

Report of investigation on available range for hand controls

A. CURRENT ECE REGULATION No. 121

- 5.1.1. The controls to be used by a driver while driving the vehicle shall be located so that they are operable by this driver under the conditions of paragraph 5.6.2.
- 5.6.2. The driver is restrained by the installed crash protection system, adjusted in accordance with the manufacturer's instructions, and is free to move within the constraints of that system.

B. PROPOSAL

A provision that reads "Hand controls shall be located within 600 mm to the right and left of the center of the steering wheel." should be added.

If we can obtain agreement on this provision from the countries concerned, we would like to submit a proposal for amendments to the gtr (TRANS/ECE/WP29/GRSG/2006/15) in addition to the ECE Regulation No. 121 as a formal document at the next GRSG.

C. JUSTIFICATION

- 1. Since the currently proposed provision is not objective, each country may interpret it in its own way in conducting a review, leading to problems in mutual recognition.
- 2. Upon examining quantitative requirements, we verified that the driver can easily operate hand controls if they are located within 600 mm to the right and left of the center of the steering wheel.

D. EXPERIMENT RESULT

- 1. Types of subject vehicles: passenger car (M1), Van (N1) and 4t truck (N2)



Passenger car



Van



4t truck

- 2. Body build of subjects

The average body build of the five subjects was close to that of the 50th percentile male (GRSG-91-34.)

3. Position of the subjects

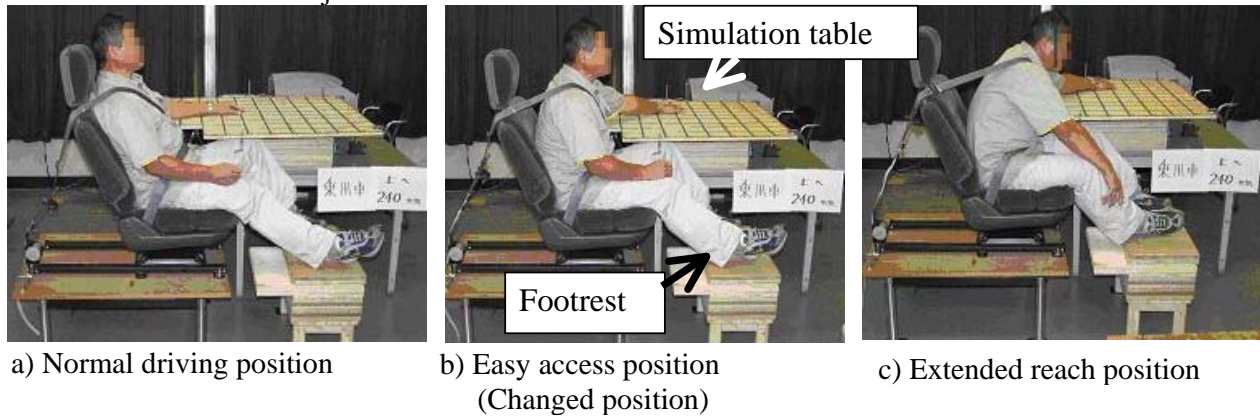


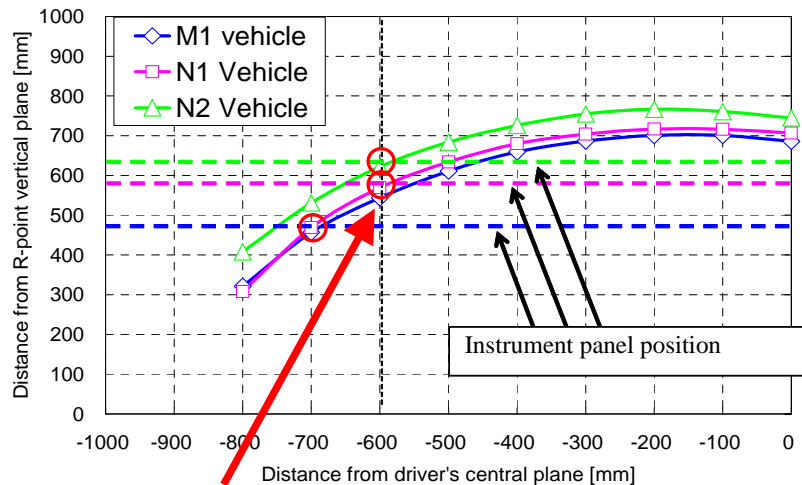
Fig. 1 Positions

- a) The driver maintains proper posture, leaning against the seat.
- b) The driver easily operates the switches on the instrument panel.
- c) The driver has extended his arm to the limit of safety while driving.

4. EXPERIMENT METHOD

Using a simulated dolly, we measured available ranges in which hand controls can be easily operated from the viewpoint of physical attributes. We instructed each subject to take the easy access position (changed position) at which s/he is usually able to easily operate hand controls, and measured the available range at that position. (See Fig. 1 b).

5. EXPERIMENT RESULT



At the easy access position (changed position), the available range crosses the instrument panel position at 600 mm from the center of the steering wheel.

Fig. 2 Available range at the easy access position

We found that the maximum range for the driver to easily access the instrument panel is 700 mm from the center of the steering wheel of a passenger car, 600 mm for a Van and 600 mm for a truck, when the driver is at the easy access position (changed position). It should be noted that ISO 3958 also stipulates that hand controls shall be located within 600 mm from the center of the steering wheel.

6. CONCLUSION

If located within 600 mm laterally from the center of the steering wheel, hand controls can be easily operated.