Massey Ferguson®

9702 / 9708 / 9722
Planter

SERVICE MANUAL
4283530M1

CONTENTS

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Massey Ferguson®

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SERVICE MANUAL
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01 - General Information

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General Information

GENERAL INFORMATION

FIG. 1

9700 Series Mounted Planters are designed, built and tested to make sure high quality, maximum strength and long service life. The planters, available as 8 and 12-row models, feature a positive air flow system and the 9000 Series meter for accurate seed spacing.

WARNING: Pictures in this manual may show protective shields and guards opened or removed for illustration purposes. Be sure all shields and guards are in place during operation.

This manual was prepared from the latest product information available at publication time. The Company reserves the right to make changes at any time without notice or obligation.

9702	12 Row, 30 inch row spacing, Rigid Frame
9708	8 row, 30 inch row spacing, Rigid Frame
9722	12 row, 30 inch row spacing, Vertical Fold Frame

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SERIAL NUMBER PLATE LOCATION

The serial number plate (1) is found on the left end of the toolbar.

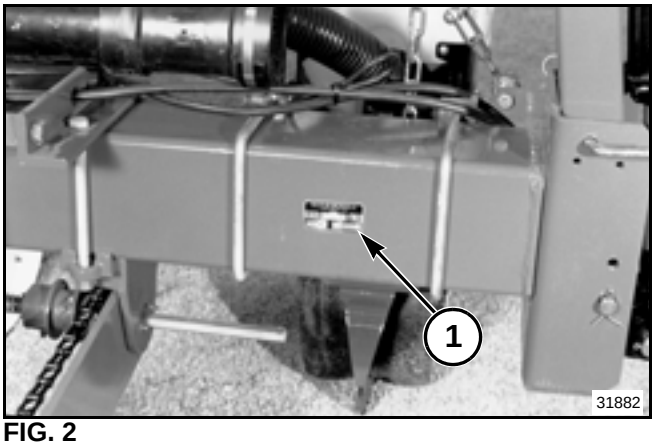

FIG. 2

Serial Number Definition

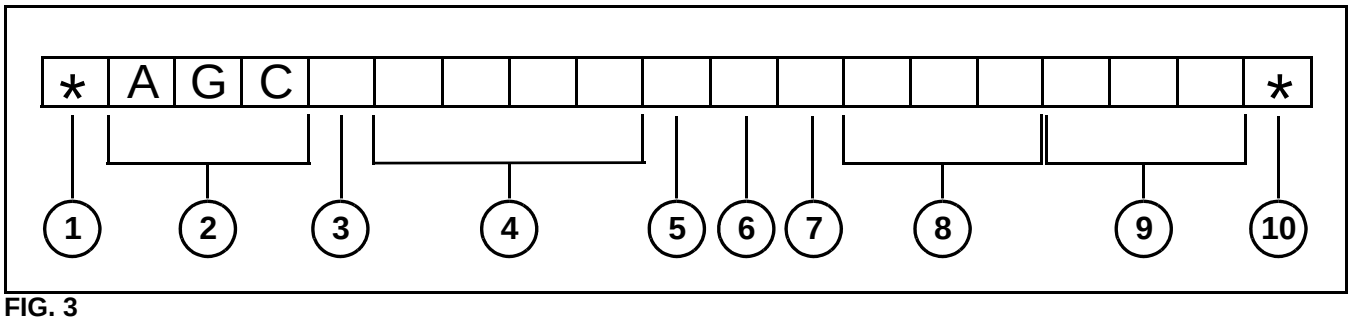

FIG. 3

Definition of the serial number for model year 2010 and up.

(1)Beginning symbol

(2)World Manufacturer Code

(3)Brand Code

(4)Model Identifier (Model number)

(5)Check Letter (0 or used if model identifier is five digits)

(6)Model Year Code (A=2010, B=2011, C=2012, and on)

(7)Plant Code

(8)Family Code

(9)Unit Number for the Year

(10)Ending symbol

NOTE: For serial number breaks in this manual, only the information from the model year code and following will be given.

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SAFETY

SAFETY ALERT SYMBOL

FIG. 4: The safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Look for the safety alert symbol both in this manual and on safety signs on this machine. The safety alert symbol will direct your attention to information that involves your safety and the safety of others.

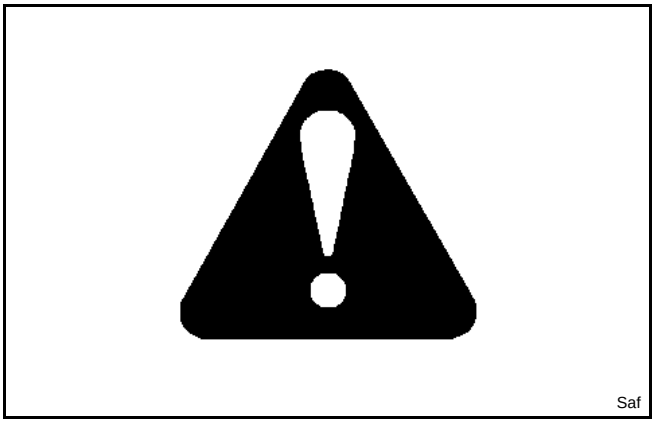

FIG. 4

SIGNAL WORDS

FIG. 5: The words DANGER, WARNING or CAUTION are used with the safety alert symbol. Learn to recognize these safety alerts and follow the recommended precautions and safety practices.

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in DEATH OR VERY SERIOUS INJURY.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in DEATH OR SERIOUS INJURY

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in MINOR INJURY.

FIG. 5

INFORMATIONAL MESSAGES

The words IMPORTANT and NOTE are not related to personal safety, but are used to give additional information and tips for operating or servicing this equipment.

IMPORTANT: Identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of the machine, process, or its surroundings.

NOTE: Identifies points of particular interest for more efficient and convenient repair or operation.

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SAFETY SIGNS

WARNING: DO NOT remove or obscure safety signs. Replace any safety signs that are not readable or are missing. Replacement signs are available from your dealer in the event of loss or damage. The actual location of the safety signs is illustrated at the end of this section.

Keep signs clean by wiping off regularly. Use a cleaning solution if necessary.

If a used machine has been purchased, make sure all safety signs are in the correct location and can be read.

See Safety Sign Location of this section for illustrations.

Replace any safety signs that can not be read or are missing. Clean the machine surface thoroughly with a cleaning solution before replacing signs. Replacement safety signs are available from your dealer.

INTRODUCTION

The Safety Section of this manual is intended to point out some of the basic safety situations in which can be encountered during normal operation of your planter. This section also suggests possible ways of dealing with those situations. The section is NOT a replacement for other safety practices featured in other sections of this manual.

Additional precautions can be necessary, depending on attachments used and conditions at the work site or in the service area. AGCO has no direct control over planter application, operation, inspection, lubrication or maintenance. Therefore, it is your responsibility to use good safety practices in those areas.

NOTE: This manual is published for North American distribution, and availability of equipment shown either as basic or accessory can vary according to the territory in which the planter will be operated. Full details of equipment available in your area can be obtained from your planter dealer. Use only AGCO approved attachments and equipment.

PREPARE FOR OPERATION

Read this manual completely and make sure you understand the controls. Know the positions and operations of all controls before you operate this machine. Check all controls in an area clear of people and obstacles before starting your work.

All equipment has a limit. Make sure you understand the speed, brakes, steering, stability, and load characteristics of this machine and your tractor before you start.

Make sure your machine has the correct equipment needed by the local regulations.

WARNING: An operator should not use alcohol or drugs which can affect their alertness or coordination. An operator on prescription or Over the counter drugs needs medical advice on whether or not they can properly operate machines.

UNDERSTANDING PLANTER SAFETY

It is YOUR responsibility to read and understand the Safety Section before operating your planter. You must follow the safety instructions that take you step-by-step through the workday.

Remember that you are the key to safety. Good safety practices not only protect you, but also those people around you. Study the features in this manual and make them a working part of your safety program. Keep in mind that this Safety Section is written specifically for a planter. Practice all other usual and customary safe working precautions.

REMEMBER: SAFETY IS YOUR RESPONSIBILITY, ONLY YOU CAN PREVENT SERIOUS INJURY OR DEATH.

NOTE: This manual covers general safety practices for this machine. The Operator Manual must always be kept with the machine.

WARNING: Pictures in this manual may show protective shields and guards opened or removed for illustration purposes. BE SURE ALL SHIELDS AND GUARDS ARE IN PLACE DURING OPERATION.

