

John Deere Active Implement Guidance (S.N. PCXL01A or B)



JOHN DEERE

OPERATOR'S MANUAL

John Deere Active Implement Guidance (S.N. PCXL01A or B)

OMPFP19019 ISSUE B4 (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.

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.

John Deere Technical Information Bookstore

Product functionality may not be fully represented in this document due to product changes occurring after time of printing. Read the latest Operator's Manual prior to operation. To obtain a copy, see your dealer or visit techpubs.deere.com.

CZ76372,000071F-19-08OCT19

Serial Number: _____

JS56696,0000C4C-19-03FEB17

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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.

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Safety

Recognize Safety Information



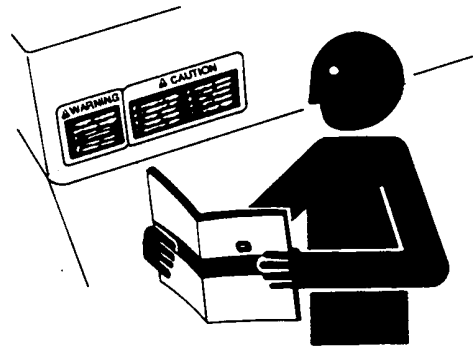
T81389—UN—28JUN13

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-19-03OCT22

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-19-01AUG22

Understand Signal Words



▲ WARNING

▲ CAUTION

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

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.

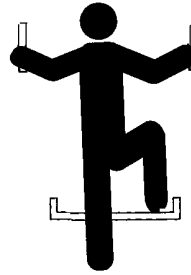
On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

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 Implement Automation Systems Safely



PC13793—UN—25MAY11

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

Implement automation systems are intended to aid the operator in performing field operations more efficiently. The operator is always responsible for the machine path.

Implement automation systems include any application that automates implement movement. This includes, but may not be limited to, iGrade™ and Active Implement Guidance.

To prevent injury to the operator and bystanders:

- Verify the machine, implement, and automation systems are set up correctly.
- Remain alert and pay attention to the surrounding environment.
- Take control of the machine, 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.

CF86321,0000366-19-19DEC13

Avoid High-Pressure Fluids



X9811—UN—23AUG88

Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

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

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

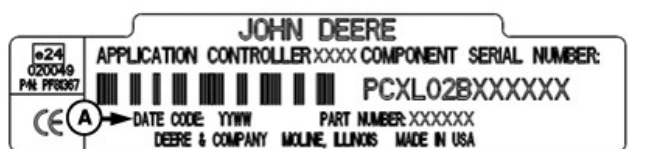
Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available in English from Deere & Company Medical Department in Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.

DX,FLUID-19-12OCT11

Regulatory and Compliance Information

Identify Date Code



PC20030—UN—23SEP14

Product Label Example

DATE CODE **YY** **WW**

(B) (C)

PC17574—UN—16AUG13

Date Code Example

- A—Date Code (Date of Manufacture)
- B—Last Two Numbers of Year of Manufacture
- C—Week Number of Calendar Year of Manufacture

Use the date code (A) on the product label to identify the date of manufacture. "YY" (B) identifies the last two numbers of the year of manufacture; "WW" (C) identifies the week number of calendar year of manufacture.

NOTE: The week number of manufacture ranges between 01-53.

Date Code		
YY	Last Two Numbers of Year of Manufacture	Example: 11 = 2011 12 = 2012 13 = 2013
WW	Week Number of Calendar Year of Manufacture	Example: 01, 02, 03...53

RW00482,00003F4-19-23SEP14

Eurasian Economic Union – EAC

Eurasian Economic Union - EAC

Information for products that bear conformity mark of the Eurasian Economic Union member states

Manufacturer: Deere & Company
Moline, Illinois U.S.A.

Universal CAN Application Controller
Model: John Deere Application Controller
Made in USA

Name and address of the authorized representative in the Eurasian Economic Union:
Limited Liability Company "John Deere Rus"

Address: 142050, Russia, Moscow region, Domodedovo district, Domodedovo, Beliy Stolbi micro district, vladeny "Warehouse 104," Building 2.

For technical support, please contact your dealer.



PC24107—UN—13APR17

Евразийский экономический союз (ЕАЭС)

Информация об изделиях, которые имеют знак соответствия требованиям технических регламентов Евразийского экономического союза (ЕАЭС)

Производитель: Компания Deere & Company
г. Молин, Штат Иллинойс, США

Универсальный CAN контроллер приложений
модель: John Deere Application Controller
Сделано в США.

Наименование и адрес уполномоченного представителя на территории Евразийского экономического союза (ЕАЭС): Общество с ограниченной ответственностью "Джон Дир Русь"

Адрес: 142050, Россия, Московская область, Домодедовский район, г. Домодедово, микрорайон "Белые столбы", владение "Склады 104," стр. 2.

Для получения технической поддержки обращайтесь к дилеру, обслуживающему вашу организацию.



PC24108—UN—20APR17
RW00482,00000FA-19-20APR17

EU Declaration of Conformity

Deere & Company
Moline, Illinois, U.S.A.

The undersigned hereby declares that:

Product: Application Controller

Model(s): XL01, XL02

fulfill(s) all relevant provisions and essential requirements of the following directives:

DIRECTIVE	NUMBER	CERTIFICATION METHOD
Electromagnetic Compatibility Directive	2014/30/EU	Annex II of the Directive

The product is in conformity with the following standards and/or other normative documents:

ISO 14982: 1998

Name and address of the person in the European Community authorized to compile the technical construction file:

Brigitte Birk
John Deere GmbH & Co. KG
Mannheim Regional Center (Zentralfunktionen)
John Deere Strasse 70
Mannheim, Germany D-68163

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Place of Declaration: Urbandale, Iowa, U.S.A

Date of Declaration: 27 April 2016

Name: Aaron Senneff

Title: Manager - Software Development



DXCE01—UN—28APR09
RW00482,00000F9-19-13MAR18

System Overview

Theory of Operation

Active Implement Guidance allows machine and implement to be independently steered onto a common track. Active Implement Guidance synchronizes with AutoTrac™ to guide the implement on the same generated path as machine. Active Implement Guidance utilizes Application Controller 1100 to calculate the implement position regarding an AB Line. Implement Control Mode applies specific implement design to position calculation. Application Controller 1100 commands the implement hydraulic steering mechanism to actuate using a hydraulic control until the implement has reached a desired position.

Implement Positioning Control Mode Options

Third-party steering systems are available depending on type, make, and model of implement. There are two available implement positioning control modes within Active Implement Guidance. Select mode that best fits the implement design and positioning mechanism.

- **Implement Shifter** is a control mode for implements with hydraulic hitches or implements with a steering motion parallel to rear machine axle. Application Controller 1100 only uses implement global positioning system (GPS) data for calculations and commands. It does not use or require feedback sensor data.
- **Implement Steering** is a control mode that uses implement receiver GPS data and feedback data from an implement steering mechanism potentiometer or Hall effect sensor. Based on implement performance, operator is required to adjust guidance and steering sensitivity through the display. Application Controller 1100 uses GPS and implement feedback for calculations and commands. Calibration of potentiometer or Hall effect sensor is required during setup.

Hydraulic Control Options

- **Selective Control Valve (SCV) Control** is used when machine is equipped with electronically controlled SCVs. Application Controller 1100 sends a signal voltage to the machine hydraulic controller to command SCV hydraulic flow to the implement steering mechanism until desired implement position is achieved. Calibration of SCV thresholds through display is required at setup and any time hydraulic system is altered. Due to normal variations in SCVs, each machine has its own unique SCV signal voltage threshold values. Hydraulic systems that do not regulate return hydraulic flow require a counterbalance valve to maintain a system return pressure for consistent performance.
- **External Valve Control** is used when electronically controlled SCVs are not utilized. Application Controller 1100 sends a signal voltage to an external valve that controls the amount of hydraulic flow to the

implement steering mechanism until desired implement position is achieved. Hydraulic supply and return oil are routed through the external valve, which does not require a counterbalance valve.

RW00482,00002F3-19-22SEP14

Active Implement Guidance Requirements

Hardware:

- GreenStar™ 2 Display, GreenStar™ 3 Display, GreenStar™ 3 CommandCenter™, John Deere 4640 Universal Display, or 4600 CommandCenter™
- StarFire™ Receiver with RTK installed on machine
- StarFire™ Receiver installed on implement
- Application Controller 1100

NOTE: Wheel angle sensor is required for implement steering control mode only. It is not required for implement shifting applications.

- Implement-mounted wheel angle sensor
- Implement hydraulic steering mechanism
- Various harnesses associated with power supply, control unit integration, sensor communication, and steering control

Software:

- AutoTrac™ activation on display (not required to steer system manually)

NOTE: Active Implement Guidance activation is displayed on the Application Controller Activations page.

- Active Implement Guidance activation on the Application Controller 1100
- AutoTrac™ and Active Implement Guidance setup complete (incomplete AutoTrac™ setup prevents operation of guidance)
- StarFire™ Receiver software updated to latest version
- Display software updated to latest version

RW00482,000025A-19-14MAR18

Navigate to Application Controller Using Generation 4 Display

NOTE: Turn key OFF and allow the display to completely power down before connecting or disconnecting ISOBUS implements.

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

AutoTrac is a trademark of Deere & Company

This Operator's Manual provides instructions for using a GreenStar™ 3 2630 Display. If using a Generation 4 Display, these instructions are the same after navigating to the Application Controller 1100.



Menu Button

PC17269—UN—15JUL13

1. Select the Menu button.



Applications Tab

PC21496—UN—05OCT15

2. Select the Applications tab.



ISOBUS VT Application

PC16682—UN—18MAR13

3. Select the ISOBUS VT application.



ISOBUS VT Menu Button

PC15293—UN—18MAR13

4. Select the ISOBUS VT Menu button.



PC22167—UN—23FEB16

Connected ISOBUS Implements

A—Application Controller 1100 Button
B—OK Button

5. Select the Application Controller 1100 button (A).
6. Select the OK button (B).

RW00482,00005AD-19-22MAR18

Activate Active Implement Guidance

To operate Active Implement Guidance, a 26-digit activation code is required for the Application Controller 1100. Contact your John Deere dealer and provide the Application Controller 1100 serial number.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller 1100 Button

PC14926—UN—27APR12

2. Select the Application Controller button.



Setup Softkey

PC12961—UN—13APR15

replacing just the EPROM or the whole tractor hydraulic controller.

For more information on EPROM requirements and compatibility, contact your John Deere dealer.

RW00482,00003A8-19-11AUG14

3. Select the Setup softkey.



Activation Entry Button

PC17966—UN—07NOV13

4. Select the Activation Entry button.



Activation Entry Box

PC17967—UN—07NOV13

5. Select the Activation Entry box and enter the activation code.



Accept Button

PC22267—UN—14MAR16

6. Select the Accept button.
7. Shut off machine, wait for display to power down, then restart machine.

RW00482,00000F6-19-14MAR18

Machine Compatibility

The guidance portion of Active Implement Guidance is compatible on machines installed with Integrated AutoTrac™, AutoTrac™ Universal, or AutoTrac™ Controller.

Active Implement Guidance external valve kit adds hydraulic control to machines that do not come with factory installed hydraulic controls.

(Reference External Valve in Components section for more information.)

RW00482,0000350-19-09JUL14

Replace Erasable Programmable Read Only Memory (EPROM)

EPROM is contained in tractor hydraulic controller. On some early models of 8000 and 9000 series tractors, it is necessary to replace EPROM. This may require

iGrade is a trademark of Deere & Company

Softkey Legend

Application Controller 1100—Setup Softkey



Setup Softkey

PC21157—UN—11MAY15

- Control Selection—Select control type for selective control valve (SCV) 1 or SCV 3.
- SCV Threshold Setup—Enter extend and retract threshold and valve test on or off.
- Serial Port Setup—Set up serial port communications.
- I/O Voltages—View Input / Output (I/O) voltage readings.
- Activation Entry—Enter Application Controller 1100 specific activations.

RW00482,00004F0-19-29JUL15

Application Controller 1100—Main Softkey



Main Softkey

PC21156—UN—11MAY15

- Control Main—View information and select operational functions for selected control type (SCV 1 or SCV 3).
- Control Setup—Set up and enter required inputs for selected control type (SCV 1 or SCV 3)
- Version Information—View application controller specific information, reset factory defaults, or turn CAN bus diagnostics on or off.

RW00482,00004F3-19-29JUL15

GreenStar™—Guidance Softkey



Guidance Softkey

PC21148—UN—11MAY15

- View Tab—View map, select track name, change

steering sensitivity, view AutoTrac™ pie chart, or turn AutoTrac™ steering on or off.

- Guidance Settings Tab—Set up tracking mode, general guidance settings, track settings, AutoTrac™ advanced settings, and lightbar settings.
- Shift Track Settings Tab—Set up shift track settings and turn shifts on or off.

RW00482,00004F4-19-29JUL15

StarFire™ Receiver—StarFire™ Softkey



StarFire™ Softkey

PC21154—UN—11MAY15

- Info Tab—View general StarFire™ and global positioning system (GPS) information.
- Setup Tab—Set up StarFire™ mount direction, fore/aft, height, optimize shading, SF2 fallback, hrs. on after shutdown, and calibrate terrain compensation module (TCM).
- Activations Tab—Enter StarFire™ Receiver activations codes.
- Serial Port Tab—Set up or change serial port settings.

RW00482,00004F5-19-04MAY16

StarFire™ Receiver—RTK Softkey



RTK Softkey

PC21155—UN—11MAY15

Select RTK softkey to set up real time kinematics (RTK) radios.

RW00482,00004F9-19-04MAY16

StarFire™ Receiver—Satellite Softkey



PC21153—UN—11MAY15

Satellite Information Softkey

- Sky Plot Tab—View sky plot and satellite tracking information.
- Graph Tab—View satellite tracking information in a graph.

RW00482,00004F6-19-04MAY16

StarFire™ Receiver—Diagnostics Softkey



PC21158—UN—11MAY15

Diagnostics Softkey

- Readings Tab—View StarFire™ and real time kinematics (RTK) information.
- Data Logs Tab—View StarFire™, differential mode, and satellite information.
- Over the Air Tab—View over the air messages.

RW00482,00004F7-19-04MAY16

Component Overview

Monitor and Control System

Because the monitor and control systems are an integral part of the machine, operations involving displays and electronic controllers are shown throughout the manual, in their respective sections.

Monitor portion of the system: takes signals from the wheel angle sensors along with relevant implement GPS information and displays the activity on the cab-mounted console. The active display informs the operator of machine activities before they can be seen from the operator seat.

Control portion of the system: used to steer implement along the desired guidance line. Control system continually adjusts the implement steering cylinder to maintain zero off-track error. A continuous system adjustment compensates for external disturbances to the system that would normally cause implement to track off the desired path.

DK01672,00000CA-19-02JUN11

StarFire™ Receiver



PC23442—UN—02DEC16

StarFire™ 6000 Receiver

Active Implement Guidance requires StarFire™ 3000, StarFire™ 6000, or StarFire™ iTC Receivers on machine and implement. Use same model receivers for best performance.

- Both receivers must have an RTK signal level, unless shared signal is used.
- Install implement receiver less than 4.0 m (13.1 ft) above the ground level.
- Implement receiver must be connected to the machine's implement CAN bus through the ISO connector.

