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The echelonVT

The unique prosthetic foot with four independent degrees of freedom

Example

ECVT25L 5 2 *For dark tone add suffix D

Size side | Spring set | Axial spring

Foot example: echelonVT, size 25 left, spring rating 5 and axial spring 2

Max. Amputee weight:	100kg / sizes 22-24 125kg / sizes 25-30
Activity level:	3
Size range:	22cm-30cm
Component weight:	855g
Build height:	168mm sizes 22-24 173mm sizes 25-26 178mm sizes 27-30
Heel height:	10mm
Fitting Instruction:	938315

[1]Component weight shown is for a size 26cm without footshell

Selection

Activity	User Weight								
	44-52 100-115	53-59 116-130	60-68 131-150	69-77 151-170	78-88 171-195	89-100 196-220	101-116 221-255	117-125 256-275	kg lbs
3	1	2	3	4	5	6	7	8	Foot spring set

Size 25-30 only

• 1 ◀ Axial shock spring rate indicated as shown

•• 2 ◀ Axial spring

••• 3

Users at Level 2 and 4 activity who would benefit from this foot will require softer or stiffer springs as appropriate for the individual.

Spring set recommendations are for trans-tibial users. For trans-femoral we suggest selecting a spring set one level lower.

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2010

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4 independent degrees of freedom.

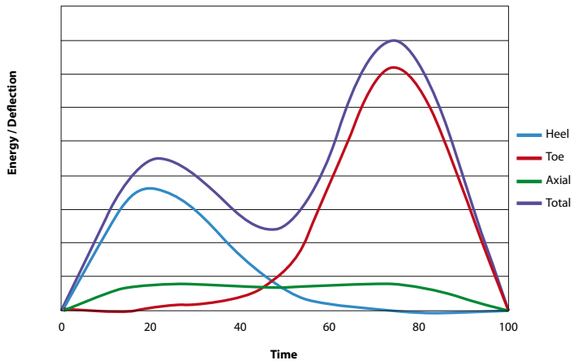
The echelonVT allows movement at the ankle in all 3 rotational directions as well as allowing axial compression.

1. The fluidity of the hydraulics provides a smooth comfortable progression from heel strike to toe off and ensures that the toe is raised during swing phase for improved ground clearance. The hydraulic ankle unit promotes greater postural symmetry regardless of terrain.

2. The e-Carbon heel and toe springs conform to the terrain, improving ground contact and providing the power for an energy efficient toe off.

3. The efficient, axial coil spring reduces peak stress[1] ensuring comfortable heel strike and then returns the energy to assist push-off.

4. The titanium coil spring also absorbs rotational shear forces that might otherwise irritate the skin or proximal joints and allows the user to pivot naturally over the foot when turning or taking a shot on the golf course.



echelonVT foot elements deflection graph

echelonVT elements

In designing a foot with 4 independent degrees of freedom it is crucial to incorporate a unifying element so that the transition from one plane to another is seamless and smooth. This design combines the responsive function of eCarbon foot springs and a titanium coil spring with a hydraulic ankle.

The echelonVT deflection graph shows the combined activity of the mobile elements of the foot during stance phase. The independent heel and toe springs show energetic tibial progression and the continuous activity of the axial spring ensures shear force attenuation and comfort. The hydraulic ankle enables a smooth transition from heel to toe on all surfaces, creating a natural interaction between the body and the foot.

