Needle Calibration Kit Work Instruction
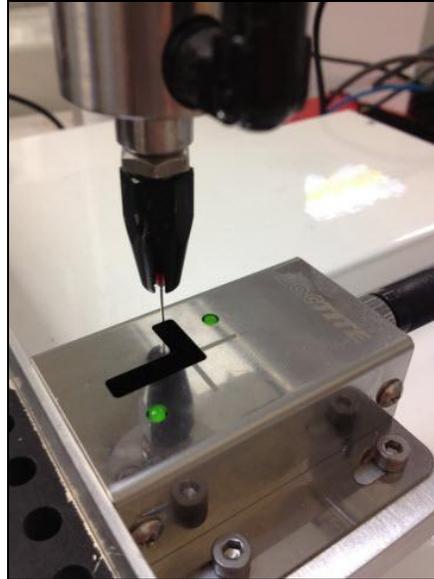
COMPONENTS LIST

Equipment	Item Numbers
Needle Calibration Kit	1569523
D Series Benchtop Robot	(200, 300, 400, or 500 Series)

③ 24V w/ H1.33 software or higher

DIMENSIONS:

.945 [24.0]

2.076 [52.7]

.157 [4.0]

LOCTITE.
Item # 1569523
Needle Calibration

2.559 [65.0]

1.575 [40.0]

.984 [25.0]

.315 [8.0]

.335 [8.5]

.669 [17.0]

1.142 [29.0]
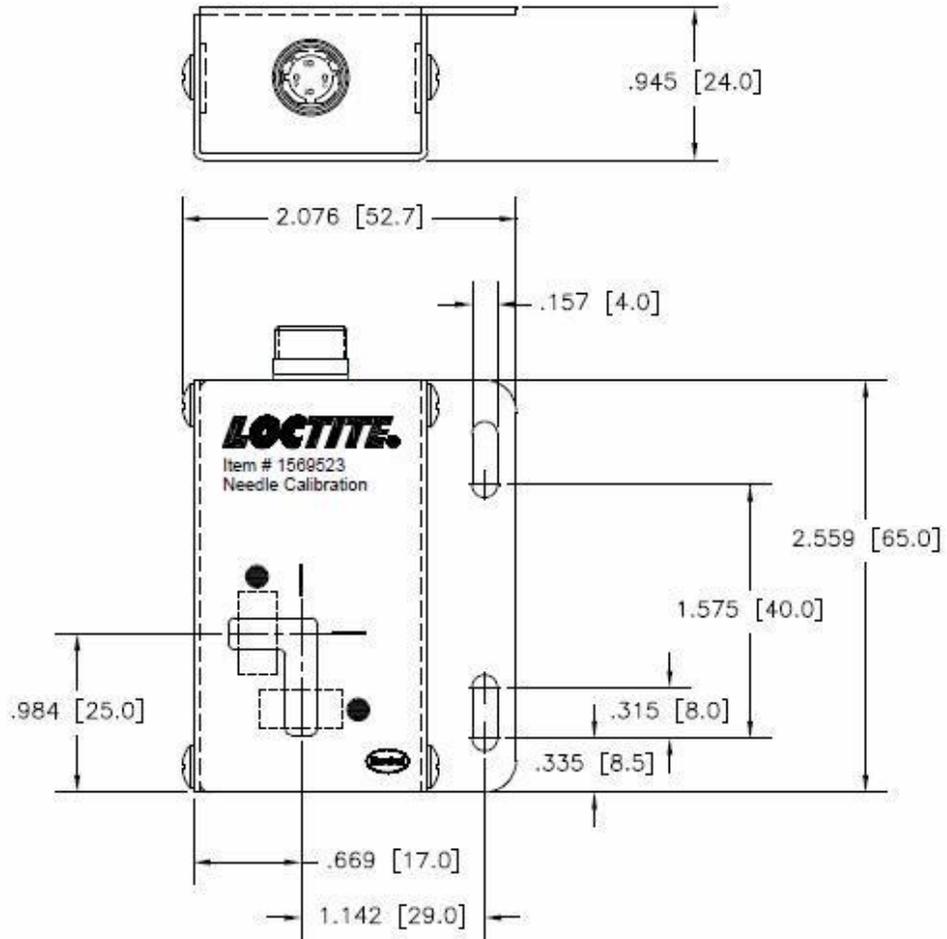
April 22, 2020

MOUNTING INSTRUCTIONS:

The Needle Calibrator must be mounted on a fixture or the Y axis motion table. It is recommended to put the calibrator in the top-left corner as shown below.