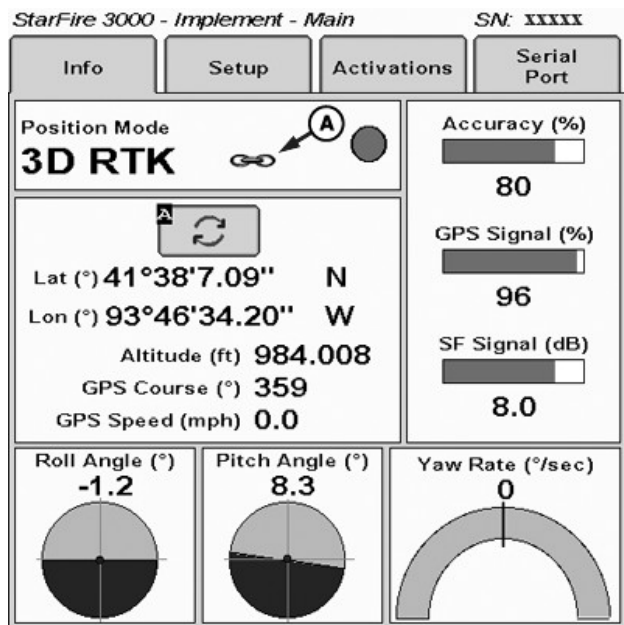
StarFire™ Receiver — Shared Signal

NOTE: To use shared signal, machine and implement receivers must be the same model. StarFire™ iTC Receivers are not capable of shared signal.

Shared signal uses the machine correction signal to share signal with the implement receiver. Receiver with highest correction signal must be mounted on the machine for shared signal to work.

Shared signal automatically links and operates with Active Implement Guidance when the following requirements are met:

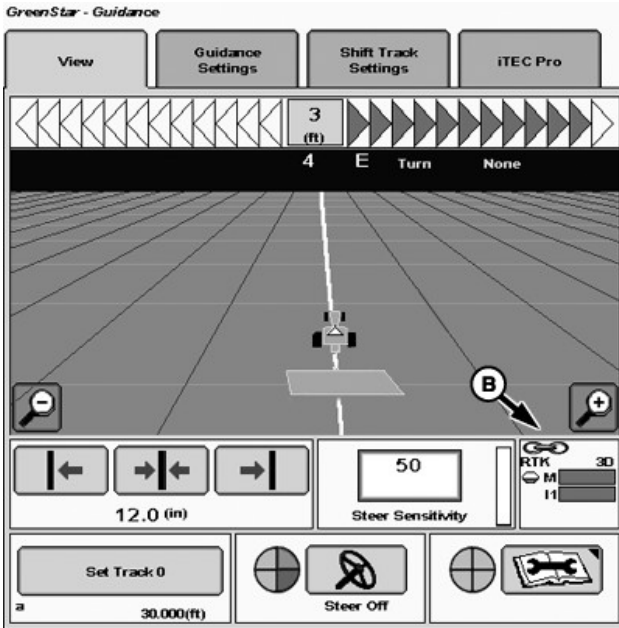
- Machine is moving.
- GreenStar™ 3 2630 Display, John Deere 4640 Universal Display, or 4600 CommandCenter™ is used.
- StarFire™ 3000 or StarFire™ 6000 Receivers are installed on machine and implement.
- SF2, SF3, or RTK is activated on the machine receiver.
- SF1, SF2, SF3, or RTK is activated on the implement receiver.
- Implement Steer or Implement Shift function is selected.
- Fore/aft value for the implement receiver is set to 0.
- Latest software updates are installed on the display, receivers, and Application Controller.
- SCV1 or SCV3 Control Type is not set to iGrade™.



PC13797—UN—02JUN11

StarFire is a trademark of Deere & Company

GreenStar is a trademark of Deere & Company
CommandCenter is a trademark of Deere & Company
iGrade is a trademark of Deere & Company



PC17672—UN—16SEP13

A—Linked—Receiver Implement Main Page
B—Linked—Display Guidance Page

To verify that receivers are linked, check the Receiver Implement Main page (A), or Display Guidance page (B). Link symbol is displayed if receivers share signal.

RW00482,0000258-19-22MAR18



PC24742—UN—28SEP17

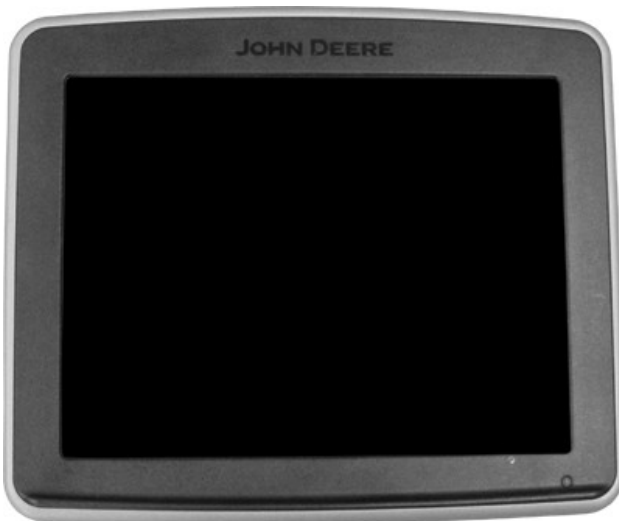
John Deere 4640 Universal Display

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

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

RW00482,000022F-19-07FEB18

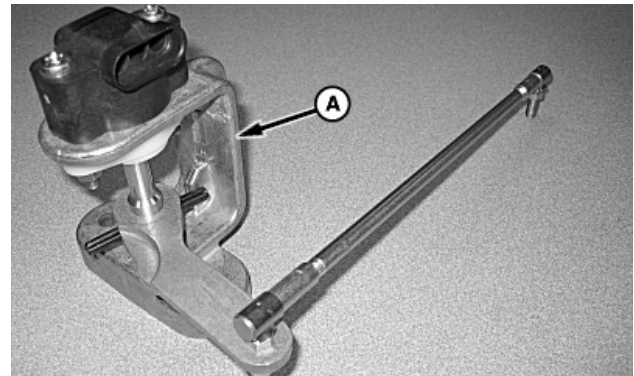
Display



PC13407—UN—20APR11

GreenStar™ 3 2630 Display

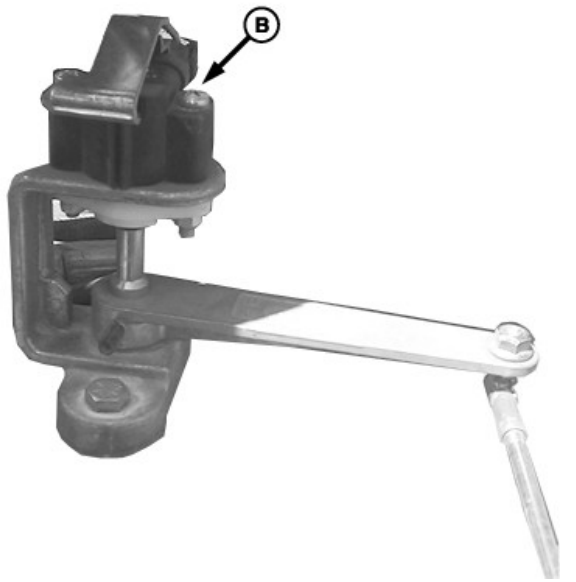
Wheel Angle Sensor



PC12344—UN—19OCT09



PC12189—UN—14OCT09



Hall Effect Sensor

PC13565—UN—03MAY11

A—Potentiometer
B—Hall Effect Sensor

For implement steering systems, a wheel angle sensor is used for implement feedback. A potentiometer (A) or a Hall effect sensor (B) is used as a wheel angle sensor.

As steering control cylinder extends or retracts, signal from potentiometer changes to reflect position of implement steering mechanism. This signal is feedback for guidance system and steering sensitivities, and is used to control steering mechanism.

NOTE: Some implement steering devices have a wheel angle sensor incorporated into equipment.

Wheel angle sensor must be a 0—5 V analog sensor.

Mount and calibrate wheel angle sensor so its range of motion is aligned and symmetrical. Failure to mount sensor properly results in poor performance. Verify hydraulic and mechanical steering linkage is properly adjusted per manufacturer's specifications.

(Reference steering system Operator's Manual for specific steering system.)

Install Requirements

For best performance, install wheel angle sensor for greatest amount of voltage range. Center should be linear and equal distance between left and right.

RW00482.0000351-19-22SEP14

Application Controller



UCC2 Application Controller with Harness

PC20218—UN—07NOV14

UCC2 Application Controller obtains guidance line information from display and machine receiver. Guidance line information is compared to implement receiver location to calculate implement lateral error. UCC2 Application Controller sends necessary commands to either external valve or machine hydraulic controller to manipulate implement steering mechanism to track the guidance line. If implement utilizes Implement Steering control mode, wheel angle sensor data is also utilized to track the guidance line.

RW00482.0000337-19-12JAN15

Counterbalance Valve



Counterbalance Valve

PC19769—UN—02JUL14

Counterbalance valve returns hydraulic fluid once pressure is present on hydraulic supply side of valve. Counterbalance valve works in conjunction with hydraulic system flow setting. When system hydraulic flow is changed, counterbalance valve requires adjustment.

A counterbalance valve is required when machine hydraulic system does not regulate return flow. A counterbalance valve is not required when utilizing an external valve.

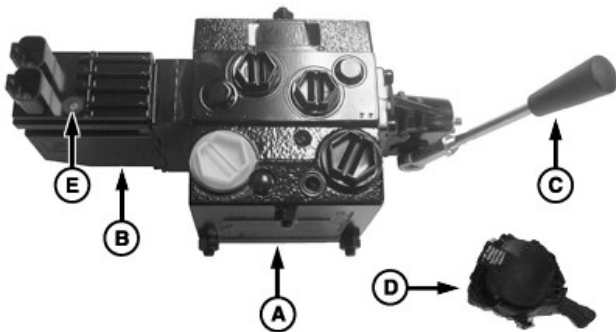
For optimal and consistence performance, install and properly adjust counterbalance valve.

The following machine models utilize CAN-based selective control valves (SCVs) requiring a counterbalance valve and must be adjusted for optimal performance:

- 8030 series wheel tractors (S.N. 40001–).
- 8030 series track tractors (S.N. 905001–).
- 9030 series wheel tractors (S.N. 013000–).
- 9030 series track tractors (S.N. 911000–).
- All 7R, 8R, 8RT, 9R, and 9RT series tractors.

RW00482,0000338-19-11SEP14

External Valve



PC19688—UN—11JUN14

A—Hydraulic Control Block
B—Electronic Valve Body
C—External Valve Control Lever
D—Remotely Mounted Electronic SCV Control Lever
E—LED Indicator

External valve gives the UCC2 Application Controller the ability to control machine hydraulics. John Deere external valve design and functionality vary for open-center and closed-center hydraulic systems. Use external valve:

- If the UCC2 Application Controller does not have the ability to control machine hydraulics. Typically, this condition occurs in older machine models or machines that are not made by John Deere but are equipped with a John Deere guidance system and an ISO connector.
- To conserve machine selective control valve (SCV) connections. External valve can connect to an open SCV on machine or can use power beyond as a hydraulic power source from machine.

John Deere External Valve Components

Hydraulic control block (A) directs hydraulic flow to the hydraulic cylinders for implement position.

Electronic valve body (B) receives commands from the Application Controller and communicates them to the hydraulic control block.

⚠ CAUTION: To avoid serious injury, keep area around equipment clear.

Moving external valve control lever (C) may cause implement to move.

External valve control lever manually controls the hydraulic control block.

Remotely mounted electronic SCV control lever (D) manually controls the hydraulic control block from the operator's station.

LED indicator (E) provides system status of the electric valve body.

- Green—Valve is receiving commands from the control unit.
- Orange—Valve is powered up. No commands are being received from the control unit.
- Red—Indicates a problem.

(Reference Troubleshooting section.)

RW00482,0000339-19-11JUN19

Active Implement Guidance Height Switch

John Deere parts can be configured to multiple implement designs.

If a height switch is required for your application, contact your John Deere dealer.

The John Deere Technical Manual has additional information.

AE77568,0000124-19-18FEB16

Setting Up

Machine and Implement Setup

1. Connect implement.
2. Configure StarFire™ Receiver on implement.
3. Assign selective control valve (SCV) control type.
4. Set implement receiver lateral offset.
5. Set up terrain compensation module (TCM) for machine and implement receivers.
6. Verify hydraulic flow routing and wheel angle sensor position (implement steering only).
7. Calibrate implement sensor (implement steering only).
8. Adjust SCV.
9. Adjust counterbalance valve (if applicable).
10. Set up hydraulic control for either:
 - SCV
 - External Valve

RW00482,000033C-19-28JAN15

2. Connect implement receiver harness to ISO 9-pin connector (A).
3. Connect implement constant power harness to machine constant power connector.
4. If implement is configured with road lights, connect lighting harness to lighting connector (B).
5. Connect all other implement connections related to attaching equipment to tractor.

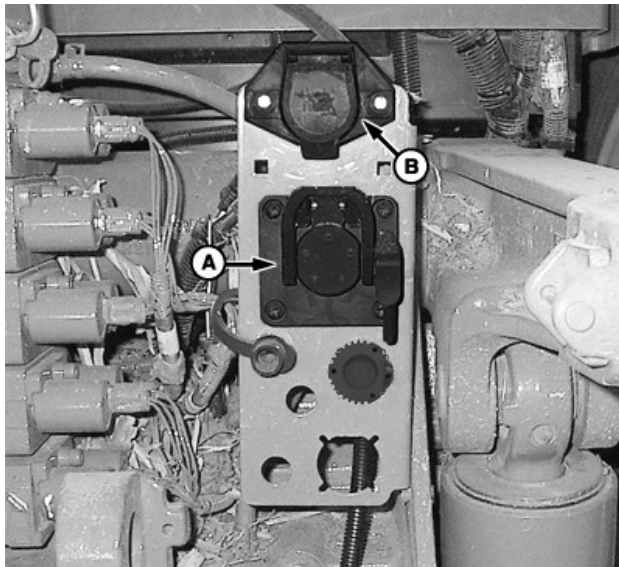
NOTE: Hydraulic hose routing is essential for proper operation. External valve has a P stamped for pressure hose connection, T for return or tank hose connection, and LS for load sense hose connection.

6. If external valve is used, connect pressure hose and return or tank hose from external valve to machine. If using power beyond to supply external valve, connect load sense hose.

(Reference machine Operator's Manual for additional information on attaching implement and implement hydraulics to machine.)

AL70325,0000378-19-18FEB16

Connect Implement



PC21197—UN—27MAY15

Rear of Tractor Shown

A—ISO 9-pin Connector
B—Lighting Connector

1. Shut off machine, set parking brake, and remove key.

NOTE: Do not connect implement when machine is on. Connecting while powered generates faults causing Active Implement Guidance not to operate.

Configure Implement StarFire™ Receiver



Menu Button

PC8663—UN—29APR15

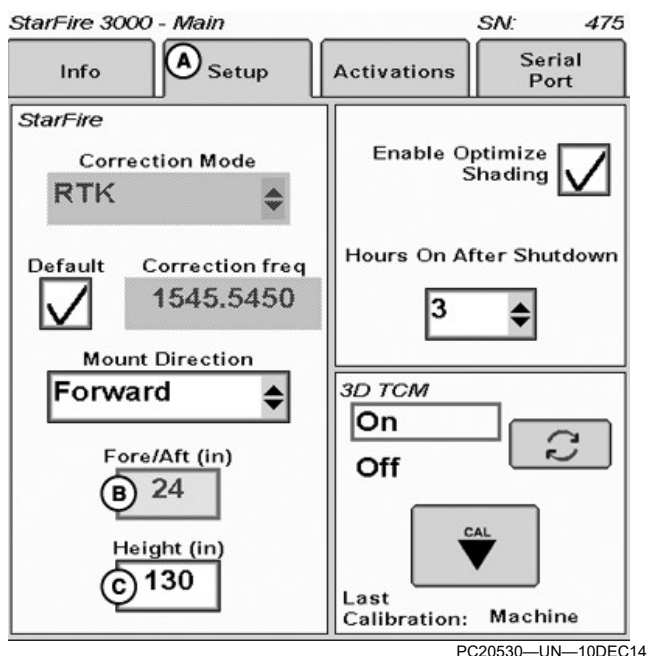
1. Select the Menu button.



