# GreenStar Applications 1800 GS2 Display

## OPERATOR'S MANUAL

## GreenStar Applications 1800 GS2 Display

**OMPC21701 ISSUE I9 (ENGLISH)**

CALIFORNIA

Proposition 65 Warning

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

If this product contains a gasoline engine:

**⚠ WARNING**

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

The State of California requires the above two warnings.

**John Deere Ag Management Solutions**

DCY

OMPC21701

# Introduction

## Foreword

WELCOME to the GreenStar™ system offered by John Deere.

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

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your system and should remain with the system 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 of forward travel.

RECORD PRODUCT IDENTIFICATION NUMBERS (P.I.N.). Accurately record all the numbers to help in tracing the components should they be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

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

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

*GreenStar is a trademark of Deere & Company*

JS56696,0000218 -19-10DEC08-1/1

## www.StellarSupport.com

*NOTE: 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 and Quick Reference Guide prior to operation. To obtain a copy, see your dealer or visit www.StellarSupport.com*

OUO6050,0000FB1 -19-28JUL09-1/1

## Read This Manual

**Before operating display/software, familiarize yourself with components and procedures required for safe and proper operation.**

**IMPORTANT: The following GreenStar components are not weather-proof and should only be used on vehicles equipped with a cab. Improper use may void warranty.**

- **Original GreenStar Display and Mobile Processor**
- **GS2 Display**
- **AutoTrac Universal Steering Kit**

JS56696,0000491 -19-06OCT08-1/1

# Contents



**Continued on next page**

*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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A John Deere ILLUSTRUCTION ® Manual

## Recognize Safety Information

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.

T81389 —UN—07DEC88

DX,ALERT -19-29SEP98-1/1

## Understand Signal Words

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

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


TS187 —19—30SEP88

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

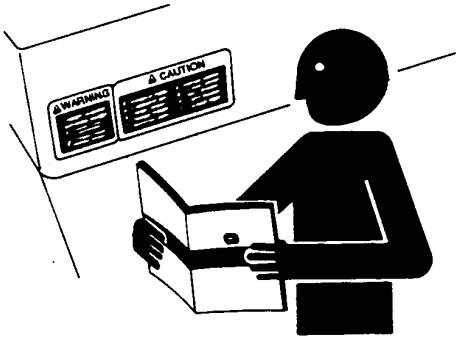
## Follow Safety Instructions

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

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.




TS201 —UN—23AUG88

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

DX,READ -19-16JUN09-1/1

## Handle Global Positioning Receivers and Brackets Safely

Falling while installing or removing a global positioning receiver can cause serious injury. Use a ladder or platform to easily reach a mounting location.

Use sturdy and secure footholds and handholds. Do not install or remove the receiver in wet or icy conditions.

The receiver mast used on implements 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. Use proper lifting techniques and wear proper protective equipment.

TS249 —UN—23AUG88

DX,WW,RECEIVER -19-08JAN08-1/1

## Operate Guidance Systems Safely

Do not use AutoTrac system on roadways.

- Always turn off (Deactivate and Disable) AutoTrac system before entering a roadway.
- Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway.

The AutoTrac system is intended to aid operator in performing field operations more efficiently. Operator is always responsible for machine path. To prevent injury to operator and bystanders: Remain alert and pay attention to surrounding environment.

- Take control of 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 machine path.

OUO6050,0001216 -19-08OCT09-1/1

## Automatic Guidance System Detected

**CAUTION: Automatic Guidance System Detected. Activating a guidance system on roadways may cause loss of vehicle control.**

**To avoid death or serious injury, disable the guidance system before entering roadways.**

This message occurs during start-up on vehicles with an Automatic Guidance System installed.


PC12314 —UN—05OCT09

OUO6050,0001219 -19-08OCT09-1/1

# GreenStar System Introduction

## Read This Manual

Before operating GreenStar applications on the GreenStar2 1800 display, such as Parallel Tracking, On-screen Mapping, AutoTrac, or Swath Control, please read this manual carefully to understand components and procedures required for safe and proper operation.

PC10857JC —UN—13APR09

*Menu Button*

This manual covers GreenStar applications, that can be accessed through the Menu button .

OUO6050,0001090 -19-12APR09-1/1

## GreenStar Basic Information

This section describes the functionality available in the GreenStar System. Manual Guidance and On-Screen Mapping are available only after the license agreement is accepted. The following optional Pro Modules can be purchased and unlocked with a 26 digit activation code:

- **AutoTrac™ (SF1, SF2, and RTK)** - Automatically guides vehicle in a defined straight, curve, or adaptive curve path.
- **PivotPro** - Automatically guides vehicle in defined concentric circles for fields with center pivot irrigation systems.
- **Swath Control Pro™** - Turns implement or sprayer boom sections ON and OFF based on GPS and defined boundaries.

Please see your dealer and www.StellarSupport.com for more information on these Pro Modules. A 15-hour demo activation for each Pro Module is included on your display.

*NOTE: Applications require a StarFire receiver or compatible third-party receiver.*

OUO6050,0001091 -19-28APR09-1/1

## Manual Guidance

Manual guidance, also known as Parallel Tracking, enables the operator to manually steer along guidance tracks using the on-screen lightbar, map, and audible tones. In addition, the GreenStar™ Lightbar may be added to run as a companion to GS2 1800. This provides a secondary display mounted on the windshield directly in the line of sight.

OUO6050,0001092 -19-11APR09-1/1

## On-Screen Mapping

On-screen coverage maps serve as a visual reference to the operator to ensure complete coverage of the field. This is especially important in applications where coverage is not easily seen by looking at the field, such as spraying and spreading operations, as well as planting or no-till seeding.

Only one Coverage map may be stored per field and only one map may be stored when no field is selected. Coverage maps are stored in the internal memory of the display until they are cleared by the operator.

OUO6050,0001093 -19-11APR09-1/1

## Boundaries

This display is capable of mapping Exterior and Interior boundaries:

- An **Exterior Boundary** delineates the perimeter of a field. Only one may be stored per field.
- An **Interior Boundary** delineates the perimeter of an area inside the field which is not farmed such as a grass waterway or field road. Interior Boundaries must be named and several may be stored per field.

Boundaries are useful for calculating acreage and required to operate Swath Control Pro or Sprayer Pro. Boundaries may be recorded in the display with GPS while driving a vehicle.

OUO6050,0001094 -19-11APR09-1/1

## AutoTrac

AutoTrac™ is an assisted steering system that allows operators to take their hands off the steering wheel as the machine travels down the created guidance line in the field. Operators still have to turn the machine around on the end rows, but by simply pressing the resume button AutoTrac™ will again regain control and start steering the vehicle down the adjacent pass.

OUO6050,0001095 -19-11APR09-1/1

## Swath Control Pro™

Swath Control Pro™ automatically turns sections ON and OFF based on the following conditions:

- **Previous Coverage** - The system will turn sections off when it enters an area that has already been covered.
- **Exterior Boundaries** - The system will turn sections off when they go outside of a previously recorded exterior boundary. Sections will turn on when they re-enter the boundary.
- **Interior Boundaries** - Interior boundaries, or no-spray zones, can be set up for any field. The system will turn sections off when go inside of a previously recorded interior boundary. Sections will turn on when they exit the boundary.

The on-screen map gives an operator a visual reference for when sections are turned on and off.

Swath Control Pro™ will only function on vehicles and implements with compatible software:

- SprayStar version 5.11 or higher
- 5430 Sprayer(European only)
- All versions of GS2 Rate Controller
- All versions of SeedStar 2: Planters, Air Carts, and 1990CCS.

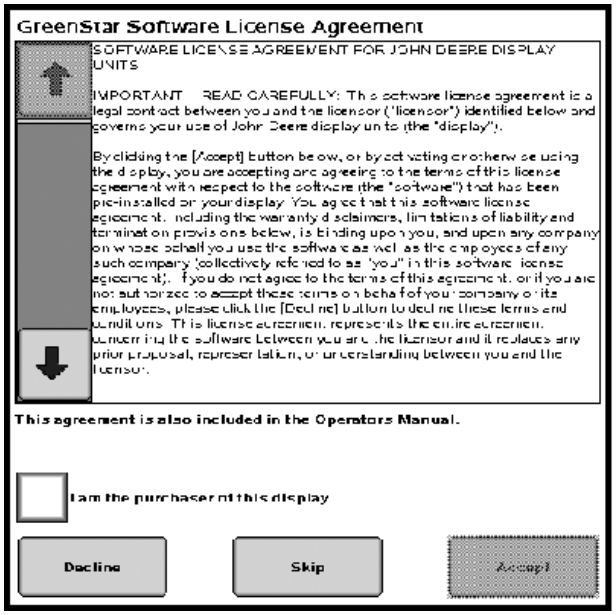
*NOTE: A 15 hour (actual use time) demo code is available on every new display. The 15 hours count down when Swath Control Pro is activated, and the master switch is on. When the demo period is over, Swath Control Pro will be unavailable until an activation code is purchased through a John Deere Dealer, and entered into the display.*

OUO6050,0001096 -19-28APR09-1/1

## License Agreement

The first time you access the GreenStar tab on the display menu a license agreement will appear. If you are the purchaser of the display, read the agreement fully, check the box next to “I am the purchaser of this display”, and Accept agreement if you agree to the terms.

The License Agreement can be obtained from you local John Deere dealer or can be viewed at www.StellarSupport.com.




PC10857JD —UN—12APR09

*License Agreement*

OUO6050,0001097 -19-12MAY09-1/1

## Activating GreenStar Pro Modules

**IMPORTANT: The date and time must be set correctly on your display before entering Activation Codes.**

Software activations are required to operate the optional Pro Modules

- AutoTrac
- PivotPro
- Swath Control Pro

Activations can be purchased from your local John Deere Dealer. The display software Activation Codes are separate from the StarFire 24 digit GPS activation numbers. The following items are REQUIRED to activate a Pro Module:

- 6 digit COMAR order number (obtained from your dealer)
- Display Serial Number (found in display)
- Display Challenge Code (found in display)

Once you have obtained the 6 digit COMAR order number from your dealer for the GS2 Pro Module you have purchased, visit StellarSupport.Deere.com to obtain a 26 digit Activation Code. Follow these steps:

1. (MENU > GreenStar > Settings > Activations)
2. Find the Serial Number and Challenge Code on your display.
3. Go to StellarSupport.Deere.com and select 'GreenStar 2 Pro Module' under Activations and Subscriptions. You may need to register for an account.
4. Select your display model and enter your Serial Number and Challenge Code.

PC10857JC —UN—13APR09

*Menu Button*

PC10857JE —UN—13APR09


*GreenStar2 Pro Button*

PC10857JF —UN—13APR09

*Settings Button*

PC10857JG —UN—13APR09

*Activation Button*

5. Follow the prompts to obtain the 26 digit code.
6. Enter the 26 digit code in your display (Menu > GreenStar > Settings > Activations > Enter Code).
7. You will now see Activated in the Pro Module area.
8. This completes the Display Software Activation Process. Keep in mind, the activations you have purchased may be transferred from other GreenStar displays to this display.

OUO6050,0001085 -19-11APR09-1/1

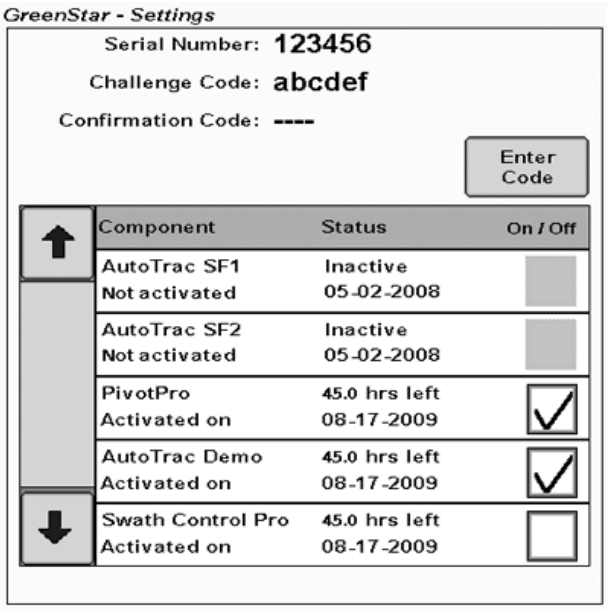
## Managing Activations

The buttons and functions corresponding to each GreenStar Pro Module activation may be shown or hidden by checking the ON / OFF checkbox for each activation. The box must be checked to use the corresponding Pro Module. By turning OFF activations that are not being used, the corresponding buttons and functions will be hidden, making the display simpler to navigate.

Demo Activations are available to try out each Pro Module for 15 hours of use. The AutoTrac Demo is turned on by default. To try another Demo, such as Swath Control Pro, turn it on and the Swath Control buttons and functions will show up on the display if an implement controller capable of that Pro Module is connected.

Go to GreenStar Main >> Settings >> Activations

**IMPORTANT: Turning a Demo Activation OFF will not stop the activation time from counting down if the corresponding function has been setup and started. It will simply hide the corresponding buttons.**



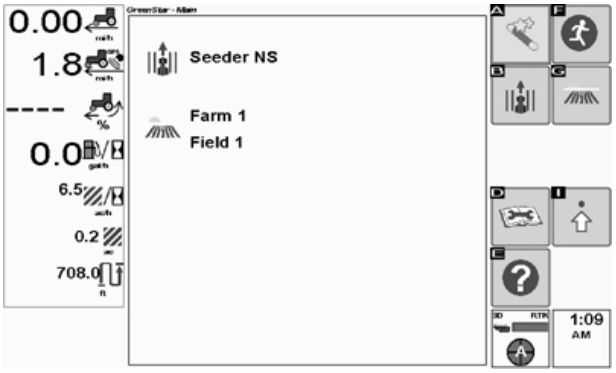

PC10857QY —UN—24SEP09

OUO6050,000120A -19-24SEP09-1/1

## GreenStar Main Page

The GreenStar Main Page is the center for access to GreenStar functions and lists the currently selected Client, Farm, Field, and Guidance Track.

*NOTE: Some buttons and softkeys only appear when the hardware or functions associated with those buttons are connected or available, respectively.*




PC10857JQ —UN—13APR09

*GreenStar Main Page*

OUO6050,0001086 -19-13APR09-1/9

**Setup Wizard** – Must complete prior to operation. Complete each step for optimal system performance.

PC10857JH —UN—13APR09

*Setup Wizard*

OUO6050,0001086 -19-13APR09-2/9

**Go!** - Return to Run Page if your system is already setup.

PC10857JI —UN—13APR09

*Go!*

OUO6050,0001086 -19-13APR09-3/9

**Guidance Quick Change** - Change Tracking Mode or Edit Track

PC10857JJ —UN—13APR09

*Guidance Quick Change*

OUO6050,0001086 -19-13APR09-4/9

**Field Quick Change** - Change Field or Create a boundary

PC10857JK —UN—13APR09

*Field Quick Change*

OUO6050,0001086 -19-13APR09-5/9

**GreenStar Diagnostics**

PC10857JL —UN—13APR09

*GreenStar Diagnostics*

**Continued on next page**

OUO6050,0001086 -19-13APR09-6/9

**GreenStar Settings**

PC10857JF —UN—13APR09

*Settings Button*

OUO6050,0001086 -19-13APR09-7/9

**Help** - Show help text in the Left Region

PC10857JM —UN—13APR09

*Help*

OUO6050,0001086 -19-13APR09-8/9

You can return to GreenStar Main from most pages in the GreenStar application by selecting the GS2 button.

PC10857JN —UN—13APR09

*GS2 button*

OUO6050,0001086 -19-13APR09-9/9

## Setup Wizard

The Setup Wizard walks you through setup of your GreenStar system to run any of the GreenStar applications. The Setup Wizard does not allow you to advance without filling out required entries but it is important to enter correct information in all entry boxes.

Proper setup is important whether you are running AutoTrac, Swath Control Pro, or just Coverage mapping. Machine and implement dimensions impact the accuracy of the maps recorded and how well the machine follows a guidance track. Naming fields allows storage of coverage maps and guidance lines by field.

You can use GreenStar Apex desktop software to assist in setting up your management data. Setup information such as Client, Farm, Field, and Implement names can be created in Apex and transferred to your display. Machine and Implement dimensions may be downloaded from a database provided by John Deere using Apex.

**IMPORTANT: If changes are made while machine key switch is in auxiliary mode, turn the key off and wait for display's power light to turn off before starting the ignition. This allows display to shut down and save the setup data to permanent memory. Changes to entries in the Setup Wizard are saved to temporary memory when the Next, Previous, or GreenStar Main softkeys are pressed.**

PC10857JH —UN—13APR09

*Setup Wizard*

*NOTE: Machine and Implement dimensions that are downloaded from the John Deere database may need to be modified for the unique variances of your equipment.*

*A GPS receiver is required to run GreenStar applications.*

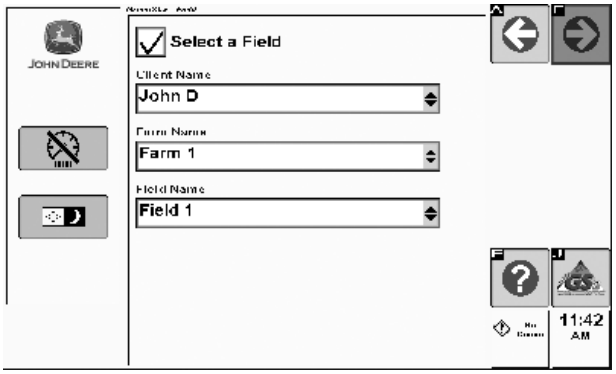
Up to 250 names may be entered for most setup items, such as Clients, Farms, Fields, and Guidance lines.

OUO6050,0001098 -19-12APR09-1/1

## Field

1. Select or create Client Name. Farms and fields are organized by Client. Cli¬ents are important for service providers, but for many operators the Client will always be the same.
2. Select or create the Farm Name.
3. Select or create the Field name. Coverage maps and guidance tracks are organized by Field.

   You may create "Global" coverage maps and guidance tracks by choosing not to select a field. Only one global coverage map may be stored at a time. Be aware that global guidance tracks can not be selected if a Field is selected.
4. Select the Next button.




PC10857JO —UN—12APR09

*Client, Farm, and Field Name*

PC10857JP —UN—13APR09

*Next Button*

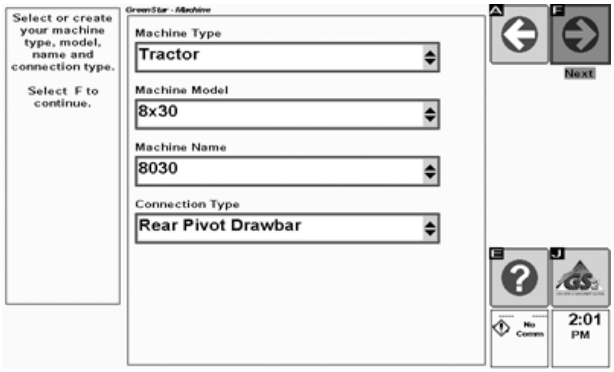
OUO6050,0001099 -19-12APR09-1/1

## Machine

1. Select the **Machine Type** (e.g. tractor, combine, or sprayer). This list box is grayed out when the display automatically recognizes the machine.
2. Select or create the **Machine Model** number being used. The drop down list is pre-populated with some John Deere vehicles. Model is not required.
3. Select or create your **Machine Name**. The name is used to further clarify which machine is being used. For instance, if there are two 8430's in your operation, the machine names may be simply "1" and "2".

*NOTE: Settings pertaining to the Machine, offset measurements are stored to the Machine Name.*

4. Select a Connection Type. The following options are available (examples are shown):
   - Rear Rigid 3-pt
   - Rear Pivot 2-pt
   - Rear Pivot Drawbar
   - Rear Pivot Wagon-Hitch
   - Front Rigid 3-pt (e.g. combine header or front mounted mower conditioner)




PC10857JR —UN—13APR09

*Machine Setup Page*

PC10857JS —UN—13APR09

*Rear Rigid 3-pt*

PC10857JT —UN—13APR09

*Rear Pivot 2-pt*

PC10857JU —UN—13APR09

*Rear Pivot Drawbar*

PC10857JV —UN—13APR09

*Rear Pivot Wagon-Hitch*

PC10857JW —UN—13APR09

*Front Rigid 3-pt*

**Continued on next page**

5. Select Next button.

PC10857JP —UN—13APR09

*Next*

OUO6050,000109A -19-24SEP09-2/6

6. Select the **Non-steering Axle Toggle** to change the non-steering axle per your machine as indicated by the diagram. The following is a list of some Non-Steering Axle Locations:

   - Row Crop Tractor (Wheel) Rear Axle
   - Track Tractor Rear Axle
     (The point is actually located somewhere in front of the rear axle. Best way to locate point is by making a turn at field operating speeds with normal draft load and ballast applied. Measurement point is where soil begins to build on the outside track.)

PC10857JX —UN—13APR09

*Non-steering Axle Toggle*

   - (4wd) Four Wheel Drive Front Axle
   - Self-Propelled Sprayer Rear Axle
   - Combine and SPFH Front Axle

OUO6050,000109A -19-24SEP09-3/6

7. Select the **Lateral Receiver Offset Toggle** to change the GPS receiver offset direction per your receiver setup. If your lateral offset is zero, the direction will not matter.

PC10857JY —UN—13APR09

*Lateral Receiver Offset Toggle*

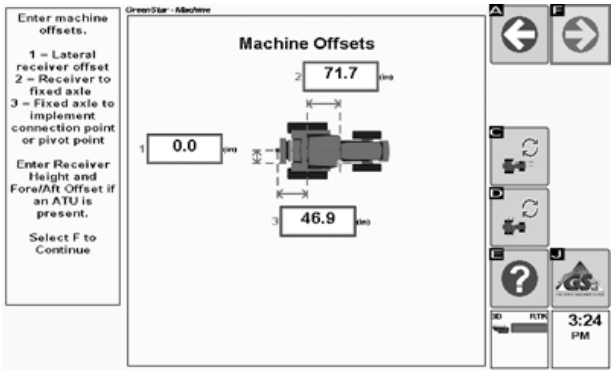
OUO6050,000109A -19-24SEP09-4/6

8. Enter the Machine Offsets. These offsets are used to eliminate skips or overlaps for mapping and for curve track accuracy.

   1. Lateral distance from the center-line of the machine to the center of the GPS receiver. This distance is zero in many cases.
   2. In-line distance from the non-steering axle to the center of the GPS receiver, measured horizontally.
   3. In-line distance from the non-steering axle to the connection/pivot point.

   The connection/pivot point is where the tractor connects to the implement (drawbar, hitch) except on 2 pt pivoting implements (e.g. large planter). In this case, measure the distance back to the pivot point immediately behind the hitch.

*NOTE: Use a tape measure to accurately determine machine offsets.*




PC10857JZ —UN—13APR09

*GreenStar Machine*

*These offsets are saved to the Machine Name.*

**Continued on next page**

OUO6050,000109A -19-24SEP09-5/6

9. Select Next button.

PC10857JP —UN—13APR09

*Next*

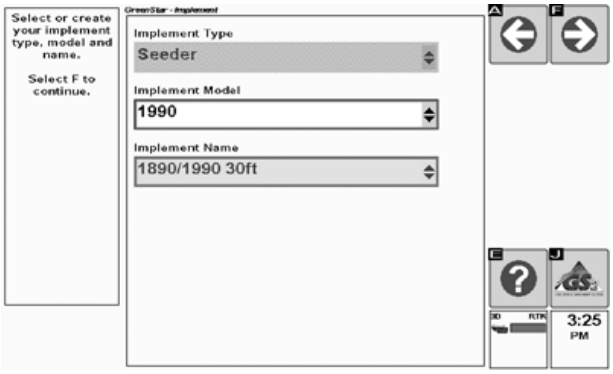
OUO6050,000109A -19-24SEP09-6/6

## Implement

1. Select the Implement Type (e.g. Seeder, Tillage, Grain Drill). This list box is auto-populated and disabled when the display automatically recognizes the implement. Use other if you do not have an implement attached.
2. Select or create the Implement Model number being used. The drop down list is pre-populated with some John Deere vehicles. Model is not required.
3. Select or create your Implement Name. The name is used to further clarify which implement is being used. For instance, if there are two 1990 seeders in your operation, the implement names may be simply “1” and “2”.

*NOTE: Settings pertaining to the Implement, such as offset measurements are stored to the Implement Name.*

*This display only allows one implement setup at a time. If you are operating with more than one implement, such as an air cart and seeding tool, complete the setup for the implement of interest (i.e. seeding tool).*




PC10857KA —UN—13APR09

*GreenStar Implement*

OUO6050,000109B -19-28APR09-1/7

4. Select Next button.

PC10857JP —UN—13APR09

*Next*

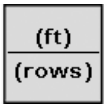
OUO6050,000109B -19-28APR09-2/7

5. Select the entry type (Total Width or Number of Rows) for Implement Width and Track Spacing by selecting. In some cases, a higher degree of precision can be achieved when track spacing is entered in Number of Rows.

*NOTE: Toggling the entry type after a value is entered may decrease the precision of the value.*

6. Enter the Implement Width. This is the actual coverage area of the implement/boom and may be used to calculate total area in Performance Monitor.

PC10857KB —UN—13APR09



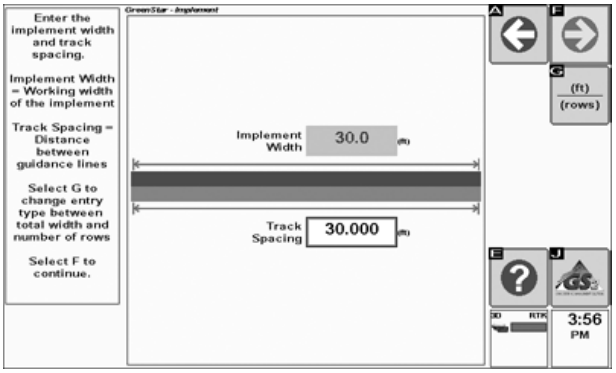

*(ft)(rows)*

*NOTE: This list box is auto-populated and disabled when the display automatically recognizes the implement controller, such as SeedStar2.*

**Continued on next page**

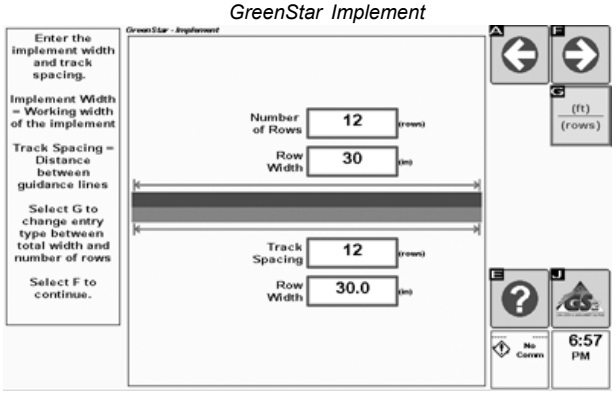
OUO6050,000109B -19-28APR09-3/7

7. Enter the desired Track Spacing to be used for AutoTrac, Parallel Tracking, and Coverage mapping to define the desired overlap or skip between passes.
   - For a total overlap of 1 foot with adjacent passes in opposite directions and a 30 foot implement, enter 29.5 feet.
   - For no overlap enter the same value as the Implement Width.