Mount the kit at least 15mm from any limits of the robot.
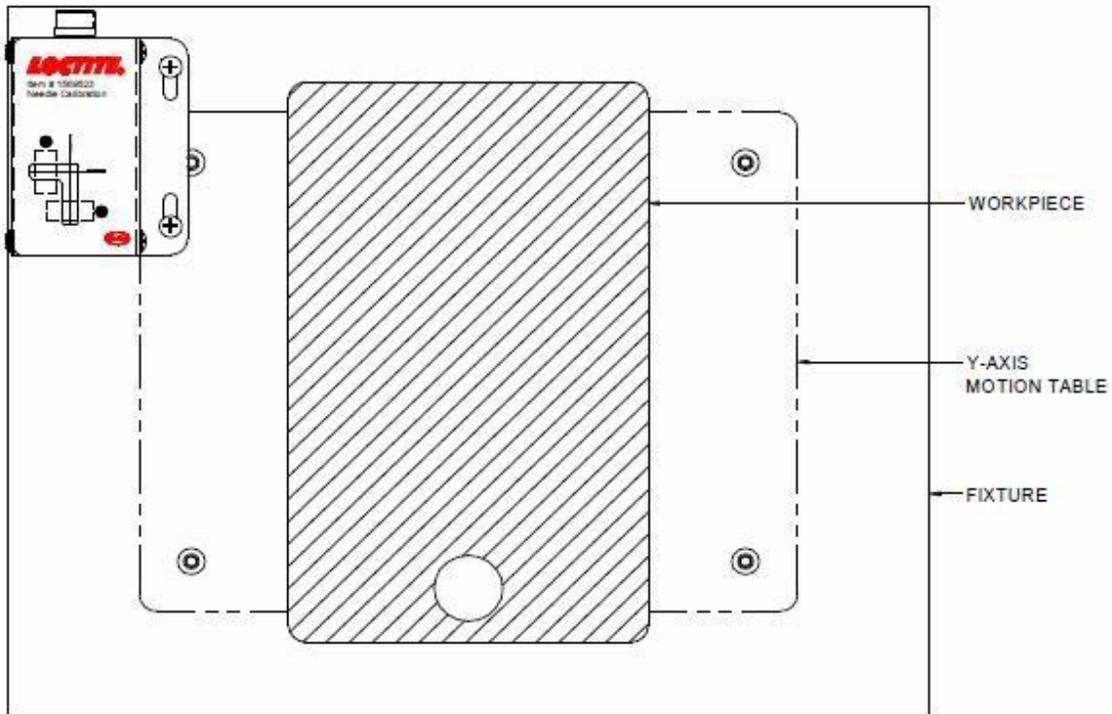
However, if your part holding fixture that is mounted to the Y axis motion table is very long in the X direction, to the point where the calibrator would be out of range if mounted on the left, then you'll need an equipment engineer to machine an aluminum plate to go under the calibrator and mount in the upper left or right hand corner. See **Figures 1 and 2** on the following page.

