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1900 Commodity Air Cart

**John Deere Seeding Group
OMA69931 Issue E1**

(This manual replaces OMA65976 Issue L0)

LITHO IN U.S.A.

Introduction

Foreword



A40115A -UN-18MAR98

1900 Tow-Between Cart

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction of forward travel.



THIS MACHINE is of metric design. Measurements in this manual are metric with the customary U.S. measurement following. Use only metric hardware and tools as specified.

WRITE PRODUCT IDENTIFICATION NUMBERS in the Specifications section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. If this manual is kept on the machine, also file the identification numbers in a secure place off the machine.

WARRANTY is provided as part of John Deere's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate, which you should have received from your dealer.

This warranty provides you the assurance that John Deere will back its products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied. Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

THE TIRE MANUFACTURER'S warranty supplied with your machine may not apply outside the U.S.

Predelivery

After the machine has been completely assembled, inspect it to be sure it is ready to be operated, before it is delivered to the customer. The following check list is a reminder of important points to be inspected. Check off each item as it is found to be satisfactory, or after proper adjustment has been made.

- ☐ SMV emblem and reflectors are installed.
- ☐ Flashing warning lights function properly.
- ☐ Safety chain is attached.
- ☐ Decals are intact and legible.
- ☐ All shields are in place and in good condition.
- ☐ Hydraulic hoses are properly routed and secured. Hydraulic connections do not leak.
- ☐ Seed hoses and wiring are properly routed and connected.
- ☐ Meter cartridges are customized to customer's seeding equipment.
- ☐ Correct sprockets have been installed per rear tire size and seeding equipment row spacing.
- ☐ Entire machine has been inspected for loose or missing nuts or bolts.

- ☐ Tires are properly inflated. Wheel hardware torqued correctly.
- ☐ Any parts scratched in shipment have been touched up with paint.
- ☐ Fan is rotating in correct direction.
- ☐ Electrical harness(es) are properly routed and retained. Electrical connections are tight.
- ☐ GREENSTAR™ display monitor is correctly installed in customer's tractor and checked for proper operation.
- ☐ All grease fittings have been lubricated. See Lubrication and Maintenance section.
- ☐ Make sure all customer ordered attachments have been installed.
- ☐ This machine has been thoroughly checked and, to the best of my knowledge, is ready for delivery to the customer.

Date Predelivered: _____

Signature: _____

- ☐ After inspection and signing, remove and/or copy this page. Keep signed checklist in machine file at the dealership.

Delivery

At the time the machine is delivered, the following checklist is a reminder of information which should be conveyed directly to the customer. Check off each item as it is fully explained to customer.

- ☐ Make the customer aware of all safety precautions that must be exercised while using this machine.
- ☐ Give the operator's manual to the customer. Encourage customer to read entire manual.
- ☐ Explain all operating adjustments.
- ☐ Review recommended procedures for attaching cart to and/or detaching from tractor or seeding tool.
- ☐ Make customer aware of safety precautions that must be observed when transporting.
- ☐ When the machine is transported on a road or highway at night or during the day, accessory lights and devices should be used for adequate warning to operators of other vehicles. In this regard, tell customer to check local governmental regulations.

☐ Explain to the customer that the life expectancy of this or any other machine depends on regular lubrication as directed in the operator's manual.

☐ Tell the customer to use the proper tools for service.

☐ Have customer record serial number(s) in the Specification section.

☐ To the best of my knowledge, this machine has been delivered ready for field use and the customer has been fully informed as to proper operation and care.

Signed: _____

Date: _____

☐ After signing, remove and/or copy this page. Keep signed delivery checklist in machine file at the dealership.

AG,OUO6023,931 -19-21JUL00-1/1

Dealer's Record

Owner's Name _____
 Address _____
 City _____
 State _____ Zip _____

Date Sold _____
 Model Number _____
 Serial Number _____

AG,OUO6023,932 -19-21JUL00-1/1

After Sale

The following is a suggested list of items to be checked at a dealer-customer mutually agreeable time during the first operating season.

☐ Check with the customer as to the performance of the machine. Make certain the proper operating adjustments are understood.

☐ If possible, operate the machine to see that it is functioning properly.

☐ Go over entire machine for loose or missing hardware.

☐ Check that safety shields and safety chain are in place. Check for other broken or damaged parts.

☐ Inspect safety signs and other decals; they should be intact, legible and understood.

☐ Ask the customer if the recommended periodic lubrication has been performed.

☐ Review the operator's manual with the customer and stress the importance of safety precautions and proper lubrication.

☐ Acquaint the customer with any special attachment which will help do a better job.

Signed: _____

Date: _____

☐ Remove and/or copy this page after follow-up inspection and signing. Keep signed checklist in machine file at the dealership.

AG,OUO6023,933 -19-21JUL00-1/1

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John Deere Service Keeps You on the Job

John Deere Is At Your Service When
You Need It IBC-1

Safety

Recognize Safety Information

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



AG,OUO1018,298 -19-15APR99-1/1

TS1389 -UN-07DEC88

Understand Signal Words

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.



DX,SIGNAL -19-03MAR93-1/1

TS187 -19-30SEP88

Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.



DX,READ -19-03MAR93-1/1

TS201 -UN-23AUG88

Operate Safely

Do not make field adjustments while machine is in motion.

Do not enter tank unless another person is present and hydraulic hoses are disconnected from tractor.

Operate machine from the tractor seat only.

Keep hands and fingers away from hinge area when positioning auger. Lock auger in storage position before operating in the field.

Clear area around machine before raising or lowering machine or wings.

Stop tractor on level ground when raising or lowering wings.

Do not operate with wings raised.

To improve stability, travel through the field with wings unfolded. Fold wings to transport position just before leaving the field and entering a roadway.

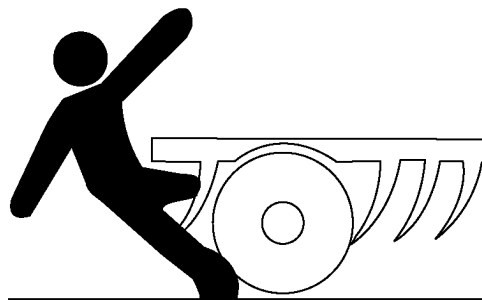
Do not operate close to the edge of a ditch, creek, gully or steep embankment.

Avoid holes, ditches and obstructions which may cause tractor, cart or seeding tool to roll over, especially on hillsides.

Avoid sharp turns on hillsides.

Slow down when turning or traveling over rough ground, and when turning on inclines.

Shut off tractor and shift to "Park" or set brakes when leaving tractor. Remove key when leaving tractor unattended.



A41982 -UN-02SEP97



N39084 -UN-30MAR89

AG,OUO1011,65 -19-16MAR99-1/1

Stay Clear of Air Hoses

Stay clear of hoses when air seeder fan is running. Seed or fertilizer blowing out at high speed can cause eye and other personal injuries.

Never attempt to clear blockage from air hoses or seeding tool boots while fan is running.



TS265 -UN-23AUG88

AG,OUO1011,66 -19-16MAR99-1/1

Use a Signal Person

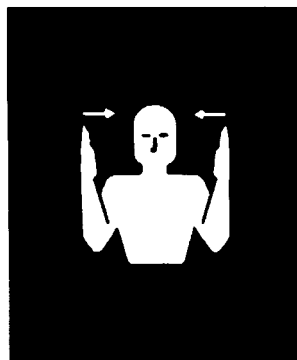
Use a signal person to direct movement of the tractor/seed cart/seeding tool combination whenever the tractor operator's view is obstructed.

Designate one individual as THE signal person. Always have signal person stand in clear view. Be sure signal person stays a safe distance away from the machine when it is moving.

Prior to starting the tractor, discuss hand signals and what each signal means to avoid misunderstandings and confusion which could result in a serious injury or fatal accident for someone.

Keep all bystanders away whenever the machine is moved.

Do not stand between air cart and implement while machines are in motion.



N43964 -UN-11DEC91

AG,OUO1011,67 -19-16MAR99-1/1

Keep Shields in Place

Do not operate commodity cart without safety shields in place.

Rotating parts can crush or dismember, causing death or personal injury.

To avoid serious injury or death from entanglement, do not allow person(s) or clothing to be near auger when it is in motion. Keep auger hopper screen in place.

Shut off tractor and disconnect hydraulic hoses before removing shields for adjustment or service.



TS268 -UN-23AUG88

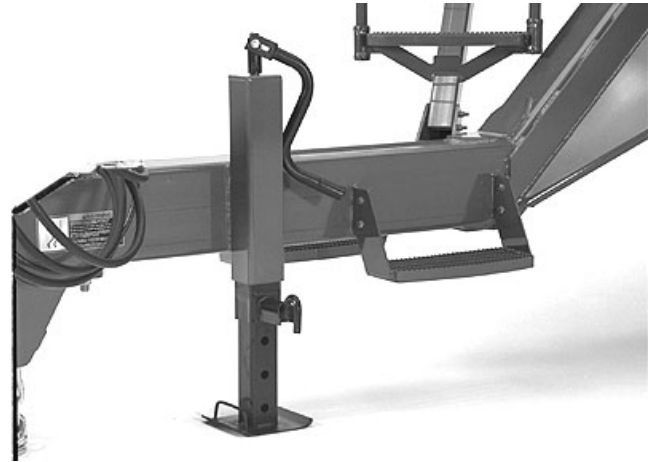


A41870 -UN-24JUL97

HX,1900C,A4A -19-18NOV97-1/1

Park Safely

Park machine on a level surface and block wheels.



Tow-Between

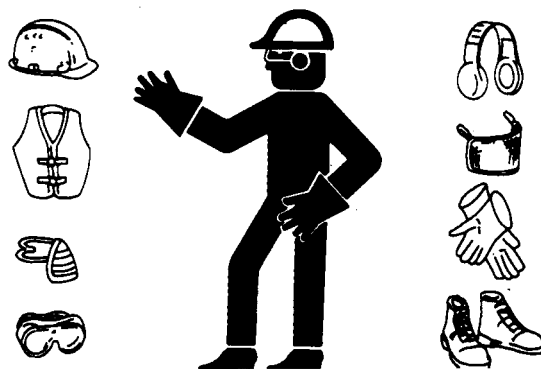
A41845A -UN-22APR98

HX,1900C,A5A -19-23APR98-1/1

Wear Protective Clothing

Wear close fitting clothing and safety equipment appropriate to the job.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



TS206 -JUN-23AUG88

DX,WEAR2 -19-03MAR93-1/1

Handle Pesticides and Fertilizers Carefully

Chemicals may cause eye, skin or breathing problems. Wear face mask, gloves and goggles.

Keep dust away from skin and hair.

Keep containers low when pouring.

Let the wind blow fumes AWAY from you when mixing with seed or when filling tank.

Wear a filtered respirator if you cannot avoid dust.

Wear goggles to protect your eyes.

Wash exposed skin areas frequently—do not leave pesticide on your skin.

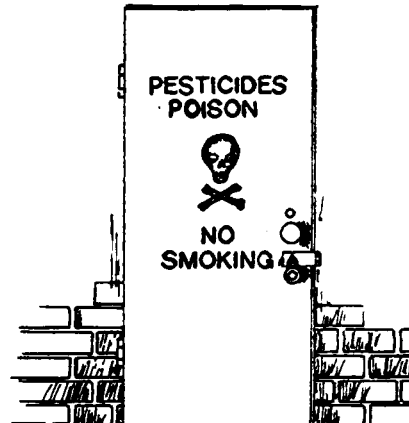
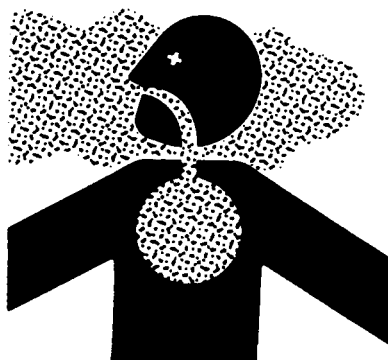
Do not smoke while handling pesticides.

Properly dispose of pesticide container, unused pesticide and left over treated seed and fertilizer.

Read and observe manufacturers recommendations.

Store pesticides in a separate, plainly marked LOCKED building.

Store pesticides in original containers with labels intact.



TS220 -JUN-23AUG88

N35988 -JUN-04OCT88

N33983 -19-31JAN89

HX,1900C,A6 -19-18AUG97-1/1

Use Handholds and Steps

Falling is a major cause of personal injury.

When you get on and off machine, always maintain a three-point contact with steps and handrails and face the machine. Do not use any controls as handholds.

Never jump on or off the machine. Never mount or dismount a moving machine.

Be careful of slippery conditions on platforms, steps and handrails when leaving the machine.

DO NOT ride on machine. DO NOT stand on tank.



TS249 -UN-23AUG88

HX,1900C,A7 -19-18AUG97-1/1

Keep Riders Off Machines

Keep riders off.

Riders are subject to injury, such as being struck by foreign objects and being thrown off the machine. Riders also obstruct the operator's view, resulting in the machine being operated in an unsafe manner.



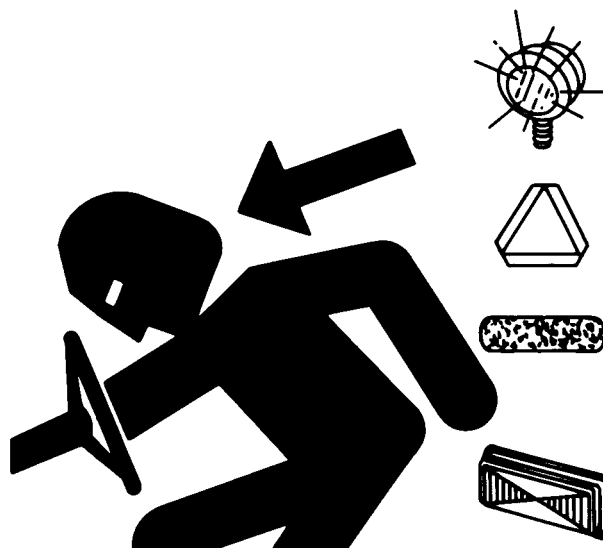
N40002 -UN-28SEP88

AG,OUO1011,68 -19-16MAR99-1/1

Use Safety Lights and Devices

Prevent collisions between other road users, slow-moving tractors with attachments or towed equipment, and self-propelled machines on public roads. Frequently check for traffic from the rear, especially in turns, and use turn signal lights.

Use headlights, flashing warning lights, and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and marking visible and in good working order. Replace or repair lighting and marking that has been damaged or lost. An implement safety lighting kit is available from your John Deere dealer.



TS951 -UN-12APR90

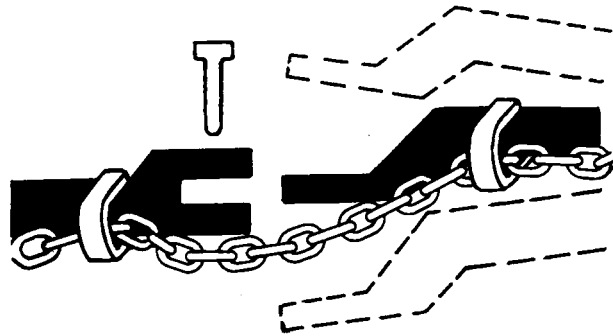
HX,1900C,A17 -19-21SEP98-1/1

Use a Safety Chain

A safety chain will help control drawn equipment should it accidentally separate from the drawbar.

Using the appropriate adapter parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning.

See your John Deere dealer for a chain with a strength rating equal to or greater than the gross weight of the towed machine. Do not use safety chain for towing.



TS217 -UN-23AUG88

DX,CHAIN -19-03MAR93-1/1

Transport Safely

Keep away from overhead power lines. Serious injury or death may result. Proceed cautiously under overhead power lines and around utility poles. Know the transport height of your machine. Do not position auger when near electric lines.

Electrocution CAN occur WITHOUT direct contact with overhead electrical lines.

Always fold wings fully for road transport. If wing-fold cylinders are removed, chain wings together to prevent accidental lowering.

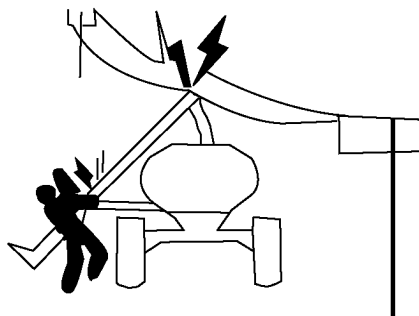
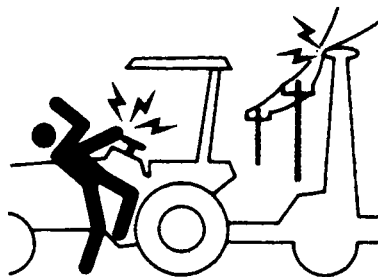
To improve stability when traveling through the field, wings should be unfolded from transport position as soon as possible after leaving the roadway.

Do not transport with an underweight tractor. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT**.

Prevent collisions between motorists and slow-moving equipment on public roads. Frequently check for traffic from the rear, especially in turns, and use the turn signals.

Always use the flashing warning lights, day and night, when transporting on a public roadway. Keep reflective material and the SMV emblem clean and visible.

Install transport lockups on depth-control cylinders or close transport lock-up valve.



N39394 -UN-06OCT88

A41983 -UN-02SEP97

Continued on next page

HX,1900C,A9A -19-21SEP98-1/2

Always travel at a reasonable and safe speed. Never exceed 32 km/h (20 mph).

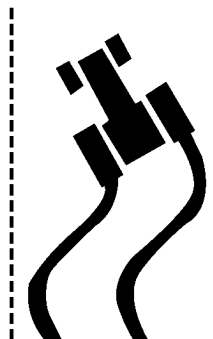
Never transport with any tank more than half full.

Never transport with fan running.

Keep hands and fingers away from hinge area when positioning auger. Always lock auger in storage position.

Never transport with meter drive clutches engaged.

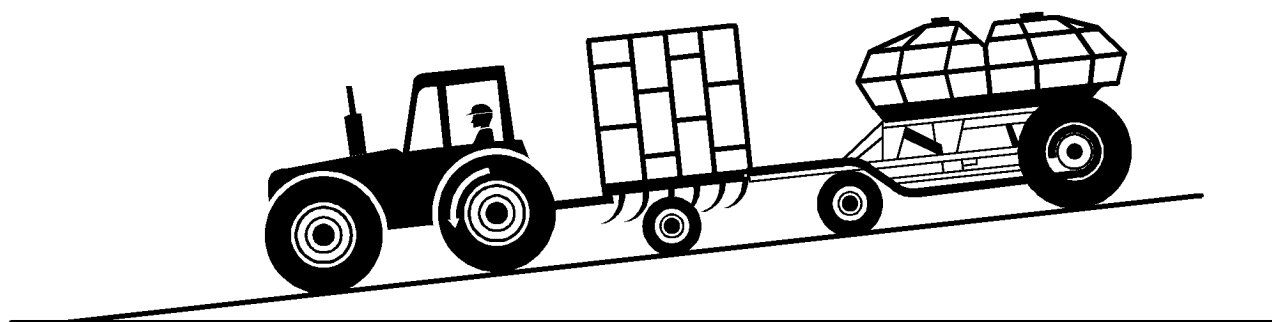
Shift the tractor into a lower gear when transporting down steep slopes or hills. Latch the tractor brakes together. Stop slowly.



A41981 -UN-02SEP97

HX,1900C,A9A -19-21SEP98-2/2

Transport Safely (Continued)



Tow-Behind Shown

Avoid loss of control due to decreased braking ability when transporting down sloped roadways, wet or muddy roadways or roadways with loose gravel or sand.

Avoid steep slopes. Some slopes may exceed tractor braking capability.

Transport only with a properly sized tractor. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT**.

Before transporting down a hill, shift tractor to a lower gear and travel at a reduced speed. Reducing speed maximizes the tractor braking capability.

Use engine braking to reduce speed.

Avoid sharp turns or rapid steering corrections on slopes.

A42888 -UN-18SEP98

AG,OUC1018,312 -19-19APR99-1/1

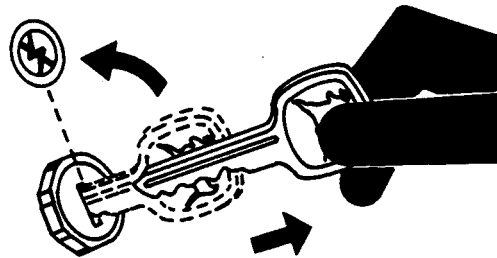
Service Machine Safely

To help prevent personal injury caused by unexpected movement, be sure to service machine on level surface.

Lower seeding tool to ground or securely lock or block raised tool before servicing. See seeding tool operator's manual.

If machine is connected to tractor, engage parking brake and/or place transmission in "PARK", shut off engine and remove key.

If machine is detached from tractor, block wheels and use shop stands to prevent movement.



TS230 -JUN-24MAY89

HX,1900C,A10A -19-21SEP98-1/1

Practice Safe Maintenance

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Disconnect wiring harnesses and cables from tractor plugs before making adjustments on electrical system components or welding on machine.

When welding near an electronic component, such as a monitor controller, unplug all connectors and remove controller from machine to prevent damage to the microprocessors inside.

High voltage electricity from welder can be conducted through the drawbar and damage electronic devices on attached machines. To protect controllers on attached equipment, disconnect equipment from drawbars and hitches before welding.



TS218 -UN-23AUG88

HX,1900C,A18 -19-21SEP98-1/1

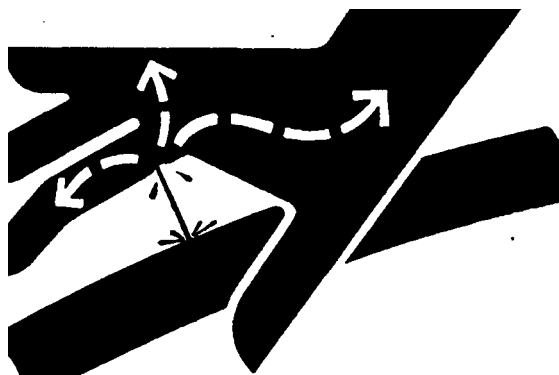
Avoid High-Pressure Fluids

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9811 -UN-23AUG88

DX,FLUID -19-03MAR93-1/1

Service Tires Safely

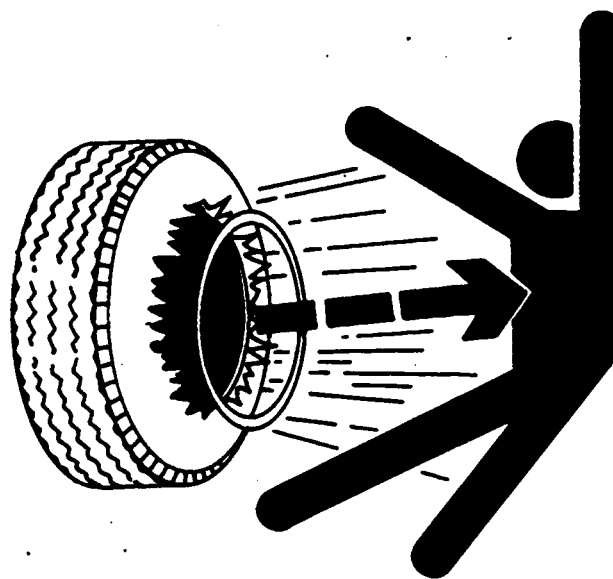
Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.



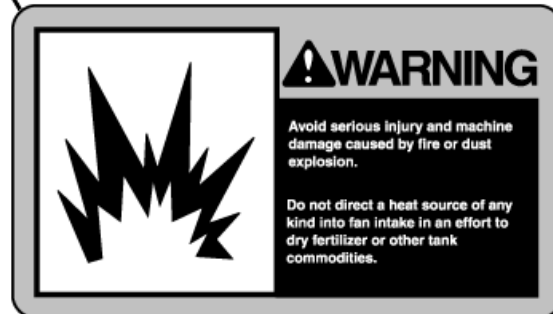
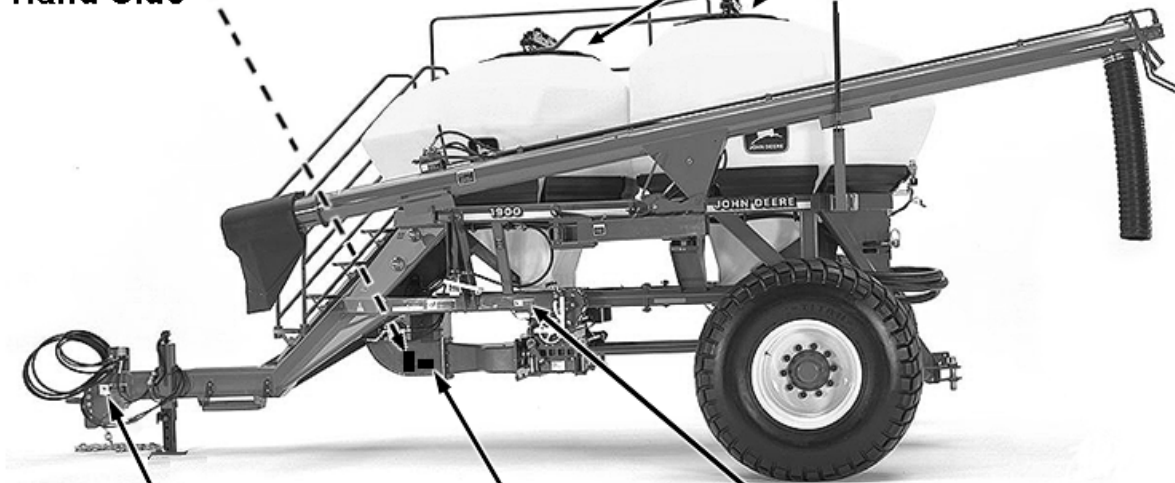
TS211 -UN-23AUG88

DX,RIM -19-24AUG90-1/1

Safety Signs



Fan Housing
Right-Hand Side



A47389 -19-07MAY01

HX,1900C,A11A -19-23APR98-1/1

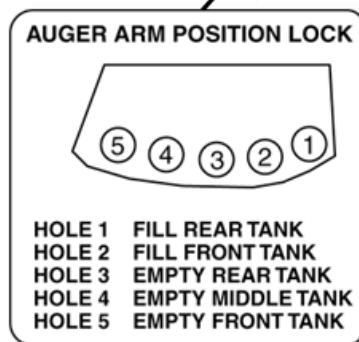
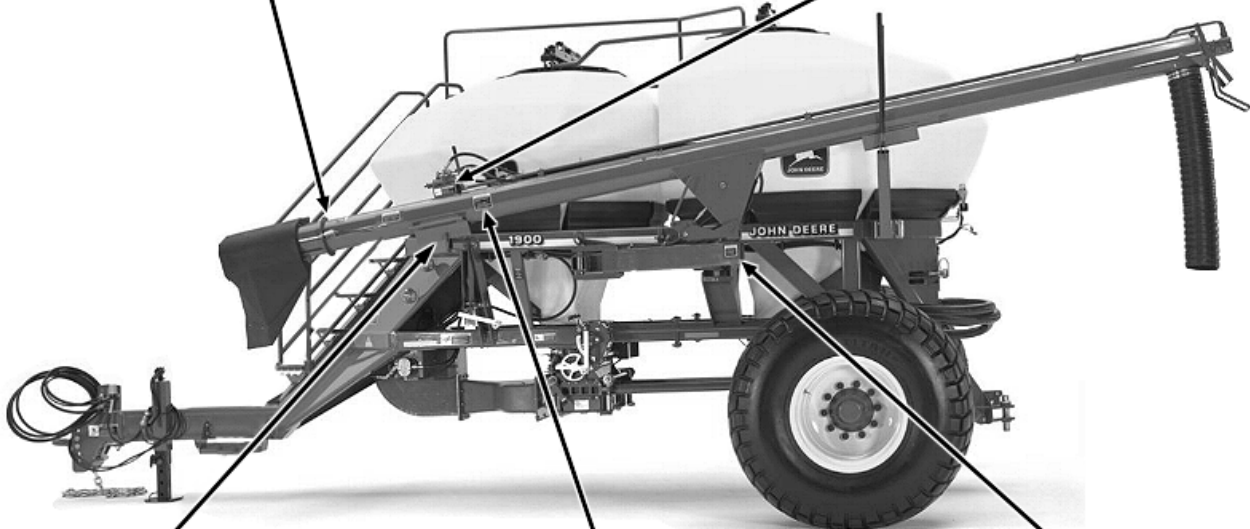
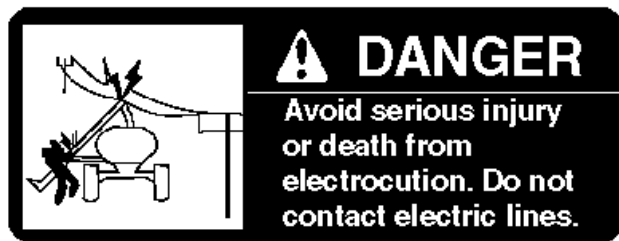
Safety Signs



A47390 -19-07MAY01

HX,1900C,A12A -19-23APR98-1/1


Safety Signs—Auger (If Equipped)



A47391 -19-07MAY01

HX,1900C,A13B -19-21SEP98-1/1

Safety Sign—Tow-Behind Cart With Yard Hitch (If Equipped)



⚠ WARNING

Avoid serious injury or death resulting from loss of control during transport or braking.

Do not transport with tanks more than 1/2 full.

Do not transport at speeds exceeding 32 kph (20 mph).

Transport only with a properly ballasted tractor.

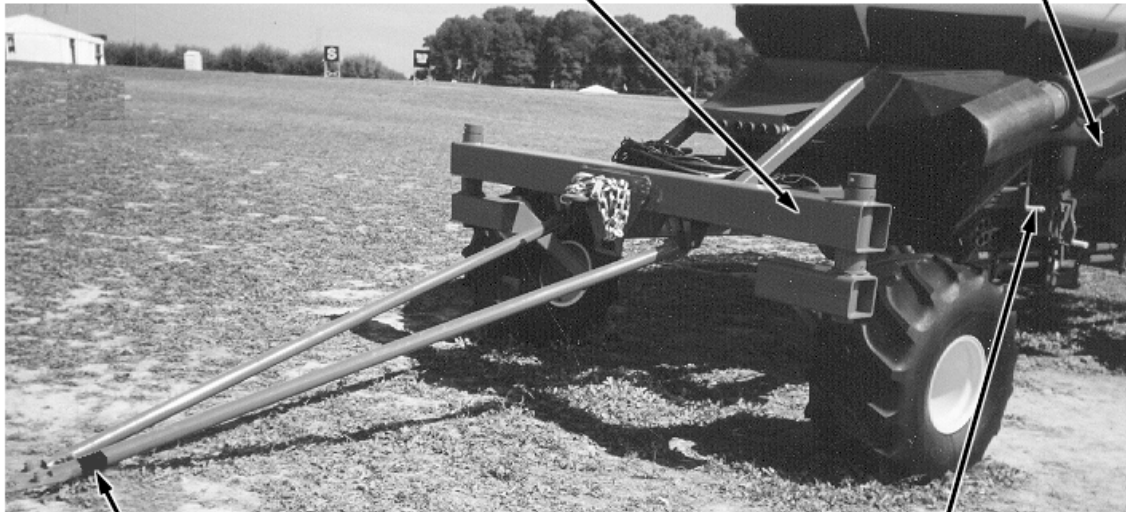
See "Calculating Minimum Tractor Weight for Safe Transport" in Operator's Manual.


Inflate cast tires to recommended pressures. See "Tire Inflation Pressures" in Operator's Manual.

Use additional caution when towing under adverse surface conditions, when turning and when on inclines.

⚠ CAUTION

1. Keep all shields in place
2. Disengage and shut off all engine and/or motor power before servicing or unclogging machine.
3. Keep hands, feet and clothing away from power-driven parts.





⚠ WARNING

Avoid serious injury or death resulting from loss of control while transporting with this yard hitch:

Do not transport on public roads using yard hitch.


Do not transport with any material in tanks.

Do not transport at speeds exceeding 32 kph (20 mph).

Do not transport with implement attached behind cart.

Do not exceed 13,000 lb. maximum pull.

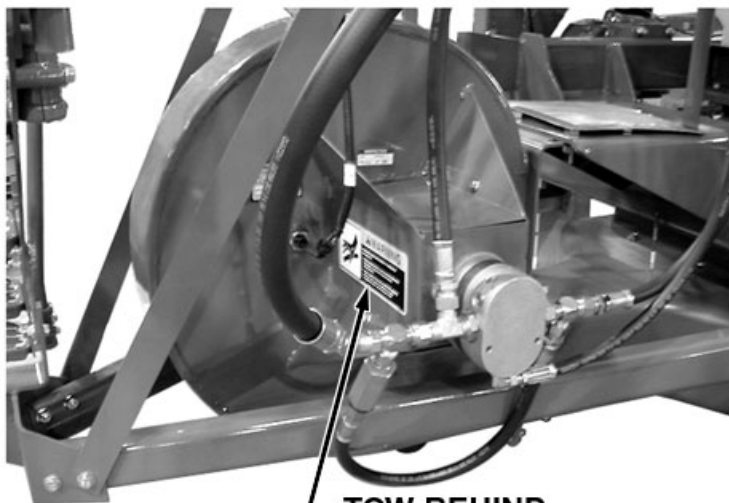
Attach safety chain (minimum 13,000 lb. rating) between tractor and yard hitch.



⚠ DANGER

To avoid injury or death do not contact electric lines

A47394 -19-08MAY01



TOW-BEHIND



⚠ WARNING

Avoid bodily injuries from injection of hydraulic oil under pressure.

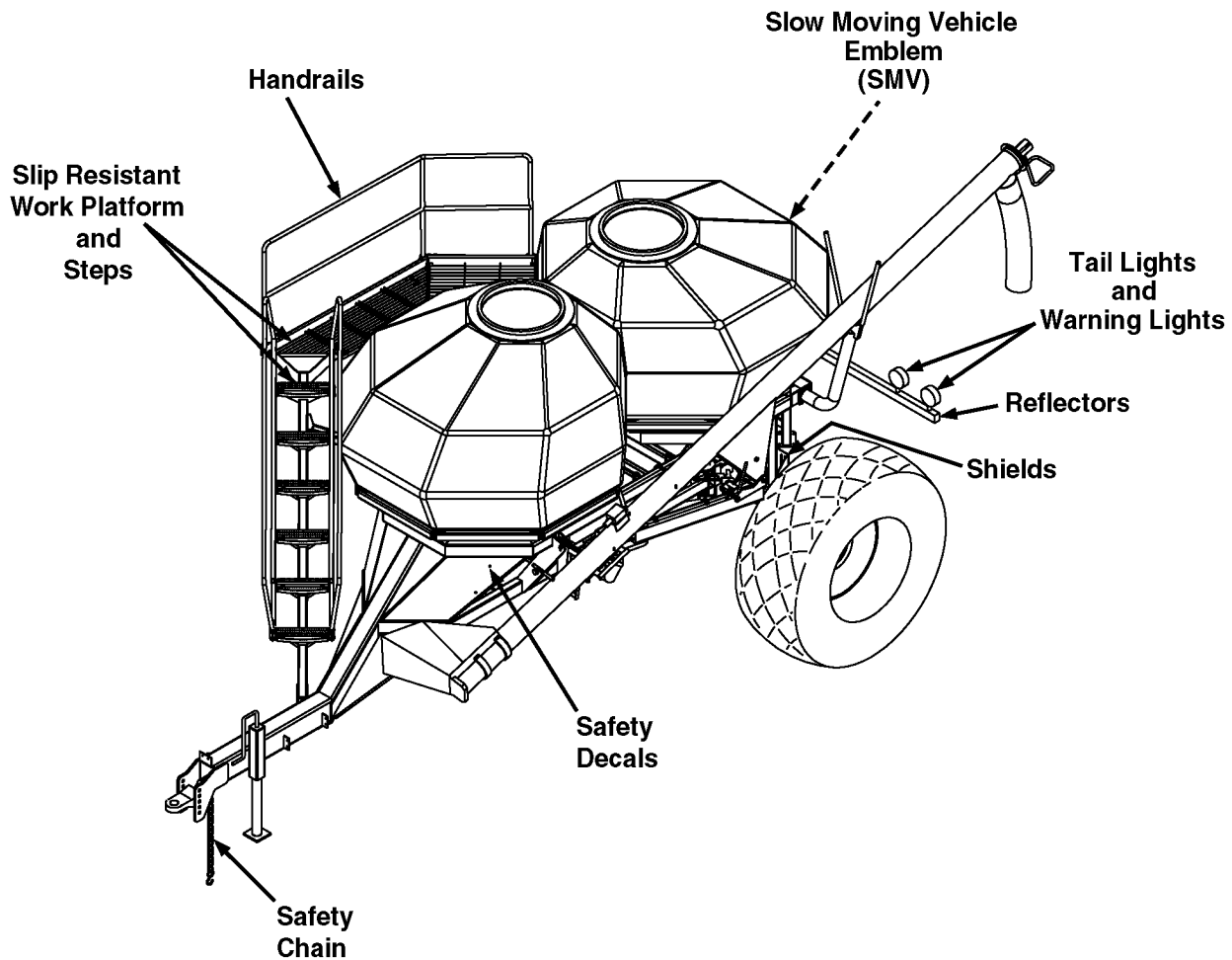
1. Relieve pressure before removing hoses and valves. Stop engine. Hold tractor hydraulic levers in float position.
2. Check/Tighten all connections BEFORE applying pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

HX,1900C,A16 -19-21SEP98-2/2

A47393 -19-07MAY01

Safety Features—1900 Commodity Air Cart

1900 Commodity Air Cart (Tow-Between Shown)



In addition to the safety features shown here, safety messages and instructions in the Operator's Manual contribute to the safe operation of the 1900 Commodity Air Cart when combined with the care and concern of a capable operator.

A41847 -19-02SEP97

HX,1900C,A15 -19-15DEC97-1/1

Keep Riders Off Machine

CAUTION: Only allow the operator on the machine. Keep riders off. Riders are subject to serious injury or death, such as being struck by foreign objects and being thrown off the machine. Riders also obstruct the operator's view, resulting in the machine being operated in an unsafe manner.



N40002 -UN-28SEP88

HX,1900J,A1 -19-18AUG97-1/1

Stay Clear of Air Hoses

CAUTION: Stay clear of hoses when air seeder fan is running. Seed or fertilizer blowing out at high speed can cause eye and other personal injuries.

Never attempt to clear blockage from air hoses or seeding tool boots while fan is running.



TS265 -UN-23AUG88

AG,OUO1018,214 -19-13APR99-1/1

Keep Shields In Place

CAUTION: Do not operate air seeder without safety shields in place.

Rotating parts can crush or dismember, causing death or personal injury.

Shut off tractor and disconnect hydraulic hoses before removing shields for adjustment or service.



TS268 -UN-23AUG88

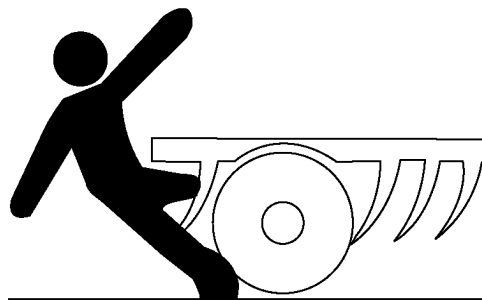
AG,OUO1018,215 -19-13APR99-1/1

Follow Safe Operating Procedures



CAUTION: To help prevent severe injury or death to you or someone else:

- Do not make field adjustments while machine is in motion.
- Do not enter tank unless another person is present and hydraulic hoses are disconnected from tractor.
- Operate machine from the tractor seat only.
- Keep all persons away from machine when raising and lowering wings.
- To improve stability, travel through the field with wings unfolded. Fold wings to transport position just before leaving the field and entering a roadway.
- Follow all recommended operating procedures.
- Always locate machine on level ground when raising and lowering wings.
- Never raise or lower wings when moving.
- Do not operate with wings raised.
- Do not operate close to the edge of a ditch, creek, gully or steep embankment.
- Avoid holes, ditches, and obstructions which may cause tractor, cart or seeding tool to roll over, especially on hillsides.
- Avoid sharp turns on hillsides.
- Slow down when turning or traveling over rough ground.
- Shut off tractor and shift to “Park” or set brakes when leaving tractor. Remove key when leaving tractor unattended.



A41982 -UN-02SEP97

AG,OUO1018,216 -19-13APR99-1/1

General Information

Look For Supplemental Information

Occasionally new or revised information will become available after manuals are printed. To get this up-to-date information into your hands, publication supplements are prepared and supplied to the field in the machine literature package.

Supplements can be supplied in the following forms and are usually identified with one of these titles:

- Direction(s) Sheet
- Installation Instructions
- Publications Supplement

Before your initial review of the Operator's Manual, look through the machine literature package to see if any supplemental information has been provided. If supplied, review this information to determine which operating procedures are impacted or modified by the revised instructions. Pay close attention to "CAUTION" and "IMPORTANT" statements as they address your safety, the safety of others, and safe operation of the machine.

When Operator's Manuals are revised, the supplemental information is incorporated directly into the manual, thereby eliminating the supplement.

OOU6038,0000035 -19-07SEP00-1/1

Use Your Tractor and Seeding Tool Operator's Manuals

Always refer to YOUR tractor and seeding tool equipment operator's manuals for specific, detailed information regarding equipment operation. Operation and adjustment procedures will vary by equipment.



TS190 -UN-17JAN89

AG,OOU6023,964 -19-21JUL00-1/1

Air Cart/Seeding Terms and Definitions

Single-Shoot—Describes air stream configuration, not number of products. Single-shoot is used when one common product is being carried and delivered from both the front and rear tanks, OR when two compatible products are being mixed in the air stream and delivered to a single furrow.

Double-Shoot—Describes independent air streams where two incompatible products cannot be mixed in a common (single-shoot) air stream and must be delivered to the soil separately (seeding and fertilizing in a single pass).

Air Damper (Double-Shoot Plenum)—Adjustable device used to divide and balance air flow between top and bottom runs.

Primary Manifold (Mixing Chamber)—Device where moving air stream(s) picks-up metered product.

Agitator Shaft—Rocking shaft above meter that keeps product free flowing.

Meter Cartridge—Product handling device that takes product from tank to primary manifold.

Half-Width Disconnect—Blocking device that shuts down product flow from tank for seeding point rows, emptying tank or removing meter cartridge.

Meter Segment—Fluted part of meter cartridge that handles product.

Fine Tuning Rings—Reduces product delivery to primary manifold.

GREENSTAR™ Display—Cab-mounted console and input device.

Electronic Controller—Cart mounted device containing display and setting storage software and microprocessor.

Sensor—Activity signal devices.

Clutch (Main Drive or Independent Meter)—Device used to control product delivery.

Remote Switch—Seeding tool mounted device that turns main drive clutch off and on.

Application Rate—Amount of product delivered to the seedbed.

Auger—Product handling device used to fill and empty tanks.

Auger Flighting—Rotating inner member that moves product.

NOTE: *Refer to CONFIGURATION IDENTIFICATION in this section for definitions of Tow-Between and Tow-Behind.*

GREENSTAR is a trademark of Deere & Company.

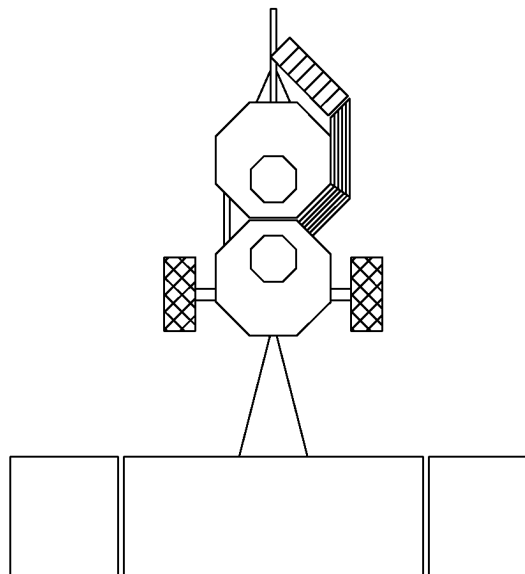
AG,OUO6023,965 -19-21JUL00-1/1

Configuration Identification

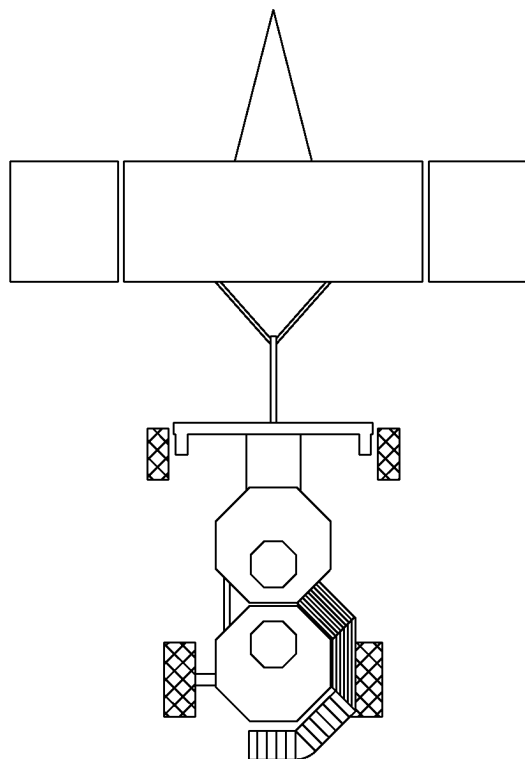
Tow-Between or Tow-Behind configuration refers to the seed carts position relative to the tractor and seeding equipment.

In tow-between configuration, seed cart is attached between the tractor and seeding equipment. Product is discharged from the rear of the seed cart in tow-between configuration.

In tow-behind configuration, seed cart is attached behind the seeding equipment. Product discharges from the front of the seed cart in tow-behind configuration.



Tow-Between Configuration



Tow-Behind Configuration

A41571 –UN-24JUL97

A41572 –UN-24JUL97

AG,OUO6023,966 –19-21JUL00-1/1

Preparing the Tractor—General

Use Your Tractor Operator's Manual

Always refer to YOUR tractor operator's manual for specific detailed information regarding operation of YOUR equipment.

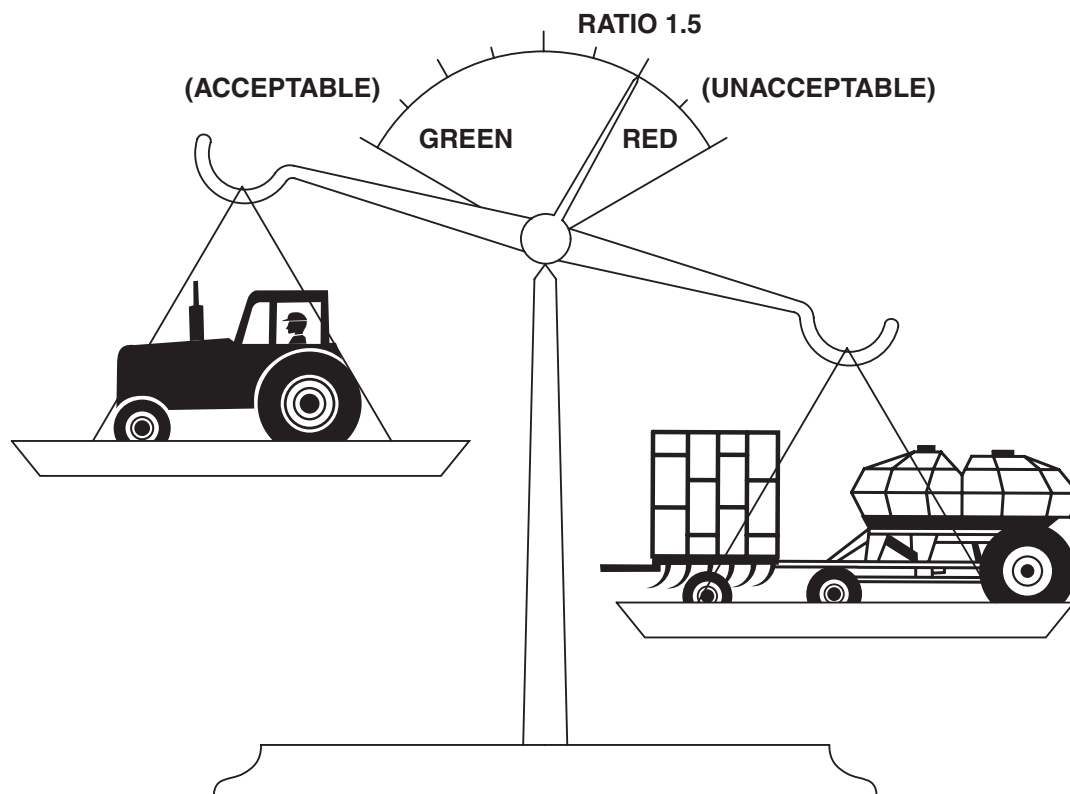
Following tractor related information uses John Deere tractors to illustrate preparation, attachment and operational procedures needed for 1900 Air Cart and seeding. Use your tractor operator's manual for detailed information, as procedures will vary by equipment.



TS190 -JUN-17JAN89

AG,OUO6023,967 -19-21JUL00-1/1

Calculating Minimum Tractor Weight for Safe Transport



A46942 -19-05DEC00

EXAMPLE WITH CART HALF-FULL

1900 CART			SEEDING TOOL		
Model	Middle Tank	Weight Half-Full kg (lb)	Model	Width m (ft)	Weight kg (lb)
270 TBH	No	8795 (19,390)	1810	17 (57)	11,113 (24,500)

CAUTION: Towing with an underweight tractor can result in loss of control during transport or braking, resulting in serious injury or death.

Transporting at speeds greater than 32 km/h (20 mph) can result in loss of control and serious injury or death.

Add weight of cart model half full with fertilizer to weight of seeding tool model. Refer to MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT—CHART in this section for cart and tool weights, and calculation example above. Divide total weight of cart

half full with fertilizer and tool by 1.5 to determine minimum tractor weight for safe transport. If an implement is attached to the rear of a tow-behind cart, add the implement's weight to the total weight of the cart and seeding tool before dividing by 1.5.

TOTAL COMBINED WEIGHT 19,608 kg (43,890 lb).

DIVIDE BY 1.5 TO FIND MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT 13,072 kg (29,260 lb).

Refer to Tractor operator's manual to determine tractor weight.

Continued on next page

AG,OUO6023,968 -19-21JUL00-1/2



CAUTION: Use of a tractor ballasted to less than the minimum tractor weight can result in loss of control and serious injury or death.

If an implement is attached to the rear of a tow-behind cart, add the implement's weight to the total weight of the cart and seeding tool before dividing by 1.5.

AG,OUO6023,968 –19–21JUL00–2/2

Calculating Minimum Tractor Weight For Safe Transport—Chart

1900 CART				SEEDING TOOL				
Model	Middle Tank	Weight Empty (kg)	Weight Empty (lb)	Model	Width (m)	Width (ft)	Weight (kg)	Weight (lb)
195 TBT	No	3289	7250	730	8.5	28	4944	10,900
250 TBT	Yes	3629	8000	730	11.0	36	6305	13,900
				730	13.4	44	7711	17,000
270 TBT	No	3742	8250					
				735	9.4	31	5625	12,400
195 TBH	No	3629	8000	735	11.0	36	6532	14,400
250 TBH	Yes	3969	8750	735	12.5	41	7893	17,400
270 TBH	No	4082	9000	737	9.4	31	7031	15,500
340 TBH	Yes	4423	9750	737	11.0	36	7938	17,500
				737	12.5	41	9208	20,300
350 TBH	No	4536	10,000					
430 TBH	Yes	4876	10,750	1810	15.8	52	10,750	23,700
				1810	17.4	57	11,113	24,500
				1810	18.3	60	11,294	24,900

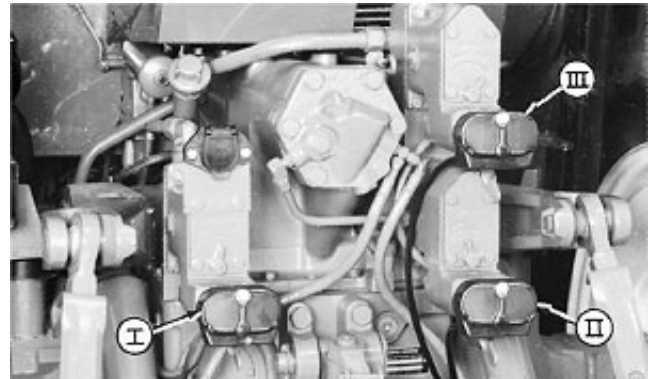
Model	Middle Tank	Half-Full With Fertilizer (kg)	Half-Full With Fertilizer (lb)	Model	Width (m)	Width (ft)	Weight (kg)	Weight (lb)
195 TBT	No	6690	14,750					
250 TBT	Yes	7992	17,620	1820	8.8	29	7666	16,900
				1820	10.7	35	8754	19,300
270 TBT	No	8455	18,640	1820	12.5	41	9888	21,800
				1820	13.7	45	12,338	27,200
195 TBH	No	7031	15,500	1820	16.2	53	13,426	29,600
250 TBH	Yes	8332	18,370	1820	18.6	61	14,651	32,300
270 TBH	No	8795	19,390	1850/1860	9.1	30	7711	17,000
340 TBH	Yes	10,360	22,840	1850/1860	11.0	36	9299	20,500
				1860	12.2	40	10,197	22,480
				1850/1860	12.8	42	10,659	23,500
350 TBH	No	10,641	23,460					
430 TBH	Yes	12,379	27,290					

TBT — Tow-Between Configuration

TBH — Tow-Behind Configuration

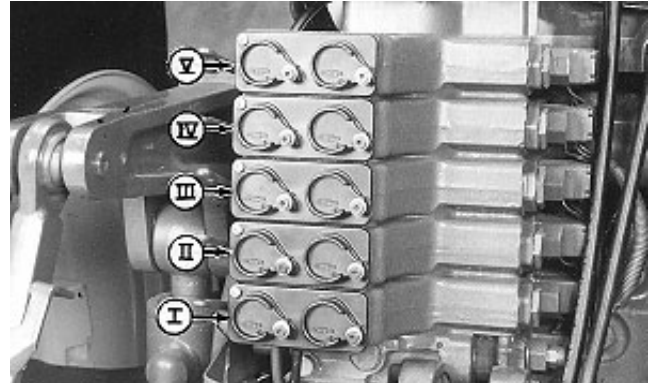
Determining Tractor Requirements

1. See TRACTOR HYDRAULIC SYSTEM REQUIREMENTS in Specifications section.
2. Install adapters if tractor does not have ISO hydraulic couplers. See your John Deere dealer.



RW5586 –UN-07DEC88

With Mechanical SCV Controls



N48100 –UN-01JUN94

With Electro/Hyd SCV Controls

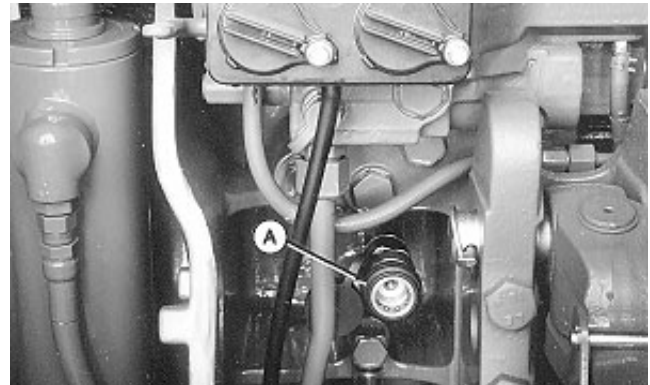
AG,OUO6023,970 –19-21JUL00-1/3

IMPORTANT: Drain port back-pressure must be less than 689 kPa (6.89 bar) (100 psi) or fan motor seal will be damaged.

NOTE: If your John Deere tractor is not equipped with a low-pressure drain connection, order installation kit from your John Deere dealer. See **LOW-PRESSURE DRAIN CONNECTION** in this section for kit listing.

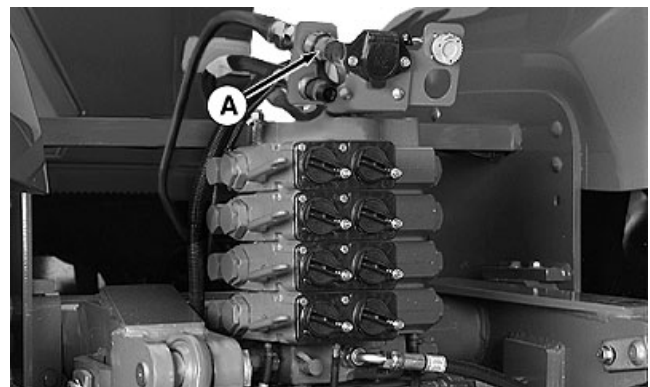
3. Tractor **MUST** be equipped with a low-pressure drain port (A) for connection of fan motor case drain. When operating with a John Deere 735 or 1810 Seeding Tool, a second low-pressure drain port is needed for connection of depth control relief circuit. Instead of a low-pressure drain, depth control bleed-off hose can be attached to an open SCV, if one is available. This SCV will need to be placed in “FLOAT” position when operating.

A—Low-Pressure Drain Port



RW55342 –UN-21JUL94

8000 Series Tractor



A42741 –UN-28JUL98

9000 Series Tractor

Continued on next page

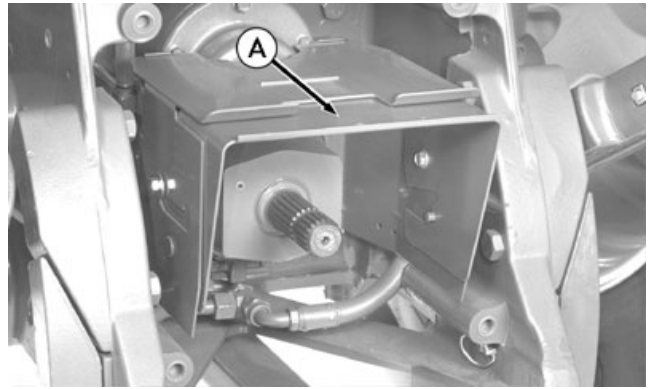
AG,OUO6023,970 –19-21JUL00-2/3



CAUTION: Make sure tractor master shield (A) is in place at all times, to prevent entanglement with rotating PTO shaft. Coming in contact with a rotating PTO shaft can cause severe injury or death.

4. Consult tractor operator's manual for specific adjustment procedures, tire inflation, wheel spacing, and ballast requirements.

A—Tractor Master Shield



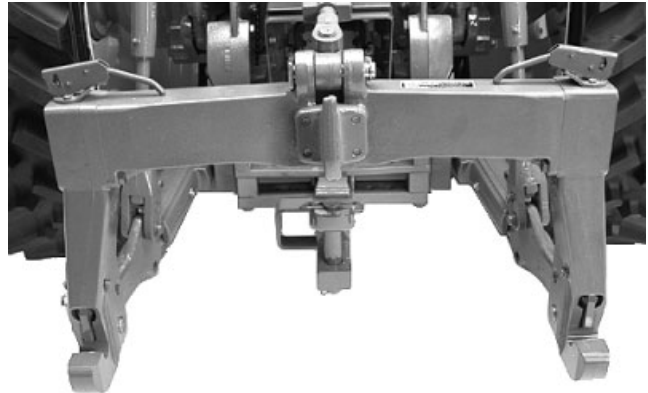
RW55317 -UN-28JUN94

AG,OUO6023,970 -19-21JUL00-3/3

Raise and Lock 3-Point Hitch

To avoid contact with seed cart or seeding tool hitch and hoses when turning, raise 3-point hitch to highest position and lock in place.

If not equipped with quick-coupler, secure lift links and center link so they do not swing into tractor tires or onto hoses.



RW56325 -UN-24FEB97

Hitch with Quick-Coupler

AG,OUO6023,971 -19-21JUL00-1/1

Positioning Drawbar

CAUTION: When transporting machine, avoid personal injury or death due to losing steering control of machine. Always pin drawbar in center position for ALL tractors.

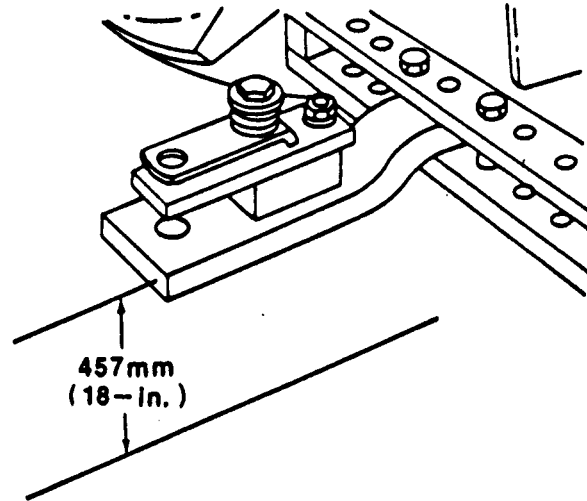
1. Set drawbar at short length, fixed centered position, as close as possible to 457 mm (18 in.) from ground to top of drawbar.
2. Be sure clevis assembly (if equipped) is installed on top of drawbar.

NOTE: For four-wheel drive tractors, leave one hole clearance on each side of drawbar for field operation only.

3. Tighten clevis assembly bolts to specification.

Specification

Clevis Assembly Bolts—Torque 407 N•m
(300 lb-ft)

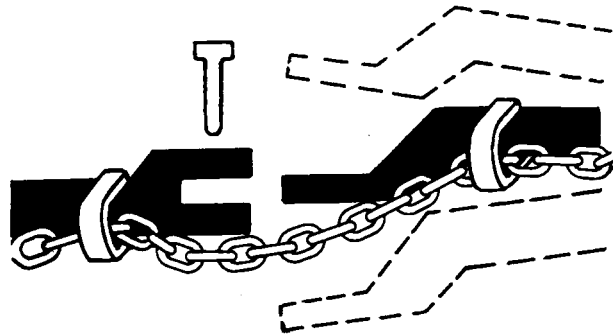


N42074N -JUN-25SEP90

AG,OUO6023,972 -19-21JUL00-1/1

Use a Safety Chain

Use of a safety chain is recommended to secure the hitch to tractor. All tractors must be equipped with an intermediate chain support ahead of the hitch pin. If tractor is not so equipped, see your John Deere dealer.



TS217 -JUN-23AUG88

AG,OUO6023,973 -19-21JUL00-1/1

Low-Pressure Drain Connection

IMPORTANT: To avoid damage to fan motor, tractor must be equipped with a low-pressure drain connection (LESS THAN 689 kPa [6.89 bar] [100 psi]), compatible with Case Drain Connection Kits. See Case Drain Connection Kits table.

IMPORTANT: Only the connection kits listed in the Case Drain Connection Kits table can be used on John Deere tractors. If low-pressure drain connection kit is already installed, ensure it matches what is listed on table.

Order one of the following kits when a John Deere tractor is used, or see tractor manufacturers dealer for a suitable connection kit.

Case Drain Connection Kits	
Tractor Model	Kit Number
30—60 Series Row Crop	BA27604
30—50 Series 4WD	BA27604
60 and 70 Series 4WD	BA27601
8000 Series	AR114664
9000 Series	RE164984

NOTE: John Deere Connection Kits include Installation Instructions.



Connection Kit BA27058 Shown

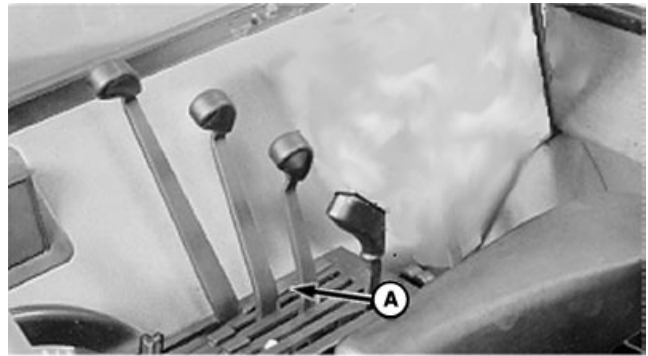
A—Connection Kit BA27058

Selective-Control-Valve Lever Stop- 30—60 Series Tractor

IMPORTANT: Damage to fan motor may occur if operated without lever stop (A).

To install selective-control-valve lever stop (A), proceed as follows:

A—Lever Stop

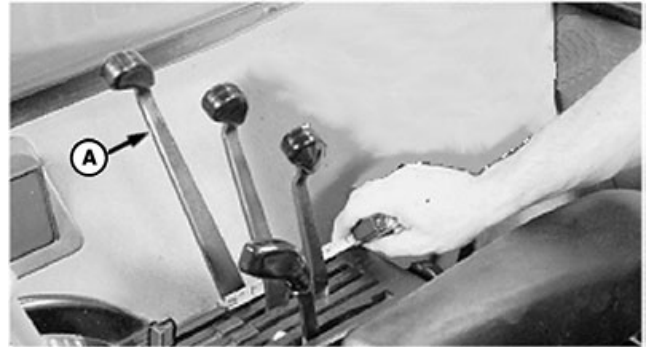


A46439 -UN-19JUL00

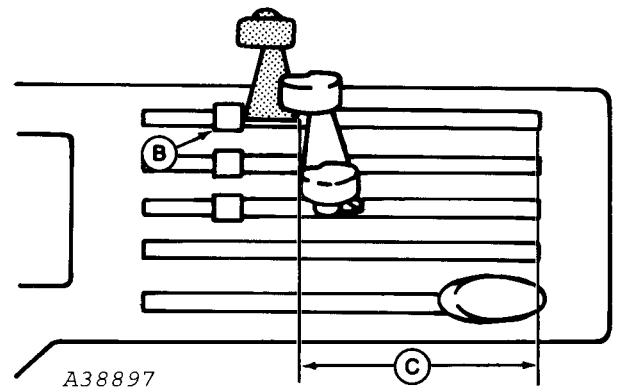
AG,OUO6023,975 -19-21JUL00-1/3

1. Push SCV lever (A) forward against float stop (B).
2. Measure dimension (C).
3. Cut rubber strip to dimension (C).

A—SCV Lever
B—Float Stop
C—Dimension



A46440 -UN-19JUL00



A38897

A38897 -UN-26JAN96

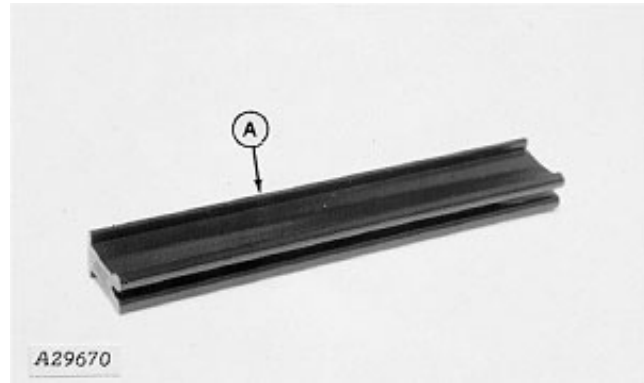
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AG,OUO6023,975 -19-21JUL00-2/3

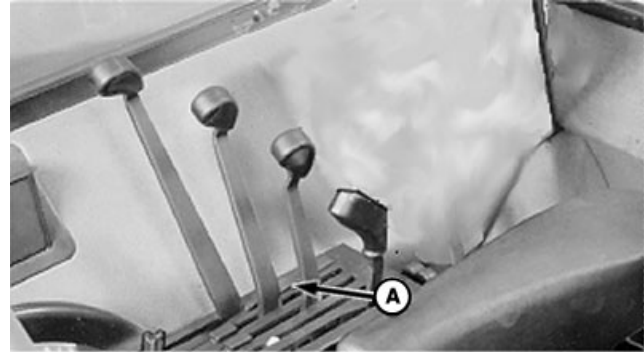
4. Insert rubber stop (A) in slot with “V” groove side down behind selective control lever.
5. If rubber strip is not correct length, the SCV could have a high-pressure leak to return.
6. Check by moving lever from FLOAT to running position with fan motor DISCONNECTED from tractor. Tractor hydraulic system should not make any noise when lever is in run position.

If hydraulic pump activates, tractor valve linkage is mis-adjusted.

A—Rubber Stop



A29670 —UN-14OCT88



A46439 —UN-19JUL00

AG,OUO6023,975 —19-21JUL00-3/3

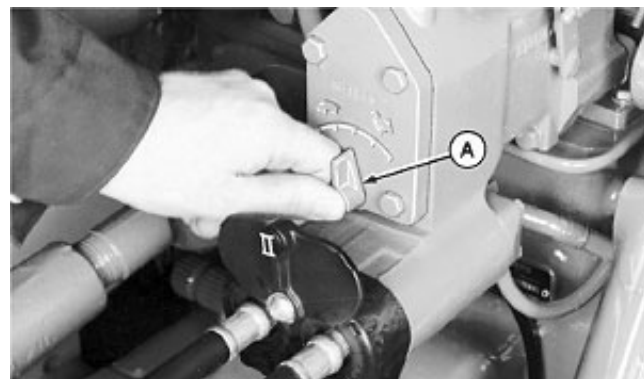
Preparing Hydraulic System—Tractors With Mechanical SCV Controls

1. Check hydraulic oil level. Fill, if necessary.

AG,OUO6023,976 —19-21JUL00-1/2

NOTE: Tractor hydraulic oil flow must be between 53-76 L/min (14-20 gpm) for proper operation of the machine.

2. Turn No. 1 and No. 2 metering valves (A) to fast operation for depth control and wing fold.
3. Metering valve No. 3, No. 4 or No. 5 will be used for air cart fan speed control. Refer to SETTING FAN SPEED in Operating the Machine - Monitor Operation section.
4. Install forward lever lock clip on No. 3, No. 4 or No. 5 tractor control lever for fan ON/OFF control. Installation Instructions are provided in Lever Lock Bundle.



RW5685 —UN-07DEC88

A—Metering Valves

AG,OUO6023,976 —19-21JUL00-2/2

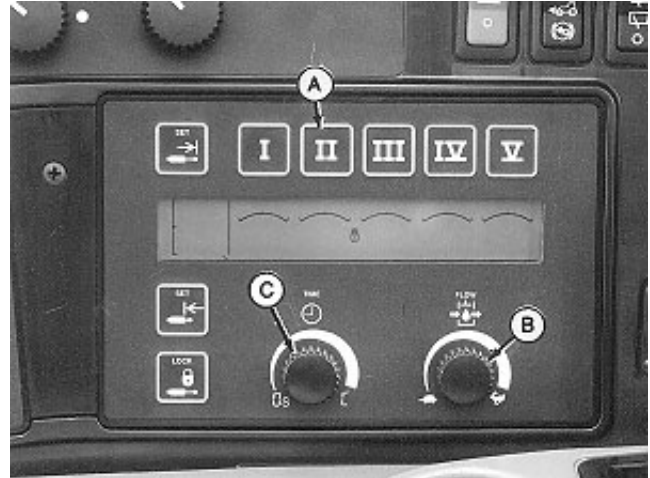
Preparing Hydraulic System—8000 and 9000 Series Tractors

1. Check hydraulic oil level. Fill if necessary.

AG,OUO6023,977 -19-21JUL00-1/3

2. WING FOLD/UNFOLD: Press SCV II selector button (A) and turn flow control knob (B) to fast (rabbit) position.
3. Turn time detent knob (C) until display reads “19” seconds. If this is not enough time to completely fold/unfold wings, the time detent button (C) may be set to constant. However, the tractor hydraulic pump will continue to operate after the fold/unfold cylinders have stopped moving. Shutting off pump by moving SCV lever to any position after lever has returned to NEUTRAL is recommended.

A—SCV II Selector Button
B—Flow Control Knob
C—Time Detent Knob

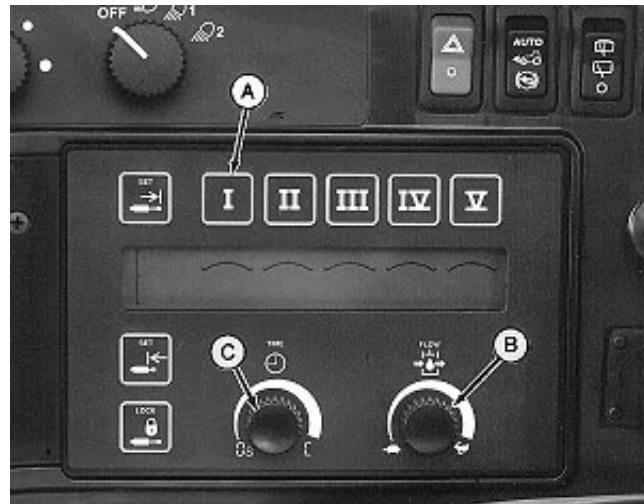


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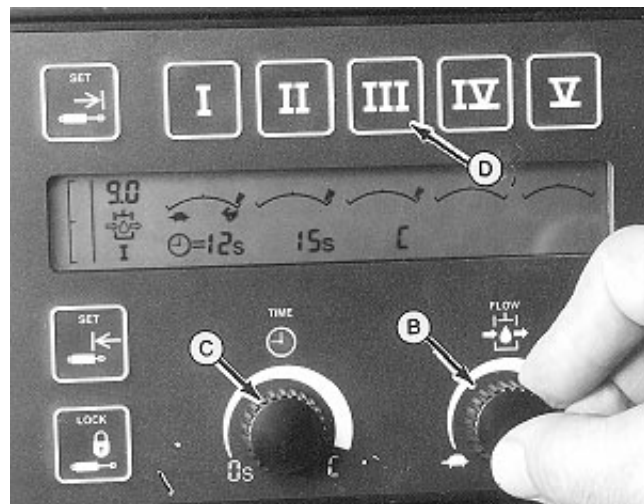
AG,OUO6023,977 -19-21JUL00-2/3

4. **DEPTH CONTROL:** Press SCV I selector button (A) and turn flow control knob (B) to rabbit position.
5. Turn time detent knob (C) until display reads “8” seconds. This can be increased or decreased, depending on actual time required to lift and lower machine.
6. **AIR SEEDER FAN AND AUGER:** Press SCV III selector button (D). Turn time detent knob (C) until display reads “constant”. Flow control knob (B) will be used to set fan speed. Refer to **SETTING FAN SPEED** in Operating the Machine - Monitor Operation section.

A—SCV I Selector Button
 B—Flow Control Knob
 C—Time Detent Knob
 D—SCV III Selector Button



N48104 -UN-01JUN94



N48137 -UN-20JUN94

AG,OUO6023,977 -19-21JUL00-3/3

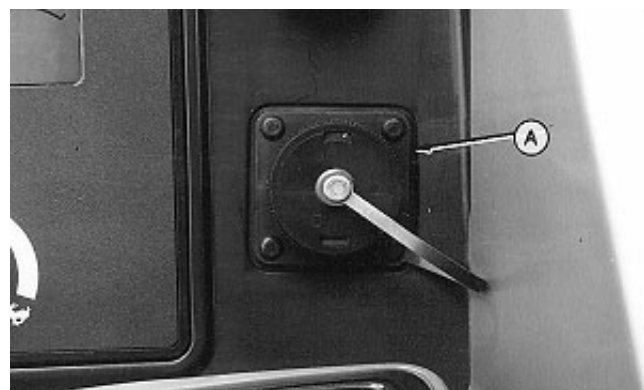
Using Convenience Outlet

NOTE: If tractor is not equipped with a convenience outlet or 6 pin program connector, order Voltage Suppression bundle BA28418 from your John Deere dealer.

Use convenience outlet (A) to connect GREENSTAR™ display console to power.

Outlet is powered when key switch is turned “ON” through accessory relay (K7) and 20 amp fuse (F23).

A—Convenience Outlet



N48122 -UN-08JUN94

8000 Series Tractor

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AG,OUO6023,978 -19-21JUL00-1/1

Powering GREENSTAR™ Display Console

GREENSTAR™ display console (A) is protected by the tractor's 20 amp fuse when tractor is equipped with a convenience outlet.

When tractor is not equipped with a convenience outlet or 6 pin program connector, one must be installed that includes transient voltage protection. Order Voltage Suppression bundle BA28418 from your John Deere dealer.

TVP (Transient Voltage Protection) module provides voltage surge protection to the console.

Refer to instructions included with bundle for wiring details.



A—Display Console

GREENSTAR is a trademark of Deere & Company.

AG,OUO6023,979 -19-21JUL00-1/1

Protect Monitor and Control System From High Voltage

IMPORTANT: Components of the monitor and control system are designed for operation in a 12-volt, negative ground, electrical system. Connection to a 24-volt electrical system will result in component failure.

GREENSTAR™ display and SEEDSTAR™ controller are both voltage sensitive electronic devices that must be protected from transient (momentary) voltage surges. If not protected, a high-voltage surge can cause the monitor/control system to reset or may result in component failure (i.e., read burn on display screen).

Most electronic components are not designed to absorb high-energy voltage surges.

Most newer John Deere tractors have transient voltage protection (TVP) circuitry designed into the electrical system to protect not only the tractor's electronic devices, but also accessories connected to the convenience outlet and/or 7-pin power plug.

John Deere 30 and 40 Series Tractors do not have this transient voltage protection circuitry and so require installation of a voltage protected convenience outlet that includes an external TVP module. The TVP module limits voltage to under 40 volts by absorbing the energy of a high-voltage surge before it reaches the display or controller. Competitive tractors not having TVP circuitry must have the voltage protected convenience outlet installed.

If in doubt that tractor has internal TVP circuitry, or if tractor is known to have TVP circuitry but its voltage protection rating (40 volt maximum) cannot be determined, a voltage protected convenience outlet should be installed. The additional protection provided by the external TVP module will not harm or have any effect on the operation of the monitor and control system.

Powering Cart Clutches and Lights

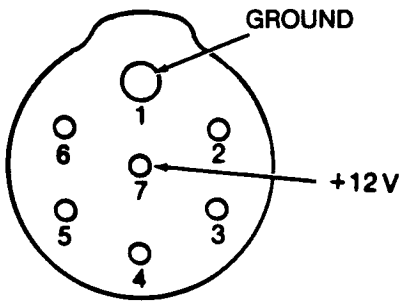
Cart clutches and lights are powered by connecting cable plug to 7-terminal outlet at the rear of the tractor.

Tractor's electrical outlet circuit has a 30-amp fuse that protects the cart components.



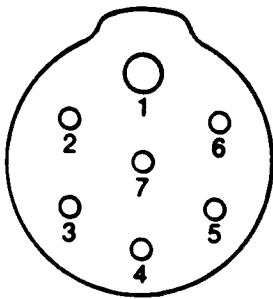
RW20845 -UN-07MAY92

AG,OUO6023,981 -19-21JUL00-1/2



H42825

VIEW OF TERMINAL



VIEW OF HARNESS END

Pin Identification

1—Ground
2—Clearance

3—Left Turn Signal
4—12-Volts

5—Right Turn Signal
6—Tail Lights

7—12-Volts

NOTE: Field installation of 7-Terminal Auxiliary Electric Kit RE17282 is required if towing tractor is not equipped with an electrical outlet. See your John Deere dealer for installation.

NOTE: Not all tractor manufacturers connect pins 4 and 7 to power (+12V). Ford, Case (4WD),

and older Cat Challenger tractors are known to leave power off these two pins. Pin 7 must be powered to operate clutches. Pin 4 provides power to the Aux 4 auxiliary power connector located near the cart controller.

H42825 -19-20FEB92

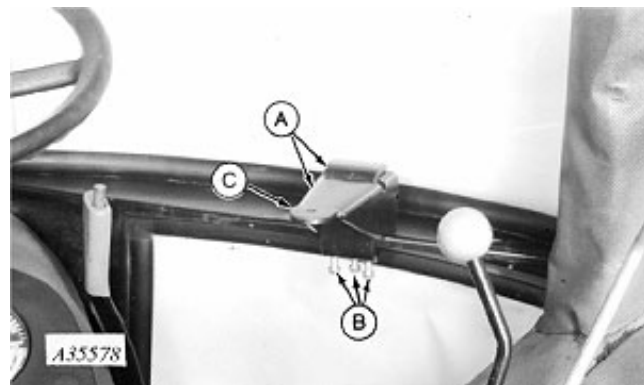
AG,OUO6023,981 -19-21JUL00-2/2

Preparing the Tractor—GREENSTAR™ Display Installation

Install GREENSTAR™ Display—30-60 Series Row-Crop Tractors

1. Assemble monitor brackets (A) together and attach to window ledge with cap screws (B).
2. Place rubber washer (C) over hole.

A—Monitor Brackets
B—Cap Screws
C—Rubber Washer

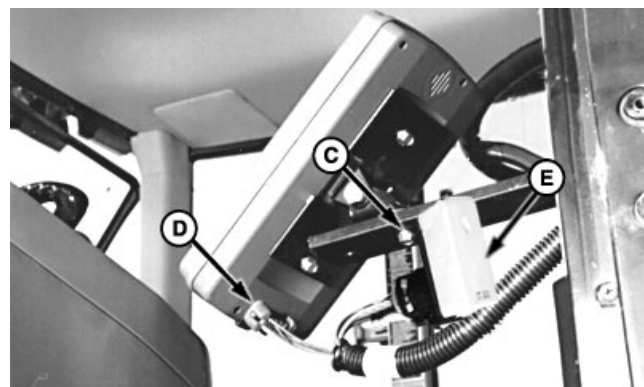
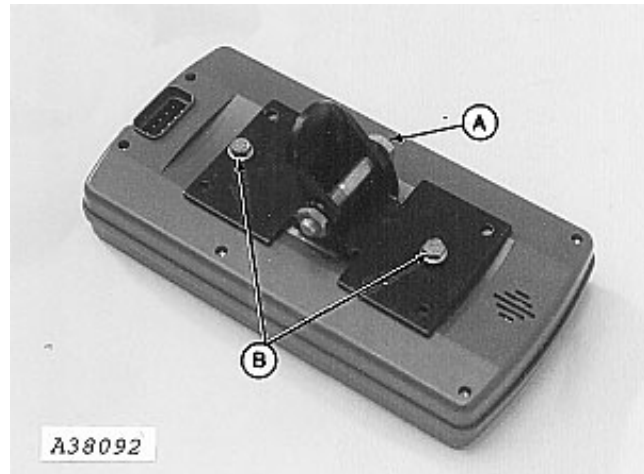


GREENSTAR is a trademark of Deere & Company.

AG,OUO6023,982 -19-21JUL00-1/9

3. Attach monitor bracket to pivot with M10 x 60 cap screw and nut (A).
4. Attach bracket to monitor with two M6 x 16 cap screws (B).
5. Install monitor to mounting bracket with M6 x 20 cap screw and nut (C).
6. Install lead end from monitor harness into monitor at (D).
7. Secure terminator (E) to underside of mounting bracket with tie strap.
8. Install monitor harness and radar harness into grommet.

A—Cap Screw, M10 x 20, and Nut
B—Cap Screw, M6 x 16 (2 used)
C—Cap Screw, M6 x 20, and Nut
D—Monitor Harness
E—Terminator

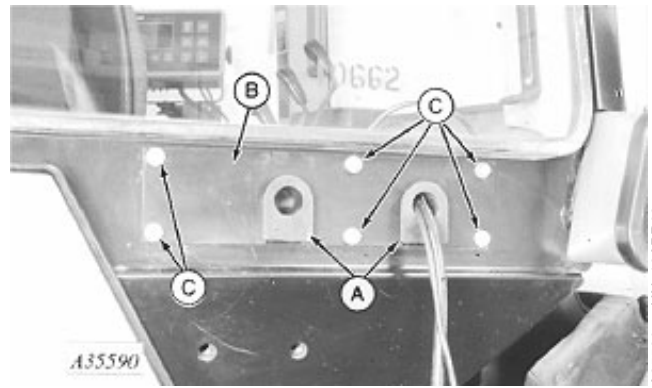


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AG,OUO6023,982 -19-21JUL00-2/9

9. Install grommets (A) into rear plate (B) as illustrated.
10. Attach plate to cab with six 5/16 x 7/8 in. screws (C).

A—Grommets
B—Rear Plate
C—Screws, 5/16 x 7/8 In. (6 used)



AG,OUO6023,982 -19-21JUL00-3/9

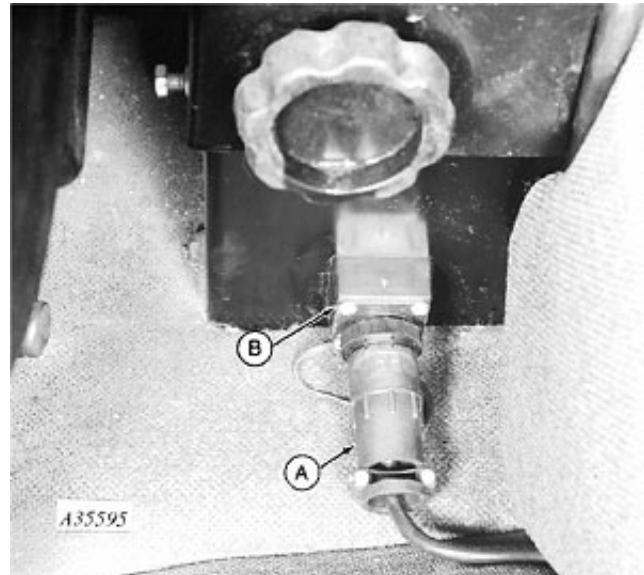
NOTE: If tractor is not equipped with a convenience outlet or 6 pin program connector, order BA28418, Voltage Suppression bundle.

Voltage Suppression bundle is needed on John Deere 50 Series (or older) tractors. Bundle can also be used to install a voltage protected convenience outlet in tractors built by other manufacturers.

Refer to instructions included with bundle for wiring details.

11. Carefully push monitor power connector (A) into convenience outlet (B) and turn collar clockwise.

If tractor is equipped with Voltage Suppression bundle, TVP (Transient Voltage Protection) module must be plugged into harness lead to protect monitor and control system. See PROTECT MONITOR AND CONTROL SYSTEM FROM HIGH VOLTAGE in Preparing the Tractor—General section for further information.

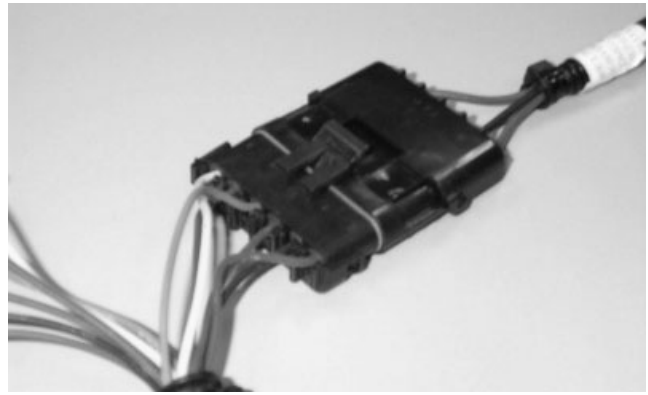


A—Monitor Power Connector
B—Convenience Outlet

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AG,OUO6023,982 -19-21JUL00-4/9

12. Connect 6-pin connector.

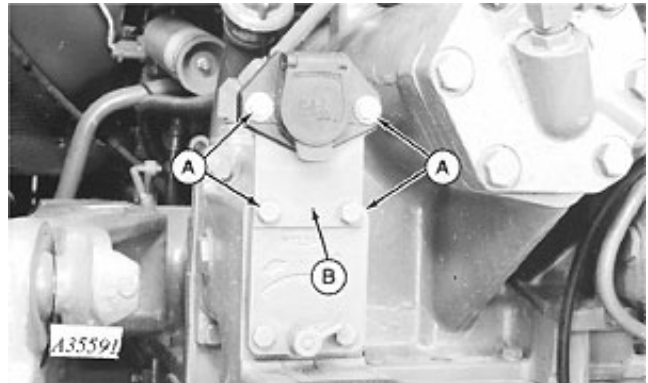


A47430 -UN-16MAY01

AG,OUO6023,982 -19-21JUL00-5/9

13. Remove four cap screws (A) and two nuts and SAVE for reuse.
14. Remove connector mounting plate (B) and DISCARD.

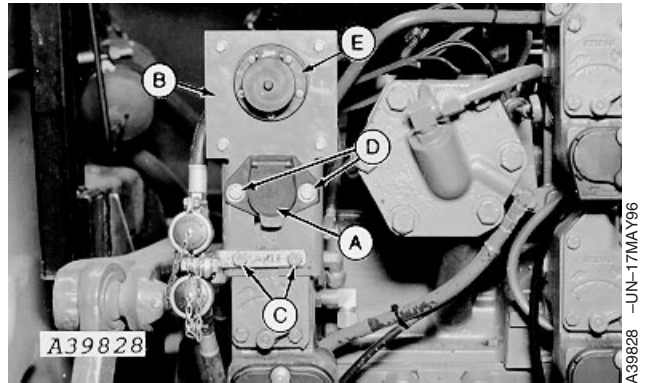
A—Cap Screws (4 Used)
B—Connector Mounting Plate



A35591 -UN-12APR83

AG,OUO6023,982 -19-21JUL00-6/9

15. Install 7-pin connector (A) through slot in bracket (B).
16. Mount bracket (B) (legs to front) to tractor SCV with two cap screws (C) previously removed.
17. Install two cap screws (D) and nuts previously removed through connector (A) to bracket (B).
18. Install plug assembly (E) on bracket (B) with M6 x 16 screws.



A39828 -UN-17MAY96

A—7-Pin Connector
B—Bracket
C—Cap Screws
D—Cap Screws
E—Plug Assembly

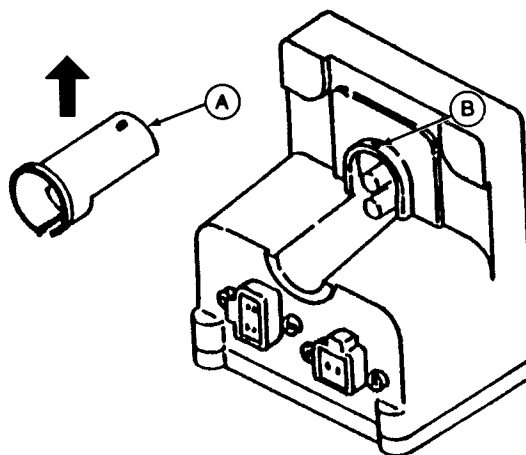
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AG,OUO6023,982 -19-21JUL00-7/9

NOTE: Cover (A) for 4-pin connector can be removed to simplify connection of red and black wires to terminals.

19. To remove cover, lift rear portion to remove from pin (B), then lift straight up in direction of arrow.

A—Cover
B—Pin



A40622 -UN-30DEC96

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AG,OUO6023,982 -19-21JUL00-8/9

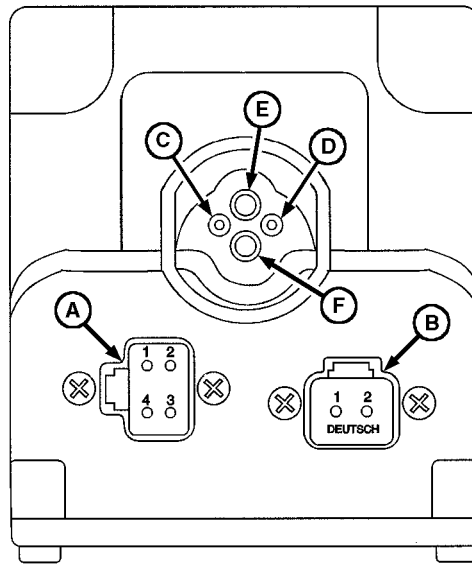
20. Connect 4-pin plug to connector (A) and 2-pin plug to connector (B).
21. The ISO Implement connector must have the 2 red and 2 black wires hooked-up to the top four sockets. These wires come tucked behind the protective wire conduit.
22. Cut the tape wrapped around these wires and remove the shrink-wrap.

NOTE: Positive and negative symbols are molded into the lip of the box as a guide showing where the insert wires.

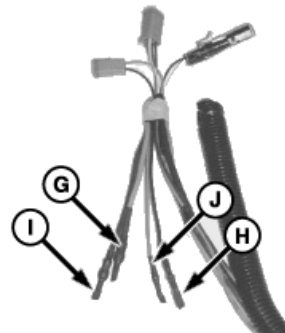
NOTE: To connect wires, insert wire end firmly into terminal. Properly connected wire will remain connected when wire is gently pulled.

23. Connect large red wire (G) to terminal (E), small black (H) to terminal (D), large black (I) to terminal (F) and small red (J) to terminal (C).

A—4-Pin Connector
 B—2-Pin Connector
 C—Terminal
 D—Terminal
 E—Terminal
 F—Terminal
 G—Large Red Wire (CC 062)
 H—Small Black Wire (CC 010B)
 I—Large Black Wire (CC 010)
 J—Small Red Wire (CC 032C)



A47323 -19-17APR01



A47322 -UN-17APR01

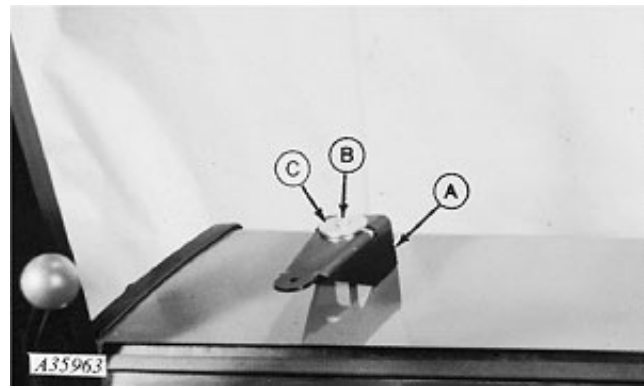
AG,OUO6023,982 -19-21JUL00-9/9

Install GREENSTAR™ Display—30—60 Series Open-Station Tractors

1. Drill hole in right fender and attach bracket (A) with 3/8 x 3-1/2 in. cap screw (B) and 0.391 x 2 x 0.22 in. washer (C) and 3/8 in. nut.

Order from Parts:

A40983	Mount
19H1912	Cap Screw, 3/8 x 3-1/2
24H1300	Washer, 0.391 x 2 x 0.22
14H1076	Nut, 3/8



A35963 —UN-17JUL93

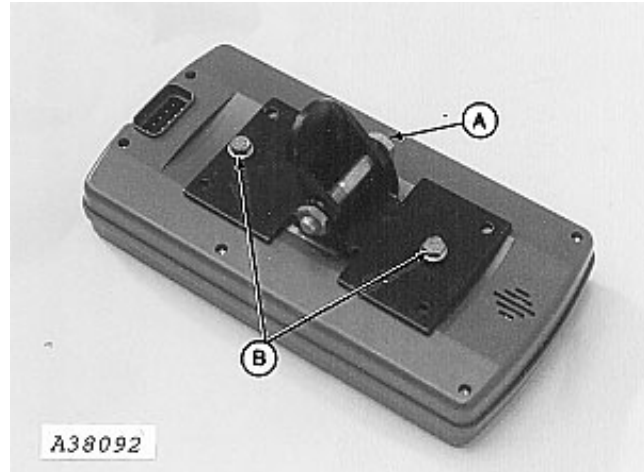
A—Bracket
B—Cap Screw, 3/8 x 3-1/2 in.
C—Washer, 0.391 x 2 x 0.22 in.

GREENSTAR is a trademark of Deere & Company.

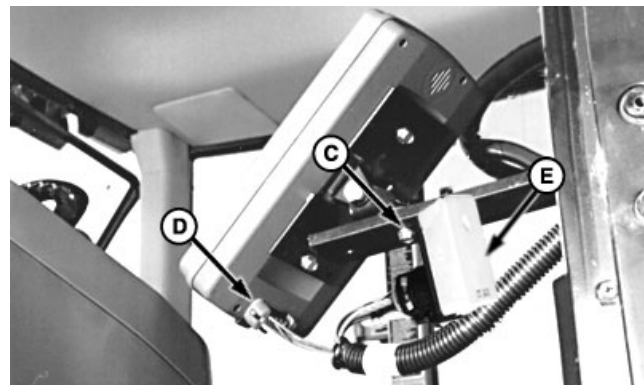
AG,OUO6023,983 —19-21JUL00-1/8

2. Attach monitor bracket to pivot with M10 x 60 cap screw and nut (A).
3. Attach bracket to monitor with two M6 x 16 cap screws (B).
4. Install monitor to mounting bracket with M6 x 20 cap screw and nut (C).
5. Install lead end from monitor harness into monitor at (D).
6. Fasten terminator (E) to underside of mounting bracket with tie strap.

A—Cap Screw, M10 x 60, and Nut
B—Cap Screw, M6 x 16 (2 used)
C—Cap Screw, M6 x 20, and Nut
D—Monitor Harness
E—Terminator



A38092 —UN-06SEP95



A46988 —UN-04JAN01

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AG,OUO6023,983 —19-21JUL00-2/8

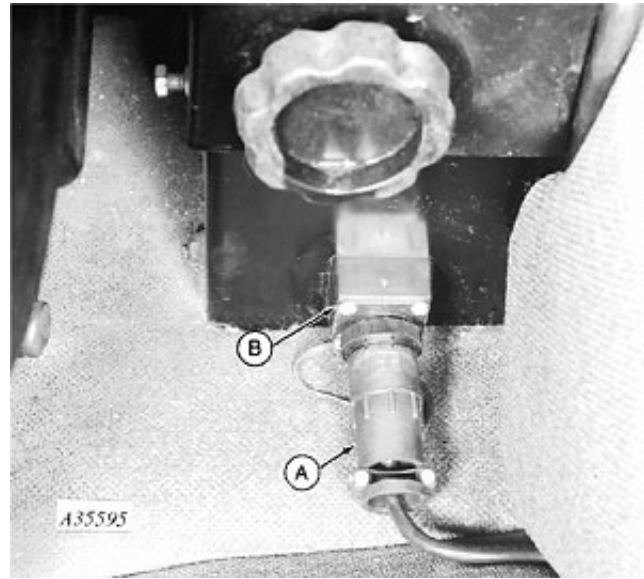
NOTE: If tractor is not equipped with a convenience outlet or 6 pin program connector, order BA28418, Voltage Suppression bundle.

Voltage Suppression bundle is needed on John Deere 50 Series (or older) tractors. Bundle can also be used to install a voltage protected convenience outlet in tractors built by other manufacturers.

Refer to instructions included with bundle for wiring details.

7. Carefully push monitor power connector (A) into convenience outlet (B) and turn collar clockwise.

If tractor is equipped with Voltage Suppression bundle, TVP (Transient Voltage Protection) module must be plugged into harness lead to protect monitor and control system. See PROTECT MONITOR AND CONTROL SYSTEM FROM HIGH VOLTAGE in Preparing the Tractor—General section for further information.

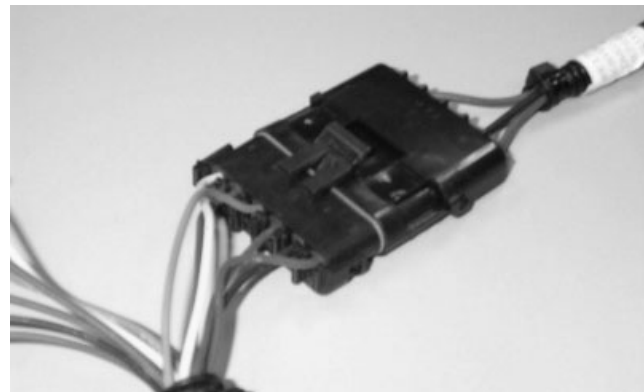


A—Monitor Power Connector
B—Convenience Outlet

A35595 —UN-12APR93

AG,OUO6023,983 —19-21JUL00-3/8

8. Connect 6-pin connector.



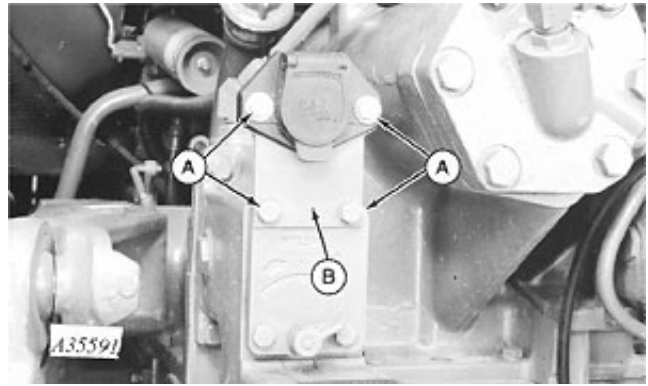
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AG,OUO6023,983 —19-21JUL00-4/8

A47430 —UN-16MAY01

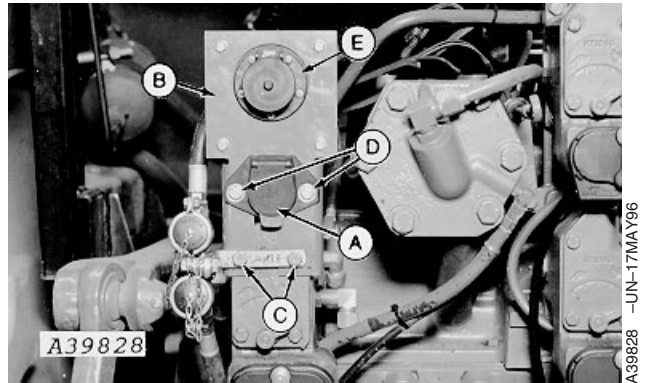
9. Remove four cap screws (A) and two nuts and SAVE for reuse.
10. Remove connector mounting plate (B) and DISCARD.

A—Cap Screws (4 Used)
B—Connector Mounting Plate



AG,OUO6023,983 -19-21JUL00-5/8

11. Install 7-pin connector (A) through slot in bracket (B).
12. Mount bracket (B) (legs to front) to tractor SCV with two cap screws (C) previously removed.
13. Install two cap screws (D) and nuts previously removed through connector (A) to bracket (B).
14. Install plug assembly (E) on bracket (B) with M6 x 16 screws.



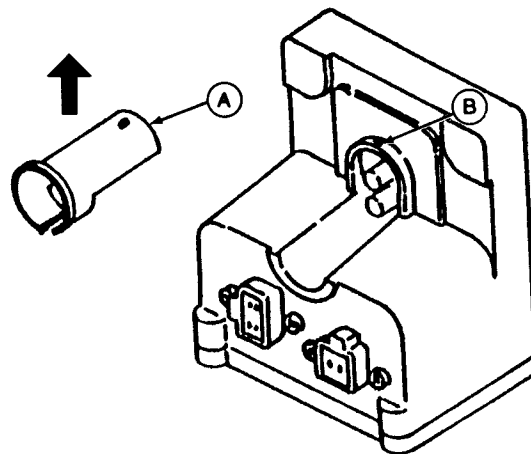
A—7-Pin Connector
B—Bracket
C—Cap Screws
D—Cap Screws
E—Plug Assembly

AG,OUO6023,983 -19-21JUL00-6/8

NOTE: Cover (A) for 4-pin connector can be removed to simplify connection of red and black wires to terminals.

15. To remove cover, lift rear portion to remove from pin (B), then lift straight up in direction of arrow.

A—Cover
B—Pin



A40622 -UN-30DEC96

Continued on next page

AG,OUO6023,983 -19-21JUL00-7/8

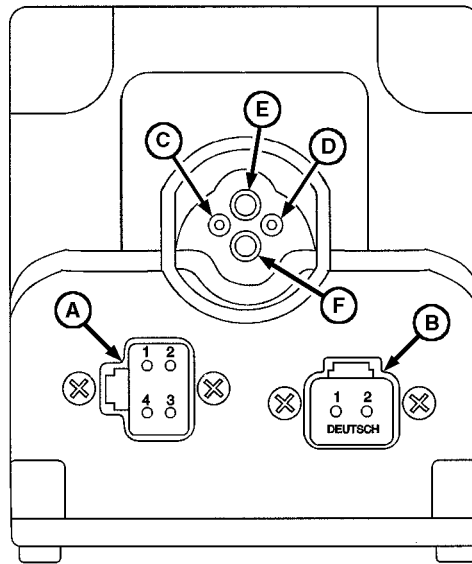
16. Connect 4-pin plug to connector (A) and 2-pin plug to connector (B).
17. The ISO Implement connector must have the 2 red and 2 black wires hooked-up to the top four sockets. These wires come tucked behind the protective wire conduit.
18. Cut the tape wrapped around these wires and remove the shrink-wrap.

NOTE: Positive and negative symbols are molded into the lip of the box as a guide showing where the insert wires.

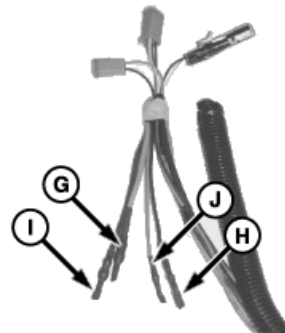
NOTE: To connect wires, insert wire end firmly into terminal. Properly connected wire will remain connected when wire is gently pulled.

19. Connect large red wire (G) to terminal (E), small black (H) to terminal (D), large black (I) to terminal (F) and small red (J) to terminal (C).

A—4-Pin Connector
 B—2-Pin Connector
 C—Terminal
 D—Terminal
 E—Terminal
 F—Terminal
 G—Large Red Wire (CC 062)
 H—Small Black Wire (CC 010B)
 I—Large Black Wire (CC 010)
 J—Small Red Wire (CC 032C)



A47323 -19-17APR01



A47322 -UN-17APR01

AG,OUO6023,983 -19-21JUL00-8/8

Install GREENSTAR™ Display—60—70 Series Four-Wheel Drive Tractors

1. Install bracket to inside of cab (right-hand front rear window) with two M10 x 25 cap screws (A).

A—Cap Screws, M10 x 25 (2 Used)



A35517 -UN-14APR93

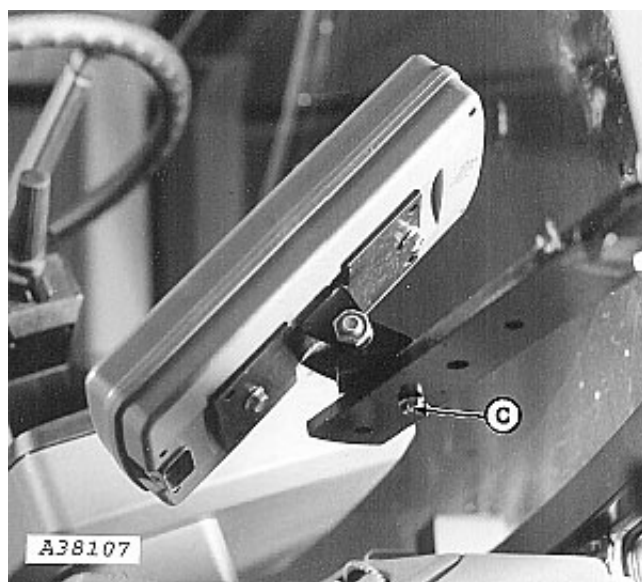
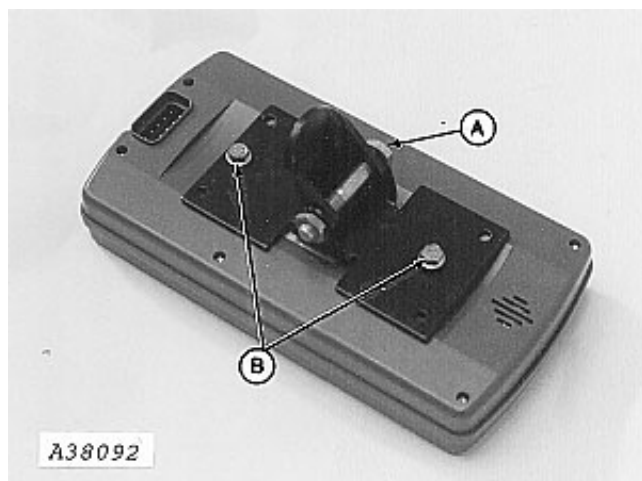
GREENSTAR is a trademark of Deere & Company.

Continued on next page

AG,OUO6023,984 -19-21JUL00-1/10

2. Attach monitor bracket to pivot with M10 x 60 cap screw and nut (A).
3. Attach bracket to monitor with two M6 x 16 cap screws (B).
4. Install monitor to mounting bracket with M6 x 20 cap screw and nut (C) making certain to install rubber washer on top of strap at mounting.

A—Cap Screw, M10 x 60, and Nut
B—Cap Screws, M6 x 16 (2 Used)
C—Cap Screw, M6 x 20, and Nut



AG,OUO6023,984 -19-21JUL00-2/10

5. Install lead end from monitor harness (A) into monitor.
6. Fasten terminator (B) to underside of mounting bracket with tie strap.

A—Monitor Harness
B—Terminator



Continued on next page

AG,OUO6023,984 -19-21JUL00-3/10

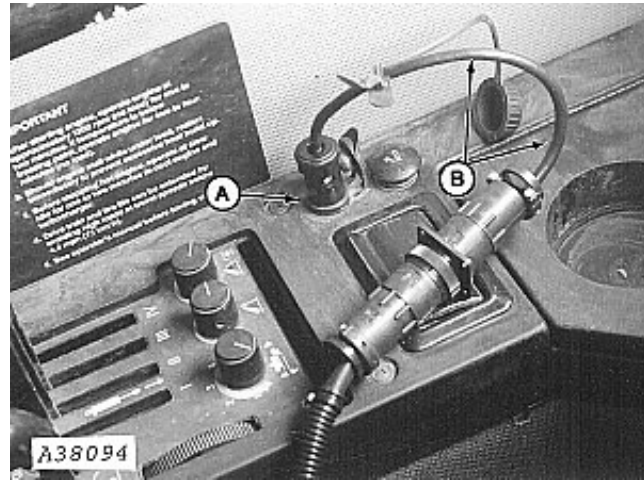
NOTE: If tractor is not equipped with a convenience outlet or 6 pin program connector, order BA28418, Voltage Suppression bundle.

Bundle can be used to install a voltage protected convenience outlet in tractors built by other manufacturers.

Refer to instructions included with bundle for wiring details.

7. Connect monitor harness lead to convenience outlet (A).

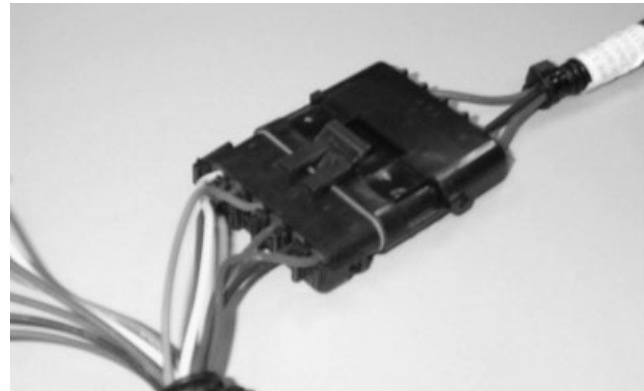
NOTE: Early 60 Series 4WD have 2-pin convenience outlet. Order Power Adapter (AA37254) (B) to convert to 3-pin convenience outlet.



A—Convenience Outlet
B—Power Adapter

AG,OUO6023,984 -19-21JUL00-4/10

8. Connect 6-pin connector.



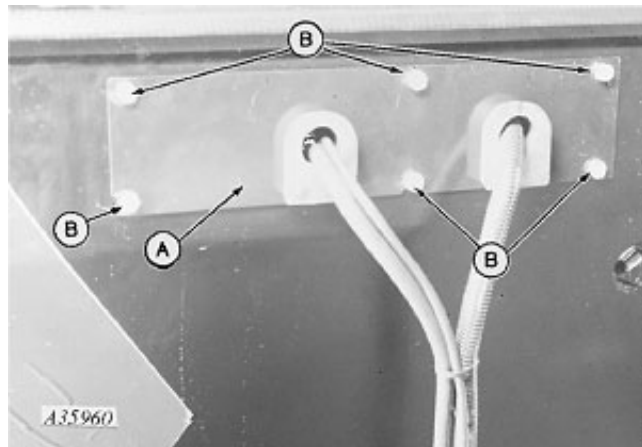
Continued on next page

AG,OUO6023,984 -19-21JUL00-5/10

9. Install two grommets into plate (A), making certain plate openings are DOWN.
10. Attach plate (A) to tractor cab with six 5/16 x 7/8 in. screws (B).

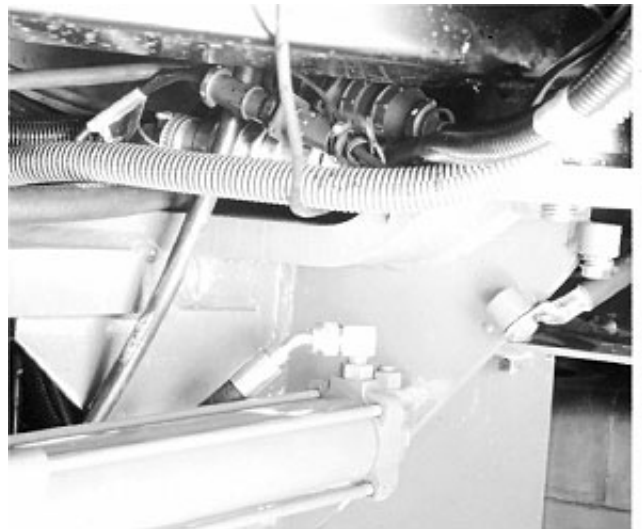
A—Plate

B—Screws, 5/16 x 7/8 In. (6 Used)



AG,OUO6023,984 -19-21JUL00-6/10

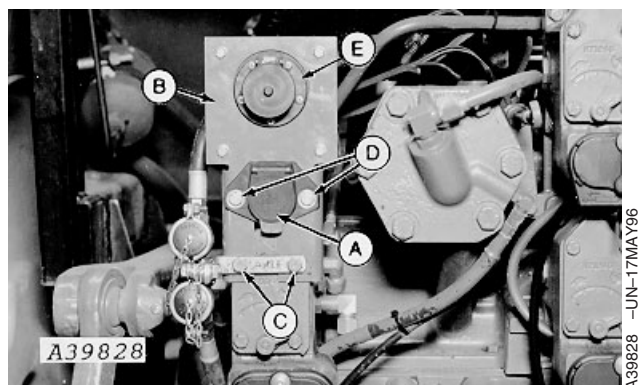
11. Route harness under floor mat along side of right-hand console.
12. Route harness under cab. DO NOT let excess harness hang loose.
13. Connect extension harness to harness from cab. Fasten connectors under right-hand rear corner of cab with nylon ties as required.



Continued on next page

AG,OUO6023,984 -19-21JUL00-7/10

14. Install 7-pin connector (A) through slot in bracket (B).
15. Mount bracket (B) (legs to front) to tractor SCV with two cap screws (C) previously removed.
16. Install two cap screws (D) and nuts previously removed through connector (A) to bracket (B).
17. Install plug assembly (E) on bracket (B) with M6 x 16 screws.



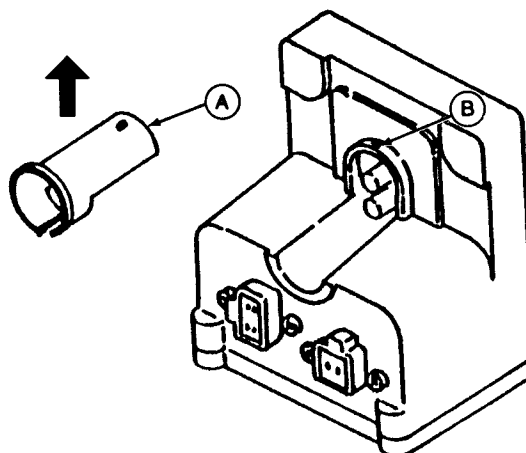
A—7-Pin Connector
B—Bracket
C—Cap Screws
D—Cap Screws
E—Plug Assembly

AG,OUO6023,984 -19-21JUL00-8/10

NOTE: Cover (A) for 4-pin connector can be removed to simplify connection of red and black wires to terminals.

18. To remove cover, lift rear portion to remove from pin (B), then lift straight up in direction of arrow.

A—Cover
B—Pin



A40622 -UN-30DEC96

Continued on next page

AG,OUO6023,984 -19-21JUL00-9/10

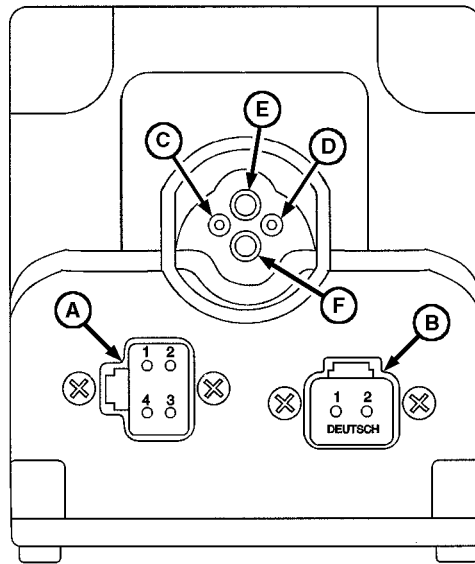
19. Connect 4-pin plug to connector (A) and 2-pin plug to connector (B).
20. The ISO Implement connector must have the 2 red and 2 black wires hooked-up to the top four sockets. These wires come tucked behind the protective wire conduit.
21. Cut the tape wrapped around these wires and remove the shrink-wrap.

NOTE: Positive and negative symbols are molded into the lip of the box as a guide showing where the insert wires.

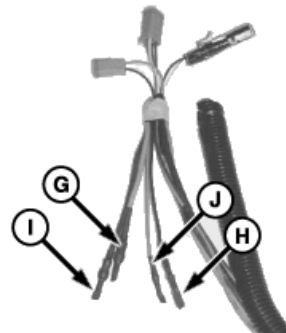
NOTE: To connect wires, insert wire end firmly into terminal. Properly connected wire will remain connected when wire is gently pulled.

22. Connect large red wire (G) to terminal (E), small black (H) to terminal (D), large black (I) to terminal (F) and small red (J) to terminal (C).

A—4-Pin Connector
 B—2-Pin Connector
 C—Terminal
 D—Terminal
 E—Terminal
 F—Terminal
 G—Large Red Wire (CC 062)
 H—Small Black Wire (CC 010B)
 I—Large Black Wire (CC 010)
 J—Small Red Wire (CC 032C)



A47323 -19-17APR01



A47322 -UN-17APR01

AG.OUO6023,984 -19-21JUL00-10/10

Connect Radar Signal Harness

1. Connect radar signal harness (A) to adapter harness (B).

A—Radar Signal Harness
B—Adapter Harness



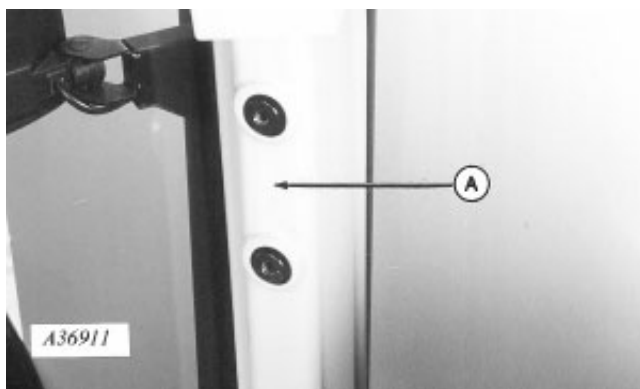
H45409 -UN-25NOV92

AG,OUO6023,985 -19-21JUL00-1/1

Install GREENSTAR™ Display—8000 and 9000 Series Tractors

1. Unscrew plastic covers from right-hand front post (A) to remove. (Already removed in illustration.)

A—Right-Hand Front Post



A36911 -UN-26APR95

Plastic Covers Removed

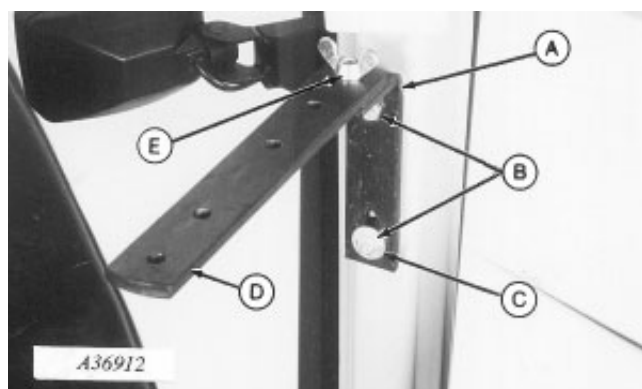
GREENSTAR is a trademark of Deere & Company.

Continued on next page

AG,OUO6023,986 -19-21JUL00-1/10

2. Install “L” bracket (A) on front post with two M10 x 20 cap screws (B) with flat washer (C) on lower cap screw.
3. Install monitor strap (D) with M10 x 30 hex head bolt and wing nut (E), with strap hole spacing as shown.

A—“L” Bracket
B—Cap Screws, M10 x 20
C—Flat Washer
D—Monitor Strap
E—Wing Nut



Continued on next page

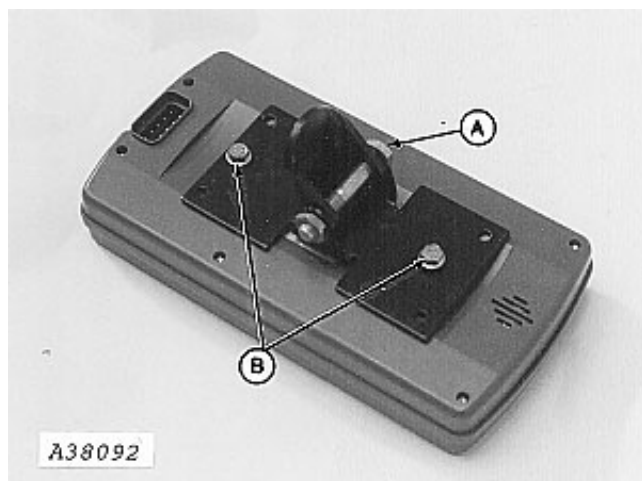
AG,OUO6023,986 -19-21JUL00-2/10

4. Attach monitor bracket to pivot with M10 x 60 cap screw and nut (A).
5. Attach bracket to monitor with two M6 x 16 cap screws (B).
6. Install monitor to mounting bracket with M6 x 20 cap screw and nut (C) making certain to install rubber washer on top of strap.

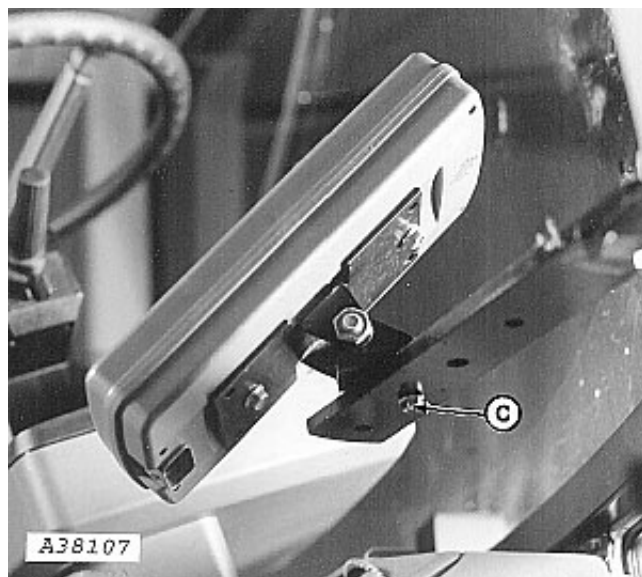
A—Cap Screw, M10 x 60, and Nut

B—Cap Screws, M6 x 16

C—Cap Screw, M6 x 20, and Nut



A38092 -UN-06SEP95



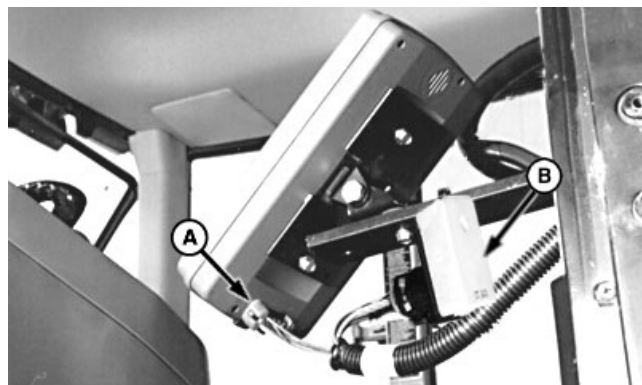
A38107 -UN-06SEP95

AG,OUO6023,986 -19-21JUL00-3/10

7. Install monitor harness (A) into monitor.
8. Fasten terminator (B) to underside of mounting bracket with tie strap.

A—Monitor Harness

B—Terminator



Continued on next page

AG,OUO6023,986 -19-21JUL00-4/10

9. Route harness (A) down side of cab and under floor mat, along right-hand console.
10. Fasten with tie straps (B).

A—Harness
B—Tie Straps

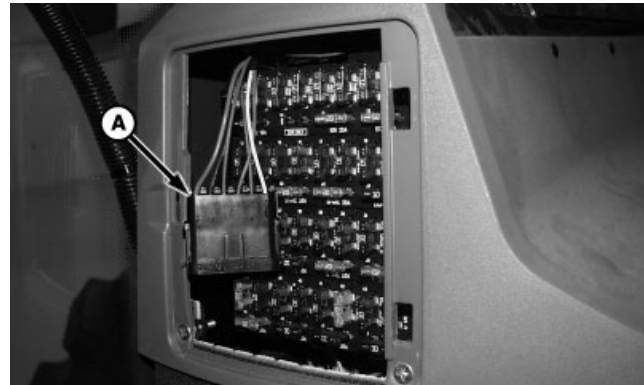


A38111 —UN-06SEP95

AG,OUO6023,986 —19-21JUL00-5/10

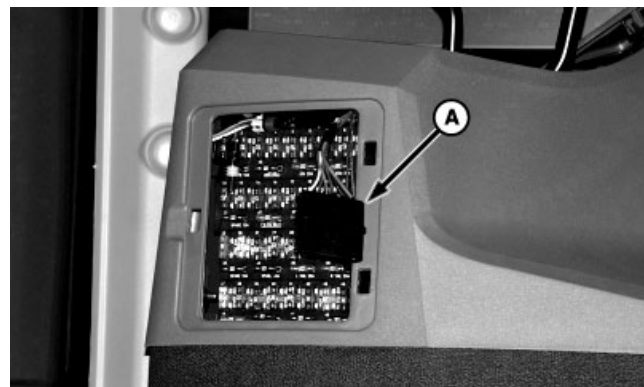
11. Remove fuse panel cover and locate 6-pin harness connector (A).

A—6-Pin Connector



A46967 —UN-04JAN01

8000 Series 6-Pin Harness Connector



A46969 —UN-04JAN01

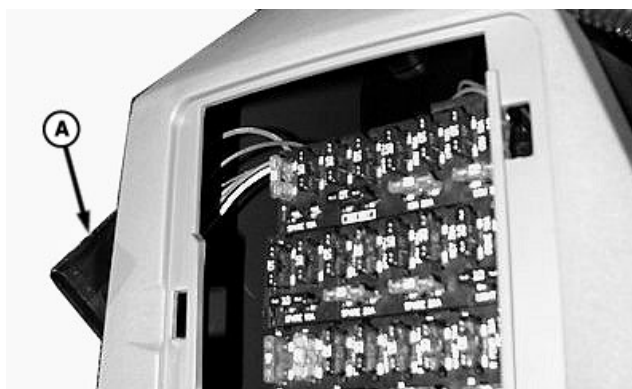
9000 Series 6-Pin Harness Connector

Continued on next page

AG,OUO6023,986 —19-21JUL00-6/10

12. Push 6-pin harness (A) out between fuse panel and window.

A—6-Pin Connector

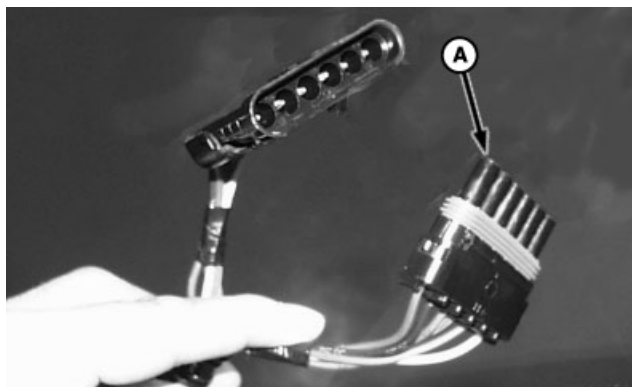


A46971 -UN-04JAN01

AG,OUO6023,986 -19-21JUL00-7/10

13. Separate 6-pin connector (A) on monitor harness and connect to 6-pin connector (B) from fuse panel.

A—6-Pin Connector, Monitor Harness
B—6-Pin Connector, Fuse Panel



A46972 -UN-04JAN01



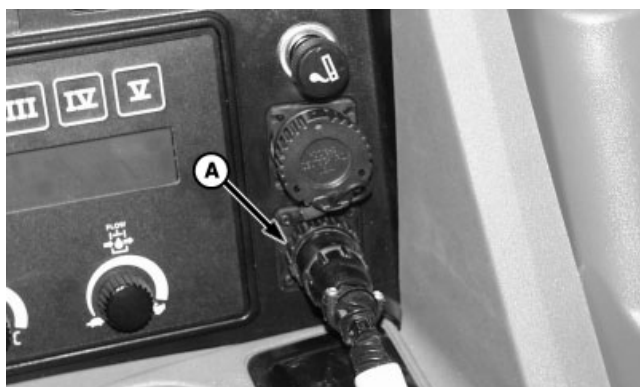
A46973 -UN-04JAN01

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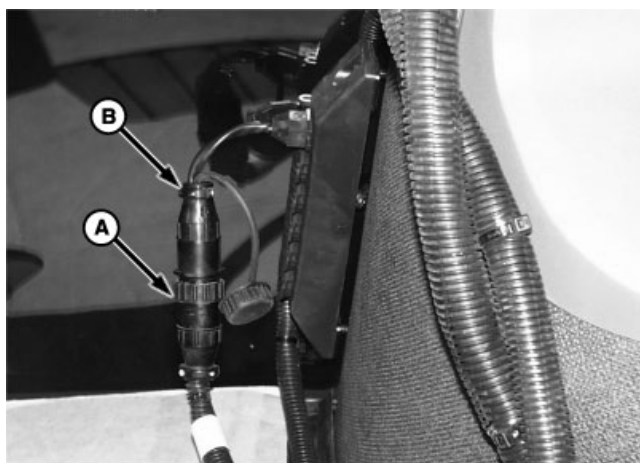
AG,OUO6023,986 -19-21JUL00-8/10

14. Install controller power harness (A) into rear outlet or into front convenience outlet using adapter harness (B), if equipped.
15. Route harness under floor mat.

A—Controller Power Harness
B—Adapter Harness



Controller Power Harness In Rear Outlet

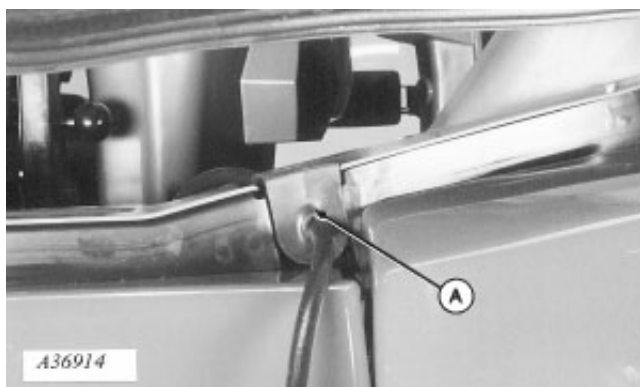


Controller Power Harness In Front Outlet

AG,OUO6023,986 -19-21JUL00-9/10

16. Remove existing right-hand side grommet. Install harness in new grommet (provided) and install grommet (A) as illustrated.

A—Grommet

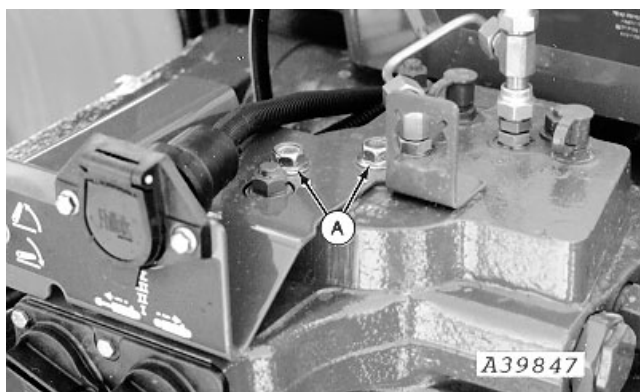


AG,OUO6023,986 -19-21JUL00-10/10

Install Harness Bracket—8000 and 9000 Series Tractors

1. Remove two cap screws (A) and discard.

A—Cap Screws



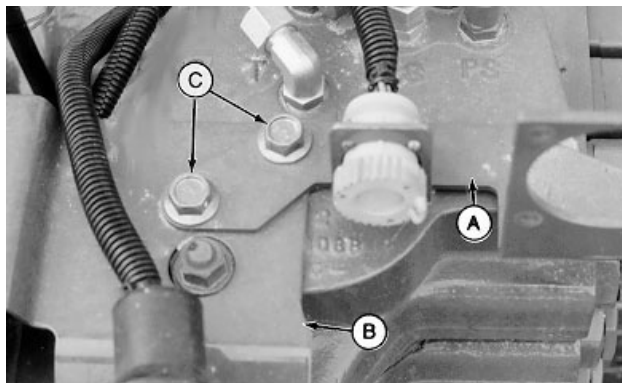
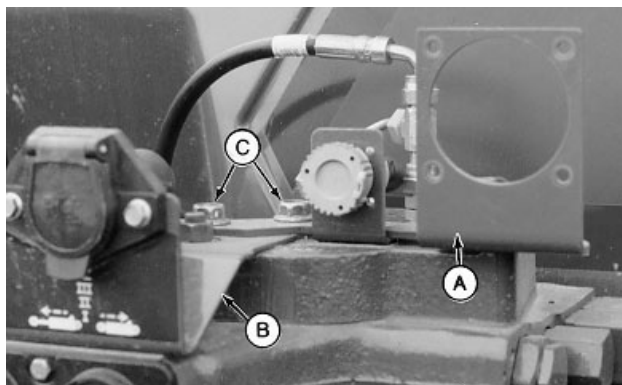
AG,OUO1074,1615 -19-24APR00-1/5

2. Install monitor bracket (A) on top of 7-pin bracket (B) and fasten with M12 x 20 cap screws (C).

A—Monitor Bracket

B—7-Pin Bracket

C—Cap Screws



Continued on next page

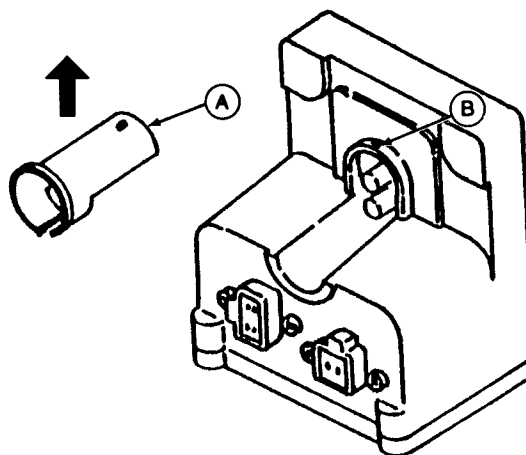
AG,OUO1074,1615 -19-24APR00-2/5

NOTE: Cover (A) for 4-pin connector can be removed to simplify connection of red and black wires to terminals.

3. To remove cover, lift rear portion to remove from pin (B), then lift straight up in direction of arrow.

A—Cover

B—Pin



A40622 -UN-30DEC96

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AG,OUO1074,1615 -19-24APR00-3/5

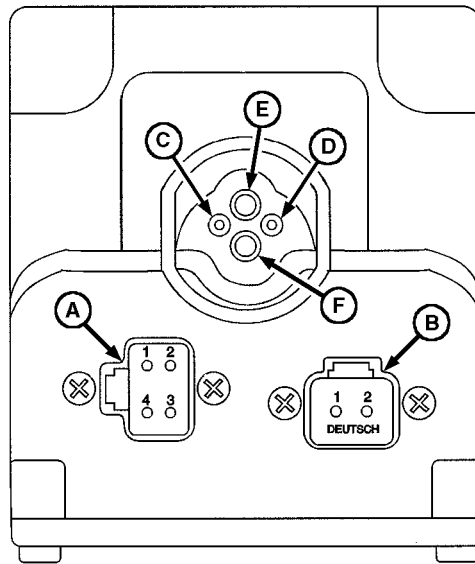
4. Connect 4-pin plug to connector (A) and 2-pin plug to connector (B).
5. The ISO Implement connector must have the 2 red and 2 black wires hooked-up to the top four sockets. These wires come tucked behind the protective wire conduit.
6. Cut the tape wrapped around these wires and remove the shrink-wrap.

NOTE: Positive and negative symbols are molded into the lip of the box as a guide showing where the insert wires.

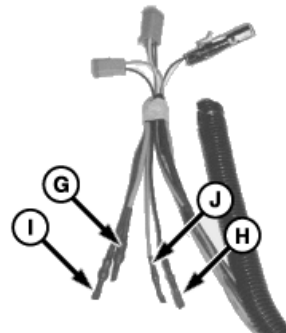
NOTE: To connect wires, insert wire end firmly into terminal. Properly connected wire will remain connected when wire is gently pulled.

7. Connect large red wire (G) to terminal (E), small black (H) to terminal (D), large black (I) to terminal (F) and small red (J) to terminal (C).

A—4-Pin Connector
 B—2-Pin Connector
 C—Terminal
 D—Terminal
 E—Terminal
 F—Terminal
 G—Large Red Wire (CC 062)
 H—Small Black Wire (CC 010B)
 I—Large Black Wire (CC 010)
 J—Small Red Wire (CC 032C)



A47323 -19-17APR01

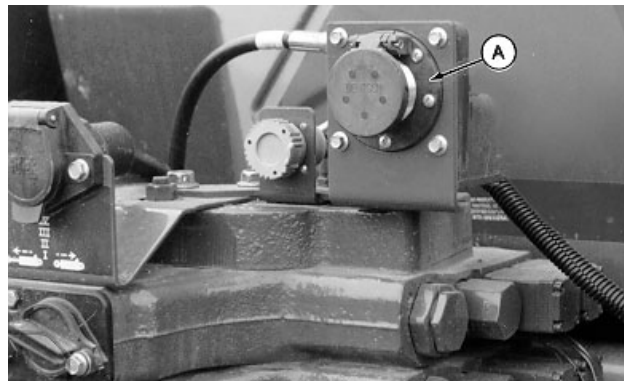


A47322 -UN-17APR01

AG,OUO1074,1615 -19-24APR00-4/5

8. Attach monitor connector (A) to bracket with M6 x 16 cap screws.

A—Monitor Connector



A44207 -UN-14OCT97

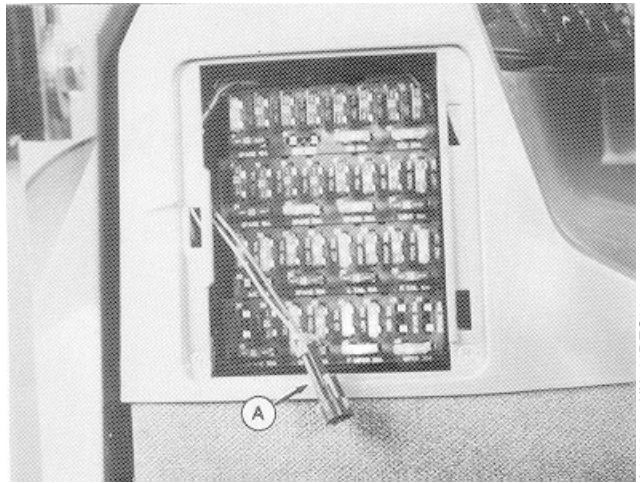
AG,OUO1074,1615 -19-24APR00-5/5

Install Radar Signal Harness—8000 and 9000 Series Tractors

NOTE: 8000 Series Tractor installation illustrated.

1. Remove fuse panel cover and locate 2-pin harness (A).

A—2-Pin Harness

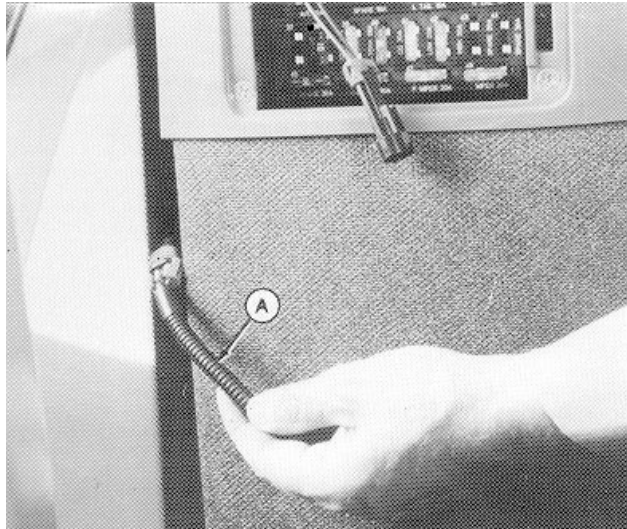


A40635 -UN-26DEC96

AG,OUO6023,988 -19-21JUL00-1/4

2. Route signal harness (A) behind console and into fuse panel area.

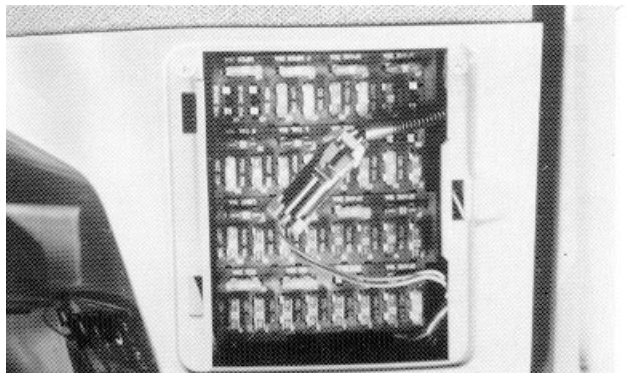
A—Signal Harness



A40636 -UN-26DEC96

AG,OUO6023,988 -19-21JUL00-2/4

3. Connect signal harness to tractor harness. Push connector back to side of fuses.
4. Install fuse panel cover.



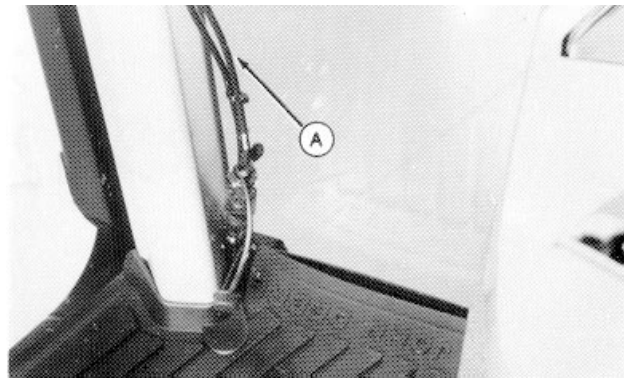
A40637 -UN-26DEC96

Continued on next page

AG,OUO6023,988 -19-21JUL00-3/4

5. Route signal harness under floor mat, along window.
6. Connect signal harness to monitor radar harness (A).

A—Monitor Radar Harness



A40638 -UN-26DEC96

AG,OUO6023,988 -19-21JUL00-4/4

Preparing the Tractor—Radar Installation

Install Radar—30-55 Series Four-Wheel Drive Tractors

1. Remove front two cap screws (A) from left-hand side of tractor.
2. Attach radar unit to mounting plate with 1/4 x 4 in. cap screws (B), washers and lock nuts (do not overtighten). Be certain radar unit is mounted on plate so serial number plate (C) is facing up when plate is attached to tractor.
3. Attach mounting plate to tractor with one cap screw (D) removed in Step 1 and 5/8 in. cap screw and bushing (E).

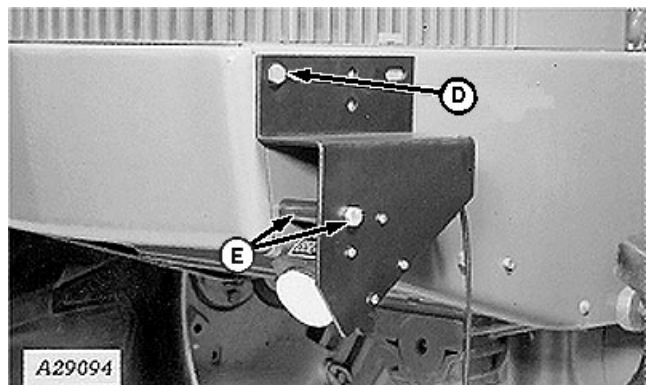
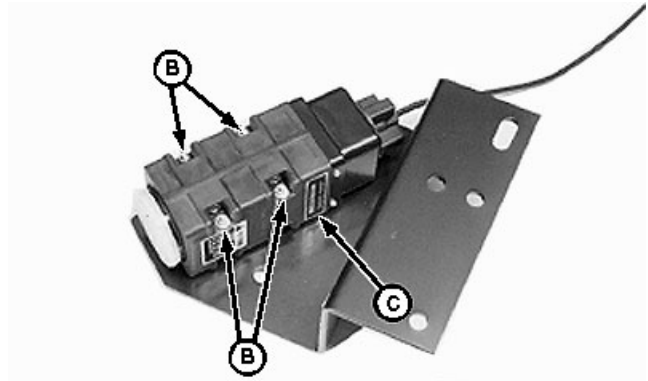
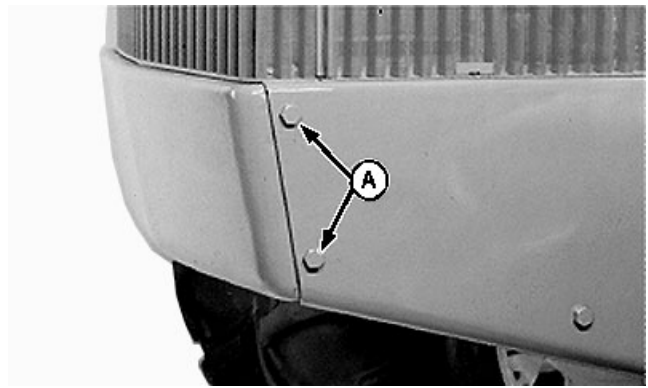
A—Cap Screws, Front

B—Cap Screws, 1/4 x 4 In., Washers and Lock Nuts

C—Serial Number Plate

D—Cap Screw

E—Cap Screw, 5/8 In., and Bushing



Continued on next page

AG,OUO6023,989 —19-21JUL00-1/2

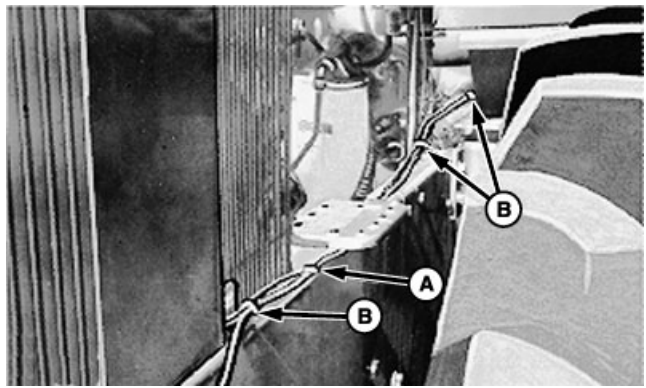
4. Route cable back toward rear axle and connect to power module radar lead (A).



CAUTION: Avoid looking directly into the sensor face to prevent possible eye damage from the microwave signal emitted from radar sensor.

5. Fasten radar cable leads to tractor with tie straps (B).
6. Loop and tie excess radar cable to tractor beneath SOUND-GARD® body with tie strap (C).

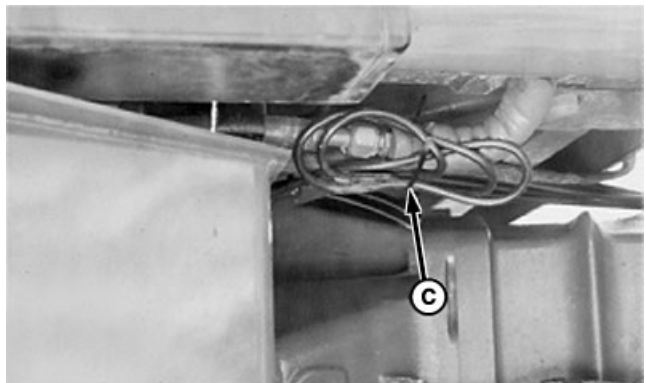
A—Power Module Radar Lead
B—Tie Straps
C—Tie Strap



A46127 -UN-05MAY00



A46128 -UN-05MAY00



A46129 -UN-05MAY00

SOUND-GARD is a trademark of Deere & Company.

AG,OUO6023,989 -19-21JUL00-2/2

Install Radar—30-60 Series Row Crop Tractors

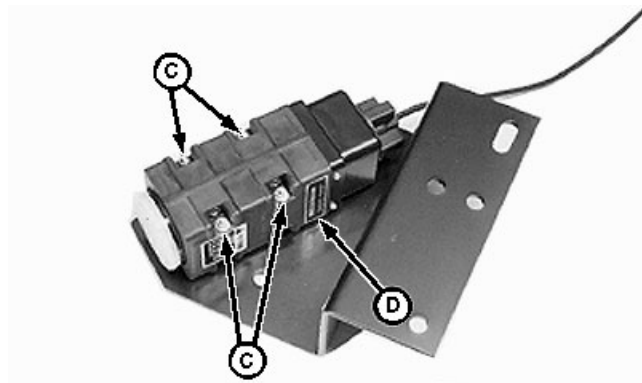
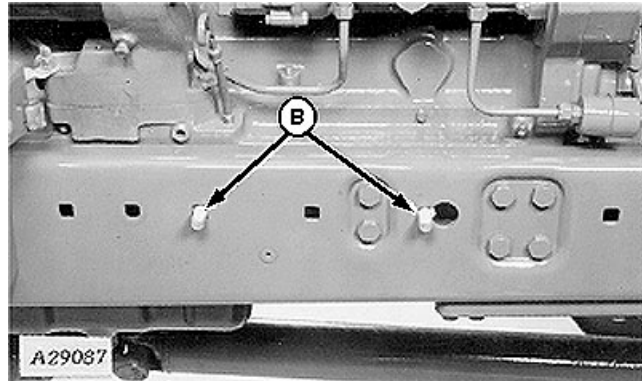
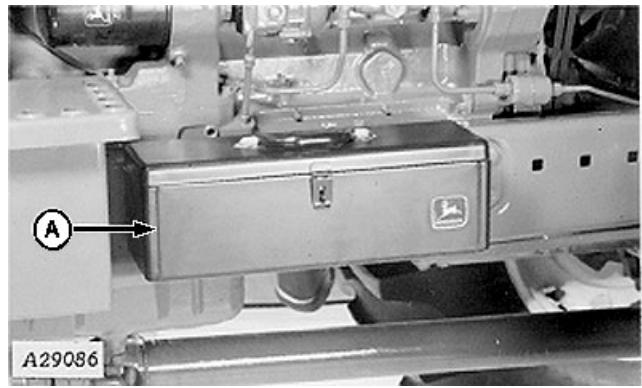
1. Remove toolbox (A) and mounting bracket from right-hand side of tractor.
2. Insert 5/8 x 1-1/2 in. cap screws (B) in holes as shown.
3. Attach radar unit to mounting plate with 1/4 in. cap screws (C), washers and lock nuts (do not overtighten). Be certain radar unit is mounted on plate so serial number plate (D) is facing up when plate is attached to tractor.

