

# John Deere SmartGrade™ Crawler Dozer



## OPERATOR'S MANUAL

### John Deere SmartGrade™ Crawler Dozer

OMT376521 ISSUE L3 (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.

**Worldwide Construction,  
And Forestry Division**  
PRINTED IN U.S.A.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: [www.heydownloads.com](http://www.heydownloads.com) by clicking the link below

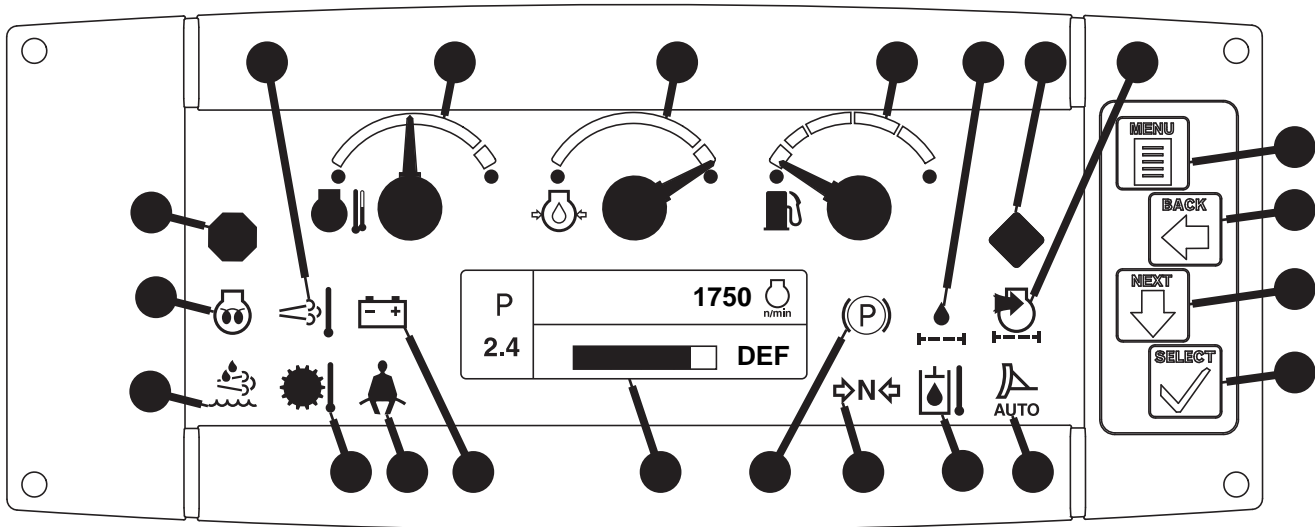


- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

# Operation—Operator's Station

## Standard Display Monitor (SDM) Functions



TX1170526

Standard Display Monitor (SDM)

- |                                     |   |  |   |
|-------------------------------------|---|--|---|
| 1—Exhaust Filter Cleaning Indicator | 7—Engine Air Filter Restriction Indicator | 13—Hydraulic Oil Temperature Indicator | 19—Transmission Oil Temperature Indicator |
| 2—Engine Coolant Temperature Gauge  | 8—MENU Button                             | 14—Return-to-Neutral Indicator         | 20—Diesel Exhaust Fluid (DEF) Indicator   |
| 3—Engine Oil Pressure Gauge         | 9—BACK Button                             | 15—Park Brake Indicator                | 21—Wait-to-Start Indicator                |
| 4—Fuel Level Gauge                  | 10—NEXT Button                            | 16—Display                             | 22—STOP Engine Indicator                  |
| 5—Oil Filter Restriction Indicator  | 11—SELECT Button                          | 17—Engine Alternator Voltage Indicator |   |
| 6—Caution Indicator                 | 12—Auto Blade Control Indicator           | 18—Fasten Seat Belt Indicator          |   |

**NOTE:** The navigation keys MENU, BACK, NEXT, and SELECT are located at the right side of the standard display monitor (SDM) display.

**NOTE:** Translations shown on display may be abbreviated.

**NOTE:** Battery disconnect switch must be in ON position for monitor to operate.

### 1—Exhaust Filter Cleaning Indicator

Indicator illuminates when exhaust gas temperature is high, elevated idle is active, or exhaust filter cleaning is in process. Machine can be operated as normal unless operator determines machine is not in a safe location for high exhaust temperatures and disables auto cleaning. When engine emissions temperature indicator is combined with warning indicator or STOP engine indicator, engine performance is reduced by the electronic control unit (ECU) because the exhaust gas temperature is higher than expected. See an authorized dealer.

