

Calibration using Electronic Scales

Calibration of spreader controllers is very important to make sure the right amount of material is being spread from the back of the truck. A spreader that is off by 10% can result in a loss of 23 tons of salt each year. The cost of that many tons is nearly \$1,500 a year per truck. With 900 trucks in the Iowa DOT fleet if all spreaders were over applying by 10% it would cost the state \$1,275,000 a year in materials.

Spreaders should be calibrated at least once a year, before the start of the winter season. If any work has been done on the auger, spreader, coil, hydraulics or other part of the spreader system, it should also be recalibrated. Calibration of liquid systems (prewet and anti-icing) should also be done at the same time to make sure the right amount of liquids is being applied.

The following is a step-by-step procedure for calibrating a FORCE America SSC5100 spreader controller using an electronic scale:

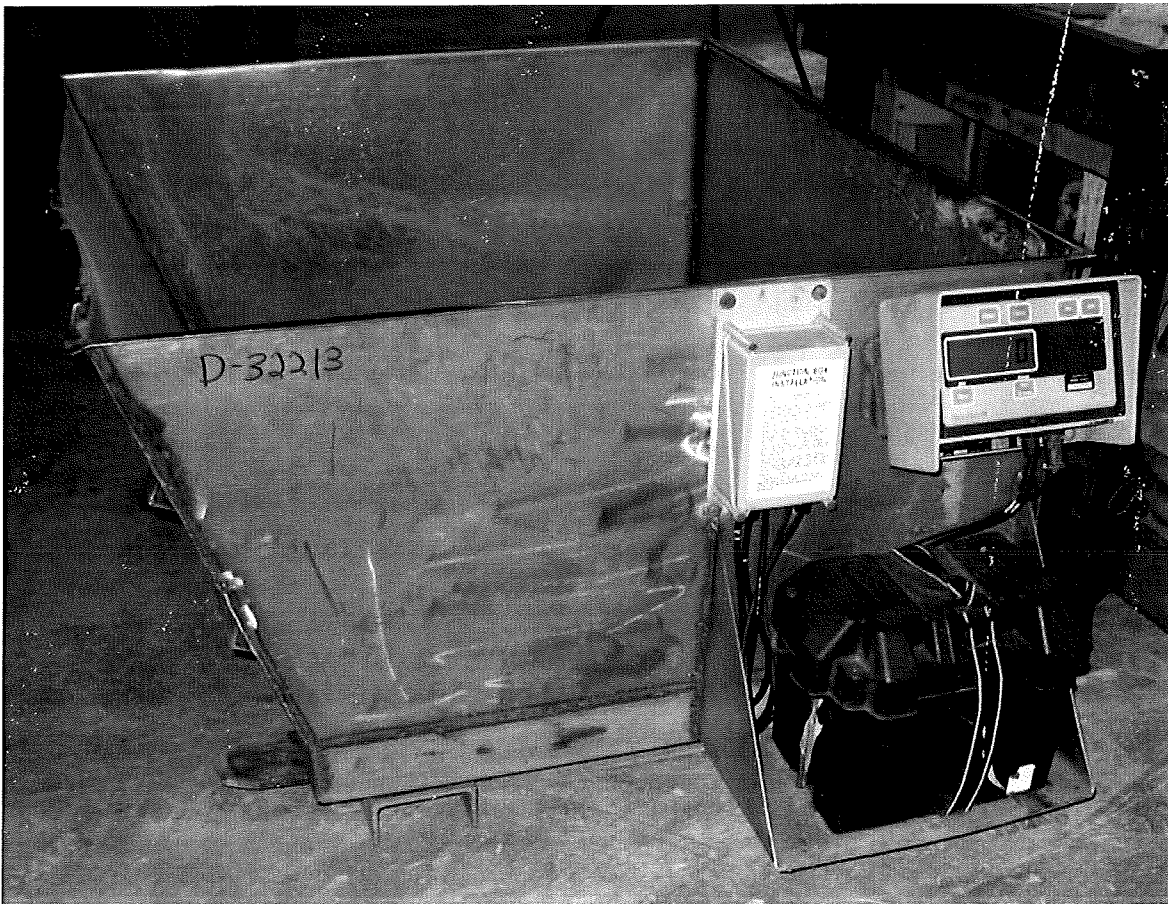


Figure 1 - Electronic Scale Used for Calibration

1. Make sure the salt you are using for the calibration is similar to the type used on the roadway and is free of clumps and debris
2. Make sure to keep your hands away from any moving parts while calibrating equipment

WARNING:

Always use caution when working around any moving machinery. During testing and calibration, always stay clear of moving parts and thrown material.

