

GTR9-5-17



FlexPLI Test Results

Concept Tech GmbH:
FlexPLI SN03





Presentation Topics

Test Procedure: Test configuration and calibrations

FlexPLI Calibration tests (Test Results)

- Inverse Calibration
- Pendulum Calibration

FlexPLI tests on a Sports Car (Test Results)

FlexPLI tests on a Limousine (Test Results)

FlexPLI tests on a test rig (Test Results)

Flex PLI technical concerns



Test Procedure



1. Pendulum
2. **Tests on a “Sports Car”**
3. Inverse calibration
4. Pendulum
5. **Tests on a “Limousine”**
6. Inverse calibration
7. Pendulum
8. **Tests on a test rig**
9. Inverse calibration
10. Pendulum

FlexPLI Calibration



Pendulum Calibration

- In this test series **3 pendulum tests** have been performed at Concept Tech
- All calibration tests have been acceptable and passed the certification
- Slight fluctuations between each test - but a good reproducibility
- All calibration tests have been accomplished in accordance to the latest version of the FLEX-PLI manual

FlexPLI Calibration



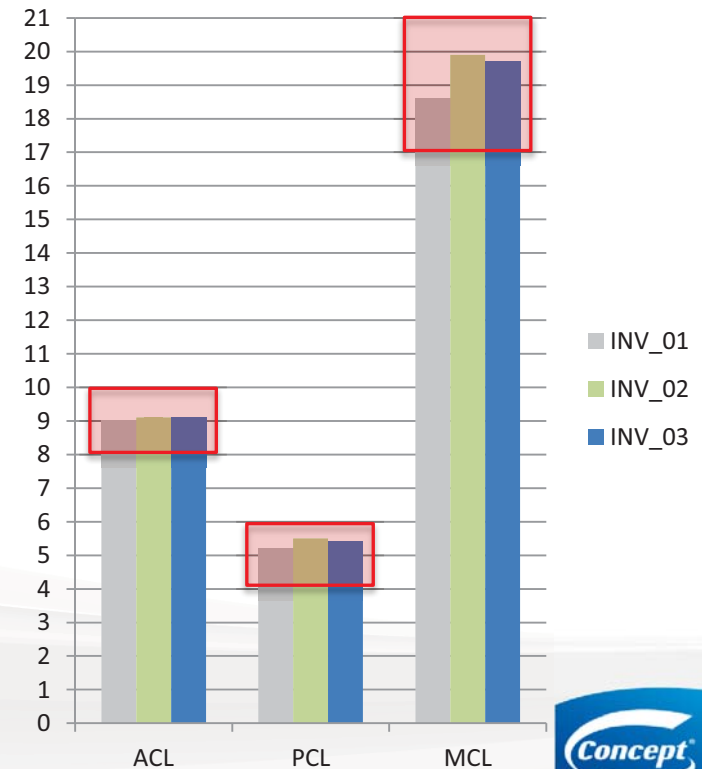
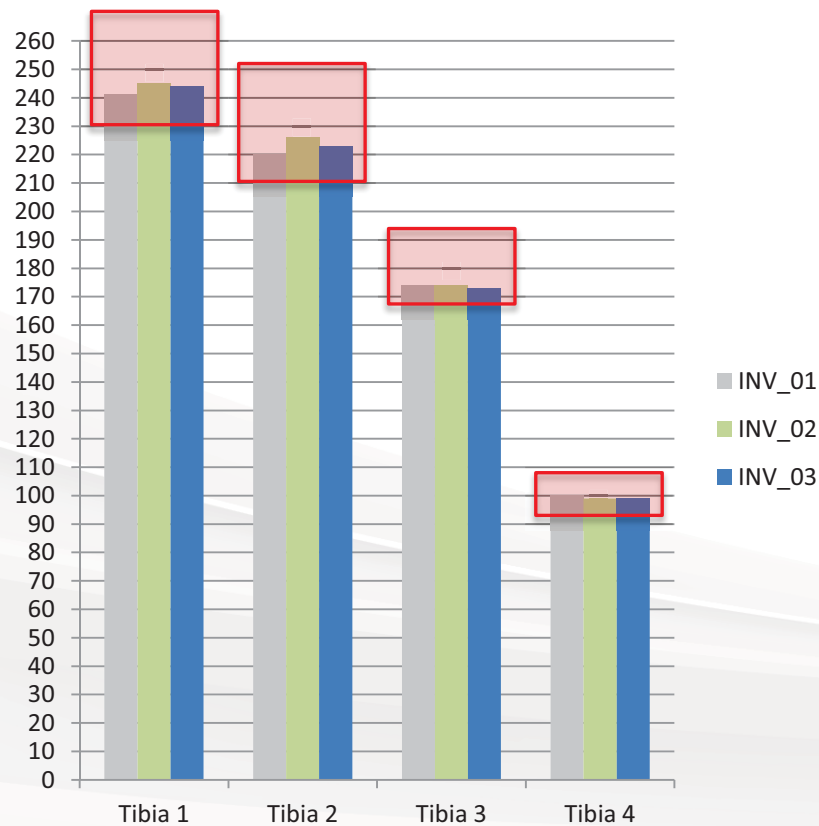
Inverse Calibration

