





FERTILIZER APPLICATION EQUIPMENT

# **F1210 Fertilizer Spreader**

Operator's Manual (Originating w/Serial Number 90-101)

# L1230 Lime Spreader

**Operator's Manual (Originating w/Serial Number 91-101)** 

# **F810 Fertilizer Spreader**

**Operator's Manual (Originating w/Serial Number 105-101)** 



Model Number:	
Serial Number:	
Date of Purchase:	

### LOFTNESS SPECIALIZED EQUIPMENT, INC. LIMITED WARRANTY POLICY

The limited warranty policy begins upon delivery of the unit to the original customers.

The following Loftness products have a two (2) year limited warranty;

XLB10 Grain Bag Loader, Battle Ax L-series Skid Steer, Battle Ax S-series Skid Steer, Battle Ax H-series Skid Steer, Battle Ax Excavator 20-series, Battle Ax Excavator 30-series, Battle Ax Excavator 40-series, Battle Ax Excavator 50-series, Battle Ax Extreme, Bad Ax Skid Steer, Timber Ax Skid Steer, Stump Ax, BT20, Kwik Cut.

All other Loftness products have a one (1) year limited warranty.

If any Loftness product is used as rental or leased equipment the limited warranty period is for only 30 days from the delivery date to the original customers.

Loftness Specialized Equipment, hereinafter referred to as LOFTNESS, a manufacturer of quality machinery since 1956, warrants new LOFTNESS machinery and/or attachments at the time of delivery to the original purchaser, to be free from defects in material and workmanship when properly set up and operated in accordance with the recommendations set forth in the LOFTNESS Operator's Manual.

LOFTNESS' liability for any defect with respect to accepted goods shall be limited to repairing the goods at an authorized dealer or other LOFTNESS designated location, or replacing them as LOFTNESS shall elect. The above shall be in accordance with LOFTNESS warranty adjustment policies.

#### WARRANTY REQUIREMENTS

**Warranty registration form must be filled out and returned to Loftness Specialized Equipment to validate all warranty claims.** To receive a warranty claim, a return authorization from LOFTNESS must be obtained. The failed part may then be returned in an untampered status. This warranty does not include freight or delivery charges incurred when returning machinery for servicing. Dealer mileage, service calls and pick-up/delivery charges are the customer's responsibility.

#### LIMITATIONS OF WARRANTY

LOFTNESS products are designed to provide years of dependable service when proper use and maintenance is adhered to. The potential for misuse in many applications exists; therefore, a limited warranty is provided as follows.

This warranty shall not apply to any machine or attachment which shall have been repaired or altered outside the LOFTNESS factory or authorized LOFTNESS dealership or in any way so as in LOFTNESS' judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor to any machine or attachment which shall not have been operated in accordance with LOFTNESS' printed instructions or beyond the company recommended machine rated capacity. LOFTNESS may elect to have an area representative evaluate the condition of the machine before warranty is considered.

In addition, this limited warranty provides no coverage for general wear or maintenance items, misuse, environmental conditions and/or contamination for which they were not designed or not intended, including but not limited to the following items;

Use of machine beyond its rated capacity, Conveyors, Improper knife replacement, Auger wear, Missing knives, Saw blades, Striking foreign objects, Brakes and brake pads, Lack of lubrication, Tires, Failures caused by running in an "out-of-balance" condition, Hydraulic hoses damaged by being caught in "pinch points" or by moving parts, and Damage caused by excessive force from the power unit.

#### **EXCLUSIONS OF WARRANTY**

Except as otherwise expressly stated herein, LOFTNESS makes no representation or warranty of any kind, expressed or implied. **The implied warranty of merchantability and fitness for a particular purpose are excluded from this limited warranty.** The remedies set forth in this warranty are the only remedies available to any person under this warranty. LOFTNESS shall have no liability to any person for incidental, consequential or special damages of any description, whether arising out of express or implied warranty or any other contract, negligence, or other tort or otherwise. This exclusion of consequential, incidental and special damages is independent from and shall survive any finding that the exclusive remedy failed of its essential purpose. Upon purchase, the buyer assumes all liability, all personal injury and property damage resulting from the handling, possession or use of the goods by the buyer.

No agent, employee or representative of LOFTNESS has any authority to bind LOFTNESS to any affirmation, representation or warranty concerning its machinery and/or attachments except as specifically set forth herein. (August 2023)



#### Warranty

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#### **Ordering Code**

#### Spreader (Example)

The ordering code will consist of a letter with four numbers (Model), one number or letter (Spread Width), one letter or number (Tire Size), one letter (Apron Drive), one letter (Spinner Drive), one number or letter (Steering, Scale, and Brake Options), and a series of letters and/or numbers (Machine Options). An example of a spreader ordering code is shown below.

Example: $F8104BWH9.TRGM$	
B C D E F C	
<ul> <li>SPREAD WIDTH</li> <li>4 = 40 ft. Driving Interval</li> <li>5 = 50 ft. Driving Interval</li> <li>6 = 60 ft. Driving Interval</li> <li>B = 66 ft. Driving Interval</li> <li>C = 72 ft. Driving Interval</li> <li>8 = 80 ft. Driving Interval</li> <li>A = 88 ft. Driving Interval</li> <li>9 = 90 ft. Driving Interval</li> </ul>	
Image: Walking Tandem       K = 14L-16.1 Flotation Tire     Walking Tandem       L = 19L-16.1 Flotation Tire     61"-105" Wheel Center       M = VF385/65R22.5 Radial Implement     61"-105" Wheel Center	
D = 320/90R50 Lugged Tire (Singles Only)Row CropB = 380/90R46 Lugged Tire (Singles Only)11.25BC HubC = 480/80R42 Lugged Tire (Singles Only)80"-150" Wheel CenterN = No Tires - 10 on 11.25 BC (Singles Only)80"-150" Wheel Center	
4         = 320/90R50 Lugged Tire (Dual Ready)         Row Crop           2         = 380/90R46 Lugged Tire (Dual Ready)         13.189BC Hub           R         = 480/80R42 Lugged Tire (Singles Only)         13.189BC Hub           F         = 710/70R38 Lugged Tire (Singles Only)         60"-144" Wheel Center           H         = No Tires - 10 on 13.189 BC (Singles Only)         60"-144" Wheel Center	
<ul> <li>APRON DRIVE         <ul> <li>A = Hydraulic Drive Raven 47 Pin - Variable Rate Ready w/ Spinner Sensor (Two Section)</li> <li>K = Hydraulic Drive Ag Leader - Variable Rate Ready w/ Spinner Sensor</li> <li>M = Mechanical Ground Drive (MGD) w/ Hydraulic Shut Off (Requires Spinner Drive Code "H")</li> <li>T = Hydraulic Drive ISO Ready - Variable Rate Ready w/Spinner Sensor</li> <li>U = Hydraulic Drive ISO Ready - Variable Rate Ready w/Spinner Sensor (Two Section)</li> <li>W = Hydraulic Drive Raven 22 Pin - Variable Rate Ready w/Spinner Sensor (Requires Spinner Drive Code "H")</li> <li>X = Hydraulic Drive Raven 37 Pin - Variable Rate Ready w/Spinner Sensor</li> <li>Y = Hydraulic Drive Raven 37 Pin - Variable Rate Ready w/Spinner Sensor (Two Section)</li> <li>Z = Hydraulic Drive Raven 47 Pin - Variable Rate Ready w/Spinner Sensor (Two Section)</li> </ul> </li> </ul>	
SPINNER DRIVE     H = Hydraulic Spinner Drive (HSD) - Fixed Speed     C = Controlled Spinner Drive (CSD) - Compensated Speed - Requires VRR	
<ul> <li>STEERING/SCALE/BRAKES</li> <li>8 = Non-Steerable - No Scale - No Brakes (Dual Ready)</li> <li>9 = Non-Steerable - 4pt Scale - No Brakes (Dual Ready)</li> <li>2 = Non-Steerable - No Scale - 2 Brakes (Walking Tandem Only) (Requires Tire Code "J"-"M")</li> <li>3 = Non-Steerable - 4pt Scale - 2 Brakes (Walking Tandem Only) (Requires Tire Code "J"-"M")</li> <li>4 = Non-Steerable - No Scale - 4 Brakes (Walking Tandem Only) (Requires Tire Code "J"-"M")</li> <li>5 = Non-Steerable - 4pt Scale - 4 Brakes (Walking Tandem Only) (Requires Tire Code "J"-"M")</li> <li>D = Steerable - 4pt Scale - No Brakes (Dual Ready)</li> </ul>	
GOPTIONS       3 = 380/90R46 (14.9R46) Lugged Tire - 20" Spacing (Requires Tire Size Code "2")       Row Crop         2 = 380/90R46 (14.9R46) Lugged Tire - 22"/30" Spacing (Requires Tire Size Code "2")       5 = 320/90R50 (12.4R50) Lugged Tire - 20" Spacing (Requires Tire Size Code "4")       Dual Tires         4 = 320/90R50 (12.4R50) Lugged Tire - 22"/30" Spacing (Requires Tire Size Code "4")       Dual Tires	
<ul> <li>T = Tarp (Installation not Included)</li> <li>E = Extensions, 11.25" (Installation not Included)</li> <li>I = Raven ISO CAN Node (Requires Apron Drive Code "T")</li> <li>J = JD GS2 Rate Controller Dry Ready (Requires Apron Drive Code "T")</li> <li>R = Raven SCS660 Rate Controller and Row Crop Tractor Harness (Requires Apron Drive Code "W")</li> <li>G = GPS Speed Sensor (Requires Apron Drive Code "W")</li> <li>D = Spinner RPM Display (Requires Apron Drive Code "M")</li> <li>M = Scale Monitor (Requires Scale Code "3", "5", "9", or "D")</li> <li>L = Ladder</li> </ul>	



### **Owner Information**

To ensure maximum performance of this product, it is mandatory that you thoroughly study the owner's manual and follow its recommendations. Proper operation and maintenance are essential to prevent injury or damage and to maximize machine life.

**NOTE:** This manual provides setup, operation, and maintenance instructions for three Loftness spreader models - the F810 Fertilizer Spreader, F1210 Fertilizer Spreader, and the L1230 Lime/Fertilizer Spreader. The instructions and information provided in this manual apply to all models unless specified by model number.

> Given the similarity between the three models, some images or drawings in the manual may portray one model, but pertain to all three models. In this case a note will be placed in the image showing which model is being shown to help clarify

# For service and replacement parts, use the machine ordering code. Refer to your model-specific parts book that accompanies this manual.

Operate and maintain this machine in a safe manner and in accordance with all applicable local, state, and federal codes, regulations and/or laws, and in compliance with on-product labeling and these instructions.

Make sure that all personnel have read this owner's manual and thoroughly understand safe and correct operating, installation, and maintenance procedures.

Continuous improvement and advancement of Loftness products may result in changes to your equipment that may not be reflected in this publication. Loftness reserves the right to make product improvements to the machine at any time. Although great care has been taken to ensure the accuracy of this publication, Loftness does not assume any liability for errors or omissions.

Loftness is not responsible for costs or damages caused by misapplication of fertilizers. It is the responsibility of the operator to assure that the fertilizer is applied uniformly and correctly over the application area.

### Warranty Policy

Be sure to read and understand the Warranty Policy at the beginning of this manual. It is also important that you fill out the Warranty Registration form(s) completely and return to Loftness so as not to void the warranty.

### **Serial Number Location**

Always use your model and serial number when requesting information or when ordering parts.

The images below show where the serial number tags (1) for each model are located.

**NOTE:** The serial number is also stamped (2) into the spreader adjacent to the serial tag.



### **Owner's Manual Access**



Each spreader is shipped with a printed owner's manual Keep in a safe, dry location.

To access a digital owner's manual and parts book, use a smart phone to scan the QR Code (1) located adjacent to the serial number tag. This code will link to the spreader owner's manual and parts book on the Loftness website.

#### Features

#### Hopper and Chassis

- Separate chassis, hopper, and drive
- Obstruction-free hopper interior
- Minimal flat surfaces
- 41 in. frame clearance (F1210, L1230) 40 in. frame clearance (F810)
- Hopper and components 409 stainless
- Frame 1/4 in. channel-formed steel
- Single bearing design
- Adjustable height hitch; 1/4 in. channel-formed steel

#### Axles (adjustable)

- 80 in. (203.2 cm) to 120 in. (304.8 cm) track setting (F1210, L1230)
- 80 in. (203.2 cm) to 150 in. (381.0 cm) track setting (F810)

#### Tires and Wheels

• Standard tires - 380/90R46 (14.9R46)

#### Integral Lights

- Sealed and rubber isolated lights; adjustable with breakaway feature; chassis-mounted
- Compliant with ASABE standard (S279.14)

#### Apron

- Hydraulic Drive single section
- Hydraulic Drive two section (F1210)
- Apron Chain 304 Stainless Steel (F1210, F810)
- 24 in. belt over 88C chain (L1230)
- Dual Apron Chains (F1210)

#### Spinners

- Hydraulic driven:
  - Hydraulic Spinner Drive (HSD)
  - Controlled Spinner Drive (CSD)
- Dual stainless steel spinners
- Spread patterns up to 90 ft.

#### **Options**

#### **Integral Scale Option**

- Four point scale system
- Extending Ladder

#### **Steerable Hitch**

Hydraulically-controlled; turnbuckle - standard

#### **Axle Extensions**

- Adjustable
- 60 in. (152.4 cm) to 152 in. (386.1 cm) wheel setting

#### **Tires and Wheel Options**

- Single tires 480/80R42 (18.4R42); 320/90R50 (12.4R50); or 710/70R38
- Dual tires 380/90R46 (14.9R46); or 320/90R50 (12.4R50) - 20 in., 22 in., or 30 in. spacing
- Flotation tires

#### **Roll Tarp**

 Optional (Contact your dealer for a hopper roll tarp.) Shur-Co.<sup>®</sup> or Agri-Cover<sup>®</sup> (Specify Loftness model).

### **Safety First**

Accidents can be prevented by recognizing the causes or hazards before an accident occurs and doing something about them. Regardless of the care used in the design and construction of this machine, there are some areas that cannot be safeguarded without interfering with accessibility and efficient operation.

### Safety Alert Symbol

This message alert symbol identifies important safety messages on the machine and in the owner's manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

In the owner's manual and on decals used on the machine the words **DANGER**, **WARNING**, **CAUTION**, **IMPORTANT**, and **NOTE** are used to indicate the following:

**DANGER:** This word warns of immediate hazards which, if not avoided, will result in severe personal injury or death. The color associated with Danger is RED.

**WARNING:** This word refers to a potentially hazardous situation which, if not avoided, could result in severe personal injury or death. The color associated with Warning is ORANGE.

**CAUTION:** This word refers to a potentially hazardous or unsafe situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

**IMPORTANT:** Highlights information that must be heeded.

**NOTE:** A reminder of other related information that needs to be considered.

If Safety Decals on this machine are ISO two panel pictorial, decals are defined as follows:

- The first panel indicates the nature of the hazard.
- The second panel indicates the appropriate avoidance of the hazard.
- Background color is YELLOW.
- Prohibition symbols such as  $\bigotimes X$  and som if used, are RED.

Be certain all machine operators are aware of the dangers indicated by safety decals applied to the machine, and be certain they follow all safety decal instructions. Contact Loftness for safety decal replacement.

Loftness cannot anticipate every possible circumstance that may involve a potential hazard. The warnings in this owner's manual are not all inclusive.

#### **Owner's Responsibility**

Operate and maintain this machine in a safe manner and in accordance with all applicable local, state, and federal codes, regulations and/or laws and in compliance with on-product labeling and this owner's manual instructions.

Make sure that all personnel have read this owner's manual, and thoroughly understand safe and correct installation, operation and maintenance procedures.

Make sure the machine is assembled and installed correctly before being placed in service. At regular intervals thereafter, the machine should be serviced in accordance with procedures outlined in this owner's manual.

Fulfill all warranty obligations so as not to void the warranties. The warranty policy included in this manual outlines the warranty policy of Loftness.

### Safety Rules

These are general safety considerations. Additional precautions may be necessary to operate your machine in a safe manner. Be certain you are operating your machine in accordance with all safety codes, OSHA rules and regulations, insurance requirements and local, state, and federal laws.

#### **Operating Safety**

- Do not allow anyone to operate the machine until he or she has read the owner's manual and is completely familiar with all safety precautions.
- Do not allow inexperienced persons unfamiliar with the machine, or unfamiliar with safe operating and maintenance procedures, to operate or maintain the machine.
- Do not allow persons under the influence of alcohol, medications, or other drugs that can impair judgment or cause drowsiness to operate or maintain the machine.
- Keep children, bystanders and other workers away from the machine while it is operating. No riders allowed.
- The machine requires an operator at all times. Never leave the machine running and unattended.
- Do not wear loose hanging clothes, neckties or jewelry. Long hair is to be placed under a cap or hat. These precautions will help prevent you from becoming caught in any moving parts on the machine.
- Do wear safety glasses, ear protection, respirators, gloves, hard hats, safety shoes and other protective clothing when required.
- The spreader should not be used to handle materials other than those which were specified as part of its design. It is the operator's responsibility to be aware of the specifications and operate the spreader accordingly.
- It is the operator's responsibility to be aware of machine operation and work area hazards at all times.

- Operators are responsible to know the location and function of all guards and shields including but not limited to chain drives, aprons/conveyors, spinners and are responsible to make certain that all guards are in place when operating the machine.
- Operators are responsible to be aware of safety hazard areas and follow instructions on warning, caution, or danger decals applied to the machine.
- Know the area before operating the machine. Be aware of power lines or other equipment. Watch for adequate overhead clearance.
- Always have an operator in the tractor while the machine is in operation.

#### **Transporting Safety**

- Be sure the machine is in the transport position before transporting on a roadway.
- Do not exceed speed rating shown on the factory provided tires, or 30 MPH, whichever is greater. Refer also to *"Tire Inflation" on page 49* for tire pressure(s) while transporting.
- Machine has high center of gravity. Exercise caution when pulling on slopes. Reduce speed while turning.

#### **Maintenance Safety**

- Do not allow inexperienced persons unfamiliar with the machine, or unfamiliar with safe operating and maintenance procedures, to operate or maintain the machine.
- Do not allow persons under the influence of alcohol, medications, or other drugs that can impair judgment or cause drowsiness to operate or maintain the machine.
- Make sure the operator's area is clear of any distracting objects. Keep work areas clean and free of grease and oil to avoid slipping or falling.
- Periodically check all guards, shields and structural members. Replace or repair anything that could cause a potential hazard.
- Periodically check all hoses, hose connections and electrical wiring. Replace or repair anything that could cause a potential hazard.

### Safety Rules (Cont'd)

#### Maintenance Safety (Cont'd)

- Do not replace components or parts with other than factory-recommended service parts. To do so may decrease the effectiveness of the machine.
- Do not lubricate parts while the machine is running.
- Do not smoke while servicing the machine.
- Never attempt to make any adjustments while the tractor engine is running or the key is in the "ON" position in the tractor. Before leaving the operator's position, disengage power to the machine and remove ignition key.

#### Hydraulic Safety

- The hydraulic system is under high pressure. Make sure all lines and fittings are tight and in good condition. These fluids escaping under high pressure can have sufficient force to penetrate skin and cause serious injury.
- Never check for leaks by using any part of your body to feel for escaping fluid.
- Always use a piece of wood to check for leaks.

**WARNING:** Contact with high pressure fluids may cause fluid penetration and burn hazards. Fluid that is under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. If fluid is injected into the skin, seek medical attention immediately!

#### **Chemical Fertilizer Safety**

- Always read the label before using chemical fertilizers. Follow manufacturer's instructions for use and handling. Also follow label directions and recommendations on keeping fertilizer residue on edible parts of plants within limits permitted by law.
- Wear personal protective equipment (PPE) when handling chemical fertilizers, such as safety glasses or face shield, respirators, proper clothing, and rubber gloves.
- Wash hands, face, and clothing after handling and spreading.

- Do not spill chemical fertilizers on skin or clothing. In case of a spill, remove contaminated clothing and wash skin and clothing thoroughly with soap and water.
- Avoid inhaling chemical fertilizers.
- Do not smoke when handling chemical fertilizers.
- Cover food and water containers when spreading around livestock or pet areas.
- Keep bystanders away while spreading fertilizer.
- The spreader should be completely emptied of chemical fertilizer, all residue removed, and washed with clean water before servicing.
- If symptoms of illness occur during or after handling and/or spreading chemical fertilizers, contact a physician immediately.
- Store chemical fertilizer in a locked, secure space away from food and animal feed. Do not store inside of the home.
- Keep chemical fertilizers away from children, pets, and unauthorized personnel.
- Store chemical fertilizers in their original containers and securely closed. Be sure to read fertilizer manufacturers storage recommendations.
- Dispose of empty fertilizer containers according to manufacturer's instructions.

