

Installation of the Smart Cylinder Update Kit - AMX1000s

WARNING

Shut down the machine, disconnect the battery and lock it out before repairing, servicing, lubricating or cleaning the machine.

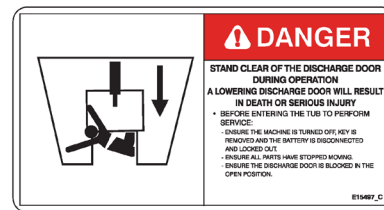
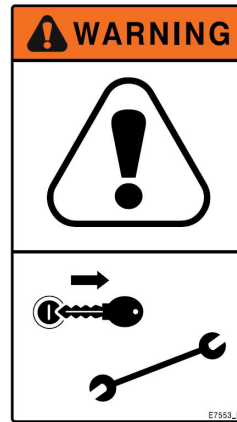
Remove

1. Ensure that the unload door is lowered to its lowest position and that the conveyor or drop chute is also lowered.
 - a. Refer to the Operator's Manual for details on how to lower the unload door and the conveyor or drop chute.

DANGER

Stand clear of the discharge door during operation.

A lowering discharge door will result in death or serious injury.



2. Disconnect the hydraulic hose fittings (1) from the hydraulic cylinder, as per *Figure 1*.
 - a. Oil will drain out of the hoses once disconnected. Catch and collect the oil in an appropriate container.
3. Remove the unload door hydraulic cylinder.
 - a. Remove the hardware fastening the hydraulic cylinder to the tub wall (2) and the unload door (3), as shown in *Figure 1*.
 - i. Keep the hardware for re-use.
 - b. Drain the oil out of the cylinder by inverting it over top of the container used in the previous step.

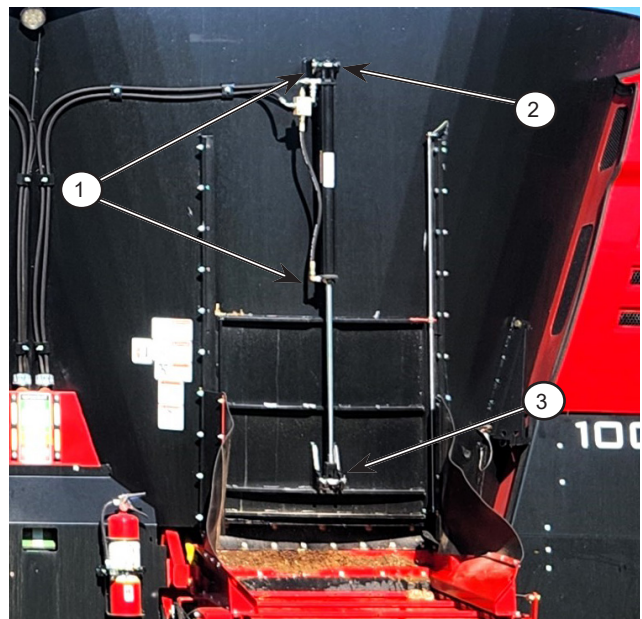


Figure 1: Remove the existing hydraulic cylinder
(Rear unload door shown)

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4. Remove the existing door sensor (1), as seen in *Figure 2*.
 - a. Disconnect the electrical harness from the top of the door sensor.
 - i. Keep the existing electrical harness in place.
 - b. Remove the hardware (2) fastening the door sensor to the tub, as per *Figure 3*.
 - c. Remove the hardware (3) fastening the door sensor to the unload door, as per *Figure 3*.
 - d. Remove the sensor.

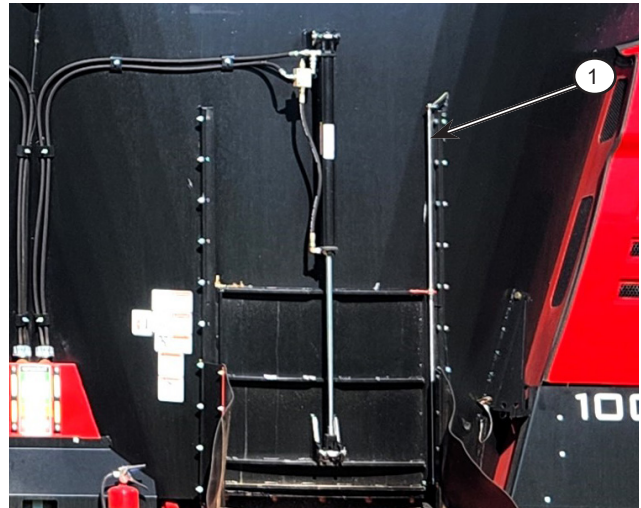


Figure 2: Existing door sensor
(Rear unload door shown)