- In this test series **3 inverse tests** have been performed at Concept Tech
- All calibration tests have been acceptable and passed the certification
- Slight fluctuations between each test - but a good reproducibility
- All calibration tests have been accomplished in accordance to the latest version of the FLEX-PLI manual

Inverse Test Results



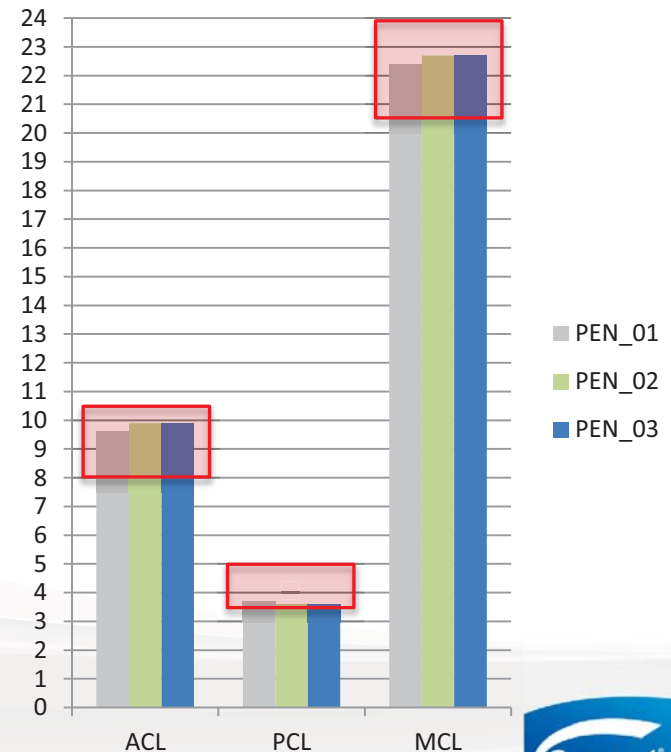
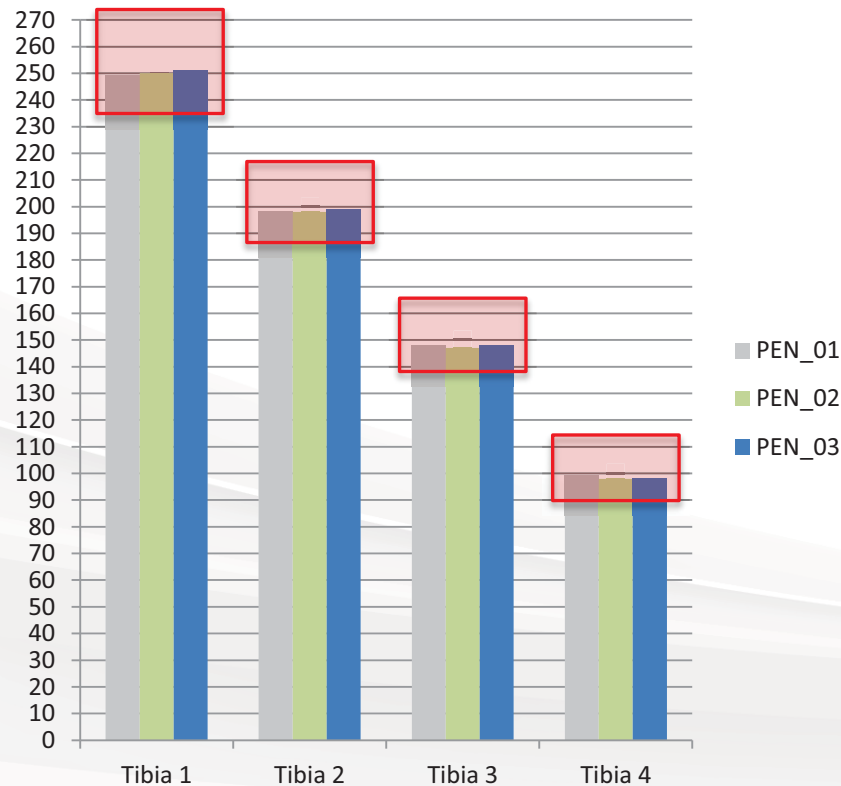
INVERSE CALIBRATION CORRIDOR								
Calibration Corridor	Tibia 1	Tibia 2	Tibia 3	Tibia 4	ACL	PCL	MCL	
Upperlimit	272	252	192	108	10.0	6.0	21.0	
Lowerlimit	230	210	166	93	8.0	4.0	17.0	
CONCEPT TECH CALIBRATION								
Test	Velocity [m/s]	Tibia 1	Tibia 2	Tibia 3	Tibia 4	ACL	PCL	MCL
Inv_01	11.01	241	220	174	100	9.0	5.2	18.6
Inv_02	11.08	245	226	174	99	9.1	5.5	19.9
Inv_03	11.06	244	223	173	99	9.1	5.4	19.7



