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National Highway Traffic Safety Administration
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Subject: Docket No. NHTSA-2000-00-8570; Notice of Proposed Rulemaking
Request for Comments (66 Fed. Reg. 968)
FMVSS 202, Head Restraints

To Whom It May Concern:

On behalf of Dr. Ing. h.c.F. Porsche AG, Porsche Cars North America, Inc. submits the following attached comment, plus an additional 10 copie, in response to the notice of proposed rulemaking published in the Federal Register on January 4th, 2001 concerning the upgrading of FMVSS 202 head restraint requirements.

Porsche's comments address the following issues:

- Harmonization with European requirements
- Head restraints for rear outboard seating positions
- Backset limit requirements
- Energy Absorption
- Dynamic Sled Test Procedure, and
- Lead-time

Porsche appreciates the opportunity to submit our comments. Should you have any questions or require further information, please do not hesitate to contact me at (770) 290-3627.

Sincerely,



Walter J. Lewis
Senior Compliance Engineer

Enclosure (11)

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Porsche appreciates the opportunity to comment on the notice of proposed rulemaking concerning the upgrading of FMVSS 202 head restraint requirements.

Harmonization with European Requirements

At Porsche, we strive to hard to build a “world car” and we appreciate all efforts to harmonize regulatory requirements. To this end, we strongly urge NHTSA to adopt the applicable requirements of the ECE to the extent possible. As discussed in the next section, we especially urge NHTSA to maintain consistency with respect to the optional fitment of head restraints at rear outboard seating positions.

Head Restraints for rear outboard seating positions

In the NPRM, NHTSA proposes head restraints having a minimum height of 750 mm be fitted at all outboard rear seating positions. In the case of the Porsche 911 sports car, this requirement is neither feasible nor safe.

As depicted in Figure 1, the Porsche 911 possesses a highly sloped roofline.

Figure 1



Figures 2, 3 and 4 on the following pages illustrate the 5th percentile female, 50th and 95th percentile male dummies positioned in the rear of the 911 Coupe, Targa and Cabrio (convertible) versions, respectively. In these figures, the blue or outer line represents the roofline while the white or inner line represents the line 25-mm below the roofline (per ECE). Also shown in these figures is the potentially available space for a rear seat head restraint.

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Further depicted is the distance from the H-point to the point 25-mm below the roofline. These distances are as follows:

	Coupe	Targa	Cabrio
Distance from H-point to point 25 mm below roof line	693 mm	666 mm	691 mm

Figure 2 (Coupe)