PC10857KC —UN—13APR09

*GreenStar Implement*




PC10857KD —UN—13APR09

*GreenStar Implement*

OUO6050,000109B -19-28APR09-4/7

8. Select Next button.

PC10857JP —UN—13APR09

*Next*

**Continued on next page**

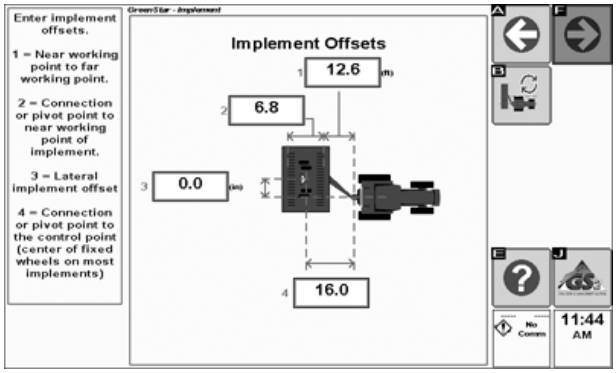
OUO6050,000109B -19-28APR09-5/7

9. Select the **Lateral Implement Offset Toggle** to change the implement offset direction per the setup of your implement. If your lateral offset is zero, the direction will not matter.
10. Enter the **Implement Offsets**. These offsets define the actual implement position relative to the tractor. This is important for eliminating skips or overlaps for coverage mapping and Swath Control Pro.
    1. In-line distance from the connection/pivot point to first working point of the implement.
    2. In-line working length of the implement.
       a. On ground engagement tools, this is the distance from the front rank of sweeps or points to the rear rank.
       b. On a standard planter or pull type sprayer, this dimension would be zero and Offset 1 would extend to the location of seed drop or the sprayer boom.

*NOTE: Offset 1 + Offset 2 = The point that Swath Control Pro uses to turn sections on/off.*

    3. Lateral distance from connection/pivot point to the control point of implement. This offset will be zero for most common implements. Examples of offset implements include mower conditioners and most split row planters with an even number of 38 cm (15 in.) rows, (e.g. 24R15 or 32R15) unless you have an adjustable hitch crossbar.
    4. In-line distance from the connection/pivot point to control point of the implement. This distance is zero for 3-pt mounted implements.

    The **connection/pivot point** is where the tractor connects to the implement (drawbar, hitch) except on 2 pt pivoting implements (e.g. large planter). In this case, measure the distance back to the pivot point immediately behind the hitch.




PC10857KE —UN—13APR09

*GreenStar Implement*

PC10857KF —UN—13APR09

The **Working Point** of the implement is the point of ground engagement, sprayer boom, crop engagement, or seed drop, depending on operation.

The **Control Point** of the implement is usually the center of the fixed wheels. On combine headers, it is the center of the header at the point where the crop is harvested.

*NOTE: Use a tape measure to accurately determine implement offsets. These dimensions may need to be adjusted once in the field, because the dimensions may change when the implement is engaged in the ground.*

*These offsets are saved to the Implement Name.*

OUO6050,000109B -19-28APR09-6/7

11. Select Next button.

PC10857JP —UN—13APR09

*Next*

OUO6050,000109B -19-28APR09-7/7

## Recording Source

1. Select a Recording Source to turn Coverage recording ON and OFF. The following are the available recording source options and are dependent upon vehicle type:
   - Manual Recording On/Off The operator pushes Recording button on the Run page.
   - Automatic (from controller)
   - Rear 3-point Hitch
   - Front PTO
   - Rear PTO
   - SCV I – SCV IV
   - Implement Switch Open
   - Implement Switch Closed

*NOTE: Minimum ground speed to activate recording is around 1.0 m.p.h. and depends on the implement controller.*

*If your machine or implement is equipped with an automatic recording source Auto will appear in the list box and it will be disabled.*


PC10857KG —UN—13APR09

*GreenStar Recording*

PC10857KH —UN—13APR09

*Manual Recording*

PC10857KI —UN—13APR09

*Recording Button*

PC10857KJ —UN—13APR09

*Rear 3-point Hitch*

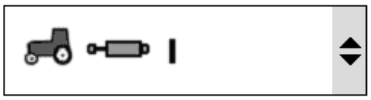
PC10857KL —UN—13APR09

*Front PTO*

PC10857KM —UN—13APR09

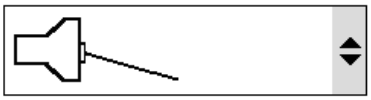
*Rear PTO*

PC10857KN —UN—13APR09



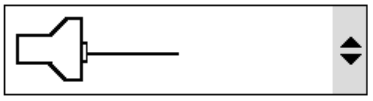
*SCV I – SCV IV*

PC10857KO —UN—13APR09



*Implement Switch Open*

PC10857KP —UN—13APR09



*Implement Switch Closed*

**Continued on next page**

OUO6050,000109C -19-08OCT09-1/2

2. Select Next button.

PC10857JP —UN—13APR09

*Next*

OUO6050,000109C -19-08OCT09-2/2

## Guidance Track

**CAUTION: While AutoTrac is activated, operator is responsible for steering at end of path and collision avoidance. Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway.**

**Always turn off (Deactivate and Disable) AutoTrac system before entering a roadway. To turn off AutoTrac toggle STEER ON/OFF button until STEER OFF is displayed.**

The final step of the Setup Wizard is creating, editing, or selecting a Guidance Track.


*GreenStar Guidance*

OUO6050,000109D -19-08OCT09-1/4

1. Select a Tracking Mode for Manual Guidance or AutoTrac. See the Operating Guidance sections for more information on Tracking Modes
   - Straight Track - Uses straight line parallel passes.
   - AB Curves - Curves uses a manually driven curved path with two end points (beginning and end) to generate parallel passes.
   - Adaptive Curves - Uses a manually driven initial pass, then guides off of previous pass
   - Circle Track (only available with Pivot Pro Activation) - Uses a center-pivot location to define concentric circles (tracks).
   - Row Finder - Used in standing row-crop applications to mark end of a pass and guide operator to next pass.

   If you do not wish to use Guidance, select Guidance OFF and select Next button.

PC10857KS —UN—14APR09

*Straight Track*

PC10857KT —UN—14APR09

*AB Curves*

PC10857KU —UN—14APR09

*Adaptive Curves*

PC10857KV —UN—14APR09

*Circle Track*

PC10857MB —UN—14APR09

*Row Finder*

**Continued on next page**

OUO6050,000109D -19-08OCT09-2/4

2. If Straight Track, AB Curves or Circle Tracking Mode was selected, select a guidance track that is stored in the memory, or name a new Guidance track to be created.

*NOTE: Only the guidance tracks for the selected field appear in the list. If no field is selected, Global Tracks appear in the list or are created.*

- Select the **Edit Track** checkbox if you selected a previously defined guidance track and would like to modify it.
- Select **Clear Shifts** to clear all shifts associated with the selected track.
- Select **Delete Track** to delete the selected track from memory.

PC10857KW —UN—14APR09

*Clear Shifts*

PC10857KX —UN—14APR09

*Delete Track*

OUO6050,000109D -19-08OCT09-3/4

3. Select Next button.

See the OPERATING GUIDANCE section for the steps to create guidance tracks in each tracking mode.

PC10857JP —UN—13APR09

*Next*

OUO6050,000109D -19-08OCT09-4/4

## Repeating Guidance Track Setup

To go back to the Guidance Track Setup page after the Setup Wizard is complete and modify or create a new guidance line, select the GUIDANCE QUICK CHANGE button on the RUN page or GreenStar MAIN page.

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JJ —UN—13APR09

*Guidance Quick Change*

OUO6050,000120B -19-24SEP09-1/1

## GreenStar Run Page

Use the Run page to operate Guidance and Mapping after the Setup Wizard is complete. Access the Run page by selecting RUN on the GreenStar MAIN page.

Off Track Error (A) — Off Track error is numerically displayed in the box. Off Track error will be displayed in cm (inches) up to 99 cm (35 in.). If Off Track error exceeds 99 cm (35 in.), the distance displayed will change to meters (feet).

Track number (B) — Represents the track number the vehicle is guiding on. It also shows the direction that the track is located from the original Track 0 for the field.

Guidance Icon (C) — The icon represents the machine and implement in relative dimensions. The triangle on the machine represents the control point, which as used for guiding the machine and is defined by the machine offset measurements.

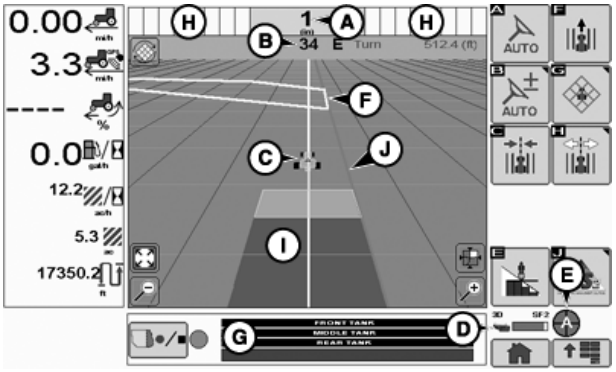
GPS Indicator (D) — Indicates what level of accuracy the StarFire receiver is currently operating at (3D, SF2, SF1, RTK). If using a GPS receiver other than a StarFire, the text 3D GPS will be displayed but the indicator bar will not fill.

AutoTrac Status Pie (E) — (See AutoTrac section)

Interior Boundary (F)

Swath Control Section Status Bar (G)

Path Accuracy Indicator (H) — Is a visual indicator of off-track error. The indicator consists of eight boxes on each side of the off-track error box. The boxes will light up indicating the direction the vehicle must be steered to get back on the AB line. Each arrow represents a distance (default is 10 cm (4 in.)). This distance and the steering direction may be defined on the Lightbar Settings Page.




PC10857QZ —UN—08OCT09

*GreenStar Run Page*

PC10857JI —UN—13APR09

*RUN*

**A—Off Track Error**
**B—Track number**
**C—Guidance Icon**
**D—GPS Indicator**
**E—AutoTrac Status Pie**
**F—Interior Boundary**
**G—Swath Control Section Status Bar**
**H—Path Accuracy Indicator**
**I— Coverage**
**J— Exterior Boundary**

Coverage (I)

Exterior Boundary (J)

*NOTE: Some softkeys only appear when the hardware or functions associated with those buttons are connected or available, such as the AutoTrac controls.*

OUO6050,000109E -19-28APR09-1/22

AutoTrac Steer ON/OFF – Enables and disables AutoTrac

PC10857LA —UN—14APR09


*AutoTrac Steer ON/OFF*

OUO6050,000109E -19-28APR09-2/22

Increase AutoTrac Steering Sensitivity

The Steering Sensitivity value may also be entered on the AutoTrac settings page.

PC10857LB —UN—14APR09


*Increase AutoTrac Steering Sensitivity*

**Continued on next page**

OUO6050,000109E -19-28APR09-3/22

Decrease AutoTrac Steering Sensitivity

PC10857LC —UN—14APR09


*Decrease AutoTrac Steering Sensitivity*

OUO6050,000109E -19-28APR09-4/22

Recording ON/OFF – Turns coverage recording ON and OFF when Manual recording source is selected.

PC10857LD —UN—14APR09

*Recording ON/OFF*

OUO6050,000109E -19-28APR09-5/22

Guidance Quick Change – Quickly go to the Guidance Setup page to create or modify a Guidance Track.

PC10857JJ —UN—13APR09

*Guidance Quick Change*

OUO6050,000109E -19-28APR09-6/22

ShiftTrack – Go to the following Shift Track Controls. Shift Track is used to adjust position of machine left, center, or right of the set track. Shift track can be used to compensate for GPS drift. Drift is inherent to any satellite based, differentially corrected GPS system.

PC10857NC —UN—24SEP09

*ShiftTrack*

OUO6050,000109E -19-28APR09-7/22

Shift Track Left

PC10857LE —UN—14APR09

*Shift Track Left*

OUO6050,000109E -19-28APR09-8/22

Shift Track Right

PC10857LF —UN—14APR09

*Shift Track Right*

**Continued on next page**

OUO6050,000109E -19-28APR09-9/22

Shift Track Center

PC10857LG —UN—14APR09

*Shift Track Center*

OUO6050,000109E -19-28APR09-10/22

Clear Shifts

PC10857LH —UN—14APR09

*Clear Shifts*

OUO6050,000109E -19-28APR09-11/22

Back to Run Page Softkeys

PC10857LI —UN—14APR09

*Back button*

OUO6050,000109E -19-28APR09-12/22

Map Controls – Go to the following Map Controls

PC10857LJ —UN—14APR09

*Map Controls*

OUO6050,000109E -19-28APR09-13/22

Toggle Mapping Mode

PC10857LK —UN—14APR09

*Toggle Mapping Mode*

OUO6050,000109E -19-28APR09-14/22

Pan Map in the direction of the arrow.

PC10857LM —UN—14APR09

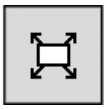
*Pan Map Up*

**Continued on next page**

OUO6050,000109E -19-28APR09-15/22

Toggle Map Size – Selecting this button increases the map to full screen, hiding the softkeys. Select the button again to decrease the maps size and show the softkeys.

PC10857LQ —UN—14APR09



*Toggle Map Size*

OUO6050,000109E -19-28APR09-16/22

Zoom Out

PC10857LR —UN—14APR09

*Zoom Out*

OUO6050,000109E -19-28APR09-17/22

Zoom In

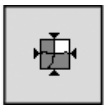
PC10857RA —UN—24SEP09

*Zoom In*

OUO6050,000109E -19-28APR09-18/22

Center Map – Centers the map on the vehicle.

PC10857LT —UN—14APR09



*Center Map*

OUO6050,000109E -19-28APR09-19/22

Back to Run Page Softkeys

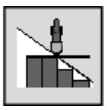
PC10857LI —UN—14APR09

*Back Button*

OUO6050,000109E -19-28APR09-20/22

Swath Control ON/OFF Toggle

PC10857LU —UN—14APR09



*Swath Control ON/OFF Toggle*

**Continued on next page**

OUO6050,000109E -19-28APR09-21/22

GreenStar – Go to GreenStar Main Page

PC10857JN —UN—13APR09

*GreenStar Main Page*

OUO6050,000109E -19-28APR09-22/22

## General GreenStar System Operations

PC10857LK —UN—14APR09

### Mapping Views

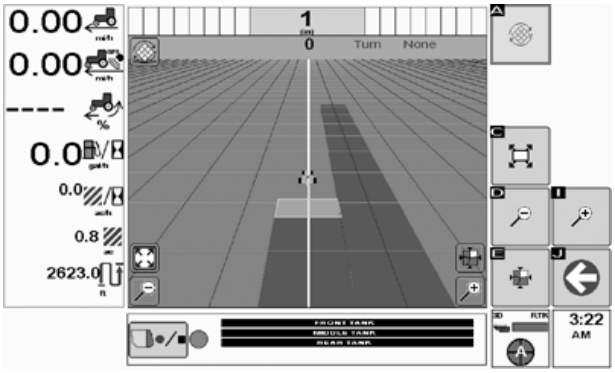
The Run Page may be toggled between three views by selecting the Toggle

Mapping Mode button on the map or softkey.

*Mapping Views*

OUO6050,000109F -19-14APR09-1/5

### Perspective View



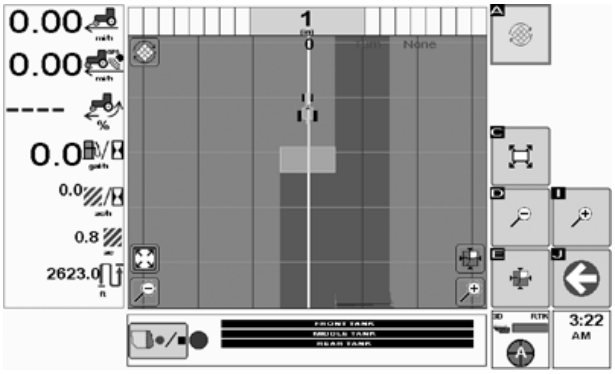

PC10857LV —UN—14APR09

*Perspective View*

OUO6050,000109F -19-14APR09-2/5

### Moving Overhead View

The map is centered on the vehicle and the direction of vehicle travel is always toward the top of the map. The Pan buttons are disabled.



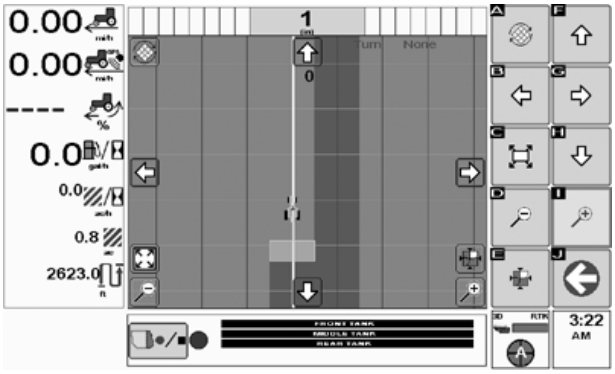

PC10857LW —UN—14APR09

*Moving Overhead View*

OUO6050,000109F -19-14APR09-3/5

### Fixed Overhead View

The map does not move and North is always at the top of the map. Use the Pan buttons to view other areas of the field.




PC10857LX —UN—14APR09

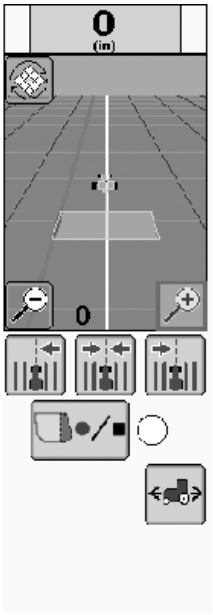
*Fixed Overhead View*

**Continued on next page**

OUO6050,000109F -19-14APR09-4/5

### Left Hand Region View

The left hand region allows the operator to view the mapping view while viewing other applications on the Home Page such as SeedStar2. This view is available by selecting it in the Layout Manager. When the mapping view is displayed as a Home Page, it will not appear in the left hand region. The buttons will not appear on the left hand region view when they are disabled.




PC10857NW —UN—12MAY09

*Left Hand Region View*

OUO6050,000109F -19-14APR09-5/5

## Changing Fields

When your display is setup for an operation, you can quickly change fields and guidance tracks:

1. GreenStar Main Page

PC10857JN —UN—13APR09

*GreenStar Main Page Button*

OUO6050,00010A1 -19-14APR09-1/4

2. Quick Change Field Softkey
3. Select or create a Client, Farm, and Field.

PC10857JK —UN—13APR09

*Quick Change Field Softkey*

OUO6050,00010A1 -19-14APR09-2/4

4. Select Next button.
5. Select your desired Tracking Mode.
6. Select or create a Guidance Track depending on Tracking Mode.

PC10857JP —UN—13APR09

*Next Button*

OUO6050,00010A1 -19-14APR09-3/4

7. Select Next button.

PC10857JP —UN—13APR09

*Next Button*

OUO6050,00010A1 -19-14APR09-4/4

## Creating a Boundary

Internal and External Boundaries are created with similar steps. The following steps outline the process for creating a boundary while driving a vehicle. Boundaries may be created during an operation (e.g. planting), but some functions are not available.

*NOTE: An Internal boundary can NOT be created without first creating an External boundary for the field.*

1. Select Field Quick Change from the GreenStar Main page.

PC10857JK —UN—13APR09

*Field Quick Change*

2. Select or create the Client, Farm, and Field for which you would like to create the boundary.

OUO6050,00010A2 -19-12APR09-1/6

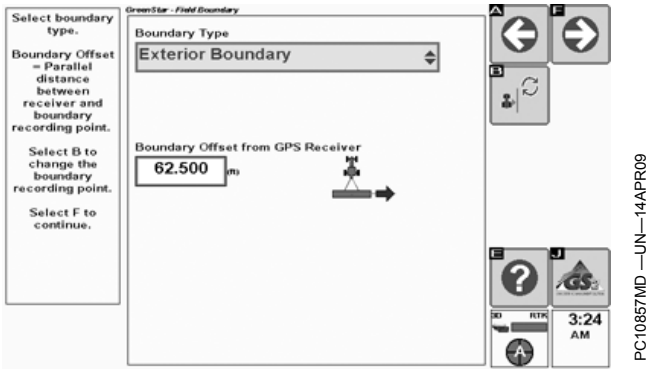
3. Select the Boundaries Softkey

PC10857MC —UN—14APR09

*Boundaries Softkey.*

OUO6050,00010A2 -19-12APR09-2/6

4. Choose TYPE of boundary you would like to create. If you choose Interior, you must give the boundary a name. Both Exterior and Interior boundaries are associated with the field name.
5. Enter the **Boundary Offset Distance**. The distance from the center of the vehicle GPS receiver to the boundary line that will be created.




PC10857MD —UN—14APR09

*GreenStar Field Boundary*

OUO6050,00010A2 -19-12APR09-3/6

6. Select the Boundary Offset Toggle Softkey to choose the Boundary Recording Point location:
   - Left or right of the vehicle GPS receiver
   - Left or right of the rear of a rear mounted implement or the front of a front mounted implement. This position is determined by implement offsets 1 and 2.

PC10857ME —UN—14APR09

*Boundary Offset Toggle Softkey*

OUO6050,00010A2 -19-12APR09-4/6

7. Select Next button.

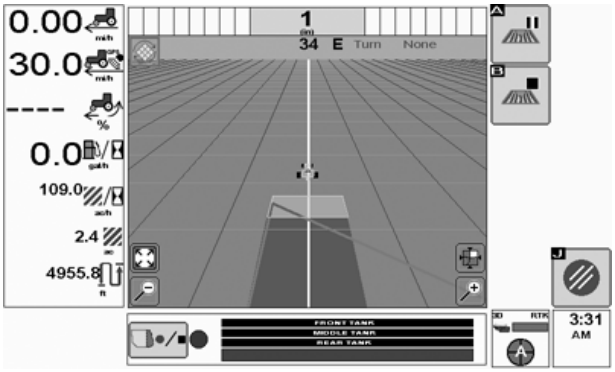
PC10857JP —UN—13APR09

*Next Button*

**Continued on next page**

OUO6050,00010A2 -19-12APR09-5/6

8. Move the vehicle for at least 1 second and then select Start Boundary Recording .
   - Select to Pause recording. This is typically used to drive around an obstacle or back the implement into a field corner for a more accurate boundary. The boundary will show a straight line from where recording was paused to where it was resumed.
   - Select to Stop recording and save the boundary.
   - Select to Cancel recording.
9. Stop recording just prior to the point where recording was started to complete the boundary. A straight line will be drawn between the stop point and start point.




PC10857MG —UN—14APR09

*Run Page*

PC10857MF —UN—14APR09

*Start Boundary Recording*

PC10857MH —UN—14APR09

*Pause Boundary Recording*

PC10857MI —UN—14APR09

*Stop Boundary Recording*

PC10857MJ —UN—14APR09

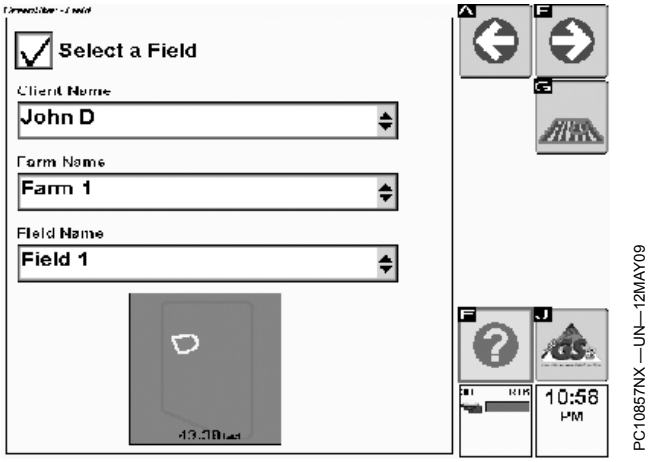
*Cancel Boundary Recording*

OUO6050,00010A2 -19-12APR09-6/6

## Calculating Area

GreenStar Main page > Field Quick Change > Select Client, Farm, and Field

This display calculates the area inside exterior boundary minus any internal boundary areas. The area value is shown on the boundary image on the Field Quick Change page after boundaries are created.




PC10857NX —UN—12MAY09

*Calculating Area*

PC10857JN —UN—13APR09

*GreenStar Main Page Button*

PC10857JK —UN—13APR09

*Field Quick Change*

OUO6050,00010EF -19-12MAY09-1/1

## Coverage Mapping

Coverage maps serve as a visual reference to the operator to ensure complete coverage of the field. One Coverage map can be saved in the internal memory for each field selected on the Field setup page. The size limit of a Coverage map is roughly 202 – 1214 hectares (500 – 3000 acres) depending on implement width, speed, and how straight the machine is driven. In some slow speed applications, the limit is reached after 30 acres.

The first Coverage point recorded for each map is the **Reference Point** for that map. If operating greater than 32 km (20 mi) away from the Reference Point, mapping may become inaccurate and erratic.

OUO6050,000120C -19-08OCT09-1/1

## Recording Coverage Maps

If an **AUTO** Recording Source is being used, ALL of the following are required for Coverage Recording to function:

- Setup Wizard is complete
- GPS signal (StarFire signal required)
- Master Switch is on (if present)
- At least one section switch is ON (if present)
- Implement is in working position or solution pump is on (sprayer)

*NOTE: On 50 and 60 series combines, the Header Set Point may need to be adjusted on the corner post display for the Auto Recording Source to work. On 00 and 10 series combines, the Auto Recording Source is not available.*

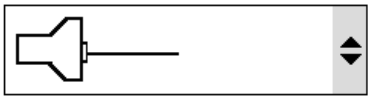
If an **Implement** ("Whisker" Switch) Recording Source is being used, ALL of the following are required for Coverage Recording to function:

- Setup Wizard is complete
- GPS signal (StarFire signal required)
- Implement is in working position

PC10857KI —UN—13APR09

*Manual Record Button*

PC10857KP —UN—13APR09



*Implement "Whisker" Switch*

If a **Manual** Recording Source is being used, ALL of the following are required for Coverage Recording to function:

- Setup Wizard is complete
- GPS signal (StarFire signal required)
- Manual Recording button is toggled ON

*NOTE: If an AUTO or Implement Switch Recording Source is being used, the Manual Recording ON/OFF button will be disabled.*

OUO6050,00010A3 -19-14APR09-1/1

## Clearing Coverage Maps

Clear (delete) Coverage maps to free up memory on the display. Coverage maps can be cleared on the Field Setup page or in Map Settings:

- GreenStar Main >> Field Quick Change >> Clear Coverage Maps
- GreenStar Main page >> Settings >> Map Settings

When clearing coverage maps, select one of the options:

- Clear All Field Maps – Deletes all Coverage data on the display.
- Clear Current Field Map – Deletes the Coverage data for the field that is selected in the Setup Wizard.
- Clear All Maps Except Current – Deletes all Coverage data on the display except for the field that is selected.