Pendulum Test Results



Pendulum CALIBRATION CORRIDOR							
Calibration Corridor	Tibia 1	Tibia 2	Tibia 3	Tibia 4	ACL	PCL	MCL
Upperlimit	272	219	166	111	10.5	5.0	24.0
Lowerlimit	235	187	139	90	8.0	3.5	20.5
CONCEPT TECH CALIBRATON							
Test	Tibia 1	Tibia 2	Tibia 3	Tibia 4	ACL	PCL	MCL
Pen_01	249	198	148	99	9.6	3.7	22.4
Pen_02	250	198	147	98	9.9	3.6	22.7
Pen_03	251	199	148	98	9.9	3.6	22.7

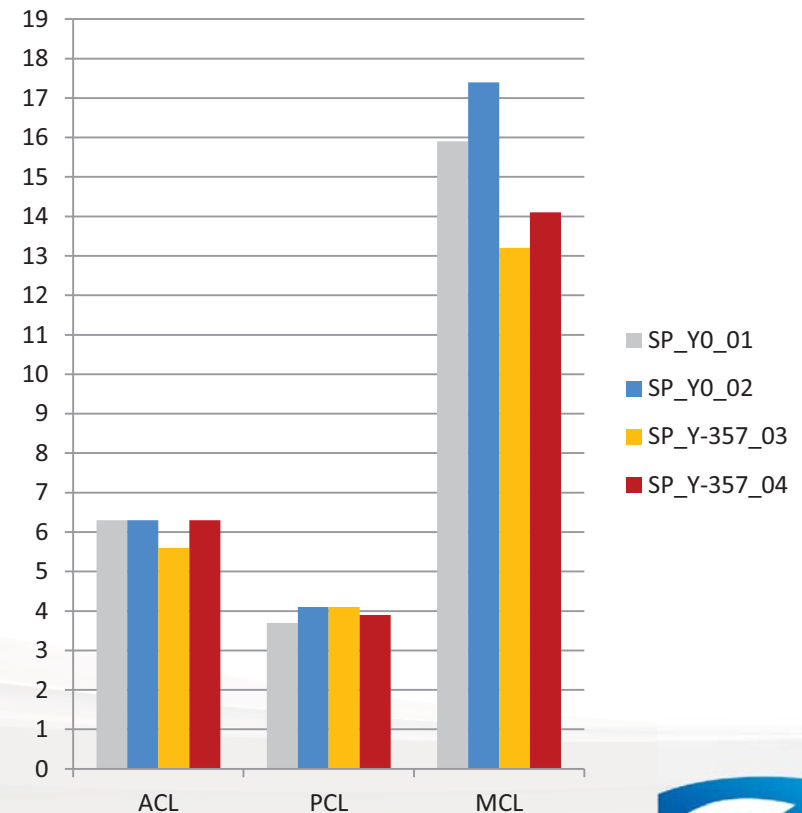
