WS-4-3

WorldSID small female SBL C

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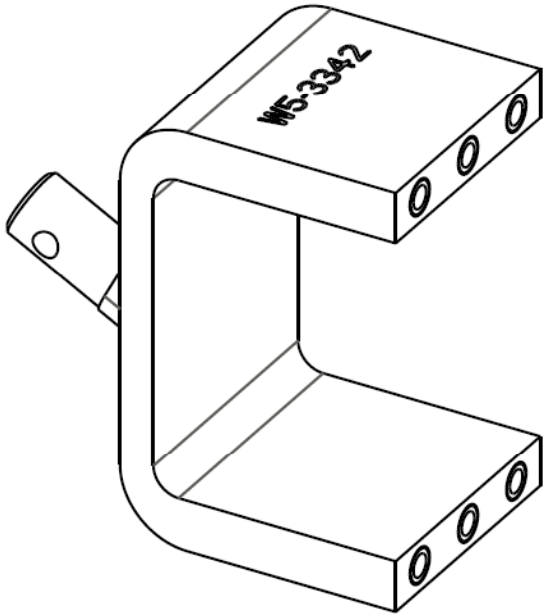
Parts List

WorldSID small female Kit Prototype conversion to Revision1 (**kit A to B**) (APROSYS Rev1 dummies)					
Next Assembly	Qty	PN	Level 2	Desc	Replacement for Part in SBL A
W5-3000	5	3700-00		2D IRTRACC Assembly with 12pin circular connector	3690-00 (ref);W5-3331
W5-3000	6	W5-3272		Inner Rib, Assembly, Thorax	W5-3283
W5-3000	2	W5-3270		Inner Rib Assembly, Shoulder	W5-3291
W5-3000	4	W5-3271		Inner Rib Assembly, Abdomen	W5-3271
W5-3000	1	W5-3156		ACCEL MOUNT, SHOULDER ENDEVCO 7264B	new part
W5-3000	5	W5-3351		W5 RIB COUPLER	W5-3304, W5-3305
W5-3000	1	W5-3352		W5 RIB COUPLER	W5-3304
W5-4000	5	W5-4040		ACCELEROMETER MOUNT, LINEAR TRIAXIAL, ENDEVCO 7264B	new part
W5-4000	1	W5-4041		MOUNTING WEDGE, LUMBAR WORLDSID 5TH	w5-4037
W5-4000	1	W5-4042-A		CLAMPING PLATE, UPPER LUMBAR	w5-4032
W5-5000	2	W5-5211		LOWER LEG WELDMENT	180-5509
W5-6000	2	W5-6106		ARM ASS'Y	w5-6000
w5-0000?	1	W5-8210-B		Dummy suit with updated sleeves (without foam arm pit)	W5-8210
pelvis	2	W5-4131-C		Hipjoint with thread run-in	W5-4131
WorldSID small female Kit Revision1 conversion to SBLC (**kit B to C)**					
W5-3000	5	3710-00		2D IRTRACC Assembly (L&R Symmetric, updated cable exit)	3700-00
	2	W5-3340-B		Mounting bracket Assy Shoulder	W5-3340-A
	1	W5-4020-D		Lower lumbar mounting bracket	W5-4020-B
	1	W5-4042-B		Clamping plate upper lumbar	W5-4032
W5-5000	1	W5-5455		Right Lower leg, ankle and foot assy	W5-5200-2A
	1	W5-5456		Left Lower leg, ankle and foot assy	W5-5200-1A
	2	W5-5012-B		G5 structural replacement	W5-5021-A
	1	W5-8400-B		Lifting Bracket Assy	W5-8400-A
	1	W5-9000		Ground wiring pelvis	new part

Shoulder Bracket

- Elimination of Shoulder joint play
- New assembly W5-3340-B
- Part W5-3342-D with machined integrated shaft



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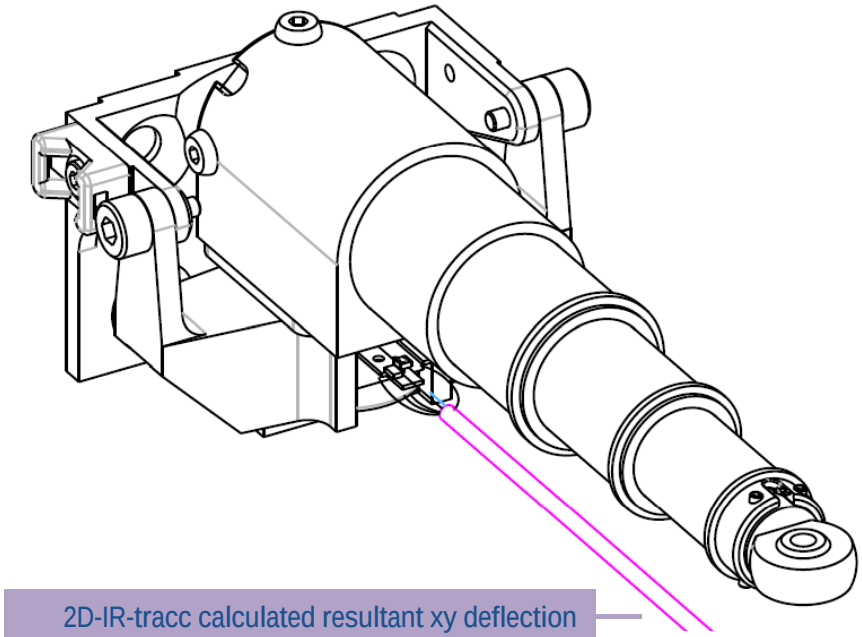
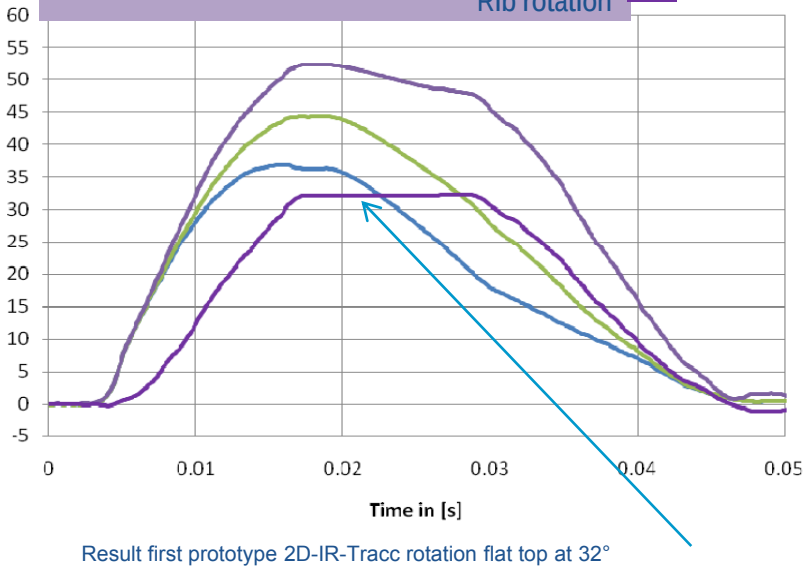
2D-IR-Tracc