### California Proposition 65 Warning

**WARNING:** This product can expose you to Mineral Oil, which is known to the State of California to cause cancer. For more information, go to www.p65warnings.ca.gov.

A decal with this warning statement is adhered to the machine. If the decal should become worn or missing, replace immediately.

### **Safety Instructions**

### F1210 Fertilizer Spreader Identification





#### L1230 Lime Spreader Identification

### **Safety Instructions**

### F810 Fertilizer Spreader Identification



### **Safety Instructions**

### **Safety Decal Locations**

Check and replace any worn, torn, hard to read or missing safety decals on your machine.

**NOTE:** This section shows where safety-related decals are applied on the machine. Refer to the Parts Book for all other decals.





Part No. N35391









Part No. N35383



Part No. N105404



Part No. 203264



#### **Preparation for Use**

Before putting the spreader into operation make sure the machine has been properly adjusted and the spread pattern has been determined.

- **IMPORTANT:** Read and thoroughly understand the contents of the operator's manual before operating.
- Visually inspect the spreader for damage or missing parts. Contact your Loftness dealer if any parts need replacing.
- Remove protective cover on Slow Moving Vehicle sign on upper rear of the spreader.
- Check the machine for loose bolts. Check bearings, chain tensions, and sprocket set screws.
- Check wheel lugs for tightness.
- Check tire pressure.
- Ensure apron clears frame/return trough. Avoid excessive contact with any part of the frame.
  - **L1230** There should be sag in the belt having slight contact with the return trough approximately 18 in. (45.75 cm) back from the front apron sprocket.
  - **F1210, F810 -** The apron chain should clear the front cross member by 3/4 in. 1 in. (1.9 cm 2.54 cm). Only tighten the apron when it touches the front cross member.
- Perform a test pattern.
- **IMPORTANT:** Before placing product into the spreader, test run the spreader to ensure all functions are operating correctly.
- **IMPORTANT:** A spread pattern test is critical to ensure even application of product. Perform a spread pattern test with intended product and rates before placing the spreader into service. Refer to the Spread Pattern Test section beginning on page 35.

### **Adjusting Track Width**

Safely raise the machine up so the tires are off of the ground and can easily be moved.

**WARNING:** To avoid serious injury or death, do not walk or sit underneath the spreader while it is being lifted.

Carefully place blocks under the frame and tongue to support the spreader.

**NOTE:** When placing blocks under the axles, do not obstruct access to the axle set bolts/jam nuts (1).



Loosen all set bolts (1) and jam nuts (2) - six per axle.



Attach end of tape measure to notch in center of the chassis (3) and extend out to center of right tire to see the current half-track dimension.

**NOTE:** Wheels can also be set with distance from hub to frame.

Slide wheel in or out to desired setting. This will be half of the track width.

(Procedure continued on following page.)

### Adjusting Track Width (Cont'd)

- **IMPORTANT:** After a track width adjustment, check the tightness of the set bolts and jam nuts after the first 20 minutes of operation. Recheck after 1 hour, and then 10 hours of operation.
- **IMPORTANT:** The center of the frame to the center of the tire can not exceed 60 in. (152.4 cm). Track width for the factory-supplied tires cannot exceed 120 in. (304.8 cm) (center of tire to center of opposite tire). Refer to the chart below for a guide.

For the wide axle option, the center of the frame to the center of the tire can not exceed 76 in. (193.04). Track width for the factory-supplied tires cannot exceed 152 in. (386.08 cm) (center of tire to center of opposite tire).

Hub Distances/Wheel Spacing						
Tread Center (in.)	Dished	Hub to Hub (in.)	Hub to Frame (in.)			
60	In	67.5	14.75			
72	In	79.5	20.75			
76	In	83.5	22.75			
70	Out	67.5	14.75			
80	In	87.5	24.75			
80	Out	71.5	16.75			
88	In	95.5	28.75			
00	Out	79.5	20.75			
120	Out	111.5	36.75			
132	Out	123.5	42.75			
144*	Out	135.5	48.75			
152*	Out	143.5	52.75			
160*	Out	151.5	56.75			
Frame to Hub Hub to Hub						

**NOTE:** Spreaders shipped with duals have the wheels installed **"dished in"**.

Spreaders shipped **without** duals have the wheels installed "**dished out**".

\* Requires long axle.

Hand tighten the set bolts for the right wheel axle and then recheck measurement to ensure desired setting is still accurate.



Ensure the axle tube is seated properly as shown above. This allows proper tightening of axle set bolts/jam nuts. (right side of spreader is shown).

#### Repeat the procedure for the left side wheel/axle.

**IMPORTANT:** Make sure the dimension from center of the frame to the center of the left wheel is exactly the same as that of the right wheel.

When new track width has been set, tighten all of the set bolts (6 per axle) to 175 ft./lbs. (237.26 Nm).

Tighten all jam nuts.

Raise spreader slightly and remove blocks.



**WARNING:** To avoid serious injury or death, do not walk or sit underneath the spreader while it is being lowered.

Lower the spreader to the ground.

#### **Dual Wheels**

Spreaders with hubs having the 10 on 13.189 in. bolt circle can be equipped with dual wheels. Common row spacing can be attained through different combinations of wheel offsets and hub extensions as shown below.



Row spacings of 20 in. and 22 in. are accomplished by utilizing extensions (20 in. or 22/30 in.) and dishing both wheels in on the machine. Row spacing of 30 in. requires dishing wheels opposite of one another. All wheels should be mounted so chevron points down when viewed while standing behind the machine.

#### **Adding Dual Wheels**

Safely raise and stabilize the spreader.



**WARNING:** To avoid serious injury or death, do not walk or sit underneath the spreader or wheels while they are being raised.

Start with either left or right side wheel. Loosen and remove the 10 wheel nuts on the current single-wheel configuration.

Install the hub extension onto the wheel studs and then install the wheel nuts. Hand tighten.





Torque the wheel nuts to 450 ft./lbs. using the criss-cross pattern shown above to evenly pull wheel tight against the hub.

Determine which wheel spacing will be used - either 20 and 22 in. center; or 30 in. center. Refer to the illustration on the previous page for the wheel rim orientation when adding the dual wheel.

Safely raise the dual wheel and align the holes on the hub extension to the holes on the dual wheel. Install all 10 wheel bolts with the bolt head facing in, towards the spreader. Install all wheel nuts and hand tighen.

Torque all wheel bolts to 450 ft.-lbs. using the same tightening sequence as the inside wheel (see illustration above).

Repeat the procedure to add the dual wheel to the opposite side of the spreader.

Check torque after 1 hour, and then 10 hours after operation.

### **Repositioning Breakaway Lights**

If the track width has been adjusted a significant amount, the breakaway lights should be moved in or out to reflect that change. There are three available locations on the frame bracket where the light bracket can be positioned.



To reposition the breakaway lights, remove bolt (1), nut (2) and spring (3) from the pivot hole.

Lift light bracket (4) off. Remove stop/detent carriage bolt (5) and nut (6).

Adjust so the outer light is within 16 in. (40.6 cm) of the outside of the tire, or the widest portion of the machine in transport mode. Determine the new position of the light bracket by aligning the holes in the light bracket to the appropriate set of position holes in the bracket frame (7). The carriage bolt keeps the bracket in the operation position.

**IMPORTANT:** See "Lights, Breakaway" in the Parts Book for extensions that can be added to the light bracket when dual wheels are added.

Reinstall carriage bolt and nut before securing light bracket. Then reinstall bolt, nut, and spring into the new pivot hole and secure.

Repeat procedure on opposite light bracket using the same alignment hole positions.

### **Monitors/Controllers**

Install controller/monitor in cab. Consult tractor manual to determine locations for mounting monitors and controllers.

Connect controllers and monitors to keyed switch power. Consult tractor manual for sources of keyed switch power. If keyed switch power is not available, constant 12V power may be used.

**IMPORTANT:** Monitors and Controllers that have power supplied via constant 12V power will not turn off with tractor key. Turn off monitor when tractor is not running.

#### **Connecting Spreader**





**WARNING:** Never use a clevis hitch with a drawbar hammer strap to secure the implement to the tractor. Using a clevis hitch with the drawbar hammer strap could result in machine damage and/or the machine could separate from the tractor if the clevis pin fails; serious injury and/or death may result.

**WARNING:** Never use a hitch without a clevis on a straight drawbar. Using a hitch without a clevis on a straight drawbar could result in machine separating from tow vehicle and/or damage to the machine; serious injury and/or death may result.

(Procedure continued on following page.)

#### **Connecting Spreader (Cont'd)**

#### For tractors with hammer strap:

Configure the hitch so the pocket in the base is facing up.

Base and wedges can be added to limit hitch play.

**NOTE:** Contact your dealer to purchase the required components to install base and wedges.



Configure the hitch so the pocket in the base is facing up. To reduce hitch play assemble hitch components as shown above – base top plate (1), block (2), cushions (3), and flat washer (4), lock washer (5), and bolt (6).

See table below for maximum pin draw size.

Category	Maximum Pin Size
2	1.5 in.
3	1.5 in.
4	2.00 in.

**NOTE:** Items 1 through 6 can be ordered separately from the dealer.

Machines are factory-shipped with a Category 3 hitch. Contact your dealer to order other sizes.

#### For tractors without hammer strap:

Configure the hitch to use the clevis. Follow the procedure below.



**NOTE:** Clevis must be used with base.

Pocket in base to be down. Assemble hitch components as shown above – base (1) clevis (2), bolt (3), lock washer (4), and nut (5)

The maximum draw pin size is 1.375 in.



Adjust bolts (1) on the clevis (if necessary) to be level as possible with the tractor drawbar height.

Connect to the tractor and install an approved hitch pin for the load, securing hitch pin with a safety locking pin.

Connect the safety chains (2) to the tractor.

Remove the jack (3) and secure in the storage position (4).

### Set-up and Operation

### **Connecting Spreader (Cont'd)**

#### **Controller/Monitor Connections**

Connect the controller harness on the spreader to the mating harness on the tractor.

For spreaders equipped with scale, connect scale harness to scale display.

#### Scale Set-up and Calibration

Spreaders equipped with the factory-installed four-point scale use the Digi-Star<sup>®</sup> GT 400 weight system. Use the numbers provided below during initial setup.

#### Setup Number: 146052 Calibration Number: 32960

Refer to the scale operator's manual if any refinement or adjustments are needed for setup, calibration, and operation of the scale system.

#### Wiring Connections

Connect the spreader wiring connector to the tractor using the provided 7-pin round connector.

#### **Hydraulic Connections**

Connect the spreader's hydraulic hoses to the tractor's hydraulic system. Hydraulic hoses are color-coded and marked with corresponding "TANK" or "PRESSURE" decals.

White - Spinners Red - Apron(s) Yellow - Steerable hitch (if equipped)



**IMPORTANT:** For models with the steerable hitch, remove both cylinder stops (1). Store the cylinder stops in a secure location.

The steerable hitch must only be employed when ground speeds are less than 12 MPH (19.3 km/h). If ground speeds exceed that amount, DO NOT REMOVE the cylinder stops!

### **Setting Tractor Hydraulics**

#### For Spinners and Apron Drive

- 1. Ensure hydraulic hose connections have been made. See *"Hydraulic Connections"* on page 18 for color-coded labeling.
- 2. Set hydraulics to continuous flow.
- 3. Determine if your tractor is equipped with an opencenter or closed-center hydraulic system.



4. If the tractor has an open-center system, rotate the knobs (1 - spinner drive; and 2 - apron drive) fully counter-clockwise until stop is reached to open the valve.

If the tractor has a *closed-center system*, rotate the knobs (1 and 2) fully *clockwise* until stop is reached to close the valve.

- **NOTE:** For the F1210 models with two-section spreading, only the knob on the right side manifold will need to be adjusted. DO NOT adjust the knob on the left side manifold.
- 5. If the tractor is equipped with an open-center system, set the tractor hydraulic flow to maximum.
- 6. Set the controller to "TEST" mode.
- 7. Set the speed to 15 MPH.

- 8. Set the rate to 1,000 lbs. or highest anticipated application speed.
- 9. Decrease the tractor hydraulic flow until the apron slows. Then slightly increase tractor flow.
- **IMPORTANT:** This is done to reduce the amount of bypass oil.
- 10. Exit the Test mode on the controller.

### **Determining Product Density**



Determine the fertilizer density using the scale provided with your spreader following these instructions.

- 1. Fill canister gently to the top with material to be spread.
- 2. Support by the ring.
- 3. Level beam.
- 4. Read pounds per cubic feet at the center of weight.

NOTE: Instructions are also written on the density scale.

**NOTE:** A density scale is provided with the spreader and is secured to the manual holder during shipping.

### **Scale Operation**

Spreaders factory-equipped with a scale system are capable of determining weight of product added to the hopper, or applied on the field.

Refer to the owner's/operator's manual that accompanies the scale head for operating instructions, and for directions on how to reset the scale before operation.

If you choose to use other scale hardware/software other than what is provided by Loftness, refer to that manufacturer's manual for instructions.

**NOTE:** For base model owners, if you would like to upgrade your spreader with a scale kit contact your Loftness dealer.

### Setting the Metering Gate Opening

The metering gate opening, along with the speed of the apron chain(s), determines the spreader constant. Refer to *"Spreader Constant Starting Values"* beginning on page 26 for the spreader constant as it relates to the metering gate opening.

Use the chart below to determine gate height based on output and speed.

Gate	Desired Application Speed for 90 ft. Spread (MPH)						
Height	4	6	8	10	12	15	
1 in.	MIN	MIN	MIN	MIN	MIN	MIN	
	75	50	35	30	25	20	
	MAX	MAX	MAX	MAX	MAX	MAX	
	450	300	225	180	150	120	
2 in.	MIN	MIN	MIN	MIN	MIN	MIN	
	145	95	70	55	50	40	
	MAX	MAX	MAX	MAX	MAX	MAX	
	855	570	430	345	285	230	
3 in.	MIN	MIN	MIN	MIN	MIN	MIN	
	210	140	105	85	70	55	
	MAX	MAX	MAX	MAX	MAX	MAX	
	1260	840	630	505	420	335	
4 in.	MIN	MIN	MIN	MIN	MIN	MIN	
	270	180	135	110	90	70	
	MAX	MAX	MAX	MAX	MAX	MAX	
	1620	1080	810	650	540	430	

Chart is approximate range for 90 ft. spread. For a 60 ft. spread increase rates by 50%

High application rates may require a reduction in speed if spinner speed can not be maintained.

Factory Settings: Up to 60 ft. set at 2 in.; 66 ft. and up set at 3 in.

**Note:** For lower rates, install a cover crop/low rate kit to avoid using 1 in. gate opening.

1 in. gate setting will result in premature chain stretch.

**NOTE:** At high application rates it maybe necessary to narrow the spread width to reduce the load on the spinners and maintain a good spread pattern.

Also, the operator may want to narrow the spread width so the product will empty from the hopper at a desired, predetermined location rather than the far end of the field.

**RAISE** the metering gate opening if the apron cannot keep up with high rates/application speeds.

**LOWER** the metering gate opening for low rates/speed to prevent ratcheting.

**IMPORTANT:** If an adjustment to the metering gate is made, the spreader constant needs to be adjusted accordingly. Refer to "Spreader Constant Starting Values" beginning on page 26 to find the spreader constant that correlates with the meter gate opening.

The gate height is measured from the floor of the apron trough.

#### **Fertilizer Spreader Models**

**NOTE:** The F810 has one metering gate. The F1210 has two metering gates and both gates must be set to the same setting.



To adjust the gate (1) on the F1210 model, remove the four bolts (2) and nuts (3).

Move the gate up or down to the desired position, lining up the holes on the gate to the holes on the frame. The gate can be moved in 1 in. increments.

(Procedure continued on following page.)

### Set-up and Operation

# Setting the Metering Gate Opening (Cont'd)

#### Fertilizer Spreader Models (Cont'd)

Reinstall bolts and nuts. Tighten.

Repeat procedure on the opposite side.

**IMPORTANT:** Ensure both gates are set to the same position.

#### Lime Spreader Models



To adjust the gate (1), remove the four bolts (2) and nuts (3).



Move the gate up or down to the desired position, lining up the holes on the gate to the holes on the frame.

Reinstall bolts and nuts. Tighten.



For lime spreading, the gate must be oriented so the two notches are at the top, away from the conveyor.

**NOTE:** The gate can be completely removed for maximum application rates.

**For fertilizer spreading,** position the gate so the notches are on the bottom. This disperses the product evenly on the conveyor before being broadcast.

- **NOTE:** The gate can be flipped with notches up and will provide less product than the same height as "notches down" and more than the next step up with notches down.
- **IMPORTANT:** When the metering gate configuration is changed, the spreader constant needs to be adjusted accordingly. Refer to "Spreader Constant Starting Values" beginning on page 26 to find the spreader constant that correlates with the meter gate opening.

### **Calibrate Spreader Constant**

The spreader constant should be calibrated every time the metering gate is adjusted. For starting values, see "Spreader Constant Starting Values" on page 26.

#### Catch Test

- 1. Fill spreader with product.
- 2. Measure product density using scale provided.
- 3. Weigh empty container and place container under spreader discharge to collect fertilizer.
- 4. Engage hydraulics for apron. DO NOT engage spinners.
- 5. Place controller console in test mode.
- a. Enter spreader constant for metering gate opening.
- b. Enter product density.
- c. Enter desired application rate, spread width, and application speed.
- d. Zero out total/field volume.
- 6. Turn on apron and collect fertilizer. Recommend 1,000 lb. for increased accuracy.
- 7. Turn off apron.
- 8. Weigh full container. Determine actual weight of fertilizer in container (full weight empty weight).
- 9. Calculate new spreader constant:



**NOTE:** If catch test is not feasible, new spreader constant can be calculated by using same formula and spreading a known amount of fertilizer on a field. Weigh spreader before and after test to determine amount actual amount of fertilizer applied.

### Engaging the Apron(s)

The apron is engaged from the controls in the tractor cab. Hydraulic valves on the tractor need to be activated. Ensure valves are set to continuous flow.

- **IMPORTANT:** When spreader is not in use, or to avoid unintended application, turn off hydraulic flow from tractor.
- **IMPORTANT:** For F1210 models with dual apron drive, make sure both aprons are engaged when performing a spread test.

### **Mechanical Ground Drive**

#### Prepare For Field Use



- 1. Move the PTO from its storage location (1) to the axle driven shaft position (2).
- 2. Ensure hydraulic connections to tractor have been made.



- Using hydraulic controls in the tractor, fully retract the hydraulic disconnect cylinder (1) to apply product. Extend the cylinder to stop application.
- **IMPORTANT:** Return the PTO back into its storage/ transport position when field work is complete. Do not transport the spreader with the PTO engaged. Also, make sure the hydraulic disconnect cylinder is extended to prevent product from spilling.



**CAUTION:** Transporting the spreader at above rated speeds with the PTO engaged could cause serious damage to the spreader.

## Setting the Metering Gate Opening (Mechanical Ground Drive)

The application rate is determined by the metering gate opening and the speed range (high or low) of the apron chain.

To determine the gate opening:

- 1. Find the fertilizer density. See "Determining Product Density" on page 19.
- **NOTE:** If scale is not available, weigh 1 gallon (3.78 Liters) of the fertilizer and then multiply that by 7.5 to establish the product density.
- 2. Go to the *"Rate Chart Selector"* on page 25. Use this chart to find the correct Application Rate Chart within this manual that corresponds with your desired spread width and the machine's tire size.
- Under the "Product Density" row of the Application Rate Chart, find the value closest to your outcome from Step 1. Follow this column down to the desired application rate.
- 4. Follow this row to the left of the chart to the proper gate opening size.



Loosen knob (1). Move the gate control lever (2) until the indicator (3) is at the proper opening size. Lock gate by retightening the knob (1).

(Procedure continued on following page.)

### Mechanical Ground Drive (Cont'd)

Adjusting for High or Low Range (Mechanical Ground Drive)



Determine if the application will be spread in high range or low range.

**High range** - The chain is placed on the *outside* sprockets.

Low range - The chain is placed on the *inside* sprockets.

If an adjustment is needed, loosen the apron drive chain tensioner (1) and move the chain to the appropriate set of sprockets. Reposition the drive chain tensioner and retighten. The chain tensioner should be oriented such that it does not touch sprockets.

**IMPORTANT:** Read the application rate chart for operating in high range. To avoid undue stress on the apron mechanism, it is recommended to use the largest practical gate opening in low range before changing to high range.

To assure a uniform application rate around field edges, make a border application with these adjustments. Reduce to 1/2 fan speed, gate opening, and travel interval.



### **Rate Chart Selector**

Use the Rate Chart Selector Guide below to determine the correct Application Rate Chart based off of your spreader's drive option (hydraulic or mechanical), tire size, and the desired spread width.

