

**MINUTES OF THE SEVENTH MEETING OF  
THE GRSP INFORMAL GROUP ON A POLE SIDE IMPACT GTR**

Held at the US Department of Transportation Offices  
1200 New Jersey Avenue, SE Washington DC, USA  
20-21 September 2012

**Attendees**

<b>Name</b>	<b>Organization</b>
Robert Hogan (Chair)	Department of Infrastructure and Transport (Australia)
Thomas Belcher (Secretary)	Department of Infrastructure and Transport (Australia)
Mark Terrell	Department of Infrastructure and Transport (Australia)
Mary Versailles	NHTSA, US Department of Transportation
Stephen Ridella	NHTSA, US Department of Transportation
Peter Martin	NHTSA, US Department of Transportation
Anthony Jaz	Transport Canada
Hans Ammerlaan	RDW Netherlands
Richard Damm	Germany – Federal Ministry of Transport
Maciej Szymanski	European Commission
EunDok Lee	KATRI
Siwoo Kim	KATRI
Younghan Youn	Korea University Of Technology
Yoshinori Tanaka	NTSEL – Japan
Shunsuke Takagi	NTSEL – Japan
Ryugo Toji	JASIC
Akito Sakai	JASIC
John Humm	Medical College of Wisconsin (MCW)
Narayan Yoganandan	Medical College of Wisconsin (MCW)
Akihiko Akiyama	Honda
Martin Delin	Volvo
Thomas Löw	Audi AG
Christian Wegeleben	Daimler
Scott Schmidt	Alliance of Automobile Manufacturers
Dan Robertson	Toyota Motors North America
Jangho Shim	Hyundai Motor Company
Wilson Yim	BMW North America

**Online/Phone**

Suzanne Tylko	Transport Canada
Jim Hand	United Kingdom – Department for Transport

Lan Xu	Chrysler
James Abraham	Ford Motor Company
Peter Davis	SMMT
Philipp Wernicke	BMW Group
Irina Dausse	Renault
Myriam Constant	PSA Peugeot Citroen
Karsten Hallbauer	Takata

## **1. Welcome and Introductions**

(Attendees as noted above)

## **2. Adoption of the Agenda**

The agenda circulated by the chairman immediately prior to the meeting was adopted with the running order to be adjusted as required to suit availability of participants, particularly those participating online (see [PSI-07-01](#)).

## **3. Minutes and Actions from the 6th Meeting**

The minutes ([PSI-07-02](#)) from the sixth meeting held in Munich and circulated by the chairman prior to the meeting were agreed with an amendment of the attendee list.

Mr Hogan summarized the action list from the 6<sup>th</sup> meeting of the Pole Side Impact (PSI) GTR informal group, noting the work that had been done with respect to each action item and where items were to be covered later in the agenda.

## **4. Developments at June WP29**

Mr Hogan advised that the second progress report of the PSI GTR informal group (ECE/TRANS/WP.29/2012/59) had been adopted by AC.3 in June. This was significant because it provided formal agreement by AC.3 of the two phase approach to the development of the PSI GTR.

It was also noted that AC.3 had provided in principle agreement in June to the establishment of a repository for technical specifications and drawings for test tools used in GTRs (referred to as Special Resolution 2), although the document title was yet to be finalised.

## **5. MUARC Analysis**

Mr Hogan provided the group with an update on progress towards completion of the MUARC report, noting that comments received to date were being considered at length prior to finalisation. As soon as these comments have been reviewed and the report revised, Australia would circulate a copy of the report to members of the informal group.

ACTION: Australia to circulate final MUARC report to members of the PSI GTR informal group (when available).

## 6. Safety Need

### 6.1. Update of Country Safety Need Data

Mr Hogan indicated that Australia would soon be approaching contracting party members for 2010 high level safety need data. This data would be likely to be used in the preamble to the GTR.

ACTION: Australia to request/collect high level 2010 safety need data from contracting party members of informal group.

### 6.2. Category 2 Vehicles

No further presentations on Category 2 vehicles were made at this meeting.

## 7. Crash Tests

### 7.1. Joint Australian/Canadian Crash Test Program

Mr Belcher presented an updated summary of results from joint Australian and Canadian pole side impact crash test research ([PSI-07-03](#)). This update provided further details of oblique and perpendicular pole side impact tests of Australian and Canadian market Fiat 500s.

