

REPORT of the 6th PVGTR INFORMAL WORKING GROUP meeting.
Held at OICA premises in Paris on 27th - 29th June 2005.

Attendance see the associated list. (PVGTR 2005/6Attend)

New member Mr Steven Graflund from the Alliance of Vehicle manufacturers of USA attended this meeting and was made welcome. Representing JAMA, Mr A Morita has replaced Mr R Osuga.

General Position discussions

The Chair was taken by Japan in the person of Mr A Fukutomi of MLIT and the meeting began with an announcement that, to achieve final agreement, AC3 had accepted that there would be a level of optionality allowed but this should be kept to a minimum.

The report of the 5th meeting was agreed but a change to the text of paragraph 5.1.1. of the test procedure section (PVGTR 2005-2b) was requested for clarity and it will now 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.

On considering the issue of ‘**options**’, the question was raised if these would be invoked on a case by case basis or if there could be a single package of options selected in their entirety. It was believed that the AC3 intent was to have options declared on a case by case basis but substantial difficulty could be seen with this freedom since the number of different ruling variations in the GTR would make them difficult for manufacturers and Technical Services to handle.

The consensus was to have only 2 versions of the GTR, a full A-version and a slightly reduced version which may contain ruling and procedural differences.

Germany was concerned that vehicles made to the reduced rulings might be imported back into regions operating the full A-version of the GTR.

As an example, it was believed that cars made in North America coming into the EU would have to meet the European standards being applied at the time.

‘**Options**’ appear therefore to be a possible pitfall in that they could tend to lead to 2 separate Regulations as currently exist and claimed benefits from a GTR could be lost.

Germany felt that the purpose of all this GTR work would be undermined if options were anything other than the absolute minimum and would lead to practical difficulty in operation.

France considered that optional section are not in the spirit or justification of the PVGTR.

Some optionality is already incorporated in the work-in-progress documents by the use of suitable text but not all issues could be accommodated in this way.

The mechanism for adopting the completed GTR, should this be achieved, was confirmed as being taken into the 98 Agreement as a replacement for Reg.13-H in the EU and Japan etc. However, it was believed that the text of the GTR would be rewritten in USA as occurred at the earlier harmonisation exercise.

It was confirmed 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. The consequent time-scale implications delay the process and some of the recently added features of R.13-H can present problems for USA to accept. Japan again 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 **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** and this limit and a specification that only braking systems using hydraulic or electrical transmission may have to be declared in the Scope (*which has yet to be written*).

USA could extend the scope above 7716lbs and vans derived from car products was likely to be an optional inclusion in North America but the original premise should be retained in that the GTR should be written for passenger cars.

Specific topics were then discussed in order to attempt to increase the level of agreement but ratification by USA will be needed at the next meeting.

Response by OICA to questions posed at the 5th meeting.

1) Parking on a 12% gradient with a trailer:

This was unlikely to present a problem with passenger cars but the likely extension to pick-ups and light trucks in USA would be difficult as these would not comply in some cases even allowing in-gear parking or Auto-transmission assistance in the PARK position.

As part of this discussion it was agreed that the **Base Scope** should be confirmed as **Passenger Cars < 3500 kg** and this could probably be agreed as larger passenger vehicles would be unlikely to meet the rules being proposed.

2) PFC measurement:

In **USA** surfaces are certified before new testing is commenced and this is normally undertaken by a contractor, often at a significant cost as the machine for making the ASTM test is very expensive. France, in common with other European Technical Services would prefer to stay with the well known k-test method as the k-values of the test surfaces are quite well known when testing is being completed regularly. Also k-testing will be used if ABS performance is required on lower adhesion surfaces.

It appears inevitable that **either** method will need to be allowed in the PVGTR.

3) Reservoir volume and warning level.

CLEPA 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. Almost all reservoirs were made to meet the Japanese TRIAS requirement but this has now been dropped in favour of the R.13-H specification. Fluid volume is now reduced and designed to meet the pad wear capacity plus an amount to fill the individual circuit compartments and to avoid giving erratic warning when the level has fallen toward the warning point. The text of Reg.13-H is acceptable and is common practice today so the paragraph 4.3.10. agreement made at the 5th PVGTR can stand.

4) Service braking performance with an unbraked trailer.

This is a calculated performance based on the Type 0 performance laden and under self-certification creates no problem. The Alliance delegate confirmed that this calculation would be made for passenger cars and be made available if there was a witnessed test. Thus inserting the Reg.13-H text would not have an additional cost and could be included in the PVGTR.

Other issues were revisited as follows:

ABS Tests/Performance. Decision: To make low- μ performance test optional and drop the minimum system design specification.

This important issue was again discussed and European Governments maintained that some low μ surface adhesion utilisation test was necessary. France recognised that all vehicles have the system tuned for the stopping distance/stability balance to be finalised and would want to check that stability performance had not cost too much stopping distance. France asked for a locked wheel comparison test to be used and NL suggested the use of a low μ surface assessed by ASTM method for PFC and then specifying a stopping distance threshold to be employed from a set speed or MFDD to be attained under ABS operation.

These new and untried methods could not be written into the PVGTR without incurring considerable risk so the k-test would have to be employed and, for simplification, made only in the unladen condition, though this latter factor is still being considered by Governments.

It was realised that NHTSA would not accept such a test so this would have to be made an **option**. The low μ test will be presented as an Appendix to the main PVGTR text and whilst this would be an option, it would always taken in the full A-version of the GTR.

