HarvestMaster™

BY JUNIPER SYSTEMS

GrainGage™

H2 NIR Upgrade

INSTALLATION GUIDE

H2 NIR Upgrade Installation Guide

Part Number: 31360-00

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Disclaimer

Information is subject to change without notice.

Cautions

⚠ **CAUTION: This symbol indicates that failure to follow directions could result in damage to equipment or loss of information.**

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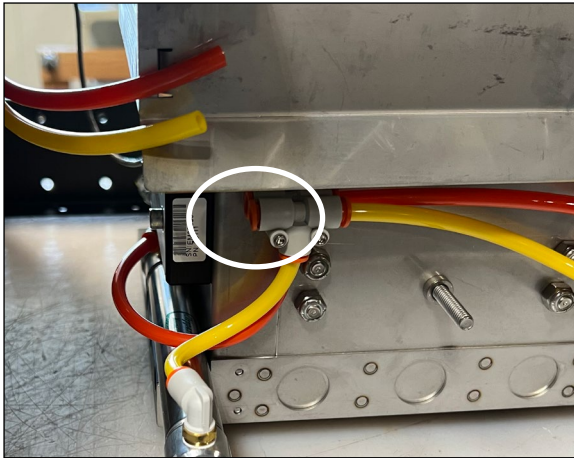# Contents

GrainGage™

H2 NIR Upgrade

INSTALL NIR UPGRADE

Single, Twin, and Triple

1 Install NIR Upgrade for Single, Twin, and Triple

1.1 Remove the Test Chamber

1. Turn off air and power. Follow all lockout/tagout procedures.

2. At the T fittings, disconnect the air lines that connect the air valve to the test chamber.
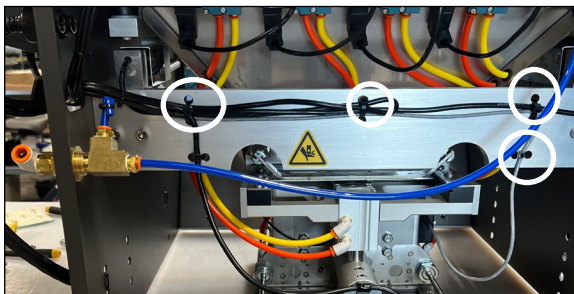

3. Use a flathead screwdriver to remove the test chamber slide gate limit switch sensor from the air cylinder. Let it hang. Keep track of the screw.

4. Disconnect the moisture sensor.

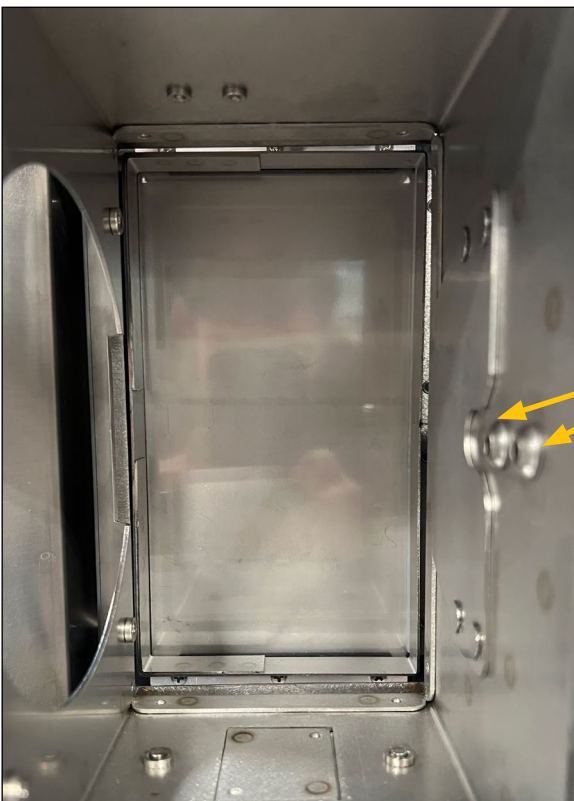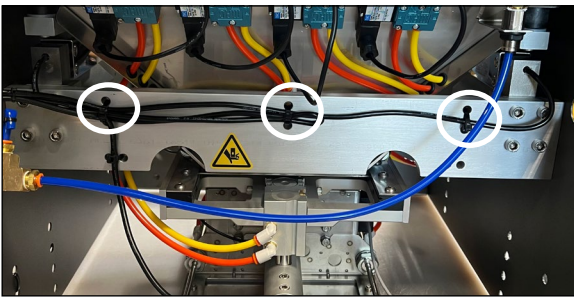   a. Unplug the moisture cable from the moisture port of the DSP module.

   b. Remove the zip ties that secure the moisture sensor cable to the chassis.

5. Reapply the zip ties to secure the load B cable. Trim the zip tie tails.

6. Carefully remove the two button head cap screws, holding the chamber to the load cell.

⚠ **CAUTION: Avoid stripping the screws, which have Loctite on them, by using a good Allen wrench and cleaning out the hex-head hole with a pick.**
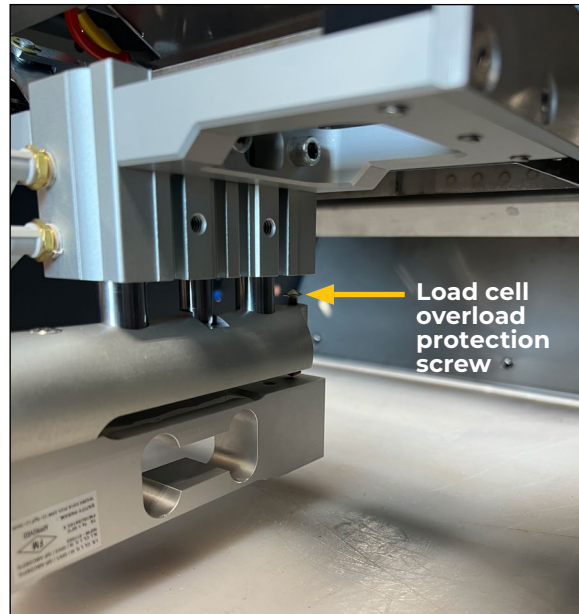

Button head cap screws

7. Remove the test chamber assembly from the GrainGage.

1.2 Install the New Chamber

1. Place the new chamber in the GrainGage. Fit the chamber lip over the fill guide.

    Note: If necessary, screw in the load cell overload protection screw four or five turns to allow the new chamber to fit into place.


Load cell overload protection screw

2. Apply Loctite 243 to the threads of the two button head screws. Hand tighten the screws.

Button head cap screws

3. Check that the new chamber is properly aligned:

   - The gap between the fill guide and the chamber is consistent and even. Check the gap when the chamber is in the down position.

   - The chamber slides freely. It does not rub or bump.

