

Transmitted by the expert  
from Japan

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(94th GRSG, 21-25 April 2008,  
Agenda item 19.)

# Investigation of available range for operating hand controls

GRSG, 94th session

Geneva, April, 2008

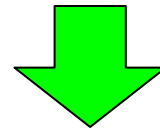


- (1) ECE R121 has the following provision on the location of the controls:
  - 5.1.1. The controls to be used by a driver while driving the vehicle shall be located so that they are operable by this driver under the condition of paragraph 5.6.2
- (2) Since this provision is not objective, it is possible that each Contracting Party that conducts approval testing will interpret it differently and that there will be problems in ensuring safety.
- (3) We investigated the quantitative requirements of the available range for operating hand controls. (Previous report: GRSG-91-inf34e, GRSG-91-inf37e, GRSG-92-inf19e)
- (4) The results of our investigation that we reported at the previous meeting showed that, if located within 600 mm laterally from the center of the steering wheel, the controls can be easily operated by test subjects with body builds close to AM50%.
- (5) However, to discuss the operation range, we must consider ranges for people with small body builds to reach the controls.
- (6) In this investigation, we studied ranges for test subjects with small body builds to operate the controls with the aim to find differences in the operation range between different body builds.

## 2. Concept



- (1) If drivers with small body builds can reach the controls, then, drivers with larger body builds can reach them as well.
- (2) As a small body build, the Japanese 5<sup>th</sup> percentile female\*<sup>1</sup> (height) will be used.
- (3) The range reachable by those at the 5% of Japanese females with small body builds in terms of height will be a range reachable by a majority of Japanese people.
- (4) By measuring the “range easily reachable” for 5 test subjects in the Japanese 5%tile female (height) group, differences in the operation range among different body builds will be studied.



<Predictions>

Which ?

- Since the subjects in this investigation are smaller than the subjects in the previous investigation, it is predicted that the range will be narrower.
- Since drivers with small body builds set the seat slider forward, it is possible that the range will not be so different from that obtained in the previous investigation.

\*1: ***Database of Human Body Dimensions 2004-2006***  
**(Research Institute of Human Engineering for Quality Life)**

# 3. Test Conditions 1



	Height (cm)	Weight (kg)	Hand Reach (cm)	Shoulder Width (cm)	Percent of Japanese body build (height)
Average (female in this investigation)	148.9	45.2	67	40	5
Average (male in previous investigation)	171.0	70.6	75.4	46	69
Hybrid III	175.0	77.7	73	48	85



Passenger car (M1)



Van (N1)



4t truck (N2)

- \* The seat slider position and backrest angle of 5 subjects are measured.
- \* The instrument panel location is measured.