### 2—Engine Coolant Temperature Gauge

**IMPORTANT: Prevent machine damage. DO NOT operate machine when engine coolant temperature is high.**

- Gauge indicates engine coolant temperature.
- Normal operating temperature is indicated by green zone.
- If needle points to RED zone, gauge turns red, STOP engine indicator illuminates, and an audible alarm sounds; engine is over operating temperature. Stop machine and operate engine at fast idle under no load until engine cools.
- If gauge pointer still points to red indicator after several minutes, stop engine. See an authorized dealer.

### 3—Engine Oil Pressure Gauge

- Displays current engine oil pressure level when engine is running.
- Normal operating pressure is indicated by green zone.
- If needle points to RED zone, gauge turns red, STOP engine indicator illuminates, and an audible alarm sounds; engine oil pressure has dropped below

Continued on next page

JB3888,00010B0-19-13JAN16-1/3

TX1170526—UN—02SEP14

Indicator illuminates rear element function as rear auxiliary mode.

### 25b—Rear Auxiliary Mode Ripper Indicator

Indicator illuminates rear element function as ripper mode.

### 25c—Rear Auxiliary Mode Winch Indicator

Indicator illuminates rear element function as winch mode.

### 26—Tachometer

Tachometer shows engine speed in revolutions per minute (rpm). If an engine control unit (ECU) malfunction occurs, “— — —” is displayed.

### 27—Transmission Forward Gear Setting

Displays the current forward gear setting.

### 28—Current Forward, Neutral, and Reverse (FNR) Gear Display

Current gear displays in the upper center of the screen above the gauge display.

- “F” is displayed for forward direction along with the gear value.
- “N” is displayed for neutral.
- “R” is displayed for reverse direction along with the gear value.

### 29—Transmission Reverse Gear Setting

Displays the current reverse gear setting.

### 30—Hour Meter

Hour meter shows accumulated machine hours to nearest 1/10 of an hour. Hours are accumulated only when engine is running. Display defaults to show hour meter when ignition is first energized.

### 31—Transmission Oil Temperature Gauge

Gauge indicates current transmission oil temperature.

- Green zone: Normal operating temperature.
- Red zone: Transmission oil temperature is too high. Needle points to RED zone, gauge turns red, transmission oil pressure indicator illuminates, STOP indicator illuminates, and an audible alarm sounds. Stop machine and operate engine at fast idle under no load until transmission cools. If gauge remains RED after several minutes, stop engine and see an authorized John Deere dealer.

### 32—Engine Oil Pressure Gauge

Gauge indicates current engine oil pressure when engine is running.

- Green zone: Normal operating pressure.
- Red zone: Engine oil pressure has dropped below recommended pressure. Needle points to RED zone, gauge turns red, STOP indicator illuminates, and an audible alarm sounds. Immediately park machine in a safe area and stop engine.

### 33—Engine Coolant Temperature Gauge

**IMPORTANT: Prevent machine damage. DO NOT operate machine when engine coolant temperature is high.**

Gauge indicates engine coolant temperature.

- Green zone: Normal operating temperature.
- Red zone: Engine coolant temperature is too high. Needle points to RED zone, gauge turns red, engine coolant temperature indicator illuminates, and an audible alarm sounds. Stop machine and operate engine at fast idle under no load until engine cools. If gauge remains RED after several minutes, stop engine and see an authorized John Deere dealer.

### 34—Hydraulic Oil Temperature Gauge

Gauge indicates hydraulic oil temperature.

- Green zone: Normal operating temperature.
- Red zone: Hydraulic oil temperature is too high. Needle points to RED zone, gauge turns red, hydraulic oil temperature indicator illuminates, and an audible alarm sounds. Immediately park machine in a safe area and stop engine.

### 35a—Main Gauge Display

Displays the transmission oil temperature gauge, engine oil pressure gauge, engine coolant gauge, and hydraulic oil temperature gauge.

### 35b—Average Fuel Consumption Display

Displays the average fuel consumption in either gallons per hour or liters per hour.

### 35c—Active Codes Display

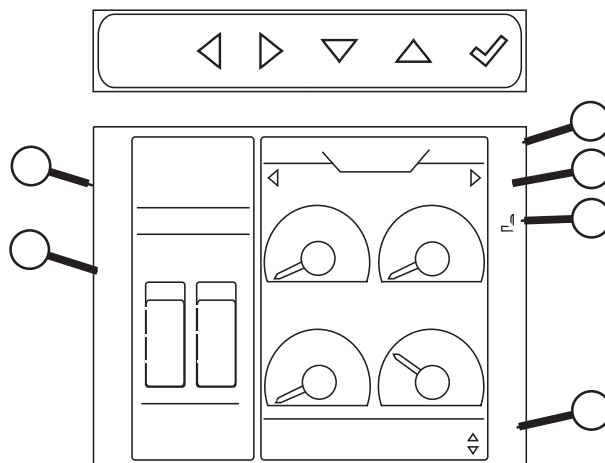
Displays active machine warning codes.