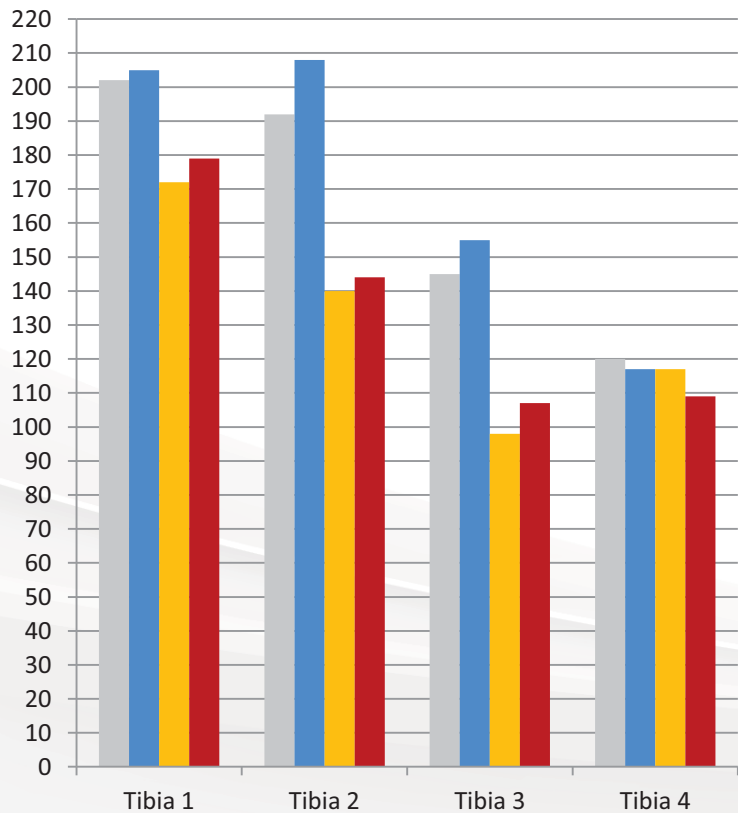


Test Results „Sports Car“

GTR9-5-17



CONCEPT TECH FlexPLI Test on a „Sports Car“									
Test	Position	Velocity [m/s]	Tibia 1	Tibia 2	Tibia 3	Tibia 4	ACL	PCL	MCL
SP_Y0_01	Y0	11.17	202	192	145	120	6.3	3.7	15.9
SP_Y0_02	Y0	11.16	205	208	155	117	6.3	4.1	17.4
SP_Y-357_03	Y-357	11,16	172	140	98	117	5,6	4,1	13,2
SP_Y-357_04	Y-357	11,17	179	144	107	109	6,3	3,9	14,1

