

REPORT of the 7th PVGTR INFORMAL WORKING GROUP meeting.
Held at UN in Geneva on 20th / 21st September 2005/ Mr. I. Yarnold presiding.

Attendance see the associated list. (PVGTR 2005/11Attend)

Representing JASIC, Mrs Y Minoura has replaced Mrs Mori and was welcomed to the meeting.

General Position discussions

The Chair started the meeting with comments on the possibilities of including some options in the text of the GTR confirming that AC3 had agreed to these to achieve a GTR but with the condition that these be kept to a minimum.

The report of the 6th meeting and the proposed agenda were agreed.

New documents as below, were accepted.

PVGTR 2005-9	ABS warning lamp signal proposal
PVGTR 2005-10	Hot and cold lining effectiveness comparison procedure proposal
PVGTR 2005-12	Table questioning the 'agreed' deletion of some EBS requirements.

On considering the issue of '**options**', the preference to have only 2 versions of the GTR, had been accepted. Discussion commenced with consideration of the means of accommodating the 2 versions so as to prevent an unlimited number of options being developed.

The Chair suggested a Basic PVGTR version and a Full version having supplementary requirements which would satisfy most of the Contracting Parties. There was however, a general preference for a Category B version with the basic clauses and a Category A version which contained all the rules.

OICA believed that this proposal would be acceptable on a 'short term' basis but looked forward to an eventual single edition.

Germany agreed that options should appear in the text but NHTSA drew attention to their view that there are 2 option types, those reflecting technical differences and those resulting from different certification process.

NHTSA then suggested that the full PVGTR should be written and NHTSA would select and apply those sections (the majority but not all) which USA would find acceptable for inclusion into the USA equivalent to the PVGTR.

The topic was not clearly resolved but from a drafting consideration and probably being more realistic, the suggestion from NHTSA that USA will have a differently worded version in which requirements, which they deem as unacceptable, will be deleted. From a practical sense, this suggestion should be taken seriously. A disadvantage with this course of action may be that the outcome will be known only at the end of the process. However, Contracting parties outside North America will be expected to adopt the full PVGTR text.

If this revision by NHTSA is seen as inevitable, acceptance at this point of development of the text, now that the difficulties are largely understood, can speed up the remaining process.

1) Scope

Given the earlier acceptance that the scope of the GTR could be extended in some regions, it was agreed that the BASIC SCOPE would be for application on Category 1-1 passenger vehicles with a weight limit of **3500 kg** as defined in TRANS/WP29/ 2005/21 SR1.

Some N₁ vehicles may be included at the manufacturers request but others would remain covered by the terms of Regulation 13.

2) PFC measurement:

In USA surfaces will remain certified by making the ASTM test but European Technical Services would prefer to stay with the well known k-test method. NHTSA suggested that either method should be allowed and the meeting accepted that since the value, however derived, could only be approximate and subject to fairly continual change, this was an issue which required a flexible solution.

Japan confirmed their use of both methods, ASTM testing for high adhesion surfaces used for stopping distance tests and also k-testing to be used if ABS performance is required on lower adhesion surfaces.

It was accepted as inevitable that **either** method will need to be allowed in the PVGTR.

NHTSA reiterated their view that the low adhesion k-test is unreliable and should not be in the GTR but since the meeting insisted that it remain, this will be one test which the NHTSA might be expected to omit. This test will remain as an Appendix until decided otherwise.

3) Combination vehicle parking.

The US Alliance spokesman agreed that for passenger cars, the 12% gradient parking would not be a problem but if extended to light trucks / SUV's etc within the 3500 kg limit could have a problem which could be handled given the time before introduction. NHTSA may apply this requirement selectively if the problem vehicles could be defined or omit it completely if not.

4) Service braking performance with a non-braking trailer.

This requirement is satisfied by calculation based on the passenger vehicle solo performance and is acceptable to the US Industry but NHTSA wants to know how it can be tested. Should it be absolutely necessary, vehicle tests could be made in which case stopping distance would be required. NHTSA was requested by the Chair, to supply the necessary calculation formula and they would make the calculation themselves, so 'by the manufacturer' would be deleted along with the 750 kg specification. Since there was no consensus on which case of loading would be the most demanding, it was agreed that the calculation shall be made for both laden and unladen states of the towing vehicle.

5) Reservoir volume and warning level.

CLEPA had presented a paper on this topic (PVGTR2005-8) which set out the legal brake fluid volume requirement but outlined the reasons why manufacturers allow extra volume.

The existing text of paragraph **4.3.10**. had been expected to be ratified but NHTSA objected to terms such as 'readily accessible' and 'easily checked'. It was agreed that CLEPA would adjust this wording to make clear the intent implied in the text.