RM91622, 1699486447341-19-21DEC23-9/9

**Primary Display Unit (PDU)—850L [S.N. —411253] and 950 P**

Fasten seat belt indicator (3) will stay illuminated until operator fastens seat belt. The low battery voltage indicator (4) will also remain on until engine is running and alternator is charging. Rear auxiliary mode (5) illuminates with the selected device.

- |                                 |                                  |
|---------------------------------|----------------------------------|
| 2—Display                       | 5—Park Brake Indicator           |
| 3—Low Battery Voltage Indicator | 6—Fasten Seat Belt Indicator     |
| 4—Rear Auxiliary Mode Indicator | 7—Operator Not Present Indicator |



TX126968—UN—22JAN19

Primary Display Unit (PDU) (850L [S.N. —411253] and 950 P)

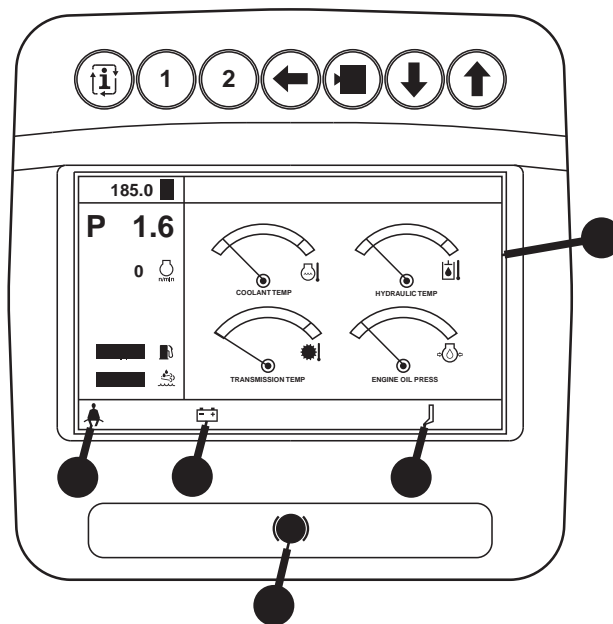
RM91622,1699486684771-19-20DEC23-5/7

**Primary Display Unit (PDU)—750K, 850K and 950K only**

Fasten seat belt indicator will stay illuminated for 5 seconds after engine start. The low battery voltage indicator will also remain on until engine is running and alternator is charging. Rear auxiliary mode illuminates with the selected device.

After the indicator check, the park brake indicator (6) remains illuminated.

- |                                 |                        |
|---------------------------------|------------------------|
| 2—Display                       | 5—Rear Auxiliary Mode  |
| 3—Fasten Seat Belt Indicator    | 6—Park Brake Indicator |
| 4—Low Battery Voltage Indicator |                        |