3. Make sure all connections between the readout display and the battery are secure and tight
4. Make sure the battery is secured to the scale. The best battery to use for this application is a gel type battery
5. Power-on the unit by pressing the On button
6. Clear the display by pressing the Net/Gross and zero buttons (the display should now show, "0" on the display screen)



Figure 2 - Press the Zero and Net/Gross Button to Reset the Scale

7. If you have an object in the garage that has a known weight, place it in the scale to see if the scale has the accurate weight. If the scale is off by more than a pound contact the scale manufacturer for how to initiate repairs

8. Remove the spinner from the truck
9. Place the electronic scale under the spreader discharge, but make sure the scale does not touch the truck or any other object. (Leaning on the scale or allowing it to touch the truck will add weight to the scale and give false readings).



Figure 3 - Raising the Dump Body

10. Raise the dump body to charge the spreader

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- Run a little material into the spreader to make sure the material is flowing freely and the auger is full

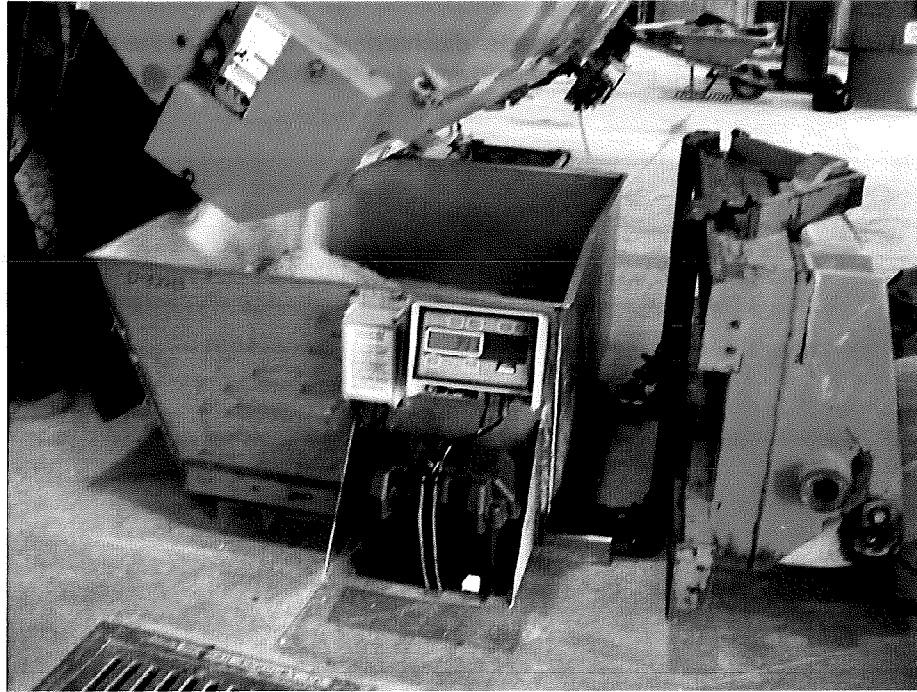


Figure 4 - Discharge Material to Ensure Auger Tray is Full.

- Reset the scale again by pressing the Net/Gross button followed by the zero button. This should reset the unit to zero (you do not need to empty the scales after each material run, just reset the display)
- Enter the CALIB menu on the SSC5100, and proceed to the material calibration menus.



Figure 5 - SSC5100 Material Calibration Menu

- Select YES to calibrate the LB/REV (displacement) of the selected material. MAT-A is shown in this example.
- Choose the PORTABLE scale type for the drop test, then proceed to the next menu.

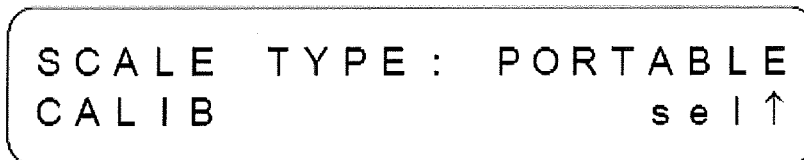


Figure 6 - Selecting Portable Scale Type

- The next screen displays the output speed of the auger/conveyor in % of max speed, as well as the number of turns counted by the spreader. To begin the drop, verify that everyone is clear of all moving parts, and press the SPREADER knob.
- Increase the % speed of the auger/conveyor by pressing the CENTER SELECT KNOB until the desired speed is reached. Turns will begin to accumulate.

