.	
	Check tractor hydraulic oil level.	
	Check all bolts and fasteners.	
	If markers do not alternate: - Check tractor flow controls and set to maximum oil flow. If problem still exists: - Remove Valve, disassemble, and check for contamination or damage to spool. Re-assemble.	

Section 6 Troubleshooting

Problem	Possible Cause	Solution
Blade does not mark		The maximum marker down float is limited by the slot in the pivot link. If the blade does not drop down to follow depressions in the field, make sure the marker cylinder is fully extended.
		The blade may be reversed to pull dirt in or throw dirt out depending on soil conditions.

Section 7 Maintenance and Lubrication

Section 7 Maintenance and Lubrication

Install Cylinder Stops

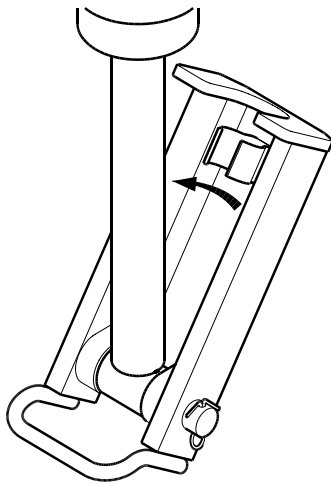
**CAUTION!**

Always install cylinder stops when working around or near planter.

Refer to Figure 7-1:

Raise planter to transport position with tractor remote cylinder operating lever. Pivot cylinder stop into position on wheel module cylinder rods. Lower to stop.

NOTE: Cylinder stops are provided for added safety when performing normal maintenance and adjustments with the planter raised.



Cylinder Stop
Figure 7-1

15042

Replacing Drill Shaft Cotter Pins and Countershaft Shear Pins

Refer to Figure 7-2:

The cotter shear pins (A), which connect the drill shaft to the transmission and shear pins (B) which connect countershaft to transmission, will shear when an excessive load is put on the drill shaft.

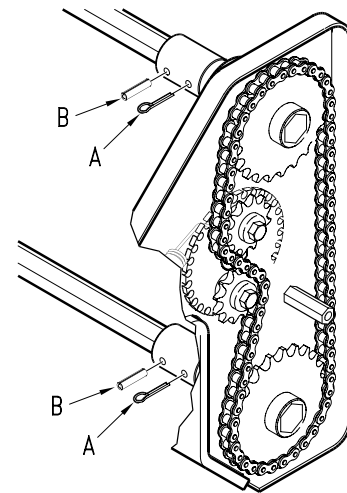
NOTE: If drill shaft binds due to misalignment, loosen bolts on drill shaft bearings on planting units. Make certain shaft turns freely and tighten bolts.

If countershaft binds due to misalignment, loosen bolts on transmission bearings. Make certain shaft turns freely, then tighten bolts.

Infrequent or improper lubrication causes “binding” of moving parts within the planter. This “binding” will cause the cotter shear pins to shear, thus preventing breakage of planter parts.

If either cotter pin shears, turn the drill shaft by hand to locate where the binding is occurring. When the drill shaft can be turned freely by hand, replace the cotter pin.

NOTE: Replace the cotter shear pins only with cotter shear pins of the same size. Do not replace with other type pins.

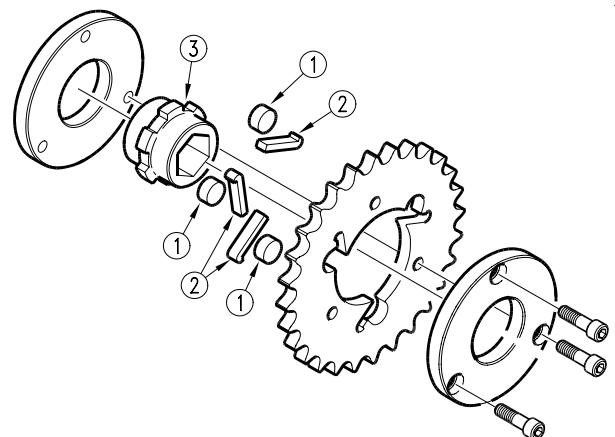


Transmission Cotter Pins & Shear Pins 15046
Figure 7-2

Ratchet Drive (8 Row Only)**Refer to Figure 7-3:**

The ratchet assembly must operate freely and the springs (#1) must bring the dogs (#2) back against the ratchet.

Repack with grease annually.



Ratchet Drive
Figure 7-3

15177

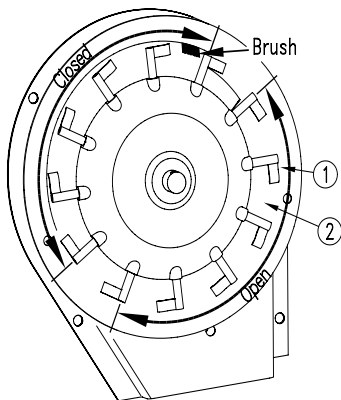
Fasteners

When working on the planter torque all bolts, screws, and nuts to the correct values listed in the *Torque Values Chart* in “Section 10 Appendix” on page 62. Check latches and other fasteners on the planter to prevent failures in the field.

Finger Pickup Meter

Inspect and repair the finger pickup meter by removing the 2 bolts holding the meter to the hopper. Remove the 3 bolts on the meter baffle to gain access to the finger mechanism.

Rotate the meter input shaft by hand to check the fingers. The fingers should be against the carrier plate in the area shown closed and raised in the area shown open in Figure 7-4.



12353

Finger Raised/Location of Brush
Figure 7-4

Inspect the brush for wear. The brush should cover at least 1/2 of the finger pickup tab. Replace every 100 acres of row operation, see Figure 7-4 for location.

Chaff and debris can build-up in the meter preventing proper functioning of the fingers. Clean every 50 hours of operation.

To clean the corn meter:

1. Remove the cotter pin, lock nut, and adjusting nut from the shaft.
2. Lift the finger assembly off the shaft and clean.
3. Replace worn fingers and springs by lifting the finger out of the slot. Average life expectancy of these parts should be 250-300 acres of row operation. When fingers are replaced, the open end of the spring loop should be toward the inside of the finger housing.

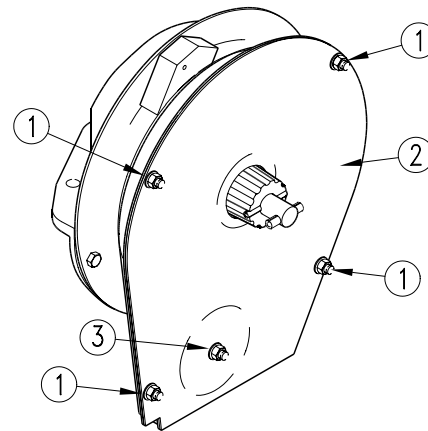
4. Inspect the indentations in the carrier plate for wear. Replace the carrier plate when wear to the plate becomes excessive or the seeding accuracy will be affected.
5. Reassemble the meter in reverse order. Be sure the fingers are installed correctly so the finger housing is flush with the carrier plate. If the finger housing is not flush with the carrier plate, make sure that the projection on the cam is in the notch on the bearing housing. The meter will not function properly if the projection is not in the notch.
6. With the finger assembly against the plate, tighten the adjusting nut until it is snug. Then turn an additional 1/3 turn. Turn the meter by hand making certain that the meter is not over tightened. Proper meter resistance would be 22-25 in/lbs of torque applied at the meter input shaft.
7. Install the cage nut and the cotter pin.
8. Install the baffle and attach the meter to the hopper.

Note: Check tightness of the adjusting nut on the meter after the first day and periodically thereafter.