Consistent gap

Inconsistent gap
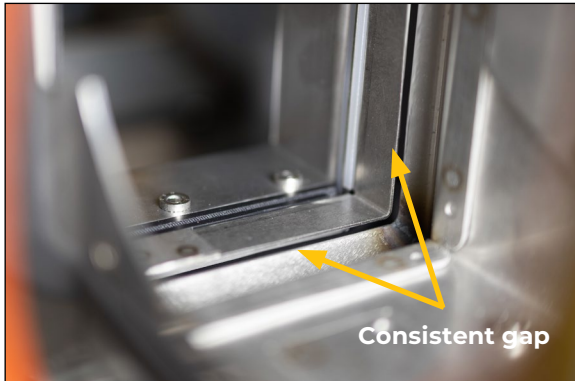
4. Tighten the button head screws securely.

⚠ **CAUTION: Make sure the test chamber can slide up and down freely without contacting the fill guide.**

Note: It is possible to install the test chamber crooked enough that it will hit the fill guide when it raises. Lightly tighten the test chamber screws, and then lift the chamber to check for interference with the fill guide. With the chamber lifted, look up through the test chamber and center it around the fill guide. Then, tighten the test chamber screws completely.

5. If you adjusted the load cell limit screw (in step 1), use a 5/16 wrench and adjust the screw to have a 0.006 in. gap.
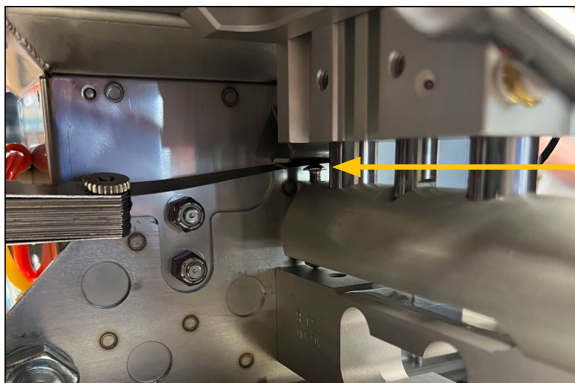
Load cell overload protection screw
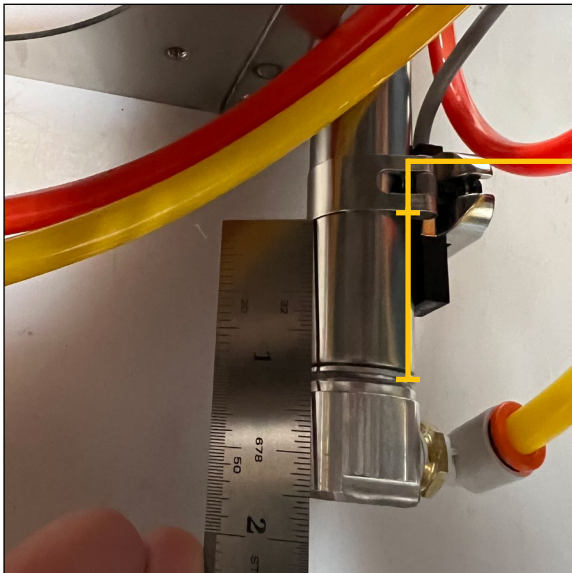
6. Attach the limit switch sensor to the air cylinder, aligning the band about 1 in. from the end of the air cylinder as shown.

Correct position of the limit switch sensor on the air cylinder

1.3 Adjust the Air Lines

1. From the Mac-valve side, remove the bottom gate air lines that were disconnected from the T fitting. (See step 2 in 1.1 Remove the Test Chamber on page 5.)

2. Replace the removed air lines with the 20 in. air lines provided in the upgrade kit. Route the 20 in. air lines through the two empty grommets on the left side of the bucket.

   Note: The air lines go in the grommets on the opposite side of the GrainGage from the ones you just removed.

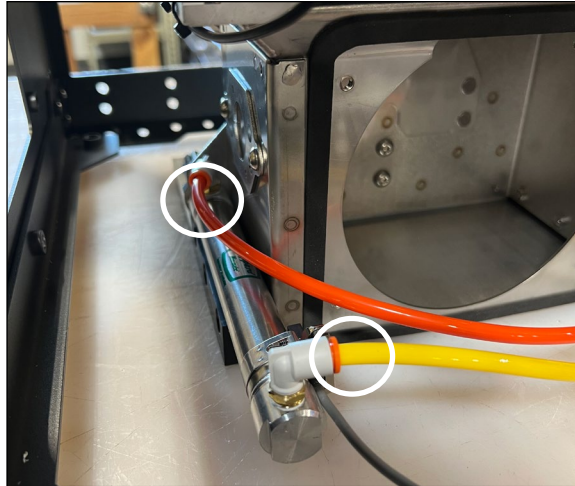   Use a non-corrosive lubricant to get the 20 in. air lines through the rubber grommets.

Before
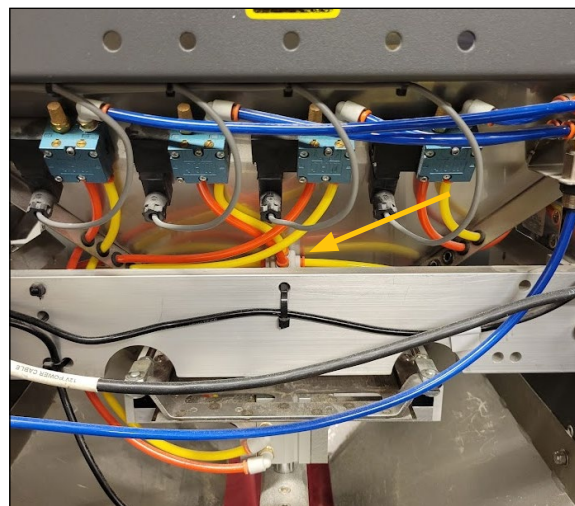
After

3. Route the supply lines to the test chamber as shown.

Supply lines

4. Disconnect the two air lines in front of the SCiO Sensor hole.

1.4 Install the SCiO Sensor

1. Position the SCiO Sensor in the new chamber. For best results,

   ▪ Match the top of the sensor to the top of the opening in the chamber.

   ▪ Insert the sensor at a slight angle. The top of the sensor angled in toward the opening.

2. Tighten the four captive screws in the sensor, using a cross pattern.

   ⚠ **CAUTION: The screws will still tighten if misaligned, and it's not always obvious.**

3. Check that the SCiO Sensor aligns properly with the test chamber from the inside.

   In proper alignment,

   ▪ The square portion of the sensor inserts fully through the sheet metal.

   ▪ The sensor plastic is flush with the inside of the sheet metal and is not recessed.

