John Deere Rate Controller 2000

JOHN DEERE

OPERATOR'S MANUAL

John Deere Rate Controller 2000

OMPFP17791 ISSUE J8 (ENGLISH)

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

John Deere Ag Management Solutions
PRINTED IN U.S.A.

Introduction

Foreword

THANK YOU for purchasing a John Deere product.

READ THIS MANUAL carefully to learn how to operate and service your product correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your product may also be available in other languages. (See your John Deere dealer to order.)

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

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction the machine or implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I. N.) in the Operator's Manual. Accurately record all the numbers to help in tracing the product should it be stolen. Your dealer also needs these numbers when you order parts. File a backup of the identification numbers in a safe location off the machine or away from the product.

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 or statement 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.

If you are not the original owner of this product, it is in your interest to contact your local John Deere dealer to inform them of this unit's serial number. This will help John Deere notify you of any issues or product improvements.

Serial Number:

JS56696,0000C4C-19-03FEB17

John Deere Technical Information Bookstore

Product functionality may not be fully represented in this document due to product changes occurring after the time of printing. Read the latest Operator's Manual prior to operation. To obtain a copy, see your dealer or visit www.deere.com and use the 'Search for Agricultural Equipment Operator's Manuals' link to locate the John Deere Technical Information Bookstore.

CZ76372,000071F-19-17FEB17

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Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Page

Recognize Safety Information

T81389—UN—28JUN13

This is a 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.

DX,ALERT-19-29SEP98

Understand Signal Words

TS187—19—30SEP88

DANGER; The signal word DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

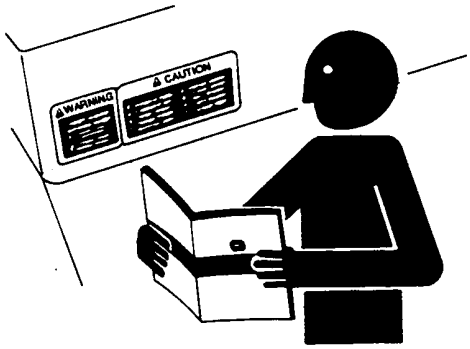
WARNING; The signal word WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION; The signal word CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION may also be used to alert against unsafe practices associated with events which could lead to personal injury.

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-19-05OCT16

Follow Safety Instructions



TS201—UN—15APR13

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.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

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-19-16JUN09

Practice Safe Maintenance

TS218—UN—23AUG88

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 away 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.

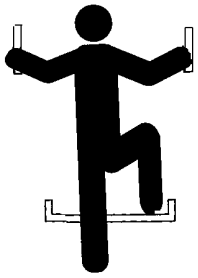
On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

Falling while cleaning or working at height can cause serious injury. Use a ladder or platform to easily reach each location. Use sturdy and secure footholds and handholds.

DX,SERV-19-28FEB17

Use Steps and Handholds Correctly



T133468—UN—15APR13

Prevent falls by facing the machine when getting on and off. Maintain 3-point contact with steps, handholds, and handrails.

Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.

DX,WW,MOUNT-19-12OCT11

Handle Electronic Components and Brackets Safely

TS249—UN—23AUG88

Falling while installing or removing electronic components mounted on equipment can cause serious injury. Use a ladder or platform to easily reach each mounting location. Use sturdy and secure footholds and handholds. Do not install or remove components in wet or icy conditions.

If installing or servicing a RTK base station on a tower or other tall structure, use a certified climber.

If installing or servicing a global positioning receiver mast used on an implement, use proper lifting techniques and wear proper protective equipment. The mast is heavy and can be awkward to handle. Two people are required when mounting locations are not accessible from the ground or from a service platform.

DX,WW,RECEIVER-19-24AUG10

Use Electronic Display Properly

Electronic displays are secondary devices intended to

aid the operator in performing field operations, increase comfort and provide entertainment. Displays offer a wide range of functionality, are used in many different machine system applications and can be used with other secondary devices such as handheld electronic devices.

A secondary device is any device that is not required to operate your machine for its primary use. The operator is always responsible for safe operation and control of the machine.

To prevent injury while operating the machine:

- Position the display according to the installation instructions. Ensure that the device is secured and does not obstruct the driver's view or interfere with the machine operating controls.
- Do not become distracted by the display. Stay alert. Pay attention to the machine and surrounding environment.
- Do not change settings or access any functions that require prolonged use of the display controls while machine is moving. Stop the machine in a safe location and place in park position before attempting such operations.
- Never set the volume so high that you cannot hear outside traffic and emergency vehicles.

To promote safe operation, certain functions of displays may be disabled unless the machine movement is restricted and/or has been placed in the park position. Overriding this safety feature may violate applicable law and can result in damage, serious injury, or death.

Only use available display functionality when conditions permit you to do so safely and in accordance with instructions provided. Always observe safe driving rules, state, or local laws and traffic regulations when using any secondary device.

DX,ELEC,DISPLAY-19-13JAN15

Operate Guidance Systems Safely

Do not use guidance systems on roadways. Always turn off (disable) guidance systems before entering a roadway. Do not attempt to turn on (activate) a guidance system while transporting on a roadway.

Guidance systems are intended to aid the operator in performing field operations more efficiently. The operator is always responsible for the machine path. Guidance systems do not automatically detect or prevent collisions with obstacles or other machines.

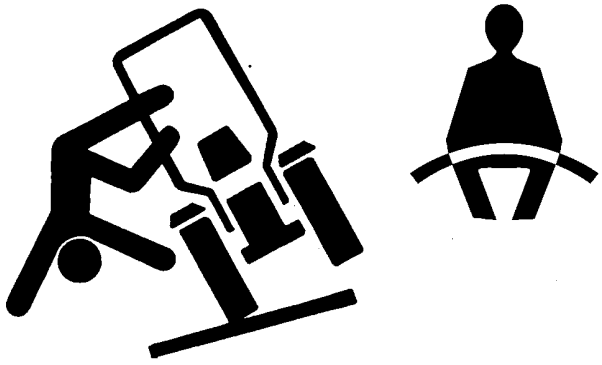
Guidance Systems include any application that automates machine steering. This includes, but may not be limited to, AutoTrac™, iGuide™, iTEC™ Pro, AutoTrac™ Turn Automation, AutoTrac™ Universal (ATU), RowSense™, and Machine Sync.

To prevent injury to the operator and bystanders:

- Never get on or off a moving machine.
- Verify the machine, implement, and guidance system are set up correctly.
  - If using iTEC™ Pro or AutoTrac™ Turn Automation, verify accurate boundaries have been defined.
  - If using Machine Sync, verify the follower's home point is calibrated with sufficient space between the machines.
- Remain alert and pay attention to the surrounding environment.
- Take control of the steering wheel, when necessary, to avoid field hazards, bystanders, equipment, or other obstacles.
- Stop operation if poor visibility conditions impair your ability to operate the machine or identify people or obstacles in the machine path.
- Consider field conditions, visibility, and machine configuration when selecting machine speed.

JS56696,0000ABC-19-20DEC17

Use Seat Belt Properly



TS1729—UN—24MAY13

Avoid crushing injury or death during rollover.

This machine is equipped with a rollover protective structure (ROPS). USE a seat belt when you operate with a ROPS.

- Hold the latch and pull the seat belt across the body.
- Insert the latch into the buckle. Listen for a click.
- Tug on the seat belt latch to make sure that the belt is securely fastened.
- Snug the seat belt across the hips.

Replace entire seat belt if mounting hardware, buckle, belt, or retractor show signs of damage.

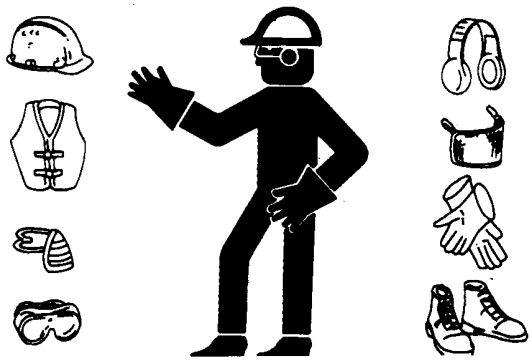
Inspect seat belt and mounting hardware at least once a

AutoTrac is a trademark of Deere & Company
iGuide is a trademark of Deere & Company
iTEC is a trademark of Deere & Company
RowSense is a trademark of Deere & Company

year. Look for signs of loose hardware or belt damage, such as cuts, fraying, extreme or unusual wear, discoloration, or abrasion. Replace only with replacement parts approved for your machine. See your John Deere dealer.

DX,ROPS1-19-22AUG13

Wear Protective Clothing



TS206—UN—15APR13

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

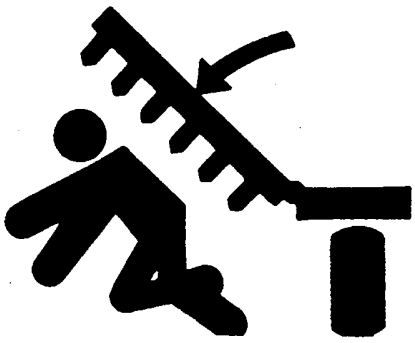
Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

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

DX,WEAR-19-10SEP90

Operate Safely



N39547—UN—06OCT88

Never allow children on or near machine.

Before operating, make sure air has been bled from wing-fold hydraulic system.

Be sure area around machine is clear before raising or lowering machine frame or wings.

Do not operate close to a ditch or creek.

Do not operate with wings folded.

Slow down when turning and traveling over rough ground.

Always shut off tractor and shift to PARK or set brakes when leaving tractor. Remove key when leaving tractor unattended.

Always have tractor stopped on level ground when raising or lowering wings.

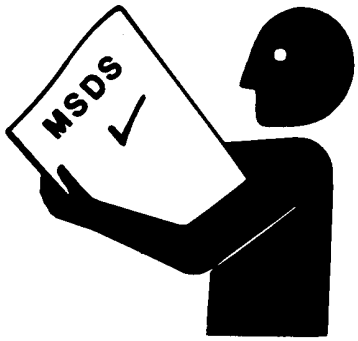
Operate machine from tractor seat only.

If chemicals are used, follow manufacturer's recommendations for handling and storage.

Tow machine behind a properly equipped tractor only.

JS56696,000065B-19-28JUL09

Read and Understand MSDS



TS1132—UN—15APR13

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

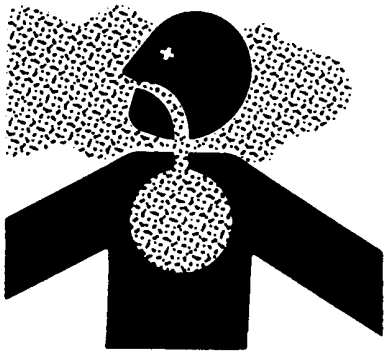
A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Follow all recommended procedures.

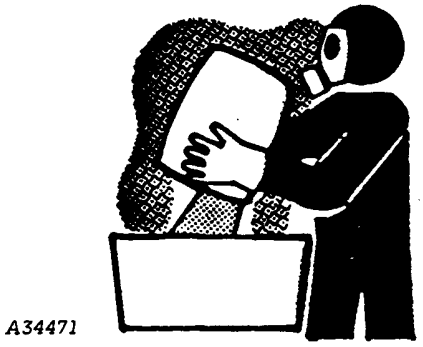
(See your John Deere dealer for MSDS's on chemical products used with John Deere equipment.)

JS56696,0000661-19-28JUL09

Handle Agricultural Chemicals Safely



TS220—UN—15APR13



A34471—UN—11OCT88

Chemicals used in agricultural applications such as fungicides, herbicides, insecticides, pesticides, rodenticides, and fertilizers can be harmful to your health or the environment if not used carefully.

Always follow all label directions for effective, safe, and legal use of agricultural chemicals.

Reduce risk of exposure and injury:

- Wear appropriate personal protective equipment as recommended by the manufacturer. In the absence of manufacturer's instructions, follow these general guidelines:
  - Chemicals labeled **'Danger'**: Most toxic. Generally require use of goggles, respirator, gloves, and skin protection.
  - Chemicals labeled **'Warning'**: Less toxic. Generally require use of goggles, gloves, and skin protections.
  - Chemicals labeled **'Caution'**: Least toxic. Generally require use of gloves and skin protection.
- Avoid inhaling vapor, aerosol or dust.
- Always have soap, water, and towel available when working with chemicals. If chemical contacts skin, hands, or face, wash immediately with soap and water. If chemical gets into eyes, flush immediately with water.
- Wash hands and face after using chemicals and before eating, drinking, smoking, or urination.
- Do not smoke or eat while applying chemicals.
- After handling chemicals, always bathe or shower and change clothes. Wash clothing before wearing again.
- Seek medical attention immediately if illness occurs during or shortly after use of chemicals.
- Keep chemicals in original containers. Do not transfer chemicals to unmarked containers or to containers used for food or drink.
- Store chemicals in a secure, locked area away from human or livestock food. Keep children away.
- Always dispose of containers properly. Triple rinse empty containers and puncture or crush containers and dispose of properly.

DX,WW,CHEM01-19-24AUG10

Working With Anhydrous Ammonia

Any person required to handle, transfer, transport or otherwise work with ammonia shall be trained to understand the properties of ammonia, to become competent in safe operating practices and to take appropriate action in events of a leak or emergency. These notes are a supplement to a thorough understanding of the Material Safety Data Sheets (MSDS), state and local regulations, and safety training from your local anhydrous ammonia supplier. They are not intended to replace other sources of safety information. Read safety instructions from anhydrous ammonia supplier and equipment supplier.

1. Anhydrous ammonia poses three distinct hazards to humans.
   a. It is desiccant and will aggressively attract water from whatever it comes in contact with. Eyes are particularly vulnerable to damage. Any exposed skin surface can also be damaged.
   b. Anhydrous ammonia is typically stored under pressure. When exposed to atmospheric pressure, it boils at -33° C (-28° F). The vaporization will freeze whatever the liquid anhydrous ammonia comes in contact with. Each 0.5 kg (1 lb.) of Anhydrous Ammonia that vaporizes is capable of freezing about 1.8 kg (4 lb.) of water.
   c. Danger to the respiratory system may occur if high concentrations of anhydrous ammonia is inhaled.
2. Reduce risk to exposure and injury.
   a. Wear PPE (Personal Protective Equipment).
      - ALWAYS WEAR REQUIRED and APPROVED PPE when working with anhydrous ammonia and anhydrous ammonia equipment.
      - PPE includes but is not limited to CHEMICALLY-PROTECTIVE, SPLASH-PROOF GOGGLES and RUBBER GLOVES.

An approved full face shield may be worn to protect the face but only as secondary eye protection.

b. Take Precautionary Measures.

- Plan your work with safety in mind. Plan escape routes from any working position and know the location of emergency water sources if they are needed.
- Always have a container with no less than 19 L (5 gal) of readily available clean water for emergency usage. Carry a squeeze bottle of water at all times.
- Never fill tank past 85% capacity.
- Before activating the application system, know the location of bystanders and/or coworkers.
- If modifying anhydrous ammonia system using a section control system to allow control of flow to individual sections of machine, additional safety measures MUST be taken. These measures include placement of bleed valve(s) at distribution lines between the main control valve and the section control valves. In addition, all anhydrous ammonia hoses NOT OPEN to atmosphere MUST be high pressure rated to ensure safety.

c. Transport and Store Safely.

- Do not park applicator and/or nurse tank in an enclosed area as toxic or flammable conditions can result.
- Verify anhydrous ammonia wagons and/or applicators are safe for road travel and securely attached to vehicles drawing them.
- NEVER tow anhydrous equipment into public places without authorization.
- When transporting anhydrous ammonia, verify discharge hoses are securely fastened to both ends. Some states require supply hoses to be secured to nurse tank before transporting. Check state and local laws.
- Turn off all hose end and tank valves prior to transporting, servicing, and storing.
- Properly bleed system to remove pressure and liquid anhydrous ammonia before servicing and storing. Verify all shut-off ball valves are operating and have released all trapped anhydrous ammonia inside ball. Follow all original equipment manufacturer's instructions.

d. Service Equipment Safely.

- Turn off all hose end and tank valves prior to transporting, servicing, and storing.
- Properly bleed system to remove pressure and liquid anhydrous ammonia before servicing and storing. Verify all shut-off ball valves are operating and have released all trapped anhydrous ammonia inside ball. Follow all original equipment manufacturer's instructions.
- NEVER attempt to connect or disconnect coupling until all flow from open bleed valves is stopped and all lines are completely bled.
- Disconnected hoses may still have liquid anhydrous in them.
- Never look directly into hoses, quick couplers, meters, and shut-off valves.
- Stay upwind of the fitting you are working on.
- Never attempt to clear blockage from any hose until pressure has been bled from the system. Plugged fertilizer tubes may have pressurized ammonia behind the plug.

3. If you come in contact with anhydrous ammonia:

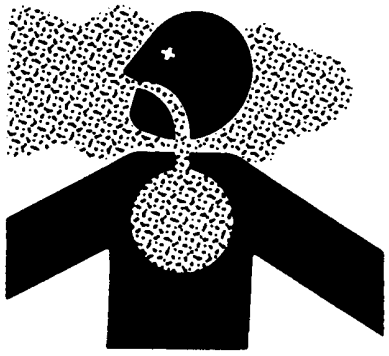
   a. Get away from the exposure.

   b. IRRIGATE THE AFFECTED AREA WITH WATER IMMEDIATELY AND CONSTANTLY. Eyes receive first attention with eyelids held open for flushing.

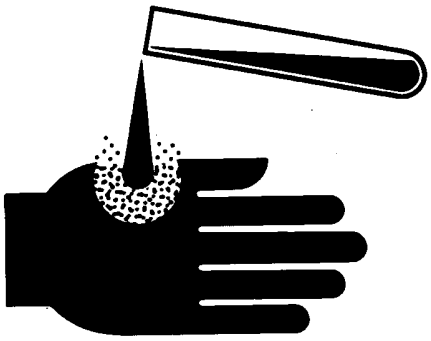
   c. Seek medical assistance.

JS56696,000065C-19-06OCT09

Emergency Procedure For Anhydrous Ammonia



TS220—UN—15APR13



TS272—UN—23AUG88

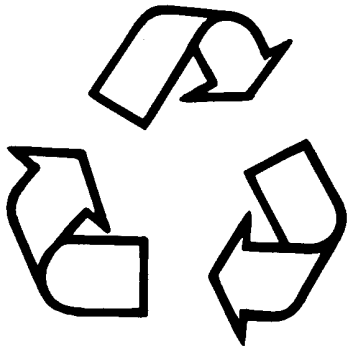
CAUTION: Only personnel trained for and designated to handle emergencies should attempt to stop a leak.

In the event of an anhydrous ammonia leak, it is vital the following steps are taken to insure the safety of you and others.

1. Position machine heading into the wind and lower shanks into ground.
2. **IMMEDIATELY** go to a safe distance upwind from vapor cloud and warn others in proximity to machine.
3. Determine possibility of safely closing shut-off valve (A) by pulling emergency rope (B) at front of machine or closing tank withdrawal valve (C). **DO NOT** attempt to close by other means. **DO NOT** reenter anhydrous ammonia vapor cloud.
4. Contact authorities as necessary and report released ammonia to environmental protection or other authorities as required by law.
5. Retrieve equipment **ONLY AFTER** all traces of anhydrous ammonia are gone.
6. Close all tank valves and open bleed valves.
7. Determine cause of leak and take following actions:
   - If leak is tank related, return to supplier.
   - If leak is from knife supply line, replace (refer to implement manual).
   - If leak is from any other part of machine, see John Deere dealer.

JS56696,0000660-19-28JUL09

Decommissioning — Proper Recycling and Disposal of Fluids and Components



TS1133—UN—15APR13

Safety and environmental stewardship measures must be taken into account when decommissioning a machine and/or component. These measures include the following:

- Use appropriate tools and personal protective equipment such as clothing, gloves, face shields or glasses, during the removal or handling of objects and materials.
- Follow instructions for specialized components.
- Release stored energy by lowering suspended machine elements, relaxing springs, disconnecting the battery or other electrical power, and releasing pressure in hydraulic components, accumulators, and other similar systems.
- Minimize exposure to components which may have residue from agricultural chemicals, such as fertilizers and pesticides. Handle and dispose of these components appropriately.
- Carefully drain engines, fuel tanks, radiators, hydraulic cylinders, reservoirs, and lines before recycling components. Use leak-proof containers when draining fluids. Do not use food or beverage containers.
- Do not pour waste fluids onto the ground, down a drain, or into any water source.
- Observe all national, state, and local laws, regulations, or ordinances governing the handling or disposal of waste fluids (example: oil, fuel, coolant, brake fluid); filters; batteries; and, other substances or parts. Burning of flammable fluids or components in other than specially designed incinerators may be prohibited by law and could result in exposure to harmful fumes or ashes.
- Service and dispose of air conditioning systems appropriately. Government regulations may require a certified service center to recover and recycle air conditioning refrigerants which could damage the atmosphere if allowed to escape.
- Evaluate recycling options for tires, metal, plastic, glass, rubber, and electronic components which may be recyclable, in part or completely.
- Contact your local environmental or recycling center,

or your John Deere dealer for information on the proper way to recycle or dispose of waste.

DX,DRAIN-19-01JUN15

Prevent Electrical Shock and Fires

PC12631—UN—04JUN10

Battery-powered equipment or other electric power sources produce an electrical shock, sparks, or arcs if a short circuit occurs. Electrical short circuits can reach temperatures high enough to burn people, or ignite or melt common materials.

To prevent injury from electrical shock, burns, or potential fire hazards, always disconnect battery power or other electric power source on equipment before installing or servicing:

- Remove ground (negative terminal [-]) battery clamp.
- Detach and remove battery.
- Switch off main battery or other electric power source.
- Unplug electric power source from equipment.

Understand and follow all local codes and regulations when installing electrical equipment.

HC94949,0000487-19-27JAN14

Avoid Exposure to High Radio Frequency Fields

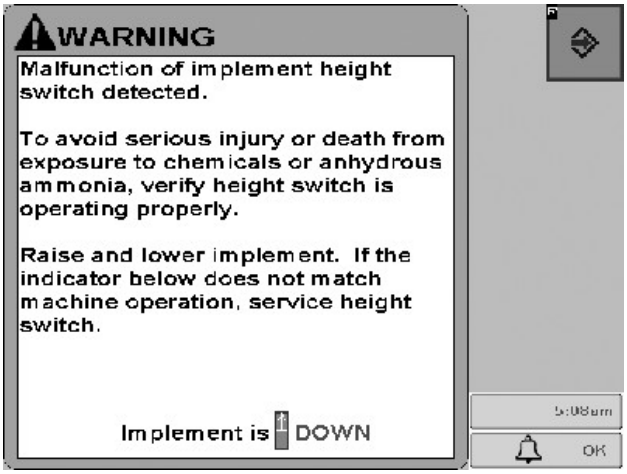
PC12632—UN—04JUN10

Prevent injury from exposure to high radio frequency fields at the antenna. Do not touch antenna while the system is transmitting. Always disconnect power to the antenna before installing or servicing.

The antenna should always be separated from the operator or nearby persons by a minimum distance of 20 cm (8 in.).

JS56696,0000C0E-19-11DEC12

Malfunction of Implement Height Switch Detected

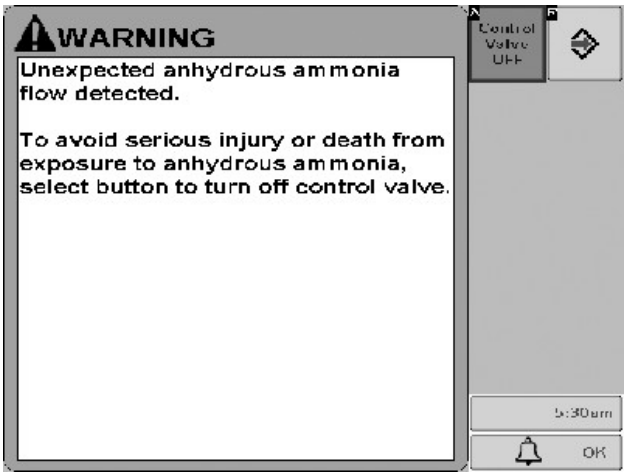


PC13147—19—17FEB11

This message will be displayed on a NH3 system when the system detects the implement is down for an extensive period of time, which can indicate a failure in the height switch. Product application will stop. To verify correct operation, follow the instructions. If the height switch indicator does not match machine operation, service height switch.

HC94949,00004EA-19-18OCT16

Unexpected NH3 Flow Detected



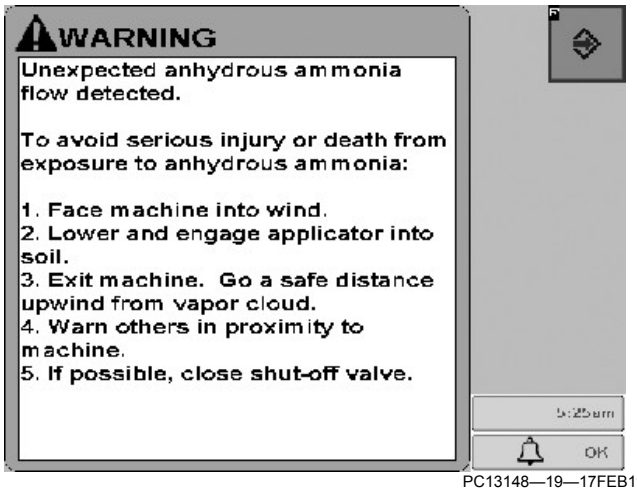
PC13152—19—17FEB11

This message will be displayed if the John Deere Rate Controller 2000 has attempted to close the On/Off valve but still detects flow. If the Control Valve OFF button is selected, the system will also attempt to shut off the control valve.

NOTE: This message will only be displayed when using a dual valve system (i.e the control valve type is Standard or Fast).

RW00482,000062B-19-17MAR16

Unexpected NH3 Flow Detected

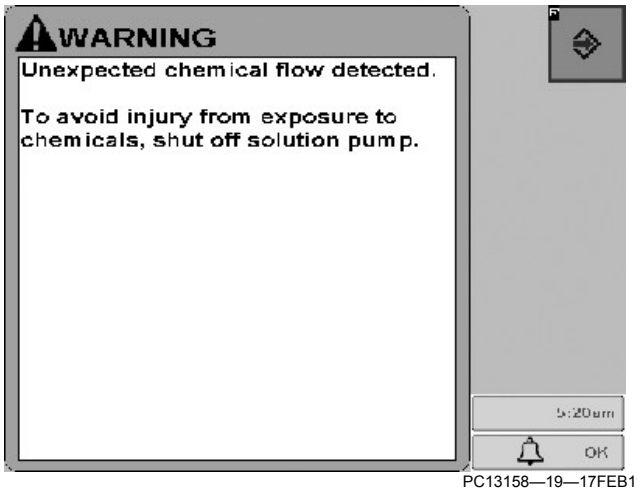


PC13148—19—17FEB11

This message will be displayed if the John Deere Rate Controller 2000 has attempted to close all valves but still detects flow. To reduce risk of injury, follow the instructions on the screen.

RW00482,000062C-19-17MAR16

Unexpected Chemical Flow Detected

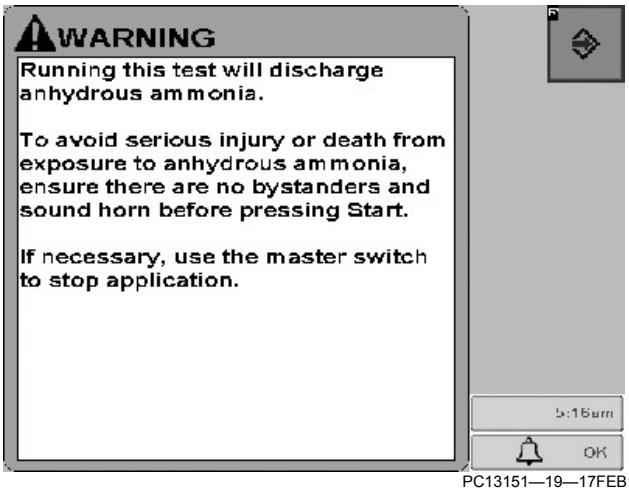


PC13158—19—17FEB11

This message will be displayed if the John Deere Rate Controller 2000 has attempted to close the section valves but still detects flow on a sprayer or liquid fertilizer system.

RW00482,000062D-19-17MAR16

NH3 Diagnostic Tests

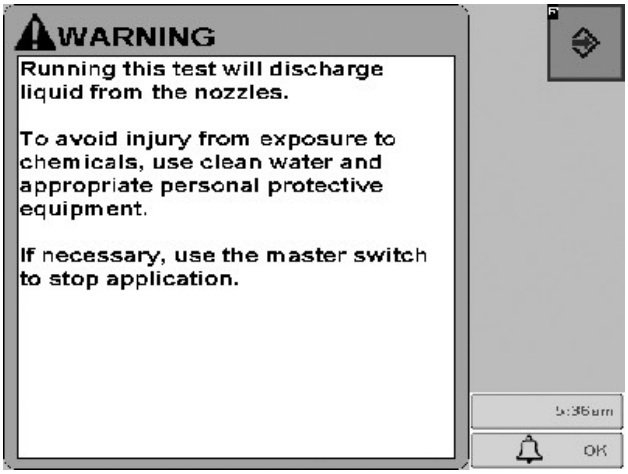


PC13151—19—17FEB11

This message will be displayed when any diagnostic test is selected on NH3 systems that discharges anhydrous ammonia.

HC94949,00004EE-19-01MAY14

Diagnostic Tests

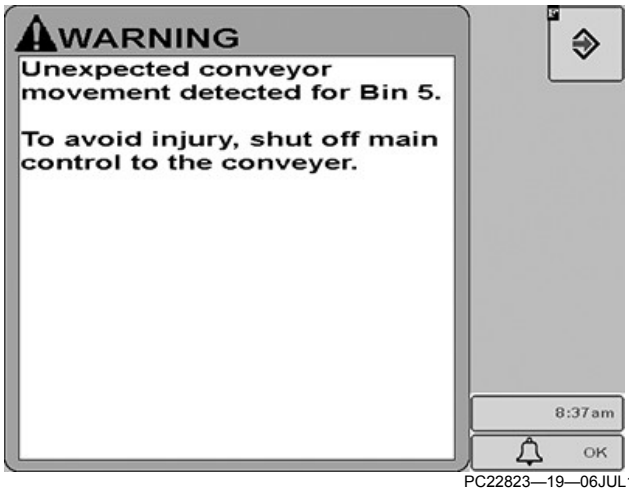


PC13156—19—17FEB11

This message will be displayed when any diagnostic test is selected on sprayer or liquid fertilizer applications that will discharge liquid.

HC94949,00004EF-19-01MAY14

Unexpected Conveyor Movement Detected

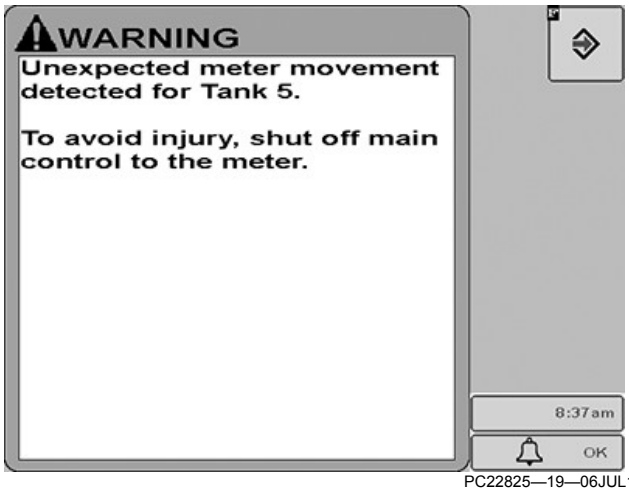


PC22823—19—06JUL16

This message will be displayed when the commanded speed of specified conveyor is zero or stopped, but movement has been detected for more than five seconds.

RW00482,00006D9-19-06JUL16

Unexpected Meter Movement Detected

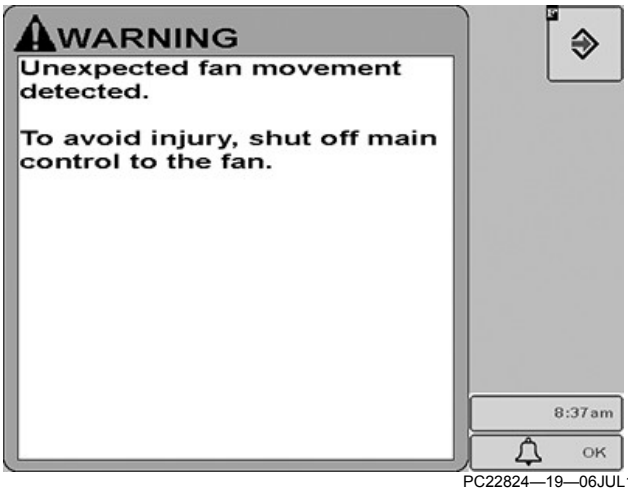


PC22825—19—06JUL16

This message will be displayed when the commanded speed of specified meter is zero or stopped, but movement has been detected for more than five seconds.

RW00482,00006DA-19-06JUL16

Unexpected Fan Movement Detected

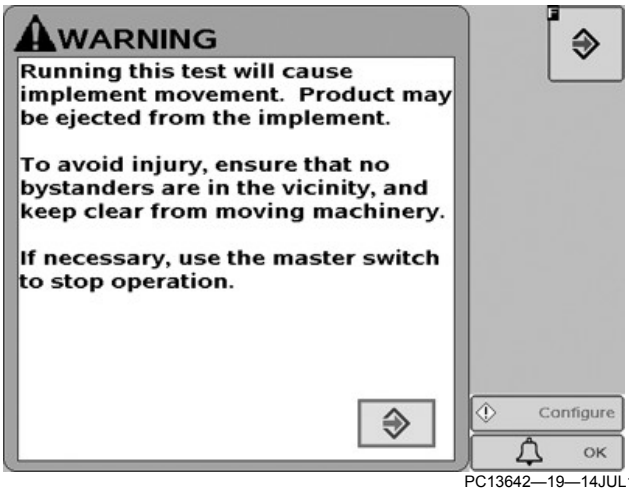


PC22824—19—06JUL16

This message will be displayed when the commanded speed of the fan is zero or stopped, but movement has been detected for more than five seconds.

RW00482,00006DE-19-06JUL16

Diagnostic Tests or Calibration Procedures

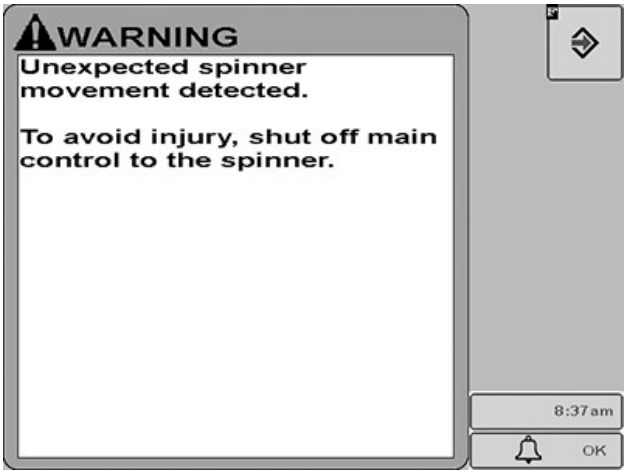


PC13642—19—14JUL11

This message will be displayed when any diagnostic test or calibration procedure is selected that will discharge product.

CZ76372,000031C-19-14JUL11

Unexpected Spinner Movement Detected



PC22826—19—06JUL16

This message will be displayed when the commanded speed of the spinner is zero or stopped, but movement has been detected for more than ten seconds.

RW00482,00006DB-19-06JUL16

Regulatory and Compliance Information

Information to User

This device must be operated as supplied by John Deere Ag Management Solutions. Any changes or modifications made to these devices without the express written approval of John Deere Ag Management Solutions may void the user's authority to operate this device.

CZ76372,00003A2-19-12DEC17

United States—Federal Communications Commission (FCC) Notifications to User

This device complies with FCC Part 15. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Radio Frequency (RF) Exposure Guidance

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm (8 in.) between the radiator and persons. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures.

RW00482,00006DC-19-20OCT17

Canada—Industry Canada Notifications to User

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

RF Exposure Guidance

This equipment complies with FCC and Industry Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm (8 in.) between the radiator and persons. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC and Industry Canada multi-transmitter product procedures.

PC22771—UN—17JUN16

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Exposition aux radiofréquences orientation

Cet équipement est conforme aux normes FCC et les limites d'exposition aux rayonnements Industrie Canada énoncées pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm (8 in.) entre le radiateur et les personnes. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec une autre antenne ou un autre émetteur, sauf en conformité avec la FCC et Industrie Canada Procédures de produits multi-émetteurs.

PC22772—UN—17JUN16
RW00482,00006C9-19-20OCT17

Theory of Operation

John Deere Rate Controller 2000 controls product application components on many configurations. It controls rate and implement sections using coverage maps, boundaries, and global positioning system (GPS) information. John Deere Rate Controller 2000 can control up to five liquid and (or) dry products all while utilizing John Deere Section Control.

John Deere Rate Controller 2000 can control multiple product configurations at once. It can control multiple products and the corresponding sections independently or group them together. For example, a five section anhydrous applicator that simultaneously applies a dry product can be configured and controlled with two section groups.

John Deere Rate Controller 2000 configurations receive inputs from the system components to assign drivers that perform functions. The two main functions are rate control and section control.

Rate Control

- Inputs
  - Rate Sensor (flowmeter that measures volume over time or encoder that measures revolutions)
  - Pressure Sensor (optional)
  - Ground Speed
  - Implement Width

- Drivers
  - Control Valve Signals—If control unit senses rate is too high, system attempts to close the control valve. If rate is too low, system attempts to open the control valve to increase flow.

Section Control

- Inputs
  - GPS Location
  - Section Control Settings—Settings determine amount of time the control unit sends on or off commands to a valve.

- Drivers
  - Section Valve Signals—Pins within the control unit are assigned to drivers that control sections. If a section is commanded open, control unit sends the required signal to the specific valve.

John Deere Rate Controller 2000 is capable of many other functions depending on configuration. Tank fill monitoring, tank level monitoring, fan speed control, spinner speed control, and bin chaining are some of these features.

RW00482,0000696-19-20DEC17

Rate Controller Requirements

Hardware

- GreenStar™ 3 2630 Display, John Deere 4640 Universal Display, or 4600 CommandCenter™
- Master Foot Switch
- John Deere Rate Controller 2000 Harnesses
- StarFire™ Receiver
- Implement Height Indicator
  - Height switch is required for NH3 applications.
  - Height switch is required for planter applications.
  - Height switch is optional for liquid fertilizer tool applications.
  - Height switch or sensor is optional for air cart applications.
  - Height switch is not used for sprayer or spreader applications.

RW00482,00001DC-19-13DEC17

Sections

Maximum Number of Sections by Configuration

NOTE: The presence of an agitator valve or a flow return valve does not affect the section availability for 3-wire section valves.

For tiered boom applications, the display manages stacked boom sections as one section. So, a two-tiered configuration with 20 section valves is mapped with 10 sections.

The number of implement sections that sprayers and liquid fertilizer tools can control depends on:

- Section valve type
- Agitator valve
- Fence row nozzles (optional for pull-behind sprayers and self-propelled sprayers only)

Maximum number of sections for all other configurations depends on number of products being controlled.

Generation 4 Displays can control all five section groups, without deactivating section control.

When controlling five products on a GreenStar™ 3 2630 Display, section control must either be deactivated or limited to four section groups (two products share the

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CommandCenter is a trademark of Deere & Company
StarFire is a trademark of Deere & Company

same section group). This allows the John Deere Rate Controller 2000 to control all five products and product sections. If the fifth product is a spinner or fan, section control can operate five sections.

NOTE: John Deere does not make a 47-pin NH3 harness that exceeds six sections. To exceed six sections, order a harness from a third-party company.

For replacing an existing GreenStar™ Rate Controller, the 47-pin to 37-pin GreenStar™ Rate Controller adapter harness allows up to eight sections.

NOTE: If needed, manual operation allows additional sections to be turned on and off.

Valve Type: 3-Wire (Such as Raven, TEEJET®, KZCO™, and BANJO®)	
Fence Row Valves, Agitator Valve, and Flow Return Valve	**Maximum Number of Sections Available**
None of the items listed above	16
All the items listed above	16

TEEJET is a trademark of Spraying System Co.
KZCO is a trademark of KZCO, Inc.
BANJO is a trademark of Alsco Industrial Products, Inc.

Valve Type: 2-Wire (Such as HARDI®)	
Fence Row Valves, Agitator Valve, and Flow Return Valve	**Maximum Number of Sections Available**
None of the items listed above	7
One of the items listed above	6
Two of the items listed above	5
All the items listed above	4

HARDI is a trademark of HARDI International A/S

NOTE: The maximum number of sections in any column is split between the number of products in that column. For Example, if using an NH3 tool configuration and the profile is only set up for one product there is 10 sections available. If using two products, 14 sections are available between those two products.

	Maximum Number of Sections				
Configuration	**1 Product**	**2 Products**	**3 Products**	**4 Products**	**5 Products**
Sprayer or liquid fertilizer tool (2-wire valves)	**8**	**Not applicable**	**Not applicable**	**Not applicable**	**Not applicable**
Sprayer or liquid fertilizer tool (3-wire valves)	16	Not applicable	Not applicable	Not applicable	Not applicable
Sprayer or liquid fertilizer tool—tiered boom (3-wire valves only)	10 per tier but utilizes 20 drivers	Not applicable	Not applicable	Not applicable	Not applicable
NH3 tool	10	14	14	Not applicable	Not applicable
Spreaders	12	12	12	12	12
Air cart or generic	16	16	16	16	12
Planters	16	Not applicable	Not applicable	Not applicable	Not applicable

NOTE: The maximum number of sections is split between the number of products. Using an NH3 tool as an example, there are 10 sections available with 1 product. If a second product is added, there are 14 sections available between the 2 products.

HC94949,0000CAA-19-20DEC17

Configuration Overview

Machine Type	Number of Products	Application Type	Raven Sidekick Pro™ ICD Direct Injection	Height Switch
Pull-behind sprayer	1	Liquid only	Creates an additional product	No
Self-propelled sprayer	1	Liquid only	Creates an additional product	No
Liquid fertilizer tool	1	Liquid only	Creates an additional product	Optional
NH3 tool	3	1 NH3 and 2—3 liquid / dry	Yes, uses 1 product from 3	Required
Air cart	5	1—5 liquid / dry	Yes, uses 1 product from 5	Optional
Generic	5	1—5 liquid / dry	Yes, uses 1 product from 5	Optional
Pull-behind spreader	5	Dry only	No	No
Self-propelled spreader	5	Dry only	No	No
Planter	1	Section control only	No	Required

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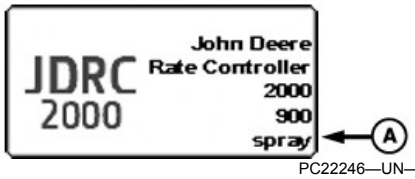
RW00482,00001DD-19-20DEC17

John Deere Rate Controller 2000 Button



PC22246—UN—23MAR16

John Deere Rate Controller 2000 Button

A—Profile Name

NOTE: John Deere Rate Controller 2000 button displays the profile name (A) of current configuration.

To navigate to John Deere Rate Controller 2000 Main page, select the John Deere Rate Controller 2000 button.

RW00482,00005CA-19-13DEC17

Help Button

PC22309—UN—11OCT18

Help Button

Help button is available throughout the John Deere Rate Controller 2000 pages. Select Help button for more information related to the page displayed.

RW00482,0000643-19-08APR16

Component Overview and Compatibility

IMPORTANT: Valve power and ground pins are not reverse-voltage protected. To prevent damaging the control unit, take precautions to prevent pins from being connected backwards.

The following component configurations are compatible with the John Deere Rate Controller 2000.

(Reference Main Harness [47-Pin Connector] Table in Specifications section for more information.)

Section Valves

- Section valves with 3-wire single pole single throw (SPST).

  For the rate control setup, a valve with a solenoid-like operation is considered a 3-wire valve. There is one signal wire controlling operation of the valve. When signal voltage is high (12 V), valve is opened. When signal voltage is low (0 V), valve closes. This is sometimes referred to as an SPST valve. There may be configurations where a valve with this operation only has two wires, a signal wire and a ground wire.

  - Use valve power and valve ground for all section valves. If valve power and valve ground are not connected, section valves do not open or close.
  - Split section valves evenly among available valve power and ground pins to disperse electrical load evenly through those terminals.

- Section valves with 2-wire double pole double throw (DPDT). Valve is not compatible on NH3 systems.

  For the rate control setup, a valve with reversing capabilities is considered a 2-wire valve. This valve needs two drivers to control its operation. When (+) signal voltage is high (12 V) and (-) signal voltage is low (0 V), valve opens. Likewise, when (-) signal voltage is high (12 V) and (+) signal voltage is low (0 V), valve closes. When both signal voltages are low (0 V), the valve does not move. This type of valve is sometimes referred to as a DPDT valve.

- Section valves that require less than 2.5 A.

Raven Sidekick Pro™ ICD (ISO Client Device) Compatibility

NOTE: Raven Sidekick Pro™ ISO pumps are not compatible with John Deere Rate Controller 2000.

John Deere Rate Controller 2000 is only compatible with the Raven Sidekick Pro™ ICD direct injection system.

Raven Sidekick Pro™ ICD injects varying amounts of product into the main solution line of the implement. This eliminates the need to mix chemicals in the main tank.

John Deere Rate Controller 2000 supports up to four Raven ICD direct injection pumps with a carrier. Total products must remain under five.

When the direct injection pump is detected in the CAN bus, the John Deere Rate Controller 2000 automatically populates the additional product in the profile.

GreenStar™ 3 2630 Display can control a maximum of five products, but only up to four products can be documented. John Deere 4640 Universal Display and 4600 CommandCenter™ can control and document five products.

RW00482,00006A0-19-20DEC17

Control Valves and Sensors

IMPORTANT: For pulse width modulation (PWM) and PWM close control valve systems, it is recommended that an external solution pump on-off switch is wired into the cab. This allows the operator to shut off the solution pump. Solution pump damage could occur if it is run without solution in it.

When the master switch is shut off on a PWM control valve system, it closes the section on-off valves and stops product flow. The PWM valve remains at its current position, which allows hydraulic flow to continue to the solution pump and allows the solution pump to continue running. An external solution pump on-off switch allows the operator to shut off the solution pump.

When the master switch is shut off on a PWM close control valve system, it shuts off the solution pump. An external solution pump on-off switch can be more user-friendly and familiar for a sprayer operator to shut off the solution pump if the solution tank runs empty.

(Reference the solution pump manufacturer Operator's Manual for more information.)

Control Valve	NH3	Liquid Fertilizer	Sprayers	Spreaders	Air Carts and Generic
Standard	X	X	X		
Fast	X	X	X		
Fast Close	X	X	X	X	X
PWM		X	X		
PWM Close		X	X	X	X
Raven	X				

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GreenStar is a trademark of Deere & Company

AccuFlow HP™ Plus					

AccuFlow HP is a trademark of Raven Industries Inc.

John Deere Rate Controller 2000 is compatible with:

- Standard, fast, fast close, PWM, and PWM close type valves.
- Valves that require 12 V to open.
- Valves that require less than 2.5 A.

Flow Control Valve Types

- **Standard control valves** are used in dual-valve systems with an on-off valve. The on-off valve closes to stop product flow and the standard control valve remains in its current position. Once the on-off valve is reopened, the standard control valve should need little to no adjustment, assuming the target flow rate has not changed dramatically.

- **Fast close control valves** are used in single-valve systems. Due to its quick response time, the fast close valve eliminates the need for an additional on-off valve. The fast close valve serves as the rate control valve and also completely closes when it is necessary to stop product flow. To start product flow once again, the fast close valve opens and quickly ramps flow back up to achieve the target application rate.