Three alarm messages also have shortcuts for clearing Coverage maps:

1. Field Coverage Map Almost Full

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JK —UN—13APR09

*Field Quick Change*

PC10857RB —UN—24SEP09

*Clear Coverage Maps*

2. Coverage Exists for selected field
3. Field Accuracy Loss due to distance from Reference Point.

OUO6050,000120D -19-24SEP09-1/1

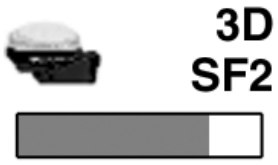
## Displaying GPS Accuracy on Coverage Map

This feature is designed for Swath Control Pro on Planters, but can be useful for any precision application. When the feature is ON, the Coverage map paints an orange color when the GPS accuracy drops below the desired threshold. It continues to paint blue when GPS accuracy is acceptable. Operating with reduced GPS accuracy may cause skips and overlaps when using Swath Control Pro. Turn on the feature by checking INDICATE GPS ACCURACY in Map Settings”

GreenStar Main page >> Settings >> Maps Settings >> GPS Accuracy >> check Indicate GPS Accuracy

The threshold that causes the Coverage Map to paint orange aligns with the GPS Accuracy Indicator bar graph under the StarFire receiver icon. This threshold is dependent on the StarFire signal type. See your StarFire manual for more information on the GPS Accuracy Indicator.

PC10857RS —UN—08OCT09




*GPS Accuracy Indicator (GAI)*

Overlapping coverage paints the normal dark blue color whether the overlapping coverage was recorded with reduced GPS accuracy.

OUO6050,0001218 -19-08OCT09-1/1

## StarFire GPS Accuracy Indicator

The GPS Indicator is located and the bottom right of the Run Page. It indicates what level of accuracy the StarFire receiver is currently operating at (3D, SF2, SF1, and RTK) and accuracy level. If using a GPS receiver other than a StarFire, the text 3D GPS will be displayed but the indicator bar will not fill. It shows an alert when the current StarFire signal is not optimal for high accuracy operations.

There are three levels of this alert system (Normal, Marginal, and Poor). The levels are determined both by the StarFire Receiver’s PDOP value and the number of satellites being tracked. It is recommended to closely monitor or discontinue operations that require high accuracy when the current status is Marginal or Poor, because accuracy degradation may occur.

Normal - Acceptable range for high accuracy operations.

PC10857LZ —UN—14APR09


*Normal*

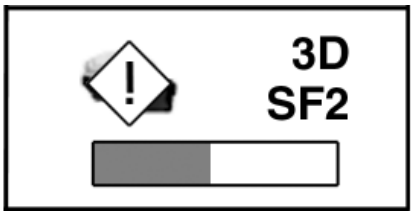
- Green Bar
- Normal Operating Range
- PDOP value: 0 3.5
- Greater than or equal to 7 satellites being tracked

OUO6050,00010A0 -19-08OCT09-1/3

Marginal - Moderate risk of accuracy degradation.

- Orange Bar with Permanent Alert Sign
- Marginal Operating Range
- PDOP value: 3.5 - 4.5
- Less than or equal to 6 satellites being tracked

PC10857MA —UN—14APR09




*Marginal*

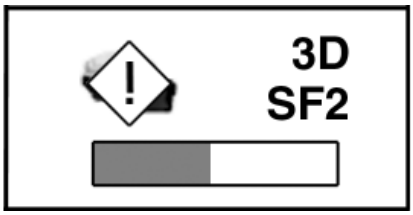
**Continued on next page**

OUO6050,00010A0 -19-08OCT09-2/3

Poor - Significant risk of accuracy degradation high accuracy operations are not advised.

- Red Bar and Flashing Alert Sign
- Poor Operating Range
- PDOP value greater than 4.6
- Less than or equal to 5 satellites being tracked

PC10857MA —UN—14APR09




*Poor*

OUO6050,00010A0 -19-08OCT09-3/3

## Operating Manual Guidance

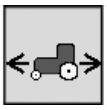
1. Complete the Setup Wizard to setup your GreenStar system for Manual Guidance and create a Guidance Track. See the GETTING STARTED section earlier in this manual.
2. Create a Guidance Track. Steps for creating guidance tracks and operating in each Tracking Mode are given later in the OPERATING GUIDANCE section.
3. See the GUIDANCE SETTINGS section of this manual to learn how to adjust your system for optimal performance.
4. ALL of the following are required for Manual Guidance to function:
   - Setup Wizard is complete
   - Tracking mode set to Straight Track, Adaptive Curve Track, AB Curve Track, Circle Track or Row Finder
   - Guidance Track 0 is setup (except Adaptive Curve Track and Row Finder)
   - GPS signal (StarFire signal required)
5. See the GREENSTAR RUN PAGE section of this manual for a description of the run page and map.
6. Drive the vehicle onto a guidance track. The closest track is highlighted with a thicker white line. Off Track error distance is shown in the path accuracy indicator. This number shows how far from closest track machine is. Error number will count up until machine reaches point halfway between two tracks. After reaching midpoint error number will count down as machine approaches next track.

   The track number is displayed below the path accuracy indicator and is automatically updated by system as a new track is approached. Track number changes when machine is half way between two tracks.

   Use the Toggle Direction softkey to change the direction of the vehicle on the map if it is different for the direction you are traveling.

   See the GENERAL GUIDANCE section for information on Tracking Tones, Shift Track, Turning View, and Turn Predictor.

PC10857MK —UN—23APR09



*Toggle Direction Softkey*

OUO6050,00010A4 -19-28APR09-1/1

# Operating AutoTrac

## Operate Guidance Systems Safely

Do not use AutoTrac system on roadways.

- Always turn off (Deactivate and Disable) AutoTrac system before entering a roadway.
- Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway.

The AutoTrac system is intended to aid operator in performing field operations more efficiently. Operator is always responsible for machine path. To prevent injury to operator and bystanders: Remain alert and pay attention to surrounding environment.

- Take control of 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 machine path.

OUO6050,00010A5 -19-08OCT09-1/1

## General Information

**IMPORTANT: AutoTrac system relies on GPS system 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.**

Operator must maintain responsibility for machine and must turn at end of each track. This system will not turn at end of a track.

AutoTrac basic system is intended to be used as an assistance tool to mechanical markers. Operator must evaluate overall system accuracy to determine specific field operations where assisted steering may be used. This evaluation is necessary because accuracy required for various field operations may differ depending on farming operation. Because AutoTrac uses STARFIRE differential correction network along with Global Positioning System (GPS), slight shifts in position may occur over time.

OUO6050,00010A6 -19-12APR09-1/1

## AutoTrac Accuracy

The overall AutoTrac system accuracy is dependent upon many variables. The equation looks like:

AutoTrac System Accuracy = Signal accuracy + Vehicle Setup + Implement Setup + Field/Soil Conditions.

It is very important to remember:

- Receiver has to go through a warm-up period after starting.
- Vehicle is setup properly (ballasted according to vehicle operator manual, etc.)
- Implement is setup to run properly (wear parts such as shanks, shovels, and sweeps are in good working condition and correctly spaced).
- Understand how field/soil conditions affect system (loose soil requires more steering than firm soil, but firm soil can cause uneven draft loads).

See the AUTOTRAC SYSTEM ACCURACY section in DIAGNOSTICS section of this manual for more information.

**IMPORTANT: Although AutoTrac system can be activated when SF2 (or SF1 if using AutoTrac SF1 activation) correction signal is confirmed, system accuracy may continue to increase after powering up system.**

AutoTrac SF2 activation will operate on a SF1, SF2, or RTK signal.

AutoTrac SF1 activation will operate on a SF1 signal only.

OUO6050,00010A7 -19-12APR09-1/1

## Enabling AutoTrac

The following criteria must be met for AutoTrac to be enabled:

- Vehicle has an AutoTrac capable steering controller (SSU)
- Valid AutoTrac Activation (26digit Activation Code)
- Setup Wizard is complete and a guidance track has been created. See the GETTING STARTED section earlier in this manual for Setup Wizard information and see the sections on each Guidance Mode for information on creating guidance tracks.
- Correct StarFire signal level for AutoTrac Activation is selected (SF1, SF2, or RTK) and a valid GPS signal is acquired.
- TCM turned on and TCM message is valid

PC10857LA —UN—14APR09


*Steer On/Off Softkey*

- SSU has no active faults pertaining to the steering function.
- Hydraulic oil warmer than minimum temperature
- Tractors - above 20°C (68°F)
- Forward vehicle speed is less than 30 km/h (18.6 mph)
- Reverse speed is less than 10 km/h (6 mph)

To Enable AutoTrac, select the Steer On/Off softkey located on the Run Page. This softkey will disable AutoTrac if selected again.

OUO6050,00010A8 -19-28APR09-1/1

## Activating AutoTrac

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

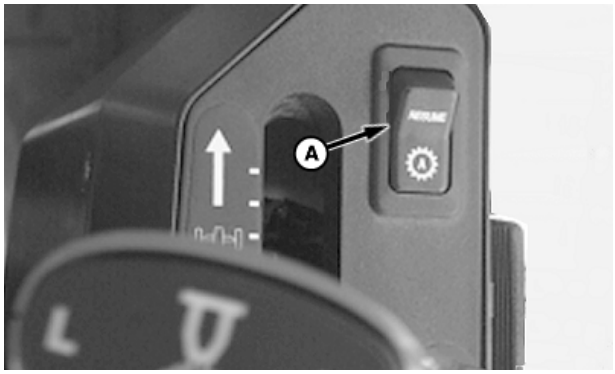
Do not attempt to turn on (Activate) AutoTrac system while transporting on a roadway.

1. ENABLE AutoTrac
2. Drive the vehicle onto a guidance track and a highlighted white navigation line will appear in front of the vehicle.
3. Manually ACTIVATE AutoTrac when steering assistance is desired by pressing the Resume Switch. This will initiate assisted steering.

*NOTE: On TRACTORS, activating AutoTrac will activate automatic power shift if it has been set. In 8020T and 9020T tractors, automatic power shift (APS) must be set up after enabling AutoTrac. If AutoTrac is enabled after automatic power shift has been set, APS must be reset. APS can be set either before or after enabling AutoTrac in 8010T tractors.*

OUO6050,00010A9 -19-12APR09-1/1

## Resume Switch




N63532 —UN—07AUG03

*Sprayer*

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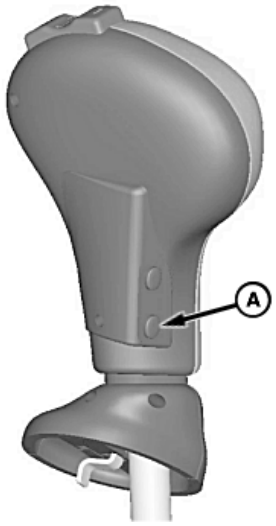
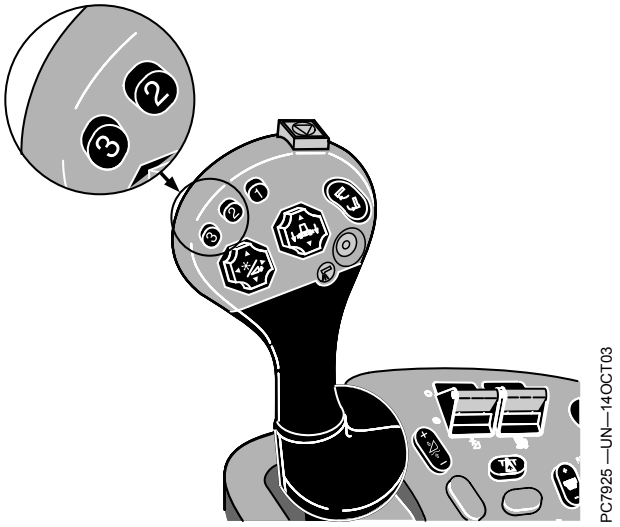
OUO6050,00010AA -19-12APR09-1/5




PC7989 —UN—04NOV03

*Sprayer*

OUO6050,00010AA -19-12APR09-2/5



PC7925 —UN—14OCT03

*Combine*

**Continued on next page**

OUO6050,00010AA -19-12APR09-3/5


PC8629 —UN—03AUG05

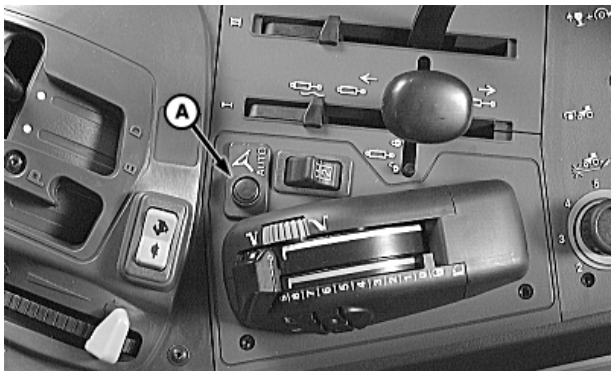
*Tractor*

OUO6050,00010AA -19-12APR09-4/5

The Resume Switch (A) location may vary depending on vehicle type, model, and year. The pictures show where Resume Switch can be found on tractors, sprayers, and combines. Combines use button 2 or 3 on multifunction handle.

Resume Switch

Press the Resume Switch to move AutoTrac from the ENABLED stage to the ACTIVATED stage. Pictures show where Resume Switch can be found on tractors, sprayers, and combines. Combines use button 2 or 3 on multifunction handle.




PC8868 —UN—02NOV05

*Tractor*

OUO6050,00010AA -19-12APR09-5/5

## AutoTrac Status Pie

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

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

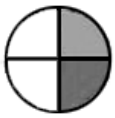
PC8832 —UN—25OCT05

*Installed*

OUO6050,00010AB -19-12APR09-1/4

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.

PC8833 —UN—25OCT05



*Configured*

OUO6050,00010AB -19-12APR09-2/4

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

PC8834 —UN—25OCT05

*Enabled*

**Continued on next page**

OUO6050,00010AB -19-12APR09-3/4

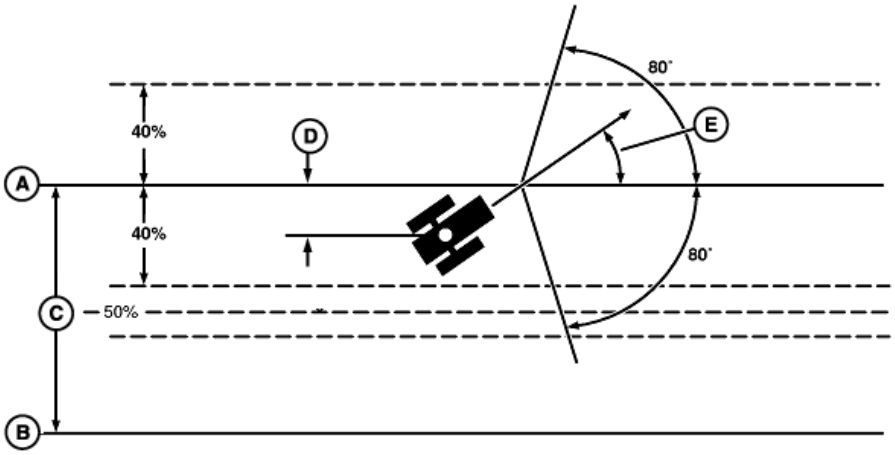
ACTIVATED (4/4 of pie with “A”)—Resume switch is pressed and AutoTrac is steering the vehicle.

PC8835 —UN—25OCT05


*Activated*

OUO6050,00010AB -19-12APR09-4/4

## Reactivating AutoTrac on Next Pass




PC8866 —UN—02NOV05

*Tracking*

**A—Track 0**
**B—Track 1 South**
**C—Track Spacing**
**D—Off-Track Lateral Error**
**E—Track Heading Error**

Once the end of the row is reached, the operator must turn system to next pass. By turning steering wheel, AutoTrac is deactivated.

AutoTrac can be activated again by pressing Resume Switch only after following conditions are met:

- Forward vehicle speed is less than 30 km/h (18.6 mph)
- Reverse speed is less than 10 km/h (6 mph).
- In reverse AutoTrac will remain activated for 45 seconds. After 45 seconds the machine must be put in a forward gear before reverse will activate again.
- Vehicle heading is within 80° of desired track.
- The machine is within 40% of track spacing
- Operator is seated.
- TCM is on.

*NOTE: The Track Number that is displayed at the top of the RUN PAGE changes at half the distance between two guidance tracks.*

OUO6050,00010AC -19-12APR09-1/1

## Deactivating AutoTrac

**⚠ CAUTION: Always turn off (Deactivate and Disable) AutoTrac system before entering a roadway.**

To turn off AutoTrac, toggle STEER ON/OFF softkey on the RUN PAGE.

AutoTrac system can be made DEACTIVE by the following methods:

- Turning steering wheel.
- Exceeding speed of 30 km/h (18.6 mph).

PC10857LA —UN—14APR09


*Steer On/Off Softkey*

- Degradation of differential correction signal from SF2 or RTK to WAAS/ EGNOS for longer than 3 minutes.
- Selecting the STEER ON/OFF button.
- Operator out of seat for more than 7 seconds.
- Activated in neutral longer than 30 seconds.
- In reverse for longer than 45 seconds.
- Reverse speed exceeds 9.6 km/h (6 mph).

OUO6050,00010AD -19-23APR09-1/1

## AutoTrac Deactivation Message

**AutoTrac deactivation message**–Each time AutoTrac is deactivated text is displayed indicating the reason why AutoTrac deactivated. Messages are also displayed as to why AutoTrac did not activate. The deactivation messages display for 3 seconds and then disappear.

| AutoTrac Deactivation Message | |
|---|---|
| Deactivation Message | Description |
| Steering wheel moved | Operator turned steering wheel |
| Speed too slow | Vehicle speed is below minimum required speed |
| Speed too fast | Vehicle speed is above maximum allowed speed |
| Invalid gear | Vehicle operating in an invalid gear |
| Track number changed | Track number changed |
| Invalid GPS signal | SF1, SF2, or RTK signal was lost |
| SSU fault | See John Deere dealer |
| Invalid display messages | Check display settings |
| Invalid display settings | Check guidance settings and Track 0 setup |
| No AutoTrac Activation | No AutoTrac Activation on GS2 |
| Heading error too large | Vehicle is at an angle greater than 45 degrees from track |
| Offtrack error too large | Vehicle not within 40% of track spacing |
| Out of seat | Out of seat too long |
| Oil temp too cold | Hydraulic oil not above minimum required temperature |
| No TCM corrections | Make sure TCM is turned on |
| Invalid SSU activation | Need SSU activation code.<br>See John Deere dealer. |
| SSU in diagnostic mode | Fuse is in diagnostic slot in vehicle fuse box. remove fuse. |
| Header off | Header was turned off |
| Road mode | In transport gear |
| Invalid SSU voltage | See John Deere dealer |
| Reverse timeout | In reverse gear for more than 45 seconds |
| Vehicle too slow | AutoTrac below minimum speed |
| Curve too sharp | Maximum curvature has been exceeded |
| Vehicle not moving in a forward direction | Vehicle must be in forward gear to activate |
| Vehicle shutting down | Vehicle is shutting down |
| Gear data error | See John Deere dealer |
| Resume switch error | See John Deere dealer |
| Keyswitch error | See John Deere dealer |
| SPFH AutoTrac switch is not on | Make sure SPFH AutoTrac switch is turned on |
| SPFH Quick Stop switch is on | Make sure SPFH Quick Stop switch is turned off |

OUO6050,00010AE -19-12APR09-1/1

## Steering Sensitivity

Steering Sensitivity adjusts the aggressiveness that AutoTrac will turn the vehicle. The higher the value, the more aggressive the turn. The vehicle's steering sensitivity may be adjusted up or down by selecting the Increase Steering Sensitivity and Decrease Steering Sensitivity softkeys on the Run Page. The current value is displayed on the softkeys.

*NOTE: Valid range for steer sensitivity is 50 - 200 and the default is 70.*

PC10857LB —UN—14APR09


*Increase*

PC10857LC —UN—14APR09


*Decrease*

OUO6050,00010AF -19-12APR09-1/1

# Operating Guidance in Straight Track Mode

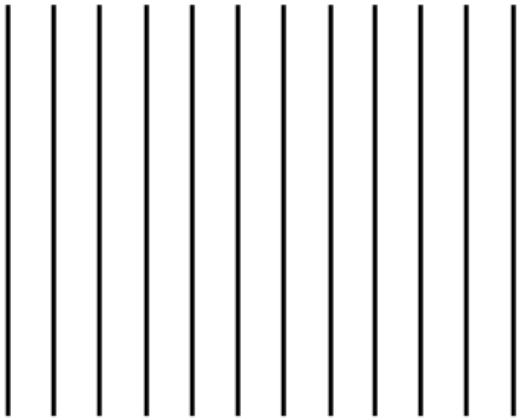
## Theory of Operation

Straight Track mode assists operator in driving straight parallel paths. First setup a Track 0 (reference path) using one of several options. Once the Track 0 has been defined, all passes for the field are generated. The generated passes can be used to operate Manual Guidance or AutoTrac. Each pass is generated from the original driven pass to ensure that steering errors are not propagated through the entire field.

Passes are identical copies of the original pass.

*NOTE: The terms "Guidance Track" and "AB line" are interchangeable. Track 0 is the track defined by the operator and the reference point from which all parallel passes in field are based.*

*The spacing between the parallel passes is the Track Spacing entered in the Setup Wizard.*



PC9508 —UN—24OCT06

OUO6050,00010B0 -19-23APR09-1/1

## Creating a New Straight Track

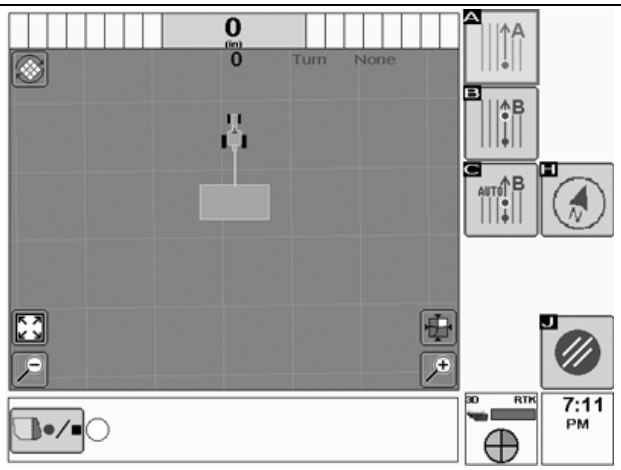
There are several methods of defining Track 0:

- A + B - Define Track 0 by driving it with the vehicle.
- A + Auto B - Define Track 0 by driving it with the vehicle.
- A + Heading - Define Track 0 by driving the vehicle to point A and entering a predefined Heading value.
- Lat/Long - Define Track 0 by entering predefined Latitude and Longitude coordinate values for the A and B points.
- Lat/Long + Heading - Define Track 0 by entering predefined Latitude and Longitude value for the A point and entering a predefined Heading value.

*NOTE: Track 0 may be defined during an operation (e.g. planting), but some softkeys are not available while it is being created.*

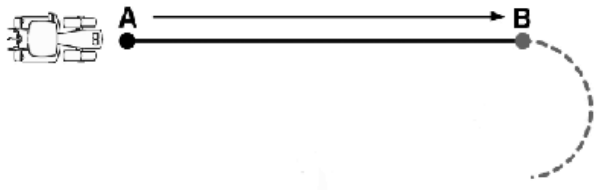
OUO6050,00010B1 -19-12APR09-1/1

## A+B, A+Auto B, and A+Heading Methods




PC10857MS —UN—23APR09

PC10857MT —UN—23APR09

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OUO6050,00010B2 -19-12APR09-1/4

1. Choose STRAIGHT TRACK mode and select or create a Track Name on the final page in the Setup Wizard (SETUP GUIDANCE TRACK).

*NOTE: This page can also be accessed with the Quick Change Guidance softkey.*

GreenStar Main Page -> Guidance Quick Change

2. Drive to the desired location in the field to create the A point.

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JJ —UN—13APR09

*Guidance Quick Change*

OUO6050,00010B2 -19-12APR09-2/4

3. Select the SET A softkey .

PC10857MU —UN—23APR09


*Set A Softkey*

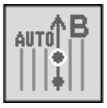
OUO6050,00010B2 -19-12APR09-3/4

4. Define the B point using one of three options:
   - To manually set the B point, drive to the desired location in the field to create the B point and select Set B . The minimum distance is 3 m (10 feet). It is recommended to Set the B point at the far end of the field to define the desired heading.
   - To automatically set the B point, select Automatically Set B at any time. The B point will be automatically set when the vehicle drives 15 m (45 ft) away from the A point.
     This method calculates point B from the last five data points taken from the 15 m (45 ft) driven and runs a best fit line through the points to determine a heading.
   - To set the B point by entering a heading direction, select the Set Heading softkey.
     Enter the desired line heading with the numeric keypad and save the value by selecting Accept. 0.000 indicates North, 90.000 East, 180.000 South, and 270.000 West.
     The Track 0 is now defined and the parallel tracks are created automatically. The GreenStar System is now setup for operation.

PC10857MV —UN—23APR09


*Set B softkey*

PC10857MW —UN—23APR09




*Automatically Set B*

PC10857MX —UN—23APR09

*Heading softkey*

To cancel setup at any time and return to the Guidance Setup page, select Cancel.

OUO6050,00010B2 -19-12APR09-4/4

## Lat/Long and Lat/Long+Heading Methods

*NOTE: The Latitude and Longitude coordinates have to be entered in decimal degrees.*

1. Complete the final page in the Setup Wizard (SETUP GUIDANCE TRACK).
2. Select Set A Point Lat/Long.
3. Enter the desired latitude and longitude values in decimal degrees
4. Save the values by selecting Accept.
5. Define the B point using one of two options:

   To set the B point by entering latitude and longitude coordinate values select Set B Point Lat/Long. Enter the desired latitude and longitude values and save the values by selecting Accept.