PC20634—UN—19DEC14

Implement StarFire™ Receiver Button

2. Select the implement StarFire™ Receiver button.



A—Setup Tab
B—Fore/Aft Input Box
C—Height Input Box

3. Select the Setup tab (A).
4. Enter 0 for the implement receiver Fore/Aft (B).
5. Enter the implement receiver Height (C). Height is measured from the ground to the middle of dome. Lower implement as close as possible to working position when measuring the height.

RW00482,000068B-19-14MAR18

Assign Selective Control Valve (SCV)

IMPORTANT: SCV control type selection must match the connection at the implement feedback sensor harness.

NOTE: For ease of instruction, this manual uses SCV 3 for the Active Implement Guidance system. Operator can choose to use SCV 1 if preferred.

Assign Control Type to SCV 3:



PC14926—UN—27APR12
Application Controller 1100 Button

1. Select the Application Controller 1100 button.



Setup Softkey

PC12961—UN—13APR15

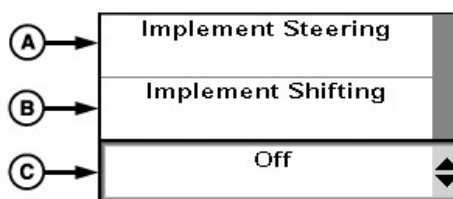
2. Select the Setup softkey.



Control Selection Button

PC17972—UN—07NOV13

3. Select the Control Selection button.



PC19788—UN—07JUL14

A—Implement Steering
B—Implement Shifting
C—SCV 3 Control Type Drop-Down Menu

4. Select either Implement Steering (A) or Implement Shifting (B) from the drop-down menu (C).
5. Cycle the machine power.

RW00482,0000392-19-07MAR18

Implement Receiver Lateral Offset

If the implement receiver cannot be mounted on the center line of implement, enter a lateral offset to account for receiver location.

NOTE: Implement global positioning system (GPS) offset is critical to performance of system. If needed, only use one offset (lateral or fore/aft). For best performance, mount implement receiver as close as possible to have zero offset.



Application Controller 1100 Button

PC14926—UN—27APR12

1. Select the Application Controller 1100 button.



PC13072—UN—16NOV10

Application Controller Main Softkey

2. Select the Application Controller Main softkey.



PC17968—UN—07NOV13

Implement Steer Setup Button



PC17980—UN—07NOV13

Implement Shifter Setup Button

3. Select either the Implement Steer Setup button or Implement Shifter Setup button.



PC17969—UN—07NOV13

Implement GPS Offset Button

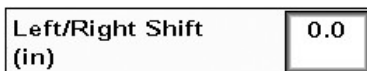
4. Select the Implement GPS Offset button.



PC17970—UN—07NOV13

Position Shifted Drop-Down Menu

5. Select either the Position Shifted Left or Right from the drop-down menu. Select either one if implement receiver is centered.



PC17971—UN—07NOV13

Left/Right Shift Input Box

6. Enter the distance from the center of receiver to the center line of implement in the Left/Right Shift input box. Enter 0.0 if the implement receiver is centered.

RW00482,00006CA-19-05JUN18

Implement Receiver Fore/Aft Offset

If implement receiver cannot be mounted directly over the ground engagement point of implement, enter a fore/aft offset to account for receiver location. Example of a ground engagement point would be the seed openers on a planter.

NOTE: Implement global positioning system (GPS) offset is critical to performance of system. If needed, only use one offset (lateral or fore/aft). For best performance, mount implement receiver as close as possible to have zero offset.



PC14926—UN—27APR12

Application Controller 1100 Button

1. Select the Application Controller 1100 button.



PC13072—UN—16NOV10

Application Controller Main Softkey

2. Select the Application Controller Main softkey.



PC17968—UN—07NOV13

Implement Steer Setup Button



PC17980—UN—07NOV13

Implement Shifter Setup Button

3. Select either the Implement Steer Setup button or Implement Shifter Setup button.



PC17969—UN—07NOV13

Implement GPS Offset Button

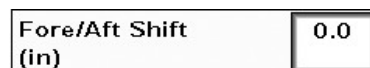
4. Select the Implement GPS Offset button.



PC21341—UN—09JUL15

GPS Offset Drop-Down Menu

5. Select GPS Offset Forward or Backward from the drop-down menu. If implement receiver is mounted over or in the front of the ground engagement point, select GPS Offset Forward. Select GPS Offset Backward if implement receiver is mounted behind the ground engagement point.



PC21342—UN—09JUL15

Fore/Aft Shift Input Box

- Enter the distance from the center of the receiver to the ground engagement point in the Fore/Aft Shift input box. Measure along the centerline of implement. Enter 0.0 if the implement receiver is centered.

RW00482,00006CB-19-05JUN18

Optimize Terrain Compensation Module (TCM)

Optimize TCM calibration by allowing the inertial measurement unit (IMU) to measure roll angle and yaw rate before performing the TCM calibration.



Menu Button

PC8663—UN—29APR15

- Select the Menu button.



StarFire™ Button

PC13006—UN—05NOV14

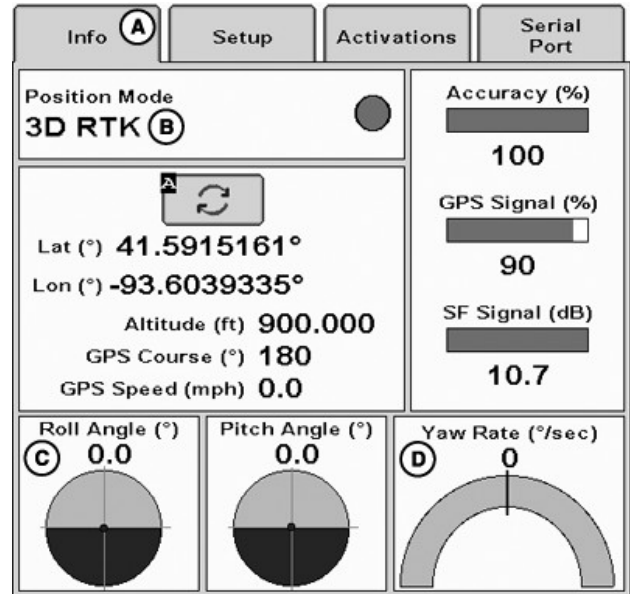
- Select the StarFire™ button.



StarFire™ Softkey

PC21154—UN—11MAY15

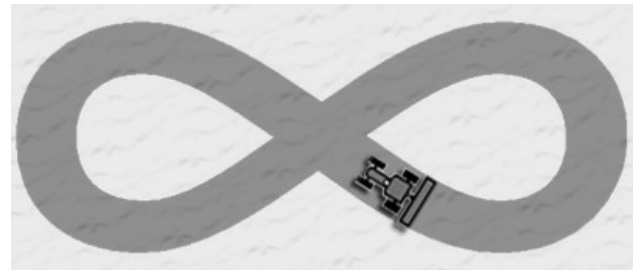
- Select the StarFire™ softkey.



PC24061—UN—06APR17

- A—Info Tab
- B—Position Mode
- C—Roll Angle
- D—Yaw Rate

- Select the Info tab (A).
- Verify 3D Position Mode (B) has established SF1 signal or better.



TCM Optimization Drive Pattern

PC21419—UN—30JUL15

- Drive machine in the TCM optimization drive pattern two times to allow the IMU to initialize.
- Complete the TCM calibration.
(Reference the Calibrate Terrain Compensation Module [TCM] for more information.)

RW00482,0000525-19-14SEP17

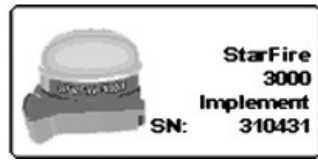
Calibrate Terrain Compensation Module (TCM)



Menu Button

PC20197—UN—05NOV14

1. Select the Menu button.



PC20634—UN—19DEC14

StarFire™ Button

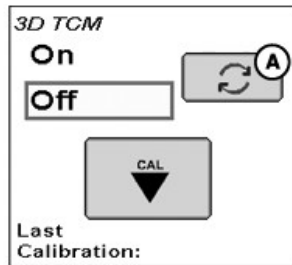
2. Select the StarFire™ button.



PC20199—UN—05NOV14

Setup Tab

3. Select the Setup tab.



PC19992—UN—04SEP14

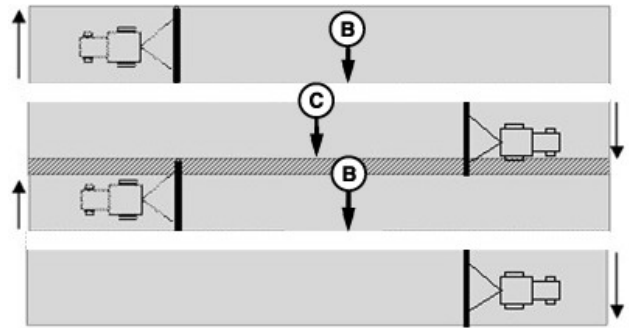
A—TCM Toggle Button

Select the TCM toggle button (A) to turn the TCM ON and OFF. When the TCM is turned OFF, StarFire™ global positioning system (GPS) message is not corrected for machine dynamics or side slopes. TCM defaults to ON after cycling power.

NOTE: TCM must be turned ON for AutoTrac™ to activate.

Calibrate the TCM so the receiver can determine zero degree roll angle and pitch angle.

Before calibrating, ensure that machine and implement are in proper working condition and ready for field work. Machine must be ballasted and tires properly inflated. Lower implement as close as possible to the working position when calibrating.



PC19993—UN—03SEP14

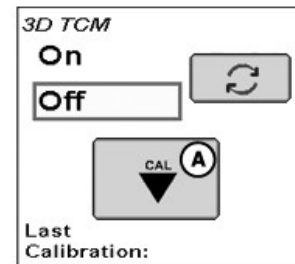
B—Skip
C—Overlap

Calibrate the TCM every time the receiver is removed from the machine and reattached or if the TCM angle in relation to the machine has changed. Changes in the TCM angle in relation to machine can create an offset and look like a consistent skip (B) or overlap (C) in pass-to-pass operation. Possible causes of this offset could be the StarFire™ mounting bracket is slightly offset, the machine cab is slightly offset, or uneven tire pressures from one side to other.

To eliminate offset, position the machine and calibrate the TCM, drive down a pass, turn around, and drive down same pass in opposite direction. If the machine does not follow same pass, measure the offset distance and enter in implement offset.

Position Machine and Calibrate Terrain Compensation Module (TCM)

1. Park the machine on a hard, level surface and come to a complete stop (cab is not rocking).
2. Mark the location of tires or tracks on ground to note the location of axle.



PC19994—UN—04SEP14

A—Calibration Button

3. Select the Calibration button (A).



Accept Button

PC22267—UN—14MAR16

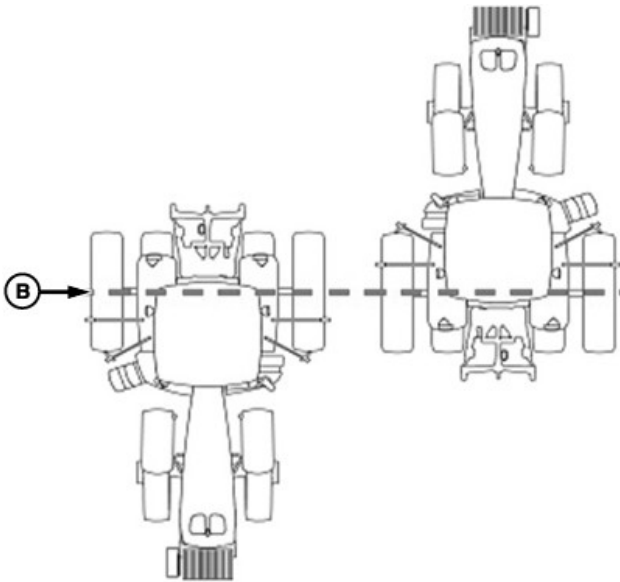
4. Select the Accept button. Calibrating status bar appears, then disappears when finished.
5. Turn the machine 180 degrees to face the opposite

direction. Ensure that tires are in proper location for fixed or floating front axle and machine has come to a complete stop (cab is not rocking).

tractors, 47X0 and 49X0 series sprayers, or 9000 and 9020 series wheel tractors), place wheels or tracks so machine pivot point (C) is in same location when facing either direction.

6. Select the Accept button. Calibrating status bar appears, then disappears when finished.
7. Select the Accept button to return to Setup tab. If calibration was unsuccessful, recalibrate the TCM.

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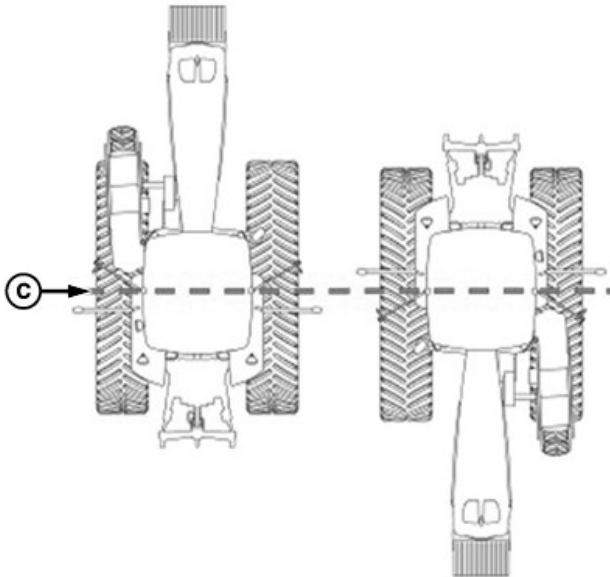


PC19995—UN—03SEP14

Floating Front Axle Machines

B—Rear Axle

- For floating front axle machines (mechanical front wheel drive [MFWD], Independent Link Suspension [ILS™], or Triple-Link Suspension [TLS™]), place wheels so rear axle (B) is in same location when performing 2-point calibration.



PC19996—UN—03SEP14

Fixed Axle Wheels Or Tracks Machines

C—Machine Pivot Point

- For fixed-axle wheels or tracks machines (track

Verify Hydraulic Flow Routing and Wheel Angle Sensor Position (Implement Steering Only)

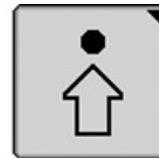
Active Implement Guidance requires correct supply and return flow of hydraulic fluid for proper operation.



PC14926—UN—27APR12

Application Controller 1100 Button

1. Select the Application Controller 1100 button.



PC12961—UN—13APR15

Setup Softkey

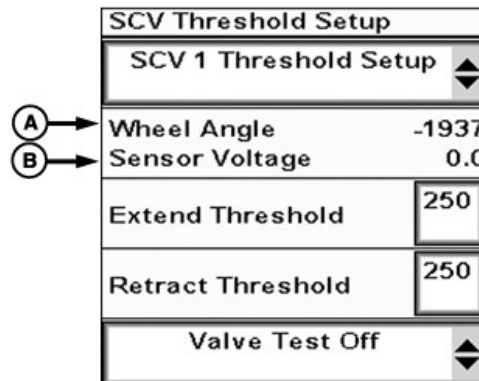
2. Select the Setup softkey.



PC17989—UN—07NOV13

SCV Threshold Setup Button

3. Select the SCV Threshold Setup button.



PC19767—UN—25JUL14

A—Wheel Angle Sensor Position Value

ILS is a trademark of Deere & Company
TLS is a trademark of Deere & Company

B—Sensor Voltage

4. Extend or retract selective control valve (SCV) control lever while monitoring the wheel angle sensor position value (A) and sensor voltage (B).
 - SCV extend: Wheel angle and sensor voltage increases (for example, voltage changes from 2.5 to 5.0).
 - SCV retract: Sensor voltage decreases (for example, voltage changes from 5.0 to 2.5).

If SCV extend or retract results in the wrong wheel angle or sensor voltage direction value, swap hydraulic lines.

5. Record sensor voltage with SCV in:
 - Maximum left position (SCV retract).
 - Maximum right position (SCV extend).
 - Center position. Center voltage = (Maximum left position voltage plus maximum right position voltage) divided by 2.