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GENRERAL OPERATION AND SERVICE

Operating

- Read and understand all the operating and safety precautions before operating machinery.
- In addition to equipment configuration and design, hazard control and accident prevention depend on awareness, concern, prudence and proper training of personnel in the operation, maintenance, transport and storage of equipment.
- Always raise implement, shut off tractor engine, set the parking brake, shift to park position (or neutral) remove the key and install cylinder lockup channels before working around the machine.
- Avoid working under the planter. However, if it becomes unavoidable to do so, make sure the planter is securely blocked and the cylinder lockup channels are in place.
- Do not attempt to lubricate or adjust the planter while the machine is in operation.
- Machinery operation can be performed only by persons who are responsible and delegated to do so.
- Only the operator must be permitted on the tractor (unless tractor has a factory-installed instructor seat) when the tractor and the planter are moving. Never permit anyone to ride on the planter.
- Avoid wearing loose-fitting clothing and jewelry. Always tie up long hair that can be caught in moving parts.
- Wear personal protective equipment (PPE) such as, but not limited to, protection for eyes, lungs, ears, head, hands and feet when operating, servicing or repairing equipment.
- Make sure bystanders are clear before operating tractor or machine.
- Do not leave tractor or implement unattended with the engine running.
- Never attempt to operate the planter unless seated in the operator's seat on the tractor.
- Tractor must be equipped with rollover protective structure (ROPS), and a seat belt. Use seat belt during operation.
- Make sure the tractor is in good operating condition, and has adequate braking capabilities.
- Do not dismount from a moving tractor.
- Regulate ground speed to field conditions, and maintain control at all times.
- When working around discs, be careful to not get cut on sharp edges.
- Watch for overhead wires or other obstructions when raising markers, and when moving the planter with marker(s) raised.
- Disconnect and store planter where children do not normally play. Stabilize the planter by using suitable supports, and block the wheels.
- Always lower the planter when not in use and relieve the pressure in hoses and cylinders.
- Do not allow children to ride on, play on, or operate equipment. Always keep children away from equipment operating, servicing, and storage areas.
- Do not stand between the tractor and the planter to install hitch pin when the tractor engine is running.

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Agricultural Chemicals

- Ag chemicals can be very hazardous. Improper use of fertilizer, fungicides, herbicides, insecticides and pesticides can injure people, plants, animals, soil and other people's property.
- Always read and follow all manufacturers' instructions before opening any chemical container.
- Even if you think you know them, read and follow instructions each time you use a chemical.

Transporting

- Do not transport planter in excess of 24 km/h (15 mph).
- Use good judgment when transporting the planter on the highway. Maintain complete control of the machine at all times.
- Use tractor of recommended size and weight to tow the machine.
- Comply with state and local laws governing highway safety and regulations when moving machinery.
- Always make the necessary safety precautions prior to transporting machine on public roads.
- Make sure the SMV (Slow Moving Vehicle) sign is clean and visible.
- Use flashing warning s except when prohibited by law.
- Watch for overhead wires or other obstructions when transporting the planter with markers raised.
- Connect the transport safety chain to the tractor drawbar and use a retainer on the hitch pin.
- Install marker lockup pins before transporting or parking planter.
- Install wheel cylinder lockup channels before transporting or parking planter.
- Vertical Fold Models: Always install wing lockup pins before transporting or parking planter.
- Use same precautions when adjusting, servicing, cleaning or storing planter as used when installing chemicals into the hoppers or tanks.
- Inform anyone who comes in contact with chemicals of the potential hazards involved and the safety precautions required.
- Stand upwind and away from smoke from a chemical fire.
- Store or dispose of all unused chemicals only in a manner as specified by the chemical manufacturer.

Servicing

FIG. 6: Fluid Leak Detection

- Correct hydraulic leaks immediately. All fittings must be tight and all lines and hoses in good condition. Escaping hydraulic fluid, under extremely high pressure, can penetrate the skin and cause blood poisoning. Use a piece of wood or cardboard to detect fluid leaks (Fig. 1). If injured by escaping fluid, see a doctor immediately.
- After repairing or adjusting planter, remove all tools and parts from machine before operating it.
- When working around discs, be careful to not get cut on sharp edges.
- Lower planter to the ground before attempting to remove a wheel for tire repair.
- Tire changing can be very hazardous and must be done by trained personnel using proper tools and equipment.
- Do not re-inflate the tire that was seriously under-inflated or run flat. Have it checked by qualified personnel.

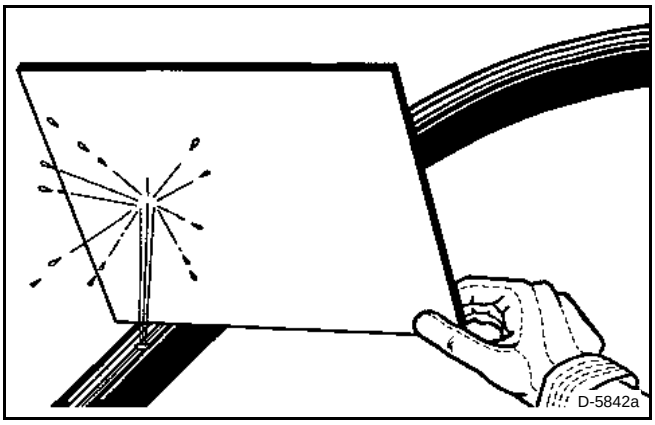

FIG. 6

LOCKUP DEVICES

Flat-Fold Markers

FIG. 7: The lockout valve in the closed position (1).

With markers fully raised, turn lockout valve to off position, stopping fluid flow to the marker cylinder.

WARNING: Always lock up markers in raised position when working around, storing or transporting planter.

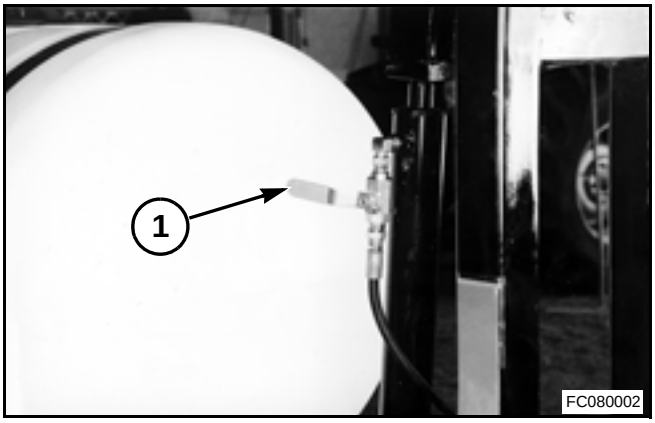

FIG. 7

FIG. 8: The lockout valve in the open position (1).

To allow marker operation, turn lockout valve to the open position.

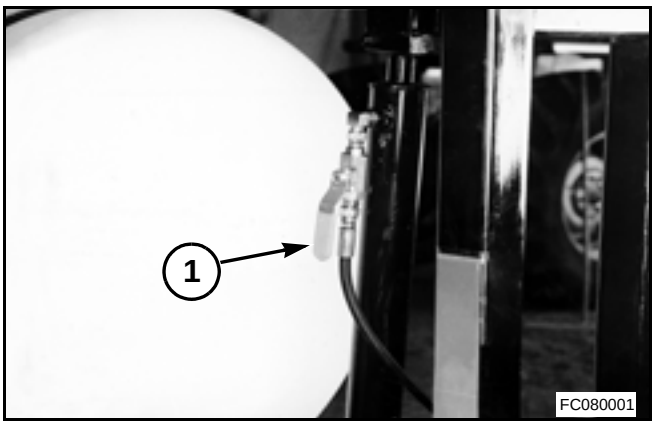

FIG. 8

Standard Markers

FIG. 9: With markers fully raised, insert lockup pin (1) through the marker support and marker arm as shown. Install a pin clip.

WARNING: Always pin markers in raised position when working around, storing or transporting planter.

During marker operation, store a pin in the support to act as an upper limit stop for the marker arm.

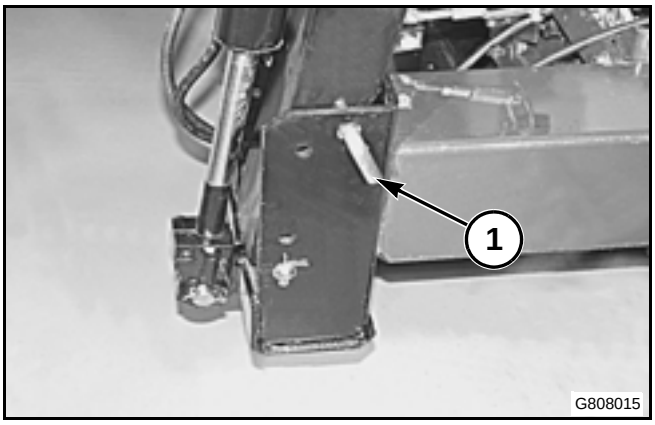

FIG. 9

Folding Wings

FIG. 10: On vertical fold models, raise the wings and install L-pins (1) and pin clips (2) in each lockup assembly as shown.

