

COMPRESSION LOADING OF LOAD CELLS THROUGH THE INTERNAL THREADS VS LOADING AGAINST THE LOAD CELL SHOULDER

TEST THREAD DEPTH IN RELATIONSHIP TO OUTPUT OF MOREHOUSE LOAD CELL IN COMPRESSION
WITH DIFFERENT THREADED ADPATERS LOCKED DOWN FINGER TIGHT

| THREAD DEPTH = LOAD APPLIED | 1.1935" | .6250" | .5035" | AVERAGE OUTPUT | 1.1935" DIFF mV/V | .6250" DIFF mV/V | .5035" DIFF mV/V | MAX DEVIATION mV/V |
|--------------------------------|----------|----------|----------|-------------------|----------------------|---------------------|---------------------|-----------------------|
| 0 | 0 | 0 | 0 | 0 | | | | |
| 500 LBF | -0.20280 | -0.20275 | -0.20268 | -0.20274 | 0.00006 | 0.00001 | -0.00006 | 0.00012 |
| 2500 LBF | -1.01468 | -1.01480 | -1.01465 | -1.01471 | -0.00003 | 0.00009 | -0.00006 | 0.00015 |
| 5000 LBF | -2.03010 | -2.03025 | -2.03021 | -2.03019 | -0.00009 | 0.00006 | 0.00002 | 0.00015 |
| 0 | 0 | 0 | 0 | 0 | | | | |

Note: Expected Output = Load Cell with Threaded Adaptor Installed

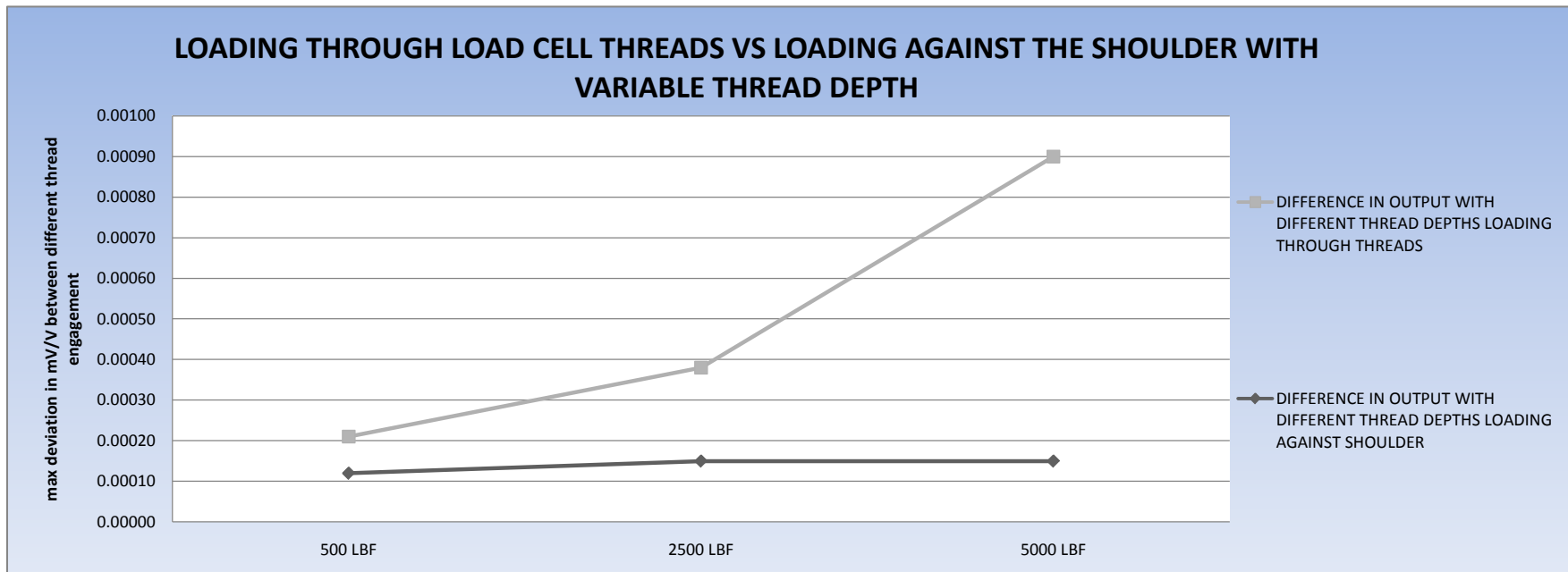
| RESOLUTION = | .00001 mV/V = | 0.024629 | LBF | 1.1935" Diff LBF | .6250" DIFF LBF | .5035" DIFF LBF | MAX DEVIATION LBF |
|--------------|---------------|----------|-----|---------------------|--------------------|--------------------|----------------------|
| | 1 mV/V= | 2462.9 | | | | | |
| | | | | 0.14 | 0.02 | 0.16 | 0.30 |
| | | | | 0.07 | 0.22 | 0.15 | 0.37 |
| | | | | 0.21 | 0.16 | 0.06 | 0.37 |

TEST THREAD DEPTH IN RELATIONSHIP TO OUTPUT OF MOREHOUSE LOAD CELL IN COMPRESSION
WITH THREADED ADPATER NOT LOCKED DOWN

| THREAD DEPTH = LOAD APPLIED | 1.1935" | .6250" | .5035" | AVERAGE OUTPUT | 1.1935" DIFF mV/V | .6250" DIFF mV/V | .5035" DIFF mV/V | MAX DEVIATION mV/V |
|--------------------------------|----------|----------|----------|-------------------|----------------------|---------------------|---------------------|-----------------------|
| 0 | 0 | 0 | 0 | 0 | | | | |
| 500 LBF | -0.20284 | -0.20297 | -0.20276 | -0.20286 | -0.00002 | 0.00011 | -0.00010 | 0.00021 |
| 2500 LBF | -1.01454 | -1.01492 | -1.01460 | -1.01469 | -0.00015 | 0.00023 | -0.00009 | 0.00038 |
| 5000 LBF | -2.02956 | -2.03046 | -2.03006 | -2.03003 | -0.00047 | 0.00043 | 0.00003 | 0.00090 |
| 0 | 0 | 0 | 0 | 0 | | | | |

Note: Expected Output = Load Cell with Threaded Adaptor Installed

| RESOLUTION = | .00001 mV/V = | 0.024629 | LBF | 1.1935" Diff LBF | .6250" DIFF LBF | .5035" DIFF LBF | MAX DEVIATION LBF |
|--------------|---------------|----------|-----|---------------------|--------------------|--------------------|----------------------|
| | 1 mV/V= | 2462.9 | LBF | | | | |
| | | | | 0.04 | 0.28 | 0.24 | 0.52 |
| | | | | 0.36 | 0.57 | 0.21 | 0.94 |
| | | | | 1.15 | 1.07 | 0.08 | 2.22 |



CONCLUSION:

When loading a shear web load cell in compression the output is much more repeatable when the load is transferred through the shoulder of the load cell versus loading at different thread depths. However, different thread depths will also produce a difference in load cell output when loading against the shoulder of the load cell (bottom line on the graph). The only way to produce repeatable results 100% of the time is to lock an adaptor into place against the shoulder of the load cell. This adapter then becomes an integral part of the load cell. This locked down adapter will eliminate all of the error shown in the above graph due to different thread depths.

A Morehouse threaded adapter with jam nut permanently locked into the load cell will eliminate the error shown in the above graph and allow the end user to accurately duplicate the results created from the calibration report.