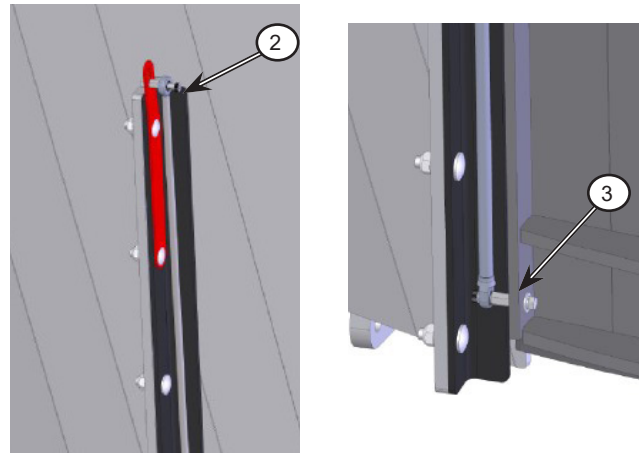


Figure 3: Attachment of the door sensor to the tub
and unload door (Front unload door shown)

Install

1. Set up the new hydraulic cylinder by installing the new smart sensor (1) within the cylinder (2), as shown in *Figure 4*.
 - a. Ensure that the smart sensor is clean and free from dust. Wipe off as needed.
 - b. Remove the plug from the top of the hydraulic cylinder. Discard the plug.
 - c. Insert the clean smart sensor into the hole at the top of the hydraulic cylinder.
 - d. Lubricate the o-ring at the top of the sensor with oil.
 - e. Thread the sensor into the cylinder, and tighten appropriately.

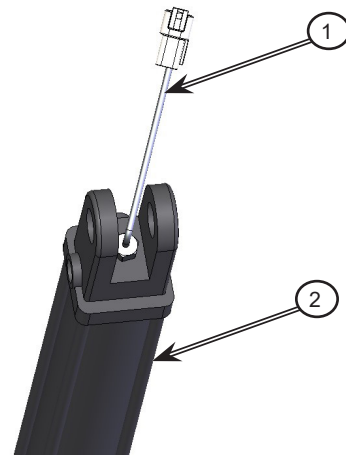


Figure 4: Set up the new cylinder

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2. Install the new hydraulic cylinder.
 - a. Use the previously removed hardware to install the new cylinder onto the tub wall and unload door.
 - b. Connect the previously removed hydraulic hose fittings to the appropriate positions (1) on the hydraulic cylinder; see *Figure 5*.
 - c. Wipe off any oil that may have leaked during the installation process. Ensure the area is clean.
3. Install the electrical harness extension; see *Figure 5*.
 - a. Connect the new harness extension (2) to the new smart sensor (3).
 - b. Connect the other end of the harness extension (2) to the existing door sensor harness (4).
4. Install the zip tie mounts; see *Figure 5*.
 - a. Clean the tub wall in suitable locations for the zip tie mounts (5).
 - b. Remove the backing paper on the mounts and adhere them to the tub wall.
5. Zip tie the harness extension in such a way to minimize strain on the sensor and to minimize rubbing anywhere, as shown in *Figure 5*.
6. Cycle the unload door up and down a minimum of 3 times to purge the air out of the hoses and new cylinder.
 - a. Follow the appropriate steps in the Operator's Manual to start up the machine.
 - b. Follow the appropriate steps in the Operator's Manual to raise and lower the unload door.
 - c. Check for any hydraulic leaks and tighten fittings as needed.