- Part IF-371
- Increased Z-axis ROM ±45°
  - 6.0m/s pendulum about 40° rotation
- More durable small end
  - Wire and ball joint fixation
- Thorax mass optimised for 2D-IR-Tracc





Result first prototype 2D-IR-Tracc rotation flat top at 32°

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Standard IR-Tracc

- Not recommended
- Limited ROM (~20°) is a source of damage
- Need to restore about 0.430kg of thorax mass with ballast
- Europe is strongly supporting 2D chest deflection measurement
  - 'Development of thoracic injury criteria based on 2-dimensional rib deformation for injuries under lateral and lateral-oblique loading conditions is a priority'*

*EEVC WG12 report: Status of WorldSID 5th Percentile Female Side Impact Dummy

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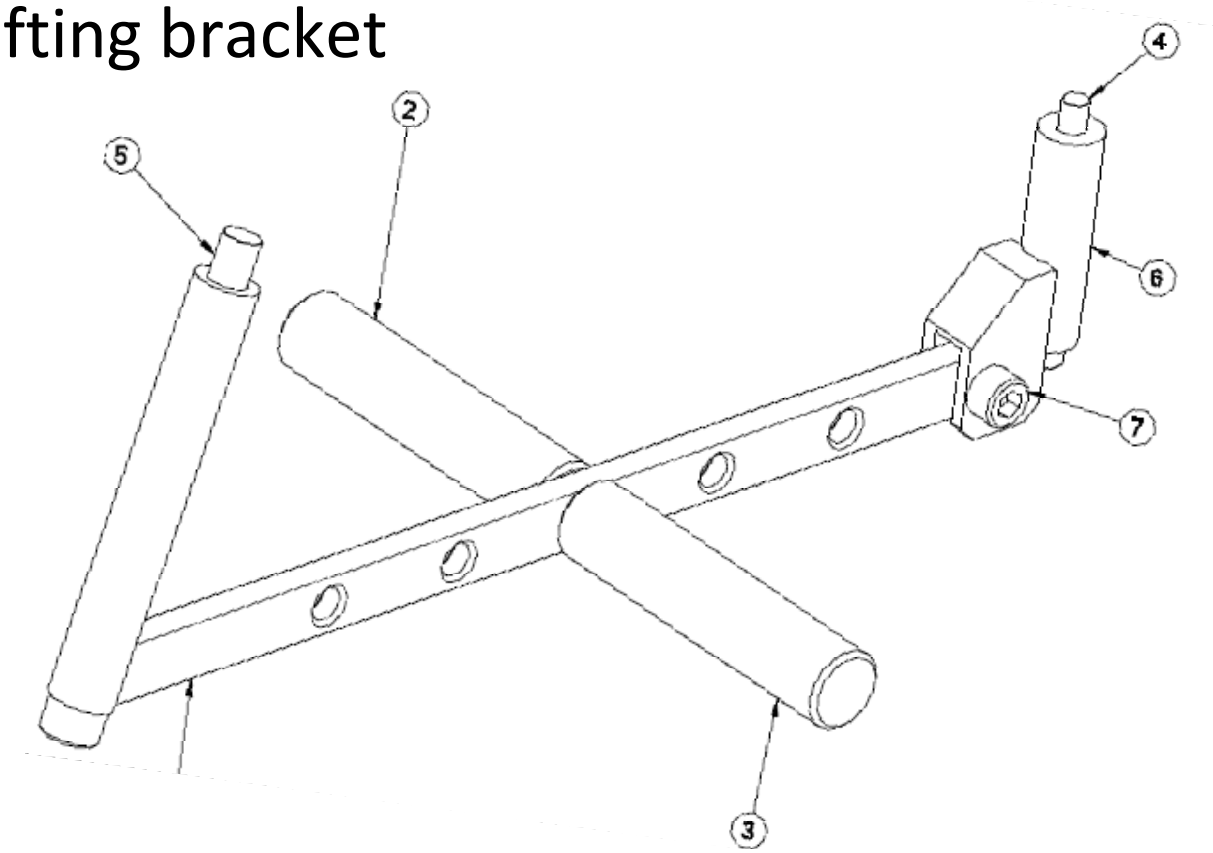
Dummy Lifting Bracket

- Old design difficult aligning 2 screws in thorax & pelvis
- Handling improvement
- New ‘split’ design allows first threading screws separately, then mating the lifting bracket
- W5-8400-B



