

Transmitted by the expert from Japan

Informal document No. GRSP-47-12
(47th GRSP, 17-21 May 2010,
agenda item 4.1)

***Status Report on
Flexible Pedestrian Legform Impactor
Technical Evaluation Group (Flex-TEG)
Activities***

Flex-TEG Activities

1st - 11th Flex-TEG meetings

- ✓ **1st Flex-TEG Meeting (OICA office, Paris, 5-6 Sep. 2005)**
- ✓ **2nd Flex-TEG Meeting (BAST, Bergisch Gladbach, 22 Nov. 2005)**
- ✓ **3rd Flex-TEG Meeting (BAST, Bergisch Gladbach, 24 Apr. 2006)**
- ✓ **4th Flex-TEG Meeting (BAST, Bergisch Gladbach, 2 Apr. 2007)**
- ✓ **5th Flex-TEG Meeting (BAST, Bergisch Gladbach, 7 Dec. 2007)**
- ✓ **6th Flex-TEG Meeting (BAST, Bergisch Gladbach, 31 Mar. 2008)**
- ✓ **7th Flex-TEG Meeting (BAST, Bergisch Gladbach, 8 Dec. 2008)**
- ✓ **8th Flex-TEG Meeting (TUV Rheinland Group, Cologne , 19 May 2009)**
- ✓ **9th Flex-TEG Meeting (BAST, Bergisch Gladbach, 3-4 Sep. 2009)**
- ✓ **10th Flex-TEG Meeting (BAST, Bergisch Gladbach, 1-2 Dec. 2009)**
- ✓ **11th Flex-TEG Meeting (ACEA office, Brussels, 21 Apr. 2010)**

1st Meeting
OICA office in Paris



2nd - 10th Meetings
BAST or TUV Rheinland Group
meeting room at around Cologne



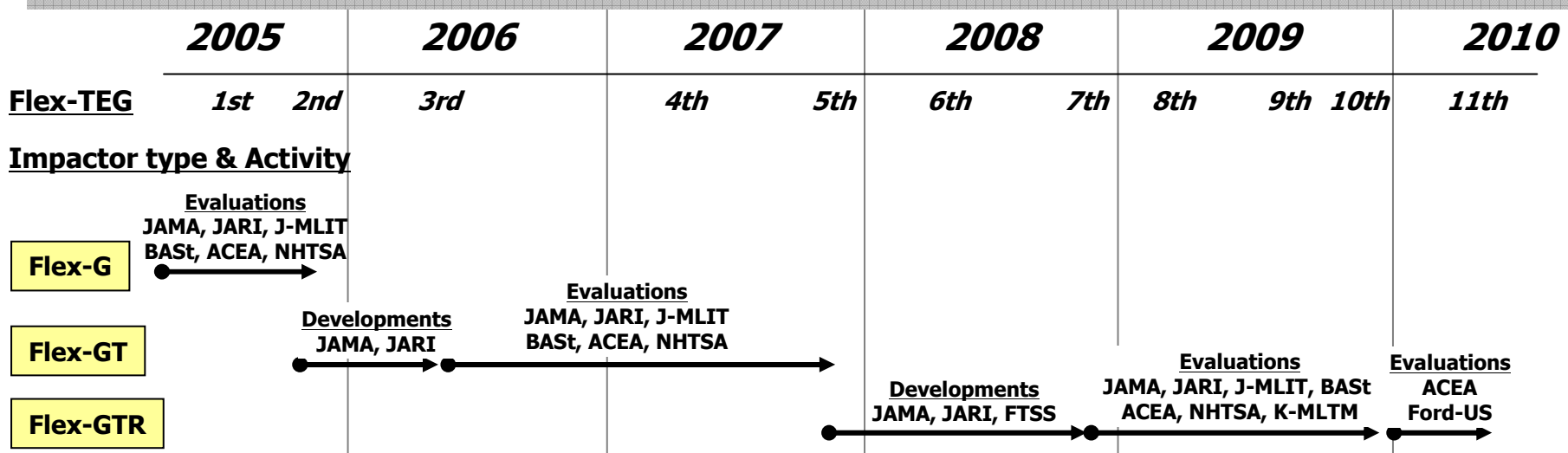
11th Meeting
ACEA office in Brussels



Flex-TEG Activities, contd.