- **Fast control valves** are used in dual-valve systems with an on-off valve. The on-off valve closes to stop product flow and the fast control valve remains in its current position. Once on-off valve is reopened, the fast control valve should need little to no adjustment, assuming the target flow rate has not changed dramatically.

- **PWM control valves** are used in dual-valve systems with an on-off valve. The on-off valve closes to stop flow and the PWM valve remains in its current position. Once on-off valve is reopened, the PWM valve should need little to no adjustment, assuming the target flow has not changed dramatically.

- **PWM close control valves** are used in single-valve systems. Due to its quick response time, the PWM close valve eliminates the need for an additional on-off valve. The PWM close valve serves as the rate control valve and also completely closes when it is necessary to stop product flow. To start product flow once again, the PWM close valve opens and quickly ramps flow back up to achieve the target application rate.

NOTE: Fast and fast close or PWM and PWM close valves are physically the same. The only difference is how the John Deere Rate Controller 2000 controls them.

Rate Sensors (Flowmeters and RPM Sensors)

- Rate sensors with a square wave signal type.
- Rate sensors that require 5 V or 12 V power supply.

Pressure Sensors

NOTE: Select custom sensor if pressure sensor has 0 V output when no pressure is present. Otherwise, No Sensor Detected warning is displayed when pressure reading is zero.

NOTE: Custom sensors allow the voltage to go down to 0 V and work with predefined sensors that have a range of 0.5 to 5 V.

- Pressure sensors that are voltage-based with an output voltage range of 0.5 V to 5 V.
- Pressure sensors that require 5 V or 12 V power supply.

Bin Level Sensors (required for bin chaining)

A bin level switch alerts the operator when the bin is low. The optical switch senses the presence or absence of product in the bin. John Deere Rate Controller 2000 requires bin level sensors that output a higher voltage when product is present and a lower voltage when product is absent.

NH3 Boost Pump Compatibility

John Deere Rate Controller 2000 can control an anhydrous boost pump that is included with a Raven AccuFlow HP™ Plus cooler.

(Reference Specifications section for wiring and pin out information.)

The John Deere Rate Controller 2000 does not support the older AccuFlow™ with two standard valves. Contact Raven to convert the system.

RW00482,00006A1-19-20DEC17

Pressure Sensor Configuration

Pressure sensors 1 and 2 can be configured for NH3 toolbars, sprayers (pull-behind or self-propelled), liquid fertilizer tools, air carts, and generic implements.

Pressure sensor 3 can be configured for air carts, generic implements, and multiple product NH3 toolbar systems.

Pressure sensor 4 can be configured for both air carts

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and generic implements with more than two products, or with two or fewer products and have less than 12 sections.

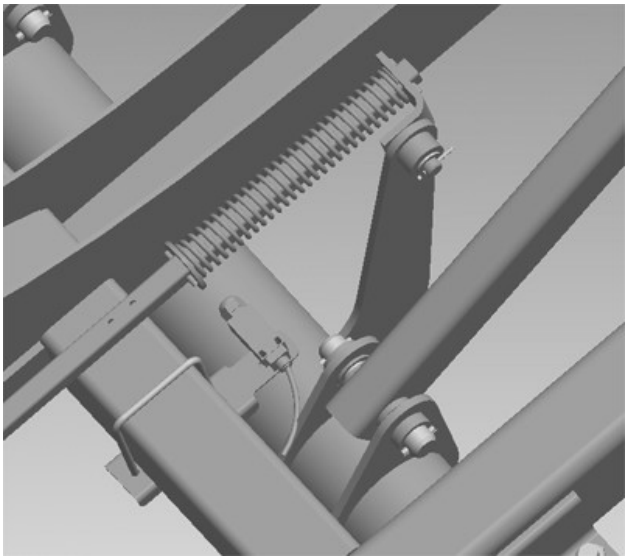
Pressure sensor 5 can be configured for both air carts and generic implements:

- Without a system master clutch, have four or fewer products, and have less than eight sections.
- With a system master clutch, have five products, and product 5 application mode:
  - Is not Granular Split Belt Dual Encoder.
  - Does not have a shaft sensor enabled.
  - Does not have a fill meter option enabled.

Pressure sensor 6 can be configured for both air carts and generic implements with less than four sections.

RW00482,0000055-19-13DEC17

Implement Height Indicator



PC10226—UN—15JUN07

Height Switch

Implement height indicator (switch or sensor) prevents product from discharging unless implement is lowered into the ground.

- Height switch is required for NH3 applications.
- Height switch is required for planter applications.
- Height switch is optional for liquid fertilizer tool applications.
- Height switch or sensor is optional for air cart applications.
- Height switch is not used for sprayer or spreader applications.

Verify that height indicator operates correctly by raising and lowering implement while observing the height switch indicator on display.

When applying NH3, if the system detects the implement has been down for an extended period of time, “Malfunction of Implement Height Switch” digital safety sign is displayed.

(Reference Malfunction of Implement Height Switch Detected in Safety Signs section for more information.)

RW00482,0000056-19-13DEC17

StarFire™ Receiver

PC20203—UN—06NOV14

Receiver uses navigation satellites with StarFire™ correction satellites to determine machine location and direction of travel. An integrated terrain compensation module (TCM) adjusts machine position to compensate for uneven terrain. A StarFire™ signal activation is required to operate AutoTrac™.

CZ76372,00007AD-19-13DEC17

GreenStar™ Display or Generation 4 Display

PC13407—UN—20APR11

GreenStar™ 3 2630 Display

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AutoTrac is a trademark of Deere & Company

PC24742—UN—28SEP17

4640 Universal Display

The display is a user interface used by the operator to:

- Configure and calibrate system components.
- Monitor system performance.
- Make system adjustments.
- Program software.
- View diagnostic tests.

CZ76372,00007AC-19-13DEC17

Foot Switch

PC20244—UN—13NOV14

Foot Switch

Foot switch activates and deactivates master switch.

CZ76372,00007AE-19-13DEC17

Configure Offsets

Set up machine and implement offsets to optimize John Deere Rate Controller 2000 performance.

(Reference the display Operator's Manual or on-screen help for more information.)

RW00482,0000642-19-13DEC17

Setup Overview

PC22309—UN—11OCT18

Help Button

Setup wizards in this manual are a general overview for single product configurations. Multiple product configurations are available by setting up more than one product and creating section groups.

(Reference Set Up Section Groups for more information.)

Select the best-fit application type to start the setup wizard. Setup wizard guides the operator through a series of steps based on options selected. Select Help button for more information about a step. Green bar across the top displays progress of the configuration.

NOTE: Raven Sidekick Pro™ ICD direct chemical injection is compatible with up to five total products for each John Deere Rate Controller 2000.

Sprayer (pull-behind or self-propelled)

- Single liquid product applications only
- Optional fence row nozzles and tank fill monitoring
- No option for implement height indicator

Liquid Fertilizer Tool

- Single liquid product applications only
- Optional implement height switch
- No option for fence row nozzles
- Capable of operating a liquid slurry or liquid slurry dragline application

NH3 Tool

NOTE: NH3 tool is the only configuration that allows control of a Raven AccuFlow HP™ Plus system.

- Required to utilize any NH3 products
- Control NH3 plus two additional products (dry and [or] liquid)
- Implement height switch required

Planter

- Profile is limited to clutches as a single product only
- Implement height switch required

Air Cart or Generic

- Control up to five products (dry and liquid)
- NH3 products not available
- Optional implement height indicator (switch or sensor)

Spreader (pull-behind or self-propelled)

- Control up to five products (dry only)
- NH3 products not available
- No option for implement height indicator

RW00482,00001DE-19-20DEC17

Setup Wizard—Sprayer and Liquid Fertilizer Tool

PC22295—UN—21MAR16

John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.

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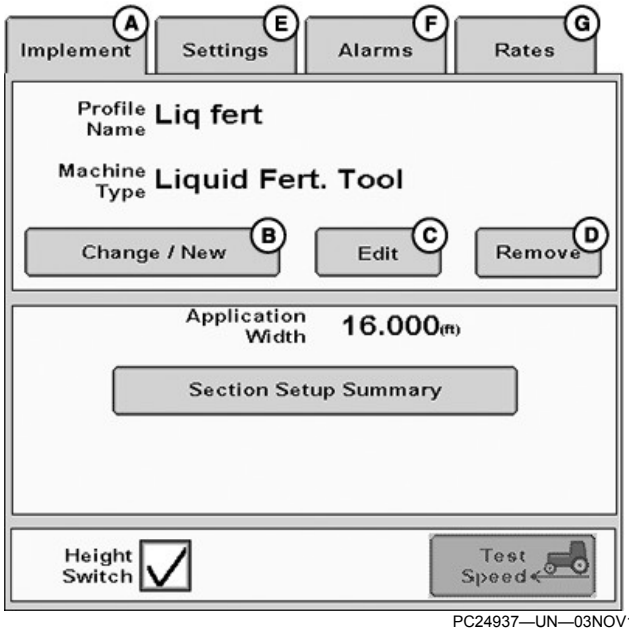


PC24937—UN—03NOV17

A—Implement Tab
B—Change / New Button
C—Edit Button
D—Remove Button
E—Setting Tab
F—Alarms Tab
G—Rates Tab

3. Select the Implement tab (A).
4. Select the Change / New button (B).

NOTE: If a profile is already configured, selecting the Edit button (C) starts the setup wizard for the selected profile and all the steps must be completed to close the wizard.

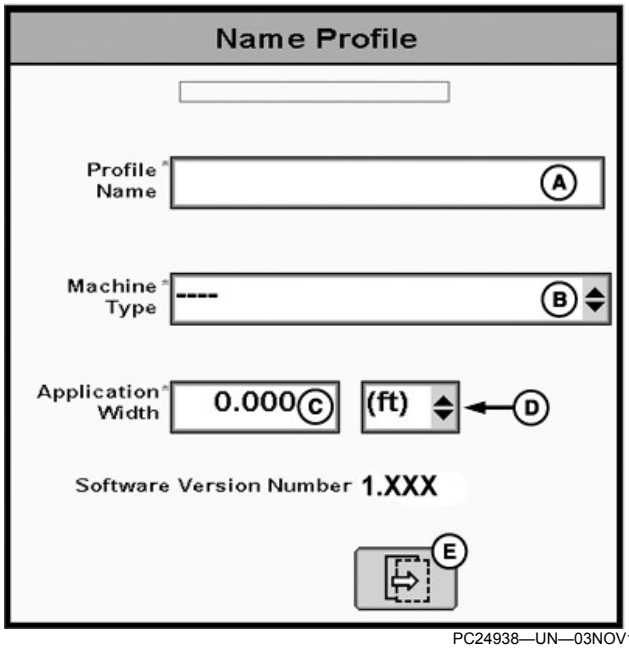
A maximum of eight profiles can be saved. Selecting the Remove button (D) deletes the selected profile.

To edit individual settings without going through the wizard, select Settings (E), Alarms (F), or Rates (G) tabs. If settings are grayed out, user must enter the wizard to edit the profile.

PC22298—UN—13APR16

H—Select Profile Drop-Down Menu
I—Accept Button

5. Select New Profile from the drop-down menu (H).
6. Select the Accept button (I).



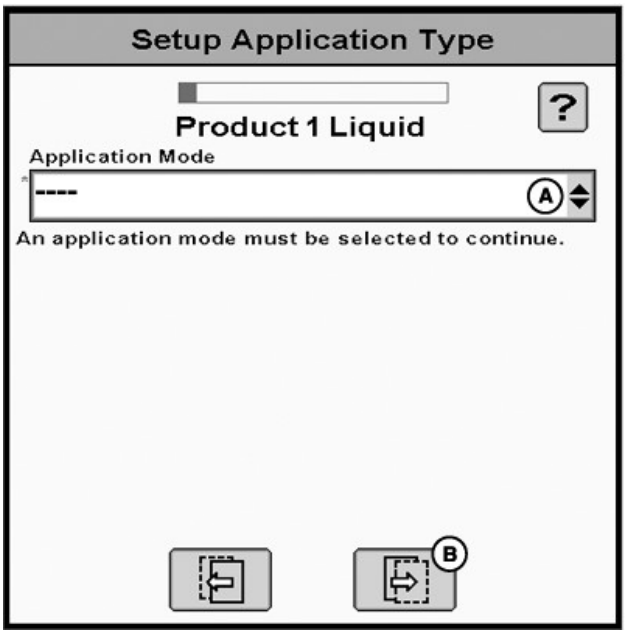
PC24938—UN—03NOV17

A—Profile Name
B—Machine Type Drop-Down Menu
C—Application Width
D—Units of Measurement Drop-Down Menu
E—Next Page Button

7. Enter the Profile Name (A). This is the name displayed on the run page.
8. Select pull-behind sprayer, self-propelled sprayer, or liquid fertilizer tool from the Machine Type drop-down menu (B).

NOTE: For this example, liquid fertilizer tool is selected.

9. Enter the Application Width (C).
10. Select the units of measurement from the drop-down menu (D).
11. Select the Next Page button (E).



PC22301—UN—21MAR16

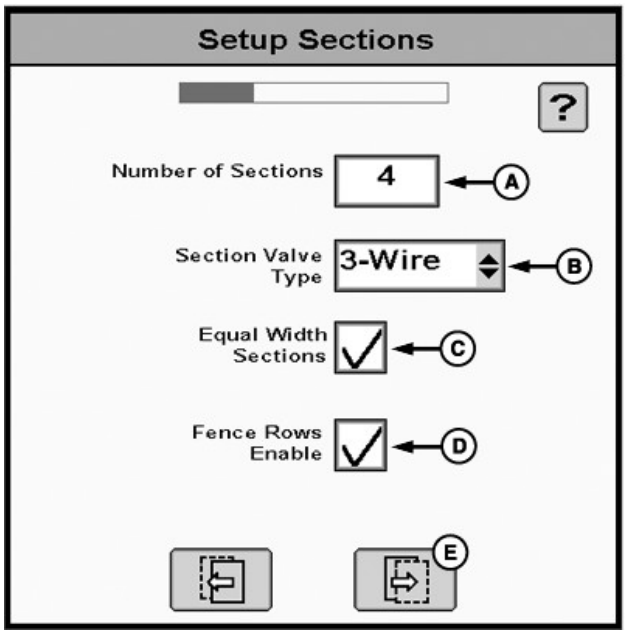
A—Application Mode Drop-Down Menu
B—Next Page Button

12. Select the Application Mode from the drop-down menu (A).
    - Liquid—Conventional liquid applications.
    - Liquid Tiered Boom (Direct)—Tiered boom applications using a two-way boom valve with the ability to divert flow to different booms based on flow rate. John Deere Rate Controller 2000 sends signals directly to the valve for control.
    - Liquid Tiered Boom (External)—Tiered boom applications using a two-way boom valve with the ability to divert flow to different booms based on flow rate. John Deere Rate Controller 2000 signals to an external module that controls the valve.
    - Liquid Constant Flow—Single boom applications using three-way boom valves that divert flow back to the tank when in the off position.
    - Liquid Slurry Dragline—Liquid application for products that do not have a control valve and require a large application rate like liquid manure.
    - Liquid Slurry—Conventional liquid application for products that require a large application rate like liquid manure.

NOTE: When the master switch is turned off with the liquid slurry dragline application, the John Deere Rate Controller 2000 totals page continues to count flow for total gallons applied, but stops counting applied acres.

When using a GreenStar™ 3 2630 Display, totals reported to John Deere Operation Center are displayed incorrectly because the display does not continue to count gallons when the master switch is off. When utilizing a Generation 4 Display, the totals match the John Deere Rate Controller 2000 totals.

13. Select the Next Page button (B).



PC22302—UN—21MAR16

A—Number of Sections
B—Section Valve Type Drop-Down Menu
C—Equal Width Sections Checkbox
D—Fence Rows Enable Checkbox
E—Next Page Button

14. Enter Number of Sections (A).

NOTE: Three-wire valves are required for tiered boom applications.

15. Select Section Valve Type from the drop-down menu (B).

    (Reference Section Valves in Component Overview and Compatibility for information on 2- and 3-wire valves.)

16. If applicable, select the Equal Width Section checkbox (C).

NOTE: Fence Rows Enable checkbox (D) is only available with self-propelled or pull-behind sprayer machine type.

17. If applicable, select the Fence Rows Enable checkbox.
18. Select the Next Page button (E).

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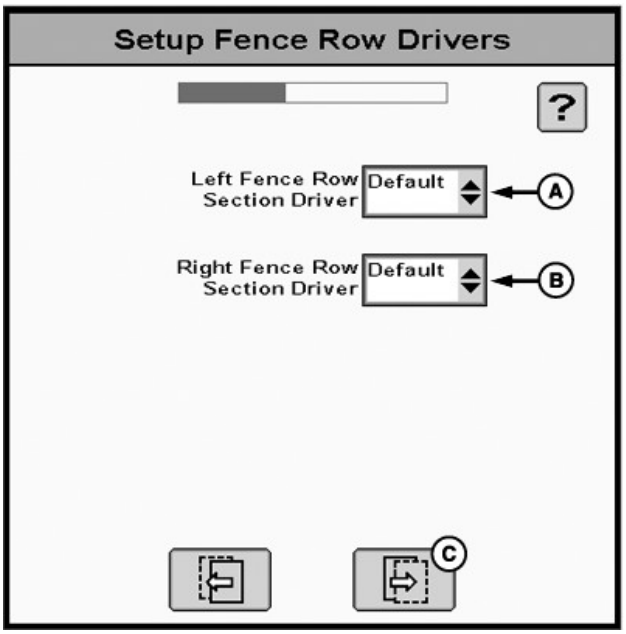


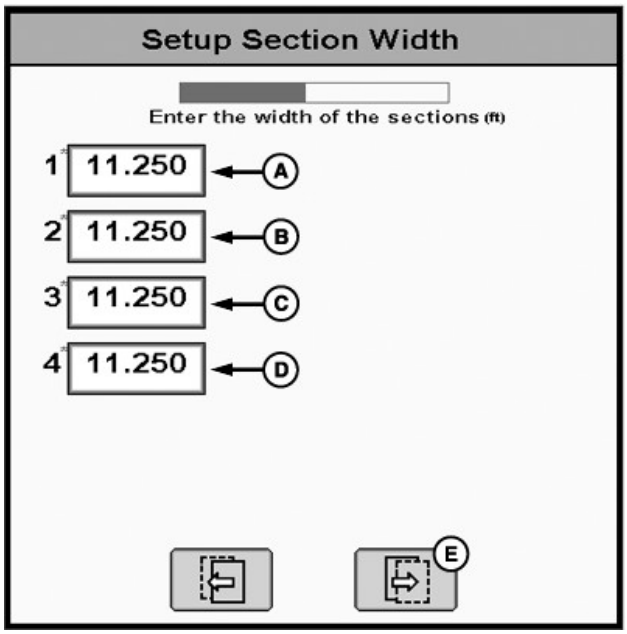
PC22304—UN—21MAR16

A—Left Fence Row Section Driver Drop-Down Menu
B—Right Fence Row Section Driver Drop-Down Menu
C—Next Page Button

NOTE: Default (section driver 17 and 18) is the recommended section driver setting. Driver number assigned becomes signal wire for each fence row valve.

(To verify correct implement wiring, reference Main Harness [47-Pin Connector] Table.)

19. If fence rows were enabled:
    a. Select Left Fence Row Section Driver from the drop-down menu (A).
    b. Select Right Fence Row Section Driver from the drop-down menu (B).
    c. Select the Next Page button (C).

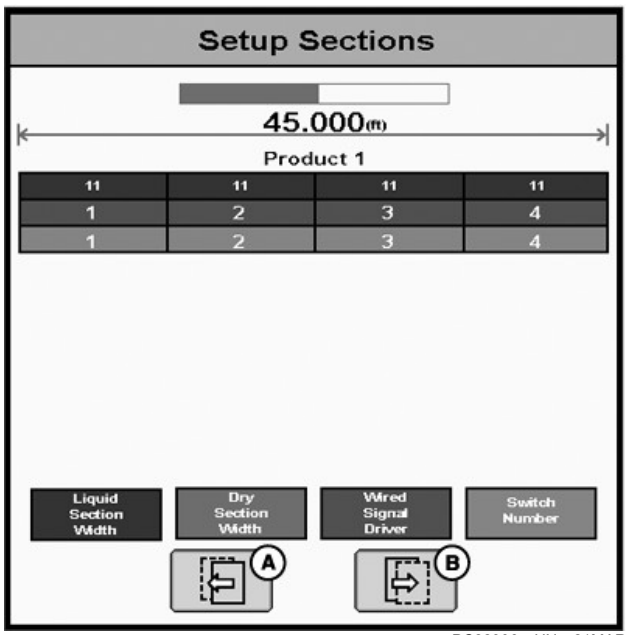


PC22305—UN—21MAR16

A—Section 1 Width
B—Section 2 Width
C—Section 3 Width
D—Section 4 Width
E—Next Page Button

NOTE: Total width of all the sections must be equal to the total application width. If Equal Width Sections was selected, the application width is evenly divided by the number of sections.

20. Enter the width for each section (A—D).
21. Select the Next Page button (E).

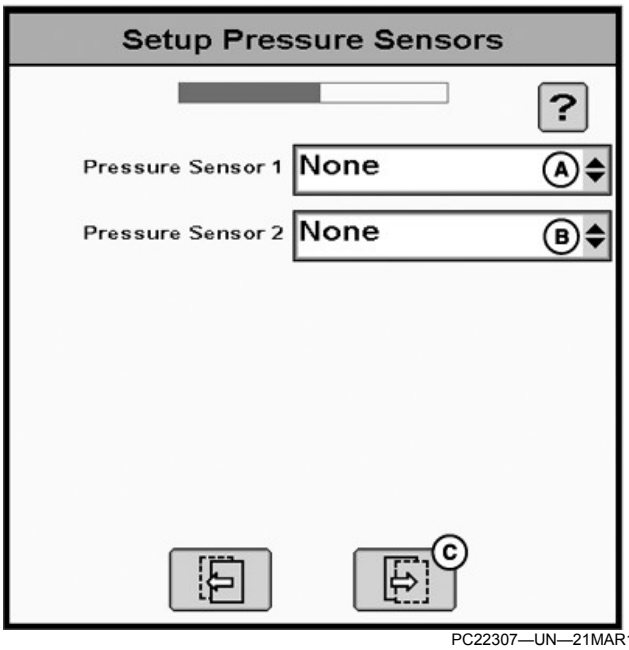


PC22306—UN—21MAR16

A—Previous Page Button
B—Next Page Button

NOTE: Graphic displays each section width and driver that controls each section valve. Verify that implement wiring is correct. Application width and section widths may only be edited in the setup wizard. If needed, select the Previous Page button (A) to make corrections.

22. Review Setup Sections and select the Next Page button (B).



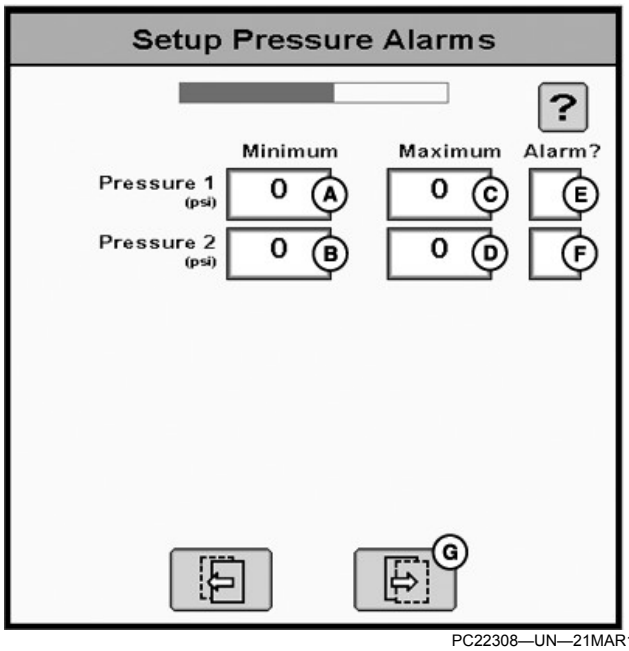
PC22307—UN—21MAR16

A—Pressure Sensor 1 Drop-Down Menu
B—Pressure Sensor 2 Drop-Down Menu
C—Next Page Button

NOTE: If the pressure sensor is not included in the drop-down menus (A and B), then select Custom or Custom Low Pressure. Custom sensors do not function properly until a calibration is completed.

The number of pressure transducers that can be used depends on the configuration and wiring.

23. If equipped, select the pressure sensor configuration from the drop-down menus.
24. Select the Next Page button (C).



PC22308—UN—21MAR16

A—Pressure Sensor 1 Minimum
B—Pressure Sensor 2 Minimum
C—Pressure Sensor 1 Maximum
D—Pressure Sensor 2 Maximum
E—Pressure Sensor 1 Alarm Checkbox
F—Pressure Sensor 2 Alarm Checkbox
G—Next Page Button

NOTE: Pressure alarm settings are based on operator preference. Set up the alarms so they notify the operator before the system needs attention.

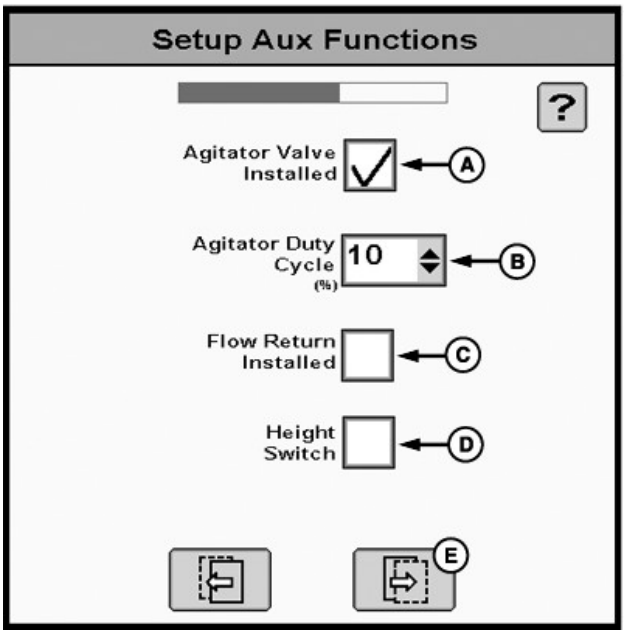
25. If sensors were specified, set up pressure alarms:

    NOTE: When the alarm is enabled and the minimum pressure threshold has been met, the control unit overrides flow control and attempts to maintain the minimum pressure setting. This may result in over-application.

    a. Enter the Minimum Pressure (A and B).

    NOTE: When the alarm is enabled and the maximum pressure threshold has been met, the control unit overrides flow control and attempts to maintain the maximum pressure setting. This may result in under-application.

    b. Enter the Maximum Pressure (C and D).
    c. To enable sensor minimum and maximum alarms, select the Alarm checkbox (E and F).
    d. Select the Next Page button (G).



PC22348—UN—24MAR16

A—Agitator Valve Installed Checkbox
B—Agitator Duty Cycle Drop-Down Menu
C—Flow Return Installed Checkbox
D—Height Switch Checkbox
E—Next Page Button

26. If equipped with an agitator valve:
    a. Select the Agitator Valve Installed checkbox (A).

    NOTE: Agitation Duty Cycle is based on 10 min run time intervals. For example, if 20% is selected, agitator runs for 2 min and is off for 8 minutes.

    If tank volume is at or below 20% of total tank volume, agitation reduces to half the set duty cycle.

    b. Select Agitator Duty Cycle from the drop-down menu (B).

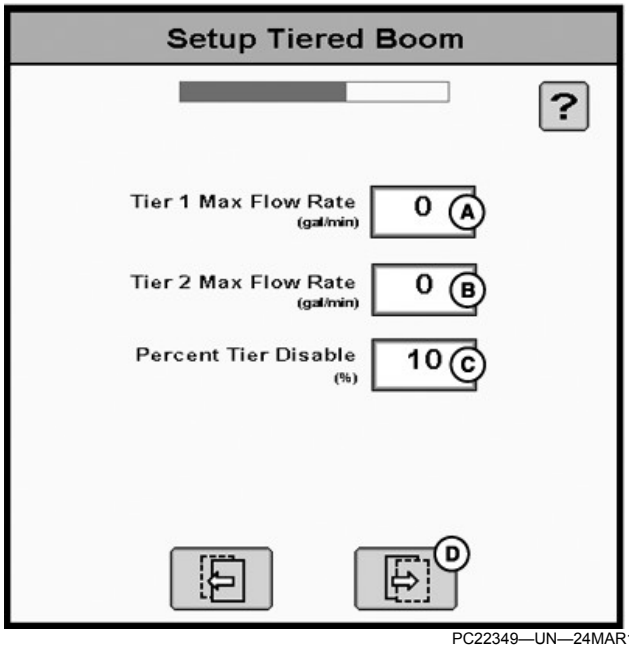
NOTE: Flow Return Installed (C) is only available for liquid applications and can only be selected in the setup wizard. If Flow Return Installed is selected and the implement is properly equipped, the control unit opens a return valve to allow product to return to the tank when all sections are closed.

27. If equipped, select the Flow Return Installed checkbox.

NOTE: The Height Switch checkbox (D) is only available when the Liquid Fertilizer Tool machine type is selected.

28. If equipped, select the Height Switch checkbox.
29. Select the Next Page button (E).

NOTE: Tiered boom systems control a directional valve to divert flow to the different booms based on a flow rate trigger. This allows system to achieve the correct droplet size during various application speeds.



PC22349—UN—24MAR16

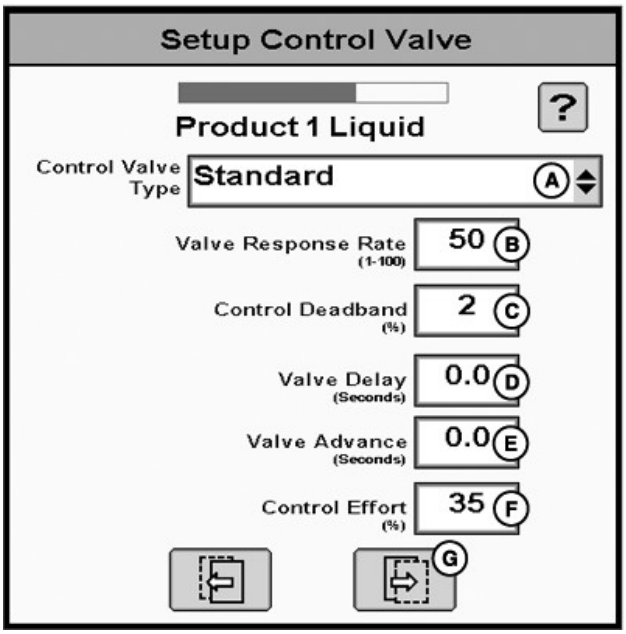
A—Tier 1 Max Flow Rate
B—Tier 2 Max Flow Rate
C—Percent Tier Disable
D—Next Page Button

30. If a tiered boom was selected for an application mode:
    a. Enter Tier 1 Max Flow Rate (A).
        - On a 2-tier system, both tiers enable once Tier 1 Max Flow Rate is achieved.
        - On a 3-tier system, the first tier disables and the second tier enables once Tier 1 Max Flow Rate is achieved.

    b. Enter Tier 2 Max Flow Rate (B).
        - On a 2-tier system, Tier 2 Max Flow Rate should be set to zero.
        - On a 3-tier system, both tiers enable once Tier 2 Max Flow Rate is achieved.

    c. Enter the Percent Tier Disable (C).
        - Percent Tier Disable is the percentage of volume per minute setting that causes system to disable higher tier.

    d. Select Next Page button (D).



PC22311—UN—22MAR16

A—Control Valve Type Drop-Down Menu
B—Valve Response Rate
C—Control Deadband
D—Valve Delay
E—Valve Advance
F—Control Effort
G—Next Page Button

CAUTION: Selecting the wrong valve type may result in valves opening unexpectedly. To avoid injury from exposure to chemicals, verify that the correct valve is selected. Review the control valve type before moving the John Deere Rate Controller 2000 between implements.

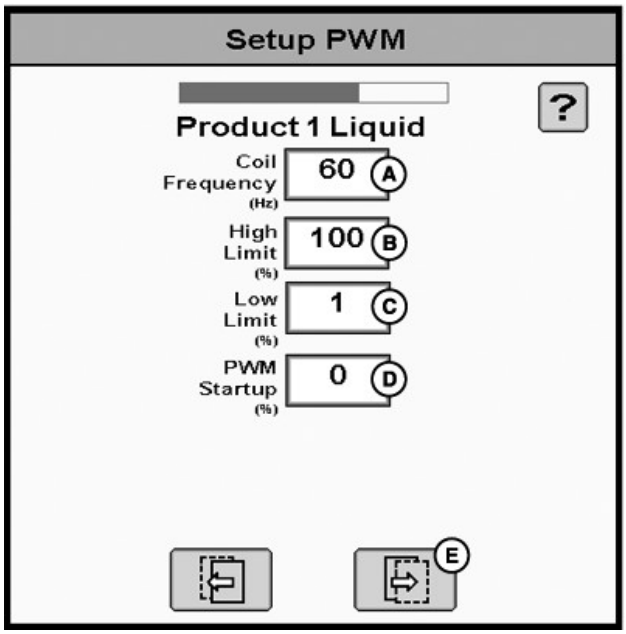
NOTE: The John Deere Rate Controller 2000 utilizes the control valve to manipulate application rates.

31. Select the Control Valve Type from the drop-down menu (A).

NOTE: Entry fields vary for each control type selected. The values that populate in the field are default values and should work to have basic control of the valve. They may need to be adjusted to improve valve performance.

(For more information, reference Adjust Control Valve.)

32. Enter the Valve Response Rate (B).
33. Enter the Control Deadband (C).
34. Enter the Valve Delay (D).
35. Enter the Valve Advance (E).
36. Enter the Control Effort (F).
37. Select the Next Page button (G).



PC22362—UN—29MAR16

A—Coil Frequency
B—High Limit
C—Low Limit
D—PWM Startup
E—Next Page Button

38. If PWM or PWM Close was selected as the control type valve:
    a. Enter Coil Frequency (A).

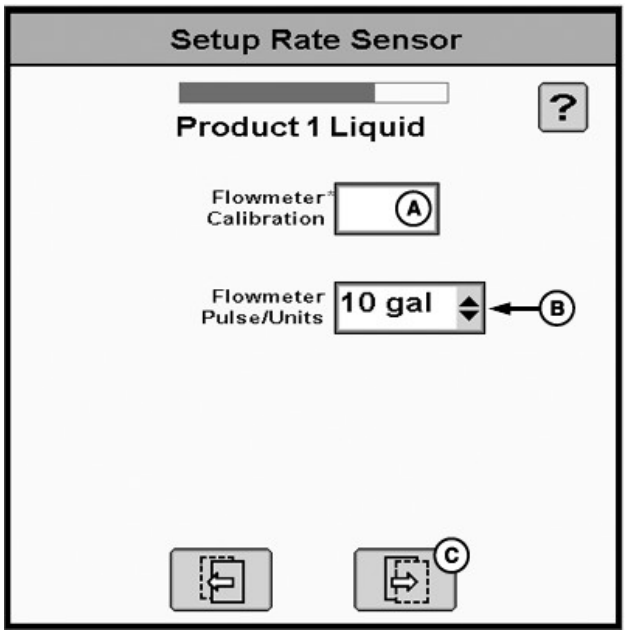
       (Reference the control valve manufacturer Operator's Manual for coil frequency.)

    NOTE: High and low limits from the GreenStar™ Rate Controller are based on a 1-255 scale. To use these values for the John Deere Rate Controller 2000, divide the high and low limits by 255. Enter this percentage for the High (B) and Low Limits (C).

    b. Enter High Limit.
    c. Enter the Low Limit.
    d. Enter the PWM Startup (D) for the PWM close valve or PWM Standby for the PWM valve.
    e. Select Next Page button (E).

NOTE: Most flowmeters are marked with a calibration number and pulse / units to use for the initial setup. Additional flowmeter calibration is recommended.

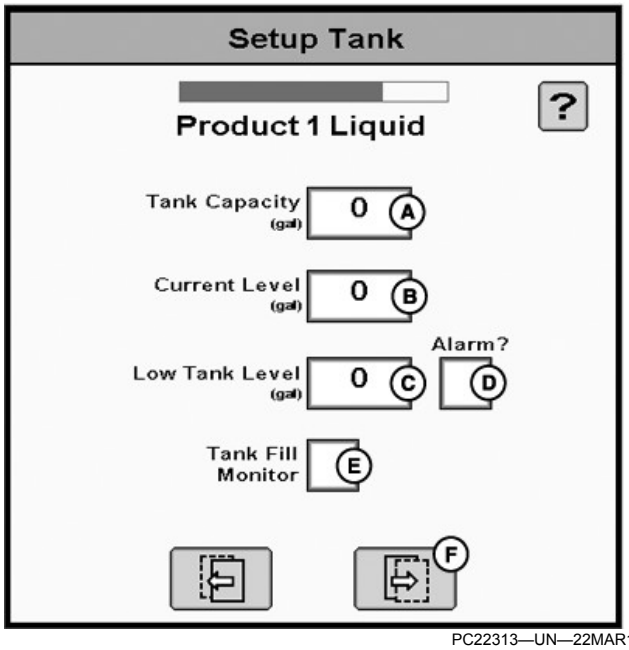
(For more information, reference Calibrate Flowmeter.)



PC22312—UN—22MAR16

A—Flowmeter Calibration
B—Flowmeter Pulse / Units Drop-Down Menu
C—Next Page Button

39. Enter the Flowmeter Calibration (A).
40. Select the Flowmeter Pulse / Units from the drop-down menu (B).
41. Select the Next Page button (C).



PC22313—UN—22MAR16

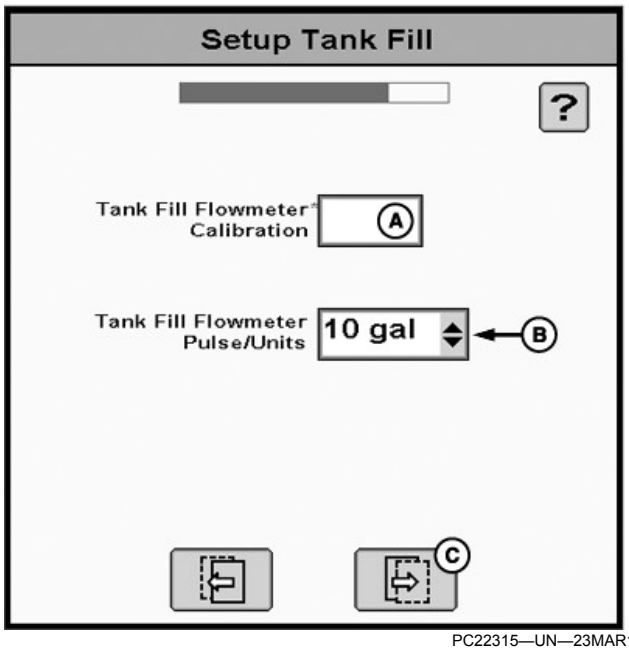
A—Tank Capacity
B—Current Level
C—Low Tank Level
D—Low Tank Level Alarm Checkbox
E—Tank Fill Monitor Checkbox
F—Next Page Button

NOTE: John Deere Rate Controller 2000 estimates tank level based on the calculated applied volume.

42. Enter the Tank Capacity (A).
43. Enter the Current Level (B).
44. If desired, enter the Low Tank Level (C) and select the Low Tank Level Alarm checkbox (D).

NOTE: Tank Fill Monitor (E) is only available for liquid applications. Only select the checkbox if implement is equipped with a tank inlet flowmeter. While refilling, Tank Fill Monitor calculates the tank volume without having to enter the Current Level manually.

45. If equipped, select the Tank Fill Monitor checkbox.
46. Select the Next Page button (F).



PC22315—UN—23MAR16

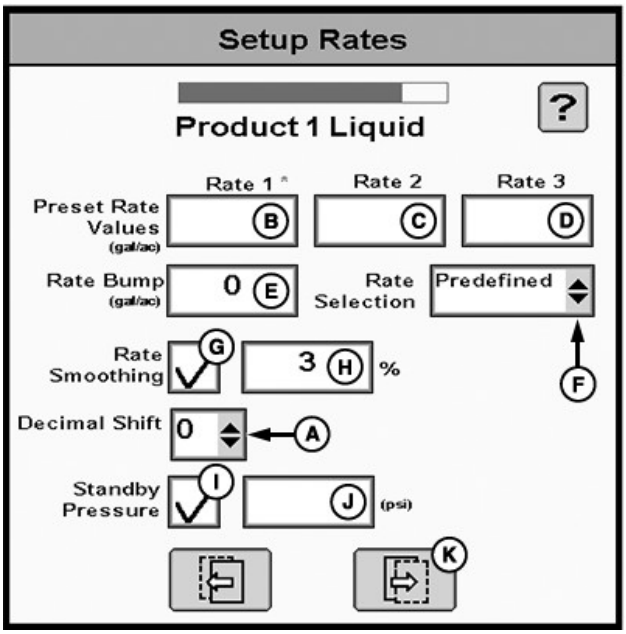
A—Tank Fill Flowmeter Calibration
B—Tank Fill Flowmeter Pulse / Units Drop-Down Menu
C—Next Page Button

NOTE: Most flowmeters are marked with a calibration number and pulse / units to use for the initial setup. Additional flowmeter calibration is recommended.

(For more information, reference Calibrate Flowmeter.)

NOTE: When filling with a flowmeter, the machine must be stationary.

47. If the Tank Fill Monitor was selected:
    a. Enter the Tank Fill Flowmeter Calibration (A).
    b. Select the Tank Fill Flowmeter Pulse / Units from the drop-down menu (B).
    c. Select the Next Page button (C).



PC24941—UN—27NOV17

A—Decimal Shift Drop-Down Menu
B—Rate 1 Preset Value
C—Rate 2 Preset Value
D—Rate 3 Preset Value
E—Bump Rate
F—Rate Selection Drop-Down Menu
G—Rate Smoothing Checkbox
H—Rate Smoothing Percentage
I—Standby Pressure Checkbox
J—Standby Pressure
K—Next Page Button

NOTE: Decimal shift allows for higher resolution of target and displayed application rates by including additional decimal places. It applies to all products of the same type, such as liquid or granular.

If the decimal is shifted 1 place, the maximum rate that can be entered is decreased by a factor of 10. If the decimal is shifted 2 places, the maximum rate that can be entered is decreased by a factor of 100. For example, 1000 is decreased to 100.0 with a decimal shift of 1, and it is decreased to 10.00 with a decimal shift of 2.

48. Select the Decimal Shift from the drop-down menu (A).
49. Enter up to three Preset Rate Values (B—D). Rate 1 preset value is required.
50. Enter the Rate Bump (E).
51. To choose the rate type displayed on main run page, select the Rate Selection from the drop-down menu (F).
    - Predefined—Displays selection buttons for Preset Rate Values.
    - Rate Bump—Displays plus (+) and minus (-) buttons that increment target rate by Rate Bump value.
    - Map Based—Displays prescription target rate for current GPS location.

      (Reference Apex™ or John Deere Operations Center for more information about creating prescriptions.)

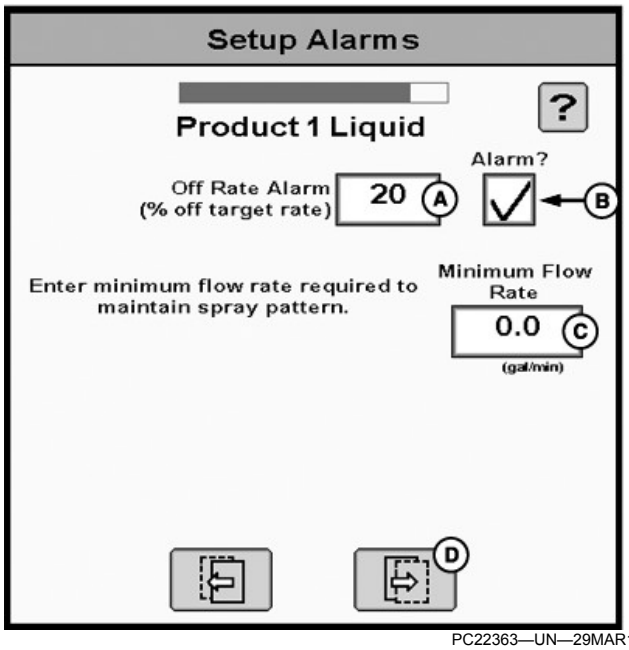
NOTE: Rate smoothing removes small fluctuations in the as-applied rate values. The displayed as-applied rate remains constant until the rate increases or decreases by more than the set rate smoothing percentage.

Default is 3% and can be set between 3—15%.

52. If desired, select the Rate Smoothing checkbox (G) and enter the Rate Smoothing Percentage (H).

NOTE: Standby Pressure is only available for PWM valve types. PWM Startup is only available for PWM Close type valves.

53. If desired, select the Standby Pressure checkbox (I) and enter the Standby Pressure (J). The control unit maintains this pressure when all sections are turned off.
54. Select the Next Page button (K).



PC22363—UN—29MAR16

A—Off Rate Alarm
B—Off Rate Alarm Checkbox
C—Minimum Flow Rate
D—Next Page Button

NOTE: If enabled, the Off Rate Alarm displays if the system detects a rate change greater than the entered percentage for more than 5 seconds.

Apex is a trademark of Deere & Company

55. If desired, enter the Off Rate Alarm (A) and select the Alarm checkbox (B).

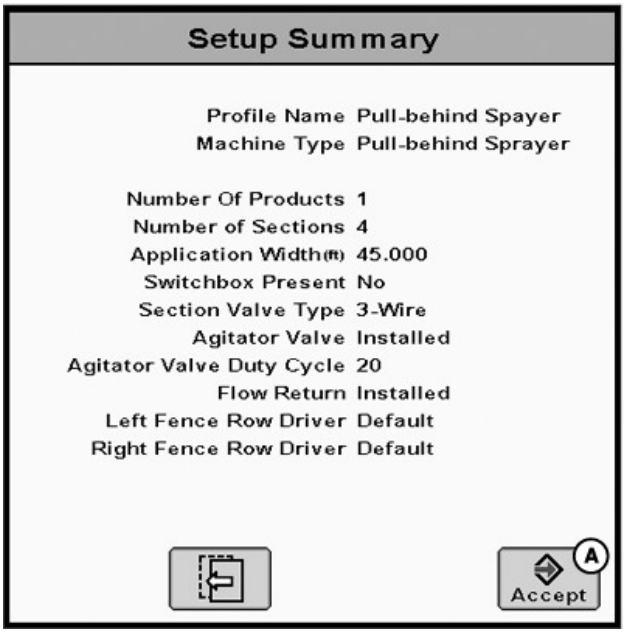
NOTE: Minimum Flow Rate (C) is the lowest flow rate the control unit allows. If the application speed is too slow, minimum flow rate applied may exceed the target rate.

If pressure sensor 1 minimum pressure alarm is enabled, the minimum flow rate is not shown. The pressure sensor 1 minimum pressure is used to maintain the spray pattern if the flow rate drops too low.

56. Enter the Minimum Flow Rate required to maintain the spray pattern.

    (Reference chemical provider for recommended settings.)

57. Select the Next Page button (D).



PC22318—UN—23MAR16

Setup Summary

A—Accept Button

NOTE: Setup Summary may appear differently based on the configuration and options selected.