Adjust wheel angle sensor position if:

- Implement does not travel straight at calculated center position voltage value.
- Difference between center position voltage and maximum left position voltage is less than 1 V.
- Difference between center position voltage and maximum right position voltage is less than 1 V.

RW00482,000007C-19-08MAR18

Calibrate Implement Steering (Implement Steering Only)

CAUTION: Implement moves during calibration. Verify that people and obstructions are clear of immediate area during all procedures. Read and follow Operate Implement Automation Systems Safely in Safety section before performing calibration.

NOTE: Implement Steering Calibration is not needed when operating Implement Shifting.

Once selective control valve (SCV) control is assigned, more pages are available for Active Implement Guidance setup.



PC14926—UN—27APR12

Application Controller 1100 Button

1. Select the Application Controller 1100 button.



PC13072—UN—16NOV10

Application Controller Main Softkey

2. Select the Application Controller Main softkey.



PC17975—UN—07NOV13

Implement Steer Setup Button

3. Select the Implement Steer Setup button.

NOTE: Depending on the steering system, it may be necessary to drive forward slowly during wheel angle sensor calibration.



PC17976—UN—07NOV13

Wheel Angle Setup Button

4. Select the Wheel Angle Setup button.



PC17977—UN—07NOV13

Set Max Right Position Button

5. Engage the SCV to set the implement steering to full right position. Hold the SCV lever, and select the Set Max Right Position button.

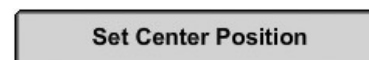


PC17978—UN—07NOV13

Set Max Left Position Button

6. Engage the SCV to set the implement steering to full left position. Hold SCV lever, and select the Set Max Left Position button.

NOTE: Center position is critical to accurate line acquisition and operation. It may be necessary to drive the machine and implement forward before setting position.



PC17979—UN—07NOV13

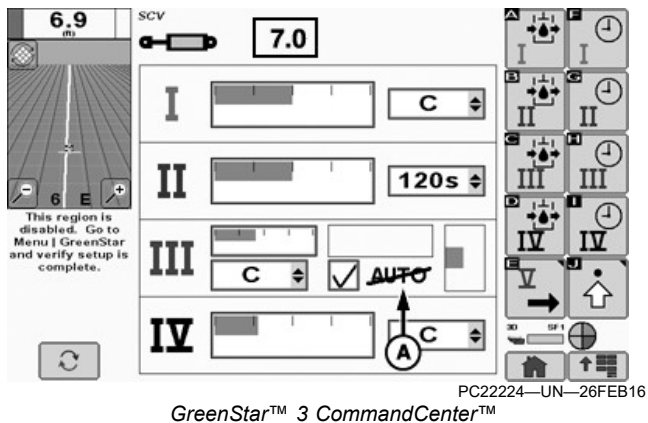
Set Center Position Button

7. Engage the SCV to center implement steering mechanism. Verify that steering mechanism makes implement follow perpendicular to the machine rear axle. Select the Set Center Position button. A correct

center position should result in an off track error of zero.

RW00482,00002F6-19-22MAR18

Adjust Selective Control Valve (SCV)



GreenStar™ 3 CommandCenter™



TouchSet™ Display

A—Auto Mode Indicator

CAUTION: Excessive SCV flow rate settings can cause sudden machine movement when the cylinder is operated. To avoid injury before engaging SCV button to check current flow rate, verify that bystanders are clear of the machine. Full extension or retraction of cylinder should take approximately 2 seconds.

To display auto mode indicator (A), automatic SCV control requires:

- Application Controller 1100 installed.
- Control type selected for SCV 1 or 3.

(Reference Assign Selective Control Valve [SCV] to select a control type.)

Automatic SCV control activates when SCV is placed in forward detent position. Auto mode requires a speed of 0.8 km/h (0.5 mph) or greater to engage implement hydraulics automatically.

- CommandCenter™—AUTO with a strike through it indicates that auto mode is not active. !AUTO! indicates a fault and that auto mode is inoperable. AUTO indicates normal auto mode operation.
- TouchSet™—EC indicates that auto mode is not active. AC indicates normal auto mode operation.

An SCV detent flow setting applies to both extend and retract. The Application Controller 1100 automatically controls detent time when a control type is selected and auto mode is engaged.

Adjust detent flow for each operation.

(For more information on SCV controls, refer to machine Operator's Manual.)

SCV can be operated to observe flow rate while in adjustment mode.

SCV Flow Output (Approximate)		
SCV Flow Settings	Flow	
	L/min	gal/min
0.1 ^a	—	—
1.0	3.6	1.0
2.0	7.2	1.9
3.0	10.2	2.7
4.0	14.4	3.8
5.0	19.2	5.0
6.0	24.0	6.4
7.0	31.2	8.2
8.0	39.6	10.5
9.0	65.4	17.2
10.0	114	30.0

^a 0.1 = Minimum Flow Setting

GreenStar™ 3 CommandCenter™

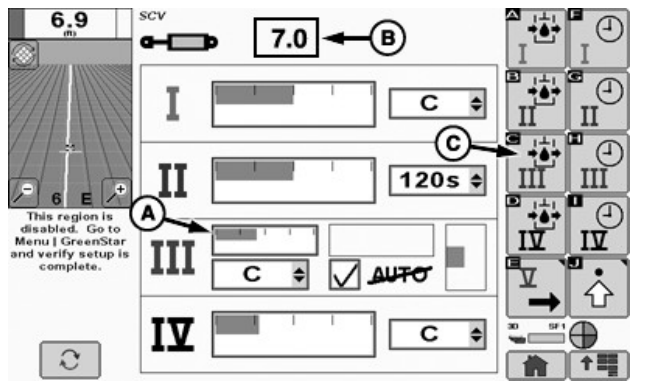


RXA0117610—UN—10JUN11
CommandARM™ Menu Button > SCV Button > Advanced Settings Softkey

1. Select the Menu button.
2. Select the SCV button.

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

3. Select the Advanced Settings softkey.



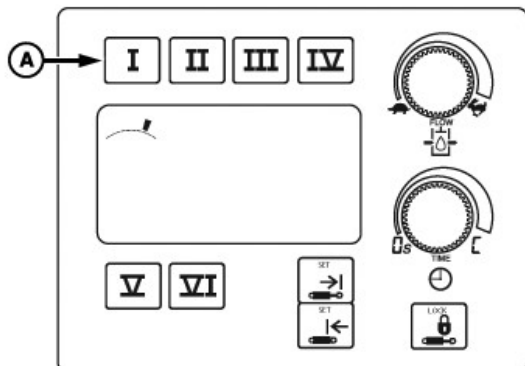
SCV Home Page

- A—Detent Flow Bar Graph
B—Detent Flow Value Box
C—Extend Set Softkey

NOTE: Bar graph (A) depicts detent flow (B).

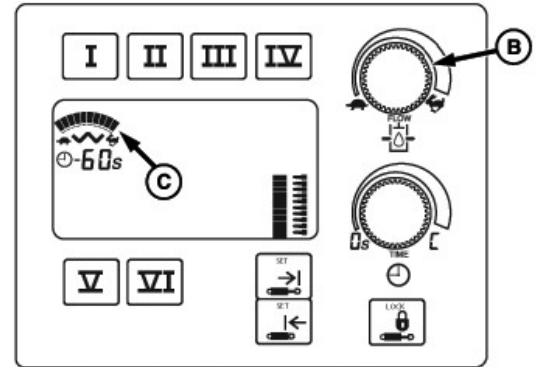
4. To navigate to detent flow bar graph, select the Extend Set softkey (C) for the SCV being used. Select the Confirm button to highlight. Rotate thumb wheel to adjust flow, then select the Confirm button.

TouchSet™ Display



A—SCV Selection Buttons

1. Select the button (A) for SCV being used. Screen under SCV selection buttons displays previous flow rate.



B—Flow Adjustment Dial
C—Bar Graph

NOTE: As operator turns flow adjustment dial (B), the number of line segments increases or decreases as flow changes.

2. Turn flow adjustment dial clockwise to increase flow or counterclockwise to decrease flow. Flow setting is displayed on bar graph (C) when adjustments are made.

RW00482,00005DA-19-15MAR18

Set Up Hydraulic Control—Selective Control Valve (SCV)

CAUTION: To avoid serious injury, keep area around equipment clear. Procedure requires machine to move forward.

Implement moves during calibration. Read and follow Operate Implement Automation Systems Safely in Safety section before performing calibration.

NOTE: Do not calibrate the SCV threshold when an external valve is used. To adjust hydraulic flow to the external valve, skip to Set Up Hydraulic Control—External Valve.

Threshold values are unique for every SCV due to the normal manufacturing tolerances. Fine-tune threshold value to lowest value that generates a sensor voltage change for optimal performance.

The SCV Valve Test is used to calibrate the Application Controller 1100 to determine minimum amount of hydraulic control unit signal that is required before the steering mechanism moves. Without SCV threshold calibration, the steering mechanism steers faster in one direction, under steers, over steers, or does not perform as expected due to hydraulic limitations. These problems make it difficult for the control unit to maintain an off-track error of 0.

NOTE: On machine designs that utilize linkage between hydraulic steering, cylinder, steering mechanism, and wheel angle sensor, it is important that wheel angle sensor moves simultaneously with hydraulic cylinder that is causing movement in steering mechanism.

Set up SCV threshold if:

- Both extend and retract values are set at 5 or 250 (factory default values).
- Values are copied from another machine.
- Hydraulic hose routing changes between SCV 1 and SCV 3.
- Hydraulic component repair is made on machine or implement.
- Counter-balance valve is adjusted.
- Hydraulic flow rate is adjusted.

Set Up SCV Thresholds

NOTE: Ensure that hydraulic oil is at operating temperature before performing the calibration.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller 1100 Button

PC14926—UN—27APR12

2. Select the Application Controller 1100 button.



Setup Softkey

PC12961—UN—13APR15

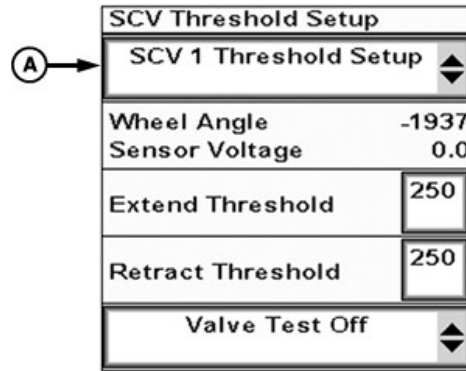
3. Select the Setup softkey.



SCV Threshold Setup Button

PC17989—UN—07NOV13

4. Select the SCV Threshold Setup button.



PC24069—UN—06APR17

A—SCV Threshold Setup Drop-Down Menu

5. Select the SCV being used from the SCV Threshold Setup drop-down menu (A).

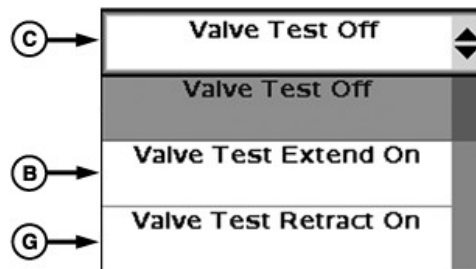
NOTE: Place the selected SCV in auto mode.

6. Place the SCV in extend detent position, not float.
7. Drive the machine forward, faster than 0.7 km/h (0.45 mph).

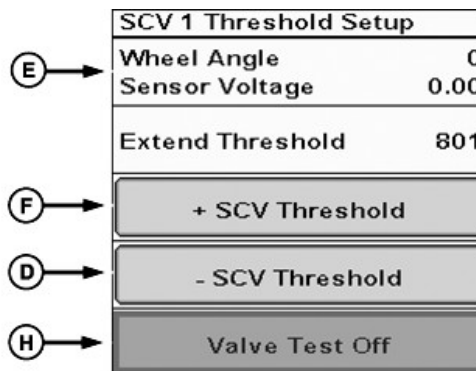
Do not engage AutoTrac™.

NOTE: Some implements require the sensor to be fully retracted to increase range of extend motion.

See the machine Operator's Manual for speed requirements on SCV.



PC21356—UN—14JUL15



PC21357—UN—15JUL15

- B—Valve Test Extend On
 C—Valve Test Drop-Down Menu
 D—Decrease (-) SCV Threshold Button
 E—Sensor Voltage
 F—Increase (+) SCV Threshold Button

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G—Valve Test Retract On
H—Valve Test Off Button

8. Select Valve Test Extend On (B) from the drop-down menu (C).
9. Select the Decrease (-) SCV Threshold button (D) until it generates no change in the sensor voltage (E).
10. Select the Increase (+) SCV Threshold button (F) until the sensor voltage value changes as slowly as possible while maintaining continuous movement.

NOTE: If the implement steering cylinder reaches maximum or minimum stroke during test, select the Valve Test Retract On (G) to reposition the cylinder.

11. To complete the extend threshold calibration, select the Valve Test Off button (H).
12. Select the Valve Test Retract On from the drop-down menu.
13. Select the Decrease (-) SCV Threshold button until it generates no change in the sensor voltage.
14. Select the Increase (+) SCV Threshold button until the sensor voltage value changes as slowly as possible while maintaining continuous movement.

NOTE: If the implement steering cylinder reaches maximum or minimum stroke during test, select the Valve Test Extend On to reposition the cylinder.

15. To complete the retract threshold calibration, select the Valve Test Off button.

If the desired performance is not achievable, adjust the hydraulic flow on the right-hand console or on CommandCenter™ to supply adequate hydraulic flow to the implement steering system. If threshold values are at maximum setting, increase the hydraulic flow setting. If threshold values are at minimum setting, decrease the hydraulic flow setting. Adjusting threshold down is only necessary on small cylinders or low flow mechanisms.

NOTE: Repeat SCV threshold setup after hydraulic flow is adjusted.

After calibration is complete, verify proper performance before using Active Implement Guidance in field operation.

AL70325,0000379-19-22MAR18

Set Up Hydraulic Control—External Valve

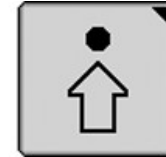
To adjust hydraulic flow:



PC14926—UN—27APR12

Application Controller 1100 Button

1. Select the Application Controller 1100 button.



PC12961—UN—13APR15

Setup Softkey

2. Select the Setup softkey.



PC17999—UN—07NOV13

External Valve Setup Button

3. Select the External Valve Setup button.

(Reference the Troubleshooting section if the External Valve Setup button is not displayed.)

External Valve Setup	
SCV 1 Max Flow (%)	100
SCV 3 Max Flow (%)	100

PC18000—UN—07NOV13

External Valve Setup

A—SCV 1 Max Flow (%)

NOTE: Only selective control valve (SCV) 1 can be used with an external valve.

4. Adjust SCV 1 Max Flow (%) (A) to desired value.

Max Flow can be adjusted from 10% to 100%. Size of cylinder determines best flow rate.

SCV Max Flow (%) value is defaulted to 100. Set value to 30 when getting started. Adjust the value up or down depending on implement performance during operation.

NOTE: When using power beyond, hydraulic flow rate to implement is adjusted on External Valve Setup page.

RW00482,0000393-19-08MAR18

Adjust Dual Counterbalance Valve

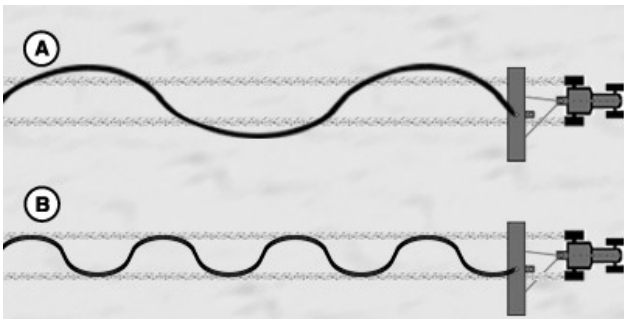
NOTE: Flow rates between 11—30 L/min (3—8 gal/min) are recommended.

