



## Freedom Maverick Xtreme AT L-Code Technical Testing Report

### Introduction

Freedom Innovations' Maverick Xtreme AT prosthetic foot was tested according to the American Orthotic and Prosthetic Association (AOPA) test specifications published in September 2010 of *AOPA Prosthetic Foot Project Report*. The Maverick Xtreme AT exceeds the required thresholds necessary to recommend the Healthcare Common Procedure Coding System (HCPCS) codes L5987 and L5986. All tests were conducted using a standard 27 cm left foot for an adult 80 kg (176lb) patient. Abbreviated test descriptions and results are described below.

### L5987 (All lower extremity prosthesis, shank foot system with vertical loading pylon)

In order to use code L5987, the prosthetic foot must meet the Dynamic Keel threshold of Keel Test, and must meet the Dynamic Heel threshold of Heel Test, and must meet threshold of Vertical Loading Test or meet threshold of the Horizontal Displacement Test described in *AOPA Prosthetic Foot Project Report* as summarized in the table below.

<b>L5987</b>	<ul style="list-style-type: none"> <li>• Must meet the Dynamic Keel threshold of <b>Keel Test</b>, and</li> <li>• Must meet threshold of <b>Dynamic Heel Test</b>, and</li> <li>• Must meet threshold of <b>Vertical Loading Test</b></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Must meet the Dynamic Keel threshold of <b>Keel Test</b>, and</li> <li>• Must meet threshold of <b>Dynamic Heel Test</b>, and</li> <li>• Must meet threshold of <b>Horizontal Displacement Test</b></li> </ul>
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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 Maverick Xtreme AT, the 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 Maverick Xtreme AT, the displacement exceeded 13 mm and exceeded 82% energy return. The displacement and energy return both independently meet the criteria for the Dynamic Heel threshold of the Heel Test.

The Vertical Loading Test involves loading the prosthetic foot vertically with the appropriate heel height block under the heel to a load of 1230 N while measuring the vertical displacement. To meet the threshold for Vertical Loading Test, the prosthetic foot must have a minimum of 10 mm of displacement as shown in the table below.

Vertical Loading Test Thresholds		
Prosthetic Foot	Vertical Displacement < 10 mm	Does not meet vertical loading test
	Vertical Displacement ≥ 10 mm	Does meet vertical loading test

For the Maverick Xtreme AT, the displacement met or exceeded 10 mm which meets the criteria for the Vertical Loading Test.

The Horizontal Displacement Test involves loading the prosthetic foot at an angle of 20° for the toe, and 15° for the heel, with a force of 1230 N and determining the horizontal displacement while under that load. The passing criterion for the Horizontal Displacement Test is shown in the table below.

Horizontal Displacement Test
The passing criterion for the horizontal toe keel motion is ≥ 25 mm.
The passing criterion for the horizontal heel motion is ≥ 5 mm.

For the Maverick Xtreme AT, the horizontal toe keel motion exceeded 25 mm and the horizontal heel motion exceeded 5 mm. Both toe and heel motion, exceed the criteria for the Horizontal Displacement Test.

The Maverick Xtreme AT meets or exceeds all necessary thresholds for the Keel Test, the Heel Test, the Vertical Loading Test, and the Horizontal Displacement Test making this foot eligible for L5987.

**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* as shown in the table below.

<b>L5986</b>	Must meet threshold of <b>Multiaxial Test</b>
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This test includes three 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 Maverick Xtreme AT, the heel contacted the test fixture during the Sagittal Dorsiflexion Test, the toe contacted the test fixture during the Sagittal Plantarflexion Test, and the inversion exceeded 8°. All three thresholds were met or exceeded making this foot eligible for L5986.