

**REPORT of the 5<sup>th</sup> PVGTR INFORMAL WORKING GROUP meeting.**  
Held at DfT premises in London on 11<sup>th</sup> - 13<sup>th</sup> April 2005.

Attendance see the associated list. (PVGTR 2005/4Attend)

The breakdown was 4-France, 3-Germany, 2-Japan, 1-Netherlands, 2-USA and 5-UK and included Government delegates from France, Germany, Japan, Netherlands, USA and UK. A single new member Mr H Nishida from JASIC (based in USA), who was present in the SWG meeting 2 in Washington, attended this meeting and was made welcome.

### **General Position discussions**

The Chair began with a statement on the current discussion situation and briefly related the view of AC3 and WP29. We were informed that the GRE Informal Group are meeting the same difficulties that are impeding our progress in Braking. It has become clear that the advice and decision making hoped for from AC3 in the resolution of difficult issues, would be unlikely since in most situations specialist solutions would be needed.

It was hoped that this meeting could come nearer to agreement on those topics and key issues which remain unresolved after earlier discussions.

The Type Approval/Self-Certification procedural differences remain a source of problems as do the different philosophical approaches to rulemaking.

The mechanism to adopt the completed GTR, should this be achieved, would probably be that it would be taken into the 98 Agreement as a replacement for Reg.13-H. The Type Approval process would be written into an Annex which could include the marking requirement and the vehicle specification document.

It was thought that a 'Type Approval special requirement Annex' as proposed earlier, ought to be avoided if at all possible and the alternative requirements made optional. Examples of the optionality are already present in the 'Work-in-Progress' documents by the use of suitable text.

Germany asked about the principle of adopting the most stringent performance standards available today but a counter statement asserted that performance standards were already aligned and this was a starting point for this GTR. The Braking GTR should be a statement of the technical requirements needed whereas the procedural issues should be settled by the Contracting Parties.

The Chair pointed out that, under the 58 Agreement, justification for new clauses had not been necessary whereas with the 98 Agreement, this had been changed and cost effectiveness has to be a careful consideration with obvious time-scale implications.

Germany believed that new developments should be incorporated and rules covering new systems such as Electronic Vehicle Stability Controls have to be produced so that these systems can be mandated. This view was not widely shared as this was believed to be a task for GRRF and including these advances would lead to a drastically lengthened time-scale giving rise to further proposals for the inclusion of yet more systems.

Japan claimed that defining a GTR with continually increasing functional and performance requirements would mean that agreement could never be reached and the harmonisation target would be abandoned.

The Chair reminded the meeting that increasing requirements nowadays needs substantial justification and asked for delegates views on the inclusion of requirements for ABS and EVSC functions since these are something of a barrier to reaching the desired agreement.

These views were generally expressed as sanctioning the inclusion of some rules covering ABS but EVSC was seen as an unrealistic inclusion at this stage despite the German wish to make this function mandated worldwide.

USA declared that, to meet the terms of the 98 Agreement, objective assessment of the benefits of any function is required and could not support any mandatory requirement for ABS. The decision was seen as a political issue even though there was an interest in and a belief that EVSC could be beneficial but it was too early to be definite and the necessary testing of the function was far from being decided.

A **quick survey** on the view of delegates as to the **mandating** of ABS and EVSC was taken with the following outcome:

ABS: **For** - Germany, France NL and CLEPA      **Against** – USA Japan UK and OICA

EVSC: **For** - Germany and CLEPA      **Against** – France USA UK NL Japan and OICA

Optional inclusion was preferred by those against mandatory requirement as it was thought that the latter would be a disincentive to the adoption of the GTR by many countries and this would be in opposition to the primary purpose of the GTR.

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The **Scope** was again discussed and Passenger vehicles Category 1-1 as defined in the GRSG document was confirmed. The maximum weight was generally accepted as 3500kg but USA could extend this above 7716lbs and vans derived from car products was believed should be an optional inclusion.

Specific topics were then discussed in order to attempt to increase the agreement currently attained.

#### **Parking with unbraked trailer.**

No agreement yet.

Whilst Japan and Europe believe that this requirement is a definite contribution to safety, USA does not want it to be included.

The majority on the meeting hoped that hill holding on a 12% grade with a trailer could be agreed if it was allowed to use the Automatic Transmission in the PARK position.

USA considered this to be a policy issue requiring justification and possibly a decision from AC3. This position was questioned since it represents a no-cost option on the majority of cars in North America and OICA was asked to confirm this from the US Manufacturers Alliance.

#### **Service Braking Performance with an Unbraked Trailer.** Not agreed

Reg.13-H calls for a combination performance to be at least  $5.4\text{m/s}^2$  (checked by calculation given a max trailer load). Many contracting parties were adamant that this should be retained but NHTSA cannot accept this ruling as trailer requirements were devolved to individual states who set local limits on maximum mass and it was claimed that US Industry would have a real problem with this clause under Self Certification.