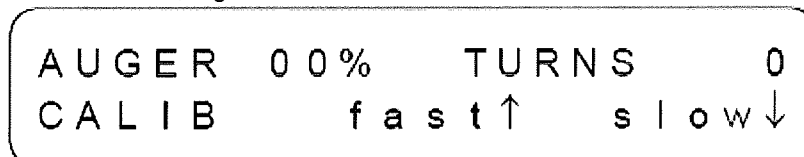


Figure 7 - Auger Speed and Turns Counted

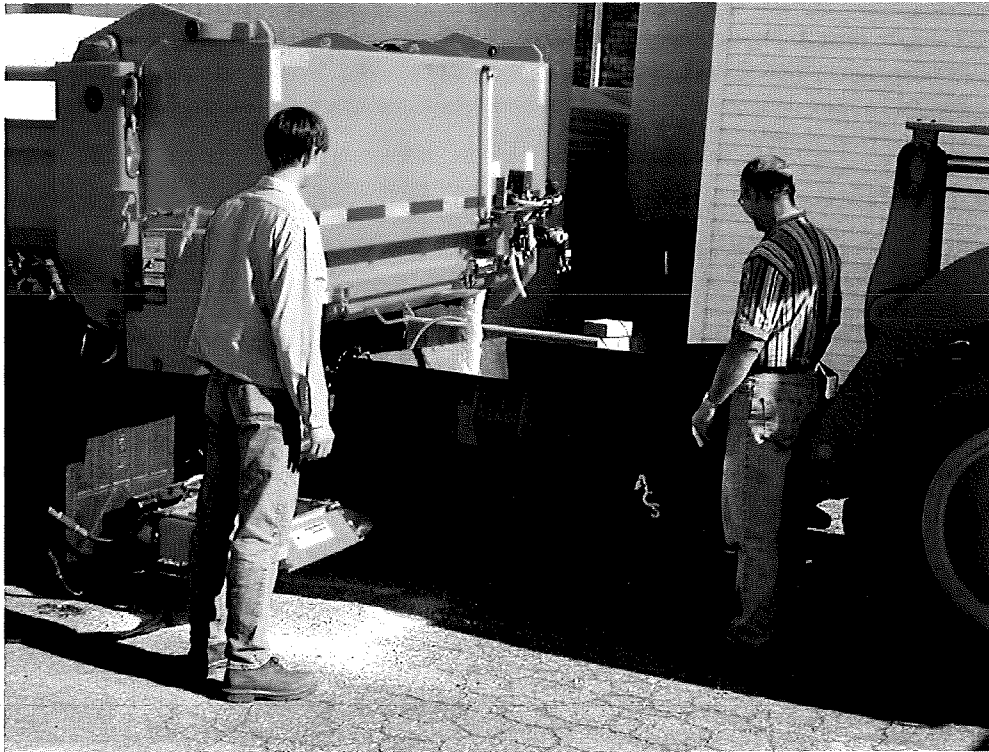


Figure 8 - Discharging Material During Calibration

18. Run the spreader until the scale reads a pre-determined weight (the higher the number the more accurate the calibration. 500 pounds is a suggested amount but a range between 250-500 should be adequate to get a good calibration).



Figure 9 - Scale Measurement

19. When the desired amount of material has been discharged, press the SPREADER knob to stop the output.
20. Rotate the LEFT SELECT KNOB on the spreader control clockwise to the following screen.

```

MAT - A  WGT           2 5 0  l b
CALIB      a d j ↑     s e l →
  
```

Figure 10 - Entering MAT-A Weight Discharged

21. Input the weight of the material discharged using the CENTER and RIGHT SELECT knobs. When the correct weight has been entered, rotate the LEFT SELECT knob to proceed.

```

CALC MAT - A  LB / REV ?
CALIB      y e s      N O
  
```

Figure 11 - Calculation of Displacement (LB/REV)

