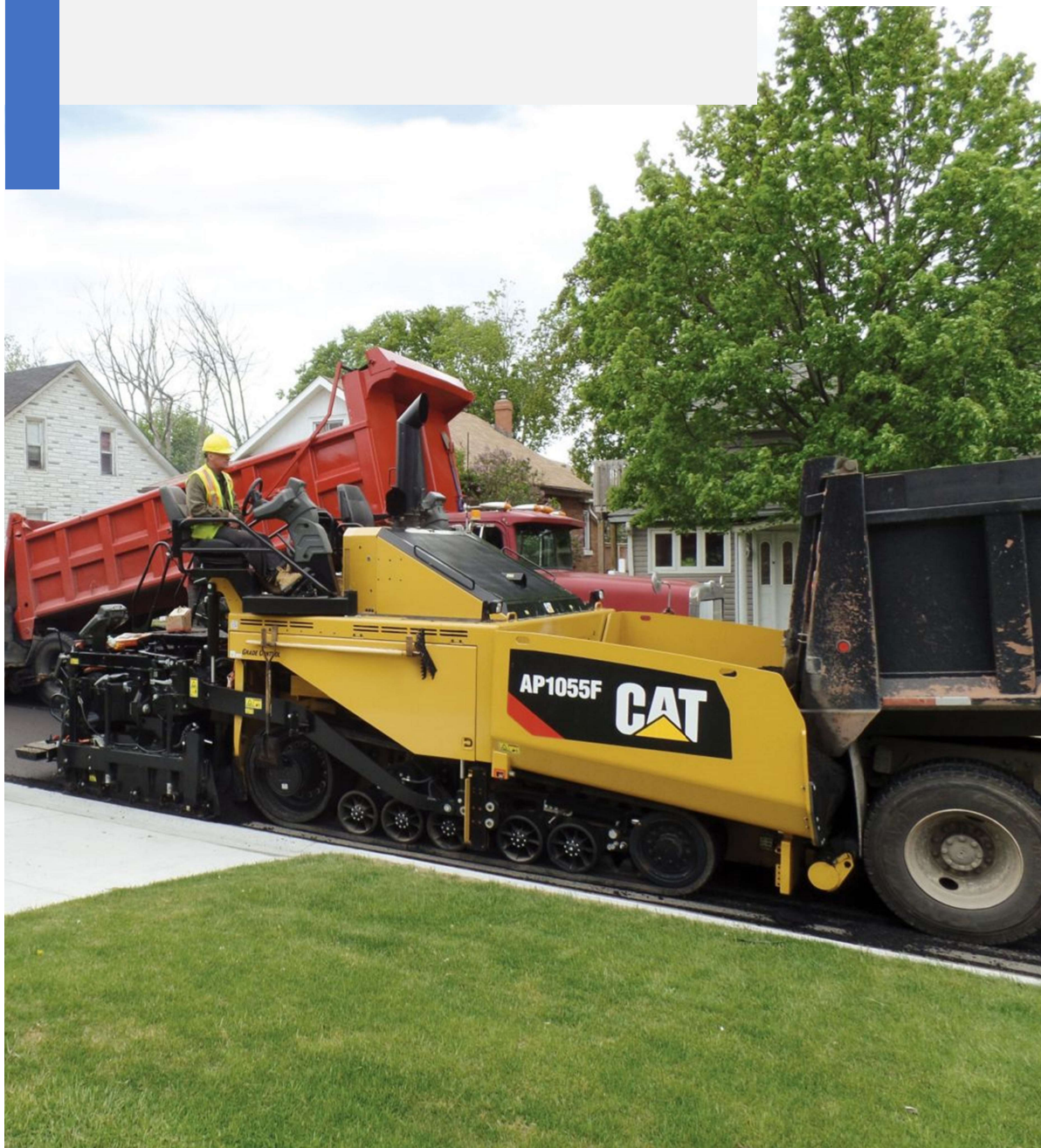


.....

# Cat Grade & Slope Setup and Configuration



SMCS - 7220

i07141438

## Set Up

Before you start to use the system, refer to the following list of tasks:

- Identify sensor configuration
- Mount sensors
- Select screen format
- Select sensors via display
- Configure units
- Check "on grade deadbands"
- Check "elevation control windows"

## Sensor Installation for Paving

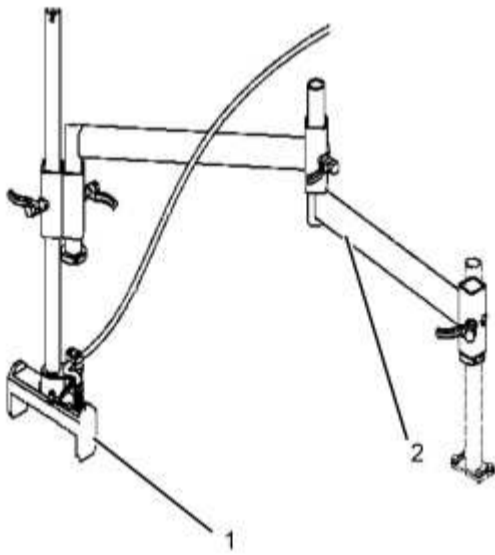


Illustration 1 g02918457  
Typical Installation of a Single Sonic Tracer  
(1) Sonic Tracer  
(2) Sensor Arm

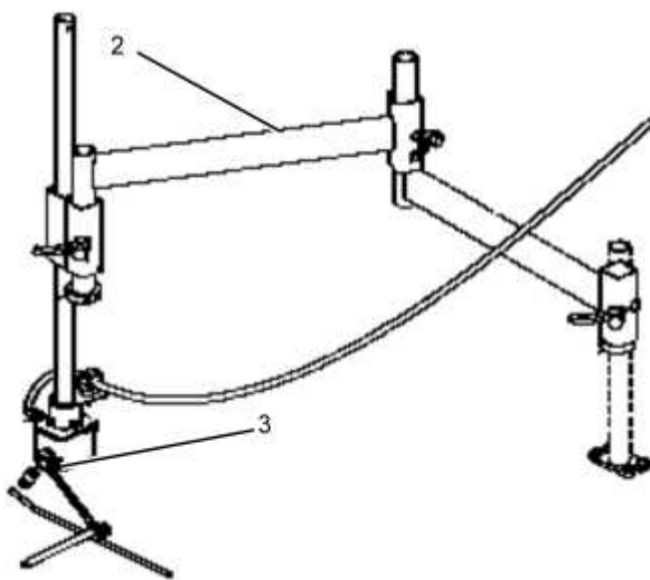


Illustration 2 g03836243  
Typical Installation of the Contact Sensor  
(2) Sensor Arm  
(3) Contact Sensor