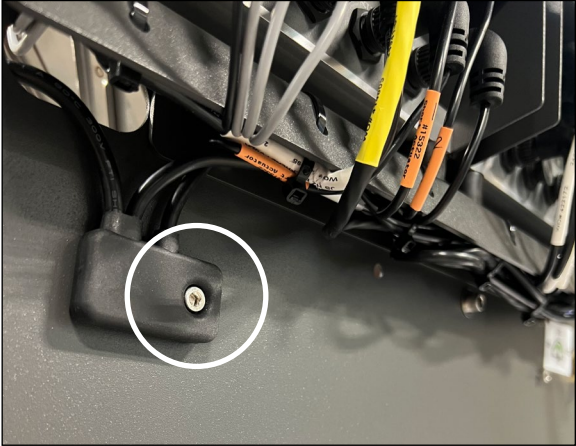   If sensor plastic is recessed or misaligned, loosen the four screws and realign.
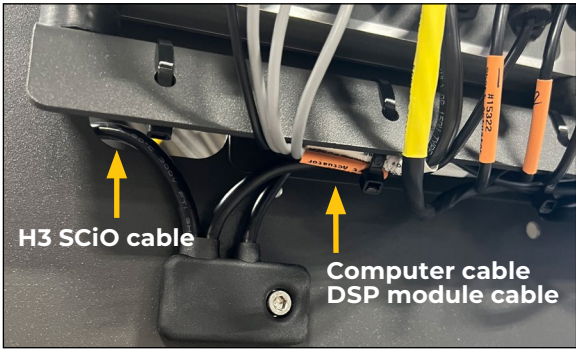

Correct installation

Incorrect installation

4. Reconnect the air lines to the left air cylinder.

5. Attach the 30712 H3 SCiO cable assembly to the outside of the GrainGage, using the ¼-20x½ in. socket head cap screw and nylock nut.

H3 SCiO cable

Computer cable
DSP module cable

6. Route the H3 SCiO cable into the GrainGage.

7. Route the computer and DSP module cables under the cable rail.

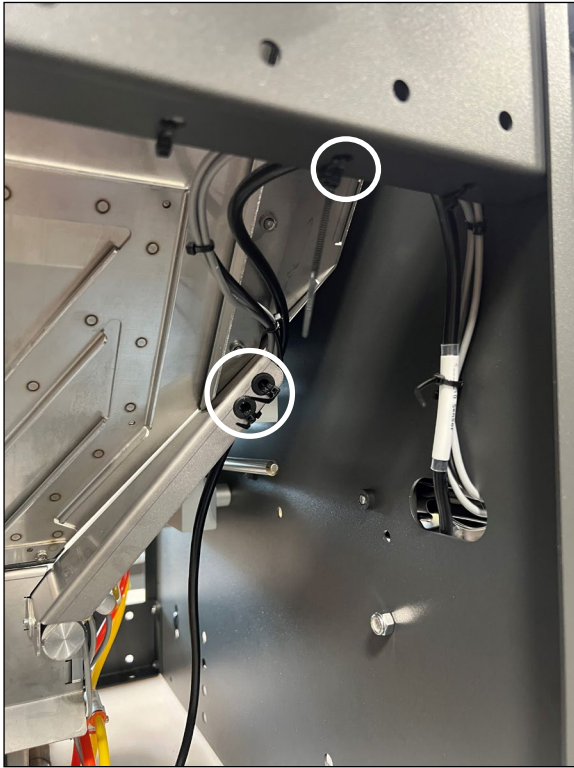8. Attach the moisture cable to the DSP moisture port.

9. Position the computer cable end as needed. Shown here inside the chassis.

10. Coil and secure the computer and moisture cables to the cable rail, using the provided zip ties.

11. Attach the SCiO cable to the SCiO Sensor.

12. Secure the cable as shown with zip ties. Allow enough slack for the test chamber to cycle without stretching the cable. A strained cable could affect the accuracy of the test weight.

1.5 Apply the Label

1. Install the new H3 GrainGage label.

1.6 Connect to the Computer

1. Position a 30712 Serial to USB cable from the junction cable to the cab. Follow the same path as the CAN cable or a cleaner path if available. If needed, you can use the 31518 SCiO 15 ft extension cable here.

2. Plug the USB end of the serial to USB cable into the USB Port of the tablet. Secure the USB end so that it can't vibrate out.

1.7 Connect to Mirus

1. Download and install Mirus 4.5.0 or above.

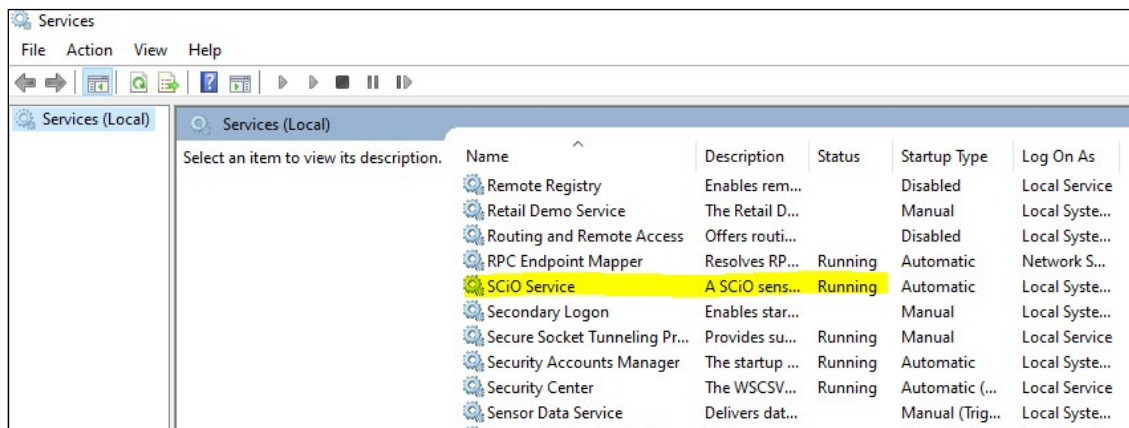   *Note: When asked to launch Mirus, do NOT launch.*

2. Enable the H3 Plugin in the Plugin Manager.

3. Install the SCiO Service for the sensor.

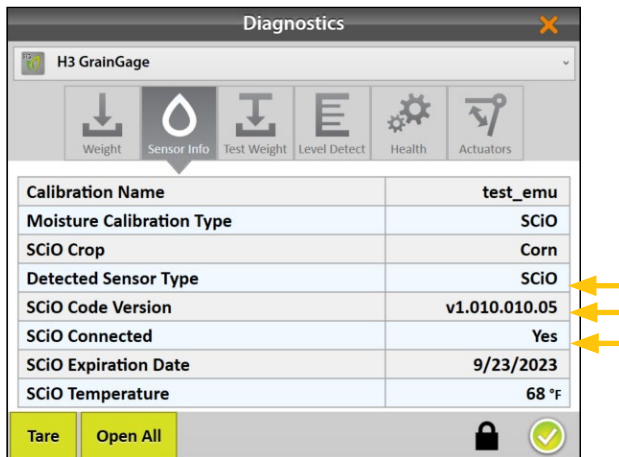   Note: Each sensor has its own activation link. If you have not yet received your link,

   a. Go to harvestmaster.com/support. Tap **My Product**.

   b. Tap **SCiO License Renewal**.