58. Review the Setup Summary and select the Accept button (A).

HC94949,0000CAD-19-20DEC17

Setup Wizard—NH3 Tool and a Raven Sidekick ICD Direct Injection Pump

PC22295—UN—21MAR16

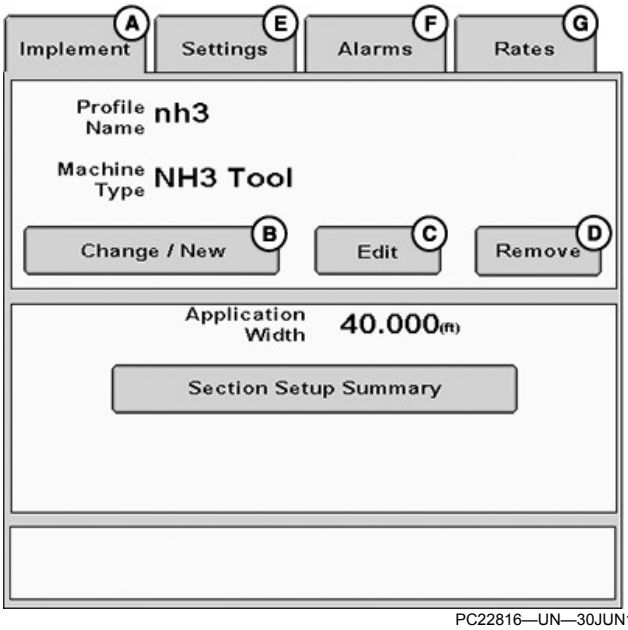
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.



PC22816—UN—30JUN16

A—Implement Tab
B—Change / New Button
C—Edit Button
D—Remove Button
E—Setting Tab
F—Alarms Tab
G—Rates Tab

3. Select the Implement tab (A).
4. Select the Change / New button (B).

NOTE: If a profile is already configured, selecting the Edit button (C) starts the setup wizard for the selected profile and all the steps must be completed to close the wizard.

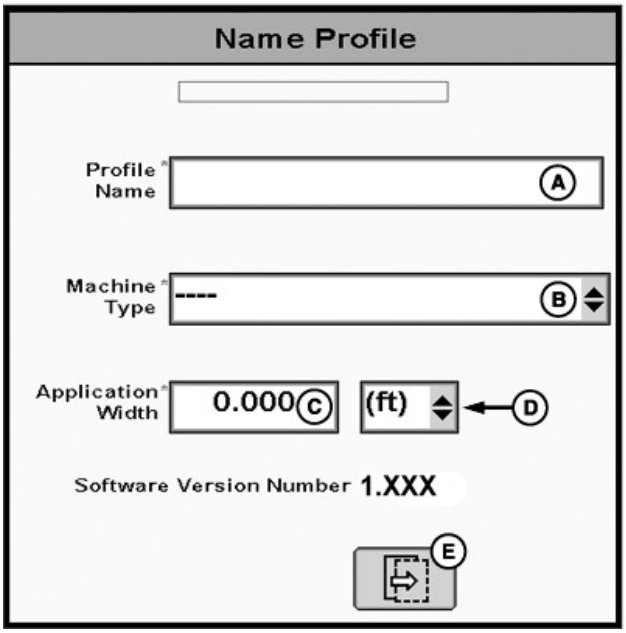
A maximum of eight profiles can be saved. Selecting the Remove button (D) deletes the selected profile.

To edit individual settings without going through the wizard, select Settings (E), Alarms (F), or Rates (G) tabs.

PC22298—UN—13APR16

H—Select Profile Drop-Down Menu
I—Accept Button

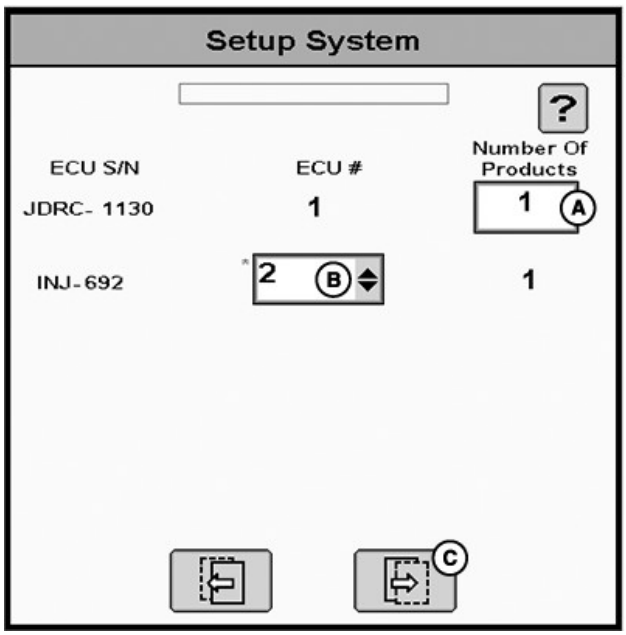
5. Select New Profile from the drop-down menu (H).
6. Select the Accept button (I).



PC24938—UN—03NOV17

A—Profile Name
B—Machine Type Drop-Down Menu
C—Application Width
D—Units of Measurement Drop-Down Menu
E—Next Page Button

7. Enter the Profile Name (A). This is the name displayed on the run page.
8. Select NH3 tool from the Machine Type drop-down menu (B).
9. Enter the Application Width (C).
10. Select the units of measurement from the drop-down menu (D).
11. Select the Next Page button (E).



PC25023—UN—21NOV17

A—Number of Products
B—ECU Drop-Down Menu
C—Next Page Button

NOTE: NH3 applications can be configured with up to three products. NH3 automatically takes the first product. Liquid and dry products can be assigned to products 2 and 3. In this example, a Raven Sidekick Pro™ ICD direct injection pump is set up.

When multiple products are selected, section groups must be set up.

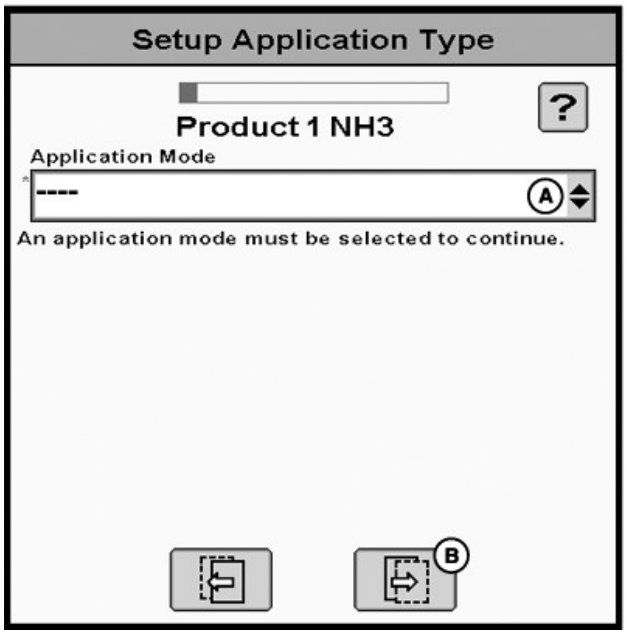
(Reference Set Up Section Groups for more information.)

12. Enter the Number of Products (A).

NOTE: When a direct injection pump is installed and configured in the profile, a carrier product must also be configured.

13. If a Raven Sidekick Pro™ ICD direct injection is installed, the setup wizard automatically populates the next available ECU number in the drop-down menu (B).
14. Select the Next Page button (C).

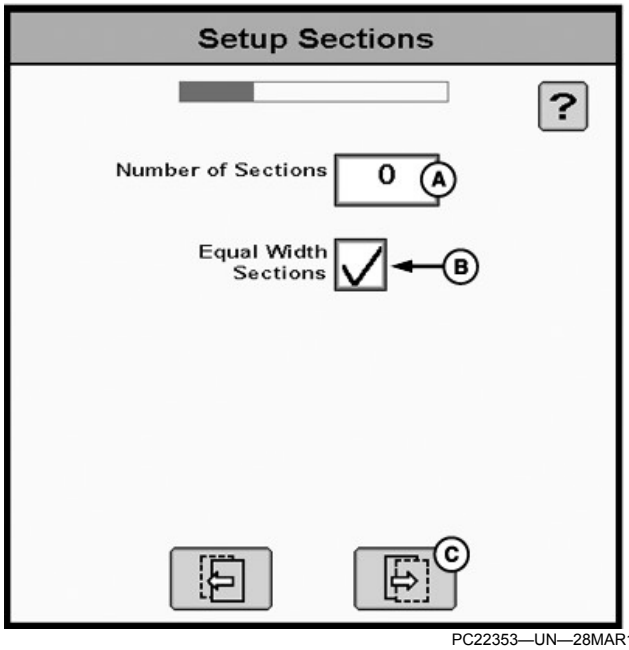
Sidekick Pro is a trademark of Raven Industries Inc.



PC22352—UN—28MAR16

A—Application Mode Drop-Down Menu
B—Next Page Button

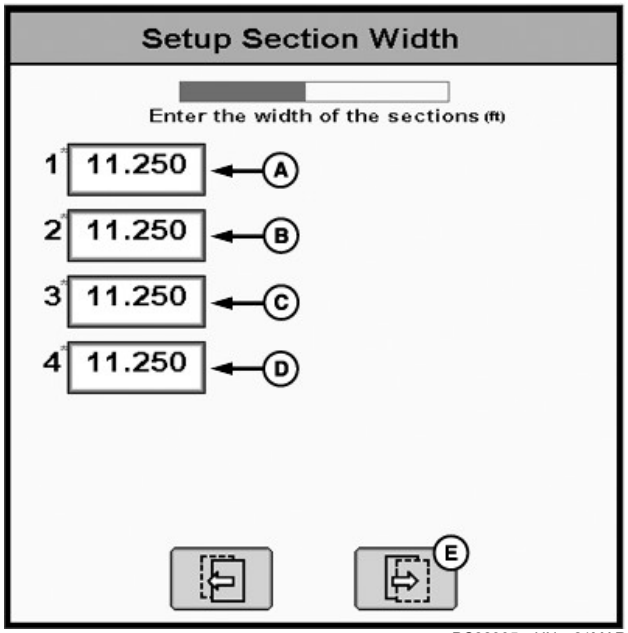
15. Select the Application Mode from the drop-down menu (A).
    - NH3—Conventional anhydrous ammonia applications.
    - NH3 AccuFlow HP+—Specific for Raven AccuFlow HP™ Plus with a boost pump. John Deere Rate Controller 2000 has the ability to control the PWM valve on the boost pump in conjunction with a fast control valve.
16. Select the Next Page button (B).



PC22353—UN—28MAR16

A—Number of Sections
B—Equal Width Sections Checkbox
C—Next Page Button

17. Enter the Number of Sections (A).
18. If applicable, select the Equal Width Sections checkbox (B).
19. Select the Next Page button (C).



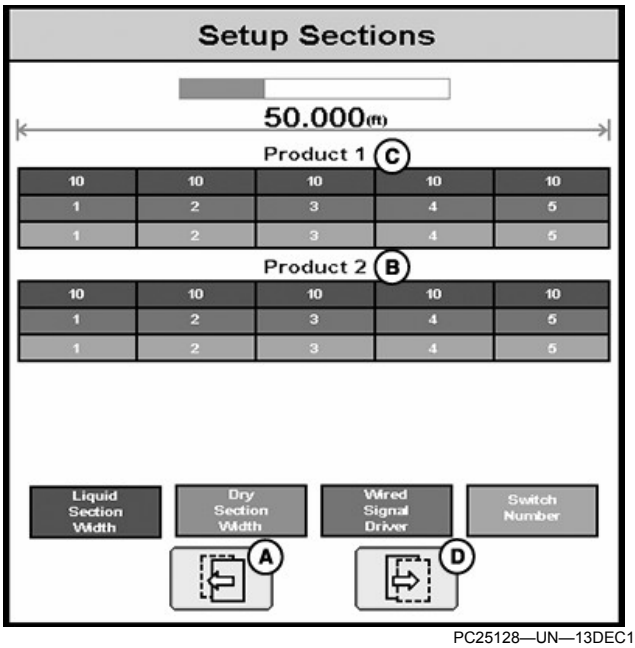
PC22305—UN—21MAR16

A—Section 1 Width
B—Section 2 Width
C—Section 3 Width
D—Section 4 Width
E—Next Page Button

NOTE: Total width of all the sections must be equal to the total application width. If Equal Width Sections was selected, the application width is evenly divided by the number of sections.

20. Enter the width for each section (A—D).
21. Select the Next Page button (E).

AccuFlow HP is a trademark of Raven Industries Inc.



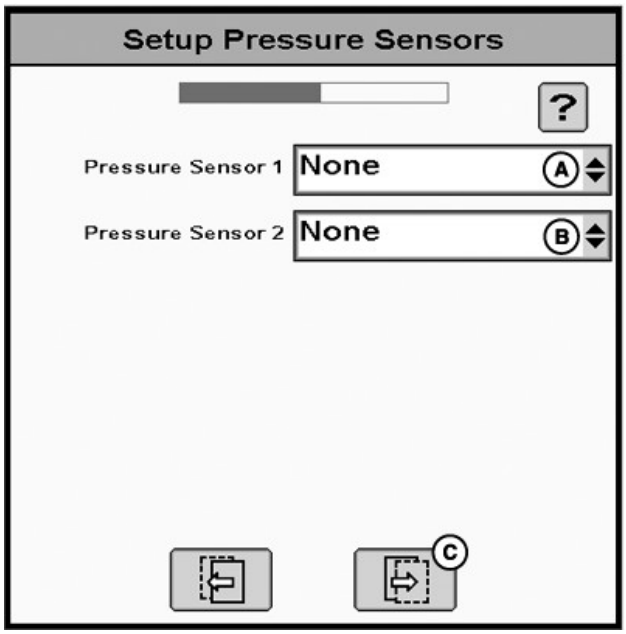
PC25128—UN—13DEC17

A—Previous Page Button
B—Product 2
C—Product 1
D—Next Page Button

NOTE: Graphic displays each section width and driver that controls each section valve. Verify that implement wiring is correct. Application width and section widths may only be edited in the setup wizard. If needed, select the Previous Page button (A) to make corrections.

22. Product 2 (B), the Raven Sidekick Pro™ ICD pump, shares the same driver and section numbers as Product 1 (C). The direct injection must be tied to a carrier so it is automatically associated to the NH3 sections.

    Review Setup Sections and select the Next Page button (D).



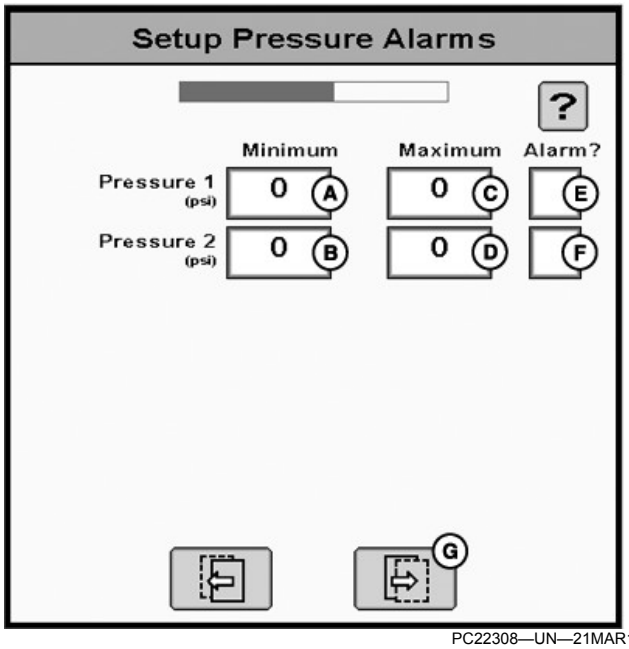
PC22307—UN—21MAR16

A—Pressure Sensor 1 Drop-Down Menu
B—Pressure Sensor 2 Drop-Down Menu
C—Next Page Button

NOTE: Raven AccuFlow HP™ Plus is automatically configured with two pressure sensors.

Custom sensors do not function properly until a calibration is completed.

23. If equipped, select the pressure sensor configuration from the drop-down menus (A and B).
24. Select the Next Page button (C).



PC22308—UN—21MAR16

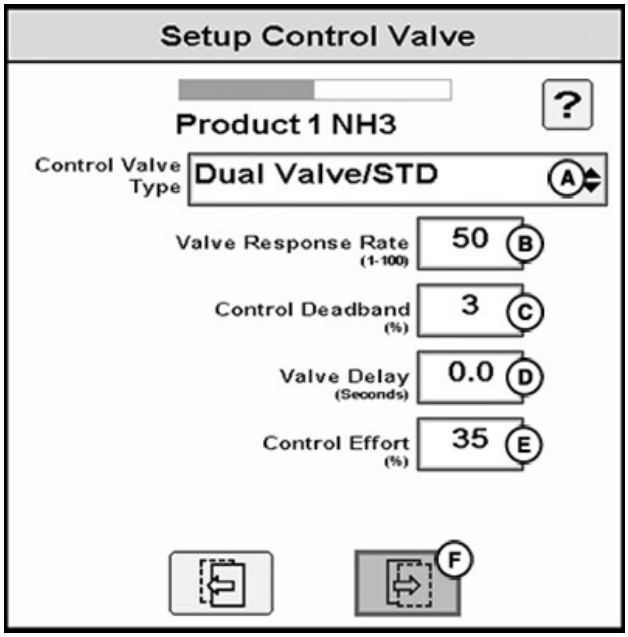
A—Pressure Sensor 1 Minimum
B—Pressure Sensor 2 Minimum
C—Pressure Sensor 1 Maximum
D—Pressure Sensor 2 Maximum

E—Pressure Sensor 1 Alarm Checkbox
F—Pressure Sensor 2 Alarm Checkbox
G—Next Page Button

NOTE: Pressure alarm settings are based on operator preference. Set up alarms so they notify operator before the system needs attention.

A Raven AccuFlow HP™ Plus boost pump enables the alarms and grays out the checkboxes. The minimum and maximum pressures are automatically populated.

25. If sensors were specified, set up the pressure alarms:
    a. Enter the Minimum Pressure (A and B).
    b. Enter the Maximum Pressure (C and D).
    c. To enable the sensor minimum and maximum alarm, select the Alarm checkbox (E and F).
26. Select the Next Page button (G).



PC25096—UN—13DEC17

A—Control Valve Type Drop-Down Menu
B—Valve Response Rate
C—Control Deadband
D—Valve Delay
E—Control Effort
F—Next Page Button

⚠ CAUTION: Selecting the wrong valve type may result in valves opening unexpectedly. To avoid injury from exposure to chemicals, verify that the correct valve is selected. Review the control valve type before moving John Deere Rate Controller 2000 between implements.

NOTE: Control unit utilizes a control valve to manipulate the application rates.

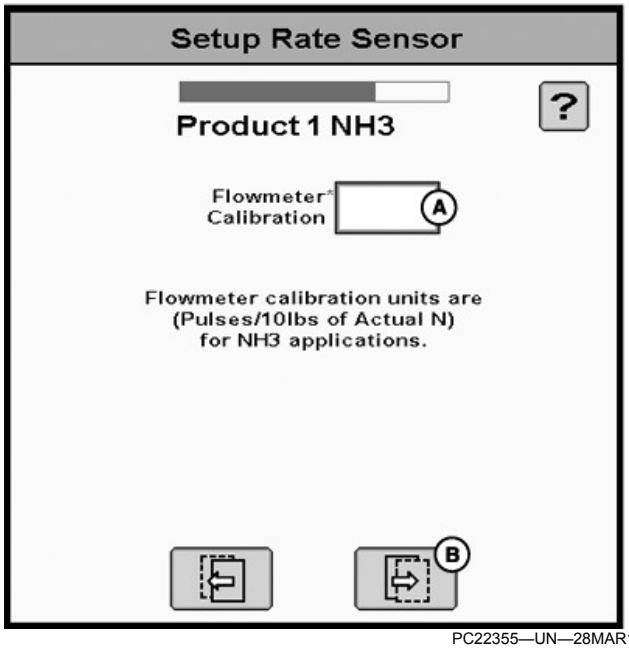
AccuFlow HP™ Plus is automatically configured with a single fast close valve and the setup wizard skips this page.

Select the Control Valve Type from the drop-down menu (A).

NOTE: Entry fields vary for each control type selected. Use default values for the initial setup.

(For more information, reference Adjust Control Valve.)

28. Enter the Valve Response Rate (B).
29. Enter the Control Deadband (C)
30. Enter the Valve Delay (D).
31. Enter the Control Effort (E).
32. Select the Next Page button (F).



PC22355—UN—28MAR16

A—Flowmeter Calibration
B—Next Page Button

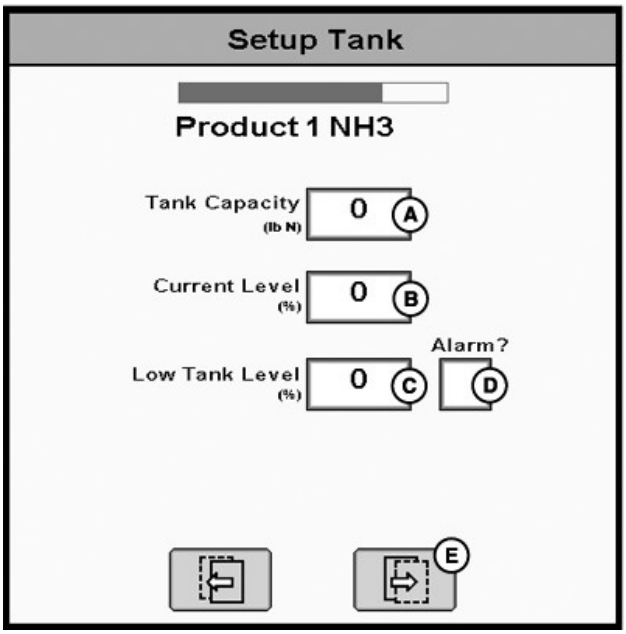
NOTE: Most flowmeters are marked with a calibration number and pulse / units to use for the initial setup. Verify units of measure marked on flowmeter. If needed, convert to pulses per 10 pounds of actual nitrogen. NH3 contains 4.22 lbs of actual nitrogen per gallon.

Pulses / 10 lbs = ((?) pulses / 10 gallons) / 4.22

Additional flowmeter calibration is recommended.

(For more information, reference Calibrate Flowmeter.)

33. Enter the Flowmeter Calibration (A).
34. Select the Next Page button (B).

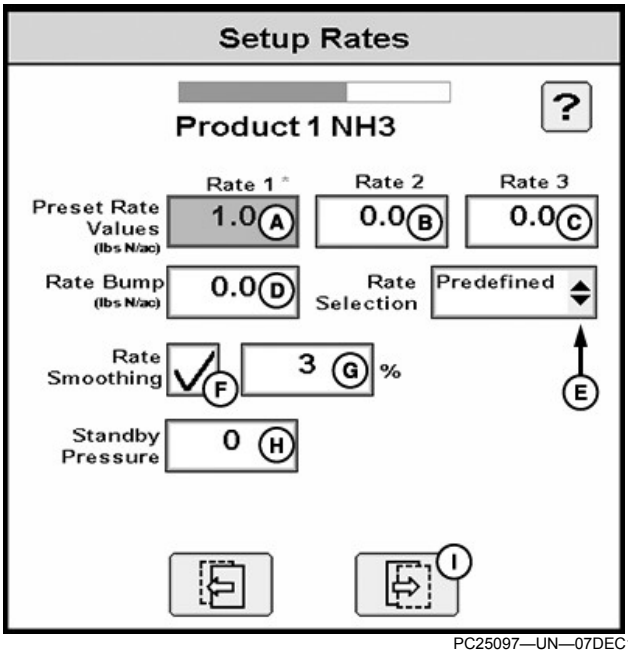


PC22357—UN—28MAR16

A—Tank Level
B—Current Level
C—Low Tank Level
D—Low Tank Level Alarm Checkbox
E—Next Page Button

NOTE: John Deere Rate Controller 2000 estimates the tank level based on the calculated applied volume.

35. Enter the Tank Capacity (A).
36. Enter the Current Level (B).
37. If desired, enter the Low Tank Level (C) and select the Low Tank Level Alarm checkbox (D).
38. Select the Next Page button (E).



PC25097—UN—07DEC17

A—Rate 1 Preset Value
B—Rate 2 Preset Value
C—Rate 3 Preset Value
D—Bump Rate
E—Rate Selection Drop-Down Menu
F—Rate Smoothing Checkbox
G—Rate Smoothing Percentage
H—Standby Pressure
I—Next Page Button

39. Enter up to three Preset Rate Values (A—C). Rate 1 preset value is required.
40. Enter the Rate Bump (D).
41. To choose the rate type displayed on main run page, select the Rate Selection from the drop-down menu (E).
    - Predefined—Displays the selection buttons for the Preset Rate Values.
    - Rate Bump—Displays the plus (+) and minus (-) buttons that increment target rate by the Rate Bump value.
    - Map Based—Displays the prescription target rate for the current GPS location.

      (Reference Apex™ or John Deere Operation Center for more information about creating prescriptions.)

NOTE: Rate smoothing removes the small fluctuations in the as-applied rate values. The displayed as-applied rate remains constant until the rate increases or decreases by more than the set rate smoothing percentage.

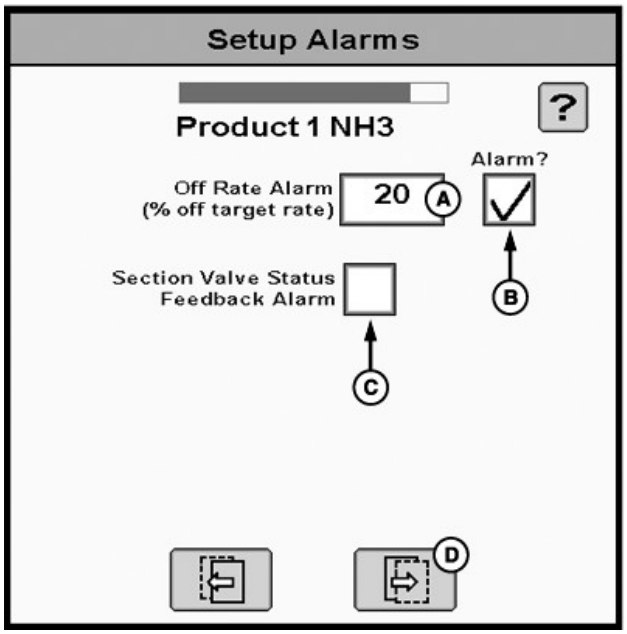
Default is 3% and can be set between 3—15%.

42. If desired, select the Rate Smoothing checkbox (F) and enter the Rate Smoothing Percentage (G).

NOTE: Standby pressure is only available when a Raven Accuflow HP™ Plus system is selected.

43. Enter the Standby Pressure (H). The control unit maintains this pressure when all sections are turned off.
44. Select the Next Page button (I).

Apex is a trademark of Deere & Company

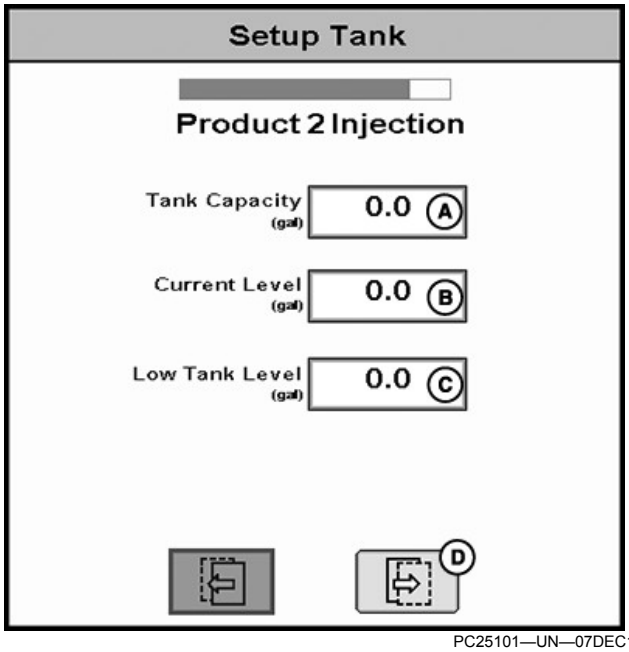


PC22359—UN—28MAR16

A—Off Rate Alarm
B—Off Rate Alarm Checkbox
C—Section Valve Status Feedback Alarm Checkbox
D—Next Page Button

NOTE: If enabled, the Off Rate Alarm displays if the system detects a rate change greater than the entered percentage for more than 5 seconds.

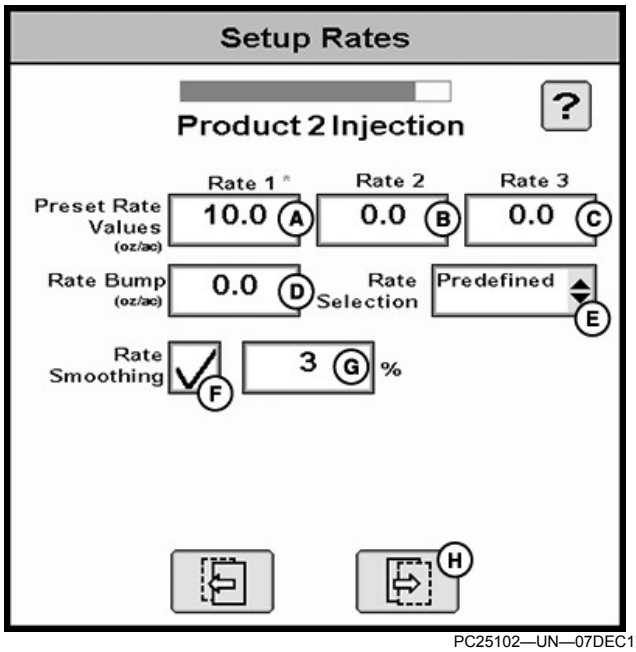
45. If desired, enter the Off Rate Alarm (A) and select the Alarm checkbox (B).
46. If desired, select the Section Valve Status Feedback Alarm checkbox (C).
47. Select the Next Page button (D).



PC25101—UN—07DEC17

A—Tank Capacity Input Box
B—Current Level Input Box
C—Low Tank Level Input Box
D—Next Page Button

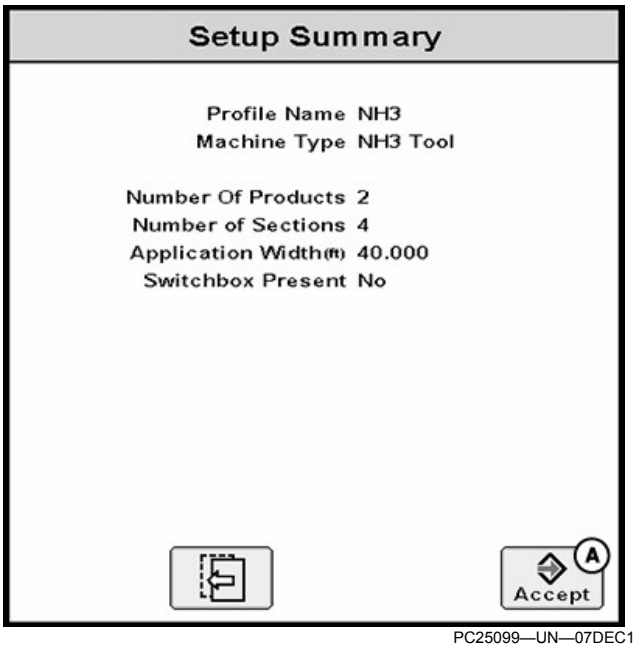
48. Enter the Tank Capacity (A).
49. Enter the Current Level (B).
50. Enter the Low Tank Level (C), if needed.
51. Select the Next Page button (D).



PC25102—UN—07DEC17

A—Preset Rate Value Input Box 1
B—Preset Rate Value Input Box 2
C—Preset Rate Value Input Box 3
D—Rate Bump Input Box
E—Rate Selection Drop-Down Menu
F—Rate Smoothing Checkbox
G—Rate Smoothing Percentage Input Box
H—Next Page Button

52. Enter up to three Preset Rate Values (A–C). Rate 1 preset is required.
53. Enter the Rate Bump (D).
54. To choose the rate type displayed on main run page, select the Rate Selection from the drop-down menu (E).
55. If desired, select the Rate Smoothing checkbox (F) and enter the Rate Smoothing percentage (G).
56. Select the Next Page button (H).



PC25099—UN—07DEC17

A—Accept Button

57. Review Setup Summary and select the Accept button (A).

HC94949,0000CAB-19-20DEC17

Setup Wizard—Planter

NOTE: John Deere Rate Controller 2000 planter profile is not compatible with planters that have variable rate drives.

PC22295—UN—21MAR16

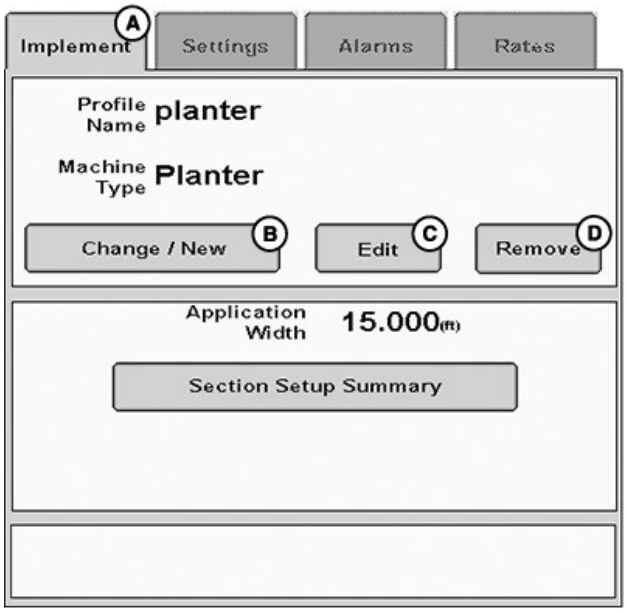
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.



PC23139—UN—04OCT16

A—Implement Tab
B—Change / New Button
C—Edit Button
D—Remove Button

3. Select the Implement tab (A).
4. Select the Change / New button (B).

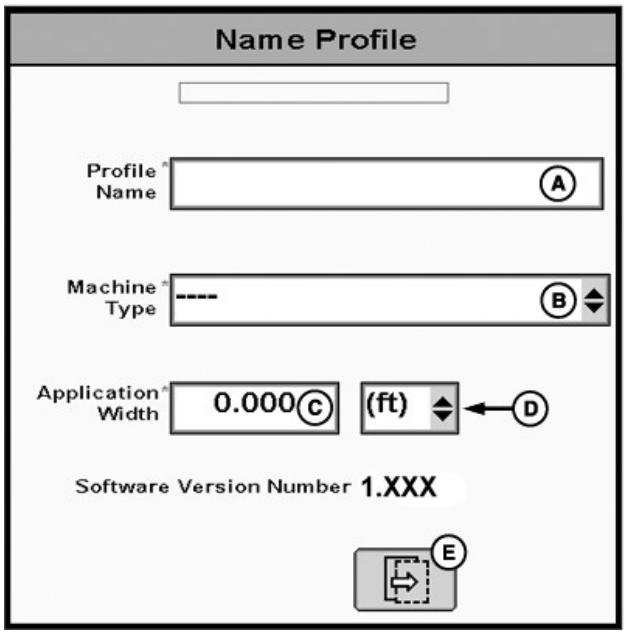
NOTE: If a profile is already configured, selecting the Edit button (C) starts the setup wizard for the selected profile and all the steps must be completed to close the wizard.

A maximum of eight profiles can be saved. Selecting the Remove button (D) deletes the selected profile.

PC23140—UN—04OCT16

E—Select Profile Drop-Down Menu
F—Accept Button

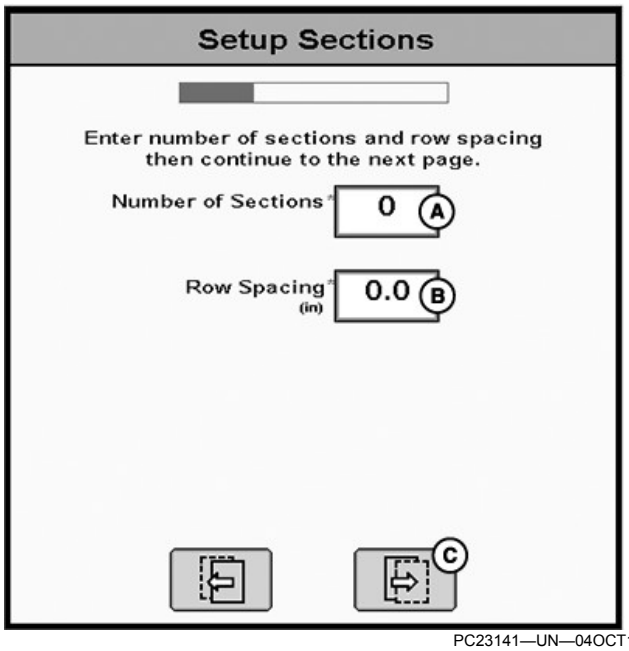
5. Select New Profile from the drop-down menu (E).
6. Select the Accept button (F).



PC24938—UN—03NOV17

A—Profile Name
B—Machine Type Drop-Down Menu
C—Application Width
D—Units of Measurement Drop-Down Menu
E—Next Page Button

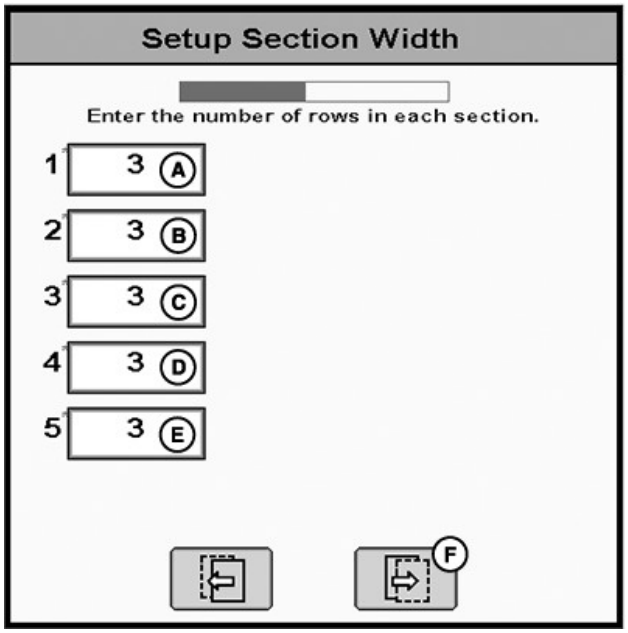
7. Enter the Profile Name (A). This is the name displayed on the run page.
8. Select planter from the Machine Type drop-down menu (B).
9. Enter the Application Width (C).
10. Select the units of measurement from the drop-down menu (D).
11. Select the Next Page button (E).



PC23141—UN—04OCT16

A—Number of Sections
B—Row Spacing
C—Next Page Button

12. Enter the Number of Sections (A).
13. Enter the Row Spacing (B).
14. Select the Next Page button (C).

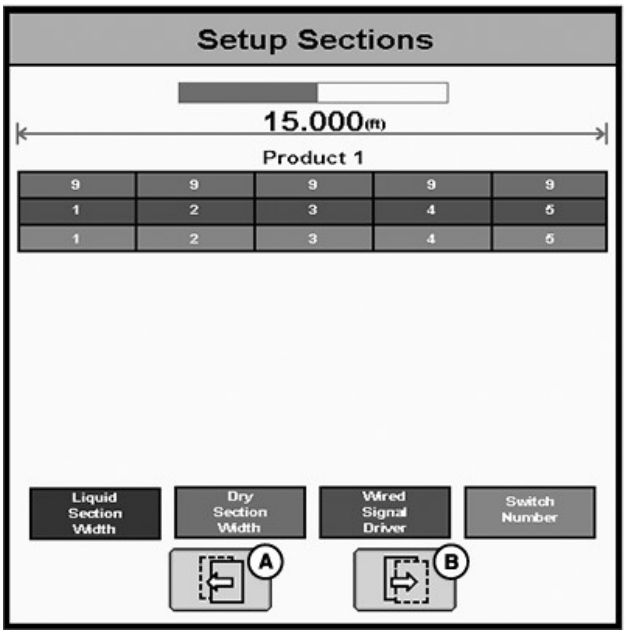


PC23142—UN—04OCT16

A—Section 1
B—Section 2
C—Section 3
D—Section 4
E—Section 5
F—Next Page Button

NOTE: Total number of rows multiplied by the row spacing cannot exceed the total application width.

15. Enter the number of rows for each section (A—E).
16. Select the Next Page button (F).

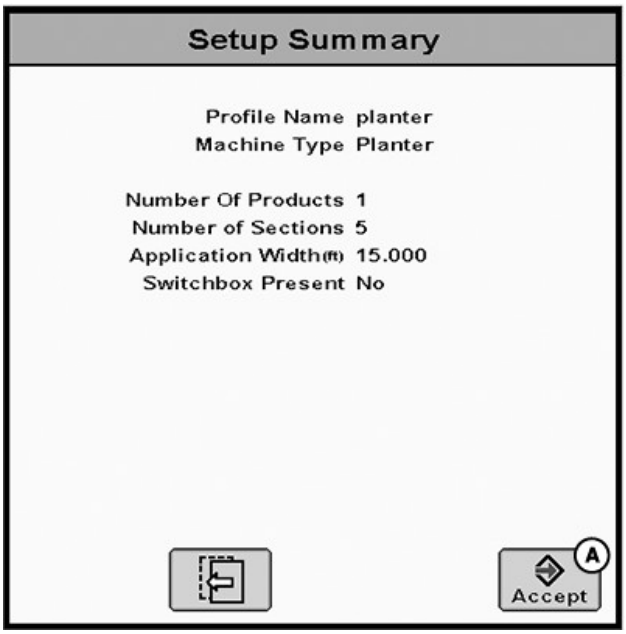


PC23143—UN—04OCT16

A—Previous Page Button
B—Next Page Button

NOTE: Graphic displays each section width and output driver that controls each section. Verify that implement wiring is correct. Application width and section widths may only be edited in the setup wizard. If needed, select the Previous Page button (A) to make corrections.

17. Review Setup Sections and select the Next Page button (B).



PC23144—UN—04OCT16

A—Accept Button

18. Review Setup Summary and select the Accept button (A).

RW00482,0000058-19-13DEC17

Setup Wizard—Air Cart, Generic, and Spreader Tools

NOTE: With air carts or generic implements, the John Deere Rate Controller 2000 supports multiple fill flowmeters. However, only Product 1 tank information can be monitored with the current software.

PC22295—UN—21MAR16

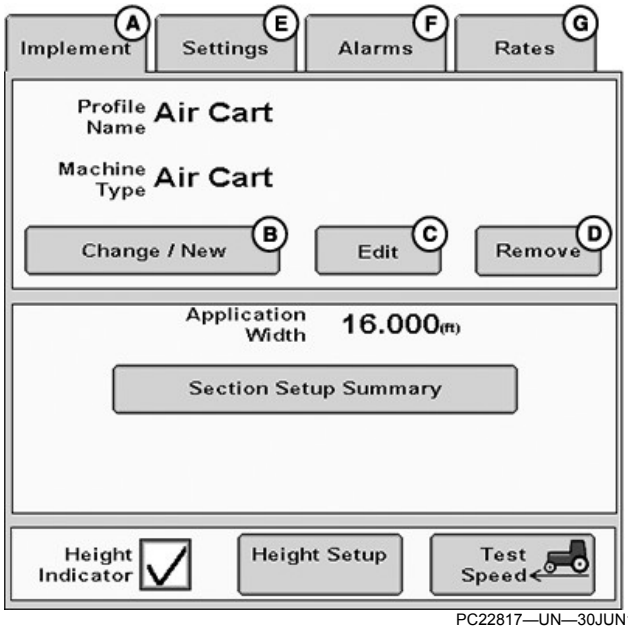
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.



PC22817—UN—30JUN16

A—Implement Tab
B—Change / New Button
C—Edit Button
D—Remove Button
E—Setting Tab
F—Alarms Tab

G—Rates Tab

3. Select Implement tab (A).
4. Select the Change New button (B).

NOTE: If a profile is already configured, selecting the Edit button (C) starts the setup wizard for the selected profile and all the steps must be completed to close the wizard.

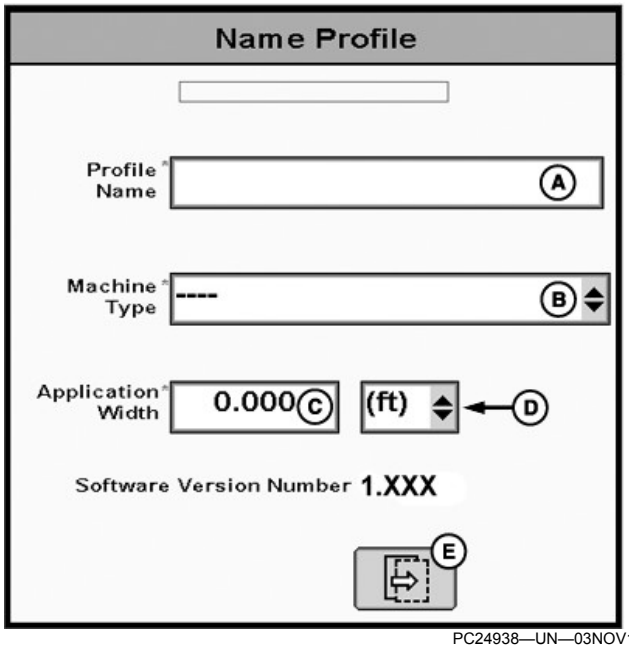
A maximum of eight profiles can be saved. Selecting the Remove button (D) deletes the selected profile.

To edit individual settings without going through the wizard, select Settings (E), Alarms (F), or Rates (G) tabs.

PC22298—UN—13APR16

H—Select Profile Drop-Down Menu
I—Accept Button

5. Select New Profile from the drop-down menu (H).
6. Select the Accept button (I).



PC24938—UN—03NOV17

A—Profile Name
B—Machine Type Drop-Down Menu
C—Application Width
D—Units of Measurement Drop-Down Menu
E—Next Page Button

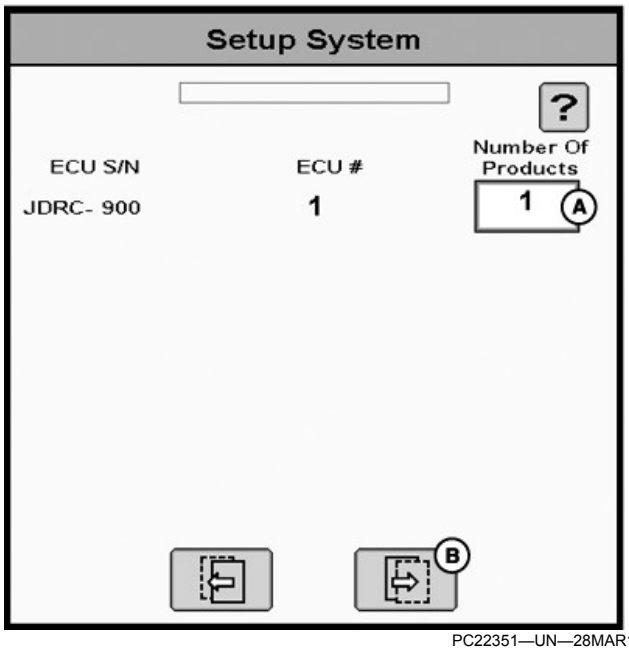
7. Enter the Profile Name (A). This is the name displayed on the run page.
8. Select air cart, generic, self-propelled spreader, or pull-behind spreader from the Machine Type drop-down menu (B).

NOTE: For this example, generic was selected.

9. Enter the Application Width (C).
10. Select the units of measurement from the drop-down menu (D).
11. Select the Next Page button (E).

NOTE: Air carts, spreaders, and generic implements can be configured with up to five products (dry and liquid). For ease of instruction, this setup wizard uses a single product. If multiple products are selected, follow the setup wizard prompts and set up section groups.

