



John Deere AutoTrac™ Controller—Raven



JOHN DEERE



OPERATOR'S MANUAL

John Deere AutoTrac™ Controller—Raven

OMPFP17742 ISSUE J7 (ENGLISH)

CALIFORNIA

Proposition 65 Warning

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

If this product contains a gasoline engine:



WARNING

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

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

John Deere Ag Management Solutions

Printed in U.S.A.



Introduction

Foreword

THANK YOU for purchasing a John Deere product.

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

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

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

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

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

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

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

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

Serial Number: _____

JS56696,0000C4C-19-03FEB17

John Deere Technical Information Bookstore

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

CZ76372,000071F-19-17FEB17

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

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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-19-29SEP88

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.

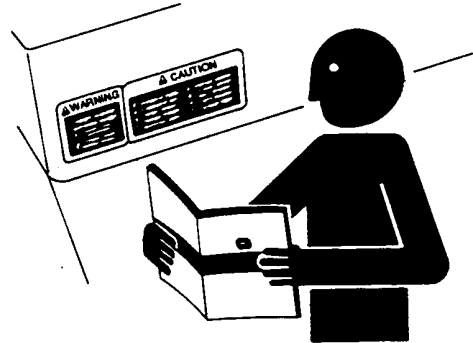
WARNING; The signal word WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

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

Follow Safety Instructions



TS201—UN—15APR13

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

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

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

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

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

DX,READ-19-16JUN09

Practice Safe Maintenance



TS218—UN—23AUG88

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

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

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

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

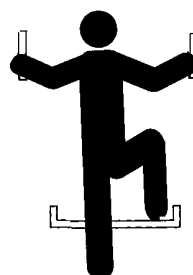
On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

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

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

DX,SERV-19-28FEB17

Use Steps and Handholds Correctly



T133468—UN—15APR13

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

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

DX,WW,MOUNT-19-12OCT11

Handle Electronic Components and Brackets Safely



TS249—UN—23AUG88

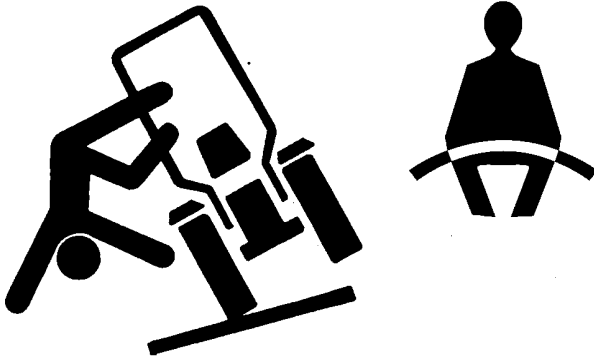
Falling while installing or removing electronic components mounted on equipment can cause serious injury. Use a ladder or platform to easily reach each mounting location. Use sturdy and secure footholds and handholds. Do not install or remove components in wet or icy conditions.

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

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

DX,WW,RECEIVER-19-24AUG10

Use 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 approved for your machine. See your John Deere dealer.

DX,ROPS1-19-22AUG13

Operate Guidance Systems Safely

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

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

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

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

To prevent injury to the operator and bystanders:

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

JS56696,0000ABC-19-02DEC13

Use Electronic Display Properly

Electronic Displays are secondary devices intended to aid the operator in performing field operations, increase comfort and provide entertainment. Displays can 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 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.

RR94114,0001FFA-19-18DEC14

Use AutoTrac™ Controller on Approved Machines

Use AutoTrac™ Controller only on approved machines. Refer to StellarSupport.com for list of approved machines.

AL70325,0000188-19-22SEP14

Inspect AccuGuide Pressure Transducer Valve for Leaks

Regularly inspect the AccuGuide Pressure Transducer Valve for leaks. Hydraulic oil leaking from this valve may result in steering wheel motion not deactivating AutoTrac. Consult your dealer if leaks are found.



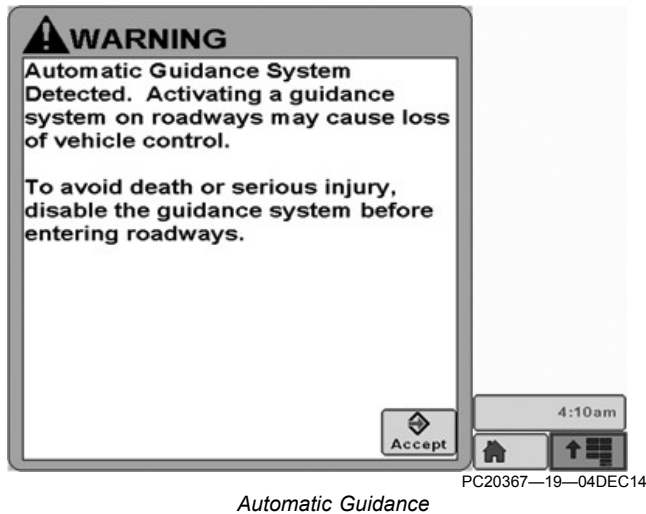
PC13830—UN—14JUN11

AccuGuide Pressure Transducer Valve

JS56696,0000535-19-14JUN11

Safety Signs

Automatic Guidance System Detected



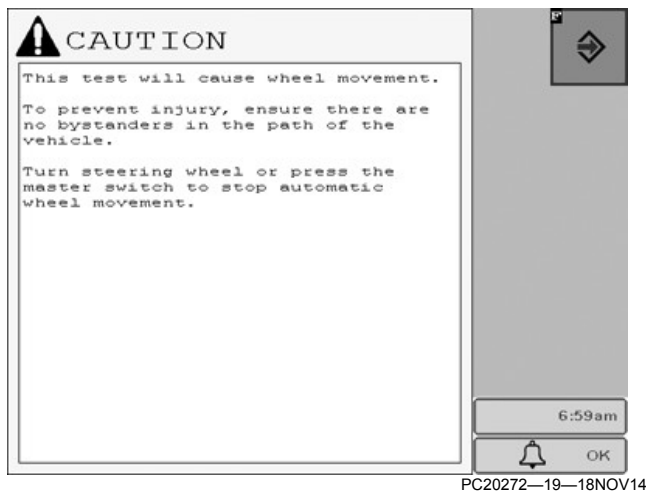
This message occurs during startup on vehicles with AutoTrac™ installed.

The master switch removes power from the EH Valve to prevent AutoTrac™ from being unintentionally activated. The master switch is intended for use on roadways or when the operator does not want AutoTrac™ able to be activated.

Ensure that AutoTrac™ is disabled by turning the Master Switch to the OFF position.

JS56696,0000A3B-19-10AUG17

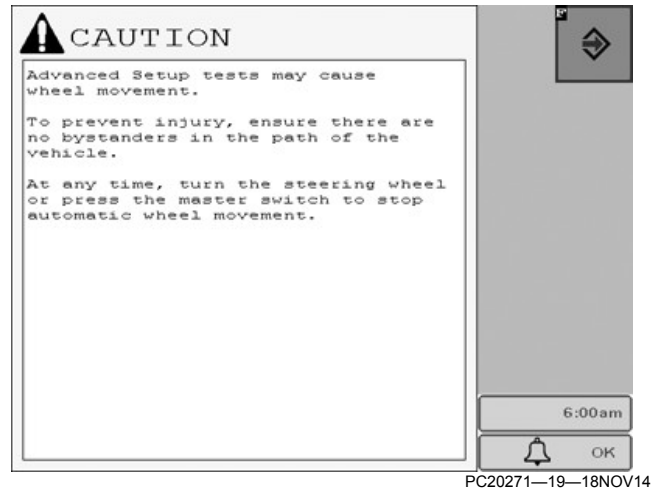
Wheel Movement



This message occurs while performing AutoTrac™ Controller–Raven Calibration and Health Test steps.

AL70325,00001A5-19-14NOV14

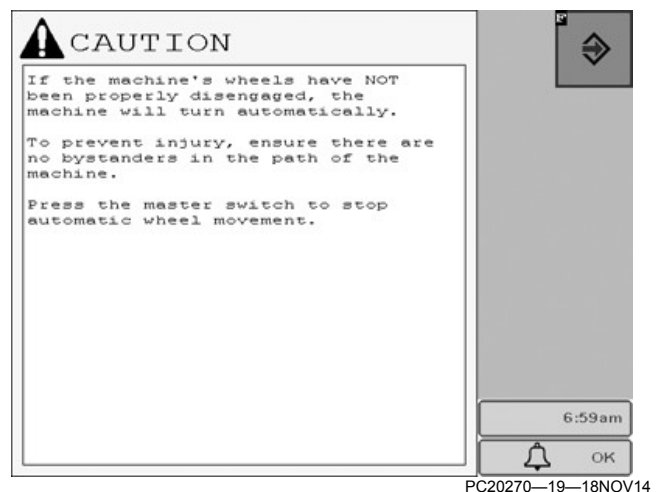
Wheel Movement



This message occurs when selecting Tool Box softkey in AutoTrac™ Controller menu.

AL70325,00001A1-19-14NOV14

Machine Movement



This message occurs while performing AutoTrac™ Controller–Raven Calibration on windrowers.

AL70325,00001A9-19-14NOV14

Regulatory and Compliance Information

Federal Communications Commission Notifications to User

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment

generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced technician for help.

RW00482,0000558-19-23SEP15

EC Declaration of Conformity (No. EN F0007)

**Raven Industries
205 E. 6th Street
Sioux Falls, South Dakota 57104
U.S.A.**

The person named below declares that

Product: AutoTrac™ ECU

Model Number: JDP-FP11-165

fulfills all relevant provisions and essential requirements of the following directives:

Directive	Number	Certification Method
Electromagnetic Compatibility Directive	2004/108/EC	Self certified, per Annex II of the Directive

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

EN ISO 14982:2009

EN 55022:2010/AC:2011

EN 55024:2010

IEC 60950-1 (ed. 2); am1; am2

Place of declaration: Sioux Falls, South Dakota
U.S.A.

Name: Jared Kocer

Date of declaration: 30 October 2015

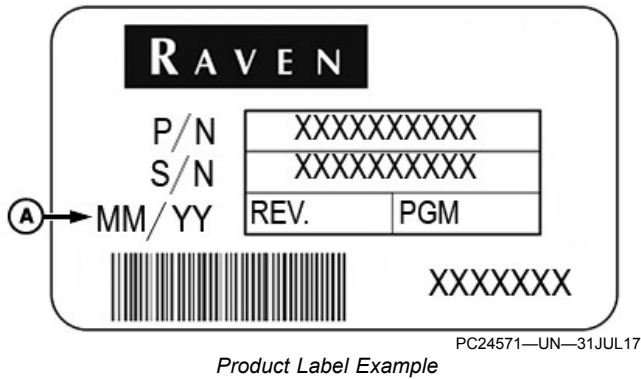
Title: Director of Product Development ATD

Manufacturing unit: Raven Industries, Inc.



DXCE01—UN—28APR09
AE77568,0000186-19-07JAN16

Identify Date Code



A—Date Code (Date of Manufacture)

Use the date code (A) on the product label to identify the date of manufacture.



Date Code Example

PC24572—UN—31JUL17

B—Month Number of Calendar Year of Manufacture
C—Last Two Numbers of Year of Manufacture

“MM” (B) identifies the month number of calendar year of manufacture; “YY” (C) identifies the last two numbers of the year of manufacture.

NOTE: The month number of manufacture ranges between 01-12.

Date Code		
MM	Month Number of Calendar Year of Manufacture	Example: 01, 02, 03...12
YY	Last Two Numbers of Year of Manufacture	Example: 14 = 2014 15 = 2015 16 = 2016

RW00482,0000199-19-31JUL17

Eurasian Economic Union—EAC

Eurasian Economic Union - EAC

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

Manufacturer: Raven Industries, Inc
Sioux Falls, South Dakota, U.S.A.

Model: AutoTrac Controller - Raven
Made in the U.S.A.

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

Address: 142050, Russia, Moscow region, Domodedovo district, Domodedovo, Beliy Stolbi micro district, vladenye “Warehouse 104,” Building 2.

For technical support, please contact your dealer.



PC24541—UN—27JUL17

Евразийский экономический союз (ЕАЭС)

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

Производитель: Компания Raven Industries, Inc.
Су-Фолс, Северная Дакота, США

модель: контроллер AutoTrac, товарный знак Raven, модель UGRA
Сделано в США

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

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

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



PC24542—UN—26JUL17
RW00482,000019A-19-11AUG17

System Overview

Theory of Operation

AutoTrac™ Controller—Raven is a hydraulic steering system designed to provide automated guidance while using a 4640 Universal Display or GreenStar™ Display and StarFire™ Receiver. The control unit sends adjustments to the steering valve based on inputs from display, receiver, and wheel angle sensor to keep machine on predetermined guidance lines. System uses hardware and software from John Deere and Raven Industries. System is capable of using the factory installed electrohydraulic valves, wheel angle sensors, and steering input devices. Once the control unit is installed, the display is used to calibrate system and set up guidance.

RW00482,0000540-19-28SEP17

AutoTrac™ Raven Requirements

Hardware:

- GreenStar™ 2 1800 Display, GreenStar™ 3 2630 Display, or 4640 Universal Display
- StarFire™ 3000 or 6000 Receiver
- Raven Steering Controller
- Steering input device
- Electro-hydraulic valve
- Wheel angle sensor
- Resume switch
- Master switch
- Seat switch (if the seat switch option is selected)

Software:

- AutoTrac™ activation on display

RW00482,000053E-19-28SEP17

Activate AutoTrac™ GreenStar™ Display



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.

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



GreenStar™ Button

PC17340—UN—24OCT13

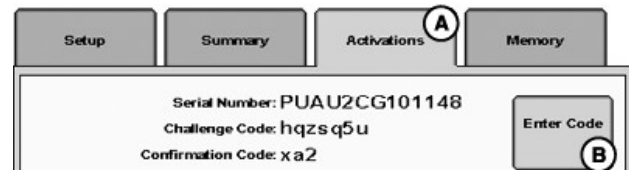
2. Select the GreenStar™ button.



GreenStar™ Softkey

PC21183—UN—20MAY15

3. Select the GreenStar™ softkey.

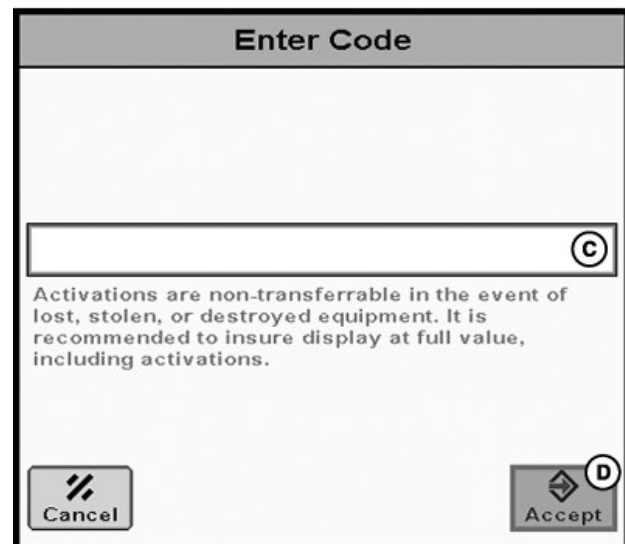


PC21181—UN—20MAY15

A—Activations Tab

B—Enter Code Button

4. Select the Activations tab (A).
5. Select the Enter Code button (B).



PC21182—UN—18MAY15

C—Enter Code Input Box

D—Accept Button

6. Enter Code (C).
7. Select the Accept button (D).

Generation 4 Display



Menu Button

PC17269—UN—15JUL13

1. Select the Menu button.



System Tab

PC24666—UN—05SEP17

2. Select the System tab.



Software Manager Application

PC15346—UN—11JUL13

3. Select the Software Manager application.



Activations Tab

PC24692—UN—13SEP17

4. Select the Activations tab.



PC24693

PC24693—UN—13SEP17

5. Select the Enter Code button.



PC24694—UN—13SEP17

A—Enter Code Input Box
B—OK Button

6. Enter Code (A).
7. Select the OK button (B).

RW00482.00001AF-19-13SEP17

AutoTrac™ Accuracy

IMPORTANT: John Deere AutoTrac™ system relies on the global positioning system (GPS) network operated by the United States government, which is solely responsible for its accuracy and maintenance. System is subject to changes that could affect accuracy and performance of all GPS equipment.

Overall AutoTrac™ system accuracy depends on many variables.

AutoTrac™ System Accuracy = Signal accuracy + Machine Setup + Implement Setup + Field and Soil Conditions.

It is important to remember:

- Receiver has to go through a warm-up period after starting.
- Machine must be set up properly (for example, ballasted machine according to Operator's Manual).
- Mechanical steering system needs to be in good condition (tight steering with minimal play in steering axle).
- Implement must be set up to run properly (wear parts, such as shanks, shovels, and sweeps, are in good working condition and correctly spaced).
- How field and soil conditions affect system (loose soil requires more steering than firm soil, and firm soil can cause uneven draft loads).

IMPORTANT: Although AutoTrac™ system can be activated when SF1, SF2, or SF3 correction signal is confirmed, system accuracy may continue to increase after signal is acquired.

AutoTrac™ SF2 activation operates using SF1, SF2, SF3, or RTK signal.

AutoTrac™ SF1 activation operates on SF1 signal only.

RW00482.00001B0-19-13SEP17

Softkey Legend

StarFire™ Receiver—StarFire™ Softkey



StarFire™ Softkey

PC21154—UN—11MAY15

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

RW00482,00004F5-19-04MAY16

- Steering Wheel softkey

RW00482,0000549-19-15SEP15

AutoTrac™ Controller—Health Test Softkey



PC21519—UN—09SEP15

- Step response test
- Frequency response test
- Max flow left test
- Max flow right test

RW00482,0000545-19-09SEP15

GreenStar™—Guidance Softkey



Guidance Softkey

PC21148—UN—11MAY15

- View Tab—View map, select track name, change steering sensitivity, view AutoTrac™ pie chart, or turn AutoTrac™ steering on or off.
- Guidance Settings Tab—Set up tracking mode, general guidance settings, track settings, AutoTrac™ advanced settings, and lightbar settings.
- Shift Track Settings Tab—Set up shift track settings and turn shifts on or off.

RW00482,00004F4-19-29JUL15

AutoTrac™ Controller—CAL Softkey



PC21521—UN—09SEP15

- Reset controller to factory defaults
- Recalibrate hydraulic system
- Exit calibration assistant

RW00482,0000547-19-09SEP15

AutoTrac™ Controller—Steering Wheel



PC21522—UN—09SEP15

- Wheel angle sensor (WAS) calibration
- Steering input device (SID) disengage setting

RW00482,0000548-19-15SEP15

AutoTrac™ Controller—Tool Box Softkey

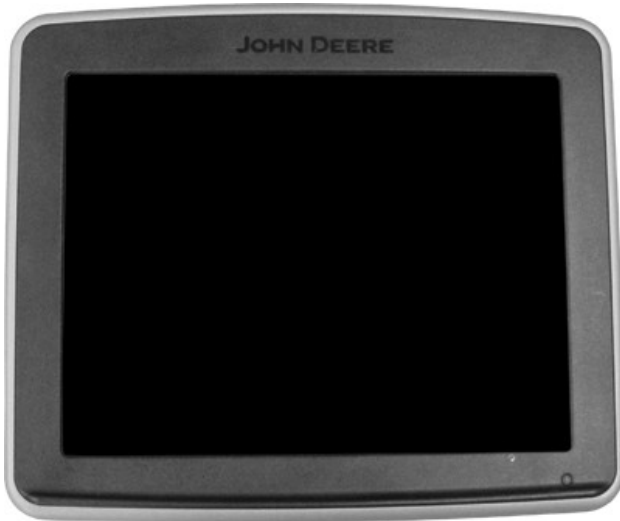


PC21520—UN—09SEP15

- Health Test softkey
- Valve Drive softkey

Component Overview

GreenStar™ Display or Generation 4 Display



PC13407—UN—20APR11

GreenStar™ 3 2630 Display



PC24742—UN—28SEP17

4640 Universal Display

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

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

RW00482,00001B1-19-28SEP17

StarFire™ Receiver



PC23442—UN—02DEC16

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

HC94949,0000AAE-19-02DEC16

Raven Steering Controller



PC20015—UN—16SEP14

Raven Steering Controller

Raven Steering Controller is an electronic control unit (ECU) which stores Raven steering settings used to control machine. Steering controller communicates with display and receiver to steer machine to a guidance line set by operator using the GreenStar™ Display. Steering controller is required with every installation.

RW00482,0000531-19-08SEP15

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

Steering Input Device

NOTE: Steering input device varies by machine model.

(Reference AutoTrac™ Controller–Raven Installation Instruction for more information.)

AL70325,0000179-19-06NOV14



Pressure Transducer

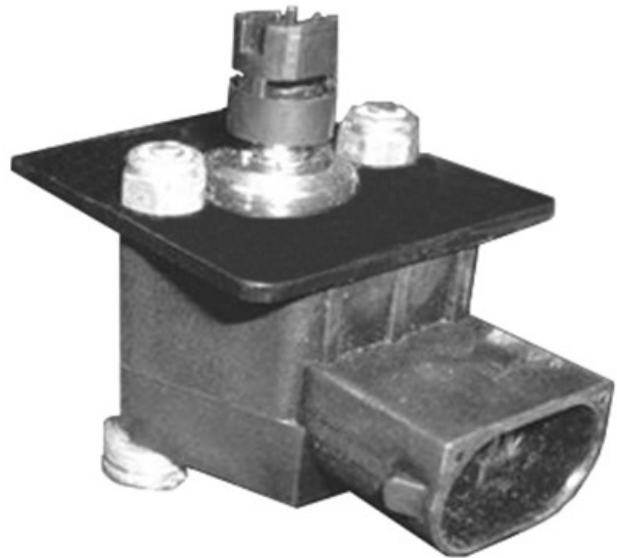
PC20016—UN—16SEP14

Steering Input Device is either a pressure transducer or steering wheel encoder which monitors for manual disengagement by operator. When operator turns steering wheel, device detects a hydraulic pressure spike, electronic pulse, or change in encoder counts. Message is sent to steering controller to disengage AutoTrac™.

AL70325,000017B-19-06NOV14

Wheel Angle Sensor

NOTE: Wheel Angle Sensor varies by machine model.



Wheel Angle Sensor

PC20067—UN—07OCT14

Electro-Hydraulic Valve

NOTE: Electro-hydraulic valve varies by machine model.

Wheel Angle Sensor measures angle that wheels are facing. Measurement is used by display and steering controller when calculating steering adjustments. Sensor must be installed if factory installed sensor is not present.