WARNING: Always engage lockups when transporting planter.

WARNING: Do not raise wings into wires or other overhead objects.

When wings are lowered, store L-pins and clips in lockup storage (3) as shown.

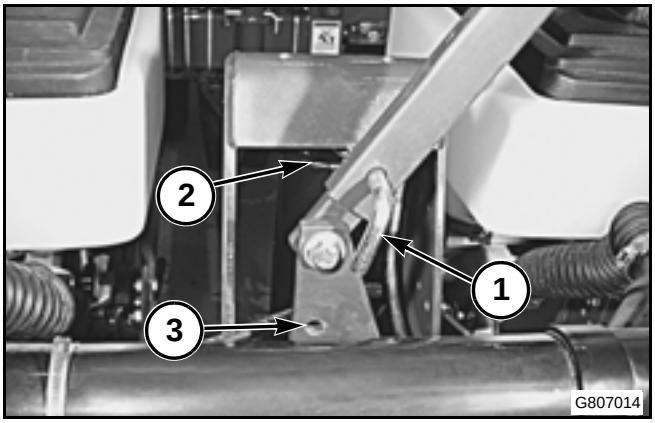

FIG. 10

SPECIFICATIONS

GENERAL

Frame (Toolbar) Size	17.5 x 17.5 cm (7 x 7 in)
Tires	9.5 L-15, 6-ply
Tire Pressure (max.)	242 kPa (35 psi)
Lift Assist Tire Pressure (max.)	276 kPa (40 psi)

9702

Frame Type	Rigid
Rows	12
Row Spacing	76 cm (30 in)
Toolbar Width	884 cm (348 in)
Transport Width	935 cm (368 in)
Wheels	4**

9708

Frame Type	Rigid
Rows	8
Row Spacing	81 cm (32 in)
Toolbar Width	579 cm (228 in)
Transport Width	630 cm (248 in)
Wheels	2**

9722

Frame Type	Vertical Fold
Rows	12
Row Spacing	76 cm (30 in)
Toolbar Width	428 cm (168.5 in)
Wing Width	251 cm (99 in)
Transport Width	650 cm (256 in)
Wheels	4**

* Wheels extend forward but can extend rearward (without lift assist) on these models. Drive wheels on all other models extend forward.

** Two lift assist wheels recommended.

ROW UNITS

Seed Discs	Corn, soybean, sunflower, sugar beet, cotton, sorghum, milo, maize, navy bean, large edible bean, snap bean, peanut
Seed Disc-to-Metering Unit Clearance	0.254 - 1.27 mm (0.010 - 0.050 in)
Metering Units	Individual

Seed Hopper Capacity	70.5 l (2.0 bu.)
Optional Hopper	105.8 l (3.0 bu.)
Chemical Capacity	32 kg (70lb)
Openers	Double Disc
Gauge Wheels	Walking Beam Type
Gauge Wheel Tire Size	11.4 x 40.6 cm (4.5 x 16 in)
Single Closing Wheel Tire Size	10.3 x 30.1 cm (4 x 12 in)
Single Closing Wheel Down Pressure	4.5 - 50.0 kg (10 - 130 lb)
Dual Closing Wheel Tire Size	30.8 cm dia (12 inch dia)
Dual Closing Wheel Down Pressure	6.8 - 90.9 kg (50 - 200 lb)

HYDRAULIC SYSTEM

Fluid Capacities	
4 and 6 Row	0.9 l (1 qt.)
8 and 12 Row	1.89 l (2 qts.)
Tractor Remote Valve Requirements	
With hydraulic pump for blower	1
With tractor hydraulics for blower	2
With folding wings	1 additional

AIR SYSTEM

PTO Pump	
Speeds	540 or 1000 rpm
Capacity	12.5 Lpm (3.3 gpm) @ rated PTO rpm
Pressure	4140 kPa (600 psi) @ rated PTO rpm
Relief Valve	15513 kPa (2250 psi) @ rated PTO rpm
Motor and Fan	
Fluid Requirement	7.6 Lpm (2 gpm)
Max. Fan Speed	2600 rpm
Max. Working Air Pressure	102 mm (4 inch) of water
Fluid Filter	10 micron w/ 20-25 psi relief valve

TRANSMISSION

Type	Chain with sliding sprockets
Sprocket Combinations	32

SHEAR PINS

Flat Fold Markers	
6 Row and 8 Row	3/8 x 2 1/4 inch bolt, Grade 5
12 Row	5/16 x 2-3/4 inch bolt, Grade 5
Row Unit Drives	3/16 x 2-1/2 inch cotter pin
Transmission	1/4 x 1 inch bolt, Grade 2

MONITOR

SM100

Voltage ..... 12 VDC

Fuse ..... 3 amp, violet ATO

Monitoring Capability ..... Seed flow

SM300

Voltage ..... 12 VDC

Fuse ..... 5 amp

Monitoring Capability ..... Row population, high/low population limits, areas (3), distance counter, seed spacing, seed count, acres hour, ground speed

SM400 ..... Standard Equipment

Voltage ..... 12 VDC

Fuse ..... 7.5 amp, brown ATO

Monitoring Capability ..... Row population, high/low population limits, areas (3), distance counter, seed spacing, seed count, acres/hour, ground speed

ELECTRONIC SEED DRIVE CONTROLLER

ISO Bus Electronic Controller

Voltage ..... 12 VDC, w/ nonvolatile memory

Program Capability ..... Seed Population, seed spacing

HIGHWAY LIGHTS

Type ..... Two red tail / stop lights, two amber lights

Connector ..... Standard seven-pin

Bulb Size ..... Red Lights use 1157

Amber Lights use 1156

APPROX. SHIPPING WEIGHTS

Model	Weight
9702 - 12RN	3370 kg (7430 lb)
9708 - 8RN	2452 kg (5405 lb)
9722 - 12RN VF	3336 kg (7355 lb)

NOTES

FIELD OPERATIONS AND ADJUSTMENTS

TRACTOR PREPARATION

General

Before operating the planter, refer to your tractor Operator Manual for operating information about hydraulics, tire inflation, connecting the planter, weights and wheel adjustments.

Recommended Tractor Horsepower

Planter Model	Minimum PTO HP Required	Planter Weight (dry)	Total Planter Weight	Desired Tractor Weight (lbs)
9702 - 12RN	100	7430	11990	7995
9708 - 8RN	85	5405	8445	5630
9722 -12RN VF	100	7355	11915	7945

Wheel Spacing

Set the tractor wheel spacing to at least twice the row spacing distance. For example: If the row spacing is 76 cm (30 in), adjust the wheels to 152 cm (60 in). Set all wheels equally from the tractor centerline.

When operating on hillsides or steep slopes, set the wheels as wide as possible for maximum stability and steering control. If the front axle is adjustable, set the wheels at the same width as the rear wheels.

Do not position the tractor wheels directly ahead of the planter row units that will cause soil compaction and inaccurate seed placement.

Electrical Requirements

The tractor electrical system must provide 12 volt DC to operate the seed monitor, highway lighting system and optional hydraulic seed drive controller.

Find a suitable location to mount the seed monitor console. Connect the leads to the tractor battery and route the wire harness to the rear of the tractor.

The transport lighting system is connected to the tractor with a standard 7-pin connector.

Remote Hydraulic Valve Requirements

Rigid Frame Model

- The planter is raised by the three-point hitch. The marker is on a separate remote.
- Another valve is required if the blower motor is operated from the tractor hydraulics.

Vertical Fold Models

- One valve is required to raise and lower the markers, and lift assist wheels if so equipped.
- A second valve is required to operate the folding wings.
- A third valve is necessary if the blower motor is operated from tractor hydraulics.

Tractor Drawbar

Length

FIG. 11: Adjust the tractor drawbar length so the pinhole is 356 mm (14 in) from the end of the PTO shaft.

NOTE: The dimension must be 36 cm (14 in) for both 540 and 1000 rpm pumps.

IMPORTANT: Fasten the drawbar on the tractor centerline.

