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**ECONOMIC COMMISSION FOR EUROPE**

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Executive Committee (AC.3) of the 1998 Global Agreement

**PROPOSAL TO DEVELOP A GLOBAL TECHNICAL REGULATION  
CONCERNING THE BRAKING OF PASSENGER VEHICLES**

Technical sponsors: Japan and the United Kingdom

Note: The text reproduced below was considered and adopted by the Executive Committee (AC.3) of the 1998 Global Agreement at its twelfth session, in November 2004. It is based on document TRANS/WP.29/2004/74 and on informal document No. WP.29-134-8, that had been submitted by Japan and the United Kingdom (TRANS/WP.29/1037, para. 96).

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## **JUSTIFICATION FOR A GLOBAL TECHNICAL REGULATION (gtr) CONCERNING THE BRAKING OF PASSENGER VEHICLES**

### **Introduction**

Japan and the United Kingdom recognize that the opportunity exists to harmonize international requirements for passenger vehicle braking. Vehicle manufacturers currently are required to comply with a number of separate national or regional requirements that exist across the global vehicle market and this adds to costs and complexity of vehicles.

An informal group was established to consider the important issues for a gtr in this area. The justification for such a harmonized approach on braking is set out in this document along with an explanation of the main existing national and regional standards currently being applied. The document goes on to describe a proposed way forward and an indicative timetable for completing the global technical regulation. It considers briefly the costs and benefits of the gtr.

### **Background**

There are three main global areas for vehicle manufacture and new vehicle registrations; Japan, United States of America and Europe. For many years, each of these regional areas has applied separate rules and performance requirements for braking of new passenger vehicles. These rules are well developed and deliver the needs of the national Governments that apply them. For system suppliers and vehicle manufacturers, however, complying with these different standards adds significantly to manufacturing costs and often requires separate development programmes depending upon the final market destination of a given product.

This can mean in practice that vehicles which appear identical sometimes require modifications to braking systems and separate approval or certification to comply with regional requirements yet offer very little quantifiable difference in safety performance.

Consequently, the automotive industry believes that a global approach to this important safety area will harmonize the safety performance of vehicles in each market, reduce design and development costs and, in turn, reduce product lead times. The effect of this will be beneficial to:

- manufacturers, by improved efficiency and faster product cycle times;
- legislators, by harmonizing minimum safety standards for all new passenger vehicles and
- consumers, by reducing the relative purchase price of new vehicles.

## **Objective of the gtr**

The objective of the gtr is to provide globally harmonized requirements for passenger vehicle braking systems, including performance and safety requirements, test procedures and compatible assessment criteria.

## **Other regulations/standards**

Many national and regional standards exist throughout the global community that set requirements for vehicle braking. Some of these national or regional requirements are specific rules requiring compliance with a single standard only. Others accept compliance with one or more of the standards applicable in the three main regional areas as being equivalent (i.e. Japan, United States of America and Europe) as an alternative to a specific national requirement.

These provisions for equivalence already represent a basic level of harmonization. It should be recognized, however, that such harmonization which might exist already continues to perpetuate a three standard system. This is far from ideal.

The informal group elaborating the gtr has assembled a compendium of candidate requirements and test procedures. This includes information on the requirements in a number of countries and regions and from this the informal group concludes that the main standards in use are US Federal Motor Vehicle Safety Standard 135, European Union Directive 71/320/EEC and United Nations Economic Commission for Europe Regulations Nos. 13 and 13-H. The summary of national and regional rules currently being applied for braking is included in Appendix 1 to this document.

## **Selection**

The informal group considered these four standards in greater detail and identified that FMVSS 135 and UNECE Regulation No. 13-H are harmonized in a number of areas already. The group proposes to develop the gtr based upon these standards.

UNECE Regulation No. 13-H contains many required elements of a safe and modern braking system but lacks the clear performance definitions of the test conditions and procedures that appear in the FMVSS 135 Standard. Combining the best features of these two standards is expected to yield a technical regulation suitable for use at a global level.

The harmonized regulation will include equipment requirements where some aspects are currently less harmonized than the braking performance requirements.

## **Proposed structure**

The informal group proposes to base the gtr, as far as practicable, on the alternative format described in document TRANS/WP.29/883.

The equipment requirements will be specified in the general requirements and safety section which will set out the non-performance system parameters expected under a self-certification system and may be checked by type approval authorities.