A—Toolbox

B—Cap Screws, 5/8 x 1-1/2 in.

C—Cap Screws, 1/4 in., Washers and Lock Nuts

D—Serial Number Plate



Continued on next page

AG,OUO6023,990 -19-21JUL00-1/2

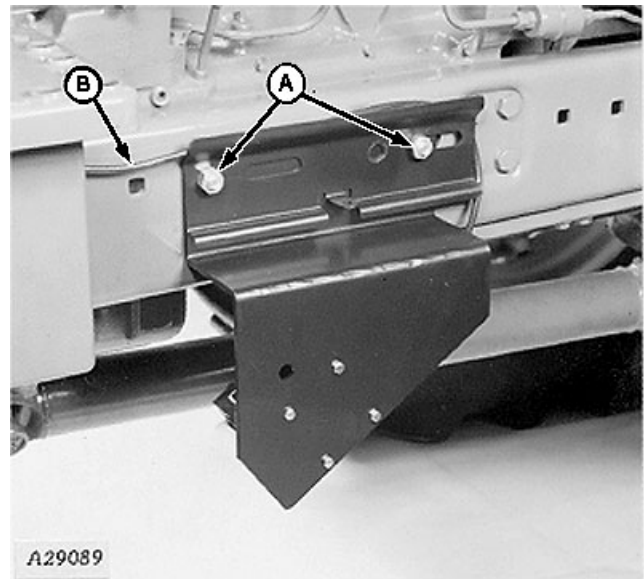
4. Install radar plate and toolbox mounting bracket on cap screws (A) and secure with lock washers and nuts.

NOTE: 55 and 60 Series Tractors have spacers on toolbox mounting hardware. Install radar bracket against side frame; then spacers and toolbox mounting bracket (in this order).

5. Route cable (B) back toward rear axle and connect to console radar lead.

CAUTION: Avoid looking directly into the sensor face to prevent possible eye damage from microwave signal emitted from radar sensor.

6. Fasten lead away from moving parts with tie straps.
7. Install toolbox on mounting bracket.



A—Cap Screws
B—Cable

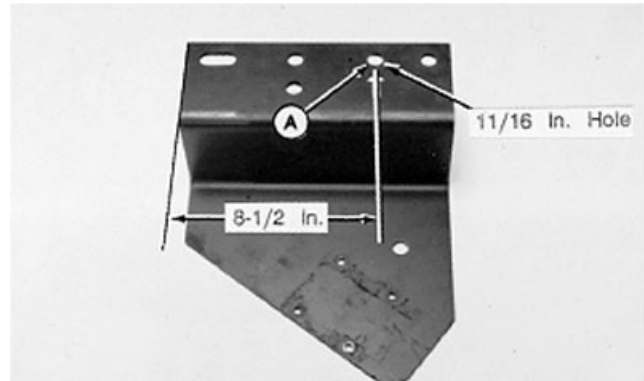
AG,OUO6023,990 —19-21JUL00-2/2

Modification and Installation of Radar Bracket (60 Series Four-Wheel Drive Tractors)

NOTE: The radar bracket needs a 17.5 mm (11/16 in.) hole added to allow bracket to bolt to the frame under the engine.

1. Mark center point as illustrated at (A) and drill 17.5 mm (11/16 in.) hole.

A—Center Point



Continued on next page

AG,OUO6023,991 —19-21JUL00-1/2

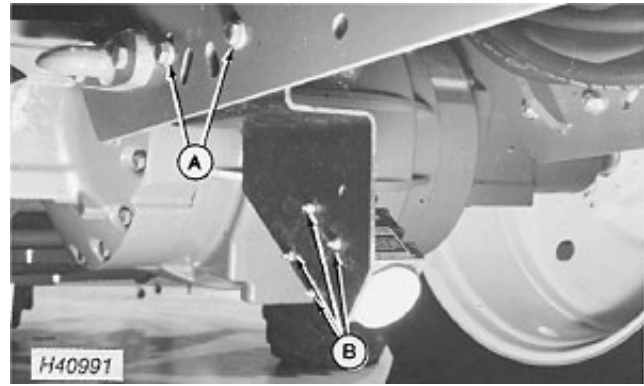
2. Install bracket on tractor with two 5/8 x 2-1/2 in. cap screws, flat washers and nuts at (A) using the holes as illustrated.

NOTE: Shift bracket so top of bracket is LEVEL.



CAUTION: Avoid looking directly into the sensor face of radar to prevent possible eye damage from microwave signal emitted from radar sensor.

3. Install radar unit on bracket, with serial number plate facing up with cap screws, washers and nuts (B).



A—Installation Point
B—Cap Screws, Washers and Nuts

AG,OUO6023,991 -19-21JUL00-2/2

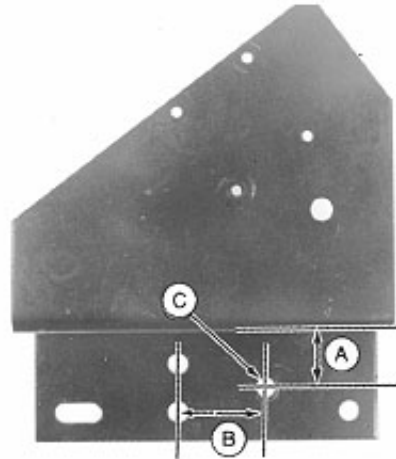
Modification and Installation of Radar Bracket (70 Series Four-Wheel Drive Tractors)

1. Mark center point from (A) and (B) as illustrated and drill 17.5 mm (11/16 in.) hole (C) in radar bracket.

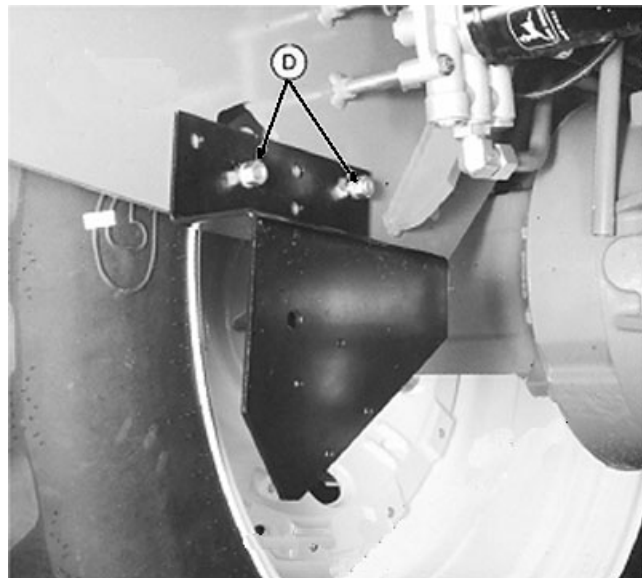
NOTE: Shift bracket until top is LEVEL.

2. Install bracket on tractor with two 5/8 x 1-1/2 in. bolts, lock washers and nuts using holes as illustrated at (D).

A—98 mm (3-7/8 in.)
B—45 mm (1-3/4 in.)
C—Hole, 17.5 mm (11/16 in.)
D—Holes



A35511 -UN-14APR93



A45954 -UN-01MAR00

Continued on next page

AG,OUO6023,992 -19-21JUL00-1/2

CAUTION: Avoid looking directly into the sensor face of radar to prevent possible eye damage from microwave signal emitted from radar sensor.

3.

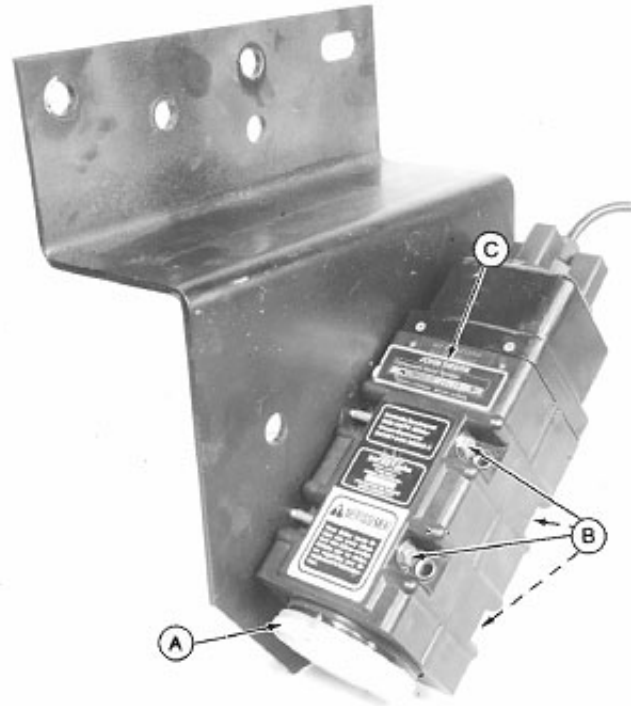
Install radar unit (A) on inside of bracket with four 1/4 x 4 in. cap screws (B) (washers under head of cap screws against radar unit), and nuts.

NOTE: Be certain radar unit is mounted on bracket with radar serial number plate (C) facing up.

A—Radar Unit

B—Cap Screws, 1/4 x 4 in. (4 Used)

C—Radar Serial Number Plate



A35513 -UN-14APR93

AG,OUO6023,992 -19-21JUL00-2/2

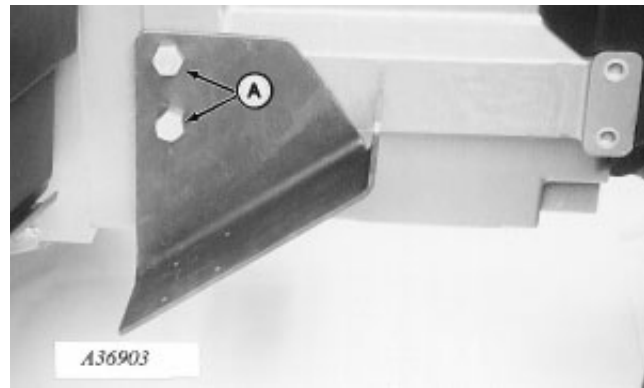
Install Radar—8000 Series Tractors

1. Remove two plastic plugs on right-hand side of tractor, ahead of fuel tank.
2. Install radar bracket with two M20 x 35 cap screws (A).

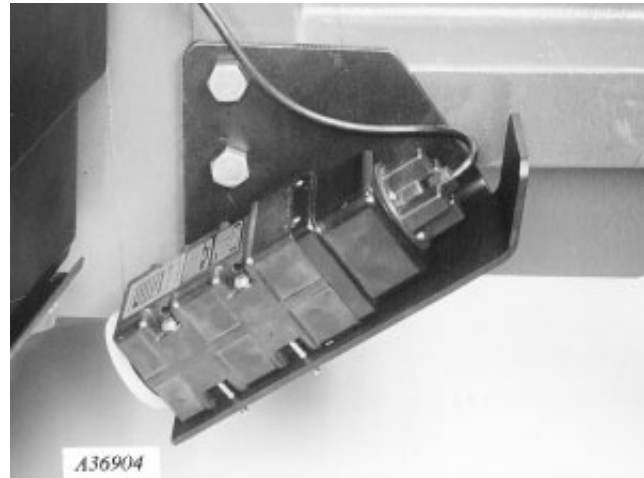
IMPORTANT: Radar serial number plate must be facing up (as illustrated) when radar is installed.

3. Install radar on bracket with four 1/4 x 4 in. cap screws and lock nuts.
4. Remove right-hand side engine cover.

A—Cap Screws, M20 x 35 (2 Used)



A36903 -UN-26APR95



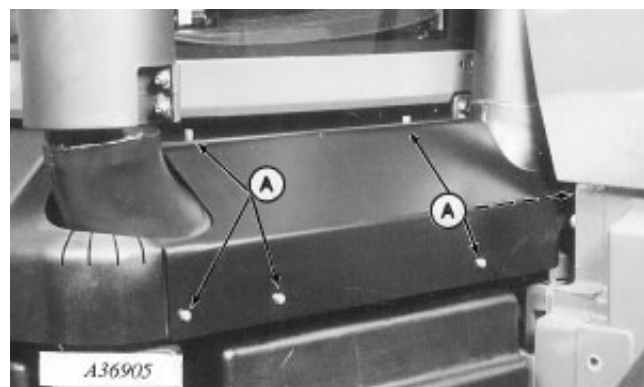
A36904 -UN-26APR95

AG,OUO6023,993 -19-21JUL00-1/7

5.

Remove six cap screws and washers (A) from exhaust shield. Save for re-use.

A—Cap Screws and Washers (6 Used)



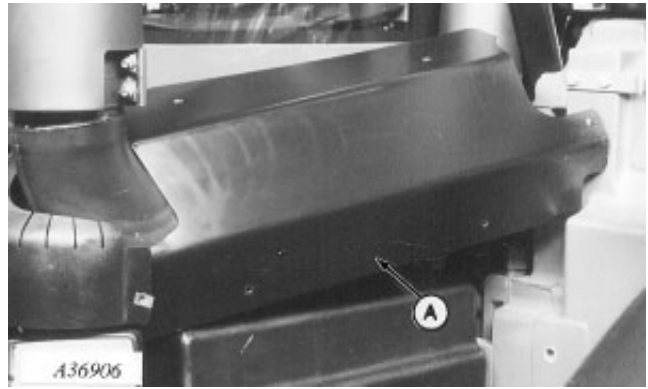
A36905 -UN-26APR95

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AG,OUO6023,993 -19-21JUL00-2/7

6. Remove exhaust shield (A).

A—Exhaust Shield

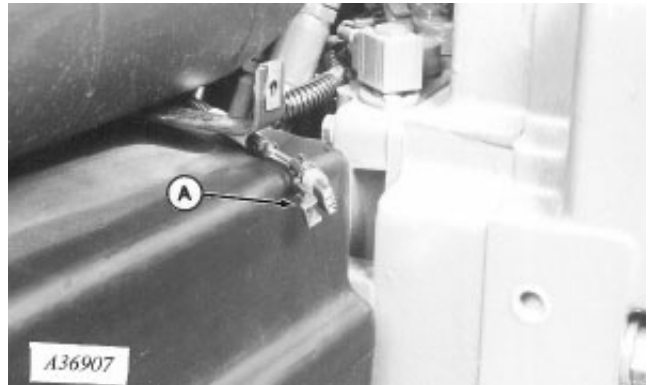


A36906 -UN-26APR95

AG,OUO6023,993 -19-21JUL00-3/7

7. Locate 3-pin connector (A) behind exhaust shield.

A—3-Pin Connector

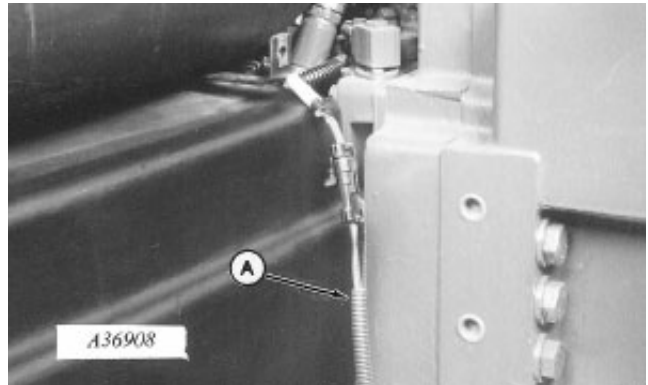


A36907 -UN-26APR95

AG,OUO6023,993 -19-21JUL00-4/7

8. Connect radar harness to adapter harness and adapter harness (A) to 3-pin connector.

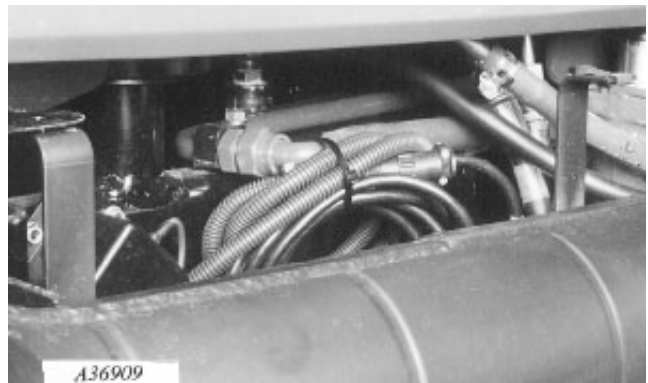
A—Adapter Harness



A36908 -UN-26APR95

AG,OUO6023,993 -19-21JUL00-5/7

9. Coil excess harness and tie away from exhaust using plastic ties as required.



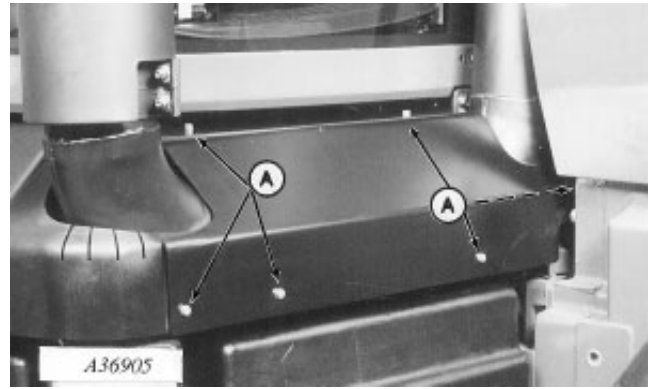
A36909 -UN-26APR95

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AG,OUO6023,993 -19-21JUL00-6/7

10. Install exhaust heat shield with six cap screws and washers (A) and right-hand side engine cover.

A—Cap Screws and Washers (6 Used)



A36905 -UN-26APR95

AG,OUO6023,993 -19-21JUL00-7/7

Preparing the Machine

Preparing and Lubricating 1900 Commodity Air Cart



A40115A -UN-18MAR98

Tow-Between Shown

1. Check tire pressure and inflate as necessary. See TIRE INFLATION PRESSURES in Specifications section.
2. Perform required lubrication. See Lubrication and Maintenance section.
3. Inspect for loose, damaged or missing parts. Repair or replace parts before entering the field.
4. Make sure air and hydraulic hoses and electrical wires do not interfere with moving parts.
5. Check inside tanks and remove any obstructions from meter inlet openings before filling.

AG,OUO6023,994 -19-21JUL00-1/1

Positioning Hitch Link—Tow-Between Cart

Cart operation requires that hitch link (A) be placed in one-of-four adjustment positions to obtain a level profile when attached to the tractor drawbar.

If desired, hitch link position can be adjusted for “front raised” profile to improve ground clearance at the front meter.

Hitch position holes are in increments of 57.2 mm (2.25 in.). If repositioning hitch link to a different set of holes raises or lowers the front of the cart too far beyond level, hitch link can be turned over and returned to it's original set of holes for a half-adjustment. Due to it's offset shape, turning the link over changes hitch height by 28.5 mm (1.125 in.).

After adjustment, tighten link hardware to specification.

Specification

Hitch Link Hardware—Torque	850 N•m (626 lb-ft)
----------------------------------	------------------------



A41848A -UN-22APR98

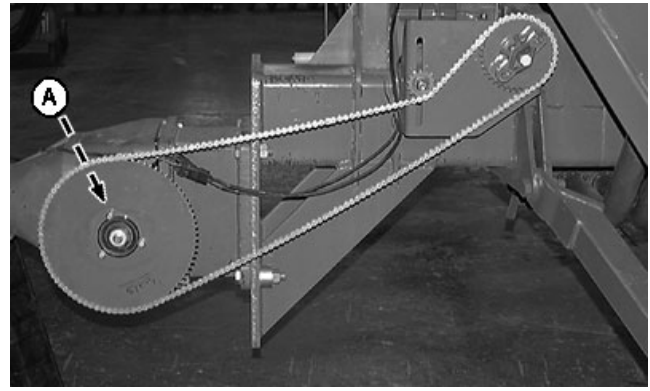
A—Hitch Link

AG,OUO6023,995 -19-21JUL00-1/1

Changing Rear Tires

If rear tires have been changed since last successful seeding, main drive clutch sprocket (A) should be inspected to ensure that tooth count agrees with new tire size. Tooth count is stamped into sprocket for easy identification.

NOTE: Chain length may need to be adjusted when sprockets are changed. Add or remove chain links as necessary.



A41558A -UN-28JUL98

A—Main Drive Clutch Sprocket

Tire Size/Travel Distance/Sprocket Teeth		
Tire Size	Travel Distance mm (in.) per Rev. ^a	Tooth Count
18.4-26 R3, 10PR	4191 (165)	57T
18.4-26 R2, 10PR	4394 (173)	62T
23.1-26 R3, 10PR	4521 (178)	62T
28L-26 R3, 12PR	4775 (188)	62T
23.1-26 R2, 10PR	5029 (198)	68T
28L-26 R2, 12PR	5080 (200)	68T
30.5L-32 R3, 12PR	5359 (211)	72T
30.5L-32 R2, 12PR	5664 (223)	80T
710/70R38 R1W, 2 Star	5893 (232)	80T
20.8R-38 R1, 1 Star	5639 (222)	80T
18.4R-46 R1, 3 Star	6020 (237)	80T
20.8R-42 R1, 2 Star	5867 (231)	80T

^aTire travel per revolution is estimated.

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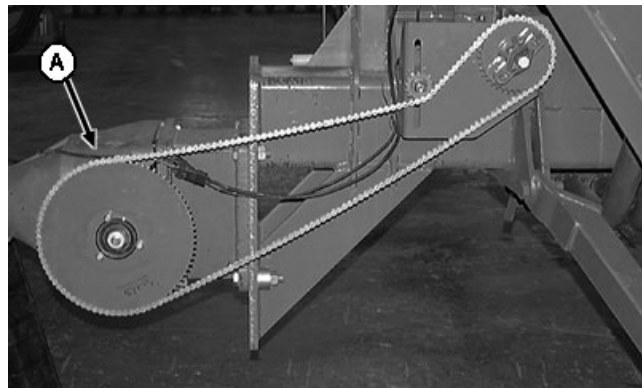
AG,OUO6023,996 -19-21JUL00-1/3

IMPORTANT: When tire size changes, tire speed sensor needs to be recalibrated for accurate display of travel speed, area, and application rate.

Refer to Operating the Machine—Monitor Set-up section, for sensor calibration procedure. Travel distance shown above can be entered into the monitor as an initial setting until full calibration procedure can be performed.

NOTE: Base sprocket selection on similar travel distance (inches traveled in one tire revolution) when unlisted tire size is used.

Wheel hub/axle housings (A) are factory attached to agree with original rear tires and may need to be repositioned if new size rear tires are used.



Drive Side Shown

A—Wheel Hub/Axle Housings

A41849A -UN-28JUL98

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AG,OUO6023,996 -19-21JUL00-2/3

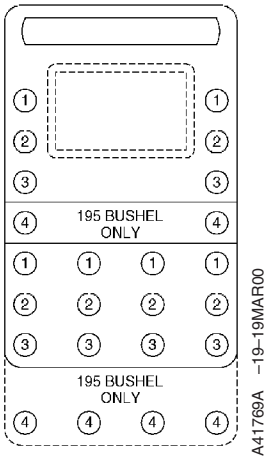
Refer to hole pattern diagram and chart to ensure that hub/axle housing-to-frame position is correct for new size tires.

Tire Sizes	Use Hole Pattern No.
30.5L-32 R2, 710/70R38, 18.4R-46, 20.8R38 Duals, 20.82-42	1
23.1-26 R2, 28L-26 R2, 30.5L-32 R3	2
23.1-26 R3, 28L-26 R3	3
18.4-26 R2 and R3	4 (195 bu TBH ^a ONLY)
^a TBH = Tow-Behind	

IMPORTANT: Rear axle mounting bolts must be tightened to 675 N•m (500 lb-ft) or machine damage may occur. This hardware must be kept tightened to the listed specification to prevent machine damage.

Specification

Rear Axle Mounting Bolts—
Torque 675 N•m
(500 lb-ft)



Changing Row Spacing

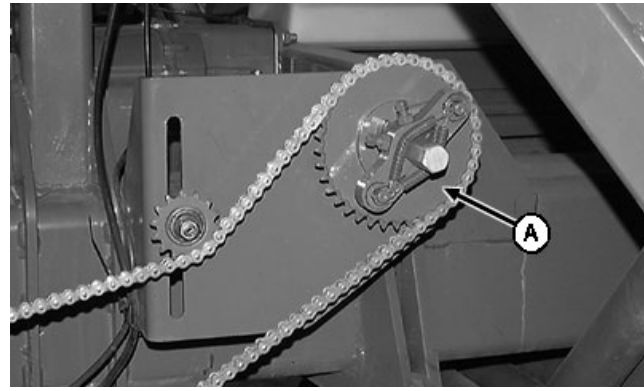
Should new or different seeding equipment be used with cart, or if row spacing is changed, one-way clutch sprocket (A) should be inspected to ensure that tooth count agrees with row spacing. Tooth count is stamped into sprocket for easy identification.

NOTE: Chain length may need to be adjusted when sprockets are changed. Add or remove chain links as necessary.

Seeding Tool Row Spacing	Sprocket Teeth
30.5 cm (12 in.) Row Spacing	23T
25 cm (10 in.) Row Spacing	28T
19 cm (7.5 in.) and 38 cm (15 in.) Row Spacing	37T
15 cm (6 in.) Row Spacing	46T

Following items should be inspected and updated if seeding equipment or row spacing is changed, or if a product change is planned.

- Add primary air runs to cart to agree with seeding runs. Remove manifold seals from newly activated runs or reconfigure manifold to agree with new application.
- Reconfigure meter cartridge assemblies by:
 1. Removing or installing enclosure doors to agree with number and position of active primary air runs.
 2. Add product handling segments to empty enclosures to agree with newly activated runs. Also install agitators above newly activated segments.
 3. Changing meter segments to meet desired product application rates.
 4. Removing or installing fine tuning rings on meter segments to agree with number of secondary header ports.
 5. Reset cart monitor and control system with current information.



A—Clutch Sprocket

A41627B -UN-28JUL98

Determining Tow-Behind (TBH) Commodity Cart/Seeding Tool Compatibility

Total cart weight with product needs to be calculated and compared to seeding tool weight to determine if they can be operated together in either flat or sloped operations.

- For slopes up to 18% Grade (10 degrees), total weight of the cart plus material should not exceed 2.5 times the seeding tool weight.
- For slopes between 18%—27% Grade (10—15 degrees) total weight of the cart plus material should not exceed two times the seeding tool weight.
- For slopes above 27% Grade (15 degrees), Tow-Behind carts should not be used.

IMPORTANT: For further information, see OPERATION ON HILLSIDES or TRANSPORTING ON HILLSIDES.

1. Locate cart size/model and approximate weight in the chart.

NOTE: Grain weight of 60 lbs-per-bushel was used for calculation. Fertilizer calculations used 77 lbs-per-bushel. Your product density may be different.

Size/Model	Weight kg (lb) Empty	Weight kg (lb) With Grain Front, Fertilizer Rear and Third (If Equipped)	Weight kg (lb) With Fertilizer in All Tanks
195 bu Tow-Behind	3629 (8,000)	9861 (21,740)	10,439 (23,015)
250 bu Tow-Behind (3rd Tank)	3969 (8,750)	12,122 (26,725)	12,701 (28,000)
270 bu Tow-Behind	4082 (9,000)	12,587 (27,750)	13,513 (29,790)
340 bu Tow-Behind (3rd Tank)	4423 (9,750)	15,372 (33,890)	16,298 (35,930)
350 bu Tow-Behind	4536 (10,000)	15,604 (34,400)	16,760 (36,950)
430 bu Tow-Behind (3rd Tank)	4876 (10,750)	18,738 (41,310)	19,895 (43,860)

NOTE: If seeding tool is not listed on chart, or was not manufactured by John Deere, refer to your seeding tool operator's manual for weight.

2. Multiply seeding tool weight by 2 or 2.5, depending on operational slope grade (degrees) to determine if cart weight exceeds allowable maximum.

NOTE: Example uses a John Deere 9.5 m (31 ft) 735 Seeding Tool and 195 Bushel Tow-Behind Cart with fertilizer in both tanks.

- For slopes up to 18% grade (10 degrees):

Seeding Tool Weight x 2.5 = Maximum Cart Weight
5625 kg (12,400 lb) x 2.5 = 14,061 kg (31,000 lb).

- For slopes between 18%—27% grade (10—15 degrees):

Seeding Tool Weight x 2 = Maximum Cart Weight
5625 kg (12,400 lb) x 2 = 11,249 kg (24,800 lb).

3. Based on the calculations, example machine combination can be used on slopes up to 18% grade (10 degrees), as the actual weight of the cart with product 10,439 kg (23,015 lb) is less than the calculated maximum weight 14,061 kg (31,000 lb).

This machine combination can be used on slopes between 18%—27% grade (10—15 degrees) as the cart weight with product 10,439 kg (23,015 lb) does not exceed the maximum allowable weight 11,249 kg (24,800 lb) for this operating condition.

Continued on next page

AG,OUO6023,998 -19-21JUL00-1/2

When cart weight with product exceeds calculated maximum weight, product level will need to be reduced to lower cart weight into compliance. Take

a density reading of the product in use, determine kg/L (lb/bushel), and reduce percent-of-fill accordingly.

Seeding Tool Model	Width (m)	Width (ft)	Weight (kg)	Weight (lb)
735	9.5	31	5625	12,400
735	11.0	36	6532	14,400
735	12.5	41	7893	17,400
737	9.5	31	7031	15,500
737	11.0	36	7938	17,500
737	12.5	41	9208	20,300
1810	15.9	52	10,750	23,700
1810	17.4	57	11,113	24,500
1810	18.3	60	11,294	24,900
1820	8.8	29	7666	16,900
1820	10.7	35	8754	19,300
1820	12.5	41	9888	21,800
1820	13.72	45	12,338	27,200
1820	16.2	53	13,426	29,600
1820	18.6	61	14,651	32,300
1850/1860	9.1	30	7711	17,000
1850/1860	11.0	36	9299	20,500
1860	12.2	40	10,197	22,480
1850/1860	12.8	42	10,659	23,500

AG,OUO6023,998 -19-21JUL00-2/2

Attaching and Detaching

Use Your Tractor and Seeding Tool Operator's Manuals

Always refer to YOUR tractor and seeding tool equipment operator's manuals for specific, detailed information regarding equipment operation. Operation and adjustment procedures will vary by equipment.



TS190 -JUN-17JAN89

AG,OUO6023,999 -19-21JUL00-1/1

Use Correct Safety Chain at Tractor Hitch

- Tow-Between Carts:

IMPORTANT: 27,216 kg (60,000 lb) safety chain is provided with both sizes (195 and 270 bu) of tow-between carts.

Some large size, wide-width, heavy-weight seeding tools are supplied with 36,287 kg (80,000 lb) safety chains.

Inspect chains for capacity rating tag and always use highest strength chain at cart-to-tractor attachment.

- Tow-Behind Carts:

IMPORTANT: Two safety chains are used, one on each side of field hitch-to-seeding tool attachment.

Cart Size	Chain Capacity kg (lb)	Quantity
195 bu w/ or w/o Middle Tank	9072 (20,000)	2
270 bu w/ or w/o Middle Tank	9072 (20,000)	2
350 bu w/o Middle Tank	9072 (20,000)	2
350 bu w/ Middle Tank	13,608 (30,000)	2

IMPORTANT: Use these chains only at their assigned locations (hitch-to-seeding tool rear bar), not at the tractor drawbar.

- Seeding Tool With Tow-Behind Cart

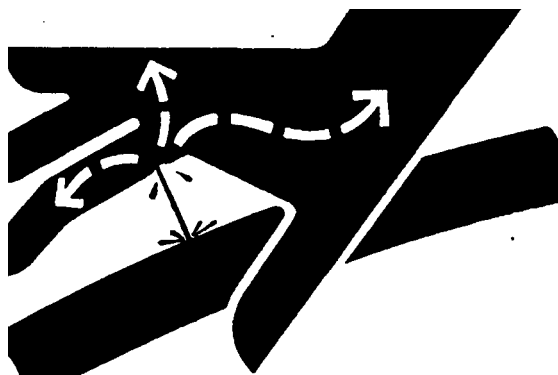
IMPORTANT: Inspect seeding tool safety chain for rating tag to ensure that it's capacity is equal to or higher than the combined total weight of seeding tool with cart. Weights of carts and John Deere seeding tools are shown in Preparing the tractor—General section under **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT**.

Refer to your seeding equipment operator's manual for machine weight when seeding tool was not manufactured by John Deere.

AG,OUO6023,1000 -19-21JUL00-1/1

Making Proper Hose Connections

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.



X9811 -UN-23AUG88

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

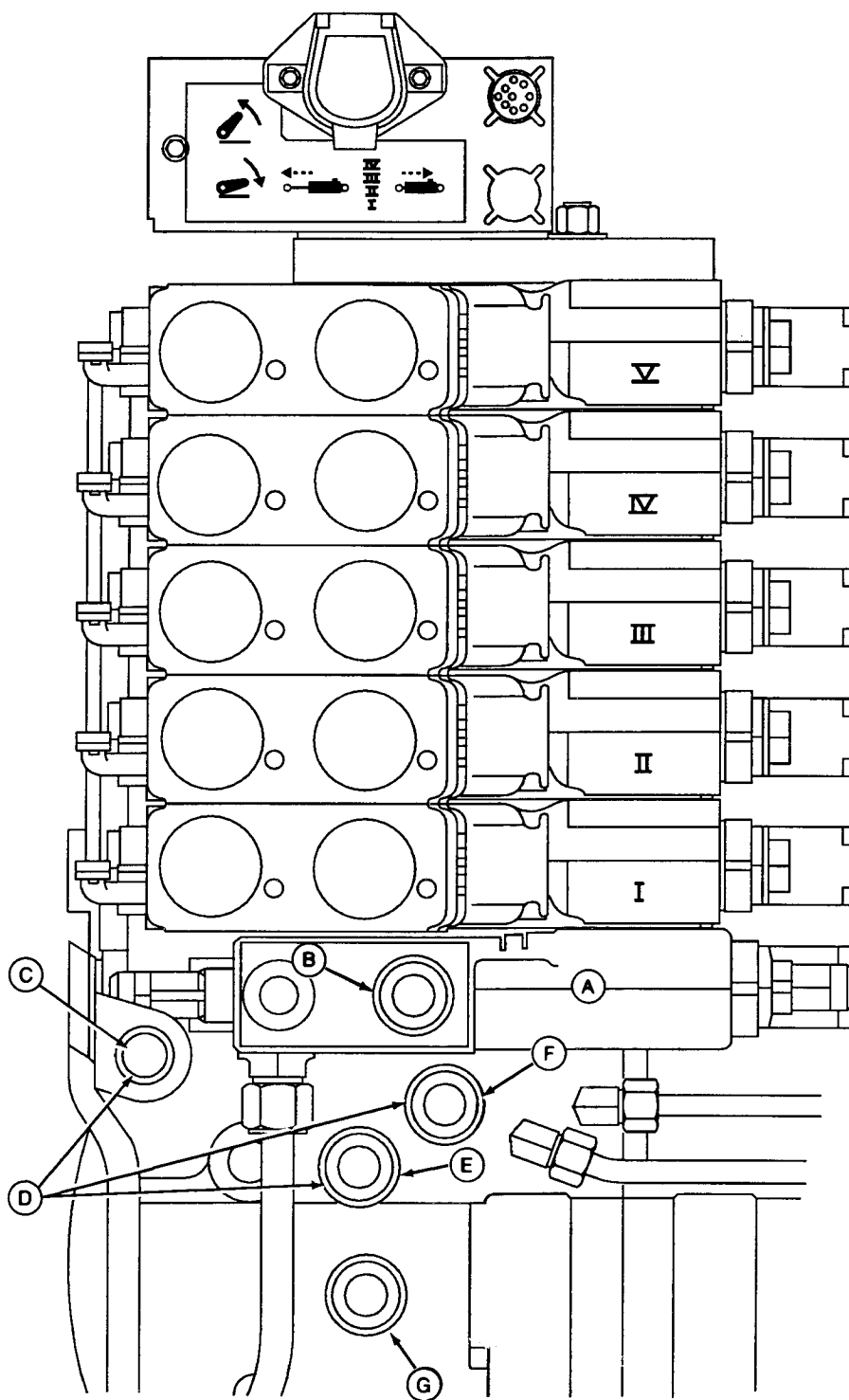
IMPORTANT: All hydraulic couplers must be clear of debris, dust, and sand. Use protective caps on fluid openings until ready to make connection. Foreign material can damage the hydraulic system.

Color coded bands are provided with some John Deere seeding equipment to help identify and properly connect depth-control hoses and wing-fold hoses to couplers.

If desired, Hose Identification Kits AA50028 are available from your John Deere dealer.

AG,OUO6023,1001 -19-21JUL00-1/1

Hydraulic Component Identification—8000 Series Tractors



RW56000 -JN-15JUL96

Continued on next page

AG,OUO6023,1002 -19-21JUL00-1/2

Attaching and Detaching

A—Hitch Valve

B—Auxiliary Hitch Valve Port

**C—Power Beyond Load Sense
Coupler**

D—Power Beyond Ports

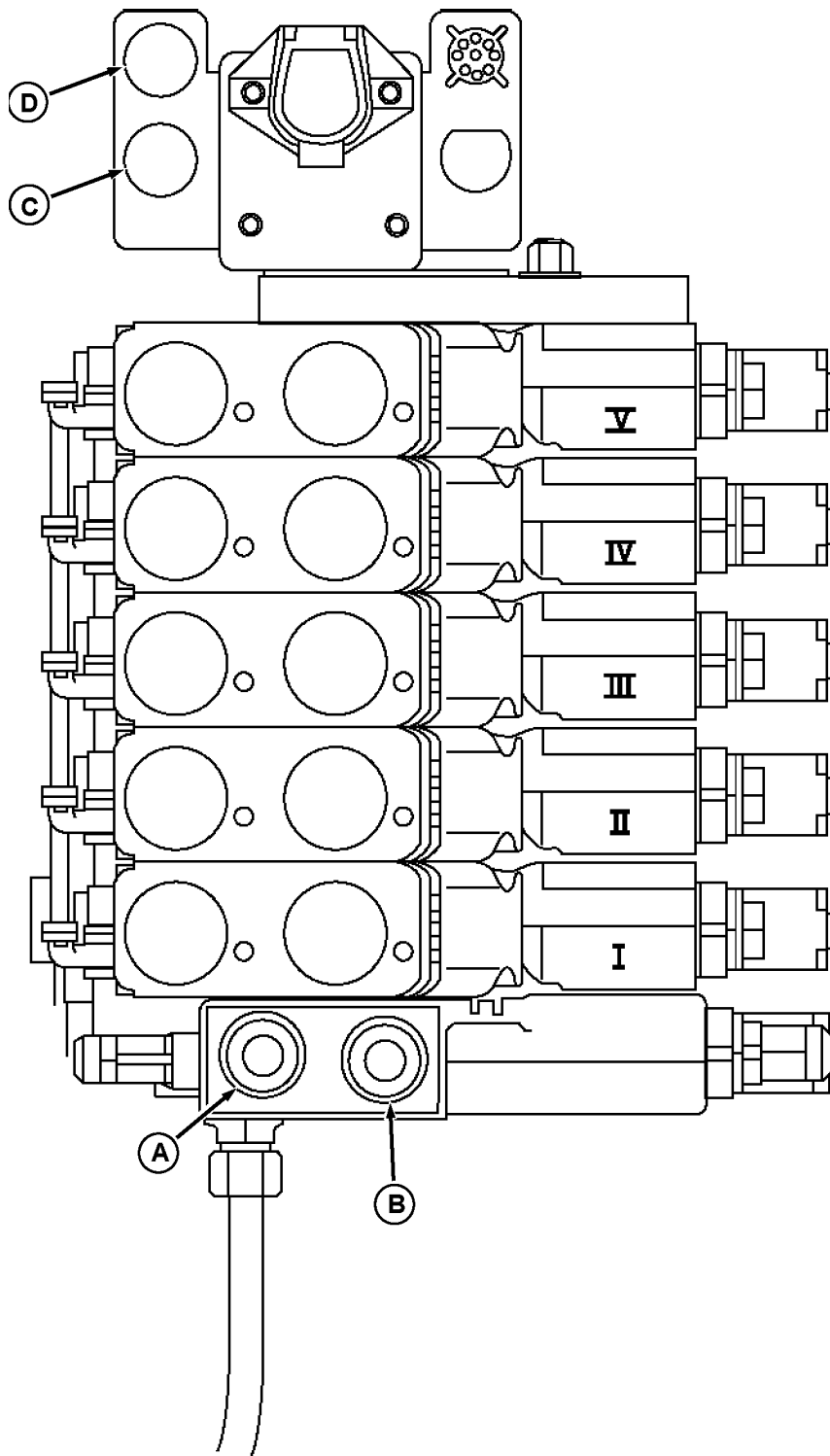
**E—Return Port (Power Beyond
or Motor Return)**

F—Auxiliary Pressure Port

**G—Sump Port (Fan Motor
Case Drain Connection)**

AG,OUO6023,1002 -19-21JUL00-2/2

Hydraulic Component Identification—Less Hitch—9000 Series Tractors



RW56431A -UN-08MAR99

A—Power Beyond Pressure Port

B—Power Beyond Return Port

C—Power Beyond Load Sense Coupler

D—Sump Port (Fan Motor Case Drain Connection)

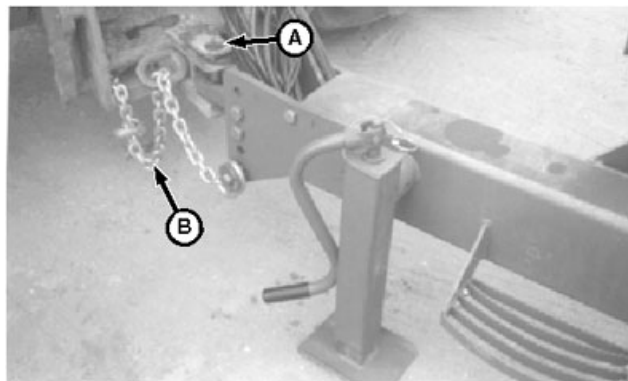
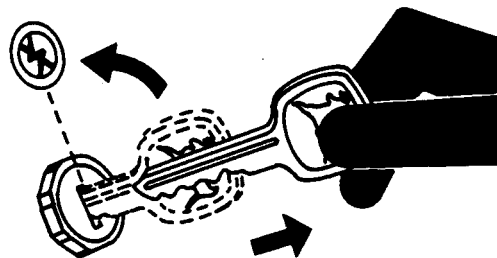
Attaching Machine to Tractor (Seeding Tool or Tow-Between Cart)

CAUTION: Help prevent personal injury caused by unexpected movement of the machine. Engage parking brake and/or place transmission in “PARK”, shut off engine, and remove key before working around hitch.

1. Back tractor into position and attach hitch link to drawbar using pin (A). Be sure hitch pin is retained, following instructions in tractor operator’s manual.

CAUTION: A safety chain will help control drawn equipment should it accidentally separate from the drawbar while transporting. A runaway machine could cause severe injury or death to a motorist, bystander or the operator. Using the appropriate adapter parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in chain to permit turning. See your John Deere dealer for a chain with a strength rating equal to or greater than the gross weight of the towed machine.

2. Attach safety chain (B) to tractor drawbar.



Tow-Between Cart Shown

A—Pin
B—Safety Chain

TS230 –UN-24MAY89

A41633 –UN-28APR97

Continued on next page

AG,OUO6023,1004 –19-21JUL00-1/7

IMPORTANT: Fan motor case drain **MUST** be attached to low-pressure drain connection (**LESS THAN 689 kPa [6.89 bar] [100 psi]**) or fan motor will be damaged.

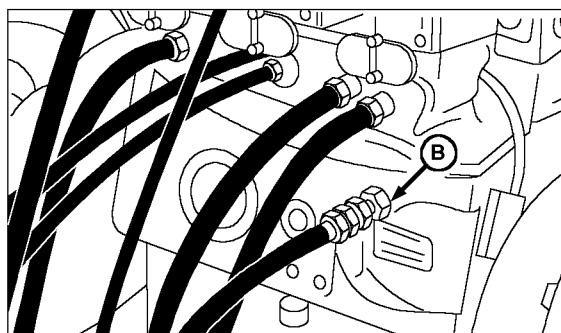
IMPORTANT: Installation of a Low-Pressure Drain Line Kit is required if towing tractor is not so equipped. Refer to **LOW-PRESSURE DRAIN CONNECTION** in Preparing the Tractor - General section for appropriate kit.

IMPORTANT: **DO NOT USE** other ports at the rear of the tractor (such as power-beyond ports) which may be similar in appearance and size to low-pressure drain port. Due to high back-pressure (over 689 kPa [6.89 bar] [100 psi]), drain connection to these ports **WILL RESULT** in fan motor damage.

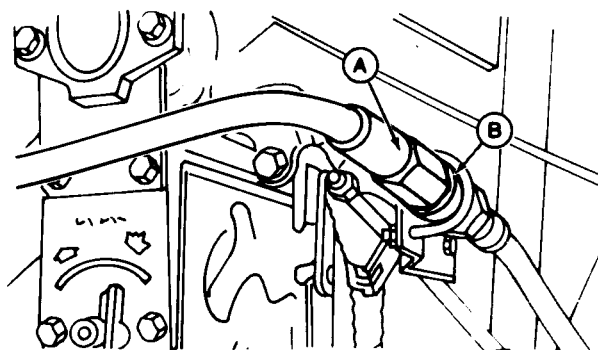
3. Attach fan motor case drain hose (A) to low-pressure drain coupler (B). Refer to **HYDRAULIC COMPONENT IDENTIFICATION—8000 and 9000 SERIES TRACTORS**.

A—Drain Hose

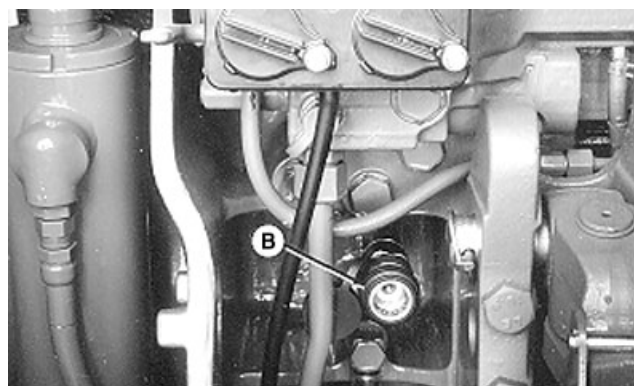
B—Drain Coupler



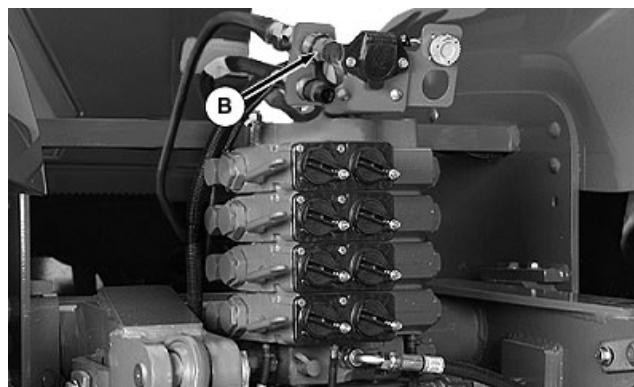
30—60 Series Row Crop Tractors



60 and 70 Series 4WD Tractors



8000 Series Tractors



9000 Series Tractors

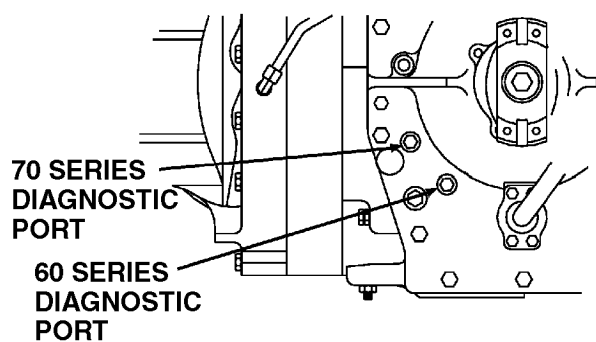
Continued on next page

AG,OUO6023,1004 -19-21JUL00-2/7

IMPORTANT: When operating with a John Deere 735 or 1810 Seeding Tool, a second low-pressure drain connection must be made for proper operation of depth control relief circuit. Depth control bleed-off hose can be connected to motor return, power beyond port, or to an open SCV if available. If connection is made to an open SCV port, place control lever for this SCV in "FLOAT" position when operating.

Drain line kit must route to appropriate diagnostic port or drain location as shown for 60 and 70 series 4WD tractors and 9000 series tractors.

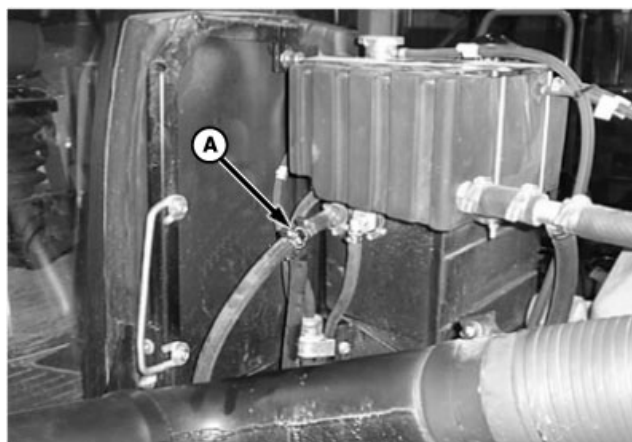
A—9000 Series Drain Line Kit Connection Point



FRONT VIEW OF DIFFERENTIAL

60 and 70 Series 4WD Tractors

A45667 -19-10DEC99



9000 Series Drain Line Kit Connection

A45668A -UN-07JAN00

Continued on next page

AG,OUO6023,1004 -19-21JUL00-3/7

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before attaching hydraulic hoses to couplers.

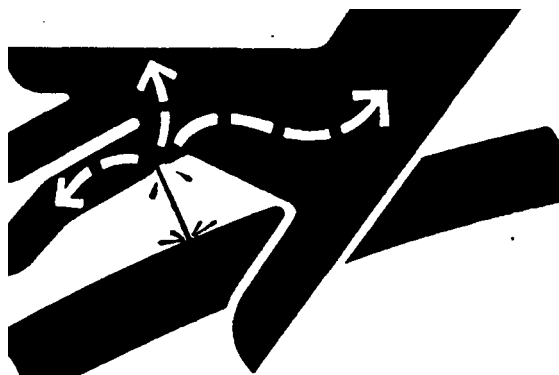
CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

IMPORTANT: Be sure to correctly connect depth control hoses to couplers when attaching 1810 Seeding Tool with TouchSet™ Depth Control to John Deere 8000 or 9000 Series Tractors. If hose connections are reversed, machine will not respond to TouchSet™ controls. Oil flow must agree with symbols on hose identification tag; “EXTEND” hose always goes in left coupler.

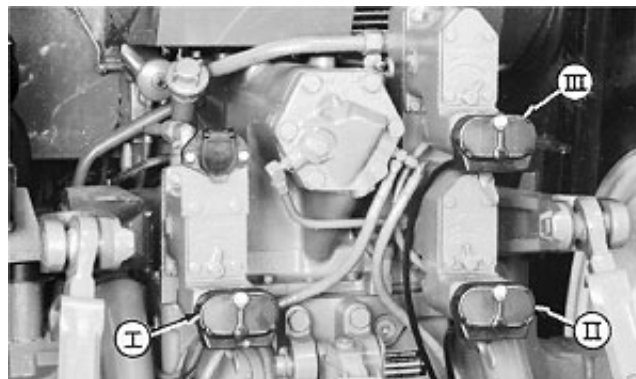
4. Plug depth control hoses (A) into No. 1 hydraulic coupler.

5. Plug wing-fold hoses into No. 2 hydraulic coupler.

A—Depth Control Hoses

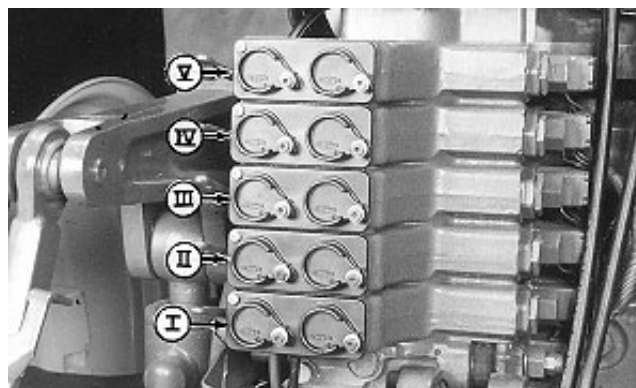


X9811 –UN-23AUG88



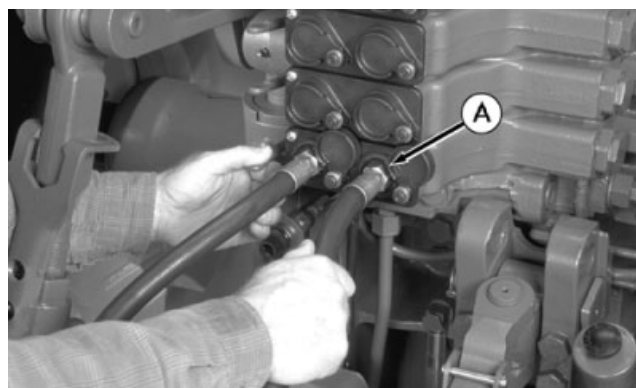
RW5836 –UN-07DEC88

With Mechanical SCV Controls



N48100 –UN-01JUN94

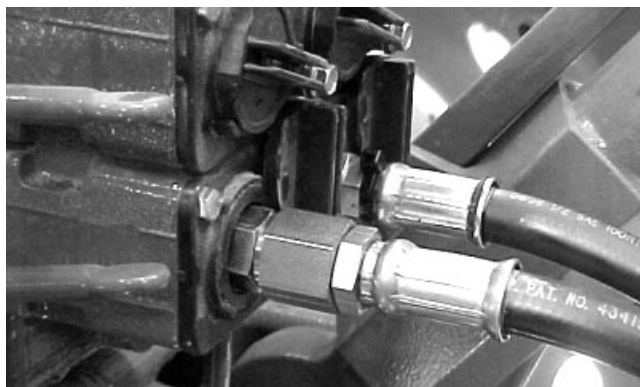
With Electro/Hyd. SCV Controls



RW55304 –UN-28JUN94

6. Plug fan/auger hoses into No. 3, No. 4 or No. 5 hydraulic coupler.

Connect hoses so fan turns with SCV lever in forward position. Usually the hose with the extra adapter goes in the left-hand SCV port.

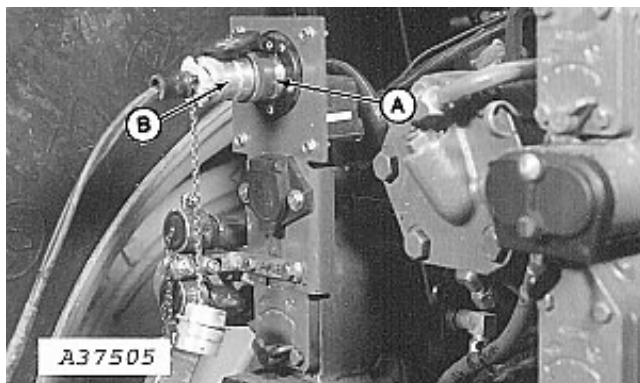


AG,OUO6023,1004 -19-21JUL00-5/7

A42167A -UN-19JUL00

7. Connect cart controller power and communications cable (B) to plug (A).

A—Plug
B—Cable



60 Series Tractor

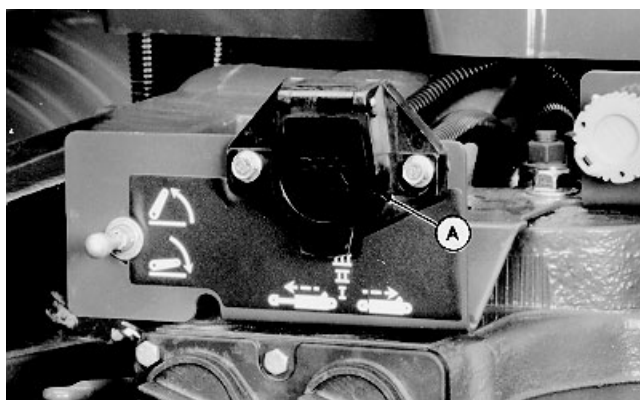
AG,OUO6023,1004 -19-21JUL00-6/7

A37505 -UN-06SEP95

NOTE: Field installation of 7-Terminal Auxiliary Electric Kit RE17282 is required if towing tractor is not equipped with an electrical outlet. See your John Deere dealer for installation.

8. Plug clutch power and warning light cable into tractor electrical outlet (A).

A—Electrical Outlet



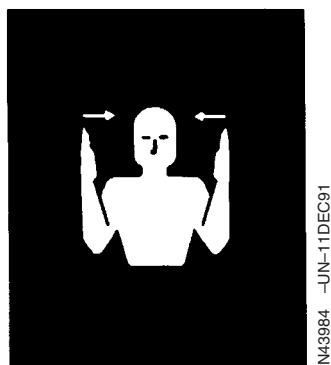
8000 Series Tractor Shown

AG,OUO6023,1004 -19-21JUL00-7/7

RW75002 -UN-29MAY96

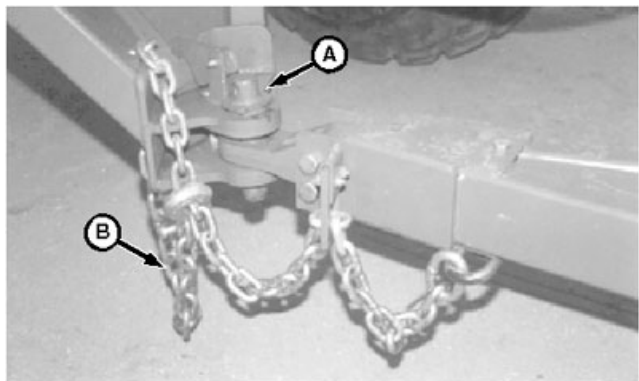
Attaching Seeding Tool to Tow-Between Cart

CAUTION: Use a signal person to direct tractor/seed cart movement. Tractor operator's view of seeding tool hitch point is completely obscured by seed cart. Know hand signals and what each signal means before moving. Move slowly and follow signal person's directions to avoid a crushing accident which could cause severe injury or death to someone. Do not stand between air cart and implement while cart and tractor are in motion.



1. Align hitch and attach with pin (A).

CAUTION: A safety chain will help control drawn equipment should it accidentally separate from the hitch while transporting. A runaway machine could cause severe injury or death to a motorist, bystander or the operator. Using the appropriate adapter parts, attach the chain to the seeder cart. Provide only enough slack in chain to permit turning. See your John Deere dealer for a chain with a strength rating equal to or greater than the gross weight of the towed machine.



A—Pin
B—Safety Chain

2. Attach safety chain (B) to seed cart hitch.

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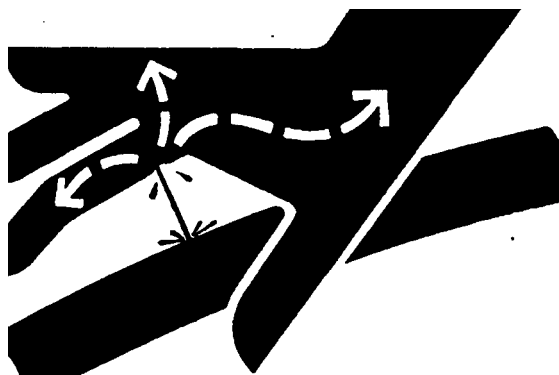
AG,OUO6023,1005 -19-21JUL00-1/3

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before attaching hydraulic hoses to couplers.

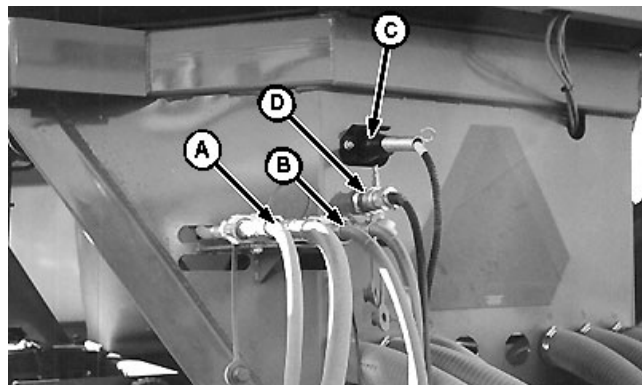
CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

NOTE: To help identify and properly connect hoses, Hose Identification Kit AR103808 is available from your John Deere dealer.

3. Plug depth-control hoses into No. 1 hydraulic couplers (A). With 735 Seeding Tools, attach depth-control crossover relief valve hose to low-pressure connector (not shown).
4. Plug wing-fold hoses into No. 2 hydraulic couplers (B).
5. Plug warning light cable into plug (C).
6. If equipped with Seed Counters and/or Blockage Monitor, attach communications cable to plug (D).



X9811 -UN-23AUG88



A41635A -UN-12DEC97

A—No. 1 Hydraulic Couplers
B—No. 2 Hydraulic Couplers
C—Plug
D—Plug

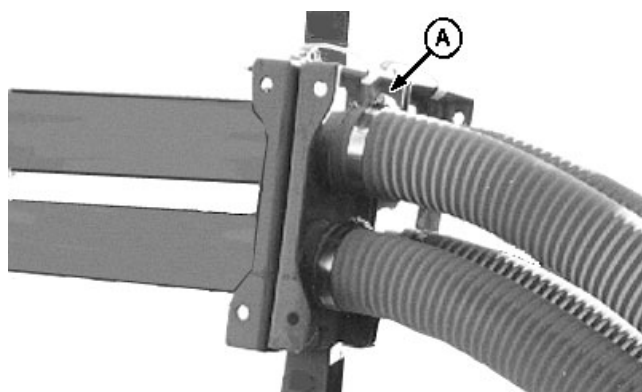
AG,OUO6023,1005 -19-21JUL00-2/3

NOTE: Be sure seals are in place when attaching hose connector.

7. Remove coupler cover plates and attach seed cart hose connectors (A) to seeding tool with clips.

If hose connectors were not covered during off-season storage, remove collected debris (rodent nests, etc.) from tubes before making connections.

A—Hose Connectors



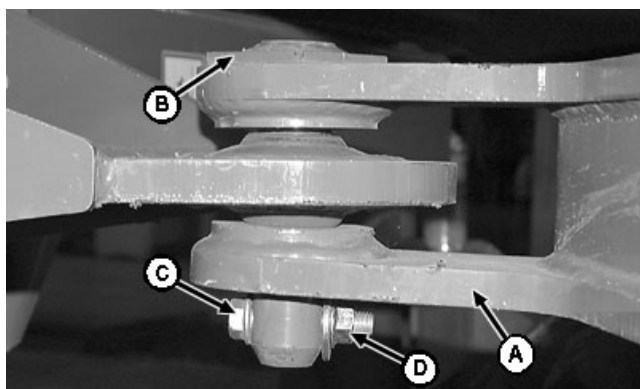
A42323 -UN-20JAN98

AG,OUO6023,1005 -19-21JUL00-3/3

Attaching Tow-Behind Cart to Air Seeder

1. Attach hitch (A) to cart using pin (B) with M12 x 50 cap screw (C) and lock nut (D) on bottom.

A—Hitch
B—Pin
C—Cap Screw
D—Lock Nut

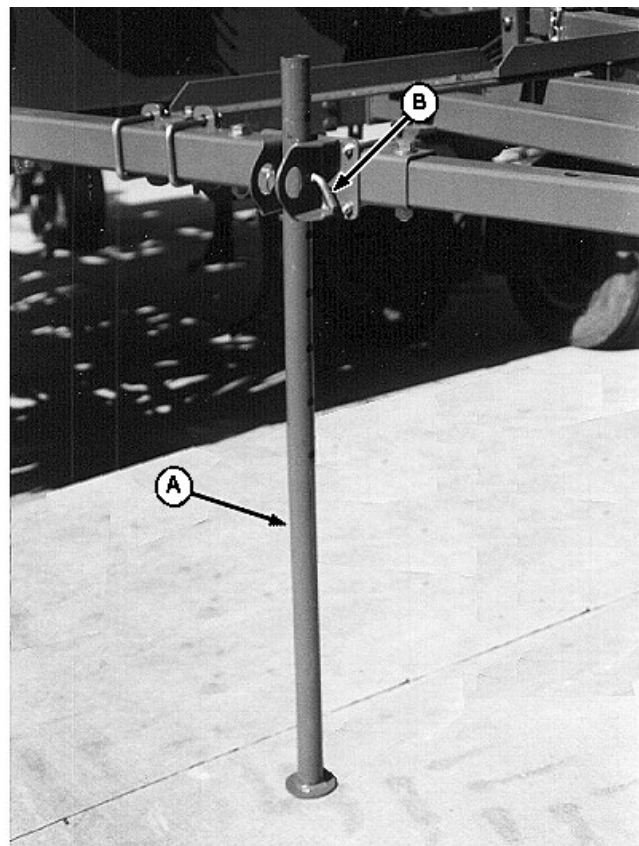


AG,OUO6023,1006 -19-21JUL00-1/8

A42142A -JUN-28JUL98

2. Use storage stands (A) to support outer end of hitch tubes during attachment. Position stands for ground contact and install L-pin (B) and quick-lock pin.

A—Storage Stands
B—L-Pin



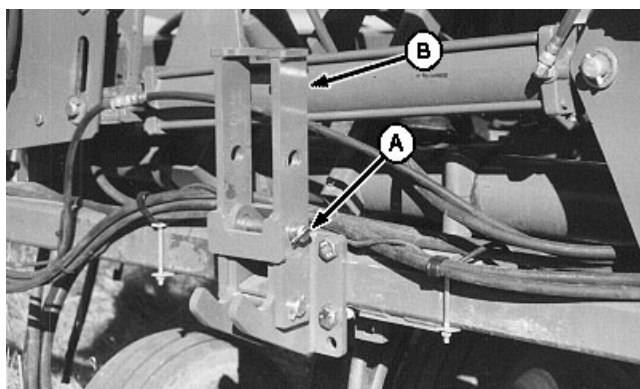
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AG,OUO6023,1006 -19-21JUL00-2/8

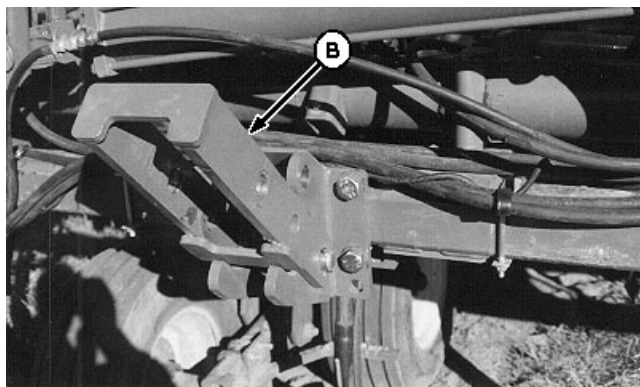
A42143 -JUN-22OCT97

3. Remove pin (A) from bracket and place arm (B) on rest plate. Repeat on opposite side bracket.

A—Pin
B—Arm



A42146 -UN-22OCT97



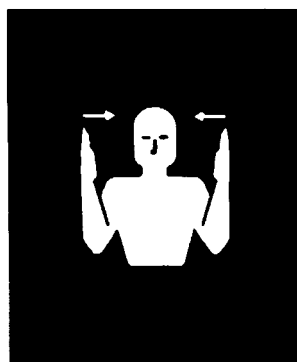
A42147 -UN-22OCT97

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AG,OUO6023,1006 -19-21JUL00-3/8



CAUTION: Use a signal person to direct tractor/seeding tool movement. Tractor operator's view of seed cart hitch points is obscured by seeding tool. Know hand signals and what each signal means before moving. Move slowly and follow signal person's directions to avoid a crushing accident which could cause severe injury or death to someone. Do not stand between air cart and implement while machines are in motion.

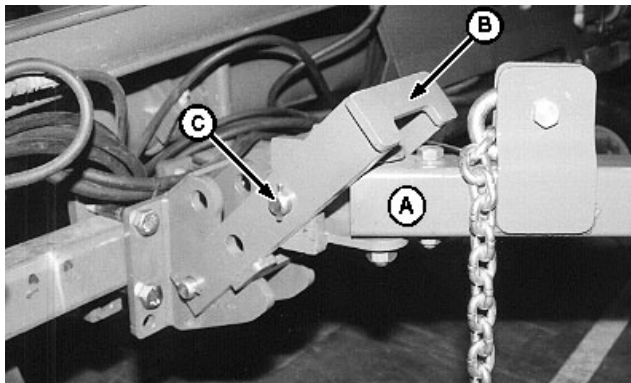


N43984 -UN-11DEC91

4. Back seeding tool toward cart and align hitch tubes (A) to arms (B).

NOTE: Hitch tubes attach at top holes in arms.

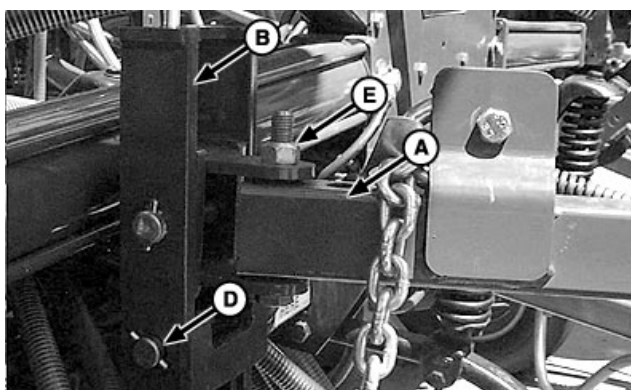
5. When holes align, install pins (C) through top arm holes and hitch tubes. Retain pins with quick-lock pins.
6. With both tubes attached to arms, back seeding tool toward cart to raise arms to vertical positions.
7. When holes align, retain arms in vertical positions using pins (D) and quick-lock pins.
8. Torque hitch tube hardware (E) to specification.



A42148 -UN-13NOV97

Specification	
Hitch Tube Hardware—Torque	1153 N•m (850 lb-ft)

- A—Hitch Tubes
- B—Arms
- C—Pins
- D—Pins
- E—Hitch Tube Bolts



A43763 -UN-09OCT99

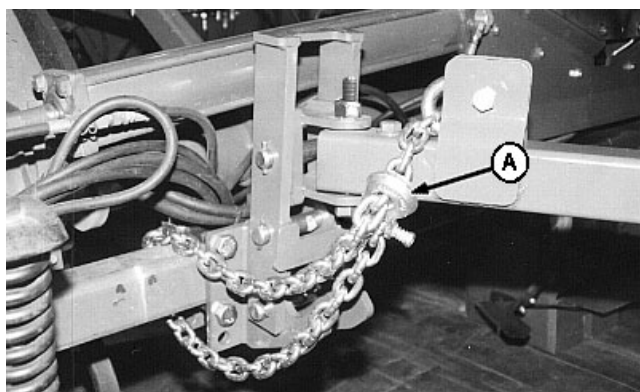
Continued on next page

AG,OUO6023,1006 -19-21JUL00-4/8



CAUTION: Safety chains will help control drawn equipment should it accidentally separate from the hitch while transporting. A runaway machine could cause severe injury or death to a motorist, bystander or the operator. Using the appropriate adapter parts, attach chains to the seeder cart hitch and rear bar of seeding tool. Provide only enough slack in chain to permit turning. See your John Deere dealer for chains with a strength rating equal to or greater than the gross weight of the towed machine.

9. At both hitch connections, wrap safety chains (A) around rear bar and retain with hook latch.



A42150A -UN-11OCT99

A—Safety Chains

Continued on next page

AG,OUO6023,1006 -19-21JUL00-5/8

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before attaching hydraulic hoses to couplers.

CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

NOTE: To help identify and properly connect hoses, Hose Identification Kit AR103808 is available from your John Deere dealer.

10. Plug fan/auger hoses (A) into hydraulic couplers.

IMPORTANT: Fan motor case drain **MUST** be attached to low-pressure drain connection or fan motor will be damaged.

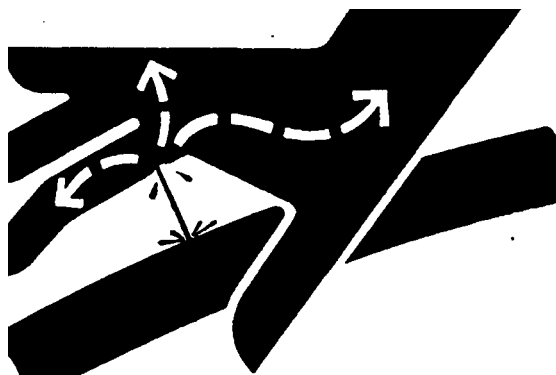
Installation of a Low-Pressure Drain Line Kit is required if towing tractor is not so equipped.

Other ports at the rear of the tractor (such as power-beyond ports) may be similar in appearance and size to low-pressure drain port. Due to high back-pressure (over 689 kPa [6.89 bar] [100 psi]), drain connection to these ports will result in fan motor damage.

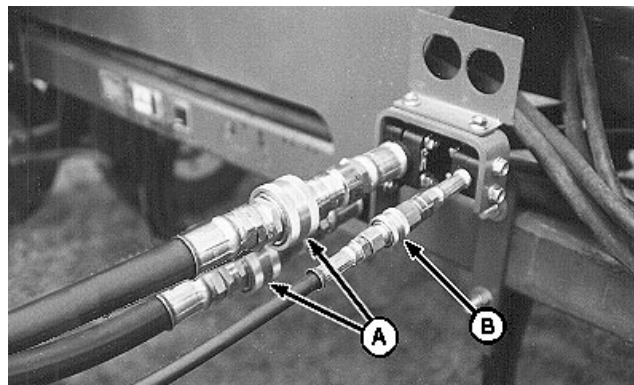
11. Attach fan motor case drain hose to low-pressure drain coupler (B).

12. Attach cart clutch and light power harness to connector plug (C).

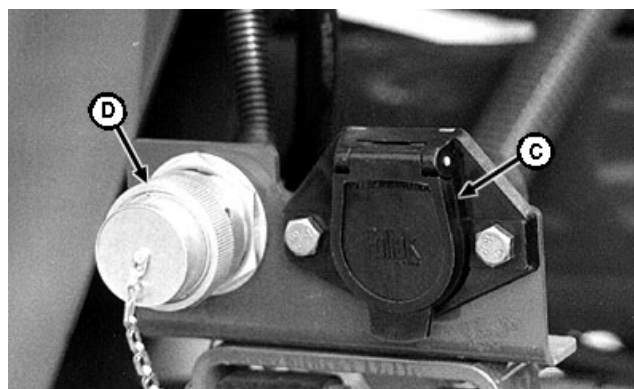
13. Attach controller power and communications cable to connector plug (D).



X9811 -UN-23AUG88



A42161A -UN-19JUL00



A42602 -UN-11MAY98

A—Fan/Auger Hoses
B—Drain Coupler
C—Connector Plug
D—Connector Plug

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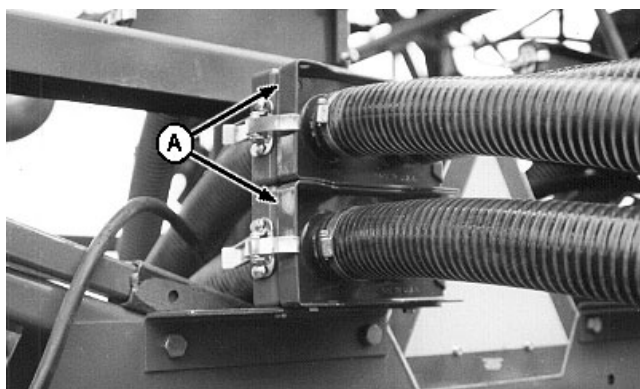
AG,OUO6023,1006 -19-21JUL00-6/8

NOTE: Be sure air hose gaskets are in place when attaching hose connector.

14. Remove coupler cover plates and attach seed cart hose connectors (A) to seeding tool with clips.

If hose connectors were not covered during off-season storage, remove collected debris (rodent nests, etc.) from hoses before making connections.

A—Hose Connectors

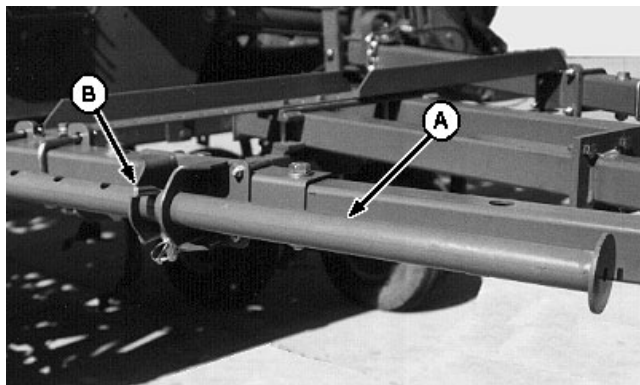


A42162 -UN-27OCT97

AG,OUO6023,1006 -19-21JUL00-7/8

15. Remove pins and move storage stands (A) into transport/field position. Retain stands with L-pins (B) and quick-lock pins.

A—Storage Stands
B—L-Pins



A42156 -UN-22OCT97

AG,OUO6023,1006 -19-21JUL00-8/8

Connecting Remote Seeder Switch Wiring

As seeding equipment lowers, remote switch closes to engage main drive clutch. On John Deere 730 Air Disk Drill, remote switch also energizes the disk lowering solenoid.

Continued on next page

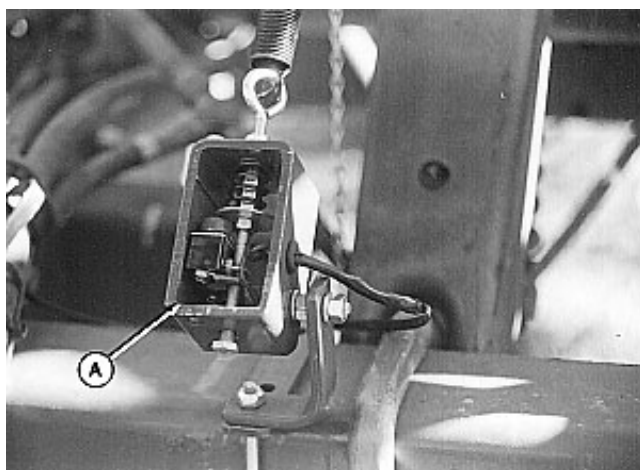
AG,OUO6023,1007 -19-21JUL00-1/2

NOTE: Harness lead is labeled "LIFT".

NOTE: Some models of the 1860 No-Till Air Drill may be equipped with two remote seeder switches. Connect cable to cart for switch on desired rank of openers (front or rear). Cables and switches are marked with color-coded tie bands for ease of identification.

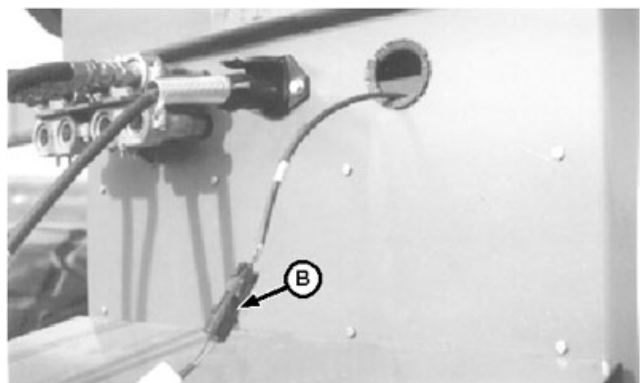
Attach cable from switch (A) to "LIFT" connector (B) at the seed cart.

A—Switch
B—Connector



Remote Switch

N47023 -UN-04AUG95



Tow-Between Shown

A41636 -UN-28APR97

AG,OUO6023,1007 -19-21JUL00-2/2

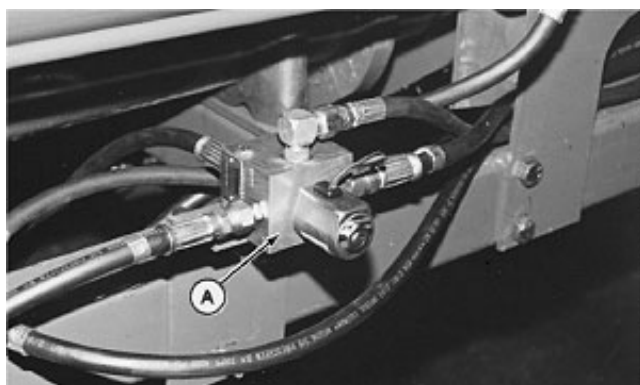
Connecting Disk Lowering Solenoid Wiring—730 Air Disk Drill

Disk lowering solenoid (A) operates to extend cylinders and lower disks into the ground. Operating voltage is supplied to the solenoid by the cart controller through operation of the remote seeder switch in the same way as the cart's main drive clutch.

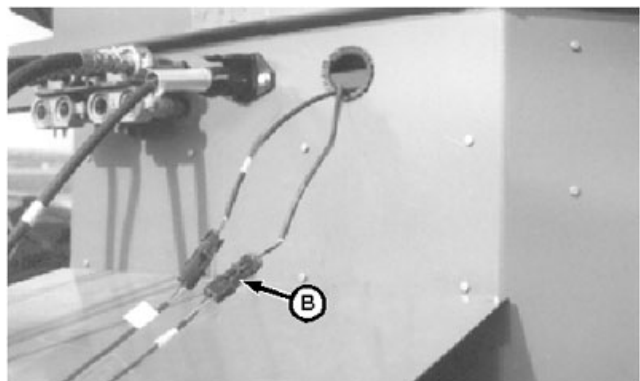
NOTE: Harness lead is labeled "SOL LOCK".

Attach disk lowering solenoid harness to "SOL LOCK" connection (B) at the rear of the cart.

A—Disk Lowering Solenoid
B—Connection



N45561 —UN-14OCT93



A41637 —UN-28APR97

Tow-Between Shown

AG,OUO6023,1008 —19-21JUL00-1/1

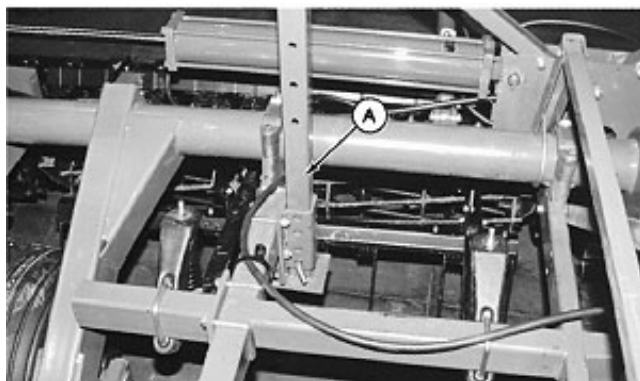
Raising and Lowering Parking Stands—730 Air Disk Drill

CAUTION: Tongue can whip upward when unhitching. To avoid bodily injury, lower the machine or the rear parking stands to ground before removing hitch pin.

RAISE parking stands (A) to transport position only after securing hitch pin with flat washer, cap screw and lock nut.

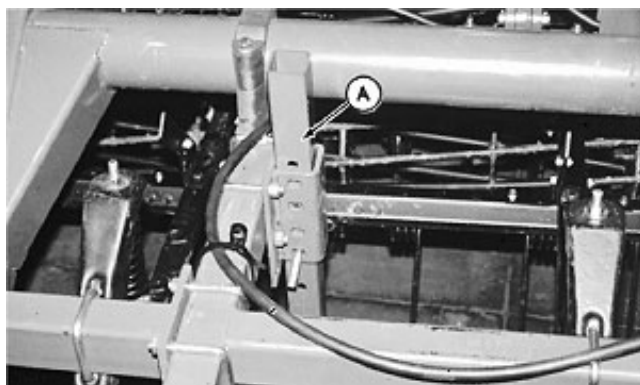
LOWER parking stands (A) to storage position before removing hitch pin.

A—Stand



N45563 —UN-14OCT93

Raised (Transport) Position



N45564 —UN-14OCT93

Lowered (Storage) Position

AG,OUO6023,1009 —19-21JUL00-1/1

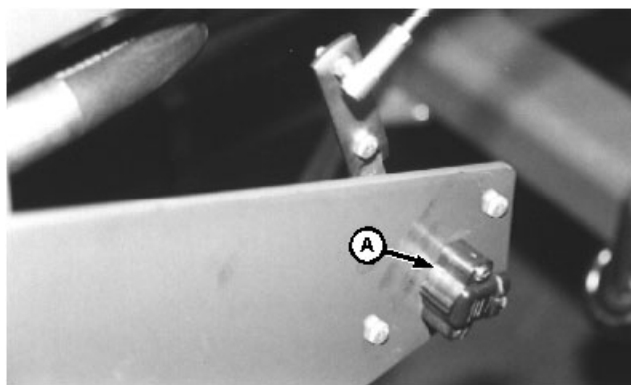
Connecting Optional TouchSet™ Depth Control Wiring—1810 Seeding Tool

Potentiometer (A) signals frame position to the tractor's electronic controller.

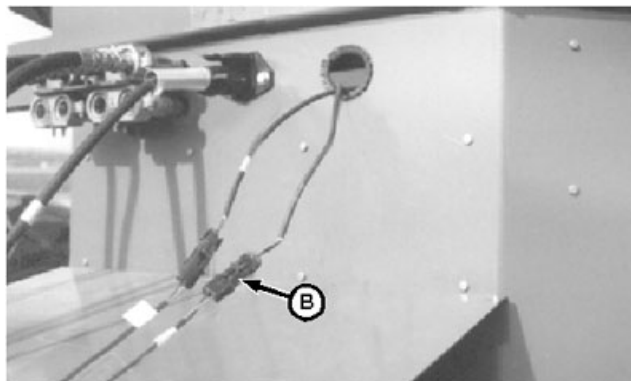
With Tow-Between Cart:

Attach potentiometer wiring harness to extension harness connector (B) at the rear of the cart.

- A—Potentiometer
- B—Extension Harness Connector



A37993 —UN-10OCT96



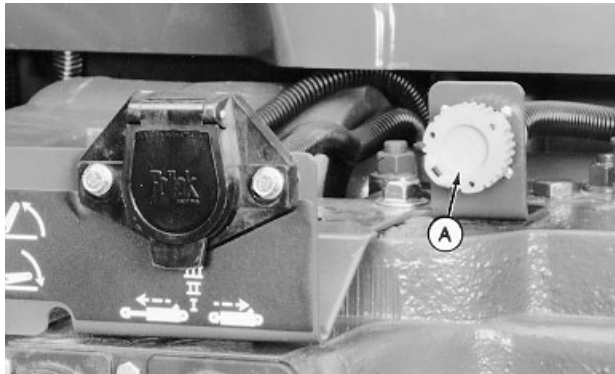
A41637 —UN-28APR97

TouchSet is a trademark of Deere & Company.

AG,OUO6023,1010 —19-21JUL00-1/2

Attach TouchSet™ depth-control wiring harness (tow-behind cart) or extension harness (tow-between cart) to 9-terminal connector (A) at rear of tractor.

- A—9-Terminal Connector



RW75003 —UN-07JUN96

TouchSet is a trademark of Deere & Company.

AG,OUO6023,1010 —19-21JUL00-2/2

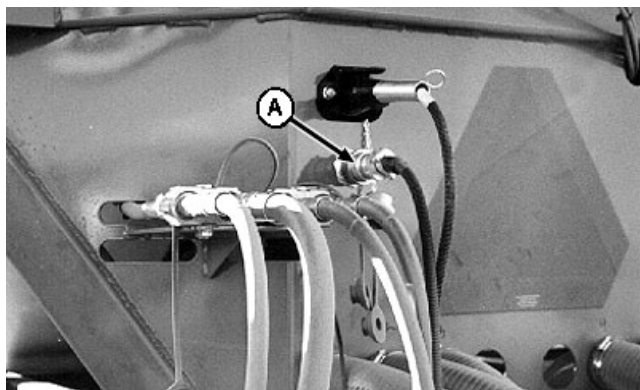
Connecting Optional Blockage Warning/Seed Counting Wiring Harness—If Equipped

Tow-Between Cart (Shown): If seeding tool is equipped with blockage monitoring system and/or seed counting system, interface connection must be made to the carts' standard monitor and control system at DEUTSCH™ screw-on connector (A).

Tow-Behind Cart (Not Shown): When equipped with seed counting system, interface connection is made on the cart and is not externally visible.

When seeding equipment is equipped with blockage monitoring system, interface connection is made at the rear of the seeding tool. This interface connection uses a DEUTSCH™ screw-on connector, similar in appearance to the one shown in tow-between application.

Tow-Between or Tow-Behind Carts: Refer to Seed Counting System or Blockage Warning System section(s) for further information on interface connections.



A42598 -UN-06MAY98

A—DEUTSCH™ Connector

DEUTSCH is a trademark of Deutsch Co.

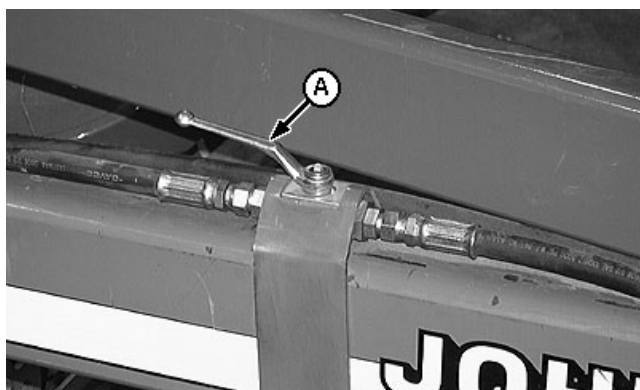
AG,OUO6023,1011 -19-21JUL00-1/1

Opening and Closing Transport Lock-Up Valve

After making hydraulic hose connections to tractor or cart, open transport lock-up valve (A) to check depth-control operation.

Before transporting, raise machine fully using depth-control cylinders and close transport lock-up valve.

A—Lock-Up Valve



A43344 -UN-19APR99

AG,OUO6023,1012 -19-21JUL00-1/1

Check Hydraulic Control Functions

CAUTION: Be sure machine area is clear of bystanders and stationary obstacles before checking control functions.

Bystanders can be struck by moving machine parts and severely injured or killed.

Machine contact with stationary obstacles may cause damage.

Refer to your tractor and seeding equipment operator's manuals for specific instructions and check that:

1. Depth-Control Operations—Frame or openers raise and lower in response to No. 1 control lever.
2. Wing-Fold Operations—Wings unfold and fold in response to No. 2 control lever.

CAUTION: Keep all persons away from machine when checking fan operation. Seed or fertilizer blowing out at high speed can strike someone, causing eye and other personal injuries.

IMPORTANT: DO NOT start fan unless you are sure case drain line is properly connected to low-pressure drain port. Fan motor damage occurs very quickly if hose is not properly connected.

3. Fan Operations—Fan turns in response to No. 3, No. 4 or No. 5 control lever.

AG,OUO6023,1013 -19-21JUL00-1/1

Detaching Machines From Tractor

CAUTION: To help prevent severe injury or death to you or someone else:

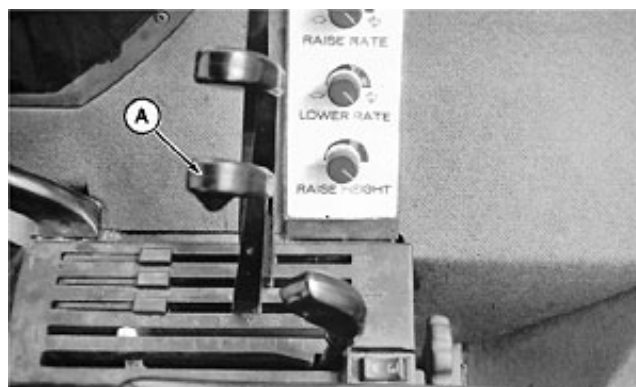
Keep all persons away from machine when raising and lowering wings.

Always locate machine on level ground when raising and lowering wings.

Never raise or lower wings when moving.

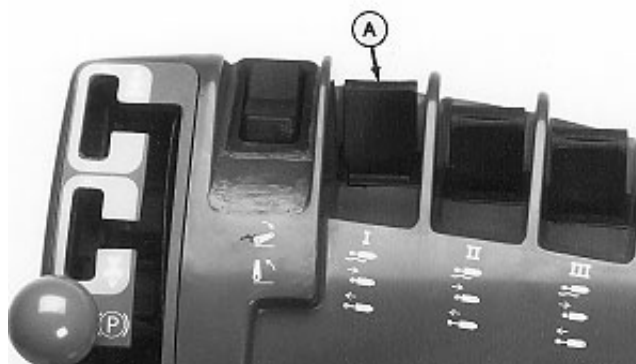
1. With transmission in "park", start tractor engine and pull No. 1 tractor control lever (A) rearward to raise frame.

A—No. 1 Tractor Control Lever



With Mechanical SCV Controls

N45491 -UN-23SEP93



With Electro/Hyd SCV Controls

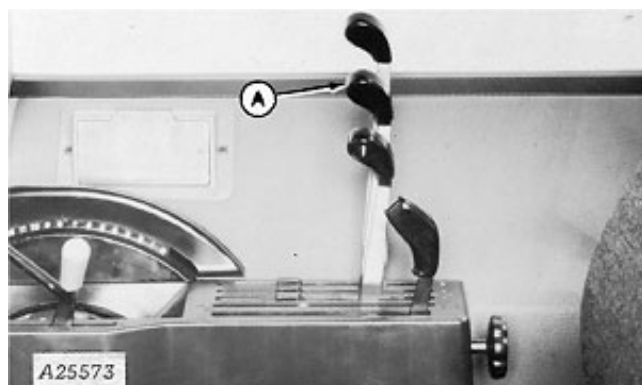
N48107 -UN-01JUN94

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AG,OUO6023,1014 -19-21JUL00-1/8

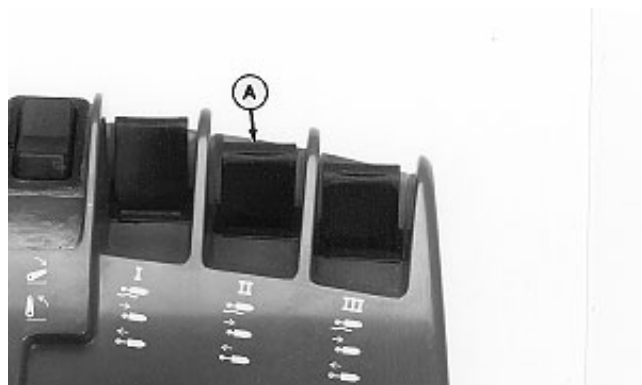
2. Move No. 2 tractor control lever (A) rearward to fold wings fully.

A—No. 2 Tractor Control Lever



A25573 -UN-13OCT88

With Mechanical SCV Controls



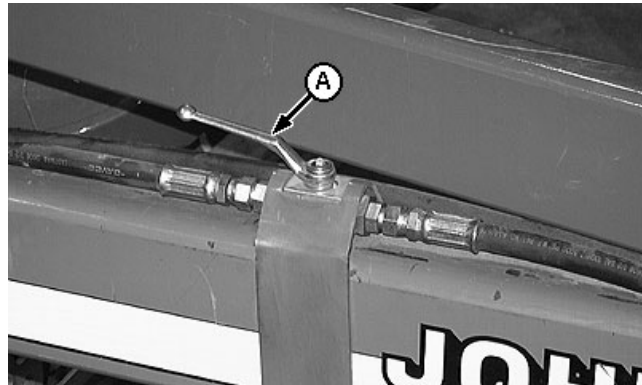
N48108 -UN-04NOV97

With Electro/Hyd SCV Controls

AG,OUO6023,1014 -19-21JUL00-2/8

3. Close transport lock-up valve (A) on seeding equipment.

A—Transport Lock-Up Valve



A43344 -UN-19APR99

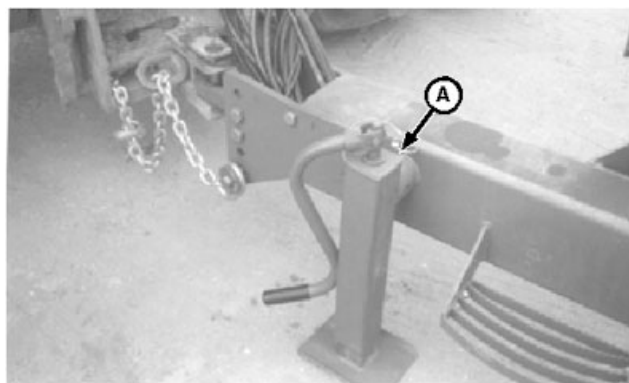
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AG,OUO6023,1014 -19-21JUL00-3/8

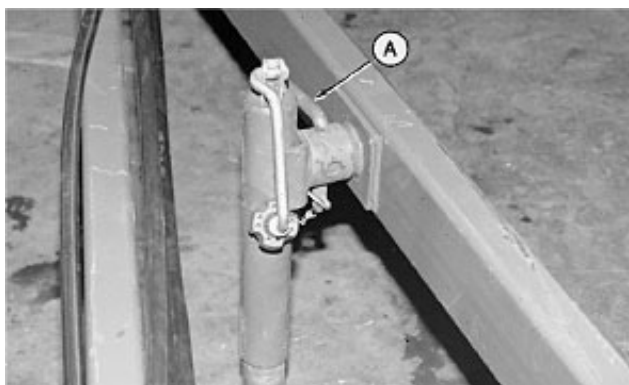
4. Seeding Tool: Attach hitch jack in storage position with pins.

Tow-Between Cart or Seeding Tool: Remove weight from tractor drawbar using hitch jack (A).

A—Hitch Jack



Tow-Between Cart



Seeding Tool

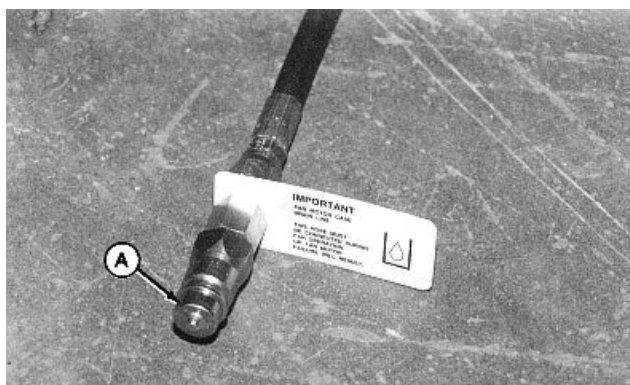
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AG,OUO6023,1014 -19-21JUL00-4/8

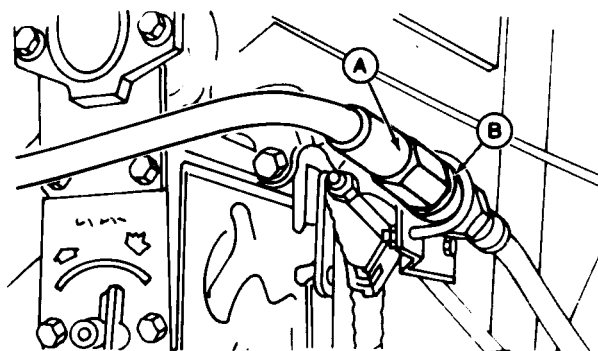
5. Remove fan motor case drain hose (A) from low-pressure drain coupler (B).

With 735 or 1810 Seeding Tools: Remove depth-control relief hose from low-pressure drain connections or SCV connection if used.

A—Fan Motor Case Drain Hose
B—Low-Pressure Drain Coupler

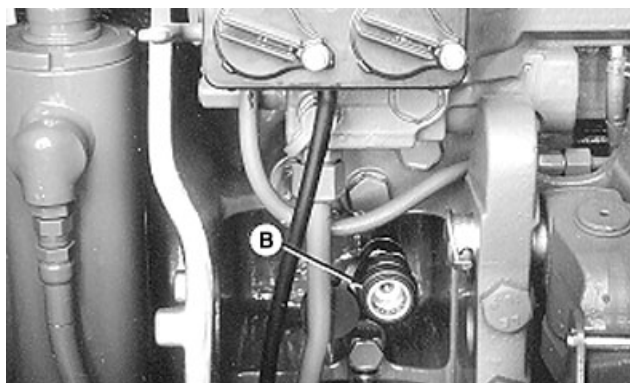


A37979 UN-07AUG98



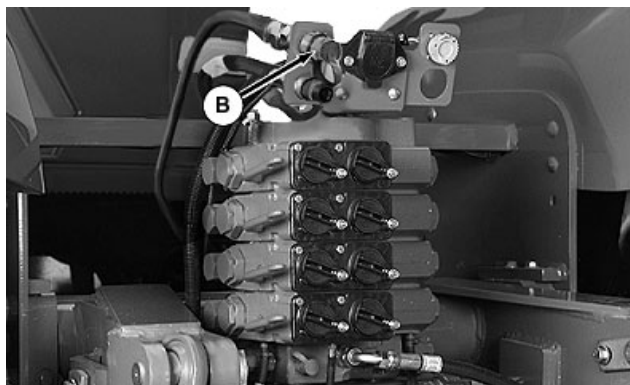
N45535 UN-30SEP93

60 and 70 Series 4WD Tractors



RW55342A UN-17APR99

8000 Series Tractors



A42741A UN-17APR99

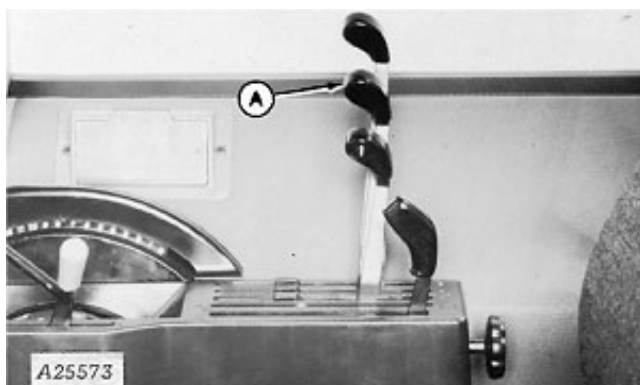
9000 Series Tractors

Continued on next page

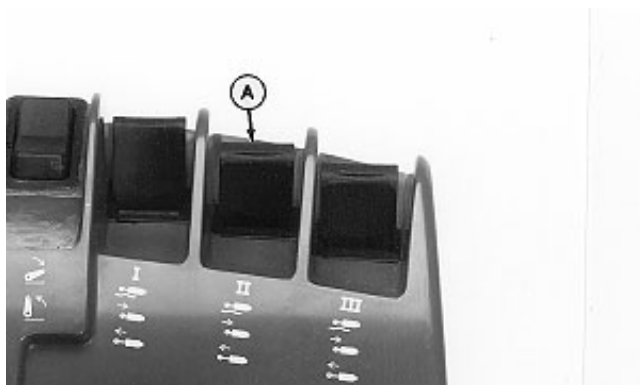
AG,OUO6023,1014 -19-21JUL00-5/8

6. (If Wings are Folded) Before disconnecting folding cylinder hydraulic hoses, relieve pressure by either positioning tractor control (A) in "float" position (with Electro/Hyd SCV Control) or turn tractor engine off and cycle lever (A) back and forth three times (with Mechanical SCV Control).

A—Tractor Control



With Mechanical SCV Controls



With Electro/Hyd SCV Controls

Continued on next page

AG,OUO6023,1014 -19-21JUL00-6/8



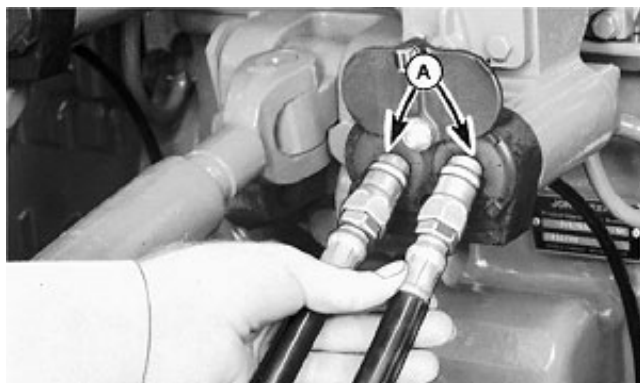
CAUTION: Serious personal injury can result if you attempt to disconnect hydraulic hoses under pressure.

Mechanical SCV Control: Shut off tractor engine and work levers back and forth to relieve pressure before disconnecting hoses.

Electro/Hydraulic SCV Control: Place SCV controls in “float” position to relieve pressure before disconnecting hoses.

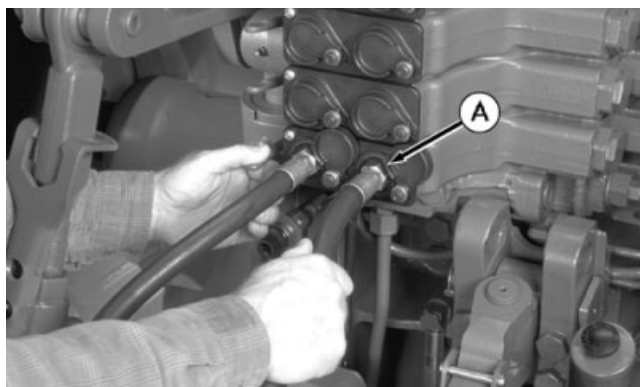
7. Remove hydraulic hoses (A) and electrical connectors from tractor outlets and cover receptacles. Place hoses and cables in storage positions on hitch bracket.

A—Hydraulic Hoses



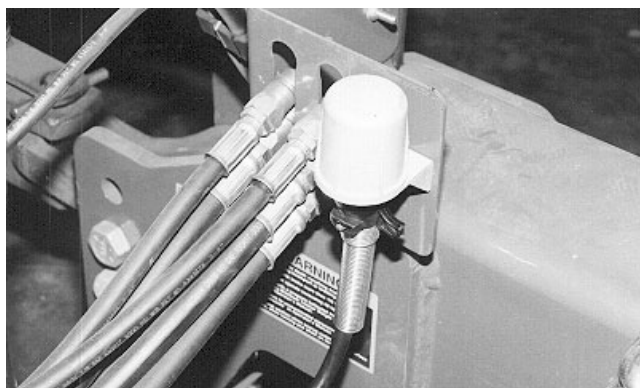
RW5687 -UN-07DEC88

With Mechanical SCV Controls



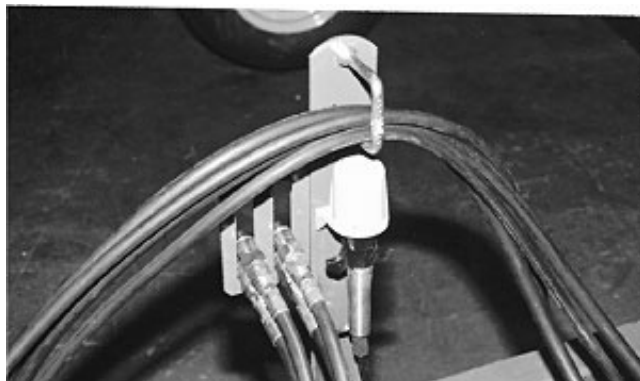
RW55304 -UN-28JUN94

With Electro/Hyd SCV Controls



A42165 -UN-18NOV97

1900 Commodity Cart



N45567 -UN-14OCT93

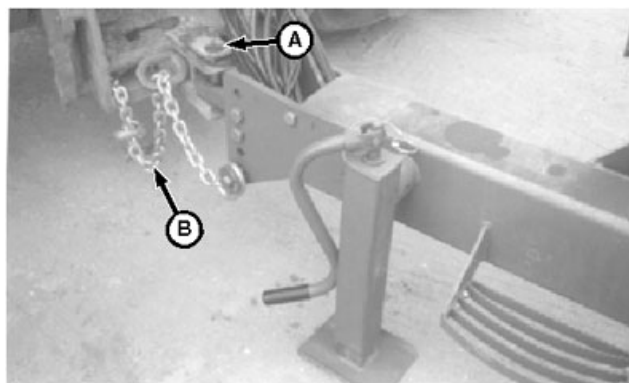
Seeding Tool

Continued on next page

AG,OUO6023,1014 -19-21JUL00-7/8

8. Remove safety chain (B).
9. Remove hitch pin (A).
10. Drive tractor away from machine.

A—Hitch Pin
B—Safety Chain



AG,OUO6023,1014 -19-21JUL00-8/8

A41633 -UN-28APR97

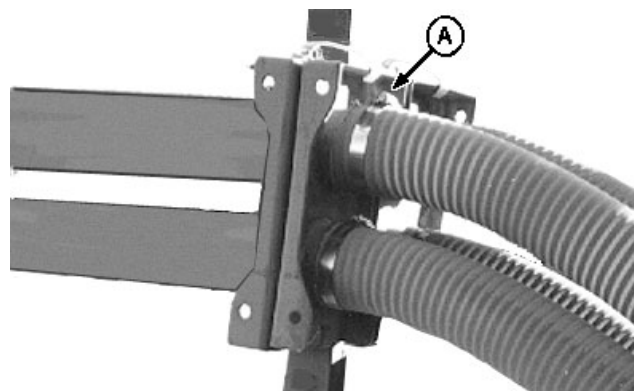
Detaching Seeding Tool From Tow-Between Cart



CAUTION: To help prevent personal injury caused by unexpected movement of the machine:

- Park machine on level surface.
- Block seeding tool tires.
- Lower seeding tool to the ground.
- Before removing hitch pin, be sure no upward force exists at hitch connection.

1. Open clips to disconnect air hose connectors (A). Install coupler cover plates. If cover plates are not available, plug tubes with rags to keep debris and rodents out.



A—Air Hose Connectors

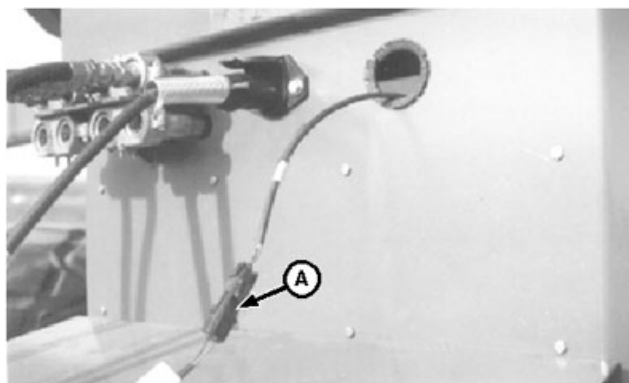
A42323 -UN-20JAN98

Continued on next page

AG,OUO6023,1015 -19-21JUL00-1/6

2. Disconnect remote seeder switch cable (A) (if equipped).
3. Disconnect any other cables or harnesses attached at the rear of the cart, including:
 - 730 Air Disk Drill—Disk lowering solenoid cable.
 - 1810 Seeding Tool with Touchset™ Depth Control—Potentiometer cable.

A—Remote Seeder Switch Cable



A41640 —UN-28APR97

TouchSet is a trademark of Deere & Company

AG,OUO6023,1015 —19-21JUL00-2/6

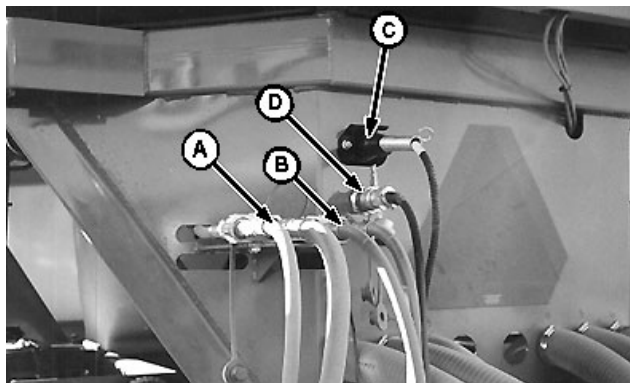
CAUTION: Serious personal injury can result if you attempt to disconnect hydraulic hoses under pressure.

- **Mechanical SCV Controls:** Shut off tractor engine and work levers back and forth to relieve pressure before disconnecting hoses.
- **Electro/Hydraulic SCV Controls:** Place SCV controls in “float” position to relieve pressure before disconnecting hoses.

4. Disconnect depth-control and wing-fold hoses from hydraulic couplers (A and B).

With 735 Seeding Tools: Disconnect crossover relief valve hose.

5. Disconnect warning light cable (C) from plug.
6. If equipped with Seed Counters and/or Blockage Monitor: Disconnect communications cable from plug (D).



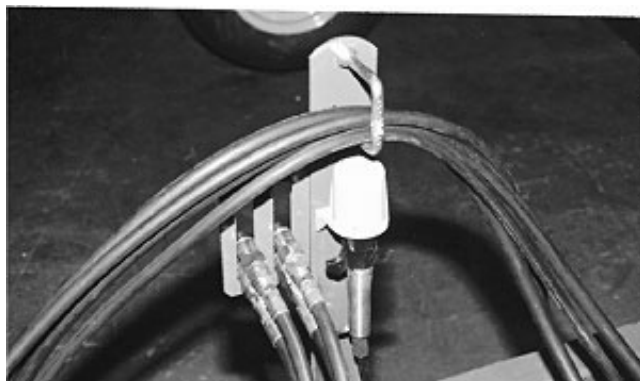
A—Hydraulic Coupler
B—Hydraulic Coupler
C—Warning Light Cable
D—Plug

A41635A —UN-12DEC97

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AG,OUO6023,1015 —19-21JUL00-3/6

7. Place hoses and warning light plug in storage position on hitch.

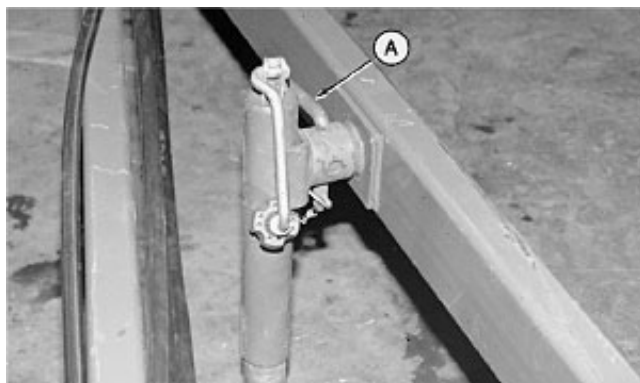


N45567 -UN-14OCT93

AG,OUO6023,1015 -19-21JUL00-4/6

8. Attach hitch jack in storage position with pin (A).
Remove weight from tongue by cranking handle.

A—Pin

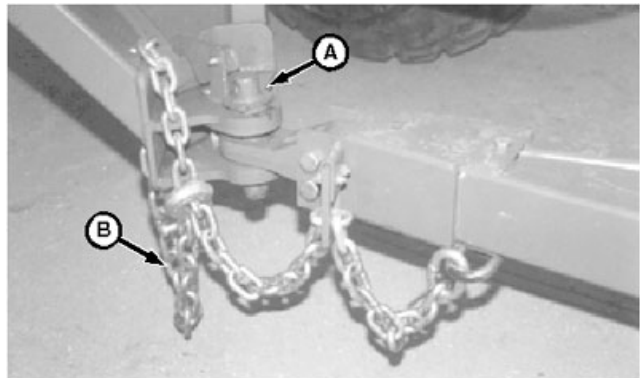


N40112 -UN-19OCT88

AG,OUO6023,1015 -19-21JUL00-5/6

9. Remove hitch pin (A) and safety chain (B).
10. Drive tractor and air cart away from seeding tool.

A—Hitch Pin
B—Safety Chain



A41634 -UN-28APR97

AG,OUO6023,1015 -19-21JUL00-6/6

Detaching Tow-Behind Cart From Seeding Tool

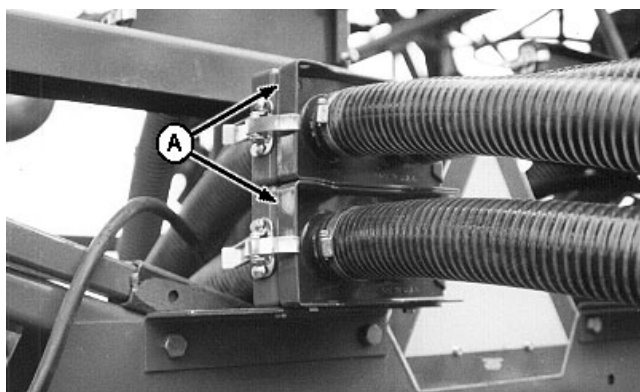


CAUTION: To help prevent personal injury caused by unexpected movement of the machine:

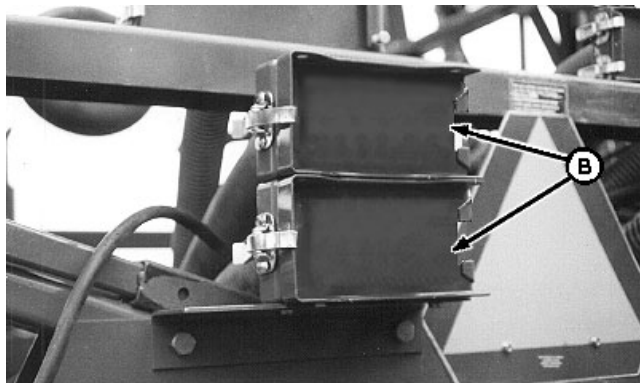
- Park machine on level surface.
- Block tires.

1. Open clips to disconnect air hose connectors (A). Install coupler cover plates (B). If cover plates are not available, plug tubes with rags to keep debris and rodents out.
2. Disconnect cart clutch and light power harness and controller power and communications cable from connectors (C and D). Install plugs and caps.
3. Disconnect any other cables or harnesses attached at the rear of the seeding tool, including:
 - Remote Seeder Switch Cable (if equipped).

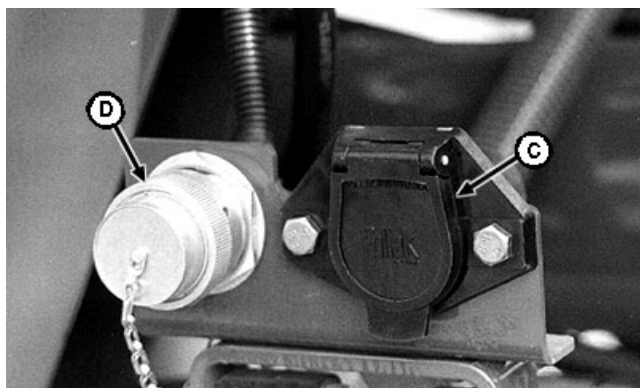
A—Air Hose Connectors
 B—Cover Plates
 C—Connector
 D—Connector



A42162 -UN-27OCT97



A42168 -UN-27OCT97



A42602 -UN-11MAY98

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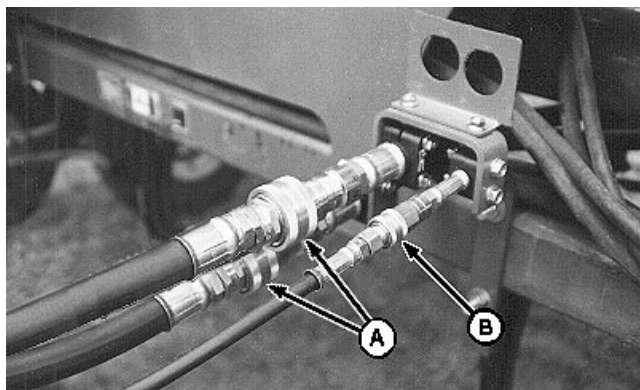
AG,OUO6023,1016 -19-21JUL00-1/5



CAUTION: Serious personal injury can result if you attempt to disconnect hydraulic hoses under pressure.

- **Mechanical SCV Controls:** Shut off tractor engine and work levers back and forth to relieve pressure before disconnecting hoses.
- **Electro/Hydraulic SCV Controls:** Place SCV controls in “float” position to relieve pressure before disconnecting hoses.

4. Disconnect fan/auger hoses (A) and fan motor case drain hose (B) from couplers. Install plugs and caps.



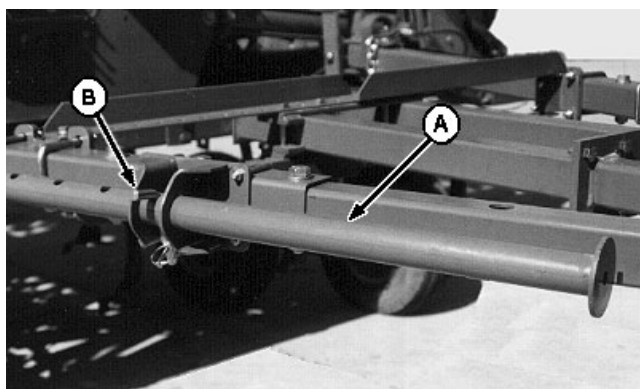
A—Fan/Auger Hoses
B—Fan Motor Case Drain Hose

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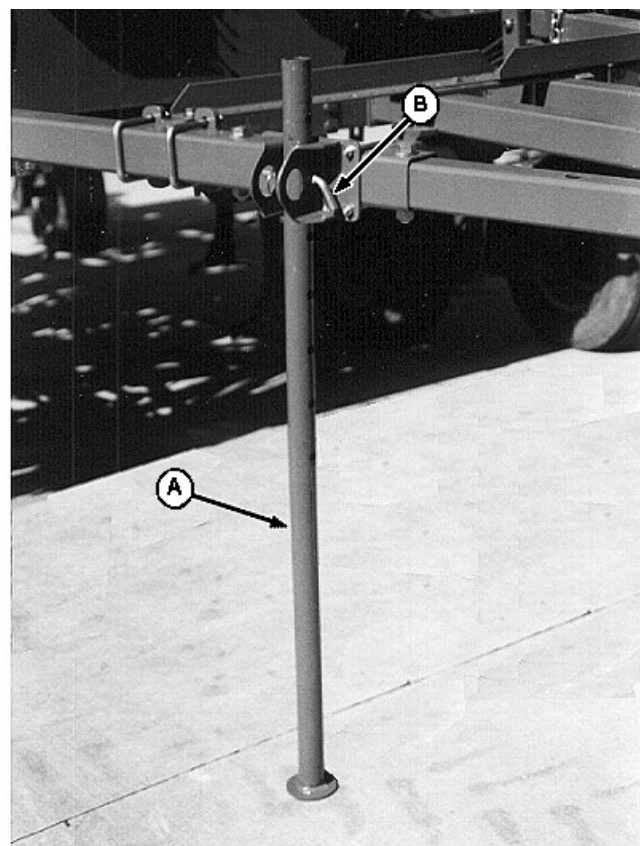
AG,OUO6023,1016 -19-21JUL00-2/5

5. Remove pins (B) and move storage stands (A) from transport/field position to storage position. Place tube ends in contact with ground and retain with L-pins and quick-lock pins.

A—Storage Stands
B—Pins



Transport/Field Position

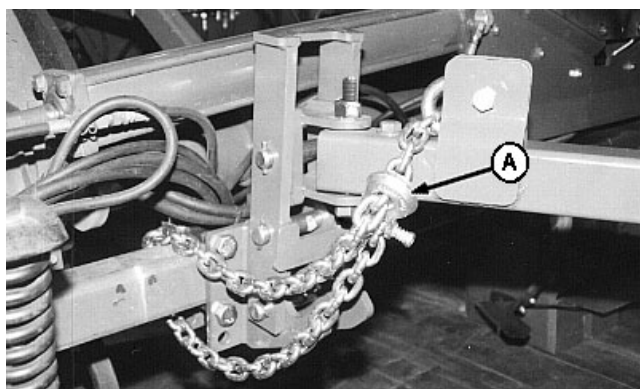


Storage Position

AG,OUO6023,1016 -19-21JUL00-3/5

6. At both hitch connections, open hook latches and remove safety chains (A) from rear bar of tool.

A—Safety Chains

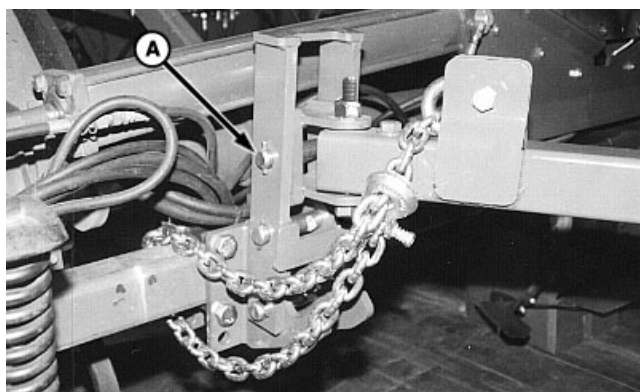


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AG,OUO6023,1016 -19-21JUL00-4/5

7. At both hitch connections, remove hitch tube-to-arm pins (A).
8. Drive tractor and seeding tool away from air cart.

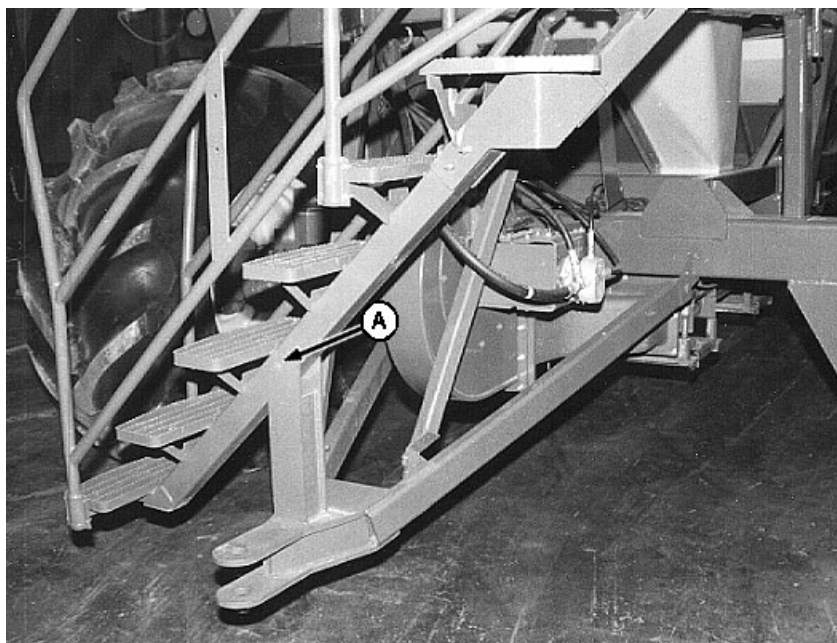
A—Pins



A42169A -UN-14AUG00

AG,OUO6023,1016 -19-21JUL00-5/5

Rear Hitch—Tow-Behind Cart (Attachment)



A42195 -UN-19NOV97

A—Rear Hitch

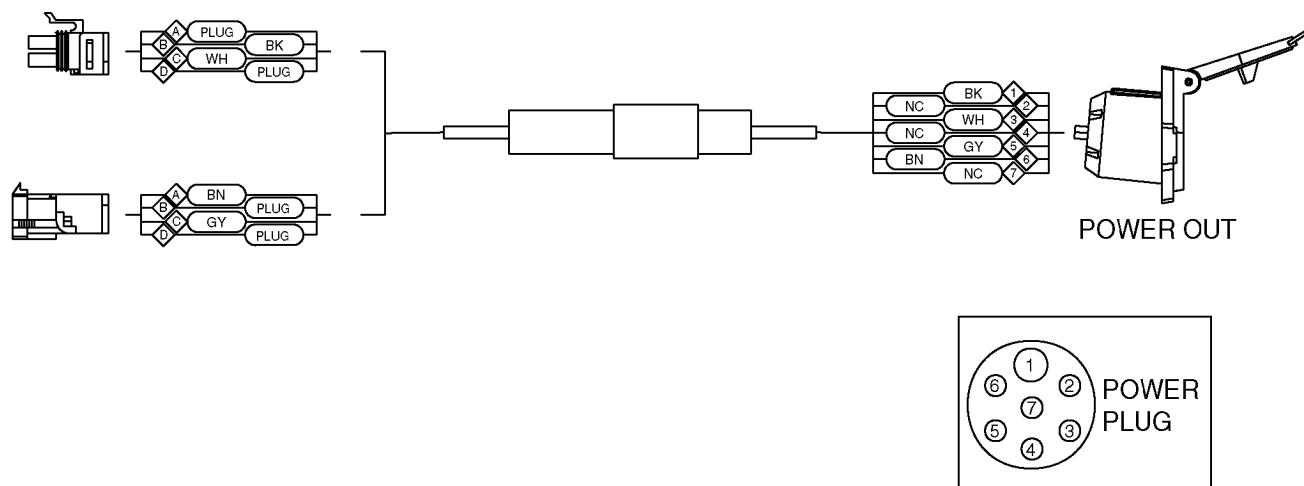
An optional rear hitch (A) is available for tow-behind carts. Rear hitch allows for towing additional implements, such as anhydrous tank, roller packer or harrow.

Rear hitch is designed for forward towing ONLY, and should not be used to pull cart backwards.

IMPORTANT: Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT** and add implement weight to cart/seeding tool weight to ensure that total weight does not exceed safety limit.

AG,OUO6023,1017 -19-21JUL00-1/1

Warning Light Harness—Rear Hitch Attachment (Tow-Behind Carts)



IMPORTANT: Wiring harness is provided to illuminate warning lights on an implement pulled behind a tow-behind cart and should only be connected to electrical system when transporting with a rear-attached implement.

When rear lighting harness is attached, cart warning lights are disconnected from the electrical system and will not operate.

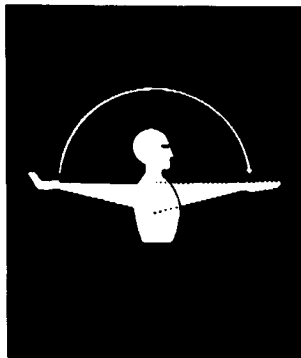
Connect harness leads to cart electrical system only when a rear attached implement (equipped with warning lights) is transported. When

done transporting rear attached implement, disconnect rear lighting harness from electrical system and reconnect cart warning light leads, returning cart warning lights to operation.

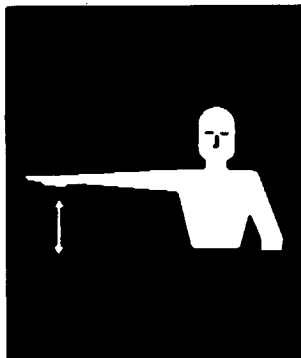
1. When needed for transporting rear attached implement, connect plug-in connectors to cart harness leads in place of left-hand and right-hand lighting leads.
2. When done transporting, disconnect rear lighting harness from electrical system and reconnect cart warning light leads, returning cart warning lights to operation.

A42020 -19-12SEP97

Hand Signals



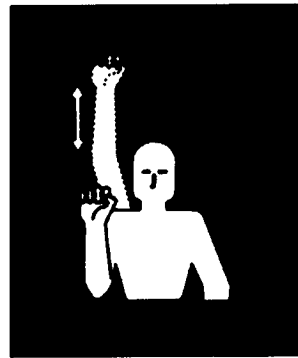
MOVE OUT-TAKE OFF—Face the desired direction of movement; hold the arm extended to the rear; then swing it overhead and forward in the direction of desired movement until it is horizontal, palm down.



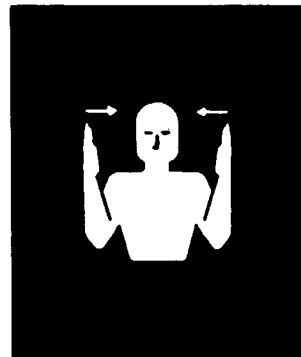
SLOW IT DOWN-DECREASE SPEED—Extend the arm horizontally sideward, palm down, and wave arm downward 45deg. minimum several times, keeping the arm straight. Do not move arm above horizontal.



MOVE TOWARD ME-FOLLOW ME—Point toward person(s), vehicle(s), or unit(s), beckon by holding the arm horizontally to the front, palm up, and motioning toward the body.



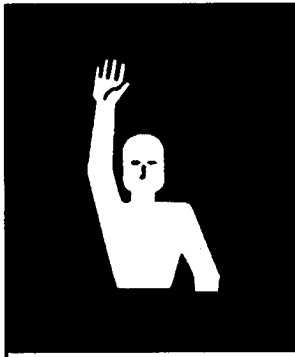
SPEED IT UP-INCREASE SPEED—Raise the hand to the shoulder, fist closed; thrust the fist upward to the full extent of the arm and back to the shoulder rapidly several times.



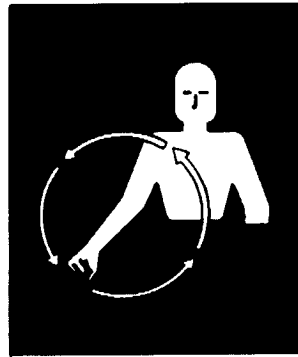
THIS FAR TO GO—Place palms at ear level facing head and move laterally inward to indicate remaining distance to go



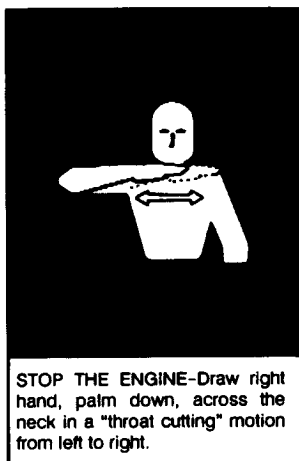
COME TO ME—Raise the arm vertically overhead, palm to the front, and rotate in large horizontal circles.



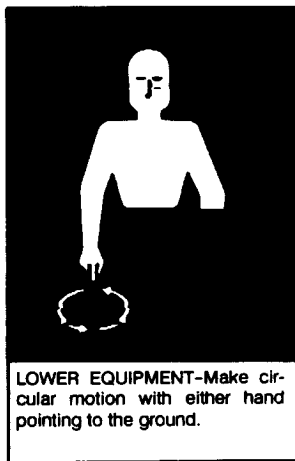
STOP—Raise hand upward to the full extent of the arm, palm to the front. Hold that position until the signal is understood.



START THE ENGINE—Simulate cranking the vehicles by moving arm in a circular motion at waist level.



STOP THE ENGINE—Draw right hand, palm down, across the neck in a "throat cutting" motion from left to right.



LOWER EQUIPMENT—Make circular motion with either hand pointing to the ground.



RAISE EQUIPMENT—Make circular motion with either hand at head level.

N44008 -19-11DEC91

Transporting

Attach Safety Chains



CAUTION: A safety chain will help control drawn equipment should it accidentally separate from the drawbar while transporting. A runaway machine could cause severe injury or death to a motorist, bystander or the operator. Using the appropriate adapter parts, attach the chain to the tractor drawbar support. Provide only enough slack in the chain to permit turning. See your John Deere dealer for a chain with a strength rating equal to, or greater than the gross weight of the towed machine.



A40132 -UN-09JUL97

Tow-Between Cart-to-Tractor



A40133 -UN-24MAR97

Tillage-to-Tow-Between Cart

AG,OUO6023,1020 -19-21JUL00-1/1

Using Warning Lights and SMV



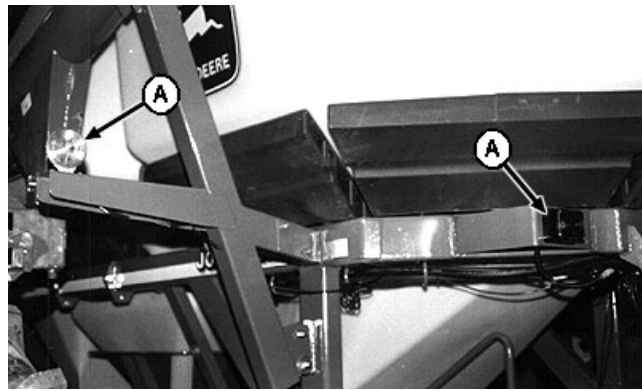
CAUTION: When transporting the machine on a road or highway at night or during the day, use accessory lights and devices for adequate warning to operators of other vehicles. Check local governmental regulations. Various safety devices are available from your John Deere dealer. Keep safety items in good condition. Replace missing or damaged items.

Amber warning lights should be installed at the widest points of the seeding tool. Red tail lamps should be located at the rear of the combined machines.

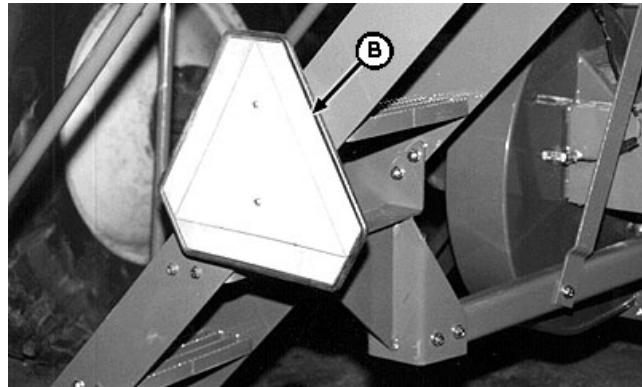
For maximum machine visibility, be sure warning and tail lights (A), reflectors and SMV sign (B) are clean.

A lighting enhancement module (C) has been incorporated into the 1900 Cart lighting circuit. This module causes the red tail lights to function as turn signals. During normal transport, both amber warning lights will flash in unison at high intensity, and both red tail lamps will illuminate steady at low intensity. When a turn is signaled, the red tail lamp in the direction of the turn will flash at high intensity and in unison with the amber warning lamp. The opposite side amber and red lamps will illuminate steady at high intensity.

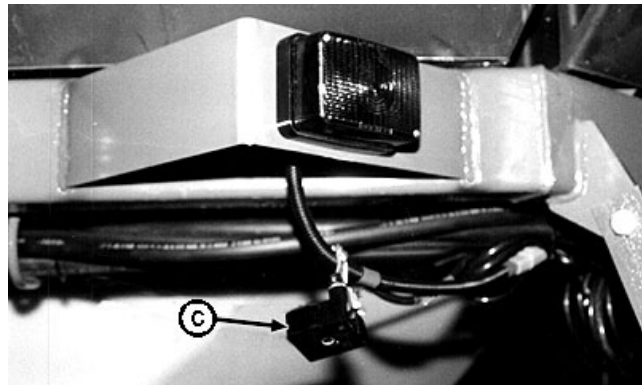
- A—Warning and Tail Lights
- B—Slow Moving Vehicle Sign
- C—Lighting Enhancement Module



Tow-Between Shown



Tow-Behind Shown



Lighting Enhancement Module

AG,OUO6023,1021 -19-21JUL00-1/1

Keep Riders Off Machine



CAUTION: Keep riders off. Riders are subject to injury, such as being struck by foreign objects and being thrown off the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.



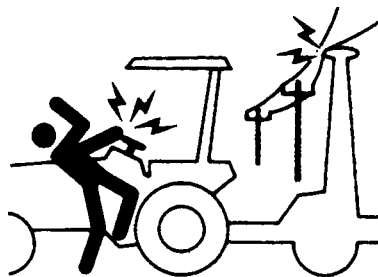
AG,OUO6023,1022 -19-21JUL00-1/1

Transport Safely

CAUTION: Keep away from overhead power lines to avoid serious injury or death to yourself or someone else. Know the transport height of your machine.

CAUTION: To avoid severe injury or death to you or someone else:

- Keep all persons away from machine when raising and lowering wings. Always locate machine on level ground when raising and lowering wings. Never raise or lower wings when moving.
- To improve stability when traveling through the field, wings should be unfolded from transport position as soon as possible after leaving the roadway.



N39394 -UN-06OCT88

N39547 -UN-06OCT88

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AG,OUO6023,1023 -19-21JUL00-1/3



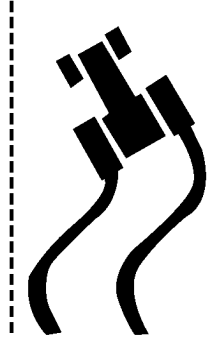
CAUTION: Prevent collisions between motorists and slow moving equipment on public roads. Frequently check for traffic from the rear, especially in turns, and use the turn signals. Always use the flashing warning lights, day and night, when transporting on a public roadway. Keep reflective material and the SMV emblem clean and visible.



CAUTION: Towing with an underweight tractor can result in loss of control during transport or braking, resulting in serious injury or death. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT**.



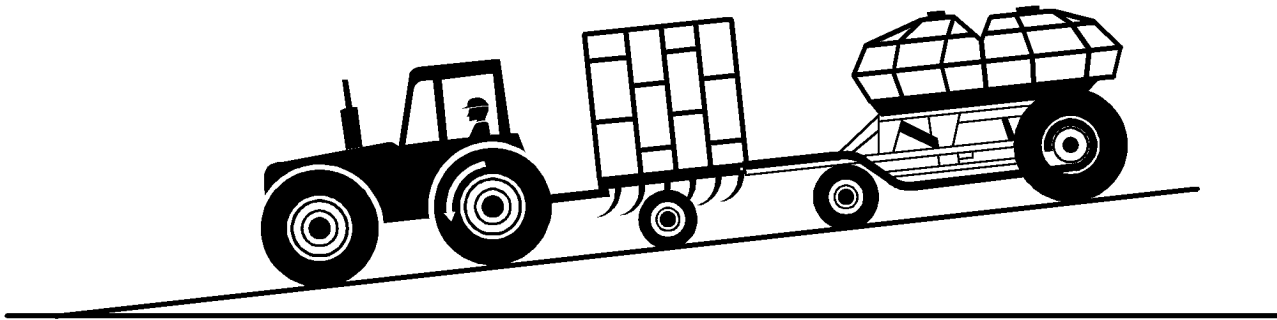
CAUTION: Transporting at speeds greater than 32 km/h (20 mph) can result in loss of control and serious injury or death. Always travel at a reasonable and safe speed. Use additional caution when transporting under adverse surface conditions when turning and when on inclines.



A41981 -UN-02SEP97

Continued on next page

AG,OUO6023,1023 -19-21JUL00-2/3



A42888 -UN-18SEP98



CAUTION: Follow all recommended transport procedures.

- Never transport with any tank more than half full.
- Never transport cart with air seeder fan running or meter drive clutches engaged. Always lock auger in storage position.
- Always fold wings fully. If wing-fold cylinders are removed, chain wings together to prevent accidental lowering.
- Install transport lockups on depth control cylinders or close transport lock-up valve.
- Shift the tractor into a lower gear when transporting down steep slopes or hills.
- Avoid holes, ditches and obstructions which may cause tractor, cart or seeding tool to roll over, especially on hillsides.
- Avoid sharp turns on hillsides.
- Never drive near the edge of a ditch, creek, gully or steep embankment.
- Latch the tractor brakes together. Stop slowly.

If necessary, add ballast as described in your tractor operator's manual.



CAUTION: Avoid loss of control due to decreased braking ability when transporting down sloped roadways, wet or muddy roadways or roadways with loose gravel or sand.

- Avoid steep slopes. Some slopes may exceed tractor braking capability.
- Transport only with a properly sized tractor. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT**.
- Before transporting down a hill, shift tractor to a lower gear and travel at a reduced speed. Reducing speed maximizes the tractor braking capability.
- Use engine braking to reduce speed.
- Avoid sharp turns or rapid steering corrections on slopes.

AG,OUO6023,1023 -19-21JUL00-3/3

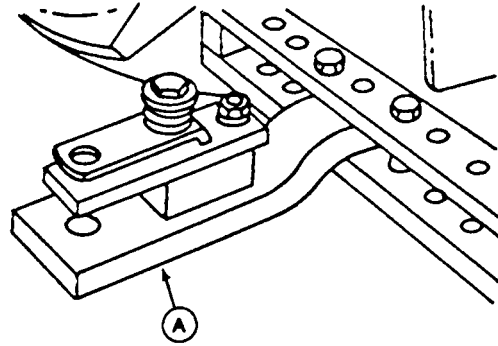
Positioning Tractor Drawbar for Transport



CAUTION: Avoid personal injury or death due to losing steering control of machine. Always pin drawbar in center position for ALL tractors when transporting machine.

Pin tractor drawbar (A) tightly in center down position.

A—Drawbar



N41041 —UN-06OCT88

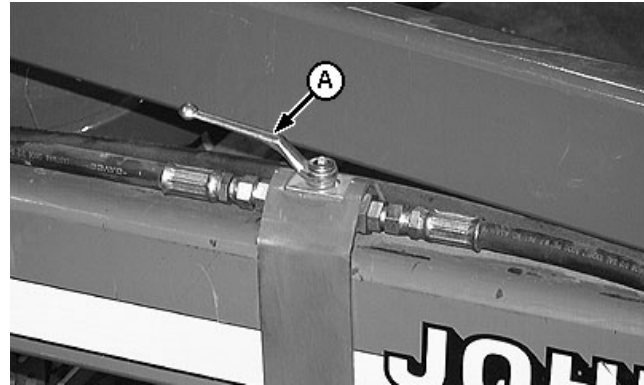
AG,OUO6023,1024 —19-21JUL00-1/1

Locking Up Depth Control

IMPORTANT: Transport seeding tool with depth control cylinders fully extended and transport lock-up valve closed.

With depth control cylinders completely extended, close transport lock-up valve (A).

A—Lock-Up Valve



A43344 —UN-19APR89

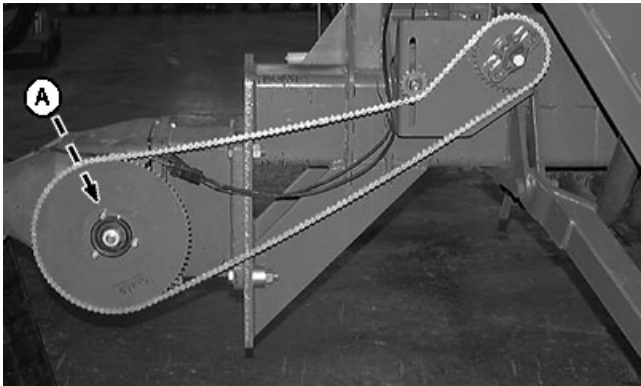
AG,OUO6023,1025 —19-21JUL00-1/1

Disengage Main Clutch for Transport

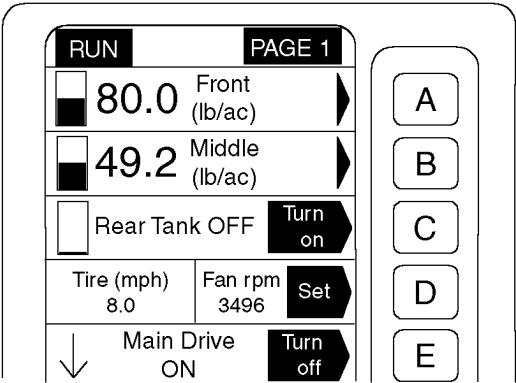
IMPORTANT: Never transport cart with main clutch (A) engaged. Main clutch must be disengaged before transporting or clutch may be damaged due to over-speed conditions.

To avoid over-speeding clutch and resulting damage, depress key “E” and make sure display shows “main drive OFF” before transporting.

A—Main Clutch



A41558A –UN-28JUL98



A46073 –19-18APR00

AG,OUO6023,1026 –19-21JUL00-1/1

Transport Speed Explanation



CAUTION: Towing with an underweight tractor can result in loss of control during transport or braking, resulting in serious injury or death. See **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT**.



CAUTION: Do not transport with any tank more than half full.

Three variable factors enter into the determination of transport speeds.

- Machine Weight

Weight of any empty two-tank cart is a base factor in the calculation of transport speeds. A 195 bushel cart weighs less than a 350 bushel cart.

Cart configuration also enters into the calculation. Tow-Between and Tow-Behind carts of the same size (195 bu, 270 bu, 350 bu) do not weigh the same.

The addition of optional equipment also affects the calculation.

- Products

As a guideline, transporting empty is preferred to transporting with product in the tanks; however, it is recognized that this is not always practical.

Equal amounts of different products do not weight the same due to product density. As an example, a half-tank of soybean seeds weigh less than a half-tank of 11-57-0 fertilizer.

- Tires

Load carrying capacity of tires vary by construction and inflation pressure. Exceeding recommended transport speeds or load may damage tires and machine.

AG,OUO6023,1027 -19-21JUL00-1/1

Using Yard Hitch (Tow-Behind Cart)



CAUTION: Yard hitch is not a transport hitch and should not be used to move cart from field-to-field on public roads.

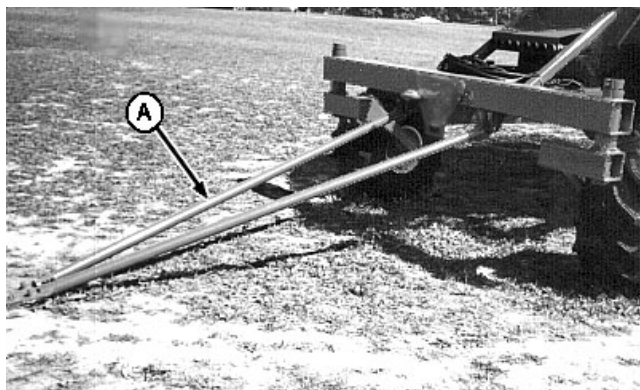
Like any other hitch, always use a safety chain when attaching yard hitch to tractor. A safety chain will help control cart, should hitch accidentally separate from the tractor drawbar.



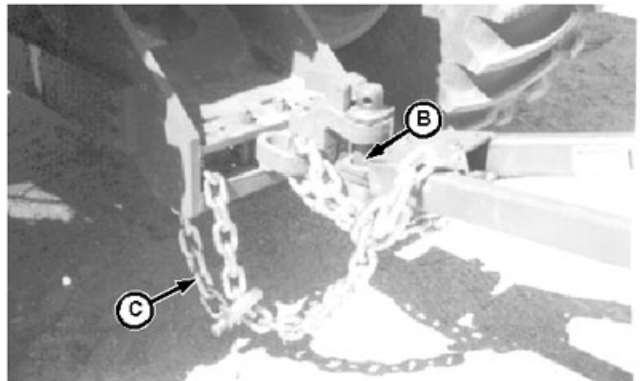
CAUTION: Tow with yard hitch only when tanks are empty, and never with an implement attached to the rear of the cart.

Yard hitch (A) is available for moving tow-behind cart around the farm yard, when long, field hitch would be difficult to use.

1. Back tractor into position and attach hitch (B) to drawbar. Be sure hitch pin is retained, following instructions in tractor operator's manual.
2. Attach safety chain (C) to tractor, leaving enough slack to permit turning.