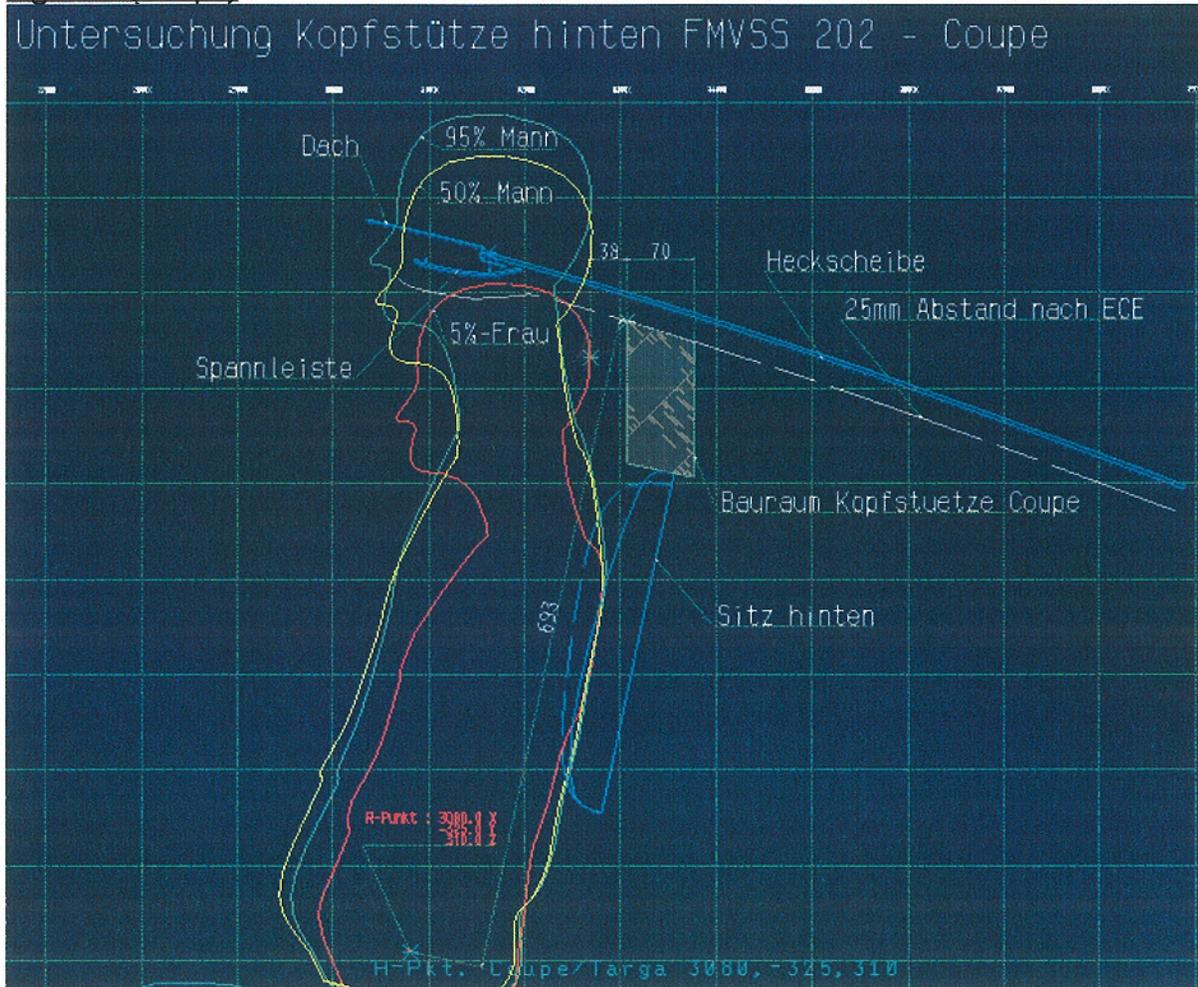


Figure 3 (Cabrio)