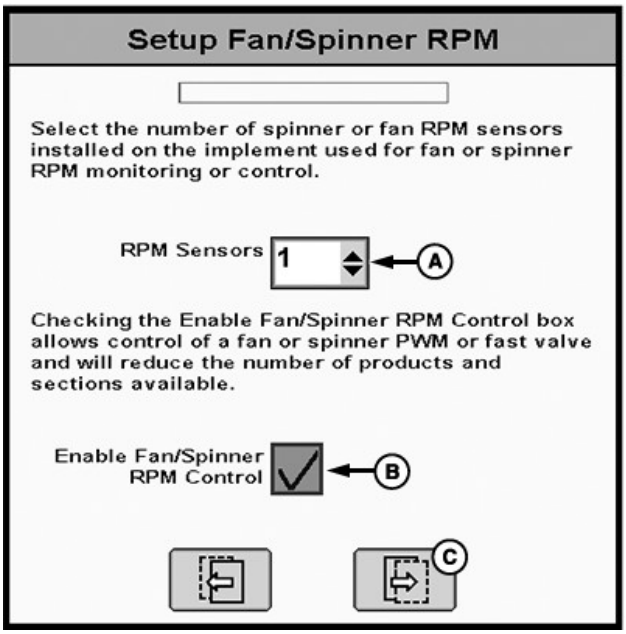
(Reference Set Up Section Groups for more information.)



PC22351—UN—28MAR16

A—Number of Products
B—Next Page Button

12. Enter the Number of Products (A).
13. Select the Next Page button (B).



PC25042—UN—22NOV17

A—Sensor Number Drop-Down Menu
B—Enable Fan / Spinner RPM Control Checkbox
C—Next Page Button

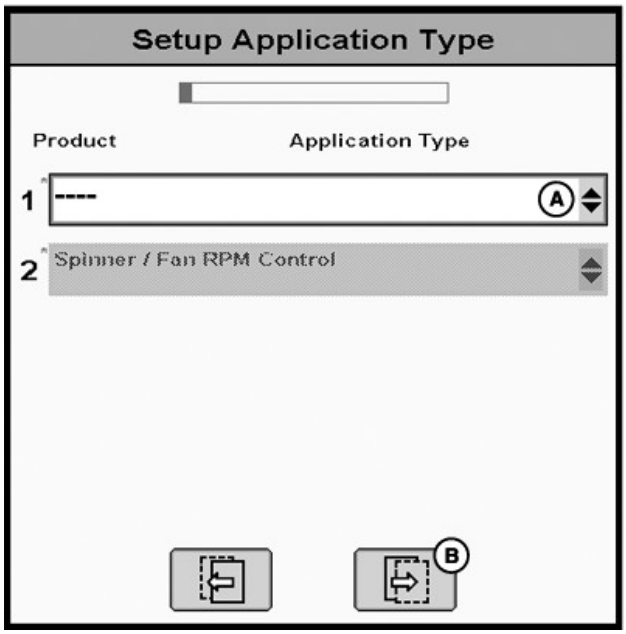
14. Select the number of spinner or fan RPM sensors from the drop-down menu (A).

NOTE: Enabling Fan / Spinner RPM Control (B) adds to product total. If five products were selected, Enable Fan / Spinner RPM Control is not an option.

Check the Enable Fan / Spinner RPM Control box to allow a PWM or fast control valve to control a fan or spinner to a predefined rate or speed.

If an RPM sensor is added and the checkbox is left unchecked, the sensor is only able to monitor speed, and alarms are able to be added.

15. If desired, select the Enable Fan / Spinner RPM Control checkbox (B).
16. Select the Next Page button (C).



PC22615—UN—10MAY16

A—Application Type Drop-Down Menu
B—Next Page Button

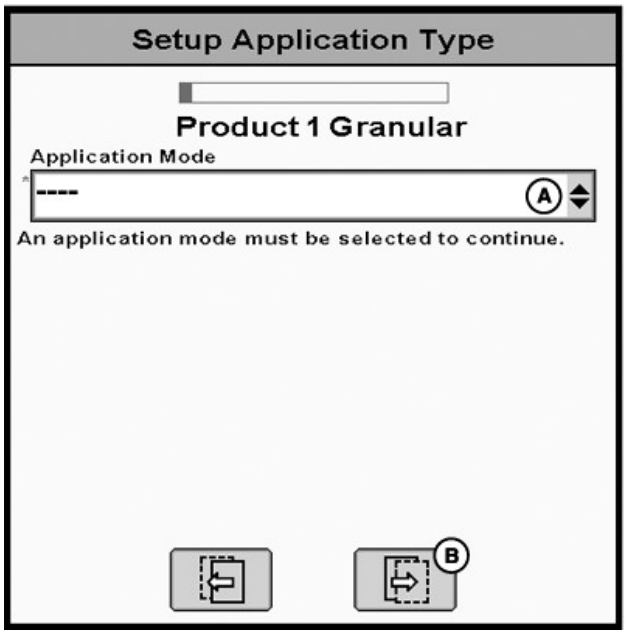
17. Select the application type from the drop-down menu (A).

NOTE: For ease of instructions, granular product is covered in this setup wizard. Liquid application setup is the same as sprayers and liquid fertilizer tools.

(Reference Setup Wizard—Sprayer and Liquid Fertilizer Tool or select the help button for more information about the liquid setup steps.)

- Granular Fertilizer configures documentation for a dry product application.
- Granular Seed configures documentation for a seeding application operation.
- Liquid (not an option for spreaders) configures documentation for a liquid product application.

18. Select the Next Page button (B).



PC22617—UN—10MAY16

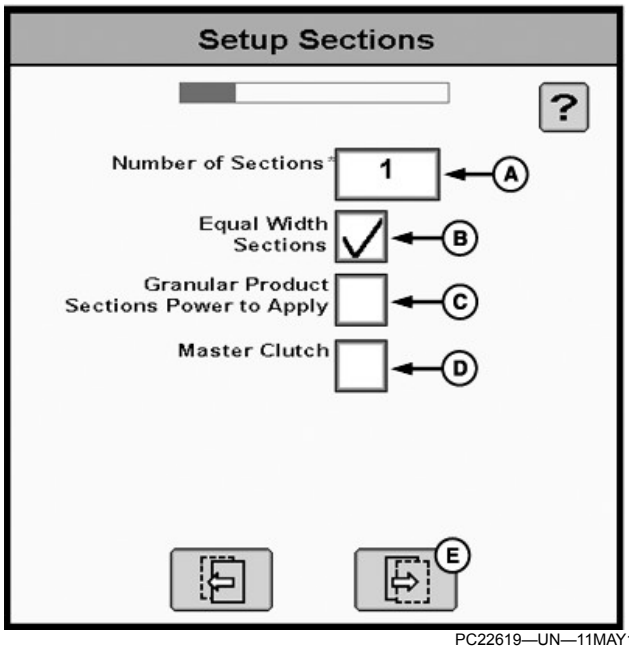
A—Application Mode Drop-Down Menu
B—Next Page Button

19. Select the Application Mode from the drop-down menu (A).
    - Granular Full Width Section—Dry or seed application using a single shutoff section.
    - Granular Multi Section (RPM compensated)—Dry or seed application using multiple shutoff sections. Meter or conveyor RPM is controlled based on the machine speed and active width as sections turn on and off.
    - Granular Multi Section (RPM maintained)—Dry or seed application using multiple shutoff sections. Meter or conveyor RPM are controlled based on the machine speed. Meter or conveyor RPM is not compensated for changes in active width as sections turn on and off.
    - Granular Split Belt / Dual Encoder—Dry or seed application using one control valve of a split meter or conveyor with shutoff control of two independent sections. Encoder feedback of meter or conveyor RPM is available for each section. Meter or conveyor RPM is controlled or compensated based on machine speed. Meter or conveyor RPM is not compensated for changes in active width as left or right sections turn on and off. The meter or conveyor stops when both sections are off.

    NOTE: If dual control valve is selected, identical PWM valves must be used. Only one valve calibration setting is applied to both valves.

    - Dual Control Valve—Dry or seed application using dual PWM control valves to independently control a left and right meter or conveyor section. Encoder feedback of meter or conveyor RPM is available for each section. Meter or conveyor RPM is independently controlled based on machine speed. Sections are turned off by closing the PWM control valve.

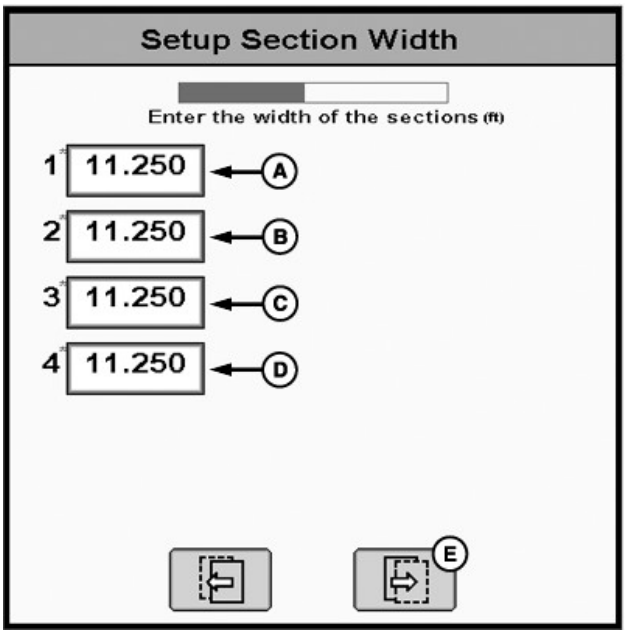
20. Select the Next Page button (B).



PC22619—UN—11MAY16

A—Number of Sections
B—Equal Width Checkbox
C—Granular Product Sections Power to Apply Checkbox
D—Master Clutch Checkbox
E—Next Page Button.

21. Enter the Number of Sections (A).
22. Select all that apply:
    - Equal Width Sections checkbox (B)—If selected, the total width is divided evenly among the number of sections entered.
    - Granular Product Sections Power to Apply checkbox (C)—Select for the control unit to provide power to section signal wire when section is on. Deselect for the control unit to provide power to section signal wire when section is off.
    - Master Clutch checkbox (D)—Select to enable master clutch signal for air cart applications which use a magnetic clutch to engage or disengage a drive.
23. Select the Next Page button (E).

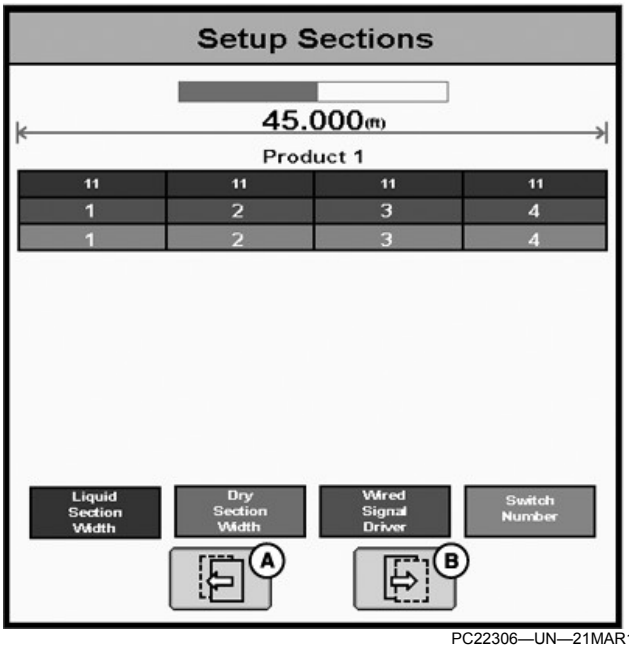


PC22305—UN—21MAR16

A—Section 1 Width
B—Section 2 Width
C—Section 3 Width
D—Section 4 Width
E—Next Page Button

NOTE: Total width of all sections must be equal to the total application width. If Equal Width Sections was selected, application width is evenly divided by the number of sections.

24. Enter the width for each section (A—D).
25. Select the Next Page button (E).

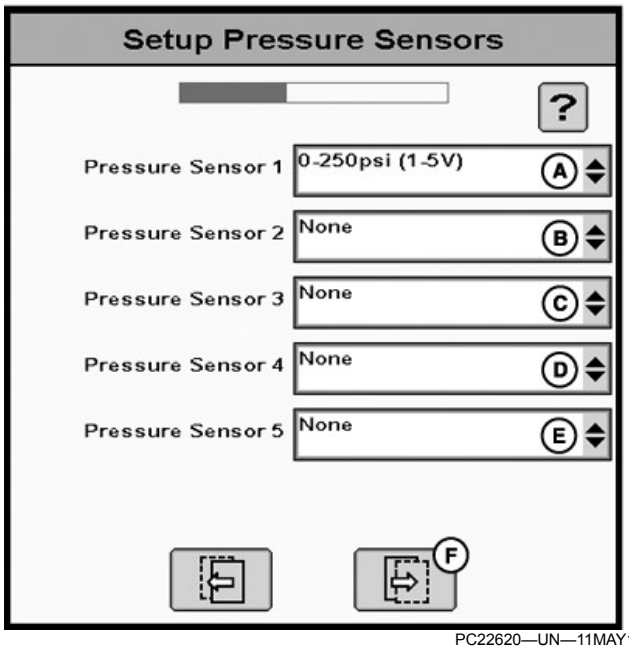


PC22306—UN—21MAR16

A—Previous Page Button
B—Next Page Button

NOTE: Graphic displays each section width and output driver that controls each section valve. Verify that implement wiring is correct. Application width and section widths may only be edited in the setup wizard. If needed, select the Previous Page button (A) to make corrections.

26. Review Setup Sections and select the Next Page button (B).



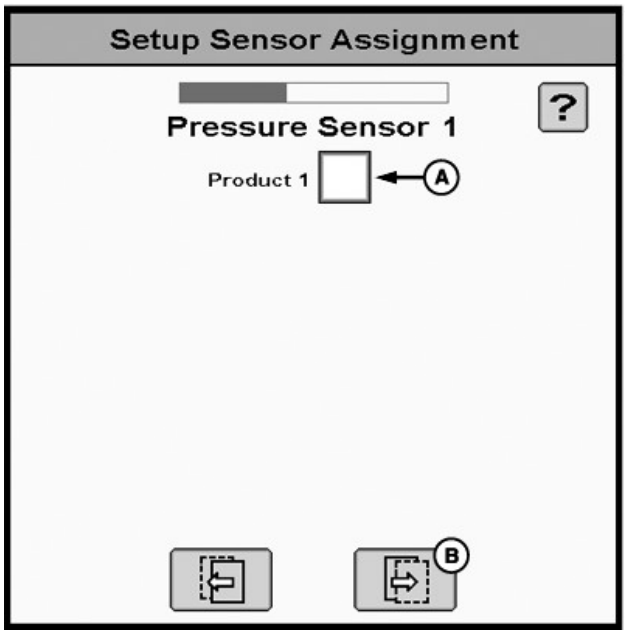
PC22620—UN—11MAY16

A—Pressure Sensor 1 Drop-Down Menu
B—Pressure Sensor 2 Drop-Down Menu
C—Pressure Sensor 3 Drop-Down Menu
D—Pressure Sensor 4 Drop-Down Menu
E—Pressure Sensor 5 Drop-Down Menu
F—Next Page Button

NOTE: The number of available pressure sensors depends on the configuration and wiring.

Sensors do not function properly until a calibration is completed.

27. If equipped, select the pressure sensor configuration from the drop-down menus (A—E).
28. Select the Next Page button (F).

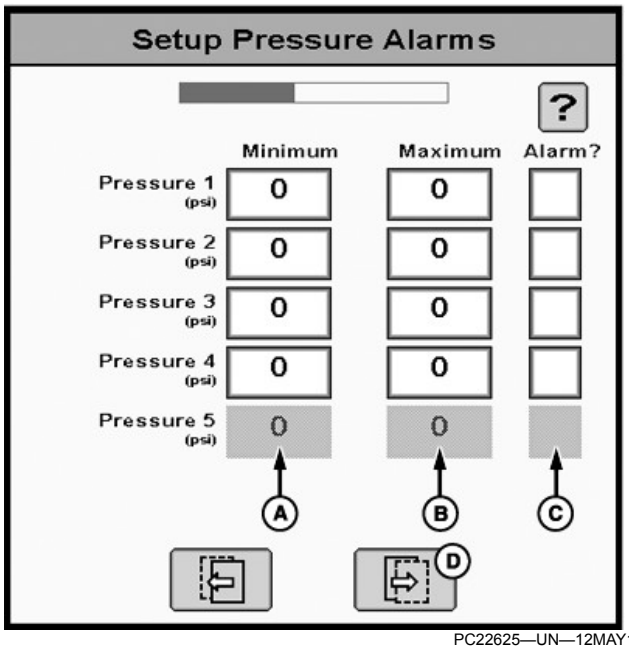


PC22622—UN—11MAY16

A—Product Checkbox
B—Next Page Button

NOTE: Pressure sensors can only be assigned to a product in the setup wizard, even if added outside of the wizard. Assigning a pressure sensor to a product allows high and low pressure alarms to be set up and enabled.

29. To assign pressure sensor, select the Product checkbox (A). Pressure sensors can be assigned to multiple products.
30. Select the Next Page button (B).

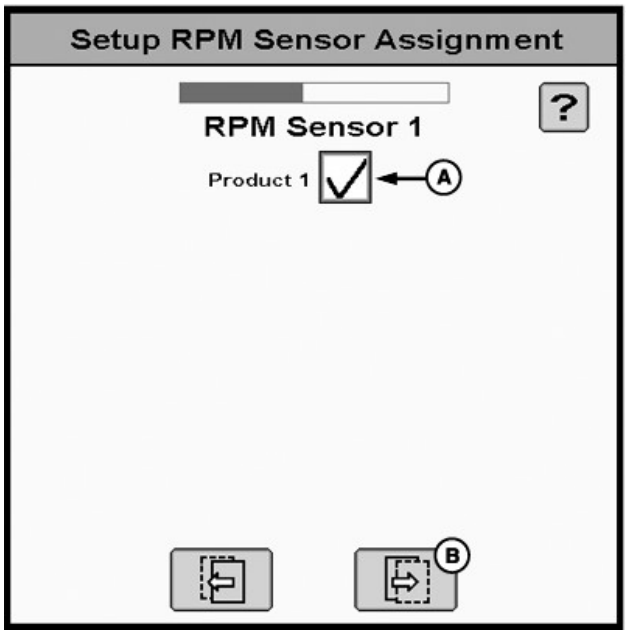


PC22625—UN—12MAY16

A—Pressure Sensor Minimum
B—Pressure Sensor Maximum
C—Alarm Checkbox
D—Next Page Button

NOTE: Pressure alarm settings are based on operator preference. Set up alarms so they notify operator before the system needs attention.

31. If sensors were specified, set up pressure alarms for each sensor:
    a. Enter the Minimum Pressure (A).
    b. Enter the Maximum Pressure (B).
    c. To enable sensor minimum and maximum alarms, select the Alarm checkbox (C).
    d. Select the Next Page button (D).

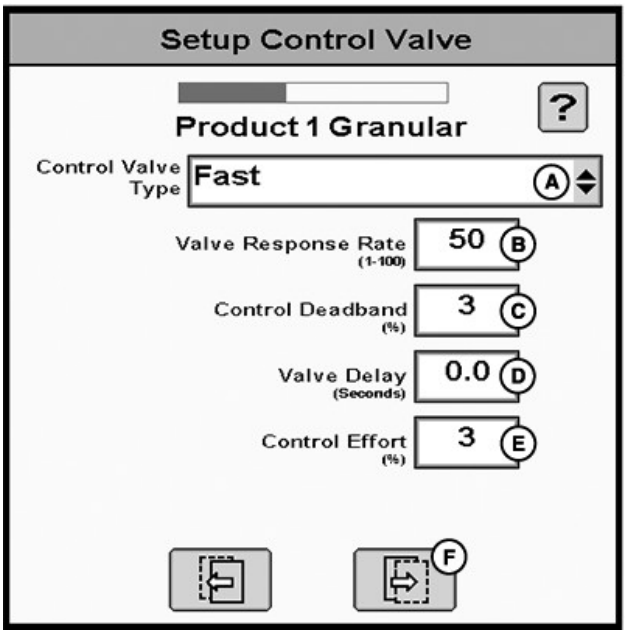


PC22626—UN—12MAY16

A—Product Checkbox
B—Next Page Button

NOTE: RPM sensors can only be assigned in the setup wizard. When an RPM sensor is assigned to a product the high and low limit RPM alarms are active when that product is turned on.

32. Select the Product checkbox (A) to assign a product to the Fan / Spinner RPM sensors. When an RPM sensor is assigned to a product, the high and low limit RPM alarms are active when that product is turned on.
33. Select the Next Page button (B).



PC25048—UN—27NOV17

A—Control Type Drop-Down menu
B—Valve Response Rate
C—Control Deadband
D—Valve Delay
E—Control Effort
F—Next Page Button

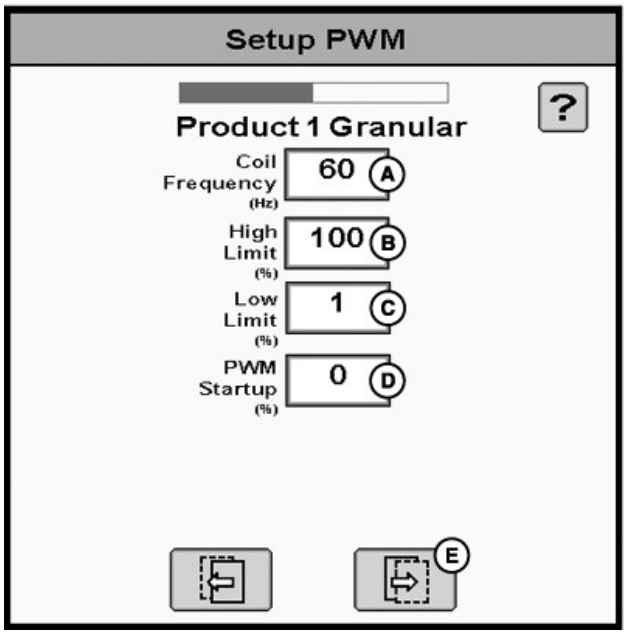
NOTE: Control unit utilizes a control valve to manipulate application rates.

34. Select the Control Valve Type from the drop-down menu (A).

NOTE: Entry fields vary for each control type selected. Use default values for the initial setup.

(For more information, reference Adjust Control Valve.)

35. Enter the Valve Response Rate (B).
36. Enter the Control Deadband (C).
37. Enter the Valve Delay (D).
38. Enter the Control Effort (E).
39. Select the Next Page button (F).



PC22631—UN—12MAY16

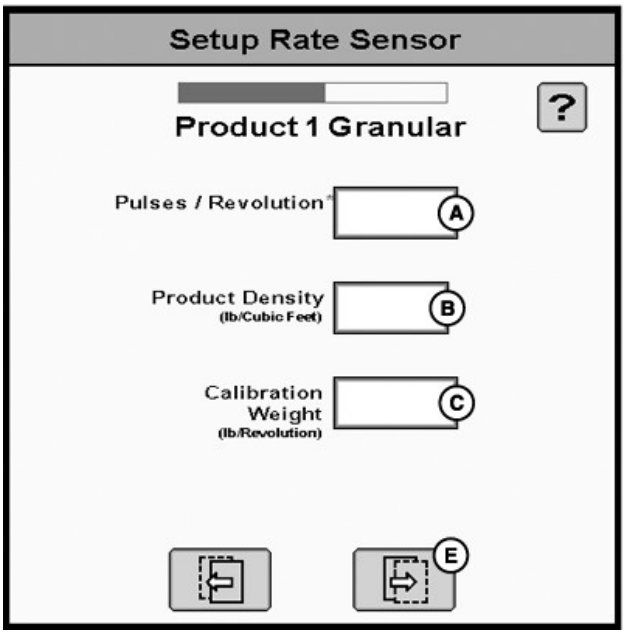
A—Coil Frequency
B—High Limit
C—Low Limit
D—PWM Startup
E—Next Page Button

40. If PWM Close was selected as the control type valve:
    a. Enter the Coil Frequency (A).

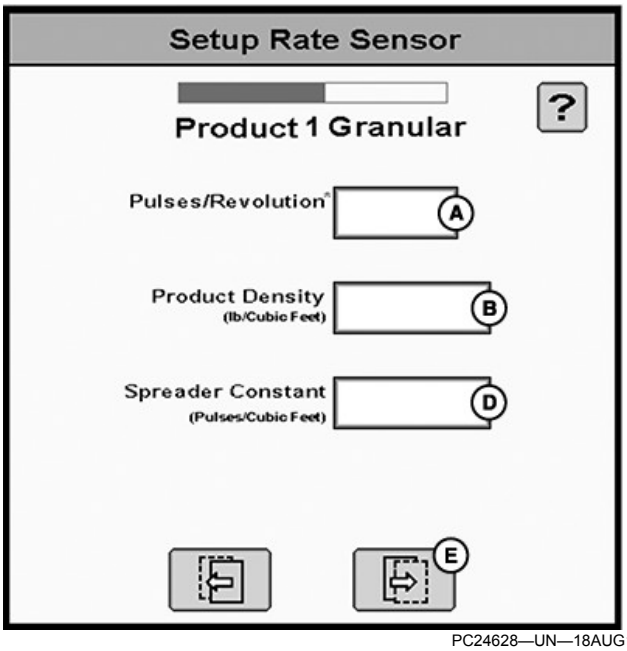
       (Reference the control valve manufacturer Operator's Manual for the coil frequency.)

    NOTE: High and low limits from the GreenStar™ Rate Controller are based on a 1-255 scale. To use these values for the John Deere Rate Controller 2000, divide the high and low limits by 255. Enter this percentage for High (B) and Low Limits (C).

    b. Enter High Limit (B).
    c. Enter the Low Limit (C).
    d. Enter the PWM Startup (D) for the PWM valve or PWM Standby for the PWM close valve.
    e. Select the Next Page button (E).



PC24629—UN—18AUG17



PC24628—UN—18AUG17

A—Pulse / Revolution
B—Product Density
C—Calibration Weight
D—Spreader Constant
E—Next Page Button

NOTE: Most RPM sensors are marked with a calibration number and pulse / revolutions to use for the initial setup. Additional RPM sensor calibration is recommended.

(For more information, reference Calibrate Rate Sensor.)

41. Enter the Pulse / Revolution (A).
42. Enter the Product Density (B).
43. If configuring an air cart or generic profile, enter the Calibration Weight (C). If configuring a pull-behind or self-propelled spreader, enter a Spreader Constant (D).

Auger System

Calibration weight =	CFR x product density
(kg [lb] / revolution) =	(m^3 [ft^3] / revolution) x (kg/m^3 [lb/ft^3])

Conveyor System

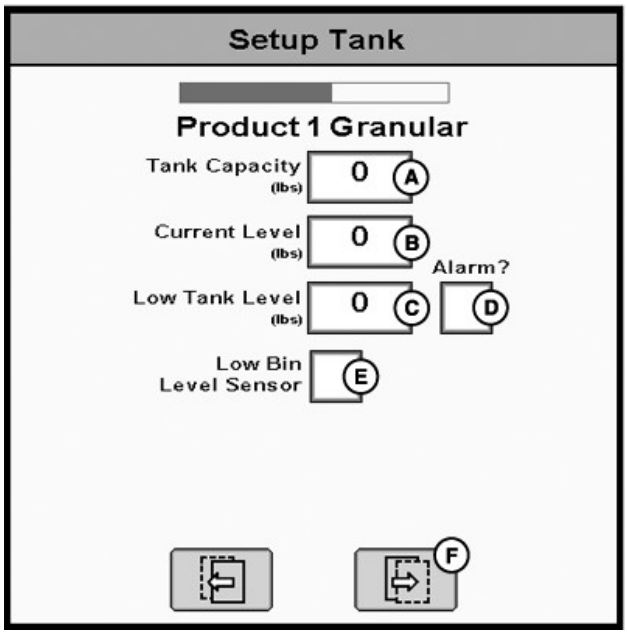
NOTE: CFR is based on 1 cm (1 in) feed gate opening, and feed gate value must be measured in cm or inches.

Calibration weight =	CFR x feed gate opening x product density
(kg [lb] / revolution) =	(m^3 [ft^3] / revolution) x (cm [in]) x (kg/m^3 [lb/ft^3])

Spreader System

Spreader Constant =	Encoder calibration value / CFR
(Pulses / m^3 [ft^3]) =	(pulses / revolution) / (m^3 [ft^3] / revolution)

44. Select the Next Page button (E).



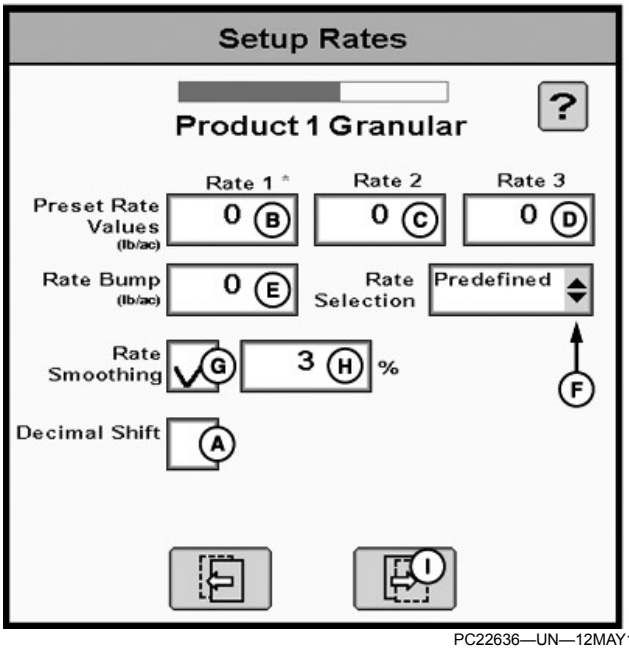
PC22635—UN—12MAY16

A—Tank Capacity
B—Current Level
C—Low Tank Level
D—Low Tank Level Alarm Checkbox
E—Low Bin Level Sensor Checkbox
F—Next Page Button

NOTE: John Deere Rate Controller 2000 estimates the tank level based on the calculated applied volume.

45. Enter Tank Capacity (A).

46. Enter the Current Level (B).
47. If desired, enter the Low Tank Level (C) and select the Low Tank Level Alarm checkbox (D).
48. If equipped, select the Low Bin Level Sensor checkbox (E).
49. Select the Next Page button (F).



PC22636—UN—12MAY16

A—Decimal Shift Checkbox
B—Rate 1 Preset Value
C—Rate 2 Preset Value
D—Rate 3 Preset Value
E—Rate Bump
F—Rate Selection Drop-Down Menu
G—Rate Smoothing Checkbox
H—Rate Smoothing Percentage
I—Next Page Button

NOTE: Decimal shift allows for higher resolution of target and displayed application rates by including an additional decimal place. It applies to all products of the same type, such as liquid or granular.

The maximum rate that can be entered is decreased by a factor of 10. For example, 1000 is decreased to 100.0.

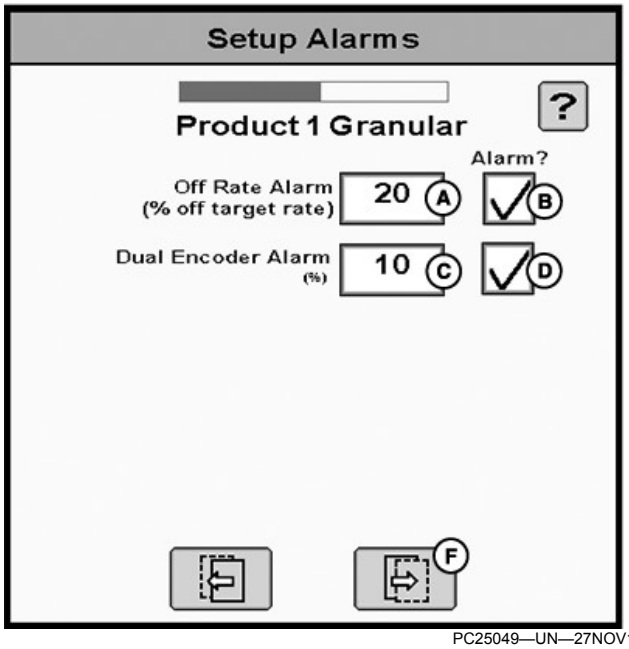
50. Select the Decimal Shift checkbox (A).
51. Enter up to three Preset Rate Values (B—D). Rate 1 preset value is required.
52. Enter the Rate Bump (E).
53. To choose the rate type displayed on the main run page select the Rate Selection from the drop-down menu (F).
    - Predefined—Displays the selection buttons for the Preset Rate Values.
    - Rate Bump—Displays the plus (+) and minus (-) buttons that increment target rate by Rate Bump value.
    - Map Based—Displays the prescription target rate for the current GPS location.

      (Reference Apex™ or John Deere Operations Center for more information about creating prescriptions.)

NOTE: Rate smoothing removes small fluctuations in the as-applied rate values. The displayed as-applied rate remains constant until rate increases or decreases by more than the set rate smoothing percentage.

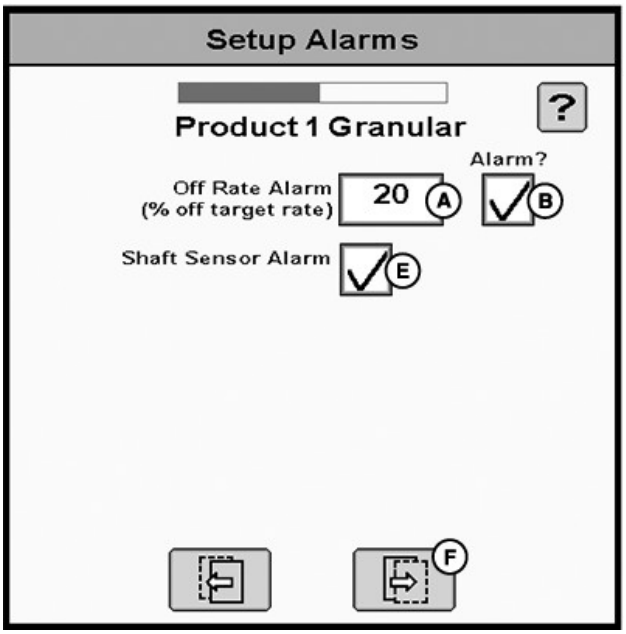
Default is 3% and can be set between 3—15%.

54. If desired, select the Rate Smoothing checkbox (G) and enter the Rate Smoothing Percentage (H).
55. Select the Next Page button (I).
56. If the Spinner / Fan Control was selected, repeat steps 35—55 to set up the spinner or fan control valve.



PC25049—UN—27NOV17

Apex is a trademark of Deere & Company



PC25050—UN—27NOV17

A—Off Rate Alarm
B—Off Rate Alarm Checkbox
C—Dual Encoder Alarm
D—Dual Encoder Alarm Checkbox
E—Shaft Sensor Alarm Checkbox
F—Next Page Button

NOTE: Alarms entry fields vary based on the control valve type selected.

If enabled, the Off Rate Alarm is displayed when the system detects a rate change greater than the entered percentage for more than 5 seconds.

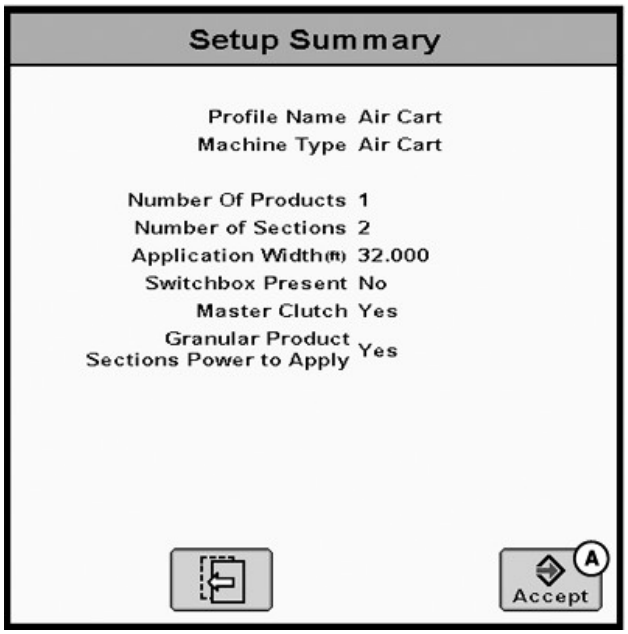
57. If desired, enter the Off Rate Alarm (A) and select the Alarm checkbox (B).

NOTE: If enabled, the Dual Encoder Alarm is displayed when the system detects a rate difference between the two encoders that exceeds the percent entered.

58. If desired, enter the Dual Encoder Alarm (C) and select the Alarm checkbox (D).

NOTE: If enabled, the Shaft Sensor Alarm is displayed when the product is on and the rate sensor is reading a rate, but the shaft sensor is not seeing shaft movement.

59. If desired, select the Shaft Sensor Alarm checkbox (E).
60. Select the Next Page button (F).



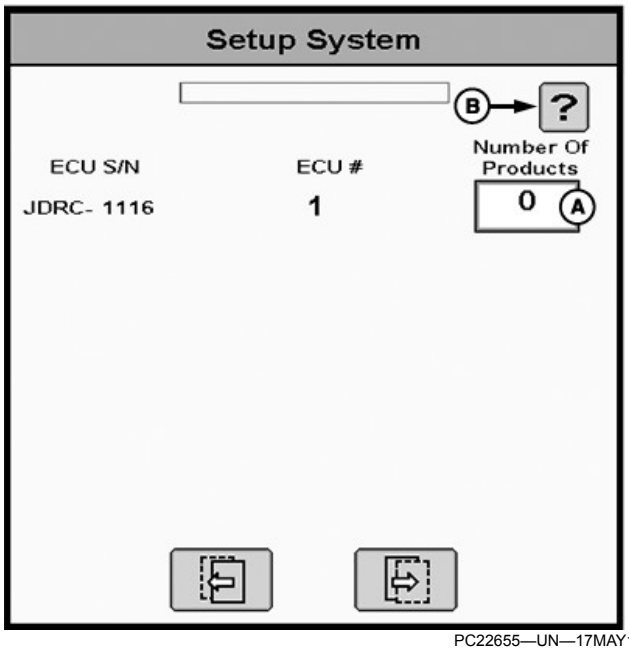
PC22637—UN—12MAY16

A—Accept Button.

61. Review the Setup Summary and select the Accept button (A).

HC94949,0000CB0-19-20DEC17

Set Up Section Groups



PC22655—UN—17MAY16

A—Number of Products
B—Help Button

Section groups allow the operator to assign products and sections to a particular group to ensure accurate control and documentation. If Number of Products (A) is greater than one, the setup wizard guides the operator through setting up section groups and assigning drivers

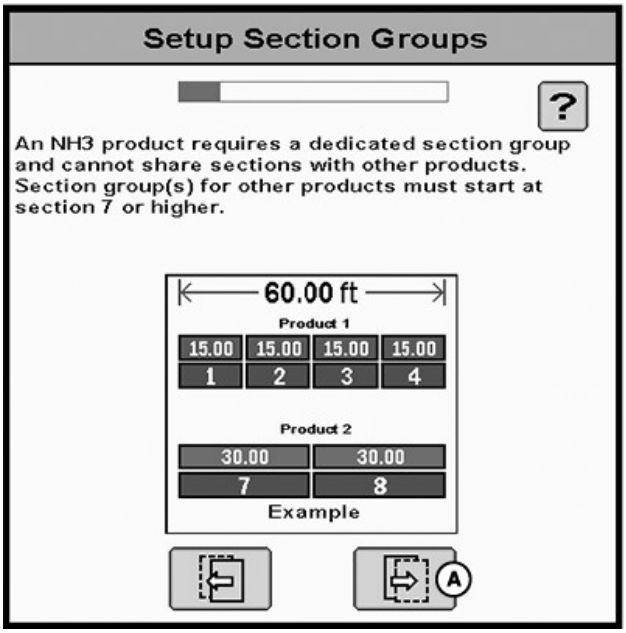
based on the options selected. Select the Help button (B) for more information about a step.

1. To start the setup wizard, select the best-fit application type and follow instructions up to the Setup Section Groups page.

   (Reference Setup Overview for more information.)

NOTE: For NH3 applications, the first six section drivers can only be assigned to NH3 section valves. The second section group starts at section driver seven or higher.

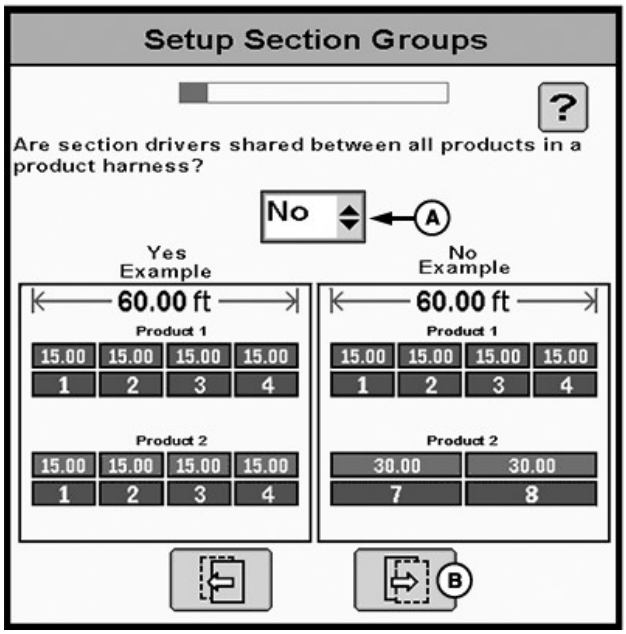
2. If configuring:



PC22656—UN—17MAY16

A—Next Page Button

- For NH3 applications, read the message and select the Next Page button (A).



PC25052—UN—28NOV17

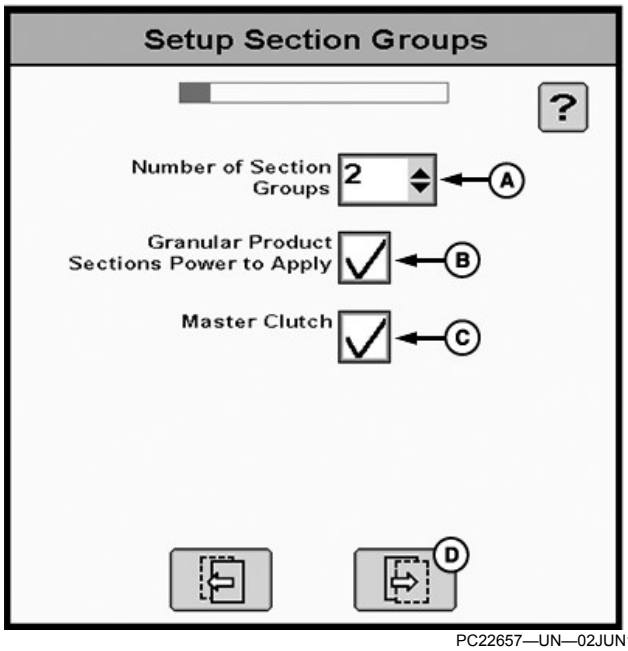
A—Shared Section Drivers Drop-Down Menu
B—Next Page Button

- For applications other than NH3:

  a. Select the Shared Section Drivers option form the drop-down menu (A).

     - Yes, all products share same section configuration and wiring.
     - No, products will not share the same configuration and wiring.

  b. Select the Next Page button (B).

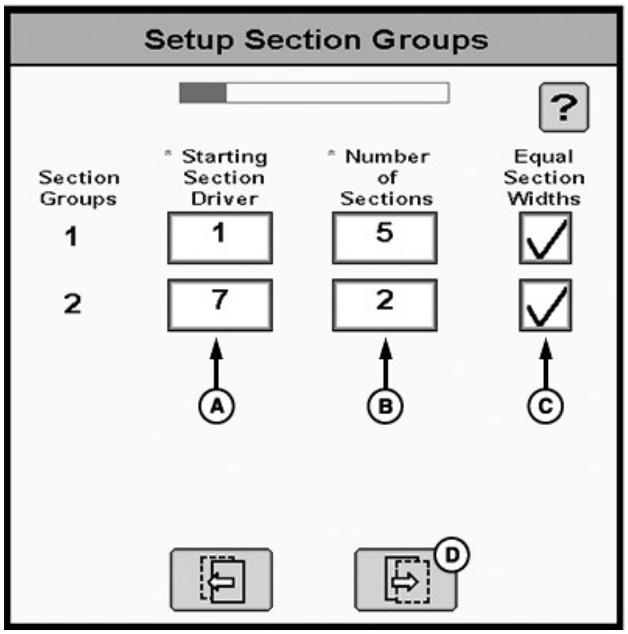


PC22657—UN—02JUN16

A—Number of Sections Drop-Down Menu
B—Granular Product Sections Power to Apply Checkbox
C—Master Clutch Checkbox
D—Next Page Button

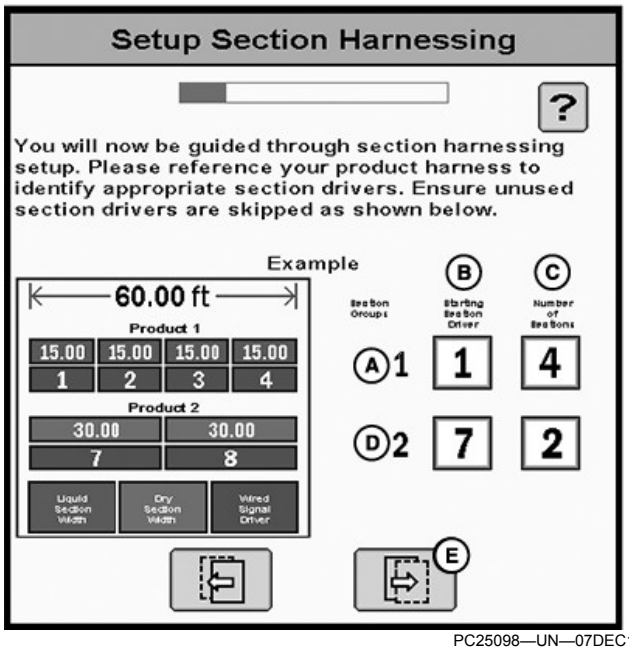
3. Select the Number of Section Groups from the drop-down menu (A). For example, if setting up an air cart with two dry products sharing the same section group with two sections and a liquid product with its own section group with four sections. The total number of section groups is two.
4. Select all that apply:
   - Granular Product Sections Power to Apply checkbox (B)—Select for the control unit to provide power to the section signal wire when the section is on. Deselect for the control unit to provide power to the section signal wire when the section is off.
   - Master Clutch checkbox (C)—Select to enable the master signal (air carts only).
5. Select Next Page button (D).

NOTE: Note how your product harness is wired before identifying the associate drivers. Section group 1 (A) valve starts on Starting Section Driver 1 (B) and has four sections (C). Section Group 2 (D) is wired to start on Driver 7, which must be identified as the starting driver. Section Group 2 has 2 sections.



PC22661—UN—18MAY16

A—Starting Section Driver
B—Number of Sections
C—Equal Section Width Checkboxes
D—Next Page Button



PC25098—UN—07DEC17

A—Section Group 1
B—Starting Section Driver
C—Number of Sections
D—Section Group 2
E—Next Page Button

6. If configuring products that requires multiple sections, read the message and select the Next Page button (E).

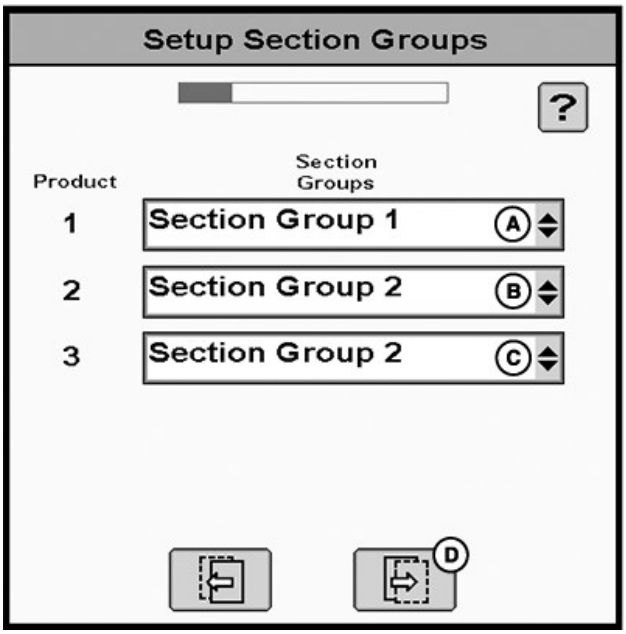
NOTE: For NH3 applications or if fitting up harnesses already pinned out to 37-pin connectors (for example replacing two GreenStar™ Rate Controllers), drivers have to be skipped in order for product 2 sections to line up with the harnessing.