A41628A -UN-14NOV97

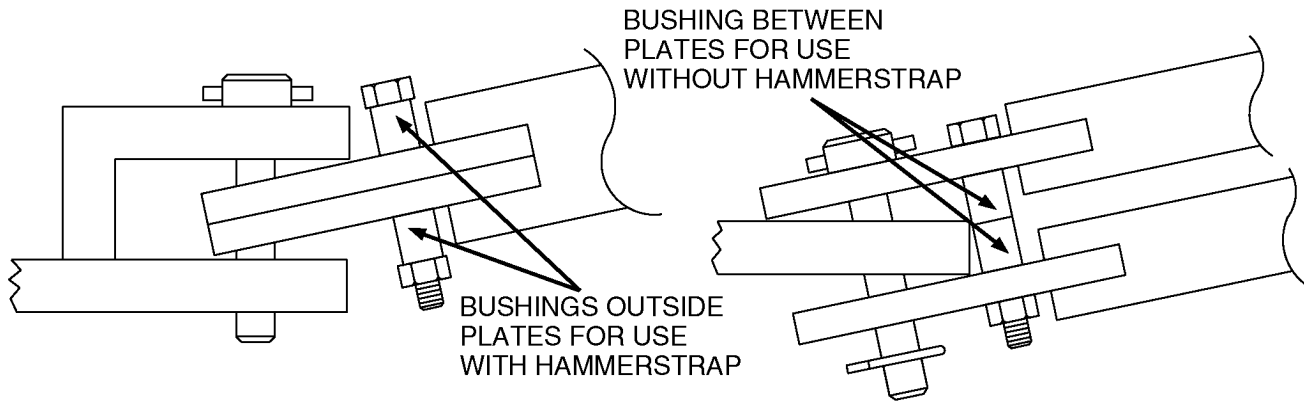


A41629 -UN-28APR97

A—Yard Hitch
B—Hitch
C—Safety Chain

Continued on next page

AG,OUO6023,1028 -19-21JUL00-1/2



NOTE: Yard hitch can be assembled to attach to drawbar with or without a hammerstrap.

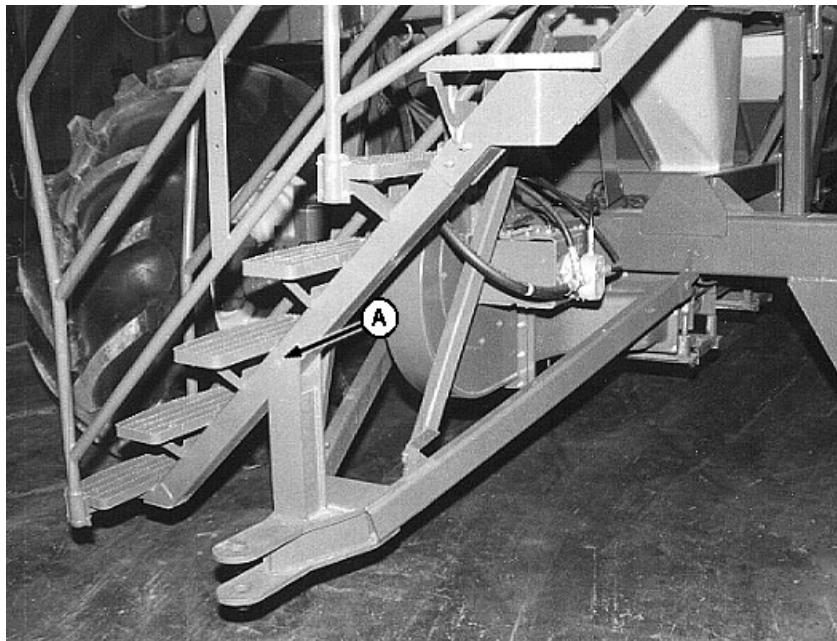
DRAWBAR WITH HAMMERSTRAP: End plates are flush together with bushings on the outside of the plates at top and bottom.

DRAWBAR WITHOUT HAMMERSTRAP: Bushings are installed between end plates, keeping them apart.

AG,OUO6023,1028 -19-21JUL00-2/2

A42258 -19-15DEC97

Transporting Rear Attached Implement—Tow-Behind Cart



A42195 -JUN-19NOV97

A—Rear Hitch

Rear hitch (A) is an optional attachment for tow-behind cart.

Before transporting with an implement attached to the rear of a tow-behind cart:

1. Refer to implement's operator's manual for machine weight.
2. Add implement weight to cart/seeding tool weight to ensure that total weight does not exceed safe transport limit of the tractor. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT** for calculation formula and examples.

IMPORTANT: For further information, refer to **CONNECT REAR LIGHTING HARNESS** in **Attaching and Detaching** section.

3. Connect rear lighting harness to cart electrical system and then implement's lighting harness to **POWER OUT** (7-terminal) plug.
4. When done transporting, disconnect rear lighting harness from electrical system and reconnect cart warning light leads, returning cart warning lights to operation.

AG,OUO6023,1029 -19-21JUL00-1/1

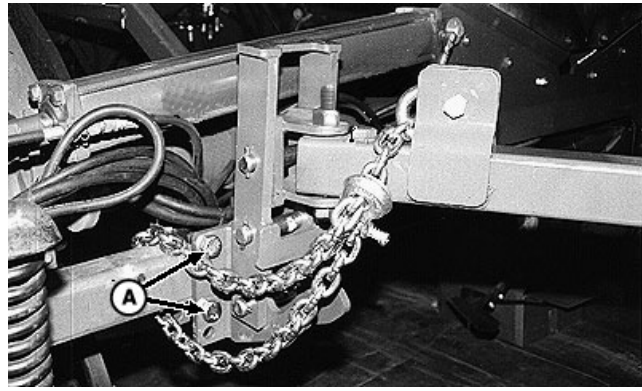
Reducing Transport Weave (Tow-Behind Cart)

Should tow-behind cart weave from side-to-side during transport, check the following items and correct if necessary.

- Hitch Brackets: Play between hitch tube bracket and rear bar can cause cart to weave.

If play is found, loosen sides of the hitch bracket to rear bar hardware (A) on both sides of the hitch, push brackets toward the center of the tool to remove play and then tighten hardware. For best tracking, make sure brackets are equal distances from tool centerline.

- Front Caster Wheels: Reversing front-wheel mounting can cause cart to weave.



A46102 -UN-26JUN00

A—Hardware

Continued on next page

AG,OUO6023,1030 -19-21JUL00-1/2

IMPORTANT: Traction-type front tires are installed in opposite direction of usual tractor applications.

IMPORTANT: Mounting dish is offset in wheel to align centerline of tire with caster pivot, when casters are in forward travel positions (hubs to the rear). Be sure to select correct wheel assembly for right-hand or left-hand application.

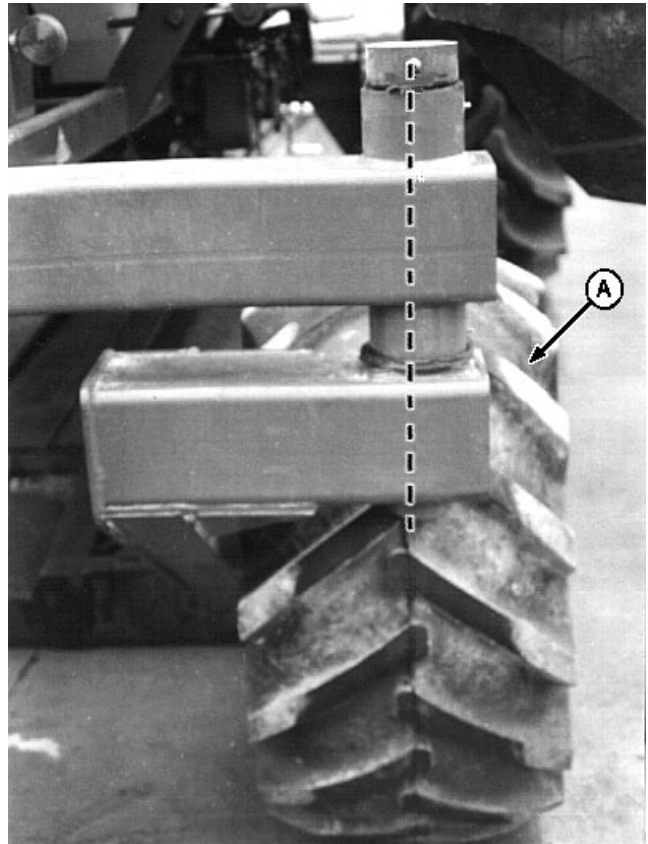
With casters in forward travel positions, check that centerline of tire (A) aligns with caster pivot.

If offset, remove wheel and reverse tire. Install wheel with retaining ring (B) and hardware (C). Torque hardware to specification.

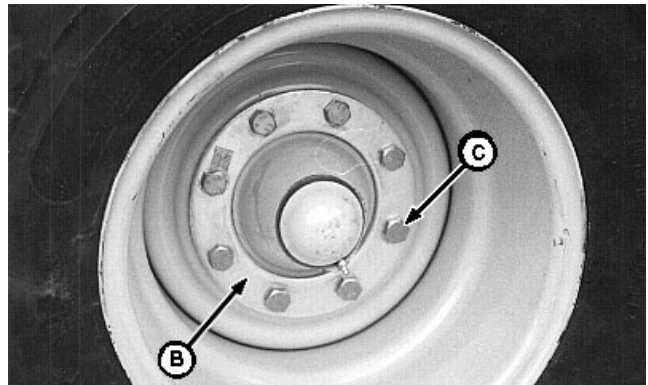
Specification

Caster Wheel Hardware—Torque 200 N•m
(150 lb-ft)

- A—Tire Centerline
- B—Retaining Ring
- C—Hardware



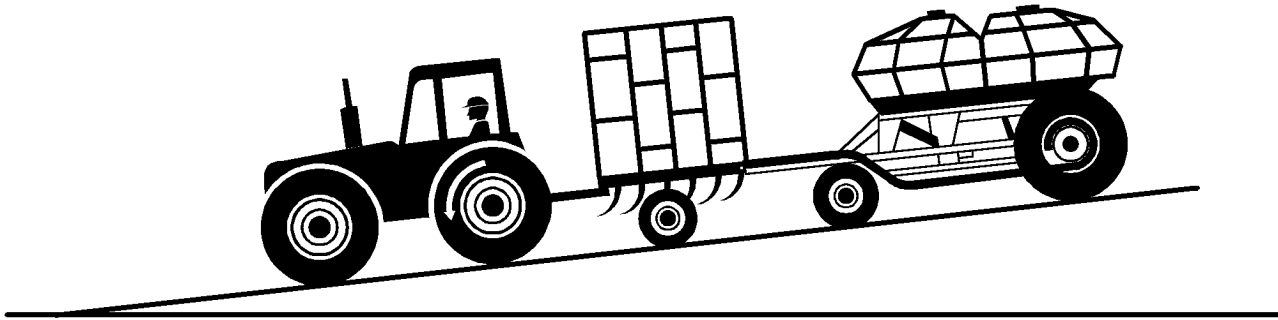
A41832A -UN-19NOV97



A41527B -UN-27JAN98

AG,OUO6023,1030 -19-21JUL00-2/2

Operation or Transport on Hillsides



Tow-Behind Shown



CAUTION: Observe these precautions whenever operating or transporting a Tow-Behind or Tow-Between cart on hillsides:

- Avoid sharp turns on hillsides.
- Openers engaging the ground improve stability on slopes. Some seeding tools can be damaged if openers are engaged during turns. Refer to the seeding tool operator's manual for guidance.
- Never drive near the edge of a ditch, creek, gully or steep embankment. Where holes, ditches or obstructions are unavoidable, reduce speed and proceed with caution.
- Avoid holes, ditches and obstructions which may cause tractor, cart or seeding tool to roll over, especially on hillsides.
- Equipping the cart with dual tires on the rear, or reducing tank fill level, adds stability against overturn of cart on slopes.
- Use a tractor with sufficient horsepower, traction and ballast for the combined weight of seeding tool and cart. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT.**

- When using a Tow-Behind cart, always equip and assemble the seeding tool per specifications. As slopes increase, reduce fill level of cart to avoid excessive load on the seeding tool.

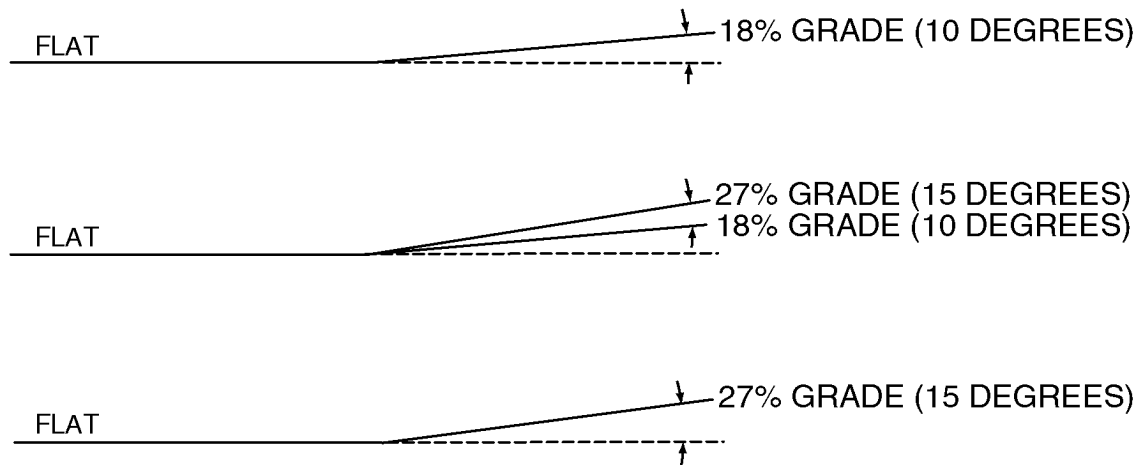


CAUTION: Avoid loss of control due to decreased braking ability when transporting down sloped roadways, wet or muddy roadways or roadways with loose gravel or sand.

- Avoid steep slopes. Some slopes may exceed tractor braking capability.
- Transport only with a properly sized tractor. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT.**
- Before transporting down a hill, shift tractor to a lower gear and travel at a reduced speed. Reducing speed maximizes the tractor braking capability.
- Use engine braking to reduce speed.
- Avoid sharp turns or rapid steering corrections on slopes.

A42888 -UN-18SEP98

Operation or Transport On Hillsides (Continued)



Slope Grade Profiles

Observe these additional precautions when operating or transporting a Tow-Behind (TBH) cart on hillsides:

For slopes up to 18% Grade (10 degrees):

- Single or dual tires on the rear of the Tow-Behind cart are acceptable.
- Total weight of the Tow-Behind cart, plus material, should not exceed 2.5 times the seeding tool weight. If an implement is towed behind the Tow-Behind cart, total weight of the cart and material, plus the weight of the towed implement, should not exceed 1.5 times the seeding tool weight.
- Reducing fill level of all tanks improves side hill stability.

For slopes from 18% to 27% Grade (10—15 degrees):

- Equip cart with dual tires on the rear.
- Total weight of the Tow-Behind cart, plus material, should not exceed 2.0 times the seeding tool weight. If an implement is towed behind the Tow-Behind cart, total weight of the cart and material, plus the weight of the towed implement, should not exceed 1.5 times the seeding tool weight.
- Reducing fill level of all tanks improves side hill and transport stability.

NOTE: Refer to Preparing the Machine section for weight charts and further information on calculations.

For slopes above 27% Grade (15 degrees):

- Tow-Behind carts should not be used.

A42259 -19-15DEC97

AG,OUO6023,1032 -19-21JUL00-1/1

Operating Machine—General

Operating Guidelines

1. Use recommended size tractor. See Specifications section.
2. Be sure tractor and machine have been properly prepared. See Preparing the Tractor and Preparing the Machine sections.
3. Check seed rates carefully.
4. Check tire pressure before seeding.
5. Allow tractor hydraulic oil to warm up thoroughly prior to seeding. Cold oil will cause slower fan speeds.
6. Run fan at recommended speed; excessive speed will cause increased wear on air system and damage seed.
7. Whenever machine has been standing for an hour or more during period of high humidity or damp, rainy days, or after sitting overnight, run fan at recommended rpm, with machine stationary for 10 minutes.

IMPORTANT: In adverse operating conditions (heavy crop residue, wet grass, slopes), additional ballast and/or slower operation may be required to maintain traction and proper control.

8. Operate at a ground speed of 6.4 km/h to 12.9 km/h (4 mph to 8 mph).
9. Control product application with switches in tractor or remote seeder switch. To avoid meter overload, only engage clutches when fan is turning.
10. To avoid plugging, have machine moving forward before lowering openers.
11. Raise openers fully out of the ground before making sharp turns or backing machine.
12. To prevent skipping, back machine up 5 m (15 ft) after stopping.

13. Use clean seed for best metering.



CAUTION: To keep from being severely injured, handle and apply fertilizers and chemically treated seeds according to manufacturers recommendations.

14. Avoid using fertilizers such as 46-0-0 that absorb moisture readily, especially during periods of high humidity. Also avoid fertilizers that contain a high percentage of fine dust, as these materials can plug meter rollers and coat the inside of seed distribution system.
15. For even metering run-to-run, in-tank product level should be kept above 152 mm (6 in.) minimum. When product level falls below 6 inches, pressure disturbances inside the tank adversely affect product delivery to the meter inlets. Do not run tank completely empty; refill when product level indicator first shows empty condition [approximately 304 mm (12 in.) of product still in tank].
16. After each day of operation, empty remaining product from tank and clean caked-on material from manifolds and rollers. Open tank lids and remove any obstructions (rocks, twigs, sticks, straw, etc.) from meter inlet openings.

More frequent cleaning (possibly as often as every other tank fill) is recommended when product contains a high level of debris (rocks, twigs, sticks, straw, etc.).
17. Recognize and correct warning and alarm conditions as indicated on the display monitor.
18. When using stationary double-shoot manifold system:
 - Larger seed, such as soybeans or chickpeas, should always feed into the top primaries.

Continued on next page

AG,OUO6023,1033 -19-21JUL00-1/2

- Airflow distribution (damper position) should be set to always feed equal or higher rates through the top primaries.
- Regular inspection of the manifold bypass passages through the bottom manifold plugs is recommended.
- Material can collect in the valve assemblies on each end of the manifold as well as the center cover plate. Use of unclean seed, granular treatments, or fine fertilizers will require more frequent cleanout.
- Cycle the slide daily when product is in the tank to keep slide free.
- When operating under high-humidity conditions or during drizzle, moisture will enter the airstream and mix with metered material. As the

cart air passages dry naturally once parked, material may harden on the slide surfaces and hinder slide operation. Before parking cart after operating in moist conditions:

- Cycle slide back-and-forth several times with fan running to clear most material from passages.
- Cycle slide back-and-forth at start of next use.
- Unused primary tubes should be capped at the cart exit and plugged above the manifold. With the stationary double-shoot manifold system, material collection within these unused, capped primaries is typical. The cover plate on the bottom of the manifold should be removed regularly to drain collected material.

AG,OUO6023,1033 –19–21JUL00–2/2

Operational Checklist

Before operating, make sure you have:

- ☐ Correctly attached hydraulic hoses to tractor, tillage or cart. Be sure fan motor case drain hose is connected to low pressure (under 689 kPa [6.89 bar] [100 psi]) return port and not crimped.
- ☐ Removed obstructions from meter inlet openings inside the tank before filling.
- ☐ Closed and locked tank lids to prevent air loss.
- ☐ Returned and locked auger in storage position. Returned selector valve to FAN setting.
- ☐ Adjusted fan speed for desired application rate. Cleaned fan screen. Adjusted damper position, if double-shooting.
- ☐ Inflated tires to proper pressure.
- ☐ Checked that meter drive sprockets agree with tire size (at main drive clutch) and row spacing (at one-way clutch).

☐ Thoroughly cleaned product residue from meter segment flutes.

☐ Customized meter cartridge assemblies by installing/removing product doors, changing out meter segments to agree with product and installing fine tuning rings to agree with secondary manifold ports.

☐ Checked position of half-width disconnects.

☐ Checked and, if necessary, reset monitor/controller system with latest information. Checked operation of remote tillage/implement switch.

☐ Performed rate check and adjusted transmission output speed(s) accordingly.

☐ Positioned slide on stationary double-shoot manifold in proper position. Ensured handle is trapped between latch pin and bracket.

AG,OUO6023,1034 –19–21JUL00–1/1

Operating in the Field

1. Start tractor.
2. Put display console (A) in AIR CART “RUN” mode.
3. Start fan using tractor control.
4. While moving forward, lower openers into ground using No. 1 tractor control.

IMPORTANT: To prevent meter drive overload, **ALWAYS** have fan running before engaging clutches. Meter drives are protected by shear bolts that will shear if meter overloads with product without the fan running.

DO NOT ignore “Low Fan Speed Detected” warning. Stop tractor and verify that fan is turning before engaging clutches.

5. Turn main drive clutch and independent meter clutches “ON” and seed and/or fertilize a short distance.
6. Leaving openers in the ground, turn clutches “OFF”. Allow hoses to empty; then turn fan “OFF”. Stop and shut off tractor.

CAUTION: To prevent serious injury or death from unexpected machine movement, always shift the transmission to “PARK” and set the brakes when leaving the tractor.

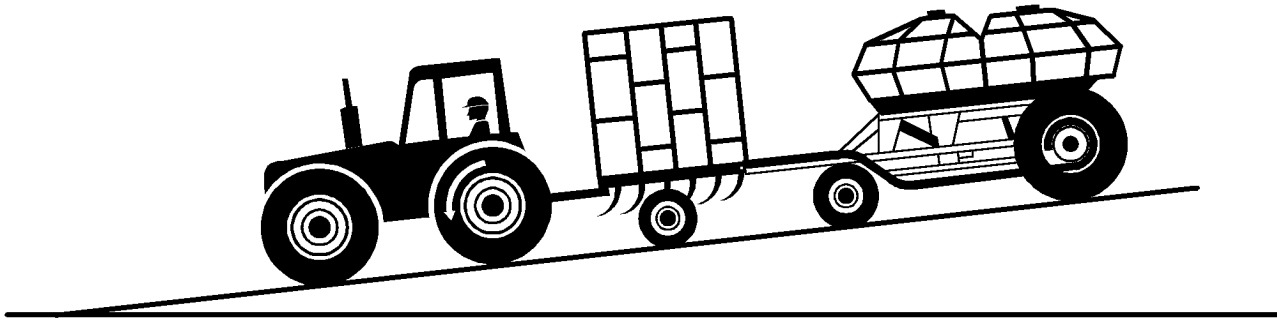
7. Check product depth behind several openers on each frame section.
8. Adjust depth control, as necessary, to maintain desired depth. Refer to seeding equipment operator’s manual for procedure.



A—Display Console

AG,OUO6023,1035 -19-21JUL00-1/1

Operation or Transport on Hillsides



Tow-Behind Shown



CAUTION: Observe these precautions whenever operating or transporting a Tow-Behind or Tow-Between cart on hillsides:

- Avoid sharp turns on hillsides.
- Openers engaging the ground improve stability on slopes. Some seeding tools can be damaged if openers are engaged during turns. Refer to the seeding tool operator's manual for guidance.
- Never drive near the edge of a ditch, creek, gully or steep embankment. Where holes, ditches or obstructions are unavoidable, reduce speed and proceed with caution.
- Avoid holes, ditches and obstructions which may cause tractor, cart or seeding tool to roll over, especially on hillsides.
- Equipping the cart with dual tires on the rear, or reducing tank fill level, adds stability against overturn of cart on slopes.
- Use a tractor with sufficient horsepower, traction and ballast for the combined weight of seeding tool and cart. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT—CHART** in Preparing Tractor-General section.

- When using a Tow-Behind cart, always equip and assemble the seeding tool per specifications. As slopes increase, reduce fill level of cart to avoid excessive load on the seeding tool.

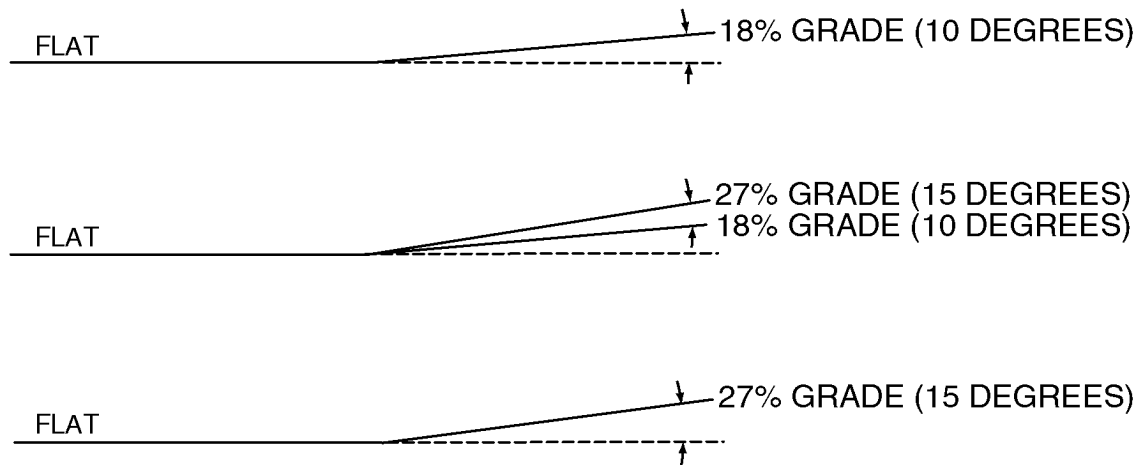


CAUTION: Avoid loss of control due to decreased braking ability when transporting down sloped roadways, wet or muddy roadways or roadways with loose gravel or sand.

- Avoid steep slopes. Some slopes may exceed tractor braking capability.
- Transport only with a properly sized tractor. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT—CHART** in Preparing Tractor-General section.
- Before transporting down a hill, shift tractor to a lower gear and travel at a reduced speed. Reducing speed maximizes the tractor braking capability.
- Use engine braking to reduce speed.
- Avoid sharp turns or rapid steering corrections on slopes.

A42888 -UN-18SEP98

Operation or Transport On Hillsides (Continued)



Slope Grade Profiles

Observe these additional precautions when operating or transporting a Tow-Behind (TBH) cart on hillsides:

- For slopes up to 18% Grade (10 degrees):
- Single or dual tires on the rear of the Tow-Behind cart are acceptable.
- Total weight of the Tow-Behind cart, plus material, should not exceed 2.5 times the seeding tool weight. If an implement is towed behind the Tow-Behind cart, total weight of the cart and material, plus the weight of the towed implement, should not exceed 1.5 times the seeding tool weight.
- Reducing fill level of all tanks improves side hill stability.
- For slopes from 18% to 27% Grade (10—15 degrees):

- Equip cart with dual tires on the rear.
- Total weight of the Tow-Behind cart, plus material, should not exceed 2.0 times the seeding tool weight. If an implement is towed behind the Tow-Behind cart, total weight of the cart and material, plus the weight of the towed implement, should not exceed 1.5 times the seeding tool weight.
- Reducing fill level of all tanks improves side hill and transport stability.

NOTE: Refer to *Preparing the Machine* section for weight charts and further information on calculations.

- For slopes above 27% Grade (15 degrees):
- Tow-Behind carts should not be used.

A42259 -19-15DEC97

AG,OUO6023,1037 -19-21JUL00-1/1

Hillside Operation

Tow-Between carts are recommended for hillside use over Tow-Behind carts because:

- Material in the Tow-Between cart transfers weight to the tractor for increased traction.
- Downhill drift of tool and Tow-Between cart is reduced due to the draft load of the seeding tool openers keeping tractor, cart and tool in line while seeding.
- Added stability against overturn of Tow-Between cart on slopes results from transfer of seeding tool load onto rear of cart.
- The side draft of a Tow-Behind cart adds to the tool's side draft on steep hills, causing uneven row spacing and potential reduction in yield.

AG,OUO6023,1038 –19–21JUL00–1/1

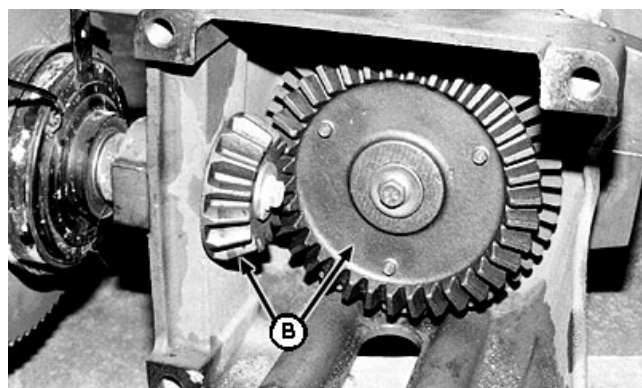
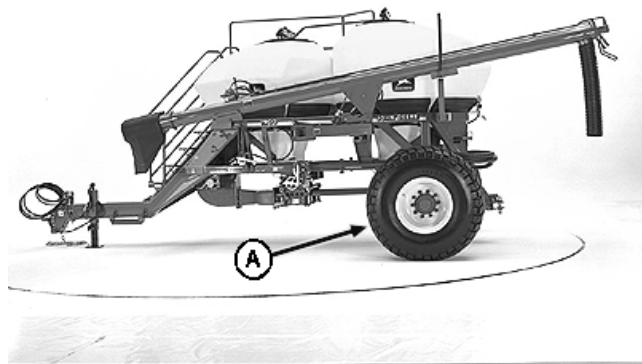
Operating Machine—Product Metering

Meter Drive System Description

Meter drive starts with forward travel of the cart's left-hand rear tire (A).

As the tire rotates, gear set (B) inside the axle housing turns to drive the main clutch input shaft.

- A—Left-Hand Rear Tire
- B—Gear Set



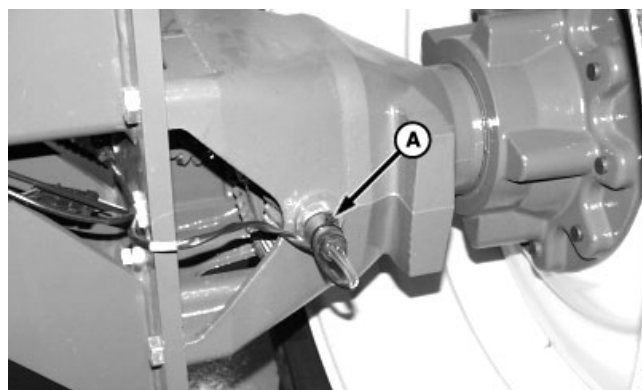
Inside Left-Hand Axle Housing

AG,OUO6023,1039 -19-21JUL00-1/7

Above the gear set is the ground speed sensor (A). Sensor sends a signal to the cart's electronic controller to display ground speed in miles-per-hour (mph) on the tractor-mounted console.

Accumulated area is also recorded from this sensor's signal.

- A—Ground Speed Sensor



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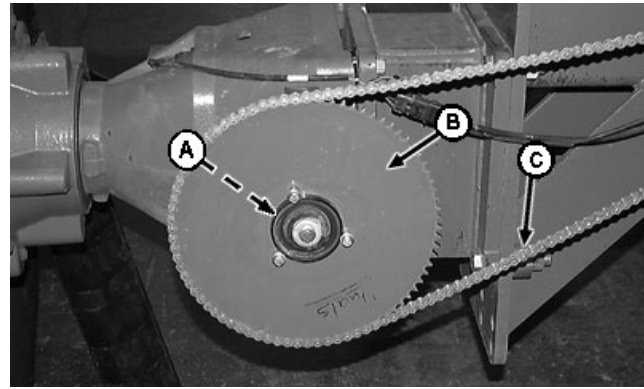
AG,OUO6023,1039 -19-21JUL00-2/7

When the main clutch (A) is engaged, the output sprocket (B) turns to drive meter chain (C) and input sprocket of one-way clutch.

Sprockets at the main and one-way clutch are “component specific” parts and not a matched set.

The main clutch output sprocket is rear tire size specific. Should the rear tires of the cart be changed, the tire sprocket must also be changed to agree with new tire size or meter drive speed will be incorrect for new requirement. Tooth count is stamped into each sprocket for easy identification.

NOTE: Base sprocket selection on similar travel distance [mm (in.) traveled in one tire revolution] when unlisted tire size is used.



A—Main Clutch
B—Output Sprocket
C—Drive Meter Chain

Tire Size/Travel Distance/Sprocket Teeth

Tire Size	Travel Distance mm (in.) per Rev. ^a	Tooth Count
18.4-26 R3, 10PR	4191 (165)	57T
18.4-26 R2, 10PR	4394 (173)	62T
23.1-26 R3, 10PR	4521 (178)	62T
28L-26 R3, 12PR	4775 (188)	62T
23.1-26 R2, 10PR	5029 (198)	68T
28L-26 R2, 12PR	5080 (200)	68T
30.5L-32 R3, 12PR	5359 (211)	72T
30.5L-32 R2, 12PR	5664 (223)	80T
710/70R38 R1W, 2 Star	5893 (232)	80T
20.8R-38 R1, 1 Star	5639 (222)	80T
18.4R-46 R1, 3 Star	6020 (237)	80T
20.8R-42 R1, 2 Star	5867 (231)	80T

^aTire travel per revolution is estimated.

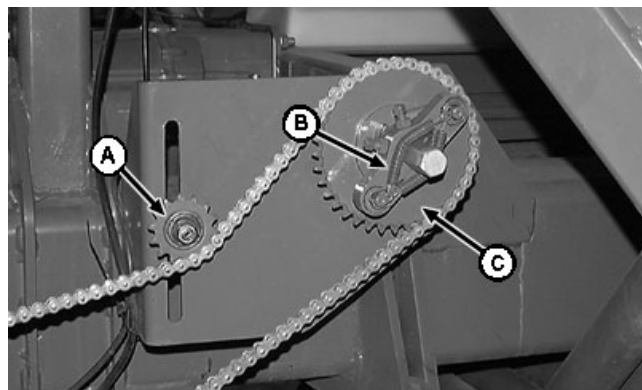
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AG,OUO6023,1039 -19-21JUL00-3/7

An adjustable idler sprocket (A) keeps tension on meter drive chain.

The one-way clutch (B) only engages when the left-hand tire turns in forward direction. The clutch disengages when the tire travels backward, to keep drive train components from reversing direction.

The input sprocket (C) of the one-way clutch is row spacing specific. Should the cart be moved to a different seeding tool, with different row spacing, the sprocket must be changed to agree with new row spacing or meter drive speed will be incorrect for new requirement. Tooth count is stamped into each sprocket for easy identification.



A41549B -UN-28JUL98

A—Adjustable Idler Sprocket
B—One-Way Clutch
C—Input Sprocket

Seeding Tool Row Spacing	Sprocket Teeth
30.5 cm (12 in.) Row Spacing	23T
25 cm (10 in.) Row Spacing	28T
19 cm (7.5 in.) and 38 cm (15 in.) Row Spacing	37T
15 cm (6 in.) Row Spacing	46T

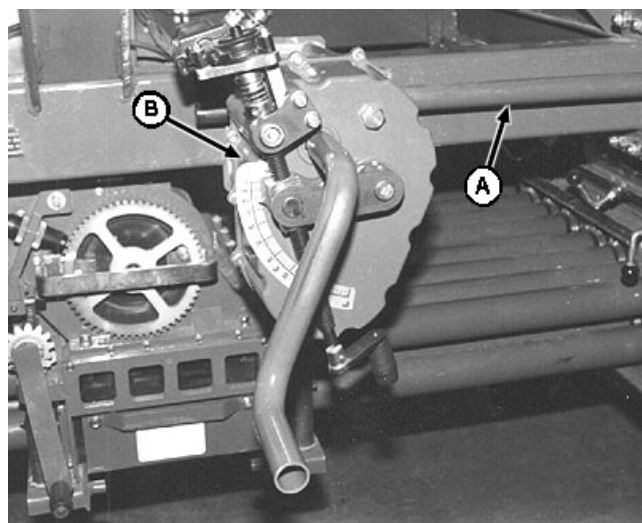
The transmission drive shaft is attached to the output side of the one-way clutch.

AG,OUO6023,1039 -19-21JUL00-4/7

The drive shaft (A) runs through the rear transmission to the front meter transmission (B). Drive shaft runs through the middle transmission when equipped with an optional middle tank.

Transmission output speed is adjusted to turn meter fast enough to deliver product at desired application rate.

A—Drive Shaft
B—Front Meter Transmission



A41550B -UN-21APR98

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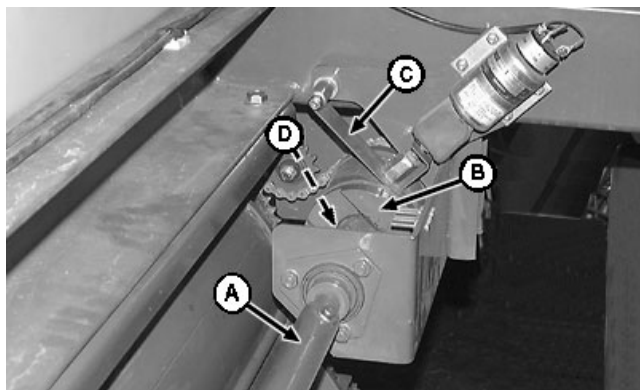
AG,OUO6023,1039 -19-21JUL00-5/7

Transmission output shafts (A) run across the frame to independent meter clutches (B) on the right-hand side.

Meter clutches make it possible to turn off one meter while continuing to deliver product from the other meter(s). Clutch is disengaged when solenoid lever (C) is down and locked in outer clutch member.

In the event of an electronics failure, clutch can be set in engaged position by lifting solenoid lever and manually retaining in raised position.

A shear pin (D) is used to protect drive transmission from damage caused by loading meter cartridge with product when fan is not running. Spare shear pins (2.5 mm diameter cotter pin) are provided with the machine and stored in holes at the clutch bracket.



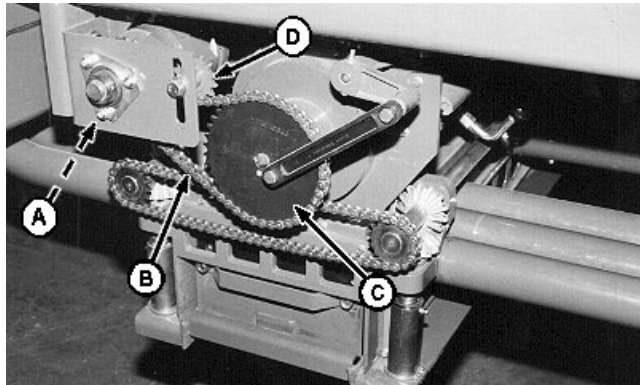
A41551B -UN-28JUL98

A—Output Shaft
B—Meter Clutches
C—Solenoid Lever
D—Shear Pin

AG,OUO6023,1039 -19-21JUL00-6/7

With the meter clutch engaged, output sprocket (A) turns to drive chain (B) and meter shaft input sprocket (C). Chain guide (D) keeps chain tensioned.

A—Output Sprocket
B—Drive Chain
C—Input Sprocket
D—Chain Guide



A41552A -UN-23OCT97

AG,OUO6023,1039 -19-21JUL00-7/7

Connect Main Clutch Power Jumper (Limp Home Feature)

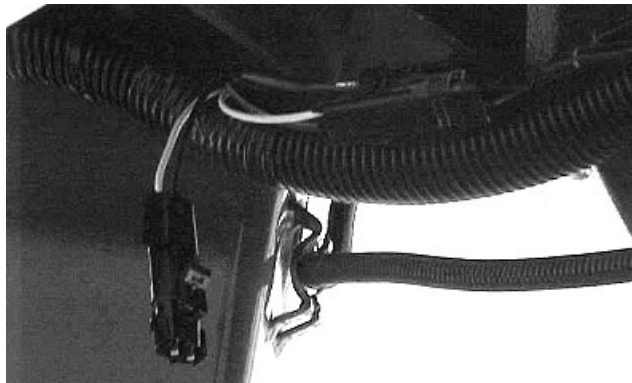
In the event of an electronics failure, main clutch can be “hot-wired” in the engaged, full-time ON, position using power jumper. Connection of the power jumper allows you to continue seeding without using display console switch for ON/OFF control.

NOTE: Power jumper wire is part of the main cart harness, with “LIMP HOME” connector located near the controller.

1. Disconnect seed cart harness connector from clutch plug.

AG,OUO6023,1040 –19–21JUL00–1/2

2. Attach power jumper “LIMP HOME” connector to clutch plug.



Limp Home Connector

A41558H
–JUN–19JUL00

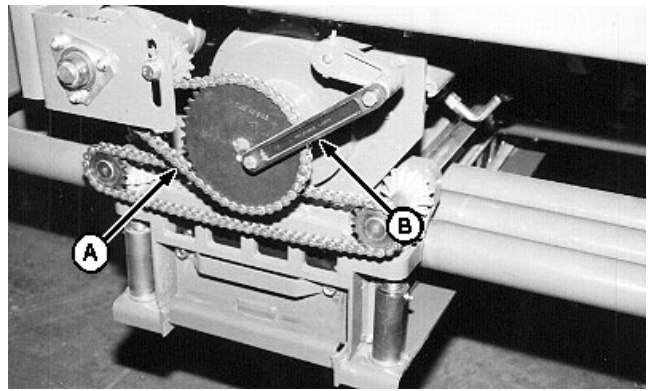
AG,OUO6023,1040 –19–21JUL00–2/2

Product Metering

Product metering starts at the right-hand end of the segment shaft where the drive chain (A), from the independent meter clutch, is attached to the shaft drive sprocket.

Agitator drive arm (B) is also attached here, to the outside of the sprocket.

A—Drive Chain
B—Agitator Drive Arm



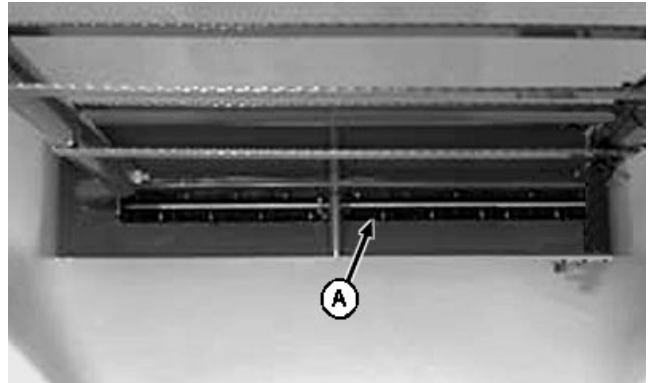
A41531A -UN-23OCT97

AG,OUO6023,1041 -19-21JUL00-1/7

At the bottom of the tank, above the meter inlet, is the product agitator shaft (A). This shaft moves with the meter and keeps product free-flowing by breaking up clumps.

For even metering run-to-run, in-tank product level should be kept above 6 in. minimum. When product level falls below 15 cm (6 in.), pressure disturbances inside the tank adversely affect product delivery to the meter inlets. Do not run tank completely empty; refill when product level indicator first shows empty condition.

On occasion, it may be advisable to run the tank completely empty and check for foreign objects (rocks, twigs, sticks, straw, etc.) that may block the meter inlet openings.



A41532B -UN-30JUL98

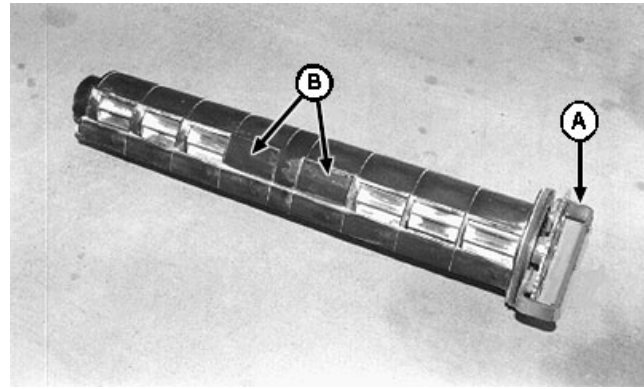
A—Agitator Shaft

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AG,OUO6023,1041 -19-21JUL00-2/7

The meter cartridge assembly (A) is made up of eight product handling segments and enclosures that keep the product separated and isolated to its own run. When the number of active primary runs is less than the full eight segments available, enclosure doors (B) are installed to block product entry into the meter. These doors snap into place in the product entry openings of the enclosures. Product doors are provided loose with the air package to customize cartridge to agree with number of primary air runs.

Brushes inside the enclosures prevent product blow-by, allowing air to pass around the meter and equalize pressure while holding back product.



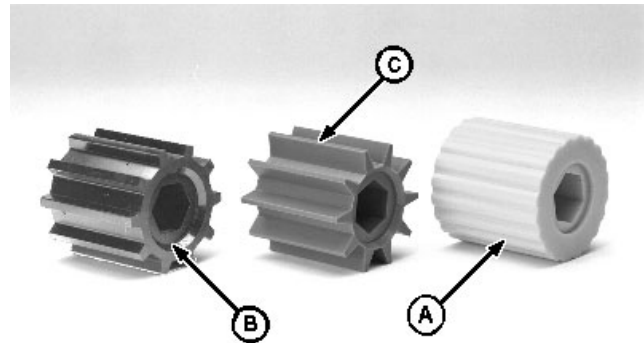
A41533A -UN-22APR98

**A—Meter Cartridge Assembly
B—Enclosure Doors**

AG,OUO6023,1041 -19-21JUL00-3/7

Three types of fluted meter segments are available to handle different products and/or product delivery needs and application rates. The segments are color-coded for easy identification.

- Yellow (A)—Low Rates and granular products: Applying low-rate products like flax, canola, alfalfa.
- Black (B)—Regular Rates: For seeds up to 6 mm (0.25 in.) diameter. Most commonly used roller; for wheat, barley, and small soybeans.
- Green (C)—Hi-Volume Rates: Applying high-rate products such as fertilizer and soybeans larger than 6 mm (0.25 in.) diameter.



A41534 -UN-13JUN97

**A—Low Rate Meter Segment
B—Regular Rate Meter Segment
C—High Rate Meter Segment**

Continued on next page

AG,OUO6023,1041 -19-21JUL00-4/7

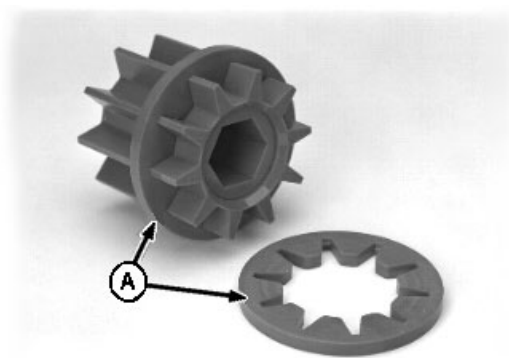
Each meter segment is designed to handle enough product for a 12-port secondary header.

Through the use of fine tuning rings (A), each meter segment is customized to proportionately reduce product delivery to agree with the number of secondary ports to which it is supplying product.

Less product is needed at an eight-port header than at a twelve-port header.

Each tuning ring effectively reduces the segment's product carrying area by one-twelfth. A segment feeding an eight-port header should have four rings installed, while a segment feeding a twelve-port header should have no rings installed.

Tuning rings are provided with each meter cartridge. An installation tool, A61656 (PVC driver), is provided with the cart.



A—Fine Tuning Rings

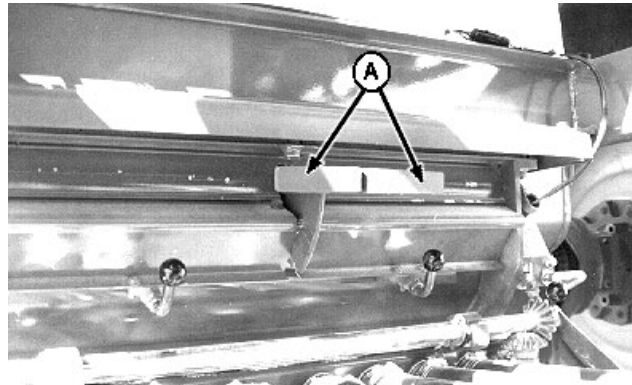
A41535 —UN—13JUN97

AG,OUO6023,1041 —19—21JUL00—5/7

Half-width disconnect handles (A) are used to block product delivery to half of the meter cartridge inlets for seeding point rows.

Product disconnects also make it possible to remove the meter cartridge without emptying the tank.

When both handles are up, product passages to the meter are blocked and the meter can be removed. This disconnect position is also used when emptying the tank. When meter passages are blocked, cleanout passages are open, allowing product to reach the cleanout ports at the front of the meter housing.



Product Passages Blocked

A—Half-Width Disconnect Handles

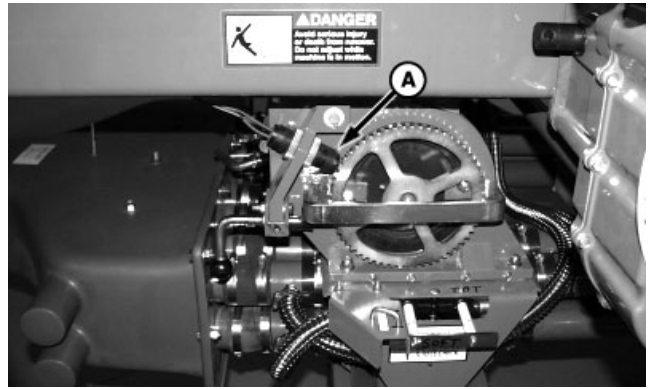
A41536 —UN—10APR97

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AG,OUO6023,1041 —19—21JUL00—6/7

At the left-hand end of the meter is the meter-speed sensor (A). Sensor sends a signal to the cart's electronic controller where it is used by the microprocessor to calculate and display application rate on the tractor-mounted console.

A—Meter-Speed Sensor



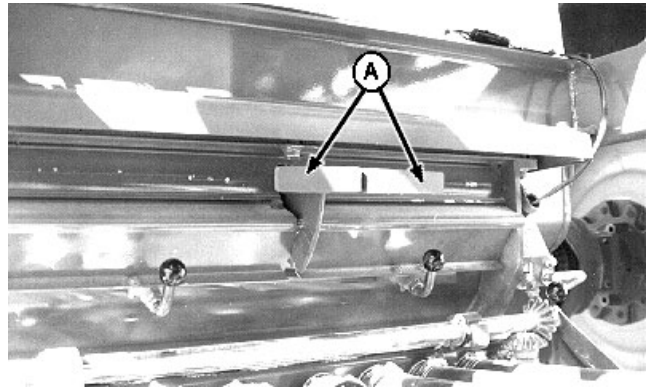
AG,OUO6023,1041 -19-21JUL00-7/7

A46131 -UN-26JUN00

Removing Meter Cartridge Assembly

1. Push both Half-Width disconnect handles (A) up to block product passages to meter. Should disconnect handles feel jammed or locked-up and not operate smoothly, they can usually be “worked” free using short up-and-down strokes at the start. Working the handles loosens caked-on residue that may be preventing smooth operation.

A—Half-Width Disconnect Handles



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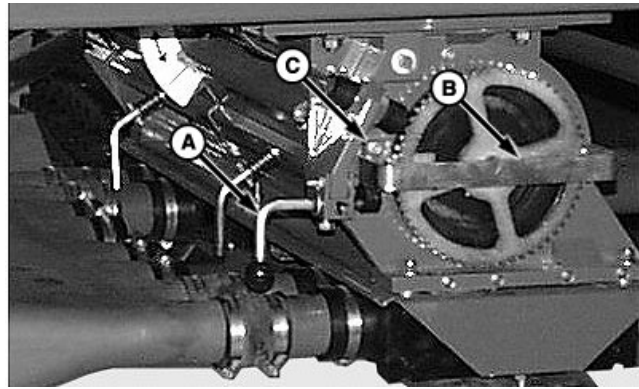
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AG,OUO6023,1042 -19-21JUL00-1/3

2. Turn lock handle (A) up, and pull forward, to release lock cam.
3. Turn meter handle (B) counterclockwise to release from lock tab (C).
4. Pull meter assembly from housing.
5. To install meter:
 - Push meter into housing.

NOTE: Meter may need to be rotated slightly to engage two-point drive coupling on inner end.

- Turn meter handle clockwise to engage lock tab.
- Push in and turn lock handle down to set cam.



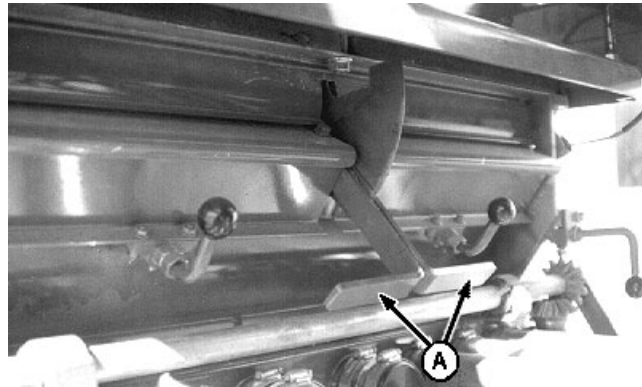
A—Lock Handle
B—Meter Handle
C—Lock Tab

A46326 -UN-10JUL00

AG,OUO6023,1042 -19-21JUL00-2/3

6. Pull both half-width disconnect handles (A) down to open product passages.

A—Half-Width Disconnect Handles



Product Passages Open

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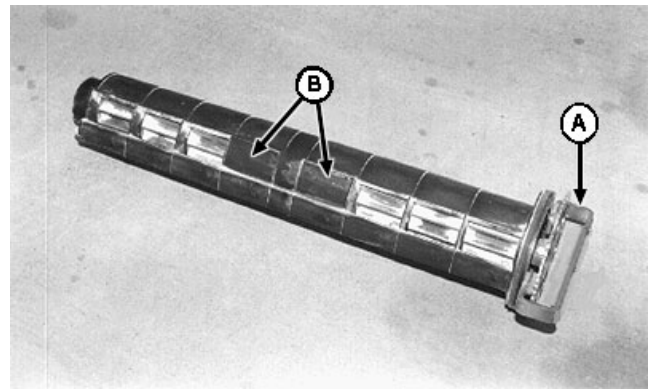
AG,OUO6023,1042 -19-21JUL00-3/3

Interchangeable Meter Cartridge Assemblies

If frequent product changes are part of normal operations, a second meter cartridge assembly (A) should be built-up, with different rate meter segments, to make product changeover faster and easier.

For cartridge assemblies to be interchangeable, second meter assembly will need to be customized with enclosure doors (B) and fine tuning rings in the same positions as original.

Refer to METER CARTRIDGE/SEEDING TOOL DIAGRAMS in this section to confirm that meter cartridge has been properly customized for your seeding tool application.



A41533A -UN-22APR98

A—Meter Cartridge Assembly
B—Enclosure Doors

AG,OUO6023,1043 -19-21JUL00-1/1

Adjusting Agitator Shaft Action

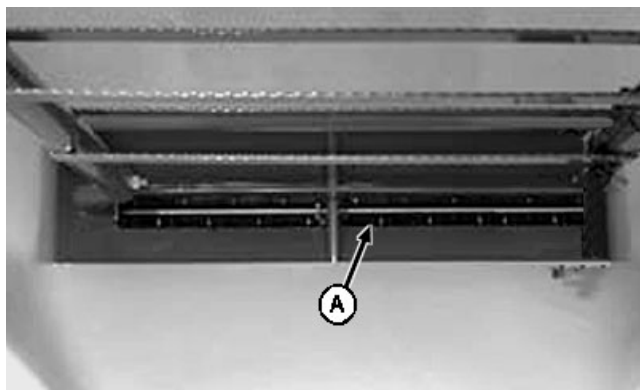
Rocking action of the agitator shaft (A) can be made more or less aggressive by changing drive arm “throw”.

- **LOW SETTING (Less Agitation)**—Attach drive arm (B) to inner sprocket hole (D) for short “throw” and less agitation. Low setting is used for most products except barley, oats and forage crops.

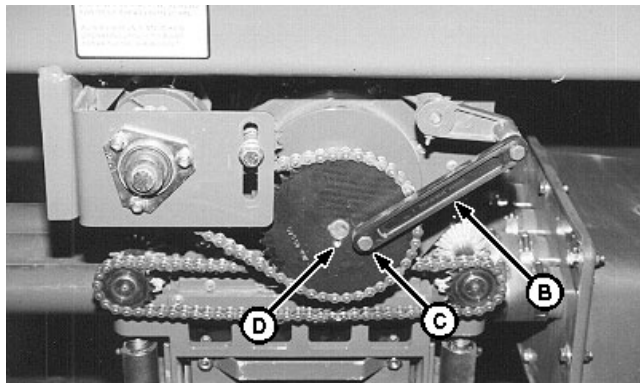
- **HIGH SETTING (More Agitation)**—Attach drive arm to outer hole (C) for long “throw” and more aggressive agitation. High setting is used for barley, oats and forage crops.

Product agitators (E) are installed only at the active runs to prevent bridging and to keep product free flowing.

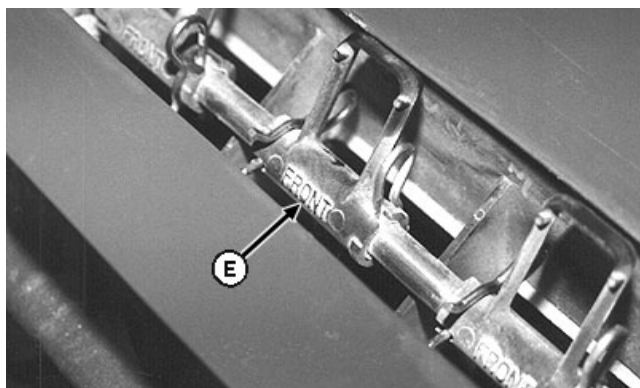
- A—Agitator Shaft
B—Drive Arm
C—Outer Sprocket Hole
D—Inner Sprocket Hole
E—Agitator



A41532B -UN-30JUL98



A41540A -UN-24OCT97



A42518 -UN-23APR98

Meter Shown Removed

AG,OUO6023,1044 -19-21JUL00-1/1

Operating Half-Width Disconnects

Half-width disconnects are used to block product passages to half of the meter, stopping product flow from this side.

Continued on next page

AG,OUO6023,1045 -19-21JUL00-1/2

When both handles (A) are down, passages are open, allowing product to reach active meter segments on both sides of centerline.

When one handle is up, product passages to this side of the meter are blocked, stopping product delivery to the corresponding side of the seeding tool.

Handles at the front and rear meters must both be up to stop all product delivery to this side.

Stopping product delivery to half of the tool is an effective way to seed point rows.

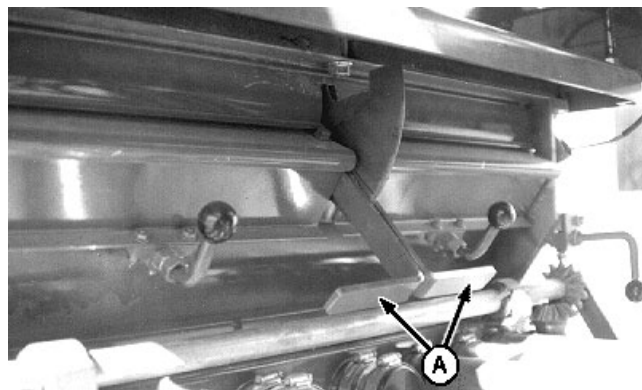
“Half-width” disconnect is an accurate description when there are an even number of primary runs delivering product. True “half-width” disconnect is not possible with an odd number of primary air runs.

When both handles are up, all product passages are blocked, allowing meter to be removed with product still in the tank. Lifting the handles not only blocks product passages to the meter but opens cleanout passages, allowing product to reach removable front panels for tank emptying.

Pull both handles down at both meters to return to full-width operations.

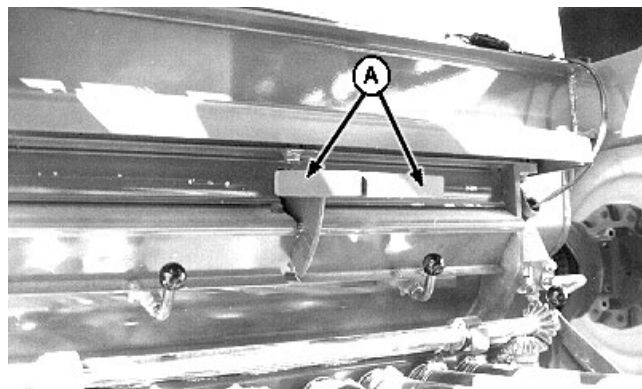
IMPORTANT: Should disconnect handles feel jammed or locked up and not operate smoothly, they can usually be “worked” free using short up-and-down strokes at the start. Working the handles loosens caked-on residue that may be preventing smooth operation.

A—Handles



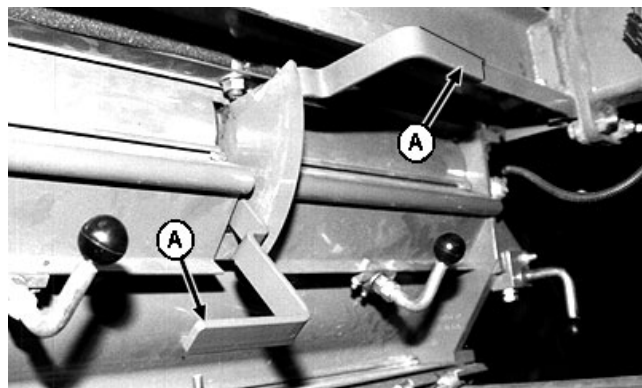
Both Sides Open

A41539 -UN-10APR97



Both Sides Closed

A41536 -UN-10APR97



Right Side Open—Left Side Closed

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AG,OUO6023,1045 -19-21JUL00-2/2

Meter Cleanout Procedure

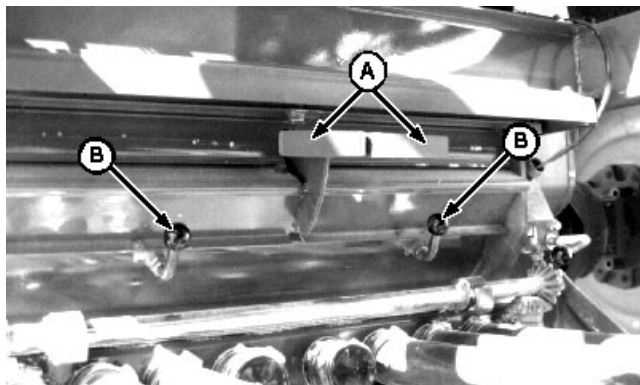
Fan generated air pressure can be used to quickly clean out product and residue from meter housings.

For best results, clean out meter housing farthest from fan (front meter on tow-behind/rear meter on tow-between) first, before cleaning housing closest to fan.

- Cleanout Procedure—Starting at the meter furthest from fan:

AG,OUO6023,1046 –19–21JUL00–1/8

1. Push both half-width disconnect handles (A) up to close off meter feed passages and open cleanout passages. Should disconnect handles feel jammed or locked up and not operate smoothly, they can usually be “worked” free using short up-and-down strokes at the start. Working the handles up-and-down loosens caked-on residue that may be preventing smooth operation.
2. Rotate lock levers (B) down and pull panels from meter housing. Product left in the tank will start draining as panels are opened.



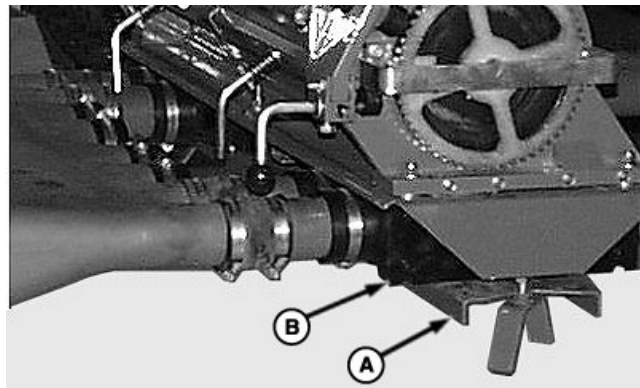
A—Half-Width Disconnect Handles
B—Lock Levers

Continued on next page

AG,OUO6023,1046 –19–21JUL00–2/8

3. Stationary Single-Shoot and Double-Shoot Manifold—Remove cover plate (A) from meter rate check ports, located on underside of stationary manifold (B).

A—Cover Plate
B—Stationary Manifold



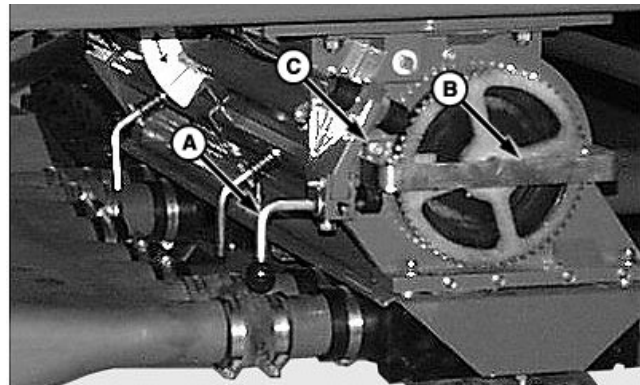
A46327 –UN–10JUL00

Single-Shoot Manifold

AG,OUO6023,1046 –19–21JUL00–3/8

4. Turn lock handle (A) up, and pull forward, to release lock cam.
5. Turn meter handle (B) counterclockwise to release from lock tab (C).
6. Pull meter cartridge from housing.

A—Lock Handle
B—Meter Handle
C—Lock Tab



A46326 –UN–10JUL00

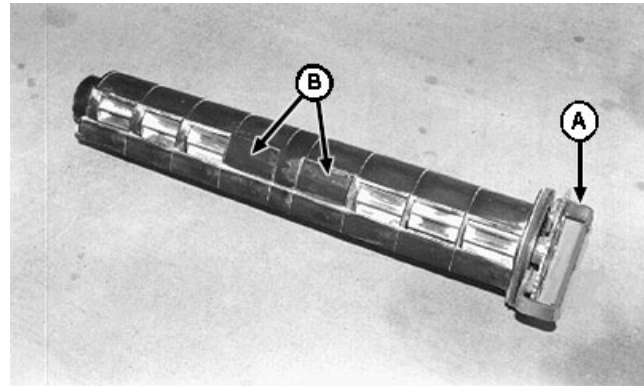
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AG,OUO6023,1046 –19–21JUL00–4/8

IMPORTANT: Do not drop meter cartridge or pound on segment enclosures to clean out product.

Enclosures are made of plastic and may be damaged by a sharp blow.

7. Place meter cartridge in operating position with inlet openings (B) up.
8. Rotate sensor ring (A) to turn meter segments and remove product from enclosures.
9. Turn cartridge over and rotate sensor ring to clean out remaining product.



A—Sensor Ring
B—Inlet Openings

IMPORTANT: Product residue (chaff, dust, etc.) should not be allowed to accumulate on meter segment flutes. Residue build-up will reduce product handling area, adversely affecting metering rate.

If residue build-up cannot be avoided (such as with barley), changing meter segments from low rate-to-higher volume may be advisable to slow down accumulation, provided new meter segments can deliver product at specified rate.

10. Remove residue build-up from meter segment flutes. If a large amount of chaff is observed, disassemble meter cartridge and thoroughly clean. See CHANGING PRODUCT HANDLING METER SEGMENTS for disassembly/assembly procedures.

Continued on next page

AG,OUO6023,1046 —19–21JUL00–5/8



CAUTION: To protect yourself from flying seed, fertilizer and debris, stay in the tractor cab while the fan is running.

If you must leave the cab with the fan running, wear protective clothing including face mask, gloves and goggles.

11. Start tractor and run fan for 30 seconds to remove product from tank and clean out passages of meter housing.
12. Stop fan and turn off tractor.

NOTE: When closing cleanout panels, slide panels to the outside of meter housing before locking. If panels are to the inside, half-width disconnect levers can bind on panels and not open or close completely when operated.

13. Position cleanout panels to the outside, push against housing and rotate levers up to lock in place.

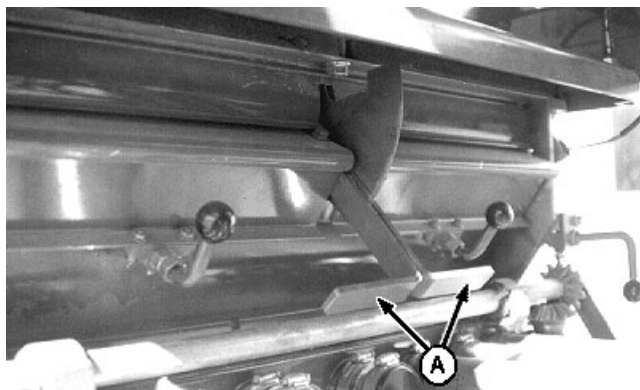


TS265 -JUN-23AUG88

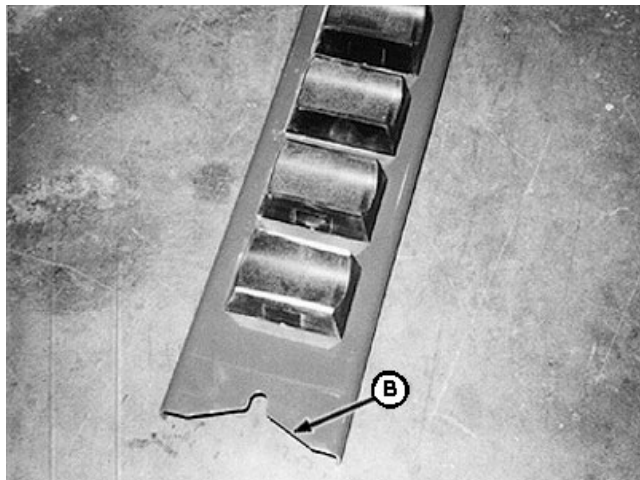
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AG,OUO6023,1046 -19-21JUL00-6/8

14. Pull both half-width disconnect handles (A) down to open product passages to meter.
 15. Start tractor and run fan for an additional 30 seconds to remove product from meter passages of housing.
 16. Stop fan and turn off tractor.
 17. Any product residue still in meter housing can be removed using a long-handle brush or a vacuum cleaner.
 18. Return meter cartridge to housing, turn into lock tab and retain with cam lock lever.
 19. Return cover plate to bottom of manifold. Shaped end of cover plate (B) goes to right-hand side of cart; square-cut end goes to left-hand side.
- NOTE:** Before returning to normal operation, ensure slide on stationary double-shoot manifold is in proper position.
20. Repeat entire cleanout procedure at meter housing closest to fan.



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A42274 -UN-16DEC97

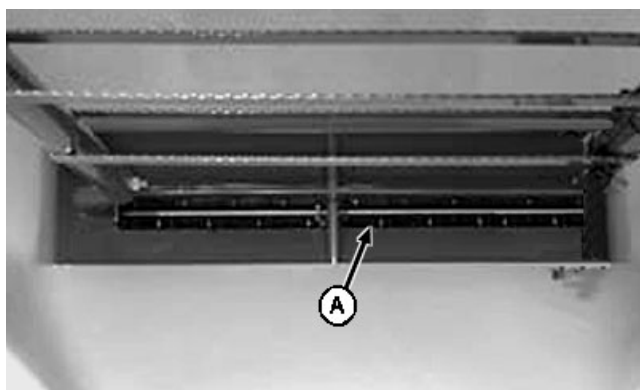
Cover Plate—Single-Shoot Manifold

A—Half-Width Disconnect Handles
B—Cover Plate

AG,OUO6023,1046 -19-21JUL00-7/8

21. Open tank lids and remove any obstructions (rocks, twigs, sticks, straw, etc.) from meter inlet openings (A).

A—Meter Inlet Openings



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AG,OUO6023,1046 -19-21JUL00-8/8

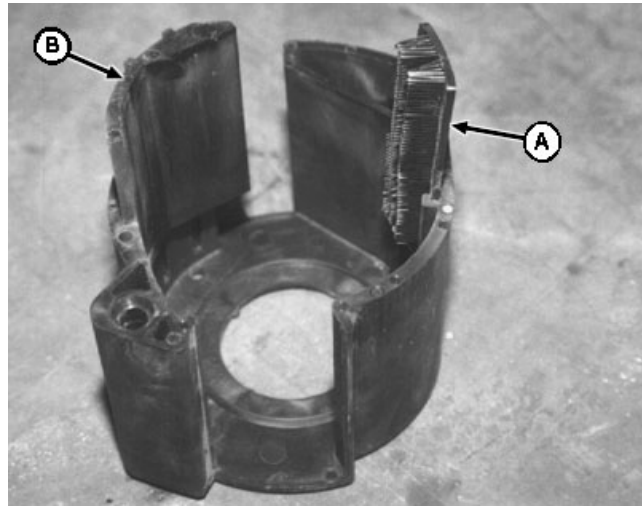
Metering Large Seeds

NOTE: *Enclosure brush (A) must be in place at all times.*

When seeding large seeds (over 6 mm in diameter), such as Garbanzo beans, it may be necessary to remove wear strip (B) from inside of the meter segment enclosures. Removing the wear strip opens the gap between the meter segment and enclosure, allowing larger seeds to pass through without crushing.

Wear strip must be returned to enclosure for normal metering of smaller products.

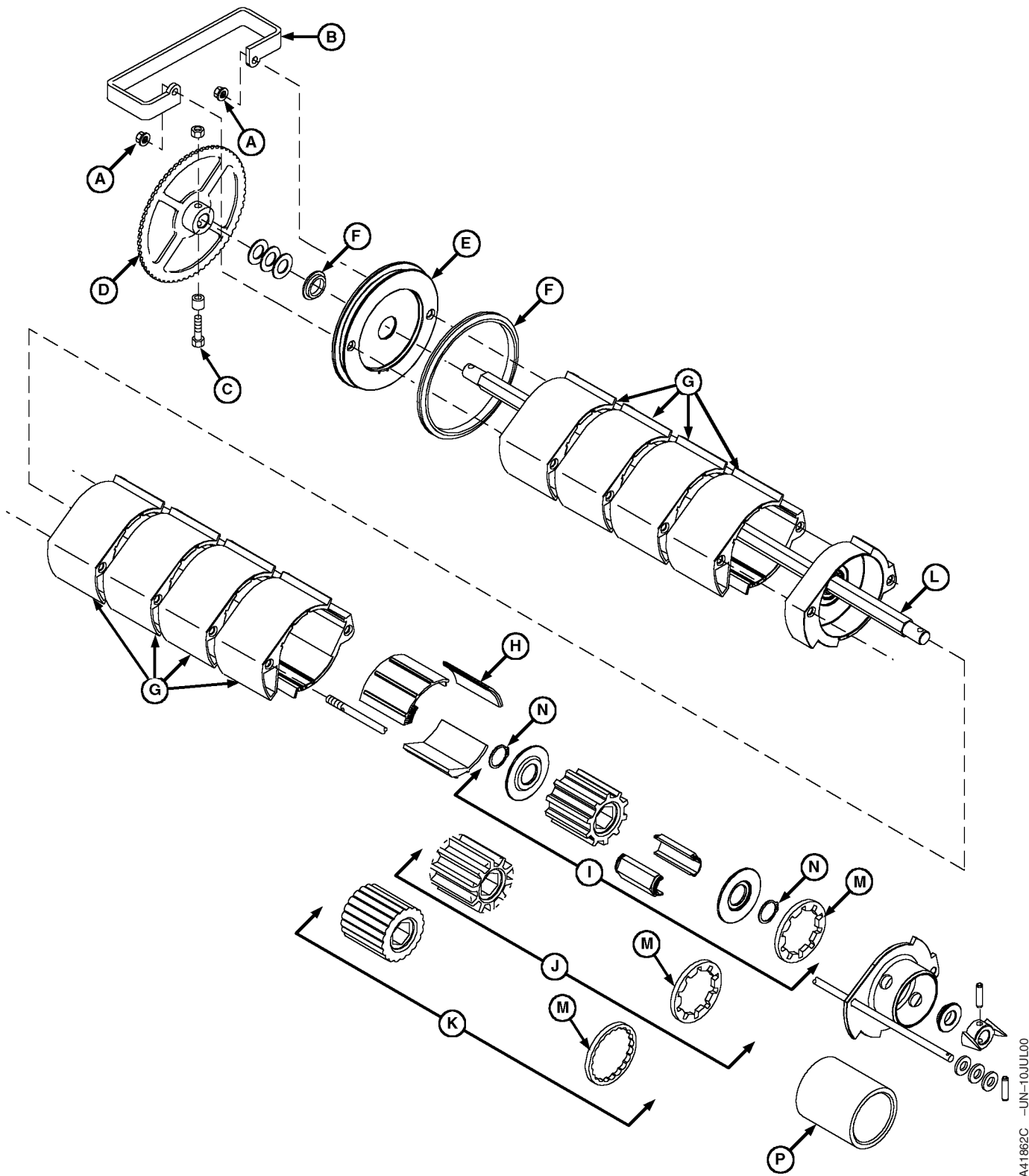
A—Enclosure Brush
B—Wear Strip



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AG,OUO6023,1047 —19-21JUL00-1/1

Changing Product Handling Meter Segments



Meter Cartridge Assembly

Continued on next page

AG,OUO6023,1048 -19-21JUL00-1/2

A—Tie Rod Flange Nuts
B—Handle
C—Cap Screw
D—Sensor Ring
E—End Cap

F—Seals (End Cap)
G—Enclosure
H—Door
I—Meter Segment Regular
Rate Black

J—Meter Segment High-Rate
Green
K—Meter Segment Low-Rate
Yellow

L—Meter Shaft
M—Fine Tuning Rings
N—Snap Rings
P—Driver Tool

Three types of fluted meter segments are available to handle different products and/or product delivery needs and application rates. The segments are color-coded for easy identification.

- Yellow—Low Rates and granular products: Applying low-rate products like flax, canola, alfalfa.
- Black (Standard Equipment)—Regular Rates: For seeds up to 6 mm (0.25 in.) diameter. Most commonly used roller for wheat, barley and small soybeans.
- Green—Hi-Volume Rates: Applying high-rate products such as fertilizer and soybeans larger than 6 mm (0.25 in.) diameter.

To change segments and application rate:

1. Remove meter cartridge assembly from housing.
2. Remove cap screw (C) and sensor signal ring (D) from shaft. Remove and retain sensor ring spacers.

NOTE: Handle will need to be returned to original position at assembly to engage lock tab. Note handle position before removing.

3. Remove nuts (A) and handle (B) from tie rods.
4. Remove end cap (E) and seals (F).

IMPORTANT: Before removing enclosures (G) and segments, note their original positions on the shaft. Numbering the enclosures works well. Work systematically from one end of the shaft to the other and BE SURE to return meter segments (with correct number of tuning rings) to their original positions when installing on shaft.

5. Leaving product doors (H) installed on inactive sections, pull enclosures and assembled meter segments (I, J or K) from shaft.
6. Remove meter segments from enclosures. Note location and quantity of fine tuning rings (M).
7. Remove snap ring (N) and bearing plate from beveled end of meter segment.
8. Replace all existing segments with new segments. All segments of the meter assembly **MUST** be the same color.

NOTE: One end of meter segment is beveled to accept fine tuning rings.

9. Install same number of fine tuning rings on new segments as was found on old. To easily install, soak rings in hot water first and position on beveled end of segment; then drive on with tool (P) A61656. Install bearing plate and snap ring.
10. Place segments in enclosures and return to their original positions on the shaft.
11. Install end parts. Be sure handle is returned to original position.

IMPORTANT: Over tightening tie rod nuts (A) can distort plastic enclosures (G), preventing meter segments (I, J or K) from turning; increases wear on meter cartridge; and causes rod to interfere with sensor ring.

12. Tighten nuts (A) until two tie-rod threads are visible.
13. Making sure product doors are installed at inactive runs, return meter cartridge assembly to housing.

Customizing Meter Segments

Through the use of fine tuning rings (A), each meter segment is customized to proportionately reduce product delivery to agree with the number of secondary ports to which it is supplying product.

Each tuning ring effectively reduces the segment's product carrying area by one-twelfth.

Secondary Ports	Insert Rings
12 Port Header	0 Rings
11 Port Header	1 Ring
10 Port Header	2 Rings
9 Port Header	3 Rings
8 Port Header	4 Rings
7 Port Header	5 Rings

NOTE: One end of the meter segment is beveled to accept fine tuning rings.

Tuning rings need to be centered on the segment for even product distribution.

When a single ring or an odd number of rings are needed:

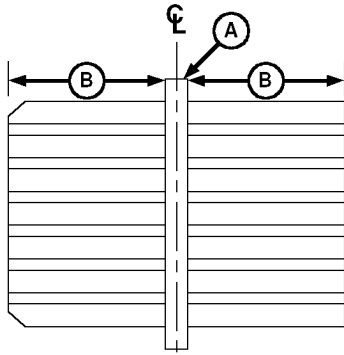
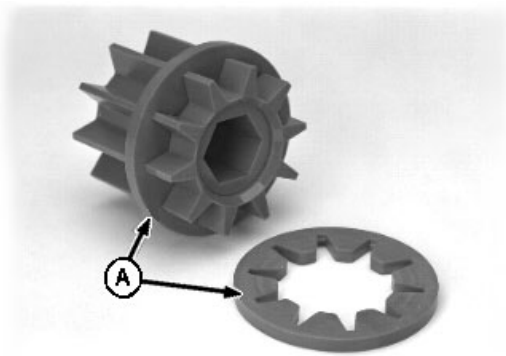
Install first ring at the middle of the segment, dividing it into equal halves (B); then install additional ring(s), keeping segment equally divided.

With an even number of rings, install so ring seam is on segment centerline with same number of rings on both sides for equal distribution.

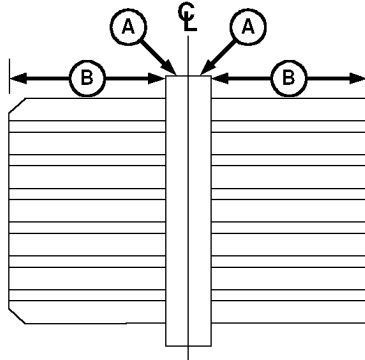
Refer to METER CARTRIDGE/SEEDING TOOL DIAGRAMS in this section to confirm that meter cartridge has been properly customized for your seeding tool application.

To install fine tuning rings:

1. Remove snap ring and bearing plate from beveled end of segment.
2. Soak rings in hot water first and position on beveled end of segment; then drive on with installation tool, A61656.



Single or Odd Number of Rings



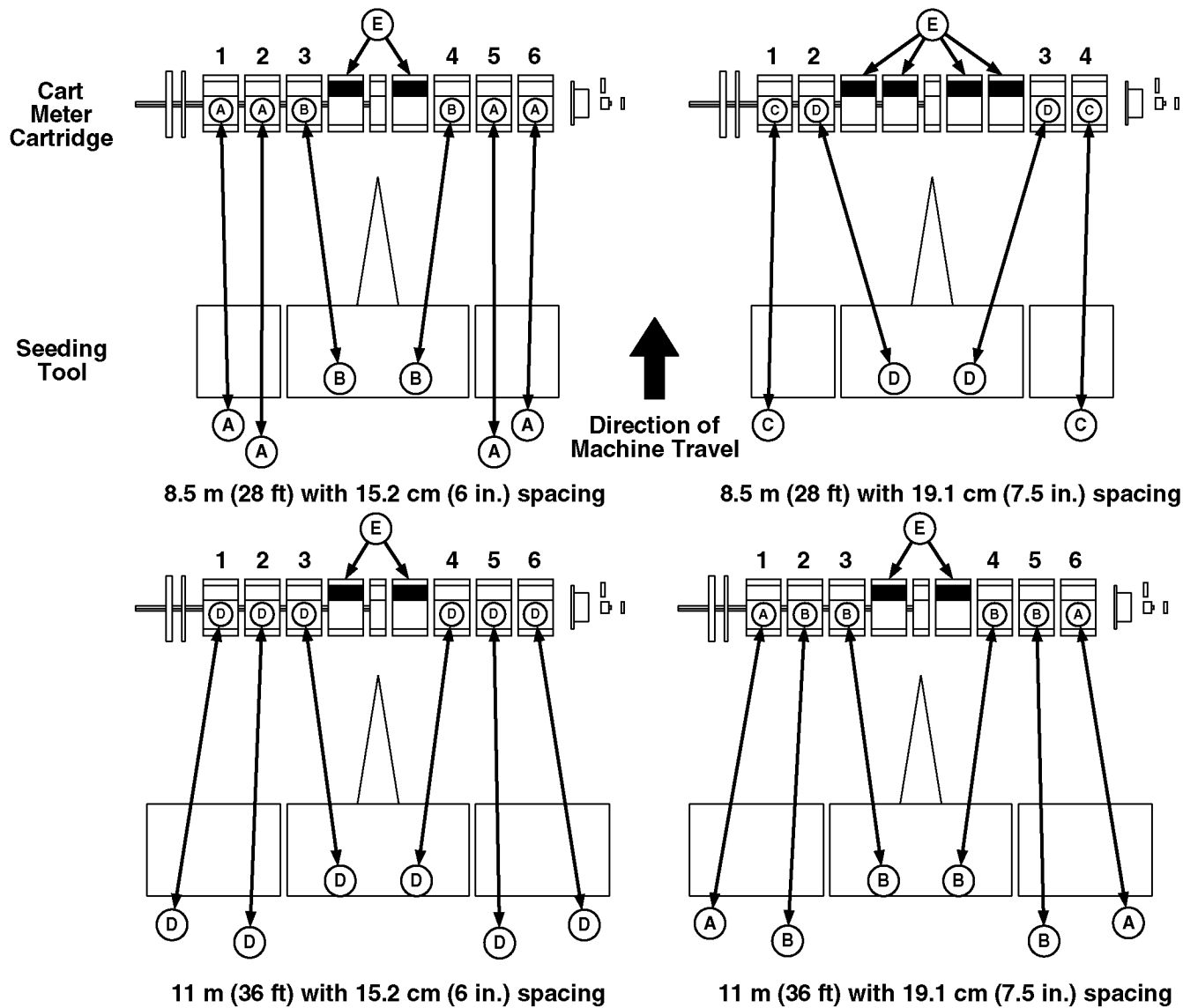
Even Number of Rings

A—Tuning Rings
B—Equal Halves

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Meter Cartridge/Seeding Tool Diagram—730 Air Disk Drill



A—9-Port Header/3 Tuning Rings
B—10-Port Header/2 Tuning Ring

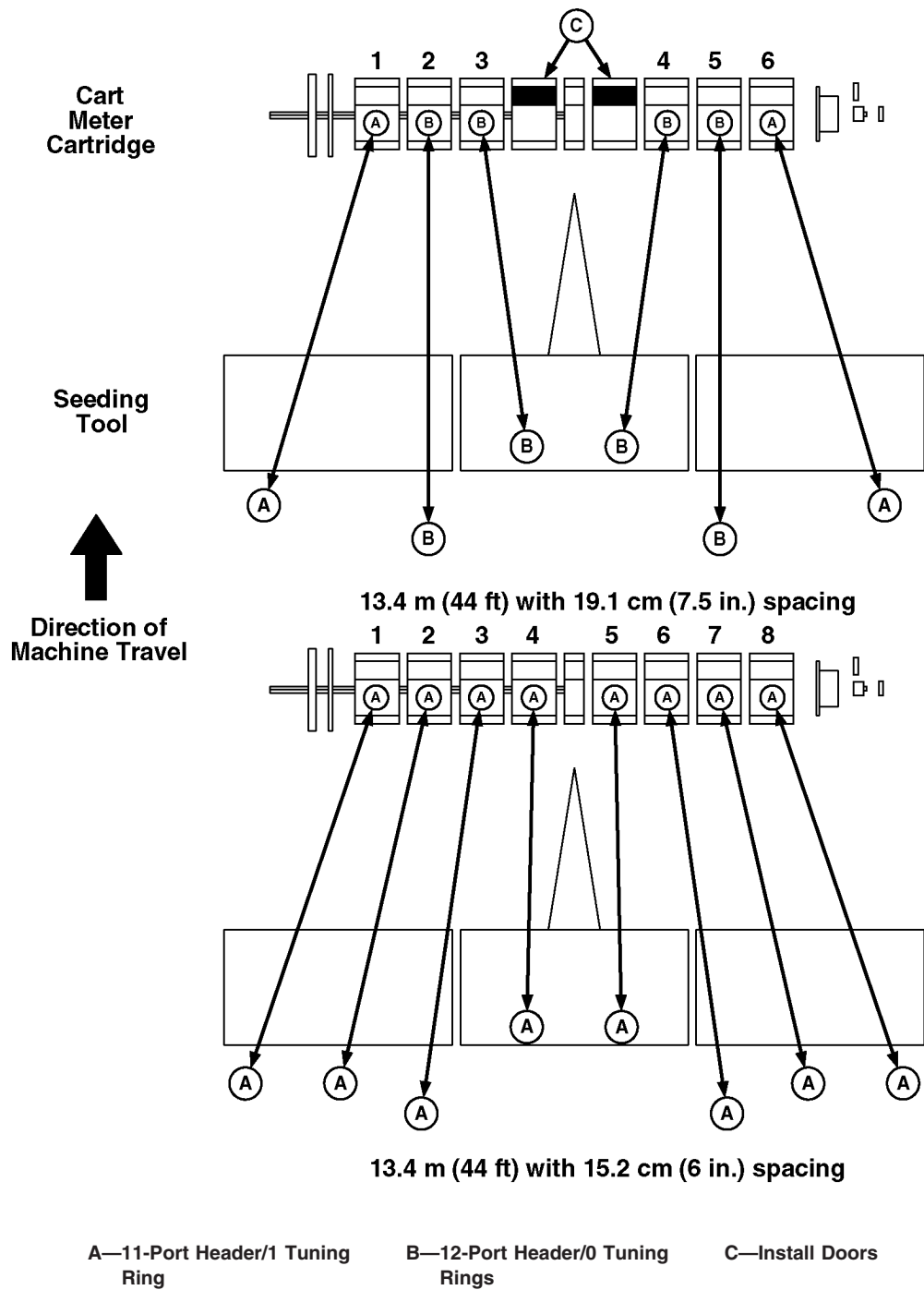
C—11-Port Header/1 Tuning Ring

D—12-Port Header/0 Tuning Rings

E—Install Doors

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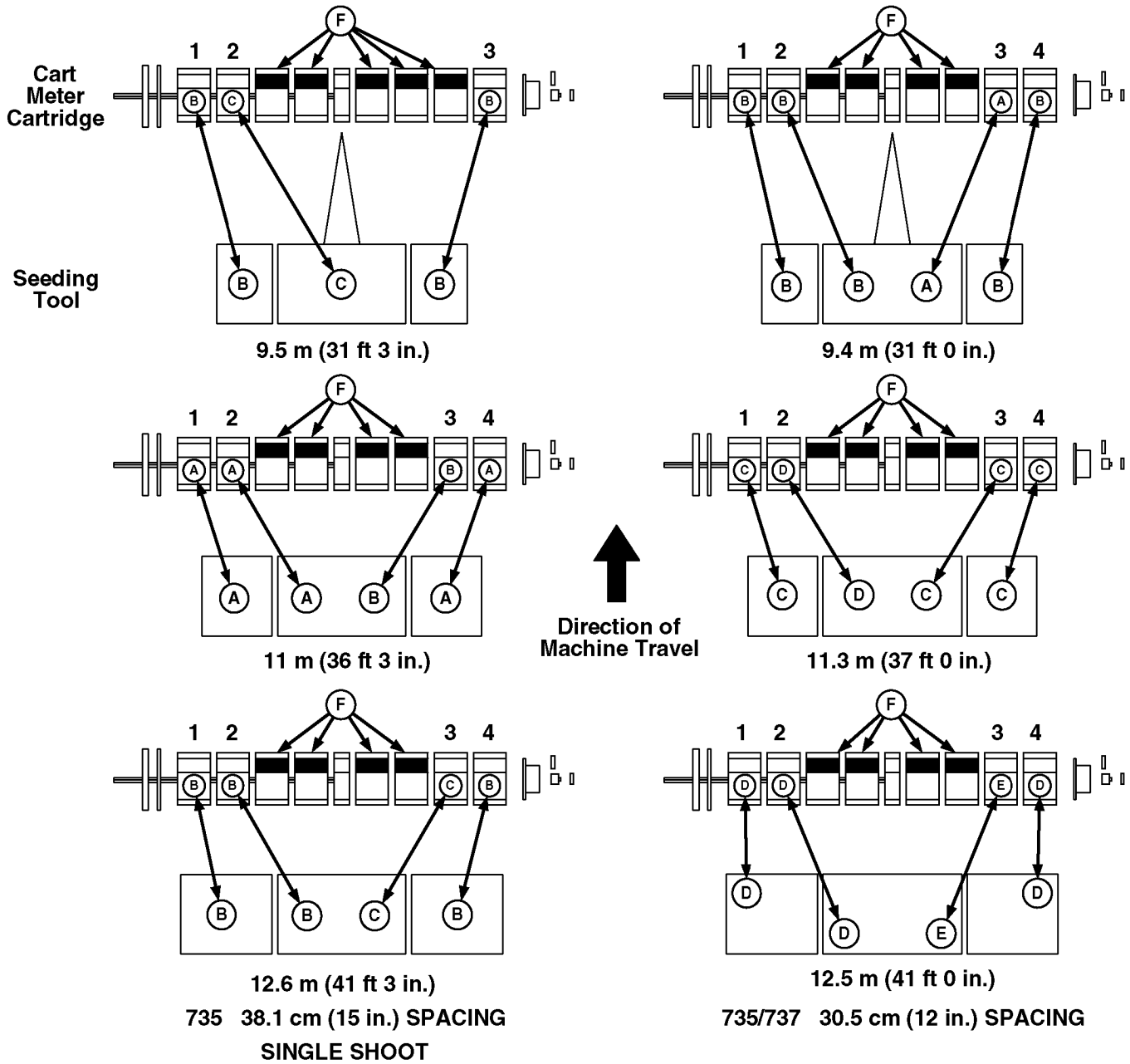
Meter Cartridge/Seeding Tool Diagram—730 Air Disk Drill



A46811 -19-21NOV00

AG,OUO6023,1053 -19-21JUL00-1/1

Meter Cartridge/Seeding Tool Diagram—735/737 Air Seeding Tools



A—7-Port Header/5 Tuning Rings
 B—8-Port Header/4 Tuning Rings

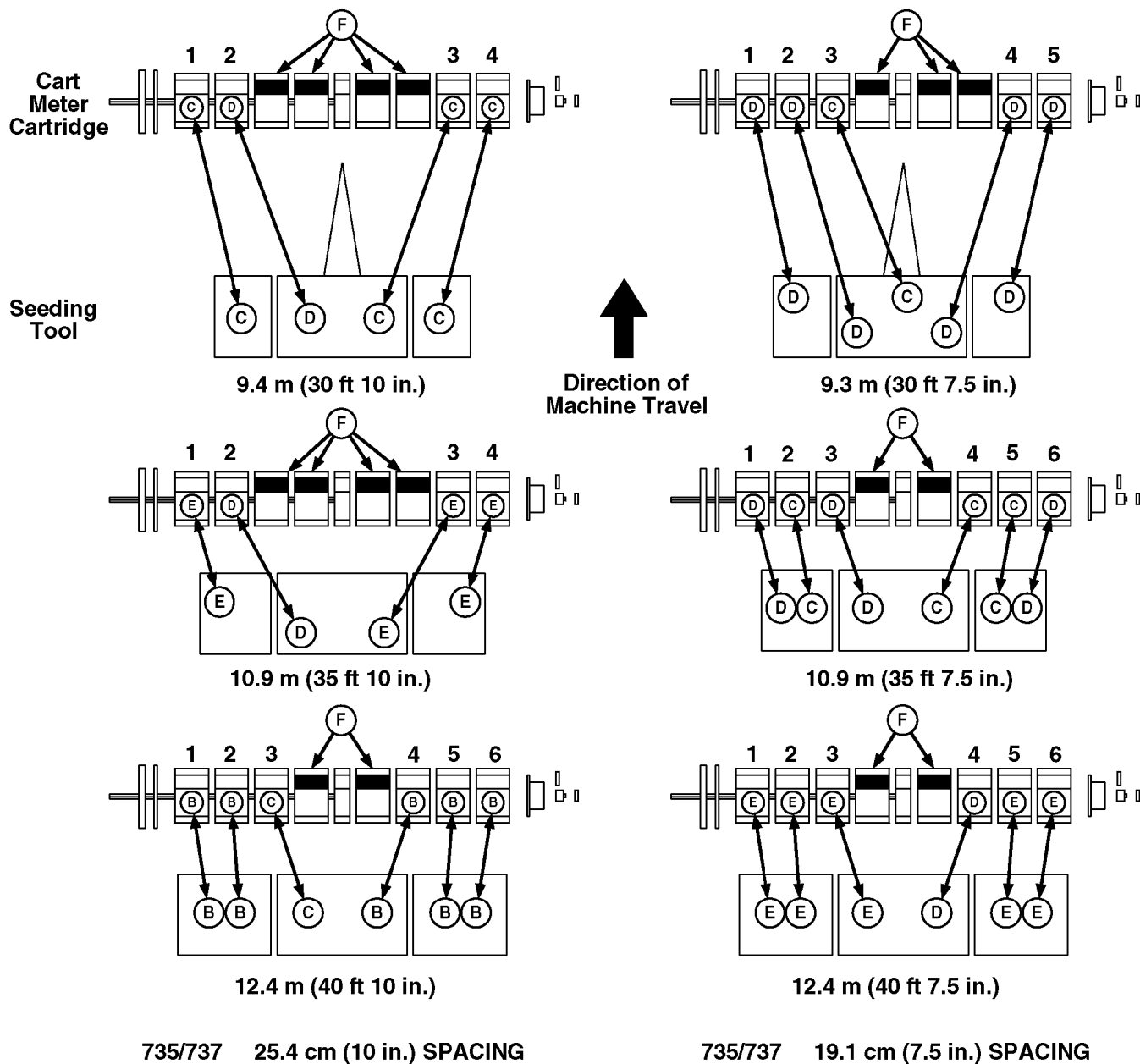
C—9-Port Header/3 Tuning Rings
 D—10-Port Header/2 Tuning Rings

E—11-Port Header/1 Tuning Ring

F—Install Doors

A46812 -19-21NOV00

Meter Cartridge/Seeding Tool Diagram—735/737 Air Seeding Tools



A—7-Port Header/5 Tuning Rings
 B—8-Port Header/4 Tuning Rings

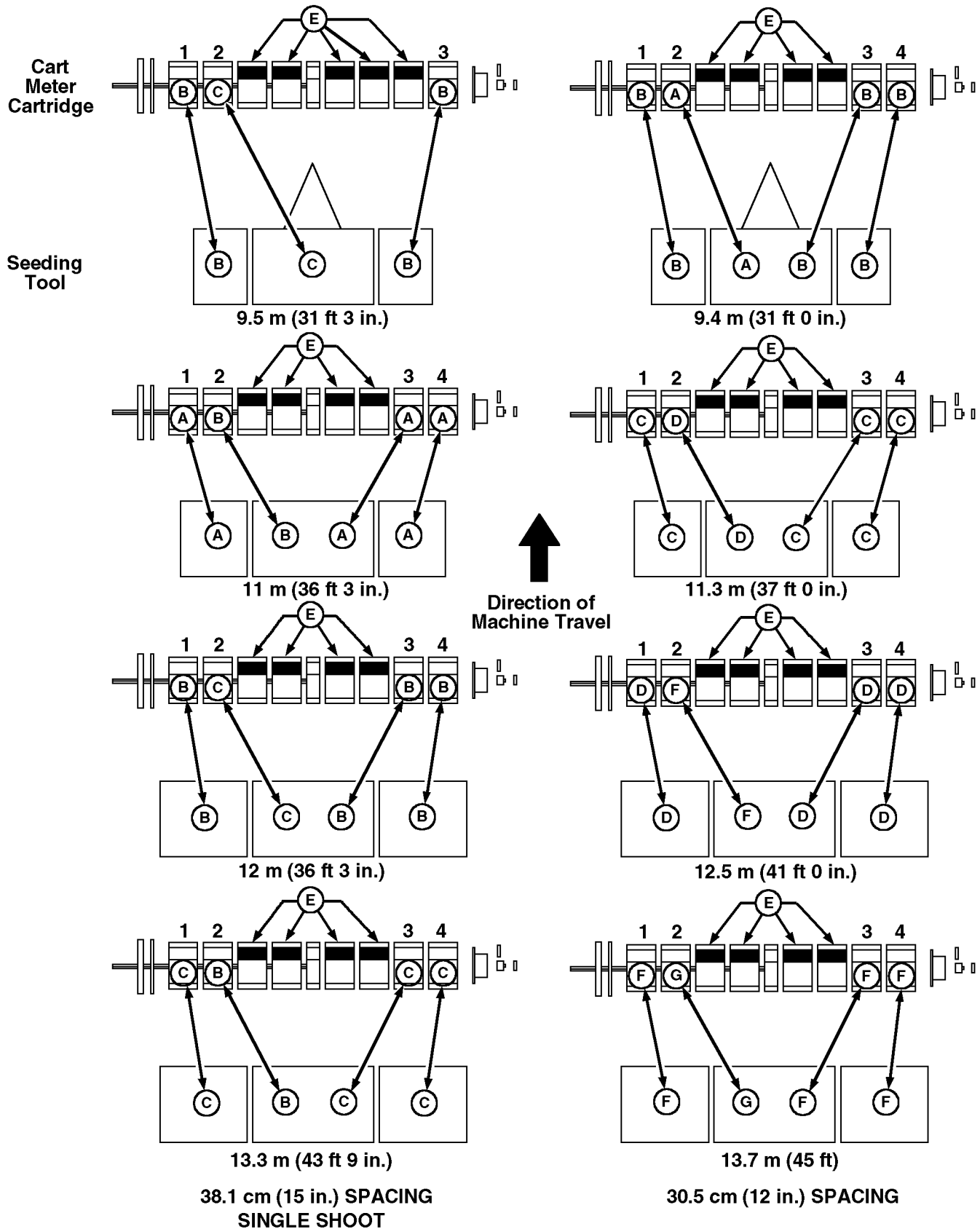
C—9-Port Header/3 Tuning Rings
 D—10-Port Header/2 Tuning Rings

E—11-Port Header/1 Tuning Rings

F—Install Doors

A46813 -19-21NOV00

Meter Cartridge/Seeding Tool Diagram—1810 Air Seeding Tools (3-Section)



- A—7-Port Header/5 Tuning
Rings

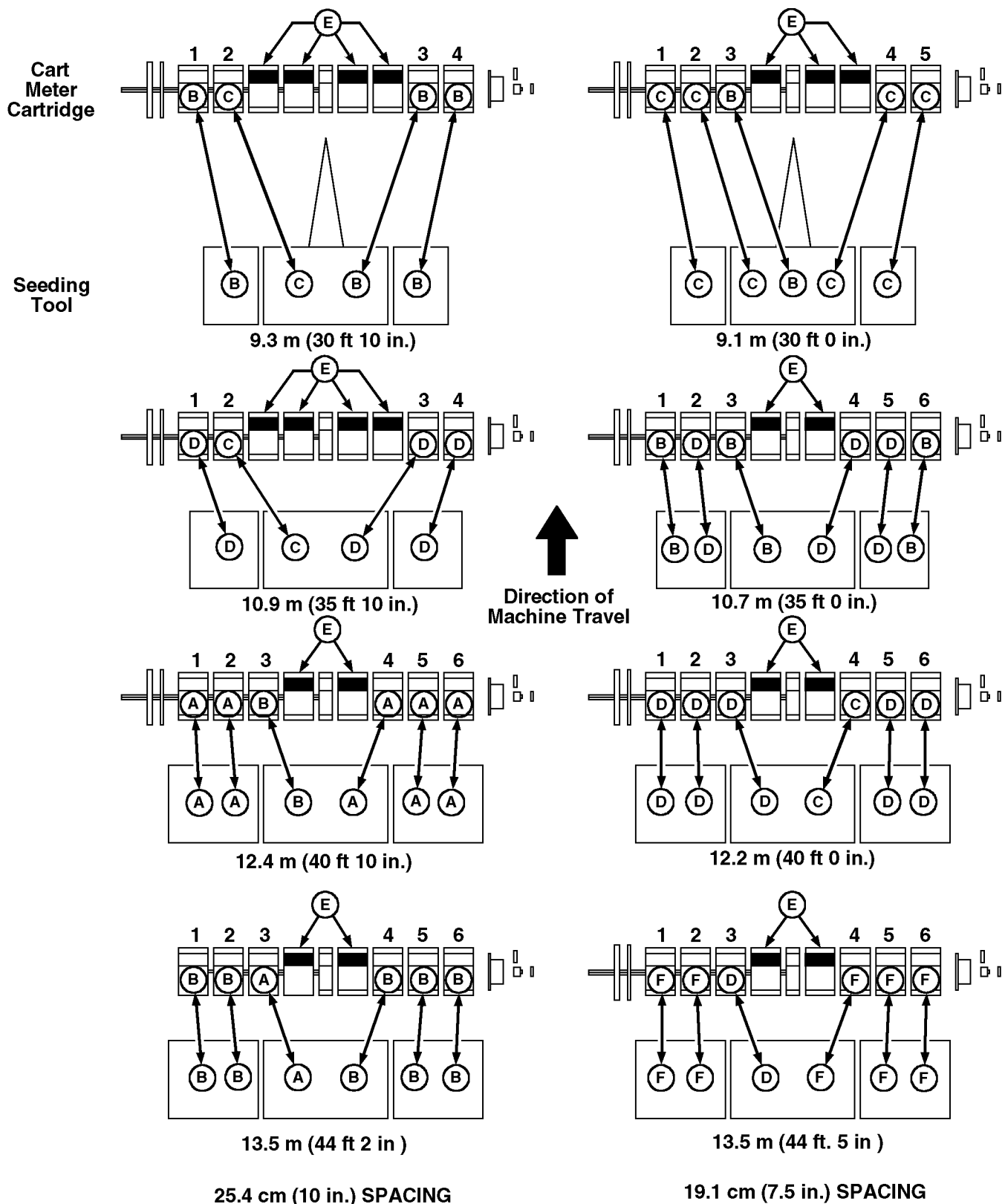
B—8-Port Header/4 Tuning
Rings
- C—9-Port Header/3 Tuning
Rings

D—10-Port Header/2 Tuning
Rings
- E—Install Doors

F—11-Port Header/1 Tuning
Rings
- G—12-Port Header/0 Tuning
Rings

AG,OUO6023,1057 –19–21JUL00–2/2

Meter Cartridge/Seeding Tool Diagram—1810 Air Seeding Tools (3-Section)



Continued on next page

OUO6076.000022A -19-07MAY01-1/2

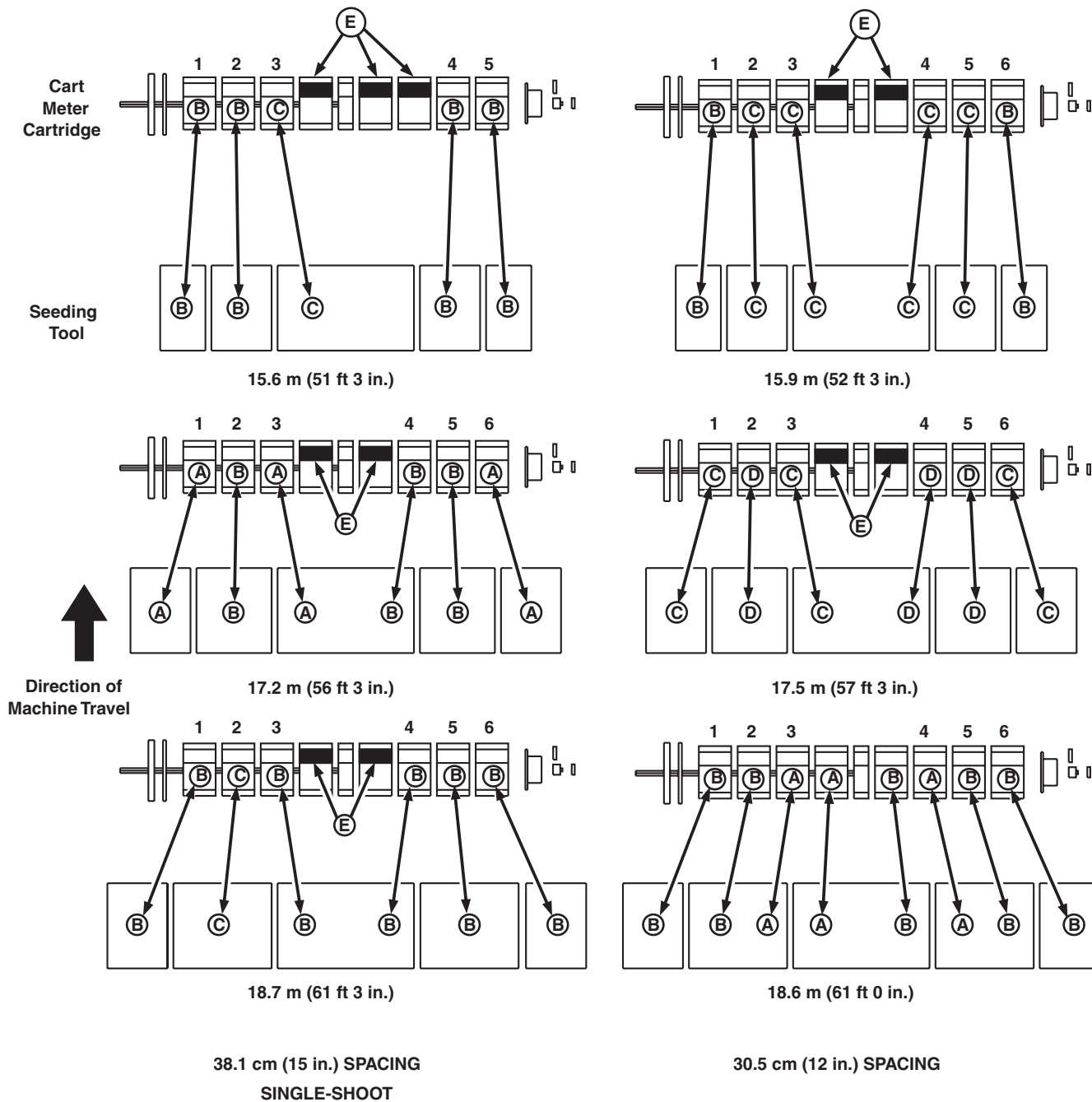
- A—8-Port Header/4 Tuning
Rings

B—9-Port Header/3 Tuning
Rings
- C—10-Port Header/2 Tuning
Rings

D—11-Port Header/1 Tuning
Rings
- E—Install Doors
- F—12-Port Header/0 Tuning
Rings

OUO6076,000022A -19-07MAY01-2/2

Meter Cartridge/Seeding Tool Diagram—1810 Air Seeding Tools (5-Section)



A—7-Port Header/5 Tuning Rings
B—8-Port Header/4 Tuning Rings

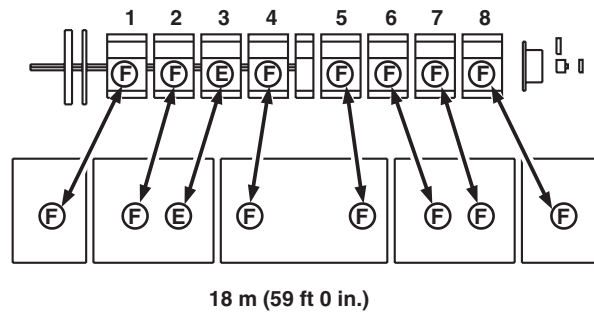
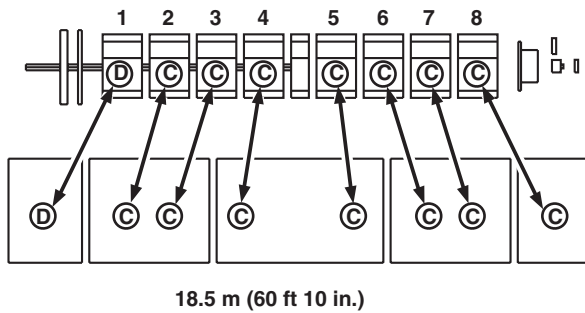
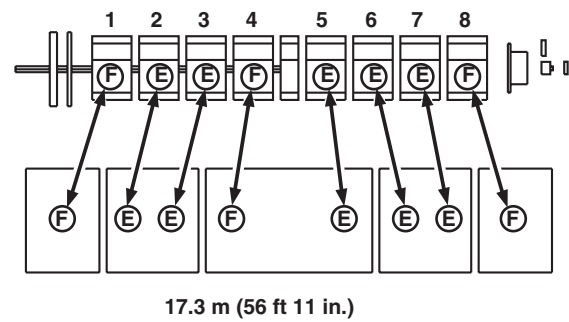
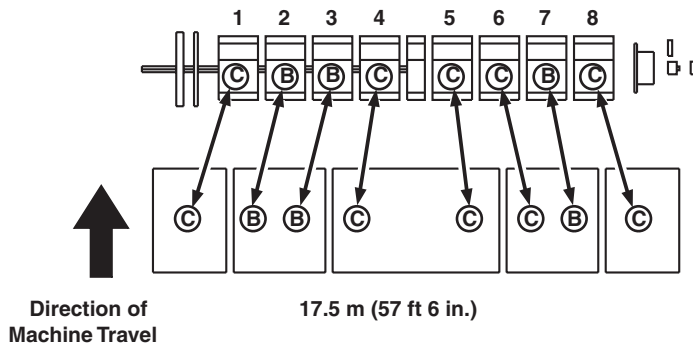
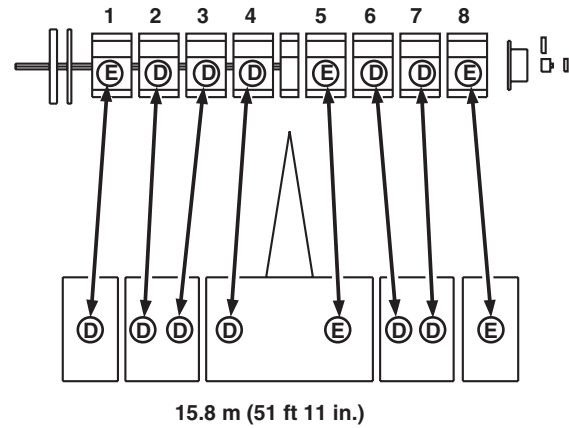
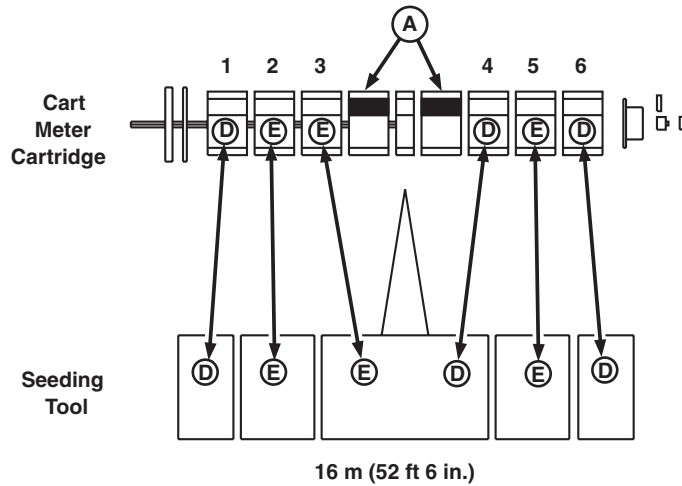
C—9-Port Header/3 Tuning Rings

D—10-Port Header/2 Tuning Rings

E—Install Doors

A46814 -19-21NOV00

Meter Cartridge/Seeding Tool Diagram—1810 Air Seeding Tools (5-Section)



25.4 cm (10 in.) SPACING

19.1 cm (7.5 in.) SPACING

A—Install Doors
B—8-Port Header/4 Tuning Rings

C—9-Port Header/3 Tuning Rings
D—10-Port Header/2 Tuning Rings

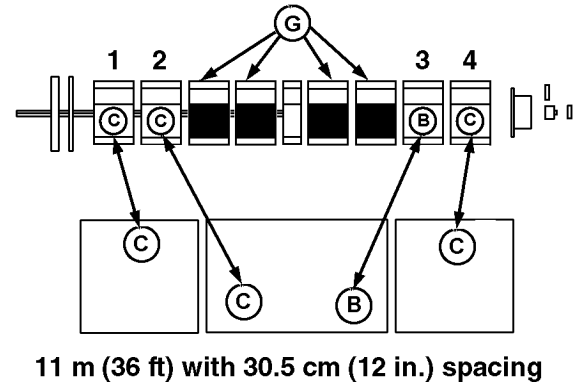
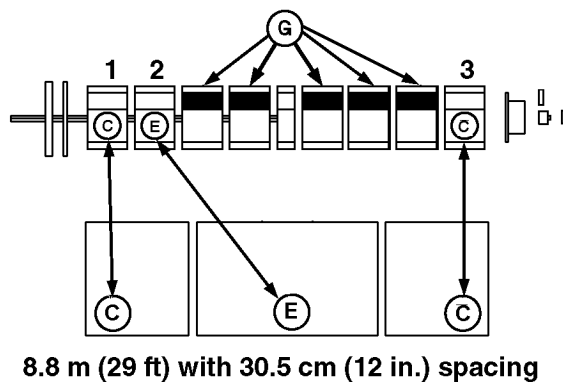
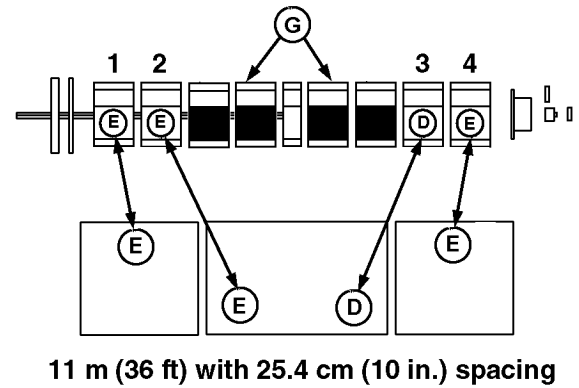
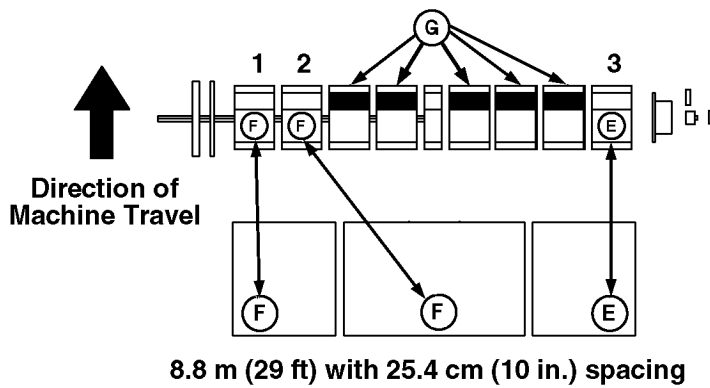
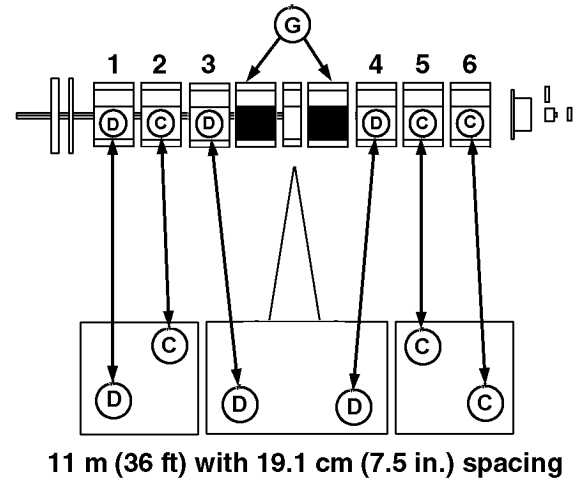
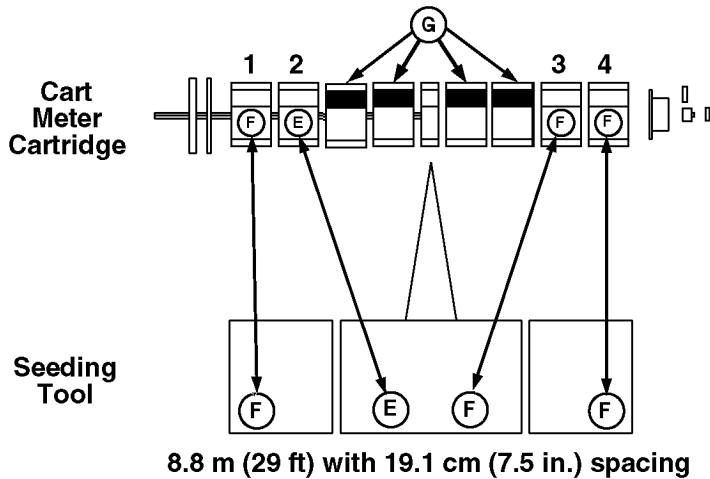
E—11-Port Header/1 Tuning Rings

F—12-Port Header/0 Tuning Rings

OUO6076,000022B -19-07MAY01-1/1

A46815 -19-21NOV00

Meter Cartridge/Seeding Tool Diagram—1820 Flex Air Hoe Drill



A—7-Port Header/5 Tuning Rings
B—8-Port Header/4 Tuning Rings

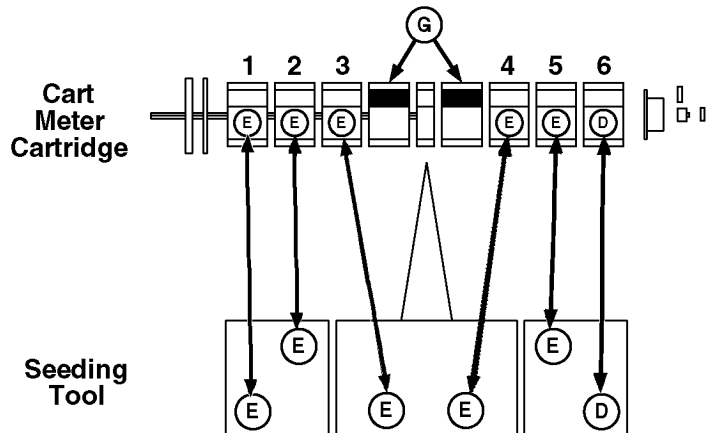
C—9-Port Header/3 Tuning Rings
D—10-Port Header/2 Tuning Rings

E—11-Port Header/1 Tuning Rings
F—12-Port Header/0 Tuning Rings

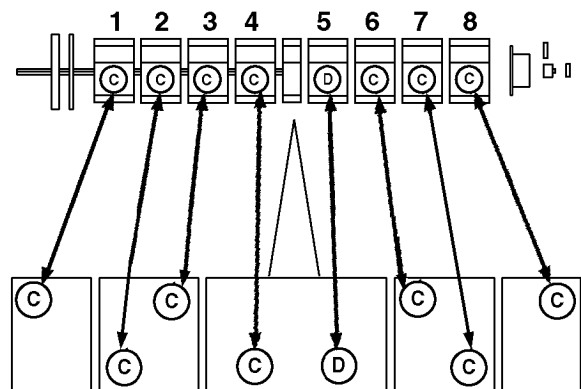
G—Install Doors

A46818 -19-21NOV00

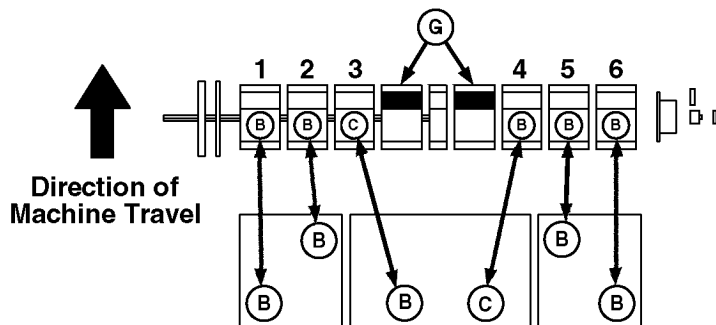
Meter Cartridge/Seeding Tool Diagram—1820 Flex Air Hoe Drill



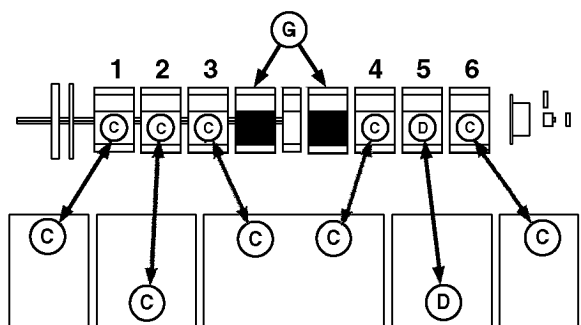
12.5 m (41 ft) with 19.1 cm (7.5 in.) spacing



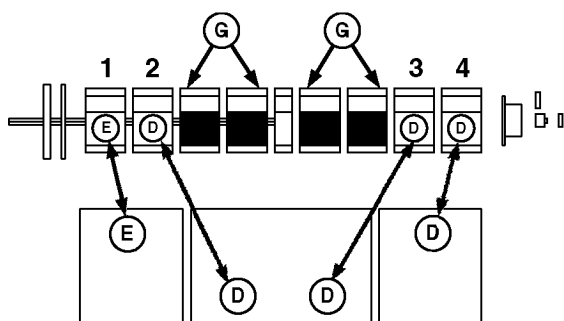
13.7 m (45 ft) with 19.1 cm (7.5 in.) spacing



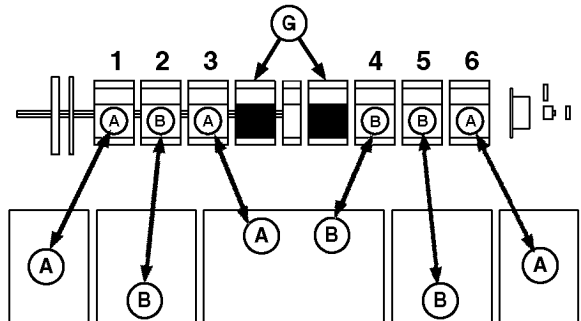
12.5 m (41 ft) with 25.4 cm (10 in.) spacing



13.7 m (45 ft) with 25.4 cm (10 in.) spacing



12.5 m (41 ft) with 30.5 cm (12 in.) spacing



13.7 m (45 ft) with 30.5 cm (12 in.) spacing

A—7-Port Header/5 Tuning Rings
B—8-Port Header/4 Tuning Rings

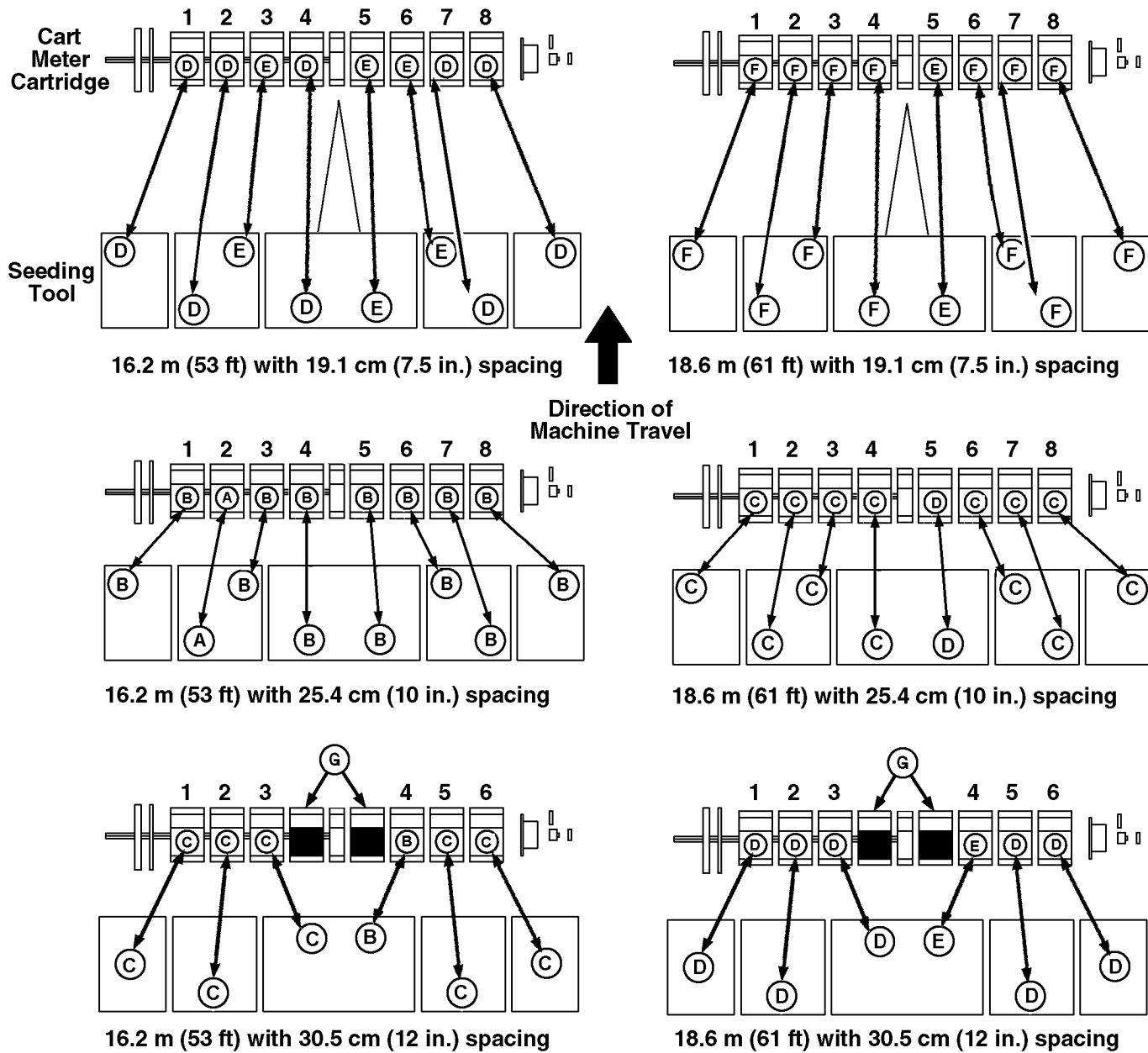
C—9-Port Header/3 Tuning Rings
D—10-Port Header/2 Tuning Rings

E—11-Port Header/1 Tuning Rings
F—12-Port Header/0 Tuning Rings

G—Install Doors

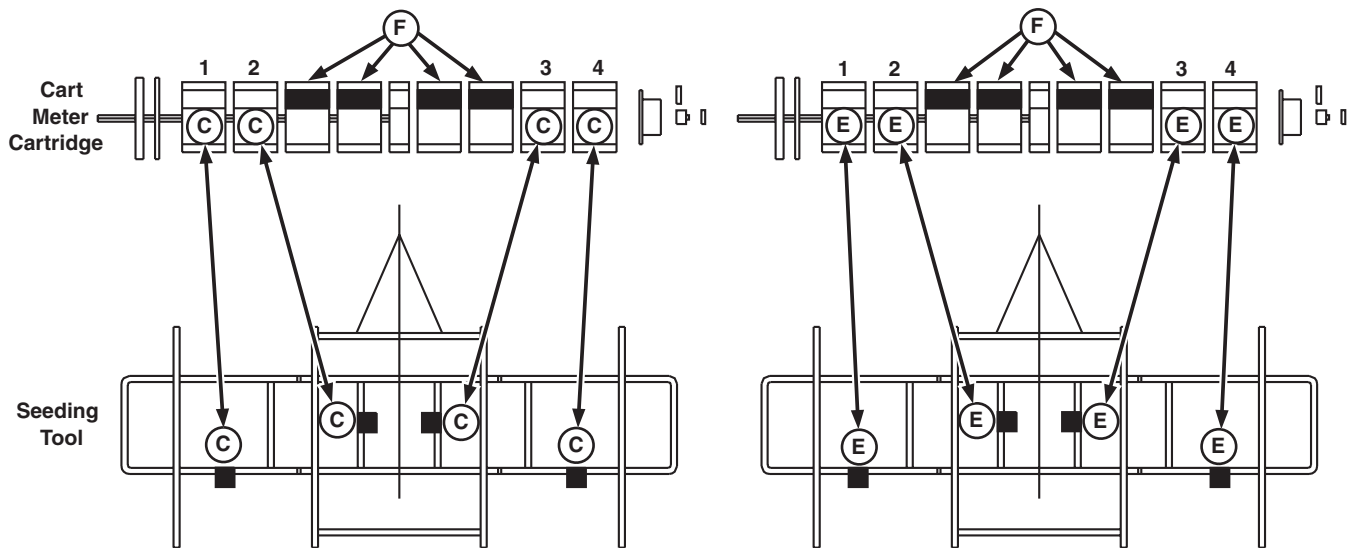
A46819 -19-21NOV00

Meter Cartridge/Seeding Tool Diagram—1820 Flex Air Hoe Drill



A46820 -19-21NOV00

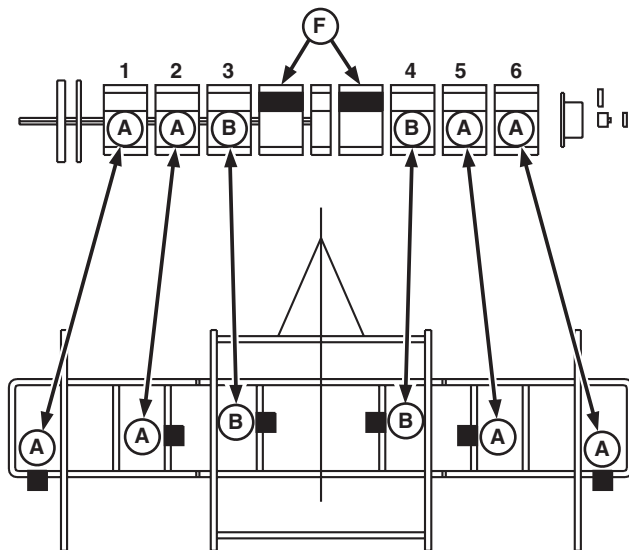
Meter Cartridge/Seeding Tool Diagram—1850/1860 No-Till Air Drill



9.1 m (30 ft) with 25.4 cm (10 in.) spacing

9.1 m (30 ft) with 19.1 cm (7.5 in.) spacing

Direction of
Machine Travel



11 m (36 ft) with 25.4 cm (10 in.) spacing

11 m (36 ft) with 19.1 cm (7.5 in.) spacing

A—7 Port Header/5 Tuning
Rings
B—8 Port Header/4 Tuning
Rings

C—9 Port Header/3 Tuning
Rings
D—10 Port Header/2 Tuning
Rings

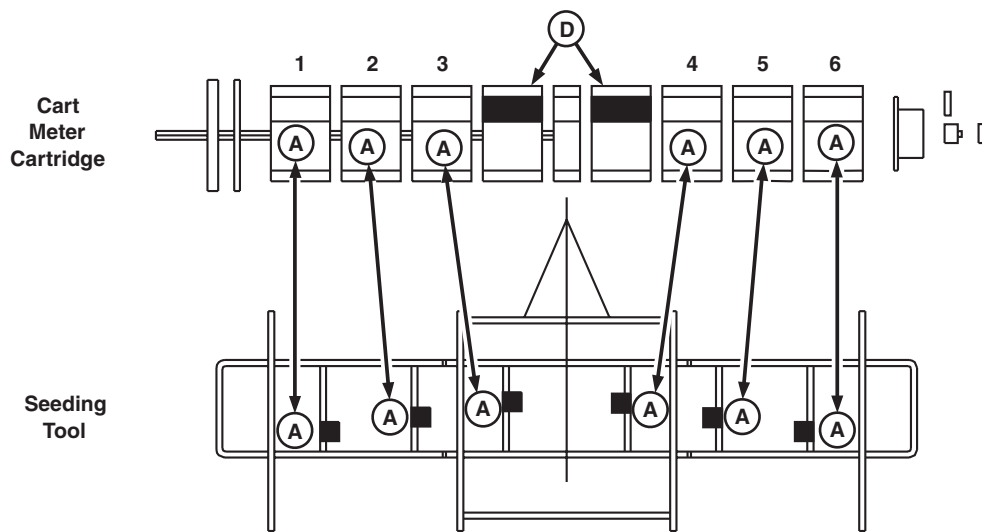
E—12 Port Header/0 Tuning
Rings

F—Install Doors

OUO6076,00001CB -19-05APR01-1/1

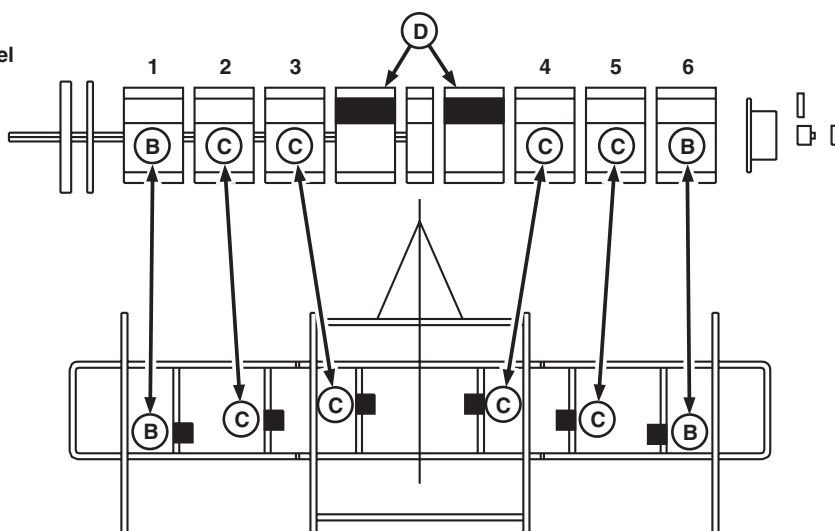
A46965 -19-04JAN01

Meter Cartridge/Seeding Tool Diagram—1860 No-Till Air Drill



12.2 m (40 ft.) with 25.4 cm (10 in.) spacing

Direction of
Machine Travel



12.2 m (40 ft.) with 19.1 cm (7.5 in.) spacing

A—8 Port Header/4 Tuning
Rings

B—10 Port Header/2 Tuning
Ring

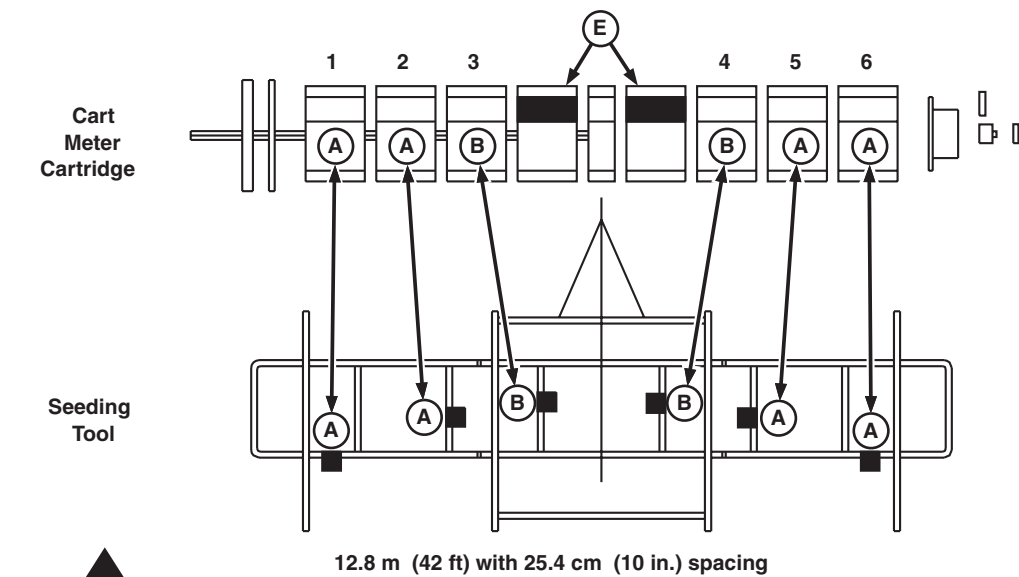
C—11 Port Header/1 Tuning
Rings

D—Install Doors

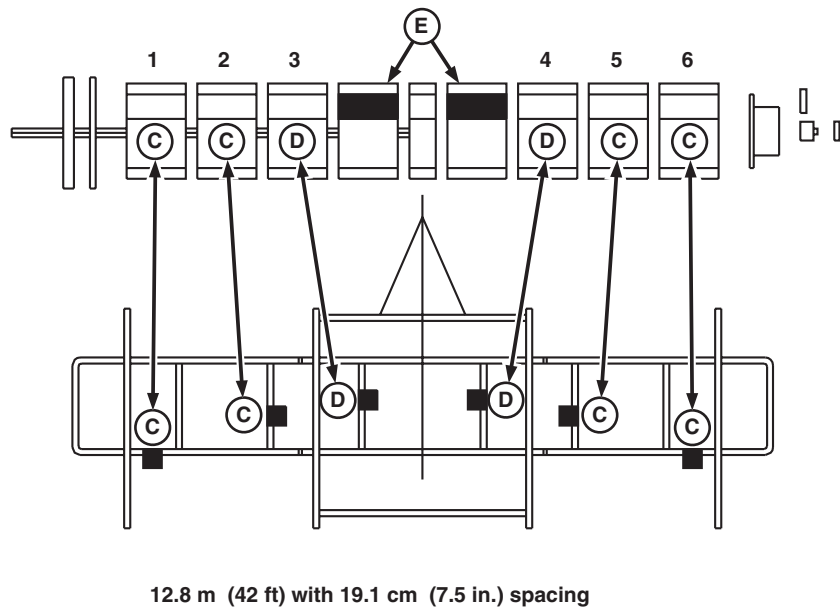
A47067 -19-04APR01

OUO6076,00001CC -19-05APR01-1/1

Meter Cartridge/Seeding Tool Diagram—1850/1860 No-Till Air Drill



Direction of
Machine Travel



A—8 Port Header/4 Tuning
Rings
B—9 Port Header/3 Tuning
Rings

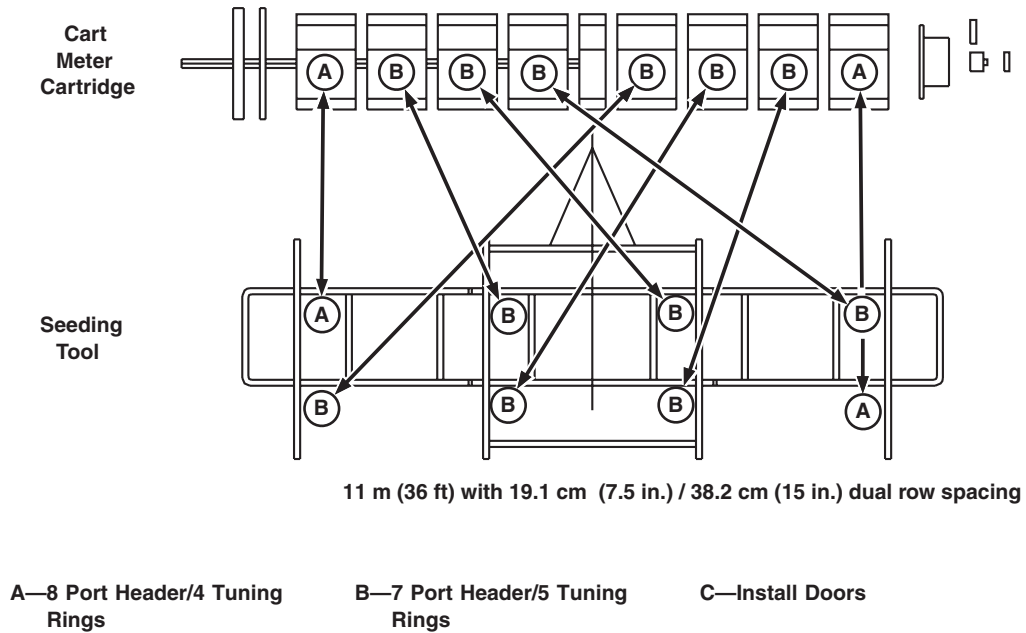
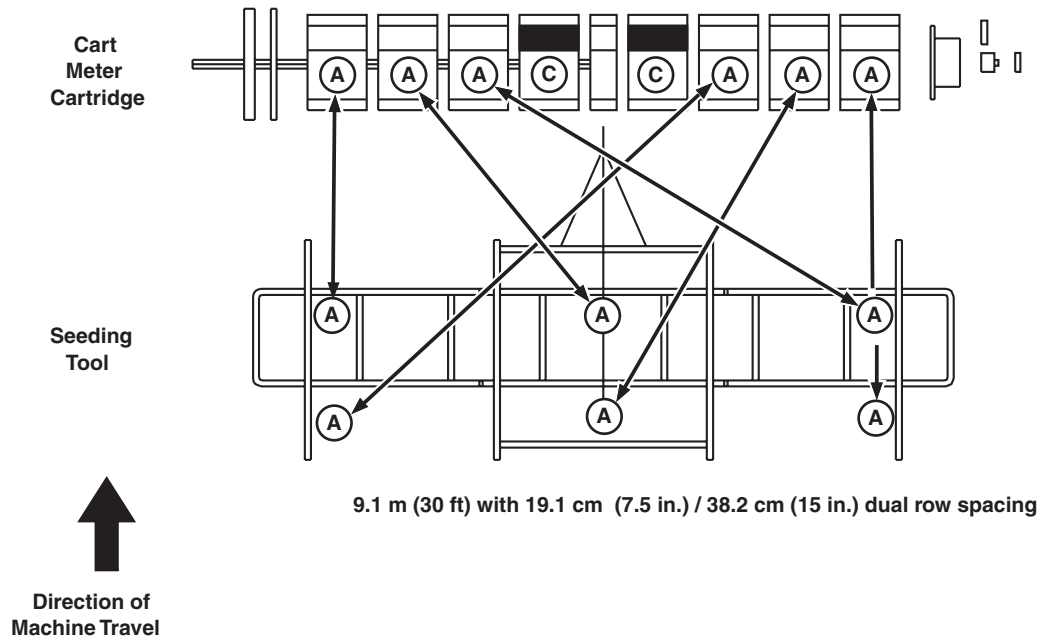
C—11 Port Header/1 Tuning
Ring

D—12 Port Header/0 Tuning
Rings

E—Install Doors

A46966 -19-04JAN01

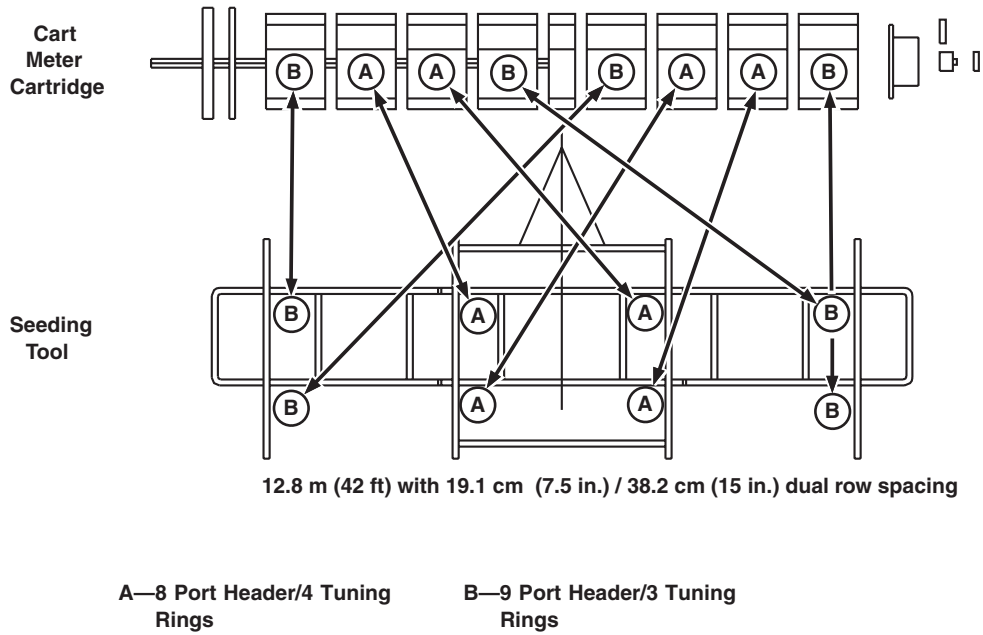
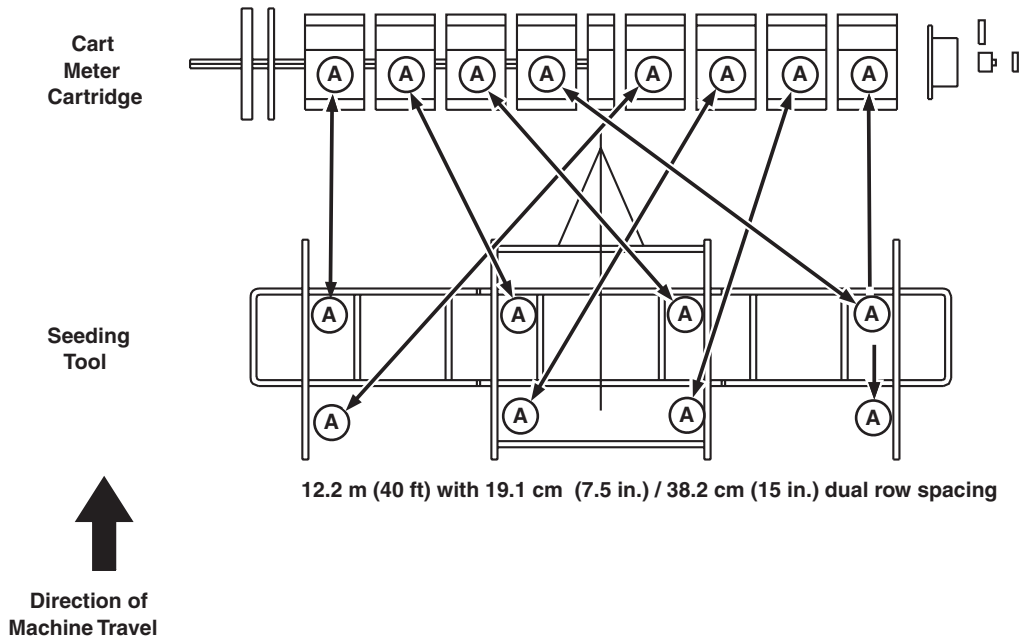
Meter Cartridge/Seeding Tool Diagram—1860 No-Till Air Drill



A47262 -19-12APR01

OUO6076,00001CE -19-05APR01-1/1

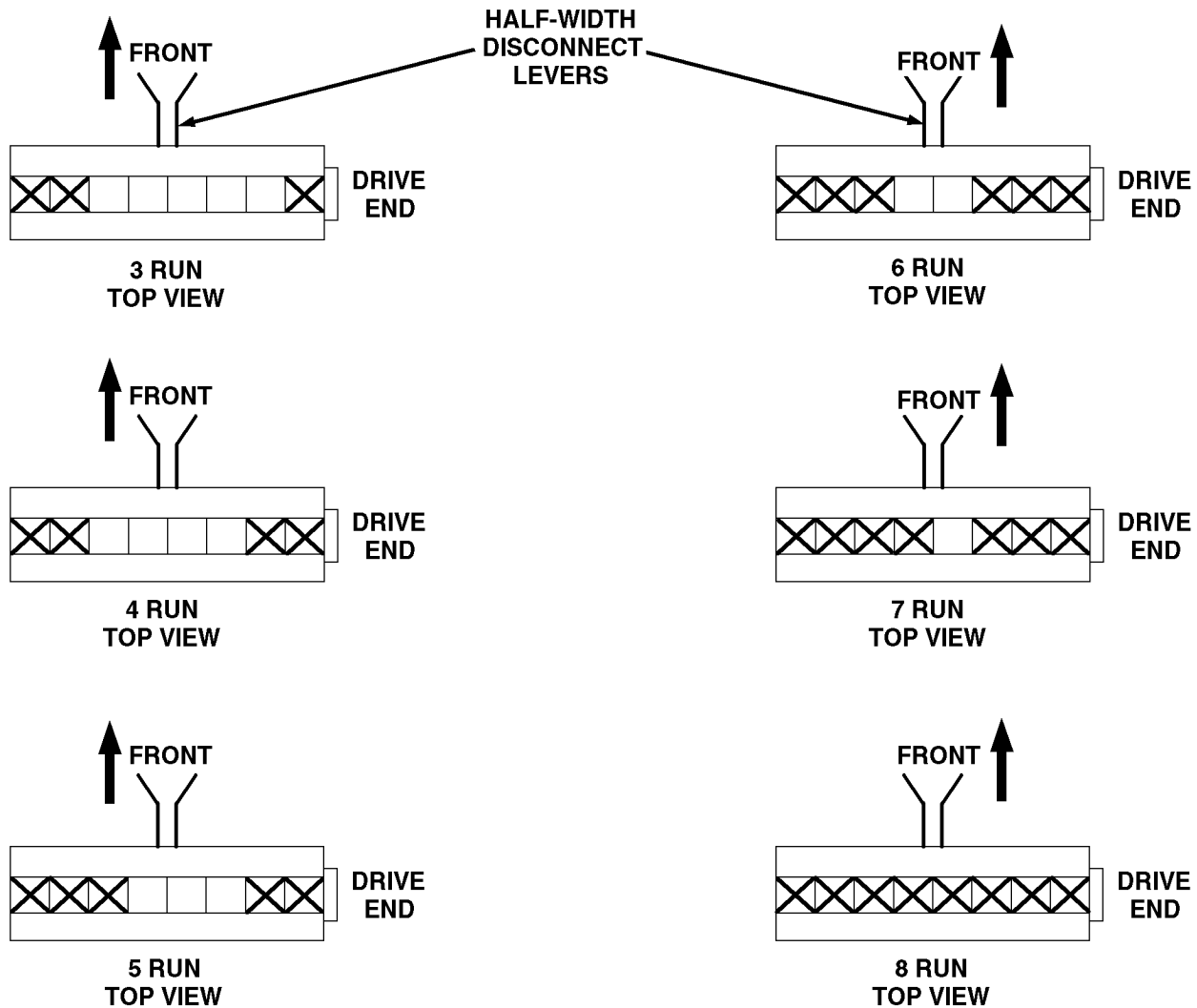
Meter Cartridge/Seeding Tool Diagram—1860 No-Till Air Drill



A47263 -19-12APR01

OUO6076,00001CF -19-05APR01-1/1

Active Meter Guide



"X" INDICATES
ACTIVE RUNS.
ALL ACTIVE RUNS
REQUIRE AGITATOR.