Other issues were revisited as follows:

6) 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 confirmed that only the input circuit involving redundancy in the Park Brake Control and its associated wiring to the ECU should be specified. This was questioned by France who drew attention to the output wiring, asking if this was not important also.

NHTSA could not understand why there should be special conditions attached to EPB which were not applied to mechanically actuated park brakes. The requirement to detect and indicate a failure could be appreciated considering the more complex electrical demand signalling but specification of a failed performance was deemed to be quite unnecessary.

In paragraph 4.3.17.2. a slightly revised text was suggested as:

‘In the case of a single break in the wiring between the control and the input of the (first) electronic control unit directly connected to it, including an electrical fault in the control itself, but not in the electrical supply, it shall still be possible to apply the parking braking system from the driver’s seat and thereby be capable of holding the laden vehicle stationary on an 8% up or down gradient.

The engine/manual transmission or the automatic transmission (in park position) may be used to achieve or assist in achieving the parking braking performance.

Alternatively, in this case, an automatic actuation of the parking brake is allowed when the vehicle is stationary, provided that the above performance is achieved and, once applied, the parking brake remains engaged independently of the status of the ignition (start) switch. In this alternative, the parking brake shall be automatically released as soon as the driver starts to set the vehicle in motion again’.

It was agreed that the clause covering the ‘need for an auxiliary release device carried or fitted on the vehicle’ would be deleted.

7a) Braking Compensation.

Deletion had been agreed and NHTSA approval was expected but Japan introduced a table (PVGTR 2005-12) which called for this to be reconsidered on the grounds that whilst the main application was in Truck EBS Systems, the function could be applied to all vehicles with EBS.

The requirements in section 4.3.6.1. will therefore be reinstated but this is another requirement which is unlikely to be accepted by NHTSA who were concerned that no test specification existed to verify the compensation values which would cause a warning signal to be given.

7b) EBS requirements.

The table from Japan commented on other features of the requirements associated with EBS systems as follows:

The single temporary failure of < 40 ms was agreed to be deleted.

The small section (5.2.20.7. of Reg.13-H) dealing with braking performance when ‘auxiliary systems’ use the same electrical supply as the electric control transmission, had been proposed for deletion. This was justified on the grounds that the requirements were not very demanding and paragraph 5.2.20.5. covered the practical case and the fault warning condition as the battery voltage falls. However, there was no agreement to delete this section so the paragraphs in section 4.3.18.6. will be reinserted.

Paragraph 4.3.18.1. dealing with the wake-up of EBS when the ignition is not switched on was discussed in the hope of a reduction of the braking requirement when the parking brake is released, from service to secondary level since the vehicle would normally be at rest at this time. NHTSA could not accept this and was concerned about the time to achieve the level of braking. Instant response was their requirement but a practical response time and new text would be supplied by CLEPA for the next meeting.

8) Stopping Distance vs MFDD.

Agreed

After some discussion it was confirmed that text will be modified to say that Stopping Distance and MFDD shall both be fulfilled but only one parameter need be measured except in the case of only marginal results. In the test section SD and MFDD will both be quoted as North America prefers SD.

9) PTI Provisions.

The position remains as at the end of PVGTR5 in that FMVSS 135 and the original Reg.13-H had the option of assessing lining wear by acoustic or optical devices or visually checking the degree of wear from the outside or underside of the vehicle, removal of the wheels being permitted for the purpose. It was agreed that NHTSA would accept this original R.13-H harmonised text which **OICA** wanted the GTR to use.

The **missing PTI clause** (already in Reg.13, Section 5.1.4.7) dealing with Complex Electronic systems which have control of braking and the means implemented to protect against simple unauthorised modification should be included in the GTR. Dr Bräuninger of CLEPA would consider the text required to insert the requirement into PVGTR 2005-1d considering the case for self certification.

10) Stop Lamp signalling.

Not agreed

This was briefly discussed but the selective braking issue remains unresolved.

The position in North America is that only the pedal demand from the driver is allowed to generate Stop Lamp illumination so there may be a problem with Automatically Commanded Braking (ACB) even though this is a non-contested issue. ACB could be a function in ACC and in some EVSC systems as a means of preventing roll-over in some extreme circumstances. The Selective braking issue could however, be made optional by suitable wording.

At the previous meeting USA announced that NHTSA is considering petitions to allow high decelerations to be especially indicated, so some increase of the Standard is envisaged and a change to the 'normal' stop lamp signal can possibly be introduced.

Industry tests were reported on a series of vehicles equipped with EVSC and 590 control interventions were recorded in 250,000 km with 83% occurring under non-braking conditions. It was concluded that Selective braking events would be unlikely to cause a serious problem with indication or non-indication which suggests that 'may' could be the word used. For acceptance, NHTSA would require tests to be defined so that the chosen rules could be verified.