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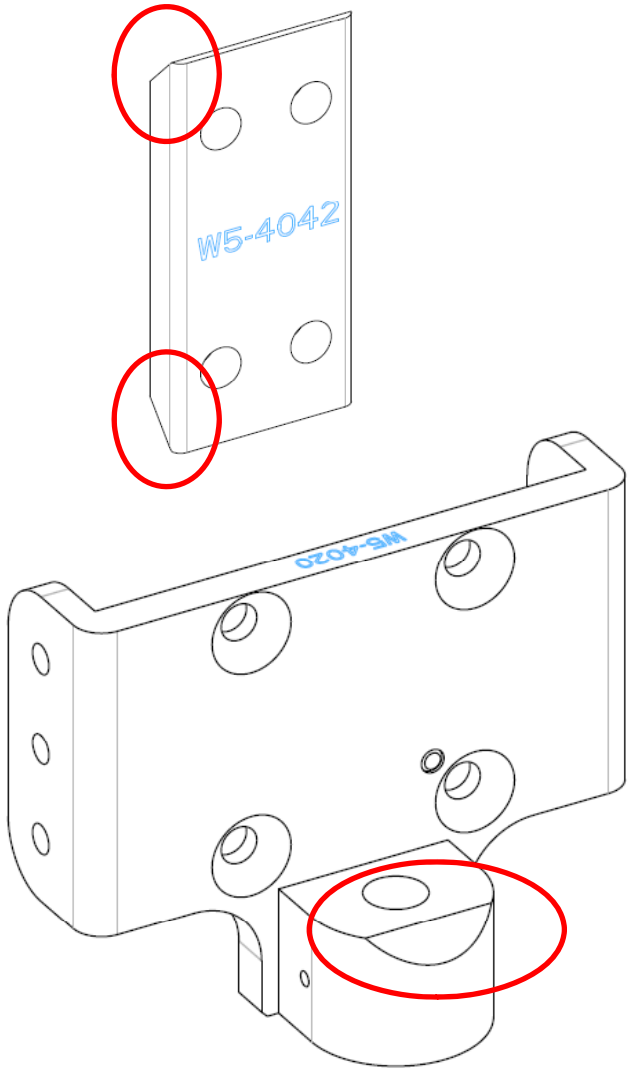
Lower lumbar mounting bracket
Clamping plate upper lumbar

- Add chamfer on W5-4020-D
- Add chamfer on W5-4042-B
- Modification of existing parts
- Reduce change at metal-metal contact



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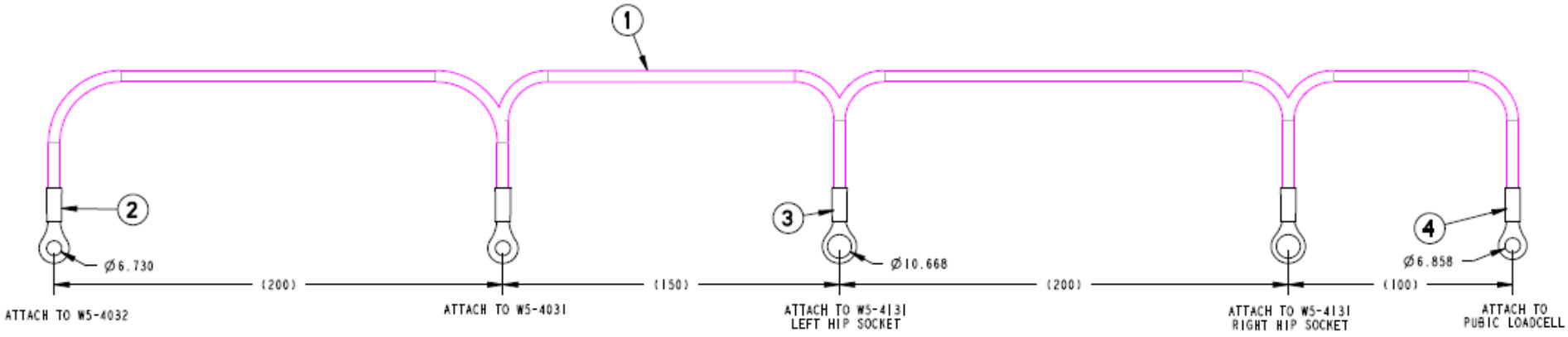
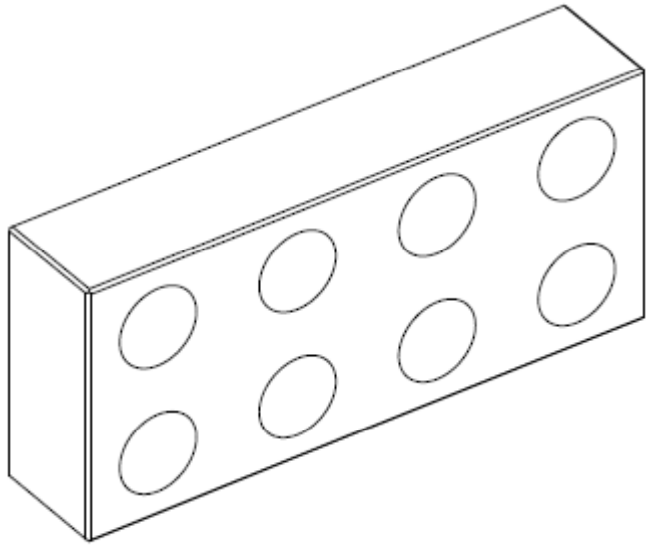
Pelvis earth leads part W5-9000

- Earthing between legs, pubic, sacrum and thorax
- Wire remains in the pelvis even when split at the thorax
- Thorax earth is restored when lumbar bracket assembled to thorax



DAS thigh structural replacement

- DAS structural replacement did not fit the thigh cavity well
- New part W5-5021-B