Check the belt on the meter periodically.

Use these steps:

1. Remove the 4 bolts (#1) located on the belt housing, the bolt holding the belt roller and the belt housing cover (#2). See Figure 7-5.



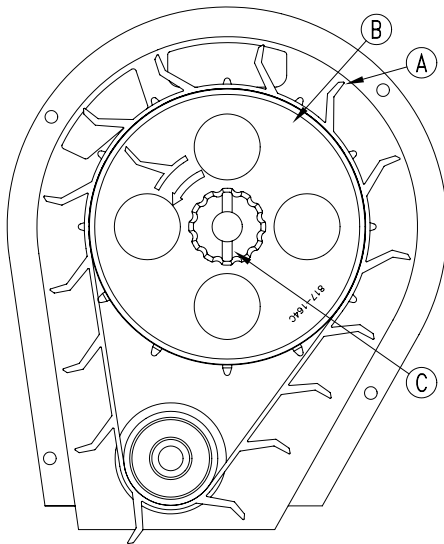
Finger Meter Belt Removal
Figure 7-5

14966

2. Inspect or replace the seed belt.

Section 7 Maintenance and Lubrication

IMPORTANT: See Figure 7-6 if belt is replaced. Be certain paddles (A) are oriented as shown. Belt drive wheel (B) may be removed by removing spring pins (C).



Finger Meter Belt Orientation
Figure 7-6

15049

3. Reassemble in the reverse order.

Spreader and Scraper

The spreader and scraper between the disks will periodically need replacing. These components scrape dirt off the disks and protect the seed tube.

To inspect or replace the spreader or scraper do as follows:

1. Remove the side gauge wheel and the arm from the row unit.
2. Remove the disk blade. Be careful, disks wear very sharp!
3. Remove both of the 1/4" bolts holding the scraper and spreader.
4. If the sides of the seed tube are worn, replace the scraper and spreader.
5. Install the scraper and spreader with 1/4" bolts. Torque the bolts to the correct values as listed in the *Torque Values Chart* in "**Section 10 Appendix**" on page 62.
6. Install the disk and torque the bolt to the correct value as listed in *Torque Values Chart* in "**Section 10 Appendix**" on page 62.
7. Install the gauge wheel according to directions under the Gauge Wheels heading below.

Disk



CAUTION!

Disk blades wear very sharp. Handle with care.

As the disks on the row unit wear, removal of shims may be required to maintain contact point. To remove disk do as follows:

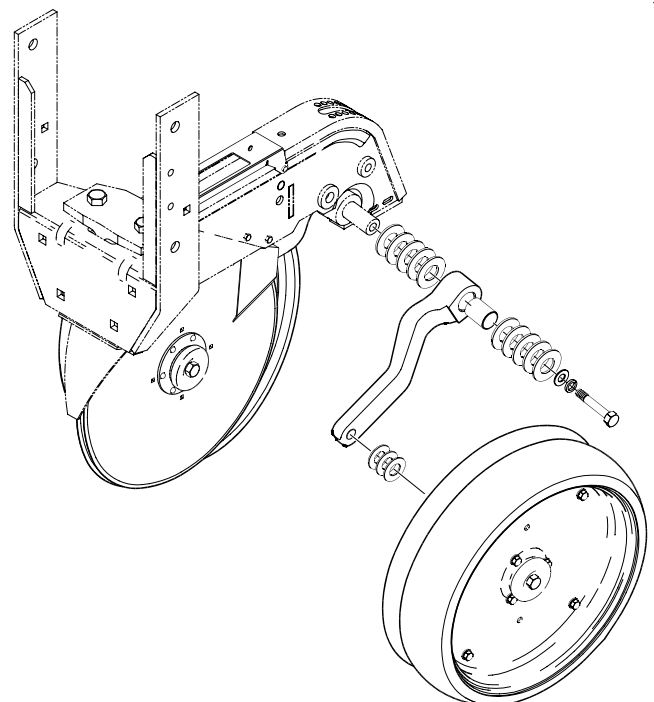
1. Remove side gauge wheels and arm from the row unit.
2. Remove 3/4" bolts retaining the disks.
3. Measure disk diameter, if disk measures 14 1/2" or less replace disk.
4. If contact is to be increase, move shims from behind disk to outside disks. This will increase the contact between the disks.
5. Install disks and tighten 3/4" bolts to torque values in Specification Section.
6. Install gauge wheels and arms according to directions in this section.

Gauge Wheels

Periodically check gauge tires to be sure there is contact or a 1/16" gap between the tires and disks.

For installation or adjustments proceed as follows:

1. Remove the 1/2" bolt holding arm on to the shank.
2. If tire needs to be closer to disk, move an appropriate amount of shims from inside of arm to outside, see Figure 7-7. Each shim is 0.050 thick.



Gauge Arm, Spindle, and Shims
Figure 7-7

12354

Section 7 Maintenance and Lubrication

3. Install the arm and the shims onto the spindle. Tighten 1/2" bolt to the correct torque value as listed in the *Torque Values Chart* in "**Section 10 Appendix**" on page 62.
4. Check clearance or contact of the tire and disk. The gauge wheel should fall freely when lifted. Repeat steps 1 through 4 if necessary.

Outside Scrapers

The row units are equipped with outside disk scrapers to remove dirt from the disks.

Periodically check the scrapers as follows:

1. Remove the gauge tires to inspect the scrapers.
2. Make sure the scrapers are contacting the disk with some pressure.
3. If scrapers are not contacting the disks properly, bend and twist the scrapers as required to establish contact. If the scraper is worn too much, replace it by removing the two 1/4" bolts. Bolt the new scraper in place and torque the bolts to correct values as listed in the *Torque Values Chart* in "**Section 10 Appendix**" on page 62.

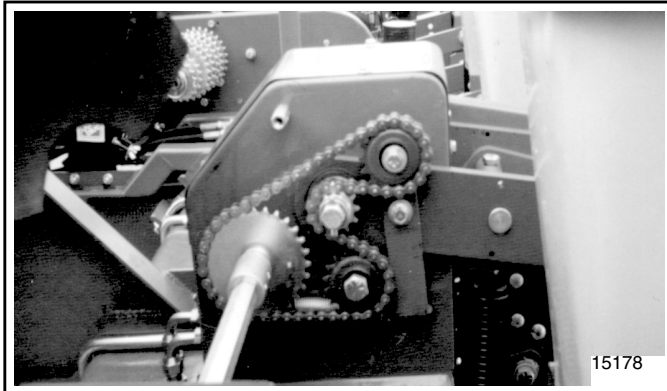
Shear Pins

The planter drive line and row units are protected by shear pins on transmission upper and lower shafts. Check and replace bent or broken pins as required.

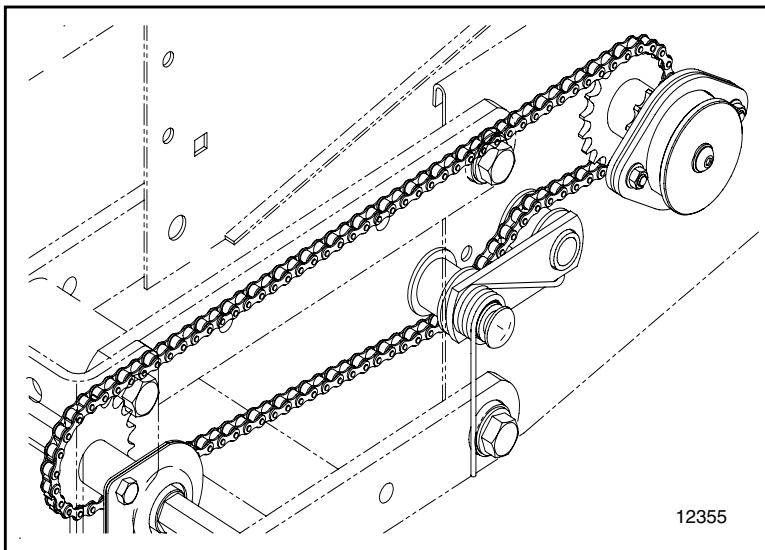
Chain Tension

The planter is equipped with spring loaded idlers to maintain tension in the chains. As the chains wear and stretch, the link(s) may be removed to provide proper chain length and tension. Check and replace broken springs and bushings on idlers. For the correct operation of the planter check all chain routings. Refer to page 44 for the chain routing diagrams.

