Transmitted by the expert from
the United States of America

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Proposal for amendments to the draft global technical regulation concerning hand controls, tell-tales and indicators present on Category 1 and 2 vehicles

(Reference document ECE/TRANS/WP.29/GRSG/2006/15)

A. PROPOSAL

Attached is a new draft global technical regulation (gtr) concerning hand controls, tell-tales and indicators present on Category 1 and 2 vehicles. The new draft inserts a new Part A to include a discussion of research that has been conducted to support the gtr. The new draft amends Table 1 to include only the eight (8) symbols which can be justified by the research conducted to date and to delete any requirements that relate only to symbols which have been deleted in this draft.

This proposed new draft does not make other changes that would be suggested by the United States, such as the deletion of sections 4.2.2. and 4.4.3., to allow discussion to focus solely on the issue of which symbols can be supported in a gtr.

B. JUSTIFICATION

The United States agrees with the assertion that, in a global context, symbols or pictograms have a clear advantage over wording because they overcome language barriers. However, the United States also believes that before mandating a symbol or pictogram in a gtr there must be evidence that the chosen symbol or pictogram is comprehended. Absent such evidence there is no reason to believe that the symbol or pictogram will not result in confusion that could result in the selection of the wrong control.

The Alliance of American Automobile Manufacturers has conducted research on the comprehension of the symbols proposed for inclusion in a gtr. Based upon this research, only eight (8) symbols have demonstrated levels on comprehension to support their inclusion in a gtr.

A. STATEMENT OF TECHNICAL RATIONALE AND JUSTIFICATION

I. INTRODUCTION

This proposed global technical regulation (gtr) concerning hand controls, tell-tales and indicators establishes criteria for the accessibility, visibility and recognition of vehicle controls and indicators determined to be critical for safety by GRSG Working Party. The objective of the proposal is to reduce the safety hazards caused by driver distraction. Specifically, the proposal is intended to reduce distractions resulting from an error in control selection or inconsistency in graphical representations of commands from one vehicle to another.

Implementing its commitment to explore the international harmonization of Federal Motor Vehicle Safety Standard (FMVSS) No. 101, the United States' National Highway Traffic Safety Administration (NHTSA) began discussions with Transport Canada (Canada's counterpart to the U.S. Department of Transportation) in the late 1990's concerning Canada's controls and displays standard, *i.e.*, Canadian Motor Vehicle Safety Standard 101. The joint goal of NHTSA and Transport Canada in these discussions was to revise their respective standards so that, subject to the overriding concern of ensuring that they continue to provide at least the same level of motor

vehicle safety, they are better organized, easier to understand, and consistent with the positions of the U.S., Canada, and European standards organizations.

1.1. PROCEDURAL BACKGROUND

a. Canada and U.S. Proposal at 76th Session of GRSG

During the 76th session of the Working Party on General Safety Provisions (GRSG) in June 1999, Canada and the United States of America proposed the development of Economic Commission for Europe (ECE) regulations regarding hand controls, tell-tales and indicators. The scope of the proposed work included an addendum to the 1958 Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions as well as global technical regulations (GTRs) under the 1998 Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles.

b. GTR Proposal at 126th Session of WP.29

Work on the GTR was postponed until the 126th session of WP.29 in March 2002, at which AC.3 established the priorities for developing future global technical regulations and WP.29 adopted the Program of Work for the 1998 Agreement. This Program of Work included development of a GTR regarding uniform provisions for hand controls, tell-tales and indicators present on category 1 and 2 vehicles. This document is the proposed preamble submitted by the United States, and Canada has drafted a regulatory text for this global technical regulation.

1.2. EXISTING REGULATIONS, DIRECTIVES AND INTERNATIONAL VOLUNTARY STANDARDS

The GRSG followed the recommendations of paragraph 4 of TRANS/WP29/2002/882. In the absence of a UNECE regulation under the 1958 Agreement or a regulation in the compendium of candidate global technical regulations, the GRSG considered the following documents:

- EC Directive 78/316/EEC-Identification of controls, tell-tales, and indicators as amended by Commission Directive 93/91/EEC;
- ECE Regulation 121-Uniform provisions concerning the approval of vehicles with regard to the location and identification of hand controls, tell-tales and indicators;
- U.S. Code of Federal Regulations (CFR) Title 49: Transportation; Part 571.101: Controls and displays; and
- Canada Motor Vehicle Safety Regulations No. 101 – Location and identification of controls and displays.