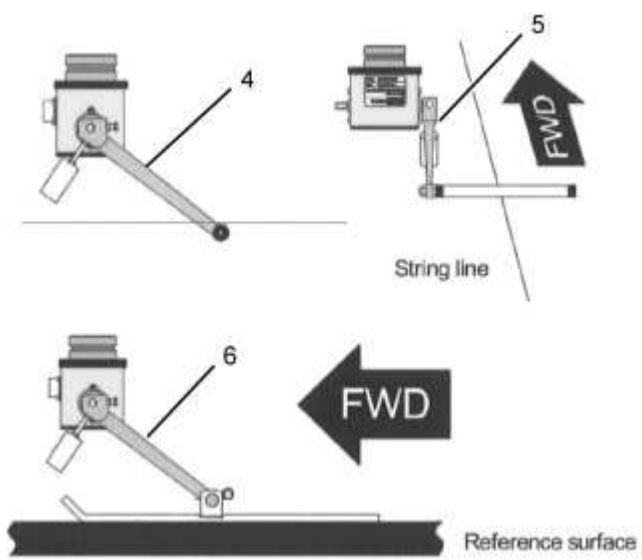


Illustration 3 g03819874  
 Contact sensor configurations  
 (5) String line application  
 (6) Contact sensor with wand attachment  
 (7) Contact sensor with reference ski

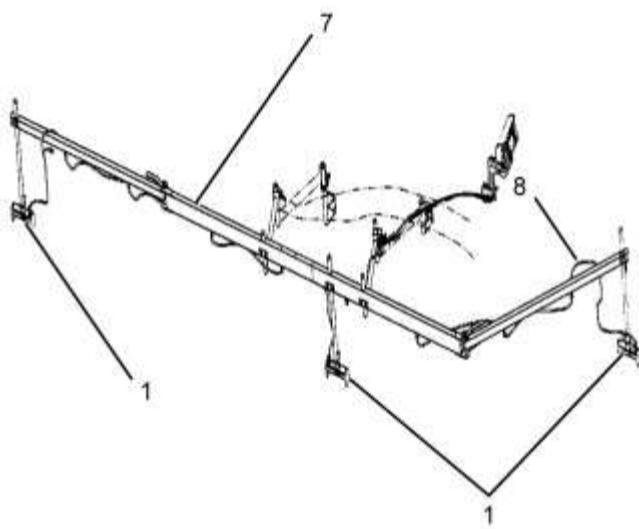


Illustration 4 g03819897  
 Typical Installation of an Averaging Beam  
 (1) Sonic Tracer  
 (7) Averaging Beam  
 (8) Averaging beam harness



Illustration 5 g06221310  
 The isomounts in this configuration should be inspected yearly and replaced as necessarily.