4. Open Mirus and connect the H3 GrainGage plugin.

   If Mirus does not successfully connect to the H3 GrainGage, complete the following steps in order.
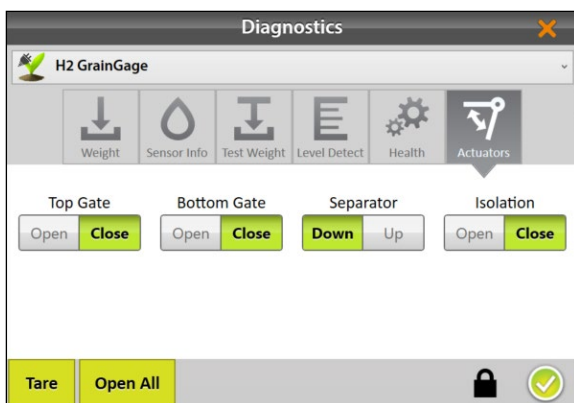
   a. Press the red button on the system controller to power off the GrainGage.

   b. Close Mirus.

   c. Unplug the CAN to USB cable from the computer.

   d. Unplug the serial to USB cable from the computer.

   e. Check that the SCiO service is running by checking the Windows Services application, as shown below.

   f. Plug the serial to USB cable into the computer.

   g. Press the red button on the system controller to turn on the GrainGage.

   h. Plug the serial to USB cable into the computer.

   i. Open Mirus.

   j. Tap the H3 icon to connect to the GrainGage.

5. Open Diagnostics, and tap the **Sensor Info** tab. Check the following settings.

   - Detected sensor type: SCiO.

   - SCiO code version: If unsure if this is latest version check with HarvestMaster repsentative.

   - SCiO connected: Yes.

6. Calibrate the test weight load cell, weigh bucket load cells, and slope and motion. (See the Mirus manual for how to calibrate.)

7. Ensure that the air lines were connected properly.

   a. Open Diagnostics.

   b. Open and close each gate while watching the GrainGage to verify that the gates open and close as expected.

Your H3 installation is complete. You are ready to follow standard harvest procedures.
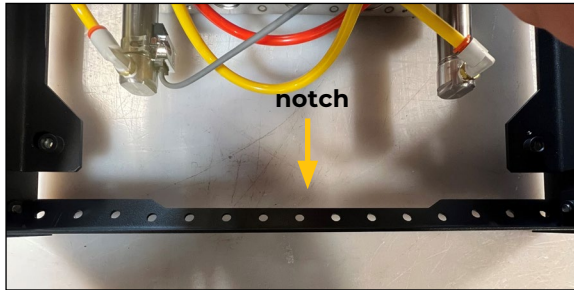
GrainGage™

H2 NIR Upgrade

INSTALL NIR UPGRADE

Classic

# 2 Install NIR Upgrade for Classic

2.1 Remove the Test Chamber

1. Turn off air and power. Follow all lockout/tagout procedures.

2. Check the bottom back crossbar. If the crossbar has no notch, replace with the notched version of 26242 H2M Crossbar.
Note: The notch is positioned on the inside of the GrainGage facing the bottom slide gate to allow more clearance between the crossbar and an open bottom slide gate.
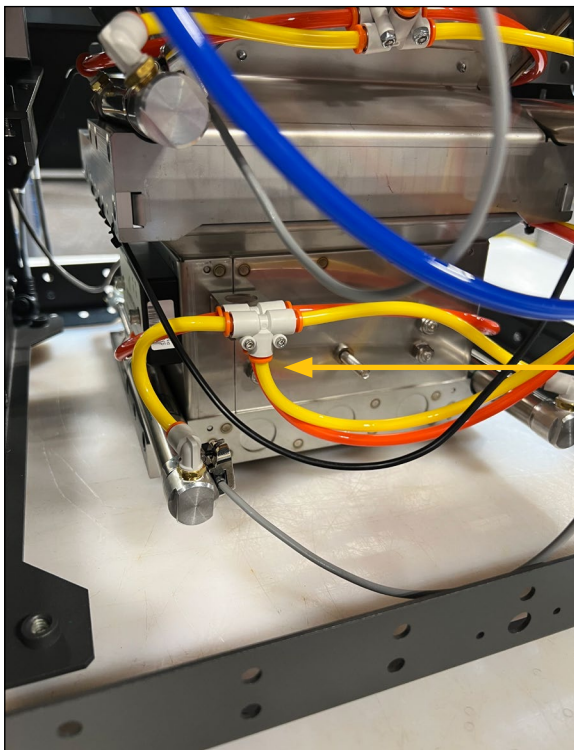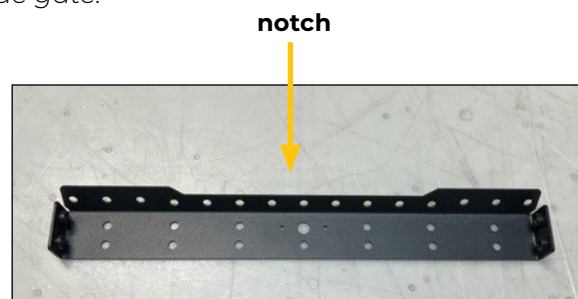

3. At the T fittings, disconnect the air lines that connect the air valve to the test chamber.

4. Shorten the air lines to 16 in.

Disconnect the two air lines and shorten to 16 in.
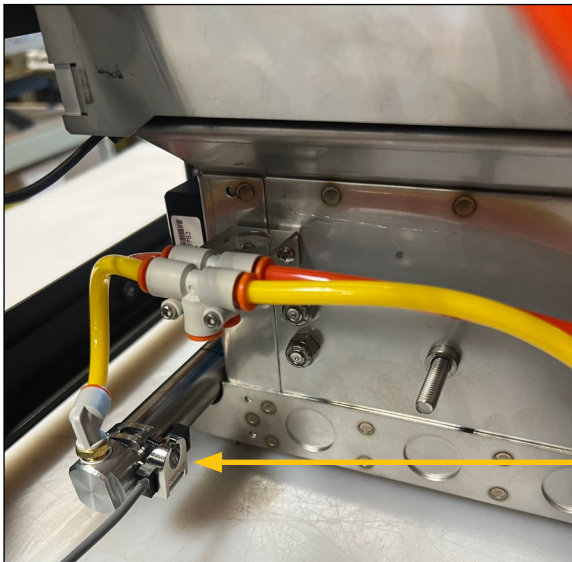
5. Use a flathead screwdriver to remove the test chamber slide gate limit switch sensor from the air cylinder. Let it hang. Keep track of the screw.

