Massey Ferguson®

8816 / 8824 / 8824-70cm
Planter

WORKSHOP SERVICE MANUAL
4283380M1 A Rev.

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Part Number 4283380M1 A Rev. (English)

Printed in U.S.A.
March 2009

Massey Ferguson®

8816 / 8824 / 8824-70cm Planter

WORKSHOP SERVICE MANUAL
4283380M1

01 - General Information

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GENERAL INFORMATION

GENERAL INFORMATION

FIG. 1

FIG. 1: Model 8824 Forward Fold Planter with Central Fill System.

8800 Series Forward Fold Planters are designed, built and tested to make sure high quality, maximum strength and long service life. All the models feature positive air metering and hydraulic, or contact tire mechanical seed drive for accurate seed spacing.

The Central Fill System planter is designed for planting corn, soybeans, milo, popcorn, and oil crop sunflowers.

8816-30	16 Row 30 inch Forward Fold Planter
8824-30	24 Row 30 inch Forward Fold Planter
8824-70cm	24 Row 70 cm Forward Fold Planter

WARNING: Pictures in this manual can 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 information available at publication time. The company reserves the right to make changes at any time without notice or obligation.

SERIAL NUMBER PLATE LOCATION

FIG. 2: The serial number plate (1) is found on the top of the left end of the left-hand wing frame.

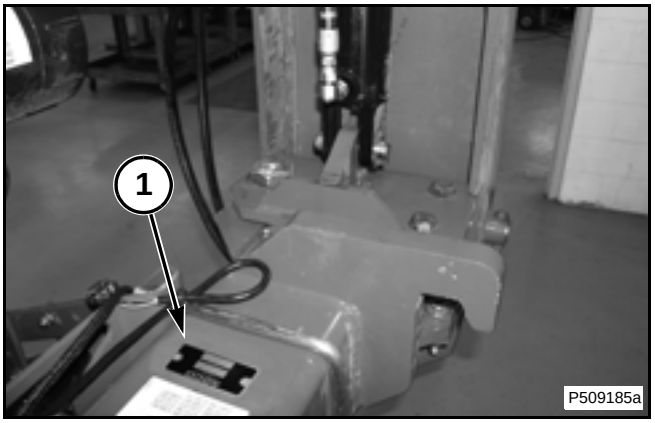

FIG. 2

SAFETY

SAFETY ALERT SYMBOL

FIG. 3: 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.

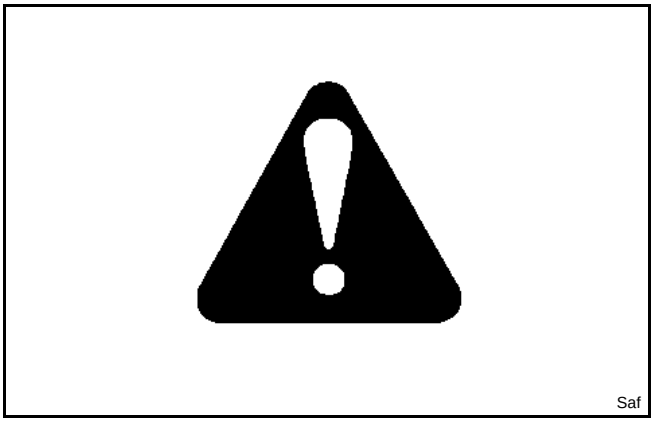

FIG. 3

SAFETY MESSAGES

FIG. 4: 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. 4

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.

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.

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

Replace any safety signs that can not be read or are missing. Replacement safety signs are available from your dealer.

GENERAL OPERATION AND SERVICE

Operating

- Read and understand all the operating and safety precautions before operating the machinery.
- In addition to the equipment configuration and design, hazard control and accident prevention depend on awareness, concern, prudence and proper training of the personnel in the operation, maintenance, transport and storage of the equipment.
- Always raise the implement, shut off the tractor engine, set the brakes, shift to park position (or neutral) and install the 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.
- The machinery operation must 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 the 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 the equipment.
- Make sure all persons are clear before operating the tractor or machine.
- Do not leave the tractor or implement unattended with the engine running.
- Never attempt to operate the planter unless seated in the operator's seat on the tractor with the seat belt fastened.
- The tractor must be equipped with rollover protective structure (ROPS), and a seat belt. Use the 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 the ground speed to field conditions, and maintain control at all times.
- When working around discs, be careful to not get cut on the sharp edges.
- Watch for overhead wires or other obstructions when raising markers, and when moving the planter with the marker(s) raised.
- Disconnect the planter. Store the 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 pressure in the hoses and cylinders.
- Do not allow children to ride on, play on, or operate equipment. Always keep children away from the equipment operating, servicing, and storage areas.
- Do not stand between the tractor and planter to install the hitch pin when the tractor engine is running.

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.
- Use same precautions when adjusting, servicing, cleaning or storing the 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 the smoke from a chemical fire.
- Store or dispose of all unused chemicals only in a manner as specified by the chemical manufacturer.

Transporting

- Do not transport planter in excess of 25 km/h (15 mph).
- Use a tractor with a minimum weight of at least 2/3 of the fully loaded planter.
- Use good judgment when transporting the planter on the highway. Maintain complete control of the machine at all times.
- Comply with the state and local laws governing highway safety and regulations when moving the machinery.
- Always make the necessary safety precautions prior to transporting the machine on public roads.
- Make sure SMV (Slow Moving Vehicle) emblem is clean and visible. SMV is not required in CE on the 8824-70cm.
- Use flashing warning lights except when prohibited by law.
- Watch for overhead wires or other obstructions when transporting the planter with markers raised.
- Make sure the markers are completely folded before transporting or parking the planter.
- Install the transport cylinder lockup devices before transporting the planter.
- For Drawbar Hitch Models: Always fasten the transport safety chain to the tractor drawbar and use the retainer on the hitch pin.

Servicing

- Always raise the implement, shut off the tractor engine, and install cylinder lockup channels before working around the machine.
- After repairing or adjusting the planter, remove all of the tools and parts from the machine before operating the planter.
- Tire changing can be very hazardous and must be done by trained personnel using the proper tools and equipment.
- Do not inflate the tire that was seriously under-inflated or run flat. Have it checked by qualified personnel.
- Lower the planter to the ground before attempting to remove a wheel for tire repair.

FIG. 5: Fluid Leak Detection

- Correct the hydraulic leaks immediately. All the fittings must be tight and all the 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. If injured by escaping fluid, see a doctor immediately.

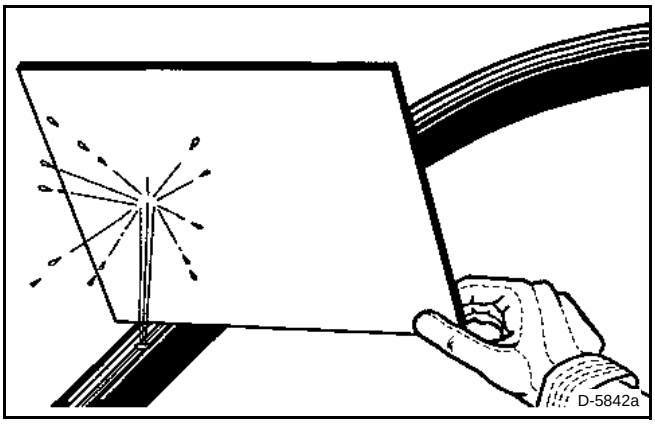

FIG. 5

NOTES

SPECIFICATIONS

8816-30 IN / 8824-30 IN

Frame

Main Frame (Toolbar) Size ..... 17.5 x 17.5 cm (7 x 7 in)

Flexibility ..... +/- 21 degrees each wing

Fold Cylinders ..... Two 5 x 20 inch double acting

Wheel Lift Cylinders ..... Eight cylinders - 16 Row
Eight cylinders (24 Row Standard, two additional, optional)

- Master Cylinder ..... Three 4-1/2 x 12 inches
- Slave Cylinder ..... Three 4 x 12 inches
- Lift Assist Cylinder ..... Two 2-1/2 x 12 inches additional, (two additional, optional on 8824)

Shaft and Disc Bearings ..... Sealed and lubricated

Tires and Wheels

Tires ..... 8816-eight, 8824-eight or ten optional, 255/70R-22.5

Tire Pressure (maximum) ..... 482 to 689 kPa (70 to 100 psi)
Do not exceed maximum indicated on sidewall

Wheel Bearings ..... Tapered roller

Fertilizer Pump Drive Wheel (if equipped)

- Size ..... 16 x 6.50, 4 ply
- Pressure ..... 193 kPa (28 psi)

8816

Rows 16

Row Spacing ..... 76 cm (30 in)

Transport Width ..... 3.6 m (11 ft 11 in)

Transport Length ..... 10.4 m (34 ft)

Transport Height ..... 3.8 m (12 ft 6 in)

Operating Length ..... 6.59 m (22 ft 6 in)

Operating Width ..... 13.25 m (43.5 ft)

Transport Wheels ..... Four transport wheels, four wing wheels

8824

Rows 24

Row Spacing ..... 76 cm (30 in)

Transport Width ..... 3.6 m (11 ft 11 in)

Transport Length ..... 14.1 m (46 ft 4 in)