A42525 -19-24APR98

AG,OUO6023,1061 -19-21JUL00-1/1

Adding Meter Segments and Agitators

As specified in the original customer's order, meter cartridges (A) are factory assembled with product handling segments installed only at the active runs.

Snap-in doors (B) are installed to prevent product from entering empty enclosures.

Should the meter cartridge be moved to a different cart, and the new application has more active runs than the original, fluted product handling segments must be installed in the empty enclosures. The same is true of activating additional runs on a cart that was originally ordered with less than eight active runs per meter.

With an uneven number of runs, the odd meter segment is always installed on the left-hand end of the cartridge (opposite of the drive end). Refer to ACTIVE METER GUIDE in this section for illustration.

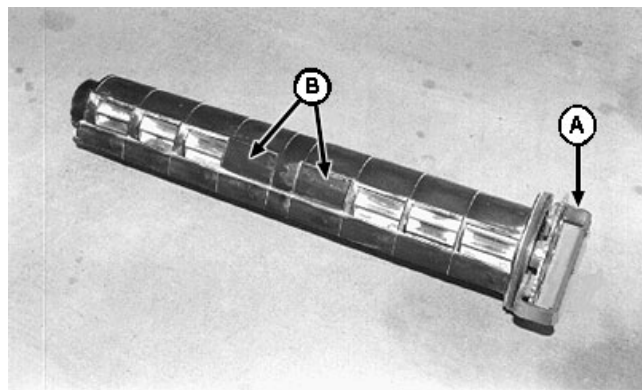
Additional product agitators (C) will also need to be installed above the newly activated runs. Refer to INSTALLING AGITATORS in this section for detailed information.

IMPORTANT: To reduce load on the agitator shaft, remove agitators from inactive runs.

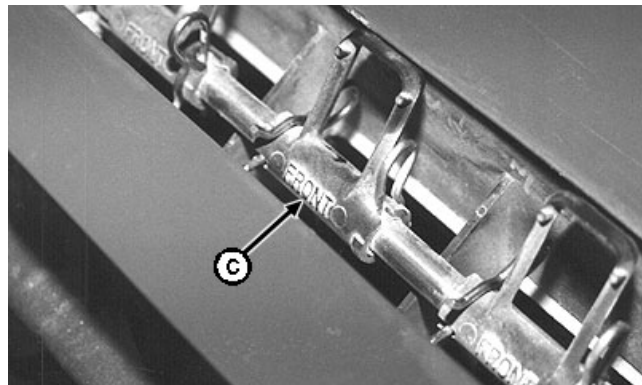
NOTE: When activating new runs, manifold may need to be reconfigured to agree with new product runs, or at minimum, plugs need to be removed from manifold inlets. Refer to OPENING AND CLOSING PRODUCT RUNS in this section for further information.

- To add active meter segments:

1. Remove cartridge from meter housing.



A41533A -UN-22APR98



A42519 -UN-23APR98

A—Meter Cartridges
B—Snap-In Doors
C—Agitators

Continued on next page

AG,OUO6023,1062 -19-21JUL00-1/9

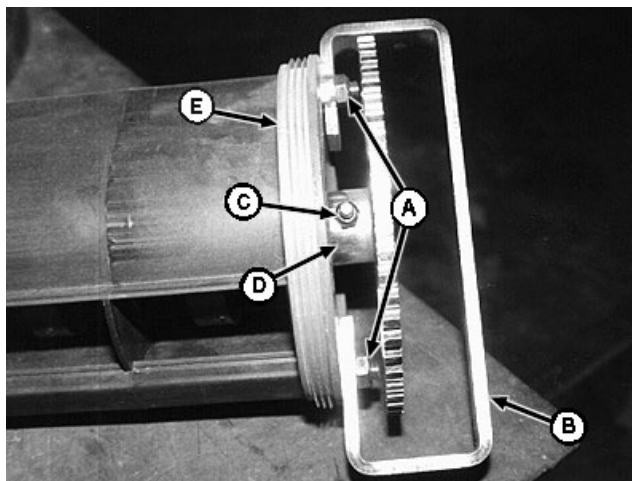
2. Remove hardware (C) and sensor sprocket (D).

NOTE: Handle will need to be returned to original position at assembly to engage lock tab. Note handle position before removing.

3. Remove hardware (A) and handle (B).

4. Remove end cap (E) with seals.

A—Hardware
B—Handle
C—Hardware
D—Sensor Sprocket
E—End Cap



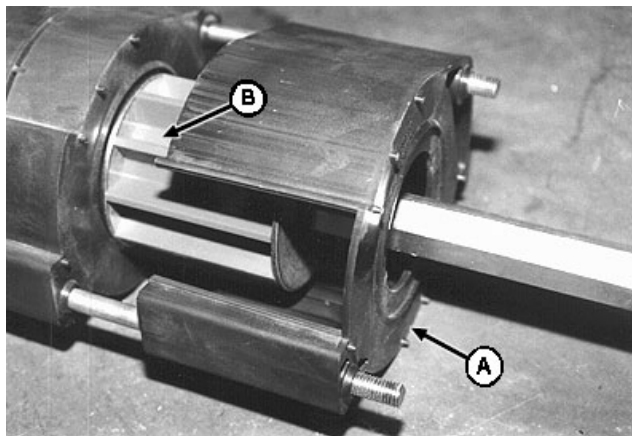
A42520 -UN-23APR98

AG,OUO6023,1062 -19-21JUL00-2/9

NOTE: Far end enclosure need not be removed from shaft unless fine tuning rings need to be installed. If left in place, far end enclosure can be used as an alignment guide for other segment enclosures.

5. Remove enclosures (A) and meter segments (B) from shaft.
6. Remove empty enclosure(s) from shaft.
7. Remove snap-in doors from enclosure(s).

A—Enclosures
B—Meter Segments



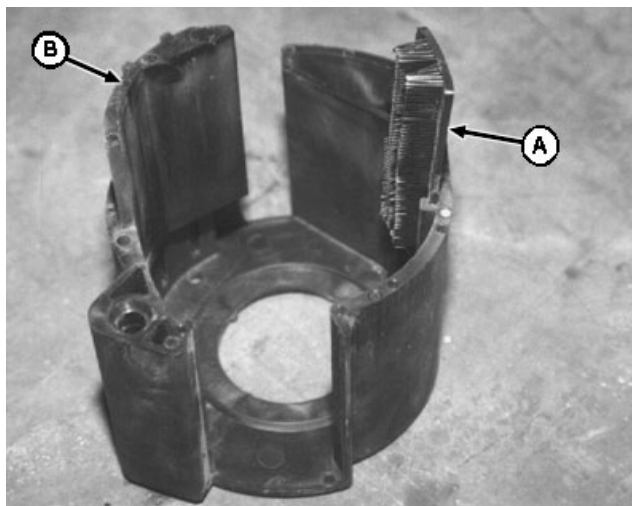
A42521 -UN-23APR98

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AG,OUO6023,1062 -19-21JUL00-3/9

8. Install brush (A) and wear strip (B) inside of enclosure. Push brush and strip into slots until top edge is flush with edge of enclosure housing.

A—Brush
B—Wear Strip



A42522 -UN-23APR98

AG,OUO6023,1062 -19-21JUL00-4/9

9. • Install Tuning Rings (if needed)

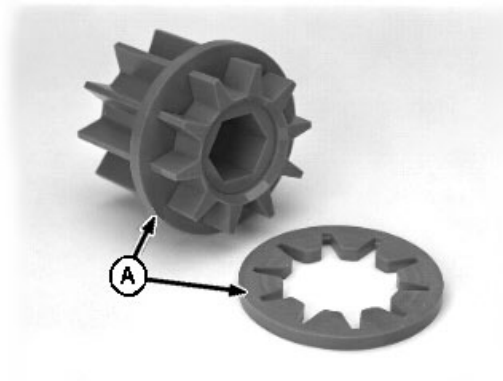
Remove snap ring and bearing plate from beveled end of the segment.

IMPORTANT: If fine tuning rings (A) need to be installed, they should be installed now while the meter segments are off the shaft.

IMPORTANT: No more than five tuning rings can be installed on any one segment.

10. Refer to CUSTOMIZING METER SEGMENTS in this section and install required number of fine tuning rings using tool A61656 (provided with the cart).

To easily install, soak rings in hot water first, position on beveled end of segment and then drive on with tool. Return bearing plate and snap ring to segment after tuning rings are installed.



A—Tuning Rings

A41535 -UN-13JUN97

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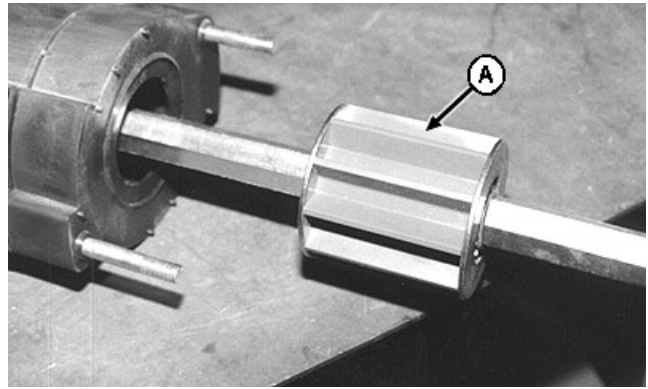
AG,OUO6023,1062 -19-21JUL00-5/9

IMPORTANT: If fine tuning rings need to be installed, they should be installed now while the meter segment is off the shaft.

IMPORTANT: All meter segments **MUST** be the same color.

11. Refer to ACTIVE METER GUIDE in this section for illustration to ensure correct positioning on shaft; then install meter segment (A).

A—Meter Segment

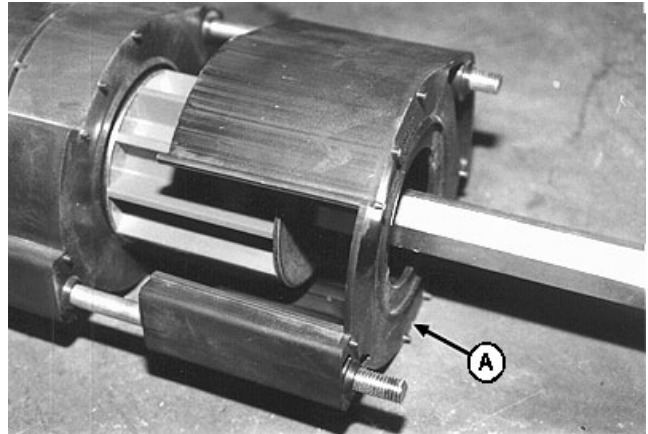


A42523 -UN-23APR98

AG,OUO6023,1062 -19-21JUL00-6/9

12. Position segment enclosure (A) to agree with those still on shaft so inlet and outlet openings align; then install enclosure on tie rods.
13. Repeat installation steps until meter cartridge assembly is complete.

A—Segment Enclosure



A42524 -UN-23APR98

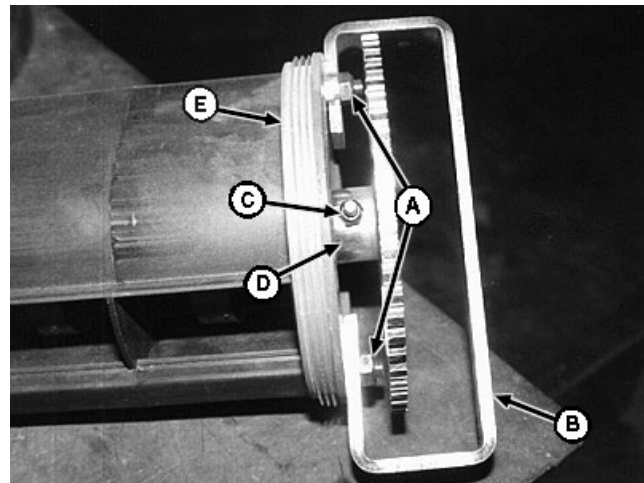
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AG,OUO6023,1062 -19-21JUL00-7/9

14. Install end cap (E) (with seals).
15. Install handle (B) with nuts, making sure handle is returned to original position.

IMPORTANT: Over tightening tie rod nuts (A) can distort plastic enclosures (G), preventing meter segments (I, J or K) from turning; increases wear on meter cartridge; and causes rod to interfere with sensor ring.

16. Tighten handle nuts (A) until rod end is flush with nut end or one thread is visible.
17. Install sensor sprocket (D) and hardware (C), including 9 x 12 x 13 mm (.354 x .472 x .512 in.) sprocket spacer. Spacer eliminates sprocket wobble and erratic meter speed readings.



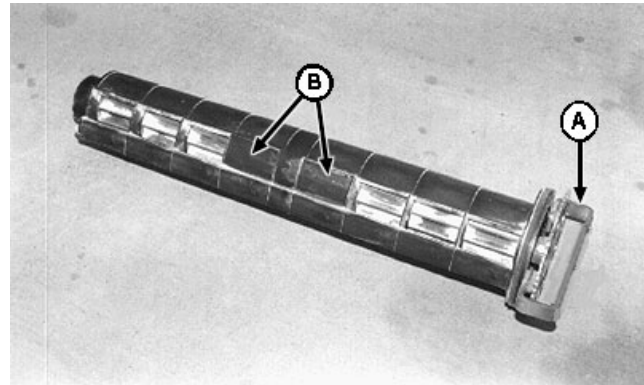
A—Handle Nuts
B—Handle
C—Hardware
D—Sensor Sprocket
E—End Cap

A42520 -UN-23APR98

AG,OUO6023,1062 -19-21JUL00-8/9

18. To complete cartridge assembly (A), install doors (B) at product inlets of empty enclosures.

A—Cartridge Assembly
B—Doors



A41533A -UN-22APR98

AG,OUO6023,1062 -19-21JUL00-9/9

Installing Agitators

Agitators (A) need to be installed above each active meter inlet opening **ONLY**, to keep product free flowing.

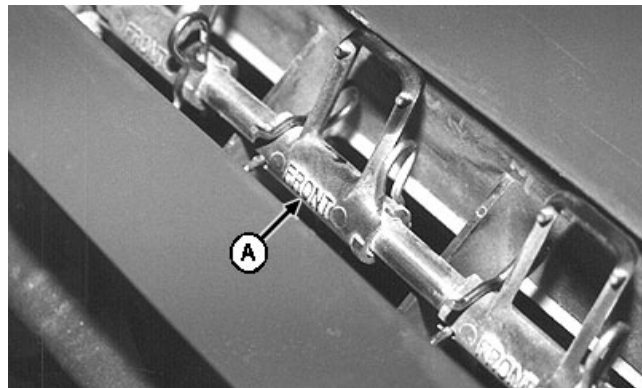
Agitators above inactive meter segments should be removed.

Meter housing need not be removed to install agitators; however, tank will need to be empty.

Installing agitators is a two-person job, one person outside the tank to slide shaft from housing and one person inside tank to position and install agitators and hair pins.

To install agitators:

- Outside Person:



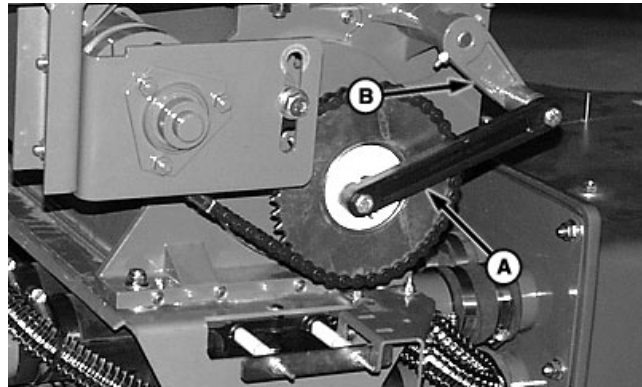
A42564 -UN-05MAY98

A—Agitator

AG,OUO6023,1063 -19-21JUL00-1/6

1. Disconnect drive arm (A) from agitator shaft crank.
2. Remove hardware and crank (B) from shaft. Remove and retain flat washers from shaft end.

A—Drive Arm
B—Crank



A46389 -UN-19JUL00

Continued on next page

AG,OUO6023,1063 -19-21JUL00-2/6

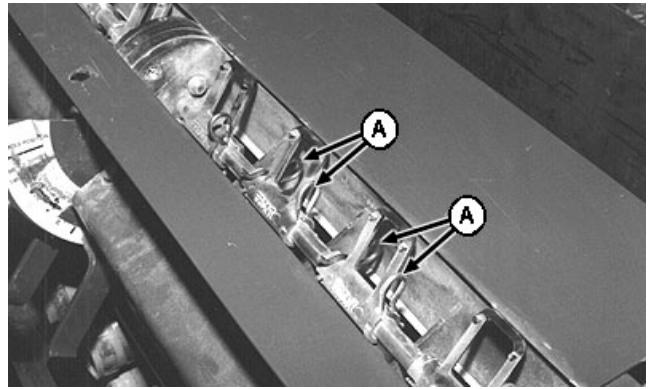
- Inside Person:

CAUTION: Do not enter tank unless another person is present and hydraulic hoses are disconnected from tractor.

NOTE: Meter housing shown removed from cart for clarity.

3. Remove all existing hair pins (A) from shaft.

A—Hair Pins



A42566 –UN-05MAY98

AG,OUO6023,1063 –19-21JUL00-3/6

4. • Outside Person:

NOTE: Half-width disconnect decal plate is installed on agitator shaft. Plate will come free when shaft is removed.

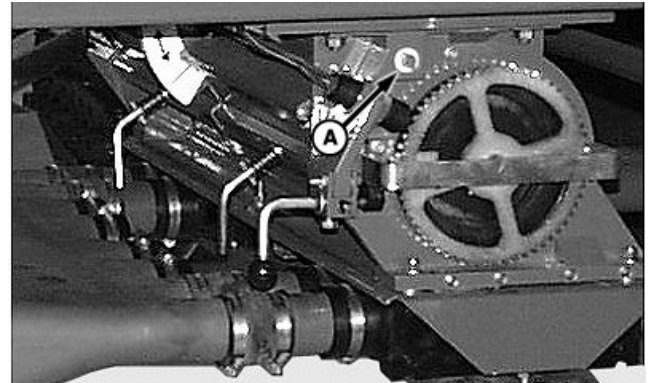
Pull agitator shaft (A) from left-hand meter end cap.

5. • Inside Person:

Collect existing agitators as shaft is removed.

6. • Outside Person:

Slide agitator shaft back into bore through left-hand end cap and half-width disconnect valve.



A42567A –UN-19JUL00

A—Agitator Shaft

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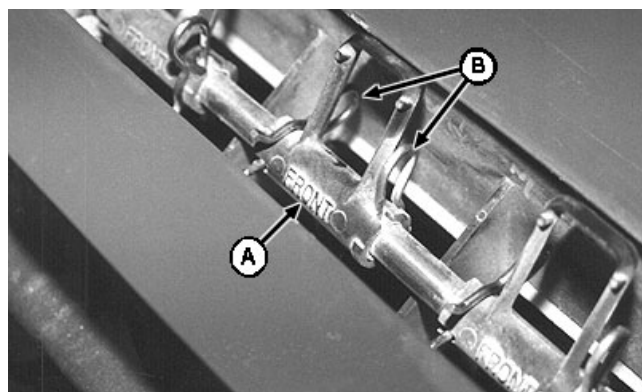
AG,OUO6023,1063 –19-21JUL00-4/6

7. • Inside Person:

Position agitators (A) so “FRONT” is to the front-side of the cart. Place agitators on shaft as it is installed. Install needed number of agitators on left-hand end of shaft before it passes through the middle support block and half-width decal plate. Then install needed number of agitators on right-hand side of center.

Be sure to install same number of agitators as active meter segments, putting one above each active meter segment (between raised ribs of the half-width disconnect valves).

8. Slide agitators over top of active meter segments and retain with two hair pins (B).



A—Agitator
B—Hair Pins

A42568 –UN-05MAY98

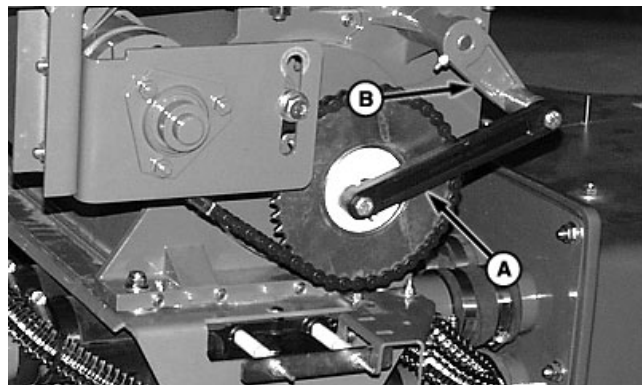
AG,OUO6023,1063 –19-21JUL00-5/6

9. • Outside Person:

Return flat washers to shaft end and install crank (B) with hardware.

10. Attach drive arm (A) to crank.

A—Drive Arm
B—Crank



A46389 –UN-19JUL00

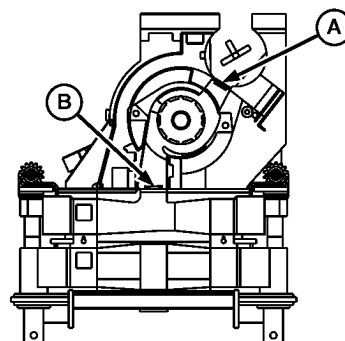
AG,OUO6023,1063 –19-21JUL00-6/6

Opening and Closing Product Runs

Blocking devices are used to keep product out of inactive runs. Meter cartridge doors (A) snap into product opening of segment enclosures. Seals (B) are installed between meter cartridge and manifold plate of inactive runs.

Both cartridge doors (A) and seals (B) must be removed to activate a run, allowing product to reach the air stream.

A—Meter Cartridge Doors
B—Seal



Double-Shoot Manifold

A41898 –UN-18AUG97

AG,OUO6023,1064 –19-21JUL00-1/1

Operating Machine—Air System

Air System Description



CAUTION: Do not direct a heat source of any kind into the fan inlet in an effort to dry fertilizer or other tank commodities. Serious injury and machine damage may occur due to fire or dust explosion.

• Fan Operation:

Fan (A) is driven by a hydraulic motor (B). Fan speed is adjusted and set through use of the tractor's SCV control. A one-way check valve in the return hose prevents the fan motor from turning backward.

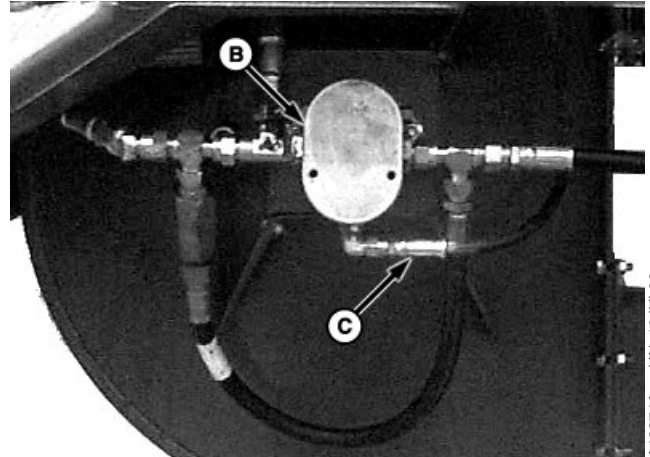
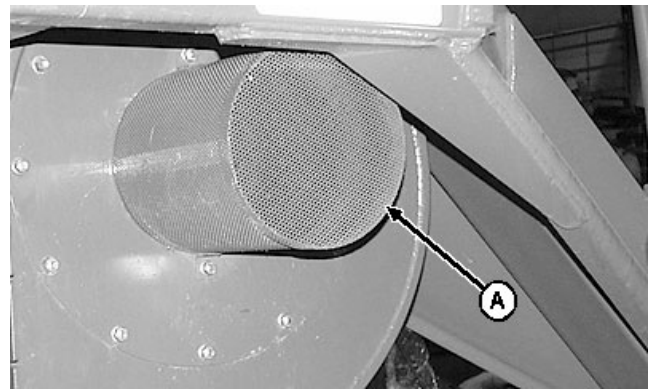
The motor case drain line (C) **MUST** be attached to a low-pressure drain connection on the tractor or motor damage will occur. Drain port back-pressure must be less than 689 kPa (6.89 bar) (100 psi).

To engage fan, pull back SCV control to open return line; then push forward until held by detent.

IMPORTANT: DO NOT place SCV control in neutral while fan is running. Damage to fan motor may occur.

To disengage fan, place SCV control in float. **DO NOT** place SCV control in neutral while fan is running.

It is **NORMAL** for fan speed to rise and fall when the cart is in a tight right-hand or left-hand turn. Turning speeds up or slows down the ground drive system, putting more or less product into the air system. Fan speed fluctuates (+/- 50 rpm approx.) in reaction to how much product is in the stream and the resulting back pressure.



A—Fan
B—Hydraulic Motor
C—Motor Case Drain Line

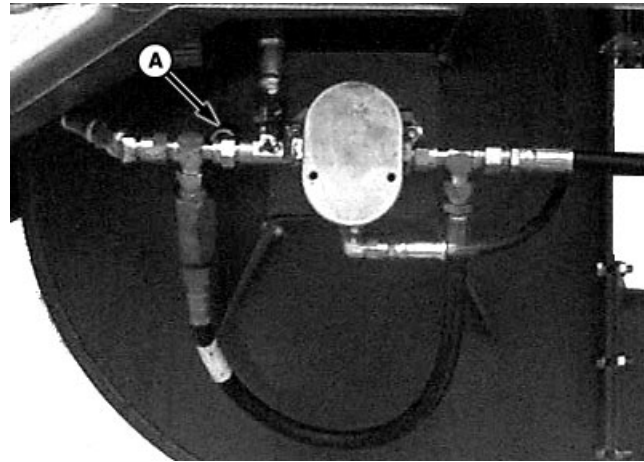
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AG,OUO6023,1065 -19-21JUL00-1/5

NOTE: On some tractors, fan speed may surge when warning lights are flashing. This usually happens on tractor with electro-hydraulic controls, but can occur with other control systems. This is not considered a problem as flashing warning lights are normally turned OFF when seeding.

In the side of the fan housing is the fan speed sensor (A). Sensor sends a signal to the cart's electronic controller to display fan speed in revolutions-per-minute (RPM) on the tractor-mounted console.

This signal is also compared to the fan speed setting entered in the cart's electronic controller, which illuminates the fan speed indicator lights as previously described. Fan speed lights are a set-up feature only, not an operational display.



A—Fan Speed Sensor

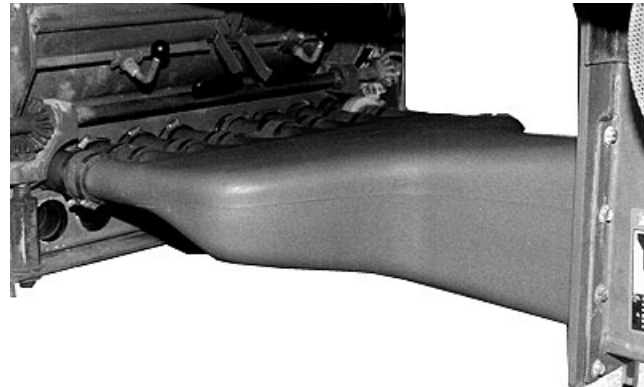
AG,OUO6023,1065 -19-21JUL00-2/5

• Air System:

Between the fan housing and first meter is the plenum (A). In the plenum the air stream disperses to reach product runs at the first manifold.

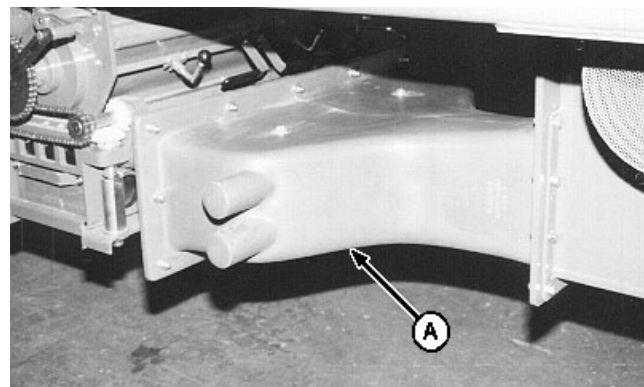
SINGLE-SHOOT PLENUM: Standard single-shoot plenum is an open chamber.

DOUBLE-SHOOT PLENUM: Optional double-shoot plenum has an adjustable damper used to divide and balance air flow between the top and bottom runs.



Single-Shoot Plenum

A—Plenum



Double-Shoot Plenum

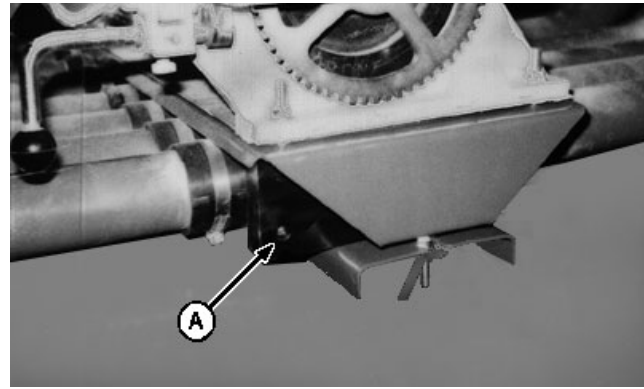
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AG,OUO6023,1065 -19-21JUL00-3/5

At each meter is a primary manifold (A) where air stream picks-up product as it is metered from the tank.

Air ports in the manifold ends provide pressurizing air to the top of the tank through passages in the meter housing and ladder tubes.

Stationary single-shoot manifolds are fixed to bottom of meter housings and can be converted to stationary double-shoot manifolds. Stationary single-shoot and double-shoot manifolds do not utilize seals between plastic components. Some initial air leakage between joints is typical, and will tend to seal due to dust over normal usage.



A42260 -UN-16DEC97

Stationary Single-Shoot Manifold

A—Primary Manifold

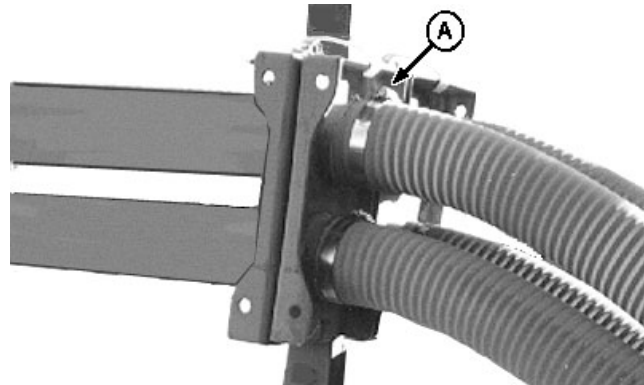
AG,OUO6023,1065 -19-21JUL00-4/5

Primary (A) and secondary (B) air hoses are color coded for air run identification.

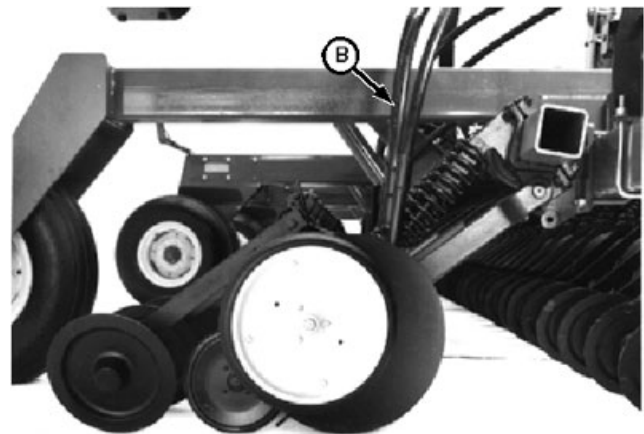
Clear hose with black spiral is used for single-shoot systems or top runs of a double-shoot system.

Clear hose with green spiral is provided for add-on, lower runs of a double-shoot system.

A—Primary Air Hose
B—Secondary Air Hose



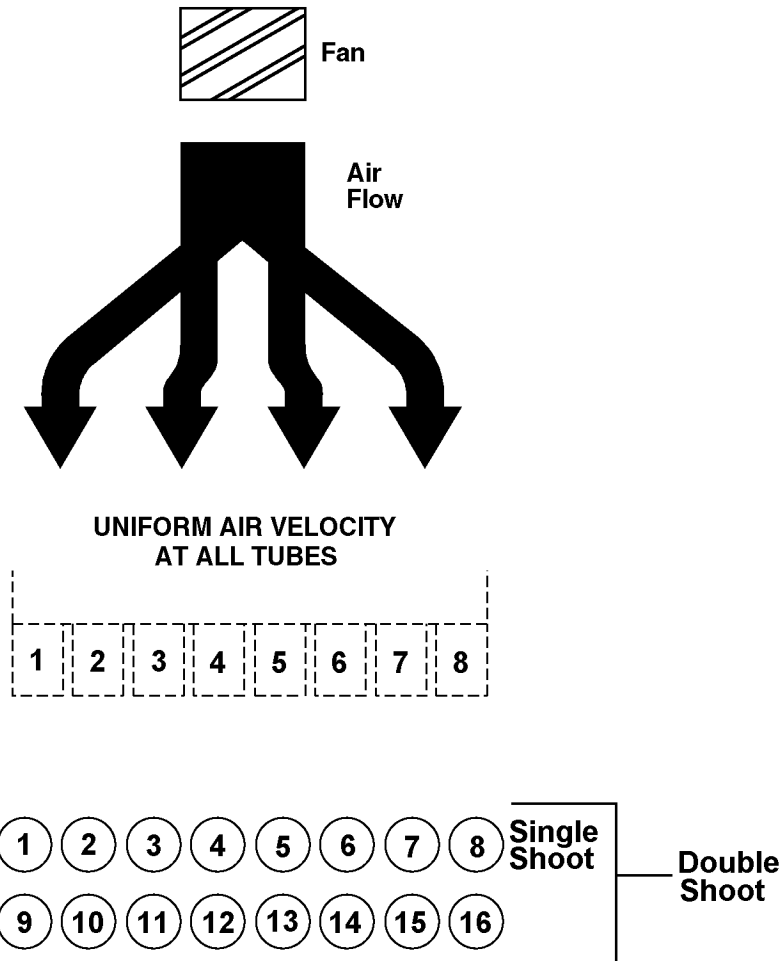
A42323 -UN-20JAN98



A41631 -UN-28APR97

AG,OUO6023,1065 -19-21JUL00-5/5

Systematic Approach to Air Run Identification



Numbering meter cartridge segments and corresponding product runs from left-to-right is a good method of systematic air run identification. This same numbering scheme can then be applied to the seeding equipment's primary air lines and secondary headers, making them easier to identify and the entire system easier to troubleshoot.

On an 8-run single-shoot system, all available meter segments and product runs are active and should be numbered left-to-right 1—8.

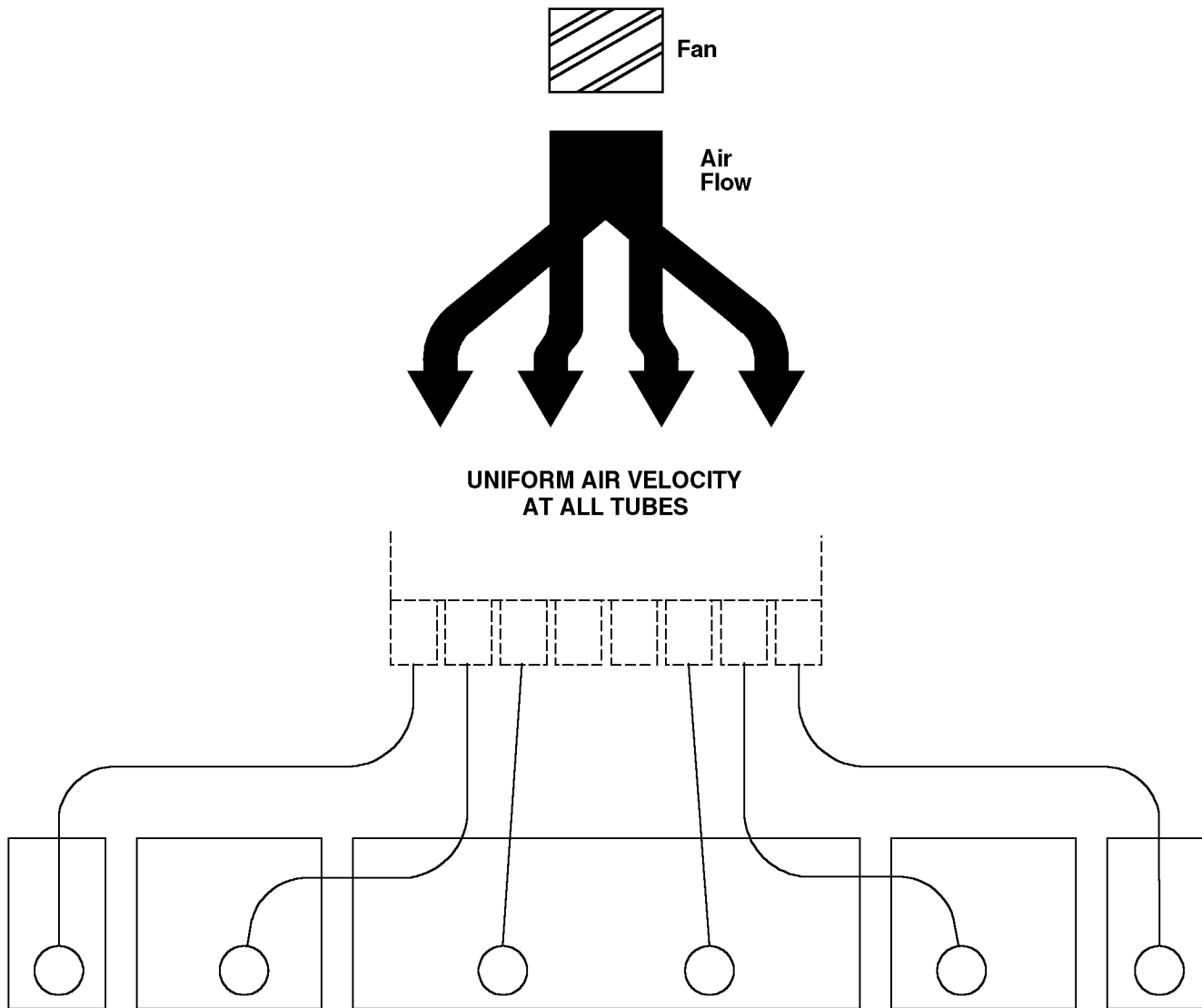
An all-run double-shoot system can be numbered left-to-right 1—8 for the top runs and left-to-right 9—16 for the bottom runs.

Systems using less than the full number of available runs should also be numbered from left-to-right, counting only the active product carrying runs.

A42191A -19-06MAY98

AG,OUO6023,1066 -19-21JUL00-1/1

Understanding Air Velocity and Hose Routings



Air Velocity:

Improvements in fan and plenum design have resulted in uniform air flow from tube-to-tube. Special hose routings (highest velocity tubes connected to longest air runs) are no longer required due to uniform air delivery. While special routings are no longer necessary, the systematic approach to air run identification is still a good practice to follow as it makes run identification and troubleshooting easier.

Primary Hoses:

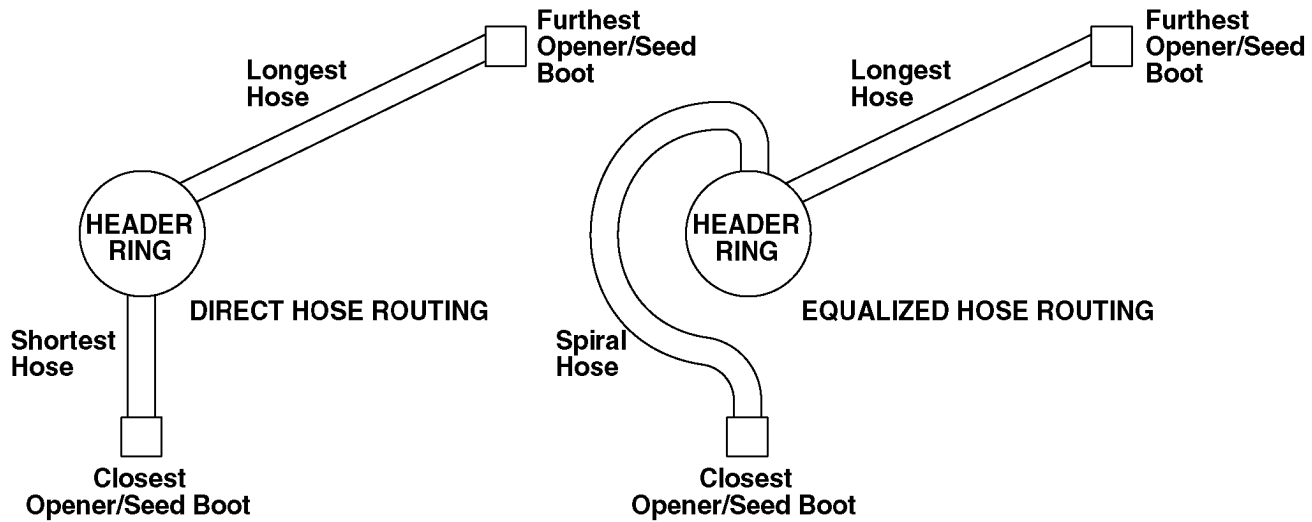
Primary hoses need not be the same length.

Avoid sharp bends, corners and kinks when routing hoses. Hoses should be routed level or down to avoid having air and product flow move in an upward direction.

A41816A -19-04MAY98

Continued on next page

AG,OUO6023,1067 -19-21JUL00-1/2



Secondary Hoses:

From a given header ring, maximum allowable difference between longest and shortest hose should be no more than 1.22 m (4 ft).

Should hose length difference exceed allowable maximum, reroute hoses using equalized method described.

1. Route longest hose from header ring to farthest opener/seed boot.

2. Use "spiral hose" routing to keep hose lengths within allowable difference 1.22 m (4 ft).

Hoses should gently slope down to openers in an "umbrella" fashion.

Avoid sharp bends.

Hoses should be routed level and/or down. Avoid rises after dips.

A37923 -19-12APR96

AG,OUO6023,1067 -19-21JUL00-2/2

Operating 19 cm (7.5 in.) or 38 cm (15 in.) Dual Row Spacing Option (1860 No-Till Air Drill Only)

IMPORTANT: (Mid-Row Banding): Do not use a single-shoot Commodity Air Cart to apply two different products with one product going to the front rank of the seeding tool and the other product going to the rear rank. Doing so may result in unacceptable seeding performance. Use a double-shoot Commodity Air Cart for Mid-Row Banding applications.

Switching between 19 cm (7.5 in.) and 38 cm (15 in.) row spacing requires changing setup on both seeding tool and air cart.



TS190 -UN-17JAN89

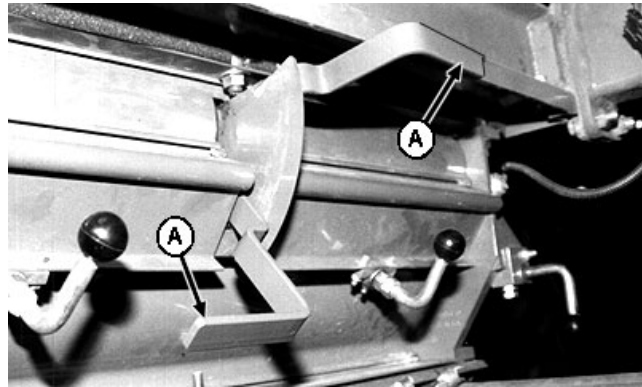
OUC6076,0000192 -19-30JAN01-1/1

Switching from 19 cm (7.5 in.) to 38 cm (15 in.) Row Spacing (1860 No-Till Air Drill Only)

IMPORTANT: Do not change seed tool configuration info on SEEDSTAR™ control unless machine has seed counting.

If machine has seed counting, change row spacing configuration from 19 cm (7.5 in.) to 38 cm (15 in.) and change all inactive primaries on all tanks to “Not Feeding”. See Air Cart Set-up Mode—Configure Seeding Tool and Air System.

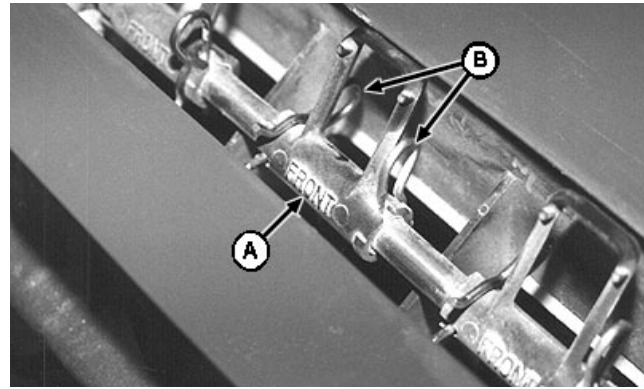
1. Lift half-width disconnect handle (A) on air cart to shut off product flow to rank of openers that will not be used. See Operating Machine—Product Metering section.



A41852A -UN-27JUL98

A—Half-Width Disconnect Handle

2. Hairpins (B) for agitators (A) on inactive runs must be removed to prevent damage to agitator shaft and crank. See Operating Machine—Product Metering section.
3. If equipped with blockage warning system, SEEDSTAR™ setup will need to have sensors turned off for the inactive runs to prevent alarms. See Operating Machine—Monitor Operation section.
4. If equipped with seed counting, SEEDSTAR™ setup will need to have seed counting turned off for the inactive runs to prevent alarms. See Operating Machine—Monitor Operation section.



A42568 -UN-05MAY98

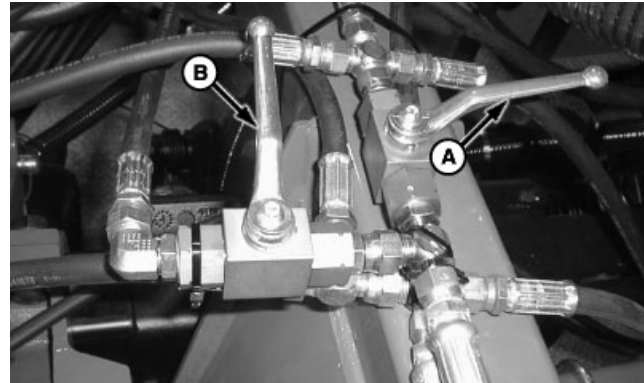
A—Agitators
B—Hairpins

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OUO6076,00001C8 -19-03APR01-2/4

5. Raise all openers on tool fully, and close hydraulic valve to lock up rank of openers which will not be used for seeding. Close front rank valve (A) to lock up front rank of openers or close rear rank valve (B) to lock up rear rank of openers for 38 cm (15 in.) spacing.

A—Front Rank Valve
B—Rear Rank Valve



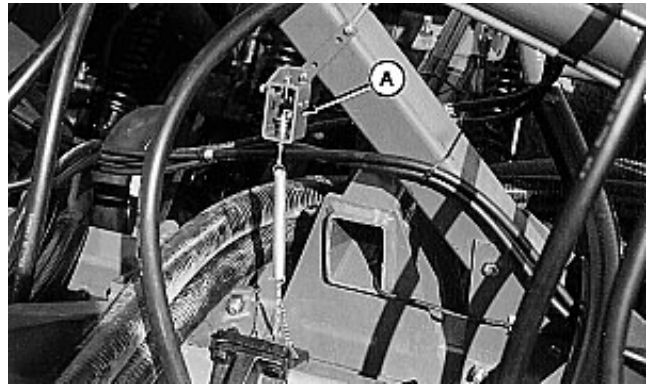
A47310 -UN-11APR01

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OUO6076,00001C8 -19-03APR01-3/4

NOTE: If equipped with dual implement switch option, cable connected to switch on rank of openers to be used for seeding must be connected to cart. Cables and switches are marked with color-coded tie bands for ease of identification.

6. If seeding tool is equipped with single remote switch (A) option, implement switch will need to be moved to the rank of openers that will be used for seeding.
7. If seeding tool is equipped with row markers, marker adjustment may be necessary to maintain proper row spacing.



A37887 -UN-31AUG95

A—Single Remote Switch

IMPORTANT: If applying seed rates greater than 65 lb/acre on 38 cm (15 in.) spacing from a single tank, green meter rollers may need to be installed in air cart meters. See Operating Machine—Product Metering section.

8. Calibrate meters according to procedure specified in this manual. This will give correct transmission setting for desired seed rate.

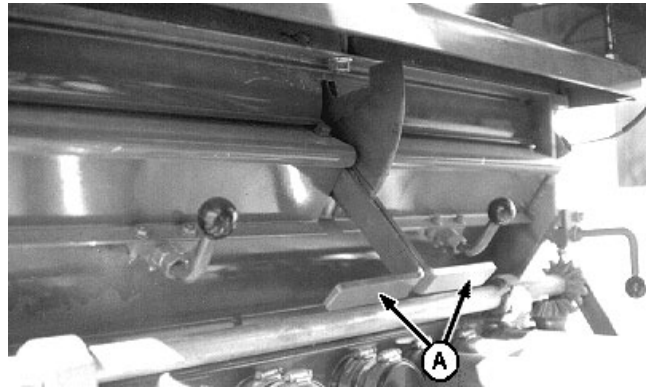
(Approximately double the value listed in the rate charts listed this manual.)

OUO6076,00001C8 -19-03APR01-4/4

Switching from 38 cm (15 in.) to 19 cm (7.5 in.) row spacing (1860 No-Till Air Drill Only)

IMPORTANT: Do not change seed tool configuration info on SEEDSTAR™ control unless machine has seed counting.

If machine has seed counting, change row spacing configuration from 38 cm (15 in.) to 19 cm (7.5 in.) and change all active primaries on all tanks to “Feeding”. See Air Cart Set-up Mode—Configure Seeding Tool and Air System.



A41539 -UN-10APR97

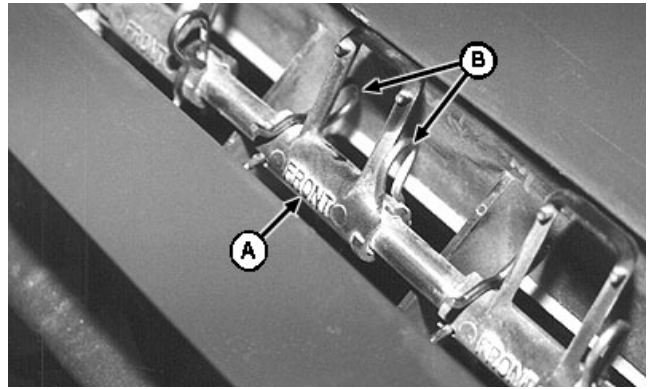
A—Half-Width Disconnect Handles

1. Lower half-width disconnect handles (A) on cart to open product flow to all runs. See Operating Machine—Product Metering section.

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OUC6076,00001D0 -19-09APR01-1/3

2. Hairpins (B) for agitators (A) must be installed on all active runs for proper seeding performance. See Operating Machine—Product Metering section.
3. If equipped with blockage warning system, ensure SEEDSTAR™ setup has sensors turned on for all active runs to allow proper performance of blockage system. See Operating Machine—Monitor Operation section.
4. If equipped with seed counting, ensure SEEDSTAR™ setup has seed counting turned on for all active runs to allow proper performance of seed counting system. See Operating Machine—Monitor Operation section.



A42568 -UN-05MAY98

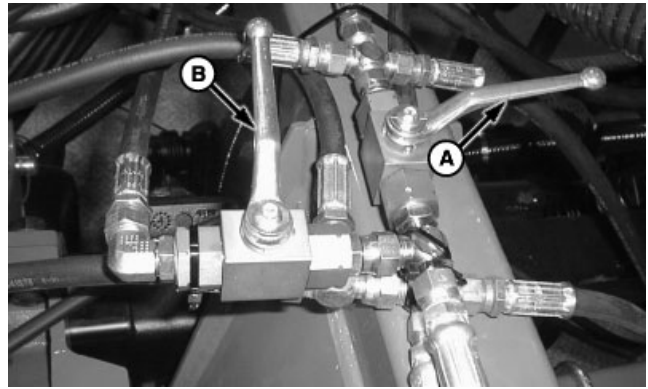
A—Agitators
B—Hairpins

SEEDSTAR is a trademark of Deere & Company

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OUC6076,00001D0 -19-09APR01-2/3

5. Raise all openers on tool fully, and open both front rank valve (A) and rear rank valve (B) for 19 cm (7.5 in.) spacing.
6. If equipped with row markers, adjustment may be necessary to maintain proper row spacing.
7. If meter rollers were changed for 38 cm (15 in.) spacing, ensure proper meter rollers are installed in all active runs. See Operating Machine—Product Metering section.
8. Calibrate meters according to procedure specified in this manual. This will give correct transmission setting for desired seed rate.



A—Front Rank Valve
B—Rear Rank Valve

OUO6076,00001D0 -19-09APR01-3/3

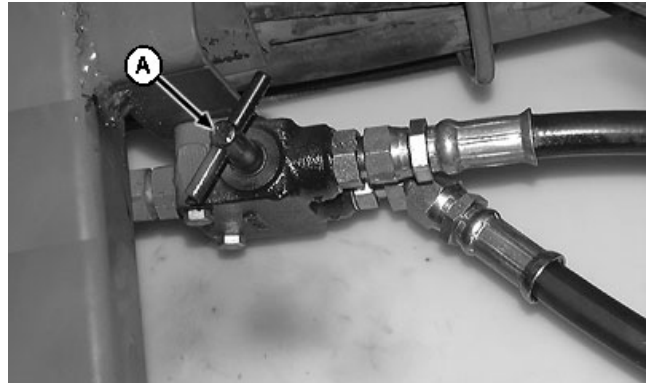
Setting Fan/Auger Selector Valve

Valve (A) is used to direct hydraulic oil to either the fan motor or to the auger operating control valve.

FAN: Push valve handle in for fan operations.

AUGER: Pull valve handle out for auger operations.

A—Fan/Auger Selector Valve



AG,OUO6023,1068 -19-21JUL00-1/1

Determining Fan Speed

IMPORTANT: Do not exceed 5000 rpm maximum fan speed.

NOTE: Refer to SETTING FAN SPEED in Operating the Machine - Monitor Operation section.

Fan RPM setting will vary depending upon:

- number of primary air runs.
- density and size of material.
- metering rate.
- ground speed.

Fan speed is correctly set when:

- equal amounts of product are delivered to each boot.
- tubes and hoses do not plug.
- hoses empty quickly and evenly when shut down.

NOTE: Ambient air temperature and altitude can both affect air flow. Adjust fan speed when these conditions affect performance.

- Single-Shoot

Determine initial fan RPM setting by adding application rates of front and rear tank products together, for combined rate. Locate combined rate/fan RPM setting in chart.

Combined Rate	Fan RPM
Light - 6-56 kg/hectare (5-50 lb/acre)	2200-2800 rpm
Medium - 56-112 kg/hectare (50-100 lb/acre)	2800-3500 rpm
Heavy - 112-224 kg/hectare (100-200 lb/acre)	3500-4200 rpm
Extra Heavy - 224-392 kg/hectare (200-350 lb/acre)	4200-5000 rpm

- Double-Shoot

IMPORTANT: Lower application rate product is usually placed in front tank.

Determine initial fan RPM setting based on the higher application rate product (rear tank).

Continued on next page

AG,OUO6023,1070 -19-21JUL00-1/2

Higher Rate Product	Fan RPM
Fine Products (i.e. Canola, Granular)	2500-3500 rpm
Coarse Grain	3500-4000 rpm
Fertilizer:	
Light - 56-112 kg/hectare (50-100 lb/acre)	3300-4000 rpm
Medium - 112-224 kg/hectare (100-200 lb/acre)	4000-4700 rpm
Heavy - 224-392 kg/hectare (200-350 lb/acre)	4700-5000 rpm

NOTE: Double-Shoot damper is adjusted to divide and balance air flow between top and bottom runs.

AG,OUO6023,1070 -19-21JUL00-2/2

Adjusting Double-Shoot Damper

Double-shoot plenum (A) comes equipped with an adjustable damper, used to direct air flow between the meters, based on product delivery needs.

Damper is adjusted by turning crank handle (B) and observing color-coded position indicator rod (C). Color coding shows that internal damper is:

NOTE: On tow-behind cart, damper crank is located on the underside of the plenum to avoid interference.

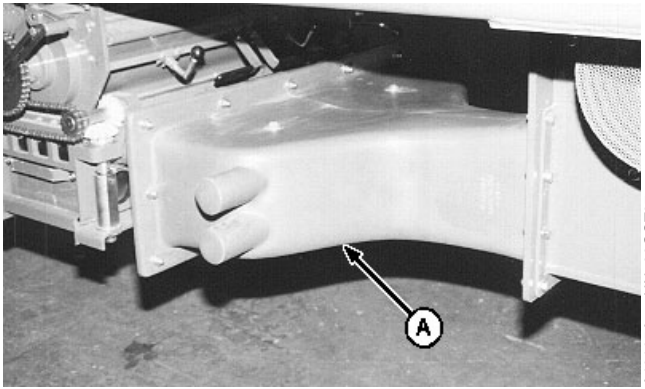
Color Code	Damper Position
Blue	Full Down
Green	Between Down and Center
Yellow	Centered
Orange	Between Up and Center
Red	Full Up

When the damper is adjusted up, more air is delivered to the lower tubes; when adjusted down, more air is delivered to upper tubes.

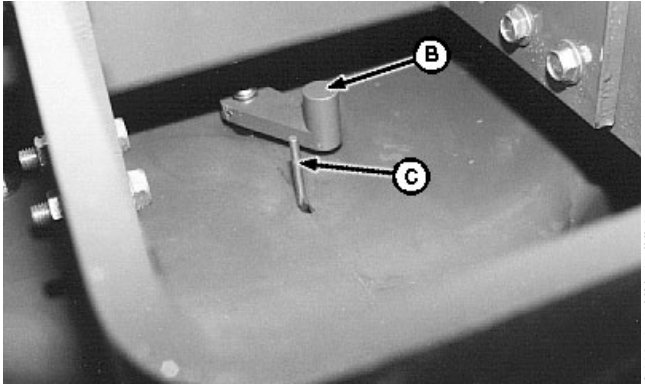
When single-shooting with a double-shoot plenum (only top or bottom tubes active), adjust damper to completely block air flow to inactive tubes.

In true double-shoot (both top and bottom tubes carrying product), set fan speed for higher rate product; then adjust damper to reduce air flow to lower rate product tubes.

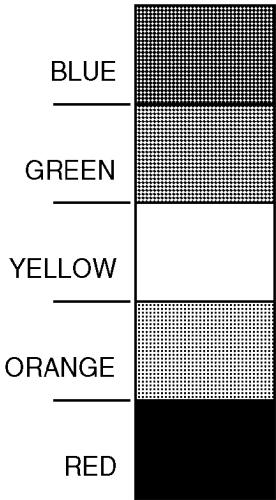
A—Double-Shoot Plenum
B—Crank Handle
C—Position Indicator Rod



A40165A -UN-22OCT97



A41850 -UN-15JUL97



A41851 -19-18JUL97

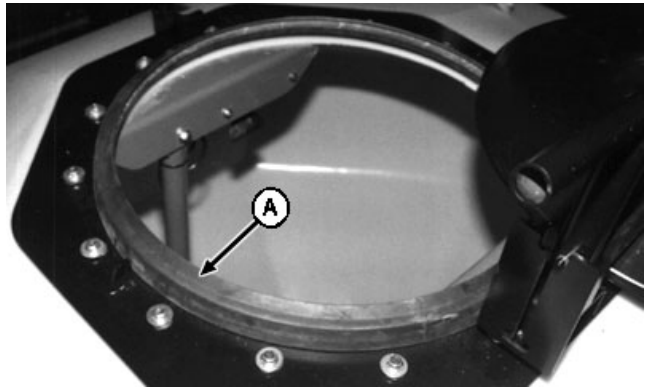
AG,OUO6023,1071 -19-21JUL00-1/1

Inspect Air System Seals, Hoses and Header Rings

IMPORTANT: Product metering will be adversely affected if tank is not sealed tightly. If the tank is not pressurized, product will not meter properly.

1. Inspect tank lid seals (A) at each filling or daily. Replace as necessary.

A—Tank Lid Seals

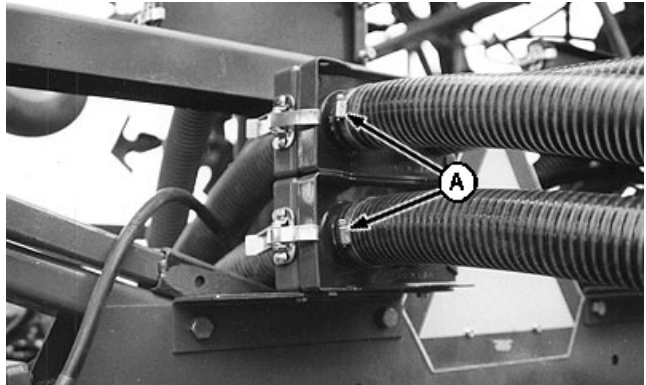


A40128C —UN-27JUL98

AG,OUO6023,1072 —19-21JUL00-1/5

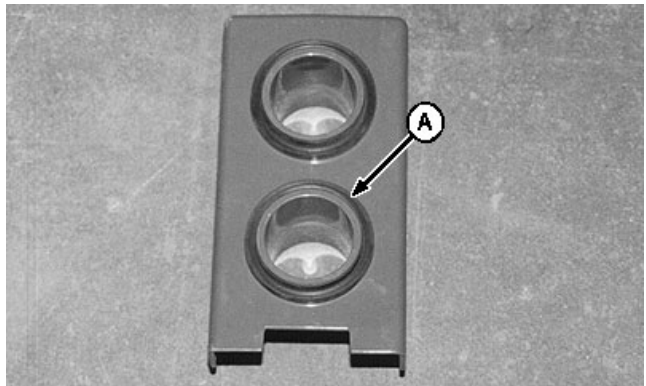
2. Inspect outlet hoses and coupler seals (A) daily. Replace as necessary.

A—Coupler Seals



A42211 —UN-26NOV97

1810 Shown



A42208 —UN-24NOV97

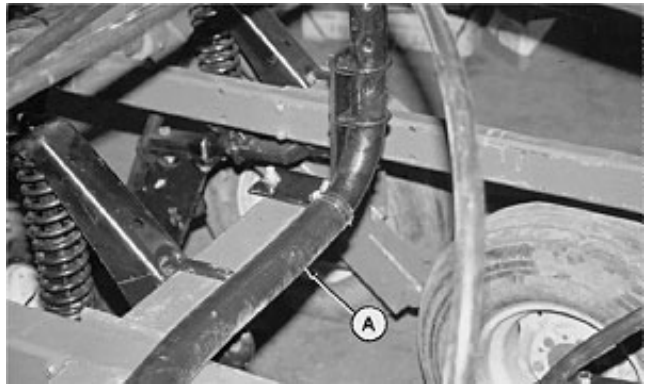
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AG,OUO6023,1072 —19-21JUL00-2/5

3. Inspect tillage primary hoses (A) for wear or damage. Replace as necessary.

NOTE: Seasonally, hoses can be rotated one quarter turn to equalize wear and extend service life.

A—Tillage Primary Hoses

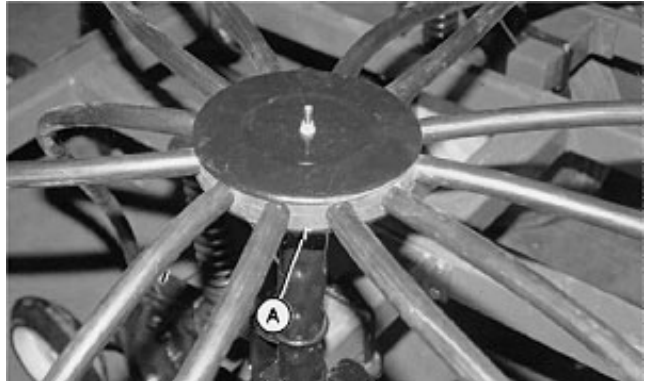


AG,OUO6023,1072 -19-21JUL00-3/5

N40320 -UN-04NOV88

4. Inspect manifold header rings (A) for weathering. Replace as necessary.

A—Manifold Header Rings

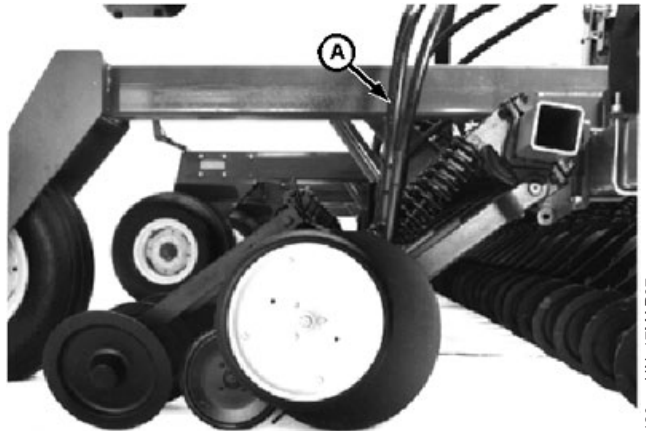


AG,OUO6023,1072 -19-21JUL00-4/5

N40319 -UN-04NOV88

5. Inspect secondary hoses (A) from header ring to seed boot for wear or damage. Replace as necessary.

A—Secondary Hoses



1850 Shown

AG,OUO6023,1072 -19-21JUL00-5/5

A40130 -UN-17MAR97

Adjusting Tank Lid Down Pressure

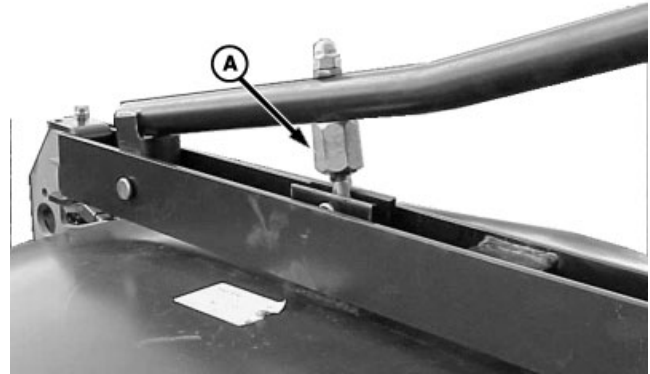
Tank lid closing down-pressure is adjustable to reduce air leaks. Use powder or fine dirt to check for air leakage around lid perimeter.

AG,OUO6023,1073 -19-21JUL00-1/5

Inspect condition of tank lid eyebolt (A). If eyebolt shows any bend, remove and replace.

To adjust:

A—Eyebolt



AG,OUO6023,1073 -19-21JUL00-2/5

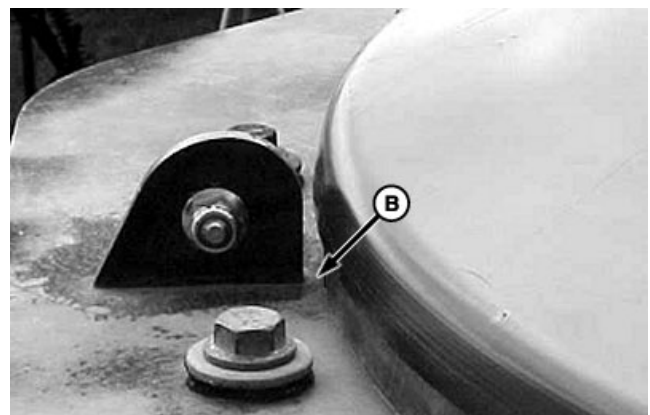
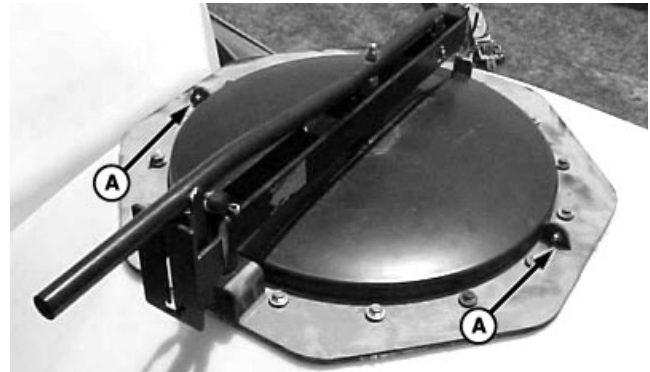
1. With lid centered on seal and closed, adjust centering tabs (A) so gap (B) meets specification.

Specification

Lid to Tab—Gap..... 1.5 mm
(.06 in.)

2. Open lid and place lock pin in top groove as shown.

A—Centering Tab
B—Gap



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AG,OUO6023,1073 -19-21JUL00-3/5

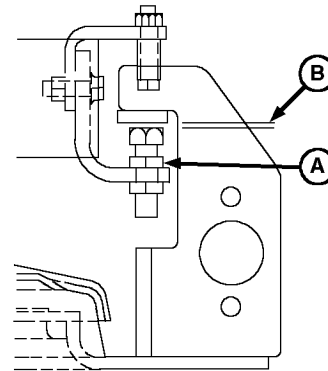
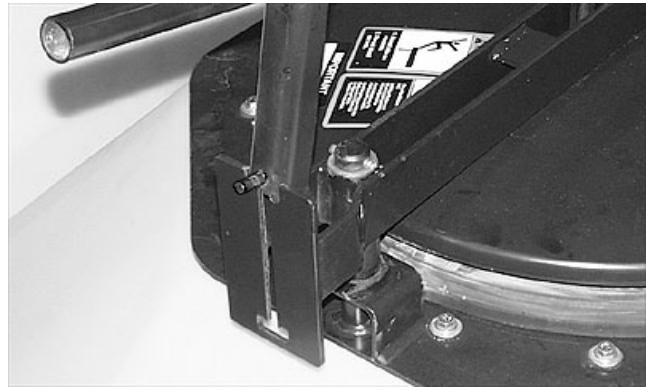
IMPORTANT: Swing arm adjustment bolt gap (B) should be as little as possible without contacting, with a maximum gap of 3 mm (.125 in.).

3. Ensure gap (B) meets specification.

Specification	
Pivot Clearance Max. (B)—Gap.....	3 mm (.125 in.)

Adjust latch set screw (A) as needed.

A—Latch Set Screw
B—Gap



Continued on next page

AG,OUO6023,1073 -19-21JUL00-4/5

4. Lower handle allowing lid to rest on tank but leaving it unlocked as shown.

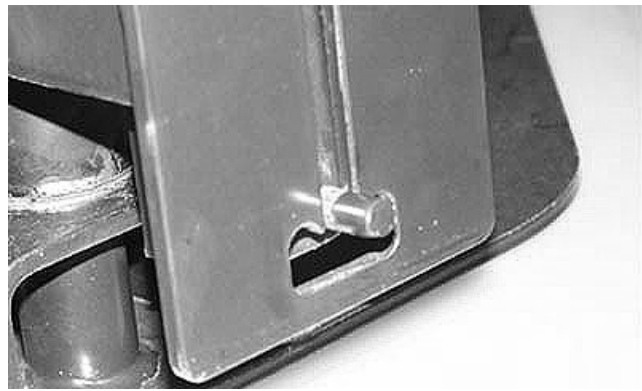
NOTE: Swing arm adjustment bolt should not have a gap with lid in this position. If adjustment is necessary, lightly press down on the lid handle while making adjustment.

5. Verify that distance (A) is 10 mm (.4 in.) \pm 2 mm (.08 in.). Adjust as necessary by turning jam nuts (B).

IMPORTANT: Product metering will be adversely affected if lid is not sealed tightly. If the tank is not pressurized, product will not meter properly.

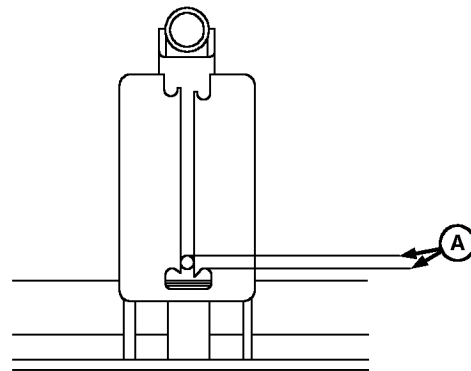
6. Close lid and check for good, tight seal when lever is down and lock pin seated in “J” slot.

A—Distance, 10 mm (.4 in.) \pm 2 mm (.08 in.)
B—Jam Nuts

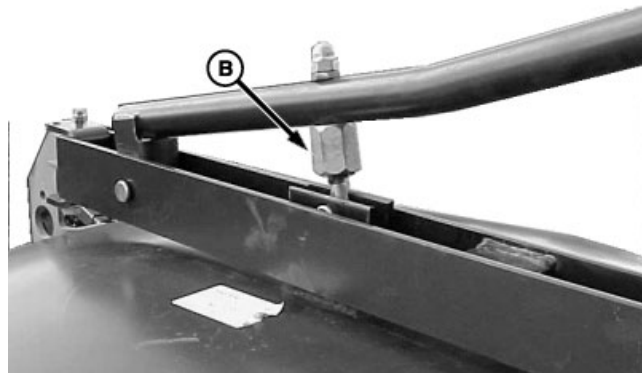


A43547 -UN-26AUG99

Unlocked Position



A43548 -UN-11OCT99



A46308 -UN-10JUL00

AG,OUO6023,1073 -19-21JUL00-5/5

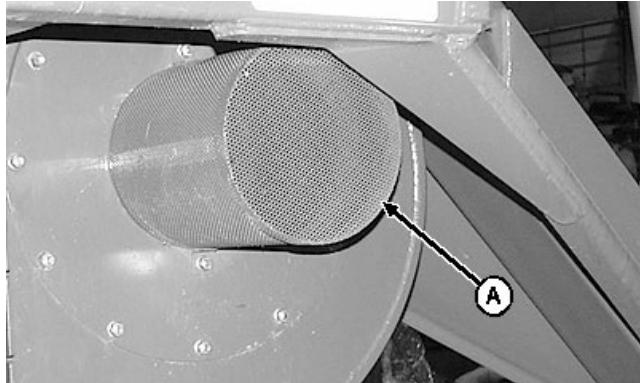
Clean Fan Intake Screen



CAUTION: Keep all shields in place. Do not operate machine if fan screen is removed. Contact with fan can cause serious injury or death to you or someone else.

Be sure fan screen (A) is clear of obstructions.

A—Fan Screen



TS268 –UN-23AUG88

A43362 –UN-09APR99

AG,OUO6023,1074 –19-21JUL00-1/1

Stationary Single-Shoot Clean Out Procedure

1. Turn off fan.
2. Remove bottom manifold plate at first meter beyond plug.

Continued on next page

AG,OUO6023,1075 –19-21JUL00-1/2



CAUTION: To protect yourself from flying seed, fertilizer and debris, stay in the tractor cab while the fan is running.

If you must leave the cab with the fan running, wear protective clothing including face mask, gloves and goggles.



TS265 -JUN-23AUG88

3. With bystanders away from cart, turn on fan at low rpm and increase until material upstream is completely emptied from all bottom primaries through manifold bottom opening.
4. Turn off fan.
5. Install bottom manifold plate. Repeat above steps for remaining meters.
6. Remove caps from unused air tubes at cart exit.
7. With bystanders away from cart, turn on fan at low rpm and increase rpm until material upstream is completely emptied from all unused primaries through air tubes at cart exit.
8. Install caps on unused air tubes at cart exit.

AG,OUO6023,1075 -19-21JUL00-2/2

Stationary Double-Shoot Clean Out Procedure

If bottom primaries are plugged:

1. Turn off fan.
2. Remove bottom manifold plate at first meter beyond plug.

Continued on next page

AG,OUO6023,1076 -19-21JUL00-1/3

CAUTION: To protect yourself from flying seed, fertilizer and debris, stay in the tractor cab while the fan is running.

If you must leave the cab with the fan running, wear protective clothing including face mask, gloves and goggles.



TS265 -JUN-23AUG88

3. With bystanders away from cart, turn on fan at low rpm and increase until material upstream is completely emptied from all bottom primaries through manifold bottom opening.
4. Turn off fan.
5. Install bottom manifold plate. Repeat above steps for remaining meters.
6. Remove caps from unused air tubes at cart exit.
7. With bystanders away from cart, turn on fan at low rpm and increase rpm until material upstream is completely emptied from all unused primaries through air tubes at cart exit.
8. Install caps on unused air tubes at cart exit.

If top primaries are plugged:

1. Turn off fan.
2. Push half-width cleanout door levers at first meter beyond plug upward to cleanout position.
3. Remove meter cartridge.
4. Ensure manifold slide is in top-shoot position.
5. With bystanders away from cart, turn on fan at low rpm and increase until material upstream is blown upward into meter cartridge opening.
6. Drag material out opening.
7. With fan off, reinstall meter cartridge. Repeat above steps for remaining meters.

Continued on next page

AG,OUO6023,1076 -19-21JUL00-2/3

NOTE: Before returning to normal operation, ensure slide on stationary double-shoot manifold is in proper position.

8. Remove caps from unused air tubes at cart exit.
9. With bystanders away from cart, turn on fan at low rpm and increase rpm until material upstream is completely emptied from all unused primaries through air tubes at cart exit.
10. Install caps on unused air tubes at cart exit.

AG,OUO6023,1076 –19–21JUL00–3/3

Air Control Valve Cleanout Procedure

Some material may collect in the valve assemblies on each end of the slide during normal operation of the cart. Use of unclean seed, seed treatments, and finer fertilizers may increase the rate material collects in these assemblies. This material will not feed into the primaries during normal operation, but during cycling of the slide, could dribble into the primaries and be blown into the seed trench.

1. Turn off fan.
2. With all bystanders away from the valve area, turn on the cart fan.

NOTE: Delay a few seconds when cycling the slide between top-shoot and bottom-shoot positions.

3. Cycle the slide back and forth several times to clean out the valve assemblies.

Continued on next page

AG,OUO6023,1077 –19–21JUL00–1/2

4. If necessary, remove air control housings (A) for more complete cleanout. See REMOVE SLIDE ASSEMBLY in this section.

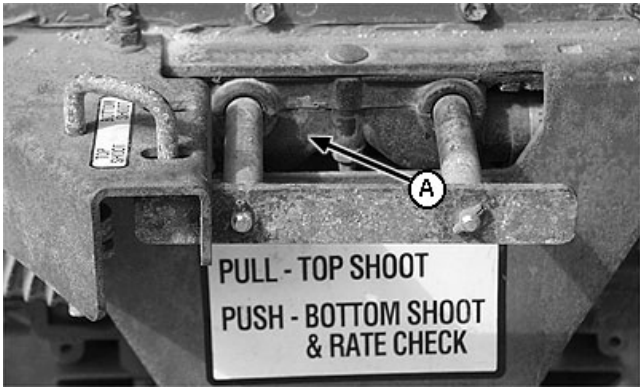
IMPORTANT: Position the slide midway between top-shoot and bottom-shoot positions before reassembling the valve assembly. Ensure quad ring seals fit in the provided grooves of the top and bottom portions of the valve assemblies. Do not over tighten the hardware when reinstalling the bottom portion of the valve assembly.

IMPORTANT: Excessive torque on air control housing hardware can result in damage to housings and/or binding of the sides.

5. Install air control housing and tighten hardware to specification.

Specification

Air Control Housing Hardware—
Torque 5 N•m
(4 lb-ft)



A—Air Control Housing

AG,OUO6023,1077 -19-21JUL00-2/2

Switching Stationary Double-Shoot From Top-Shoot To Bottom-Shoot

The Stationary Double-Shoot Manifold can be easily converted between top-shoot and bottom-shoot without tools. Tank pressurization is automatically converted to the proper primary when the slide is switched from top- to bottom-shoot, or bottom- to top-shoot.

Continued on next page

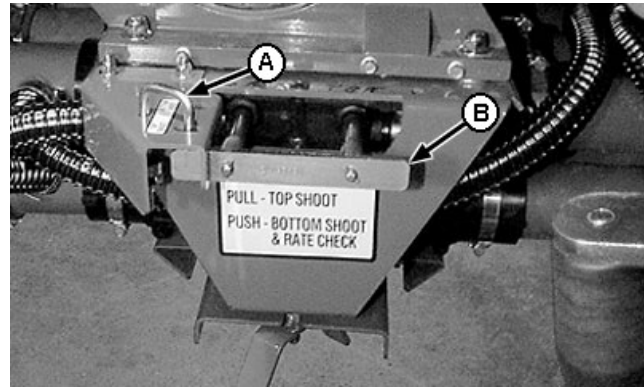
AG,OUO6023,1078 -19-21JUL00-1/4

1. Raise slide position latch pin (A) on the left end of the slide, positioning it in the center on top of the stop bracket.

NOTE: Material buildup on the slide can result with some products under moist conditions. Daily cycling of the slide is recommended when product is in the tank to keep slide free.

2. To change from top-shoot to bottom-shoot , push in slide (B) until the slide handle contacts the stop bracket.

To change from bottom-shoot to top-shoot , pull out slide (B) until the slide handle contacts the stop bracket.

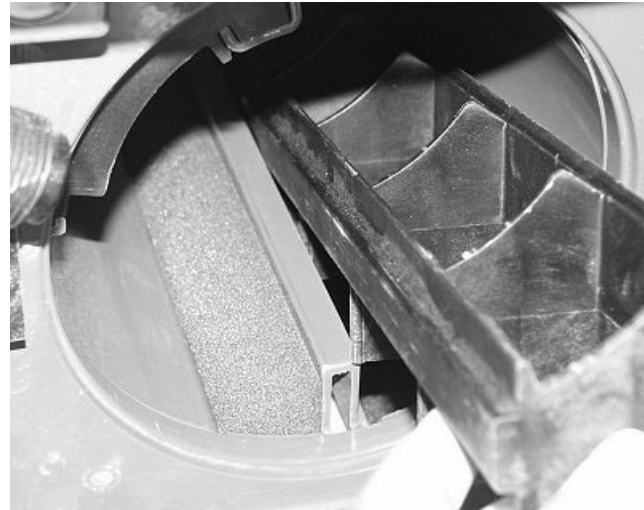


A—Latch Pin
B—Slide

AG,OUO6023,1078 -19-21JUL00-2/4

If slide cannot be moved by hand:

- Inspect manifold passages for foreign objects through bottom manifold plate and remove.
- Remove meter cartridge and inspect for foreign objects and remove.
- Ensure latch pin is in unlatched position and tap lightly on ends of slide rods with plastic or rubber mallet to free slide.
- Remove hard seals and inspect for foreign objects and remove.



Hard Seal

Continued on next page

AG,OUO6023,1078 -19-21JUL00-3/4

3. Insert the end of the slide position latch pin in the front slot for top-shoot, or the back slot for bottom-shoot to prevent slide from moving during operation. Ensure handle is trapped between latch pin and bracket as shown.



Top Shoot Position

A43722 -UN-16SEP99

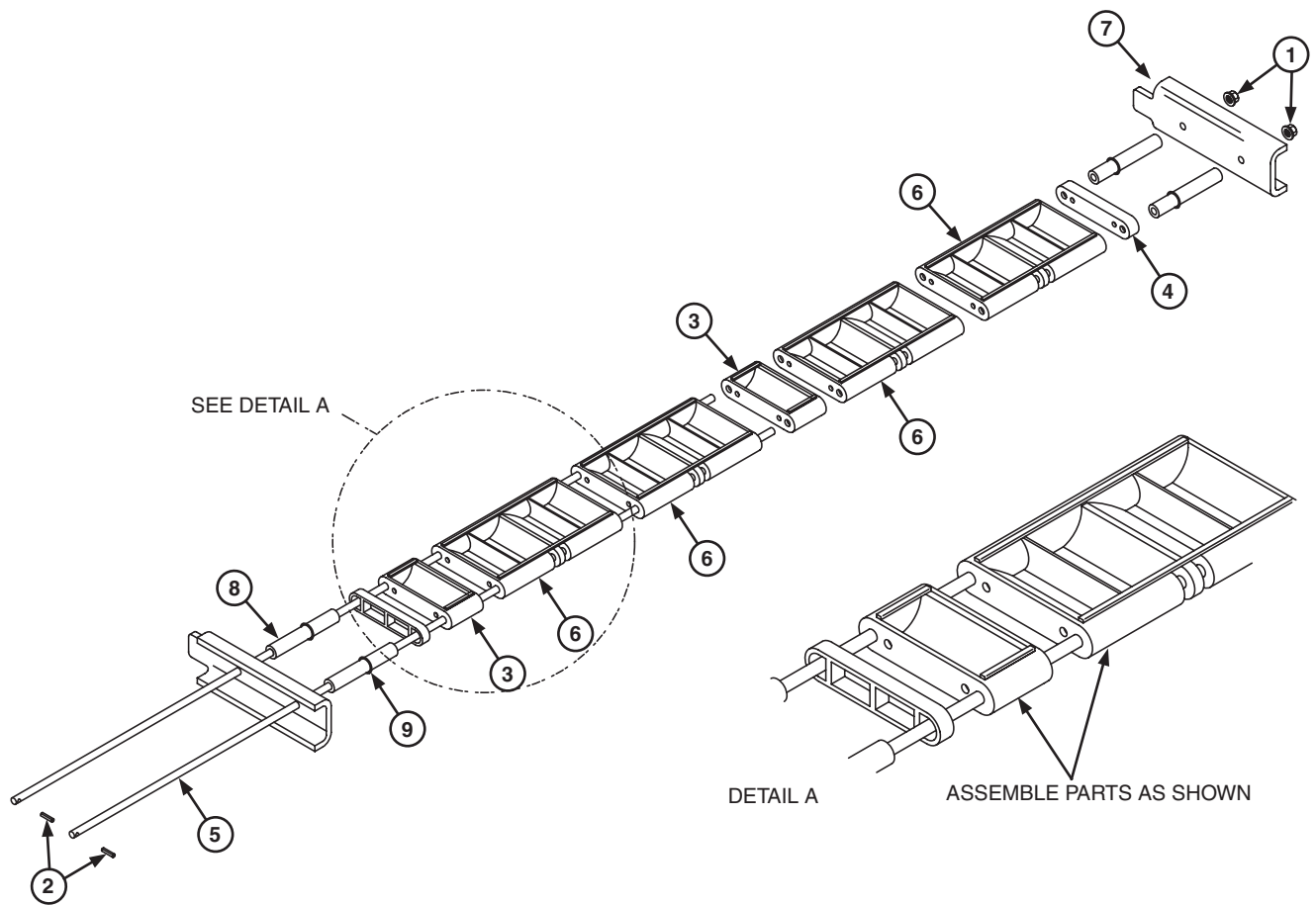
AG,OUO6023,1078 -19-21JUL00-4/4

Remove Slide Assembly

The slide assembly can be removed from the manifold assembly without disassembling the manifold sections.

Continued on next page

AG,OUO6023,1079 -19-21JUL00-1/6



1—Lock Nut
2—Pin
3—Manifold Gate

4—Slide End Seal
5—Rod

6—Manifold Gate
7—Handle

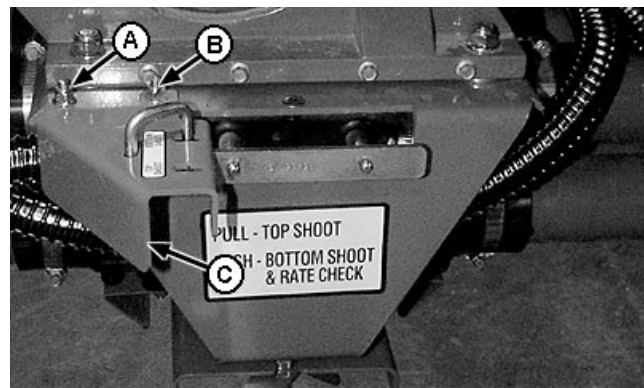
8—Bushing
9—Quad Ring Seal

AG,OUO6023,1079 —19-21JUL00-2/6

A45601A —19-05DEC00

1. Loosen the front cap screw (A) and remove the rear cap screw (B) for left-hand slide stop bracket (C).

A—Front Cap Screw
B—Rear Cap Screw
C—Slide Stop Bracket



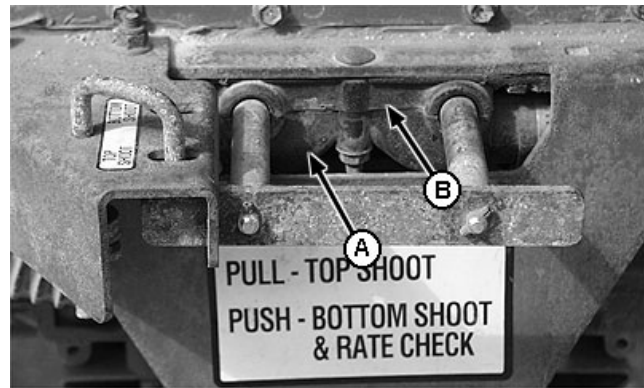
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AG,OUO6023,1079 —19-21JUL00-3/6

A43709 —UN-16SEP99

2. Remove left-hand and right-hand air control housings (A).
3. Remove left-hand and right-hand air control caps (B) by prying slide away from the mounting plate in order to drop 3 mm (0.118 in.) for clearance from seal; then sliding through end opening in mounting plate.

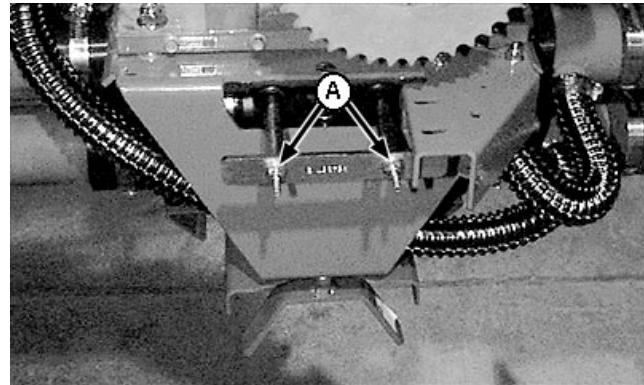
A—Air Control Housing
B—Air Control Caps



AG,OUO6023,1079 -19-21JUL00-4/6

A43721 -UN-16SEP99

4. Remove lock nuts (A) from the right-hand ends of the slide rods.
5. Remove slide handle, two bushings with quad ring seals, and slide end seal from the right-hand end of the slide.
6. Reinstall the two bushings on the slide rods.
7. Gently pull the slide assembly out from the left-hand side of the manifold.
8. Clean slide and coat with DuPont KRYTOX™ WDL-10A Coating Lubricant or similar lubricant to minimize product build-up.



A—Lock Nuts

A43710 -UN-16SEP99

KRYTOX is a trademark of E.I. DuPont, DeNemours and Co. Inc.

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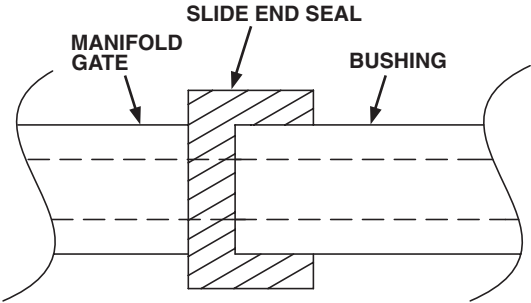
AG,OUO6023,1079 -19-21JUL00-5/6

NOTE: Ensure that slide end seal is seated between manifold gate and bushing as illustrated.

Ensure quad ring seals fit in the provided grooves of the top and bottom portions of the valve assemblies.

Position the slide midway between top-shoot and bottom-shoot positions before reassembling the valve assembly.

Do not over tighten the hardware when installing the bottom portion of the valve assembly.



A46944 -19-05DEC00

9. Reverse process to install slide back in manifold.

IMPORTANT: Excess torque on slide hardware can result in slide end seal being unseated on slide assembly.

10. Tighten hardware to specification.

Specification	
Slide Hardware—Torque	1.0 N•m (8.8 lb-in.)

AG,OUO6023,1079 -19-21JUL00-6/6

Adjust Stop Slide Bracket

A stop bracket is located at each end of the manifold slide assembly to protect the slide from residue and to provide a visual confirmation that the slide is properly positioned. The slide handle should contact a stop bracket at full extension and full retraction.

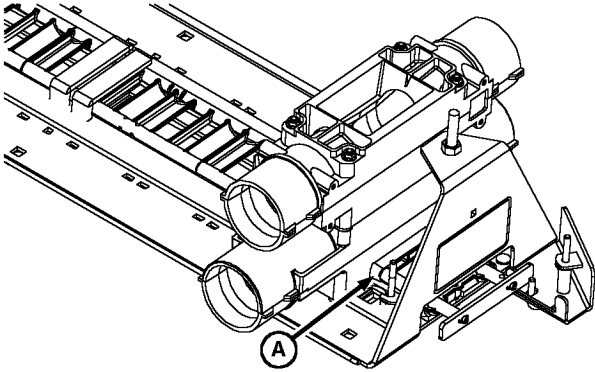
1. Remove left-hand and right-hand air control housings.

Continued on next page

AG,OUO6023,1080 -19-21JUL00-1/2

2. Fully push in slide assembly. Left-hand slide end seal (A) should be within 1 mm (0.039 in.) of contacting left-hand top manifold section when slide handle contacts stop brackets.
3. Fully pull out slide assembly. Right-hand slide end seal should be within 1 mm (0.039 in.) of contacting right-hand top manifold section when slide handle contacts stop brackets.

NOTE: When properly adjusted, insert the end of the slide position latch pin in the front slot for top-shoot , or the back slot for bottom-shoot to prevent slide from moving during operation. Ensure handle is trapped between latch pin and bracket as shown.



A—Slide End Seal

A43720 -UN-16SEP99

4. Adjust stop brackets as required.
5. Tighten bracket attaching hardware to specification.

Specification

Cap Screws—Torque 12 N•m
(9 lb-ft)

6. Install left-hand and right-hand air control housings.
7. Tighten air control housing hardware to specification.

Specification

Air Control Housing Hardware—
Torque 5 N•m
(4 lb-ft)

AG,OUO6023,1080 -19-21JUL00-2/2

Reconfiguring Stationary Double-Shoot Manifold

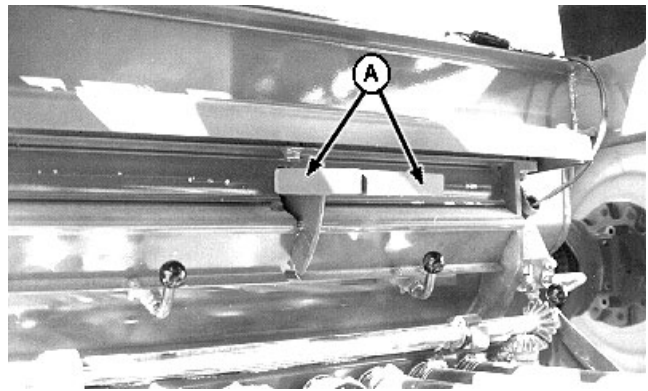
Stationary double-shoot manifold is factory configured to agree with original customer order. A variety of manifold configurations are possible, ranging from three-run double-shoot to eight-run double-shoot.

AG,OUO6023,1081 -19-21JUL00-1/1

Remove Stationary Double-Shoot Manifold

1. Ensure both disconnect handles (A) are up.
2. Perform cleanout procedures on meter and manifold.

A—Disconnect Handles

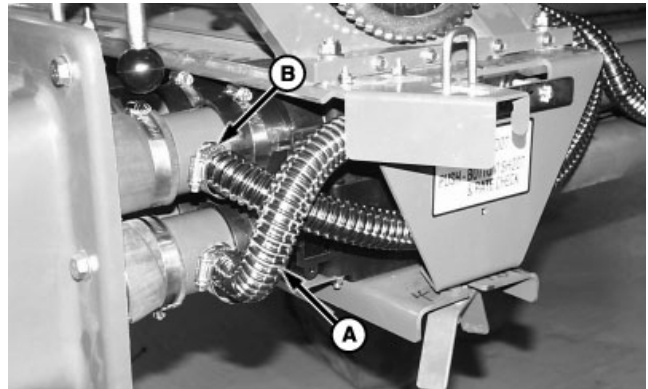


A41536 -UN-10APR97

AG,OUO6023,1082 -19-21JUL00-1/5

3. Remove all tank-pressure hoses (A) and hose clamps (B).
4. Remove slide assembly. See REMOVE SLIDE ASSEMBLY in this section.
5. Remove all tubes from manifolds.
6. Remove meter cartridge assembly.

A—Tank-Pressure Hoses
B—Hose Clamps

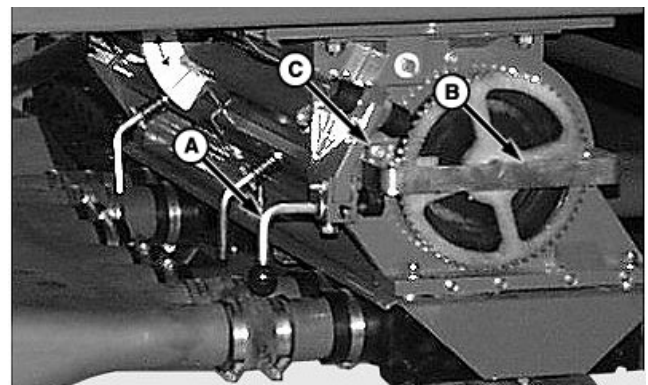


A45750 -UN-18JAN00

AG,OUO6023,1082 -19-21JUL00-2/5

- a. Turn lock handle (A) up and pull forward to release lock cam.
- b. Turn meter handle (B) counterclockwise to release from lock tab (C).
- c. Pull meter assembly from housing.

A—Lock Handle
B—Meter Handle
C—Lock Tab



A46326 -UN-10JUL00

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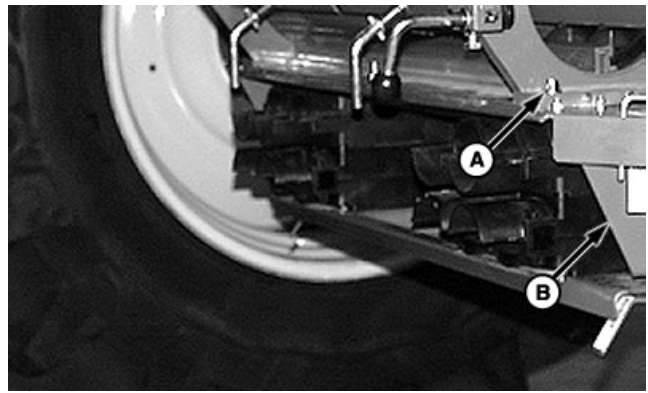
AG,OUO6023,1082 -19-21JUL00-3/5

IMPORTANT: Top manifold seal must be replaced when manifold is removed.

NOTE: Plenum removed for clarity of photos.

7. Remove six carriage bolts, nuts and washers (A) and lower manifold (B).
8. Remove excess silicone from bottom of meter housing.

A—Carriage Bolts, Nuts and Washers (6 Used)
B—Manifold



AG,OUO6023,1082 -19-21JUL00-4/5

9. Remove and discard meter slot seal (A) if not already removed.



AG,OUO6023,1082 -19-21JUL00-5/5

Add/Remove Runs To Stationary Double-Shoot Manifold

NOTE: Procedures for adding or removing runs include the same steps, the only difference will be actually adding or removing runs.

NOTE: Maintenance on manifold is performed with manifold removed from cart and placed upside down.

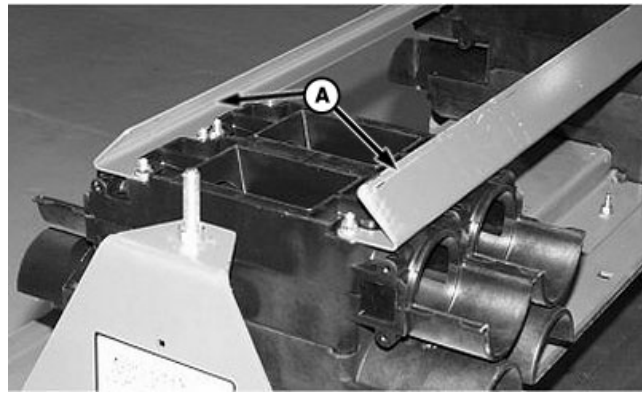
1. Place manifold upside down on blocks and remove manifold plug tray assembly.

Continued on next page

AG,OUO6023,1083 -19-21JUL00-1/8

2. Remove slide panels (A).

A—Slide Panels



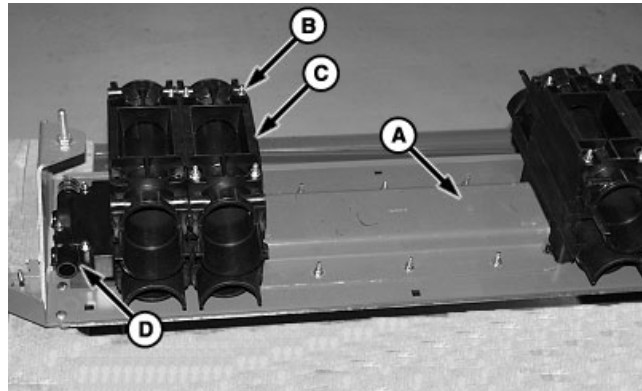
A45756 -UN-18JAN00

AG,OUO6023,1083 -19-21JUL00-2/8

NOTE: Center plate will vary in size based on number of runs installed.

3. Remove center plate (A).
4. Remove flange nut (B) and carriage bolt from shoot assemblies (C).
5. Remove air control housing (D).

A—Center Plate
B—Flange Nut
C—Shoot Assembly
D—Air Control Housing



A45757 -UN-18JAN00

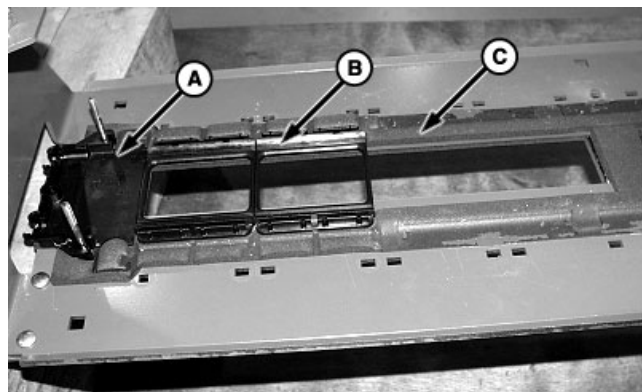
Four Run Manifold Shown

AG,OUO6023,1083 -19-21JUL00-3/8

IMPORTANT: Internal manifold seal must be replaced when a shoot is added or removed.

6. Remove air manifold cover (A), shoot cover (B), and internal seal (C).
7. Install new internal seal.
8. Install air manifold cover.

A—Manifold Cover
B—Shoot Cover
C—Internal Seal



A45777 -UN-18JAN00

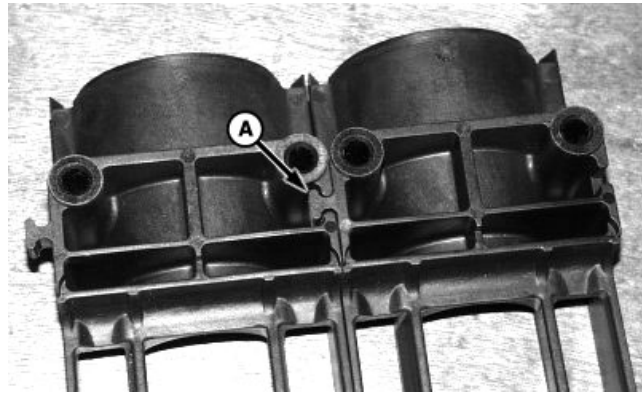
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AG,OUO6023,1083 -19-21JUL00-4/8

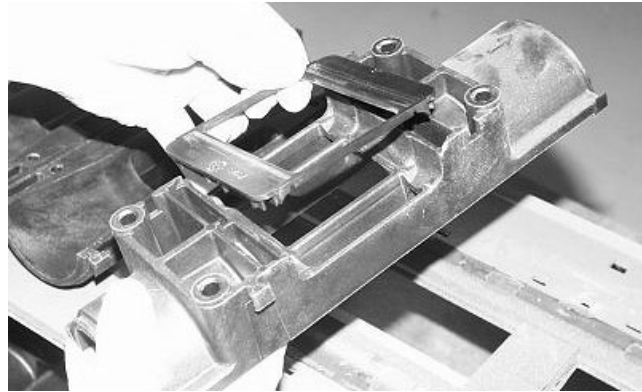
NOTE: Manifold assemblies snap fit to each other using tongue and groove (A).

9. Place shoot cover on top half of double-shoot manifold in slot provided and hold in place while attaching runs together.

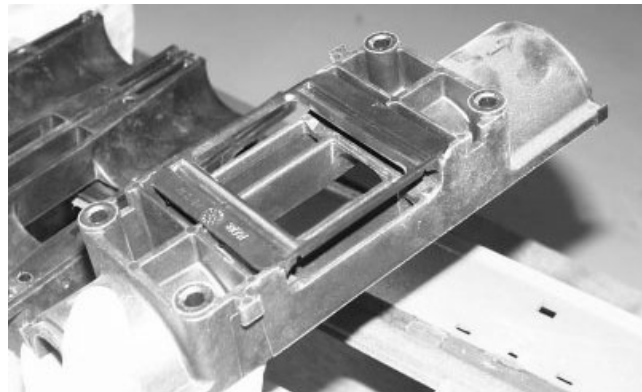
A—Tongue and Groove



A45758 -UN-18JAN00



A45759 -UN-18JAN00

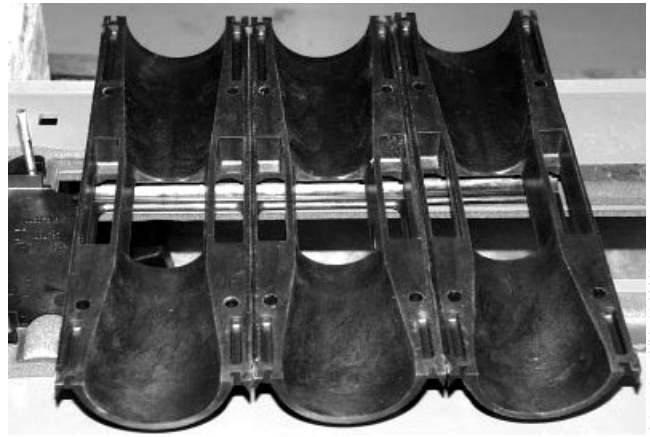


A45760 -UN-18JAN00

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AG,OUO6023,1083 -19-21JUL00-5/8

10. Position shoots on seal. Use bolt holes to verify position.



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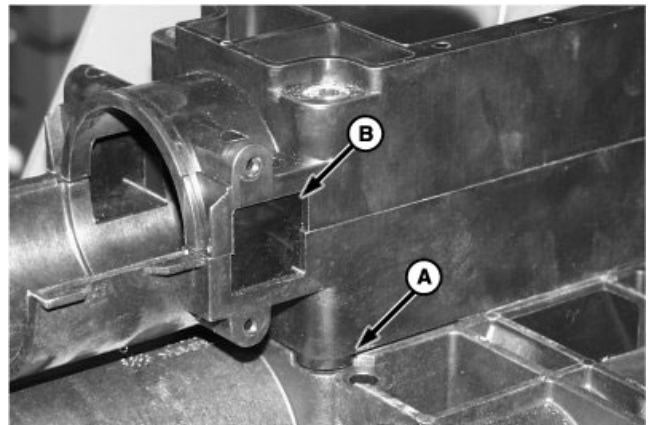
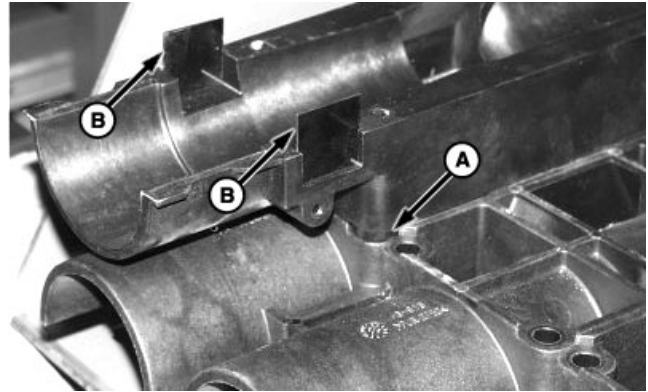
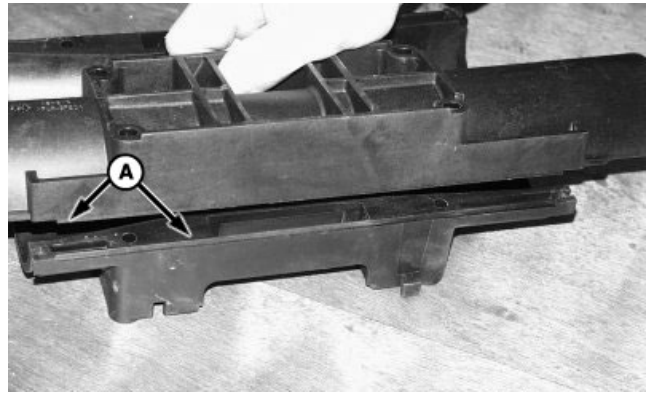
AG,OUO6023,1083 -19-21JUL00-6/8

NOTE: When assembling manifold halves, ensure all tongue and grooves (A), and cross-flow inhibitor panels (B) fit properly.

11. Assemble manifolds.

12. Install air control housing.

A—Tongue and Grooves
B—Cross-flow Inhibitor Panels



Continued on next page

AG,OUO6023,1083 -19-21JUL00-7/8

13. Secure shoot assemblies with carriage bolt and flange nut (A). Tighten to specification.

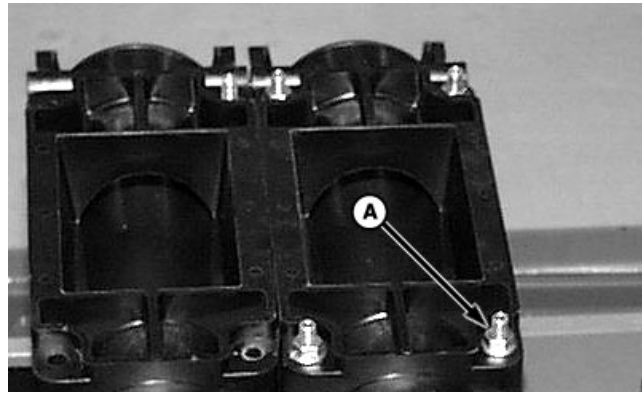
Specification

Flange Nut—Torque 5 N•m
(3.7 lb-ft)

NOTE: Center plate will vary in size based on number of runs installed.

Ensure new center plates have seals attached.

14. Install center plate.
15. Install slide panels.
16. Install manifold plug tray assembly.



A—Nut

A45757A —UN-20JAN00

AG,OUO6023,1083 —19-21JUL00-8/8

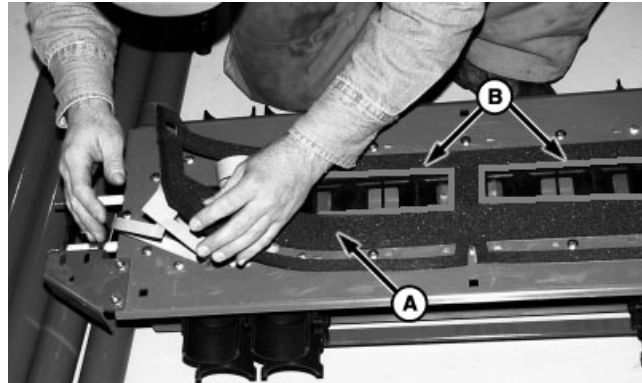
Install Stationary Double-Shoot System

IMPORTANT: Top manifold seal must be replaced whenever manifold is removed.

NOTE: Position seal 1 mm to 2 mm (0.04 in. 0.08 in.) back from edge of metal cut outs (B).

1. Install seal (A) on top of manifold.

A—Seal
B—Cut Outs



A45734A —UN-13OCT00

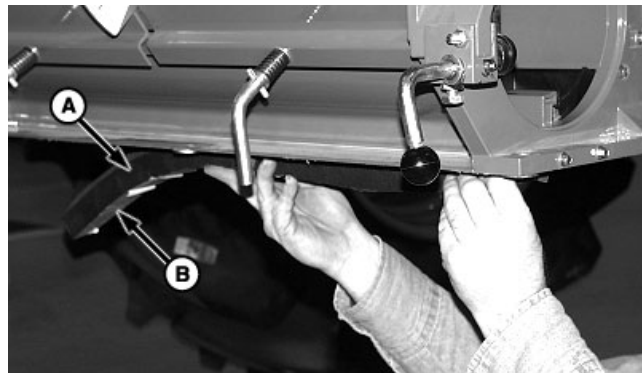
AG,OUO6023,649 —19-12JAN00-1/14

2. Install new meter slot seal (A). Ensure it is positioned properly before removing adhesive paper (B).

NOTE: For ease of installation of inactive run seals, new hard seals are removable.

3. Install inactive run seals into the hard seals.

A—Meter Slot Seal
B—Adhesive Paper



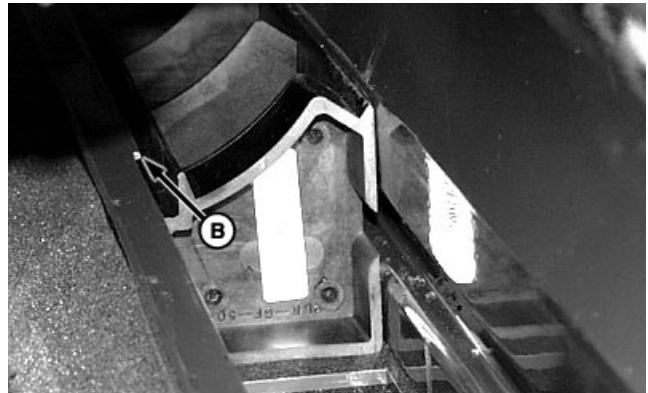
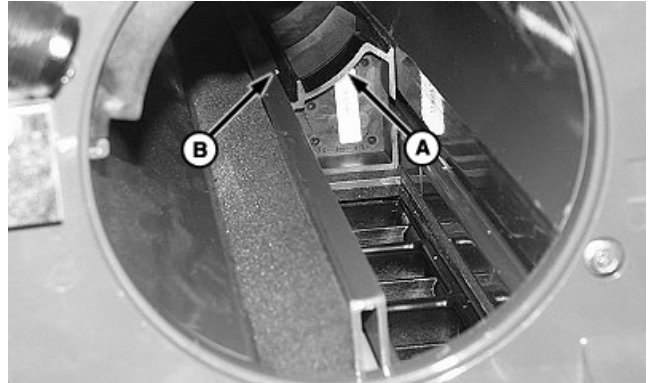
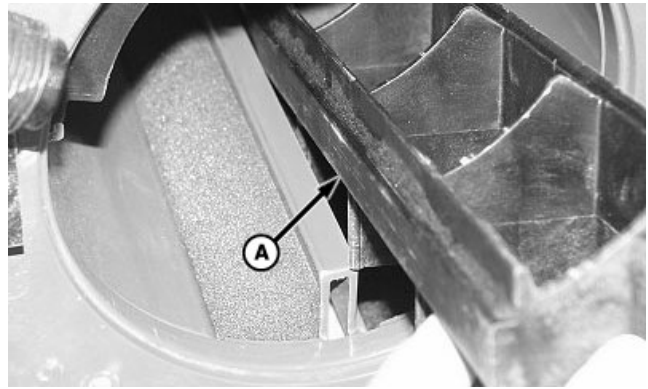
A45735 —UN-18JAN00

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AG,OUO6023,649 —19-12JAN00-2/14

4. Guide first hard seal (A) in under lip (B) and slide back.

A—Hard Seal
B—Lip



Continued on next page

AG,QUO6023,649 -19-12JAN00-3/14

NOTE: Hard seals are properly seated when top of hard seal (B) is parallel with seam in meter housing (C).

5. Slide second hard seal (A) into place. Verify hard seals are properly seated.

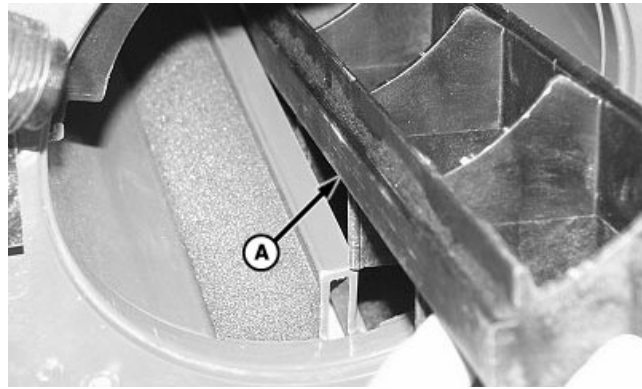
IMPORTANT: If hard seals are not properly seated, damage to equipment can occur when installing meter cartridge.

6. Install meter cartridge assembly with care.

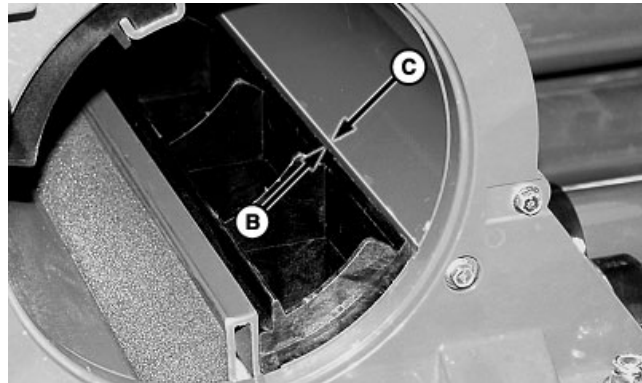
NOTE: Meter may need to be rotated slightly to engage two-point drive coupling on inner end.

- a. Push meter into housing.
- b. Turn meter handle clockwise to engage lock tab.
- c. Push in and turn lock handle down to set cam.

A—Hard Seal
B—Top of Hard Seal
C—Meter Housing Seam



A46983 -UN-12JAN01



A46984 -UN-12JAN01

AG,OUO6023,649 -19-12JAN00-4/14

NOTE: Washers must be placed between meter housing and manifold. For ease of installation, put washers in place using silicone before installing manifold.

7. Place a 6 mm (0.25 in.) bead of silicone around the base of the meter housing and around the holes. Place washers in position.



A45737 -UN-18JAN00

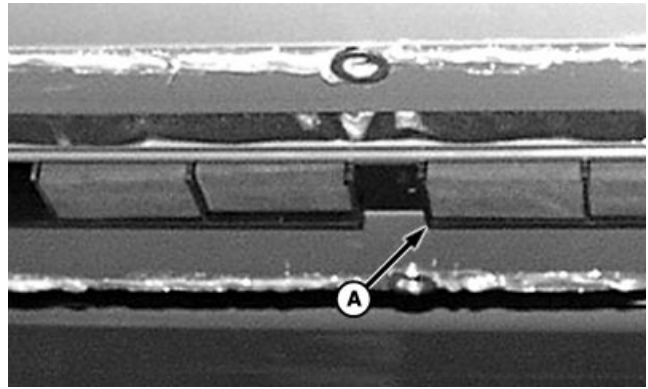
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AG,OUO6023,649 -19-12JAN00-5/14

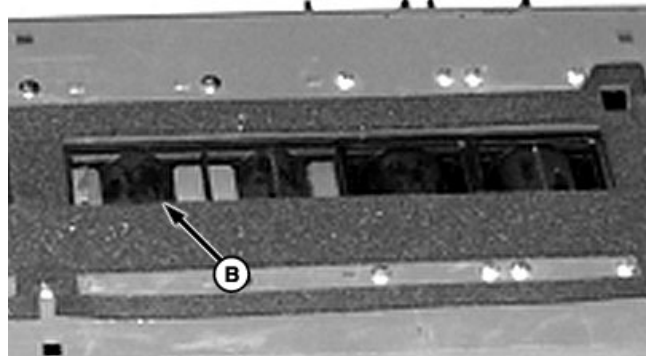
IMPORTANT: Use caution not to damage hard seals when aligning manifold.

8. Raise manifold and align hard seals (A) with manifold opening (B).

A—Hard Seals
B—Manifold Opening



A46986 -UN-12JAN01

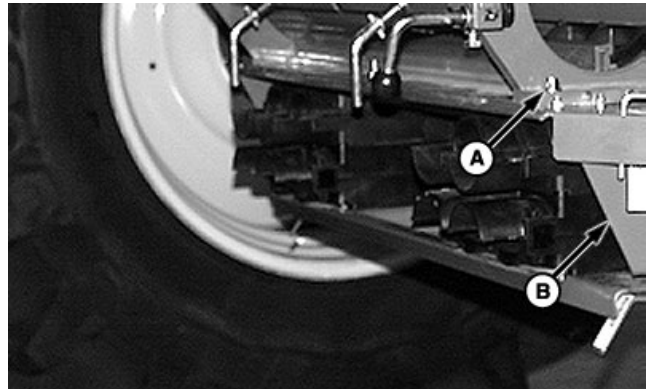


A46987 -UN-12JAN01

AG,OUO6023,649 -19-12JAN00-6/14

NOTE: Hard seals may have a snug fit but should not require excessive force (hammering or prying) for proper placement. Any adjustment for better fit should be made through the alignment of manifold to meter.

9. Install manifold (B) using six carriage bolts, washers, and nuts (A) previously removed. Once manifold to meter assembly is complete, carefully remove meter cartridge to test ease of hard seal removal and installation. Carefully install meter cartridge and verify silicone seal is complete.



A45738 -UN-20JAN00

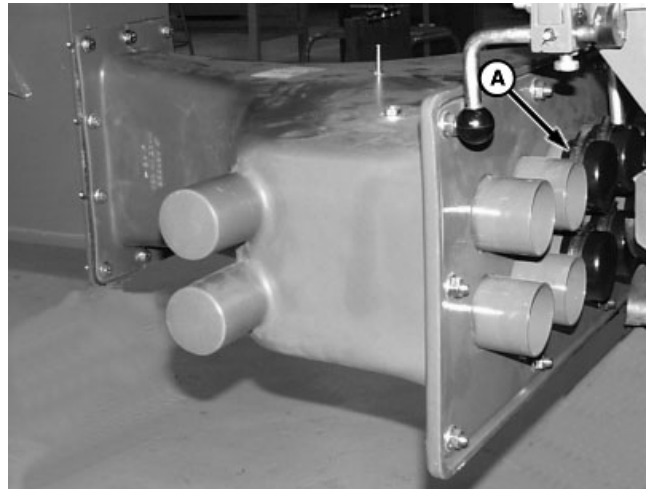
A—Carriage Bolts, Nuts, and Washers
B—Manifold

Continued on next page

AG,OUO6023,649 -19-12JAN00-7/14

10. Cap off inactive runs with plenum caps and clamps (A) if applicable.

A—Plenum Caps and Clamps



A47002 -UN-17JAN01

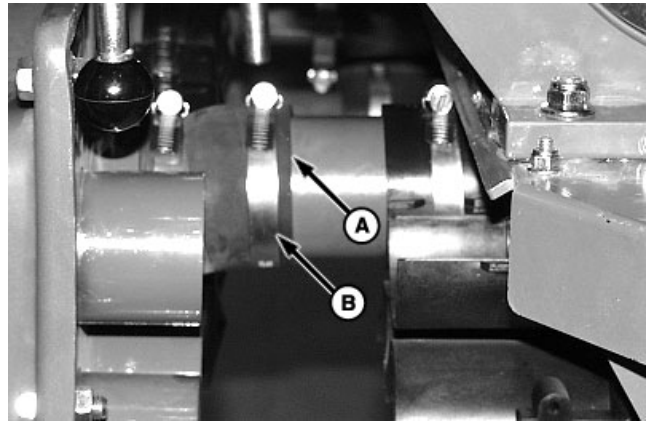
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AG,OUO6023,649 -19-12JAN00-8/14

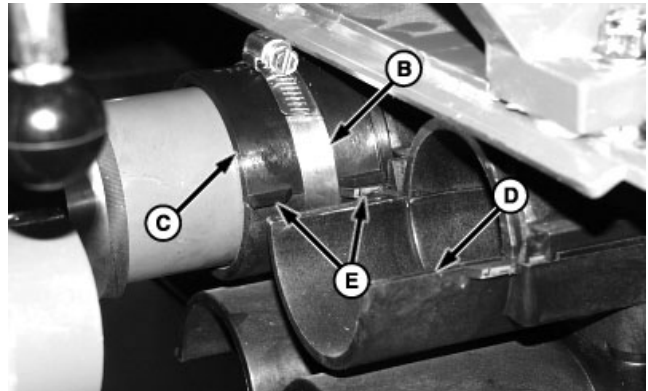
NOTE: Use front tubes previously removed on inner runs only. Outside runs require new tubes with air ports. For carts with third tank, a set of new tubes with air ports need to be installed on inner most active runs.

11. Install all inner run front tubes working from inside out. For carts with third tank, a set of new tubes with air ports need to be installed on inner most active runs. Secure front tubes to plenum using rubber seals (A) and hose clamps (B). Secure front tubes to manifold using single-shoot clamps (C) and hose clamps (B). Ensure tongues (F) on single-shoot clamps fit correctly in grooves (D) of manifold and that hose clamps are positioned between manifold lips (E).

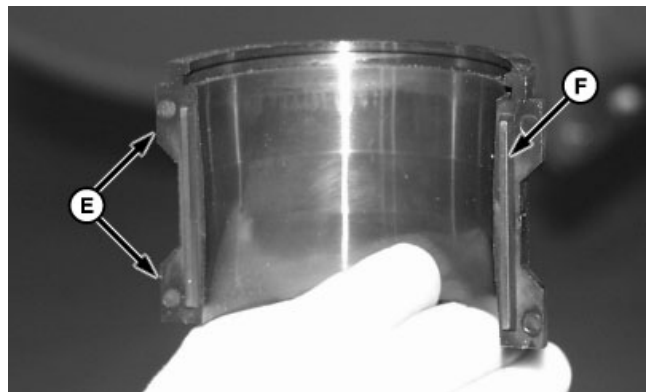
A—Rubber Seal
B—Hose Clamp
C—Single-Shoot Clamp
D—Groove
E—Manifold Lip
F—Tongue



A45745 –UN-18JAN00



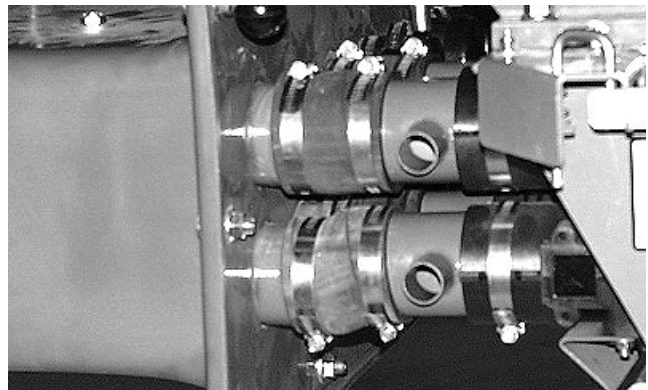
A45747 –UN-18JAN00



A45746 –UN-18JAN00

AG,OUO6023,649 –19-12JAN00-9/14

12. Install outer run front tubes with air ports facing out.



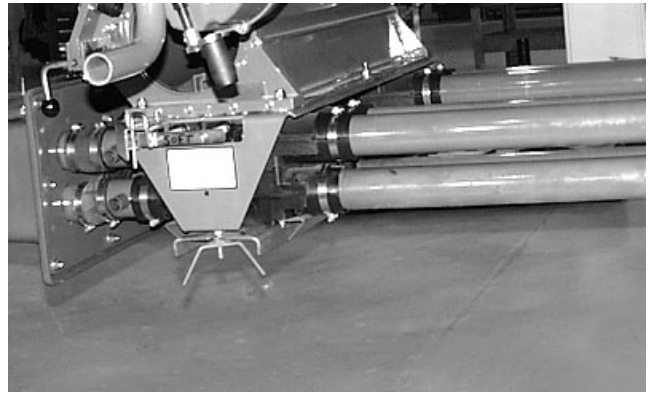
A45748 –UN-18JAN00

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AG,OUO6023,649 –19-12JAN00-10/14

NOTE: The center tubes are different lengths. The longer tubes go on the bottom shoot.

13. Install center tubes and secure to manifold using single-shoot clamps and hose clamps.
14. Install offset tubes and secure to manifold using single-shoot clamps and hose clamps.



A45749 -UN-18JAN00

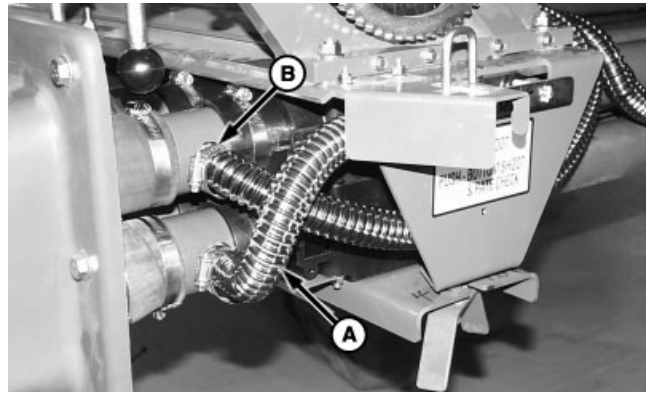
Two Tank Tow-between Cart Shown

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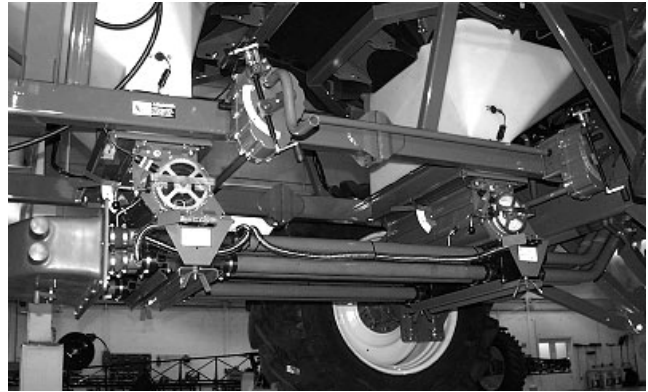
AG,OUO6023,649 -19-12JAN00-11/14

15. Attach tank pressure hoses (A) with hose clamps (B). Route tank pressure hoses and secure with tie straps as illustrated.

A—Tank Pressure Hose
B—Hose Clamp

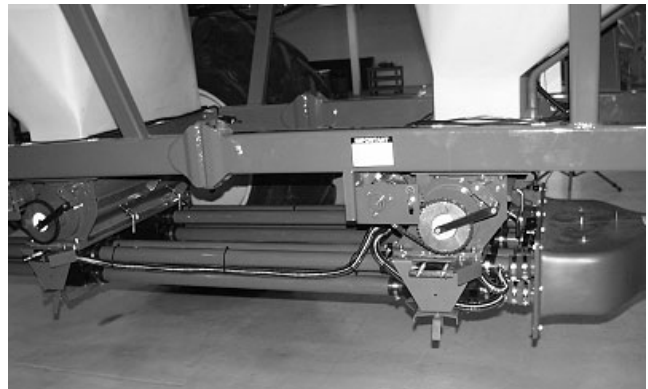


A45750 -UN-18JAN00



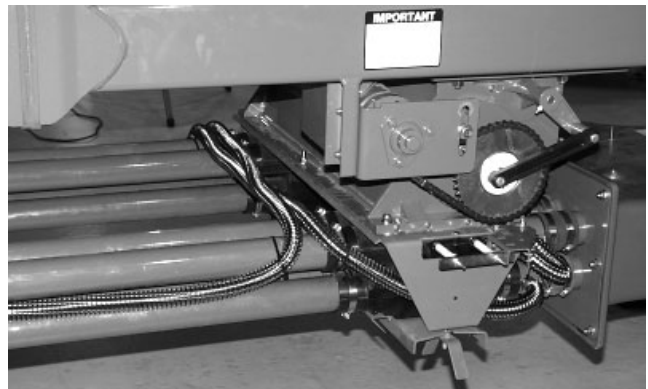
A45751 -UN-18JAN00

Two Tank TBT Cart - Left Side



A45752 -UN-18JAN00

Two Tank TBT Cart - Right Side



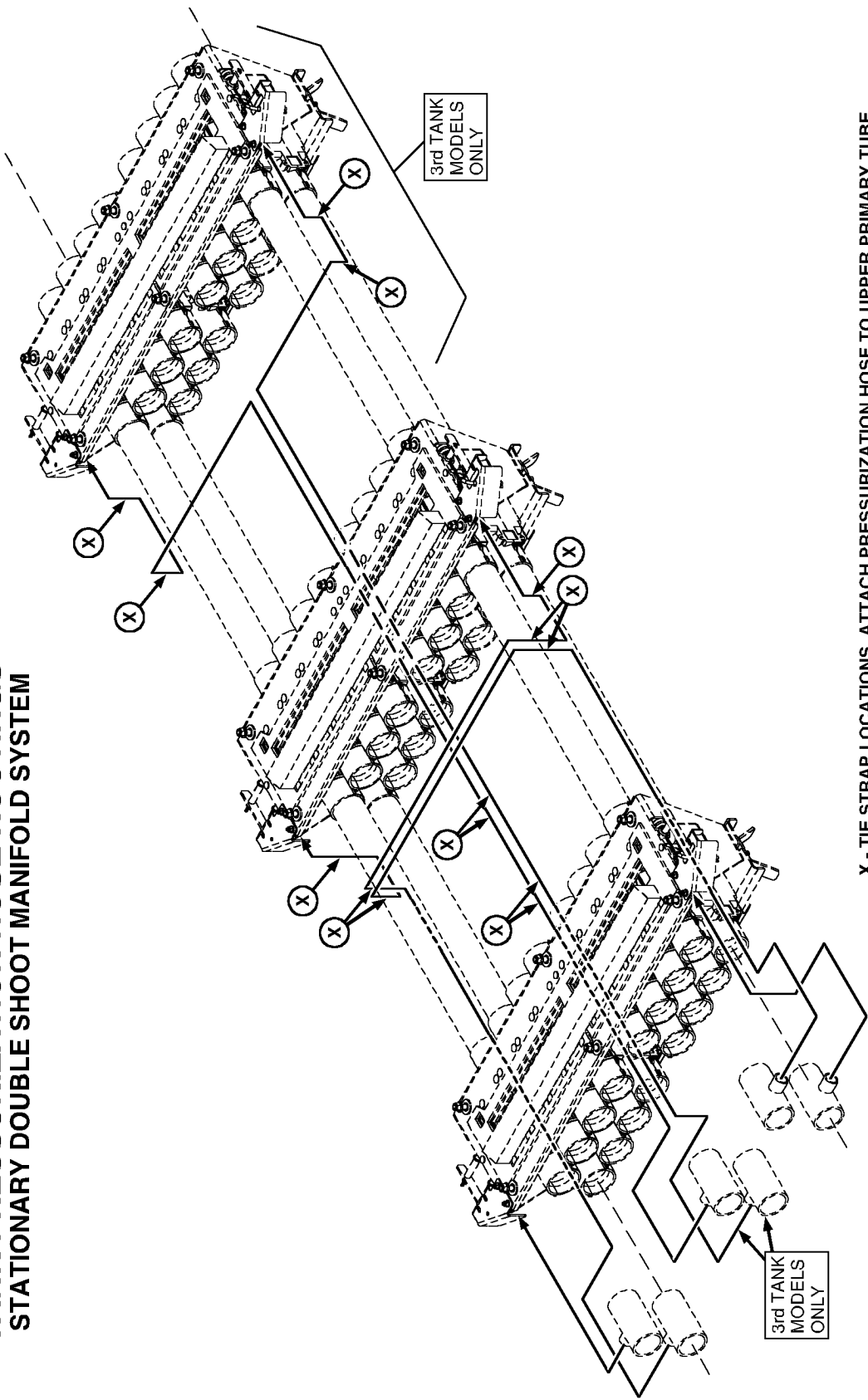
A45753 -UN-18JAN00

Tank Pressure Hose Cross Over

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AG,OUO6023,649 -19-12JAN00-12/14

**1900 CART TOW BETWEEN MODELS
TANK PRESSURIZATION HOSE ROUTINGS
STATIONARY DOUBLE SHOOT MANIFOLD SYSTEM**

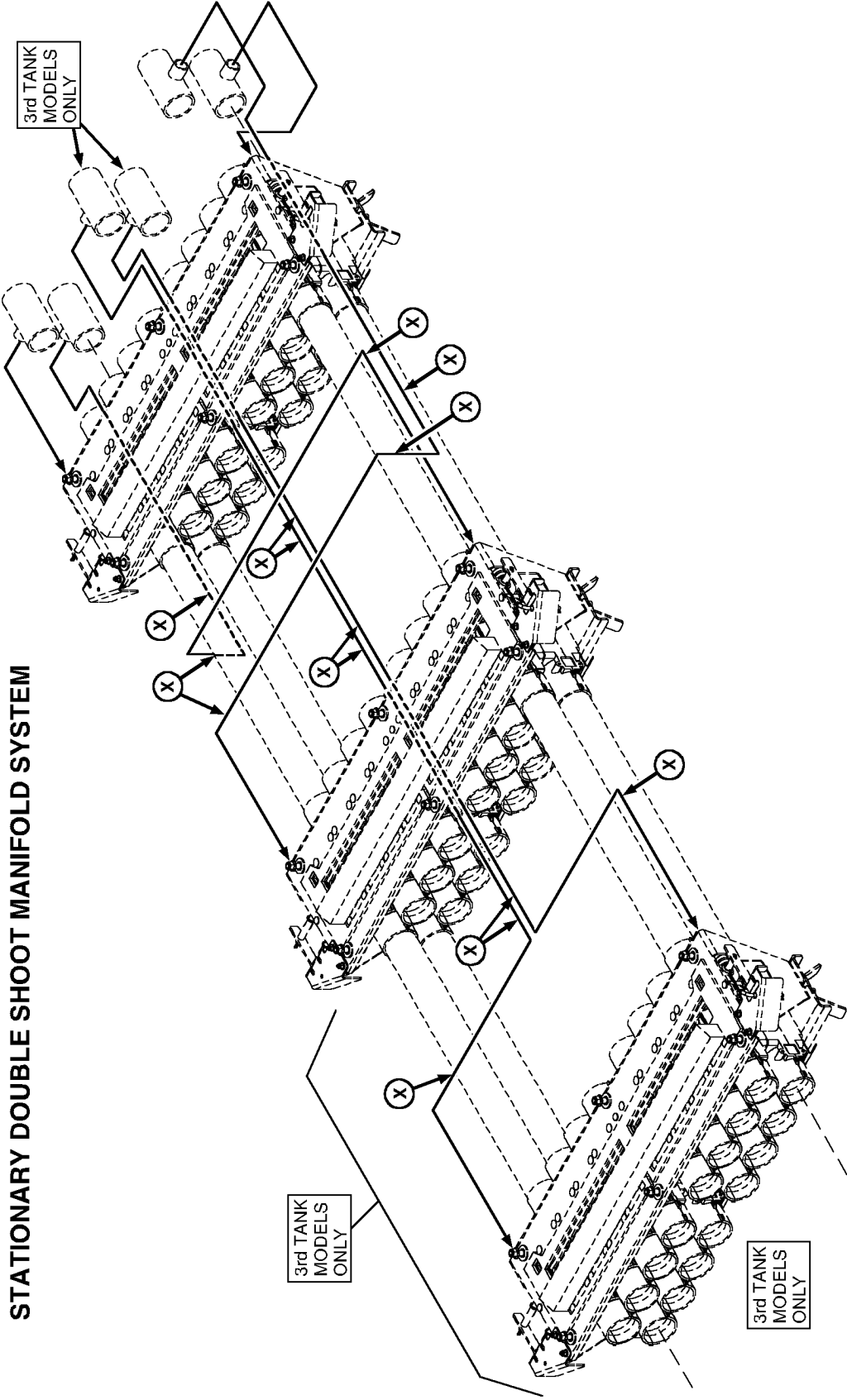


**X - TIE STRAP LOCATIONS. ATTACH PRESSURIZATION HOSE TO UPPER PRIMARY TUBE.
LATERAL ROUTING OF PRESSURIZATIONS HOUSING TO BE DIRECTLY BEHIND 1st & 2nd MANIFOLDS.**

Continued on next page

AG,OUO6023,649 -19-12JAN00-13/14

**1900 CART TOW BEHIND MODELS
TANK PRESSURIZATION HOSE ROUTINGS
STATIONARY DOUBLE SHOOT MANIFOLD SYSTEM**



X - TIE STRAP LOCATIONS. ATTACH PRESSURIZATION HOSE TO UPPER PRIMARY TUBE.
LATERAL ROUTING OF PRESSURIZATIONS HOUSING TO BE DIRECTLY BEHIND 1st & 2nd MANIFOLDS.

Operating Machine—Monitor Set-Up

Monitor and Control System—Standard Air Cart Equipment

1900 Commodity Air Cart comes with an electronic monitor and control system as standard equipment.

Because the monitor and control system is an integral part of the cart, operations involving the GREENSTAR™ display and SEEDSTAR™ controller are shown throughout this manual in appropriate sections.

Monitor portion of the system takes signals from the seed cart sensors and displays activity on the cab-mounted console. Active display informs the operator of cart activities that cannot be seen from the tractor seat.

Control portion of the system is used to engage main drive clutch and independent meter clutch solenoids.

Additionally, equipment and product information is entered by the operator to customize both the monitor and control portions of the system for specific applications.

Standard system monitors these functions:

- Fan Speed
- Ground Speed
- Application Rate
- Product Levels
- Area Seeded
- Time

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AG,OUO6023,1085 —19–21JUL00–1/1

Monitor/Control System Components

The following components make up the monitor/control system.

- GREENSTAR™ Display Console (A)

NOTE: Display console is powered by attaching cable to tractor convenience outlet located in the cab.

Operator is informed of seed cart activity by observing display screen(s).

System, display and operator changes are made using function keys (PAGE, SETUP, INFO, RUN).

Cart functions are selected and/or turned ON and OFF using lettered keys. Follow on-screen directions to use lettered keys; their functions change from mode-to-mode and screen-to-screen.

Display can be set to read out in English or Metric units of measure. Operator entries must be made in the same units of measure as display readout.

Equipment and product specific information is entered using numbered keys. Hi-lited settings (displayed in an arrow) are operator adjustable. Follow on-screen directions to revise settings. "CLR" button is used to clear mis-keyed digits.

NOTE: Console operating software is housed in SEEDSTAR™ controller, located on the air cart.

Tractor Radar setting, units-of-measure and language selection are stored within display console. If a new or different display console is used with the cart, tractor radar setting must be retrieved from the old display and manually entered into new or recalibrated and stored. Units-of-measure and language selection will need to be reset on new display if different than factory defaults.

Numbers shown in regular text display are either factory entered defaults or system generated totals or readings that cannot be altered by the operator.



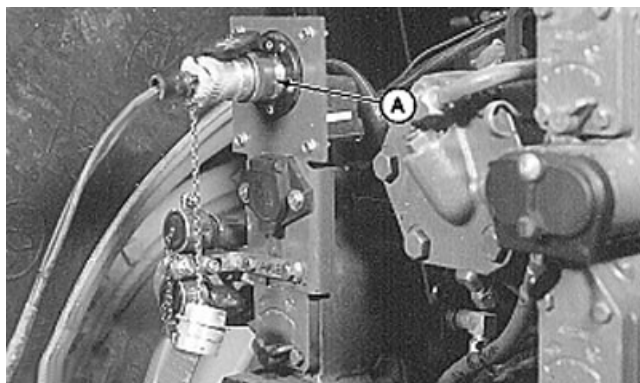
A—GREENSTAR™ Display Console

A41529 -UN-10APR97

- Communications Cable

Information and data exchanged between the display console and controller passes through communications cable (A), connected at the rear of the tractor. Cart controller is powered through this cable.

A—Communications Cable



A41555 -UN-16APR97

AG,OUO6023,1086 -19-21JUL00-2/7

- SEEDSTAR™ Controller

SEEDSTAR™ controller (A) is located on the air cart.

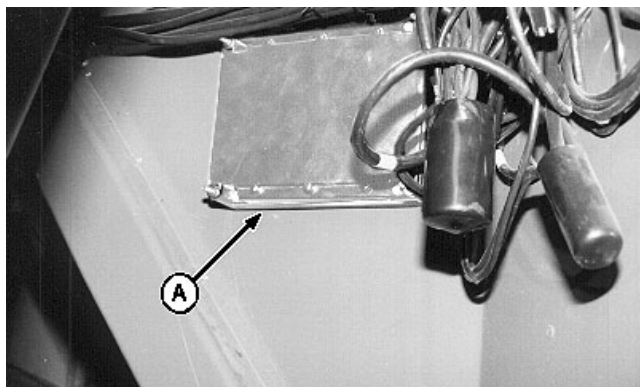
Contained within the controller is:

Display software used by the cab-mounted GREENSTAR™ console.

A microprocessor, that takes impulse signals from function sensors, translates them into communication language and sends to the tractor-mounted console for display to the operator.

NOTE: When cart is equipped with middle tank or variable rate options, standard controller is replaced with an expanded controller containing software to operate and monitor these functions.

Factory defaults and operator entered settings are stored in the controller's nonvolatile memory.



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A—SEEDSTAR™ Controller

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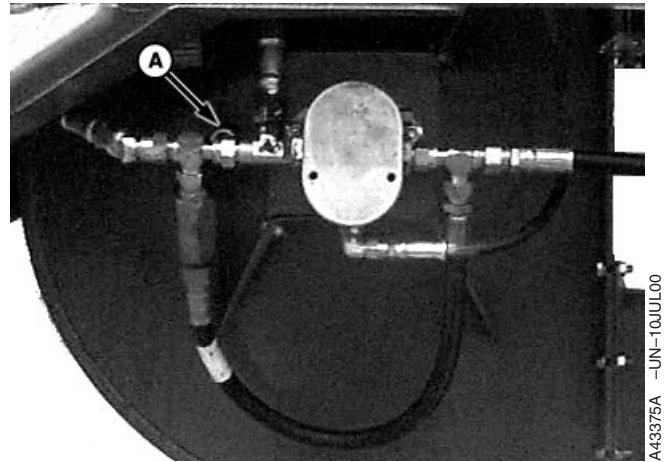
AG,OUO6023,1086 -19-21JUL00-3/7

- Fan Speed Sensor

Fan speed sensor (A) sends a signal to the cart controller to display fan speed in revolutions-per-minute (RPM) on the tractor-mounted console.

This signal is also compared to the fan speed setting entered in the controller and illuminates the fan speed indicator lights. Fan speed indicator lights are a set-up feature, not an operational display.

A—Fan Speed Sensor



A43375A -UN-10JUL00

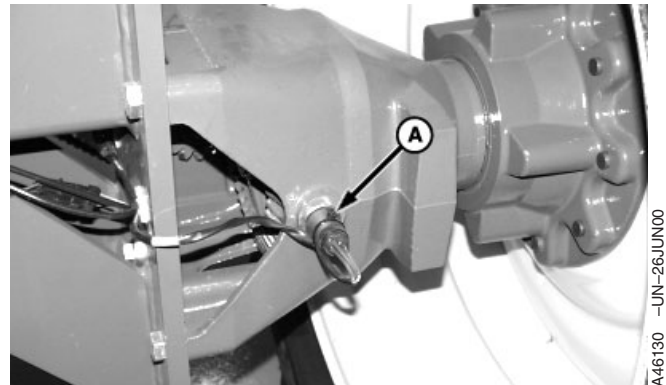
AG,OUO6023,1086 -19-21JUL00-4/7

- Ground Speed Sensor

Ground speed sensor (A) sends a signal to the cart controller to display ground speed in kilometers-per-hour (km/h) [miles-per-hour (mph)] on the tractor-mounted console.

Accumulated area is also recorded from this sensor's signal.

A—Ground Speed Sensor



A46130 -UN-26JUN00

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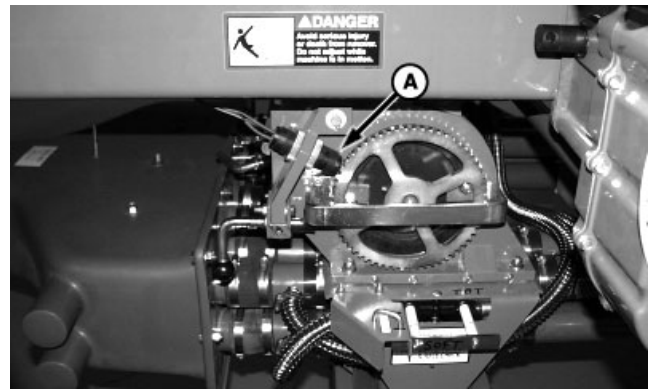
AG,OUO6023,1086 -19-21JUL00-5/7

- Meter Speed Sensors

Meter speed sensor(s) (A) send signal(s) to the cart controller where it is used by the microprocessor to calculate and display application rate on tractor-mounted console.

