

MSDII Testing – Extended Use Test

Team: P15001: Active Ankle Foot Orthotic

Engineer: Noah Schadt – Mechanical Engineer

Related System: ABBBBB- Raise Foot

This test is an extension of the Lift_Foot_1 integrated test. The test is designed to subject the integrated mechanical components of the AFO to extended use testing to determine performance and reliability.

Engineering Requirements:

ER6: Number of muscle flexes untethered (#flexes)

Ideal Value: 5000

Marginal Value: 3000

Testing Plan

The approximate time required for testing is 1.5 hours

There are two viable testing methods to be determined by the team/lead engineer at a later date.

Method I: Purely Mechanical (Sitting)

- 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 **100** 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 functionality and have the volunteer fill out the comfort survey
(G:\EDGE\web\public\Detailed Design Documents\Mechanical\Lower and Upper Attachment\P15001_Lower_Attachment_Comfort_Survey)

Method II: Electro Mechanical (Walking)

- 1.) Have a volunteer apply the AFO to their foot and activate the electrical equipment.
- 2.) Connect air supply to the portable air compressor in the lab
- 3.) Place the filled compressor on a wheeled cart and follow the volunteer as he walks on level ground for at least 100 steps.
- 7.) Record the functionality and have the volunteer fill out the comfort survey
(G:\EDGE\web\public\Detailed Design Documents\Mechanical\Lower and Upper Attachment\P15001_Lower_Attachment_Comfort_Survey)

Start Date: February 10 2015

End Date: March 5 2015

Potential Locations

Engineering Building, BAD Lab, 4th floor of INS

Budget

Equipment	Price	Quantity
AFO base with attached air muscle	-	1
Compressed Air Tank		1
Cart for the Air Tank		1
Total:	-	