Transport Height ..... 3.8 m (12 ft 6 in)

Operating Length ..... 7.0 m (23 ft)

Operating Width ..... 19.8 m (65 ft)

Transport Wheels ..... Four transport wheels,
four (two additional, optional) wing wheels

Specifications

Markers (Optional)

Type	Automatic sequencing, tri-fold arms
Disc Size	40.6 cm (16 in) diameter
Disc Type	Notched
Cylinder Sizes:	
16R-30 inch	64 x 610 mm (3 x 20 in)
24R-30 inch	89 x 711 mm (3 x 28 in)

Row Units

CFS Seed Hoppers	Two 1585.8 liters (45 bu) central fill hoppers
Seed Hoppers	70.5 liters or 105.7 liters (2 bu or 3 bu) hoppers
Seed Discs	Corn, soybean, sunflower, sugar beet, cotton, sorghum, milo, maize, navy bean, large edible bean, snap bean, peanut
Seed Drive System	Electronic controlled hydraulics
Seed Disc-to-Metering Unit Clearance	0.254 to 1.27 mm (0.010 to 0.050 in)
Herbicide/Insecticide Hoppers	70 lb per row
Metering Unit Drives	Sprocket, chain and shaft with hydraulic motor
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)
Dual Closing Wheel Tire Size	30.8 cm dia (12 in dia)
Single Closing Wheel Down Pressure	4.5 to 50.0 kg (10 to 130 lb)
Dual Closing Wheel Down Pressure	6.8 to 107 kg (50 to 230 lb)

Air System

Seed Meter Blowers	Two
Max. Blower Speed	2600 rpm @ rated PTO rpm
Operating Air Pressure (Min)	12.7 mm (0.5 in) of water
Operating Air Pressure (Max)	102 mm (4 in) of water

Hydraulic System

Tractor Remote Valve Requirements	Three
Frame Lift - Fold System Capacity	Approx. 42 liters (11 gal)
PTO Pump Circuit	
Return Line Filter	10 micron, spin-on cartridge-type
Suction Screen	100 mesh
Reservoir Capacity	28.8 liters (7.6 gal)
Fluid Cooler	Standard Equipment
Blower Motor	
Fluid Requirement (Max)	3.8 to 11.3 Lpm (1 to 3 gpm)
Operating Pressure (Min)	3445 kPa (500 psi) @ rated PTO rpm
Operating Pressure (Max)	17 238 kPa (2500 psi*) @ rated PTO rpm

* Maintained by relief valve in planter proportional flow divider valve block.

Shear Pins

Metering Unit Shaft ..... 3/16 x 1-1/2 inch roll pin

Main Drive Shaft Sprockets ..... 1/4 x 1 inch bolt, Grade 2

Herbicide/Insecticide Meter Shaft ..... 5/32 x 1-1/4 inch roll pin

Electronic Seed Drive Controller

ISOBUS Planter Controller

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

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

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

Fuse

Control Box ..... 30 amp

SM400 Monitor ..... 7.5 amp, brown ATO

Approximate Shipping Weights

8816-30 ..... 6924 kg (15,265 lb)

8824-30 ..... 8494 kg (18,725 lb)

Specifications

8824-70CM

Frame

Main Frame (Toolbar) Size ..... 17.5 x 17.5 cm (7 x 7 in)

Flexibility ..... +/- 21 degrees each wing

Fold Cylinders ..... Two 5 x 20 inch double acting

Wheel Lift Cylinders ..... Ten cylinders (24 Row Standard, two additional, optional)

- Master Cylinder ..... Three 4-1/2 x 12 inches
- Slave Cylinder ..... Three 4 x 12 inches
- Lift Assist Cylinder ..... Four 2-1/2 x 12 inches (two additional, optional)

Shaft and Disc Bearings ..... Sealed and lubricated

Tires and Wheels

Tires 8824-ten, 255/70R-22.5

Tire Pressure (maximum) ..... 482 to 689 kPa (70 to 100 psi)
Do not exceed maximum indicated on sidewall

Wheel Bearings ..... Tapered roller

8824-70cm

Rows 24

Row Spacing ..... 70 cm (27.5 in)

Transport Width ..... 3.6 m (11 ft 11 in)

Transport Length ..... 1371.6 cm (45 ft)

Transport Height ..... 297.2 cm (24 ft 8 in)

Operating Length ..... 7.0 m (23 ft)

Operating Width ..... 19.8 m (65 ft)

Transport Wheels ..... Four transport wheels
Six wing wheels

Markers

Type ..... Automatic sequencing, tri-fold arms

Disc Size ..... 40.6 cm (16 in) diameter

Disc Type ..... Notched

Cylinder Sizes:

- 24R-70 cm ..... 89 x 711 mm (3 x 28 in)

Row Units

Seed Hoppers ..... 70 Liter or 105 Liter hoppers
Seed Discs ..... Corn, soybean, sunflower, sugar beet, maize
Seed Drive System ..... Ground drive
Seed Disc-to-Metering Unit Clearance ..... 0.254 to 1.27 mm (0.010 to 0.050 in)
Herbicide/Insecticide Hoppers ..... 70 lb per row
Metering Unit Drives ..... Sprocket, chain and shaft from planter drive wheels
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)
Dual Closing Wheel Tire Size ..... 30.8 cm dia (12 in dia)
Single Closing Wheel Down Pressure ..... 4.5 to 50.0 kg (10 to 130 lb)
Dual Closing Wheel Down Pressure ..... 6.8 to 107 kg (50 to 230 lb)

Air System

Seed Meter Blowers ..... Two
Max. Blower Speed ..... 2600 rpm @ rated PTO rpm
Operating Air Pressure (Min) ..... 12.7 mm (0.5 in) of water
Operating Air Pressure (Max) ..... 102 mm (4 in) of water

Hydraulic System

Tractor Remote Valve Requirements ..... Three
Frame Lift - Fold System Capacity ..... Approx. 42 liters (11 gal)
Blower Motor
- Fluid Requirement (Max) ..... 3.8 to 11.3 Lpm (1 to 3 gpm)
- Operating Pressure (Min) ..... 3445 kPa (500 psi)
- Operating Pressure (Max) ..... 17 238 kPa (2500 psi*)

* Maintained by relief valve in planter flow divider valve block.

Shear Pins

Metering Unit Shaft ..... 3/16 x 1-1/2 inch roll pin
Herbicide/Insecticide Meter Shaft ..... 5/32 x 1-1/4 inch roll pin
Main Drive Shaft Sprockets ..... 1/4 20T x 1 inch bolt, Grade 2

Monitor

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

Specifications

Fuse

Control Box ..... 30 amp

SM400 Monitor ..... 7.5 amp, brown ATO

Approximate Shipping Weights

8824-70cm ..... 10 659 kg (23 500 lb)

FIELD OPERATIONS AND ADJUSTMENTS

TRACTOR PREPARATION

Recommended Tractor Horsepower

Planter Model	Minimum PTO HP Required	Planter Weight (dry)	Total Planter Weight	Desired Tractor Weight (lbs)
8816 - 30 inch	150	18,000	23,400	15,600
8824 - 30 inch	200	27,500	32,900	21,933
8824 - 70 cm	200	27,500	32,900	21,933

Recommended Tractor Horsepower With Fertilizer Openers

Planter Model	Minimum PTO HP Required	Planter Weight (dry)	Total Planter Weight	Desired Tractor Weight (lbs)
8816 - 30 inch	170	18,000	30,000	20,000
8824 - 30 inch	240	27,500	40,000	26,700
8824- 70 cm	240	27,500	40,000	26,700

Wheel Tread Spacing

IMPORTANT: Dual rear wheels are recommended for tractor stability and for load-carrying capacity when the planter is folded.

The ideal wheel tread spacing dimensions are listed below.

NOTE: Some outer wheels cannot be adjusted to these dimensions.

16-Row, 30 inch Model

Set inner wheel tread to 153 cm (60 in).

Set outer wheel tread to 305 cm (120 in).

24-Row, 30 inch Model

Set inner wheel tread to 153 cm (60 in).

Set outer wheel tread to 305 cm (120 in).

24-Row, 70 cm Model

Set inner wheel tread to 153 cm (60 in).

Set outer wheel tread to 305 cm (120 in).

NOTE: Set all the 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 outside edge of the inner rear wheels.

Tractor PTO

The planter hydraulic pump requires a 1000 rpm tractor PTO shaft of either size:

21-spline, 1-3/8 inch diameter

20-spline, 1-3/4 inch diameter

Tire Inflation

Inflate the tires as recommended.

Front Weights

Install as many weights as required for the front end stability when the planter is folded.

Hydraulic Requirements

Two remote valves are required:

1. One valve controls the frame lift/lower circuit.
2. A second valve controls the tongue height/marker/fold circuits.
3. A third valve will be required to control the central fill seed hopper pressure if the planter is equipped with the central fill system.
4. A fourth remote valve will be needed for the hydraulic drive and the singulation blowers if the PTO pump is not used.

Minimum available tractor system pressure must be 15,502 kPa (2250 psi).

Electrical Requirements

The tractor electrical system must provide 12 volts DC to operate the highway lighting system, the frame fold control system, and the hydraulic seed monitor.

IMPORTANT: Connect the electrical equipment only to 12 volts DC.