(Reference AutoTrac™ Controller–Raven Installation Instruction for more information.)

AL70325,000017A-19-06NOV14



Electro-Hydraulic Valve

PC20012—UN—11SEP14

Electro-Hydraulic Valve receives input from AutoTrac™ Controller–Raven and directs flow of hydraulic fluid to steer machine. Valve must be installed if factory installed valve is not present.

Resume Switch



PC20037—UN—24SEP14

Tractor



PC20011—UN—11SEP14

Windrower

A—Resume Switch

Resume Switch is an electronic switch used to activate AutoTrac™ after system is enabled. Resume switch must be installed if factory installed switch is not present.

NOTE: Resume switch and mounting location vary by machine model.

AL70325,000017C-19-06NOV14

Master Switch

NOTE: Mounting location varies by machine and operator preference.

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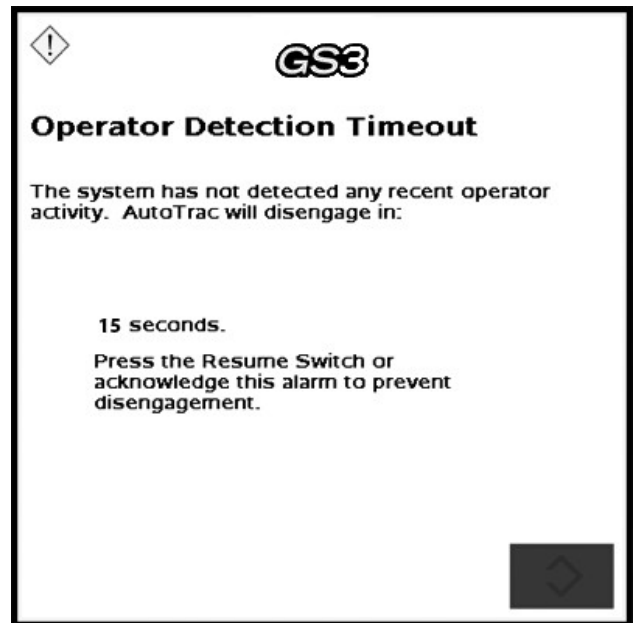


PC20010—UN—11SEP14

Master Switch is used when transporting machine. When switch is set to off position, no power is supplied to electro-hydraulic valve. This ensures AutoTrac™ is disabled while driving on roads or when operator does not want AutoTrac™ to be activated. Switch is also referred to as Road Mode or Road Switch.

AL70325,000017D-19-12NOV14

Seat Switch and Activity Monitor



PC13872—UN—20JUL11

Operator Detection Timeout

Seat Switch is used to detect operator presence. Switch is connected to machine wiring harness during component installation. If no seat switch is available for machine, Activity Monitor detects operator presence.

Activity Monitor detects operator presence if seat switch is not available or operational. An on-screen alert appears if operator has not interacted with display within the last seven minutes. Operator accepts warning to let system know they are in seat.

• Operator Detection Timeout

The system has not detected any recent operator activity. AutoTrac™ will disengage in:

15 seconds.

Press the Resume Switch or acknowledge this alarm to prevent disengagement.

RW00482,0000541-19-15SEP15

Setting Up

AutoTrac™ Controller—Raven Setup

1. Verify display settings.
2. Configure StarFire™ Receiver.
3. Measure receiver fore/aft value.
4. Measure receiver height value.
5. Optimize terrain compensation module (TCM).
6. Calibrate terrain compensation module (TCM).
7. Calibrate AutoTrac™ Controller—Raven.
8. Set up basic guidance.

RW00482,0000543-19-30AUG17

Verify Display Settings

NOTE: The display with the activation must be set up as the primary display.

GreenStar™ Display



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



Display Button

PC11392CC—19—24OCT13

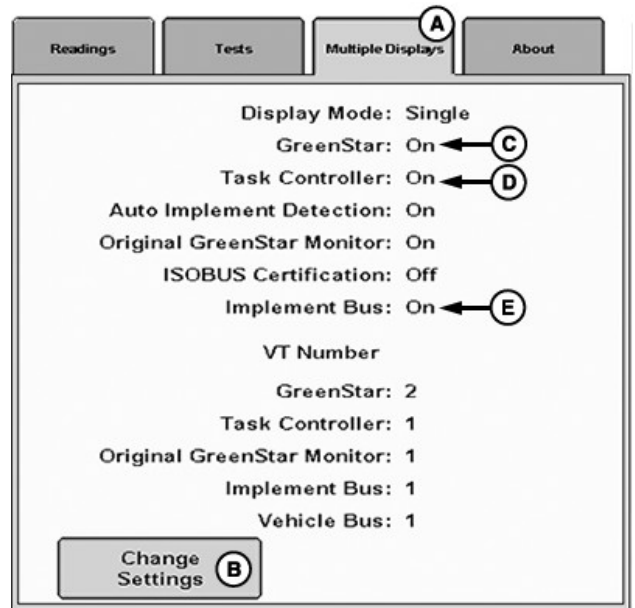
2. Select the Display button.



Diagnostics Softkey

PC20267—UN—14NOV14

3. Select the Diagnostics softkey.



PC24665—UN—28SEP17

Multiple Displays Tab

- A—Multiple Displays Tab
- B—Change Settings Button
- C—GreenStar™
- D—Task Controller
- E—Implement Bus

4. Select the Multiple Displays tab (A).
5. Verify display settings. If needed, select the Change Settings button (B) and change the settings.

Verify:

- GreenStar™ (C) is ON.
- Task Controller (D) is ON.
- Implement Bus (E) is ON.

Generation 4 Display



Menu Button

PC17269—UN—15JUL13

1. Select the Menu button.



System Tab

PC24666—UN—05SEP17

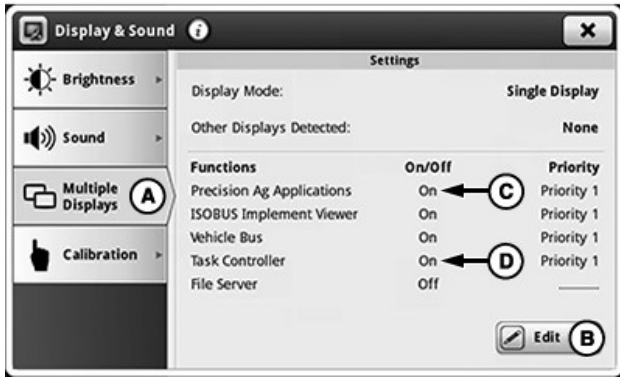
2. Select System tab.



PC16685—UN—18MAR13

Display and Sound

3. Select Display and Sound application.



PC24716—UN—14SEP17

- A—Multiple Displays Tab
B—Edit Button
C—Precision Ag Applications
D—Task Controller

4. Select the Multiple Displays tab (A).

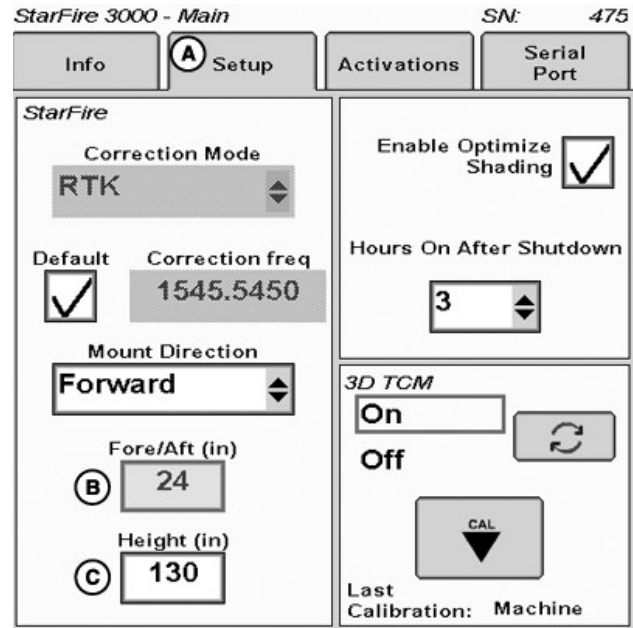
5. Verify display settings. If needed, select the Edit button (B) and change the settings.

Verify:

- Precision Ag Applications (C) is ON.
- Task Controller (D) is ON.

RW00482,00001AD-19-28SEP17

2. Select the StarFire™ button.



PC21232—UN—17JUN15

- A—Setup Tab
B—Fore/Aft Entry Box
C—Height Entry Box

3. Select the Setup tab (A).

4. Enter the StarFire™ Fore/Aft (B) and Height (C) measurements.

(Refer to StarFire™ Height and Fore/Aft for more information.)

AL70325,0000326-19-28AUG17

Configure StarFire™ Receiver

NOTE: AutoTrac™ Controller—Raven is compatible only with StarFire™ 3000 or 6000 Receivers.



PC8663—UN—29APR15

Menu Button

1. Select the Menu button.

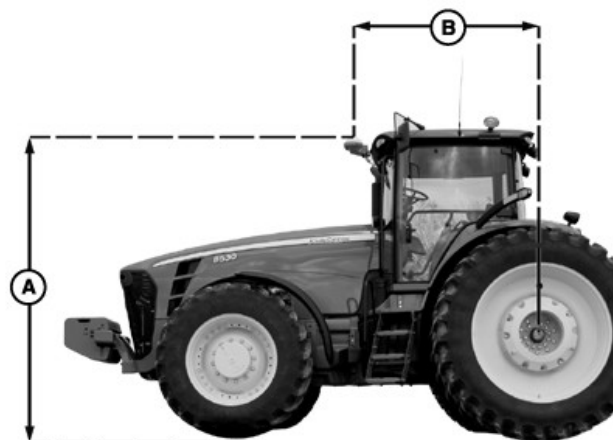


PC13738—UN—17MAY11

StarFire™ Button

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StarFire™ Height and Fore/Aft



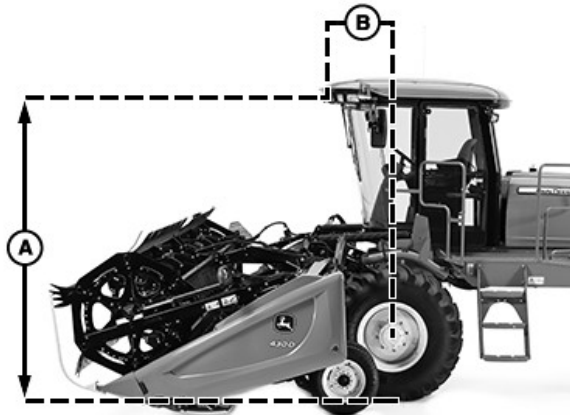
PC8995—UN—07MAR06

Fixed-Axle Machine
(Row-Crop Tractor, Sprayer)



Articulated Tractor

PC8996—UN—07MAR06



Windrower

PC21285—UN—19JUN15

A—Height
B—Fore-Aft

StarFire™ Height—Enter height of StarFire™ Receiver. Height is measured from ground to middle of receiver dome.

StarFire™ Fore/Aft—Enter fore/aft measurement. Fore/aft is distance from fixed axle of machine to receiver. Fixed axle is rear axle on a row-crop tractor and sprayer, or front axle on a windrower. For track machines, this measurement is 0. Receiver must be at or in front of fixed axle for all machines except articulated tractors. On articulated tractors, receiver is behind the front axle resulting in a negative value.

AL70325,0000327-19-15SEP15

StarFire™ Height and Fore/Aft Measurements Table

Use the following table to record the height and fore/aft of the StarFire™ Receiver.

StarFire™ Height and Fore/Aft Measurements		
Machine	Height	Fore/aft

HC94949,00008B6-19-28AUG17

Optimize Terrain Compensation Module (TCM)

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



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



StarFire™ Button

PC13006—UN—05NOV14

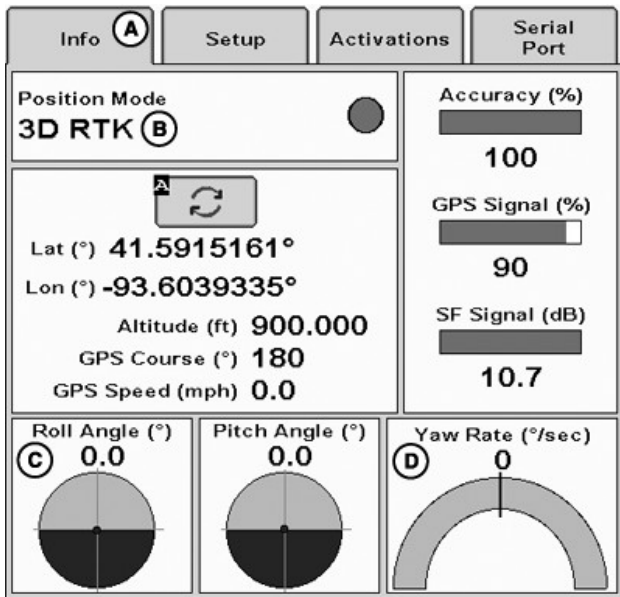
2. Select the StarFire™ button.



StarFire™ Softkey

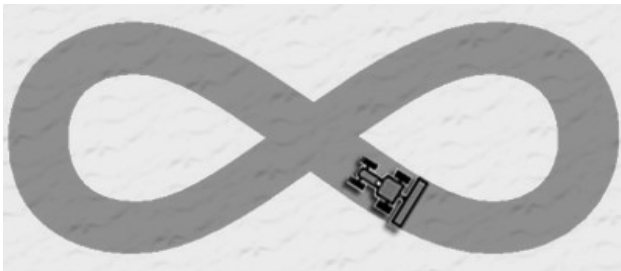
PC21154—UN—11MAY15

3. Select the StarFire™ softkey.



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

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



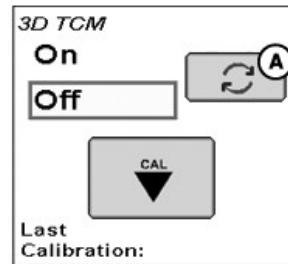
PC21419—UN—30JUL15
TCM Optimization Drive Pattern

6. Drive machine in the TCM optimization drive pattern two times to allow the IMU to initialize.
7. Complete the TCM calibration.

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

RW00482,0000525-19-14SEP17

Calibrate Terrain Compensation Module (TCM)



PC19992—UN—04SEP14

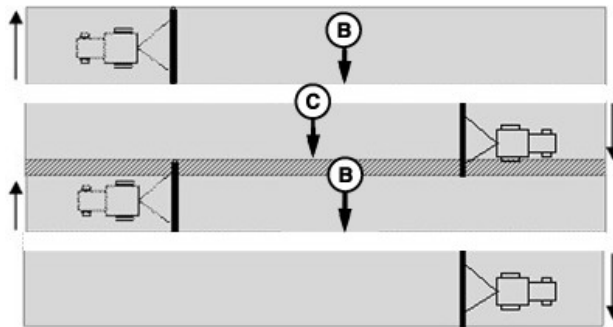
A—TCM Toggle Button

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

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

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

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



PC19993—UN—03SEP14

- B—Skip
C—Overlap

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

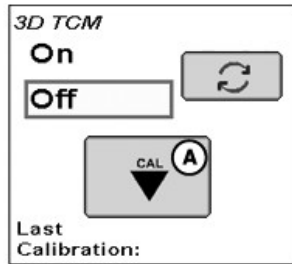
To eliminate offset, position the machine and calibrate the TCM, drive down a pass, turn around, and drive down the same pass in the opposite direction. If the

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AutoTrac is a trademark of Deere & Company

machine does not follow the same pass, measure the offset distance and enter in the 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. To note the location of the axle, mark the location of the tires or tracks on the ground.



PC19994—UN—04SEP14

- A—Calibration Button
- B—Rear Axle
- C—Machine Pivot Point

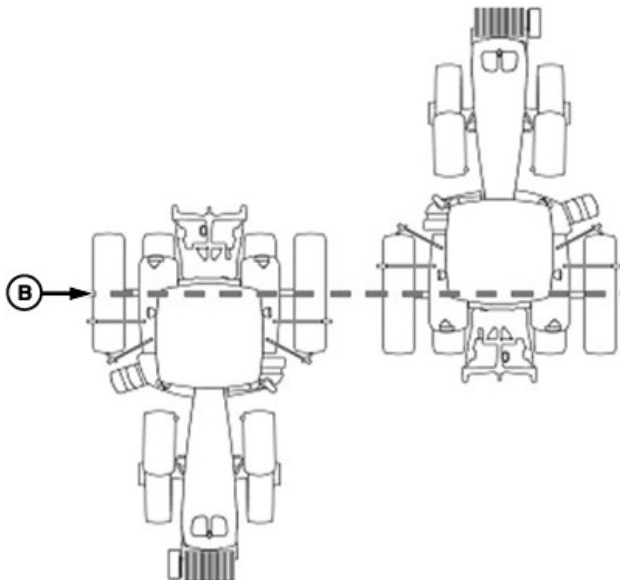
3. Select the Calibration button (A).



PC22267—UN—14MAR16

Enter Button

4. Select the Enter button. The calibrating status bar appears, then disappears when finished.
5. Turn the machine 180 degrees to face the opposite direction. Ensure that tires are in proper location for fixed or floating front axle and that machine has come to a complete stop (cab is not rocking).

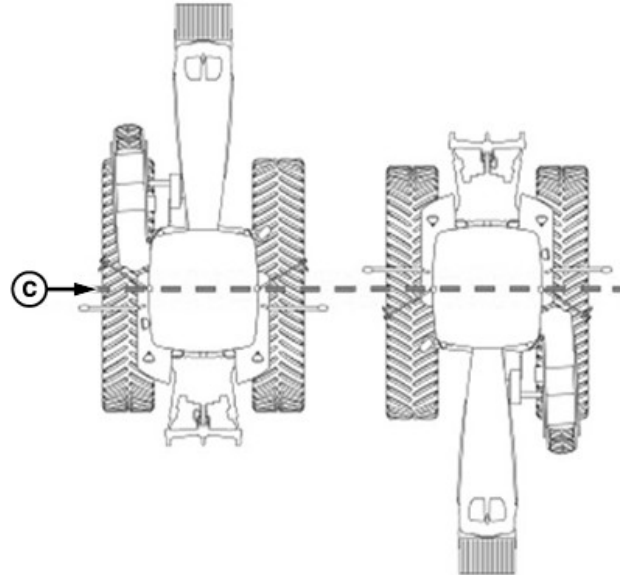


PC19995—UN—03SEP14

Floating Front Axle Machines

B—Rear Axle

- For floating front axle machines (MFWD (mechanical front wheel drive), ILS™ (Independent Link Suspension), TLS™ (Triple-Link Suspension)), place the wheels so rear axle (B) is in the same location when performing a 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, 9000, and 9020 series wheel tractors), place the wheels or tracks so the machine pivot point (C) is in the same location when facing either direction.
 - For windrowers, place the wheels so the front axle is in the same location.
6. Select the Enter button. The calibrating status bar appears, then disappears when finished.
 7. Select the Enter button to return to the Setup tab. If calibration was unsuccessful, recalibrate the TCM.

RW00482,000015E-19-14SEP17

AutoTrac™ Controller—Raven Calibration

NOTE: After replacement or disassembly of any hydraulic component, a complete system calibration is required.

NOTE: In windrowers, perform the calibration with the header attached.

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

The calibration procedure requires a large, open, and level surface to complete the required steps.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



AutoTrac™ Controller Button

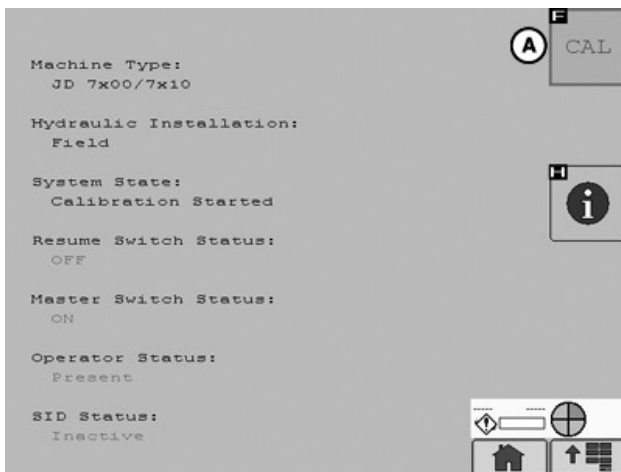
PC21500—UN—03SEP15

2. Select the AutoTrac™ Controller button.

IMPORTANT: To bring the hydraulic fluid to operating temperature before beginning the calibration procedure, drive the machine slowly at full throttle for approximately 2—5 min.

NOTE: At any time during calibration, operator may take control of the system by grabbing the steering wheel or by stopping the machine.

Ensure that master switch is in the on position.



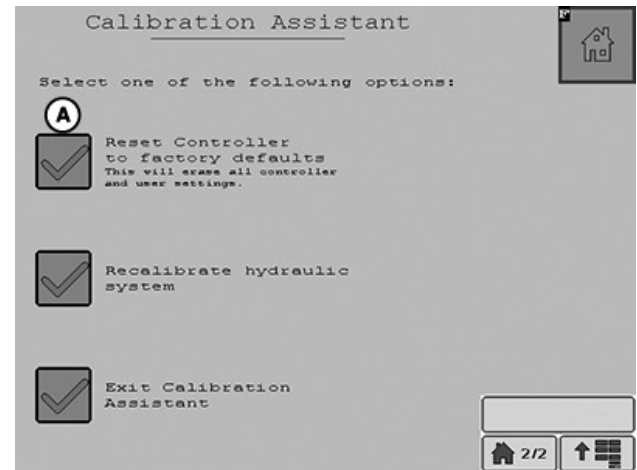
PC19772—UN—10NOV14

A—Calibration Softkey

3. To display the Calibration Assistant page, select Calibration softkey (A).

IMPORTANT: Read all instructions before calibrating the AutoTrac™ Controller.

To avoid damage to the machine or implement, disconnect the implement from the machine before performing the AutoTrac™ calibration.