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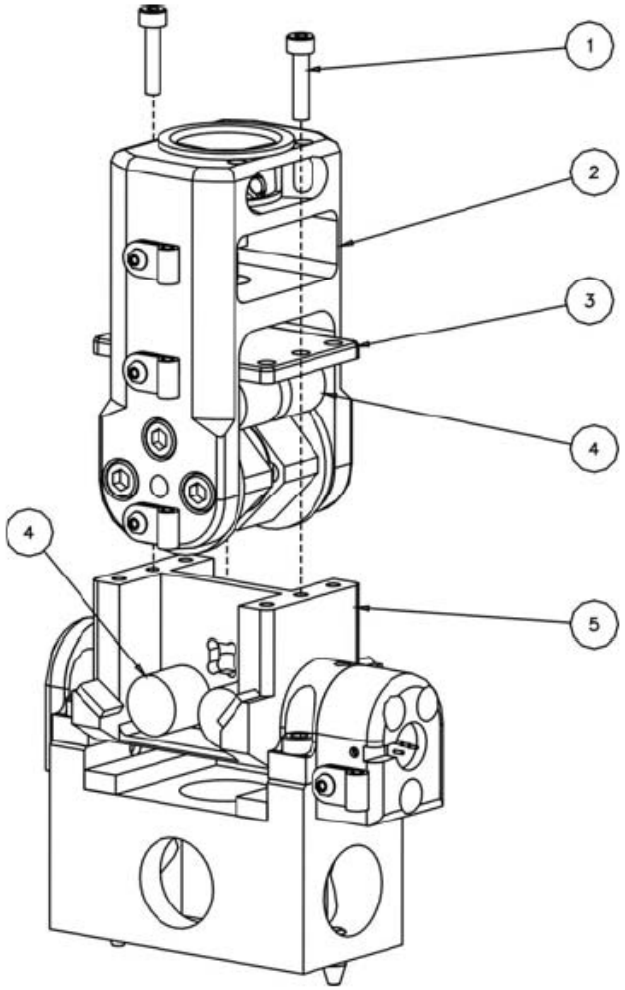
Issue current WS50M ankle design

- WorldSID adjustment of foot position to vehicle interior is difficult
- Increasing moment of ankle joint from mid position
- Desire friction setting in mid position and free range for adjustment
- WorldSID 50M has highest priority
- In Tokyo it was decided to first try concept in the 5F WorldSID



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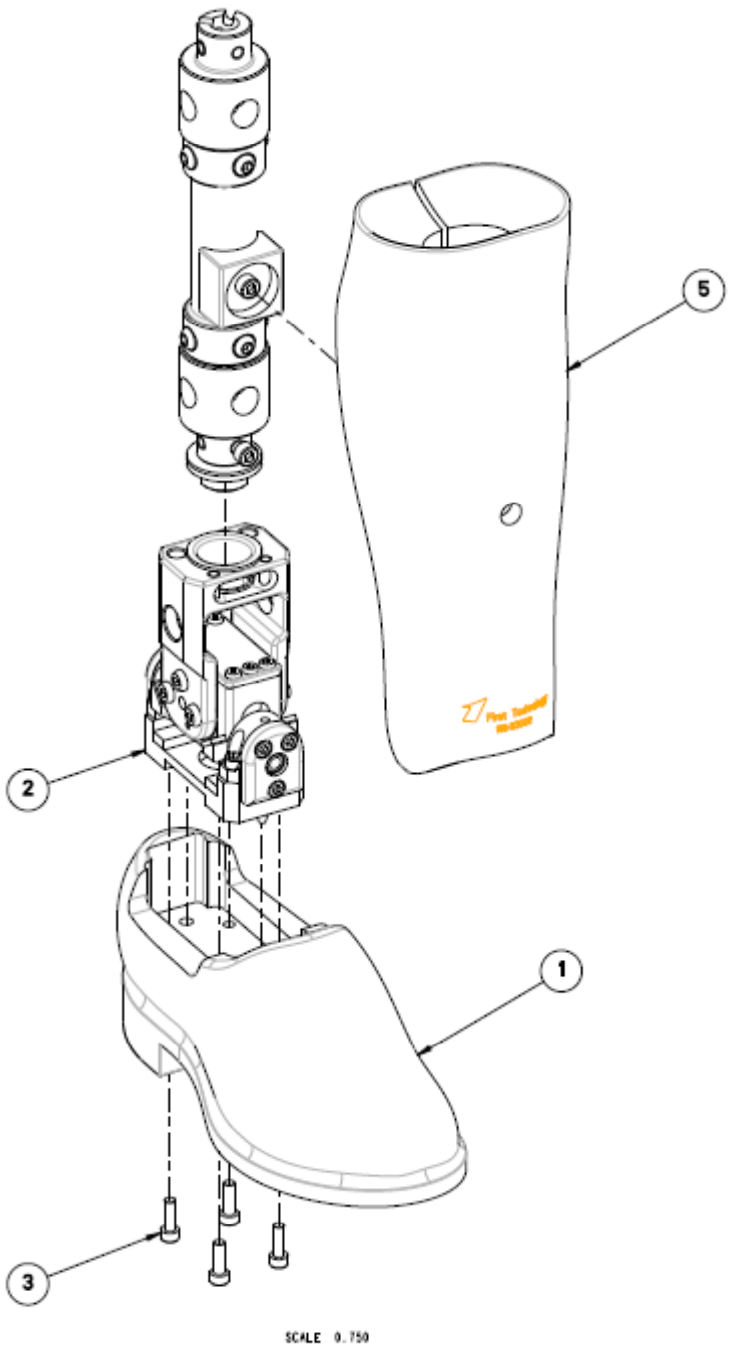
Lower leg, ankle & foot

- WorldSID 50M style
- New aluminium tibia load cell
- Molded foot and shoe
- Parts W5-5455 and 5456
- Ankle and lower leg LH&RH identical
- Shoe is handed left and right
- Redesign ankle flexion joint just started
  - Adjustable friction
  - address foot positioning started



