Test report

No.: 22-00041-CP-PRG-00

Test of a type of a vehicle
with regard to ECE Regulation No. **14.00**
taking into consideration amendment No. **14.09, Supplement 1**
Approval subject: **Strength of safety belt anchorages**

And

Test of a type of a vehicle
with regard to ECE Regulation No. **145.00**
taking into consideration amendment No. **145.00, Supplement 00, corrigendum 01**
Approval subject: **Uniform provisions concerning the approval of vehicles with regard to ISOFIX anchorages systems ISOFIX top tether anchorages and i-Size seating positions**

Approval status		
☒	Granting of a type approval	N/A
☐	Extension/correction to type approval no.	N/A

I. General

Make	MOBIFRAME
Type:	RAM02, RAM03
Category of vehicle:	M1, N1, M2, N2
Name and address of manufacturer	OKB SP. Z O.O. ul. Szkolna 9 95-006 Bukowiec Poland
Reference number of information folder:	MOBIFRAME/04/2022-00
Date of issue of information folder:	16.09.2022

II. Test results

Refer to the Annex

III. Enclosures

Information Folder

IV. Statement of conformity

The mentioned information folder and the type described therein are in accordance with the test basis mentioned above. The worst-case was selected in accordance with document "Requirements for Test Reports (AS-PB-T-02)".

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Vehicle Certification Agency (VCA)	Vereinigtes Königreich *United Kingdom*	VCA-TS-006
Approval Authority of the Netherlands (RDW)	Niederlande *The Netherlands*	RDWT-082-xx
National Standards Authority of Ireland (NSAI)	Irland *Ireland*	Technical Service Number: 49
Vehicle Safety Certification Center (VSCC)	Taiwan/Taiwan	DE04-06-2
Société Nationale de Certification et d'Homologation s.à r.l.	Luxemburg *Luxembourg*	13/B(g)
Swedish Transport Agency (STA)	Schweden *Sweden*	TT 0024

Munich, 04.10.2022

Ing. Vít Bursík
Authorized signatory

Annex

Test report

1. Technical data of the test sample

1.1	Make:	MOBIFRAME
1.2	Type:	RAM02, RAM03
1.3	Commercial description(s):	RAM02, RAM03

1.3.1. Remark

Detailed drawings and description of benches (RAM02 and RAM03) and their fixation solutions in vehicles are included in Information Document MOBIFRAME/04/2022-00 attached to this test report.

Test results and comparison of RAM02 and RAM03 anchorage points geometry and its influence on the vehicle's floor are presented in section "3. Test results" of this report.

1.4	Category of vehicle:	M1, N1, M2, N2
1.5	Test object:	Double seat bench RAM02 and RAM03 mounted in representative vehicle bodies (Mercedes Sprinter 906/907, Fiat Ducato, Renault Master) and on rigid test bench). For details see manufacturer's information folder.

1.6. Table of vehicle types for which is seat bench intended to use:

Manufacturer	Commercial description / Type	Wheelbase
Daimler / Mercedes-Benz	Sprinter, e-Sprinter (906, 907)	3250, 3665, 4325
	Sprinter (910)	3259, 3924
	Vito/Viano/V-klasse, e-Vito (639, 639/2, 639/4)	3200, 3430
VW	Crafter (2E__)	3250, 3665, 4325
	Crafter, e-Crafter (SYN__ e.g. SYN1E, SYN2E, SYN2Z)	3640, 4490
	T5 (7H_, 7E_, 7J_)	3000, 3400
	T6, T6.1, e-Transporter (7H_, 7E_, 7J_)	3000, 3400
Citroen	Jumper, e-Jumper (Y)	3000, 3450, 4035
	Jumpy (X)	3000, 3122
	Jumpy, e-Jumpy (2016)	2925, 3275
	SpaceTourer, E-SpaceTourer	2925, 3275
	Berlingo, E-Berlingo	2785, 2975
Peugeot	Boxer, e-Boxer (Y)	3000, 3450, 4035
	Expert (VF3__)	3000, 3122
	Expert, e-Expert (2016-…)	2925, 3275
	Traveller, e-Traveller	2925, 3275
	Rifter, e-Rifter	2785, 2975
Fiat	Ducato, e-Ducato (250)	3000, 3450, 4035
	Scudo (270)	3000, 3122
	Scudo (2022-…)	2925, 3275
	Talento (FJL, FFL)	3098, 3498
Opel	Movano (MR, MS, MW)	3182, 3682, 4332
	Movano, Movano-e (Y)	3000, 3450, 4035
	Vivaro (F7)	3098, 3498
	Vivaro, Vivaro-e, Vivaro e-Kombi, Zafira Life	2925, 3275
	Combo Life, Combo-e Life	2785, 2975
Renault	Master, Master E-Tech (FV, MA, VA)	3182, 3682, 4332
	Trafic (FL, L)	3098, 3498
	Trafic 2014 (JL, L)	3098, 3498
Renault Trucks	Master (MF, VF)	3182, 3682, 4332
Ford	Transit, (FA_, FD_)	2933, 3300, 3750
	Transit, e-Transit (FC_)	3300, 3750, 3954
	Transit Custom (FA_, FC_), Turneo Custom	2933, 3300
	Transit Connect (PU2)	2662, 3062
Iveco	Daily, Daily Electric (IS_)	3000, 3300, 3520, 3950, 4100, 4750

