

iGrade™ and Distance Trip (S.N. PCXL01C or D)



JOHN DEERE

OPERATOR'S MANUAL

iGrade™ and Distance Trip (S.N. PCXL01C or D)

OMPFP22579 ISSUE J5 (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

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 www.techpubs.deere.com (Ag&Turf/JDPS), www.johndeeretechnico.com (C&F), or 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 product or implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (PIN) in the Specification or Product Numbers section. Accurately record all the numbers to help in tracing the product should it be stolen. PIN information is helpful when ordering parts. File the identification numbers in a secure place off the product.

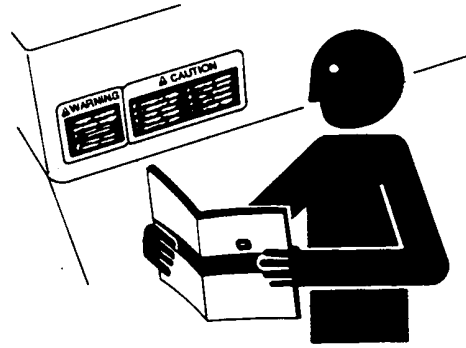
WARRANTY is provided as part of John Deere's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate or statement which you should have received at time of purchase.

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.

DX,IFC5E-19-08SEP25

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.
- **John Deere replacement parts, repair services, and information for maintenance or repair are available. For more information, please visit deere.com or deere.ca.**

DX,IFC,JDS-19-30SEP25

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 dealer or visit techpubs.deere.com.

CZ76372,000071F-19-04AUG25

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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.

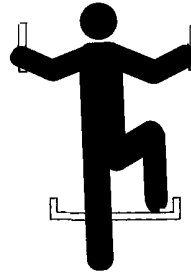
On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

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 Guidance Systems Safely

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

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

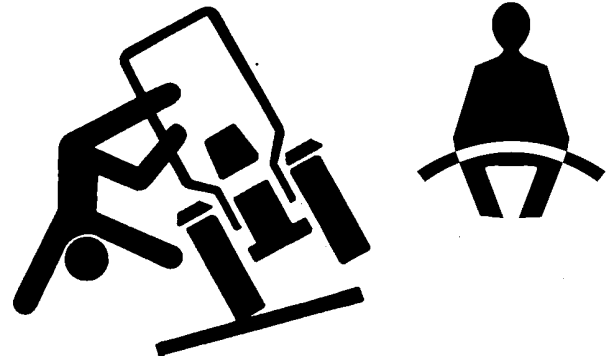
Guidance systems include any application that automates machine steering. This includes, but may not be limited to, AutoTrac, iTEC, AutoTrac Turn Automation, AutoTrac Implement Guidance (passive), AutoTrac Universal, AutoTrac Controller, AutoTrac RowSense, and Machine Sync.

To prevent injury to the operator and bystanders:

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

AL70325,000048F-19-24AUG23

Use Seat Belt Properly



TS1729—UN—24MAY13

Avoid crushing injury or death during rollover.

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

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

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

Inspect seat belt and mounting hardware at least once a year. Look for signs of loose hardware or belt damage, such as cuts, fraying, extreme or unusual wear, discoloration, or abrasion. Replace only with

replacement parts that meet specifications for your machine.

DX,ROPS1-19-22AUG13

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.

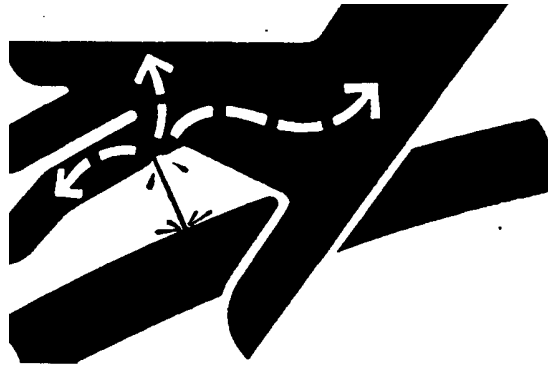
Implement automation systems include any application that automates implement movement. This includes, but may not be limited to, iGrade and Active Implement Guidance.

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.

CF86321,0000366-19-05AUG25

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



PC28647—UN—07FEB22

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” identifies the last two numbers of the year of manufacture (B); “WW” identifies the week number of calendar year of manufacture (C).

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

Date Code		
YY	Last Two Numbers of Year of Manufacture	Example: 16 = 2016 17 = 2017 18 = 2018
WW	Week Number of Calendar Year of Manufacture	Example: 01, 02, 03—53

RW00482,00007B7-19-08FEB22

Eurasian Economic Union – EAC

Eurasian Economic Union - EAC

Information for products that bear conformity mark of the Eurasian Economic Member States

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

Universal CAN Application Controller

Model: John Deere Application Controller

Made in the 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, Beliye Stolbi micro district,

vladenye “Warehouse 104,” Building 2.

EAC

PC20044—UN—30SEP14
CT47125,00011A7-19-05AUG25

EU Declaration of Conformity

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

The undersigned hereby declares that:

Product: Universal Can Controller 2, Application Controller Application Controller 1100, Application Controller 1120

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:

EN 55032: 2012/AC: 2013

EN 55024: 2010

EN ISO 14982: 2009

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

John Deere Walldorf GmbH & Co. KG
Customer Support
Impexstraße 3
D-69190 Walldorf
EUConformity@JohnDeere.com

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

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

Date of Declaration: 12 April 2021

Manufacturing Unit: Deere & Company, Moline, IL 61265

Name: Scott Torgerson

Title: Delivery Manager Electronic Hardware



DXCE01—UN—28APR09
CT47125,000115A-19-22OCT21

UK Declaration of Conformity

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

The undersigned hereby declares that:

Product: Universal Can Controller, Application Controller 1100, Application Controller 1120

Model(s): XL01, XL02

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

DIRECTIVE	NUMBER	CERTIFICATION METHOD
The Electromagnetic Compatibility Regulations	S.I. 2016/1091	Schedule 2, Module A

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

EN 55032:2012/AC:2013

EN ISO 14982:2009

EN 55024:2010

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

John Deere Ltd
Harby Road
Langar
Nottinghamshire
NG13 9HT
EUConformity@JohnDeere.com

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

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

Date of Declaration: 12 April 2021

Manufacturing Unit: Deere & Company, Moline, IL 61265

Name: Scott Torgerson

Title: Delivery Manager Electronic Hardware

Ag & Turf Products Importer: John Deere Ltd- Harby
Road, Langar, Nottinghamshire, NG13 9HT, United
Kingdom

Forestry Products Importer: John Deere Forestry Ltd-
Carlisle Airport Industrial Estate, Carlisle, Cumbria, CA6
4NW, United Kingdom

Construction Importer: Wirtgen Limited, Wirtgen Group
House, Overfield Park, Godfrey Drive, Newark, Notts.
NG24 2UA, United Kingdom



APY46000—UN—25AUG21
CT47125,000115B-19-22OCT21

System Overview—iGrade™

Theory of Operation—iGrade™

iGrade™ is an active elevation control system which uses selective control valves (SCVs) to control implement height based on the global positioning system (GPS) elevation data.

iGrade™ utilizes latitude and longitude position from StarFire™ Receivers to obtain a plane or elevation point. To function properly, setup is crucial to performance.

iGrade™ has three surface modes:

- Grade Control
- Plane Control
- Remote Control

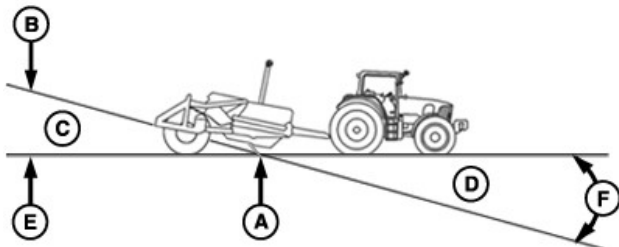
(For more information, reference the specific surface mode.)

Cross Slope

If the scraper is capable, cross slope can be used in addition to the surface mode. Using cross slope allows control of both position and roll angle of the scraper blade, resulting in a cleaner and more precise cut. Cross slope is typically necessary when creating ditches, creating crowned surfaces, or scraping perpendicular to the direction of fall on a plane.

RW00482,00007B9-19-12JUN19

Grade Control



PC22266—UN—15MAR16

- A—Origin Point
- B—Desired Plane or Grade
- C—Area Filled (dirt added)
- D—Area Cut (dirt removed)
- E—Starting Plane or Grade
- F—Slope %

Grade Control is commonly used to create field roads or simple ditches. Grade Control automatically controls scraper to a defined slope over a global positioning system (GPS) distance. Grade may be defined by the Grade Calculator or by the operator entering a slope, direction, and origin point (A).

Origin point is a location on the ground that is at the absolute elevation for the desired plane or grade (B). The origin point is a reference location that is used to

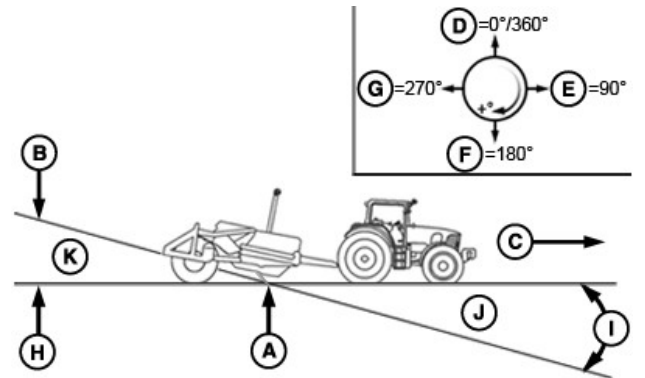
compare absolute elevation versus elevation calculated by iGrade™.

(For more information, reference Origin Point.)

System automatically fills (C) or cuts (D) during uphill or downhill operation based on distance traveled.

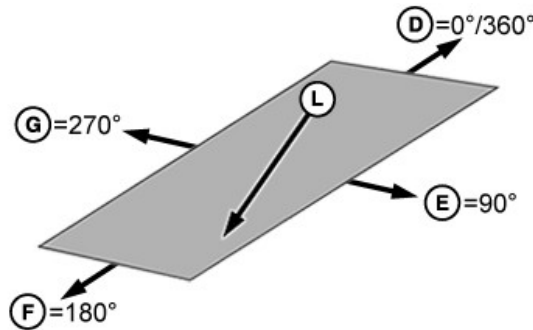
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Plane Control



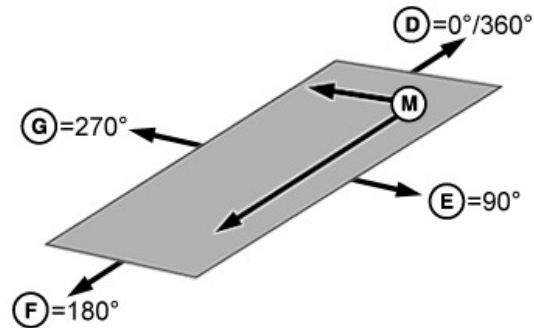
PC21009—UN—23MAR15

Slope Direction



PC21010—UN—23MAR15

Single Slope



PC21011—UN—27MAR15

Dual Slope

- A—Origin Point
- B—Desired Plane or Grade
- C—Slope Direction
- D—North = 0°/360°
- E—East = 90°
- F—South = 180°
- G—West = 270°
- H—Starting Plane or Grade

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

I—Slope Percent
 J—Area Cut (dirt removed)
 K—Area Filled (dirt added)
 L—Origin Point with Single Slope (down slope direction 160°)
 M—Origin Point with Dual Slope (down slope direction G and down slope direction F)

Plane Control automatically controls the scraper to cut to a defined plane. Defined planes can be a single sloped plane or a dual sloped plane. Planes can be defined by the Plane Calculator or by the operator entering a slope, direction, and origin point (A).

Origin point is a location on the ground that is at the absolute elevation for the desired plane or grade (B). The origin point is a reference location that is used to compare absolute elevation versus elevation calculated by iGrade™.

(For more information, reference Origin Point.)

Slope direction (C) is calculated based on the global positioning system (GPS) heading in relation to true north (D) and in the down slope direction. North corresponds to a heading of 0° or 360°. iGrade™ has the option of setting five independent planes that are selectable during operation. Each of the 5 planes can be configured to have a custom name up to 19 characters. A common field operation that requires multiple planes is when material is being removed to create a plane profile and transferred to fill another plane profile.

The Plane Calculator can create a best fit plane based on recorded elevation data. Once all data has been collected, a best fit plane is created.

RW00482,00007BE-19-15DEC21

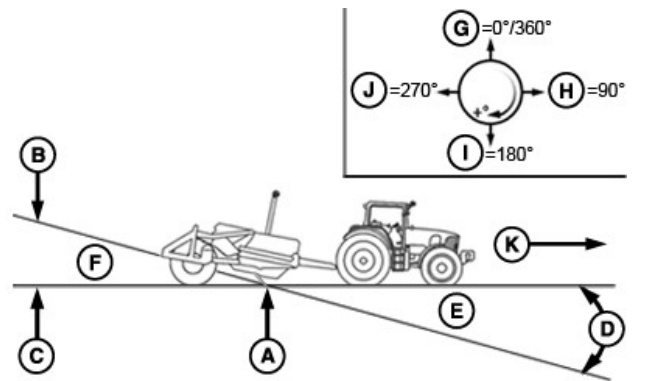
Remote Control

Third-party software can connect to the Application Controller using a serial connection and operation-specific message protocols. This functionality is used with additional software packages that provide capabilities such as cut and fill mapping. After a serial connection is established, the third-party software can send set point commands to the Application Controller and automatically control elevation on an implement. The Application Controller is also capable of retransmitting global positioning system (GPS) data to the third-party software using the serial port.

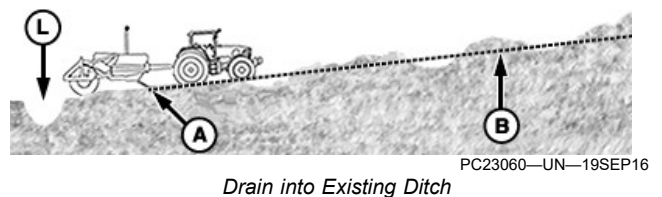
(For more information, contact your John Deere dealer.)

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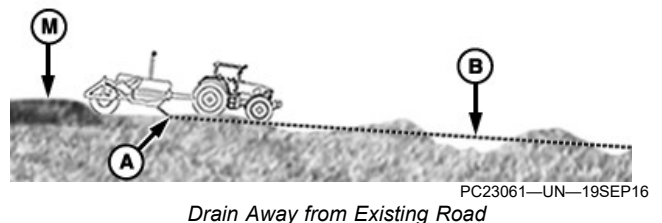
Origin Point



PC21104—UN—21APR15



PC23060—UN—19SEP16



PC23061—UN—19SEP16

A—Origin Point
 B—Desired Plane or Grade
 C—Starting Plane or Grade
 D—Slope %
 E—Area Cut (dirt removed)
 F—Area Filled (dirt added)
 G—North = 0°/360°
 H—East = 90°
 I—South = 180°
 J—West = 270°
 K—Slope Direction (degrees)
 L—Existing Ditch
 M—Existing Road

An origin point (A) is a location in the field at an elevation that does not require the removal or addition of material to be at the desired plane or grade (B). Origin points should be identified with flags or markers to allow scrapers to return for system validation and to reset plane or grade origin. System validation and resetting of plane or grade origin is necessary due to normal global positioning system (GPS) drift.

The location of the origin point varies by field design. Examples to determine origin point:

- Results from using the plane calculator
- Where slope drains into the existing ditch (L)

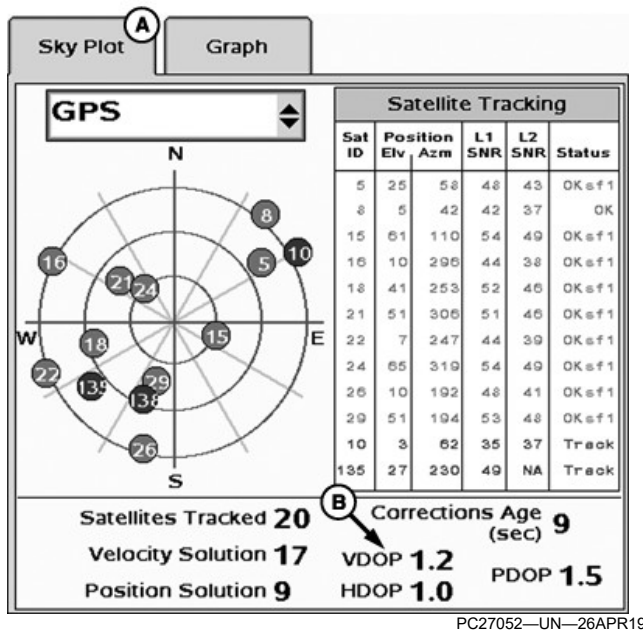
- Where slope drains away from the existing road (M)

RW00482,00008A3-19-11JUN19

Satellite Information—VDOP

iGrade™ depends on satellites that provide global positioning system (GPS) signals. Vertical dilution of precision (VDOP) is an indicator of GPS satellite coverage at the receiver. A lower VDOP value indicates better satellite coverage for calculating vertical position. Before tuning or adjusting iGrade™, verify that VDOP value is below 1.6. Adjustments made when VDOP value is above 1.6 are inaccurate and must be readjusted.

1. Navigate to StarFire™ pages.

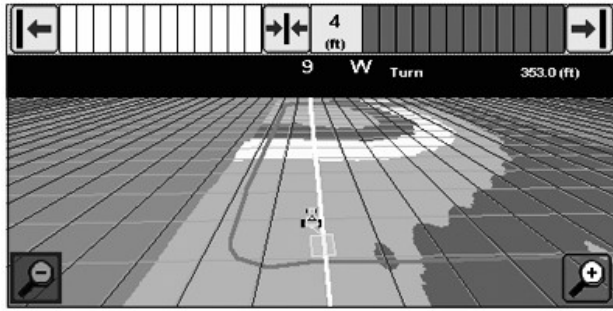


A—Sky Plot Tab
 B—VDOP

2. Select the Sky Plot tab (A).
3. Verify that the VDOP (B) is below 1.6.

RW00482,00008A6-19-04JUN19

Surface Maps



PC20994—UN—19MAR15

Topography Maps

NOTE: For ease of operation, use the Layout Manager to configure display run pages for specific operations.

(For more information, reference the display Operator's Manual.)

Topography and elevation maps provide a visual of the terrain for a specific area. These maps can be used as a reference for moving material from higher areas to lower areas before forming a plane. Once a boundary is defined and a survey is created, a map can be generated as a paper reference or as a background layer shown on the display.

NOTE: Elevation maps utilize a five color map legend. Minimum and maximum elevation points determine the threshold. The difference between minimum and maximum elevation is calculated and elevation bands are spaced out evenly among five colors.

- Blue = maximum elevation point
- Green
- Yellow
- Orange
- Red = minimum elevation point

Available sources to obtain elevation information:

- Surface Water Pro™ Plus survey
(For more information, reference the Surface Water Pro™ Operator's Manual.)
- Documentation elevation layer
The display captures elevation information when it documents a product application, planting, harvest, or tillage operation. APEX™ is able to create an elevation map as a background map.
(For more information, reference the APEX™ help files.)
- GSDNet (available in the United States only)
GSDNet requires the boundary and Documentation

Elevation Layer of the area to be mapped. GSDNet offers the following maps:

- Elevation data map
- Digital elevation map
- Drainage map
- Depression map
- Land surveyor

Commercial land surveyors are a source of elevation maps and data. A surveyor may provide the data as shapefiles or CSV files that can be imported into APEX™.

RW00482,00008A4-19-24JUN19

System Overview—Distance Trip

Theory of Operation—Distance Trip

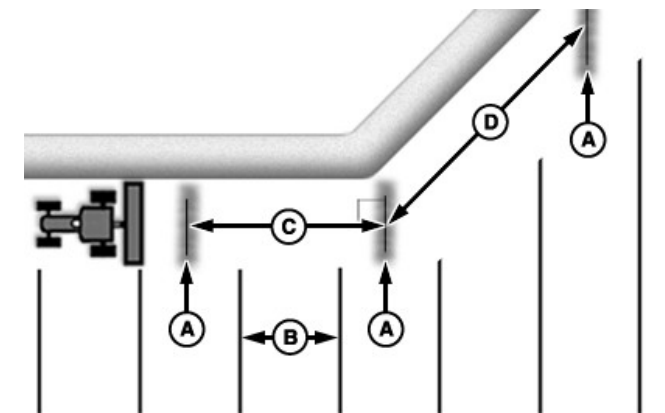
Distance Trip works with front- or rear-mounted implements. Trip commands are calculated based on global positioning system (GPS) distance or time and an operator-defined trip pattern. Actuator on and off times can be adjusted for precise and repeatable event placement.

Distance Trip has four trip patterns:

- Parallel Lines
- Fence Post
- Grid
- Plot Pattern

RW00482,000089D-19-18JUN19

Parallel Lines

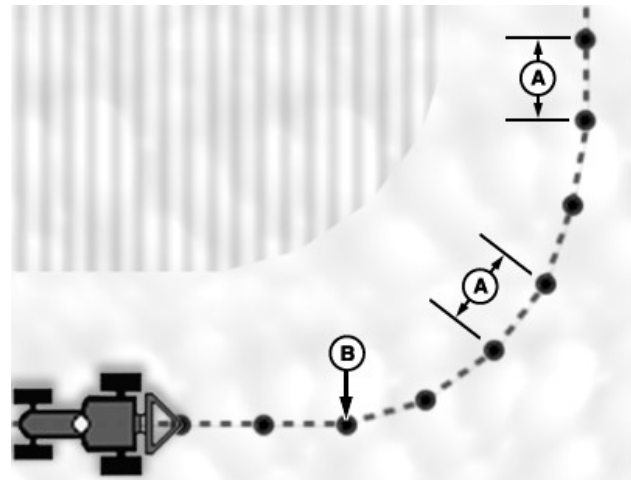


A—Event Point
B—Parallel Lines
C—5.5 m (18 ft)
D—7.9 m (26 ft)

Parallel Lines can create event points (A) on parallel lines (B) and accounts for the difference in distance (C and D) when traveling at angles.

RW00482,00008A8-19-18JUN19

Fence Post



PC27047—UN—26APR19

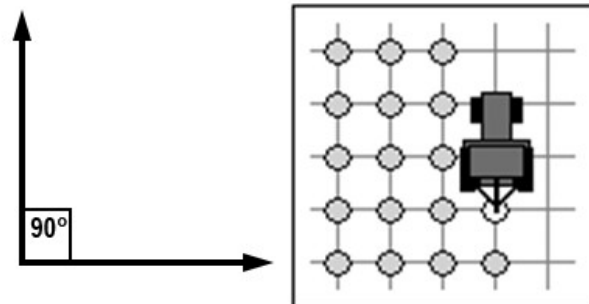
A—Same Linear Distance
B—Event Point

Fence Post creates the same linear distance (A) between consecutive event points (B).

RW00482,00008A9-19-26APR19

Grid

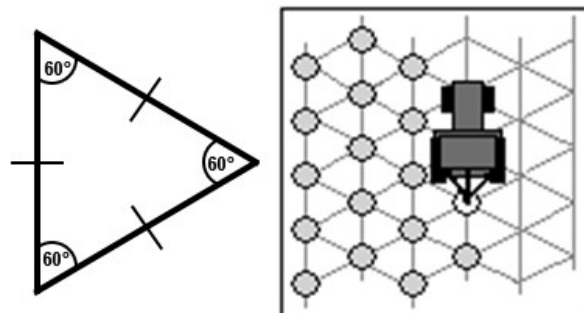
Grid can create four different grid patterns.



PC27058—UN—29APR19

90 Degrees

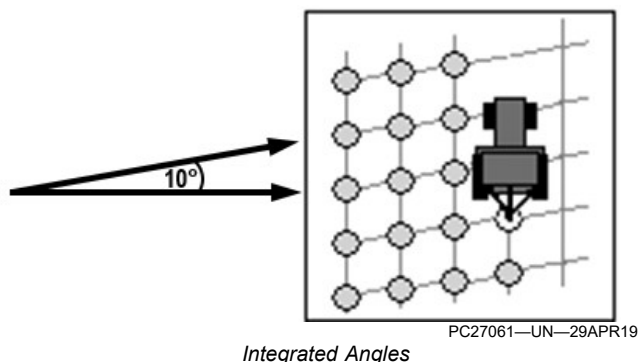
- **90 Degrees** creates even columns and rows so each point is 90° from other points.



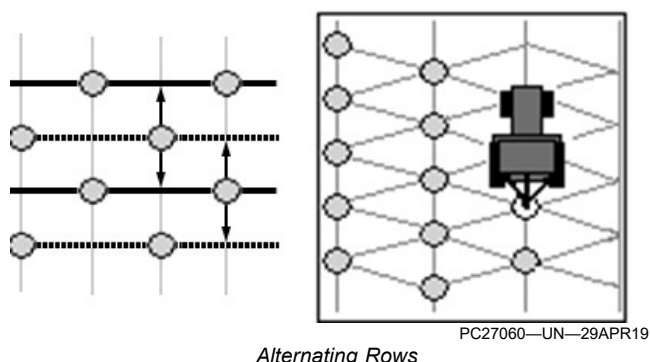
PC27059—UN—29APR19

Equilateral Triangle

- **Equilateral Triangle** creates equal distance between points.



