

TEG-133

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# First Technology Safety Systems

## 400 Nm Tibia Gage Loading Results

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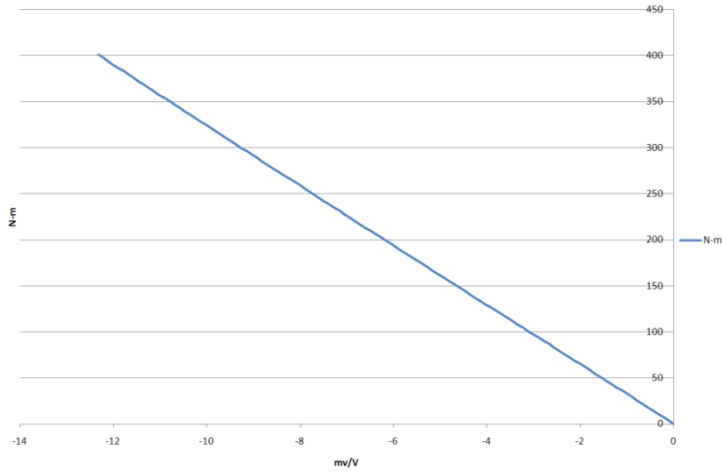
# 400Nm testing status

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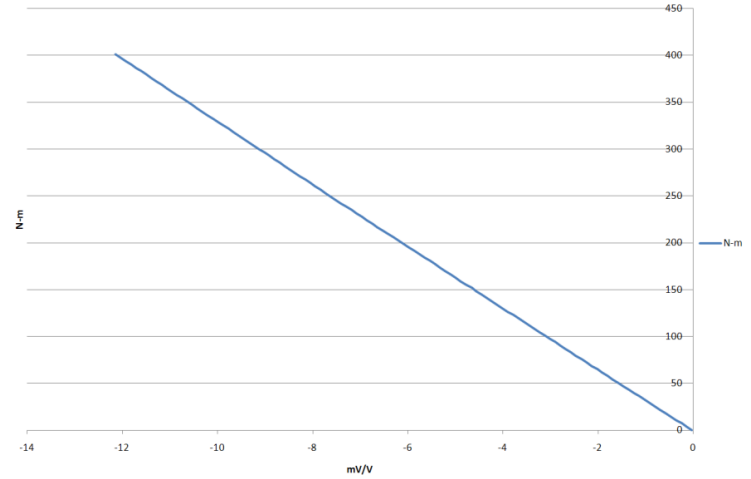
- Injury threshold 340Nm agreed
- Current BM calibration up to 325Nm, 340Nm not calibrated
- Industry requested 10-20% higher BM for development purpose
- FTSS proposes 400Nm BM calibration (118% of criterion)
  - Must keep safe margin from failure BM for frequent testing
- So far on one tibia bone has been tested with good results
- Highly linear bending moment – output voltage were obtained
- Further testing to be done
  - Cycle testing 50 times to check gage bonding
  - Tibia assembly testing

# Gage Output Graphs

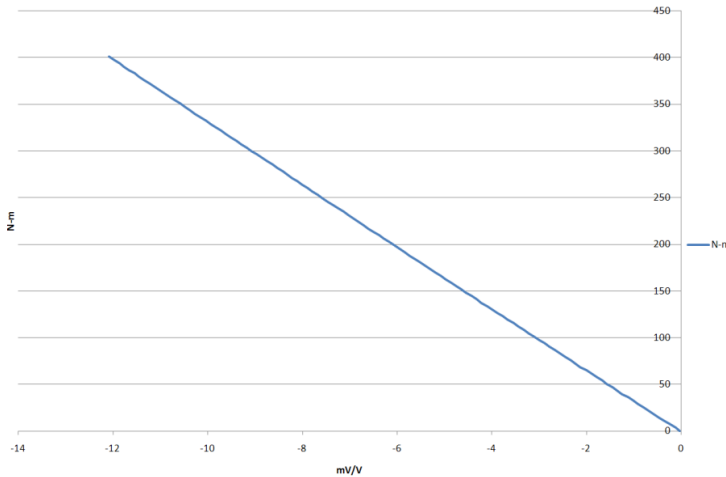
Gauge 1 Output mV/V



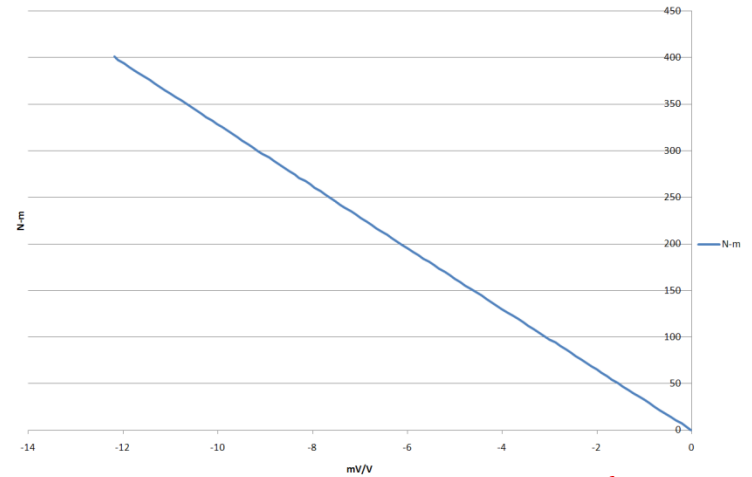
Gauge 2 Output



Gauge 3 Output



Gauge 4 Output



# Summary

VOLTAGE CALIBRATION SUMMARY							
	Capacity N-m	Offset mV/V	NonLinearity %Full Scale	Hysteresis %Full Scale	Expected Output mV/V	Output @Capacity mV/V	Sensitivity mV/V/EU
GAUGE 1	401.17	-0.0616	0.46	0.36	-12	-12.3231	-0.03071754
GAUGE 2	401.17	-0.1206	0.53	0.69	-12	-12.1468	-0.03027816
GAUGE 3	401.17	-0.6333	0.59	0.79	-12	-12.0931	-0.03014437
GAUGE 4	401.17	0.0489	0.44	0.72	-12	-12.1873	-0.03037914
			Pass	Pass		Pass	

If 400 Nm loading is agreed at TEG this will be production test.

FTSS will investigate any problems related to higher Loading.

# Further actions

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- Bone cycle testing and Tibia Assembly Testing
- Introduce 400Nm in production scheme and update manual
- Increase stopper cable free play
  - Tibia from 9 mm to 10.3 mm
  - Femur from 8 mm to 9.1 mm
  - Change free play tool
- Establish certification corridors after gathering larger data set
  - tibia & femur bones
  - tibia & femur assemblies
- Current Flex GTRs are not calibrated to higher load.
- Current legs to be calibrated to higher load on recertification
- Introduction date?