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

The transport lighting system is connected to the tractor with an ISO 7-pin connector (CE).

CONNECTING THE PLANTER TO THE TRACTOR

Three-point Hitch

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

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

FIG. 6: Lower Link Hitch Positions

Install hitch pins according to hitch category. Install lynch pins (1) in holes nearest hitch plates as shown.

Install pin clips 2 as shown.

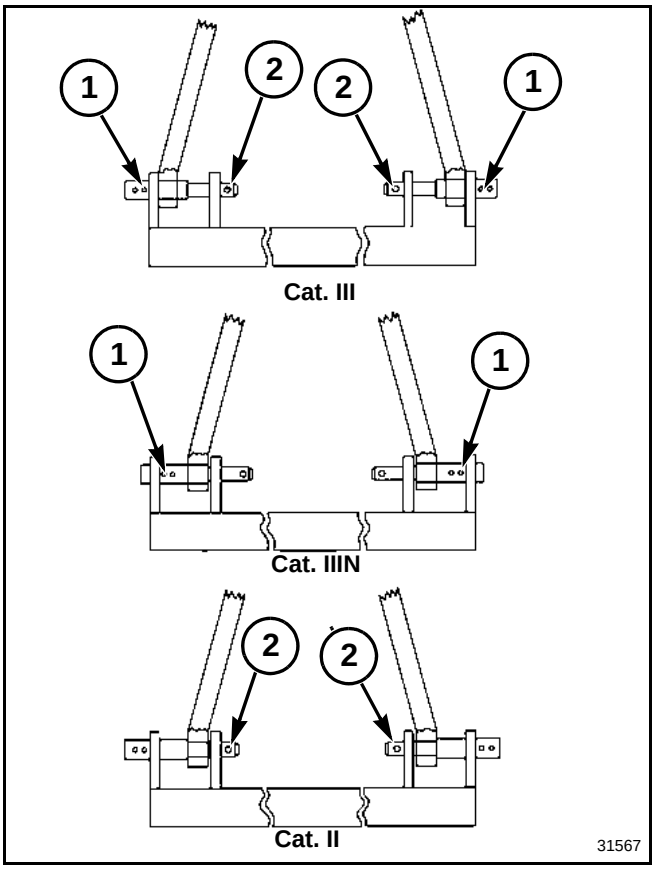

FIG. 6

FIG. 7: Completed Hookup

IMPORTANT: Before raising, lowering, unfolding or folding planter, make sure hoses and electrical harnesses cannot be pinched, stretched, or damaged during operation.

FIG. 7

Drawbar Hitch

FIG. 8: Back the tractor toward the planter hitch.

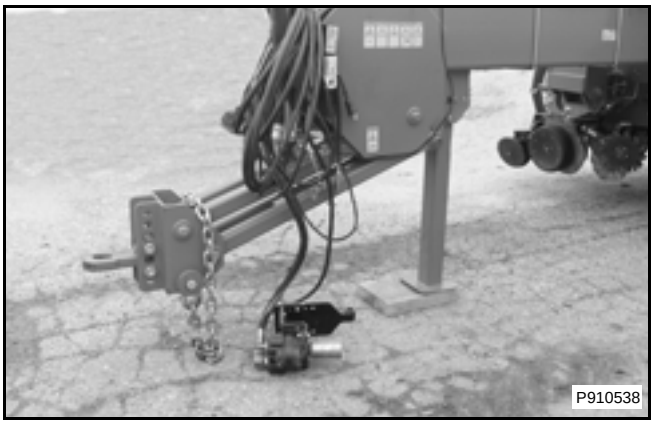

FIG. 8

FIG. 9: When the hitches are aligned, install a hitch pin with a minimum diameter of 30 mm (1-1/4 in). Install a pin clip.

Install the transport safety chain around the tractor drawbar and connect the hook to the chain.

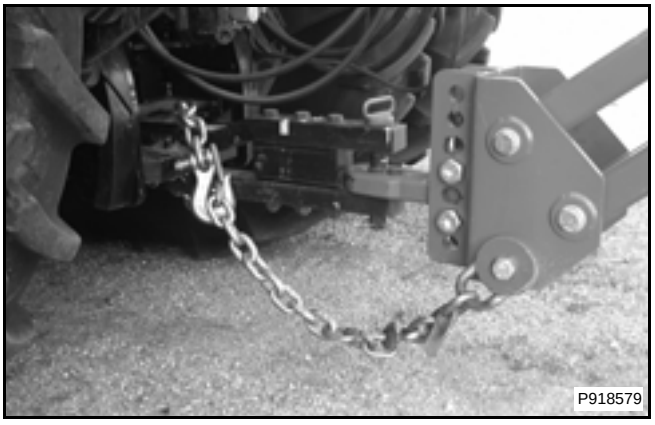

FIG. 9

Hydraulic Lines

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

IMPORTANT: Clean off the hose ends and the tractor couplers to remove dirt before making connections.

Relieve internal system hydraulic pressure, then connect the planter hydraulic hoses to the tractor remote outlets.

FIG. 10: The hydraulic hoses come down the tongue of the planter.

FIG. 10

FIG. 11: Frame Lift/Lower Circuit Hoses:

Connect a 5/8 inch ID raise hose (1) to the tractor outlet showing the extended cylinder. Connect a 5/8 inch ID lower hose to the tractor outlet showing the retracted cylinder.

Hitch Height/Marker/Fold Circuit Hoses:

Connect a 3/8 inch ID lower hose (2) to the tractor outlet showing the extended cylinder.

Connect a 3/8 inch ID raise hose to the tractor outlet showing the retracted cylinder.

Connect the frame control box harness to the planter harness.

IMPORTANT: If the planter hydraulic system is not full of fluid, see the Priming Hydraulic Circuits in the Lubrication and Maintenance Section.

IMPORTANT: Before raising, lowering, unfolding or folding the planter, make sure the hoses and the electrical harnesses cannot be pinched and damaged during the operation.

NOTE: See the Frame Control System for complete control box operating.

Connect the ISOBUS planter controller harness to the mating console harness.

IMPORTANT: Connect all the consoles to a 12-volt DC system only.

Connect the highway lighting plug (3) to the tractor receptacle.

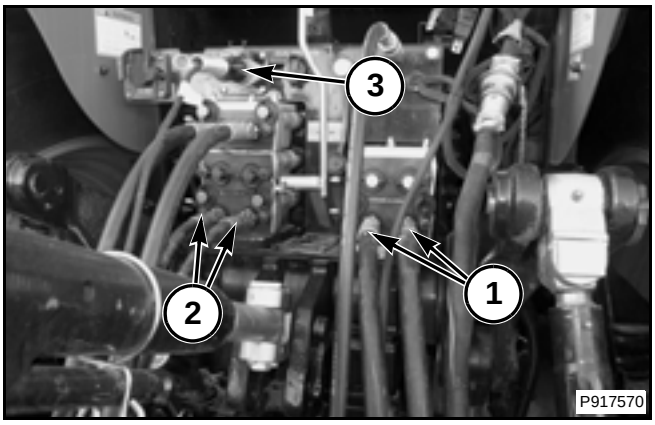

FIG. 11

FIG. 12: Central Fill Blower Hydraulic Connections

(1) Central Fill Blower Circuit Hoses

(2) Case Drain Line - Zero Pressure Return

The hoses are tagged pressure, return, and case drain and are connected to steel tubes on the draft link.

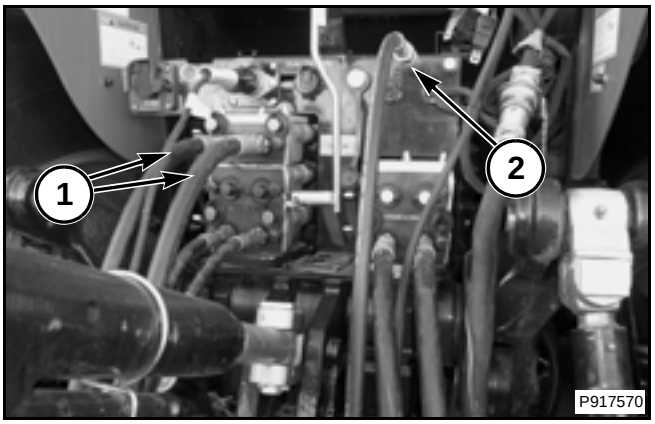

FIG. 12

Pump Fluid

After installing the pump, make sure the pump is filled with fluid. Check the fluid level in the planter hydraulic tank.

Seed Meter Blower/Meter Drive Hoses

FIG. 13: If the PTO pump is not used the seed drive and blower motor operate from the tractor closed center hydraulic system, connect pressure hose and return hose.

NOTE: If available, a priority tractor remote valve must be used.

NOTE: If blower motor is operated from closed center tractor hydraulic systems, the bypass hose between motor outlet and control valve may require removal.