   To set the B point by entering a heading direction, select the Set Heading softkey. Enter the desired line heading with the numeric keypad and save the value by selecting Accept.

*NOTE: 0.000 indicates North, 90.000 East, 180.000 South, and 270.000 West.*

The Track 0 is now defined and the parallel tracks are created automatically. The GreenStar System is now setup for operation.

To cancel setup at any time and return to the Guidance Setup page, select Cancel.

OUO6050,00010B3 -19-28APR09-1/1

## Guiding on a Straight Track

When operating Straight Track it is not necessary to drive tracks in a specific order. The closest track is highlighted with a thicker white line. The track number is displayed below the path accuracy indicator and is automatically updated by system as a new track is approached. Track number changes when machine is half way between two tracks.

Off Track error distance is shown in the path accuracy indicator. This number shows how far from the machine is from the closest track. Error number will count up until machine reaches point halfway between two tracks. After reaching midpoint error number will count down as machine approaches next track.

Distance to end of pass utilizing Turn Predictor is shown in the top right portion of the guidance view. Distance will count down to predicted turn and tones will sound when machine is 10 seconds from intersecting turn point and again when predicted turn point has been reached.

OUO6050,00010B4 -19-12APR09-1/1

# Operating Guidance in AB Curves Mode

## Theory of Operation

AB Curves Mode allows an operator to drive curved parallel passes that have end points on either end of the field. The guidance tracks will be parallel to the track in either direction and will be generated based on the original track to ensure that steering errors are not propagated through the entire field.

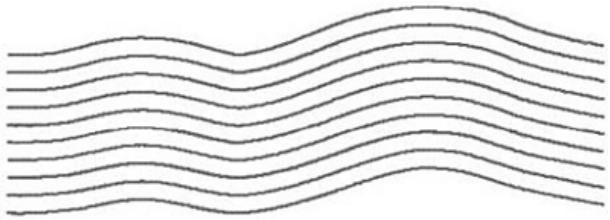
Track 0 is the reference track from which subsequent curve passes in the field are based. Once the first AB curve (Track 0) is created, 4 tracks will be generated. The system will continue to generate additional passes when the vehicle drives the last pass displayed on the screen.

*NOTE: Skip pass is available in AB Curves mode.*

**Generating AB Curve Path Information** - As the system generates the initial passes after recording Track 0 or when generating additional passes the text “Generating AB Curve” will be displayed on the perspective view. During this time you will not be able to track off of any paths.

**AB Curve Generation Limits** - The initially recorded AB curve must be at least 10 feet in length to be a valid AB Curve to use for guidance. The vehicle must be within 400 meters (0.25 miles) of where Track 0 was recorded for the

PC9028 —UN—16APR06



system to start generating curve paths. If the vehicle is at this outer limit it may take several minutes to generate a path that shows up on the screen. During this time “Generating AB Curve” will be displayed on the screen.

**Multiple AB Curves in a field** - A field can contain multiple AB Curve paths. Each AB curve for a field must be recorded and uniquely named.

**Track Numbering** - Tracks will be numbered to allow for skip pass and to aid in finding passes. The direction label (N,S,E, or W) is defined by the heading determined between the first and last point in the curve.

The curvature of the path changes as the subsequent paths get more convex or concave.

OUO6050,00010B5 -19-12APR09-1/1

## Creating a New AB Curve Track

Use the following procedure to setup the first AB curve (Track 0) from, which subsequent curve passes in the field are based.

*NOTE: Multiple AB Curves may be recorded per field. They will need to be named and recorded separately.*

1. Choose AB CURVE TRACK mode and select or create a Track Name on the final page in the Setup Wizard (SETUP GUIDANCE TRACK).

*NOTE: This page can also be accessed with the Quick Change Guidance softkey.*

2. Drive to desired location in the field for start of Track 0.
3. Selecting the AB Curves Start Recording softkey. This softkey will be replaced by the following softkeys after it is selected:
   - Pause Recording
   - Stop Recording
   - Cancel.
4. Drive the initial pass. A blue guidance track will appear on the map.

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JJ —UN—13APR09

*Guidance Quick Change*

*NOTE: When driving straight, the recorded path may not be shown behind the machine icon on the display. The path will appear when the machine is turned.*

5. Press Stop Recording at the end of the pass and the track will be saved to memory.

*NOTE: If GPS signal is lost while recording, recording is stopped and the AB curve that was recorded to that point will be saved. If the AB Curve is not what the operator intended, it may be deleted by using the Delete Track button on the SETUP GUIDANCE TRACK page of the SETUP WIZARD.*

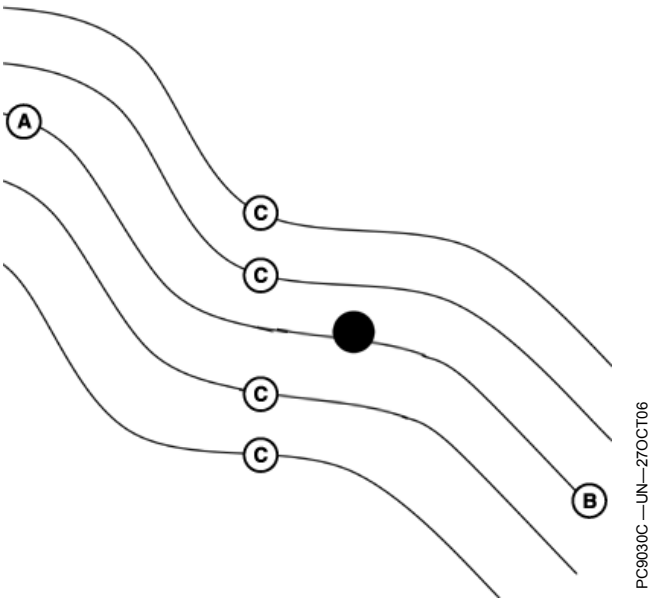
OUO6050,00010B6 -19-12APR09-1/1

## Recording a Straight Path or Navigating Around Obstacles

1. Start AB Curves Recording
2. Select Pause Recording to temporary stop recording of a vehicle's path.
3. Select AB Curves Recording to resume recording the AB curve.

The distance between where recording was PAUSED and RESUMED will be connected with a straight line. This can be helpful when there is a long straight section of path or when navigating around obstacles.

*NOTE: The longest bridge segment (line segment created between PAUSED and UNPAUSED) that can be created is a distance of 0.8 km (0.5 miles) (2,640ft). For a greater distance, the line segment will not connect resulting in a gap in the path.*



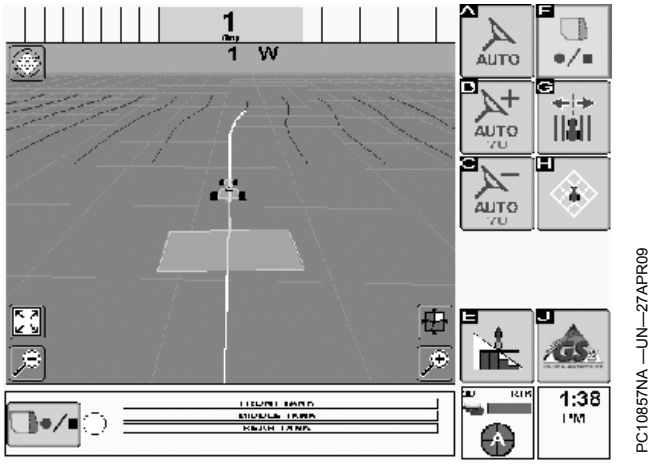

PC9030C —UN—27OCT06

**A—Pause before obstacle**
**B—Resume after obstacle**
**C—Paths Generated from Track 0**

OUO6050,00010B7 -19-12APR09-1/1

## Straight Line Extensions

Straight Line Extensions A/B Curve paths are generated with a 91 m (300 ft) straight line extension attached to the end of the actual recorded path. This straight line extension allows the operator to get the vehicle back on the path prior to entering the field. It may also aid in continuing the guidance path when the recorded path gets shorter than the field boundary.




PC10857NA —UN—27APR09

OUO6050,00010B8 -19-28APR09-1/1

## Guiding on an AB Curve

See CURVE SETTINGS in the GUIDANCE SETTINGS section to learn how to adjust your system for optimal performance.

The closest track is highlighted with a thicker white line. The track number is displayed below the path accuracy indicator and is automatically updated by system as a new track is approached. Track number changes when machine is half way between two tracks.

Off Track error distance is shown in the path accuracy indicator. This number shows how far from closest track machine is. Error number will count up until machine reaches point halfway between two tracks. After reaching midpoint error number will count down as machine approaches next track.

OUO6050,00010B9 -19-12APR09-1/1

# Operating Guidance in Adaptive Curves Mode

## Theory of Operation

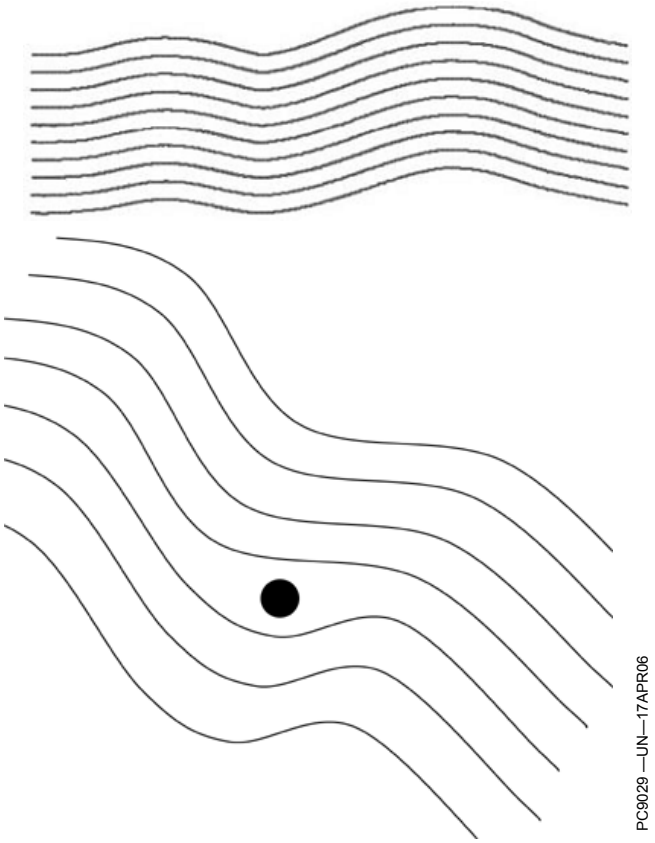
Adaptive Curves Mode allows the operator to record a manually driven curved path. Once the first curved pass has been recorded and machine is turned around, the operator can Parallel Track or activate AutoTrac once the propagated path appears. The vehicle will be guided along subsequent passes, based off of the previous recorded pass. Each pass is generated in relation to the original driven pass to ensure that steering errors are not propagated through the entire field. The passes are not identical copies of the original pass. The curvature of the pass changes to maintain pass to pass error. When necessary, the operator can change the curve path anywhere in the field by simply steering the machine off the propagated path.

*NOTE: Skip pass is not available in Adaptive Curves Mode.*

The curvature of the path changes as the subsequent paths get more convex or concave.

Adaptive Curve Track Mode allows an operator to drive and be guided along a variety of field patterns.

PC9028 —UN—16APR06



PC9029 —UN—17APR06

OUO6050,00010BA -19-12APR09-1/1

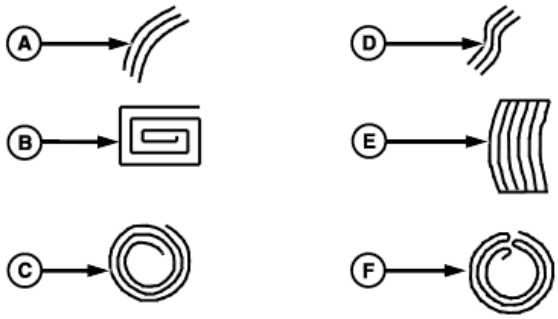
## Guidance Patterns

The method of searching all line segments allows an operator to drive and be guided along a variety of field patterns:

- Simple Curve
- S-Curve
- Boxed
- Race Track
- Spiral
- Circle

### Shift Track Operation

The use of shift track is not recommended when using Curve Track. Shift track will not compensate for inherent GPS drift in Curve Track mode.




PC9032 —UN—17APR06

**A—Simple Curve**
**B—Boxed**
**C—Spiral**
**D—S-Curve**
**E—Race Track**
**F—Circle**

OUO6050,00021FB -19-14NOV06-1/1

## Creating a New Adaptive Curve Track

*NOTE: Setup of Client, Farm, and Field is not required for Adaptive Curve Track operation but only one Global Adaptive Curve Track can be saved.*

1. Choose ADAPTIVE CURVE TRACK mode on the final page in the Setup Wizard (SETUP GUIDANCE TRACK).

*NOTE: This page can also be accessed with the Quick Change Guidance softkey.*

2. Drive to desired location in the field for the start of the track.

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JJ —UN—13APR09

*Guidance Quick Change*

PC10857ND —UN—27APR09

*Start Recording*

**Continued on next page**

OUO6050,00010BB -19-28APR09-1/2

3. Start Recording.

*NOTE: The Adaptive Curve recording softkey is disabled when Repeat Mode is ON. When recording new paths (i.e. Planting), Repeat Mode should be unchecked (Off). When guiding on existing paths (i.e. Spraying, Harvesting) the Repeat Mode button should be checked (On). Repeat Mode is OFF by default.*

To start recording manually, select the Adaptive Curves Start Recording softkey. This softkey will be replaced by the following softkeys after it is selected:

- Pause Recording
- Stop Recording
- Cancel

*NOTE: Recording only needs to be turned off if machine is driven outside of normal field pattern (i.e. refill sprayer, planter) or if you do not want to record turns at end of field.*

Curve Settings—Recording may be triggered based on AutoTrac or Coverage by selecting those options in Guidance Settings

4. Drive the initial pass. A blue guidance track will appear on the map.

*NOTE: When driving straight, the recorded path may not be shown behind the machine icon on the display. The path will appear when the machine is turned.*

*The white high-lighted navigation line will NOT appear until end of pass is reached and machine is turned around. Once machine is turned around, system will determine path to guide on. System locates a line segment that is parallel and within 1/2 to 1-1/2 track spacings. The predicted path will appear from which the operator can navigate from. Drive vehicle along desired path.*

5. Turn vehicle at the end of first pass and a white navigation line for the next pass will be generated. It may take a few seconds for the navigation line to appear.

6. Once the white navigation line for the intended pass appears, press resume switch (AutoTrac only) on the machine and the machine will automatically steer on that pass. For Manual Guidance, guide on the white highlighted navigation line.

PC10857NE —UN—27APR09

*Pause Recording*

PC10857NF —UN—27APR09

*Stop Recording*

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JF —UN—13APR09

*Settings*

PC10857NG —UN—27APR09

*Guidance Settings*

7. Select Stop Recording when the field is finished.

**IMPORTANT: STOP recording before entering the next field. Failure to do so may result in deleting the Adaptive Curve data from the last field before recording Adaptive Curve data in the next field.**

*NOTE: The stored Adaptive Curve Track data is assigned to the selected Client, Farm, Field name. It will be stored in the display's internal memory until it is cleared by the user and can be transferred from one display to another.*

OUO6050,00010BB -19-28APR09-2/2

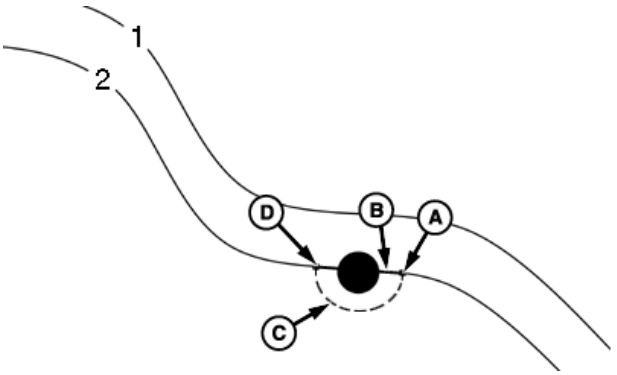
## Recording a Straight Path or Navigating Around Obstacles

1. Start Recording
2. Select Pause Recording to temporary stop recording of a vehicle's path.
3. Select Recording to resume recording the Adaptive curve.

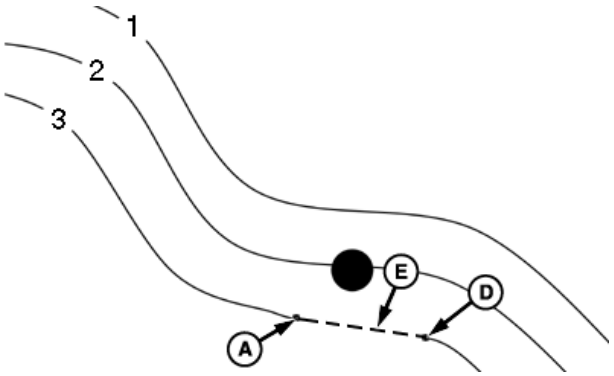
The distance between where recording was PAUSED and RESUMED will be connected with a straight line. This can be helpful when there is a long straight section of path or when navigating around obstacles.

*NOTE: The longest bridge segment (line segment created between PAUSED and UNPAUSED) that can be created is a distance of 0.8 km (0.5 miles) (2,640ft). For a greater distance, the line segment will not connect resulting in a gap in the path.*

**A—Recording PAUSED**
**B—Bridge segment is generated to connect two points**
**C—Tractor path not recorded while paused**
**D—Recording UNPAUSED**
**E—Path recorded as a straight line between points A and D**




PC9284 —UN—29JUL06




PC9285 —UN—08AUG06

OUO6050,00010BC -19-12APR09-1/1

## Guiding on a Previously Recorded Track

**IMPORTANT: If it is desired to have repeatability with saved Adaptive Curve Track data, it is required that the initial track data and subsequent trips across the field be created using StarFire RTK accuracy. RTK base station should be operating in Absolute Base mode.**

*NOTE: The track spacing for Adaptive Curve Track data is constant. If a different implement width is used when returning to the field, new data must be recorded.*

1. Select a field that has previously recorded Adaptive Curve Track data associated with it. The previously track will reappear on the map.
2. Turn ON Repeat Mode in GUIDANCE SETTINGS to guide on a previously recorded Adaptive Curve Track. Repeat Mode allows the guidance track to be displayed when Recording is OFF.

   Select Curve Settings
3. Drive the vehicle onto the track and a highlighted white navigation line will appear in front of the vehicle.

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JF —UN—13APR09

*Setting*

PC10857NG —UN—27APR09

*Guidance Settings*

4. Press Resume Switch (AutoTrac only) on the machine and the machine will automatically steer on that pass. For Manual Guidance, guide on the white highlighted navigation line.

OUO6050,00010BD -19-28APR09-1/1

## Shift Track

Shift Track will shift the entire recorded line left or right, based on the current direction of the machine.

OUO6050,00010BE -19-12APR09-1/1

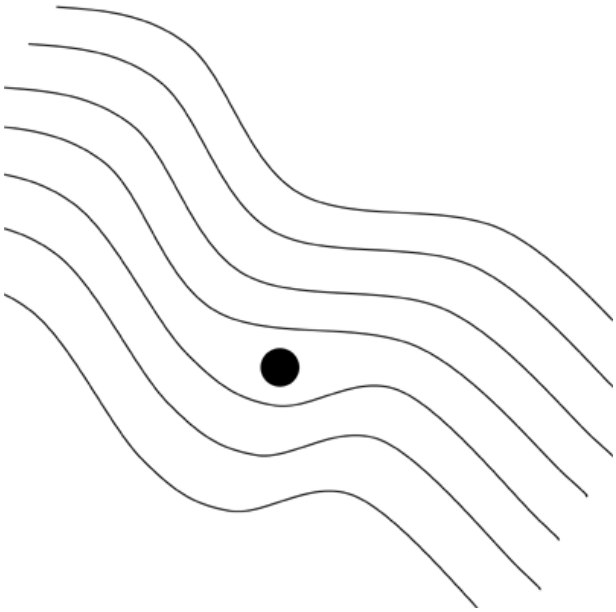
## Guiding around Obstacles in Field

When operating Curve Track in a field and an obstacle is encountered such as a well head, telephone pole, or power line, the operator must drive around these obstacles.

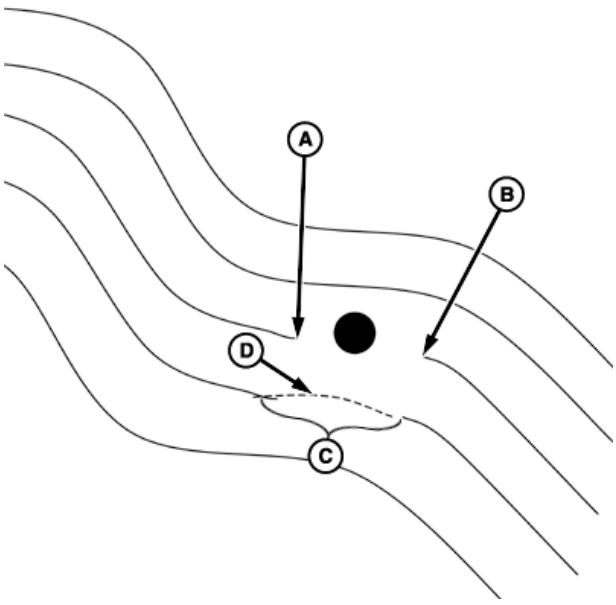
**Recording ON**: If recording is left on while driving around an obstacle that deviation to the propagated path will be recorded and become a part of the path. On the next pass when you approach the area in the field the propagated path for the pass that the machine is on will have incorporated that deviation and the machine will steer along that deviation. To straighten out that deviation, the operator must take over manual steering of the machine and straighten out that deviation. Once the operator has driven past the deviation in the field and reacquired the intended path the resume switch may be engaged and AutoTrac will take over machine steering.

**Recording OFF**: If recording is turned off when the obstacle is approached and steered around and then recording turned back on once the obstacle has been navigated around and AutoTrac engaged to finish the pass, there will be a gap in the recorded path where the obstacle is. On the next path when the machine approaches the gap the operator must take over manual steering of machine and navigate through the gap. Once the gap has been navigated and the propagated path is reacquired, AutoTrac can be engage and the gap will not appear in subsequent passes.

**A—Turned Recording Off**
**B—Turned Recording On**
**C—Gaps Results in Next Pass**
**D—Manually Driven to Re-establish Path**



PC9029 —UN—17APR06




PC9030 —UN—17APR06

OUO6050,00010BF -19-12APR09-1/1

# Operating Guidance in Circle Track Mode

## Theory of Operation

Circle Track helps operators drive concentric circles in a field with center pivot irrigation. Operators can create an initial circle using a variety of different methods. Once the initial circle has been defined, all the subsequent circles in the field are created.

Circle Track Mode is available for Manual Guidance; however, to AutoTrac in Circle Track mode requires both an AutoTrac and Pivot Pro activation. The Pivot Pro activation is available in North America only.

Circle Center Latitude and Longitude coordinates are saved and associated to a Field Name. If a field is not selected when the circle center is defined, Global circle centers will be saved. Circle Centers can be recalled for future use.

OUO6050,00010C1 -19-12APR09-1/1

## Creating a New Circle Track

Circle Tracks are created by defining the center point of the circle. There are two methods to define the center point:

First choose CIRCLE TRACK mode and select or create a Track Name on the final page in the Setup Wizard (SETUP GUIDANCE TRACK).

*NOTE: This page can also be accessed with the Quick Change Guidance softkey.*

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JJ —UN—13APR09

OUO6050,00010C2 -19-12APR09-1/1

## Drive Circle Method

- Drive Circles - Creates a circle track by driving at least 10 percent of the desired circle. It is recommended to drive the entire circle for optimum circle center calculation and a higher accuracy track.
- Lat/Long - Sets a circle track off a specific latitude and longitude point in the middle of the circle that is defined by the user.

1. Drive to the desired location in the field to drive a circular pass.
2. Select Start Circle Recording.
3. Drive the desired circle pass.
4. Select Stop Circle Recording. The Circle Tracks are created automatically with the Track Spacing defined in the Setup Wizard.

*NOTE: The Stop Circle Recording button will appear when enough of the circle has been driven to calculate the center point.*

OUO6050,00010C3 -19-12APR09-1/1

## Lat / Long Method

1. Select Center Point Latitude and Longitude.
2. Enter the desired latitude and longitude values in decimal degrees for the circle center. The previous latitude and longitude values associated with the field are displayed when the entry screen is first displayed.
3. Save the values by selecting Accept. The Circle Tracks are created automatically with the Track Spacing defined in the Setup Wizard.

*NOTE: It may be necessary to line the vehicle up on the center pivot tower track or use center shift track to get the tracks lined up with the vehicle.*

OUO6050,00010C4 -19-12APR09-1/1

## Guiding on a Circle Track

When operating Circle Track it is not necessary to drive tracks in a specific order. Depending on your zoom level all tracks that can be displayed will show up on the screen with the closest Track designated by a thicker line. The track number is displayed below the path accuracy indicator and is automatically updated by system as a new track is approached. Track number changes when machine is half way between two tracks.

Off Track error distance is shown in the path accuracy indicator. This number shows how far from closest track machine is. Error number will count up until machine reaches point halfway between two tracks. After reaching midpoint error number will count down as machine approaches next track.

Distance to end of pass utilizing Turn Predictor is shown in the top right portion of the guidance view. Distance will count down to predicted turn and tones will sound when machine is 10 seconds from intersecting turn point and again when predicted turn point has been reached.

*NOTE: Track spacing may require adjustment due to operator and/or GPS error.*

EXAMPLE: An operator may want to enter a slightly smaller implement width to account for operator error while steering or GPS error.

OUO6050,00010C5 -19-12APR09-1/1

## Shift Track

Shift Track controls work as described in the GENERAL GUIDANCE section.

Shift Track is used to shift the tracks radially closer or further from the center point. Shift Track does not move the center point itself. This method of Shift Track allows the operator to use various implement widths, account for different lengths of center pivot towers or to account for stretching/shrinking of the center pivot irrigation sections.