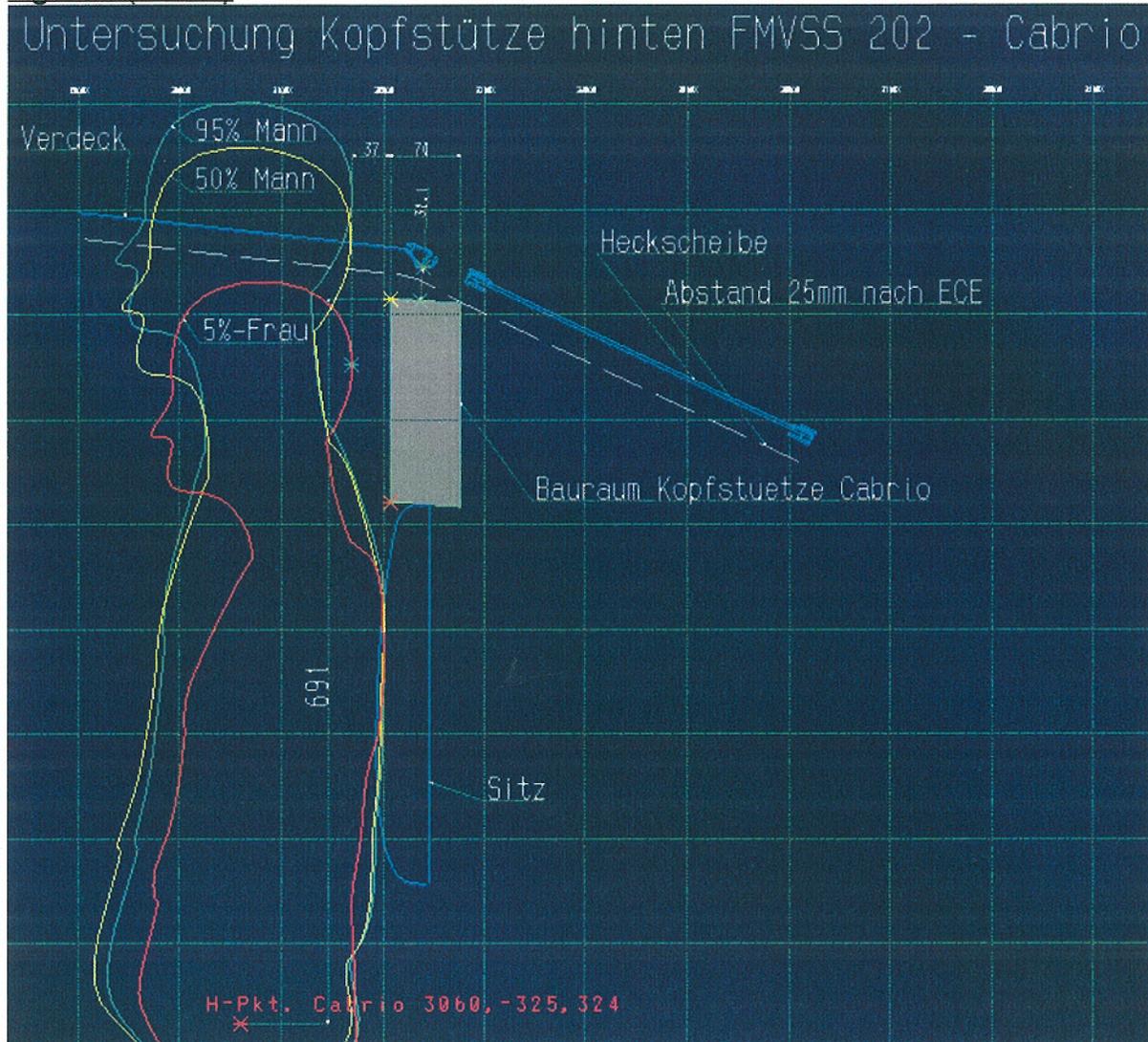
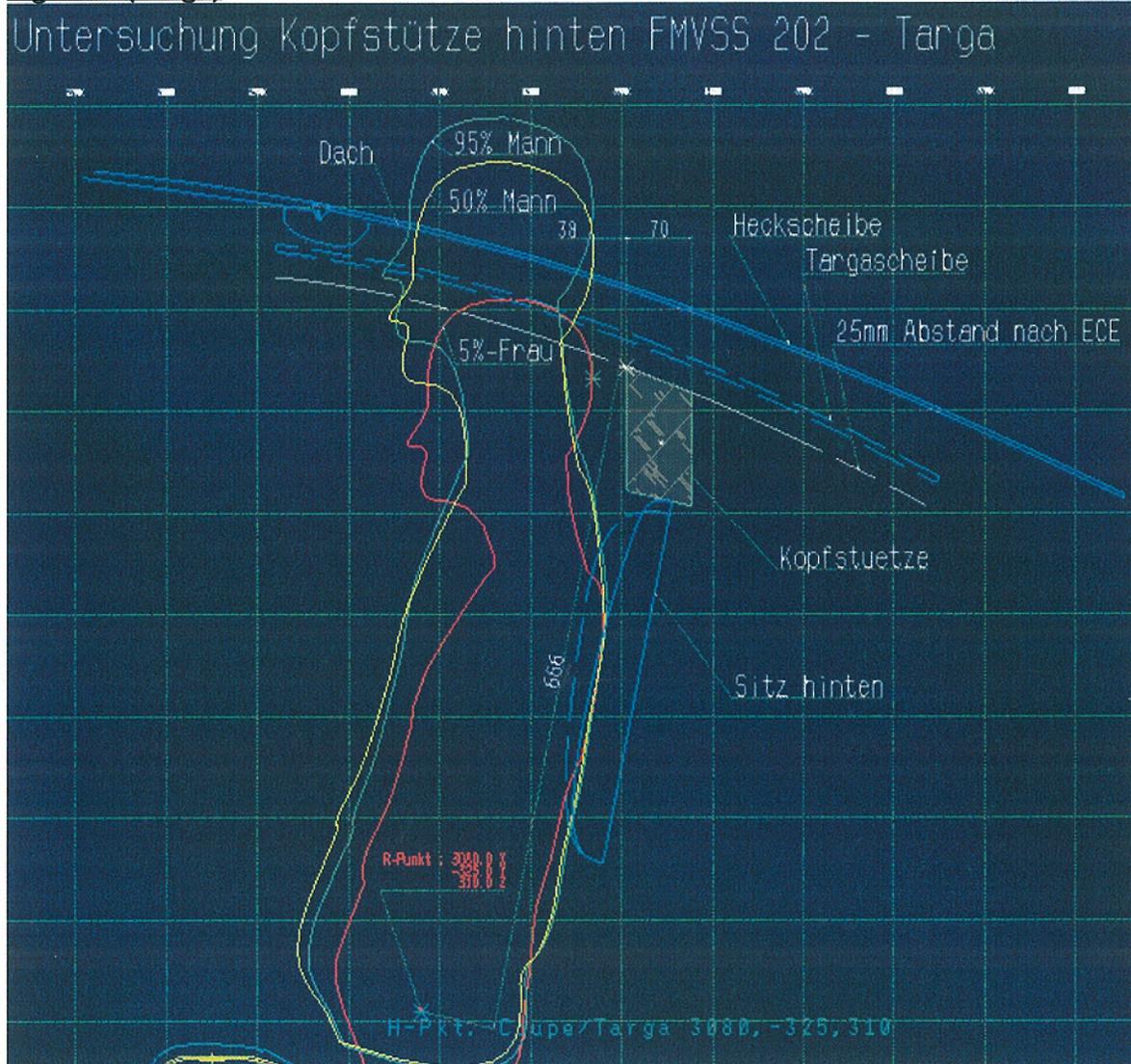