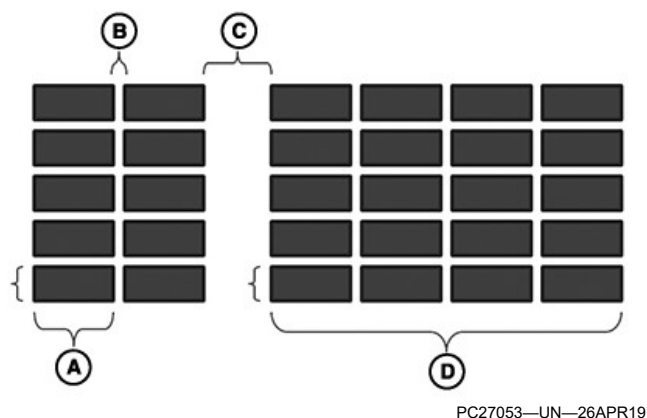
- **Integrated Angles** creates points in a row that are offset from the points of the adjacent row at operator defined angles.



- **Alternating Rows** creates points that are between the points in the adjacent rows.

RW00482,00008AA-19-04JUN19

Plot Pattern



- A—Plot
- B—Plot Divider
- C—Segment Divider
- D—Segment

Plot Pattern creates precise patterns with repeatable

plots (A), plot dividers (B), segment dividers (C), and segments (D). Plot patterns are often used to create different width paths. For example, the smaller paths could be used for mulch or walking paths and the larger paths could be used for sprayers or utility vehicles.

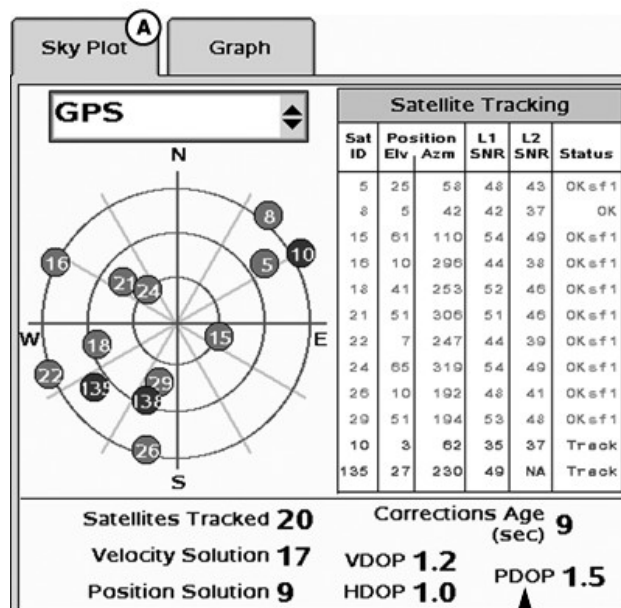
RW00482,00008AB-19-26APR19

Satellite Information—PDOP

Distance Trip depends on the distribution of satellites that provide 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 positions.

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

1. Navigate to StarFire™ pages.



PC24075—UN—10APR17

- A—Sky Plot Tab
- B—PDOP

2. Select the Sky Plot tab (A).
3. Verify that the PDOP (B) is below 2.5.

RW00482,00008A7-19-18JUN19

System Overview

Requirements

Compatibility and system functionality vary by location and equipment configuration. For more information about availability of components, system functionality, and compatibility, contact your John Deere dealer. Additional information can be referenced in the Compatibility Guide on the Value Selling Navigator.

Hardware:

- UCC2 Application Controller
- Various harnesses associated with power supply, controller integration, sensor communication, and steering control
- GreenStar™ 3 Display or Generation 4 Display

NOTE: It is crucial to system performance to use lowest serial numbered receiver on the front scraper and highest serial numbered receiver on the rear scraper.

- StarFire™ 3000 or 6000 Receiver installed on machine
- StarFire™ 3000 or 6000 Receiver installed on implement
 - StarFire™ global navigation satellite system (GNSS) antenna is recommended
- StarFire™ 3000 or 6000 Receiver installed on base station

NOTE: StarFire™ 6000 Receiver is not compatible with external antennas.

- StarFire™ GNSS antenna is recommended.
- Choke ring antenna is optional.

Software:

- Latest software installed on the:
 - Display
 - UCC2 Application Controller
 - StarFire™ Receiver(Go to www.StellarSupport.com and navigate to Software Updates.)
- Real time kinematic (RTK) activation on implement and base station receivers
- AutoTrac™ activation on display (not required to steer system manually)

NOTE: iGrade™ activation is displayed on the Application Controller Activations page.

- iGrade™ activation on the UCC2 Application Controller

- Distance Trip activation on the UCC2 Application Controller

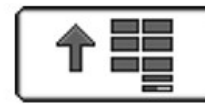
RW00482,00007BA-19-24JUN19

Navigate to Application Controller Pages

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

After navigating to the Application Controller pages, the GreenStar 3 and Generation 4 Displays have the same layouts.

To navigate to the Application Controller pages using a GreenStar 3 Display:



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Application Controller Button

PC26351—UN—10OCT18

2. Select the Application Controller button.

To navigate to the Application Controller pages using a Generation 4 Display:



Menu Button

PC17269—UN—15JUL13

1. Select the Menu button.



Applications Tab

PC21496—UN—05OCT15

2. Select the Applications tab.



PC16682—UN—18MAR13

ISOBUS VT Application

3. Select the ISOBUS VT application.



PC15293—UN—18MAR13

ISOBUS VT Menu Button

4. Select the ISOBUS VT Menu button.



PC26351—UN—10OCT18

Application Controller Button

5. Select the Application Controller button.

RW00482,000078D-19-05AUG25

Navigate to StarFire Pages

After navigating to the StarFire pages, the GreenStar 3 and Generation 4 Displays have the same layouts.

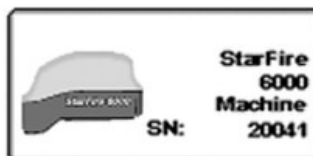
To navigate to the StarFire pages using a GreenStar 3 Display:



PC8663—UN—29APR15

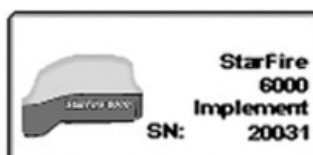
Menu Button

1. Select the Menu button.



PC27253—UN—03JUN19

Machine StarFire Button



PC27254—UN—03JUN19

Implement StarFire Button

2. Select a StarFire button.

- Machine StarFire button
- Implement StarFire button

To navigate to the StarFire pages using a Generation 4 Display:



PC17269—UN—15JUL13

Menu Button

1. Select the Menu button.



PC21496—UN—05OCT15

Applications Tab

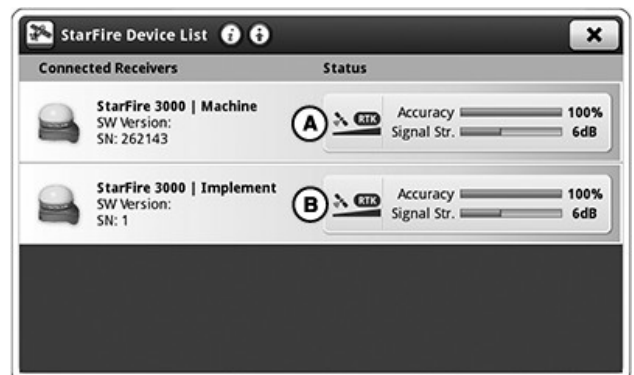
2. Select the Applications tab.



PC26493—UN—08NOV18

StarFire Application

3. Select the StarFire application.



PC26398—UN—16OCT18

A—Machine StarFire
B—Implement StarFire

4. Select a receiver from the StarFire device list.

- Machine StarFire (A)
- Implement StarFire (B)

RW00482,000079A-19-05AUG25

Enter Activation Code

The UCC2 Application Controller requires a 26-digit activation code to operate applications. Contact your John Deere dealer and provide the UCC2 Application Controller serial number.

With the 22-1 software update, multiple applications can be activated on the UCC2 Application Controller. Repeat this procedure for each application using the 26-digit activation code.

Available applications:

- Harvest Identification, Cotton
- Mobile Weather
- Yield Documentation, Specialty Crop
- Active Implement Guidance
- iGrade

1. Navigate to the Application Controller page.



Controller Setup Softkey

PC26352—UN—05OCT18

2. Select the Controller Setup softkey.



Activations Tab

PC25903—UN—05JUL18

3. Select the Activations tab.



Add Activation Button

PC25904—UN—05JUL18

4. Select the Add Activation button.

Add Activation Window

PC25905—UN—05JUL18

A—Input Box
B—Accept Button

5. Enter the activation code into the input box (A).
6. Select the Accept button (B).
7. To activate the next application, repeat steps 4—6.
8. Shut OFF the machine, wait for the display to power down, and then restart the machine.

RW00482,000073E-19-05AUG25

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 replacing only the EPROM or the whole tractor hydraulic controller.

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

RW00482,000048A-19-15APR15

Machine Compatibility

John Deere external valve kit adds hydraulic control to machines that do not come with factory-installed hydraulic controls.

(Reference the Value Selling Navigator for a complete machine compatibility list and the ordering guide.)

RW00482,00009C6-19-28APR20

Component Overview

StarFire™ Receiver



PC23442—UN—02DEC16
StarFire™ 6000 Receiver

The receiver uses navigation satellites along with the StarFire™ satellite and real time kinematic (RTK) corrections to determine machine and implement location, direction of travel, and elevation. An integrated terrain compensation module (TCM) adjusts machine position to compensate for uneven terrain.

Install the implement receiver less than 4.0 m (13.1 ft) above the ground level.

RW00482,00004AC-19-24JUN19

satellites are low on horizon or when signals reflect off a surface.

RW00482,00004AA-19-07AUG15

Choke Ring Antenna (Optional)



PC20986—UN—17MAR15
Choke Ring Antenna

A choke ring antenna is designed to be used on base stations with multipath issues to help reduce signal interference. A coaxial cable is required.

RW00482,00004AB-19-07AUG15

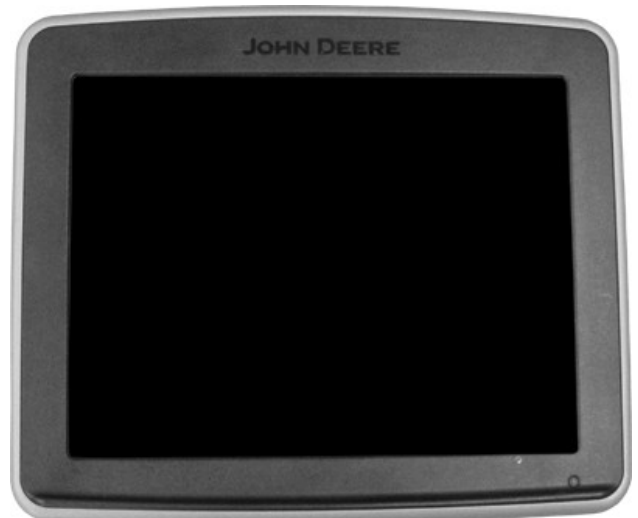
StarFire™ Global Navigation Satellite System (GNSS) Antenna (Recommended)



PC20975—UN—16MAR15
GNSS Antenna

Implement receivers may require a StarFire™ GNSS antenna if operating iGrade™ in high multipath conditions. High multipath conditions can occur when

Display



PC13407—UN—20APR11
GreenStar 3 2630 Display



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-19-05AUG25

UCC2 Application Controller



PC20218—UN—07NOV14

UCC2 Application Controller with Harness

UCC2 Application Controller sends commands to machine hydraulic controller to operate implement hydraulic mechanism to cut or fill to desired elevation.

RW00482,000041A-19-07AUG15

Counterbalance Valve



PC20217—UN—07NOV14

Counterbalance Valve

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

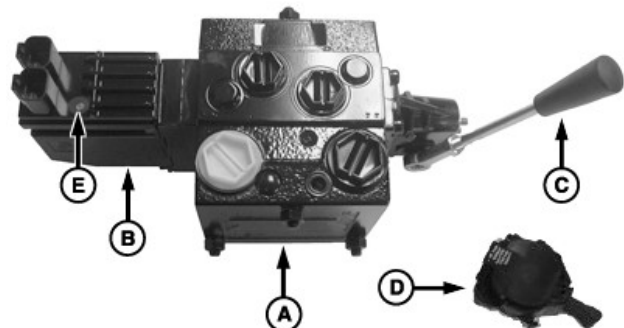
A counterbalance valve is required when machine hydraulic system does not regulate return flow. For optimal and consistent performance, install and properly adjust counterbalance valve.

The following machine models utilize CAN-based selective control valves (SCVs) requiring a counterbalance valve.

- 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

RW00482,000041B-19-07AUG15

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

Assembly

Message Definition

John Deere UCC2 Application Controller uses two types of message protocols.

Elevation Set Point

Application controller can use third-party elevation messages to control implement to match set point elevation. An implement receiver is required. Supported elevation data is in meters with up to two decimal places. Ensure message has no spaces and a carriage return ends the message. The message protocol is as follows:

\$JD,ELEV,<Value><Carriage Return>

Depth Set Point

Application controller can use third-party elevation messages to control implement to match set point depth. Machine and implement receivers are required to calculate the difference between ground surface and implement depth. Offsets are used to account for height differences between machine and implement receivers.

Cross Slope Point

Application controller can use third-party elevation messages to control implement to match set point cross slope. An implement receiver is required. Supported cross slope value is the desired cross slope percentage. The message protocol is as follows:

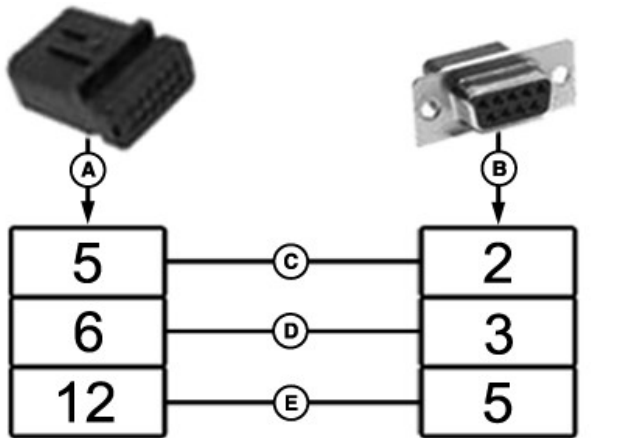
\$JD,CROSS,<Value><Carriage Return>

A positive value commands right-hand side of scraper blade lower than the left-hand side. A negative value commands the opposite.

RW00482,00004EC-19-04AUG15

Remote Control Serial Port Hardware

Use the following guidelines to configure remote control harnesses for third-party software.



Serial Port Wiring Pinouts

A—57M9804 Connector

B—DB9 Receptacle
C—RS232 Transmit
D—RS232 Receive
E—RS232 Ground

*NOTE: Contact your John Deere dealer to order parts.
The harness does not come assembled.*

Part Number	Description	Quantity
57M9804	Application Controller Harness Connector	1
57M8164	Pins for 57M9804	3
—	DB9 Receptacle Connector Assembly	1
—	2.5 m (8 ft) of 0.5 mm ² (20 AWG) Wire	3

RW00482,00008DC-19-18JUN19

Distance Trip Low Side Driver

IMPORTANT: To avoid damaging the Application Controller, use relay coils that are rated at 1 A or less and do not exceed 12 V.

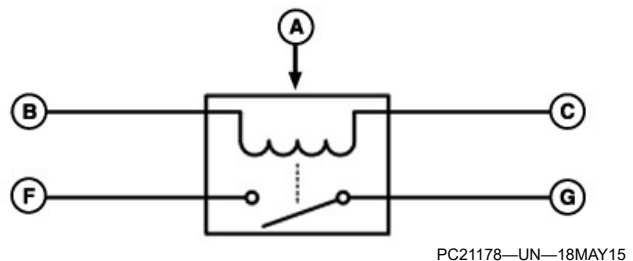
NOTE: The required relays to use Application Controller low side drivers are not provided.

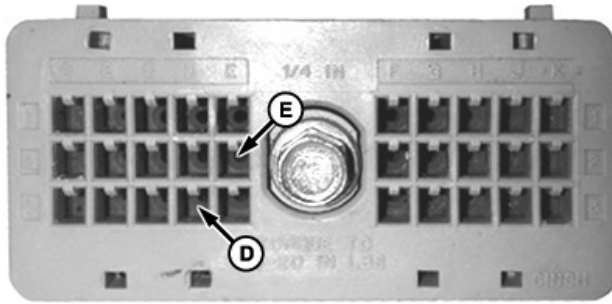
Distance Trip has two low side drivers, pin E2 and D3.

A relay is used as a switch. The low side drivers use a low current (1 A or less) to activate (closes/grounds) the high current side of the relay. Pin E2 activates only for the trip ON time or distance, then deactivates. After pin E2 deactivates, pin D3 immediately activates (closes/grounds) for 1.5 times the ON duration, then it deactivates.

Example: A paint marker is used to paint a 0.15 m (0.5 ft) long mark every 1.83 m (6 ft) for fence post locations. Pin E2 activates (actuator extends to paint) for 0.15 m (0.5 ft), then pin D3 activates (actuator retracts to stop painting) for 0.23 m (0.75 ft). Nothing happens for the next 1.45 m (4.75 ft) until the next event is triggered.

To install a relay:





PC27068—UN—30APR19

- A—Relay (1 A or less)
- B—Low Current Power Supply
- C—Ground (D3 or E2)
- D—D3
- E—E2
- F—High Current Power Supply
- G—Electronic Device

1. Connect a relay (A) to a 5—12 V DC low current power supply (B) and ground (C) to pin D3 (D) or E2 (E) of the UCC2 Application Controller connector.

NOTE: D3 has a short, open-ended lead wire connected that can be used.

2. Connect the high current power supply (F) and electronic device (G) to the relay.

RW00482,00008AC-19-12JUN19

Implement Operator's Station

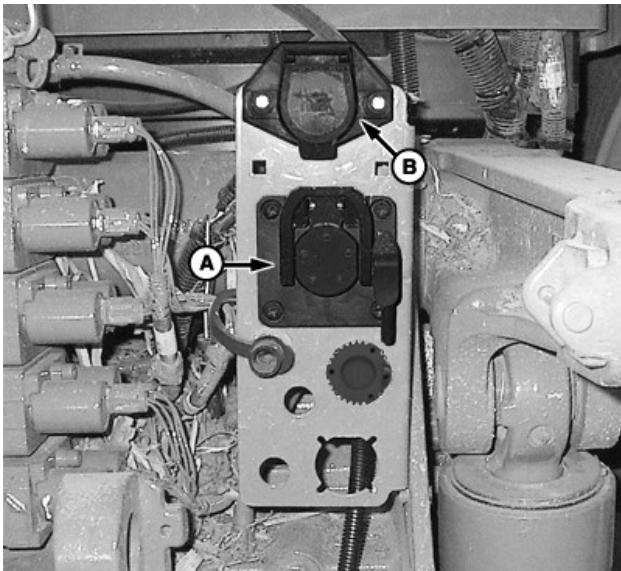
If the machine configuration for distance trip has an implement operator's station, make sure that the implement's operator station has a master switch or an emergency stop button. Install the master switch or emergency stop button as a digital input.

(Refer to Input/Output Readings in the Troubleshooting section.)

RW00482,0000AA1-19-07DEC20

Setting Up—Equipment

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 iGrade™ or Distance Trip to not operate.

2. Connect implement receiver harness to ISO 9-pin connector (A).
3. Connect implement constant power harness to the machine constant power connector.
4. If implement is configured with road lights, connect lighting harness to the 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 the 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 the machine.)

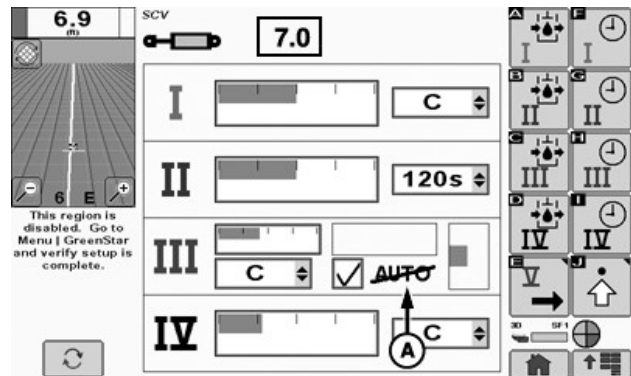
RW00482,00008AD-19-11JUN19

Adjust Selective Control Valve (SCV)



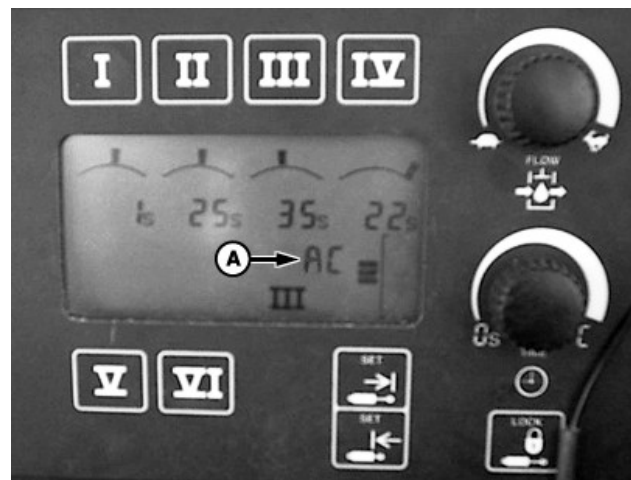
PC22223—UN—26FEB16

Generation 4 CommandCenter™



PC22224—UN—26FEB16

GreenStar™ 3 CommandCenter™



PC22225—UN—26FEB16

TouchSet™

A—Auto Mode Indicator

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

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

- Application Controller is installed.
- A profile is configured and the SCV is calibrated.

(For more information, reference Setting Up—UCC2 Application Controller.)

Automatic SCV control activates when SCV is placed in forward detent position.

- 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 automatically controls detent time when a control valve is configured and auto mode is engaged.

Adjust detent flow for each operation.

(For more information on SCV controls, reference the machine Operator's Manual.)

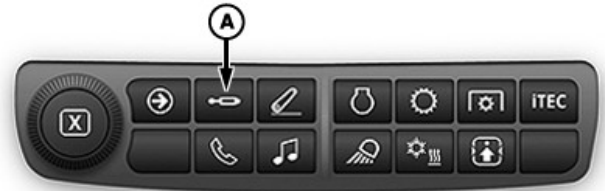
SCV can be operated to observe flow rate while in adjustment mode.

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	114.0	30.0

^a 0.1 = Minimum Flow Setting

NOTE: For ease of instruction, this manual uses SCV 1 or SCV 3. Operator can choose to use any available SCV.

Generation 4 CommandCenter™

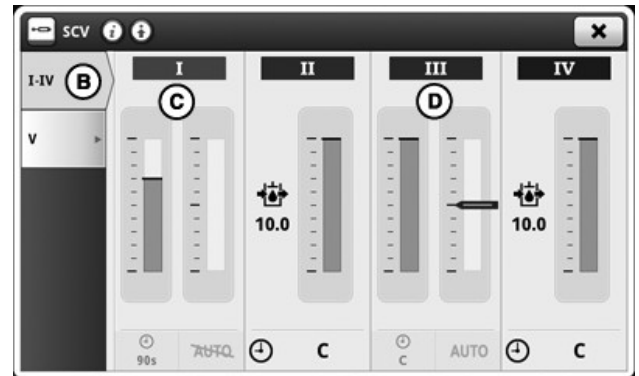


PC25700—UN—21MAY18

Navigation Bar

A—SCV Shortcut

1. Select the SCV shortcut (A).



PC22198—UN—24FEB16

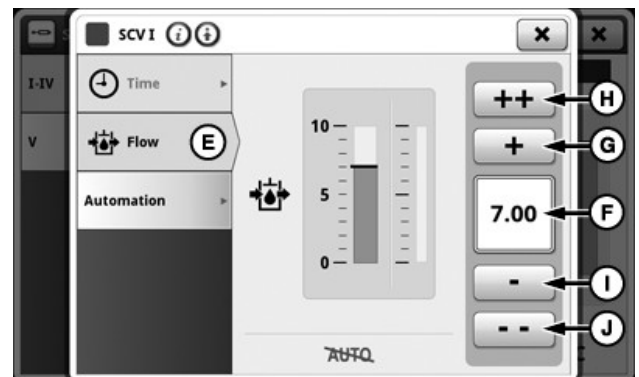
SCV Main Page

B—SCV I-IV Tab

C—SCV I

D—SCV III

2. Select the SCV I-IV tab (B).
3. Depending on configuration, select either SCV I or SCV III (C or D).



PC22199—UN—24FEB16

SCV Detent Flow

E—Flow Tab

F—Detent Flow

G—Small Increase (+)

H—Large Increase (++)

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

- I—Small Decrease (-)
- J—Large Decrease (- -)

4. Select the Flow tab (E).

NOTE: Detent flow (F) is displayed from 0.04 through 10. Select small increase (+) (G) to increase flow by 0.04 and select large increase (++) (H) to increase flow by 1.00. Select small decrease (-) (I) and large decrease (- -) (J) to decrease flow by the same increments.



Navigation Bar

K—Encoder Wheel

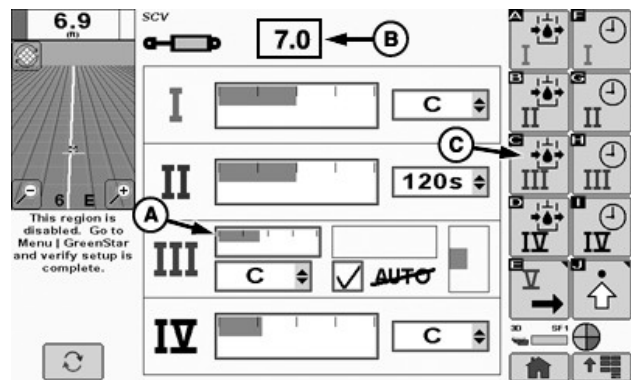
5. To increase flow, select small increase (+) or large increase (++). To decrease flow, select small decrease (-) or large decrease (- -). Turning the encoder wheel (K) also increases or decreases flow settings.