Regulations previously considered from other countries were found to be largely derived from the standards listed above. As a result, these documents were selected as a representation of the existing regulations concerning controls and displays. The GRSG also considered the draft UNECE regulation being developed for the 1958 Agreement as well as the known voluntary standards on the subject listed in the proposal specifically:

- ISO 2575-2004/amd.1:2005 – Road vehicles: Symbols for control indicators and tell-tales; and

- ISO/FDIS 4040-2001 – Road vehicles: Location of hand controls, indicators and tell-tales in motor vehicles.

All known regulations and voluntary standards on the subject of the installation and identification of controls, tell-tales and indicators were considered during development of the draft UNECE regulation. The GRSG decided to use the documents and standards listed above as the basis for the development of a new global technical regulation.

1.3. HISTORY OF CONTROLS AND DISPLAYS REGULATIONS

a. United States Federal Motor Vehicle Safety Standard No. 101

The United States began regulating controls and displays in passenger cars, multipurpose passenger vehicles (MPVs), trucks, and buses in 1967 when the National Highway Traffic Safety Administration issued FMVSS No. 101, *Controls and Displays*, (32 FR 2408). The purpose of the original standard was to assure the accessibility and visibility of motor vehicle controls and displays under all lighting conditions. The standard was designed to reduce the risk of safety hazards caused by the diversion of the driver's attention from the driving task to locate and identify the desired control or display, and to ensure that a driver wearing a safety belt could reach controls needed to accomplish the driving task.

In May of 1996, NHTSA issued a notice of proposed rulemaking (NPRM) to identify possible approaches to amend FMVSS 101 as a result of a regulatory reinvention initiative (61 FR 27039; May 30, 1996). The following were identified as alternative approaches to amending FMVSS 101: (1) rescinding the standard; (2) regulating only those controls and displays whose function is related to motor vehicle safety, and removing outdated provisions; (3) regulating only those controls and displays required by other FMVSSs; (4) consolidating all controls and displays requirements into FMVSS 101; and (5) permitting the use of International Standards Organization (ISO) symbols on some or all controls and displays currently required to be identified.

The public comments on the proposal indicated that the current requirements did not impose unnecessary regulatory burdens and there was no broad consensus, even among the vehicle manufacturers, in support of any of the proposals. After reviewing the public comments, NHTSA published a final rule announcing that none of the proposals would be adopted (62 FR 32538; June 16, 1997), however, the standard was amended to remove outdated provisions. As to the proposal to permit the use of ISO symbols to identify some or all controls and displays currently required by the standard to be identified, commenters from the motor vehicle industry generally supported that proposal. The American Automobile Manufacturers Association (AAMA) supported use of the ISO symbols, noting that symbols not specified in FMVSS 101 have been used in the U.S. vehicles for years and that the "motoring pubic has been educated as to the meaning of these symbols."

Nevertheless, public interest groups raised concerns about the ISO symbols. The Center for Auto Safety (CAS) urged NHTSA not to permit ISO symbols because of potential adverse safety consequences if a driver were uncertain how to interpret the symbols. Commenters opposed to using ISO symbols also cited several past NHTSA rulemakings in which the agency had been reluctant to permit ISO symbols whose meaning it did not believe to be intuitively obvious, *i.e.*, immediately understandable without the necessity for any education or memorization. In the response to these comments, NHTSA expressed a commitment to "exploring the possibilities of harmonizing its regulatory requirements with the regulatory requirements of other nations, provided that such harmonization did not reduce the safety protection afforded to the American public."

On September 23, 2003, the National Highway Traffic Safety Administration published in the Federal Register (68 FR 55217) a notice of proposed rulemaking to modernize FMVSS No. 101. Two of the primary concerns of the proposal were the standardization of identifying symbols for additional controls and displays and also updating identification requirements for advanced multi-function controls with remote displays. Lastly, on August 17, 2005, a final rule was published (70 FR 48295) requiring that certain controls, telltales and indicators be identified by specified symbols or words, and extending FMVSS 101's telltale and indicator requirements to vehicles with a gross vehicle weight rating (GVWR) of 4,536 kg (10,000 pounds) and greater.

b. EC Directive 78/316/EEC

On December 21, 1977 The Council of the European Communities (Council), in regard to Article 100 of the treaty establishing the European Economic Community, adopted Directive 78/316/EEC, which outlined the technical requirements for motor vehicles as it related to the identification of controls, tell-tales and indicators.

At the time Directive 78/316/EEC was adopted, the technical requirements for controls, tell-tales and indicators differed from one member state to another and the Council felt that it was necessary that all member states adopt the same technical requirements in order to align with those of the United Nations Economic Commission and the International Organization for Standardization.