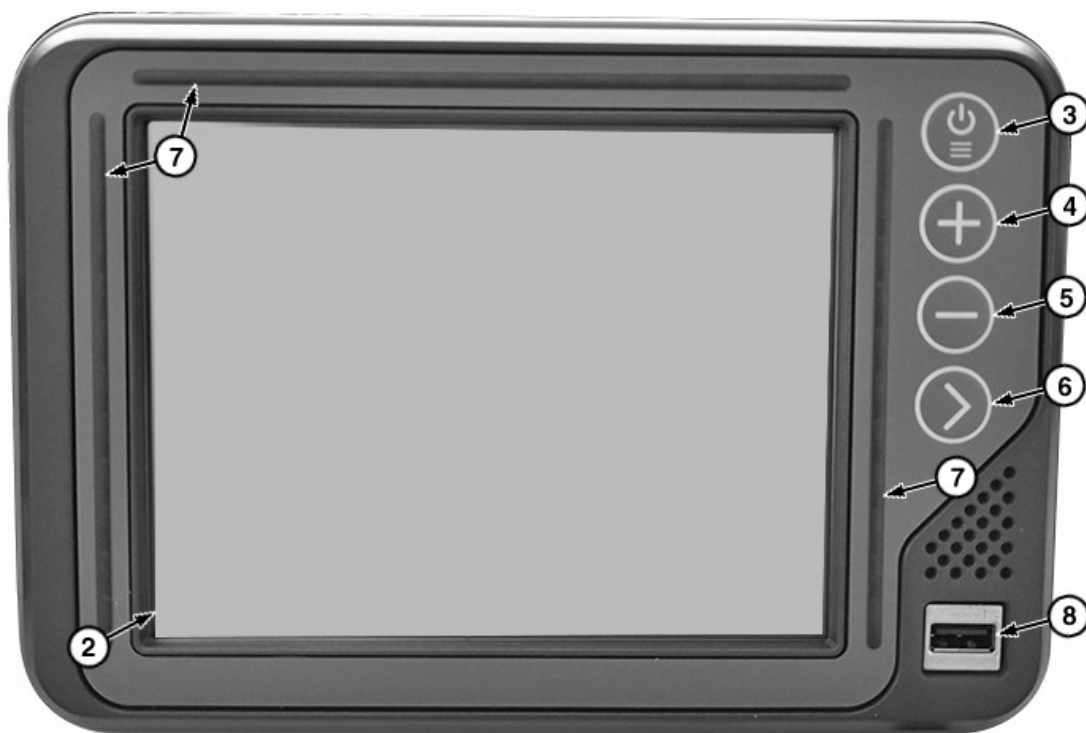


TX1161834—UN—30MAY14

Primary Display Unit (PDU) (750K, 850K and 950K only)

Continued on next page

RM91622,1699486684771-19-20DEC23-6/7



TX1241907—UN—19JUL17

*Display*

2—Touch Screen  
3—Power/Menu Button

4—Zoom In Button  
5—Zoom Out Button

6—Next View Button  
7—Grade Indicator LED (3 used)

8—USB Port

3. Press and release the SmartGrade™ display unit

power/menu button (3) for approximately 2 seconds until grade indicator LEDs (7) are illuminated on the monitor.

*SmartGrade is a trademark of Deere & Company*

RM91622,1699486536047-19-17NOV23-4/4

## Main Menu—SmartGrade—850L and 950 P

The SMARTGRADE menu allows the operator to change machine settings to suit their needs. Navigate through menu: **MAIN MENU >> SMARTGRADE.**

SMARTGRADE Menu Items						
Menu Items		Submenu Items		Submenu Items	Submenu Items	
SMARTGRADE™	>>	MATERIAL TYPE	>>	HARD PACKED LOOSE		
	>>	LOAD LEVEL	>>	SMALL MODERATE LARGE		
	>>	ACTIVITY	>>	GRADING ONLY CUTTING SPREADING		
	>>	GRADUAL START	>>	ENABLED DISABLED		
	>>	BLADE HEIGHT KICKOUT	>>	ON OFF		
	>>	DIAGNOSTICS		IGC SYSTEM STATUS	>>	<ul style="list-style-type: none"> <li>• READY</li> <li>• CALIBRATION</li> <li>• NOT READY</li> </ul>
				BLADE IMU STATUS	>>	<ul style="list-style-type: none"> <li>• ROLL OUT OF RANGE</li> <li>• PITCH OUT OF RANGE</li> <li>• CONNECTED</li> <li>• DISCONNECTED</li> </ul>
				CHASSIS IMU STATUS		
				GNSS ANTENNA	>>	<ul style="list-style-type: none"> <li>• CONNECTED</li> <li>• DISCONNECTED</li> </ul>
				GPS LOCALIZATION	>>	

SmartGrade is a trademark of Deere & Company

1. MATERIAL TYPE—The hard, packed, and loose material type settings determine how quickly the blade is raised and lowered.
2. LOAD LEVEL—The small, moderate, and large load level settings determine when the machine will raise and lower the blade in response to the material through which the crawler is cutting or spreading.
3. ACTIVITY—Grading only mode allows system to control the blade for final grading when there is a small amount of material above the design surface. Cutting mode is intended for removing material from an area above the final grade. Spreading mode is intended to push material to fill an area up to the final grade.
4. GRADUAL START—When gradual start is enabled and

the design surface is below the surface of the ground, the blade will gradually cut through the ground at a fixed slope. When the gradual start is disabled and the design surface is below the surface of the ground, the blade will cut through the ground at a faster rate than when gradual start is enabled.

5. BLADE HEIGHT KICKOUT—When blade height kickout is enabled, the raise jab can be used to raise the blade and disable automatic grading. When blade height kickout is disabled, the raise jab will not work to raise the blade and disable automatic grading.
6. DIAGNOSTICS—Displays information transmitted from the SmartGrade™ controller/receiver.

SmartGrade is a trademark of Deere & Company

RM91622,1699538240084-19-20DEC23-1/1

## File Menu Options

The FILE MENU contains information needed to accurately grade work site.