The Application Rate Charts are found in this manual and the page numbers are provided within the Rate Chart Selector Guide below, after each respective chart/decal number.

**NOTE:** An Application Rate Chart decal is also applied to the spreader when shipped from the factory that is reflective of the spreader's tire size and/or drive option. If changes are made to the spreader's configuration, and/or a different application setting is desired, a new decal can be ordered to coincide with the new changes.

Mechanical Ground Drive Rate Chart Selector Guide						
		Tire Size				
		380/90R46 320/90R50	480/80R42	19L-16.1 VF295/75R22.5	14L-16.1	
Driving Interval (ft)	40	210000 (page 63)	210009 (page 72)	210060 (page 78)	210090 (page 84)	
	44	210001 (page 64)				
	50	210002 (page 65)	210010 (page 73)	210061 (page 79)	210091 (page 85)	
	60	210003 (page 66)	210011 (page 74)	210062 (page 80)	210092 (page 86)	
	66	210004 (page 67)				
	72	210005 (page 68)	210012 (page 75)	210063 (page 81)	210093 (page 87)	
	80	210006 (page 69)	210013 (page 76)	210064 (page 82)	210094 (page 88)	
	88	210007 (page 70)				
	90	210008 (page 71)	210014 (page 77)	210065 (page 83)	210095 (page 89)	

### **Spreading Speed and Interval**

#### Speed

When spreading for a test pattern and for the final field application, maintain a speed of 3-8 mph.

#### **Driving Interval**

**Test Pattern Interval:** Driving interval is 40-90 ft. (12.19 m - 27.43 m), depending on machine, to maintain an accurate spreader constant and spread pattern.

**Field Application Interval:** Determine optimum driving interval by following the steps below.

- **NOTE:** The spreader is designed to spread the material 40-90 ft. (12.19 m 27.43 m)to each side of center, giving a double coverage for a uniform application. The application chart is based on 40-90 ft. (12.19 m 27.43 m) driving intervals, not the actual spread width. However, a slight change in driving distance or spinner RPM may be beneficial for optimum coverage.
- 1. Make sure all spread pattern adjustments are complete, and a spread pattern test has been produced following the instructions in the Spread Pattern Test section beginning on page 35.
- 2. From the *Spread Pattern Test Results Sheet* found on page 44, determine the maximum (cc) volume value of material in center of pattern.
- 3. Divide this value by two.
- 4. Locate the distance from the zero foot mark (centerline of driving path) where the graph intersects this (cc) value.
- 5. Multiply this distance by two to determine the optimum driving interval.

Even if the pattern has an acceptable shape, optimum driving interval may be too small for practical field use. If this is the case, the spreader must be adjusted to produce the best possible pattern shape with an acceptable driving interval.



**CAUTION:** Do not exceed the rated gross weight of the spreader.

#### **Spreader Constant Starting Values**

#### **Spreader Constant**

Approx Spreader Constant (SC)					
Gate	F810 and F1210		L1230		
Opening (in.)	Standard Rate	Low Rate	Notch Down	Notch Up	
1	3170	9510	4259	1990	
2	1664	4992	1336	988	
3	1132	3396	82	648	
4	880	2640	561	488	
5	702	2106	444	397	
6	601	1803	371	337	
7			322	299	

#### **Cubic Feet Per Revolution**

Approx Cubic Feet per Revolution					
Gate	F810	F1210	L1230	L1230	
Opening (in.)	All		Notch Down	Notch Up	
1	0.0568	0.1136	0.1268	0.2714	
2	0.1082	0.2164	0.4042	0.5463	
3	0.159	0.318	0.6909	0.8339	
4	0.2045	0.409	0.9619	1.1059	
5	0.2565	0.513	1.2167	1.3617	
6	0.2993	0.5986	1.4554	1.6013	
7			1.6778	1.8044	

#### Apron Chain Position - F810 Model


## Spreader Constant Starting Values (Cont'd)

#### Initial Spreader Settings

The following chart shows the recommended calibration numbers for all spreader models. Quick Start Guides for the most common rate controllers are available on the Loftness website. Visit https://www.loftness.com/ag-manuals/ and select "Fertilizer Equipment".

Hydraulic Apron Drive					
	F810	F1210	L1230		
Valve Type	PWM Closed	PWM Closed	PWM Closed		
Valve Calibration	Raven 43 Deere GS2 1533	Raven 43 Deere GS2 1533	Raven 43 Deere GS2 1533		
Valve Response Rate	50	50	50		
Control Deadband	3%	3%	3%		
Valve Delay	0	0	0		
Control Effort	3%	3%	3%		
	PWM Setti	ngs	<u>.</u>		
Coil Frequency	Raven 122 Deere 100	Raven 122 Deere 100	Raven 122 Deere 100		
High Limit	Raven 255 Deere 100%	Raven 255 Deere 100%	Raven 255 Deere 100%		
Low Limit	Raven 0 Deere 1%	Raven 0 Deere 1%	Raven 0 Deere 1%		
Pusle Per Revolution - Standard	180	360	540		
Pusle Per Revolution - Low Rate	540	1080	N/A		
· · · · ·	Spinner D	rive	•		
	F810	F1210	L1230		
Valve Type	PWM Closed	PWM Closed	PWM Closed		
Valve Calibration	Raven 43 Deere GS2 1533	Raven 43 Deere GS2 1533	Raven 43 Deere GS2 1533		
Valve Response Rate	50	50	50		
Control Deadband	3%	3%	3%		
Valve Delay	0	0	0		
Control Effort	3%	3%	3%		
÷	PWM Setti	ngs			
Coil Frequency	Raven 122 Deere 100	Raven 122 Deere 100	Raven 122 Deere 100		
High Limit	Raven 170 Deere 65%	Raven 170 Deere 65%	Raven 255 Deere 100%		
Low Limit	Raven 70 Deere 25%	Raven 70 Deere 25%	Raven 70 Deere 25%		
Pusle Per Revolution	20	20	20		

## Spread Pattern Adjustments

Before attempting any spread pattern adjustments, make sure the actual spread pattern has been determined.

#### **Spinner Blade Positions**

The spinner blades are the primary means of adjustment.



To adjust a spinner blade, remove the nut (1) and washer (2) from the bolt securing the blade to the spinner. Reposition the blade and reinsert the bolt into the appropriate hole, securing with washer and nut.

**NOTE:** Any adjustment to a blade must also be duplicated to the blade opposite the spinner shaft. Also, spinner blade settings should be identical to the opposite spinner.

#### **Rear Deflector Adjustment**

#### F1210 and L1230





To adjust rear deflector (1), loosen the hardware (2) on each side of deflector. Slide the deflector forward or back accordingly. Retighten hardware when deflector is in the desired position.

Repeat the procedure for the deflector on the opposite side of the spreader. Make sure both deflectors are in the same position.

#### F810



To adjust the rear stop plate (deflector) (1), loosen the nut (2) on each side of deflector. Slide the deflector forward or back accordingly. Retighten hardware when deflector is in the desired position.

### Spread Pattern Adjustments (Cont'd)

# Bottom Deflector Adjustment (F1210 and L1230 only)



To adjust the bottom deflectors (1), loosen the bolts (2) on each deflector. Slide the deflectors to the left or right accordingly.

**IMPORTANT:** Make sure the dimension (B) between the bottom deflector and side plate is the same on both sides.

Retighten the bolts when deflectors are in the desired position.

#### **Spinner RPM**

Hold an electronic or mechanical tachometer near one of the spinners to check the spinner speed.

**NOTE:** For spreaders with a spinner speed sensor, speed can be checked from the controller.

For spreaders with a controlled spinner drive (CSD), speed is set by controller. Refer to your controller manual for setup instructions.



**WARNING:** Spinners rotate at high speed. Do not get hands or tachometer too close when checking spinner RPM.

#### 20 Inch Spinners

Driving Interval	Spinner	Pattern	Sp		r Bla ting	de
(Spread Width)	Speed RPM	Туре	1	2	3	4
40 ft.	700	Pattern 1				
50 ft.	830	Triangle 100%	3	2	3	2
60 ft.	950	Overlap				
80 ft.	740					
88 ft.	780	Pattern 2 Trapezoidal	3	3	3	3
90 ft.	790	hapozoidai				

**NOTE:** Spinner blade hole number increases as blade is moved rearward. 4-3-2-1-0 when facing RH spinner; and 0-1-2-3-4 when facing LH spinner.



Procedure continued on following page.)

## Spread Pattern Adjustments (Cont'd)

#### Spinner RPM (Cont'd)

#### 24 Inch Spinners

	Spreader Setup for 24-inch Spinners								
Driving	Spinner	S	pinne	er Cu	up Se	ettin	g*		
Interval (Spread Width)	Speed RPM	1	2	3	4	5	6	Pattern Type	
50 ft.	520	2	3	3	2	3	3		
60 ft.	580	2	3	3	2	3	3		
66 ft.	600	2	3	3	2	3	3	Trapezoid	
72 ft.	630	2	3	3	2	3	3	Partial	
80 ft.	660	2	3	3	2	3	3	Overlap	
88 ft.	690	2	3	3	2	3	3		
90 ft.	700	2	3	3	2	3	3		

**NOTE:** Spinner cup hole number increases as cup is moved rearward. 0-1-2-3-4-5-6-7-8 when facing RH spinner; and 8-7-6-5-4-3-2-1-0 when facing LH spinner.

\* The cup setting refers to the actual number of holes exposed at the side of the spinner cup, NOT THE HOLE NUMBER.



#### 30 Inch Spinners

	Spreader Setup for 30-inch Spinners								
Driving	Spinner	S	pinne	er Cu	up Se	etting	g*	-	
Interval (Spread Width)	Speed RPM	1	2	3	4	5	6	Pattern Type	
50 ft.	420	4	4	4	4	4	4		
60 ft.	460	4	4	4	4	4	4		
66 ft.	480	4	4	4	4	4	4	Trapezoid	
72 ft.	500	4	4	4	4	4	4	Partial	
80 ft.	530	4	4	4	4	4	4	Overlap	
88 ft.	550	4	4	4	4	4	4		
90 ft.	560	4	4	4	4	4	4		

**NOTE:** Spinner cup hole number increases as cup is moved rearward. 0-1-2-3-4-5-6-7-8-9-10 when facing RH spinner; and 10-9-8-7-6-5-4-3-2-1-0 when facing LH spinner.

\* The cup setting refers to the actual number of holes exposed at the side of the spinner cup, NOT THE HOLE NUMBER.



not get hands or tachometer too close when checking spinner RPM.

## Spread Pattern Adjustments (Cont'd)

#### Spinner RPM (Cont'd)

For Hydraulic Spinner Drive (HSD)



To make adjustments, use a hex key to turn the flow control on the hydraulic spinner manifold located adjacent to the left side spinner.

Turn the adjustment screw (1) clockwise to decrease RPM and counterclockwise to increase spinner RPM.

# **NOTE:** Do not make more than 1/4 turn of the adjustment screw without rechecking the spinner RPM.

Recheck the spinner RPM using the tachometer or spinner speed sensor on control display, if equipped.

When complete, tighten the lock nut (2) to maintain the desired setting.

For Controlled Spinner Drive (CSD)



Spinner speed is controlled via a PWM (pulse width modulation) proportional flow control valve (1) and spinner speed sensor to maintain desired spinner speed. Spinner speed is set via the controller interface. Enter desired spinner speed in the application controller following the controller instructions.

Settings for valve and spinner speed are as follows:

Spinner Speed Sensor : 20 pulses per revolution Spinner Valve Type : PWM Closed PWM Frequency : 122 Spinner Valve Calibration : 43

Verify that spinner speed is correct.

NOTE: See also "Spinner RPM" on page 29.

## **Steerable Hitch (Optional)**

To prevent drifting on side hills, and/or to keep the spreader in the tractor tracks when turning on headlands, utilize the steerable hitch feature to reduce crop damage.

Steering must be controlled by the operator in the tractor using the hydraulic controls.

**NOTE:** If automatic hitch position system is desired, contact your Loftness dealer.



The steerable hitch gives the spreader a range of 19 in (48.3 cm) either side from the center of the tractor/hitch connection.

**NOTE:** Cylinder stops must be removed before employing the steerable hitch.



**CAUTION:** Install cylinder stops when ground speeds exceed 12 MPH (19.3 km/h).

## One Section and Two Section Spreading (F1210 Models Only)

The F1210 Fertilizer Spreader hydraulic apron drive is available in either a one section or two section spreading option.



In a **one section system**, a single apron motor will always turn both aprons whenever the apron hydraulics are engaged.

With a **two section system,** a motor is assigned to each apron. The operator can control which apron(s) should turn - both, right side only, or left side only.

Use both aprons for normal operation. Use one apron to spread product from just one side of the machine. This is a product-saving feature that can be utilized during certain situations such as spreading on point rows, or when nearing the edge of the field and only enough product needs to be spread to cover the overlap.

For hydraulic controls: Left apron: Boom 1 Right apron: Boom 2

**NOTE:** Both spinners will continue to spin when either apron is shut down.

#### Transporting (Towing with Truck)



**CAUTION:** Tow only with a truck or vehicle capable of pulling the weight of the spreader and its contents.

Adjust the spreader hitch so the spreader is as level as possible. Connect to the truck hitch and install an approved hitch pin for the load, securing hitch pin with a safety locking pin. Connect the safety chains to the truck.

Connect the spreader's running light wiring harness to the truck. An adapter may be required.

Ensure the light wiring harness, hydraulic hoses, and safety chain are secured high enough so they will not drag on the ground during transport.



**IMPORTANT:** Make sure hydraulic hoses are secure before transport. Place hose ends into the storage slots on the front plate located at the front left of the chassis.



**IMPORTANT:** For models equipped with the steerable hitch, ensure cylinder stops (1) are in position on the cylinder rods and secured before transport.



## **Spread Pattern Test Overview**

Before placing the fertilizer spreader into operation, a spread pattern test must be performed. Differences in product density and/or texture can vary a spread pattern, therefore a test must be performed each time a new material is implemented. Certain variables must be controlled and adjusted to ensure that there is uniform product coverage and that the spreader is operating efficiently with optimal performance.

It is the responsibility of the operator to assure that the fertilizer is applied uniformly and correctly over the application area. Loftness is not responsible for costs or damages caused by misapplication of fertilizers.

**NOTE:** A spread pattern test must also be performed at the beginning of each season, after adjustments have been made, and when product type has changed.

## **Machine Preparation**

Ensure the following items are completed before performing the spread pattern test.

- Inspect, repair, or replace any components that are damaged or not performing properly.
- Make all of the adjustments indicated in this manual.
- **IMPORTANT:** For standard models, ensure the hitch turnbuckles are adjusted correctly so the spreader is centered behind the tractor. The tires of the spreader should follow the track of the tractor.
- Ensure rear end and spinners are clear and free of obstruction.
- Determine the weight per cubic foot of material to be spread as accurately as possible using a density scale. See Loftness part number N105370.
- Fill the hopper 20-30% of full capacity. There must be enough product added to ensure the gate is completely covered throughout the test.

• Set the machine to the appropriate RPM. Refer to "Spinner RPM" on page 29 for instructions. Chart shows recommended spinner speeds and blade setting for desired driving intervals. Adjustments to spinner speed/blade settings may be required to optimize spread pattern.

## Pattern Test Equipment



#### You will need:

- Density scale
- 17-21 identical collecting pans lined with dividers
- 3 flags
- Yellow rope
- 17 cone-bottom vials with rack
- Funnel
- **NOTE:** For a test pattern kit with these items, contact your dealer.

## **Preparing the Spread Pattern Test**

Select a flat, level area 300 ft. x 600 ft. (92 m x 184 m). The 600 ft. (184 m) length should be parallel with the wind direction. For best results wind speed should be less than 5 mph.

- 1. Set the gate for the desired spreader constant. Refer to "Setting the Metering Gate Opening" on page 20 for instructions. For mechanical ground drive models, see "Setting the Metering Gate Opening (Mechanical Ground Drive)" on page 23.
- Using a wide front-end tractor to pull the spreader, drive the tractor/spreader for at least 450 ft. to allow the material in the hopper to settle while applying product to charge the system.
- **IMPORTANT:** DO NOT let the spreader sit for an extended period of time with material in the hopper.
- 3. Setup the spread pattern for the appropriate spread pattern course. Place the pans lined with dividers in a line approximately 5-7 ft. apart (on center) from one another as shown in the illustration *"Single Pass "I" Course"*. Use the yellow rope to keep all pans in a straight line.
- **NOTE:** All pans must be at the same elevation. Additional pans may be necessary for wider spread patterns or increased test resolution. Pans should be evenly spaced.
- **IMPORTANT:** Do not test if the wind speed is over 5 mph (8 km/h). If a wind exists, the direction of travel must be parallel with the wind direction, and all passes must be made traveling in the same direction.

Single Pass "I" Course



- 1. Set pans up from L8 to R8, equally spaced with Pan 0 centered on Pass A. Place a flag on centerline of Pass A (Track 0) in line with Pan 0. Place pans approximately 6-8 ft. apart.
- **NOTE:** If your tractor is equipped with auto guidance, a guidance line with heading direction the same as the wind direction can be driven to determine where the tractor/spreader tires should be; this allows placing the pans so they do not get run over during the test.
- 2. Position the unit at the beginning of the course, directed at Flag A.
- 3. Make sure the apron drive is engaged.
- **NOTE:** The recommended speed is 3-8 mph (4.8-12.9 km/h). The speed test should match your operating speed.
- 4. Engage the spinners.
- **NOTE:** During the test, note the farthest point from the course and unit center line that material is being spread. You will record this on the data sheet "Spread Pattern Test Results Sheet" on page 44.
- 5. Drive through Flag A with the center of the unit lined up with the center of Pan L0. Refer to illustration *"Single Pass "I" Course"* for course direction.
- 6. At the end of the course, turn off the spinners and disengage the apron drive.
- **NOTE:** Depending on rate per acre, as many as five passes may be required to obtain a measurable amount of material in the outermost pans.

# Preparing the Spread Pattern Test (Cont'd)

#### Two Pass "U" Course



- Set pans up from L8 to R8, equally spaced with Pan 0 centered on Track 1. Place flags ½ the spread width to the left and right of Pan 0. Place the pans approximately 2-3 ft. apart.
- NOTE: If your tractor is equipped with auto guidance, a guidance line with heading direction the same as the wind direction can be driven on tracks 0, 1, and 2 to determine were the tractor/spreader tires should be and establish the overlap point between Pass A (Track 0) and Pass B (Track 2). Guidance track spacing should be set to ½ the spread width of the machine so Track 1 represents the overlap between passes. I.e. for an 80 ft. spread width use 40 ft. track spacing.
- 2. Position the unit at the beginning of the course, directed at Flag A.
- 3. Make sure the apron drive is engaged.
- **NOTE:** The recommended speed is 3-8 mph (4.8-12.9 km/h). The speed test should match your operating speed.

- 4. Engage the spinners.
- **NOTE:** During the test, note the farthest point from the course and unit center line that material is being spread. You will record this on the data sheet "Spread Pattern Test Results Sheet" on page 44.
- 5. Drive through Flag A with the center of the unit lined up with the flag. Allow ample room to turn back and drive back through Flag B, keeping the center of the unit lined up with the flag. Refer to the illustration *"Two Pass "U" Course"* for course direction.
- 6. At the end of the course, turn off the spinners and disengage the apron drive.
- **NOTE:** Depending on rate per acre, as many as five passes may be required to obtain a measurable amount of material in the outermost pans.



#### Three Pass "S" Course

 Set pans up from L8 to R8, equally spaced with Pan 0 centered on Track 1. Place flags 1x the spread width to the left and right of Pan 0. Place pans approximately 6-8 ft. apart with Pan L8 in Track 0 and Pan R8 in Track 2.

# Preparing the Spread Pattern Test (Cont'd)

#### Three Pass "S" Course (Cont'd)

- **NOTE:** If your tractor is equipped with auto guidance, a guidance line with heading direction the same as the wind direction can be driven on tracks 0, 1, and 2 to determine were the tractor/spreader tires should be. Guidance track spacing should be set to the spread width of the machine so Track 1 represents the the center of 3 adjacent passes; i.e. for an 80 ft. spread width use 80 ft. track spacing.
- 2. Position the unit at the beginning of the course, directed at Flag A.
- 3. Make sure the apron drive is engaged.
- **NOTE:** The recommended speed is 3-8 mph (4.8-12.9 km/h). The speed test should match your operating speed.
- 4. Engage the spinners.
- **NOTE:** During the test, note the farthest point from the course and unit center line that material is being spread. You will record this on the data sheet "Spread Pattern Test Results Sheet" on page 44.
- 5. Drive through Flag A with the center of the unit lined up with the flag. Allow ample room to turn back and drive back through Flag B, keeping center of the unit lined up with the flag. Again, allow ample room to turn back and drive back through Flag C, keeping center of the unit lined up with the flag. Refer to illustration "Three Pass "S" Course" for course direction.
- 6. At the end of the course, turn off the spinners and disengage the apron drive.
- **NOTE:** Depending on rate per acre, as many as five passes may be required to obtain a measurable amount of material in the outermost pans.