If hydraulic flow rate is adjusted, complete selective control valve (SCV) threshold calibration test.

A counterbalance valve controls a moving load and prevents load runaway. Controlling the load allows a smooth transition of implement movement. Dual counterbalance valve settings depend on hydraulic cylinder types and configuration.

Turn the valve cartridge clockwise to increase pressure.

Turn the valve cartridge counterclockwise to decrease pressure.



PC23480—UN—09DEC16

Implement S-ing

A—Slow S-ing

B—Aggressive S-ing

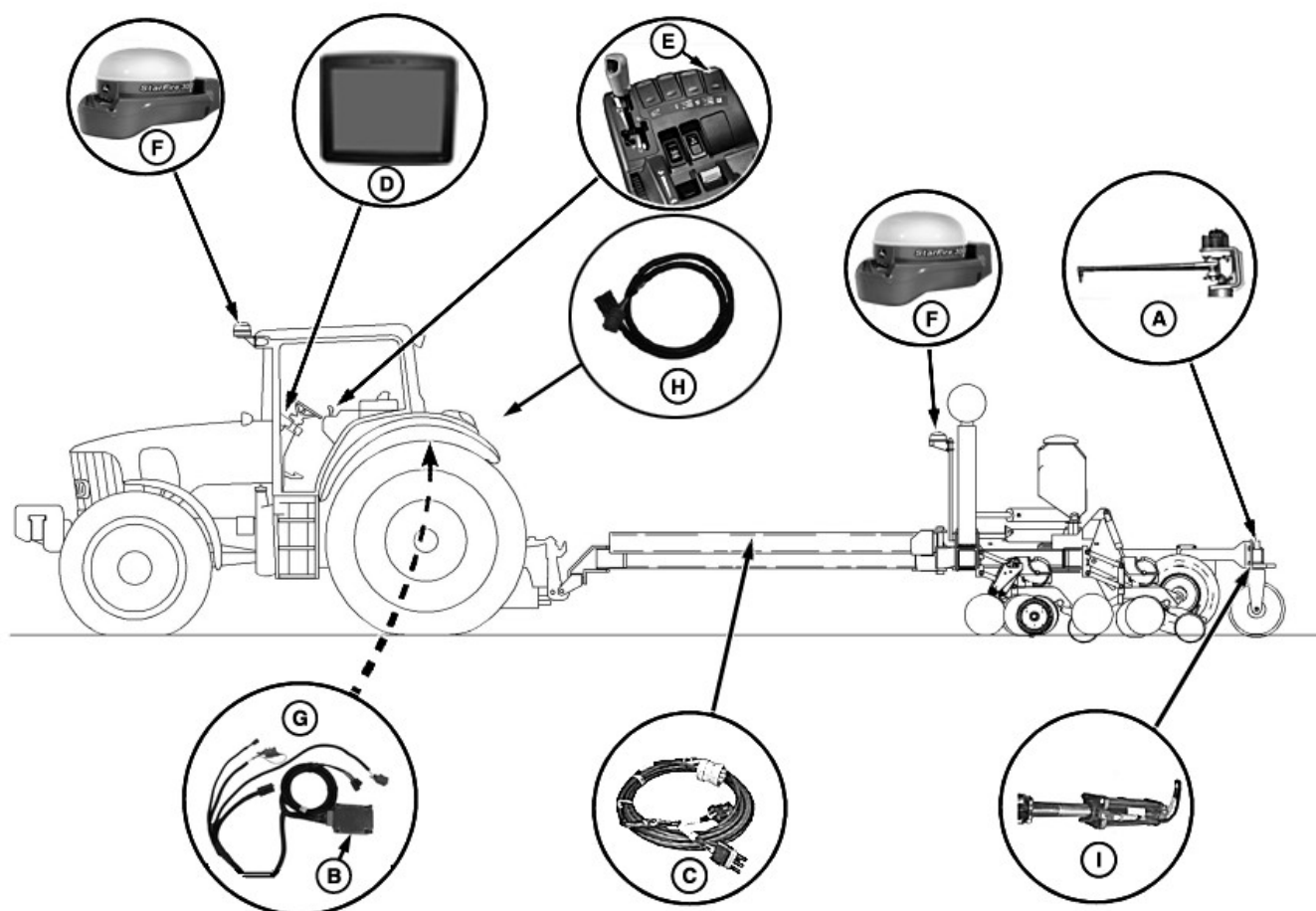
Operate system and monitor ground condition. If implement S-ing occurs, adjust counterbalance valve pressure.

- If implement is slowly S-ing (A), pressure is too high. Turn the valve cartridge counterclockwise to decrease pressure.
- If implement is aggressively S-ing (B), pressure is too low. Turn the valve cartridge clockwise to increasing pressure.

AE77568,0000297-19-05JAN17

Operating Active Implement Guidance

Basic Operation of Active Implement Guidance System



Active Implement Guidance Overview

PC18001—UN—09DEC13

A—Wheel Angle Sensor
B—Application Controller 1100
C—Implement Feedback Sensor Harness
D—Display
E—SCV Control Lever

F—StarFire™ Receiver
G—Application Controller Harness
H—9-Pin Machine Side Implement Feedback Harness
I—Implement Steering Mechanism

- Selective control valve (SCV) is set to auto mode.

NOTE: SCV cannot change to auto mode when machine is in park. Auto mode requires a speed of 0.8 km/h (0.5 mph) or greater to engage implement hydraulics automatically.

- Wheel angle sensor (A) communicates implement steering angle to the Application Controller 1100 (B) with signals carried through implement feedback harness (C).
- Operator calibrates the implement steering angle using display (D) and SCV control lever (E).
- Application Controller 1100 calculates implement off-track error using StarFire™ Receivers (F).
- When a steering adjustment is required, a signal is sent from Application Controller 1100, through Application Controller harness (G), to either a machine SCV control unit through the implement feedback harness (H) or an external valve through the CAN bus.
- SCV control unit communicates instructions for sending hydraulic fluid to implement steering mechanism (I).
- Process returns to first step to monitor for any implement off-track error. Constant adjustments are made to keep implement steering towards the guidance line.

StarFire is a trademark of Deere & Company

NOTE: If using an external valve, 9-pin machine side implement feedback harness cannot be used.
Disconnect harness when machine is powered off.

RW00482,0000347-19-22MAR18

Active Implement Guidance Operation

1. Select Mode for Engagement.
2. Select Optional Guidance Features.
 - a. Follow Mode (Implement Steering Only).
 - b. Shifter Stay On Mode (Implement Shifting Only).
3. Engage Active Implement Guidance.
4. Adjust Sensitivity Settings.
5. Disable Active Implement Guidance.

RW00482,0000348-19-25JUL14

Select Mode for Engagement

To select how Active Implement Guidance engages:



PC14926—UN—27APR12

Application Controller 1100 Button

1. Select the Application Controller 1100 button.



PC17995—UN—07NOV13

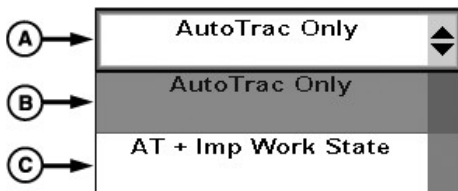
Implement Steer Setup Button



PC17980—UN—07NOV13

Implement Shifter Setup Button

2. Select either the Implement Steer Setup button or Implement Shifter Setup button.



PC19640—UN—16MAY14

A—Requirement to Engage Drop-Down Menu
B—AutoTrac™ Only
C—AT + Imp Work State

3. To change setting, select the requirement to engage from the drop-down menu (A).

- AutoTrac™ Only (B) engages Active Implement Guidance whenever AutoTrac™ is enabled.
- AT + Imp Work State (C) engages Active Implement Guidance whenever AutoTrac™ and recording source are enabled.

(To set up recording source, reference the display Operator's Manual.)

RW00482,000034A-19-08MAR18

Select Optional Guidance Features

Follow Mode (Implement Steering Only)

CAUTION: Do not use Follow Mode on roadways.

To prevent serious injury, read and follow instructions in this manual to disable Active Implement Guidance before entering roadways.

NOTE: Follow Mode turns OFF if speed is greater than 35 km/h (21.7 mph).

Follow Mode turns OFF if speed is less than 0.7 km/h (0.45 mph) for more than 30 seconds.

If speed is less than 0.8 km/h (0.5 mph), auto mode turns OFF and implement hydraulics disengage.

Follow Mode sets the implement guidance path in the same path as the machine receiver, including turns on end rows. Using Follow Mode allows Active Implement Guidance to operate while operator is driving machine without a guidance line defined. Follow Mode is useful during the first pass through field when guidance line is being defined.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



PC14926—UN—27APR12

Application Controller 1100 Button

2. Select the Application Controller 1100 button.

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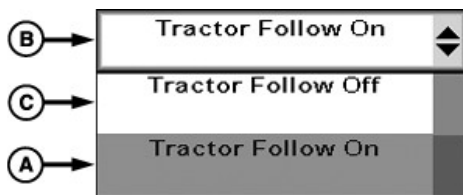
Application Controller Main Softkey
PC13072—UN—16NOV10

3. Select the Application Controller Main softkey.



Implement Steer Main Button
PC18007—UN—07NOV13

4. Select the Implement Steer Main button.



PC19792—UN—14AUG14

A—Tractor Follow On
B—Tractor Follow Drop-Down Menu
C—Tractor Follow Off

5. Select Tractor Follow On (A) from the drop-down menu (B).
 6. Set AB line. Operator is able to engage and disengage AutoTrac™.
- To disengage Follow Mode, select the Tractor Follow Off (C) from the drop-down menu.

Shifter Stay On Mode (Implement Shifting Only)

Shifter Stay On Mode allows implement to follow guidance line independent of machine AutoTrac™ state. Shifter Stay On Enabled is used in applications where operator manually drives machine while implement follows guidance line. Use Shifter Stay On Disabled when AutoTrac™ is used to guide machine.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller 1100 Button

PC14926—UN—27APR12

2. Select the Application Controller 1100 button.



Application Controller Main Softkey

PC13072—UN—16NOV10

3. Select the Application Controller Main softkey.



Implement Shift Main Button

PC19780—UN—07JUL14

4. Select the Implement Shift Main button.



PC19905—UN—11AUG14

A—Shifter Stay On Enabled
B—Shifter Stay On Drop-Down Menu
C—Shifter Stay On Disabled

5. Select Shifter Stay On Enabled (A) from the drop-down (B) menu.
6. Drive towards the guidance line.
7. Select AutoTrac™ resume.
8. Disengage AutoTrac™ by moving steering wheel. Implement will continue to track guidance line.
9. When completing a turn, select Shifter Stay On Disabled (C) or implement will continue to steer towards the guidance line unless automatic disengagement distance from the guidance line is met.

Global Line Shifts (Implement Steering Only)

NOTE: Global line shifts only work with straight track guidance lines.

Use global line shifts to offset the implement based on heading. For example, an implement is traveling north and it is offset to the east. When it is turned around for the next pass and is traveling south, it will still be offset to the east.

Global line shifts support controlled traffic applications where the machine uses permanent traffic lanes in the field. The machine follows the guidance line (tram line) on the permanent track while the Application Controller 1100 commands the implement steering system to shift the implement. Examples of controlled traffic applications are:

- Planting between the crop stubble
- Inter-planting crops

To enable global line shifts, specify offset magnitude and direction. Application Controller 1100 automatically adjusts implement position from pass to pass.

Positive and negative offset direction is determined by travel heading when the feature is turned on. For headings from 0° to less than 180°, shifting to the right is positive and left is negative. For headings from 180° to less than 360°/0°, shifting to the right is negative and left is positive.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller 1100 Button

PC14926—UN—27APR12

2. Select the Application Controller 1100 button.



Application Controller Main Softkey

PC13072—UN—16NOV10

3. Select the Application Controller Main softkey.



Implement Steer Setup Button

PC17968—UN—07NOV13

4. Select the Implement Steer Setup button.



Global Line Shifts Button

PC23215—UN—19OCT16

5. Select the Global Line Shifts button.

Global Line Shifts	
Negative Offset	A
Offset Magnitude (in)	0.0 B
Back	

PC23216—UN—19OCT16

A—Offsets Drop-Down Menu

B—Offset Magnitude Input Box

6. Select either Positive Offset or Negative Offset from the drop-down menu (A).

7. Enter the Offset Magnitude (B).

RW00482,000006D-19-22MAR18

Engage Active Implement Guidance

IMPORTANT: If the steering device is not in contact with the ground, Active Implement Guidance cannot effectively steer the implement.

NOTE: For ease of instruction, this manual uses selective control valve (SCV) 3 for the Active Implement Guidance system. Operator can choose to use SCV 1 if preferred.

1. Set up guidance line on the display.

Implement Steer Main	
Implement Steering Status	SCV 1 A OK
Track Error (in)	0
Wheel Angle	-1823
Line Sensitivity Tracking	3000
Line Sensitivity Accumulated	300
Tractor Follow Off	

PC22111—UN—04FEB16

A—Status

2. Verify the Application Controller 1100 Status (A) displays OK.

(Reference Troubleshooting if status is not OK.)

NOTE: SCV cannot change to auto mode when the machine is in park.

Auto mode requires a speed of 0.8 km/h (0.5 mph) or greater to engage implement hydraulics automatically.

3. Take the machine out of park.

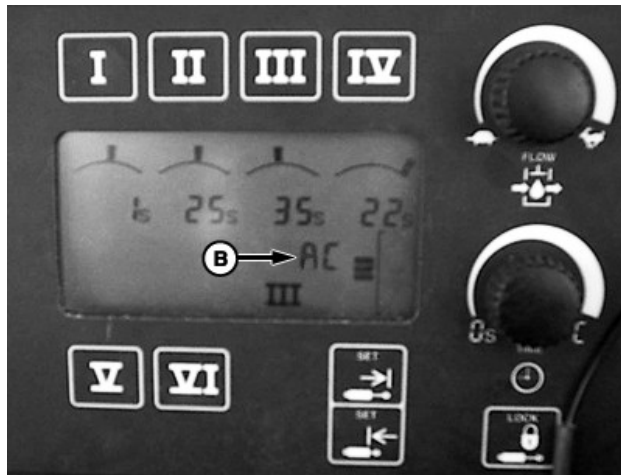
NOTE: Leave SCV 3 in detent after each pass.



A—SCV Control Lever

PC18220—UN—05DEC13

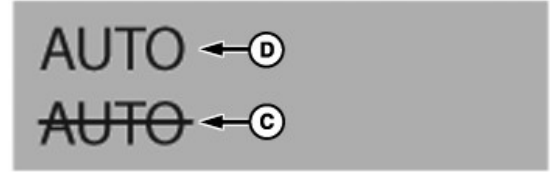
4. To engage implement auto mode, place the SCV control lever (A) in the forward detent position.



B—AC Mode

PC18234—UN—11DEC13

- If operating a machine with a TouchSet™ Display, verify EC changes to AC (B).



PC22235—UN—01MAR16

C—Auto Mode OFF
D—Auto Mode ON

- If operating a machine with a CommandCenter™, verify auto mode OFF (C) changes to auto mode ON (D).

IMPORTANT: If AutoTrac™ Only is the requirement to engage, Active Implement Guidance begins to acquire line immediately after the AutoTrac™ resume switch is selected. For implements using a coulter steering system, movement starts even if implement is not in contact with ground.

5. To activate AutoTrac™ and Active Implement Guidance simultaneously, select the resume switch. Machine and implement steer toward the guidance line.

NOTE: Active Implement Guidance operates in reverse for 45 seconds. After 45 seconds, AutoTrac™ and Active Implement Guidance disengage.