MOUNTING INSTRUCTIONS (continued):
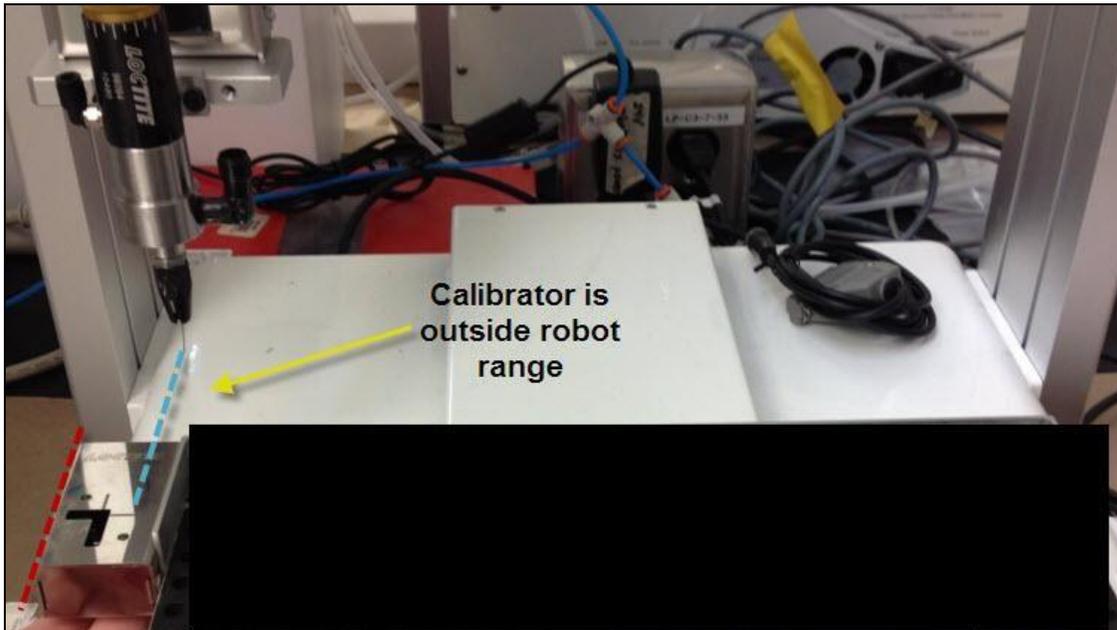
Figure 1: Customer fixture is too large in the X direction; out of range for the robot to reach. Need to mount the calibrator somewhere else. (NOTE: customer fixture blacked out for confidentiality reasons)
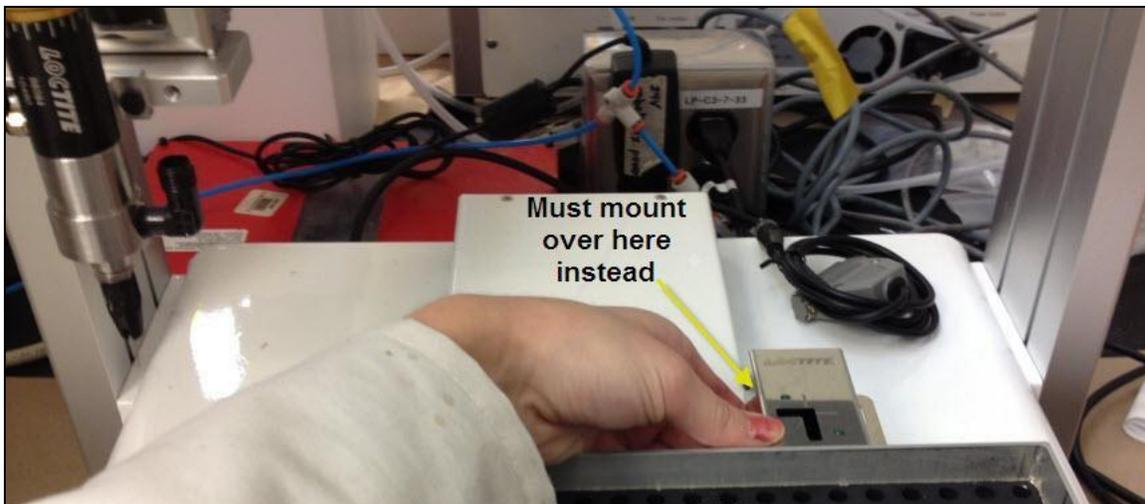
Figure 2: An aluminum plate was machined to mount the calibrator underneath the top of the fixture. This is because the calibrator doesn't have a connector panel anywhere but the right side.