GreenStar™ 3 CommandCenter™



CommandARM™ Menu Button > SCV Button > Advanced Settings Softkey

1. Select the Menu button.
2. Select the SCV button.
3. Select the Advanced Settings softkey.



PC22226—UN—10MAR16

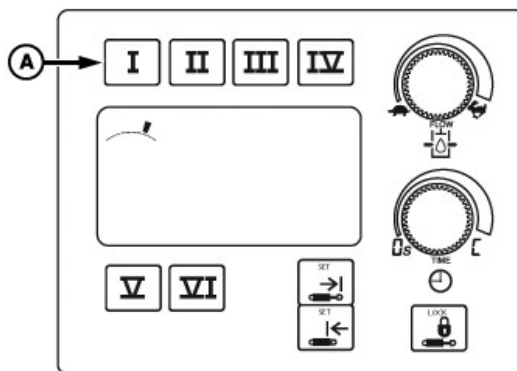
SCV Home Page

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

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

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

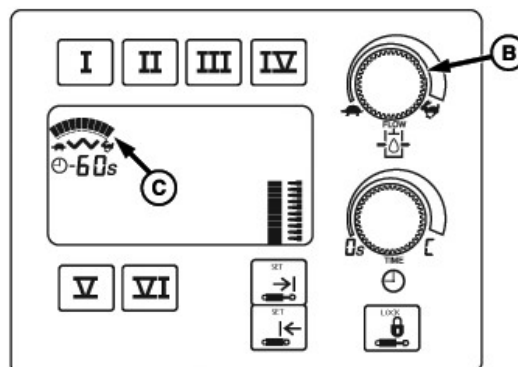
TouchSet™ Display



PC17987—UN—07NOV13

A—SCV Selection Buttons

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



PC17988—UN—07NOV13

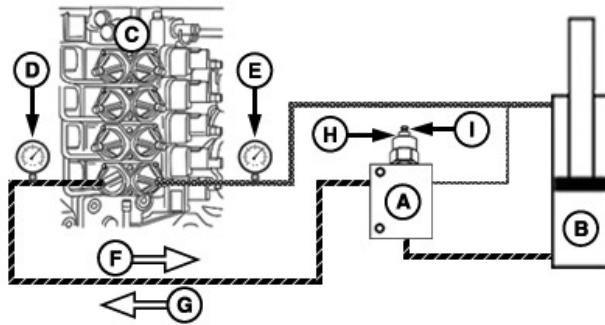
B—Flow Adjustment Dial
C—Bar Graph

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

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

RW00482,00007BB-19-11JUN19

Adjust Counterbalance Valve



PC23339—UN—16NOV16



PC23340—UN—10NOV16

Pressure Gauge Tool

A—Counterbalance Valve
B—Implement Hydraulic Cylinder
C—Machine
D—Pressure Gauge
E—Pressure Gauge
F—Extend Hydraulic Flow
G—Retract Hydraulic Flow
H—Lock Nut
I—Valve Cartridge

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.

Counterbalance valve (A) regulates the return flow from implement hydraulic cylinder (B) back to the machine (C). Regulating return flow allows a smooth transition of implement movement when the cylinder is retracting. Counterbalance valve settings depend on the weight of the implement. If using a scraper capable of transporting

material, fill scraper half-full when setting counterbalance valve.

NOTE: Make pressure gauge tools using quick couplers, T-fittings, and pressure gauges. Required range for pressure gauges is 0—20 684 kPa (206.8 bar) (3000 psi).

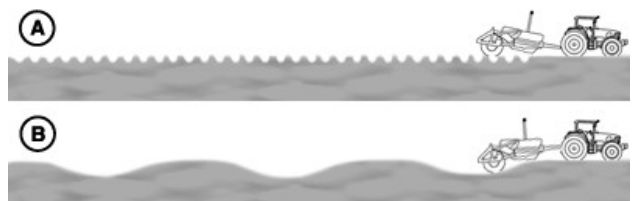
- Install pressure gauges (D and E) close to selective control valves (SCVs) at rear of machine.
- Select SCV control lever to extend hydraulic flow (F) and record load pressure on gauge (D) while raising implement.
- Determine counterbalance valve set point pressure value.

Load pressure x 1.3 = set point pressure
Example: 14 650 kPa x 1.3 = 19 045 kPa
146.5 bar x 1.3 = 190.5 bar
2125 psi x 1.3 = 2763 psi
- Select SCV control lever to retract hydraulic flow (G) and adjust counterbalance valve to set point pressure while lowering implement. Setting counterbalance valve may require raising and lowering the implement several times.
 - Loosen lock nut (H).
 - Turn valve cartridge (I) until pressure gauge (E) reading is equal to set point pressure while implement is lowering.
 - Turn clockwise to increase pressure.
 - Turn counterclockwise to decrease pressure.
- Tighten lock nut on the valve cartridge.

Specification

Lock Nut—Torque. 20—25 N·m
(15—18 lb·ft)

Valve Cartridge Adjustment	kPa	bar	psi
1 full turn	8790	87.9	1275
1/2 turn	4395	44.0	638
1/3 turn	2930	29.3	425
1/4 turn	2200	22.0	319



PC23341—UN—10NOV16

A—Washboarding Peaks and Valleys Close Together
B—Washboarding Peaks and Valleys Far Apart

6. Operate system and monitor ground condition. If washboarding peaks and valleys occur, adjust counterbalance valve pressure.
- If washboarding peaks and valleys are close together (A), pressure is too low. Turn the valve cartridge clockwise to increase pressure.
 - If washboarding peaks and valleys are far apart (B), pressure is too high. Turn the valve cartridge counterclockwise to decrease pressure.

RW00482,000069E-19-05JUN18

Set Up Base Station



PC21180—UN—15MAY15

Receiver on Rigid Pole

CAUTION: To prevent serious injury or death, ensure that base station receiver does not move or sway. Any motion of the base station receiver while transmitting directly affects machine position and can cause unexpected machine movement.

A real time kinematic (RTK) enabled StarFire™ Receiver on a machine must have a direct line of sight with the base station to receive the RTK signal. Distance from the base station affects RTK system performance.

StarFire is a trademark of Deere & Company

When operating iGrade™ beyond 1.6 km (1 mi) radius of the base station, vertical accuracy is degraded.

The base station is critical to the RTK system. Shading and multipathing are responsible for most problems with the base station.

Shading occurs when objects are more than 5° above the horizon and block the direct line of sight between the receiver and a satellite. If an object can cast a natural shadow over the receiver, it can also cause shading.

Multipathing occurs when satellite signals reflect off objects, causing indirect signals to arrive at the receiver. Reflected signals take longer to reach the base station receiver than direct signals and cause inaccurate satellite range measurements. Reflections can even interfere with the direct signal, causing the receiver to temporarily lose the satellite. Metal buildings, chain-link fences, motor vehicles, and bodies of water are all reflectors that can make a base station less reliable.

If a base station experiences either of these problems, it is detrimental to RTK accuracy. Ensure that the base station receiver:

- Is mounted to a rigid structure that does not move or sway.
- Has a good view of the sky, more than 5° above the horizon.
- Has few to no reflective objects close to it.

Configure Base Station

Absolute Base

An absolute base station helps minimize global positioning system (GPS) drift while using iGrade™. GPS drift is more noticeable while grading the same plane over multiple days. Absolute base mode requires a 24-hour survey conducted on location before first use. After the survey is completed, the base station stores location information and starts transmitting corrections. The receiver can be removed after completing a 24-hour survey. Return it to exact same position and it transmits corrections without conducting a new 24-hour survey. For a permanent base location, install a receiver bracket on a post that is buried 0.9—1.2 m (3—4 ft) in the ground.

Quick Survey Base

Quick survey base does not require a 24-hour survey. If using a tripod for temporary operation, a quick survey base may be more practical as long as the receiver does not move. Any movement of the receiver results in movement of machines using the base station. Verify blade height and offsets before operation and reset if needed.

The following example uses a John Deere RTK Radio 900.

iGrade is a trademark of Deere & Company

(For more information about the base station setup, reference the RTK Operator's Manual.)

1. Navigate to the StarFire™ pages.



RTK Softkey

PC18498—UN—05NOV14

2. Select the RTK softkey.



Configure Button

PC18499—UN—05NOV14

3. Select the Configure button.

PC21086—UN—10APR15

- A—Operating Mode Drop-Down Menu
- B—Radio Channel Input Box
- C—Network ID Input Box
- D—Accept Button

4. Select Absolute Base or Quick Survey Base from the drop-down menu (A).

NOTE: Base station and machine must be set up with the same radio channel and network identification (ID).

5. Enter the radio channel into the input box (B).
6. Enter the network ID into the input box (C).
7. Select the Accept button (D).
8. For Absolute Base, conduct a 24-hour survey.

24-Hour Survey

PC21087—UN—10APR15

A—Edit Stored RTK Base Start Button

1. Select the Edit stored RTK Base Start button (A).

PC21088—UN—10APR15

B—Survey RTK Base Location Start Button

2. Select the Survey RTK Base Location Start button (B).

PC21089—UN—10APR15

C—Storage Location Drop-Down Menu

D—Start 24-Hour Survey Button

3. Select the storage location (C).
4. Position the StarFire™ Receiver.
5. Press the Start 24-hour survey button (D).
6. Wait 24 hours (display can be disconnected).
7. Base station location automatically saves at end of the 24-hour survey.

Once the survey is started, a 24-hour countdown displays on RTK Configuration page. During the 24-hour countdown, the base station is non-functional and cannot be used. Do not switch power off. Once the survey is complete, record and store the base location survey results at a separate location for future reference.

RW00482,00008C9-19-24JUN19

Set Up Global Position System (GPS) Receiver

Mount implement receiver directly over the cutting edge of implement or a position that copies the vertical movement of the cutting edge. The preferred mount direction for the implement receiver is forward.

1. Navigate to the StarFire™ pages.

PC20941—UN—09MAR15

A—Implement

B—Setup Tab

C—Correction Mode Drop-Down Menu

D—Mount Direction Drop-Down Menu

E—Fore/Aft Input Box

F—Height Input Box

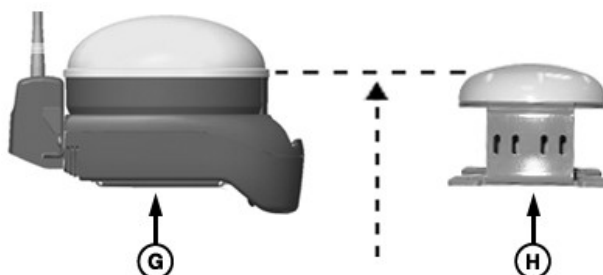
NOTE: Implement (A) displays at top of page if the StarFire™ Implement button is selected.

2. Select the Setup tab (B).
3. If using StarFire™ signal, select the correction mode from the drop-down menu (C). To turn real time kinematic (RTK) ON or OFF, configure RTK.

(Reference the StarFire™ Receiver or RTK Operator's Manual.)

NOTE: If the machine or implement is automatically detected, Mount Direction drop-down menu (D), Fore/Aft input box (E), and Height input box (F) may be grayed out and cannot be changed.

4. If it is not grayed out, select the mount direction from the drop-down menu.



G—Receiver

H—External Antenna

PC23079—UN—20SEP16

- If they are not grayed out, enter a value for fore/aft and height into the input boxes. Height is measured from ground to middle of the receiver (G) or to the top of the external antenna (H) (if equipped).

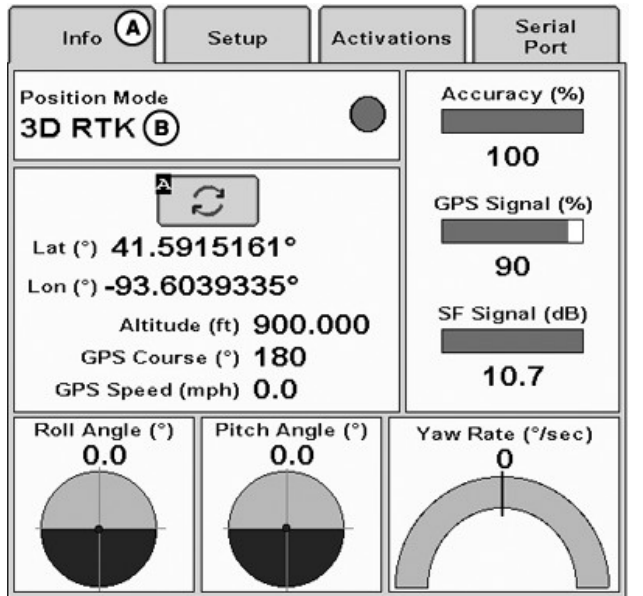
(Reference the StarFire™ Receiver Operator's Manual for more information.)

RW00482,00007BC-19-24JUN19

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.

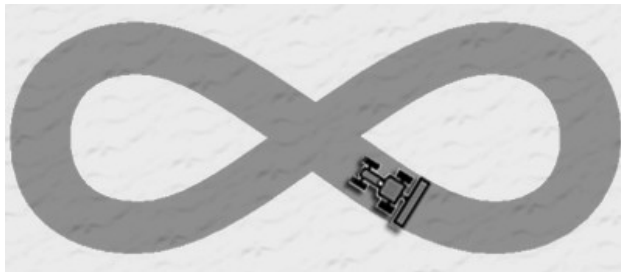
- Navigate to the StarFire ages.



PC26530—UN—16NOV18

A—Info Tab
B—Position Mode

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



PC21419—UN—30JUL15

TCM Optimization Drive Pattern

- Drive machine in the TCM optimization drive pattern two times to allow the IMU to initialize.

- Complete the TCM calibration.

(Reference Calibrate Terrain Compensation Module [TCM] for more information.)

RW00482,0000729-19-05AUG25

Calibrate Terrain Compensation Module (TCM)

NOTE: StarFire 6000 Integrated Receivers are calibrated at the factory. If there is a need to perform a field calibration, reference the StarFire 6000 Receiver Operator's Manual.

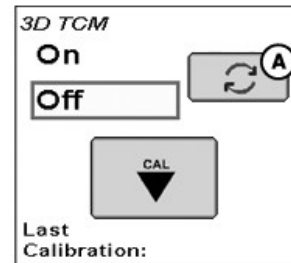
- Navigate to the StarFire pages.



Setup Tab

PC26049—UN—27JUL18

- Select the Setup tab.



PC19992—UN—04SEP14

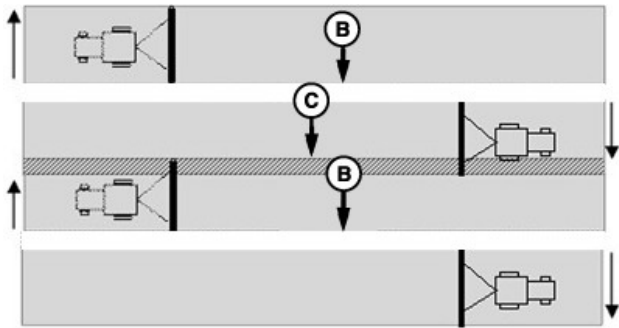
A—TCM Toggle Button

Select the TCM toggle button (A) to turn the TCM ON and OFF. When the TCM is turned OFF, StarFire signal 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 engage.

Calibrate the TCM so the receiver can determine 0° 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.



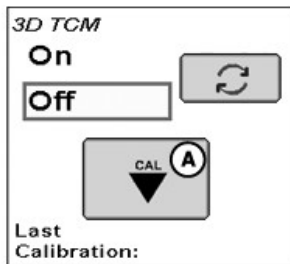
B—Skip
C—Overlap

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 the 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 that the StarFire mounting bracket is slightly offset, the machine cab is slightly offset, or there is uneven tire pressures from one side to the other.

To eliminate offset, position the machine and calibrate the TCM. Drive down a pass, turn around, and drive down the same pass in the opposite direction. If the machine does not follow the 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 the ground to note the location of axle.



A—Calibration Button

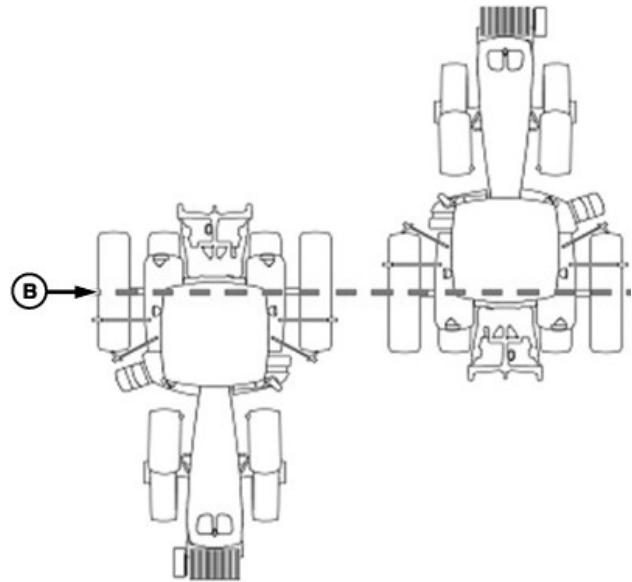
3. Select the Calibration button (A).



Accept Button

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

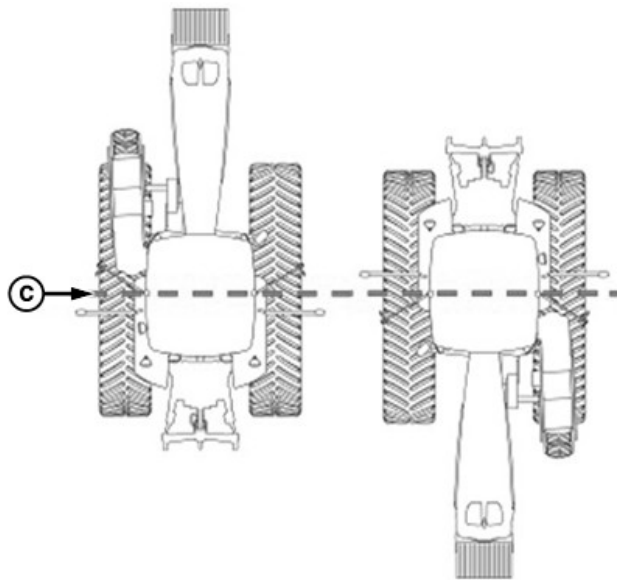
Ensure that tires are in proper location for fixed or floating front axle and machine has come to a complete stop (cab is not rocking).



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 the 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 tractors, 47X0 and 49X0 Series Sprayers, or 9000

and 9020 Series Wheel Tractors), place wheels or tracks so machine pivot point (C) is in the same location when facing either direction.

6. Select the Accept button. Calibration status bar is displayed, then removed when calibration is finished.
7. Select the Accept button to return to the Setup tab. If calibration was unsuccessful, recalibrate the TCM.

RW00482,000072A-19-05AUG25

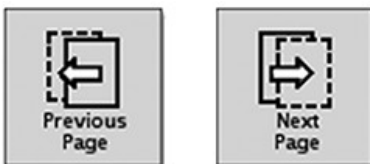
Setting Up—UCC2 Application Controller

Setup Wizard Overview

The setup wizard in this manual is a general overview for iGrade™ and Distance Trip. The UCC2 Application Controller can control multiple features at the same time. For example, John Deere Active Implement Guidance and iGrade™ can be used on various implements. iGrade™ with Active Implement Guidance can be used on bed-forming implements to maintain the gradient of the furrow. This method assists the furrow in draining while leaving the topsoil on the bed intact.

(For more information, reference John Deere Active Implement Guidance and Plow Steer Operator's Manual.)

Multiple application features are available by selecting and setting up more than one feature.



PC26051—UN—13SEP18
Previous Page and Next Page Buttons

The setup wizard guides the operator through a series of steps based on the options selected. Select the Previous Page and Next Page buttons to navigate through the setup wizard.



Help Softkey

PC26386—UN—11OCT18

In addition to this Operator's Manual, the operator can select the Help softkey for more information about a step.

To start the setup wizard:

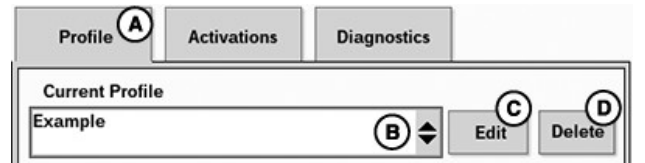
1. Navigate to the Application Controller pages.



Controller Setup Softkey

PC26352—UN—05OCT18

2. Select the Controller Setup softkey.



- A—Profile Tab
- B—Current Profile Drop-Down Menu
- C—Edit Button
- D—Delete Button

3. Select the Profile tab (A).
4. Select a profile from the Current Profile drop-down menu (B).
 - Select < Add New Profile > to create a profile.
 - Select an existing profile to edit.

NOTE: After a profile is set up, more items populate in the Profile tab. Each item allows individual settings to be changed without stepping through the setup wizard.

5. Select the Edit button (C).

NOTE: The Delete button (D) only shows if an existing profile is selected.

6. Select the features needed for the task.

RW00482,00008AE-19-30APR19

Serial Ports

Select Controller Setup softkey > Profile tab > Serial Ports Edit button > Serial Port 1 or 2 Edit button.

Third-party software can connect to the application controller using a serial connection and operation-specific message protocols. Ensure that the baud rate matches the baud rate required by the third-party device. If the third-party software requires GPS information, enable National Marine Electronics Association (NMEA) messaging and select the NMEA message type and rate.

PC26071—UN—22MAY19

- A—Baud Rate Drop-Down Menu
 B—Used By Drop-Down Menu
 C—Enable NMEA Checkbox
 D—NMEA Message Type Drop-Down Menu
 E—NMEA Rate Drop-Down Menu

1. Select the baud rate from the drop-down menu (A).
2. Select the device that uses the serial port from the drop-down menu (B).
3. To enable NMEA messaging, select the checkbox (C).
 - a. Select the NMEA message type from the drop-down menu (D).
 - GGA
 - GGA, GSA
 - GGA, GSA, VTG
 - GGA, GSA, RMC
 - NMEA All
 - b. Select the NMEA rate from the drop-down menu (E).

RW00482,00009C7-19-14APR20

Set Up Run Page

PC27910—UN—14APR20

Application Controller Module Examples

A—Elevation Bars

NOTE: The elevation bars (A) represent elevation errors. The vertical sensitivity (how much a given error moves the bar plot) changes per application and does not display scales along the bar.

After a UCC2 Application Controller profile has been set up, a run page can be configured to display UCC2 Application Controller information and functions.

To set up a run page, use the Layout Manager application and select a UCC2 Application Controller module.

(Reference the display Operator's Manual to set up run pages.)

RW00482,00009C8-19-28APR20

Setting Up—iGrade™

GPS Offsets

Select Controller Setup softkey > Profile tab > GPS Offsets Edit button.

GPS Offsets

Machine GPS Receiver

Lateral Offset: 0.0 (in) Height: 0.0 (in) Edit **A**

Implement 1 GPS

Work Point: 0.0 (in) Lateral Offset: 0.0 (in) Height: 0.0 (in) Edit **A**

Inline Offset: 0.0 (in)

Return

A—Edit Button

PC27914—UN—15APR20

NOTE: Ensure that offset values entered in Application Controller, StarFire™ Receiver, and Equipment Setup applications match.

The GPS Offsets page automatically populates with detected StarFire™ Receivers. iGrade™ requires an implement StarFire™ Receiver before the next page is shown in the wizard. Up to three implement receivers can be populated. A machine GPS receiver is required for max cut. To configure the GPS offsets, select the corresponding receiver Edit button (A).

Machine GPS Receiver Offsets

Machine GPS Receiver Offsets

Serial Number: 262143

Machine Dimensions

GPS Offsets

1 - Lateral Offset: 0.0 (in) Center (in) **A**

2 - Height: 10.1 (in) **B**

NOTE: Offsets configured here, on receiver VT, and John Deere Display should match.

Return

PC26067—UN—15NOV18

A—Lateral Offset Input Box

B—Height Input Box

1. Enter the lateral offset into the input box (A).

2. Enter the height into the input box (B).

Implement GPS Receiver Offsets

Implement GPS Receiver Offsets

Implement 1 GPS

Serial Number: 1

GPS Offsets

1 - Lateral Offset: 0.0 (in) Center (in) **A**

2 - Inline Offset: 24.0 (in) **B**

3 - Height: 100.0 (in) **C**

Return

PC28323—UN—20NOV20

A—Lateral Offset Input Box

B—In-Line Offset Input Box

C—Height Input Box

1. Enter the lateral offset into the input box (A).

NOTE: The in-line offset is the horizontal distance between the implement axle and the receiver. A positive value is closer to the tractor and a negative value is further away from the tractor.

2. Enter the in-line offset into the input box (B).
3. Enter the height into the input box (C).

RW00482,0000AA3-19-25NOV20

SCV Configuration

Select Controller Setup softkey, Profile tab, SCV Edit button, and then the SCV Configuration Edit button.