- *NH3 application—The first six section drivers can only be assigned to the first section group. The second section group must start at section driver seven or higher.*
- *37-Pin connectors—The second section group must start at section driver eleven or higher as the first products 37 pin product harness is claiming sections 1 to 10.*

7. Enter the Starting Section Driver (A) and Number of Sections (B) for each section group. Skip any unused section drivers. Product harness wiring to the section valves or clutches determine the starting section drivers.

   (Reference Sections for more information on maximum number of available sections.)

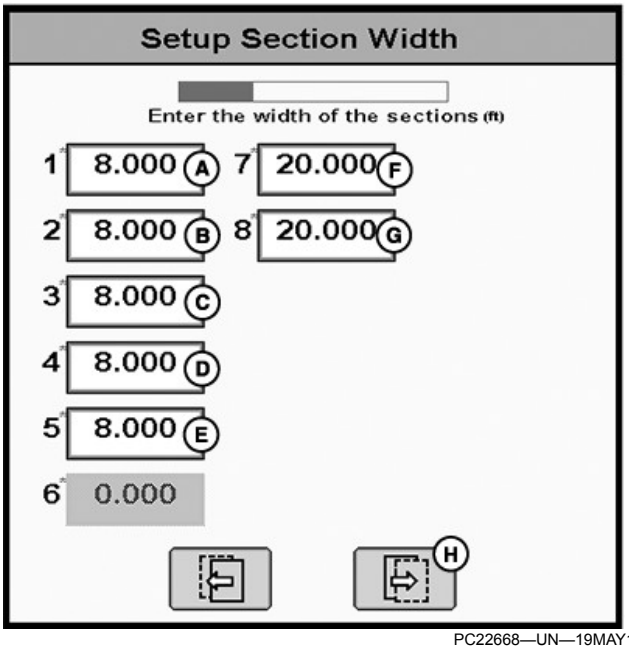
   (Reference harnessing Installation Instructions or schematics for more information.)
8. If applicable, select the Equal Section Width checkboxes (C).
9. Select the Next Page button (D). If all products share the same section drivers, skip to step 12.



PC22667—UN—19MAY16

A—Product 1 Section Group Drop-Down Menu
B—Product 2 Section Group Drop-Down Menu
C—Product 3 Section Group Drop-Down Menu
D—Select Next Page Button

10. For each product, select the Section Group from the drop-down menus (A—C).
11. Select the Next Page button (D).

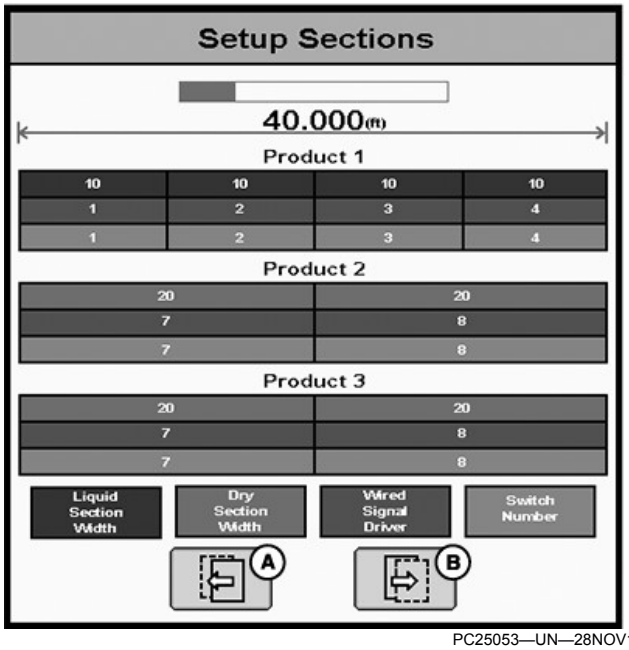


PC22668—UN—19MAY16

A—Group 1, Section 1 Width
B—Group 1, Section 2 Width
C—Group 1, Section 3 Width
D—Group 1, Section 4 Width
E—Group 1, Section 5 Width
F—Group 2, Section 7 Width
G—Group 2, Section 8 Width
H—Next Page Button

NOTE: Total width of all sections must be equal to the total Section Group width. If Equal Width Sections was selected, Section Group width is evenly divided by the number of sections.

12. Enter the width for each section (A—G).
13. Select the Next Page button (H).



PC25053—UN—28NOV17

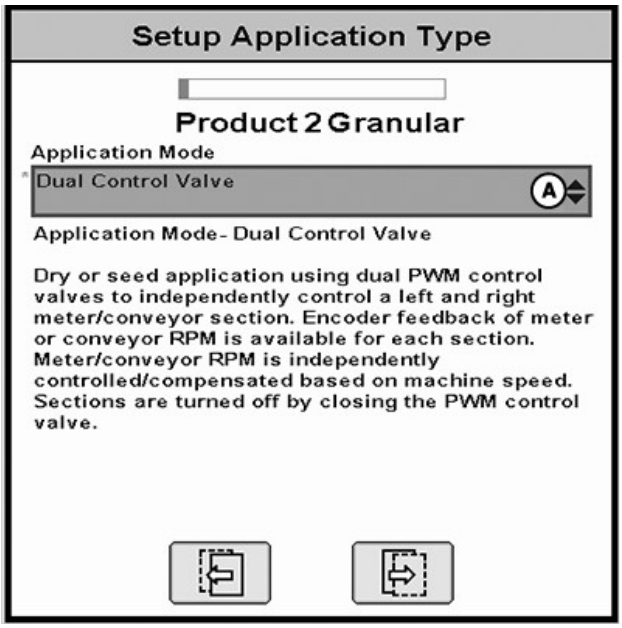
A—Previous Page Button
B—Next Page Button

NOTE: Graphic displays each section width and output driver that controls each section valve. Verify that implement wiring is correct. Section Group width and section widths may only be edited in the setup wizard. If needed, select the Previous Page button (A) to make corrections.

14. Review the Setup Sections and select the Next Page button (B).
15. Continue the rest of the setup wizard for the selected configuration.

HC94949,0000CAC-19-20DEC17

Set Up Dual Control Valve



PC25100—UN—07DEC17

A—Application Mode Drop-Down Menu

NOTE: The return side of the PWM control valve must be wired to the control valve return ground.

Select Dual Control Valve from the Application Mode drop-down menu (A). The control unit changes the product valve driver pairs from increase (+) and decrease (-) to left-hand PWM source and right-hand PWM source. On an NH3 configuration, the second and third product drivers are different from a Generic or Air Cart profile.

(Reference Dual Control Valve in Specifications section.)

HC94949,0000CAE-19-12DEC17

Set Up Implement Height Indicator

NOTE: Implement height switch is required for NH3 applications and cannot be disabled.

Implement height indicator is optional for liquid fertilizer tools (switch only) and air carts (switch or sensor). Implement height indicator can be enabled, disabled, and set up without the setup wizard for these applications.

PC22295—UN—21MAR16

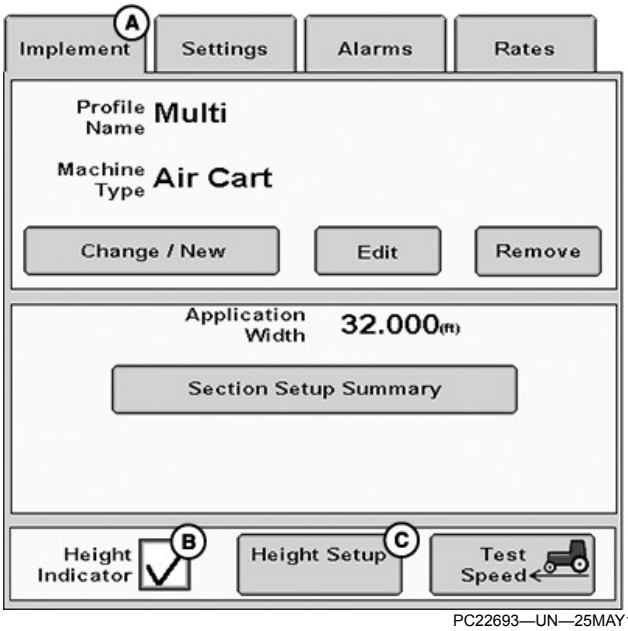
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

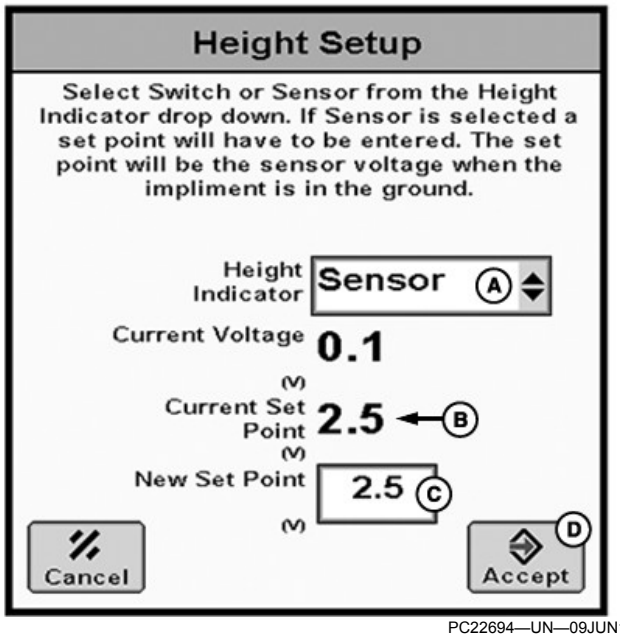
2. Select the Setup softkey.



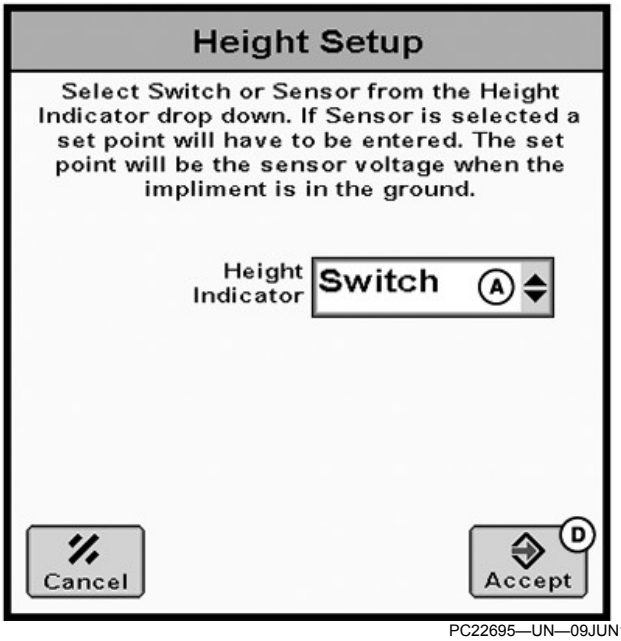
PC22693—UN—25MAY16

A—Implement Tab
B—Height Indicator Checkbox
C—Height Setup Button

3. Select the Implement tab (A).
4. To enable, select the Implement Height Switch or Height Indicator checkbox (B).
5. To change the type of the height indicator, select the Height Setup button (C).



PC22694—UN—09JUN16



PC22695—UN—09JUN16

A—Height Indicator Drop-Down Menu
B—Current Voltage
C—New Set Point
D—Accept Button

6. Select Sensor or Switch from the Height Indicator drop-down menu (A).

   If Sensor is selected, lower implement to the ground and enter the Current Voltage (B) into New Set Point (C).

7. Select the Accept button (D).

RW00482,00006AD-19-13DEC17

Adjust Settings

Settings tab allows the operator to change most settings after creating a profile with the setup wizard.

PC22295—UN—21MAR16

John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.

PC22341—UN—06APR16

A—Settings Tab

3. Select the Settings tab (A).

Control Valve Setup Button

PC22436—UN—06APR16

Control Valve Setup Button

- Valve Response Rate
- Control Deadband
- Valve Delay
- Valve Advance
- Control Effort
- PWM Setup

  (Reference Adjust Control Valve for more information.)

  - Coil Frequency
  - High Limit
  - Low Limit
  - PWM Standby
  - PWM Startup
- Boost Pump Setup

  - Coil Frequency
  - High Limit
  - Low Limit

- Valve Response Rate

Flow / Rate Sensor Setup Button

PC22437—UN—06APR16

Flow / Rate Sensor Setup Button

- Flowmeter Calibration
- Flowmeter Pulse / Units
- Tank Fill Flowmeter Calibration
- Tank Fill Flowmeter Pulse / Units
- Catch Test Calibration

  (Reference Calibrate Flowmeter—Catch Test for more information.)
- Applied Product Calibration

  (Reference Calibrate Flowmeter—Applied Product for more information.)

Tank / Bin Setup Button

PC22438—UN—06APR16

Tank / Bin Setup Button

- Tank Capacity
- Current Level
- Low Tank Level
- Low Tank Level Alarm
- Low Bin Level Sensor
- Bin Chaining Mode
- Bin Chaining Order

(Reference Set Up Bin Chaining for more information.)

Display Settings Button

PC22439—UN—06APR16

Display Settings Button

NOTE: The four data fields selected display on the top half of the main run page. Softkey region may be configured to display the first three selected data fields for each product.

- Data Fields Displayed
  - Actual Rate Per Area
  - Target Rate Per Area
  - Area Per Hour
  - Area Remaining on Current Tank Level
  - Traveling Speed
  - Pressure Sensor
  - Volume Remaining
  - Volume Per Time (Flow Rate)
  - Area
  - Volume Applied
  - Duty Cycle

NOTE: It is recommended to select Duty Cycle as a data field to display when the boost pump is present.

Pressure Sensor Setup Button

PC22440—UN—06APR16

Pressure Sensor Setup Button

- Pressure Sensor 1—6
- Calibrate Pressure Sensor
- Pressure Alignment Setup

(Reference Calibrate Pressure Sensor for more information.)

Auxiliary Features Setup Button

PC22441—UN—06APR16

Auxiliary Features Setup Button

- RPM 1 Calibration Pulse / Rev
- RPM 1 Low Limit
- RPM 1 Low Limit Alarm
- RPM 1 High Limit
- RPM 1 Low Limit Alarm
- RPM Sensor Assignment
- Enable Agitator
- Agitator Duty Cycle

Tiered Boom Setup Button

PC22442—UN—06APR16

Tiered Boom Setup

- Tier 1 Max Flow Rate
  - On a 2-tier system, both tiers are enabled once Tier 1 Max Flow Rate is achieved.
  - On a 3-tier system, the first tier is disabled and the

second tier is enabled once Tier 1 Max Flow Rate is achieved.

- Tier 2 Max Flow Rate
  - On a 2-tier system, Tier 2 Max Flow Rate should be set to zero.
  - On a 3-tier system, both tiers are enabled once Tier 2 Max Flow Rate is achieved.
- Percent Tier Disable
  - Percent Tier Disable is the percentage of volume per minute setting that causes system to disable higher tier.

RW00482,00006AE-19-20DEC17

Set Up Bin Chaining

Bin chaining is not an option while creating or editing a profile. Bin chaining is only available on bins 1 and 2 under a spreader profile. Each product must share the same section group for bin chaining to be available.

Activating or deactivating bin chaining results in changes to the displays documentation settings. Verify product application type and name for all products within documentation after setting up bin chaining.

PC22295—UN—21MAR16

John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

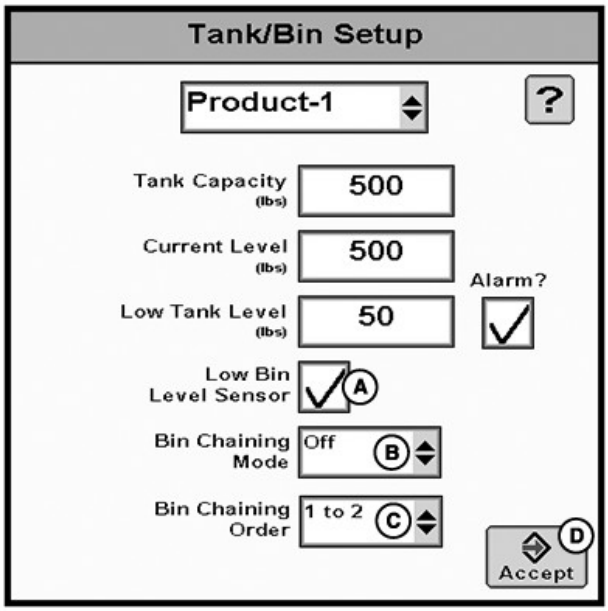
2. Select the Setup softkey.

PC22341—UN—06APR16

A—Settings Tab

3. Select the Settings tab (A).

NOTE: Low bin level sensor required for bin chaining to function.



PC24631—UN—21AUG17

A—Low Bin Level Sensor checkbox
B—Bin Chaining Mode Drop-Down Menu
C—Bin Chaining Order Drop-Down Menu
D—Accept Button

5. Select the Low Bin Level Sensor checkbox (A). If not selected, the Bin Chaining Mode (B) and Bin Chaining Order (C) drop-down menus do not display.
6. Select the Bin Chaining Mode from the drop-down menu.
   - Auto—automatically switches bins.
   - Manual—alerts operator when the low bin level sensor trips.
   - Off—is the default mode. To change the Bin Chaining order, the Bin Chaining Mode must be off.
7. Select the Bin Chaining Order from the drop-down menu.
8. Select the Accept button (D).

RW00482,00001AA-19-20DEC17

Adjust Control Valve

NOTE: For information on control valves, refer to the Component Overview.

Control valve may need adjustment for specific applications or to fine-tune for best performance. The default values should work for basic operation of the valve.

PC22365—UN—31MAR16

To adjust control valve, select the Control Valve Setup button.

	Stand-ard	Fast Close	Fast	PWM	PWM Close
Valve Response Rate (1—100)	50	50	50	50	50
Control Deadband (%)	2	2	2	2	2
Valve Delay (sec)	0.0		0.0	0.0	
Valve Advance (sec)	0.0		0.0		
Control Effort (%)	35	3	3		

Default Valve Values

Valve Response Rate—Enter value for aggressiveness of the control unit as it approaches target rate. A value that is too high may lead to oscillation. While a value too low may take a long time to reach target rate.

Control Deadband—Enter percent of target rate tolerance for the control valve. For example, if 2% is entered, control unit attempts to adjust flow rate until actual rate is within 2% of target rate.

Valve Delay—Enter amount of time in seconds between when first section is turned on and control unit begins to control flow rate. Valve Delay is useful when starting product application at lower speeds, such as coming out of headland areas.

Valve Advance—Enter amount of time in seconds the control unit commands the control valve to open after all the sections are turned off. Valve Advance may be used with valve delay for low rate applications to build up pressure when the master switch is turned on.

Control Effort—Enter the minimum percentage power needed for the control valve to change position.

PC22366—UN—31MAR16

PWM Setup Button

PWM (Pulse Width Modulation) Setup Button

If a PWM valve was selected, select PWM Setup button for additional options.

	PWM	PWM Close
Coil Frequency (50—500 Hz)	60	60
High Limit (%)	100.0	100.0
Low Limit (%)	1.0	1.0
PWM Startup (%)		0.0
PWM Standby (%)	0.0	

Default PWM Settings

Coil Frequency—Frequency of pulses sent to the PWM valve. PWM coil frequencies synchronize for all products that have PWM valve selected.

(Reference valve manufacturer Operator's Manual for the recommended settings.)

High Limit—Maximum PWM percent the control unit allows system to reach when product is applying.

Low Limit—Minimum PWM percent the control unit allows system to reach when product is applying.

PWM Standby (PWM valve)—When controlling a liquid product, the PWM standby value sets the duty cycle which the system maintains when all sections are closed.

PWM Startup (PWM close valve)—Duty cycle the control unit commands to when valve is opened.

RW00482,0000649-19-20DEC17

Set Up NH3+ Boost Pump

NOTE: It is recommended to select Duty Cycle as a data field to display when the boost pump is present.

(For more information on changing display settings, reference Adjust Settings.)

The Raven AccuFlow HP™ Plus is controlled based on flow. The John Deere Rate Controller 2000 is only able to control one fast valve when utilizing an NH3 AccuFlow HP™ Plus configuration. Use a PWM in conjunction with a fast control valve to control the AccuFlow HP™ Plus boost pump.

NH3 AccuFlow HP™ Plus configuration requires two pressure sensors:

- Sensor 1 on the gauge tree.
- Sensor 2 on the pump inlet.

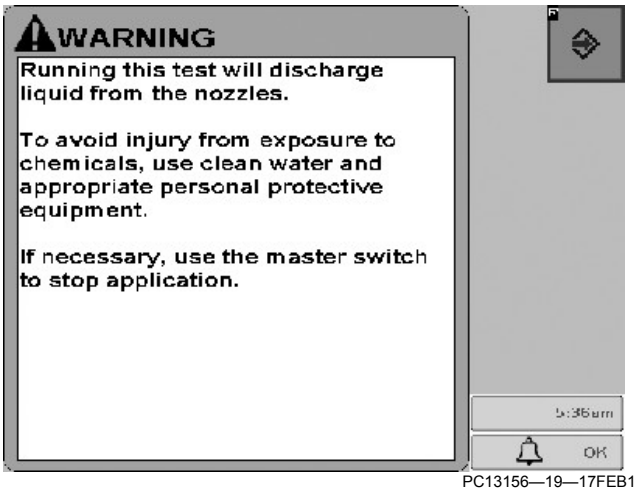
Recommend starting settings:

- Coil Frequency: 122
- High limit: 85
- Low limit: 20
- Response Rate: 70
- Control Deadband: 3

RW00482,00001AC-19-20DEC17

AccuFlow HP is a trademark of Raven Industries Inc.

Calibrate Flowmeter — Liquid Catch Test



PC13156—19—17FEB11

This message will be displayed when any diagnostics test is selected on sprayer or liquid fertilizer applications that will discharge liquid.

RW00482,00006B6-19-01JUN16

Calibrate Flowmeter—Liquid Catch Test

IMPORTANT: Always fill solution tank with clean water before performing a calibration test.

NOTE: Ensure that control valve and rate sensor are configured before performing a calibration test.

Catch Test allows operator to collect product from up to seven samples and enter exact amounts collected to calibrate flowmeter. Place containers (such as calibration containers) under the nozzles to capture the product sprayed during test. If all the nozzles require testing, repeat the Flowmeter Calibration as many times as needed. By measuring these samples and entering the values into system, an accurate flowmeter calibration value is determined.

PC22295—UN—21MAR16

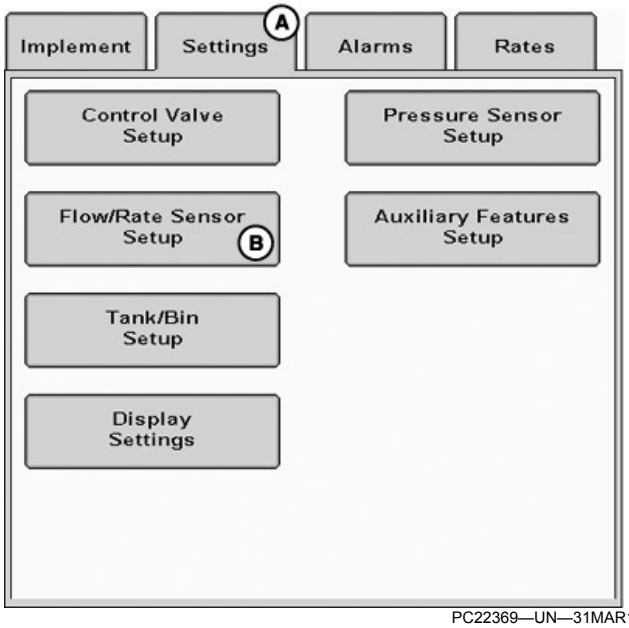
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

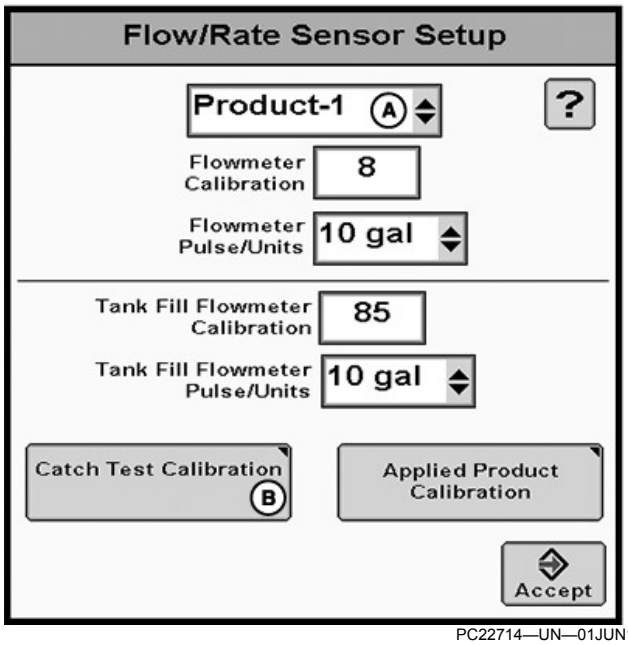
2. Select the Setup softkey.



PC22369—UN—31MAR16

A—Settings Tab
B—Flow / Rate Sensor Setup Button

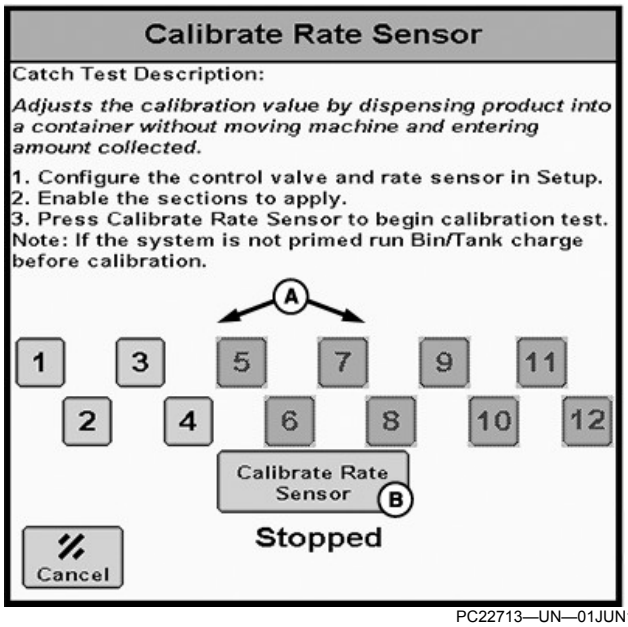
3. Select the Settings tab (A).
4. Select the Flow / Rate Sensor Setup button (B).



PC22714—UN—01JUN16

A—Product Drop-Down Menu
B—Catch Test Calibration Button

5. Select the Product from the drop-down menu (A).
6. Select the Catch Test Calibration button (B).



PC22713—UN—01JUN16

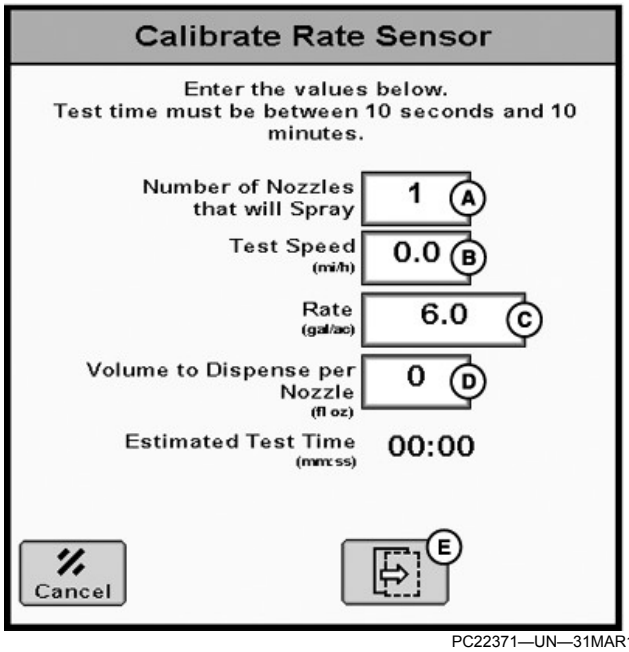
A—Sections
B—Calibrate Rate Sensor Button

NOTE: If the system is not primed, charge the tank or bin before calibration.

(Reference Tank / Bin Charging for more information.)

In multiple product configurations, only the sections assigned to the selected product may be selected. Repeat Flowmeter Calibration as many times as needed for all product and sections that requires testing.

7. Enable the sections (A) to apply.
8. Select the Calibrate Rate Sensor (B).

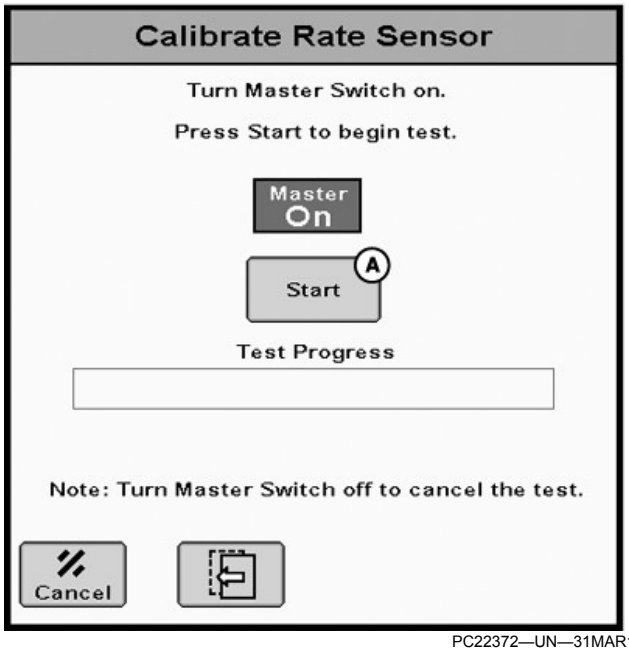


PC22371—UN—31MAR16

A—Number of Nozzles that will Spray
B—Test Speed
C—Rate
D—Volume to Dispense per Nozzle
E—Next Page Button

NOTE: Enter conditions that are comparable to normal operation. Larger dispense volumes result in longer, but more accurate, calibration tests.

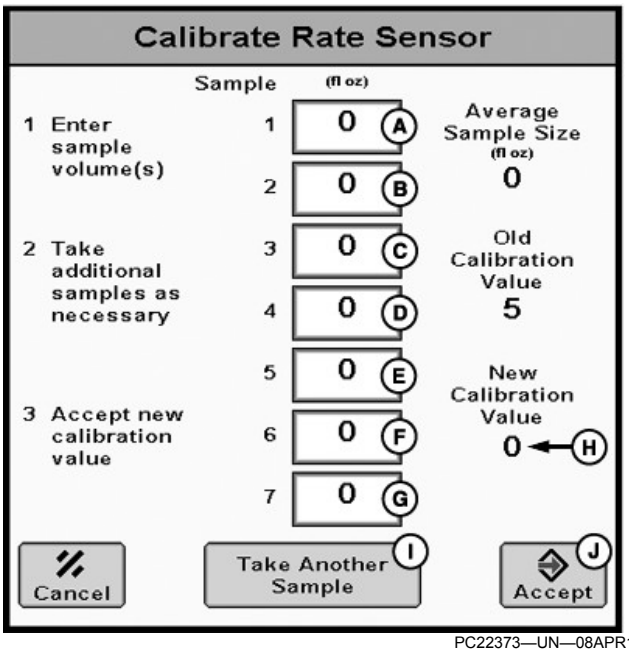
9. Enter the calibration test parameters (A—D).
10. Select the Next Page button (E).



PC22372—UN—31MAR16

A—Start button

11. Turn on the master switch.
12. To begin the test, select the Start button (A).



PC22373—UN—08APR16

A—Sample 1
B—Sample 2
C—Sample 3
D—Sample 4
E—Sample 5
F—Sample 6
G—Sample 7
H—New Calibration Value
I—Take Another Sample Button
J—Accept Button

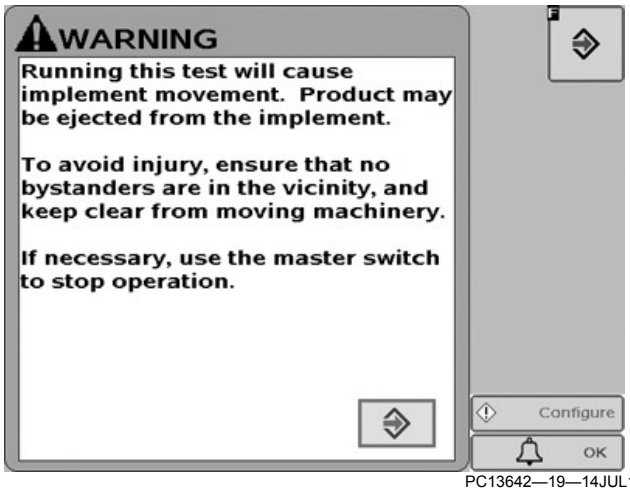
NOTE: Turn master switch off at any time to cancel the test.

If fewer than seven samples are collected, leave remaining values set to 0.

13. Enter the sample volumes (A—G). New Calibration Value (H) is calculated as the samples are entered.
14. Select Take Another Sample (I) if necessary.
15. Select the Accept button (J).

RW00482,00006B7-19-13DEC17

Calibrate Rate Sensor — Dry Catch Test



PC13642—19—14JUL11

This message will be displayed when any diagnostic test or calibration procedure is selected that will discharge product.

RW00482,00006BB-19-02JUN16

Calibrate Rate Sensor—Dry Catch Test

NOTE: Ensure that control valve and rate sensor are configured before performing a calibration test.

Place containers (such as calibration containers) under the application point to capture product during the test. Repeat Rate Sensor Calibration as many times as needed for all product and sections that requires testing. By measuring these samples and entering values into system, an accurate rate sensor calibration value is determined.

PC22295—UN—21MAR16

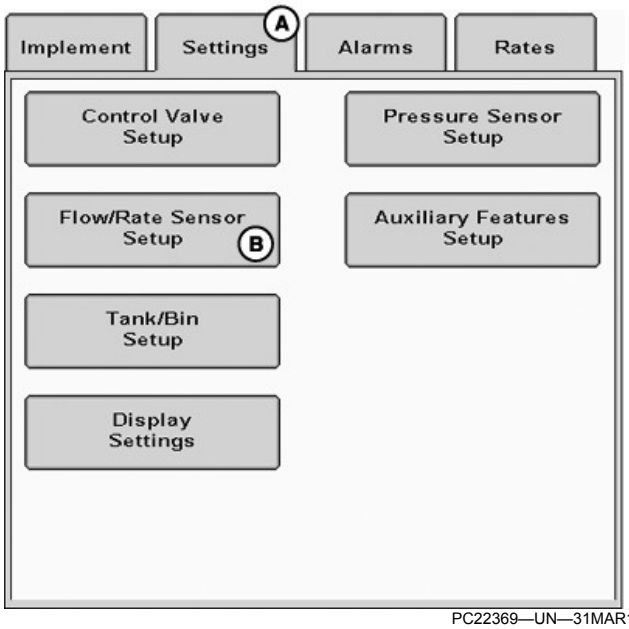
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

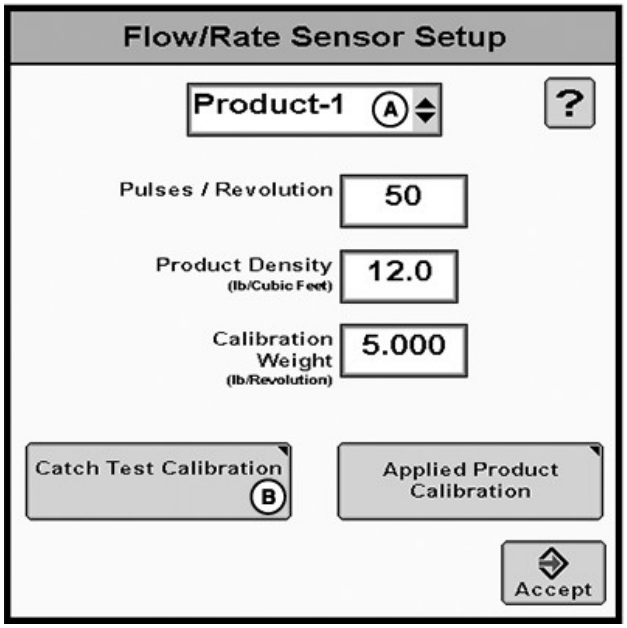
2. Select the Setup softkey.



PC22369—UN—31MAR16

A—Settings Tab
B—Flow / Rate Sensor Setup Button

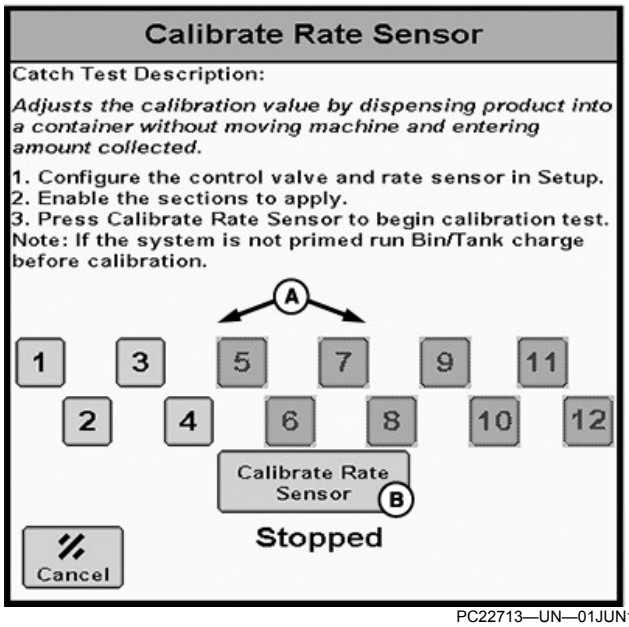
3. Select the Settings tab (A).
4. Select the Flow / Rate Sensor Setup button (B).



PC22718—UN—02JUN16

A—Product Drop-Down Menu
B—Catch Test Calibration Button

5. Select the Product from the drop-down menu (A).
6. Select the Catch Test Calibration button (B).



PC22713—UN—01JUN16

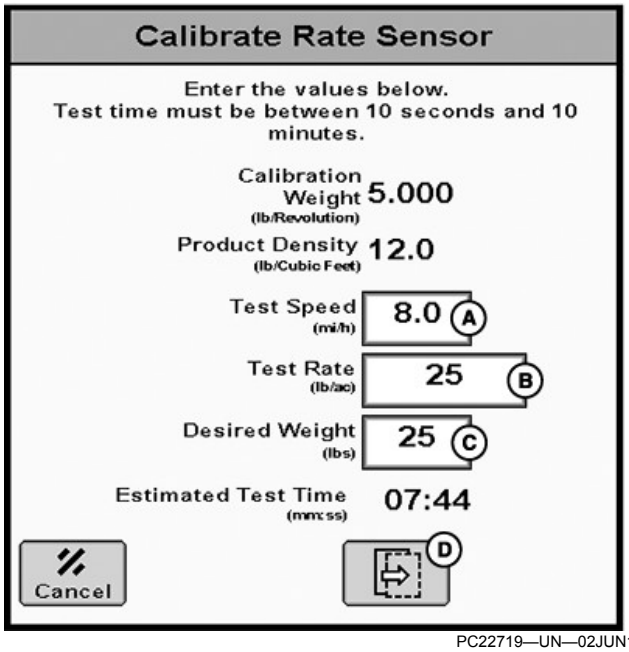
A—Sections
B—Calibrate Rate Sensor Button

NOTE: If the system is not primed, charge the tank or bin before calibration.

(Reference Tank / Bin Charging for more information.)

In multiple product configurations, only the sections assigned to the selected product may be selected. Repeat Flowmeter Calibration as many times as needed for all product and sections that requires testing.

7. Enable the sections (A) to apply.
8. Select the Calibrate Rate Sensor (B).

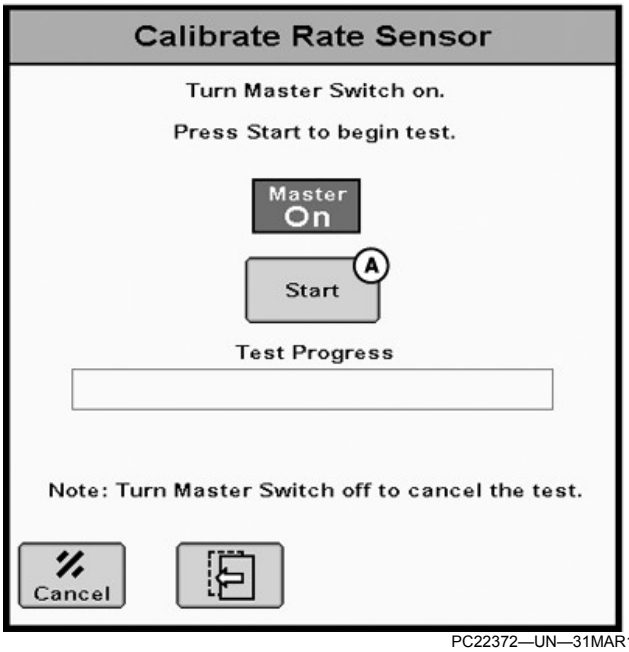


PC22719—UN—02JUN16

A—Test Speed
B—Test Rate
C—Desired Weight
D—Next Page Button

NOTE: Enter conditions that are comparable to normal operation. Larger dispense volumes result in longer, but more accurate, calibration tests.

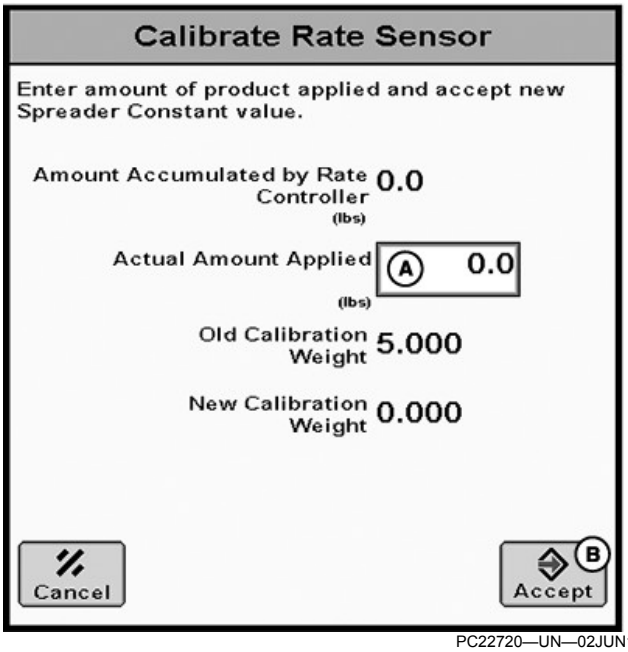
9. Enter the calibration test parameters (A—C).
10. Select the Next Page button (D).



PC22372—UN—31MAR16

A—Start Button

11. Turn on the master switch.
12. To begin the test, select the Start button (A).



PC22720—UN—02JUN16

A—Actual Amount Applied
B—Accept Button

NOTE: Turn the master switch off at any time to cancel test.

13. Enter Actual Amount Applied (A).
14. Select the Accept button (B).

RW00482,00006BA-19-13DEC17

Calibrate Flowmeter—Applied Liquid Product

NOTE: Ensure that control valve and rate sensor are configured before performing a calibration test.

Applied product test allows the operator to apply a known amount of a product to calibrate the flowmeter. The actual amount applied is compared to the amount recorded by the control unit and that is used to adjust the calibration value.

PC22295—UN—21MAR16

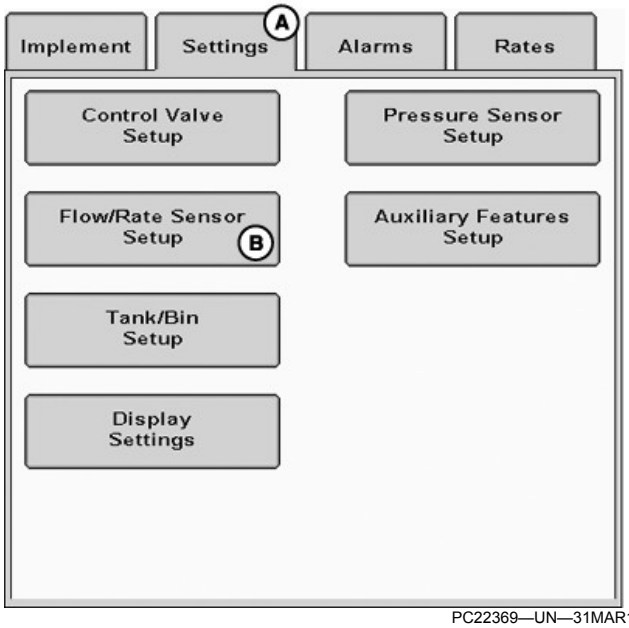
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.



PC22369—UN—31MAR16

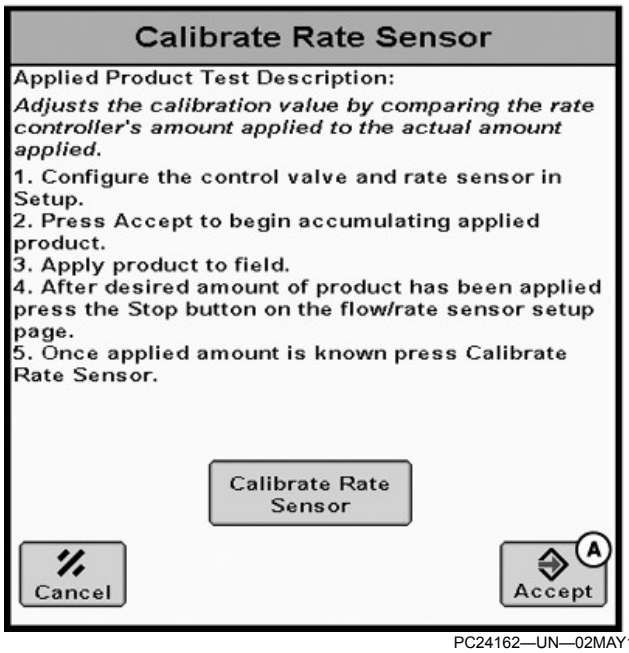
A—Settings Tab
B—Flow / Rate Sensor Setup Button

3. Select the Settings tab (A).
4. Select the Flow / Rate Sensor Setup button (B).

PC22377—UN—31MAR16

Applied Product Calibration Button

5. Select the Applied Product Calibration button.



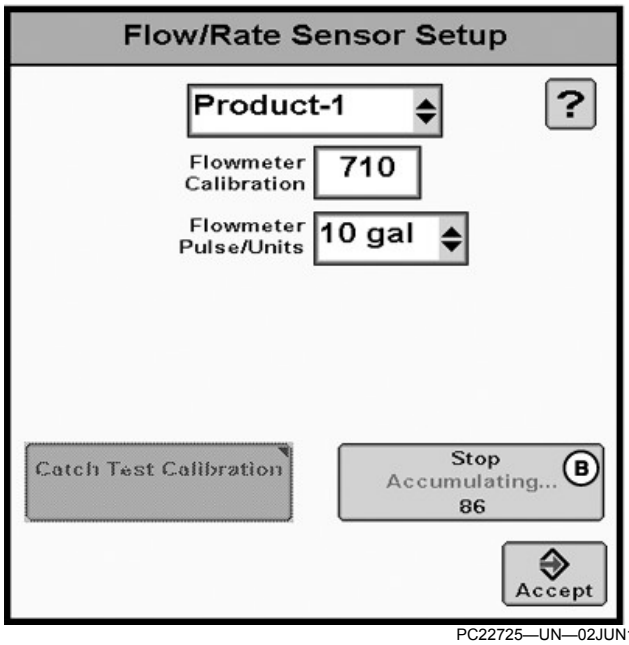
PC24162—UN—02MAY17

A—Accept Button

6. Select the Accept button (A).

NOTE: Turn on the master switch to apply product. While applying product, the operator can navigate away from the page and return after applying sufficient amount of product to complete the calibration.

