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PROPOSAL FOR A DRAFT GLOBAL TECHNICAL REGULATION ON SAFETY-BELT ANCHORAGES

Transmitted by the Expert from the International Organization of
Motor Vehicle Manufacturers (OICA)

Note: The comparison tables reproduced in this document were prepared by the experts from OICA to support the proposal for a draft global technical regulation (GTR) on safety-belt anchorages; the proposed GTR had been distributed without a symbol (informal document No. 3) during the twenty-sixth session of GRSP. The experts are kindly requested to bring their copies of this informal document for consideration during the twenty-seventh session (TRANS/WP.29/GRSP/26, paras. 28 and 29).

Note: This document is distributed to the Experts on General Safety Provisions only.

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**FMVSS 210, SAFETY REGULATION ART. 22-3, ECE Regulation No.14
SAFETY BELT-ANCHORAGES**

<i>ITEM</i>	<i>FMVSS</i>	<i>ECE</i>	<i>JAPAN</i>	<i>TECHNICAL DIFFERENCES IN REGULATIONS</i>	<i>PERFORMANCE DIFFERENCES FOR PRODUCTS</i>
SUBJECT	Safety belt assembly anchorages - FMVSS 210	Safety-belt anchorages ECE Regulation No. 14.	Safety Regulations Art. 22-3		
VEHICLE APPLICATION	Passenger cars, multi-purpose vehicles, trucks and buses.	Motor vehicles of categories M and N.	Ordinary-, small- and mini-sized motor vehicles	Applicable vehicle categories are differentiated according to vehicle weight and seating capacity.	
ANCHORAGES FOR TYPE OF SAFETY-BELT ASSEMBLIES REQUIRED	Type 2 (lap and shoulder) for each forward-facing outboard designated seating position, or Type 1 (lap only) for other designated seating positions.	Front and all outboard seats shall have two lower and one upper belt anchorages. (Type A). Front center all other seats positions shall have two lower belt anchorages (Type B).	Forward-facing outboard seats shall have anchorages for Type 2 (3-point) safety-belts. (Regular trucks and buses may have anchorages for 2-point safety-belts.) Other seats shall have anchorages for Type 1 (2-point) seat belts.	Basically all outboard seats are required to have 3-point safety-belt anchorages, while other seats are required to have 2-point (or 3-point) safety-belt anchorages.	No difference
STRENGTH REQUIREMENTS	Type 2 anchorages shall withstand separate belt loop loads of 3,000 lbs. (13,344 N) each applied with a body block to the upper torso and pelvic belt anchorages.	For M1 and N1, Type A (lap and shoulder) anchorages shall withstand separate belt loop loads of 13,500 N each applied with a body block to the upper torso and pelvic belt anchorages. For vehicle categories M2 and N2, belt loop load shall be 6,750 N. For vehicle categories M3 and N3 belt loop load shall be 4,500 N.	Type 2 anchorages shall withstand a load of 1,380 kgf (13,500 N) each applied with a body block.	Requirements are equivalent up to ECE categories M1 and N1. In other categories, requirements differ among the three regulations.	Practically no difference up to ECE categories M1 and N1.

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	Type 1 anchorages shall withstand belt loop load of 5,000 lbs. (22,240 N) applied with body block to the pelvic belt anchorages.	For M1 and N1, Type B (Lap) anchorages shall withstand belt loop load of 22,250 N applied with body block to pelvic belt anchorages. For vehicle categories M2 and N2, belt loop load shall be 11,100 N. For vehicle categories M3 and N3, belt loop load shall be 7,400 N.	Type 1 anchorages shall withstand a load of 2,270 kgf (22,300 N) each applied with a body block.	Requirements are equivalent up to ECE categories M1 and N1. In other categories, requirements differ among the three regulations.	
STRENGTH REQUIREMENTS	If a safety-belt anchorage of Type 1 or 2 is attached to the seat/track assembly, then a load equal to 20 times the weight of the seat/track assembly is also applied simultaneously on the seat/track assembly while the body block load is applied.	For vehicle categories M1 and N1, if anchorages are on the seat structure, force equal to 20 times the weight of the complete seat is to be applied horizontally and longitudinally through the centre of gravity of the seat. For vehicle categories M2 and N2 the supplementary force shall instead be equal to 10 times the mass of the completed seat. For vehicle categories M3 and N3 the supplementary force equal to 20 times the mass of the complete shall instead be 6.6 times the mass of the complete seat.	If anchorages are attached to the seat, a static or dynamic load 20 times the weight of the complete seat is to be applied horizontally and longitudinally through the centre of gravity of the seat.	Requirements are equivalent up to ECE categories M1 and N1. In other categories, requirements differ among the three regulations.	The same requirements up to ECE categories M1 and N1.