PC27069—UN—01MAY19

- A—Elevation Valve Drop-Down Menu
 B—Valve Interface Drop-Down Menu
 C—Roll Valve Drop-Down Menu
 D—Valve Interface Drop-Down Menu
 E—Elevation Calibrate Button
 F—Enable Cross Slope Checkbox
 G—Roll Calibrate Button
 H—Control Sensitivity Edit Button

Options available from the drop-down menus (A—D) populate based on CAN and hardware signal detection. Ensure that the UCC2 Application Controller is connected to the CAN bus and that all input and output signals are connected before configuration.

1. Select an elevation valve from the drop-down menu.
2. Select the valve interface from the drop-down menu.

- External Selective Control Valve (SCV) and External SCV Switch
 - Compatible with non John Deere, 60 Series and older, 5XXX, 6X00, 6X10, 6X30, 7X00, 7X10, 7X20, and small-frame 7X30 Tractors.
- John Deere Legacy
 - Compatible with 8X00, 8X10, 8X20, 9X00, 9X10, and 9X20 Tractors.
 - Uses SCV 1 or 3 only.
 - Requires the UCC2 Application Controller

harness connected to the option connector at the rear of the tractor cab.

- John Deere Proprietary SCV
 - Compatible with 7X30, 8X30, U8, 9X30, 6R Final Tier 4 (FT4), 7R, 8R, 8RT, 8RX, 9R, 9RT, and 9RX Tractors.
 - Triple scraper combinations are supported on these platforms.
 - Any SCV can be used.
 - Do not connect the UCC2 Application Controller harness to the option connector at the rear of the tractor cab.
 - If an SCV is mapped to a joystick it cannot be controlled via JD Prop control.
- ISO SCV
 - Compatible with 6R, 6M (when equipped with optional electronic SCVs), 7R, 8R, 8RT, 8RX, 9R, 9RT, and 9RX Tractors.
 - Any SCV can be used.
 - Do not connect the UCC2 Application Controller harness to the option connector at the rear of the tractor cab.

3. Select the Elevation Calibrate button (E) and calibrate the selective control valve (SCV).

(For more information, reference Manual SCV Calibration.)

4. If the scraper is capable, select the Enable Cross Slope checkbox (F).

- a. Select the roll valve from the drop-down menu.
- b. Select the valve interface from the drop-down menu.
- c. Select the Roll Valve Calibrate button (G) and calibrate the SCV.

(For more information, reference Manual SCV Calibration.)

5. Select the Control Sensitivity Edit button (H) and adjust the sensitivity settings.

(For more information, reference Edit Control Sensitivity.)

RW00482,0000AA2-19-13DEC21

Manual SCV Calibration

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.

SCV threshold setup is used to calibrate UCC2

Application Controller to determine minimum amount of signal from the hydraulic control unit required before scraper moves. Without SCV threshold calibration, scraper may move significantly faster in one direction, undercompensate, overcompensate, or not perform as expected due to hydraulic limitations.

Calibrate if:

- A new profile is created.
- 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 SCVs.
- Hydraulic component repairs are made on the machine or implement.
- Counterbalance valve is adjusted.
- Hydraulic flow rate is adjusted.

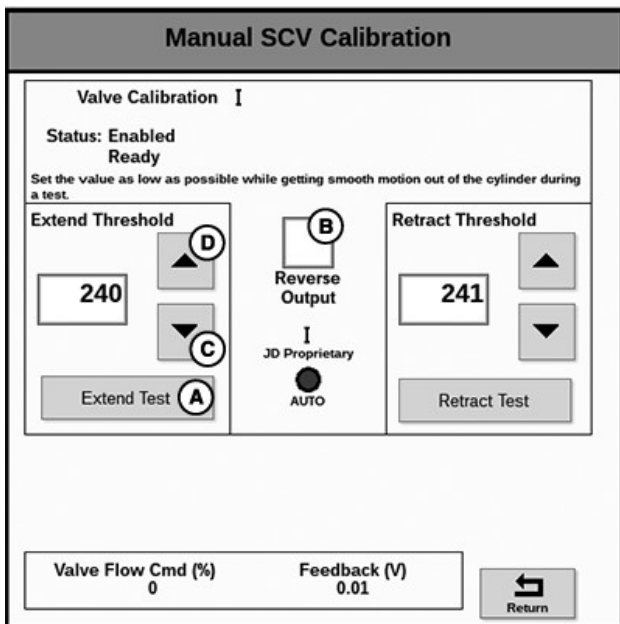
NOTE: Ensure that hydraulic oil is at operating temperature before performing the calibration.

Manual SCV Calibration

Select Controller Setup softkey > Profile tab > SCV Edit button > SCV Configuration Edit button > Calibrate button.

1. Place the selected SCV in auto mode.
2. Place the SCV in extend detent position, not float.
3. Drive the machine forward, faster than 0.7 km/h (0.45 mph). Do not engage AutoTrac™.

(Reference the machine Operator's Manual for speed requirements of the SCV.)



PC27005—UN—10JUN19

A—Extend Test Button

B—Reverse Output Checkbox
C—Decrease Button
D—Increase Button

4. Select the Extend Test button (A).

NOTE: If implement moves in the opposite direction than intended, select the Reverse Output checkbox (B) instead of switching hydraulic hose positions.

5. Select the decrease button (C) until the scraper does not move.
6. Select the increase button (D) until the scraper moves as slowly as possible while maintaining continuous movement.

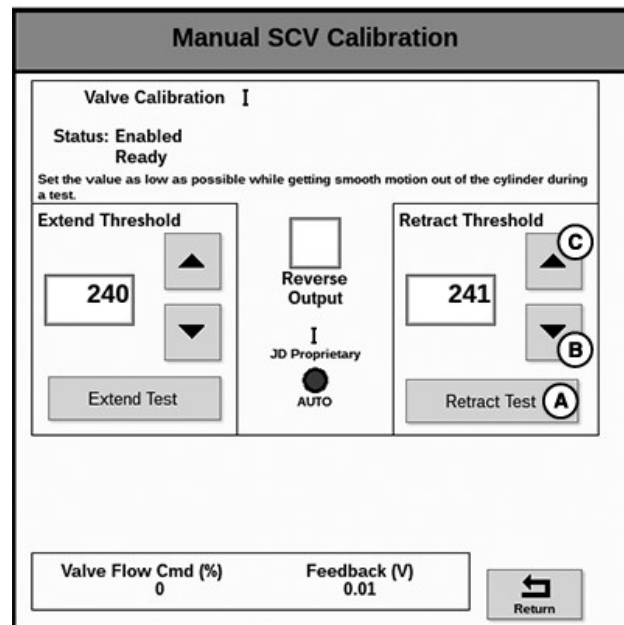
NOTE: If the implement steering cylinder reaches maximum or minimum stroke during test, reposition the cylinder.



Stop Test Button

PC26416—UN—22OCT18

7. Select the Stop Test button.



PC27006—UN—10JUN19

A—Retract Test button
B—Decrease Button
C—Increase Button

8. Select the Retract Test button (A).
9. Select the decrease button (B) until the scraper does not move.
10. Select the increase button (C) until the scraper moves as slowly as possible while maintaining continuous movement.

NOTE: If the implement steering cylinder reaches maximum or minimum stroke during test, reposition the cylinder.



Stop Test Button

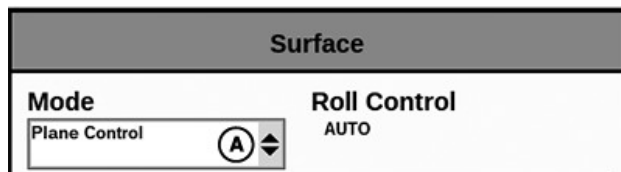
PC26416—UN—22OCT18

11. Select the Stop Test button.

RW00482,00009CB-19-08MAY20

Surface

Select iGrade™ softkey > Setup tab > Surface Edit button.



PC27090—UN—06MAY19

A—Control Mode Drop-Down Menu

Select a control mode from the drop-down menu (A).

- **Plane Control** creates and automatically controls the scraper to cut a single slope or dual slope plane. The Plane Calculator can create a best fit plane based on recorded elevation data. A best fit plane calculates a plane design with the least amount of material required to be moved (cut and fill).
- **Remote Control** receives elevation data commands from another source for a desired plane or ditch design. Remote Control automatically controls blade height to a calculated elevation of a plane or ditch created by Surface Water Pro™ Plus, T3RRA Cutta™, or other third-party software.
- **Grade Control** creates a desired slope by actual distance traveled, not linear distance. Grade control is not direction-dependent and is commonly used to create field roads or simple ditches. The system automatically fills or cuts during uphill or downhill operation.

(For more information about a control mode, reference System Overview—iGrade™.)

Plane Control

Single A		Dual B	
Slope	Direction	Slope 1	Direction
0.4200 (%)	180.0000 (deg)	0.4200 (%)	180.0000 (deg)
Plane Origin Point		Slope 2	Direction
Lat.:	37.2343323 (deg)	0.0370 (%)	265.6000 (deg)
Long.:	-115.806663 (deg)	Plane Origin Point	
Altitude:	3,573 (ft)	Lat.:	37.2343323 (deg)
		Long.:	-115.806663 (deg)
		Altitude:	3,573 (ft)

PC27091—UN—07MAY19

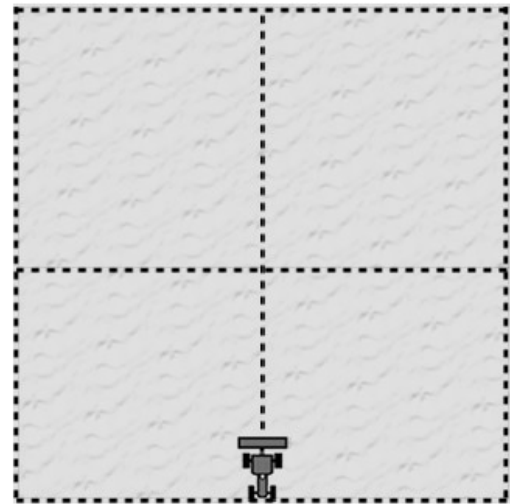
A—Single Slope Plane

B—Dual Slope Plane

Define the plane as a single (A) or dual (B) slope plane. Define planes using the plane calculator or by manually entering the slope and direction.

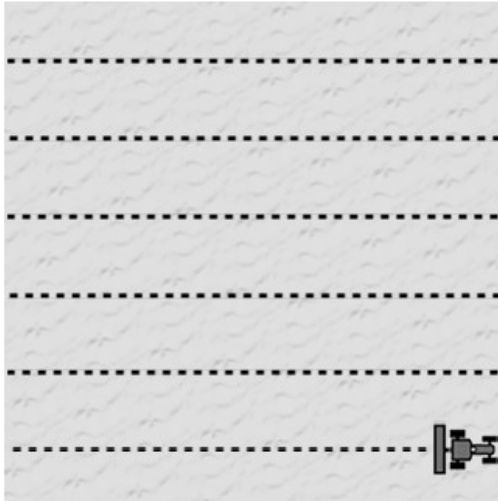
Plane Control—Plane Calculator

To calculate a surface, the plane calculator requires the operator to drive over a portion of the area and collect survey data points. Data points are collected from the implement 1 global positioning system (GPS) receiver. Maintain a real time kinematic (RTK) signal while collecting data points.



Minimum

PC27092—UN—07MAY19

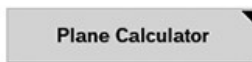


PC21064—UN—06APR15

Best Results

As more data points are collected, the accuracy of the results increases. At a minimum, survey the perimeter and an X pattern through the center. For best results, conduct a thorough survey by setting up straight track lines through the field. Depending on the field being surveyed, create tracking lines with the following track spacing:

- For fields with significant elevation changes and slopes, track spacing of 7.5—15 m (25—50 ft) is recommended.
- For flatter fields, track spacing of 15 m (50 ft) is recommended.
- For flat or precision leveled ground, track spacing of 15—30 m (50—100 ft) is recommended. Do not exceed 50 m (164 ft) track spacing for surveying purposes.



PC27093—UN—07MAY19

Plane Calculator Button

1. Select the Plane Calculator button.
2. Raise the scraper blade to the highest position.



PC27094—UN—07MAY19

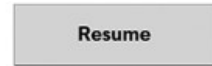
Start Button

3. To begin collecting data points, select the Start button.
4. Travel throughout the intended area and collect data points.



PC27095—UN—07MAY19

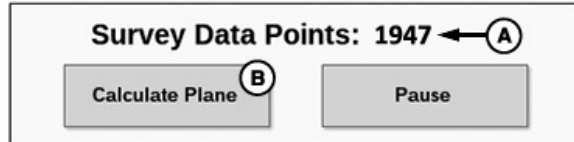
Pause Button



PC27096—UN—07MAY19

Resume Button

5. Select the Pause button when traveling outside of the intended area. Select the Resume button when reentering the intended area.



PC27102—UN—07MAY19

- A—Survey Data Points
B—Calculate Plane Button

6. Once 50 survey data points (A) have been collected, the Calculate Plane button (B) can be selected. Select the button when the survey is complete.

Plane Calculator

Calculated Plane:

Results	Origin Point
Slope	0.4200 (%) Lat.: 37.2343323 (deg)
Direction	180.0000 (deg) Long.: -115.806663 (deg)
	Altitude: 3,573 (ft)

Save To:

Plane 1

A

Save

B

Return

PC27103—UN—07MAY19

- A—Save To: Drop-Down Menu
B—Save Button

7. Select a plane from the drop-down menu (A).
8. Select the Save button (B).

Plane Control—Manual Entry

Direction heading is relative to true north. Negative slope percentage values decline to a lower altitude relative to the origin point (downhill). Positive slope percentage values incline to a higher altitude relative to the origin point (uphill). Slope percent does not equal angle of slope in degrees (for example, a slope of 8.75% = 5°).

- $\text{Slope (\%)} = \frac{\text{Vertical Distance}}{\text{Horizontal Distance}} \times 100$

- $\text{Slope (\%)} = (\text{Tangent [slope in degrees]}) \times 100$

An origin point is a reference point at the absolute elevation for the desired plane. The origin point is used to compare the absolute elevation to the elevation calculated by iGrade™. If multiple systems are used, all the systems must use the exact same origin point. The global positioning system (GPS) offsets for each system must be correctly entered.

(For more information, reference Origin Point.)



PC27111—UN—08MAY19

Manual Entry Button

1. Select the Manual Entry button.

PC27112—UN—05JUN19

PC27113—UN—05JUN19

- A—Single Tab
- B—Dual Tab
- C—Slope 1 Input Box
- D—Direction 1 Input Box
- E—Slope 2 Input Box
- F—Direction 2 Input Box
- G—Edit Origin Point Button

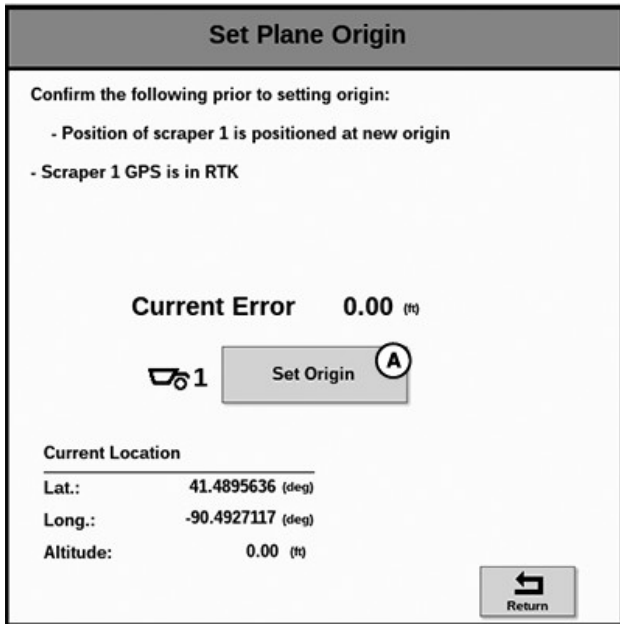
2. Select either the Single tab (A) or the Dual tab (B).

NOTE: Ensure that the implement 1 GPS receiver is using RTK signal.

3. Position the machine in the direction of the desired slope with the scraper blade directly at the origin point.
4. Enter the slope into the input box (C).
5. Enter the direction into the input box (D).

NOTE: For best dual slope results, use a second slope that is 90° (perpendicular) to the first slope.

6. If entering a dual slope:
 - a. Enter the slope into the input box (E).
 - b. Enter the direction into the input box (F).
7. Select the Edit Origin Point button (G).
8. When first setting an origin point, identify the location with flags or markers to allow scraper to return for system validation and to reset the plane origin point as needed during operation.



Set Plane Origin

Confirm the following prior to setting origin:

- Position of scraper 1 is positioned at new origin
- Scraper 1 GPS is in RTK

Current Error 0.00 (ft)

1 **Set Origin (A)**

Current Location

Lat.: 41.4895636 (deg)
 Long.: -90.4927117 (deg)
 Altitude: 0.00 (ft)

Return

PC27115—UN—09MAY19

A—Set Origin Button

9. Select the Set Origin button (A).

Origin Point



Distance Trip **Origin**

Latitude (deg)
 32.5656260

Longitude (deg)
 -91.3554372

Set To Current Location (A)

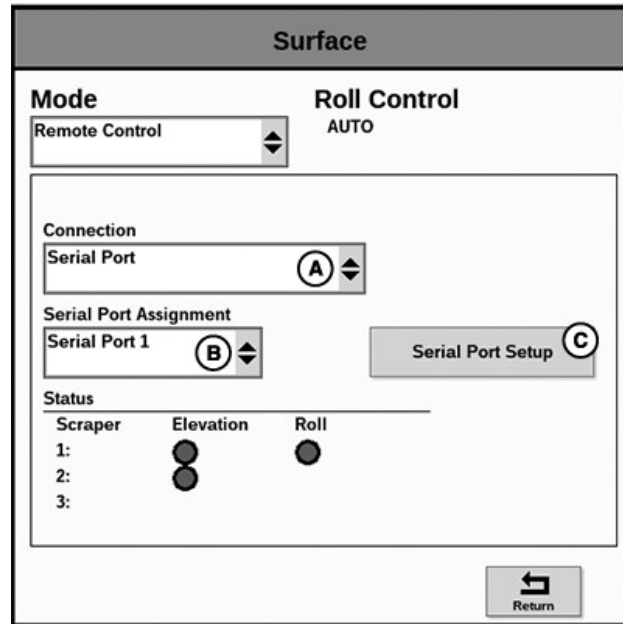
Shift Origin

Forward (B) **0 cm** **Backward (C)**

PC28564—UN—19NOV21

The origin point can be set to the current location (A), shifted forward (B), and shifted backward (C) using the Origin point run page overlay.

Remote Control



Surface

Mode
 Remote Control

Roll Control
 AUTO

Connection
 Serial Port **(A)**

Serial Port Assignment
 Serial Port 1 **(B)** **Serial Port Setup (C)**

Status

Scraper	Elevation	Roll
1:		
2:		
3:		

Return

PC27116—UN—09MAY19

A—Connection Drop-Down Menu
 B—Serial Port Assignment Drop-Down Menu
 C—Serial Port Setup Button

1. Select the connection type from the drop-down menu (A).

NOTE: Some connection types do not require a serial port assignment or a serial port setup.

2. Select a serial port assignment from the drop-down menu (B).

3. Select the Serial Port Setup button (C) and complete serial port setup.

(For more information, reference Serial Ports.)

Grade Control

Define grade by manually entering the slope or by using the grade calculator.

Grade Control—Manual Entry

Negative slope percentage values decline to a lower altitude relative to the origin point (downhill). Positive slope percentage values incline to a higher altitude relative to the origin point (uphill). Slope percent does not equal angle of slope in degrees (for example, a slope of 8.75% = 5°).

- Slope (%) = Vertical Distance/Horizontal Distance X 100
- Slope (%) = (Tangent [slope in degrees]) X 100

1. Position the machine in the direction of the desired slope with the scraper blade directly at the origin point.

NOTE: Ensure that the implement 1 GPS receiver is using RTK signal.

- Identify the origin point with flags or markers to allow scraper to return for system validation and to reset the plane origin point as needed during operation.

PC27118—UN—10MAY19

- A—Slope Input Box
B—Roll Setpoint Input Box

- Enter the slope into the input box (A).
- If cross slope is enabled and configured, enter a roll setpoint into the input box (B).

Grade Control—Grade Calculator

The grade calculator requires a path of at least 30.5 m (100 ft) to be surveyed. If the desired path is less than 30.5 m (100 ft), manually enter the slope. Data points are collected from the implement 1 GPS receiver. RTK signal is required while collecting data points.



PC27119—UN—10MAY19

Grade Calculator Button

- Select the Grade Calculator button.
- Position the machine in the direction of the desired slope with the scraper blade directly at the origin point.

NOTE: Ensure that the implement 1 GPS receiver is using RTK signal.

- Identify the origin point with flags or markers to allow scraper to return for system validation and to reset the plane origin point as needed during operation.
- Raise the scraper blade to the highest position.



PC27094—UN—07MAY19

Start Button

- To begin collecting data points, select the Start button.
- Travel the intended path and collect data points.



PC27095—UN—07MAY19

Pause Button



PC27096—UN—07MAY19

Resume Button

- Select the Pause button and Resume button as needed.

PC27117—UN—10MAY19

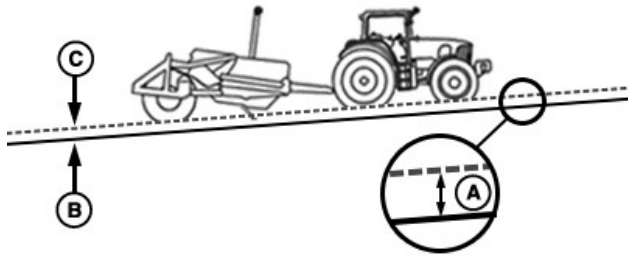
- A—Survey Data Points
B—Save Grade Button

- Once 20 survey data points (A) have been collected, the Save Grade button (B) can be selected. Select the button when the survey is complete.

RW00482,00008C0-19-12NOV21

Elevation Offset

Select iGrade™ softkey > Setup tab > Elevation Edit button.



PC27915—UN—15APR20

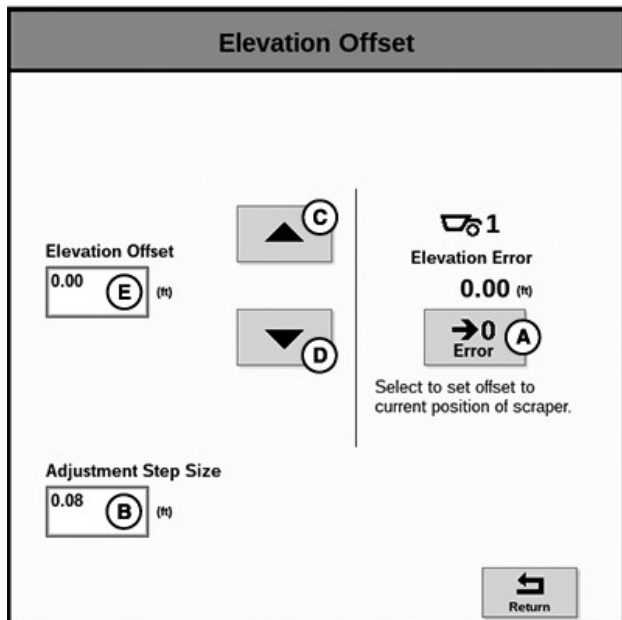
- A—Elevation Offset**
B—Designed Plane (zero error)
C—Offset Plane

Elevation offset (A) is the total vertical distance between the designed plane (B) and the offset plane (C). The scraper cutting edge adjusts each time the elevation offset is adjusted. As elevation of the plane is shifted, the scraper cutting edge is adjusted each time offset button is selected. For multiple scraper applications, the same offset step value is applied to all scrapers.

1. Position the machine in the direction of the desired slope with the scraper blade directly at the origin point.

NOTE: Ensure that the implement 1 GPS receiver is using RTK signal.

2. Identify the origin point with flags or markers to allow scraper to return for system validation and to reset the plane origin point as needed during operation.



PC27918—UN—16APR20

- A—Set Zero Error Button**
B—Adjustment Step Size Input Box
C—Increase Button
D—Decrease Button
E—Elevation Offset Input Box

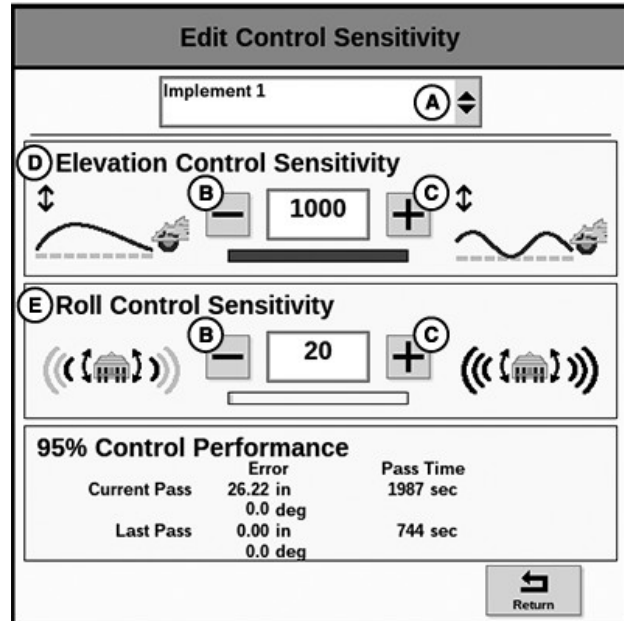
3. To set the designed plane to the current scraper 1 cutting edge elevation, select the Set Zero Error button (A). This resets the elevation offset to zero.