Nissan	NV200	2725
	NV300, Primastar	3098, 3498
	NV400	3182, 3682, 4332
Toyota	Pro Ace (2013-2016)	3000, 3122
	Pro Ace, Pro Ace Verso, Pro Ace Electric (2016)	2925, 3275
MAN	TGE, eTGE (SYN__ e.g. SYN1E, SYN2E, SYN2Z)	3640, 4490
MAXUS (LDV)	V80, Maxus (SV6C)	3100, 3850
	V90, Deliver 9, E-Deliver 9	3000, 3366, 3760
	Deliver 3, E Deliver 3	2910, 3285
Hyundai	H350 (EU(V))	3435, 3670
RAM	ProMaster	3000, 3450, 4035
Freightliner/Dodge	Sprinter	3250, 3665, 4325

1.7. Type of bodywork using the codes set out in Part C of Annex II of Directive 2007/46/EC and/or in Part C of Annex I of Regulation (EU) 2018/858: AC, AF, BB, CA, SA, SH

1.8. Mass of seats:

RAM02 – 62 kg – mass of the heaviest configuration

RAM02 is double seat frame with two single seats S1NOV01

RAM03 – 62 kg – mass of the heaviest configuration

RAM03 is double seat frame with two single seats S1NGR03

2. Test conditions

2.1. ECE Regulation No. 14.09

2.1.1. Instrumentation:

- Digital ballance
- Electrohydraulic test device and respective fixtures
- Force measuring chain with load cells
- Interface 1210AF
- Tape rule

2.1.2. Ambient conditions:

Normal laboratory conditions, not directly limited in Regulation

2.2. ECE Regulation No. 145.00

2.2.1. Instrumentation:

- Electro-hydraulic test equipment and control unit
- Force measuring chain
- Data acquisition unit
- Traction devices
- 3D H-point measurement device
- Tape measure

2.2.2. Ambient conditions:

Normal laboratory conditions, not directly limited in Regulation

3. Test results

3.1 Test procedures used (ECE R14):

Strength test of safety belt anchorages according to ECE R 14.09 concerning to strength of seat bench to vehicle floor.

For seat

Seat manufacturer	Seat type	Fulfilling of requirements
INTAP	S1NOV01	Test report No. BLB.056.012B
INTAP	S1NGR03	See point 3.2.6.

For seat bench

Seat manufac-turer	Seat type	Mass of the heaviest configuration (seat + legs/base)	Fulfilling of require-ments
OKB	RAM02 (RAM02 is double seat frame with two single seat S1NOV01)	62 kg	See point 3.2.1, 3.2.2., 3.2.3. and 3.2.4.
OKB	RAM03 (RAM03 is double seat frame with two single seat S1NGR03)	62 kg	See point 3.2.5 and 3.2.7. .

The below mentioned test results cover all variants including the maximum mass stated in the enclosed information document (seat bench, seat-to-vehicle anchorages, seat bench arrangement, removable elements and floor to vehicle attachment).

Geometrical requirements are fulfilled; all the seat belts anchorages are provided on- seat.

3.2. Forward facing seats for M1/N1 vehicles:

3.2.1. 2 x single seat type S1N0V01 on frame bench type RAM02 mounted on representative vehicle body structure (Mercedes Sprinter).

Mass of the heaviest possible single seat configuration covered by the test m_s = 31 kg.

Additional force applied to seat base:
F_z = 20 x ms x g (N) as relevant for M1 vehicle category.

Seat	Left	Right
Safety belt	Ar	Ar
Upper belt anchorage	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure
Required force in shoulder belt portion	13 500 ± 200 N	13 500 ± 200 N
Required force lab belt portion	13 500 ± 200 N	13 500 ± 200 N
Required force inertia	12 400 N	
Force in the shoulder belt	13 700 N / > 0,2 s	13 450 N / > 0,2 s
Force in the lap belt	13 600 N / > 0,2 s	13 500 N / > 0,2 s
Inertia force in the seat base	13 600 N / > 0,2 s	
Displacement of upper anchorage point	184 mm	191 mm
Remark: No ruptures occurred. Additional force is added to seat base. Upper anchorage points were in tolerance.		

3.2.2. 2 x single seat type S1N0V01 on frame bench type RAM02 mounted on rigid test bench.

Mass of the heaviest possible single seat configuration covered by the test m_s = 31 kg.

Additional force applied to seat base:
F_z = 20 x ms x g (N) as relevant for M1 vehicle category.

Seat	Left	Right
Safety belt	Ar	Ar
Upper belt anchorage	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure
Required force in shoulder belt portion	13 500 ± 200 N	13 500 ± 200 N
Required force lab belt portion	13 500 ± 200 N	13 500 ± 200 N
Required force inertia	12 400 N	
Force in the shoulder belt	13 700 N / > 0,2 s	13 500 N / > 0,2 s
Force in the lap belt	13 600 N / > 0,2 s	13 550 N / > 0,2 s
Inertia force in the seat base	13 600 N / > 0,2 s	
Displacement of upper anchorage point	168 mm	210 mm
Remark: No ruptures occurred. Additional force is added to seat base. Upper anchorage points were in tolerance.		