Meter area feature also uses this signal for recording and calculation.

A—Meter Speed Sensor



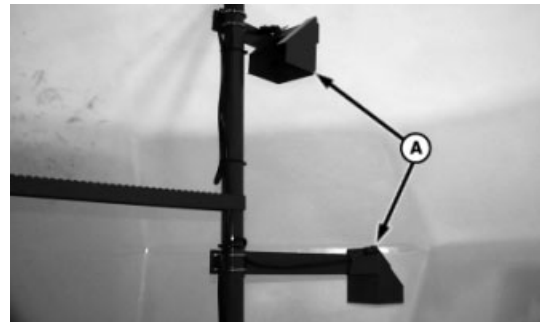
AG,OUO6023,1086 -19-21JUL00-6/7

- Product Level Sensors

In-tank sensors (A) send signals to the cart controller to display product level on the tractor-mounted console.

Signals from all three sensors are used to illuminate tank filling indicator lights.

A—In-Tank Sensors



AG,OUO6023,1086 -19-21JUL00-7/7

Communication System Terminator

For proper operation, communications system must have two terminator(s) (A and B) installed in the CAN communication line.

When optional devices are attached (Seed Counting and/or Blockage Monitoring), passive terminator is relocated from the end of the cart CAN line to the end of the optional device(s) CAN line. Optional device CAN IN plug is connected at the open terminator plug, providing a communications interface between the optional and standard controllers.

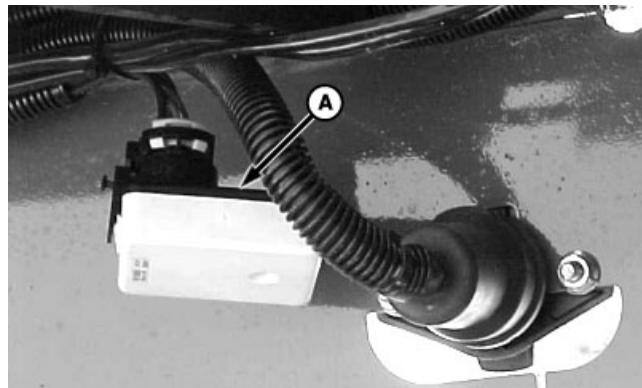
- Passive Terminator (A):

Passive terminator is installed in the end of the CAN communications line on the cart.

- Passive Terminator (B):

Passive terminator is installed in the tractor end of the CAN communications line, at the GREENSTAR™ display console.

A—Terminator
B—Terminator



Tow-Between

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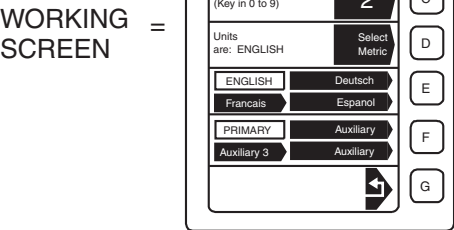
Monitor Set-Up Flow Charts

The following flow charts will help the user to understand the set-up processes of the monitor system. Each phase of the process flow chart includes up to five parts; Section Title, Instruction Location, Brief Description, Working Screen, and Buttons to be Selected.

SECTION TITLE = GREENSTAR DISPLAY

INSTRUCTION LOCATION = SEE SECTION 60 — SET-UP MODE — STANDARD GREENSTAR DISPLAY

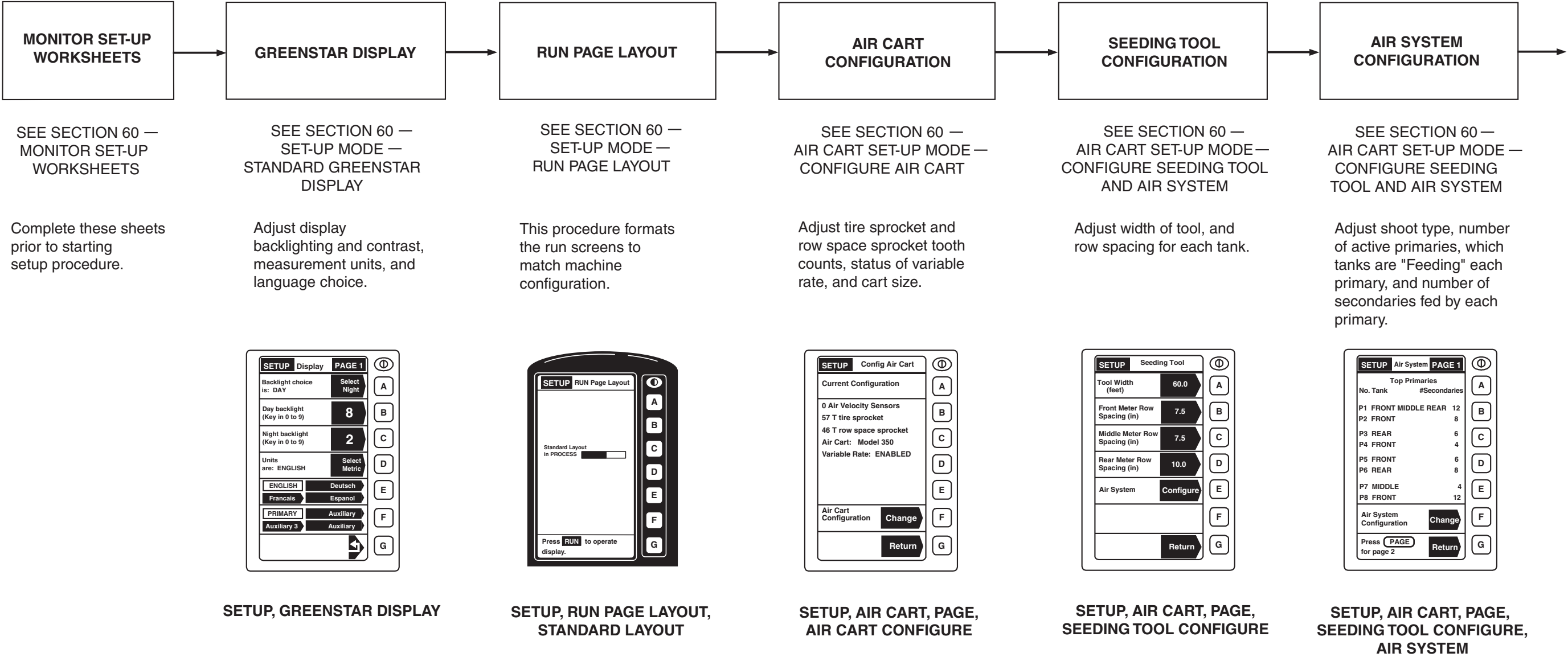
BRIEF DESCRIPTION = Adjust display backlighting and contrast, measurement units, and language choice.



BUTTONS TO BE SELECTED = SETUP, GREENSTAR DISPLAY

A43732DS -19-21FEB01

AIR SEEDER MONITOR SETUP FLOWCHART

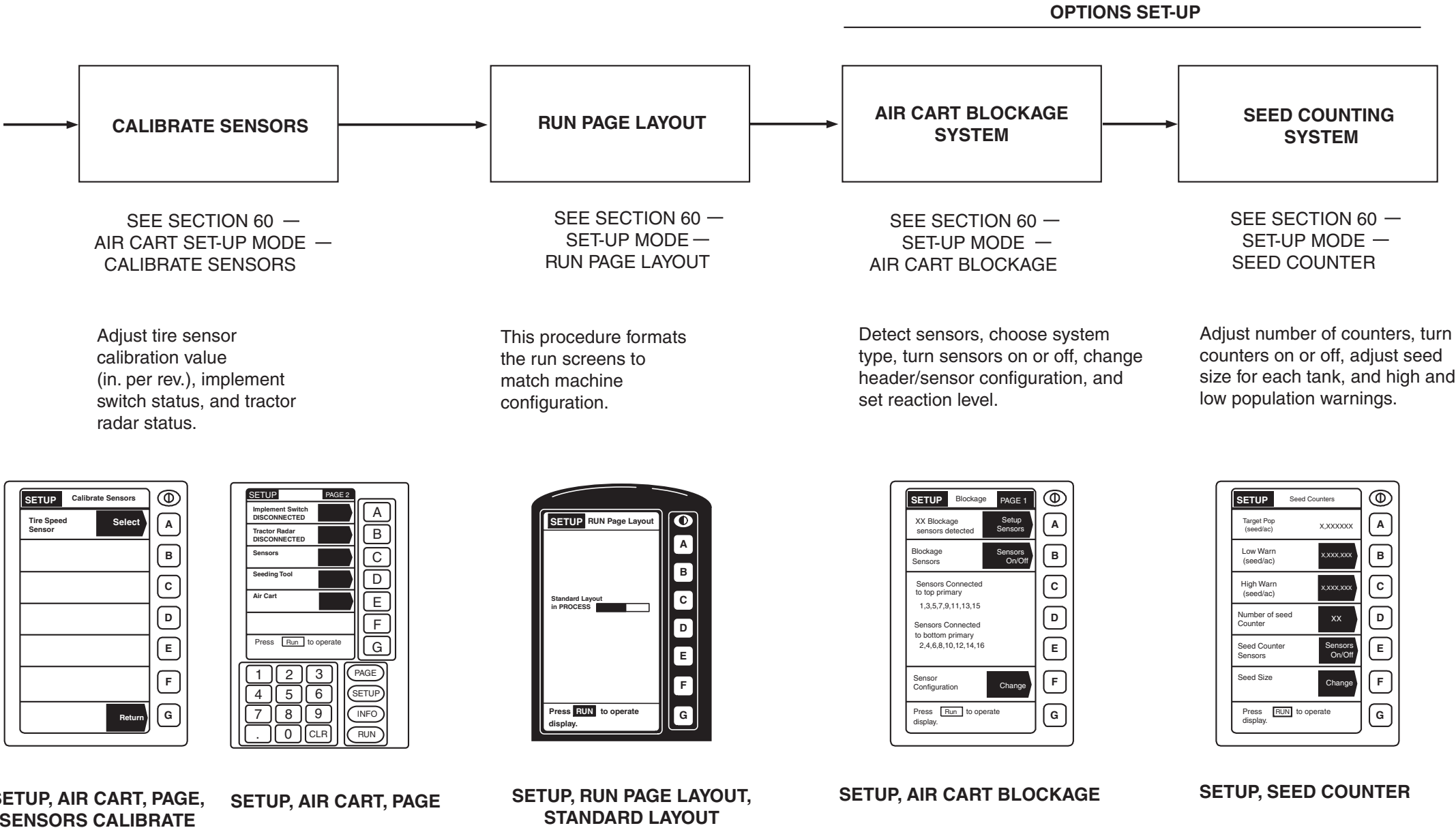


A47396

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AIR SEEDER MONITOR SETUP FLOWCHART - CONT.



Monitor Set-up Work Sheets

The following work sheets are provided to assist in setting up the monitor. Enter the required information before setting up the monitor.

MONITOR SETUP WORKSHEET	
Row space sprocket-tooth count	ENTER THE VALUE HERE THAT IS SHOWN IN THE SEEDING TOOL ROW SPACING/SPROCKET TABLE. (See Air Cart Set-Up Mode-Configure Air Cart)
Tire sprocket-tooth count	ENTER THE VALUE HERE THAT IS SHOWN IN THE TIRE SIZE/TRAVEL DISTANCE/SPROCKET TEETH TABLE. (See Air Cart Set-Up Mode-Configure Air Cart)
Type of system: Single Shoot or	
Row Spacing for Each Tank	FRONT TANK REAR TANK MIDDLE TANK (IF APPLICABLE)
Number of Top Primaries	FROM METER CARTRIDGE/SEEDING TOOL DIAGRAMS OR ACTUAL TOOL
Number of bottom Primaries (Double-Shoot only)	FROM SEEDING TOOL.
PRIMARIES ARE NUMBERED LEFT-TO-RIGHT AS SHOWN IN DIAGRAMS AND AS SEEN STANDING BEHIND THE SEEDING TOOL FACING THE DIRECTION OF TRAVEL.	
Primary Number 1	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 2	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 3	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 4 (top / bottom) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 5 (top / bottom) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 6 (top / bottom) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 7 (top / bottom) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries

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AG,OUO6023,1089 -19-21JUL00-2/3

MONITOR SETUP WORKSHEET	
Primary Number 8 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 9 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 10 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 11 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 12 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 13 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 14 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 15 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
Primary Number 16 (<i>top / bottom</i>) (If Applicable)	LIST NUMBER OF SECONDARIES SHOWN FOR THIS PRIMARY Feeding Tank(s) (Front, Rear, Middle) # of secondaries
<i>Roller</i> (for specific product & desired rate)	CHOOSE FROM OPERATOR'S MANUAL SECTION "PRODUCT DELIVERY CHECKS/SETTING"
<i>Fan Speed</i>	SEE DETERMING FAN SPEED IN OPERATING MACHINE - AIR SYSTEM SECTION

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AG,OUO6023,1089 -19-21JUL00-3/3

GREENSTAR™ Display Start-Up

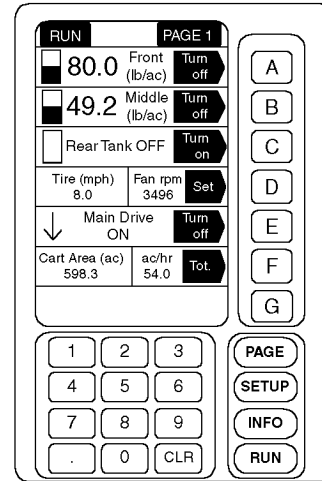
NOTE: GREENSTAR™ display console has no on/off switch. If properly connected to power, display will come on when tractor key is turned to accessory position, or when the engine is started.

If SEEDSTAR™ controller power and communication cable is connected, the first display seen will be Page One of Air Cart RUN MODE.

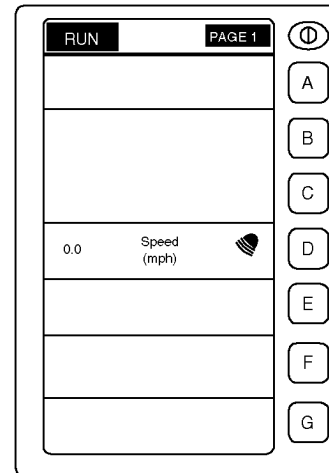
If communication cables are not properly connected, RUN screen will display radar ground speed only [0.0 km/h (0.0 mph) if standing still].

First time use will require complete system set-up as described in this section and in sections describing optional attachments. Depress SET-UP key to enter this mode.

Set-up will need to be revised and run page layout refreshed if optional devices are added or equipment changes made since last successful use. This also applies to product changes.



Start-Up OK.



Bad Start-Up

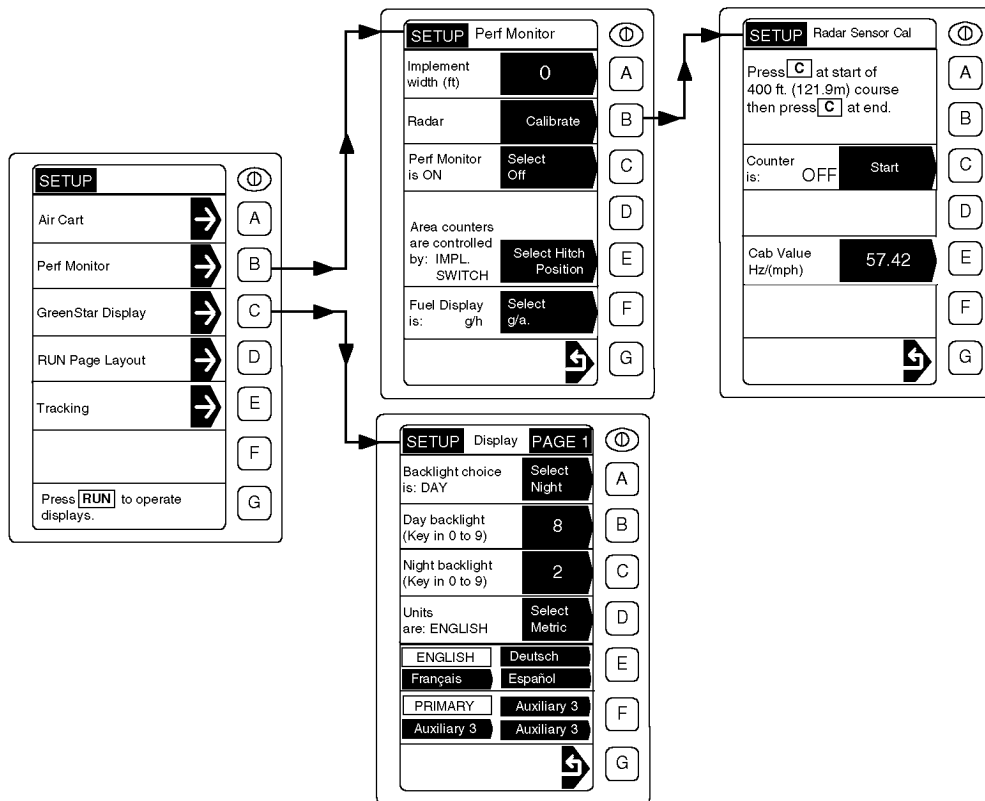
A46074 -19-18APR00

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AG,QUO6023,1090 -19-21JUL00-1/1

Set-Up Mode—Standard GREENSTAR™ Performance Monitor



IMPORTANT: Perf (Performance) Monitor is not active when connected to the 1900 Commodity Air Cart.

Standard GREENSTAR™ Display includes Perf (Performance) Monitor that keeps its own records on implement and tractor operations.

IMPORTANT: Implement width must be exact. Incorrect entry will cause hectares (acres) to be incorrect.

Enter Implement Width and select controlling device (Hitch Position or Implement Switch) to activate Area counters. Entries made here are different than those made when setting up a 1900 Air Cart.

Fuel Display can be selected to show in gallons-per-hour or gallons-per-acre, or in Metric equivalents of liters-per-hour or liters-per-hectare.

If equipped, Radar is calibrated using the performance monitor. Refer to SET-UP MODE—CALIBRATE TRACTOR RADAR SENSOR in this section for detailed information on procedure.

Screen readability is adjusted by entering GREENSTAR™ Display Set-Up. See SET-UP MODE—ADJUST DISPLAY CONTRAST AND BACKLIGHT in this section for detailed information.

English or Metric units and display language are also changed in “Adjust Display”. Refer to SET-UP MODE—CHANGING READOUT LANGUAGE AND UNITS-OF-MEASURE in this section for procedure.

Set-Up Mode—Adjust Display Contrast and Backlight

Adjust both contrast and backlight to obtain best screen readability.

Contrast Adjustment: Depress contrast button (A) to sharpen screen display. Release button and depress again to dull screen image.

Backlight Adjustment: Enter Set-Up mode and select “GREENSTAR™ Display”.

1. From any screen press SETUP.
2. Select GREENSTAR™ Display.

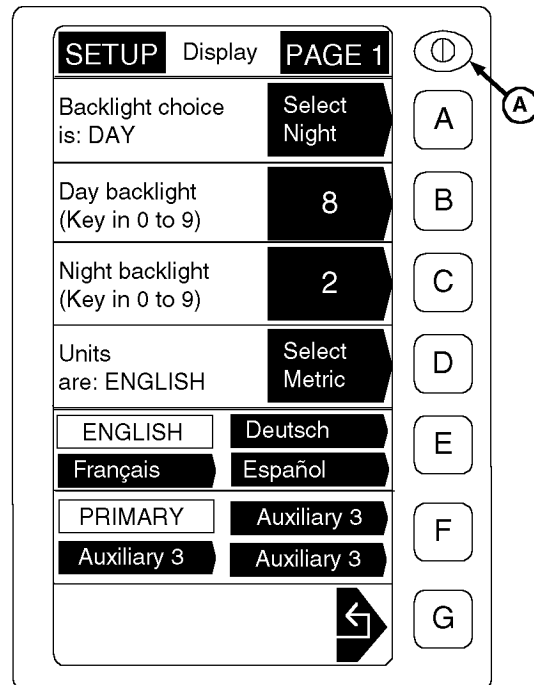
NOTE: The option in the shaded arrow is what becomes selected if this button is pushed. The unshaded area is the current selection.

3. Press key “A” to toggle backlight between day and night settings.

NOTE: • Newer displays (RE150184 or PF80162) can be set between 0 (Darkest) and 9 (Brightest).

• Older displays (RE67542) can be set between 0 and 8. Full bright setting “9” should not be used on older displays as the circuit draws too much current, resulting in light circuit shutdown.

4. Enter desired day and night backlight settings using numbered keys. The higher the setting, the brighter the screen.
 - a. Press key B, enter a number between 0 and 9, press key B again to accept the value.
 - b. Press key C, enter a number between 0 and 9, press key C again to accept the value.
5. Press key G to return to the SETUP screen.



A—Contrast Button

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Changing Readout Language and Units-of-Measure—GREENSTAR™ Display

Display can be set to read out in English or Metric units-of-measure.

NOTE: Newer displays (PF80162 and later) have language choice available.

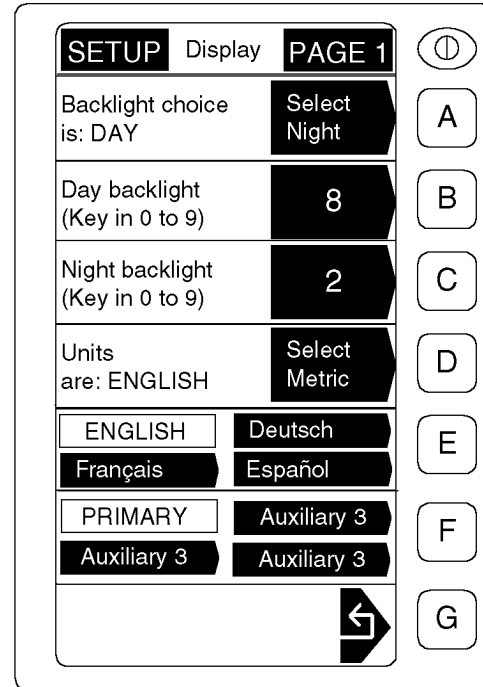
Depending on the system software, display may be reset to read out in languages other than English. Currently only English and Spanish are available for standard GREENSTAR™ display. Air Cart screens and related optional devices (Seed Counter, Blockage) are also available in English and Spanish.

1. From any screen press SETUP.
2. Select GREENSTAR™ Display.

NOTE: The option in the shaded arrow is what becomes selected if this button is pushed. The unshaded area is the current selection.

3. Press key D to toggle between ENGLISH and METRIC units.
4. Press key E to toggle between languages.
5. Press key G to return to the SETUP screen.

NOTE: Operator entries must be made in the same units of measure as display readout.

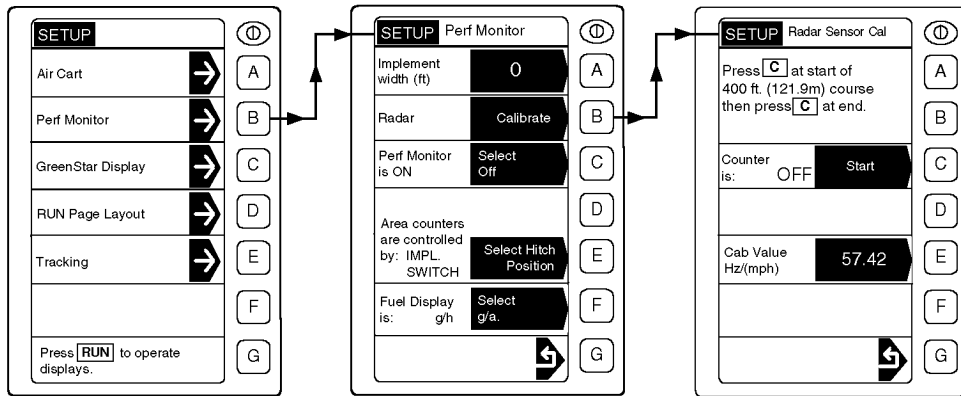


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AG,OUO6023,1093 -19-21JUL00-1/1

Set-Up Mode—Calibrate Tractor Radar Sensor (If Equipped)



IMPORTANT: Tractor Radar is not necessary to operate the 1900 Commodity Cart. Radar speed is used to determine cart tire slippage and/or seed populations if equipped with optional seed counting.

Radar calibration is used to determine the true ground speed of the tractor. Radar speed value is approximately 57 Hz per km/h (57 Hz per mph), and should be calibrated to ensure accuracy.

If radar calibration value is already known, it can be manually placed into memory by entering set-up mode, pressing Cal. Value key and making entry using numbered keys. Press Cal. Value key again to store this setting in memory.

IMPORTANT: For best results and most accurate setting, radar calibration should be done in the field (in the type of soil

to be seeded) with all tires inflated to proper pressure.

Hard, smooth surfaces are not acceptable for calibration and may produce a "Radar Sensor Calibration Error" message.

NOTE: Radar calibration procedure is similar to final in-field procedure used to calibrate the air cart's tire speed sensor except that it is done at slower speed (approximately 3 km/h [2 mph]), not seeding speed.

1. Lay out a 122 m (400 ft) straight line course.
2. Enter Set-Up mode.
3. Enter Perf (Performance) Monitor Set-Up mode, Radar Calibrate function.

Continued on next page

AG,OUO6023,1094 -19-21JUL00-1/2

4. Driving at approximately 3.2 km/h (2 mph), press counter start key as tractor front tires pass the opening marker of the course.
5. Press stop key as tractor front tires pass the closing marker of the course to end calibration; “Radar Sensor Calibration Finished” should display along with radar calibration value. This value is automatically entered into the monitor’s memory.

Pressing the stop key before the closing marker may produce a “Radar Sensor Calibration Error”

message if more feedback signals are needed for calibration.

Error message can also display when feedback signal is outside the normal range of 1—150 Hz.

6. If “Radar Sensor Calibration Error” interrupts the active procedure, check that sensor lens is clean and cable connections tight; then re-run test.

AG,OUO6023,1094 –19–21JUL00–2/2

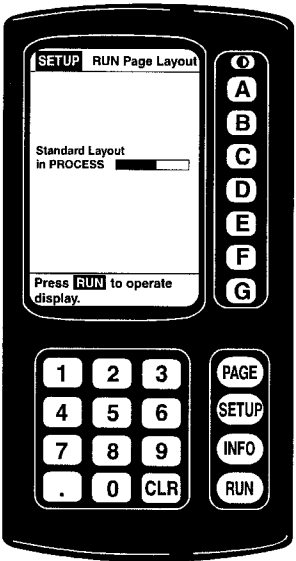
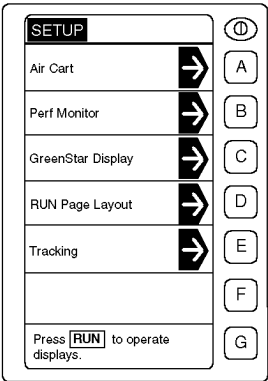
Set-Up Mode—Run Page Layout

RUN Page(s) Layout should be done at the end of set-up and when changes are made or options connected and system requests page layout.

Page Layout identifies standard and optional controllers connected to the system, and adds their configuration information to the “RUN” pages.

When all set-up entries have been made, depress RUN Page Layout key to refresh RUN screen(s) with new (changed) settings or information. Select Standard Layout when it appears on the screen.

Screen will show “Layout in Process” and “Complete” when done.

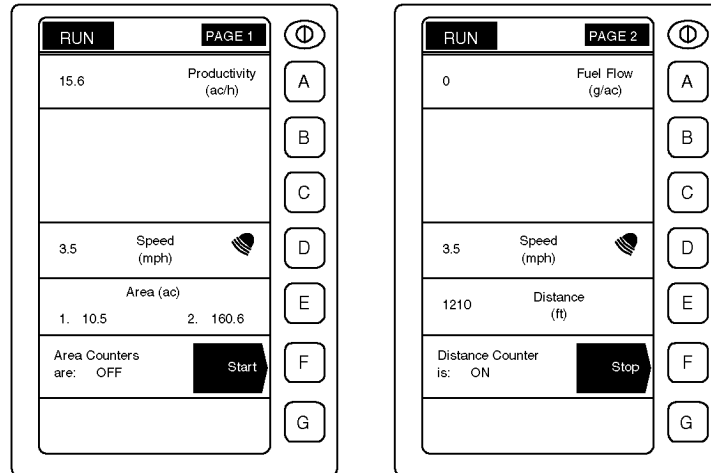


A40412

A46427 –19–20JUL00

A40412 –19–06DEC96

Run Mode—Standard GREENSTAR™ Display



When GREENSTAR™ equipped tractor is operated with a different implement (NOT an air cart), the RUN page(s) will show these displays.

Productivity shows area covered and time.

Tractor speed is shown. Icon shows that radar sender is the source of the speed signal.

Counters 1 (field) and 2 (farm) show area covered.

Area counters are turned ON and OFF using Select.

Fuel flow is displayed in units used per area.

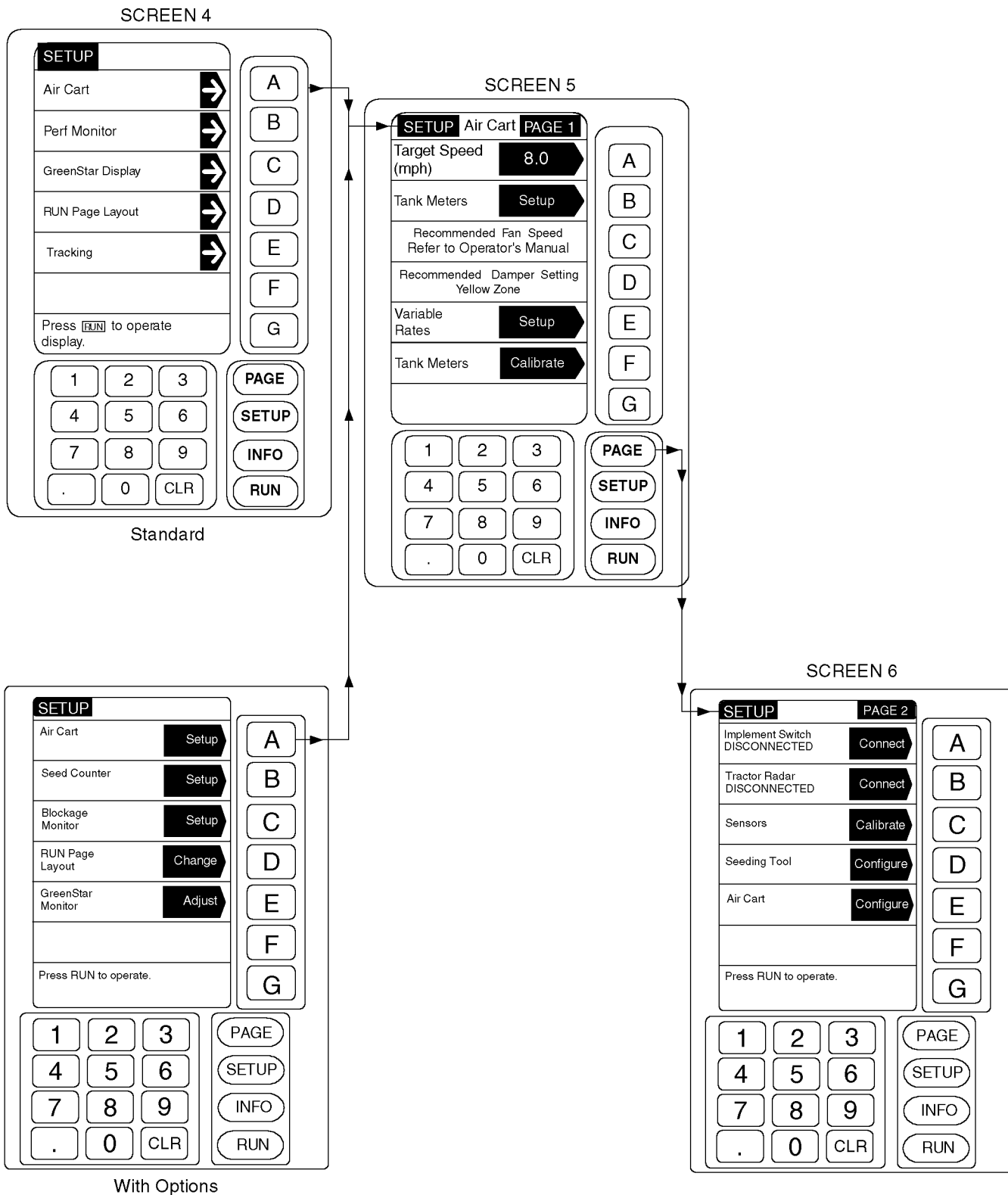
Distance reading shows how far the tractor has traveled. Distance counter is turned ON and OFF using select.

GREENSTAR is a trademark of Deere & Company.

AG,OUO6023,1096 –19–21JUL00–1/1

A41925 –19–27AUG97

Air Cart Set-Up Mode—Overview



IMPORTANT: Display screens illustrated on the following pages are provided for reference only. Your actual screens may appear differently due to connection of optional devices and/or software version in use.

NOTE: Disregard screen references to JD Map and Air Velocity Sensors. Neither of these features are supported at this time.

Set-up mode is the process of introducing the cart to it's seeding tool and to the products you wish to apply.

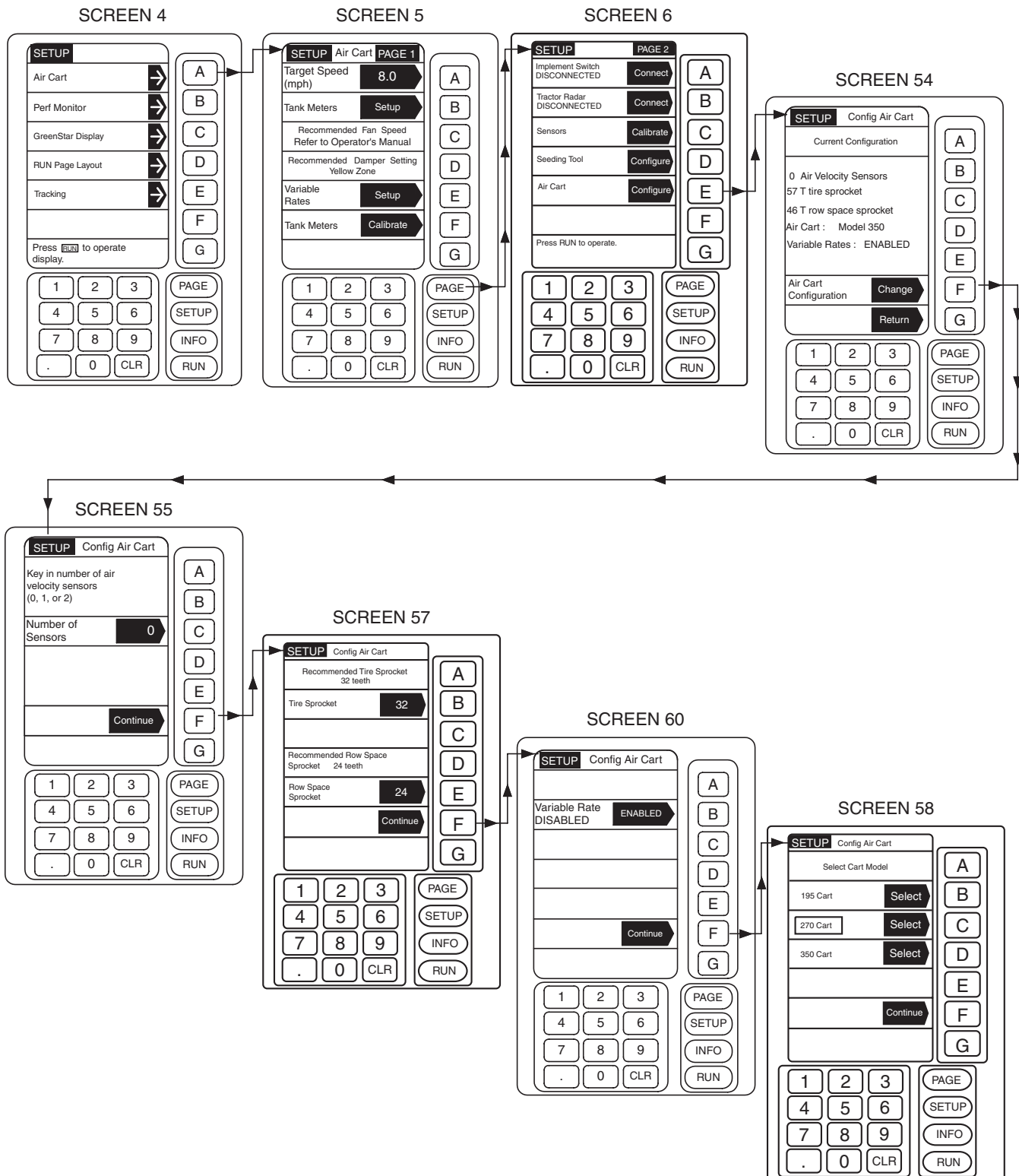
Introductions to optional devices are also made in set-up mode. Refer to Set-Up Mode—Variable Rate, Set-Up Mode—Seed Counting, and Set-Up Mode—Air Cart Blockage sections for set-up of these optional devices.

If so equipped, implement switch and tractor radar should be connected.

Proceed with set-up procedures as described in this section.

AG,OUO6023,1097 -19-21JUL00-2/2

Air Cart Set-Up Mode—Configure Air Cart



Continued on next page

AG,OUO6023,1098 -19-21JUL00-1/3

Compare current configuration to air cart and make changes accordingly.

1. From any screen press SETUP.
2. From the list given, choose Air Cart.
3. Once on the Air Cart page, press PAGE to advance to PAGE 2. Select Air Cart key E.
4. The Air Cart summary page is displayed. From this page, press Change key F to start the configuration.
5. Air Velocity Sensors will remain 0, they are not available at this time. Press key F to Continue.
6. Next, enter the number of teeth on the Row Spacing sprocket. In the SEEDING TOOL ROW SPACING/SPROCKET TEETH chart, find the seeding tool row spacing in the left-hand column. Find the corresponding sprocket size in the right-hand column. Press key E, enter the number of teeth (23, 28, 37 or 46); then press key E again to accept.

SEEDING TOOL ROW SPACING/SPROCKET TEETH	
Row Spacing	Recommended Sprocket Size
38 cm (15 in.)	37 Tooth
30.5 cm (12 in.)	23 Tooth
25 cm (10 in.)	28 Tooth
19 cm (7.5 in.)	37 Tooth
15 cm (6 in.)	46 Tooth

7. Next, enter the number of teeth on the Tire Sprocket. In the TIRE SIZE/TRAVEL DISTANCE/SPROCKET TEETH chart, find the cart tire size in the left-hand column and then the corresponding sprocket size in the far right-hand column. Press key B, enter the number of teeth (57, 62, 68, 72 or 80) using the number key pad. Then press key B again to accept the number.

Tire Size/Travel Distance/Sprocket Teeth		
Tire Size	Travel Distance mm (in.) per Rev. ^a	Tooth Count
18.4-26 R3, 10PR	4191 (165)	57T
18.4-26 R2, 10PR	4394 (173)	62T
23.1-26 R3, 10PR	4521 (178)	62T
28L-26 R3, 12PR	4775 (188)	62T
23.1-26 R2, 10PR	5029 (198)	68T
28L-26 R2, 12PR	5080 (200)	68T
30.5L-32 R3, 12PR	5359 (211)	72T
30.5L-32 R2, 12PR	5664 (223)	80T
710/70R38 R1W, 2 Star	5893 (232)	80T
20.8R-38 R1, 1 Star	5639 (222)	80T
18.4R-46 R1, 3 Star	6020 (237)	80T
20.8R-42 R1, 2 Star	5867 (231)	80T

^aTire travel per revolution is estimated.

NOTE: Travel distance is approximate. For accuracy, calibrate by driving through 122 m (400 ft) course.

8. Press key F to continue.

IMPORTANT: This is the section of SETUP in which the Middle Tank, and Variable Rate options are enabled. This must be done prior to any other configuration to ensure that the right menu options are present.

9. If the cart is equipped with a Middle Tank or Variable Rate, proceed to Step 10. If the cart is not equipped with either one of these options, proceed to Step 12.
10. Press key B to enable the Middle Tank, if equipped. Cancel Run Page Layout warning message at this time. A Run Page Layout will need to be performed after all setup is complete.

NOTE: The option in the shaded arrow is what becomes selected if this button is pushed. The unshaded area is the current selection.

11. Press key D to enable the Variable Rate option, if equipped. Cancel Run Page Layout warning. Press key F to continue.

NOTE: When cart is equipped with a middle tank, use base cart size for model selection.

430 bu Cart, use 350

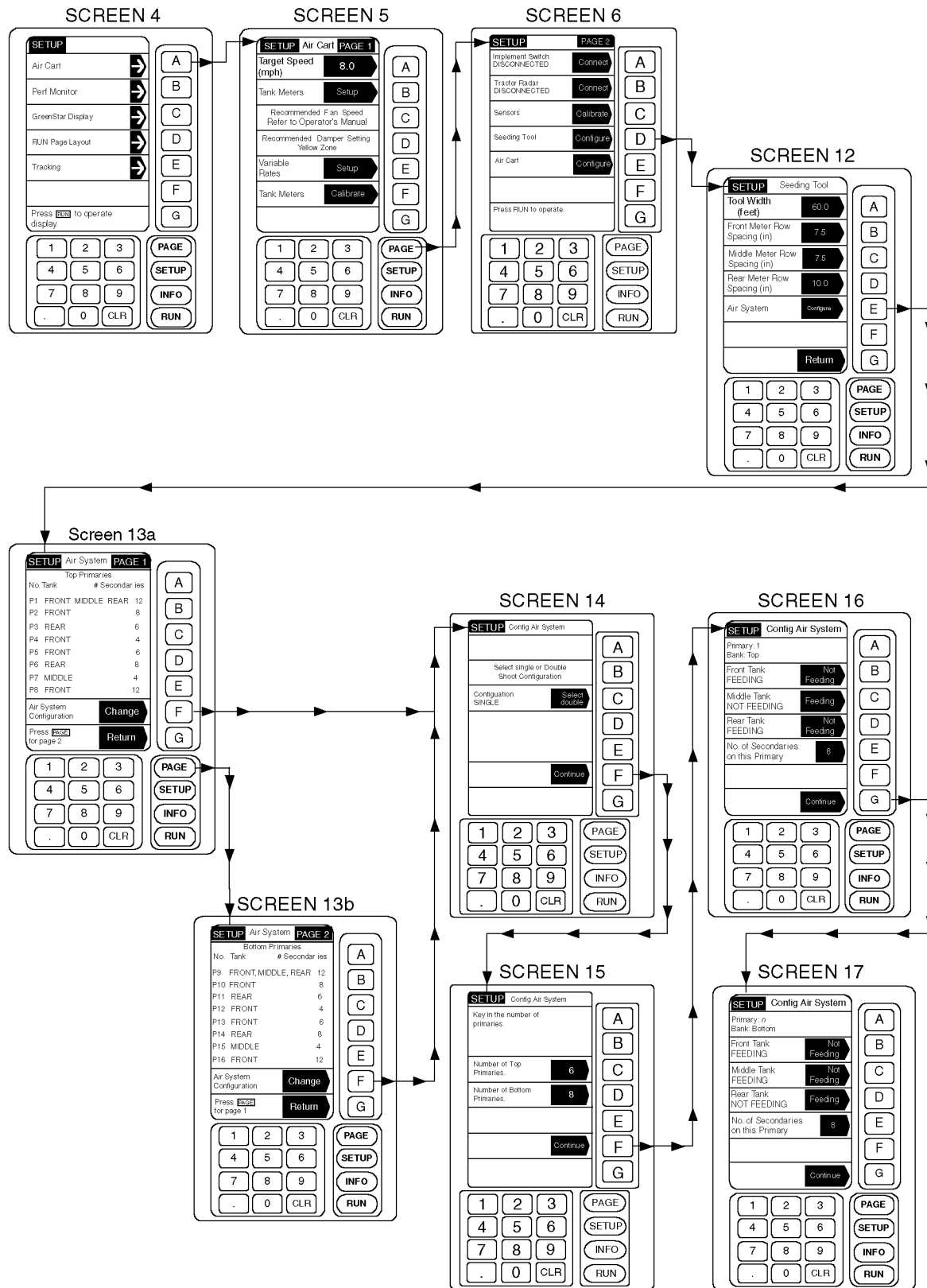
340 bu Cart, use 270

250 bu Cart, use 195

12. Select the Cart Model. Press keys B, C, or D for 195, 270 or 350 sizes, respectively.
13. Press key F to continue. The summary page will again be displayed.
14. Review the settings, if an error is found, return to Step 4. Otherwise, press key G to Return to Page 2 of the Air Cart Setup section.

AG,OUO6023,1098 -19-21JUL00-3/3

Air Cart Set-Up Mode—Configure Seeding Tool and Air System



Continued on next page

AG,OUO6023,1099 -19-21JUL00-1/3

1. From any screen press SETUP.
2. From the list given, choose Air Cart.
3. Once on the Air Cart page, press PAGE to advance to PAGE 2. Select Seeding Tool key D.
4. Press key A to select tool width; then enter the machine width (30, 42, 61, etc.). Press key A again to accept.

NOTE: On most machines, the row spacing for each tank meter will be the same.

5. Press key B, C or if the cart is equipped with a Middle Tank, press key D to change the Row Spacing. Enter the value (6, 7.5, 10, 12 or 15). Press the same key again to accept the value. Repeat step until each tank meter has a row spacing.
6. Press key E to configure the Air System.

A summary screen that details the configuration of each Primary (P1, P2, etc.) is presented. This includes: Bank (Top primaries on Page 1; Bottom primaries on Page 2), Feeding Tank (FRONT, REAR, THIRD) and Number of Secondaries (7 to 12).
7. Press key F to change the Air System configuration.

NOTE: The option in the shaded arrow is what becomes selected if this button is pushed. The unshaded area is the current selection.

8. Select the shoot system. Press key C to toggle between Single or Double.
9. Press key F to continue.

NOTE: An advisory message will display if more than eight primaries are entered.

10. Press key C to change the number of top primaries. Enter a number (1 thru 8). Press key C again to accept. If double-shoot, press key D to change the number of bottom primaries.
11. Press key F to continue.

IMPORTANT: For most configurations, Single-Shoot carts will have all tanks feeding all primaries.

NOTE: An information message will appear if two tanks with different row spacings are associated with the same primary line.

12. Starting with Primary 1, press key B, C, or if the cart is equipped with a Middle Tank, press key D to select which tank, or tanks, are feeding (putting product) in this particular primary.

NOTE: On a double-shoot system, the same tank cannot feed both a top and bottom primary. A warning will be issued by the system if attempted.

13. Find the appropriate Meter Cartridge/Seeding Tool Diagram in the operator's manual (Product Metering System section). Note that these diagrams show the number of secondaries fed by each primary and they also show the number of fine tuning rings that should be installed on each primary meter roller to ensure the correct rate of application for that primary.
14. Press key E to change the number of secondaries associated with this primary. Enter a number (7 to 12). Press key E to accept.
15. Press key G to continue.
16. Repeat Steps 12 thru 15 for each primary (maximum of 16).

17. When all primaries have been configured, the summary screen will again be presented. (The Top primaries are shown on Page 1. Press the PAGE key to view the Bottom primaries on Page 2.) Double check that the tank, or tanks, that will be feeding each primary are listed under the Tank Heading. Also, check that the correct number of secondaries are entered for each primary. If an

error is discovered, start over at Step 7 of this section to correct.

When all entries are made, the summary screen will be displayed. After verifying that all information is correct, press "Return" twice to end seeding tool configuration set-up.

AG,OUO6023,1099 -19-21JUL00-3/3

Custom Set-Up For Non-Standard Seeding Tools (Configure Seeding Tool and Air Cart)

IMPORTANT: For best results, always enter factual data as collected from the seeding tool and cart.

After all entries are made, a meter calibration should be performed to ensure that product delivery meets desired results.

Except for operator entered data, monitor configuration for non-standard seeding tools is no different than configuring monitor for standard applications.

As an example, when row spacing is something other than one that is commonly used for air seeding 15, 19, 25, 30.5, 38 cm (6.0, 7.5, 10, 12, 15 in.), enter the actual non-standard row spacing when called for.

Row spacings from 0.1 to 99.9 can be entered.

When a row spacing is entered, standard or non-standard, the system recommends one of the four row spacing sprockets available. This recommendation is based on the entered row spacing and the largest row spacing on the cart, and appears in Air Cart Set-Up screens. The recommended sprocket is the

one the system most closely associates with the entered data, and may or may not agree with the actual sprocket on the cart. The system compares the row spacing of the cart to the row spacing entry, starting with the smallest value. If the cart's row spacing is less than or equal to the row spacing entry, the corresponding sprocket is recommended.

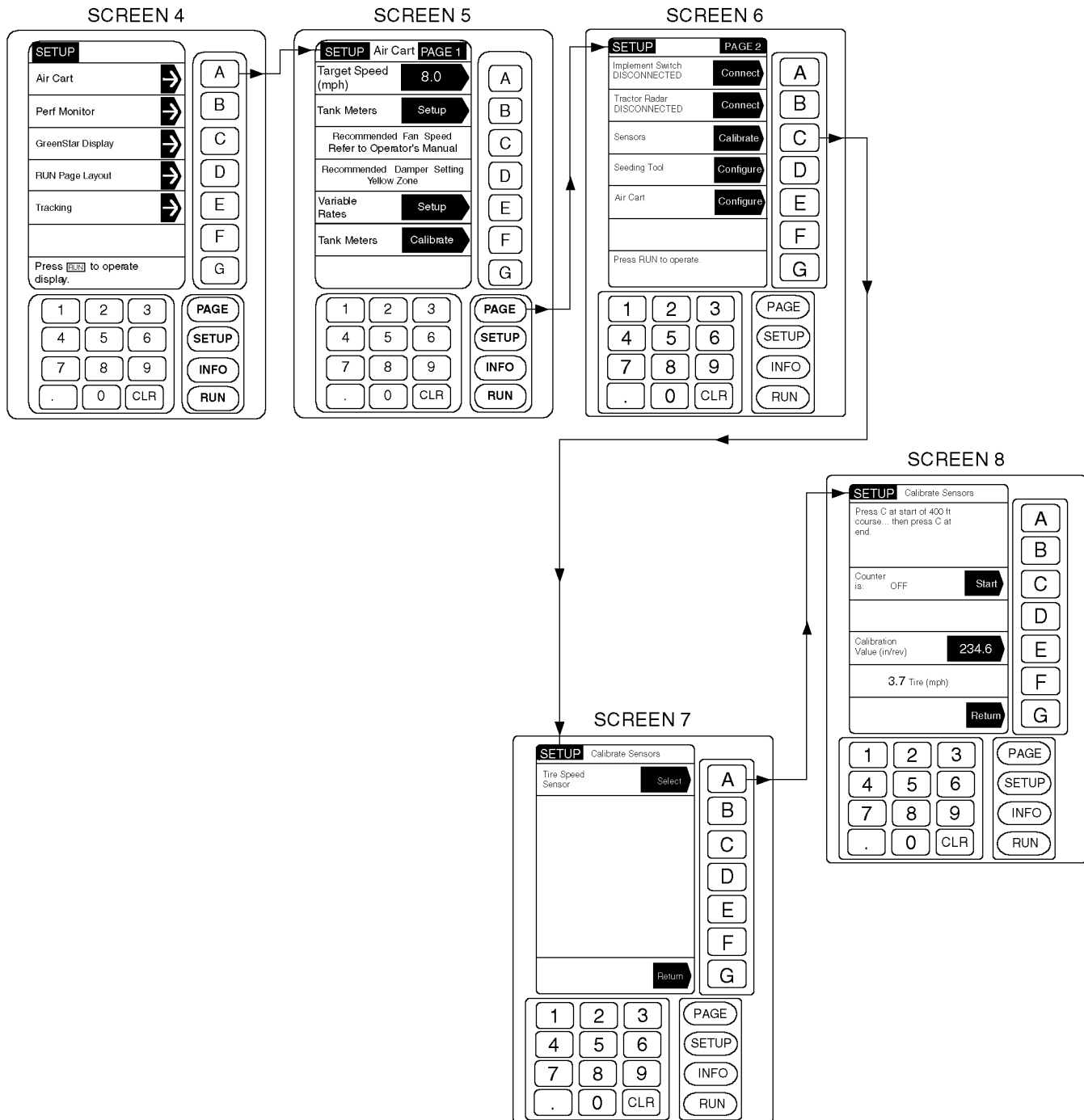
When configuring monitor for non-standard application:

1. Follow set-up instructions, entering non-standard, factual data as needed.
2. Perform a meter calibration as usual to obtain system generated recommendations, based on custom, non-standard entries.
3. Manual Transmission: Adjust transmission to agree with recommendation.

Variable Rate: System will automatically adjust transmission setting when seeding starts. Variable rate controller compares the target rate (from prescription menu) with the calculated rate and adjusts the transmission accordingly.

AG,OUO6023,1100 -19-21JUL00-1/1

Air Cart Set-Up Mode—Calibrate Sensors



Continued on next page

AG,OUO6023,1101 -19-21JUL00-1/3

Speed Calibration default value is factory set at 0.0, resulting in 0.0 speed readout. An initial calibration value (in-per-rev) can be manually entered during set-up to override default and provide speed readout. See Tire Size/Travel Distance/Sprocket Teeth chart and use travel distance of the tires in use as initial calibration setting until final calibration procedure can be performed.

IMPORTANT: Tire sensor calibration procedure is similar to procedure used to calibrate the tractor's radar sensor except that it is done at approximate seeding speed, not slower radar calibration speed (approximately 3 km/h [2 mph]).

For best results and most accurate setting, final calibration of tire speed sensor should be done in the field (in the type of soil to be seeded) with tanks half full, cart tires inflated to proper pressure and traveling at seeding speed.

Tire Size/Travel Distance/Sprocket Teeth		
Tire Size	Travel Distance mm (in.) per Rev. ^a	Tooth Count
18.4-26 R3, 10PR	4191 (165)	57T
18.4-26 R2, 10PR	4394 (173)	62T
23.1-26 R3, 10PR	4521 (178)	62T
28L-26 R3, 12PR	4775 (188)	62T
23.1-26 R2, 10PR	5029 (198)	68T
28L-26 R2, 12PR	5080 (200)	68T
30.5L-32 R3, 12PR	5359 (211)	72T
30.5L-32 R2, 12PR	5664 (223)	80T
710/70R38 R1W, 2 Star	5893 (232)	80T
20.8R-38 R1, 1 Star	5639 (222)	80T
18.4R-46 R1, 3 Star	6020 (237)	80T
20.8R-42 R1, 2 Star	5867 (231)	80T
^a Tire travel per revolution is estimated.		

NOTE: Travel distance is approximate. For accuracy, calibrate by driving through 122 m (400 ft) course.

1. From any screen press SETUP.
2. From the list given, choose Air Cart.
3. Once on the Air Cart page, press PAGE to advance to PAGE 2. Select Sensors key C.
4. Press key A to select the Tire Speed Sensor.

This screen allows a known calibration value (travel distance in inches per tire revolution) to be entered. This value can be found in the Tire Size/Travel Distance/Sprocket Teeth chart.

5. Press key E. Then enter the number (150 to 250). Press key E again to accept.
6. To ensure accuracy, the Tire Speed Sensor should be calibrated by driving the tractor and cart over a 122 m (400 ft) course. Measure out the course in the field, bring the cart up to the desired planting speed, and when crossing the start point of the course, press key C to start the calibration. Press key C again when crossing the end point of the course to stop the calibration. The tire speed is shown throughout the calibration.
7. Press key G twice to return to Page 2 of the Air Cart Set-Up.

NOTE: The option in the shaded arrow is what becomes selected if this button is pushed. The unshaded area is the current selection.

8. Press key A to toggle between CONNECTED and DISCONNECTED for Implement Switch.

IMPORTANT: Tractor Radar is not necessary to operate the 1900 Commodity Cart. Radar speed is used to determine cart tire slippage and/or seed populations if equipped with optional seed counting. If connected, see **SET-UP MODE—CALIBRATE TRACTOR RADAR SENSOR** in this section for calibration.

9. Press key B to toggle between CONNECTED and DISCONNECTED for Tractor Radar. Cancel Run Page Layout warning message at this time. A Run Page Layout will need to be performed after all setup is completed.

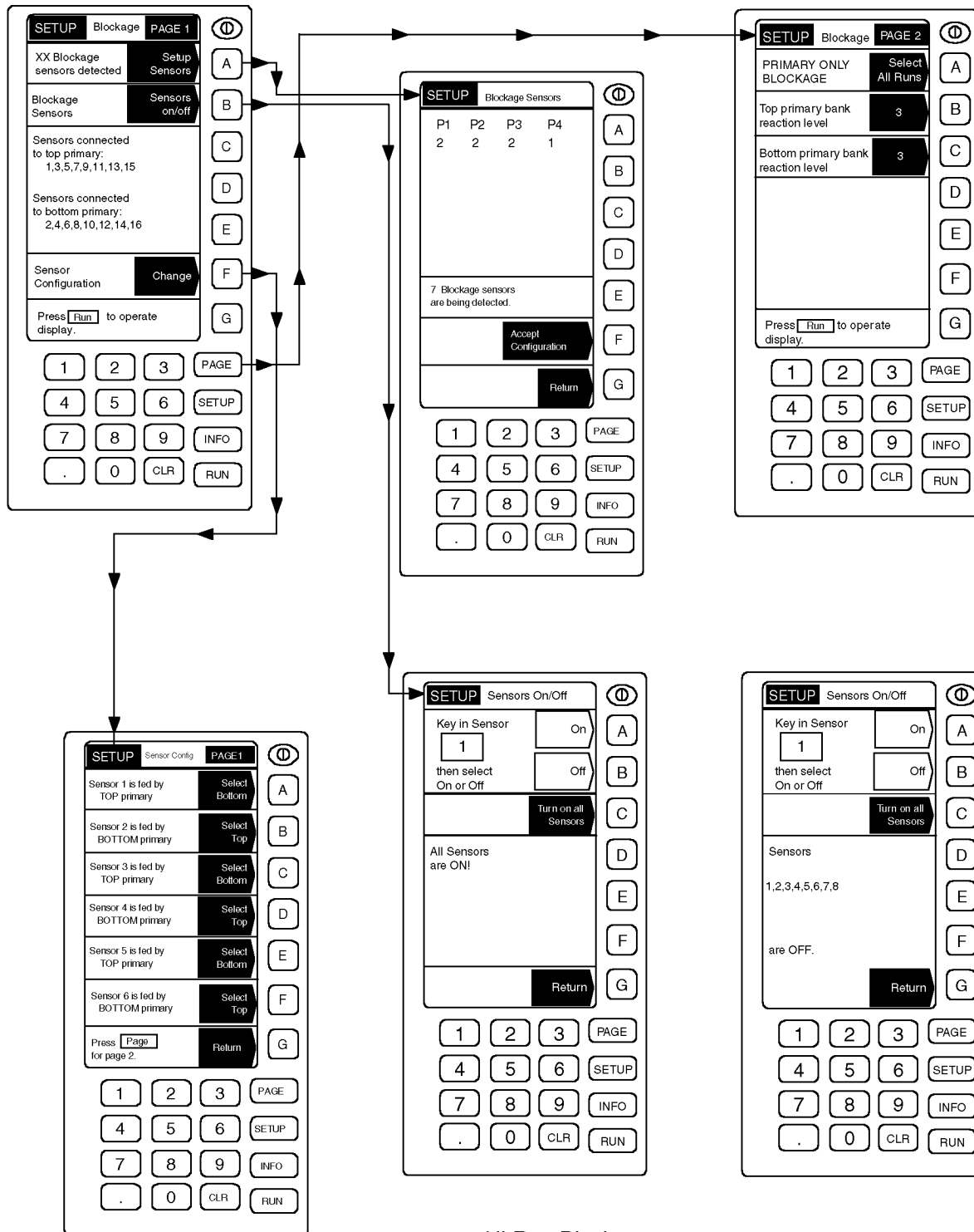
AG,OUO6023,1101 –19–21JUL00–3/3

Air Seeder Monitor Set-Up—Optional Equipment

If equipped with optional Air Cart Blockage or Seed Counting equipment, monitor set-up should be performed for these options prior to setting Target Seeding Speed.

AG,OUO6023,1102 –19–21JUL00–1/1

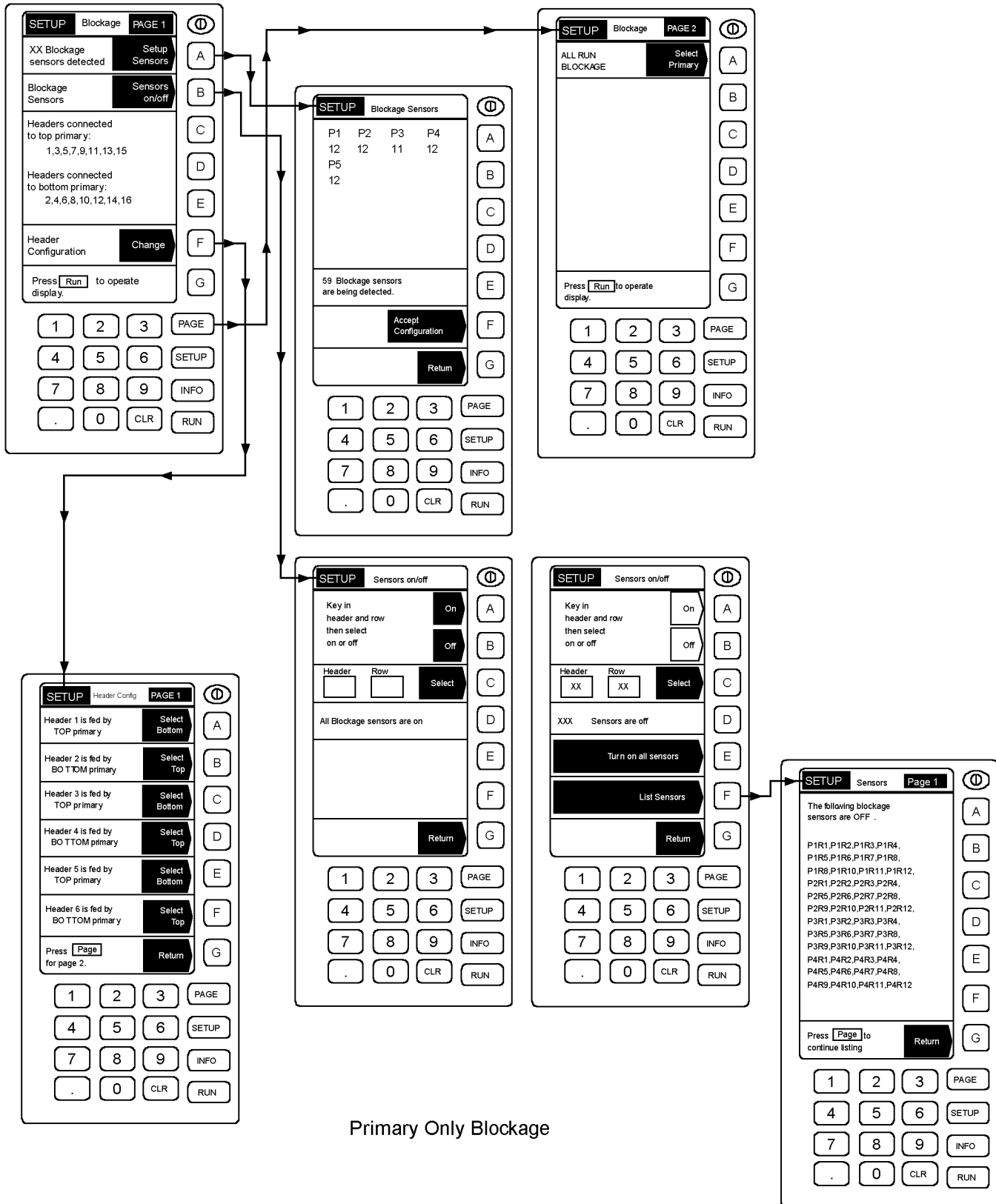
Set-Up Mode—Air Cart Blockage



All-Run Blockage

Continued on next page

AG,OUO6023,1103 -19-21JUL00-1/3



Continued on next page

AG,OUO6023,1103 -19-21JUL00-2/3

NOTE: Primary Only blockage system makes reference to sensors while ALL RUN system references headers.

IMPORTANT: During monitor set-up, machines must be stationary (not seeding) with the fan off.

1. Be sure tractor is NOT MOVING and the fan on the 1900 cart is NOT RUNNING.
2. From any page press SETUP.
3. Select Air Cart Blockage.
4. Select key A to Setup Sensors.

IMPORTANT: The number of sensors detected should equal the number of sensors on the tool. If one processor displays less sensors than is on the machine, check the next numbered sensor after the number displayed. **EXAMPLE:** If P1 displays "6" and there are 11 sensors on this processor, check the pins in the #7 connection on the slave box.

5. Press key F to accept the configuration after all sensors are detected.
6. Press PAGE to go to PAGE 2.
7. If the system detects 16 sensors or less, select key A to toggle between ALL RUN BLOCKAGE and PRIMARY ONLY BLOCKAGE.
8. Press PAGE to return to PAGE 1.

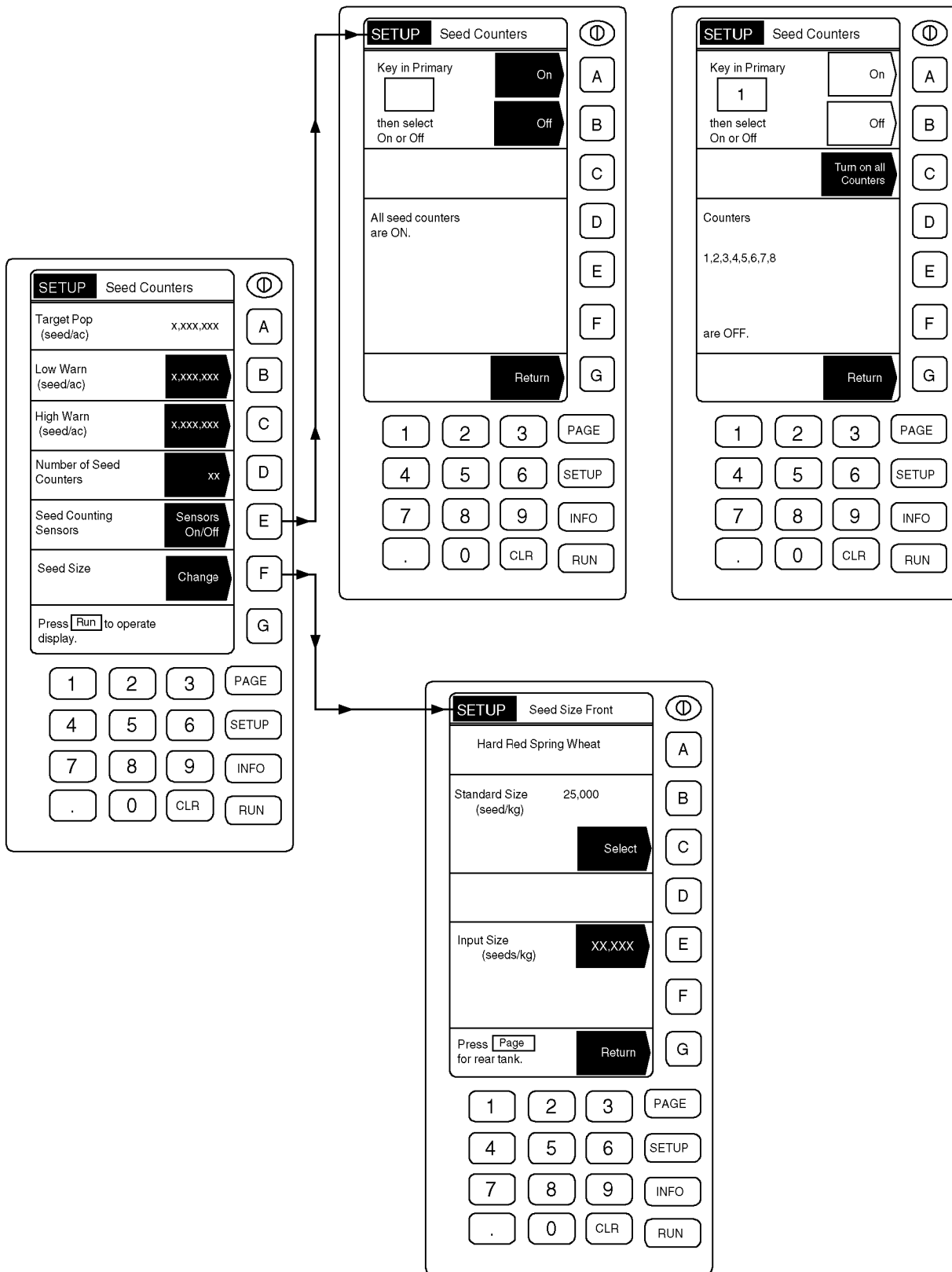
NOTE: The option in the shaded arrow is what becomes selected if this button is pushed. The unshaded area is the current selection.

9. Press key F to define the configuration. This section will refer to Sensor configuration for Primary Only

blockage and Header configuration for All Run blockage.

10. Press the button next to each Header (or Sensor for Primary Only blockage) to toggle between the top and bottom bank of primaries. Make sure each Header (or Sensor) is correctly defined as being fed by the top or bottom bank of primaries. If single-shooting, all Headers (or Sensors) should be fed by the top bank of primaries. If double-shooting, typically the odd numbered Headers (or Sensors) will be fed by the top primaries and the even numbered Headers (or Sensors) will be fed by the bottom primaries.
11. Press key G to return.
12. Press key B to turn sensors ON or OFF. If all sensors are to be used, the message "All blockage sensors are ON" should be displayed. If some sensors are to be turned Off, select the Header (light box under "Header"); then enter the header number and press key C to select row. After the light box is under "Row", enter the desired row number on the keyboard and press key B to turn this row off.
13. Press key G to return.
14. Press PAGE to go to Page 2.
15. Select key B to enter the Reaction Level for sensors connected to the Top Bank of Primaries. Enter the desired Reaction Level. Valid entries range from 1 to 5 with 1 providing the quickest warning response times and 5 providing longer response times. Press key B again to accept the value.
16. Repeat Step 15 for the Bottom Bank of Primaries by pressing key C instead of key B.
17. Press SETUP to return to the setup page.

Set-Up Mode—Seed Counter



Continued on next page

AG,OUO6023,1104 -19-21JUL00-1/2

NOTE: Seed counter system uses product information settings previously entered in standard system Tank Meter Set-up. Advisory messages will display when keyed entries are not acceptable.

Target population is displayed from standard Tank Meter Set-up or as defined by prescription selection from Variable Rate menu. No target population is displayed until cart begins seeding.

Certain air seeded products, such as wheat, will display target population in pounds-per-hectare (acre).

Other products, such as beans and peas, are converted from pounds-per-hectare (acre) to seeds-per-hectare (acre) for target population.

No population is displayed when fertilizer is selected, or when two products are combined (single-shooting) in top primaries.

See SEED COUNTER READOUTS in Seed Counting System section for listing of products that displays seeds-per-area and those that displays mass-per-area.

IMPORTANT: During monitor set-up, machines must be stationary (not seeding) with the fan off.

1. Be sure tractor is NOT MOVING and the fan on the 1900 cart is NOT RUNNING.
2. From any page press SETUP.
3. Select Seed Counter.
4. Press key D, enter the number of seed counters and press key D again to accept.
5. Press key E to turn sensors On/Off.
6. If the message "All seed counters are ON" is displayed, go to Step 7. Turn Seed Counters On or Off by entering the number of the counter and then pressing keys A or B to turn the Seed Counter On or Off respectively.
7. Press key G to return.

8. Press key F to change seed size.

9. To select Standard Size Seed press key C. If seed size is other than standard size, input seed size by pressing key E, enter seeds per pound and press key E again to accept the value.

10. Press PAGE to repeat for other tanks.

NOTE: Target population is the mid-point between high and low settings. Target population is automatically entered by the wedge box. Values entered should be in lb/hectare (acre) or seeds/hectare (acre), depending on the product being applied.

11. Press key G to return. Target value will be displayed when actual seeding begins.

The High and Low Warning Limits default to 20% above and 20% below the target value. These settings can both be adjusted closer to the target population (or rate) to tighten the warning band and more closely monitor seed count. Tightening the warning band may produce an unacceptable number of rate deviation messages. Widening the warning band will reduce the number of nuisance warnings.

A target population greater than zero must be displayed on the SETUP page before a different lower limit can be entered in. To generate a target population, the machine must be moving, the meters must be turning, and the fan must be running. While the target rate is being generated, the lower limit can be set to any value lower than what is being displayed. A different upper limit can be entered at any time in the SETUP menu. The limit must be higher than the target population.

Once manually entered, the limits are set and will remain stored for a particular type of seed unless manually changed again. If the seed type is changed in the Cart Controller Setup, the entire process must be repeated for the new seed type. Limits already entered for a particular seed type are stored in regard to that seed type.

Air Cart Monitor Set-Up Checklist

All of the following items should have been entered during set-up mode procedures. The monitor and control system will not operate properly if an item was omitted or missed.

Initial Setup:

- ☐ Adjust display contrast and backlight.
- ☐ Refresh RUN pages using RUN Page Layout.
- ☐ Configure Air Cart.
 - ☐ Enter zero for air sensors.
 - ☐ Enter tire sprocket tooth count.
 - ☐ Enter row spacing sprocket tooth count.
 - ☐ Enable Variable Rate (if equipped).
 - ☐ Enter cart size, i.e., 195, 270, or 350.
- ☐ Configure Seeding Tool.
 - ☐ Enter seeding tool width.
 - ☐ Enter row spacing for EACH tank.
- ☐ Configure Air System.
 - ☐ Select Single- or Double-Shoot air system.
 - ☐ Enter number of active primary lines, both top and bottom runs.
 - ☐ For each Primary:
 - ☐ Select "FEEDING" for each tank that will supply product to this primary.
 - ☐ Enter the number of secondary ports on the secondary manifold fed by this primary.
- ☐ Calibrate Sensors.
- ☐ Manually enter initial calibration value (mm/in. per rev.) for rear tires in use.

- ☐ Perform final in-field calibration procedure.
- ☐ Connect Tractor Radar (if equipped).
- ☐ Connect Implement Switch (if equipped).
- ☐ Refresh RUN pages using RUN Page Layout.

Options Setup:

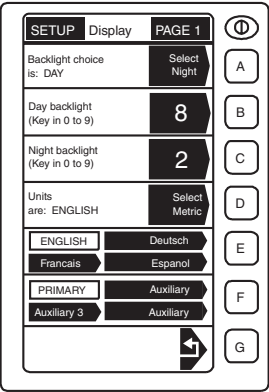
- ☐ Blockage System.
 - ☐ Setup Sensors; i.e., allow system to detect all sensors.
 - ☐ If Primary-Only system, select PRIMARY ONLY BLOCKAGE on PAGE 2.
 - ☐ Check that all sensors being used are turned "ON".
 - ☐ Header/Sensor configuration.
 - ☐ For Primary-Only blockage, verify that each Sensor is fed by the appropriate bank of primaries.
 - ☐ For All-Run blockage, verify that each Header is fed by the appropriate bank of primaries.
- ☐ Set Reaction Level on PAGE 2.
- ☐ Seed Counting System.
 - ☐ Enter number of sensors.
 - ☐ Check that all sensors being used are turned "ON".
 - ☐ Enter Seed Size for EACH tank.
 - ☐ Enter High Population Warning if value other than default value is desired.
 - ☐ Enter Low Population Warning if value other than default value is desired.

AG,OUO6023,1105 -19-21JUL00-1/1

Operating Machine—Monitor Operation

Monitor Operation Flow Charts

The following flow charts will help the user to understand the operation processes of the monitor system. Each phase of the process flow chart includes up to five parts; Section Title, Instruction Location, Brief Description, Working Screen, and Buttons to be Selected.

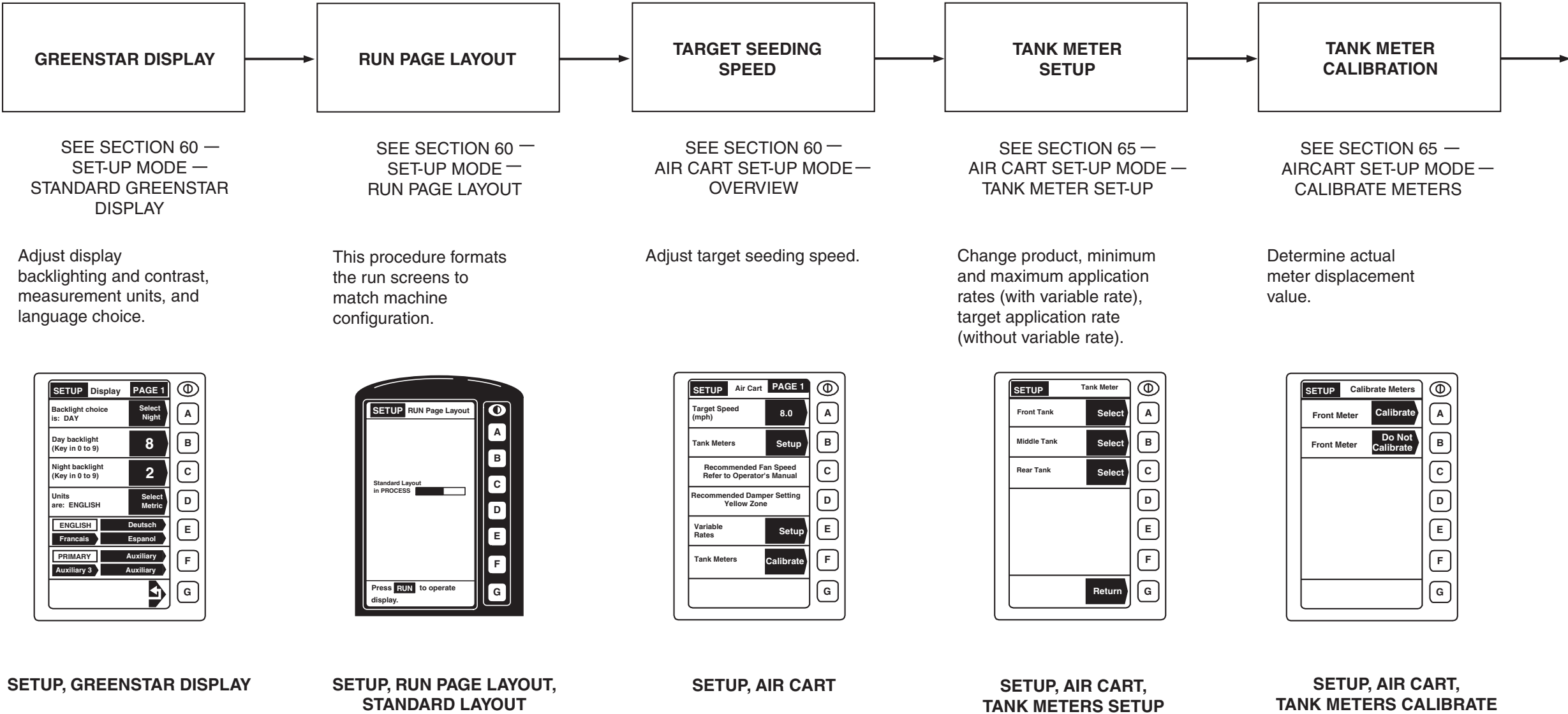
SECTION TITLE	=	GREENSTAR DISPLAY
INSTRUCTION LOCATION	=	SEE SECTION 60 — SET-UP MODE — STANDARD GREENSTAR DISPLAY
BRIEF DESCRIPTION	=	Adjust display backlighting and contrast, measurement units, and language choice.
WORKING SCREEN	=	
BUTTONS TO BE SELECTED	=	SETUP, GREENSTAR DISPLAY

A43732DS –19–21FEB01

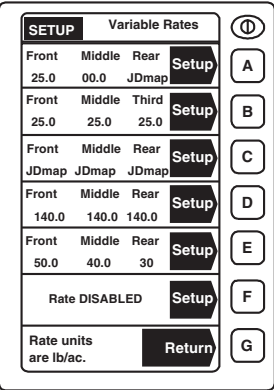
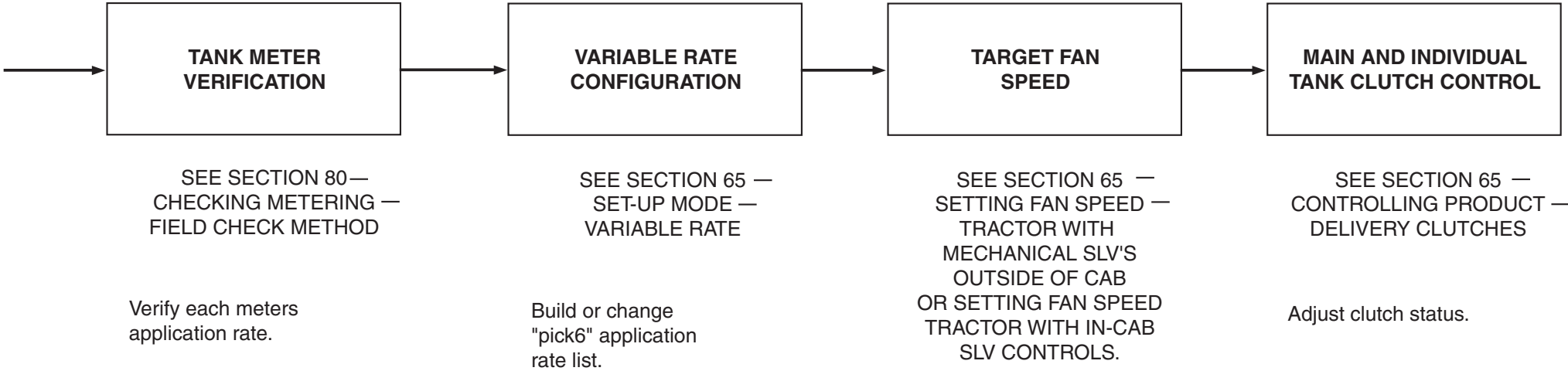
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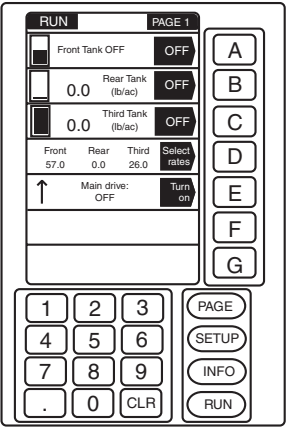
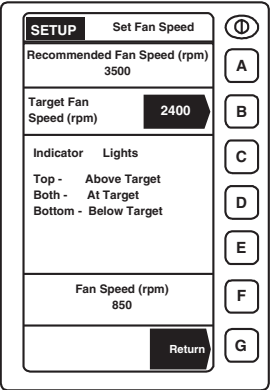
AIR SEEDER MONITOR OPERATION FLOWCHART



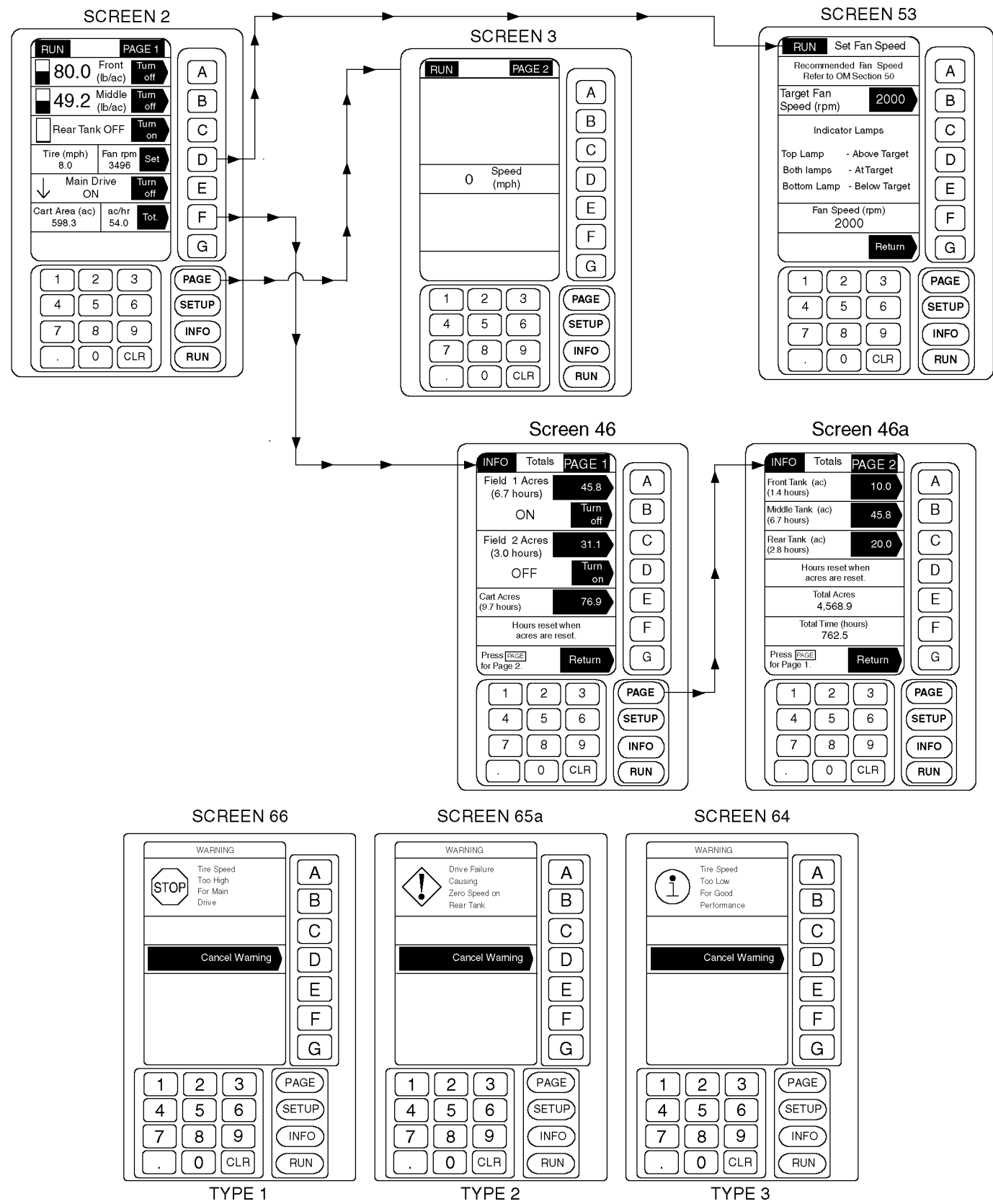
AIR SEEDER MONITOR OPERATION FLOWCHART - CONT.



SETUP, AIR CART
VARIABLE RATES



Air Cart Run Mode



IMPORTANT: Full screen STOP WARNINGS require immediate attention and corrective action or machine damage will occur. To get the operator's attention, an audio alarm sounds when a WARNING is displayed.

RUN mode informs the operator of cart activities during operations. Depress PAGE key to toggle from page one to page two while operating.

Product level bar graphs are displayed regardless of tank ON/OFF selection. Because there are only three in-tank product level sensors, display changes between the sensors are not actual sensed levels, but a calculated display showing how much product should have been used at current application rate.

Mid-level and almost empty displays are actual sensed level readings from the middle and bottom in-tank sensors. When these switches open, product level will drop quickly from calculated display level to actual in-tank level. When bottom switch opens, bar graph will disappear and caution message "Tank Almost Empty" will appear on bottom of page one. See AIR CART INFO (INFORMATION) MODE (WITHOUT OPTIONS) in this section for tank level display adjustment information.

Application rate (lb/ac) is shown when tank is turned ON, otherwise OFF is displayed.

Display console keys are used to engage product delivery clutches and to set fan speed indicator. Refer to CONTROLLING PRODUCT DELIVERY CLUTCHES

and SETTING FAN SPEED in this section for detailed information.

Display console key F is used for instant access to Air Cart Info Totals screens. See AIR CART INFO (INFORMATION) MODE (WITHOUT OPTIONS) in this section for specific information

System is capable of generating four different types of messages to inform the user of changes in operating conditions.

IMPORTANT: Audio alarm will sound when a full page WARNING is displayed.

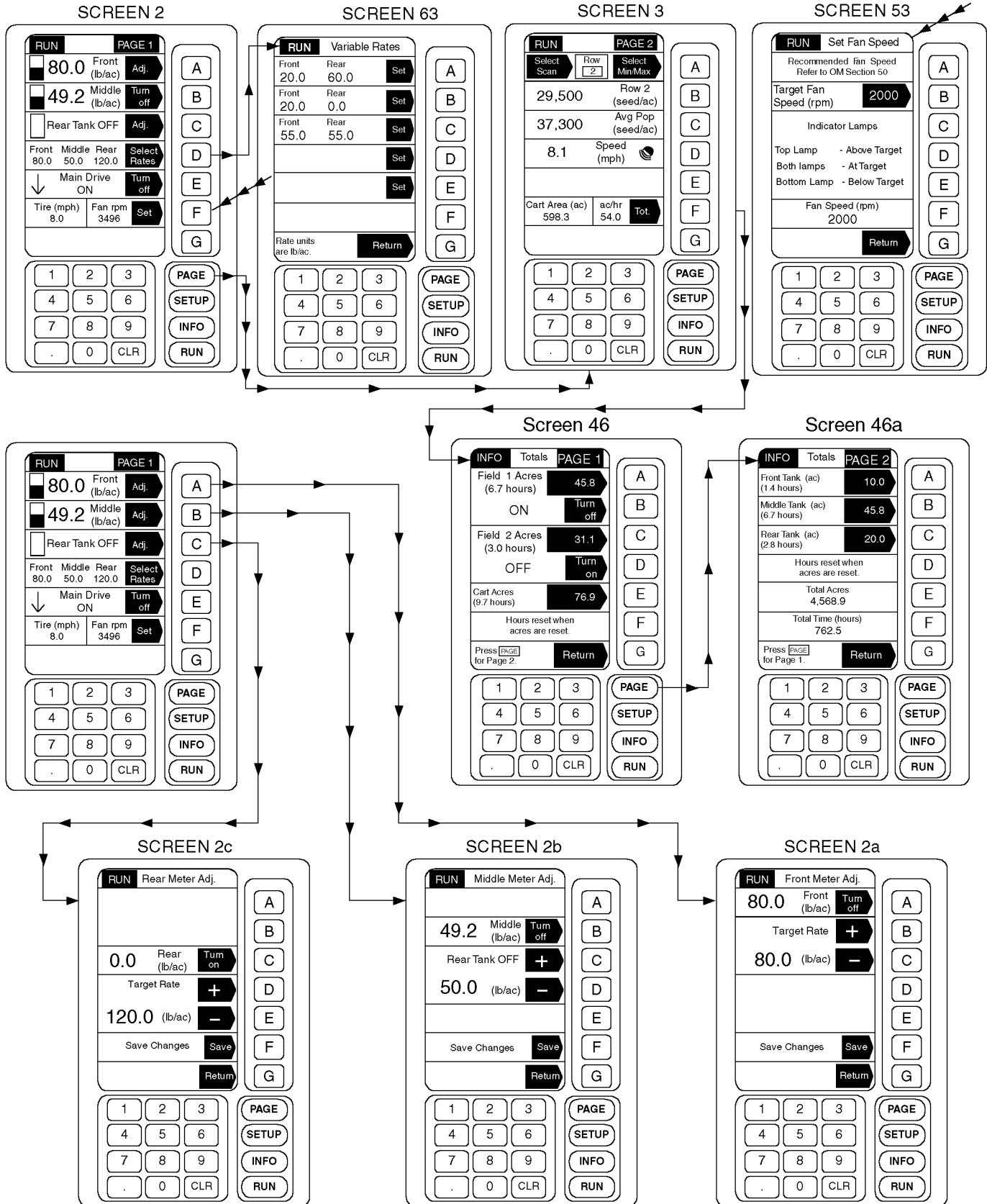
- TYPE 1—STOP WARNINGS are full screen displays telling the operator to stop seeding and take immediate corrective action.
- TYPE 2—WARNING messages are full screen displays telling the operator of sensed equipment failures or other problems.
- TYPE 3—INFORMATION WARNING messages are full screen displays telling the operator of changing machine or performance conditions.

If warning message is cancelled, audio alarm will sound again and a similar caution message will display at the bottom of RUN Page 1.

- TYPE 4—INFORMATIVE (CAUTION) messages show at the bottom of RUN Page 1, and are advisory in nature. For further information, see INFORMATIVE (CAUTION) MESSAGES AND REACTIONS for both Standard and Optional systems.

AG,OUO6023,1107 -19-21JUL00-2/2

Air Cart Run Mode With Options



Continued on next page

AG,OUO6023,1108 -19-21JUL00-1/4

IMPORTANT: Full screen STOP WARNINGS require immediate attention and corrective action or machine damage will occur. To get the operator's attention, an audio alarm sounds when a WARNING is displayed.

RUN mode informs the operator of cart activities during operations. Depress PAGE key to toggle from page one to page two while operating.

Product level bar graphs are displayed regardless of tank ON/OFF selection. Because there are only three in-tank product level sensors, display changes between the sensors are not actual sensed levels but a calculated display showing how much product should have been used at current application rate.

Mid-level and almost empty displays are actual sensed level readings from the middle and bottom in-tank sensors. When these switches open, product level will drop quickly from calculated display level to actual in-tank level. When bottom switch opens, bar graph will disappear and caution message "Tank Almost Empty" will appear on bottom of page one. See AIR CART INFO (INFORMATION) MODE (WITHOUT OPTIONS) in this section for tank level display adjustment information.

Application rate (lb/ac) is shown when tank is turned ON, otherwise "XXXX TANK OFF" is displayed.

When equipped with variable rate option, display console keys can be used to engage delivery clutches or to adjust application rates.

If adjust feature is enabled, pressing adjustment key for each tank will display the adjustment screen.

Target rate can be adjusted by pressing key D (+) or key E (-). Adjustment can be made permanent by pressing key F to save changes.

When equipped with variable rate option, display will show set rates for front, rear and middle tank meters. Rate screen area will not display if not equipped with variable rate. Console key is used to select a different combination of application rates from operator entered menu.

Selecting a different rate combination from the RUN Rates menu changes the setting(s) of the meter speed transmissions.

When only one rate combination is defined, it will display on the RUN page.

When two rate combinations are defined, one will show on display with RATE B in selection area. Depress RATE B to toggle between different rate combinations.

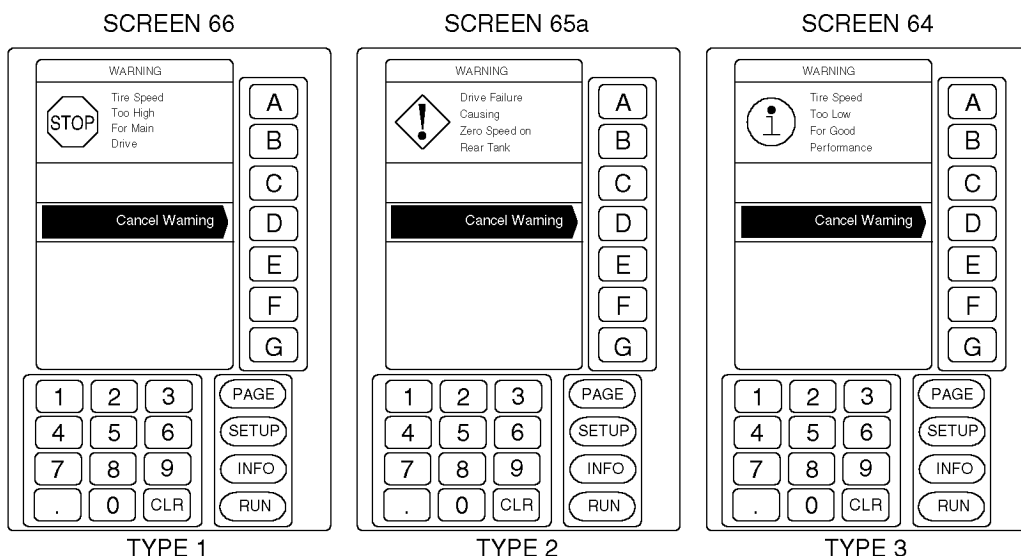
Chosen combination and Select Rates will display when more than two rate combinations are defined.

Display console keys are used to engage product delivery clutches and to set fan speed indicator. Refer to CONTROLLING PRODUCT DELIVERY CLUTCHES and SETTING FAN SPEED in this section for detailed information.

Display console key F is used for instant access to Air Cart Info Totals screens. See AIR CART INFO (INFORMATION) MODE (WITHOUT OPTIONS) in this section for specific information

Continued on next page

AG,OUO6023,1108 -19-21JUL00-2/4



System is capable of generating four different types of messages to inform the user of changes in operating conditions.

IMPORTANT: Audio alarm will sound when a full page WARNING is displayed.

- TYPE 1—STOP WARNINGS are full screen displays telling the operator to stop seeding and take immediate corrective action.
- TYPE 2—WARNING messages are full screen displays telling the operator of sensed equipment failures or other problems.
- TYPE 3—INFORMATION WARNING messages are full screen displays telling the operator of changing machine or performance conditions.

If warning message is cancelled, audio alarm will sound again and a similar caution message will display at the bottom of RUN Page 1.

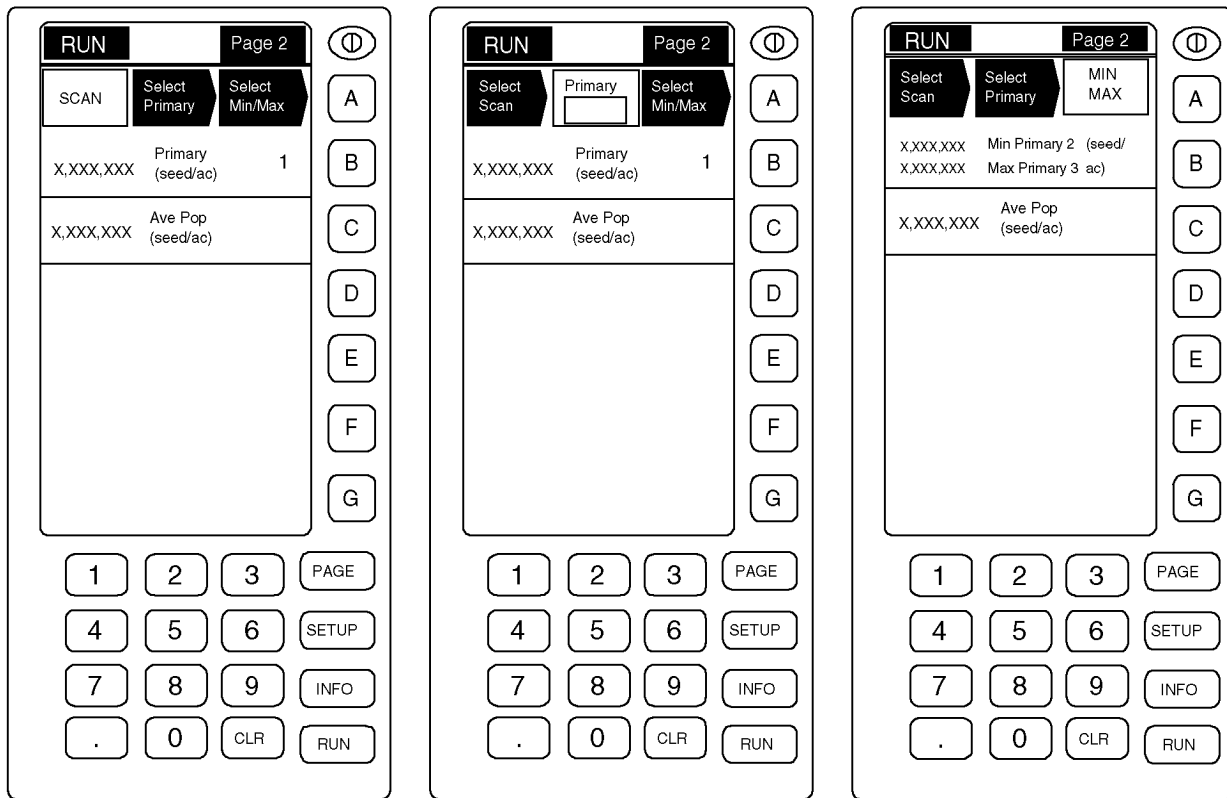
- TYPE 4—INFORMATIVE (CAUTION) messages show at the bottom of RUN Page 1, and are advisory in nature. For further information, see INFORMATIVE (CAUTION) MESSAGES AND REACTIONS for both Standard and Optional systems.

If cart is equipped with optional devices, RUN display will show activity for middle tank and seed counting system. These screen areas will not display if optional devices are not connected.

Continued on next page

AG,OUO6023,1108 -19-21JUL00-3/4

A46236 -19-02JUN00



A41911 -19-22AUG97

• RUN MODE—SEED COUNTER

Seed count display is shown in one of three ways, as selected by the operator:

SCAN: Displays population of each active primary, moving from primary-to-primary in five second intervals.

PRIMARY: Displays population of only certain primaries as selected by the operator.

MIN/MAX: Displays primaries with minimum (lowest) and maximum (highest) populations.

Average population displays the count average for only the active sensors. Only sensors that are ON are included in the calculation.

Seed count will display rate in seeds-per-area as seen by the sensors or in mass-per-area as calculated by

the counter controller based on seeds counted. No population is displayed for fertilizer.

See SEED COUNTER READOUTS in Seed Counting System section for listing of products that display seeds-per-area and those that display mass-per-area.

• RUN MODE—BLOCKAGE MONITOR

Blockage monitor has no active display in RUN mode. The only indication you will receive that the system is working is when a full page Blockage WARNING is displayed, or if blockage related messages appear at the bottom of RUN Page 1.

Depress SET-UP or INFO key to view Implement List; if properly connected, Air Cart Blockage will display here.

Controlling Product Delivery Clutches

NOTE: Display console must be in *RUN* mode to operate clutches.

NOTE: An audible alarm sounds when main drive clutch is engaged or disengaged for more positive warning.

- Main Drive Clutch

Main drive clutch (A) is engaged and disengaged (ON/OFF) through the use of the following devices:

CONSOLE KEY: Depressing console key “E” turns the main drive clutch on and off.

- With optional implement switch (B):

OFF/ON position disengages/engages main drive clutch regardless of remote switch/seeding position. Clutch can be disengaged while seeding tool is still in the ground (indicator arrow down). All application rate displays change to 0.0 when main clutch disengages.

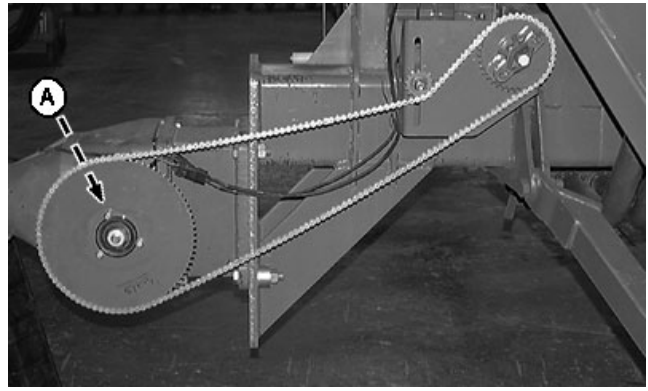
If the seeding is raised, arrow will be pointing up with Main Drive display showing “OFF” unless overridden by user.

When seeding tool openers are lowered, arrow points down, display changes to “ON”, and application rates return to active display unless overridden by user.

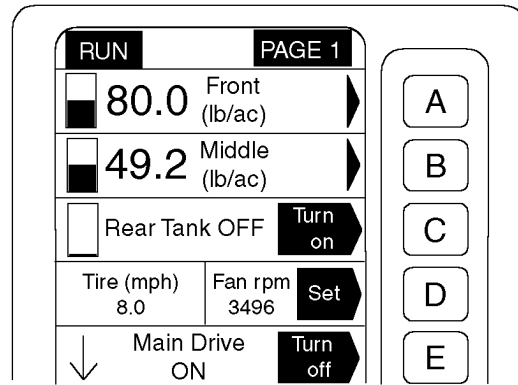
- Without implement switch:

OFF position disengages main drive clutch.

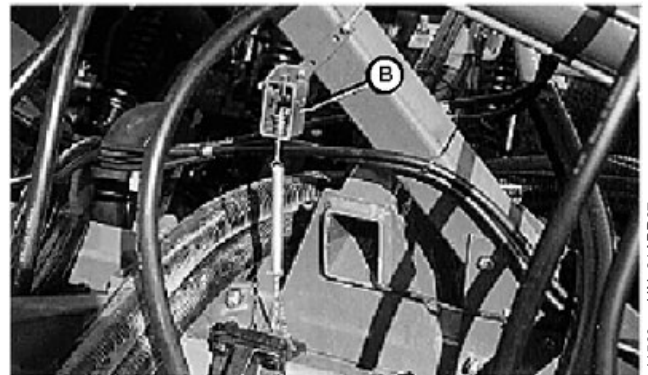
ON position engages main drive clutch.



A41558A —UN-28JUL98



A46073 —19-18APR00



A41560 —UN-21APR97

1850/1860 Shown

A—Main Drive Clutch
B—Optional Implement Switch

Continued on next page

AG,OUO6023,1109 —19-21JUL00-1/2

IMPORTANT: Main drive clutch must be disengaged when transporting cart.

• Independent Meter Clutches:

Each meter (front, rear and middle, if equipped) has it's own independent clutch (A).

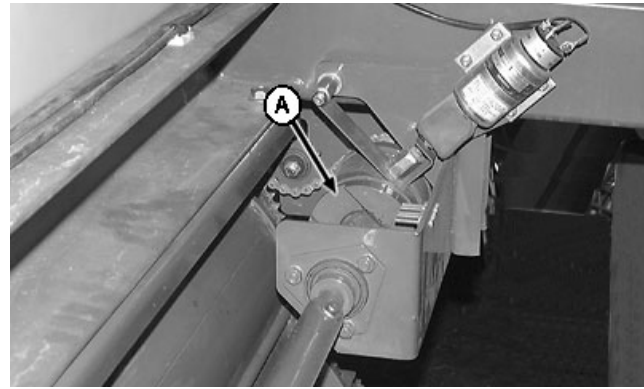
Depressing console keys A (Front), B (Middle) or C (Rear) turns clutch on and off.

OFF Position disengages clutch to stop product delivery from this meter. Display will show OFF.

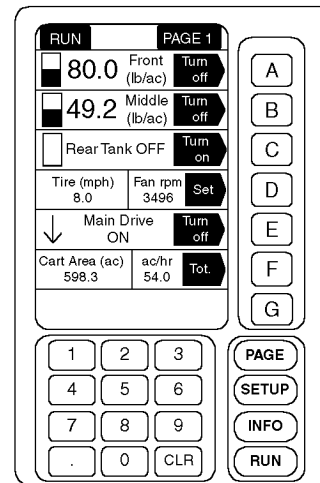
IMPORTANT: To avoid product overload of meter cartridge and shearing of drive system protection pin, engage clutch only when fan is running.

ON position engages clutch to start product delivery from this meter. Display will show application rate information when main and meter clutches are engaged and cart is in motion.

NOTE: In-tank product level is displayed regardless of clutch/meter state.



A41541B -UN-28JUL98



A46074 -19-18APR00

A—Independent Clutch

AG,OUO6023,1109 -19-21JUL00-2/2

Remote Tillage/Implement Switch (If Equipped)

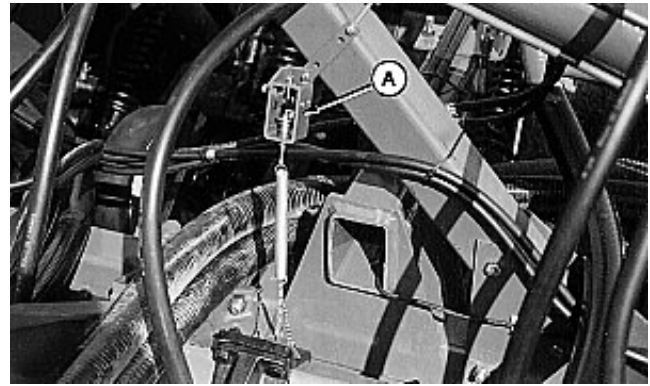
Remote switch (A) is attached to seeding tool near depth-control linkage. As openers or seeding tool is raised, depth-control linkage moves spring and plunger to open switch.

In the open position, switch disengages main drive clutch to stop product delivery. Main Drive display shows OFF, with arrow pointing up, and 0.0 for all application rates.

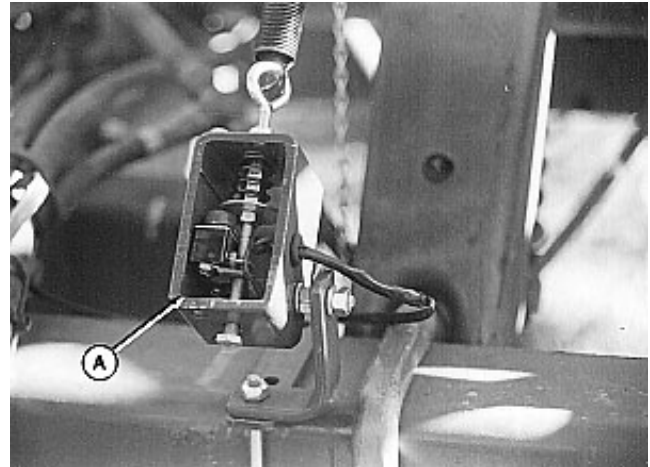
As seeding tool is lowered, switch closes, main clutch engages and product delivery resumes. Display console shows ON, and arrow pointing down, with application rates returning to active display.

Accumulate area is recorded from the switch's feedback signal and from the ground speed sensor signal.

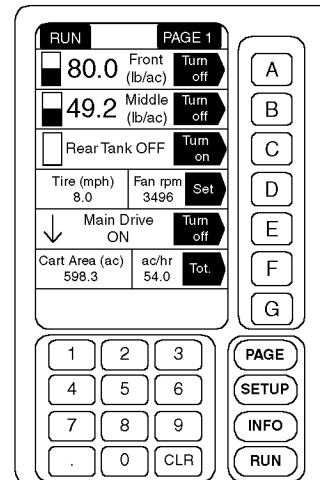
A—Remote Switch



1850/1860



700 Series and 1810 Seeding Tools

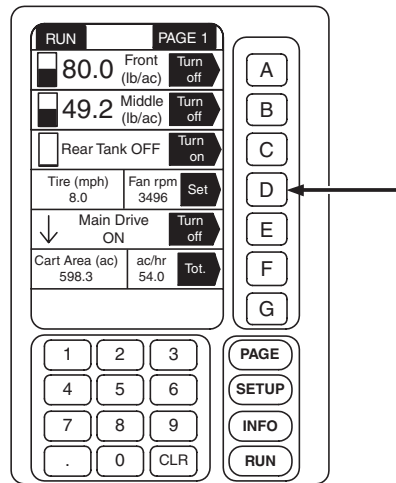


AG,OUO6023,1110 -19-21JUL00-1/1

Setting Fan Speed—Tractor With In-Cab SCV Controls



A41529 -UN-10APR97



A46074A -19-15MAY01

A—Display Console

IMPORTANT: Prior to setting fan speed, allow tractor hydraulic oil to warm up to operating temperature. Cold oil will cause slower fan speeds.

Motor case drain hose must be connected before running fan, or motor shaft seal will fail within 30 seconds.

1. Put display console (A) in “RUN” mode, and locate Fan (rpm) display and set key.

2. Depress Fan (rpm) “SET” key.

NOTE: Refer to Operating the Machine—Air System section.

3. Enter target fan speed (rpm). DO NOT exceed 5000 rpm maximum fan speed.

Continued on next page

AG,OUO6023,1111 -19-21JUL00-1/3

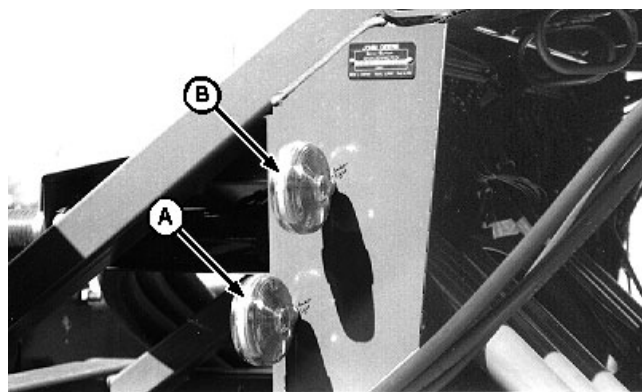
4. Fan speed indicator lights (A and B) can be observed while setting fan speed.

Lower light (A) is on when fan first starts turning and actual speed is below target speed by more than 5 percent.

When both lights shine steady, fan is turning at target speed (+/- 5%) entered in the display console.

Top light (B) comes on and bottom light (A) goes off when target speed has been exceeded by more than 5 percent.

Most accurate setting will be realized by observing the display console's fan speed readout.



A—Lower Fan Speed Indicator Light
B—Top Fan Speed Indicator Light

AG,OUO6023,1111 -19-21JUL00-2/3

5. Pull back SCV control (A) to open return line; then push forward until held by detent.
6. Press button (D) to adjust fan speed.
7. Turn time detent knob (C) until display reads CONSTANT.

IMPORTANT: Do not exceed 5000 rpm maximum fan speed.

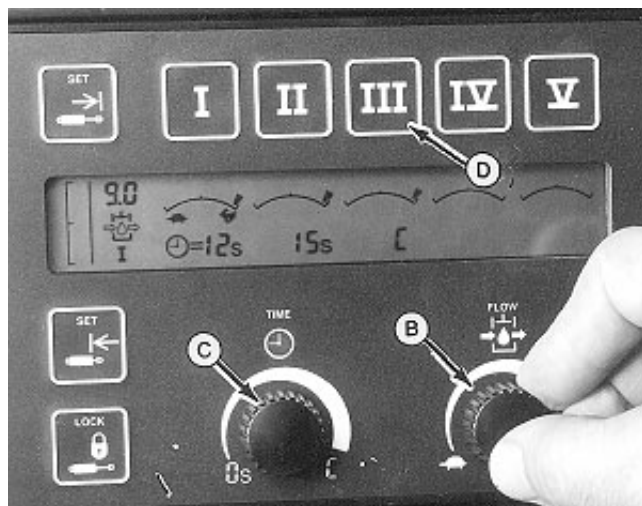
NOTE: Using excessive fan speed (RPM) will damage seed, increase wear on system and blast seed out of the seed bed. Inadequate air velocity will result in plugged lines.

8. While observing fan rpm on display console, turn flow control knob (B) until desired fan speed is shown.

A—SCV Control
B—Flow Control Knob
C—Time Detent Knob
D—Button



8000 Tractor Shown



AG,OUO6023,1111 -19-21JUL00-3/3

Setting Fan Speed—Tractor With Mechanical SCV'S Outside of Cab

IMPORTANT: Prior to setting fan speed, allow tractor hydraulic oil to warm up to operating temperature. Cold oil will cause slower fan speeds.

Motor case drain hose must be connected before running fan or motor shaft seal will fail within 30 seconds.



A41529 -UN-10APR97

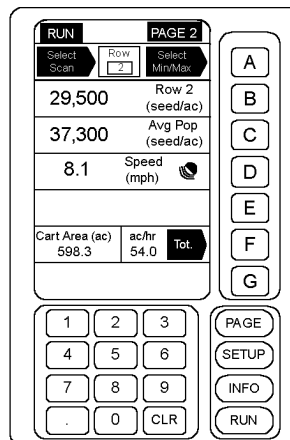
1. Put display console (A) in RUN mode, locate Fan (rpm) display and set key.

2. Depress Fan (rpm) SET key.

NOTE: Refer to Operating the Machine—Air System section.

3. Enter target fan speed (rpm). DO NOT exceed 5000 rpm maximum fan speed.

A—Display Console

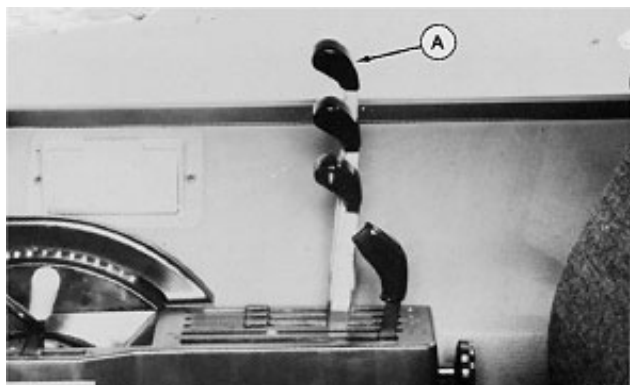


A46416 -19-20JUL00

AG,OUO6023,1112 -19-21JUL00-1/3

4. Pull SCV tractor control lever (A) rearward momentarily to open return line; then push forward until held by lever lock clip (not shown).

A—SCV Tractor Control Lever



N40339 -UN-16NOV88

Continued on next page

AG,OUO6023,1112 -19-21JUL00-2/3

CAUTION: To prevent serious injury or death from unexpected machine movement, always shift the transmission to “PARK” and set the brakes when leaving the tractor.

If adjustment is made by an assistant, be sure they are well clear of machine before operating or they may be severely injured or killed.

IMPORTANT: Do not exceed 5000 RPM maximum fan speed.

NOTE: Using excessive fan speed (RPM) will damage seed, increase wear on system and blast seed out of the seed bed. Inadequate air velocity will result in plugged lines.

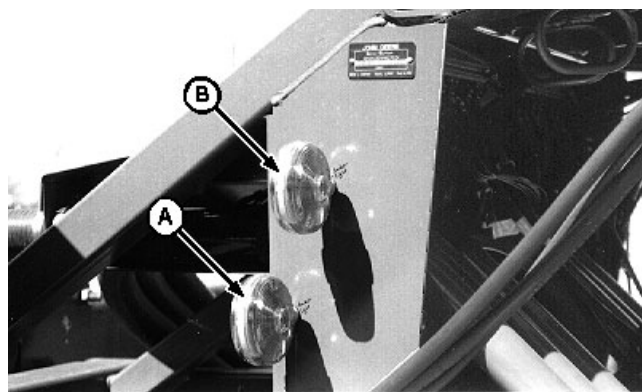
5. Observe fan speed indicator lights (A and B) while adjusting metering valve (C).

Lower light (A) is on when fan first starts turning and actual speed is below target speed by more than 5 percent.

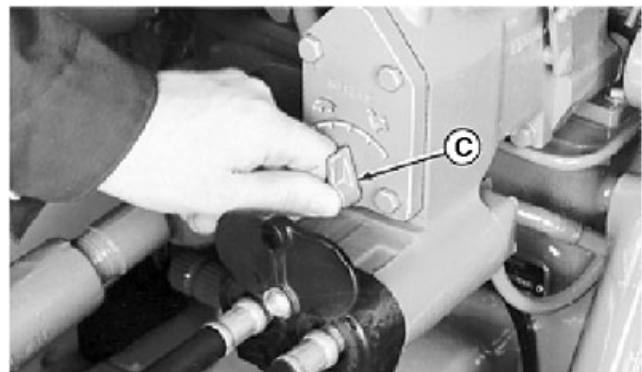
When both lights shine steady, fan is turning at target speed (+/- 5%) entered in the display console.

Top light (B) comes on and bottom light (A) goes off when target speed has been exceeded by more than 5 percent.

6. With both lights shining steady, leave metering valve in adjusted position and use SCV tractor control lever for fan on/off control.



A40164 -UN-09APR97



A41616 -UN-25APR97

A—Top Fan Speed Indicator Light
B—Lower Fan Speed Indicator Light
C—Metering Valve

AG,OUO6023,1112 -19-21JUL00-3/3

Air Cart Set-Up Mode—Target Seeding Speed

Target speed is the speed at which you intend to seed.

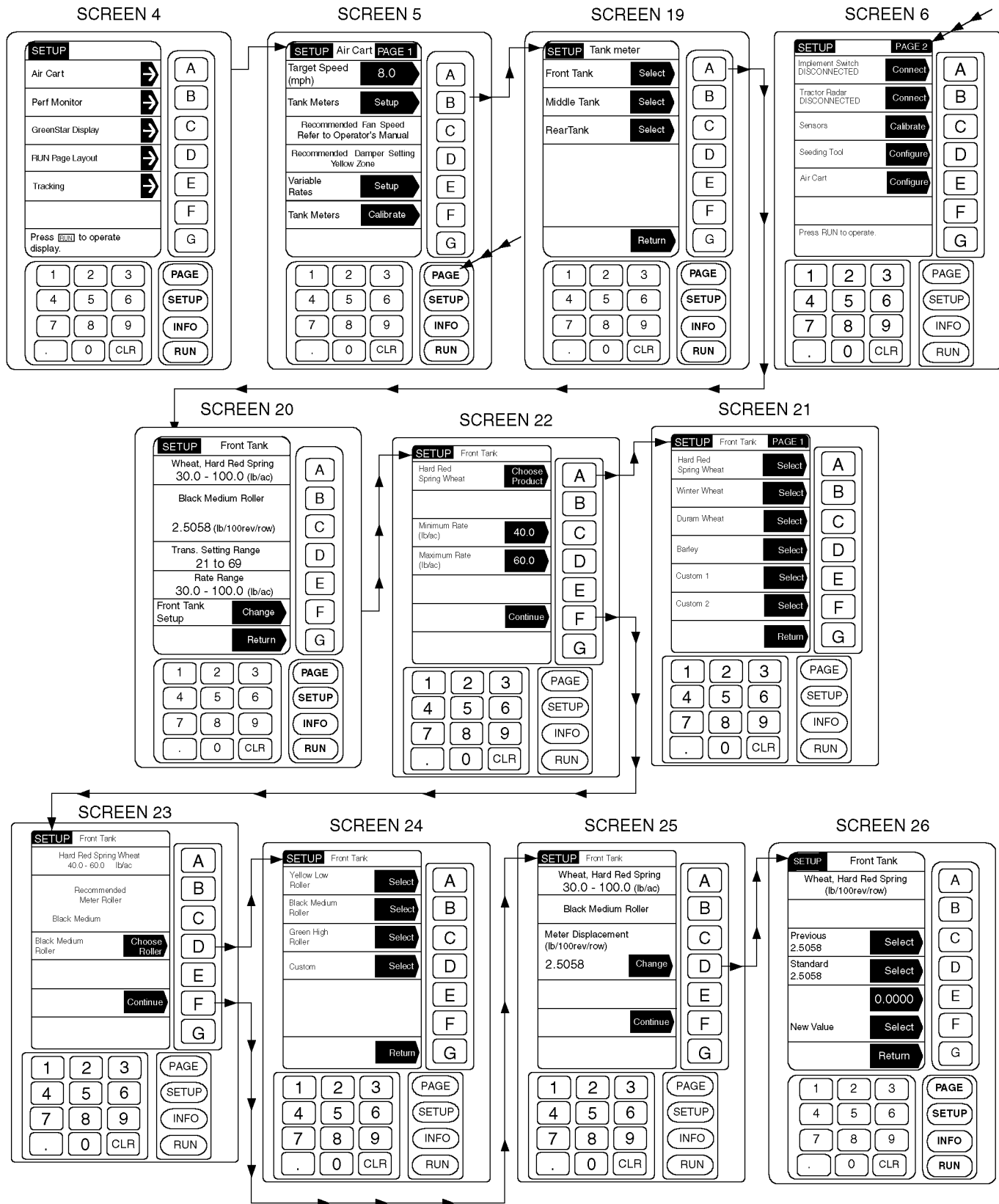
1. From any screen press SETUP.
2. From the list given, choose Air Cart.

IMPORTANT: John Deere Seeding Tools should not be operated above 13 km/h (8 mph).

3. Press key A to change the target seeding speed. This is the approximate machine speed while seeding. Enter number (2 to 12). Press key A to accept.

AG,OUO6023,1113 -19-21JUL00-1/1

Air Cart Set-Up Mode—Tank Meter Set-Up



Continued on next page

AG,OUO6023,1114 -19-21JUL00-1/3

1. From any screen press SETUP.
2. From the list given, choose Air Cart.
3. From Tank Meter Setup screen, press key A, B, or C if the cart is equipped with a Middle Tank to choose which tank to setup.
4. A summary page for this tank is presented. The summary page includes product, application rate, roller type, and meter displacement value. Press key F to change the setup.
5. Press key A to choose a new product.
6. From the menu presented, choose a product (A-F), or press PAGE to advance to the next set of product choices (a total of eight pages), or press key G to return without selecting a product.

When product selection is entered, the following values are made available.

- Recommended Roller
- Meter Displacement (lb/100 rev/row)
- Recommended Damper Setting Zone (at Double-Shoot Plenum)

NOTE: If rates are mis-keyed, a message will inform user that Max must be larger than Min value entered.

7. If variable rate is enabled, Min and Max rates are setup by pressing key C or D, entering the Min or Max application rate in pounds-per-hectare (acre), and then pressing key C or D again to accept. If the cart is not equipped with the Variable Rate option, only the desired application rate, or target rate, can be entered.
8. Press key F to continue.
9. Press key D to choose the meter roller. A recommended roller for the target rate is presented

on the previous screen. If no roller can be recommended, a message will indicate so.

NOTE: Be sure the selected roller is the actual roller metering product from this tank.

10. Select the correct roller from the menu presented (A—D). Custom rollers are very seldom used and proper calibration is critical when using custom rollers.
11. Press key F to continue.

IMPORTANT: Some product choices may not yet be loaded in the Standard value table, and **MUST** be determined by Calibration of the Tank Meter. In every situation, for the most accurate Meter Displacement Value (weight per 100 meter revolutions per row) the Tank Meter Calibration must be performed.

12. Press key D to select a meter displacement value. There are three different values that can be used. “**Previous**”, a value that had previously been used for this tank, “**Standard**”, a value for this particular meter and product combination from a table saved in the controller’s memory, or “**New Value**”, obtained by other means such as a previous calibration.

“**New Value**” is manually entered, if so desired, but must first be calculated using the sample weight obtained from meter calibration and the following formula. Note that meter turns, not crank turns, are used in this calculation.

$$\{\text{Weighed Sample kg (lb)} \div \text{meter turns}\} \times (100 \div \text{rows}) = \text{Displacement Value}$$

EXAMPLE: $\{5.74 \text{ kg (12.65 lb)} \div 15\} \times (100 \div 41) = .93 \text{ (2.06)}$

IMPORTANT: If Previous and Standard are both zero and a New Value is not known, select Standard even if it is zero.

13. Press key C to select Previous, press key D to select Standard, or press key E, enter a value, press key E again to accept the value, and then press key F to select New Value.

14. Press key F to continue.

15. The tank summary screen is then displayed. If everything is set to the conditions desired, press

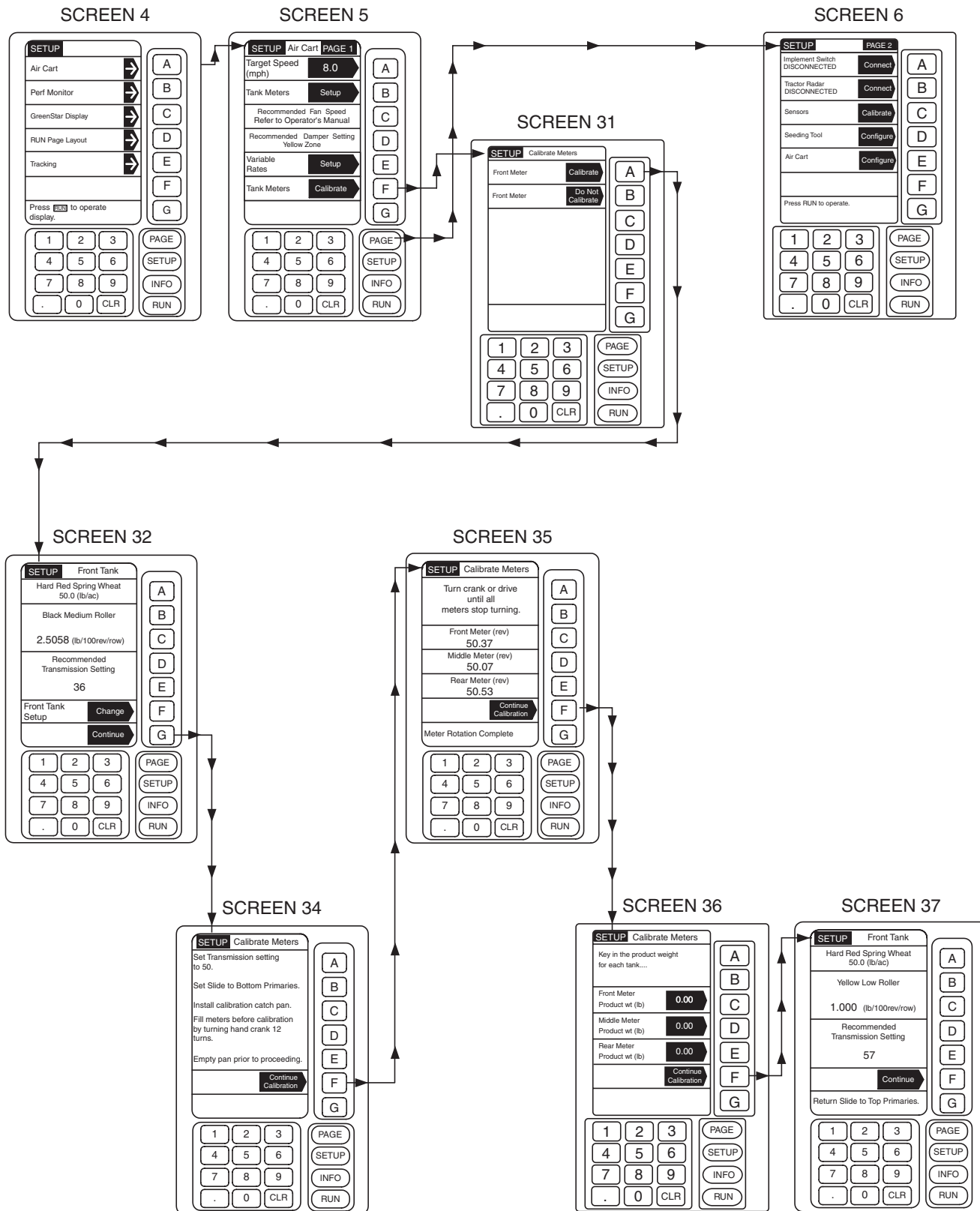
key G to return to the Tank Meter Setup Screen and choose the next Tank. If not, start at Step 4 again.

16. Repeat Steps 3 thru 15 until all tank meters are configured to the desired conditions.

17. Press key G to return to the Air Cart Setup Page 1.

AG,OUO6023,1114 -19-21JUL00-3/3

Air Cart Set-Up Mode—Calibrate Meters



Continued on next page

AG,OUO6023,1115 -19-21JUL00-1/7

IMPORTANT: Certain products, such as some cereal grains, can settle in the bottom of the tank after filling or transport. This may alter product flow during initial calibration. In such cases, it may be advisable to recalibrate the meter after seeding first two hectares (five acres). This will ensure a consistent product flow into the meter during calibration, and yield the most accurate transmission setting.

1. From any screen press SETUP.
2. From the list given, choose Air Cart.
3. From Air Cart Setup Page 1, press key F to advance to the calibration screen.

4. Press key A to calibrate the front meter, press key B to decline. This determines whether or not the front tank clutch will be engaged when calibration begins. Make sure only the desired meter is selected. Otherwise, product will plug or spill out of the other meter(s) unnecessarily.

NOTE: An extra catch pan is required if more than one tank is calibrated at once.

5. A summary screen is displayed for the tank meter selected for calibration. If the tank meter setup shown is correct, press key G to continue. If not, press key F and see AIR CART SET-UP MODE—TANK METER SET-UP, Steps 4—15.
6. Repeat Steps 4 and 5 for all tanks.

Continued on next page

AG,OUO6023,1115 —19–21JUL00–2/7

7. Hang empty bag (A) from scale (B) and reset scale to "0" (zero) by turning knob on top of scale. Setting scale to "0" (zero) will ensure that measured weight is of collected sample only, and does not include the weight of the bag.

NOTE: Make sure there is sufficient product in tank to collect a measurable sample. Product should cover all meter inlets and not be heaped to one side. Half-width disconnect handles must be fully down for accurate meter calibration.

8. Follow on-screen instructions:

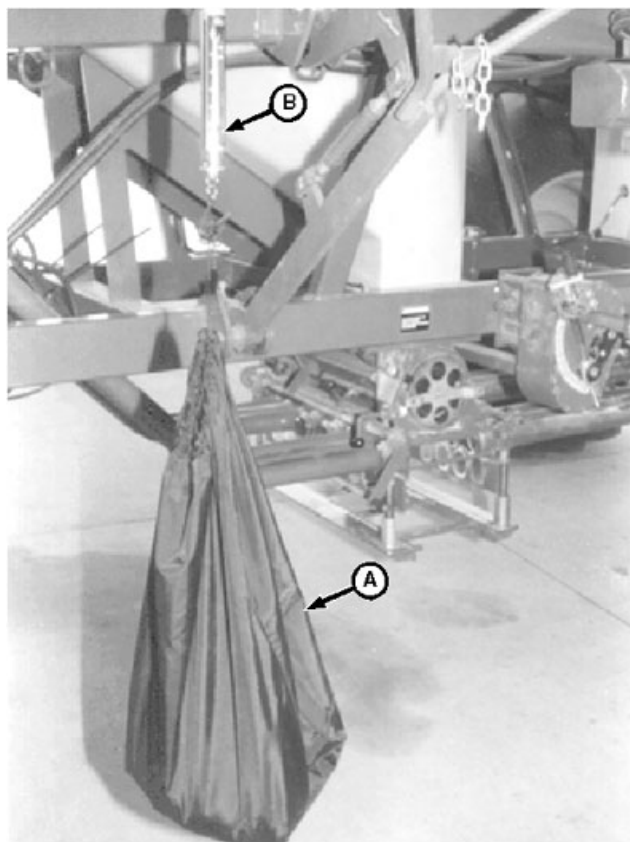
- **SET TRANSMISSION SETTING TO 50.**

NOTE: See *ADJUSTING METER SPEED TRANSMISSIONS* in *Operating Machine—Setting Metering Rates* section.

- **SET SLIDE TO BOTTOM PRIMARIES** (Stationary Double-Shoot only).

NOTE: Before returning to normal operation, ensure slide on stationary double-shoot manifold is in proper position.

- **INSTALL CALIBRATION CATCH PAN:**



A—Collection Bag
B—Scale

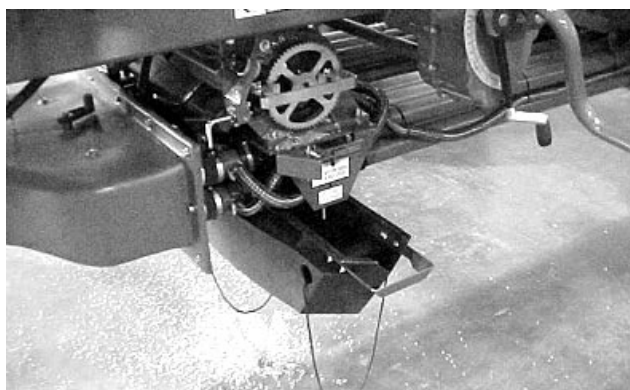
A41554 -JUN-14APR97

AG,OUO6023,1115 -19-21JUL00-3/7

Remove cover plate from bottom of manifold.

Slide collection pan, squared end first, in from left hand side of manifold using the provided rails.

- **FILL METERS BEFORE CALIBRATION BY TURNING HAND CRANK 12 TURNS:**



Collection Pan—SDS

A46133 -JUN-10JUL00

Continued on next page

AG,OUO6023,1115 -19-21JUL00-4/7

NOTE: On two-tank carts, crank handle is factory installed on front transmission. On carts with optional middle tank, crank handle is installed on middle-tank transmission.

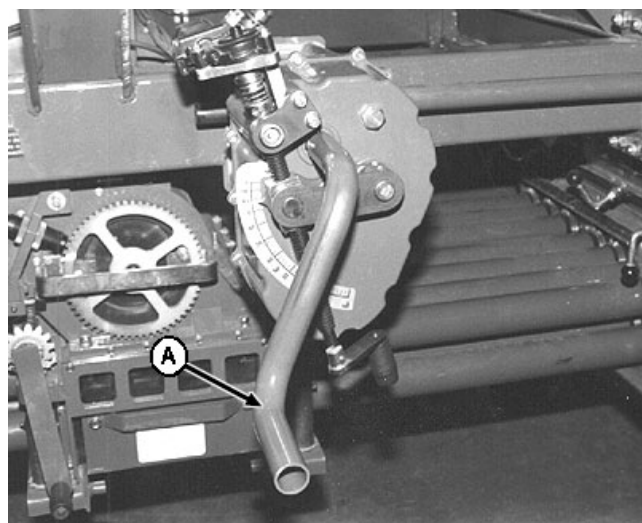
Leave crank handle in factory installed position to avoid contacting frame or other components during meter calibration.

Noting starting point, turn crank handle (A) counterclockwise counting 12 full 360° turns. All transmissions and driveshafts turn when crank handle is turned.

- **EMPTY PAN PRIOR TO PROCEEDING.**

9. Press key F to continue calibration. A screen is presented that provides additional instructions and shows the revolutions accumulated for each meter. Follow instructions on screen.

- **TURN CRANK OR DRIVE UNTIL ALL METERS STOP TURNING:**



Two Tank Cart Shown

A—Crank Handle

Continued on next page

AG,OUO6023,1115 -19-21JUL00-5/7

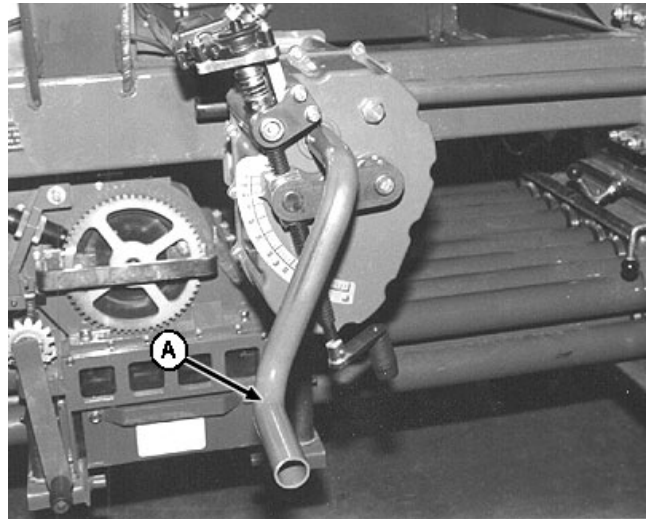
IMPORTANT: Turning crank handle clockwise will result in an inaccurate meter calibration.

NOTE: Check product level occasionally; do not overfill pan.

Turn crank handle (A) counterclockwise or drive the tractor ahead until all meters have stopped turning. All transmissions and driveshafts turn when crank handle is turned.

10. Remove the catch pan and pour contents into collection bag.

A—Crank Handle



Two Tank Cart Shown

Continued on next page

AG,OUO6023,1115 -19-21JUL00-6/7

Hang filled collection bag (A) from scale (B) and weigh product.

11. Press key F to continue calibration.

A screen is presented that provides additional instructions.

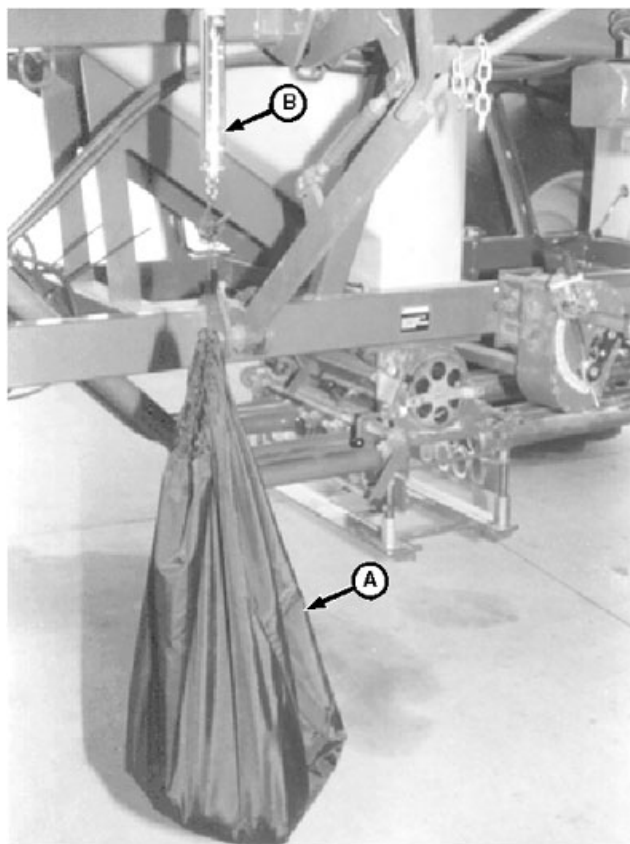
Follow instructions on screen.

- **Key in the product weight for each tank....**
Enter product weight for each tank into the monitor by pressing the appropriate key C—E and entering the weight collected. Press key C—E again to accept.

12. Press key F to continue the calibration.

13. Review each meters summary screen for recommended transmission setting. Set transmission setting for each meter calibrated, if the cart is not equipped with the variable rate option. Variable rate transmissions will adjust automatically when seeding begins.

An advisory message will display if no valid transmission setting can deliver product at previously entered target rate.



A—Collection Bag
B—Scale

A41554 —UN-14APR97

AG,OUO6023,1115 —19-21JUL00-7/7

Variable Rate Control System

Variable rate control allows the operator to increase or decrease product application rates without leaving the tractor cab by changing rate settings through the GREENSTAR™ display console (A). Rate settings are not adjusted individually, but in combination with other tank(s), through use of operator built menus. See SET-UP MODE—VARIABLE RATE in this section for further information.

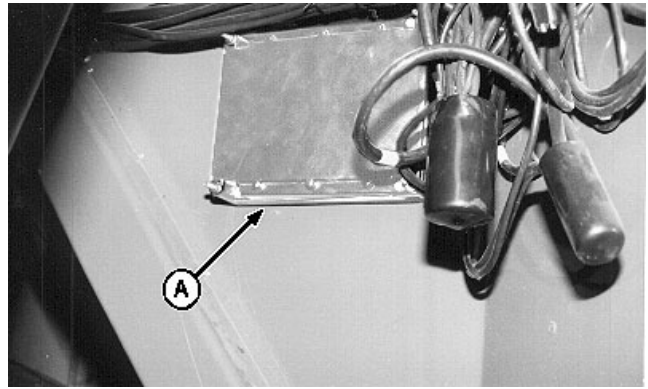
A—GREENSTAR™ Display Console



A41529 —UN-10APR97

When cart is equipped with optional rate control, standard SEEDSTAR™ controller is replaced with an expanded controller (A) containing software to operate and monitor this function.

A—Expanded Controller



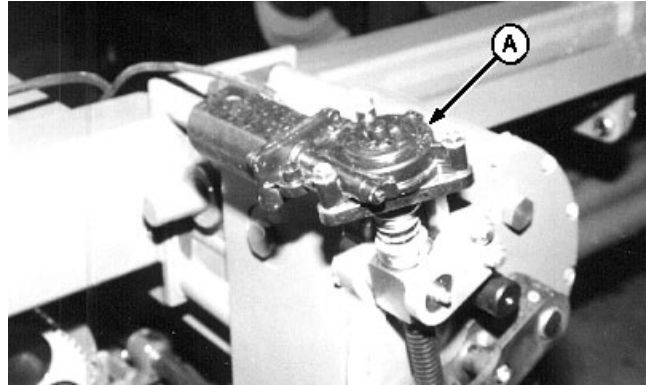
A46388 -UN-19JUL00

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AG,OUO6023,1116 -19-21JUL00-2/3

Changing rate settings energizes the transmission mounted rate motor (A); turning adjustment screw to increase or decrease transmission output speed and application rate to agree with operator's selection.

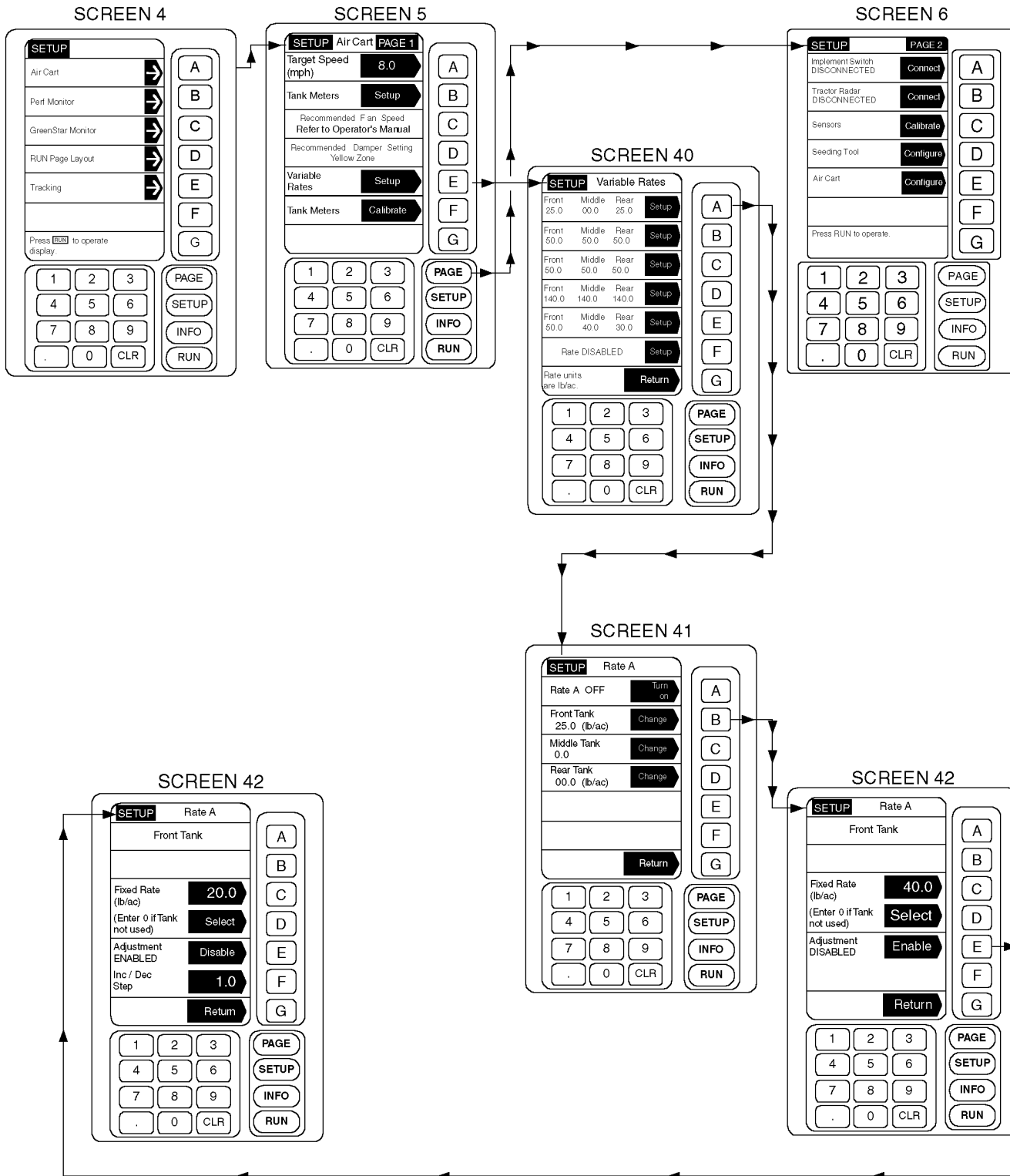
A—Transmission Mounted Rate Motor



A41861 -UN-18JUL97

AG,OUO6023,1116 -19-21JUL00-3/3

Set-Up Mode—Variable Rate



Continued on next page

AG,OUO6023,1117 -19-21JUL00-1/2

Variable rate set-up is a menu building process where up to six different application rate combinations are entered into memory.

Memory entries are recalled and selected from the menu in RUN mode. When a rate change is desired, the operator selects a new combination of rate(s) from the menu, which changes the transmission speed setting to achieve the desired application rate(s).

1. Press SETUP; then select Air Cart.
2. From Air Cart Setup Page 1, press key E to setup variable rates. The Setup Variable Rates screen is where the rates are defined. If no rates are defined, a "No Rates Defined" message will be displayed on the RUN screen.
3. To define a rate, press key A—F.
4. Press key B—D to setup or change the target application rate for one of the tanks.
5. Press key C, enter a fixed rate, and press key C to accept. Press key D to select this rate and enable it.
6. Press key E to enable the adjustment feature. This option allows adjustment of the target rate from the run page. When this option is enabled, a minimum step value must be entered. Press key F to enter value.
7. Repeat Steps 4—6 for each tank.
8. Press key A to turn the rate ON. This will allow the rate to be selected from the RUN screen.
9. Press key G to return.
10. For each desired rate or set of rates, repeat Steps 3 through 9.
11. Press key G to return to the Air Cart Setup Page 1.