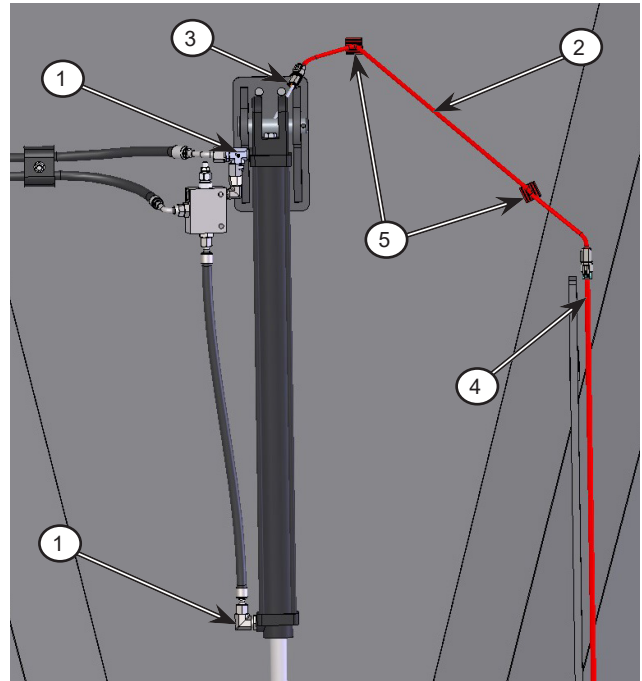


Figure 5: Install the new smart sensor



DANGER

Stand clear of the discharge door during operation.

A lowering discharge door will result in death or serious injury.



DANGER

STAND CLEAR OF THE DISCHARGE DOOR DURING OPERATION

A LOWERING DISCHARGE DOOR WILL RESULT IN DEATH OR SERIOUS INJURY

- BEFORE ENTERING THE TUB TO PERFORM SERVICE
- ENSURE THE MACHINE IS TURNED OFF KEY IS REMOVED AND THE BATTERY IS DISCONNECTED AND LOCKED OUT.
- ENSURE ALL PARTS HAVE STOPPED MOVING
- ENSURE THE DISCHARGE DOOR IS BLOTTED IN THE OPEN POSITION.

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7. Check the oil level in the hydraulic oil tank. If necessary, add oil to the tank.
 - a. Refer to the Operator's Manual for additional information.

Calibration

Note: Prior to calibration, the tub door position indicator on the Display may not show the correct door positions and may flicker.

1. On the Display, press the 'Unload/Load' button and select 'Unload'; see *Figure 6*.
2. Press the 'Unload' button and select 'Front & Rear'; see *Figure 6*.

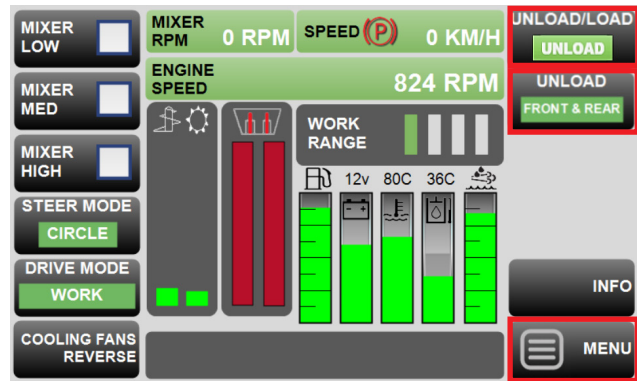


Figure 6: Main Display screen

3. Press the 'Menu' button; see *Figure 6*.
4. In the 'Menu' screen, hold down the bottom right rubber button until the 'BODAS Service' button appears, then release the button; see *Figure 7*.



Figure 7: Menu Screen

5. Press the 'BODAS Service' button; see *Figure 8*.
 - a. It may take a few seconds to populate this screen. Do not press any other buttons while waiting.



Figure 8: BODAS Service button appears

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6. In the Main BODAS screen, press the 'Scan' button; see [Figure 9](#).
 - a. The scanning process will take a few seconds to complete.

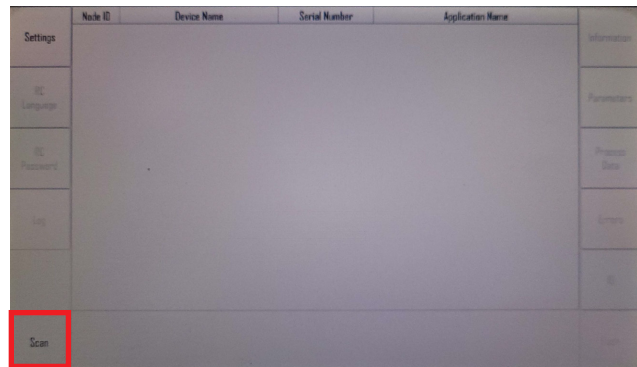


Figure 9: Main BODAS screen

7. Once scanning is complete, rotate the selector wheel to highlight 'RC28'; see [Figure 10](#).
 - a. Push the wheel to select it.