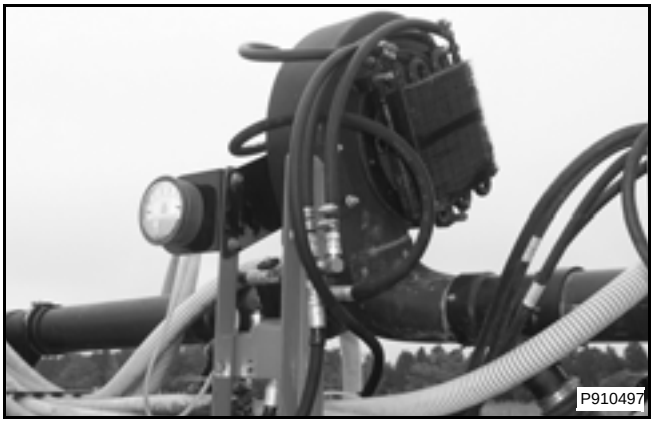

FIG. 13

FIG. 14: Example of blower motor connections on tractor with closed center hydraulic system.

Pressure hose (1)

Return hose, zero pressure port (2)

NOTE: Tractor return line connection is an example.

NOTE: Tractor return line must hook up to a 0 pressure return that dumps straight into reservoir.

IMPORTANT: Wipe off hose ends and clean tractor couplers to remove dirt before making connections.

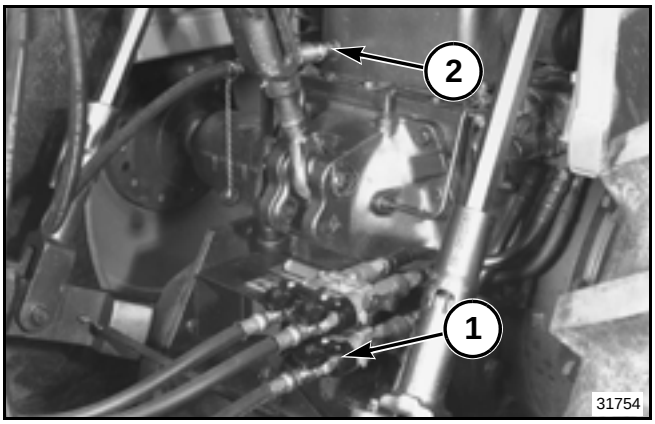

FIG. 14

Adjusting Tractor Remote Valve Flow

Adjusting tractor remote valve flow preferred method using a flow rater. Adjust the tractor remote valve flow to a setting of:

- Hydraulic drive flow rate - 13.0 to 13.5 gpm
- Ground drive flow rate - 6.0 to 6.5 gpm

Adjusting tractor remote valve flow using alternate method. Adjust planter blower flow control valve fully open (counter clockwise) and set tractor flow control to the minimum setting. Engage valve and increase remote valve flow to get 3 to 4 inches of water on both air gauges.

For hydraulic drive planters set seed monitor to maximum desired population, and operate drive using the continuous test at the maximum desired planting speed. Increase tractor flow rate to again get 3 to 4 inches of water on both air gauges. Use planter flow control valve to adjust air pressure.

NOTE: It is important that the tractor has enough hydraulic capacity to maintain air pressure in the seed meter while raising and lowering the planter. If the seed drops out of the disc there will be an unplanted area when operation resumes.

CONTROL BOX SWITCHES

FIG. 15: Frame Control Box

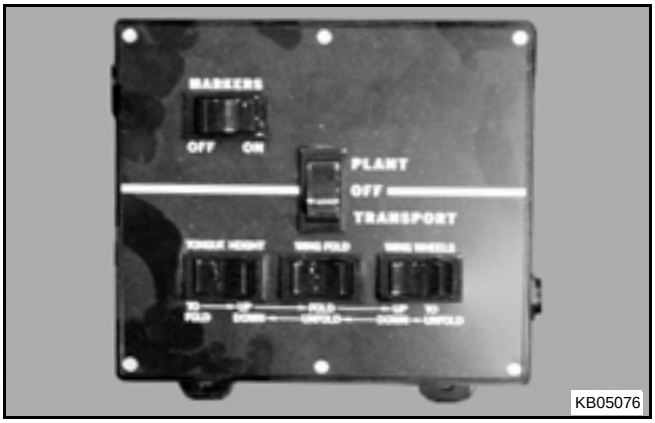

FIG. 15

PLANT/OFF/TRANSPORT Switch:

Press the switch to PLANT for field operation.

Press the switch to TRANSPORT for folding the frame.

NOTE: To prevent battery drain, make sure that the blue with red wire is wired to the switch side of the tractor key switch.

Select the desired function with one of the five control box switches, then control the speed and direction of each function with one of two tractor hydraulic control levers.

TONGUE HEIGHT Switch (Drawbar Hitch Only): Press and hold the switch, then use the tractor hydraulic valve to:

- Raise the hitch for the transport position.
- Lower the hitch for the field operation.
- Raise the lower hitch to connect to the tractor.
- Raise lower hitch to hook/unhook wings.
- Unlatch hitch extension.

WING FOLD Switch: Press and hold the switch, then use the tractor hydraulic valve to fold or unfold the planter wing frames.

WING WHEELS Switch: Press and hold the switch, then use the tractor hydraulic valve to raise or lower the wing wheels (transport position only).

NOTE: If the switch is in PLANT position, the wing wheels raise and lower with four transport wheels whether frame is folded or unfolded. If the switch is in TRANSPORT, the WING WHEELS switch must be pressed to raise and lower the wing wheels independently of the transport wheels.

MARKERS Switch: Press the switch ON when in the field operating position. Press the switch OFF for all other operations.

OPERATING NOTES

- The planter raises in the folded or unfolded positions without electrical power, but will not lower without it.
- The tongue and fold cylinders will not operate without electrical power.
- The planter will not lower in the folded or unfolded positions if the PLANT/OFF/TRANSPORT switch is in the TRANSPORT position.
- The planter will lower and raise in the folded position if the PLANT/OFF/TRANSPORT switch is in the PLANT position. When raising the planter, wing wheels will lower. Change the switch to the TRANSPORT position. Press the WING WHEELS switch, then return the WING WHEELS to the TRANSPORT position.

FOLDING AND UNFOLDING THE PLANTER

Whenever folding or unfolding the planter, observe the following:

- A firm, level surface provides for easiest operation.
- Allow at least 4.6 m (15 ft) clearance behind the planter for folding.
- Allow at least 6.7 m (25 ft) clearance ahead of the tractor for unfolding.
- The tractor must roll slightly as the frame is folded or unfolded. Do not engage the parking brake.

Safety

CAUTION: Be sure everyone is clear of planter before proceeding to fold or unfold planter.

WARNING: Always stop tractor engine and shift to park position, or shift to neutral and set brakes before dismounting from tractor.

Folding Procedure

FIG. 16: Start the tractor engine, release the brakes and shift to neutral. Change the PLANT/OFF/TRANPORT (1) switch to TRANSPORT. Use the hydraulic valve to fully raise the planter.

If using a three point hitch, fully raise the tractor three point hitch.

If using a drawbar hitch, fully raise the planter tongue by holding the TONGUE HEIGHT switch while using the tractor hydraulic valve.

Press and hold the WING FOLD switch (2). Start to fold the wings. When the wing latches are near the tongue, lower the tractor hitch to adjust the planter tongue height to 4 to 6 inches of vertical gap between the hooks. Finish folding the wings.

Press and hold the WING WHEELS (4) switch. Lower the wings, and engage wing hooks into the transport hooks.

Press and hold the WING WHEELS switch. Use the hydraulic valve to raise the wing wheels off the ground.

NOTE: Some field conditions can produce a situation where the wing hooks may not be directly above the transport hooks. If this occurs the 4 to 6 inches of height will allow the wings to continue to travel inward, closing the gap between the hooks.

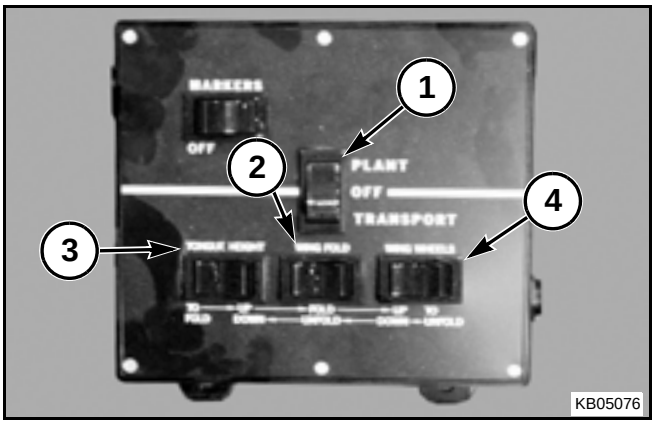

FIG. 16

FIG. 17: Finish folding the planter.

Press and hold the WING WHEELS switch. Use the hydraulic valve to raise the wing wheels.

FIG. 17

FIG. 18: Stop the tractor, engage the parking brake, and install the wheel lift cylinder stops (1). Install two wheel lift cylinder stops on the master cylinders on the center main frame (1) during transport.

Switch the PLANT/OFF/TRANSPORT to PLANT.

Turn the control box switch OFF.