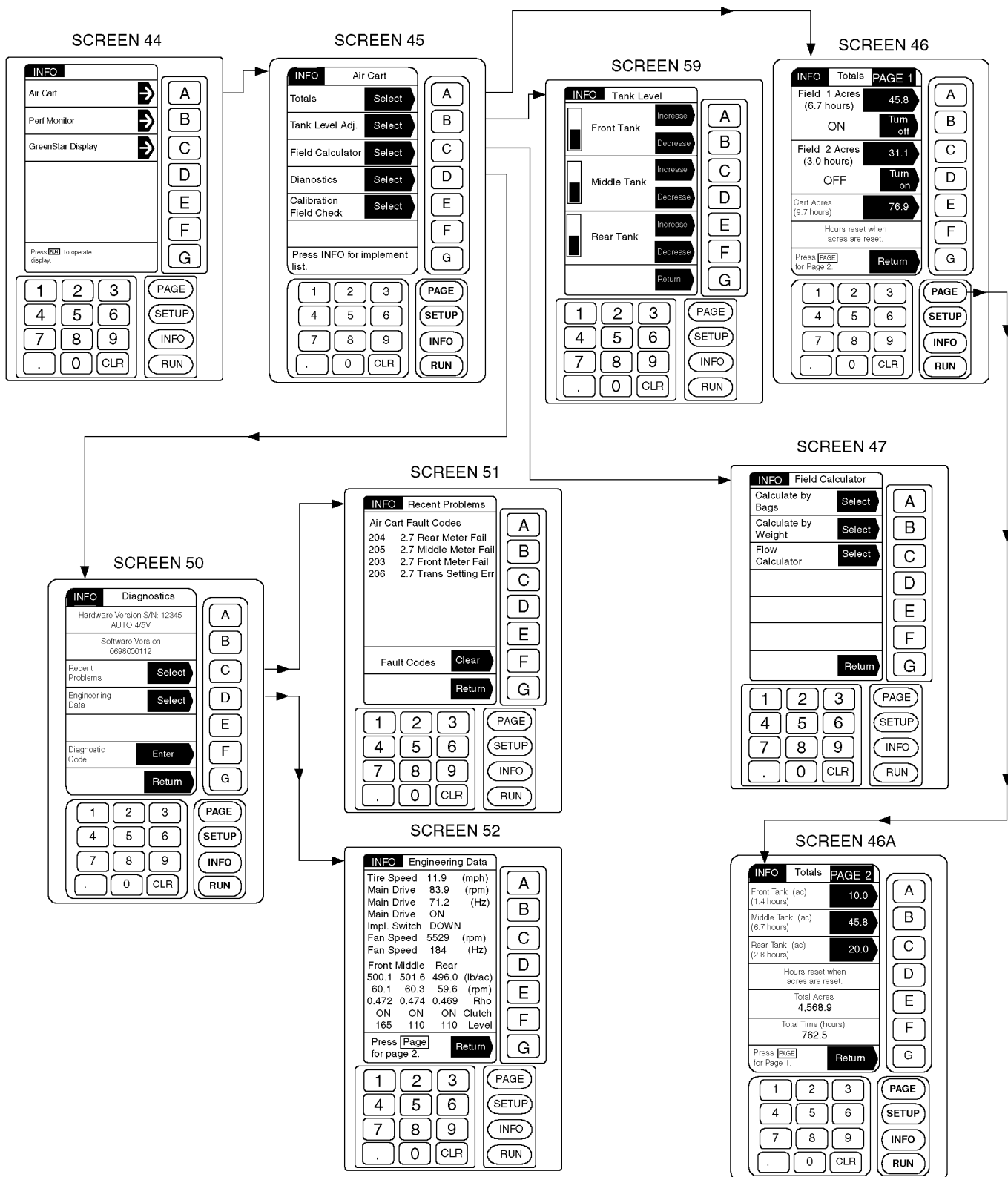
AG,OUO6023,1117 —19–21JUL00–2/2

Air Cart Monitor Operations Checklist

- ☐ Adjust display contrast and backlight.
 - ☐ Refresh RUN pages using RUN Page Layout.
 - ☐ Enter Target Seeding Speed.
 - ☐ Tank Meter Setup.
 - ☐ Choose and enter product.
 - ☐ Enter the minimum and maximum rates (w/Variable Rate) -OR-
 - ☐ Enter target rate (w/o Variable Rate).
 - ☐ Select roller.
 - ☐ Change and/or select and enter new Meter Displacement Value.
 - ☐ Calibrate Tank Meter.
 - ☐ Follow on-screen and written directions to obtain weighable product sample.
 - ☐ Enter weight of product sample.
 - ☐ Have system calculate Meter Displacement Value.
 - ☐ Variable Rate (build menu of different rate combinations).
 - ☐ Turn rate ON.
 - ☐ Enter fixed rate for each tank.
 - ☐ Enable adjustment and set increment for each tank, if desired.
 - ☐ Set Target Fan Speed.
 - ☐ Turn appropriate clutches ON.
- Options Setup:**
- ☐ Seed Counting.
 - ☐ Enter Seed size for EACH tank.
 - ☐ Enter High Population Warning if value other than default value is desired.
 - ☐ Enter Low Population Warning if value other than default value is desired.

AG,OUO6023,1118 -19-21JUL00-1/1

Air Cart INFO (Information) Mode (Without Options)



Continued on next page

AG,OUO6023,1119 -19-21JUL00-1/3

Display language is selected and readout units (English or Metric) are reset in GREENSTAR™ Display function. See CHANGING DISPLAY LANGUAGE AND UNITS—STANDARD GREENSTAR™ DISPLAY in Operating Machine Setup section for further information.

“Implement List” is the opening screen of INFO mode. List shows all software in use, including optional devices connected to and recognized by the system controller.

Air Cart INFO (information) mode displays accumulated data recorded during operations.

Hectares (Acres) are accumulated when clutches are energized with ground speed and meter rpm sensed. Total hectares (acres) are calculated using distance traveled and total tool width.

Totals

Page 1 shows accumulated hectares (acres)/time by field and by cart.

Page 2 shows accumulated hectares (acres)/time by tank. It also shows total accumulated hectares (acres) and total time.

Field, Cart and Tank Hectares (Acres) can be cleared from memory by performing the following steps.

1. From any page press INFO.
2. Press key A to select Air Cart.
3. Press key A to select Totals.

IMPORTANT: The value displayed within the Cart Hectares (Acres) arrow is the value that is displayed on RUN Page 1 under "Cart Area". Resetting this

number will reset "Cart Area" on RUN PAGE.

4. All values in the dark arrows on pages 1 and 2 can be reset to zero. Press console key; then press CLR to reset to zero. Press key A again to accept. All other hectare (acre) totals are reset by the same method.
5. Press key G to return.
6. Press RUN to return to RUN Page 1.

Tank Level Adjustment

Tank Level function is used to adjust display when actual in-tank product level is between sensors. Adjustment range is limited so display cannot be over-adjusted above actual sensor state.

1. From any page press INFO.
2. Press key A to select Air Cart.
3. Press key B to select Tank Level Adjust.

IMPORTANT: Product must be above the bottom tank level sensor in order to make adjustments.

4. The darkened arrows labeled Increase and Decrease allow the displayed Tank Level to be adjusted to correspond with the tanks actual level. One press of the button equals one bar.
5. Adjust all tanks to correspond with actual product level.
6. Press key G to return.
7. Press RUN to return to RUN Page 1.

Field Calculator

Field calculator features two methods of determining how much product is needed. See USING FIELD/FLOW CALCULATOR—GREENSTAR™ DISPLAY in this section.

Diagnostics

Entering Diagnostic mode reveals version numbers of software and hardware in use, and engineering data.

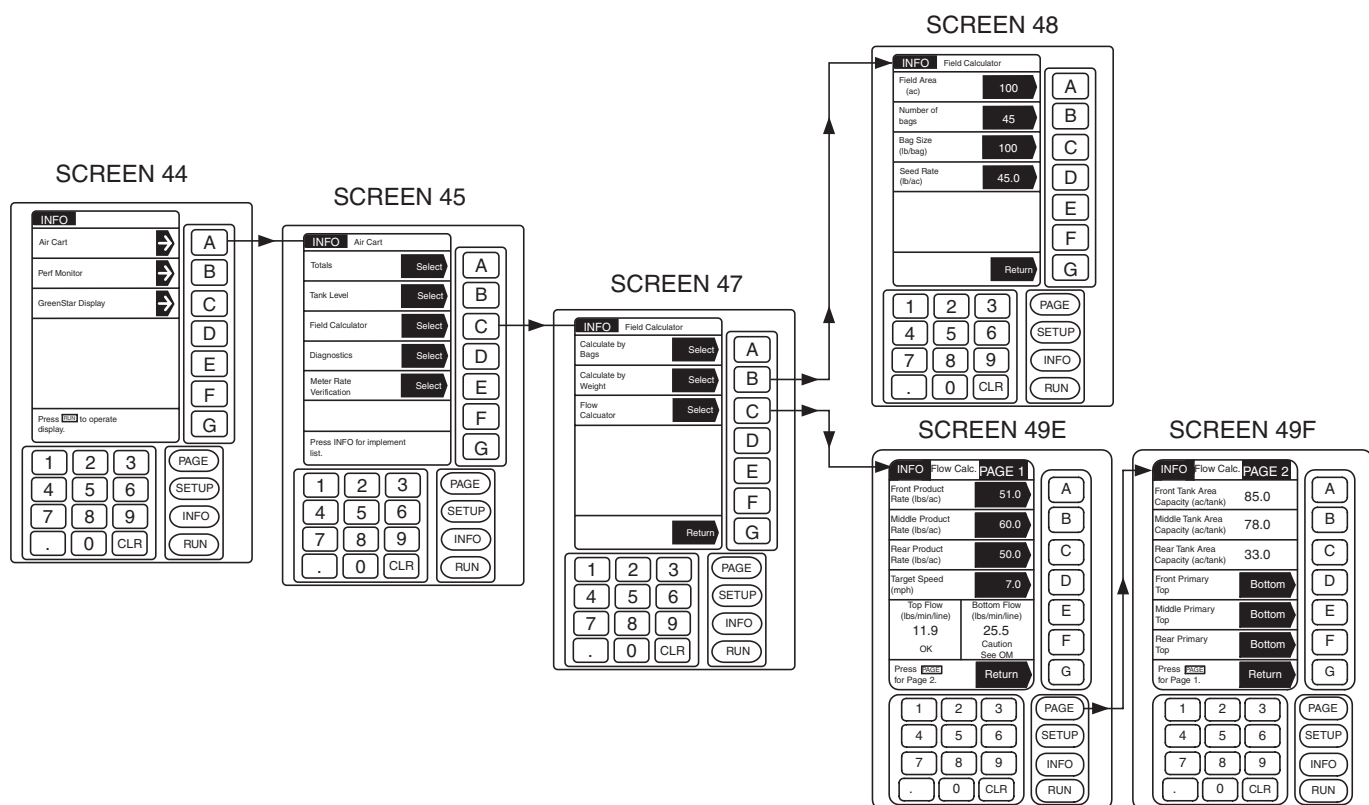
Software and hardware version numbers are historical records and should not be altered.

Recent Problems list shows the last eight air cart problems that produced a caution or warning message, the problems code, and a time stamp (hours) of when it occurred. Only the three most recent occurrences of any one problem are recorded. Depress key F to clear fault codes from problem list.

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AG,OUO6023,1119 -19-21JUL00-3/3

Using Field/Flow Calculator—GREENSTAR™ Display



A47357 -19-27APR01

Field Calculator

Field calculator features two methods of determining how much product is needed.

Enter Air Cart INFO mode, Field Calculator function.

- Calculate by Bags—

1. Enter Bag Size and Seed Rate as constant values.
2. Changing value of Field Area or Seed Rate updates total Number of Bags required.

- Calculate by Weight—

1. Enter Seed Rate as a constant value.
2. Changing value of Field Area updates Total Seed Weight required.

Flow Calculator

IMPORTANT: Flow calculator will not function until meter set-up has been completed at least once.

The Flow Calculator predicts the weight of product-per-minute-per-primary and verifies the ability of the air system to achieve the application rate requirements based on this prediction. It also displays the area covered per tank based on the entered Product Rate.

NOTE: Default values are obtained from meter set-up.

Enter Air Cart INFO mode, Flow Calculator function.

1. Push PAGE to go to page 2.
2. Set up each tank primary for top or bottom.

3. Push PAGE to go to page 1.

If message reads “OK”, the product rates entered are acceptable.

4. Enter target product rate for each tank.

If message reads “Caution See OM”, the product rates entered may cause blockage and are not recommended. A lower product rate should be used.

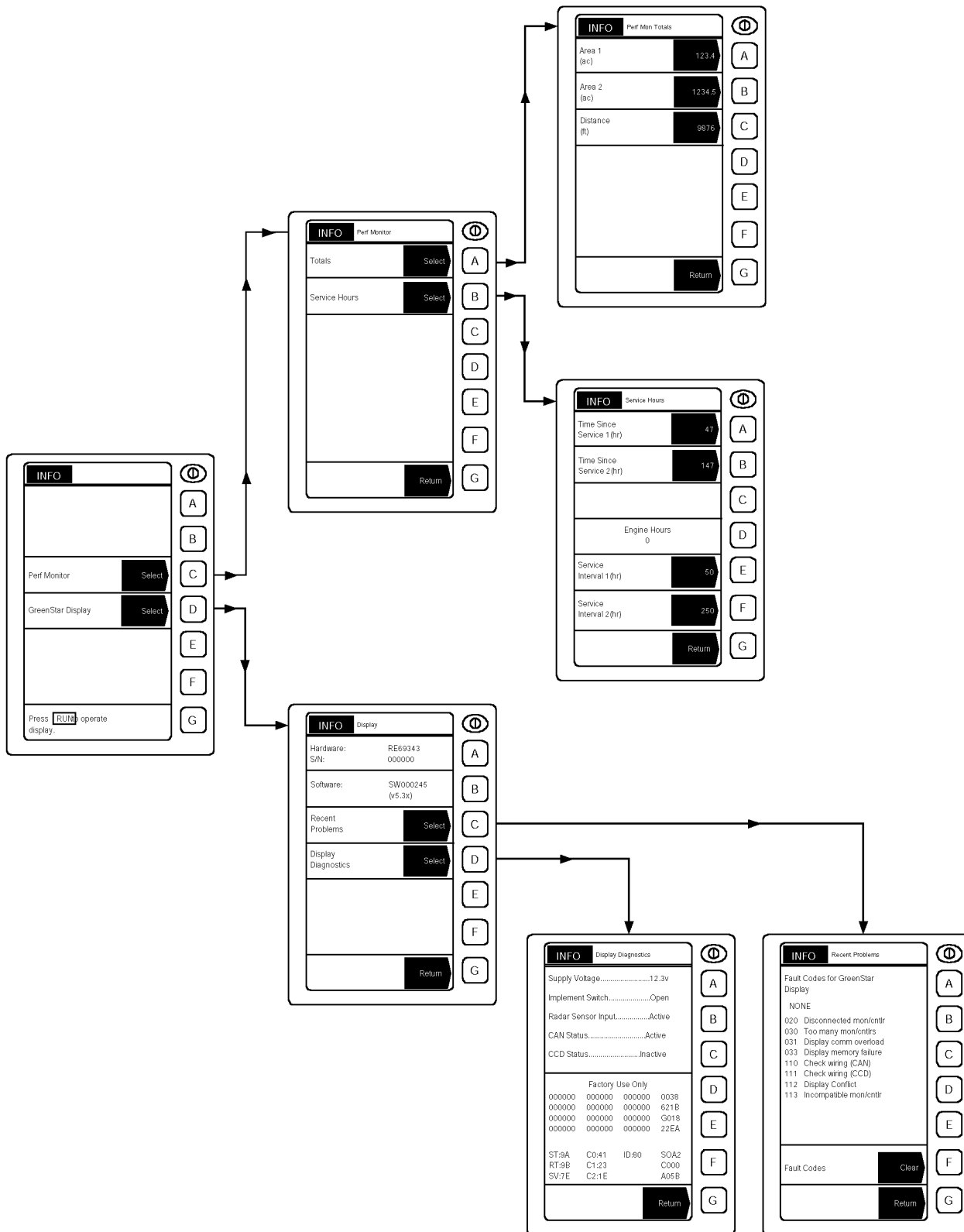
5. Top Flow (lbs/min/line) or Bottom Flow (lbs/min/line) on page one will show calculated product flow and one of the following three messages:

- OK
- Caution See OM
- High See OM

If message reads “High See OM”, the product rates entered are not acceptable. A lower product rate or slower seeding speed must be used.

AG,OUO6023,1120 -19-21JUL00-2/2

INFO (Information) Mode—Standard GREENSTAR™ Display



IMPORTANT: Perf (Performance) Monitor is not active when connected to the 1900 Commodity Air Cart.

Perf (Performance) Monitor stores tractor and implement related information ONLY.

Area counters 1 and 2 can be set up for use as “field” and “farm” where field is reset to 0 (zero) after working an area and farm is allowed to accumulate total area worked. These Area counters are different than those shown in Air Cart information. Area and Distance totals are all resettable. Press related key and CLR to reset totals to 0 (zero). Use numbered keys to make new entries and press related key to record.

Service Hours (time since last and intervals) are resettable and adjustable.

When service is performed, reset “Time Since” to 0 (zero).

Service Intervals are also resettable:

- Routine tractor service is normally scheduled for 50 Hours.

- Engine service is normally scheduled for 250 Hours.

Refer to tractor operator’s manual for maintenance schedule.

Engine Hours are total running hours and not resettable.

GREENSTAR™ Display INFO reveals version number of hardware and software in use.

Recent Problems list shows the last eight display problems that produced a caution or warning message in order of occurrence. Depress key F to clear faults from problem list.

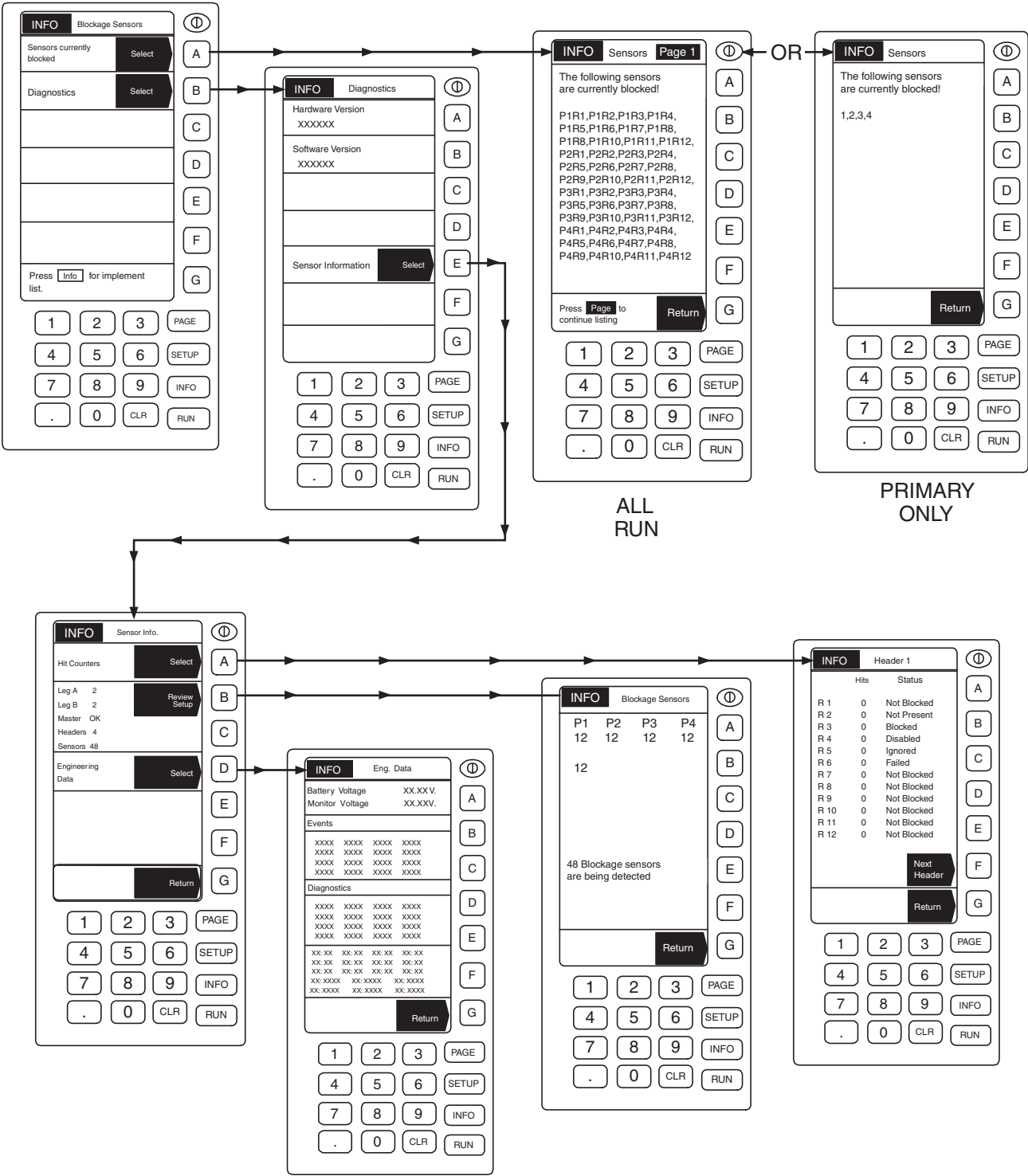
Display Diagnostics shows Supply Voltage, system connections and activity, and engineering data. Engineering data is a historical record that should not be altered.

Supply voltage can be checked if a low power problem is suspected.

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AG,OUO6023,1121 –19–21JUL00–2/2

INFO (Information) Mode—Blockage Monitoring



A46889A -19-27NOV00

The “Sensors Currently Blocked” screen lists all blocked sensors currently identified by the system. A review of this page while machine is stopped is useful when many secondaries appear blocked.

Entering Diagnostic mode reveals version number of software and hardware in use, troubleshooting information and engineering data.

Software/Hardware version numbers are historical records that cannot be altered.

In Sensor Information, a system summary is available for review, showing how many slave modules are on each leg of the splitter harness, the status of the

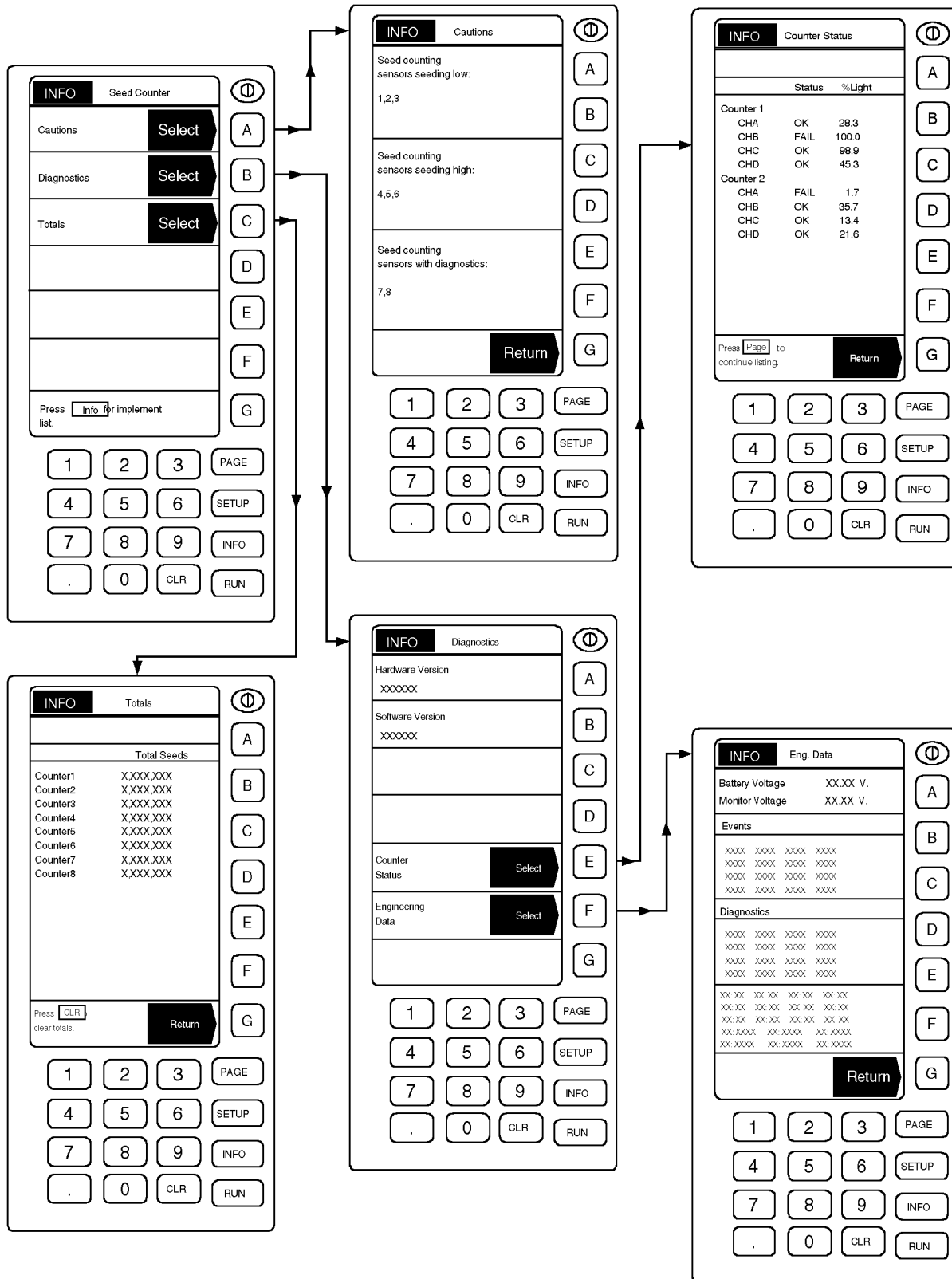
master module, and total number of headers (modules) and sensors. “Review Setup” shows how many sensors are on each primary and the total number of sensors detected.

A review of the Hit Counter, while machine is operating, can quickly identify problem runs or sensors. A run with a low hit count may be close to blocking.

In Engineering Data, battery and monitor voltage can be checked if a low power problem is suspected. Events and Diagnostic codes are recorded here for later recall when reporting or diagnosing a problem.

AG,OUO6023,1122 –19–21JUL00–2/2

INFO (Information) Mode—Seed Counter



Seed counter INFO mode is a multi-purpose mode that displays diagnostic information similar to standard system and also identifies specific problem runs and sensors using “Cautions” selection. Seed count “Totals” (per sensor) are also viewed in INFO mode.

When a seed counter related caution message is displayed on the bottom of RUN Page 1, enter INFO mode and “Cautions” to get specific information on what runs or sensors caused the message to display. If necessary, use PAGE key to review entire caution listing.

“Seed counting sensors with diagnostics” indicates that these sensors are no longer counting seeds accurately. Message can reflect a dirty lens that needs cleaning, a damaged fiber optic cable, a failed sensor or failed controller. Take corrective action accordingly.

Entering Diagnostic mode reveals version numbers of software and hardware in use, counter status

information, and engineering data, including battery and monitor voltage.

Software/Hardware version numbers and Events/Diagnostic codes are historical records and should not be altered.

Battery and monitor voltage can be checked if a low power problem is suspected.

Counter status display shows sensor status by channel. Take corrective action for any sensor showing “FAIL” status.

Entering Totals mode shows the total number of seeds counted by each sensor. Press CLR (clear) to reset totals to 0 (zero).

AG,OUO6023,1123 –19–21JUL00–2/2

Audio Alarm Signals

Two types of audio alarms are sounded by the monitor:

Alert alarm is a short tone that draws the operator's attention to the display console when operating conditions have changed or when making keyed entries.

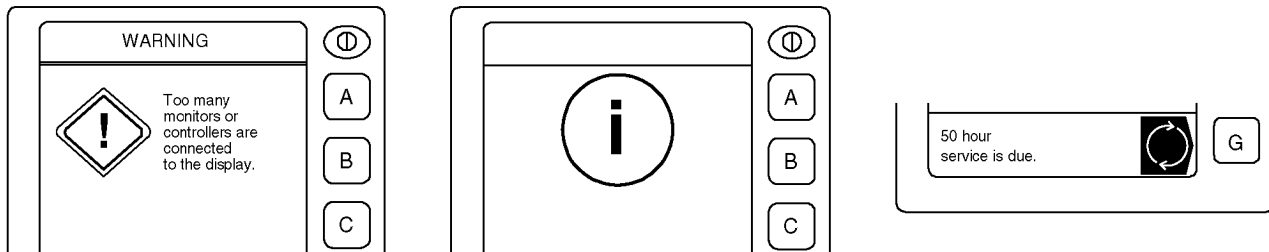
Warning alarm is a longer, fluctuating tone that indicates an urgent need for immediate attention and corrective action.

Neither of these alarms sound continuously; only long enough to get the operator's attention.

Warning volume is not adjustable.

AG,OUO6023,1124 -19-21JUL00-1/1

Warnings, Cautions and Advisories—Standard GREENSTAR™ Display



GREENSTAR™ Display has its own full page warnings and cautions that communicate faults and failures to the operator.

When cancelled, full-page warnings display at the bottom of RUN Page 1 as advisories until the condition is corrected.

Fault Code Descriptions

Fault Code	Display Action Message	Description
CAUTIONS [i] 110	Check Wiring	Communications wiring problem.
111	Check Wiring	Communications wiring problem.
112	Display Conflict	Request for display space made without space being free.
113	Incompatible monitor/controller	Controller is trying to send messages while not being logged into display.

Except for Display Conflict (Codes 21 and 112), Caution Fault Codes are cleared by re-booting system

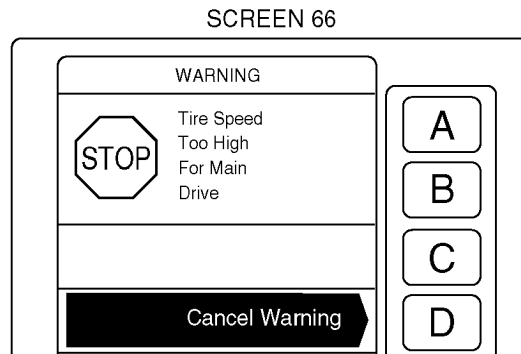
(power OFF and ON). Display Conflict is cleared by performing Run Page Layout.

WARNINGS [!] 20	Disconnected monitor/controller	Controller is not communicating with display.
21	Display Conflict	Request for display space made without space being free.
30	Too many monitor/controllers	More controllers are logged into display than can be received.
31	Display communications overload	Queue is overloaded. Queue messages are not being recorded.
33	Display memory failure	Likely permanent memory failure.

Except for Display Communications Overload (Code 31), Warning Fault Codes are cancelled by pressing F—Clear key if indicated on screen. Display Communications Overload is cleared by re-booting system (power OFF and ON).

NOTE: Fault codes are added to “Recent Problems” list found in “GREENSTAR™ Display” “INFO” mode.

Stop Warning Messages and Reactions—Air Cart



A41947 -19-29AUG97

IMPORTANT: Full screen STOP WARNINGS require immediate attention and corrective action or machine damage will occur.

If WARNING message is cancelled, audio alarm will sound again and a similar caution message will display at the bottom of RUN Page 1.

Audio alarm will sound when a full page WARNING is displayed.

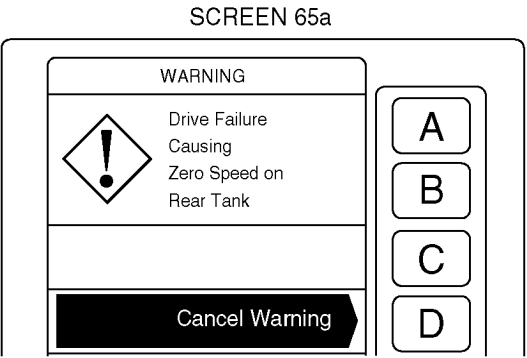
[STOP] Warning Message	Cause	Solution
[STOP] Tire Speed Too High For Main Drive	Tire speed exceeds 12 mph with main clutch on.	Disengage main clutch or decrease speed immediately.
[STOP] Fan Overspeed Detected	Fan speed exceeds 5600 rpm for one second.	Disengage clutches and fan immediately.
[STOP] Meter Revolution Exceeding Maximum Limit	Meter speed exceeds 100 rpm.	Disengage clutch immediately. Determine cause of overspeed condition.
[STOP] Excessive Speed For Main Drive	Tire speed exceeds 22 km/h (14 mph) with main clutch on.	Disengage main clutch or decrease speed immediately.
[STOP] No 7-Pin Power	7-Pin Connector	Connect 7-Pin Connector

NOTE: Warning messages are coded at occurrence and added to recent problem listing. See INFO

(INFORMATION) MODE for recall and description.

AG,OUO6023,1126 -19-21JUL00-1/1

Caution Warning Messages and Reactions—Air Cart



IMPORTANT: Audio alarm will sound when a full page WARNING is displayed.

similar caution message will display at the bottom of RUN Page 1.

If WARNING message is cancelled, audio alarm will sound again and a

[!] Warning Message—Air Cart	Cause	Solution
[!] Drive Failure Causing Zero Speed At Meter	Drive tire is turning, main and meter clutches are on, but no meter speed is detected for five seconds.	Disengage clutches and stop. Check condition of meter drive shear bolt.
[!] Meter Clutch Off. Meter Is Turning	Meter signal is detected for five seconds but clutch is turned off.	Check that sensor jam nuts are tight. Check that meter cartridge target sprocket is tight and not vibrating. Check clutch for damage.

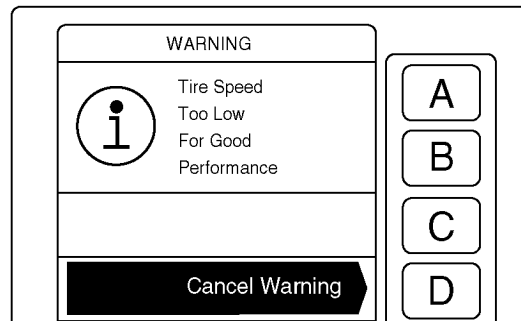
Air Cart warning messages are coded at occurrence and added to recent problems listing. See INFO (INFORMATION) MODE, for recall and description.

AG,QUO6023,1127 –19–21JUL00–1/1

A41948 –19–29AUG97

Information Warning Messages and Reactions—Air Cart

SCREEN 64



IMPORTANT: Audio alarm will sound when a full page WARNING is displayed.

similar caution message will display at the bottom of RUN Page 1.

If WARNING message is cancelled, audio alarm will sound again and a

[I] Warning Message	Cause	Solution
[I] Low Fan Speed Detected, Main Clutch Disengaged	Fan speed below 500 rpm for five seconds with meter turning.	Check and reset fan speed setting. Inspect fan speed sensor for damage or failure. Clear warning and press "Main Drive" to reactivate clutch.

NOTE: Main clutch is deactivated when low speed warning is displayed. This allows disabling the feature until power is cycled.

[I] Tire Speed Too High For Good Performance	Tire speed exceeds 16 km/h (10 mph) with main clutch and at least one meter clutch engaged.	Slow to recommended speed for best performance.
[I] Tire Speed Too Low For Good Performance	Tire speed below 1.5 km/h (1 mph) with main clutch on.	Disengage main clutch or increase speed.

NOTE: Low speed warning and caution messages will disable below 0.5 mph.

[I] Clutch Slippage or Transmission Setting Error (Normal to occur while making large rate adjustments with variable rate.)	Actual application rate is +/- 15% of target rate for 60 seconds.	Stop and check application rate and transmission setting. Check clutch for slippage.
[I] Tire Speed Inconsistent With Radar Speed	Tire speed and radar speed differ by more than +/- 10% for 60 seconds.	Stop travel. Recalibrate tire speed sensor and radar speed sensor.
[I] Tire sensors need to be calibrated.	Uncalibrated	Calibrate Sensors

Continued on next page

AG,OUO6023,1128 -19-21JUL00-1/2

NOTE: WARNING messages are coded at occurrence and added to recent problems listing. See

INFO (INFORMATION) MODE for recall and description.

[I] Invalid Configuration. Meter cannot feed top and bottom primaries.

Only the top OR bottom primary can be associated with one meter at a time.

Choose the desired primary (top or bottom) and choose not feeding for the other.

AG,OUO6023,1128 –19–21JUL00–2/2

Informative Caution Messages and Reactions—Air Cart

SCREEN 2

INFORMATIVE
(CAUTION)
MESSAGES
DISPLAY HERE

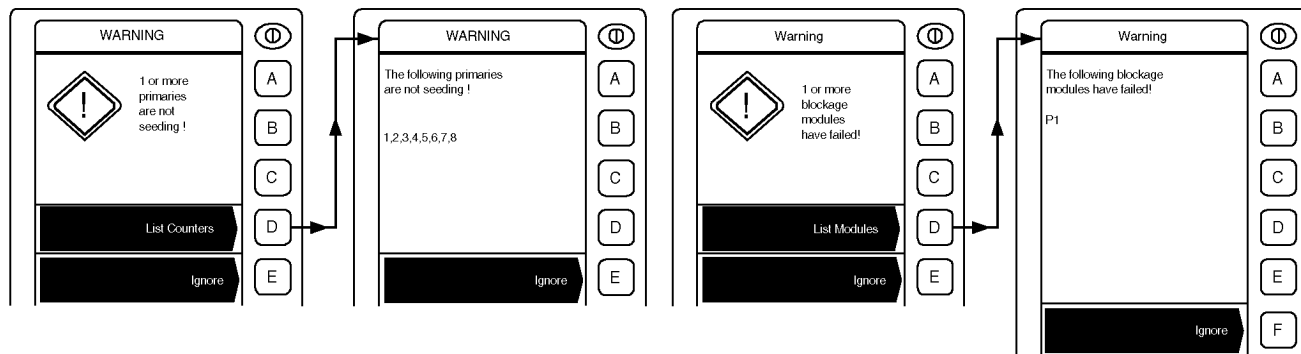
Informative (caution) messages display at the bottom of RUN Page 1 and are advisory in nature. Message will remain on screen until corrective action is taken.

Caution Message—Air Cart	Cause	Solution
Tank Almost Empty	Bottom sensor open and meter is active.	Stop and fill tank(s).
Fan Speed Outside Limits	Fan Speed not within +/- 15% of target speed for 15 seconds.	Adjust fan speed or reset monitor with new speed setting.
Transport Mode— (NOTE: Tire Speed and Application Rates Show 0 (ZERO)).	Tire Speed exceeds 40 km/h (25 mph).	Come to complete stop 0 km/h (0 mph) to reset displays.

AG,OUO6023,1129 –19–21JUL00–1/1

A46084 –19–18APR00

Caution Warning Messages and Reactions—Seed Counters and Blockage



A41912A -19-31MAR98

IMPORTANT: Audio alarm will sound when a full page WARNING is displayed.

similar caution message will display at the bottom of RUN Page 1.

If WARNING message is cancelled, audio alarm will sound again and a

[!] Warning Message—Seed Counter	Cause	Solution
[!] One or more primaries are not seeding! Press “List Counters”. The following primaries are not seeding! Primary ID Numbers.	One or more active sensors are counting below five seeds-per-second; sensors listed by primary ID number. <i>NOTE: Warning clears automatically if rate goes above 15 seeds-per-second.</i>	<p>Check for product in tank.</p> <p>Check for plugged primary lines.</p> <p>Check for plugged slide or manifold bypass openings.</p> <p>Press “Ignore” to deactivate non-seeding primaries. Sensors are reactivated by turning meter or main drive clutch off and on (like when row end is reached). Sensors can also be turned off in the SETUP section of the Seed Counters.</p>

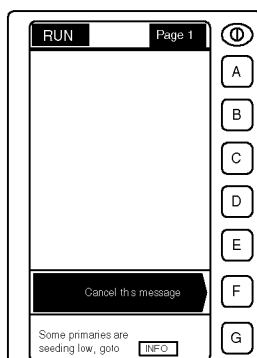
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QUO6076,0000229 -19-03MAY01-1/2

[!] Warning Message—Blockage Monitor (All Run or Primary Only)	Cause	Solution
[!] One or more blockage modules have failed. Press "List Modules". The following blockage modules have failed! Primary ID numbers.	One or more previously detected modules cannot be detected now. <i>NOTE: Warning clears automatically if module is detected.</i>	<p>Press "INFO" to review system set-up.</p> <p>Check for broken wires or disconnected modules.</p> <p>Check for damaged modules.</p> <p>Press "Ignore" or turn sensors OFF to deactivate non-working modules. Modules are reactivated by turning meter or main drive clutch off and on (like when row end is reached).</p>
[!] One or more secondaries are blocked! Press "List Sensors". The following secondaries are blocked! Primary and RUN ID Numbers.	One or more active sensors is blocked. <i>NOTE: Warning clears automatically if blockage goes away.</i>	<p>Check for product in tank.</p> <p>Check for line blockage or partial blockage.</p> <p>Check for plugged slide or manifold bypass openings.</p> <p>Press "INFO" to review Hit Counter.</p> <p>Press "Ignore" to deactivate blocked sensors. Sensors are reactivated by turning meter or main clutch off and on (like when row end is reached). Sensors can also be turned off in the SETUP section of the Air Cart Blockage.</p>

OUO6076,0000229 -19-03MAY01-2/2

Informative Caution Messages and Reactions—Seed Counter



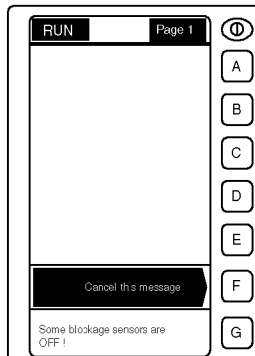
Informative (caution) messages display at the bottom of RUN Page 1 and are advisory in nature. Message will remain on screen until corrective action is taken.

NOTE: In SET-UP or INFO modes, these same messages will display as full page Information Warnings (shown with [i] icon).

Caution Message—Seed Counter	Cause	Solution
Some primaries are seeding low.	One or more active sensors are counting below Low Warning Population setting for 7.5 seconds. NOTE: Message clears automatically if rate goes above Low Warning setting for 7.5 seconds.	Press INFO to identify LOW runs. Reset Low Warning limit, if desired.
Some primaries are seeding high.	One or more active sensors counting above High Warning Population setting for 7.5 seconds. NOTE: Message clears automatically if rate goes below High Warning setting for 7.5 seconds.	Press INFO to identify HIGH runs. Reset High Warning limit, if desired.
Diagnostics on counting sensors.	Performance of one or more sensors has degraded. NOTE: Message clears automatically if sensor condition improves.	Press INFO to identify sensors. Sensor lens may need cleaning. Check for pinched or cut fiber optic cables. Press INFO, Counter Status, and check channels. Check that sensors are plugged in.
Some counting sensors are OFF!	One or more sensors are turned off.	Press SET-UP and turn sensors ON.
Some counting sensors are ignored!	One or more sensors are being ignored.	Turn main clutch off and on to reactivate sensor(s).
Invalid seed type, counter disabled!	One or more sensors are not on top primary bank, or two different crop types are being fed into sensor or fertilizer is being fed into sensor.	Correct primary run routing. Correct crop type in Air Cart Set-Up mode. Stop single-shooting two products through top runs.

A41913 -19-27AUG97

Informative Caution Messages and Reactions—Blockage Monitor



Informative (caution) messages display at the bottom of RUN Page 1 and are advisory in nature. Message will remain on screen until corrective action is taken.

NOTE: In SET-UP or INFO modes, these same messages will display as full page information warnings (shown with [i] icon).

Caution Message—Blockage Monitor	Cause	Solution
Some blockage sensors are OFF!	One or more sensors are turned off.	Press SET-UP and turn sensors ON.
Some blockage sensors are being ignored!	One or more sensors are being ignored.	Turn clutches off and on to reactivate sensor(s).
Some blockage modules are being ignored!	One or more blockage modules are being ignored.	Turn clutches off and on to reactivate module(s).
Too many headers fed by BOTTOM/TOP primaries! (All Run).	More than eight headers are configured for a primary bank.	Correct air system configuration errors in blockage set-up to clear. See Set-Up Mode, Blockage Monitoring Systems.
Too many sensors fed by BOTTOM/TOP primaries! (Primary ONLY.)	More than eight sensors are configured for a primary bank.	Correct sensor/header configuration error in blockage set-up to clear. See Set-Up Mode, Blockage Monitoring Systems.
Too many blockage slaves on leg X.	Connected too many modules to one leg of splitter harness (maximum per side is 8). NOTE: Message clears if slave configuration is accepted or returned to previous configuration.	Correct slave module location and wiring error.

AG,OUO6023,1132 –19–21JUL00–1/1

A41914 –19–27AUG97

Operating Machine—Setting Metering Rates

Using Pounds of Seed Per Acre Chart

NOTE: If a specific population of seed is desired, use the Pounds of Seed Per Acre Chart and Rate Chart to determine the approximate transmission speed setting. Seed cart meters are VOLUME meters and not POPULATION meters. The number of seeds planted per acre will vary according to the size of seed.

1. Determine from seed bag how many seeds equal one pound. Locate value on left-hand column of chart.

2. Locate under “desired population” the number of seeds wanted per acre in thousands.
3. Where side column and upper column meet is number of pounds of seed to apply for each acre.

EXAMPLE: When you have 2050 seeds per pound, and you want to plant 190,000 seeds per acre, you will apply 93 pounds of seed per acre.

Continued on next page AG,OUO6023,1133 –19–21JUL00–1/2

SEEDS/ LB	DESIRED POPULATION (seeds per acre in thousands)															
	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
1200	83	92	100	108	117	125	133	142	150	158	167	175	183	192	200	208
1250	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200
1300	77	85	92	100	108	115	123	131	138	146	154	162	169	177	185	192
1350	74	81	89	96	104	111	119	126	133	141	148	156	163	170	178	185
1400	71	79	86	93	100	107	114	121	129	136	143	150	157	164	171	179
1450	69	76	83	90	97	103	110	117	124	131	138	145	152	159	166	172
1500	67	73	80	87	93	100	107	113	120	127	133	140	147	153	160	167
1550	65	71	77	84	90	97	103	110	116	123	129	135	142	148	155	161
1600	63	69	75	81	88	94	100	106	113	119	125	131	138	144	150	156
1650	61	67	73	79	85	91	97	103	109	115	121	127	133	139	145	152
1700	59	65	71	76	82	88	94	100	106	112	118	124	129	135	141	147
1750	57	63	69	74	80	86	91	97	103	109	114	120	126	131	137	143
1800	56	61	67	72	78	83	89	94	100	106	111	117	122	128	133	139
1850	54	59	65	70	76	81	86	92	97	103	108	114	119	124	130	135
1900	53	58	63	68	74	79	84	89	95	100	105	111	116	121	126	132
1950	51	56	62	67	72	77	82	87	92	97	103	108	113	118	123	128
2000	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125
2050	49	54	59	63	68	73	78	83	88	93	98	102	107	112	117	122
2100	48	52	57	62	67	71	76	81	86	90	95	100	105	110	114	119
2150	47	51	56	60	65	70	74	79	84	88	93	98	102	107	112	116
2200	45	50	55	59	64	68	73	77	82	86	91	95	100	105	109	114
2250	44	49	53	58	62	67	71	76	80	84	89	93	98	102	107	111
2300	43	48	52	57	61	65	70	74	78	83	87	91	96	100	104	109
2350	43	47	51	55	60	64	68	72	77	81	85	89	94	98	102	106
2400	42	46	50	54	58	63	67	71	75	79	83	88	92	96	100	104
2450	41	45	49	53	57	61	65	69	73	78	82	86	90	94	98	102
2500	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100
2550	39	43	47	51	55	59	63	67	71	75	78	82	86	90	94	98
2600	38	42	46	50	54	58	62	65	69	73	77	81	85	88	92	96
2650	38	42	45	49	53	57	60	64	68	72	75	79	83	87	91	94

A41957 -19-27AUG97

AG,OUO6023,1133 -19-21JUL00-2/2

Using Pounds of Seed Per Acre Chart (Continued)

SEEDS/ LB	DESIRED POPULATION (seeds per acre in thousands)															
	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
2700	37	41	44	48	52	56	59	63	67	70	74	78	81	85	89	93
2750	36	40	44	47	51	55	58	62	65	69	73	76	80	84	87	91
2800	36	39	43	46	50	54	57	61	64	68	71	75	79	82	86	89
2850	35	39	42	46	49	53	56	60	63	67	70	74	77	81	84	88
2900	34	38	41	45	48	52	55	59	62	66	69	72	76	79	83	86
2950	34	37	41	44	47	51	54	58	61	64	68	71	75	78	81	85
3000	33	37	40	43	47	50	53	57	60	63	67	70	73	77	80	83
3100	32	35	39	42	45	48	52	55	58	61	65	68	71	74	77	81
3200	31	34	38	41	44	47	50	53	56	59	63	66	69	72	75	78
3300	30	33	36	39	42	45	48	52	55	58	61	64	67	70	73	76
3400	29	32	35	38	41	44	47	50	53	56	59	62	65	68	71	74
3500	29	31	34	37	40	43	46	49	51	54	57	60	63	66	69	71
3600	28	31	33	36	39	42	44	47	50	53	56	58	61	64	67	69
3700	27	30	32	35	38	41	43	46	49	51	54	57	59	62	65	68
3800	26	29	32	34	37	39	42	45	47	50	53	55	58	61	63	66
3900	26	28	31	33	36	38	41	44	46	49	51	54	56	59	62	64
4000	25	28	30	33	35	38	40	43	45	48	50	53	55	58	60	63
4100	24	27	29	32	34	37	39	41	44	46	49	51	54	56	59	61
4200	24	26	29	31	33	36	38	40	43	45	48	50	52	55	57	60
4300	23	26	28	30	33	35	37	40	42	44	47	49	51	53	56	58
4400	23	25	27	30	32	34	36	39	41	43	45	48	50	52	55	57
4500	22	24	27	29	31	33	36	38	40	42	44	47	49	51	53	56
4600	22	24	26	28	30	33	35	37	39	41	43	46	48	50	52	54
4700	21	23	26	28	30	32	34	36	38	40	43	45	47	49	51	53
4800	21	23	25	27	29	31	33	35	38	40	42	44	46	48	50	52

A41958 -19-27AUG97

AG,OUO6023,1134 -19-21JUL00-1/1

Using Kilograms of Seeds Per Hectare Chart

NOTE: If a specific population of seed is desired, use the Kilograms of Seeds Per Hectare Chart and Rate Chart to determine the approximate transmission speed setting. Seed cart meters are VOLUME meters and not POPULATION meters. The number of seeds planted per acre will vary according to the size of seed.

1. Determine from seed bag how many seeds equal one kilogram. Locate value on left-hand column of chart.
2. Locate under “desired population” the number of seeds wanted per hectare in thousands.
3. Where side column and upper column meet is number of kilograms of seed to apply for each hectare.

EXAMPLE: When you have 4500 seeds per kilogram, and you want to plant 475,000 seeds per hectare, you will apply 106 kilograms of seed per hectare.

Continued on next page

AG,OUO6023,1133 –19–21JUL00–1/4

	DESIRED POPULATION (seeds per hectare in thousands)													
SEEDS kg	225	250	275	300	325	350	375	400	425	450	475	500	525	550
2600	87	96	106	115	125	135	144	154	163	173	183	192	202	212
2700	83	93	102	111	120	130	139	148	157	167	176	185	194	204
2800	80	89	98	107	116	125	134	143	152	161	170	179	188	196
2900	78	86	95	103	112	121	129	138	147	155	164	172	181	190
3000	75	83	92	100	108	117	125	133	142	150	158	167	175	183
3100	73	81	89	97	105	113	121	129	137	145	153	161	169	178
3200	70	78	86	94	102	109	117	125	133	141	148	156	164	172
3300	68	76	83	91	98	106	114	121	129	136	144	152	159	167
3400	66	74	81	88	96	103	110	118	125	132	140	147	154	162
3500	64	71	79	86	93	100	107	114	121	129	136	143	150	157
3600	63	69	76	83	90	97	104	111	118	125	132	139	146	153
3700	61	68	74	81	88	95	101	108	115	122	128	135	142	149
3800	59	66	72	79	86	92	99	105	112	118	125	132	138	145
3900	58	64	71	77	83	90	96	103	109	115	122	128	135	141
4000	56	63	69	75	81	88	94	100	106	113	119	125	131	138
4100	55	61	67	73	79	85	91	98	104	110	116	122	128	134
4200	54	60	65	71	77	83	89	95	101	107	113	119	125	131
4300	52	58	64	70	76	81	87	93	99	105	110	116	122	128
4400	51	57	63	68	74	80	85	91	97	102	108	114	119	125
4500	50	56	61	67	72	78	83	89	94	100	106	111	117	122
4600	49	54	60	65	71	76	82	87	92	98	103	109	114	120
4700	48	53	59	64	69	74	80	85	90	96	101	106	112	117
4800	47	52	57	63	68	73	78	83	89	94	99	104	109	115
4900	46	51	56	61	66	71	77	82	87	92	97	102	107	112
5000	45	50	55	60	65	70	75	80	85	90	95	100	105	110
5100	44	49	54	59	64	69	74	78	83	88	93	98	103	108
5200	43	48	53	58	63	67	72	77	82	87	91	96	101	106
5300	42	47	52	57	61	66	71	75	80	85	90	94	99	104
5400	42	46	51	56	60	65	69	74	79	83	88	93	97	102
5500	41	45	50	55	59	64	68	73	77	82	86	91	95	100
5600	40	45	49	54	58	63	67	71	76	80	85	89	94	98
5700	39	44	48	53	57	61	66	70	75	79	83	88	92	96
5800	39	43	47	52	56	60	65	69	73	78	82	86	91	95
5900	38	42	47	51	55	59	64	68	72	76	81	85	89	93
6000	38	42	46	50	54	58	63	67	71	75	79	83	88	92
6100	37	41	45	49	53	57	61	66	70	74	78	82	86	90
6200	36	40	44	48	52	56	60	65	69	73	77	81	85	89
6300	36	40	44	48	52	56	60	63	67	71	75	79	83	87

Continued on next page

AG,OUO6023,1133 -19-21JUL00-2/4

	DESIRED POPULATION (seeds per hectare in thousands)													
SEEDS kg	225	250	275	300	325	350	375	400	425	450	475	500	525	550
6400	35	39	43	47	51	55	59	63	66	70	74	78	82	86
6500	35	38	42	46	50	54	58	62	65	69	73	77	81	85
6600	34	38	42	45	49	53	57	61	64	68	72	76	80	83
6700	34	37	41	45	49	52	56	60	63	67	71	75	78	82
6800	33	37	40	44	48	51	55	59	63	66	70	74	77	81
6900	33	36	40	43	47	51	54	58	62	65	69	72	76	80
7000	32	36	39	43	46	50	54	57	61	64	68	71	75	79
7100	32	35	39	42	46	49	53	56	60	63	67	70	74	77
7200	31	35	38	42	45	49	52	56	59	63	66	69	73	76
7300	31	34	38	41	45	48	51	55	58	62	65	68	72	75
7400	30	34	37	41	44	47	51	54	57	61	64	68	71	74
7500	30	33	37	40	43	47	50	53	57	60	63	67	70	73
7600	30	33	36	39	43	46	49	53	56	59	63	66	69	72
7700	29	32	36	39	42	45	49	52	55	58	62	65	68	71
7800	29	32	35	38	42	45	48	51	54	58	61	64	67	71
7900	28	32	35	38	41	44	47	51	54	57	60	63	66	70
8000	28	31	34	38	41	44	47	50	53	56	59	63	66	69
8100	28	31	34	37	40	43	46	49	52	56	59	62	65	68
8200	27	30	34	37	40	43	46	49	52	55	58	61	64	67
8300	27	30	33	36	39	42	45	48	51	54	57	60	63	66
8400	27	30	33	36	39	42	45	48	51	54	57	60	63	65
8500	26	29	32	35	38	41	44	47	50	53	56	59	62	65
8600	26	29	32	35	38	41	44	47	49	52	55	58	61	64
8700	26	29	32	34	37	40	43	46	49	52	55	57	60	63
8800	26	28	31	34	37	40	43	45	48	51	54	57	60	63
8900	25	28	31	34	37	39	42	45	48	51	53	56	59	62
9000	25	28	31	33	36	39	42	44	47	50	53	56	58	61
9100	25	27	30	33	36	38	41	44	47	49	52	55	58	60
9200	24	27	30	33	35	38	41	43	46	49	52	54	57	60
9300	24	27	30	32	35	38	40	43	46	48	51	54	56	59
9400	24	27	29	32	35	37	40	43	45	48	51	53	56	59
9500	24	26	29	32	34	37	39	42	45	47	50	53	55	58
9600	23	26	29	31	34	36	39	42	44	47	49	52	55	57
9700	23	26	28	31	34	36	39	41	44	46	49	52	54	57
9800	23	26	28	31	33	36	38	41	43	46	48	51	54	56
9900	23	25	28	30	33	35	38	40	43	45	48	51	53	56
10000	23	25	28	30	33	35	38	40	43	45	48	50	53	55
10100	22	25	27	30	32	35	37	40	42	45	47	50	52	54
10200	22	25	27	29	32	34	37	39	42	44	47	49	51	54

Continued on next page

AG,OUO6023,1133 -19-21JUL00-3/4

	DESIRED POPULATION (seeds per hectare in thousands)													
SEEDS kg	225	250	275	300	325	350	375	400	425	450	475	500	525	550
10300	22	24	27	29	32	34	36	39	41	44	46	49	51	53
10400	22	24	26	29	31	34	36	38	41	43	46	48	50	53
10500	21	24	26	29	31	33	36	38	40	43	45	48	50	52
10600	21	24	26	28	31	33	35	38	40	42	45	47	50	52

NOTE: Chart continued on next page.

AG,OUO6023,1133 -19-21JUL00-4/4

Pounds of Seed Per Acre—Soybeans

	DESIRED SEEDS PER ACRE					
SEEDS/LB	100,000	120,000	140,000	160,000	180,000	200,000
2,000	50	60	70	80	90	100
2,100	48	57	67	76	86	95
2,200	46	55	64	73	82	91
2,300	44	53	61	70	78	87
2,400	42	50	58	67	75	83
2,500	40	48	56	64	72	80
2,600	38	46	54	62	69	77
2,700	37	44	52	59	67	74
2,800	36	43	50	57	64	71
2,900	35	41	48	55	62	69
3,000	34	40	47	53	60	67
3,100	33	39	45	52	58	65
3,200	32	38	44	50	56	63
3,300	31	36	42	48	55	61
3,400	30	35	41	47	53	59
3,500	29	34	40	46	51	57

N44009 -19-11DEC91

NOTE: Refer to ADJUSTING FOR SEED GERMINATION for additional information.

NOTE: Refer to ADJUSTING FOR SEED GERMINATION for additional information.

AG,OUO6023,1135 -19-21JUL00-1/1

Kilograms of Seeds Per Hectare—Soybeans

Seeds/kg	DESIRED SEEDS PER HECTARE					
	247,000	296,400	345,800	395,200	444,600	494,000
4400	56	67	78	90	100	112
4620	54	64	75	85	96	106
4840	52	62	72	82	92	102
5060	49	59	68	78	87	97
5280	47	56	65	75	84	93
5500	45	54	63	72	81	90
5720	43	52	60	69	77	86
5940	41	49	58	66	75	83
6160	40	48	56	64	72	80
6380	39	46	54	62	69	77
6600	38	45	53	59	67	75
6820	37	44	50	58	65	72
7040	36	43	49	56	63	71
7260	35	40	47	54	62	68
7480	34	39	46	53	59	66
7700	32	38	45	52	57	64

NOTE: Refer to ADJUSTING FOR SEED GERMINATION for additional information.

AG,OUO6023,1135 –19–21JUL00–1/1

Seeds Per Foot Per Row—Soybeans

ROW SPACING (Inches)	DESIRED POPULATION (seeds per acre in thousands)															
	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
6	1.1	1.3	1.4	1.5	1.6	1.7	1.8	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.8	2.9
7.5	1.4	1.6	1.7	1.9	2.0	2.2	2.3	2.4	2.6	2.7	2.9	3.0	3.2	3.3	3.4	3.6
10	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8
12	2.3	2.5	2.8	3.0	3.2	3.4	3.7	3.9	4.1	4.4	4.6	4.8	5.1	5.3	5.5	5.7
15	2.9	3.2	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.7	6.0	6.3	6.6	6.9	7.2

NOTE: Refer to ADJUSTING FOR SEED GERMINATION for additional information.

AG,OUO6023,1136 –19–21JUL00–1/1

A41819 –19–29AUG97

Seeds Per Meter Per Row—Soybeans

	Desired Population (seeds per hectare in thousands)															
Row Spacing (cm)	247	271.7	296.4	321.1	345.8	370.5	395.2	419.9	444.6	469.3	494	518.7	543.4	568.1	592.8	617.5
15.2	3.6	4.3	4.6	5.0	5.3	5.6	5.9	6.6	6.9	7.3	7.6	7.9	8.3	8.6	9.2	9.6
19	4.6	5.3	5.6	6.3	6.6	7.3	7.6	7.9	8.6	8.9	9.6	9.9	10.6	10.9	11.2	11.9
25.4	6.3	6.9	7.6	8.3	8.9	9.6	10.2	10.9	11.2	11.9	12.5	13.2	13.9	14.5	15.2	15.8
30.5	7.6	8.3	9.2	9.9	10.6	11.2	12.2	12.9	13.5	14.5	15.2	15.8	16.9	17.5	18.2	18.8
38.1	9.6	10.6	11.2	12.2	13.2	14.2	15.2	16.2	17.2	18.2	18.8	19.8	20.8	21.8	22.8	23.8

NOTE: Refer to *ADJUSTING FOR SEED GERMINATION* for additional information.

AG,OUO6023,1136 -19-21JUL00-1/1

Pounds of Seed Per Acre for Desired Plants Per Acre—Sunflowers

	PLANTS PER ACRE											
	11,000	12,000	14,000	16,000	18,000	20,000	21,000	22,000	23,000	24,000	25,000	
KERNELS/LB												
4,000	2.7	3.0	3.5	4.0	4.5	5.0	5.2	5.5	5.7	6.0	6.2	
4,500	2.4	2.6	3.1	3.5	4.0	4.4	4.6	4.8	5.1	5.3	5.5	
5,000	2.2	2.4	2.8	3.2	3.6	4.0	4.2	4.4	4.6	4.8	5.0	
5,500	2.0	2.1	2.5	2.9	3.2	3.6	3.8	4.0	4.1	4.3	4.5	
6,000	1.8	2.0	2.3	2.6	3.0	3.3	3.5	3.6	3.8	4.0	4.1	
6,500	1.6	1.8	2.1	2.4	2.7	3.0	3.2	3.3	3.5	3.6	3.8	
7,000	1.5	1.7	2.0	2.2	2.5	2.8	3.0	3.1	3.2	3.4	3.5	
7,500	1.4	1.6	1.8	2.1	2.4	2.6	2.8	2.9	3.0	3.2	3.3	
8,000	1.3	1.5	1.7	2.0	2.2	2.5	2.6	2.7	2.8	3.0	3.1	
8,500	1.2	1.4	1.6	1.8	2.1	2.3	2.4	2.5	2.7	2.8	2.9	
9,000	1.2	1.3	1.5	1.7	2.0	2.2	2.3	2.4	2.5	2.6	2.7	
9,500	1.1	1.2	1.4	1.6	1.8	2.1	2.2	2.3	2.4	2.5	2.6	
10,000	1.1	1.2	1.4	1.6	1.8	2.0	2.1	2.2	2.3	2.4	2.5	
10,500	1.0	1.1	1.3	1.5	1.7	1.9	2.0	2.0	2.1	2.2	2.3	
11,000	1.1	1.1	1.2	1.4	1.6	1.8	1.9	2.0	2.0	2.1	2.2	

N44011 -19-11DEC91

NOTE: Refer to *ADJUSTING FOR SEED GERMINATION* for additional information.

AG,OUO6023,1137 -19-21JUL00-1/1

Adjusting for Seed Germination

To compensate for seed germination, use the following formula to adjust kg/hectare (lbs/acre).

FORMULA:

Desired kg/hectare (lbs/acre) divided by % Germination = Actual kg/hectare (lbs/acre) required.

EXAMPLE: Based on 73 kg/hectare (65 lbs/acre) desired from 90% germination.

$73 \text{ kg/hectare (65 lbs/acre)} \div .90 = 81 \text{ kg/hectare (72 lbs/acre)}$

AG,OUO6023,1138 -19-21JUL00-1/1

Custom Products—Unlisted Products

IMPORTANT: Do not use granular herbicide or pesticide with air cart.

IMPORTANT: If the product you are wanting to air seed does not appear in the rate charts or monitor, contact your John Deere Dealer for product use recommendations.

Rate charts show settings for products that are most commonly air seeded. Corn is listed in the hi-volume meter rate chart. However, seeding corn is not recommended when seed singulation and precision spacing is required. If the product you are wanting to air seed does not appear in the rate charts or monitor, contact your John Deere Dealer for product use recommendations.

AG,OUO6023,1139 -19-21JUL00-1/1

Emptying Front and Rear Tanks Simultaneously (lb/acre)

Drive Box Setting	46-0-0 Fertilizer	11-52-0 Fertilizer	Barley	Flax	Laird Lentils	Oats	Century Peas	Rye	Soybeans	Sorghum	Wheat
6											
7										10	11
8										11	12
9								14		12	14
10	10	16		11				16	16	14	15
12	12	20	15	13	17		18	19	19	16	18
14	14	23	18	15	20		21	22	22	19	21
16	16	26	20	17	22		24	25	25	22	24
18	18	29	23	20	25		27	28	28	25	27
20	20	33	25	22	28		30	31	31	27	30
22	21	36	28	24	31	20	33	34	34	30	33
24	23	39	30	26	34	21	36	37	38	33	36
26	25	42	33	28	36	23	39	40	41	36	39
28	27	46	35	30	39	25	42	43	44	38	42
30	29	49	38	32	42	27	45	46	47	41	45
32	31	52	40	35	45	29	48	49	50	44	48
34	33	55	43	37	47	30	51	53	53	46	51
36	35	58	45	39	50	32	54	56	56	49	54
38	37	62	48	41	53	34	57	59	59	52	57
40	39	65	50	43	56	36	59	62	63	55	60
42	41	68	53	45	59	37	62	65	66	57	63
44	43	71	55	47	61	39	65	68	69	60	66
46	45	75	58	50	64	41	68	71	72	63	69
48	47	78	60	52	67	43	71	74	75	65	72
50	49	81	63	54	70	44	74	77	78	68	75
52	51	84	65	56	72	46	77	80	81	71	78
54	53	88	68	58	75	48	80	83	84	74	81
56	55	91	70	60	78	50	83	86	87	76	84
58	56	94	73	63	81	52	86	89	91	79	87
60	58	97	75	65	84	53	89	92	94	82	90
62	60	101	77	67	86	55	92	96	97		93
64	62	104	80	69	89	57	95	99	100		96

A41867 -19-08AUG97

Front and rear tanks can be set to empty simultaneously when applying one product. Total application rate (lbs/acre) is split between the two tanks and meter settings adjusted for the proper ratio.

actual meter segment types on your machine and use corresponding charts to make ratio calculations and rate setting adjustments.

Cart	Front/Rear Ratio
At 100% Capacity	40/60

NOTE: Example based on a desired application rate of 101 lbs/acre of 11-52-0 fertilizer with tanks filled to capacity.

IMPORTANT: Sample chart illustrated. Do not use to calibrate machine setting.

EXAMPLE:

This non-typical example is based on the same meter segment type being used in both tanks. Determine

Front Tank—100 (lbs/acre) x .40 = 40.4 (lbs/acre)
Rear Tank—100 (lbs/acre) x .60 = 60.6 (lbs/acre)

Continued on next page

AG,OUO6023,1140 -19-21JUL00-1/2

Total Application— $60.6 + 40.4 = 101$ lbs/acre

Use individual application rates to set front (A) and rear (B) metering as close as possible to total application rate. 39 is the closest match to the front

tanks computation of 40.4 (lbs/acre). 24 would be the drive box setting for the front tank. 62 is the closest match to the rear tanks computation of 60.6 (lbs/acre). 38 would be the drive box setting for the rear tank.

AG,OUO6023,1140 –19–21JUL00–2/2

Emptying Front and Rear Tanks Simultaneously (kg/hectare)

LOW RATE METER (BLACK)						
KILOGRAMS PER HECTARE						
1 OF 3						
Drive Box Setting	11-52-0	33-0-0	46-0-0	Barley	Canary Grass	Cotton
6					13.9	8.8
7					16.2	10.2
8					18.4	11.7
9					20.7	13.1
10	17.8	13.8	11.1		23.0	14.6
12	21.3	16.5	13.3	17.1	27.5	17.4
14	24.8	19.2	15.5	19.9	32.1	20.3
16	28.3	22.0	17.7	22.7	36.6	23.2
18	31.8	24.7	19.9	25.5	41.1	26.1
20	35.3	27.4	22.0	28.3	45.7	28.9
22	38.8	30.1	24.2	31.1	50.2	31.8
24	42.2	32.9	26.4	33.9	54.8	34.7
26	45.9	35.6	28.6	36.8	59.3	37.6
28	49.4	38.3	30.8	39.6	63.8	40.4
30	52.9	41.0	33.0	42.4	68.4	43.3
32	56.4	43.8	35.2	45.2	72.9	46.2
34	59.9	46.5	37.4	48.0	77.5	49.1
36	63.4	49.2	39.6	50.8	82.0	52.0
38	66.9	51.9	41.8	53.6	86.5	54.8
40	70.4	54.7	44.0	56.5	91.1	57.7
42	74.0	57.4	46.1	59.3		60.6
44	77.5	60.1	48.3	62.1		63.5

A46843 -19-15NOV00

Front and rear tanks can be set to empty simultaneously when applying one product. Total application rate (kg/hectare) is split between the two tanks and meter settings adjusted for the proper ratio.

Cart	Front/Rear Ratio
At 100% Capacity	40/60

IMPORTANT: Sample chart illustrated. Do not use to calibrate machine setting.

This non-typical example is based on the same meter segment type being used in both tanks. Determine actual meter segment types on your

machine and use corresponding charts to make ratio calculations and rate setting adjustments.

NOTE: Example based on a desired application rate of 112 kg/hectare of 11-52-0 fertilizer with tanks filled to capacity.

EXAMPLE:

Front Tank—112 kg/hectare x .40 = 44.8 kg/hectare

Rear Tank—112 kg/hectare x .60 = 67.2 kg/hectare

Total Application—67.2 + 44.8 = 112 kg/hectare

AG,OUO6023,1140 -19-21JUL00-1/2

Use individual application rates to set front (A) and rear (B) metering as close as possible to total application rate. 45.9 is the closest match to the front tanks computation of 44.8 kg/hectare. 26 would be the

drive box setting for the front tank. 66.9 is the closest match to the rear tanks computation of 67.2 kg/hectare. 38 would be the drive box setting for the rear tank.

AG,OUO6023,1140 -19-21JUL00-2/2

Understanding Meter Settings

The following factors affect product delivery as shown in the rate charts.

1. Physical Characteristics—Two bags of seed that weigh the same may hold different quantities of seed because of moisture content, trash, unfilled kernels, or simple seed size.
2. Drive Wheel Circumference—Tire size, air pressure, field condition and ground speed all affect seeding rate.
3. Operator Judgement—Land contains more or less area than assumed. Overlapping rows or leaving too wide a space between rows.

4. Machine Settings—Accuracy in setting meter drive transmissions.

IMPORTANT: Application rate-to-transmission setting data shown on the rate charts was established with meter segment tuning rings installed.

IMPORTANT: For 38 cm (15 in.) Row Spacing Only—Transmission speed setting shown on Rate Chart **MUST** be doubled for this row spacing.

AG,OUO6023,1141 –19–21JUL00–1/1

Air Cart Set-Up Mode—Target Seeding Speed

Target speed is the speed at which you intend to seed.

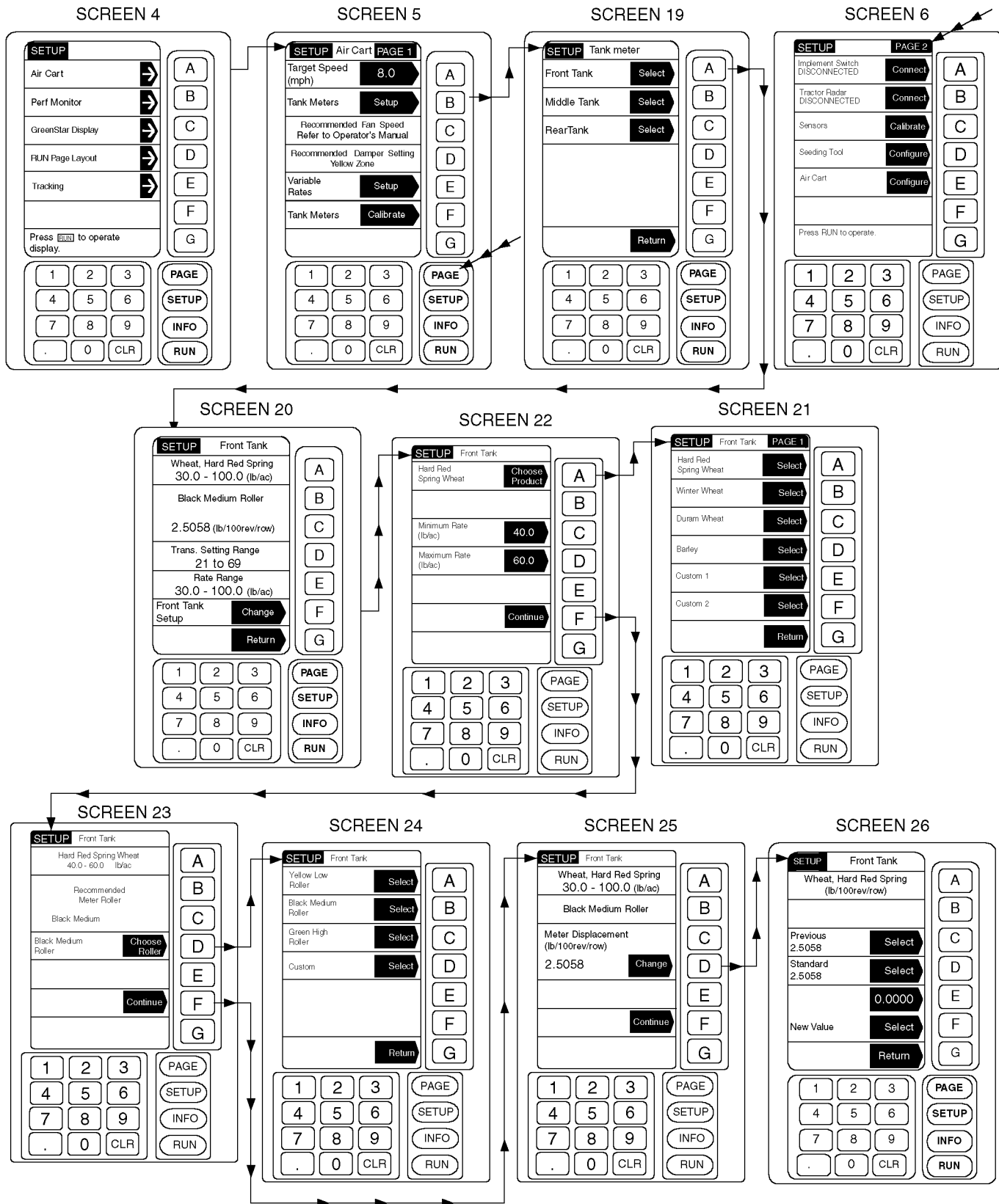
1. From any screen, press SETUP.
2. From the list given, choose Air Cart.

IMPORTANT: John Deere Seeding Tools should not be operated above 13 km/h (8 mph).

3. Press key A to change the target seeding speed. This is the approximate machine speed while seeding. Enter number (2 to 12). Press key A to accept.

AG,OUO6023,1142 –19–21JUL00–1/1

Air Cart Set-Up Mode—Tank Meter Set-Up



Continued on next page

AG,OUO6023,1143 -19-21JUL00-1/3

1. From any screen, press SETUP.
2. From the list given, choose Air Cart.
3. From Tank Meter Setup screen, press key A, B, or C if the cart is equipped with a Middle Tank to choose which tank to setup.
4. A summary page for this tank is presented. The summary page includes product, application rate, roller type, and meter displacement value. Press key F to change the setup.
5. Press key A to choose a new product.
6. From the menu presented, choose a product (A-F), or press PAGE to advance to the next set of product choices (a total of eight pages), or press key G to return without selecting a product.

When product selection is entered, the following values are made available.

- Recommended Roller
- Meter Displacement (lb/100 rev/row)
- Recommended Damper Setting Zone (At Double-Shoot Plenum)

NOTE: If rates are mis-keyed, a message will inform user that Max must be larger than Min value entered.

7. If variable rate is enabled, Min and Max rates are setup by pressing key C or D, entering the Min. or Max. application rate in pounds-per-hectare (acre), and then pressing key C or D again to accept. If the cart is not equipped with the Variable Rate option, only the desired application rate, or target rate can be entered.
8. Press key F to continue.
9. Press key D to choose the meter roller. A recommended roller for the target rate is presented

on the previous screen. If no roller can be recommended, a message will indicate so.

NOTE: Be sure the selected roller is the actual roller metering product from this tank.

10. Select the correct roller from the menu presented (A—D). Custom rollers are very seldom used and proper calibration is critical when using custom rollers.
11. Press key F to continue.

IMPORTANT: Some product choices may not yet be loaded in the Standard value table, and **MUST** be determined by Calibration of the Tank Meter. In every situation, for the most accurate Meter Displacement Value (weight per 100 meter revolutions per row) the Tank Meter Calibration must be performed.

12. Press key D to select a meter displacement value. There are three different values that can be used. “**Previous**”, a value that had previously been used for this tank, “**Standard**”, a value for this particular meter and product combination from a table saved in the controller’s memory, or “**New Value**”, obtained by other means such as a previous calibration.

“**New Value**” is manually entered, if so desired, but must first be calculated using the sample weight obtained from meter calibration and the following formula. Note that meter turns, not crank turns, are used in this calculation.

$$\{\text{Weighed Sample kg (lb)} \div \text{meter turns}\} \times (100 \div \text{rows}) = \text{Displacement Value}$$

EXAMPLE: $\{5.74 \text{ kg (12.65 lb)} \div 15\} \times (100 \div 41) = .93 \text{ (2.06)}$

IMPORTANT: If Previous and Standard are both zero and a New Value is not known, select Standard even if it is zero.

13. Press key C to select Previous, press key D to select Standard, or press key E, enter a value, press key E again to accept the value, and then press key F to select New Value.

14. Press key F to continue.

15. The tank summary screen is then displayed. If everything is set to the conditions desired, press

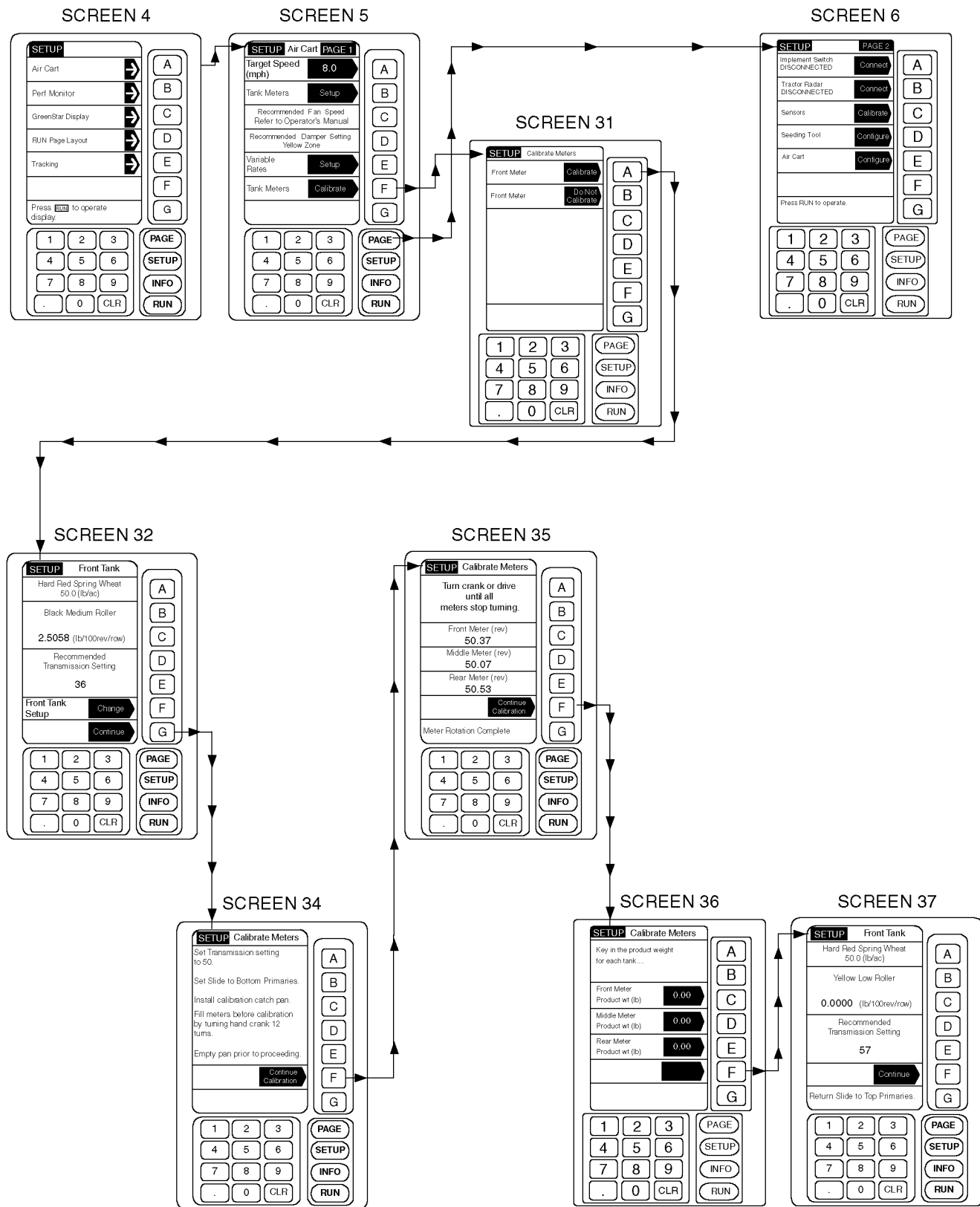
key G to return to the Tank Meter Setup Screen and choose the next Tank. If not, start at Step 4 again.

16. Repeat Steps 3 thru 15 until all tank meters are configured to the desired conditions.

17. Press key G to return to the Air Cart Setup Page 1.

AG,OUO6023,1143 -19-21JUL00-3/3

Air Cart Set-Up Mode—Calibrate Meters



Continued on next page

AG,OUO6023,1144 -19-21JUL00-1/7

IMPORTANT: Certain products, such as some cereal grains, can settle in the bottom of the tank after filling or transport. This may alter product flow during initial calibration. In such cases, it may be advisable to recalibrate the meter after seeding first 2 hectares (five acres). This will ensure a consistent product flow into the meter during calibration, and yield the most accurate transmission setting.

1. From any screen press SETUP.
2. From the list given, choose Air Cart.
3. From Air Cart Setup Page 1, press key F to advance to the calibration screen.

4. Press key A to calibrate the front meter, press key B to decline. This determines whether or not the front tank clutch will be engaged when calibration begins. Make sure only the desired meter is selected. Otherwise, product will plug or spill out of the other meter(s) unnecessarily.

NOTE: An extra catch pan is required if more than one tank is calibrated at once.

5. A summary screen is displayed for the tank meter selected for calibration. If the tank meter setup shown is correct, press key G to continue. If not, press key F and see AIR CART SET-UP MODE—TANK METER SET-UP, Steps 4—15.
6. Repeat Steps 4 and 5 for all tanks.

Continued on next page

AG,OUO6023,1144 —19–21JUL00–2/7

7. Hang empty bag (A) from scale (B) and reset scale to "0" (zero) by turning knob on top of scale. Setting scale to "0" (zero) will ensure that measured weight is of collected sample only, and does not include the weight of the bag.

NOTE: Make sure there is sufficient product in tank to collect a measurable sample. Product should cover all meter inlets and not be heaped to one side. Half-width disconnect handles must be fully down for accurate meter calibration.

8. Follow on-screen instructions:

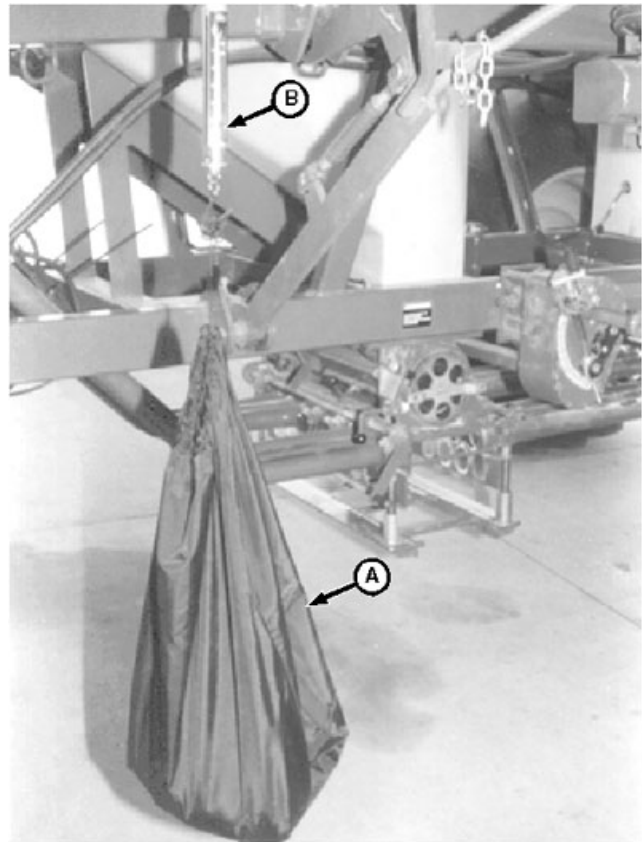
- **SET TRANSMISSION SETTING TO 50.**

NOTE: See *ADJUSTING METER SEED TRANSMISSIONS* in *Operating Machine—Setting Metering Rates* section.

- **SET SLIDE TO BOTTOM PRIMARIES** (Stationary Double-Shoot only).

NOTE: Before returning to normal operation, ensure slide on stationary double-shoot manifold is in proper position.

- **INSTALL CALIBRATION CATCH PAN:**



A—Collection Bag
B—Scale

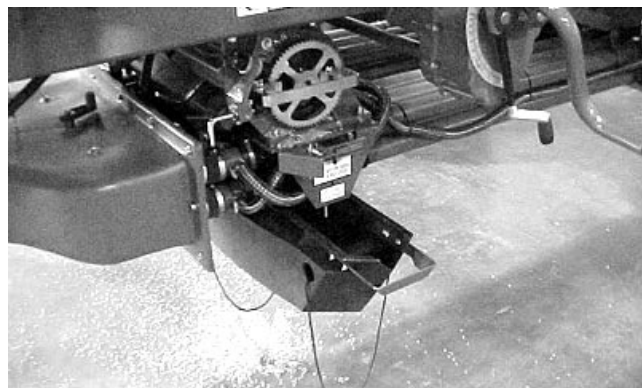
A41554 -JUN-14APR97

AG,OUO6023,1144 -19-21JUL00-3/7

Remove cover plate from bottom of manifold.

Slide collection pan, squared end first, in from left hand side of manifold using the provided rails.

- **FILL METERS BEFORE CALIBRATION BY TURNING HAND CRANK 12 TURNS:**



Collection Pan—SDS

A46133 -JUN-10JUL00

Continued on next page

AG,OUO6023,1144 -19-21JUL00-4/7

NOTE: On two-tank carts, crank handle is factory installed on front transmission. On carts with optional middle tank, crank handle is installed on middle-tank transmission.

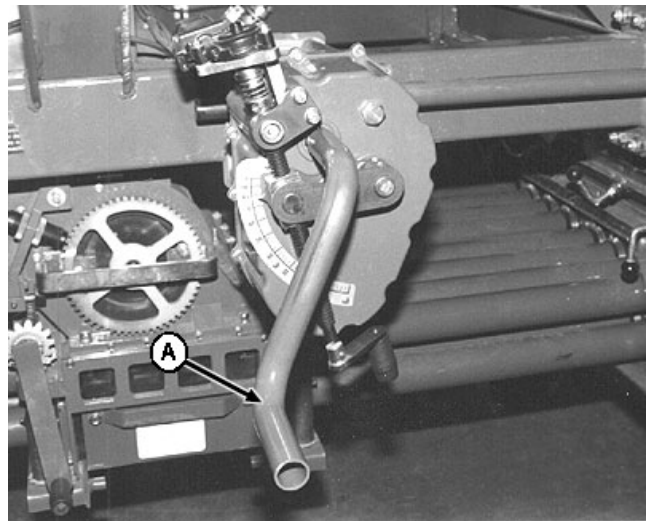
Leave crank handle in factory installed position to avoid contacting frame or other components during meter calibration.

Noting starting point, turn crank handle (A) counterclockwise counting 12 full 360° turns. All transmissions and driveshafts turn when crank handle is turned.

- **EMPTY PAN PRIOR TO PROCEEDING.**

9. Press key F to continue calibration. A screen is presented that provides additional instructions and shows the revolutions accumulated for each meter. Follow instructions on screen.

- **TURN CRANK OR DRIVE UNTIL ALL METERS STOP TURNING:**



Two Tank Cart Shown

A—Crank Handle

Continued on next page

AG,OUO6023,1144 -19-21JUL00-5/7

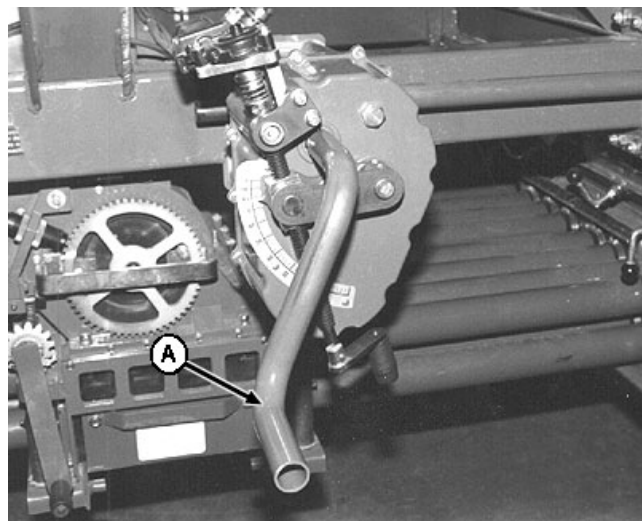
IMPORTANT: Turning crank handle clockwise will result in an inaccurate meter calibration.

NOTE: Check product level occasionally; do not overfill pan.

Turn crank handle (A) counterclockwise or drive the tractor ahead until all meters have stopped turning. All transmissions and driveshafts turn when crank handle is turned.

10. Remove the catch pan and pour contents into collection bag.

A—Crank Handle



Two Tank Cart Shown

Continued on next page

AG,OUO6023,1144 -19-21JUL00-6/7

Hang filled collection bag (A) from scale (B) and weigh product.

11. Press key F to continue calibration.

A screen is presented that provides additional instructions.

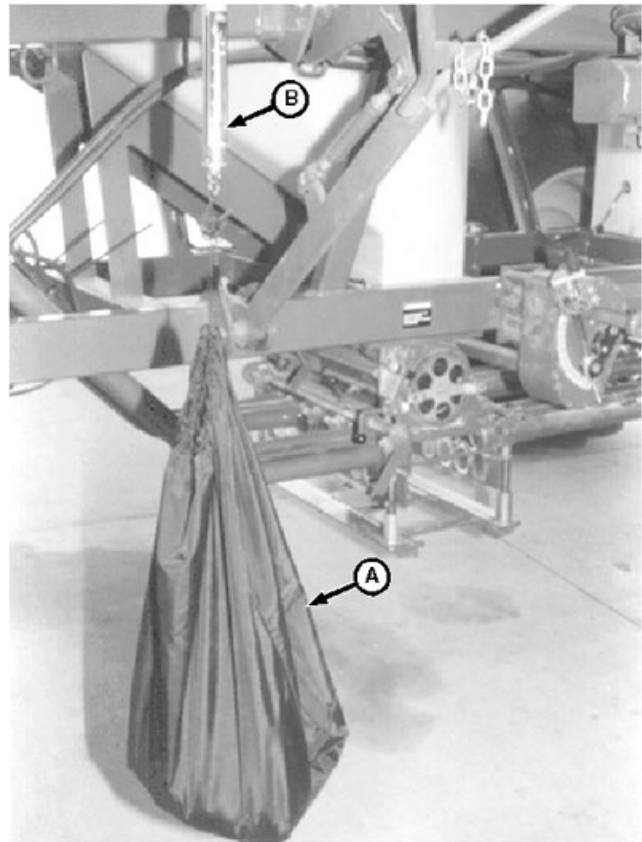
Follow instructions on screen.

- **Key in the product weight for each tank....**
Enter product weight for each tank into the monitor by pressing the appropriate key C—E and entering the weight collected. Press key C—E again to accept.

12. Press key F to continue the calibration.

13. Review each meters summary screen for recommended transmission setting. Set transmission setting for each meter calibrated, if the cart is not equipped with the variable rate option. Variable rate transmissions will adjust when seeding begins.

An advisory message will display if no valid transmission setting can deliver product at previously entered target rate.



A—Collection Bag
B—Scale

A41554 —UN-14APR97

AG,OUO6023,1144 —19-21JUL00-7/7

Variable Rate Control System

Variable rate control allows the operator to increase or decrease product application rates without leaving the tractor cab by changing rate settings through the GREENSTAR™ display console (A). Rate settings are not adjusted individually, but in combination with other tank(s), through use of operator built menus. Refer to SET-UP MODE—VARIABLE RATE in this section for further information.

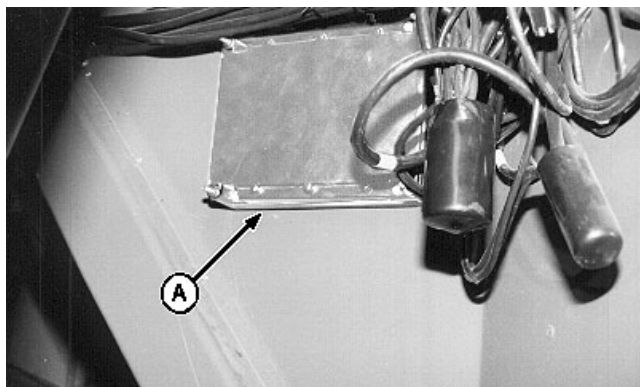
A—GREENSTAR™ Display Console



A41529 —UN-10APR97

When cart is equipped with optional rate control, standard SEEDSTAR™ controller is replaced with an expanded controller (A) containing software to operate and monitor this function.

A—Expanded Controller



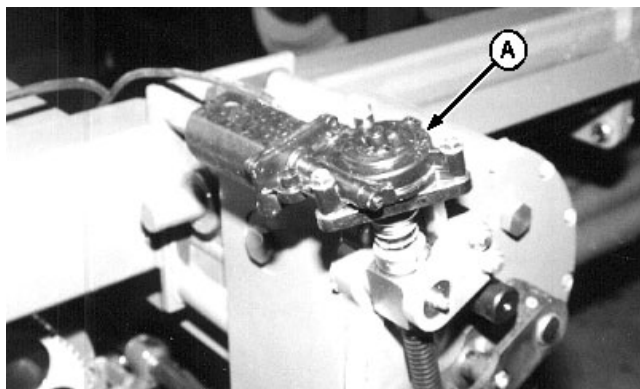
A46388 -UN-19JUL00

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AG,OUO6023,1145 -19-21JUL00-2/3

Changing rate settings energizes the transmission mounted rate motor (A), turning adjustment screw to increase or decrease transmission output speed and application rate to agree with operator's selection.

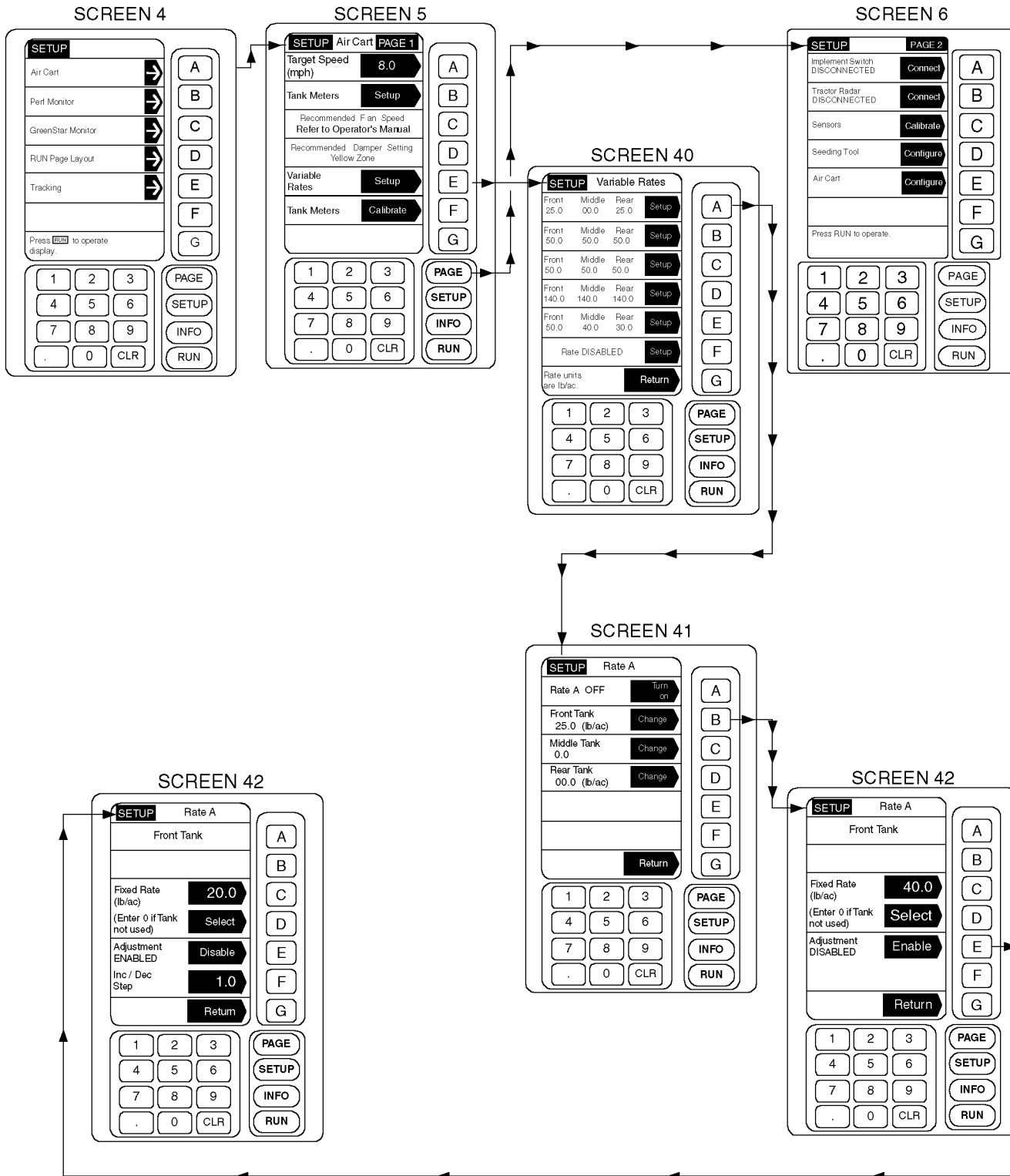
A—Transmission Mounted Rate Motor



A41861 -UN-18JUL97

AG,OUO6023,1145 -19-21JUL00-3/3

Set-Up Mode—Variable Rate



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AG,OUO6023,1146 -19-21JUL00-1/2

Variable rate set-up is a menu building process where up to six different application rate combinations are entered into memory.

Memory entries are recalled and selected from the menu in "RUN" mode. When a rate change is desired, the operator selects a new combination of rate(s) from the menu, which changes the transmission speed setting to achieve the desired application rate(s).

1. Press SETUP; then select Air Cart.
2. From Air Cart Setup Page 1, press key E to setup variable rates. The Setup Variable Rates screen is where the rates are defined. If no rates are defined, a "No Rates Defined" message will be displayed on the RUN screen.
3. To define a rate, press key A—F.
4. Press key B—D to setup or change the target application rate for one of the tanks.
5. Press key C, enter a fixed rate, and press key C to accept. Press key D to select this rate and enable it.
6. Press key E to enable the adjustment feature. This option allows adjustment of the target rate from the run page. When this option is enabled, a minimum step value must be entered. Press key F to enter value.
7. Repeat Steps 4—6 for each tank.
8. Press key A to turn the rate ON. This will allow the rate to be selected from the RUN screen.
9. Press key G to return.
10. For each desired rate or set of rates, repeat Steps 3 through 9.
11. Press key G to return to the Air Cart Setup Page 1.

AG,OUO6023,1146 —19-21JUL00-2/2

Using Rate Charts

IMPORTANT: Application rate-to-transmission setting data shown on the rate charts was established with meter segment tuning rings installed. Tuning rings must be installed to use these charts.

IMPORTANT: If the product you are wanting to air seed does not appear in the rate charts or monitor, contact your John Deere Dealer for product use recommendations.

IMPORTANT: Do not use granular herbicide or pesticide with air cart.

The provided rate charts are used to determine transmission setting number for the product in use and type (color) of segments installed in meter cartridge.

EXAMPLE:

Example based on a desired application rate of 27.5 kg/hectare (25 lbs/acre) of Alfalfa using the low rate (yellow) meter segments.

Finding the Alfalfa column on the Low Rate (Yellow) Meter chart and following it down to the application rate 27.5 kg/hectare (25 lbs/acre), we find that the drive box setting is 62.

AG,OUO6023,1147 —19-21JUL00-1/1

Rate Chart (Pounds-Per-Acre)—Low Rate (Yellow) Meter

LOW RATE METER (YELLOW) POUNDS PER ACRE 1 OF 3						
Drive Box Setting	11-52-0	46-0-0	Alfalfa	Canola, Arg.	Canola, Polish	Canary Grass
6		3.0		2.3	2.1	
7		3.5		2.7	2.4	
8		4.0		3.1	2.7	
9	5.7	4.5		3.5	3.1	
10	6.3	5.0	4.0	3.9	3.4	
12	7.5	6.0	4.8	4.6	4.1	
14	8.8	7.0	5.6	5.4	4.8	
16	10	8.0	6.4	6.2	5.4	
18	11	9.0	7.2	6.9	6.1	
20	13	9.9	8.0	7.7	6.8	
22	14	11	8.8	8.5	7.5	13
24	15	12	9.6	9.2	8.1	14
26	16	13	10	10	9	15
28	17	14	11	11	9	16
30	19	15	12	12	10	17
32	20	16	13	12	11	18
34	21	17	14		11	20
36	22	18	14		12	21
38	24	19	15			22
40	25	20	16			23
42	26	21	17			24
44	27	22	17			25
46	29	23	18			27
48	30	24	19			28
50	31	25	20			29
52	32	26	21			30
54	34	27	21			31
56	35	28	22			32
58	36	29	23			33
60	37	30	24			35
62	39	31	25			36
64	40	32				37
66		33				38
68		34				39
70		35				40
72		36				41
74		37				43
76		38				44
78		39				45
80		40				46
82		41				47
84		42				48
86		43				50
88		44				51
90		45				52
92		46				53
94		47				54
96		48				55

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AG,OUO6023,1148 -19-21JUL00-1/3

LOW RATE METER (YELLOW) POUNDS PER ACRE 2 OF 3						
Drive Box Setting	Cotton	Flax	Lentils, Indian Head	Millet	Mung Bean	Mustard, Yellow
6				2.8	4.4	3.1
7				3.2	5.1	3.6
8				3.7	5.8	4.1
9				4.1	6.5	4.7
10				4.6	7.2	5.2
12				5.5	8.6	6.2
14				6.4	10	7.2
16	10.0			7.3	11	8.2
18	11.3			8.2	13	9.2
20	12.5			9.1	14	10
22	14		13	10	16	11
24	15		15	11	17	12
26	16		16	12	19	13
28	17	12	17	13	20	14
30	19	13	18	14	21	15
32	20	14	20	15	23	16
34	21	15	21	15	24	17
36	22	16	22	16	26	18
38	24	17	23	17	27	19
40	25	18	24	18	29	20
42	26	19	26	19	30	21
44	27	20	27	20		23
46	29	20	28	21		24
48	30	21	29	22		25
50	31	22	31	23		26
52	32	23	32	24		27
54	34	24	33	25		28
56	35	25	34	25		29
58	36	26	35	26		30
60	37	27	37	27		31
62	39	27	38	28		
64	40	28	39	29		
66	41	29	40	30		
68	42	30	42	31		
70	44	31	43	32		
72	45	32	44	33		
74	46	33	45	34		
76	47	34	46	34		
78	48	35	48	35		
80	50	35	49	36		
82	51	36	50	37		
84	52	37	51	38		
86	53	38	53	39		
88	55	39	54	40		
90	56	40	55			
92	57	41	56			
94	58	42	57			
96	60		59			

A45902A -19-20JUL00

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AG,OUO6023,1148 -19-21JUL00-2/3

LOW RATE METER (YELLOW) POUNDS PER ACRE 3 OF 3					
Drive Box Setting	Sorghum, Sudangrass	Sunflower #1	Sunflower #4	Wheat, Durum	Wheat, Winter
6	2.1	1.8	2.4		
7	2.4	2.1	2.8		
8	2.8	2.4	3.2		
9	3.1	2.7	3.6		
10	3.5	3.0	3.9		
12	4.1	3.6	4.7		
14	4.8	4.2	5.5		
16	5.5	4.8	6.3		
18	6.2	5.4	7.1		11
20	6.9	6.0	7.8		12
22	7.6	6.6	8.6		13
24	8.2	7.2	9.4		14
26	9	7.7	10		16
28	10	8.3	11	20	17
30	10	8.9	12	21	18
32	11	10		23	19
34	12	10		24	20
36	12	11		25	22
38	13	11		27	23
40	14	12		28	24
42	14	12		30	25
44	15	13		31	26
46	16			33	28
48	16			34	29
50	17			35	30
52	18			37	31
54	18			38	32
56	19			40	34
58	20			41	35
60	21			42	36
62	21			44	37
64	22			45	38
66	23			47	39
68	23			48	41
70	24			49	42
72	25			51	43
74	25			52	44
76	26			54	45
78	27			55	47
80	27			57	48
82	28			58	49
84	29			59	50
86	29			61	51
88	30			62	53
90	31			64	54
92	31			65	55
94	32			66	56
96	33			68	57

A45903 -19-18FEB00

Rate Chart (Kilograms-Per-Hectare)—Low Rate (Yellow) Meter

LOW RATE METER (YELLOW)						
KILOGRAMS PER HECTARE						
1 OF 3						
Drive Box Setting	11-52-0	46-0-0	Alfalfa	Canola, Arg.	Canola, Polish	Canary Grass
6		3.4		2.6	2.3	
7		3.9		3.1	2.7	
8		4.5		3.5	3.1	
9	6.4	5.1		3.9	3.4	
10	7.1	5.6	4.5	4.3	3.8	
12	8.4	6.7	5.4	5.2	4.6	
14	9.8	7.8	6.3	6.0	5.3	
16	11.2	8.9	7.1	6.9	6.1	
18	12.6	10.0	8.0	7.8	6.8	
20	14.0	11.1	8.9	8.6	7.6	
22	15.4	12.2	9.8	9.5	8.3	14.2
24	16.8	13.4	10.7	10.3	9.1	15.5
26	18.2	14.5	11.6	11.2	9.9	16.8
28	19.6	15.6	12.5	12.0	10.6	18.1
30	21.0	16.7	13.4	12.9	11.4	19.4
32	22.4	17.8	14.2	13.8	12.1	20.7
34	23.8	18.9	15.1		12.9	22.0
36	25.2	20.0	16.0		13.6	23.3
38	26.5	21.1	16.9			24.6
40	27.9	22.2	17.8			25.8
42	29.3	23.3	18.7			27.1
44	30.7	24.4	19.6			28.4
46	32.1	25.5	20.4			29.7
48	33.5	26.6	21.3			31.0
50	34.9	27.7	22.2			32.3
52	36.3	28.8	23.1			33.6
54	37.7	30.0	24.0			34.9
56	39.1	31.1	24.9			36.1
58	40.5	32.2	25.8			37.4
60	41.9	33.3	26.7			38.7
62	43.3	34.4	27.5			40.0
64	44.6	35.5				41.3
66		36.6				42.6
68		37.7				43.9
70		38.8				45.2
72		39.9				46.4
74		41.0				47.7
76		42.1				49.0
78		43.2				50.3
80		44.3				51.6
82		45.5				52.9
84		46.6				54.2
86		47.7				55.5
88		48.8				56.8
90		49.9				58.0
92		51.0				59.3
94		52.1				60.6
96		53.2				61.9

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LOW RATE METER (YELLOW)						
KILOGRAMS PER HECTARE						
2 OF 3						
Drive Box Setting	Cotton	Flax	Lentis, Idian Head	Millet	Mung Bean	Mustard, Yellow
6				3.1	4.9	3.5
7				3.6	5.7	4.1
8				4.1	6.5	4.6
9				4.6	7.3	5.2
10				5.1	8.1	5.8
12				6.2	9.7	6.9
14				7.2	11.3	8.1
16	11.2			8.2	12.9	9.2
18	12.6			9.2	14.5	10.4
20	14.0			10.2	16.1	11.5
22	15.4		15.1	11.2	17.7	12.6
24	16.8		16.5	12.2	19.3	13.8
26	18.2		17.8	13.3	20.9	14.9
28	19.6	13.9	19.2	14.3	22.5	16.1
30	20.9	14.9	20.6	15.3	24.0	17.2
32	22.3	15.9	21.9	16.3	25.6	18.4
34	23.7	16.9	23.3	17.3	27.2	19.5
36	25.1	17.9	24.7	18.3	28.8	20.6
38	26.5	18.9	26.0	19.3	30.4	21.8
40	27.9	19.9	27.4	20.4	32.0	22.9
42	29.3	20.9	28.8	21.4	33.6	24.1
44	30.7	21.8	30.1	22.4		25.2
46	32.1	22.8	31.5	23.4		26.4
48	33.5	23.8	32.9	24.4		27.5
50	34.8	24.8	34.2	25.4		28.6
52	36.2	25.8	35.6	26.4		29.8
54	37.6	26.8	37.0	27.5		30.9
56	39.0	27.8	38.3	28.5		32.1
58	40.4	28.8	39.7	29.5		33.2
60	41.8	29.8	41.1	30.5		34.4
62	43.2	30.8	42.4	31.5		
64	44.6	31.7	43.8	32.5		
66	46.0	32.7	45.2	33.5		
68	47.4	33.7	46.5	34.6		
70	48.7	34.7	47.9	35.5		
72	50.1	35.7	49.3	36.6		
74	51.5	36.7	50.6	37.6		
76	52.9	37.7	52.0	38.6		
78	54.3	38.7	53.4	39.6		
80	55.7	39.7	54.7	40.7		
82	57.1	40.7	56.1	41.7		
84	58.5	41.6	57.5	42.7		
86	59.9	42.6	58.8	43.7		
88	61.3	43.6	60.2	44.7		
90	62.6	44.6	61.6			
92	64.0	45.6	62.9			
94	65.4	46.6	64.3			
96	66.8		65.7			

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LOW RATE METER (YELLOW)					
KILOGRAMS PER HECTARE					
3 OF 3					
Drive Box Setting	Sorghum, Sudangrass	Sunflower #1	Sunflower #4	Wheat, Durum	Wheat, Winter
6	2.3	2.0	2.7		
7	2.7	2.4	3.1		
8	3.1	2.7	3.5		
9	3.5	3.0	4.0		
10	3.9	3.4	4.4		
12	4.6	4.0	5.3		
14	5.4	4.7	6.2		
16	6.2	5.4	7.0		
18	6.9	6.0	7.9		12.1
20	7.7	6.7	8.8		13.5
22	8.5	7.3	9.6		14.8
24	9.2	8.0	10.5		16.1
26	10.0	8.7	11.4		17.5
28	10.8	9.3	12.3	22.2	18.8
30	11.5	10.0	13.1	23.8	20.1
32	12.3	10.7		25.4	21.5
34	13.0	11.3		27.0	22.8
36	13.8	12.0		28.5	24.2
38	14.6	12.7		30.1	25.5
40	15.3	13.3		31.7	26.8
42	16.1	14.0		33.3	28.2
44	16.9	14.6		34.9	29.5
46	17.6			36.4	30.8
48	18.4			38.0	32.2
50	19.2			39.6	33.5
52	19.9			41.2	34.9
54	20.7			42.8	36.2
56	21.5			44.3	37.5
58	22.2			45.9	38.9
60	23.0			47.5	40.2
62	23.7			49.1	41.5
64	24.5			50.7	42.9
66	25.3			52.2	44.2
68	26.0			53.8	45.6
70	26.8			55.4	46.9
72	27.6			57.0	48.2
74	28.3			58.6	49.6
76	29.1			60.1	50.9
78	29.9			61.7	52.2
80	30.6			63.3	53.6
82	31.4			64.9	54.9
84	32.2			66.5	56.3
86	32.9			68.1	57.6
88	33.7			69.6	58.9
90	34.5			71.2	60.3
92	35.2			72.8	61.6
94	36.0			74.4	62.9
96	36.7			76.0	64.3

A46829 -19-15NOV00

Rate Chart (Pounds-Per-Acre)—Regular Rate (Black) Meter

REGULAR RATE METER (BLACK) POUNDS PER ACRE 1 OF 3						
Drive Box Setting	11-52-0	33-0-0	46-0-0	Barley	Canary Grass	Cotton
6					12	8
7					14	9
8					16	10
9					18	12
10	16	12	10		21	13
12	19	15	12	15	25	16
14	22	17	14	18	29	18
16	25	20	16	20	33	21
18	28	22	18	23	37	23
20	32	24	20	25	41	26
22	35	27	22	28	45	28
24	38	29	24	30	49	31
26	41	32	26	33	53	34
28	44	34	28	35	57	36
30	47	37	29	38	61	39
32	50	39	31	40	65	41
34	54	42	33	43	69	44
36	57	44	35	45	73	46
38	60	46	37	48	77	49
40	63	49	39	50	81	52
42	66	51	41	53		54
44	69	54	43	55		57
46	72	56	45	58		59
48	75	59	47	60		62
50	79	61	49	63		
52	82	63	51	65		
54	85	66	53	68		
56	88	68	55	71		
58	91	71	57	73		
60	94	73	59	76		
62	97	76	61	78		
64	101	78	63	81		
66	104	80	65	83		
68	107	83	67	86		
70	110	85	69	88		
72	113	88	71	91		
74	116	90	73	93		
76	119	93	74	96		
78	122	95	76	98		
80	126	97	78	101		
82	129	100	80	103		
84	132	102	82	106		
86	135	105	84	108		
88	138	107	86	111		
90	141	110	88	113		
92	144	112	90	116		
94	148	114	92	118		
96	151	117	94	121		

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Continued on next page

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REGULAR RATE METER (BLACK) POUNDS PER ACRE 2 OF 3						
Drive Box Setting	Flax	Lentils, Eston	Lentils, Laird	Lupins	Oats	Peas, Century
6						
7						
8		10				
9		11				
10	11	12				
12	13	15				
14	15	17				
16	17	20				
18	20	22				
20	22	25		32		
22	24	27		35	20	
24	26	29		38	22	
26	28	32		41	23	
28	30	34		44	25	
30	33	37	42	47	27	
32	35	39	45	50	29	
34	37	42	48	54	30	
36	39	44	51	57	32	
38	41	47	53	60	34	
40	43	49	56	63	36	
42	46	51	59	66	38	60
44	48	54	62	69	39	63
46	50	56	65	72	41	66
48	52	59	67	76	43	69
50	54	61	70	79	45	72
52	56	64	73	82	47	75
54	59	66	76	85	48	78
56	61	69	79	88	50	81
58	63		81	91	52	83
60	65		84	94	54	86
62	67		87	98	56	89
64	70		90	101	57	92
66	72		93	104	59	95
68	74		95	107	61	98
70	76		98	110	63	101
72	78		101	113	64	104
74	80		104	116	66	106
76	83		107	120	68	109
78			109	123	70	112
80			112	126	72	115
82			115	129	73	118
84			118	132	75	121
86			121		77	124
88					79	127
90					81	129
92					82	132
94					84	135
96					86	138

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REGULAR RATE METER (BLACK) POUNDS PER ACRE 3 OF 3						
Drive Box Setting	Rice, Cypress	Rye	Soybeans	Grain Sorghum	Wheat, Durum	Wheat, HRS
6						
7				9		
8				11		
9				12		
10			16	13		
12			19	16		
14		21	22	19	22	21
16		24	25	21	25	24
18		27	28	24	28	27
20		30	32	27	31	30
22		33	35	29	34	33
24		36	38	32	37	36
26		39	41	34	40	39
28		42	44	37	43	42
30		45	47	40	46	45
32		48	50	42	49	48
34		51	54	45	52	51
36		54	57	48	55	54
38		57	60	50	59	57
40		60	63	53	62	60
42	50	63	66	55	65	63
44	53	66	69	58	68	66
46	55	69	72	61	71	69
48	58	72	76	63	74	72
50	60	75	79	66	77	75
52	62	78	82	69	80	78
54	65	81	85	71	83	81
56	67	84	88	74	86	84
58	70	87	91	77	89	87
60	72	90	94	79	92	90
62	74	93	98		95	93
64	77	96	101		99	96
66	79	99	104		102	99
68	82	102	107		105	102
70	84	105	110		108	105
72	86	107	113		111	108
74	89	110	116		114	111
76	91		120		117	114
78	94		123		120	117
80	96		126		123	120
82	98		129		126	123
84	101		132		129	126
86	103		135		132	129
88	106		138		135	132
90	108		141		138	135
92	110		145		142	138
94	113		148		145	141
96	115		151		148	144

A45906 -19-08JUN00

Rate Chart (Kilograms-Per-Hectare)—Regular Rate (Black) Meter

REGULAR RATE METER (BLACK)						
KILOGRAMS PER HECTARE						
1 OF 3						
Drive Box Setting	11-52-0	33-0-0	46-0-0	Barley	Canary Grass	Cotton
6					13.9	8.8
7					16.2	10.2
8					18.4	11.7
9					20.7	13.1
10	17.8	13.8	11.1		23.0	14.6
12	21.3	16.5	13.3	17.1	27.5	17.4
14	24.8	19.2	15.5	19.9	32.1	20.3
16	28.3	22.0	17.7	22.7	36.6	23.2
18	31.8	24.7	19.9	25.5	41.1	26.1
20	35.3	27.4	22.0	28.3	45.7	28.9
22	38.8	30.1	24.2	31.1	50.2	31.8
24	42.4	32.9	26.4	33.9	54.8	34.7
26	45.9	35.6	28.6	36.8	59.3	37.6
28	49.4	38.3	30.8	39.6	63.8	40.4
30	52.9	41.0	33.0	42.4	68.4	43.3
32	56.4	43.8	35.2	45.2	72.9	46.2
34	59.9	46.5	37.4	48.0	77.5	49.1
36	63.4	49.2	39.6	50.8	82.0	52.0
38	66.9	51.9	41.8	53.6	86.5	54.8
40	70.4	54.7	44.0	56.5	91.1	57.7
42	74.0	57.4	46.1	59.3		60.6
44	77.5	60.1	48.3	62.1		63.5
46	81.0	62.8	50.5	64.9		66.3
48	84.5	65.6	52.7	67.7		69.2
50	88.0	68.3	54.9	70.5		
52	91.5	71.0	57.1	73.3		
54	95.0	73.7	59.3	76.2		
56	98.5	76.5	61.5	79.0		
58	102.1	79.2	63.7	81.8		
60	105.6	81.9	65.9	84.6		
62	109.1	84.6	68.1	87.4		
64	112.6	87.3	70.2	90.2		
66	116.1	90.1	72.4	93.0		
68	119.6	92.8	74.6	95.8		
70	123.1	95.5	76.8	98.7		
72	126.6	98.2	79.0	101.5		
74	130.1	101.0	81.2	104.3		
76	133.7	103.7	83.4	107.1		
78	137.2	106.4	85.6	109.9		
80	140.7	109.1	87.8	112.7		
82	144.2	111.9	90.0	115.5		
84	147.7	114.6	92.2	118.4		
86	151.2	117.3	94.3	121.2		
88	154.7	120.0	96.5	124.0		
90	158.2	122.8	98.7	126.8		
92	161.7	125.5	100.9	129.6		
94	165.3	128.2	103.1	132.4		
96	168.8	130.9	105.3	135.2		

Continued on next page

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REGULAR RATE METER (BLACK)						
KILOGRAMS PER HECTARE						
2 OF 3						
Drive Box Setting	Flax	Lentils, Eston	Lentils, Laird	Lupins	Oats	Peas, Century
6						
7						
8		11.1				
9		12.5				
10	12.3	13.8				
12	14.7	16.6				
14	17.1	19.3				
16	19.6	22.0				
18	22.0	24.8				
20	24.4	27.5		35.4		
22	26.9	30.2		38.9	22.1	
24	29.3	33.0		42.4	24.1	
26	31.7	35.7		45.9	26.1	
28	34.1	38.4		49.9	28.1	
30	36.6	41.2	47.2	53.0	30.1	
32	39.0	43.9	50.3	56.5	32.1	
34	41.4	46.6	53.5	60.0	34.1	
36	43.8	49.4	56.6	63.5	36.1	
38	46.3	52.1	59.7	67.1	38.2	
40	48.7	54.8	62.9	70.6	40.2	
42	51.1	57.6	66.0	74.1	42.2	67.7
44	53.6	60.3	69.1	77.6	44.2	71.0
46	56.0	63.0	72.3	81.1	46.2	74.2
48	58.4	65.8	75.4	84.6	48.2	77.4
50	60.8	68.5	78.5	88.2	50.2	80.6
52	63.3	71.3	81.7	91.7	52.2	83.8
54	65.7	74.0	84.8	95.2	54.2	87.0
56	68.1	76.7	87.9	98.7	56.2	90.3
58	70.5		91.1	102.2	58.2	93.5
60	73.0		94.2	105.7	60.2	96.7
62	75.4		97.3	109.3	62.2	99.9
64	77.8		100.5	112.8	64.2	103.1
66	80.3		103.6	116.3	66.2	106.3
68	82.7		106.7	119.8	68.2	109.5
70	85.1		109.9	123.3	70.2	112.8
72	87.5		113.0	126.9	72.2	116.0
74	90.0		116.1	130.4	74.2	119.2
76	92.4		119.3	133.9	76.2	122.4
78			122.4	137.4	78.2	125.6
80			125.5	140.9	80.2	128.8
82			128.7	144.4	82.2	132.1
84			131.8	148.0	84.2	135.3
86			134.9		86.2	138.5
88					88.2	141.7
90					90.2	144.9
92					92.2	148.1
94					94.2	151.4
96					96.2	154.6

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REGULAR RATE METER (BLACK)						
KILOGRAMS PER HECTARE						
3 OF 3						
Drive Box Setting	Rice, Cypress	Rye	Soybeans	Grain, Sorghum	Wheat, Durum	Wheat, HRS
6						
7				10.5		
8				12.0		
9				13.5		
10			17.8	14.9		
12			21.3	17.9		
14		23.6	24.8	20.8	24.3	23.8
16		26.9	28.4	23.8	27.7	27.1
18		30.3	31.9	26.7	31.2	30.5
20		33.6	35.4	29.7	34.6	33.9
22		36.9	38.9	32.6	38.1	37.2
24		40.3	42.4	35.6	41.5	40.6
26		43.6	45.9	38.5	44.9	44.0
28		46.9	49.4	41.5	48.4	47.3
30		50.3	53.0	44.4	51.8	50.7
32		53.6	56.5	47.4	55.3	54.1
34		57.0	60.0	50.3	58.7	57.4
36		60.3	63.5	53.3	62.1	60.8
38		63.6	67.0	56.2	65.6	64.1
40		67.0	70.5	59.2	69.0	67.5
42	59.5	70.3	74.1	62.1	72.5	70.9
44	59.2	73.6	77.6	65.1	75.9	74.2
46	61.9	77.0	81.1	68.0	79.3	77.6
48	64.5	80.3	84.6	71.0	82.8	81.0
50	67.2	83.7	88.1	73.9	86.2	84.3
52	69.9	87.0	91.6	76.9	89.7	87.7
54	72.6	90.3	95.2	79.8	93.1	91.1
56	75.3	93.7	98.7	82.8	96.6	94.4
58	78.0	97.0	102.2	85.7	100.0	97.8
60	80.6	100.3	105.7	88.7	103.4	101.2
62	83.3	103.7	109.2		106.9	104.5
64	86.0	107.0	112.7		110.3	107.9
66	88.7	110.4	116.3		113.8	111.3
68	91.4	113.7	119.8		117.2	114.6
70	94.1	117.0	123.3		120.6	118.0
72	96.7	120.4	126.8		124.1	121.4
74	99.4	123.7	130.3		127.5	124.7
76	102.1		133.8		131.0	128.1
78	104.8		137.4		134.4	131.4
80	107.5		140.9		137.8	134.8
82	110.1		144.4		141.3	138.2
84	112.8		147.9		144.7	141.5
86	115.5		151.4		148.2	144.9
88	118.2		154.9		151.6	148.3
90	120.9		158.4		155.0	151.6
92	123.6		153.7		158.5	155.0
94	126.2		157.1		161.9	158.4
96	128.9		160.4		165.4	161.7

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Rate Chart (Pounds-Per-Acre)—High-Volume (Green) Meter

HIGH RATE METER (GREEN) POUNDS PER ACRE 1 OF 3						
Drive Box Setting	11-52-0	33-0-0	46-0-0	Barley	Corn	Oats
6						
7						
8	19	18	14	14	14	
9	21	20	16	15	16	
10	23	22	18	17	17	
12	28	27	21	21	21	
14	32	31	25	24	24	
16	37	35	28	27	27	22
18	42	40	32	31	31	25
20	46	44	35	34	34	28
22	51	48	39	38	38	30
24	55	53	42	41	41	33
26	60	57	46	44	44	36
28	65	62	50	48	48	39
30	69	66	53	51	51	41
32	74	70	57	55	55	44
34	78	75	60	58	58	47
36	83	79	64	61	61	50
38	87	83	67	65	65	53
40	92	88	71	68	68	55
42	97	92	74	72	72	58
44	101	97	78	75	75	61
46	106	101	81	78	79	64
48	110	105	85	82	82	66
50	115	110	88	85	85	69
52	120	114	92	88	89	72
54	124	119	95	92	92	75
56	129	123	99	95	96	77
58	133	127	102	99	99	80
60	138	132	106	102		83
62	142	136	109	105		86
64	147	140	113	109		88
66	152	145	116	112		91
68	156	149	120	116		94
70	161	154	123	119		97
72	165	158	127	122		99
74	170	162	131	126		102
76	175	167	134	129		105
78	179	171	138	133		108
80	184	175	141	136		110
82	188	180	145	139		113
84	193	184	148	143		116
86	198	189	152	146		119
88	202	193	155	150		121
90	207	197	159	153		124
92	211	202	162	156		127
94	216	206	166	160		130
96	220	210	169	163		132

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Continued on next page

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HIGH RATE METER (GREEN) POUNDS PER ACRE 2 OF 3						
Drive Box Setting	Lentils, Eston	Lentils, Indian Head	Lentils, Laird	Lupins	Peas, Century	Rice, Cypress
6						
7						
8						
9						
10	17	20				
12	20	24			25	19
14	24	28		31	29	22
16	27	32		36	33	25
18	31	36	35	40	37	29
20	34	40	38	45	42	32
22	37	44	42	49	46	35
24	41	48	46	54	50	38
26	44	52	50	58	54	41
28	47	56	54	63	58	44
30	51	60	58	67	62	47
32	54	64	61	72	66	51
34	58	68	65	76	70	54
36	61	72	69	81	75	57
38	64	76	73	85	79	60
40	68	80	77	89	83	63
42	71		81	94	87	66
44	74		84	98	91	70
46	78		88	103	95	73
48			92	107	99	76
50			96	112	103	79
52			100	116	108	82
54			103	121	112	85
56			107	125	116	88
58			111	130	120	92
60			115	134	124	95
62			119	138	128	98
64			123	143	132	101
66			126	147	136	104
68			130		141	107
70			134		145	110
72			138		149	114
74			142		153	117
76			145		157	120
78			149		161	123
80					165	126
82					169	129
84					174	133
86					178	136
88					182	139
90					186	142
92					190	145
94					194	148
96					198	151

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Continued on next page

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HIGH RATE METER (GREEN) POUNDS PER ACRE 3 OF 3			
Drive Box Setting	Soybeans	Wheat, Durum	Wheat, HRS
6			
7			
8			
9			
10			
12	25	25	25
14	29	29	29
16	33	33	33
18	37	37	37
20	41	41	41
22	45	45	45
24	49	49	49
26	54	53	53
28	58	57	57
30	62	61	61
32	66	65	65
34	70	70	69
36	74	74	73
38	78	78	77
40	82	82	81
42	86	86	85
44	90	90	89
46	95	94	93
48	99	98	97
50	103	102	102
52	107	106	106
54	111	110	110
56	115	114	114
58	119	118	118
60	123	122	122
62	127	127	126
64	131	131	130
66	136	135	134
68	140	139	138
70		143	142
72		147	146
74		151	150
76			
78			
80			
82			
84			
86			
88			
90			
92			
94			
96			

A45909 -19-18FEB00

Rate Chart (Kilograms-Per-Hectare)—High-Volume (Green) Meter

HIGH RATE METER (GREEN)						
KILOGRAMS PER HECTARE						
1 OF 3						
Drive Box Setting	11-52-0	33-0-0	46-0-0	Barley	Corn	Oats
6						
7						
8	20.9	19.9	16.0	15.4	15.5	
9	23.4	22.4	18.0	17.3	17.4	
10	26.0	24.8	20.0	19.2	19.3	
12	31.1	29.7	23.9	23.0	23.1	
14	36.3	34.6	27.9	26.9	26.9	
16	41.4	39.5	31.8	30.7	30.7	24.9
18	46.6	44.4	35.7	34.5	34.5	28.0
20	51.7	49.4	39.7	38.3	38.4	31.0
22	56.8	54.3	43.6	42.1	42.2	34.1
24	62.0	59.2	47.6	45.9	46.0	37.2
26	67.1	64.1	51.5	49.7	49.8	40.3
28	72.2	69.0	55.5	53.5	53.6	43.4
30	77.4	73.9	59.4	57.3	57.4	46.5
32	82.5	78.8	63.4	61.1	61.2	49.5
34	87.7	83.7	67.3	64.9	65.0	52.6
36	92.8	88.6	71.2	68.7	68.9	55.7
38	97.9	93.5	75.2	72.5	72.7	58.8
40	103.1	98.4	79.1	76.3	76.5	61.9
42	108.2	103.3	83.1	80.1	80.3	65.0
44	113.3	108.2	87.0	83.9	84.1	68.1
46	118.5	113.1	91.0	87.7	87.9	71.1
48	123.6	118.0	94.9	91.5	91.7	74.2
50	128.7	122.9	98.8	95.3	95.5	77.3
52	133.9	127.8	102.8	99.1	99.3	80.4
54	139.0	132.7	106.7	102.9	103.2	83.5
56	144.2	137.6	110.7	106.7	107.0	86.6
58	149.3	142.5	114.6	110.5	110.8	89.6
60	154.4	147.4	118.6	114.3		92.7
62	159.6	152.3	122.5	118.1		95.8
64	164.7	157.2	126.5	121.9		98.9
66	169.8	162.1	130.4	125.7		102.0
68	175.0	167.1	134.3	129.5		105.1
70	180.1	172.0	138.3	133.3		108.2
72	185.3	176.9	142.2	137.1		111.2
74	190.4	181.8	146.2	140.9		114.3
76	195.5	186.7	150.1	144.7		117.4
78	200.7	191.6	154.1	148.5		120.5
80	205.8	196.5	158.0	152.3		123.6
82	210.9	201.4	161.9	156.1		126.7
84	216.1	206.3	165.9	159.9		129.7
86	221.2	211.2	169.8	163.7		132.8
88	226.3	216.1	173.8	167.5		135.9
90	231.5	221.0	177.7	171.3		139.0
92	236.6	225.9	181.7	175.1		142.1
94	241.8	230.8	185.6	178.9		145.2
96	246.9	235.7	189.6	182.7		148.3

Continued on next page

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HIGH RATE METER (GREEN)						
KILOGRAMS PER HECTARE						
2 OF 3						
Drive Box Setting	Lentils, Eston	Lentils, Indian Head	Lentils, Laird	Lupins	Peas, Century	Rice, Cypress
6						
7						
8						
9						
10	19.1	22.7				
12	22.9	27.2			28.0	21.4
14	26.7	31.6		35.3	32.6	24.9
16	30.5	36.1		40.3	37.3	28.5
18	34.3	40.6	38.8	45.2	41.9	32.0
20	38.0	45.1	43.1	50.2	46.5	35.5
22	41.8	49.6	47.4	55.2	51.1	39.0
24	45.6	54.0	51.6	60.2	55.8	42.6
26	49.4	58.5	55.9	65.2	60.4	46.1
28	53.2	63.0	60.2	70.2	65.0	49.6
30	56.9	67.5	64.5	75.2	69.6	53.1
32	60.7	71.9	68.8	80.2	74.2	56.7
34	64.5	76.4	73.0	85.2	78.9	60.2
36	68.3	80.9	77.3	90.2	83.5	63.7
38	72.1	85.4	81.6	95.2	88.1	67.3
40	75.8	89.9	85.9	100.2	92.7	70.8
42	79.6		90.2	105.1	97.3	74.3
44	83.4		94.4	110.1	102.0	77.8
46	87.2		98.7	115.1	106.6	81.4
48			103.0	120.1	111.2	84.9
50			107.3	125.1	115.8	88.4
52			111.6	130.1	120.5	92.0
54			115.8	135.1	125.1	95.5
56			120.1	140.1	129.7	99.0
58			124.4	145.1	134.3	102.5
60			128.7	150.1	138.9	106.1
62			133.0	155.1	143.6	109.6
64			137.2	160.1	148.2	113.1
66			141.5	165.1	152.8	116.7
68			145.8		157.4	120.2
70			150.1		162.1	123.7
72			154.4		166.7	127.2
74			158.6		171.3	130.8
76			162.9		175.9	134.3
78			167.2		180.5	137.8
80					185.2	141.4
82					189.8	144.9
84					194.4	148.4
86					199.0	151.9
88					203.6	155.5
90					208.3	159.0
92					212.9	162.5
94					217.5	166.1
96					222.1	169.6

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HIGH RATE METER (GREEN)			
KILOGRAMS PER HECTARE			
3 OF 3			
Drive Box Setting	Soybeans	Wheat, Durum	Wheat, HRS
6			
7			
8			
9			
10			
12	27.8	27.7	27.5
14	32.4	32.2	32.0
16	37.0	36.8	36.6
18	41.6	41.4	41.1
20	46.2	45.9	45.6
22	50.8	50.5	50.2
24	55.4	55.0	54.7
26	60.0	59.6	59.2
28	64.6	64.2	63.8
30	69.2	68.7	68.3
32	73.8	73.3	72.8
34	78.4	77.9	77.4
36	83.0	82.4	81.9
38	87.5	87.0	86.5
40	92.1	91.5	91.0
42	96.7	96.1	95.5
44	101.3	100.7	100.1
46	105.9	105.2	104.6
48	110.5	109.8	109.1
50	115.1	114.4	113.7
52	119.7	118.9	118.2
54	124.3	123.5	122.7
56	128.9	128.0	127.3
58	133.5	132.6	131.8
60	138.1	137.2	136.3
62	142.7	141.7	140.9
64	147.3	146.3	145.4
66	151.8	150.9	149.9
68	156.4	155.4	154.5
70		160.0	159.0
72		164.6	163.6
74		169.1	168.1
76			
78			
80			
82			
84			
86			
88			
90			
92			
94			
96			

A46835 -19-15NOV00

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Adjusting Meter Speed Transmissions

Transmission (A) output speed is crank adjusted to agree with recommended setting shown on rate chart or monitor.

IMPORTANT: For 38 cm (15 in.) Row Spacing Only—Transmission speed setting shown on Rate Chart MUST be doubled for this row spacing.

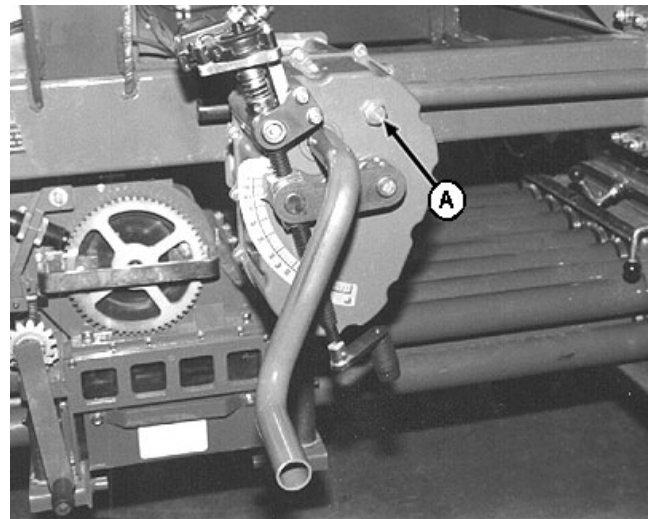
To adjust:

1. Determine setting number from correct rate chart for the product in use and type (color) of segments installed in meter cartridge.
2. Standard Transmission: Turn handle until pointer tip aligns with desired setting number on gauge.

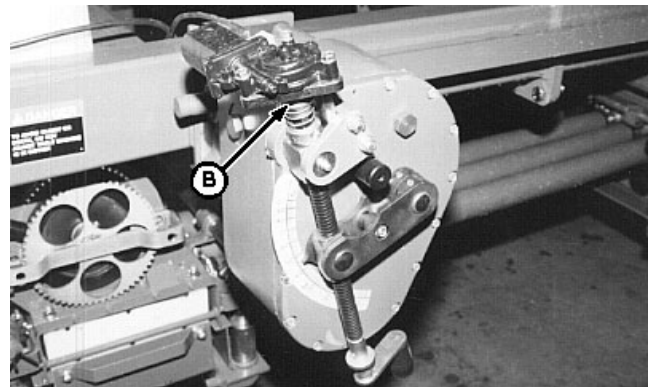
Variable Rate Transmission: To manually adjust motorized variable rate transmission, pull down on spring-loaded drive disconnect collar (B) and turn crank handle to align pointer with desired setting.

3. Release handle to lock-in transmission setting.

A—Transmission
B—Drive Disconnect Collar



Transmission



Variable Rate Transmission

AG,OUO6023,1151 -19-21JUL00-1/1

Checking Meter Transmission Output

If meter output is inconsistent with desired application rate, even though correct main clutch (tire) and one-way clutch (row spacing) sprockets are installed, transmission should be checked for possible internal damage.

To check transmission output:

1. Set suspect transmission to 50 setting.

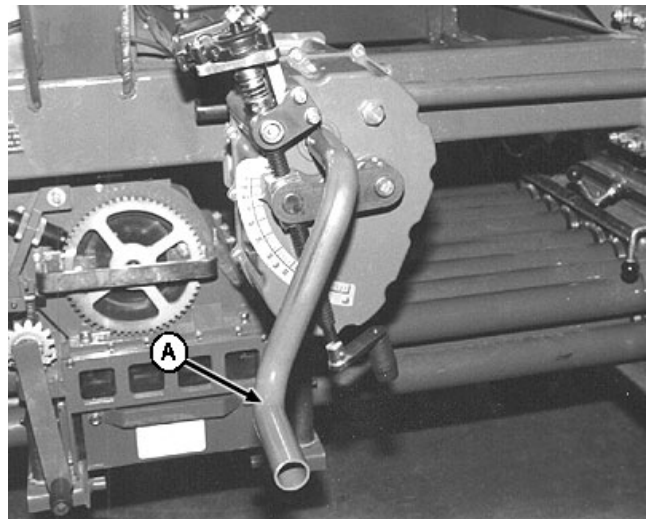
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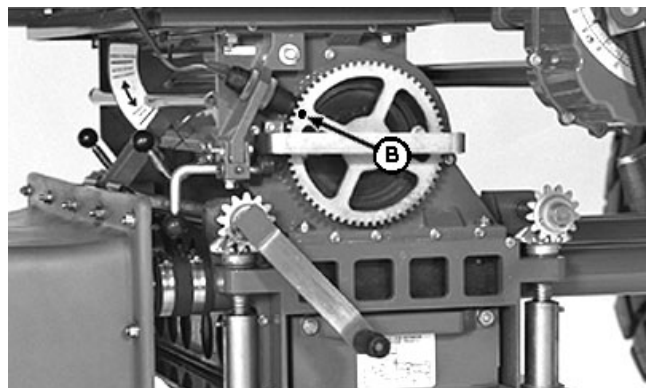
NOTE: All transmissions and output shafts turn when crank handle is turned. All transmissions can be checked at the same time.

2. Turn crank handle (A) a few turns and watch for meter sensor ring rotation. This ensures that independent clutch is on and that meter drive coupling is engaged.
3. Select and mark one tooth of the meter rpm sensor ring (B). This tooth will be used as the transmission output indicator; be sure it is clearly marked. Selecting a tooth directly under the meter rpm sensor will provide an accurate, easy to view, stationary reference point.
4. Accurately note the starting positions of the sensor ring mark and crank handle.
5. Turn crank handle six full counterclockwise revolutions while observing sensor ring mark; it should make approximately one full 360° revolution.
6. Transmission is OK if sensor ring makes one full revolution ± 4 teeth.

If sensor ring does not return to starting position ± 4 teeth, transmission has failed and must be replaced.



A41544B -UN-21APR98



A41877B -UN-22APR98

Marked Tooth

A—Crank Handle
B—Meter RPM Sensor Ring

AG,OUO6023,1152 -19-21JUL00-2/2

Operating Machine—Meter Rate Verification

Meter Verification

Meter verification is used to double check the product application rate before or during seeding.

The field method of verification is most accurate and takes into account all configurations of the cart. This method does not rely on any operator inputs or sprockets. It tells you exactly what you are seeding. The stationary method is the second most accurate. This method, however, does rely on the customer to have the correct sprocket combination installed for the drive train. The .04 Hectare (1/10 Acre) stationary method is the least accurate. Sprocket combinations are still a concern and the amount of product metered out is considerably less.

Products which are susceptible to bridging (barley, oats, grass seeds, etc.) should be used with caution. Be sure to set agitators to the high position and use an all run blockage system. For grass seed, mix fertilizer with seed if permitted by seed company or switch to a different variety. If seed rate or distribution problems occur perform a tank pressurization test and check the machine for air leaks.

Using seed treatments and inoculants can also cause bridging. Be sure the treatment is dry going into the tank. Use of the auger to apply seed treatments and inoculants is not recommended. If seed rate or distribution problems persist discontinue using the machine and contact your John Deere dealer.

AG,OUO6023,1153 -19-21JUL00-1/1

Meter Verification Distances Chart

Seeding Tool Width	Calibration Distance	Seeding Tool Width	Calibration Distance
Meters (Ft/In.)	Meters (Ft)	Meters (Ft/In.)	Meters (Ft)
8.5 (28)	1177 (1556)	12.6 (41/3)	794 (1056)
8.8 (28/9)	1136 (1515)	12.7 (41/8)	787 (1046)
9.1 (30)	1099 (1452)	12.9 (42/6)	775 (1025)
9.3 (30/7.5)	1075 (1422)	13.3 (43/9)	752 (996)
9.4 (30/10)	1064 (1413)	13.4 (44)	746 (990)
9.4 (31)	1064 (1405)	15.4 (50/7.5)	649 (860)
10.7 (35)	935 (1245)	15.5 (50/10)	645 (857)
10.5 (35/7.5)	952 (1223)	15.5 (51)	645 (854)
10.9 (35/10)	917 (1216)	15.6 (51/3)	641 (850)
11.0 (36)	909 (1210)	16.9 (55/7.5)	592 (783)
11.1 (36/3)	901 (1202)	17 (55/10)	588 (780)
11.2 (36/8)	893 (1188)	17.1 (56/3)	584 (774)
11.3 (37)	885 (1177)	17.4 (57)	574 (764)
12.2 (40)	820 (1089)	17.9 (58/9)	559 (741)
12.4 (40/7.5)	806 (1072)	18.1 (59/4.5)	553 (734)
12.5 (40/10)	800 (1067)	18.5 (60/10)	541 (716)
12.5 (41)	800 (1062)	18.6 (61)	538 (714)

NOTE: Calibration distance reflects distance required to travel to cover one Hectare (Acre) based on seeding tool width.

OUO6023,0001392 -19-21FEB01-1/1

Verify Metering—Field Method

IMPORTANT: Ground speed sensor and tank meters must be calibrated prior to doing field check. Refer to **AIR CART SET-UP MODE—CALIBRATE TIRE SENSOR** in Operating Machine—Monitor Setup section and **AIR CART SET-UP MODE—CALIBRATE METERS** in Operating Machine—Monitor Operation section.

1. Determine target application rate for the product in use.
2. Check that existing meter segments can deliver product at desired rate.
3. Make sure there is sufficient product in tank to collect a measurable sample. Product should cover all meter inlets and not be heaped to one side. Half-width disconnect handles must be fully down for accurate rate verification.
4. Meter cartridge assembly must be full of product at the start of the procedure.

IMPORTANT: With variable rate option, for the correct transmission setting and rate desired, seeding must take place for a short distance **BEFORE THE CHECK** in order to let the variable rate define a transmission setting.

5. Set transmissions to the recommended transmission setting given at the end of each tank calibration.

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AG,OUO6023,1155 –19–21JUL00–1/6

6. Hang empty bag (A) from scale (B) and reset scale to “0” (zero) by turning knob on top of scale. Setting scale to “0” (zero) will ensure that measured weight is of collected sample only, and does not include the weight of the bag.

NOTE: Calibration distance is the distance a given machine width must travel to cover one hectare (acre).

7. Find “calibration distance”, for your seeding tool width, by referring to Meter Verification Distances Chart or by calculating using the following formula.

FORMULA:

10,000 sq m (1 hectare) ÷ Seeding Tool Width (m) = Calibration Distance

43560 sq ft (1 acre) ÷ Seeding Tool Width (ft) = Calibration Distance

EXAMPLE:

10,000 sq m (1 hectare) ÷ 13.7 m tool = 730 m

43560 ÷ 45 ft tool = 968 ft

If this distance is driven, one acre will be seeded.

8. Take the desired application rate and either divide or multiply by 2, 3, 4, 5, 6 or 8 to achieve between 4.5 kg to 15.8 kg (10 lb to 35 lb) in the collection pan.

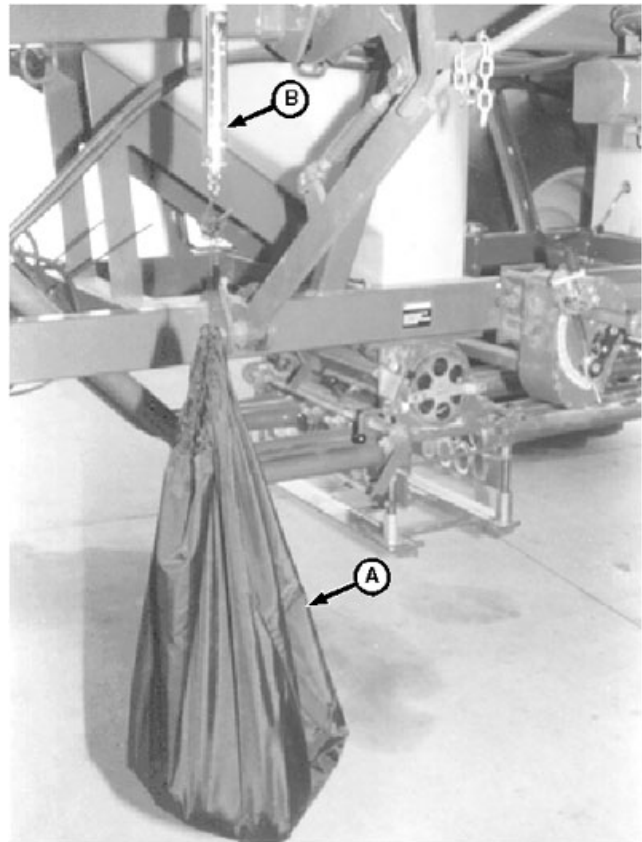
EXAMPLE:

Milo—3.4 kg/hectare x 2 = 6.8 kg or 2 hectares worth of seeding

Milo—3 lb/acre x 4 = 12 lbs. or 4 acres worth of seeding

EXAMPLE:

Wheat—83.9 kg/hectare ÷ 6 = 14 kg or 1/6 of a hectare worth of seeding



A—Collection Bag
B—Scale

A41554 -JUN-14APR97

Wheat—75 lb/per acre $\div 3 = 25$ lb or 1/3 of an acre worth of seeding

9. Determine exact distance to drive by dividing or multiplying the distance (Step 7) by the same number that was used with the product weight (Step 8).

EXAMPLE:

Number of m at 3.4 kg/hectare— $730 \times 2 = 1460$ m should achieve 6.8 kg of product in the collection pan.

Number of ft at 3 lb of milo per acre— $968 \times 4 = 3872$ ft should achieve 12 lb of product in the collection pan.

EXAMPLE:

Number of m at 83.9 kg/hectare— $730 \div 6 = 121.6$ m should achieve 14 kg of product in the collection pan.

Number of ft at 75 lb of wheat per acre— $968 \div 3 = 322$ ft 8 in. should achieve 25 lb of product in the collection pan.

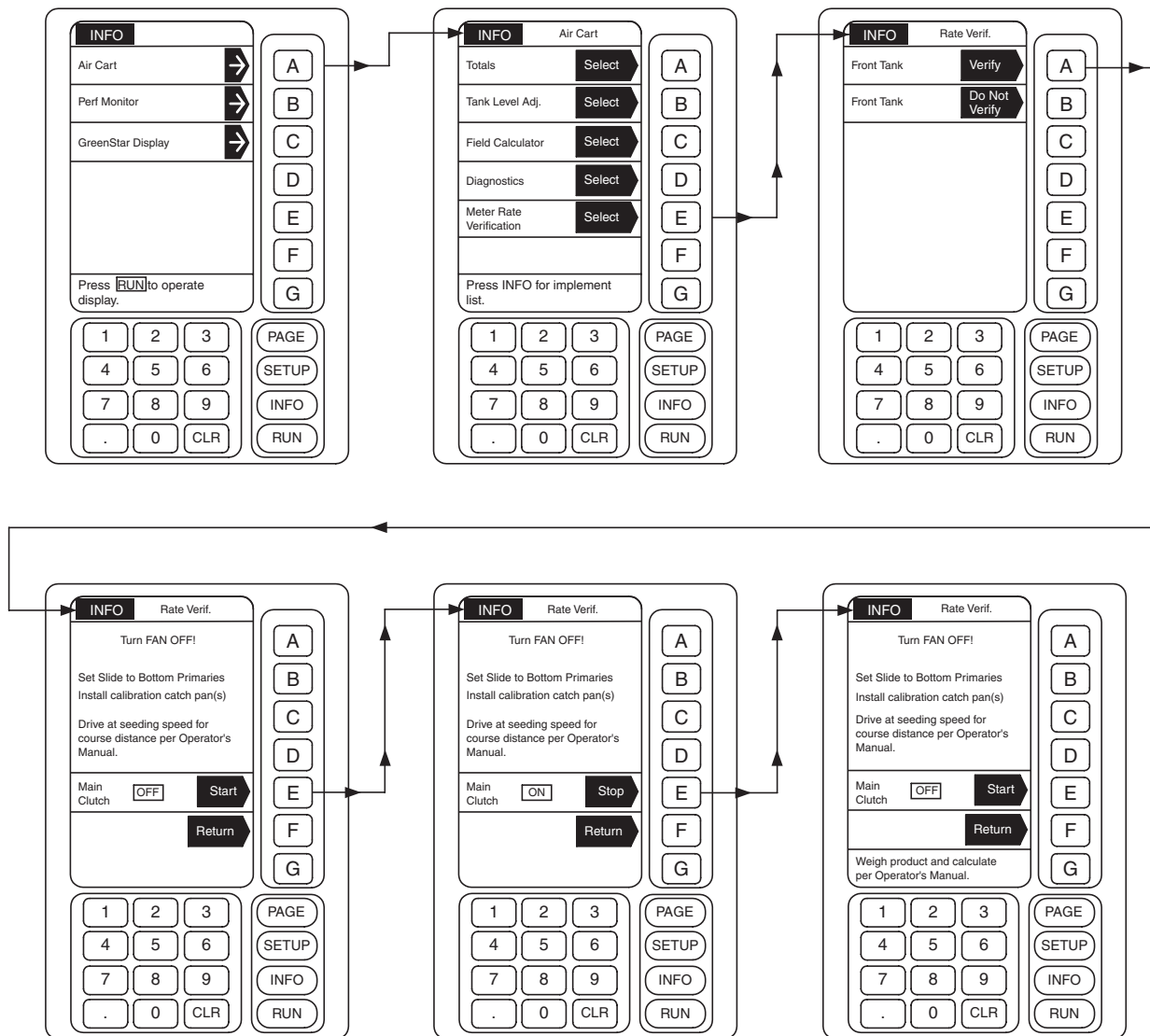
NOTE: The field check accuracy improves by increasing distance driven.