<u>MOUNTING INSTRUCTIONS (continued):</u>

If the calibrator is mounted outside the limits of the robot, you'll see an error on the Teach Pendant that says X or Y or Z OVER TABLE SIZE. Mount the calibrator somewhere else within the limits of the robot and re-start the programming.

JUNCTION BOX WIRING:

Hard wire the Needle Calibration Kit cable into the 24V Junction Box as seen below.
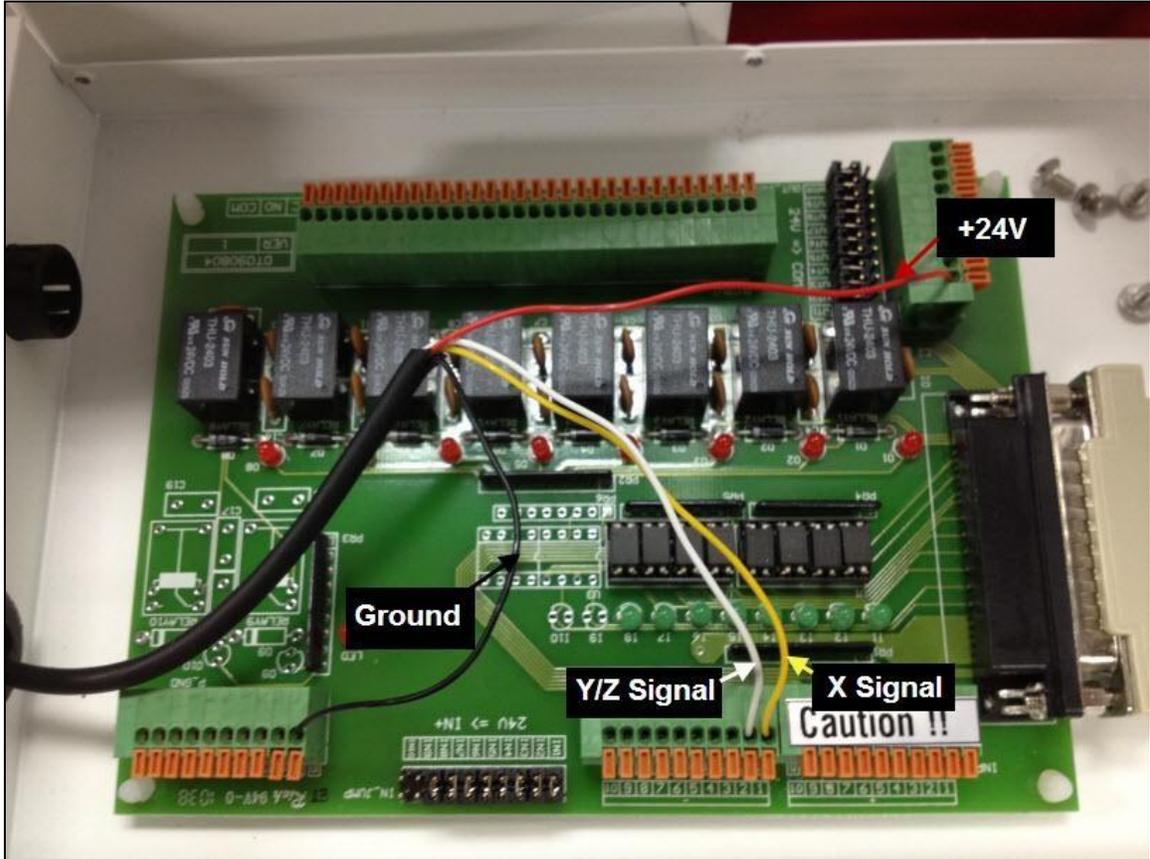
PROGRAMING:

Once the calibrator is properly mounted to the Y motion plate on the robot, it's ready to be programmed.
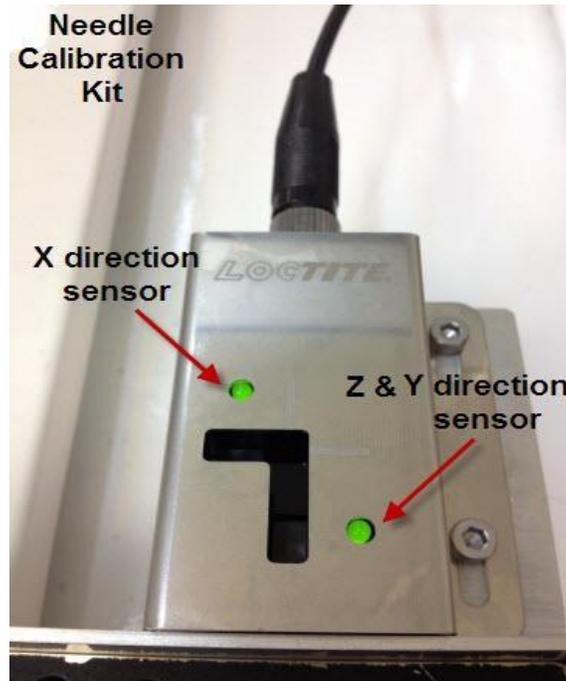
Figure 4: Needle Calibration Kit.

1) On memory ADDR 1
   F1, menu 4
   Option 6: Needle Adjustment Counter
   Set for example 100 dispense cycles (depending on your preference/dispense program)

The Needle Adjustment Counter sets after how many dispense cycles you'd like the system to re-calibrate. If you do not set a Needle Adjustment Counter, the program will automatically re-calibrate before every single dispense (very time consuming). NOTE: If the robot is turned off, the counter will reset to zero once the robot is turned back on, meaning the first time you hit start the Needle Calibration will commence.

2) F4, menu 4
   Option 4: Needle Adjustment Set Up
   Choose Loop: 2
   Choose 2. Precise
   Enter

PROGRAMING (continued):

3) F4, menu 4
   Option 3: Teach Needle Adjustment
   Press Enter
   "MOVE TIP" will appear on the screen

4) Move the needle tip using the Jog buttons on the Teach Pendant to the imaginaryintersection from the white X and Y lines on the calibrator (highlighted in **Figure 5** as the blue dotted lines). Hit Enter.
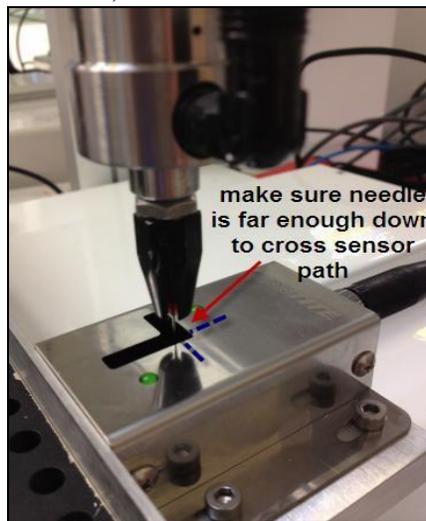
Figure 5: The blue dotted lines designate where the needle
should intersect in the calibrator.

5) Make sure to move the needle down in the Z direction as far as it will go into thecalibrator without touching the bottom of the unit.

6) If the needle is not far enough down in the Z direction, when the needle starts to autoalign in the X and Y directions, it will not pass through the sensors and therefore run into the side of the calibrator and you'll see X or Y Adjust Sensor Error ! !. Hit [W+] Stop, realign the needle farther down on the Z, and start over. See **Figure 6** below.

PROGRAMING (continued):
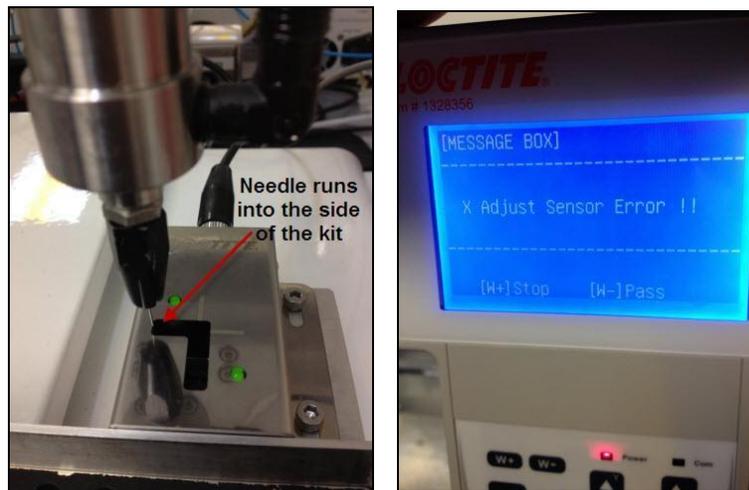
Figure 6 & 7: Needle tip is too high in the Z direction, need to lower so it crosses the sensors.