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Latest Flex-TEG Activities (11th Flex-TEG meeting)

11th Flex-TEG meeting

Date : 21st April 2010

Place: ACEA office, Brussels, Belgium

Attendances

A. Konosu (Chairperson/J-MLIT/JARI)*

M. Burleigh (Secretariat/FTSS-Europe)*

O. Zander (BAST)

D. Gehring (BGS)

F. Minne (UTAC)*

O. Ries (ACEA/VW)*

T. Kinsky and B. Buenger (ACEA/Opel)

R. Fleischhacker (ACEA/Porsche)

C. Hess (ACEA/Audi)*

A. Sipido (ACEA/Ford Europe)

N. Lubbe (ACEA/Toyota Europe)

A. Pott (ACEA/Hyundai Motor Europe)*

A. Otubushin (ACEA/BMW)*

F. Travert (ACEA/PSA)

R. Ciclloni (ACEA)*

Y. Takahashi and I. Imaizumi (JAMA/Honda R&D)*

D. Martin (DTS)*

C. Roesch (Cellbond)

* Phone and Internet Access

Total: 20 persons

Main Agenda of the 11th Flex-TEG meeting

5. Information: Flex-GTR-prototype Technical Evaluation Test Results (ACEA)

6. Finalizations: Injury Threshold Values (Tibia Relaxation Zone, ACL Requirement) *Main Discussion Topic!*

7. Information: Catch rope bracket, 400 Nm Loading Test and CAE status (FTSS)

8. Minor Updates: gtr 9 amendment (Corrigendum: Knee measurement locations)

9. Future Action Plans

Latest Flex-TEG Activities (11th Flex-TEG meeting)

5. Information: Flex-GTR-prototype Technical Evaluation Test Results (ACEA)

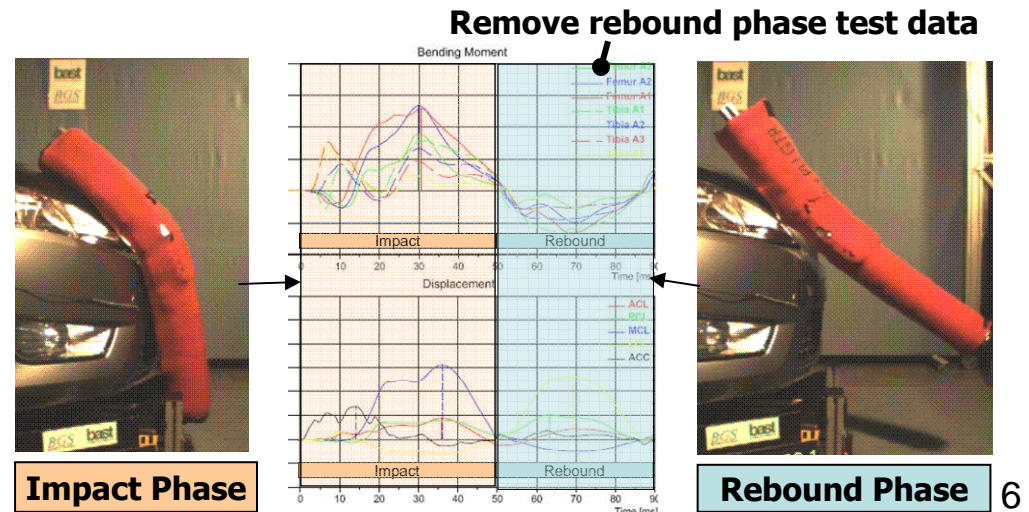
◆ Evaluation Tests had been conducted by ACEA.

Round Robin Tests (ACEA)

- ✓ Still some open questions due to limited experiences and missing availability of a simulation tool
- ✓ Ongoing to allow all manufacturers at least some tests
- ✓ Proposal: Test data during impactor Rebound Phase shall be ignored.
 - ✓ TEG agreed.
 - ✓ ACEA/BGS will make a proposal how to cut the rebound phase test data within two weeks.

Technical Feasibility Study (ACEA)

- ✓ Continuing, FE Model necessary to assess impact on vehicle design



Latest Flex-TEG Activities (11th Flex-TEG meeting)

6. Finalizations: Injury Threshold Values (Tibia Relaxation Zone, ACL Requirement)

Main Discussion Topic!