10. Layout the calculated distance. If tractor radar has been previously calibrated, it may be used to measure this distance. The following field conditions are needed:

- Correct cart tire psi
- Product in tanks
- Field ground conditions
- Normal seeding speed

Continued on next page

AG,OUO6023,1155 -19-21JUL00-3/6



11. From any screen press [INFO].
12. From the list given, choose Air Cart.
13. From the list given, choose Meter Rate Verification.
14. Select which tanks to verify.
15. Follow applicable instructions on screen.

- Turn fan off.
- Set slide to bottom primaries(Stationary Double-Shoot only).

NOTE: Before returning to normal operation, ensure slide on stationary double-shoot manifold is in proper position.

Continued on next page

AG,OUO6023,1155 -19-21JUL00-4/6

A47358 -19-27APR01

- **Install calibration catch pan.**

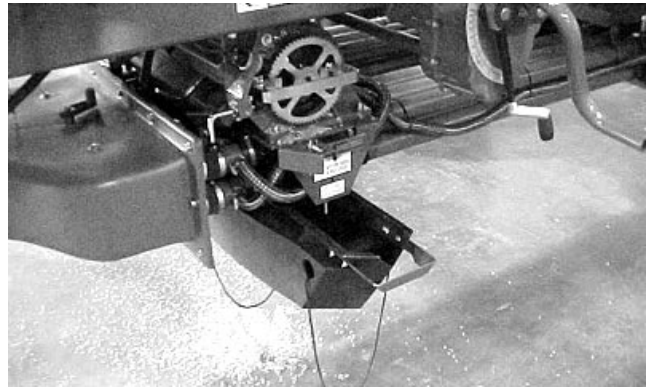
Remove cover plate from bottom of manifold.
Slide collection pan, squared end first, in from left hand side of manifold using the provided rails.

- **Drive at seeding speed for course distance per operator's manual.**

Start driving at seeding speed towards course.
When you reach course starting point, press START. When you reach the course ending point, press STOP.

- **Weigh product and calculate per operator's manual.**

Remove the catch pan and pour contents into collection bag.



Catch Pan - SDS

A46133 -UN-10JUL00

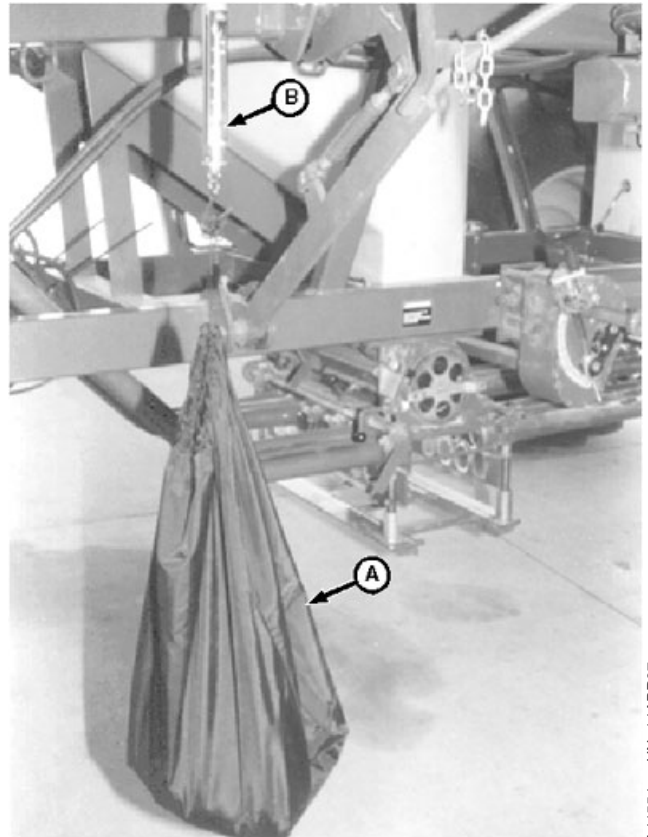
AG,OUO6023,1155 -19-21JUL00-5/6

Hang filled collection bag (A) from scale (B) and weigh product. Multiply or divide the weighed amount by the same number used in Step 9. This will give the actual application rate. It should be close to the desired rate.

16. If calculated application rate is above or below target rate:

NOTE: See your John Deere dealer for assistance, if desired.

- Verify transmission setting and meter settings are correct for the product in use.
 - Recalibrate cart tire sensor. See AIR CART SET-UP MODE—CALIBRATE SENSORS in Operating Machine—Monitor Set-Up section.
 - Recalibrate meter. See AIR CART SET-UP MODE—CALIBRATE METERS in Operating Machine—Setting Meter Rates section.
 - Verify that monitor is set-up properly.
17. Perform rate verification again to see that corrective action had the desired results and the application rate meets requirements.
 18. Return manifolds to normal operating configuration



A—Collection Bag
B—Scale

A41554 -UN-14APR97

AG,OUO6023,1155 -19-21JUL00-6/6

Verify Metering—Stationary Method

IMPORTANT: Ground speed sensor and tank meters must be calibrated prior to doing field check. Refer to **AIR CART SET-UP MODE—CALIBRATE TIRE SENSOR** in Operating Machine—Monitor Setup section and **AIR CART SET-UP MODE—CALIBRATE METERS** in Operating Machine—Monitor Operation section.

1. Determine target application rate for the product in use.
2. Check that existing meter segments can deliver product at desired rate.
3. Make sure there is sufficient product in tank to collect a measurable sample. Product should cover all meter inlets and not be heaped to one side. Half-width disconnect handles must be fully down for accurate rate verification.
4. Meter cartridge assembly must be full of product at the start of the procedure.

IMPORTANT: With variable rate option, for the correct transmission setting and rate desired, seeding must take place for a short distance **BEFORE THE CHECK** in order to let the variable rate define a transmission setting.

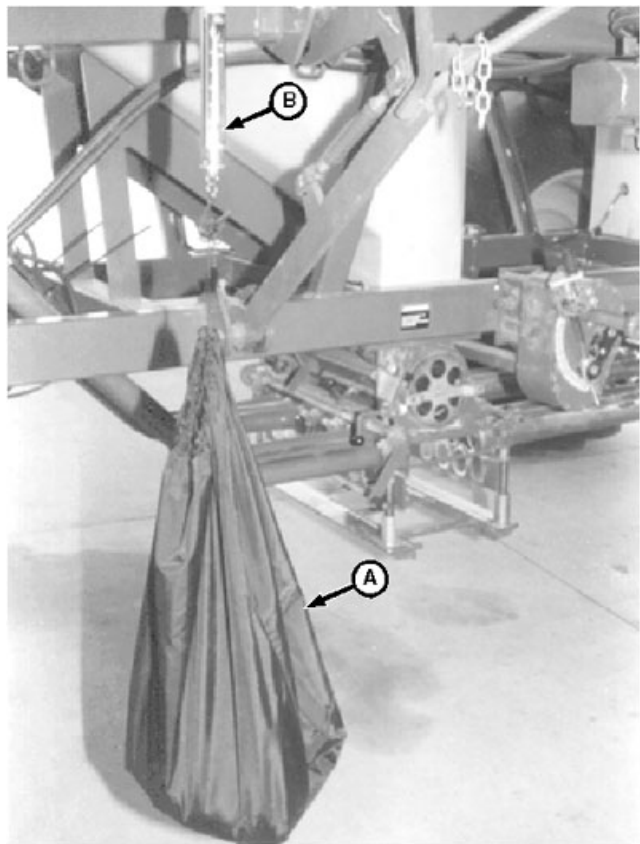
5. Set transmissions to the recommended transmission setting given at the end of each tank calibration.

Continued on next page

AG,OUO6023,1156 –19–21JUL00–1/8

6. Hang empty bag (A) from scale (B) and reset scale to "0" (zero) by turning knob on top of scale. Setting scale to "0" (zero) will ensure that measured weight is of collected sample only, and does not include the weight of the bag.

A—Collection Bag
B—Scale

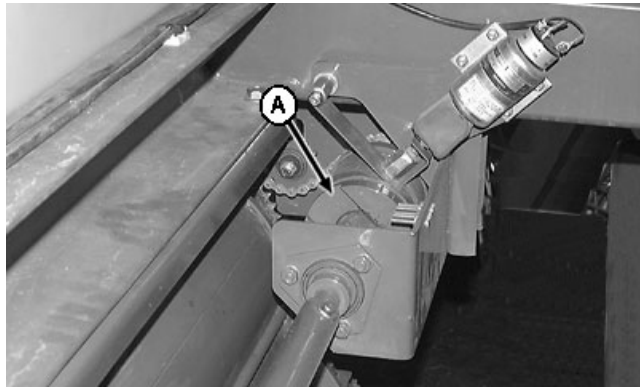


A41554 -UN-14APR97

AG,OUO6023,1156 -19-21JUL00-2/8

7. Make sure independent meter clutch (A) is electrically or mechanically engaged during rate verification. Clutch is engaged when solenoid lever is up and out of outer member slot.

A—Independent Meter Clutch



A41541B -UN-28JUL98

Continued on next page

AG,OUO6023,1156 -19-21JUL00-3/8

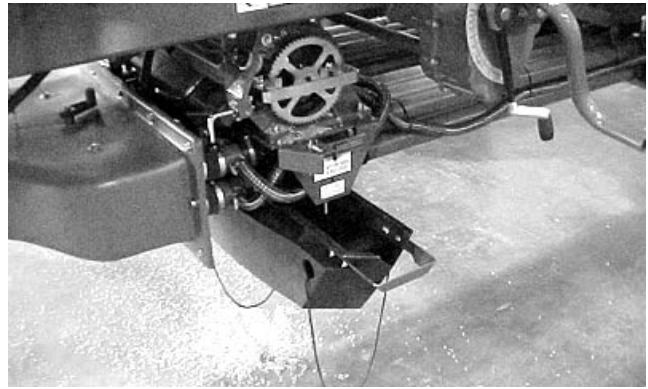
8. Install catch pan.

Remove cover plate from bottom of manifold.

Slide collection pan, squared end first, in from left hand side of manifold using the provided rails.

Move slide to bottom shoot position (Stationary Double-Shoot only).

NOTE: Before returning to normal operation, ensure slide on stationary double-shoot manifold is in proper position.



A46133 -UN-10JUL00

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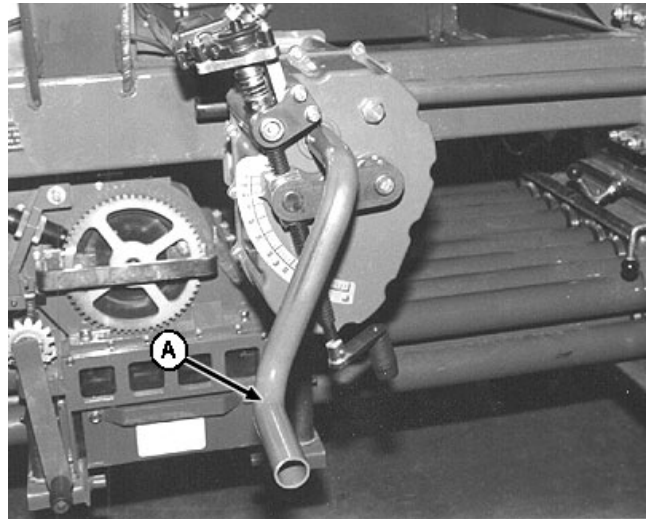
AG,OUO6023,1156 -19-21JUL00-4/8

IMPORTANT: Turning crank handle clockwise will result in an inaccurate rate verification.

IMPORTANT: For Stationary Double-Shoot Manifold, turning crank handle with slide in top-shoot position will result in an inaccurate rate check and can result in difficult operation or damage of the slide assembly.

NOTE: On two-tank carts, crank handle is factory installed on front transmission. On carts with optional middle tank, crank handle is installed on middle-tank transmission.

Leave crank handle in factory installed position to avoid contacting frame or other components during rate verification.



A41544B -UN-21APR98

Two Tank Cart Shown

A—Crank Handle

9. Noting starting point, turn crank handle (A) counterclockwise, counting each full 360° revolution. All transmissions and driveshafts turn when crank handle is turned.

NOTE: Check product level occasionally; do not overfill pan.

Depending on product displacement, 100 full crank turns will normally produce a good measurable sample.

For low displacement products, or when yellow meter segments are used, more crank turns may be needed to obtain a measurable amount of product.

10. Remove collection pan and empty contents into collection bag.

Continued on next page

AG,OUO6023,1156 -19-21JUL00-5/8

11. Hang filled collection bag (A) from scale (B) and weigh sample.
12. Use the following formulas and examples to calculate application rate.

IMPORTANT: Rate calculation is correct only if the proper sprockets are used for row spacing and rear tire. Refer to charts below.

NOTE: For 38 cm (15- in.) and 76 cm (30 in.) rows, use 19 cm (7.5 in.) row spacing in calculation.

NOTE: Select K-Factor based on tire size and “R” rating from the following chart:

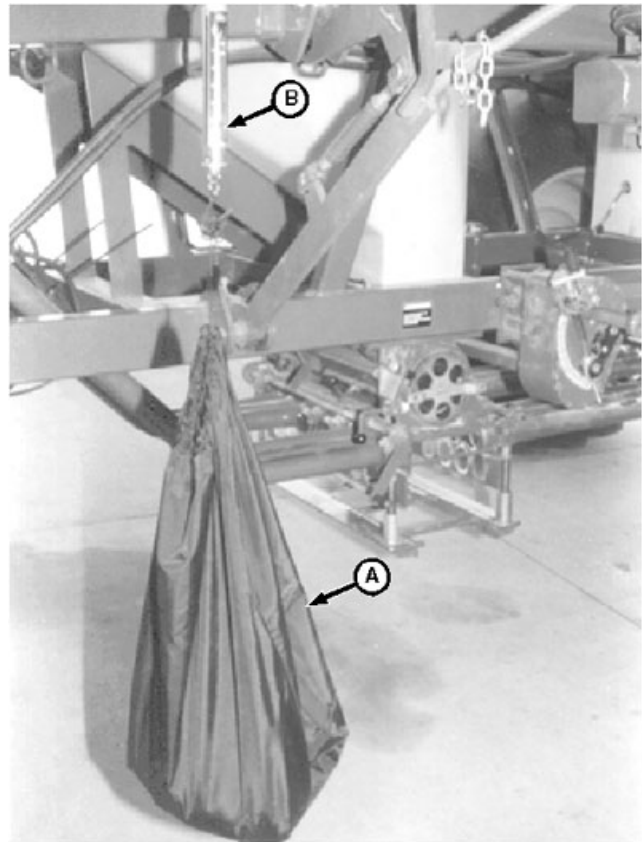
Tire Size	Sprocket Teeth	K-Factor for cm	K-Factor for in.
18.4-26 (R3)	57	358.6	1519
23.1-26 (R3)	62	361.6	1532
28L-26 (R3)	62	353.5	1498
30.5L-32 (R3)	72	354.2	1501
18.4R-46 (R1)	80	350.2	1484
20.8R-38 (R1)	80	374.1	1585
710/70R-38 (R1W)	80	357.8	1516
18.4-26 (R2)	62	371.9	1576
23.1-26 (R2)	68	356.4	1510
28L-26 (R2)	68	352.8	1495
30.5L-32 (R2)	80	372.4	1578
20.8R-42 (R1)	80	359.4	1523

Row Spacing cm (in.)	Row Spacing Rear Tire Sprocket Teeth
15 (6)	46
19 (7.5)	37
25 (10)	28
30.5 (12)	23

NOTE: For 37.5 cm (15 in.) and 75 cm (30 in.) rows, use 19 cm (7.5 in.) row spacing in calculation.

NOTE: The following formulas are designed for both metric and standard computations.

The two factors needed to calculate application rate are arrived at separately.



A—Collection Bag
B—Scale

A41554 -JUN-14APR97

- **Weight Factor:** Multiply weight kg (lbs) of collected sample by the appropriate K-Factor by row spacing in cm (inches) to arrive at weight factor. Select K-Factor based on tire size and “R” rating. Refer to chart on previous page.

**Weighed Sample kg (lb) x K-Factor for cm
(K-Factor for in.) x Row Spacing cm (in.)**

EXAMPLE: 5.74 kg (12.65 lb) x 358.6 (1519) x 30.5 cm (12 in.) = 62780.1 (230584.2)

- **Area Factor:** Multiply crank turns used to collect sample by seeding tool width to arrive at area factor.

Machine Width (ft) x Crank Turns

EXAMPLE: 12.5 cm (41 ft) tool width x 80 turns = 1000 (3280)

- **Application Rate kg/hectare (lb/ac):** Divide weight factor by area factor to calculate application rate in kg/hectare (lb/acre).

Application Rate kg/hectare (lb/acre) = Weight Factor ÷ Area Factor.

EXAMPLE: 62780.1 (230584.2) ÷ 1000 (3280) = 62.8 kg/hectare (70.3 lb/ac)

13. If calculated application rate is above or below target rate:

NOTE: See your John Deere dealer for assistance, if desired.

- Verify transmission setting and meter settings are correct for the product in use.
- Recalibrate cart tire sensor. See AIR CART SET-UP MODE—CALIBRATE SENSORS in Operating Machine—Monitor Set-Up section.
- Recalibrate meter. See AIR CART SET-UP MODE—CALIBRATE METERS in Operating Machine—Setting Meter Rates section.
- Verify that monitor is set-up properly.

14. Perform rate verification again to see that corrective action had the desired results and the application rate meets requirements.

AG,OUO6023,1156 -19-21JUL00-8/8

Verify Metering—1/10 Acre Stationary Method

As 1900 Commodity Air Carts meter seed, a handle turns on the left-hand side of the machine. This handle turns a certain number of turns per acre. The number of turns is different for every cart. There can be up to 500 turns per acre, so the following calculation shows how to figure the number of turns for **1/10 acre**.

IMPORTANT: Metering accuracy is directly related to the amount of product metered out. At least 10 lbs. of metered product is required to accurately use this method.

For example, 1/10 of an acre of canola is only about 0.3 lbs. This cannot be weighed accurately with the scale provided so this method should not be used with this product.

Drive Tire Chart		
Tire Size	Tire Circumference (mm/rev)	Tire Circumference (in/rev)
18.4-26 R3, 10PR	4191	165
18.4-26 R2, 10PR	4394	173
23.1-26 R3, 10PR	4521	178
23.1-26 R2, 10PR	5029	198
28L-26 R3, 12PR	4775	188
28L-26 R2, 12PR	5080	200
30.5L-32 R3, 12PR	5359	211
30.5L-32 R2, 12PR	5664	223
20.8R-38 R1, 1 STAR	5639	222
710/70R-38 R1W, 2 STAR	5893	232
18.4R-46 R1, 3 STAR	6020	237
20.8R-42 R1, 2 Star	5867	231

1. Calculate wheel turns for 1/10 acre.

FORMULA:

Number of Wheel Turns for 1/10 acre = $52272 \div \text{Seeding Tool Width (ft)} \div \text{Drive Tire Circumference (in.)}$

EXAMPLE:

1900 cart with 30 ft seeding tool and 28L x 26 R3 tires. Tire circumference from the Drive Tire Chart is 188 in.

Wheel turns for 1/10 acre = $52272 \div 30 \text{ ft} \div 188 \text{ in.}$
or 9.27 turns per 1/10 acre.

2. Calculate crank turns for 1/10 acre.

FORMULA:

Number of Crank Turns = $\text{Wheel Turns} \times 2.333 \times \text{Wheel Sprocket Teeth} \div \text{Row Space Sprocket}$

EXAMPLE:

The chain sprocket has 62 teeth and the row space sprocket has 27 teeth.

Crank turns for 1/10 acre = $9.27 \text{ wheel turns} \times 2.333 \times 62 \text{ teeth} \div 27 \text{ teeth}$ or 49 1/2 crank turns per 1/10 acre.

Continued on next page

AG,OUO6023,1157 -19-21JUL00-1/2

3. Calculate seeding rate.

Metering accuracy can now be checked quickly by turning the meter crank counterclockwise (same way it runs in field) the calculated number of turns.

Multiply sample weight by 10 to determine actual seeding rate.

EXAMPLE:

11.5 pounds of product is caught after turning the crank 49 1/2 turns. Seeding Rate = $11.5 \text{ lb} \times 10 = 115 \text{ lb per acre}$.

AG,OUO6023,1157 -19-21JUL00-2/2

Verify Metering—1/10 Hectare Stationary Method

As 1900 Commodity Air Carts meter seed, a handle turns on the left-hand side of the machine. This handle turns a certain number of turns per acre. The number of turns is different for every cart. There can be up to 1300 turns per hectare, so the following calculation shows how to figure the number of turns for **1/10 hectare**.

IMPORTANT: Metering accuracy is directly related to the amount of product metered out. At least 5 kg of metered product is required to accurately use this method.

For example, 1/10 of an acre of canola is only about 0.5 kg. This cannot be weighed accurately with the scale provided so this method should not be used with this product.

Drive Tire Chart		
Tire Size	Tire Circumference (m/rev)	Tire Circumference (in/rev)
18.4-26 R3, 10PR	4.191	165
18.4-26 R2, 10PR	4.394	173
23.1-26 R3, 10PR	4.521	178
23.1-26 R2, 10PR	5.029	198
28L-26 R3, 12PR	4.775	188
28L-26 R2, 12PR	5.080	200
30.5L-32 R3, 12PR	5.359	211
30.5L-32 R2, 12PR	5.664	223
20.8R-38 R1, 1 STAR	5.639	222
710/70R-38 R1W, 2 STAR	5.893	232
18.4R-46 R1, 3 STAR	6.020	237
20.8R-42 R1, 2 Star	5.867	231

1. Calculate wheel turns for 1/10 ha.

FORMULA:

Number of Wheel Turns for 1/10 ha = $1000 \div \text{Seeding Tool Width (m)} \div \text{Drive Tire Circumference (m)}$

EXAMPLE:

1900 cart with 9.14 m seeding tool and 28L x 26 R3 tires. Tire circumference from the Drive Tire Chart is 4.775 m.

Wheel turns for 1/10 ha = $1000 \div 9.14 \text{ m} \div 4.775 \text{ m}$ or 22.9 turns per 1/10 ha.

2. Calculate crank turns for 1/10 ha.

FORMULA:

Number of Crank Turns = $\text{Wheel Turns} \times 2.333 \times \text{Wheel Sprocket Teeth} \div \text{Row Space Sprocket}$

EXAMPLE:

The chain sprocket has 62 teeth and the row space sprocket has 27 teeth.

Crank turns for 1/10 ha = $22.9 \text{ wheel turns} \times 2.333 \times 62 \text{ teeth} \div 27 \text{ teeth}$ or 123 crank turns per 1/10 ha.

3. Calculate seeding rate.

Continued on next page

AG,OUO6023,1157 -19-21JUL00-1/2

Metering accuracy can now be checked quickly by turning the meter crank counterclockwise (same way it runs in field) the calculated number of turns.

Multiply sample weight by 10 to determine actual seeding rate.

EXAMPLE:

5.2 kg of product is caught after turning the crank 49 1/2 turns. Seeding Rate = 5.2 kg x 10 = 52 kg per hectare.

AG,OUO6023,1157 -19-21JUL00-2/2

Blockage Warning System

Optional Product Monitoring Systems

Readout displays for optional Blockage Warning System appear on the GREENSTAR™ display console (A).

A—Console



GREENSTAR is a trademark of Deere & Company.

AG,OUO6023,1158 -19-21JUL00-1/1

Blockage Monitoring Systems

Blockage monitoring system consists of movement sensors (A), installed in-line on the secondary air hoses, and seeding mounted electronic controller (B) that translate the sensor's signals into communications language for blockage notification display on the tractor-mounted console.

Slave controllers (C) are provided to keep loose wiring to a minimum.

Two types of systems are available:

Primary-Only System—Uses one sensor at each secondary manifold to check for seed flow from the primary run (16 sensors maximum).

All-Run System—Uses one sensor in each secondary hose to sense seed flow to every opener (192 sensors maximum).

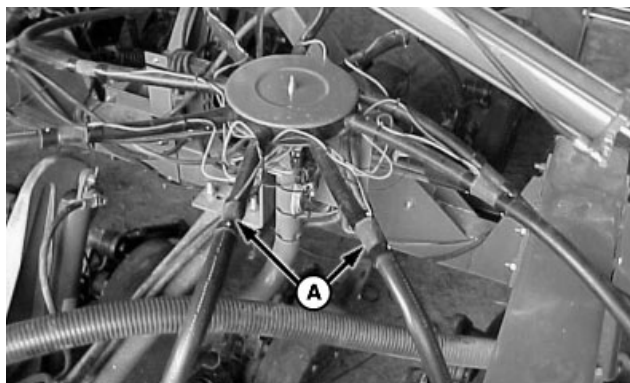
Communication cable from seeding mounted electronic controller attaches to cart controller at interface plug, dislocating terminator to the end of the CAN line.

Interface connection is necessary as blockage controller receives “meter enabled” signal(s) from the cart controller.

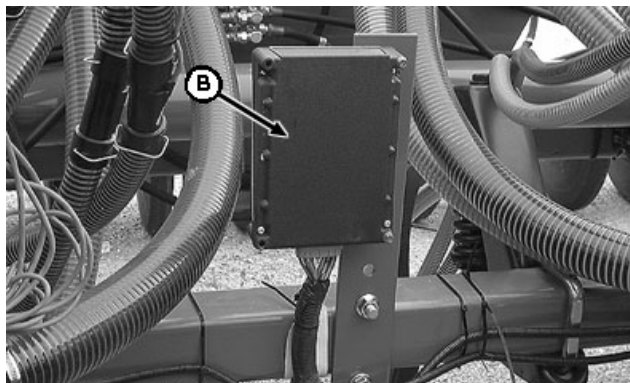
Cart controller sends meter enabled signal(s) when all of the following conditions are met:

- Main clutch engaged
- Ground speed greater than 3 km/h (2 mph)
- Fan speed greater than 500 rpm
- Meter clutch(es) engaged
- Meter rpm(s) sensed

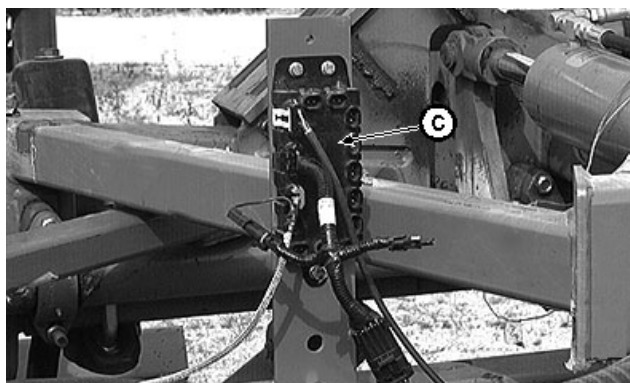
A—Movement Sensors
B—Controller
C—Slave Controllers



A47381 -UN-26APR01

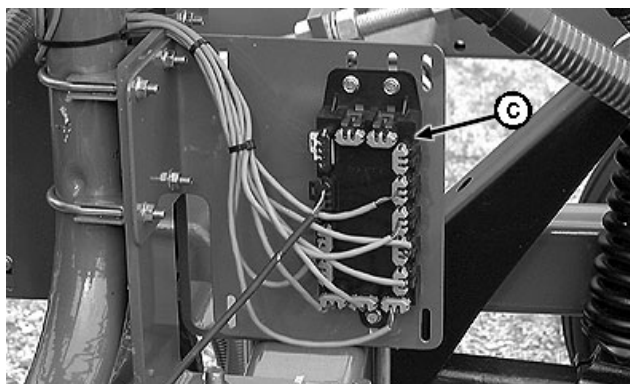


A42705 -UN-22JUL98



A42731A -UN-05NOV98

Primary Only System



A42706 -UN-22JUL98

All Run System

Continued on next page

AG,OUO6023,1159 -19-21JUL00-1/4

NOTE: *Air system configuration determines if meter enable signals are needed from one or both meters.*

In single-shoot (two products in the same air stream), only one meter enable signal is needed (front or rear) to activate blockage warnings.

In double-shoot (separated air streams) warnings will be sent only for the primary runs actively seeding (top or bottom). At least two meters need to be "enabled" to receive blockage warnings for both top and bottom primaries.

Without meter enabled signal(s), system will not provide blockage warnings.

Continued on next page

AG,OUO6023,1159 -19-21JUL00-2/4

Blockage Monitoring—Primary Only:

Run identification is an important factor in set-up of blockage warning systems.

Primary Only system can monitor up to 16 secondary lines for blockage by placing one blockage sensor in a secondary hose at each header. More than one sensor can be installed at each header if less than 16 primaries are used.

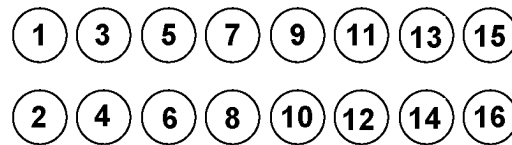
Primary run identification for an 8-run single-shoot system is the same as others where runs are numbered left-to-right 1—8 when all are active. If desired, two sensors can be installed in each run to use up all sixteen available, and improve monitoring capability. Systems using less than the full number of available runs should be numbered left-to-right, counting only the active, product carrying runs.

Numbering of an all-run double-shoot blockage system deviates from numbering scheme.

The primaries are numbered left-to-right across the seeding tool with primary one on the left-hand end of the tool. For a typical double-shoot system, the first left-hand top primary is still numbered as one but the first left-hand bottom primary is numbered as two (NOT 9). Top and bottom alternating scheme continues across the entire width of the seeding placing primaries fifteen and sixteen on the right-hand end, NOT 8 and 16 as done with end-to-end numbering.

Systems using less than the full number of available runs are numbered the same way; counting only the active, product carrying runs.

When a blockage occurs, the processor number and sensor number associated with the blocked secondary will be displayed. As an example, P2R1 indicates processor 2, run 1 is blocked. This would be the third sensor from the left-hand end of the machine. Sensors are actually installed in secondary lines.

4 Active**8 Active Single Shoot****All-Run Double Shoot**

A46946 -19-05DEC00

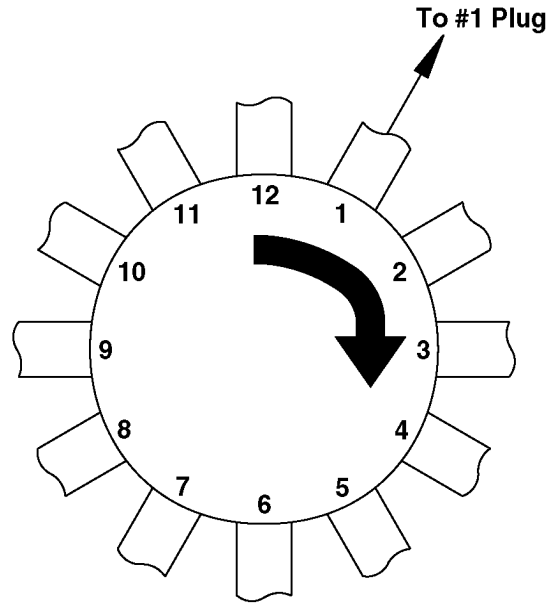
A46945 -19-05DEC00

Blockage Monitoring—All Runs:

All-run system can monitor up to 192 secondary runs for blockage.

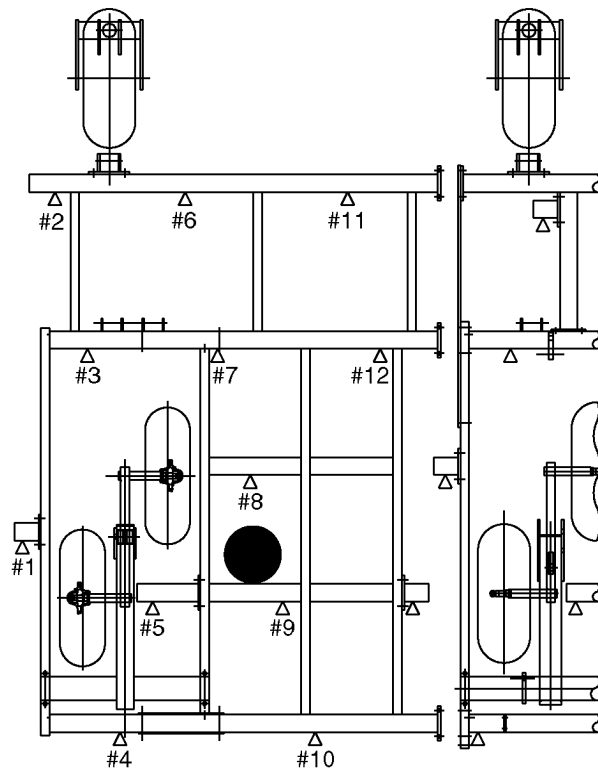
Same scheme as described for Primary-Only system is used to identify primaries for an All-Run system.

With the primaries identified, each secondary port is numbered in a clockwise direction -OR- runs are numbered by row in sequential order from left to right for easy identification when blockage occurs. Blockage signal will identify both the primary header and secondary run/row using a PXRXX code. As an example, if P1R11 were to signal “blockage”, you would check the number eleven port (R11) of the first primary header (P1) on the left-hand side of the machine, attached to the top bank of runs.



Secondary Port—Clockwise Identification

A41982 -19-29AUG97



Row-By-Row Sequential Identification

A41972 -UN-15SEP97

AG,OUO6023,1159 -19-21JUL00-4/4

Testing Blockage Sensors

GREENSTAR™ display console (A) can be used to test blockage sensors.

1. Press INFO to go to the Information Section of the monitor.

2. Press key B or C for Air Cart Blockage.

1. Press key B for Diagnostics.

2. Press key E for Sensor Information.

3. Press key A for Hit Counters. Header 1 will be displayed at the top of the page. The status of each sensor is displayed as NOT BLOCKED, BLOCKED, IGNORED or NOT PRESENT.

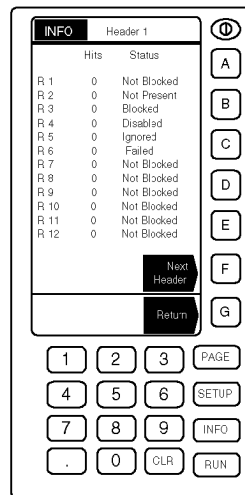
NOTE: *Tapping on an undetected (NOT PRESENT) sensor will not advance the hit count.*

4. This page also displays "Hits" for each of the sensors. This feature allows the user to lightly tap on the side of each sensor to verify that it is working. This also allows the user to verify the numbering of each sensor. Press key F to advance to the next header.

5. Press key G to return.



A41529 -UN-10APR97



A41975 -19-29AUG97

A—GREENSTAR™ Display Console

Seed Counting System

Optional Product Monitoring Systems

NOTE: Seed counting should not be used as a blockage monitor.

Readout displays for optional Seed Counting System appear on the GREENSTAR™ display console (A).

A—Display Console



GREENSTAR is a trademark of Deere & Company.

AG,OUO6023,1161 -19-21JUL00-1/1

Primary Seed Counting System

Seed counting system consists of fiber optic sensors (A), installed in-line on the primary air distribution lines, and electronic controller(s) (B) that translate the sensor's optical signals into communications language for seed count display on the tractor-mounted console.

NOTE: On tow-behind models, seed counting sensors are installed at the front of the cart.

Seed counting sensors are installed on the seeding tool hitch for tow-between carts.

Regardless of cart configuration, seed counting sensors are mounted horizontally for smooth seed flow and accurate counting.

Seed counting sensors work best with larger products, such as soybeans and peas.

Small, light products, such as cereal grains, caraway, coriander and grass seeds may pass through the sensor "unseen" and not register an actual seed count.

Seed counters should not be used with treated seeds. Seed treatments, such as vidavax, will cloud optical eye, blinding the sensor.

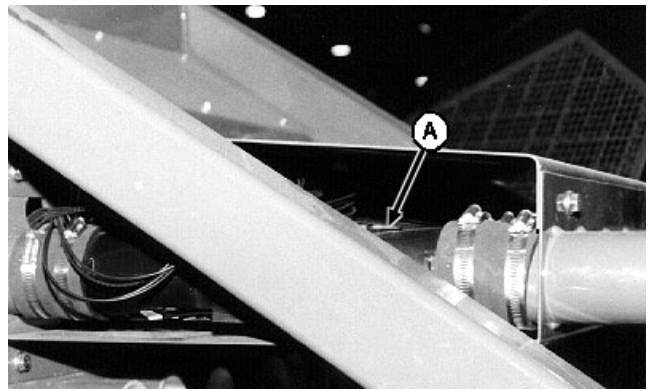
On tow-behind carts, communication cable from seed counting controller(s) attaches to cart controller at interface plug, dislocating terminator to the end of the CAN line.

For tow-between carts, seed counting communications cable attaches to the back of the cart.

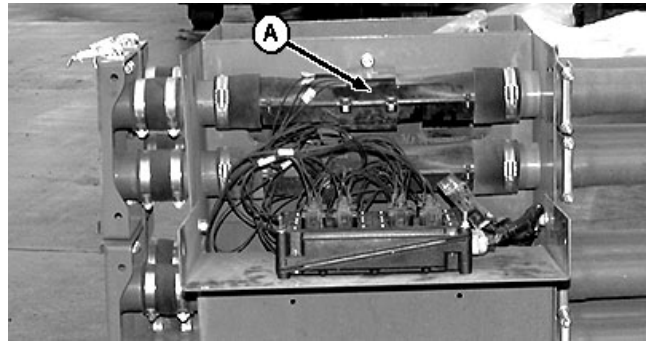
Interface connection is necessary as seed count controller receives signals from the cart controller.

Cart controller sends a meter enabled signal when all of the following conditions are met:

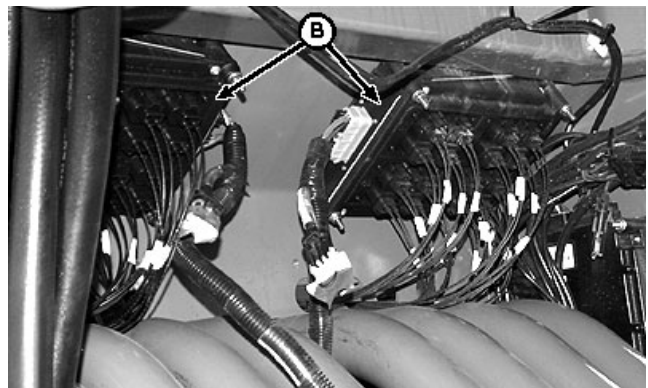
- Main clutch engaged
- Ground speed greater than 2 mph
- Fan speed greater than 500 rpm
- Seed delivery meter clutch engaged
- Meter rpm sensed at seed delivery meter



Tow-Behind Cart Shown



Hitch Mount for Tow-Between



A—Fiber Optic Sensor
B—Electronic Controllers

NOTE: Seed delivery meter is the one providing product to the top bank of primary runs, where counting sensors are installed.

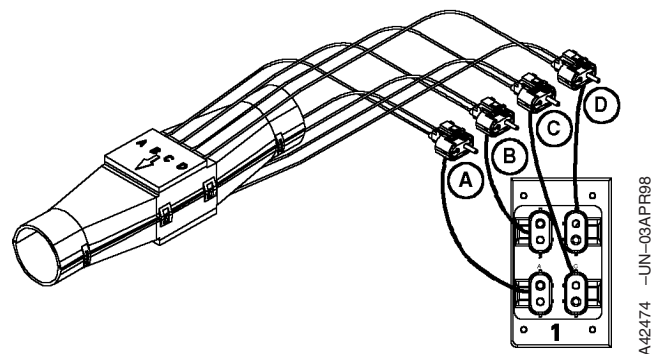
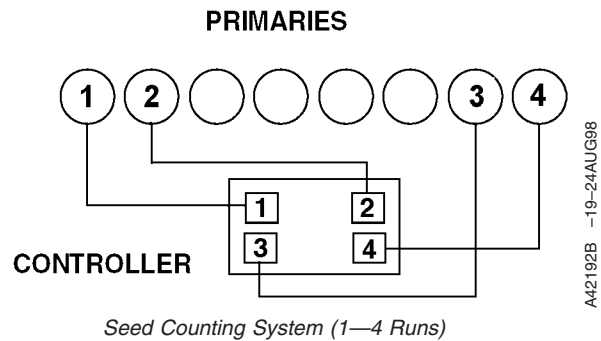
Without “meter enabled” signal, counting system will not display seed count populations and associated warnings.

Run identification is an important factor in set-up of seed counting systems.

An in-line optical sensor is installed in each primary air run of a single-shoot system (maximum of eight sensors). On an all-run double-shoot system, all sensors are installed in the top runs that deliver countable seed.

AG,OUO6023,1162 -19-21JUL00-2/4

For a counting system having 1—4 primaries, install No. 1 sensor in the first active primary on the left-hand side of the cart. The four fiber optic cables are then attached to the four corresponding connectors (A—D) in quadrant 1 on the electronic controller. Sensors 2, 3 and 4 are then installed in their corresponding runs and connected to the corresponding controller connectors. Controller quadrants are numbered 1—4; with caps installed on unused connectors when less than four primaries are active.



Continued on next page

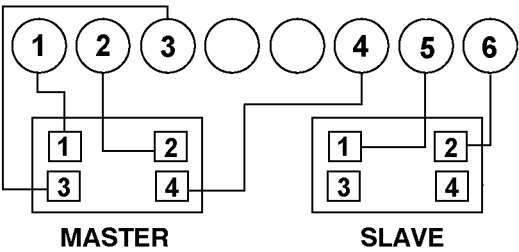
AG,OUO6023,1162 -19-21JUL00-3/4

NOTE: Always install all four connectors (A—D) from a sensor into one quadrant.

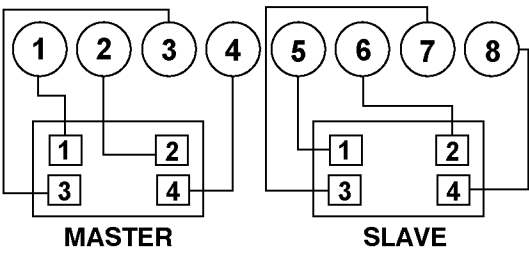
Connections for a counting system having more than four primaries is the same as described earlier, with sensors 1—4 installed in primaries 1—4 and connected to quadrants 1—4 on controller No. 1 (master). Sensors are installed in primaries five and above and then connected to the second electronic controller (slave). The hardware in both controllers are identical. Slave controller (2) is identified by a jumper connector installed on a harness stub near the controller. Jumper connector has an external wire that connects two pins. Master controller (1) has a connector plug on its harness stub. Connector plug has no external jumper wire. Quadrants on the second controller are numbered 1—4, but will be displayed as primaries 5—8 when sensors and both controllers are connected.

Primary No.	Master Quadrant	Displays as
1	1	Primary 1
2	2	Primary 2
3	3	Primary 3
4	4	Primary 4

Primary No.	Slave Quadrant	Displays as
5	1	Primary 5
6	2	Primary 6
7	3	Primary 7
8	4	Primary 8



More Than Four, Less Than Eight Runs



Eight Runs

A42215A -19-08APR98

A42193A -19-08APR98

Seed Counter Readouts

Seed Types	Population Display	Average Seeds/kg	Average Seeds/lb.
Wheat, Hard Red Spring	mass/area	33,440	15,200
Wheat, Winter	mass/area	31,900	14,500
Wheat, Durum	mass/area	26,620	12,100
Barley	mass/area	31,460	14,300
Oats	mass/area	35,640	16,200
Buckwheat	mass/area	32,780	14,900
Rye	mass/area	40,040	18,200
Alfalfa	mass/area	440,000	200,000
Canary Grass	mass/area	----	
Grain Sorghum	seeds/area	35,200	16,000
Forage Sorghum	seeds/area	35,200	16,000
Sorghum Sudangrass Hybrids	seeds/area	35,200	16,000
Canola, Argentine Type	mass/area	341,000	155,000
Canola, Polish Type	mass/area	385,000	175,000
Flax	mass/area	193,600	88,000
Mustard, Yellow (Gisilba)	mass/area	198,000	90,000
Mustard, Brown (Oriental)	mass/area	396,000	180,000
Lentil, Black (Indian Head)	seeds/area	39,600	18,000
Lentil, Red (Crimson)	seeds/area	24,200	11,000
Lentil, Green (Eston)	seeds/area	26,400	12,000
Lentil, Green (Chilean)	seeds/area	14,960	6,800
Lentil, Green (Laird)	seeds/area	13,200	6,000

Continued on next page

AG,OUO6023,1163 -19-21JUL00-1/2

Seed Counting System

Seed Types	Population Display	Average Seeds/kg	Average Seeds/lb.
DRY PEAS:			
Austrian Winter Peas	seeds/area	9900	4,500
Small Yellow Peas (Trapper)	seeds/area	8360	3,800
Medium Yellow or Green Peas	seeds/area	4400	2,000
Large Yellow or Green Peas	seeds/area	3740	1,700
Sunflower, #1 (Oil Seed)	seeds/area	11,000	5,000
Sunflower, #2 (Oil Seed)	seeds/area	14,960	6,000
Sunflower, #3 (Oil Seed)	seeds/area	16,500	7,500
Sunflower, #4 (Oil Seed)	seeds/area	18,700	8,500
Sunflower, #5 (Oil Seed)	seeds/area	22,000	10,000
Sunflower, Small (Confectionery)	seeds/area	9900	4,500
Sunflower, Medium (Confectionery)	seeds/area	7920	3,600
Sunflower, Large (Confectionery)	seeds/area	7040	3,200
Sunflower, X-Large (Confectionery)	seeds/area	6160	2,800
Soybeans	seeds/area	6160	2,800
Corn, medium round	seeds/area	3740	1,700
Custom 1	mass/area	22	10
Custom 2	seeds/area	22	10

NOTE: Chart shows which crops will have population displayed in seeds-per-area (acre or hectare) and which crops will have population displayed in mass-per-area (pounds-per-acre or kilograms-per-hectare). This default will be automatic, depending on the crop type selected.

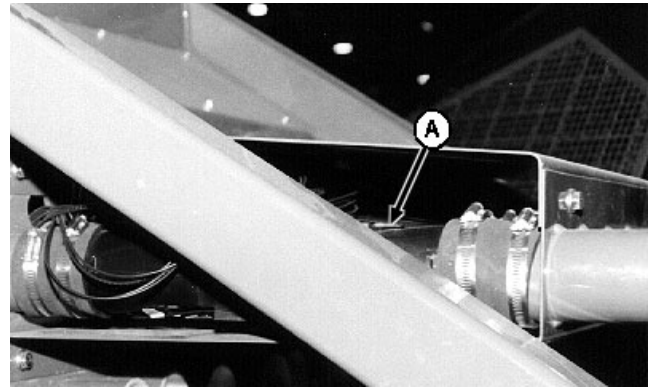
Also shown are the “average” seeds/kg and seeds/lb values that the software will give the user as the “default” values. The user can input their own value.

AG,OUO6023,1163 –19–21JUL00–2/2

Cleaning Seed Counting Sensors

Optical lens of the seed counting sensors should be cleaned when “Diagnostics on counting sensors” appears on display console.

IMPORTANT: Do not disassemble sensor for cleaning. Internal alignment of the optical lens is critical to the operation of the sensor and should not be disturbed.



Tow-Behind Shown

A—Sensor

1. Remove sensor (A) from in-line mounting.
2. Using a soft nylon bristle brush, dry clean lens by working brush back-and-forth inside sensor. Insert brush from both the inlet and outlet sides of the sensor to remove product residue deposits from lens.
3. Use compressed air to blow out loosened deposits or return sensor to in-line mounting and use fan air pressure.
4. If dry cleaning does not improve sensor performance, wrap brush with a clean cloth, apply window cleaning agent to cloth, and repeat cleaning procedure.

AG,OUO6023,1164 -19-21JUL00-1/1

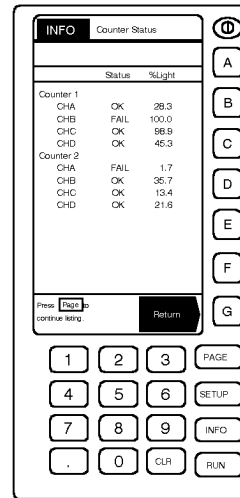
Checking Fiber Optic Cables

A damaged fiber optic cable can be identified using the “Counter Status” screen of the GREENSTAR™ display.

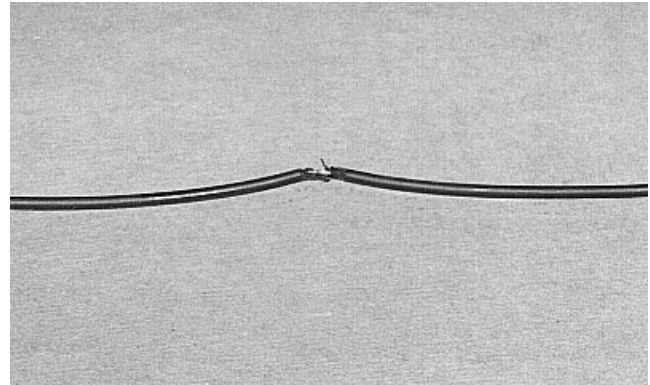
Percent Light (% Light) reading shows how much signal light is being lost between the sensor and controller. A 0—10% reading indicates that a full light signal is being seen. A 100% reading shows that not enough light is being seen at the controller to effectively operate. Cable connections at the controller should be inspected. Press PAGE to check status of other sensors.

Significant breaks or damage to the cables may have a red glow from escaping light.

“FAIL” status and % Light readings are explained below:



GREENSTAR™ Display

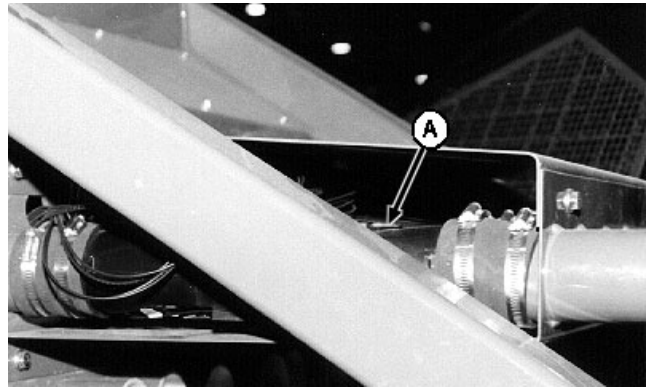


Damaged Cable

Status	Reading	Problem/Solution
FAIL	Number other than 0 or 100% (may fluctuate wildly)	Inspect for disconnected or cut cables. Attach or repair cables.
		Ambient light entering cable can cause readings other than 100% in FAIL mode. Inspect and repair cables.
FAIL	100%	Dirty or disconnected sensor. Clean sensor and connector end. Inspect and repair cable.
		Sensors incorrectly connected to controller(s), or connected out of sequence (open connector).
		Attach sensors in proper order.
FAIL	0%	Electrical circuit or electrical connection problem.
		Check electrical connections.

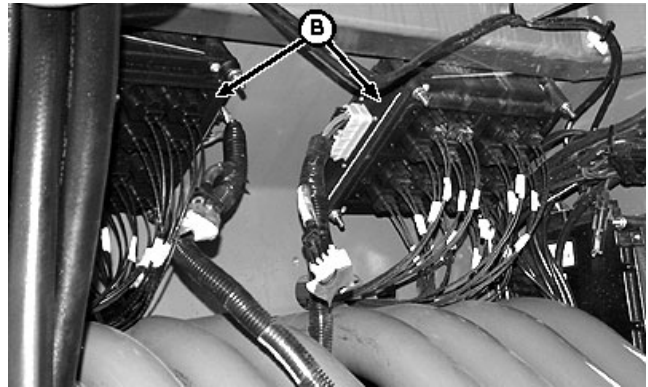
Check fiber optic cables between seed counter sensor (A) and count controllers (B) as indicated on the “status” screen. Check that cables are plugged into controllers and not cracked or damaged. Repair or replace as necessary.

A—Seed Counter Sensor
B—Count Controllers



A41563A -UN-06MAY98

Tow-Behind Shown



A41564A -UN-12MAR99

Tow-Behind Shown

AG,OUO6023,1165 -19-21JUL00-2/2

Tank and Auger

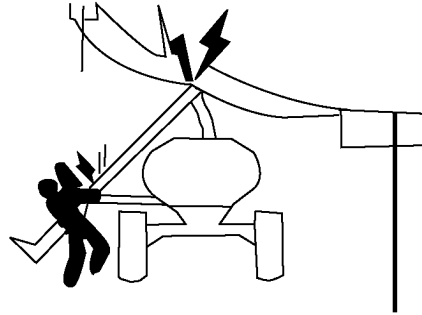
Auger Precautions



CAUTION: Avoid serious injury or death from electrocution.

Do not contact electric lines.

Do not position auger when near electric lines. Electrocution can occur without direct contact with overhead electrical lines.



A41983 -UN-02SEP97



CAUTION: Keep all shields in place. DO NOT operate auger if hopper grate shield (A) is removed. Entanglement with auger flighting will cause serious injury or death to you or someone else.

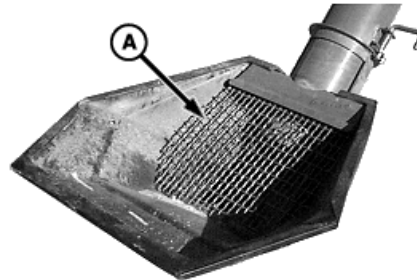


CAUTION: Avoid roadway collisions. Auger should be latched in storage position any time it is not in use. Latch (B) keeps auger tube from bouncing out of storage position when traveling over rough ground or when transporting.

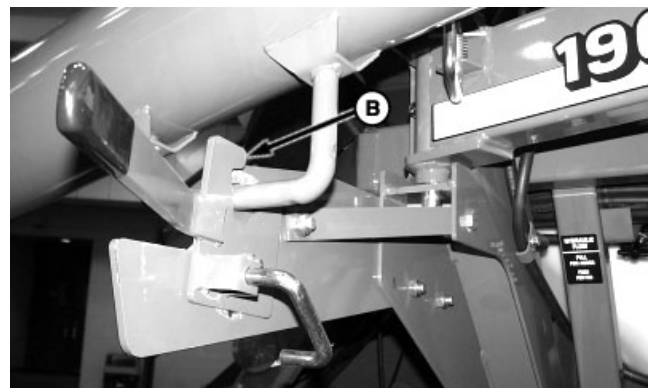


A41870 -UN-24JUL97

A—Hopper Grate Shield
B—Auger Latch



A46372 -UN-10JUL00



A46134 -UN-26JUN00

AG,OUO6023,1166 -19-21JUL00-1/1

Operating Tank Lids

IMPORTANT: Product metering will be adversely affected if tank is not sealed tightly. If the tank is not pressurized, product will not meter properly.

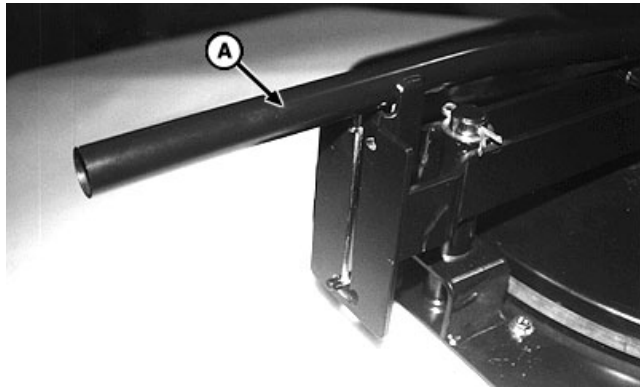
When closing tank lids, perform the following steps to ensure that tank is properly sealed:

1. Wipe product overflow, if any, from lid seal.
2. Inspect lid seal.
3. Rotate lid over opening until it contacts stop.
4. Make sure lid is not clamped down on lid centering brackets.

AG,OUO6023,1167 -19-21JUL00-1/2

5. Push down on handle (A) to lock lid in "J" slot as shown.

A—Handle



"J" Slot

AG,OUO6023,1167 -19-21JUL00-2/2

Filling Tank to Capacity

Tank is filled to rated capacity when product touches lid rim all the way around. If product is allowed to naturally flow into tank, rated volume will be reached when product contacts lid rim, all the way around, without stuffing product into the tank top dome. Stuffing product into the dome can increase volume by 5 to 7 bushels over the tank's rated capacity.

AG,OUO6023,1168 –19–21JUL00–1/1

Adjusting Tank Lid Down Pressure

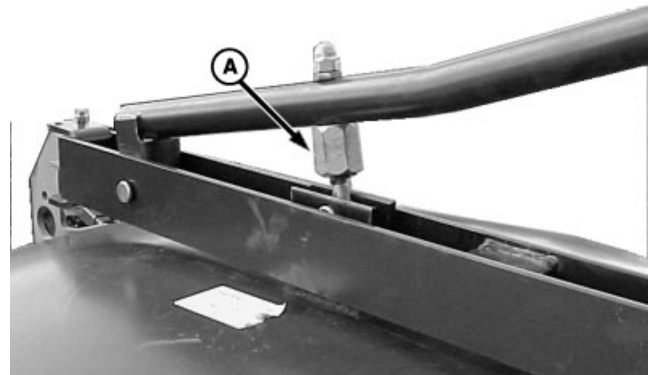
Tank lid closing down-pressure is adjustable to reduce air leaks. Use powder or fine dirt to check for air leakage around lid perimeter.

AG,OUO6023,1169 –19–21JUL00–1/6

Inspect condition of tank lid eyebolt (A). If eyebolt shows any bend, remove and replace.

To adjust:

A—Eyebolt



051601
PN=424
A46307 –UN–10JUL00

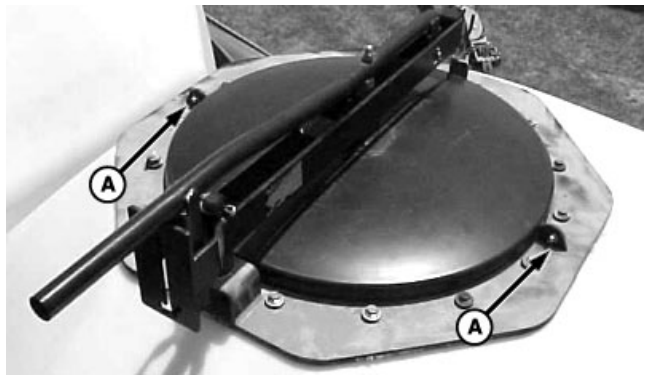
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AG,OUO6023,1169 –19–21JUL00–2/6

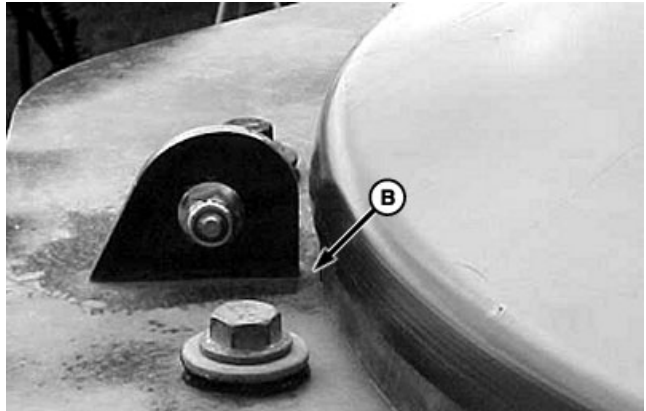
1. With lid centered on seal and closed, adjust centering tabs (A) so gap (B) meets specification.

Specification
 Lid to Tab—Gap 1.5 mm
 (.06 in.)

A—Centering Tab
 B—Gap



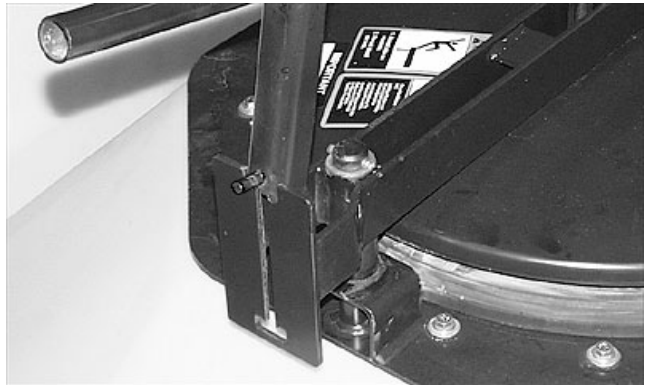
A46310 -UN-10JUL00



A46309 -UN-10JUL00

AG,OUO6023,1169 -19-21JUL00-3/6

2. Open lid and place lock pin in top groove as shown.



A43546 -UN-26AUG99

Continued on next page

AG,OUO6023,1169 -19-21JUL00-4/6

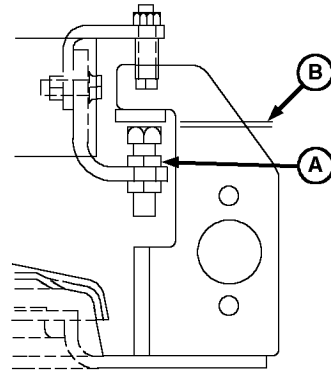
IMPORTANT: Swing arm adjustment bolt gap (B) should be as little as possible without contacting, with a maximum gap of 3 mm (.125 in.).

3. Ensure gap (B) meets specification.

Specification	
Pivot Clearance Max. (B)—Gap.....	3 mm (.125 in.)

Adjust latch set screw (A) as needed.

A—Latch Set Screw
B—Gap



A43545 -UN-27SEP99

Continued on next page

AG,OUO6023,1169 -19-21JUL00-5/6

4. Lower handle allowing lid to rest on tank but leaving it unlocked as shown.

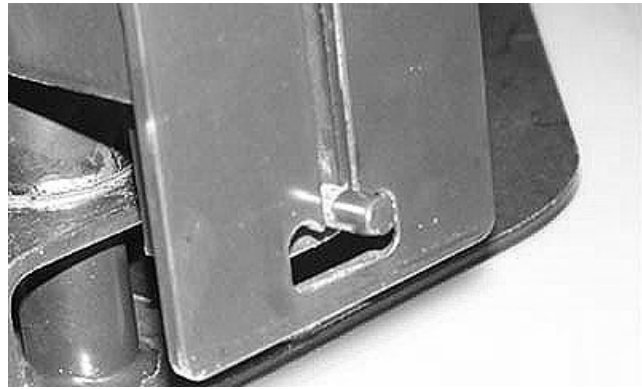
NOTE: Swing arm adjustment bolt should not have a gap with lid in this position. If adjustment is necessary, lightly press down on the lid handle while making adjustment.

5. Verify that distance (A) is 10 mm (.4 in.) \pm 2 mm (.08 in.). Adjust as necessary by turning coupling nut (B).

IMPORTANT: Product metering will be adversely affected if lid is not sealed tightly. If the tank is not pressurized, product will not meter properly.

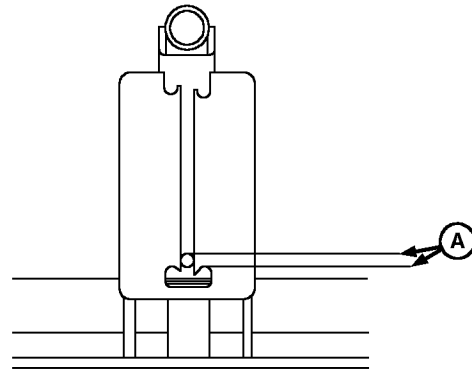
6. Close lid and check for good, tight seal when lever is down and lock pin seated in "J" slot.

A—Distance, 10 mm (.4 in.) \pm 2 mm (.08 in.)
B—Coupling Nuts

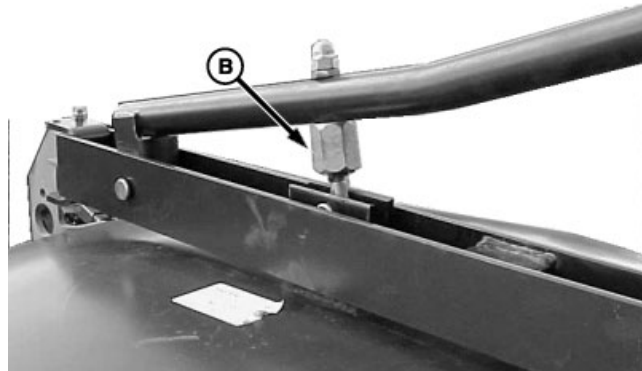


A43547 -UN-26AUG99

Unlocked Position



A43548 -UN-11OCT99



A46308 -UN-10JUL00

AG,OUO6023,1169 -19-21JUL00-6/6

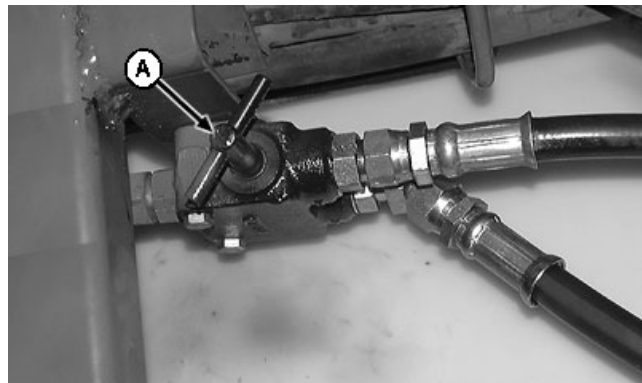
Setting Fan/Auger Selector Valve

Valve (A) is used to direct hydraulic oil to either the fan motor or to the auger operating control valve.

FAN: Push valve handle in for fan operations.

AUGER: Pull valve handle out for auger operations.

A—Fan/Auger Selector Valve



A40131B -UN-28JUL98

AG,OUO6023,1170 -19-21JUL00-1/1

Tank Filling Indicator Lights

1. GREENSTAR™ console (A) does not need to be set in any particular mode for tank filling indicator lights to display. Tank filling lights display regardless of console's current mode (SET-UP, RUN or INFO).

A—GREENSTAR™ Console



A41529 -UN-10APR97

GREENSTAR is a trademark of Deere & Company.

AG,OUO6023,1171 -19-21JUL00-1/2

NOTE: Amber indicator lights are dual purpose. In any display mode, they indicate tank filling status as described below. In RUN mode, lights indicate fan speed, as described in the Air System section. Fan speed indicator lights are a set-up feature, not an operational display.

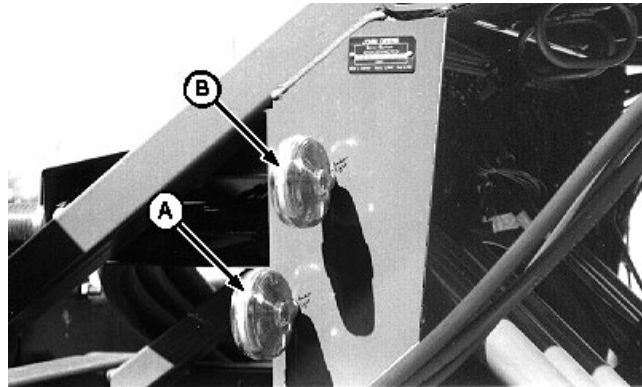
2. Filling status of either front or rear tank is indicated by lower (A) and upper (B) lights.

When all in-tank level sensors (C) are covered with product, the upper and lower lights alternately flash to indicate the tank is full. Lights will stop flashing if:

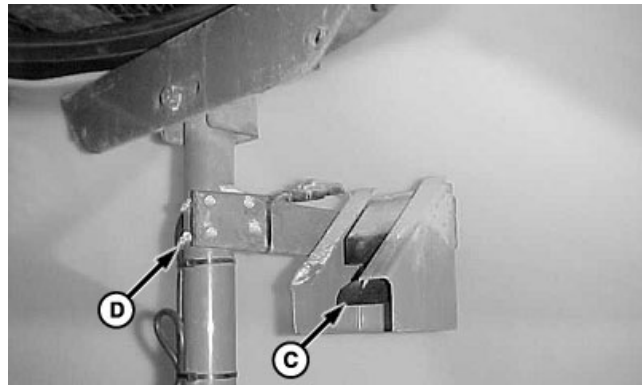
- More than three minutes have elapsed with no activity.
- There is activity at another tank (any sensor activated).
- Cart begins to move; tire speed sensed.

NOTE: Product level is also indicated on the tractor-mounted display console.

NOTE: Top sensor may be lowered to allow the top sensor to trip earlier when using mesh basket. To lower bracket and sensor assembly, loosen U-bolts (D).



A40164 -UN-09APR97



A46297 -UN-19JUL00

A—Lower Lights
B—Upper Lights
C—In-Tank Level Sensors
D—U-bolt

AG,OUO6023,1171 -19-21JUL00-2/2

Auger Control Valve

Rotary variable speed control valve is mounted on top of the auger tube for convenient operator access when filling or emptying tanks. Hydraulic oil is supplied to the valve from the tractor's SCV, through the fan/auger selector valve.

AG,OUO6023,1172 -19-21JUL00-1/2

Levers (A) and (B) control oil delivery to the bi-directional motor (C) located at the outlet end of the auger tube. With lever in center position, valve is in neutral.

Rotating the lower lever (A) up rotates the auger, moving product up the tube to the outlet hose.

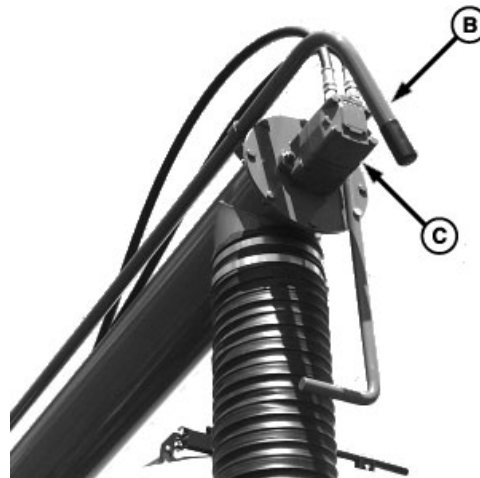
Rotating the lower lever down reverses oil delivery to the motor, moving product down the tube, back to the hopper for emptying.

The control valve can also be operated from the outlet end, using upper lever (B). Rotating down on the handle brings product up the tube to the outlet hose. Rotating up on the handle reverses oil delivery to the motor, moving product down the tube, back to the hopper for emptying.

- A—Lower Lever
- B—Upper Lever
- C—Bi-Directional Motor



A43876 -UN-10JUL00



A43877 -UN-10JUL00

AG,OUO6023,1172 -19-21JUL00-2/2

Auger Storage/Transport Latch

CAUTION: Avoid roadway collisions. Before transporting, secure auger in the storage position by:

- Locking auger arm into swing link.
- Placing auger in storage position.
- Rotating auger latch clockwise to lock auger in storage position.

CAUTION: To avoid injury when opening latch, stand to the inside of the auger, out of the tube's release path to the ground.

Bystanders should also be cleared from the tube's release path as they could be injured if the auger slides off the rest bracket when the latch is opened.

Latch (A) keeps auger from bouncing out of storage position when traveling over rough ground or when transporting. Auger should be locked in storage position any time it is not in use.



A—Latch

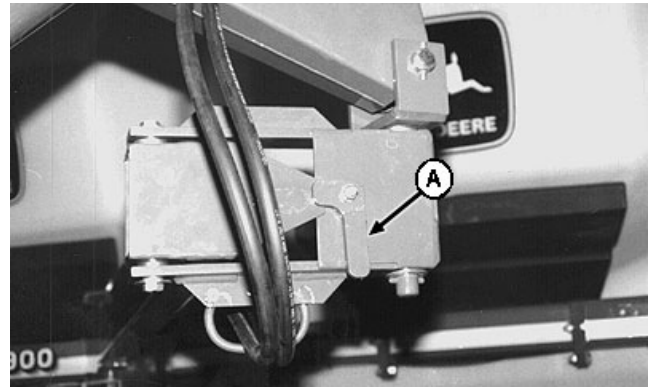
AG,OUO6023,1173 -19-21JUL00-1/1

Auger Swing Link Lock

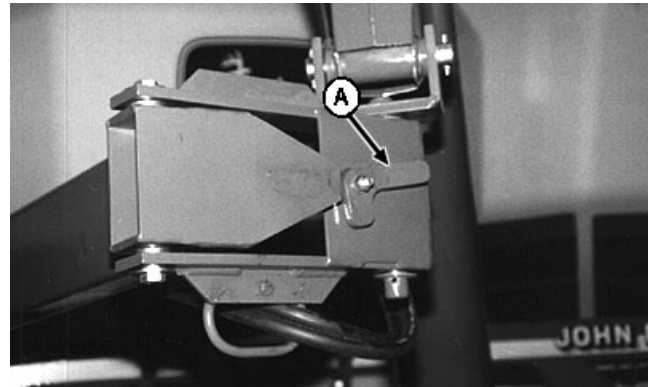
IMPORTANT: Swing link lock (A) should be engaged to restrict movement when taking auger from storage to operating position, and when returning auger to storage position.

Release swing link lock, when necessary, to reposition auger outlet to a different tank opening without moving the hopper or when positioning hopper under front meter for emptying.

A—Swing Link Lock



Swing Lock Engaged



Swing Lock Released

AG,OUO6023,1174 -19-21JUL00-1/1

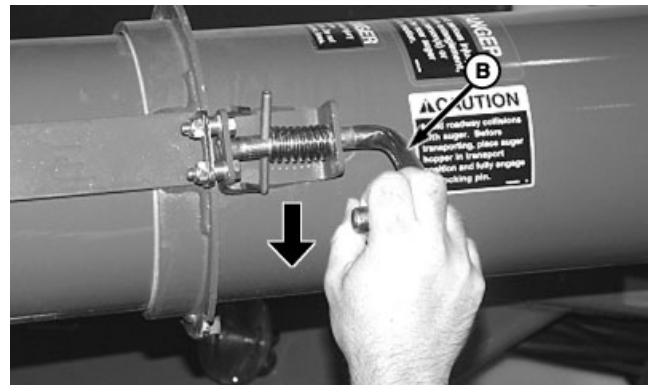
Adjusting Hopper Position

Hopper (A) is held in adjusted position by spring-loaded lock pin (B).

To adjust hopper, pull down on lock pin handle to release lock pin from sleeve hole. Rotate hopper to desired position. Align closest sleeve hole with pin and release pin to lock hopper.

A—Hopper

B—Spring-Loaded Lock Pin



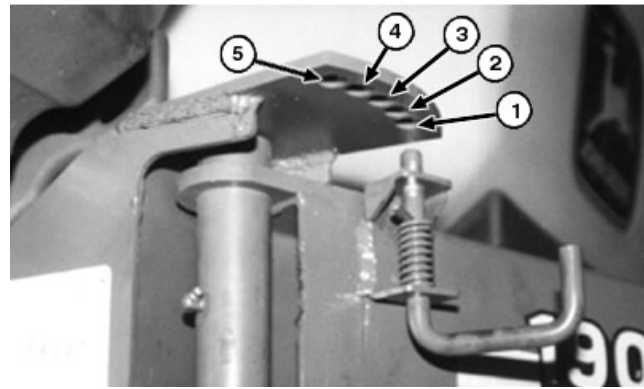
AG,OUO6023,1175 -19-21JUL00-1/1

Auger Arm Position Lock

Auger arm position lock has five hole/pin positions. Reset spring loaded pin (A) into correct hole for desired operation.

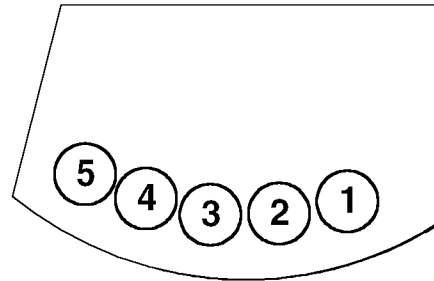
Hole Number	Auger Operation
1	Fill Rear Tank(s)
2	Fill Front Tank
3	Empty Rear Tank
4	Empty Middle Tank
5	Empty Front Tank

Hole/pin positions are recommendations only. You may prefer to use a different hole/pin position than the one that is suggested.



A42790 -UN-25AUG98

AUGER ARM POSITION LOCK



HOLE 1 : FILL REAR TANKS
 HOLE 2 : FILL FRONT TANK
 HOLE 3 : EMPTY REAR TANK
 HOLE 4 : EMPTY MIDDLE TANK
 HOLE 5 : EMPTY FRONT TANK

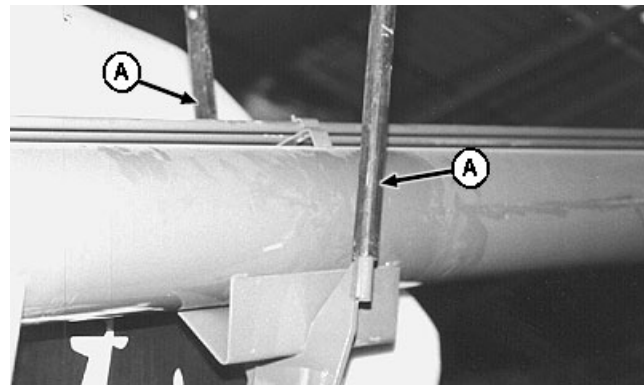
A42791 -19-25AUG98

AG,OUO6023,1176 -19-21JUL00-1/1

Auger Preload

1. Position auger tube between storage posts (A) or auger sling.

A—Storage Posts



A42580 -UN-05MAY98

Continued on next page

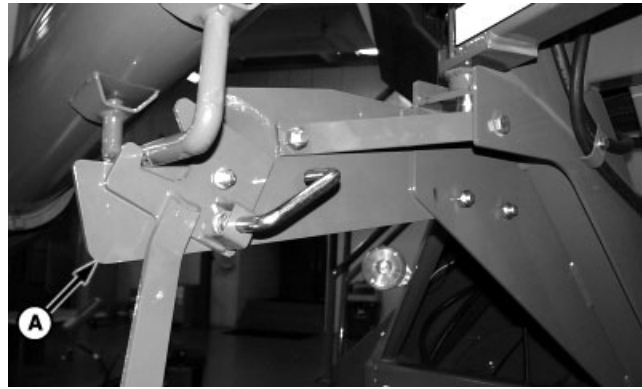
AG,OUO6023,1177 -19-21JUL00-1/3

2. Lift auger into rest position on latch plate (A). Leave latch arm open.
3. Loosen latch plate hardware (B), support strap hardware (F) and offset cam washer hardware (D).

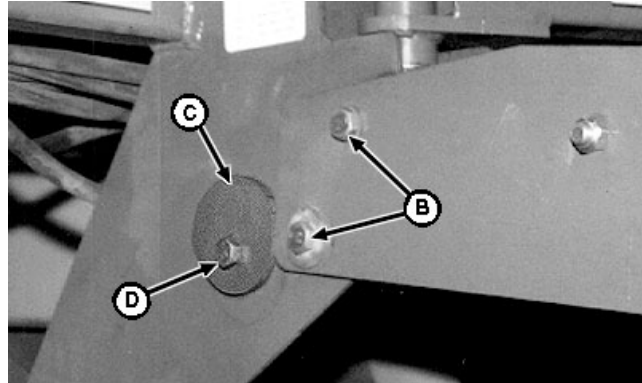
IMPORTANT: DO NOT allow auger arm (G) to raise more than 26 mm (1 in.) or damage to auger may occur.

4. Raise outside end of latch plate (A) until the auger arm (G) STARTS to deflect upward APPROXIMATELY 13 mm (0.5 in.). Tighten latch plate hardware (B).
5. Tighten hardware (F) on support strap (E).
6. Rotate offset cam washer (C) to contact plate edge and tighten hardware (D). Offset cam washer retains latch plate in adjusted position.

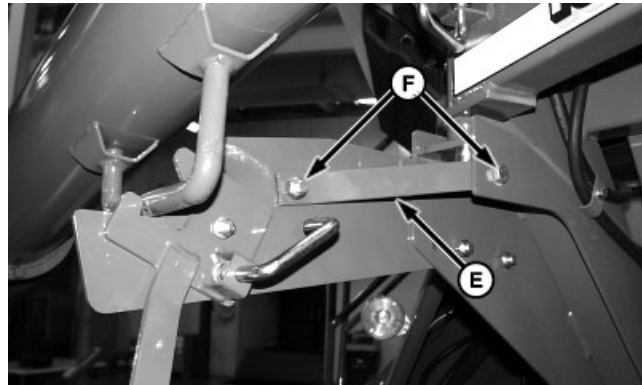
A—Latch Plate
B—Plate Hardware
C—Offset Cam Washer
D—Offset Cam Washer Hardware
E—Support Strap
F—Support Strap Hardware
G—Auger Arm



A46136 -UN-13OCT00



A42890 -UN-23SEP98



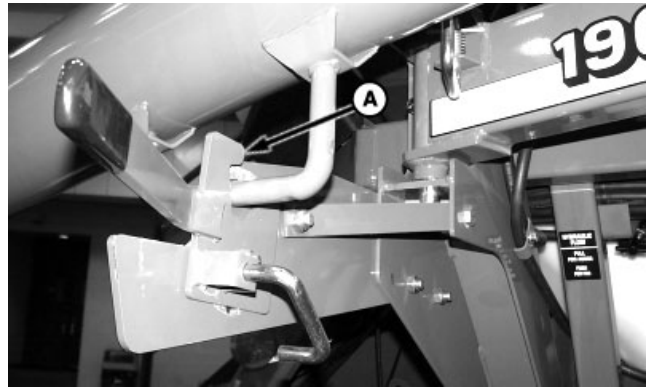
A46137 -UN-13OCT00



A46562 -UN-13OCT00

7. Close latch arm (A). Auger arm should have more upward deflection when the latch is closed.
8. Open latch and lift auger tube off plate, lowering hopper to the ground.
9. To check latch adjustment, lift auger tube onto plate and close latch. Latch should close firmly, but not require excessive force. If latch is extremely hard to close, lower the latch plate slightly.

A—Latch Arm



A46135 -UN-26JUN00

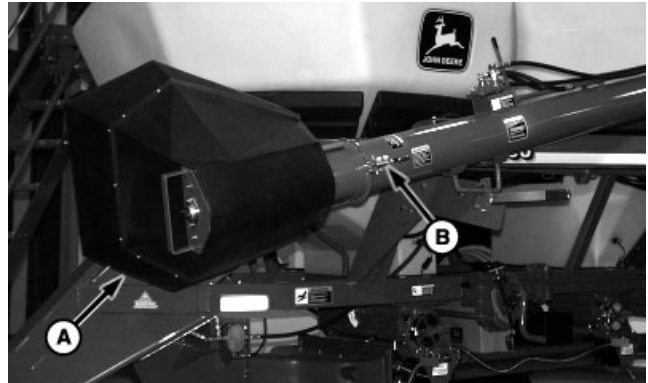
AG,OUO6023,1177 -19-21JUL00-3/3

Positioning Auger

- In Storage Position:

IMPORTANT: To avoid contact with left-hand front tire of a tow-behind cart, hopper must be stored with closed side out, away from cart frame.

1. Hopper (A) is rotated so closed side is out away from cart and held by spring-loaded pin (B). With hopper turned to this position, rain cannot collect in the bottom.



A46141 -UN-26JUN00

A—Hopper
B—Spring-Loaded Pin

AG,OUO6023,1178 -19-21JUL00-1/17

2. Auger storage/transport latch (A) is closed on tube and held by spring-loaded pin. Lever is down when latch is closed.

A—Auger Storage/Transport Latch



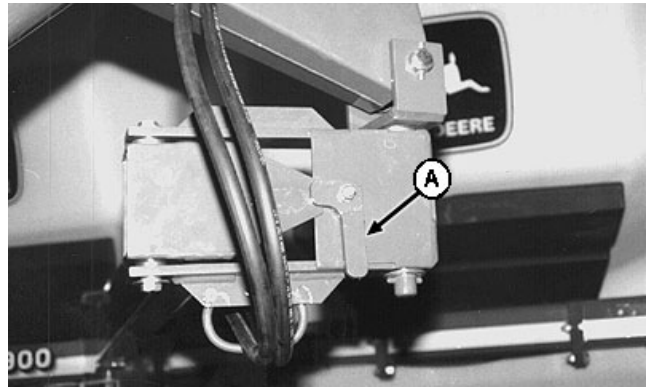
A46135 -UN-26JUN00

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AG,OUO6023,1178 -19-21JUL00-2/17

3. Swing link lock (A) is engaged to restrict movement.

A—Swing Link Lock

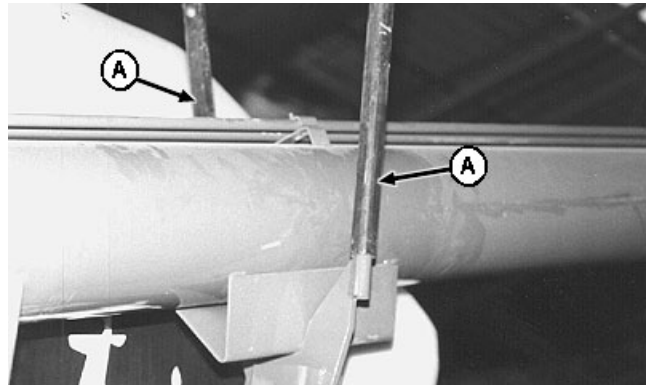


AG.OUO6023,1178 -19-21JUL00-3/17

A42577 -UN-05MAY98

4. Rear of the auger tube is captured between storage posts (A).

A—Storage Post



AG.OUO6023,1178 -19-21JUL00-4/17

A42580 -UN-05MAY98

5. • To release from storage:

CAUTION: To avoid injury when opening latch, stand to the inside of the auger, out of the tube's release path to the ground.

Bystanders should also be cleared from the tube's release path as they could be injured if the auger slides off the rest bracket when the latch is opened.



TS263 -UN-23AUG88

Standing to the inside of the auger tube, release lock pin and push up on lever to open hook and release storage latch (A). Auger tube should rest on top of latch bracket.

6. Using both hands for control, slide auger tube off bracket, gently lowering hopper to the ground.

A—Storage Latch



A46136 -UN-13OCT00

Continued on next page

AG.OUO6023,1178 -19-21JUL00-5/17

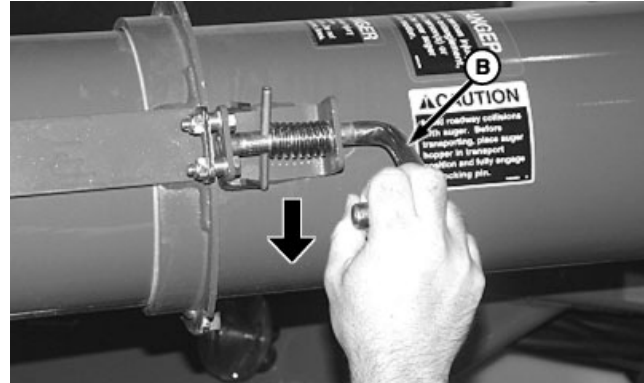
7. Hopper (A) is held in adjusted position by spring-loaded lock pin (B).

To position hopper, pull down on lock pin handle to release lock pin from sleeve hole. Rotate hopper to filling/emptying position. Align closest sleeve hole with pin and release pin to lock hopper.

A—Hopper
B—Spring-Loaded Lock Pin



A46373 -UN-10JUL00



A46399 -UN-03DEC00

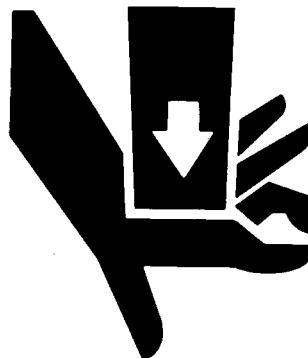
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AG,OUO6023,1178 -19-21JUL00-6/17

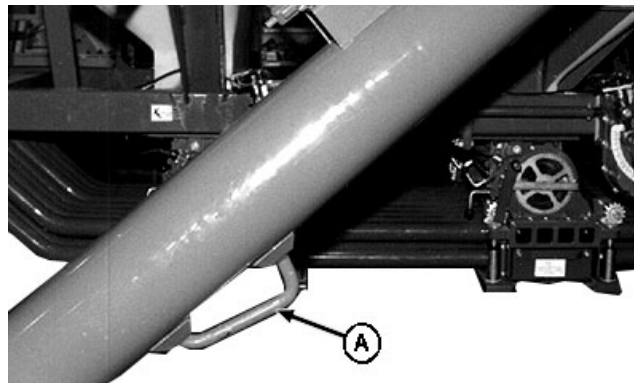
CAUTION: Avoid crushing injuries. Keep hands and fingers away from hinge area when positioning auger.

8. Auger has three hand-holds, any one of which can be used for positioning. Auger can be moved using lock tube (A), hopper handle (B), or the top outside lip of the hopper (C).

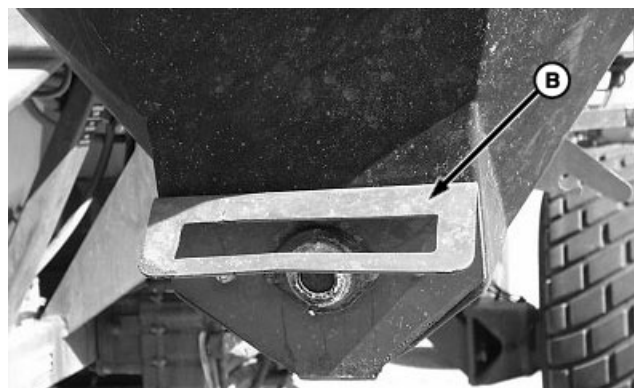
A—Lock Tube
B—Hopper Handle
C—Outside Hopper Lip



TS260 -UN-23AUG88



A42582 -UN-05MAY98



A43880 -UN-09OCT99



A46374 -UN-19JUL00

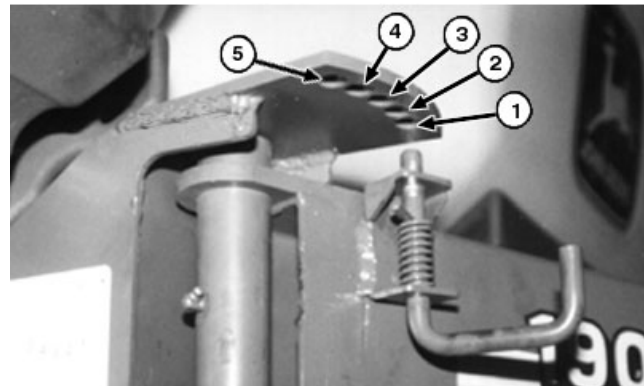
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AG.OUO6023,1178 -19-21JUL00-7/17



A46138 -UN-05MAY00

9. Using any one of the hand-holds, pull hopper toward front of cart, pivoting straight support arm away from frame, until outlet end of tube clears storage posts. Set arm position lock pin into holes 1 or 2 for filling operations or holes 3, 4 or 5 for tank emptying.
10. Pivot hopper around to the outside of cart, positioning outlet hose near lid of empty tank.



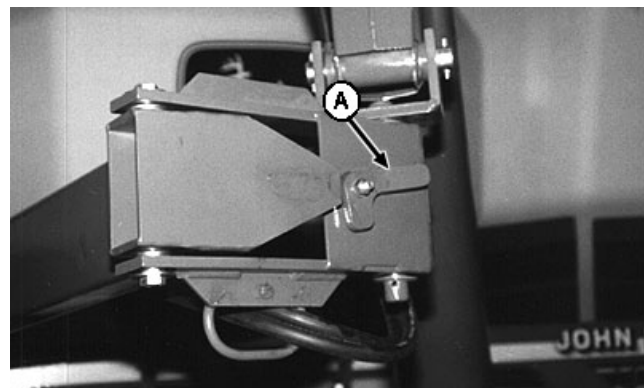
A42790 -UN-25AUG98

Arm Position Lock Pin

AG.OUO6023,1178 -19-21JUL00-8/17

11. If unable to position outlet hose near tank lid, release swing link lock (A) to improve maneuverability and reach.

A—Swing Link Lock



A42578 -UN-05MAY98

Swing Link Lock Released

Continued on next page

AG.OUO6023,1178 -19-21JUL00-9/17

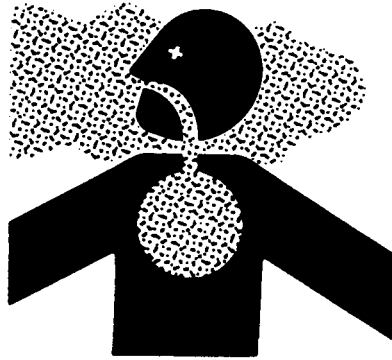
- Tank Filling:



CAUTION: Stop fan before opening tank lid. Lid may fly upward if opened while fan is operating.

Avoid exposure to airborne chemicals. Dust and fumes will be exhausted if tank lid is opened while tank is pressurized.

12. Reset selector valve from “FAN” to “AUGER” position before climbing to tank lid platform.

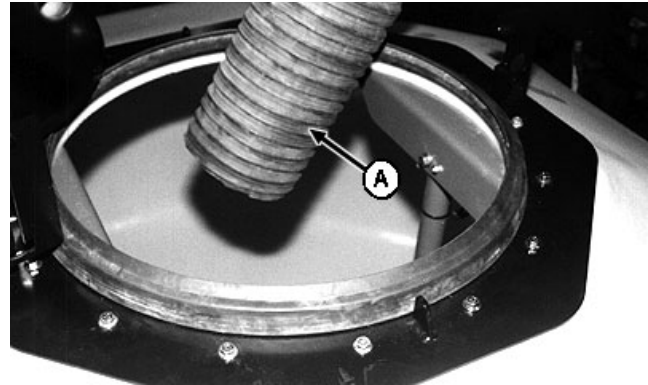


TS220 –JUN-23AUG88

AG,OUO6023,1178 –19-21JUL00-10/17

13. Release and rotate tank lid and position auger tube so outlet hose (A) is over tank opening.

A—Outlet Hose



A40160B –JUN-27JUL98

Continued on next page

AG,OUO6023,1178 –19-21JUL00-11/17

IMPORTANT: Before filling, check inside tanks and remove any obstructions (rocks, twigs, sticks, straw, etc.) from meter inlet openings.

IMPORTANT: Use of clean dry product is recommended for best metering. Do not use seeds treated with liquid inoculents.

NOTE: Depending on product quality, agitator shaft may need to be reset for more aggressive agitation. See "Product Metering" for further information.

IMPORTANT: If meter cartridge assembly is removed, be sure half-width disconnect handles are up (blocking product passages to meter) and that cleanout panels are in place and locked before filling tank.

14. Operate auger control valve (A) to fill tank. Valve on 203 mm (8 in.) auger can also be operated from the outlet end.

15. After filling:

- Wipe product overflow from lid seal.
- Inspect lid seal.
- Rotate lid over opening until it contacts stop.
- Make sure lid is not clamped down on lid centering brackets.
- Push down on handle to lock lid.

NOTE: See *Operating Machine—Air System* for inspection and adjustment procedures for tank seals and lids.



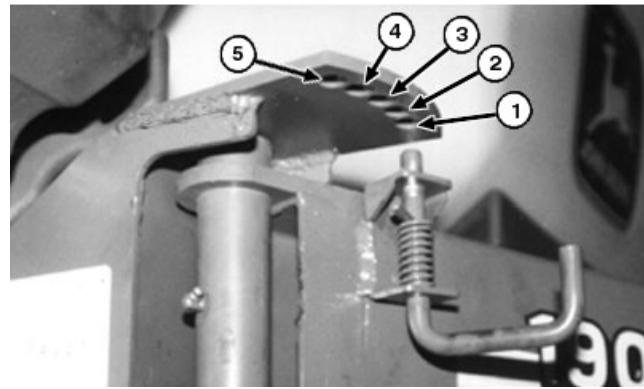
A—Auger Control Valve

Continued on next page

AG,OUO6023,1178 -19-21JUL00-12/17

16. • Tank Emptying:

Depending on which tank will be emptied, reset arm position lock pin into holes 3 (rear), 4 (middle) or 5 (front).



Arm Position Lock Pin

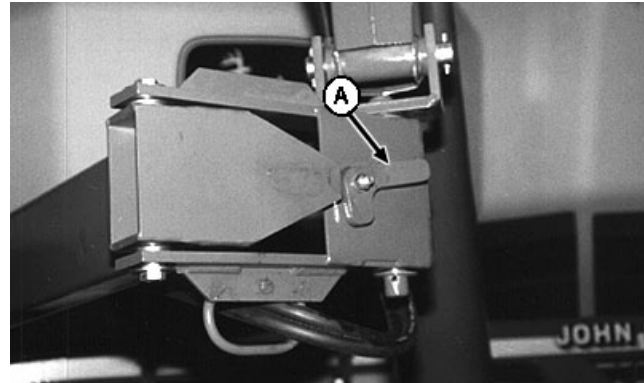
A42790 -UN-25AUG98

AG,OUO6023,1178 -19-21JUL00-13/17

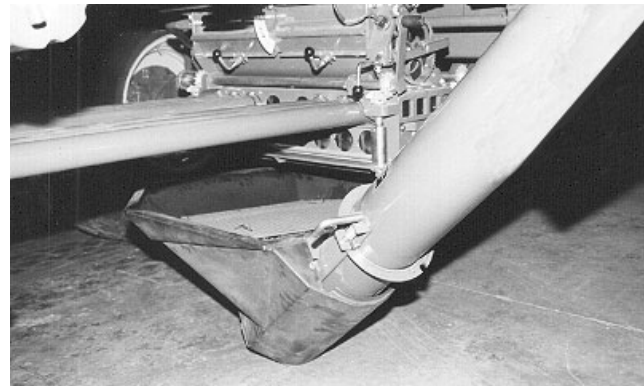
NOTE: To place hopper under front meter, it may be necessary to release swing link lock (A).

17. Place hopper under meter cleanout panels.

A—Swing Link Lock



A42578 -UN-05MAY98



A40162B -UN-05MAY98

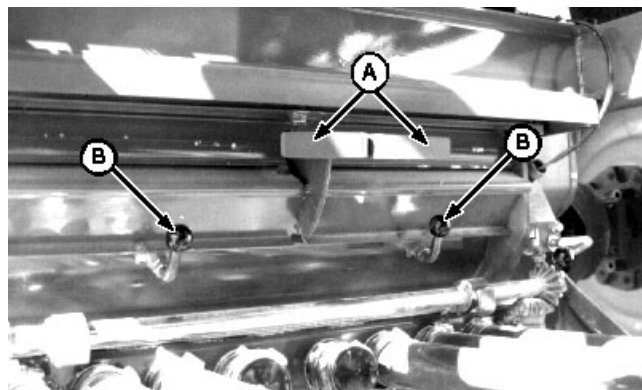
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AG,OUO6023,1178 -19-21JUL00-14/17

18. Push both disconnect handles (A) up to close off meter feed and open cleanout passages. Should disconnect handles feel jammed or locked up and not operate smoothly, they can usually be “worked” free using short up-and-down strokes at the start. Working the handles up-and-down loosens caked-on residue that may be preventing smooth operation.
19. Rotate lock levers (B) down and pull panels from meter housing to empty product from tank. Product will start flowing as panels are removed.
20. Operate auger control valve to empty hopper until product flow stops.
21. If complete cleanout is desired, refer to METER CLEANOUT PROCEDURE in Product Metering System section.

NOTE: When closing cleanout panels, slide panels to the outside of meter housing before locking. If panels are to the inside, half-width disconnect levers can bind on panels and not open or close completely when operated.

22. When done emptying, check seals on cleanout panels and return to meter housing. Position panels to the outside, push against housing and rotate levers up to lock in place.
23. Pull both disconnect handles down to close off cleanout passages and re-open meter feed passages.



A—Disconnect Handles
B—Lock Levers

Continued on next page

AG,QUO6023,1178 -19-21JUL00-15/17

• Returning to storage position:

To return auger to storage position, reverse the order of operational steps previously described. You need to:

1. Reset swing link lock (A) to engaged, storage position.
2. Release arm position lock pin from hole.

CAUTION: Avoid auger damage. Auger storage latch must be properly adjusted to prevent damage/wear to the auger and sling. See **AUGER PRELOAD**.

3. While moving hopper to the front of the cart, push support arm to frame and position outlet end of auger tube between storage posts.

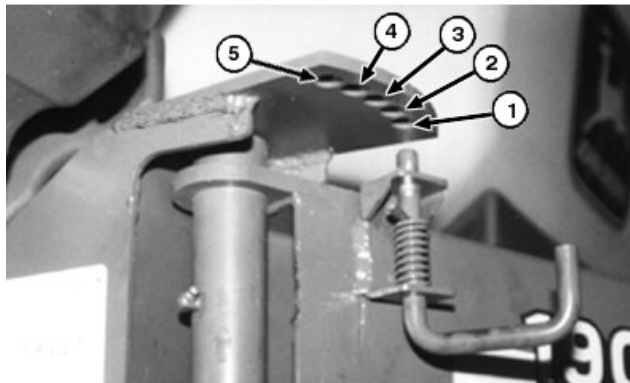
CAUTION: Avoid auger damage. Before transporting, place auger hopper in transport position and fully engage the locking pin.

IMPORTANT: To avoid contact with left-hand front tire of a tow-behind cart, hopper must be stored with closed side out, away from cart frame.

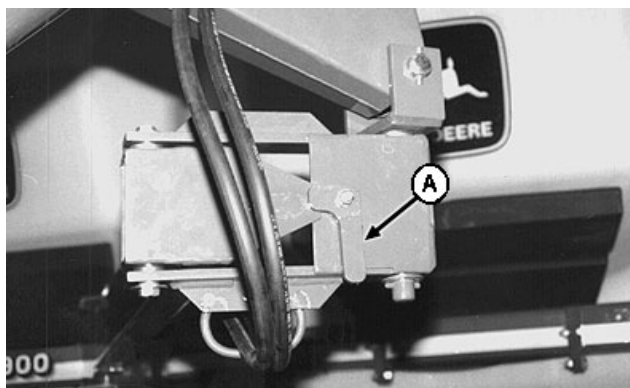
4. Release lock pin and rotate hopper so closed side is out, away from cart. Reset pin to hold hopper in transport position.

CAUTION: Auger tube is heavy. To avoid injury, use your legs for lifting.

5. On solid footing, grasp lock handle with both hands, and using your legs for lifting, raise auger tube onto latch bracket.



Arm Position Lock Pin

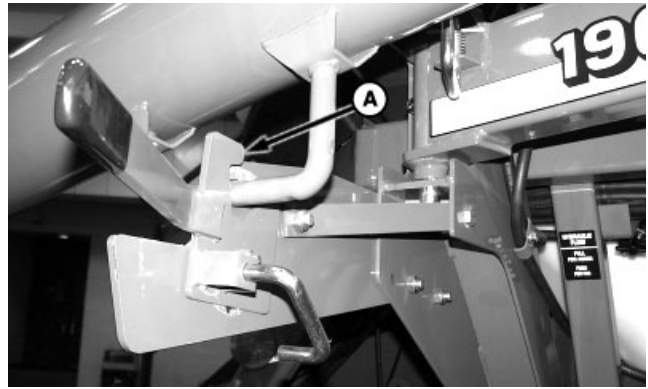


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AG,OUO6023,1178 -19-21JUL00-16/17

CAUTION: Avoid roadway collisions. Before transporting, secure auger in the storage position.

6. Push lock tube into open latch. Release lock pin and pull lever down to rotate auger latch (A) clockwise, locking auger in storage position. Make sure spring loaded pin fully engages in lock hole.
7. Place a catch pail under hopper and operate auger in reverse to remove remaining product from auger tube.
8. Reset selector valve to FAN position.
9. To clean out product residue from bottom of hopper, insert a long stick or pry bar through guard screen and chip or scrape away caked on material. This should only be done with selector valve set in FAN position.



A—Auger Latch

A46135 —UN-26JUN00

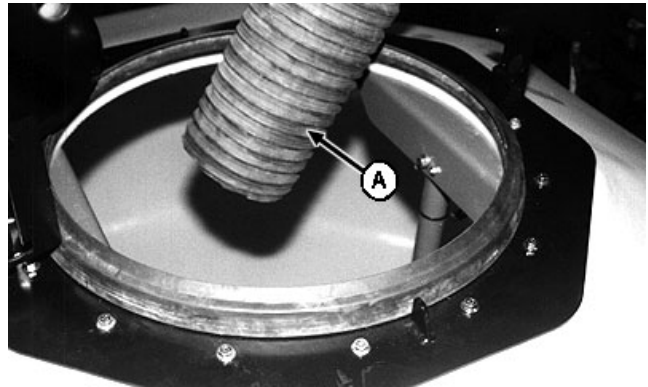
AG,OUO6023,1178 —19-21JUL00-17/17

Shortening Auger Outlet Hose

Auger hose (A) is the same length 124 cm (49 in.) for all models and sizes of carts.

If desired, hose may be shortened to your preferred length. Use a utility knife and wire cutter to shorten hose.

A—Auger hose



A40160B —UN-27JUL98

AG,OUO6023,1179 —19-21JUL00-1/1

Lubrication and Maintenance

Lubricating and Maintaining Machine Safely



CAUTION: To help prevent serious injury or death to you or others caused by unexpected movement, be sure to service machine on a level surface. Lower seeding tool to ground or securely lock or block raised tool before servicing. See seeding tool operator's manual. If machine is connected to tractor, engage parking brake and place transmission in "PARK", shut off engine and remove key. If machine is detached from tractor, block wheels and use shop stands to prevent movement.



N40000 -UN-28SEP88

AG,OUO6023,1180 -19-21JUL00-1/1

Keep Shields In Place



CAUTION: Do not operate air seeder without safety shields in place.

Rotating parts can crush or dismember, causing death or personal injury.

Shut off tractor and disconnect hydraulic hoses before removing shields for adjustment or service.



TS268 -UN-23AUG88

AG,OUO6023,1181 -19-21JUL00-1/1

Perform Lubrication and Maintenance Procedures



CAUTION: Do not clean, lubricate, or adjust machine while in motion.

IMPORTANT: The recommended service intervals are based on normal conditions; severe or unusual conditions may require more frequent lubrication.

Perform each lubrication and service procedure illustrated in this section

at the beginning and end of each season.

Clean grease fittings before using grease gun. Replace any lost or broken fittings immediately. If a new fitting fails to take grease, remove and check for failure of adjoining parts.

AG,OUO6023,1182 -19-21JUL00-1/1

Grease

Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

The following grease is preferred:

- John Deere SD POLYUREA GREASE

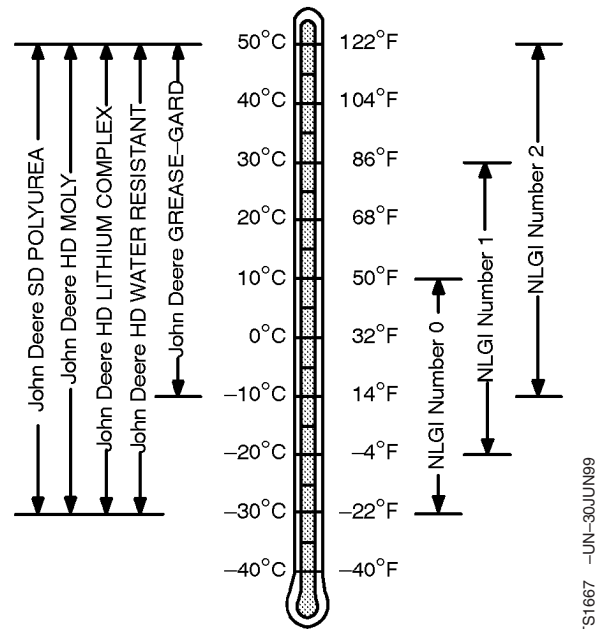
The following greases are also recommended:

- John Deere HD MOLY GREASE
- John Deere HD LITHIUM COMPLEX GREASE
- John Deere HD WATER RESISTANT GREASE
- John Deere GREASE-GARD

Other greases may be used if they meet the following:

- NLGI Performance Classification GC-LB

IMPORTANT: Some types of grease thickener are not compatible with others.



DX,GREAI -19-17FEB99-1/1

Transmission Oil

Use John Deere TORQ-GARD SUPREME® PLUS-50® SAE 15W-40 oil.

*TORQ-GARD SUPREME is a trademark of Deere & Company.
PLUS-50 is a trademark of Deere & Company.*

AG,OUO6023,1184 -19-21JUL00-1/1

Alternative and Synthetic Lubricants

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some John Deere brand coolants and lubricants may not be available in your location.

Consult your John Deere dealer to obtain information and recommendations.

Synthetic lubricants may be used if they meet the performance requirements as shown in this manual.

The temperature limits and service intervals shown in this manual apply to both conventional and synthetic oils.

Re-refined base stock products may be used if the finished lubricant meets the performance requirements.

DX,ALTER -19-18MAR96-1/1

Lubricant Storage

Your equipment can operate at top efficiency only when clean lubricants are used.

Use clean containers to handle all lubricants.


Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.


Make certain that all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

DX,LUBST -19-18MAR96-1/1

Observe Lubrication Symbols

 Lubricate with John Deere EP Moly or an equivalent SAE multipurpose-type grease.

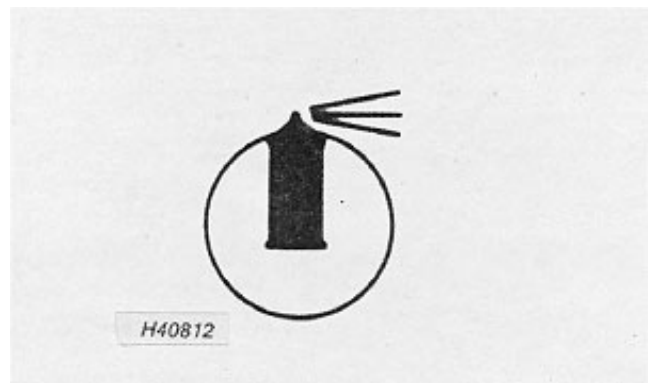
 Lubricate with SAE 10W oil.

AG,OUO6023,1187 -19-21JUL00-1/2

Lubricate chains with John Deere TY6350 Multipurpose Spray Lube.

IMPORTANT: Do not use Spray Lube on main clutch.

Lubricate manifold sealing surfaces with John Deere TY6431 Slip-Plate Lubricant.

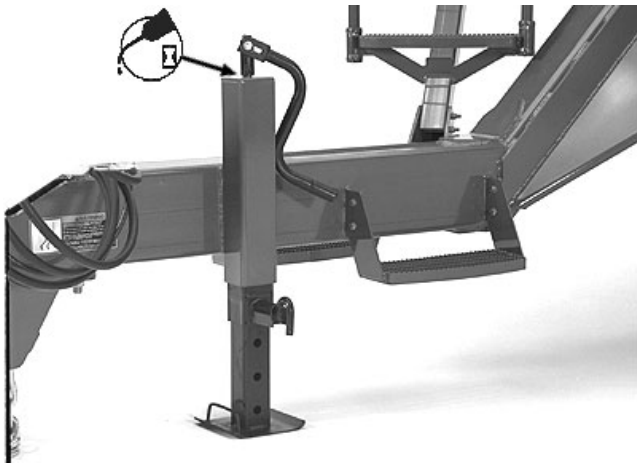


AG,OUO6023,1187 -19-21JUL00-2/2

Before and After Each Season

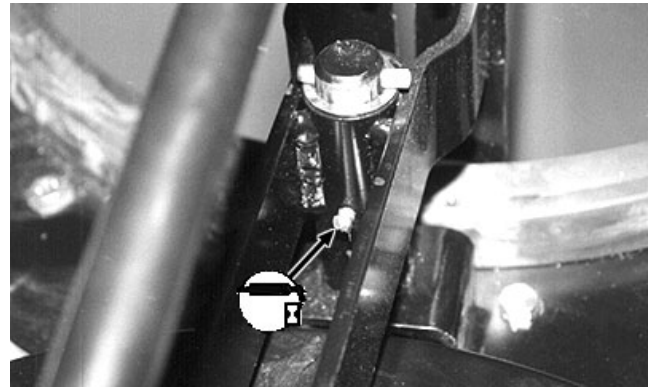
Lubricate each of the following points before each operating season and after each season when placing machine in storage. Apply oil or grease as indicated on the symbol.

AG,OUO6023,1188 -19-21JUL00-1/2



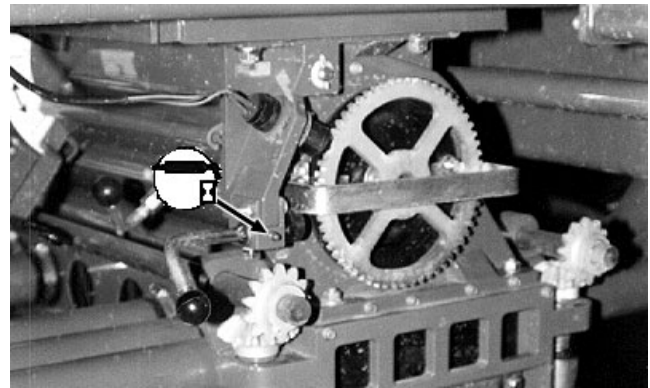
Tow-Between Hitch Jack

A40116A -UN-04MAY98



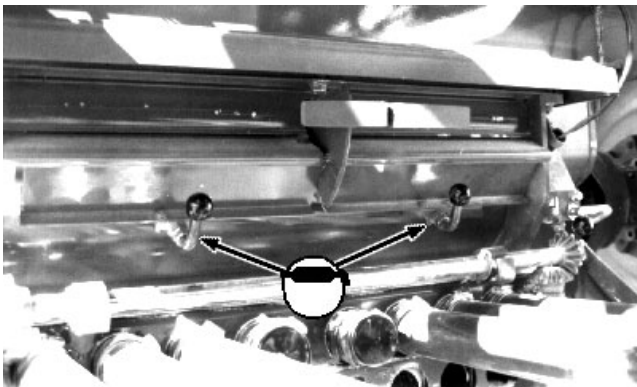
Tank Lid Pivot—All

A40117B -UN-21APR98



Meter Lock Levers—All

A41507B -UN-04MAY98



Cleanout Panel Levers—All

A41508 -UN-09APR97

AG,OUO6023,1188 -19-21JUL00-2/2

Rear Wheel Bearing Maintenance

IMPORTANT: Grease is used to lubricate rear wheel bearings. Recommended maintenance for grease lubricated wheel bearings is to repack annually, using John Deere Multi-purpose High Temperature EP Grease (TY 6341).

The use of a special tool (John Deere JDG1228) is required to disassemble wheel hubs for repacking. Therefore, it is strongly recommended that this service procedure be done by your John Deere dealer.

Apply Loctite LOCTITE®587 Ultra Blue RTV Silicone Sealant (TY 16135) to hub cap sealing surface. Install hub cap and tighten cap screws to specification.

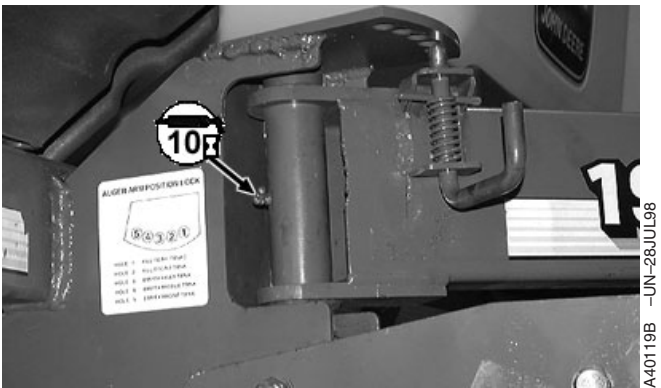
Specification	
Cap Screws—Torque	55 N•m (40 lb-ft)

IMPORTANT: Be sure to tighten wheel bolts to proper specification. Refer to **TIGHTENING REAR WHEEL HARDWARE** in Service section and follow procedure.

Tighten spindle nut to specification.

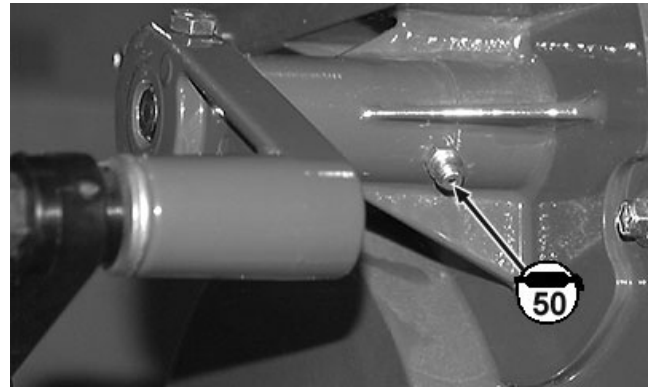
Specification	
Spindle Nut—Torque	339 N•m (250 lb-ft)

Lubricate Pivot Arm—10 Hours



Lubricate Agitator Shaft—50 Hours

Each meter has one agitator shaft lube fitting, located on the right-hand end of the shaft.



Right-Hand End

A42766 -UN-17AUG98

AG,OUO6023,1191 -19-21JUL00-1/1

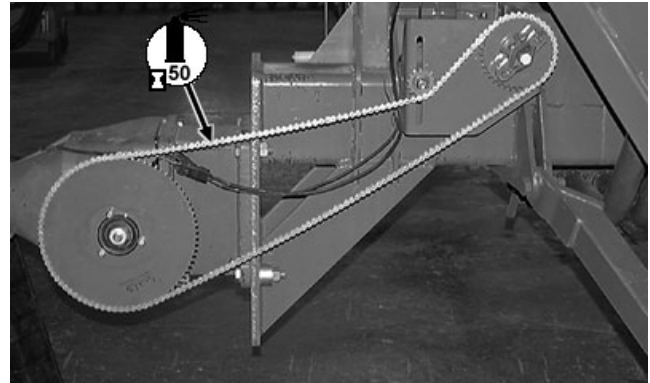
Lubricate Roller Chains—50 Hours

IMPORTANT: Do not use chain lube or any other petroleum based lubricant on chains. Petroleum base acts as a “dirt magnet”, holding dust on chain links and limiting free movement.

Lubricate roller chains with John Deere Multipurpose Spray Lube, TY6350 (or equivalent) at weekly (50 hour) interval. Under adverse operating conditions, lubricate chains daily.

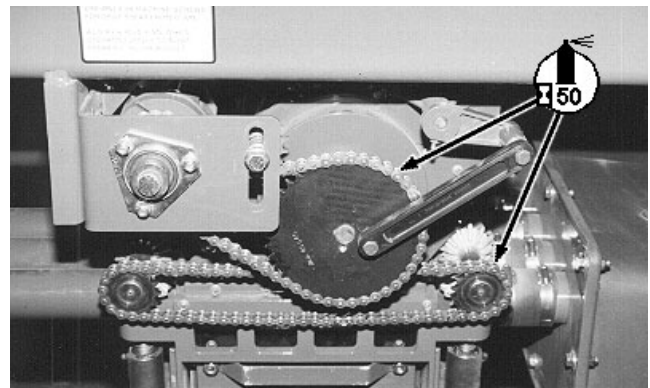
Effective roller chain maintenance varies, depending on environmental conditions and/or condition of the chain(s). The goal is to maintain free movement at every chain link joint.

If not well lubricated, airborne moisture can accumulate on chains causing them to rust and stiffen. Over time, rust can become serious enough to restrict chain movement, preventing smooth power-flow through the ground/meter drive systems.



Drive Chain

A40124A -UN-28JUL98

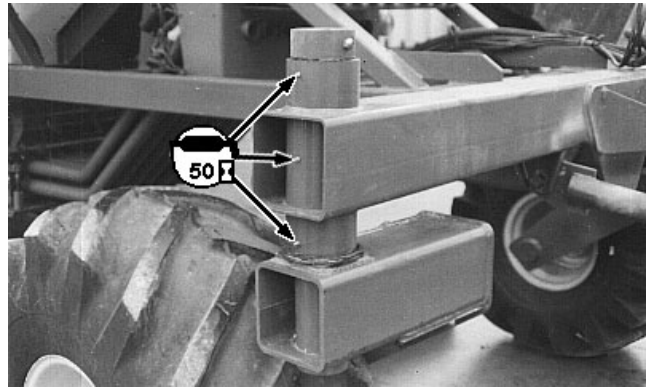


All Meters

A40125A -UN-24OCT97

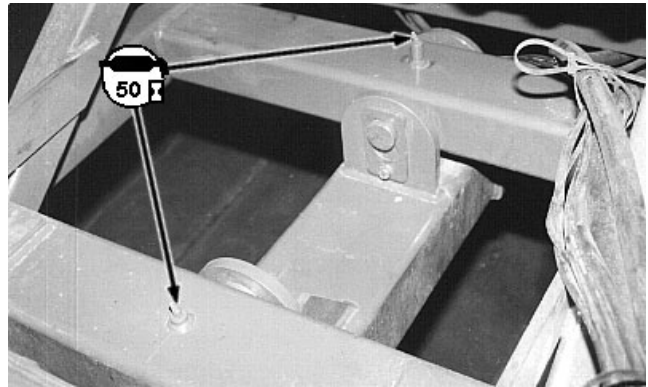
AG,OUO6023,1192 -19-21JUL00-1/1

Lubricate Caster Wheel and Front Beam Pivots (Tow-Behind)—50 Hours



A41510A -UN-13NOV97

Caster Wheel Pivots



A41511A -UN-13NOV97

Front Beam Pivots

AG,OUO6023,1193 -19-21JUL00-1/1

Check Transmission Oil Level—Annually

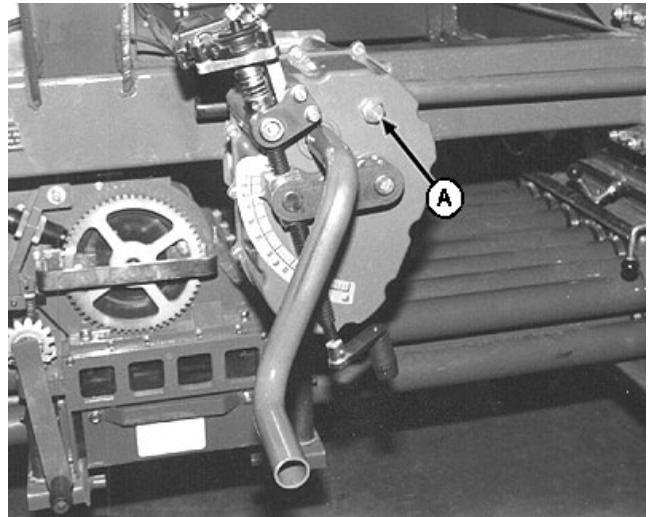
NOTE: For accurate reading, check oil level with machine on a level surface.

Remove front plug (A) to check oil level. Level is correct when oil is found at the bottom of the plug hole.

If found low, fill to correct level with John Deere PLUS-50®, SAE 15W-40 Oil.

If an oil leak is discovered, see your John Deere dealer for repairs.

A—Front Plug



A40126B -UN-21APR98

PLUS-50 is a trademark of Deere & Company.

AG,OUO6023,1194 -19-21JUL00-1/1

Lubricate Fan Shaft Bearings—Annually

IMPORTANT: Do not over lubricate bearings.

Remove cover plate and lubricate fan shaft bearings (A) annually.

A—Fan Shaft Bearings



A43376 -UN-09APR99

AG,OUO6023,1195 -19-21JUL00-1/1

Troubleshooting

Troubleshooting Auger

Symptom	Problem	Solution
Auger fighting does not turn, or turns slow.	Low hydraulic oil level.	Check and fill reservoir.
	Pressurized return line.	Reverse hose connections to tractor or move control lever in opposite direction.
	Tractor control valve return line closed.	Cycle control lever in opposite direction momentarily to open.
	Tractor flow control set too low.	Increase valve setting.
	Tractor pressure too low.	Check and repair tractor hydraulic system. See your John Deere dealer.
	Selector valve set for FAN.	Pull valve handle out for AUGER operations.
	Motor-to-fighting coupler damaged.	Replace coupling hardware.
	Damaged shaft seal.	See your John Deere dealer.
	Faulty selector valve.	Repair or replace valve. See your John Deere dealer.
	Faulty control valve.	Repair or replace valve. See your John Deere dealer.
	Faulty auger motor.	Repair or replace motor. See your John Deere dealer.
Auger spout hose plugs during fill.	Hose is too long.	Shorten hose to desired length.

AG,OUO6023,1196 -19-21JUL00-1/1

Troubleshooting Fan Assembly

Symptom	Problem	Solution
Fan motor leaks.	Case drain line crimped, not connected to low pressure port, or connected to wrong port with high back-pressure.	Repair fan motor. To avoid future failures, be sure to connect drain line to low-pressure (sump) return on tractor.
Fan not turning.	Low hydraulic oil level.	Check and fill reservoir.
	Pressurized return line.	Reverse hose connections to tractor.
	Selector valve set for AUGER.	Push valve handle in for FAN operation.
	Tractor control valve return line not open.	Cycle control lever in opposite direction momentarily. Connect hoses so fan turns in proper direction when SCV lever is held in forward position.
	Faulty selector valve.	Repair or replace valve. See your John Deere dealer.
	Damaged fan/motor coupling.	Repair or replace coupling. See your John Deere dealer.
	Fan motor seal leaking.	Replace seal. See your John Deere dealer.
	Faulty fan motor.	Repair or replace motor. See your John Deere dealer.
Fan vibrates.	Dirty fan blades.	Clean fan.
	Damaged fan/motor coupling.	Repair or replace coupling. See your John Deere dealer.
	Broken fan blades; fan out of balance.	Replace fan assembly.

Continued on next page

AG,OUO6023,1197 -19-21JUL00-1/2

Symptom	Problem	Solution
Fan speed too slow.	Tractor flow control set too low.	Increase valve setting.
	Tractor pressure too low.	Check and repair tractor hydraulic system. See your John Deere dealer.
	More than one hydraulic coupler in line.	Use one coupler at tractor or full flow couplers.
	Faulty selector valve.	Repair or replace valve. See your John Deere dealer.
	Fan motor seal leaking.	Replace seal. See your John Deere dealer.
	Faulty fan motor.	Repair or replace motor. See your John Deere dealer.
Plugged air hoses or manifolds.	Fan turning backward.	Check valve removed from return line. Check and correct hose connections to tractor.

AG,OUO6023,1197 —19–21JUL00–2/2

Troubleshooting Air System

Symptom	Problem	Solution
Plugged air hoses or manifolds.	Air volume too low.	Increase fan speed.
	Ground speed too fast.	Reduce ground speed or meter rate.
	Foreign material blocking air system.	Clean air system hoses and manifold openings.
	Unbalanced air flow (Double-Shoot System).	Adjust damper position.
	Secondary hoses routed flat or uphill.	Reroute hoses correctly.
	Non-compatible fertilizers.	Do not mix Urea with Ammonium Nitrate fertilizer.
	High humidity.	Use moisture resistant fertilizer or wait for drier conditions.
	Leaking air manifold.	Inspect wedge seals for tight fit. Caulk manifold pieces together.

Continued on next page

AG,OUO6023,1198 -19-21JUL00-1/2

Symptom	Problem	Solution
Uneven product distribution between runs.	Air leak between manifold and meter.	Check manifold to meter seal.
	Product level too low for accurate metering.	Do not run tank empty; refill sooner.
	Air volume too low.	Increase fan speed.
	Meter tuning rings not installed, or wrong number installed.	Install correct number of tuning rings for secondary header ports.
	Blockage in air lines or manifolds.	Clean air system and manifold openings.
	Improper assembly of header ring.	Reassemble correctly.
	Manifold slide not fully positioned in top-shoot or bottom-shoot position	Check for foreign material in slide path, manifold passages, and slide openings.
	Variation in secondary hose lengths or routings.	Trim hoses to uniform lengths and re-route correctly.
	Unbalanced air flow (Double-Shoot System).	Adjust damper position.
Plugged seed boots.	Tank not pressurized.	Inspect lid seal for leaks.
		Clean manifold screens.
		Clean tank pressurization hoses.
		Clean manifold end caps and/or air control valves
Seed damage.	Backing or turning with seeding tool in ground.	Raise seeding tool before backing or turning.
	Air volume too high.	Reduce fan speed.
	Old, dry seeds.	Use fresh seeds.

Troubleshooting Meter Drive System

Symptom	Problem	Solution
Main drive clutch will not engage.	Blown tractor fuse.	Replace tractor fuse.
	No power on pin 7 of 7-pin tractor plug.	Connect pin 7 wire to power.
	Remote seeder switch open (seeding out of ground).	Lower seeding equipment to close switch.
	Remote seeder switch out of adjustment.	Adjust so switch is open when seeding is raised from ground; closed when lowered into ground.
	Faulty remote seeder switch.	Replace switch.
	Poor or damaged wiring.	Inspect and repair clutch and remote switch wiring and connections.
	No control signal.	Use power jumper to hot wire clutch in engaged position.
	Faulty clutch.	Replace clutch.
No product delivery with clutches engaged.	Faulty display console or controller.	See your John Deere dealer.
	Meter overload; drive pin sheared.	Replace sheared drive pin with 2.5 mm diameter cotter pin.
		Engage meter only when fan is running to avoid overload.
	Half-width disconnects closed, blocking product from meter.	Open half-width disconnects.
	Large product bridging meter entry.	Install agitators above active runs to keep product free flowing.

Continued on next page

AG,OUO6023,1199 -19-21JUL00-1/2

Symptom	Problem	Solution
Independent meter clutch will not engage.	Dirty solenoids.	Remove dirt from solenoid, clutch and housing.
	Operating lever jammed.	Repair operating lever. Wire in raised position until repairs are made.
	No power on pin 7 of 7-pin tractor plug.	Connect pin 7 wire to power.
	Poor or damaged wiring.	Inspect and repair wiring or connectors.
	Faulty clutch.	Repair or replace clutch. See your John Deere dealer.
	Faulty solenoid.	Replace solenoid. See your John Deere dealer.
	Faulty relay.	Replace relay. See your John Deere dealer.
	Faulty display console or controller.	See your John Deere dealer.
Main drive or independent meter clutch slipping.	Low power to clutch or solenoid.	Check wiring connections. Check tractor electrical system. See your John Deere dealer.
	Meter drive blocked.	Remove blockage.
	Faulty clutch or solenoid.	Repair or replace clutch and/or solenoid. See your John Deere dealer.
Application rate above or below expected rate.	Transmission out of adjustment.	Adjust transmission to proper setting for desired application rate. See Rate Chart for setting.
	Wrong drive sprockets installed.	Change sprockets to agree with rear tire size and seeding row spacing.
	Faulty meter drive transmission.	Check transmission output. See your John Deere dealer for replacement.

Troubleshooting Product Metering System

Symptom	Problem	Solution
Uneven/Inaccurate metering or product delivery.	Air leaking past lid seal.	Adjust lid closing down pressure. Replace seal.
	Product level too low for accurate metering.	Do not run tank empty; refill sooner.
	In-tank pressure tubes (ladder rails), air control valves, or manifold end cap screens plugged.	Clean tubes, air valves, and screens.
	Tank pressurization hoses plugged.	Clean hoses.
	Half-width disconnect(s) closed or partially closed.	Completely open both disconnects.
	Foreign material blocking product passages.	Remove blockage. Use screens when filling tanks.
	Lumps in seed or fertilizer.	Use clean seed. Remove lumps from fertilizer. Use screens when filling tanks. Reset agitator shaft action.
	Meter segment rings not installed or wrong number installed.	Install correct number of fine tuning rings for secondary header ports.
	Improper assembly of header ring or air system.	Reassemble correctly.
	Slide or manifold bypass openings plugged.	Clean openings.

Continued on next page

AG,OUO6023,1200 -19-21JUL00-1/4

Symptom	Problem	Solution
No product delivery with clutches engaged.	Meter overload; drive pin sheared.	Replace sheared drive pin with 2.5 mm diameter cotter pin. See OPERATING MACHINE - PRODUCT METERING.
		Engage meter only when fan is running to avoid overload.
	Manifold slide in wrong position.	Position slide correctly.
	Half-width disconnects closed, blocking product from meter.	Open half-width disconnects.
	Large product bridging meter entry.	Install agitators above active runs to keep product free flowing.
Continued on next page		AG,OUO6023,1200 -19-21JUL00-2/4

Symptom	Problem	Solution
Delivery rate above or below expected rate.	Tank not pressurized.	Adjust lid closing down pressure. Check and replace lid seal. Clean in-tank pressure tubes (ladder tubes), air control valves, and manifold end cap screens. Clean tank pressurization hoses.
	No enclosure doors installed.	Install doors on inactive runs.
	Incorrect transmission speed setting.	Review rate chart and reset transmission. Perform monitor calibration. Check tire speed sensor gap and calibration.
	Wrong meter segments for product in use.	Replace meter segments with correct segments for desired application rate. Check transmission settings. Check monitor set-up and calibration.
	Inaccurate rate check results.	Rerun rate check.
	Plugged product passages or meter segment flutes.	Check and remove caked product from passages and segments.
	Wrong drive sprockets installed.	Change sprockets to agree with rear tire size and tillage row spacing.
	Transmission crank turned in wrong direction during calibration.	Rerun rate check, turning crank counterclockwise.
	Slide or manifold bypass openings plugged.	Clean openings.
	Manifold slide in wrong position.	Position slide correctly.

Continued on next page

AG,OUO6023,1200 -19-21JUL00-3/4

Symptom	Problem	Solution
Manifold slide difficult to reposition.	Half-width disconnects not fully open.	Move handles down to open product passages. Rerun rate check.
	Variable rate not established.	Build rate selection menus. Perform variable rate set-up.
	Desired rates exceed capacity.	Reduce speed or add more primaries.
	Foreign objects in slide path	Inspect for and remove foreign objects.
	Material collects on slide.	Tap lightly on slide handle. Remove slide and coat with a PTFE or graphite lubricant.

AG,OUO6023,1200 -19-21JUL00-4/4

Troubleshooting Blockage System

Symptom	Problem	Solution
Blockage system does not recognize all sensors on Setup.	Sensor setup not done with machine stationary and fan off.	Stop machine. Turn fan off and perform Blockage/Setup Sensors.
	Sensors not connected into slave sequentially.	Reconnect sequentially.
	Damaged slaves, slave-to-slave harness, or sensor wires.	See your John Deere dealer.
No blockage warning.	Incorrect setup.	Verify blockage sensor setup identified correctly with top and bottom primaries on Display (Air Cart Blockage). Verify each primary correctly identified as being fed by front, rear, and/or middle tank in Air Cart Setup on display. Verify all blockage sensors detected by system (Blockage Setup).
	Single-shoot from two or more tanks.	Sensor may not detect if product stops flowing from one tank if application rate for that tank is much lower than the rate for the remaining tanks (i.e. canola and fertilizer).
	Static electricity causing noise on sensor wires.	Inspect grounding harness and sleeves to verify all connections made.
		Inspect grounding wires for damage.

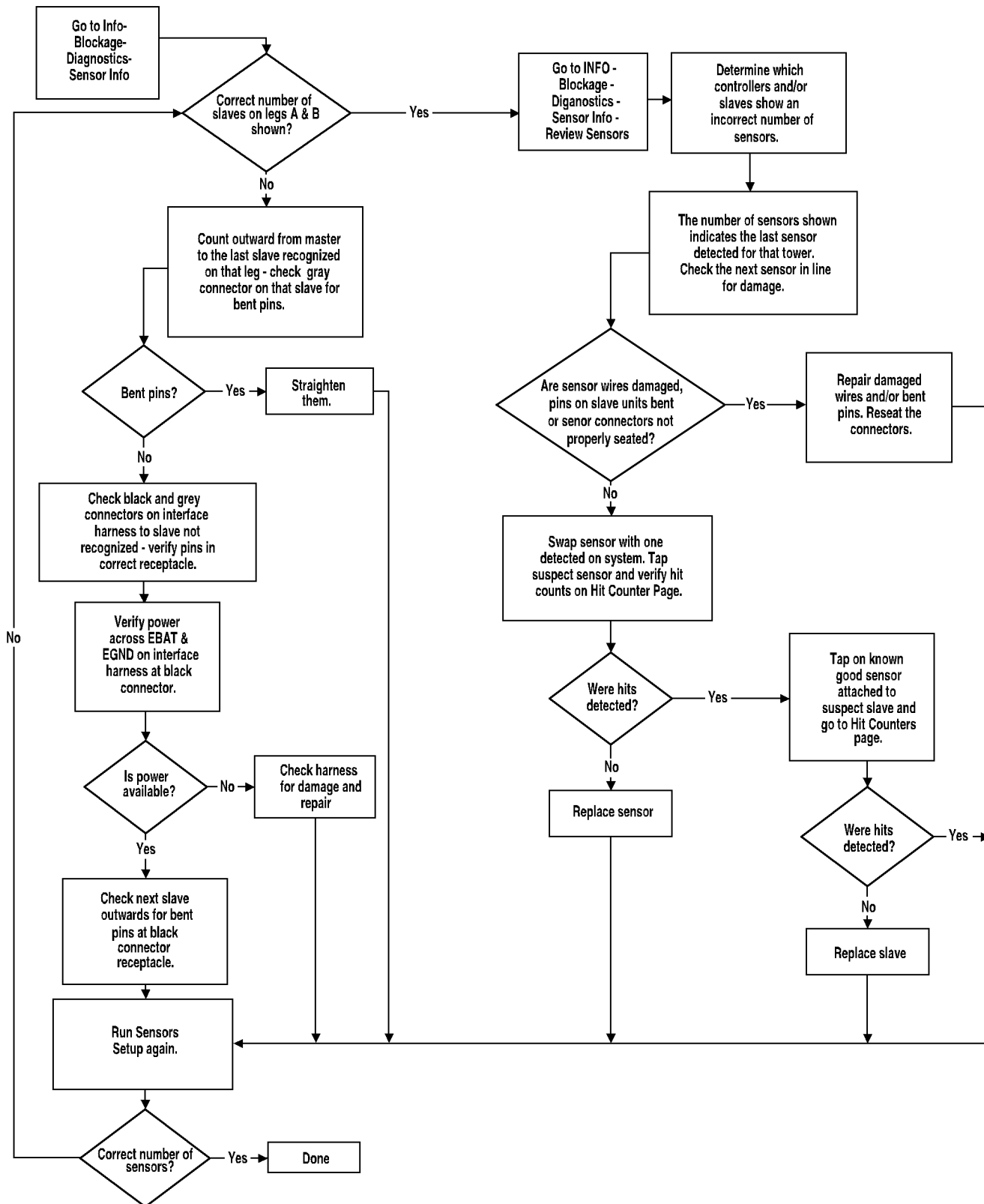
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AG,OUO6023,1201 -19-21JUL00-1/2

Symptom	Problem	Solution
One or more secondaries are blocked.	No product flow.	Tank empty, fill with seed.
	Meter segment and/or product run blocked.	Clean out meter segment and/or unblock product run.
	Sensors or header incorrectly identified with top or bottom primaries.	Correct Setup, Blockage Information.
	No blockage found.	<p>Perform blockage sensor test to determine if sensor is bad. See TESTING BLOCKAGE SENSORS in Blockage Warning section.</p> <p>Increase the reaction level in Blockage Setup.</p> <p>Inspect sensor for inside wear. Replace if worn.</p>

AG,OUO6023,1201 –19–21JUL00–2/2

Troubleshooting Blockage System (Continued)—Flow Chart 3



A42805 -19-04OCT99

AG,OUO6023,1202 -19-21JUL00-1/1

Troubleshooting Seed Counters

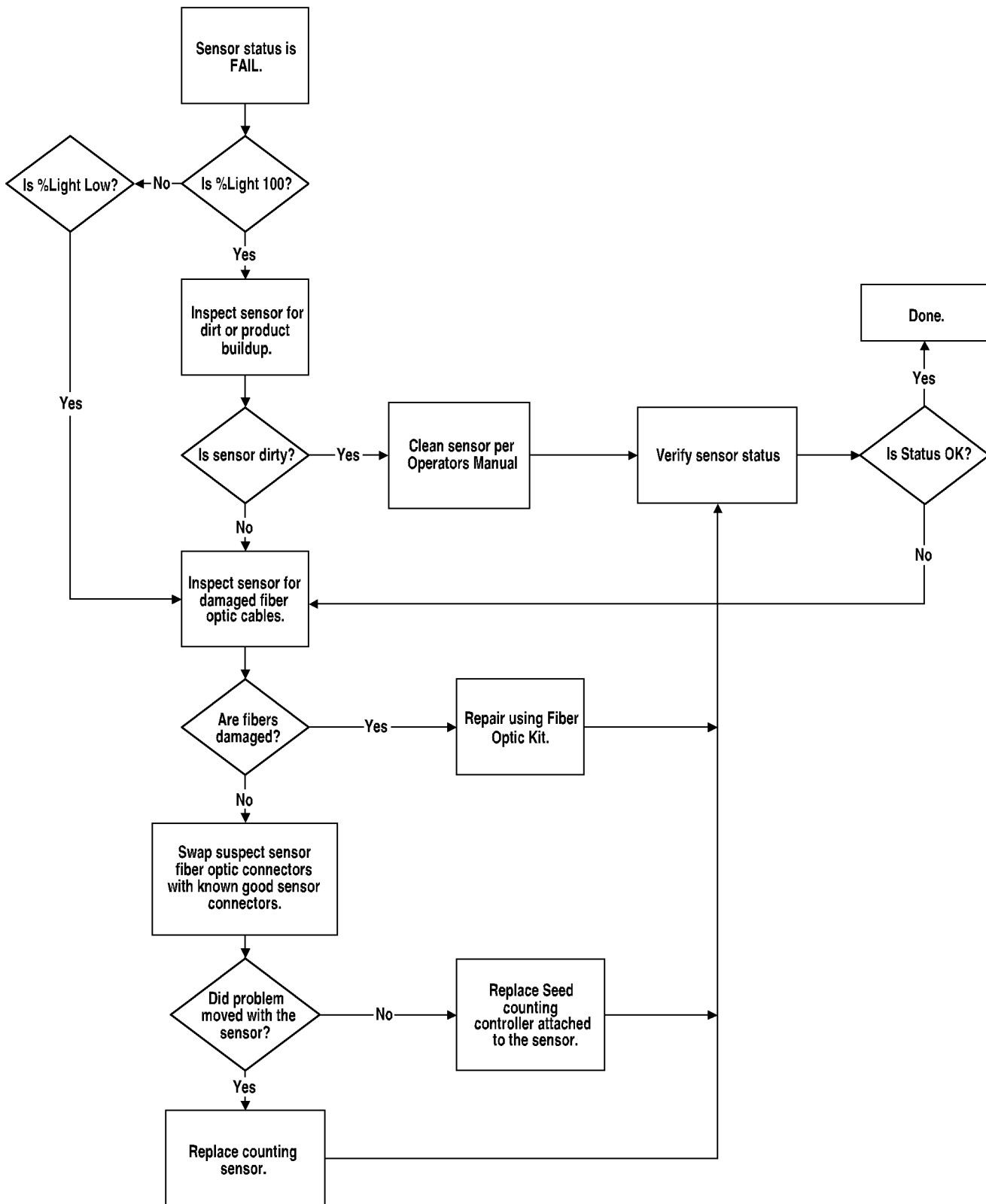
NOTE: Refer to *CHECKING FIBER OPTIC CABLES* in *Seed Counting System* section for how to inspect fiber optic cables using GREENSTAR™ display.

Symptom	Problem	Solution
No population reading on display.	Meters/main drive not engaged.	Engage meters/main drive.
	Seed counting controller not connected to harness.	Check sensor connections to controller and check harness connection to controller.
	Slave jumper connector attached to both counting controllers.	Remove unnecessary slave jumper and replace with dust cap. Cycle power.
	RUN page conflict.	Perform RUN page layout.
Seed counting population too "High".	Incorrect setup in Air Cart.	Press Setup/Air Cart/Seeding Tool/Air System to verify correct number of secondaries per primary and correct row spacing for each meter. Also check that each primary is set up with the correct tank feeding.
	Incorrect meter setup.	Verify correct number of fine tuning rings on meter matches the number of rows in the Air Cart Setup.
"Primary not seeding" warning.	No product.	Tank empty, fill with seed.
	Meter segment and/or product run blocked.	Clean out meter segment and/or unblock product run.
	Half-width disconnect engaged.	Enable product flow by opening half-width disconnect lever.
Diagnostics on counting sensor.	Sensor dirty or damaged or controller damaged.	See Flow Chart 3.

Symptom	Problem	Solution
Seed counting population low.	Incorrect Setup in Air Cart for row spacing and number of secondaries.	Press Setup/Air Cart/Seeding Tool/Air System to verify correct number of secondaries per primary and correct row spacing for each meter. Also check that each primary is setup with the correct tanks feeding.
		Verify correct number of fine tuning rings on meter matches the number of rows in the Air Cart Setup.
	Obstruction in meter/tank preventing product flow.	Check product passages for obstructions.
	Sensor dirty or damaged.	Verify sensor status—Info/Seed Counter/Diagnostics/Counter Status. See Flow Chart 3.
Seed counting population low or high.	Ground speed reading incorrect.	Verify radar calibration done correctly if used. Otherwise verify tire calibration is done correctly.
	Incorrect seed size entered for grains.	If seeding cereals or grains, correct seed size in seed counter setup.

AG,OUO6023,1203 –19–21JUL00–2/2

Troubleshooting Seed Counters (Continued)—Flow Chart 4



A42806 -19-04OCT99

Troubleshooting General Monitor/Control Systems

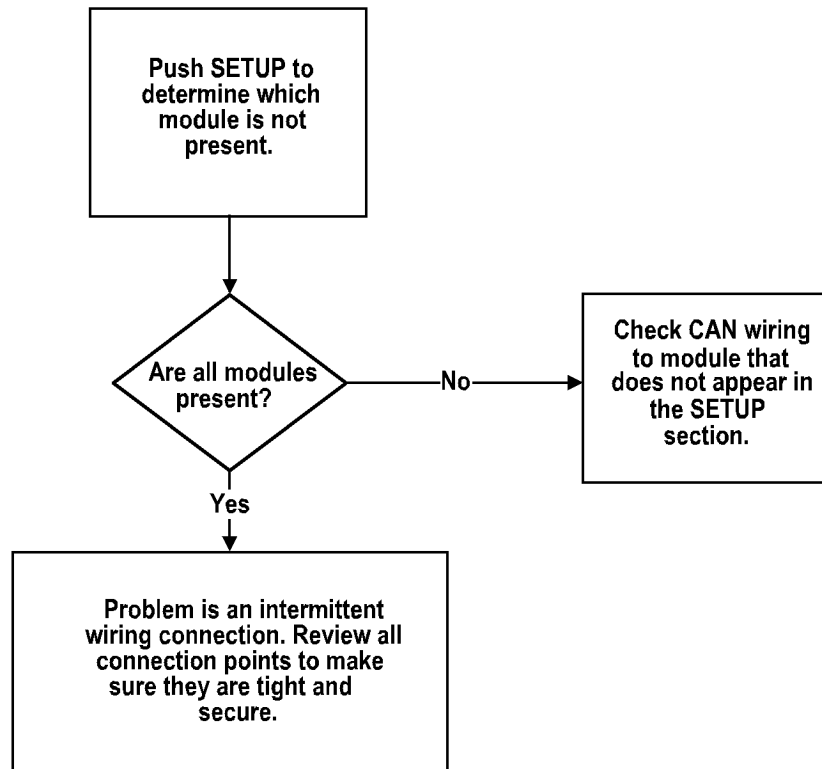
Symptom	Problem	Solution
Display does not power up when tractor key switch is on.	Blown tractor fuse.	Check and replace fuses.
	Monitor display does not have power.	Tractor key switch on. Check for 8 volts nominal at monitor display connector pin G. If voltage is within spec, replace monitor display. If voltage is not within spec, repair or replace tractor wiring harness.
Implement controllers are not present on display.	Disconnected harness.	Check Communication Harness connection.
	Tractor auxiliary power outlet not wired correctly.	On display monitor, go to INFO, GREENSTAR™ Display Setup, System Volts. Tractor volts should be a minimum 11 vdc. If voltage is not within spec, check 3-pin monitor power connector (tractor end) pin 1 (red wire) to pin 3 (black wire) for at least 11.0 vdc. If voltage is not within spec, replace auxiliary power outlet or troubleshoot tractor or TVP wiring harness.
	Convenience outlet adapter harness.	On display monitor, go to INFO, GREENSTAR™ Display Setup, System Volts. Tractor volts should be a minimum 11 vdc. If voltage is not within spec, check 3-pin monitor power connector (tractor end) pin 1 (red wire) to pin 3 (black wire) for at least 11.0 vdc. If voltage is not within spec, replace auxiliary power outlet or troubleshoot tractor or TVP wiring harness.
	Bad terminator.	See your John Deere dealer.
	Bad harness.	See your John Deere dealer.

Symptom	Problem	Solution
“Fault Code (FC) 110 Check Wiring”	Intermittent wiring connection.	Check all CAN wiring connectors and reconnect.
		Inspect Connectors for damage and repair.
	Missing terminator	Verify terminators installed.
	Bad terminator	See your John Deere dealer.
	Three terminators connected.	Check continuity between pins 4 and 5 on the implement DEUTSCH™ connector attached to the tractor.
Fault Code (FC) 110 or (FC) 020. Monitor/Controller disconnected.	Miswired harness	See your John Deere dealer.
	Check for missing terminator	Check that both the in-cab and implement terminators are installed.
	Three terminators connected.	Check for continuity between Pins 4 and 5 in the implement DEUTSCH™ connector attached to the tractor. Verify pins seated properly in housing.
Fault Code (FC) 020, Monitor/Controller Disconnected.	Monitor/controller disconnected.	See Flow Chart 1.

DEUTSCH is a trademark of Deutsch Co.