4. Enter an adjustment step size into the input box (B). Each time the increase (C) or decrease (D) buttons are selected, the elevation offset value displayed in the input box (E) adjusts by the step size entered.

RW00482,00009CC-19-16APR20

Edit Control Sensitivity

Select iGrade™ softkey > Calibrations tab > Control Sensitivity button.



PC27916—UN—15APR20

- A—Implement Selection Drop-Down Menu**
B—Decrease Button
C—Increase Button
D—Elevation Control Sensitivity
E—Roll Control Sensitivity

If iGrade™ is controlling the blade elevation or roll poorly, verify that:

- All the selective control valve (SCV) thresholds have been calibrated accurately.
- The SCV flow rate settings are correct.
- The counterbalance valve (if equipped) is correctly installed and adjusted.
- The control sensitivity settings are appropriately adjusted.

To adjust control sensitivity settings:

1. Select the implement from the drop-down menu (A).
2. Select the decrease (B) or increase (C) buttons.

Elevation Control Sensitivity (D) adjusts the aggressiveness with which the hydraulics adjust for vertical error. If implement is leaving a wash board appearance, decrease the value.

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Roll Control Sensitivity (E) adjusts the aggressiveness with which the hydraulics adjust for roll (cross slope) error. If implement appears to be rocking left and right aggressively, decrease the value.

RW00482,00009CD-19-16APR20

Load Limiting

NOTE: Load limiting is not compatible with Chrysler Collision Detection (CCD) tractors.

Select iGrade™ softkey > Setup tab > Load Limiting Edit button.

The operator can set thresholds for any, all, or none of the load limiting options. Set load limits when conditions could cause the machine or scraper to get stuck. If maximum cut or a load limit is set, the scraper height automatically adjusts. Utilizing wheel slip requires a StarFire™ Receiver on the machine.

Engine Load monitors the engine load (torque) on the CAN bus. As the engine load approaches the maximum value, the Application Controller commands the hydraulics to raise the scraper blade to reduce system load. When the engine load is low, the Application Controller commands the hydraulics to lower the scraper blade to the previous elevation.

Engine Speed monitors the engine speed (rpm) on the CAN bus. As the engine speed approaches the minimum value, the Application Controller commands the hydraulics to raise the scraper blade to reduce the system load. As the engine speed increases, the Application Controller commands the hydraulics to lower the scraper blade to the previous elevation.

Wheel Slip monitors the difference between the wheel speed and the machine global positioning system (GPS) speed. As the wheel slip approaches the maximum wheel slip threshold, the Application Controller commands the hydraulics to raise the scraper blade to reduce slippage. As the wheel slip decreases, the Application Controller commands the hydraulics to lower the scraper blade to the previous elevation.

PC27089—UN—06MAY19

- A—Engine Load Checkbox
- B—Engine Speed Checkbox
- C—Wheel Slip Checkbox
- D—Engine Load Input Box
- E—Engine Speed Input Box
- F—Wheel Slip Input Box
- G—Edit Sensitivity Button

1. To enable a load limiting feature, select the corresponding checkbox (A—C).
 2. Enter the threshold value into the corresponding input box (D—F).
 3. Select the Edit Sensitivity button (G) and adjust sensitivity values as needed.
- (For more information, reference Edit Load Limiting Sensitivity.)

RW00482,00008BF-19-11JUN19

Edit Load Limiting Sensitivity

Select iGrade™ softkey > Calibrations tab > Edit Load Limiting Sensitivity button.

Engine Speed is the current RPM. Engine speed droop is the current RPM below the minimum set threshold. Load limiting height adjustments are calculated by multiplying the engine speed droop by the sensitivity.

Engine Load is the torque output of the engine. Engine load excess is the current engine load above the maximum set threshold. Load limiting height adjustments are calculated by multiplying the engine load excess by the sensitivity.

Wheel Slip is based on the difference between wheel and GPS speed. The wheel slip droop is the amount of slippage beyond the maximum set threshold. Load limiting height adjustments are calculated by multiplying the wheel slip droop by the sensitivity.

(For more information, reference Load Limiting.)

PC27071—UN—01MAY19

- A—Decrease Button
- B—Increase Button
- C—Engine Speed
- D—Engine Load
- E—Wheel Slip

Load limiting sensitivity settings are used to raise the scraper blade when the thresholds are exceeded to prevent the tractor from stalling, over-working, or having excessive wheel slippage.

Increase load limiting values when:

- Ground conditions could cause machine or scraper to get stuck.
- Operator has limited experience with iGrade™.

To adjust a load limiting sensitivity setting, select the decrease (A) or increase (B) buttons for the corresponding load limiting sensitivity threshold (C—E).

RW00482,00008BA-19-18JUN19

Maximum Cut

Select iGrade™ softkey > Setup tab > Max Cut Edit button.

Maximum cut allows an operator to set the maximum depth of the scraper cutting edge while cutting. Maximum cut requires StarFire™ Receivers with real time kinematic (RTK) equipped on the machine and implement. The Application Controller monitors elevation of machine and scraper receivers to limit maximum depth of the cutting edge.

After setting the maximum cut, adjust the elevation

control sensitivity to change the rate that the Application Controller commands the hydraulics to raise or lower the scraper.

(For more information, reference Edit Control Sensitivity.)

The maximum cut setting is applied to scrapers 1—3.

PC27121—UN—10MAY19

- A—Enable Max Cut Checkbox
- B—Max Cut Input Box
- C—Increase Button
- D—Decrease Button
- E—Set To Current Cut Button
- F—Edit Calibration Button

1. To enable maximum cut, select the checkbox (A).
2. Set the maximum cut setting with any of the following:
 - Enter a maximum cut into the input box (B).
 - Select the increase (C) or decrease (D) button.
 - Select the Set To Current Cut button (E).
3. Select the Edit Calibration button (F) and calibrate the global positioning system (GPS) vertical offsets for each scraper.

GPS Vertical Offsets

The GPS vertical offset calibration determines the height difference between the machine GPS receiver and each implement GPS receiver. Perform the calibration on a flat and level surface. Recalibrate the GPS vertical offsets if the machine weight or tire pressure changes.

1. Drive in a straight line until the rear scraper is over ground that the tractor has driven on.
2. Manually move each scraper blade to the surface of the ground.

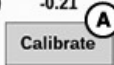
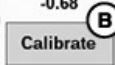
GPS Vertical Offsets

Calibration instructions:

- 1) Drive in a straight line until the rear scraper is over ground that the tractor has driven.
- 2) Manually move each scraper blade to the surface of the ground.
- 3) Select the calibrate button for each scraper. This determines the height between machine GPS and implement GPS.

Note: Re-calibrate vertical offsets if the machine weight or tire pressures change.

GPS Vertical Offsets

	 1	 2
Stored Offset (ft)	-0.21	-0.68
Detected Offset (ft)	-0.21	-0.68
		
		

PC27122—UN—10MAY19

A—Calibrate Button (scraper 1)

B—Calibrate Button (scraper 2)

3. Select the Calibrate button (A and B) for each scraper.

RW00482.00008C2-19-24JUN19

Setting Up—Distance Trip

Equipment Offsets

Select the Distance Trip softkey, Setup tab, and then the Equipment Edit button.

Equipment Offsets

Implement Type
Rear Mounted (A)

1 - GPS Connection Offset
112.5 (B) in

2 - Work Point
39.4 (C) in

Additional Machine Offsets

GPS Lateral Offset
0.0 in - Left

Actuator On Delay
0.010 (D) sec

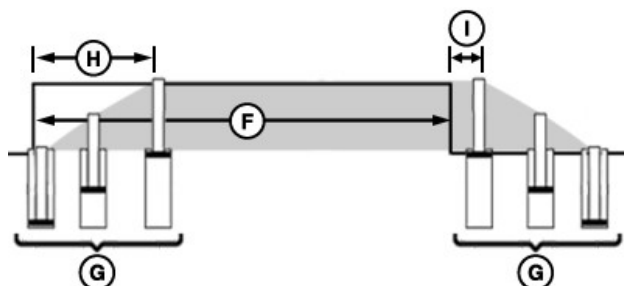
Actuator Off Delay
0.010 (E) sec

Note: Trip Time / Distance must be greater than actuator on/off delay times to properly work.

Edit (J)

Return

PC27073—UN—02MAY19



PC27074—UN—02MAY19

- A—Implement Type Drop-Down Menu
- B—GPS Connection Offset Input Box
- C—Work Point Input Box
- D—Actuator On Delay Input Box
- E—Actuator Off Delay Input Box
- F—10 s Total Trip Time
- G—Hydraulic Piston
- H—3 s Actuator On Delay
- I—0.75 s Actuator Off Delay
- J—Edit Button

1. Select implement type from the drop-down menu (A).
2. Enter the global positioning system (GPS) connection offset into the GPS connection offset input box (B).
3. Enter the inline distance from the connection point to the implement working point into the Work Point input box (C).
4. To account for mechanical delay, enter the actuator ON delay and actuator OFF delay times into the Actuator Delay input boxes (D and E).

Example: The total trip time is 10 seconds (F). The hydraulic piston (G) takes 3 seconds (H) to reach full stroke to be considered ON and 0.75 seconds (I) to

retract below the ON threshold. Enter 3.0 seconds for the actuator ON delay time and 0.75 seconds for the actuator OFF delay time.

5. Select the Edit button (J).

Machine GPS Receiver Offsets

Serial Number: 262143

Machine Dimensions

GPS Offsets

1 - Lateral Offset: 0.0 (A) Center (in)

2 - Height: 10.1 (B) (in)

NOTE: Offsets configured here, on receiver VT, and John Deere Display should match.

Return

PC26067—UN—15NOV18

- A—Lateral Offset Input Box
- B—Height Offset Input Box

6. Enter the GPS lateral offset into the Lateral Offset input box (A).
7. Enter the GPS height into the Height input box (B).

Equipment Offsets with Implement GPS

Select the Distance Trip softkey, Setup tab, and then the Equipment Edit button.

Equipment Offsets

Implement Type
Implement 1 GPS (A)

1 - Implement Width
8.00 (B) m

GPS Offsets
Edit (J)

Actuator On Delay
0.000 (D) sec

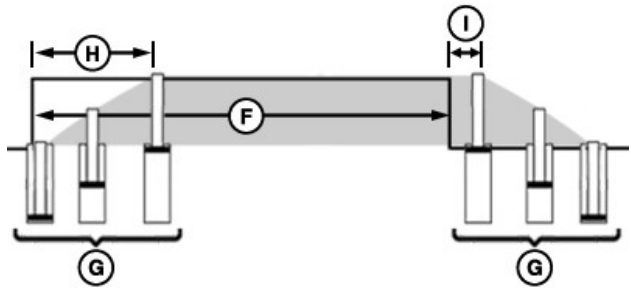
Actuator Off Delay
0.000 (E) sec

Note: Trip Time / Distance must be greater than actuator on/off delay times to properly work.

Dimensions were imported from Equipment Manager. To edit, use Equipment Manager. To disable, uncheck option in GPS offsets.

Return

PC28570—UN—19NOV21



PC27074—UN—02MAY19

- A—Implement Type Drop-Down Menu
- B—Implement Width Input Box
- C—Change Implement Width/ Lateral Offset Input Button
- D—Actuator On Delay Input Box
- E—Actuator Off Delay Input Box
- F—10 s Total Trip Time
- G—Hydraulic Piston
- H—3 s Actuator On Delay
- I—0.75 s Actuator Off Delay
- J—Edit Button

1. Select implement type from the Implement Type drop-down menu (A).
2. Enter the implement width into the Implement Width input box (B).
3. Select the Change Implement Width/Lateral Offset Input button (C) and enter the lateral offset input.
4. To account for mechanical delay, enter the actuator ON delay and actuator OFF delay times into the Actuator Delay input boxes (D and E).

Example: The total trip time is 10 seconds (F). The hydraulic piston (G) takes 3 seconds (H) to reach full stroke to be considered ON and 0.75 seconds (I) to retract below the ON threshold. Enter 3.0 seconds for the actuator ON delay time and 0.75 seconds for the actuator OFF delay time.

5. Select the Edit button (J).

Implement GPS Receiver Offsets

Implement 1 GPS
Serial Number: 302442

GPS Offsets

1 - Lateral Offset: 0.0 (A) Center (Cm)

2 - Inline Offset: 0.0 (B) (Cm)

3 - Height: 0.0 (C) (Cm)

Dimensions were imported from Equipment Manager. To edit, use Equipment Manager. To disable, uncheck option in GPS offsets.

Return

PC28569—UN—19NOV21

- A—Lateral Offset Input Box
- B—Inline Offset Input Box
- C—Height Offset Input Box

6. Enter the GPS lateral offset into the input box (A).
7. Enter the GPS inline offset into the Inline Offset Box (B).
8. Enter the GPS height into the Height input box (C).

Implement Type

Implement 1 GPS

1 - Lateral Offset: 1.00 (A) m

Change Implement Width/ Lateral Offset Input Button (B)

PC28568—UN—19NOV21

- A—Lateral Offset Input Box
- B—Change Implement Width/ Lateral Offset Input Button

Implement GPS Offsets Page allows for a lateral offset to be set past the Implement Width. Selecting the Change Implement Width/ Lateral Offset Input Button (B) brings up the Lateral Offset Input Box (A).

RW00482,00009CE-19-13DEC21

Trip Pattern

Select the Distance Trip softkey, Setup tab, and then the Trip Pattern Edit button.

To enter a new task:

Trip Pattern

Task

<Add New Task> (A)

Edit (B)

PC27126—UN—13MAY19

- A—Task Drop-Down Menu
- B—Edit Button

1. Select Add New Task from the Task drop-down menu (A).
 2. Select the Edit button (B).
 3. Complete the steps listed for a pattern type.
- (For more information on pattern types, reference System Overview—Distance Trip.)

Parallel Lines

PC28565—UN—19NOV21

- A—Pattern Drop-Down Menu
B—Task Name Input Box
C—Return Button

1. Select Parallel Lines from the Pattern drop-down menu (A).
2. Enter a task name into the Task Name input box (B).
3. Select the Return button (C).

PC28566—UN—19NOV21

- A—Furrow Heading Input Box
B—Line Spacing Input Box
C—Edit Origin Button

4. Enter the furrow heading into the Furrow Heading input box (A).
5. Enter the line spacing into the Line Spacing input box (B).

6. Select the Edit Origin button (C) and set the origin point.

(Reference Origin Point for more information.)

Fence Post

PC27129—UN—13MAY19

- A—Pattern Drop-Down Menu
B—Task Name Input Box
C—Return Button

1. Select Fence Post from the Pattern drop-down menu (A).
2. Enter a task name into the Task Name input box (B).
3. Select the Return button (C).

PC27130—UN—13MAY19

- A—Fence Post Spacing Input Box

- Enter the fence post spacing into the Fence Post Spacing input box (A).

Plot Pattern

New Task

Pattern
Plot Pattern (A)

Task Name
South test field (B)

Return (C)

PC27131—UN—13MAY19

- A—Pattern Drop-Down Menu
B—Task Name Input Box
C—Return Button

- Select Plot Pattern from the Pattern drop-down menu (A).
- Enter a task name into the Task Name input box (B).
- Select the Return button (C).

Trip Pattern

Task
South test field

Edit

Plot Pattern

Plot Length
6.56 (A) ft

Plot Divider
3.28 (B) ft

Segment Divider
3.28 (C) ft

Guidance Track Heading (deg)
0.0000 (D)

Plots per Segment
4 (E)

Plots per Pass
100 (F)

Start of Pass
Full Segment (G)

Edit Origin (H)

Return

Note: Set Guidance Track Heading to match Guidance settings.

PC27132—UN—13MAY19

- A—Plot Length Input Box
B—Plot Divider Input Box
C—Segment Divider Input Box
D—Guidance Track Heading Input Box

- E—Plots per Segment Input Box
F—Plots per Pass Input Box
G—Start of Pass Drop-Down Menu
H—Edit Origin Button

- Enter the plot length into the Plot Length input box (A).
- Enter the plot divider into the Plot Divider input box (B).
- Enter the segment divider into the Segment Divider input box (C).
- Enter the guidance track heading into the Guidance Track Heading input box (D).
- Enter the number of plots per segment into the Plots per Segment input box (E).
- Enter the number of plots per pass into the Plots per Pass input box (F).
- Select either Half Segment or Full Segment from the State of Pass drop-down menu (G).
- Select the Edit Origin button (H) and set the origin point.

(Reference Origin Point for more information.)

Grid—90 Degrees

New Task

Pattern
Grid (A)

Grid Layout
90 Degrees (B)

Task Name
Grid (C)

Return (D)

PC27136—UN—13MAY19

- A—Pattern Drop-Down Menu
B—Grid Layout Drop-Down Menu
C—Task Name Input Box
D—Return Button

- Select Grid from the Pattern drop-down menu (A).
- Select 90 Degrees from the Grid Layout drop-down menu (B).
- Enter a task name into the Task Name input box (C).
- Select the Return button (D).

Trip Pattern

Task
Grid

Grid | 90 Degrees

Guidance Track Heading (deg) 0.0000 (A)

Plant Spacing 3.28 (B) ft

Track Spacing 3.28 (C) ft

Origin
Lat. (deg) 0.0000000
Long. (deg) 0.0000000
Edit Origin (D)

Note: Set Guidance Track Heading to match Guidance settings.

Return

PC27137—UN—13MAY19

- A—Guidance Track Heading Input Box
- B—Plant Spacing Input Box
- C—Track Spacing Input Box
- D—Edit Origin Button

5. Enter the guidance track heading into the Guidance Track Heading input box (A).
6. Enter the plant spacing into the Plant Spacing input box (B).
7. Enter the track spacing into the Track Spacing input box (C).
8. Select the Edit Origin button (D) and set the origin point.

(Reference Origin Point for more information.)

Grid—Equilateral Triangles

New Task

Pattern
Grid (A)

Grid Layout
Equilateral Triangles (B)

Task Name
Grid (C)

Return (D)

PC27138—UN—13MAY19

- A—Pattern Drop-Down Menu
- B—Grid Layout Drop-Down Menu
- C—Task Name Input Box
- D—Return Button

1. Select Grid from the Pattern drop-down menu (A).
2. Select Equilateral Triangles from the Grid Layout drop-down menu (B).
3. Enter a task name into the Task Name input box (C).
4. Select the Return button (D).

Trip Pattern

Task
Grid

Grid | Equilateral Triangles

Guidance Track Heading (deg) 0.0000 (A)

Plant Spacing 3.28 (B) ft

Track Spacing 3.28 ft

Origin
Lat. (deg) 0.0000000
Long. (deg) 0.0000000
Edit Origin (C)

Note: Set Guidance Track Heading to match Guidance settings.

Return

PC27139—UN—13MAY19

- A—Guidance Track Heading Input Box
- B—Plant Spacing Input Box
- C—Edit Origin Button

5. Enter the guidance track heading into the Guidance Track Heading input box (A).

6. Enter the plant spacing into the Plant Spacing input box (B).
7. Select the Edit Origin button (C) and set the origin point.

(Reference Origin Point for more information.)

Grid—Integrated Angles

PC27140—UN—13MAY19

- A—Pattern Drop-Down Menu
- B—Grid Layout Drop-Down Menu
- C—Task Name Input Box
- D—Return Button

1. Select Grid from the Pattern drop-down menu (A).
2. Select Integrated Angles from the Grid Layout drop-down menu (B).
3. Enter a task name into the Task Name input box (C).
4. Select the Return button (D).

PC27141—UN—13MAY19

- A—Guidance Track Heading Input Box
- B—Plant Spacing Input Box
- C—Plant Angle Input Box
- D—Track Spacing Input Box
- E—Edit Origin Button

5. Enter the guidance track heading into the Guidance Track Heading input box (A).
6. Enter the plant spacing into the Plant Spacing input box (B).
7. Enter the plant angle into the Plant Angle Input input box (C).
8. Enter the track spacing into the Track Spacing input box (D).
9. Select the Edit Origin button (E) and set the origin point.

(Reference Origin Point for more information.)

Grid—Alternating Rows

PC27142—UN—13MAY19

- A—Pattern Drop-Down Menu
B—Grid Layout Drop-Down Menu
C—Task Name Input Box
D—Return Button

1. Select Grid from the Pattern drop-down menu (A).
2. Select Alternating Rows from the Grid Layout drop-down menu (B).
3. Enter a task name into the Task Name input box (C).
4. Select the Return button (D).

PC27143—UN—13MAY19

- A—Guidance Track Heading Input Box
B—Plant Spacing Input Box
C—Track Spacing Input Box
D—Edit Origin Button

5. Enter the guidance track heading into the Guidance Track Heading input box (A).
6. Enter the plant spacing into the Plant Spacing input box (B).
7. Enter the track spacing into the Track Spacing input box (C).
8. Select the Edit Origin button (D) and set the origin point.
(Reference Origin Point for more information.)

Edit Origin

The origin point represents a trip location used to locate all other trips within the defined pattern. It is critical to have it accurately located. The origin point uses the machine GPS offsets and equipment offsets. Ensure that both offsets are correctly entered before setting the origin point. Depending on the configuration, set up guidance lines on the display to match the origin point and travel direction.

PC28567—UN—19NOV21

- A—Origin Latitude Input Box
B—Origin Longitude Input Box
C—Forward Nudging Button
D—Reverse Nudging Button
E—Shift Origin Total
F—Shift Origin Point Left
G—Shift Origin Point Right
H—Set To Current Location Button

If the exact origin point is known:

1. Enter the origin latitude into the Origin Latitude input box (A).
2. Enter the origin longitude into the Origin Longitude input box (B).

If the exact origin point is unknown:

1. Position the machine in the direction of the next trip

location with the implement directly at the origin point.

2. Select the Set To Current Location button (H).
3. Document the latitude and longitude of the origin point.

The Forward Nudging button (C) and Backward Nudging button (D) are tied to the machine orientation within the pattern. The buttons disable when the machine is greater than 45° from the pattern orientation. Each button press shifts the origin by 2.5 cm (1 in). The shift origin total (E) displays the total amount shifted.

The Shift Origin Point Left button (F) and Shift Origin Point Right button (G) move the Origin point to the left or right edge of the implement width.

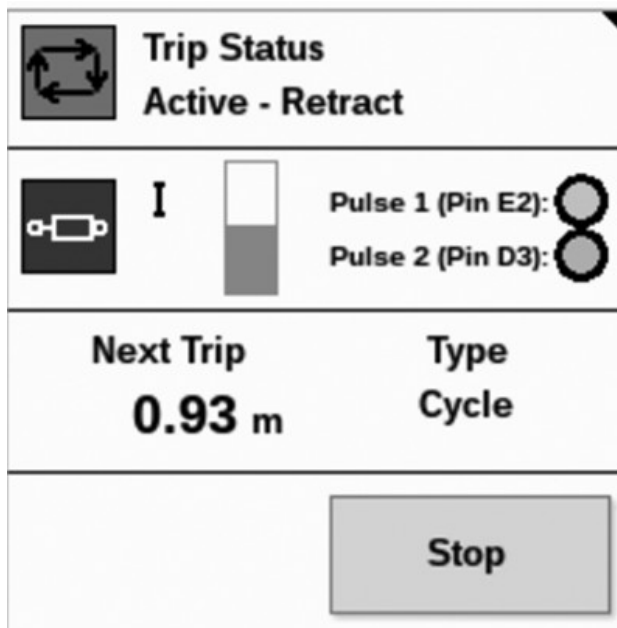
RW00482,0000AA4-19-14DEC21

Trip Command

Select the Distance Trip softkey, Setup tab, and then the Trip Command Edit button.

Trip command defines the method that controls when an action is triggered. There are five trip command types:

- **Manual Trip** notifies the operator, with an on-screen status or optional alert tone, when to execute the trip command.
- **Valve** utilizes selective control valve (SCV) flow commands.
- **Serial Port** utilizes serial communication.
- **Pulse** utilizes a low-side driver.
- **Rear Hitch** utilizes ISO CAN messages.



PC28562—UN—19NOV21

When Valve and Pulse are selected, LSD and SCV status is merged into one frame.

Manual Trip



PC27146—UN—14MAY19

- A—Trip Command Type Drop-Down Menu
- B—Require AutoTrac™ Engaged to Trip Checkbox
- C—Require In-Work State to Trip Checkbox
- D—Play Alert Tone Checkbox

1. Select Manual Trip from the Trip Command Type drop-down menu (A).
2. To require that AutoTrac™ is engaged to enable trip commands, select the Require AutoTrac™ Engaged to Trip checkbox (B).
3. To require an active work recording state to enable trip commands, select the Require In-Work State to Trip checkbox (C).
4. To alert the operator with an audible tone at the start of each trip, select the Play Alert Tone checkbox (D).

Valve

AutoTrac is a trademark of Deere & Company

PC27147—UN—14MAY19

- A—Trip Command Type Drop-Down Menu
 B—On Distance or On Time Input Box
 C—Use Distance for Events Checkbox
 D—Valve Drop-Down Menu
 E—Interface Drop-Down Menu
 F—Require AutoTrac™ Engaged to Trip Checkbox
 G—Require In-Work State to Trip Checkbox
 H—Play Alert Tone Checkbox

1. Select Valve from the Trip Command Type drop-down menu (A).

NOTE: Input box (B) changes to On Distance or On Time based on whether the Use Distance for Events checkbox (C) is selected.

2. To use distance for events, select the Use Distance for Events checkbox (C). To use time for events, deselect the Use Distance for Events checkbox.

NOTE: When triggered, the valve extends during the selected On Time or On Distance value, then retracts for 1.5 times the On Time or On Distance value. For example, if the On Time is set for 2 seconds, the valve extends for 2 seconds, then retracts for 3 seconds.