The WorldSID 50<sup>th</sup> percentile male dummy responses indicated a significantly lower AIS 3+ thorax injury risk for the Canadian model. It was noted that the thorax airbag in the Canadian market vehicle had deployed significantly earlier and was substantially larger than the thorax airbag in the Australian market vehicle. There had been significantly less kinetic impact energy absorbed through deflection of the dummy ribs in the Canadian vehicle and there was no evidence of a substantial increase in impact energy absorption for other body regions. The improved thorax responses observed for the Canadian model were therefore most heavily linked to earlier airbag deployment and more impact energy being absorbed by the larger thorax airbag design.

Results presented for repeated 32 km/h oblique pole side impact tests of the Canadian market Fiat 500 showed excellent repeatability in dummy responses and test configuration (alignment etc).

Mr Hogan noted that the degree of adaptation required for vehicles to meet a 32 km/h oblique pole test standard was likely to be relatively minor for countries with a substantial proportion of 5 star NCAP rated vehicles.

Ms Versailles added that many of the development costs associated with meeting a 32 km/h oblique pole test regulation have already been incurred by manufacturers who have designed vehicles to meet the FMVSS 214 pole side impact requirements. This means many manufacturers have already developed effective countermeasures that are already in production and costs will be likely to decrease with time.

## 7.2. KATRI Program

Professor Younghan Youn presented an evaluation of WorldSID and ES-2 50<sup>th</sup> male pole side impact test results ([PSI-07-04](#)). These tests were part of a WorldSID and PSI joint research program conducted by Hyundai Motor Company and KATRI.

Professor Youn explained that car-to-car accidents are the major source of side impact fatalities in South Korea. UN R95 is applied in South Korea, but a significant proportion of fatalities are due to head injury. UN R95 cannot guarantee head protection. A reduction in head injury fatalities is a benefit that will come from a pole side impact regulation.

WorldSID and ES-2 50<sup>th</sup> males indicated similar AIS 3+ abdominal and pelvic injury risks in 32 km/h oblique pole side impact tests of the same vehicle model. However, the WorldSID 50<sup>th</sup> predicted a substantially higher head injury risk and ES-2 indicated a higher thorax injury risk. The WorldSID test was done using the ISO WorldSID seating procedure (draft) and the ES-2 test was done using the EuroNCAP pole side impact seating procedure.

Ms Tylko suggested the WorldSID 50<sup>th</sup> male may possibly have impacted a seam or sub-optimal portion of the curtain airbag, given the very high head injury risk recorded.

## **8. WorldSID Update**

### 8.1. Summary

Ms Versailles summarized the progress of the Informal Group on the Harmonization of Side Impact Dummies (WorldSID Group), including the outcomes and major remaining issues from the WorldSID meeting held the previous day.

The WorldSID 50<sup>th</sup> male was progressing well. The WorldSID group had made progress that would enable informal (draft) documents for the WorldSID 50<sup>th</sup> male to be submitted to GRSP in December and formal documents to be submitted to GRSP next May.

The WorldSID 5<sup>th</sup> female timeline may need to be re-considered. Minor fixes (e.g. removal of some pelvis bone material) have been tried to resolve the contact issue between the dummy pelvis bone and the sacro-iliac load cell. However, it was looking more and more likely that the WorldSID 5<sup>th</sup> female pelvis re-design may need to be more substantial than the minor fixes attempted thus far. Substantial pelvis re-design would delay the timeline for the second phase of the PSI GTR.

Mr Martin suggested that some consideration could be given to the likely need for the instruments that are causing the interference. If these instruments were able to be substituted with structural replacements, this could speed up the resolution of this issue.

Professor Youn asked if the dummy specifications to be developed by the WorldSID group were going to propose a 1D-IRTRACC or 2D-IRTRACC harmonized WorldSID.

Ms Versailles advised that the purpose of Special Resolution 2 as a repository for test devices was to ensure that everyone is using the same version of the dummy when testing for regulatory purposes. The plan was to include the build level F WorldSID 50<sup>th</sup> male

with 2D-IRTRACC in the repository. Regulations which use the dummy would initially include one-dimensional injury criteria. The 2D-IRTRACC would allow two dimensional injury criteria to be developed in the future, without needing to change the dummy.

## 8.2. Deflection Responses from PMHS in Oblique Side Impact Sled Tests (MCW)

Dr Yoganandan summarized results observed from MCW oblique post mortem human subject (PMHS) sled tests ([PSI-07-05](#)). Oblique loadings have been found to produce more severe injuries in recent NASS field crash data. The peak PMHS thorax rib loadings were observed to be greater in the oblique sled tests.