## Sensor Positioning for Paving

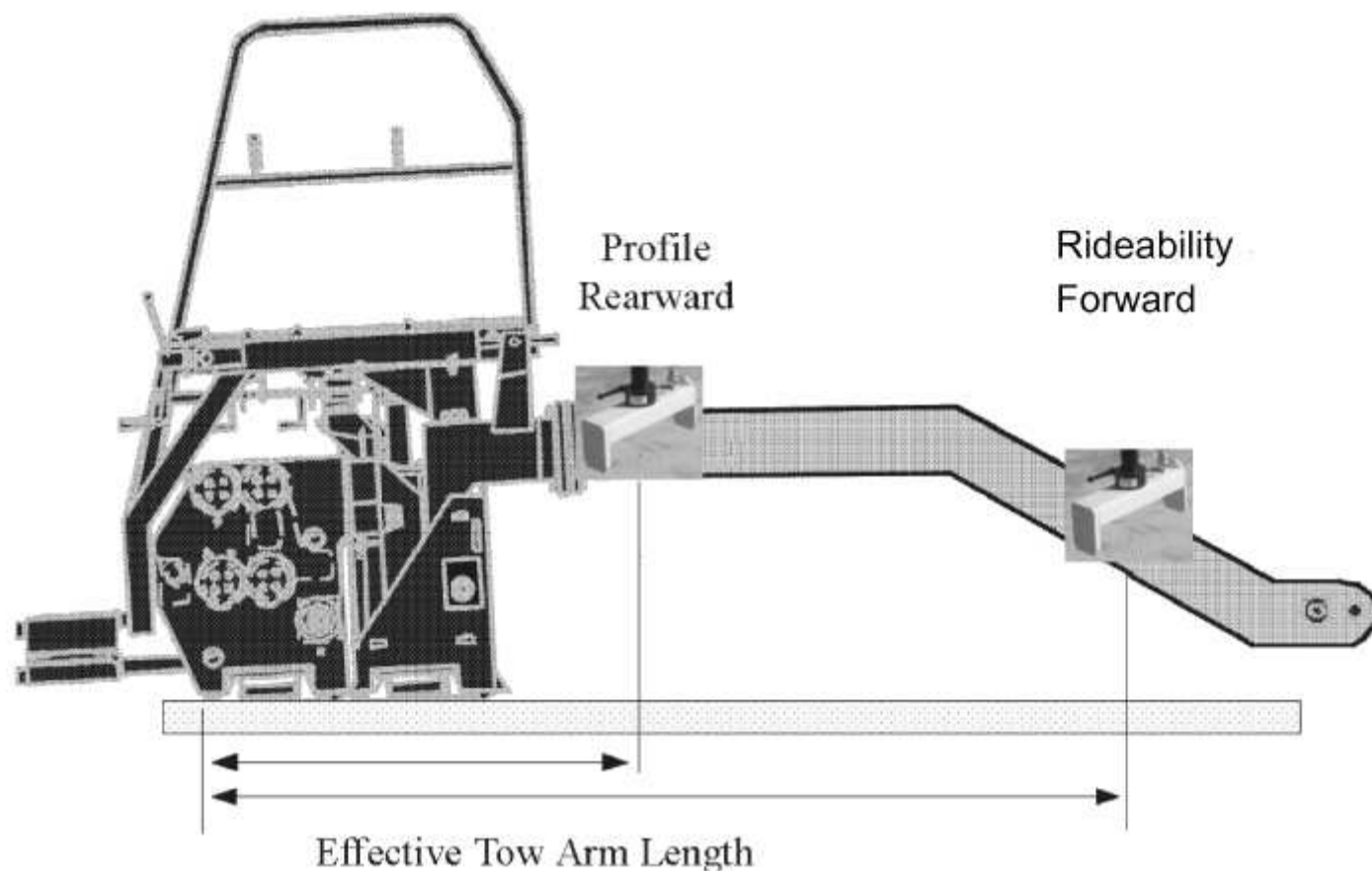


Illustration 6

g03825562

The position of the single sensor determines screed reaction time. Position the sensor slightly ahead of the center line of the auger shaft for building profile or joint matching. Position the sensor slightly behind the tow point cylinder for smoothness.

The location of the single sensor becomes the control point. To regain the null point at the sensor, the tow point cylinder is the only point that should raise the tow arm. The effective length of tow arm is the distance between the control point and the pivot point. The screed moves five tow arm lengths to react to any corrections. If the distance of the effective tow arm length is shortened, the time that is needed for a correction is shortened. The shortened tow arm length will increase the time of reaction. If you move the sensor near the screed, the time of reaction will increase. If you move the sensor near the tow point, the time of reaction decreases.

**Note:** Never mount a single sonic sensor or contact sensor behind the center line of the auger or in front of the tow point cylinder.

Perform the following for setting up the sensors.

## Set Up for Single Sonic Tracers Over a Surface

1. Mount the sonic tracer parallel to the direction of the run.
2. Position the connector toward the rear of the machine for following a surface. The distance between the sonic tracer and the machine must be adjusted so the sonic tracer covers the reference surface. Keep in mind the possibility of spills from the hopper during refilling.  
**Note:** Position the sonic tracer closer to the tow point for a smoother surface.
3. Adjust the height of the position of the sonic tracer to approximately 46 cm (18 inch) above the surface.

## Set Up for Single Sonic Tracers Over a String Line

1. Mount the sonic tracer perpendicular to the direction of the run.
2. Position the connector towards the left in relation to machine travel.
3. Position the sonic tracer toward the auger for a quick response to an elevation error.
4. Adjust the height of the sonic tracer so that the sonic tracer is approximately 46 cm (18 inch) above the string line.

## Set Up for Single Contact Sensor Over a Surface

1. Mount the contact sensor parallel to the direction of the run.
2. Position the connector toward the front of the machine.
3. The distance between the contact sensor and the machine must be adjusted so the contact sensor covers the reference surface. Keep in mind the possibility of spills from the hopper during refilling.
4. Position the contact sensor toward the auger for a quick response to an elevation error.
5. Adjust the height of the contact sensor so that the swing arm is following at 45° and the counterweight is facing downward.
6. Adjust the counterweight on the swing arm so that the profiling ski follows the surface.

## Set Up for Single Contact Sensor Over a String Line

1. Mount the contact sensor parallel to the direction of the run.
2. Position the connector toward the front of the machine.
3. Position the contact sensor toward the auger for a quick response or closer to the tow point for a smoother surface.
4. Adjust the height of the contact sensor so that the swing arm is following at 45° and the counterweight is facing downward.
5. Adjust the counterweight on the swing arm so that the wand does not distort the string line.

## Set Up for Sonic Averaging Ski

1. Ensure that the beam is level, parallel to the machine, and the center sensor is within the center 1/3 of the tow point arm.
2. Mount the sonic tracers approximately 46 cm (18 inch) above surface during paving.
3. Position the connectors toward the rear of the machine for following a surface.
4. Route the beam harness so that the 3 pin connector is towards the front sensor.
5. The distance between the sonic tracers and the machine must be adjusted so the sonic tracers cover the reference surface. Keep in mind the possibility of spills from the hopper during refilling.

**Note:** For smoother surfaces, run the rear sensor over the new surface.

**Note:** The averaging beam can be configured to run with one (center) sonic sensor. When configured this way, the front and rear sonic sensors continue to output a sonic pulse. If the beam is folded up and all 3 sensors are in the same general area, these extra pulses can create noise in the sensor being used. Be sure to unplug unused sensors or locate them to avoid interference.

## Display Setup for Paving

Before you start to use the system and after the sensors are installed, refer to the following list of tasks to set up the display:

- Mount the sensors
- Select single screen or split screen
- Ensure that the sensors displayed on the screen are correct for the sensors installed
- Ensure that the desired unit of measure is selected



2017/09/11

## Grade Control Configuration (SEBU8845)

SMCS - 7220

i07141506

The display has an LCD screen that shows specific information related to the current job.  
The LCD can be used in two modes:

- Guidance mode
- Configuration mode

The display has menus that allow you to configure the system settings. These menus are accessed by using the "Configuration" menu.

## Accessing Configuration Menu

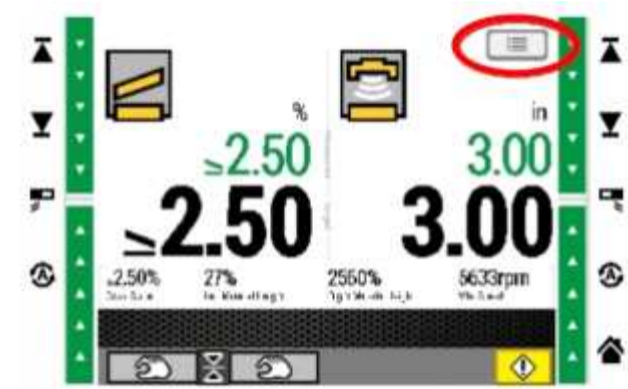


Illustration 1

g03799406

The configuration menu is accessed by using the touch screen icon in the upper right area of the screen.