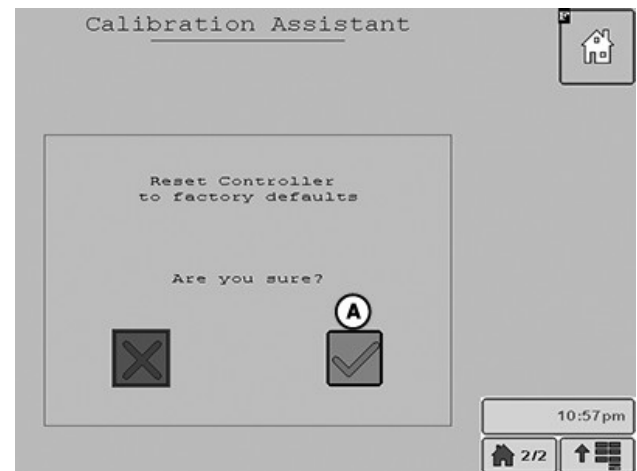


PC19945—UN—10NOV14

Calibration Assistant Main Screen

A—Reset Controller to Factory Defaults

4. To begin calibration, select the Reset Controller button (A).

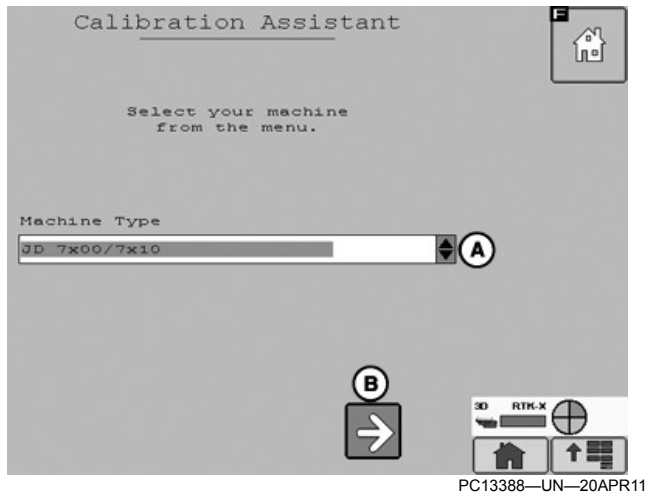


PC20114—UN—10NOV14

Reset Controller to Factory Default

A—Accept Button

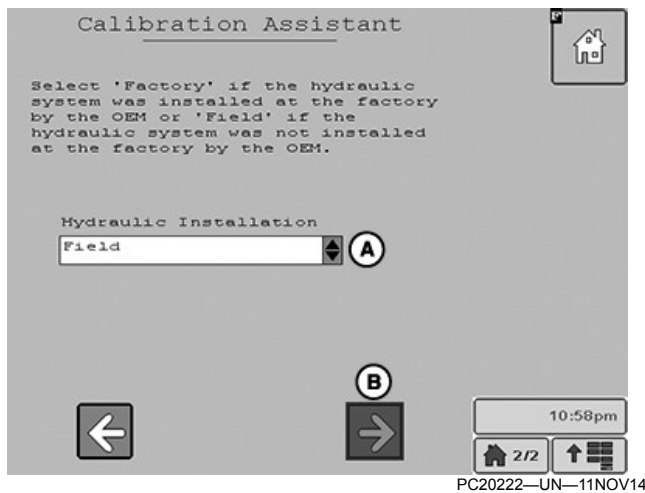
5. To proceed with calibration process, select the Accept button (A).



Machine Type

A—Drop-Down Menu
B—Next Button

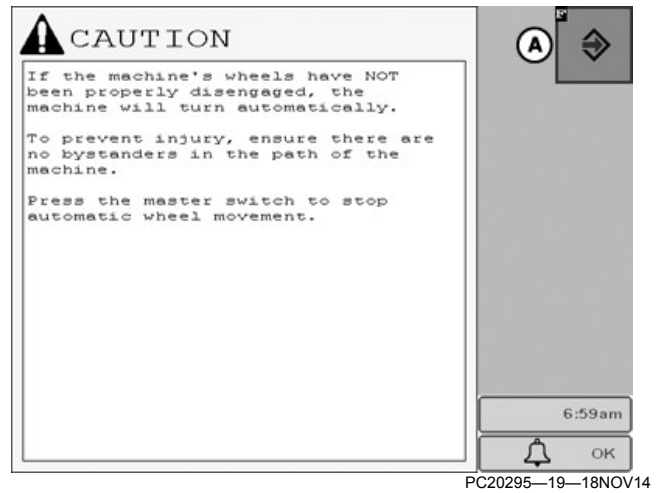
6. Select machine type from the drop-down menu (A), then select the Next button (B).



A—Drop-Down Menu
B—Next Button

7. From the drop-down menu (A), select:
 - **Factory**—if the original equipment manufacturer (OEM) installed the hydraulic system at the factory.
 - **Field**—if the OEM did not install the hydraulic system at the factory.

To select the installation type, follow the on-screen instructions. Select the Next button (B) to proceed. On windrowers only, a caution message is displayed.



A—Accept Button

8. Read the caution message and select the Accept button (A).

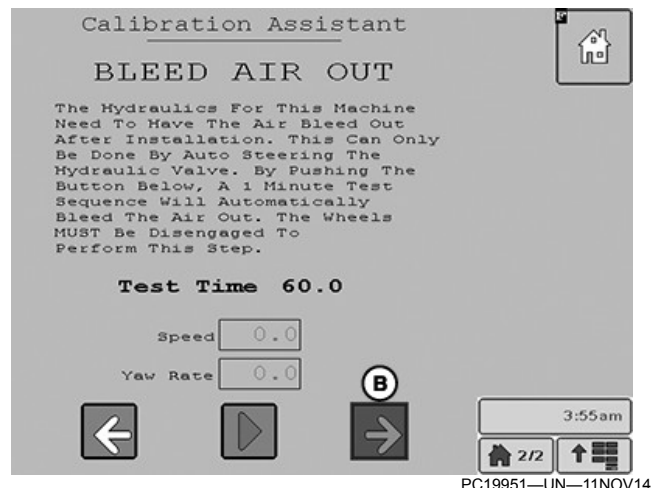
NOTE: A valid global positioning system (GPS) signal is required. Complete the Bleed Air Out step for windrowers outdoors.

This test requires wheels to be disengaged.

(Reference the Installation Instructions or the machine Operator's Manual for more information.)

9. Bleed Air Out step is for windrowers only, and does not appear during control unit calibration on other machines.

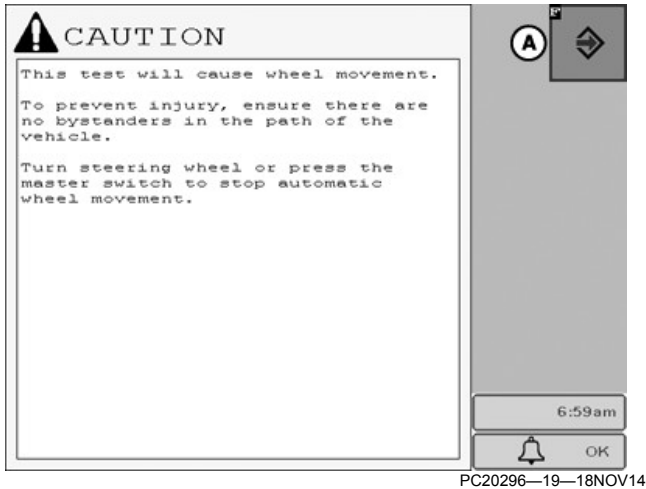
This step is only required at time of installation or if a hydraulic repair is made. The John Deere dealer completes this step.



B—Next Button

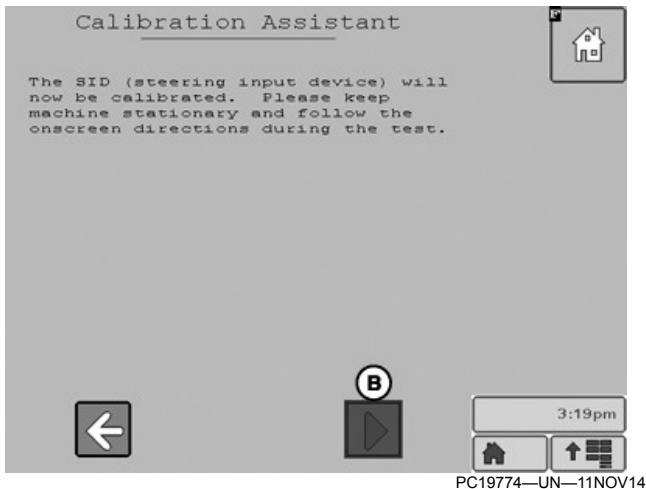
10. To proceed with the steering input device (SID) calibration, select the Next button (B). On windrowers only, a caution message is displayed.

NOTE: Follow the on-screen instructions for machine movement before starting the calibration.

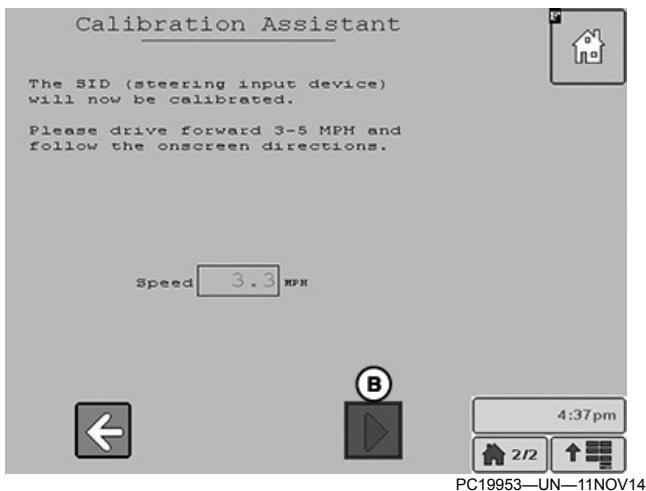


A—Accept Button

11. Read the caution message and select the Accept button (A) on windrowers only.



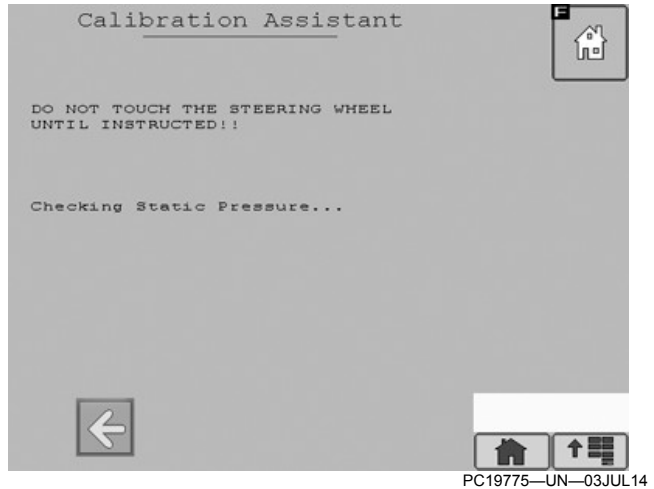
SID Calibration - Tractors



SID Calibration - Windrowers

B—Start

To calibrate steering input device (SID), select Start (B).

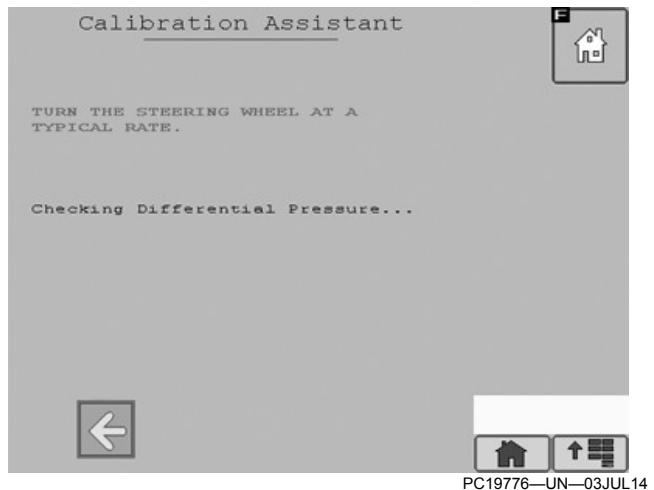


SID Calibration

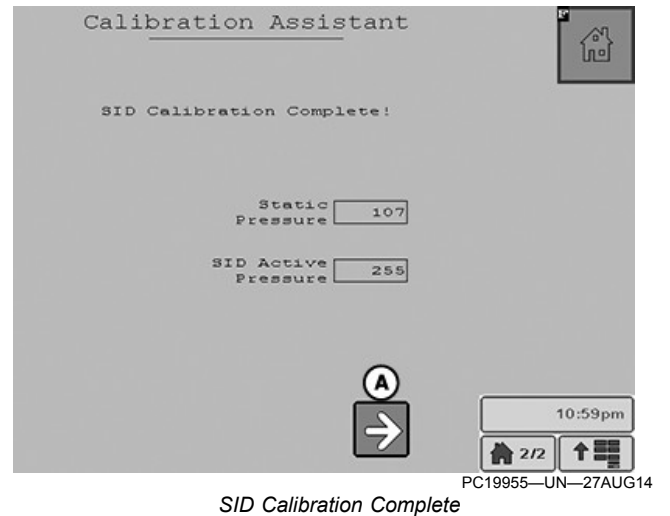
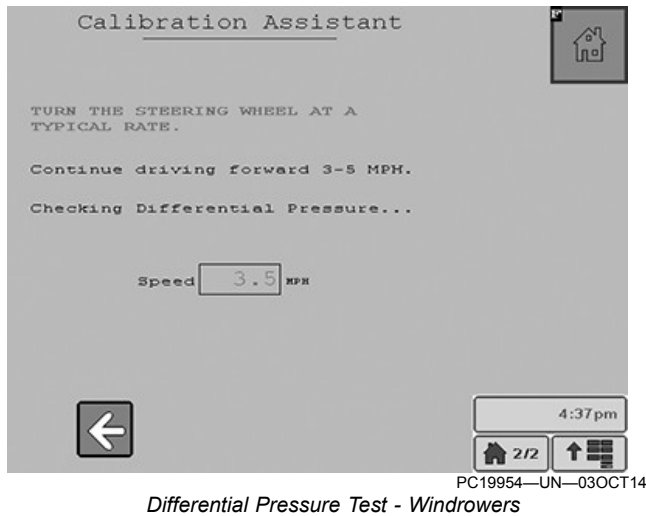
12. Calibration starts for SID. The AutoTrac™ Controller performs a static pressure test. Do not touch the steering wheel until instructed.

NOTE: Turning the steering wheel too aggressively results in high active pressure measurement. Turning too slow results in low active pressure measurement.

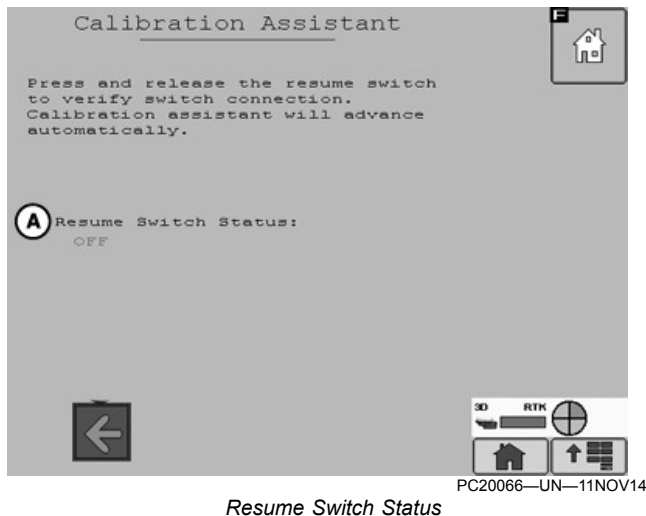
On windrowers, the steering wheel turns on its own. Turn the steering wheel in opposite direction against resistance.



Differential Pressure Test - Tractors



13. AutoTrac™ Controller performs Active Pressure test. When instructed, turn the steering wheel at a typical rate.



A—Status

14. While monitoring the resume switch status (A), press and release the resume switch. Status changes to green “ON” text when the button is pressed, and to red “OFF” text when the button is released.

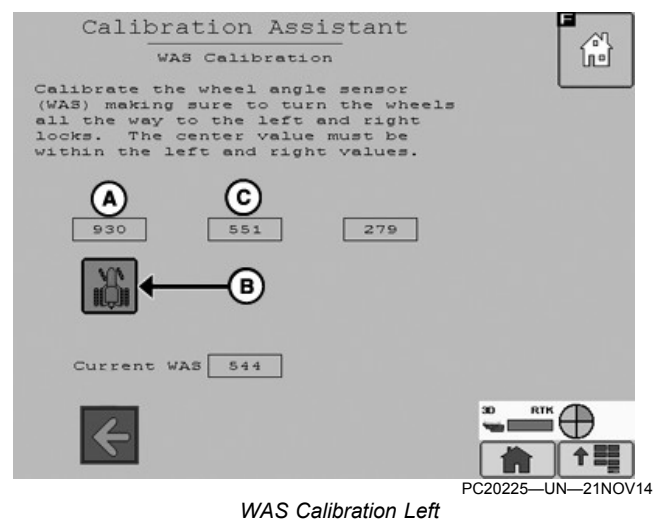
A—Next Button

15. After testing resume switch, SID Calibration Complete page is displayed. To proceed to the Wheel Angle Sensor (WAS) Calibration page, select the Next button (A).

CAUTION: To prevent injury, ensure that there are no bystanders in the path of the machine. The machine drives in a circle while the steering wheel is turned towards the left and right limits.

NOTE: On windrowers, perform test with the machine moving 4.8—8 km/h (3—5 mph).

NOTE: Ensure that wheels are turned all the way to left and right during the WAS calibration, or undesired AutoTrac™ operation may occur. Do not hold the wheel into the lock position when setting the left position.



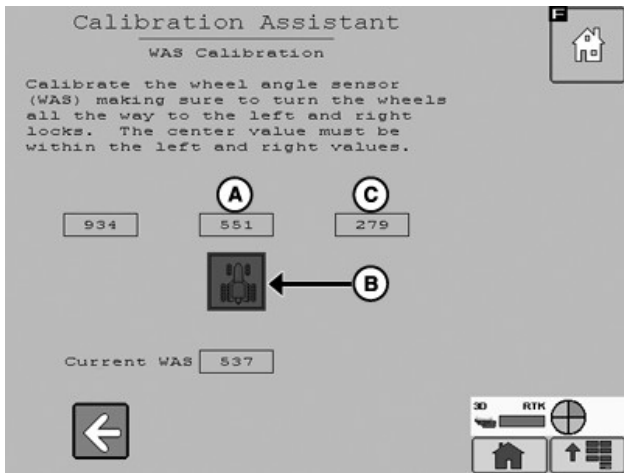
A—WAS Left Limit
B—Tractor Icon

C—WAS Center Position

16. Set the WAS left limit (A). Turn the steering wheel all the way left until the wheel stops and select the tractor icon (B). The icon moves under the WAS center position (C).

NOTE: An accurate center WAS calibration is critical for AutoTrac™ operation. It is required to drive a short distance straight forward to a fixed point on the horizon.

If the center WAS position is not accurately set, the machine may track off line, and (or) cause degraded performance.



PC20226—UN—11NOV14

WAS Calibration Center

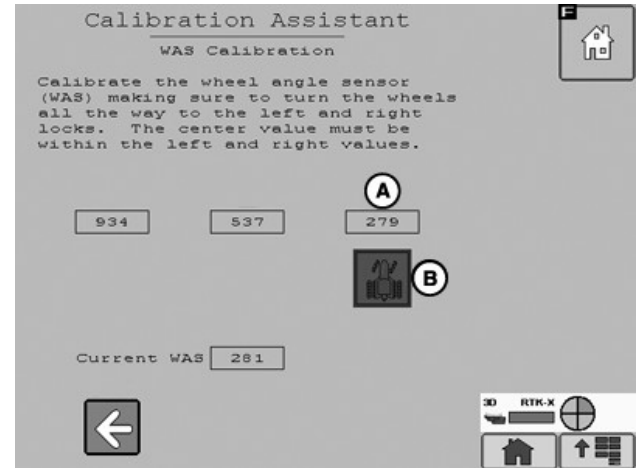
A—WAS Center Position

B—Tractor Icon

C—WAS Right Limit

17. Set the WAS center position (A). Turn the steering wheel so wheels are pointing straight forward and select the tractor icon (B). The icon moves under the WAS right limit (C).

NOTE: Do not hold the wheel into the lock position when setting the right position.



PC20227—UN—11NOV14

WAS Calibration Right

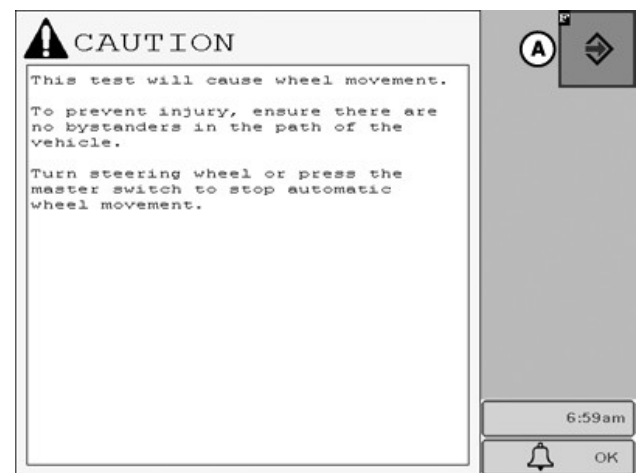
A—WAS Right Limit

B—Tractor Icon

18. Set the WAS right limit (A). Turn the steering wheel all the way right until the wheel stops and select the tractor icon (B). WAS calibration is complete. Valve Autocalibration caution is automatically displayed.

NOTE: WAS center position must be between the WAS left and right limits for a valid WAS calibration.

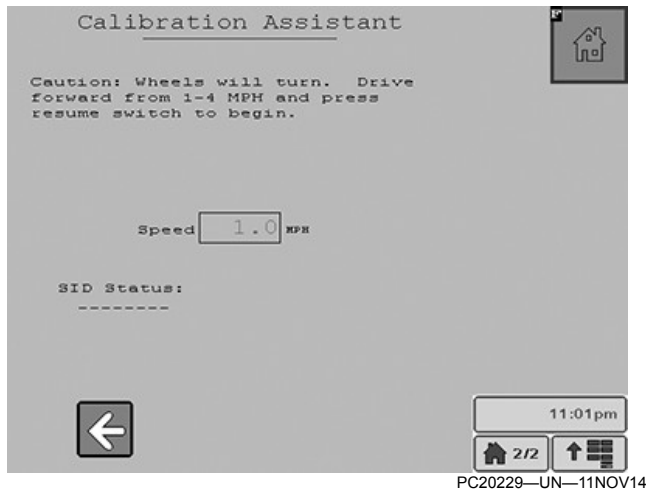
NOTE: Abort autocalibration procedure and take control at any time by manually turning the steering wheel. Aborting the autocalibration procedure results in a failed calibration. When restarted, autocalibration begins where it left off.