Figure 4 (Targa)

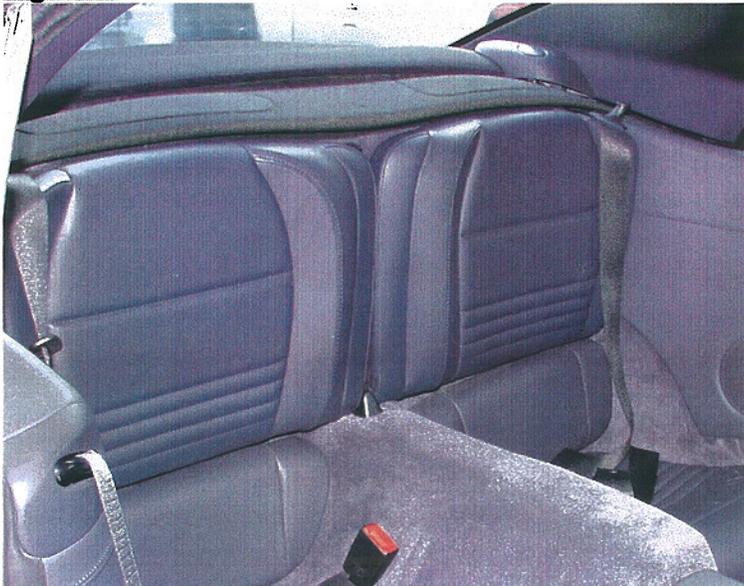


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It is clear from figures 2, 3 and 4 that there is little opportunity for interaction between an adult male head and any head restraint that could be installed in the rear of the 911.

