

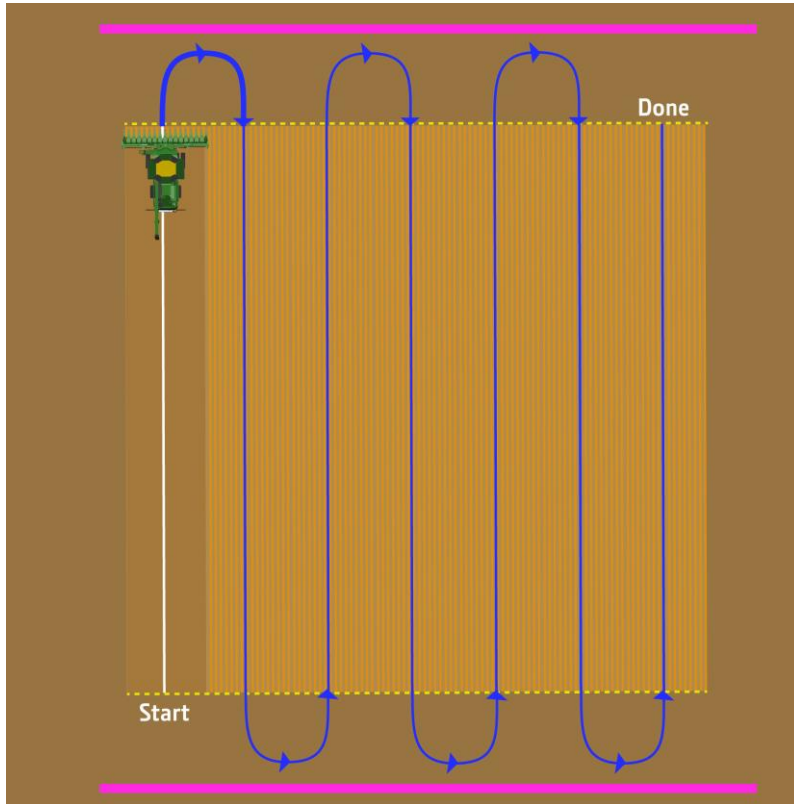
# AutoTrac™ Turn Automation (ATTA)