File Menu Options Items	
Menu Items	Description
PROJECTS	Allows operator to create, copy, or export project files.
CONTROL	Allows operator to import, add, or edit 3DMC control point files.
LAYERS	Allows operator to import layers from 3DMC project files that contain point data.
POINTS	Allows operator to assign desired points used for navigation.
SURFACES	Allows operator to display the following surface file types: <ul style="list-style-type: none"> <li>• IMPORT A SURFACE FILE FROM A PROJECT FILE</li> <li>• CREATE FLAT OR SLOPING SURFACE FILES</li> <li>• CREATE CROWN ROAD SURFACE FILES</li> <li>• CREATE TRIANGULATED SURFACES FROM A TOPO SURVEY FILE</li> <li>• RAISING OR LOWERING AN EXISTING SURFACE</li> <li>• SUBGRADE AN EXISTING ALIGNMENT</li> <li>• SELECTING AN ACTIVE SURFACE FILE</li> <li>• SELECTING AN ACTIVE ALIGNMENT FILE</li> </ul>
ACTIVE	Allows operator to select desired active surface, alignment, or as-built file.
EXIT 3DMC	Allows operator to exit 3DMC.

JB3888,00010B9-19-11DEC15-1/1

### Creating a Project File

A design project file for the job site is required. The correct file must be imported into the SmartGrade™ display unit and selected as the project for the job site.

*SmartGrade is a trademark of Deere & Company*

Navigate from main screen: **MAIN MENU >> FILE >> PROJECTS >> NEW.**

Using the alphanumeric keyboard, enter the name of the project and select Ok.

PN36905,0009AE9-19-13JUL17-1/1

### Copying Project Files From a USB

1. Insert the USB key into the SmartGrade™ display unit USB port.
2. Navigate from main screen: **MAIN MENU >> FILE >> PROJECTS.**

*SmartGrade is a trademark of Deere & Company*

3. From the Project Files screen, select Copy.
4. Select E: from the 3DMC folder drop-down list.
5. Select the files to copy from the project files list and select Ok.

PN36905,0009AEA-19-13JUL17-1/1

### Exporting Project Files

1. Navigate from main screen: **MAIN MENU >> FILE >> PROJECTS.**
2. Select Export.

3. Select All to select or deselect files to export. Select to change the Export option to Yes or No.
4. Select Ok to export the files and return to the project files screen.
5. Select Ok again to return to the main screen.

PN36905,0009AEB-19-26NOV19-1/1

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: [www.heydownloads.com](http://www.heydownloads.com) by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

1. Navigate from main screen: **MAIN MENU >> FILE >> ACTIVE >> ASBUILT.**
2. Select <none> (2) to be displayed on the main screen.

1—AsBuilt Menu

2—<none>



Active AsBuilt File Menu Screen

PN36905,0009B15-19-31JUL17-2/2

TX1205848—UN—07JAN16

## Control Menu Options

The CONTROL menu allows the operator to create, edit, copy, and delete machine setup files.

CONTROL Menu Items	
Menu Items	Description
MACHINE SETUP	Allows operator to configure machine for use with 3DMC.
AS-BUILT CONTROL <sup>1</sup>	Allows operator to configure as-built surface display options.
BLADE CONTROL	Allows operator to select automatic best-fit method or single-point control with 3DMC.
STEER INDICATION <sup>1</sup>	Allows operator to select point of interest, alignment feature, additional steer offset, and override machine direction.
LIGHTBARS <sup>2</sup>	850L (S.N. —411253) only—Allows operator or John Deere SmartGrade™ dealer to configure the light bar settings.
VALVE OFFSETS <sup>1</sup>	Allows operator to set, raise, and lower elevation and also raise and lower slope parameters.
BLADE CALIBRATION	Allows operator to configure the elevation valve calibration, slope valve calibration, and MC <sup>2+</sup> calibration.
SMARTGRADE™	Allows operator to choose what activity to perform, the density and amount of material, and whether or not the machine will gradually engage these functions.
BLADE WEAR	850L (S.N. —411253) only—Allows operator or John Deere SmartGrade™ dealer to adjust elevation calculations to compensate for cutting edge and blade insert wear.
MC <sup>2+</sup> CALIBRATION	Allows operator to perform four MC <sup>2+</sup> calibration procedures: MC <sup>2+</sup> sensor calibration, blade sensor alignment, body sensor alignment, and blade rotation alignment. (Each procedure must be done individually.)
3D/2D CONTROL <sup>1</sup>	Allows operator to select either three-dimensional (3D) or two-dimensional (2D) mode. (SmartGrade™ only works in 3D mode.)
RESTART CONNECTION	Allows operator to restart connection to the display unit.

SmartGrade is a trademark of Deere & Company

<sup>1</sup>First generation display only.

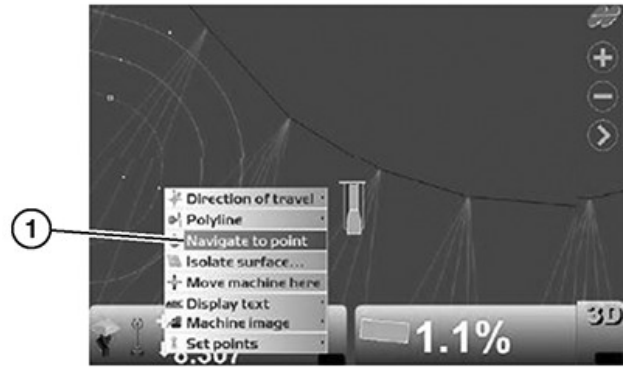
<sup>2</sup>Second generation display only.