## 8.3. Sled Tests Focused on WorldSID 50<sup>th</sup> Male Abdominal Rib and Pelvis Flesh Interference

Mr Humm presented a summary ([PSI-07-06](#)) of MCW 2" rigid abdomen offset sled tests conducted to investigate the influence of pelvis flesh and lower abdominal rib interference on the WorldSID 50<sup>th</sup> male rib response. The tests were conducted in upright and reclined seating positions using the standard pelvis flesh and a modified (partially cut-away) pelvis flesh. The tests showed that the WorldSID 50<sup>th</sup> lower abdominal rib responses were not substantially affected by pelvis flesh interference. On the basis of these results, the ISO WorldSID 50<sup>th</sup> working group had decided not to recommend changing the WorldSID 50<sup>th</sup> male pelvis flesh geometry.

# **9. GTR Issues**

## 9.1. Progress on Special Resolution 2 (S.R.2)

### 9.1.1. WorldSID 50<sup>th</sup> Male Addendum to S.R.2

It was noted that considerable progress had been made at the WorldSID meeting the previous day in discussing the WorldSID 50<sup>th</sup> Male Addendum to S.R.2. The WorldSID group had determined that the majority of the WorldSID 50<sup>th</sup> male drawings are currently freely available with no copyright restrictions which could prevent and/or delay inclusion in Special Resolution 2. There are some Humanetics IP drawings (more recent design enhancements), but an agreement is expected to be able to be used to allow these drawings to be made freely available in the public domain (i.e. in S.R.2), when the WorldSID 50<sup>th</sup> male is adopted by W.P.29 as a regulatory dummy. The ISO user manual and calibration requirements are subject to copyright. The WorldSID group will therefore need to consider/investigate how best to proceed regarding incorporation of user manual and calibration requirements in S.R.2, but should be able to proceed immediately with development of a drawing package for S.R.2.

### 9.1.2. Three dimensional H-point Machine Addendum to S.R.2

Mr Belcher noted that there had been discussions at GRSP and in other informal group meetings (e.g. GTR 7) about including the 3-D H Machine as a test tool in S.R.2. Any decisions taken elsewhere with regard to inclusion of the 3-D H Machine as a test tool in S.R.2, could impact how the 3-D H Machine is referenced in the PSI GTR regulatory text.

Ms Versailles was of the view that new regulatory test tools, such as the Q series dummies, BioRID and WorldSID should be included in S.R.2 before existing test tools. Ms Versailles therefore suggested that existing GTRs be checked for references to the 3-D H Machine and the most suitable reference be included in the PSI GTR.

It was agreed that the 3-D H Machine Annex from GTR 7 would be the most suitable Annex to use to reference the 3-D H Machine for the PSI GTR. Mr Belcher confirmed that the 3-D H Machine Annex in the existing draft of the PSI GTR was originally sourced from GTR 7.

## 9.2. WorldSID 50th Male Seating Procedure

Mr Hogan noted that finalisation of the ISO seating procedure could be on a different timetable to the PSI GTR and that it may be necessary to include seating procedure text directly in the PSI GTR. Mr Hogan therefore asked Mr Belcher and Ms Tylko to draft a seating procedure text for the next informal group meeting.

ACTION: Transport Canada and Australia in consultation with NHTSA to draft a WorldSID 50th percentile adult male seating procedure text for the next informal group meeting.

## 9.3. Possible Exemptions

### 9.3.1. OICA Proposal Regarding GTR Scope

Mr Abraham summarized OICA's PSI GTR scope ([PSI-07-06](#)) and preamble text ([PSI-07-09](#)) proposals. Mr Abraham referred to van and passenger car dimensions ([PSI-07-08](#)) OICA members had provided, showing the types of vehicles which would be captured by OICA's proposed exemption criteria.

Ms Versailles was not convinced that the exemptions OICA were proposing were justified for all countries. Ms Versailles agreed that appropriate text could be included in the preamble describing the types of vehicles Contracting Parties may exclude in domestic regulation, but the GTR should not require all countries to exclude these vehicles.

Ms Tylko and Ms Versailles both suggested that it would be technically feasible to conduct pole side tests on vans. Ms Versailles also noted that the FMVSS 214 pole test requirements are currently applied to vans.

Mr Damm suggested the OICA proposal could be enhanced by including data and further safety need related justification of why a Contracting Party may consider exclusion of these vehicles. Mr Damm supported inclusion of appropriate text in the preamble, but agreed the scope of the GTR would need to remain as drafted.