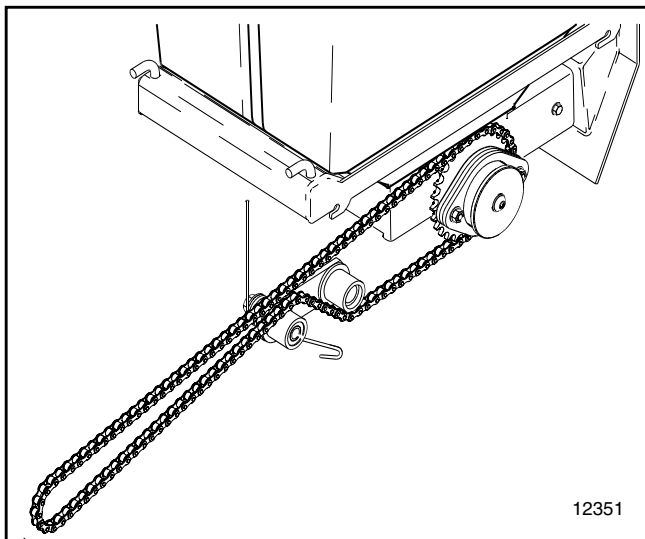
Section 7 Maintenance and Lubrication



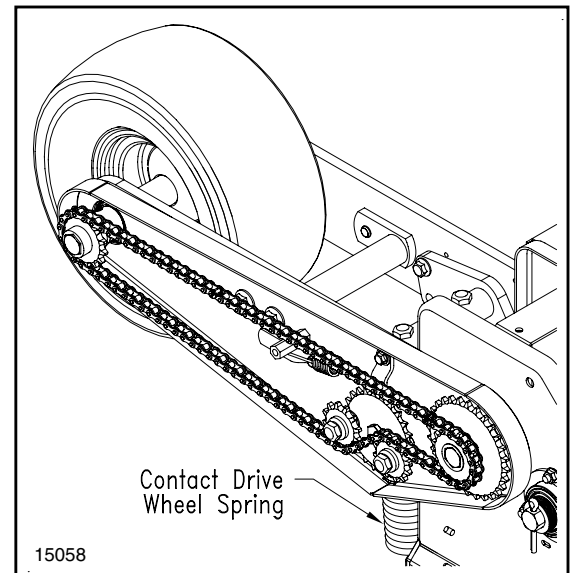
Reverser Drive



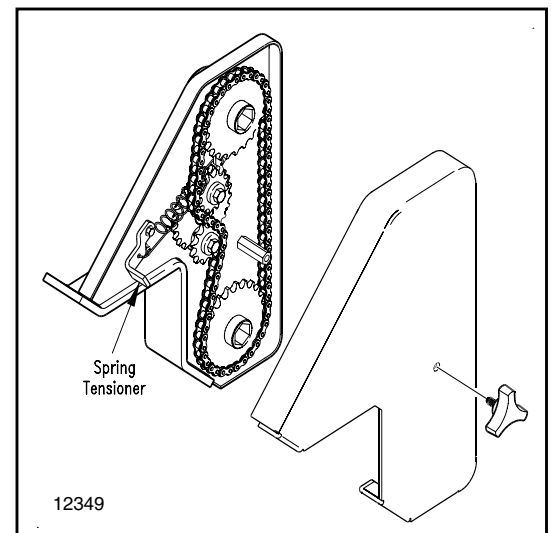
Meter Drive Chain Routing



Granular Chemical Drive Chain Routing



Drive Gauge Wheel Chain Routing



Transmission Chain Routing

Cleaning Insecticide and/or Herbicide Hoppers



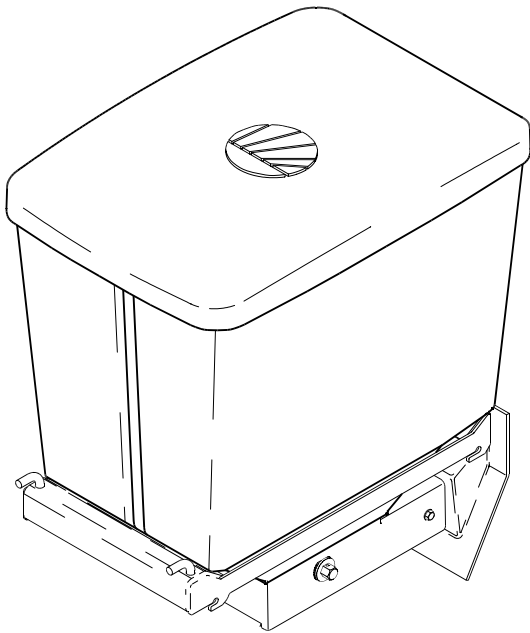
CAUTION!

Agricultural chemicals can be dangerous. Follow the instructions of the chemical manufacturer when cleaning hoppers and handling insecticides or herbicides.

IMPORTANT: Under certain humidity or moisture conditions, material may tend to cake. When this happens, thoroughly clean hoppers at the end of each day's use.

To remove hoppers, proceed as follows:

1. Disengage drive clutch.
2. Pull pins.
3. Slide hopper rearward.
4. Clean thoroughly.



Chemical Hopper
Figure 7-8

14912

Cleaning Liquid Fertilizer Tanks

Although the tanks are made of a highly durable and corrosion resistant plastic, proper maintenance is required.

Rinse the tank with water when changing from one solution to another.

Rinse tank thoroughly with water after each season or before any shutdown lasting over one week.

Do not allow sludge to accumulate in the bottom of the tank.

Do not leave fertilizer in the tanks if the temperature is expected to drop below 40 degrees as some types of liquid

fertilizers will begin to crystallize at this temperature.

To clean tanks, proceed as follows:

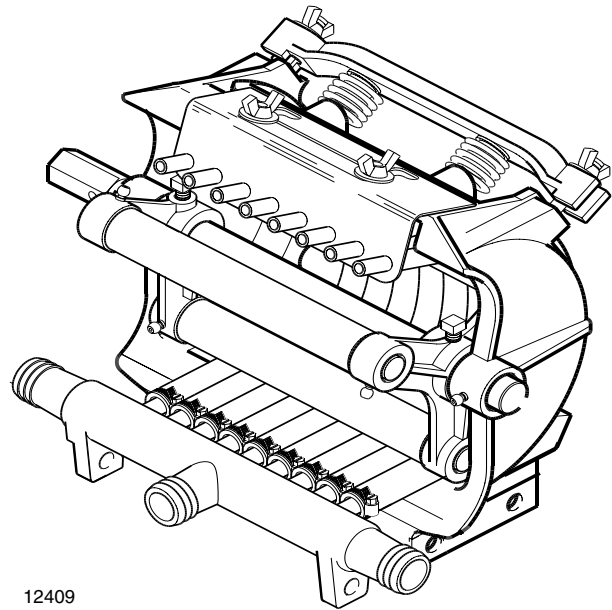
5. Remove lids from tanks.
6. Turn valve to elbow.
7. After cleaning tanks, close shutoff valve, replace cap on metering pump and replace lids on tanks.