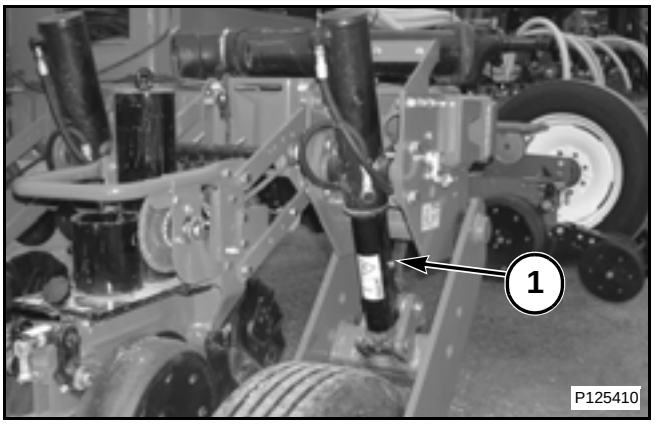

FIG. 18

FIG. 19: The wings are folded and the wing latches are hooked into the wing receiver (1).

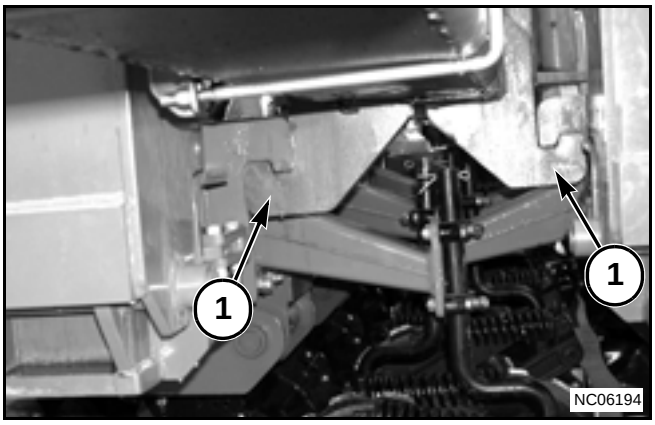

FIG. 19

FIG. 20: If equipped with the wing transport pins (1), install the wing transport pins. Planter is now folded, raised and ready for transport.

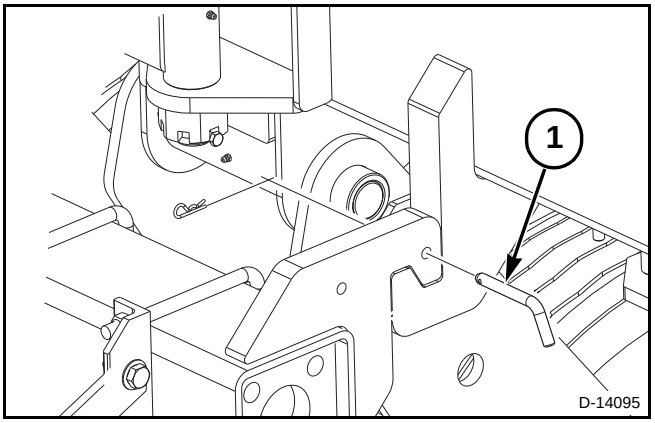

FIG. 20

Unfolding Procedure

FIG. 21: If equipped with the wing transport pins (1), remove the wing transport pins.

Switch the PLANT/OFF/TRANSPORT switch to TRANSPORT and MARKER to OFF. Use the hydraulic valve to fully raise the planter if using three point hitch. If using a drawbar hitch fully raise the planter by holding the TONGUE HEIGHT switch and using the tractor hydraulic valve.

Remove the wheel cylinder lockup channels.

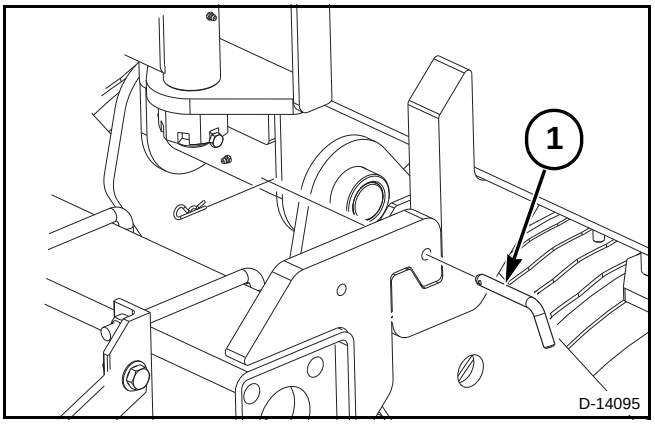

FIG. 21

FIG. 22: Press and hold the WINGS WHEELS switch to lower the wing wheels.

As the wing wheels lower, the wings will raise and disengage from the receiver.

If necessary, lower the planter tongue to help disengage the wing wheels.

FIG. 22

FIG. 23: Press and hold the WING FOLD switch. Use the hydraulic valve to unfold the planter.

FIG. 23

FIG. 24: Planter Nearly Unfolded

FIG. 24

FIG. 25: Unfolded Raised Position

FIG. 25

FIG. 26: Hold the hydraulic lever after movement stops until the hitch latch (1) is fully engaged.

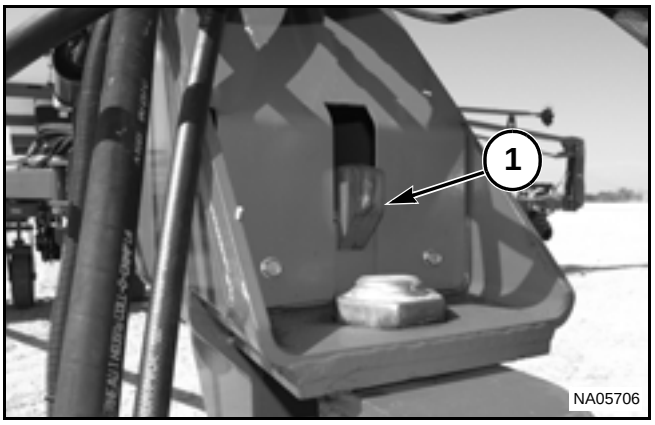

FIG. 26

MARKERS

Operation

FIG. 27: The marker cylinders are connected to a tractor remote hydraulic circuit. A hydraulically operated sequence valve allows the markers to alternately raise and lower each time the tractor control lever is moved.

Before operating the markers:

Push the PLANT/OFF/TRANSPORT switch (1) to PLANT.

Push the MARKERS switch (2) to ON.

WARNING: Do not stand under markers. Clear bystanders from area before operating markers.

If both markers must be lowered, lower one marker to the ground, then move the hydraulic lever to raise. Just as the lowered marker cylinder begins to extend, move the lever to lower the other 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.

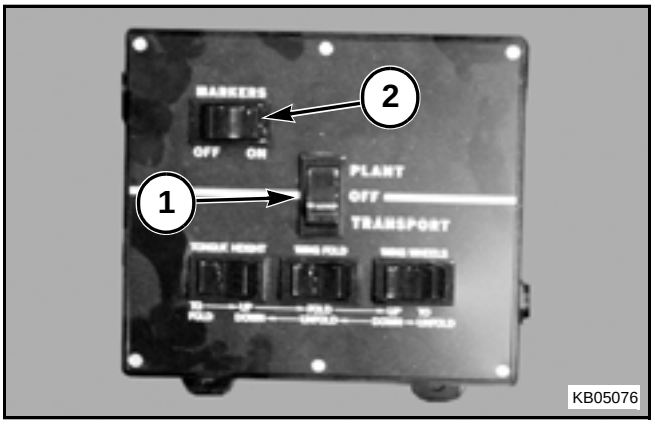

FIG. 27

Sequence Valve

FIG. 28: A sequence valve (1) provides automatic marker cycling after one marker is raised, the opposite marker is lowered. The operation is reversed the next time the circuit is activated.

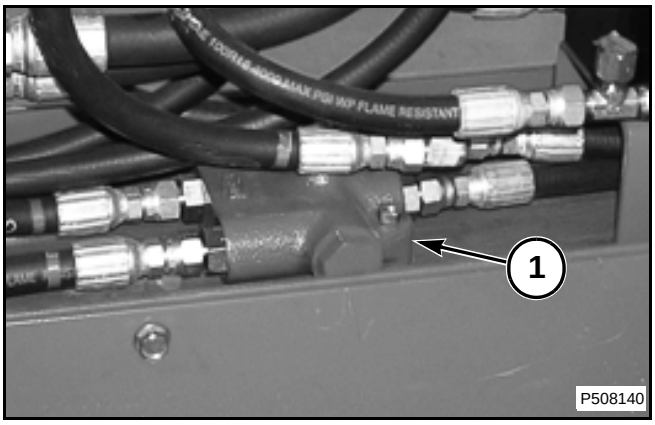

FIG. 28

Position Switch

FIG. 29: As the planter frame is folded, the marker position switch (1) opens, disconnecting the marker raise/lower circuit. When the frame is unfolded, the switch is closed, allowing normal marker operation.

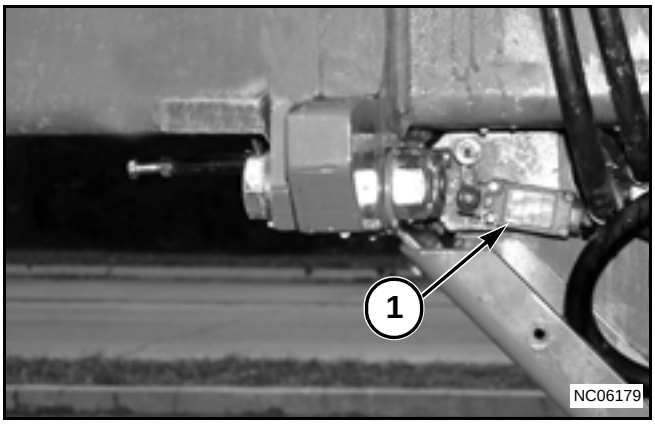

FIG. 29

Shear Bolts

FIG. 30: The markers are protected with a Grade 5 Standard SAE shear bolt and lock nut (1). If the shear bolt needs to be replaced. Use a USS flat washer next to the bolt head and nut.