7) Once the needle is in the proper position, the Robot will begin to auto align. Leave thesystem alone and it will adjust in the X, Y, and Z direction to find exactly where the tip of the needle is. This process may take up to ~1min.

8) Once the auto alignment is complete, the Teach Pendant will go back to the Homescreen.

9) Hit "HOME" on the Teach Pendant.

10) On memory ADDR 2
F1, menu 4
Option 5: Needle Adjustment
(NOTE: this will be memory ADDR 2, steps 1-8 for Teach Needle Adjustment will not actually show up in a memory address)

11) The Needle Calibration Kit programming is now complete.

12) Continued on memory ADDR 3 to start your dispense program.

PROGRAMING (continued):

Figure 7: This is how the memory address screen will look after programming the Needle Calibration Kit is complete. ***Note Address 1 and 2 are reversed in this picture***

The most important time to calibrate is when a needle is changed out.

1) Turn robot off.
2) Change to new needle tip.
3) Turn robot on.
4) When the robot turns back on, the Needle Adjustment Counter will reset to zero. The first time the start button is pushed, the Needle Calibration will commence. After that first calibration it will not calibrate again until it reaches the counter number (ex: 100cycles later).

INPUT/OUTPUT TEST:

To test to see if the sensors are functioning properly, you can conduct an I/O test.

1) F2, menu 2
Option 6: Utility Menu
Option 1: Test Function
Option 3: Input/Output

2) You'll see the screen below on the Teach Pendant. There should be "00" at the start of"In:" to designate X and Y.

3) Take a dispense needle in your hand. Manually put the needle down in the calibratorand move back and forth in front of the X sensor (right and left). You should see a 1 appear in the first digit when the needle crosses the sensor. See **Figure 8** below. Repeat for the Y & Z sensor (forward and backwards), you should see a 1 in the second digit.
See **Figure 9** below.

Figure 8: X I/O test.   **Figure 9:** Y I/O test.
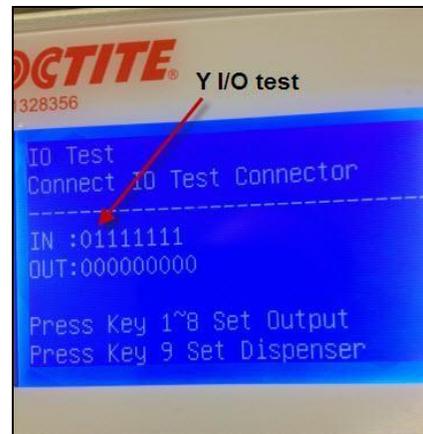
MISCELANOUS NOTES:

- ③ The 2 green sensor lights for X, Y &Z should always be illuminated unless the needle tip is passing by the sensor for calibration.
- ③ The needle calibration programming must be programmed BEFORE the dispense programming.
- ③ If you program the Needle Calibration Kit in say PROGRAM 1, it will only work in PROGRAM 1. For say PROGRAM 2, you need to reprogram the calibrator. The Needle Calibration Kit is a on a program by program basis; programming it for 1 program does NOT mean it will count for the rest of the 99 programs on the D Series Robots.
- ③ The Robot must be a 24V with H1.33 software or higher. If your robot does not meet these criteria, you can send your robot to Loctite Equipment Service to get upgraded for a fee.
- ③ Every time a new dispense needle is put on, as best practice you should recalibrate the system.