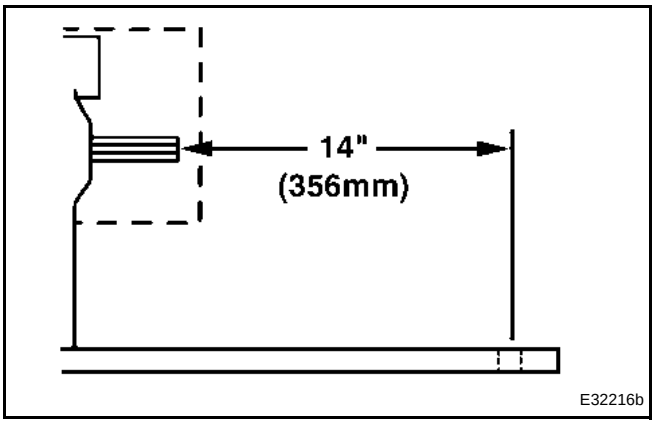

FIG. 11

Three-Point Hitch

4 and 6 Row: Cat. II

8 and 12 Row: Cat. II or III

Three-Point Hitch Adjustment

Before connecting the planter to the tractor:

- Adjust hitch sway blocks and stabilizing bars to provide minimum lateral hitch sway. The planter must not swing into tractor when planter is in the raised position.
- Adjust length of lower lift links so center of hitch latches are 15 cm (6 in) from the ground in the fully-lowered position.
- Adjust the lower links to the float position to ensure planter drive wheels are continuously contacting the ground during operation.
- Adjust hitch draft control for average conditions.

See your tractor Operator Manual for more specific hitch adjustment information.

Quick Hitch

Adjust the standard three-point hitch, then connect the quick hitch.

NOTE: If the planter is equipped with lift assist wheels, remove the quick hitch upper hook.

Front Weights

Add enough front weights to keep the tractor front wheels on the ground at all times. Refer to the tractor Operator Manual for Weight information about mounted and semi-mounted implements.

Rear Wheel Weights

Add weights as required to maintain stability when planting on hillsides and when transporting the planter.

PLANTER PREPARATION

Lubrication

Lubricate the planter as described in the Lubrication and Maintenance Section. Also, check the fluid level in the PTO pump. Add fluid if required.

Bolt Torque

Make sure all bolts, nuts, and screws are tight and all cotter pins are spread.

IMPORTANT: Tighten lift wheel bolts after first day of operation and periodically thereafter.

Tire Inflation

See the Specifications Section for the correct tire pressure.

Seed Discs

Install the desired seed discs in all metering units.

Chains

Make sure all drive chains are installed with proper tension, alignment, and lubrication.

Weights

Add optional weights as necessary, especially for no-till operation. Weights can be installed on the frame or on the lift assist wheel arms.

Seed and Transmissions

Determine the seed and chemical rates before going to the field, if possible, and set the transmission or the seed drive controller accordingly. Make a test run in a clear area to verify initial settings.

NOTE: If the planter is equipped with chemical attachment, rates will change when adjusting the seed transmission.

Planter Monitor

Monitor and Hydraulic Drive Controls

(1) Monitor Console

(2) AGCO Console

(3) Implement Switch

Mount the seed monitor console in a suitable location near the operator. Connect the input leads of monitor to the battery terminals.

NOTE: The monitor does not have to be mounted on the level to operate properly.

Planter Hydraulic Drive Controls

NOTE: Controls are for optional hydraulic seed drive.

Mount the seed drive controller in a suitable cab location. Connect the input leads to the battery terminals.

For convenience, mount implement switch on lever controlling planter raise-lower hydraulic circuit.

NOTE: Controller does not have to be mounted level to operate properly.

Route the battery harness to the controller. Route the output wire harness to the rear of the tractor.

NOTE: All electrical controls must be installed on the tractor by the dealer.

Leveling The Planter

To level the planter:

With the tractor and planter on a level surface, lower the toolbar until 46 to 56 cm (18 to 22 in) from the ground on both sides.

WARNING: Stop tractor engine and shift to park or neutral and set brakes and remove the key before dismounting.

Adjust the tractor upper three-point hitch link until the toolbar is level.

Loosen the lock nut and turn the drive wheel adjusting screw (both wheels) until the planter drive wheels firmly contact the ground.

NOTE: Larger model planters have leading drive wheels while smaller models have trailing wheels. Adjusting procedure is the same.

Lift assist wheels on larger models are not involved in this procedure.

Operating Notes

- The planter toolbar is properly adjusted when the row unit parallel linkage arms are approximately parallel to the ground, and the linkage support angles are perpendicular.
- Check the adjustments after planting a short distance. Adjust if necessary.

FIG. 12: Trailing Drive Wheel

(1) Adjusting Bolt

(2) Dimension = 46 - 56 cm (18 - 22 in)

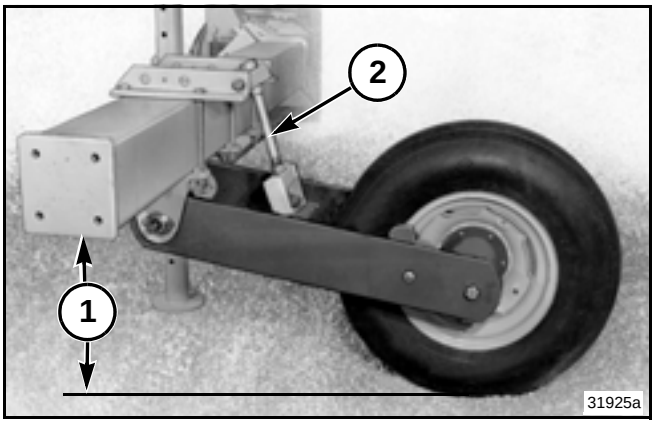

FIG. 12

FIG. 13: Leading Drive Wheel

(1) Adjusting Bolt

(2) Dimension = 46 - 56 cm (18 - 22 in) (Same as dimension of trailing drive wheel).

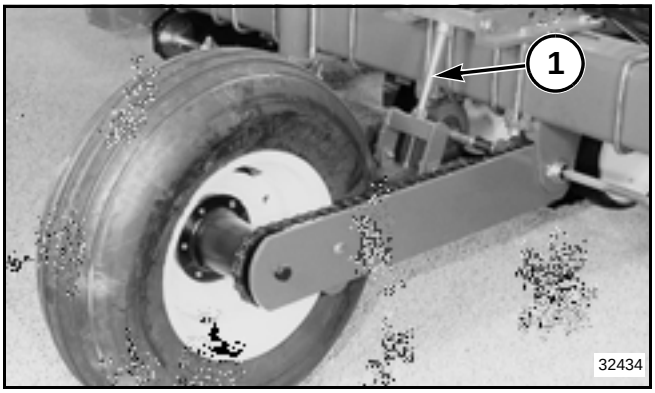

FIG. 13

CONNECTING THE PLANTER TO THE TRACTOR

Connecting the Three-Point Hitch

The following hitching procedures are for tractors with standard three-point hitch or quick hitches, and planters with or without lift assist wheels.

NOTE: Adjust both lower links to equal length and height before proceeding

Lower Links - Standard Hitch

Back the tractor to the planter and raise the lower links between the hitch plates.

WARNING: Stop tractor engine and shift to park or set parking brake and remove the key before dismounting.

Install the hitch pins according to the tractor hitch category (III, IIIN, II). Install roll pins (A) in the holes nearest the hitch plates as shown.

Install clip pins (B) as shown.

Lower Links - Quick Hitch

FIG. 14: Hookup for Hitch Categories

Install the hitch pins according to the tractor hitch category (III, IIIN, II). Install roll pins (A) in holes nearest the hitch plates as shown.

Install clip pins (B) as shown.

Perform upper link procedures for the quick hitch and connect the tractor to the planter.