Combines



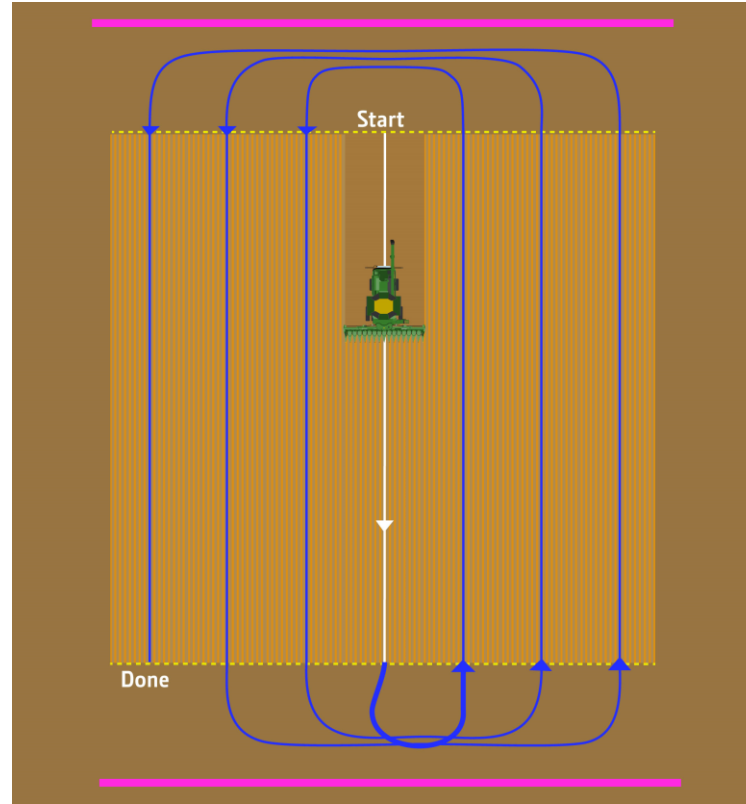
# ATTA | Combines – Turn Types

## U-Turn



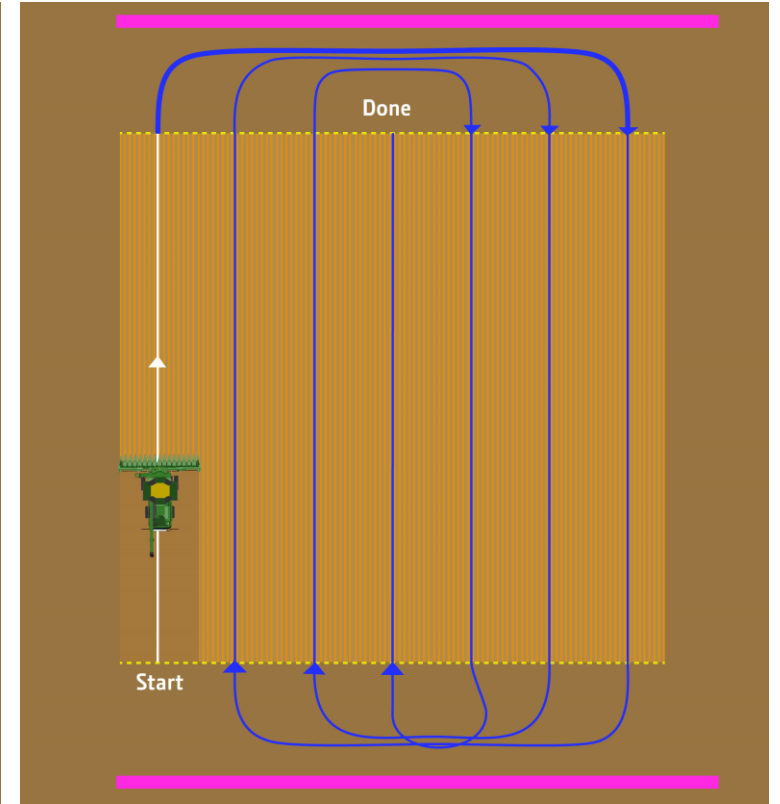
Skip Turns Available

## Spiral Out



Left-Hand Turns

## Spiral In



Right-Hand Turns

*Note that when using a spiral turn type, the auger is always extended over the harvested crop rows, creating an opening for grain cart tractors or semis for simple unloading on-the-go – This is especially important when harvesting high-yielding corn.*

- Automated turning solution
  - Combine ATTA will get better over time, as automated header raise/lower and speed control integration are considered
- Hardware Requirements: Gen4 or G5 Display
  - MTG and StarFire Receiver encouraged
- Software Requirements: Automation 4.0 or G5 Advanced
  - Ensure the combine's steering controller is updated
- Works seamlessly with other harvest technologies like AutoPath™, Machine Sync, and RowSense
- Can support multiple combines working in the same field using In-Field Data Sharing
  - Reliable and strong cellular coverage is required for the system to allow real-time updates of coverage maps for an efficient harvest operation.
- Simple, square shaped fields will yield best performance:
  - A field and headland boundary are required
    - Headland boundaries trigger the start of a turn
  - Straight tracks or AutoPath (Rows) are required

## About the Solution

Combine ATTA is compatible with the following machine models & displays

*NOTE: ATTA performance is best when used on wheeled machines vs. tracked.*



John Deere Combines	Model Year	4600 V2	4640	G5 CC	G5 UNI	G5 <sup>Plus</sup> CC	G5 <sup>Plus</sup> UNI
X Series	2021 & Newer	X		X		X	
S700 Series	2018 & Newer	X		X		X	
S430 and S440 Series	2017 & Newer	X		X		X	
S600 Series	2012 - 2017		X		X		X
S540 and S550 Series	2012 & Newer		X		X		X
T Series	2012 & Current		X		X		X
W Series	2012 & Newer		X		X		X