On October 29, 1993, Commission Directive 93/91/EEC was adopted to amend or clarify requirements of Directive 78/316/EEC. The Council noted that new symbols identifying motor vehicle controls, tell-tales and indicators were internationally recognized and standardized by ISO, and that certain symbols were no longer in use. Further, Directive 93/91/EEC would delete the outdated symbols, and allow for words and abbreviations to be used in addition to symbols for controls, tell-tales and indicators. The current ECE regulation for controls and displays is ECE Regulation No. 121.

c. Canada Motor Vehicle Safety Regulations No. 101

The first Canadian regulation concerning controls location and identification was introduced in November 1970. This regulation was subsequently modified to reflect new technologies, add metric formatting and partially harmonize the Canadian and United States' regulations. A complete harmonization was never completed as Canada is an official bilingual country and English wording alone would not have been appropriate. Therefore, ISO symbols were chosen for the Canadian regulation.

Since March 2002, Canada has been leading the development of a global technical regulation regarding the uniform provisions for hand controls, tell-tales and indicators presented on category 1 and 2 vehicles within the United Nations.

2. TECHNICAL RATIONALE AND JUSTIFICATION

This proposed global technical regulation specifies requirements for hand controls, tell-tales and indicators and establishes criteria for the accessibility, visibility and recognition of vehicle controls and indicators determined to be critical for vehicle safety. The objective of this regulation is to reduce the safety hazards caused by driver distractions resulting from an error in control selection or inconsistency in graphical representations of commands from one vehicle to another. Also, it is expected that with global standardization of vehicle controls, tell-tales and indicators, symbol awareness and recognition would become more straightforward for the travelling public.

2.1. BENEFITS ACHIEVED BY THE GTR

Symbols are an efficient way to communicate vehicle safety information to drivers. A clear advantage of symbols, or pictograms, over wording is that symbols overcome language barriers. Travellers must be able to operate vehicles safely, even if they are unable to understand the language of the country they are visiting. Therefore, the consistent use of selected symbols identifying controls, tell-tales and indicators in all motor vehicles would increase its recognition, and recognition that is independent of language is necessary in a global automotive market.

Requiring vehicle controls and displays to be consistently identified by means of an internationally recognized set of graphics in all vehicles would promote safety. This is particularly important as the controls and displays in vehicles increase in number. The complexity and the consistent use in all new motor vehicles of a single symbol for each function would increase the recognition of that function among all drivers. In response to the increase in the number of controls in vehicles, it would be desirable to require each control to be labeled with the same symbol in every vehicle in order to minimize driver confusion and distraction. It is believed that after a period of learning by drivers, symbols would be generally recognized as to the function or condition they represent.

2.2. RESEARCH

This proposal to develop a global technical regulation for controls and displays in motor vehicles does not specify any immediate and measurable threat to vehicle safety; however, GRSG has agreed that there is a need to harmonize the way in which the motor vehicle controls, tell-tales and indicators are installed and identified. Minimal testing has been conducted by contracting parties to quantify the amount of distractions resulting from driver error in control selection so there is little data or research regarding the subject. However, an incident was reported in Canada wherein the controls on a city bus were not displayed in the proper order as specified in the ECE and U.S. regulations. As a result, a pedestrian was struck by the bus due to the fact that the driver assumed he was going forward when the bus was actually in reverse gear. This example illustrates the importance of harmonizing vehicle controls and displays to prevent further incidents of this type.

Nevertheless, the rationale behind the proposed requirement of globally harmonized symbols representing vehicle controls, tell-tales and indicators is that symbols can convey information more quickly and with less chance of human error than words. This is particularly true with respect to the increasingly global automotive market since manufacturers that sell vehicles in multiple countries can realize significant cost savings by utilizing internationally standardized symbols. Also, by simplifying the identification of controls and displays, this standard should reduce the problems resulting from driver's attention being diverted from the roadway to the controls and displays.

2.3. DISCUSSION OF ISSUES ADDRESSED BY THE GTR

It has been argued that the meaning of some controls and displays located within motor vehicles is not immediately clear to drivers, and that drivers would have to consult the owner's manual to discover their meaning. However, it is recognized that driving skills need to be learned and safety symbol recognition should be incorporated into that learning process. By standardizing symbols around the world, the GRSG working group will provide driving schools and evaluation organizations with a standard from which it will be possible to educate and test new drivers. The driving population would be informed of the meaning of new symbols as they are added. Also, this regulation could improve the communication of safety symbols to the driving public since contracting parties have the responsibility to inform their populations of the proposed requirements.