Inclusion of the requirement as an optional clause was suggested but this was not taken as a serious possibility as it would be a measure which could easily be applied to all contested clauses leading to a meaningless GTR with little Global harmonisation.

#### **Electric Parking Brake EPB.**

No agreement.

The question concerned R.13-H paragraph **5.2.19.2.** for which deletion was being sought. Germany wanted this to be retained but suggested that only the input circuit involving redundancy in the Park Brake Control and its associated wiring to the ECU should be specified. It was pointed out that removing the paragraph does not in reality remove the fall back requirement since holding on an 8% grade can be achieved by suitable in-gear parking. Despite the ability to use automatic transmission in PARK position or in-gear parking, USA could not accept the 8% gradient 'secondary performance'. Only Germany argued for keeping the paragraph but France was reluctant to delete on principle that it would represent a requirement reduction so the issue was not resolved.

#### **Fault Warning Signalling.**

Agreed.

The new text in PVGTR 2005-1a was examined and whilst the listing of failures causing RED and YELLOW warnings were seen as a useful addition to the R.13-H text, several detail changes were necessary and these will be incorporated.

The big issue in this discussion concerned the warning to be given in the event of ABS failure. Japan prepared a paper dealing with the Control Transmission, asserting that R.13-H paragraph **5.2.20.** applies only to vehicles with Electronic Braking Systems. Discussion resolved that this depends upon the interpretation placed on the general definition of Control Transmission, in particular relating to what meaning should be applied in the case of conventional braking systems equipped with ABS.

Japan insisted that this would decide whether an ABS failure should be indicated only by the Yellow warning signal.

After a great deal of discussion the following clarification of the rules was reached and the text of documents PVGTR 2005-1b/2b have been amended to make the ruling definite:

If only the ABS function is affected and the requirements of test section **5.2.10.** are met, the Yellow warning is allowed. However, if the ABS failure means that control of braking distribution is lost, then the Red warning shall be given.

#### **EMC.**

No discussion but note the previous comment.

This was thought to have been accepted by deleting paragraph 5.1.1.4. which requires conformance with ECE reg.10. A paragraph calling for some EMC testing was to be inserted in the introduction specifically mentioning ECE Reg.10 or other local Standards where more appropriate.

If Reg.10 appears inadequate, then it is that document which should be amended as it is not possible for the GTR to detail universal EMC test procedures to which electronic controls should be subject.

**Type 0 test procedure Cold Performance & Hot Comparison.** Agreed eventually.

The issue here is the brake force to be used in the Type 0 test. Currently both R.13-H and 135 require there to be no wheel locking but there appear to be two different interpretations:

- a) braking forces are kept below the high adhesion surface skidding threshold.
- b) braking forces can exceed this limit but ABS cycling prevents wheel locking.

It was argued that interpretation b) means that the effectiveness of the brakes is not tested and the result is, in fact, a measure of the surface adhesion and the ABS operating efficiency. Additionally, the comparison with the later Hot Performance test could be invalid if the cold brake performance was not known.

France, Germany, Japan and the Netherlands wanted the full pedal force applied even though shorter stopping distances could be obtained with a lower pedal force. FMVSS135 in S6.5.3.2. requires the shortest stopping distance to be obtained whilst Reg.13-H wording implies that only the required performance needs to be attained and the pedal force used is to be recorded for repeat use in the Hot Test.

After much discussion it was decided to change the conditions of the Cold Performance test to allow full pedal force on vehicles equipped with ABS. Those vehicles not so equipped would have a reduced pedal force so as to remain below the high adhesion surface skidding threshold of the wheel most susceptible to skidding. On ABS vehicles, it was concluded that an additional test of Cold Performance would be made on the laden vehicle, in neutral, with reduced pedal force so that no ABS cycling was caused. The pedal force used on this 'Cold Performance Reference test' and the MFDD would be noted and used as a comparator for the subsequent Hot test.

In the Cold Performance test, 6 stops are allowed and the shortest stopping distance (highest MFDD) is taken whether the ABS is cycling or not. If there is no ABS cycling, the Cold Performance Reference test does not have to be made. The test **5.2.7.4.** has been added to the test procedures in PVGTR 2005-2b.

**Surface Adhesion Specification.** PFC level agreed but not yet decided on measurement method.

In the current test document PVGTR 2005-2a, the adhesion level has been stated in terms of PFC and previous values had been discussed at some length and allowances had been made for surface wetting of the high adhesion surface in transition and split  $\mu$  testing.

The value of  $>0.85$  had been adopted but USA was concerned that special surfaces with very high adhesion might be used. The value of 0.9 should, they claimed, be the upper limit and could accept a 'nominal' 0.9.

Interpretation of 'nominal' was questioned and stating tolerances was examined but providing surfaces with a closely controlled PFC was seen as a practical impossibility.