3.2.3. Frame bench type RAM02 on fixation plate in the representative vehicle (Renault Master).
Mass of the heaviest possible single seat configuration covered by the test m_s = see table kg.
Additional force applied to seat base:
F_z = 20 x ms x g (N) as relevant for M1 vehicle category.

Type of seat	RAM02 (left seat)	RAM02 (right seat)
Safety belt	Ar	Ar
Upper belt anchorage	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure
Mass of seat/seats	62 kg	
Required force in upper anchorage point	13 500 N ± 200 N	13 500 N ± 200 N
Required force in lower anchorage point	13 500 N ± 200 N	13 500 N ± 200 N
Max force in upper anchorage point	13 800 N/ > 0,2 s	13 900 N/ > 0,2 s
Max. force in lower anchorage point	13 500 N/ > 0,2 s	14 000 N/ > 0,2 s
Required force inertia	12 400 N	
Inertia force in the seat base	12 900 N /> 0,2 s	
Displacement of upper anchorage point	82 mm	97 mm
Where was applied additional force	CoG	

3.2.4. Seat bench type RAM02 mounted on lowered fixation plate in the representative vehicle (Fiat Ducato).
Mass of the heaviest possible single seat configuration covered by the test m_s = see table kg.
Additional force applied to seat base:
F_z = 20 x m_s x g (N) as relevant for M1 vehicle category.

Type of seat	RAM02 (left seat)	RAM02 (right seat)
Safety belt	Ar	Ar
Upper belt anchorage	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure
Mass of seat/seats	62 kg	
Required force in upper anchorage point	13 500 N ± 200 N	13 500 N ± 200 N
Required force in lower anchorage point	13 500 N ± 200 N	13 500 N ± 200 N
Max force in upper anchorage point	14 450 N/ > 0,2 s	14 300 N/ > 0,2 s
Max. force in lower anchorage point	14 800 N/ > 0,2 s	14 350 N/ > 0,2 s
Required force inertia	12 400 N	
Inertia force in the seat base	13 500 N /> 0,2 s	
Displacement of upper anchorage point	244 mm	203 mm
Where was applied additional force	CoG	

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3.2.5. Seat bench RAM03 mounted on the rigid frame.

Two single dummy seats in rear row mounted on the seat bench (RAM03).
Mass of the single seat with seat bench m_s = 36 kg.
Additional force applied F_z = 20 x m_s x g (N) as relevant to M1/N1 vehicle category.

Seat	Left	Right
Seat adjustment	N/A	N/A
Safety belt	Ar	Ar
Mass of the tested seat bench	2 x 36 kg	
Upper belt anchorage	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure
Required force in shoulder belt portion	13 500 ±200 N	13 500 ±200 N
Required force in lap belt portion	13 500±200 N	13 500 ±200 N
Required force inertia	14 400 N	
Force in the shoulder belt	13 700 N / > 0,2 s	13 700 N / > 0,2 s
Force in the lap belt	13 600 N / > 0,2 s	13 350 N / > 0,2 s
Displacement of upper anchorage point	188 mm	233 mm
Inertia force in the seat base	14 720 N / > 0,2 s	
Remark: No ruptures occurred. Additional force added to the seat base. Test is positive.		

3.2.6. Seat type S1NGR03 mounted on rigid plate.

Mass of the heaviest possible single seat configuration covered by the test m_s = 22 kg.

Additional force applied to seat base:
F_z = 20 x ms x g (N) as relevant for M1 vehicle category.

Seat	S1NGR03
Safety belt	Ar
Upper belt anchorage	Seat structure
Lower belt anchorages	Seat structure
Required force in shoulder belt portion	13 500 ± 200 N
Required force lab belt portion	13 500 ± 200 N
Required force inertia	4 400N (5 600 N*****)
Force in the shoulder belt	14 000 N / > 0,2 s
Force in the lap belt	15 500 N / > 0,2 s
Inertia force in the seat base	5 700 N / > 0,2 s
Displacement of upper anchorage point	216 mm
Remark: No ruptures occurred. Additional force is added to seat base. Upper anchorage points were in tolerance. ***Based on test results above - maximum allowable mass (seat + leg) can be 38 kg**.	

3.2.7. Comparison of RAM02 with 2 seats S1NOV01 (total mass 62 kg) and RAM03 with 2 seats S1NGR03 (total mass 62 kg) in terms of force moment exerted on the vehicle floor.

3.2.7.1. Presented calculation of force moments proves (see below), that RAM03 can be used in the same fixation solutions as RAM02 (for details see Information Document MOBIFRAME/04/2022-00), where total mass of the bench does not exceed 62 kg.