The GRSG working group has successfully obtained agreement on most of the criteria for the location, illumination and position of in-vehicle controls and displays. One issue regarding the selection of symbols critical for safety remains.

a. Applicability

The application of the requirements of this GTR refers to power-driven vehicles of categories 1 and 2 intended for use on the road, with our without bodywork and a maximum design speed exceeding 25 km/h. Contracting parties may apply this regulation to other categories of vehicles. In the United States, FMVSS 101 regulating controls and displays applies to passenger cars, multipurpose passenger vehicles, trucks and buses with a gross vehicle weight rating of 4,536 kg (10,000 pounds) and greater.

b. General Requirements

This global technical regulation specifies requirements for the location, identification, and illumination for controls, tell-tales and indicators fitted within applicable vehicles of categories 1 and 2.

2.4. COMPREHENSION TESTING

a. Context and Application

Comprehension testing is most often used to test brand new symbols being considered for production as part of a larger test and evaluation effort. Comprehension testing is considered to be a quick, inexpensive method that provides a means to determine which of a number of candidate symbols for a concept is best understood by a representative sample of subjects. During the test, a symbol is presented to a subject, the context of the symbol is specified (i.e., where they might expect to see the symbol), and the subject is asked to name the message, object, location or activity associated with the symbol.
Driver comprehension of a given in-vehicle symbol typically reflects a driver's understanding of the symbol obtained from a combination of three sources: (1) the inherent meaning conveyed by the symbol, in which greater comprehension is associated with a symbol that contains elements with a direct and obvious relationship to the symbol's meaning, (2) a driver's familiarity or experience with the symbol, and (3) driving circumstances (e.g., vehicle startup vs. unusual circumstances) or the conditions (e.g., location of the symbol, symbol color, symbol function) associated with the presentation of the symbol.

b. Alliance of Automobile Manufacturers Research

When the NHTSA issued notices of proposed rulemaking to amend FMVSS 101, automotive manufacturers expressed concerns that the agency's proposal for use of graphic symbols would expand the scope of the standard thereby creating substantial compliance problems and redesign costs for some manufacturers without demonstrated commensurate safety benefits. American Honda Motor Company (Honda) and General Motors (GM) stated that they understood and supported the goal of harmonization of symbols, but that a set of internationally recognized symbols that satisfied safety goals was not possible because the requisite comprehension testing and education of the driving public had not been conducted. According to Honda, to responsibly adopt a set of internationally recognized symbols, a process of testing each symbol for comprehension among drivers must be established to assure that each symbol is understood by an acceptable minimum percentage of drivers.

In response to Honda and GM's comments, the NHTSA sought data of driver comprehension for in-vehicle symbols, some of which were contained in FMVSS 101. The Alliance of Automobile

Manufacturers (Alliance), which has been a contributing participant in the development of GTRs, contracted with Battelle Human Factors Transportation Center to conduct the testing. Battelle employed a well-defined process for symbol comprehension testing proposed to the Society of Automotive Engineers (SAE) by the SAE Safety and Human Factor ITS Symbols Working Group in 2002. The final report for the first phase of testing was published on September 7, 2005.[1]

The research objective of the testing was to evaluate driver comprehension of 41 symbols for in-vehicle systems.[2] The symbols selected during the first phase of testing were: (1) symbols included in FMVSS 101 and present in most vehicles currently in service; (2) symbols not included in FMVSS 101 and present in some (primarily late-model) vehicles currently in service; (3) symbols not included in FMVSS 101 and present in very few or no vehicles currently in service; and (4) new or candidate symbols for in-vehicle tire pressure and electronic stability control safety systems. Seventy-one (71) subjects participated in the icon comprehension testing and screen criteria included an active driver's license, at least 2 years of driving experience, over 18 years of age and matching desired combinations of age and gender. Five data collection sessions were conducted with each lasting approximately 45 minutes.

i. Phase-One Results

Battelle researchers noted that in general, decisions regarding minimum correct rates for individual icons should reflect designer needs, as well as the consequences associated with selecting a cutoff rate that is either too high or too low. The results of this comprehension testing showed that there was a broad range of comprehension scores ranging from 0% to 92% amongst the 41 symbols. The minimum rates typically found in the symbol/icon design and evaluation literature lie between 60% and 80%.[3] Thus, using 60% in the "high" comprehension category as a minimum value for high comprehension, six symbols tested in the study resulted in high comprehension:

- #13, Engine OBD, 62%
- #23, Automatic Transmission Control Position, 92%
- #25, Low Tire Pressure, 92%
- #28, Horn, 68%
- #34, Hazard Warning Signal, 82%
- #35, Windshield Wiping and Washing Combined, 70%