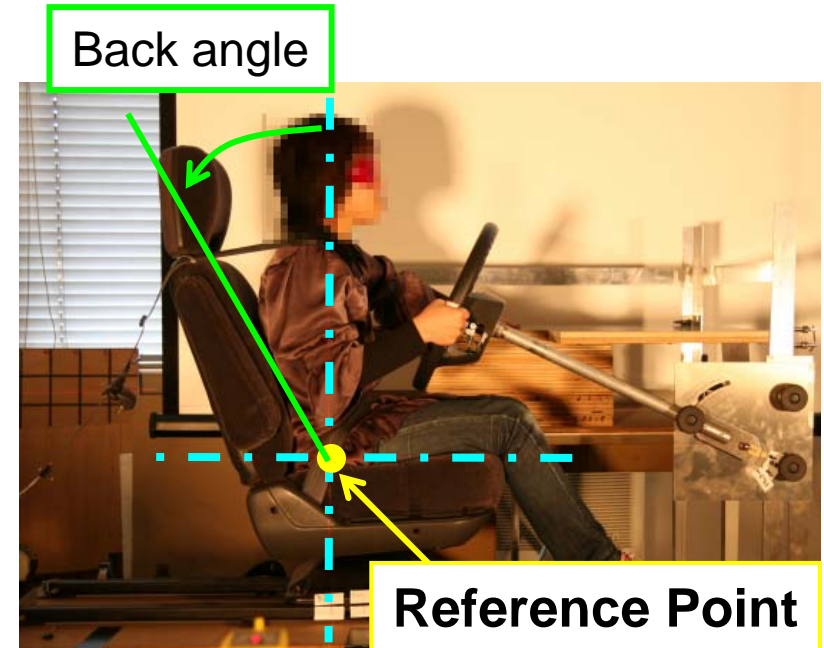
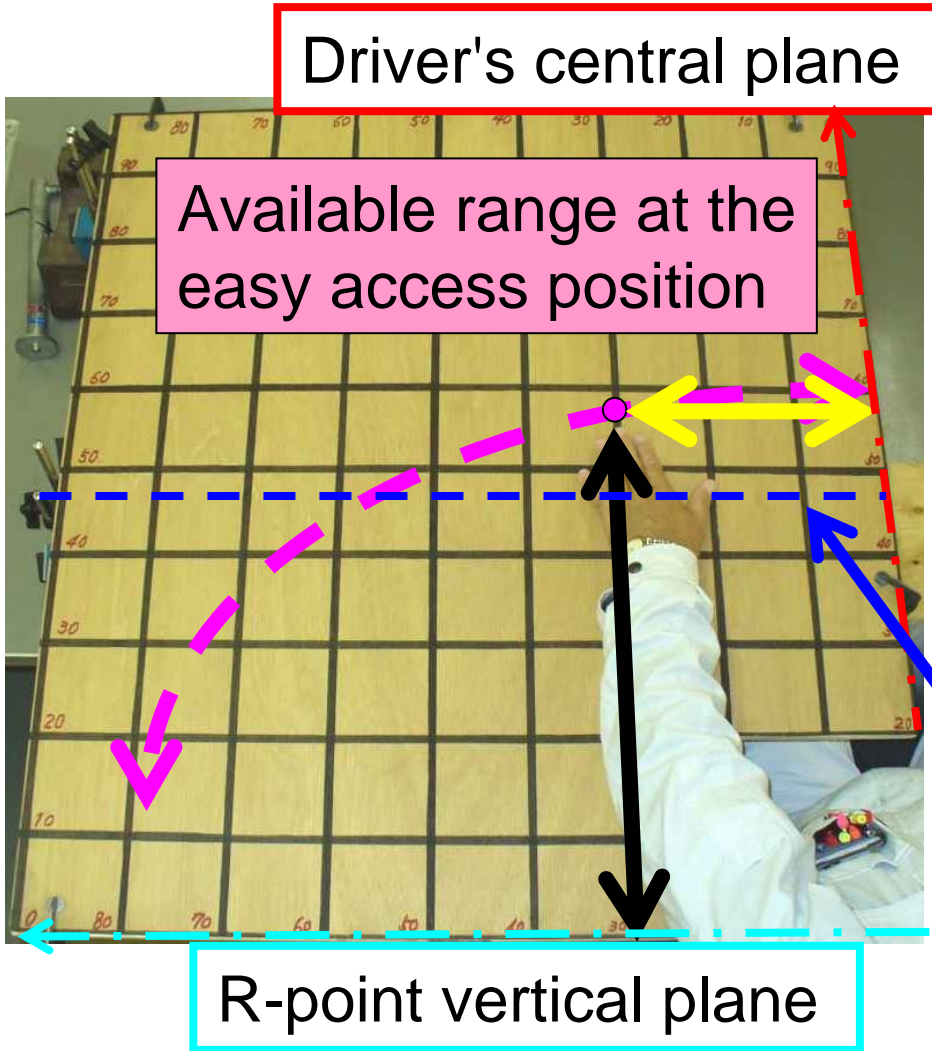
\* The average of 5 subjects will be used in the simulated seat setting.



# 4. Test Method



Subjects were instructed to take the “easy access position (changed position)” and the available range was measured at that position



Instrument panel position  
Average seat slider position of subjects is used.

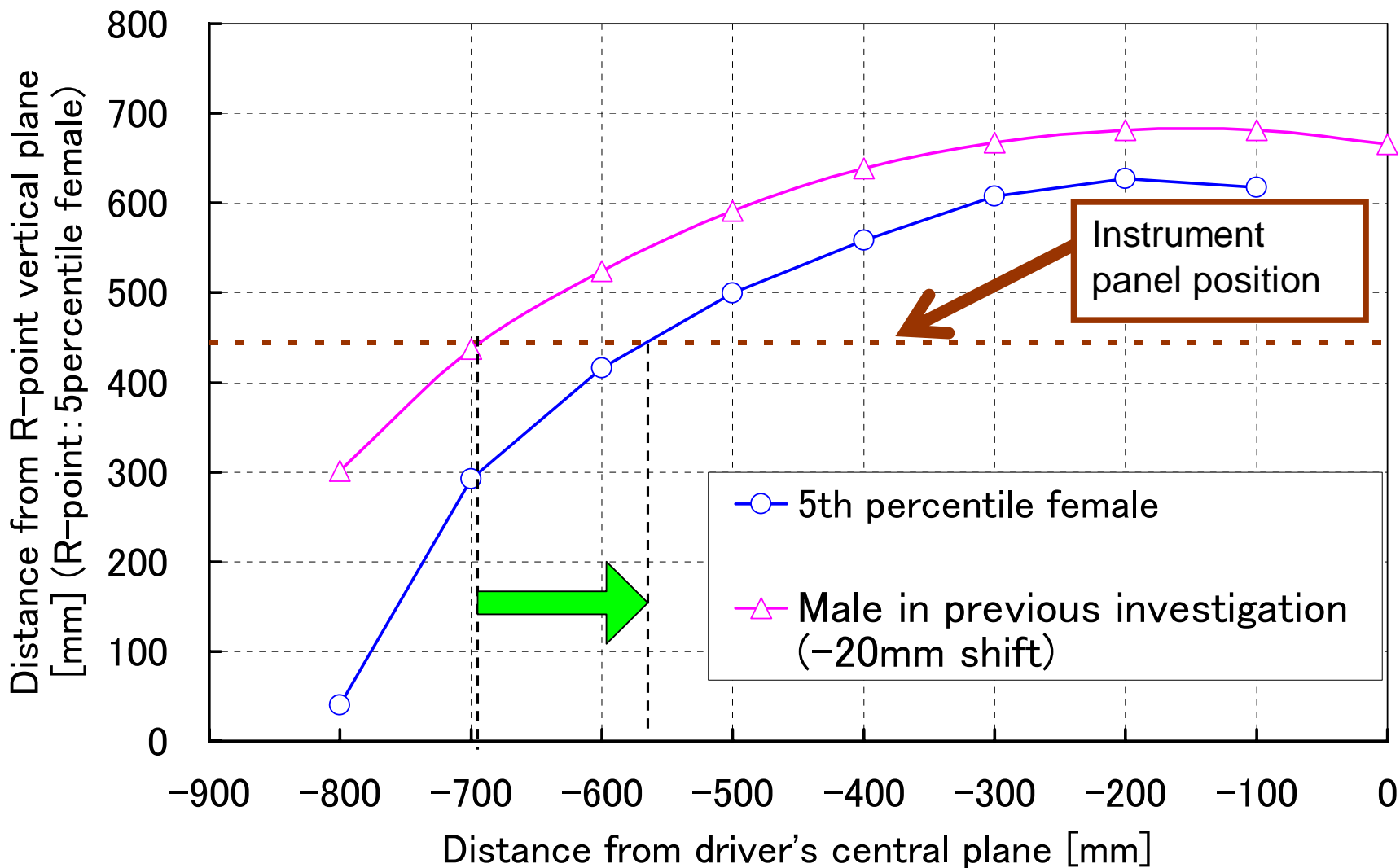


Subjects set the seat slider position based on accelerator pedal and brake pedal positions.

# 5. Test Results (M1)



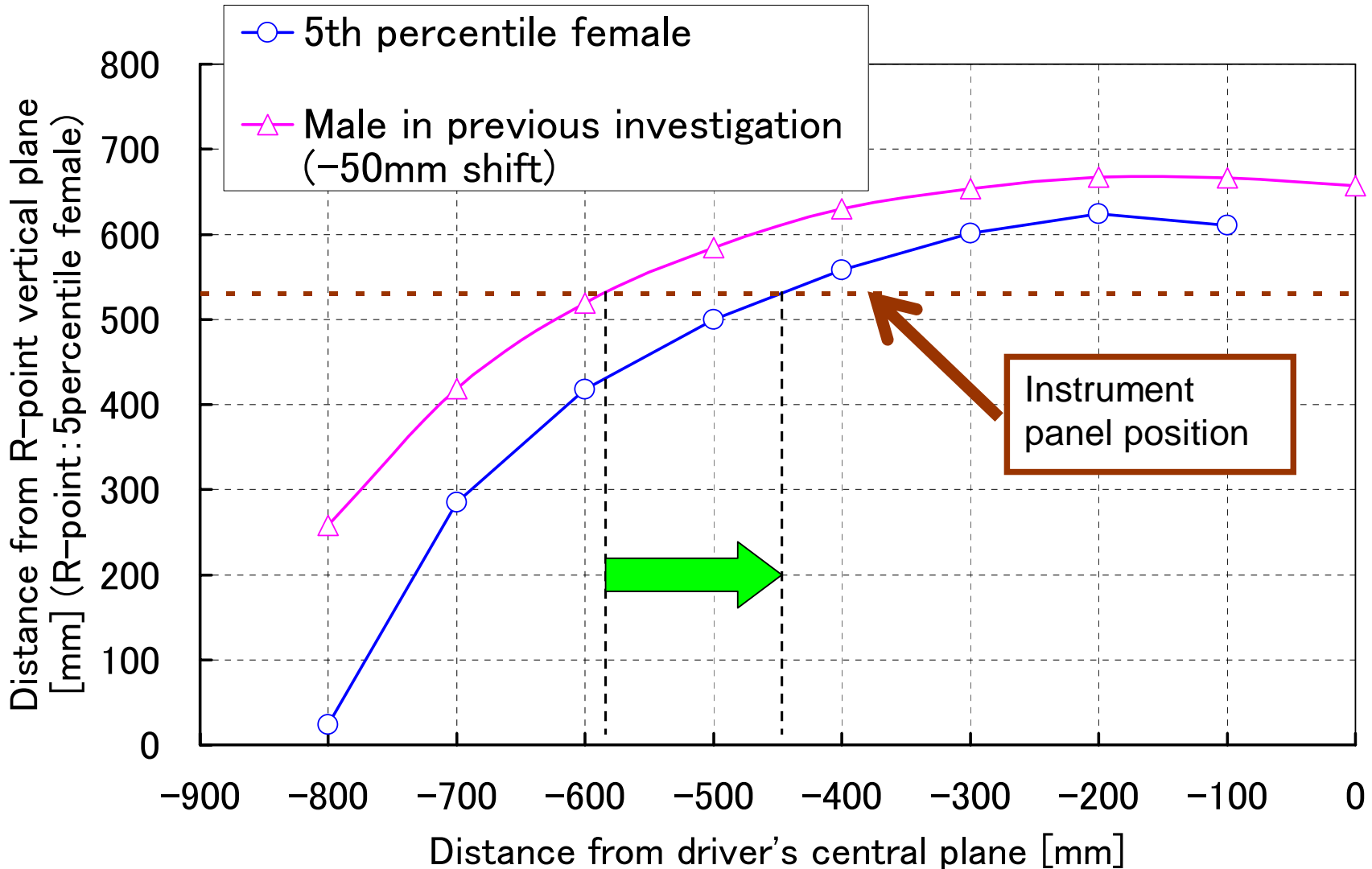
## <M1: Passenger car>



# 6. Test Results (N1)



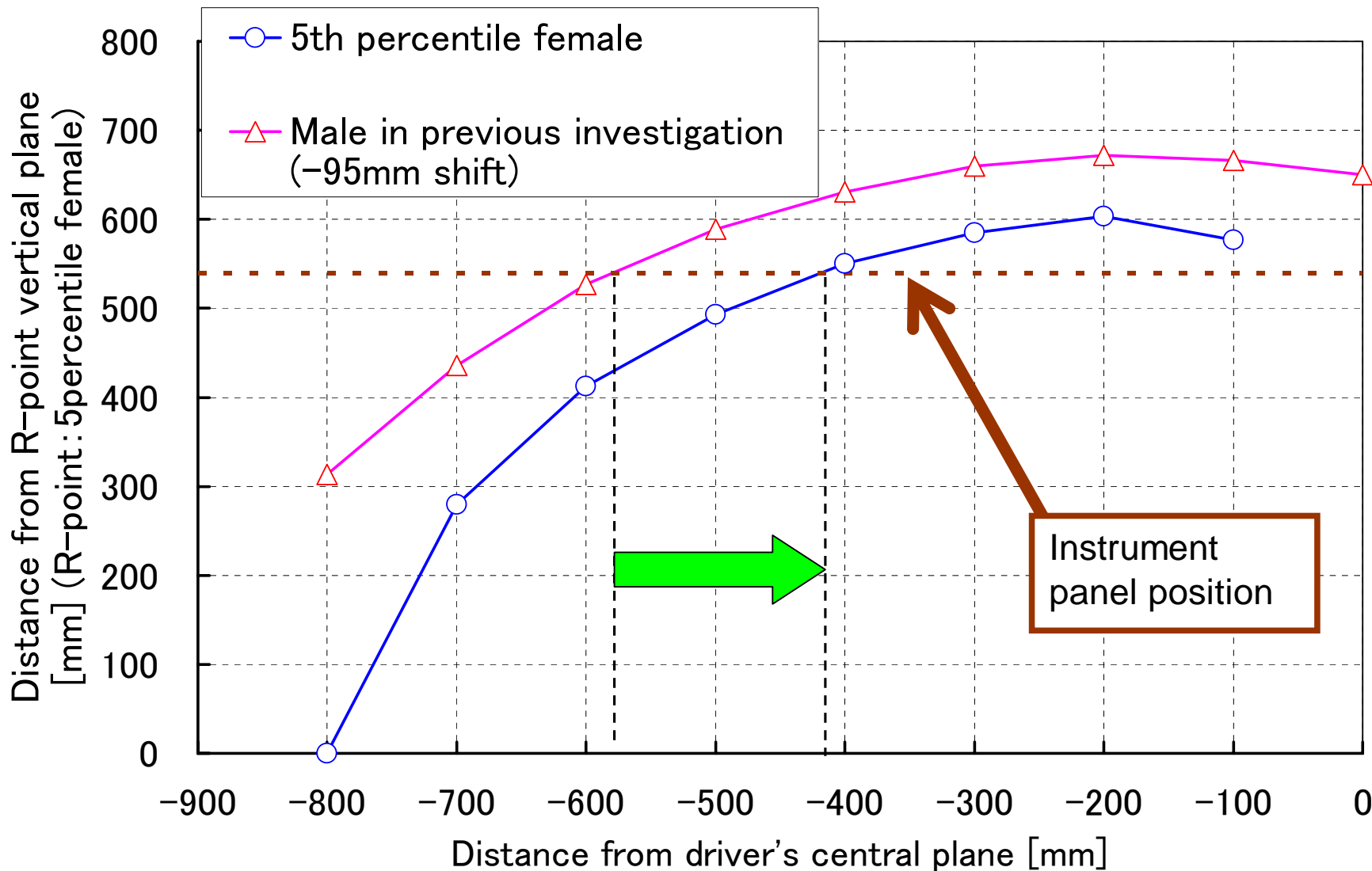
## <N1: VAN>



# 7. Test Results (N2)



## <N2: 4t truck>





# 8. Conclusion



The “range easily reachable” was measured for 5 subjects in the Japanese 5<sup>th</sup> percentile female (height) group.

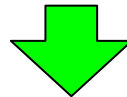


With the seat slider position moved forward, the distance between subjects and instrument panel was shortened.

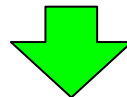


However,

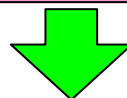
The range reachable by hand **at easy access position became narrower** than the previous investigation.



The operation range of Japanese 5<sup>th</sup> percentile female is narrower than that of Japanese 69<sup>th</sup> percentile male in the previous investigation.



Japan believes it is important to consider operation ranges of drivers with small body builds.



*Question:* What is the view of each Contracting Party on this issue?