# THIS SIMPLE SOLUTION |

Facilitates Tech Utilization 

Drives Hardware Updates 

Will Get Better Over Time 

ATTA FEATURE	TRACTORS 	COMBINES 
Speed Control	X	
Implement Control	X	
U-Turn	X	X
Figure-Eight Turn	X	
Spiral Out Turn Pattern		X
Spiral In Turn Pattern		X
Straight Through 'Turn'	X	X

Lessons learned from the tractor ATTA release: Sometimes **simpler is better**, especially from a setup and utilization standpoint.

When operators feel comfortable with the base product, it will be more natural and easier to build and add more automation from their base.

*"I can easily raise my header with the push of a button and speed up around the turn with confidence, even when it's so dusty that I can't see outside of my cab. I can trust the system to steer me in the right direction and put me right where I need to be. This product makes me more productive and efficient because it keeps me moving. I don't have to sit and wait for dust to settle or wonder where the next rows are."*

# Key Customer Benefits



By automating the turns at the end of each pass, combine operators can make consistent and accurate turns each pass they make through the field. **There is no more waiting for dust to settle or backing up to realign with the crop rows. Turn Automation puts operators exactly where they need to be.** Automating this task will also allow operators of any skill level to execute at a higher-level and more efficiently over a longer duration of time.



Turn Automation contributes to the power of the G5 Advanced technology suite, by stitching AutoPath guidance lines together to achieve perfect path alignment each time the combine re-enters the standing crop rows, **reducing crop damage and turning inefficiencies.** Plus, if there are multiple combines working the same field, In-Field Data Sharing and Turn Automation will work together to ensure operators are not taking rows that have already been or are being harvested.



AutoTrac™ Turn Automation is a key technology required to enable 100% hands-free guidance across the harvest production step in the future. This would not be possible without the additional machine guidance and automation tools found within the Automation 4.0 and G5 Advanced packages working seamlessly with ATTA.





## Turn Automation On-Screen Setup and Adjustments

# Select / Create Field and Headland Boundaries

The screenshot displays the 'Fields & Boundaries' application window. On the left, a sidebar menu includes 'Menu', 'Machine Settings', 'Applications', and 'System'. The main window features a map with a field boundary outlined in purple and a scale bar indicating approximately 1050 feet. Below the map, the 'Area Within Boundary' is listed as 18.53 ac. To the right, the 'Current Location' section identifies the Client as Jensens, the Farm as Main, and the Field as Combine ATTA. The 'Combine ATTA-Boundary' section includes a warning: 'Headland must be large enough to complete a turn. At least 2 passes recommended.' and an example: 'Ex: 50' header = 100' headland'. The last modification date is 08/16/2023. At the bottom, there are three main action buttons: 'Manage Clients/Farms/Fields', 'Create Boundary Track', and 'Base Station'.

**Fields & Boundaries**

**Current Location**

- Client: Jensens
- Farm: Main
- Field: Combine ATTA

**Combine ATTA-Boundary**

- Exterior
- Headland must be large enough to complete a turn. At least 2 passes recommended.
- Ex: 50' header = 100' headland