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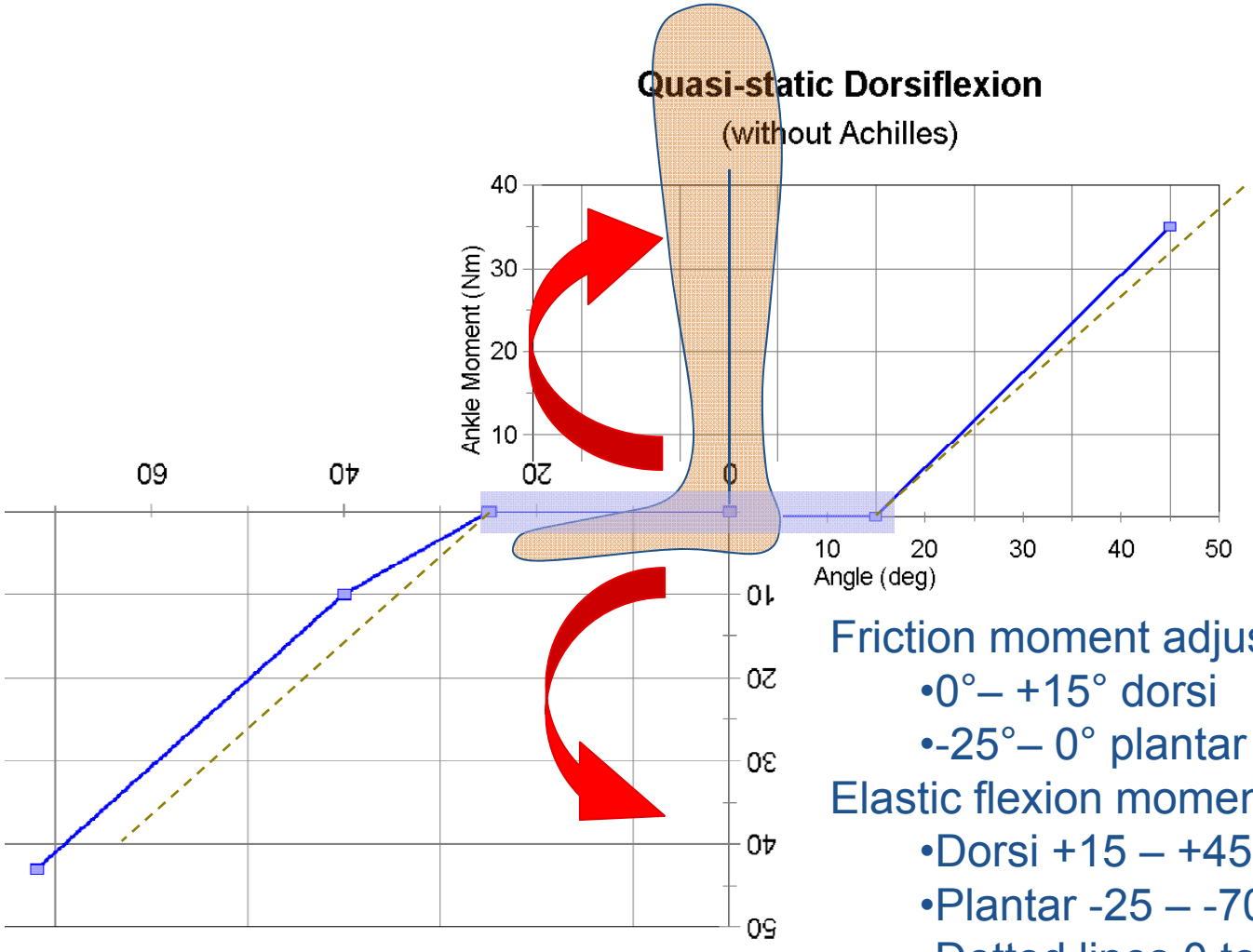
Initial proposal moment vs. angle WorldSID 50%Male (based on LX)



Quasi-static Plantarflexion

Friction moment adjustable between
- 0°– +15° dorsi
- -25°– 0° plantar

Elastic flexion moment
- Dorsi +15 – +45°, 0 to 35Nm:1.2Nm/°
- Plantar -25 – -70°, 0 to 42Nm: 0.93Nm/°
- Dotted lines 0 to 40Nm: 1.1Nm/°

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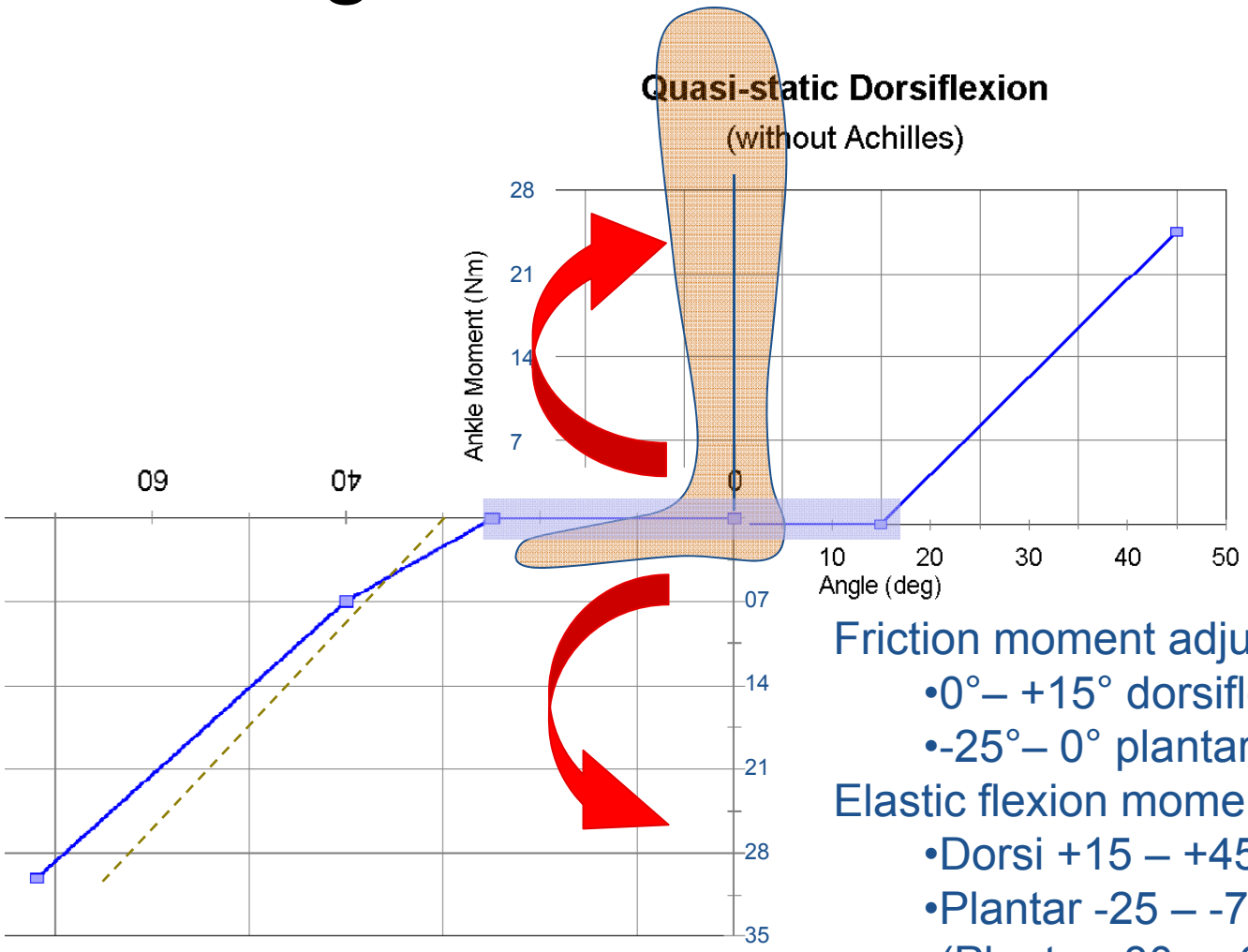
Initial proposal moment vs. angle WorldSID5F 70%scaled THOR-LX