Mr Belcher indicated that the alpha criterion (in particular) that OICA had proposed had merit, as it would allow vans and light trucks to be differentiated from pickups. This would enable Contracting Parties to exclude vans/light trucks when implementing the PSI GTR in domestic regulation without exempting all Category 2 vehicles (i.e. without exempting pickups), if this was warranted by safety need data. The alpha criterion would

identify vehicle types where the driver is typically seated in a high position over the front axle. These vehicles, typically vans and light trucks, were not commonly involved in pole side impact crashes in Australia (for example), and high seating positions would make occupant head to striking vehicle contact less likely in vehicle-to-vehicle side impact crashes.

Increasing fitment rates of ESC for Category 2 vehicles were also discussed. Most Category 2 vehicles in Europe will soon be required to be fitted with ESC. These vehicles will therefore go from very low ESC fitment rates to almost complete ESC fitment in a relatively short period of time. However, it was also noted that Contracting Parties applying the PSI GTR are not necessarily all going to require ESC for Category 2 vehicles and the PSI GTR would provide benefits for other side impact crashes not significantly influenced by ESC.

Mr Hogan suggested the preamble would deal with safety need, including the likely impact of ESC for all vehicle types based on data from presentations made by BAST, NHTSA and Australia. The preamble would also cover the need for longer lead times for certain vehicle categories. Australia would work with OICA to ensure appropriate text is included in the preamble.

ACTION: OICA in consultation with Australia to revise text proposed for the preamble of the PSI GTR ([PSI-07-09](#)) to include a more detailed explanation including supporting statistics and detailed side impact safety related arguments explaining why contracting parties may specifically consider exempting vans and light trucks when implementing the pole side impact GTR in domestic regulations.

### 9.3.2. Narrow Vehicles (e.g. Kei-cars) - Japanese Proposal

Japan presented a proposal for narrow vehicles (see [PSI-07-10](#)).

Ms Versailles commented that the proposal appeared to be very well justified for Japan, but that the crash circumstances would be unlikely to be the same for these narrow vehicles in all countries. Ms Versailles did not support the 26 km/h test speed for narrow vehicles being mandated for all Contracting Parties in the GTR, but was supportive of Contracting Parties being provided with the option to limit the test speed to 26 km/h in their own domestic legislation.

Mr Ammerlaan agreed that exceptions such as the proposed reduction in test speed for narrow vehicles should be a matter for each national territory and should not be required to be implemented by all nations.

Mr Szymanski concurred with Ms Versailles and Mr Ammerlaan, noting that narrow vehicles which may not satisfy authorities' safety concerns may appear on European roads in the future. Mr Szymanski therefore supported retaining the original wording regarding the test speed option for narrow vehicles.

Mr Damm also supported retaining the original wording regarding the test speed option for narrow vehicles.

Mr Hogan noted that Japan could have dealt with this narrow vehicle issue through

exemption in national legislation. Mr Hogan felt that Japan deserved credit for trying to find a way to include some requirements for narrow vehicles rather than exempting them completely. Mr Hogan's view was that the GTR and resultant UN Regulation would be able to be drafted in a way that allowed Contracting Parties to exercise their own sovereign rights, in determining whether narrow vehicles tested to a lower speed were admitted to their markets, but also accommodated Japan's concerns regarding narrow vehicles.

Ms Versailles suggested some concerns may relate to the mandating of a review period in the GTR, which could be alleviated by removing the time period for review from the GTR regulatory text and including a suitable statement in the preamble noting that the test speed for narrow vehicles should be reviewed in the future.

It was agreed that the 26 km/h maximum test speed for narrow vehicles (vehicles with a width less than 1.5m) would remain at the option of the Contracting Party and appropriate text recommending appropriate future review(s) of the technical need for this option would be included in the preamble.

#### 9.4. Injury Thresholds

##### 9.4.1. Shoulder Criteria

Mr Ammerlaan presented results of TNO active human model simulations of the effect of sitting height in side impact ([PSI-07-11](#)) and an overview of shoulder loading for the WorldSID 50<sup>th</sup> male ([PSI-07-12](#)).