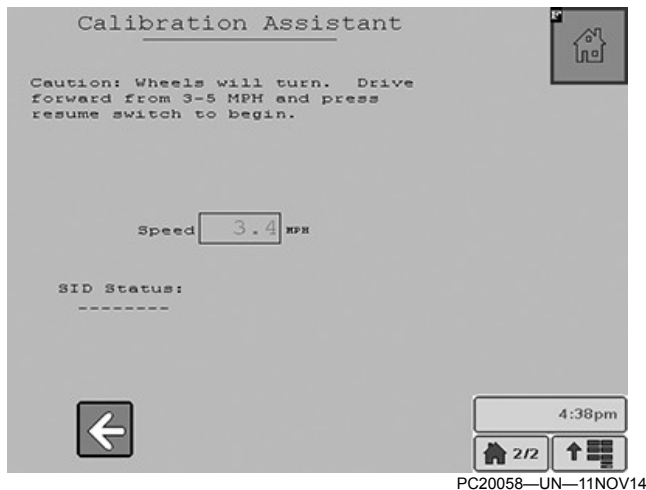
PC20296—19—18NOV14

A—Accept Button

19. Read the caution message and select the Accept button (A).



Valve Autocalibration on Tractors



Valve Autocalibration on Windrowers

20. To begin the valve autocalibration procedure, the machine must be moving forward between 1.6—6.4 km/h (1—4 mph) for tractors or 4.8—8 km/h (3—5 mph) for windrowers.

NOTE: All machines steer left first. If the machine steers right first, calibration fails. If the machine continues to turn left and does not proceed into the rest of calibration, recalibrate the WAS left and right limits.

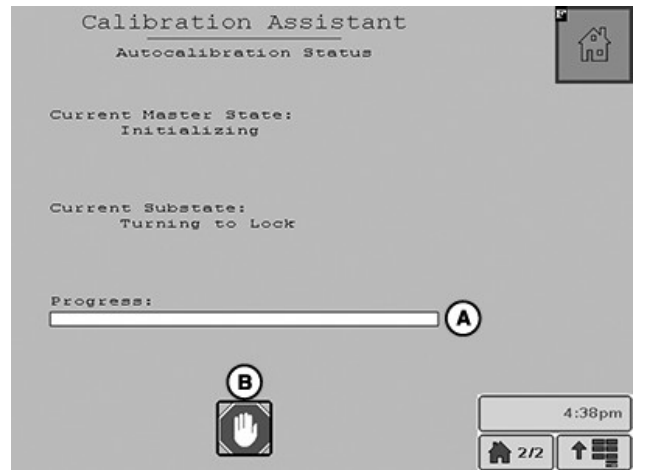
1. Steer all the way to the left. Release the wheel. Look at the current WAS reading. Turn back to the right by 10 points. (For example, the full right WAS value is 930, turn the wheel back right to a value of 920 and select the tractor icon.)
2. Continue and adjust the right WAS limit. Turn full right. Release the wheel. Look at the current WAS reading. Turn back to the left by 10 points.

(If calibration failure persists, reference *Troubleshooting AutoTrac™ Controller—Raven* for more information.)

21. When the machine is at an acceptable speed, press

the resume switch to start the autocalibration process and follow the on-screen instructions.

NOTE: Do not turn the steering wheel during the autocalibration process unless it is an emergency. Turning the steering wheel causes the test to stop. If the test is stopped, it must be completed to operate AutoTrac™.



Autocalibration Status

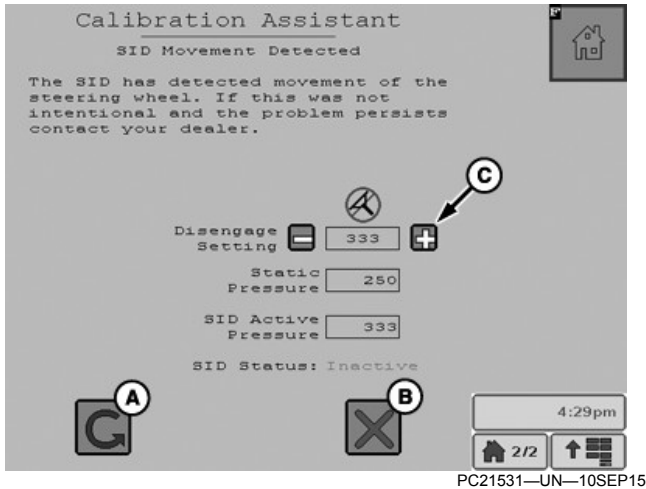
- A—Progress Bar
- B—Stop

22. Autocalibration process goes through several steps. When the progress bar (A) is filled, autocalibration is finished.

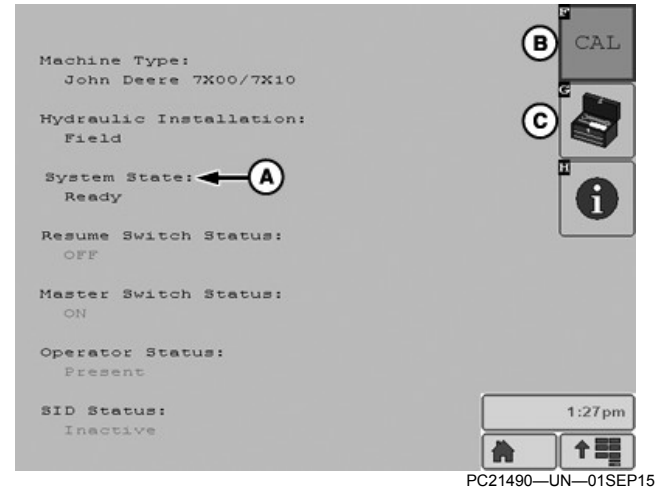
To stop the autocalibration, select Stop (B) or turn the steering wheel at any time.



Speed Error



SID Movement Detected



System State

- A—Continue
- B—Cancel
- C—Increase (+)

23. During the valve calibration, if the Stop button is selected or the steering wheel is moved, the user is prompted to continue (A) or cancel (B) the calibration.
24. If the SID Movement Detected page is displayed without turning the wheel, increase the SID Disengage Setting. Select the increase (+) button (C) until value increases by ten points and select Continue to retest.



PC21532—UN—10SEP15

NOTE: If gains are calibrated too far apart, an Autocalibration Error is displayed. AutoTrac™ performance may be degraded.

- A—System State Ready
- B—Calibration Softkey
- C—Tool Box Softkey

25. When the autocalibration is complete, the Main page is displayed. If the calibration completed successfully, the System State (A) is “READY”. If the calibration process was aborted, not completed, or failed, the system state is “Calibration Started”. If calibration failed, select the Calibration softkey (B) to start the calibration process over.

If calibration failure persists, check the Message Center.

(Refer to Troubleshooting AutoTrac™ Controller for more information)

The Tool Box (C) is displayed when the calibration is complete. The Tool Box contains the AutoTrac™ Controller Health Test.

(To perform an AutoTrac™ Controller Health Test, refer to Troubleshooting AutoTrac™ Controller.)

AE77568,00001AA-19-02OCT17

AutoTrac™ Controller—Raven Machine Test

The machine test allows the operator to test the system functions without completing the calibration.

NOTE: The machine test procedure requires a large, open, level surface to complete the required steps.

NOTE: In windrowers, perform the machine test with the header attached.



Menu Button

PC8663—UN—29APR15

1. Select Menu button.



PC21500—UN—03SEP15

AutoTrac™ Controller Button

2. Select the AutoTrac™ Controller button.

IMPORTANT: To bring the hydraulic fluid to operating temperature before beginning machine test procedure, drive the machine slowly at full throttle for approximately 2—5 min.

NOTE: At any time during the machine test, the operator may take control of the system by grabbing the steering wheel or by stopping the machine.

Ensure that master switch is in the on position.



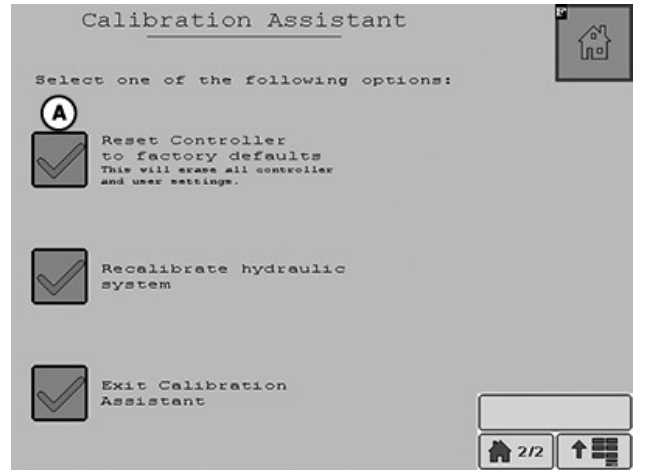
PC19772—UN—10NOV14

A—Calibration Softkey

3. To display the Calibration Assistant page, select the Calibration softkey (A).

IMPORTANT: Read all instructions before testing the AutoTrac™ Controller.

To avoid damage to the machine or implement, disconnect the implement from the machine before performing the machine test.

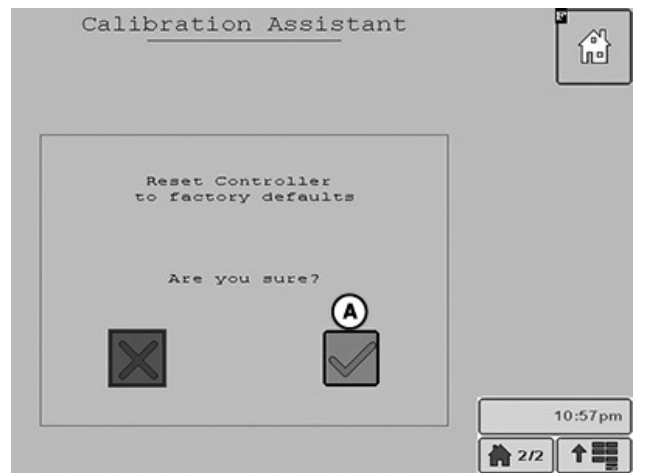


PC19945—UN—10NOV14

Calibration Assistant Main Screen

A—Reset Controller to Factory Defaults

4. To begin the machine test, select the Reset Controller button (A).

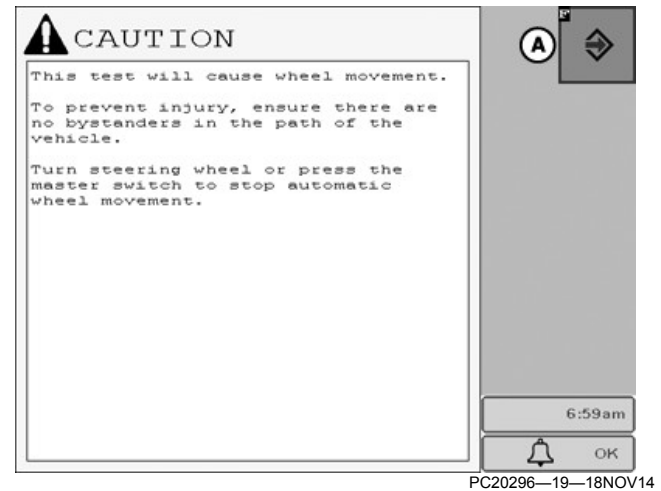
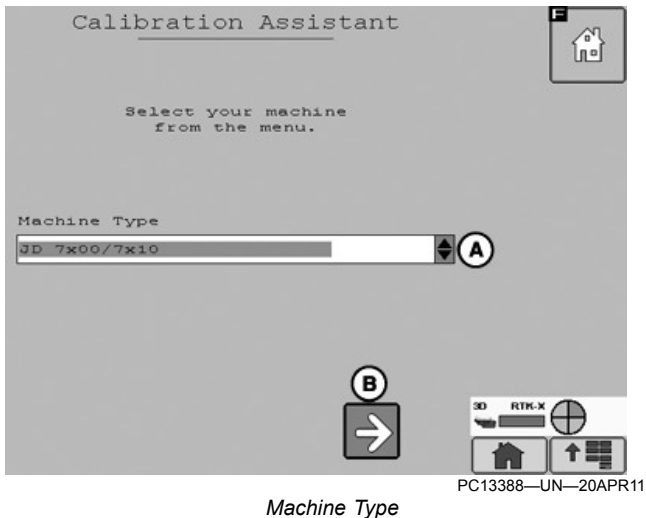


PC20114—UN—10NOV14

Reset Controller to Factory Default

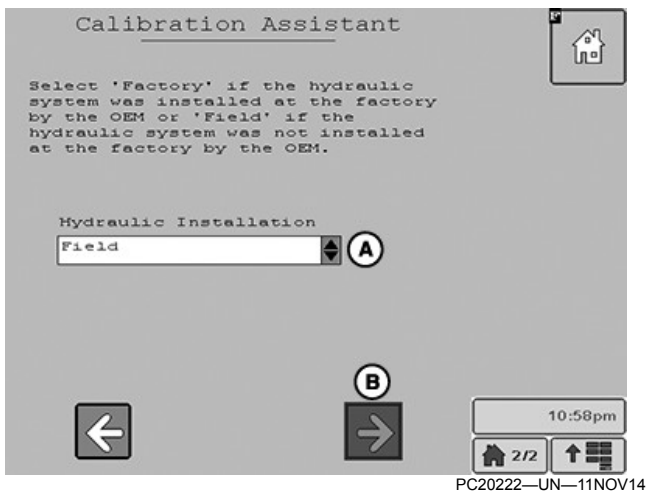
A—Accept Button

5. To proceed with the machine test procedure, select the Accept button (A).



- A—Drop-Down Menu
B—Next Button

6. Select the machine type from the drop-down menu (A), then select Next button (B).



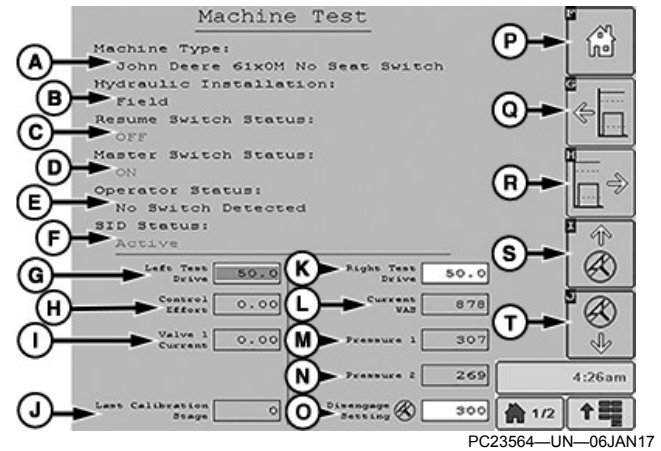
- A—Drop-Down Menu
B—Next Button

7. From the drop-down menu (A), select:

- **Field**—if the original equipment manufacturer (OEM) did not install the hydraulic system at the factory.
- **Factory**—if the OEM installed hydraulic system at the factory.

Select the installation type. Select the Next button (B) to proceed.

NOTE: Follow the on-screen instructions for machine movement before starting the machine test.



- A—Machine Type
B—Hydraulic Installation
C—Resume Switch Status
D—Master Switch Status
E—Operator Status
F—SID Status
G—Left Test Drive
H—Control Effort
I—Valve 1 Current
J—Last Calibration Stage
K—Right Test Drive
L—Current WAS
M—Pressure 1
N—Pressure 2
O—Disengage Setting
P—Home Softkey
Q—Left Test Drive Softkey
R—Right Test Drive Softkey
S—Increase Disengage Setting Softkey
T—Decrease Disengage Setting Softkey

9. The Machine Test page displays the following information:

- **(A) Machine Type**—Machine type on which the system is installed.
- **(B) Hydraulic Installation**—Field-installed or factory-installed hydraulic system.

- **(C) Resume Switch Status**—Resume switch on or off.
- **(D) Master Switch Status**—Master switch on or off.
- **(E) Operator Status**—Seat switch status.
- **(F) SID Status**—SID active or inactive.
- **(G) Left Test Drive**—Current left test drive value. Operator can manually adjust this value.
- **(H) Control Effort**—Should match the value of the test drive being pulsed.
- **(I) Valve 1 Current**—Amount of current the valve is drawing while being pulsed.
- **(J) Last Calibration Stage**—If last calibration was unsuccessful, displays value corresponding to failure point.
- **(K) Right Test Drive**—Current right test drive value. Operator can manually adjust this value.
- **(L) Current WAS**—Current WAS reading.
- **(M) Pressure 1**—SID pressure transducer 1 reading.
- **(N) Pressure 2**—SID pressure transducer 2 reading.
- **(O) Disengage Setting**—Current disengage setting. Operator can manually adjust this value.
- **(P) Home Softkey**—Returns to AutoTrac™ Controller—Raven home screen.
- **(Q) Left Test Drive Softkey**—Select and hold to pulse the left test drive at the current left test drive value.
- **(R) Right Test Drive Softkey**—Select and hold to pulse the right test drive at the current right test drive value.
- **(S) Increase Disengage Setting Softkey**—Increases disengage setting by ten.
- **(T) Decrease Disengage Setting Softkey**—Decreases disengage setting by ten.

AE77568,0000295-19-14SEP17

Basic Guidance Setup

NOTE: Instructions are for the GreenStar™ 3 2630 Display only. For complete guidance setup instructions, refer to the GreenStar™ Display Operator's Manual.



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



GreenStar™ Button

PC12685—UN—29APR15

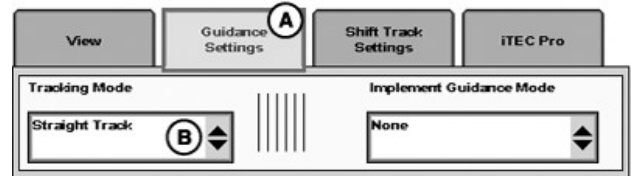
2. Select the GreenStar™ button.



Guidance Softkey

PC21148—UN—11MAY15

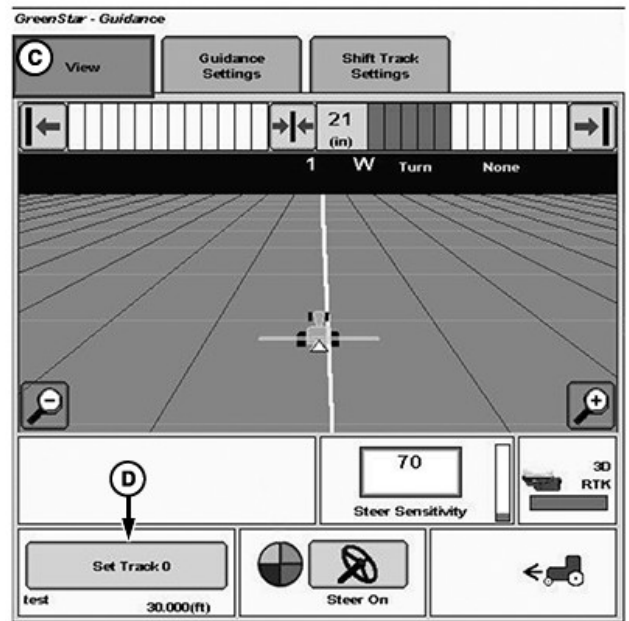
3. Select the Guidance softkey.



PC21537—UN—14SEP15

- A—Guidance Settings Tab**
- B—Tracking Mode Drop-Down**

4. Select the Guidance Settings tab (A).
5. Select Straight Track mode (B).



PC20334—UN—25NOV14

- C—View Tab**
- D—Set Track 0 Button**

6. Select the View tab (C).

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7. Select the Set Track 0 button (D).

PC20335—UN—25NOV14

- A—New Button
 B—Method Drop-Down
 C—Guidances Line Calculation Drop-Down
 D—Track Spacing Button
 E—Set A Button
 F—Set B Button
 G—Enter Button

8. Select the New button (A).
9. Enter a name for Track 0. Select the Enter button to accept and return to the Track 0 setup.
10. Select A + B option from the Method drop-down menu (B).
11. Select John Deere from the Guidance Line Calculation drop-down menu (C).
12. Enter the desired track spacing (D).
13. Drive the machine to the desired location in field, and select the Set A button (E).

NOTE: To set B point, drive more than 3 m (10 ft).

14. Drive the machine to the desired point B, and select the Set B button (F).
15. To complete the Track 0 setup, select the Enter button (G).

RW00482,000054B-19-12SEP17

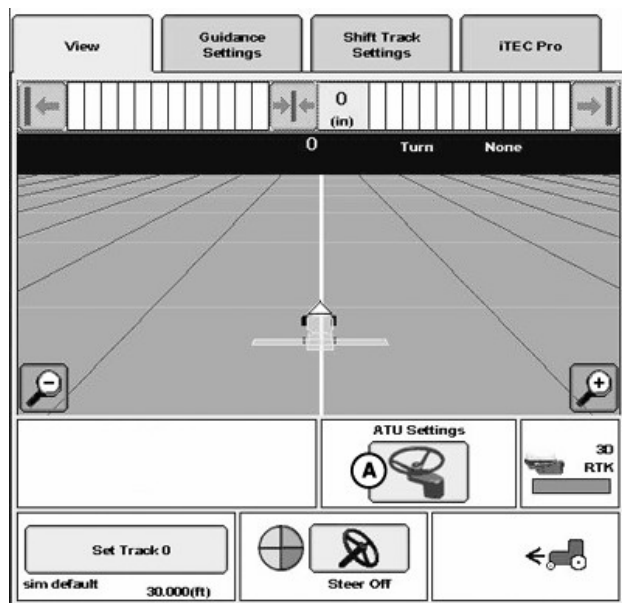
Operating—AutoTrac™ Controller—Raven

Operating AutoTrac™

1. **Automatic Guidance System Detected** is displayed each time a machine with AutoTrac™ Controller—Raven is powered on.
2. **AutoTrac™ Status Pie** details system status information.
3. **Requirements to Enable AutoTrac™** describes necessary equipment and settings to use AutoTrac™.
4. **Enable AutoTrac™** shows steps to enable system.
5. **Activating System** describes steps to turn on AutoTrac™.
6. **Deactivating System** describes methods of disengaging AutoTrac™.