Upper anchorage height: 1,205 m
Lower anchorage height: 0,542 m
Inertia point height: 0,450 m

RAM02 (S1NOV01)	Required force		Required moment	Total moment
Shoulder belt (upper anchorage)	13 500 N		8 134 Nm	16 268 Nm
Lap belt (lower anchorage)	13 500 N		10 975 Nm	21 950 Nm
Inertia force (lower anchorage)	7 200 N		3 240 Nm	6 480 Nm
SUM			**22 349 Nm**	**44 698 Nm**

Upper anchorage height: 1,182 m
Lower anchorage height: 0,554 m
Inertia point height: 0,42 m

RAM03 (S1NGR03)	Required force		Required moment	Total moment
Shoulder belt (upper anchorage)	13 500 N		7 978 Nm	15 956 Nm
Lap belt (lower anchorage)	13 500 N		11 218 Nm	22 436 Nm
Inertia force (lower anchorage)	7 200 N		3 024 Nm	6 048 Nm
SUM			**22 220 Nm**	**44 440 Nm**

3.3. Test procedures used (ECE R145):

Test of 2 seat bench type RAM02 and RAM03 - strength of ISOFIX and Top-tether anchorages according to ECE R 145.00

Seat manufacturer	Seat type	Fulfilling of requirements
INTAP	S1NOV01	See Technical report No. 120732-15-TAC
	S1NGR03	See point 3.3.

The below mentioned test results cover all variants including the maximum mass stated in the enclosed information document (seat, seat-to-vehicle anchorages, seat arrangement).

Seat bench manufacturer	Name	Vehicle category	Direction of test forces	Fulfilling of requirements
OKB	RAM03 without TOP TETHER	M1, N1, M2, N2	Forward	See point 3.3.1.
	RAM03 without TOP TETHER	M1, N1 M2, N2	Oblique	See point 3.3.2.

Note: For M1 category minimum 2 seats with ISOFIX anchorage systems and their ISOFIX top tether anchorages shall be mounted. At least one of them shall be in 2nd row of seats.

In case of special purpose M1 vehicle (motor-caravan) converted from N1 or N2 base vehicle, according to Commission Regulation 2018/858 and Directive 2007/46, ISOFIX and top tether anchorages are only optional (therefore, no ISOFIX or only lower ISOFIX anchorage points are acceptable).

3.3.1.1. Single seat type S1NGR03 of seat bench Type RAM03 (single seat S1NGR03) - ISOFIX without Top Tether – forward direction

Seat	S1NGR03
Required force	8 000 N
Max. measured force	8 400 N
Displacement of X point SFAD device (max 125 mm)	76 mm
Result	Without failure

3.3.1.2. Single seat type S1NGR03 of seat bench Type RAM03 (single seat S1NGR03) - ISOFIX without Top Tether – oblique direction

Seat	S1NGR03
Required force	5 000 N
Max .measured force	5 400 N
Displacement of X point SFAD device (max 125 mm)	74 mm
Result	Without failure

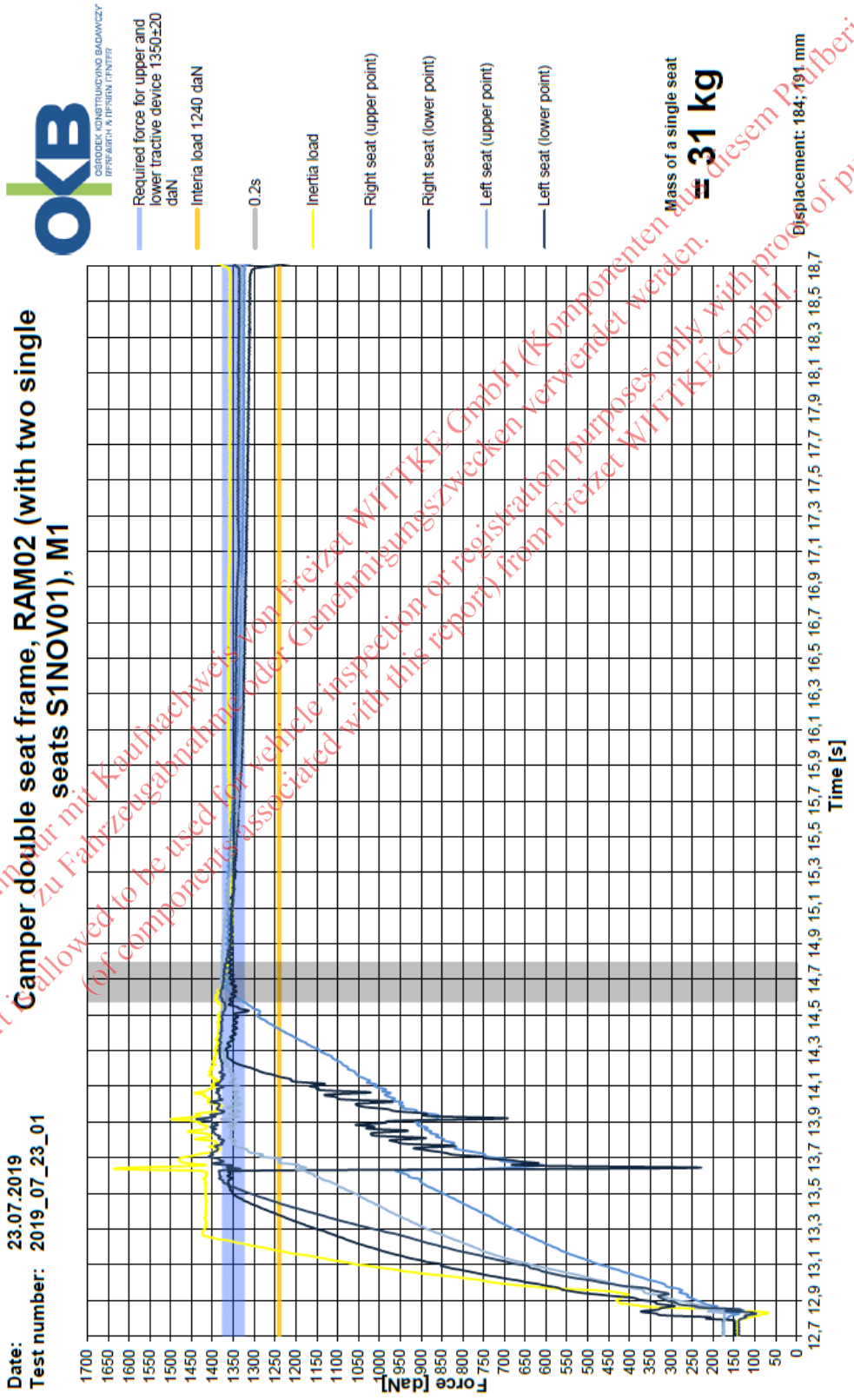
3.4. Final assessment:

Presented test results prove, that seat benches RAM02 and RAM03 meet the requirements of ECE Regulation 14-09 and Regulation 145-00 and can be used in the M1, N1, M2 and N2 vehicles, if they are fixed as presented in Information Document MOBIFRAME/04/2022-00).

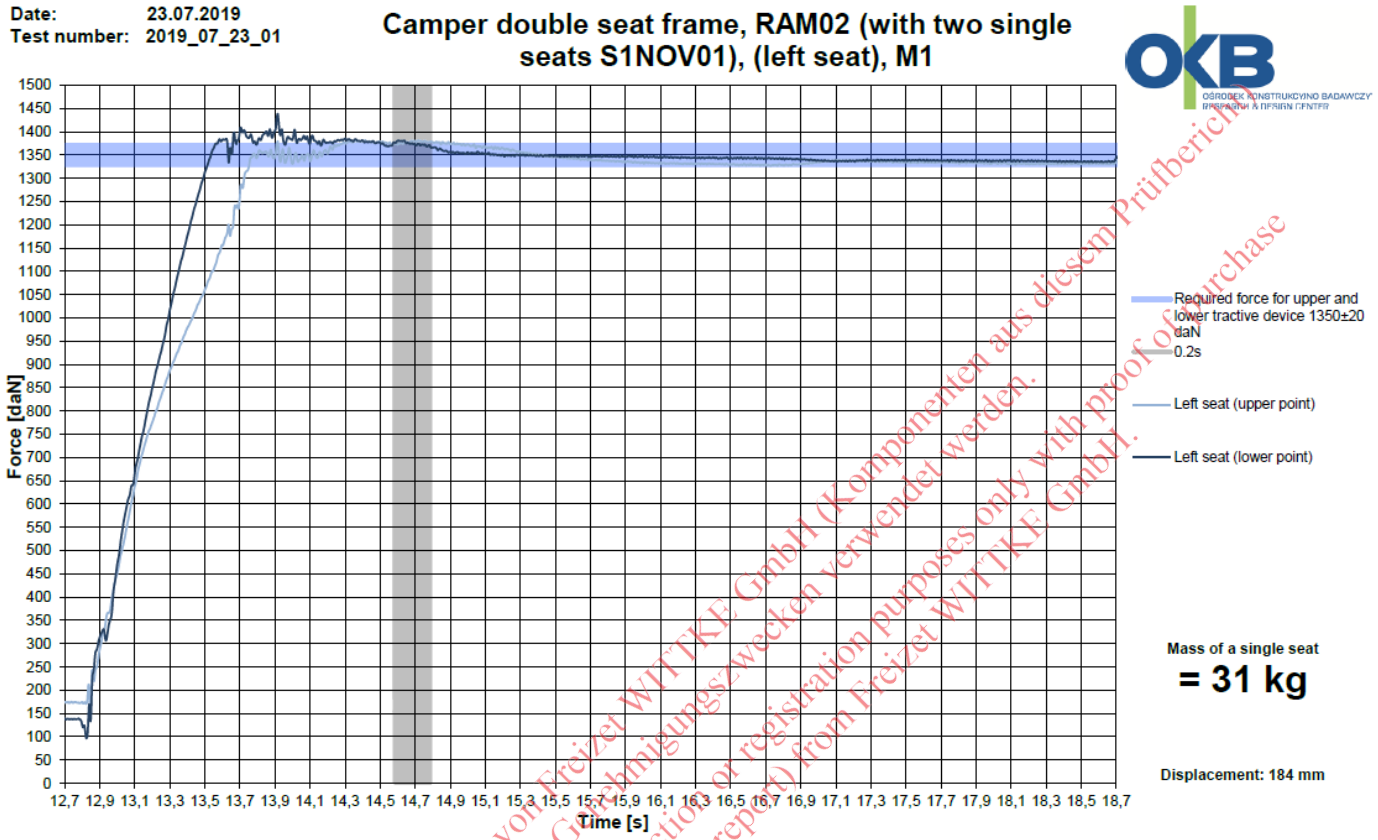
3.6. Test records

3.6.1. Graphs:

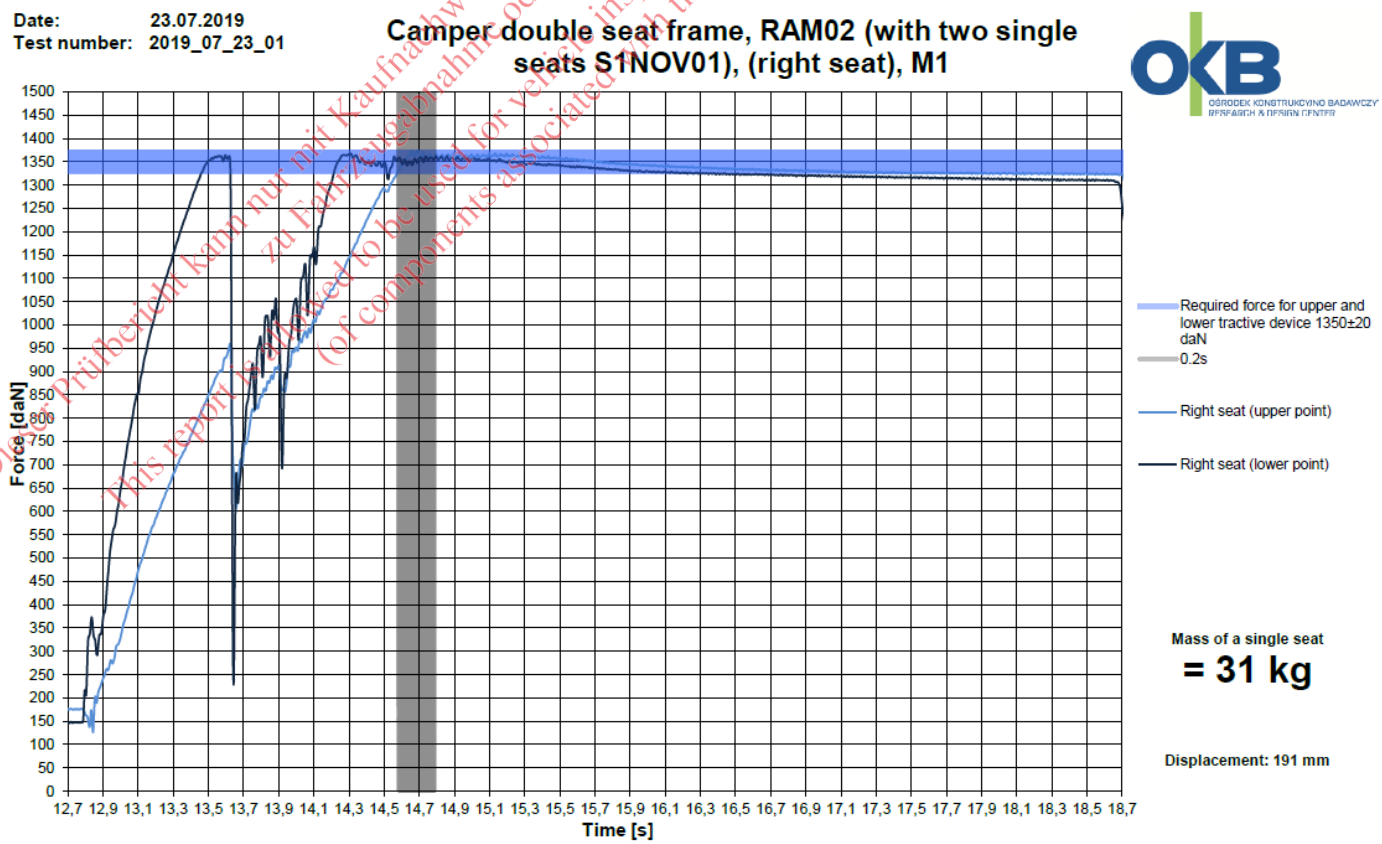
3.2.1. - 2 seats S1NOV01 on frame type RAM02



