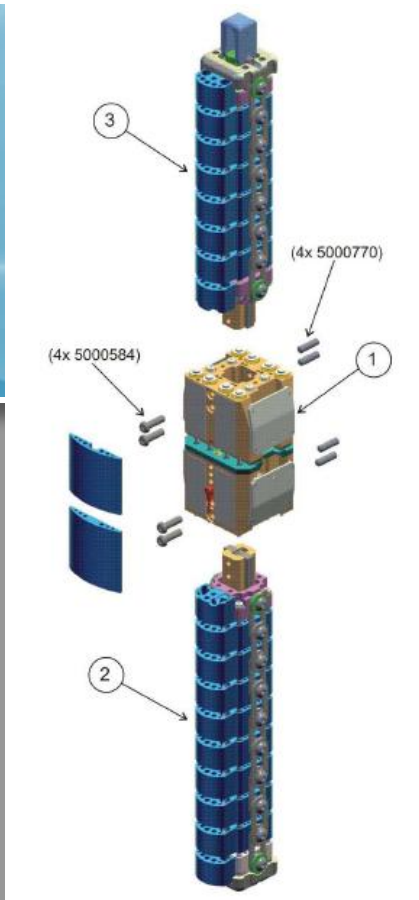


Flex PLI GTR Status

Informal Group GTR9 PH2



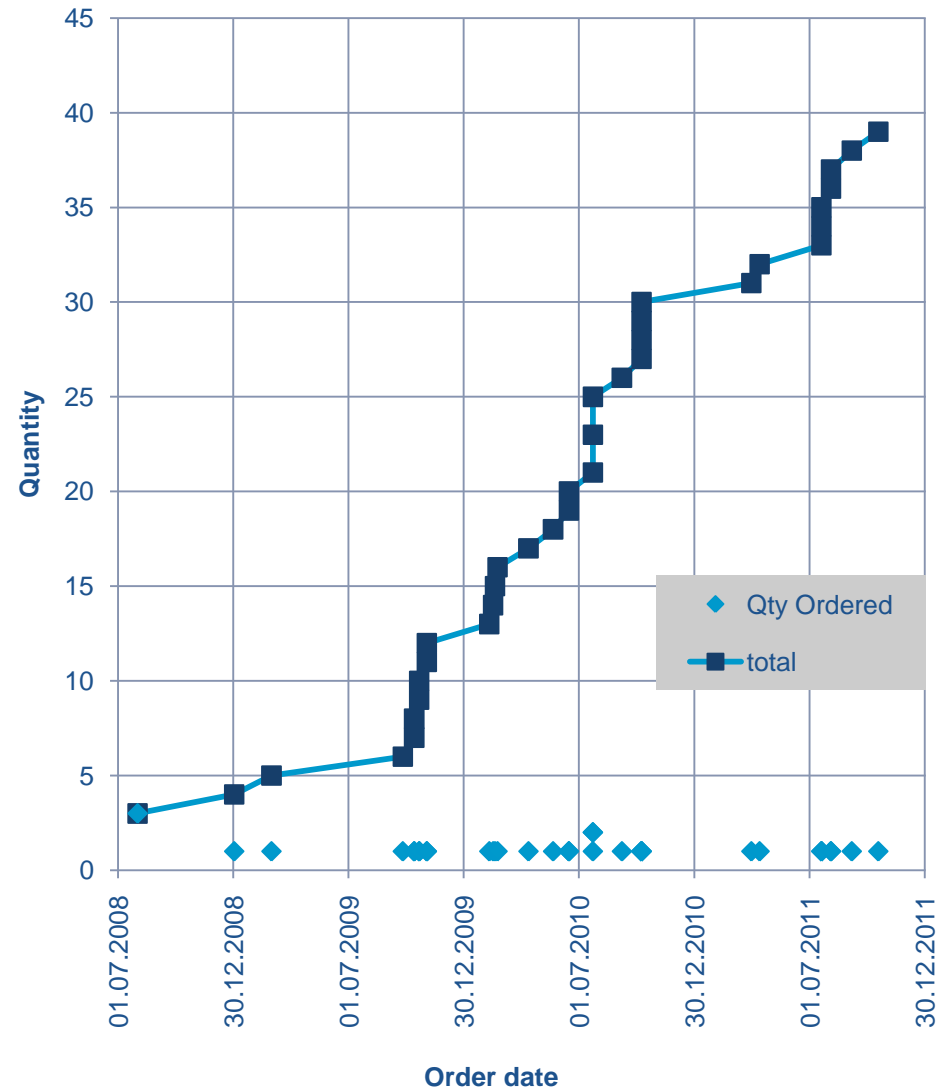
1-2 December 2011
Bernard Been

Content

- ▶ Number of GTR legs manufactured
- ▶ Flex Status
- ▶ Leg availability

Number of GTR Legs Made

- ▶ 3 JARI prototypes
- ▶ 3 Humanetics for internal testing, demo and CAE
- ▶ 22 customer legs have been sold
- ▶ 12 legs are on order
- ▶ All customer legs have onboard DAS
- ▶ Some with optional addition channels up to 24