**IMPORTANT: When using SF2 or SF1 Differential Correction (or when using RTK Quick Survey Mode) the Circle Center may drift over time or at power cycles. In Circles Track Mode, Shift Track does not compensate for GPS drift. In order to achieve accuracy and repeatability when using SF1 or SF2 Differential Correction, the center point must be recalculated by manually driving the circle on a daily basis (see Calculating Circle Center).**

*NOTE: RTK Absolute Base Mode is highly recommended in high accuracy applications when using Circle Track. Only RTK Absolute Base Mode provides consistent repeatability and accuracy in Circle Track.*

Example 1 - Operator makes first pass through the field saving Circle Center information to EAST FIELD (Field Name) and CENTER1 (Track Name), pulling a 4.6 m (15 ft) implement. The operator returns for second pass in same field with 9.1 m (30 ft) implement. To follow the same track stored, recall EAST FIELD and CENTER1, line up on desired track and SHIFT CENTER to allow for the difference in implement widths.

Example 2 - Operator is using SF2 and defines a circle center point by manually driving the circle. The following day, the operator returns to the field and finds that the AutoTrac is not lining up properly with the previous day's path due to GPS drift. The operator must re-drive the circle to find the Circle Center Point.

OUO6050,00010C6 -19-12APR09-1/1

## Accuracy

Accuracy in Slope Conditions - Circle Track was designed for center pivot operation on ground with less than 2% slope. Customers who use circle track on slopes greater than 2% need to be aware of the performance of circle track in these conditions and why circle track performs the way that it does. In operating Circle Track in some slope conditions there are cases where the circle track spacing and the center pivot tower track will not match in tower tracks away from the center pivot. This is due to the difference between distance traveled over a hill and on a level plane. AutoTrac draws the circle spacing as if the plane were level. The tower tracks obviously go over the hill terrain. This difference in distance will increase as slope increases.

See the DIAGNOSTICS section for an overview of AutoTrac Accuracy.

OUO6050,00010C7 -19-12APR09-1/1

# Operating in Row Finder Mode

## Theory of Operation

Row Finder (Manual Guidance Only) mode is intended for use in row crop applications where rows are not always equally spaced. Row Finder will aid the operator in finding which set of rows to enter back into the field on after setting a reference point when coming out of the previous set of rows.

*NOTE: Row Finder can only be operated in Parallel Tracking Mode.*

Track Spacing must be set for operation of this mode.

OUO6050,00010C8 -19-12APR09-1/1

## Row Finder Operation

To use Row Finder press SET ROW softkey at end of pass before starting turn. Track 0 will be reset based on current track spacing, position and heading. After starting turn, turning view will guide operator into next pass.

**IMPORTANT: For optimal performance the SET ROW button must be pressed before machine begins making turn at end of pass.**

*NOTE: If SET ROW button is pressed when machine is stopped, system will reset track 0 based on a 0° heading.*

OUO6050,00010C9 -19-12APR09-1/1

# General Guidance

## Turning On and Off

**To turn guidance ON**, complete the Setup Wizard or go to GreenStar Main Page -> Guidance Quick Change -> Select a Tracking Mode -> Select or create a Guidance Track

**To turn guidance OFF**, go to GreenStar Main Page -> Guidance Quick Change -> Select Tracking Mode = Guidance OFF

OUO6050,00010CD -19-14APR09-1/1

## Clearing Guidance Tracks

Clear (delete) Guidance Tracks to free up memory on the display. Guidance Tracks are cleared on the Guidance Setup page:

GreenStar Main >> Guidance Quick Change >> Delete Track

1. Select Tracking Mode
2. Select Track Name (depending on Tracking Mode)
3. Select Delete Track

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*GreenStar Main Page*

PC10857JJ —UN—13APR09

*Guidance Quick Change*

PC10857KX —UN—14APR09

*Delete Track*

OUO6050,0001217 -19-08OCT09-1/1

## Shift Track

Shift Track is used to adjust the position of guidance tracks left or right to compensate for GPS drift. Shift Track moves Track 0 and all the tracks associated with it left or right the distance specified in Guidance Settings with each press of the SHIFT LEFT or SHIFT RIGHT buttons. Shift Track defaults to OFF and may be turned ON/OFF in Guidance Settings.

*NOTE: Drift is inherent to any satellite based, differentially corrected GPS system.*

Select Shift Track on the Run Page to access the Shift Track controls.

- To move tracks to left, select SHIFT LEFT .
- To move tracks to right, select SHIFT RIGHT .
- To center the tracks on the vehicle's current location select SHIFT CENTER .
- To clear all shifts and return Track 0 and all the tracks associated with it to the originally defined location, select CLEAR SHIFTS .

**IMPORTANT: When using SF1 or SF2 differential correction (or when using RTK Quick Survey Mode) the track may drift over time or at power cycles. Shift Track can be used to compensate for GPS drift.**

**Anytime the North American RTK radio is reconfigured or changed, power must be cycled at the GPS receiver before continuing.**

**Power to the RTK radio must be turned off before unplugging RTK radio.**

*NOTE: CLEAR SHIFTS is disabled when AutoTrac is active.*

PC10857NC —UN—24SEP09

*Shift Track*

PC10857LE —UN—14APR09

*Shift Left*

PC10857LF —UN—14APR09

*Shift Right*

PC10857LG —UN—14APR09

*Shift Center*

PC10857LH —UN—14APR09

*Clear Shifts*

*RTK Absolute Base Mode is highly recommended in high accuracy applications when repeatability is needed. Only RTK Absolute Base Mode provides consistent repeatability and accuracy.*

OUO6050,00010D1 -19-28APR09-1/1

## Tracking Tones

Tracking tones can be used as an audible indication of steering direction. If the track is right of machine, two low beeps will sound, if left of machine a single high beep will sound. The alarm will repeat twice a second until the off-track error between machine and guidance track is less than value specified in Guidance Settings.

Tracking Tones default to ON and may be turned ON/OFF in Guidance Settings.

OUO6050,00010CF -19-14APR09-1/1

## Turning View

*NOTE: Track 0 must be established for turning view to be active.*

Turning View assists the operator view the next track when turning around from one pass to the next by showing an overhead view of the field instead of the perspective view.

Turning View will appear once the vehicle has turned more than 45 degrees from the track heading. The screen will revert back to the perspective view once the vehicle is within approximately 5 degrees of the track. The operator has the ability to cancel the Turning View once the screen transitions into turning view with a cancel button that

PC10857NB —UN—27APR09

*Cancel Turning View*

appears in the top left corner of the guidance view. Once the cancel button is selected the screen will switch back to the perspective view.

Turning View defaults to ON and may be turned ON/OFF in Guidance Settings.

Select Cancel Turning View to return to the map view.

OUO6050,00010D2 -19-28APR09-1/1

## Turn Predictor

Turn Predictor alerts the operator by predicting the end of pass and displays the distance to the end of pass in the top right portion of the map view. Turn Predictor defaults to ON and may be turned ON/OFF in Guidance Settings. Distance will count down to predicted turn and tones will sound when machine is 10 seconds from intersecting turn point and again when predicted turn point has been reached. A visual indicator is displayed 10 seconds before approaching a predicted turning point. When the system detects a previous turn on a previous pass, the distance to that turning point will be displayed. The visual indication on the Perspective Map is accompanied by tones.

Turn predictor is intended to only predict turn point of a vehicle using Parallel Tracking or AutoTrac. It is NOT a headland alert. Turn predictions are based solely on previous turn behavior of vehicle. Turn points are also defined when AutoTrac is deactivated and the heading error exceeds 45 degrees. Turn predictions will not coincide with field boundary if field boundary is not linear and continuous, or if operator makes turns before or after field boundary.

*NOTE: If there is a seat switch timeout (operator out of seat for 7 seconds on tractors, 5 seconds on combines and sprayers), the display resets Turn Predictor back to ON.*

OUO6050,00010D3 -19-14APR09-1/1

## Guidance Settings

Optimal performance of the GreenStar system usually requires adjustment of settings. Access Guidance settings to customize your user experience and optimize the system performance.

General Settings

**Turning View** - assists the operator view the next track when turning around. To turn ON/OFF, select / unselect check box.

**Turn Predictor** - alerts operator by predicting the end of pass. To turn ON/ OFF, select / unselect check box.

**Tracking Tones** – provide an audible indication off-track error. To turn ON/ OFF, select / unselect check box. To change distance at which tracking tones make a sound, select input field, scroll the thumb wheel to the desired value, and press Enter. Values between 10—60 cm (4—24 in.) may be entered.

**Lead Compensation** – shows how far down current track guidance looks to for such things as turns. It is used with Parallel Tracking only. To turn ON/OFF, select / unselect check box.

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*GreenStar Main Page*

PC10857JF —UN—13APR09

*Settings*

PC10857NG —UN—27APR09

*Guidance Settings*

**Continued on next page**

OUO6050,00010D4 -19-28APR09-1/2

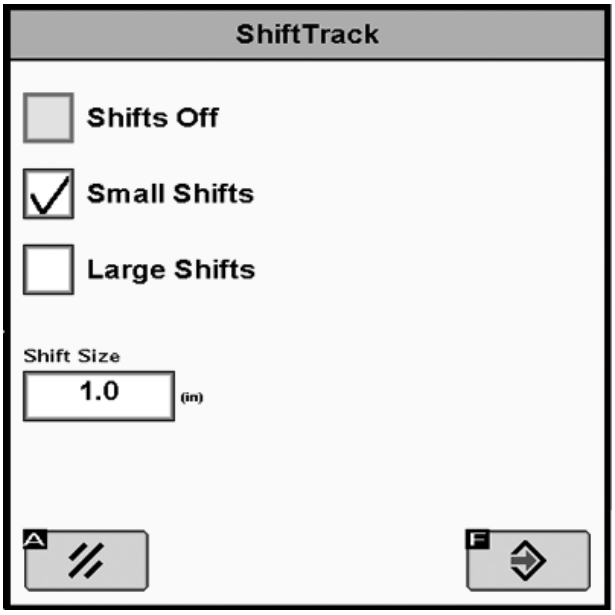
**Shift Track** – is used to adjust the position of guidance tracks left or right to compensate for GPS drift. This setting will turn shifts ON/OFF, select small shifts or large shifts, and change the distance of each shift.

**Shifts Off** – Check the box to turn shifts OFF.

**Small Shifts** – Select Small Shifts to use a Shift Size of 1—30 cm (0.4—12 in.).

**Large Shifts** – Select Large Shifts to use a Shift Size of 1— 410cm (12-161.5 in.). Large Shifts are disabled when AutoTrac is active or when operating in Adaptive Curve Track mode.

**Shift Size** – Distance that tracks shift when SHIFT LEFT or SHIFT RIGHT buttons are selected.




PC10857NH —UN—27APR09

OUO6050,00010D4 -19-28APR09-2/2

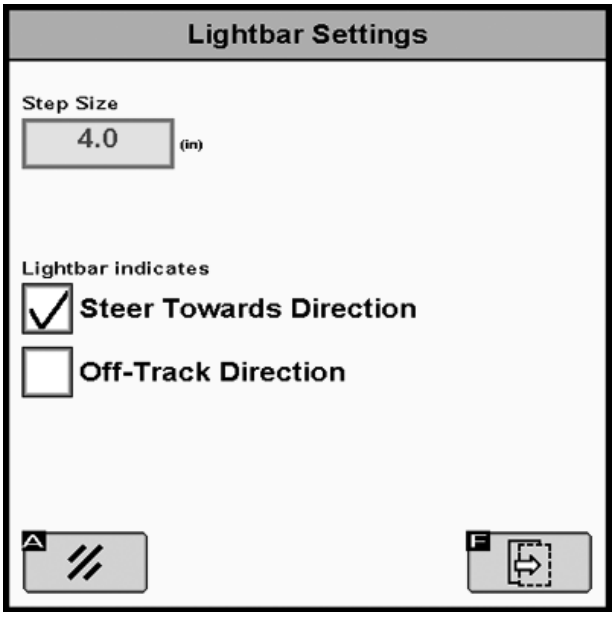
## Lightbar Settings

**Step Size** – is used to set the value of off-track distance each box on the Path Accuracy Indicator represents. If the display is used with an external GreenStar Lightbar, the Step Size will also set the off-track distance that each light represents on the Lightbar.

**Steer Towards Direction** – When this option is selected, the lights illuminated to the left on the Path Accuracy Indicator and external GreenStar Lightbar mean the vehicle must be steered to the left to align with the guidance track.

**Off Track Direction** – When this option is selected, the lights illuminated to the left on the Path Accuracy Indicator and external GreenStar Lightbar mean the vehicle must be steered to the right to align with the guidance track.

**External Lightbar On** – Check the box to turn ON the External Lightbar




PC10857NI —UN—27APR09

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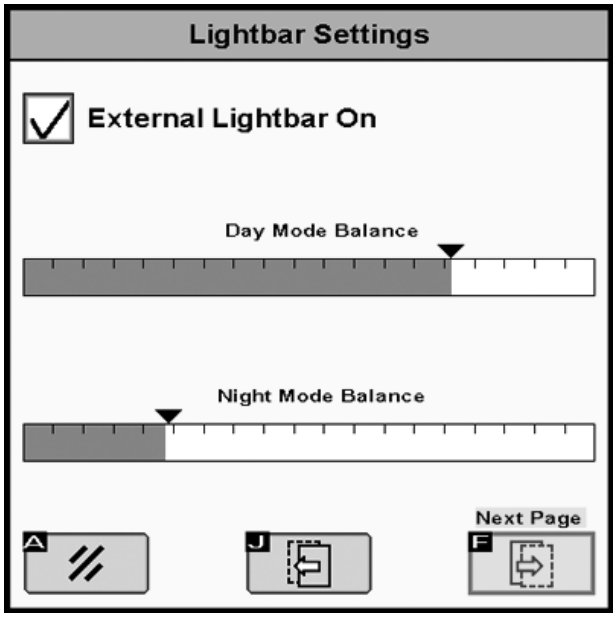
OUO6050,00010D5 -19-28APR09-1/3

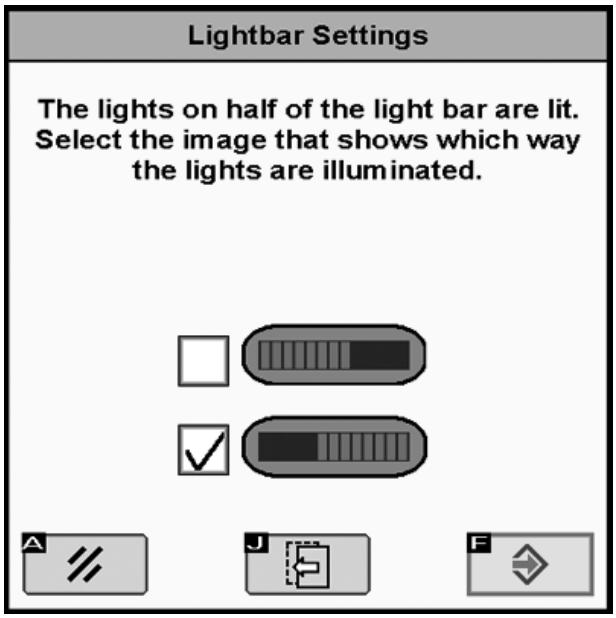
**Adjust Brightness of GreenStar Lightbar** – The brightness of the external GreenStar Lightbar will synchronize with the brightness setting of the display. This setting is available to adjust the GreenStar Lightbar brightness relative to the brightness of the display.




PC10857NJ —UN—27APR09

OUO6050,00010D5 -19-28APR09-2/3

**Configure the Mounting Direction of the Lightbar** – This setting allows the GreenStar Lightbar to be mounted upside down. When this page is open, half of the lights on the GreenStar Lightbar will light up if it is installed correctly. Simply check the box for the direction that the lights appear.

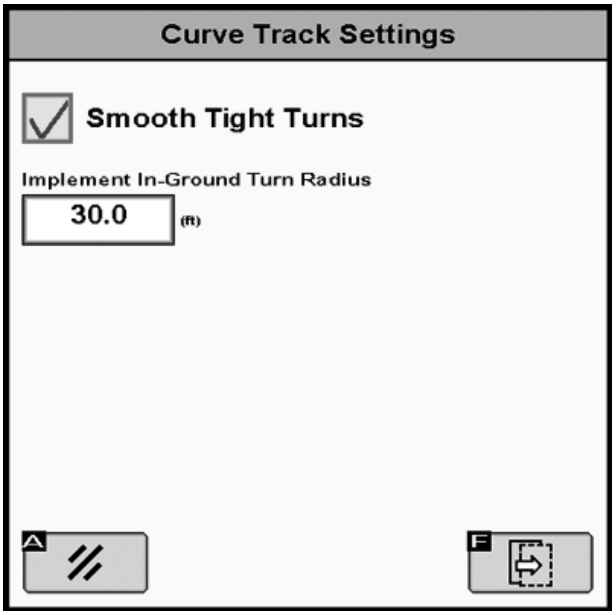



PC10857NK —UN—27APR09

OUO6050,00010D5 -19-28APR09-3/3

## Curve Track Settings

**Smooth Tight Turns** - When box is checked the system will automatically smooth a propagated path that was becoming tight.

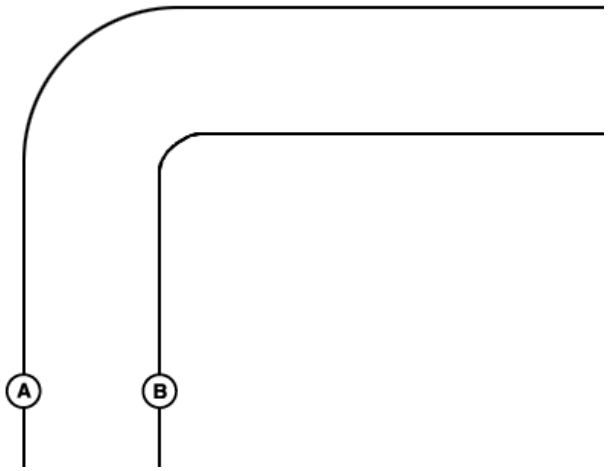



PC10857NL —UN—27APR09

OUO6050,00010D6 -19-14APR09-1/5

**A—Previous Pass**

**B—Next Pass—Smoothing Tight Turns Off**




PC9529 —UN—27OCT06

*Smoothing Tight Turns OFF*

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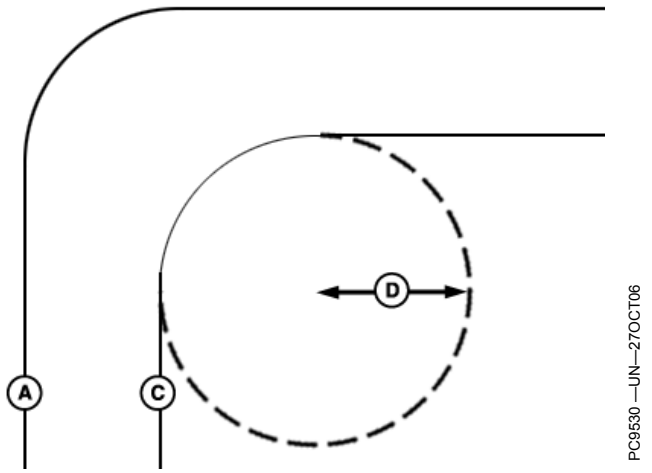
OUO6050,00010D6 -19-14APR09-2/5

**A—Previous Pass**

**B—Next Pass—Smoothing Tight Turns On**



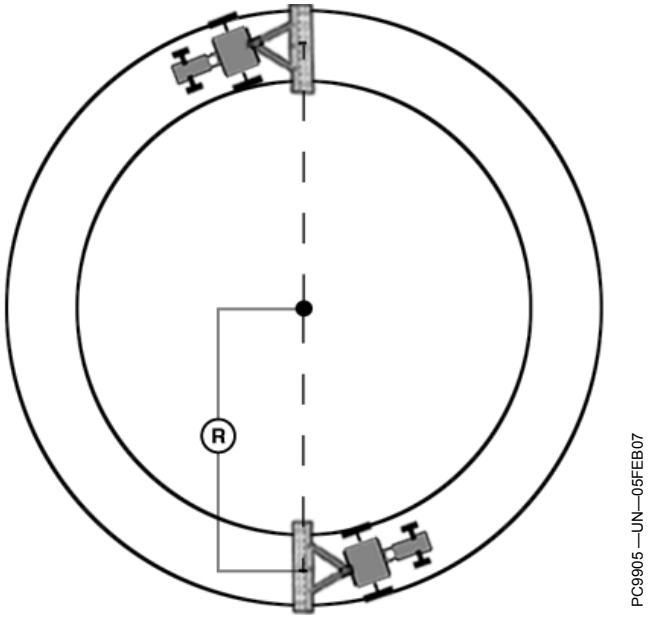

*Smoothing Tight Turns ON*

OUO6050,00010D6 -19-14APR09-3/5

Implement In-Ground Turn Radius - This value is the smallest turn radius the implement can turn while in the ground.

R—Implement Turn Radius

**Recording Source – Adaptive Curve Track** recording may be triggered manually or based on AutoTrac or Coverage.




*Radius*

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OUO6050,00010D6 -19-14APR09-4/5

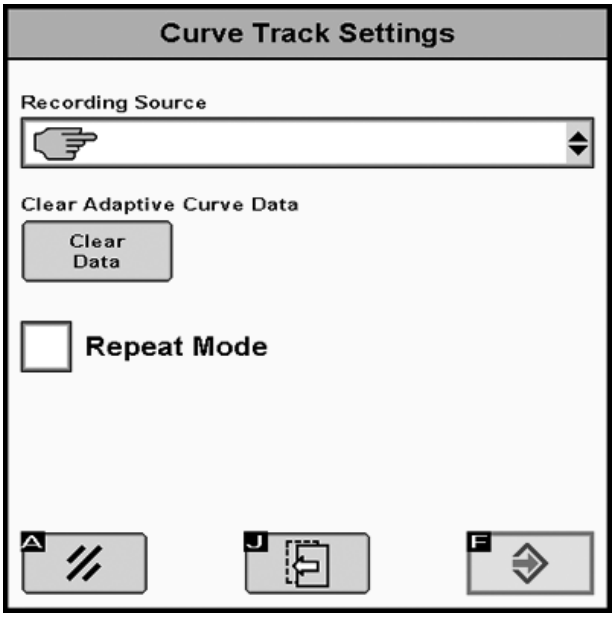
**Clear Adaptive Curve Data** - If Curve Track data has been recorded previously for this field and operator does not want to use it or the internal memory is full due to stored Curve Track data, the Curve Track data can be removed from the data card. There are two options for clearing Curve Track data:

For this field only—clears Curve Track data for current field only on data card

For all fields—clears Curve Track data for all fields stored on data card

**Repeat Mode** – Repeat Mode allows the guidance track to be displayed when Recording is OFF. Turn ON Repeat Mode to guide on a previously recorded Adaptive Curve Track. Repeat Mode is OFF by default.

The Adaptive Curve Recording softkey is disabled when Repeat Mode is ON.




PC10857NM —UN—27APR09

OUO6050,00010D6 -19-14APR09-5/5

## AutoTrac Settings

*NOTE: AutoTrac Settings only appear on the display in machines that are AutoTrac capable.*

**Steering Sensitivity**—Allows AutoTrac users to adjust the vehicle's steering sensitivity. To adjust steering sensitivity select the input box and enter the desired steering sensitivity value via numeric keypad and select the enter button. The sensitivity can also be adjusted up or down by selecting the Increase Steering Sensitivity and Decrease Steering Sensitivity softkeys on the Run Page.

*NOTE: Valid range for steer sensitivity is 50 - 200 with 200 being the most aggressive setting.*

PC10857LB —UN—14APR09


*Increase Steering Sensitivity*

PC10857LC —UN—14APR09

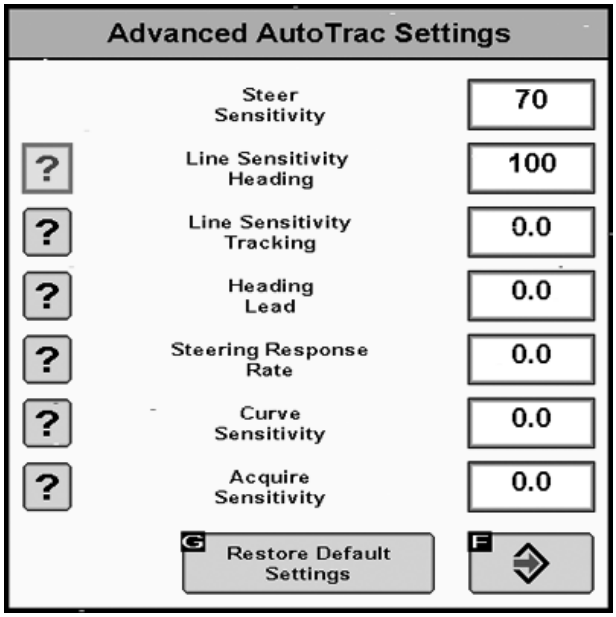

*Decrease Steering Sensitivity*

OUO6050,00010D7 -19-28APR09-1/1

## Advanced AutoTrac Settings

The AutoTrac Settings button will only be visible under Guidance Settings when an SSU that supports advanced AutoTrac Integrated settings is detected.

The Accept button saves and applies the current settings and returns the user to the previous page. The Restore Default Settings button will set all settings to the factory default value. See each setting for its default value. The '?' button will display a popup with help text for the specific setting.




PC10857NN —UN—27APR09

OUO6050,000108A -19-11APR09-1/1

## Line Sensitivity Heading

Determines how aggressively AutoTrac responds to heading errors.

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

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

OUO6050,00010DB -19-14APR09-1/1

## AutoTrac Universal

For instructions on operating AutoTrac Universal, see the AutoTrac Universal operator's manual.

OUO6050,00010DA -19-14APR09-1/1

## External GreenStar Lightbar

The GreenStar Lightbar will operate in companion configuration with a GS2 1800 display when both are connected to the implement CAN bus. The GreenStar Lightbar mounts on the windshield in front of the operator, projecting the Path Accuracy Indicator from the display to the operator's line of sight. No extra setup is necessary to use the GreenStar Lightbar with the GS2 1800, but the following settings are available in Guidance Settings.

For instructions on proper mounting and installation, see the GreenStar Lightbar Operator Manual.

OUO6050,00010D8 -19-14APR09-1/1

## Operating Swath Control Pro

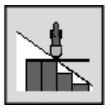
1. Complete the Setup Wizard to setup your GreenStar system for Swath Control Pro and create a Guidance Track. See the GETTING STARTED section earlier in this manual.