Last Modified: 08/16/2023

Area Within Boundary: 18.53 ac

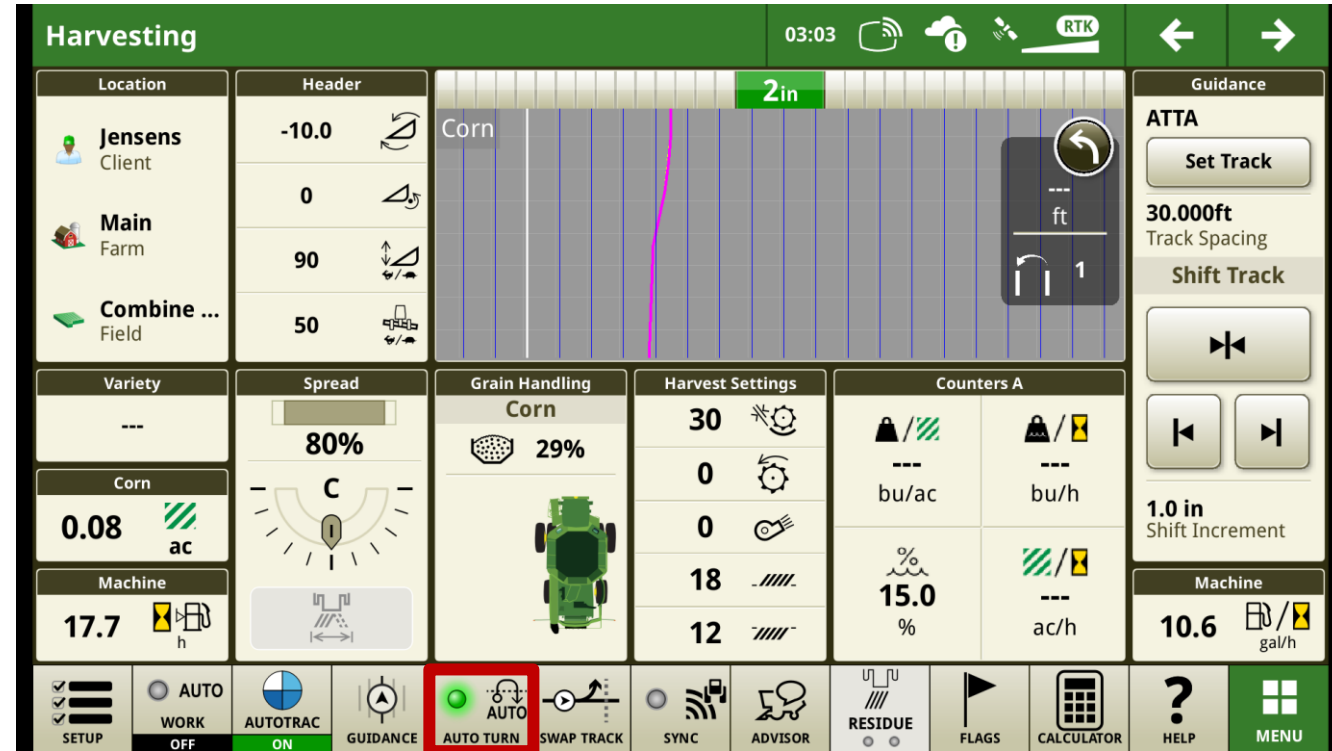