22. When Figure 11 is displayed, press the CENTER SELECT KNOB to have the spreader calculate the displacement for MAT-A.

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CALC MAT - A  LB / REV ?
CALIB                                D O N E
  
```

Figure 12 - Calculation Complete - Press DONE

23. Press DONE when the calculation is complete.

MAT - A	LB / REV	10 . 0
CALIB	adj ↑	sel →

Figure 13 - Display of Calculated Displacement

24. The calculated displacement will be shown on the display. In the example of Figure 13, a displacement of 10 LB/REV has been found.
25. At this point, the drop test is complete.
26. The test should be repeated at least two times for each truck but preferably three times to make sure the readings are reasonably consistent and repeatable.
27. Once the calibration is completed a calibration form should be completed on each truck and filed until the next calibration. A copy of the calibration should be kept in the truck and in the garage.

28. Some garages maintain historical records of truck calibrations to better understand when a system is becoming erratic and need further repairs. Use the FORCE America software CalCommand to retrieve and manage calibration settings for the SSC5100.
29. Make sure the electronic scale is turned off and secured to the end-loader with chains. Move the scales away from the truck to dump the salt back into the salt pile (If the scale is equipped with standard 12-volt battery, make sure to remove the battery before dumping the salt back into the pile. If a sealed gel-cell battery is used, it does not need to be removed before dumping the salt back into the pile).

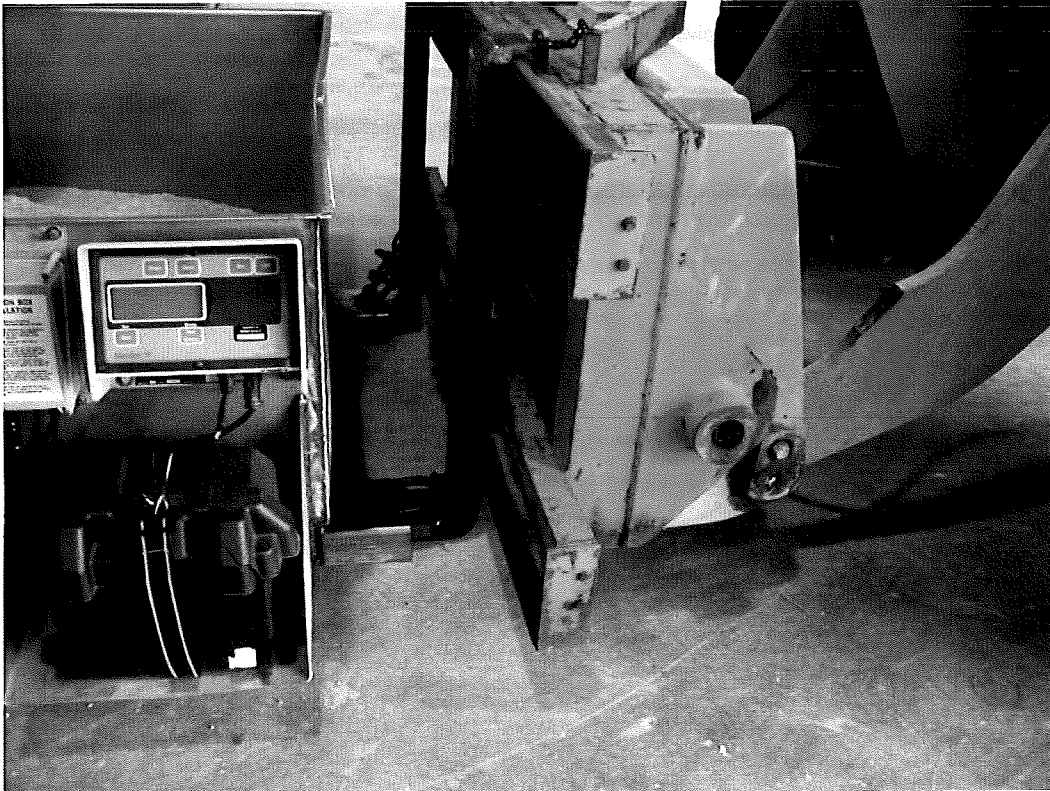


Figure 14 - Secure Scale to End Loader Before Emptying



Figure 15 - Secure Battery Prior to Emptying



Figure 16 - Scale Emptied and Ready for Cleaning

30. After calibrating all trucks, wash the scales thoroughly to remove any salt that might be left behind. If cleaned properly the scales should last for many years.



Figure 13. Make sure to wash the scale before putting it away

Using the electronic scale should reduce the amount of time required to calibrate trucks and also improve the accuracy of the spreader output.

If you have any problems with the electronic scale, please contact Scale-Tec at 319-462-2344.