Remove the test chamber slide gate limit switch sensor.
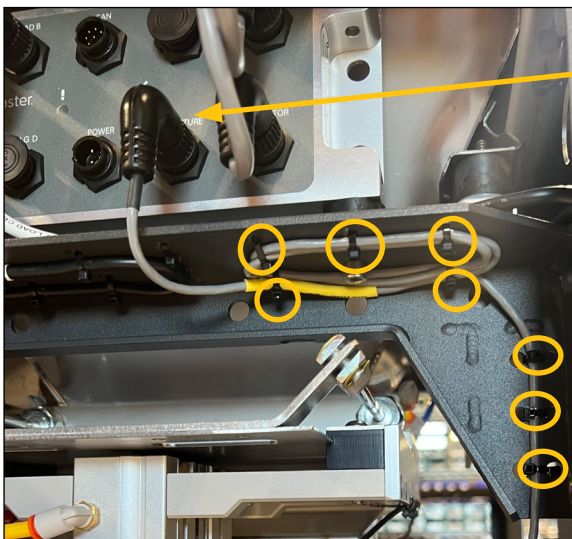
6. Disconnect the moisture sensor.

    a. Unplug the moisture cable from the moisture port of the DSP module.

    b. Remove the zip ties that secure the moisture sensor cable to the chassis.
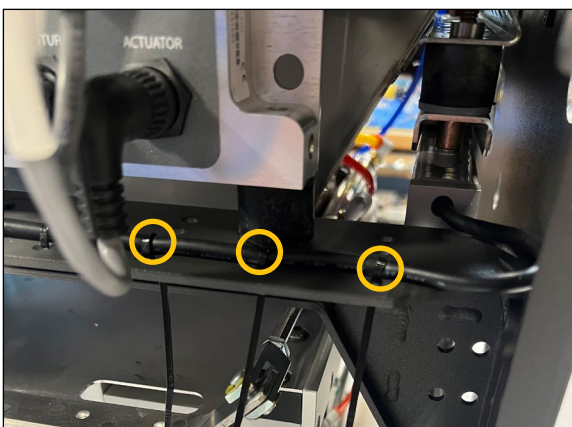
   c. Reapply three zip ties to secure the load B cable to the chassis. Trim the zip tie tails.

7. Carefully remove the two button head cap screws holding the chamber to the load cell.

⚠ **CAUTION: Avoid stripping the screws, which have Loctite on them, by using a good Allen wrench and cleaning out the hex-head hole with a pick.**
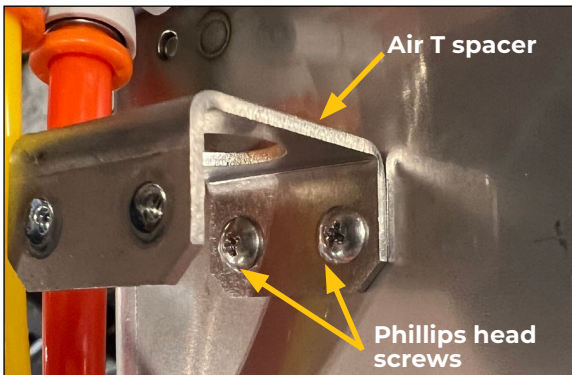
Button head cap screws

8. Remove the test chamber assembly from the GrainGage.

2.2 Install the New Chamber

Socket-head cap screws
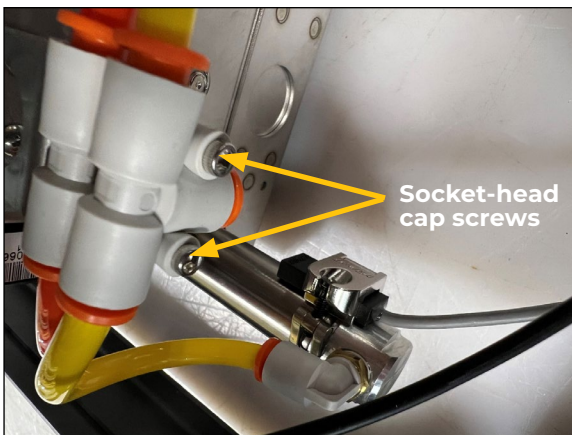
1. From the new chamber remove the air T from the spacer.

   a. Remove the two socket head cap screws. Keep track of the screws.

Air T spacer

Phillips head screws

Socket head screws

b. Remove the two Phillips head screws, and throw them away.

c. Remove the air T spacer, and throw it away.
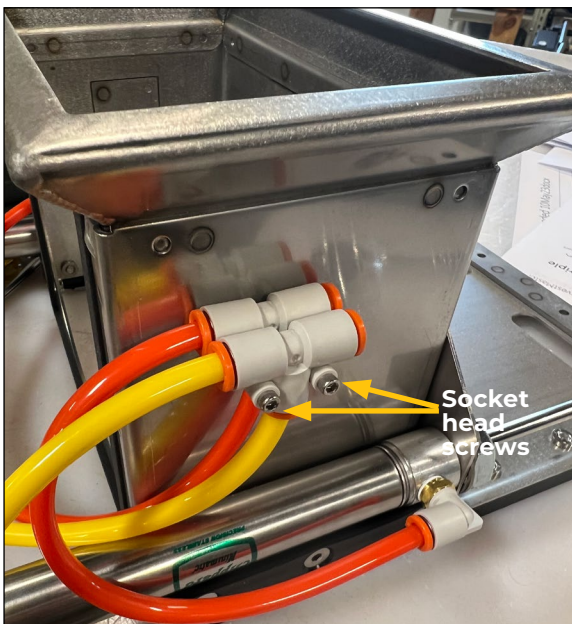
d. Secure the T fittings to the chamber, using the two socket head cap screws.
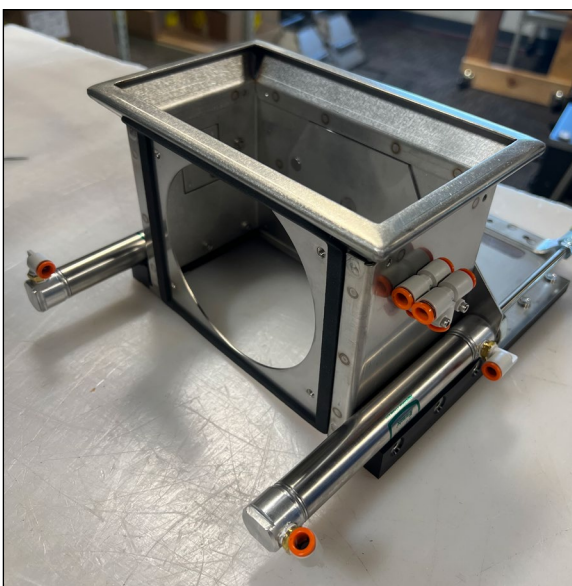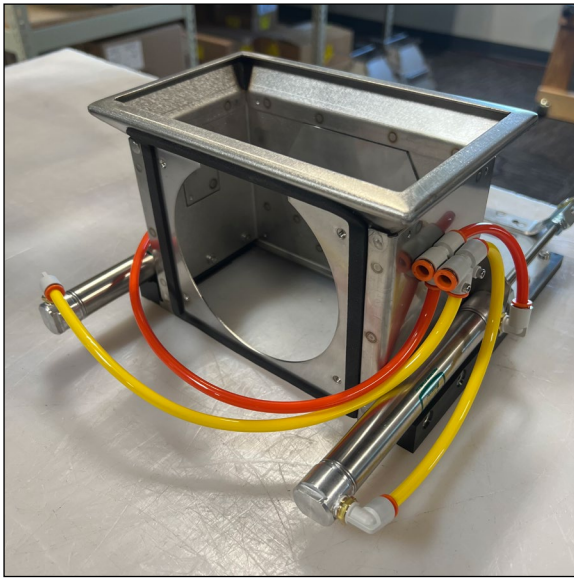
2. Remove the air lines from the new chamber.