- 8816 - 3/8 x 3 inch
- 8824 - 1/2 x 3 1/4 inch
- 8824-70cm - 1/2 x 3 1/4 inch

NOTE: Fully engage nut threads on bolt, but it is not necessary to tighten the nut.

IMPORTANT: Replace only with the correct size and grade.

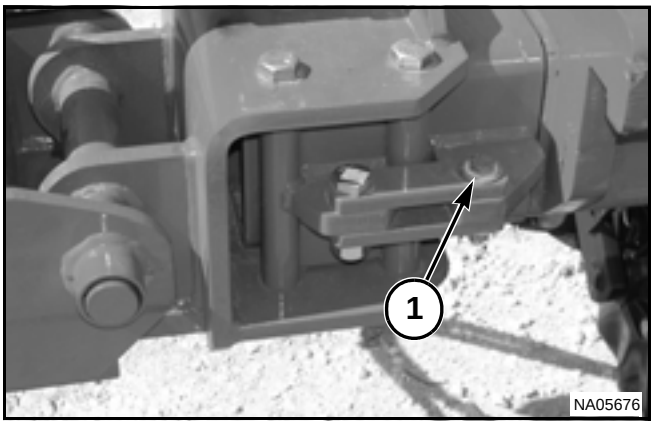

FIG. 30

SEED RECOMMENDATIONS

Seed must be clean, not damaged, the same size, and have a high germination test. If low germination seed must be used, adjust the seed rate accordingly. See the seed supplier for recommendations.

IMPORTANT: To obtain best singulation and uniform spacing, round corn is preferred.

When planting other crops, medium size seed is best for overall performance and seed economy.

NOTE: Insecticide treatments can prevent the flow of the seed from the central hopper to the meter. It can be beneficial to add talc to the seed.

Mix in 2.2 ml talc per liter (1/3 cup talc per bushel) of treated seed. When filling the 1586 liter (45 bushel) central hoppers, mix 3.8 liter (1 gallon) of talc with the seed in each hopper.

Do not apply the entire amount of talc over the top of the seed after filling the central hopper. Do one of the following:

- Mix the talc with the treated seed before putting the seed in the central hopper

- Spread talc on top of the seed in layers as the central hopper is filled.

Seed treatments can also affect seed monitor performance and require periodic cleaning of the seed disc.

INITIAL PRESSURE SETTINGS

The following chart is a suggested guide for the initial planter air pressure settings. It DOES NOT eliminate the need for the operator to visually check the 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

LIQUID FERTILIZER

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

Tire Pressure and Radius - Piston Pump Drive

FIG. 31: For maximum accuracy:

- Traction Drive for Piston Pump (1): Inflate transmission tire to 517 kPa (75 psi)
- Inflate planter tire (2) to 441 kPa (64 psi) or maximum indicated on sidewall.

One spring is mounted under the transmission drive wheel arms. The spring provides the necessary down force to hold the transmission drive tire against the planter tire during operation.

Once set, routine spring adjustments are not required.

Loaded transmission tire radius must be 140 to 146 mm (5-1/2 to 5-3/4 in). Measure radius when planter is lowered so transmission tires fully contact planter tires.

If the transmission tire pressure is correct, but the loaded radius is incorrect, adjust the spring. Use the adjustment bolts on the transmission arm to adjust the transmission arm spring.

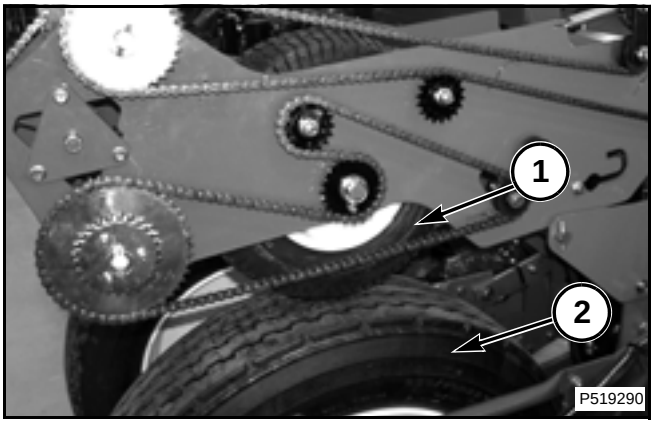

FIG. 31

Piston Pump Chain

FIG. 32: To adjust the chain tension, loosen the four pump mounting bolts (1), move the pump forward, align the sprockets, and tighten the bolts.

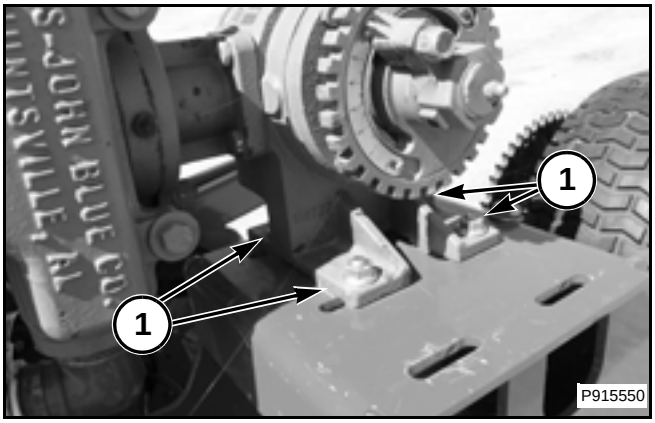

FIG. 32

FIG. 33: This is the piston pump strainer (1) location for the tow behind hitch. For the on board tank option, the strainer is located on the tank support bracket.

Periodically remove and clean the screen inside the strainer.

To take out the strainer:

1. Close the tank valve.
2. Remove the drain plug in the bottom of the canister.
3. Unscrew the canister and remove the strainer.

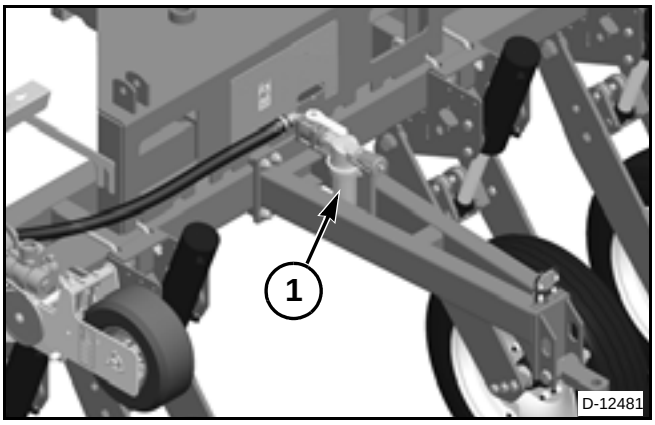

FIG. 33

Initial Startup

Refer to the Pump Parts and Instruction Manual supplied with the pump for the initial startup procedures.

IMPORTANT: Clean pumping system components before storage.

Distribution to Openers

Two distribution devices are available for distributing liquid fertilizer from the pump to the openers.

FIG. 34: If the cast manifold (1) is installed, check valves are recommended for installation in each opener hose.

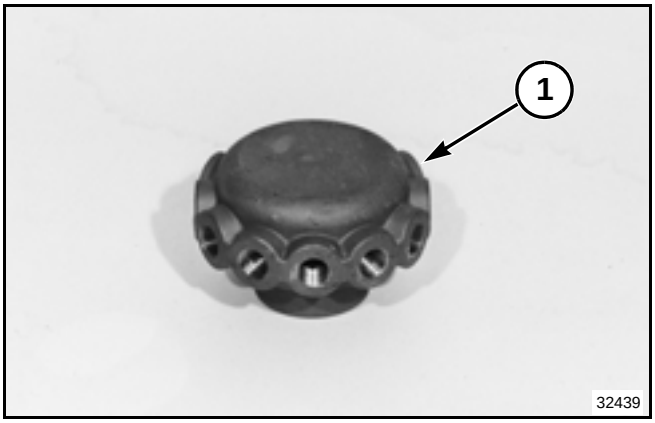

FIG. 34

FIG. 35: If the flow divider (1) is installed, no check valves or orifices are required.

IMPORTANT: Make sure to clean entire pumping system of liquid fertilizer when the planter is not operating for a period of time.