Quasi-static Plantarflexion

Friction moment adjustable between
- 0°– +15° dorsiflexion
- -25°– 0° plantarflexion

Elastic flexion moment
- Dorsi +15 – +45°, 0 – 25Nm: 0.83 Nm/°
- Plantar -25 – -70°, 0 – 30Nm: 0.67Nm/°
- (Plantar -30 – -66°, 0 – 30Nm: 0.83 Nm/° (dotted lines))

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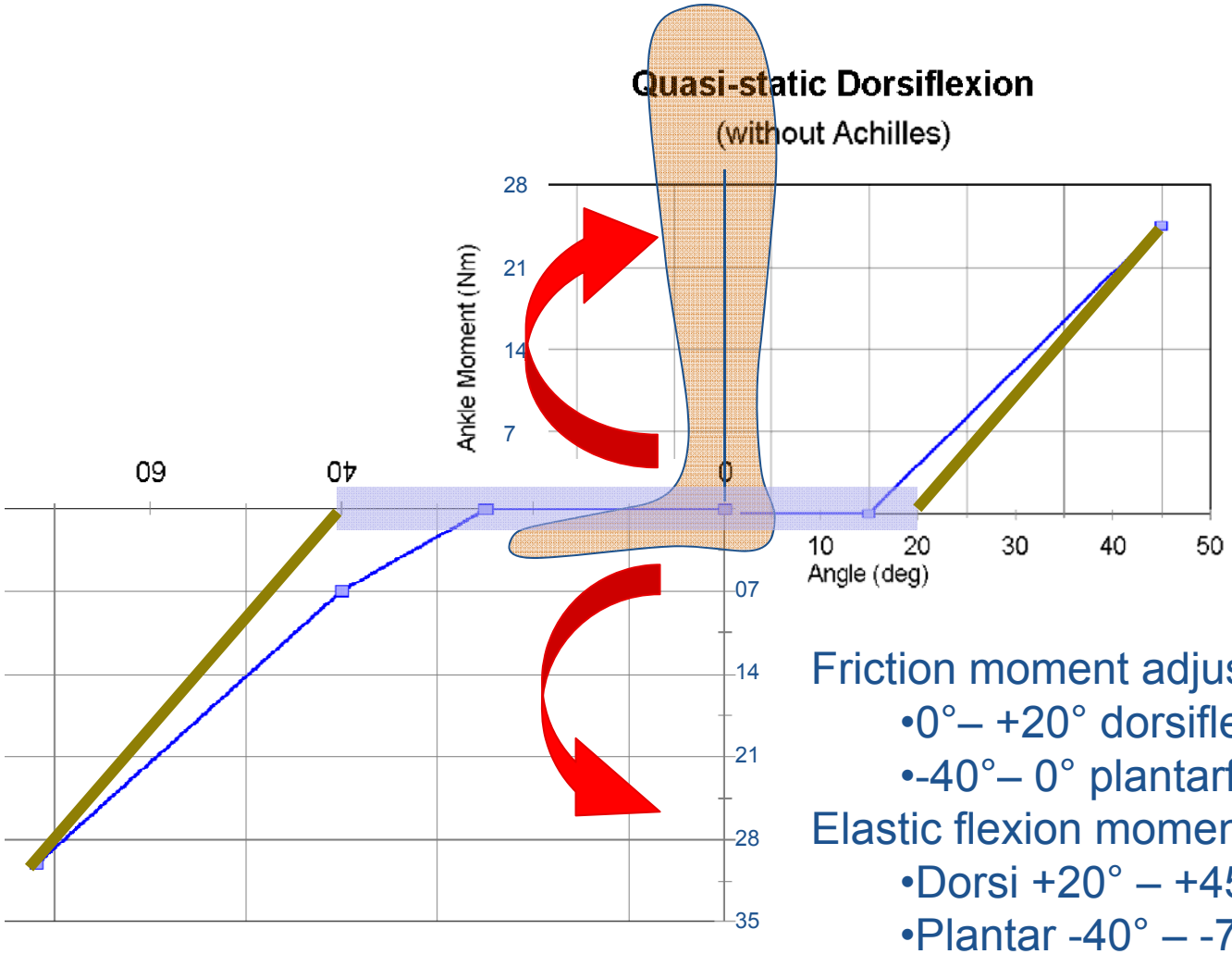
PDB proposal
WorldSID5%F moment vs. angle



Quasi-static Plantarflexion

	PDB recommendation
Dorsiflexion	0° until +20°
Plantarflexion	-40° until 0°

Friction moment adjustable between
- 0°– +20° dorsiflexion
- -40°– 0° plantarflexion

Elastic flexion moment
- Dorsi +20° – +45°, 0 – 25Nm: 1.0 Nm/°
- Plantar -40° – -70°, 0 – 30Nm: 1.0Nm/°

