



# Bus & Coach Testing Requirements

Jan 2020

# Summary matrix combining seat belt type as a function of vehicle category/ testing

Vehicle Category	Forward facing seating positions				Exemptions	Required Testing (R80)	
	Outboard		Centre			Seat Strength	Anchor Strength
	Front	Other	Front	Other			
<b>M<sub>2</sub> ≤ 3.5 tonnes</b>	3	3	3	3	Compulsory		
<b>M<sub>2</sub> &gt; 3.5 tonnes</b>	3	3	3	3	3-point not compulsory if one of the conditions below is fulfilled	Dynamic Test (30-32 km/h, 8-12g max peak) Type 1 - Unrestrained rear occupant Or Quasi-Static Push Test (Appendix 5) & Energy Absorption Drop Test (Appendix 6)	Dynamic Test (30-32 km/h, 8-12g max peak) Type 2 - Restrained occupant Or Quasi-Static Force Pull Test (Appendix 2) R14
	Or	Or	Or	Or	8.1.7.1. There is a seat or other vehicle parts conforming to paragraph 3.5. of Appendix 1 to R80 (Type 2 Dynamic Test), directly in front; or 8.1.7.2. No part of vehicle is in or, when vehicle is in motion, capable of being in reference zone; or 8.1.7.3. Parts of vehicle within reference zone comply with energy absorbing requirements set out in Appendix 6 of R80 (Energy Absorption Drop Test)		
<b>M<sub>3</sub></b>	3	3	3	3	3-point not compulsory if one of the conditions below is fulfilled	Dynamic Test (30-32 km/h, 8-12g max peak) Type 1 - Unrestrained rear occupant Or Quasi-Static Push Test (Appendix 5) & Energy Absorption Drop Test (Appendix 6)	Dynamic Test (30-32 km/h, 8-12g max peak) Type 2 - Restrained occupant Or Quasi-Static Force Pull Test (Appendix 2) Or Comply with Regulation 14 if seat belt anchors are installed in seats
	Or	Or	Or	Or	8.1.7.1. There is a seat or other vehicle parts conforming to paragraph 3.5. of Appendix 1 to R80 (Type 2 Dynamic Test), directly in front; or 8.1.7.2. No part of vehicle is in or, when vehicle is in motion, capable of being in reference zone; or 8.1.7.3. Parts of vehicle within reference zone comply with energy absorbing requirements set out in Appendix 6 of R80 (Energy Absorption Drop Test)		

# R80 Definitions

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"**Reference zone**", means the space between two vertical longitudinal planes, 400 mm apart and symmetrical with respect to the H-point, and defined by rotation from vertical to horizontal of the headform apparatus, described in Regulation No. 21, Annex 1.

The apparatus shall be positioned as described in that annex to Regulation No. 21 and set to its maximum length of 840 mm and its minimum length of 736 mm for residual limitation of said space;



Headform Apparatus

# R80 Dynamic Test (Appendix 1)

## Test Conditions:

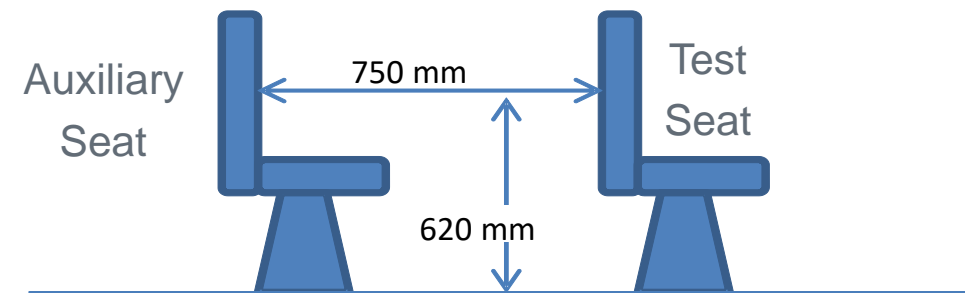
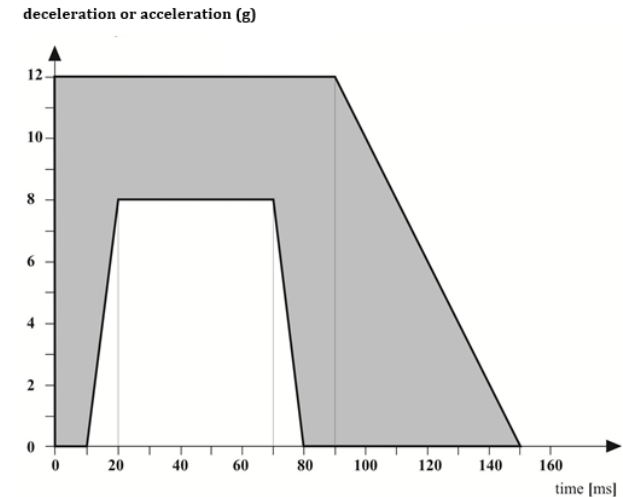
- Impact speed = 30-32 km/h
- Peak = 8-12g

## Type 1 test (dummies unrestrained)

- Auxiliary seat shall be placed just behind test seat, at a distance of 750 mm between the back of the seat backrest & the front of the auxiliary, at 620 mm high

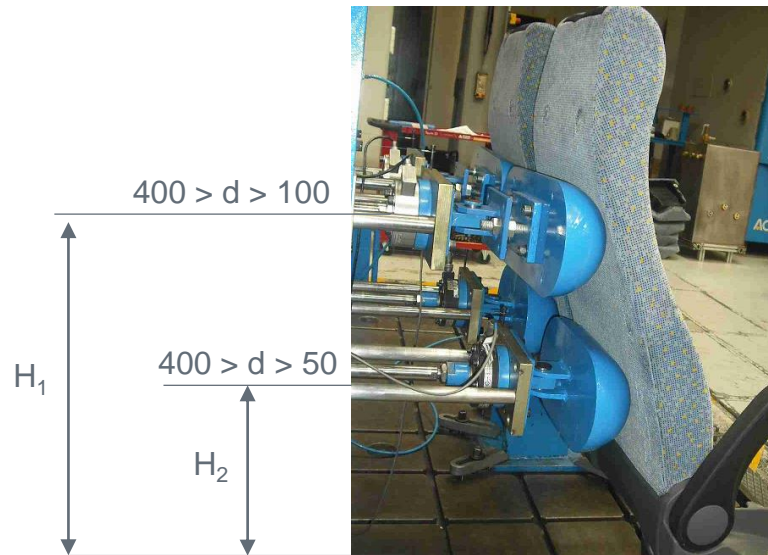
## Type 2 test (dummies restrained)

- Test same as type 1 but with dummies restrained



# R80 Static Tests

## Quasi-Static Push Test (Appendix 5)



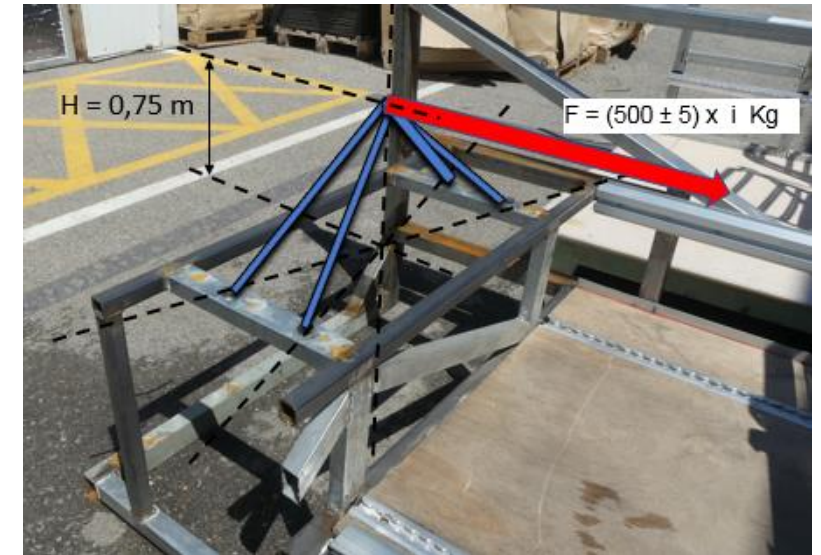
- Test Force  $1000/H_1 \pm 50$  N applied at  $H_1$
- Test Force  $2000/H_2 \pm 100$  N applied at  $H_2$
- Loads applied simultaneously & should be applied as quickly as possible & maintained for at least 0.2 s

## Energy Absorption Drop Test (Appendix 6)



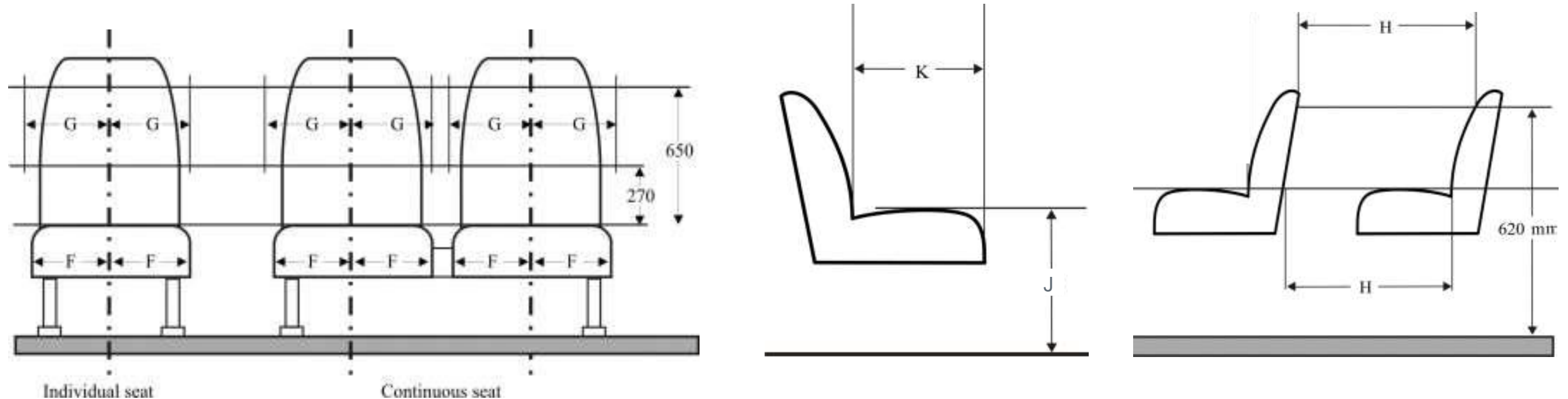
- R21 test
- Areas within range of R21 headform apparatus are tested
- 6.8kg headform
- Headform acceleration shall not exceed 80g

## Quasi-Static Force Pull Test (Appendix 2)



- "i" represents the number of seats in the seat for which the anchors have been tested.
- Direction of the force is horizontal & forward of vehicle, it should be applied as quickly as possible & maintained for at least 0.2 s

# Regulation 107 Minimum space requirements



Class	Min. Measurements	F (seat base width)	G (seat back width)	K (seat pan length)	J (Seat Pan to Floor)	H (seat spacing)
Class B (Minibus)	(mm)	200	200*	350	400-500 <sup>#</sup>	650
Class III (Coach)	(mm)	225	200*	400	400-500 <sup>#</sup>	680

\*Worst case if vehicle is  $\leq 2.35$ m in width

<sup>#</sup>350mm at wheel arches