*NOTE: If a client, farm, and field are NOT selected, only one Coverage map can be stored in the display. Coverage can NOT be mapped 5 miles beyond the first recorded point in the map.*

2. Create any necessary External and Internal Boundaries. Boundaries, though optional, can be helpful when using Swath Control. For example, with Swath Control set to Minimize Overlap, an exterior boundary can help ensure there is no application outside of the field if a section extends over the boundary. Similarly, a setting of Minimize Overlap on an interior boundary will allow you to drive across a waterway and help ensure each section is off while crossing.
3. See the SWATH CONTROL SETTINGS section of this manual to learn how to adjust your system for optimal performance.
4. ALL of the following are required for Swath Control to function:

   Valid Swath Control Pro activation code is entered in display

PC10857NO —UN—28APR09



*Swath Control On/Off*

- Swath Control capable controller is detected and displays the appropriate machine type on the Machine Setup Page.
- Setup Wizard is complete.
- Master Switch is on.
- Section switch is in the ON position.
- GPS signal status is present (SF1, SF2, or RTK).
- Speed above.5 m.p.h.

5. Turn Swath Control ON/OFF with the Swath Control Toggle on the GreenStar Run Page.

*NOTE: If the Swath Control Pro Toggle ON/OFF button does not appear on the Run Page, check that Valid Swath Control Pro activation code is entered in display and a Swath Control capable controller is detected by the display (Go to Menu -> Message Center -> Electronic Control Unit Info -> See that the message counts for the controller are increasing steadily).*

*If multiple Swath Control Pro capable controllers are connected to the CAN Bus, they will automatically be prioritized and the highest priority will be displayed.*

OUO6050,00010DC -19-28APR09-1/1

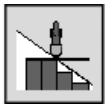
## Enabling / Disabling the System for Sprayers

ALL of the following are required for Swath Control to function:

- Turn solution pump on.
- Turn Boom Section Switches on.
- Select the Swath Control ON/OFF toggle on the GreenStar Run Page.
- Speed is greater than 0.8 km/h (0.5 m.p.h.).
- Turn Master Spray Switch on.

*NOTE: If IBS or a boom section switch has turned a section off, swath control will not turn it on. If Swath Control has turned a section off, IBS will not turn it back on.*

PC10857NO —UN—28APR09



*Swath Control On/Off*

Any one of these will disable Swath Control:

- Master Spray Switch is off.
- Select the Swath Control ON/OFF toggle
- Section pump is off.

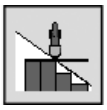
OUO6050,00010DD -19-28APR09-1/1

## Enabling / Disabling the System for Seeding Tools

ALL of the following are required for Swath Control to function:

- Turn all section switches on.
- Lower the implement into the ground.
- Select the Swath Control ON/OFF toggle on the GreenStar Run Page
- Vehicle speed must be greater than 1 km/h (0.62 m.p.h.) for Air Cart and 1990 CCS and 0.3 km/h (0.2 m.p.h.) for planters.
- Turn the Master Switch on.

PC10857NO —UN—28APR09



*Swath Control On/Off*

Any of the following will disable Swath Control:

- The implement is raised above the ground.
- All section switches are off.
- Master Switch is off.
- Select the Swath Control ON/OFF toggle
- Vehicle speed below minimum value.

OUO6050,00010DE -19-28APR09-1/1

## Section Status Bar

When Swath Control is functioning, the detected section status is displayed at the bottom of the Run Page in the Section Status Bar.

Example Status Bar for an air cart

- Green bar at bottom – Swath Control Enabled and section is on.

PC10857NP —UN—28APR09


*Section Status Bar*

- Tank bar is black – Tank is ON
- Tank bar is clear – Tank is OFF

OUO6050,00010DF -19-28APR09-1/2

Example Status Bar for a sprayer

- Detected sections are displayed
- L1 – First section left of center
- R1 – First section right of center
- C – Center section
- Green triangle – Section status is ON
- Clear triangle – Section status is OFF

PC10857NQ —UN—28APR09


OUO6050,00010DF -19-28APR09-2/2

## Swath Control Pro Accuracy

The overall Swath Control Pro system accuracy is dependent upon many variables:

Signal Accuracy + Vehicle Setup + Section Setup + Field Conditions + Product Rate.

It is important to remember:

- Receiver has to go through a warm-up period upon startup.
- Vehicle must be setup properly (according to vehicle operator manual).
- Implement must be setup to run properly (wear parts are in good working condition and correctly spaced).
- To understand how field conditions and product rate to be applied can affect system.
- As the GPS Accuracy increases (SF1, SF2, and RTK subscriptions), Swath Control Pro reaction accuracy will also increase.
- Swath Control Pro accuracy will be affected by GPS shading situations (such as trees).
- The more constant the speed is kept when entering and exiting coverage and boundary areas, the more accurate swath control will become. Accelerating and decelerating quickly has the potential to induce issues as the times are associated to the vehicles travel speed.

OUO6050,00010E0 -19-28APR09-1/1

## Swath Control Settings

Optimal performance of the GreenStar system usually requires adjustment of settings. Access Swath Control settings to optimize your system performance.

*NOTE: The Swath Control Settings button will only appear if a valid Swath Control Pro activation code is entered in display and Swath Control capable controller is detected.*

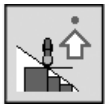
PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JF —UN—13APR09

*Settings*

PC10857NR —UN—28APR09



*Swath Control Settings*

OUO6050,00010E1 -19-14APR09-1/1

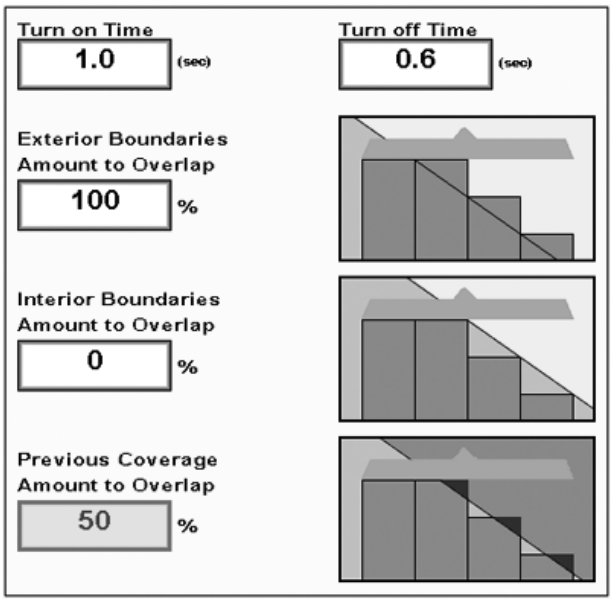
## Turn ON / OFF Time

This setting compensates for the average physical machine reaction delay. (Electrical and Mechanical) by turning on or off the section before the implement actually enters an area.

The reaction time is not affected by ground speed. The physical reaction time delay remains constant for that machine configuration. The machine will travel at varying rates of speed but the reaction time remains the same. If the time is set to 0.0 seconds (turn on or turn off) the command signal to trigger the valves will be sent when the controller portion of the implement or boom section reaches the boundary or previously covered area. (minimum overlap, minimum skip, or percentage). This is usually referred to as the machine is reacting too late.

As the values increase (turn on or turn off seconds), the command will be sent sooner in relation to the boundary or coverage area. If your turn on time is 1.0 second, the command will be sent 1.0 second before the implement reaches the boundary or previously covered area. These values have little effect on what is seen on the display map; the values only control the command trigger times for the valves.

*NOTE: Implement Offset 1 + Implement Offset 2 = The point that Swath Control Pro uses to turn sections on/off.*




PC10857NS —UN—28APR09

OUO6050,00010E2 -19-14APR09-1/1

## Optimal Turn ON / OFF Times

Optimal Turn ON / OFF Times will be determined by experience with your equipment in the field. Keep in mind that your ground speed only affects the distance traveled while the machine reaction delay is taking place and that the distance traveled will vary between turn on and turn off times and from operator to operator. Two different cases are discussed below.

**Sprayers:**

At 16 m.p.h. in a self propelled sprayer, the average physical reaction time of the system (turn off command at the hydro handle, the boom valve reacts and turns off, liquid flows out of the boom freely until the check valve pressure is met) is under 1.5 seconds. The liquid will continue to fall to the crop canopy past the 1.5 seconds so the physical overall operational reaction time could reach approximately 2 - 3 seconds in total. In two seconds of time, while traveling at 16 m.p.h., the self propelled sprayer travels 46.93 feet. If there is 1.5 seconds of machine reaction time before spray completely stops flowing, you will want to begin with a 1.5 to 2.5 second Turn Off Time. As a rule of thumb, it takes a liquid handling system longer to react when turning on than when turning off due to liquid pressure differentials, so many times the turn on time is slightly greater than the turn off time.

**Planters and Seeding Tools**:

Planters/Seeders average 4 to 7 m.p.h. while planting and have very minimal machine electrical clutch reaction delay times (under 0.8 seconds usually). On planters, the largest delay time is usually from the time the seed leaves the meter disk, travels in the seed tube, and reaches the soil. At a 10 km/h (6 m.p.h.) planting speed, you will travel 2.8 m (8.8 ft) in one second. That's 280 mm (10.5 in.) of travel distance every one-tenth of a second. The entire time elapsed from the switch being pressed in the cab, the clutch stops, the seed meter stops, and all the seed has reached the soil is only 0.8 seconds. Therefore, changing Turn ON/ OFF Time from 0.2 to 0.8 seconds can dramatically change the location of seed placement. On average, most row crop planters generally set a turn off time between 0.0 to 0.3 seconds and a turn on time between 0.5 to 1.0 seconds. On average, most air carts set a turn off time at 0.6 seconds and a turn on time at 1.0 second.

OUO6050,000108B -19-28APR09-1/1

## Understanding Swath Control Turn On and Turn Off Settings

*NOTE: The Turn on and Turn off times in the examples in this section are not true for every machine. It is important that you determine the Turn on and Turn off times for your particular machine and implement.*

*Swath Control Pro operates based on the drop point and turn on and off time of the primary function.*

### Seeding Tools

Planters average 6—12 km/h (4—7 mph) while planting and have minimal machine electrical clutch reaction delay times (under 0.8 seconds usually). The largest delay time is usually from the time the seed leaves the meter disk, travels in the seed tube, and reaches the soil. At a 10 km/h (6 mph) planting speed, you travel 2.8 m (8.8 ft.) in one second. That's 280 mm (10.5 in.) of travel distance every one-tenth of a second. (Example - Entire seed delay time from the switch being selected in the cab, the clutch stops, the seed meter stops, and all the seed has reached the soil; time elapsed 0.8 seconds) You can see that changing 0.3—0.8 seconds on the look ahead time can dramatically change the location of your seed placement when turning on or turning off. On average, most row-crop planters generally set a turn off time to 0.3 seconds and a turn on time between 0.5—1.0 seconds. On average, most air carts set a turn off time at 0.6 seconds and a turn on time at 1.0 second.

Minimize Skip on ranked tools (seeding tools with multiple ranks). Set swath settings for minimize skips. Swath Control maps to the rear rank on the tool so the Turn on time must be increased to account for rank spacing. See figure at the end of this section.

The goal is to compensate for Rank Delay spacing by entering ranked turn on for the "Turn on" setting. Turn on + Rank Delay = Ranked Turn On. Maintain a constant turn around speed to keep the Turn On time accurate. Examine and adjust the settings before planting.

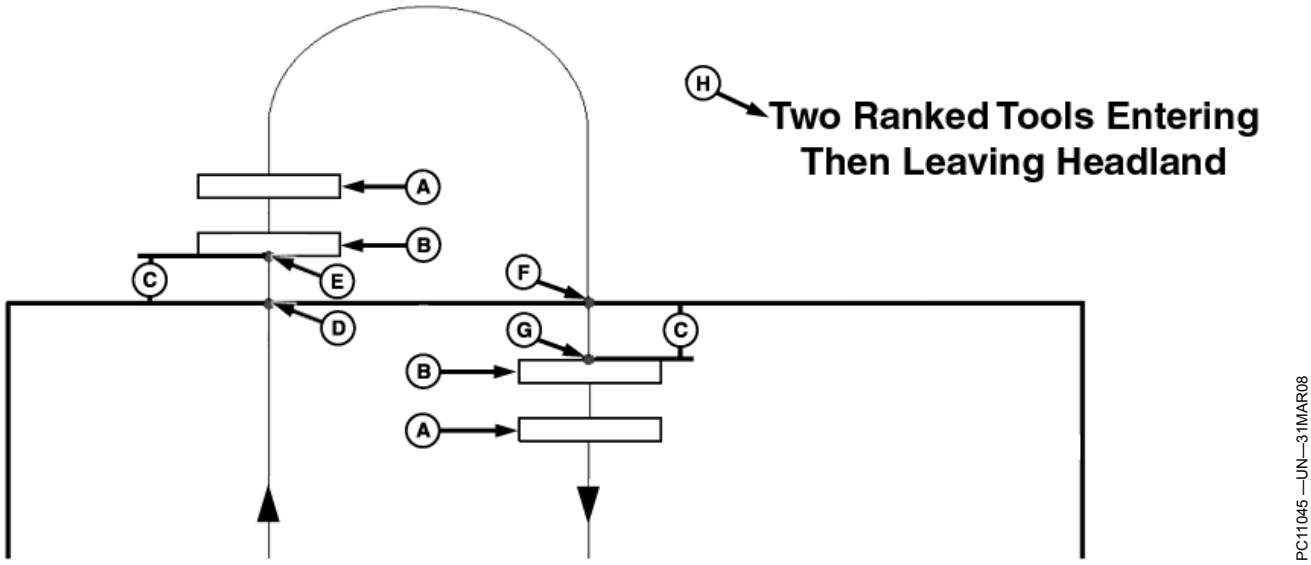
*NOTE: Ranked Delay is a time, not a distance, and is affected by speed.*

### Sprayers

At 24 km/h (16 mph) in a self-propelled sprayer, if the average physical reaction time of the system (turn off command at the multifunction control handle, the boom valve reacts and turns off, liquid flows out of the boom freely until the check valve pressure is met) is 2.5 seconds. The liquid continues to fall to the crop canopy past the 2.5 seconds so the physical overall operational reaction time could be approximately 3.0 seconds in total.

To determine the Turn on time for a sprayer, press the master on switch and measure the amount of time until you start to see product hit the crop. To determine your Turn off time, shut the master off switch and measure the amount of time until you see product stop flowing.

As a rule of thumb, it takes a liquid handling system longer to react when turning on than when turning off due to liquid pressure differentials, so many times the turn on time is slightly greater than the turn off time. Keep in mind that your ground speed only affects the distance traveled while the machine reaction delay is taking place and that the distance traveled varies between turn on and turn off times and from operator to operator.




**NO SWATH CONTROL**

**A—Rank 1**
**B—Rank 2**
**C—System Delay**
**D—Switch Off**
**E—Actual Off**
**F—Switch On**
**G—Actual On**
**H—Two Ranked Tool Leaving Then Entering Headland**

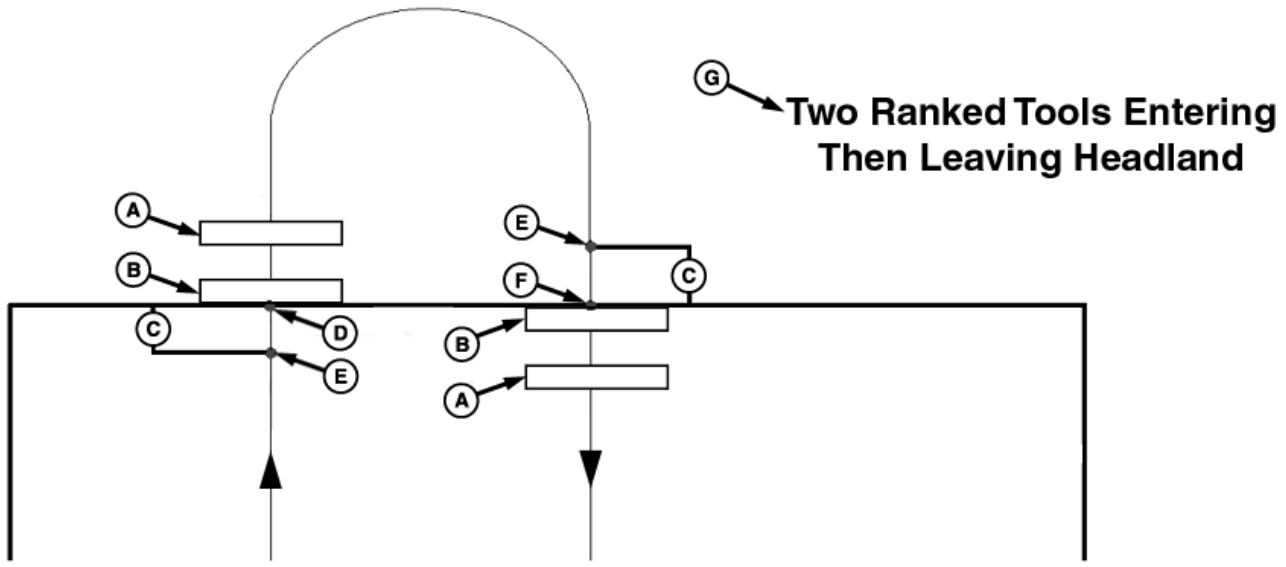
**Continued on next page**

OUO6050,0000E44 -19-10SEP09-1/4

System Delay = Overlap (A) and Overlap (B)

System Delay = Overlap (A) and Overlap (B)

OUO6050,0000E44 -19-10SEP09-2/4




**NORMAL SWATH CONTROL**

**A—Rank 1**
**B—Rank 2**
**C—System Delay**
**D—Actual Off**
**E—Swath Command**
**F—Actual On**
**G—Two Ranked Tool Leaving Then Entering Headland**

System Delay = No Overlap (A) and No Overlap (B)

System Delay = Overlap (A) and No Overlap (B)

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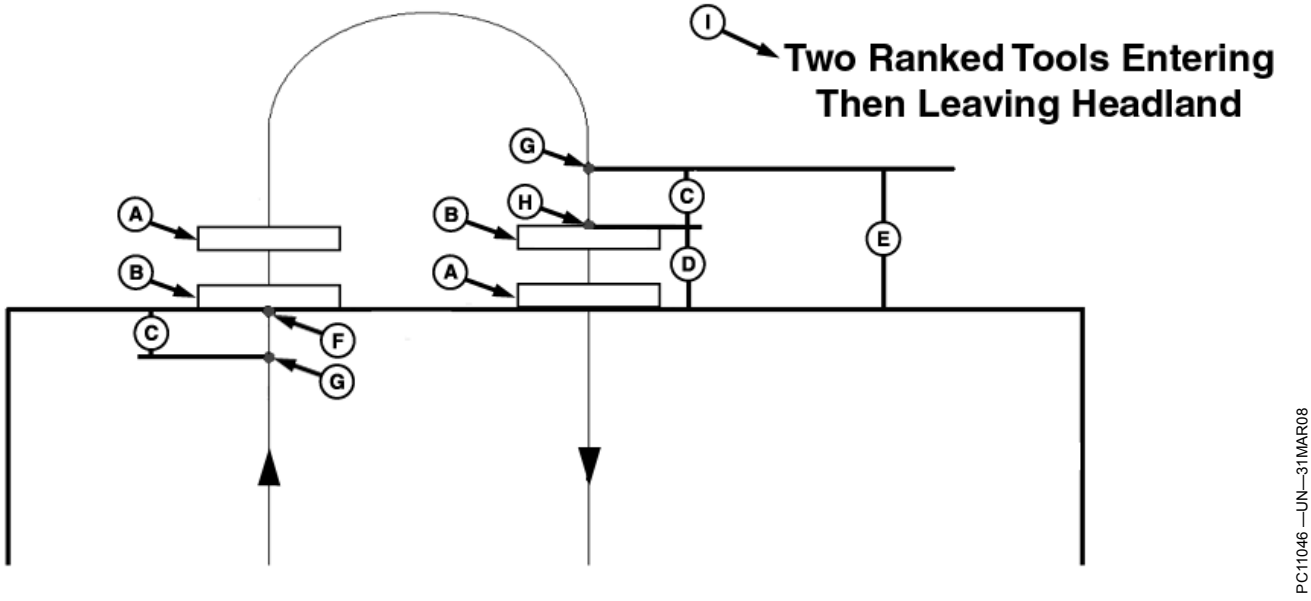
OUO6050,0000E44 -19-10SEP09-3/4




**RANKED TURN ON**

**A—Rank 1**
**B—Rank 2**
**C—System Delay**
**D—Rank Delay**
**E—Ranked Turn On**
**F—Actual Off**
**G—Swath Command**
**H—Actual On**
**I— Two Ranked Tool Leaving Then Entering Headland**

System Delay = No Overlap (A) and No Overlap (B)

System Delay + Ranked Delay = No Overlap (A) and No Overlap (B)

OUO6050,0000E44 -19-10SEP09-4/4

## GS2 Swath Control Pro Settings Quick Sheet—Metric

| Constant Ground Speed (km/h) | Physical machine reaction delay time (seconds) | Distance traveled at given speed and time (meters) | Distance traveled per GPS update (meters) |
|---|---|---|---|
| 3 | 1 | 0.83 | 0.17 |
| 3 | 2 | 1.67 | 0.17 |
| 3 | 3 | 2.50 | 0.17 |
| 3 | 4 | 3.33 | 0.17 |
| 3 | 5 | 4.17 | 0.17 |
| 3 | 10 | 8.33 | 0.17 |
| 6 | 1 | 1.67 | 0.33 |
| 6 | 2 | 3.33 | 0.33 |
| 6 | 3 | 5.00 | 0.33 |
| 6 | 4 | 6.67 | 0.33 |
| 6 | 5 | 8.33 | 0.33 |
| 6 | 10 | 16.67 | 0.33 |
| 9 | 1 | 2.50 | 0.50 |
| 9 | 2 | 5.00 | 0.50 |
| 9 | 3 | 7.50 | 0.50 |
| 9 | 4 | 10.00 | 0.50 |
| 9 | 5 | 12.50 | 0.50 |
| 9 | 10 | 25.00 | 0.50 |
| 12 | 1 | 3.33 | 0.67 |
| 12 | 2 | 6.67 | 0.67 |
| 12 | 3 | 10.00 | 0.67 |
| 12 | 4 | 13.33 | 0.67 |
| 12 | 5 | 16.67 | 0.67 |
| 12 | 10 | 33.33 | 0.67 |
| 15 | 1 | 4.17 | 0.83 |
| 15 | 2 | 8.33 | 0.83 |
| 15 | 3 | 12.50 | 0.83 |
| 15 | 4 | 16.67 | 0.83 |
| 15 | 5 | 20.83 | 0.83 |
| 15 | 10 | 41.67 | 0.83 |
| 18 | 1 | 5.00 | 1.00 |
| 18 | 2 | 10.00 | 1.00 |
| 18 | 3 | 15.00 | 1.00 |
| 18 | 4 | 20.00 | 1.00 |
| 18 | 5 | 25.00 | 1.00 |
| 18 | 10 | 50.00 | 1.00 |
| 21 | 1 | 5.83 | 1.17 |
| 21 | 2 | 11.67 | 1.17 |
| 21 | 3 | 17.50 | 1.17 |
| 21 | 4 | 23.33 | 1.17 |
| 21 | 5 | 29.17 | 1.17 |
| 21 | 10 | 58.33 | 1.17 |
| 24 | 1 | 6.67 | 1.33 |
| 24 | 2 | 13.33 | 1.33 |
| 24 | 3 | 20.00 | 1.33 |
| 24 | 4 | 26.67 | 1.33 |
| 24 | 5 | 33.33 | 1.33 |
| 24 | 10 | 66.67 | 1.33 |
| 27 | 1 | 7.50 | 1.50 |

**Continued on next page**

| Constant Ground Speed (km/h) | Physical machine reaction delay time (seconds) | Distance traveled at given speed and time (meters) | Distance traveled per GPS update (meters) |
|---|---|---|---|
| 27 | 2 | 15.00 | 1.50 |
| 27 | 3 | 22.50 | 1.50 |
| 27 | 4 | 30.00 | 1.50 |
| 27 | 5 | 37.50 | 1.50 |
| 27 | 10 | 75.00 | 1.50 |
| 30 | 1 | 8.33 | 1.67 |
| 30 | 2 | 16.67 | 1.67 |
| 30 | 3 | 25.00 | 1.67 |
| 30 | 4 | 33.33 | 1.67 |
| 30 | 5 | 41.67 | 1.67 |
| 30 | 10 | 83.33 | 1.67 |

OUO6050,0000E45 -19-08SEP09-2/2

## GS 2 Swath Control Pro Settings Quick Sheet—SAE

| Constant Ground Speed (mph) | Physical machine reaction delay time (seconds) | Distance traveled at given speed and time (feet) | Distance traveled per GPS update (inches) |
|---|---|---|---|
| 2 | 1 | 2.93 | 7.04 |
| 2 | 2 | 5.87 | 7.04 |
| 2 | 3 | 8.80 | 7.04 |
| 2 | 4 | 11.73 | 7.04 |
| 2 | 5 | 14.67 | 7.04 |
| 2 | 10 | 29.33 | 7.04 |
| 4 | 1 | 5.87 | 14.08 |
| 4 | 2 | 11.73 | 14.08 |
| 4 | 3 | 17.60 | 14.08 |
| 4 | 4 | 23.47 | 14.08 |
| 4 | 5 | 29.33 | 14.08 |
| 4 | 10 | 58.67 | 14.08 |
| 6 | 1 | 8.80 | 21.12 |
| 6 | 2 | 17.60 | 21.12 |
| 6 | 3 | 26.40 | 21.12 |
| 6 | 4 | 35.20 | 21.12 |
| 6 | 5 | 44.00 | 21.12 |
| 6 | 10 | 88.00 | 21.12 |
| 8 | 1 | 11.73 | 28.16 |
| 8 | 2 | 23.47 | 28.16 |
| 8 | 3 | 35.20 | 28.16 |
| 8 | 4 | 46.93 | 28.16 |
| 8 | 5 | 58.67 | 28.16 |
| 8 | 10 | 117.33 | 28.16 |
| 10 | 1 | 14.67 | 35.20 |
| 10 | 2 | 29.33 | 35.20 |
| 10 | 3 | 44.00 | 35.20 |
| 10 | 4 | 58.67 | 35.20 |
| 10 | 5 | 73.33 | 35.20 |
| 10 | 10 | 146.67 | 35.20 |
| 12 | 1 | 17.60 | 42.24 |
| 12 | 2 | 35.20 | 42.24 |
| 12 | 3 | 52.80 | 42.24 |
| 12 | 4 | 70.40 | 42.24 |
| 12 | 5 | 88.00 | 42.24 |
| 12 | 10 | 176.00 | 42.24 |
| 14 | 1 | 20.53 | 49.28 |
| 14 | 2 | 41.07 | 49.28 |
| 14 | 3 | 61.60 | 49.28 |
| 14 | 4 | 82.13 | 49.28 |
| 14 | 5 | 102.67 | 49.28 |
| 14 | 10 | 205.33 | 49.28 |
| 16 | 1 | 23.47 | 56.32 |
| 16 | 2 | 46.93 | 56.32 |
| 16 | 3 | 70.40 | 56.32 |
| 16 | 4 | 93.87 | 56.32 |
| 16 | 5 | 117.33 | 56.32 |
| 16 | 10 | 234.67 | 56.32 |
| 18 | 1 | 26.40 | 63.36 |

**Continued on next page**

| Constant Ground Speed (mph) | Physical machine reaction delay time (seconds) | Distance traveled at given speed and time (feet) | Distance traveled per GPS update (inches) |
|---|---|---|---|
| 18 | 2 | 52.80 | 63.36 |
| 18 | 3 | 79.20 | 63.36 |
| 18 | 4 | 105.60 | 63.36 |
| 18 | 5 | 132.00 | 63.36 |
| 18 | 10 | 264.00 | 63.36 |
| 20 | 1 | 29.33 | 70.40 |
| 20 | 2 | 58.67 | 70.40 |
| 20 | 3 | 88.00 | 70.40 |
| 20 | 4 | 117.33 | 70.40 |
| 20 | 5 | 146.67 | 70.40 |
| 20 | 10 | 293.33 | 70.40 |

OUO6050,0000E46 -19-08SEP09-2/2

## Data Management

Data and settings may be transferred to or from a USB storage device to

- Backup your data
- Transfer to desktop software
- Transfer to another display

The following types of data may be transferred to and from this display:

- Client, Farm, Field
- Machine and Implement Resources
- Guidance Lines
- Interior / Exterior boundaries
- Coverage maps

The display will not read the following types of data:

- Prescription Maps
- Aerial Images
- Background Images
- Variety Locator Maps

*NOTE: The GS2 1800 display has two USB ports for redundancy. Only one USB storage device may be inserted at a time. The USB ports are meant for data transfer and reprogramming only and should not be used to recharge electronic devices.*

OUO6050,00010E4 -19-14APR09-1/1

## Transferring Data

1. Turn off Recording and stop the vehicle.
2. Insert a USB storage device into the display. The internal memory of the display is 512 MB, so the USB should have at last 512 MB of free space.