3. Enter the time or distance into the On Distance or On Time input box (B).
4. Select a valve from the Valve drop-down menu (D).
5. Select an interface from the Interface drop-down menu (E).

- External Selective Control Valve (SCV) and External SCV Switch
 - Compatible with non-John Deere, 60 Series and older, 5XXX, 6X00, 6X10, 6X30, 7X00, 7X10, 7X20, and small-frame 7X30 Tractors.
- John Deere Legacy

- Compatible with 8X00, 8X10, 8X20, 9X00, 9X10, and 9X20 Tractors.
- Uses SCV 1 or 3 only.
- Requires the UCC2 Application Controller harness connected to the option connector at the rear of the tractor cab.
- John Deere Proprietary SCV
 - Compatible with 7X30, 8X30, U8, 9X30, 6R Final Tier 4 (FT4), 7R, 8R, 8RT, 8RX, 9R, 9RT, and 9RX Tractors.
 - Any SCV can be used.
 - Do not connect the UCC2 Application Controller harness to the option connector at the rear of the tractor cab.
 - If an SCV is mapped to a joystick, it cannot be controlled via JD Prop control.
- ISO SCV

- Compatible with 6R, 6M (when equipped with optional electronic SCVs), 7R, 8R, 8RT, 8RX, 9R, 9RT, and 9RX Tractors.
- Any SCV can be used.
- Do not connect the UCC2 Application Controller harness to the option connector at the rear of the tractor cab.

6. Enter the time or distance into the On Distance or On Time input box (B).
7. To require that AutoTrac™ is engaged to enable trip commands, select the Require AutoTrac™ Engaged to Trip checkbox (F).
8. To require that work recording is active to enable trip commands, select the Require In-Work State to Trip checkbox (G).
9. To alert the operator with an audible tone at the start of each trip, select the Play Alert Tone checkbox (H).

Serial Port

PC27148—UN—14MAY19

- A—Trip Command Type Drop-Down Menu
- B—On Distance or On Time Input Box
- C—Use Distance for Events Checkbox
- D—Serial Port Assignment Drop-Down Menu
- E—Serial Port Setup Button
- F—Require AutoTrac™ Engaged to Trip Checkbox
- G—Require In-Work State to Trip Checkbox
- H—Play Alert Tone Checkbox

1. Select Serial Port from the Trip Command Type drop-down menu (A).

NOTE: Input box (B) changes to On Distance or On Time based on whether the Use Distance for Events checkbox (C) is selected.

2. To use distance for events, select the Use Distance for Events checkbox (C). To use time for events, deselect the Use Distance for Events checkbox.

NOTE: When triggered, the valve extends during the selected On Time or On Distance value, then retracts for 1.5 times the On Time or On Distance value. For example, if the On Time is set for 2 seconds, the valve extends for 2 seconds, then retracts for 3 seconds.

3. Enter the time or distance into the On Distance or On Time input box (B).
4. Select a serial port from the Serial Port Assignment drop-down menu (D).
5. Select the Serial Port Setup button (E) and set up the serial port.
(For more information, reference Serial Ports.)
6. To require that AutoTrac™ is engaged to enable trip commands, select the Require AutoTrac™ Engaged to Trip checkbox (F).
7. To require that work recording is active to enable trip

commands, select the Require In-Work State to Trip checkbox (G).

8. To alert the operator with an audible tone at the start of each trip, select the Play Alert Tone checkbox (H).

Pulse

PC27149—UN—14MAY19

- A—Trip Command Type Drop-Down Menu
- B—On Distance or On Time Input Box
- C—Use Distance for Events Checkbox
- D—Require AutoTrac™ Engaged to Trip Checkbox
- E—Require In-Work State to Trip Checkbox
- F—Play Alert Tone Checkbox

1. Select Pulse from the Trip Command Type drop-down menu (A).

NOTE: Input box (B) changes to On Distance or On Time based on whether the Use Distance for Events checkbox (C) is selected.

2. To use distance for events, select the Use Distance for Events checkbox (C). To use time for events, deselect the Use Distance for Events checkbox.

NOTE: When triggered, the valve extends during the selected On Time or On Distance value, then retracts for 1.5 times the On Time or On Distance value. For example, if the On Time is set for 2 seconds, the valve extends for 2 seconds, then retracts for 3 seconds.

3. Enter the time or distance into the On Distance or On Time input box (B).
4. To require that AutoTrac™ is engaged to enable trip commands, select the Require AutoTrac™ Engaged to Trip checkbox (D).
5. To require that work recording is active to enable trip

commands, select the Require In-Work State to Trip checkbox (E).

- To alert the operator with an audible tone at the start of each trip, select the Play Alert Tone checkbox (F).

Rear Hitch

PC28325—UN—23NOV20

- A—Trip Command Type Drop-Down Menu
- B—On Distance or On Time Input Box
- C—Use Distance for Events Checkbox
- D—On Position Input Box
- E—Set to Current Position Button
- F—Off Position Input Box
- G—Set to Current Position Button
- H—Require AutoTrac™ Engaged to Trip Checkbox
- I—Require In-Work State to Trip Checkbox
- J—Play Alert Tone Checkbox

- Select Rear Hitch from the Trip Command Type drop-down menu (A).

NOTE: Input box (B) changes to On Distance or On Time based on whether the Use Distance for Events checkbox (C) is selected.

- To use distance for events, select the Use Distance for Events checkbox (C). To use time for events, deselect the Use Distance for Events checkbox.

NOTE: When triggered, the valve extends during the selected On Time or On Distance value, then retracts for 1.5 times the On Time or On Distance value. For example, if the On Time is set for 2 seconds, the valve extends for 2 seconds, then retracts for 3 seconds.

- Enter the time or distance into the On Distance or On Time input box (B).

NOTE: The on and off position of the hitch is displayed as a percentage. 100% is raised up all the way and 0% is lowered down all the way.

- Enter the on position in the On Position input box (D), or manually move the rear hitch and then select the Set to Current Position button (E).
- Enter the off position in the Off Position input box (F), or manually move the rear hitch and then select the Set to Current Position button (G).
- To require that AutoTrac™ is engaged to enable trip commands, select the Require AutoTrac™ Engaged to Trip checkbox (H).
- To require that work recording is active to enable trip commands, select the Require In-Work State to Trip checkbox (I).
- To alert the operator with an audible tone at the start of each trip, select the Play Alert Tone checkbox (J).

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Trip Documentation

Select the Distance Trip softkey > Setup tab > Trip Documentation Edit button.

PC27917—UN—16APR20

- A—Enable Distance Trip Documentation Checkbox
- B—Number of Rows Input Box
- C—Row Spacing Input Box

When enabled, trip events are logged using the file server. Ensure that the file server is enabled on the main display. If using multiple displays, ensure that the file server is disabled on the other display.

NOTE: When the field name changes, the Application Controller will automatically request a wireless data transfer file sync.

(For more information, reference Enable File Server.)

Trip documentation logs the desired trip location to a file so each trip event can be located after the work has been completed. This can be especially useful when using distance trip to create patterns for longer term crops, such as orchards. Files use CSV format with the following headings:

Client, Farm, Field, Pattern Name, Latitude, Longitude, Heading, GMT Date, GMT Time, Trip Number, Action Type

1. To enable Distance Trip documentation, select the checkbox (A).
2. Enter the number of rows into the input box (B).
3. Enter the row spacing into the input box (C).

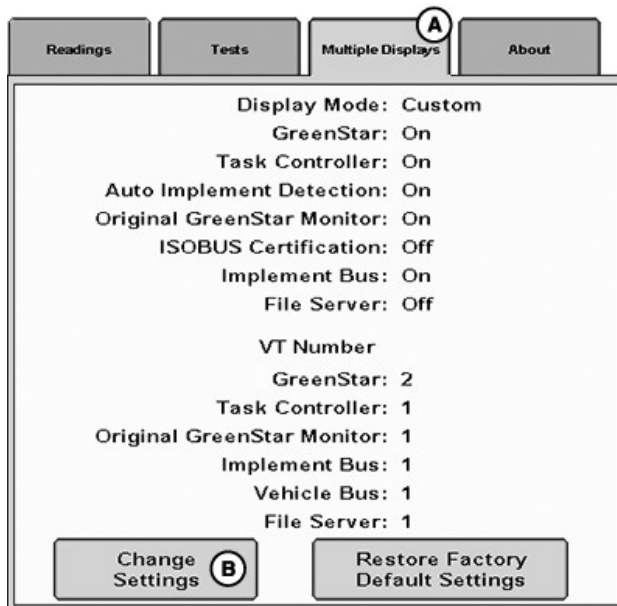
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Enable File Server

NOTE: If using multiple displays, make sure that the file server is OFF on the other display.

GreenStar™ 3 2630 Display

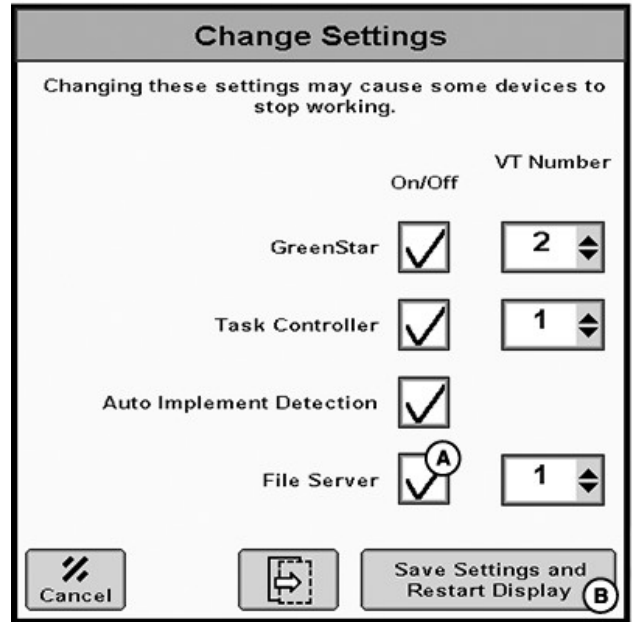
1. Select the Menu button > Display button > Diagnostics softkey.



PC26729—UN—09JAN19

- A**—Multiple Displays Tab
B—Change Settings Button

2. Select the Multiple Displays tab (A), then the Change Settings button (B).



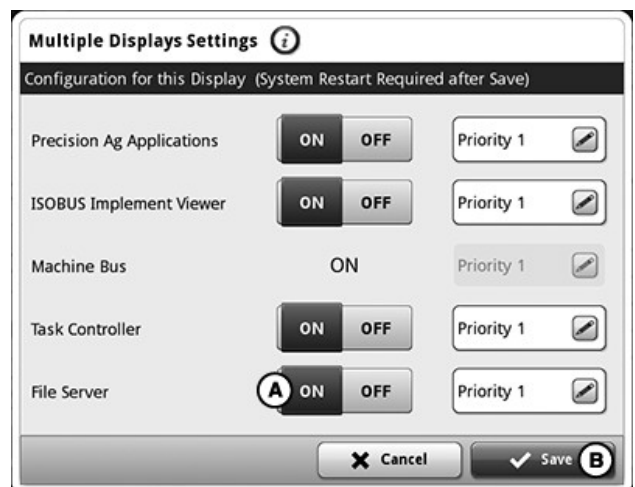
PC26730—UN—09JAN19

- A**—File Server Checkbox
B—Save Settings and Restart Display Button

3. Select the File Server checkbox (A), then the Save Settings and Restart Display button (B).
4. Turn the machine OFF, allow the display to shut down, and then restart the system.

Generation 4 Display

1. Select the Menu button > System tab > Display and Sound application > Multiple Displays tab > Edit button > Advanced Setup button.



PC26731—UN—09JAN19

- A**—File Server Toggle
B—Save Button

2. Turn the file server ON using the toggle (A), then select the Save button (B).
3. Turn the machine OFF, allow the display to shut down, and then restart the system.

RW00482,00007ED-19-11JUN19

Equipment Offset Calibration

Validate and adjust the equipment work point offsets. Before performing calibration, ensure that the machine global positioning system (GPS) offsets are entered correctly and the receiver is using RTK signal.

1. Select the Distance Trip softkey > Calibrations tab > Equipment Offset Calibration button.
2. Create a straight track guidance line and engage AutoTrac™.
3. Once the machine and implement are on the guidance line, stop the machine.
4. Mark the position of the trip actuator on the ground.



Next Page button

PC22285—UN—16MAR16

5. Select the Next Page button.
6. Drive machine forward to allow enough room to turn around and acquire the guidance line before reaching the marked position.
7. Turn the machine around to face the opposite direction and engage AutoTrac™ on the same guidance line.
8. Stop the machine when the work point is aligned with the marked position.



Next Page button

PC22285—UN—16MAR16

9. Select the Next Page button.

Equipment Offset Calibration

Work Point Offset Calibration Complete!

Detected Work Point Offset:
-112.5 in

Current Work Point Offset:

36.0

 in

Update Value

A

Return

PC27158—UN—14MAY19

A—Update Value Button

10. Select the Update Value button (A).

RW00482,00008C6-19-06OCT21

Trip Action Test

CAUTION: To avoid serious injury, keep area around the equipment clear. The procedure requires the machine to move forward. The implement moves during test. Read and follow Operate Implement Automation Systems Safely in Safety section before performing the test.

Manually execute a trip event to validate the trip actuator without setting up a pattern. To execute a trip test, the machine requires a valid global positioning system (GPS) signal and must be moving at a speed greater than 0.1 km/h (0.06 mph).

Trip Action Test

This test is used to validate the trip actuators. It allows the user to manually execute a trip event without setting up a pattern. In order to operate the vehicle must have a valid GPS and be moving > 0.5 mph (0.8 kph).

●	Grid
●	Active
↻	Trip Status
↻	Waiting For Trip
⏸	Command
⏸	Blocked

Execute Trip Test

A

Return

PC27159—UN—14MAY19

A—Execute Trip Test Button

1. Select the Distance Trip softkey > Calibrations tab > Trip Action Test button.
2. To execute a trip action, select the Execute Trip Test button (A).
3. Repeat the test as needed.

RW00482,00009D1-19-16APR20

Equipment Delay Calibration

The equipment delay calibration requires an accurate measurement of the trip events locations between two adjacent passes. There are many ways to do this on the ground, but two of the easiest ways are:

- Use a camera and place a long tape measure on the ground along the center of a straight track guidance line. Ensure that the camera has a clear view of both the tape measure and the actuator while the machine is moving.
- Set up the actuator to leave marks on the ground based on the trip events, then move the machine along the center of a straight guidance line and measure the actuation marks.

Equipment Delay Calibration

Drive to a straight track guidance line, engage AutoTrac, and maintain target speed. When ready, press the "Queue Trip" button, which will set a trip event 16.4 ft (5 m) ahead of the current position.

Continue driving until the actuator has cycled and is fully retracted/off.

The calibration wizard will automatically go to the next step once the trip is fully completed.

Target Speed
(B) → 5.0 (mi/h)

Actual Speed
5.0 (mi/h)

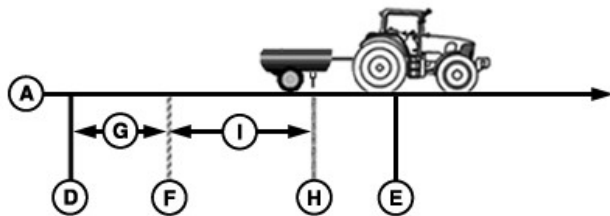
Exit Code:
OK

Queue Trip **(C)**

Wizard Progress

Return

PC27161—UN—16MAY19



PC27162—UN—15MAY19

- A—Straight Track Guidance Line
 B—Target Speed
 C—Queue Trip Button
 D—Trip Event Start
 E—Actuator Fully Retracted
 F—Actuator Extended to ON Position
 G—Mechanical ON Delay
 H—Actuator at OFF Position (but not fully retracted)
 I—Actuator at ON or Working Position

1. Select the Distance Trip softkey > Calibrations tab > Mechanical Delay Calibration button.
2. Drive on a straight track guidance line (A) with AutoTrac™ engaged while maintaining the target speed (B).
3. Engage auto mode.
(For more information, reference Engage Auto Mode.)

4. Select the Queue Trip button (C). The trip event starts (D) 5 m (16.4 ft) ahead of the current position.
5. Continue driving straight forward until the actuator has cycled and is fully retracted (E).

Equipment Delay Calibration

Turn the machine around and drive back over the same location, taking care to use the same guidance line and acquire the line completely at target speed before crossing the trip position.

Continue driving until the actuator has cycled and is fully retracted/off.

The calibration wizard will automatically go to the next step once the trip is fully completed.

Target Speed
(C) → 5.0 (mi/h)

Actual Speed
5.0 (mi/h)

Next Trip
42.5 ft

Type
Cycle

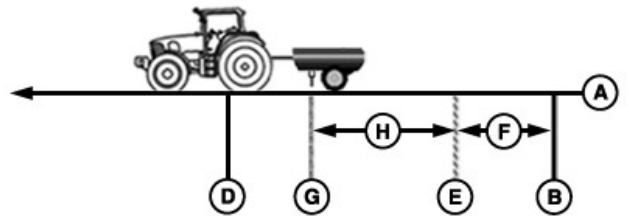
I

Command
Blocked

Wizard Progress

Return

PC27164—UN—31MAY19



PC27165—UN—16MAY19

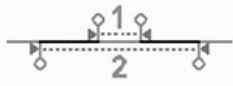
- A—Straight Track Guidance Line
 B—Trip Event Start
 C—Target Speed
 D—Actuator Fully Retracted
 E—Actuator Extended to ON Position
 F—Mechanical ON Delay
 G—Actuator at OFF Position (but not fully retracted)
 H—Actuator at ON or Working Position

NOTE: Ensure that there is enough room to acquire the guidance line (A) after turning around before reaching the trip event start (B).

6. Turn the machine around and drive on the same straight track guidance line with AutoTrac™ engaged while maintaining the target speed (C).
7. Continue driving straight forward until the actuator has cycled and is fully retracted (D).

Equipment Delay Calibration

Measure the dimensions and enter them below to calculate the mechanical delays.



Distance between Actuator On Points

1 (in) B

Distance between Actuator Off Points

2 (in) D

Actuator On Delay

Current 1.704 sec

Estimated 0.000 sec

Update On Delay E

Actuator Off Delay

Current 0.319 sec

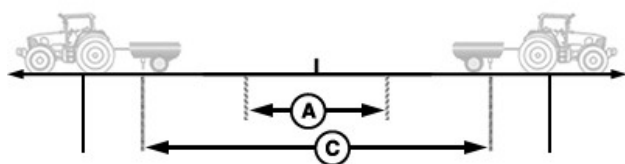
Estimated 0.000 sec

Update Off Delay F

Wizard Progress

Return

PC27168—UN—16MAY19



PC27169—UN—16MAY19

A—Distance between Actuator On Points
 B—Distance between Actuator On Points Input Box
 C—Distance between Actuator Off Points
 D—Distance between Actuator Off Points Input Box
 E—Update On Delay Button
 F—Update Off Delay Button

8. Enter the distance between actuator ON points (A) into the input box (B).
9. Enter the distance between actuator OFF points (C) into the input box (D).
10. Select the Update On Delay button (E).
11. Select the Update Off Delay button (F).

RW00482,00009D2-19-08MAY20

Operating

Engage Auto Mode

⚠ CAUTION: Do not use iGrade™ or Distance Trip on roadways. To prevent serious injury, read and follow instructions in this manual to disable iGrade™ and Distance Trip before entering roadways.

NOTE: For ease of instruction, this manual uses selective control valve (SCV) 3. If preferred, the operator can choose a different SCV.

The system requirements to operate depend on the configuration. For ease of instruction, this manual uses basic tractor operation of selective control valves (SCVs) to engage auto mode.

(For more information to engage SCVs for a specific machine, reference the machine Operator's Manual.)

(If the configuration requires a third-party device to engage auto mode or action, reference the third-party Operator's Manual.)

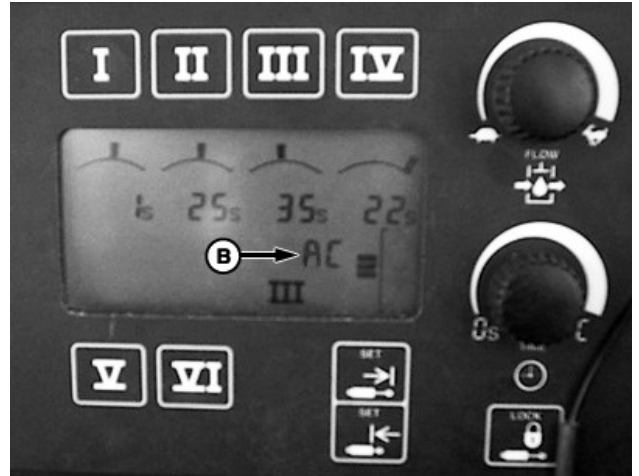
To engage hydraulic auto mode:



PC18220—UN—05DEC13

A—SCV Control Lever

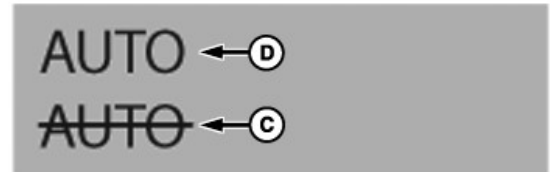
1. If using Legacy JD Proprietary or JD Proprietary, place the SCV control lever (A) in the forward detent position. If using an ISO valve interface, select the resume switch.
2. Verify that auto mode is ON.



PC18234—UN—11DEC13

B—AC Mode

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



PC22235—UN—01MAR16

**C—Auto Mode OFF
D—Auto Mode ON**

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

RW00482,00009EE-19-22MAY20

Disengage, Deactivate, and Disable Implement Automation

⚠ CAUTION: To avoid death or serious injury, disable machine and implement guidance systems before entering roadways.

Disengage Implement Automation

- Slow the machine to speeds less than the minimum speed of 0.1 km/h (0.06 mph).
- Depending on the configuration, either toggle the Grade button OFF, select the grade Pause button, or select the Distance Trip Stop button.
- Depending on the configuration, disengage AutoTrac™.

(For more information on AutoTrac™, reference the display Operator's Manual.)

Deactivate Implement Automation

Depending on the configuration, either toggle the Grade button OFF or select the Distance Trip Stop button.

Disable Implement Automation

- Turn off the selective control valve (SCV).
- Turn off auto mode.
- Depending on the configuration, disable AutoTrac™.

(For more information on AutoTrac™, reference the display Operator's Manual.)

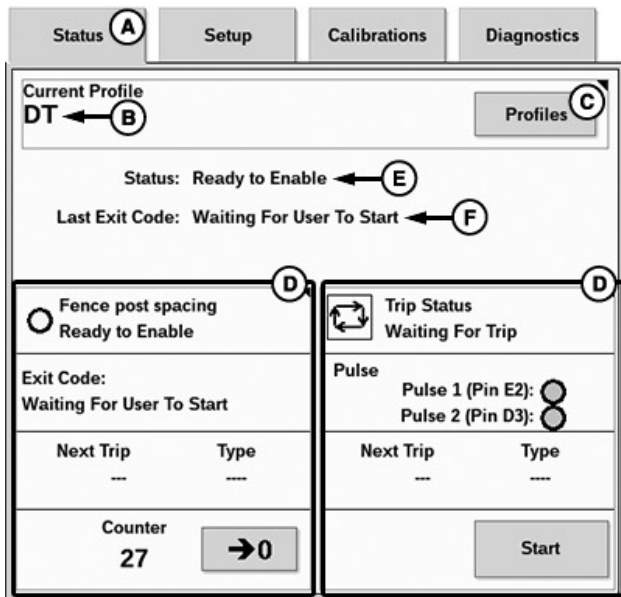
RW00482,00009EF-19-26MAY20

SCV Command Control

If the selected UCC2 Application Controller profile is set up to use selective control valves (SCVs), it commands control of those SCVs, even when the application is not in use, and other applications will not be able to send commands to those SCVs. To release SCV command control, create and select a UCC2 Application Controller profile without SCVs or disconnect the UCC2 Application Controller.

RW00482,0000A93-19-25NOV20

Status Tab



PC27173—UN—05JUN19

- A—Status Tab
B—Current Profile
C—Profiles Button
D—Quarter Page Module
E—Status
F—Last Exit Code

Select either the Distance Trip softkey or iGrade™ softkey > Status tab (A).

After a profile has been set up, application-specific information can be viewed on the Status tab or on a run page, if set up. The name of the current profile (B) is displayed. To change profiles, select the Profiles button (C).

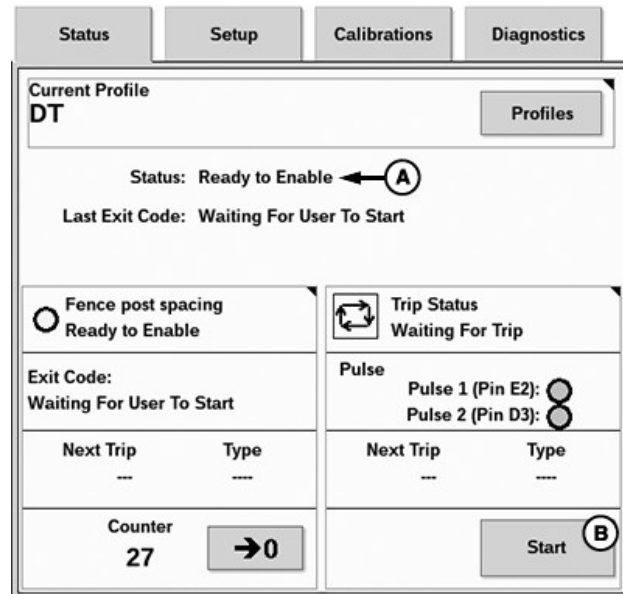
Selecting within most modules (D) opens a full operational information page. The Status tab displays the status (E) and the last exit code (F).