The CLEPA suggestion of specifying 0.9 but allowing a lower figure provided this does not cause a failure to meet the performance requirements, was a practical solution and was accepted.

The wording of General Requirements for testing paragraph **5.1.3.4.** has been amended to define this new ruling.

This agreement prompted a discussion of how PFC should be measured. Two contenders were:

- a) k measurement using the vehicle under test
- b) ASTM test using a reference tyre.

It was revealed that some test tracks make both measurements but generally Europe, Japan and other areas use k measurements whilst North America uses ASTM.

OICA was asked to investigate the cost of using both methods of measurement for all those VM's interested in the North American market. Until this is known the measurement method issue cannot be resolved.

**Fluid Reservoirs – level warning and labelling.** Agreed.

For fluid level warning the manufacturer's minimum level has been accepted but OICA was asked, for the next meeting, for a definition of how this is determined since it is below the normal useage level allowing for lining wear.

The definition of lining wear-out had been taken from 135 and incorporated into PVGTR 2005-1a as **4.3.10.1**. but the manufacturer's set limit will also be included.

The cap labelling for a GTR should include both ISO and DOT fluid indications and USA agreed to accept this so the text of paragraph **4.3.10.2**. is now accepted.

**Stop Lamp signalling.** Not agreed (selective braking issue)

There is no FMVSS 135 clause covering this issue so the R.13-H wording was taken but the 'Selective Braking' clause was contested. The clause in PVGTR 2005-1a has 'may' in the text to suggest some optionality to try and overcome the impasse but UK, who are assessing the effect that stop lamp signals are having on following drivers, could not agree to 'may'. USA, France, Germany OICA and CLEPA could accept may but NL sided with UK so the situation is unresolved. However, USA announced that NHTSA is considering petitions to allow high decelerations to be especially indicated, so some increase of the Standard is envisaged and 'normal' stop lamp signals could be introduced.

**PTI Provisions.** No decision yet

The latest proposal included in PVGTR 2005-1a used the term 'using commonly available inspection equipment' but 'equipment commonly available at inspection stations' could be an alternative.

FMVSS 135 has no PTI requirement although some states have regular vehicle testing which includes braking and lining wear-out. USA would prefer no PTI requirement but if any clause was to be inserted, the original R.13-H harmonised text allowing wheel removal was preferred.

A Reg.13 clause which, despite being applicable, was never transferred into Reg.13-H but perhaps, should now be inserted into R.13-H and into the GTR.

This was not discussed but dealt with:

The means implemented to protect against simple unauthorized modification to the operation of the system (electrical) verification means.

**ABS Tests/Performance.**

No decision

This was discussed only briefly and USA said that they did not object to the idea of a low adhesion test but could not see, under Self Certification, how it could be done.

Germany agreed that k-testing could not be made to work satisfactorily and UK urged Industry to come up with some workable means of providing a low adhesion test.

The difficulty of doing so was apparent to all and UK accepted that a 4-sensor, 3-modulator system, as a minimum, would be likely to provide adequate low  $\mu$  stopping distance and would take this as a fall-back position provided the stability benefits were demonstrated in transition and split  $\mu$  conditions. Germany would agree but preferred no test at all.

NL suggested the use of a low  $\mu$  surface assessed by ASTM method for PFC and then specifying a stopping distance threshold corresponding to  $\epsilon = 0.75$  but other delegates thought that k-measurement would be just as good under Type Approval.

The Chair held an opinion survey on ABS testing yielding the following results:

- 1) Need for a low  $\mu$  test? All Contracting Parties except USA say it ought to be included.
- 2) Should k-testing be used? Only NL thought this to be a good test for the GTR.  
USA said definitely not under Self Certification.
- 3) Is 4-S 3-M an adequate specification? Japan, Germany and UK – Yes as a last resort!  
France, NL and USA - No

**Stopping Distance vs MFDD.**

Agreed

Both measurements should be made but only in marginal cases ( $\pm 5\%$ ) shall performance be required to comply with both parameters.

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**Questions the Informal Group developing a Passenger Vehicle GTR require answering by OICA/Alliance.**

- Q1 Does a harmonised requirement for the parking brake performance to include a trailer (braked or unbraked) increase manufacturers cost?  
What are the increased costs?
- Q2 When performing the Type “0” test is industry content to use the Peak Friction Co-efficient (PFC), measured by ASTM?  
What is the impact of only using this method?
- Q3 How do Vehicle Manufacturers determine the minimum fluid level in the brake fluid reservoir and how is the volume measured?  
Is it acceptable to include the ISO symbol for brake fluid and the minimum fluid standard (e.g. DOT 4) on the reservoir cap?
- Q4 Is it an additional cost to include the requirement to measure the service brake performance of the vehicle with an unbraked trailer (i.e. up to 750 kg)?  
If it is, what is the cost?