*NOTE: Most types of USB devices that fit in the USB opening will work with the display. Large USB storage devices, around 30MB, might be formatted to NTSF. The display is not compatible with NTSF. Reformat the USB storage device to FAT. If you do not see the USB Detected message, try the other USB port or another USB device.*

3. A **USB Detected** message will appear if the display recognizes the USB. Read and Accept it.
4. Navigate to the GreenStar application, if GreenStar is not already open.

PC10857JC —UN—13APR09

*Menu Button*

PC10857JN —UN—13APR09

*GreenStar Main Page*

5. A USB Detected message will appear. Read it and select Transfer Data.

*NOTE: GreenStar applications are not functional while a USB device is inserted and Recording must be off to transfer data.*

6. Select whether you would like to Backup data to the USB or Import data to the display.

OUO6050,00010E5 -19-12OCT09-1/2

7. Select Next button.

PC10857JP —UN—13APR09

*Next button*

OUO6050,00010E5 -19-12OCT09-2/2

## Backup Data to a USB storage device

1. Select or create a Profile name to store the data under. Profiles already on the USB storage device will appear in the list.

**IMPORTANT: If you choose a previously created Profile from the USB, it will be deleted and replaced. This display does not merge or sync data. When using the same USB storage device with two or more GreenStar displays, you may wish to use separate profiles for each display to avoid losing data.**

2. Enter a Check in the box if you would like to clear the internal memory of the display after data transfer.
3. Select Next button.

PC10857JP —UN—13APR09

*Next button*

4. A message will appear when data transfer is complete. Accept it and remove the USB storage device.

*NOTE: Removing the USB storage device, removing power to the display, or cranking the engine before this message appears may result in loss of data.*

OUO6050,00010E6 -19-14APR09-1/1

## Importing Data from a USB storage device

1. Select a Profile name to store the data under. Profiles already on the USB storage device will appear in the list.

**IMPORTANT: All data on the display will be deleted and replaced with the data from the selected Profile on the USB. This display does not merge or sync data.**

2. Select Next button.
3. A message will appear when data transfer is complete. Accept it and remove the USB storage device.

PC10857JP —UN—13APR09

*Next button*

**IMPORTANT: Removing the USB storage device, removing power to the display, or cranking the engine before this message appears may result in loss of data.**

OUO6050,00010E7 -19-28APR09-1/1

## View Amount Internal Memory Remaining

The total internal memory of the display is 512 MB and 350 MB is available for field and setup data. When it is 90% full, an alert message will appear. The amount of total internal memory space remaining can be viewed on the Recording page in GreenStar diagnostics:

GreenStar Main >> Diagnostics >> select Recording (from the drop down list)

The amount of memory space remaining is displayed in Megabytes and is also indicated by the bar graph.

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JL —UN—13APR09

OUO6050,000120F -19-24SEP09-1/1

## Removing Data from the Internal Memory

There are three methods to remove data from the internal memory:

- **Clear all data and settings** during Data Backup to a USB storage device (see section on backing up data)
- **Clear Adaptive Curve data** (GreenStar Main >> Guidance Quick Change >> Delete Track)
- **Clear Coverage Map data** (GreenStar Main >> Field Quick Change >> Clear Coverage Maps)

Adaptive curves and Coverage maps can take up a significant amount of memory. The amount of memory depends on implement width, speed, and how straight the machine is driven.

OUO6050,00010E8 -19-08OCT09-1/1

## Clearing Guidance Tracks

Clear (delete) Guidance Tracks to free up memory on the display. Guidance Tracks are cleared on the Guidance Setup page:

GreenStar Main >> Guidance Quick Change >> Delete Track

1. Select Tracking Mode
2. Select Track Name (depending on Tracking Mode)
3. Select Delete Track

PC10857JN —UN—13APR09

*GreenStar Main Page*

PC10857JJ —UN—13APR09

*Guidance Quick Change*

PC10857KX —UN—14APR09

*Delete Track*

OUO6050,0001210 -19-24SEP09-1/1

# Connecting RS232 GPS Receivers

## RS232 Serial Port Setup

RS232 devices must be assigned to a serial port. Navigate to the Port Settings page in GreenStar settings.

Devices that are connected and recognized by the display will appear in the drop down list. Assign each device to one port. GreenStar Main Page > Settings > Port Settings

OUO6050,00010F5 -19-12MAY09-1/1

## Connecting RS-232 GPS Receivers

*NOTE: AutoTrac requires CAN GPS messages from an original StarFire receiver or StarFire iTC receiver.*

Non-John Deere GPS receivers that output correct NMEA 0183 standard messages can be used for documentation and manual guidance on GreenStar application. It is critical that receiver is setup to output following messages:

- GGA
- GSA
- RMC setup at 19200 baud (This is fixed and Non-adjustable)
- Data Bits 8
- Parity none
- Stop 1
- Flow Control none
- 1 or 5 Hz output rate (Recommend operation at 5 Hz. Guidance requires 5 Hz.)

Without these messages, receiver will not function with GreenStar application.

A harness and installation instructions are available to connect DB9 port of receiver to correct pins of display connector. See a John Deere dealer for more information.

OUO6050,0000CE1 -19-31OCT07-1/1

## Guidance Alarms

| | |
|---|---|
| SSU Communication Error | No communication with vehicle steering controller (SSU). 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 SSU Software Incompatible | See your John Deere Dealer for SSU 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. |
| 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. |

| | |
|---|---|
| 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. |

**Continued on next page**

| | |
|---|---|
| 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 Alert | Out of field prescription rate is now being applied. |
| Prescription Alert | Loss of GPS signal has occurred. Loss of GPS prescription rate is now being applied. |
| Prescription Alert | Controller does not support selected prescription. |

OUO6050,00021D6 -19-29SEP09-2/2

## Message Center

Message Center screen can be reached by selecting the Clock button (GS2 2600 display only) or MENU button then MESSAGE CENTER button (With Info Icon).

PC8664 —UN—05AUG05


*MESSAGE CENTER button (showing time)*

PC8663 —UN—05AUG05

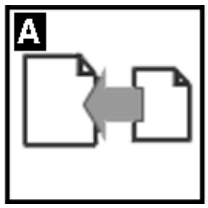
*MENU button*

PC8655 —UN—05AUG05


*MESSAGE CENTER button (With Info Icon)*

**Continued on next page**

OUO6050,0002327 -19-12OCT09-1/7

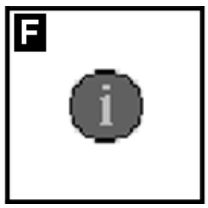



PC8665 —UN—05AUG05

*COMPONENTS AND SOFTWARE VERSIONS button*


PC8666 —UN—05AUG05

*SOFTWARE INFORMATION button*




PC8667 —UN—05AUG05

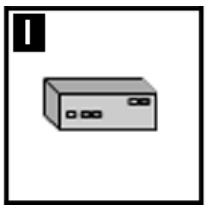
*MESSAGES button*


PC8668 —UN—05AUG05

*DIAGNOSTIC ADDRESSES button*

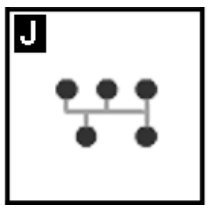

PC8669 —UN—05AUG05

*TROUBLE CODES button*




PC8670 —UN—05AUG05

*Electronic CONTROL UNIT INFORMATION button*




PC8671 —UN—05AUG05

*BUS INFORMATION button*

Message center will display all active alarms, alert messages and icons.

OUO6050,0002327 -19-12OCT09-2/7

**Message Center Icons**

These icons are used throughout Message Center.

PC8582 —UN—01NOV05

*CANCEL*

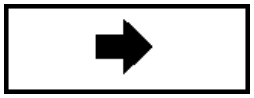
PC8648 —UN—01NOV05

*CLEAR*

PC8649 —UN—01NOV05

*ENTER*

PC8650 —UN—01NOV05



*GOTO*

PC8651 —UN—01NOV05

*NEXT CAL*

PC8652 —UN—01NOV05

*RETURN*

**Continued on next page**

OUO6050,0002327 -19-12OCT09-3/7

COMPONENTS AND SOFTWARE VERSIONS button will allow users to view all components on the network and the software versions loaded to them. You may also use the reprogram device button to reprogram a specific controller if necessary.

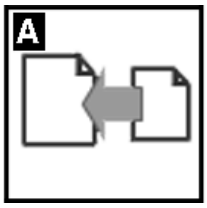
PC8663 —UN—05AUG05

*MENU button*

PC8655 —UN—05AUG05


*MESSAGE CENTER button (With Info Icon)*

PC8665 —UN—05AUG05




*COMPONENTS AND SOFTWARE VERSIONS button*

OUO6050,0002327 -19-12OCT09-4/7

**Diagnostic Addresses**

*NOTE: Diagnostic addresses are available to access specific diagnostic information. This information can assist the John Deere Dealer in diagnosing problems. Different device controllers can be selected from drop-down box, as shown.*

Select DIAGNOSTIC ADDRESSES button. The number of devices available will depend upon machine configuration. The list of addresses can be scrolled up or down with rotary thumb wheel. Selecting an address will show data for that address.

PC8663 —UN—05AUG05

*MENU button*

PC8655 —UN—05AUG05


*MESSAGE CENTER button (With Info Icon)*

PC8668 —UN—05AUG05


*DIAGNOSTIC ADDRESSES button*

**Continued on next page**

OUO6050,0002327 -19-12OCT09-5/7

**Trouble Codes**

Select TROUBLE CODES button, a list of controllers will appear and controllers with diagnostic codes are indicated.

Individual controllers can be accessed by navigating with rotary thumb wheel and selected by selecting ENTER button, to view codes for that controller.

Codes can also be displayed for all controllers by selecting SHOW ALL button with rotary thumb wheel and selecting ENTER button. Codes can be relayed to a John Deere dealer to assist in diagnosing machine problems.

PC8663 —UN—05AUG05

*MENU button*

PC8655 —UN—05AUG05


*MESSAGE CENTER button (With Info Icon)*

PC8669 —UN—05AUG05


*TROUBLE CODES button*

**Continued on next page**

OUO6050,0002327 -19-12OCT09-6/7

### Device Info and Bus Status

When DEVICE INFO button is selected, controllers communicating on CANBUS communication system will be indicated. Message counts indicate quantity of communications from controller. When BUS STATUS button is selected, status of various communication networks will be indicated.

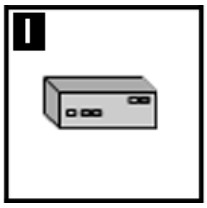
PC8663 —UN—05AUG05

*MENU button*

PC8655 —UN—05AUG05

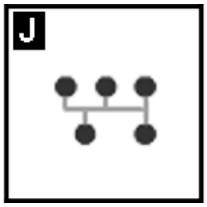

*MESSAGE CENTER button (With Info Icon)*

PC8670 —UN—05AUG05




*Electronic CONTROL UNIT INFORMATION button*

PC8671 —UN—05AUG05




*BUS INFORMATION button*

OUO6050,0002327 -19-12OCT09-7/7

## Reprogramming Error Codes

| Error Number | Meaning | What to Do |
|---|---|---|
| 8 | Directory creation error | Reprogramming could not create a directory on the internal file system. User should try again, but the session may fail again. |
| 12 | Missing update file | Check that all update files have been correctly saved to the compact flash card (all files listed in ManifestFile.sdm should be on the card in their proper path). |
| 14 | File read error | Reprogramming was not able to read one of the update files. Check for file corruption when the files were saved to the card. |
| 16 | File write error | Reprogramming was not able to write one of the update files to internal flash. File system cleanup problem, reboot the display and try again. |
| 37 | Invalid file handle | Reprogramming received a file handle that was not valid, check validity of card to make sure it matches the original image. |
| 44 | Checksum failed | Reprogramming calculated a checksum that did not match the expected checksum. Check that all files match the original image. |
| 45 | Controller file invalid | Reprogramming parsed a file for a PF controller that was invalid. Check that all files match the original image. |
| 47 | Incompatible hardware | Customer is using an incorrect hardware revision version as the reprogramming image for the display. Make sure you have the correct image for the display hardware. |
| 48 | Update file invalid | The reprogramming ManifestFile.sdm file has been corrupted. Make sure the file matches the original image. |
| 51 | User aborted | User removed the compact flash card during a reprogramming session. Repeat the reprogramming process with the compact flash card inserted the entire session. |
| 55 | Controller flash erase failed | A PF controller could not erase its flash memory. |
| 56 | Message missing colon | A PF controller received a record that was missing a colon. Customer could try reprogramming the controller again in case of a bus error. |
| 57 | Record too long | A PF controller received a record that was too long. Customer could try reprogramming the controller again in case of a bus error. |
| 58 | Invalid record length | A PF controller received a record that was not the expected length. Customer could try reprogramming the controller again in case of a bus error. |
| 59 | Sequence error | A PF controller received a record that was out of the expected sequence. Customer could try reprogramming the controller again in case of a bus error. |
| 60 | Controller received odd address | A PF controller received a record that had an invalid address. Customer could try reprogramming the controller again in case of a bus error. |
| 61 | Controller timed out | A PF controller stopped responding to the display during a reprogramming session. Check connection to the controller, may require a power cycle. If communication is resumed, repeat the reprogramming session. |
| 62 | NOR flash reprogramming problem | There was an error with trying to reprogram the NOR flash boot application image. |
| 63 | Unknown controller response | A PF controller returned a response that the display did not know how to interpret. |
| 81 | Reprogramming session failed | Generic notification that some part of the reprogramming session failed. Another error will be reported in addition to this one to indicate the specific failure mode. |

OUO6050,0002329 -19-01SEP09-1/1

## Alarm Screens

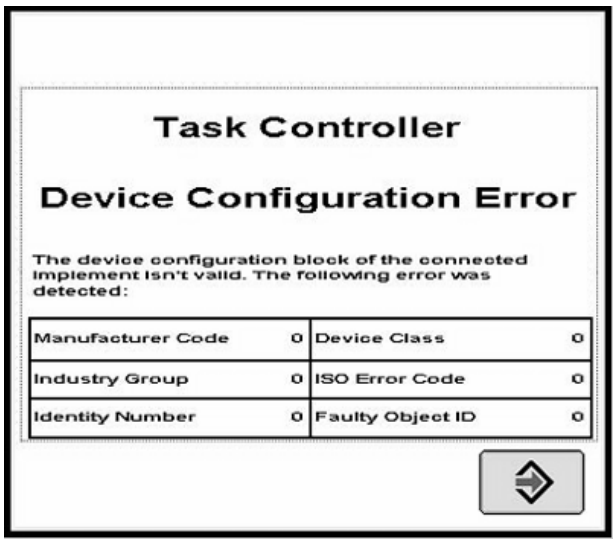
| SPN.FMI | Applicable Failure Mode | Recommended Solutions |
|---|---|---|
| 158.3 | VTI Switched Supply Voltage Too High | The voltage level of the switched power is greater than the nominal. Turn off the ignition key, then turn it back on. If this diagnostic code shows up again, check power supply wiring. Please contact your John Deere dealer. |
| 158.4 | VTI Switched Supply Voltage Too Low | The switched power voltage is below the nominal. Turn off the ignition key and turn it back on. If this diagnostic code shows up again, check the battery. Please contact your John Deere dealer. |
| 168.3 | Unswitched Supply Voltage Too High | The voltage level of from the battery power supply is greater than the nominal. Cycle power on the display. If this diagnostic code shows up again, check wiring. Please contact your John Deere dealer. |
| 168.4 | Unswitched Supply Voltage Too Low | The voltage level from the battery is lower than the nominal. Cycle power on the display. If this diagnostic code shows up again, check battery power and recharge it as needed. Please contact your John Deere dealer. |
| 1386 | Display Unit Temperature Too High | The LCD backlight was not turned off when the temperature was above the highest limit. Please contact your John Deere dealer. |
| 1386.1 | Display Unit Temperature Too Low | The LCD backlight was not turned off when the unit temperature was below the lowest limit. Contact you John Deere Dealer. |
| 3597.2 | Regulate Voltage 5.0 v Abnormal | The 5.0 v regulated power is out of range. Click Cancel if it occurs occasionally. If it occurs continually, contact your John Deere Dealer. |
| 3598.2 | Regulated Voltage 1.5 v Abnormal | The 1.5 v regulated power is out of range. Click Cancel if it occurs occasionally. If it occurs continually, contact your John Deere Dealer. |
| 3599.2 | Regulated Voltage 3.3 v Abnormal | The 3.3 v regulated power is out of range. Click Cancel if it occurs occasionally. If it occurs continually, contact your John Deere Dealer. |
| 523310.12 | Non-Volatile Memory Read/Write Failure | Failed to read/write from/to the NOR flash. See your John Deere dealer. |
| 523771.3 | CCD+ Line Voltage Too High | The voltage on the CCD_HIGH line of the CCD network is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the harness wiring. |
| 523771.3 | CCD+ Line Voltage Too Low | The voltage level on the CCD_HIGH line of the CCD network is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery and harness wiring. |
| 523772.4 | CCD- Line Voltage Too High | The voltage on the CCD_Low line of the CCD network is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the harness wiring. |
| 523772.4 | CCD- Line Voltage Too Low | The voltage level on the CCD_Low line of the CCD network is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery and harness wiring. |
| 523773.3 | Vehicle CAN+ Line Voltage Too High | The voltage on the CAN_HIGH line of the Vehicle Bus (Tractor Bus) is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the harness wiring. |
| 523773.4 | Vehicle CAN+ Line Voltage Too Low | The voltage level on the CAN_HIGH line of the Vehicle CAN Bus (Tractor CAN Bus) is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery and harness wiring. |
| 523774.3 | Vehicle CAN- Line Voltage Too High | The voltage on the CAN_LOW line of the Vehicle Bus (Tractor Bus) is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the wiring. |
| 523774.4 | Vehicle CAN- Line Voltage Too Low | The voltage level on the CAN_LOW line of the Vehicle CAN Bus (Tractor CAN Bus) is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery and harness wiring. |
| 524050.12 | Real Time Clock Malfunction | Real Time Clock malfunctioned. It may be caused by the damage on the RTC chip or no power applied to the chip. |
| 524215.3 | Implement CAN+ Line Voltage Too High | The voltage on the CAN_HIGH line of the Implement Bus is above the nominal. Cycle power on the display. If this diagnostic code shows up again, check the harness wiring. |
| 524215.4 | Implement CAN+ Line Voltage Too Low | The voltage on the CAN_HIGH line of the Implement Bus is below 0.5 v Cycle power on the display. If this diagnostic code shows up again, check the battery power and recharge the battery as needed. |
| 524217.3 | Implement CAN+ Line Voltage Too High | The voltage on the CAN_HIGH line of the Implement Bus is above nominal. Cycle power on the display. If this diagnostic code shows up again, check wiring. |
| 524217.4 | Implement CAN+ Line Voltage Too Low | The voltage on the CAN_LOW line of the Implement Bus is below the nominal. Cycle power on the display. If this diagnostic code shows up again, check the battery power and recharge the battery as needed. |

OUO6050,000232A -19-13OCT09-1/1

## Task Controller Alarms

Alarm, Task Controller, Device Configuration Error, The device configuration block of the connected implement isn't valid. The following error was detected: Manufacturer Code:, Industry Group:, Identity Number:, Device Class:, ISO Error Code:, Faulty Object ID:

This alarm screen will be displayed whenever an error in the received Device Configuration Description of the ISO implement was detected. Please contact your John Deere Dealer or the manufacturer of the implement.




PC9745 —UN—24SEP09

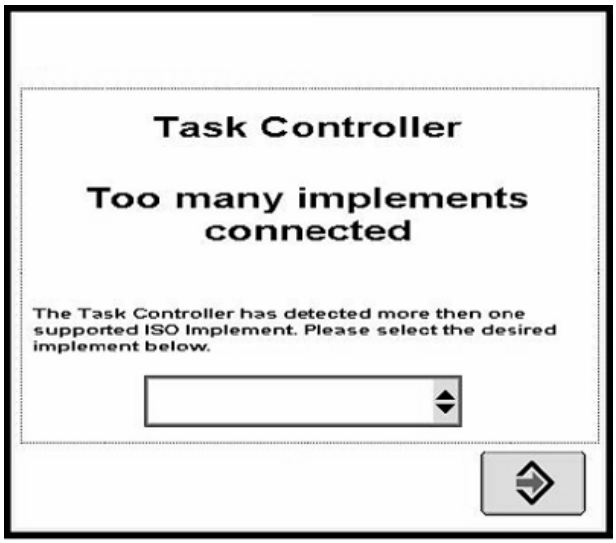
*Device Configuration Error*

OUO6050,0000CF8 -19-13OCT09-1/6

Alarm, Task Controller, Too Many Implements Connected, The Task Controller has detected more than one supported ISO implements. Please select the desired implement below.

This alarm screen will be displayed whenever the ISO Task Controller unit detects more then one compatible ISO implement on the ISOBUS. The pull down list will contain all found ISO implements which can be used for documentation purposes. Each ISO Implement is listed in the following format: 10 chars of manufacturer name + 10 chars of the implement type + ISO network address in the hex format.

Example: John Deere Sprayer with ISO Network Address 0x81: John Deere-Sprayer-81x




PC9746 —UN—24SEP09

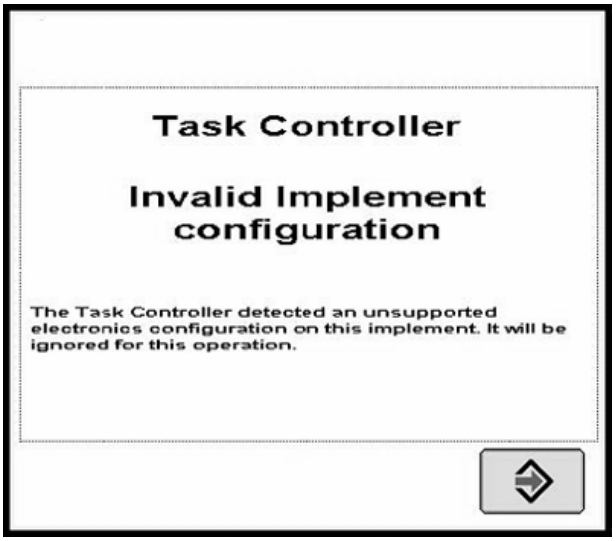
*Too Many Implements Connected*

**Continued on next page**

OUO6050,0000CF8 -19-13OCT09-2/6

Alarm, Task Controller, Invalid Implement Configuration, The task controller detected an unsupported electronics configuration on this implement. It will be ignored for this operation.

This alarm screen will be displayed whenever an ISO implement is detected, which has member controllers. The John Deere Task controller does only support ISO implements with a master controller and no member controllers.



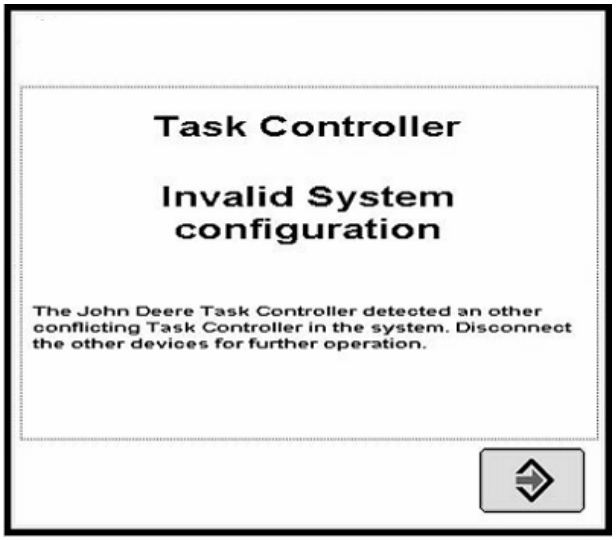

PC9747 —UN—24SEP09

*Invalid Implement Configuration*

OUO6050,0000CF8 -19-13OCT09-3/6

Alarm, Task Controller, Invalid System Configuration, The John Deere task controller detected an other conflicting task controller in the system. Disconnect the other device for further operation.

This alarm screen will be displayed whenever another ISO Task Controller is found on the ISOBUS. Disconnecting of the other Task Controllers is required because an ISO implement can only work with one Task Controller, which is in most cases the first one. When this alarm screen is displayed the John Deere Task Controller is not the first one, and cannot use the ISO implements for documentation purposes.




