

ML10EJ_ML340EJ Load sense functionality and trouble shooting



This instruction explains how the system works and shares troubleshooting steps in case a machine fails to complete the load sense calibration or goes into overload too fast.

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A. How does the load sense system work?

The load in the platform is related to the pressure inside the Jib cylinder: the more pressure, the more load is in the platform. As the jib angles and outreach vary during the movement of the jib, the load moment is not always the same: an angle sensor determines the angle of the jib so the system knows the angle of the jib and the pressure at that angle. With the load sense calibration we “learn” the system what the pressure and the jib angle is without load in the platform but also with the maximum platform capacity.

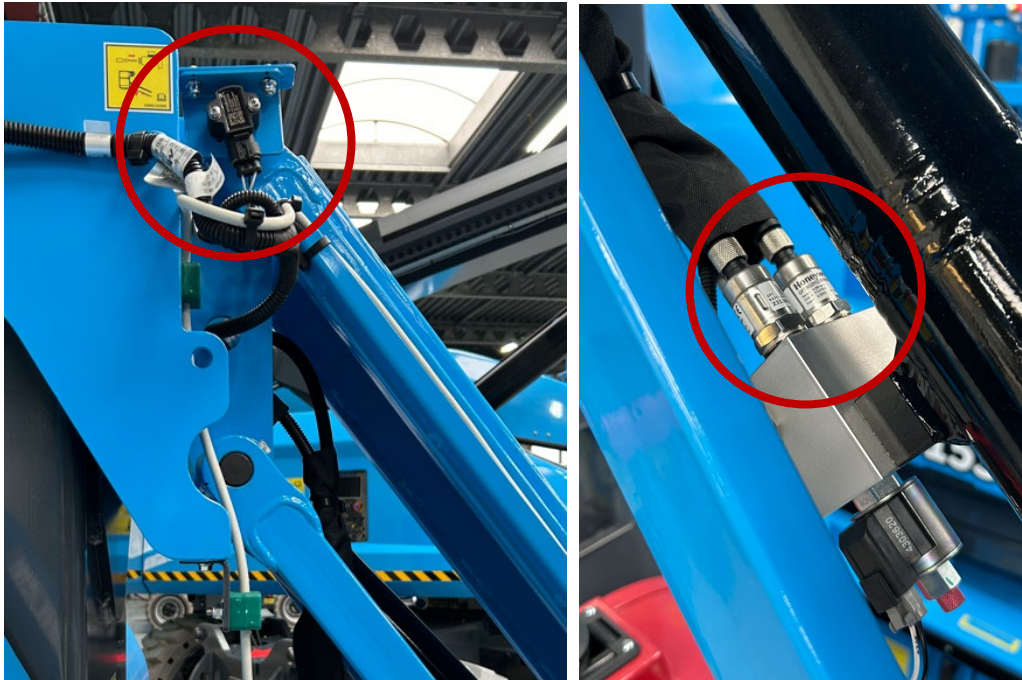


Image 1: the angle sensor(Left) and the pressure sensors(Right).

When we lower the jib during normal operation it should always stop just before the cylinder is fully retracted(the “down stop”): this is necessary to measure the pressure inside the jib cylinder. If the cylinder would be fully retracted the pressure reading would always be zero. See image 2 of the jib cylinder rod: it shows the Down stop and the mark when it is al the way down: the gab should be $20\text{mm}\pm 5\text{mm}$

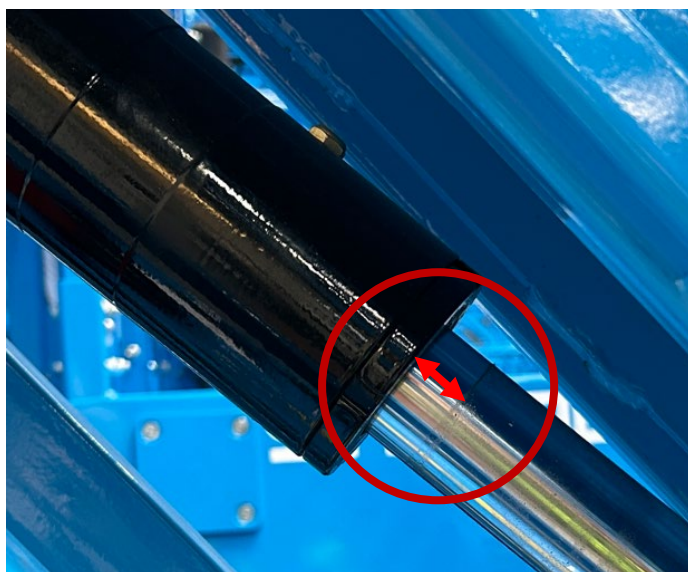


Image 2: Jib rod in the “Down Stop” Position

During the load sense calibration we must lower the jib cylinder with the emergency lowering valve because the system needs to store the full working range of the jib.