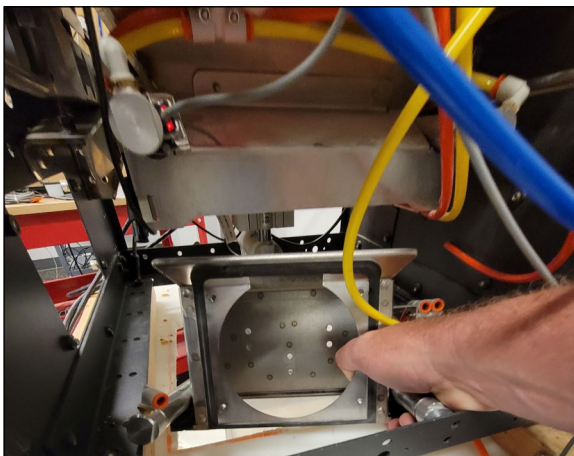3. Cut the removed air lines to the following lengths.

    ▪ Short orange line: 4.5 in.

    ▪ Short yellow air line: 8.5 in.

    Discard the trimmed off pieces.

    Note: You will use the long yellow and orange lines at their original length.

4. Route the air lines on the test chamber as shown.
   Note: Photo shows chamber with air lines attached outside of GrainGage.

5. Place the new chamber in the GrainGage. Fit the chamber lip over the fill guide.

   Note: If necessary, screw in the load cell overload protection screw four or five turns to allow the new chamber to fit into place.

Load cell overload protection screw

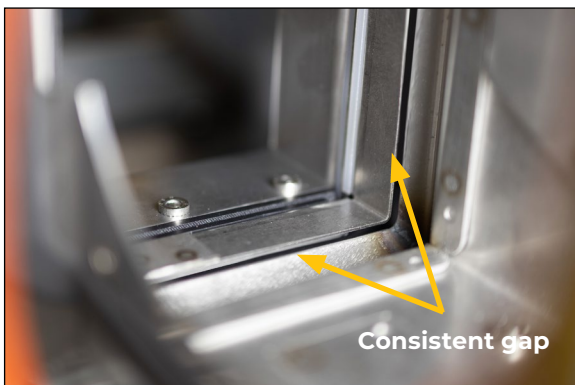**Button head cap screws**
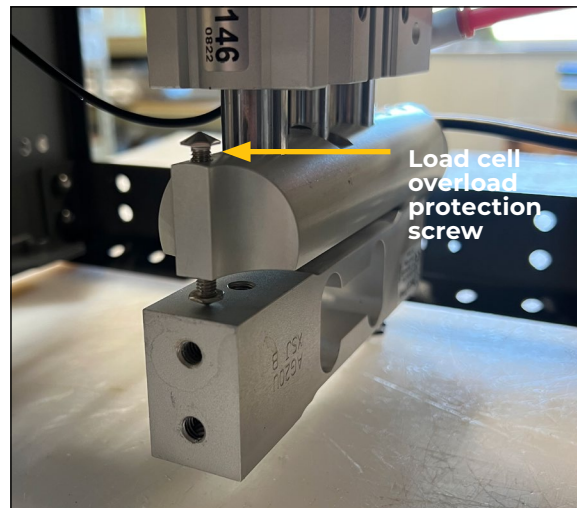
6. Apply Loctite 243 to the threads of the two button head screws. Hand tighten the screws.

7. Check that the new chamber is properly aligned:
   - The gap between the fill guide and the chamber is consistent and even.
   - The chamber slides freely. It does not rub or bump.


Consistent gap

Inconsistent gap

8. Tighten the button head screws securely.

   (!) **CAUTION: Make sure the test chamber can slide up and down freely without contacting the fill guide.**

   Note: It is possible to install the test chamber crooked enough that it will hit the fill guide when it raises. Lightly tighten the test chamber screws, and then

lift the chamber to check for interference with the fill guide. With the chamber lifted, look up through the test chamber and center it around the fill guide. Then, tighten the test chamber screws completely.
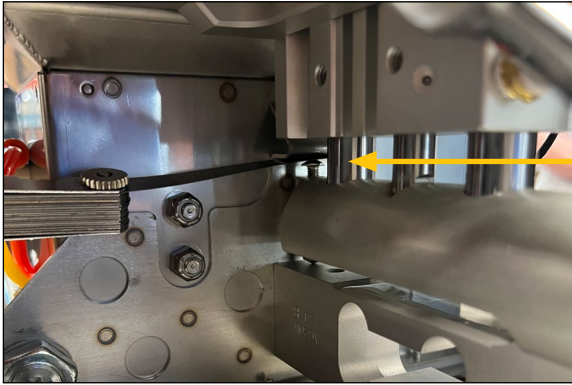
9. If you adjusted the load cell limit screw (in step 5), use a 5/16 wrench and adjust it to have a 0.006 in. gap.