It is anticipated that the format adopted will provide clear and self-contained descriptions of each test condition and procedure and specify the performance levels required from each test. This format will make it easier for users of the gtr to locate and understand each requirement and the informal group considers this as an important factor in achieving common interpretations.

### **Costs and benefits**

Establishing firm evidence on the safety benefits of this gtr has proved difficult. The primary reason for this is that the group has been unable to determine the world-wide benefits that would accrue in terms of road safety or casualty reduction from harmonizing the current standards.

A benefit will also exist by demonstrating to new Contracting Parties to the 1998 Agreement and to emerging markets that a globally harmonized regulation on braking exists and could be adopted for use in their territory. This should promote the development of safer transport systems and so help to improve road safety.

Vehicle manufacturers and system suppliers have considered carefully the economic benefits that could result from a gtr. These would be realized by:

- reducing and streamlining administrative procedures, thereby avoiding duplicate certification, approval and administration costs;
- harmonizing testing procedures and instrumentation, thereby reducing test equipment and processing costs;
- reducing the number of components across models, thereby minimizing the need to develop different products for separate markets.

The preliminary cost analysis from one regional sector of the motor industry indicates savings of approximately € 650,000 per year (~US\$ 800,000 or Yen 85 million) for that sector. If it can be assumed that each of the main regions has an equal share of the market, this could represent a total saving of € 2 million (~US\$ 2.4 million or Yen 255 million) per year to the global automotive industry.

### **Contentious issues**

The informal group has reviewed the two target standards and identified a number of contentious issues. These fall into two main areas:

- differences in assessment philosophy and
- differences in technical content or requirement.

A small working group examined the differences in greater depth and developed a short summary table highlighting the relative importance of the issue in technical and policy terms and the possible difficulty of finding a solution. A summary analysis is set out in Appendix 2 to this document.

The informal group made the working assumption that the majority of issues will be resolved by negotiation. It is clear from the preliminary discussions, however, that there are likely to be topics where a policy direction is needed from the regulatory authorities. The group proposes to identify these areas more precisely, propose alternative solutions and seek further advice from WP.29 and AC.3 on a preferred approach.

A separate issue exists concerning vehicle categories. The group has been working on the basis that its work covers passenger vehicles but it also recognizes that this definition is not uniform within the global regulatory community. The group understands that once common definitions have been finalized by WP.29 and AC.3, then the scope of the gtr will be confirmed.

### **Research**

Provision has been made in the delivery programme for any necessary research, although this has yet to be specified.

### **Next steps**

With the candidate regulations for the gtr identified and some of the preliminary work completed, the next stages are to:

- (i) develop and agree a structure for the new gtr;
- (ii) identify the areas of clear agreement and record these in the draft gtr;
- (iii) develop complete harmonization of test procedures and identify any work-plans to deal with these;
- (iv) determine harmonized test equipment requirements and consider how to include these into the gtr and
- (v) agree those issues that need policy guidance and seek advice from WP.29 and AC.3 on the handling of these.

### **Timing**

An indicative completion date is November 2006, although much will depend on the ability of the group to find solutions. The informal group will continue to press for the earliest completion of the gtr and will seek further advice from AC.3 as needed.