There had been considerable opposition to the specification of a minimum ABS design standard so with the adoption of a low μ performance test it would be dropped

ABS failure warning.

The argument was presented that the ABS failure warning should be by the Yellow warning lamp despite there being some conflict in Reg.13-H from paragraph 5.2.20.3. The controversy comes down to whether the conventional hydraulic braking system with ABS has, in fact, an electrical control transmission. This term was not used when Reg.13 Annex 13 was written and was brought into use along with paragraph 5.2.20.3 only when EBS rules were developed.

Recognising the extent of a modern ABS a compromise interpretation was made such that Annex 13 paragraph 4.2. would 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 the simple ABS system, the Yellow warning would be used even though the braking performance may not 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) has suggested a modified strategy for this warning signal and this will be circulated for discussion at the next meeting as doc. PVGTR 2005-9

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.

Despite the ability to use automatic transmission in PARK position or in-gear parking, USA Industry, represented by the Alliance delegate Mr Graflund, believed NHTSA would be reluctant to accept the 8% gradient 'secondary performance' requirement

Germany argued strongly for keeping the paragraph and the French position continued a reluctance to delete on principle that it would represent a requirement reduction. Germany could accept only the first clause of 5.2.19.2. but Industry would rather have the whole paragraph if full deletion cannot be accepted. Therefore paragraph 5.2.19.2. will be reinstated.

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 test of Cold Performance Test 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 achieved would be noted and used as a comparator for the subsequent Hot test.

Japan asked for a reconsideration of the Cold Reference test and suggested that the Hot performance test should be made at the maximum 500 N pedal effort even though this may also invoke ABS operation.

An alternative was also suggested but discussion brought up the problem of what procedure should be used on vehicles with 'Brake Assist'.

Given this consideration, it was decided that the Cold Reference test will be deleted and the Hot Performance Test will be made at 500 N pedal effort and the required performance will be 75% of the prescribed service braking figure, ie. 4.82m/s^2 .

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 second Hot Performance requirement of meeting 60% of the achieved Cold performance deceleration was questioned by NL who suggested deleting the requirement. Germany protested that the 60% requirement was the more stringent figure and must be retained or the 75% figure should be increased to 85%.

This one factor remains undecided and NL will make a Hot Performance proposal for the next meeting.

Braking Compensation. (Deletion agreed and NHTSA approval expected)

The purpose of this compensation was explained to the meeting and the main application was in Truck EBS Systems, but it was believed that, in practice, the function was not used. The requirements set limits to the level of compensation which could be made before a driver warning has to be given. This feature was not destined for passenger vehicles and the meeting agreed that these requirements in section 4.3.6.1. could be deleted.

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 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 decided to restrict the paragraph to hydraulic auxiliary equipment even though it is not normally associated with passenger vehicles.

Electric trailer service brakes. (Final decision deferred)

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.

The view of NHTSA must be sought on this topic as if USA does not need such a Section, it can be deleted.

Regenerative Braking systems. (Preliminary introduction of the topic)

RGB, as part of the service braking system, has not yet been discussed in any detail but appears in the proposed PVGTR 2005-1 & 2 in several places marked by a smaller font being used.

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.

Japan asks **NHTSA to please study** the RGB proposals set out in Informal 16 to 53rd GRRF.

Stop Lamp signalling.

Not agreed (selective braking issue remains)

This was briefly discussed but the position remains as from PVGTR5 and is stated as below:

FMVSS 135 has no clause covering this issue so the R.13-H wording was taken but the 'Selective Braking' clause is 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 agreed 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 signal requirement would then be appropriate and should be introduced.

NOTE from Sec: Would OICA ask US Industry if 'no signal under Selective braking' could be accepted given that Stability Controls can automatically switch from Selective Braking to the fuller Automatically Commanded braking if retardation of the vehicle is deemed, by the system, to be necessary.

PTI Provisions.

(No decision yet)

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

At the end of PVGTR5 the position was that 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. The Alliance is asked to obtain a US Industry view on this issue.

Germany stressed that wheel removal would not be accepted so an optional requirement may be the only way to proceed and the question would be whether the whole PTI issue should be made optional.

There is still the outstanding question concerning the 'means implemented to protect against simple tampering with the system operational verification means'.

Stopping Distance vs MFDD.

Agreed

The 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.

Full Power Systems.

(No decision as yet-awaiting agreement of USA)

The text of Sections 4.3.3. and 4.3.21. was explained as being a simplification/combination of the requirements of R.13-H para. 5.2.14.1-2 and para 1.3. of Annex 4. This 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.

Questions from the Alliance.

What is the purpose of giving a lower pedal force level of 65 N in many of the braking test specifications. This is in R.13-H but not in R.13 so it is likely that it is a US requirement designed to outlaw very sensitive pedals which would be difficult to control. NHTSA comment please?

Transient wheel locking. This was discussed and a maximum period of 500ms is allowed in the Hi μ to Low μ transition. Other tests on Hi μ should not see locking for longer than 100 ms.

The high μ deceleration to be achieved depends on the surface μ (allowing for it being wetted from the low μ surface and thus having $\mu = 0.7$) would be typically $0.75 \times 0.7 = 5.25 \text{ m/s}^2$.
Time taken to achieve this deceleration: $< 1.0 \text{ s max.}$

The meeting raised a most important final question before closure:

Can all delegates be informed well before future meetings if key delegates are not able to attend so that they can make the decision as to whether it is worth coming to the future meeting themselves?

MB 7.7.05