### **Gathering and Recording Pans**

The material collected in the pans will be measured in the *"Spread Pattern Test Results Sheet"* on page 44 and will reveal the spread pattern. This data can be used to make adjustments to the machine, if necessary, based on the results.

Before entering the test pattern results, be sure to fill out the information requested such as location, serial number, etc. This information, along with the results, can be filed for future reference when completed.

- NOTE: Keep the original Spread Pattern Test Results sheet in this Owner's Manual and use a photocopy for writing down the information and recording the test results.
- 1. Gather the collection pans in an organized fashion. Start with the outermost pan - Pan L8. Proceed left to right until all pans have been picked up.
- **IMPORTANT:** Keep track of the order in which the pans are stacked. It is vital that they stay in order as this will facilitate the recording procedure. It may help to label each pan accordingly.



2. Using the funnel, empty the contents of each pan into its corresponding vial, starting with the L8 pan and vial.

Measure the weight of the material in each vial using a scale. Record the weight for each vial in its proper square on the Test Pattern Results sheet.

NOTE: Although each vial has marks for measure, the most reliable method for measurement is by weight as granular fertilizer components can settle with some irregularity.

# Gathering and Recording Pans (Cont'd)



- 3. After all of the data has been entered on the "Spread Pattern Test Results Sheet" on page 44, graph the results (see example above).
- 4. Compare the shape of the graph on your Spread Pattern Test Results sheet to the patterns shown above.

## Analyzing Pattern and Making Adjustments to Machine

Each of the 3 pattern courses has a different pattern that will result in an even field application. Compare your pattern to the Acceptable Patterns list for Single and Multi-Pass courses to determine if adjustments need to be made to the machine.

#### **Single Pass Patterns**

For the single pass course, patterns resembling S1 (triangular), S2 (trapezoidal), or S3 (elliptical) are acceptable patterns while S4 (low middle), S5 (high middle), and S6 (offset unbalance) are unacceptable patterns.

#### Acceptable Single Pass Patterns



If the pattern resembles any of the three acceptable patterns shown above, no adjustments will need to be made to the fins and/or deflector settings. At this point, the spread pattern is good, however some spinner RPM and/or driving interval adjustments may need to be made. Proceed to *"Two Pass "U" Course"* on page 37 for instructions.

Single Pass Patterns (Cont'd)

#### Unacceptable Single Pass Patterns



If the pattern resembles any of the three unacceptable patterns shown above, take the recommended corrective action described in the following chart.

Spread Pattern	<b>Recommended Corrective Action</b>
Pattern S4	Move one or two spinner blades to a lower or higher numbered hole.*
Low at center -	Increase dimension "A" **.
High at sides	Decrease dimension "B" **.
	Increase spinner RPM.
Pattern S5	Move one or two spinner blades to a lowered numbered hole.*
High at center -	Reduce dimension "A" **.
Low at sides	Increase dimension "B" **.
	Decrease spinner RPM.
	Gates at same setting.
Pattern S6 Pattern off	Spinner blade settings should be identical on each spinner.
center	Check component condition and adjustment settings.

\* Refer to "Spinner Blade Positions" on page 28 for adjustment instructions.

\*\* Follow "Stop Plate And Deflector Adjustments" on the following page for model-specific adjustment instructions.

#### **Stop Plate And Deflector Adjustments**

#### 1210 and L1230



Adjust dimension "A". See *"Rear Deflector Adjustment"* - *"F1210 and L1230"* on page 28 for instructions.

**IMPORTANT:** Dimension should be the same on both sides.



**For F1210 and L1230 models only,** adjust dimension "B". See "Bottom Deflector Adjustment (F1210 and L1230 only)" on page 29 for instructions.

**IMPORTANT:** Dimension "B" should be the same on both sides.

F810



Adjust dimension "A". See "Rear Deflector Adjustment" - "F810" on page 28 for instructions.

**IMPORTANT:** Dimension should be the same on both sides.

#### **Retesting the Pattern**

Once adjustments have been made, perform a single pass test down the middle of the course. This will be "Pass B" shown in the illustration "*Three Pass* "S" *Course*" on page 37. DO NOT use the full three pass "S" course.

Retest and adjust the machine until the pattern matches one of the *"Acceptable Single Pass Patterns"* on page 39. Refer to *"Spread Pattern Adjustments"* beginning on page 28 for adjustment instructions.

Once the adjustments have been made, perform a single pass test down the middle of the course. This will be "Pass A" shown in the illustration *"Single Pass "I" Course"* on page 36.

Retest and adjust the machine until the pattern matches one of the acceptable patterns - S1, S2, or S3 shown in the illustration *"Acceptable Single Pass Patterns"* on page 39. See *"Spread Pattern Adjustments"* beginning on page 28 for adjustment instructions.

#### **Spread Pattern/Driving Interval**



Any symmetrical spread pattern of these dimensional characteristics is acceptable:

- A Application rate at centerline.
- **B** One half of application rate at centerline.
- **C** Driving interval width.
- **D** One half of driver interval width.

Acceptable patterns will deliver one half of the desired application rate at distance equal to one half driving interval from centerline, or halfway between passes. This point will be at the middle of the overlap. If measurement "C" is lower than the desired driving interval, increase spinner RPM. If measurement "C" is greater than the desired driving interval, decrease spinner RPM.

**NOTE:** The approximate increase or decrease in RPM to hit desired driving interval can be estimated by multiplying the difference in "C" from the desired pattern by 5 for 20 in. spinners, 4 for 24 in. spinners, or 3 for 30 in. spinners. If a change is made to the RPM, perform a Single Pass "I" course test prior to proceeding forward to.

#### Multi-Pass Pattern Test



For patterns of type S1, set up and run the Three Pass "S" Course Test.

For patterns of type S2 or S3, set up and run the Two Pass "U" Course Test.

The resulting pattern should be of M1, M2, or M3 shown above.

If the resulting pattern is M1, the spreader is calibrated and ready to spread.

If resulting pattern is M2, the spreader is set too wide. *Increase* driving interval or reduce spinner speed.

If resulting pattern is M3, the spreader is set too narrow. **Decrease** driving interval or increase spinner speed.

Spread Pattern	Recommended Corrective Action			
Pattern M1 Pattern is flat	No machine adjustments are needed and the spreader is ready for use.			
Pattern M2	Product being spread too wide.			
High bumps at the overlaps	<b>Decrease</b> the spinner RPM to narrow the spread of the product.			
Pattern M3 Low dips at the overlaps	Product not spread wide enough. <i>Increase</i> the spinner RPM to broaden the spread of the product.			

For initial fin settings and spinner speed for the 20 in. spinners, 24 in. spinners, and 30 in. spinners, see *"Spinner Blade Positions"* beginning on page 28.

## **Spread Pattern Test**

# Serial #\_\_\_\_\_ Date\_\_\_\_\_ Location\_\_\_\_ Test#\_\_ **Spread Pattern Test Results** L8 L7 L6 L5 L4 L3 L2 L1 0 R1 R2 R3 R4 R5 R6 R7 R8 40-90 ft. 40-90 ft. Driving Interval Driving Interval **Recorded Vial Readings** L8 L7 L6 L5 L4 L3 L2 L1 0 R1 R2 R3 R4 R5 R6 R7 R8 Spinner Blade Hole Location Rear Deflector Setting Gate Setting Range Spinner RPM Material Density Notes/Comments:

## Spread Pattern Test Results Sheet

#### **General Maintenance**

See *"Maintenance Safety"* on page 6 before performing any service or maintenance on the fertilizer spreader.



**WARNING:** Always shut down the tractor, remove the ignition key, and set the park brake before performing any inspections or maintenance.

To ensure efficient operation, you should inspect, lubricate, and make necessary adjustments and repairs at regular intervals. Parts that are starting to show wear should be ordered ahead of time, before a costly breakdown occurs and you have to wait for replacement parts. Keep good maintenance records, and adequately clean your spreader after each use.

#### **Maintenance Schedule**

			SERV	ICE F	REQU	IRED	
HOURS	SERVICE POINTS	СНШСК	CLEAN	REPLACE	GREASE	A D J U S T	0   L
	Machine		Х				
	Loose Bolts	Х				Х	
Every 8	Hoses and Wiring	Х					
o (or	Oil Leaks	Х					
after each use)	<b>Bearings</b> (Spinner, Apron, Metering Gate)				х		
	Chain Tension	X					
Hinge Pin					Х		
	Apron(s)	Х					
Every	Safety Labels	Х					
50	Wheels and Tires	Х					
	Axle Set Bolts and Jam Nuts					х	
Every 60	Bearing Set Screws	х				х	
	Wheel Bearings	Х			Х	Х	
Every 250/	Jack				Х		
Annually	Turnbuckles (no-scale models)					х	
Every 750	Wheel Bearings - Duals			x			

#### **Fluids And Lubricants**

**CAUTION:** Use proper safety procedures when handling petroleum products including, but not limited to, the use of rubber gloves and eye protection.

Proper lubrication is important. Too little lubricant will cause premature failure of a bearing. Too much lubrication usually causes high operating temperature and early failure of seals. Follow all lubrication instructions and schedules included in this section.

- 1. Grease Use an SAE multipurpose high temperature grease with extreme-pressure (EP) rating. Also acceptable is an SAE multipurpose lithium based grease.
- 3. Storing Lubricants Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

## Lubrication

#### **Grease Points**



**WARNING:** Do not lubricate parts while the machine is running.

Use an SAE multipurpose high temperature grease with extreme-pressure (EP) rating.

- **NOTE:** Replace any broken or missing grease fittings. Be sure to clean fittings before greasing.
- **NOTE:** See pages 8 and 9 for component location and identification.



Location: Spinner bearings (1, 2). Interval: Every 8 hours of operation.



**Location:** Apron bearings, front (3, 4, 5, 6). **Interval:** Every 8 hours of operation.

## Lubrication (Cont'd)

#### Grease Points(Cont'd)



**Location:** Apron bearings, rear (7, 8, 9, 10). **Interval:** Every 8 hours of operation.



Location: Hinge pin (11). Interval: Every 8 hours of operation.



Location: Jack (12).

Interval: Every 250 hours, or annually, of operation. Disassemble jack and clean and re-pack acme screw and thrust bearing after each season.

## Lubrication (Cont'd)

Grease Points(Cont'd)

Mechanical Ground Drive Models



**Location:** PTO tube and U-joints (1, 2). **Interval:** Every 8 hours of operation.

**NOTE:** Cover can be marked and a hole cut in tube to access grease zerk (19) without having to remove shaft from drive couplings.



Location: Right idler shaft bearing. (3, 4). Interval: Every 8 hours of operation.



**Location:** Ground drive shaft bearings (5, 6). **Interval:** Every 8 hours of operation.



**Location:** Intermediate shaft bearings (7, 8). **Interval:** Every 8 hours of operation.



Location:Clutch shaft bearings (9, 10).<br/>Slip clutch cylinder bearings (11,12).Interval:Every 8 hours of operation.

## Lubrication (Cont'd)

#### Grease Points(Cont'd)

#### Wheels



Location: Wheel bearings - all wheel bearings (3). Interval: Every 250 hours, or annually, of operation.

**NOTE:** See "Wheel Maintenance" for more information on wheel bearing maintenance.

## Wheel Maintenance

#### Bearing



/!\

**CAUTION:** Do not remove wheel hubs with wheels and tires attached.

**WARNING:** Block and support the spreader securely before removing the tires and wheels to prevent it from falling.

Thoroughly clean all parts in solvent and check for bearing wear or cracked spindles. Repack bearings by forcing grease between the rollers. Assemble washer and nut on spindle and rotate hub while tightening the nut to 20-25 ft/lbs. Back off the nut until it becomes loose. While rotating the hub, hand tighten the nut, and alight the cotter pin hole in the spindle with the slot in the nut. There should be .001-.005 in of end play. Insert cotter pin and bend it around the nut.

#### Wheel Nuts

After the initial first hour of operation or when tires have been changed, and every 10 hours thereafter, check wheel nuts and torque to 450 ft.-lbs. if necessary. Follow torque pattern shown under *"Wheel Nut Torque Pattern"* on page 15.

### **Tire Inflation**

Check tire inflation pressure. Set correct inflation pressure for tire per table.

Tire Inflation Pressure for Field Speed up to 10 MPH						
Tire Size	F8	10	F1210 ar	nd L1230		
The Size	Single	Dual	Single	Dual		
			75 PSI			
320/90R50	44 PSI	20 PSI	20,000 Ib. max.	46 PSI		
			load			
380/90R46	28 PSI	15 PSI	56 PSI	27 PSI		
480/80R42	23 PSI		35 PSI			
520/85R38	20 PSI		29 PSI			
650/65R38	18 PSI		25 PSI			
710/70R38	13 PSI		19 PSI			

**NOTE:** Inflation pressures listed above are for loaded field speeds up to 10 MPH.

If transporting the spreader loaded, or when field speeds are greater than 10 MPH, contact the tire manufacturer for the recommended inflation pressure. Increasing inflation pressure may be necessary.



**CAUTION:** Never exceed tire manufacturer's maximum tire pressure.

## **Hose Replacement - Caution**



**DANGER:** Shut down power from the tractor before replacing any hydraulic hoses. Failure to do so could result in serious injury or death.

When any hydraulic hose is being replaced, or there is a break in the spreader's hydraulic circuit, air will enter the hydraulic system. This air must be purged by running the spreader's hydraulic system in an open-center setting to prevent damage to the spreader's hydraulic motors and other components within the circuit, including damage to the tractor's hydraulic system.

**NOTE:** After this procedure is completed, check the spreader's hydraulic system to maintain the correct hydraulic flow (GPM).

When done bleeding the hydraulic system, reset the valves. See "Setting Tractor Hydraulics" on page 19 for instructions.

<b>CAUTION:</b> Failure to purge the air in the hydraulic system when replacing hoses, or repairing a break in the hydraulic circuit, may
cause damage to the speader's hydraulic motors and/or other components.

# Adjusting Apron and Agitator Chain Tension



**DANGER:** Shut down power from the tractor before adjusting the tension on the apron and agitator chains. Failure to do so could result in serious injury or death.

#### F1210

**NOTE:** There are two apron motors on the F1210 two section model, and one motor on the F1210 one section model. All follow the same adjustment procedure as shown below.



To adjust the apron chain tension, loosen bolt and nut (1).

Adjust the chain tension by rotating motor on pivot bolt. There should be approximately 1/4 in. (.64 cm) deflection in the chain between the sprockets.

**NOTE:** If motor assembly is difficult to rotate, slightly <u>loosen</u> pivot bolt and nut (2).

Retighten all hardware when proper tension has been reached.

# Adjusting Apron and Agitator Chain Tension (Cont'd)

#### L1230 (Later models, S/N 91-121 and up)

**NOTE:** L1230 model spreaders include a chain for an agitator. Refer to the illustration below to differentiate.



To adjust the apron chain and agitator chain tension, <u>loosen</u> the four bolts (1) securing the apron motor.



Then <u>loosen</u> the four nuts (1) on each side of the front apron tensioner (eight nuts total).



<u>Loosen</u> the four nuts (1) on <u>each side</u> of the rear agitator tensioner (2) (eight nuts total).

Turn the FRONT jam nut (3) to either increase or decrease agitator chain tension. Adjust jam nut on opposite side of the apron equally. There should be approximately 1/4 in. (.64 cm) deflection in the chain between the sprockets.

Retighten all hardware on the rear tensioner when the proper tension has been reached.

Slide the apron motor up or down and tighten all four bolts when there is approximately 1/4 in. (.64 cm) deflection in the chain between the sprockets.

Check the apron tension. If adjustments need to be made, follow the instructions for adjusting the apron tension for L1230 models found on page 53.

When finished, tighten all eight nuts on the front apron tensioner.

# Adjusting Apron and Agitator Chain Tension (Cont'd)

L1230 (Early models, S/N thru 91-120)



**To adjust the apron chain tension,** <u>loosen</u> bolt and nut (1).

Adjust the chain tension by rotating motor on pivot bolt. There should be approximately 1/4 in. (.64 cm) deflection in the chain between the sprockets.

**NOTE:** If motor assembly is difficult to rotate, slightly <u>loosen</u> pivot bolt and nut (2).

Retighten all hardware when proper tension has been reached.

**To adjust the agitator chain tension,** follow the same procedure as above until there is approximately 1/8 in. to 1/4 in. (.32 cm to .64 cm) deflection between the sprockets.

Retighten all hardware when proper tension has been reached.

F810



Loosen bolt and nut (1).

Adjust the chain tension by rotating motor on pivot bolt. There should be approximately 1/4 in. (.64 cm) deflection in the chain between the sprockets.

**NOTE:** If motor assembly is difficult to rotate, slightly <u>loosen</u> pivot bolt and nut (2).

Retighten all hardware when proper tension has been reached.

# Apron and Agitator Chain Maintenance

#### **Chain Lubrication**

During the season the apron chain(s) should be removed every two weeks and soaked in oil for at least 4 hours. This must also be done to the agitator chain on the L1230 model.

To remove the chain(s), refer to the instructions in *"Adjusting Apron and Agitator Chain Tension"* on page 50. Loosen the tension enough to lift the chain(s) off of the sprockets.

After soaking, wipe off excess oil and re-install the chain. Make sure to adjust and set the chain tension by following the instructions beginning on page 50.

## Tightening/Loosening Apron

#### F1210

**NOTE:** The F1210 Fertilizer Spreader has two aprons. Adjusting the tension for one apron does not necessarily suggest the other apron needs adjustment. Evaluate the tension for each apron independently.



Loosen the two bolts (1) on each side of the apron trough securing the tensioner (2). (Four bolts total.)

Turn the FRONT jam nut (3) to either increase or decrease apron tension. Adjust jam nut on opposite side of the tensioner equally. Ensure the sag in the apron clears the frame by 1/2 in. to 1 in. and that the bearing shaft is parallel with the front of the frame.

**IMPORTANT:** Make sure that the measurement from the end of the tensioner (2) to the end of the trough is the same on both sides (see dimension "A") of the tensioner/trough.

> Dimension "A" for the left side apron tensioner and right side apron tensioner do not need to be identical as tension for each apron is independent of the other.

Retighten the four nuts securing the bearing plates.

**NOTE:** If an apron is drifting, increase the tension on the opposite side the apron is drifting towards until it is tracking on center.

#### L1230

**IMPORTANT:** Before making adjustments to the front apron tensioner, the tension must first be properly adjusted on the rear agitator chain. See "Adjusting Roller and Agitator Chain Tension", L1213 on page 50 for instructions.



<u>Loosen</u> the four nuts (1) on <u>each side</u> of the apron trough securing the tensioner (2). (Eight nuts total.)

Turn the FRONT jam nut (3) to either increase or decrease apron tension. Adjust jam nut on opposite side of the apron equally. Ensure the sag in the rubber apron contacts the white UHMW wear strip (4) 10-12 in. from the center of the roller shaft (5).

Retighten the eight nuts securing the bearing plates.

**NOTE:** If the apron is drifting, increase the tension on the opposite side the apron is drifting towards until it is tracking on center.

### Tightening/Loosening Apron (Cont'd)

#### F810



Loosen the four nuts (1) on each side of the apron trough securing the tensioner (2). (Eight nuts total.)

Turn the FRONT jam nut (3) to either increase or decrease apron tension. Adjust jam nut on opposite side of the apron equally. Ensure the sag in the apron clears the frame by 1/2 in. to 1 in. and that the bearing shaft is parallel with the front of the frame.

Retighten the eight nuts securing the bearing plates.

**NOTE:** If the apron is drifting, increase the tension on the opposite side the apron is drifting towards until it is tracking on center.

### Hitch Turnbuckle Adjustment (No-Scale Models Only)



The hitch turnbuckles should be adjusted so the tires of

the spreader follow the track of the tractor.

**NOTE:** Storage for the turnbuckle handle is located in the channel pocket in the front left corner of the hopper.

Check every 250 hours, or annually, and adjust if necessary.

## Removing the Rear End

The rear end can be removed if repairs, replacement, or reconditioning should ever be needed.



**WARNING: Crushing hazard.** The rear end assembly is heavy. Use a hoist and strap when lifting the assembly off of the frame.

Label and disconnect spinner hydraulic hoses at the rear bulkhead of the chassis.

Disconnect the electrical spinner manifold connections on the wiring harness.



Use the center-balance hole (1) provided in the rear end assembly to attach the winch hook, or strap.

While rear end assembly is being supported by the hoist, remove the four bolts securing the rear end to the frame.

