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PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 16
(Safety-belts)

Transmitted by the Expert from Japan

Note: The text reproduced below was prepared by the expert from Japan in order to amend the retraction force limit, to facilitate displacements in the dynamic test and the dynamic test condition. It is based on a document distributed without a symbol (informal document No. 3) during the twenty-seventh session (TRANS/WP.29/GRSP/27, para. 30)

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

A. PROPOSAL

Paragraph 6.2.5.3.4., amend to read:

" ..... If the retractor is part of an upper torso restraint, the retracting force of the strap shall be not less than 0.1 daN and not more than 0.7 daN when similarly measured. If the strap ....."

Paragraph 6.2.5.3.5., amend to read:

" ..... After the above test, the retractor shall operate correctly and still meet the requirements of paragraphs 6.2.5.3.1. to 6.2.5.3.3. above."

Insert a new paragraph 6.2.5.3.6., to read:

"6.2.5.3.6. After the test of paragraph 6.2.5.3.5., the retracting force shall be no less than 50 per cent of its original retraction force."

Paragraph 7.7.4., amend to read:

"... equivalent results, for example, an accelerating sled. This apparatus shall comply ..."

[Paragraph 7.7.5., amend to read:

"...before impact, or the trolley speed obtained by calculation according to the curves of the trolley's deceleration as a function of time equivalent results, for example, an accelerating sled, and the maximum forward displacement ...."]

Annex 1B, item 11, footnote 4/, amend to read;

" ..... is approved to Regulation no. 94, 01 series of amendments or its any later version in force, Japan's safety regulation for Road Vehicles, Article 11-4-14, or United States of America Standard FMVSS 208, section 4."

* * *

B. JUSTIFICATION

Ref. to paragraphs 6.2.5.3.4. to 6.2.5.3.6.:

The current retraction force lower limit (0.2 daN) is to be reduced to the level of current regulations in the United States of America and Japan (0.1 daN)

Furthermore, it is also proposed that the retraction force after the durability test be the 50 per cent of the primary force. (Cf. In the current Regulation No. 16, the force is to be more than 0.2 daN even after the durability test.)

The proposed amendments help to increase the rate of safety-belt usage by reducing the compressive force when wearing safety-belt.

In the Japanese market, many passengers claim the reason for not wearing safety-belt as compressive force. (approximately 30 per cent, see attachment 1). It is feared that with even stronger retraction force than in the present Regulation, the rate of safety-belt usage might decline.

The proposed values have already been qualified both in the United States of America and in Japan.

The impact on the passenger injury by reducing the retraction force was verified using dummy simulation (MADYMO), and it was proved that there was almost no impact (see attachment 2).

Ref. to annex 1B. item 11, footnote 4/:

As the conditions assumed for easing displacements in dynamic tests, the proposal is to add the national regulation of frontal collision such as Safety Regulation of Japan (50 km/h barrier collision) to Regulation No. 94 (Offset collision).

The load-limiting device in safety-belts is very popular in Japan for improving vehicle safety. If Japan adopts current Regulation No. 16, it would be very difficult for Japanese manufacturers to incorporate load-limiting device.

Taking into account that ECE Regulations should be in line with global technical regulations in the future, the Japanese and the United States of America frontal collision regulations, which are equivalent to Regulation No. 94 in displacement of chest and pelvis, there is a need to deal this prescription relating to load-limiting device.

In the original Regulation No. 16 dynamic test, accidental head-on collision at 50 km/h was assumed. Therefore, the Japanese regulation of frontal collision (almost the same as FMVSS 208), which assumes the head-on collision at 50 km/h can be considered appropriate for evaluating the safety performance.

A comparison of dummy displacements of chest and pelvis was made under the tests of Regulation No. 94 and Japanese regulation. It was revealed that there were some larger displacements under Japanese regulation but the differences were not important (see attachment 3).

Ref. to paragraphs 7.7.4. and 7.7.5.:

Similarly to the proposal for draft amendments to Regulation No. 44 (TRANS/WP.29/GRSP/2000/3), in addition to the primary speed (50 ± 1 km/h) and the stopping distance (40 ± 5 cm) of the trolley in impacting device, the trolley speed and the stopping distance obtained by calculation according to the curves of the trolley's deceleration as a function of time should be added.

When equivalent test condition is provided, the acceleration sled test device should be accepted.