Squeeze Pumps

Refer to Figure 7-13:

During periods when the pump is not being used, these important steps are recommended to prevent hose deformation and prolong hose life.

1. Unscrew (about 1/2 inch) the wing nuts holding the spring anchor bar to the pump frame. This releases pressure against the hoses.
2. Loosen the wing nuts on the discharge manifold and shift the manifold rearward.
3. Store out of sunlight.



12409

Relaxing Pressure on Metering Hoses
Figure 7-13

Marker Breakaway Protection

The marker arm is attached to the marker body with a 5/16" breakaway bolt. If excessive force is put on the marker during operation, the bolt will break, allowing the marker arm to swing away rather than cause damage to the marker.

NOTE: The breakaway bolt is a 5/16"-18 x 1 1/2" long grade 5 on planter only (GP #802-012C). If it breaks, it must be replaced by an equivalent grade 2 bolt to prevent marker damage.

Section 7 Maintenance and Lubrication

Storage

To extend the life of your planter follow the recommendations for removing the planter from storage and storing the planter during the off season.

Beginning of the Season Service

Before using the planter after it has been stored, inspect the seed hoppers for cleanliness to be certain the seed will flow from hoppers freely.

Thoroughly inspect the planter unit for loose parts and adjust as necessary. Check all bolts and replace worn parts to prevent failure in the field.

Clean any dirt or grease that may have accumulated on moving parts, and chains before operating the planter. This will prevent abrasive action that could cause excessive wear.

When roller chains remain unused for several days, moisture in the air will accumulate on the chain, causing the chain to rust. This can, and will, become serious enough in time to cause the chain joints to become stiff, restricting their normal free movement. While very difficult to detect, this stiffness can encourage the chains to operate abnormally and disturb the smooth rotation of important meter components, causing deterioration in performance.

If the planter is not used for several days, or if oil has been removed from chains, etc. while cleaning the planter thoroughly lubricate chains with multipurpose spray lube.

IMPORTANT: Do not use chain lube or any other heavy petroleum base lubricant that may cause a buildup of dust or dirt in the sprocket or gear teeth.

Turn the meter drive shaft by hand to be sure the drive shaft and seed meter are free to turn. Rotate forward only, as assemblies are not designed to rotate in reverse.

Be certain all adjustments are made for the planting conditions to be encountered.

Service at the End of the Season

When planting is complete clean the seed and chemical hoppers. Remove all dirt, debris, chemicals, and fertilizer from the planter that may hold moisture and cause corrosion.

Use spray paint to cover scratches, chips, and worn areas on the planter to protect the metal.

Lubricate the planter as outlined in *Lubrication*. Pay careful attention to the lubrication of the chains to help prevent rusting.

Inspect the planter for worn or damaged parts. Make repairs and service during the off season to reduce down time in the field.

Place the 1 X 12 closing wheel handle in the middle slot to relieve the tension on the closing wheels. Move opener adjustment bar on heavy and medium down pressure spring packages to hole A.

Remove the finger pickup meters from the hoppers. Disassemble the meters and inspect them for wear. Make any repairs required at this time. Blow excessive debris from the meter. Wash the meters with mild soap and water. Dry the meters and spray a light coat of rust inhibitor on the meters. Reassemble and store in a dry place.

Thoroughly flush liquid herbicide system with clean water. Disconnect from tractor and completely drain all lines and components to prevent damage from freezing.

Store the planter in a clean, dry place with all tires out of the sun. A sheltering structure is best for overall protection, but a high quality tarp would suffice.

Section 7 Maintenance and Lubrication

Lubrication

Lubrication Legend



Multipurpose
spray lube



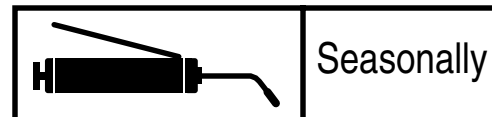
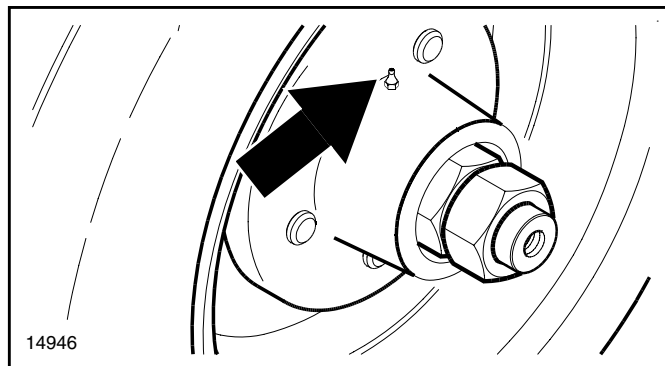
Multipurpose
grease lube



Multipurpose
oil lube



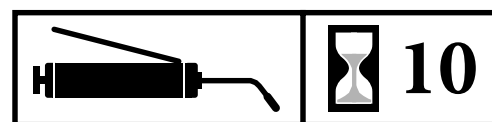
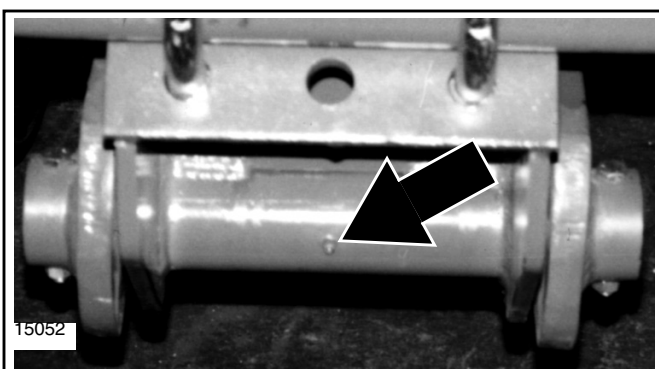
Intervals at which
lubrication is required



Wheel Bearings

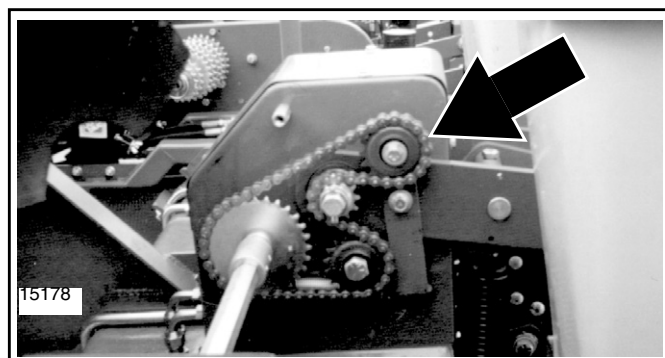
Lift the wheel off the ground. Move the tire in and out to check for end play. Check for roughness in the bearing by rotating the wheel. If the bearings are rough they should be inspected and replaced if necessary.