(For more information on statuses and exit codes, reference Troubleshooting.)

RW00482,00008CB-19-24JUN19

Operate Distance Trip

1. Position the machine at the origin point facing the next trip event of the desired pattern.
2. Depending on the configuration, set up guidance lines on the display to match the origin point and travel direction.



PC27238—UN—30MAY19

- A—Status
B—Start Button

3. Verify that the status (A) is Ready to Enable.
(Reference Troubleshooting if the status is not Ready to Enable.)
4. If the Require In-Work State to Trip checkbox is selected, turn ON work recording.
5. If the Require AutoTrac™ Engaged to Trip checkbox is selected, enable AutoTrac™. Verify that the

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AutoTrac is a trademark of Deere & Company

AutoTrac™ status pie displays 3/4 pieces when engaged.

(Reference the display or AutoTrac™ Operator's Manual for more information.)

6. Select the Start Button (B). Verify that the status turns to Enabled.

(Reference Troubleshooting if the status is not Enabled.)

NOTE: Auto mode requires a speed of 0.1 km/h (0.06 mph) or greater to engage.

7. Engage auto mode. If AutoTrac™ is required, press the resume switch.

(For more information, reference Engage Auto Mode.)

8. Drive machine along the defined pattern.



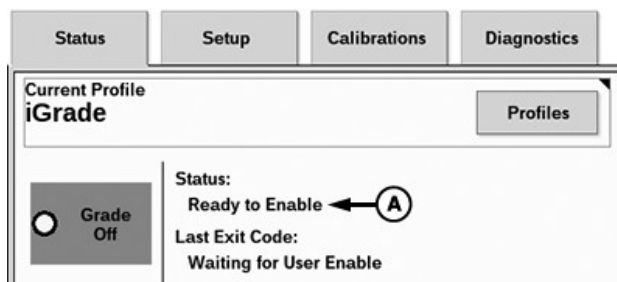
Stop Button

PC27239—UN—30MAY19

9. If needed, select the Stop button, reposition machine on the next guidance line, and repeat steps.

RW00482,00009D3-19-16APR20

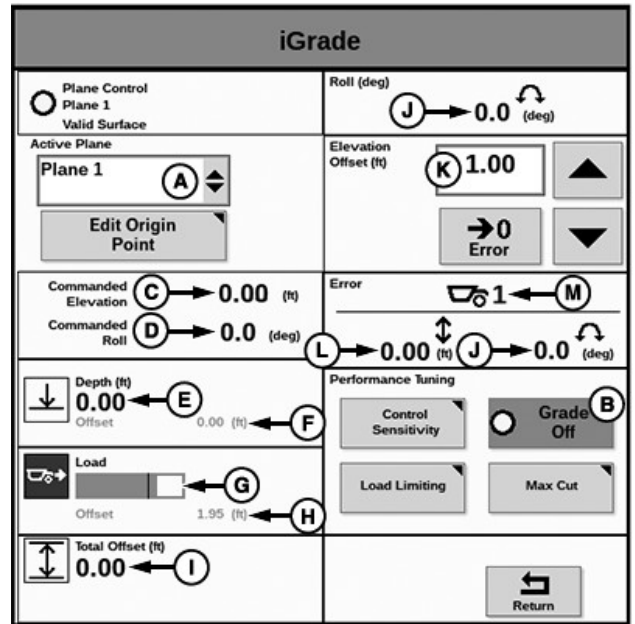
Operate iGrade™—Plane Control and Remote Control



PC27229—UN—30MAY19

A—Status

1. Verify that the status (A) is Ready to Enable.
(Reference Troubleshooting if the status is not Ready to Enable.)
2. With scrapers empty, position the machine within the defined slope cut area.



PC27302—UN—18JUN19

- A—Active Plane Drop-Down Menu
- B—Grade On/Off Button
- C—Commanded Elevation
- D—Commanded Roll
- E—Max Cut Depth
- F—Max Cut Offset
- G—Current Load
- H—Load Limiting Offset
- I—Total Offset
- J—Roll Error
- K—Elevation Offset
- L—Elevation Error
- M—Scraper Number

3. For plane control, select the appropriate plane from the drop-down menu (A).
4. Select the Grade On button (B). Verify that the status turns to Enabled.
(Reference Troubleshooting if the status is not Enabled.)

NOTE: Machine must be moving faster than 0.1 km/h (0.06 mph) for SCV to engage.

(Reference machine Operator's Manual for more information on SCV speed requirements.)

5. Engage auto mode. If using multiple scrapers, use the empty scraper that is the most forward first. Verify that the status turns to Active.
(For more information, reference Engage Auto Mode.)
(Reference Troubleshooting if the status is not Active.)
6. Allow the scraper to fill.
7. Monitor the commands, errors, and offsets. If needed, adjust settings or offsets.

The commands, errors, and offsets that are displayed depend on the configuration.

- Commanded Elevation (C) is the desired elevation.
- Commanded Roll (D) is the desired cross slope angle.
- Max Cut Depth (E) is the current maximum cut depth.
- Max Cut Offset (F) is the current maximum cut offset.
- Current Load (G) is the current load. Anything past the line is over the current load limiting settings.
- Load Limiting Offset (H) is the total offset calculated from all active load limiting options.
- Total Offset (I) is the total offset calculated from all active offsets.
- Roll Error (J) is the difference between the current roll angle and the commanded roll angle.
- Elevation Offset (K) is the operator defined-offset.
- Elevation Error (L) is the difference between the current elevation and the commanded elevation.

(For more information about settings and offsets, reference the Setup section.)

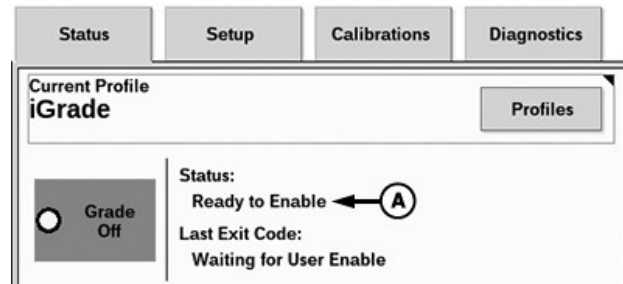
- Monitor the material in the bucket.
- When the bucket is full, disengage auto mode and raise the scraper.
- If using multiple scrapers, engage auto mode for the next scraper. Ensure that the scraper number (M) changes to the active scraper.
- Repeat steps until the scrapers are full or until the fill portion of the plane is reached.
- Unload the buckets in either the fill portion of the plane or the designated dump site. Use the Grade On/Off button when passing the boundaries of the plane.

(Reference scraper Operator's Manual for unloading operations.)

- Repeat steps until plane is created.

RW00482,00009D4-19-28APR20

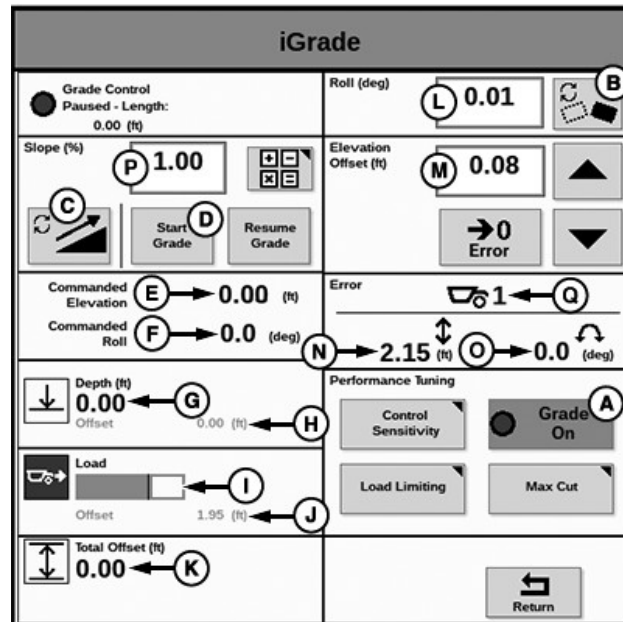
Operate iGrade™—Grade Control



PC27229—UN—30MAY19

A—Status

- Verify that the status (A) is Ready to Enable.
(Reference Troubleshooting if the status is not Ready to Enable.)
- With scrapers empty, position the machine in the direction of the desired grade with the scraper blade directly at the origin point.



PC27235—UN—30MAY19

- A—Grade On/Off Button
- B—Roll Direction Toggle
- C—Uphill/Downhill Toggle
- D—Start Grade Button
- E—Commanded Elevation
- F—Commanded Roll
- G—Max Cut Depth
- H—Max Cut Offset
- I—Current Load
- J—Load Limiting Offset
- K—Total Offset
- L—Roll
- M—Elevation Offset
- N—Elevation Error
- O—Roll Error
- P—Slope
- Q—Scraper Number

- Select the Grade On button (A). Verify that the status turns to Enabled.

(Reference Troubleshooting if the status is not Enabled.)

4. If cross slope is enabled, use the Roll Direction toggle (B) to define the cross slope direction.
5. Use the Uphill/Downhill toggle (C) to define travel direction.

NOTE: Machine must be moving faster than 0.1 km/h (0.06 mph) for SCV to engage.

(Reference machine Operator's Manual for more information on SCV speed requirements.)

6. Select the Start Grade button (D) and engage auto mode. If using multiple scrapers, use the forward most empty scraper first. Verify that the status turns to Active.

(For more information, reference Engage Auto Mode.)

(Reference Troubleshooting if the status is not Active.)

7. Allow the scraper to fill.
8. Monitor the commands, errors, and offsets. If needed, adjust settings or offsets.

The commands, errors, and offsets that are displayed depend on the configuration.

- Commanded Elevation (E) is the desired elevation.
- Commanded Roll (F) is the desired cross slope angle.
- Max Cut Depth (G) is the current maximum cut depth.
- Max Cut Offset (H) is the current maximum cut offset.
- Current Load (I) is the current load. Anything past the line is over the current load limiting settings.
- Load Limiting Offset (J) is the total offset calculated from all active load limiting options.
- Total Offset (K) is the total offset calculated from all active offsets.
- Roll (L) is the operator-defined cross slope angle.
- Elevation Offset (M) is the operator-defined offset.
- Elevation Error (N) is the difference between the current elevation and the commanded elevation.
- Roll Error (O) is the difference between the current roll angle and the commanded roll angle.
- Slope (P) is the define grade slope percentage.

(For more information about settings and offsets, reference the Setup section.)

9. Monitor the material in the bucket.

10. When the bucket is full, disengage auto mode and raise the scraper.
11. If using multiple scrapers, engage auto mode for the next scraper. Ensure that the scraper number (Q) changes to the active scraper.
12. Repeat steps until all scrapers are filled.



Pause Button

PC27236—UN—30MAY19

13. Once the last scraper is full, select the Pause button.
14. Unload the buckets in the appropriate area, then return to the area where the operation was paused.



Resume Grade Button

PC27237—UN—30MAY19

15. Select the Resume Grade button and resume operation.

RW00482,00009D5-19-28APR20

Troubleshooting

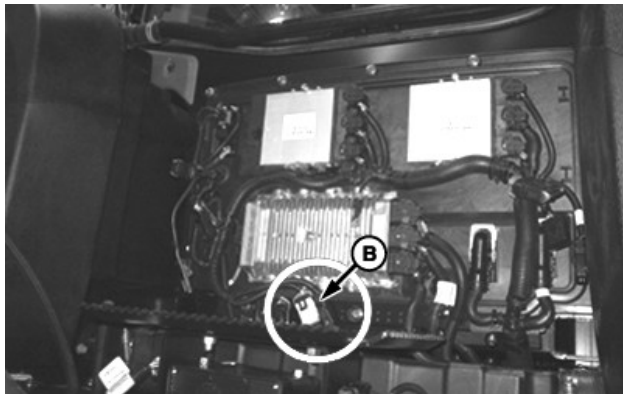
Reset UCC2 Application Controller

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.



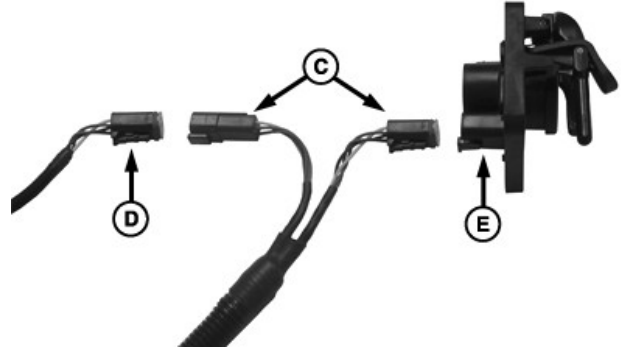
PC22232—UN—29FEB16



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

Status and Exit Codes

Status Code	Description	Solution
Disabled	The system has faults present.	Check the Distance Trip or iGrade™ Diagnostic pages for more information and to resolve faults.
Ready to Enable	The system is waiting for the operator to enable.	To enable, select either the Grade On button for iGrade™ or the Start button for Distance Trip.
Enabled	The system is waiting for the operator to turn on implement automation.	Enabling the system depends on how the system is configured. (Reference the Operating section for more information.)
Active	System is actively controlling the implement utilizing global positioning system (GPS) based guidance.	Normal operation.

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Troubleshooting

Exit Codes	Description	Solution
OK	Implement automation is ready to operate or is operating without errors. Any faults are likely to be independent of the UCC2 Application Controller system.	System is working properly.
Not Activated	Desired application has not been activated on the UCC2 Application Controller.	Reference Enter Activation Code for more information.
Machine GPS Accuracy Not Met	No machine GPS signal available or accuracy level is too low.	Reference Satellite Information or the StarFire™ Receiver Operator's Manual for more information.
Implement GPS Accuracy Not Met	No implement GPS signal available or accuracy level is too low.	Reference Satellite Information or the StarFire™ Receiver Operator's Manual for more information.
Valve Not Selected	Valve selection or interface is not selected.	Select either: - Distance Trip softkey > Setup tab > Trip Command Edit button > a valve selection or interface. - iGrade™ softkey > Setup tab > Equipment Edit button > Implement Edit button > a valve selection or interface.
Valve Not Available	The selected valve is not currently detected or is unable to actuate function.	Verify the connections and then restart the machine to attempt recovery.
Valve Not In Auto	The selected valve has not been placed into Auto mode.	If using Legacy JD Proprietary or JD Proprietary, detent the desired valve and release. If using ISO valve interface, select the resume switch.
Valve Fault	The selected valve is reporting a fault and cannot be used.	Inspect valve and then restart machine to attempt recovery.
Valve Not Calibrated	The selected valve has not had thresholds calibrated.	Calibrate thresholds. Select the iGrade™ softkey > Setup tab > Equipment Edit button > Implement Edit button > Calibrate button.
Speed Too Slow	The machine speed is below 0.1 km/h (0.06 mph) and cannot control valves.	Increase machine speed above the minimum speed threshold of 0.1 km/h (0.06 mph).
Implement Not Recording	Disable steering when work recording off is enabled and the display is reporting that work recording is off.	Turn on the display work recording.
Waiting for User Enable	Waiting for the operator to select the Steer On button.	To enable, select either the Grade On button for iGrade™ or the Start button for Distance Trip.
Speed Out of Range	Speed is too fast or too slow.	Operate machine between 0.1—35 km/h (0.06—22 mph).
Operator Not Present	Operator is not present.	Operator must be seated. Check the seat switch.
Maximum Cut Not Configured	Maximum Cut was enabled but was not configured.	Select the Distance Trip softkey > Setup tab > Max Cut Edit button > enter a maximum cut value.
Load Limiting Data Not Available	The Application Controller is not seeing the load limiting data on the CAN bus.	Check wiring and then restart machine to attempt recovery.
Load Limiting Not Configured	Load Limiting features are enabled but not configured.	Select the iGrade™ softkey > Setup tab > Load Limiting Edit button > enter load limits.
Grade Surface Not Defined	Surface setup is incomplete.	Select the iGrade™ softkey > Setup tab > Surface Edit button > complete the surface setup.
No Machine GPS Detected	Machine GPS signal is not available.	Check wiring and then restart the machine.
Distance Trip Not Selected	Trip pattern setup is not complete.	Complete the trip pattern setup. Select the Distance Trip softkey > Setup tab > Trip Pattern Edit button.
Distance Trip Reference Not Set	The origin point is not set.	Set the origin point. Select the Distance Trip softkey > Setup tab > Trip Pattern Edit button > Edit Origin button.
Ready	System is ready to be engaged.	Select the resume switch.
Valve Error—Restart To Attempt Recovery	A valve fault has been reported.	Check wiring and then restart machine to attempt recovery.
AutoTrac™ Not Active	AutoTrac™ is not active.	Engage AutoTrac™.

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RW00482,00009D6-19-29APR20

Troubleshooting—Distance Trip System

Symptom	Problem	Solution
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Symptom	Problem	Solution
Each pass shifts the trip pattern unexpectedly.	Equipment offsets are incorrect.	Enter the correct offsets. (Reference Equipment Offsets.) Perform an equipment offset calibration. (Reference Equipment Offset Calibration.)
Trip events are slightly off.	Account for mechanical delay.	Either adjust the actuator on and off delay times or perform a mechanical delay calibration. (Reference Equipment Offsets or Equipment Delay Calibration.)
The trip time or distance is longer than the entered value.	Each low side driver activates for different times or distances.	Verify that the relay is connected to the correct low side driver. (Reference Equipment Offsets or Equipment Delay Calibration.)

RW00482,00008D4-19-18JUN19

Troubleshooting—iGrade™ System

Symptom	Problem	Solution
Implement is not moving for any surface mode.	iGrade™ status does not display active.	Resolve the condition that is not configured. (Reference Diagnostics—iGrade™ Status.)
	Selective control valve (SCV) thresholds have not been adjusted.	Calibrate the SCV. (Reference SCV Configuration.)
	Application Controller was connected while machine was powered ON, creating hydraulic control unit diagnostic trouble codes.	Reset the UCC2 Application Controller. (Reference Reset UCC2 Application Controller.)
Scraper is raising or lowering without operator shifting the offset up or down.	Scraper is being commanded to move by the Application Controller based on a load limiting setting.	Verify load limiting settings and edit the control sensitivity and load limiting sensitivity to operator preference. (Reference Edit Control Sensitivity, Load Limiting, and Edit Load Limiting Sensitivity.)
The display is not showing the Application Controller.	There is no communications with the Application Controller.	Shut off power, check connections, and power up the system.

Symptom	Problem	Solution
		Clean and reconnect the 4-pin DEUTSCH® connector at the back of the ISO implement connector on machine. <i>NOTE: If a rear extension harness is not used, a terminator is required at the end of the harness.</i> Verify the connection at the front of the implement.
Graphics are not displaying or are not displaying correctly.	Graphics did not load correctly.	Remove graphic files from the display cache. (If using a GreenStar™ Display, reference Data Cleanup.) (If using a Generation 4 CommandCenter™, reference Clean Up ISOBUS VT.)
Implement is not receiving remote commands.	Display is not set up to send proper elevation error from Surface Water Pro™ Plus or third-party software.	Ensure that display software is updated and that Surface Water Pro™ Plus or third-party software is set up correctly.
Periodically, iGrade™ performs erratically.	Vertical dilution of precision (VDOP) value is high.	If needed, install a global navigation satellite system (GNSS) antenna or a choke ring antenna. (Reference Satellite Information—VDOP and Component Overview.)
	Multipathing is occurring at the implement receiver or base station.	(Reference Set Up Base Station.)
External antenna status is disconnected.	There is a faulty antenna connection.	Ensure that the coaxial cable from the radio to the antenna is not damaged and that the antenna is not loose. Ensure that the antenna is not broken.
iGrade™ performance is poor.	SCV thresholds are not set correctly.	Calibrate the selective control valve (SCV). (Reference SCV Configuration.)
	Load limiting settings are too high or too low.	Adjust load limiting settings. Verify load limiting settings and edit the control sensitivity and load limiting sensitivity to operator preference. (Reference Load Limiting.)

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 CommandCenter is a trademark of Deere & Company
 Surface Water Pro is a trademark of Deere & Company
 iGrade is a trademark of Deere & Company

Troubleshooting

Symptom	Problem	Solution
	Sensitivity settings are too high or too low.	Adjust control and load limiting sensitivities. Verify load limiting settings and edit the control sensitivity and load limiting sensitivity to operator preference. (Reference Edit Control Sensitivity and Edit Load Limiting Sensitivity.)
One side of the furrow bed is lower than the other side.	Gauge wheel cylinders are out of phase.	Cycle hydraulics for the gauge wheel cylinders.

RW00482,00008D2-19-18JUN19

Troubleshooting—Machine

Symptom	Problem	Solution
The tractor stalls.	Load limiting thresholds are not set properly.	Adjust the load limiting thresholds. (Reference Load Limiting for more information.)
	Maximum cut is too aggressive.	Adjust the maximum cut settings. (Reference Maximum Cut for more information.)
Auto mode indicator is not showing on the display.	Dirty or loose 10-pin connector at the rear of the machine.	Power down the machine and disconnect all iGrade™ components. Clean all the connectors and check for loose or dirty pins. Reconnect all the iGrade™ components and power up the machine. (Reference Reset UCC2 Application Controller for more information.)
		Verify that correct surface mode and selective control valve (SCV) are selected in the iGrade™ setup, then cycle power.
Implement is not adjusting to the desired grade.	AUTO with a strike through it or EC is displayed.	To enable auto mode, push the correct SCV control lever into detent.
Display and operation of implement lost.	Dirty or loose 4-pin connection at the rear of the machine.	Clean and reconnect the connectors.
	The GreenStar™ harness is improperly connected.	Power down the machine and system. Disconnect, clean, and then reinstall the harness properly.
	There is an electrical short in the harness.	Check the electrical wiring for breaks, shorts, and damage.
Washboarding—scraper is overly sensitive and causes a washboard effect.	SCV flow rate is too high.	Decrease the SCV flow rate.
	Counterbalance valve is improperly adjusted.	Adjust the counterbalance valve cartridges and perform manual SCV threshold calibration. (Reference Manual SCV Calibration for more information.)
	Roll control sensitivity is set too high or low.	Adjust the roll control sensitivity settings. (Reference Edit Control Sensitivity for more information.)

Symptom	Problem	Solution
Control and load limiting functionality is impaired or limited.	SCV flow rate is too low.	Increase the SCV flow rate.
Unable to create a grade while unloading or filling the scraper.	Distance between the cutting edge and receiver does not stay constant while unloading or filling due to scraper design.	Unloading or filling can only be done when the distance between the cutting edge and receiver is constant.

RW00482,00008D8-19-18JUN19

External Valve

Symptom	Problem	Solution
The 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 the implement feedback sensor connector on the machine-side.
	The external valve wiring harness is disconnected.	Connect the external valve wiring harness. The LED on the external valve should light up.
	The external valve installed is not compatible with the machine hydraulic system design (open-center versus closed-center designs).	Verify that the part number of the valve installed on the implement is compatible with the machine hydraulic system design. (For more information, reference UCC2 Application Controller and External Valve Installation Instructions or contact your John Deere dealer.)
	SCV control harness has loose or no connection to the Application Controller harness.	Verify that connections are correct.
	SCV control harness is plugged into the implement receiver or front extension harness.	Verify that SCV control harness is plugged into the Application Controller harness.
	Inline check valve on the pump hose is not functioning or not present.	Install, repair, or replace the check valve.

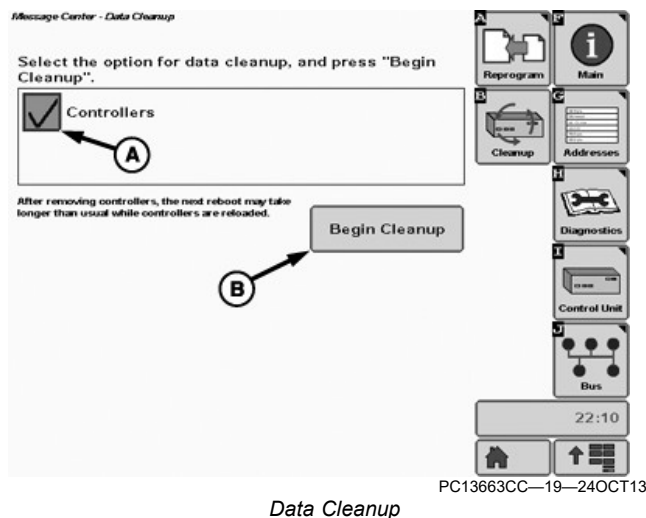
Symptom	Problem	Solution
LED light is red.	There is back pressure buildup in the external valve.	CAUTION: When moving the external valve control lever, the implement may move. The hoses connected are reversed, causing back pressure. Verify that hoses are connected properly. If the problem still exists, perform the following: 1. With the tractor running, put the hydraulics in float. 2. Key off the machine. 3. Cycle the external valve control lever manually several times. 4. Cycle the power to clear red light.
	There is an external valve error.	Contact your John Deere dealer.

RW00482,00008D6-19-06JUN19

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.