- ◆ TEG had an extensional meeting regards to 1) Tibia Relaxation Zone and 2) ACL requirement on 26 April, and then finally, TEG made their proposals as follows,

TEG Proposal for Tibia Relaxation Zone (Main Points)

		Initial 5 years	After 5 years
Tibia Requirement (Relaxation Zone)	Preamble	For feasibility reasons, TEG is proposing to introduce relaxation zones with a total width of 264 mm allowing a maximum tibia bending moment of 380 Nm for the first five years after the agreement of the incorporation of the FlexPLI into the GTR, providing the possibility to verify its technical need.	Corresponding data should be collected and evaluated until the end of the initial 5 years. Based on those results the relaxation zone should be kept, modified or dropped.
	Main Text	Relaxation zone: 380 Nm (264 mm width) A contracting party may restrict application of the relaxation zone requirement in its domestic legislation if it decides that such restriction is appropriate.	(update after 5 years based on the above preamble)

Latest Flex-TEG Activities (11th Flex-TEG meeting)

6. Finalizations: Injury Threshold Values, contd. *Main Discussion Topic!* (Tibia Relaxation Zone, ACL Requirement)

TEG Proposal for ACL Requirement (Main Points)

		Initial 5 years	After 5 years
ACL/PCL Requirement	Preamble	TEG strongly recommends to the contracting parties of the 98 agreement to monitor the ACL/PCL elongation against a threshold value of 13 mm for the first five years after the agreement of the incorporation of the FlexPLI into the GTR.	13 mm mandatory unless the results of possible new research will lead to additional biomechanical data, providing additional information on biomechanical limits, allowing the development of a set of injury risk curves, and the derivation of corresponding threshold values. Based on the results, it should then also be decided whether the PCL criterion should be introduced as a mandatory threshold value or kept on being monitored against the ACL threshold.
	Main Text	ACL/PCL threshold = 13 mm. TEG recommends to the contracting parties of the 98 agreement to monitor the ACL/PCL elongation against a threshold value of 13 mm for the first five years after the agreement of the incorporation of the FlexPLI into the GTR.	(update after 5 years based on the above preamble)

Latest Flex-TEG Activities (11th Flex-TEG meeting)

7. Information: Catch rope bracket, 400 Nm loading test results and CAE status (FTSS)

◆ FTSS informed Catch rope bracket, 400 Nm loading test status and CAE status.

Catch rope bracket (optional parts)

- ✓ TEG accepted the catch rope bracket as one of an optional part of Flex-PLI.

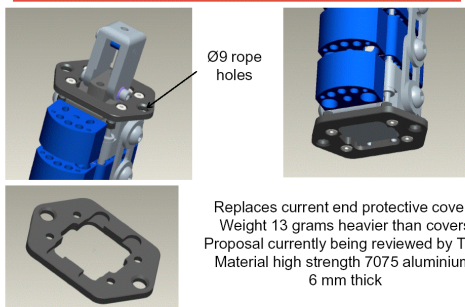
400 Nm loading test results

- ✓ No serious issue occurred under 400 Nm loading tests on the bone cores so far.
- ✓ TEG offered to FTSS to continue the 400 Nm loading tests to change the bending stopper cable start timing to 400 Nm (for tibia relaxation zone).

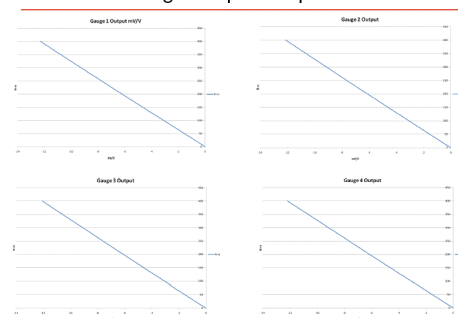
CAE status

- ✓ FTSS explained that their CAE Models are validated at material, component, pendulum and inverse test level. Requirements were set for next release based on OEM vehicle testing.
- ✓ ACEA asked to continue the model validation/improvement under car impact test level based on feedback from car impact test to use for their technical feasibility study.

4 Point Catch Rope Bracket Proposal



Gage Output Graphs



FLEX PLI GTR Model development status

- FLEX PLI GTR Beta model versions have been released in February 2010
 - Models are validated at material, component, pendulum and inverse test level
- Eight OEM's tested the model and simulated one or more vehicle tests
 - correlation results have been discussed at the 5th consortium meeting in Braunschweig, Germany (March 25th)
 - some OEM's already achieved very good correlation results
 - some improvement points were identified and requirements are defined for the next (production) release to be expected this year

Latest Flex-TEG Activities (11th Flex-TEG meeting)

8. Minor Updates: gtr 9 amendment (Corrigendum: Knee measurement locations)

◆ Corrigendum on the Knee measurement locations were made by JARI.

Corrigendum: Knee measurement locations

✓ TEG accepted the editorial corrigendum (editorial corrections).