Load cell overload protection screw
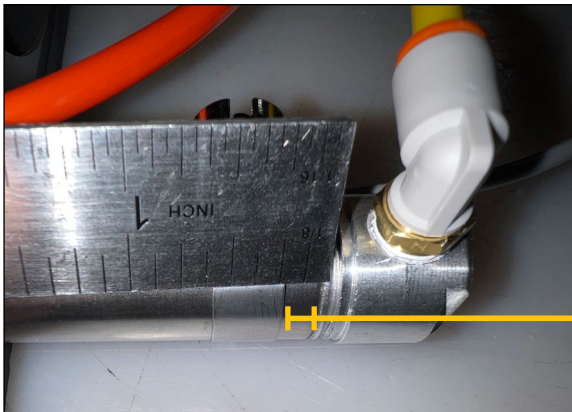
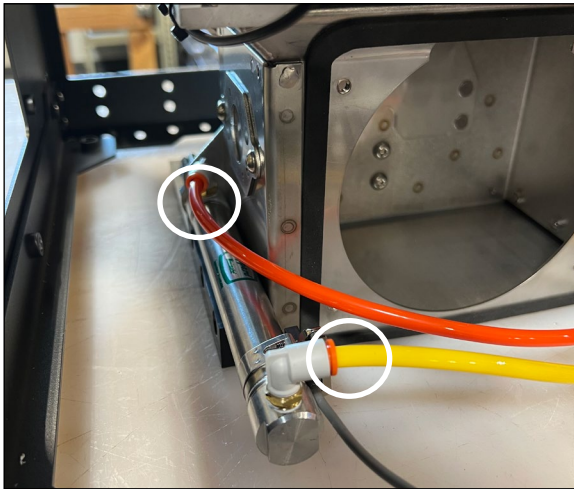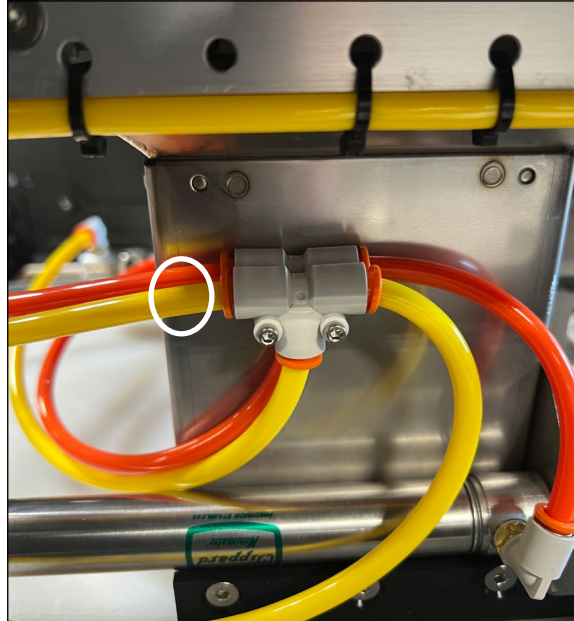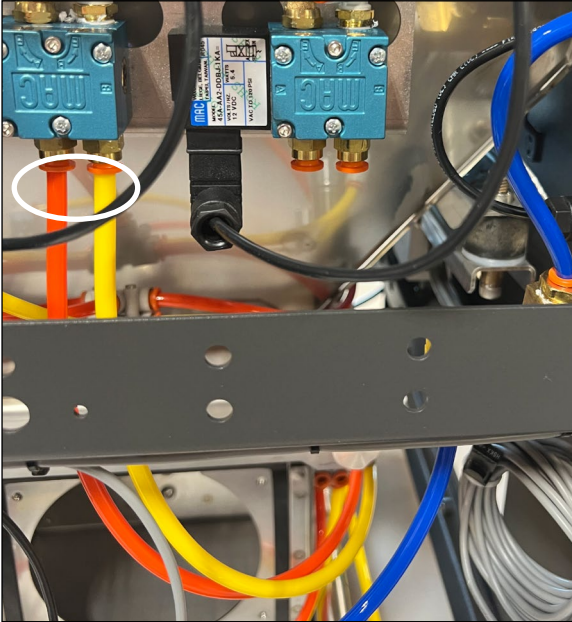10. Attach the limit switch sensor to the air cylinder leaving a 1/8–1/4 in. gap between the end fitting and the band.

Correct position of the limit switch sensor on the air cylinder

2.3 Adjust the Air Lines

1. Insert the 16 in. air lines from the Mac valve into the air Ts, as shown. (See step 4 in 2.1 Remove the Test Chamber on page 19.)

2. Disconnect the air lines from the left air cylinder.

2.4 Install the SCiO Sensor

1. Position the SCiO Sensor in the new chamber. For best results,

   ■ Match the top of the sensor to the top of the opening in the chamber.

   ■ Insert the sensor at a slight angle. The top of the sensor angled in toward the opening.

2. Tighten the four captive screws in the sensor, using a cross pattern.

   ⚠ **CAUTION: The screws will still tighten if misaligned, and it's not always obvious.**

3. Check that the SCiO Sensor aligns properly with the test chamber from the inside.

   In proper alignment,

   ■ The square portion of the sensor inserts fully through the sheet metal.

   ■ The sensor plastic is flush with the inside of the sheet metal. It is not recessed. There is no gap.
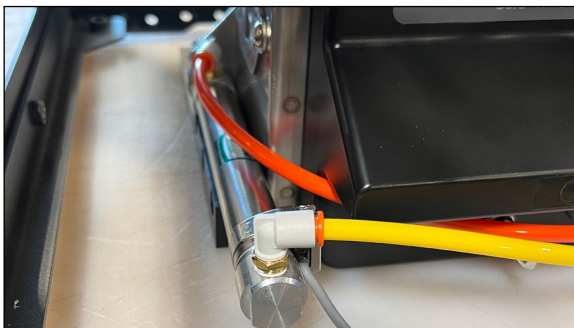
   If the sensor plastic is recessed or misaligned, loosen the four screws and realign.

Correct installation

Incorrect installation

4. Reconnect the air lines to the left air cylinder.

5. Attach the 30712 H3 SCiO cable assembly to the outside of the GrainGage, using the ¼-20x½ in. socket head cap screw and nylock nut.
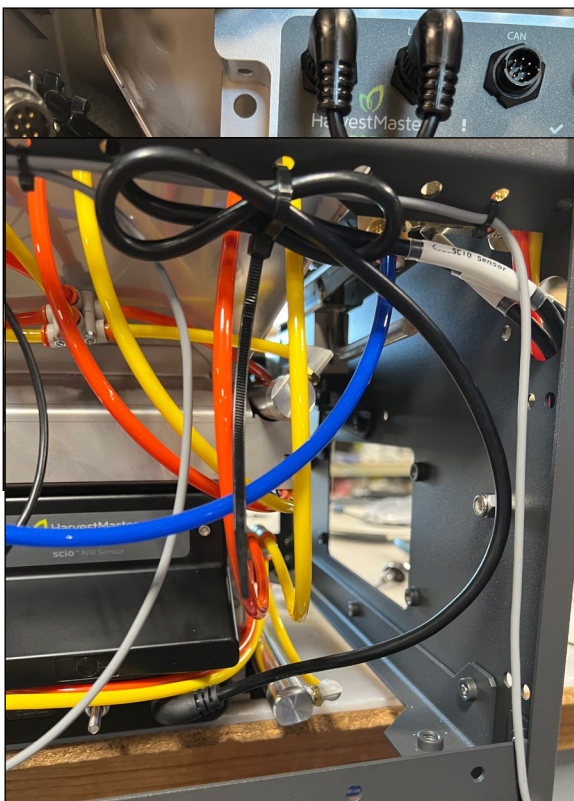

6. Thread the cables through the hole in the chassis.

7. Route the computer and DSP moisture cables toward the DSP side of the GrainGage along the inside wall of the chassis. Use the cable routing tabs.