AL70325,000037E-19-22MAR18

Adjust Sensitivity Settings

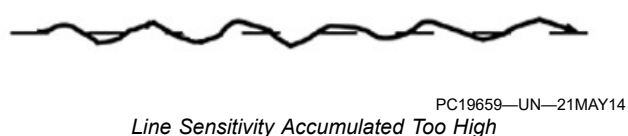
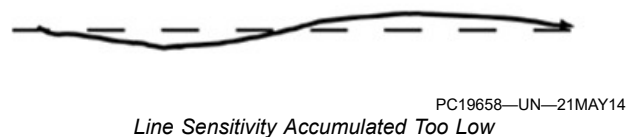
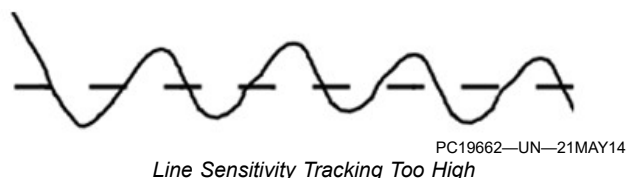
A	Track Error (in)	0
B	Wheel Angle	0
C	Line Sensitivity Tracking	500
D	Line Sensitivity Accumulated	125
E	Wheel Angle Sensitivity	2500

PC19794—UN—11AUG14

PC19795—UN—25JUL14



PC19661—UN—21MAY14
Line Sensitivity Tracking Too Low



- A—Track Error
- B—Wheel Angle
- C—Line Sensitivity Tracking
- D—Line Sensitivity Accumulated
- E—Wheel Angle Sensitivity
- F—Desired Track-Broken Line
- G—Actual Track-Solid Line

With AutoTrac™ and Active Implement Guidance engaged, adjust sensitivity settings for optimum performance.

NOTE: If adjustments are necessary during field operation, refer to *Tuning and Adjustment* section.

Track Error (Distance) (A): Distance implement is off-track from current guidance line. A properly balanced implement has positive and negative off-track errors on each side of 0.

Wheel Angle (Implement) (B): Amount of corrective wheel movement to keep Track Error at 0. Wheel angle should be positive and negative on each side of 0. A wheel angle consistently on one side or the other indicates that system is steering one way to shift machine. If operating in straight track mode, this may indicate operation on hillside. If on flat ground, it may indicate an incorrect center calibration or poor implement balance.

Line Sensitivity Tracking (C): Affects line acquisition performance only. Determines how fast or aggressively implement steers towards guidance line.

Range is 10—10000 with typical setting between 1500—5000. Default setting is 3000. Increasing value increases aggressiveness of steering.

Line Sensitivity Accumulated (D): Affects on-line

performance only. Determines how quickly system reacts to errors while off-line, on hills, and slopes.

Range is 10—10000 with typical setting between 150—500. Default setting is 300. Increasing setting increases reaction speed during off-track conditions.

Set value to 1/4 of line sensitivity tracking value, then adjust to desired preference.

Wheel Angle Sensitivity (E): Determines how aggressively system responds to errors in commanded steering angle.

Higher values cause system to respond more aggressively to errors. Wheel angle sensitivity values range between 10—9999. Typical settings for wheel angle sensitivity:

- Small Cylinder = 500
- Large Cylinder = 5000

RW00482,00002FD-19-11AUG14

Disable Active Implement Guidance

CAUTION: Do not use Active Implement Guidance on roadways.

To prevent serious injury, disable Active Implement Guidance by removing SCV control before entering roadways.

Disable Active Implement Guidance by removing SCV control.



Setup Softkey

PC12961—UN—13APR15

1. Select the Setup softkey.



Control Selection Button

PC17972—UN—07NOV13

2. Select the Control Selection button.

Control Selection	
SCV1 Control Type	
Off	(A) 
SCV3 Control Type	
Off	(B) 
Back	

PC18270—UN—02JAN14

SCV Control Selection

A—SCV 1 Control Type Drop-Down Menu

B—SCV 3 Control Type Drop-Down Menu

3. Select Off from the drop-down menus (A and B).

RW00482,00003A7-19-15MAR18

Optimize Active Implement Guidance

Optimize Machine AutoTrac™ Performance

Optimize machine AutoTrac™ performance before connecting implement. Optimizing AutoTrac™ reduces potential machine and implement counteraction that results in degraded Active Implement Guidance performance.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



GreenStar™ Button

PC12685—UN—29APR15

2. Select the GreenStar™ button.



Guidance Softkey

PC21148—UN—11MAY15

3. Select the Guidance softkey.



Guidance Settings Tab

PC11948—UN—30JUN09

4. Select the Guidance Setting tab.



AutoTrac™ Advanced Settings Button

PC21902—UN—03DEC15

5. Select the AutoTrac™ Advanced Settings button.



Next Page Button

PC22285—UN—16MAR16

6. Select the Next Page button (page 2).

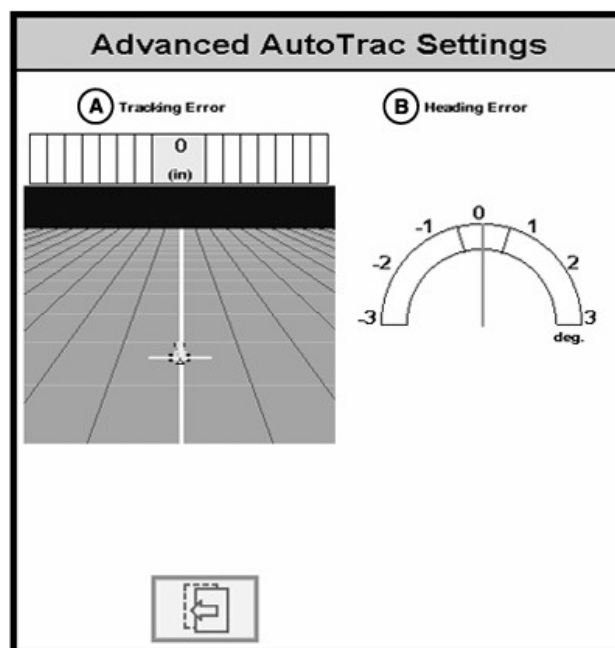


Monitor Performance Button

PC22286—UN—16MAR16

7. Select the Monitor Performance button.

8. Acquire line and drive for 30 seconds.

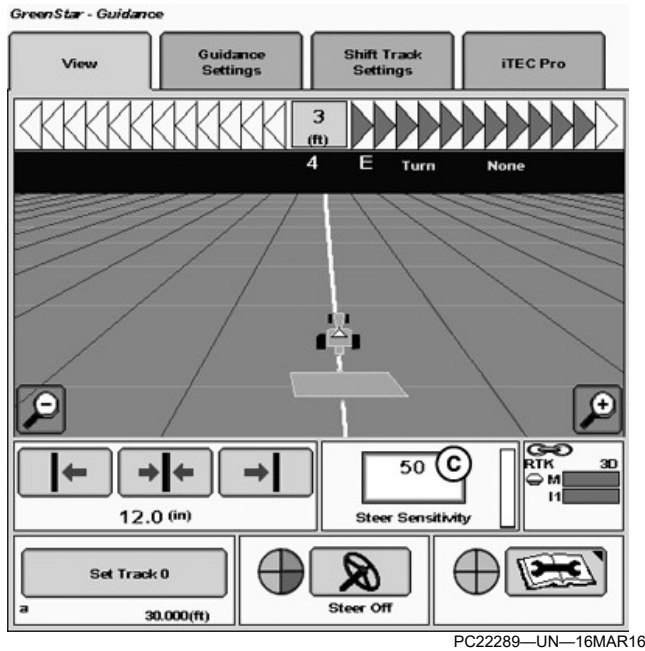


PC22287—UN—16MAR16

A—Tracking Error
B—Heading Error

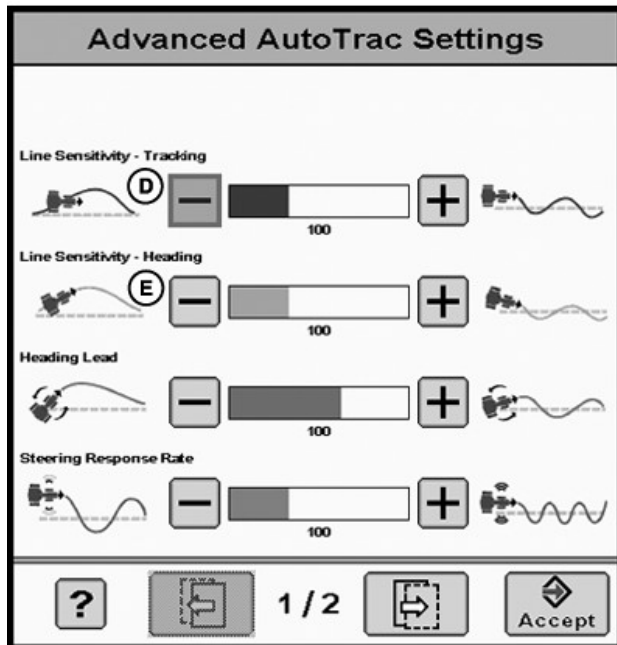
NOTE: Values closest to zero error are preferred and indicate better system performance.

9. Use the two graphs to monitor Tracking Error (A) and Heading Error (B) for 30 seconds.



C—Steering Sensitivity

NOTE: Adjust Steering Sensitivity (C) to preferred performance before adjusting line sensitivity tracking and heading settings.



D—Adjust Line Sensitivity – Tracking
E—Adjust Line Sensitivity – Heading

NOTE: Adjust Line Sensitivity – Tracking (D) for tracking error.

Adjust Line Sensitivity – Heading (E) for heading error.

10. Adjust settings until preferred performance is achieved. Global positioning system (GPS) signal

accuracy and machine condition affects the overall performance.

RW00482,00005B1-19-15MAR18

Optimize Active Implement Guidance

To optimize guidance line tracking, utilize real time kinematics (RTK) receivers on both machine and implement. Once receivers are set up, disable shared signal so each receiver uses its own RTK signal to track guidance lines.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller 1100 Button

PC14926—UN—27APR12

2. Select the Application Controller 1100 button.



Application Controller Main Softkey

PC13072—UN—16NOV10

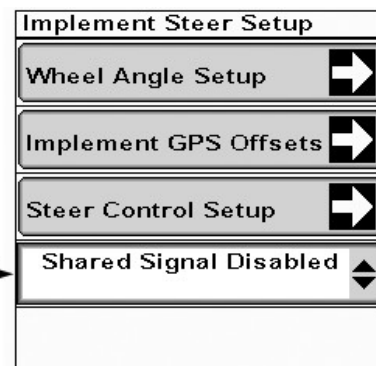
3. Select the Application Controller Main softkey.



Implement Steer Setup Button

PC17968—UN—07NOV13

4. Select the Implement Steer Setup button.



PC22590—UN—03MAY16

A—Shared Signal Drop-Down Menu

5. Select Shared Signal Disabled from the drop-down menu (A).

RW00482,000068A-19-08MAR18

Disconnecting Active Implement Guidance

Disconnecting the Active Implement Guidance System

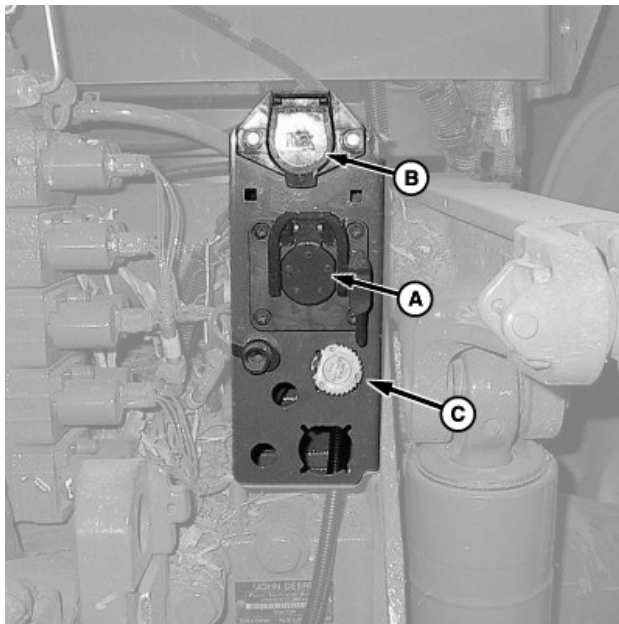
NOTE: If an electronic failure occurs, hydraulic control can be set to operate in normal, manual mode.

If running an external valve, operation is not possible during an electronic failure.

Without electronic control, automatic implement steering adjustments are not possible.

Disconnection Procedure for Changing Machine or Implement:

1. Shut OFF the machine, set the parking brake, and remove the key.



PC13526—UN—03MAY11

Rear of Tractor Shown

A—ISO Connector
B—Lighting Connector
C—9 Pin Feedback Harness

2. Disconnect implement receiver harness at ISO 9-pin connector (A).
3. Disconnect constant power harness (harness not shown).

NOTE: Once completed, machine SCV control reverts to normal manual operation.

4. Disconnect the 9-pin feedback harness (C).
5. Disconnect lighting connector (B) and all other implement connections related to releasing equipment from machine.

Disconnection Procedure for Electronic Failure:

1. Disable Active Implement Guidance.
(Reference Disable Active Implement Guidance.)

2. Cycle the machine power.

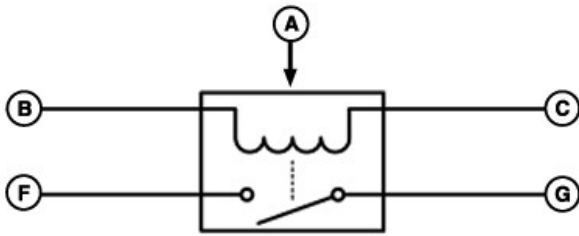
Disconnection Procedure for Permanent Removal:

1. Shut OFF the machine, set the parking brake, and remove the key.
2. Disconnect the Application Controller 1100 from rear of the ISO connector.
3. Remove the Application Controller 1100 and components following procedures in Active Implement Guidance installation instructions.

RW00482,000025B-19-08MAR18

Third-party Installation

Low Side Driver



PC21178—UN—18MAY15

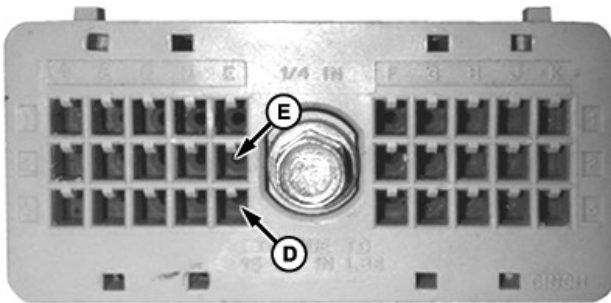
A—1 A (Max) Relay
B—Low Current Power Supply
C—Ground (E3 or E2)
F—High Current Power Supply
G—Electronic Device

IMPORTANT: To avoid damaging the Application Controller 1100, use a relay coil (A) rated at 1 A or less, and does not exceed 12 V.

NOTE: The required relay to use Application Controller 1100 low side driver is not provided.

Applications that utilize low side driver functionality:

- Implements equipped with electronic brakes that lock and release steering wheels during turnaround events.
- Implements with hydraulic steering systems that utilize electronic valves to allow steering cylinders to float during turnaround events.



PC21147—UN—15MAY15

D—E3
E—E2

Connect relay to a 5—12 V DC low current power supply (B) and ground (C) to pin E3 (D) or E2 (E) of Application Controller 1100 connector.

If using Selective Control Valve (SCV) 1, use pin E3. If using SCV 3, use pin E2.

Pin E3 or E2 low side driver closes (grounds) and holds while AutoTrac™ is active. Low side driver releases (opens) when AutoTrac™ is inactive.

AE77568,0000123-19-08MAR18

Troubleshooting

Satellite Information

Active Implement Guidance depends on the distribution of satellites providing global positioning system (GPS) signals. Position dilution of precision (PDOP) is an indicator of GPS satellite coverage at the receiver. A lower PDOP value indicates better satellite coverage for calculating both horizontal and vertical position.