Lower than expected comprehension rates were observed for very standard symbols, such as the turn signal, fuel level, electrical charge and oil pressure symbols. Battelle researchers explained that very low or zero comprehension for some symbols could reflect a lack of experience with the symbols, or a need to redesign symbols. Additionally, Battelle researchers asserted that much confusion occurred between similar looking symbols, and that subjects were generally unable to distinguish between control/gauge labels and warning symbols. The latter was

[1] Campbell, J.L. & Richman, J.B. (2005). *Comprehension Testing for In-Vehicle Symbols*. Final Report prepared for the Alliance of Automobile Manufacturers. Seattle, WA: Battelle Human Factors. Transportation Center.
[2] See Appendix A.
[3] Campbell, J.L. & Richman, J.B., at 18.

particularly apparent with the fuel level, turn signal, electrical charge, and oil pressure symbols, all of which are "dual use" symbols. Battelle researchers suggested that additional contextual information and further testing may be needed to improve results.

ii. Phase-Two Results

On August 15, 2006, Battelle Human Factors Transportation Center published a final report for the second phase of comprehension testing for in-vehicle systems.[4] This study was conducted as a follow-on to the first phase of testing in 2005. The report summarized the conduct and findings of a study that evaluated driver comprehension of nine (9) symbols.[5] These symbols received lower than expected comprehension levels considering that they had been in use for many years. In Battelle's report to the Alliance on the 2005 study, researchers noted that one of the reasons for the lower than expected comprehension levels may have been the lack of contextual cues, such as co-location of a symbol with a specific control, control function, gauge or related symbol, provided during the first phase of testing,. Battelle speculated that providing more descriptive content than just the symbol might improve comprehension.

Contrary to phase one procedures, symbols were presented to the subjects as part of a larger graphic showing co-located displays, controls, or vehicle interiors in order to increase the available context presented to subjects. Compared to the previous study, providing subjects with more contextual information improved the comprehension rate for some symbols and helped subjects determine more accurately whether the symbol was a control or tell-tale. However, the addition of contextual information did not improve comprehension for all of the symbols tested. Again, using 60% in the "high" comprehension category as a minimum value for high comprehension, three (3) of the nine symbols resulted in high comprehension:

- #3, Seatbelt Unfastened, 98%
- #6, Automatic Transmission Control Position, 81%
- #9, Low Fuel, 95%

Specifically, the comprehension rates for lighting system symbols (#1, 2 and 8) and the brake malfunction symbol (#4) remained essentially the same relative to the previous study. According to Battelle researchers, in the absence of a re-design of these symbols, comprehension would likely increase with the addition of exposure to and experience with the symbols, greater task context, and other cues to symbol meaning that might be available to the driver.

iii. Summary of Alliance Research

Given the lower than expected comprehension ratings for some symbols, it is reasonable to wonder what constitutes "acceptable" comprehension. In general, determining minimal acceptable comprehension is a subjective process that could vary from symbol to symbol. Symbol designers are sometimes the best judge of this because they understand how and when a symbol is likely to be used, as well as the consequences of a driver misinterpreting the meaning of a symbol. For this study, high comprehension ranged from 60%-100%. Battelle researchers selected 60% as minimum high comprehension based on symbol/icon design and evaluation literature.

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[4] Campbell, J.L. & Kludt, K. (2006). *Comprehension Testing for In-Vehicle Symbols: Phase Two*. Final Report prepared for the Alliance of Automobile Manufacturers. Seattle, WA: Battelle Human Factors.

[5] See Appendix B.

Although the results of the first phase of testing revealed that the testing procedure did not provide sufficient contextual information and a second phase of testing was needed, comprehension increased for only three of the nine symbols tested. Overall, eight (8) symbols resulted in high comprehension and can be supported by the Alliance research to be included in the GTR.

Although higher comprehension levels are desired, Battelle researchers did not conclude that the various symbols tested were poorly designed or that they should be redesigned. Rather, they contend that in an actual vehicle, there are alternate cues available to the driver to support and reinforce the driver's interpretation and use of the symbols. Also it is believed, that through extended experience with the symbols in an actual driving environment, drivers will gain a "functional understanding" of what the symbols mean.

2.5. CONTROLS AND DISPLAYS SYMBOLS

Defining the installation and identification of controls and displays is of sufficient importance to warrant this regulation. This proposed global technical regulation is a first step. In accordance with the 1998 Agreement, the symbols to be included in the controls and displays GTR are supported and justified by research data.