AL70325,00001B1-19-13NOV14

AutoTrac™ Settings



View Tab

PC20143—UN—05JAN15

A—ATU Settings Button

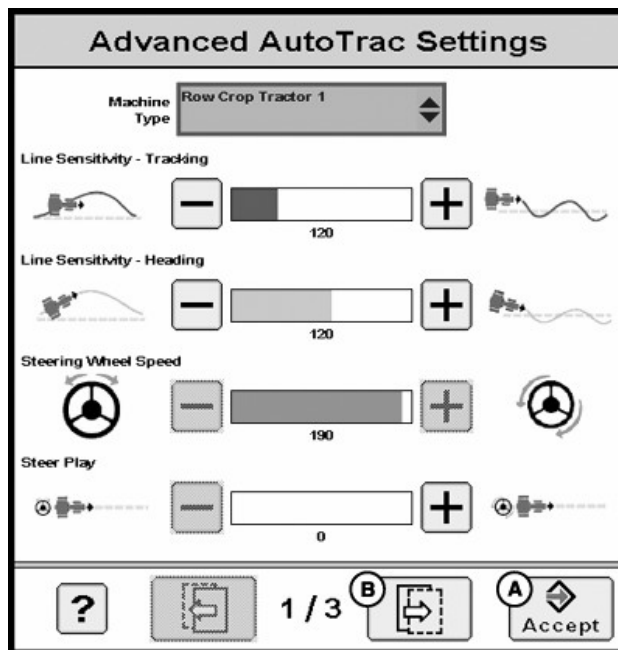
1. To access setup pages, select ATU Settings button (A).

CAUTION: AutoTrac™ Universal does not steer properly in reverse for articulated tractors and windrowers. Do not activate AutoTrac™ in reverse for articulated tractors and windrowers.

NOTE: Steer Wheel Speed setting is grayed out when using ATU 200. Steer Wheel Speed defaults to appropriate steering wheel speed.

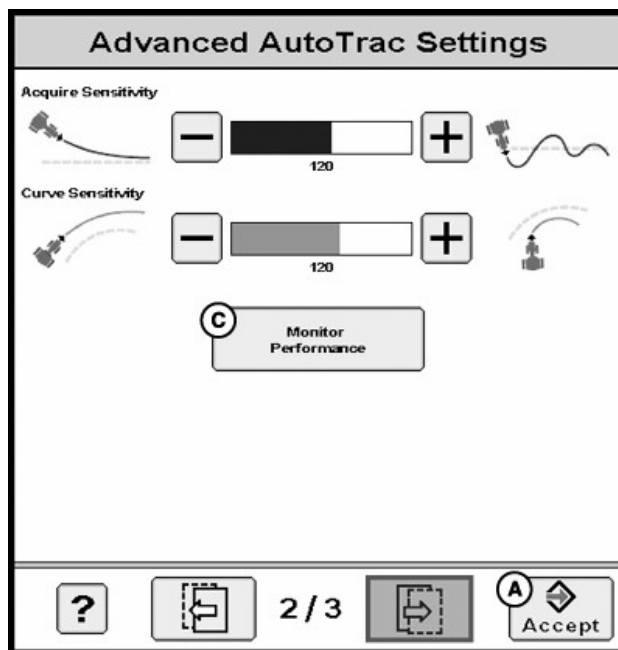
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The Help button is only available on GreenStar™ 3 2630 Display.



Advanced AutoTrac Settings Page 1/3

PC20540—UN—11DEC14



Advanced AutoTrac Settings Page 2/3

PC20541—UN—11DEC14

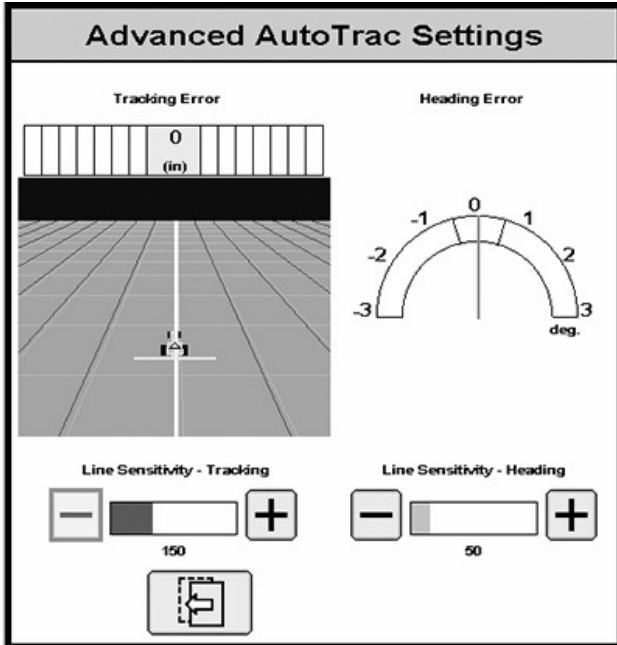
- A—Accept Button
- B—Next Button
- C—Monitor Performance Button

2. Adjust the settings. The Accept button (A) saves and applies current settings and returns user to the previous page.

NOTE: To advance pages, select Next (B).

For fine-tuning the line sensitivity tracking and heading, select the Monitor Performance button (C). Monitor Performance allows performance to be viewed using a numeric scale.

Line Sensitivity Tracking



PC22868—UN—25JUL16

Advanced AutoTrac Settings—Monitor Performance

Determines how aggressively AutoTrac™ responds to off-track (lateral) error.



PC19662—UN—21MAY14

Line Sensitivity Tracking Too High

Higher settings: Result in more aggressive response to machine off-track error.



PC19661—UN—21MAY14

Line Sensitivity Tracking Too Low

Lower settings: Result in less aggressive response to machine off-track error.

Line Sensitivity Heading

Determines how aggressively AutoTrac™ responds to heading errors.

Higher settings: Result in more aggressive response to machine heading error.

Lower settings: Result in less aggressive response to machine heading error.

Steering Wheel Speed



PC20345—UN—01DEC14

Steering Wheel Speed 3/6

Adjusts the rate of the machine steering to maintain tracking performance. Increasing the steering wheel speed generally results in better tracking performance. If set too high, the steering column resistance can result in AutoTrac™ deactivations.

NOTE: The Steer Wheel Speed setting is grayed out when using ATU 200. Steer Wheel Speed defaults to the appropriate steering wheel speed.

Steer Play

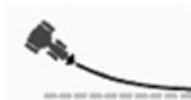


PC20346—UN—01DEC14

Steer Play 4/6

Some machines have excess play in their steering system, which allows the steering wheel to be turned without change in the machine direction. This setting controls the distance that the steering wheel turns to take up this excess play.

Acquire Sensitivity



PC20347—UN—01DEC14

Acquire Sensitivity 5/6

Determines how aggressively the machine acquires the track. This setting affects performance while acquiring the track only.

High settings: Result in a more aggressive track acquisition.

Lower settings: Result in a smoother entry into the next track.

Curve Sensitivity



PC20348—UN—01DEC14

Curve Sensitivity 6/6

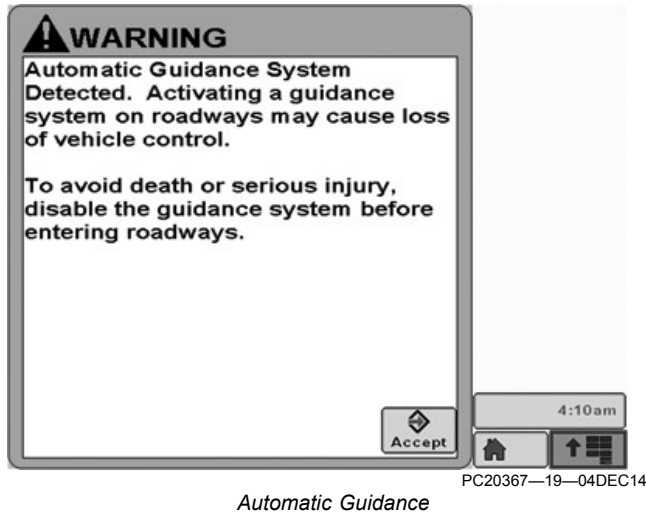
Determines how aggressively AutoTrac™ responds to a curve in the track. This setting affects performance in curve track guidance only.

Higher settings: Turns the machine in a smaller radius (tighter) around the curve.

Lower Settings: Turns the machine in a larger radius around the curve.

RW00482,00001A7-19-12SEP17

Automatic Guidance System Detected

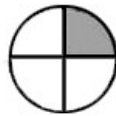


Each time a machine equipped with AutoTrac™ is started, this screen appears as a reminder of operator responsibilities when using the AutoTrac™ steering system.

CF86321,000038D-19-10AUG17

AutoTrac Status Pie

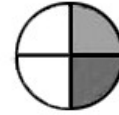
The AutoTrac Status Pie is shown at the bottom of the Run Page as a quick diagnostic indicator.



Installed

PC8832—UN—25OCT05

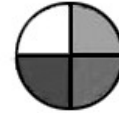
INSTALLED (1/4 of pie)—AutoTrac Steering Controller and all other necessary hardware are installed.



Configured

PC8833—UN—25OCT05

CONFIGURED (2/4 of pie)—Valid AutoTrac Activation, Tracking Mode has been determined and a valid Track 0 has been established. Correct StarFire signal level for AutoTrac Activation is selected (SF1, SF2, or RTK). Vehicle conditions met.



Enabled

PC8834—UN—25OCT05

ENABLED (3/4 of pie)—Steer On/Off softkey has been selected.



Activated

PC8835—UN—25OCT05

ACTIVATED (4/4 of pie with "A")—Resume switch is pressed and AutoTrac is steering the vehicle.

CF86321,0000392-19-01JUN11

Requirements to Enable AutoTrac™

The following criteria must be met to enable AutoTrac™:

- Machine has an AutoTrac™ capable steering controller (ACI).
- Valid AutoTrac™ activation (26-digit activation code).
- Setup Wizard is complete and a guidance track has been created.
- Correct StarFire™ signal level (SF1, SF2, or RTK) is selected for AutoTrac™ activation and a valid GPS signal is acquired.
- Terrain compensation module (TCM) is turned on and TCM message is valid.
- ACI has no active faults pertaining to steering function.
- Hydraulic oil warmer than minimum temperature.
 - Above 20°C (68°F) for tractors and windrowers.
- Operator presence mode detected.

- Master switch in the on position.

RW00482,0000534-19-15SEP15

Enable AutoTrac™



PC8836—UN—25OCT05

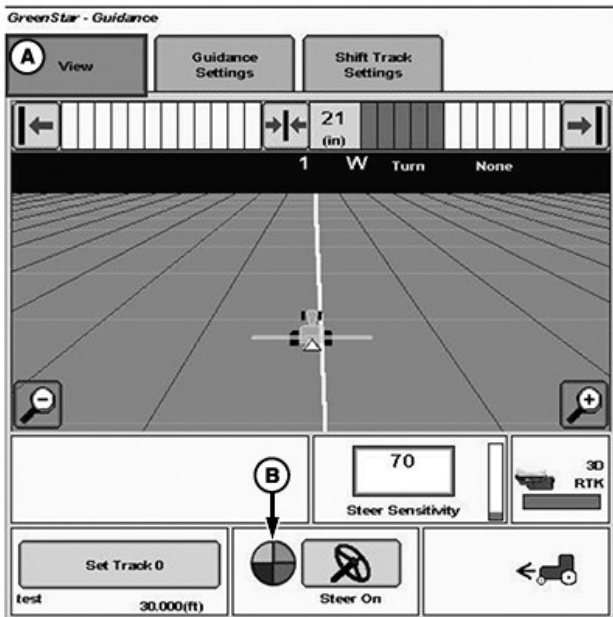
Steer On / Off for GreenStar™ 3 2630 Display



PC13711—UN—16MAY11

Steer On / Off for GreenStar™ 2 1800 Display

1. To enable AutoTrac™, select the Steer On / Off button on the run page. Select the Steer On / Off button again to disable AutoTrac™.



PC19798—UN—11NOV14

A—View Tab

B—AutoTrac™ Status Pie

When enabled, 3/4 of AutoTrac™ status pie (B) is filled.



PC11973—UN—09APR09

AutoTrac™ Diagnostics Wrench

If Steer On / Off icon is not present, a diagnostics

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wrench is displayed next to AutoTrac™ status pie. To view AutoTrac™ diagnostics, select the Wrench icon.

(For more information, refer to AutoTrac™ Status Pie Diagnostic Readings in the Troubleshooting AutoTrac™ Controller section.)

AE77568,00001BA-19-12SEP17

Activating System

CAUTION: While AutoTrac™ is activated, the operator is responsible for steering at end of path and collision avoidance.

Do not attempt to turn on (activate) the AutoTrac™ system while transporting on a roadway.

IMPORTANT: The operator must stay seated while the machine is moving.

NOTE: While AutoTrac™ is activated, steering wheel moves when the machine makes steering adjustments (windrower only).

NOTE: When no seat switch is present, AutoTrac™ Controller looks for operator activity every seven minutes. The operator receives a time-out alarm 15 sec before AutoTrac™ deactivates. To reset the activity monitor timer, press the resume switch.

After the system has been Enabled, the operator must manually change the system to Activated status when steering assistance is desired.



PC20037—UN—24SEP14

Resume Switch on Tractor



PC19766—UN—01JUL14

Resume Switch on Windrower

- Exceeding forward speed of 30 km/h (18.6 mph) for tractors, 19.3 km/h (12 mph) for windrowers.
- Exceeding reverse speed of 10 km/h (6 mph).
- Toggle Steering Off button on Guidance View tab.
- Operator out of seat for more than 5 sec if using seat switch or no activity detected by activity monitor for 7 minutes.

NOTE: Shifting to reverse in windrowers and articulated tractors disengages AutoTrac™.

RW00482,0000533-19-15SEP15

- A—Resume Switch
- B—Multi-Function Lever

1. **Press and release the resume switch (A)** to initiate assisted steering.

To activate system, the following criteria must be met:

- Forward machine speed is less than 30 km/h (18.6 mph) for tractors, 19.3 km/h (12 mph) for windrowers.
- Reverse machine speed is less than 10 km/h (6 mph).
- Machine within 40 degrees of the desired track.
- Operator is seated.
- Terrain compensation module (TCM) is on.
- In reverse, AutoTrac™ remains activated for 45 sec. After 45 sec, the machine must be put in a forward gear before reverse will activate again.

NOTE: Shifting to reverse in windrowers and articulated tractors disengages AutoTrac™.

RW00482,0000532-19-12SEP17

Deactivating System

CAUTION: Always turn off (deactivate and disable) AutoTrac™ system before entering a roadway.

To turn off AutoTrac™, turn Master Switch to Off position.

AutoTrac™ system deactivates by:

- Turning Master Switch to Off position.
- Turning steering wheel.
- Remaining stopped for more than 30 seconds.

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Operating—Optimizing AutoTrac™ Controller—Raven

Advanced AutoTrac™ Settings— GreenStar™ 3 2630 Display



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



GreenStar™ Button

PC12685—UN—29APR15

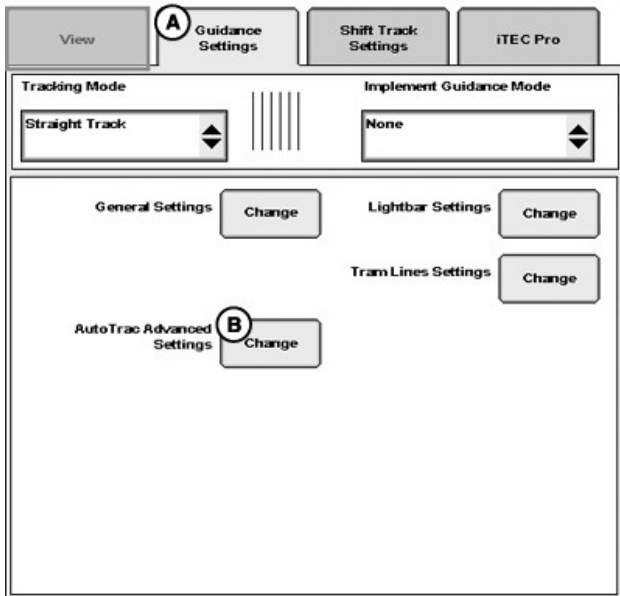
2. Select the GreenStar™ button.



Guidance Softkey

PC21148—UN—11MAY15

3. Select the Guidance softkey.



Guidance Settings Tab

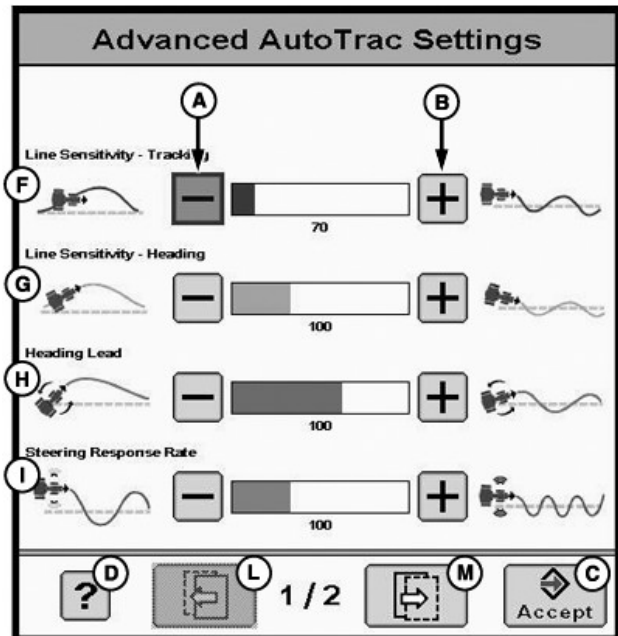
PC21523—UN—09SEP15

- A—Guidance Settings Tab
- B—AutoTrac™ Advanced Settings Button

4. Select the Guidance Settings tab (A).

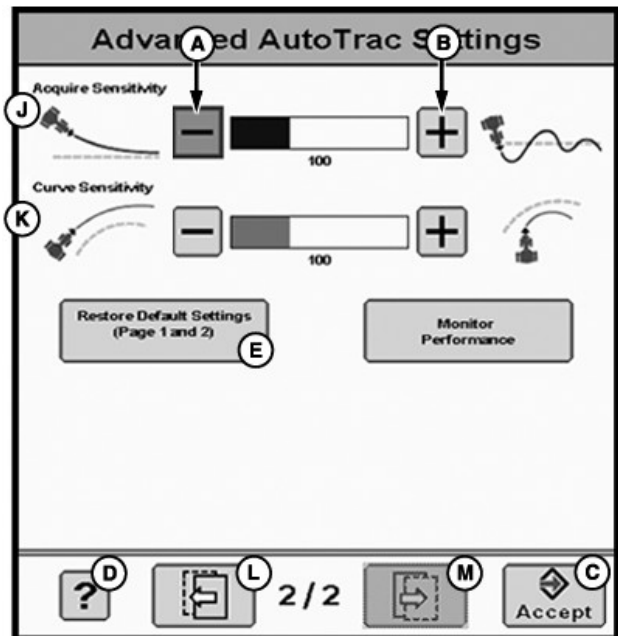
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5. Select the AutoTrac™ Advanced Settings button (B).



PC24418—UN—26JUN17

Advanced Settings Page 1



PC21557—UN—11SEP15

Advanced Settings Page 2

- A—Decrease Button
- B—Increase Button
- C—Accept Button
- D—Help Button
- E—Restore Defaults Settings Button
- F—Line Sensitivity-Tracking
- G—Line Sensitivity-Heading
- H—Heading Lead
- I—Steering Response Rate
- J—Acquire Sensitivity
- K—Curve Sensitivity
- L—Page Back Button

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M—Page Forward Button

NOTE: When selecting the decrease (A) and increase (B) buttons, change occurs immediately without selecting the Accept button (C).

The Help button (D) displays a page with details about each setting.

(Reference Optimizing AutoTrac™ Performance for more information.)

Select the Accept button to save the current settings and return to the previous page. To return all the settings to the factory default values, select the Restore Default Settings button (E).

RW00482,000054C-19-28AUG17

Advanced AutoTrac™ Settings— GreenStar™ 2 1800 Display



Menu Button

PC8663—UN—29APR15

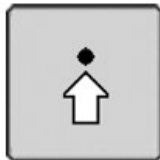
1. Select the Menu button.



GreenStar™ Softkey

PC21572—UN—11SEP15

2. Select the GreenStar™ softkey.



Settings Softkey

PC21573—UN—11SEP15

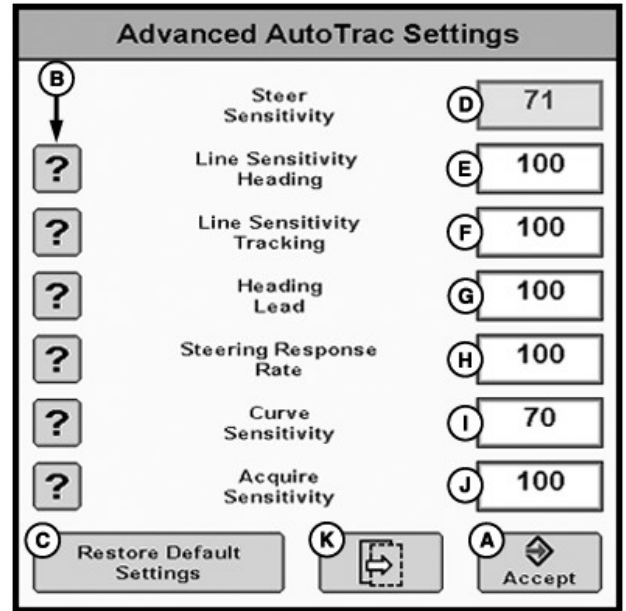
3. Select the Settings softkey.



AutoTrac™ Settings Button

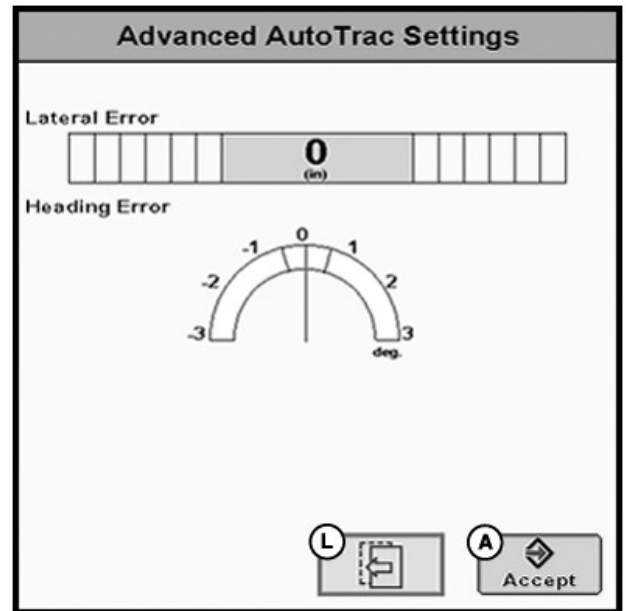
PC21574—UN—11SEP15

4. Select the AutoTrac™ Settings button.



PC21575—UN—11SEP15

Advanced Settings



PC21576—UN—11SEP15

Advanced Settings

- A—Accept Button
- B—Help Buttons
- C—Restore Defaults Settings Button
- D—Steer Sensitivity
- E—Line Sensitivity-Heading
- F—Line Sensitivity-Tracking
- G—Heading Lead
- H—Steering Response Rate
- I—Curve Sensitivity
- J—Acquire Sensitivity
- K—Page Forward Button
- L—Page Back Button

NOTE: When changing settings, values take effect after selecting the Accept button (A).