Mr Wernicke presented a WorldSID 50<sup>th</sup> male shoulder assessment proposal ([PSI-07-13](#)). Mr Wernicke noted that engagement of the human shoulder joint is likely to provide a valid means of protecting the human thorax and noted results of NHTSA and ISO biofidelity testing which had shown the WorldSID 50<sup>th</sup> shoulder to be a very biofidelic part of the dummy. Shoulder force deflection responses were analysed from a variety of pendulum, sled and vehicle-to-pole side impact tests. The results showed the shoulder force would typically plateau between 2-2.5 kN across the 40-70 mm deflection range. This indicated the shoulder rib of the WorldSID 50<sup>th</sup> percentile male would not have the attributes to be misused as a non-biofidelic load path. Mr Wernicke suggested that a shoulder criterion should only need to be used to prevent excessive non-biofidelic shoulder loadings. Shoulder force was not considered suitable because of the nature of the shoulder force-deflection responses and deflection may not be suitable due to limitations of the shoulder IRTRACC. Mr Wernicke suggested the use of a rib stop which replaces the IR-TRACC in the WorldSID shoulder. Detection of peak force in the shoulder load caused by bottoming out on a rib stop could be used to detect excessive shoulder loadings.

Ms Versailles was concerned the addition of a shoulder rib stop could delay the WorldSID 50<sup>th</sup> male timeline and noted that the WorldSID group had agreed to freeze the dummy design for the PSI GTR during the meeting held the previous day.

Mr Belcher suggested that even for the most severe shoulder loadings it may be likely to take 40-50ms to bottom-out the shoulder anyway. This would typically leave no more than 10 ms in which high shoulder load could be used to offload the thorax in a non-

biofidelic way. Otherwise the thorax deflection would typically have peaked anyway. It may therefore be extremely difficult, if not impossible to use the shoulder of the WorldSID to offload the thorax in a non-biofidelic way.

The issue of how removal of the IRTRACC might influence the shoulder biofidelity was also discussed. Ms Tylko confirmed that a number of the WorldSID 50<sup>th</sup> male biofidelity and injury criteria tests had been conducted without shoulder IRTRACCs. Ms Tylko offered to make a presentation at the next meeting showing that the shoulder IRTRACC can be removed without adversely affecting results.

ACTION: Transport Canada to provide information for next meeting on results of matched WorldSID 50<sup>th</sup> male side impact tests with and without a shoulder IRTRACC fitted.

Mr Hogan took the key point from Mr Wernicke's presentation to be that the shoulder cannot really be unreasonably exploited as a load path and suggested a shoulder criterion may therefore not be required.

Mr Ammerlaan was not comfortable with not including a shoulder criterion in the PSI GTR, but was also not sure (at this stage) what the best shoulder criterion would be.

Ms Tylko agreed that a satisfactory criterion had not yet been developed.

Mr Wernicke asked to keep the shoulder criterion discussions open till the next meeting. Mr Wernicke and Mr Ammerlaan noted the matter was also being considered within EuroNCAP.

Mr Hogan stated he was open to leaving shoulder criterion discussions open, but that it would be necessary to have a solid proposal by the next meeting for anything to be included in the first phase of the GTR.

ACTION: Sub-group including Hans Ammerlaan, Steve Ridella, Philipp Wernicke and Thomas Belcher to consider possible shoulder injury criterion.

#### 9.4.2. Thorax Deflection

Mr Belcher advised he had been investigating the incremental benefits that may be obtained by lowering the AIS 3+ injury risk threshold for the thorax rib deflection limit in the GTR to the 30<sup>th</sup> percentile. The analysis undertaken had suggested using a lower (than 50% AIS 3+) thorax injury risk threshold would be likely to reduce injury severity scores and therefore mortality risk in pole side impact crashes. However, it seemed the majority of the thorax injury reduction benefits would be most likely to occur in pole side impact crashes where the impact speed was significantly greater than the test speed (i.e. over 40 km/h lateral delta V). For pole side impact crashes occurring at speeds significantly greater than the test speed, some head protecting airbags could well bottom out, in which case the head injury risk would be most likely to be the major determinant of the maximum AIS.

There was also some discussion of the need to ensure appropriate thorax injury protection was provided for occupants older than 45. Mr Belcher commented that data from most

countries had shown the substantial majority of pole side impact fatalities were aged less than 45. In contrast, data from these same countries had shown a much greater proportion of other (e.g. vehicle-to-vehicle) side impact fatalities were aged over 45. Mr Belcher suggested that the 67 year old AIS 3+ thorax injury risk curve that is being developed could therefore be used to set the WorldSID thorax injury criterion threshold limit for mobile deformable barrier side impact tests. Given people over 45 are much more likely to be injured in vehicle-to-vehicle side impacts than pole side impacts this may be a better way of ensuring appropriate thorax protection is provided for older occupants.