In addition to the lack of occupant/head restraint interaction in the rear of the 911, we are very concerned that the fitment of head restraints will severely compromise an already limited rearward field of view. As shown in Figure 5 below, there is no space between the two rear seating positions at the shoulder level. Consequently, head restraints fitted in the rear of the 911 will consume nearly 100% of the available rear field of view through the rear window. We should note also that given the close proximity of engine, transmission and other components aft of the rear seat bucket, there exists no opportunity for retractable or folding head restraint designs.

Figure 5



Based on the above, Porsche recommends that in situations where the minimum height of 750 mm cannot be achieved due to interference with the roof or rear window, and when installed head restraints for rear seating positions greatly compromise the rearward field of view, NHTSA should harmonize its requirements with those of the ECE by allowing the installation of head restraints as an option only. In any case, there should be no mandatory requirement to fit head restraints at the rear outboard seating positions when the distance from the H-point to the point 25-mm below the interior roof or window line is less than 700 mm. As indicated above, the negative benefit associated with the loss of rearward visibility would far outweigh any potential benefit in such cases.

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Backset Limit

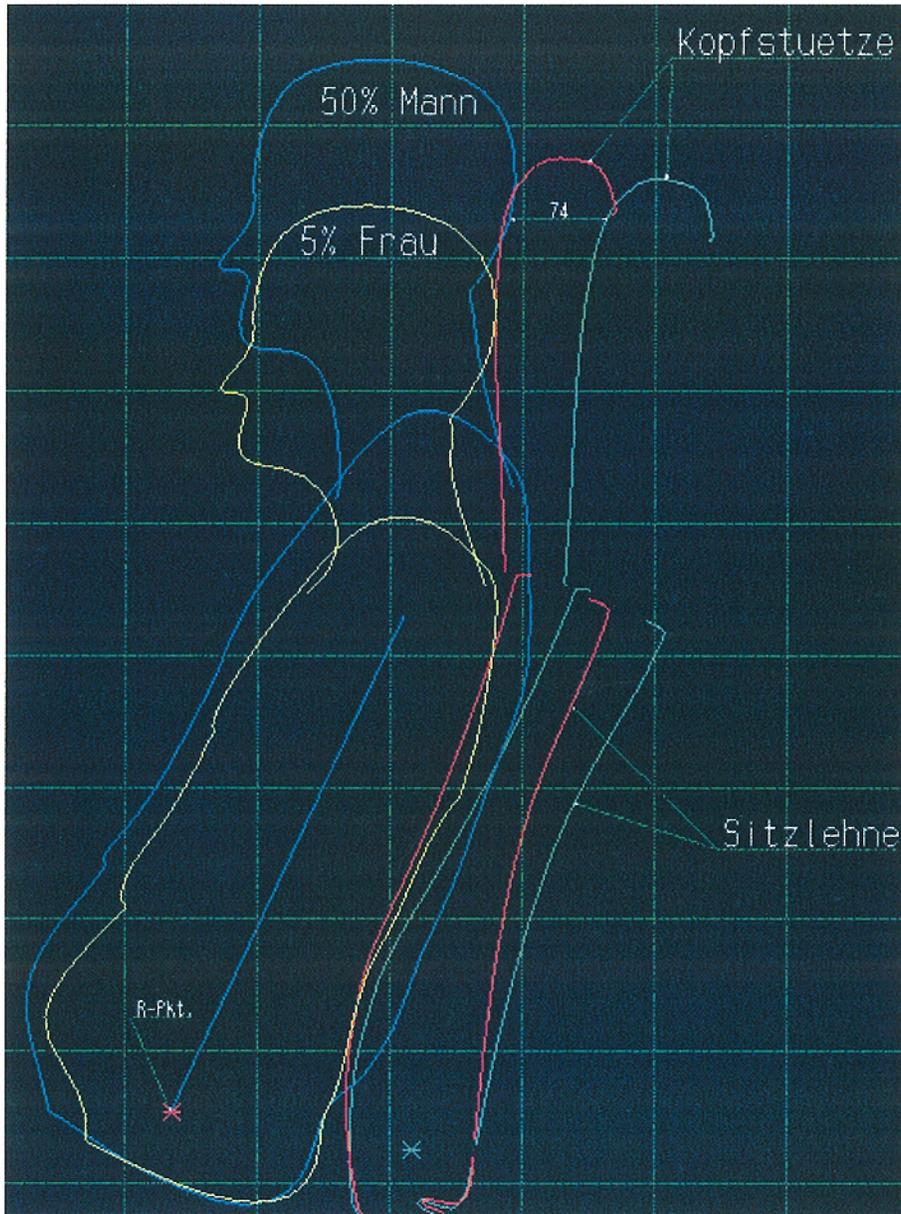
In our view, the proposed backset limit seems somewhat arbitrary with relatively serious implications with respect to the future design of our sport seats with integrated head restraints, please refer to the following Figure 6.

