



Sierra L-Code Technical Testing Report

Introduction

The Sierra (FS1) was tested according to the American Orthotic and Prosthetic Association (AOPA) test specifications published in September 2010 of *AOPA Prosthetic Foot Project Report*. The Sierra exceeds all required thresholds necessary to recommend the Healthcare Common Procedure Coding System (HCPCS) codes L5981 and L5986. All tests were conducted using a standard 27 cm left foot for an A80 patient. Abbreviated test descriptions and results are described below.

L5981 (All lower extremity prosthesis, flex-walk system or equal)

In order to use code L5981, the prosthetic foot must meet the Dynamic Keel threshold of Keel Test, and must meet the Dynamic Heel threshold of Heel Test, and must have independently deflecting heel and keel as described in *AOPA Prosthetic Foot Project Report*.

The Keel Test involves loading the toe of the prosthetic foot at an angle of 20° with a force of 1230 N and determining the displacement while under that load and percent of energy returned by calculating area between loading and unloading curves. Based on the test results the Keel can be classified as Rigid, Flexible, or Dynamic based on the classification criteria below.

Keel Type	Displacement @ 1230 N	% Return
Rigid	<25 mm	NA
Flexible	≥25 mm	<75%
Dynamic	≥25 mm	≥75%

For the Runway, the actual displacement exceeded 25 mm and the percent of energy returned exceeded 75% which meets the criteria for the Dynamic Keel threshold of the Keel Test.

The Heel Test involves loading the heel of the prosthetic foot at an angle of 15° with a force of 1230 N and determining the displacement while under that load and percent of energy returned by calculating area between loading and unloading curves. Based on the test results the Heel can be classified as Dynamic or Cushioned based on the classification criteria below.

Heel Type	Displacement @ 1230 N	% Return
Dynamic	≥13 mm or pass % Return	≥82% or pass Displacement
Cushioned	Does not meet displacement and % Return Criteria for Dynamic	

For the Runway, the actual displacement exceeded 13 mm and the percent of energy returned exceeded 82% which meets the criteria for the Dynamic Heel threshold of the Heel Test.

Determination of whether a foot has independently deflecting heel and keel is a judgment based on whether the mechanical design of the prosthetic foot meets AOPA requirement of independent heel/keel design. The Runway with its two primary composite springs; the primary keel and the integrated full length soleplate in Freedom Innovations' judgment, meets the definition of independently deflecting heel and keel.

L5986 (All lower extremity prosthesis, multi-axial rotation)

In order to use code L5986, the prosthetic foot must meet the thresholds of the Multi-axial Test described in *AOPA Prosthetic Foot Project Report*.

This test includes 3 separate tests all of which must be passed in order to recommend L5986. They include: Sagittal Dorsiflexion Test, Sagittal Plantarflexion Test, and Coronal Inversion Test. The Sagittal Dorsiflexion Test requires the heel of the foot to contact the 10° test fixture when a force of 1230 N is applied to the foot. The Sagittal Plantarflexion Test requires the toe of the foot to contact the 8° test fixture when a force of 1230 N is applied to the foot. The Coronal Inversion Test requires a minimum of 8° of inversion when a force of 1230 N is applied as specified in report previously mentioned.

For the Sierra the heel contacted the test fixture during the Sagittal Dorsiflexion Test, the toe contacted the test fixture during the Sagittal Plantarflexion Test, and the actual inversion exceeded 8°. All three thresholds were met or exceeded making this foot eligible for L5986.