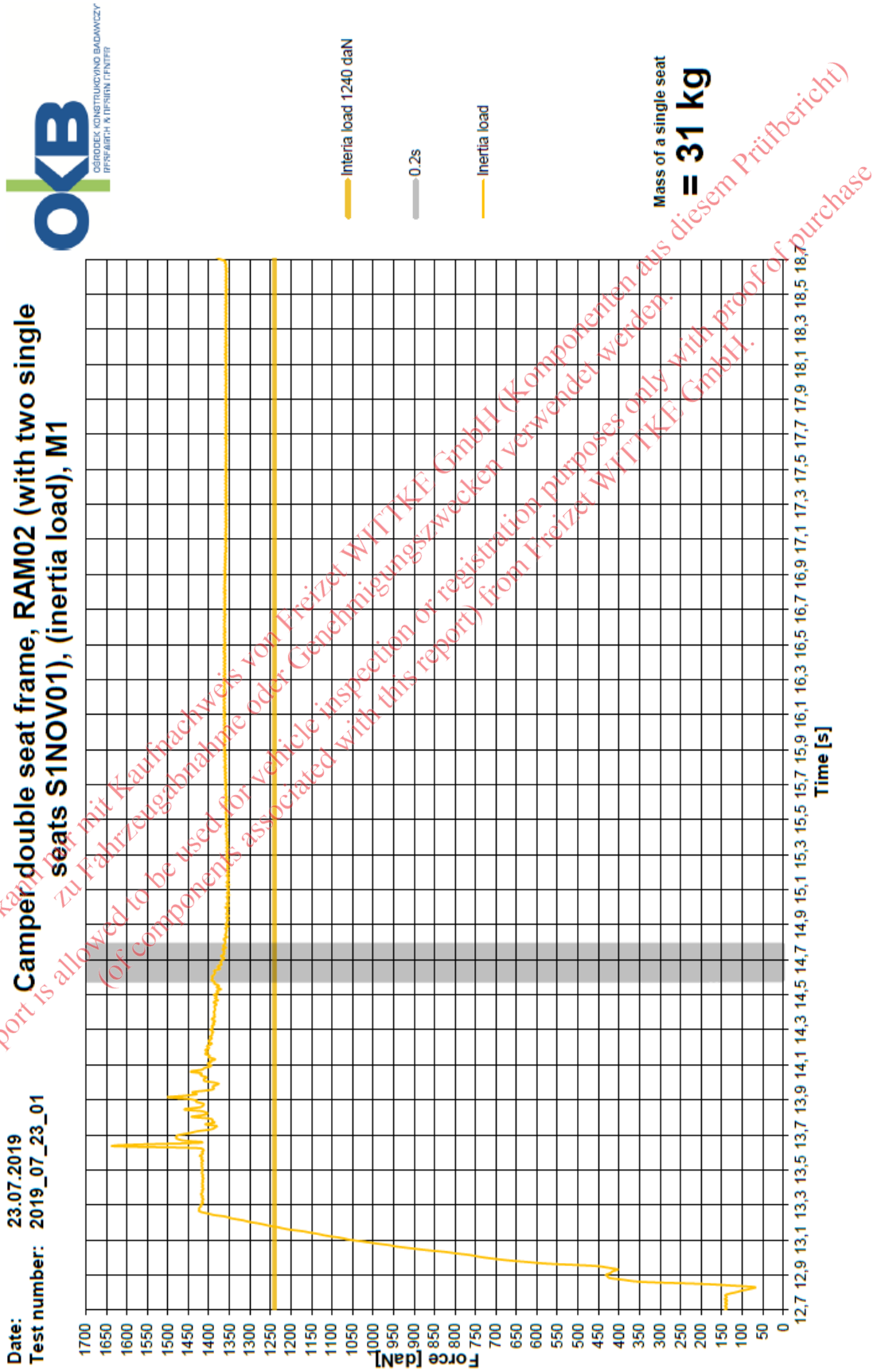
3.2.1. Left seat - type S1NOV01 mounted on frame type RAM02



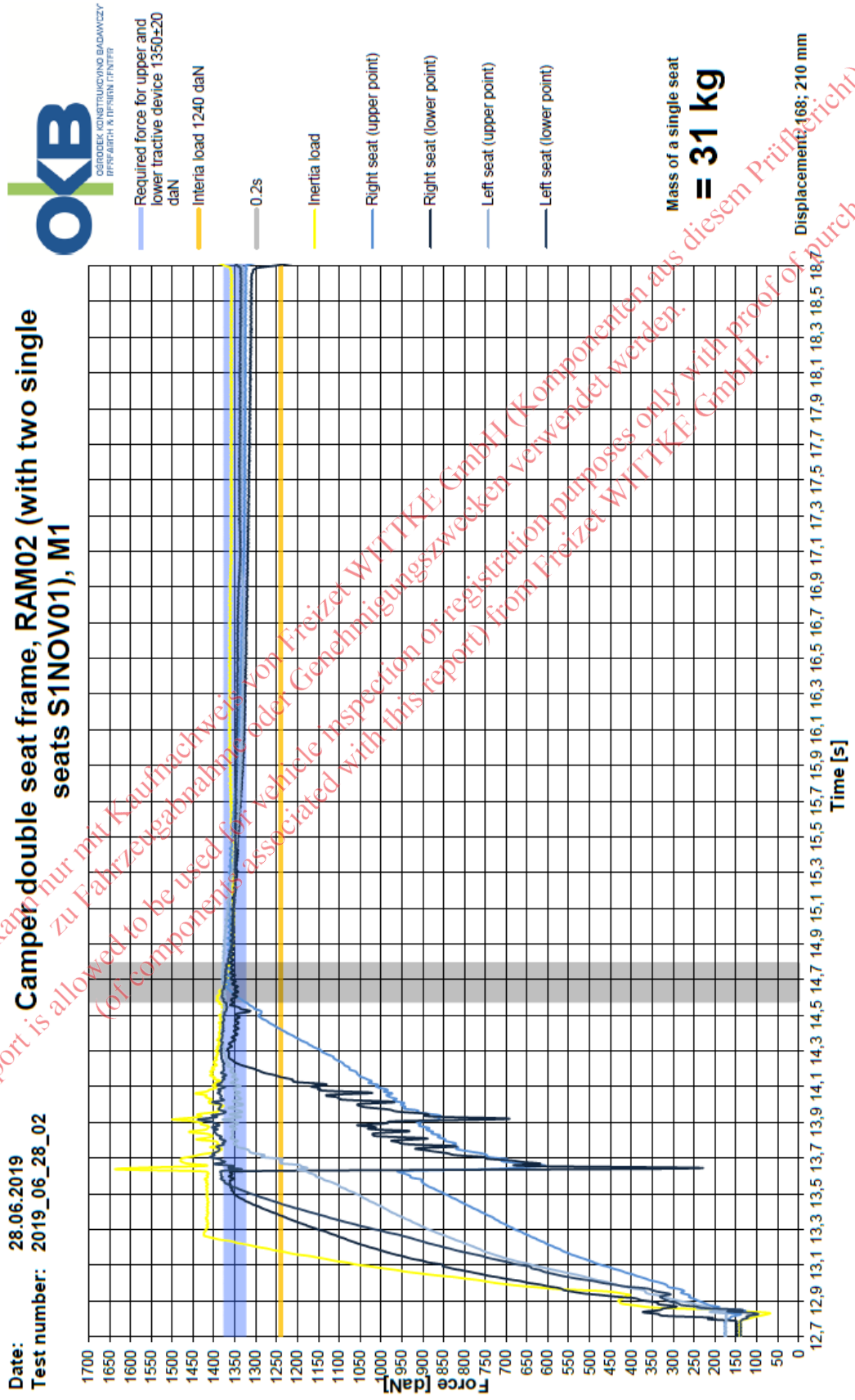
3.2.1. Right seat - type S1NOV01 mounted on frame type RAM02