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GreenStar is a trademark of Deere & Company

Help buttons (B) displays a page with details about each setting.

(Reference Optimizing AutoTrac™ Controller Performance for more information.)

To return all settings to the factory default values, select the Accept button to save current settings and return to previous page. Select the Restore Default Settings button (C).

RW00482,000054D-19-28AUG17

Optimize AutoTrac™ Controller Performance

NOTE: AutoTrac™ Controller has been tuned to perform in most field conditions using various implements. For conditions outside of normal, Advanced Settings allows operator to fine-tune system for specific field conditions and implements.

Read this information in its entirety before tuning AutoTrac™ Advanced Settings.

1. **Check and fix problems before tuning.** Perform necessary mechanical checks and calibrations on machine. Tuning without fixing problems can mask actual machine faults and cause issues later.
2. **Access Advanced AutoTrac™ Settings page.** (See Advanced AutoTrac™ Settings for GreenStar™ Display.)
3. **Start with factory default settings.** Steering Sensitivity value correlates to value on Guidance View tab. Use a value for current conditions (70 for concrete, 100 for most conditions, 120 for soft ground). Adjust number to fine-tune system as needed.
4. **General Tuning Instructions**
 - Attempt to adjust settings in problem field conditions while AutoTrac™ is active. Adjust one value at a time. Reset to factory defaults if settings do not correct performance.
 - If adjusting one value does not give satisfactory performance, try different combinations of parameters.

Adjustment Recommendations:

- **Steering Sensitivity**—Set at 100 before making other adjustments, then adjust in increments of 10.
- **Line Sensitivity Tracking**—Adjust in increments of 20.
- **Line Sensitivity Heading**—Adjust in increments of 10.
- **Heading Lead**—Adjust in increments of 10.

- **Steering Response Rate**—Adjust in increments of 10.
- **Acquire Sensitivity**—Adjust in increments of 20.
- **Curve Sensitivity**—Adjust in increments of 20.

NOTE: If desired performance is not achieved, see *Troubleshooting AutoTrac™ Controller—Raven* for more detail.

Steering Sensitivity

Determines aggressiveness of AutoTrac™ steering system. A high steering sensitivity setting is more aggressive to allow system to handle tough manual steering conditions such as integral implements with a heavy draft load. A low steering sensitivity setting is less aggressive to allow system to handle lighter draft loads and higher speeds.



PC19658—UN—21MAY14
Line Sensitivities Too Low



PC19659—UN—21MAY14
Line Sensitivities Too High



Legend

PC8999—UN—08MAR06

A—Desired Track—Broken Line
B—Actual Track—Solid Line

Optimize Line Sensitivity

A: Line Sensitivity—Heading

Determines how aggressively AutoTrac™ responds to heading error.

- Tune line sensitivity—heading while operating on AB line.
- If front of machine wanders too far from track direction, adjust line sensitivity—heading higher.
- If machine becomes unstable, adjust line sensitivity—heading lower.

B: Line Sensitivity—Tracking

Determines how aggressively AutoTrac™ responds to off-track (lateral) error.

- Tune line sensitivity—tracking while operating on AB line.
- If machine wanders too far from the AB line, adjust line sensitivity—tracking higher.

- If machine becomes unstable around AB line, adjust line sensitivity—tracking lower.

NOTE: Line sensitivities work together. If both are set too high, machine becomes unstable. If both are set too low, machine wanders around AB line.

Optimize Heading Lead

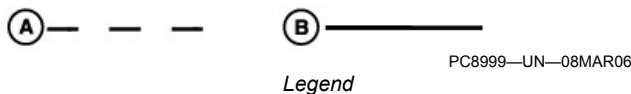
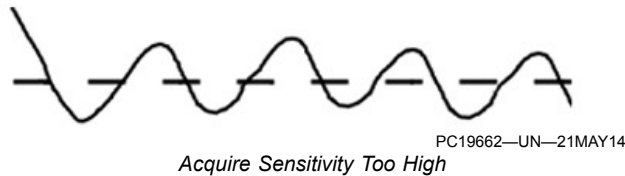
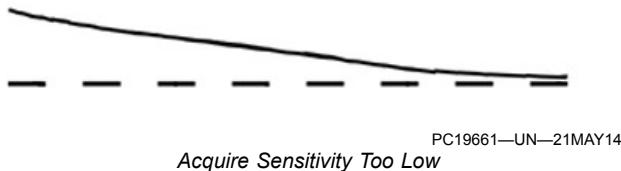
Determines impact of yaw rate (machine rate of turn) on tracking performance. This can be thought of as a look-ahead setting. Large adjustments may result in poor performance.

- Higher settings result in more aggressive response to changes in machine direction.
- Lower Settings result in less aggressive response to changes in machine direction.

Optimize Steering Response Rate

Adjusts rate of machine steering in order to maintain tracking performance. Increasing steering responsiveness generally results in better tracking performance.

- Tune speed by operating parallel to and 1.2 m (4 ft.) off the AB line.
- While tuning, adjust in increments of 10 between range of 50 to 200.

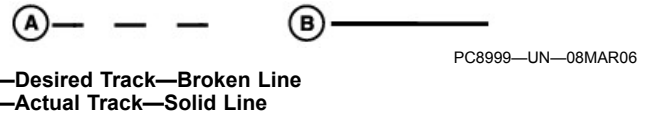
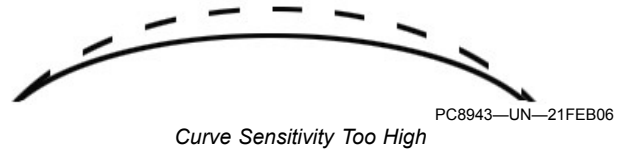
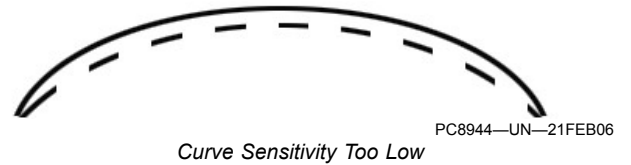


A—Desired Track—Broken Line
B—Actual Track—Solid Line

Optimize Acquire Sensitivity

Determines how aggressively machine acquires track. This setting affects performance while acquiring track only.

- Tune speed by operating parallel to and 1.2 m (4 ft.) off the AB Line.
- Tune acquire sensitivity until machine acquires line smoothly.



Curve Sensitivity

Determines how aggressively AutoTrac™ responds to a curve in track. This setting affects performance in curve track guidance only. Start with curve sensitivity equal to optimized acquire sensitivity.

- Tune curve sensitivity while operating in curve track.
- If machine turns outside of curve, adjust sensitivity higher.
- If machine turns inside of curve, adjust sensitivity lower.

AE77568,00001BB-19-03MAR16

Monitor AutoTrac™ Performance GreenStar™ 3 2630 Display



Guidance Settings Tab

PC11948—UN—30JUN09

1. Select the Guidance Settings tab.

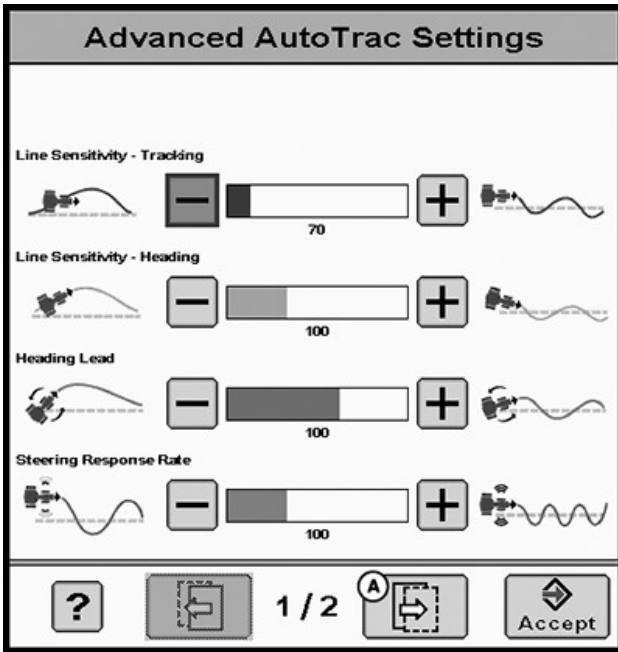


AutoTrac™ Advanced Settings Button

PC21902—UN—03DEC15

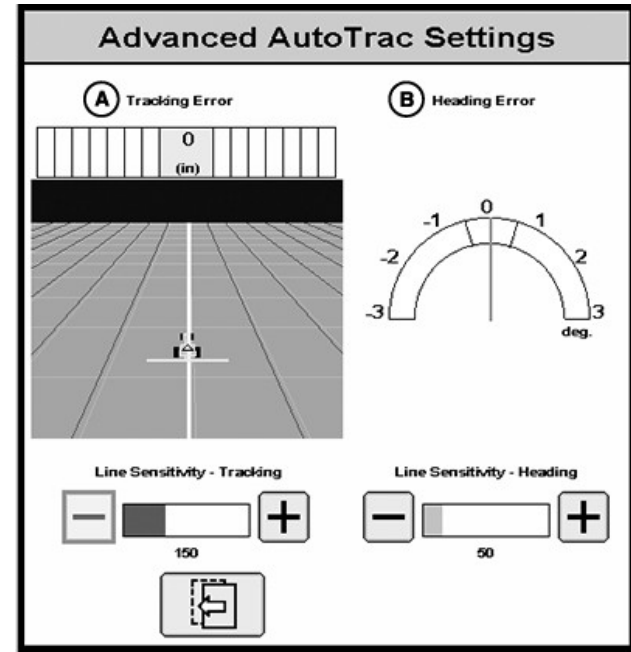
2. Select the AutoTrac™ Advanced Settings button.

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AutoTrac is a trademark of Deere & Company



PC22098—UN—28JAN16

Advanced AutoTrac™ Settings—Page 1



PC23225—UN—21OCT16

Tracking and Heading Error

A—Next Page Button

3. Select page 2 (A).



PC22002—UN—07JAN16

Monitor Performance Button

4. Select the Monitor Performance button.

GreenStar™ 2 1800 Display

1. Select the AutoTrac™ Settings button.
2. Select the Advanced Settings button.
3. Select page 2 (A).

A—Tracking Error B—Heading Error

Use the two graphs to monitor the tracking (A) and heading (B) errors.

1. Acquire the line and drive for 30 seconds.
2. Monitor both values for 30 sec.

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

Adjust the steering sensitivity to preferred performance before adjusting the line sensitivity tracking and heading settings.

3. Adjust the settings until preferred performance is achieved, based on the signal accuracy and the overall machine condition and health.

NOTE: Adjust Line Sensitivity—Tracking for tracking error.

Adjust Line Sensitivity—Heading for heading error.

HC94949,0000A80-19-28AUG17

Optimize AutoTrac™ Performance

AutoTrac™ performance can be optimized for commonly used operations and speeds. When optimizing AutoTrac™ on a tractor, it is recommended to first optimize performance without an implement to set baseline. Use the following chart to record values of AutoTrac™ advanced settings so they can be referenced when changing operations.

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Operation / Speed	Steer Sensitivity	Line Sensitivity —Tracking	Line Sensitivity —Heading	Heading Lead	Steering Response Rate	Acquire Sensitivity	Curve Sensitivity

HC94949,0000998-19-21MAR16

Wheel Angel Sensor (WAS) Calibration

CAUTION: To prevent injury, ensure that there are no bystanders in the path of the machine.
The machine drives in a circle while the steering wheel is turned towards the left and right limits.

The operator may recalibrate the WAS without performing a complete system recalibration. The operator also may recalibrate the left, right, and center positions individually or together.

NOTE: Perform test with the machine moving 4.8—8 km/h (3—5 mph).

NOTE: Ensure that wheels are turned all the way to the left and right during the WAS calibration, or undesired AutoTrac™ operation may occur. Do not hold wheel into the lock position when setting the left position.

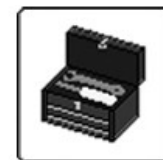
1. Select the Menu button.



AutoTrac™ Controller Button

PC21500—UN—03SEP15

2. Select the AutoTrac™ Controller button.



AutoTrac™ Tool Box Softkey

PC21501—UN—03SEP15

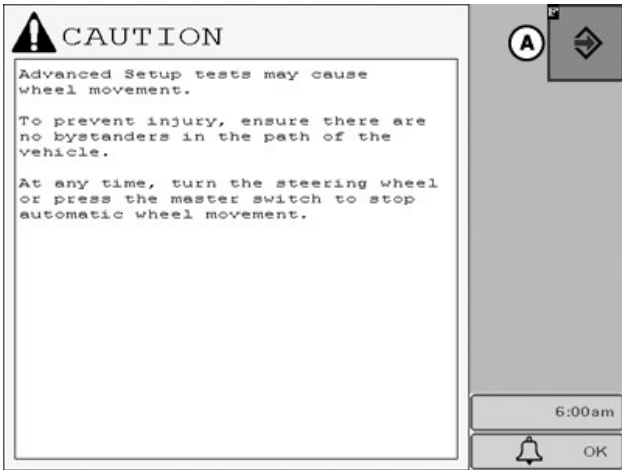
3. Select the AutoTrac™ Tool Box softkey.



Menu Button

PC8663—UN—29APR15

AutoTrac is a trademark of Deere & Company



PC20294—19—18NOV14

A—Accept

4. To proceed to Advanced Setup page, read and Accept (A) the caution message.



Steering Wheel Softkey

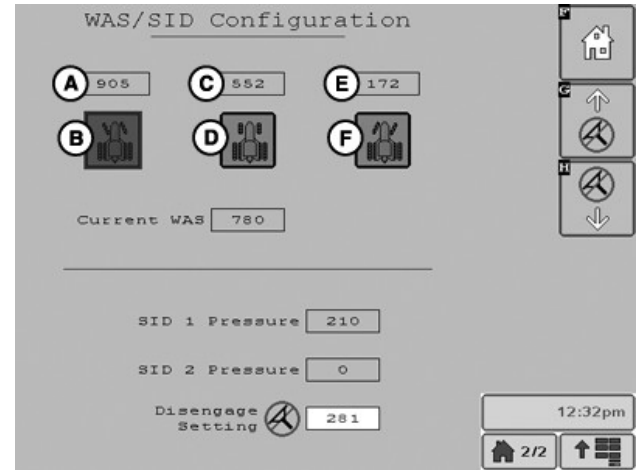
PC21522—UN—09SEP15

5. Select the Steering Wheel softkey.

NOTE: An accurate center WAS calibration is critical for AutoTrac™ operation. It is required to drive a short distance straight forward to a fixed point on the horizon.

If the center WAS position is not accurately set, the machine may track off line, and (or) cause degraded performance.

6. Recalibrate to the desired WAS limits. Do not hold wheel into the lock position when setting the left or right limits. The center position must be between the left and right limits for a valid WAS calibration.



PC21538—UN—10SEP15

WAS / SID Configuration

A—WAS Left Limit
B—Left Tractor
C—WAS Center Limit
D—Center Tractor
E—WAS Right Limit
F—Right Tractor

- Left Limit (A)—Turn the steering wheel all the way left until wheel stops, let off the steering wheel, and select the Left Tractor (B).
- Center Limit (C)—Turn the steering wheel so the wheels are pointing straight forward and select the Center Tractor (D).
- Right Limit (E)—Turn the steering wheel all the way right until the wheel stops, let off the steering wheel, and select the Right Tractor (F).

RW00482,0000535-19-02OCT17

Steering Input Device (SID) Disengage Adjustment

The SID disengage value is adjustable. If the SID Movement Detected page displays without turning the wheel, the SID disengage setting is too low. If the SID value is set too high, the machine kicks out of AutoTrac™ and displays a steering control unit fault.



Menu Button

PC8663—UN—29APR15

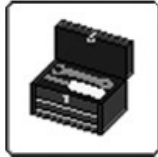
1. Select the Menu button.



PC21500—UN—03SEP15

AutoTrac™ Controller Button

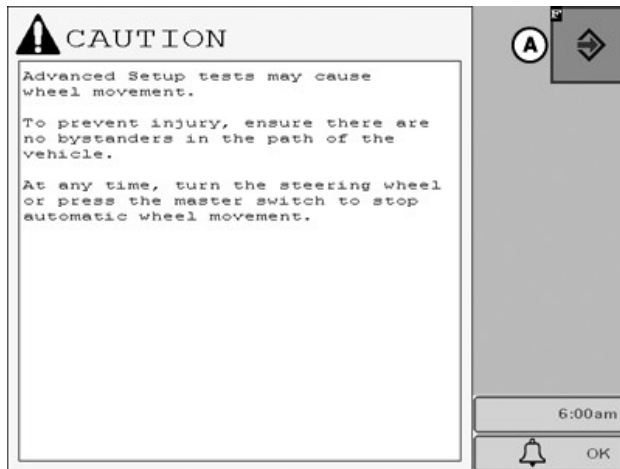
2. Select the AutoTrac™ Controller button.



PC21501—UN—03SEP15

AutoTrac™ Tool Box Softkey

3. Select the AutoTrac™ Tool Box softkey.



PC20294—19—18NOV14

A—Accept

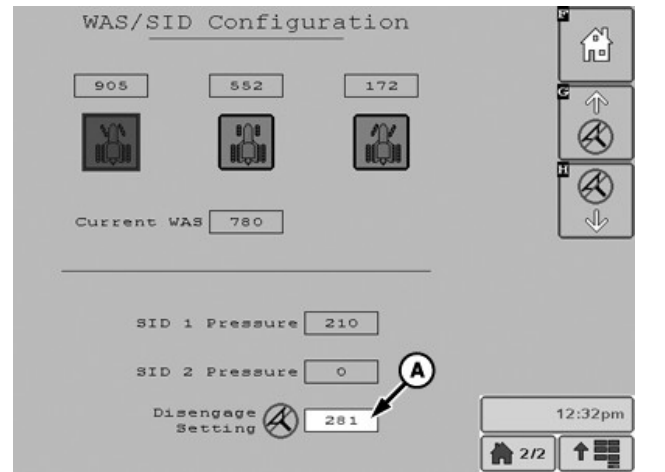
4. To proceed to Advanced Setup page, read and Accept (A) the caution message.



PC21522—UN—09SEP15

Steering Wheel Softkey

5. Select the Steering Wheel softkey.



PC21539—UN—10SEP15

WAS / SID Configuration

A—Disengage Setting

6. Increase the SID Disengage Setting (A) by ten points.
7. Retest the machine.

RW00482,0000536-19-12SEP17

Troubleshooting

Troubleshooting

1. **AutoTrac™ Controller–Raven Health Test** is used to validate health of hydraulic steering system and other steering components. Complete health test if performance issues are observed.
2. **Observable Symptoms** gives solutions to symptoms and issues an operator may encounter.
3. **AutoTrac™ Controller Diagnostic Readings** shows important statistics and system information.
4. **AutoTrac™ Pie Status and Diagnostic Readings** shows current status of requirements to operate AutoTrac™. It is useful in determining why AutoTrac™ does not engage.
5. **AutoTrac™ Controller-Raven System Information** shows important statistics and system information.
6. **Stop Codes** provides information and explains AutoTrac™ Controller–Raven stop codes.
7. **AutoTrac™ Exit Codes and Deactivation Messages** explains and provides solutions for exit codes and deactivation messages received when AutoTrac™ disengages.
8. **Guidance Alarms** explains alarms on display that appear as a full page message.
9. **Diagnostic Addresses** explains what each diagnostic address represents. Many important settings are stored as a diagnostic address.
10. **Diagnostic Trouble Codes** explains what each diagnostic trouble code represents and provides troubleshooting solutions for each issue.

AL70325,00001B0-19-26NOV14

Troubleshooting—Raven Steering Controller



Raven Steering Controller LEDs

PC21571—UN—11SEP15

LED display on electronic control unit (ECU) shows device status. If all lights are off, ECU is not receiving power.

ECU LED Status		
Name	Status	Message
LOGIC POWER (A)	Solid	ECU is receiving 12 V operating power.
	Dim	Check ground wire.
	Off	ECU is not receiving 12 V operating power.
HC POWER (B)	Solid	ECU is receiving high current power.
	Off	ECU is not receiving high current power.
MICRO 1 Hz (C)	Flashing	Operating
	Solid	Reprogramming
CAN RX (D)	Flashing	ECU is receiving CAN bus messages.
	Solid	Reprogramming
CAN TX (E)	Flashing	ECU is transmitting CAN bus messages.
	Solid	Reprogramming
DIAG 1 (F)	Not applicable	Not applicable
DIAG 2 (G)	Solid	CAN bus OFF state.

RW00482,0000544-19-11SEP15

AutoTrac™ Controller Health Test

NOTE: AutoTrac™ Controller Health Test cannot be conducted unless the AutoTrac™ Controller has been calibrated successfully.

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Utilize the Health Test only if performance issues are present.

The Health Test is an advanced test used to evaluate the machine hydraulic system. Use this test if poor

steering performance continues after calibration and advanced AutoTrac™ settings are fine-tuned.



Main Menu Button

PC19784—UN—07JUL14

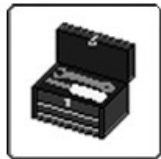
1. Select the Menu button.



AutoTrac™ Controller Button

PC21500—UN—03SEP15

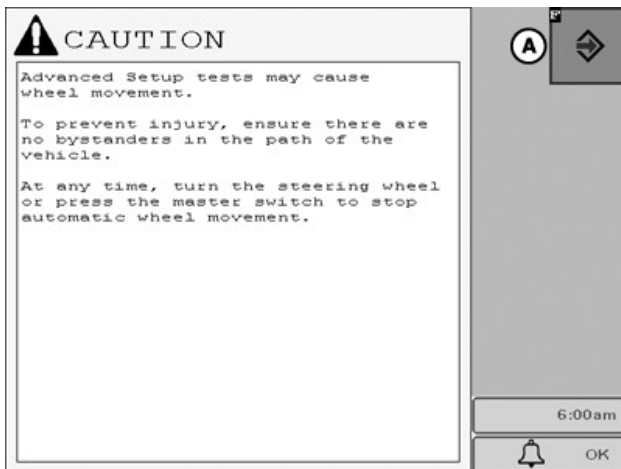
2. Select the AutoTrac™ Controller button.