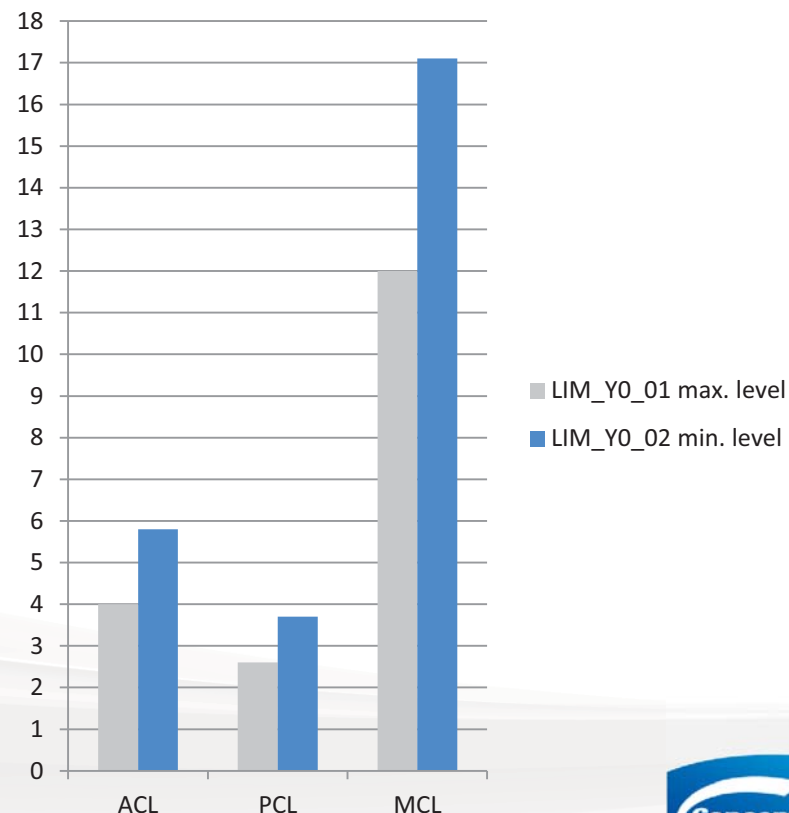
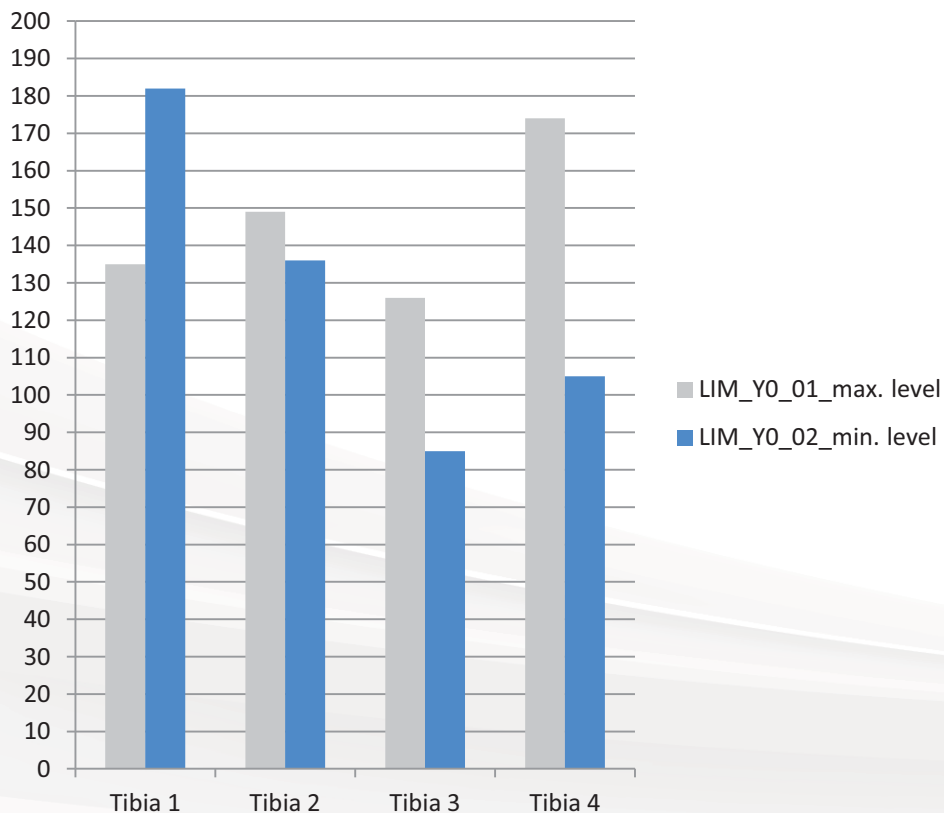