## Using the Configuration Menu

The configuration menus may be navigated in one of two ways:

- Using the buttons to navigate.
- Using the touch screen to navigate.

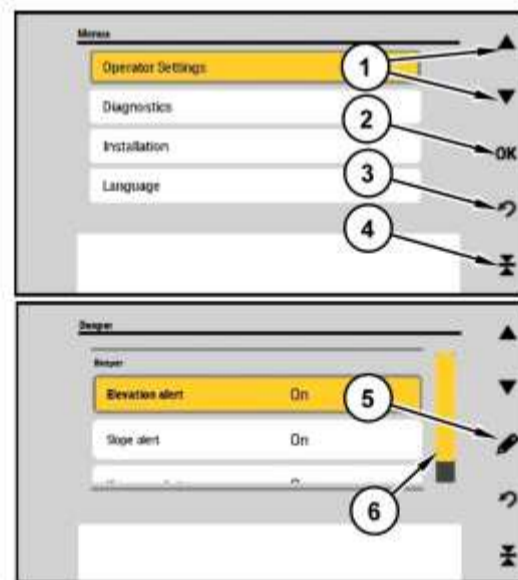


Illustration 2

g03799545

- (1) Up/ Down arrows, used to scroll through menus
- (2) OK, Pressing OK will also save changes made
- (3) Escape, returns to previous menu without saving changes. If escape is continually presses, will return to main grade slope screen
- (4) Grade slope symbol, one press returns to main grade slope screen immediately
- (5) Edit symbol, indicates that changes are available with highlighted selection. In some menus, this symbol will instead be a right facing arrow. The right facing arrow is a "Next" prompt.
- (6) Slide bar, move with arrow keys or by touch

## Working with Menus

The following menus are available from the "Configuration" menu:

Operator Settings:

## Operator Settings

- USB Sync (Only present when USB is inserted on Machine)
  - To USB

## Global Settings

- Increment Adjustment
  - Increment Adjustment
- Beeper
  - Elevation Alert
  - Slope Alert
  - Key press alert

## Local Settings

- Text Slider Bar
  - Display Set
- Units
  - Distance
  - Speed
  - Cross Slope
- Main Screen
  - Layout
- Guidance Settings
  - Lightbars
    - Enabled
    - Type
  - Lightbar Tolerances
    - Elevation
    - Slope

Illustration 3

g06221044

Diagnostics:

## Diagnostics

- Connectivity
- Test valves
  - Master Valve Speed
    - Test valve Speed
  - Tests
    - Left tow arm
    - Right tow arm
- Report
  - System Information
- Error Log
  - Messages
- Software License Info
  - Copyright and Trademarks



## Installation

- Control Settings
    - Manual Tow Point Speed
      - Manual tow point speed
    - Elevation Control Windows
      - Sonic tracer
      - Sonic tracer averaging sample
      - Contact Sensor
      - Averaging beam
      - 3D
    - Valve Speeds
      - Left Elevation
      - Right Elevation
      - Slope
    - On-Grade Deadbands
      - Sonic tracer
      - Contact sensor
      - Averaging beam
      - Slope
      - 3D
    - Cross Coupling
      - Slope
    - Slope Control
      - Extender Pause
    - Reset
      - Reset
  - Calibration
    - Valves
      - Left
      - Right
  - Firmware Upgrade (Only present when USB is inserted on Machine)
  - Restore Settings (Only present when USB is inserted on Machine)
  - Option Keys
    - Installation Details
- 

## Operator Settings

### Global Settings

Global settings are settings that relate to the entire machine, and can not have different values for different displays on the same machine.

### Increment Adjustment

---



Illustration 6

g06218683

Use the Increment adjustment to change the desired response change from a single increment/decrement adjustment.

For example, change the target value in increments of 2 mm (0.1 inch) per button press rather than the default 1mm (0.05 inch).

## Beeper

The beeper menu is used to configure the audible beeper sound ON or OFF. The beeper configuration choices are:

- Elevation alert, will sound beeper when the elevation is outside of the on-grade state
- Slope alert, will sound beeper when the slope is outside of the target range
- Key press alert, will sound beeper when keys are pressed.

Refer to the following steps to configure the audible beeper sound ON or OFF:

1. Select "Operator Settings" from the main menu screen. The "Beeper" menu will be shown with the three selections. Select desired beeper menu item to change by touching icon or pressing edit key.
2. Select "Beeper" from the "Operator Settings" menu.



Illustration 7

g03802349

3. Select desired beeper menu item to change by touching icon or pressing edit key. Refer to Illustration 7.
4. Touch left or right arrows on screen to change beeper selection to ON or OFF.
5. Press OK softkey to save changes.

## Local Settings

Local Settings relate only to the display they are set at, and are able to be adjusted independent of the other displays on the machine.

## Text Slider Bar



Illustration 8

g03802538

The text slider bar menu is used to configure the informational text at the bottom of the grade slope screen. Refer to Illustration 8.

1. Select "Operator Settings" from the main menu screen.
2. Select "Text Slider Bar" from the "Operator Settings" menu.

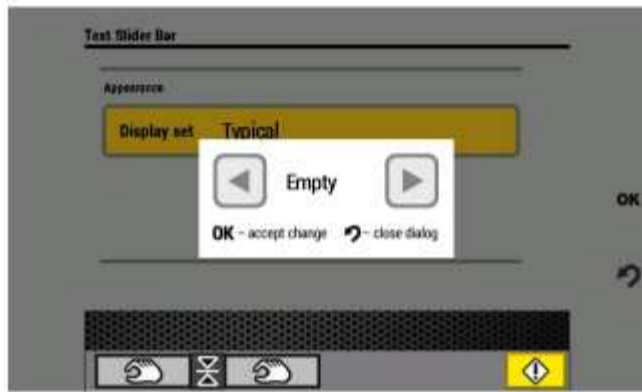


Illustration 9

g03802680

3. Press the edit key to enter the menu. A screen similar to Illustration 9 will appear.
4. Touch the arrow keys to change the display set type.
5. Touch OK softkey to save changes.