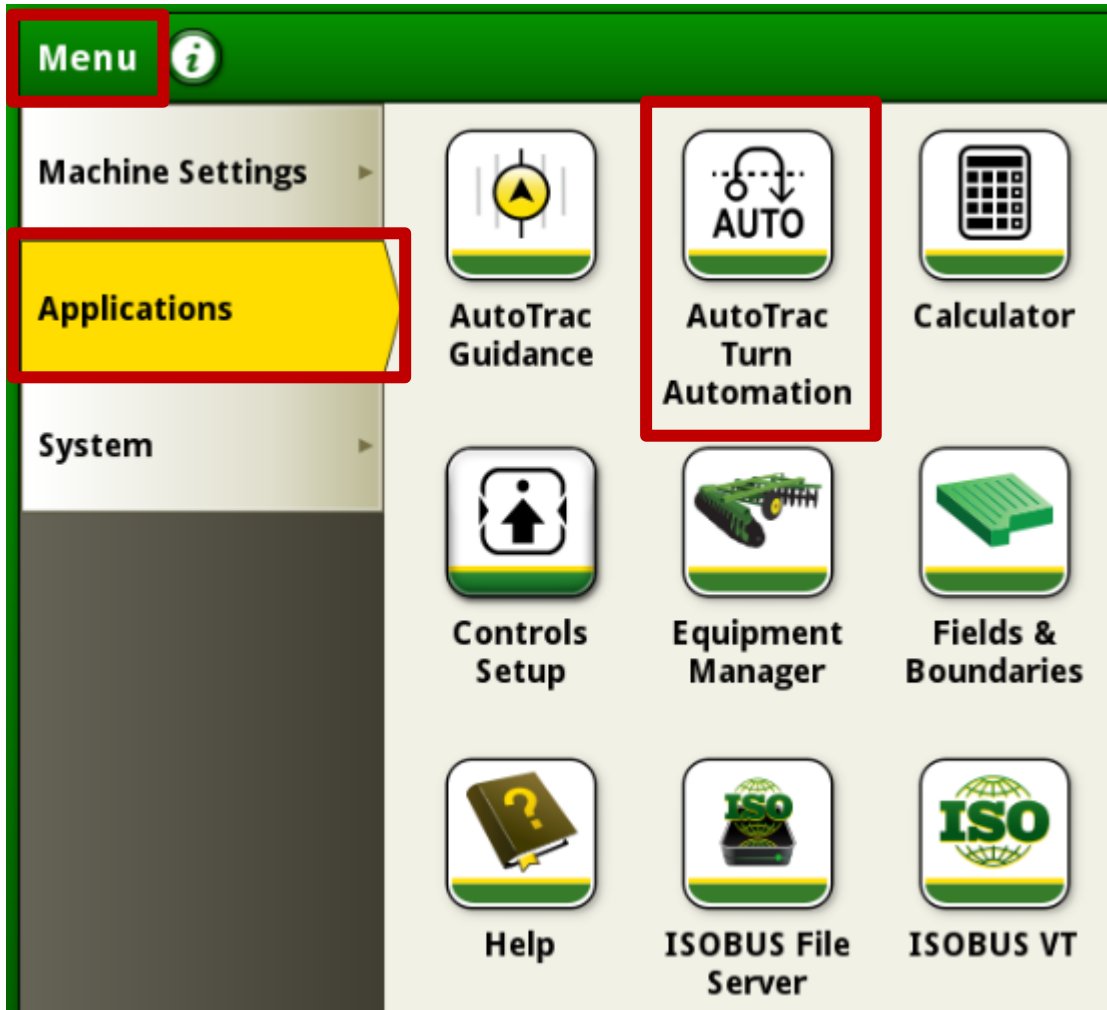
Exterior boundary minus interior boundary areas.

