

Repeatability Tests - Teco Drives

First, test for backlash. Section 2.4:

<https://machmotion.com/documentation/Motion%20Controllers/Apollo%20III/Apollo-III-Manual-1000-Series.pdf>

Move axis to a place where you can test to be sure if it returns exactly to that point or not (have a clear way to mark it for example) and where it has 10 or so inches of travel if possible. Zero out the DRO (the readout for the axis position). (note: If using Mach4, you can use DRO mode in the software in the upper right area so it doesn't change your fixture offsets). Record the numbers displayed on the axis drive (the tecu drives in the electrical enclosure).

Command motion (you can use the MDI box or load in a gcode file) to move axis one direction, then back the other (see note below). Here is an example command to move X axis 10 units (inches or mm depending on machine setup and if using G20 or G21):

```
G00 G91
X10
M00 (programmed stop so you can get the data)
X-10
```

Record the numbers displayed on the drive. (send us the before and after numbers). Did the DRO return to zero? Did the machine make it back to the actual physical starting point? Repeat test as needed to ensure it is repeatable or if not repeatable, run a few times to see if the "problem/offset" is repeatable.

Here is example of what the data would look like:

Starting point:
Drive Display = 864579

Move 10 inches:
Drive Display = 823904
Actual position = -.012

Move back to Starting Point:
Drive Display = 861742
Actual Position = .005

NOTE: Doing the test with as a great a travel distance as possible is best to start with. If the data suggests it is mechanical type issue then doing the test with smaller distance and in different locations of travel can help determine if it is an issue with a certain portion of the mechanics. Also, if everything is repeatable and accurate, doing the test with coordinated movement should be done. Do the same test, but include motion with other axes. Using example above it would look something like this:

```
G00 G91
X10Y10Z3
M00 (programmed stop so you can get the data)
X-10Y-10Z-3
```

Keywords: Position Error Testing, accuracy