Available configurations:

- Typical: A pre-defined set of values
- Empty: No values will be shown, text bar will be blank
- Expanded: Predefined set of values using the text slider bar
- Legacy: a predetermined set of values that replicates older grade control symbols
- Custom: selected values from the menu

## Units

The units menu allows the units of measure to be changed for certain items.

1. Select "Operator Settings" from the Operator Settings menu.
2. Select "Units".
3. Select the desired item to change.
4. Touch the left or right arrows to change selections.
5. Press "OK" softkey or icon when desired change is made.

The following options are given for units that can be configured :

### Distance

- Inches (in)
- Millimeters (mm)
- US Survey Feet (FT)
- Meters (m)

- International Feet (ft)
- Centimeters (cm)

### Speed

- Feet per Minute (ft/min)
- Meters per Minute (m/min)
- Kilometers per Hour (km/hr)
- Miles per Hour (mph)

### Cross Slope

- 0.1%
- 0.01%

**Note:** The Units set in "Machine Health" determine what units are currently available in this menu. If the "Machine Health" units are metric, then only the metric choices are shown. If the "Machine Health" units are English, then only the English choices are shown.

## Main Screen

The main screen menu allows the user to set up the display to view and control one or both sides of the machine.

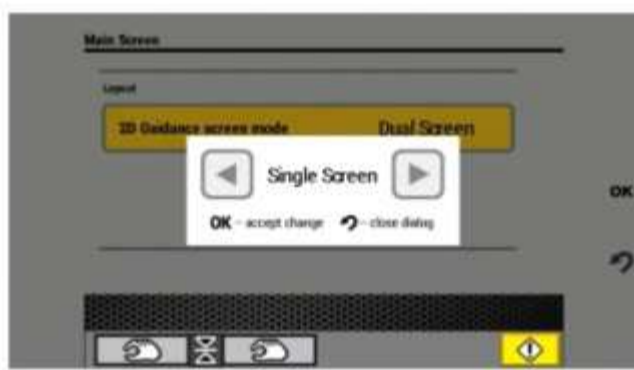


Illustration 10

g03799915

1. Select "Operator Settings" from the main menu screen. From the Operator Settings menu, select "Main Screen". On the Main Screen, select "2"D Guidance Screen Mode". A screen similar to Illustration 10 will appear.
2. Touch left or right arrows on screen to change selection to "Single Screen" or "Dual Screen". Press "OK" softkey to save change



Illustration 11

g03802070



Illustration 12

g03802071

**Note:** For jobs that will have two operators, both of the displays are typically set to the "Single Screen" display mode. In "Single Screen" display mode, the display will only show the sensor and guidance information for the side that the display is located. A typical guidance screen for "Single Side" display mode is shown in Illustration 11. For jobs with one operator, one or both displays can be set to "Split Screen" display mode. In Split Screen display mode, the display will show the sensor and guidance information for both sides of the screed. A typical guidance screen for Split Screen display mode is shown in Illustration 12.

## Guidance Settings

The "Guidance Settings" menu allows the operator to configure the external and graphical grade indication bars.

1. Select "Installation" from the main menu screen.



Illustration 13

g03811658

2. Select "Guidance Settings" from the Installation menu. Refer to Illustration 13.
3. Select desired light bar setting to configure.
4. Use the left or right arrow keys to scroll, or touch the yellow slider button when selection window appears.
5. Press "OK" softkey to save selection.

Settings available:

- Light bars- enabled, enabled automatic only, disabled
- Type- external and graphical, graphical only, external only
- Light bar tolerances- elevation grade, slope

## Diagnostics

The diagnostics menu contain system function tests and system information.

## Connectivity

The "Connectivity" menu is used to check the sensors that are detected by the system. Use the following steps to open the "Sensor Connectivity" menu.

**Note:** For a list of icons, refer to Operation and Maintenance Manual, SEBU8845, "Components of the Guidance Screen".

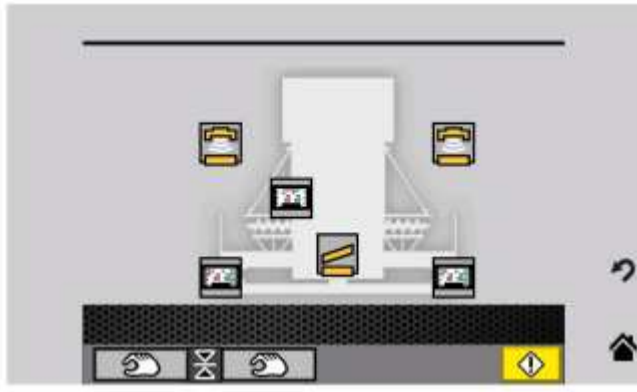


Illustration 14

g03803584

1. From the "Diagnostics" menu, select "Connectivity".
2. The "Sensor Connectivity" dialog shows a simplified plan view of the machine. The view indicates the presence of sensors using various icons. If a sensor was connected and detected at start-up, and has then become disconnected, then the icon will be red.

## Test Valves

The "Test Valves" menu is used to test that the system is correctly driving the hydraulic valves.