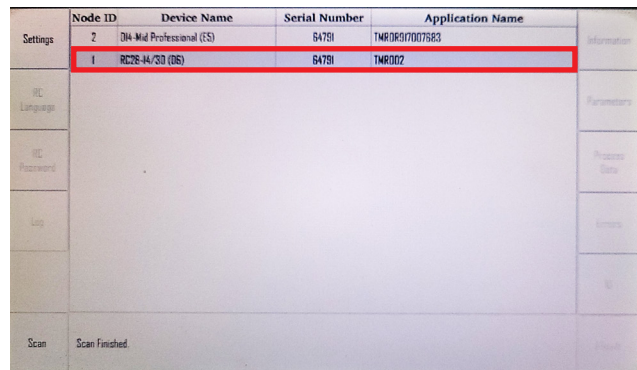


Figure 10: Select RC28

8. Once 'RC28' is selected, press the 'IO' (Input/Output) button; see [Figure 11](#).

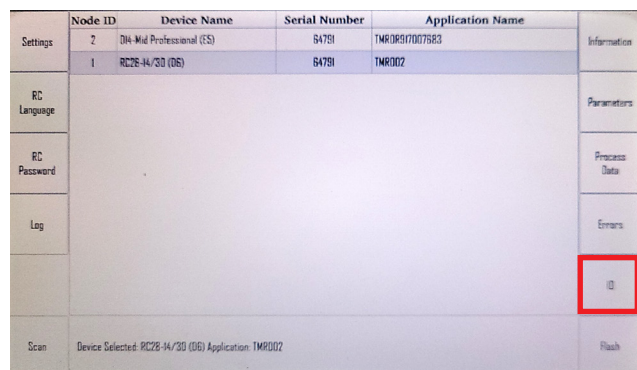


Figure 11: Press the 'IO' button

9. Press on the 'Next' button until 'Port' 'IN_28' and 'IN_29' appear on the screen; see [Figure 12](#).
 - a. 'IN_28' - Input for the FRONT unload door
 - b. 'IN_29' - Input for the REAR unload door

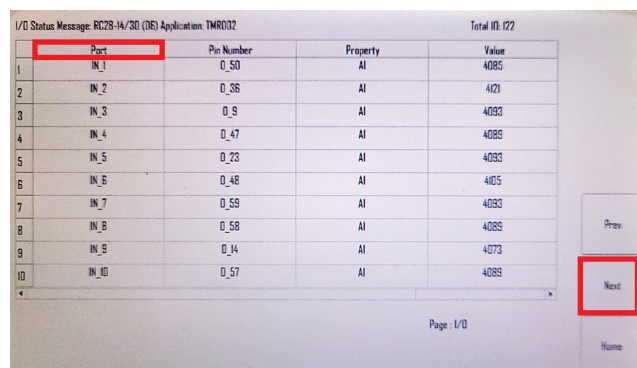


Figure 12: IO Screen

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10. Using the joystick, raise the unload doors up all the way. Refer to **Figure 13** as needed.
11. Record the 'Value' displayed in the 'IN_28' and 'IN_29' rows; see **Figure 14**.
 - a. The values will fluctuate. Watch the screen for a minimum of 20s and record the highest and lowest values that are displayed, e.g. IN_28: 550, 600.
 - b. The typical range is approximately 500 - 900 mV.
 - c. Record the values in the table provided on the following page.



Figure 13: Joystick Unloading Functions

12. To obtain the calibration values for 'IN_28' and 'IN_29' at the highest tub door position, add the highest and lowest values for each input together and divide that number by 3.
 - a. E.g. IN_28: $(550 + 600) / 3 = 383$
13. Using the joystick, lower the unload doors all the way down. Refer to **Figure 13** as needed.

Port	Pin Number	Property	Value
1	IN_1	AI	4085
2	IN_2	AI	4129
3	IN_3	AI	4093
4	IN_4	AI	4085
5	IN_5	AI	4093
6	IN_6	AI	4105
7	IN_7	AI	4093
8	IN_8	AI	4085
9	IN_9	AI	4073
10	IN_10	AI	4085

Figure 14: Record the 'Value's

14. Record the 'Value' displayed in the 'IN_28' and 'IN_29' rows.
 - a. The values will fluctuate. Watch the screen for a minimum of 20s and record the highest and lowest values that are displayed, e.g. IN_28: 4300, 4350.
 - b. The typical range is approximately 4000 - 4500 mV.
 - c. Record the values in the table provided on the following page.
15. To obtain the calibration values for 'IN_28' and 'IN_29' at the highest tub door position, add the highest and lowest values for each input together and divide that number by 3.
 - a. E.g. IN_28: $(4300 + 4350) / 3 = 2883$

DANGER

Stand clear of the discharge door during operation.