View Sets | Create Set

Manage Clients/Farms/Fields | Create Boundary Track | Base Station

# Navigate to the AutoTrac Turn Automation Display Page



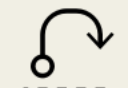
Menu → Applications → AutoTrac Turn Automation



We highly recommend placing ATTA module in the shortcut bar for easy access to adjustments while operating in the field.

# Turn the Application On, Adjust Start Turn and Turn Size as Needed

**AutoTrac Turn Automation** ? ⓘ

Turn Automation	Status
<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF	 Ready Waiting for AutoTrac Resume
Turn Settings	
Turn Size	Start Turn
 5	 +5.0 ft

Harvesting

02:51



Location

Jensens Client

Main Farm

Combining Field

Variety

Corn

0.00

Machine

20.9

12

8.7

Guidance

ATTA

Set Track

000ft  
Track Spacing

Shift Track

in  
ft Increment

Machine

8.7

gal/h

SETUP

AUTO WORK OFF

AUTOTRAC ON

AUTO TURN

SWAP TRACK

SYNC

ADVISOR

RESIDUE

FLAGS

CALCULATOR

HELP

MENU

Location

Jensens Client

Main Farm

Combining Field

Header

-10.0

### AutoTrac Turn Automation

Turn Automation

**ON** OFF

Variety

---

Corn

0.00

Machine

20.9

### Start Turn ?

+50 ft

-50 ft

+

5.0 ft

-

Guidance

ATTA

Set Track

1000ft

Track Spacing

Shift Track

Turn

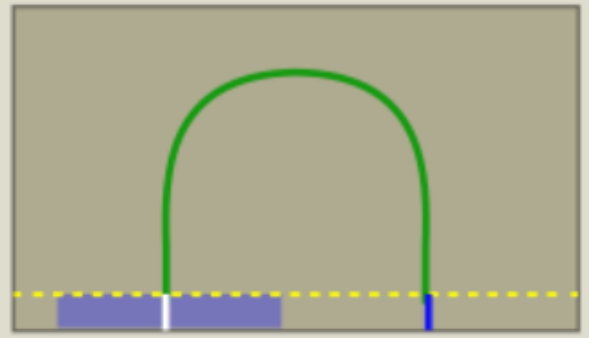
5.0 ft

Machine

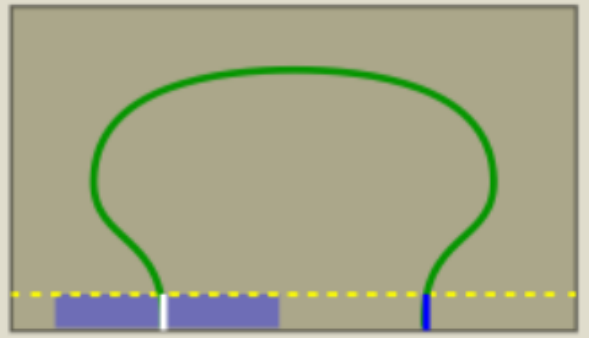
8.5

gal/h

## Adjust Turn Size



Small Turn



Large Turn

-      0      5      10      +

 **Equipment Turn Settings**

Location: Deere Client, Simulated Farm, South 40 Field

Variety: ---

Corn: 0.00

Machine: ---

Guidance: Set Track, 1000ft Track Spacing, Shift Track

Machine: gal/h

SETUP OFF    AUTO WORK OFF    AUTOTRAC OFF    GUIDANCE    AUTO TURN    SWAP TRACK    SYNC    RESIDUE    AUTO FAULT    AUTO READY    AUTO READY    HELP    MENU

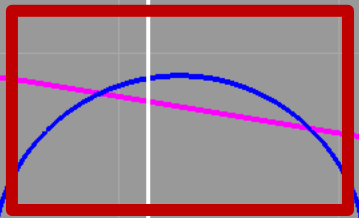
Corn

0 in

0

# Common Issues / Adjustments

Navigation controls including icons for turn types (U-turn, left turn, straight, right turn), a distance indicator showing 0 and 1379 ft, and a refresh button.



Planned route is outside of the field boundary;  
adjustment options:

- Increase Turn Size
- Increase Start Turn Distance
- Add Skip Pass
- Increase Headland Size





N  
3°



0 in

Corn

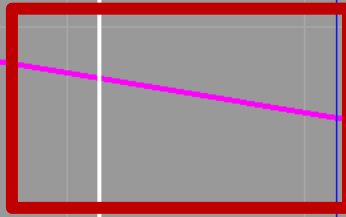
0



# Common Issues / Adjustments



0 1379 ft



Result of making the recommended adjustments





N  
0°



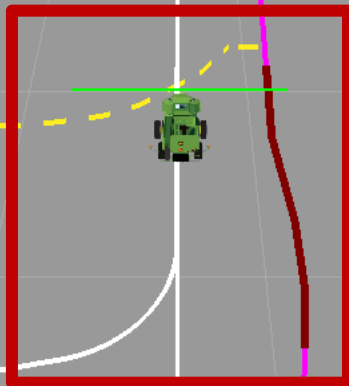
6in

Corn

## Common Issues / Adjustments

2E




Operators are not required to adjust their turn if it's planned route is outside of the field boundary; this is what you can expect to see onscreen if the turn is not adjusted.