Figure 6



Shown in Figure 7 below is a depiction of the standard Porsche sport seat for driver and front passenger with the seat back inclination adjusted as is typical for a 50% male or 5% female.

Figure 7



With our sport seats, the available distance between the occupant's head and the head restraint varies according to the seat back angle. The seat back angle is largely dependent on the overall size of its occupant - 5th, 50th or 95th percentile. Small individuals generally adjust their seat backs to a more upright position while taller persons tend to adjust their seatback in a more

reclined position. This behavior reflects consumer tastes and is one of the basic criteria that must be considered for the design of comfortable and effective vehicle seats. As a consequence, the backset values measured for each of the dummies is different.

According to NHTSA, the seat and the head restraint with a backset value of 50mm, designed for the 95th percentile dummy, offers a backset value that provides the best safety for the occupant. If such a seat with the above described head restraint design is applied to a 5th percentile dummy, the occupants head and the head restraint interfere with each other and the dummy's head is forced into an unnatural forward-tilting seating position. Taking the above design procedure and considering it the other way around, then the backset value for the 95th percentile dummy will be larger than NHTSA requires and therefore the restraint cannot provide the necessary safety benefit.

Given the above observation, a scientifically valid backset requirement can only be achieved after further research is conducted using differently sized dummies. Analysis of the resulting data should then provide sufficient information to develop an effective backset value.

With respect to the means of demonstrating compliance with this requirement, we would like NHTSA to take into consideration virtual test methods using the well-known Ramsis software. These test methods should be considered with respect to future technical developments and harmonized certification procedures. The possibility for manufacturers to use virtual certification procedures should be offered as an alternative method for certification. Ramsis is an oft-used software tool in industry for the design and packaging of vehicle interiors, especially seats. The further application of such software into the certification arena is a natural consequence of technical progress.

The proposed ICBC measuring device used by IIHS, in general, does have detrimental effects on special seating concepts (e.g. the 911-sport seat). The ICBC measuring device cannot be positioned onto seats which have a strongly contoured shape necessary for lateral support. The contours of such seats prevent this measuring device from being positioned correctly onto an actual seating position.

Energy Absorption

In the NPRM, a test procedure is proposed which differs from that in of Annex 6 of ECE Regulation No. 17, which utilizes a pendulum impactor, and also from the current FMVSS 201 head form impact test requirement specified in Section 5.2. We strongly urge NHTSA to adopt energy absorption test procedures that are harmonized with the ECE Reg. No. 17 and FMVSS 201 tests.

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Dynamic Sled Test Procedure

While we appreciate all efforts by NHTSA to provide manufacturers with alternative compliance approaches, we seriously question the validity of a test that relies on dummies that have not been validated in rear crash testing.

Lead-time

As discussed earlier, Porsche believes that further research is necessary in order to issue proposed requirements, which are acceptable to the engineering community. Until such research has been completed, we recommend NHTSA adopt the ECE requirements indefinitely. Should NHTSA ultimately adopt new requirements, we would like to remind NHTSA that a phase-in approach places small limited-line manufacturers such as Porsche at a great competitive disadvantage relative to larger multi-line manufacturers. We ask that limited line manufacturers, especially those that are independent companies such as Porsche, be provided additional lead-time or at the very least until the end of a phase-in period.