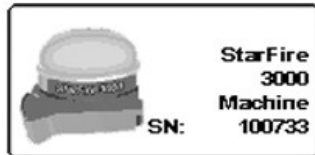
Before tuning or adjusting Active Implement Guidance sensitivity values, verify that PDOP value is below 2.5. Sensitivity values set when PDOP value is above 2.5 are inaccurate and must be readjusted.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



StarFire™ Button

PC13006—UN—05NOV14

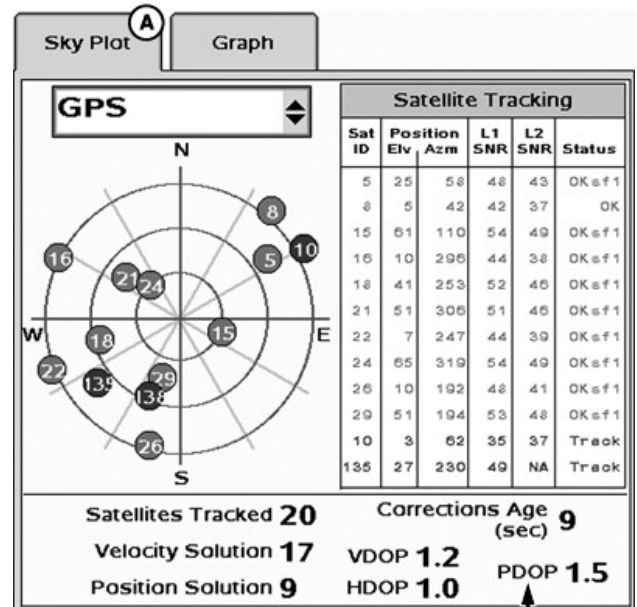
2. Select the StarFire™ button.



Satellite Information Softkey

PC13048—UN—10NOV10

3. Select the Satellite Information softkey



PC24075—UN—10APR17

A—Sky Plot Tab
B—PDOP

4. Select the Sky Plot tab (A).
5. Verify PDOP (B) is below 2.5.

RW00482,000068C-19-08MAR18

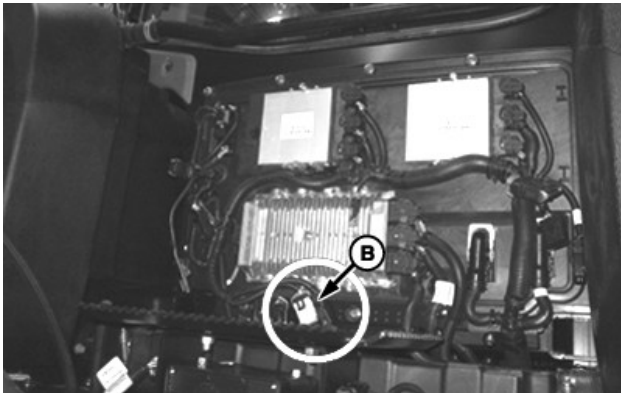
Reset UCC2 Application Controller

IMPORTANT: Do not connect the UCC2 Application Controller while machine is powered ON. Connecting while powered can create CAN bus communication errors and generate hydraulic control unit faults.

1. Turn OFF the machine.



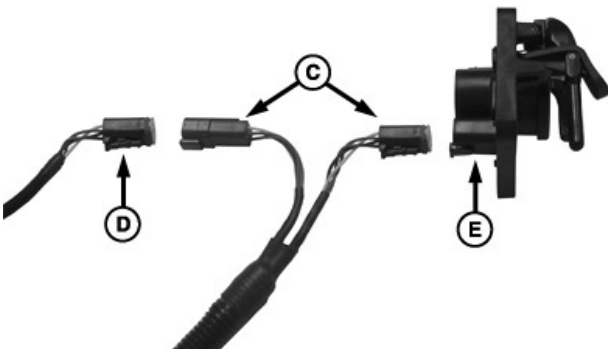
PC22232—UN—29FEB16



PC22233—UN—29FEB16

A—Constant Power Connector
B—Option Connector

2. Disconnect the constant power connector (A) and the option connector (B).



PC22234—UN—29FEB16

C—CAN Bus T-Connectors
D—4-Pin CAN Bus Connector
E—ISO Implement Connector

3. Disconnect the CAN bus T-connectors (C) and connect the 4-pin CAN bus connector (D) directly to the ISO implement connector (E).

4. Start the machine. Once all systems start up, view and clear all machine diagnostic trouble codes, then turn OFF the machine.
5. Reconnect the constant power and option connectors.
6. Reconnect the CAN bus T-connectors between the 4-pin connector and the ISO implement connector.

RW00482,00005B8-19-24NOV20

Reset Application Controller 1100 Settings

NOTE: If system issues cannot be corrected by changing settings, restore the Application Controller 1100 to default settings and complete setup of the system.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller 1100 Button

PC14926—UN—27APR12

2. Select the Application Controller 1100 button.



Application Controller Main Softkey

PC13072—UN—16NOV10

3. Select the Application Controller Main softkey.



Version Information Button

PC18216—UN—05DEC13

4. Select the Version Information button.



Factory Defaults Button

PC19932—UN—19AUG14

5. Select the Factory Defaults button.



Reset All Button

PC19933—UN—19AUG14

6. Select the Reset All button.

AE77568,0000121-19-26SEP17



Application Controller Main Softkey

PC13072—UN—16NOV10

3. Select the Application Controller Main softkey.

System Status



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller 1100 Button

PC14926—UN—27APR12

2. Select the Application Controller 1100 button.



Implement Steer Main Button

PC18007—UN—07NOV13

4. Select the Implement Steer Main button.

Implement Steer Main	
Implement Steering	SCV 1
Status (A)	No GPS
Track Error (in)	0
Wheel Angle	-1823
Line Sensitivity	3000
Tracking	
Line Sensitivity	300
Accumulated	
Tractor Follow Off	

Status Code Location

PC13527—UN—03MAY11

A—Status Code

5. Verify Status Code (A).

Status Code	Description	Solution
Not Activated	Desired application has not been activated on the control unit.	Obtain an activation code for application.
No GPS	No global position system (GPS) correction available.	Ensure that StarFire™ Receivers on implement and machine are connected and functioning properly.
Cycle Power	Controller must be restarted to communicate with new function.	Shut OFF machine, wait for display to power down, then restart machine.
No RTK	No real time kinematic (RTK) correction seen on selected receiver, or RTK not currently available.	Activate RTK on the implement receiver and (or) machine receiver.
Update GPS SW	Incompatible software loaded.	Update software on StarFire™ Receivers to newest version.
Machine SCV is Not in Auto	Selective control valve (SCV) control not detented to engage Active Implement Guidance.	Detent SCV to engage Active Implement Guidance. For an external valve, detent added SCV lever.
OK	Active Implement Guidance is ready to operate, or is operating without errors. Any faults are likely to be independent of the Active Implement Guidance control system.	System working properly.
Implement Up	Implement is raised or has faulty implement height switch.	Ensure requirement to engage is correct.

StarFire is a trademark of Deere & Company

Symptom

Display not readable when connected to machine.

Problem

There is no communication with the implement control unit.

Solution

Shut OFF power, check connections, and power up to reboot system.

Clean and reconnect the 4-pin DEUTSCH® connector at back of the ISO implement connector on machine.

Verify connection at the front of the implement.

3. Select the Application Controller Setup softkey.

RW00482,0000689-19-13MAR18



PC21345—UN—09JUL15

I/O Voltages Button

Input/Output (I/O) Voltages



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller 1100 Button

PC14926—UN—27APR12

2. Select the Application Controller 1100 button.



Setup Softkey

PC12961—UN—13APR15

4. Select the I/O Voltages button.

I/O Voltages	
Analog In 1(Pin G2)	0.03
Analog In 2(Pin K2)	0.02
Analog In 1(Pin H1)	0.05
Analog In 2(Pin J1)	0.05
5 Volt Out(Pin J3)	4.91
Sense Volt(Pin E1)	0.08
Digital In 1(Pin G1)	1
Digital In 2(Pin K1)	1
Back	

PC19689—UN—12JUN14

I/O Voltages

5. Verify I/O Voltages.

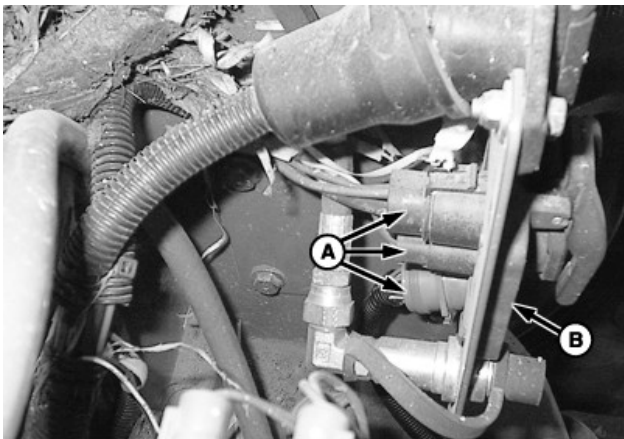
I/O Voltages Page		System Definitions	
Description	Reading	Integrated	External Valve
Analog In Pin 1 (Pin G2)	Wheel angle sensor voltage reading SCV 1 = 0—5 V, 2.5 V = neutral	Current voltage reading of the wheel angle sensor when plugged into the selective control valve (SCV) 1 on implement feedback harness.	
Analog In Pin 2 (Pin K2)	Wheel angle sensor voltage reading SCV 3 = 0—5 V, 2.5 V = neutral	Current voltage reading of the wheel angle sensor when plugged into SCV 3 on implement feedback harness.	
Analog Out Pin 1 (Pin H1)	Command SCV 1 voltage value 0—5 V, 2.5 V = neutral	When set up for SCV 1, this is the voltage commanded to the hydraulics control unit, or current command voltage of respective SCV if not in Auto mode.	When set up for SCV 1, this is the voltage reading of external SCV lever. Approximately 2.8 V is neutral. If the voltage is close to 0 V and (or) not changing with movement of the remote mount electronic SCV control

Troubleshooting

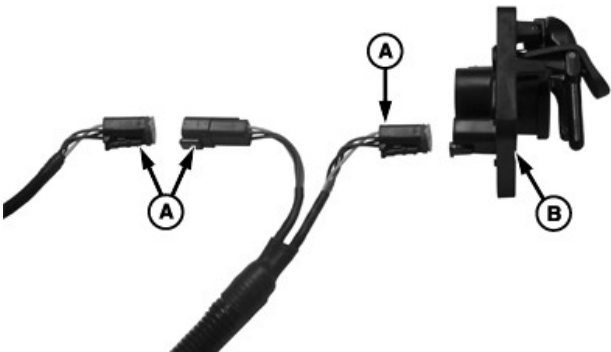
			lever, ensure that external valve is connected and the light is on.
Analog Out Pin 2 (Pin J1)	Command SCV 3 voltage value 0—5 V, 2.5 V = neutral	When set up for SCV 3, this is the voltage commanded to the hydraulics control unit, or current command voltage of respective SCV if not in Auto mode.	Not available with the external valve.
5 Volt Out	Supplied voltage 0—5 V for system	Voltage supplied to system should read close to 5 V.	
Sensor Volt	Sensor voltage 0—5 V, with implement feedback harness plugged in, it is 5 V, with tractor SCV, it is 0 V and changes with command	Voltage coming from the hydraulics control unit system should read 5 V.	At rest and in detent, voltage is close to 0 V. While manually commanding, value changes with lever movement.
Digital In 1 (Pin G1)	External valve remote mount electronic SCV control lever, 0 = no command, 1 = command	Not available.	Value is used for the external valve SCV 1 and reads 0 at rest and changes to a 1 when moved.
Digital In 2 (Pin K1)	Value displays 1		Not available with the external valve.
Line Count	Not available for Active Implement Guidance.		

AL70325,0000384-19-22MAR18

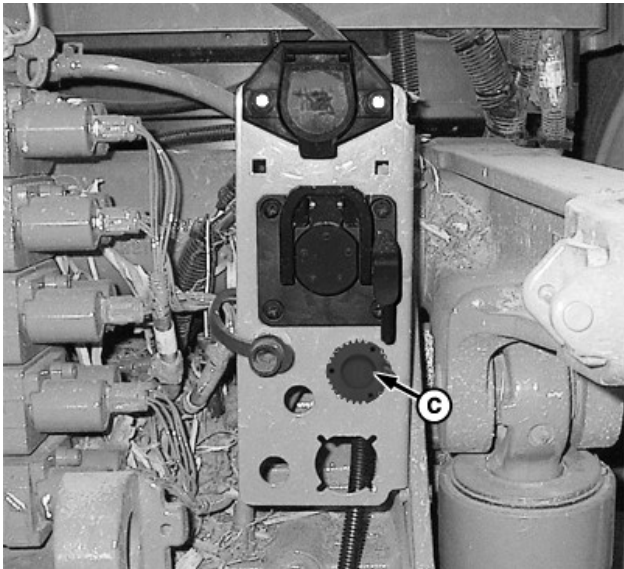
Machine Configuration



PC19673—UN—28MAY14



PC19672—UN—27MAY14



PC19674—UN—28MAY14

- A—Machine-Side Connectors
- B—ISO Connector
- C—Feedback Sensor Connector

Symptom	Problem	Solution
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Symptom	Problem	Solution
Implement not displayed or inoperable.	Dirty or loose connectors (A) on the machine side of the ISO connector (B).	Clean connectors and reconnect tightly.
	GreenStar™ harness is improperly connected.	Power down machine and system, disconnect harness, clean, and install properly.
	There is an electrical short in harness.	Check electrical wiring for breaks, shorts, and damage.
	The Application Controller 1100 was connected with the machine powered on and (or) codes active on the machine.	Turn OFF the machine and completely disconnect the Application Controller 1100 from system. (Reference Disconnecting the Active Implement Guidance System.) Start the machine and allow the display to completely boot up. Turn OFF the machine and reconnect the Application Controller 1100 and all harnesses.
	The Application Controller 1100 is not communicating with CAN bus after key cycle.	Verify that the Application Controller 1100 has switched power. If the Application Controller 1100 has constant power, it does not power down and will not appear on display when machine is powered back on.
SCV does not enter Auto mode.	SCV option connector is not plugged in.	Verify that 9-pin SCV option connector is plugged into machine.
AC (Auto Control) is not showing on the selective control valve (SCV) display (30 series tractor or older). Auto Mode checkbox is grayed out and cannot be selected (R series tractors).	Dirty or loose machine-side implement feedback sensor connector (C) at rear of machine. Early versions of harness used a 10-pin rectangular connector.	Clean connectors and reconnect tightly.
	SCV is not in detent.	Ensure that SCV is in detent and not in float mode. If the SCV lever remains in forward position, then it is in float mode.
	Incorrect Setup.	Verify that correct control type is selected, SCVs are selected in the Active Implement Guidance setup, and power has been cycled.
	SCV selection is not correct in CommandCenter™ (R series).	On the CommandCenter™, select the SCV being utilized.
System steers in one direction.	Inline check valves are installed in the system.	Remove the check valves.

Troubleshooting

Symptom	Problem	Solution
	Hydraulic hoses are reversed.	Switch positions of hydraulic hoses and calibrate maximum left, center, and maximum right positions.
	Application Controller 1100 was connected while machine was running, creating hydraulic control unit fault codes.	(Reference Reset Application Controller 1100 for more information.)
Side shift 3-point hitch locks in one direction after reaching headland.	Implement Shifter mode - Shifter Stay On Enabled.	Drive toward the next guidance line and select AutoTrac™ resume. Implement acquires line and begins tracking. Change Implement Shifter mode to Shifter Stay On Disabled.
	Hitch travel is not parallel to the machine rear axle.	Install an implement feedback sensor and sensor harness. Change the control selection from Implement Shifting to Implement Steering. Calibrate left, center, and right positions.
Implement steers away from line when AutoTrac™ resume button is pressed.	SCV hoses hooked up in reverse.	Switch hoses in SCV outlets.
	Implement steering calibration was done with right and left limits reversed.	Reverse right and left inputs and perform implement steer calibration again.
	Incorrect implement feedback sensor connector plugged in to the wheel angle sensor.	Plug in the correct implement feedback connector for SCV selected in the settings.
Machine not steering to line.	EC is displayed on SCV display.	To bring up AC mode, push the correct SCV control lever into detent.
Hydraulic steering is not responding well.	Steering cylinder is leaking fluid.	Check for leakage. (Reference service section for more information.) Repair or replace the cylinder. Contact your John Deere dealer or any other qualified service provider for assistance.
	There is insufficient machine hydraulic pressure.	Check machine hydraulic pressure. (Reference machine Operator's Manual for more information.) Ensure that hydraulic oil is at operating temperature.