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Appendix 1

BRAKE REGULATION CONTENDERS TABLE FOR M1 VEHICLES

Country/Region	Requirement
USA	Federal Regulation FMVSS 135
Canada	Transport Canada CMVSS 135
Mexico	<b>NOM-D-148-1979</b>
EC + Norway.	<b>Directive 71/320/EEC (98/12)</b> or <b>UNECE Regulations Nos. 13</b> or <b>13-H</b>
UNECE	<b>UNECE Regulation No. 13</b> or <b>UNECE Regulation No. 13-H</b>
Algeria	<b>Specific National Regulation</b> (similar requirement to Regulation No. 13-H. Slightly higher at test but lower in service).
Ivory Coast	Comply with <b>UNECE Regulation No. 13</b> latest revised version; otherwise respect the <b>Specific National Requirements</b> .
South Africa	Comply with either <b>Directive 71/320/EEC (98/12)</b> or <b>UNECE Regulation No. 13</b> latest version. Otherwise shall respect the <b>Specific National Requirements</b> .
Israel	Comply with <b>Directive 71/320/EEC (98/12)</b> . Comply with <b>FMVSS 135</b> from September 2001 for NAFTA production vehicles as an alternative.
Iran	<b>Directive 71/320/EEC</b> or <b>UNECE Regulation No. 13</b>
Qatar	<b>Specific National Regulation</b> Individual circuit should be formed. Secondary brake should be independent .
Gulf Countries Cooperation (GCC)	Comply with one of the following and <b>GS 48</b> <b>UNECE Regulation No. 13</b> latest revised version, <b>Directive 71/320/EEC</b> latest revised version, <b>FMVSS 135</b> or <b>Japan Safety Standard 12</b> .
Saudi Arabia	Imported vehicles must show the same level of performance as required in the country of manufacture and also comply with the <b>National Specific Requirement SSA 1438</b> (main difference: protection of brake lines)
Turkey	Comply with <b>UNECE Regulation No. 13</b> latest revised version or <b>Directive 71/320/EEC</b> latest revision (98/12).
Bulgaria	Comply with <b>UNECE Regulation No. 13</b> latest revised version or <b>Directive 71/320/EEC</b> latest revision (98/12).
Macedonia	Comply with <b>UNECE Regulation No. 13</b> latest revised version or <b>Directive 71/320/EEC</b> latest revision (98/12)
Yugoslavia	Comply with <b>UNECE Regulation No. 13</b> latest revised version or <b>Directive 71/320/EEC</b> latest revision (98/12)
Romania	Comply with <b>UNECE Regulation No. 13</b> latest revised version or <b>Directive 71/320/EEC</b> latest revision (98/12)
Russian Federation	Comply with <b>UNECE Regulation No. 13</b> latest revised version
Ukraine	Comply with <b>UNECE Regulation No. 13</b> latest revised version and <b>Directive 71/320/EEC</b> latest revised version. <u>Additionally</u> must comply with the <b>Specific National Requirements</b> . PKB performance: to hold on 25 per cent slope.
Slovenia	Comply with <b>UNECE Regulation No. 13</b> latest revised version or <b>Directive 71/320/EEC</b> latest revision (98/12)
Croatia	Comply with <b>UNECE Regulation No. 13</b> latest revised version or <b>Directive 71/320/EEC</b> latest revision (98/12)
Argentina	Comply with <b>UNECE Regulation No. 13</b> as amended by the <b>05 series of amendments</b> .
Brazil	Comply with <b>UNECE Regulation No. 13</b> as amended by the <b>05 series of amendments</b> .
Chile	Comply with <b>FMVSS</b> or <b>UNECE</b> or <b>Japan Safety Standard</b> or <b>KMVSS</b> or <b>MERCOSUR</b> if ABS is fitted.

Country/Region	Requirement
Australia	<b>Australian Design Rules</b> (similar to FMVSS 105) or <b>UNECE Regulation No. 13-H.</b>
New Zealand	Comply with one of the followings: <b>UNECE Regulation No. 13</b> latest revised version, <b>Directive 71/320/EEC</b> latest revision (98/12), <b>FMVSS 105</b> , <b>ADR 31</b> or <b>Japan Safety Standard 12.</b>
New Caledonia	Comply with <b>UNECE Regulation No. 13</b> latest revised version.
India	Comply with <b>UNECE Regulation No. 13</b> as amended by the 06 series of amendments
Japan	<b>UNECE Regulation No.13-H.</b>
Korea	Vehicle models with U.S. spec. must comply with <b>FMVSS 105 or 135.</b> Models with European spec. must comply with <b>UNECE Regulation No. 13-H.</b>
China: Vehicles made in China	Comply with <b>UNECE Regulation No. 13</b> as amended by the 06 series of amendments and additionally the <b>Specific National Regulation.</b>
China: Imported vehicles	Comply with either <b>UNECE Regulation No. 13</b> as amended by the 06 or 09 series of amendments, for brake performance otherwise respect the <b>Specific National requirement.</b>
Philippine	<b>Republic Act 4136.20.6/Philippine Legislature Act No.2159 ?</b>
Malaysia	<b>Article 19-23, 64 or UNECE Regulation No. 13 or Japan Safety Standard</b> trial
Indonesia	<b>Specific National Regulation</b> requirement. Service brake 60 per cent at GVW, pedal effort 50kg max. Parking brake 16 per cent at GVW, hand effort 40kg, foot effort 60kg max.
Hong Kong	Comply with <b>UNECE Regulations Nos.13 or 13-H</b> or <b>Specific National Regulation:</b> Service brake efficiency: min.50 per cent, Pedal effort max.154 lbs Secondary brake efficiency: min.25 per cent, pedal effort max.154 lbs (foot), max 132 lbs(hand) Parking brake: must hold the vehicle stationary on a 16 per cent up or down-gradient.
Taiwan	<b>Specific National Regulation Brake efficiency &amp; Balance standards</b> Service brake efficiency 60 per cent min. at curb weight, Balance: 20 per cent max. Parking brake efficiency 20 per cent min. at curb weight
Singapore	Comply with one of the following, or otherwise respect the <b>National specific Regulation.</b> <b>UNECE Regulation No.13-H</b> latest revised version or <b>UNECE Regulation No. 13</b> latest revised version. <b>National Specific Regulation:</b> Service brake 50 per cent, PKB 20 per cent