#### 9.4.3. VC Injury Curves

Mr Ridella advised that animal surrogate data had only recently been forwarded to Audrey Petitjean. He therefore asked to defer consideration one meeting to determine whether this animal data can be used to improve the reliability of the VC injury risk curves.

ACTION: NHTSA (in consultation with ISO WG6) to determine if available surrogate animal model research data can be used to improve the reliability of the VC injury risk curves.

## **10.Detailed Consideration of Draft GTR Regulatory Text**

See summary of discussions on specific GTR issues above and updated draft (with track changes) of GTR circulated by email to informal group members by Mr Hogan on 5 October 2012, which included changes agreed at the meeting.

## **11.Future Work and Timetable**

Mr Hogan advised of plans to submit an informal PSI GTR regulatory text and preamble to GRSP in December 2012, and formal documents to the May 2013 GRSP, with a view to having the PSI GTR agreed at the November 2013 WP29. (Note: a detailed timetable was attached to the email of 5 October 2012.)

## **12.Other Business**

No other business was discussed at this meeting.

## **13.Next Meetings**

Mr Hogan suggested the informal group would be likely to need at least one more face-to-face meeting prior to submission of the draft PSI GTR to GRSP in December. Australia would also be likely to make use of online drafting meetings to finalise the GTR.

Mr Hogan suggested that the next face-to-face meeting would be likely to be held the week after WP29 (most likely 19-21 November) and invited participants to suggest a venue, preferably in central Europe.

Mr Hogan undertook to work with NHTSA to resolve as many square bracket issues as possible prior to the next meeting.

Mr Hogan thanked Ms Versailles and NHTSA for hosting highly productive meetings of the WorldSID and PSI GTR informal groups.

ACTION: Australia to advise details of next meeting.

## SUMMARY OF ACTIONS

1. Australia to circulate final MUARC report to members of the informal group (when available).
2. UTAC to provide Australia with detailed pole side impact test results for inclusion in preamble/technical report.
3. Australia to request/collect high level 2010 safety need data from contracting party members of informal group.
4. NHTSA to review purpose wording (paragraph 1) in draft GTR and suggest revised wording if necessary.
5. NHTSA to advise why the transmissions of manual and automatic vehicles are required to be placed in different gears (i.e. second vs. neutral gear) in FMVSS 214.
6. NHTSA to advise how 136kg mass used to define test vehicle mass in FMVSS 214 was originally derived.
7. NHTSA to consider proposed use of Special Resolution 1 unladen mass definition for the purpose of defining the test vehicle mass, test vehicle attitude, fuel ballast etc throughout the draft GTR.
8. NHTSA to review proposal for $\pm 25\text{mm}$ impact alignment tolerance (paragraph 6.5 of Annex 1) and advise if acceptable.
9. NHTSA to advise if $+0/-2$ percent test mass tolerance specified in paragraph 3.4 of Annex 1 can be accepted.
10. NHTSA to advise if $1.5 \text{ m/s}^2$ maximum vehicle acceleration limit in paragraph 6.6 of Annex 1 can be accepted.
11. NHTSA to provide feedback on suitability/acceptability of the terms “laden mass” and “laden attitude”.
12. NHTSA (in consultation with ISO WG6) to determine if available surrogate animal model research data can be used to improve the reliability of the VC injury risk curves.
13. NHTSA to draft text for preamble of GTR foreshadowing the likely future (i.e. phase 2) inclusion of a rotational brain injury criterion (e.g. BRIC) and a sacroiliac load limit.
14. OICA in consultation with Australia to revise text proposed for the preamble of the PSI GTR ( <a href="#">PSI-07-09</a> ) to include a more detailed explanation including supporting statistics and detailed side impact safety related arguments explaining why contracting parties may specifically consider exempting vans and light trucks when implementing the pole side impact GTR in domestic regulations.
15. Transport Canada and Australia in consultation with NHTSA to draft a WorldSID 50th percentile adult male seating procedure text for the next informal group meeting.
16. Transport Canada to provide information for next meeting on results of matched WorldSID 50 <sup>th</sup> male side impact tests with and without a shoulder IRTRACC fitted.
17. Sub-group including Hans Ammerlaan, Steve Ridella, Philipp Wernicke and Thomas Belcher to consider possible shoulder injury criterion.
18. Australia to revise Figure 6-1 and Figure 6-2 of Annex 6 to show an example pitch and roll angle.
19. Australia in consultation with Germany and NHTSA to resolve fuel ballast (e.g. Stoddard Solvent, water) text.
20. Australia to circulate updated draft GTR to informal group members.
21. Australia to advise details of next meeting.