AutoTrac™ Tool Box Softkey

PC21501—UN—03SEP15

3. Select the Tool Box softkey. A caution message is displayed.



PC20294—19—18NOV14

A—Accept

4. To proceed to Advanced Setup page, read and Accept (A) the caution message.



Health Test Softkey

PC21519—UN—09SEP15

5. Select the Health Test softkey.

Step Response Test

The Step Response Test changes the target wheel angle from the current position when the test is started, to straight ahead (0 degrees). The Step Response Test provides an indication of the machine controllability.

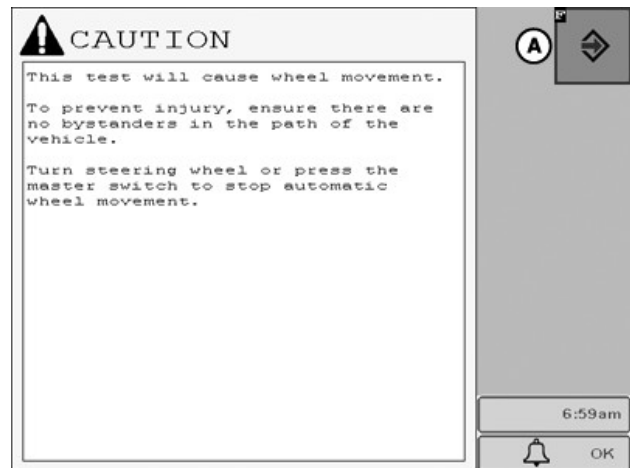
NOTE: Conduct test on a firm and level surface.



Step Response Test Softkey

PC19793—UN—08JUL14

1. Select the Step Response Test softkey. A caution message is displayed.

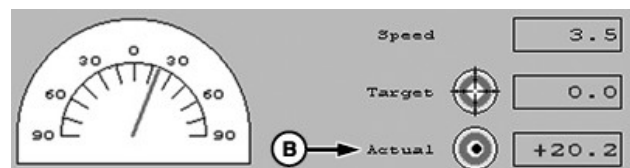


PC20296—19—18NOV14

Caution Message

A—Accept

2. To proceed to step response test, read and Accept (A) the caution message.
3. Drive the machine at a constant speed of 4.0 km/h (2.5 mph) with the engine rpm at approximately 2000 (+/- 300 rpm).



PC21540—UN—10SEP15

Wheel Angle

B—Actual Wheel Angle

4. Turn the machine so Actual Wheel Angle (B) displays +20 degrees (+/- 0.3 degrees).



Start Button

PC20040—UN—24SEP14

5. Select the Start button.

NOTE: When the Start button is selected, the AutoTrac™ Controller attempts to steer the machine so the actual wheel angle returns to 0 degrees.

6. After the machine has returned to a wheel angle of 0 degrees, the AutoTrac™ Controller generates the health test results.

7. Repeat the health test with the actual wheel angle set at -20 degrees (+/- 0.3 degrees).

8. Test results should not exceed values in table.

C	Step Size	0.0
D	Delay Time	0.000
E	Rise Time	0.000
F	Settling Time	0.000
G	Overshoot	0.0

PC21541—UN—10SEP15

Health Test Values

C—Step Size
D—Delay Time
E—Rise Time
F—Settling Time
G—Overshoot

NOTE: Step Size (C) is the actual wheel angle value at the start of test.

Machine Type	Delay Time (D)	Rise Time (E)	Settling Time (F)	Overshoot (G)
Row Crop	0.250 sec	1.500 sec	1.750 sec	2.5%
Articulated	0.320 sec	1.900 sec	2.000 sec	2.5%
Windrower	0.450 sec	1.400 sec	3.000 sec	45.0%

Troubleshoot Step Response Test Results

NOTE: If troubleshooting does not resolve the Health Test issues, contact your John Deere dealer.

Delay Time

Delay time is the time it takes for the wheel angle to

decrease by 0.5 degrees for tractors or 5.0 degrees for windrowers from the initial setting. If the delay time fails the test:

- Verify that wheel angle sensor is functioning properly.
 - Inspect if the wheel angle sensor (WAS) components are rubbing or binding on the machine.
 - Turn the steering wheel slowly and monitor the actual wheel angle reading on the health test screen.

NOTE: Value should smoothly increase when turning in one direction and smoothly decrease when turning in the opposite direction.

Value should change with the lightest steering wheel movements.

- Inspect the wiring harness for loose or bare wires between the control unit and wheel angle sensor.

NOTE: To change the valve settings, select the Tool Box > Valve Drive Configuration.

Rise Time

Rise time is the time it takes for the wheel angle to be within 0.5 degrees of straight ahead. If rise time fails the test:

- Inspect if the WAS components are rubbing or binding on the machine.
- Verify correct installation of all hydraulic components; specifically load sense hoses for closed center hydraulic systems.

Settling Time

Settling time is the time it takes for the wheel angle to achieve stability of less than 0.33 degrees from straight ahead. If settling time fails the test:

- Verify that the wheel angle sensor is functioning properly.
 - Inspect if the WAS components are rubbing or binding on the machine.
 - Inspect the wiring harness for loose or bare wires between the control unit and wheel angle sensor.
 - Turn the steering wheel slowly and monitor the actual wheel angle reading on the test page.

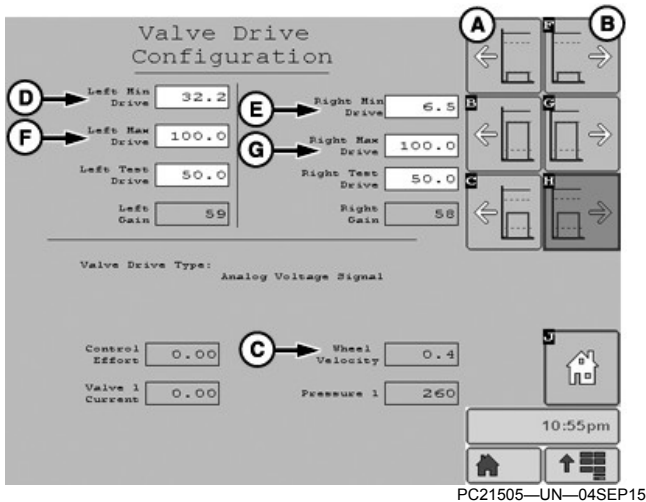
NOTE: Value should smoothly increase when turning in one direction and smoothly decrease when turning in opposite direction.

Value should change with slightest steering wheel movements.

- Adjust the valve settings to correct the wheel angle response. Minimum valve setting determines how

aggressively the valve responds when the control unit attempts to make a small wheel angle change.

wheel angle response is functioning properly, repeat the test.



Valve Drive Configuration

- A—Left Steering Pulse
- B—Right Steering Pulse
- C—Wheel Velocity
- D—Left Min Drive
- E—Right Min Drive
- F—Left Max Drive
- G—Right Max Drive

- Select and hold the Left or Right Steering Pulse (A or B) and verify Wheel Velocity (C) stays between 0 to 2 degrees per second. If value falls to 0, increase the Min Drive (D or E). If value does not fall below 2, decrease Max Drive (F or G). Make adjustments in increments of 1 to 3. Once the

Overshoot

Overshoot percentage is the maximum overshoot of wheel angle error after crossing the 0 degree line. If overshoot percentage fails the test:

- Verify that wheel angle sensor is functioning properly.
 - Inspect if the WAS components are rubbing or binding on the machine.
 - Inspect the wiring harness for loose or bare wires between the control unit and the wheel angle sensor.
 - Turn steering wheel slowly and monitor the actual wheel angle reading on the test page.

NOTE: Value should smoothly increase when turning in one direction and smoothly decrease when turning in opposite direction.

Value should change with the slightest steering wheel movements.

- To reset minimum settings, recalibrate the hydraulics.

Frequency Response Test

Only a John Deere Dealer should conduct a frequency response test.

Max Flow Left and Max Flow Right Tests

Only a John Deere Dealer should conduct max flow tests.

RW00482,0000537-19-13SEP17

Observable Symptoms

Symptom	Problem	Solution
AutoTrac™ Controller–Raven calibration failed. No steering input device detected.	Calibration procedure fails. AutoTrac™ does not engage.	Ensure that correct hydraulic installation type is selected (Field or Factory). Ensure status of the steering input device (SID) on the calibration page changes from inactive to active when steering wheel is moved. Check the wiring harness from the control unit to the SID for damaged or exposed wires.
The StarFire™ button is missing.	Display is not communicating with the StarFire™ Receiver.	Check display settings. (Reference Verify Display Settings.)

Symptom	Problem	Solution
AutoTrac™ Controller does not activate. AutoTrac™ does not resume.	Stop code encountered.	See list of stop codes to find the issue.
	System State does not show Ready.	Complete calibration. (Reference AutoTrac™ Controller–Raven Calibration for more information.)
AutoTrac™ Controller does not appear in the main menu.	System does not recognize AutoTrac™ Controller on CAN bus.	Ensure AutoTrac™ Controller is connected to GreenStar™ harness and receiving power. Check for faulty fuses in AutoTrac™ Controller wiring harness. Verify that the terminator is connected.
	Direction cannot be determined.	Update TCM to newest software.
	The terrain compensation module (TCM) software is old.	Verify differential correction frequency with your John Deere dealer.
Tractor acquires guidance line, but tracks to right or left of line.	Differential corrections are being received.	Ensure clear view of sky. Move machine away from obstructions.
	There are no global positioning system (GPS) signals being received.	Drive forward at a speed greater than 1.6 km/h (1 mph) and turn steering wheel greater than 45 degrees in one direction.
	AutoTrac™ Controller did not establish direction correctly.	Recalibrate wheel angle sensor and ensure that center point is accurately selected. (Reference Wheel Angle Calibration for more information.)
The AutoTrac™ Controller is unstable when entering track.	Acquire sensitivity too high.	Optimize acquire sensitivity. (See Optimizing AutoTrac™ Controller Performance.)
The AutoTrac™ Controller takes too long to enter next track.	Acquire sensitivity too low.	Optimize acquire sensitivity. (See Optimizing AutoTrac™ Controller Performance.)
AutoTrac™ Controller constantly weaves in the row.	StarFire™ Receiver height or fore/aft is not properly set.	Enter correct height and fore/aft dimensions. Perform Health Test. (See AutoTrac™ Controller Health Test.)

Symptom	Problem	Solution
	There is an aggressive S-ing motion.	Optimize line sensitivities. (See Optimizing AutoTrac™ Controller Performance.)
	There is a lazy S-ing motion.	Optimize line sensitivities. (See Optimizing AutoTrac™ Controller Performance.)
	StarFire™ Receiver mount direction setting is different from actual mount direction.	Correctly match mount direction in the receiver setup.
	AutoTrac™ Controller did not establish direction correctly.	Drive forward at a speed greater than 1.6 km/h (1 mph) and turn steering wheel greater than 45 degrees in one direction.
	Loose soil.	Add ballast (Follow recommended machine specifications).
There is excessive steering or wheel motion.	Steering wheel motion is exaggerated.	Adjust steering response rate and line sensitivities. (See Optimizing AutoTrac™ Controller Performance.)
		Perform Health Test. (See AutoTrac™ Controller Health Test.)
AutoTrac™ Controller drives inside or outside curve.	Curve sensitivity too high or low.	Optimize curve sensitivity (See Optimizing AutoTrac™ Controller Performance.).
AutoTrac™ Controller–Raven calibration fails.	There is not enough area to complete calibration without stopping.	Ensure that machine has enough area to complete calibration.
	Steering wheel turned to avoid obstacles.	Ensure that area is clear of obstacles.
	Incorrect inputs provided by operator.	Start calibration process over. Verify operator inputs.
	Wheel angle sensor (WAS) not responding.	Check WAS wiring harness connections for damage or debris.
	The electrohydraulic (EH) valve is not responding.	Check the EH valve wiring harness connections for damage or debris.
	Machine hardware failure.	Contact your John Deere dealer.
	The installation is incorrect.	Contact your John Deere dealer.
Manual steering is stiff or loose while driving.	Blocker valve may have failed.	Inspect blocker valve, fittings, and hoses for damage or hydraulic leaks.
		Inspect harnesses and connectors for damage.

Symptom	Problem	Solution
AutoTrac™ Controller performance is poor.	Steering is stiff.	Recalibrate hydraulic system. Temperature changes throughout the day can affect machine characteristics. Check torque specifications. (See windrower Operator's Manual.) Ensure that components are properly installed.
	Steering is loose.	Recalibrate hydraulic system. Temperature changes throughout the day can affect machine characteristics. Check torque specifications. (See windrower Operator's Manual.)
	Advanced AutoTrac™ Controller settings are set incorrectly.	Adjust the steering response rate. (See Optimizing AutoTrac™ Controller Performance.) Ensure that advanced AutoTrac™ settings are at default values before optimizing. Perform a Health Test. (See AutoTrac™ Controller Health Test.)
	Machine type is set incorrectly.	Recalibrate the system. Select the correct machine type during the calibration procedure. (See AutoTrac™ Controller–Raven Calibration.)
	Steering is stiff.	Recalibrate the hydraulic system. Temperature changes throughout the day can affect machine characteristics. (See AutoTrac™ Controller–Raven Calibration.) Check torque specifications. (See windrower Operator's Manual.)
	Steering is loose.	Recalibrate hydraulic system. Temperature changes throughout the day can affect machine characteristics. (See AutoTrac™ Controller–Raven Calibration.) Check torque specifications. (See windrower Operator's Manual.)

Symptom	Problem	Solution
AutoTrac™ disengages during use without turning wheel.	SID disengage setting is too low.	Increase SID disengage setting. (Reference Steering Input Device (SID) Disengage Adjustment for more information.)

RW00482,0000538-19-13SEP17

AutoTrac™ Controller Diagnostic Readings



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



GreenStar™ 3 Pro Button

PC17340—UN—24OCT13

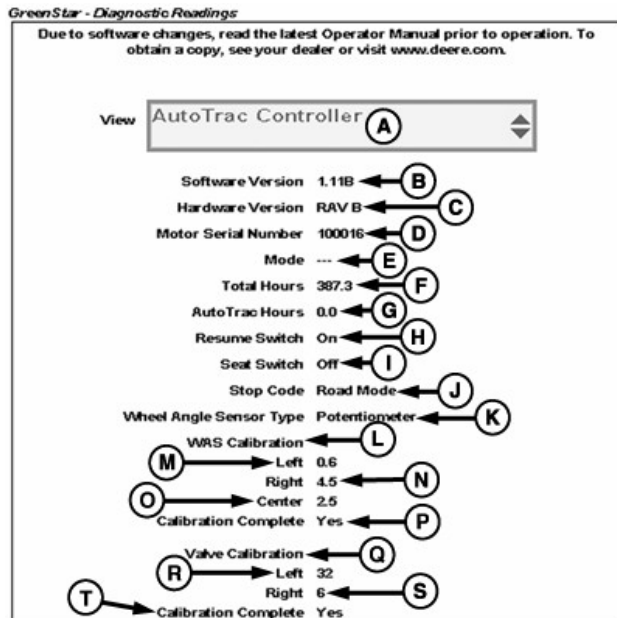
2. Select the GreenStar™ button.



Diagnostics Softkey

PC20267—UN—14NOV14

3. Select the Diagnostics softkey.



PC21726—UN—13OCT15

Diagnostic Readings - AutoTrac™ Controller View

A—View Drop-Down Menu

4. Select the AutoTrac™ Controller from the View drop-down menu (A).

AutoTrac™ Controller View displays:

- Software Version (B)—Software version on the control unit.
- Hardware Version (C)—Hardware part number.
- Serial Number (D)—Serial number of the control unit.
- Mode (E)—Status of AutoTrac™ on the control unit. Status corresponds with AutoTrac™ status pie.

---	0 of 4 Pieces
Disabled	1 of 4 Pieces
Disabled	2 of 4 Pieces
Enabled	3 of 4 Pieces
Active	4 of 4 Pieces

(See AutoTrac™ Status Pie Diagnostic Readings.)

- Total Hours (F)—Number of hours the control unit was powered on.

- AutoTrac™ Hours (G)—Number of hours AutoTrac™ was engaged on the control unit.
- Resume Switch (H)—Status of resume switch. Select the resume switch and verify functionality.
- Seat Switch (I)—Status of the seat switch. Verify functionality by sitting down in seat.
- Stop Code (J)— Last stop code.
(Reference AutoTrac™ Controller Stop Codes for more information.)
- Wheel Angle Sensor (WAS) Type (K)
- WAS Calibration (L)—Displays values for:
 - Left (M): 0.1–1
 - Right (N): 4–4.8
 - Center (O): 2–3
- Calibration Complete (P)—Status of WAS calibration. If status is No, calibrate WAS.
- Valve Calibration (Q)—Displays values for:
 - Left (R)
 - Right (S)
- Calibration Complete (T)—Status of valve calibration. If status is No, calibrate valve.

HC94949,0000985-19-13SEP17

AutoTrac™ Status Pie Diagnostic Readings



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



GreenStar™ 3 Pro Button

PC17340—UN—24OCT13

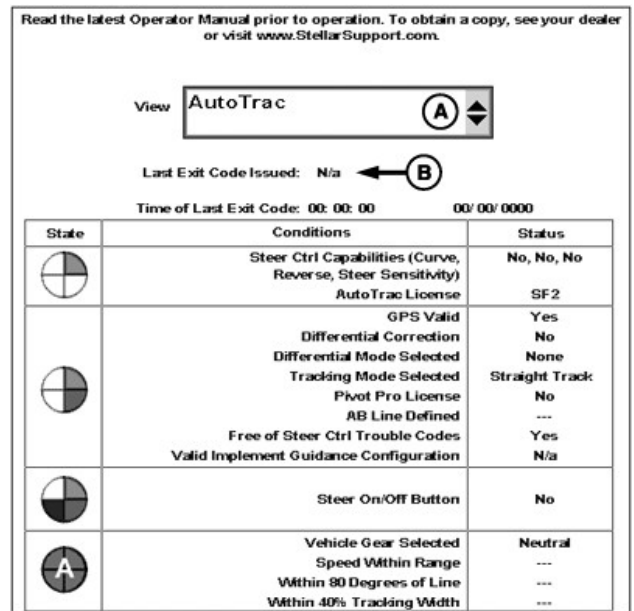
2. Select the GreenStar™ button.



Diagnostics Softkey

PC20267—UN—14NOV14

3. Select the Diagnostics softkey.



PC20269—UN—14NOV14

Diagnostic Readings - AutoTrac View

- A—View Drop-Down Menu**
B—Last Exit Code Issued

4. Select the AutoTrac™ from the View drop-down menu (A).

AutoTrac™ View displays the status of required conditions for each pie state.

Pie State	Conditions
1 piece out of 4	Steering Controller Capabilities (Curve, Reverse, and Steer Sensitivity)
	AutoTrac™ License
2 pieces out of 4	Global Positioning System (GPS) Valid
	Differential Correction
	Differential Mode Selected
	Tracking Mode Selected
	Pivot Pro Licensed
	AB Line Defined
	Free of Steer Control Trouble Codes
3 pieces out of 4	Valid Implement Guidance Configuration
	Steer On-Off Button
4 pieces out of 4	Machine Gear Selected
	Speed Within Range
	Within 80 Degrees of Line
	Within 40% Tracking Width

If AutoTrac™ disengages, check Last Exit Code (B). If AutoTrac™ does not engage, verify conditions of first 3 pieces of pie are met.

AL70325,00001B2-19-13SEP17

AutoTrac™ Controller—Raven System Information



Menu Button

PC19784—UN—07JUL14

1. Select the Menu button.



AutoTrac™ Controller Button

PC19785—UN—07JUL14

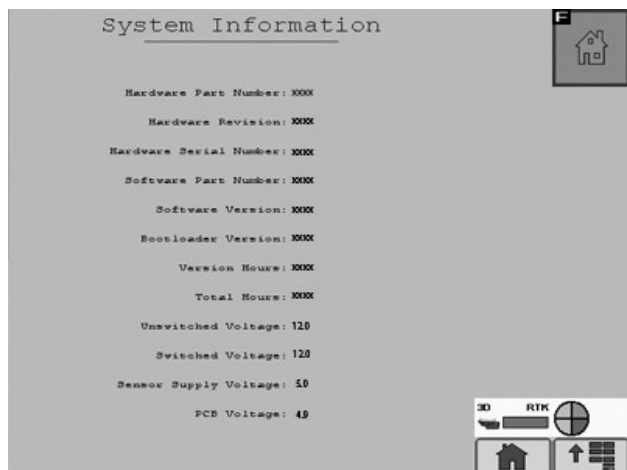
2. Select the AutoTrac™ Controller button.



Information Softkey

PC20291—UN—17NOV14

3. Select the Information softkey.



PC20329—UN—25NOV14

System Information displays the AutoTrac™ Controller information, such as the software version and operating voltages. If there are no voltages, check all the connections.

AL70325.00001B3-19-28AUG17

AutoTrac™ Controller—Raven Stop Codes



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



GreenStar™ 3 Pro Button

PC17340—UN—24OCT13

2. Select the GreenStar™ button.



Diagnostics Softkey

PC20267—UN—14NOV14

3. Select the Diagnostics softkey.
4. Select the AutoTrac™ Controller from the View drop-down menu.

The following Stop Codes can be displayed.

Stop Code	Description	Solution
No Code	Nothing has been checked yet.	No Code. System is ready.
Incorrect Gear	The transmission is in park.	Place transmission in a forward gear.
DTC Present	Diagnostic trouble code (DTC) is active.	Check DTC and corresponding issue.
Alt Guidance Active	Alternate guidance system active.	Turn off or uninstall alternate guidance system.
CMD MSG Timeout	The automation command message timed out.	Display message not received within 4 times the repetition rate.
Auth Denied	Authorization has been denied.	Denial of authorization or timeout of request at start-up.
Oil Temp Too Low	Oil temperature below threshold.	Allow oil temperature to warm up.
Diagnostic Mode	Steering control unit is in diagnostic mode.	Navigate to Guidance > View tab. Guidance system does not operate while diagnostic page is displayed.