From the comprehension tests conducted by the Alliance of Automobile Manufacturers, eight (8) symbols are justified for inclusion in this global technical regulation. The table identifying these symbols is provided below. As other graphic symbols are agreed upon by the contracting parties, the list of symbols will be updated periodically to prescribe more symbols and to further increase global harmonization of controls and displays. Additionally, this GTR does not prohibit the use of words to identify vehicle controls and displays. In some situations, words may be selected, instead of a graphic symbol, to designate certain controls, displays and indicators inside the vehicle.

No.	**Column 1**	Column 2	**Column 3**	**Column 4**
	ITEM	**SYMBOL**	**FUNCTION**	**PERCENT COMPREHENSION**
1.	Automatic transmission control position (park) (reverse) (neutral) (drive)	P R N D	Indicator	81%
2.	Engine OBD		Tell-tale	62%
3.	Hazard Warning Signal		Control	82%
4.	Horn		Control	68%

No.	Column 1	Column 2	Column 3	Column 4
	ITEM	**SYMBOL**	**FUNCTION**	**PERCENT COMPREHENSION**
5.	Low Fuel		Tell-tale	95%
6.	Low Tire Pressure		Tell-tale	92%
7.	Seatbelt Unfastened		Tell-tale	98%
8.	Windshield Wiping and Washing Combined		Control	70%

3. REGULATORY IMPACT AND ECONOMIC EFFECTIVENESS

An adequate analysis of the costs and other consequences of this regulatory action reveal that this proposed rule would provide both the opportunity for vehicle manufacturers to reduce production costs through international uniformity and the benefit of quicker driver identification of controls and displays. The increased recognition of controls and displays by drivers will reduce driver distraction, which is a significant contributor to incidents involving motor vehicles. Therefore, standardizing vehicle symbols and controls would result in improved safety for all motorists and ensure better understanding of safety symbols by drivers around the world.
The cost of this regulation would be minimal since all eight (8) graphic symbols prescribed in the global technical regulation are currently accepted by most of the contracting parties as specifically established by the International Standards Organization for controls and displays in motor vehicles, ISO 2575:2000.

B. TEXT OF THE REGULATION

1. SCOPE AND PURPOSE

This global technical regulation specifies requirements for the location, identification, colour, and illumination of power driven vehicle hand controls, tell-tales and indicators. The purpose of this global technical regulation is to ensure the accessibility, visibility, and recognition of vehicle controls, tell-tales, and indicators and to facilitate the proper selection of controls under daylight and night-time conditions. The global technical regulation intention is also to reduce the safety hazards that would otherwise be caused by the diversion of the driver's attention from the driving task by mistakes in selecting controls.

2. APPLICATION

This global technical regulation applies to power-driven vehicles of categories 1 and 2 [6]/ intended for use on the road, with or without bodywork and a maximum design speed exceeding 25 km/h. Contracting Parties may apply this global technical regulation to other categories of vehicles.

3. DEFINITIONS

For the purpose of this global technical regulation

3.1. "Adjacent", with respect to a symbol identifying a control, tell-tale or indicator, means that the symbol is in close proximity to the control, telltale or indicator and no other control, tell-tale, indicator, identification symbol or source of illumination appears between an identification symbol and the control, tell-tale, or indicator which that symbol identifies.

3.2. "Common space" means an area on which more than one tell-tale, indicator, identification symbol, or other message may be displayed but not simultaneously.

3.3. "Control" means the hand-operated part of a device that enables the driver to change the state or functioning of a vehicle or vehicle's subsystem.

3.4. "Device" means an element or an assembly of elements used to perform one or more functions.

3.5. "Indicator" means a device that shows the magnitude of the physical characteristics that the device is designed to sense.

3.6. "Multi-function control" means a control through which the driver may select, and affect the operation of, more than one vehicle function.

3.7. "Multi-task display" means a display area on which more than one message may be displayed simultaneously.

3.8. "Tell-tale" means an optical signal that, when illuminated, indicates the actuation of a device, a correct or improper functioning or condition, or a failure to function.

4. REQUIREMENTS

A vehicle, if fitted with a control, tell-tale or indicator identified in Table 1, shall meet the prescribed requirements of this global technical regulation respecting the location, identification, illumination, and colour of that control, tell-tale or indicator.

4.1. Location

4.1.1. The controls, listed in Table 1, shall be located so that they are operable by the driver under the conditions set out in paragraph 4.6.2.

6/ As defined in the Special Resolution No. 1 concerning the common definitions of vehicle categories, masses and dimensions (TRANS/WP.29/1045).

4.1.2. The tell-tales and indicators listed in Table 1, and their identification symbols shall be located so that they are visible to a driver under the conditions set out in paragraphs 4.6.1. and 4.6.2., during daylight and nighttime driving. Tell-tales, indicators and their identification symbols need not be visible when not activated.