PN36905,000A045-19-04OCT22-1/1

3. Select Navigate to point (1). The points navigation results will display on the main screen.
4. To stop the navigation, select and hold anywhere on the main screen. Select Stop navigation (2) from the context pop-up menu.

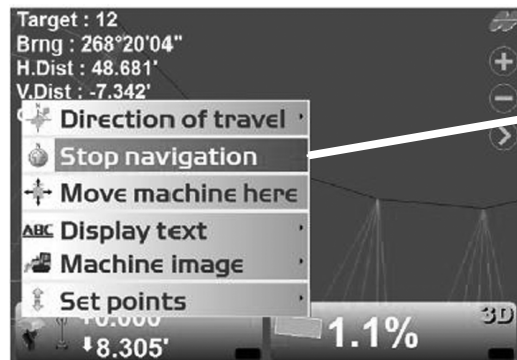
1—Navigate to point

2—Stop navigation



Navigate to Point Screen

TX1206522—UN—02DEC15



Stop Navigation Screen

TX1206534—UN—01DEC15

PN36905,0009AFF-19-14JUL17-4/4

## Topographic Surveys

### Select an Existing Point File

Before performing a topo survey, an existing point file must be selected or a new one created.

1. Navigate from main screen: **MAIN MENU >> FILE >> LAYERS.**

Continued on next page

PN36905,0009B1B-19-31JUL17-1/5

## Display Options

Navigate from main screen: **MAIN MENU >> VIEW >> DISPLAY OPTIONS.**

DISPLAY OPTIONS Items	
Menu Items	Description
WORKING SURFACE <sup>1</sup>	Allows operator to select display options for a TIN file and turn grade transition markers on or off.
POINTS	Allows operator to select point options.
SHORTCUTS	Allows operator to enable or disable shortcut buttons.
BACKGROUND COLOR	Allows operator to select the desired background color.
DISPLAY UNITS	Allows operator to select display unit options.
LANGUAGE SELECTION	Allows operator to select the desired language setting on the display.
SCREEN BRIGHTNESS <sup>1</sup>	Allows operator to select the desired brightness of the display.

<sup>1</sup> First generation display only.

PN36905.0009B1C-19-31JUL17-1/1

## Working Surface Display Options

*NOTE: Working Surface Display Options screen is not present on second generation SmartGrade™ monitors.*

*SmartGrade is a trademark of Deere & Company*

1. Navigate from main screen: **MAIN MENU >> VIEW >> DISPLAY OPTIONS >> WORKING SURFACE.**

Continued on next page

PN36905.0009B1D-19-31JUL17-1/2

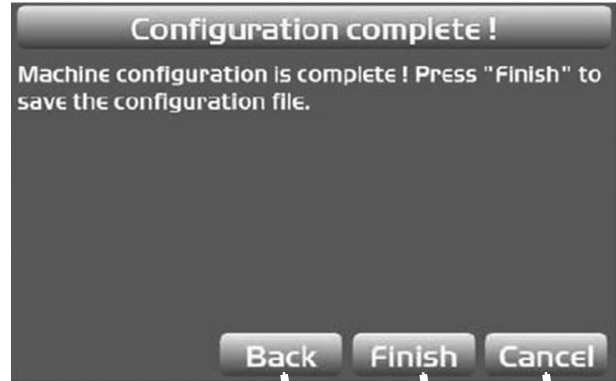
11. Select Next to bypass the light bar setup and complete the configuration.
12. On the Configuration complete ! screen, select Finish (71) to return to the Machine files screen.
13. Select desired machine file name and select Ok (74). The main screen appears.

**L-Series Machines**

1. Navigate from main screen: **MAIN MENU >> CONTROL >> MACHINE SETUP.**
2. Select New. The Configuration name/type screen appears.