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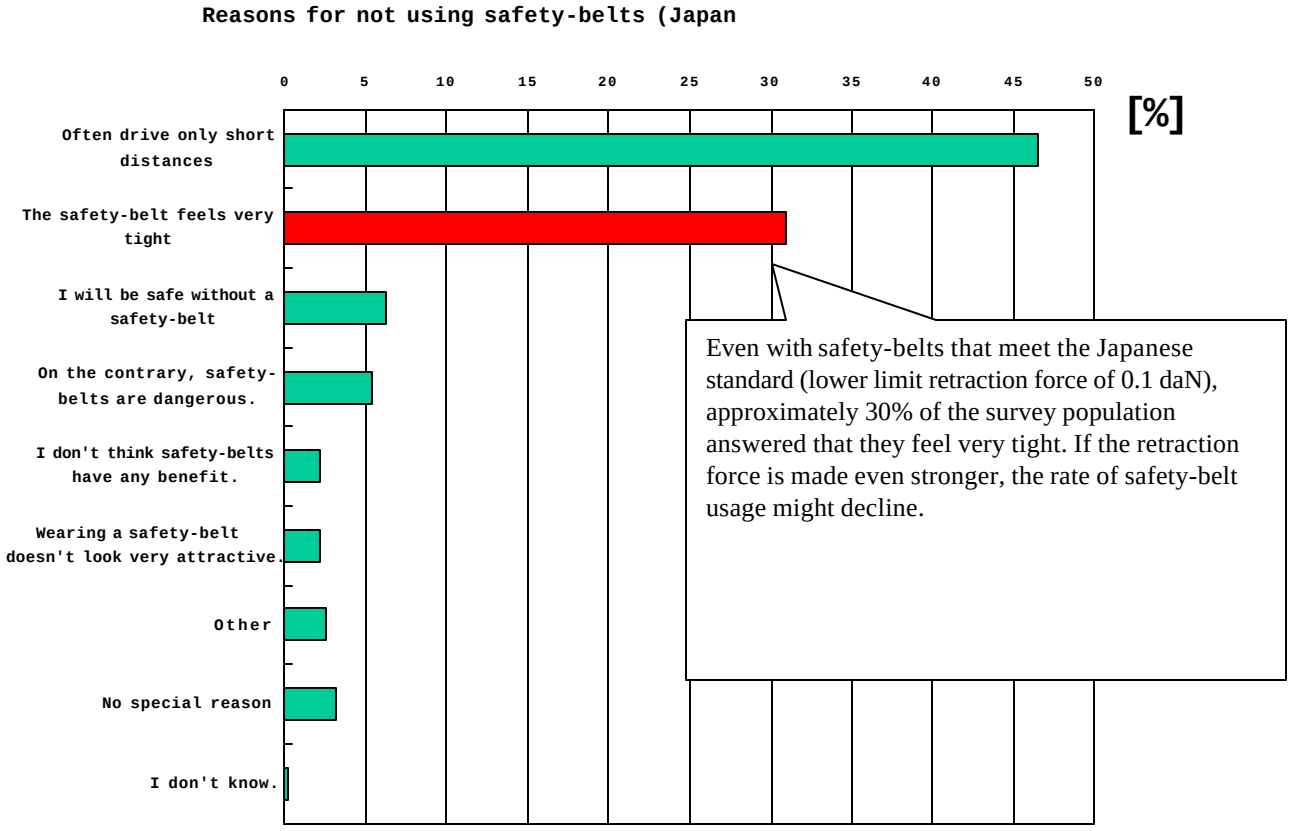
Attachment 1: .Surveys for reasons not to use safety-belts



Survey of Traffic Safety" by the Public Relations Office, Minister's Secretariat, September 1994

Attachment 2: Impact of passenger restraint performance with reduced retraction force of safety-belt

Procedure:
Change in safety-belt slack was measured by experiment, and the data was fed into a dummy simulation programme (MADYMO) to calculate the impact on injury.

Change in location of occupant injuries, small sedan

Retraction Force	Increase in slack	Chest g m/s^2	Chest deformation mm	Head displacement m	Chest displacement m
0.2 daN	Base line	502.4	21.0	0.506	0.305
0.1 daN	8 mm	505.9	50.8	0.511	0.309
0.05 daN	12 mm	507.9	20.0	0.513	0.311

Change in location of occupant injuries, mini van

Retraction Force	Increase in slack	Chest g m/s^2	Chest deformation mm	Head displacement m	Chest displacement m
0.2 daN	Base line	357.6	27.5	0.568	0.417
0.1 daN	12 mm	356.8	27.7	0.572	0.420
0.05 daN	18 mm	355.6	27.8	0.573	0.422

Attachment 3: Comparison of Regulation No. 94
with frontal collision standards in Japan