Troubleshooting

CTRL State	Controller state incompatible.	Machine is in a non-operable state, such as key on and engine off, shutdown, or start-up state.
Bad Resume Data Received	Steering control unit sending bad data from resume switch.	Verify correct installation of the resume switch. Check wiring to resume switch.
Curvature Mismatch	The wheel angle sensor (WAS) readings do not match yaw rate of the machine.	Inspect installation of the wheel angle sensor. Ballast machine if machine is crabbing.
Security Not Satisfied	Security not satisfied.	Security challenge not satisfactory upon start-up. Update software to latest version and perform a power cycle.
Auth Pending	Authorization pending.	Authorization has not yet been granted.
Bad Seat Data Received	Steering control unit sending bad data from seat switch.	Verify correct installation of the seat switch.
Implement Released Control	AutoTrac™ deactivated by display.	Attempt to engage AutoTrac™. If problem persists, view diagnostic page for last display exit code.
Global Stop	Critical system failure has occurred.	Stop and restart machine.
Steering Wheel Moved	Steering wheel has moved.	If the steering wheel was not moved, increase the SID disengage setting.
Access MGR Blocked	Access Manager blocked.	Access Manager settings have blocked access. Change settings in Access Manager.
RSC Fault	A steering control fault severe enough to disable AutoTrac™.	Cycle tractor power.
Not Available	Not available or not installed.	Review hardware installation.

RW00482,000053B-19-28AUG17

AutoTrac™ Exit Codes and Deactivation Messages

Select Menu > GreenStar™ > Diagnostics > AutoTrac™ from View drop-down menu. The following Exit Codes can be displayed.

Select Menu > GreenStar™ > Guidance > View tab. The following deactivation messages can be displayed.

Each time AutoTrac™ is deactivated, text is displayed indicating the reason why it deactivated. Messages are also displayed when AutoTrac™ does not activate. The deactivation message displays for 3 s and then disappears.

Exit Code	Deactivation Message	Description	Solution
None	None	Nothing has been checked yet.	Boot-up code. System has not been checked for errors.
Wheel Speed Too Slow	Speed too slow	Machine speed too slow to use AutoTrac™.	Increase speed over 0.5 km/h (0.3 mph).
Wheel Speed Too Fast	Speed too fast	Machine Speed too high to use AutoTrac™.	Reduce speed below platform limit. Tractor—30 km/h (18.6 mph) Windrower—19.3 km/h (12 mph) Reverse speed on row-crop tractors only—10 km/h (6 mph)
Track Changed	Track number changed	Track number changed.	Align machine on desired track and press resume.
Lost Dual GPS	Invalid GPS signal	SF1, SF2, or RTK signal was lost.	Establish signal.
RSC Fault	Steering Controller fault	A steering control fault severe enough to disable AutoTrac™.	Cycle tractor power.
OK	None	Last state upgrade was successful.	
PT Turned Off	None	Tracking not turned on.	Turn tracking on in Guidance Settings > Tracking Mode.
Steering Wheel	Steering wheel moved	Steering wheel has moved to deactivate AutoTrac™.	Press resume switch to reactivate AutoTrac™. If steering wheel was not moved,

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AutoTrac is a trademark of Deere & Company

Troubleshooting

Exit Code	Deactivation Message	Description	Solution
			increase SID disengage setting.
Heading Error	Heading error too large	Heading error is out of range.	Align machine within heading limit: • 80° below 6 mph • 45° above 6 mph
Lateral Error	Off track error too large	Lateral error is out of range.	Align machine within lateral limit (40% of track spacing).
No TCM	No TCM corrections	Either no terrain compensation module (TCM) present or TCM is turned off.	Turn on TCM, or install TCM.
Master Switch	Road mode	Machine master switch is off.	Set switch status to on.
Reverse Timeout	Reverse timeout	Reverse timeout (greater than 45 seconds).	Select forward gear before resuming in reverse.
Incorrect Direction	Vehicle not moving in a forward direction	Machine is not traveling in a forward direction.	Machine must be in forward gear to activate.
Bad Resume Data Received	Resume switch error	Raven steering controller (RSC) sending bad data from resume switch.	See John Deere dealer.
Unknown Direction	Unknown direction	Unknown direction.	Drive forward faster than 1.6 km/h (1 mph) and turn steering wheel greater than 45°.
Curvature Mismatch	Curve too sharp	Curve Track radius is tighter than AutoTrac™ allows.	Manually drive through tight radius curves.
Bad Seat Data Received	Out of seat	RSC sending bad data from seat switch.	Operator in seat or press resume for activity monitor to reset time. If not resolved, see John Deere dealer.
Bad Wheelbase Data	None	RSC sending bad wheelbase data.	Bad wheelbase for machine class. See John Deere dealer or qualified service provider to obtain latest steering controller software.

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Guidance Alarms

ACI Communication Error	No communication with vehicle steering controller (Steering Controller). Check vehicle for diagnostic codes and contact your John Deere Dealer.
Turn Predictor Turned On	Turn predictor is turned ON. Use the check box to turn it OFF
AutoTrac Deactivated	AutoTrac system deactivates when operator is out of seat for more than 5 seconds
AutoTrac	The operator is responsible for collision avoidance. Turn AutoTrac OFF before entering roadways.
Data Card Problem!	A data card must be inserted in the compact flash drive with the door closed to use the GreenStar2 Pro application.
No Setup Data!	Setup data for the GreenStar2 Pro application could not be found on the data card. The GreenStar2 Pro application will not be available until a data card with setup data is inserted
AutoTrac Steering Controller Software Incompatible	See your John Deere Dealer for Steering Controller update.
Communication Error	Communication problem with controller. Check connections to controller.
Mobile Processor Detected	Mobile Processor Detected on CAN Bus. GreenStar Application is disabled. Remove mobile processor and cycle power to enable GreenStar application.
GPS Communication Problem	No communication with GPS receiver. Check connections at GPS receiver.
Tracking Inaccurate	The GPS receiver must be set to report at the 5Hz message output rate. Confirm settings on GPS receiver and change output to 5Hz,
Invalid Boundary	An invalid boundary has been recorded. You may continue recording or clear the current boundary and start recording again.
Activation Error	Invalid activation code. Please reenter activation code.

Troubleshooting

Invalid Filter	All the fields that are required to be filled out based on the Totals Type Selected have not been filled out.
Flags of Same Selection	Selected the Flags of same name and mode.
Name Already Exists	The name you have entered already exists in this list. Please enter a new name.

Alarms

GPS Communication Problem	No communication with GPS receiver. Check connection at GPS receiver and perform operation again.
Curve Track Memory Full	Internal memory available for Curve Track is full. Data must be cleared to continue Curve Track Operation. Clear curved track data from system
AutoTrac Disabled	AutoTrac SF1 license cannot operate with current StarFire software. Update StarFire software to operate AutoTrac.
AutoTrac Disabled	AutoTrac SF1 license cannot operate while SF2 corrections are turned on. Turn SF2 corrections off to operate AutoTrac.
License Problem	No license available for the selected tracking mode. Previous tracking mode will be selected.
Duplicate Name	Name already exists. Select another name.
Curve Track Recording	Curve Track recording in progress. Cannot perform operation until recording is turned off.
Circle Definition Problem	There was an internal error during Circle definition. Redefine the circle.
Circle Definition Problem	Communication with GPS receiver was lost during circle definition. Redefine the circle once communication has been re-established.
Circle Definition Problem	Center point is too far. Select another center point.
A-B Line Definition Problem	There was an internal error during A-B line definition. Redefine the A-B line.
A-B Line Definition Problem	A timeout occurred during A-B line definition. Redefine the A-B line.
A-B Line Definition Problem	A and B points of the A-B line are too close. Perform operation again.
Loss of GPS While Recording Boundary	GPS has been lost while recording the boundary. Point logging will resume when the GPS signal returns. This may result in an inaccurate boundary.
Data Card Full	Unload and cleanup data card or insert new data card.
Data Card 90% Full	Unload and cleanup data card or insert new data card.
No Memory	No Memory available for Curve Track. Unload and cleanup data card or insert new data card.
Low Memory	Low Memory available for Curve Track. Unload and cleanup data card or insert new data card.
No Memory	No Memory available for Straight Track. Unload and cleanup data card or insert new data card.
No Memory	No Memory available for Circle Track. Unload and cleanup data card or insert new data card.
Circle Definition Problem	The distance from the vehicle to the center point is greater than 1 mile. Select another center point or drive another circle.
Zero All Totals	You have decided to zero all totals for the selected filter.
Incorrect RS232 Controller Model Selected	The RS232 controller model selected is incorrect. Please verify and reenter manufacturer and model number.
Prescription Error	Controller is not setup to accept prescriptions.
Prescription Error	Controller is setup to accept prescriptions. No controller prescription has been selected.
Prescription Error	Prescription rate is out of controller range.
Controller Unit of Measure Error	Controller will only operate when using metric units.
Controller Unit of Measure Error	Controller will only operate when using English (US) units.
Controller Unit of Measure Error	Controller will only operate when using metric or English (US) units.
Controller Operation Error	Invalid operation selected for controller.
Prescription Warning	Out of field prescription rate is now being applied.
Prescription Warning	Loss of GPS signal has occurred. Loss of GPS prescription rate is now being applied.
Prescription Warning	Controller does not support selected prescription.

INFO

CF86321.0000333-19-23MAY11

AutoTrac™ Controller—Raven Diagnostic Addresses Diagnostic Addresses



Menu Button

PC8663—UN—29APR15

1. Select the Menu button.



PC8655—UN—05AUG05

Message Center Button (With Info Icon)

2. Select the Message Center button.



PC8668—UN—05AUG05

Diagnostic Addresses Softkey

3. Select the Diagnostic Address softkey. A list of control units is displayed and the control units with diagnostic codes are indicated.

Individual control units can be accessed by selecting the Enter button to view codes for that control unit.

To view the AutoTrac™ Controller—Raven codes, select ACI.001 Implement from the device drop-down menu.

Codes can also be displayed for all control units by selecting the Show All button and selecting the Enter button. To help with diagnosing the machine problems, communicate codes to your John Deere dealer.

The following diagnostic codes are specific to AutoTrac™ Controller—Raven.

Diagnostic Address	Description
001	Recall Trouble Codes
003	ELX (Display) Voltage
004	Battery voltage
005	5 V Regulator Voltage at the Regulator
008	LS pressure Sensor Voltage
009	LS Pressure Sensor-Measured pressure in kPa
010	WAS or Gyro Sensor Voltage
013	WAS Calibrated Center Voltage
014	WAS Calibrated Full-Left Voltage
015	WAS Calibrated Full-Right Voltage
016	WAS Actual Wheel Angle
019	GPS Speed
023	Max Flow Rate Test
025	Closed-loop Step Response Test
031	Adjustable Parameter-Heading Lead
037	AutoTrac™ Aggressiveness
048	Adjustable Parameter-Inner-Loop Gain
051	Adjustable Parameter-Heading Gain
052	Adjustable Parameter-Curvature Sensitivity
053	Adjustable Parameter-Acquisition Sensitivity
054	Adjustable Parameter-Lateral Gain
056	AutoTrac Hours
060	AutoTrac Exit Code
061	Steer Switch-Resume Switch-AutoTrac™ State
062	Parallel Tracking-Keycard Present-TCM State
063	Seat, Track Number, and GPS Status
065	Lateral Error
067	Heading Error
071	Lateral Error Accumulator
076	Engineering Diagnostics Enable or Disable
077	Actual Curvature
078	Target Curvature
079	Yaw-Rate

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Troubleshooting

Diagnostic Address	Description
080	Inner loop Gain Proportional
081	Inner Loop Gain Integral
082	Inner Loop Gain Derivative
083	Inner Loop Filtered Constant 1
084	Inner Loop Filtered Constant 2
085	Valve Left Gain
086	Valve Right Gain
087	Valve Left Deadband (%)
088	Valve Right Deadband (%)
089	Signal to valve (%)
090	Current draw from valve (Power line) (mA)
091	Pressure Sensor 2 Voltage
092	Pressure Transducer 2 (kPa)
093	Pressure Differential (kPa)
110	Steering Override Setting - SID Disengage Pressure Setting (kPa)
112	Valve Left Gain 1
113	Valve Left Gain 2
114	Valve Left Gain 3
115	Valve Left Gain 4
116	Valve Left Gain 5
117	Valve Left Gain 6
118	Valve Left Gain 7
119	Valve Left Gain 8
120	Valve Left Gain 9
121	Valve Left Gain 10
122	Valve Right Gain 1
123	Valve Right Gain 2
124	Valve Right Gain 3
125	Valve Right Gain 4
126	Valve Right Gain 5
127	Valve Right Gain 6
128	Valve Right Gain 7
129	Valve Right Gain 8
130	Valve Right Gain 9
131	Valve Right Gain 10
219	Controller Configuration Data Part Number
220	Controller Configuration Data Version Number

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AutoTrac™ Controller—Raven Diagnostic Trouble Codes (DTC)



Menu Button

PC8663—UN—29APR15



Message Center Button (With Info Icon)

PC8655—UN—05AUG05

1. Select the Menu button.
2. Select the Message Center button.



Trouble Codes Softkey

PC8669—UN—05AUG05

units is displayed and the control units with diagnostic trouble codes are indicated.

To view trouble codes, select the control unit. To view AutoTrac™ Controller—Raven diagnostic trouble codes, select ACI.001. To display codes from all the control units, select the Show All button.

To help with diagnosing the machine problems, communicate codes to your John Deere dealer.

3. Select the Trouble Codes softkey. A list of control

Code	Description
168.03	AutoTrac™ Controller Integrated (ACI) unswitched supply voltage is high. Check wiring harness and power supply.
168.04	ACI unswitched supply voltage low. Check wiring harness and power supply.
232.09	Loss of StarFire™ differential status message. Check global positioning system (GPS) connection. Disconnect receiver harness and reconnect.
517.09	GPS speed message not available on CAN bus for more than 5 seconds. Check GPS connection.
628.12	Indicates control unit being reprogrammed. To reprogram steering control unit, contact your John Deere dealer.
630.13	Indicates incomplete calibration of the steering valve. Wheel angle sensor (WAS) calibration incomplete. Restart WAS calibration. (See AutoTrac™ Controller—Raven Calibration.)
1504.09	Seat switch message not available. Check wiring harness to seat switch. If no seat switch is present, change operator presence to activity the monitor.
1504.14	Operator out of seat during AutoTrac™. Check wiring harness to seat switch.
1504.31	Operator out of seat during AutoTrac™ (within 2—7 seconds). Check wiring harness to seat switch.
1807.05	Steering input device (SID) 1 channel current out of range low. Check wiring harness to SID.
1807.06	SID 1 channel current out of range high. Check wiring harness to SID.
3509.03	Indicates sensor supply voltage (circuit code # 733) for steering wheel pressure sensor and (or) wheel angle position sensor out of range high. Check wiring harness to each component.
3509.04	Indicates sensor supply voltage (circuit code # 733) for steering wheel pressure sensor and (or) wheel angle position sensor out of range low. Check wiring harness to each component.
3509.05	Steering wheel position sensor 1 circuit current low. Check wiring harness to sensor.
3509.06	Steering wheel position sensor 1 circuit current high. Check wiring harness to sensor.
520431.05	The isolation shutoff valve has low circuit current. Check wiring harness to the hydraulic valve.
520431.06	The isolation shutoff valve has high circuit current. Check wiring harness to the hydraulic valve.
520826.09	Communication with the machine ISO cannot be established. Verify that all the wiring harnesses are connected and ISO connector is clean and free of debris.
522385.01	Indicates that AutoTrac™ Controller on-off switch on the machine is not ON. Switch AutoTrac™ master switch to ON position.
522387.07	No wheel motion being sensed during active AutoTrac™ while electrohydraulic (EH) valve is commanded. Indicates steering control unit not receiving wheel angle position sensor signal. Check wiring harness and ensure that sensor is clear of debris.
522390.09	External guidance messages missing, security not satisfied, or invalid implement request. Return to park and verify implement connections to attempt machine recovery.
522394.09	Terrain compensation module (TCM) message not available. Verify that TCM is turned on and calibrated. (Reference StarFire™ Receiver Operator's Manual for TCM calibration instructions.)
523698.09	GreenStar™ Display Parallel Tracking™ message not available. No communication data. Check display and receiver wiring harness connections.
523767.02	AutoTrac™ resume switch circuits conflict. Resume switch data invalid. Check resume switch wiring harness.
523795.02	Indicates steering valve orientation incorrect. Check if steering valve right and left circuit codes are switched. Electro-hydraulic (EH) valve appears to be plumbed backwards. Contact your John Deere dealer.
523795.11	Left and right EH valve deadbands during calibration are significantly different. Indicates inconsistency in steering valve deadbands. Check hydraulic hoses and fittings and recalibrate system. If the problem persists, contact your authorized dealer.
523795.12	EH valve or harness faulty. EH valve shows no current draw. Check wiring harness to the EH valve.
523795.13	Left or Right EH valve deadband is out of range. Incomplete valve calibration. Recalibrate system.
523824.05	SID 2 channel current out of range high. Check wiring harness to SID.
523824.06	SID 2 channel current out of range low. Check wiring harness to SID.
523826.00	WAS primary signal high. Sensor analog to digital converter (ADC) value is too high. Check wiring harness to WAS.
523826.01	WAS primary signal low. Sensor ADC value is too low. Check wiring harness to WAS.

Troubleshooting

Code	Description
523826.02	Indicates that WAS direction orientation is reversed. Mount WAS in the correct orientation and recalibrate WAS. If the problem persists, contact your authorized dealer.
523826.07	Indicates that WAS range of movement was too small during calibration. Check WAS hardware for correct installation. Recalibrate WAS. If the problem persists, contact your authorized dealer.
523826.10	Wheel angle has changed by more than 5 degrees in two seconds. SID disengage has not been detected in last 30 seconds. Possible faulty wiring harnesses or faulty pressure transducer. Check wiring harness and hardware for each component.
523826.14	Primary and secondary WAS conflict. Check the wiring harness to WAS.
524221.09	Machine yaw rate message missing. Check the wiring harness to GPS receiver.

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Parallel Tracking is a trademark of Deere & Company

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Maintenance

Preseason Checklist

Before start of season, it is recommended that machine operator performs the following software updates, inspections, and calibrations:

- ☐ Reference electronic Operator's Manual from JohnDeere.com or contact your John Deere dealer for downloadable versions.
- ☐ Update equipment software. Visit StellarSupport.com for latest software.
 - ☐ Display
 - ☐ Receivers
 - ☐ Controller
 - ☐ Other AMS equipment
- ☐ Contact your dealer to inquire about steering controller software updates. AutoTrac™ Controller—Raven software can only be updated by a John Deere dealer.
- ☐ Inspect wiring harness for wear and damage around pinch points, corners, edges, and harness support locations.
- ☐ Inspect wiring harness at connectors for wear on exposed wires.
- ☐ Inspect connector seals and latching mechanisms.
 - ☐ Receivers
 - ☐ Displays
 - ☐ Steering Controller
- ☐ Inspect mechanical steering system for wear.
- ☐ Inspect hydraulic system for leaks.
- ☐ Calibrate receiver terrain compensation module (TCM).
- ☐ Operate AutoTrac™ and recalibrate if necessary.
- ☐ Inspect AccuGuide™ pressure transducer valve for leaks. (See Safety section for more information.)

AE77568,00001B7-19-03MAR16

- ☐ Displays
- ☐ Steering Controllers
- ☐ Inspect AccuGuide™ pressure transducer valve for leaks. (See Safety section for more information.)

AE77568,00001B8-19-03MAR16

Daily Checklist

It is recommended that machine operator performs the following inspections daily:

- ☐ Inspect wiring harness for wear and damage around pinch points, corners, edges, and harness support locations.
- ☐ Inspect wiring harness at connectors for wear on exposed wires.
- ☐ Inspect hydraulic system for leaks.
- ☐ Inspect mounting hardware.
 - ☐ Displays
 - ☐ Receivers
- ☐ Inspect AccuGuide™ pressure transducer valve for leaks. (See Safety section for more information.)

AE77568,00001B9-19-03MAR16

Postseason Checklist

After conclusion of season it is recommended that machine operator performs the following inspections:

- ☐ Inspect wiring harness for wear and damage around pinch points, corners, edges, and harness support locations.
- ☐ Inspect wiring harness at connectors for wear on exposed wires.
- ☐ Inspect mechanical steering system for wear.
- ☐ Inspect hydraulic system for leaks.
- ☐ Inspect connector seals and latching mechanisms.
- ☐ Inspect connector pins for wear, debris, and corrosion.
 - ☐ Receivers

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AccuGuide is a trademark of CNH Industrial N.V.*

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John Deere Service Literature Available

Technical Information

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

Orders can be made using one of the following:

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

Available information includes:



TS189—UN—17JAN89

PARTS CATALOGS list service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.



TS191—UN—02DEC88

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



TS224—UN—17JAN89

TECHNICAL MANUALS outlining service information for your machine. Included are specifications, illustrated assembly and disassembly procedures, hydraulic oil flow diagrams, and wiring diagrams. Some products have separate manuals for repair and diagnostic information. Some components, such as engines, are available in a separate component technical manual.



TS1663—UN—10OCT97

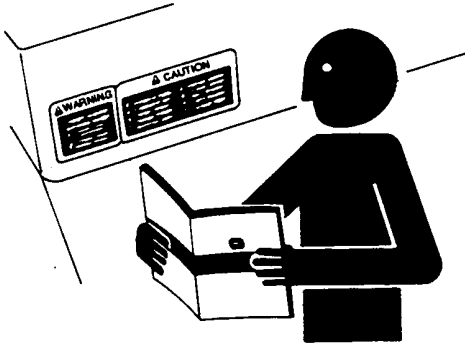
EDUCATIONAL CURRICULUM including five comprehensive series of books detailing basic information regardless of manufacturer:

- Agricultural Primer series covers technology in farming and ranching.
- Farm Business Management series examines “real-world” problems and offers practical solutions in the areas of marketing, financing, equipment selection, and compliance.
- Fundamentals of Services manuals show you how to repair and maintain off-road equipment.
- Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.
- Fundamentals of Compact Equipment manuals provide instruction in servicing and maintaining equipment up to 40 PTO horsepower.

DX,SERV LIT-19-07DEC16

John Deere Service Keeps You On Job

John Deere Is At Your Service



TS201—UN—15APR13

CUSTOMER SATISFACTION is important to John Deere.

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

- Maintenance and service parts to support your equipment.
- Trained service technicians and the necessary diagnostic and repair tools to service your equipment.

CUSTOMER SATISFACTION PROBLEM RESOLUTION PROCESS

Your John Deere dealer is dedicated to supporting your equipment and resolving any problem you may experience.

1. When contacting your dealer, be prepared with the following information:

- Machine model and product identification number
- Date of purchase
- Nature of problem

2. Discuss problem with dealer service manager.

3. If unable to resolve, explain problem to dealership manager and request assistance.

4. If you have a persistent problem your dealership is unable to resolve, ask your dealer to contact John Deere for assistance. Or contact the Ag Customer Assistance Center at 1-866-99DEERE (866-993-3373) or e-mail us at www.deere.com/en_US/ag/contactus/.

DX,IBC,2-19-02APR02