Test Results „Limousine“

CONCEPT TECH Limousine									
Test	Position	Velocity [m/s]	Tibia 1	Tibia 2	Tibia 3	Tibia 4	ACL	PCL	MCL
LIM_Y0_01 max. level	Y0	11.17	135	149	126	174	4.0	2.6	12.0
LIM_Y0_02 min. level	Y0	11.21	182	136	85	105	5.8	3.7	17.1

Ground level difference: 37 mm

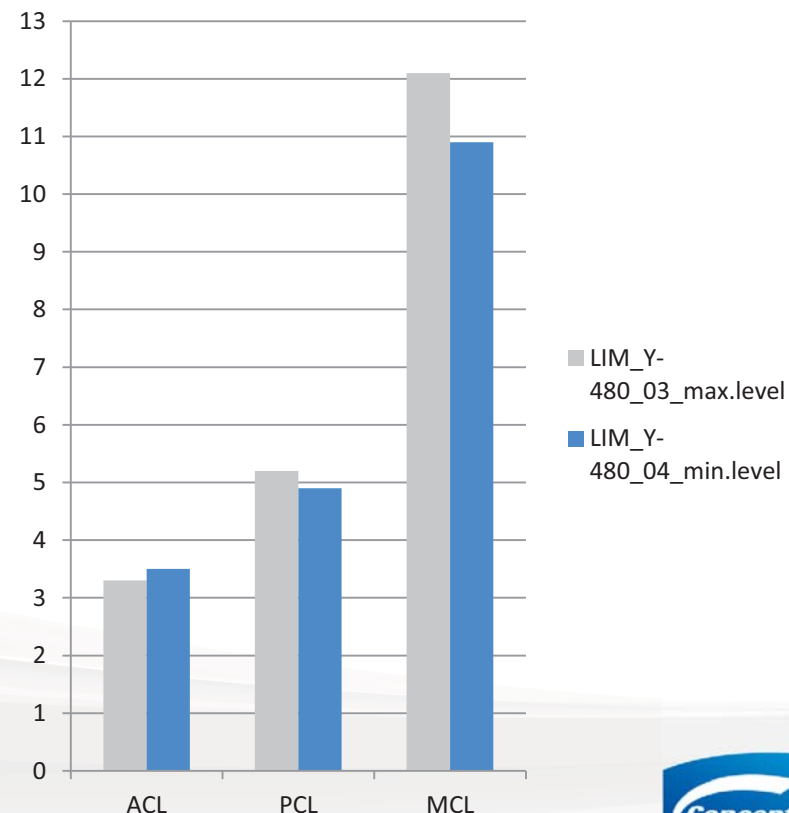
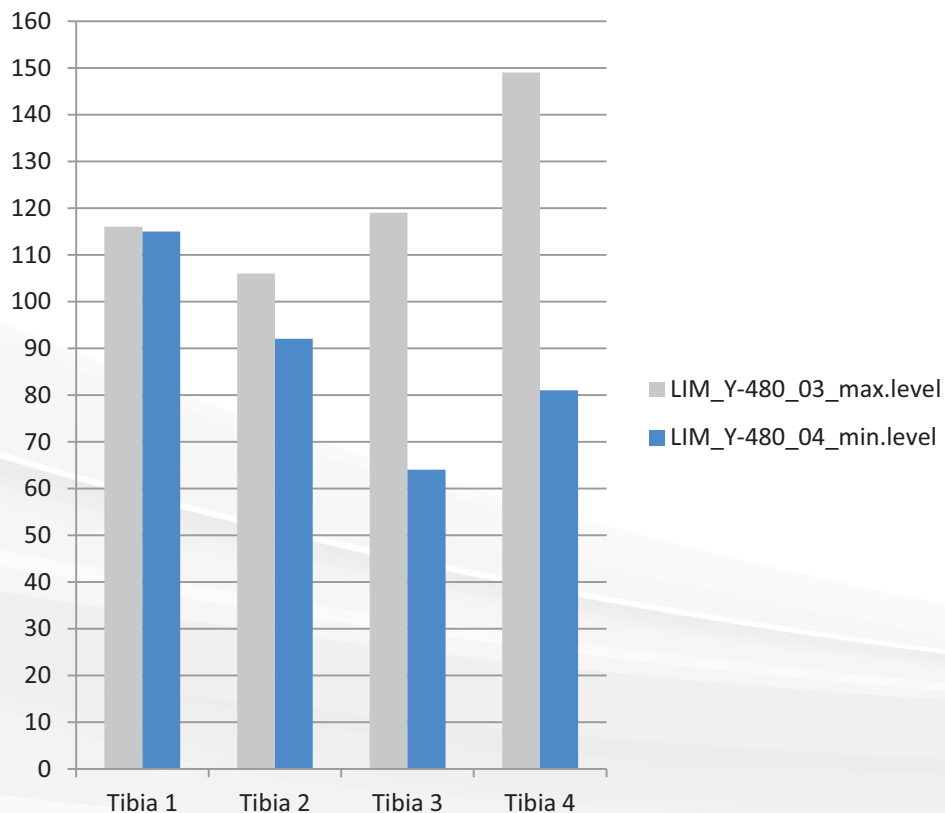