Type of Lubrication: Grease



Gauge Wheel Module

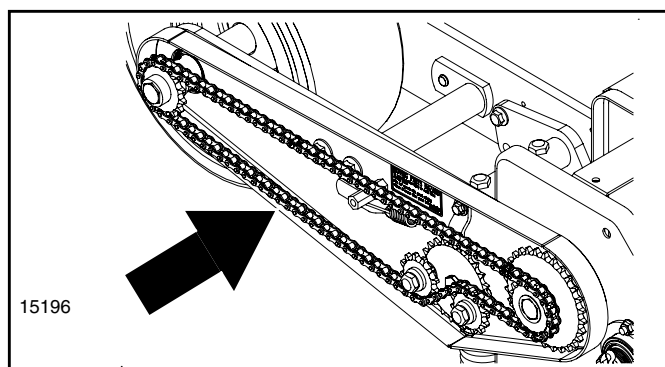
Type of Lubrication: Grease



Reverser Chains

Lubricate all chains at intervals to maintain freedom at every chain link joint. Use a multipurpose spray lubricant on chains, because it penetrates into the rollers on the chain. Spray chains if planter is going to be idle to prevent the chains from rusting and becoming stiff. Stiff chains will cause metering inaccuracies.

Type of Lubrication: Multipurpose Spray Lube

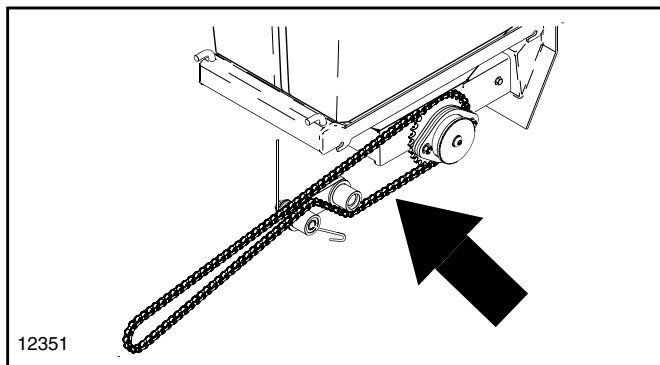


Contact Drive Chain

Lubricate all chains at intervals to maintain freedom at every chain link joint. Use a multipurpose spray lubricant on chains, because it penetrates into the rollers on the chain. Spray chains if planter is going to be idle to prevent the chains from rusting and becoming stiff. Stiff chains will cause metering inaccuracies.

Type of Lubrication: Multipurpose Spray Lube

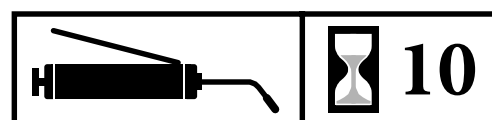
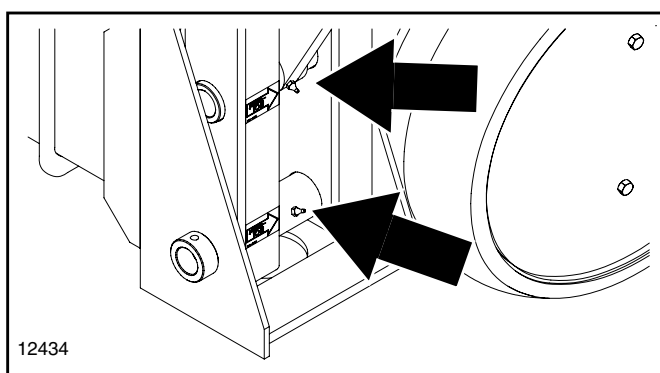
Section 7 Maintenance and Lubrication



Seed and Chemical Meter Chains

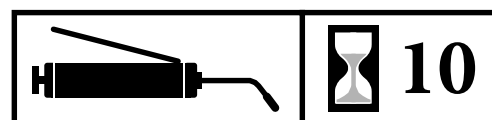
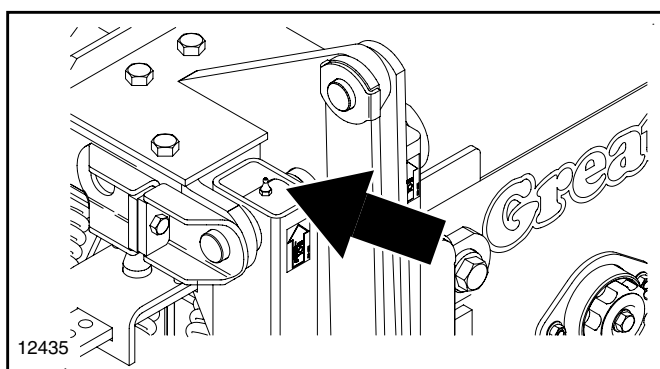
Lubricate all chains at intervals to maintain freedom at every chain link joint. Use a multipurpose spray lubricant on chains, because it penetrates into the rollers on the chain. Spray chains if planter is going to be idle to prevent the chains from rusting and becoming stiff. Stiff chains will cause metering inaccuracies.

Type of Lubrication: Multipurpose Spray Lube



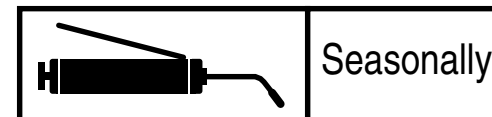
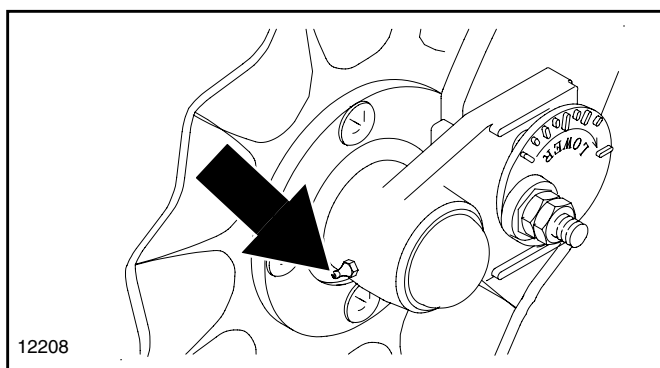
Markers

Type of Lubrication: Grease



Markers

Type of Lubrication: Grease

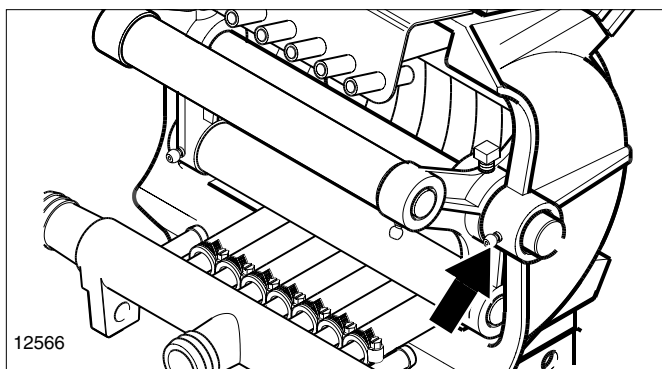


Coulter Arm Housing

The grease zerk is located on the coulter arm housing.

Type of Lubrication: Heavy Duty Multipurpose Grease

Section 7 Maintenance and Lubrication



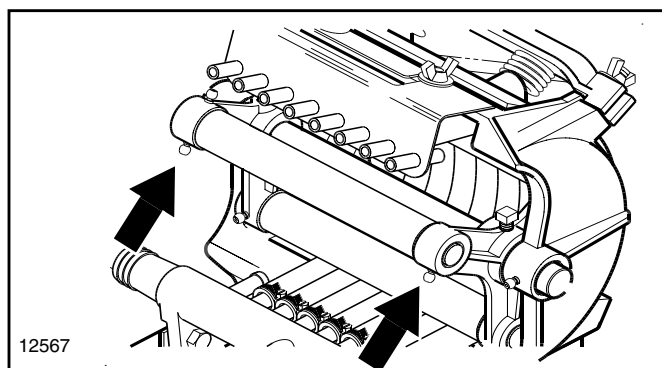
Twice Daily

Squeeze Pump Main Metering Shaft

Located near ends of squeeze pump main metering shaft (2 total)

Type of Lubrication: Multi-Purpose Lithium Base Grease

Quantity: Until grease begins to emerge.