8. Use three zip ties to secure the cables to the chassis as shown.

9. Secure the moisture cable to the crossbar with two zip ties as shown.

10. Attach the moisture cable to the DSP moisture port.

11. Connect the SCiO Sensor cable end to the SCiO Sensor.

12. Loop and secure the extra length of SCiO cable to the chassis crossbar.

    Note: Leave enough slack in the cable that it will not touch the side of the chassis as the chamber moves. The looped cable can be secured under the crossbar (as shown) or tucked inside the crossbar.

2.5 Apply the Label

1. Install the new H3 GrainGage label.

2.6 Connect to the Computer

1. Position a 30712 Serial to USB cable from the junction cable to the cab. Follow the same path as the CAN cable or use a cleaner path if available. If needed, you can use the 31518 SCiO 15 ft extension cable here.

2. Plug the USB end of the serial to USB cable into the USB Port of the tablet. Secure the USB end so that it can't vibrate out.

2.7 Connect to Mirus

1. Download and install Mirus 4.5.0 or above.

    Note: When asked to launch Mirus, do NOT launch.

2. Enable the H3 Plugin in the Plugin Manager.
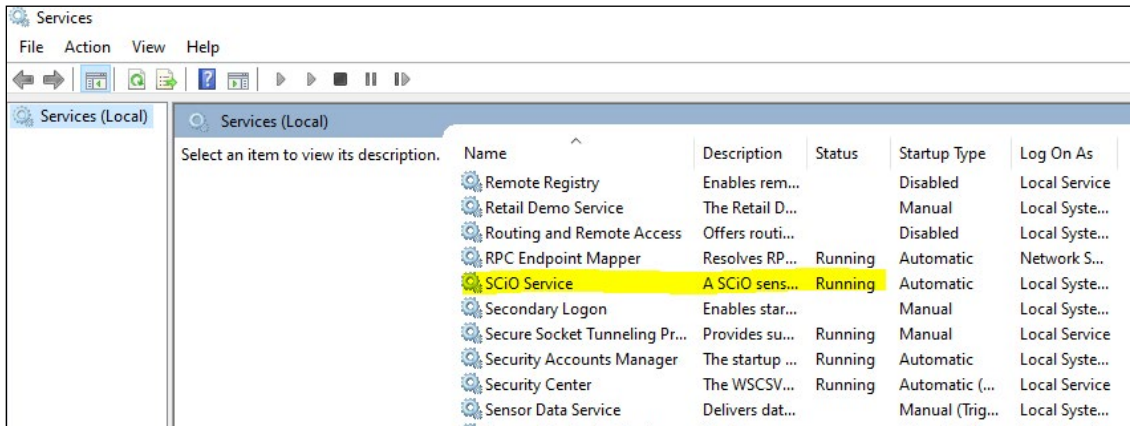
3. Install the SCiO Service for the sensor.

    Note: Each sensor has its own activation link. If you have not yet received your link,

    a. Go to harvestmaster.com/support. Tap **My Product**.

    b. Tap **SCiO License Renewal**.

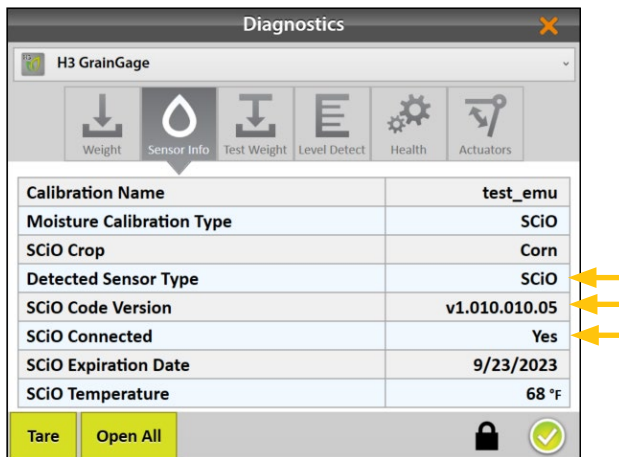4. Open Mirus and connect to the H3 GrainGage plugin.

    If Mirus does not successfully connect to the H3 GrainGage, complete the following steps in order.

    a. Press the red button on the system controller to power off the GrainGage.

    b. Close Mirus.

    c. Unplug the CAN to USB cable from the computer.

    d. Unplug the serial to USB cable from the computer.

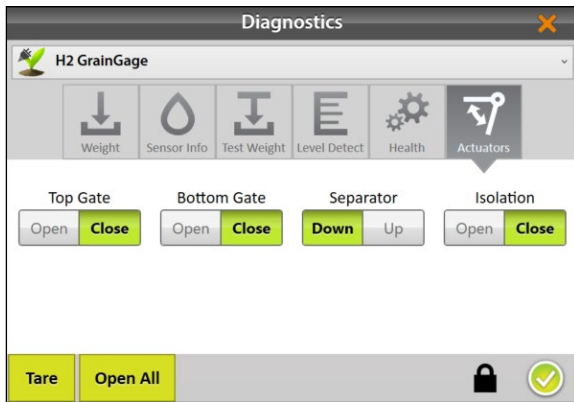e. Check that the SCiO service is running by checking the Windows Services application, as shown below.

f. Plug the serial to USB cable into the computer.

g. Press the red button on the system controller to turn on the GrainGage.

h. Plug the serial to USB cable into the computer.

i. Open Mirus.

j. Tap the H3 icon to connect to the GrainGage.

5. Open Diagnostics, and tap the **Sensor Info** tab. Check the following settings.

- Detected sensor type: SCiO.

- SCiO code version: If unsure if this is latest version check with HarvestMaster repsentative.

- SCiO connected: Yes.

6. Calibrate the test weight load cell, weigh bucket load cells, and slope and motion. (See the Mirus manual for how to calibrate.)

7. Ensure that the air lines were connected properly.

   a. Open Diagnostics.

   b. Open and close each gate while watching the GrainGage to verify that the gates open and close as expected.

Your H3 installation is complete. You are ready to follow standard harvest procedures.