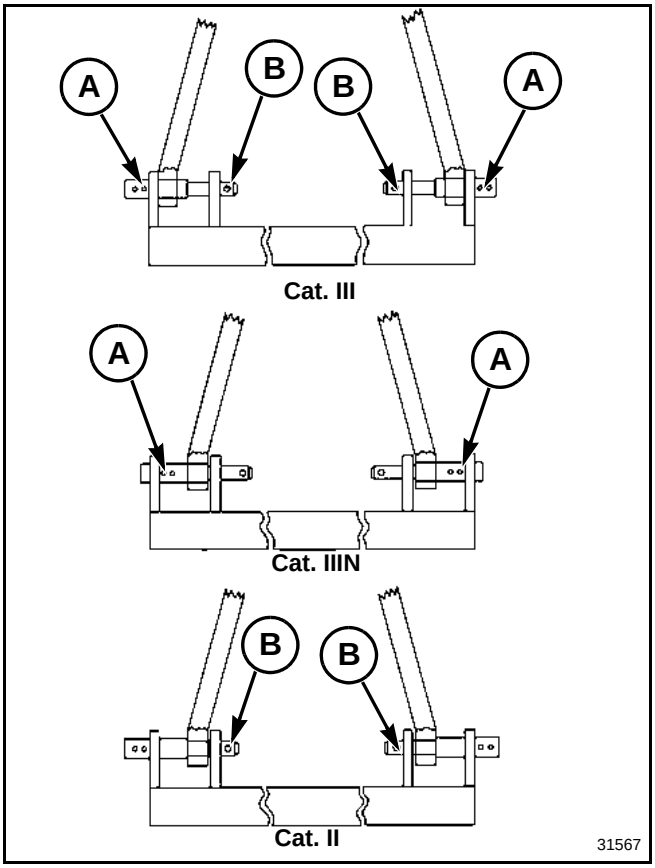

FIG. 14

Upper Link - Standard Hitch

Planter without Lift Assist Wheels

FIG. 15: Standard Hitch Hookup

(1) Upper Link

(2) Lower Links

Connect the upper link with a pin and link pin.

NOTE: Do not install a pivot link (Figs. 4 and 5).

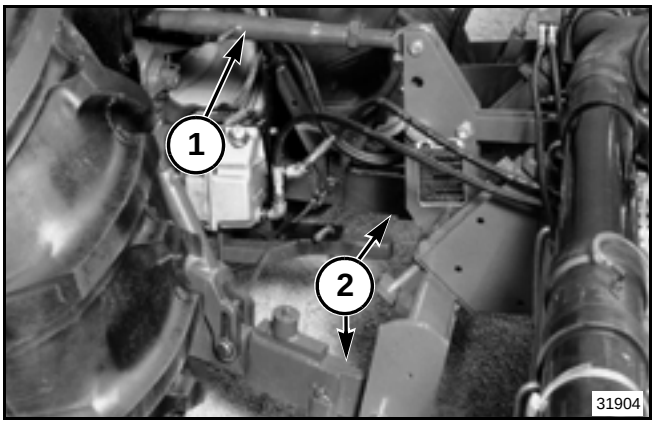

FIG. 15

Planter with Lift Assist Wheels

FIG. 16: Hookup for Planters with Lift Assist Wheels

Connect the upper tractor link to the planter pivot link (1) with a pin and clip pin.

After the planter is leveled and adjusted for height, adjust the upper link to allow 3 mm (1/4 in) between the lift pin spacer and the front edge of the hitch mast.

Install the transport pin (2) if the planter will be transported.

IMPORTANT: Failure to install the transport pin can cause the planter to float into the tractor and cause damage.

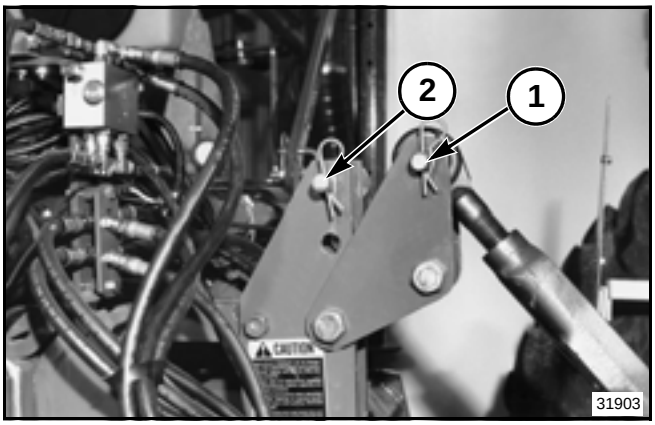

FIG. 16

FIG. 17: Pivot Link Adjustment

(1) Pivot Link

(2) Mast

(3) Spacer

(4) Dimension = 6 mm (1/4 in) minimum

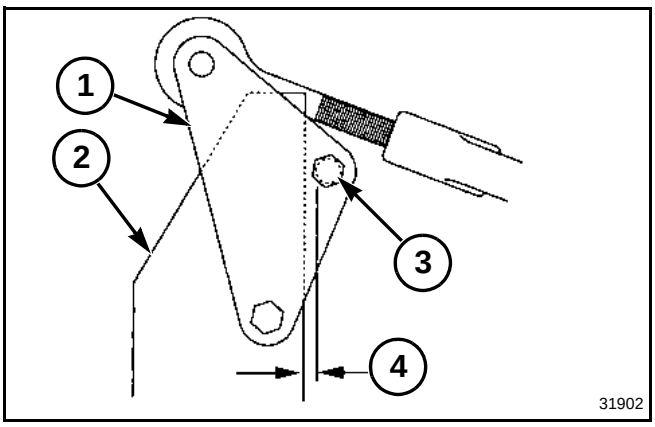

FIG. 17

Upper Link - Quick Hitch

Planter without Lift Assist Wheels

Install the upper link to the hitch with a bolt and spacer in the upper hole on the planter hitch mast.

Connect the planter to the tractor with the quick hitch.

NOTE: Do not install a pivot link.

Planter with Lift Assist Wheels

Install the hitch in the bolt with a spacer in the upper hole on the planter hitch mast.

Remove the upper hook on the quick hitch, if possible.

IMPORTANT: Leave the pivot link in place, but do not connect to the tractor hitch.

Connect the planter to the tractor with a quick hitch.

DISCONNECTING THE PLANTER FROM THE TRACTOR

WARNING: Stop tractor engine and shift transmission to park or neutral position. Set brakes and remove the key before leaving the tractor.

If planter is equipped with folding wings and the wings are in the raised position, unfold the wings and lock in place.

FIG. 18: Wing Folded

(1) Inner Wing Hopper

(2) Potential Interference

IMPORTANT: With folding wing models, do not lower planter with wings in the raised position. Hopper interference can result.

IMPORTANT: If planter is equipped with optional three-bushel hoppers, remove inner wing hopper on each wing before folding wings to prevent hopper interference. Do not remove outer main frame hoppers because reflective decals are installed on those hoppers.

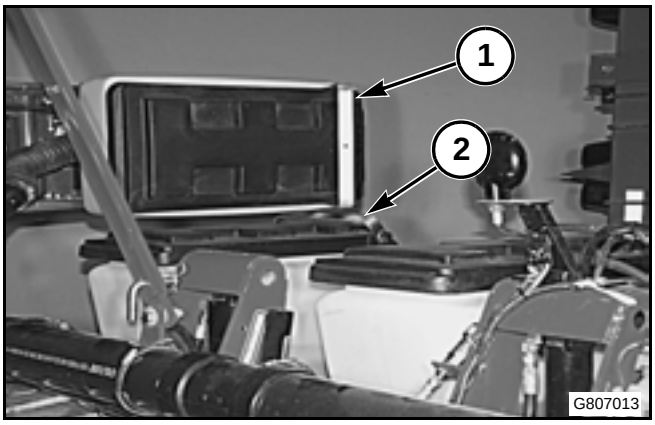

FIG. 18

DANGER: To avoid injury or death, stand clear of machine when wings are folded. Mechanical or hydraulic failure can allow wings to fall rapidly.

Lower the planter to the ground.

Lock the markers in the raised position.

WARNING: Stop engine, shift to park or neutral and set parking brake and remove the key before dismounting from tractor.

FIG. 19: Planter in Parked Position

FIG. 19

Lower both jack stands on the main frame and pin in place.

Disconnect all the wire harnesses.

Cycle the hydraulic levers with the tractor engine off to relieve pressure. Disconnect the hoses.

NOTE: If the blower motor is driven from the tractor hydraulic system, remove the return line first.

Remove the PTO pump and store upright on the planter hitch frame or on a clean, dry surface.

Install the PTO shield on the tractor.

WARNING: Always replace PTO shaft shield after removing pump. Failure to do so could result in severe personal injury or death.

TRANSPORTING THE PLANTER

Preparation - All Models

Make sure the planter is connected according to the procedures outlined. See Connecting the Planter to the Tractor.

Preparation - Folding Models

IMPORTANT: Before transporting planters with wings folded, empty at least half of the seed and ALL fertilizers, insecticides and herbicides from the hoppers on the wing units.

In addition to the procedures under All Models, complete the following:

If the frame lock down pins are installed, remove the pins before attempting to raise the wings.

Raise the markers and install the lockup pins.