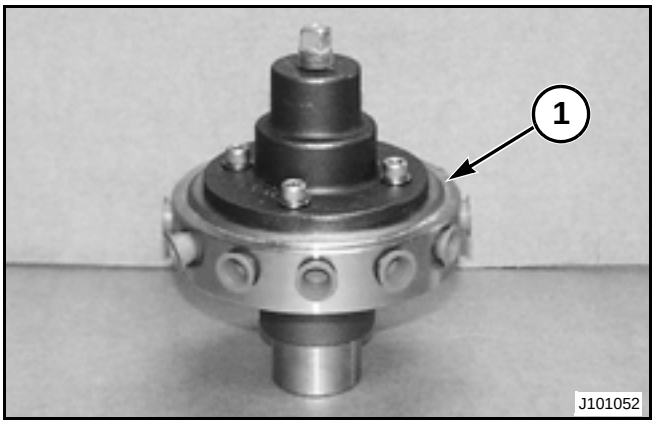

FIG. 35

Check Valve Orifices

FIG. 36: The liquid fertilizer application rate is adjusted on the pump. If the planter is equipped with a standard cast distribution manifold and check valves (1) the orifice discs must be used with the desired application rate.

Several orifice sizes are available for different application rate ranges. See the Orifice Disc chart to select the size of orifice that covers the desired rate and expected application speed.

Shown is check valve with orifice.

NOTE: Part number is stamped on orifice disc.

IMPORTANT: When changing or assembling orifice discs, make sure part number faces toward outlet.

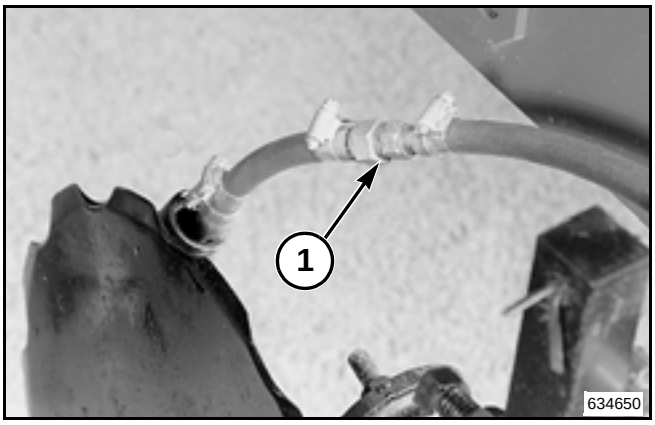

FIG. 36

Orifice Disc Chart

Part No.	Liters/Acre (Gallons/Acre)	KPH (MPH)
4916-43	17.8 - 31 (4.7 - 8.2)	9.6 (6.0)
	26.5 - 46.2 (7.0 - 12.2)	6.4 (4.0)
4916-57	31 - 54.1 (8.2 - 14.3)	9.6 (6.0)
	46.5 - 81.4 (12.3 - 21.5)	6.4 (4.0)
4916-75	46.2 - 93.9 (14.3 - 24.8)	9.6 (6.0)
	54.1 - 140.8 (21.5 - 37.2)	6.4 (4.0)
4916-98	98.4 - 168.5 (26.0 - 44.5)	9.6 (6.0)
	145.7 - 252.9 (38.5 - 66.8)	6.4 (4.0)
4916-128	159.4 - 276.3 (42.1 - 73.0)	9.6 (6.0)
	238.9 - 414.5 (63.1 - 109.5)	6.4 (4.0)

IMPORTANT: Make sure to disassemble and clean check valves of liquid fertilizer when planter is not operating for a period of time.

IMPORTANT: To avoid pump over speed, do not plant faster than 9.6 kph (6 mph).

FIG. 37: Disassembled Check Valve

(1) Inlet

(2) Ball

(3) Spring

(4) Spring Seat

(5) Orifice

(6) Outlet

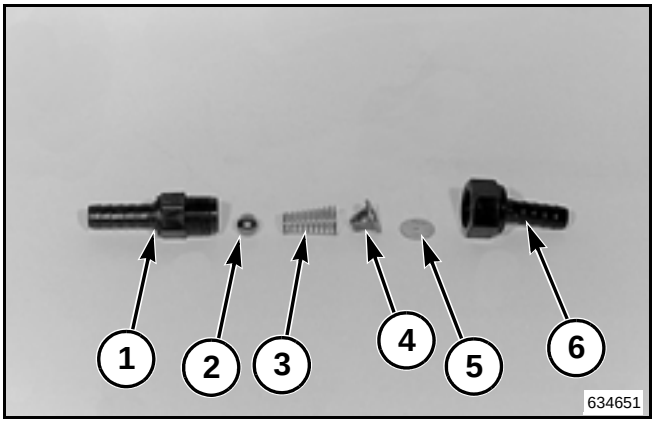

FIG. 37

Checking Application Rate

Operate system to make sure system is full.

Remove delivery tube from an opener and insert tube into a container connected to planter.

With fertilizer attachment engaged, drive forward at planting speed for 91.44 m (300 ft).

Measure fluid ounces of liquid fertilizer caught in container and multiply it by the figure in the chart below to obtain gallons per acre.

Row Width	Factor
30 inch	0.453

Piston Pump Rate Chart - Double Chain

FIG. 38: Double chain pump drive. Arrow is pointing in the forward direction.

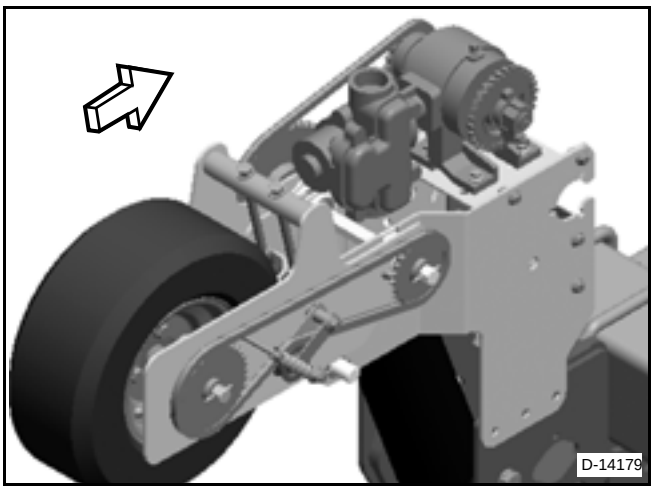

FIG. 38

Piston Pump Application Rates Gallons Per Acre		
Number of Rows	16	24
Row Spacing	30	30
Pump Setting		
2.0	6.6	4.4
2.5	8.2	5.5
3.0	9.9	6.6
3.5	11.5	7.7
4.0	13.1	8.8
4.5	14.8	9.8
5.0	16.4	10.9
5.5	18.1	12.0
6.0	19.7	13.1
6.5	21.3	14.2
7.0	23.0	15.3
7.5	24.6	16.4
8.0	26.3	17.5
8.5	27.9	18.6
9.0	29.6	19.7
9.5	31.2	20.8
10.0	32.8	21.9

Use the chart above to determine piston pump setting for the desired rate.

Example:

- Desired rate, per acre = 30 gallons
- Row spacing = 30 inch
- Planter = 16

Read across the top rows to 16 and 30, then down to 29.6 (gpa). Pump setting is in the left column. Set the pump at 9.0 to apply approximately 30 gpa.

Piston Pump Rate Chart - Single Chain

FIG. 39: Single chain pump drive. Arrow is pointing in the forward direction.

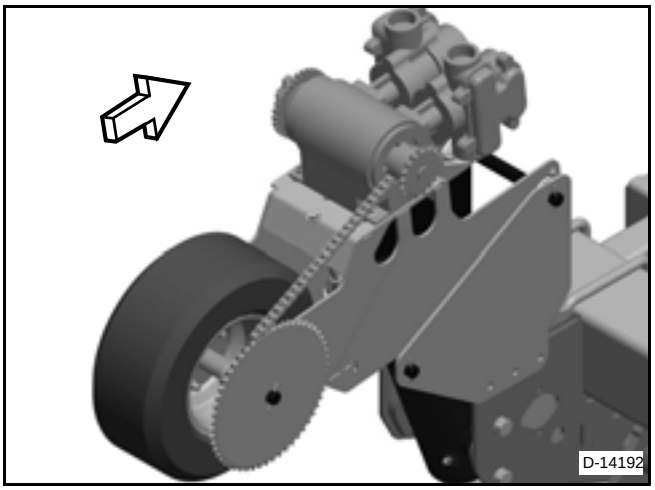

FIG. 39

FIG. 40: Use this chart to determine piston pump setting for the desired rate.

(1) Read your Operator Manual

(2) Number of Rows

(3) Row Spacing

(4) Pump Setting

(5) Single Piston Pump

(6) Double Piston Pump

Example for the single piston pump:

- Desired rate, per acre = 30 gallons
- Row spacing = 30 inch
- Planter = 16

Read across the top rows to 16 and 30, then down to 31.1 (gpa). Pump setting is in the left column. Set the pump at 9.0 to apply approximately 30 gpa.

Example for the double piston pump:

- Desired rate, per acre = 30 gallons
- Row spacing = 30 inch
- Planter = 24

Read across the top rows to 24 and 30, then down to 29.9 (gpa). Pump setting is in the left column. Set the pump at 6.5 to apply approximately 30 gpa.