11) ABS failure warning.

Recognising the extent of a modern ABS, a compromise interpretation was made such that Annex 13 paragraph 4.2. will be adhered to and the Yellow lamp used if the electrical functional failure affects **only** the ABS function. This means that if the ABS functionally controls braking distribution or any other safety function, a failure shall be signalled by the Red warning. In a failure of a simple ABS system, the Yellow warning would be used even though the braking performance may only just exceed 5.15 m/s^2 and this is already incorporated into PVGTR 2005-1b paragraph 4.3.16.1.2.

Mr Böhm (Conti-Teves/ETRTO) had suggested a modified strategy for this warning signal and Doc. PVGTR 2005-9 was discussed but the resulting disagreement caused its withdrawal.

ABS Tests/Performance.

The decision to make low- μ performance test optional and drop the minimum system design specification taken at the last meeting, was confirmed and NHTSA stated that, given the optionality, it would be omitted.

Type 0 test procedure Cold Performance & Hot Comparison. (Agreed previously but now reconsidered)

France, Germany, Japan and the Netherlands had wanted the full pedal force applied for the cold performance test even though shorter stopping distances might be obtained with a lower pedal force.

It had been decided in PVGTR5 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 had been concluded that an additional Reference 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 updated proposal from the Netherlands used just sufficient pedal force on this 'Cold Performance Reference test' to achieve a mean deceleration of 5.0 m/s^2 . This pedal force would be noted and used as a braking input for the subsequent comparison in the Hot test where the achieved deceleration or SD would be noted.

Whether this could be used on vehicles with 'Brake Assist' is something which still has to be decided and could require that a lower deceleration needs to be specified.

Vehicles without ABS should be tested at pedal input levels which do not cause wheel locking in both Cold and Hot performance tests as is currently required in R.13-H.

The Hot Performance lining test requirement of meeting a proposed 85% of the achieved Cold performance deceleration was questioned by OICA who suggested retaining the 75% usual requirement. The actual figure was not agreed but it was suggested that the Cold Reference and Hot Comparison tests should be made closer together. This would mean making the Cold Reference test just before the heating phase is commenced, but has yet to be finalised.

Auxiliary Equipment. (Agreed and NHTSA approval expected)

This is a little used concept in passenger vehicle < 3500kg but is in R.13-H under paragraph 5.2.16. and was put into the PVGTR as 4.3.13. The last meeting agreed that the requirement could not reasonably be applied to electrical auxiliary equipment as this would be made up of all the normal vehicle electrical loads which could hardly be termed auxiliary. It was confirmed to restrict the paragraph to hydraulic auxiliary equipment even though it is not normally associated with passenger vehicles.

Electric trailer service brakes. (Final decision not considered due to time limit)

The last meeting revealed that these type of trailer brakes are in quite common use in USA, often as a retro-fit, so that the section 4.3.14., which had been proposed for deletion, may have to be retained even though there is no similar section in FMVSS 135 and these braking systems are not used in Europe or Japan. NHTSA to please consider this topic.

Regenerative Braking systems. (Preliminary introduction of the topic presented but not discussed due to insufficient time)

RBS detail appears in the proposed PVGTR 2005-1 & 2 in several places marked by a smaller font being used and Group members are please asked to familiarise themselves with this topic for the next meeting including those RGB proposals set out in Informal 16 to 53rd GRRF.

The features/issues of RGB incorporated into R.13-H are as follows:

- a) Phased braking allowed to give RGB operating alone on one axle.
- b) Compensation for RGB variation (due to State of Charge) using friction braking.
- c) Braking proportional to driver demand – being extended to all wheels if necessary.
- d) RGB disconnection – only by automatic means.
- e) RGB controlled by ABS or distribution maintained under all control strategies.
- f) Service brake tests made with RGB at a minimum level.
- g) Speeds required during heating phase and the Hot test.
- h) No RGB used in the Recovery test.

Full Power Systems. (Not discussed - decision as yet-awaiting agreement of USA)

The text of Sections 4.3.3. and 4.3.21. is included as a reminder of the issue.

It deals with the two versions of the power feed to the storage accumulators and the consequent volume differences.

The required volume is specified as the number of brake applications remaining in the accumulators when the driver warning is given (based on pressure threshold) set by the manufacturer.

FMVSS 135 sets a fixed pressure level of 50% of the normal operating pressure which is simpler but does not take into account the two possibilities of power feed circuit.

A decision is still to be made on this topic in consideration of the likelihood of these two possibilities being used in future. However, the proposed rules have, for now, been inserted into the PVGTR work-in-progress documents PVGTR 2005-1b & 2b.