**Note:** The machine must be in the proper state to perform correctly or the cylinders will not move.

Refer to the machine "Operation and Maintenance Manual" for information and proper machine functions listed:

- Engine running (low idle)
- Propel mode set to "Pave"
- Parking brake engaged
- Propel lever forward
- Screed in float

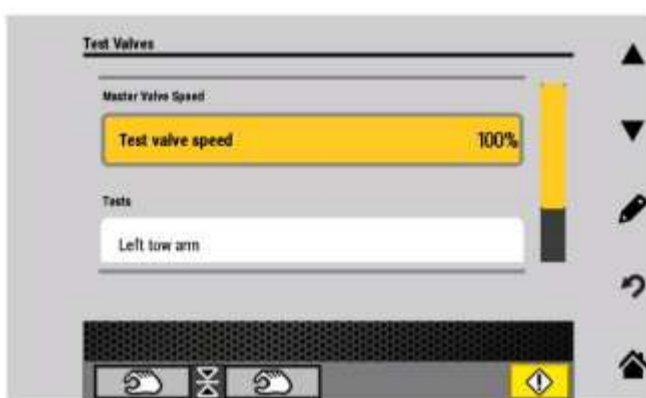


Illustration 15

g03803653

1. Select "Test Valves" from the main menu screen.

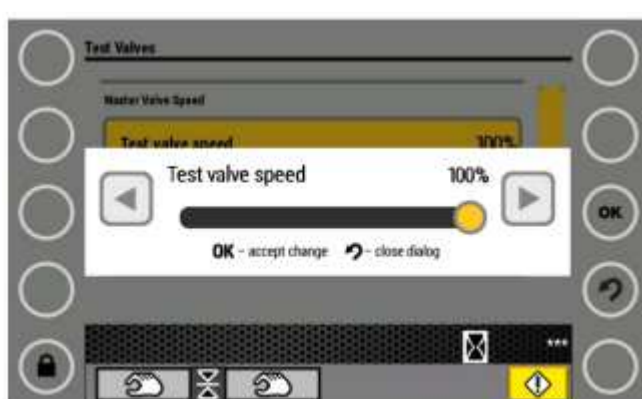


Illustration 16

g03818042

2. Select "Test valve speed" from the Diagnostics menu. Refer to Illustration 16

**Note:** The default value of the master valve speed is 100%. The valve speed percentage may be changed by selecting "Test Valve Speed". The valve speed is changed by touching the arrow buttons or moving the yellow slider button. Press "OK" soft key to save the change. The valve speed can be adjusted to check the response rate of the valve.

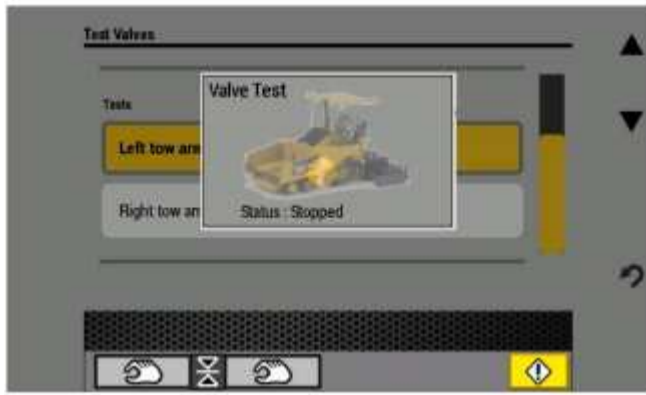


Illustration 17

g03810703

3. Select desired tow arm to test (tow point cylinder). A screen similar to Illustration 17 will appear.



Illustration 18

g03810710



Illustration 19

g03810736

4. Press the arrow buttons in the upper right corner to raise or lower the cylinder. The cylinder should react smooth and stable. Illustration 18 and Illustration 19 show the raise and lower commands.

## Report

The "Report" screen provides general information about the Grade Slope system.



Illustration 20

g03810777

1. Select "Diagnostics" from the main menu screen. From the Diagnostics menu, select "Report". Refer to Illustration 20.
2. Scroll using the arrow keys, or touch the yellow slider button. Available information:

Available system information:

- Product
- Software Version
- Software Date
- Serial Number
- OS Version
- RB410 OS Version

Available Hours Meter information:

- Operating Hours
- Control Hours (the amount of time spent in the "automatic" mode)

Additional Information:

- 2D Sensor check (live information that shows the operator which sensors are plugged in to the machine)
- Ethernet checks

## Error Log

The "Error Log" displays error messages (faults) that are stored in the Grade And Slope system after the ECM detects a problem.

1. Select "Diagnostics" from the main menu screen.



Illustration 21

g06218689

2. Select "Error Log". Refer to Illustration 21.
3. Scroll using the yellow slider bar at the right side of the screen or the arrow buttons.





Illustration 22

g06218723

4. Clear error messages by touching the "X" that is inside the circle. Refer to Illustration 22

The error log displays the following information:

**Details** - Description of the error

**Occurrences** - Number of times that the error has occurred

**Last** - Machine hour reading of the most recent occurrence.

## Software License Information

The software license page contains product information such as:

- Copyrights and Trademarks
- End-user license agreement
- Software product license
- Software warranty

1. Select "Diagnostics" from the main menu screen.
2. Select "Software License Info" from the Diagnostics menu to access information.

## Installation

The installation menus contain sensor and control settings, valve calibrations, firmware, and license key interface.

When the Installation menu is entered, a warning message will appear. The warning message is intended to inform the operator that changing certain settings may render the machine inoperable. Press the "OK" softkey to acknowledge and continue to the "Installation Menu".

**Note:** Entering the menu will also take the grade and slope system out of the "Automatic" mode. Do not enter when paving.

## Control Settings

The control settings menu allows the operator to configure valve speeds, cross-coupling, on-grade dead bands, and elevation control windows.

1. Select "Installation" from the main menu screen.

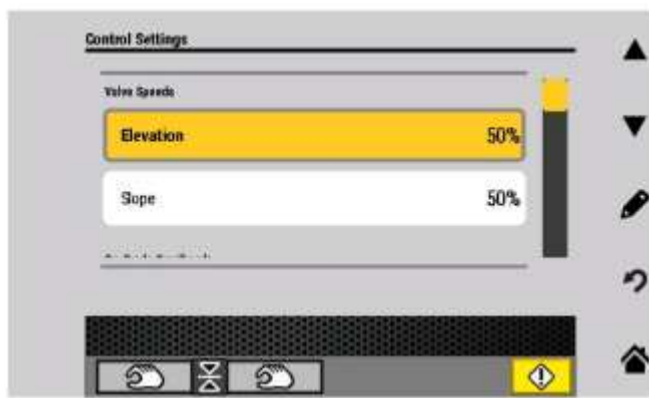


Illustration 23

g03818318

2. Select "Control Settings" from the Installation menu. A screen similar to Illustration 23 will appear.
3. Use the arrow keys to scroll, or touch the yellow slider button.