Symptom	Problem	Solution
		Use correct size hydraulic cylinders for machine pressure.
	Counterbalance valve improperly adjusted.	Adjust counterbalance valve cartridges and perform threshold calibration.
	Hydraulic hoses are connected improperly or poorly.	Check hose O-rings, connect properly, and tighten connections.
	Valve is frozen.	Manually cycle hydraulic cylinders to the full right and left. If condition repeats, oil may be contaminated, causing plugging, or SCV may require a shuttle valve to prevent it from going into Desilting Mode during low flow conditions.
	Active Implement Guidance settings are incorrect.	Verify system moves fluidly with extend and retract tests, and adjust sensitivities and thresholds accordingly.
Active Implement Guidance does not engage.	Implement steering Status does not display OK.	Refer to the System Status table in Troubleshooting.
	Application Controller 1100 was connected while machine was running, creating hydraulic control unit fault codes.	1. Turn OFF machine. 2. Disconnect the Application Controller 1100, constant power harness, and option connector from the external rear panel of cab. 3. Disconnect CAN bus T-connectors and connect 4-pin connector directly to the ISO implement connector. 4. Start machine. Once all systems start up, turn OFF machine. 5. Reconnect the Application Controller 1100, constant power harness, and option connector. 6. Reconnect CAN bus T-connectors between 4-pin connector and ISO implement connector.

AL70325,0000380-19-22MAR18

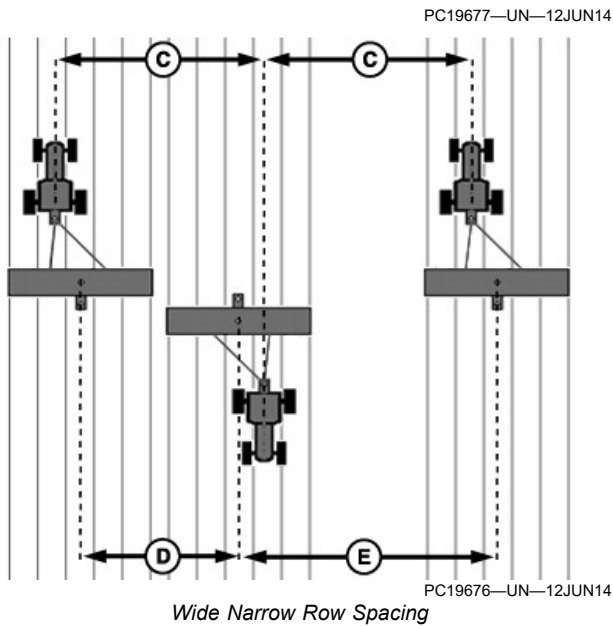
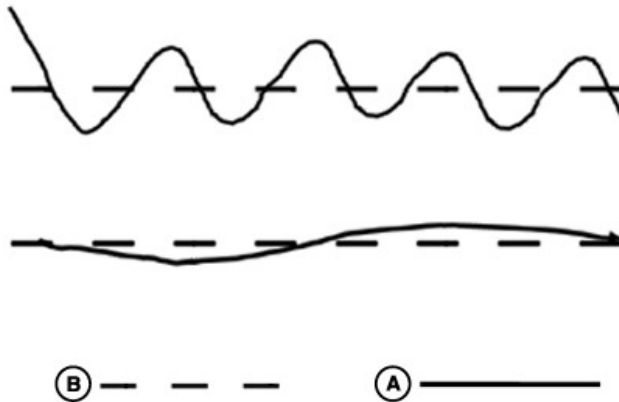
External Valve

Symptom	Problem	Solution
External valve not responding.	Selective control valve (SCV) 3 selected during system setup.	Verify the correct operation mode is selected for SCV 1.

Symptom	Problem	Solution
External valve setup button is not displayed.	Machine-side implement feedback sensor connector at rear of machine for integrated SCV control is plugged in. Early versions of harness used a 10-pin rectangular connector.	Disconnect machine-side implement feedback sensor connector.
	External valve wiring harness disconnected.	Connect external valve wiring harness. LED on external valve should light up.
	External valve installed is not compatible with machine hydraulic system design. Open-center versus closed-center designs.	Verify part number of valve installed on implement is compatible with machine hydraulic system design. (Reference Application Controller 1100 and External Valve Installation Instructions or contact your John Deere dealer for more information.)
	SCV control harness has loose or no connection to application controller harness.	Verify connections.
	SCV control harness is plugged into implement receiver or front extension harness.	Verify that SCV control harness is plugged into application controller harness.
LED light is red.	Inline check valve on pump hose not functioning or not present.	Install, repair, or replace check valve.
	Back pressure buildup in external valve.	 CAUTION: When moving external valve control lever the implement may move. Hoses connected in reverse, causing back pressure. Verify hoses are connected properly. If problem still exists, perform the following: 1. With tractor running, put hydraulics in float. 2. Key off machine. 3. Cycle external valve control lever manually several times. 4. Cycle power to clear red light.
	External Valve Error.	Contact your John Deere dealer.

RW00482,0000304-19-19JUN15

Implement Performance



- A—Implement Travel Path
- B—Desired Guidance Line
- C—Machine Center-to-center Same Distance
- D—Implement Center-to-center Narrow Distance
- E—Implement Center-to-center Wide Distance

Symptom

S-ing (A) — Implement Travel Path continuous back and forth motion over desired guidance line (B).

Problem

Field conditions.

Drawbar is not locked in position.

Line sensitivity tracking or line sensitivity accumulated settings are not optimized.

Solution

Utilize tractor differential lock, if equipped.

Lock drawbar into position.

(Reference Adjust Sensitivity Settings in Operation section.)

Symptom	Problem	Solution
Wide Narrow Row Spacing — parallel inconsistency in row spacing across entire length of field between passes.	Machine center-to-center distance (C) is the same between passes. Implement center-to-center distances (D and E) are different on each pass causing narrow and wide rows between passes.	1. Ensure Application Controller 1100, display, and receiver have latest software. (Reference Service section.) 2. Turn on Terrain Compensation Module (TCM) and calibrate. (Reference receiver Operator's Manual.) 3. Check and adjust machine ballast, tire pressure, and tire spacing. (Reference machine Operator's Manual.)
	Implement center-to-center distance is same between passes. Implement not tracking directly behind machine.	1. Measure and input accurate implement offsets. (Reference display Operator's Manual.) 2. Repair or replace worn or damaged implement components. (Reference implement Operator's Manual.) 3. Adjust 3-point hitch. Adjust machine sway blocks and lift links to recommended settings. (Reference machine Operator's Manual.) 4. Measure and adjust all row units to be symmetrical to implement center line. (Reference implement Operator's Manual.)
Guidance AB line is not in correct location for implement.	Shifts were not cleared from display from a previous operation.	Recreate guidance line using A+ Heading. Best practice is to set guidance lines for most critical operation. Utilize shifts for less critical operations in same field. Clear all shifts when leaving field. (Reference display Operator's Manual for information on guidance line creation.)
Erratic performance.	Position dilution of precision (PDOP) value above 2.5 with obstructions more than five degrees above elevation.	Ensure that implement receiver is not being shaded by obstructions or machine cab in all travel directions.
	Real time kinematics (RTK) signal is weak or drops to RTK extended (RTK-X) differential.	Utilize base station that provides signal with clear line of sight.

Symptom	Problem	Solution
	PDOP value above 2.5 with no obstructions.	Wait for satellite solution to improve. If settings and adjustments are made, record original setting values to input when PDOP drops below 2.5.
	After making headland turn, performance becomes erratic.	Ensure application controller, display, and receiver have latest software. (Reference Service section.)
	Guidance tracking error value for machine is greater than tracking error of Active Implement Guidance on implement.	Determine root cause of high machine tracking error. (Reference display Operator's Manual.)
Steer system not responding, but status displays OK.	SCV Threshold set too low.	Perform SCV Threshold calibration.

RW00482,0000305-19-11SEP14

Receiver



PC13798—UN—02JUN11

Receiver Accuracy Warning

Receiver Accuracy Warning

Please connect the receiver with the highest level of accuracy to the primary machine (vehicle) to achieve better performance for the following application(s):

Symptom	Problem	Solution
Receiver Accuracy Warning is displayed.	Correction signal is higher on implement receiver.	Shared signal automatically uses machine correction signal. Install receiver with higher correction signal on machine. Accuracy warning does not disable shared signal.

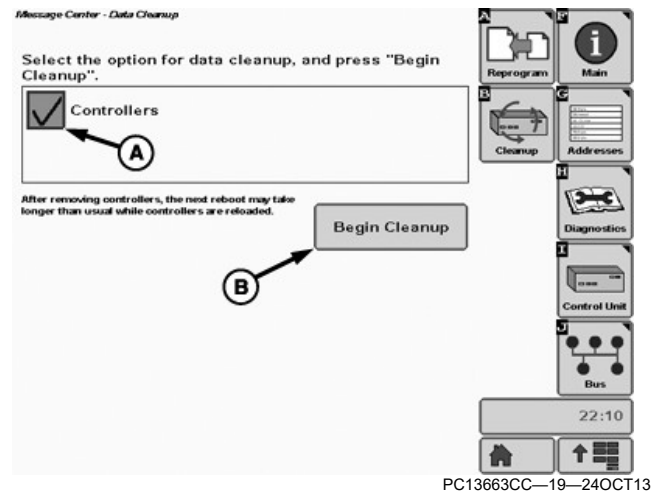
Symptom	Problem	Solution
Unable to utilize shared signal when machine is moving.	Software issue.	Ensure application controller, display, and receiver have latest software. (Reference Service section.)
	iGrade™ application is active.	Set SCV1 or SCV3 Control Type to Implement Steering and ensure neither Control Type is set to iGrade™.
	Both receivers utilize real time kinematics (RTK) and RTK is turned on.	Turn off RTK on implement receiver. (Reference StarFire™ Receiver Operator's Manual.)
	Fore and aft values for implement receiver are not set to zero.	Set implement fore and aft values to zero.
Receivers not linked with Shared Signal.	Shared Signal is disabled in Implement Steer Setup page.	1. Select Menu button. 2. Select Application Controller button. 3. Select Application Controller Main softkey. 4. Select Implement Steer Setup button. 5. Select Shared Signal Enabled from drop-down menu.

AL70325,000037B-19-15MAR16

Data Cleanup

Data cleanup function removes control unit VI graphic files from the display. This can be done in case the implement's user interface does not show up anymore or if it does not show up correctly. The cleanup forces the implement control unit to send its data to the display again after a restart.

Select the Menu button > Message Center button > Cleanup softkey.



Data Cleanup

A—Controllers Checkbox
B—Begin Cleanup Button

Select the checkbox (A) for the data to be removed and then select the Begin Cleanup button (B).

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

RW00482,0000196-19-15MAR18

Clean Up ISOBUS VT

If using a Generation 4 Display and the implement user interface does not show up or does not show up correctly, clean up ISOBUS VT. This function clears the cached ISOBUS control unit object pools. Clearing the cache forces the implement control unit to send its data to the display again after a restart.



ISOBUS VT Softkey

PC23372—UN—15NOV16

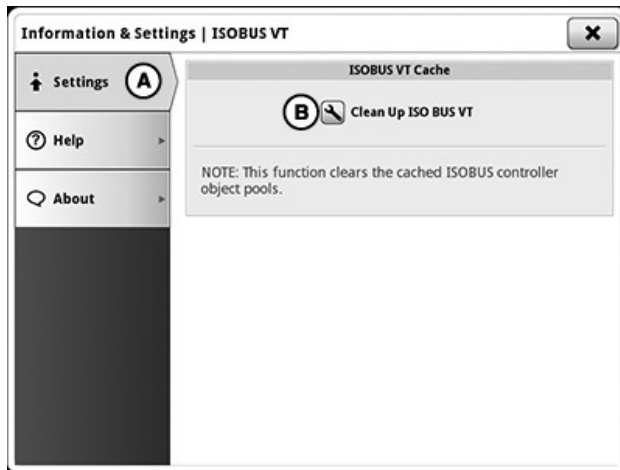
1. Select the ISOBUS VT softkey.



Settings Icon

PC15305—UN—19MAR13

2. Select the Settings icon.



PC23373—UN—15NOV16

A—Settings Tab

B—Clean Up ISOBUS VT Button

3. Select the Settings tab (A).
4. Select the Clean Up ISOBUS VT button (B).

RW00482,0000074-19-13MAR18

Maintenance

Machine

Refer to manufacturer of implement steering module for servicing procedures.

CF86321,0000349-19-23MAY11

Preseason Checklist

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

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

Preseason Checklist

- ☐ Obtain the latest Operator's Manual.
(Reference John Deere Technical Information Bookstore for more information.)
- ☐ Update Software. Go to StellarSupport.com for latest software.
 - ☐ Display
 - ☐ Machine receiver
 - ☐ Implement receiver(s)
 - ☐ Base station receiver
 - ☐ Controller
- ☐ Activate applications on display.
- ☐ 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 connector seals and latching mechanisms. Repair as necessary.
- ☐ Inspect connector pins for wear, debris, and corrosion. Clean and (or) repair as necessary.
 - ☐ ISO connector
 - ☐ Receivers
 - ☐ Display
- ☐ Inspect mounting hardware. Retorque as necessary.
 - ☐ Display
 - ☐ Receivers
 - ☐ Mast
- ☐ Adjust selective control valve (SCV) flow rates.
- ☐ Adjust counterbalance valve (if applicable).
- ☐ Calibrate SCV thresholds.
- ☐ Calibrate machine and implement terrain compensation modules (TCMs).

- ☐ Inspect implement hydraulic cylinder for leaks.

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

RW00482,00005B0-19-15MAR16

Daily Checklist

- ☐ Adjust line sensitivity tracking and accumulated settings to soil conditions.
- ☐ 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
 - ☐ Receivers
 - ☐ Mast
- ☐ Inspect implement steering mechanism for wear.
- ☐ Inspect implement feedback linkage mechanism for wear.
- ☐ Inspect implement hydraulic cylinder for leaks.

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

RW00482,0000307-19-12JUN14

Postseason 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 connector seals and latching mechanisms. Repair as necessary.
- ☐ Inspect connector pins for wear, debris, and corrosion. Clean and (or) repair as necessary.
 - ☐ ISO connector
 - ☐ Receivers
 - ☐ Display
- ☐ Inspect mounting hardware. Retorque as necessary.
 - ☐ Display
 - ☐ Receivers
 - ☐ Mast
- ☐ Inspect implement steering mechanism for wear.
- ☐ Inspect implement feedback linkage mechanism for wear.
- ☐ Inspect implement hydraulic cylinder for leaks.

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

RW00482,0000308-19-02JUN14

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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

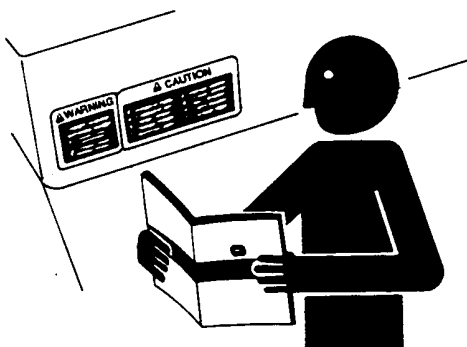
EDUCATIONAL CURRICULUM including five comprehensive series of books detailing basic information regardless of manufacturer:

- 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.

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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/.

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