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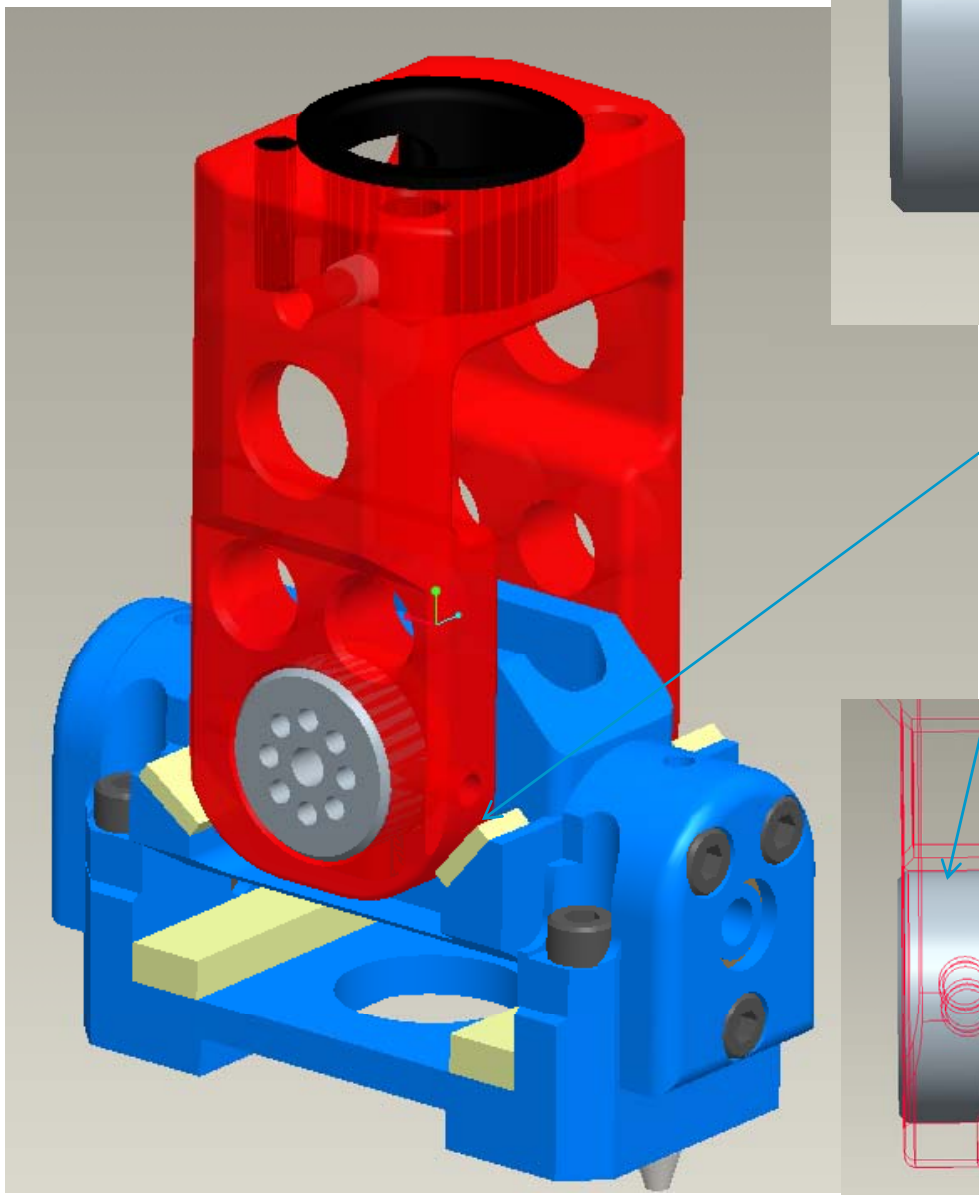
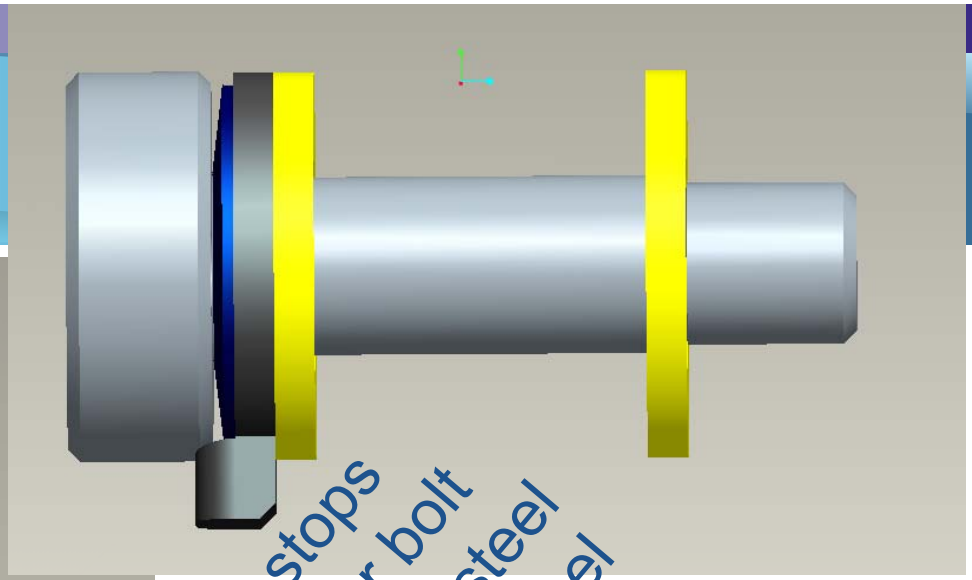
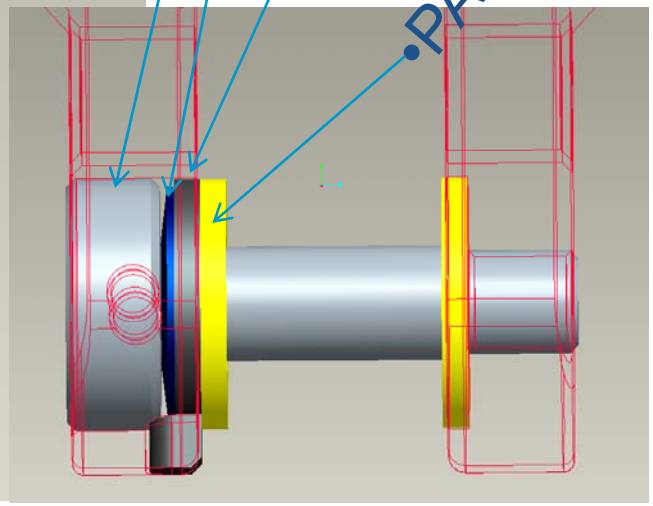
Concept