Wrong Numbers

Instruments locations

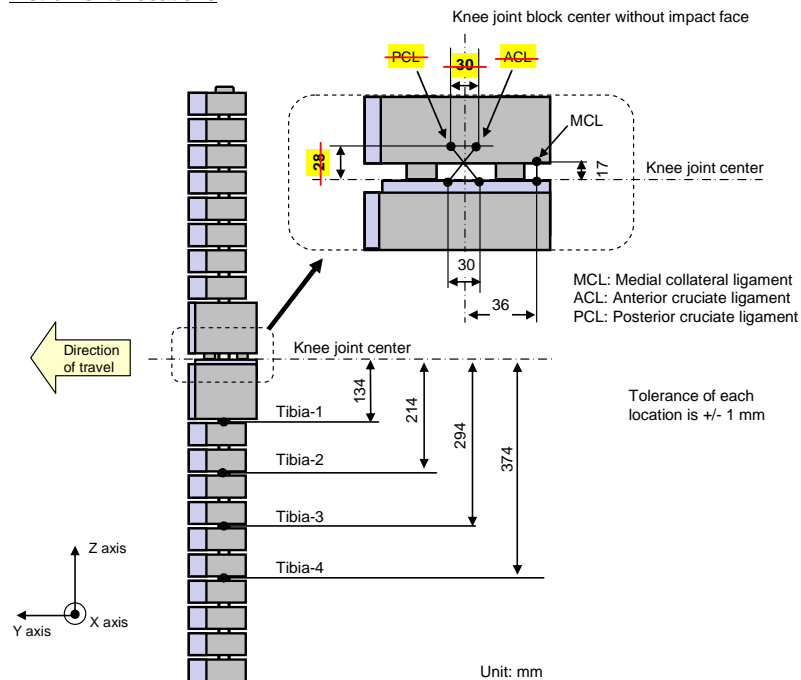


Figure 17: Flex-PLI; instrument locations

Correct Numbers

Instruments locations

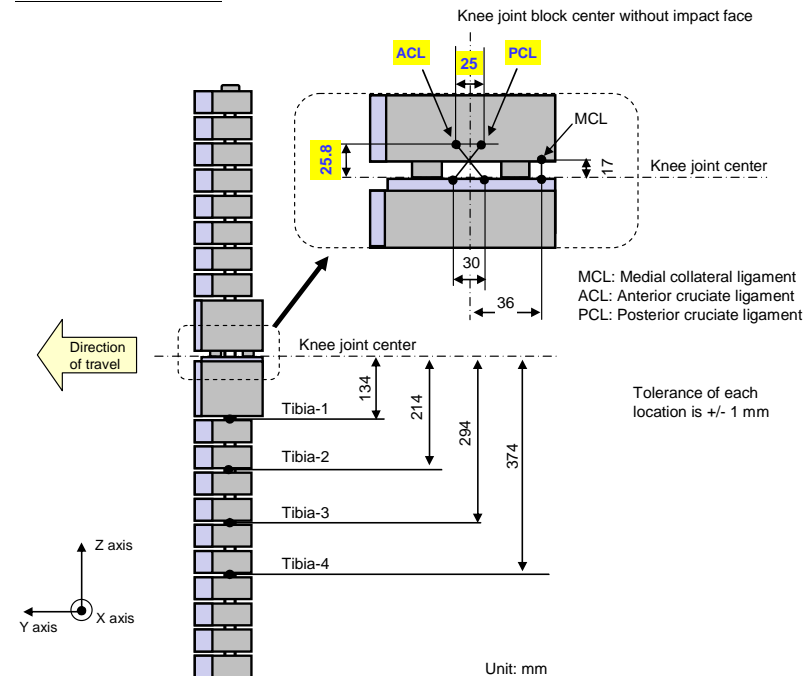


Figure 17: Flex-PLI; instrument locations

Latest Flex-TEG Activities (11th Flex-TEG meeting)

9. Future Action Plans

●ACEA/BGS:

- ✓ Make a proposal how to cut the rebound phase test data within two weeks (by 5th May 2010).
 - Information: ACEA made a proposal, and then other 11th TEG members agreed.

●FTSS:

- ✓ Continue 400 Nm loading test to change the bending stopper cable start timing to 400 Nm (for tibia relaxation zone).
 - Information: JAMA/JARI are going to conduct the 400 Nm loading test to assembled bone instead of FTSS before the 47th GRSP meeting.

●Japan:

- ✓ Japan are going to submit an informal document regards to corrigendum on the ECE/TRANS/WP.29/GRSP/2010/2 based on the 11th Flex-TEG meeting results (to 47th GRSP meeting).

●ACEA:

- ✓ Continue their Technical Feasibility Study.

●FTSS:

- ✓ Continue to enhance their CAE model validation/update under car impact test level.

Thank you for your attentions!