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DANGER

STAND CLEAR OF THE DISCHARGE DOOR DURING OPERATION

A LOWERING DISCHARGE DOOR WILL RESULT IN DEATH OR SERIOUS INJURY

- BEFORE ENTERING THE TUB TO PERFORM SERVICE:
- ENSURE THE MACHINE IS TURNED OFF, KEY IS REMOVED AND THE BATTERY IS DISCONNECTED AND LOCKED OUT
- ENSURE ALL PARTS HAVE STOPPED MOVING
- ENSURE THE DISCHARGE DOOR IS BLOCKED IN THE OPEN POSITION

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Door Position	IN_28	IN_28	Calculated Value (mV)	IN_29	IN_29	Calculated Value (mV)
Highest Point - Example	550	600	$(550+600)/3 = 383$	602	632	$(602+632)/3 = 411$
Highest Point (Open)						
Lowest Point (Closed)						

16. Press the 'Home' button in the bottom right corner.

17. In the Home screen, press the 'Parameters' button; see [Figure 15](#).

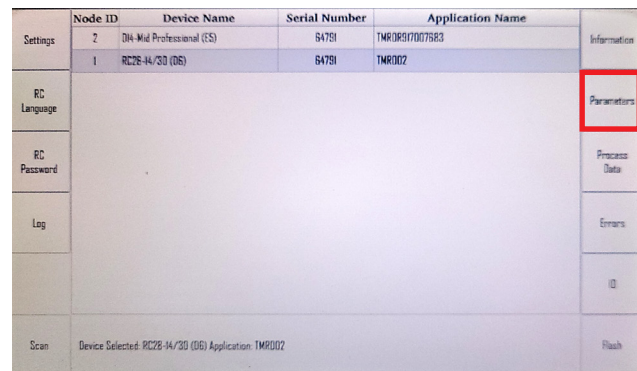


Figure 15: Press the 'Parameters' button

18. Using the selector wheel, scroll down to 'Menu 2'; see [Figure 16](#).

a. Push the wheel to select it.

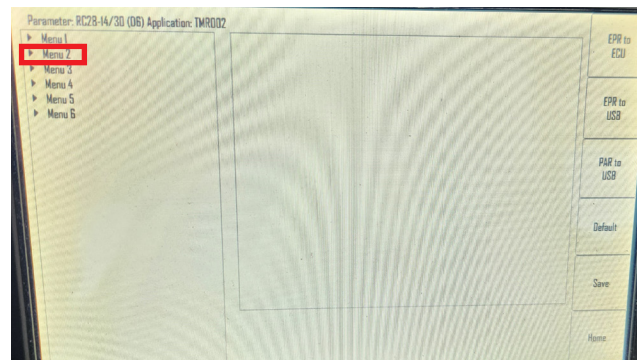


Figure 16: Select 'Menu 2'

19. Using the selector wheel, scroll down to 'Tub Position'; see [Figure 17](#).

a. Push the wheel to select it.

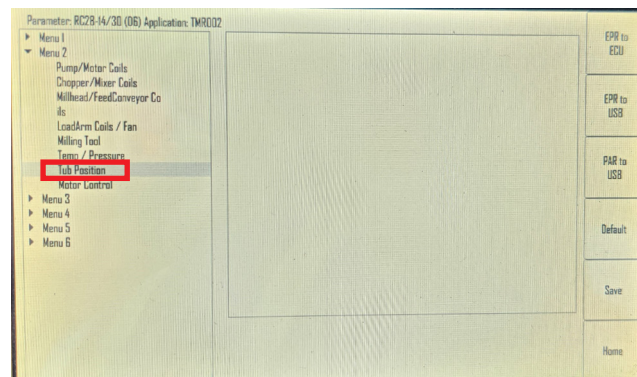


Figure 17: Select 'Tub Position'

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20. Using the selector wheel, select 'Tub Position Min' and input calculated calibration value for 'IN_28' recorded in [step 12](#) (e.g. 383); see [Figure 18](#).

- a. Use the selector wheel to input the appropriate values 1 digit at a time.
 - i. Push the wheel to select each digit.
 - ii. Click 'OK' once all digits are input.
- b. Press the 'Save' button.