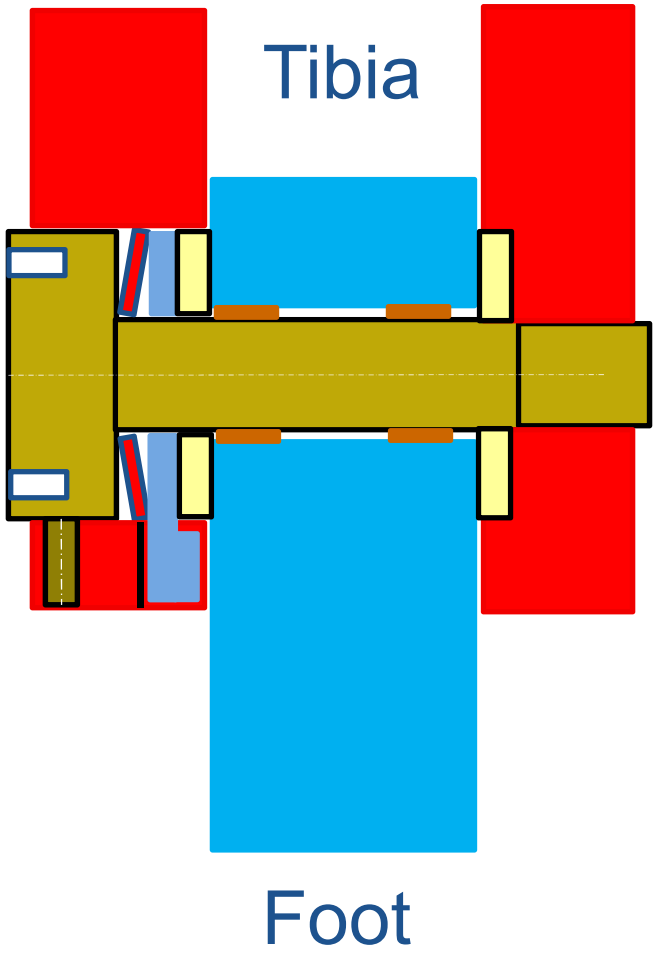


- End stops
- Shoulder bolt
- Disc spring steel
- Keyed ring steel stainless
- PA friction rings



Concept

- Shoulder bolt
- Adjust compression on disc spring
- Nylon friction rings
- Set screw to maintain adjustment
- Friction adjustable between 0 and 10Nm



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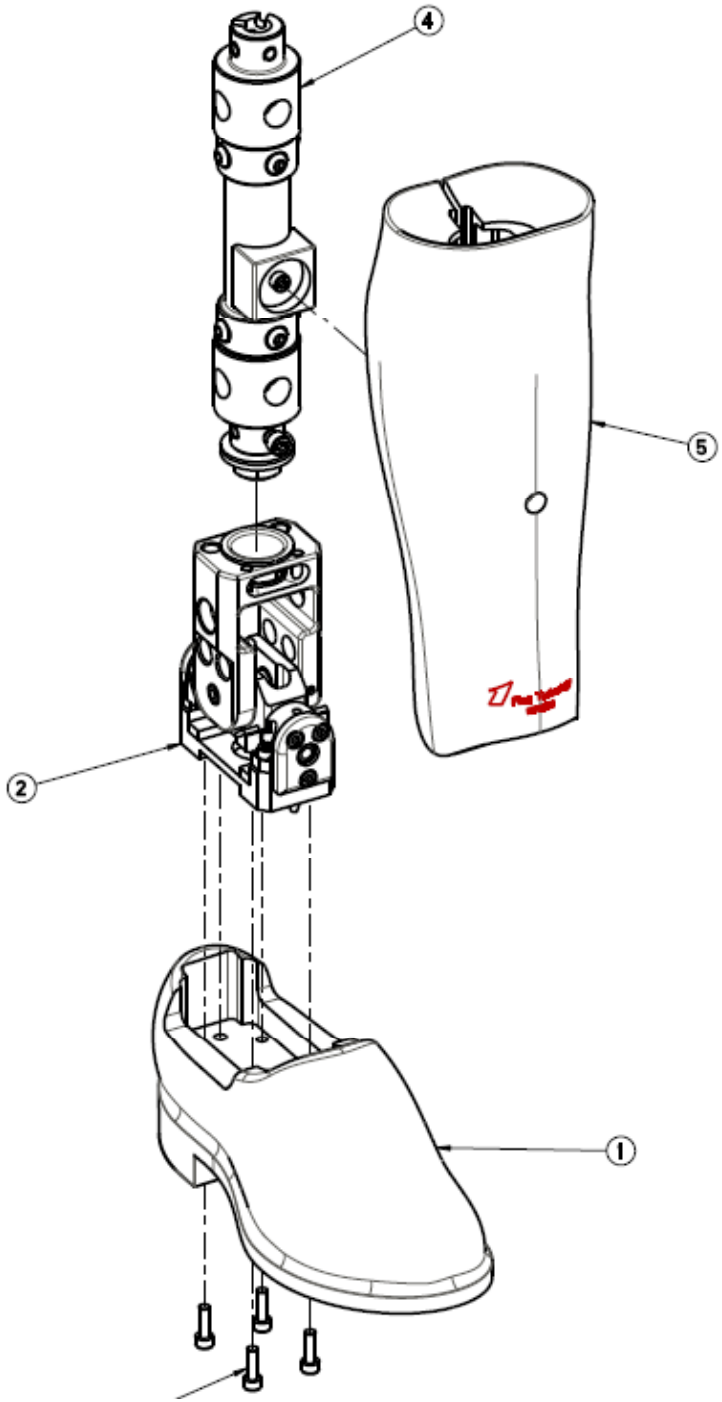
Progress and outlook

- Building prototype legs
- Prototype expected around end 2010
- Humanetics currently upgrading the APROSYS dummy to SBL-C
- WS5F dummy can be made available for evaluation



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