Reverse procedure to return the rear end back to normal operating position.

## Cleaning

To extend the life of the spreader and to keep it running efficiently, it should be cleaned after each day of use and before both short-term and long term storage. Left unchecked, accumulation of fertilizer will cause corrosion on the machine. Fertilizer buildup in and around the apron(s) and rear gate could also decrease the spreader constant.



**CAUTION:** Chemical ingredients in some fertilizers may cause paint to blister or peel. Some chemical solvents may also damage or alter the integrity of rubber components.

Position so one end of the spreader is lower than the other and place blocks under the apron chain to lift it up off of the floor of the spreader.

Using a high-pressure water sprayer, clean the apron, rear end, spinners, and everywhere that the fertilizer accumulates.

- **IMPORTANT:** For L1230 models, use only pressurized water to clean the apron. Use of chemical solvents could damage the rubber on the apron.
- **IMPORTANT:** To avoid damage to the apron mechanism, make sure all fertilizer is removed in the areas around the spinners and on the floor of the spreader.

### Storage

Because of the corrosiveness of granular fertilizers, the machine should be kept clean and lubricated to extend the life of the machine and prevent damage to moving parts.

#### For Short-term Storage:

- 1. Make sure the spreader hopper is completely empty.
- 2. Wash machine thoroughly to remove all fertilizer, grease, and oil.
- 3. Lubricate machine per instructions in this manual.

#### For Long-term or End of Season Storage:



- 1. Make sure the spreader hopper is completely empty.
- 2. Wash machine thoroughly to remove all fertilizer, grease, and oil.
- Lubricate machine per instructions in this manual. Remove the apron chain(s) and agitator chain (L1230 models) and store them in a container of oil. Remove wheel hubs and repack the wheel bearings. Do not remove hubs with wheels and tires attached.
- 4. Sand and clean any rusted areas. Apply a coat of metal primer and finish with a top coat of paint.
- 5. Park spreader with one end lower for drainage. Do not cover during storage. If equipped, do not have cover on hopper.

## Troubleshooting

To assist with maintenance and repair, a list of common problems and corrections is provided on the following pages.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Spreader constant inaccurate.	Driving at wrong interval.	Drive at correct interval for pattern. Check controller settings for application width.
	Incorrect metering gate setting and/or incorrect range being used.	Verify metering gate setting and ensure operation range is correct.
	Fertilizer build-up on floor and around metering gate.	Clear fertilizer build up.
	Spreader not calibrated correctly.	Calibrate spreader.
Spread pattern not the same on both	Stop plate(s) not adjusted evenly.	Check alignment.
sides of the spreader.	Spinners height not consistent.	Verify and adjust spinners to be the same height.
Spread pattern heavy or light at center line of spreader.	Spinner RPM is incorrect.	Use tachometer to verify spinner RPM. Adjust if necessary.
	Spinner blades and deflector position are in incorrect position.	Adjust blades and deflector accordingly.
	Driving at wrong interval.	Drive at correct interval for pattern. Check controller settings for application width.
Spread pattern too narrow.	Low spinner RPM.	Increase spinner speed.
Spread pattern too wide.	High spinner RPM.	Decrease spinner speed.
Applied rate low.	Speed too fast.	Drive slower.
	Rate set too high.	Increase gate opening and adjust spreader constant.
		Decrease rate.
Application rate inaccurate.	Driving at wrong interval.	Drive at correct interval. (Example: Drive at 40 ft. intervals for 40 ft. spread pattern; 50 ft. intervals for 50 ft. spread pattern, etc.)
	Wrong interval entered.	Enter correct interval in controller.
	Calibration number incorrect.	Calibrate spreader.
	Incorrect metering gate setting and/or incorrect range being used.	Verify metering gate setting and ensure operation range is correct.
	Fertilizer build-up on floor and around metering gate.	Clear fertilizer build up.
Spinner speed does not increase.	Low tractor hydraulic flow.	Increase flow from tractor.
Spinner speed not stable.	Flow control set too high.	Decrease flow until speed is stable.

## Troubleshooting (Cont'd)

PROBLEM	POSSIBLE CAUSE	SOLUTION
Spinners not spinning.	Tractor hydraulics not running.	Turn on tractor hydraulics.
	Incorrect hydraulic setting.	Set tractor hydraulics to motor/ continuous.
		Check priority setting of tractor hydraulics.
	Tank line pressurized.	Pressurize "Pressure" line.
Spinner speed not reading.	Sensor not connected.	Connect sensor.
	Calibration not entered.	Enter correct calibration number.
	Incorrect calibration.	Enter correct calibration number.
	Poor electrical connection.	Check electrical connections.
		See Troubleshooting in controller manufacturer's manual.
	Failed sensor.	Replace sensor.
Apron will not move.	Tractor hydraulics not running	Turn on tractor hydraulics.
	Incorrect hydraulic setting.	Set tractor hydraulics to motor/ continuous.
		Check priority setting of tractor hydraulics.
	Tank line pressurized.	Pressurize "Pressure" line.
	Master switch off.	Turn on master switch.
	No rate entered.	Enter desired rate.
	Tractor not moving.	Drive tractor.
		Enter test mode.
	Insufficient tractor speed.	Drive faster than minimum application speed.
Left or right apron will not turn ON.	No power at relief valve solenoid.	Verify power at relief valve solenoid.
(F1210 two-section models)	Boom 1 and/or boom 2 switches turned OFF.	Turn boom switches ON.
Left or right apron will not turn OFF.	Boom switch ON.	Turn boom switch OFF.
(F1210 two-section models)	No product on chain.	Refill hopper.
Apron speed will not change.	Controller in test mode.	Exit test mode.
	Rate set to manual.	Set rate to automatic mode.
Apron ratches.	Rate set too low.	Increase rate.
		Decrease gate opening and adjust spreader constant.
	Speed too slow.	Drive faster.

## Troubleshooting (Cont'd)

PROBLEM	POSSIBLE CAUSE	SOLUTION
Wheel has moved in or out (track width).	Set bolts on axle are loose.	Reset track width and retighten set bolts.
Load will not stabilize. <i>(Scale model)</i>	Defective Load Cell	Disconnect load cells, one at a time to isolate defective load cell. Replace defective load cell.
Load decreased with additional weight. <i>(Scale model)</i>	Load cell(s) installed incorrectly.	Connect one load cell at a time to determine which load cells are installed correctly. Correct load cells that are installed incorrectly.

## Spreader Constants/Rate Charts

Hydraulic (Variable Rate Ready) - N129459

	SPREADER SETUP			
MACHINE:		N129459		
FS800, RC800, OS170				
GATE OPENING	SPREADER	CUBIC FEET		
INCHES	CONSTANT	PER REVOLUTION		
1.00	3,170	0.0568		
2.00	1,664	0.1082		
3.00	1,132	0.1590		
4.00	880	0.2045		
5.00	702	0.2565		
6.00	601	0.2993		
DRIVING INTERVAL	SPINNER RPM	BLADE SETTING		
40	700			
50	830	3 - 2 - 3 - 2		
60	950			
80	740			
88	780	3 - 3 - 3 - 3		
90	790			
LH	仑	RH		
° <sup>°</sup> <sup>°</sup> <sup>°</sup> <sup>°</sup> <sup>°</sup> <sup>°</sup> <sup>°</sup> <sup>°</sup>	Front of Machine	° 97887 0 12345 ° 12345 °		

## Spreader Constants/Rate Charts (Cont'd)

#### **20-Inch Spinners**

Driving Interval (Spread Width)	Spinner	Pattern	Spinner Blade Setting				
	Speed RPM	Туре	1	2	3	4	
40 ft.	700	Pattern 1	3	2	3	2	
50 ft.	830	Triangle 100%					
60 ft.	950	Overlap					
80 ft.	740		3	3	3	3	
88 ft.	780	Pattern 2 Trapezoidal					
90 ft.	790	inapozoidai					





## Spreader Constants/Rate Charts (Cont'd)

#### 24-Inch Spinners

Spreader Setup for 24-inch Spinners										
Driving	Spinner	Spinner Cup Setting*								
Interval (Spread Width)	Speed RPM	1	2	3	4	5	6	Pattern Type		
50 ft.	520	2	3	3	2	3	З			
60 ft.	580	2	3	3	2	3	3			
66 ft.	600	2	3	3	2	3	3	Trapezoid		
72 ft.	630	2	3	3	2	3	3	Partial		
80 ft.	660	2	3	3	2	3	3	Overlap		
88 ft.	690	2	3	3	2	3	3			
90 ft.	700	2	3	3	2	3	3			

**NOTE:** Spinner cup hole number increases as cup is moved rearward. 0-1-2-3-4-5-6-7-8 when facing RH spinner; and 8-7-6-5-4-3-2-1-0 when facing LH spinner.

\* The cup setting refers to the actual number of holes exposed at the side of the spinner cup, NOT THE HOLE NUMBER.



## Spreader Constants/Rate Charts (Cont'd)

**30-Inch Spinners** 

Spreader Setup for 30-inch Spinners										
Driving	Spinner	Spinner Cup Setting*								
Interval (Spread Width)	Speed RPM	1	2	3	4	5	6	Pattern Type		
50 ft.	420	4	4	4	4	4	4			
60 ft.	460	4	4	4	4	4	4			
66 ft.	480	4	4	4	4	4	4	Trapezoid		
72 ft.	500	4	4	4	4	4	4	Partial		
80 ft.	530	4	4	4	4	4	4	Overlap		
88 ft.	550	4	4	4	4	4	4			
90 ft.	560	4	4	4	4	4	4			

**NOTE:** Spinner cup hole number increases as cup is moved rearward. 0-1-2-3-4-5-6-7-8-9-10 when facing RH spinner; and 10-9-8-7-6-5-4-3-2-1-0 when facing LH spinner.

\* The cup setting refers to the actual number of holes exposed at the side of the spinner cup, NOT THE HOLE NUMBER.


#### **Rate Selector Charts**

#### 40 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210000)

APPLICA	APPLICATION RATE		lbs/ACRE								210000
					MACHINE:	INE:	F810	BLADE SETTING	ETTING	SPINNER RPM	RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		/00 <sup>RH</sup>	
J					380/90	380/90R46 (14.9R46)	.9R46)	4	PE2:00 Machine	43210 au	(
			_		320/90	320/90R50 (12.4R50)	.4R50)	0,123,4	01234	0 4 <sup>321</sup> 0	43.2°0
LOW F	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 40 FT DRIVING INTERVALS	ON 40 FT DRI	VING INTERV/	ALS			012334	43210	
HIGH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	DRIVING INTEF	RVALS / TIRE S	IZES		/	•	°	N.
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
=	43	47	52	55	57	59	61	63	99	71	76
Ŧ	157	175	192	203	210	217	227	234	245	262	279
"/ 1 1	61	67	74	78	81	84	88	90	94	101	108
7 /T T	224	249	274	289	299	309	323	333	348	373	398
"C	81	06	66	105	108	112	117	121	126	135	144
7	300	333	366	386	399	413	433	446	466	499	532
"010	101	112	124	130	135	139	146	151	157	169	180
7/7 7	374	415	457	481	498	515	540	556	581	623	664
"6	119	132	146	154	159	164	172	178	185	199	212
'n	440	489	538	567	587	607	636	655	685	734	783
3 1 / 2"	136	151	166	175	181	187	196	203	212	227	242
7 /T C	502	558	614	647	670	692	725	748	781	837	893
"V	153	170	187	198	204	211	221	228	239	256	273
t	566	629	692	730	755	780	818	843	881	944	1,006
"C/ F V	172	191	211	222	230	237	249	257	268	287	306
7/7 4	636	707	778	820	848	877	919	947	066	1,060	1,131
" 2	192	214	235	248	256	265	278	286	299	321	342
Ŋ	710	789	868	915	947	978	1,026	1,057	1,105	1,184	1,262
ייכ/ 1 ב	211	234	257	271	281	290	304	314	328	351	374
7/T C	778	864	950	1,002	1,037	1,071	1,123	1,158	1,210	1,296	1,383
"7	224	249	274	289	299	309	324	334	349	374	399
D	829	921	1,013	1,068	1,105	1,142	1,197	1,234	1,289	1,381	1,473

### Rate Selector Charts (Cont'd)

#### 44 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210001)

APPLICA	APPLICATION RATE		lbs/ACRE								210001
					MACHINE:	HINE:	F810	$\cap$	ETTING	SPINNER RPM	R RPM
					–	TIRE SIZES:		3 - 2 - 3 LH	7 -	06/ <sup>HR</sup>	5
	↓ ↓				380/90	380/90R46 (14.9R46)	.9R46)	4	PE2000 Machine	of 0°°°°°°	(
					320/9(	320/90R50 (12.4R50)	.4R50)	0,123,4	01°5°3°¢	0 4 <sup>321</sup> 0	43°5°0
IDWI	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 44 FT DRIVING INTERVALS	ON 44 FT DR	VING INTERV	ALS		· /	012334	43210	
HIGH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	DRIVING INTE	RVALS / TIRE	SIZES		/	)		
Gate			1	ľ	Prod	Product Density lbs/ft3					
Opening	45		55	28	9	62	65	67	70	75	8
1"	39	43	47	50	52	53	56 200	58	60	65	69
	- <b>143</b>	6 <b>CI</b>	2/T	71 71	74 74	26 761	<b>907</b>	<b>213</b> 82	777 98	<b>238</b> 92	<b>98</b>
1 1/2"	204	226	249	262	271	281	294	303	317	339	362
Ē	74	82	06	95	98	102	107	110	115	123	131
7	272	303	333	351	363	375	393	405	424	454	484
"(1 )	92	102	112	119	123	127	133	137	143	153	163
- /	340	377	415	438	453	468	490	506	528	566	604
ň	108	120	132	140	145	149	157	161	169	181	193
'n	400	445	489	516	534	551	578	596	623	667	711
3 1/2"	124	137	151	159	165	170	179	184	192	206	220
- /+ C	457	507	558	588	609	629	660	680	710	761	812
۳"	139	155	170	180	186	192	201	208	217	232	248
r	515	572	629	663	686	709	743	766	801	858	915
"C/ L V	157	174	191	202	209	216	226	233	244	261	278
7/7 4	578	643	707	746	771	797	835	861	900	964	1,028
- U	175	194	214	225	233	241	253	260	272	291	311
D	646	717	789	832	861	889	932	961	1,004	1,076	1,148
ייכ/ 1	191	213	234	247	255	264	277	285	298	319	340
- /+ 0	707	786	864	911	943	974	1,021	1,053	1,100	1,178	1,257
"ש	204	227	249	263	272	281	295	304	317	340	363
>	753	837	921	971	1,004	1,038	1,088	1,122	1,172	1,255	1,339

### 50 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210002)

APPLICA	APPLICATION RATE		lbs/ACRE								210002
					MACHINE	INE:	F810	BLADE SETTING		SPINNER RPM	RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		830 <sup>RH</sup>	
					380/90	380/90R46 (14.9R46)	.9R46)	0,123,4	Front of Machine	43210 •	/
					320/90	320/90R50 (12.4R50)	.4R50)	0,123,4	012004	O 4 <u>3210</u>	4 <mark>3251</mark> 0
LOW F	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 50 FT DRIVING INTERVALS	ON 50 FT DRI	VING INTERVA	ILS		0,12334	34	43210	
HOIH	HIGH RANGE	SEE MANUAI	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	DRIVING INTER	kvals / Tire Si	ZES		)		•	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
= ٢	34	38	42	44	45	47	49	51	53	57	61
4	126	140	154	162	168	173	182	187	196	210	224
"C/11	49	54	59	63	65	67	70	72	75	81	86
7/7 7	179	199	219	231	239	247	259	267	279	299	319
"6	92	72	62	84	87	68	94	97	101	108	115
7	240	266	293	309	319	330	346	357	373	399	426
"(/ 1 )	81	06	66	104	108	111	117	120	126	135	144
7/7 7	299	332	365	385	398	412	432	445	465	498	531
۳۶	95	106	117	123	127	131	138	142	148	159	170
)	352	391	430	454	470	485	509	524	548	587	626
3 1/2"	109	121	133	140	145	150	157	162	169	181	193
7/T C	402	446	491	518	536	554	580	598	625	670	714
"1	123	136	150	158	164	169	177	183	191	204	218
t	453	503	554	584	604	624	654	674	705	755	805
"C/ F V	138	153	168	178	184	190	199	205	214	230	245
7/7 4	509	566	622	656	679	701	735	758	792	848	905
۲ ۲	154	171	188	198	205	212	222	229	239	256	274
ר	568	631	694	732	757	783	821	846	884	947	1,010
"C/1 ]	168	187	206	217	225	232	243	251	262	281	300
7/T C	622	691	760	802	830	857	899	926	968	1,037	1,106
"4	180	199	219	231	239	247	259	267	279	299	319
þ	663	737	810	854	884	913	957	987	1,031	1,105	1,178

### Rate Selector Charts (Cont'd)

#### 60 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210003)

APPLIC/	APPLICATION RATE		lbs/ACRE								210003
					MACHINE:	HNE:	F810	BLADE SETTING		SPINNER RPM	RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		950 <sup>вн</sup>	
					380/90	380/90R46 (14.9R46)	.9R46)	4	/	4	0
			_		320/90	320/90R50 (12.4R50)	.4R50)	0	0153%	0	4°3°5°1°(
FOW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 60 FT DRIVING INTERVALS	ON 60 FT DRI	VING INTERV	ALS		0 <sup>1233</sup> 4	334	43210	
Gate			ANUAL FUN UTTEN UNIVING INTERVALS / TIRE SIZES Product []		Produ	Product Density lbs/ft3	s/ft3	)		)	
Opening	45	50	55	58	60	62	65	67	70	75	80
=	28	32	35	37	38	39	41	42	44	47	50
-	105	116	128	135	140	144	151	156	163	175	186
"/11	40	45	49	52	54	56	58	60	63	67	72
- /	149	166	182	192	199	206	216	222	232	249	265
"(	54	60	99	70	72	75	78	81	84	06	96
7	200	222	244	257	266	275	288	297	311	333	355
" ( / 1 C	67	75	82	87	06	93	97	100	105	112	120
7/7 7	249	277	304	321	332	343	360	371	387	415	443
- 7	79	88	97	102	106	110	115	118	124	132	141
,	293	326	359	378	391	404	424	437	457	489	522
3 1/2"	91	101	111	117	121	125	131	135	141	151	161
- 1/- 0	335	372	409	432	446	461	484	499	521	558	595
"1	102	114	125	132	136	141	148	152	159	170	182
t	377	419	461	486	503	520	545	562	587	629	671
"C/ F V	115	128	140	148	153	158	166	171	179	191	204
7/7 4	424	471	518	547	566	584	613	632	660	707	754
= 7	128	142	157	165	171	177	185	191	199	214	228
r	473	526	579	610	631	652	684	705	736	789	842
5 1 /J"	140	156	172	181	187	193	203	209	218	234	250
7/F C	518	576	634	668	691	714	749	772	806	864	922
ש	150	166	183	193	199	206	216	223	233	249	266
þ	552	614	675	712	737	761	798	822	859	921	982

### 66 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210004)

APPLIC/	APPLICATION RATE		lbs/ACRE								210004
					MACHINE:	HINE:	F810	BLADE SETTING	DNILI J	SPINNER RPM	RPM
						TIRE SIZES:		нл 7 - 7 - 7 - 7		6/0 <sup>вн</sup>	
					380/90	380/90R46 (14.9R46)	.9R46)	0,123,4	Machine	432210	(
			_		320/90	320/90R50 (12.4R50)	.4R50)	0	01534	O 4 <sup>3.21</sup> 0	435°00
ROW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 66 FT DRIVING INTERVALS	ON 66 FT DRI	VING INTERV	ALS		0,12334	4	43210	
HOIH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	DRIVING INTER	VALS / TIRE S	IZES		1	1		
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
-	26	29	32	33	34	36	37	38	40	43	46
H	95	106	116	123	127	131	138	142	148	159	169
"C/11	37	41	45	47	49	51	53	55	57	61	65
- /	136	151	166	175	181	187	196	202	211	226	241
"¢	49	55	60	63	99	68	71	73	76	82	87
7	182	202	222	234	242	250	262	270	282	303	323
"0/10	61	68	75	79	82	84	89	91	95	102	109
7/7 7	226	252	277	292	302	312	327	337	352	377	402
۲. ۲	72	80	88	93	96	100	104	108	112	120	128
D	267	296	326	344	356	368	385	397	415	445	474
"C/1 2	82	92	101	106	110	114	119	123	128	137	147
7/T C	304	338	372	392	406	419	440	453	473	507	541
"1	63	103	114	120	124	128	134	138	145	155	165
t	343	381	419	442	457	473	496	511	534	572	610
"C/ F V	104	116	128	135	139	144	151	155	162	174	186
4 T/Z	386	428	471	497	514	531	557	574	600	643	686
- 1	117	130	142	150	155	161	168	174	181	194	207
n	430	478	526	555	574	593	622	641	699	717	765
"() 1 3	128	142	156	165	170	176	184	190	199	213	227
7/T C	471	524	576	607	628	649	681	702	733	786	838
"J	136	151	166	175	181	187	196	202	212	227	242
þ	502	558	614	647	670	692	725	748	781	837	893