Test Results „Limousine“



CONCEPT TECH Limousine									
Test	Position	Velocity [m/s]	Tibia 1	Tibia 2	Tibia 3	Tibia 4	ACL	PCL	MCL
LIM_Y-480_03 max. level	Y-480	11,19	116	106	119	149	3,3	5,2	12,1
LIM_Y-480_04 min. level	Y-480	11,20	115	92	64	81	3,5	4,9	10,9

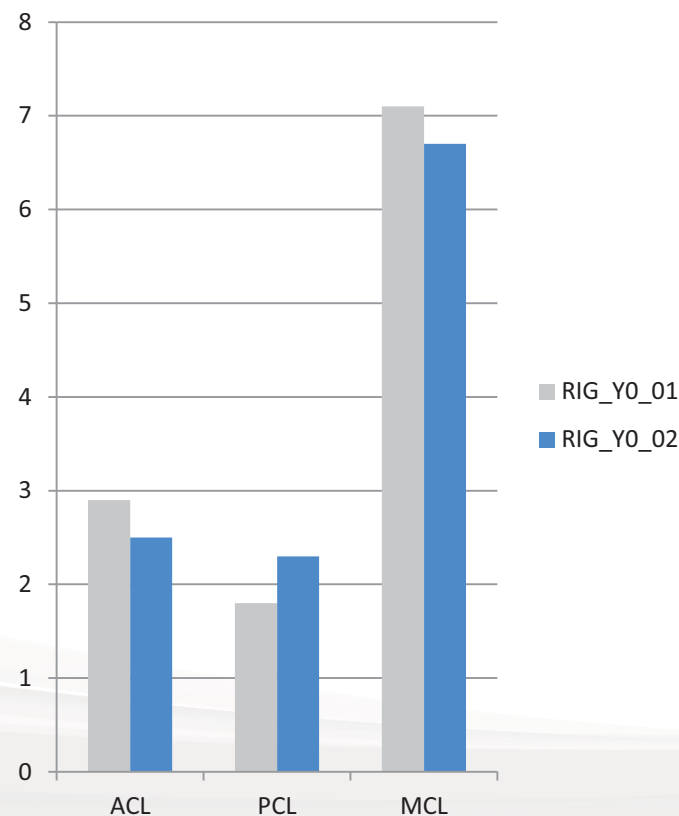
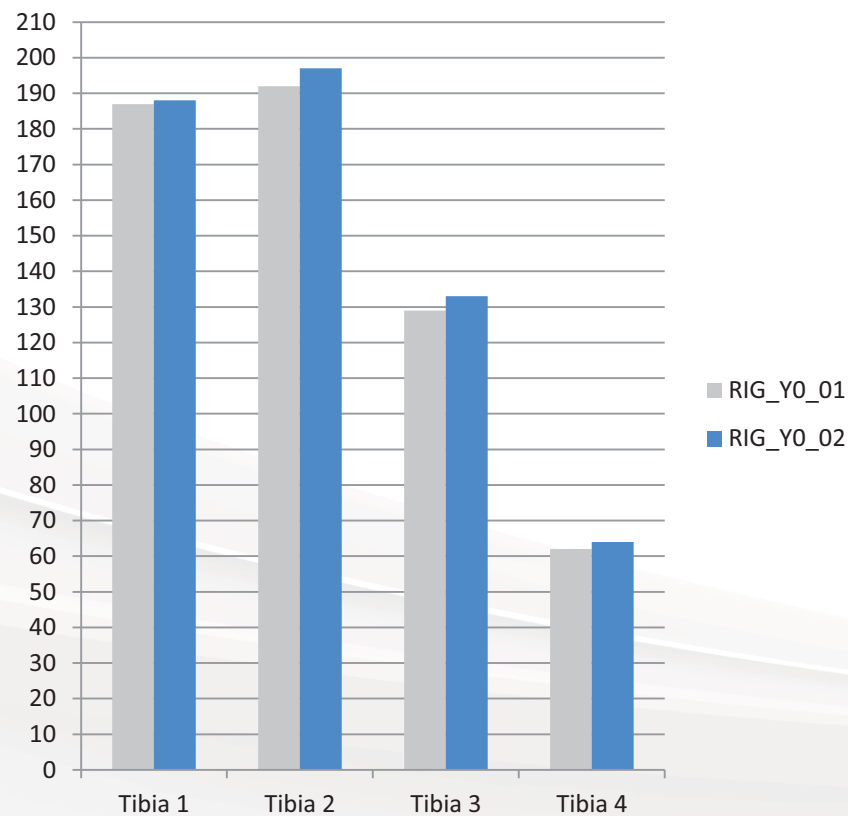
Ground level difference: 37 mm



Test Results „test rig“



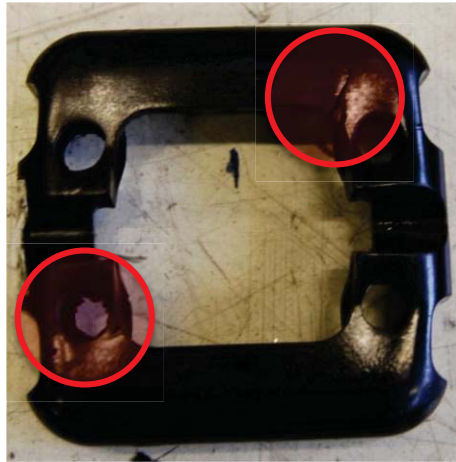
CONCEPT TECH „test rig“									
Test	Position	Velocity [m/s]	Tibia 1	Tibia 2	Tibia 3	Tibia 4	ACL	PCL	MCL
RIG_Y0_01	Y0	11,14	187	192	129	62	2,9	1,8	7,1
RIG_Y0_02	Y0	11,14	188	197	133	64	2,5	2,3	6,7



Flex PLI technical concerns



End cover broken very quick



Outer skin cover gets damaged very fast after a few tests

GTR9-5-17