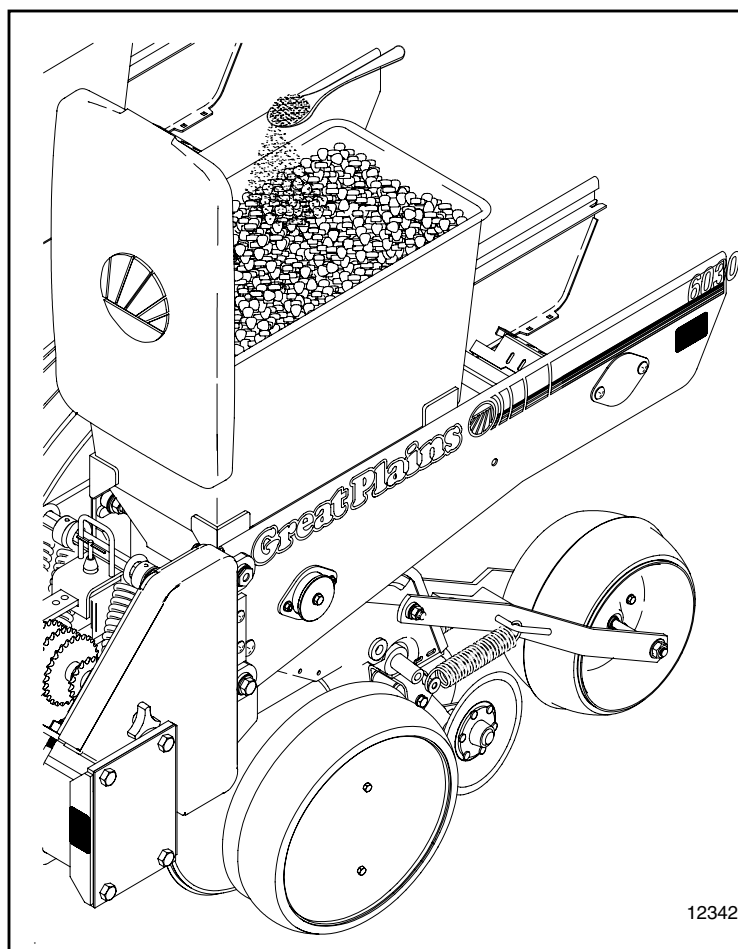
Seasonally

Squeeze Pump Roller Bushings

Located on the ends of the squeeze pump roller shafts (6 total)

Type of Lubrication: Multi-Purpose Lithium Base Grease

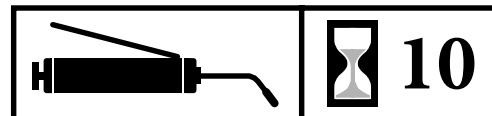
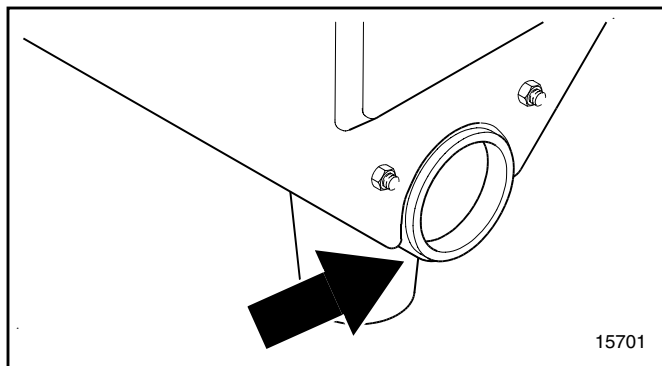
Quantity: Until grease begins to emerge.



Finger Pickup Meter

To prolong the life of the finger pickup meter and increase the planting accuracy, add a teaspoon of graphite to the seeds every time you fill the hopper. Sprinkle the graphite on top of the seeds and it will filter down to lubricate the finger pickup meter.

Section 7 Maintenance and Lubrication

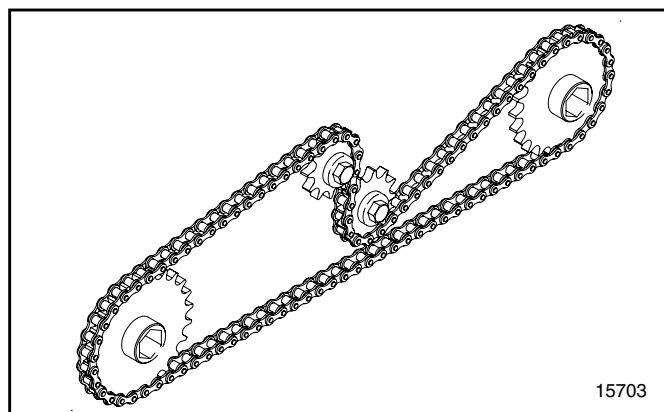


Dry Fertilizer Outlet Housing

Located on each outlet housing (1 each)

Type of Lubrication: Multi-Purpose Lithium Base Grease

Quantity: Until grease begins to emerge.

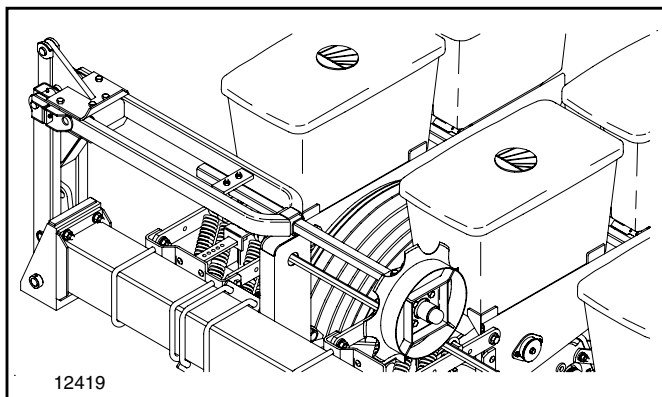


Liquid/Dry Fertilizer Chains

Lubricate all chains at intervals to maintain freedom at every chain link joint. Use a multipurpose spray lubricant on chains, because it penetrates into the rollers on the chain. Spray chains if planter is going to be idle to prevent the chains from rusting and becoming stiff. Stiff chains will cause metering inaccuracies.

Type of Lubrication: Multipurpose Spray Lube

Section 8 Options



Marker Attachment

The Pull-Type Planter Marker is a center ground marking disk unit which can be mounted on either the right or left side of the planter or both. When mounted on both ends, the controls can be on separate hydraulic circuits or, by the means of sequence valve, alternate activation between markers from a single hydraulic circuit.

For additional information refer to:

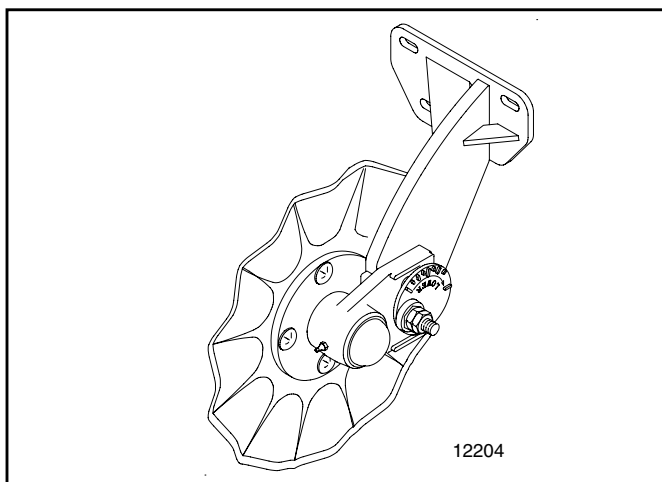
For additional information refer to:

- “Important Safety Information” on page 1
- “Section 1 Assembly and Setup” on page 10
- “Section 2 Planter Operation” on page 13
- “Section 4 Adjustments” on page 23
- “Section 6 Troubleshooting” on page 42
- “Section 7 Maintenance and Lubrication” on page 45

Marker Bundles

6 Row 30” Pull-Type Planter Marker

8 Row 30” Pull-Type Planter Marker



Coulter Option

The Unit Mount Coulter Option mounts on the row units with a cam-operated depth adjustment. The coulter tills a narrow strip immediately ahead of the openers.