Note: In this example, this operator is using a Top & Bottom headland offset. Had this operator created a Constant headland offset, this automated turn would not have been possible, as the planned turn would guide them into a headland pass.



Select Turn Type

-  U Turn
-  Spiral Out
-  Spiral In

0 in

0

On-Screen, Real-time Adjustments:



Change Turn Type

Change Turn Direction (Left)

Change Turn Direction (Right)

Countdown to next turn

Cancel Next Turn



Add/Number of planned skip passes



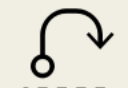
Next Turn Direction

Corn

\*\*Can make changes on-the-go up to 50' before the planned turn starts

Turn Automation Advanced Settings Can be Accessed Here

**AutoTrac Turn Automation**  

Turn Automation	Status
<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF	 Ready Waiting for AutoTrac Resume
Turn Settings	
Turn Size	Start Turn
 5	 +5.0 ft

# Information & Settings | AutoTrac Turn Automation



## Settings

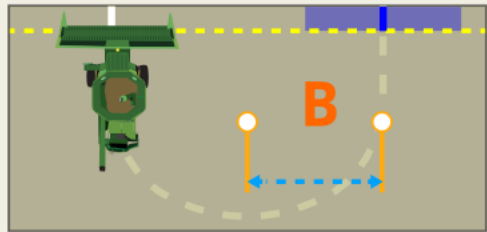
Help

About

### Equipment Turn Settings

**B** Minimum Turn Radius

*This setting is auto-populated from the factory/rarely needs adjusted.*



*If working in a spiral pattern, input desired number of passes per spiral here.*

### Spiral Turns

Spiral Out Land Size

Spiral In Land Size

### Allow Turn with Auger Extended

Harvesting

- Location
- Jensens Client
- Main Farm
- Combining Field

Variety

Corn  
0.08

Machine  
17.3

SETUP

- Guidance
- TA
- Set Track
- 000ft  
Track Spacing
- Shift Track
- Navigation buttons
- in  
ft Increment
- Machine  
0.6 gal/h
- MENU

### Land Size | Spiral Out

Enter the number of consecutive passes the machine should make in a Spiral Out pattern before moving on to the next Land

 count

7	8	9
4	5	6
1	2	3
+ / -	0	.

Cancel

OK

Allow Turn with Auger Extended

Location

Jensens Client

Main Farm

Combining Field

Variety

Corn

0.08

Machine

18.3

SETUP

Guidance

TA

Set Track

000ft

Track Spacing

Shift Track

ft Increment

Machine

0.5 gal/h

MENU

# Information & Settings | AutoTrac Turn Automation



Settings

Help

About

## Spiral Turns

Spiral Out Land Size

5 passes

Spiral In Land Size

5 passes

## Allow Turn with Auger Extended

**ON**

**OFF**

Unloading auger engaged will always disable turn regardless of above settings.

**ON - Allows turns with unloading auger extended**

**OFF - Does not allow turn with unloading auger extended**

**This setting is defaulted to off for safety purposes. If you want to allow the machine to complete automated turns while the auger is extended, this needs to be manually toggled on.**



**AUTOTRAC DISENGAGED**

Heading error too large



Corn

If the toggle remains 'off', this is the warning you will experience each time you approach a turn.



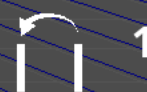
**AUTOTRAC DISENGAGED**

Retract auger prior to turn and resume AutoTrac.



8

ft



1





**JOHN DEERE**