PC9748 —UN—24SEP09

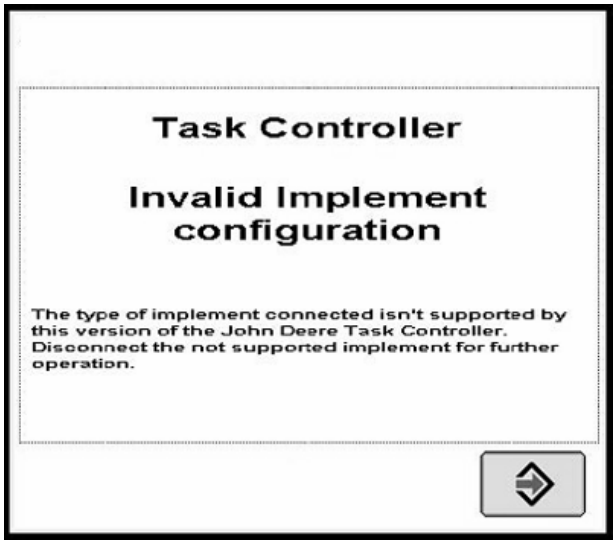
*Invalid System Configuration*

**Continued on next page**

OUO6050,0000CF8 -19-13OCT09-4/6

Alarm, Task Controller, Invalid Implement Configuration, The type of implement connected isn't supported by this version of the John Deere task controller. Disconnect the not supported implement for further operation.

This alarm screen will be displayed whenever an ISO implement is detected which is not from type sprayer or seeder/planter. All other ISO implement types are ignored by the John Deere Task Controller and cannot be used for documentation purposes.



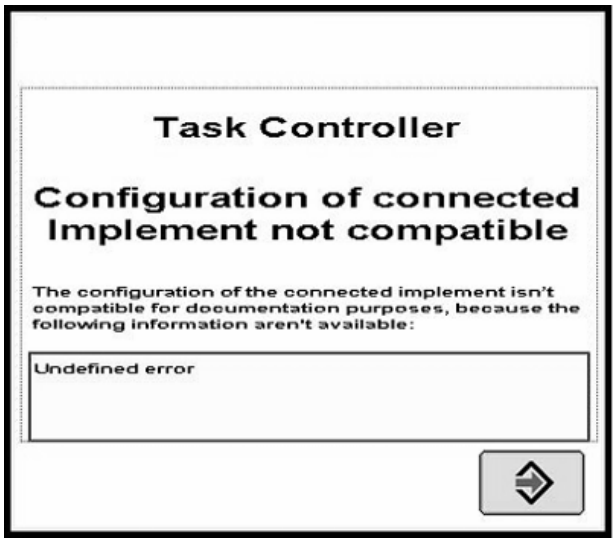

PC9749 —UN—24SEP09

*Invalid Implement Configuration*

OUO6050,0000CF8 -19-13OCT09-5/6

Task Controller, Configuration of the connected implement not compatible, The configuration of the connected implement isn't compatible for the documentation purposes, because the following information isn't available:

This alarm screen will be displayed whenever an implement is detected which is not compatible with Field Doc, because some information is missing from the ISO implement which is required for automatically setup of Field Doc for documentation purposes. The missed information is displayed in the message box of the alarm screen. Please contact your John Deere Dealer or the manufacturer of the implement.




PC9750 —UN—24SEP09

*Configuration of Connected Implement Not Compatible*

OUO6050,0000CF8 -19-13OCT09-6/6

## Diagnostic Addresses

MESSAGE CENTER button > DIAGNOSTIC ADDRESSES button > DEVICE drop down box > “VT;.001 Implement”

PC8655 —UN—05AUG05


*MESSAGE CENTER button*

PC8668 —UN—05AUG05


*DIAGNOSTIC ADDRESSES button*

| Address Number | Address Name |
|---|---|
| 008 | Unswitched Power Supply Voltage |
| 009 | Switched Power Supply Voltage |
| 010 | Unit Internal Temperature |
| 011 | Vehicle CAN - Bus Status |
| 012 | Vehicle CAN - CAN HIGH Voltage |
| 013 | Vehicle CAN - CAN LOW Voltage |
| 015 | Implement CAN - Bus Status |
| 016 | Implement CAN - CAN HIGH Voltage |
| 017 | Implement CAN - CAN LOW Voltage |
| 018 | Flash Wear Count |
| 019 | Hours of Operation |
| 020 | 1.5 v Regulated Power Supply Voltage |
| 021 | 3.3 v Regulated Power Supply Voltage |
| 022 | 5.0 v Regulated Power Supply Voltage |
| 023 | Radar Input Status |
| 024 | Implement Switch Status |
| 025 | External Analog Input Voltage |
| 026 | Compact Flash Drive Status |
| 028 | CCD Bus - Bus Status |
| 029 | CCD Bus - Positive Voltage |
| 030 | CCD Bus - Negative Voltage |
| 031 | Bezel Key Status |
| 032 | Real Time Clock (RTC) |
| 033 | Maximum Sleep Time |
| 038 | Synchronize Brightness |
| 039 | Daytime Luminance |
| 040 | Daytime Luminance Balance Ratio |
| 041 | Nighttime Luminance |
| 042 | Nighttime Luminance Balance Ratio |
| 043 | Internal Speaker Volume |
| 044 | Display ISO Function Instance |
| 045 | Settings - Country Code |
| 046 | Settings - Language Code |

**Continued on next page**

| Address Number | Address Name |
|---|---|
| 047 | Settings - Numeric Format |
| 048 | Settings - Date Format |
| 049 | Settings - Time Format |
| 050 | Settings - Units of Distance |
| 051 | Settings - Units of Area |
| 052 | Settings - Units of Volume |
| 053 | Settings - Units of Mass |
| 054 | Settings - Units of Temperature |
| 055 | Settings - Units of Pressure |
| 056 | Settings - Units of Force |
| 057 | Settings - GPS Time Sync |
| 058 | Settings - Current Date |
| 059 | Settings - Current Time |
| 060 | Radar Calibration Constant |
| 227 | Boot Block Program Part Number (Software) |
| 228 | Boot Block Program Version Number (Software) |
| 231 | Board Service Package Part Number (Software) |
| 232 | Board Service Package Version Number (Software) |
| 233 | Virtual Terminal Part Number (Software) |
| 234 | Virtual Terminal Version Number (Software) |
| 235 | Device Part Number (Hardware) |
| 236 | Device Serial Number (Hardware) |
| 247 | Current Vehicle Model Number |
| 248 | Current Vehicle Serial Number |
| 249 | Original Vehicle Model Number |
| 250 | Original Vehicle Serial Number |

OUO6050,000232B -19-01SEP09-2/2

## Trouble Code Pop-Up Boxes—Platform Core Software

| FAULT CONDITION FAULT DESCRIPTION | ALARM TEXT |
|---|---|
| CAN bus inbound communications overload. | CAN bus communications overload. Reset the display or turn the power off and then back on. |
| When an implement's object pool is rejected by the VT | There is a technical problem preventing proper operation of the display with the following implement. Please contact implement manufacturer with this information: |
| A valid card is inserted that contains bad setup data. | The setup data on the compact flash card is invalid. Please resave the setup data to the card from your computer. |
| A valid card is inserted that contains bad setup data that cannot be read by this version of the display software. | The setup data on the compact flash card can not be read by the display. Please update your display software. |
| A card is inserted that can not be used by the display | The compact flash card is not compatible with the display. Please use a different card. |
| If the user is in the middle of setting up a new operation and they switch to the homepage, the apps on the homepage would be disabled in that case. Similarly, if the user was changing the status of a job, the apps on the homepage would be disabled. In both of these cases there is no error | There is an alarm or pop-up within the GreenStar 2 application that requires your attention. |
| Data Card 90% Full | Unload and cleanup data card or insert new data card soon. |
| Data Card Full | Unload and cleanup data card or insert new data card. |
| VI Implement is removed | Communication lost with ISO implement. If implement was not disconnected, check connections and cycle power. |
| Internal Memory Full--From VI Object Pools | Internal memory dedicated to ISO implements is full. Remove implements to free memory space. |
| Internal Memory Full-From Documentation and Curved Track data | Internal memory is full. |
| New software found for display | New software found for display. (This alarm will re-appear at every power cycle or if card is re-inserted.) |
| The following VI(s) are no longer communicating with the display. Check the indicated device(s) and CAN bus wiring. | Some device(s) are no longer communicating with the display. Check the CAN Bus wiring. |
| CAN bus inbound communications overload. | CAN Bus communications overload. Reset the display or turn the power off and then back on. |
| A failure has been detected in the display's internal memory. (Reprogramming) | An error occurred during reprogramming. Perform reprogramming process again. If problem reoccurs contact your John Deere dealer. |
| Legacy device reprogramming error. Device not reporting version info | An error occurred during reprogramming. Perform reprogramming process again. If problem reoccurs contact your John Deere dealer. |
| Legacy device not found while programming product | Device not found while programming product. Check wiring and connectors. |
| Attempt to copy the setup data to a "new" card that already has setup data on it | Prior setup data found on card. Select CONTINUE button to overwrite this data. Select CANCEL button to abort the copy to card operation. (If the user decides to continue, there will be a second popup)"Are you sure you want to overwrite?" |
| Wrong activation code | Invalid activation code. Please reenter activation code. |
| Customer attempts to record boundary when one already exists | Are you sure you want to redefine the boundary? |
| All New/Edit Screens: User attempts to create a duplicate name in any of the New/Edit screens | This entry is already being used. Please select a new entry or cancel to modify the entry. |
| This alarm will be shown after we have received a touch event for 60 seconds. | The touchscreen is malfunctioning. Try to reboot the device, utilize an external display control, or the bezel keys on the backside of this display for screen response. If problem persists, please contact your John Deere Dealer. |
| This alarm will be shown after we have received a touch event for 60 seconds. | A button is malfunctioning. Try to reboot the display. If the problem persists, please contact your John Deere Dealer. |
| GPS Alarms For GreenStar Basic/Deluxe | |
| 200 GPS communications failure | No communication with GPS receiver. Check connections at GPS receiver. |
| No GPS. Tracking Disabled | No GPS position available. Verify GPS receiver has clear view of sky. |
| No Diff. Tracking Disabled. | No GPS differential correction available. Verify GPS receiver has clear view of sky. |
| 2D GPS in use. | 2D GPS in use. Verify GPS receiver has clear view of sky. |

**Continued on next page**

| FAULT CONDITION FAULT DESCRIPTION | ALARM TEXT |
|---|---|
| Tracking Inaccurate The GPS receiver must be set to report at the 5Hz. Rate. Confirm settings on receiver. | The GPS receiver must be set to report at the 5Hz message output rate. Confirm settings on GPS receiver and change output to 5Hz. (For 3rd-Party Controllers)<br>*NOTE: 3rd-Party controllers are controllers using RS232 connection (Field Doc Connect) and ISOBUS compliant controllers supporting Task Controller functionality.* |
| Language Loading Errors: | |
| CRC bad, missing a colon, bad prep header, etc. | Language load detected corrupt file. Reload software to data card. |
| Hardware compat. version mismatch. | Invalid hardware for language file. Reload software to data card. |
| Software version mismatch. | Language file incompatible with application. Reload software to data card. |
| Timeout waiting for CAN62 Response To Request | Device failed to start programming language. Reload software to data card. |
| Target sent FAIL in CAN62 Response To Request | Device failed to continue programming language. Reload software to data card. |
| Timeout waiting for CAN62 Response To Checksum | Device failed to report a language checksum. Reload software to data card. |
| Target sent FAIL in CAN62 Response To Checksum | Device reported an invalid language checksum. Reload software to data card. |
| Timeout waiting for CAN62 Response To Remove | Device didn't respond to the request to remove language. Reload software to data card. |
| Target sent FAIL in CAN62 Response To Remove | Device failed to remove a language. Reload software to data card. |
| Flash Write Failure. | Device failed while writing language to memory. Reload software to data card. |
| Timeout waiting for CAN62 Response To New Data | Device stopped programming language prematurely. Reload software to data card. |
| Product ID mismatch | Language is incompatible with loaded product. Reload software to data card. |

OUO6050,000232C -19-01SEP09-2/2

## Trouble Code Pop-Up Boxes—Documentation Software

| FAULT CONDITION FAULT DESCRIPTION | ALARM TEXT |
|---|---|
| Task selected, recording is on, the operation mandatory details are not defined. | No operation details defined. Go to GreenStar setup and enter operation info. |
| Invalid prescription | Prescription file is invalid. -Verify rate units on prescription are correct. |
| Totals: Client Undefined | Alarm issued stating that the user must select a Client to view totals. |
| Totals: Client and Farm defined, Field undefined. | Alarm issued stating that the user must select a Field to view Field, Task, or Load Totals. |
| Totals: CFF, Task, and Operation defined, Crop/Product Type undefined. | No Alarm. Operation defaulted to “” and Task Totals are listed. |
| Totals: CFF and Crop/Product Type defined, Task and/or Operation undefined. | Alarm issued stating that the user must select a Task and Operation to view Field or Load Totals. |
| Totals: Client, Crop and Task defined, Farm and Field undefined. | No Alarm. Task and Operation defaulted to “” and Crop Totals are listed. |
| Reset totals to zero | Are you sure you want to zero the totals listed below? |
| In order to record a product application, you must choose a product type and product name on one of the ADD PRODUCT boxes. Choices will be CHANGE, which takes the user to the product summary screen, or REMOVE OPERATION which will flash up the "Are you sure you want to delete this operation" message. | In order to record a product application, you must choose a product type and product name on one of the Add Product boxes. |
| When no products are specified in an application | No products are specified, please select a product. |
| An alarm shall be issued if there is a prescription selected in Field Doc but not selected in the planter/sprayer setup. | Prescription available but not selected. Go to implement setup to select the prescription as the rate. |
| An alarm will be issued if Field Doc has a prescription selected, but the planter/sprayer is outside the field boundary for the prescription. "Default Rx Rate Used. | Machine outside the field boundary for the prescription. Default Prescription rate being used. |
| At power-up, An alarm will be issued if a prescription is being used and the prescription multiplier for an operation is not set to 100%. | Prescription Multiplier not 100%. |
| Implement width set to zero. | Implement width is set to zero. Implement width is required to record data. |
| Anywhere: User selects the DOCUMENTATION button before filling out CFFT | You must choose a Client, Farm, Field, Task from the Resources button |
| Communication lost with a connected controller. | Communication lost with controller. If controller was not disconnected, check connections and cycle power. If controller was disconnected please review operations selected. |
| Field Doc didn’t get some periodic messages | Communication lost with controller. If controller was not disconnected, check connections and cycle power. If controller was disconnected please review operations selected. |
| | Prescription available but not selected. Check setup on the implement to ensure prescription is selected as the rate. |
| Air Cart Setup: Air cart is on the bus, 1st tank has been defined with an operation, Second tank is created with the same operation type as the first tank. | You are creating another seeding (application) operation. Would you like this to be the same as the Front (Middle)(Rear) Tank seeding (application) operation? |
| Air Cart Setup: User selects enter for the previous message | Please enter the tank ratios for each tank. (if applicable) |
| Air Cart Setup: User enters tank ratios that do not add to 100 | Tank ratios must add to 100 |
| SeedStar selects Rx but Documentation doesn’t have Rx selected. | No prescription file for selected field. -Verify field and operation are correct. -Verify prescription is on card. -Resave prescription to card if necessary. |
| Tank Mix Screen: User attempts to add a second ingredient in a tank mix without a carrier or base solution rate | You must enter a carrier and base solution rate before building a tank mix |
| Incorrect model is possibly selected | The RS232 controller model selected is incorrect. Please verify and reenter manufacturer and model number. |
| Recording is not currently allowed | Recording is not currently allowed. Verify settings on RS232 controller. |
| Alarm for manual controller when target rate changes | Target rate has changed. Alarm for manual controller. |
| Alarm when Raven is communicating everything but an actual rate | Raven controller not communicating actual rate. Verify Raven controller settings and connections to the display. |
| Special handling will be needed for each controller to monitor the health of the connection | Communication problem with controller. Check connections to controller. |

OUO6050,000232D -19-30SEP09-1/1

## GreenStar Diagnostics

**Required Items for Documentation**

The following items are required for documentation to function:

- Client, Farm and Field
- Task
- Operation
- Operation Details
- Product Type/Name
- Target Rate/Rate Units
- Recording Source
- Implement Width/Offsets
- Controller Setup (when using 3rd-Party controllers)

*NOTE: 3rd- controllers are controllers using RS232 connection (Field Doc Connect) and ISOBUS compliant controllers supporting Task Controller functionality.*

**Required Items for Guidance**

The following items are required for guidance to function:

- Tracking mode set to Straight Track, Curve Track, Circle Track (only available with optional PivotPro module) or Row Finder
- Track spacing (See equipment section of GreenStar Basics/Pro General Setup)
- Track 0 (Except for Curve Track and Row Finder)
- GPS signal (StarFire signal required)

OUO6050,000232E -19-01SEP09-1/1

## Troubleshooting And Diagnostics

Contacting Technical Support

If you have a question related to your GreenStar products and you can not find the information in your product publications, please contact the Stellar Support Contact Center at

E-mail GreenStar@JohnDeere.com

North America 1-888-GRN-STAR

Australia 0011-800-0000-3333

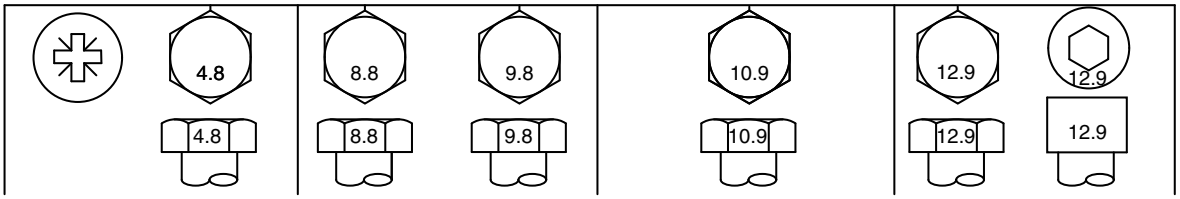
New Zealand 00-800-0000-3333

Or visit www.StellarSupport.com

OUO6050,000108D -19-12MAY09-1/1

## Metric Bolt and Screw Torque Values

TS1670 —UN—01MAY03




| Bolt or | Class 4.8 | | | | Class 8.8 or 9.8 | | | | Class 10.9 | | | | Class 12.9 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Screw | Lubricated[a] | | Dry[b] | | Lubricated[a] | | Dry[b] | | Lubricated[a] | | Dry[b] | | Lubricated[a] | | Dry[b] | |
| Size | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in |
| M6 | 4.7 | 42 | 6 | 53 | 8.9 | 79 | 11.3 | 100 | 13 | 115 | 16.5 | 146 | 15.5 | 137 | 19.5 | 172 |
| | | | | | | | | | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft |
| M8 | 11.5 | 102 | 14.5 | 128 | 22 | 194 | 27.5 | 243 | 32 | 23.5 | 40 | 29.5 | 37 | 27.5 | 47 | 35 |
| | | | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft | | | | | | | | |
| M10 | 23 | 204 | 29 | 21 | 43 | 32 | 55 | 40 | 63 | 46 | 80 | 59 | 75 | 55 | 95 | 70 |
| | N·m | lb-ft | | | | | | | | | | | | | | |
| M12 | 40 | 29.5 | 50 | 37 | 75 | 55 | 95 | 70 | 110 | 80 | 140 | 105 | 130 | 95 | 165 | 120 |
| M14 | 63 | 46 | 80 | 59 | 120 | 88 | 150 | 110 | 175 | 130 | 220 | 165 | 205 | 150 | 260 | 190 |
| M16 | 100 | 74 | 125 | 92 | 190 | 140 | 240 | 175 | 275 | 200 | 350 | 255 | 320 | 235 | 400 | 300 |
| M18 | 135 | 100 | 170 | 125 | 265 | 195 | 330 | 245 | 375 | 275 | 475 | 350 | 440 | 325 | 560 | 410 |
| M20 | 190 | 140 | 245 | 180 | 375 | 275 | 475 | 350 | 530 | 390 | 675 | 500 | 625 | 460 | 790 | 580 |
| M22 | 265 | 195 | 330 | 245 | 510 | 375 | 650 | 480 | 725 | 535 | 920 | 680 | 850 | 625 | 1080 | 800 |
| M24 | 330 | 245 | 425 | 315 | 650 | 480 | 820 | 600 | 920 | 680 | 1150 | 850 | 1080 | 800 | 1350 | 1000 |
| M27 | 490 | 360 | 625 | 460 | 950 | 700 | 1200 | 885 | 1350 | 1000 | 1700 | 1250 | 1580 | 1160 | 2000 | 1475 |
| M30 | 660 | 490 | 850 | 625 | 1290 | 950 | 1630 | 1200 | 1850 | 1350 | 2300 | 1700 | 2140 | 1580 | 2700 | 2000 |
| M33 | 900 | 665 | 1150 | 850 | 1750 | 1300 | 2200 | 1625 | 2500 | 1850 | 3150 | 2325 | 2900 | 2150 | 3700 | 2730 |
| M36 | 1150 | 850 | 1450 | 1075 | 2250 | 1650 | 2850 | 2100 | 3200 | 2350 | 4050 | 3000 | 3750 | 2770 | 4750 | 3500 |

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

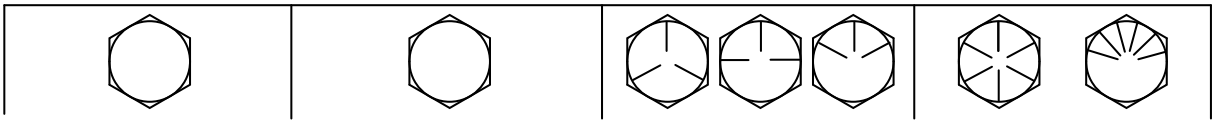
[a] *"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C zinc flake coating.*

[b] *"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B zinc flake coating.*

JS56696,0000237 -19-22JUL08-1/1

## Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



| Bolt or | SAE Grade 1 | | | | SAE Grade 2[a] | | | | SAE Grade 5, 5.1 or 5.2 | | | | SAE Grade 8 or 8.2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Screw | Lubricated[b] | | Dry[c] | | Lubricated[b] | | Dry[c] | | Lubricated[b] | | Dry[c] | | Lubricated[b] | | Dry[c] | |
| Size | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in | N·m | lb-in |
| 1/4 | 3.7 | 33 | 4.7 | 42 | 6 | 53 | 7.5 | 66 | 9.5 | 84 | 12 | 106 | 13.5 | 120 | 17 | 150 |
| | | | | | | | | | | | | | N·m | lb-ft | N·m | lb-ft |
| 5/16 | 7.7 | 68 | 9.8 | 86 | 12 | 106 | 15.5 | 137 | 19.5 | 172 | 25 | 221 | 28 | 20.5 | 35 | 26 |
| | | | | | | | | | N·m | lb-ft | N·m | lb-ft | | | | |
| 3/8 | 13.5 | 120 | 17.5 | 155 | 22 | 194 | 27 | 240 | 35 | 26 | 44 | 32.5 | 49 | 36 | 63 | 46 |
| | | | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft | | | | | | | | |
| 7/16 | 22 | 194 | 28 | 20.5 | 35 | 26 | 44 | 32.5 | 56 | 41 | 70 | 52 | 80 | 59 | 100 | 74 |
| | N·m | lb-ft | | | | | | | | | | | | | | |
| 1/2 | 34 | 25 | 42 | 31 | 53 | 39 | 67 | 49 | 85 | 63 | 110 | 80 | 120 | 88 | 155 | 115 |
| 9/16 | 48 | 35.5 | 60 | 45 | 76 | 56 | 95 | 70 | 125 | 92 | 155 | 115 | 175 | 130 | 220 | 165 |
| 5/8 | 67 | 49 | 85 | 63 | 105 | 77 | 135 | 100 | 170 | 125 | 215 | 160 | 240 | 175 | 305 | 225 |
| 3/4 | 120 | 88 | 150 | 110 | 190 | 140 | 240 | 175 | 300 | 220 | 380 | 280 | 425 | 315 | 540 | 400 |
| 7/8 | 190 | 140 | 240 | 175 | 190 | 140 | 240 | 175 | 490 | 360 | 615 | 455 | 690 | 510 | 870 | 640 |
| 1 | 285 | 210 | 360 | 265 | 285 | 210 | 360 | 265 | 730 | 540 | 920 | 680 | 1030 | 760 | 1300 | 960 |
| 1-1/8 | 400 | 300 | 510 | 375 | 400 | 300 | 510 | 375 | 910 | 670 | 1150 | 850 | 1450 | 1075 | 1850 | 1350 |
| 1-1/4 | 570 | 420 | 725 | 535 | 570 | 420 | 725 | 535 | 1280 | 945 | 1630 | 1200 | 2050 | 1500 | 2600 | 1920 |
| 1-3/8 | 750 | 550 | 950 | 700 | 750 | 550 | 950 | 700 | 1700 | 1250 | 2140 | 1580 | 2700 | 2000 | 3400 | 2500 |
| 1-1/2 | 990 | 730 | 1250 | 930 | 990 | 730 | 1250 | 930 | 2250 | 1650 | 2850 | 2100 | 3600 | 2650 | 4550 | 3350 |

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

*[a] Grade 2 applies for hex cap screws (not hex bolts) up to 6. in (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.*

*[b] "Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C zinc flake coating.*

*[c] "Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B zinc flake coating.*

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# John Deere Service Keeps You On The Job

## John Deere Parts

We help minimize downtime by putting genuine John Deere parts in your hands in a hurry.

That's why we maintain a large and varied inventory—to stay a jump ahead of your needs.


TS100 —UN—23AUG88

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## The Right Tools

Precision tools and testing equipment enable our Service Department to locate and correct troubles quickly . . . to save you time and money.

TS101 —UN—23AUG88

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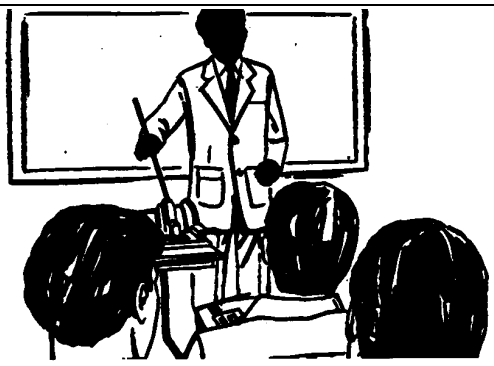
## Well-Trained Technicians

School is never out for John Deere service technicians.

Training schools are held regularly to be sure our personnel know your equipment and how to maintain it.

Result?

Experience you can count on!



TS102 —UN—23AUG88

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## Prompt Service

Our goal is to provide prompt, efficient care when you want it and where you want it.

We can make repairs at your place or at ours, depending on the circumstances: see us, depend on us.

JOHN DEERE SERVICE SUPERIORITY: We'll be around when you need us.

TS103 —UN—23AUG88

JS56696,000023C -19-08FEB08-1/1