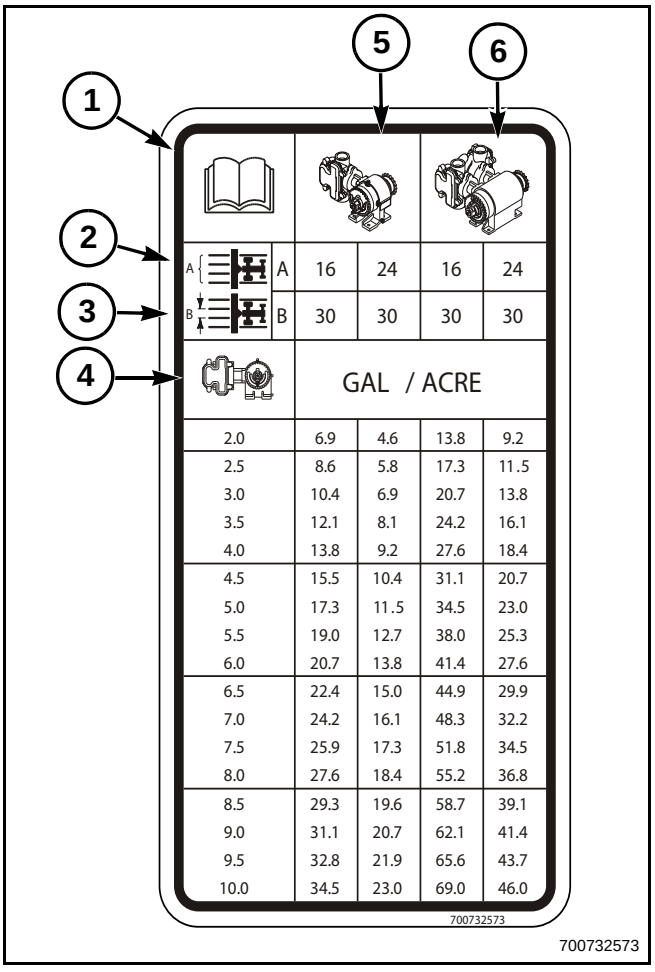

FIG. 40

Piston Pump Slide Chart - Ground Drive

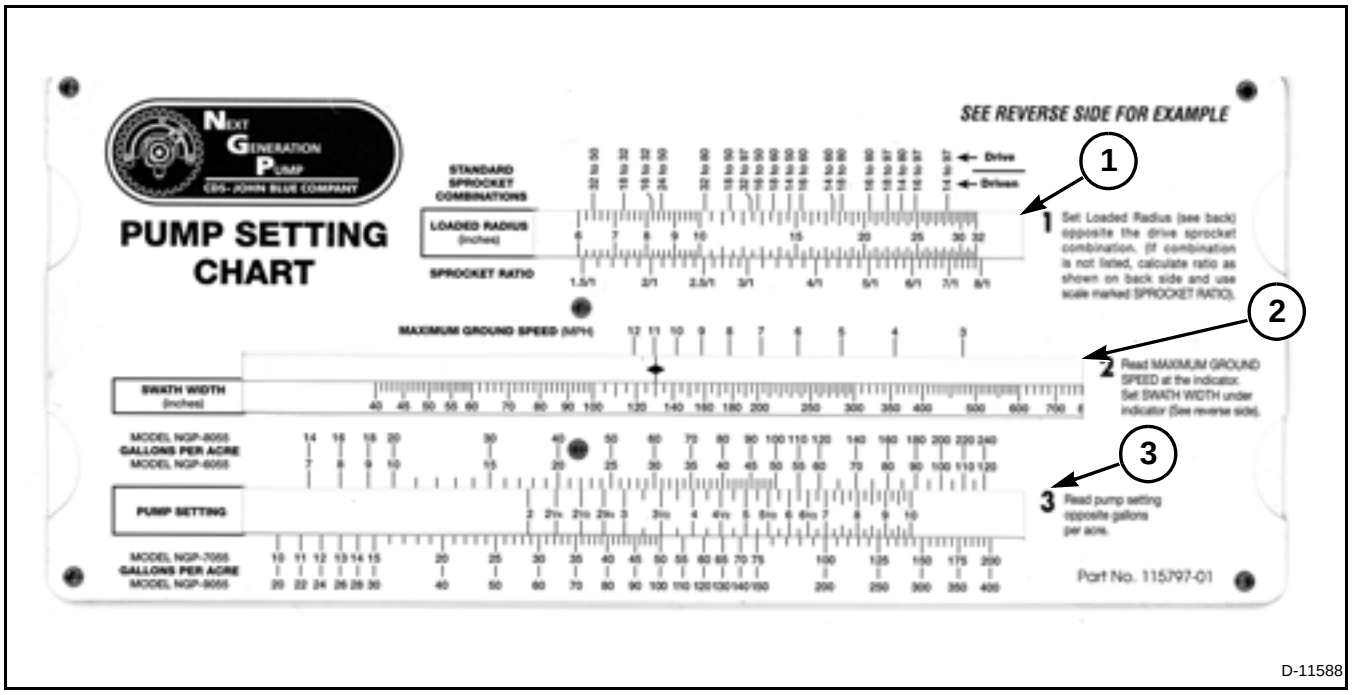

FIG. 41

FIG. 41: Universal Pump Setting Chart

NOTE: This chart is based on theoretical values. Actual pump setting to achieve desired rate may need to be greater than indicated by chart due to field conditions.

(1) Loaded Radius over Sprocket Ratio

(2) Swath Width under Arrow

(3) Gallons per Acre over Pump Setting

To set the pump for desired application rate, use the slide chart above (provided with the pump) to determine required pump setting.

A 40T drive sprocket and a 18T pump sprocket are available. The maximum application rate is approximately:

- 8816 - 29 gallons/acre
- 8824 - 19 gallons/acre

NOTE: If openers are equipped with check valves, change orifices to match desired rate.

Pump Setting Chart

The sliding-scale chart is designed for a variety of applications, so use the following figures for 16-row planters with NGP-6055 pump.

Drive ratio: 2.2 to 1.

Loaded radius: 7.5 inch (16 X 6.50 drive tire)

Swath width = 30 inch x 16 rows = 480 inch

Move upper slide until 7.5 (Loaded Radius) is over 2.2 to 1 (Sprocket Ratio).

Move lower slide until 480 inch (Swath Width) is under large arrow.

Read pump setting under Gallons per Acre, Model NGP-6055. If desired rate is 25 gpa, read 8-3/4, under 25 on Pump Setting Scale.

Set pump at 8-3/4.

FERTILIZER OPENERS

Double-Disc Openers

CAUTION: Do not let opener drop from a holder. Be careful! Disc blades are sharp.

FIG. 42: The double-disc opener is used for planting conventional tillage. The opener can apply liquid fertilizer to a depth of 102 mm (4 in), depending on soil conditions.

Actual fertilizer location will be dependent on local test information, personal observation and fertilizer supplier information.

To adjust horizontally:

Loosen the U-bolts (1) to adjust the opener horizontally. Slide the opener assembly to the desired location, usually about 5 to 7.5 cm (2 to 3 in) on either side of the seed openers. Tighten the U-bolts.

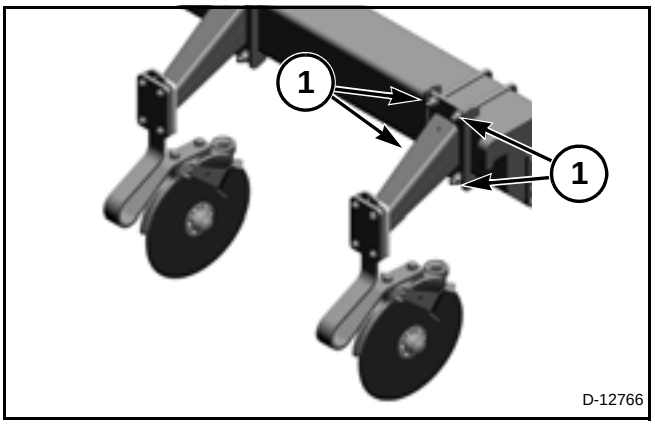

FIG. 42

FIG. 43: To adjust the depth:

- Raise the planter.
- Loosen the clamp plate hardware (1).
- Raise or lower opener assembly (2) to the desired depth, usually about 25 mm (1 in) below the seed depth.
- Tighten the hardware.

IMPORTANT: Always verify correct fertilizer placement after adjustments have been made.

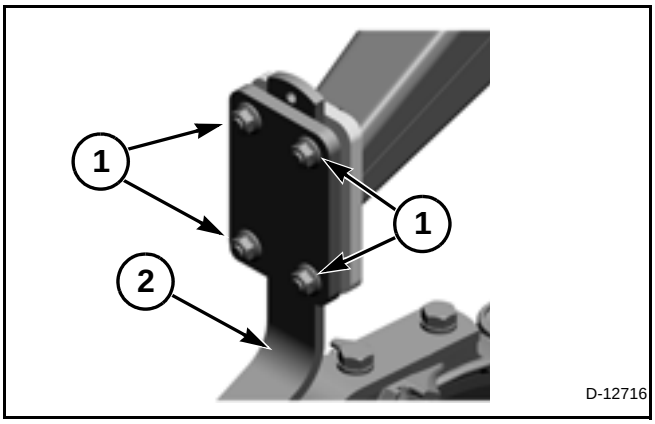

FIG. 43

Single-Disc Openers

Single-disc openers are used for conventional and minimum tillage conditions. The openers can apply liquid to a depth of 10 cm (4 in).