

MSDII Testing – Force to Lift Foot

Team: P15001: Active Ankle Foot Orthotic

Engineer: Geni Giannotti – Biomedical Engineer

Related System: ABBBBB- Raise Foot

This test will determine if the applied force is the appropriate amount to lift the foot. Ideally, values obtained in this test will be equal or less than those obtained during feasibility tests completed during MSDI.

Engineering Requirements:

rqmt. #	Importance	Source	Engr. Requirement (metric)	Unit of Measure	Ideal Value	Marginal Value	Direction of improvement	Mapping to Functional Decomposition
ER4	9	FT1, FT3, ST5	Torque to Lift Foot by McKibben Air Muscle	ft-lbs	3.7	2.2	▲	(ABBBBB) Apply Torque

Testing Plan

This test will take no longer than 30 minutes to complete.

- 1.) Have a volunteer apply the AFO to their foot
- 2.) Have the volunteer sit on a table top with their foot hanging freely
- 3.) Attach a ruler to the table leg so that it forms a 90° angle and ensure that it is placed at the same level that the volunteer's ankle is at. **Note: the ruler will be used as a reference point**
- 4.) Actuate the McKibben air muscle and note whether or not the bottom of the volunteer's foot is parallel to the ruler. Complete this step a total of 20 times and record the number of times that the foot fails to lift to the appropriate level, if any.
- 5.) Make any necessary adjustments to the McKibben muscles in order to achieve the lift
- 6.) Record the force used to actuate the muscle (force= pressure*area of muscle)

Start Date: March 2015

End Date: March 2015

Budget

Equipment	Price	Quantity
AFO base with attached air muscle	-	1
Total:	-	