Configurable items:

- Manual Towpoint Speed
- Elevation Control windows
- Valve Speeds
- On Grade Dead bands
- Cross Coupling
- Slope Control
- Reset Function



Illustration 24

g06204571

**Manual Towpoint Speed** - Use this setting to adjust the speed that the towpoints are driven when using the increment / decrement buttons while in manual mode. This is different than the valve speeds, which is the speed the towpoints move when in Auto Mode.

**Elevation Control Window** - If the reported sensor deviation falls outside of the "Elevation Control Window" value, the system will go to manual and the elevation will be locked into the current position. The position lock guards against large, sudden changes in elevation movement. The position lock helps to maintain smoothness.

**Valve Speeds** - Use the valve speed menu in order to adjust the response time of the valve. If the valve is over correcting and causing short waves in the material, slow down the valve speed. If the valve is causing long rolling waves, speed up the valve speed. Default is 50%. Valve speeds can be adjusted dependently on the left hand side, right hand side, and the side being controlled by slope. If the valve speed is set to 0%, the valve will not drive.

**On-Grade Dead Bands** - The setting is used in order to select the distance from the "NULL" position before the system will signal the valves to drive. Adjustment of the "On Grade Dead Band" setting will also affect the LED patterns. For example, a value that is set to 3 mm (0.12 inch) is plus or minus 3 mm (0.12 inch) from the "Null" position. A value that is too small will cause the system to become unstable and will raise and lower the cylinder constantly.

- Sonic sensor (default value 3 mm (0.12 inch))
- Contact sensor (default value 1.5 mm (0.06 inch)1.5mm)
- Averaging Beam (default value 3 mm (0.12 inch))
- Slope (default value 0.10%)
- 3D (default value 3 mm (0.12 inch))

Sudden changes in sensor deviation may be caused by any of the following conditions:

- Rough terrain below the sensor
- Obstacles lying on the surface
- The sensor slipping off a curb being used as a reference surface
- Accidental movement of the sensor from the mounting
- An operator boot moving between the sensor and the reference surface

The system allows the elevation control window be set according to the sensor type. The "Elevation Control Window" setting does not affect slope sensors, however the setting does affect the following elevation sensors:

- Sonic sensor (default value 50 mm (1.95 inch))
- Sonic tracer averaging sample (default 10)
- Contact sensor (default value 20 mm (0.80 inch))
- Averaging beam ( 105 mm (4.15 inch))
- 3D elevation sensors (default value 50 mm (1.95 inch))

Sonic Tracer Averaging activates when a quick fluctuation in sonic data is detected and remains active until fluctuation is no longer detected. This value is the amount of sonic tracer readings being averaged together to keep the system running smoothly in the event of fluctuations in sonic tracer data. Increase the Sonic Tracer Averaging Sample to have more sample readings added to the averaging.

**Slope Control** - If unwanted slope movement is occurring when moving the extender on the screed, extender pause can be turned on. This will pause the slope control while the extender is in use.

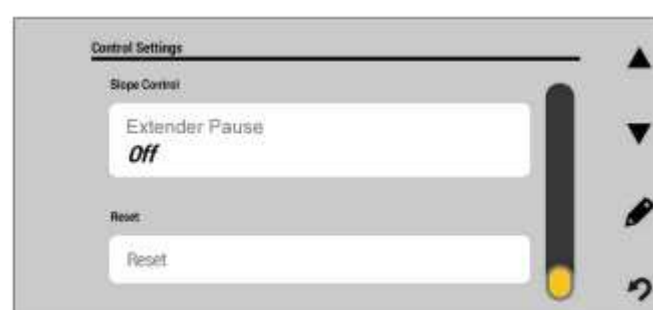


Illustration 25

g06218880

**Cross Coupling** - The cross coupling menu communicates corrections from one side of the machine to the other side of the machine. Use the cross coupling menu in order to ensure that the machine adjusts up and down without delays. Removing the delays will smooth out the movement. Removing the delays also prevents the opposite side of the cross coupling from digging into the desired grade. If the system determines that the elevation side must be raised to maintain mat depth, the system will automatically raise the slope side to maintain the desired cross slope. If cross coupling is set to 0%, the slope side will not move until the system senses that the slope sensor is not at the desired slope.

**Note:** Cross coupling can be adjusted to zero in order to stabilize the system in heavy passes or rough surfaces. Cross coupling default value 100%

**Reset Function** - The reset function allows the operator to set all control settings back to default values. Resetting is recommended as a starting point if there are undesirable control characteristics.

**Note:** Resetting the default values will not reset the valve calibration values.

1. Select "Installation" from the main menu screen. A screen similar to illustration 64 will appear



Illustration 26

g03818774

2. Select "Reset" from scrolling all the way down on the Installation menu. A screen similar to Illustration 26 will appear.
3. Press the "OK" softkey.

**Note:** All control settings will be set to default values.

## Left and Right Valve Calibrations

The valve calibrations are automatic sequences that the Grade Control system performs to tune the tow point valve to the system. The Grade Control system applies electrical current to the tow point valve in order to determine the operating range of the valve. The operating range of the valve is crucial in order to have a properly performing Grade Control system. Caterpillar recommends performing the calibration procedure periodically for optimum system performance.

**Note:** The left and right valve calibration procedures are identical. Left calibration applies to the left tow point valve and right valve calibration applies to the right tow point valve. Repeat procedure for opposite side.

**Note:** Calibration can only be performed on one side at a time. Once a calibration has been started on a display, do not interact with Grade and Slope screens on other displays.