7. Apply product to field.



PC22725—UN—02JUN16

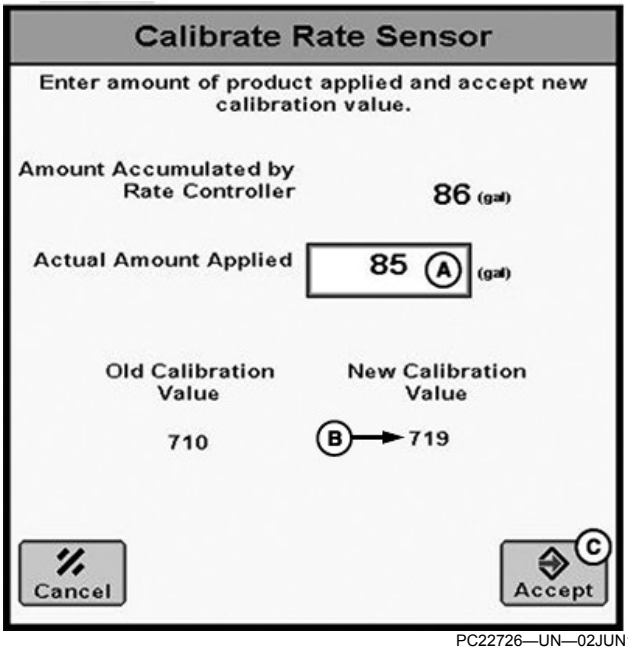
B—Stop Button

8. After desired amount of product has been applied, select the Stop button (B).

PC24163—UN—02MAY17

Calibrate Rate Sensor Button

9. Select the Calibrate Rate Sensor button.



PC22726—UN—02JUN16

A—Actual Amount Applied
B—New Calibration Value
C—Accept Button

10. Enter the amount of product applied (A). New Calibration Value (B) is calculated after the amount is entered.
11. Select the Accept button (C).

RW00482,00006BC-19-13DEC17

Calibrate Rate Sensor—Applied Dry Product

NOTE: Ensure that control valve and rate sensor are configured before performing a calibration test.

Applied product test allows operator to apply a known amount of product to calibrate the rate sensor. The actual amount applied is compared to the amount recorded by the control unit and that is used to adjust the calibration value.

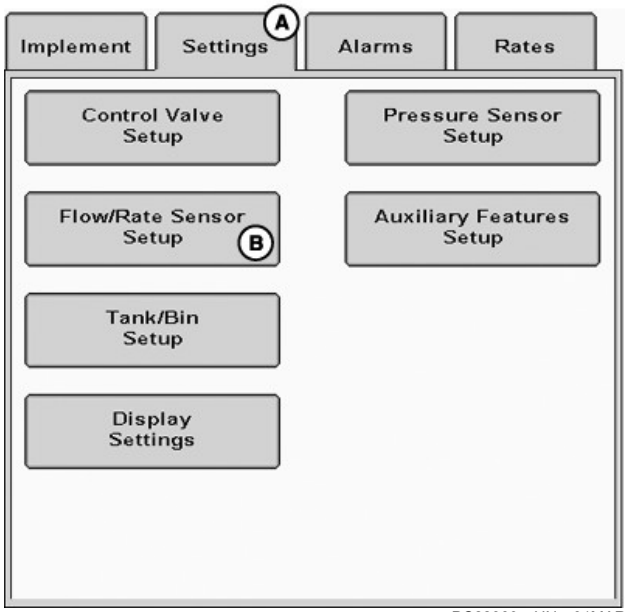
PC22295—UN—21MAR16

John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

2. Select the Setup softkey.



PC22369—UN—31MAR16

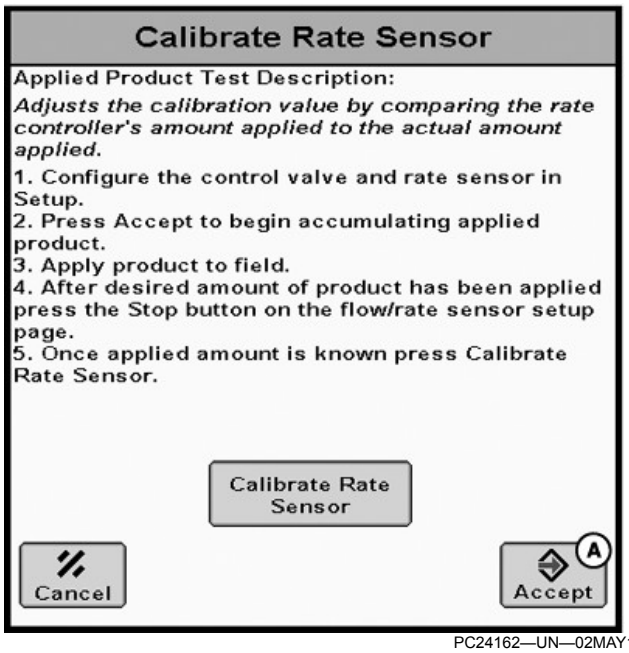
A—Settings Tab
B—Flow / Rate Sensor Setup Button

3. Select the Settings tab (A).
4. Select the Flow / Rate Sensor Setup button (B).

PC22377—UN—31MAR16

Applied Product Calibration Button

5. Select the Applied Product Calibration button.



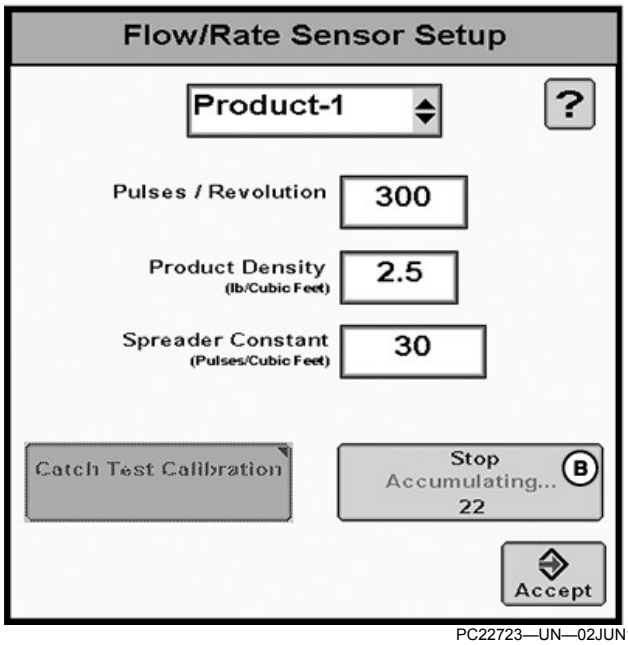
PC24162—UN—02MAY17

A—Accept Button

6. Select the Accept button (A).

NOTE: Turn on the master switch to apply product. While applying product, the operator can navigate away from the page and return after applying sufficient amount of product to complete the calibration.

7. Apply product to field.



PC22723—UN—02JUN16

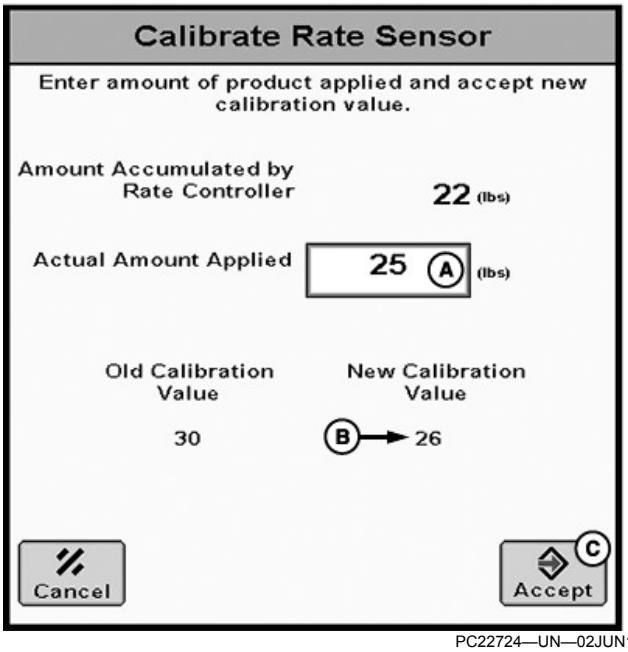
B—Stop Button

8. After desired amount of product has been applied, select the Stop button (B).

PC24163—UN—02MAY17

Calibrate Rate Sensor Button

9. Select the Calibrate Rate Sensor button.



PC22724—UN—02JUN16

A—Actual Amount Applied
B—New Calibration Value
C—Accept Button

10. Enter the amount of product applied (A). New Calibration Value (B) is calculated after the amount is entered.
11. Select the Accept button (C).

RW00482,00006BD-19-13DEC17

Calibrate Pressure Sensor

To measure boom pressure, calibrate the pressure sensor.

PC22295—UN—21MAR16

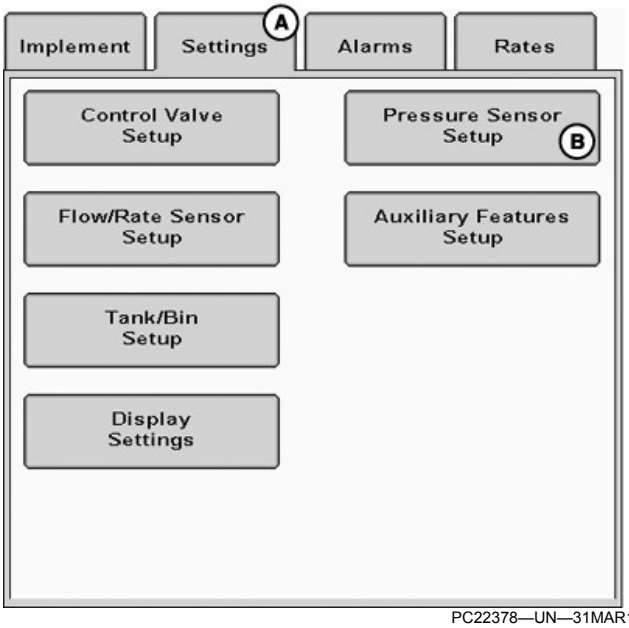
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.



PC22378—UN—31MAR16

A—Settings Tab
B—Pressure Sensor Setup Button

3. Select the Settings tab (A).
4. Select the Pressure Sensor Setup button (B).

PC22379—UN—31MAR16

Calibrate Pressure Sensor Button

5. Select the Calibrate Pressure Sensor button.

PC22380—UN—31MAR16

Pressure Sensor Drop-Down Menu

6. Select the sensor to calibrate from the Pressure Sensor drop-down menu.

PC22382—UN—31MAR16

Voltage-based Calibration Button

PC22381—UN—31MAR16

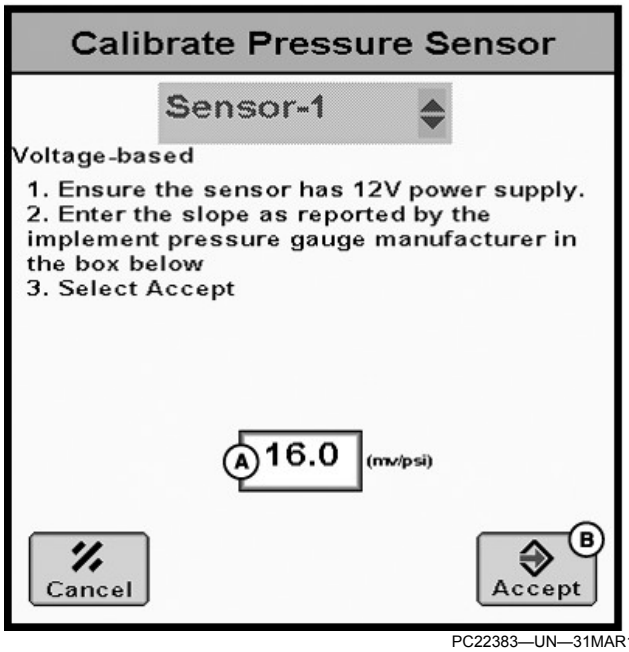
Operation-based Calibration Button

7. Select either the Voltage-based Calibration button or the Operation-based Calibration button.

Use the Voltage-based Calibration when the pressure sensor slope is known.

NOTE: Operation-based calibration is only available when the system is configured for a single liquid product.

To use Operation-based Calibration, two calibration points must be determined since the slope is unknown. The John Deere Rate Controller 2000 automatically measures the voltage at zero pressure. The second calibration point is measured at an operator desired pressure.



PC22383—UN—31MAR16

A—Voltage Slope
B—Accept Button

Voltage-based Calibration

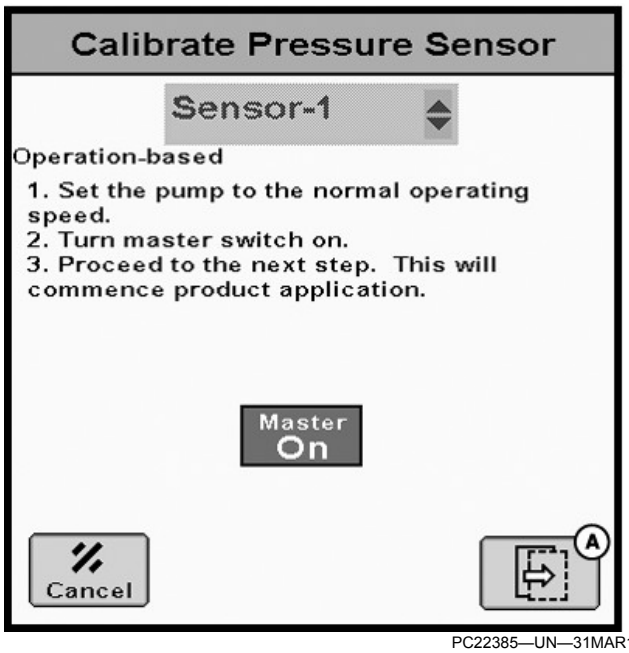
The system requires zero pressure when entering the slope for the pressure sensor setup. Zero-volt sensors can be unplugged to zero the pressure sensor reading. One- to five-volt sensors require the pressure be relieved before entering the slope value.

IMPORTANT: Verify with the sensor manufacturer that sensor can accept 12 V power.

1. Ensure that sensor has 12 V power supply.

NOTE: For Raven pressure sensors with a 12 V power supply, slope is 16 mV/psi.

2. Enter the slope (A) from the pressure sensor manufacturer.
3. Select the Accept button (B).



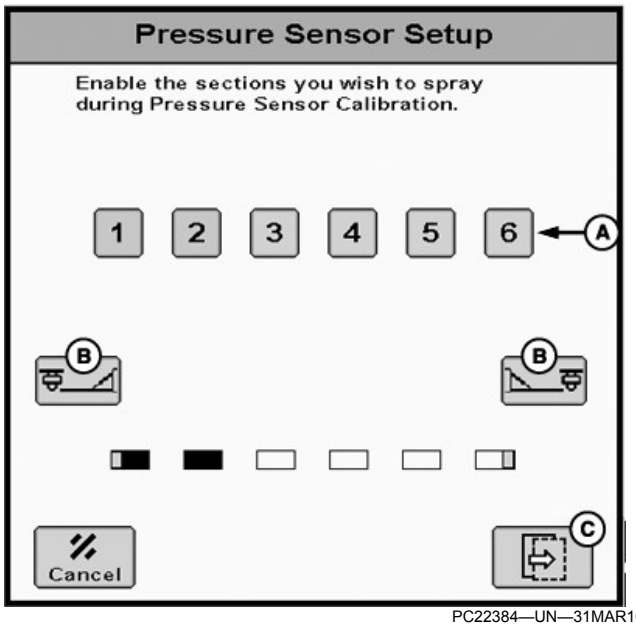
PC22385—UN—31MAR16

A—Next Page Button

Operation-based Calibration

NOTE: Operation-based calibration is only available in the single product configurations.

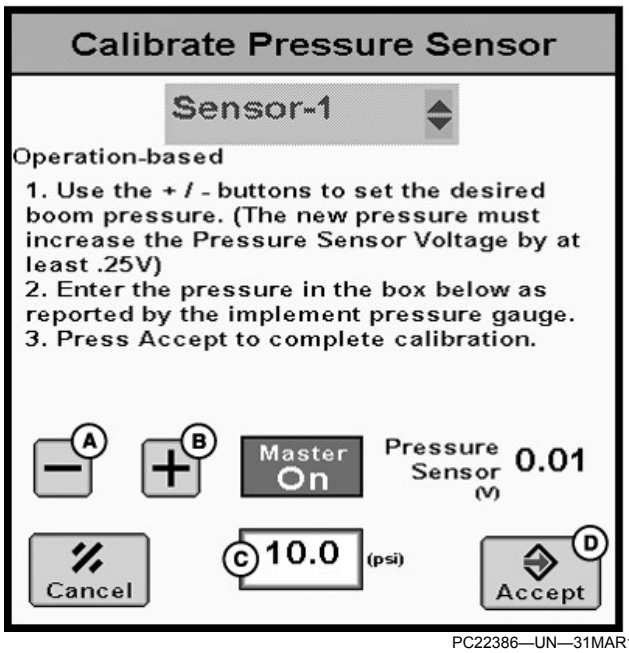
1. Set the pump to the normal operating speed.
2. Turn on the master switch.
3. Select the Next Page button (A).



PC22384—UN—31MAR16

A—Sections
B—Fence Row Nozzle
C—Next Page button

4. To spray during calibration, enable sections (A) and if needed, fence row nozzles (B).
5. Select the Next Page button (C).



PC22386—UN—31MAR16

A—Minus (-) Button
B—Plus (+) Button
C—Sensor Pressure
D—Accept Button

6. To set the desired boom pressure, use the + / - buttons (A and B). The new pressure must increase pressure sensor voltage by at least 0.25 V.
7. Enter the pressure (C) from the implement pressure gauge.

8. To complete calibration, select the Accept button (D).

RW00482,000064D-19-20DEC17

Adjust Alarms

Alarms tab allows the operator to change alarm settings after creating a profile with the setup wizard.

PC22295—UN—21MAR16

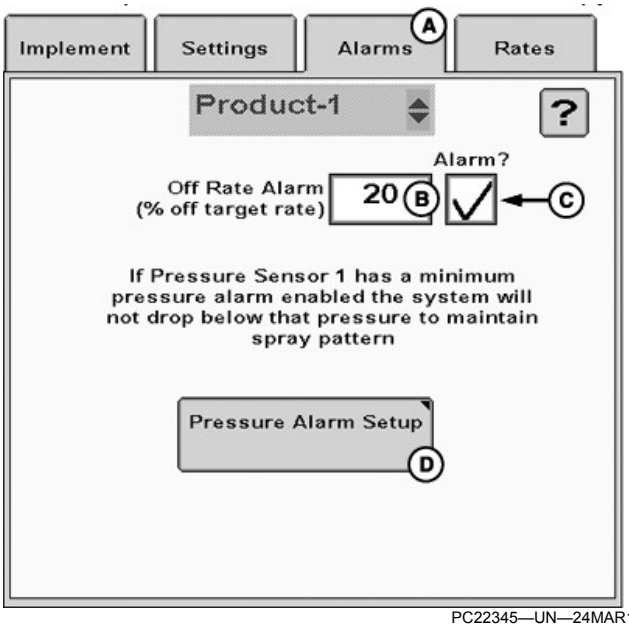
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.

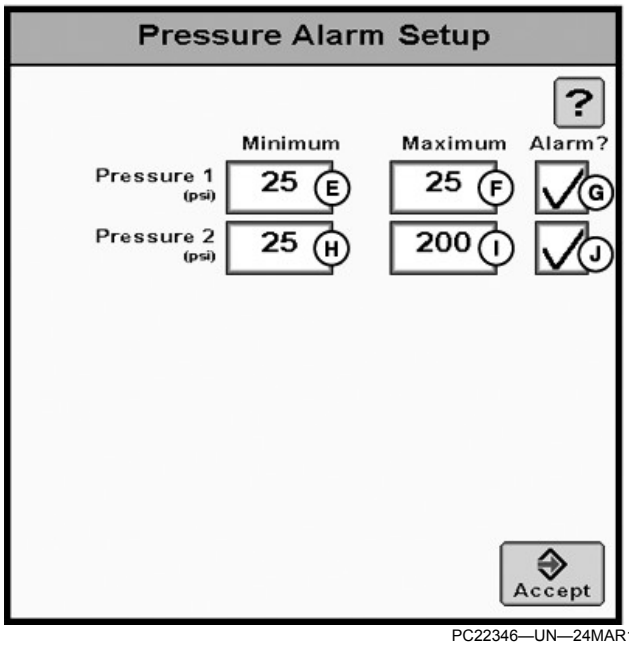


PC22345—UN—24MAR16

A—Alarms Tab
B—Off Rate Alarm
C—Off Rate Alarm Checkbox
D—Pressure Alarm Setup Button

3. Select the Alarms tab (A).

- Off Rate Alarm (B)
- Off Rate Alarm checkbox (C)
- Pressure Alarm Setup button (D)



PC22346—UN—24MAR16

E—Pressure Sensor 1 Minimum
F—Pressure Sensor 1 Maximum
G—Pressure Sensor 1 Alarm Checkbox
H—Pressure Sensor 2 Minimum
I—Pressure Sensor 2 Maximum
J—Pressure Sensor 2 Alarm Checkbox

- Pressure Sensor 1 Minimum (E)
- Pressure Sensor 1 Maximum (F)
- Pressure Sensor 1 Alarm checkbox (G)
- Pressure Sensor 2 Minimum (H)
- Pressure Sensor 2 Maximum (I)
- Pressure Sensor 2 Alarm checkbox (J)

When an alarm is enabled and the minimum or maximum threshold are met for pressure, flow, or RPM, the control unit overrides flow control and attempts to maintain the minimum or maximum setting. This may result in over or under application.

HC94949,0000C9A-19-20DEC17

Adjust Rates

Rates tab allows the operator to change the rate settings after creating a profile with the setup wizard.

PC22295—UN—21MAR16

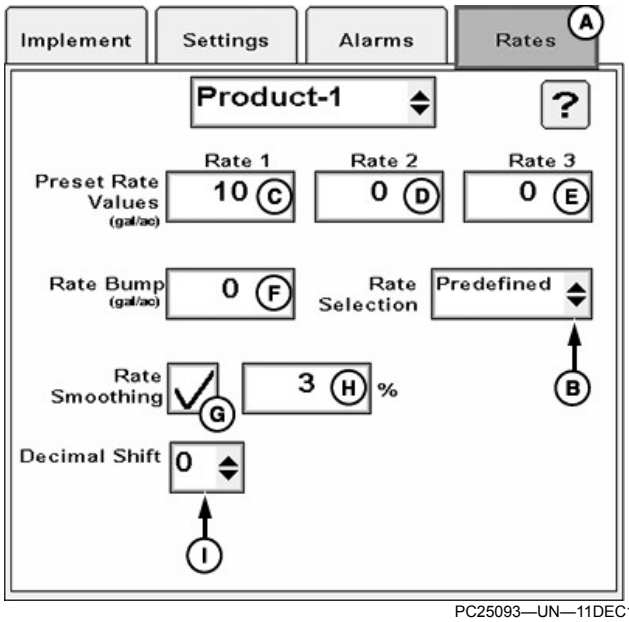
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

2. Select the Setup softkey.



PC25093—UN—11DEC17

A—Rates Tab
B—Rate Selection Drop-Down Menu
C—Rate 1 Preset Value
D—Rate 2 Preset Value
E—Rate 3 Preset Value
F—Rate Bump
G—Rate Smoothing Checkbox
H—Rate Smoothing Percentage
I—Decimal Shift Drop-Down Menu

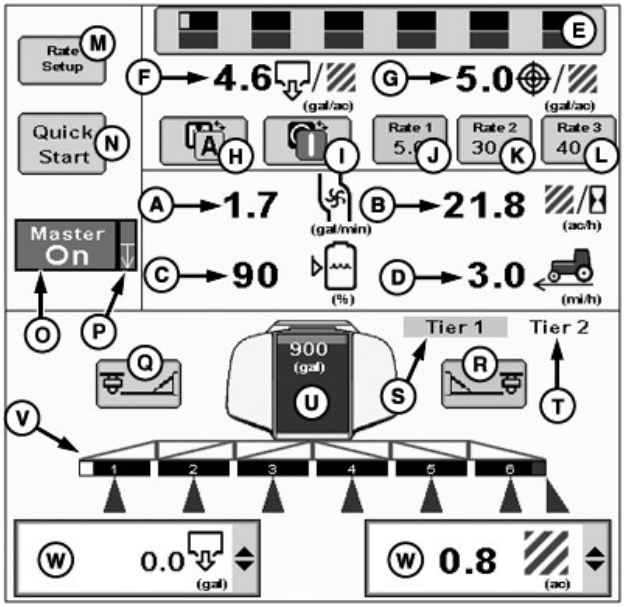
3. Select the Rates tab (A).
4. To choose the rate type displayed on the main run page, select the Rate Selection from the drop-down menu (B).
   - Predefined—Displays the selection buttons for Preset Rate Values. Enter up to three Preset Rate Values (C—E). Rate 1 Preset value is required.
   - Rate Bump—Displays the plus (+) and minus (-) buttons that increment target rate by Rate Bump value. Enter Rate Bump (F).
   - Map Based—Displays the prescription target rate for the current GPS location.

     (Reference Apex™ or John Deere Operations Center for more information about creating prescriptions.)
5. If desired, select the Rate Smoothing checkbox (G) and enter the Rate Smoothing Percentage (H).
6. If desired, select the Decimal Shift from the drop-down menu (I).

HC94949,0000C9B-19-13DEC17

Apex is a trademark of Deere & Company

Run Page Overview — Sprayer and Liquid Fertilizer Tool



PC22705—UN—27MAY16

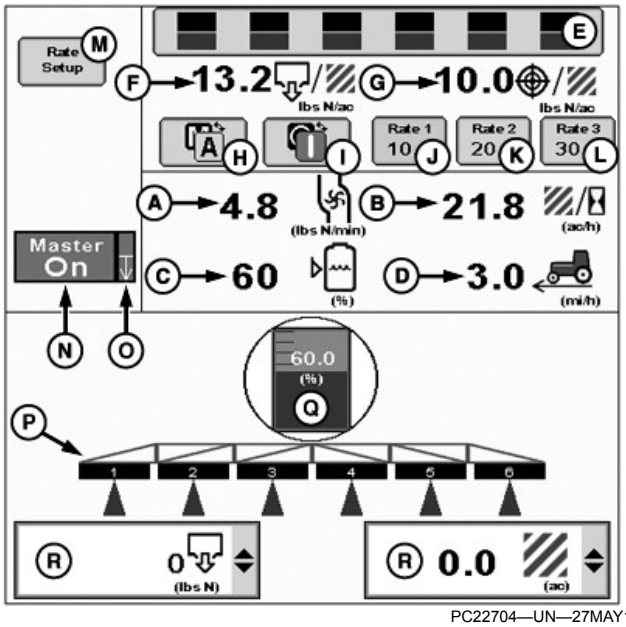
A—Flow (Volume per Time)
B—Area Per Hour
C—Volume Remaining
D—Traveling Speed
E—Section Switchbox Button
F—Actual Rate
G—Target Rate
H—Manual / Automatic Toggle
I—System Enable / Disable Toggle
J—Predefined Rate 1 Button
K—Predefined Rate 2 Button
L—Predefined Rate 3 Button
M—Rate Setup Button
N—Quick Start Button
O—Master Switch Indicator
P—Implement Height Indicator
Q—Left Fence Row Nozzle On / Off Toggle (Sprayer Only)
R—Right Fence Row Nozzle On / Off Toggle (Sprayer Only)
S—Tier 1 Indicator (Liquid Tiered Boom Only)
T—Tier 2 Indicator (Liquid Tiered Boom Only)
U—Tank Level Indicator and Fill Button
V—Implement Sections
W—Data Field Drop-Down Menu

Data Fields (A—D) display selected settings and can be changed to operators preferences.

(Reference Display Settings Button for more information.)

RW00482,00006B1-19-13DEC17

Run Page Overview — NH3 Tool



PC22704—UN—27MAY16

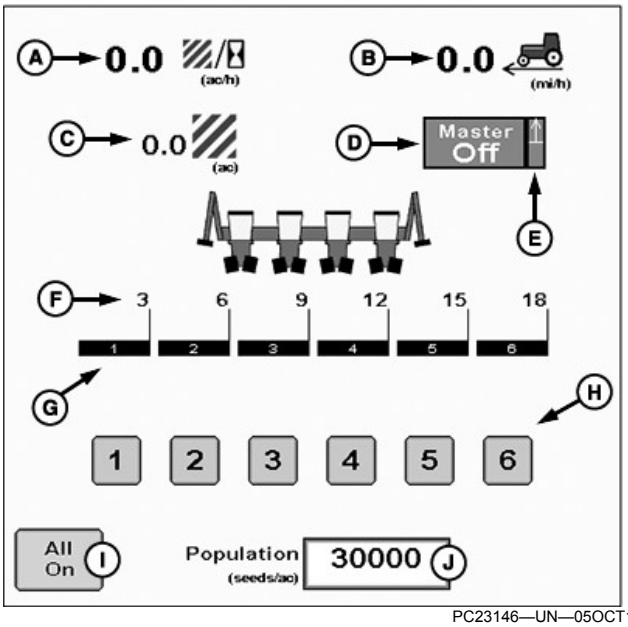
A—Flow (Volume per Time)
B—Area Per Hour
C—Volume Remaining
D—Traveling Speed
E—Section Switchbox Button
F—Actual Rate
G—Target Rate
H—Manual / Automatic Toggle
I—System Enable / Disable Toggle
J—Predefined Rate 1 Button
K—Predefined Rate 2 Button
L—Predefined Rate 3 Button
M—Rate Setup Button
N—Master Switch Indicator
O—Implement Height Indicator
P—Implement Sections
Q—Tank Level Indicator and Fill Button
R—Data Field Drop-Down Menu

Data Fields (A—D) display selected settings and can be changed to operators preferences.

(Reference Display Settings Button for more information.)

RW00482,00006B2-19-13DEC17

Run Page Overview — Planter

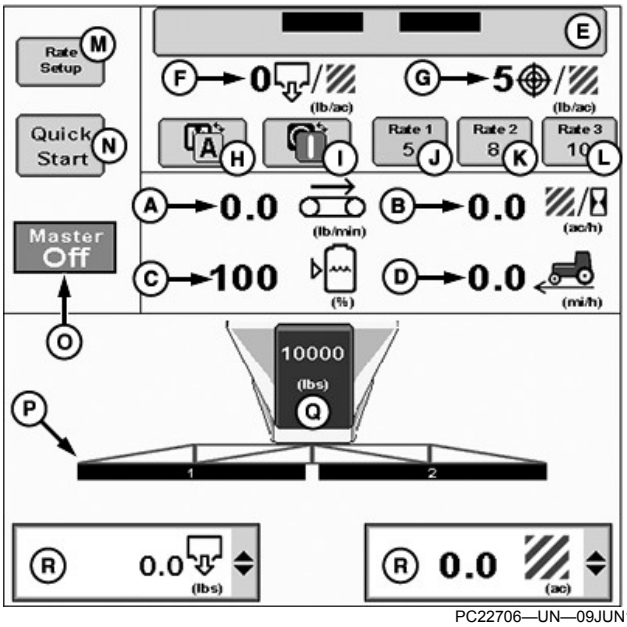


PC23146—UN—05OCT16

A—Area Per Hour
B—Traveling Speed
C—Total Area
D—Master Switch Indicator
E—Implement Height Indicator
F—Row Number
G—Implement Sections
H—Section Number Buttons
I—All On Button
J—Population Entry Box

RW00482,0000059-19-30NOV17

Run Page Overview — Spreader



PC22706—UN—09JUN16

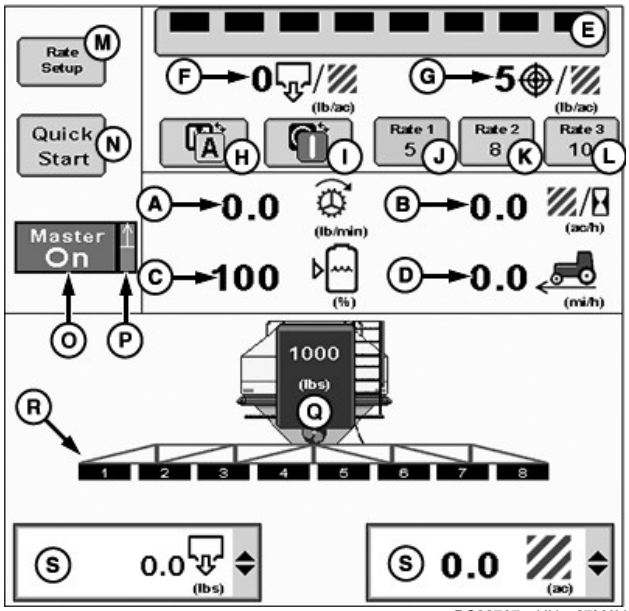
A—Conveyor Speed
B—Area Per Hour
C—Volume Remaining
D—Traveling Speed
E—Section Switchbox Button
F—Actual Rate
G—Target Rate
H—Manual / Automatic Toggle
I—System Enable / Disable Toggle
J—Predefined Rate 1 Button
K—Predefined Rate 2 Button
L—Predefined Rate 3 Button
M—Rate Setup Button
N—Quick Start Button
O—Master Switch Indicator
P—Implement Sections
Q—Tank Level Indicator and Fill Button
R—Data Field Drop-Down Menu

Data Fields (A—D) display selected settings and can be changed to operators preferences.

(Reference Display Settings Button for more information.)

RW00482,00006B3-19-13DEC17

Run Page Overview — Air Cart



PC22707—UN—27MAY16

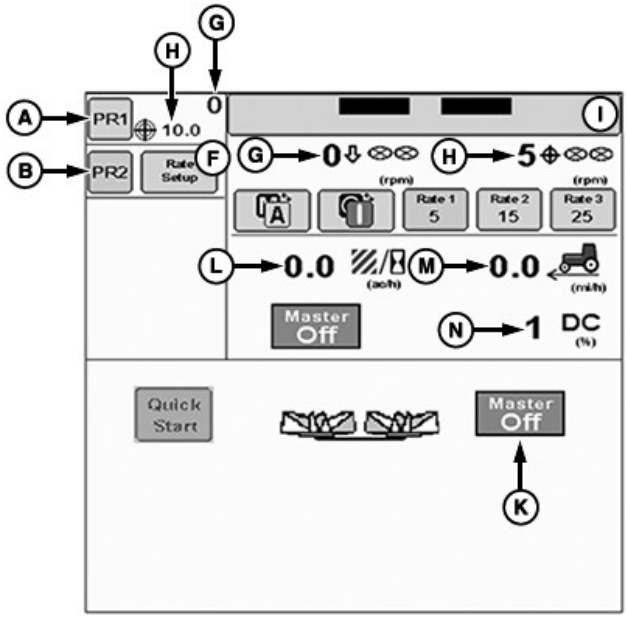
A—Meter Speed
B—Area Per Hour
C—Volume Remaining
D—Traveling Speed
E—Section Switchbox Button
F—Actual Rate
G—Target Rate
H—Manual / Automatic Toggle
I—System Enable / Disable Toggle
J—Predefined Rate 1 Button
K—Predefined Rate 2 Button
L—Predefined Rate 3 Button
M—Rate Setup Button
N—Quick Start Button
O—Master Switch Indicator
P—Implement Height Indicator
Q—Tank Level Indicator and Fill Button
R—Implement Sections
S—Data Field Drop-Down Menu

Data Fields (A—D) display selected settings and can be changed to operators preferences.

(Reference Display Settings Button for more information.)

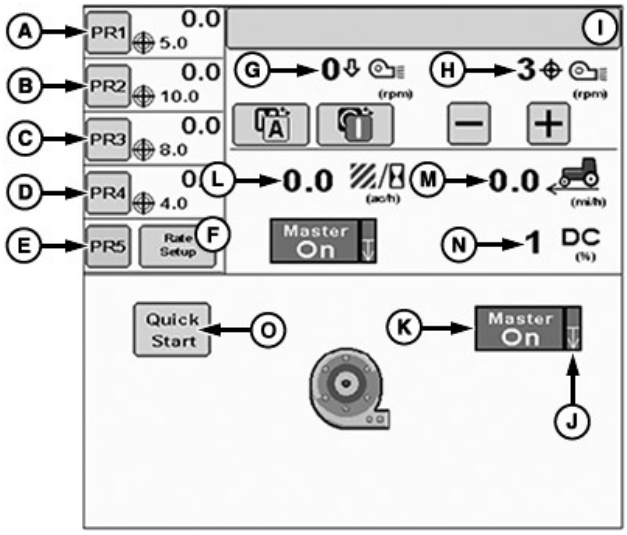
RW00482,00006B4-19-20DEC17

Run Page Overview — Multiple Products



PC22703—UN—27MAY16

Spinner RPM Control



PC22702—UN—27MAY16

Fan Control

A—Product 1 Button
B—Product 2 Button
C—Product 3 Button
D—Product 4 Button
E—Product 5 Button
F—Rate Setup Button
G—Actual Rate
H—Target Rate
I—Section Switch Box Button
J—Implement Height Indicator
K—Master Switch Indicator
L—Area Per Hour
M—Traveling Speed
N—Duty Cycle
O—Quick Start Button

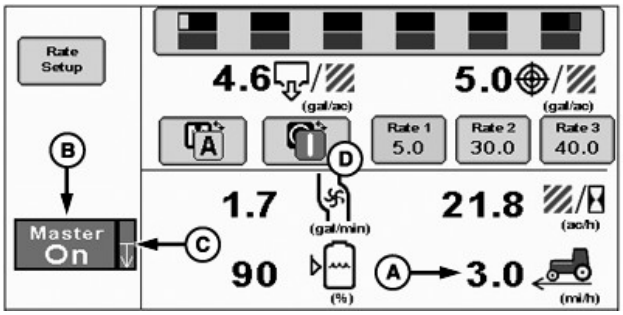
When operating multiple products, select Product button (A—E) to view and operate that products run page. If enabled, a Product button is assigned for Fan Control or Spinner RPM Control.

In multiple product applications, Rate Setup button (F) is beside the active Product button. Actual Rate (G) and Target Rate (H) displayed under the Section Switch Box button (I) are for selected product. The top number beside Product button is that products Actual Rate and under that is that products Target Rate.

Depending on configuration, Implement Height Indicator (J) displays implement position as up or down.

RW00482,00006BE-19-13DEC17

Activate System



PC22413—UN—05APR16

A—Ground Speed
B—Master Switch Indicator
C—Height Switch Indicator
D—System Enable / Disable Toggle

Requirements to activate system:

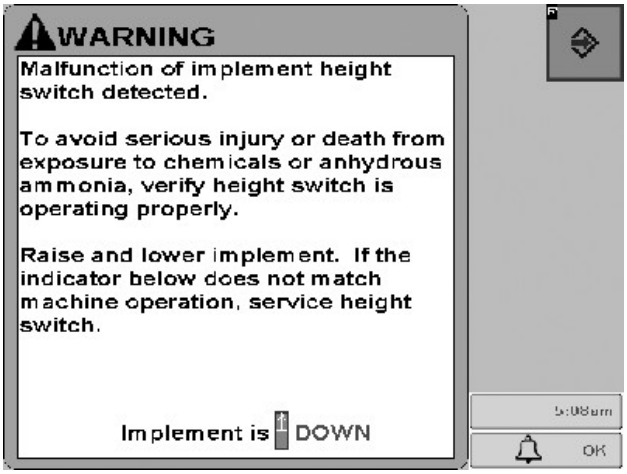
- Machine ground speed (A) is greater than 0.8 km/h (0.5 mph).
- Master switch (B) is on.
- If equipped, implement height switch (C) is engaged.
- System Toggle (D) enabled. If operating multiple products, enable System Toggle on each product run page desired for operation.

Orange Master Switch

If one or more requirements are not met, system does not apply product. If all requirements are met and the master switch turns orange, cycle the master foot switch to get out of hold state.

HC94949,0000C9D-19-20DEC17

Malfunction of Implement Height Switch Detected

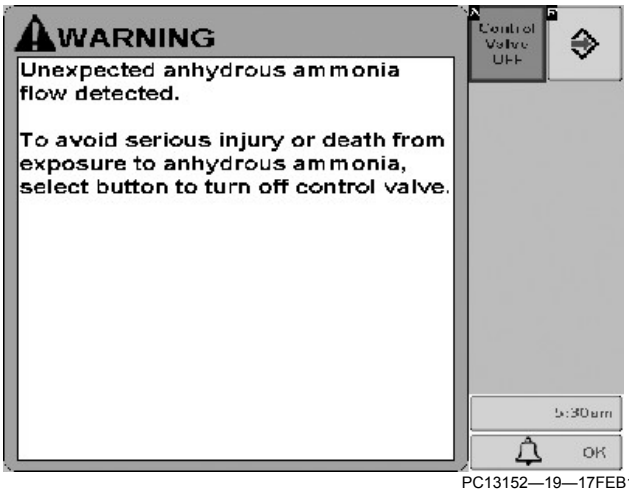


PC13147—19—17FEB11

This message will be displayed on a NH3 system when the system detects the implement is down for an extensive period of time, which can indicate a failure in the height switch. Product application will stop. To verify correct operation, follow the instructions. If the height switch indicator does not match machine operation, service height switch.

HC94949,00004EA-19-18OCT16

Unexpected NH3 Flow Detected



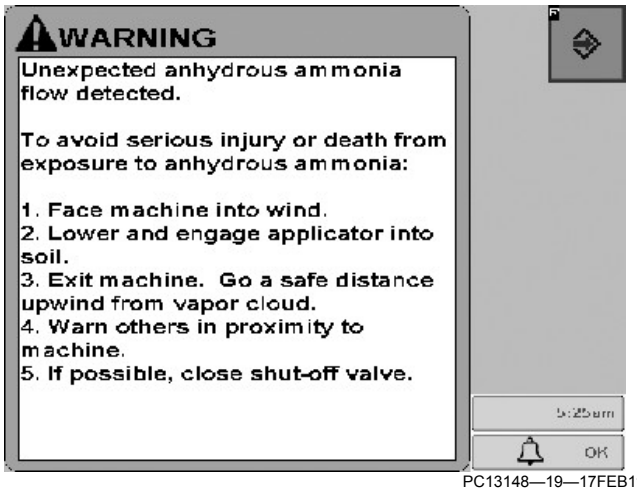
PC13152—19—17FEB11

This message will be displayed if the John Deere Rate Controller 2000 has attempted to close the On/Off valve but still detects flow. If the Control Valve OFF button is selected, the system will also attempt to shut off the control valve.

NOTE: This message will only be displayed when using a dual valve system (i.e the control valve type is Standard or Fast).

RW00482,000062B-19-17MAR16

Unexpected NH3 Flow Detected

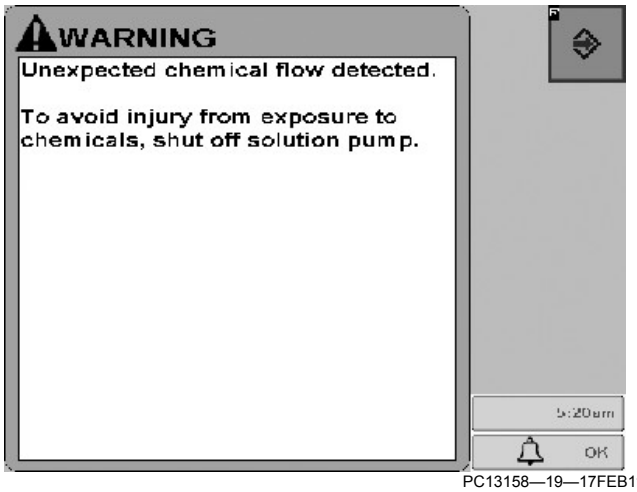


PC13148—19—17FEB11

This message will be displayed if the John Deere Rate Controller 2000 has attempted to close all valves but still detects flow. To reduce risk of injury, follow the instructions on the screen.

RW00482,000062C-19-17MAR16

Unexpected Chemical Flow Detected

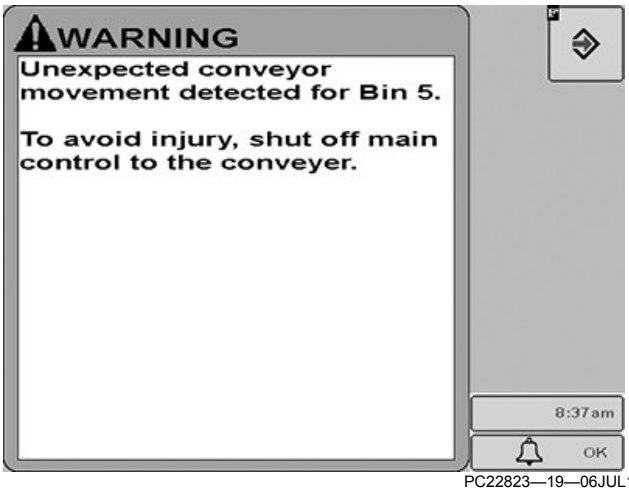


PC13158—19—17FEB11

This message will be displayed if the John Deere Rate Controller 2000 has attempted to close the section valves but still detects flow on a sprayer or liquid fertilizer system.

RW00482,000062D-19-17MAR16

Unexpected Conveyor Movement Detected

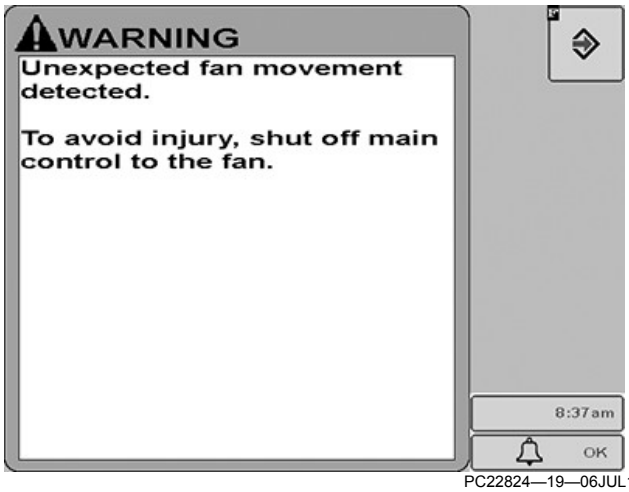


PC22823—19—06JUL16

This message will be displayed when the commanded speed of specified conveyor is zero or stopped, but movement has been detected for more than five seconds.

RW00482,00006D9-19-06JUL16

Unexpected Fan Movement Detected

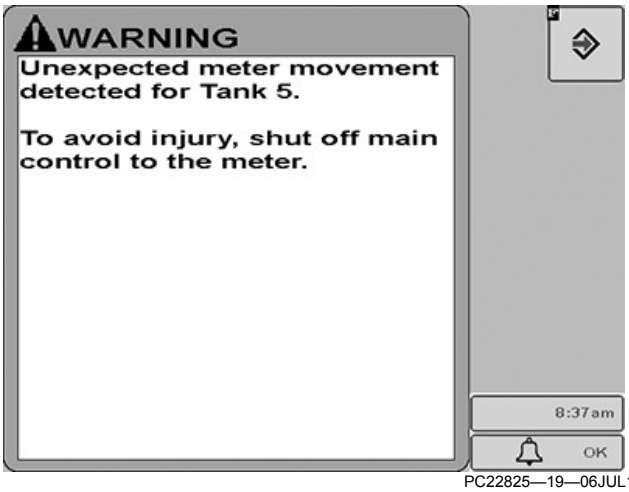


PC22824—19—06JUL16

This message will be displayed when the commanded speed of the fan is zero or stopped, but movement has been detected for more than five seconds.