Raise the planter to the maximum height.

Observe all safety precautions.

IMPORTANT: Wings must fold straight up (90 degrees) to the frame and no further. If the wings fold beyond vertical (90 degrees) position, or the wings are not locked into place, the wing cylinders and other planter components can be damaged. If the wings are not vertical, loosen the lockup bar U-bolts on the frame and adjust the bar anchor accordingly. Tighten the U-bolts to 169 Nm (125 ft. lb) torque.

Observe all the safety precautions.

WARNING: To avoid injury or death, stand clear of machine when wings are unfolded. Mechanical or hydraulic failure can allow wings to fall rapidly.

Safety Precautions

- Use good judgment when transporting the tractor implements on the highway. Maintain complete control of the machines at all times.
- Comply with state and local laws governing highway safety and regulations when moving machinery.
- Always make the necessary safety precautions prior to transporting the planter on public roads. This includes maintaining the SMV (Slow Moving Vehicle) emblem and using adequate lighting or other safety warnings after dark except when prohibited by law.
- Limit towing speed to 25 km/h (15 mph).
- Never permit persons on tractor or planter.

WARNING: Serious injury or death can result from contact with electric lines. Use care when moving or operating this machine near electric lines to avoid contact.

FIELD PREPARATION

General

Use this section as an outline whenever the planter is in the field. Use the information as a checklist of actions to be performed whenever using the planter. Refer to sections in this manual and the tractor Operator Manual for specific operating procedures.

Before Entering the Field

Check the following items and make sure the preparation of the planter is according to the instructions.

- Check the tractor wheel spacing.
- Make sure the planter daily lubrication and service is completed.
- Make sure the PTO pump is filled with hydraulic fluid.
- Make sure all seed meters have the correct discs installed.
- Determine the planter transmission settings needed to plant seed at desired rates.
- Check the marker speed and arm length.
- Travel to the field at a safe speed.
- Check blower operation

In the Field

Unfold wings on folding models. Pin in place.

DANGER: To avoid injury or death, stand clear of machine when wings are unfolded. Mechanical or hydraulic failure can allow wings to fall rapidly.

Folding models: Pin wings in position if row spacing is critical. Do not install pins if wing flotation is desirable for hilly areas.

NOTE: Wing drive shafts can become disconnected when wings float upward in hilly areas.

WARNING: Stop engine, shift to park or neutral and set parking brake and remove key before dismounting from tractor.

Remove marker lockup pins. Pull out each marker arm and install pins in marker support.

WARNING: Lower planter to ground or install cylinder lockup channels before working around planter.

Adjust the following to the desired initial settings:

- Seed transmission sprockets
- Seed meter gates
- Gauge wheel depth
- Closing wheel pressure
- Chemical metering gates

PTO-Driven Pump: Adjust the flow control valve to provide about 3 inch air pressure and let the motor run for 3 to 5 minutes or while going to the field. Check the fluid level.

Tractor Hydraulics for Blower: Operate the blower for a short length of time, then check the fluid level in the tractor.

CAUTION: Always travel at speed that allows complete control of tractor and implement at all times.

WARNING: Avoid overhead obstacles, especially electric wires.

CAUTION: Folding planters may be unstable on rough ground.

- Down pressure spring tension
- All row unit attachment adjustments
- Marker disc angle
- Put seed in hoppers and close covers.

NOTE: The covers must be closed for proper seed meter operation.

- Put chemicals in the hoppers and close the covers.

WARNING: Always read and follow chemical manufacturer's labels and use care when handling agricultural chemicals. Misuse or mishandling can cause severe personal injury.

Set the air pressure as follows:

IMPORTANT: Keep trash from blower intake. If screen is installed, remove trash as required.

a. Start the tractor and run the hydraulic blower at the rated PTO speed (540 or 1000 rpm) for 3 to 5 minutes.

b. Set the air pressure to the desired setting.

CAUTION: Stay clear of moving parts because tractor engine must be running during this adjustment.

c. Lower the planter and drive forward far enough to fill the seed discs with seed.

d. Check the air pressure periodically until hydraulic fluid reaches operating temperature. Set as necessary.

With the planter in the operating position, the row unit parallel links must be parallel to the ground and the main frame must be approximately 457 to 559 mm (18 to 22 in) above the ground.

Finishing the Field

Disconnect the seed meter clutches on the individual row units as required to finish the field without planting multiple rows.

With the folding planters, empty the seed hoppers to half full or less, and empty all chemicals before folding the wings.

Raise the markers and pin in position.

Raise the planter, fold wings and lock in position.

DANGER: To avoid injury or death, stand clear of machine when wings are folded. Mechanical or hydraulic failure can allow wings to fall rapidly.

If chemicals were spilled on planter, clean off.

WARNING: Use same precautions when cleaning up chemical spills as used when filling chemical hoppers. Failure to do so can result in severe personal injury.

Perform any daily maintenance as outlined in Lubrication and Maintenance Section.

If the planter will be stored, see the End of Season in the Lubrication and Maintenance section.

Plant a test strip.

NOTE: Operate at desired travel speed or the test will be invalid.

Check the seed depth, spacing and cover. Adjust as needed.

NOTE: If adjustments are made, run the test strip again.

Check the chemical application and adjust if needed.

Once tests show everything is operating as desired, continue with planting.

NOTE: Planting seeds in excess of 12 kmh (8 mph) are not recommended.

Reduce speed in rough, rocky or not even field conditions.

NOTE: If using a PTO pump, engine speed can be reduced to about 2/3 rated speed while maintaining desired air pressure. (Reducing speed may be helpful when turning at the ends of the field.)

Check all application rates periodically, at least as frequently as seed is added.

MARKERS

Rigid Markers

Operation

FIG. 20: Remove the marker lockup pins and pin clips (1) before planter operation. Install the pins in the marker arm supports.

Permit at least 6 m (20 ft.) of clear area to lower the makers.

WARNING: Clear bystanders from area before operating markers.

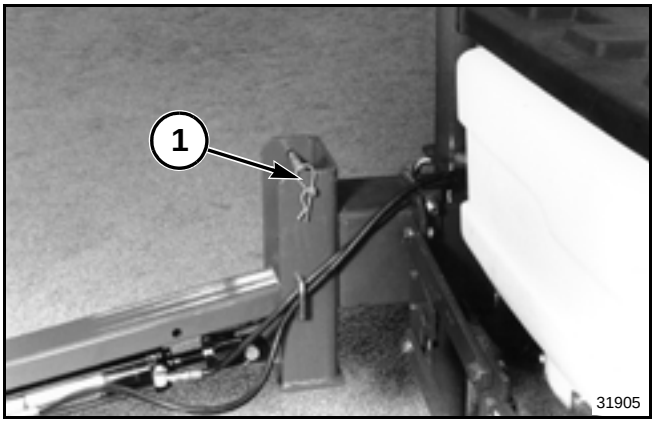

FIG. 20

Flat-fold Markers

Operation Position

Open both marker lockout valves before planter operation.

Allow at least 6 m (20 ft.) of clear area to lower markers.

WARNING: Clear bystanders from area before operating markers.

NOTE: Marker and hydraulic circuit operation is identical to standard marker operation on previous page.

Marker Cylinder Stops

To reduce marker cycle time, install marker cylinder stops on the extended cylinder rods to prevent the entire marker from raising.

When not in use, store the stops on the lower marker sections.

FIG. 21: Marker Raised

(1) Cylinder Stop

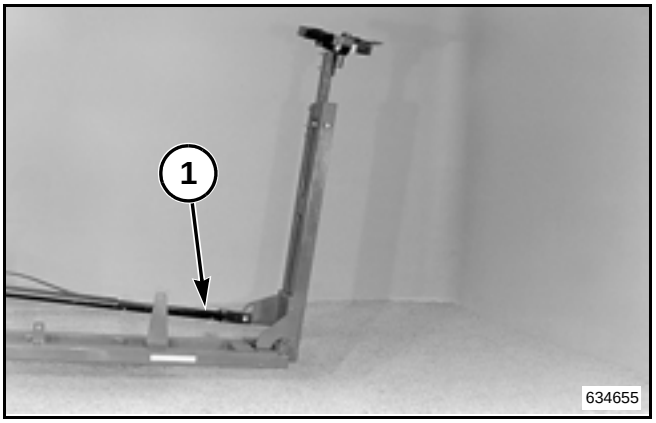

FIG. 21

FIG. 22: 6-Row Wide, 8-Row

(1) Stop Storage

(2) Shear Bolt

6-Row Wide and 8-Row: 3/8 x 2 1/4 inch, 23 Nm (17 ft. lb)

The markers are protected with a Grade 5 shear bolt and nut. Tightened to the torque values listed:

IMPORTANT: Replace only with the correct size and grade.