4.1.3. Except as provided in paragraph 4.1.4., the identification symbols for controls, tell-tales, and indicators shall be placed on or adjacent to the controls, tell-tales or indicators that they identify.

4.1.4. Paragraph 4.1.3. does not apply to multi-function controls, if:

4.1.4.1. the control is associated with a multi-task display, and

4.1.4.2. the associated multi-task display is visible to the driver under the conditions of paragraphs 4.6.1. and 4.6.2., and

4.1.4.3. identifies the control with which it is associated, either graphically or in words, and

4.1.4.4. all of the vehicle systems for which control is possible from the multi-function control are identified on a multi-task display. Sub-functions of those systems need not be shown on the top-most layer of the multi-task display, and

4.1.4.5. does not display telltales listed in Table 1.

[U.S. final rule]

4.1.5. Controls for hazard warning lamps and for windscreen washing must be always accessible to the driver as primary function of the corresponding control.

4.2. Identification

4.2.1. Each control, tell-tale and indicator that is listed in column 1 of Table 1, shall be identified by the symbol specified for it in column 2 of Table 1. No identification symbol is required for any horn (an audible warning signal) control that is activated by a lanyard.

4.2.2. If a symbol is used for identification of a control, tell-tale or indicator not listed in Table 1, it is recommended to use a symbol designated for the purpose in International Standard ISO 2575:2004/Amd.1:2005 Road vehicles – Symbols for controls, indicators and tell-tales.

[As per discussion GRSG]

4.2.3. Supplementary symbols (for example words) may be used in conjunction with any symbol.

4.2.4. Each additional or supplementary symbol used by the manufacturer must not cause confusion with any symbol specified in this global technical regulation.

4.2.5. If the control, indicator or tell-tale for the same function are combined, one symbol may be used to identify that combination.

4.2.6. Except as provided in paragraph 4.2.7., all identification symbols for the tell-tales, indicators and controls must be positioned so as to appear to the driver to be perceptually upright. For rotating controls that have an "off" position, this requirement applies to the control in the "off" position.

4.2.7. The identification symbols for the following need not be positioned so as to appear to the driver to be perceptually upright:

4.2.7.1. a horn control,

4.2.7.2. any control, tell-tale or indicator located on the steering wheel, when the steering wheel is positioned for the power driven vehicle to travel in other than a straight forward direction, and

4.2.7.3. any rotating control that does not have an "off" position.

4.2.8. Identification symbols shall be provided for the control of each function of the automatic vehicle speed system (cruise control) and the heating and air conditioning systems.

4.2.9. When fitted, each control that regulates a system function over a continuous range shall have identification provided for the limits of the adjustment range.

4.2.10. If colour coding is used to identify the limits of the adjustment range of a temperature function or temperature status, the hot limit or status must be identified by the colour red and the cold limit or status by the colour blue. If the limit of a function is shown by a display not adjacent to the control for that function, both the control and the display must be independently identified as to the function of the control, in compliance with paragraph 4.2.1., on or adjacent to the control and on or adjacent to the display.

4.3. Illumination

4.3.1. Timing of illumination

4.3.1.1. Except as provided in paragraph 4.3.1.3., wherever the word "Yes" is indicated in column 4 of Table 1, the corresponding identification symbol for a control listed in column 1 in Table 1 shall be capable of being illuminated whenever the headlamps are activated. This does not apply to controls located on the floor, floor console, steering wheel, steering column, in the area of the windscreen header, or to those controls for a heating or air-conditioning system that does not direct air directly upon the windscreen.

4.3.1.2. Except as provided in paragraph 4.3.1.3., wherever the word "Yes" is indicated in column 4 of Table 1, the corresponding indicator and its identification symbol shall be illuminated whenever the vehicle’s propulsion system and the headlamps are activated.

4.3.1.3. The indicators, their identifications and the identifications of controls need not be illuminated when the headlamps are being flashed or operated as daytime running lamps.

4.3.1.4. At the manufacturer's option, any control, indicator and their respective identification symbols may be capable of being illuminated at any time.

[In ECE and U.S. final rule]

4.3.1.5. A tell-tale shall emit light when the malfunction or vehicle condition it is designed to indicate occurs. It shall not emit light at any other time, except during a bulb check.

4.3.2. Brightness of illumination regarding controls and indicators

4.3.2.1. Means shall be provided for illuminating the indicators and identification symbols for indicators and controls listed in Table 1, for which the word "Yes" is indicated in column 4 of Table 1, to make them visible to the driver under daylight and night time driving conditions.