For additional information refer to:

- “Section 4 Adjustments” on page 23
- “Section 7 Maintenance and Lubrication” on page 45

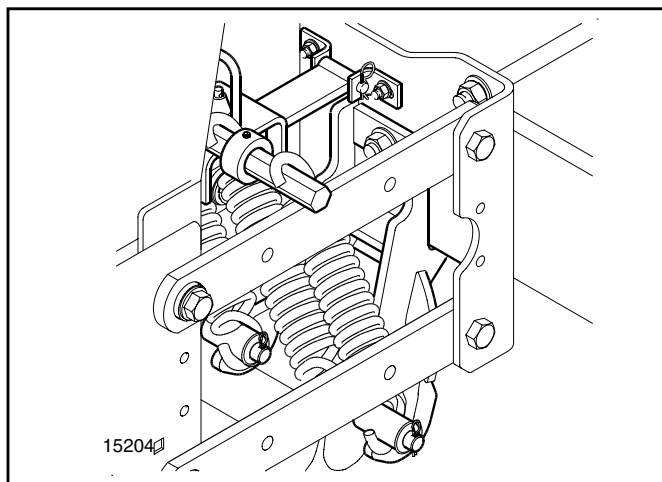
Coulter Bundles

5/8” Wavy Coulter

3/4” Wavy Coulter

Turbo Coulter

Section 8 Options



Spring Package

The optional spring package enables opener down pressure to be adjusted from 100 lbs. to 400 lbs. per row.

For additional information refer to:

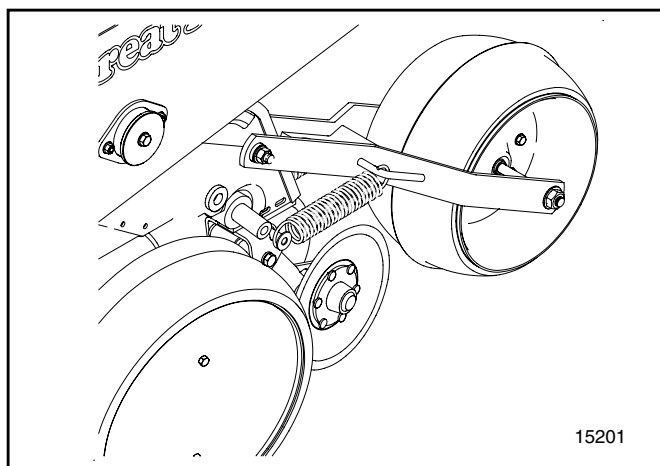
- “Section 4 Adjustments” on page 23
- “Section 6 Troubleshooting” on page 42

Spring Bundles

Light Duty Springs

Medium Duty Springs

Heavy Duty Springs

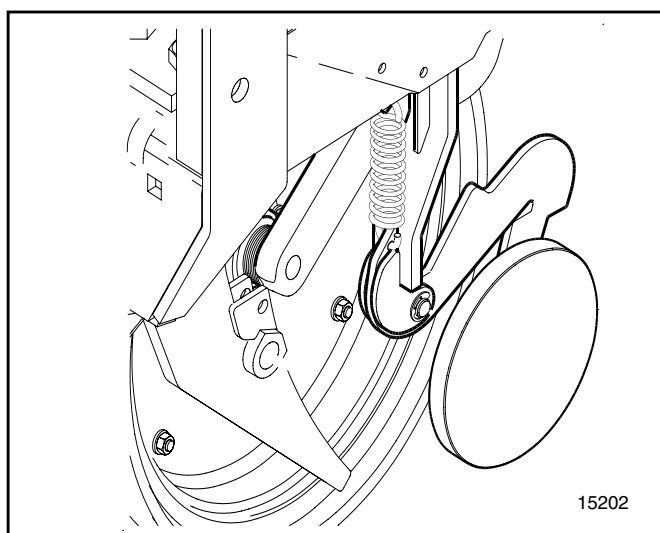


6.5 x 12 Press Wheel w/Closing Disk

The single 6.5 x 12 chevron wheel comes with two closing disks.

For additional information refer to:

- “Section 4 Adjustments” on page 23



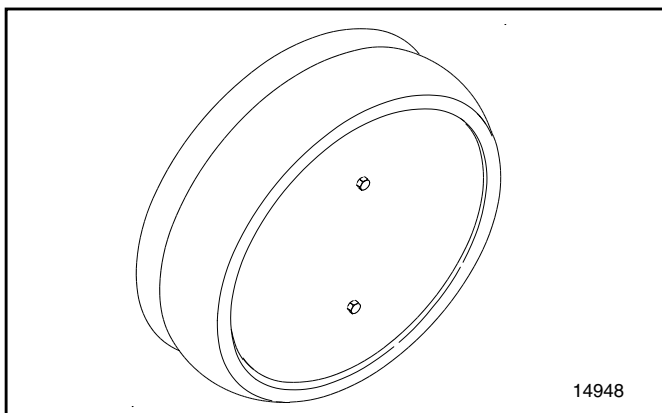
Seed Lok

The optional spring loaded Seed-Lok TM Firming wheel presses the seed directly into the bottom of the soil groove for the very best contact between soil and seed. Each seed is securely firmed into the bottom of the V-slot. The result is even emergence, since seeds are planted and firmed at the same depth.

For additional information refer to:

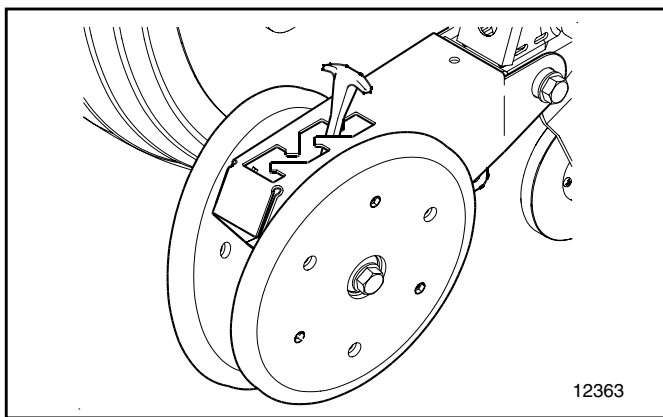
- “Section 4 Adjustments” on page 23

Section 8 Options



16" Wheel Cover

Helps keep soil and stones from being flipped up into the chains and sprockets.



1 x 12 Closing Wheel

The 1x12 Closing Wheel Press Wheel Option has a "T" handle pressure adjustment.

For additional information refer to:

- "Section 4 Adjustments" on page 23



Liquid Fertilizer Option

The fertilizer option is a complete system which allows you to band liquid fertilizer on either 6 rows or 8 rows. The 6 row option contains two 150 gallon liquid tanks and the 8 row option contains two 200 gallon liquid tanks. Also included are mounts, an eight row squeeze pump, a squeeze pump drive wheel, 6 or 8 fertilizer coulter coil tine injection kits, and the plumbing hardware to tie all the components together.