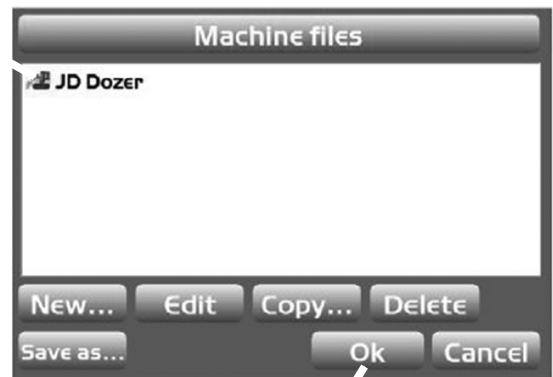
70—Back  
71—Finish  
72—Cancel

73—Machine File Name  
74—Ok



TX1215525—UN—16MAY16

*Configuration Complete Screen*



TX1215526—UN—16MAY16

*Machine Files Screen*

Continued on next page

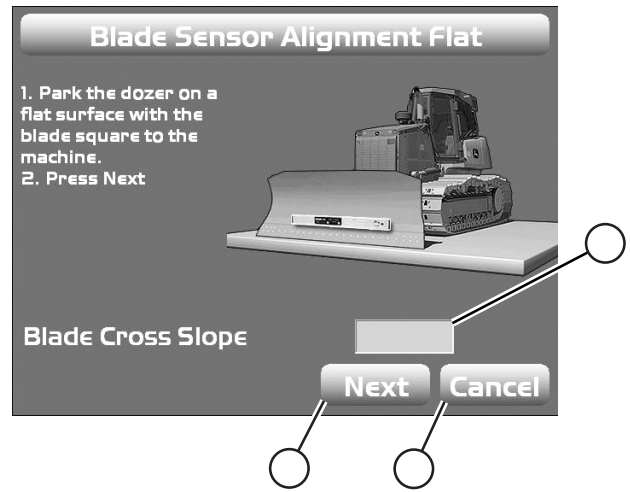
PN36905,000A048-19-06MAR20-5/9

2. Follow the on-screen instructions and select Next (2).
3. Follow the remaining instructions and select Finish (7) to complete the calibration procedure.

### Body Sensor Alignment

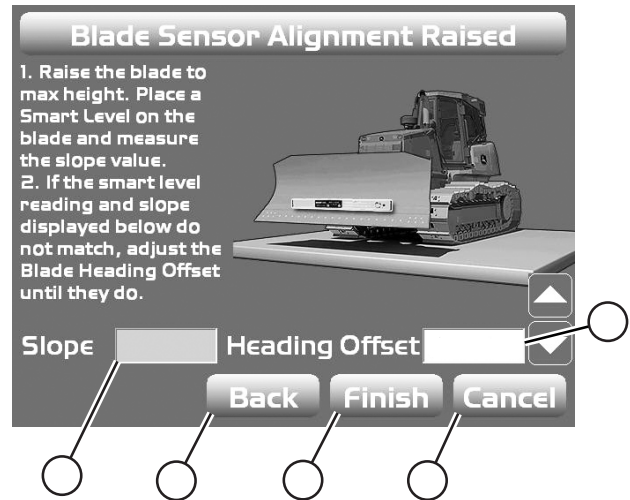
1. Navigate from main screen: **MAIN MENU >> CONTROL >> MC<sup>2</sup>+ CALIBRATION >> BODY SENSOR ALIGNMENT.**

- |                                |                             |
|--------------------------------|-----------------------------|
| 1—Blade Cross Slope Data Field | 5—Heading Offset Data Field |
| 2—Next                         | 6—Back                      |
| 3—Cancel                       | 7—Finish                    |
| 4—Slope Data Field             | 8—Cancel                    |



Blade Sensor Alignment Flat Screen

TX1215529—UN—16MAY16



Blade Sensor Alignment Raised Screen

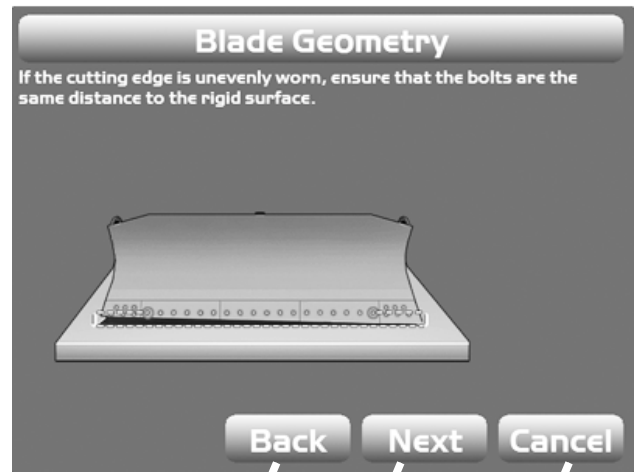
TX1215530—UN—16MAY16

Continued on next page

RM91622,1699559680236-19-20NOV23-3/21

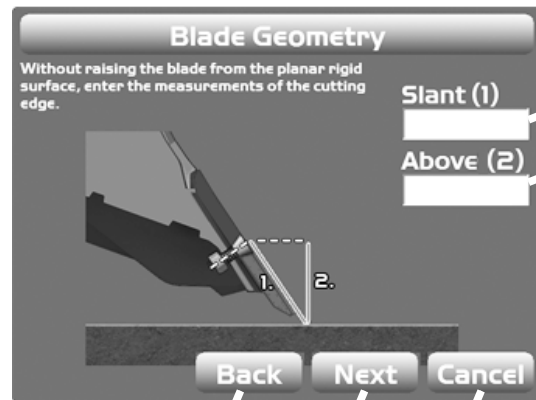
13. On the Blade Geometry screen, select Next (12).
14. On the Blade Geometry screen, measure and enter the value in the Slant (1) data field (14). Select OK.
15. Measure and enter the value in the Above (2) data field (15). Select OK.
16. Select Next (17). The Calibrate MC<sup>2</sup>+ Sensors Mainfall screen appears.