Flex Status

- ▶ All production legs have Vinyl ester bones (more durable)
Some prototypes have been updated to Vinyl ester
- ▶ All legs were build passing agreed GTR static component corridors
- ▶ All production legs pass GTR Pendulum corridors
 - T3 and T4 are usually high and MCL is generally low
- ▶ Production legs consistently fail some Inverse GTR corridors
 - some tibia moment channels are too low
 - failure very repeatable
- ▶ 4 different batches of Vinyl ester bone have been used
- ▶ From test experience Humanetics currently manufactures bones to be as close to GTR inverse corridors as possible

Example 2011 Production Pendulum Results

Pendulum			SN DH5646			
Date			3/21/2011	3/21/2011	4/1/2011	4/7/2011
Test site	Low	High	Plymouth	Plymouth	Nagoya	Nagoya
Peak Moment @ T1	235	272	243.29	245.57	246.97	252.70
Peak Moment @ T2	185	211	198.12	199.87	199.64	205.10
Peak Moment @ T3	135	160	152.92	154.93	151.24	156.50
Peak Moment @ T4	94	108	102.79	103.89	102.89	107.00
Peak ACL Elongation	9	11	10.02	9.99	10.03	10.20
Peak MCL Elongation	23	26	22.87	23.08	23.17	23.60
Peak LCL Elongation	2	4.5	3.24	3.18	3.19	4.30
Peak PCL Elongation	4	5.4	4.09	4.18	4.27	2.00
Femur stiffness			mid			
Femur thickness			10.44mm			
Femur Batch			B2			
Tibia stiffness			mid-high			
Tibia thickness			10.36mm			
Tibia Batch			B2			
Tibia Assembly			Pass			
Femur Assembly			Pass			
Knee Assembly			Pass			
				1/2 turn to springs		With SLICE

SN DG0726		
4/29/2011	5/2/2011	5/16/2011
Plymouth	Plymouth	BAST
251.00	246.83	248.30
207.98	204.93	199.50
159.07	155.94	150.30
109.33	106.83	101.50
9.23	9.07	9.90
23.14	22.96	22.90
3.66	3.54	3.10
4.94	5.06	4.20
High		
10.38mm		
B2		
High		
10.67mm		
B3		
Pass		
Pass		
Pass		

SN DG6304		
6/16/2011	6/16/2011	6/17/2011
Plymouth	Plymouth	Plymouth
244.25	244.33	243.67
199.49	199.54	198.98
151.61	151.77	151.08
102.39	102.45	101.50
9.23	9.24	9.25
22.67	22.70	22.72
2.86	2.86	2.86
4.93	4.95	4.96
MID		
?		
B2		
MID		
?		
B2		
Pass		
Pass		
Pass		

SN DH6791		
5/5/2011	5/6/2011	5/6/2011
Plymouth	Plymouth	Plymouth
247.76	247.71	248.41
204.72	204.12	204.63
156.46	155.79	153.01
106.91	106.50	106.52
9.55	9.90	9.68
23.14	23.08	23.18
4.10	3.93	3.97
4.76	4.45	4.53
Low		
~10.3		
B2		
Medium		
10.4		
B3		
Pass		
Pass		
Pass		

Example 2011 Production Inverse Results

Inverse			SN DH5646	
Date			4/19/2011	4/20/2011
Test site			Plymouth	Plymouth
Pre Impact velocity	10.9	11.3	11.05	11.34
Peak Moment @ T1	237	277	0.00	257.14
Peak Moment @ T2	223	269	228.26	232.05
Peak Moment @ T3	176	204	173.37	180.00
Peak Moment @ T4	98	120	98.19	101.26
Peak ACL Elongation	8.5	10.5	8.28	8.75
Peak MCL Elongation	18	23	19.77	19.73
Peak PCL Elongation	4.5	6	0.01	5.83
Femur stiffness			mid	
Femur thickness			10.44mm	
Femur Batch			B2	
Tibia stiffness			mid-high	
Tibia thickness			10.36mm	
Tibia Batch			B2	
Tibia Assembly			Pass	
Femur Assembly			Pass	
Knee Assembly			Pass	

SN DG0726	
4/29/2011	5/16/2011
Plymouth	BAST
11.34	11.09
237.73	250.30
221.94	229.50
169.13	177.70
93.42	97.40
9.27	8.70
19.59	19.10
5.34	5.10
High	
10.38mm	
B2	
High	
10.67mm	
B3	
Pass	
Pass	
Pass	

SN DG6304	
6/17/2011	8/4/2011
Plymouth	BAST
11.24	11.15
241.32	246.8
222.27	224.1
170.39	170.5
97.06	97.3
9.26	9.7
19.33	20.3
5.62	5.4
MID	
?	
B2	
MID	
?	
B2	
Pass	
Pass	
Pass	

DH6791
4/20/2011
Plymouth
11.24
231.48
216.31
171.09
99.40
8.22
16.24
4.38
Low
~10.3
B2
Medium
10.4
B3
Pass
Pass
Pass

DI6014
6/2/2011
Plymouth
11.24
241.01
217.43
167.68
97.11
9.55
19.42
6.27
High
?
B3
High
?
B2
Pass
Pass
Pass

Leg Availability for Testing

- ▶ Humanetics proposes at least 6 legs should be tested for corridor definition at 6 labs minimum after they have been checked and certified
- ▶ Availability of legs for testing would depend on customer co-operation
- ▶ Humanetics would make their internal leg available for testing

Thank you for your attention!