RW00482,00006DE-19-06JUL16

Unexpected Meter Movement Detected

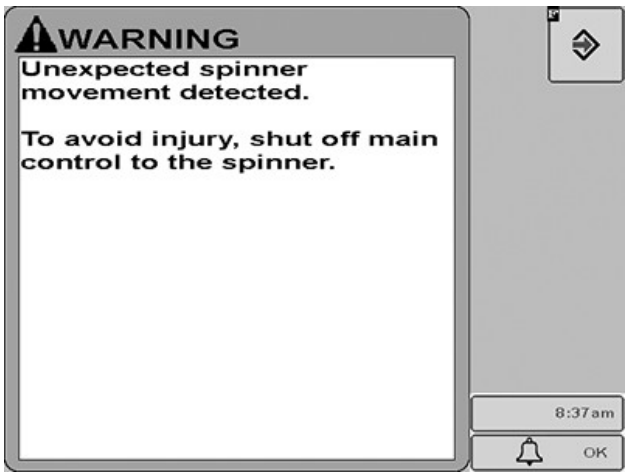


PC22825—19—06JUL16

This message will be displayed when the commanded speed of specified meter is zero or stopped, but movement has been detected for more than five seconds.

RW00482,00006DA-19-06JUL16

Unexpected Spinner Movement Detected

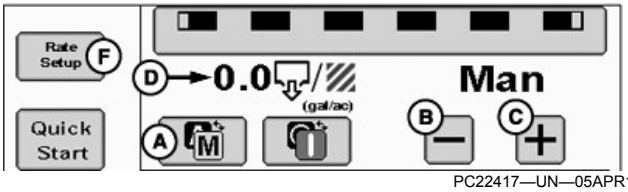


PC22826—19—06JUL16

This message will be displayed when the commanded speed of the spinner is zero or stopped, but movement has been detected for more than ten seconds.

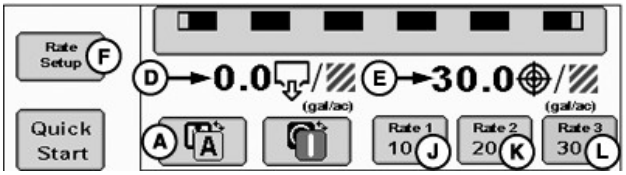
RW00482,00006DB-19-06JUL16

Adjust Rate Control



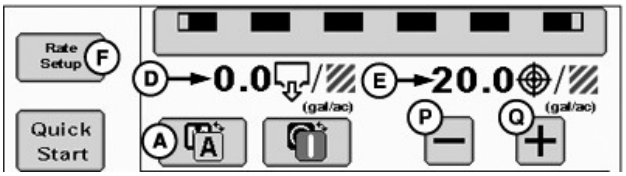
PC22417—UN—05APR16

Manual Rate Control



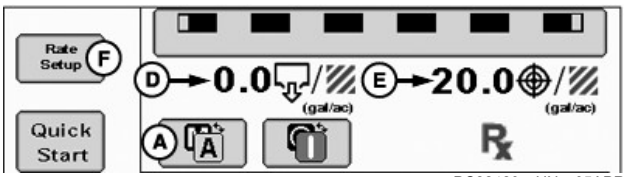
PC25150—UN—20DEC17

Predefined Rate Control



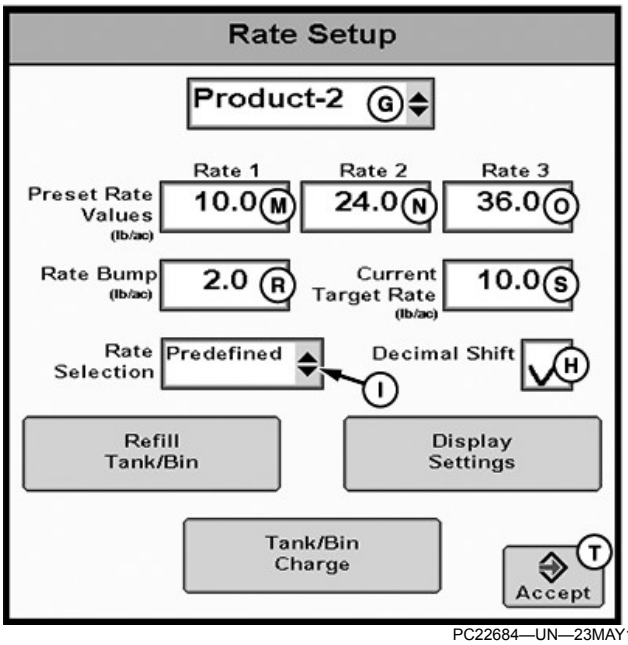
PC24273—UN—26MAY17

Rate Bump Rate Control



PC22420—UN—05APR16

Map Based Rate Control



PC22684—UN—23MAY16

Rate Setup

A—Manual / Automatic Toggle
B—Minus (-) Button
C—Plus (+) Button
D—Actual Rate
E—Target Rate
F—Rate Setup Button
G—Product Drop-Down Menu
H—Decimal Shift Checkbox
I—Rate Selection Drop-Down Menu
J—Rate 1 Preset Button
K—Rate 2 Preset Button
L—Rate 3 Preset Button
M—Rate 1 Preset
N—Rate 2 Preset
O—Rate 3 Preset
P—Plus (+) Button
Q—Minus (-) Button
R—Rate Bump
S—Current Target Rate
T—Accept Button

Select the Toggle button (A) to toggle between manual or automatic rate control. If operating multiple products, select the desired product to toggle between manual or automatic rate control for that product.

Manual Rate Control

To open or close the control valve, select the minus (-) or plus (+) buttons (B and C). Monitor the Actual Rate (D) while making adjustments.

Automatic Rate Control

Control unit operates the control valve to a defined Target Rate (E).

To change the rate type displayed on the run page:

1. Select the Rate Setup button (F).
2. If operating multiple products, select the desired product from the drop-down menu (G).
3. To enter values with an extra decimal, select the Decimal Shift checkbox (H).
4. Select the Rate Selection from the drop-down menu (I).
   - Predefined—Displays the selection buttons for Preset Rate Values (J—L). Enter up to three Preset Rate Values (M—O). Rate 1 Preset value is required.
   - Rate Bump—Displays the plus (+) and minus (-) buttons (P and Q) that increment the target rate by Rate Bump value. Enter the Rate Bump (R) and the Current Target Rate (S).
   - Map Based—Displays the prescription target rate for the current GPS location.

     (Reference Apex™ or John Deere Operations Center for more information about creating prescriptions.)
5. Select the Accept button (T).

RW00482,00006A6-19-20DEC17

Apex is a trademark of Deere & Company

Charge Tank / Bin

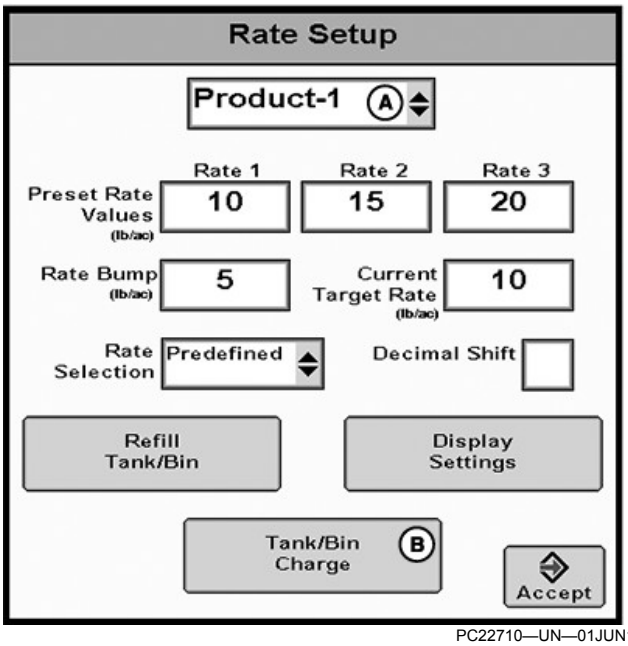
CAUTION: Always check for bystanders before starting the spinner. Failure to do so may cause injury to you or others.

NOTE: If the tank or bin is not enabled, the Tank / Bin Charge button is grayed out.

PC22709—UN—01JUN16

Rate Setup Button

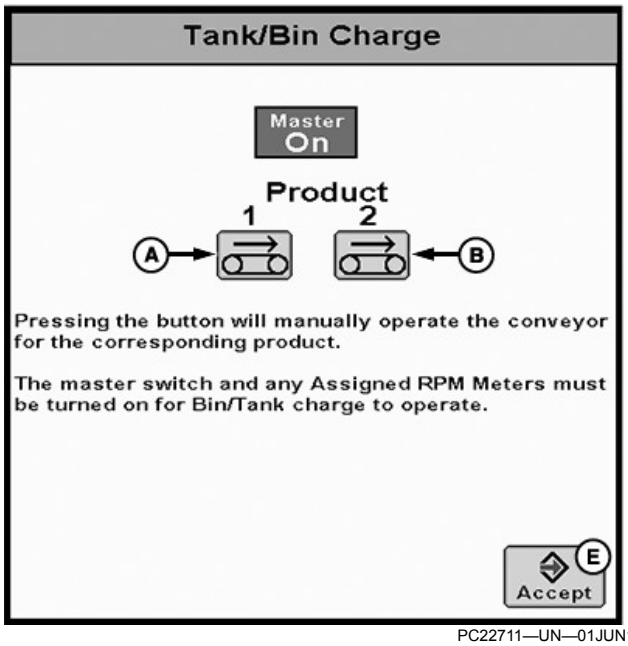
1. Select the Rate Setup button.



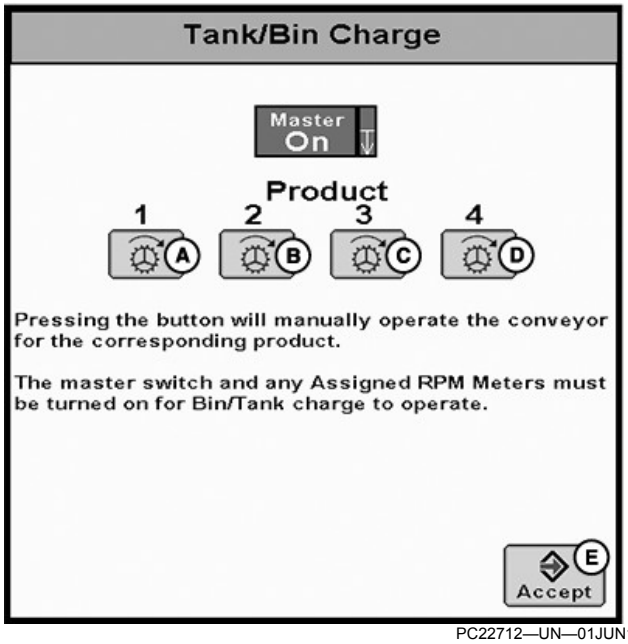
PC22710—UN—01JUN16

A—Product Drop-Down Menu
B—Tank / Bin Charge Button

2. Select a product from the drop-down menu (A). Control valve assigned to the product must control rate.
3. Select the Tank / Bin Charge button (B).



PC22711—UN—01JUN16



PC22712—UN—01JUN16

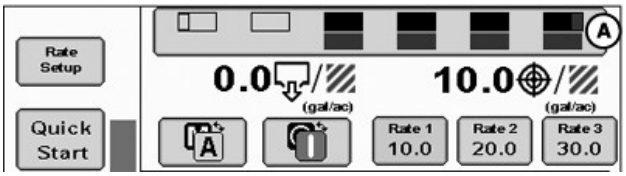
A—Product 1 Tank / Bin Charge Button
B—Product 2 Tank / Bin Charge Button
C—Product 3 Tank / Bin Charge Button
D—Product 4 Tank / Bin Charge Button
E—Accept Button

NOTE: Master switch and any assigned RPM meters must be turned on for Tank / Bin charge to operate.

4. To operate the conveyor manually, select and hold the Product Tank / Bin Charge button (A—D).
5. Select the Accept button (E) when finished.

RW00482,00006B5-19-13DEC17

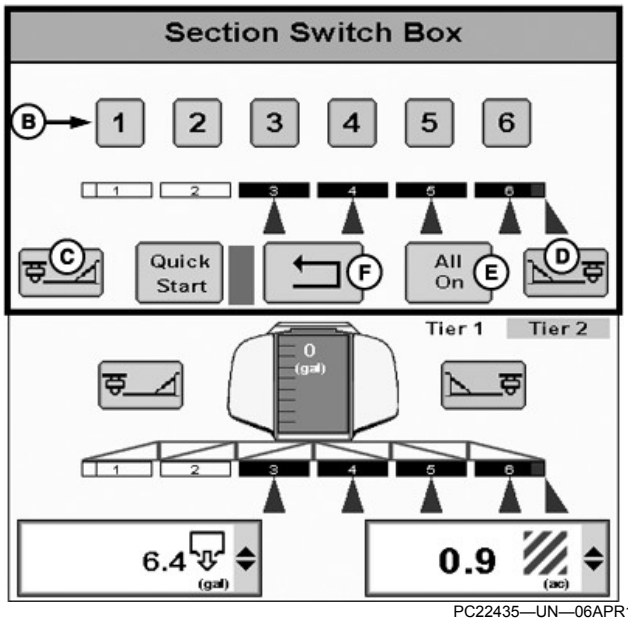
Disable or Enable Sections



PC22434—UN—06APR16

A—Section Switch Box Button

1. Select the Section Switch Box button (A).



PC22435—UN—06APR16

B—Section Number Buttons
C—Left Fence Row Nozzle Button
D—Right Fence Row Nozzle Button
E—All On Button
F—Back Button

NOTE: Section Number buttons (B) highlighted orange are enabled.

2. Disable or enable sections.
   - To enable or disable a section, select the Section Number button. If operating a multiple product configuration, enabling or disabling a section affects all the products in that section group. If needed, select a different product to access different section groups.
   - If equipped, select the Fence Row Nozzle buttons (C and D) to enable or disable fence rows nozzles.
   - To enable all sections for product or section group, select the All On button (E).
3. To return to main run page, select the Back button (F).

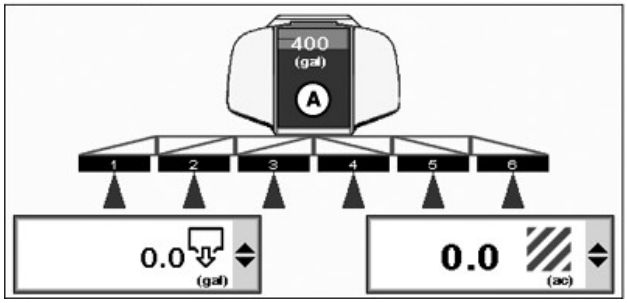
Implement sections can be in one of three states:

- Disabled—Manually disabled by the Section Switchbox buttons.
- Enabled—Section is ready to apply.
- Active—Section is applying.

State	Section	Fence Row Nozzle
Disabled	Clear	Clear
Enabled	Black	Purple
Active	Implement Icon—Black with Blue Triangle Below	Implement Icon—Blue with Blue Triangle Below
	Section Switchbox Button—Black with Blue Box Below	Section Switchbox Button—Black with Blue Box Below

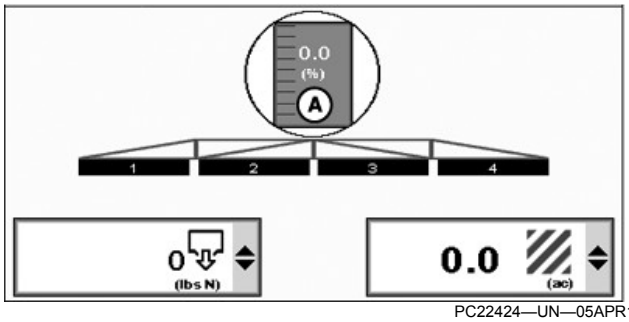
RW00482,00006A7-19-30NOV17

Refill Tank / Bin



PC22414—UN—05APR16

Sprayer and Liquid Fertilizer Tool

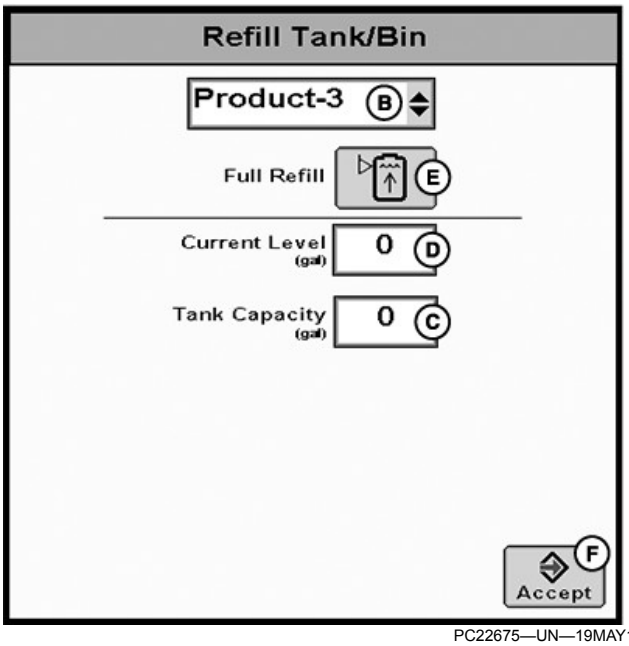


PC22424—UN—05APR16

NH3

A—Tank / Bin Level Indicator Button

1. Select the Tank / Bin Level Indicator button (A).



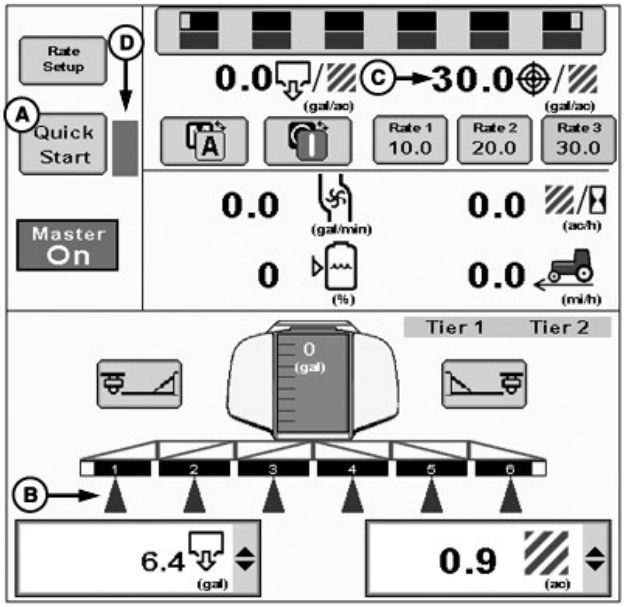
PC22675—UN—19MAY16

B—Product Drop-Down Menu
C—Tank Capacity
D—Current Level
E—Full Refill Button
F—Accept Button

2. If operating a multiple product configuration, select the desired product from the drop-down menu (B).
3. Verify the Tank Capacity (C). If needed, enter new value.
4. Enter the Current Level (D) or select the Full Refill button (E).
5. Select the Accept button (F).

RW00482,00006A8-19-13DEC17

Quick Start



PC22430—UN—05APR16

A—Quick Start Button
B—Section Status Indicators
C—Target Rate
D—Countdown Indicator

NOTE: Quick Start is not available for any NH3 configuration.

Quick Start button (A) enables after activating system for a product. If operating multiple products, select desired products and enable system, and then select Quick Start button. This activates all enabled products on the profile. Selecting Quick Start button turns on all sections (B) only for selected product and applies product at target rate (C).

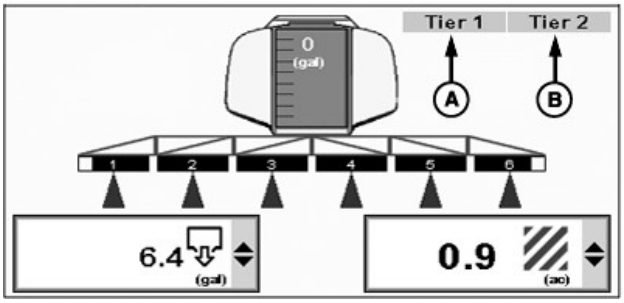
When selected, Quick Start overrides Section Control and machine speed threshold for the selected product for 15 seconds at a simulated 3 mph. A countdown indicator (D) appears when selected. Select Quick Start button at any time during countdown to reset counter back to 15 seconds.

Use Quick Start to prime system when:

- Entering a field.
- Starting in a field corner.
- Performing calibration or diagnostic tests.

HC94949,0000C9E-19-20DEC17

Tiered Boom Operation



PC22431—UN—05APR16

A—Tier 1
B—Tier 2

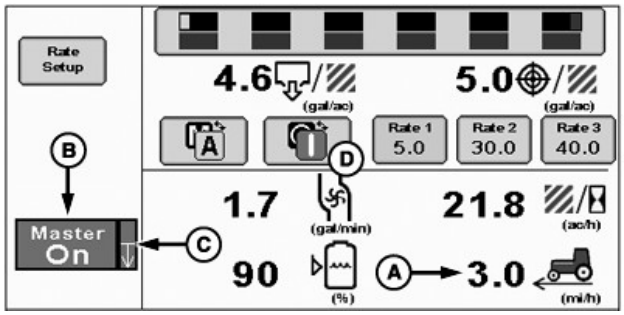
John Deere Rate Controller 2000 supports two and three tier systems on sprayers and liquid fertilizer tools. If equipped, Tier 1 (A) and Tier 2 (B) boom indicators display on main run page and highlight to indicate which tiered boom is currently in operation. Tier boom systems automatically operate a directional valve to direct flow to one or two booms to maintain a specific droplet size.

(Reference Adjust Settings to change boom settings.)

	Boom 1 Only	Boom 2 Only	Operate Both
Two Tier System	Yes	No	Yes
Three Tier System	Yes	Yes	Yes

RW00482,000065A-19-20DEC17

Deactivate System



PC22413—UN—05APR16

A—Ground Speed
B—Master Switch Indicator
C—Height Switch Indicator
D—System Enable / Disable Toggle

To deactivate system, perform any of the following:

- Reduce machine ground speed (A) to less than 0.8 km/h (0.5 mph).
- Turn off master switch (B).
- If equipped, disengage implement height switch (C).
- Disable System Toggle (D). If operating multiple products, disable system toggle on each product run page.
- If max speed is reached, reduce speed and cycle master switch. Max speed requirement changes based on profile selected.

RW00482,00006AA-19-20DEC17

Review Totals

Totals displays the current totals and lifetime totals of the device.

PC22295—UN—21MAR16

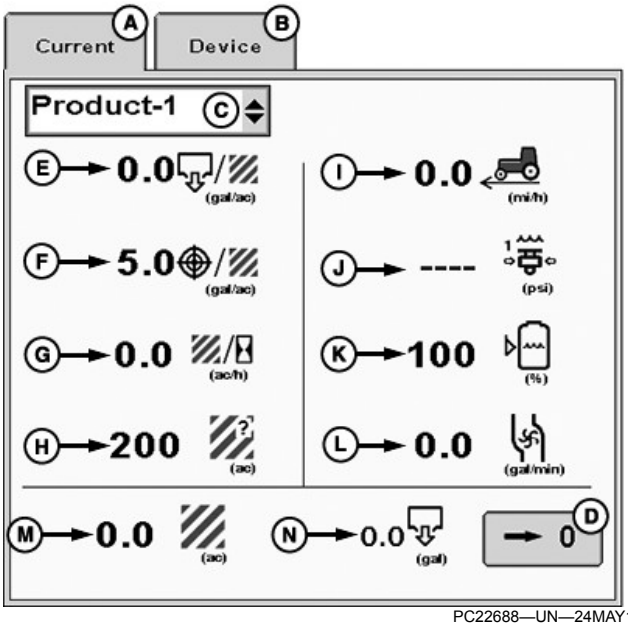
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22425—UN—05APR16

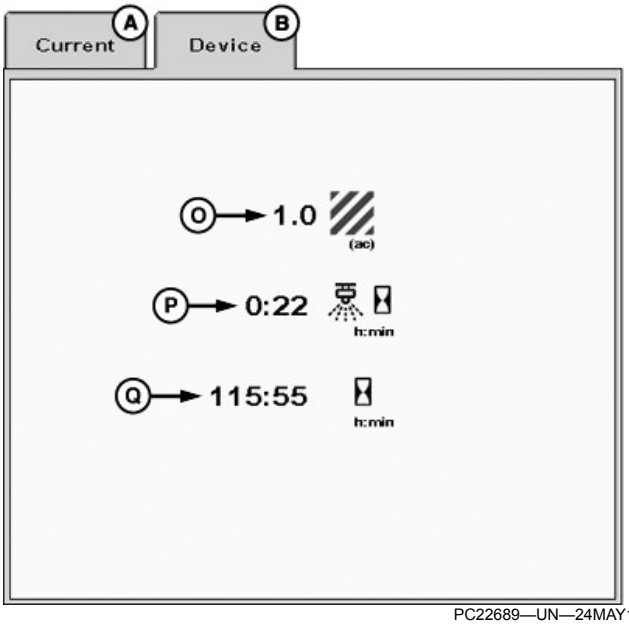
Totals Softkey

2. Select the Totals softkey.



PC22688—UN—24MAY16

Current Tab



PC22689—UN—24MAY16

Device Tab

A—Current Tab
B—Device Tab
C—Product Drop-Down Menu
D—Reset Counter Button
E—Actual Rate Per Area
F—Target Rate Per Area
G—Area Per Hour
H—Area Remaining at Current Tank Level
I—Traveling Speed
J—Pressure Sensor 1
K—Volume Remaining
L—Volume Per Time (Flow rate)
M—Total Area (Current)
N—Volume Applied
O—Total Area (Device)
P—Time Spent Applying
Q—Total Hours

3. Select the Current tab (A) or Device tab (B).
   - Current tab displays instant values for each product. Select the desired Product from the drop-down menu (C). To zero the current totals, select the Reset Counter button (D).
   - Device tab displays totals for the lifetime of the current profile.

HC94949,0000C9F-19-13DEC17

Diagnostic Trouble Codes (DTCs) — John Deere Rate Controller 2000

DTC	Description	Solution
158.03	Switched Supply Voltage High	Contact your John Deere dealer or qualified service provider.
158.04	Switched Supply Voltage Low	Contact your John Deere dealer or qualified service provider.
628.12	Bad Intelligent Device or Component	Contact your John Deere dealer or qualified service provider.
629.12	Bad Intelligent Device or Component	Contact your John Deere dealer or qualified service provider.
630.13	System configuration or calibration required	(Reference Operator's Manual and calibrate system.)
3132.04	Pressure 1 — Sensor not detected	Verify pressure sensor installation.
3132.13	Pressure 1 — Sensor not calibrated	(Reference Operator's Manual and calibrate system.)
3132.16	Pressure 1 — Pressure above maximum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
3132.18	Pressure 1 — Pressure below minimum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
4305.00	Application speed exceeded	Operate at lower application speeds.
4305.02	Speed is below operational speed	Operate at higher application speeds.
517247.04	Pressure 2 — Sensor not detected	Verify pressure sensor installation.
517247.13	Pressure 2 — Sensor not calibrated	(Reference Operator's Manual and calibrate system.)
517247.16	Pressure 2 — Pressure above maximum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517247.18	Pressure 2 — Pressure below minimum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517248.00	Product 1 Rate — No rate expected	Contact your John Deere dealer or qualified service provider.
517248.01	Product 1 Rate — No rate detected	Contact your John Deere dealer or qualified service provider.
517248.15	Product 1 Rate — Rate above target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517248.17	Product 1 Rate — Rate below target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517248.18	Product 1 Rate — Volume per minute below minimum	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517249.17	Product 2 Injection — Pump lost communication	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517250.01	Product 2 Injection — Injection pressure below carrier pressure	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517251.17	Product 3 Injection — Pump lost communication	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517252.01	Product 3 Injection — Injection pressure below carrier pressure	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517253.17	Product 4 Injection — Pump lost communication	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517254.01	Product 4 Injection — Injection pressure below carrier pressure	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517255.17	Product 5 Injection — Pump lost communication	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517256.01	Product 5 Injection — Injection pressure below carrier pressure	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517257.15	RPM 1 - Above maximum threshold	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517257.17	RPM 1 - Below minimum threshold	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517258.00	Section valve master open when it should be closed	Contact your John Deere dealer or qualified service provider.

517258.01	Section valve master closed when it should be open	Contact your John Deere dealer or qualified service provider.
517259.00	Section valve 1 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517259.01	Section valve 1 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517260.00	Section valve 2 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517260.01	Section valve 2 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517261.00	Section valve 3 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517261.01	Section valve 3 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517262.00	Section valve 4 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517262.01	Section valve 4 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517263.00	Section valve 5 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517263.01	Section valve 5 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517264.00	Section valve 6 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517264.01	Section valve 6 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517265.00	Section valve 7 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517265.01	Section valve 7 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517266.00	Section valve 8 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517266.01	Section valve 8 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517267.00	Section valve 9 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517267.01	Section valve 9 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517268.00	Section valve 10 open when it should be closed	Contact your John Deere dealer or qualified service provider.
517268.01	Section valve 10 closed when it should be open	Contact your John Deere dealer or qualified service provider.
517269.01	Valve power sense circuit 1 error	Contact your John Deere dealer or qualified service provider.
517270.01	Valve power sense circuit 2 error	Contact your John Deere dealer or qualified service provider.
517271.01	Valve power harness error	Contact your John Deere dealer or qualified service provider.
517272.01	Low current power loss	Contact your John Deere dealer or qualified service provider.
517273.01	Product Pump 1 — Pump dry	Turn off master foot switch and verify there is product within the tank.
517273.07	Product Pump 1 — Raven AccuFlow HP™ Plus boost pump fault	(Reference ravenhelp.com for more information on Raven Direct Injection systems.)
517274.01	Test canceled	No checks needed.
517296.04	Pressure 3 — Sensor not detected	Verify pressure sensor installation.
517296.13	Pressure 3 — Sensor not calibrated	(Reference Operator's Manual and calibrate system.)
517296.16	Pressure 3 — Pressure above maximum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517296.18	Pressure 3 — Pressure below minimum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517297.04	Pressure 4 — Sensor not detected	Verify pressure sensor installation.
517297.13	Pressure 4 — Sensor not calibrated	(Reference Operator's Manual and calibrate system.)
517297.16	Pressure 4 — Pressure above maximum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517297.18	Pressure 4 — Pressure below minimum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517298.04	Pressure 5 — Sensor not detected	Verify pressure sensor installation.
517298.13	Pressure 5 — Sensor not calibrated	(Reference Operator's Manual and calibrate system.)
517298.16	Pressure 5 — Pressure above maximum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517298.18	Pressure 5 — Pressure below minimum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517299.04	Pressure 6 — Sensor not detected	Verify pressure sensor installation.
517299.13	Pressure 6 — Sensor not calibrated	(Reference Operator's Manual and calibrate system.)
517299.16	Pressure 6 — Pressure above maximum set point	Check settings within Alarms tab and adjust as needed.

		Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517299.18	Pressure 6 — Pressure below minimum set point	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517300.01	Product 2 Rate — No rate detected	Contact your John Deere dealer or qualified service provider.
517300.15	Product 2 Rate — Rate above target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517300.17	Product 2 Rate — Rate below target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517300.18	Product 2 Rate — Volume per minute below minimum	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517301.01	Product 3 Rate — No rate detected	Contact your John Deere dealer or qualified service provider.
517301.15	Product 3 Rate — Rate above target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517301.17	Product 3 Rate — Rate below target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517301.18	Product 3 Rate — Volume per minute below minimum	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517302.01	Product 4 Rate — No rate detected	Contact your John Deere dealer or qualified service provider.
517302.15	Product 4 Rate — Rate above target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517302.17	Product 4 Rate — Rate below target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517302.18	Product 4 Rate — Volume per minute below minimum	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517303.01	Product 5 Rate — No rate detected	Contact your John Deere dealer or qualified service provider.
517303.15	Product 5 Rate — Rate above target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517303.17	Product 5 Rate — Rate below target	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517303.18	Product 5 Rate — Volume per minute below minimum	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517304.15	RPM 2 - Above maximum threshold	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517304.17	RPM 2 - Below minimum threshold	Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517305.01	Product Pump 2 — Pump dry	Turn off master foot switch and verify there is product within the tank.
517306.01	Product Pump 3 — Pump dry	Turn off master foot switch and verify there is product within the tank.
517307.01	Product Pump 4 — Pump dry	Turn off master foot switch and verify there is product within the tank.
517308.01	Product Pump 5 — Pump dry	Turn off master foot switch and verify there is product within the tank.
517309.31	Product Bin/Tank 1 — Empty	Turn off master foot switch and verify there is product within the bin or tank.
517310.31	Product Bin/Tank 2 — Empty	Turn off master foot switch and verify there is product within the bin or tank.
517311.31	Product Bin/Tank 3 — Empty	Turn off master foot switch and verify there is product within the bin or tank.
517312.31	Product Bin/Tank 4 — Empty	Turn off master foot switch and verify there is product within the bin or tank.

517313.31	Product Bin/Tank 5 — Empty	Turn off master foot switch and verify there is product within the bin or tank.
517314.17	Product Bin/Tank 1 — Low	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517315.17	Product Bin/Tank 2 — Low	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517316.17	Product Bin/Tank 3 — Low	Check bin or tank level. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517317.17	Product Bin/Tank 4 — Low	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517318.17	Product Bin/Tank 5 — Low	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517319.1	Product 1 Shaft Sensor	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517320.1	Product 2 Shaft Sensor	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517321.1	Product 3 Shaft Sensor	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517322.1	Product 4 Shaft Sensor	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517323.1	Product 5 Shaft Sensor	Turn off master foot switch and verify there is product within the bin or tank. Check settings within Alarms tab and adjust as needed. Menu button > John Deere Rate Controller 2000 button > Setup softkey > Alarms tab.
517324.01	Product 1 Dual Encoder	The rate difference between the left and right encoder has exceeded the allowed tolerance. Contact your John Deere dealer or qualified service provider.
517325.01	Product 1 Dual Encoder	The rate difference between the left and right encoder has exceeded the allowed tolerance. Contact your John Deere dealer or qualified service provider.
517326.01	Product 1 Dual Encoder	The rate difference between the left and right encoder has exceeded the allowed tolerance. Contact your John Deere dealer or qualified service provider.
517327.01	Product 1 Dual Encoder	The rate difference between the left and right encoder has exceeded the allowed tolerance. Contact your John Deere dealer or qualified service provider.
517328.01	Product 1 Dual Encoder	The rate difference between the left and right encoder has exceeded the allowed tolerance. Contact your John Deere dealer or qualified service provider.
523350.08	Implement height switch malfunction	Verify that implement is functioning properly.

AccuFlow HP is a trademark of Raven Industries Inc.

Observable Symptoms

Symptom	Problem	Solution
Unexpected application rate.	Incorrect rate type selected (gal/min or gal/acre).	Select the correct rate type.
Product does not shut off.	Valve does not respond to commands.	Select the correct valve type.
2-Wire valve selection is not available.	Dual boom is selected.	Disable dual boom.
	More than seven sections are selected.	Assign fewer than eight sections.
Erratic implement section is not turning on or off.	The incorrect section valve type is selected.	Select the correct section valve type.
Application is erratic.	Calibration number is not set correctly.	Enter the correct calibration number.
Trouble code is displayed for high pressure.	System pressure is high.	Select flow return in the system setup.
Trouble code is displayed for unexpected flow.	Constant flow is disabled when using a constant flow system with the boom valve closed.	Select constant flow in the system setup.
Flow is not applying at desired rate.	Incorrect application rate.	Ensure that correct units are used.
	Minimum Flow rate feature causes over-application in areas where machine speed is low enough to activate Minimum Flow Rate.	To disable feature, set the minimum flow rate to 0.
	Flow per minute is not an option.	Ensure that pressure sensor is installed.
System detects implement is down for an extensive period of time.	Height switch is disabled.	If height switch indicator does not match machine operation, service height switch.
Unexpected chemical flow detected.	Controller attempts to close section valves, but detects flow on a sprayer or liquid fertilizer system.	Shut off the solution pump.
Unable to set up the minimum and maximum alarms.	Minimum and maximum alarms are disabled.	Ensure that pressure sensor is installed and configured.
Unable to set values.	System is not allowing changes to values or settings.	Ensure that Master Switch is off.
Unexpected anhydrous ammonia flow detected.	Controller attempts to the close On / Off valve, but still detects flow.	Select button to turn off control valve.

Symptom	Problem	Solution
	Controller attempts to close all valves, but still detects flow.	Follow instructions on Warning page on display.
Height indicator is not functioning properly.	Height indicator is not configured properly.	Navigate to the height indicator setup and verify settings. Verify that checkbox is selected and that switch or sensor is specified. If sensor is being used, ensure that correct height sensor voltage is entered. (Reference Setup Implement Height Indicator for more information.)
Pressure sensors are not configured.	Pressure sensor 2 is not an option.	Ensure that both sensors are configured.
Not able to activate system.	Master Switch indicator is orange.	Cycle the master switch.
Fence row nozzles are not functioning.	Fence row nozzles are not configured or wired correctly to control unit.	Verify that fence row nozzles are configured and wired correctly.
Pump information drop-down does not appear.	Pump Enable checkbox is selected.	Ensure that Enable Pump checkbox is not selected.
Unwanted minimum flow rate activation.	Over application in low speed areas.	To disable function, set the minimum flow rate to 0.

RW00482,000068F-19-20DEC17

Diagnostic Readings

PC22295—UN—21MAR16

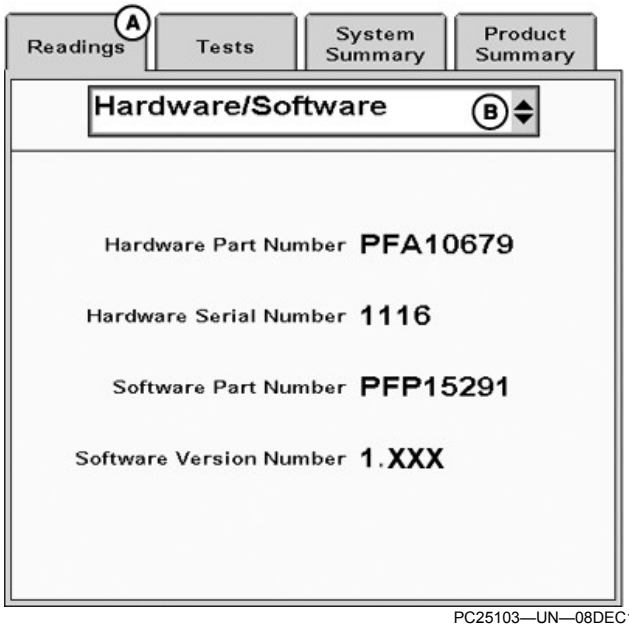
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC21158—UN—11MAY15

Diagnostics Softkey

2. Select the Diagnostics softkey.



PC25103—UN—08DEC17

Readings Tab

A—Readings Tab
B—Readings Drop-Down Menu

3. Select the Readings tab (A).
4. Select a reading from the drop-down menu (B).

Hardware / Software

- Hardware Part Number
- Hardware Serial Number
- Software Part Number
- Software Version Number

Switchbox

- Switchbox Present
- Status of each switch

Delivery System

- Application Width
- Flowmeter (Hz Rate)
- Flow Rate
- Application Rate
- PWM Duty Cycle

Section Status

- Status of each section

System Voltage

- Power
- Sensor Power A
- Sensor Power B
- Sensor Power C
- Sensor Power D
- Controller Internal Current
- Sensor Power Current A
- Sensor Power Current B
- Sensor Power Current C
- 5 V Power Rail Current

Working Parameters

- Speed
- Speed Source

Switches / Status

- Master Switch
- Height Switch Status

Pressure Sensors

- Pressure Voltage
- Pressure Sensor
- Pressure
- Slope

RPM Sensors

- RPM Sensors 1

HC94949,0000CA0-19-13DEC17

System Summary

PC22295—UN—21MAR16

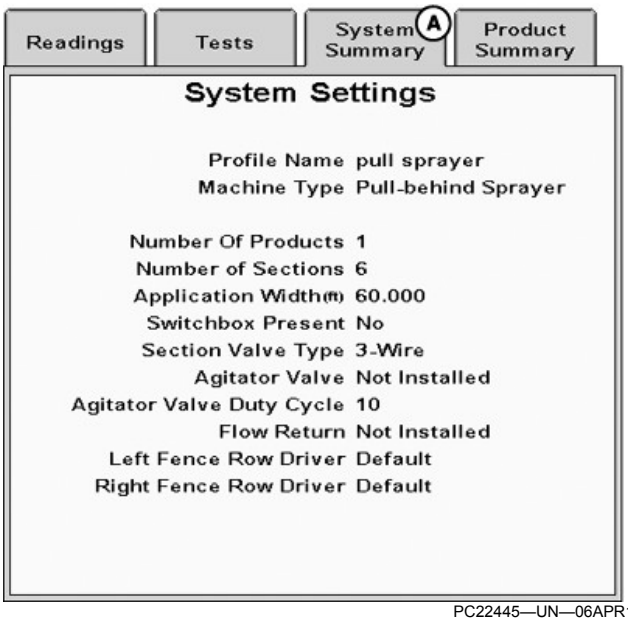
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC21158—UN—11MAY15

Diagnostics Softkey

2. Select the Diagnostics softkey.



PC22445—UN—06APR16

A—System Summary Tab

3. Select the System Summary tab (A).

System Settings

- Profile Name
- Machine Type
- Number of Products
- Number of Sections
- Application Width
- Switchbox Present
- Section Valve Type

- Agitator Valve
- Agitator Valve Duty Cycle
- Flow Return
- Left Fence Row Driver
- Right Fence Row Driver

HC94949,0000CA1-19-13DEC17

Product Summary

PC22295—UN—21MAR16

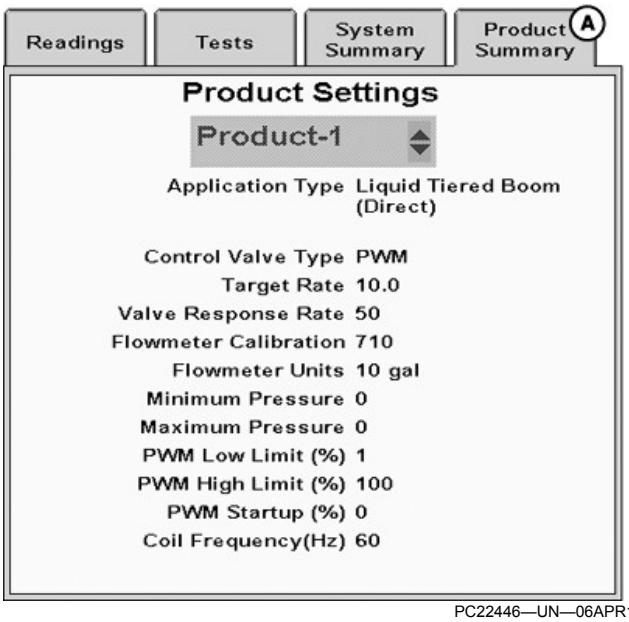
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC21158—UN—11MAY15

Diagnostics Softkey

2. Select the Diagnostics softkey.



PC22446—UN—06APR16

A—Product Summary Tab

3. Select the Product Summary tab (A).

Product Settings

- Application Type
- Control Valve Type
- Target Rate
- Valve Response Rate
- Flowmeter Calibration
- Flowmeter Units
- Minimum Pressure
- Maximum Pressure
- PWM Low Limit
- PWM High Limit
- PWM Startup
- Coil Frequency

HC94949,0000CA2-19-13DEC17

Test Speed

To simulate ground speed for the control unit, enter a test speed. Test speed clears if an actual ground speed is detected.

PC22295—UN—21MAR16

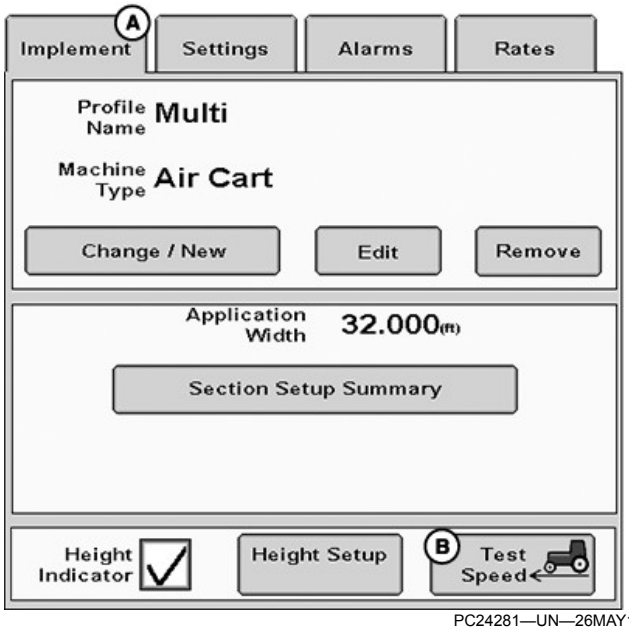
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC22296—UN—21MAR16

Setup Softkey

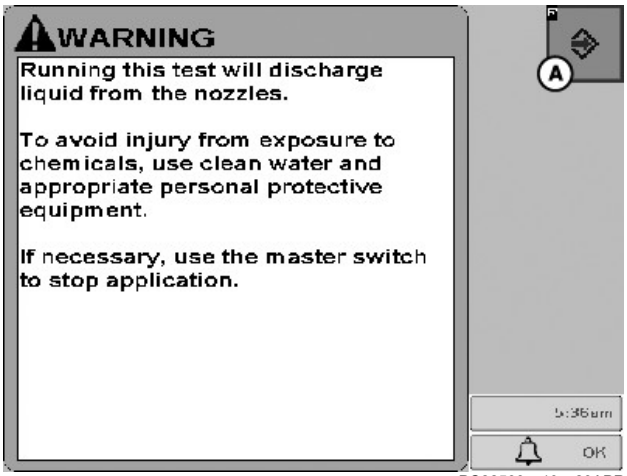
2. Select the Setup softkey.



PC24281—UN—26MAY17

A—Implement Tab
B—Test Speed Button

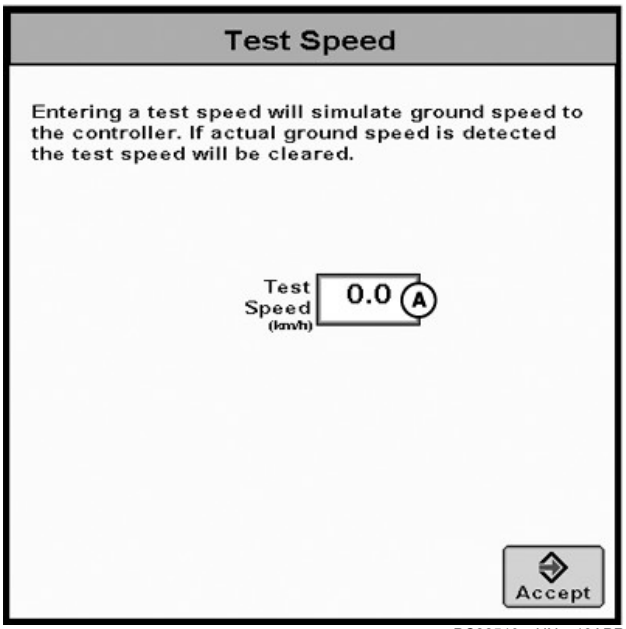
3. Select the Implement tab (A).
4. Select the Test Speed button (B).