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

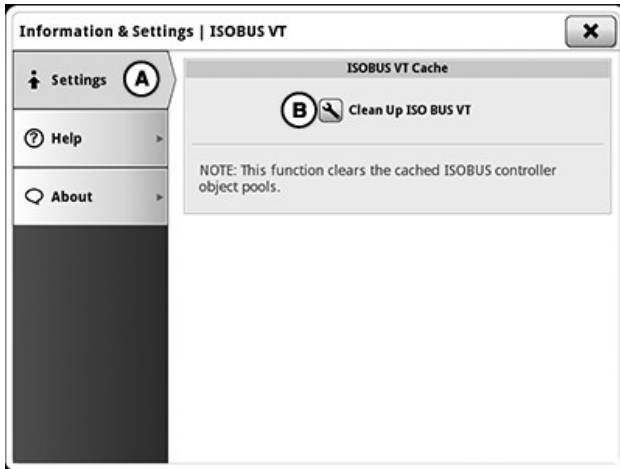
1. Select the ISOBUS VT softkey.



Settings Icon

PC15305—UN—19MAR13

2. Select the Settings icon.



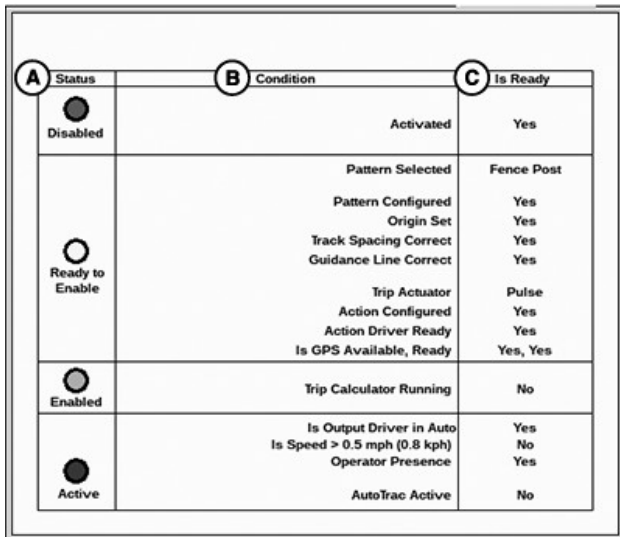
PC23373—UN—15NOV16

- A—Settings Tab
B—Clean Up ISOBUS VT Button

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

RW00482,000074-19-13MAR18

Diagnostics—Distance Trip Status



PC27190—UN—20MAY19

- A—Status
B—Condition
C—Is Ready

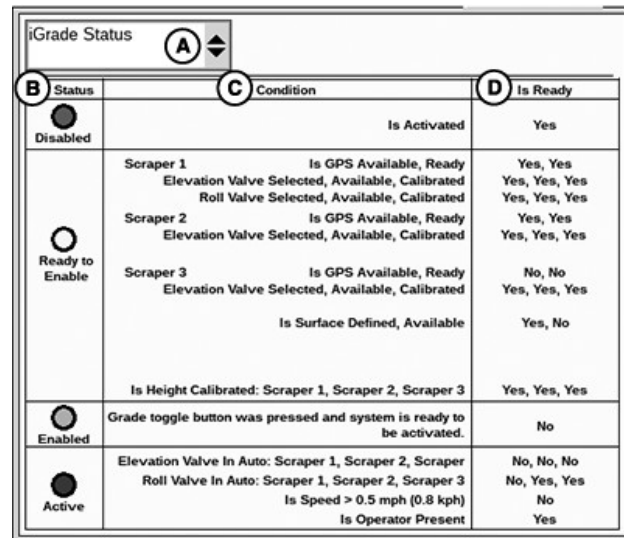
Select Distance Trip softkey > Diagnostics tab.

Distance Trip Status displays:

- Status (A)—The operational status of Distance Trip.
- Condition (B)—The requirements to reach each status.
- Is Ready (C)—Indicates if the condition has been met.

RW00482,00008D0-19-18JUN19

Diagnostics—iGrade™ Status



PC27189—UN—20MAY19

- A—Drop-Down Menu
B—Status
C—Condition
D—Is Ready

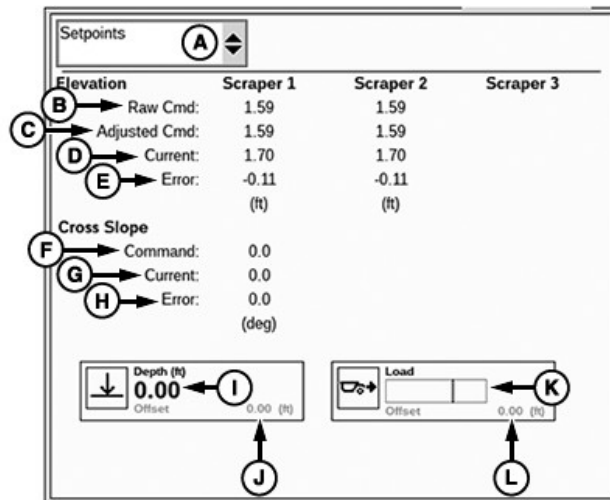
Select iGrade™ softkey > Diagnostics tab > iGrade™ Status from the drop-down menu (A).

iGrade™ Status displays:

- Status (B)—The operational status of iGrade™.
- Condition (C)—The requirements to reach each status.
- Is Ready (D)—Indicates if the condition has been met.

RW00482,00008CF-19-06JUN19

Diagnostics—Setpoints



PC27191—UN—20MAY19

- A—Drop-Down Menu
B—Raw Elevation Command

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C—Adjusted Elevation Command
D—Current Elevation
E—Elevation Offset Error
F—Cross Slope Command
G—Cross Slope Current Position
H—Cross Slope Offset Error
I—Current Cutting Depth
J—Elevation Offset Applied
K—Current Load
L—Load Limiting Offset Applied

Select iGrade™ softkey > Diagnostics tab > Setpoints from the drop-down menu (A).

Setpoints displays elevation and cross slope (if enabled) information for up to three implements:

- Raw Elevation Command (B)
- Adjusted Elevation Command (C)
- Current Elevation (D)
- Elevation Offset Error (E)
- Cross Slope Command (F)
- Cross Slope Current Position (G)
- Cross Slope Offset Error (H)
- Current Cutting Depth (I)
- Elevation Offset Applied (J)
- Current Load (K)
- Load Limiting Offset Applied (L)

RW00482,00008D1-19-18JUN19

Select iGrade™ softkey > Diagnostics tab > Max Cut from the drop-down menu (A).

Diagnostics—Maximum Cut displays the following information for up to three implements:

- GPS to Cutting Edge Elevation (B)
- Ground Elevation (C)
- Cutting Edge Elevation (D)
- Current Cutting Depth (E)
- Elevation Offset Applied (F)
- Current Load (G)
- Load Limiting Offset Applied (H)

RW00482,00008D9-19-06JUN19

Diagnostics—Load Limiting

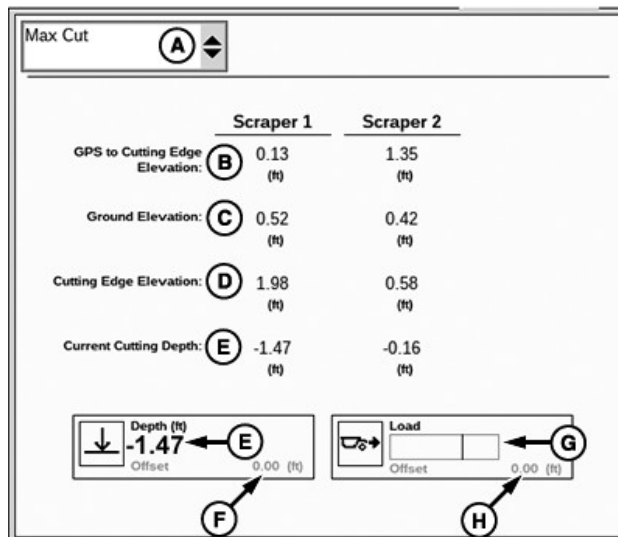


PC27204—UN—24MAY19

A—Current Load
B—Load Limiting Offset Applied

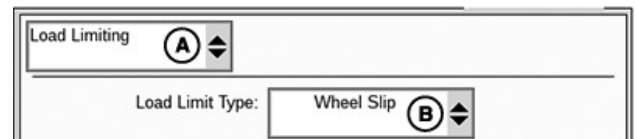
The current load (A) and load limiting offset applied (B) are an overall calculation based on all the enabled load limiting options, threshold settings, and sensitivity settings. If needed, adjust the threshold and sensitivity settings for enabled load limiting options.

Diagnostics—Maximum Cut



PC27197—UN—23MAY19

A—Drop-Down Menu
B—GPS to Cutting Edge Elevation
C—Ground Elevation
D—Cutting Edge Elevation
E—Current Cutting Depth
F—Elevation Offset Applied
G—Current Load
H—Load Limiting Offset Applied



PC27199—UN—23MAY19

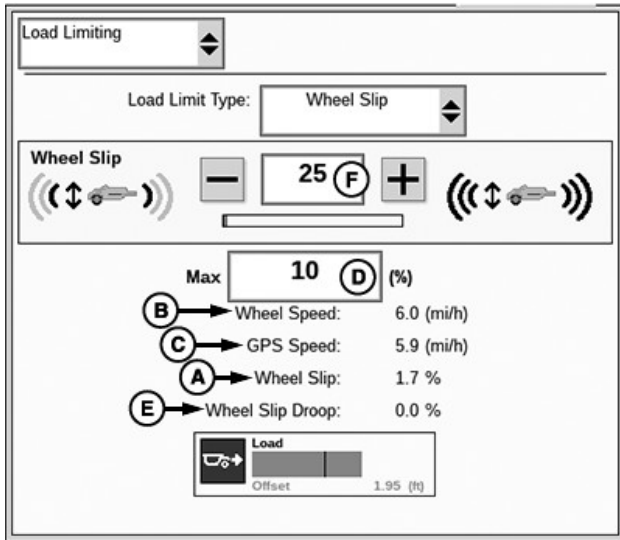
A—Drop-Down Menu
B—Load Limit Type Drop-Down Menu

Select iGrade™ softkey > Diagnostics tab > Load Limiting from the drop-down menu (A).

Select a load limit type from the drop-down menu (B).

- Wheel Slip
- Engine Speed
- Engine Load

Wheel Slip



PC27200—UN—24MAY19

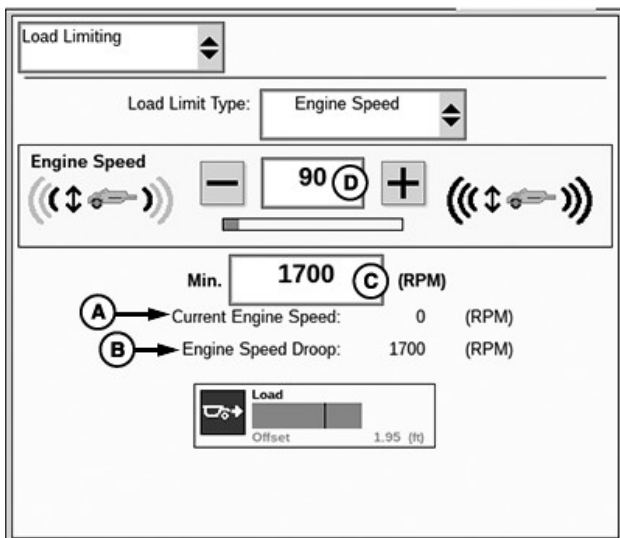
- A—Wheel Slip
- B—Wheel Speed
- C—GPS Speed
- D—Maximum Wheel Slip Threshold
- E—Wheel Slip Droop
- F—Wheel Slip Sensitivity

Wheel slip (A) monitors the difference between the wheel speed (B) and the global positioning system (GPS) speed (C).

As the wheel slip approaches the maximum wheel slip threshold (D), the Application Controller commands the hydraulics to raise the scraper blade to reduce slippage. As the wheel slip decreases, the Application Controller commands the hydraulics to lower the scraper blade to the previous elevation.

Wheel slip droop (E) is the amount of slippage beyond the entered maximum wheel slip threshold. The load offset applied is calculated by multiplying the wheel slip droop by sensitivity (F).

Engine Speed



PC27201—UN—24MAY19

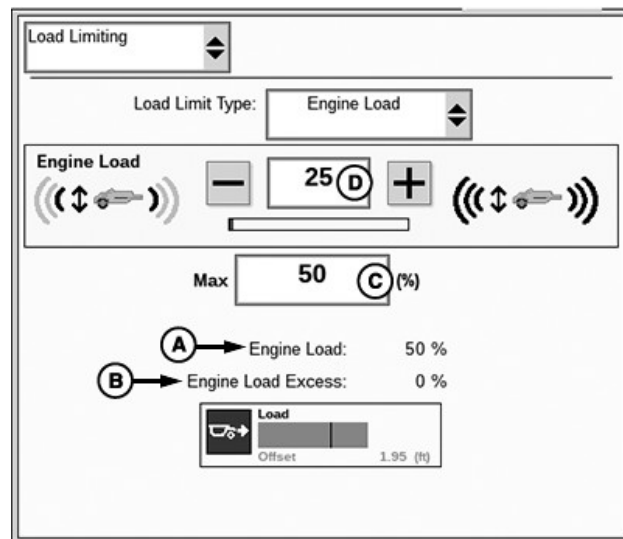
- A—Current Engine Speed

- B—Engine Speed Droop
- C—Minimum Engine Speed Threshold
- D—Engine Speed Sensitivity

Current engine speed (A) monitors the engine speed (rpm) on the CAN bus. As the engine speed approaches the minimum value, the Application Controller commands the hydraulics to raise the scraper blade to reduce the system load. As the engine speed increases, the Application Controller commands the hydraulics to lower the scraper blade to the previous elevation.

Engine speed droop (B) is the engine speed below the minimum engine speed threshold (C). Load limiting height adjustments are calculated by multiplying the wheel speed droop by sensitivity (D).

Engine Load



PC27202—UN—24MAY19

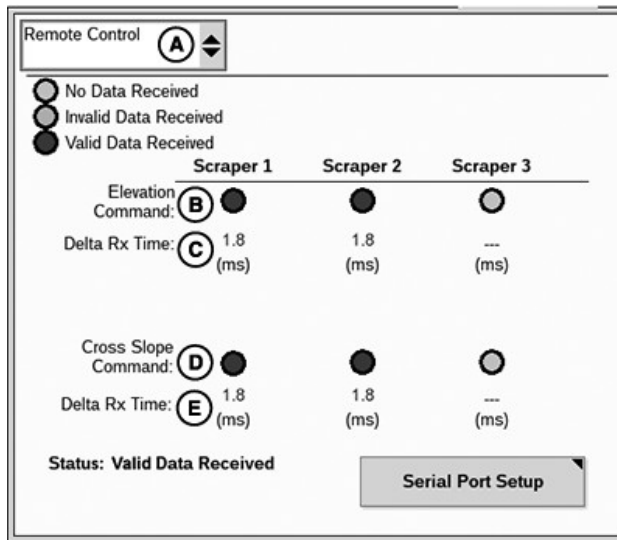
- A—Engine Load
- B—Engine Load Excess
- C—Maximum Engine Load Threshold
- D—Engine Load Sensitivity

Engine load (A) monitors the engine load (torque) on the CAN bus. As the engine load approaches the maximum value, the Application Controller commands the hydraulics to raise the scraper blade to reduce system load. When the engine load is low, the Application Controller commands the hydraulics to lower the scraper blade to the previous elevation.

Engine load excess (B) is the current engine load above the maximum engine load threshold (C). Load limiting height adjustments are calculated by multiplying the engine load excess by sensitivity (D).

RW00482,00008DA-19-18JUN19

Diagnostics—Remote Control



PC27198—UN—23MAY19

- A—Drop-Down Menu
 B—Scraper Elevation Command
 C—Scraper Delta Rx Time
 D—Cross Slope Elevation Command
 E—Cross Slope Delta Rx Time

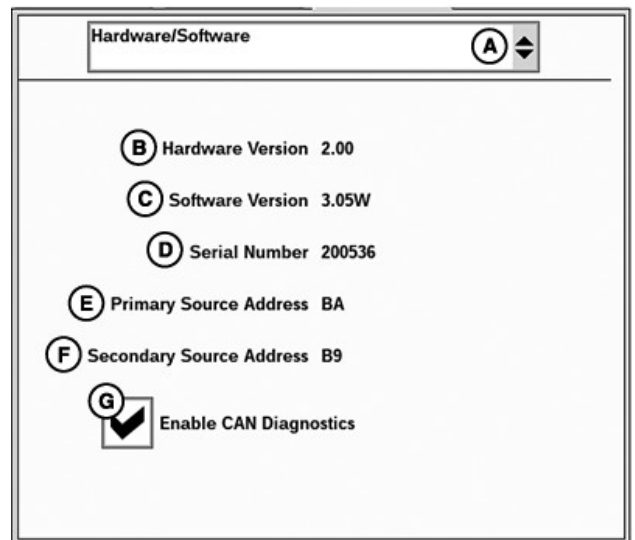
Select iGrade™ softkey > Diagnostics tab > Remote Control from the drop-down menu (A).

Remote Control displays the following information for up to three implements:

- Scraper Elevation Command (B)
- Scraper Delta Rx Time (C)
- Cross Slope Elevation Command (D)
- Cross Slope Delta Rx Time (E)

RW00482,00008DB-19-18JUN19

Hardware/Software



PC26366—UN—27MAR19

- A—Drop-Down Menu
 B—Hardware Version
 C—Software Version
 D—Serial Number
 E—Primary Source Address
 F—Secondary Source Address
 G—Enable CAN Diagnostics Checkbox

Select the Controller Setup softkey > Diagnostics tab > Hardware/Software from the drop-down menu (A).

Hardware/Software displays the Application Controller:

- Hardware Version (B)
- Software Version (C)
- Serial Number (D)
- Primary Source Address (E)
- Secondary Source Address (F)

To enable broadcasting of diagnostic values and statuses for CAN recording, select the Enable CAN Diagnostics checkbox (G). CAN recordings are used for advanced troubleshooting.

RW00482,0000791-19-04APR19

Input/Output Readings

Input/Output Readings			
A			
B Signal	E Pin	F Voltage	
Analog In 1	G2	0.01	
Analog In 2	K2	0.01	
Analog In 3	G3	0.00	
Analog Out 1	H1	0.03	
Analog Out 2	J1	0.03	
5 V In	E1	0.02	
5 V Out	K3	4.94	
C Signal	E Pin	G State	H Frequency (Hz)
Dig In 1	G1	0	0
Dig In 2	K1	0	0
Dig In 3	C3	1	0
D Signal	E Pin	G State	I Current (mA)
Low Side Driver 1	E3	1	21
Low Side Driver 2	E2	1	7
Low Side Driver 3	D3	1	27

PC26375—UN—11DEC18

A—Drop-Down Menu
 B—Analog Signal
 C—Digital Signal
 D—Low Side Driver Signal
 E—Pin Number
 F—Voltage
 G—State
 H—Frequency
 I—Current

Select the Controller Setup softkey > Diagnostics tab > Input/Output Readings from the drop-down menu (A).

Input/Output Readings display the signal type (B—D) and the pin number (E) used on the Application Controller connector.

- Analog signals display voltage (F).
- Digital signals display the state (G) and frequency (H).
- Low side drivers display the state (G) and current (I).

Analog and Voltage			SCV Type Selected			
Signal	Pin	Voltage	Legacy JD Proprietary	JD Proprietary	ISO	External Valve
Analog In 1	G2	iGrade™ Dealer SCV calibration tool can use this input.	Only applicable for advanced troubleshooting.			
Analog In 2	K2	iGrade™ Dealer SCV calibration tool can use this input.	Only applicable for advanced troubleshooting.			
Analog In 3	G3	Not applicable for iGrade™ or Distance Trip.	Not applicable			
Analog Out 1	H1	Command SCV 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.	Not applicable	Not applicable	When set up for SCV 1, this is the voltage reading of the 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 lever, ensure that external valve is connected and the light is on.
Analog Out 2	J1	Command SCV 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 applicable	Not applicable	When set up for SCV 2, 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 lever, ensure that external valve is connected and the light is on.
5 V In	E1	0—5 V sensor voltage. With the implement feedback harness connected, it is 5 V.	Voltage coming from the hydraulics control unit system should read 5 V.	Not applicable	Not applicable	Not applicable

Troubleshooting

		With a tractor SCV, it is 0 V and changes with command.				
5 V Out	K3	Supplied voltage for system. 0—5 V	Voltage supplied to system should read close to 5 V.			

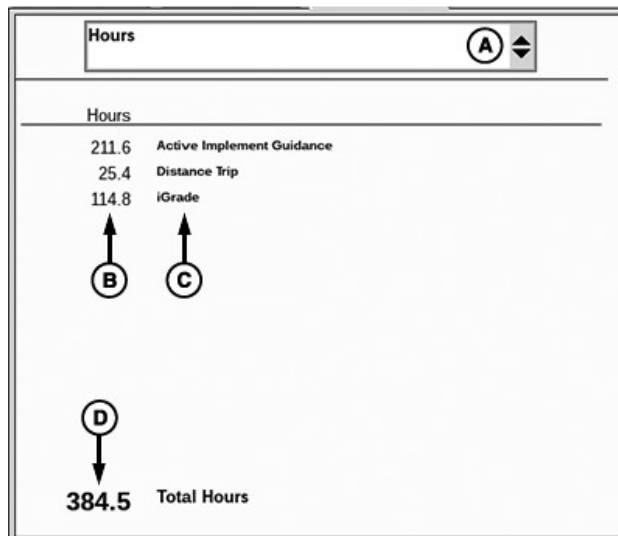
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Digital Signal	Pin	State	Frequency (Hz)
Digital In 1	G1	External valve remote mount electronic SCV control lever, 0 = no command, 1 = command	Not applicable for iGrade™ or Distance Trip.
Digital In 2	K1	External valve remote mount electronic SCV control lever, 0 = no command, 1 = command	
Digital In 3	C3	Not applicable for iGrade™ or Distance Trip.	

Drivers	Pin	State	Current (mA)
Low Side Driver 1	E3	Not applicable for iGrade™ or Distance Trip.	< 3000 mA
Low Side Driver 2	E2	Driver for relay used with Distance Trip. The low side drivers use a low current (30 mA or less) to activate (close/ground) the high current side of the relay. Pin E2 activates only for the trip on time or distance, then deactivates. After pin E2 deactivates, pin D3 immediately activates (closes/grounds) for 1.5 times the on duration, then it deactivates. 0 = idle, 1 = trip extend/on	< 3000 mA
Low Side Driver 3	D3	Driver for relay used with Distance Trip. The low side drivers use a low current (30 mA or less) to activate (close/ground) the high current side of the relay. Pin E2 activates only for the trip on time or distance, then deactivates. After pin E2 deactivates, pin D3 immediately activates (closes/grounds) for 1.5 times the on duration, then it deactivates. 0 = idle, 1 = trip retract	< 3000 mA

RW00482,00009D9-19-29APR20

Hours



PC26561—UN—27NOV18

- A—Drop-Down Menu
- B—Hours
- C—Application
- D—Total Hours

Select the Application Controller softkey > Diagnostics tab > Hours from the drop-down menu (A).

Hours (B) displayed are the amount of time each application (C) operated with an active status.

Total hours (D) displayed are the total time the Application Controller operated with an active status.

RW00482,00007CD-19-03JUN19

SCV Diagnostics

SCV Diagnostics					
A					
B	C	D	E	F	
Config.	Imp #/ Flow	Feedback	User Cmd	App. Cmd.	
SCV1	1	Blocked	Blocked	Retract	
JD Proprietary	0	0	0	0	
iGrade Elev.					
SCV2	0	Blocked	Blocked	Retract	
JD Proprietary	0	0	0	0	
iGrade Xslope					
SCV3	0	Blocked	Blocked	Retract	
JD Proprietary	0	0	0	0	
iGrade Elev.					
SCV4	0	Blocked	Blocked	Retract	
JD Proprietary	0	0	0	0	
iGrade Elev.					

PC27188—UN—20MAY19

A—Drop-Down Menu

B—Configuration

C—Implement Number Flow

D—Sensor Feedback

E—User Command

F—Application Controller Command

Select the Controller Setup softkey > Diagnostics tab > SCV Diagnostics from the drop-down menu (A).

SCV Diagnostics displays:

- Configuration (B)
- Implement Number Flow (C)
- Sensor Feedback (D)
- User Command (E)
- Application Controller Command (F)

SCV Diagnostics Values		
Flow State	Number	Definition
Blocked	0	Valve does not allow any flow.
Extend	1	Valve allows positive flow.
Retract	2	Valve allows negative flow.
Float	3	Valve is opened.
Error	14	Something went wrong.

RW00482,00008CD-19-06OCT21

Maintenance

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 the 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.)

NOTE: Ensure that the equipment has an uninterrupted power supply while updating software. Software update times vary based on the equipment, network or CAN bus speed, and file size of the program. For example, updating the UCC2 Application Controller takes an average of 30 minutes.

- ☐ Update software. Refer 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 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.
- ☐ Set up applicable machine features:
 - ☐ IVT™ (Infinitely Variable Transmission)
 - ☐ Automatic PowerShift™
 - ☐ PowerShift™ Efficiency Manager™
 - ☐ Foot Decelerator

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

RW00482,00005AF-19-07DEC20

Daily Checklist

- ☐ Calibrate benchmark.
- ☐ 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 hydraulic cylinder for leaks.

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

RW00482,00002AD-19-11NOV14

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

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Efficiency Manager is a trademark of Deere & Company

- ☐ Inspect implement hydraulic cylinder for leaks.

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

RW00482,00002B0-19-11NOV14

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