### Rate Selector Charts (Cont'd)

#### 72 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210005)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210005
					MACHINE:	INE:	F810	BLADE SETTING		SPINNER RPM	RPM
						TIRE SIZES:		нл 7 - 7 - 7 - 7		/00 <sup>RH</sup>	
					380/90	380/90R46 (14.9R46)	.9R46)	33,4	P <sup>o</sup> <sup>2</sup> o <sup>0</sup> 0 Front of Machine	432210	/
			_		320/90	320/90R50 (12.4R50)	.4R50)	0,1234	01°5°3°4	0 4 <sup>321</sup> 0	432100
TOW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 72 FT DRIVING INTERVALS	ON 72 FT DRI	VING INTERV/	ALS		00 <sup>15</sup>	01,234	43210	
HIGH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	<b>DRIVING INTEI</b>	RVALS / TIRE S	IZES		)	)	°	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
=	24	26	29	30	32	33	34	35	37	39	42
Ŧ	87	97	107	113	116	120	126	130	136	146	155
"C/11	34	37	41	43	45	46	49	50	52	56	60
- /	124	138	152	160	166	171	180	185	194	207	221
"¢	45	50	55	58	60	62	65	67	70	75	80
7	166	185	203	214	222	229	240	248	259	277	296
"0/10	56	62	69	72	75	77	81	84	87	94	100
7/7 7	208	231	254	267	277	286	300	309	323	346	369
	99	74	81	85	88	91	96	66	103	110	118
ŋ	245	272	299	315	326	337	353	364	380	408	435
3 1/2"	76	84	92	97	101	104	109	113	118	126	134
7 /T C	279	310	341	360	372	384	403	415	434	465	496
"1	85	95	104	110	114	117	123	127	133	142	151
r	315	349	384	405	419	433	454	468	489	524	559
"C/ F V	96	106	117	123	128	132	138	143	149	160	170
7/7 +	353	393	432	456	471	487	511	526	550	589	628
ב ני	107	119	131	138	142	147	154	159	166	178	190
D	395	438	482	508	526	544	570	587	614	658	701
"C/13	117	130	143	151	156	161	169	174	182	195	208
7/T C	432	480	528	557	576	595	624	643	672	720	768
ש".	125	139	152	161	166	172	180	186	194	208	222
þ	460	511	563	593	614	634	665	685	716	767	818

### 80 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210006)

APPLICA	APPLICATION RATE		lbs/ACRE							210006	900
					MACHINE:	IINE:	F810	BLADE SETTING	DNI	SPINNER RPM	-
						TIRE SIZES:		Z - Z - Z - Z		/40 вн	
					380/90	380/90R46 (14.9R46)	9R46)	0,02,3,4	Front of Machine	432,0 0	
					320/90	320/90R50 (12.4R50)	4R50)	0	0,234	°°°°°°°°₽ 0°°°°°°°₽ 0	
LOW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 80 FT DRIVING INTERVALS	ON 80 FT DRI	VING INTERV/	VLS		00003334		43,810	
HIGH	HIGH RANGE	SEE MANUAI	SEE MANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	<b>DRIVING INTER</b>	RVALS / TIRE S	IZES		.)		.)	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
= ٢	21	24	26	27	28	29	31	32	33	35	38
H	79	87	96	101	105	108	114	117	122	131 1	140
"C/11	30	34	37	39	40	42	44	45	47	51	54
7/7 7	112	124	137	144	149	154	162	167	174	187 1	661
"C	41	45	50	52	54	56	59	60	63	68	72
7	150	166	183	193	200	206	216	223	233	250 2	266
"(/ ) (	51	56	62	65	67	20	73	75	79	84	90
7/7 7	187	208	228	241	249	257	270	278	291	311 3	332
3"	09	99	73	77	62	82	86	68	63	99 1	106
n	220	245	269	284	293	303	318	328	342	367 3	391
3 1/2"	68	76	83	88	91	94	98	101	106	113 1	121
7/T C	251	279	307	324	335	346	363	374	391	419 4	446
"1	77	85	94	66	102	106	111	114	119	128 1	136
t	283	315	346	365	377	390	409	421	440	472 5	503
"C/ F V	86	96	105	111	115	119	124	128	134	144 1	153
4 T/Z	318	353	389	410	424	438	460	474	495	530 5	566
= U	96	107	118	124	128	132	139	143	150	160 1	171
n	355	395	434	458	473	489	513	529	552	592 6	631
"C/13	105	117	129	136	140	145	152	157	164	176 1	187
7/T C	389	432	475	501	518	536	562	579	605	648 6	691
"7	112	125	137	145	150	155	162	167	175	187 1	199
- D	414	460	506	534	552	571	598	617	644	2 069	737

### Rate Selector Charts (Cont'd)

#### 88 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210007)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210007
					MACI	MACHINE:	F810	BLADE SETTING	TING	SPINNER RPM	K RPM
						TIRE SIZES:		HT 7 - 7 - 7 - 7		/8U <sup>RH</sup>	_
U	000				380/90 320/90	380/90R46 (14.9R46) 320/90R50 (12.4R50)	.9R46) .4R50)	0,123 0,000,000 0,000,000 0,000,000 0,000,00	Front of Amachine 0	43210 43210 4000 4000	4.05 <sup>0</sup> 0.00
TOW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 88 FT DRIVING INTERVALS	ON 88 FT DR	IVING INTERV	'ALS		0,1,2,3,4		43210 430000	
HIGH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	<b>DRIVING INTE</b>	RVALS / TIRE	SIZES		•		·	
Gate					Prod	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
=	19	22	24	25	26	27	28	29	30	32	34
H	71	79	87	92	95	98	103	106	111	119	127
"C/ L L	28	31	34	36	37	38	40	41	43	46	49
7/7 7	102	113	124	131	136	140	147	152	158	170	181
"C	37	41	45	48	49	51	53	55	57	61	66
7	136	151	166	175	182	188	197	203	212	227	242
"() 1 (	46	51	56	59	61	63	99	68	72	77	82
7/7 7	170	189	208	219	226	234	245	253	264	283	302
"5	54	60	99	70	72	52	78	81	84	06	96
n	200	222	245	258	267	276	289	298	311	333	356
1/1 °	62	69	76	80	82	85	89	92	96	103	110
7/T C	228	254	279	294	304	315	330	340	355	380	406
"1	70	77	85	06	93	96	101	104	108	116	124
t	257	286	315	332	343	355	372	383	400	429	457
"C/ F V	78	87	96	101	104	108	113	117	122	131	139
7/7 4	289	321	353	373	386	398	418	431	450	482	514
= U	87	97	107	113	117	120	126	130	136	146	155
n	323	359	395	416	430	445	466	481	502	538	574
"C/13	96	106	117	123	128	132	138	143	149	160	170
7/T C	353	393	432	456	471	487	511	526	550	589	628
"J	102	113	125	131	136	141	147	152	159	170	181
þ	377	418	460	485	502	519	544	561	586	628	670

### 90 Ft. Mechanical Drive, 380/90R46 - 320/90R50 (210008)

APPLICA	APPLICATION RATE		lbs/ACRE								210008
					MACHINE:	HNE:	F810	BLADE SETTING	ETTING	SPINNER RPM	R RPM
						TIRE SIZES:		нт 7 - 7 - 7 - 7		лч И И И И И И И И И И И И И И И И И И И	-
					380/90	380/90R46 (14.9R46)	.9R46)	A A	PE2:00 Machine	to to to to to	(
			_		320/90	320/90R50 (12.4R50)	.4R50)	0.1.2.3.4	01534	0 4 <sup>3,21</sup> 0	43210
LOWI	LOW RANGE	APPLICATIO	APPLICATION RATE BASED ON 90 FT DRIVING INTERVALS	ON 90 FT DR	VING INTERV	ALS		Š	0,2334	43210	
HIGH	HIGH RANGE	SEE MANUAL	SEE MANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	<b>DRIVING INTE</b>	RVALS / TIRE S	IZES		/		)	
Gate		·		·	Produ	Product Density lbs/ft3	s/ft3				
Opening	45		55	58	60	62	65	67	70	75	80
=	19	21	23	24	25	26	27	28	29	32	34
1	70	78	85	90	93	96	101	104	109	116	124
"C/11	27	30	33	35	36	37	39	40	42	45	48
- /	100	111	122	128	133	137	144	148	155	166	177
۳ <b>ر</b>	36	40	44	46	48	50	52	54	56	60	64
7	133	148	163	172	177	183	192	198	207	222	237
"(1) (	45	50	55	58	60	62	65	67	70	75	80
7/7 7	166	184	203	214	221	229	240	247	258	277	295
۳. ۲	53	59	65	68	71	73	77	79	82	88	94
'n	196	217	239	252	261	270	283	291	304	326	348
3 1/2"	60	67	74	78	81	83	87	90	94	101	107
7/T C	223	248	273	288	298	308	322	332	347	372	397
"1	68	76	83	88	91	94	98	101	106	114	121
t	252	280	308	324	335	347	363	375	391	419	447
"C/ L V	<i>LL</i>	85	94	66	102	106	111	114	119	128	136
7/7 4	283	314	346	364	377	390	408	421	440	471	503
= 7	85	56	104	110	114	118	123	127	133	142	152
D	316	351	386	407	421	435	456	470	491	526	561
5 1 / C"	94	104	114	121	125	129	135	139	146	156	166
7/T C	346	384	422	445	461	476	499	515	538	576	614
"J	100	111	122	129	133	137	144	148	155	166	177
þ	368	409	450	475	491	507	532	548	573	614	655

### **Rate Selector Charts (Cont'd)**

#### 40 Ft. Mechanical Drive, 480/80R42 (210009)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210009
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		700	
	ノ				480/80	480/80R42 (18.4R42)	.4R42)	0,123 0,000,4	Provident of Alachine Control of Alachine Control of Co		0°°°°°¢¢
TOW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 40 FT DRIVING INTERVALS	ON 40 FT DRI	VING INTERV,	ALS			0,2334	43210	
HOIH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	<b>DRIVING INTEI</b>	<u> RVALS / TIRE 5</u>	sizes		/	•	•)	\ \
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
- 1	44	48	53	56	58	60	63	65	68	73	78
Ŧ	161	179	197	208	215	222	233	240	251	269	286
"C/11	62	69	76	80	83	86	06	93	97	104	111
7/7 7	230	255	281	296	306	316	332	342	357	383	408
۳C	83	92	102	107	111	115	120	124	129	139	148
7	307	341	375	396	409	423	443	457	478	512	546
"C/1 C	104	115	127	134	138	143	150	154	161	173	184
- 1	383	425	468	494	511	528	553	570	596	638	681
	122	136	149	158	163	168	177	182	190	204	217
D	451	501	552	582	602	622	652	672	702	752	802
3 1 / 2"	139	155	170	180	186	192	201	208	217	232	248
7 /T C	515	572	629	664	686	709	744	767	801	858	915
"7	157	175	192	203	210	217	227	234	245	262	279
r	580	645	709	748	774	800	838	864	903	967	1,032
"C/ L V	177	196	216	228	236	243	255	263	275	294	314
7/7 +	652	725	797	841	870	899	942	971	1,015	1,087	1,160
- - -	197	219	241	254	263	272	285	294	307	329	351
D	728	809	890	938	971	1,003	1,052	1,084	1,132	1,213	1,294
ייכ/ 1	216	240	264	278	288	297	312	321	336	360	384
7/7 0	797	886	974	1,028	1,063	1,098	1,152	1,187	1,240	1,329	1,417
"ע	230	256	281	297	307	317	332	343	358	383	409
>	849	944	1,038	1,095	1,133	1,170	1,227	1,265	1,321	1,416	1,510

### Rate Selector Charts (Cont'd)

#### 50 Ft. Mechanical Drive, 480/80R42 (210010)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210010
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	R RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		830 <sup>RH</sup>	-
	2				480/80	480/80R42 (18.4R42)	4R42)	0,1,23,4	Period of Front of Machine Control of Period of Control	432210 432210 43000 43000 43000 43000 43000	4 <sup>3</sup> 0°0°0
	LOW RANGE	APPLICATION SEE MANI IAI	APPLICATION RATE BASED ON 50 FT DRIVING INTERVALS SEE MANNINI FOR OTHER DRIVING INTERVALS (7THE 51755	ON 50 FT DRI		ALS		0	0,1,2,3,4	43210	
Gate						Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	. 62	. 65	67	70	75	80
=	35	39	43	45	47	48	50	52	54	58	62
4	129	143	158	166	172	178	186	192	201	215	229
1 1/2"	50	55	61	64	99	69	72	74	17	83	88
	184	204	224	237	245	253	265	273	286	306	327
"C	67	74	81	86	89	92	96	66	103	111	118
7	246	273	300	317	328	338	355	366	382	409	437
"() 1 (	83	92	101	107	111	114	120	124	129	138	147
7/7 7	306	340	374	395	408	422	442	456	476	511	545
۳ <del>د</del>	98	109	120	126	130	135	141	146	152	163	174
D	361	401	441	465	481	497	521	538	562	602	642
3 1/2"	112	124	136	144	149	154	161	166	174	186	198
7/T C	412	458	503	531	549	567	595	613	641	686	732
"1	126	140	154	162	168	173	182	187	196	210	224
t	464	516	567	598	619	640	671	691	722	774	825
"0/ 1 1	141	157	173	182	188	195	204	210	220	236	251
7/7 4	522	580	638	673	969	719	754	777	812	870	928
ت ۲	158	175	193	203	210	217	228	235	245	263	280
n	582	647	712	751	777	802	841	867	906	971	1,035
۲ / / ۲	173	192	211	223	230	238	249	257	269	288	307
7/T C	638	709	779	822	850	879	921	950	992	1,063	1,134
יי ע	184	204	225	237	245	254	266	274	286	307	327
>	680	755	831	876	906	936	982	1,012	1,057	1,133	1,208

### **Rate Selector Charts (Cont'd)**

#### 60 Ft. Mechanical Drive, 480/80R42 (210011)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210011
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		950 вн	
	て				480/80	480/80R42 (18.4R42)	4R42)	4 0.123 0.00004	PESPON PE		0°0°5°¢¢
FOW F	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 60 FT DRIVING INTERVALS	ON 60 FT DRI	IVING INTERV/	ALS		/	012334	4321 <sub>0</sub> 0	
HDIH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	<b>DRIVING INTE</b>	RVALS / TIRE S	IZES		/	•	°	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
- 1	29	32	36	38	39	40	42	43	45	48	52
H	107	119	131	138	143	148	155	160	167	179	191
"C/11	41	46	51	53	55	57	60	62	64	69	74
- /	153	170	187	197	204	211	221	228	238	255	272
"6	55	62	68	71	74	76	80	83	86	92	66
7	205	227	250	264	273	282	296	305	318	341	364
"C/1 C	69	77	84	89	92	95	100	103	108	115	123
- 1	255	284	312	329	340	352	369	380	397	425	454
	81	91	100	105	109	112	118	121	127	136	145
D	301	334	368	388	401	415	435	448	468	501	535
3 1 / 2"	93	103	114	120	124	128	134	138	145	155	165
7 /T C	343	381	420	442	458	473	496	511	534	572	610
"7	105	116	128	135	140	144	151	156	163	175	186
r	387	430	473	499	516	533	559	576	602	645	688
"C/ L V	118	131	144	152	157	162	170	175	183	196	209
7/7 +	435	483	531	560	580	599	628	647	676	725	773
- - -	131	146	161	169	175	181	190	196	204	219	234
D	485	539	593	626	647	669	701	723	755	809	863
5 1 / C"	144	160	176	186	192	198	208	214	224	240	256
7 /T C	531	591	650	685	709	732	768	791	827	886	945
"U	153	170	187	198	204	211	222	228	239	256	273
>	566	629	692	730	755	780	818	843	881	944	1,007

### Rate Selector Charts (Cont'd)

#### 72 Ft. Mechanical Drive, 480/80R42 (210012)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210012
					MACHINE:	HINE:	F810	BLADE SETTING	DNILL	SPINNER RPM	۲M
						TIRE SIZES:		7 - 7 - 7 - 7 гн		700	
					480/80	480/80R42 (18.4R42)	4R42)	0,1234 0,234 0	Pront of Addition	0 <sup>°</sup> 1 <sup>°</sup> 2 <sup>°</sup> 0	0
FOW	LOW RANGE	APPLICATION SEE MANIIAL	CATION RATE BASED ON 72 FT DRIVING INTERVALS	ON 72 FT DRI	VING INTERV	ALS		0,00004	34	43210	\
Gate	nion Maivue te				Prodi	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	. 65	67	70	75	80
	24	27	30	31	32	33	35	36	38	40	43
Ŧ	90	66	109	115	119	123	129	133	139	149	159
1 1/2"	35	38	42	45	46	48	50	51	54	58	61
- /	128	142	156	164	170	176	184	190	198	213	227
"C	46	51	56	60	62	64	67	69	72	77	82
7	171	190	208	220	227	235	246	254	265	284	303
"() 1 (	58	64	70	74	77	79	83	86	90	96	102
7/7 7	213	236	260	274	284	293	307	317	331	355	378
۳۲	68	75	83	88	91	94	98	101	106	113	121
D	251	279	306	323	334	345	362	373	390	418	446
3 1/2"	77	86	95	100	103	107	112	115	121	129	138
7/T C	286	318	350	369	381	394	413	426	445	477	509
"1	87	97	107	113	116	120	126	130	136	146	155
t	322	358	394	416	430	444	466	480	502	537	573
"() 1 1	86	109	120	126	131	135	142	146	153	164	174
7/7 4	362	403	443	467	483	499	523	540	564	604	644
ت ۲	110	122	134	141	146	151	158	163	170	183	195
n	404	449	494	521	539	557	584	602	629	674	719
۲ / / ۲	120	133	147	155	160	165	173	179	187	200	213
7 /T C	443	492	541	571	591	610	640	659	689	738	787
יי ע	128	142	156	165	170	176	185	190	199	213	227
þ	472	524	577	608	629	650	682	703	734	786	839

### **Rate Selector Charts (Cont'd)**

#### 80 Ft. Mechanical Drive, 480/80R42 (210013)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210013
					MAC	MACHINE:	F810	BLADE SETTING	ETTING 2 2	SPINNER RPM	RPM
						TIRE SIZES:		г-7-7-7 Г-		/40 RH	
V	ノ				480/8(	480/80R42 (18.4R42)	4R42)	0000004 00000004	Provided from of the machine of the	43210 43210 44000	0°°°5°¢¢
FOW	LOW RANGE	APPLICATION SEE MANNIAL	APPLICATION RATE BASED ON 80 FT DRIVING INTERVALS	ON 80 FT DRI		'ALS		0,1	0,123,4	43210	
Gate		JEE IVIAINUAL			Prodi	Product Density lbs/ft3	s/ft3		y	)	
Opening	45	50	55	58	60	62	. 65	67	70	75	80
=	22	24	27	28	29	30	32	32	34	36	39
H	81	06	98	104	107	111	116	120	125	134	143
"C/11	31	35	38	40	41	43	45	46	48	52	55
- /	115	128	140	148	153	158	166	171	179	191	204
۳ <b>ر</b>	42	46	51	54	55	57	60	62	65	69	74
7	154	171	188	198	205	212	222	229	239	256	273
"(1) (	52	58	63	67	69	71	75	77	81	86	92
- 1	191	213	234	247	255	264	277	285	298	319	340
۳. ۲	61	68	75	79	81	84	88	91	95	102	109
D	226	251	276	291	301	311	326	336	351	376	401
3 1/2"	70	77	85	06	93	96	101	104	108	116	124
7 /T C	257	286	315	332	343	355	372	383	400	429	458
"1	79	87	96	101	105	108	114	117	122	131	140
t	290	322	355	374	387	400	419	432	451	484	516
"C/ L V	88	86	108	114	118	122	128	132	137	147	157
7/7 4	326	362	399	420	435	449	471	486	507	544	580
ב ני	66	110	120	127	131	136	142	147	153	164	175
D	364	404	445	469	485	501	526	542	566	607	647
5 1/2"	108	120	132	139	144	149	156	161	168	180	192
7 /T C	399	443	487	514	531	549	576	593	620	664	709
ש".	115	128	141	148	153	158	166	171	179	192	204
>	425	472	519	547	566	585	613	632	661	708	755