The following components are required in order to perform a valve calibration:

- ST200 sonic sensor
- Sensor coil cord

- Necessary brackets to ensure that the ST200 is positioned even with the tow point cylinder
1. Park the machine on a flat and a level surface.
  2. Center the tow point cylinder to the middle of the cylinder stroke, using the controls on each side of the machine.
  3. Lower the screed. Drive the machine forward a few inches in order to remove any slack from the tow arms.
  4. Neutralize the pitch of the screed using the thickness control screw on each side of the machine. When pitch of the screed is neutralized, little or no resistance is felt when turning the thickness control screw.  
**Note:** On machines with no thickness control screws, use the tow point jog switches to align the screed so that the main plate is flat on the ground.
  5. Position a sonic tracer directly next to the tow arm cylinder on the side to be calibrated.  
**Note:** The sonic tracer must be oriented for use over a surface that is parallel to the side of the machine and approximately 46 cm (18 inch) above the surface.
  6. Select sonic sensor on main screen.  
**Note:** You cannot perform a valve calibration with a contact or slope sensor.
  7. Bench the sonic sensor on the main screen.
  8. Select "Installation" from the main menu screen. Follow the preparation steps in order on the screen:
  9. Select "Left or Right Valve Calibration" from the Installation menu.
  10. Warm oil.  
**Note:** Warm the machine oil to at least 45° C (113° F). Operate the paver augers and conveyors at full throttle to help warm the hydraulic oil. Cycle the tow point cylinder up and down several times so that warm oil enters the valve and cylinder.
  11. Ensure that the machine is configured to allow the system to control the tow points.
    - Engine running (low idle)
    - Propel mode set to "Pave"
    - Parking brake engaged
    - Propel lever forward
    - Screed in float
  12. Ensure that sonic sensor is properly positioned, as per Step 5.
  13. Touch "Completed – continue to calibration" or button next to right facing arrow.
-



Illustration 27

g06204616

14. "Set normal take off position" and press "OK" softkey when tow arm is centered.  
**Note:** Normal take off position, is the starting point of tow point cylinder centered with the sonic sensor approximately 46 cm (18 inch) inches off the ground.



Illustration 28

g03819333

15. "Set lower motion limit" and press "OK" softkey when tow arm is in green indicated area.  
**Note:** Use the arrow keys to lower the tow point to the green indicated area. Make small changes and allow the display to update tow arm position on screen.



Illustration 29

g03819381

16. "Set upper motion limit" press "OK" softkey when tow arm is in green indicated area.  
**Note:** Use the arrow keys to lower the tow point to the green indicated area. Make small changes and allow the display to update tow arm position on screen.

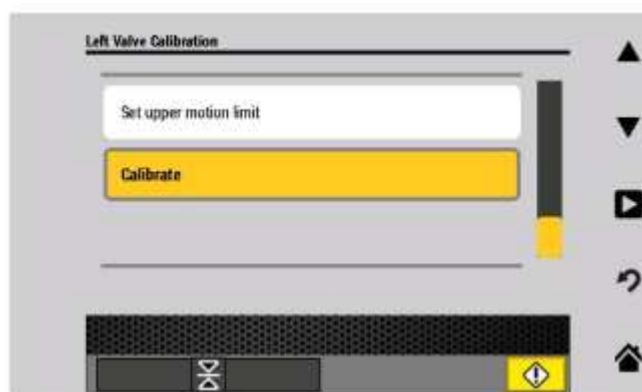


Illustration 30

g03819388

17. Touch "Calibrate" or button next to right facing arrow to begin calibration process. Refer to Illustration 30.

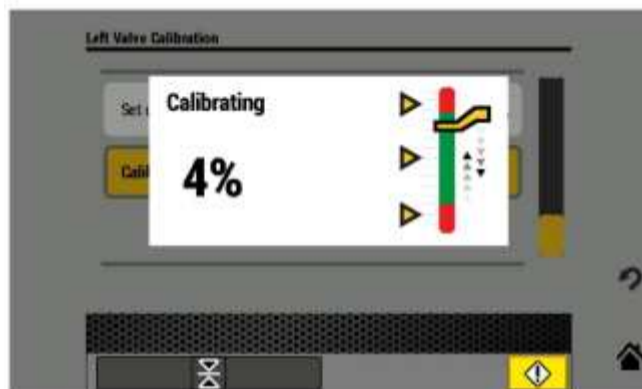


Illustration 31

g03819489



Illustration 32

g03819507

18. Wait for calibration process to complete. Refer to Illustration 31.  
**Note:** Calibration may take several minutes to complete.
19. When calibration is complete, a screen similar to Illustration 32 will appear. Press "OK" softkey to complete.
20. Repeat steps 1-12 for the opposite side.

## Firmware Upgrade

The "Firmware Upgrade" function is used to upgrade the Grade Slope system application.

This menu only appears when a USB is inserted in the machine. The USB port is located next to the ignition switch for the paver and connects to the left tractor display.

**Note:** The firmware upgrade can only be performed from the left tractor display and the USB stick must be inserted prior to performing the firmware upgrade.

1. Insert USB memory stick in USB port.
2. Select "Installation" from the main menu screen.
3. Select "Firmware Upgrade" from the Installation menu.
4. Touch icon or press menu button with right facing arrow to select "Upgrade Firmware". Upgrade will begin.

5. Wait for upgrade to complete.
6. Remove USB memory stick when complete message appears.
7. Reinstall protective cap over USB port immediately.

## Option Keys

The option keys menu contains information about the installation details of the grade slope system:

- Serial Number
- Product
- Software install date
- Software support date

**Note:** After Software support date, free software upgrades are no longer available without purchasing another license agreement.

## Language Menu

The language menu allows the operator to change the interface language of the Grade Slope system. The language is a display-specific setting, meaning that different language selections can be selected on the left and right screed displays. From the main menu screen, select "Language".

Available languages for selection:

- English
- French
- German
- Italian
- Spanish (Español)
- Portuguese (Brazilian) (Portuguese)
- Swedish
- Finnish
- Norwegian
- Danish
- Dutch (Netherlands)
- Slovakian
- Polish
- Czech
- Romanian
- Russian
- Chinese (Simplified)
- Indonesian (Indonesia)
- Turkish
- Thai
- Korean
- Vietnamese



- Japanese
- Arabic
- Serbian