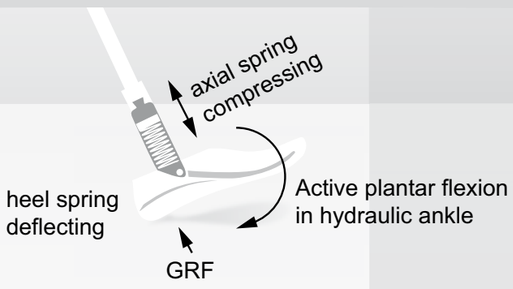
echelonVT user perspective

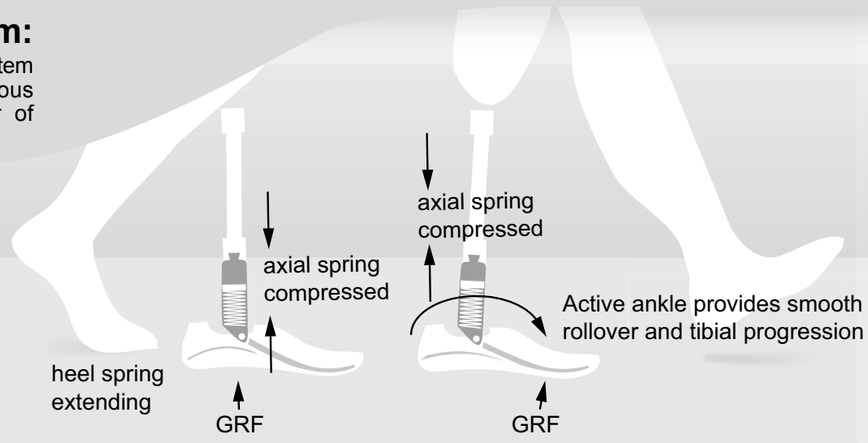
Architectural Designer, Lee Boxall, in Montpellier for a site visit to Zaha Hadid's iconic Pieres Vives Building, is interested in how man-made objects interact with the topography and the environment. "The concepts underlying Hadid's designs show a strong interaction with the natural environment and balance the interplay between their functional requirements and the surroundings."

Lee's interest is more than simply work related. He uses an echelonVT prosthetic foot and considers the interaction between his body, the foot and the terrain, whether he's striding across a building site or going for a run through the nearby park, as considerably more comfortable than a fixed ankle foot.[2]

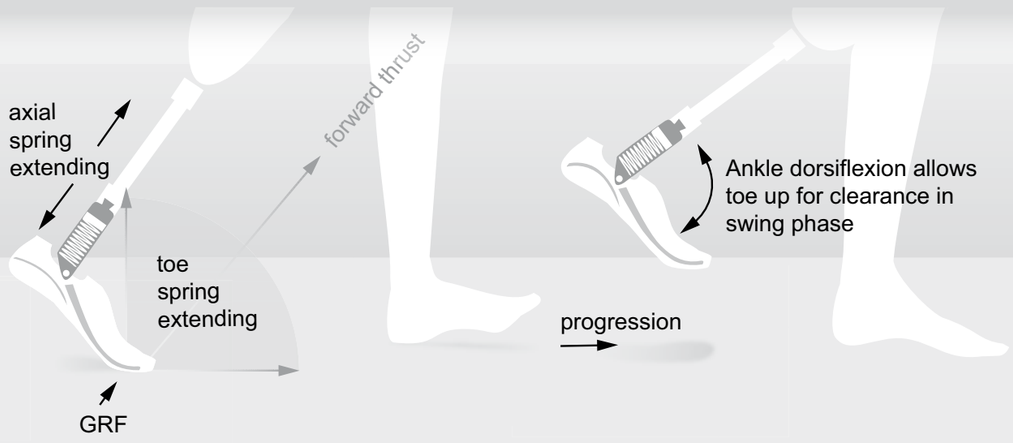
endolite energy management system:

Energy efficient gait requires an energy management system with an optimised alignment. The synergy between the various spring elements maximises and smoothes the transfer of energy for an excellent overall performance.





Energy absorption phase



Efficient and timely energy release

CE

1."Outdoor dynamic subject-specific evaluation of internal stresses in the residual limb: Hydraulic energy-stored prosthetic foot compared to conventional energy-stored prosthetic feet" by Sigal Portnoy, Anat Kristal, Amit Gefen, Itzhak Siev-Ner
2."Investigation into the Effects of Self Aligning Hydraulic Ankle on Patients' Activity and Quality of Life" by Alan McDougall BSc (Hons) and Christina Erikstrop BSc (Hons)