NOTE: Use a bolt with a shoulder, not a fully-threaded bolt.

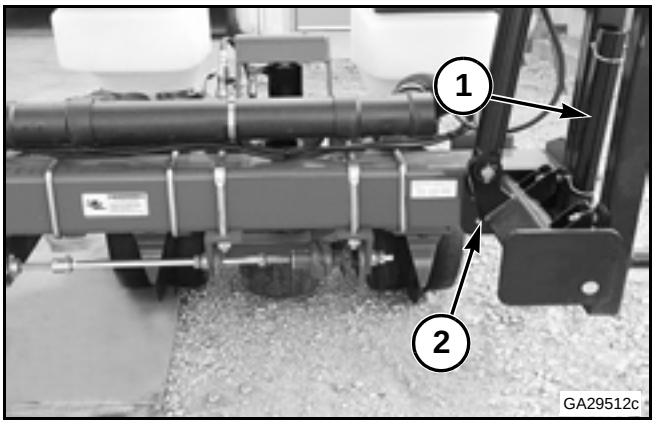

FIG. 22

FIG. 23: 12-Row Bases

(1) Stop Storage

(2) Shear Bolt

12-Row: 5/16 x 2-3/4 inch.

The markers are protected with a Grade 5 shear bolt of the following sizes:

NOTE: Bolt does not require nut. Be sure installed bolt is loose.

IMPORTANT: Replace only with the correct size and grade.

NOTE: Use a bolt with a shoulder, not a fully-threaded bolt.

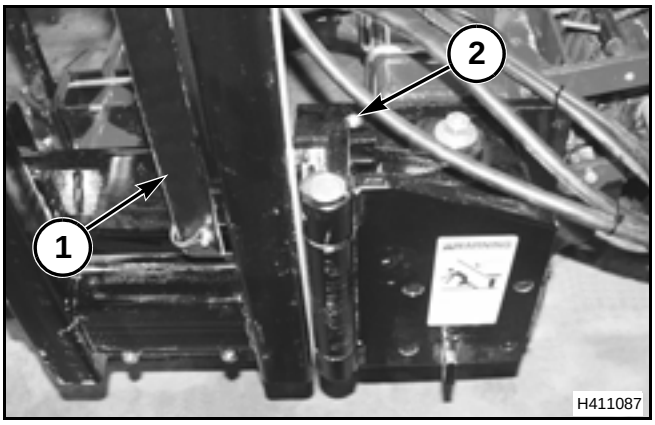

FIG. 23

Circuit Operation - All Marker Types

The marker cylinders are connected to one tractor remote hydraulic circuit.

NOTE: On models with lift assist wheels, the circuit operates both the marker and planter lift assist functions.

The markers alternately raise and lower each time the planter is raised and lowered.

If both markers must be lowered, lower the first marker to the ground. When the first marker is all the way down, move the hydraulic lever to the RAISE position. Hold the hydraulic lever in the RAISE position just until the marker cylinder for the first marker begins to move. Shift the lever to the LOWER position to lower the second marker.

NOTE: If a marker begins to raise, it cannot be lowered until after it is fully raised.

On tractors with pressure detent remote valves, the control lever will have to be held until marker is fully raised or lowered.

Marker Disc Blade

Standard Disc

FIG. 24: To adjust the disc angle:

- Loosen the mounting bolts (1).
- Rotate disc assembly (2) forward to increase the mark size and rearward to decrease the mark size.
- Tighten the bolts.

The depth band (3) prevents the disc from digging too deeply in soft soil.

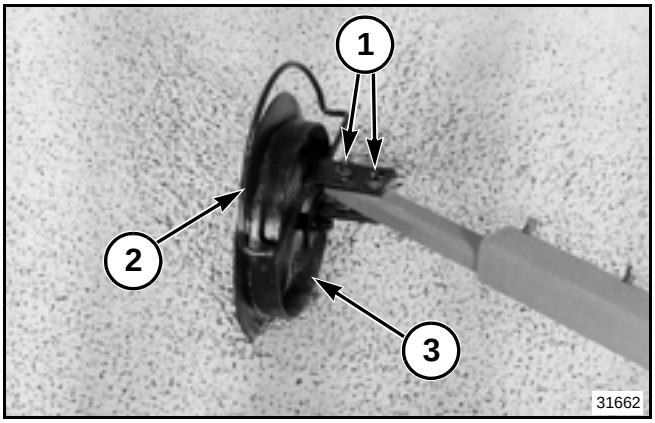

FIG. 24

C-Spring No-Till Marker Disc

FIG. 25: C-Spring Disc

(1) C-Spring

(2) Mounting Plates

(3) Adjusting Pivot Bolt

FIG. 25

Notched No-Till Disc

The notched no-till disc, an aggressive blade for tough, no-till conditions, is available for the standard marker. Adjustment is the same as the standard disc.

FIG. 26: Notched Disc on Standard Marker

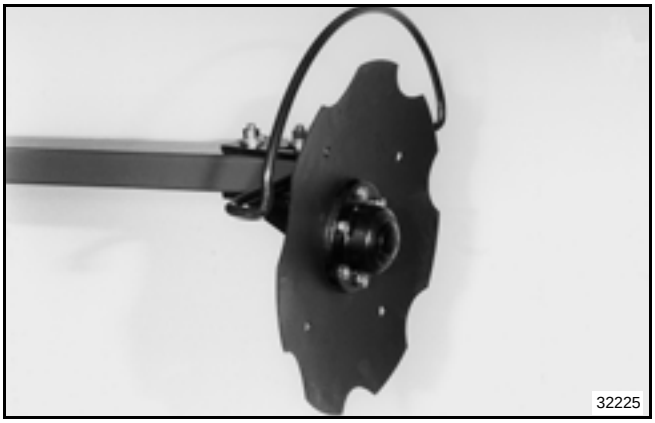

FIG. 26

FIG. 27: Notched Disc on Flat-Fold Marker

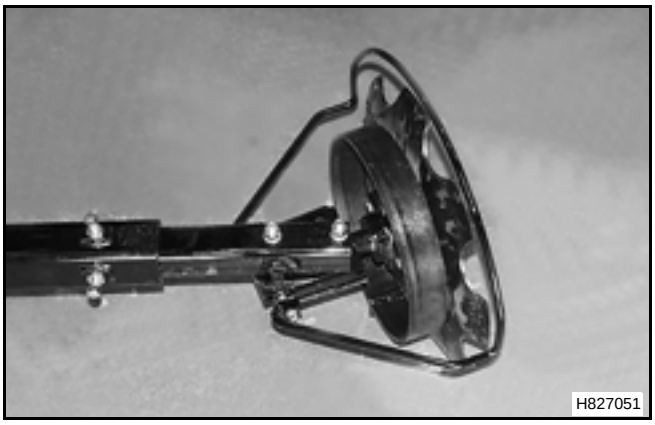

FIG. 27

To adjust the disc angle:

- Loosen the bolts (1).
- Rotate the disc assembly (2) forward to increase the mark size and rearward to decrease the mark size.
- Tighten the bolts.

The depth band (3) prevents the disc from digging too deeply in soft soil.

The disc guard (4) must be in-line with the disc. To adjust, loosen the set screws (5) on each side. Tighten the set screws when the adjustment has been made.

The notched no-till disc is standard for the flat-fold marker.

NOTE: Blade guard moves with disc blade when blade is repositioned.

Arm Section And Linkage Adjustments

NOTE: These are made at the factory. Check periodically.

Inner Section Position for Bi-Fold Markers

FIG. 28: When folded, the inner arm (2) should be perpendicular to the ground. If not, reposition washer on stop bolts (1) until arm is vertical.

IMPORTANT: If marker arm does not contact rest bracket, or if arm contacts rest bracket but does not contact arm, exchange stop bolt washers until contact is made.