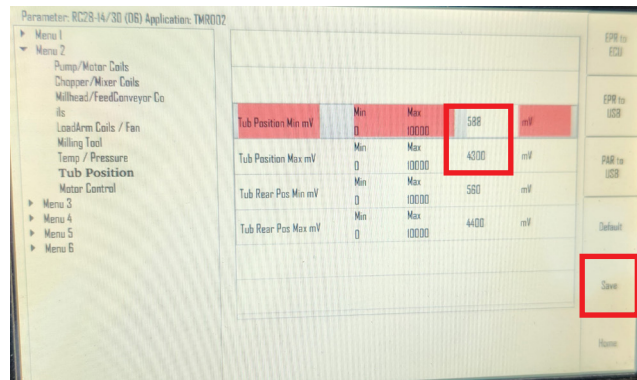


Figure 18: Input the 'IN_28' calibration values and save

21. Using the selector wheel, select 'Tub Position Max' and input calculated calibration value for 'IN_28' recorded in [step 15](#) (e.g. 2883); see [Figure 18](#).

- a. Use the selector wheel to input the appropriate values 1 digit at a time.
 - i. Push the wheel to select each digit.
 - ii. Click 'OK' once all digits are input.
- b. Press the 'Save' button.

22. Using the selector wheel, select 'Tub Rear Pos Min' and input calculated calibration value for 'IN_29' recorded in [step 12](#); see [Figure 19](#).

- a. Use the selector wheel to input the appropriate values 1 digit at a time.
 - i. Push the wheel to select each digit.
 - ii. Click 'OK' once all digits are input.
- b. Press the 'Save' button.

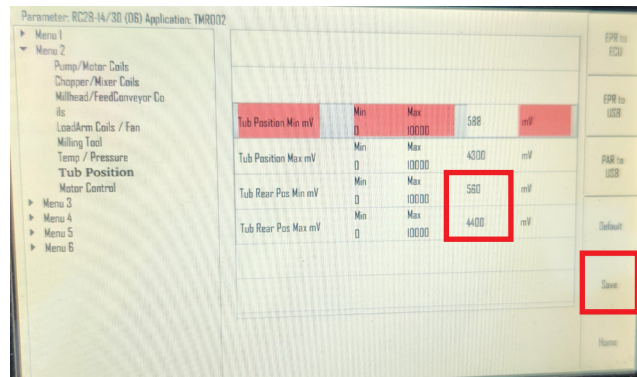


Figure 19: Input the 'IN_29' calibration values and save

23. Using the selector wheel, select 'Tub Rear Pos Max' and input calculated calibration value for 'IN_29' recorded in [step 15](#); see [Figure 19](#).

- a. Use the selector wheel to input the appropriate values 1 digit at a time.
 - i. Push the wheel to select each digit.
 - ii. Click 'OK' once all digits are input.
- b. Press the 'Save' button.

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24. Now that all values are input and saved, press the 'Home' button in the bottom right corner, and the 'Back' rubber button to return to the main Display screen.
25. Using the joystick, raise and lower the unload doors and monitor the door position indicator on the Display; see *Figure 20*.
- The tub door position indicator should be reading the position of the doors.
 - If the tub position indicator is not reading the correct position of the doors or is flickering, repeat the calibration.
 - If after a 2nd calibration the door position indicator is still not reading the correct door position or is flickering, contact your local dealer or Highline Customer Service.

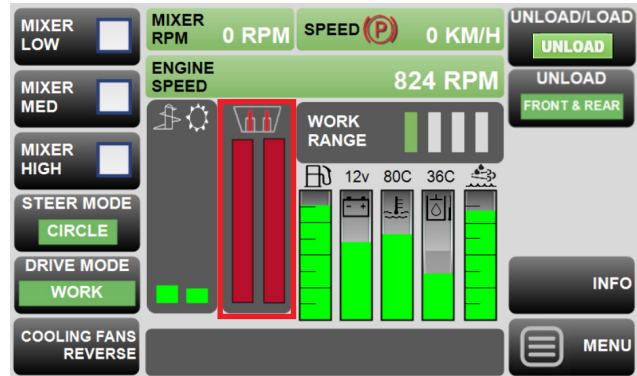


Figure 20: Tub Door Indicator



DANGER

Stand clear of the discharge door during operation.

A lowering discharge door will result in death or serious injury.