Appendix 2RATIONALIZATION OF DIFFERENCES BETWEEN  
REGULATION No. 13-H AND FMVSS 135.**Importance:** 1 – 5 (5, most important)**Difficulty :** 1 – 5 (5, most difficult)

<b>ISSUE of Major Differences</b>	<b>Importance</b>	<b>Difficulty</b>
How to define the test procedures – in defined order with clear instructions.	5	3
Burnish/bedding of linings - option?	5	1
Stopping distance/MFDD vs stopping distance only	5	5
Regenerative braking as part of the service braking system. Several Issues involved.	5	5
Braking distribution (for non-ABS vehicles) - calculation or measurement.	5	5
ABS - performance definition and tests	5	3
Parking brake – dynamic	5	2
Parking brake – friction type or able to be applied whilst in motion?	5	2
Unbraked trailer and static parking braking performance included in requirements?	3	5
EBS + Annex CEL - requirement to be included?	5	5
Provisions for PTI to be included?	5	4
EMC requirement to be included?	5	5
Peak frictional coefficient of test surface, requirement 0,9 – how to define? or test track used has to be agreed with Technical Service option	5	4

<b>ISSUE of Minor Differences</b>	<b>Importance</b>	<b>Difficulty</b>
Warning signal function test switch <span style="float: right;">yes/no</span>	2	2
Production and display of warning indication signals (subject to draft gtr controls and displays being produced by GRSG)	3	1
Reservoir design and volume - labelling	2	5
Full power system - pressure fall. 50 per cent or number of applications remaining or delete?	3	3
Type 0 test - which stop counts?	2	3
Wheel locking order - defined or inferred as two different surfaces?	3	3
Stop lamp illumination <span style="float: right;">yes/no</span>	1	4
Terminology, Definitions	2	2
Special requirements for single circuit needed? <span style="float: right;">yes/no</span>	1	4

### Appendix 3

### Passenger Vehicle GTR – Time Schedule

PVGTR2004/14 BEST TIMING	2004												2005												2006																				
	Quarter 1			Quarter 2			Quarter 3			Quarter 4			Quarter 1			Quarter 2			Quarter 3			Quarter 4																							
	J	F	M	A	L	M	J	J	A	W	S	O	N	D	P	J	F	M	T	A	M	J	J	P	A	S	O	N	D	P	J	F	M	A	M	J	J	A	S	O	N	D			
GRRF		G		swg1						swg2	G			swg3			G	swg4						swg5		G			swg6			G								G					
Report by Chairman of GRRF to AC 3																																													
Preliminary meetings																																													
Submission of Justification to AC 3																																													
Initial prioritising of topics																																													
Sub-working group meeting																																													
Further prioritising of topics																																													
Resolution of difficult items																																													
Preparation of 1st draft of GTR																																													
Consideration of 1st draft by GRRF																																													
Infomral group to agree handling																																													
AC3 to consider Justification																																													
Sub-working group meeting																																													
Refiningt 1st draft of GTR																																													
Sub-working group meeting																																													
Prioritising of remaining issues																																													
Preparation of 2nd draft of GTR																																													
Sub-working group meeting																																													
identifying final outstanding issues and handling																																													
Resolving final issues																																													
Report to GRRF																																													
Sub-working group FINAL meeting																																													
Preparation of final draft GTR																																													
Final draft GTR to GRRF & informal group.																																													
Final editing																																													
Report by Chairman of GRRF to AC 3																																													
Final sign off by GRRF																																													
Submission of GTR as formal document to AC 3																																													
Consideration of final GTR																																													