4.3.2.2. The means of illumination required by paragraph 4.3.2.1.:

4.3.2.2.1. shall be adjustable to provide at least two levels of brightness, at the lower of which the indicators and identification symbols for controls and indicators are barely discernible to the driver who has adapted to dark ambient roadway condition; and

4.3.2.2.2. may be operable manually or automatically; and

4.3.2.2.3. may have level of brightness at which those items and identification are not visible.

[U.S. final rule]

4.3.3. Brightness of illumination regarding tell-tales

Means shall be provided for illuminating tell-tales and their identification symbols to make them visible to the driver under daylight and night time driving conditions.

4.4. <u>Colour</u>

4.4.1. Subject to paragraph 4.5.1.6., the light of each tell-tale shall be of the colour specified in column 5 of Table 1.

4.4.2. The colour of indicators, tell-tales and the identification symbols for indicators and controls not listed in Table 1 shall be selected by the manufacturer in accordance with paragraphs 4.4.3 and 4.4.4. The colour selected must not mask or interfere with the identification of any tell-tale, control or indicator specified in Table 1.

4.4.3. Subject to paragraph 4.2.10., colours must be selected in accordance with the following colour code:

[OICA comment]

4.4.3.1. red: danger to persons or very serious damage to equipment is immediate or imminent;

4.4.3.2. yellow or amber: caution, outside normal operating limits, vehicle system malfunction, damage to vehicle likely, or other condition which may produce hazard in the longer term;

4.4.3.3. green: safe, normal operating condition (except if blue or yellow is required by Table 1.).

4.4.4. Each symbol used for the identification of a tell-tale, control or indicator shall be in a colour that stands out clearly against the background.

4.4.5. The filled-in part of any symbol may be replaced by its outline and the outline of any symbol may be filled in.

4.5. Common space for displaying multiple messages

4.5.1. Except as provided in paragraph 4.5.1.3., a common space may be used to show information from any source, subject to the following requirements:

4.5.1.1. The tell-tales and indicators displayed in the common space shall illuminate at the initiation of the condition they are designed to identify.

4.5.1.2. The tell-tale and indicators that are listed in Table 1 and are shown in the common space must illuminate at the initiation of any underlying condition.

[U.S. final rule]

4.5.1.3. Except as provided in paragraph 4.5.1.4., when the condition exists for actuation of two or more tell-tales, the information shall be either

(i) repeated automatically in sequence, or

(ii) indicated by visible means and capable of being selected for viewing by the driver under the conditions of paragraph 4.6.2.

4.5.1.4. The tell-tales for the low tyre pressure and seat belt shall not be shown in the same common space.

[OICA comment]

4.5.1.5. If condition of activation exists for the following tell-tales: low tyre pressure or seat belt, and they are displayed on a common space with other tell-tale, they must have priority over anything else in the common space.

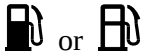
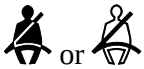
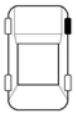
4.5.1.6. Information displayed in the common space may be cancellable automatically or by the driver, except for the tell-tales of low tyre pressure and those for which the colour red is required by Table 1 shall not be cancellable if the condition exists for their activation.

4.6. Conditions

4.6.1. The driver has adapted to the ambient light roadway conditions.

4.6.2. The driver, 50th percentile male, is restrained by the installed crash protection system, adjusted in accordance with the manufacturer's instructions.

Table 1. Symbols identifying controls, tell-tales and indicators

No.	Column 1	Column 2	Column 3	Column 4	Column 5
	ITEM	**SYMBOL**	**FUNCTION**	**ILLUMINATION**	**COLOUR**
1.	Hazard warning signal	 1/	Control	Yes	
			Tell-tale 2/	Yes	Red
2.	Fuel level		Tell-tale	Yes	
			Indicator	Yes	
3.	Windscreen washing and wiping system		Control	Yes	
4.	Seat belt		Tell-tale	Yes	Red
5.	Horn	 1/	Control		
6.	Engine on-board diagnostics or engine malfunction		Tell-tale	Yes	Yellow
7.	Automatic transmission control position (park) (reverse) (neutral) (drive)	P R N D , 3/	Indicator	Yes	
8.	Tyre malfunction (e.g. low tyre pressure)		Tell-tale	Yes	Yellow

1/ Framed areas of the symbol may be solid.

2/ Not required when arrows of turn signal tell-tales that otherwise operate independently flash simultaneously as hazard warning tell-tale.

3/ Letter "D" may be replaced or supplemented by other alphanumeric character(s) or symbol(s) chosen by the manufacturer to indicate additional selection modes. The indicators shall be displayed top to bottom or left to right.

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