The squeeze pump features a heavy duty cast iron body to hold it true when mounted on equipment that has to flex over rough terrain. The floating aluminum alloy back plate provides a positive shutoff when the pump stops.

For additional information refer to:

- "Important Safety Information" on page 1
- "Section 2 Planter Operation" on page 13
- "Section 4 Adjustments" on page 23
- "Section 5 Adjusting Planting Rates" on page 28
- "Section 7 Maintenance and Lubrication" on page 45

Liquid Fertilizer Option Bundles

6 Row 30" Liquid Fertilizer Van I

8 Row 30" Liquid Fertilizer Van I

6 Row 30" Liquid Fertilizer Van II

8 Row 30" Liquid Fertilizer Van II

Section 8 Options



Insecticide Option

Insecticide & Herbicide Option

Chemical hoppers of 70 lbs/row capacity can be split to hold 35/35 lbs. insecticide and herbicide. Use the 7" band in front of the closing wheels or place insecticide directly in the furrow. Use the 7" or 14" band directly behind the closing wheels for herbicide application.

For additional information refer to:

- "Important Safety Information" on page 1
- "Section 3 Row Unit Operation" on page 19
- "Section 5 Adjusting Planting Rates" on page 28
- "Section 7 Maintenance and Lubrication" on page 45



Insecticide Option Bundles

- 1 x 12 Insecticide in Furrow
- 6.5 x 12 Insecticide in Furrow
- 1 x 12 Insecticide 7" Diffuser

Insecticide & Herbicide Option Bundles

- Insecticide Furrow & Herbicide 7" 1 x 12
- Insecticide Furrow & Herbicide 7" 6.5 x 12
- Insecticide Furrow & Herbicide 14" 1 x 12
- Insecticide Furrow & Herbicide 14" 6.5 x 12
- Insecticide 7" & Herbicide 7" 1 x 12
- Insecticide 7" & Herbicide 14" 1 x 12

Dry Fertilizer Option

The dry fertilizer option can carry 275 pounds of dry fertilizer per row.

For additional information refer to:

- "Section 5 Adjusting Planting Rates" on page 28

Dry Fertilizer Option Bundles

- Dry Fertilizer Bundle 6-30
- Dry Fertilizer Bundle 8-30

Section 9 Specifications and Capacities

Section 9 Specifications and Capacities

6 - Row 30"	Without Markers	With Markers
Frame	7" sq. 5/16" Wall	7" sq. 5/16" Wall
9.5L X 15 gauge Wheels	4	4
Planter Width	15'	16'
Planter Height (in planting position)	4'	5'
Planter Length	6'	6'
Shipping Weight (with fertilizer option)	4600 lbs.	5000 lbs.

8 - Row 30"	Without Markers	With Markers
Frame	7" sq. 3/8" Wall	7" sq. 3/8" Wall
9.5L X 15 Drive gauge Wheels	2	2
Planter Width	20'	21'
Planter Height (in planting position)	4'	5'
Planter Length	6'	6'
Shipping Weight (with fertilizer option)	6475 lbs.	6875 lbs.

Row Unit Equipment

Standard

2 bu. Seed Hopper (Standard with corn Meter)

Double disk staggered Openers

4" x 16" Gauge tires

Light Down Pressure Springs

Optional

80 lbs. Insecticide/Herbicide Hopper with 7" & 14" Diffusers

1 x 12 Double "V" Press Wheels

Closing Disks with 6 1/2" x 12" Press Wheels

Medium & Heavy Down Pressure Springs

5/8" & 3/4" Wavy Coulters

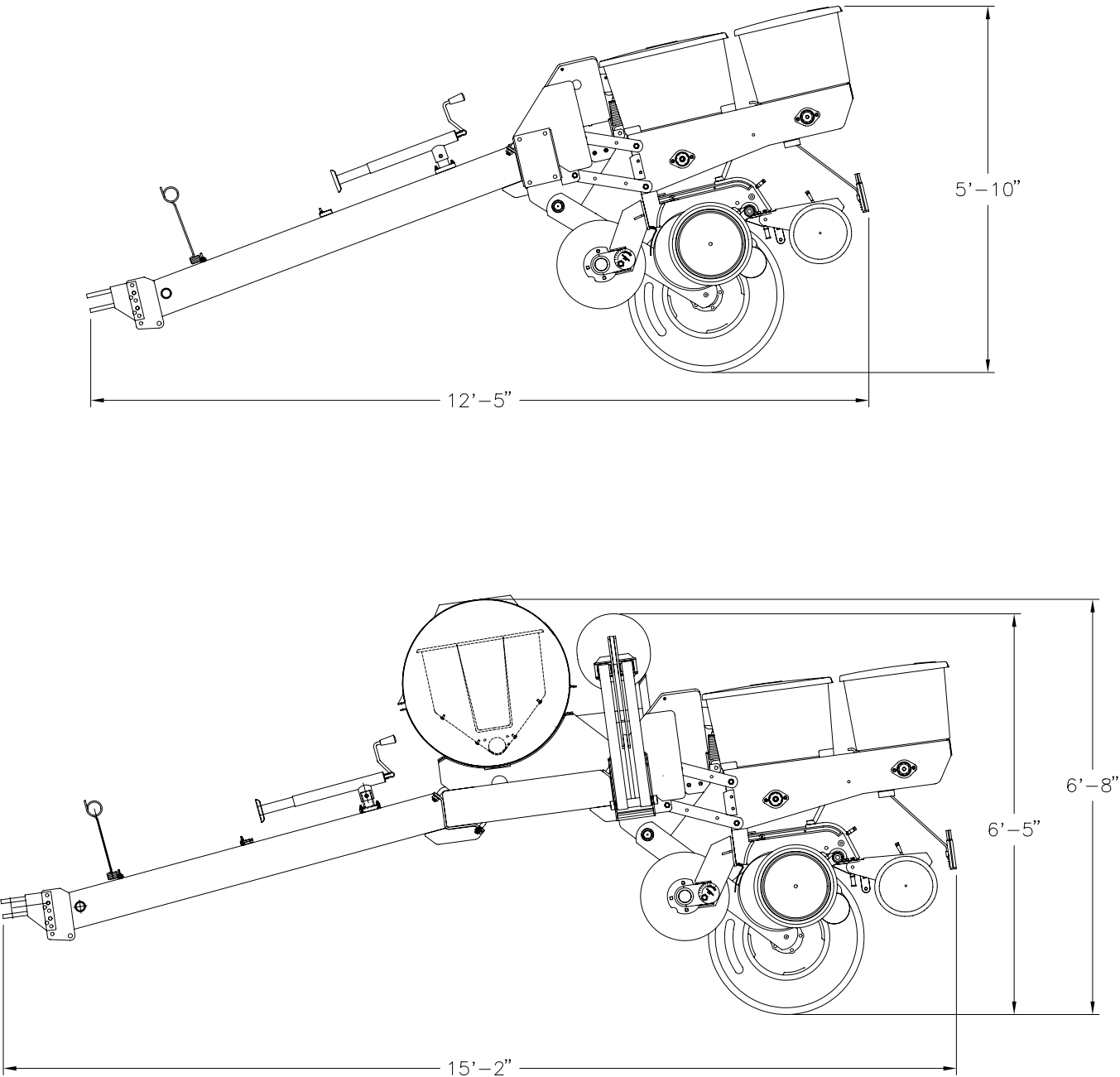
16" Wheel Covers

Seed Lok

Liquid Fertilizer

Dry Fertilizer

Section 9 Specifications and Capacities



Specification Drawing

14953S

Section 10 *Appendix*

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