#### 90 Ft. Mechanical Drive, 480/80R42 (210014)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210014
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING 2 2	SPINNER RPM	RPM
						TIRE SIZES:		H1 2 - 2 - 2 - 2		/90 <sup>вн</sup>	5
	ハ				480/80	480/80R42 (18.4R42)	.4R42)	0,0,0,0,4 0,0,0,0,4	PE220 PE220 PE220 PE220 PE220 PE000 PE		0°°°°°¢¢
	LOW RANGE HIGH RANGE	APPLICATION SEF MANI IAI	APPLICATION RATE BASED ON 90 FT DRIVING INTERVALS SEE MANITAL FOR OTHER DRIVING INTERVALS (7TRE 51755	ON 90 FT DRI	VING INTERV	ALS		0	00 <sup>1</sup> 0 <sup>2</sup> 004	43.210	
Gate					Produ	Product Density lbs/ft3	s/ft3		S		
Opening	45	50	55	58	60	62	65	67	70	75	80
-	19	22	24	25	26	27	28	29	30	32	34
1	72	80	88	92	95	66	103	107	111	119	127
1 1/2"	28	31	34	36	37	38	40	41	43	46	49
	102	113	125	132	136	141	147	152	159	170	181
"C	37	41	45	48	49	51	53	55	57	62	66
7	136	152	167	176	182	188	197	203	212	227	243
"(1) (	46	51	56	59	61	64	67	69	72	77	82
7/7 7	170	189	208	219	227	234	246	253	265	284	303
۳۴	54	60	99	70	72	75	78	81	84	91	97
n	201	223	245	259	267	276	290	299	312	334	357
3 1 / 2"	62	69	76	80	83	85	06	92	96	103	110
7/T C	229	254	280	295	305	315	331	341	356	381	407
"1	70	78	85	06	93	96	101	104	109	116	124
<del>,</del>	258	287	315	332	344	355	373	384	401	430	459
"C/ F V	62	87	96	101	105	108	113	117	122	131	140
7/T +	290	322	354	374	387	399	419	432	451	483	515
" 2	88	26	107	113	117	121	127	130	136	146	156
n	324	359	395	417	431	446	467	482	503	539	575
יי <i>כן ו</i>	96	107	117	124	128	132	139	143	149	160	171
7 /T C	354	394	433	457	472	488	512	528	551	591	630
"4	102	114	125	132	136	141	148	152	159	170	182
5	378	419	461	487	503	520	545	562	587	629	671

### Rate Selector Charts (Cont'd)

#### 40 Ft. Mechanical Drive, 19L-16.1 - VF295/75R22.5 (210060)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210060
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	RPM
						TIRE SIZES:		3 - 2 - 3 - LH	2	/00 <sup>RH</sup>	2
J						19L-16.1		3.4	PE2:00 Machine	43210 o 10	(
			_		VF2	VF295/75R22.5	2.5	0,123,4	012334	0 4 <sup>3.21</sup> 0	435°1°0
TOW	LOW RANGE	APPLICATION	N RATE BASED	APPLICATION RATE BASED ON 40 FT DRIVING INTERVALS	VING INTERV/	ALS		01	0,2334	4 <sup>3210</sup> 4°°°°°0	
HDIH	HIGH RANGE	SEE MANUAL	FOR OTHER I	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	RVALS / TIRE S	IZES		/	.)	·)	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
-	62	69	76	80	83	86	06	93	97	104	111
H	230	256	282	297	307	317	333	343	358	384	410
"C/11	89	66	109	115	119	122	128	132	138	148	158
/	328	365	401	423	438	452	474	489	510	547	583
"¢	119	132	145	153	158	164	172	177	185	198	211
7	439	488	536	566	585	605	634	653	683	731	780
"(1)	148	165	181	191	198	204	214	221	231	247	264
7/7 7	547	608	699	705	730	754	791	815	851	912	973
۲. ۲.	175	194	214	225	233	241	252	260	272	291	311
D	645	717	788	831	860	889	932	960	1,003	1,075	1,147
3 1/2"	199	221	244	257	266	275	288	297	310	332	354
7 /T C	736	818	006	949	981	1,014	1,063	1,096	1,145	1,227	1,308
"1	225	250	275	290	300	310	325	335	350	374	399
r	830	922	1,014	1,069	1,106	1,143	1,198	1,235	1,290	1,383	1,475
"C/ L V	253	281	309	325	337	348	365	376	393	421	449
7/7 4	932	1,036	1,140	1,202	1,243	1,285	1,347	1,388	1,450	1,554	1,657
- 2	282	313	344	363	376	388	407	420	438	470	501
D	1,041	1,156	1,272	1,341	1,387	1,434	1,503	1,549	1,619	1,734	1,850
5 1 / C"	309	343	377	398	412	425	446	460	480	514	549
7/T C	1,140	1,266	1,393	1,469	1,519	1,570	1,646	1,697	1,773	1,899	2,026
"u	329	365	402	424	438	453	475	490	512	548	585
þ	1,214	1,349	1,484	1,565	1,619	1,673	1,754	1,808	1,889	2,024	2,159

### 50 Ft. Mechanical Drive, 19L-16.1 - VF295/75R22.5 (210061)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210061
					MACHINE:	HNE:	F810	BLADE SETTING	DNILL	SPINNER RPM	R RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		830 <sup>RH</sup>	
						19L-16.1		23,4	* Front of Machine	432 <sup>0</sup> ,0 en	(
J					VF29	VF295/75R22.5	2.5	0	012304	0 4°°°°°°°00	4321°0
	LOW RANGE	APPLICATION SEE MANI IAI	N RATE BASED	APPLICATION RATE BASED ON 50 FT DRIVING INTERVALS SEE MANI IAL FOR OTHER DRIVING INTERVALS (7THE SUSES	VING INTERV/	ALS		0,00000	5334	43210	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
=	50	55	61	64	67	69	72	74	78	83	89
H	184	205	225	238	246	254	266	274	287	307	328
"C/11	71	79	87	92	95	98	103	106	111	119	126
/	263	292	321	338	350	362	379	391	408	438	467
"¢	95	106	116	123	127	131	137	142	148	158	169
7	351	390	429	453	468	484	507	523	546	585	624
"0/10	119	132	145	153	158	163	171	177	184	198	211
7/7 7	438	487	535	564	584	603	632	652	681	730	778
ň	140	155	171	180	186	193	202	208	217	233	248
'n	516	573	631	665	688	711	745	768	803	860	917
3 1/2"	159	177	195	206	213	220	230	237	248	266	283
7 /T C	589	654	720	759	785	811	850	877	916	981	1,047
۳.	180	200	220	232	240	248	260	268	280	300	320
t	664	737	811	855	885	914	959	988	1,032	1,106	1,180
"C/ L V	202	224	247	260	269	278	292	301	314	337	359
7/7 +	746	829	912	961	994	1,028	1,077	1,110	1,160	1,243	1,326
= 7	225	251	276	291	301	311	326	336	351	376	401
D	832	925	1,017	1,073	1,110	1,147	1,202	1,239	1,295	1,387	1,480
"01 3	247	274	302	318	329	340	357	368	384	412	439
7/T C	912	1,013	1,114	1,175	1,216	1,256	1,317	1,357	1,418	1,519	1,621
"J	263	292	322	339	351	362	380	392	409	438	468
þ	971	1,079	1,187	1,252	1,295	1,338	1,403	1,446	1,511	1,619	1,727

### Rate Selector Charts (Cont'd)

#### 60 Ft. Mechanical Drive, 19L-16.1 - VF295/75R22.5 (210062)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210062
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	R RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		950 <sup>RH</sup>	
					, i	19L-16.1		°4	PE2:00 Machine	432,0 • • • • • • • • •	(
					VF2	VF295/75R22.5	2.5	0,123,4	0 1 0 1 5 3 4	0 4 <sup>3.21</sup> 0	43°5°1°0
LOW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 60 FT DRIVING INTERVALS	ON 60 FT DRI	VING INTERV.	ALS		°1	012334	4 <sub>ae0ac</sub> 0	
HOIH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	<b>DRIVING INTEL</b>	<b>RVALS / TIRE 5</b>	sizes		/	•	°	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
= +	42	46	51	54	55	57	60	62	65	69	74
Ŧ	154	171	188	198	205	212	222	229	239	256	273
"C/11	59	99	72	76	79	82	86	88	92	66	105
7/T T	219	243	267	282	292	301	316	326	340	365	389
"C	62	88	97	102	106	109	114	118	123	132	141
7	293	325	358	377	390	403	423	436	455	488	520
"C/1 C	66	110	121	127	132	136	143	147	154	165	176
- 1	365	405	446	470	487	503	527	543	568	608	649
n.	116	129	142	150	155	160	168	173	181	194	207
D	430	478	526	554	573	593	621	640	669	717	765
3 1 / 2"	133	148	162	171	177	183	192	198	207	221	236
7 /T C	491	545	600	632	654	676	709	731	763	818	872
"1	150	166	183	193	200	206	216	223	233	250	266
t	553	615	676	713	737	762	799	823	860	922	983
"C/ L V	168	187	206	217	224	232	243	251	262	281	299
7/7 4	622	691	760	801	829	856	898	925	967	1,036	1,105
= Ľ	188	209	230	242	251	259	271	280	292	313	334
D	694	771	848	894	925	956	1,002	1,033	1,079	1,156	1,233
"6/13	206	229	251	265	274	283	297	306	320	343	366
- 1- 0	760	844	929	979	1,013	1,047	1,097	1,131	1,182	1,266	1,351
ש".	219	244	268	283	292	302	317	326	341	365	390
>	808	668	686	1,043	1,079	1,115	1,169	1,205	1,259	1,349	1,439

### 72 Ft. Mechanical Drive, 19L-16.1 - VF295/75R22.5 (210063)

APPLICA	APPLICATION RATE		lbs/ACRE								210063
					MACHINE:	IINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	RPM
						TIRE SIZES:		2 - 2 - 2 - 2 - 2 LH		700 RH	
					П	19L-16.1		2,4	PE210 Machine	43.20,0 eu	(
					VF29	VF295/75R22.5	2.5	0,123,4	0 1 2 3 4	0 4 <u>3210</u>	43°°°1°0
LOW F	LOW RANGE	APPLICATION	N RATE BASED	ON 72 FT DRI	ATION RATE BASED ON 72 FT DRIVING INTERVALS	VLS		0,1	0,123,4	43210	
HIGH	HIGH RANGE	SEE MANUAL	FOR OTHER D	DRIVING INTEI	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	IZES		)	•	°	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
=	35	39	42	45	46	48	50	52	54	58	62
4	128	142	156	165	171	176	185	191	199	213	228
"C/11	49	55	60	64	99	68	71	74	77	82	88
7 /T T	182	203	223	235	243	251	263	271	284	304	324
"C	99	73	81	85	88	91	95	98	103	110	117
7	244	271	298	314	325	336	352	363	379	406	433
ויכ/ 1 כ	82	92	101	106	110	113	119	123	128	137	146
7/7 7	304	338	372	392	405	419	439	453	473	507	541
"6	67	108	119	125	129	134	140	145	151	162	173
'n	358	398	438	462	478	494	518	534	557	597	637
3 1 / 2"	111	123	135	143	148	153	160	165	172	185	197
7/T C	409	454	500	527	545	563	591	609	636	681	727
"'	125	139	153	161	166	172	180	186	194	208	222
t	461	512	563	594	615	635	666	686	717	768	819
"C/ L V	140	156	171	181	187	193	203	209	218	234	249
4 T/Z	518	576	633	668	691	714	748	771	806	863	921
	157	174	191	202	209	216	226	233	244	261	278
n	578	642	707	745	771	796	835	861	899	963	1,028
"C/13	171	191	210	221	229	236	248	255	267	286	305
7/T C	633	703	774	816	844	872	914	943	985	1,055	1,125
"7	183	203	223	235	244	252	264	272	284	304	325
D	675	749	824	869	899	929	974	1,004	1,049	1,124	1,199

### Rate Selector Charts (Cont'd)

#### 80 Ft. Mechanical Drive, 19L-16.1 - VF295/75R22.5 (210064)

APPLICA	APPLICATION RATE		lbs/ACRE								210064
					MACHINE:	HINE:	F810	BLADE SETTING		SPINNER RPM	R RPM
					⊢	TIRE SIZES:		2 - 2 - 2 - 2 LH		740 <sup>RH</sup>	0
						19L-16.1		234 234	PE210 Machine	43221,0 • • • • • • • • • •	(
					VF2	VF295/75R22.5	2.5	0,1,2,3,4	0 1 0 1 5 3 4	0 4 <sup>3.22.1</sup> 0	43.22,00
TOW	LOW RANGE	APPLICATIO	APPLICATION RATE BASED ON 80 FT DRIVING INTERVALS	ON 80 FT DRI	VING INTERV	ALS		01	012334	4321 <sub>0</sub>	
HIGH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	<b>DRIVING INTEL</b>	RVALS / TIRE	SIZES		)	.)	•)	
Gate					Prod	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
=	31	35	38	40	42	43	45	46	49	52	55
4	115	128	141	148	154	159	166	171	179	192	205
"C/11	44	49	54	57	59	61	64	99	69	74	79
- /	164	182	201	211	219	226	237	244	255	273	292
"(	59	99	73	77	62	82	86	88	92	66	106
7	219	244	268	283	293	302	317	327	341	366	390
"(1)	74	82	91	96	66	102	107	110	115	124	132
7/7 7	274	304	334	353	365	377	395	407	426	456	487
ع ۳	87	67	107	113	116	120	126	130	136	146	155
D	323	358	394	416	430	444	466	480	502	538	573
3 1/2"	100	111	122	128	133	137	144	148	155	166	177
	368	409	450	474	491	507	532	548	572	613	654
"T	112	125	137	145	150	155	162	167	175	187	200
t	415	461	507	535	553	572	599	618	645	691	737
"C/ L V	126	140	154	163	168	174	182	188	196	210	224
7/7 4	466	518	570	601	622	642	673	694	725	777	829
ב ני	141	157	172	182	188	194	204	210	219	235	251
D	520	578	636	671	694	717	752	775	809	867	925
ייכ/1 2	154	171	189	199	206	213	223	230	240	257	274
- /- 0	570	633	969	734	760	785	823	848	886	950	1,013
U	164	183	201	212	219	227	237	245	256	274	292
>	607	675	742	782	808	836	877	904	944	1,012	1,079

#### 90 Ft. Mechanical Drive, 19L-16.1 - VF295/75R22.5 (210065)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210065
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING 2 2	SPINNER RPM	R RPM
						TIRE SIZES:		7 - 7 - 7 - 7		/90 ня	
						19L-16.1		34	P <sup>o</sup> <sup>o</sup> <sup>o</sup> <sup>o</sup> <sup>o</sup> Front of Machine	4321,0 eu	(
			_		VF2	VF295/75R22.5	2.5	0,123,4	0 1 0 1 0 3 4	0 4 <sup>321</sup> 0	43.210 °°°°°°°0
TOW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 90 FT DRIVING INTERVALS	ON 90 FT DRI	VING INTERV	ALS		1°0	012334	43210	
HOIH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	DRIVING INTE	RVALS / TIRE	SIZES		/		.)	
Gate					Prod	Product Density lbs/ft3	s/ft3			·	
Opening	45		55	58	60		65	67	70	75	80
1"	28	31	34	36	37	38	40	41	43	46	49
I	102	114	125	132	137	141	148	152	159	171	182
11/2"	40	44	48	51	53	54	57	59	61	99	70
- /	146	162	178	188	194	201	211	217	227	243	259
"(	53	59	65	68	70	73	76	79	82	88	94
V	195	217	238	251	260	269	282	290	303	325	347
"() 1 (	99	73	81	85	88	91	95	98	102	110	117
7/7 7	243	270	297	314	324	335	351	362	378	405	432
"5	78	86	95	100	104	107	112	116	121	129	138
D	287	319	350	370	382	395	414	427	446	478	510
3 1/2"	89	98	108	114	118	122	128	132	138	148	157
7 /T C	327	363	400	422	436	451	472	487	509	545	581
"V	100	111	122	129	133	138	144	149	155	166	178
F	369	410	451	475	492	508	533	549	574	615	655
"C/ F V	112	125	137	145	150	155	162	167	175	187	200
7/7 4	414	460	506	534	552	571	599	617	645	691	737
= 7	125	139	153	161	167	173	181	186	195	209	223
D	462	514	565	596	617	637	668	689	719	771	822
"01 3	137	152	168	177	183	189	198	204	213	229	244
7/T C	506	563	619	653	675	698	732	754	788	844	900
"J	146	162	179	188	195	201	211	218	227	244	260
D	540	600	660	969	720	743	6/1	803	839	899	959

### Rate Selector Charts (Cont'd)

#### 40 Ft. Mechanical Drive, 14L-16.1 (210090)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210090
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	R RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		/00 RH	5
						14L-16.1		0,000,000 0,000,000 0	Provided of the second of the	43210 43210 43000 43000 40000 40000 90000	0°°°°°¢¢
TOW	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 40 FT DRIVING INTERVALS	ON 40 FT DRI	VING INTERV	'ALS		_°	0100004	43210	
HIGH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES Draduct D		VALS / IIKE	IIRE SIZES Product Density Ibs/ft3	:/ft.3	/		)	
Opening	45	50	55	58	60	62	65	67	70	75	80
=+	71	62	87	92	95	98	103	106	111	119	127
Ŧ	264	293	323	340	352	364	381	393	410	440	469
"C/11	102	113	124	131	136	140	147	152	158	170	181
7/7 7	376	418	459	484	501	518	543	560	585	627	668
"C	136	151	166	175	182	188	197	203	212	227	242
7	503	559	614	648	670	693	726	748	782	838	894
"() 1 (	170	189	208	219	226	234	245	253	264	283	302
7/7 7	627	697	766	808	836	864	906	933	975	1,045	1,115
2"	200	222	245	258	267	276	289	298	311	334	356
ז	739	821	903	952	985	1,018	1,067	1,100	1,149	1,231	1,314
3 1/2"	228	254	279	294	304	315	330	340	355	381	406
7 /T C	843	937	1,030	1,087	1,124	1,161	1,218	1,255	1,311	1,405	1,499
"1	257	286	315	332	343	355	372	383	400	429	458
r	950	1,056	1,161	1,225	1,267	1,309	1,373	1,415	1,478	1,584	1,689
"C/ L V	289	321	354	373	386	398	418	431	450	482	514
7/7 4	1,068	1,187	1,305	1,376	1,424	1,471	1,543	1,590	1,661	1,780	1,899
ב ני	323	359	395	416	430	445	466	481	502	538	574
ו	1,192	1,324	1,457	1,536	1,589	1,642	1,722	1,775	1,854	1,987	2,119
5 1/2"	354	393	432	456	471	487	511	526	550	589	628
7 /T C	1,305	1,450	1,595	1,682	1,740	1,798	1,885	1,943	2,030	2,175	2,321
"ע	377	419	460	485	502	519	544	561	586	628	670
þ	1,391	1,545	1,700	1,793	1,854	1,916	2,009	2,071	2,163	2,318	2,472

### Rate Selector Charts (Cont'd)

#### 50 Ft. Mechanical Drive, 14L-16.1 (210091)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210091
					MACHINE:	INE:	F810	BLADE SETTING	ETTING	SPINNER RPM	RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		830 <sup>RH</sup>	
					-	14L-16.1		0,123,4 0,000,04	Period of Front of Machine Control of Period of Control		0°°°°°°¢h
I NON	LOW RANGE	APPLICATION	N RATE BASED	ON 50 FT DRI	APPLICATION RATE BASED ON 50 FT DRIVING INTERVALS	LS L		Ĭ	01000044	43,21,0	
HIGH	HIGH RANGE	SEE MANUAL	- FOK UTHEK L		ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	like Sizes Broduct Doncitiv Ibc / <del>1</del> 2		/	)	)	
Opening	45	50	55	58	60	62	65	67	70	75	80
Ę	57		70	74	76	62	83	85	89	95	102
Ŧ	211	235	258	272	281	291	305	314	328	352	375
"C/11	81	06	100	105	109	112	118	121	127	136	145
- /	301	334	368	388	401	414	434	448	468	501	535
"(	109	121	133	140	145	150	157	162	169	182	194
7	402	447	492	518	536	554	581	599	626	670	715
"(1)	136	151	166	175	181	187	196	202	211	226	241
7/7 7	502	557	613	646	669	691	724	747	780	836	892
۳. ۲	160	178	196	206	213	221	231	238	249	267	285
D	591	657	722	762	788	814	854	880	920	985	1,051
3 1/2"	183	203	223	235	244	252	264	272	284	304	325
7 /T C	674	749	824	869	899	929	974	1,004	1,049	1,124	1,199
"V	206	229	252	265	275	284	297	307	320	343	366
r	760	845	929	980	1,014	1,047	1,098	1,132	1,183	1,267	1,352
"C/ L V	231	257	283	298	309	319	334	345	360	386	411
7/7 4	854	949	1,044	1,101	1,139	1,177	1,234	1,272	1,329	1,424	1,519
ב ני	258	287	316	333	344	356	373	385	402	430	459
D	954	1,059	1,165	1,229	1,271	1,314	1,377	1,420	1,483	1,589	1,695
5 1/2"	283	314	346	365	377	390	409	421	440	471	503
7 /T C	1,044	1,160	1,276	1,346	1,392	1,439	1,508	1,555	1,624	1,740	1,856
יי ע	301	335	368	388	402	415	435	449	469	502	536
>	1,113	1,236	1,360	1,434	1,483	1,533	1,607	1,657	1,731	1,854	1,978