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	The vehicle structure and the seat belt assembly anchorages must sustain simultaneous loads of all lateral seat positions.	All anchorages of the same group must be tested simultaneously	Anchorage tests may be carried out for each individual seat, except for the following cases: 1. Where two or more anchorages are attached to the seat. 2. Where two or more anchorages are attached in a close vicinity.	Basically the same.	
SEAT POSITION	Seats must be placed in the rearmost position.	Seat must be in driving position or worst case conditions with respect to the strength of the system. Seat back angle as close as possible to 25 degree. For vehicle categories other than M1 and N1, the seat back angle shall instead be as close as possible to 15°. These angles apply unless otherwise specified by the vehicle manufacturer.	Seats must be placed in the design reference position.	FMVSS requires the rearmost position, the Safety Regulations: the design reference position, and ECE the driving (design reference) position, or the worst case position.	No clear differences in requirements for anchorages.
STRENGTH REQUIREMENTS	Load is applied to an upper torso and/or pelvic body block at an angle of not less than 5° nor more than 15° above the horizontal in a plane parallel to the longitudinal centreline of the vehicle.	Specified tractive forces must be applied in a forward direction by means of specific traction device reproducing the upper torso and pelvic portions of the human body at an angle of 10° ±5° above the horizontal in a plane parallel to the median longitudinal plane of the vehicle.	Force is applied to the body block in a forward direction at an angle of 10° ± 5° above the horizontal in a plane parallel to the median longitudinal plane of the vehicle.	The direction of loads	

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LOAD APPLICATION	Load rate is such that the load requirement must be reached in not more than 30 seconds, and is than maintained for 10 seconds.	Full application of load requirement as rapidly as possible, but no less than 0.2 seconds.	Full application of the load shall be achieved within 60 seconds, and for a duration of at least 0.2 second.	FMVSS requires the load to be applied within 30 seconds for a duration of 10 seconds. The Safety Regulations: within 60 seconds and for at least 0.2 second. ECE: for at least 0.2 second.	The load application conditions of the Safety Regulations and ECE more closely resemble actual conditions, as compared to FMVSS.
TEST RESULTS	Permanent deformation or rupture of a seat belt anchorage or its surrounding area is not considered to be a failure, if the required force is sustained for at least 10 seconds.	Permanent deformation, including rupture or brakeage of any anchorage of any anchorage of surrounding area shall not constitute failure if the required force is sustained for a period of at least 0.2 seconds, and deformation of minimum lateral spacing for lower horizontal plane of "permitted area" for upper belt anchorages shall not be exceeded.	The safety-belt anchorage and intermediate guide shall not exhibit any detachment, cracking or deformation, etc. which will cause the failure of the intended function.	FMVSS and ECE do not consider permanent deformation or rupture of an anchorage or of its surrounding area failure, if a required force is sustained for a certain duration. Safety Regulations: prohibits such deformation or rupture that causes the failure of the intended function of the anchorage.	FMVSS and ECE are more realistic in allowing permanent deformation or rapture of an anchorage or of its surrounding area when a required force is sustained for a certain duration.

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ANCHORAGE LOCATION	A) Type 1 and pelvic portion of Type 2 The nearest point (take-off point) of the belt hardware attachment shall be in a zone between 30° and 75° from horizontal in side view. (Original of zone in dependent if fixed or moveable).	A) Lower belt anchorages shall be located between front seat: 30 and 80 (all categories) 45 and 80 (M1, buckle side) 20 and 80 (other than M1, bench seat) or for constant angle 60 ± 10 rear seat: 30 and 80 (M1) 20 and 80 (other than M1) from the horizontal in the side view with the origin of the zone extending from the "seating reference point".	Lap belt anchorages shall be within the range of 20° and 75° from the horizontal, in any position to which the seat can be adjusted.	Basically the same, though with slight differences.	
	Two adjacent belts to one anchorage.	Two adjacent belts may be attached to one anchorage.		FMVSS and ECE provide the same requirements.	
	For seat belt anchorage location shall be 6.5 inch (165 mm) apart	Lateral location shall be 350 mm apart and no less than 120 mm to the median longitudinal plane of the seat.	The lateral locations of lap belt anchorages shall be at least 350 mm apart (may be made as close as 300 mm), and no less than 120 mm from the median longitudinal plane of the seat.	The Safety Regulations and ECE provide the same requirements.	
	B) Type 2 Upper torso portion with seat adjusted full rearward and downward and seat back in most upright position. Anchorage shall be located within specified zone.	B) "Effective upper belt anchorage" (point where belt leaves guide) shall be located in specified zone identified as "permitted area"	The attaching location of the anchorage that secures the upper part of the shoulder belt shall be within a designated area, and no less than 140 mm from the median longitudinal plane of the seat.	Compared to FMVSS, ECE provides a greater permitted anchorage zone forward to the belt anchorage guide.	

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EFFECTIVE BELT ANCHORAGE POINT A) FOR LOWER BELT ANCHORAGES	Nearest contact point of belt with attaching hardware attached to seat or vehicle structure	Point where belt (strap) is attached to rigid part (Attaching hardware)	Point on the vehicle structure (may be a point on the vehicle structure where the webbing comes in contact with attaching hardware, seat, etc.)	Basically the same.	
B) FOR UPPER TORSO OR STRAP GUIDE D-RING	Anchorage point (where load is transferred to vehicle structure) is considered as the bolt attaching point	Point where belt (strap) is leaving the guide.	Point on the vehicle structure (may be a point on the vehicle structure where the webbing comes in contact with the guide ring)	FMVSS requires points on the vehicle structure. ECE requires the points at which a guide ring and a webbing come in contact. The Safety Regulations permit both.	
OWNER'S MANUAL INSTRUCTIONS	Owner's manual shall include explanation that child restraint systems are designed to be secured by lap belts or lap belt portion of a Type 2 belt, and have a statement that children are safer in a rear seating position rather than in a front seating position.	Vehicle operating instructions require no statement for child restraint systems. However the location of all anchorages and Type of belts intended for use are to be stated.	(No requirements)	While FMVSS requires explanation on child restraint systems to be included in owner's manuals, the Safety Regulations and ECE do not provide this requirement.	