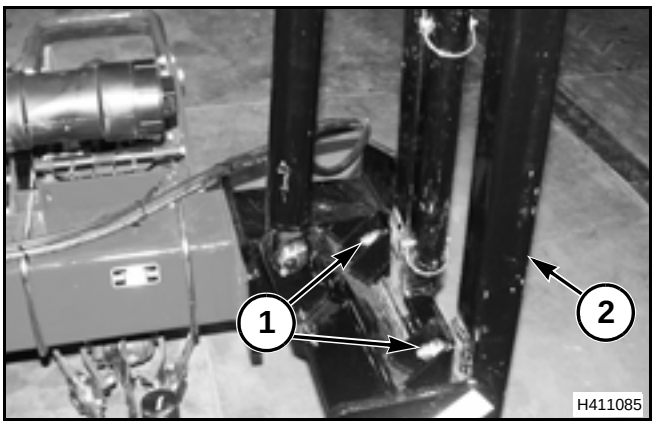

FIG. 28

Outer/Center Section Position for Bi-Fold Markers

FIG. 29: Marker arm stop bolts with washers (1) (both side of the arm).

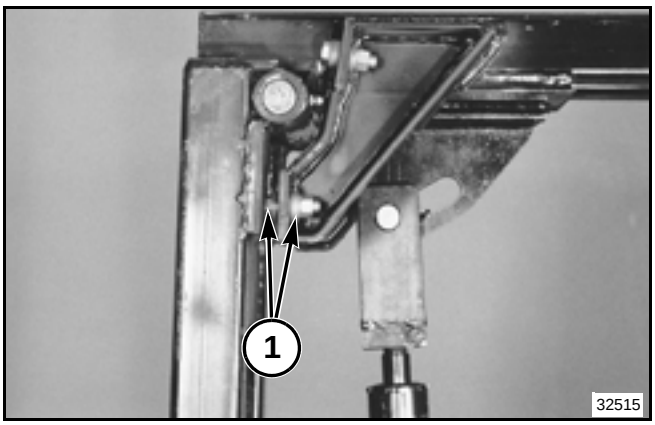

FIG. 29

AIR PRESSURE SETTINGS

The following chart is a suggested guide for initial planter air pressure settings. The chart DOES NOT remove the need for the operator to visually check seed spacing, depth and population, and to make final adjustments accordingly.

Seeds/lb	Seed Disc	Air Pressure (Inch Water)
3600	Popcorn / Sunflower P/N 852437	1.0
3000		1.7
2400		2.5
2800	Small Corn P/N 852436	2.0
2200		3.0
1600		4.0
1900	Regular Corn P/N 852435	1.5
1600		2.0
1300		2.5
1400	Large Corn P/N 852434	2.0
1100		2.5

Seed Disc Identification Chart

CORN

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100023	852435	30		Field Corn - Medium, 1300 to 1900 seeds/lb	1.0 to 2.5 0.5 to 2.0
6100024	852434	30		Field Corn - Large, 1100 to 1400 seeds/lb	2.0 to 2.5
6100032	852436	30		Field Corn - Small, 1600 to 2800 seeds/lb	2.0 to 4.0
6100027	852437	30		Popcorn Field Corn - Small, 2400 to 3600 seeds/lb	1.5 to 2.5 0.5 to 1.5
6000709	700722998	30		Popcorn Field Corn - Very Small, 3200 to 4500 seeds/lb	1.0 to 3.0

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

SUNFLOWER

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100027	852437	30		Sunflower - Small to Medium	1.5 to 2.5 0.5 to 1.5
6100023	852435	30		Sunflower - Large	1.0 to 2.5 0.5 to 2.0
6001000	700730352	30		Sunflower - Small, 22/64” to 26/64” long x 11/64” to 18/64” diameter 6000 to 8500 seeds/lb, Disc requires 700730684 Tickler Brush	1.0 to 3.0

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

SOYBEAN

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100026	852433	60		Soybeans (1 seed per cell)	2.0 to 2.5
6100025	852432	60		Soybeans (2 seeds per cell), 2000 to 3500 seeds/lb	2.0 to 2.5
6000698	700722513	60		Soybeans - Small (2 seeds per cell), 3000 to 4500 seeds/lb	1.0 to 3.0

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

EDIBLE BEAN

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100253	854960	60		Nato Bean (2 seeds per cell), 7300 seeds/lb 7/32” wide x 1/4” long	1.0 to 3.0
6100031	852441	50		Large Edible Bean Pinto Cranberry, 1/2” long x 5/16” diameter Red Kidney, 3/4” long x 13/32” wide x 1/4” tall Baby Lima, 1/2” diameter x 3/16” thick	3.0 2.5 to 3.0 3.2 to 3.5 2.5
6100106	854048	60		Snap Bean, 1200 to 2500 seeds/lb (5/8” long x 11/32” diameter maximum)	1.0 to 3.5
6100025	852432	60		Navy Beans	2.0 to 2.5

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

SORGUM

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100030	852439	30		Sorgum, Milo Maize	0.5 to 1.0
6100029	852440	120		Sorgum, Milo	2.0
6100254	N856067	60		Sorgum, Milo, 8500 seeds/lb (11/64” to 14/64” diameter)	1.0 to 3.0
6000703	N857115	60		Sorgum, Milo, 12000 to 14000 seeds/lb (9.5/64” to 11.5/64” diameter)	1.0 to 3.0

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

SUGAR BEETS

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100028	852438	60		Sugar Beets - Large Pellet	1.0 to 1.5
6100129	854047	60		Sugar Beets, 2M, 27 500 to 42 000 seeds/lb (8/64” to 11/64” diameter)	1.0 to 4.0
6100254	N856067	60		Sugar Beets, 5M, 8500 seeds/lb (11/64” to 14/64” diameter)	1.0 to 3.0
6000703	N857115	60		Sugar Beets, 4M, 12 000 to 14 000 seeds/lb (9.5/64” to 11.5/64” diameter)	1.0 to 3.0
6100030	852439	30		Sugar Beets - All sizes	0.5 to 1.0

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

PEANUTS

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100107	854082	40		Peanut, Runner, 750 seeds/lb	2.0 to 3.5
6100108	854049	38		Peanut, Virginia, 550 seeds/lb	2.0 to 3.5

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

COTTON

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100028	852438	60		Cotton (remove the tickler brush)	1.0 to 1.5
6100130	854486	20		Hill Drop Cotton (3 seeds per cell) 4500 to 6000 seeds/lb	1.0 to 3.0

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

WHEAT

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100222	854754	60		Wheat (8 seeds per cell average)	1.0 to 3.0

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

BLANK DISC

Catalog Number	Marking on Disc	Number of Cells	Cell View	Usage	Suggested Air Pressure*
6100229	N855794			One disc - order one per row	

* Measured in Inches of Water. This is a starting range. The actual pressure can be higher or lower.

Larger Bean Disc

When planting large beans with the large bean disc, 852441, refer to the chart below for specific air pressure and meter adjustment information.

For seeds not listed, measure a seed and set the planter according to the nearest seed size shown.

Use the 50 seeds per disc table to determine sprocket sizes, seed spacing, maximum speed, and seed population per acre.

IMPORTANT: Always check actual seeds planted over a measured distance to determine actual spacing and population. The operator is responsible for making sure the desired population is planted. See Checking Population.

Seed Description	Average Seed Dimensions L x W x T	Air Pressure at Gauge	Tickler Brush	Seed Gate
Red Kidney Bean	3/4 x 13/32 x 1/4	3.2 - 3.5	Remove	Remove
Large White Bean	5/8 x 3/8 x 9/32	3 - 3.5	Remove	Remove
Peanuts - Runner Type	5/8 x 3/8	3 - 3.3	Remove	Remove
Green or Snap Bean	1/2 x 7/32 dia.	1.5 - 2	Installed	Full Open
Chinese Soy Bean	5/16 dia.	1.5	Installed	Full Open
Baby Lima Bean	1/2 dia. x 3/16 thick	2.5	Installed	Full Open
Cranberry Bean	1/2 long x 5/16 dia.	2.5 - 3	Remove	Remove

NOTE: Use chart above for 852441 large bean disc only.

Snap Bean Disc

The disc, 854048, is designed to plant most snap bean seeds no larger than 5/8 inch long x 11/32 inch diameter, with seed size of 1200 - 2500 seeds/lb.

To measure for correct seed size:

- Seed must lay flat inside a 5/8 inch diameter hole.
- Seed must pass lengthwise through an 11/32 inch diameter hole, 1/2 inch deep.

NOTE: Extremely small seeds can lodge in the seed disc air orifice.

When planting, the tickler brush must be installed and the seed gate fully opened.

Use the 60 seeds per disc table for planting rates.

Treated Seed

Insecticide treatments can be sticky and/or inhibit the flow of the seed from the hopper to the meter. It may be beneficial to add talc to the seed. Mix in 1/2 cup talc per two bushel hopper or 1 cup talc per three bushel hopper. Seed treatments can also affect seed monitor performance and require periodic cleaning of the seed disc.

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