

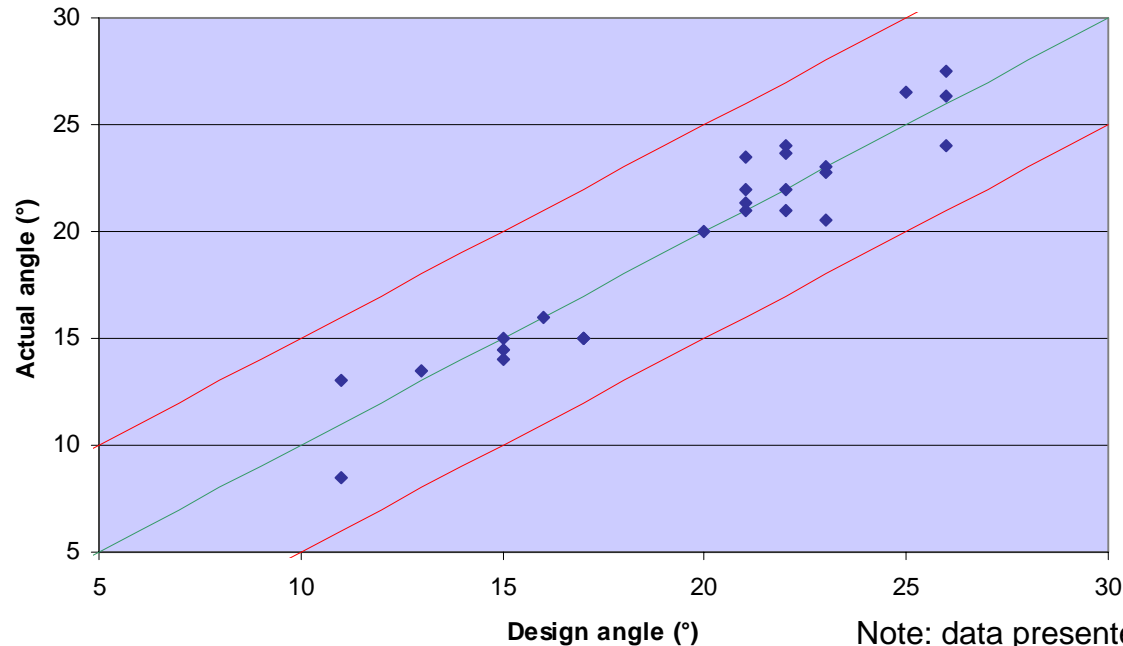


INTERNATIONAL ORGANIZATION OF MOTOR VEHICLE MANUFACTURERS

R-point and manufacturer design seat back angle



Range of design seat back angles used in different vehicle types



- Design seat back angle ranges from 10° to 30° depending on the vehicle type
 - For certain seat designs 25° bears no relation to the real world seating position and in some cases may even not be physically achievable
 - Advise to use the procedure specified in ECE17 Annex 3
- Conclusion: use the manufacturer design seat back angle



Example of Driving Posture Comparison between Design seat back angle and 25 degree seat back angle

In case of typical truck, 25 degree seat back angle makes unusual driving posture.

- Design seat back angle
15 degree



Note: driving posture identical to small truck, large truck used for ease of photography

Normal Driving Posture

- FMVSS202a proposal
25 degree

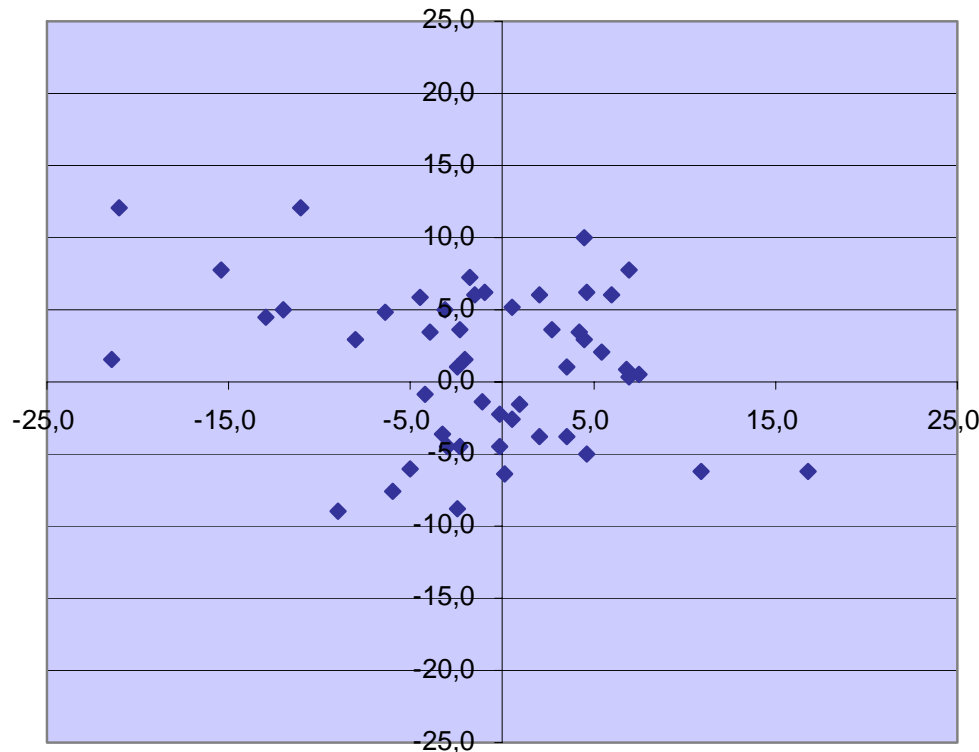


Unusual Driving Posture



Relationship H / R-point

H versus R-point (mm)

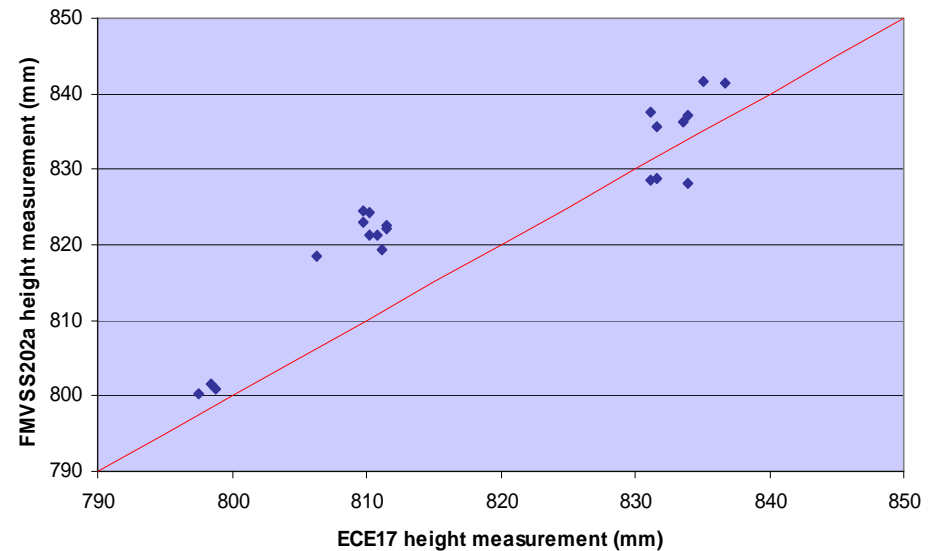
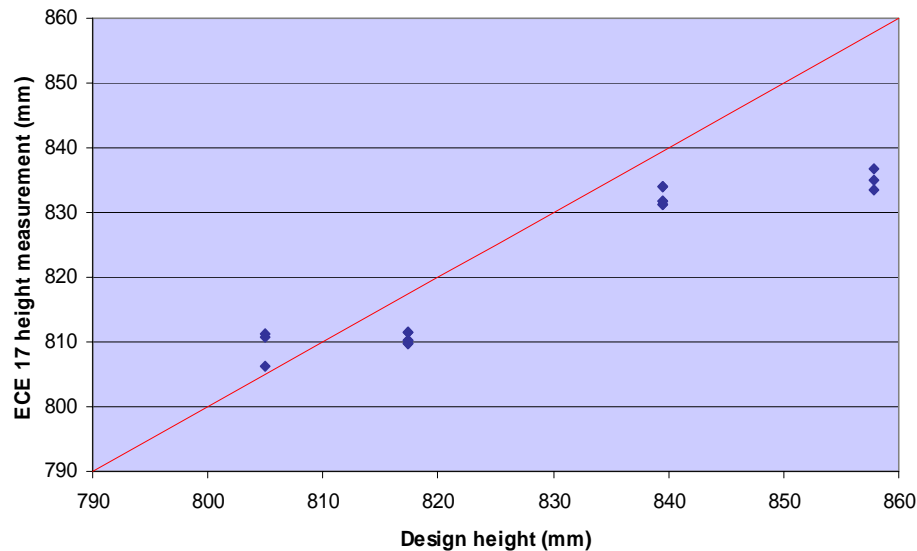


Note: data presented in HR-4-13

- ECE17 Annex 3 §3.2.2 “The relative positions of the "R" point and the "H" point and the relationship between the design torso angle and the actual torso angle shall be considered satisfactory for the seating position in question if the "H" point, as defined by its co-ordinates, lies within a square of 50 mm side length with horizontal and vertical sides whose diagonals intersect at the "R" point, and if the actual torso angle is within 5 degree of the design torso angle.”
- Half of this square (25 mm) actually is a disbenefit for manufacturers (measuring from R-point means measuring less height than when using H-point).



Relationship H / R-point

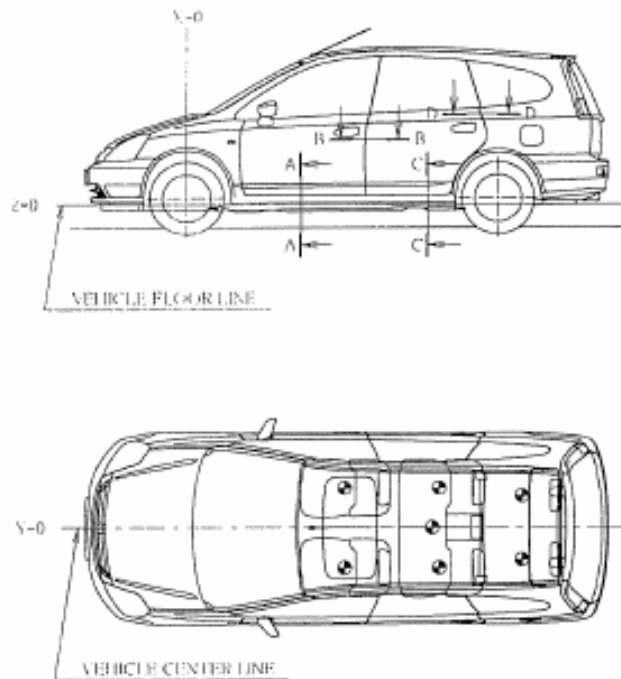


- Data used from HR-5-14 presented by Canada in Jan 2006
- ECE17 measurement underestimates the design height
- FMVSS202a measurement gives a height above the ECE17 measurement
- Conclusion: ECE17 is the worst case (measures the lowest height)



Use of R-point

- The use of the R-point will also solve the problem of defining the “designated seating position”. Every R-point by definition represents a seating position.
- As the R-point will be communicated to NHTSA anyway, the R-points will unambiguously define the designated seating positions.

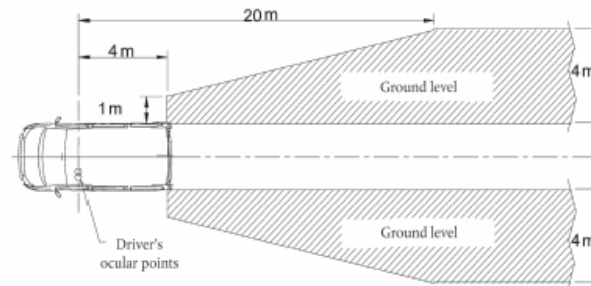


	SEAT ADJUSTMENT & SETTING FOR R POINT					DESIGN				COORDINATES OF REFUCIAL MARKS
	V	β	B	γ	C	α	X1	Y	Z1	SECTION A(AICC) & (HRH19)
1L	210*1 210*2	3°	25	70°		23°	-132	-350	+244	UPPER HOLE CTR. OF SIDE PANEL FOR DOOR STRIKER 1L&1R : X = +1504 Y = +738 2L,2R,2C,3L&3R : X = +2536 Y = +720 "R" POINT HOLE CTR. OF SIDE SILL FOR SIDE GARNISH Z = +113
1R								+350		
2L							350			
2R	240	0°	N.A.	58°	N.A.	23°	-353	+350	+307	
2C							-398	± 0	+325	
3L								-280		
3R	N.A.	N.A.	N.A.	22°		24°	+380		+347	
								-280		

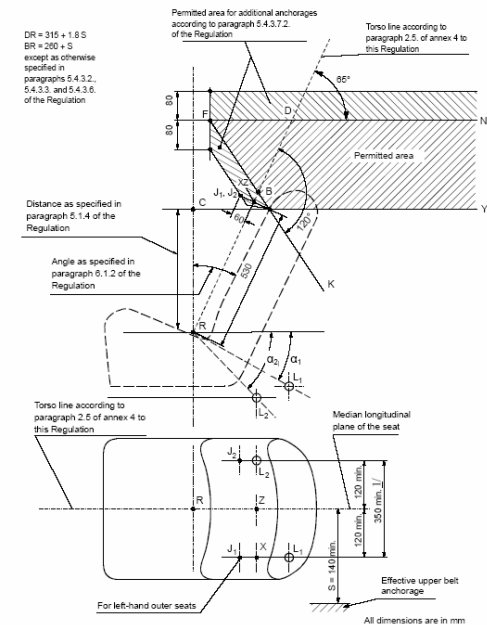
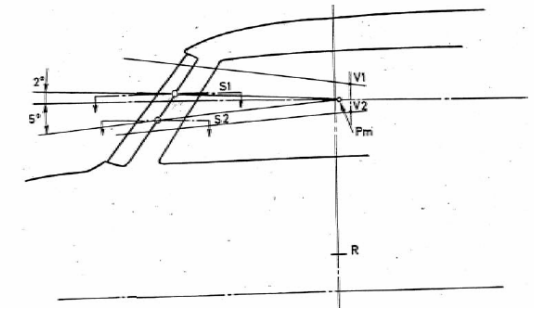


R-point and manufacturer design seat back angle form the basis of various regulations

- ECE12: protection of the driver against the steering mechanism in the event of an impact
- ECE14: safety belt anchorages
- ECE16: safety belts
- ECE17: seats, anchorages and head restraints
- ECE21: interior fittings
- ECE25: head restraints
- ECE32: behaviour of structure in a rear end collision
- ECE33: behaviour of structure in a head on collision
- ECE35: arrangement of foot controls
- ECE43: safety glazing
- ECE46: rear view mirrors
- ECE94: front impact
- ECE95: side impact
- ECE12X: field of vision



Informal group gtr head restraints





R-point or manufacturer design seat back angle form the basis of various US regulations

- FMVSS201: Occupant Protection in Interior Impact
- FMVSS201(U): Occupant Protection in Interior Impact
- FMVSS202: Head Restraints
- FMVSS203: Impact Protection for the Driver from the Steering Control System
- FMVSS207: Seating Systems
- FMVSS208: Occupant Crash Protection
- FMVSS210: Seat Belt Assembly Anchorages
- FMVSS214: Side Impact Protection
- FMVSS225: Child Restraint Anchorage Systems
- FMVSS301: Fuel System Integrity



R-point and manufacturer design seat back angle are already communicated to NHTSA

- In case of, amongst other FMVSS202, the compliance test procedure request to conduct the test at the SRP with design seat back angle.
- NHTSA request to manufacture to provide SRP information and design seat back angle (form **SRP-PC 201/202/203/207/210**)

12. COMPLIANCE TEST EXECUTION....Continued

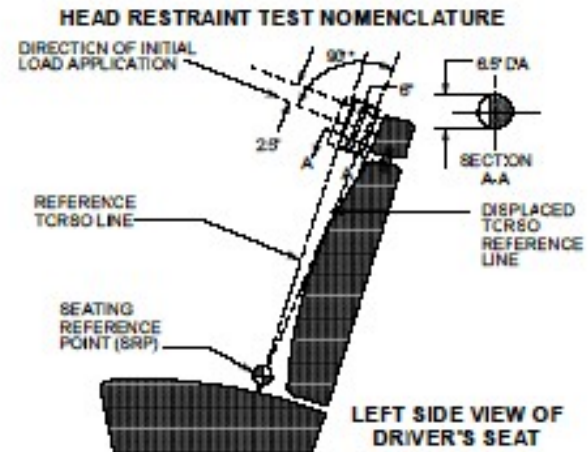
DIMENSIONAL MEASUREMENTS

Confirm that a head restraint system is provided in test vehicle at each front outboard DSP. Provide a photograph.

Where applicable, adjust each head restraint to its fully extended design position.

Establish the torso line for each outboard front DSP using dimensional information provided by the COTR or the 2-dimensional template device described in SAE J826.

Measure the distance, parallel to the torso line, between the top of the head restraint and the SRP. This distance shall not be less than 27.5". See the figure below. Record this measurement on the appropriate data sheet.





Conclusion

- **R-point and manufacturer design seat back angle are to be used throughout the gtr on head restraints:**
 - Because of the range of seat back angles that exist in different vehicle models
 - Because the H/R point variation is controlled
 - Because ECE17 represents the worst case for the height measurement (when compared to FMVSS202a)
 - Because R-point and manufacturer design seat back angle form the basis of many other regulations and are one of the main pillars around which a car is designed
 - Because NHTSA already uses the R-point and manufacturer design seat back angle in their compliance test procedures