AG,OUO6023,1205 –19–21JUL00–2/2

Troubleshooting General Monitor/Control Systems (Continued) — Flow Chart 1



Flow Chart 1

A42804 -19-29SEP99

AG,OUO6023,1206 -19-21JUL00-1/1

Troubleshooting General Monitor/Control Systems (Continued)

Symptom	Problem	Solution
Skull and Crossbones.	Correct factory default values not loaded.	See your John Deere dealer.
	Incorrect data sent to the display.	See your John Deere dealer
	Defective controller.	See your John Deere dealer
	Harness miswired.	See your John Deere dealer
Fault Code (FC) 031.	Display overload. Excessive number of messages received by display.	Cycle power.
Fault Code (FC) 112 or (FC) 021.	Display receives more than one request for RUN page space.	Perform "RUN PAGE LAYOUT"
	Seed counting system with five or more sensors is missing slave box jumper wire.	Install slave jumper on Wedge Box attached to sensors 5—8.

AG,OUO6023,1207 —19–21JUL00–1/1

Troubleshooting GREENSTAR™ Display

Symptom	Problem	Solution
Display does not sound alarms	Faulty or failed speaker.	See your John Deere dealer.
GREENSTAR™ Display screen is difficult to read.	Display screen contrast not set correctly.	Press upper right-hand button to set contrast on monitor display.
	Display screen backlighting set too low.	On display monitor, go to SETUP, GREENSTAR™ Display Setup, and enter number 9 for Backlight choice.

GREENSTAR is a trademark of Deere & Company.

AG,OUO6023,1208 —19–21JUL00–1/1

Troubleshooting Cart Controller

Symptom	Problem	Solution
Tank level shown on display is incorrect.	Bin level sensors not functioning properly	Verify cart harness plugged into sensor.
		Faulty bin level sensor. Put sensor in closed position and check for continuity. Put sensor in open position and verify open circuit.
Erratic tire speed reading while stationary.	Improper sensor alignment.	Check and adjust sensor. See Service section.
	Faulty sensor.	Replace tire speed sensor.
No tire speed while moving.	Incorrect Setup.	Perform/verify tire calibration in Setup/Air Cart/Page/Sensors.
	Improper sensor alignment.	Check and adjust sensor. See Service section
	Damaged sensor/wiring.	Verify tire sensor connected to cart harness and inspect for damage and repair.
No application rate.	Main clutch OFF.	Turn main clutch ON.
	Incorrect Setup.	No meter displacement defined.
	Improper sensor alignment.	Check and adjust sensor. See Service section.
	Damaged sensor/wiring.	Verify meter sensor connected to cart harness. Inspect for damage and repair.
Incorrect meter revolution while doing a calibration.	Improper sensor alignment.	Check and adjust sensor. See Service section.
	Disconnected or damaged wiring.	Inspect, connect or repair wiring to meter and tire speed sensors.
	No sensor signal.	Replace failed sensor. See Service section.

Continued on next page

AG,OUO6023,1209 -19-21JUL00-1/7

Symptom	Problem	Solution
Indicator lights do not show tank full or fan speed.	Burned out bulb.	Replace light bulb.
	Display not set for fan speed entry.	Enter fan speed set-up.
	Cart movement sensed.	Cart must be stationary for lights to work.
	Disconnected or damaged wiring.	Inspect, connect or repair wiring to both lights and sensors.
	Fan speed sensor out of adjustment.	Check and adjust sensor-to-target gap. (See Service section.)
	No sensor signal.	Replace failed sensor.
	Faulty display console or controller.	See your John Deere dealer.
Incorrect product application rate displayed.	Disconnected or damaged wiring.	Inspect, connect or repair wiring to meter and tire speed sensors.
	Sensor(s) out of adjustment.	Check and adjust sensor-to-target gap. (See Service section.)
	No sensor signal.	Replace failed sensor. (See Service section.)
	Incorrect values entered at Tank Meter Set-Up.	Review and correct set-up entries.
	Main drive clutch slipping.	See your John Deere dealer.
	Independent meter clutch slipping.	See your John Deere dealer.

Continued on next page

AG,OUO6023,1209 –19–21JUL00–2/7

Symptom	Problem	Solution
Inaccurate area or no area displayed.	Excessive overlap while seeding.	Account for overlap.
	Disconnected or damaged wiring to tire speed sensor.	Inspect, connect or repair wiring.
	Sensor(s) out of adjustment.	Check and adjust sensor-to-target gap. (See Service section.)
	No sensor signal.	Replace failed sensor.
	Incorrect values entered at set-up.	Review and correct set-up entries.
	Incorrect tire speed calibration value entered.	Reset speed calibration value.
	Remote seeder switch out of adjustment.	Adjust so switch is open when tillage is raised from ground; closed when lowered into ground.
	Faulty remote seeder switch.	Replace remote switch.
Variable rate goes to highest/lowest setting.	Faulty display console or controller.	See your John Deere dealer.
	Target rate outside of transmission/meter combination range.	Check meter setup. Check meter calibration.
	Tire and meter sensor not adjusted correctly.	See Service section.
	Tire sensor.	See your John Deere dealer.
	Meter sensor.	See your John Deere dealer.
	Faulty controller.	Unplug harness from motor. Manually set transmission to 50. Connect harness to motor again. If motor turns while cart is stationary, see your John Deere dealer.

Continued on next page

AG,OUO6023,1209 -19-21JUL00-3/7

Symptom	Problem	Solution
Variable rate fluctuates (cannot maintain set point).	Lead screw binding.	Check lead screw locking collar end play and verify lead screw is free to move.
		Check threads for foreign material and clean if necessary.
	Erratic meter rotations.	See your John Deere dealer.
	Warped or loose tone wheel with meter sensor and/or tire sensor.	Replace and/or adjust tone wheel.
Variable rate does not adjust.	No voltage to motor.	Verify power lead is connected and inspect wiring for damage.
	Transmission adjustment screw jammed or stripped.	Clean, lubricate or replace adjustment screw. See your John Deere dealer for appropriate choice of lubricant.
	Variable rate option not selected in Setup.	Enable variable rate in Setup.
	Rate not defined for tanks.	Define Target Rate for tanks.
	Meters not engaged.	Turn on Front, Rear or Middle Tanks as appropriate.
	Faulty sensors.	See your John Deere dealer.
	Sensors not adjusted.	See your John Deere dealer.
	Faulty harness.	See your John Deere dealer.
	Bad motor or bad controller.	See your John Deere dealer.

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AG,OUO6023,1209 -19-21JUL00-4/7

Symptom	Problem	Solution
Main drive or independent meter clutch slipping.	Lubricant (grease or oil) inside clutch (main only).	See your John Deere dealer.
	Low power to clutch or solenoid.	Check wiring connections. Check tractor electrical system. See your John Deere dealer.
	Faulty clutch or solenoid.	Repair or replace clutch and/or solenoid. See your John Deere dealer.
Clutches do not shut off during calibration.	Incorrect Air System setup.	Check Setup/Air Cart/Seeding Tool/Air System. Enter correct values for number of secondaries for each primary and which tank feeds that primary. Verify sprocket selection. Check Setup/Air Cart/Seeding Tool/Air System. Enter correct values for tire and row spacing sprockets.
Shows 0.0 for meter displacement after calibration.	Incorrect Air System setup.	Check Setup/Air Cart/Seeding Tool/Air System. Enter correct values for number of secondaries for each primary and which tank feeds that primary. Verify sprocket selection. Check Setup/Air Cart/Seeding Tool/Air System. Enter correct values for tire and row spacing sprockets.
Distance check does not match target rate.	Incorrect Air System setup.	Check Setup/Air Cart/Seeding Tool/Air System. Enter correct values for number of secondaries for each primary and which tank feeds that primary. Verify sprocket selection. Check Setup/Air Cart/Seeding Tool/Air System. Enter correct values for tire and row spacing sprockets.

Continued on next page

AG,OUO6023,1209 -19-21JUL00-5/7

Symptom	Problem	Solution
No transmission setting recommended.	Target rate too high/low for meter displacement.	Verify number of fine tuning rings. Verify correct meter roller.
	Tire calibration incorrect/not done.	Perform tire calibration.
	See solution for Incorrect Air System Setup above.	Correct Setup.
	Meter not filled before calibration.	Fill meter—perform calibration.
	Improper meter sensor placement.	Check sensor adjustment. See Service section.
Meter displacement lower than expected.	Obstruction in Meter/Tank preventing product flow.	Check product passages for obstructions.
	Slide or manifold bypass openings plugged.	Clean openings.
Cannot calibrate meter.	Obstruction in Meter/Tank preventing product flow.	Check product passages for obstructions.
	Slide or manifold bypass openings plugged.	Clean openings.

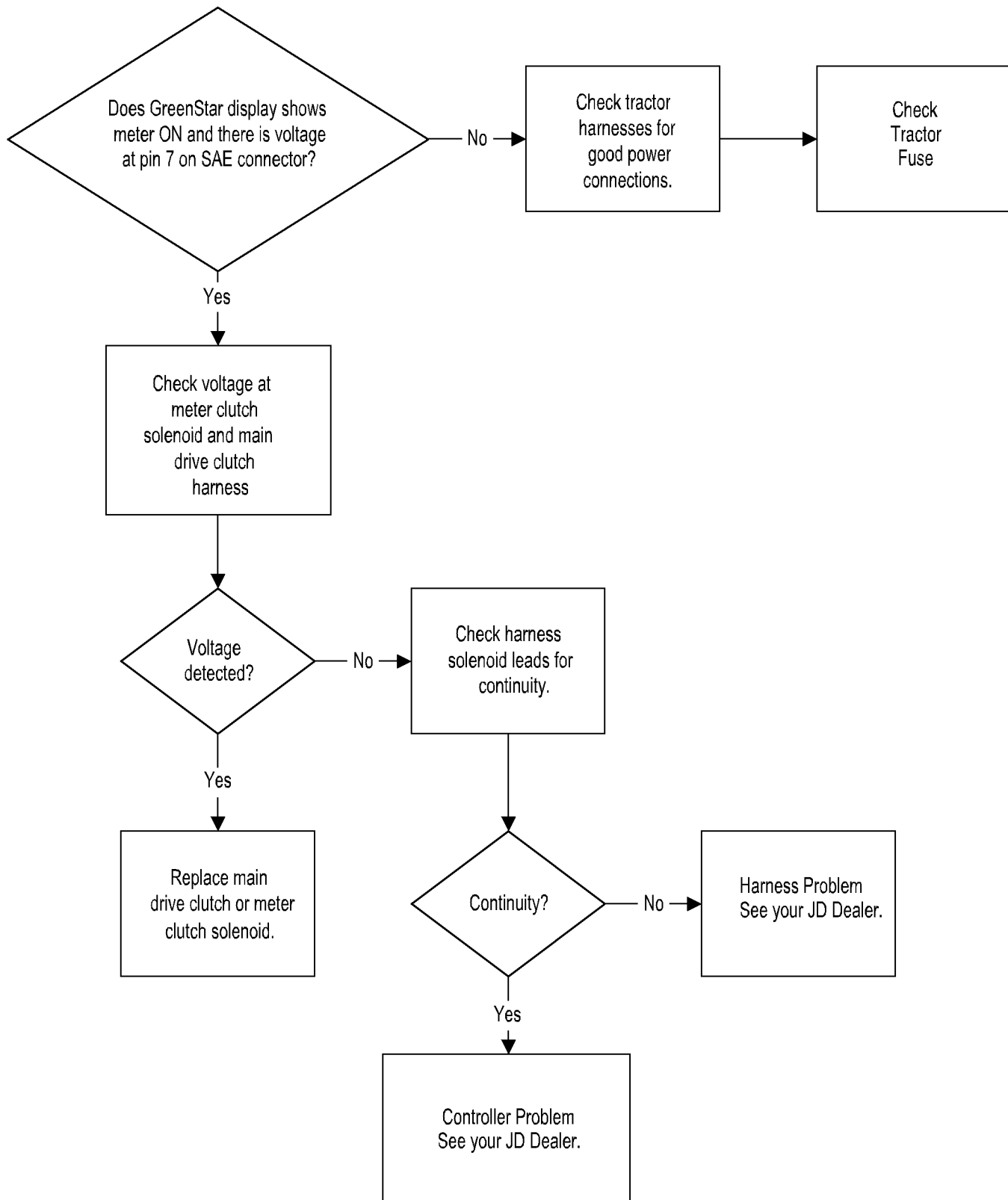
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AG,OUO6023,1209 –19–21JUL00–6/7

Symptom	Problem	Solution
Clutches will not engage (Main or Meter).	Variable rate enabled and target rate defined as zero (meter clutch only).	Adjust Target rate (prescription).
	Clutch strap binding on meter clutch.	Check for clearance at pivot point and adjust if necessary.
	No power to clutches.	Check power to pin 7 on SAE 7-pin connector to tractor. See Flow Chart 2.
	Remote seeder switch open (tillage out of ground).	Lower tillage to close switch.
	Remote seeder switch out of adjustment.	Adjust so switch is open when tillage is raised from ground, closed when lowered to ground.
	Faulty remote seeder switch.	Replace switch.
	Dirty solenoid.	Remove dirt from solenoid, clutch and housing.
	Paint preventing solenoid from engaging.	Remove paint. Apply grease.

AG,OUO6023,1209 –19-21JUL00-7/7

Troubleshooting Cart Controller (Continued)— Flow Chart 2



A42807A -19-20APR99

Service

Detailed Service Information—Use TM1711

Refer to the technical (repair) manual for detailed service information or see your John Deere dealer.



TS224 -UN-17JAN89

AG,OUO6023,1211 -19-21JUL00-1/1

Using Safe Service Procedures



CAUTION: To help prevent serious injury or death to you or others caused by unexpected movement, be sure to service machine on a level surface. Lower seeding tool to ground or securely lock or block raised tool before servicing. See seeding tool operator's manual. If machine is connected to tractor, engage parking brake and/or place transmission in "PARK", shut off engine and remove key. If machine is detached from tractor, block wheels and use shop stands to prevent movement.



N40000 -UN-28SEP88

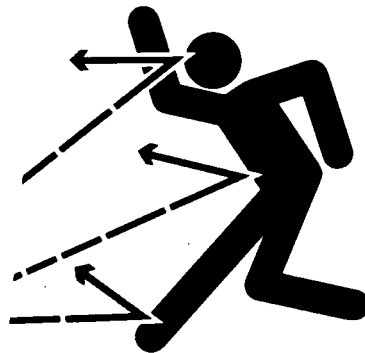
AG,OUO6023,1212 -19-21JUL00-1/1

Stay Clear of Air Hoses



CAUTION: Stay clear of hoses when air seeder fan is running. Seed or fertilizer blowing out at high speed can cause eye and other personal injuries.

Never attempt to clear blockage from air hoses or seeding tool boots while fan is running.



TS265 -UN-23AUG88

AG,OUO6023,1213 -19-21JUL00-1/1

Keep Shields in Place



CAUTION: Do not operate air seeder without safety shields in place.

Rotating parts can crush or dismember causing death or personal injury.

Shut off tractor and disconnect hydraulic hoses before removing shields for adjustment or service.



TS268 -JUN-23AUG88

AG,OUO6023,1214 -19-21JUL00-1/1

Keep Service Area Clean



CAUTION: To help prevent personal injury, keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment.

Be sure all electrical outlets and tools are properly grounded.

Use adequate light for the job at hand.

Never lubricate or service machine while it is moving. Keep hands, feet and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure.

Securely support any machine elements that must be raised for service work.



Understand service procedure before doing work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil or debris.

Disconnect wiring harness at 7-pin connector and communication cable from tractor plug before making adjustments on electrical systems or welding on machine.

When welding near an electronic component, such as a monitor controller, unplug all connectors and remove controller from machine to prevent damage to the microprocessors inside.

High voltage electricity from welder can be conducted through the drawbar and damage electronic devices on attached machines. To protect controllers on attached equipment, disconnect equipment from drawbars and hitches before welding.

TS218 -JUN-23AUG88

AG,OUO6023,1215 -19-21JUL00-1/1

Service Tires Safely

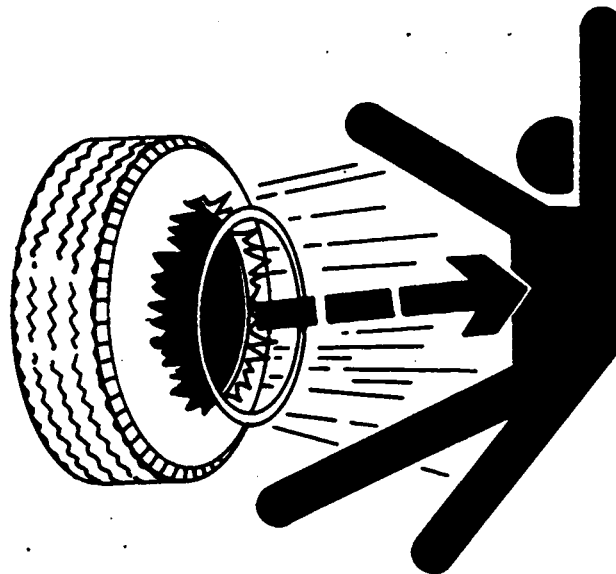
CAUTION: Explosive separation of a tire and rim parts can cause serious injury or death.

Only attempt to mount a tire if you have the proper equipment and experience to perform the job. Have it done by your John Deere dealer or a qualified tire repair service.

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

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

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



TS211 -UN-23AUG88

IMPORTANT: Traction-type tires are installed in opposite direction of usual tractor applications.

IMPORTANT: Mounting dish is offset in wheel to place tire out, away from cart. Be sure to select correct wheel assembly for right-hand or left-hand application when replacing.



A43435 -UN-25APR99

Traction Tire--Viewed from Rear

Tightening Hardware

Check the tightness of ALL BOLTS, U-BOLT AND CAP SCREW NUTS after the first 10—15 hours of operation, and again at the end of the first week (50 hours) of operation. Tighten all bolts to the torques specified in the Service section unless otherwise noted.

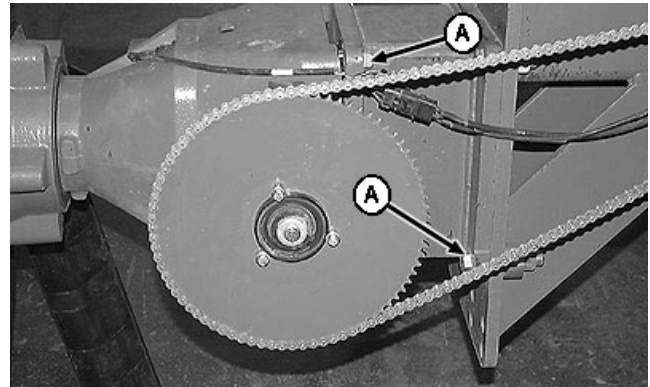
AG,OUO6023,1217 –19–21JUL00–1/2

Check tightness of all hardware periodically, giving special attention to the rear axle mounting bolts (A) on all carts. When equipped with dual rear wheels, both the rear axle mounting bolts and frame extension mounting bolts must be checked and torqued. Torque of hitch attaching fasteners found at the rear of a tow-between cart must also be given special attention. This hardware must be kept torqued to the listed specification to prevent machine damage.

Rear Hitch Hardware—Tow Between	
Location (Size)	Torque
Link Ends (M24)	720 N•m (530 lb-ft)
Hitch Plates (M12)	90 N •m (65 lb-ft)

Rear Hitch Hardware—All Machines	
Location (Size)	Torque
Rear Axle Mounting Bolts (M20)	675 N•m (500 lb-ft)
Frame Extension Bolts (Dual Wheels)	675 N•m (500 lb-ft)

Rear Hitch Hardware—Tow Behind	
Location (Size)	Torque
Field Hitch Bolts (M25)	720 N•m (530 lb-ft)



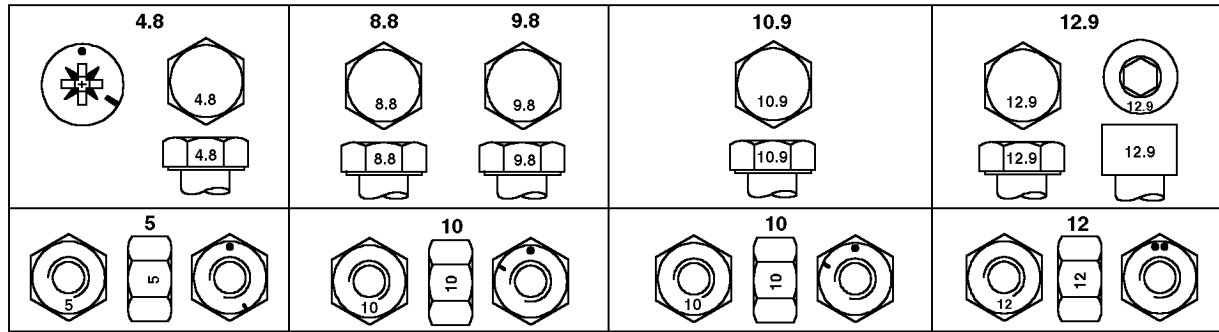
A42792 –UN–25AUG98

Cart With Frame Extensions

A—Mounting Bolts

AG,OUO6023,1217 –19–21JUL00–2/2

Metric Bolt and Cap Screw Torque Values



Top, Property Class and Head Markings; Bottom, Property Class and Nut Markings

Size	Class 4.8		Class 8.8 or 9.8		Class 10.9		Class 12.9	
	Lubricated ^a N•m(lb-ft)	Dry ^b N•m(lb-ft)	Lubricated ^a N•m(lb-ft)	Dry ^b N•m(lb-ft)	Lubricated ^a N•m(lb-ft)	Dry ^b N•m(lb-ft)	Lubricated ^a N•m(lb-ft)	Dry ^b N•m(lb-ft)
M6	4.7 (3.5)	6 (4.4)	9 (6.6)	11.5 (8.5)	13 (9.5)	16.5 (12.2)	15.5 (11.5)	19.5 (14.5)
M8	11.5 (8.5)	14.5 (10.7)	22 (16)	28 (20.5)	32 (23.5)	40 (29.5)	37 (27.5)	47 (35)
M10	23 (17)	29 (21)	43 (32)	55 (40)	63 (46)	80 (59)	75 (55)	95 (70)
M12	40 (29.5)	50 (37)	75 (55)	95 (70)	110 (80)	140 (105)	130 (95)	165 (120)
M14	63 (46)	80 (59)	120 (88)	150 (110)	175 (130)	220 (165)	205 (150)	260 (190)
M16	100 (74)	125 (92)	190 (140)	240 (175)	275 (200)	350 (255)	320 (235)	400 (300)
M18	135 (100)	170 (125)	265 (195)	330 (245)	375 (275)	475 (350)	440 (325)	560 (410)
M20	190 (140)	245 (180)	375 (275)	475 (350)	530 (390)	675 (500)	625 (460)	790 (580)
M22	265 (195)	330 (245)	510 (375)	650 (480)	725 (535)	920 (680)	850 (625)	1080 (800)
M24	330 (245)	425 (315)	650 (480)	820 (600)	920 (680)	1150 (850)	1080 (800)	1350 (1000)
M27	490 (360)	625 (460)	950 (700)	1200 (885)	1350 (1000)	1700 (1250)	1580 (1160)	2000 (1475)
M30	660 (490)	850 (625)	1290 (950)	1630 (1200)	1850 (1350)	2300 (1700)	2140 (1580)	2700 (2000)
M33	900 (665)	1150 (850)	1750 (1300)	2200 (1625)	2500 (1850)	3150 (2325)	2900 (2150)	3700 (2730)
M36	1150 (850)	1450 (1075)	2250 (1650)	2850 (2100)	3200 (2350)	4050 (3000)	3750 (2770)	4750 (3500)

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.

^b "Dry" means plain or zinc plated without any lubrication.

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.

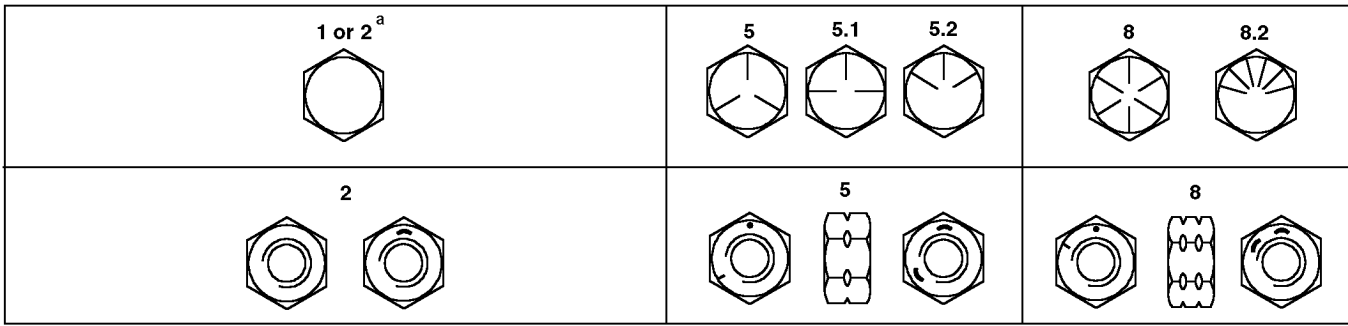
Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

TORQ2 -UN-07SEP99

Unified Inch Bolt and Cap Screw Torque Values



Top, SAE Grade and Head Markings; Bottom, SAE Grade and Nut Markings

Size	Grade 1 (No Mark)		Grade 2 ^a (No Mark)		Grade 5, 5.1 or 5.2		Grade 8 or 8.2	
	Lubricated ^b N•m(lb-ft)	Dry ^c N•m(lb-ft)	Lubricated ^b N•m(lb-ft)	Dry ^c N•m(lb-ft)	Lubricated ^b N•m(lb-ft)	Dry ^c N•m(lb-ft)	Lubricated ^b N•m(lb-ft)	Dry ^c N•m(lb-ft)
1/4	3.8 (2.8)	4.7 (3.5)	6 (4.4)	7.5 (5.5)	9.5 (7)	12 (9)	13.5 (10)	17 (12.5)
5/16	7.7 (5.7)	9.8 (7.2)	12 (9)	15.5 (11.5)	19.5 (14.5)	25 (18.5)	28 (20.5)	35 (26)
3/8	13.5 (10)	17.5 (13)	22 (16)	27.5 (20)	35 (26)	44 (32.5)	49 (36)	63 (46)
7/16	22 (16)	28 (20.5)	35 (26)	44 (32.5)	56 (41)	70 (52)	80 (59)	100 (74)
1/2	34 (25)	42 (31)	53 (39)	67 (49)	85 (63)	110 (80)	120 (88)	155 (115)
9/16	48 (35.5)	60 (45)	76 (56)	95 (70)	125 (92)	155 (115)	175 (130)	220 (165)
5/8	67 (49)	85 (63)	105 (77)	135 (100)	170 (125)	215 (160)	240 (175)	305 (225)
3/4	120 (88)	150 (110)	190 (140)	240 (175)	300 (220)	380 (280)	425 (315)	540 (400)
7/8	190 (140)	240 (175)	190 (140)	240 (175)	490 (360)	615 (455)	690 (510)	870 (640)
1	285 (210)	360 (265)	285 (210)	360 (265)	730 (540)	920 (680)	1030 (760)	1300 (960)
1-1/8	400 (300)	510 (375)	400 (300)	510 (375)	910 (670)	1150 (850)	1450 (1075)	1850 (1350)
1-1/4	570 (420)	725 (535)	570 (420)	725 (535)	1280 (945)	1630 (1200)	2050 (1500)	2600 (1920)
1-3/8	750 (550)	950 (700)	750 (550)	950 (700)	1700 (1250)	2140 (1580)	2700 (2000)	3400 (2500)
1-1/2	990 (730)	1250 (930)	990 (730)	1250 (930)	2250 (1650)	2850 (2100)	3600 (2650)	4550 (3350)

^a Grade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

^b "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.

^c "Dry" means plain or zinc plated without any lubrication.

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

Checking Wheel Attaching Hardware and Bearings

Check the tightness of all wheel hardware and front wheel bearings (tow-behind) during the first week of operation, and annually after that.

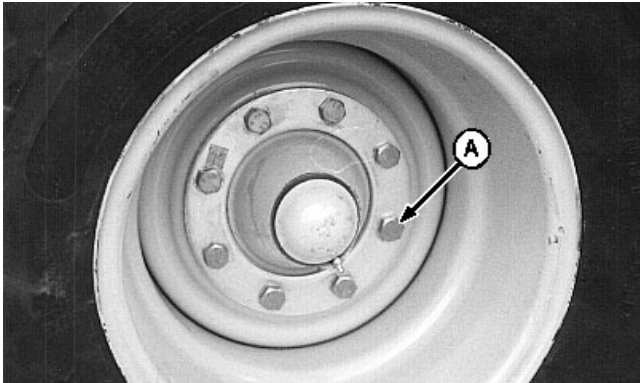
To adjust front wheel bearings on tow-behind cart, remove center hub cap and cotter pin. Raise the wheel and turn it. Tighten the nut until there is a slight drag on the bearings, back off to the first hole, and insert cotter pin. Replace hub cap.

AG,OUO6023,1220 -19-21JUL00-1/2

Tow-Behind Carts: Tighten front wheel bolts (A) to specification.

Specification	
Front Wheel Bolts—Torque.....	200 N•m (150 lb-ft)

A—Wheel Bolt



A41568A -UN-13NOV97

AG,OUO6023,1220 -19-21JUL00-2/2

Tightening Rear Wheel Hardware

- All Carts: Torque rear wheel hardware using the following procedure.

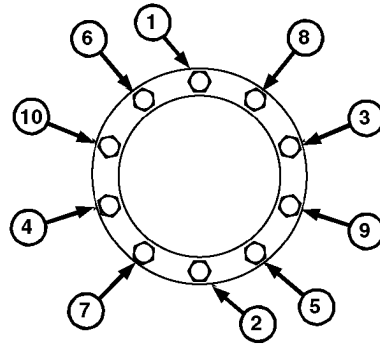
IMPORTANT: Wheel bolts **MUST** be clean and oil-free when torquing. Torque values specified in the following steps are for clean, dry wheel bolts. Lubricating oil reduces friction and thread bit to overload bolts.

- Initial Wheel Bolt Torque:

1. Using tightening sequence shown, tighten wheel bolts to specification using criss/cross pattern to evenly pull wheel tight to hub.

Specification

Wheel Bolts—Initial Torque..... 200 N•m
(150 lb-ft)



Wheel Bolt Tightening Sequence

H48807 -UN-12DEC96

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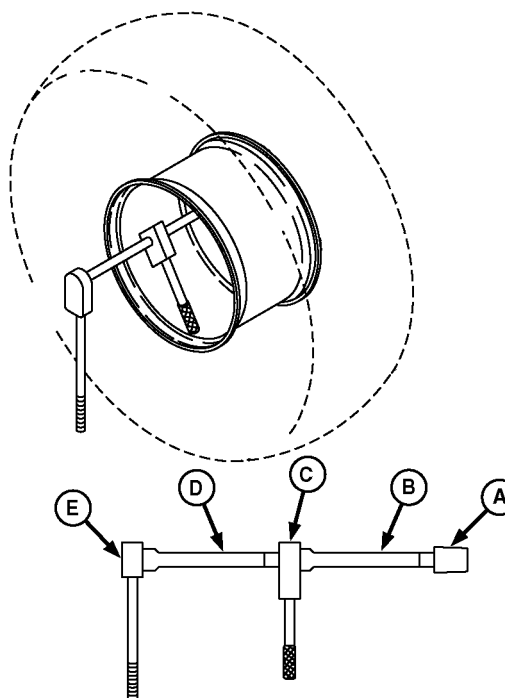
AG,OUO6023,1221 -19-21JUL00-1/2

- Final Wheel Bolt Torque:

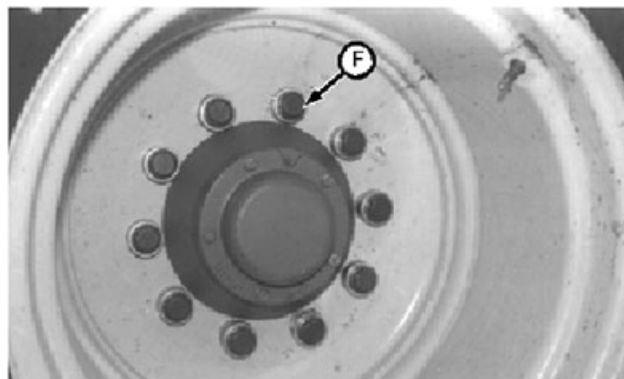
IMPORTANT: Final wheel bolt torque is extremely high and cannot be reached using common hand tools and torque wrench. A Four-To-One Torque Multiplier is required to reach final wheel bolt torque. To achieve high torque results, final torquing must be done with tire on the ground and with multiplier handle against inside of rim.

2. Position tools (A—E) as shown, with Torque Multiplier handle against inside of rim.
3. Turn all BOLT HEADS (F) an additional one-half turn, past initial torque. Due to 4 to 1 torque multiplier, torque wrench will make two full turns while bolt head make a one-half turn.

A—Socket, 30 mm (3/4 In. Drive)
 B—Extension, 3/4 x 10 In.
 C—4 to 1 Torque Multiplier
 D—Extension, 1/2 x 10 In.
 E—Wrench, Torque or Ratchet
 F—Bolts, Rear Wheel



A40108 -UN-14MAR97



A41570 -UN-21APR97

AG,OUO6023,1221 -19-21JUL00-2/2

Replace Meter Drive Shear Pin

1. Shear pin is used to protect drive transmission from damage caused by loading meter cartridge with product when fan is not running. To prevent shearing pin, engage meter only when fan is running to avoid overload.

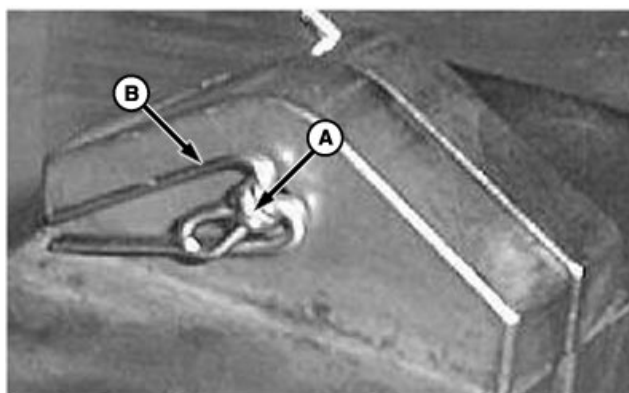
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AG,OUO6023,1296 -19-30AUG00-1/2

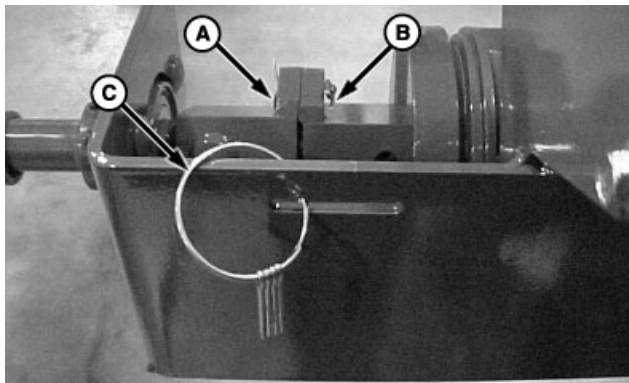
IMPORTANT: Do not use any other hardware to replace factory specified shear pin (11m7082) or transmission could be damaged. See your John Deere dealer for correct repair parts.

2. Insert 2.5 mm diameter cotter pin (B) through eye of 2.5 mm diameter cotter pin (A) and spread cotter pin (B) apart. Install cotter pins in shear blocks and spread cotter pin (A) apart as shown.
3. Extra cotter pins can be found on ring (C) on clutch plate as shown.

A—Cotter Pin
B—Cotter Pin
C—Ring



A46540 -UN-03OCT00



A46541 -UN-23AUG00

AG,OUO6023,1296 -19-30AUG00-2/2

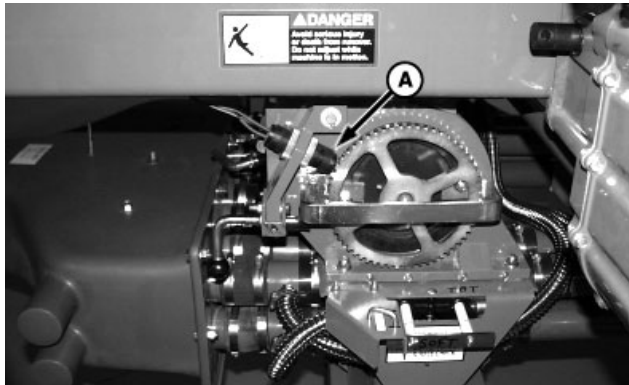
Adjust Meter Speed Sensor Gap

Sensor (A) must be set 2 mm (0.08 in.) from outer edge of sensor ring teeth to properly read and signal meter speed.

To adjust, loosen clamp hardware and set sensor-to-ring gap at 2 mm (0.08 in.).

Tighten hardware after adjustment.

A—Sensor



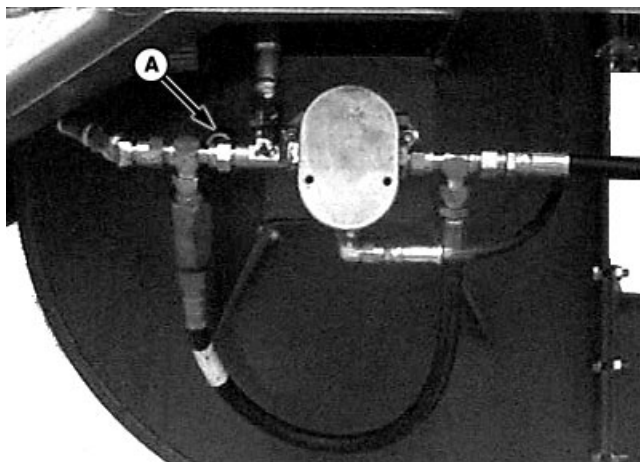
A46131 -UN-26JUN00

AG,OUO6023,1223 -19-21JUL00-1/1

Replace and/or Adjust Fan Speed Sensor

1. Remove sensor (A) from fan housing.
2. Rotate fan to bring signal rivet directly in line with hole.
3. Turn sensor into hole until it contacts rivet.
4. Back sensor out 1 to 2 full turns and tighten jam nut.
5. Rotate fan two turns to verify sensor-to-rivet clearance.

A—Sensor



A43375A -UN-10JUL00

AG,OUO6023,1224 -19-21JUL00-1/1

Clean Manifold Air Passages—Every 50 Hours

STATIONARY SINGLE-SHOOT MANIFOLDS:

Disassemble/remove manifold end caps and clean residue from passages every 50 hours.

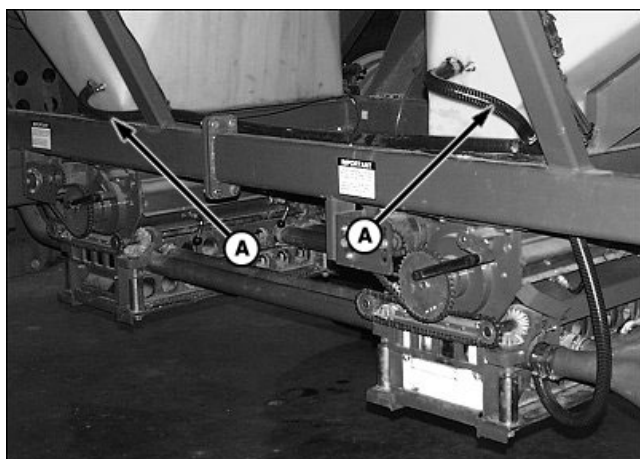
STATIONARY DOUBLE-SHOOT MANIFOLD: Clean air control valves every 50 hours and at end of season.

AG,OUO6023,1225 -19-21JUL00-1/1

Clean Tank Pressurization Lines—Every 50 Hours (Single-Shoot Only)

Disassemble/remove tank pressurization lines (A) and clean residue from passages.

A—Tank Pressurization Lines



A43881 -UN-08OCT99

Tank Pressurization Lines

AG,OUO6023,1226 -19-21JUL00-1/1

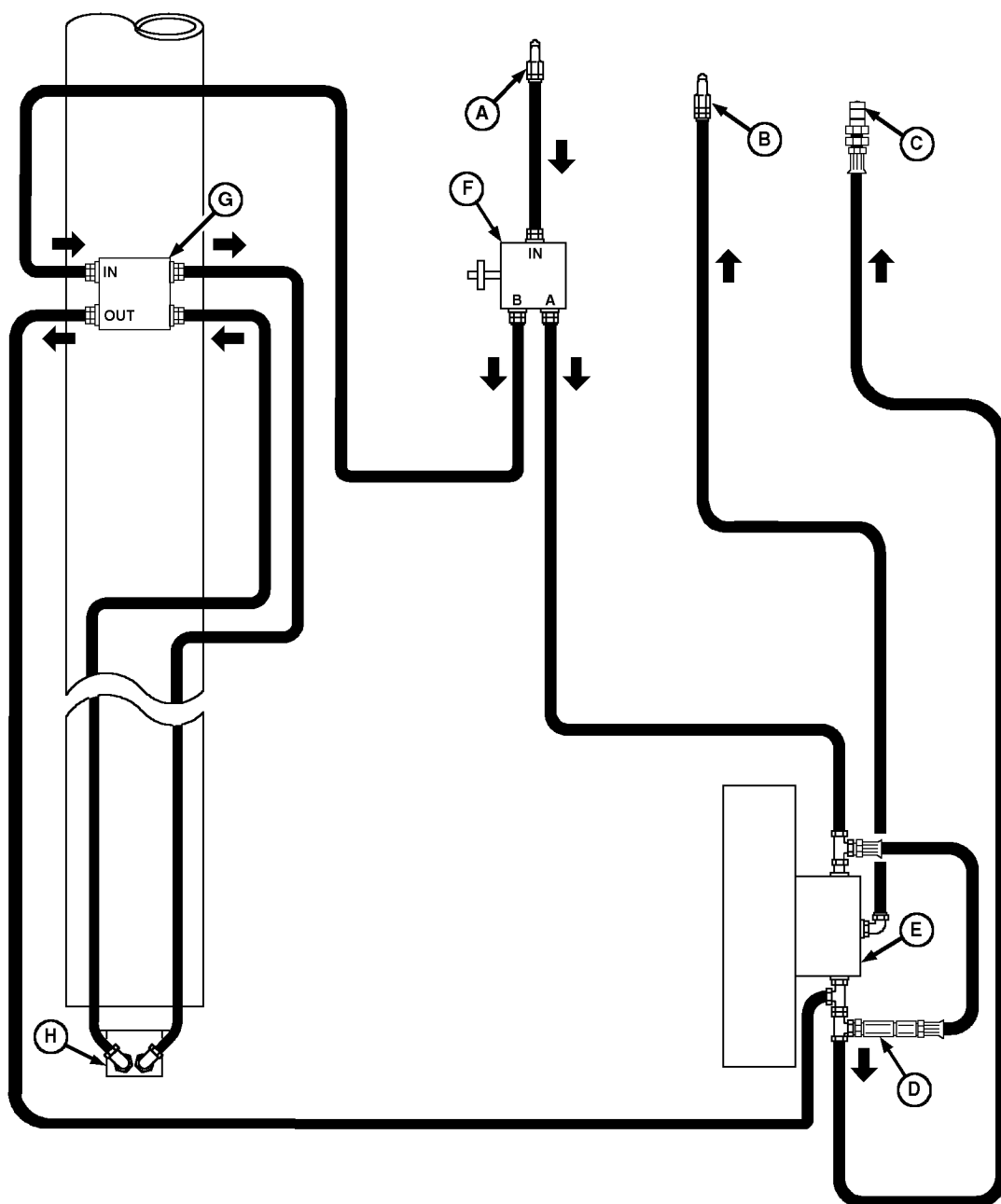
Prevent Hydraulic System Contamination

IMPORTANT: Cleanliness is very important when working on the hydraulic system. Prevent contamination by assembling the cylinders, hoses, couplers, and valves in a clean area of the shop.

Leave protective caps on the fluid openings until ready to make the connection. When charging the system, use a tractor or other source that contains clean oil, free of abrasive materials. Keep couplers clean. Abrasive particles, like sand or metal fragments, can damage seals, barrels and pistons, causing internal leakage.

AG,OUO6023,1227 -19-21JUL00-1/1

Hydraulic Hose Diagram—Fan and Auger



Tow-Behind Shown/Tow-Between Similar

A—Pressure Line
W/Quick-Coupler
B—Fan Motor Case Drain
W/Quick-Coupler

C—Return Line
W/Quick-Coupler
D—One-Way Check Valve (Fan
Motor Rotation)

E—Fan Motor
F—Fan/Auger Selector Valve
(If Equipped)

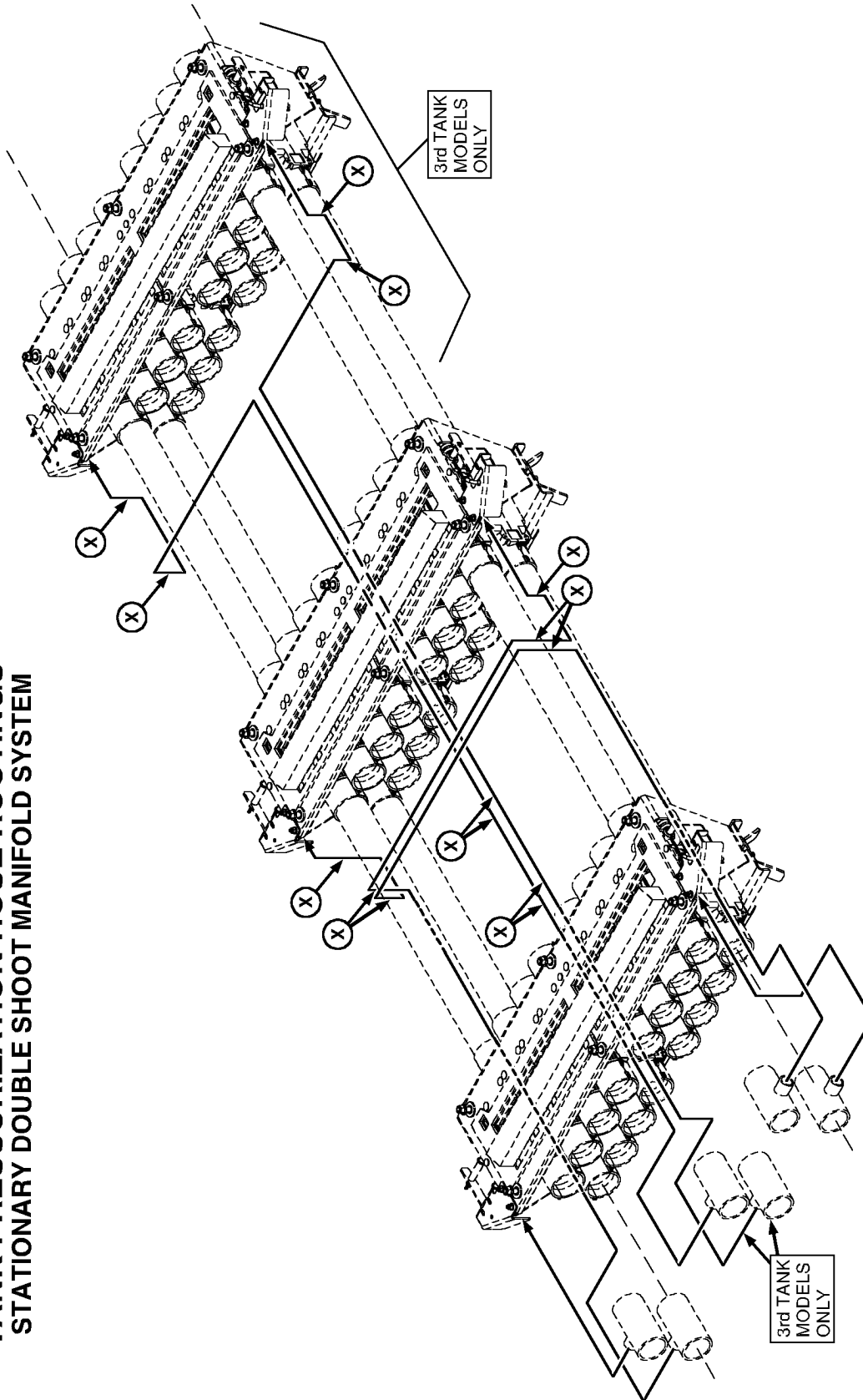
G—Auger Control Valve (If
Equipped)
H—Auger Motor (If Equipped)

A46375 -UN-11JUL00

AG,OUO6023,1228 -19-21JUL00-1/1

Tank Pressurization Hose Routings—TBT Cart

1900 CART TOW BETWEEN MODELS TANK PRESSURIZATION HOSE ROUTINGS STATIONARY DOUBLE SHOOT MANIFOLD SYSTEM



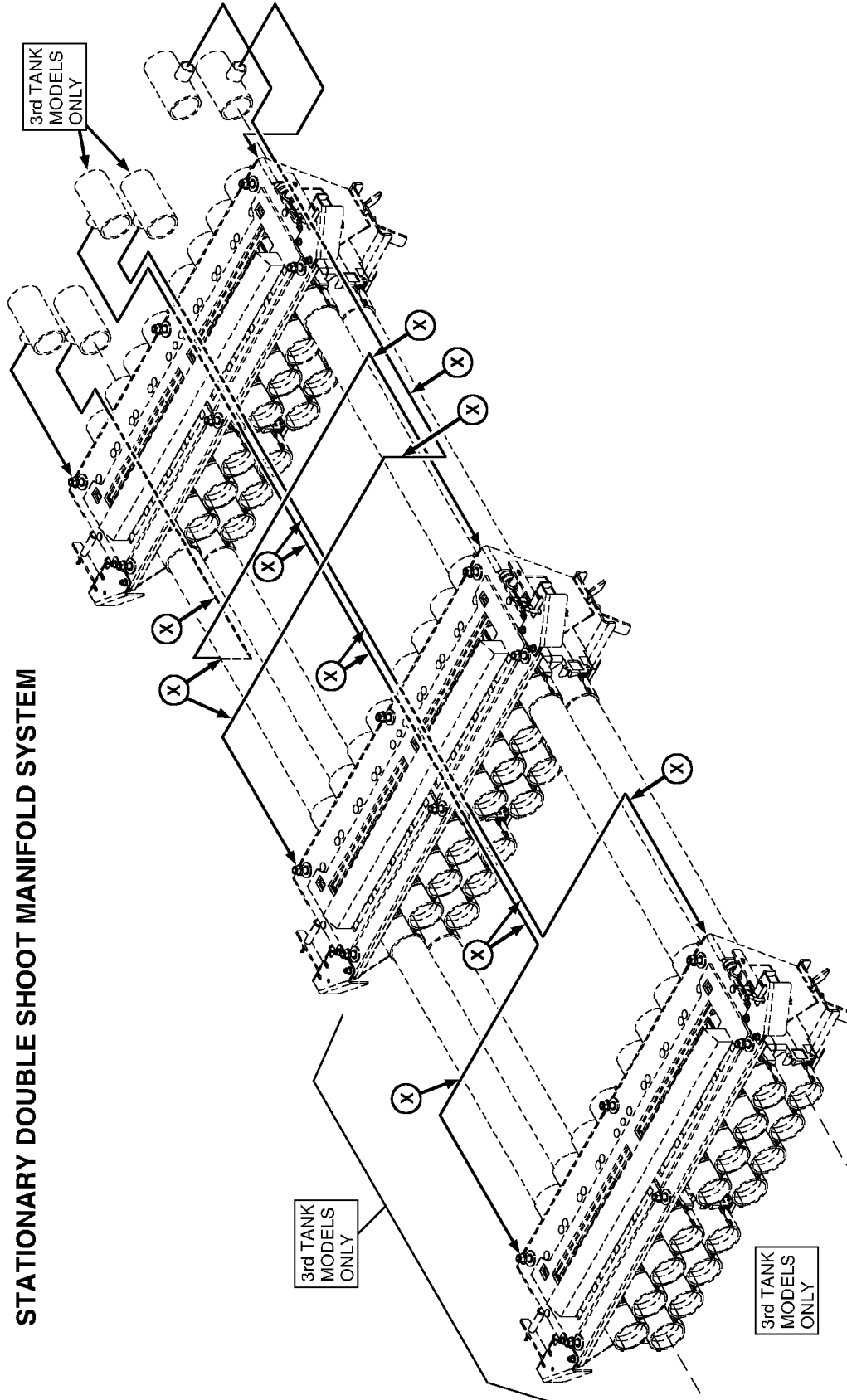
X - TIE STRAP LOCATIONS. ATTACH PRESSURIZATION HOSE TO UPPER PRIMARY TUBE.
LATERAL ROUTING OF PRESSURIZATIONS HOUSING TO BE DIRECTLY BEHIND 1st & 2nd MANIFOLDS.

AG,OUO6023,1229 -19-21JUL00-1/1

A43711 -19-20SEP99

Tank Pressurization Hose Routings—TBH Cart

1900 CART TOW BEHIND MODELS TANK PRESSURIZATION HOSE ROUTINGS STATIONARY DOUBLE SHOOT MANIFOLD SYSTEM



X - TIE STRAP LOCATIONS. ATTACH PRESSURIZATION HOSE TO UPPER PRIMARY TUBE.
LATERAL ROUTING OF PRESSURIZATIONS HOUSING TO BE DIRECTLY BEHIND 1st & 2nd MANIFOLDS.

AG,OUO6023,1230 -19-21JUL00-1/1

A43712 -19-20SEP99

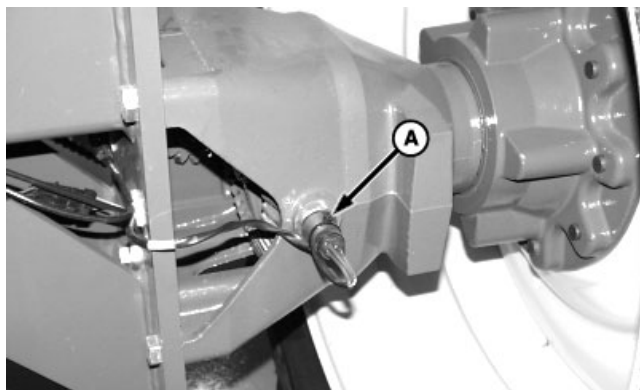
Replace and/or Adjust Ground Speed Sensor

1. Remove sensor (A) from left-hand wheel casting.
Replace with new, if necessary.

NOTE: Sensor-to-plate contact can be viewed through top hole in casting.

2. Turn sensor into hole until it contact target plate.
3. Back sensor out two turns and tighten jam nut.

A—Sensor



A46130 -UN-26JUN00

AG,OUO6023,1231 -19-21JUL00-1/1

Electromagnetic Interference (EMI)

EMI can disrupt or overload the communication circuits of the monitor system causing erratic display activity, and in severe cases a complete system shut down.

Phantom displays, such as meter RPM or ground speed when the machine is stationary, can be the result of system “noise” or EMI.

Common causes of EMI are:

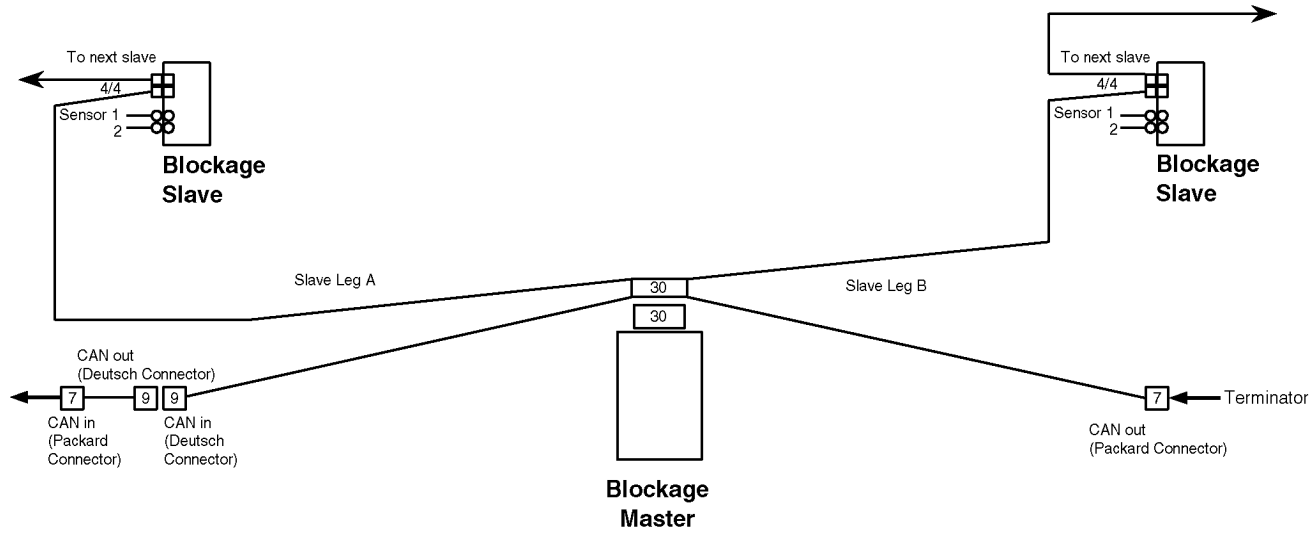
- Operating close to “high tension” wires and broadcast towers.

- “Noisy” power supply.
- Monitor too close to radio antenna.
- Old radio cables used.
- Poor system ground.
- Monitor power not directly connected to battery.
- Radio power not directly connected to battery.
- Monitor wiring too close to radio wiring.
- Console not connected to controller with standard system cables.

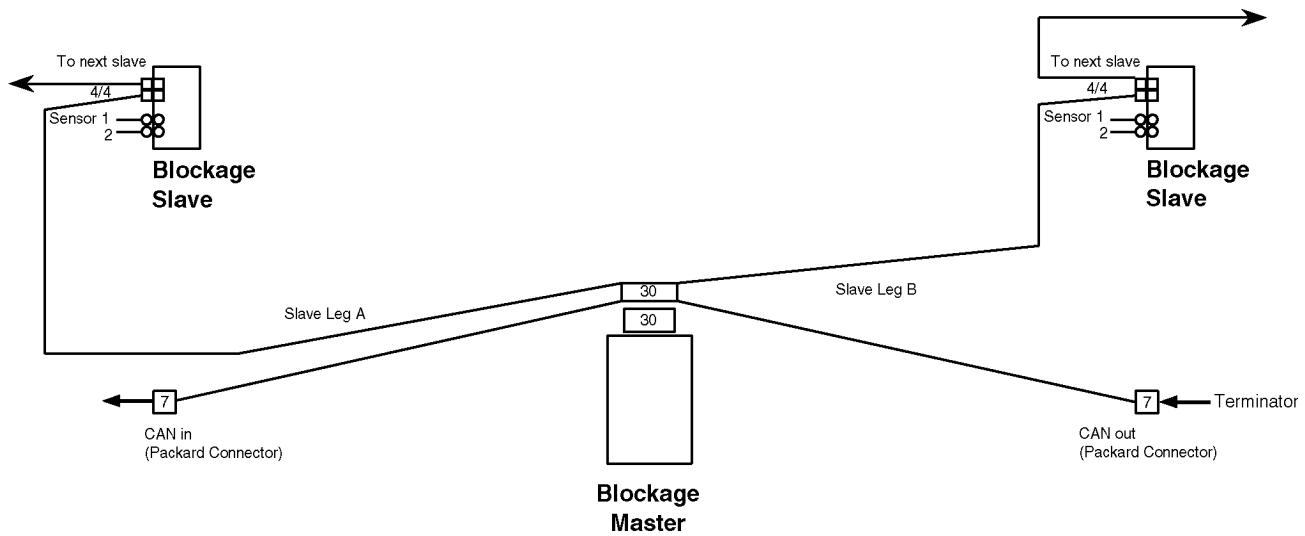
Check causes of EMI and take corrective measures to overcome problems.

AG,OUO6023,1232 -19-21JUL00-1/1

Electrical Wiring Diagram—Primary Only Blockage System (Tow-Between)



Tow-Between w/o Seed Counting

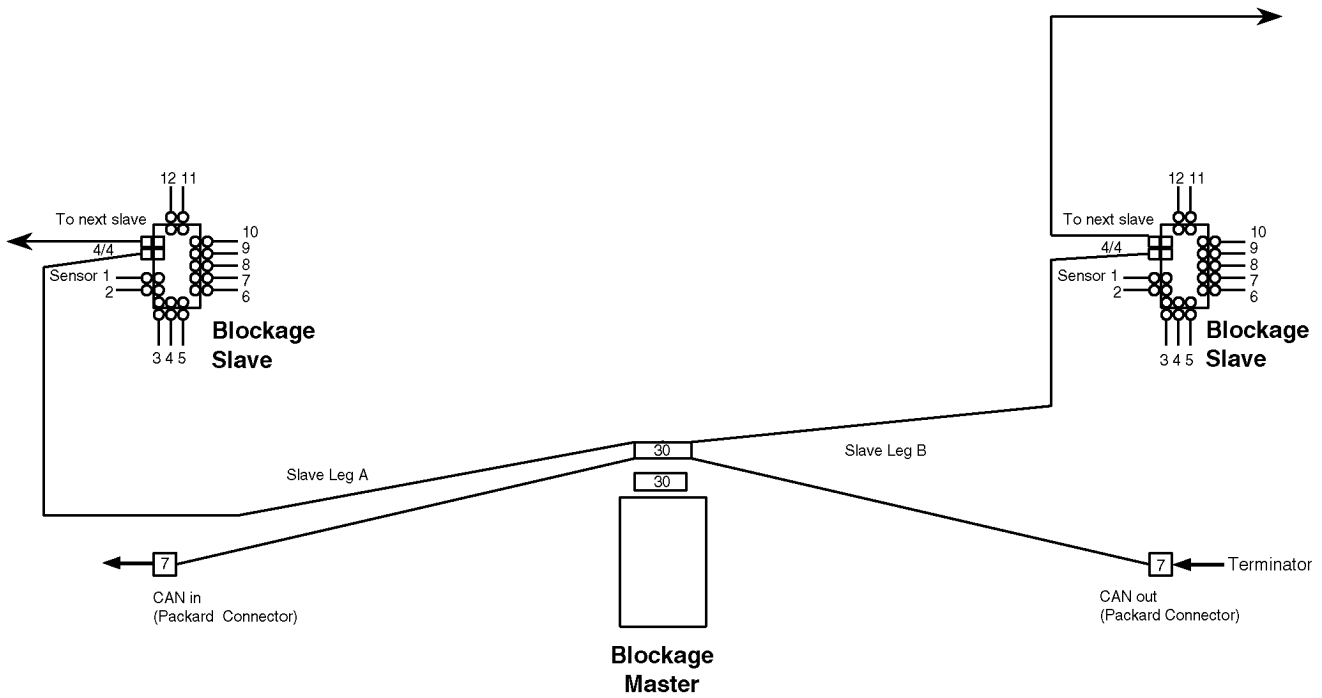
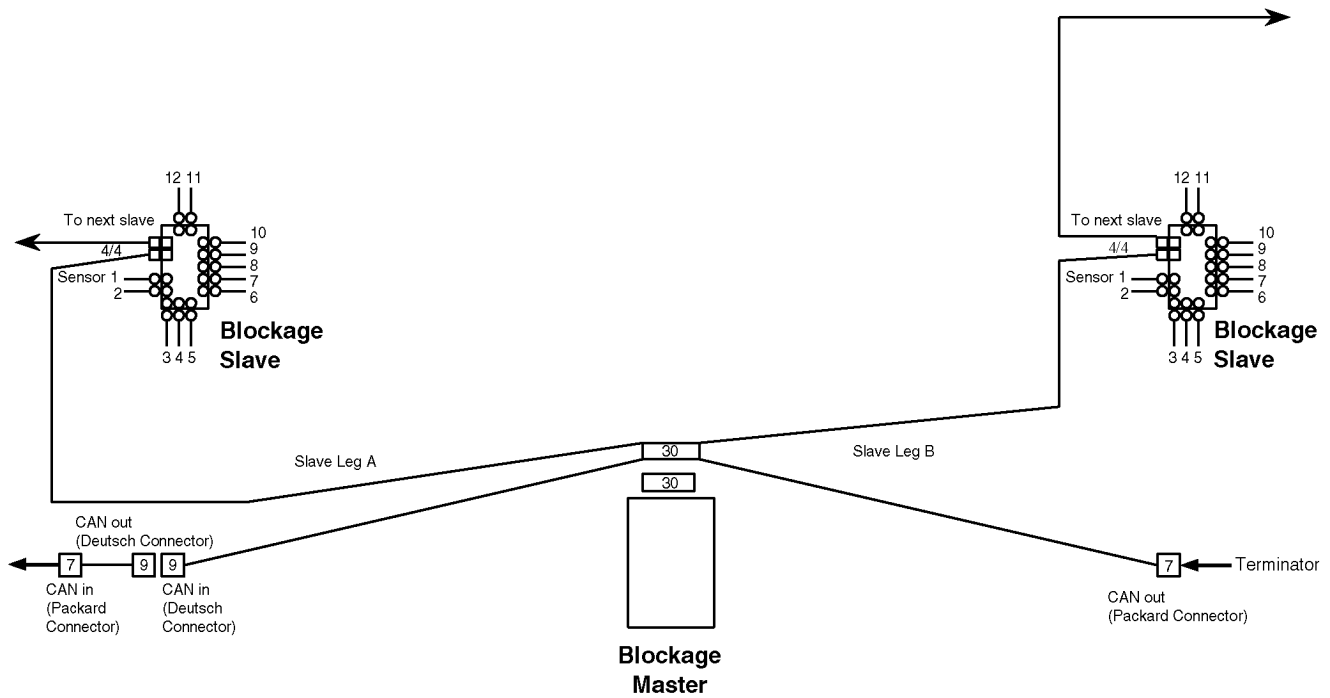


Tow-Between w/ Seed Counting

A41903C -19-22JUL98

AG,OUO6023,1233 -19-21JUL00-1/1

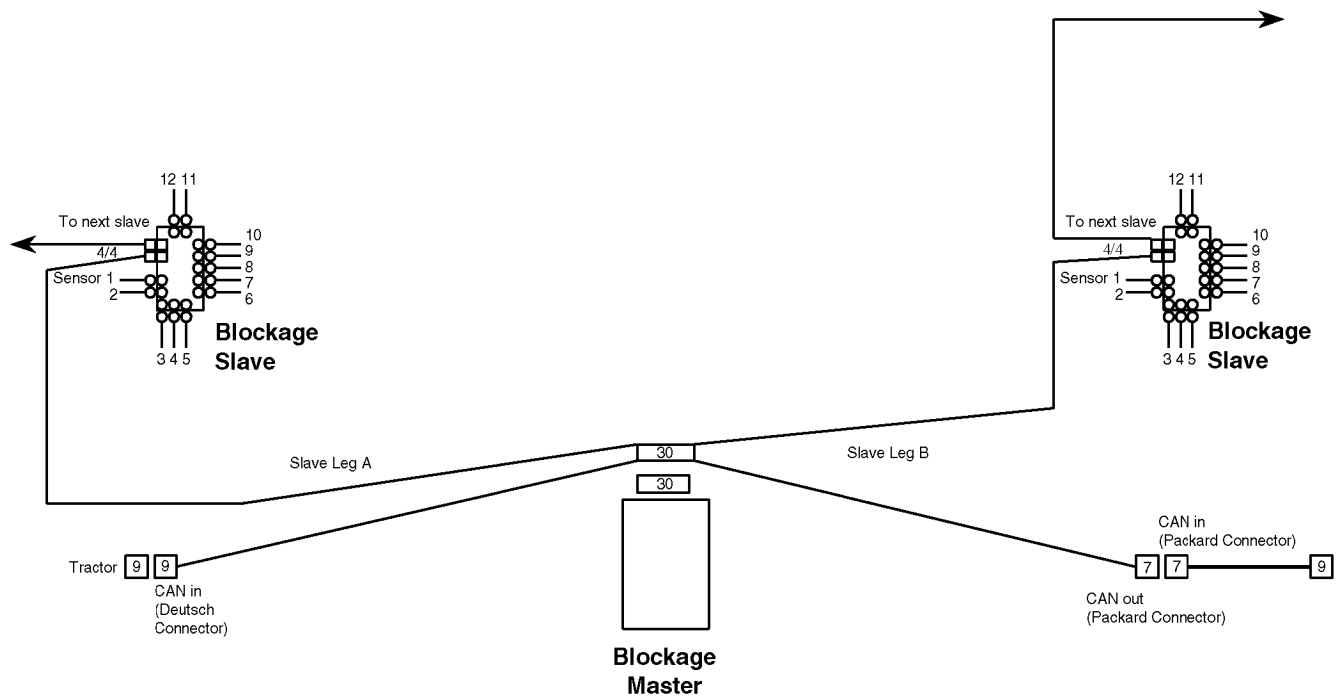
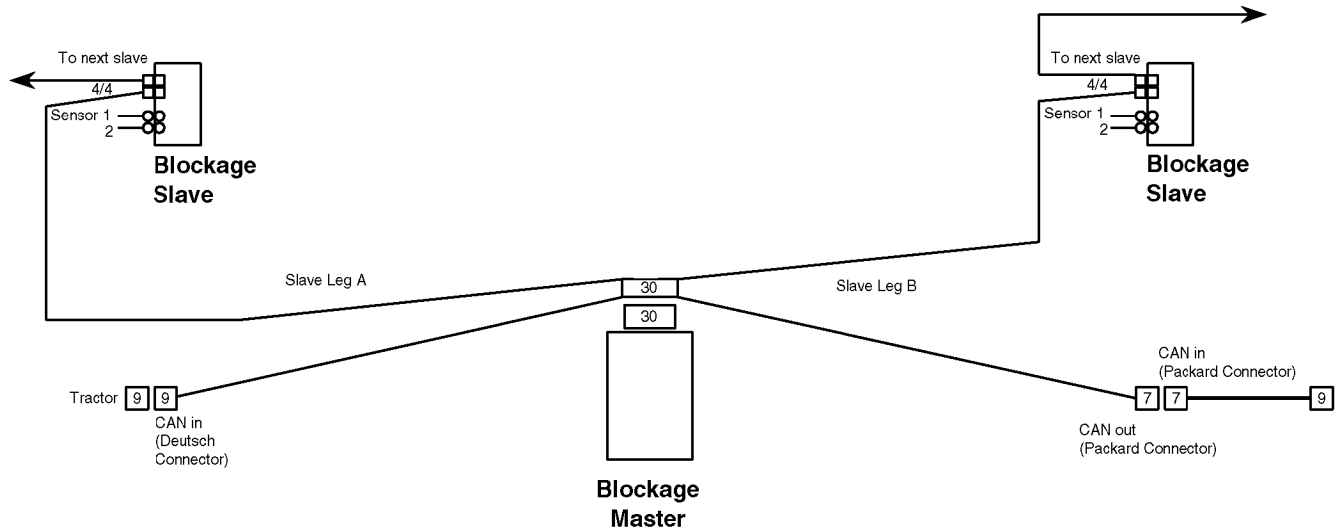
Electrical Wiring Diagram—All-Run Blockage System (Tow-Between)



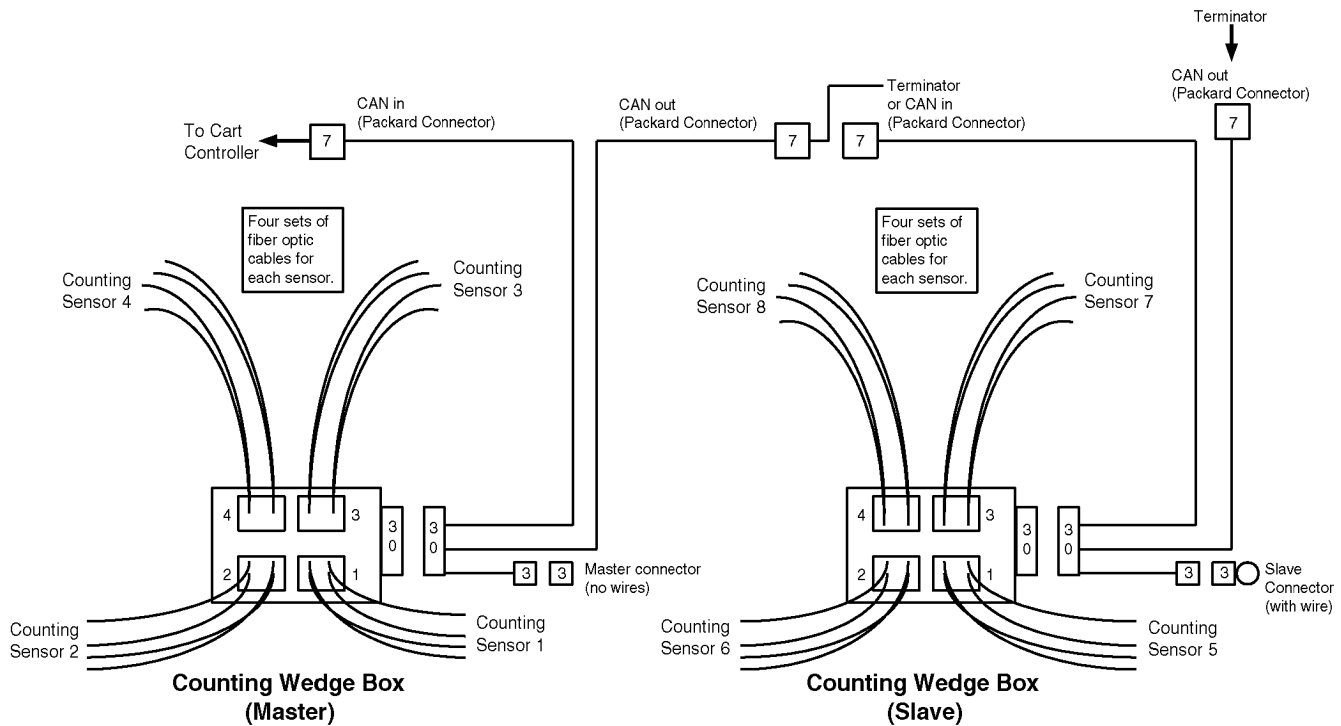
A41904C -19-22JUL98

AG,OUO6023,1234 -19-21JUL00-1/1

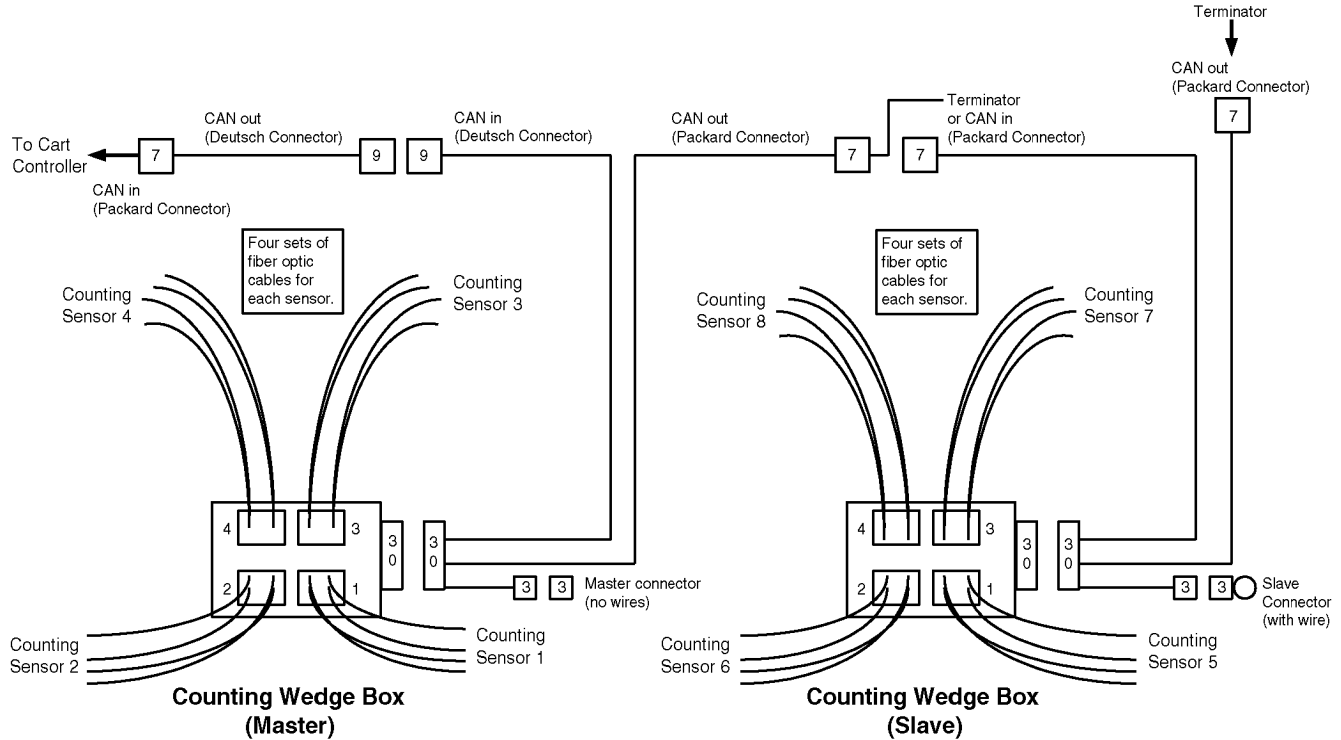
Electrical Wiring Diagram—Blockage Systems (Tow-Behind)



Electrical Wiring Diagram—Seed Counting System



Tow-Behind



Tow-Between

A41902A -19-12SEP97

Storage

Use Your Tillage Equipment Operator's Manuals

Always refer to YOUR seeding equipment operator's manuals for specific, detailed information regarding equipment storage.

Storage procedures will vary by equipment.



TS190 -JUN-17JAN89

AG,OUO6023,1237 -19-21JUL00-1/1

Preparing for Storage

1. Empty tanks and clean out caked deposits.

- Compressed Air (Dry) Cleaning:

CAUTION: Reduce compressed air to less than 210 kPa (2 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying debris, and wear personal protection equipment, including eye protection.

IMPORTANT: Compressed air (dry) cleaning method is recommended to prevent gum-like deposits (left by water wash) from forming on seed cart components and/or blocking air passages.

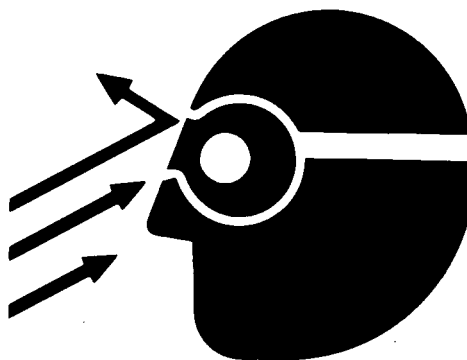
2. Thoroughly clean inside of tanks and meter boxes using compressed air. A good dry cleaning is preferable to poor washing and drying.

- Water Wash (Wet) Cleaning:

CAUTION: Do not allow residue from tank washing to contaminate well or ground water.

IMPORTANT: If compressed air is not available for cleaning, water wash method may be used, provided meter boxes and rollers are thoroughly dried after cleaning. Drying takes time since moisture trapped in bearing areas is slow to drain or evaporate.

3. Wash machine thoroughly, inside and out. Wipe surfaces and components dry.
4. When utilizing stationary double-shoot manifold, clean air control valves, blow out tank pressurization lines and remove and clear product from center manifold plate at end of season.



TS266 -JUN-23AUG88



CAUTION: Be careful when using diesel fuel so that it does not ignite. Use only in well ventilated areas, away from any sparks and flames, to prevent being seriously injured or killed by fire.

5. Remove chains from meter drive system. Clean chains with diesel fuel, coat with John Deere Multipurpose Spray Lube TY6350 and hang in a dry place.
6. Paint all bare metal and rust spots.
7. Replace any missing or damaged parts including hoses, hardware, and decals. Tighten all hardware.
8. Lubricate entire machine.

AG,OUO6023,1238 -19-21JUL00-2/2

Removing From Storage



CAUTION: Keep all shields in place. Do not operate machine if any safety shields are missing. Entanglement with rotating parts can cause serious injury or death to you or someone else.

1. Check inside of tanks and remove any obstructions.
2. Lubricate meter drive chains with John Deere Multipurpose Spray Lube TY6350 and install. If roller chains have become rusty or stiff during storage, "work" chains while lubricating to ensure that all joints move freely.
3. Check tires and inflate as necessary.
4. Clean the machine thoroughly.
5. Perform required lubrication. (See Lubrication and Maintenance section.)
6. Check all hardware and torque bolts as needed.
7. Review operator's manual, giving special attention to safety precautions.

AG,OUO6023,1239 -19-21JUL00-1/1

Assembly

1900 Commodity Air Cart

1900 Commodity Air Cart is considered a factory assembled product. However, some components may have been removed to allow for truck shipment.

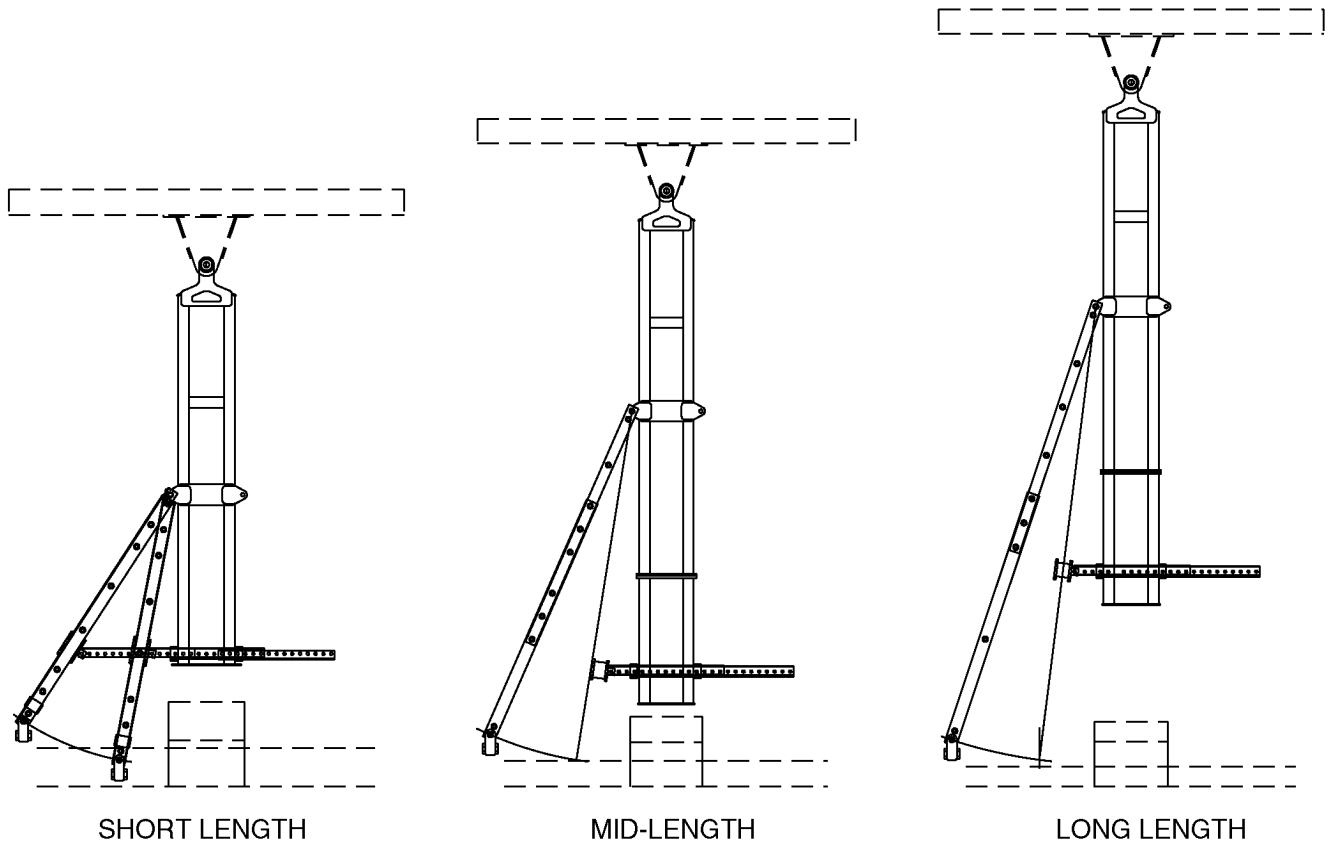
In addition to this, tractor parts (related to the cart) may have shipped loose and need to be installed (i.e., GREENSTAR™ Display Console and Radar Sensor).

Refer to PREDELIVERY CHECKLIST and DELIVERY CHECKLIST to ensure that cart and related attachments are ready for customer use.

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AG,OUO6023,1240 -19-21JUL00-1/1

Tow-Behind Field Hitch



Field hitch is factory assembled with tubes set at the shortest length. Short tube length is used for some seeding applications and need not be reset from factory shipping positions.

Length of tool-to-cart hitch tubes are adjustable to provide clearance for rear bar attachments such as press wheels and harrow.

These applications require that tubes be reset to mid-length or long-length positions.

Installation of hitch frame extension is required in all applications where hitch tubes are extended.

Hitch Tube Setting	Tillage Model
Short Length	1850/1860
Short Length	735/1810 w/o Attachments
Mid-Length	735/1810 w/Attachments
Mid-Length	730,737
Long Length	1820

Continued on next page

AG,OUO6023,1241 -19-21JUL00-1/2

A42138 -19-18NOV97

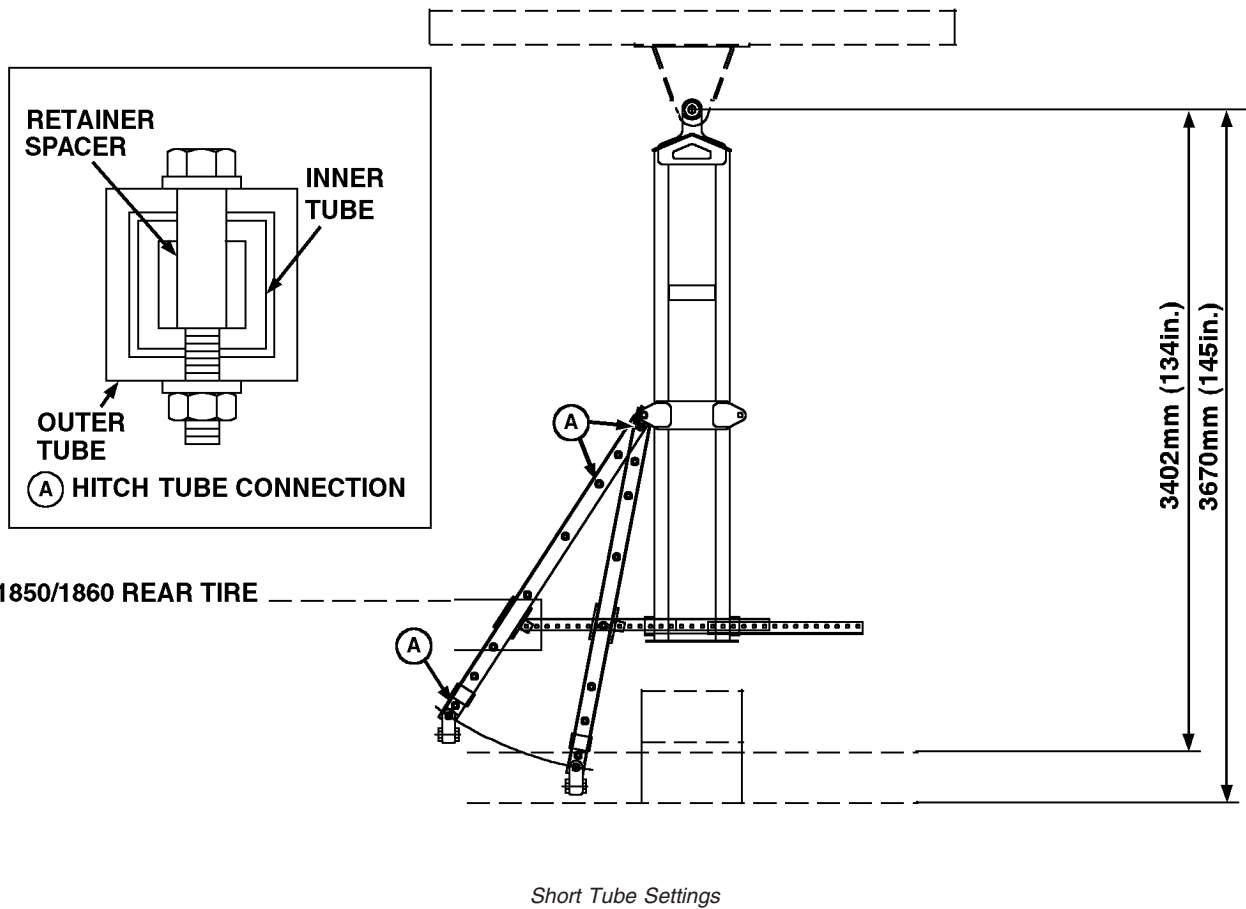
NOTE: See diagram on following pages for specific applications and settings.

Storage stands may need to be relocated closer to tube ends to support hitch when disconnected from tool.

Adjustment of hitch tube cross-support is required for all installations, regardless of tube length settings. Cross-support must be relocated to frame extension when mid-length or long-length settings are used.

AG,OUO6023,1241 -19-21JUL00-2/2

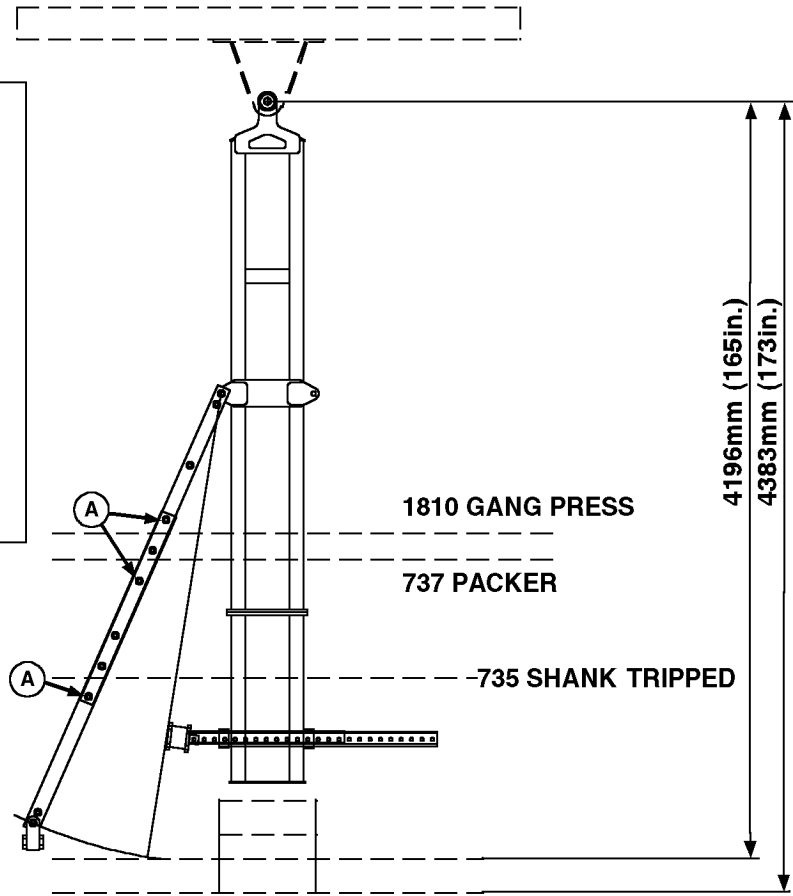
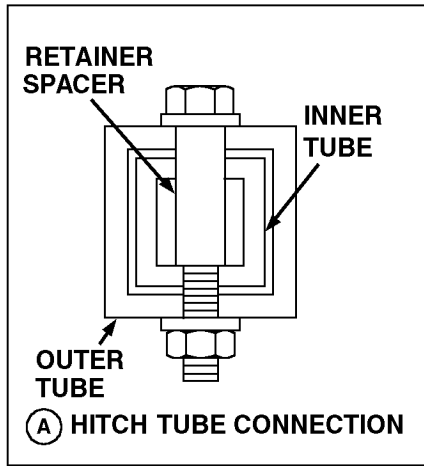
Field Hitch Diagram—1850/1860 and 735/1810 Without Attachments



A42113A -19-22APR98

AG,OUO6023,1242 -19-21JUL00-1/1

Field Hitch Diagram—737 and 735/1810 With Attachments



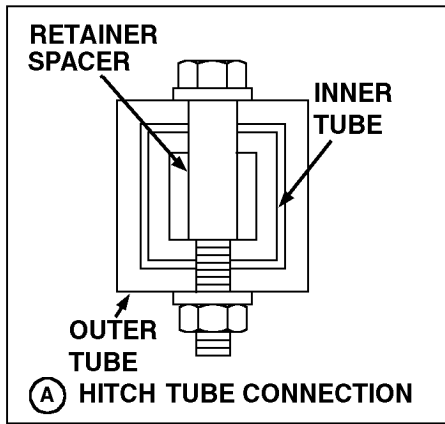
Mid-Length Tube Settings

1. Reset hitch tubes to mid-length setting.
2. Install hitch frame extension.

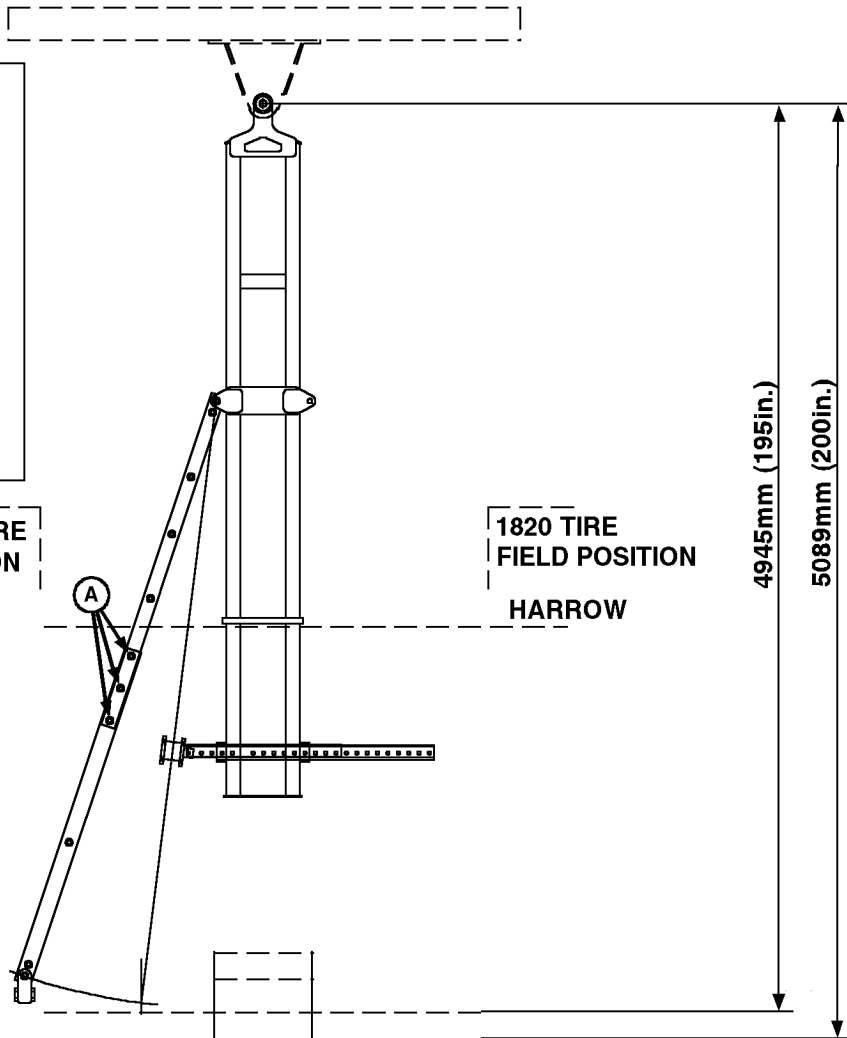
A42114A -19-22APR98

AG,OUO6023,1243 -19-21JUL00-1/1

Field Hitch Diagram—1820



1820 TIRE
FIELD POSITION



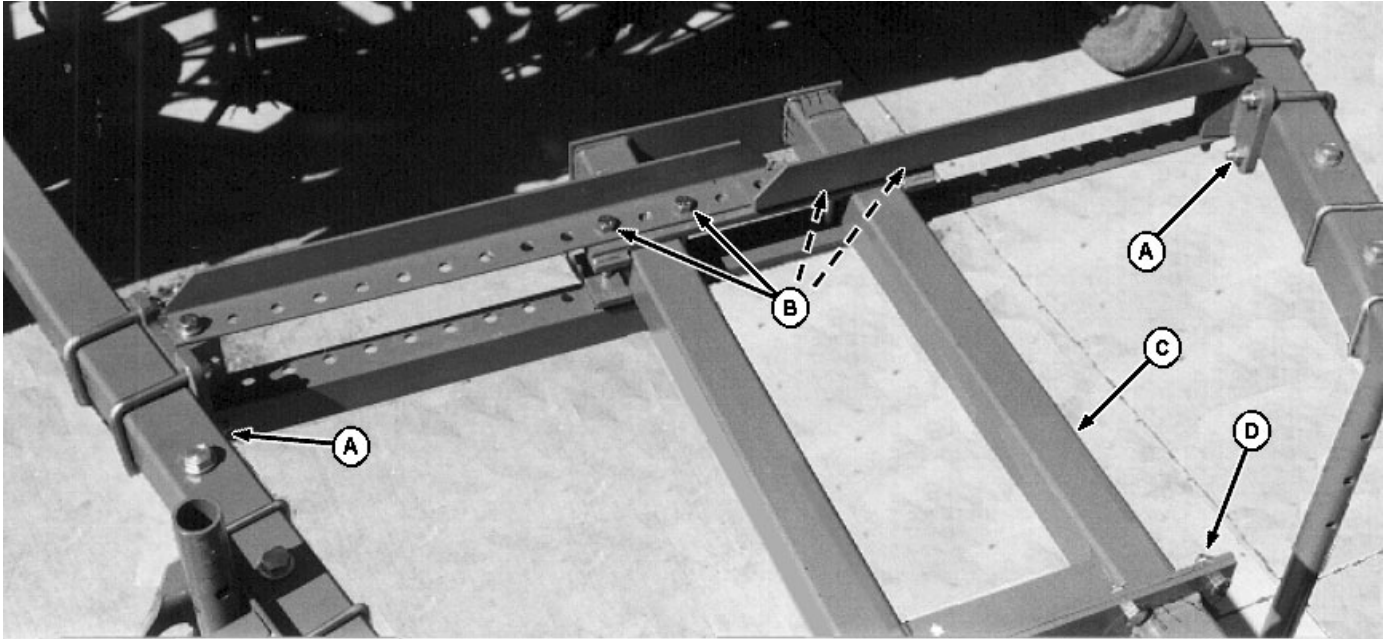
Long-Length Tube Settings

1. Reset hitch tubes to long-length settings.
2. Install hitch frame extension.

A42115A -19-22APR98

AG,OUO6023,1244 -19-21JUL00-1/1

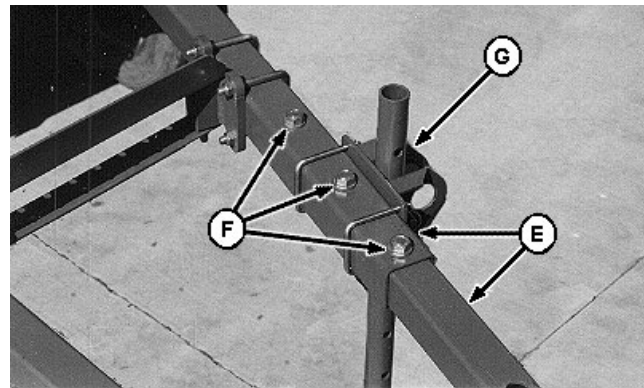
Prepare Field Hitch—Tow-Behind Carts



A42139 -UN-22OCT97

NOTE: Following steps are taken to adjust hitch tubes to mid-length or long-length applications.

1. Loosen or remove support-to-hitch tube (outer end) hardware (A).
2. Remove support-to-hitch frame (inner) hardware (B).
3. Attach frame extension (C) to hitch frame using eight M16 x 35 cap screws and lock nuts (D).
4. Remove hardware and extend hitch tubes (E) to mid-length or long-length positions as shown on applicable diagram.
5. Align tube holes (F) and install hardware only in positions shown on diagram.
6. Position cross-support brackets to end of frame extension and loosely install inner hardware. Cross support will need to be reset when hitch tubes are spread to align with rear bar brackets on seeding tool.
7. If needed, relocate storage stands (G) closer to tube ends. Storage stands support hitch tubes when disconnected from seeding tool.



A42140 -UN-22OCT97

Long-Length Setting

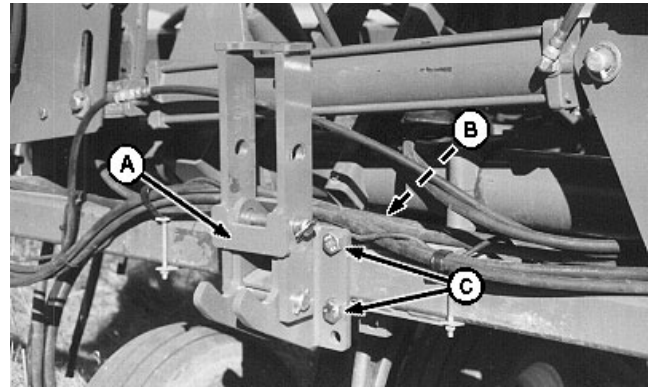
- A—Hardware (Outer)
- B—Hardware (Inner)
- C—Frame Extension
- D—Lock Nuts
- E—Hitch Tubes
- F—Holes
- G—Stand

Attach Tow-Behind Hitch Brackets

IMPORTANT: Hitch brackets should be installed equal distances from the machine centerline. Bracket locations will be different for each machine due to opener locations (row spacings) and interference with rear bar components.

NOTE: Leave hardware loose until instructed to tighten.

Attach hitch brackets (A) to rear frame bar, equal distances from machine centerline, using straps (B), M24 x 200 cap screws (C) and lock nuts.



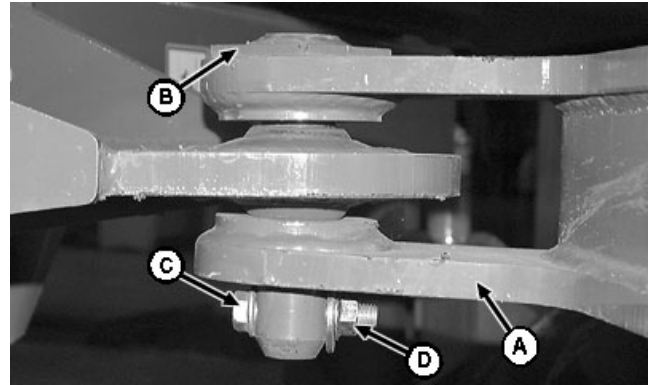
A—Hitch Brackets
B—Straps
C—Cap Screws and Lock Nuts

AG,OUO6023,1246 -19-21JUL00-1/1

Install Tow-Behind Field Hitch

1. Attach hitch (A) to cart using pin (B) with M12 x 50 cap screw (C) and lock nut (D) on bottom.

A—Hitch
B—Pin
C—Cap Screw, M12 x 50
D—Lock Nut

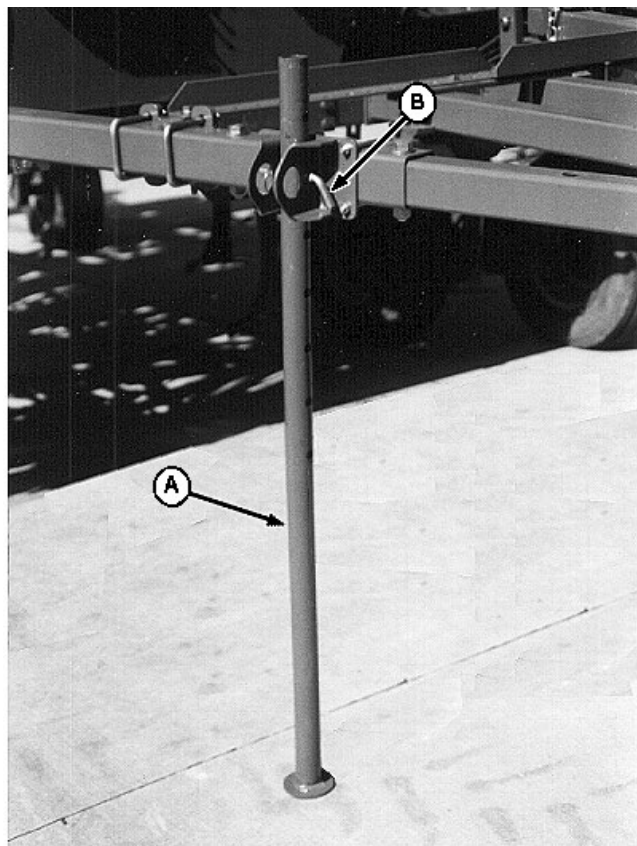


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AG,OUO6023,1247 -19-21JUL00-1/10

2. Use storage stands (A) to support outer end of hitch tubes during assembly. Position stands for ground contact and install L-pin (B) and quick-lock pin.

A—Storage Stands
B—L-Pin and Quick-Lock Pin



A42143 -UN-22OCT97

Continued on next page

AG,OUO6023,1247 -19-21JUL00-2/10

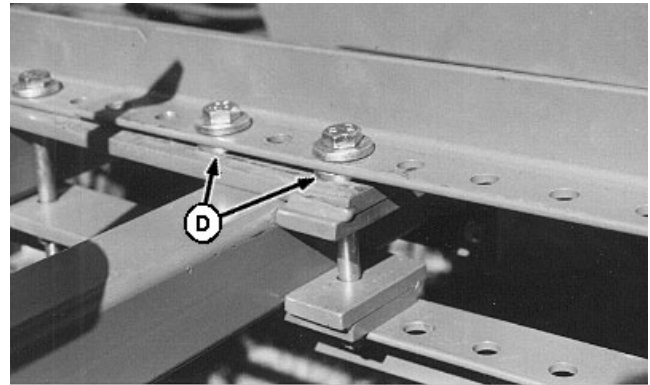
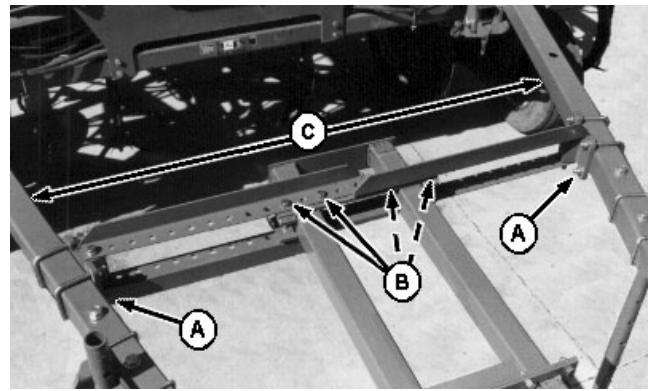
3. Loosen hardware (A) at cross-support outer brackets.
4. Remove hardware (B) from cross-support center connections.

NOTE: *Tube to frame hardware will need to be loosened for the following step.*

5. Spread hitch tube ends (C) into alignment with rear bar brackets (previously installed on seeding tool).

NOTE: *Final attachment and tightening of cross-support can be delayed until hitch tubes are attached to rear bar brackets.*

6. Extending both sides equally, align holes in cross-support brackets and attach with previously removed hardware (B). Use additional flat washers (D) (provided) to fill gap between "over" bracket and connecting strap. "Under" bracket rests flat on strap and does not need spacer washers. Leave hardware loose until instructed to tighten.
7. Slide cross-support assembly as far forward as possible and tighten hardware (A) at cross-support outer brackets.
8. Tighten hardware at cross-support center connections.



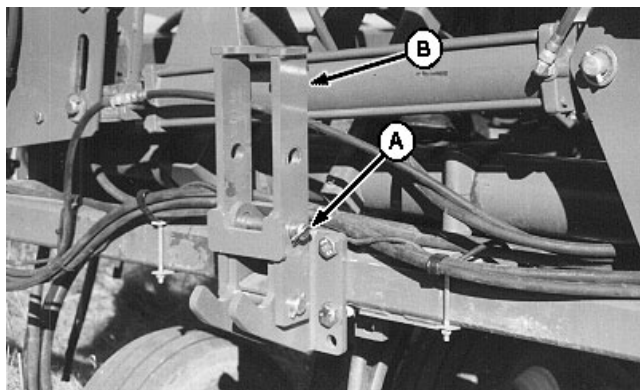
A—Hardware
B—Hardware
C—Hitch Tube Ends
D—Flat Washers

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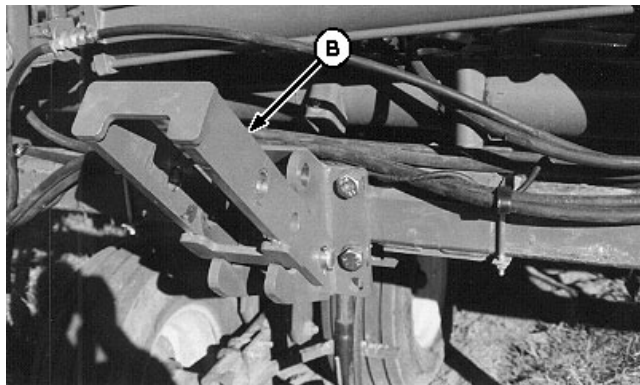
AG.OUO6023,1247 -19-21JUL00-3/10

9. Remove pin (A) from bracket and place arm (B) on rest plate. Repeat on opposite side bracket.

A—Pin
B—Arm



A42146 -UN-22OCT97



A42147 -UN-22OCT97

Continued on next page

AG,OUO6023,1247 -19-21JUL00-4/10

NOTE: End bracket-to-tube hardware will need to be tightened after the following steps.

10. Back seeding tool toward cart and align hitch tubes (A) to arms (B).

NOTE: Hitch tubes attach at top holes in arms.

11. When holes align, install pins (C) through top arm holes and hitch tubes. Retain pins with quick-lock pins.
12. With both tubes attached to arms, back seeding tool toward cart to raise arms to vertical positions.
13. When holes align, retain arms in vertical positions using pins (D) and quick-lock pins.

IMPORTANT: Torque on hitch tube hardware should be checked after first 10 hours and again after 50 hours.

14. Tighten hitch tube hardware (E) to specification.

Specification

Hitch Tube Hardware—Torque 1153 N•m
(850 lb-ft)

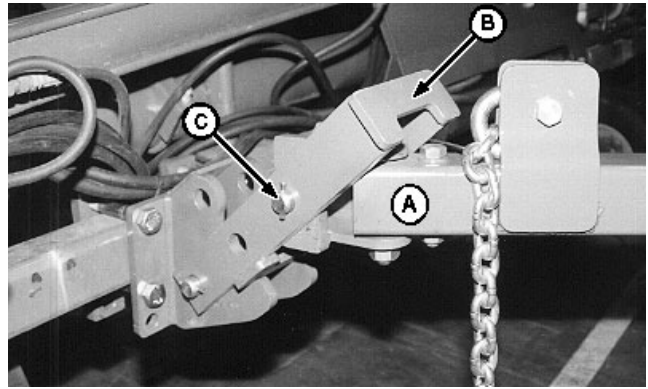
15. Remove play in hitch brackets by pushing both brackets toward center of machine. For best tracking make sure brackets are equal distance from tool centerline.

IMPORTANT: Torque on end bracket hardware should be checked after first 10 hours and again after 50 hours.

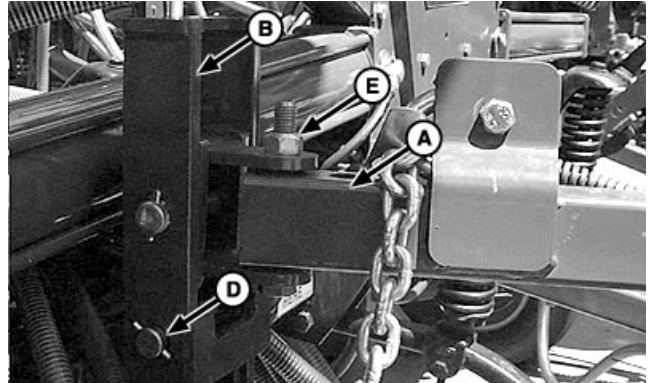
16. Tighten end bracket hardware to specification.

Specification

Hitch Tube Hardware—Torque 576 N•m
(425 lb-ft)



A42148 -UN-13NOV97



A43763 -UN-09OCT99

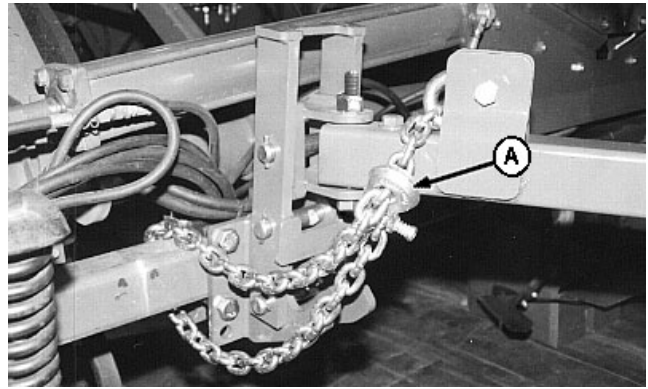
- A—Hitch Tubes
- B—Arms
- C—Pins
- D—Pins
- E—Hitch Bracket Hardware

Continued on next page

AG,OUO6023,1247 -19-21JUL00-5/10

17. At both hitch connections, wrap safety chains (A) around rear bar and retain with hook latch.

A—Safety Chains



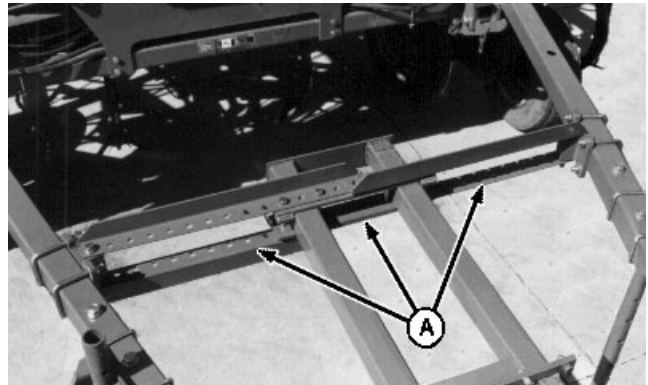
A42150A -UN-11OCT99

AG.OUO6023,1247 -19-21JUL00-6/10

18. If not already done, assembly and adjustment of hitch cross-support (A) can now be finished and hardware tightened. Refer to Steps 6 and 7 for details.

19. Tighten ALL hardware.

A—Hitch Cross-Support



A42152 -UN-22OCT97

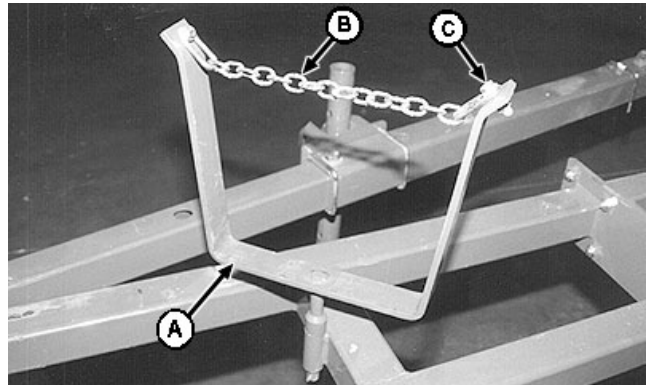
AG.OUO6023,1247 -19-21JUL00-7/10

20. Install air hose cradles (A) with M6 x 40 roll pins.

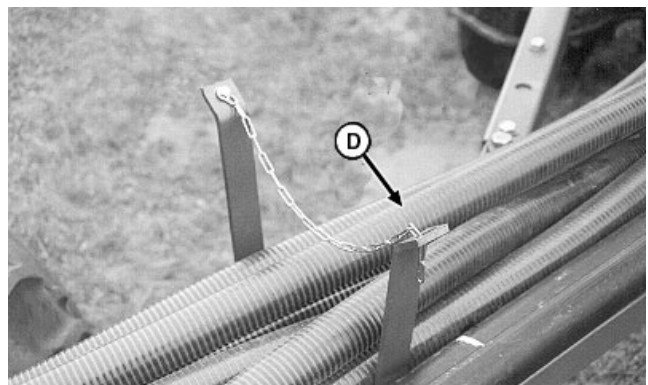
21. Attach retaining chain(s) (B) using M10 x 25 cap screws (C), 10.5 x 18 x 1.6 mm flat washers, with flange lock nuts on the bottom.

When installed, lay primary air hose (D) into cradles. Refer to Air System Predelivery Instructions (PDI) for air hose connections to rear bar.

- A—Air Hose Cradles**
B—Retaining Chains
C—Hardware
D—Primary Air Hose



A42153A -UN-17AUG98



A42155A -UN-17AUG98

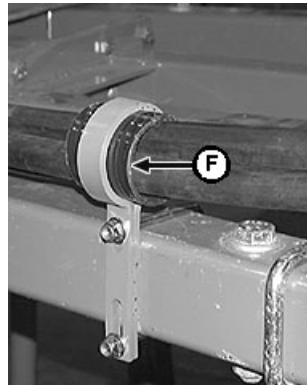
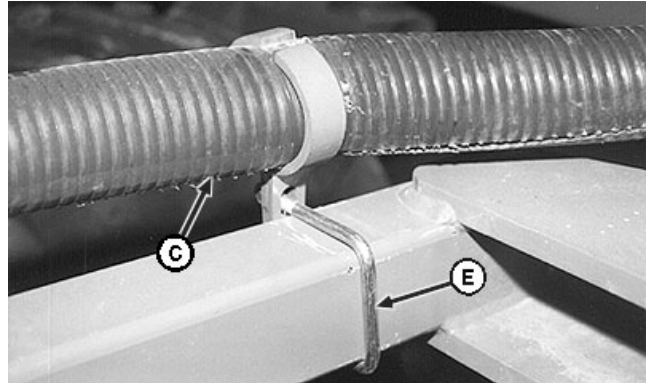
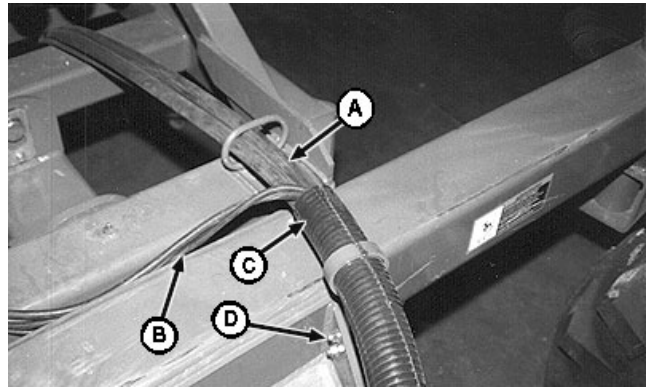
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AG.OUO6023,1247 -19-21JUL00-8/10

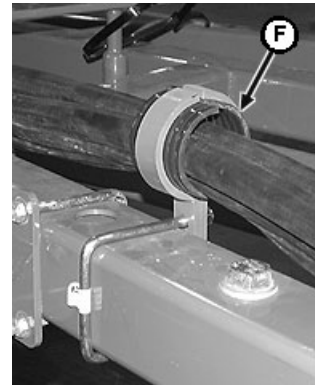
NOTE: Leave clamp hardware loose until instructed to tighten.

22. Route hydraulic hoses (A) and electrical harnesses (B) through longest length guard hose 1003 mm (39.5 in.) (C). Turn guard hose so slit is down. Retain hose guard to cart using clamp and M10 x 40 flange head cap screws with lock nuts (D).
23. Bend hose guard to right-hand side of hitch and retain with clamp, U-bolt (E) and M10 lock nuts. Center hose guard between clamps and tighten hardware.
24. Install the remaining short hose guards 63.5 mm (2.50 in.) (F) along the right-hand side of the hitch frame and telescoping member, using same clamp and hardware as shown in previous step. Evenly space clamps along the hitch, keeping hoses away from sharp edges.

A—Hydraulic Hoses
B—Electrical Harnesses
C—Long Hose Guard
D—Lock Nuts
E—U-Bolt
F—Short Hose Guard



Outside

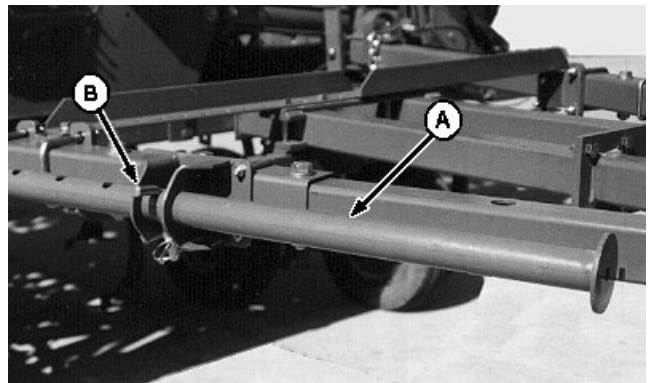


Inside

AG.OUO6023,1247 -19-21JUL00-9/10

25. Remove pins and move storage stands (A) into transport/field position. Retain stands with L-pins (B) and quick-lock pins.

A—Storage Stands
B—L-Pins



AG.OUO6023,1247 -19-21JUL00-10/10

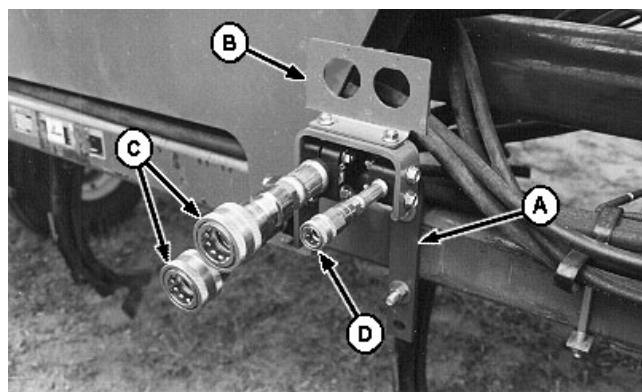
Install Tillage Bracket, Hoses and Harnesses—Tow-Behind Cart

NOTE: Hose and harness connection bracket is installed on rear bar of seeding equipment, inside of the hitch brackets. Put bracket on the same side as hose/harness support tube is installed on hitch for convenient access by the operator.

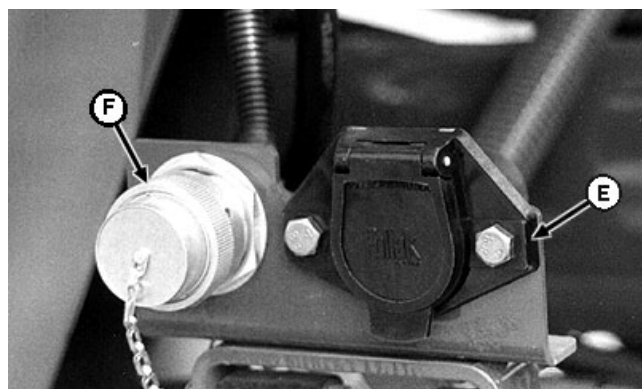
1. Install hose bracket (A) on rear bar using U-bolt and M16 flange lock nuts.
2. Attach harness connection plate (B) using M10 x 16 cap screws and nuts.
3. Attach pressure and return hoses (C) (with female disconnect couplers) to inside and outside of bracket using two-piece clamps, M8 x 60 cap screws and flange lock nuts.
4. Attach drain hose (D) (with female quick disconnect coupling) to inside of bracket using two-piece clamp, M8 x 60 cap screws and flange lock nuts.
5. Route hoses along seeding frame, onto hitch, placing tractor hose ends in storage slots. Retain hoses away from moving parts using tie straps.
6. Attach cart power harness (E) (7-terminal plug) and CAN communications cable (DEUTSCH™ connector (F) to connection plate.

IMPORTANT: Run harness and cable where they will not be pinched, pulled or snagged by moving parts during normal operations.

7. Route harness and cable along seeding frame, onto hitch, placing tractor ends in storage position. Retain harness and cable away from moving parts using tie straps.
8. Route power harness seeding lighting leads to right-hand and left-hand sides and attach to amber warning and red tail lights. Retain lighting leads with tie straps.



Rear Bar End



Tillage Hitch End

- A—Hose Bracket
- B—Harness Connection Plate
- C—Pressure and Return Hoses
- D—Drain Hose
- E—Cart Power Harness
- F—CAN Communications Cable

9. Refer to Attaching and Detaching Section, make all connections to tractor and perform fit and function checkout.

If fan motor does not turn in response to control, hose connections are reversed and need to be corrected.

AG,OUO6023,1248 -19-21JUL00-2/2

Specifications

Specifications¹—1900 Commodity Air Cart

	Front	Rear	Middle Tank
Capacity (full):			
195 Bushel	2.64m³ (75 bu)	4.22m³ (120 bu)	1.93m³ (55 bu) Tow-Between and Tow-Behind
270 Bushel	4.22m³ (120 bu)	5.28m³ (150 bu)	2.46m³ (70 bu) Tow-Behind Only
350 Bushel	5.28m³ (150 bu)	7.04m³ (200 bu)	2.81m³ (80 bu) Tow-Behind Only
Tank Ratio—All Sizes (front/rear)	40/60%		
Lid Diameter	673 mm (26.5 in.)		
Auger Diameter:			
195 and 270 Bushel	178 mm (7 in.) standard or 203 mm (8 in.) optional		
350 Bushel	203 mm (8 in.)		
Air System:			
Drive	Hydraulic		
Horsepower required to drive	4.5—10.4 kW (6—14 hp)		
Primary air hose	63.5 mm (2.5 in.)		
Secondary air hose	25.4 mm (1 in.)		
Fan diameter	438 mm (17.25 in.)		
Meters:	Front Tank	Rear Tank	Middle Tank
Number	1 Meter	1 Meter	1 Meter
Drive	Ground	Ground	Ground
Tires:		Turf Tread Tires Standard—Other Sizes Optional	
Tow-Behind Only		Front	Rear
195 Bushel		16.5L-16.1, I-3, 6PR (2)	18.4-26 R3, 10PR (2)
270 Bushel		16.5L-16.1, I-3, 6PR (2)	23.1-26 R3, 10PR (2)
350 Bushel		21.5L-16.1, I-3, 8PR (2)	28L-26 R3, 12PR (2)
Tires:		Turf Tread Tires Standard—Other Sizes Optional	
Tow-Between		Front	Rear
195 Bushel		—	23.1-26 R3, 10PR (2)
270 Bushel		—	28L-26 R3, 12PR (2)

¹Specifications and design subject to change without notice.

Continued on next page

AG,OUO6023,1249 —19–21JUL00–1/2

Specifications

Dimensions:

Height:

195 Bushel	378 cm (149 in.)
270 Bushel	390 cm (153 in.)
350 Bushel	411 cm (162 in.)

Length:

195 Bushel	566 cm (223 in.)
270 Bushel	653 cm (257 in.)
350 Bushel	673 cm (265 in.)

Width:

195 Bushel	417 cm (164 in.)
270 Bushel	432 cm (170 in.)
350 Bushel	434 cm (171 in.)

Ground clearance at meters (Both Models):

Empty	584 mm (23 in.)
Loaded	508 mm (20 in.)

AG,OUO6023,1249 -19-21JUL00-2/2

Machine Weights

Seeding Tool Model	Width (M)	Width (ft)	Weight (kg)	Weight (lb)
730	8.5	28	4944	10,900
730	11.0	36	6305	13,900
730	13.4	44	7711	17,000
735	9.4	31	5625	12,400
735	11.0	36	6532	14,400
735	12.5	41	7893	17,400
737	9.4	31	7031	15,500
737	11.0	36	7938	17,500
737	12.5	41	9208	20,300
1810	15.8	52	10,750	23,700
1810	17.4	57	11,113	24,500
1810	18.3	60	11,294	24,900
1820	8.8	29	7666	16,900
1820	10.7	35	8754	19,300
1820	12.5	41	9888	21,800
1820	13.7	45	12,338	27,200
1820	16.2	53	13,426	29,600
1820	18.6	61	14,651	32,300
1850/1860	9.1	30	7711	17,000
1850/1860	11.0	36	9299	20,500
1850/1860	12.8	42	10,659	23,500

AG,OUO6023,1250 –19–21JUL00–1/1

Recommended Tractors

There are three steps to determine if the tractor is compatible with the chosen 1900 Cart and Seeding Tool.

1. **Tractor Power**—Can the tractor pull this combination in the field?
2. **Tractor Weight**—Does tractor weigh enough to tow combination safely on the road with the cart less than half full?
3. **Tractor Hydraulics**—Can tractor operate cart fan for given seeding tool, rate and speed?

• Tractor Power

A general guideline is 6 horsepower per each foot of seeding tool. Add the following horsepower for the 1900 Cart:

350 Bushel Model	60 HP
270 Bushel Model	40 HP
195 Bushel Model	30 HP

IMPORTANT: These are only rough guidelines; hills and soil conditions can have a large impact on tractor power requirements.

• Tractor Weight

Use the chart on seeding tool weights and cart weights to determine the minimum tractor weight. Refer to **CALCULATING MINIMUM TRACTOR WEIGHT FOR SAFE TRANSPORT**—chart in Preparing Tractor section.

Continued on next page

AG,OUO6023,1251 –19–21JUL00–1/2

• Tractor Hydraulics

The fan is run from one tractor selective control valve and must provide the flow and pressure needed to run the fan motor for each seeding condition. Larger seeding tools have more primaries which require more air power and higher hydraulic power. Double-shoot machines have twice as many primaries and require more hydraulic power. Higher seeding speed, at a given rate, requires more hydraulic power to move the high material flow. Slowing down will lower the hydraulic power and improve performance in a marginal condition.

See Tractor Hydraulic Compatibility Chart for further information.

AG,OUO6023,1251 -19-21JUL00-2/2

Tractor Hydraulic System Requirements

Operation of the hydraulically driven fan requires tractor to have either a load sensing hydraulic system or a closed center hydraulic system with flow control. These types of hydraulic systems usually have large oil reservoirs and increased oil cooling capacity and deliver only the oil flow needed for the fan motor to consistently maintain fan speed at the selected RPMs without surging.

Tractors with open center hydraulic systems are not recommended for the following reasons:

- No means to control volume of oil flow.
- Excessive oil temperature.
- Decreased oil flow to fan motor during operation of other tractor control valves.
- Reduced oil flow to tractor power steering.

Hydraulic System Requirements	
Number of SCV's (min.)	1 - Fan/Auger
Gallons-per-minute	14-20 GPM - Fan

IMPORTANT: In addition to these requirements, tractor **MUST** be equipped with a low-pressure drain line connection for the fan motor case drain.

Sump pressure MUST be less than 689 kPa (6.89 bar) (100 psi), or fan motor will be damaged.

See your John Deere dealer for installation of a Low-Pressure Drain Line Kit, if your tractor is not so equipped.

NOTE: See Recommended Tractors and Tractor Hydraulic Compatibility for further information.

Make sure tractor hydraulic system meets all requirements.

AG,OUO6023,1252 -19-21JUL00-1/1

Tractor Hydraulic Compatibility¹

Tractor Hydraulic Compatibility									
Number of Primaries	Approximate Required Fan Speed rpm	SCV GPM	Net SCV Psi	9000 Series	8000 Series	60 and 70 Series 4WD	55-60 Series MFWD	50 Series MFWD and 4WD	40 Series 4WD
SINGLE-SHOOT									
5	3500	13.0	1462	OK	OK	OK	OK	OK	MARGINAL
6	4000	15.6	1752	OK	OK	OK	OK	OK	NO
7	4200	16.7	1872	OK	OK	OK	OK	OK	NO
8	4500	18.5	2060	OK	OK	OK	MARGINAL	MARGINAL	NO
DOUBLE-SHOOT									
5	4200	16.4	2225	OK	OK	OK	MARGINAL	MARGINAL	NO
6	4500	18.2	2350	OK	OK	MARGINAL	NO	NO	NO
7	4750	19.6	2465	OK	OK	NO	NO	NO	NO
8	5000	20.0	2500	OK	OK	NO	NO	NO	NO

NOTE: Fan speeds are estimate based on average application rates.

To use chart:

1. Find the row that describes your cart (number of primaries, and single-shoot or double-shoot).
2. On that row is shown the tractor flow and pressure requirement.
3. Also shown on that row is compatibility recommendations for John Deere Tractors.

IMPORTANT: Marginal tractors would perform better at lower rates and/or lower operating speed.

NOTE: The above chart reflects tractor compatibility primarily with regard to hydraulic flow and

pressure requirements and tractor capabilities. Certain competitive tractors in the same horsepower range as those listed, may not have oil cooling capacity equal to John Deere tractors and may have the potential to excessively heat hydraulic oil when two or more of the following conditions are present:

- High oil flow (7 or 8 primaries with a high rate of product).
- Maximum system pressure (due to active down force system on seeding tool).
- High ambient temperature.
- High drawbar load (large tool running deep).
- Tractor radiator plugged with dust and debris.

¹GPM = Gallons-per-minute, Psi = Pounds-per-square inch pressure.

Tillage Compatibility Guide

1900 Commodity Air Carts can be used with the following John Deere seeding tools:

- 730 Air Disk Drill (Tow-Between Only)
- 735 Air Seeding Tool
- 737 Air Hoe Drill
- 1810 Air Seeding Tool
- 1820 Air Hoe Drill
- 1850 and 1860 No-Till Air Drill

Non-traditional tools manufactured by John Deere are also compatible with the 1900.

- 980/985 Field Cultivators
- 680/685 Chisel Plows

In addition, the 1900 can be used with seeding tools manufactured by companies other than John Deere.

AG,OUO6023,1254 -19-21JUL00-1/1

Tire Inflation Pressures—195 Bushel Carts

Tow-Behind Cart	Without Middle Tank			With Middle Tank		
Size/Tread/Ply-Rating	kPa	Bar	Psi	kPa	Bar	Psi
Front 16.5L-16.1/I-3/6PR	166	1.66	24	166	1.66	24
Rear 18.4-26/R2 or R3/10PR	234	2.34	34	--	--	--
23.1-26/R2 or R3/10PR	138	1.38	20	179	1.79	26
18.4R-46/R1/3 Star	--	--	--	207	2.07	30
710/70R38/R1W/2 Star	90	.90	13	117	1.17	17
20.8R38 Duals/R1/1 Star	62	.62	9	83	.83	12
20.8R42 Singles/R1/2 Star	110	1.10	16	138	1.38	20
20.8R42 Duals/R1/2 Star	70	.70	10	70	.70	10

Tow-Between Cart	Without Middle Tank			With Middle Tank		
Size/Tread/Ply-Rating	kPa	Bar	Psi	kPa	Bar	Psi
Rear 18.4-26/R2 or R3/10PR	234	2.34	34	--	--	--
23.1-26/R2 or R3/10PR	179	1.79	26	179	1.79	26
18.4R-46/R1/3 Star	207	2.07	30	207	2.07	30
710/70R38/R1W/2 Star	62	.62	9	145	1.45	21
20.8R38 Duals/R1/1 Star	83	.83	12	110	1.10	16
20.8R42 Singles/R1/2 Star	138	1.38	20	166	1.66	24
20.8R42 Duals/R1/2 Star	70	.70	10	83	.83	12

AG,OUO6023,1255 -19-21JUL00-1/1

Tire Inflation Pressures—270 Bushel Carts

Tow-Behind Cart	Without Middle Tank			With Middle Tank		
Size/Tread/Ply-Rating	kPa	Bar	Psi	kPa	Bar	Psi
Front 16.5L-16.1/I-3/6PR	166	1.66	24	--	--	--
21.5L-16.1/I-3/8PR	--	--	--	166	1.66	24
Rear 23.1-26/R2 or R3/10PR	179	1.79	26	--	--	--
28L-26/R2 or R3/12PR	179	1.79	26	179	1.79	26
710/70R38/R1W/2 Star	124	1.24	18	159	1.59	23
20.8R38 Duals/R1/1 Star	96	.96	14	124	1.24	18
20.8R42 Singles/R1/2 Star	152	1.52	22	179	1.79	26
20.8R42 Duals/R1/2 Star	83	.83	12	96	.96	14

Tow-Between Cart	Without Middle Tank		
Size/Tread/Ply-Rating	kPa	Bar	Psi
Rear 28L-26/R2 or R3/12PR	179	1.79	26
710/70R38/R1W/2 Star	159	1.59	23
20.8R38 Duals/R1/1 Star	117	1.17	17
20.8R42 Singles/R1/2 Star	179	1.79	26
20.8R42 Duals/R1/2 Star	96	.96	14

AG,OUO6023,1256 --19-21JUL00-1/1

Tire Inflation Pressures—350 Bushel Carts

Tow-Behind Cart	Without Middle Tank			With Middle Tank		
Size/Tread/Ply-Rating	kPa	Bar	Psi	kPa	Bar	Psi
Front 21.5L-16.1/I-3/8PR	166	1.66	24	166	1.66	24
Rear 28L-26/R2 or R3/12PR	179	1.79	26	—	—	—
30.5L-32/R2 or R3/12PR	179	1.79	26	179	1.79	26
710/70R38/R1W/2 Star	159	1.59	23	159	1.59	23
20.8R38 Duals/R1/1 Star	124	1.24	18	124	1.24	18
20.8R42 Duals/R1/2 Star	110	1.10	16	124	1.24	18
20.8R42 Singles/R1/2 Star	193	1.93	28	—	—	—

AG,OUO6023,1257 --19-21JUL00-1/1

Metric Conversion Factors

To convert from English to Metric measurements, multiply by the following factors.

To Convert	To	Multiply By
Inches	Millimeters	25.4
Feet	Meters	0.3048
Yards	Meters	0.9144
Miles	Kilometers	1.609
Square Foot	Square Meters	0.0929
Acres	Hectares	0.4047
Pounds	Kilograms	0.4536
Cubic Foot	Cubic Meter	0.02832
Bushels	Cubic Meters	0.03524
Pounds/Square Inch	Kilopascals	6.8948
Pounds/Square Inch	Bar	0.06895
Pounds-Force-Foot	Newton-Meters	1.3568
Miles-Per-Hour	Kilometers-Per-Hour	1.609
Pounds-Per-Acre	Kilograms-Per-Hectare	1.1209
Acre-Per-Hour	Hectare-Per-Hour	0.405
Feet-Per-Minute	Meters-Per-Second	0.005
Feet-Per-Second	Meters-Per-Second	0.305
Horsepower	Kilowatt	0.746
27 in. of Water = 1 psi		

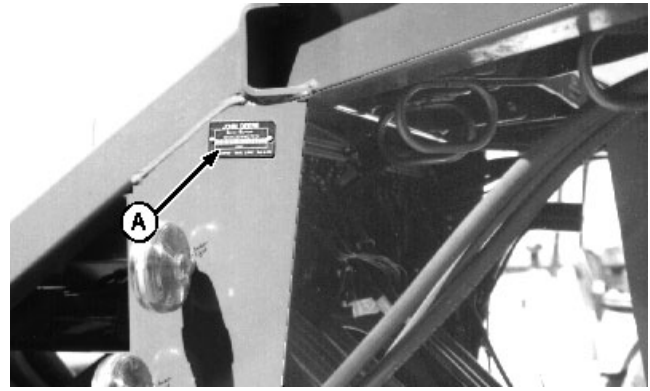
AG,OUO6023,1258 -19-21JUL00-1/1

Record Machine Serial Number¹

When ordering parts, furnish the machine model and serial number as given on the serial number plate (A).

Your serial number plate is located at the front of the main frame on the left-hand side. Record serial number.

Model	
Serial Number	
Date Purchased	



A40150 -UN-09APR97

¹Specifications and design subject to change without notice.

Record Serial Numbers—Monitor and Control Components

Component serial numbers are located on the back of the console, controller and radar unit. Record numbers in the spaces provided.



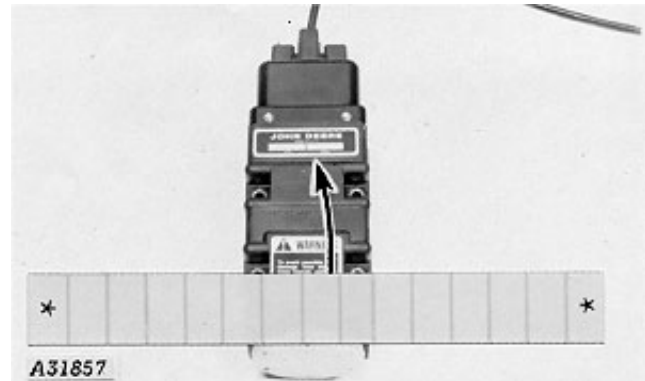
A37529 -UN-06SEP95

Display Console Serial Number



A46140 -UN-26JUN00

Controller Serial Number



A31857 -UN-13MAR89

Radar Serial Number

Continued on next page

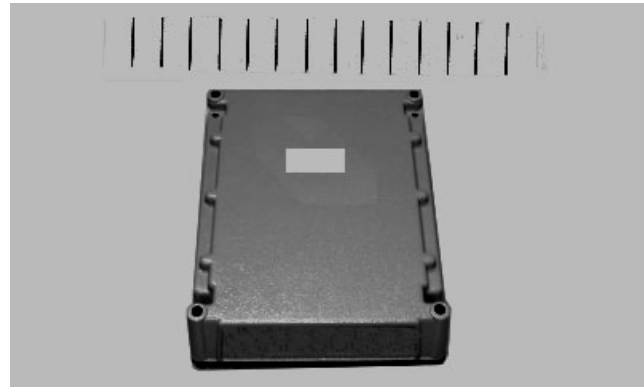
AG,OUO6023,1260 -19-21JUL00-1/2

Specifications

If equipped with optional product monitoring systems, record serial numbers of blockage controller(s) and/or seed counting controllers in the spaces provided.

Blockage Controller(s)—Slave (Not Shown)

Seed Counting Controller(s) (Not Shown)



Blockage Controller—Main

AG,OUO6023,1260 -19-21JUL00-2/2

Crime Prevention Tips

Help Prevent Crime

You can help take a bite out of crime by properly documenting ownership and discouraging theft.

**TAKE A BITE OUT OF
CRIME**
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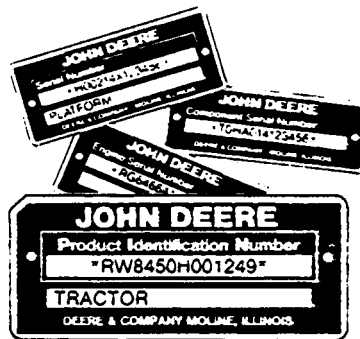


TS140 -19-07OCT88

AG,OUO6023,1261 -19-21JUL00-1/1

Record Identification Numbers

1. Mark your machines with your own unique numbering system.
2. Record the Product Identification Number (PIN) of the unit and also individual component identification numbers for engines, axles, pumps, etc. Include the PIN numbers on all documentation, such as insurance, financial, and warranty papers.

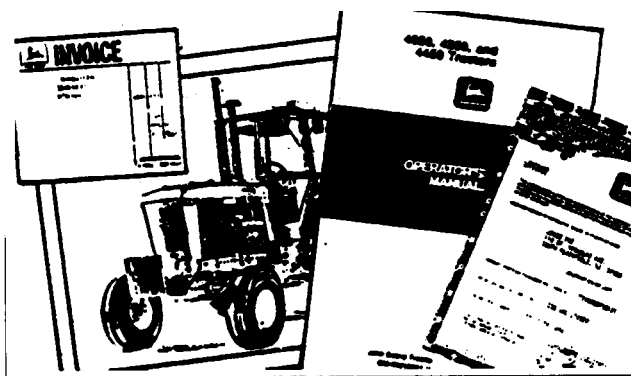


TS161 -UN-23MAR89

AG,OUO6023,1262 -19-21JUL00-1/1

Keep Proof of Ownership

1. Take color photographs from several angles of each machine.
2. Maintain an up-to-date inventory of all your machines.
3. Keep your documented identification numbers, color photographs, and inventory in a safe, secure location.



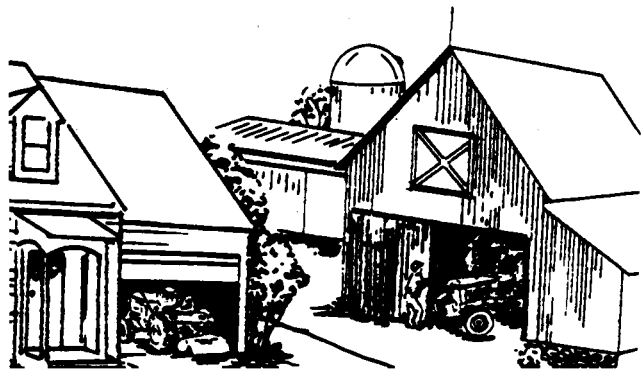
TS142 -UN-23MAR89

AG,OUO6023,1263 -19-21JUL00-1/1

Park Indoors Out of Sight

Make machines hard to move:

- Park large equipment in front of exits.
- Lower equipment to the ground. Remove key.
- Remove battery when unit is in storage.
- Lock cab doors, windows, and vandal-proof devices.
- Set wheels in widest position making loading more difficult. Lock building.



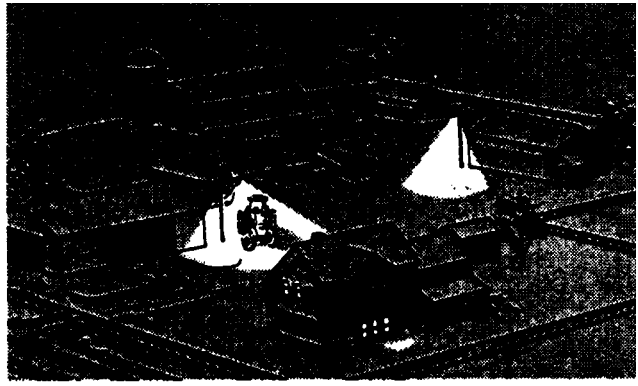
TS143 -UN-23AUG88

DX,CRPRV,D -19-03MAR93-1/1

When Parking Outdoors

Make machines hard to move:

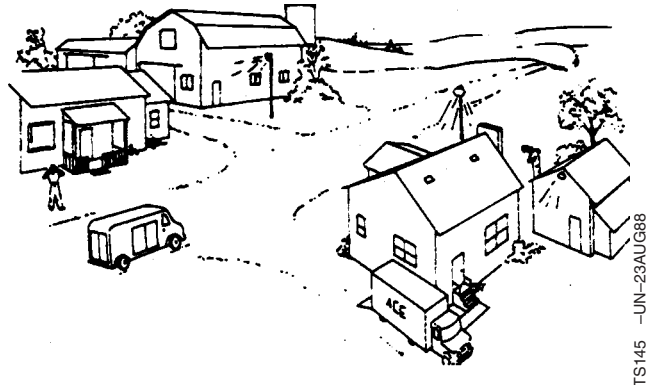
- Park in a well-lighted, fenced area.
- Lower all equipment to the ground.
- Remove ignition key. Remove battery when unit is in storage.
- Lock cab doors, windows, and vandal-proof devices.
- Set wheels in widest position making loading more difficult.



DX,CRPRV,E -19-03MAR93-1/1

Reduce Vandalism

1. Install vandal-proof devices.
2. Participate in a watch program. Take written notes of suspicious vehicles or persons and report your findings to a law enforcement agency.
3. Regularly verify that identification plates have not been removed. If they have, notify law enforcement agency. Order duplicate plates from your dealer.



DX,CRPRV,F -19-03MAR93-1/1

Report Thefts Immediately

1. Immediately notify your local law enforcement agency and insurance agent.
2. Provide a complete description of the machine, all of the documented identification numbers and color photographs.
3. Request verification of the identification numbers after they have been entered with any regional or national crime information center. Double check the numbers to be sure they are correct.
4. Notify your John Deere dealer of the theft and request that its loss be posted with full description and identification numbers.



TS146 -JUN-09JAN89

DX,CRPRV,G -19-03MAR93-1/1

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John Deere Service Literature

Technical Information

Technical information is available from John Deere. Some of this information is available in electronic as well as printed form. Order from your John Deere dealer or call **1-800-522-7448**. Please have available the model number, serial number, and name of the product.

Available information includes:

- **PARTS CATALOGS** list service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.
- **OPERATOR'S MANUALS** providing safety, operating, maintenance, and service information. These manuals and safety signs on your machine may also be available in other languages.
- **OPERATOR'S VIDEO TAPES** showing highlights of safety, operating, maintenance, and service information. These tapes may be available in multiple languages and formats.
- **TECHNICAL MANUALS** outlining service information for your machine. Included are specifications, illustrated assembly and disassembly procedures, hydraulic oil flow diagrams, and wiring diagrams. Some products have separate manuals for repair and diagnostic information. Some components, such as engines, are available in separate component technical manuals
- **FUNDAMENTAL MANUALS** detailing basic information regardless of manufacturer:
 - Agricultural Primer series covers technology in farming and ranching, featuring subjects like computers, the Internet, and precision farming.
 - Farm Business Management series examines "real-world" problems and offers practical solutions in the areas of marketing, financing, equipment selection, and compliance.
 - Fundamentals of Services manuals show you how to repair and maintain off-road equipment.
 - Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.



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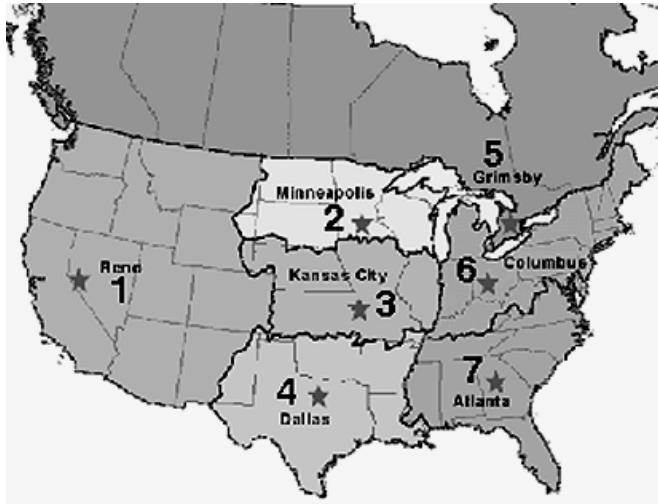
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CUSTOMER SATISFACTION is important to John Deere. Our dealers strive to provide you with prompt, efficient parts and service.

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- Maintenance and service parts to support your equipment.
- Trained service technicians and the necessary diagnostic and repair tools to service your equipment.

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Your John Deere dealer is dedicated to supporting your equipment and resolving any problem you may experience.

1. When contacting your dealer, be prepared with the following information:

- Machine model and product identification number
- Date of purchase
- Nature of problem

2. Discuss problem with dealer service manager.

3. If unable to resolve, explain problem to dealership manager and request assistance.

4. If you have a persistent problem your dealership is unable to resolve, ask your dealer to contact John Deere for assistance.

5. If a problem is not resolved to your satisfaction, contact the appropriate John Deere sales location for your area shown in map and ask to speak with customer service.

1900 Commodity Air Cart

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