PC22533—19—20APR16

A—Accept Softkey

5. Read the Diagnostic Tests Warning and select the Accept softkey (A).



PC22519—UN—18APR16

A—Test Speed

6. Enter the Test Speed (A).

HC94949,0000CA3-19-13DEC17

Tests

PC22295—UN—21MAR16

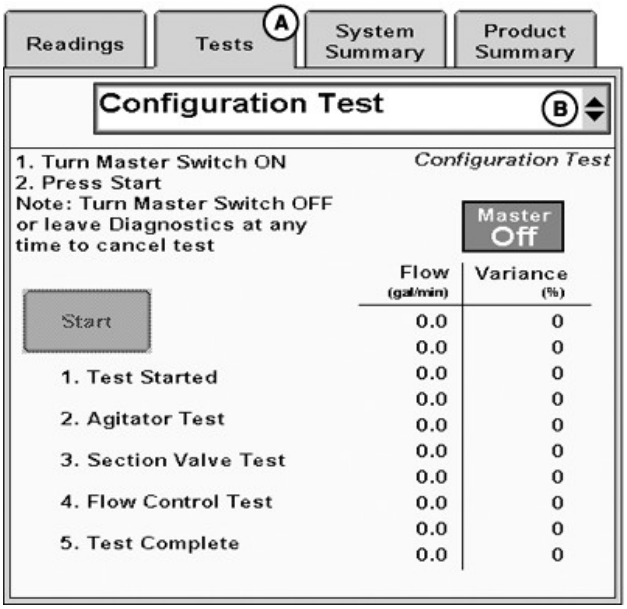
John Deere Rate Controller 2000 Button

1. Select the John Deere Rate Controller 2000 button.

PC21158—UN—11MAY15

Diagnostics Softkey

2. Select the Diagnostics softkey.



PC22396—UN—01APR16

A—Tests Tab
B—Tests Drop-Down Menu

3. Select the Tests tab (A).
4. Select test from the drop-down menu (B).

Liquid Diagnostic Test Warning displays after selecting any of the following for liquid applications:

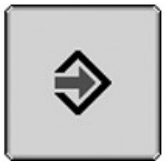
- Configuration Test
- Nozzle Flow Check
- Rinse Cycle
- Control / Section Test
- Control Valve Test
- Calibrate PWM Limits

NH3 Diagnostic Test Warning displays after selecting any of the following for NH3 applications:

- Energize System
- Bleed System Test

Dry Diagnostic Test Warning displays after selecting any of the following for dry applications:

- Granular Flow Check
- Spreader / Air Cart Check
- Control / Section Test
- Calibrate PWM Limits
- Bin / Tank Cleanout

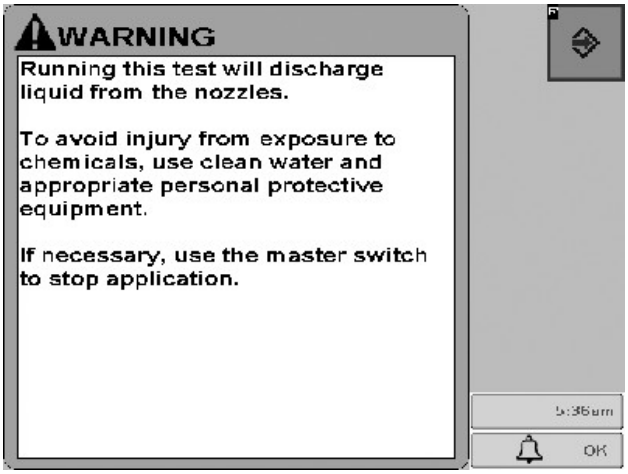


PC22532—UN—20APR16

Accept Softkey

5. Read the Discharge Warning and select the Accept softkey.

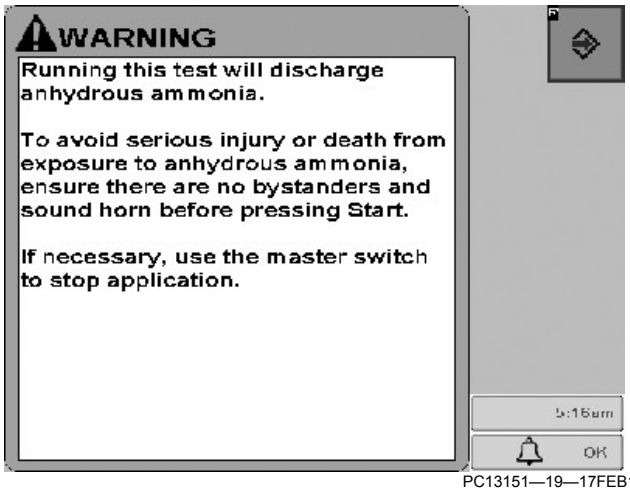
Liquid Diagnostic Test Warning



PC13156—19—17FEB11

This message displays when any diagnostic test is selected that discharges liquid.

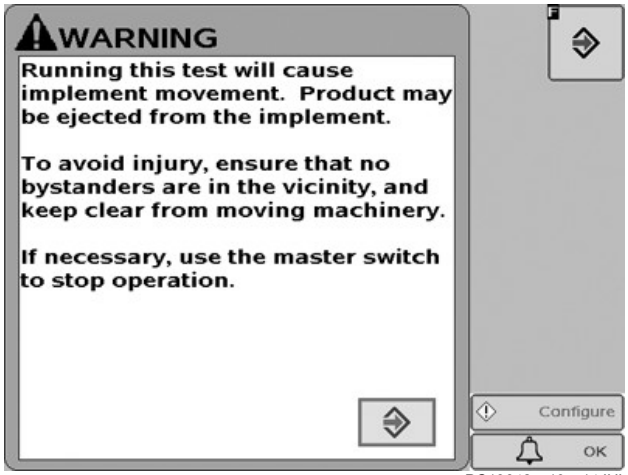
NH3 Diagnostic Test Warning



PC13151—19—17FEB11

This message displays when any diagnostic test is selected that discharges anhydrous ammonia.

Dry Diagnostic Test Warning

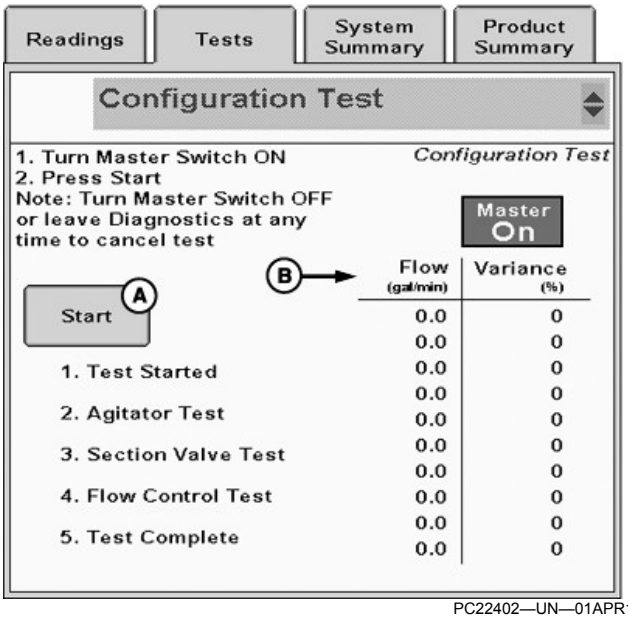


PC13642—19—14JUL11

This message displays when any diagnostic test is selected that discharges dry products.

HC94949,0000CA4-19-13DEC17

Configuration Test



PC22402—UN—01APR16

A—Start Button
B—Flow and Variance Table

Perform a Configuration Test to ensure that the system is functioning properly.

IMPORTANT: Always fill solution tank with clean water to perform configuration test.

NOTE: Turn master switch off or leave Diagnostics at any time to cancel test.

1. Turn master switch on.
2. Select Start button (A).

When test starts, the following procedures are automatically performed:

1. **Test Started**
2. **Agitator Test**

   If equipped, agitator valve opens for 15 seconds.
3. **Section Valve Test**

   Each boom section valve is individually cycled on and off for approximately 6 seconds, starting from left to right then back from right to left. All boom section valves are then turned on for approximately 10 seconds.
4. **Flow Control Test**

   Flow control valve is tested across entire range of flow. Results are displayed in Flow and Variance table (B). A low Variance % indicates a properly functioning flow control valve.
5. **Test Complete**

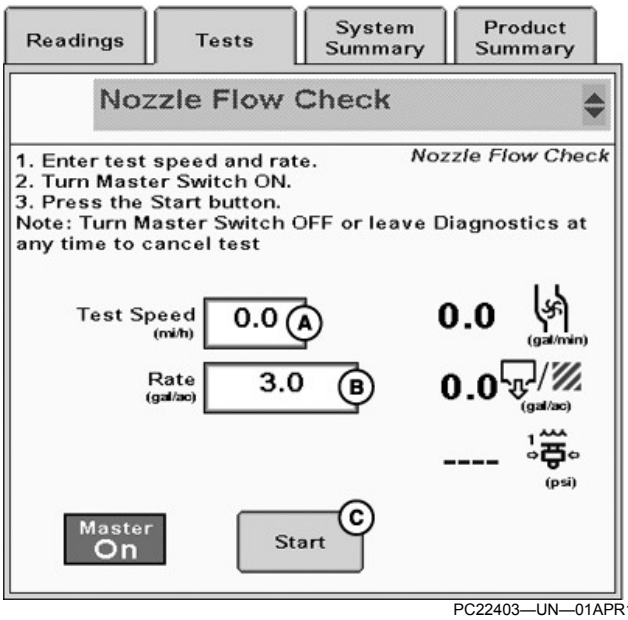
   A high variance number in desired flow range indicates inaccurate rate control.

If system does not control rate accurately, there are a few things to look for and adjust:

- Ensure that correct calibration value is entered for control valve type being used. This value is a starting point and can be fine-tuned.
- The lower the Variance (%), the better the rate controller is able to control a desired flow rate. There are a few issues that might cause variance to be inconsistent:
  - Low pump speed (low flow through selective control valve [SCV]).
  - Tank level. For example, if liquid in tank is low and machine is on a downhill slope, it may not be able to draw in enough product to achieve higher flow rates.
- System operating parameters (for example, tractor speed or pump speed) may need to be adjusted to increase performance at certain levels.

RW00482,0000650-19-13DEC17

Nozzle Flow Check



PC22403—UN—01APR16

A—Test Speed
B—Rate
C—Start Button

IMPORTANT: Always fill solution tank with clean water to perform nozzle flow check.

NOTE: Enter conditions that are comparable to normal operation. Larger dispense volumes result in longer but more accurate calibration tests.

Before starting test, verify that the Low Limit in Setup

PWM is correct. Too low a value may cause the test to fail.

Perform Nozzle Flow Check to test an application rate at a desired speed without the machine moving. The following items can be determined:

- If actual application rate meets the target application rate at a given speed.
- The actual flow rate of an implement section.
- Whether the nozzles are worn.
- Spray control valve pressure at a desired speed and application rate.

NOTE: Turn master switch off or leave Diagnostics at any time to cancel test.

Speed and rate can be changed while test is running.

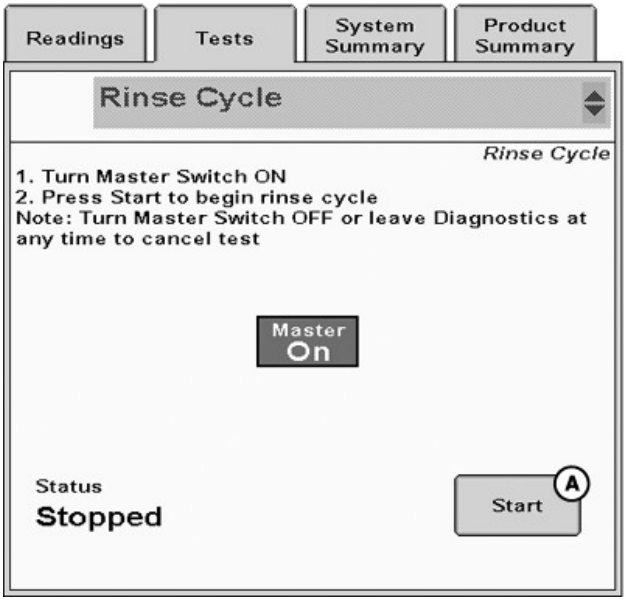
1. Enter Test Speed (A) and Rate (B).
2. Turn on master switch.
3. Select Start button (C).

If volume is higher than expected and pressure is lower than expected, nozzle tips could be worn.

If pressure is higher than expected for the given output, nozzle tips could be partially plugged. Drops in pressure can occur between section shutoff valves and nozzle tips. This is normally only associated with high flow rates.

AE77568,0000467-19-09OCT18

Rinse Cycle



PC22404—UN—01APR16

A—Start Button

IMPORTANT: Always fill solution tank with clean water to perform rinse cycle.

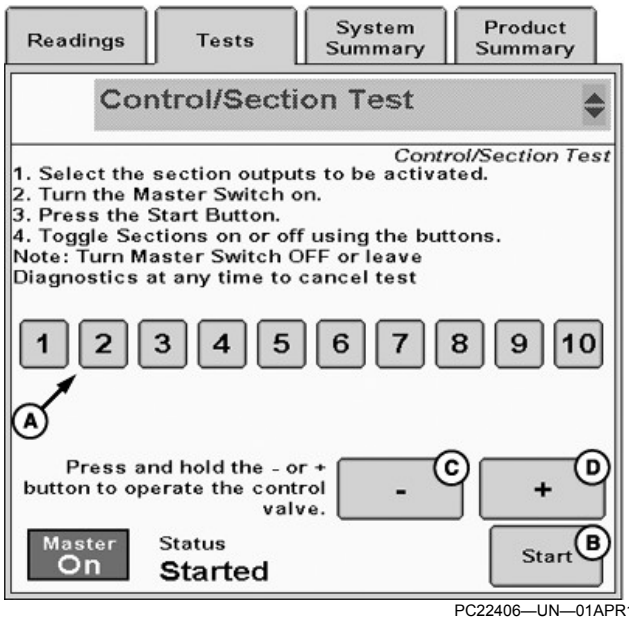
Rinse Cycle test fully opens all sections, fence row valves, and flow control valve until flow meter detects reduced flow.

NOTE: Turn master switch off or leave Diagnostics at any time to cancel test.

1. Turn master switch on.
2. Select Start button (A).

RW00482,00006C0-19-13DEC17

Control / Section Test



PC22406—UN—01APR16

A—Section Toggles
B—Start Button
C—Minus (-) Button
D—Plus (+) Button

Selected sections open while test is in progress. Unselected sections remain closed.

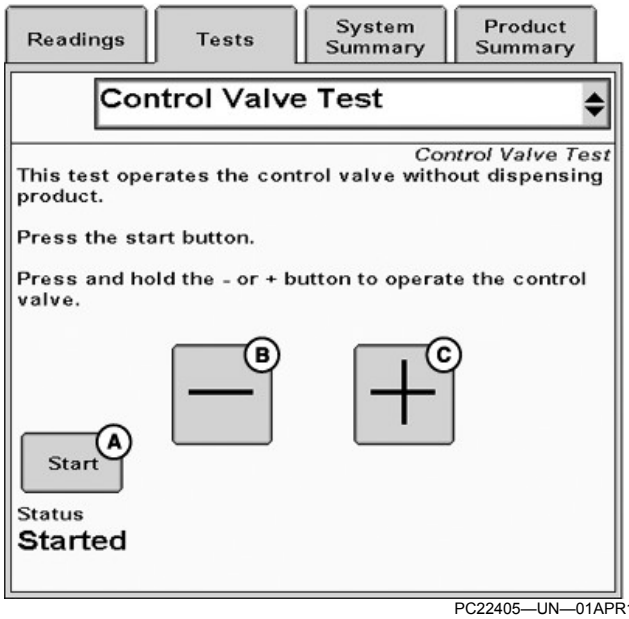
NOTE: Turn master switch off or leave Diagnostics at any time to cancel test.

1. Enable desired sections (A).
2. Turn master switch on.
3. Select Start button (B).
4. Toggle sections on or off using the buttons.

Press and hold - or + buttons (C and D) to operate control valve.

RW00482,0000653-19-13DEC17

Control Valve Test



PC22405—UN—01APR16

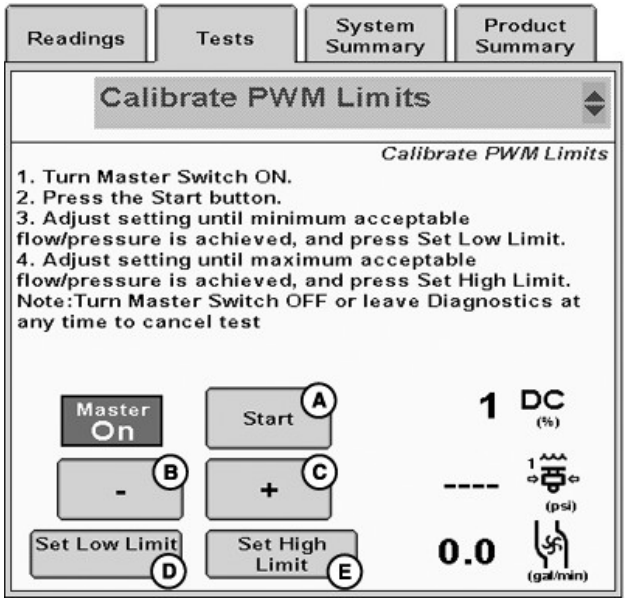
A—Start Button
B—Minus (-) Button
C—Plus (+) Button

This test operates control valve without dispensing product.

1. Select Start button (A).
2. Press and hold - or + buttons (B and C) to operate control valve.

RW00482,0000654-19-13DEC17

Calibrate PWM Limits



PC22410—UN—04APR16

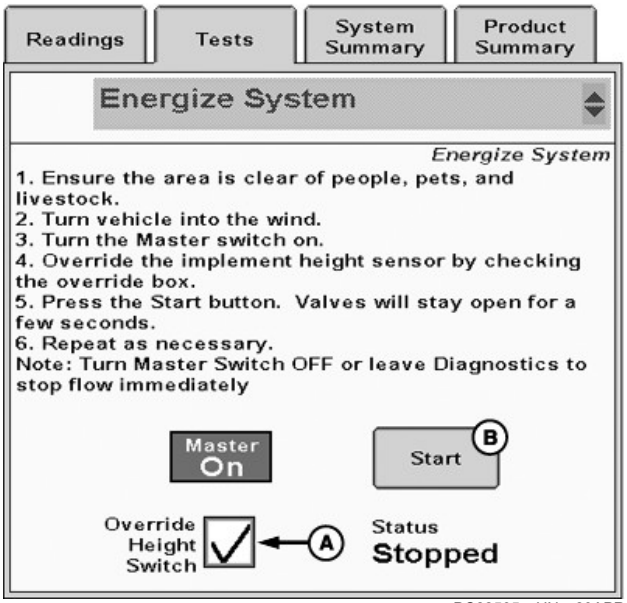
A—Start Button
B—Minus (-) Button
C—Plus (+) Button
D—Set Low Limit Button
E—Set High Limit Button

NOTE: Turn master switch off or leave Diagnostics at any time to cancel test.

1. Turn master switch on.
2. Select Start button (A).
3. Press and hold - or + buttons (B and C) until minimum acceptable flow / pressure is achieved. Select Set Low Limit (D).
4. Press and hold - or + buttons until maximum acceptable flow / pressure is achieved. Select Set High Limit (E).

RW00482,0000655-19-13DEC17

Energize System



PC22535—UN—20APR16

A—Override Height Switch Checkbox
B—Start Button

NOTE: Turn master switch off or leave diagnostics page to immediately force valves to return to closed position and stop flow.

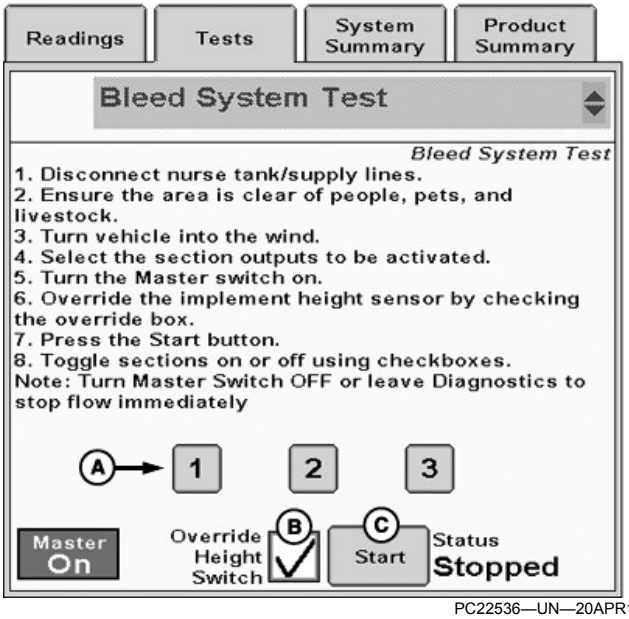
Use Energize System procedure to test for flow at openers, purge air and vapor from NH3 delivery system, and fill cooler and hoses with liquid anhydrous. Select Start button to fully open control valve and section valves for a few seconds, and then automatically close them.

1. Ensure that area is clear of people, pets, and livestock.
2. Position machine into the wind.
3. Turn master switch on.

4. Select Override Height Switch checkbox (A).
5. Select Start button (B). Valves stay open for a few seconds.
6. Repeat as needed.

RW00482,000067E-19-13DEC17

Bleed System Test



PC22536—UN—20APR16

A—Section Toggles
B—Override Height Switch Checkbox
C—Start Button

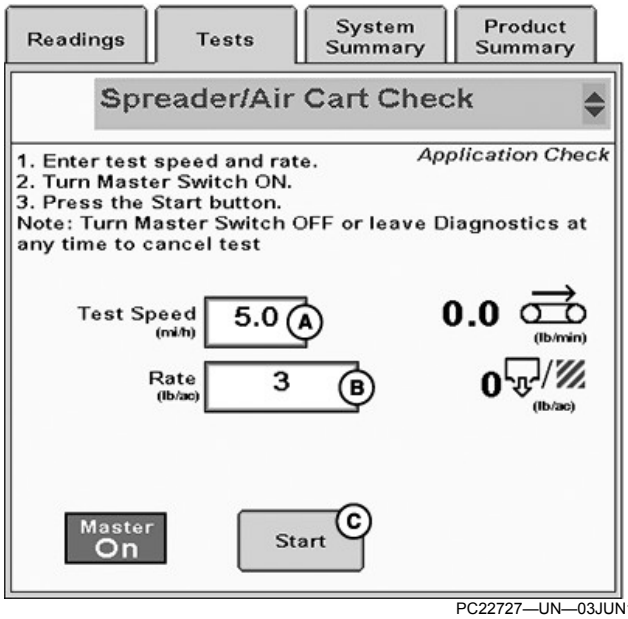
NOTE: Turn master switch off or leave diagnostics page to immediately force valves to return to closed position and stop flow.

Bleed Section Test allows operator to bleed trapped anhydrous ammonia from high-pressure lines between section valves and control valve while remaining seated in cab.

1. Disconnect nurse tank and supply lines.
2. Ensure that area is clear of people, pets, and livestock.
3. Position machine into the wind.
4. Enable desired sections (A).
5. Turn master switch on.
6. Select Override Height Switch checkbox (B).
7. Select Start button (C).
8. Toggle sections as needed.

RW00482,000067F-19-13DEC17

Spreader / Air Cart Check



PC22727—UN—03JUN16

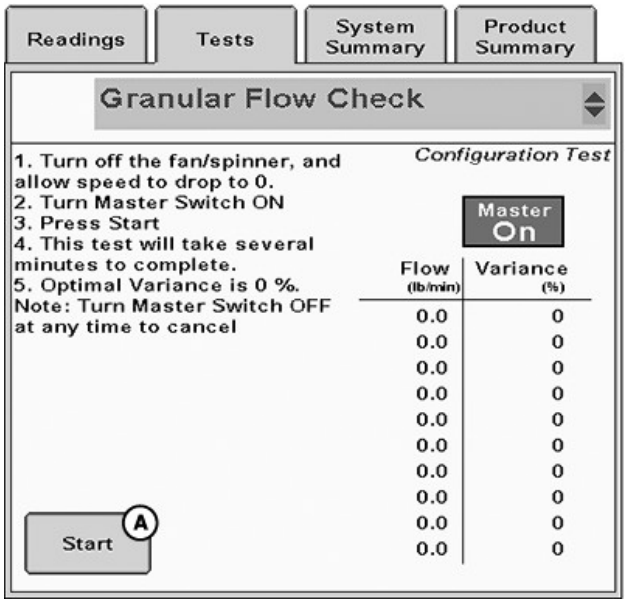
A—Test Speed
B—Rate
C—Start Button

NOTE: Turn master switch off or leave Diagnostics at any time to cancel test.

1. Enter Test Speed (A) and Rate (B).
2. Turn master switch on.
3. Select Start button (C).

RW00482,00006C1-19-13DEC17

Granular Flow Check



PC22728—UN—03JUN16

A—Start Button

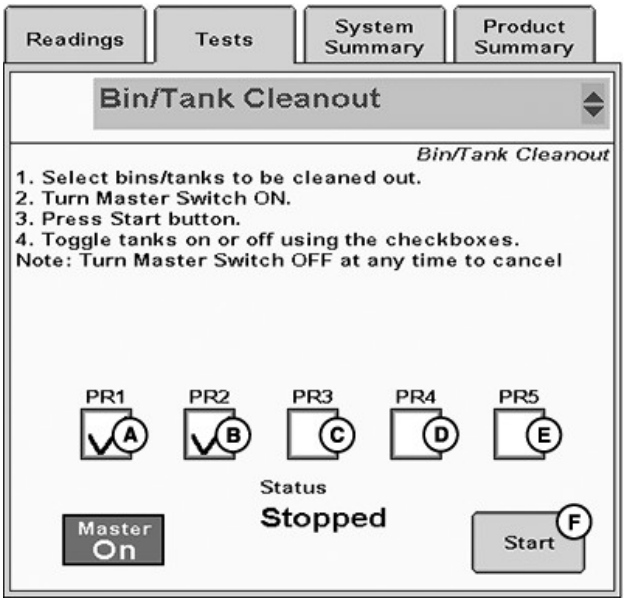
NOTE: Turn master switch off or leave Diagnostics at any time to cancel test.

Granular Flow Check takes several minutes to complete. Optimal variance is zero percent.

1. Turn fan and spinner off and allow speed to drop to zero.
2. Turn master switch on.
3. Select Start button (A).

RW00482,00006C2-19-13DEC17

Bin / Tank Cleanout



PC22729—UN—03JUN16

A—Product 1
B—Product 2
C—Product 3
D—Product 4
E—Product 5
F—Start Button

NOTE: Turn master switch off or leave Diagnostics at any time to cancel test.

1. Select Product (A—E) bins or tanks to be cleaned out.
2. Turn on master switch.
3. Select Start button (F).

RW00482,00006C3-19-13DEC17

Diagnostic LEDs

PC22411—UN—04APR16

A—A LED
B—B LED
C—C LED
D—Power LED

LED	Color	Blinks Per Second	Description
A	None	Solid state	Microprocessor is not powered
	Yellow	1	Boot hold mode
	Red	5	Microprocessor is programming
	Red	1	ISOBUS is offline
	White	1	Virtual terminal (VT) is offline
	Green	1	VT and system are normal
B	Red	Solid state	Field programmable gate array is not running
	Red	1	Low voltage power lost
	Blue	1	Signal is present on 1 or more rate sensors
	Yellow	1	Diagnostic Trouble Codes (DTCs) are active
	White	1	System voltage is below 11.5 V
	Purple	1	System voltage is above 16 V
	Blue	Solid state	One or more product switches have been set to on
	Purple	Solid state	Signal is present on one or more rpm sensors

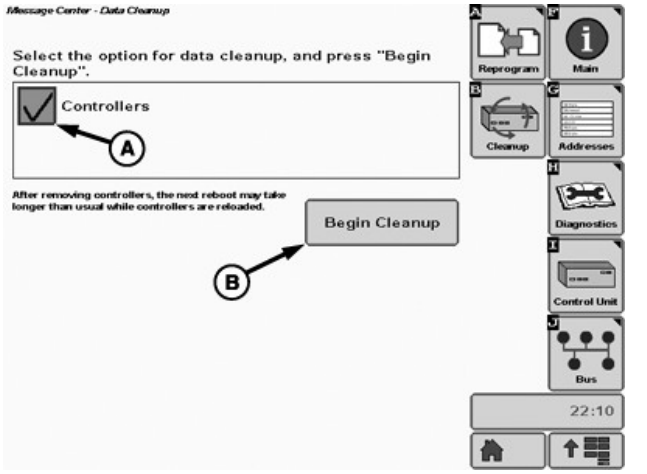
	Green	Solid state	All product switches have been set to off
C	Red	Solid state	Field programmable gate array is not running
	Green	1	Auxiliary CAN channel is active
	Red	1	Auxiliary CAN channel was active and is now offline
	Green	Solid state	No problems reported
Power	Green	Solid state	Electronic control unit (ECU) powered

RW00482,0000656-19-13DEC17

Data Cleanup

If the user interface does not show up anymore or if it does not show up correctly, the data cleanup function removes the control unit user interface files from the display. The cleanup forces the control unit to send its data to the display again after a restart.

GreenStar™ 3 2630 Display



PC13663CC—19—24OCT13

Data Cleanup

A—Controllers Checkbox
B—Begin Cleanup Button

1. Select Menu button.
2. Select Message Center button.
3. Select Cleanup softkey.
4. Select the checkbox (A) for the data to be removed.
5. Select the Begin Cleanup button (B).

After a restart, the control unit will display a bar graph in the main menu until the user interface is reloaded.

Generation 4 Display

PC16682—UN—18MAR13

ISOBUS VT

View the ISOBUS control unit in Status Center, and follow troubleshooting steps for the status indicated. For more information, view ISOBUS control units in Diagnostic Center.

If the interface still does not display correctly:

1. Select settings at the top of ISOBUS VT application.
2. Select Clean Up ISOBUS VT in advanced settings to clear stored ISOBUS control unit user interface files.

The user interface is reloaded the next time the control unit is connected.

HC94949,0000CA5-19-13DEC17

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Main Harness (47-Pin Connector) Table

NOTE: This pin-out table references the 47-pin connector on the main rate controller harness. When a pin has both a driver and input listed, the driver takes priority. See the driver and input tables to understand if the pin is a driver or input.

Pin	Function
1	High current ground
2	Sensor return
3	Sensor return
4	High current ground
5	High current power (fused at 15 A)
6	High current power (fused at 15 A)
7	Input 14
8	Input 16
9	Input 18
10	Input 11
11	Input 9
12	Input 1
13	Input 2
14	Driver 21 / Input 3
15	Driver 24 / Input 4
16	Driver 22 / Input 5
17	Driver 23 / Input 7
18	Input 24
19	Input 13
20	Input 15
21	Input 17
22	5 V DC
23	Driver 16
24	Driver 15
25	Driver 14
26	Driver 13
27	Driver 19 / Input 8
28	Driver 20 / Input 6
29	Driver 11
30	Driver 12
31	Implement height switch input / Input 26
32	12 V DC sensor power
33	12 V DC sensor power
34	Sensor Return
35	Input 23
36	Driver 1
37	Driver 2
38	Driver 3 / Input 22
39	Driver 4 / Input 12
40	Driver 5
41	Driver 6
42	Driver 7 / Input 21
43	Driver 8 / Input 10
44	Driver 9
45	Driver 10
46	Driver 17 / Input 19
47	Driver 18 / Input 20

HC94949,0000CA7-19-13DEC17

John Deere Rate Controller 2000 Multi-Product Connector

NOTE: This table references the middle 23-pin connector on the John Deere Rate Controller 2000.

Pin	Function
1	Driver 25
2	Driver 26
3	Driver 27
4	Driver 28
5	Driver 29
6	Driver 30
7	Driver 31
8	Driver 32
9	Sensor 12 V DC
10	Sensor Return
11	CAN Low 2
12	CAN High 2
13	Input 27
14	Input 30
15	Plugged
16	Sensor 5 V DC
17	Sensor 12 V DC
18	Sensor Return
19	Input 29
20	Input 28
21	Plugged
22	Plugged
23	Plugged

HC94949,0000CA6-19-13DEC17

Recommended Wire Sizes

Minimum Recommended Wire Size—Metric (mm^2)					
Length (mm)	Current (A)				
	0.5	1.0	1.5	2.0	2.5
1000	0.8	0.8	0.8	0.8	0.8
2500	0.8	0.8	0.8	0.8	0.8
5000	0.8	0.8	0.8	0.8	1.0
7500	0.8	0.8	0.8	1.0	2.0
10000	0.8	0.8	1.0	2.0	2.0
15000	0.8	1.0	2.0	3.0	3.0

Minimum Recommended Wire Size—SAE (gauge)					
Length (in.)	Current (A)				
	0.5	1.0	1.5	2.0	2.5
39	18	18	18	18	18
98	18	18	18	18	18
197	18	18	18	18	16
295	18	18	18	16	14
394	18	18	16	14	14
591	18	16	14	12	12

JS56696,0000762-19-13DEC17

Dual Control Valve

NOTE: The configuration of products determines the dual control valve setup. Use the product number in these tables that corresponds with the dual control valve to wire the drivers, inputs, and ground.

(See Driver Table–Multiple Products and Inputs Table-Multiple Products for control valves for all other products.)

Drivers		
	Left-Hand PWM Valve Source	**Right-Hand PWM Valve Source**
Product 1	Driver 15	Driver 16
Product 2	Driver 13	Driver 14
Product 2 (NH3)	Driver 11	Driver 12
Product 3	Driver 11	Driver 12
Product 3 (NH3)	Driver 25	Driver 26
Product 4	Driver 9	Driver 10
Product 5	Driver 5	Driver 6

Inputs		
	Left-Hand Rate Sensor Signal	**Right-Hand Rate Sensor Signal**
Product 1	Input 1	Input 2
Product 2	Input 3	Input 4
Product 2 (NH3)	Input 5	Input 3
Product 3	Input 5	Input 6
Product 3 (NH3)	Input 27	Input 28
Product 4	Input 7	Input 8
Product 5	Input 9	Input 10

Ground	
	PWM Valve Return Ground
All Products	High current ground (Pin 4 on 47-pin connector.)

HC94949,0000CB2-19-20DEC17

Driver Table—Single Product

(Reference Sections in System Overview section.)

NOTE: Enabling optional features, such as fence rows nozzles and agitators, reduces the number of section controls.

NOTE: For air cart and generic configurations, reference the Driver Table—Multiple Product.

Driver Number	3-Wire Section Valves	2-Wire Section Valves	NH3 Tool	Tiered Boom Applications	Planters
1	Section 1	Section 1 (+)	Section 1	Section 1	Section 1
2	Section 2	Section 1 (-)	Section 2	Section 2	Section 2
3	Section 3	Section 2 (+)	Section 3	Section 3	Section 3
4	Section 4	Section 2 (-)	Section 4	Section 4	Section 4
5	Section 5	Section 3 (+)	Section 5	Section 5	Section 5
6	Section 6	Section 3 (-)	Section 6	Section 6	Section 6
7	Section 7	Section 4 (+)	Section 7	Section 7	Section 7
8	Section 8	Section 4 (-)	Section 8	Section 8	Section 8
9	Section 9	Section 5 (+) or agitator valve (+)	Boost pump (+)	Section 9	Section 9
10	Section 10	Section 5 (-) or agitator valve (-)	Boost pump (-)	Section 10	Section 10
11	Section 15 or agitator valve	Section 6 (+) or left fence row		Section 15 or agitator valve	Section 11
12	Section 16 or flow return (+)	Section 6 (-) or right fence row		Section 16 or flow return (+)	Section 12
13	Flow return (-) or left fence row	Section 7 (+) or flow return valve (-)	Master on / off valve	Section 17, tier 1 solenoid signal, flow return (-)	Section 13
14	Right fence row	Section 7 (-) or flow return valve (+)		Section 18, tier 2 solenoid signal	Section 14
15	Control valve (+)	Control valve (+)	Control valve (+)	Control valve (+)	Section 15
16	Control valve (-)	Control valve (-)	Control valve (-)	Control valve (-)	Section 16
17	Section 11			Section 11	
18	Section 12			Section 12	
19	Section 13			Section 13	
20	Section 14			Section 14	
21					
22					
23				Section 19	
24			Fast control valve power	Section 20	
25	Flow return (+)	Section 8 (+) or agitator valve B (+)		Flow return (+)	
26	Flow return (-)	Section 8 (-) or agitator valve B (-)		Flow return (-)	
27			Section 9		
28	Agitator valve		Section 10	Agitator valve	
29	Right fence row	Right fence row		Right fence row	
30	Left fence row	Left fence row		Left fence row	
31					
32					

HC94949,0000CA8-19-13DEC17

Driver Table—Multiple Products

NOTE: Enabling optional features, such as fence rows nozzles and agitators, reduces the number of section controls.

A three product implement, where the first two products are dry and the third is a liquid, uses the generic column in this table. A three-product NH3 tool uses the NH3 tool column due to the drivers being different.

(Reference Sections in System Overview section.)

Driver Number	NH3 Tool	Spreader	Air Cart / Generic (Multi-Product Liquid / Dry)
1	Section 1	Section 1	Section 1
2	Section 2	Section 2	Section 2
3	Section 3	Section 3	Section 3
4	Section 4	Section 4	Section 4 or input 22
5	Section 5	Product 5 control valve (+) or spinner PWM (+)	Product 5 control valve (+), section 5 (primary), or master clutch (secondary)
6	Section 6	Product 5 control valve (-) or spinner PWM (-)	Product 5 control valve (-) or section 6 (primary),
7	Section 7		Input 21 or section 7 (primary)
8	Section 8		Master clutch (primary), section 8 (primary), or input 10
9	Boost pump (+)	Product 4 control valve (+)	Product 4 control valve (+) or section 9 (primary)
10	Boost pump (-)	Product 4 control valve (-)	Product 4 control valve (-) or section 10 (primary)
11	Product 2 control valve (+)	Product 3 control valve (+)	Product 3 control valve (+) or section 15 (primary)
12	Product 2 control valve (-)	Product 3 control valve (-)	Product 3 control valve (-) or section 16 (primary)
13	Master on / off valve	Product 2 control valve (+)	Product 2 control valve (+)
14		Product 2 control valve (-)	Product 2 control valve (-)
15	NH3 control valve (+)	Product 1 control valve (+)	Product 1 control valve (+)
16	NH3 control valve (-)	Product 1 control valve (-)	Product 1 control valve (-)
17			Section 11
18			Section 12
19			Section 13
20			Section 14
21			
22			
23			
24	Fast control valve power		
25	Product 3 control valve (+)	Section 11	Next available section +6
26	Product 3 control valve (-)	Section 12	Next available section +7
27	Section 9	Section 5	Next available section
28	Section 10	Section 6	Next available section +1
29	Section 11	Section 7	Next available section +2
30	Section 12	Section 8	Next available section +3
31	Section 13	Section 9	Next available section +4
32	Section 14	Section 10	Next available section +5

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Inputs Table—Single Product

(Reference Sections in System Overview section.)

NOTE: Enabling optional features, such as fence rows nozzles and agitators, reduces number of section controls.

Input Number	Sprayer and Liquid Fertilizer Tool	NH3 Tool
1	Flow meter signal	Flow meter signal
2	Fill flow meter signal	Master valve status
3		
4		
5		
6		Valve status 4
7		Valve status 5
8		Valve status 3
9		Valve power 1 sense
10		
11		Valve power 2 sense
12		
13		Valve status 1
14	Pressure signal 1 (boom pressure)	Pressure signal 1 (NH3 outlet)
15		Valve status 2
16	Pressure signal 2 (sparge pressure)	Pressure signal 2 (NH3 inlet)
17		
18		Pressure signal 3
19		Valve status 7
20		Valve status 8
21		
22		
23		Valve status 6
24	Pump RPM signal	Pump RPM signal
25	Master Switch	Master Switch
26	Implement Height Switch	Implement Height Switch
27		
28		Valve status 9
29		Valve status 10

RW00482,0000062-19-13DEC17

Inputs Table—Multiple Products

(Refer to Sections in System Overview section.)

NOTE: Enabling optional features, such as fence-row nozzles and agitators, reduces number of section controls.

A three product implement, where the first two products are dry and the third is a liquid, uses the Generic column for the dry and liquid inputs.

NOTE: If the John Deere Rate Controller 2000 is configured for more than two products or 16 total sections, the pressure signals are transferred from the primary to the secondary pressure sensor inputs.

Input Number	NH3 Tool	Spreader	Air Cart and Generic (Multi-Product Liquid and Dry)
1	Flow meter signal	Product 1 rate sensor signal	Product 1 shaft sensor signal
2	Master valve status	Product 1 rate sensor signal (right-hand dual encoder)	Product 1 shaft sensor signal or fill flow meter signal
3		Product 2 rate sensor signal	Product 2 rate sensor signal

4		Product 2 rate sensor signal (right-hand dual encoder)	Product 2 shaft sensor signal or fill flow meter signal
5	Product 2 rate sensor signal	Product 3 rate sensor signal	Product 3 rate sensor signal
6	Valve status 4	Product 3 rate sensor signal (right-hand dual encoder)	Product 3 shaft sensor signal or fill flow meter signal
7	Valve status 5	Product 4 rate sensor signal	Product 4 rate sensor signal
8	Valve status 3	Product 4 rate sensor signal (right-hand dual encoder)	Product 4 shaft sensor signal or fill flow meter signal
9	Valve power 1 sense	Product 5 rate sensor signal	Product 5 rate sensor signal
10		Product 5 rate sensor signal (right-hand dual encoder) or pressure signal 5	Product 5 shaft sensor signal or pressure signal 5
11	Valve power 2 sense		
12	Pressure signal 6	Pressure signal 6	Pressure signal 6
13	Valve status 1	Product 1 bin level signal	Product 1 bin level signal
14	Pressure signal 1 (NH3 outlet)	Pressure signal 1 (primary)	Pressure signal 1 (primary)
15	Valve status 2	Product 2 bin level signal	Product 2 bin level signal
16	Pressure signal 2 (NH3 inlet)	Pressure signal 2 (primary)	Pressure signal 2 (primary)
17	Product 2 bin level signal	Product 3 bin level signal	Product 3 bin level signal
18	Pressure signal 3	Pressure signal 3 (primary)	Pressure signal 3 (primary)
19	Valve status 7	Product 4 bin level signal	Product 4 bin level signal
20	Valve status 8	Pressure signal 4 (primary)	Pressure signal 4 (primary)
21		Product 5 bin level signal	Product 5 bin level signal
22			
23	Valve status 6		Fan 2 RPM signal
24	Pump, fan, or spinner RPM signal	Fan or spinner RPM signal	Fan 1 RPM signal
25	Master switch	Master switch	Master switch
26	Implement height switch	Implement height switch	Implement height switch
27	Product 3 rate sensor signal	Pressure signal 4 (secondary)	Pressure signal 4 (secondary)
28	Valve status 9	Pressure signal 3 (secondary)	Pressure signal 3 (secondary)
29	Product 3 bin level signal or valve status 10	Pressure signal 2 (secondary)	Pressure signal 2 (secondary)
30	Pressure signal 4	Pressure signal 1 (secondary)	Pressure signal 1 (secondary)

AE77568,0000468-19-09OCT18

Preseason Checklist

In addition to performing checklist before season begins, utilize preseason checklist if any of the following occur:

- A different machine or implement is introduced to system.
- A hydraulic system component is repaired, replaced, or adjusted.
- An Ag Management Systems (AMS) component is replaced.

☐ Refer to electronic Operator's Manual from Manuals.Deere.com or contact your John Deere dealer for latest version.
☐ Update software. Refer to StellarSupport.com for latest software.
  ☐ Display
  ☐ Controller
☐ Load and activate applications on display.
☐ Inspect wiring harness for wear and damage around pinch points, corners, edges, and harness support locations. Repair as necessary.
☐ Inspect connector seals and latching mechanisms. Repair as necessary.
☐ Inspect connector pins for wear, debris, and corrosion. Clean and (or) repair as necessary.
  ☐ ISO connector
  ☐ Controller connectors
  ☐ Display
☐ Inspect mounting hardware. Retorque as necessary.
  ☐ Display
  ☐ Controller mount
☐ Calibrate sensors and control valves.
☐ Perform system voltage test.
☐ Perform flow control test.

(Reference implement Operator's Manual for detailed checklists.)

NOTE: Some tests are not available depending on application.

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Daily Checklist

☐ Inspect wiring harness for wear and damage around pinch points, corners, edges, and harness support locations. Repair as necessary.
☐ Inspect wiring harness at connectors for wear on exposed wires. Repair as necessary.
☐ Inspect mounting hardware. Retorque as necessary.
  ☐ Display
  ☐ Controller mount
☐ Run control unit diagnostic tests.
☐ Perform Control Valve test.
☐ Verify section status readings.
☐ Verify system voltage readings.
☐ Verify switches and status readings.
☐ Verify sensor and status readings.

(Reference implement Operator's Manual for detailed checklists.)

NOTE: When changing product, empty bin or tank, perform rinse cycle, and perform new product setup and calibration.

Some tests are not available depending on application.

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Postseason Checklist

☐ Inspect wiring harness for wear and damage around pinch pints, corners, edges, and harness support locations. Repair as necessary.
☐ Inspect wiring harness at connectors for wear on exposed wires. Repair as necessary.
☐ Inspect connector seals and latching mechanisms. Repair as necessary.
☐ Inspect connector pins for wear, debris, and corrosion. Clean and (or) repair as necessary.
  ☐ ISO connector
  ☐ Control unit connectors
  ☐ Display
☐ Inspect mounting hardware. Retorque as necessary.
  ☐ Display
  ☐ Control unit mount
☐ Perform rinse cycle.

(Reference implement Operator's Manual for detailed checklists.)

NOTE: Some tests are not available depending on application.

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John Deere Service Literature Available

Technical Information

Technical information can be purchased from John Deere. Publications are available in print or CD-ROM format.

Orders can be made using one of the following:

- John Deere Technical Information Store: **www.JohnDeere.com/TechInfoStore**
- Call 1-800-522-7448
- Contact your John Deere dealer

Available information includes:

TS189—UN—17JAN89

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.

TS191—UN—02DEC88

OPERATOR'S MANUALS providing safety, operating, maintenance, and service information.

TS224—UN—17JAN89

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 a separate component technical manual.

TS1663—UN—10OCT97

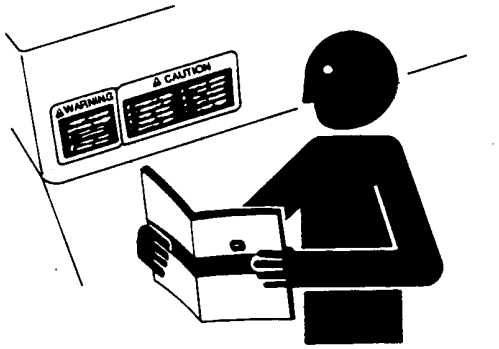
EDUCATIONAL CURRICULUM including five comprehensive series of books detailing basic information regardless of manufacturer:

- Agricultural Primer series covers technology in farming and ranching.
- 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.
- Fundamentals of Compact Equipment manuals provide instruction in servicing and maintaining equipment up to 40 PTO horsepower.

DX,SERVLIT-19-07DEC16

John Deere Service Keeps You on The Job

John Deere Is At Your Service



TS201—UN—15APR13

CUSTOMER SATISFACTION is important to John Deere.

Our dealers strive to provide you with prompt, efficient parts and service:

–Maintenance and service parts to support your equipment.

–Trained service technicians and the necessary diagnostic and repair tools to service your equipment.

CUSTOMER SATISFACTION PROBLEM RESOLUTION PROCESS

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. Or contact the Ag Customer Assistance Center at 1-866-99DEERE (866-993-3373) or e-mail us at www.deere.com/en_US/ag/contactus/.

DX,IBC,2-19-02APR02