B. The process of calibration

Load sense calibration is done in 2 parts: Zero load calibration and Full load calibration.

In each part the platform goes 2 times up and 2 times down:

1st cycle: Up and down in stops: the jib goes up automatically up and down, stopping at various points; the system takes readings of the jib angle and pressure inside the jib cylinder.

2nd cycle: Up and down continuous: the jib goes up automatically in one go, same when going down.

C. Calibration feedback messages:

After the calibration the system should give the following feedback:

“No Load or Full Load calibration Complete!”(depending on the selected calibration) . This is ok, the calibration is successful.

“Pressure Sensor Failure !”(see D).

“Angle Sensor Failure !” (see E).

“No load or Full load Calibrating ...” It could also happen that somewhere in the process the platform stops at the top or at the bottom and does not continue, in the display it still shows “No load or Full load Calibrating ...” (see E).

D. “Pressure Sensor Failure !”

1. The system does not see enough change in the pressure, this fault does not happen often and usually goes together with a fault code 31. You may check the pressure sensor for the correct value: typically this should be 0.5 Volt when the Jib cylinder is completely lowered by the emergency lowering valve(no pressure in the cylinder). You can also check the ECU value(bit value) via the run screen menu. Image 3 shows that the select buttons for Mast, Jib and Turntable rotate are also Menu Navigation buttons:



Image 3: Display Menu Navigation buttons

2. Lower the jib by opening the jib down valve manually. To this this you must depress the red knob and turn it counterclockwise. If you release it lowers by itself so be careful.



Image4: emergency lowering valve

3. When the jib stops coming down, make sure to close the valve by depressing it and turning it clockwise.
4. Press and hold the Return button(Mast up/down selection button) until the display shows: Angle Sensor: 00???.
5. Press the Down button(Jib up/down selection button) once to see the pressure sensor value. This value must be 00087 ± 6 bits.

E. “Angle Sensor Failure !” & “No load or Full load Calibrating ...”

Are usually related to the same issues. Chapters F,G,H and I provide instructions to fix the issue.

F. Angle sensor is not set to the correct value:

6. Lower the jib to the lowest point(see steps 2 and 3).
7. Power up the machine to the ground controls and then press and hold the Return button(Mast up/down selection button) until the display shows: Angle Sensor: 00???.
8. The Value should be 180 ± 3 . If this is not correct then change the value by loosening the 2 screws that hold the angle sensor in place. Turn the sensor so that the value is set to 180. Tighten the screws and check the value again.
9. Perform the zero load and full load calibration to see if it is successful now.

G. Bad ground signal to the angle sensor:

10. The Jib down coil and the angle sensor share the same ground wire: it would be good to check the angle sensor reading while the down coil is activated. This to test the Voltage variation when current flow through the jib coil.
11. Lift the Jib half way so the arms are about horizontal.
12. On the Jib cylinder valve block: see image 5 below: remove the nut that holds the coil in place: remove the coil and keep it connected with the power supply. -Note- Do not remove the Valve.

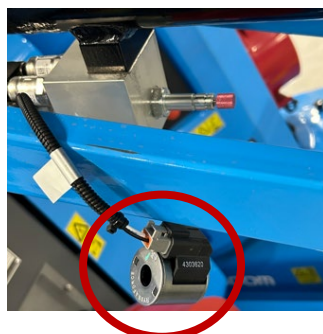


Image5: Jib Down coil removed from valve

13. From the ground controls power up the machine and press the return button: the angle sensor value is shown.
14. Press Up(turntable rotate selection) and then Down(jib selection): the angle sensor value is shown AND the Jib function is selected for ground control operation.
15. Note the static angle sensor value and activate jib decent via de enable and jib down button. The jib should not decent.
16. Note the value when the function is active. The difference between the 2 values could be seen as the Voltage difference due to the current flowing through the down coil.
17. Compare the static value and the value while jib down is active: they should not be more than 20 bits apart.
18. Is the Value difference ok? Then install the coil back on the jib and move to Chapter H. Is the value difference to much? Perform the following actions:



Image 6: Angles sensor ground wire Image

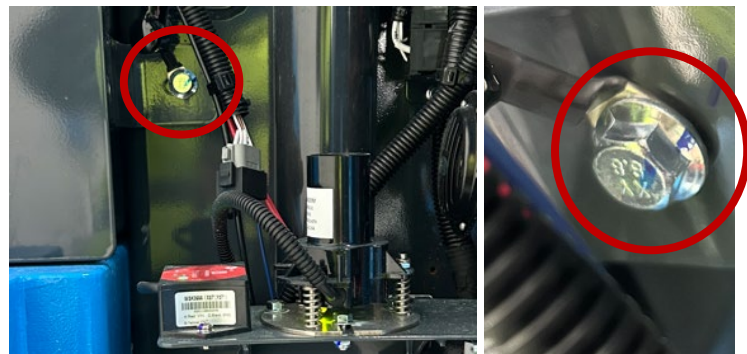


Image 7: Chassis Negative cable +close up

19. See image 6 and 7: Remove both the ground cable connected to the chassis and clean the contact surface, scratch off the paint to insure good electric conductivity.
20. Repeat point 17 and check if the reading has improved.
21. Is the Value within tolerance? Then install the coil back on the jib and move to point 24 Is the value difference still not ok? Perform the following actions:
22. Check all ground connections and wires from the battery terminal up to the jib decent coil. Improve Voltage drops and check point 17 for improvement. Especially the Grey 12 pin connectors at both ends of the spiral cable.
23. Is the Value difference now ok? Then install the coil back on the jib and move to point 24. Is the value difference still not ok? Contact Support@Sinoboom.eu for more information.
24. Perform the zero load and full load calibration to see if it is successful.

H. Angle sensor has play between the adaptor plate/ Pin/ bracket:

If the angle sensor has too much play it may also fail the calibration:

25. From the ground controls powerup the machine and press the return button: the angle sensor value is shown.
26. Press Up and then Down: the angle sensor value is shown AND the Jib function is selected.
27. Lower the jib with the emergency lowering so it is al the way down(see point 2). Note the angle sensor value.
28. Observe the angle sensor value as you activate Jib Up: it should start moving right away or with a very short delay. If the value remains the same for various degrees there is play.
29. Does it move right away? Perform the zero load and full load calibration. Is there a delay? Perform the following actions:

30. Check/ repair play on the angle sensor, bracket, adaptor plate or Pivot Pin. See image 8 below:

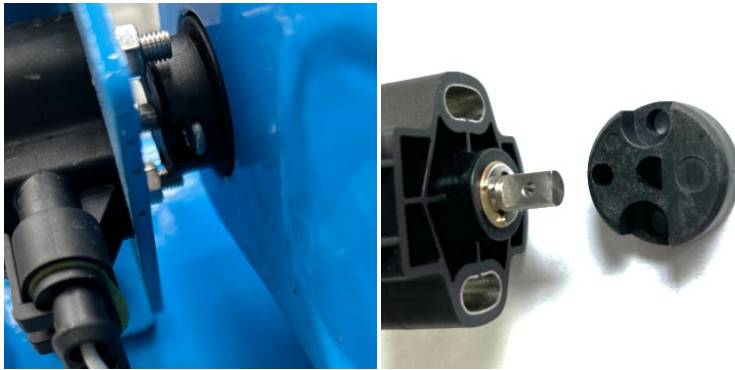


Image 8: Angle sensor shaft and adaptor plate

31. After fixing the play perform the zero load and full load calibration.

I. Perform Software Update.

If chapters F,G and H do not help then observe the ground control display while powering up the machine: read the software revision: If it starts with 12 then an update could fix the load sense calibration issue.

32. Contact your Sinoboom dealer or email to Support@Sinoboom.eu for the Software and instructions.
33. Perform the zero load and full load calibration and check for improvement.

J. Jib down stop is too high

34. If the jib down stop is too high then check the instructions for: **F. Angle sensor is not set to the correct value.**
35. If this is ok then lift the jib horizontal and make a small adjustment on the angle sensor position. You can do this by loosening the 2 screws that hold the angle sensor in place. Turn the sensor just a little and remember to which side you have turned the adjustment.
36. Tighten the screws and lower the jib with the down function until it stops. You may have to do this a few times to get the correct stop, just make sure to lift the jib much higher before lowering it again. See image 2: the stroke should be around 20mm±5mm. Note: when the angle sensor position is been adjusted you must recalibrate the load sense system.
37. If this all does not help you can adjust the spare 6 in the Sensata PC diagnostic software.
38. For the Software and Software training please contact your Sinoboom dealer or email us via support@sinoboom.eu

K. Jib down stop is too low

39. If the Jib continues to lower until the cylinder is fully retracted(no down stop) then first check the instructions for: **G. Bad ground signal to the angle sensor.**
39. If all these solutions are checked and it is still not ok, you can adjust the spare 6 in the Sensata PC diagnostic software.
40. For the Software and Software training please contact your Sinoboom dealer or email us via support@sinoboom.eu

L. Machine gets in overload at maximum jib height:

41. Usually this fault disappears after performing the instructions for: ***J. Jib down stop is too high or K. Jib down stop is too low.***
42. But if the machine performs well and only has this issue you can lower the spare 3 parameter in the Sensata PC diagnostic software in steps of 5 bit.
43. For the Software and Software training please contact your Sinoboom dealer or email us via support@sinoboom.eu

Need help? Please contact your local Sinoboom dealer or the support@sinoboom.eu mailbox for questions.