- |                         |                         |
|-------------------------|-------------------------|
| 11—Back                 | 15—Above (2) Data Field |
| 12—Next                 | 16—Back                 |
| 13—Cancel               | 17—Next                 |
| 14—Slant (1) Data Field | 18—Cancel               |



Blade Geometry Screen

TX1275369—UN—11APR19



Blade Geometry Screen

TX1275370—UN—11APR19

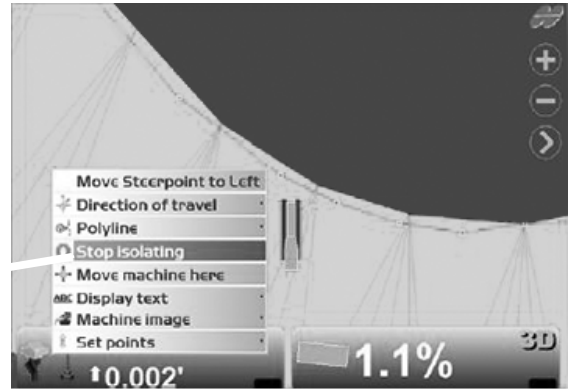
Continued on next page

RM91622,1699559680236-19-20NOV23-13/21

### Stop Isolating a Surface

1. Select and hold on the main screen to display the context menu.
2. Select Stop isolating (1).

**1—Stop isolating**

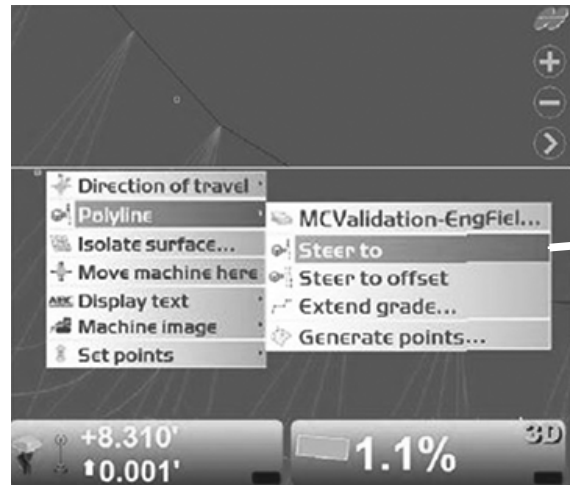


TX1206544—UN—03DEC15

*Stop Isolating Surface*

PN36905,0009B1F-19-31JUL17-3/8

### Steering to Polyline



TX1206545—UN—02DEC15

*Polyline Steer to Screen*

Continued on next page

PN36905,0009B1F-19-31JUL17-4/8

## GPS Localization Problems

Symptom	Problem	Solution
<b>Measurement Taking Too Long</b>	The machine may be blocking satellite signals to the range-pole or tripod mounted antenna	Watch the status of the measurement screen. If the status indicates waiting for satellites, move the machine away from the antenna.
	The control point may be located too close to obstructions	Move to an alternative control point or have the surveyor place a new control point away from the obstructions.
	The SmartGrade™ controller/receiver has not yet initialized	The SmartGrade™ controller/receiver may take several minutes to initialize.
<b>Localization Produces Large Errors</b>	A typographical error occurred	If coordinates are manually entered, check that longitudes are correctly prefixed with a minus sign if working in the western hemisphere.
	The range pole is unsteady	If the errors are decimeter level in magnitude, it may point to either inaccurately measured local site coordinates or not holding the range pole vertical when measuring the GPS coordinates.
	Inaccurate local site coordinates	If error values of the first few points are reasonable but increase when a new point is measured, the point just measured must have inaccurate local site coordinates. To isolate the error, disable horizontal and vertical localization for each control point in turn and observe the set of errors.
<b>There are No H. Error and V. Error Values</b>	Check boxes may have not been selected	The check boxes need to be selected for a minimum of three points. The error will be calculated once three control points are measured and used for the GPS localization.

*SmartGrade is a trademark of Deere & Company*

JB3888,0001116-19-11JAN16-1/1

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: [www.heydownloads.com](http://www.heydownloads.com) by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL