PMG | TECHNOLOGIES

TEST REPORT

CMVSS 207 – ANCHORAGE OF SEATS
FMVSS 207 – SEATING SYSTEMS

Specimens: **OEM SEAT RETROFITTED WITH OBV10004 SWIVEL BASE AND SOFA BED BENCH SEAT**
UN: **22-260, 22-261**
Contract: **22-7145**
Report: **RP22-0554**

Presented to:
TRAVOIS RV – VR INDUSTRIES INC.
2005 Country Road 4
L'Orignal, Ontario
K0B 1K0

Date: **2022-03-22**

SUMMARY

Pursuant to a request from **TRAVOIS RV – VR INDUSTRIES INC.**, we performed compliance tests on a **OEM SEAT RETROFITTED WITH OBV10004 SWIVEL BASE AND SOFA BED BENCH SEAT**, identified at PMG Technologies as unit numbers: **22-260, 22-261**.

The purpose of the tests was to verify compliance to the following standards:

- Canada Motor Vehicle Safety Standard (CMVSS) 207 “Anchorage of Seats”
- Federal Motor Vehicle Safety Standard (FMVSS) 207 “Seating systems”

Testing was conducted as per the following subsections (as applicable):

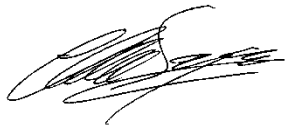
- S4.2(d) Application force producing a moment
- S4.2(a) Application of a force in a forward direction
- S4.2(b) Application of a force in a rearward direction
- S4.2(c) Simultaneous application of required forces
- S4.2.1 Seat adjustment

The seats tested were also used to verify compliance to subsections S4.2.1 and S4.2.2 (as applicable) of standards:

- CMVSS 210 “Seat Belt Anchorages”
- FMVSS 210 “Seat Belt Assembly Anchorages”

Testing was performed between **March 3, 2022** and **March 9, 2022** at the PMG Technologies Test and Research Center in Blainville (Quebec).

Test results show that the specimens tested **meet** the requirements of standards CMVSS 207 and FMVSS 207 for the verified subsections.

Verified by	Claude Sauvageau P.Eng. #104089		Date: **2022-03-15**
Approved by	Hugo Brunet P.Eng. #5080749		Date: **2022-03-22**

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INTRODUCTION

CMVSS 207 and FMVSS 207 establish requirements for seats, their attachment assemblies and their installation to minimize the possibility of their failure by forces acting on them as a result of vehicle impact. This standard applies to passenger cars, multipurpose passenger vehicles, trucks and buses.

GENERAL REQUIREMENTS

S4.2 When tested in accordance with S5, each occupant seat shall withstand the following forces, in newtons, except for: a side-facing seat (*CMVSS*: or a passenger seat on a bus) (*FMVSS*: ; a passenger seat on a bus other than a school bus; a passenger seat on a school bus with a GVWR greater than 4,536 kilograms (10,000 pounds); and a passenger seat on a school bus with a GVWR less than or equal to 4,536 kg manufactured before October 21, 2011).

(a) In any position to which it can be adjusted, 20 times the mass of the seat in kg multiplied by 9.8 m/s^2 applied in a forward longitudinal direction;

(b) In any position to which it can be adjusted, 20 times the mass of the seat in kg multiplied by 9.8 m/s^2 applied in a rearward longitudinal direction;

(c) For a seat belt assembly attached to the seat, the force specified in paragraph (a), if it is a forward-facing seat, or paragraph (b), if it is a rearward-facing seat, in each case applied simultaneously with the forces imposed on the seat by the seat belt assembly when it is loaded in accordance with subsections (*CMVSS*: 210(7), (8) and (10) of Schedule IV of the Motor Vehicle Safety Regulations) (*FMVSS*: S4.2 of §571.210); and

(d) In its rearmost position, a force that produces a 373 newton-meter moment about the seating reference point for each designated seating position that the seat provides, applied to the upper cross-member of the seat back or the upper seat back, in a rearward longitudinal direction for forward-facing seats and in a forward longitudinal direction for rearward-facing seats.

S4.2.1 Seat adjustment. Except for vertical movement of nonlocking suspension type occupant seats in trucks or buses, each seat shall remain in its adjusted position when tested in accordance with the test procedures specified in S5.

Tests were carried out according to the versions of standards:

- CMVSS 207, SOR/2016-318, s. 9. (December 16, 2016)
- TSD No. 207, Revision 0R (December 7, 2011)
- FMVSS 207, 49 CFR 571.207, current according to title 49 CFR Ch. V (10-1-20 Edition).

The test method used complied with NHTSA's TP-207-09 (June 18, 1992).

LEGEND: NP: Not Performed | N/A: Not Applicable | SRP: Seating Reference Point | DSP: Designated Seating Position

SUMMARY OF RESULTS

Seat	UN number	Subsection	NP	N/A	Pass	Fail	Page
1	22-260 (Pass. seat)	S4.2(b) Application of a force in a rearward direction			X		4
		S4.2.1 Seat adjustment			X		
		S4.2(a) Application of a force in a forward direction	X				
		S4.2.1 Seat adjustment	X				
		S4.2(c) Simultaneous application of required forces			X		5
		S4.2.1 Seat adjustment			X		
		S4.2(d) Application of a force that produces a moment			X		4
		S4.2.1 Seat adjustment			X		
2	22-261 (Bench seat)	S4.2(b) Application of a force in a rearward direction			X		4
		S4.2.1 Seat adjustment		X			
		S4.2(a) Application of a force in a forward direction	X				
		S4.2.1 Seat adjustment	X				
		S4.2(c) Simultaneous application of required forces			X		5
		S4.2.1 Seat adjustment		X			
		S4.2(d) Application of a force that produces a moment			X		4
		S4.2.1 Seat adjustment		X			

VEHICLE DATA

Manufacturer	Body style	Make, model, year
TRAVOIS RV – VR INDUSTRIES INC.	Cargo Van	MERCEDES-BENZ , METRIS, 2015
Class of vehicle	Odometer (km)	Designated seating positions
TRUCK	4 923 km	2
Date of manufacture	GVWR kg (lb)	VIN
12/2015	3 050 kg	WD3BG2EAXG3125446

LEGEND: NP: Not Performed | N/A: Not Applicable | SRP: Seating Reference Point | DSP: Designated Seating Position

SEAT INFORMATION

Description	Seat 1	Seat 2
UN number	UN22-260	UN22-261
Manufacturer	OEM	OEM
Model	–	–
Designated seating positions	1	2
Row	1	2
Seat position(s)	Passenger	Left and right
Weight | kg (lb)	43.2 (95.2)	102.4 (225.8)
Height of cg above ground | mm (in)	330 (13.0)	440 (17.3)
Individual seat	Yes	No
Bench seat	No	Yes
Split back bench seat	No	No
Adjustable	Yes	No
Hinged	No	No
Folding seat back	No	No
Adjustable seat back	Yes	No
Self-locking device	No	No
Forward orientation	Yes	Yes
Backward orientation	No	No

SEAT BELT INFORMATION

Description	Seat belt 1	Seat belt 2
Seat belt type	2	2
Seat belt anchorages attached to seat	Yes	Yes

COMMENTS:
Seat belts were replaced with slings during testing.

LEGEND: NP: Not Performed | N/A: Not Applicable | SRP: Seating Reference Point | DSP: Designated Seating Position

TEST RESULTS

S4.2(d) APPLICATION OF A FORCE THAT PRODUCES A MOMENT

Seat	Vertical dist. from upper horizontal cross member to SRP* "d" mm (in)	Required force per DSP 373/d x 1000 = N (3 300/d = lbf) Tol: +0-5 % N (lbf)	Applied load "F" N (lbf)	Moment produced F x d = M N-m (lbf-in)	NP	N/A	Pass	Fail
1	500 (19.7)	746 (168)	785 (176)	393 (3478)			X	
2	490 (19.3)	761 (171)	1 588 (357)	778 (6886)			X	
1	S4.2.1 Seat adjustment: The seat shall remain in its adjusted position.						X	
2						X		

COMMENTS:
The seat(s) sustained a force 5 % greater than the required load for not less than 10 seconds. See Appendix B for graphical representation.

S4.2(a) APPLICATION OF A FORCE (FORWARD DIRECTION)

Seat	Required load (20 x mass of seat in kg x 9.8 m/s^2) N (lbf)	Applied load N (lbf)	NP	N/A	Pass	Fail
–	–	–	X			
–	S4.2.1 Seat adjustment: The seat shall remain in its adjusted position.		X			

COMMENTS:
Test not performed.

S4.2(b) APPLICATION OF A FORCE (REARWARD DIRECTION)

Seat	Required load (20 x mass of seat in kg x 9.8 m/s^2) N (lbf)	Applied load N (lbf)	NP	N/A	Pass	Fail
1	8 467 (1 903)	8 893 (1 999)			X	
2	20 070 (4 512)	21 106 (4 745)			X	
1	S4.2.1 Seat adjustment: The seat shall remain in its adjusted position.				X	
2				X		

COMMENTS:
- Seat 1 was positioned in the middle of the adjustment rail during testing.
- "D" rings were replaced with steel plates and shackles.
- The seats sustained a force 5 % greater than the required load for not less than 20 seconds.
- See Appendix B for graphical representation.

LEGEND: NP: Not Performed | N/A: Not Applicable | SRP: Seating Reference Point | DSP: Designated Seating Position

S4.2(c) SIMULTANEOUS APPLICATION OF REQUIRED FORCES

Seat	Required load at CG (20 x mass of seat in kg x 9.8 m/s²) N (lbf)	Applied load at CG N (lbf)	Required load on seat belt (per CM/FM 210) N (lbf)	Applied load on seat belt			NP	N/A	Pass	Fail
				Position	Lap N (lbf)	Shoulder N (lbf)				
1	8 467 (1 903)	9 030 (2 030)	Type 2: 13 345 (3 000)	Right	14 073 (3 164)	14 021 (3 152)			X	
2	20 070 (4 512)	21 327 (4 795)		Right	14 068 (3 163)	14 086 (3 167)			X	
				Left	14 046 (3 158)	14 070 (3 163)			X	
1	S4.2.1 Seat adjustment: The seat shall remain in its adjusted position.								X	
2								X		

COMMENTS:

- Seat 1 was positioned in the middle of the adjustment rail during testing.
- "D" rings were replaced with steel plates and shackles and seat belts were replaced with slings.
- Loads were applied simultaneously in extension at the seat CG, and in tension on the seat belts.
- Target applied loads were 5 % over the minimum required load and were to be maintained for not less than 10 seconds.
- See Appendix B for graphical representation.
- Given the configuration of the test seats and seat belt systems, testing for section S4.2(c) also confirms compliance to subsections 210(7), (8) and (10) of Schedule IV of the Motor Vehicle Safety Regulations, and subsection S4.2 of FMVSS 210.

CONCLUSION

Test results show that the specimens tested **meet** the requirements of standards CMVSS 207 and FMVSS 207 for the verified subsections.

LEGEND: NP: Not Performed | N/A: Not Applicable | SRP: Seating Reference Point | DSP: Designated Seating Position

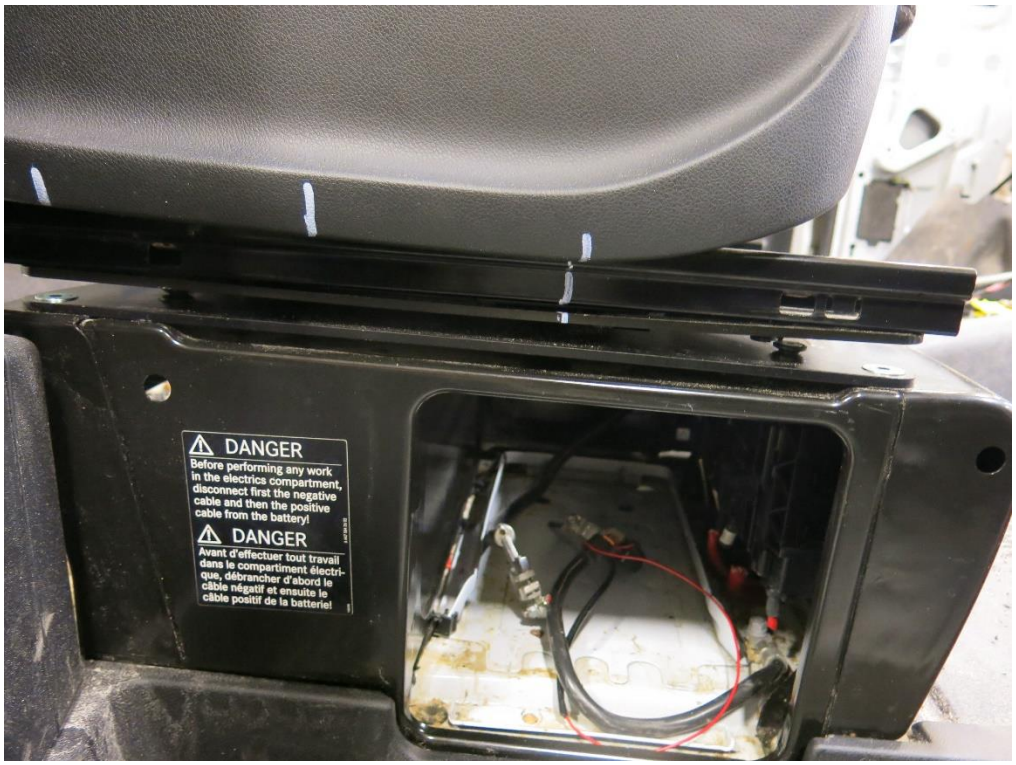
APPENDIX A

TEST PHOTOGRAPHS

SEAT NO. 1 (UN22-260)

1. ¾ Front view

2. ¾ Rear view



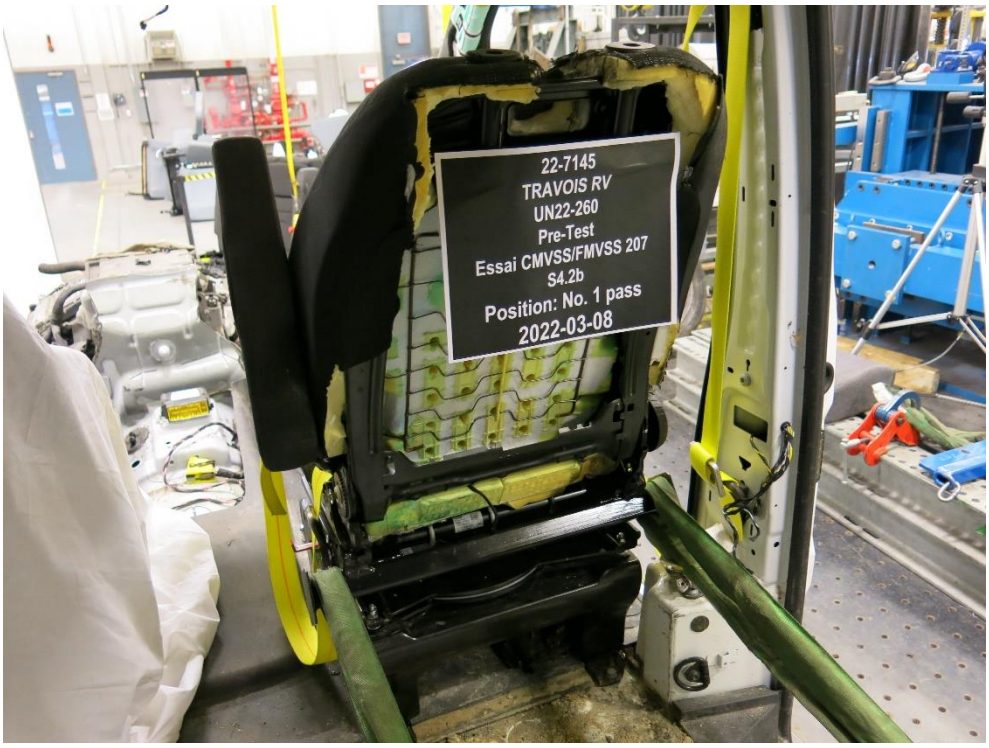
3. Seat anchorages – pre-test




4. Seat belt anchorages – pre-test

5. S4.2(d) Moment load test – pre-test

6. S4.2(d) Moment load test – post-test



7. S4.2(b) Rearward direction test – pre-test

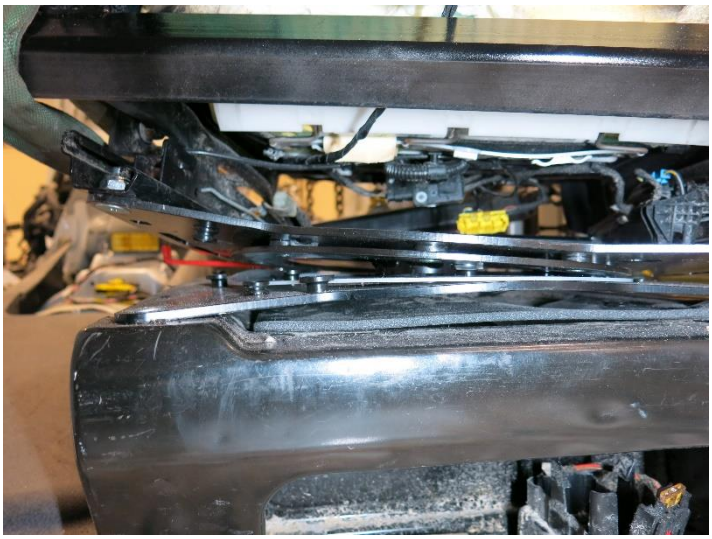
8. S4.2(b) Rearward direction test – post-test

9. S4.2(c) Simultaneous load application test – pre-test

10. S4.2(c) Simultaneous load application test – post-test







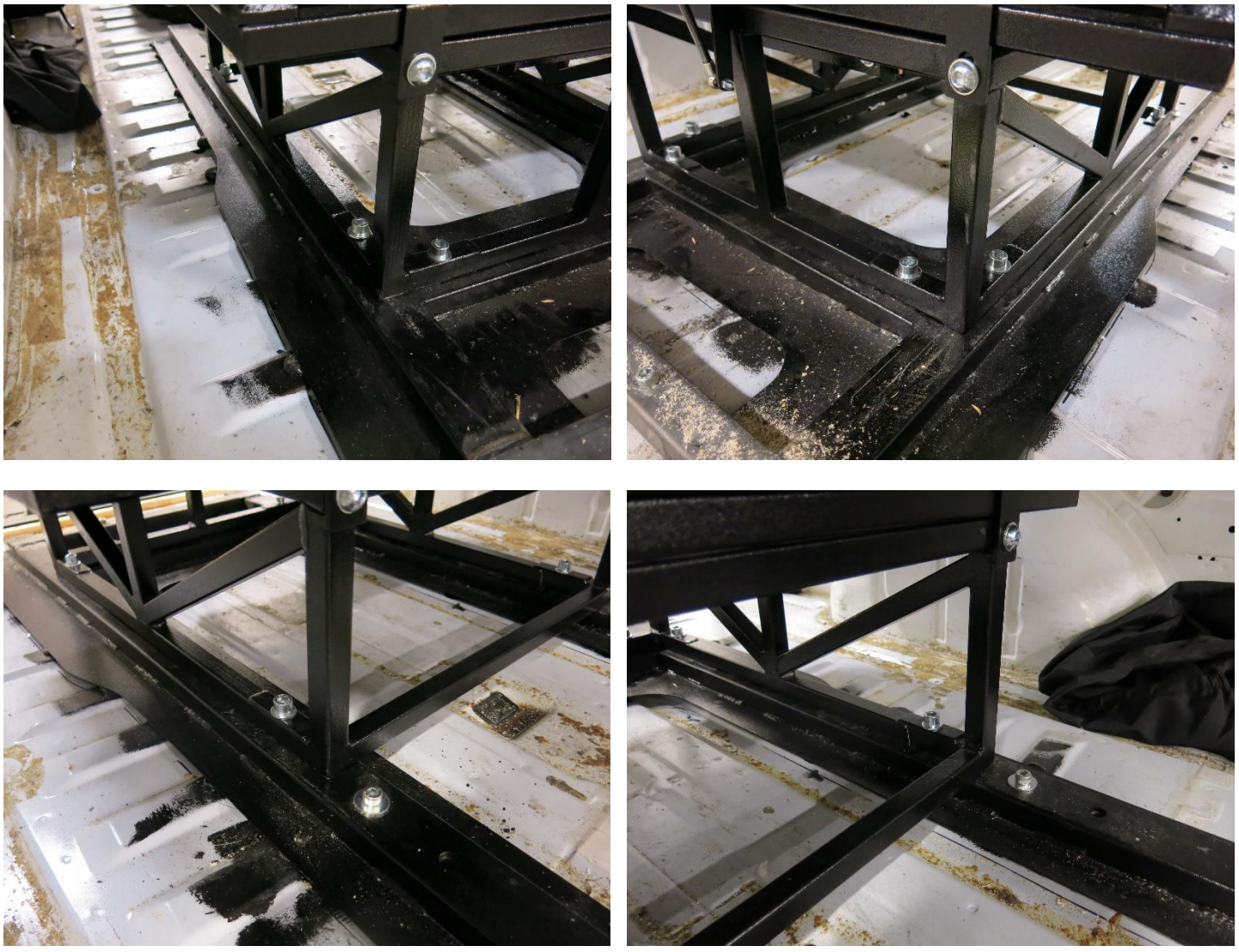

11. Seat anchorages – post-test

12. Seat belt anchorages – post-test

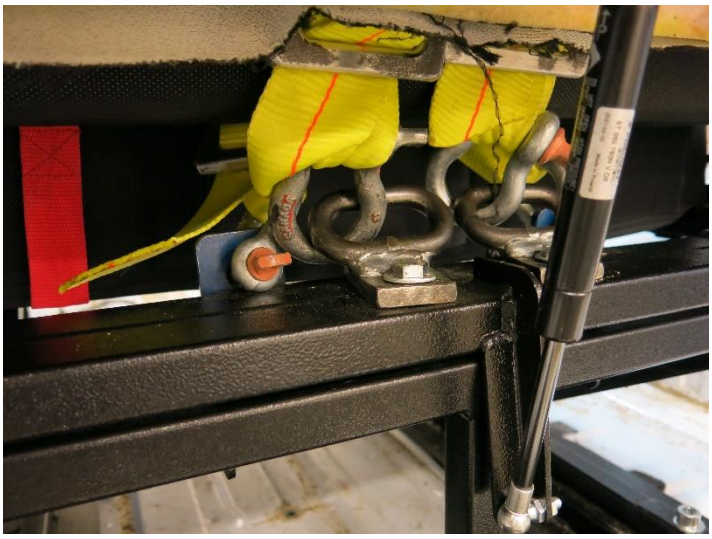
SEAT NO. 2 (UN22-261)

13. ¾ Front view

14. ¾ Rear view



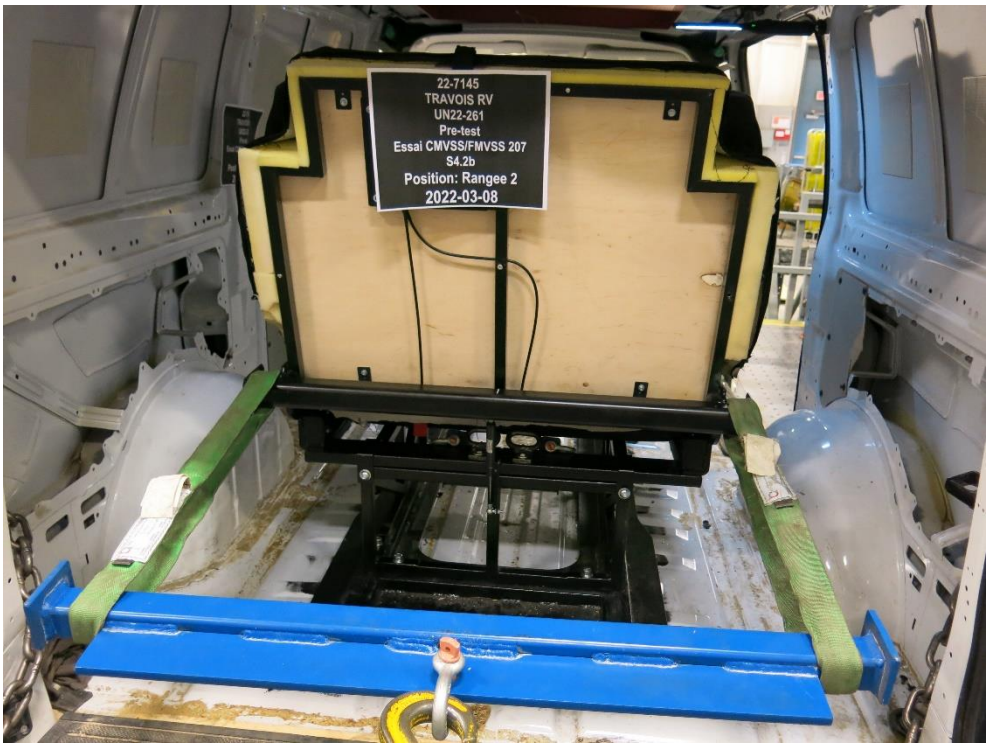
15. Seat anchorages – pre-test



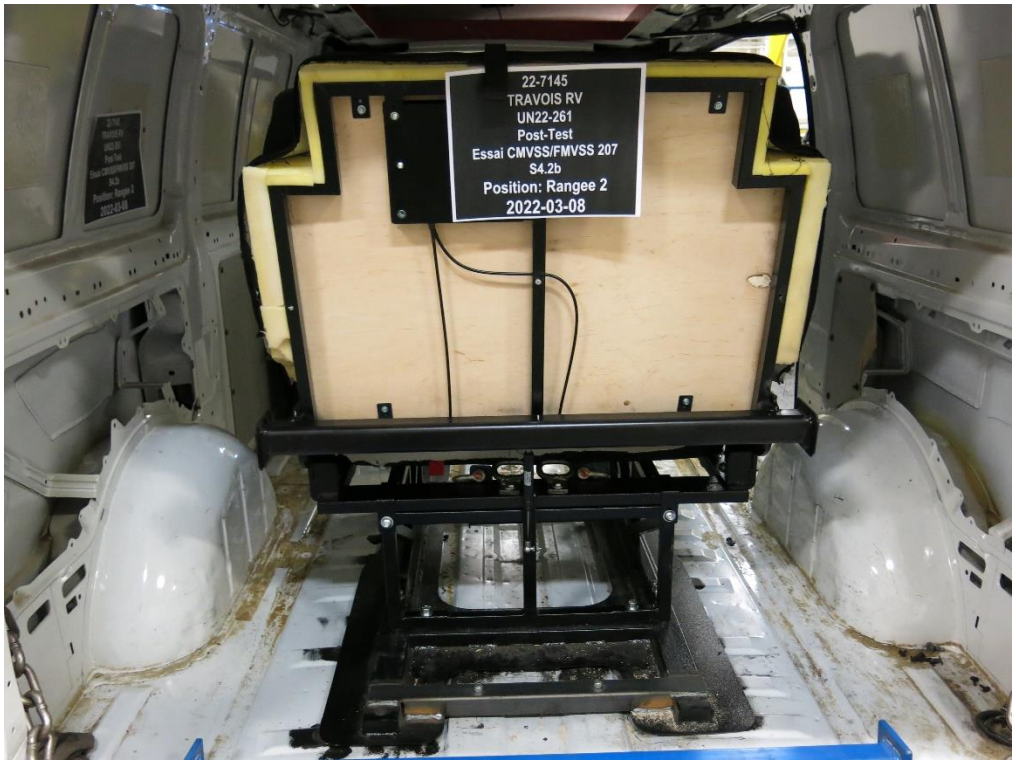
16. Seat belt anchorages – pre-test

17. S4.2(d) Moment load test – pre-test

18. S4.2(d) Moment load test – post-test



19. S4.2(b) Rearward direction test – pre-test



20. S4.2(b) Rearward direction test – post-test

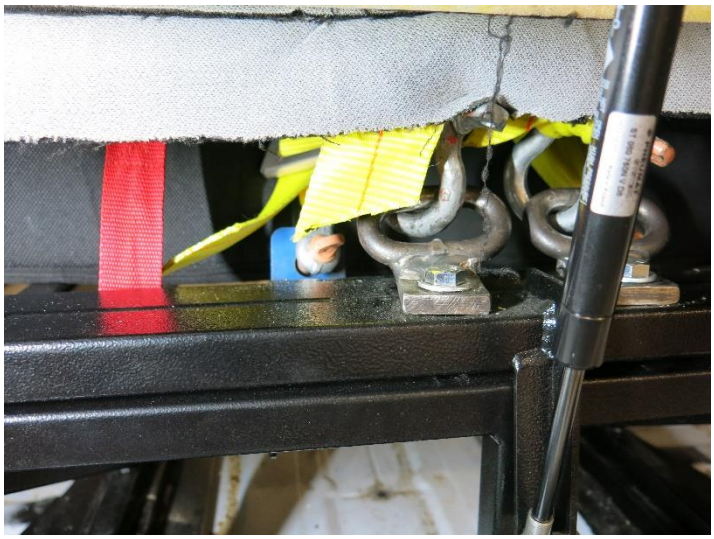
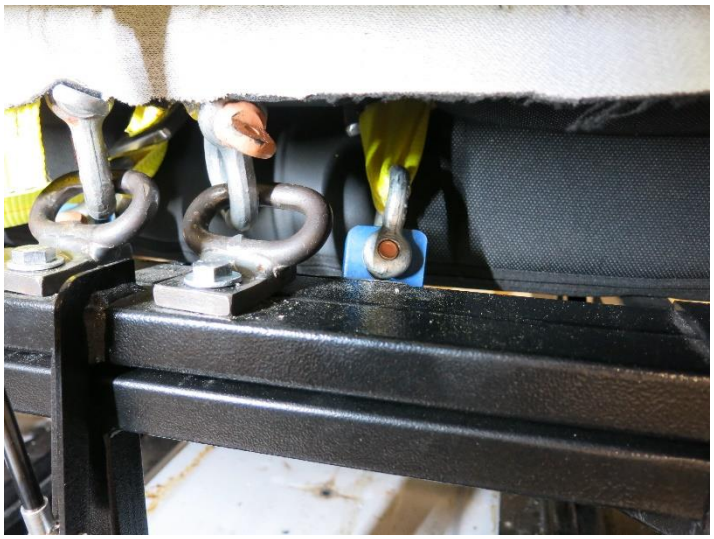
21. S4.2(c) Simultaneous load application test – pre-test

22. S4.2(c) Simultaneous load application test – post-test

23. Seat anchorages – post-test





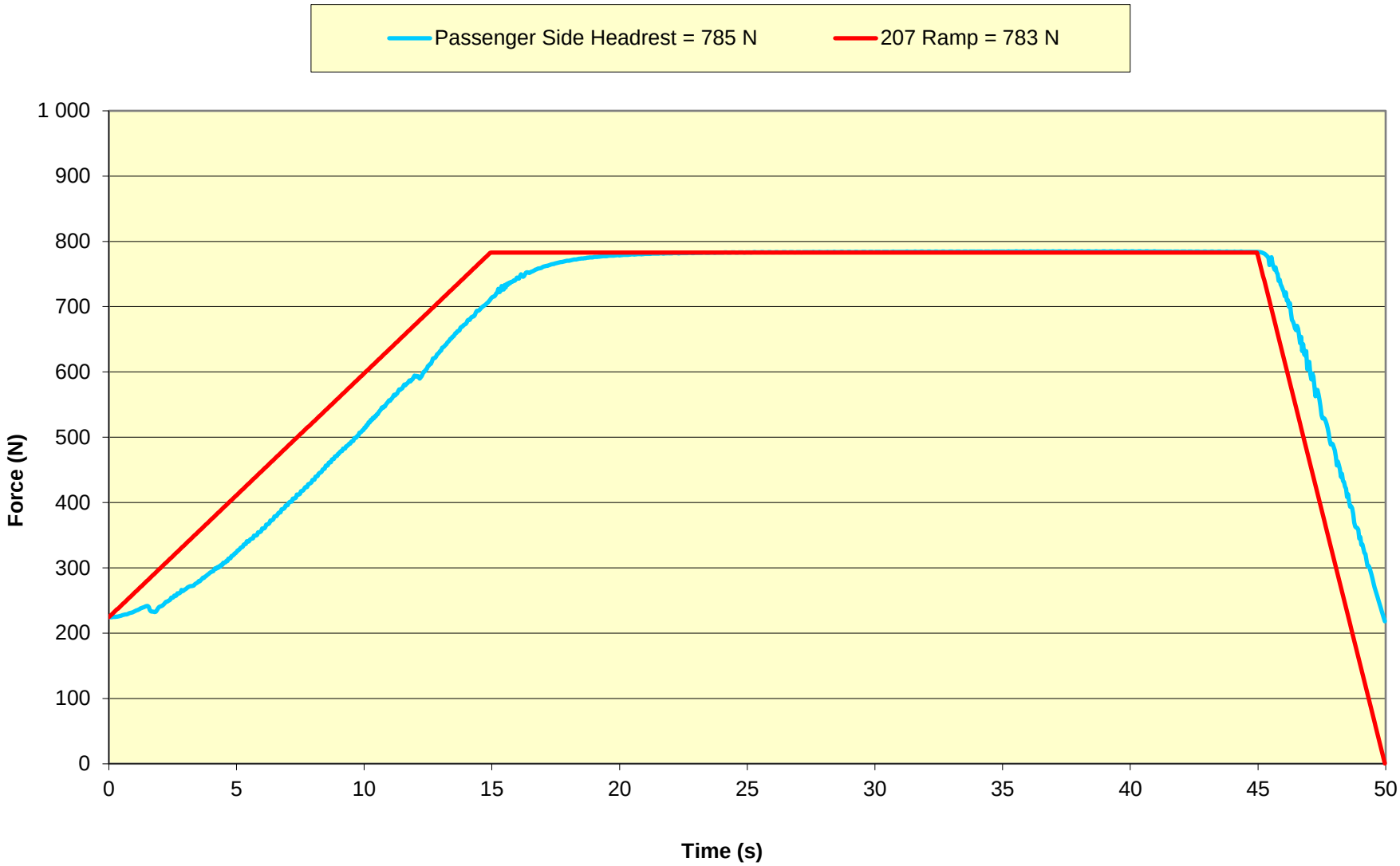



24. Seat belt anchorages – post-test

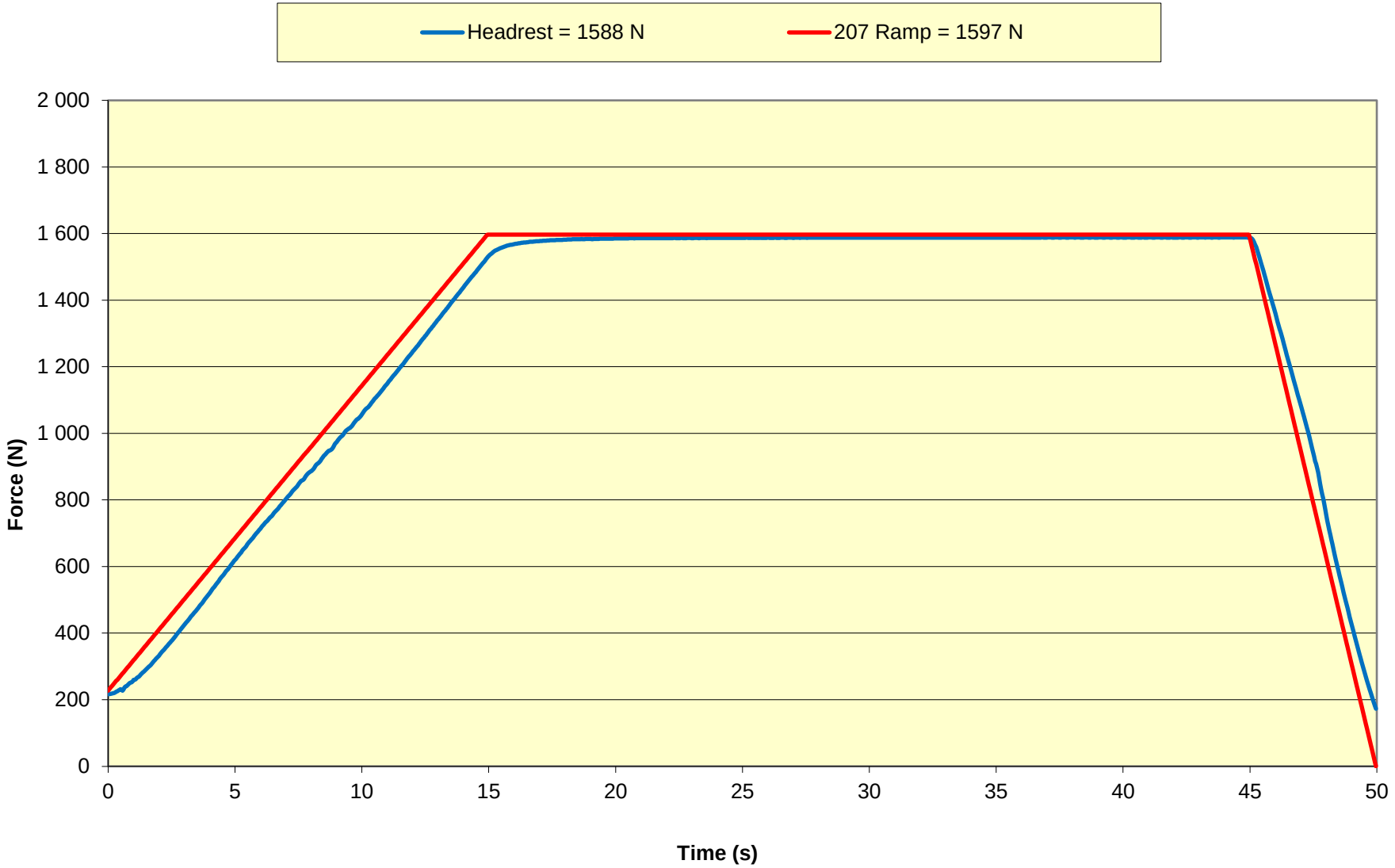
APPENDIX B

GRAPHICAL DATA

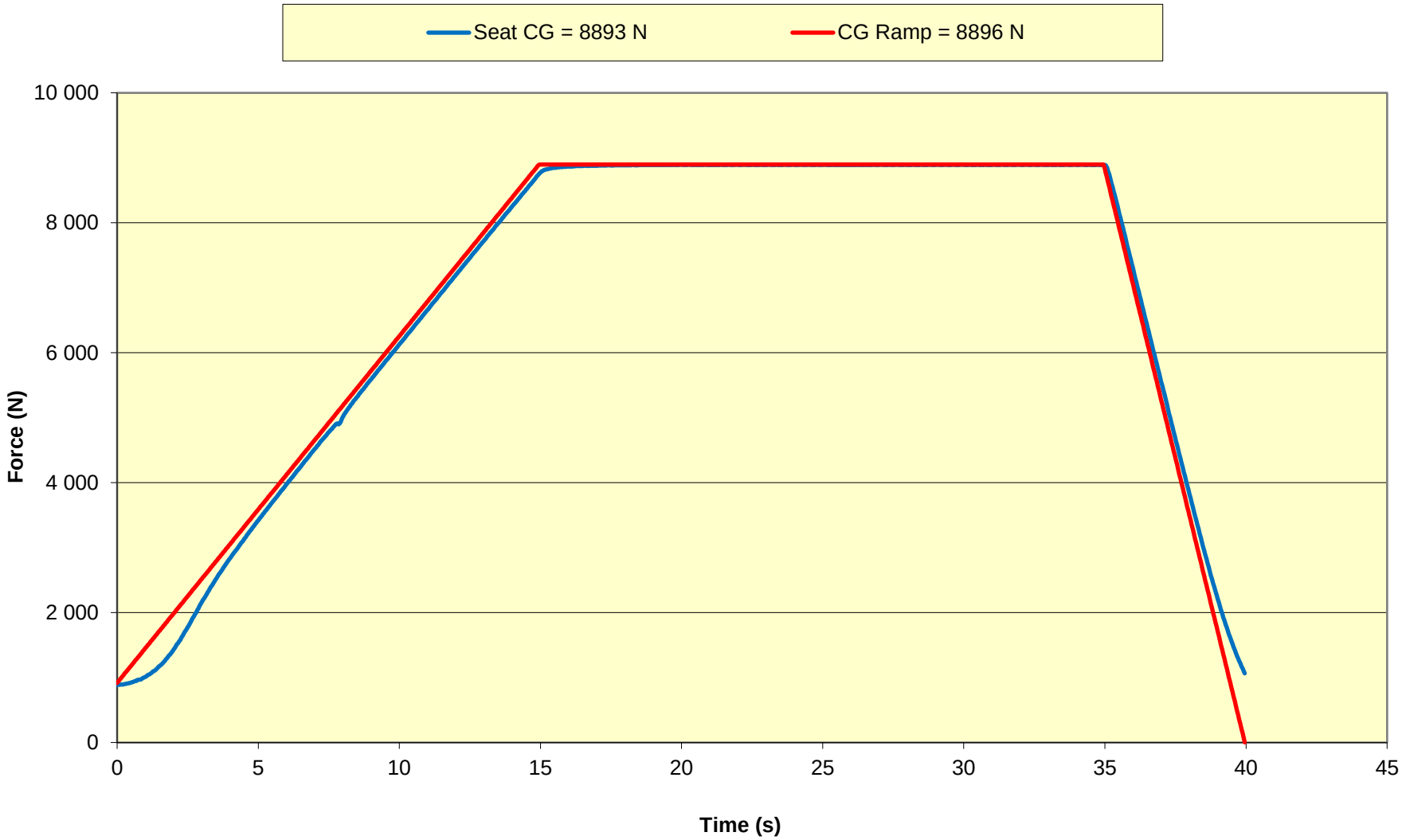
CMVSS/FMVSS 207 S4.2(d)
Proj. 22-7145 | Travois | UN22-260
Passenger Seat Row 1



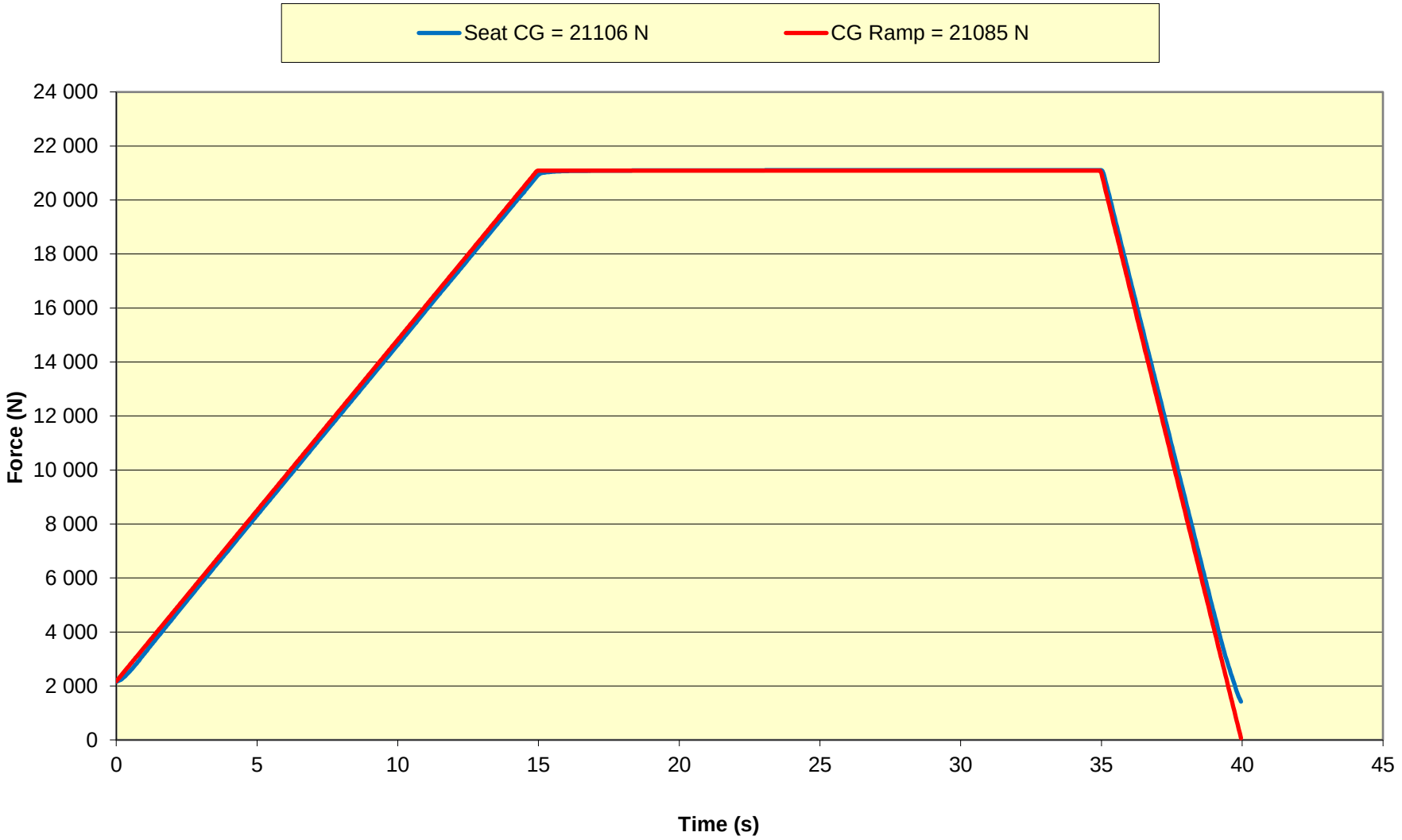
CMVSS/FMVSS 207 S4.2(d)
Proj. 22-7145 | Travois | UN22-261
Bench Seat Row 2



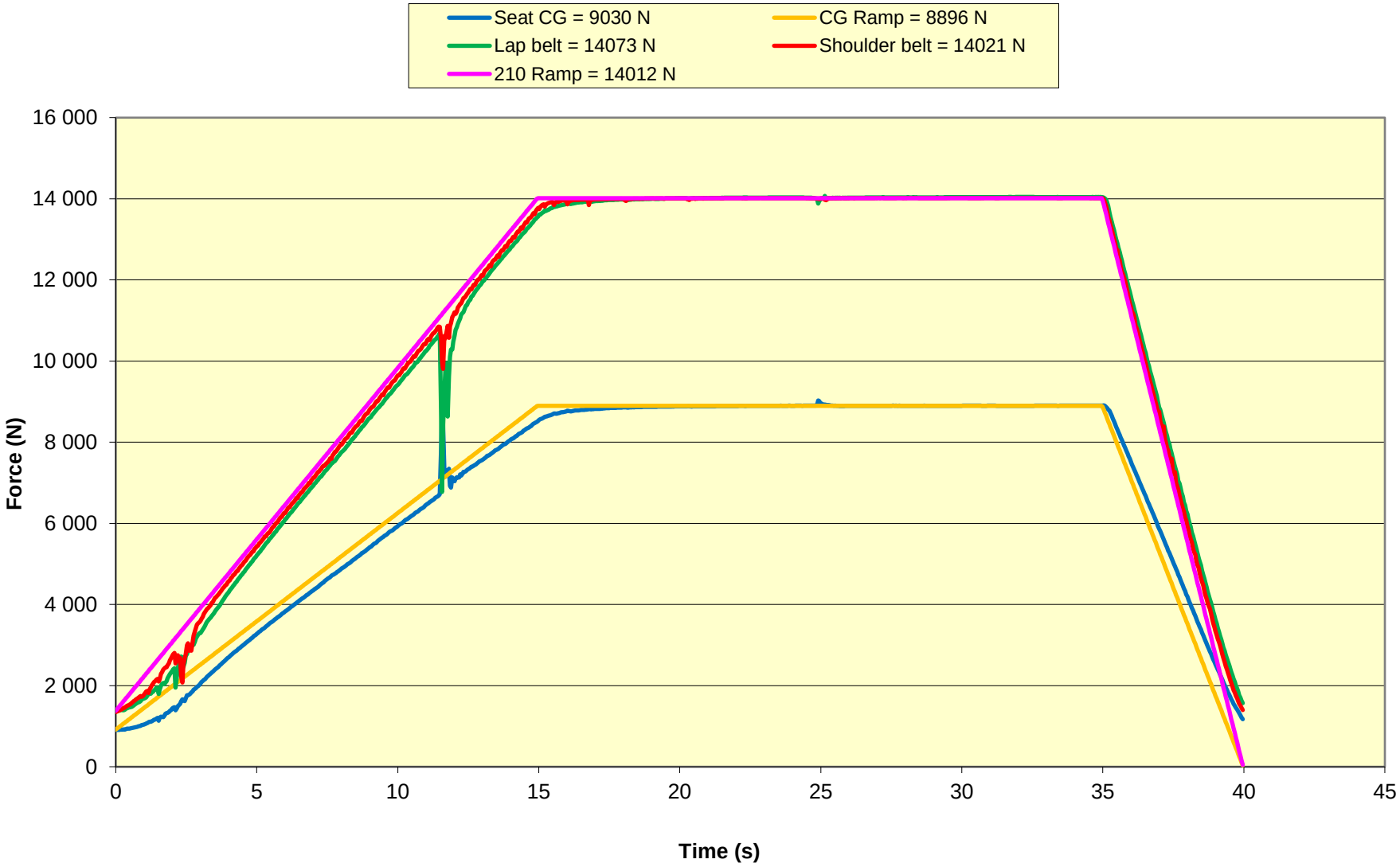
CMVSS/FMVSS 207 S4.2(b)
Proj. 22-7145 | Travois | UN22-260
Passenger Seat Row 1



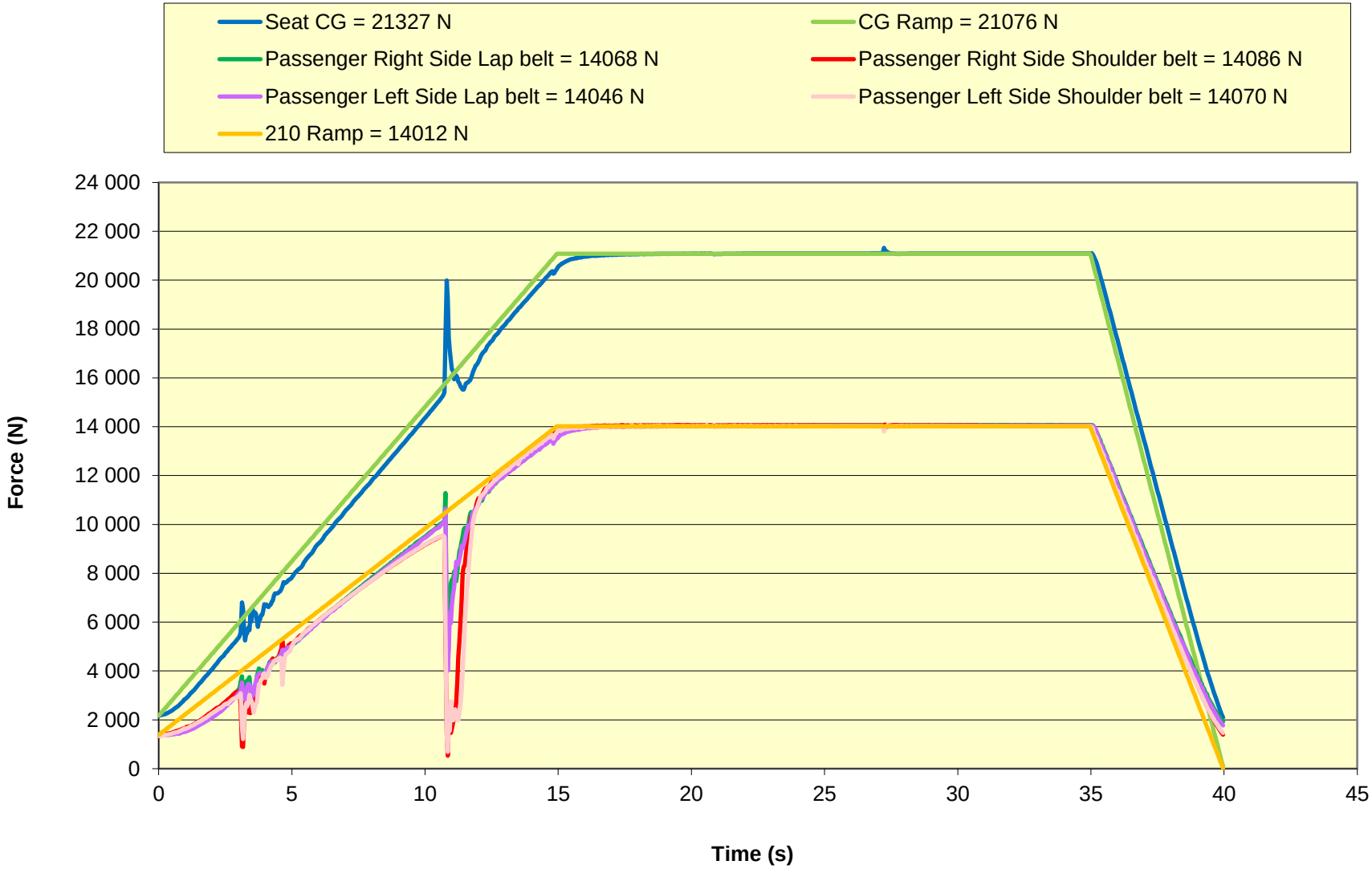
CMVSS/FMVSS 207 S4.2(b)
Proj. 22-7145 | Travois | UN22-261
Bench Seat Row 2



CMVSS/FMVSS 207 S4.2(c)
Proj. 22-7145 | Travois | UN22-260
Passenger Seat Row 1



CMVSS/FMVSS 207 S4.2(c)
Proj. 22-7145 | Travois | UN22-261
Bench Seat Row 2



APPENDIX C

INSTRUMENTATION

INSTRUMENTATION

The following instrumentation was used for performing the tests described in this report. Calibration certificates may be provided upon request.

Load cell	Manufacturer	Model	Serial no.	Calibration due date
210 – 1	Lebow	3157-10K	1874 A	2022-08-18
210 – 2	Lebow	3187-10K	2333 A	2022-08-18
201 – 3	Lebow	3157-10K	1872 A	2022-08-18
210 – 4	Lebow	3157-10K	1871 A	2022-08-18
210 – 5	Lebow	3157-10K	1899 A	2022-08-18
210 – 6	Lebow	3157-10K	1903 A	2022-08-18
207 – 1	Lebow	3157-5K	329	2022-08-19
207 – 2	Lebow	3157-5K	345	2022-08-01
Moment	Lebow	3132-500	16357	2022-08-15
Moment	Sensor Dev.	10127-500	71306	2022-10-04

APPENDIX D

CMVSS 207, TSD 207

Door Locks and Door Retention Components (Standard 206)

206 (1) Every bus with a GVWR of 4 536 kg or less, enclosed motorcycle, multi-purpose passenger vehicle, three-wheeled vehicle, passenger car and truck that is equipped with side doors or back doors shall be so equipped in accordance with either

(a) the requirements of *Technical Standards Document No. 206, Door Locks and Door Retention Components* (TSD 206), as amended from time to time; or

(b) the general requirements, performance requirements and test procedures set out in United Nations Regulation No. 11, *Uniform Provisions Concerning the Approval of Vehicles with regard to Door Latches and Door Retention Components* (United Nations Regulation No. 11), as amended from time to time by any amendment in the 03 or 04 series of amendments.

(2) For the purposes of paragraph 6.3.2 of United Nations Regulation No. 11, the locking device shall be the device referred to in paragraph 6.3.2.1(a) or (b) of that Regulation.

(3) [Repealed, SOR/2014-307, s. 16]

SOR/97-14, s. 2; SOR/2001-116, s. 3; SOR/2002-55, s. 21; SOR/2003-272, s. 23; SOR/2005-42, ss. 7, 8; SOR/2006-94, s. 4(E); SOR/2008-73, s. 3; SOR/2009-34, s. 1; SOR/2013-220, s. 2; SOR/2014-307, s. 16; SOR/2017-57, ss. 6, 8.

Anchorage of Seats

207 (1) Every passenger car, three-wheeled vehicle, truck, bus and multi-purpose passenger vehicle shall conform to the requirements of *Technical Standards Document No. 207, Anchorage of Seats* (TSD 207), as amended from time to time.

(2) The label referred to in S4.4 of TSD 207 shall be in both official languages.

(3) In the case of a truck or multi-purpose passenger vehicle with a GVWR greater than 4 536 kg or a motor home, a seat that is labelled in accordance with S4.4 of TSD 207 is not considered to be a designated seating position.

(4) [Repealed, SOR/2014-307, s. 17]

SOR/2011-264, s. 5; SOR/2014-307, s. 17; SOR/2016-318, s. 9.

Serrures de porte et composants de retenue de porte (Norme 206)

206 (1) Les autobus dont le PNBV est d'au plus 4 536 kg, les motocyclettes à habitacle fermé, les véhicules de tourisme à usages multiples, les véhicules à trois roues, les voitures de tourisme et les camions qui sont munis de portes latérales ou de portes arrière doivent l'être en conformité avec, selon le cas :

a) les exigences du *Document de normes techniques nº 206 — Serrures de porte et composants de retenue de porte* (DNT 206), avec ses modifications successives;

b) les spécifications générales, les spécifications d'efficacité et les procédures d'essai qui figurent dans le règlement nº 11 des Nations Unies intitulé *Prescriptions uniformes relatives à l'homologation des véhicules en ce qui concerne les serrures et organes de fixation des portes* (règlement nº 11 des Nations Unies), tel qu'il est modifié par tout amendement de la série 03 ou 04 d'amendements.

(2) Pour l'application du paragraphe 6.3.2 du règlement nº 11 des Nations Unies, le dispositif de verrouillage est celui visé aux alinéas 6.3.2.1a) ou b) de ce règlement.

(3) [Abrogé, DORS/2014-307, art. 16]

DORS/97-14, art. 2; DORS/2001-116, art. 3; DORS/2002-55, art. 21; DORS/2003-272, art. 23; DORS/2005-42, art. 7 et 8; DORS/2006-94, art. 4(A); DORS/2008-73, art. 3; DORS/2009-34, art. 1; DORS/2013-220, art. 2; DORS/2014-307, art. 16; DORS/2017-57, art. 6 et 8.

Ancrage des sièges

207 (1) Les voitures de tourisme, les véhicules à trois roues, les camions, les autobus et les véhicules de tourisme à usages multiples doivent être conformes aux exigences du *Document de normes techniques nº 207 — Ancrage des sièges* (DNT 207), avec ses modifications successives.

(2) L'étiquette visée à la disposition S4.4 du DNT 207 doit être rédigée dans les deux langues officielles.

(3) Dans le cas des camions et véhicules de tourisme à usages multiples ayant un PNBV supérieur à 4 536 kg et des autocaravanes, n'est pas considéré comme étant une place assise désignée le siège étiqueté conformément à la disposition S4.4 du DNT 207.

(4) [Abrogé, DORS/2014-307, art. 17]

DORS/2011-264, art. 5; DORS/2014-307, art. 17; DORS/2016-318, art. 9.

Transport Canada
Motor Vehicle Safety

Transports Canada
Sécurité des véhicules automobiles

TECHNICAL STANDARDS DOCUMENT
No. 207, Revision 0R

Anchorage of Seats

The text of this document is based on Federal Motor Vehicle Safety Standard No. 207, *Seating Systems*, as published in the U.S. *Code of Federal Regulations*, Title 49, Part 571, revised as of October 1, 2010.

Publication Date:	**December 7, 2011**
Effective Date:	**December 7, 2011**
Mandatory Compliance Date:	**December 7, 2011**

(Ce document est aussi disponible en français)

Introduction

As defined by section 12 of the *Motor Vehicle Safety Act*, a Technical Standards Document (TSD) is a document that reproduces an enactment of a foreign government (e.g. a Federal Motor Vehicle Safety Standard issued by the United States National Highway Traffic Safety Administration). According to the Act, the *Motor Vehicle Safety Regulations* may alter or override some provisions contained in a TSD or specify additional requirements; consequently, it is advisable to read a TSD in conjunction with the Act and its counterpart Regulation. As a guide, where the corresponding Regulation contains additional requirements, footnotes indicate the amending subsection number.

TSDs are revised from time to time in order to incorporate amendments made to the reference document, at which time a Notice of Revision is published in the *Canada Gazette*, Part I. All TSDs are assigned a revision number, with "Revision 0" designating the original version.

Identification of Changes

In order to facilitate the incorporation of a TSD, certain non-technical changes may be made to the foreign enactment. These may include the deletion of words, phrases, figures, or sections that do not apply under the Act or Regulations, the conversion of imperial to metric units, the deletion of superseded dates, and minor changes of an editorial nature. Additions are underlined, and provisions that do not apply are ~~stroked through~~. Where an entire section has been deleted, it is replaced by: "[CONTENT DELETED]". Changes are also made where there is a reporting requirement or reference in the foreign enactment that does not apply in Canada. For example, the name and address of the United States Department of Transportation are replaced by those of the Department of Transport.

Effective Date and Mandatory Compliance Date

The effective date of a TSD is the date of publication of its incorporating regulation or of the notice of revision in the *Canada Gazette*, and the date as of which voluntary compliance is permitted. The mandatory compliance date is the date upon which compliance with the requirements of the TSD is obligatory. If the effective date and mandatory compliance date are different, manufacturers may follow the requirements that were in force before the effective date, or those of the TSD, until the mandatory compliance date.

In the case of an initial TSD, or when a TSD is revised and incorporated by reference by an amendment to the Regulations, the mandatory compliance date is as specified in the Regulations, and it may be the same as the effective date. When a TSD is revised with no corresponding changes to the incorporating Regulations, the mandatory compliance date is six months after the effective date.

Official Version of Technical Standards Documents

The PDF version is a replica of the TSD as published by the Department and is to be used for the purposes of legal interpretation and application.

Table of Contents

List of Figures

S1. Purpose and Scope

This Technical Standards Document (TSD) ~~standard~~ establishes requirements for seats, their attachment assemblies, and their installation to minimize the possibility of their failure by forces acting on them as a result of vehicle impact.

S2. Application

[CONTENT DELETED] For applicability, see Schedule III and subsection 207(1) of Schedule IV to the *Motor Vehicle Safety Regulations*.

S3. Definitions

Occupant seat means a seat that provides at least one designated seating position. *(siège d'occupant)*

Seat adjuster means the part of the seat that provides forward and rearward positioning of the seat bench and back, and/or rotation around a vertical axis, including any fixed portion, such as a seat track. In the case of a seat equipped with seat adjusters at different levels, the term means the uppermost seat adjuster. *(mécanisme de réglage du siège)*

S4. Requirements

S4.1 Driver's seat

Each vehicle shall have an occupant seat for the driver.

S4.2 General performance requirements

When tested in accordance with S5, each occupant seat shall withstand the following forces, in newtons, except for: a side-facing seat or a passenger seat on a bus~~; a passenger seat on a bus other than a school bus; a passenger seat on a school bus with a GVWR greater than 4,536 kilograms (10,000 pounds); and a passenger seat on a school bus with a GVWR less than or equal to 4,536 kg manufactured before October 21, 2011~~.

(a) In any position to which it can be adjusted, 20 times the mass of the seat in kilograms multiplied by 9.8 m/s^2 applied in a forward longitudinal direction;

(b) In any position to which it can be adjusted, 20 times the mass of the seat in kilograms multiplied by 9.8 m/s^2 applied in a rearward longitudinal direction;

(c) For a seat belt assembly attached to the seat, the force specified in paragraph (a), if it is a forward-facing seat, or paragraph (b), if it is a rearward-facing seat, in each case applied simultaneously with the forces imposed on the seat by the seat belt assembly when it is loaded in accordance with subsections 210(7) , (8) and (10) of Schedule IV of the *Motor Vehicle Safety Regulations* ~~S4.2 of §571.210~~; and

(d) In its rearmost position, a force that produces a 373 newton-meter moment about the seating reference point for each designated seating position that the seat provides, applied to the upper cross-member of the seat back or the upper seat back, in a rearward longitudinal direction for forward-facing seats and in a forward longitudinal direction for rearward-facing seats.

S4.2.1 Seat adjustment. Except for vertical movement of nonlocking suspension type occupant seats in trucks or buses, each seat shall remain in its adjusted position when tested in accordance with the test procedures specified in S5.

S4.3 Restraining device for hinged or folding seats or seat backs

Except for a passenger seat in a bus or a seat having a back that is adjustable only for the comfort of its occupants, a hinged or folding occupant seat or occupant seat back shall:

(a) Be equipped with a self-locking device for restraining the hinged or folding seat or seat back, and
(b) If there are any designated seating positions or auxiliary seating accommodations behind the seat, either immediately to the rear or to the sides, be equipped with a control for releasing that restraining device.

S4.3.1 Accessibility of release control. If there is a designated seating position immediately behind a seat equipped with a restraining device, the control for releasing the device shall be readily accessible to the occupant of the seat equipped with the device and, if access to the control is required in order to exit from the vehicle, to the occupant of the designated seating position immediately behind the seat.

S4.3.2 Performance of restraining device

S4.3.2.1 Static force

(a) Once engaged, the restraining device for a forward-facing seat shall not release or fail when a forward longitudinal force, in newtons, equal to 20 times the mass of the hinged or folding portion of the seat in kilograms multiplied by 9.8 m/s^2 is applied through the center of gravity of that portion of the seat.

(b) Once engaged, the restraining device for a rearward-facing seat shall not release or fail when a rearward longitudinal force, in newtons, equal to 8 times the mass of the hinged or folding portion of the seat in kilograms multiplied by 9.8 m/s^2 is applied through the center of gravity of that portion of the seat.

S4.3.2.2 Acceleration. Once engaged, the restraining device shall not release or fail when the device is subjected to an acceleration of 20 g in the longitudinal direction opposite to that in which the seat folds.

S4.4 Labeling

Seats not designated for occupancy while the vehicle is in motion shall be conspicuously labeled to that effect.[1]

S5. Test Procedures

S5.1 Apply the forces specified in S4.2(a) and S4.2(b) as follows.

S5.1.1 For a seat whose seat back and seat bench are attached to the vehicle by the same attachments,

(a) ~~For a seat whose seat back and seat bench are attached to the vehicle by the same attachments~~ And whose height is adjustable, the loads are applied when the seat is in its highest adjustment position in accordance with the procedure or procedures specified in S5.1.1(a)(1)~~, S5.1.1(a)(2),~~ or S5.1.1(a)(3), as appropriate.

(1) For a seat whose center of gravity is in a horizontal plane that is above the seat adjuster, or that passes through any part of the adjuster, use, at the manufacturer's option, either S5.1.1(b) or, if physically possible, S5.1.1(c).

(2) ~~For a seat specified in S5.1.1(a)(1) for which it is not physically possible to follow the procedure in S5.1.1(c), use S5.1.1(b).~~

(3) For a seat whose center of gravity is in a horizontal plane that is below the seat adjuster, use S5.1.1(c).

(4) For all other seats ~~whose seat back and seat bench are attached to the vehicle by the same attachments~~, use S5.1.1(b).

(b) Secure a strut on each side of the seat from a point on the outside of the seat frame in the horizontal plane of the seat's center of gravity to a point on the frame as far forward as possible of the seat anchorages. Between the upper ends of the struts, attach a rigid cross-member in front of the seat back frame for rearward loading and behind the seat back frame for forward loading. Apply the force specified by S4.2(a) or S4.2(b) horizontally through the rigid cross-member as shown in Figure 1.

(c) Find "cg_1," the center of gravity of the portion of the seat that is above the lowest surface of the seat adjuster. On each side of the seat, secure a strut from a point on the outside of the seat frame in the horizontal plane of cg_1 to a point on the frame as far

[1] Please see subsection 207(2) of the *Motor Vehicle Safety Regulations* (MVSR) for an additional requirement.

forward as possible of the seat adjusted position. Between the upper ends of the struts, attach a rigid cross-member in front of the seat back frame for rearward loading and behind the seat back frame for forward loading. Find "cg_2," the center of gravity of the portion of the seat that is below the seat adjuster. Apply a force horizontally through cg_1 equal to 20 times the weight of the portion of the seat represented by cg_1, and simultaneously apply a force horizontally through cg_2 equal to 20 times the weight of the portion of the seat represented by cg_2.

S5.1.2 If the seat back and the seat bench are attached to the vehicle by different attachments, attach to each component a fixture capable of transmitting a force to that component. Apply forces, in newtons, equal to 20 times the mass of the seat back in kilograms multiplied by 9.8 m/s^2 horizontally through the center of gravity of the seat back, as shown in Figure 2, and apply forces, in newtons, equal to 20 times the mass of the seat bench in kilograms multiplied by 9.8 m/s^2 horizontally through the center of gravity of the seat bench, as shown in Figure 3.

S5.2 Develop the moment specified in S4.2(d), as shown in Figure 4.

S5.3 Apply the forces specified in S4.3.2.1(a) and (b) to a hinged or folding seat, as shown in Figure 1, and to a hinged or folding seat back, as shown in Figure 5.

S5.4 Determine the center of gravity of a seat or seat component with all cushions and upholstery in place and with the head restraint in its fully extended design position.

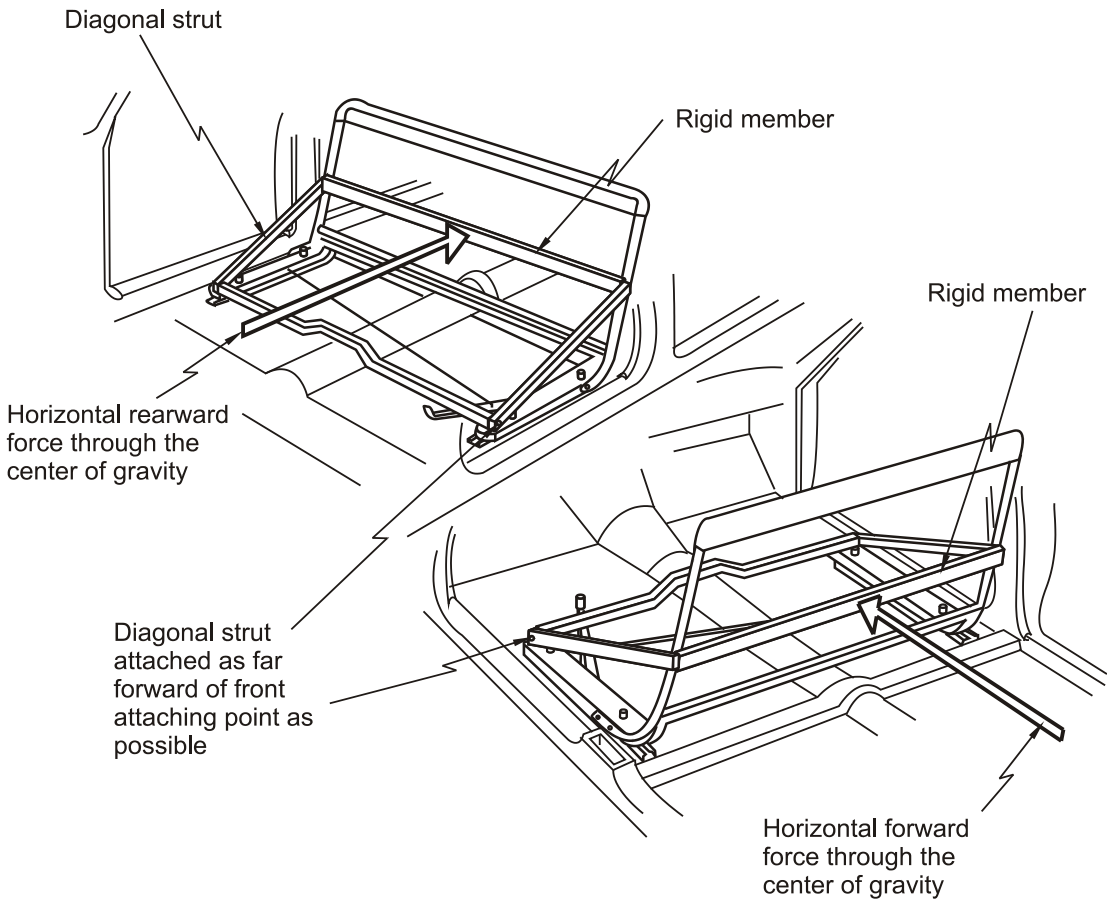

Diagonal strut
Rigid member
Rigid member
Horizontal rearward force through the center of gravity
Diagonal strut attached as far forward of front attaching point as possible
Horizontal forward force through the center of gravity

Figure 1

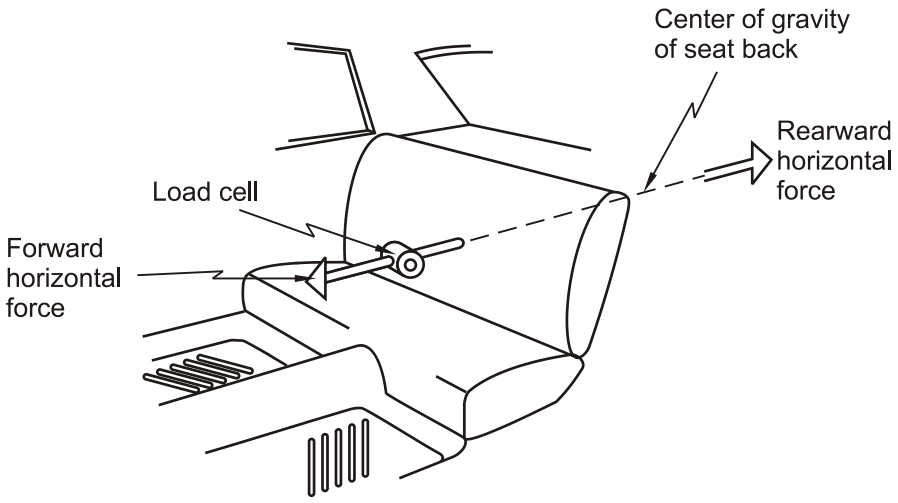


Figure 2

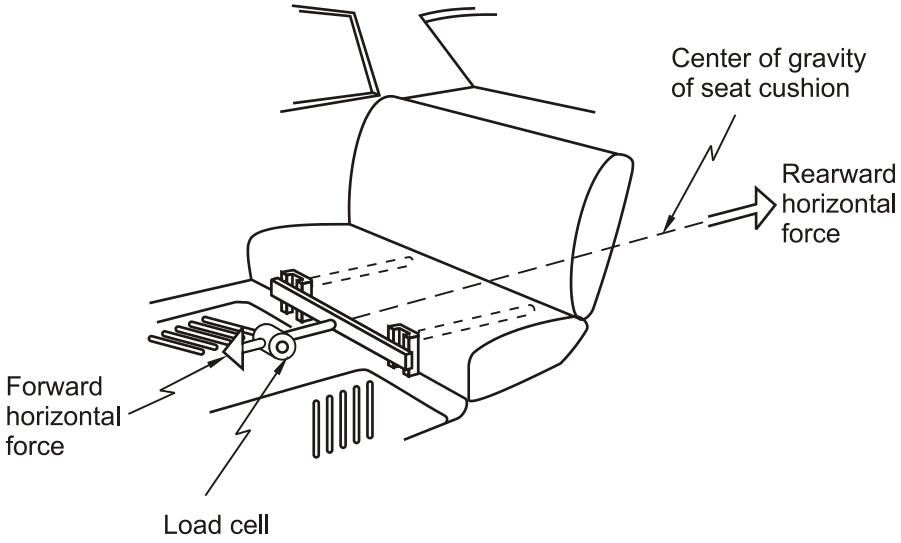
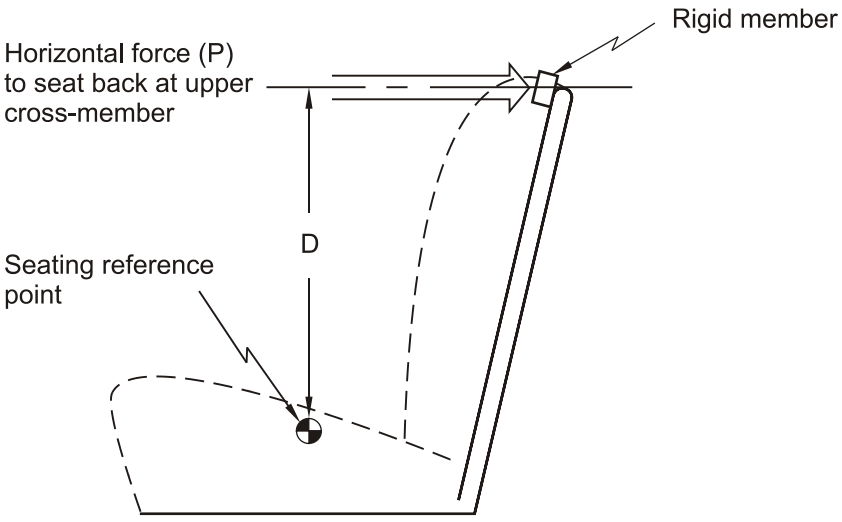


Figure 3



Note:
Moment (P x D) is computed about the seating reference point.

Figure 4

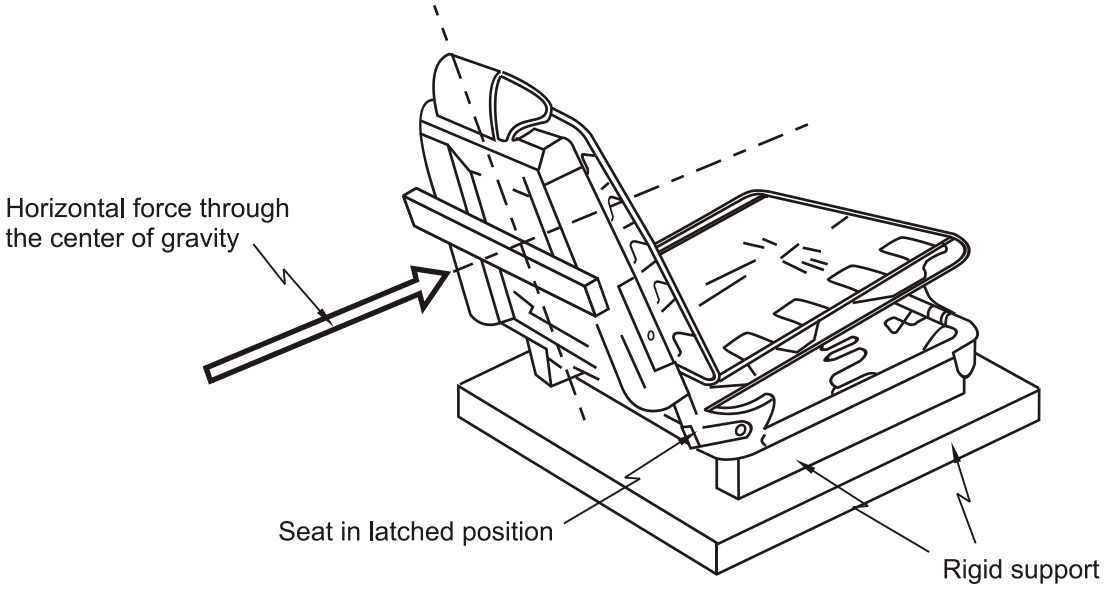


Figure 5

APPENDIX E

FMVSS 207

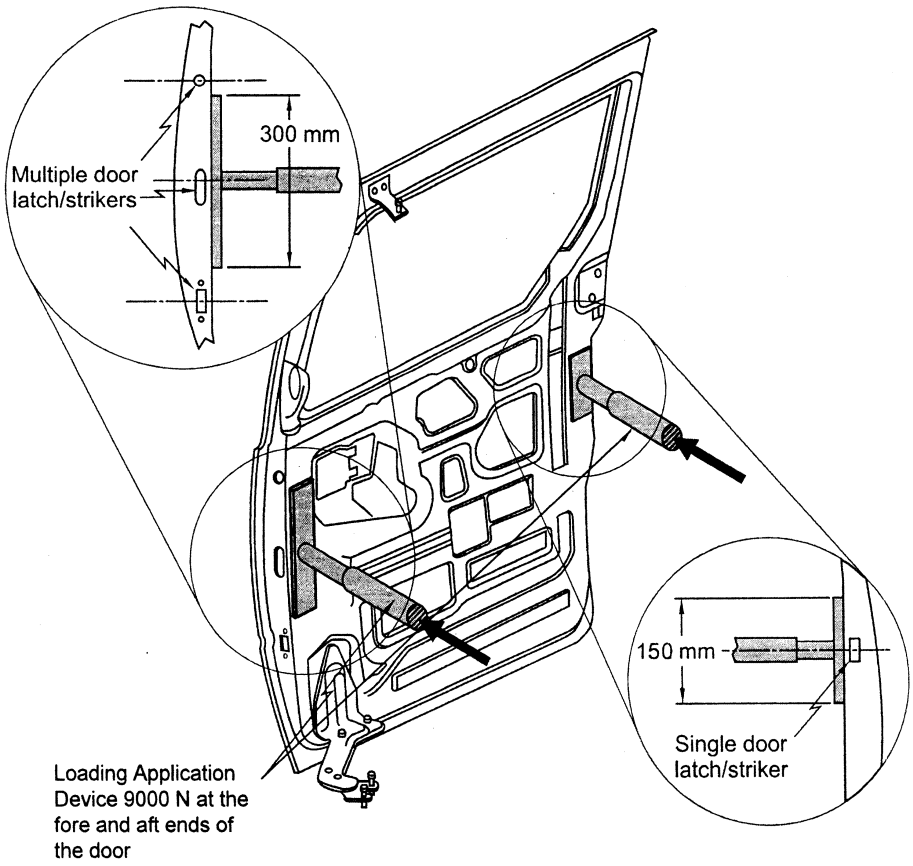


FIGURE 10 – Sliding Door Full Vehicle Test Procedure
(Note: Sliding door is shown separated from the vehicle)

[36 FR 22902, Dec. 2, 1971, as amended at 37 FR 284, Jan. 8, 1972; 50 FR 12031, Mar. 27, 1985; 60 FR 13646, Mar. 14, 1995; 60 FR 50134, Sept. 28, 1995; 61 FR 39907, July 31, 1996; 72 FR 5399, June 27, 2007; 74 FR 35135, July 20, 2009; 74 FR 37176, July 28, 2009; 75 FR 7382, Feb. 19, 2010; 77 FR 764, Jan. 6, 2012]

EDITORIAL NOTE: At 72 FR 5399, June 27, 2007, § 571.206 was amended by adding S.5.3; however, the amendment could not be incorporated because S.5.3 already exists.

§ 571.207 Standard No. 207; Seating systems.

S1. *Purpose and scope.* This standard establishes requirements for seats, their attachment assemblies, and their installation to minimize the possibility of their failure by forces acting on them as a result of vehicle impact.

S2. *Application.* This standard applies to passenger cars, multipurpose passenger vehicles, trucks and buses.

S3. *Definitions. Occupant seat* means a seat that provides at least one designated seating position.

Seat adjuster means the part of the seat that provides forward and rearward positioning of the seat bench and back, and/or rotation around a vertical

axis, including any fixed portion, such as a seat track. In the case of a seat equipped with seat adjusters at different levels, the term means the uppermost seat adjuster.

S4. *Requirements.*

S4.1 *Driver's seat.* Each vehicle shall have an occupant seat for the driver.

S4.2. *General performance requirements.* When tested in accordance with S5, each occupant seat shall withstand the following forces, in newtons, except for: a side-facing seat; a passenger seat on a bus other than a school bus; a passenger seat on a school bus with a GVWR greater than 4,536 kilograms (10,000 pounds); and, a passenger seat on a school bus with a GVWR less than or equal to 4,536 kg manufactured before October 21, 2011.

(a) In any position to which it can be adjusted—20 times the mass of the seat in kilograms multiplied by 9.8 applied in a forward longitudinal direction;

(b) In any position to which it can be adjusted—20 times the mass of the seat in kilograms multiplied by 9.8 applied in a rearward longitudinal direction;

(c) For a seat belt assembly attached to the seat—the force specified in paragraph (a), if it is a forward facing seat, or paragraph (b), if it is a rearward facing seat, in each case applied simultaneously with the forces imposed on the seat by the seat belt assembly when it is loaded in accordance with S4.2 of §571.210; and

(d) In its rearmost position—a force that produces a 373 newton meters moment about the seating reference point for each designated seating position that the seat provides, applied to the upper cross-member of the seat back or the upper seat back, in a rearward longitudinal direction for forward-facing seats and in a forward longitudinal direction for rearward-facing seats.

S4.2.1 *Seat adjustment.* Except for vertical movement of nonlocking suspension type occupant seats in trucks or buses, each seat shall remain in its adjusted position when tested in accordance with the test procedures specified in S5.

S4.3. *Restraining device for hinged or folding seats or seat backs.* Except for a passenger seat in a bus or a seat having a back that is adjustable only for the comfort of its occupants, a hinged or folding occupant seat or occupant seat back shall—

(a) Be equipped with a self-locking device for restraining the hinged or folding seat or seat back, and

(b) If there are any designated seating positions or auxiliary seating accommodations behind the seat, either immediately to the rear or to the sides, be equipped with a control for releasing that restraining device.

S4.3.1 *Accessibility of release control.* If there is a designated seating position immediately behind a seat equipped with a restraining device, the control for releasing the device shall be readily accessible to the occupant of the seat equipped with the device and, if access to the control is required in order to exit from the vehicle, to the occupant of the designated seating position immediately behind the seat.

S4.3.2 *Performance of restraining device.*

S4.3.2.1 *Static force.* (a) Once engaged, the restraining device for a forward-facing seat shall not release or fail when a forward longitudinal force, in newtons, equal to 20 times the mass of the hinged or folding portion of the seat in kilograms multiplied by 9.8 is applied through the center of gravity of that portion of the seat.

(b) Once engaged, the restraining device for a rearward-facing seat shall not release or fail when a rearward longitudinal force, in newtons, equal to 8 times the mass of the hinged or folding portion of the seat in kilograms multiplied by 9.8 is applied through the center of gravity of that portion of the seat.

S4.3.2.2 *Acceleration.* Once engaged, the restraining device shall not release or fail when the device is subjected to an acceleration of 20 g., in the longitudinal direction opposite to that in which the seat folds.

S4.4 *Labeling.* Seats not designated for occupancy while the vehicle is in motion shall be conspicuously labeled to that effect.

S5. *Test procedures.*

S5.1 Apply the forces specified in S4.2(a) and S4.2(b) as follows:

S5.1.1 *For a seat whose seat back and seat bench are attached to the vehicle by the same attachments.* (a) For a seat

whose seat back and seat bench are attached to the vehicle by the same attachments and whose height is adjustable, the loads are applied when the seat is in its highest adjustment position in accordance with the procedure or procedures specified in S5.1.1(a)(1), S5.1.1(a)(2), or S5.1.1(a)(3), as appropriate.

(1) For a seat whose center of gravity is in a horizontal plane that is above the seat adjuster or that passes through any part of the adjuster, use, at the manufacturer's option, either S5.1.1(b) or, if physically possible, S5.1.1(c).

(2) For a seat specified in S5.1.1(a)(1) for which it is not physically possible to follow the procedure in S5.1.1(c), use S5.1.1(b).

(3) For a seat whose center of gravity is in a horizontal plane that is below the seat adjuster, use S5.1.1(c).

(4) For all other seats whose seat back and seat bench are attached to the vehicle by the same attachments, use S5.1.1(b).

(b) Secure a strut on each side of the seat from a point on the outside of the seat frame in the horizontal plane of the seat's center of gravity to a point on the frame as far forward as possible of the seat anchorages. Between the upper ends of the struts attach a rigid cross-member, in front of the seat back frame for rearward loading and behind the seat back frame for forward loading. Apply the force specified by S4.2(a) or S4.2(b) horizontally through the rigid cross-member as shown in Figure 1.

(c) Find ''cg_1,'' the center of gravity of the portion of the seat that is above the lowest surface of the seat adjuster. On each side of the seat, secure a strut from a point on the outside of the seat frame in the horizontal plane of cg_1 to a point on the frame as far forward as possible of the seat adjusted position. Between the upper ends of the struts attach a rigid cross-member, in front of the seat back frame for rearward loading and behind the seat back frame for forward loading. Find ''cg_2,'' the center of gravity of the portion of the seat that is below the seat adjuster. Apply a force horizontally through cg_1 equal to 20 times the weight of the portion of the seat represented by cg_1, and simultaneously apply a force horizontally through cg_2 equal to 20 times the weight of the portion of the seat represented by cg_2.

S5.1.2 If the seat back and the seat bench are attached to the vehicle by different attachments, attach to each component a fixture capable of transmitting a force to that component. Apply forces, in newtons, equal to 20 times the mass of the seat back in kilograms multiplied by 9.8 m/s^2 horizontally through the center of gravity of the seat back, as shown in Figure 2 and apply forces, in newtons, equal to 20 times the mass of the seat bench in kilograms multiplied by 9.8 m/s^2 horizontally through the center of gravity of the seat bench, as shown in Figure 3.

S5.2 Develop the moment specified in S4.2(d) as shown in Figure 4.

S5.3 Apply the forces specified in S4.3.2.1(a) and (b) to a hinged or folding seat as shown in Figure 1 and to a hinged or folding seat back as shown in Figure 5.

S5.4 Determine the center of gravity of a seat or seat component with all cushions and upholstery in place and with the head restraint in its fully extended design position.

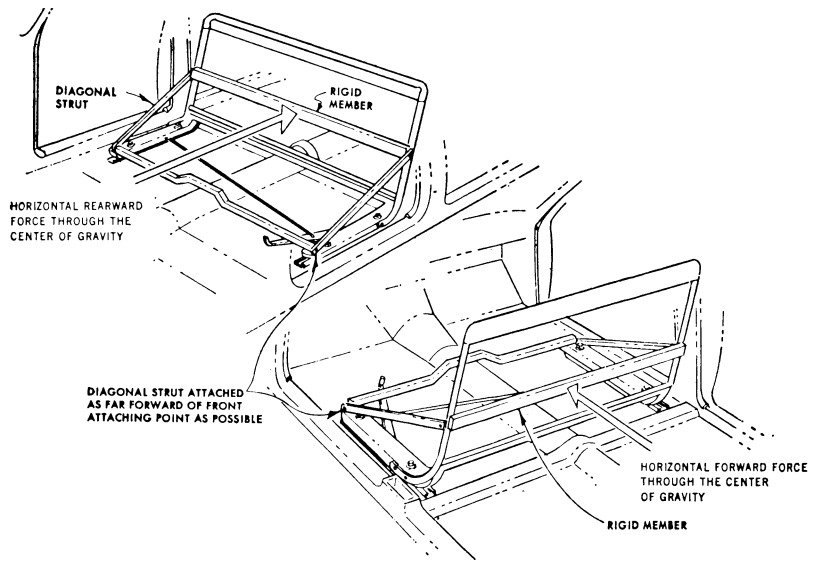


FIGURE 1

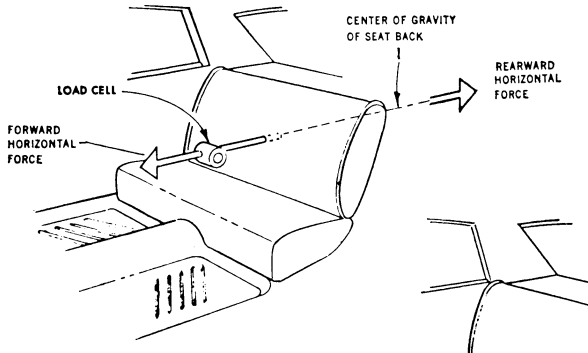


FIGURE 2

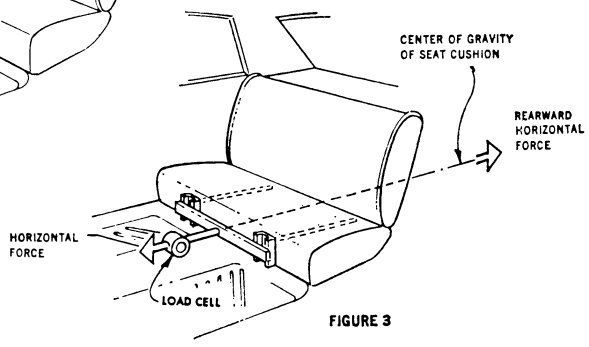


FIGURE 3

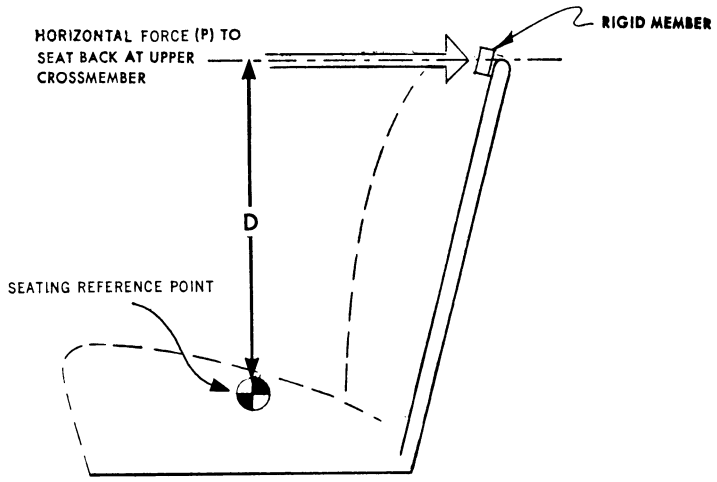


FIGURE 4

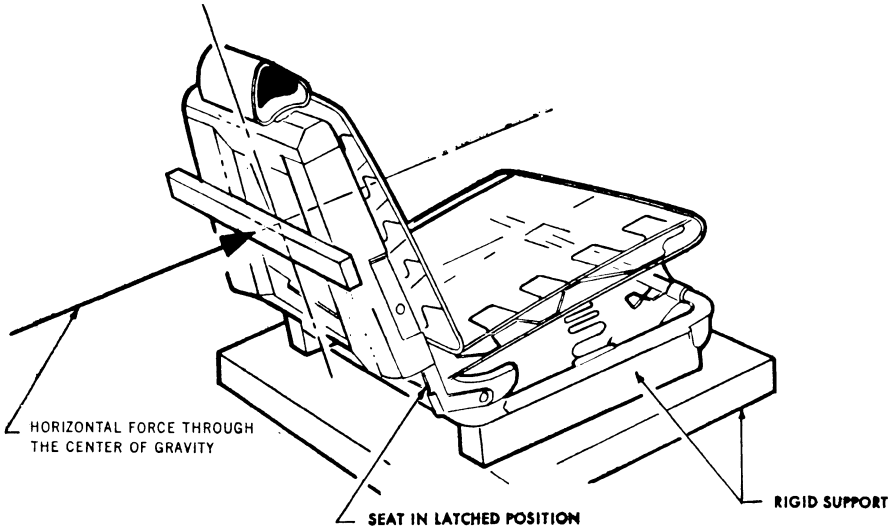


FIGURE 5

[36 FR 22902, Dec. 2, 1971, as amended at 52 FR 7868, Mar. 13, 1987; 53 FR 30434, Aug. 12, 1988; 59 FR 37167, July 21, 1994; 60 FR 13647, Mar. 14, 1995; 63 FR 28935, May 27, 1998; 73 FR 62779, Oct. 21, 2008]