### Rate Selector Charts (Cont'd)

#### 60 Ft. Mechanical Drive, 14L-16.1 (210092)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210092
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	RPM
						TIRE SIZES:		3 - 2 - 3 - 2 LH		950 <sup>RH</sup>	_
	て					14L-16.1		00000000000000000000000000000000000000	PESPON PESPON		0°°°°°¢¢
FOW	LOW RANGE	APPLICATION SEE MANI IAI	APPLICATION RATE BASED ON 60 FT DRIVING INTERVALS	ON 60 FT DRI	VING INTERV.	ALS		1°0	0,123,4	43210	
Gate	NAINGE				Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	. 65	67	70	75	80
=	48	53	58	61	64	99	69	71	74	79	85
4	176	195	215	227	235	242	254	262	274	293	313
"C/11	68	75	83	87	90	94	98	101	106	113	121
7/7 7	251	278	306	323	334	345	362	373	390	418	446
"6	91	101	111	117	121	125	131	135	141	151	161
7	335	372	410	432	447	462	484	499	521	559	596
"(1)	113	126	138	146	151	156	164	169	176	189	201
7/7 7	418	464	511	539	557	576	604	622	650	697	743
۳۴	133	148	163	172	178	184	193	199	208	222	237
)	493	547	602	635	657	679	712	733	766	821	876
3 1/2"	152	169	186	196	203	210	220	227	237	254	271
7 /T C	562	624	687	724	749	774	812	837	874	937	666
"1	172	191	210	221	229	236	248	255	267	286	305
t	634	704	774	817	845	873	915	943	985	1,056	1,126
"C/ F V	193	214	236	249	257	266	279	287	300	321	343
7/7 4	712	791	870	918	949	981	1,028	1,060	1,107	1,187	1,266
ت ۲	215	239	263	277	287	297	311	320	335	359	383
)	795	883	971	1,024	1,059	1,095	1,148	1,183	1,236	1,324	1,413
ב 1/2"	236	262	288	304	314	325	340	351	367	393	419
7/7 0	870	967	1,064	1,122	1,160	1,199	1,257	1,296	1,354	1,450	1,547
"ר	251	279	307	324	335	346	363	374	391	419	446
þ	927	1,030	1,133	1,195	1,236	1,277	1,339	1,380	1,442	1,545	1,648

### Rate Selector Charts (Cont'd)

#### 72 Ft. Mechanical Drive, 14L-16.1 (210093)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210093
					MACHINE:	HINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	RPM
						TIRE SIZES:		н <sup>л</sup> 7 - 7 - 7 - 7		и0/	_
	N					14L-16.1		0.00004	Provided from the machine of the mac		4 <sup>3</sup> 0 <sup>20</sup> 00
FOW	LOW RANGE	APPLICATION	CATION RATE BASED ON 72 FT DRIVING INTERVALS	0N 72 FT DR	VING INTERV	ALS		· ·	01234	43210	
HOIH	HIGH RANGE	SEE MANUAI	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES	DRIVING INTE	RVALS / TIRE 5	SIZES		/	•	•	
Gate					Produ	Product Density lbs/ft3	s/ft3				
Opening	45	50	55	58	60	62	65	67	70	75	80
=	40	44	49	51	53	55	57	59	62	99	71
H	147	163	179	189	195	202	212	218	228	244	261
"C/11	57	63	69	73	75	78	82	84	88	94	101
7/7 7	209	232	255	269	278	288	302	311	325	348	371
"C	26	84	92	97	101	104	109	113	118	126	134
7	279	310	341	360	372	385	403	416	434	465	497
"() 1 (	94	105	115	122	126	130	136	140	147	157	168
7/7 7	348	387	426	449	464	480	503	519	542	580	619
"6	111	124	136	143	148	153	161	166	173	185	198
D	410	456	502	529	547	566	593	611	639	684	730
3 1 / 2 "	127	141	155	163	169	175	183	189	197	211	225
7 /T C	468	520	572	604	624	645	676	697	729	781	833
"V	143	159	175	184	191	197	207	213	222	238	254
t	528	587	645	680	704	727	763	786	821	880	939
"C/ L V	161	179	196	207	214	221	232	239	250	268	286
7/7 4	593	659	725	765	791	817	857	883	923	989	1,055
۲ ۲	179	199	219	231	239	247	259	267	279	299	319
n	662	736	809	853	883	912	956	986	1,030	1,104	1,177
ייכ/1 ב	196	218	240	253	262	271	284	292	306	327	349
7/7 0	725	806	886	935	967	666	1,047	1,080	1,128	1,209	1,289
"4	209	233	256	270	279	288	302	312	326	349	372
þ	773	859	944	966	1,030	1,065	1,116	1,150	1,202	1,288	1,374

### Rate Selector Charts (Cont'd)

#### 80 Ft. Mechanical Drive, 14L-16.1 (210094)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210094
					MAC	MACHINE:	F810	BLADE SETTING	ETTING	SPINNER RPM	R RPM
						TIRE SIZES:		Z - Z - Z - Z		/40	5
V	~					14L-16.1		4 0;0:23,4 0	PEST O	4300 4300 400 4000 4	0°°°°°°¢
LOWF	LOW RANGE	APPLICATION	APPLICATION RATE BASED ON 80 FT DRIVING INTERVALS	ON 80 FT DRI	VING INTERV	/ALS		Ĵ	0,000,000,000	43210	
HIGH	HIGH RANGE	SEE MANUAL	ANUAL FOR OTHER DRIVING INTERVALS / TIRE SIZES Droduct D		<u> VALS / IIKE</u> Brod	IIRE SIZES Product Density Ibs / <del>ft</del> 3	:/f+3	/		)	
Opening	45	50	55	58	60	62	65	67	70	75	80
=+	36	40	44	46	48	49	52	53	56	60	64
1	132	147	161	170	176	182	191	196	205	220	235
"C/11	51	57	62	99	68	70	74	76	79	85	90
7/7 7	188	209	230	242	251	259	271	280	292	313	334
"C	68	76	83	88	91	94	98	101	106	113	121
7	251	279	307	324	335	346	363	374	391	419	447
"C/ L C	85	94	104	109	113	117	123	126	132	141	151
7/7 7	313	348	383	404	418	432	453	467	488	522	557
3"	100	111	122	129	133	138	145	149	156	167	178
ŋ	369	410	452	476	493	509	534	550	575	616	657
3 1/2"	114	127	140	147	152	157	165	170	178	190	203
7 /T C	422	468	515	543	562	581	609	628	656	703	749
"1	129	143	157	166	172	177	186	192	200	214	229
ŀ	475	528	581	612	634	655	686	707	739	792	845
"C/ L V	145	161	177	186	193	199	209	215	225	241	257
7/7 4	534	593	653	688	712	736	771	795	831	890	949
۳ ۲	161	179	197	208	215	222	233	240	251	269	287
ŋ	596	662	728	768	795	821	861	887	927	993	1,059
יי <i>כו</i> ן 5	177	196	216	228	236	244	255	263	275	295	314
2/7 0	653	725	798	841	870	868	943	972	1,015	1,088	1,160
"4	188	209	230	243	251	259	272	280	293	314	335
þ	695	773	850	896	927	958	1,004	1,035	1,082	1,159	1,236

### Rate Selector Charts (Cont'd)

#### 90 Ft. Mechanical Drive, 14L-16.1 (210095)

APPLICA	<b>APPLICATION RATE</b>		lbs/ACRE								210095
					MACHINE:	HNE:	F810	BLADE SETTING	ETTING	SPINNER RPM	R RPM
						TIRE SIZES:		Z - Z - Z - Z		/90 <sup>вн</sup>	-
						14L-16.1		0,000,04	Provided from the form of the	432210 432210 4300 4300 4300 90	0°0°°°°0
TOW	LOW RANGE	APPLICATIO	APPLICATION RATE BASED ON 90 FT DRIVING INTERVALS	ON 90 FT DRI	VING INTERV	ALS		0,1	01000044	43210	
HIGH	HIGH KANGE	SEE MANUAL	ANUAL FUR UTHER DRIVING INTERVALS / TIRE SIZES		VALS / TIKE S	like Sizes Product Doncity/ Ibc / <del>f</del> t3	C+#/ ·	/		)	
Opening	45	50	55	58	60	62 62	65	67	70	75	80
=	32	35	39	41	42	44	46	47	49	53	56
-	117	130	143	151	156	162	169	175	182	195	208
"C/11	45	50	55	58	60	62	65	67	70	75	80
/ <del>-</del> -	167	186	204	215	223	230	241	249	260	278	297
"¢	61	67	74	78	81	83	87	06	94	101	108
7	223	248	273	288	298	308	323	333	348	372	397
"0/10	75	84	92	97	101	104	109	112	117	126	134
7/7 7	279	310	341	359	372	384	402	415	433	464	495
	68	66	109	115	119	123	128	132	138	148	158
n	328	365	401	423	438	452	474	489	511	547	584
31/2"	101	113	124	131	135	140	147	151	158	169	180
7/T C	375	416	458	483	500	516	541	558	583	624	666
۳.	114	127	140	147	153	158	165	170	178	191	203
r	422	469	516	544	563	582	610	629	657	704	751
"C/ L V	129	143	157	166	171	177	186	191	200	214	229
7/7 4	475	527	580	612	633	654	686	707	738	791	844
= U	143	159	175	185	191	198	207	214	223	239	255
D	530	589	647	683	706	730	765	789	824	883	942
5 1 / 2"	157	175	192	203	209	216	227	234	244	262	279
7 /T C	580	645	709	748	774	799	838	864	902	967	1,031
<b>"</b>	167	186	205	216	223	231	242	249	260	279	298
>	618	687	755	797	824	852	893	920	962	1,030	1,099

# **Spreader Dimensions**



# Spreader Dimensions (Cont'd)

DESCRIPTION	F1210	L1230	F810
Length (A)	246 in.	246 in.	196 in.
	(624.8 cm)	(624.8 cm)	(497.84 cm)
Width (B)	99 in 135 in.	98 in 135 in.	92 in 168 in.
	(251.46 cm - 342.9 cm)	(248.92 - 342.9 cm)	(233.68 - 426.72 cm)
Height (C)	120.5 in.	117 in.	120 in.
	(306.07 cm)	(297.18 cm)	(304.8 cm)
Hopper Width (D)	99 in.	97 in.	92 in.
	251.46 cm	(246.38 cm)	(233.68 cm)
Hopper Length (E)	155 in.	155 in.	119 in.
	(393.7 cm)	(393.7 cm)	(302.26 cm)
Hopper Depth (F)	57 in.	49 in.	56 in.
	(144.78 cm)	(124.46 cm)	(142.24 cm)
Frame/Crop Clearance	41 in. (1	04.1 cm)	40 in. (101.6 cm)

# **Spreader Specifications**

DESCRIPTION		F1210	L1230	F810		
Spread Pattern - (	Dual)	40 - 90 ft. (12.19 - 27.43 m)	Lime: 20 - 60 ft. (6.09 - 18.29 m) Fertilizer: 40 - 90 ft. (12.19 - 27.43 m)	40-90 ft. (12.19 - 27.43 m)		
Hopper	Struck	398 cu. ft. (11.27 cu. m)	266 cu. ft. (7.53 cu. m)	295 cu. ft. (8.35 cu. m)		
Capacity	Heaped	499 cu. ft. (14.13 cu. m)	362 cu. ft. (10.25 cu. m)	295 cu. ft. (8.35 cu. m)		
Weight-Empty		7,000 lbs. (3175.14 kg)	6,480 lbs. (2939.27 kg)	5,540 lbs. (2512.90 kg)		
Max Gross Weigh	t	28,000 lbs. (12700.58 kg)	28,000 lbs. (12700.58 kg)	20,000 lbs. (9071.84 kg)		
Standard Tires			380/90-R46			
Ayloo/Supposion	Standard	Adjustable 60 in 134	in. (152.4 - 340.36 cm)	Adjustable 80 in 150 in. (203.2 - 381 cm)		
Axles/Suspension	Optional	Adjustable 80 in 160	) in. (203.2 - 406.4 cm)	Adjustable 60 in 160 in. (152.4 - 406.4 cm)		
Frame		1⁄4 in.,	hot-rolled sheet, channel-fo	ormed		
Hitch		1⁄4 in.,	hot-rolled sheet, channel-fo	ormed		
Drawbar			Bolt-in, adjustable position			
Hopper		-	2-gauge, 409 stainless stee	el		
Skid		-	2-gauge, 409 stainless stee	əl		
Gate		7-gauge, 409 stainless steel				
Apron		7-in. wide, 304 stainless steel with 1 in. x 1 in. mesh (two)	24 in. belt-over 88C chain with ½ in. x 2 in. slots	7-in. wide, 304 stainless steel with 1 in. x 1 in. mesh		
Apron Drive		Two Section Dual Variable Rate Ready (VRR) - Left/Right Independent Rates	Variable Rate Ready (VRR) Variable Rate Ready (VRR) (VRR); Mechanical Ground			
	Diameter	24 in. diameter	30 in. diameter	20 in. diameter		
Spinner Dish	Material		7-gauge, 409 stainless stee			
Spinner Drive		HSD - Hydraulic S	pinner Drive; or CSD - Conti	rolled Spinner Drive		
		Options				
Tires			480/80-R42; 320/90-R50; 7 Ils - 380/90-R46; or 320/90-			
Hitch			Hitch Steerable			
Scale			Scale Intergral			
Roll Tarp			Roll Tarp Blue			

#### **Torque Specifications**

#### Inches Hardware and Lock Nuts

#### **TORQUE CHARTS**

#### Minimum Hardware Tightening Torques

#### **Normal Assembly Applications**

(Standard Hardware and Lock Nuts)

SAE Gr. 2	SAE G	rade 5	SAE G	irade 8		LOCK	NUTS	
Nominal Size	Unplated or Plated Silver	Plated W / ZnCr Gold	Unplated or Plated Silver	Plated W / ZnCr Gold	Unplated or Plated Silver	Plated W / ZnCr Gold	Grade W / Gr. 5 Bolt	Grade W / Gr. 8 Bolt
1/4	55 inlb.	72 inlb.	86 inlb.	112 inlb.	121 inlb.	157 inlb.	61 inlb.	86 inlb.
	(6.2 N•m)	(8.1 N∙m)	(9.7 N∙m)	(12.6 N•m)	(13.6 N•m)	(17.7 N•m)	(6.9 N•m)	(9.8 N•m)
5/16	115 inlb.	149 inlb.	178 inlb.	229 inlb.	250 inlb.	324 inlb.	125 inlb.	176 inlb.
	(13 N•m)	(17 N•m)	(20 N•m)	(26 N•m)	(28 N•m)	(37 N•m)	(14 N•m)	(20 N•m)
3/8	17 ftlb.	22 ftlb.	26 ftlb.	34 ftlb.	37 ftlb.	48 ftlb.	19 ftlb.	26 ftlb.
	(23 N•m)	(30 N•m)	(35 N•m)	(46 N∙m)	(50 N•m)	(65 N•m)	(26 N•m)	(35 N•m)
7/16	27 ftlb.	35 ftlb.	42 ftlb.	54 ftlb.	59 ftlb.	77 ftlb.	30 ftlb.	42 ftlb.
	(37 N•m)	(47 N•m)	(57 N•m)	(73 N∙m)	(80 N•m)	(104 N•m)	(41 N∙m)	(57 N•m)
1/2	42 ftlb.	54 ftlb.	64 ftlb.	83 ftlb.	91 ftlb.	117 ftlb.	45 ftlb.	64 ftlb.
	(57 N•m)	(73 N•m)	(87 N•m)	(113 N•m)	(123 N•m)	(159 N•m)	(61 N•m)	(88 N•m)
9/16	60 ftlb.	77 ftlb.	92 ftlb.	120 ftlb.	130 ftlb.	169 ftlb.	65 ftlb.	92 ftlb.
	(81 N•m)	(104 N•m)	(125 N∙m)	(163 N•m)	(176) N•m	(229 N•m)	(88 N•m)	(125 N•m)
5/8	83 ftlb.	107 ftlb.	128 ftlb.	165 ftlb.	180 ftlb.	233 ftlb.	90 ftlb.	127 ftlb.
	(112 N•m)	(145 N•m)	(174 N•m)	(224 N•m)	(244) N•m	(316 N•m)	(122 N•m)	(172 N•m)
3/4	146 ftlb.	189 ftlb.	226 ftlb.	293 ftlb.	319 ftlb.	413 ftlb.	160 ftlb.	226 ftlb.
	(198 N•m)	(256 N•m)	(306 N•m)	(397 N•m)	(432 N•m)	(560 N∙m)	(217 N•m)	(306 N•m)
7/8	142 ftlb.	183 ftlb.	365 ftlb.	473 ftlb.	515 ftlb.	667 ftlb.	258 ftlb.	364 ftlb.
	(193 N•m)	(248 N•m)	(495 N∙m)	(641 N•m)	(698 N•m)	(904 N•m)	(350 N•m)	(494 N•m)
1	213 ftlb.	275 ftlb.	547 ftlb.	708 ftlb.	773 ftlb.	1000 ftlb.	386 ftlb.	545 ftlb.
	(289 N•m)	(373 N•m)	(742 N•m)	(960 N•m)	(1048 N•m)	(1356 N•m)	(523 N•m)	(739 N•m)



### **Torque Specifications (Cont'd)**

#### Metric Hardware and Lock Nuts

#### **TORQUE CHARTS**

#### **Minimum Hardware Tightening Torques**

	Class	s 5,8	Clas	s 8,8	Class	s 10,9	Lock nuts
Nominal Size	Unplated or Plated Silver	Plated W / ZnCr Gold	Unplated or Plated Silver	Plated W / ZnCr Gold	Unplated or Plated Silver	Plated W / ZnCr Gold	Class 8 W / CL. 8,8 Bolt
M4	1.7 N•m	2.2 N•m	2.6 N•m	3.4 N∙m	3.7 N•m	4.8 N∙m	1.8 N•m
	(15 inlb.)	(19 inlb.)	(23 inlb.)	(30 inlb.)	(33 inlb.)	(42 inlb.)	(16 inlb.)
M6	5.8 N•m	7.6 N•m	8.9 N•m	12 N•m	13 N•m	17 N•m	6.3 N•m
	(51 inlb.)	(67 inlb.)	(79 inlb.)	(102 inlb.)	(115 inlb.)	(150 inlb.)	(56 inlb.)
M8	14 N•m	18 N•m	22 N•m	28 N•m	31 N•m	40 N•m	15 N•m
	(124 inlb.)	(159 inlb.)	(195 inlb.)	(248 inlb.)	(274 inlb.)	(354 inlb.)	(133 inlb.)
M10	28 N•m	36 N•m	43 N•m	56 N•m	61 N•m	79 N•m	30 N•m
	(21 ftlb.)	(27 ftlb.)	(32 ftlb.)	(41 ftlb.)	(45 ftlb.)	(58 ftlb.)	(22 ftlb.)
M12	49 N•m	63 N•m	75 N•m	97 N∙m	107 N•m	138 N•m	53 N•m
	(36 ftlb.)	(46 ftlb.)	(55 ftlb.)	(72 ftlb.)	(79 ftlb.)	(102 ftlb.)	(39 ftlb.)
M16	121 N•m	158 N•m	186 N•m	240 N•m	266 N•m	344 N•m	131N•m
	(89 ftlb.)	(117 ftlb.)	(137 ftlb.)	(177 ftlb.)	(196 ftlb.)	(254 ftlb.)	(97 ftlb.)
M20	237 N•m	307 N•m	375 N•m	485 N•m	519 N•m	671 N•m	265 N•m
	(175 ftlb.)	(226 ftlb.)	(277 ftlb.)	(358 ftlb.)	(383 ftlb.)	(495 ftlb.)	(195 ftlb.)
M24	411 N•m	531 N•m	648 N•m	839 N•m	897 N•m	1160 N•m	458 N•m
	(303 ftlb.)	(392 ftlb.)	(478 ftlb.)	(619 ftlb.)	(662 ftlb.)	(855 ftlb.)	(338 ftlb.)

Normal Assembly Applications (Metric Hardware and Lock Nuts)







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