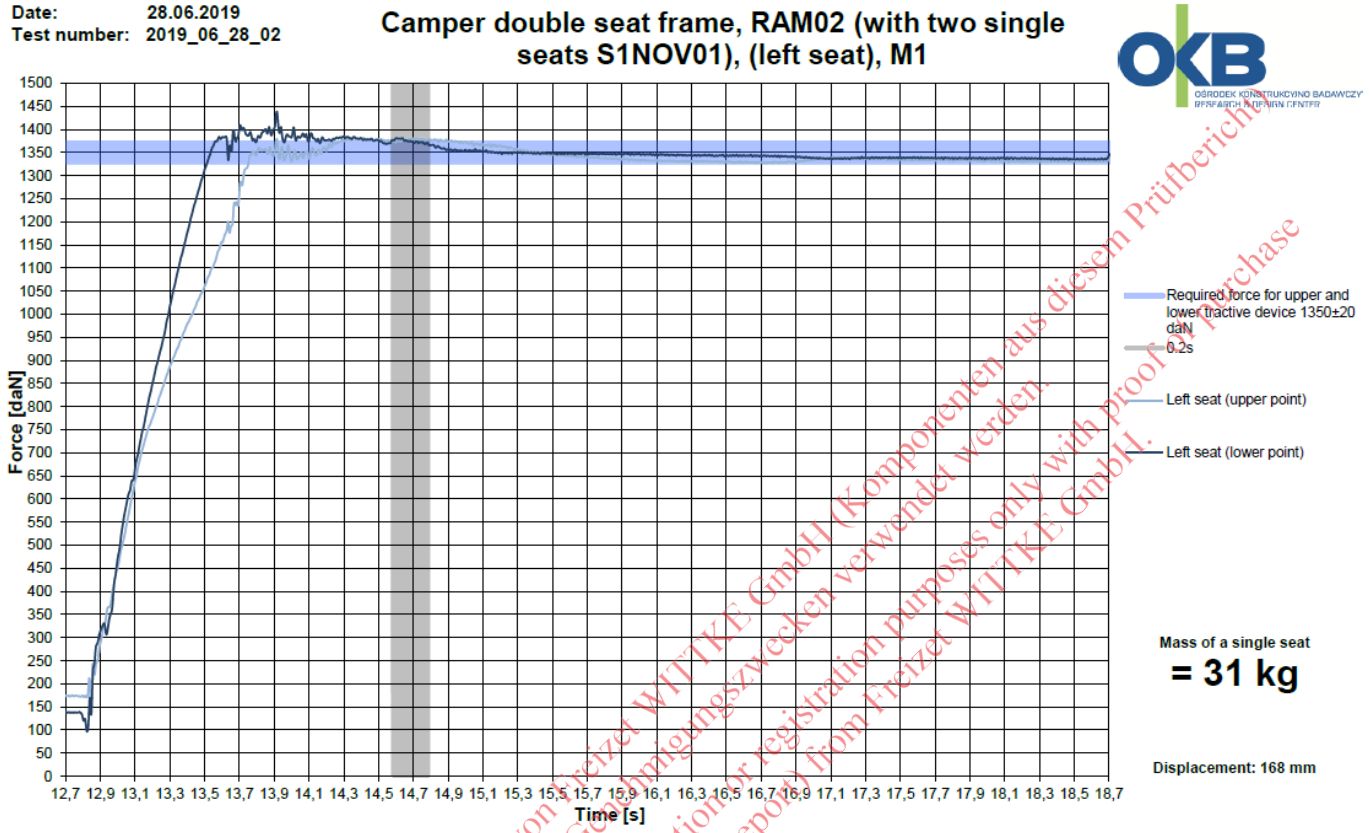
3.2.1. - Inertia load – Additional force applied to seat base (frame base)



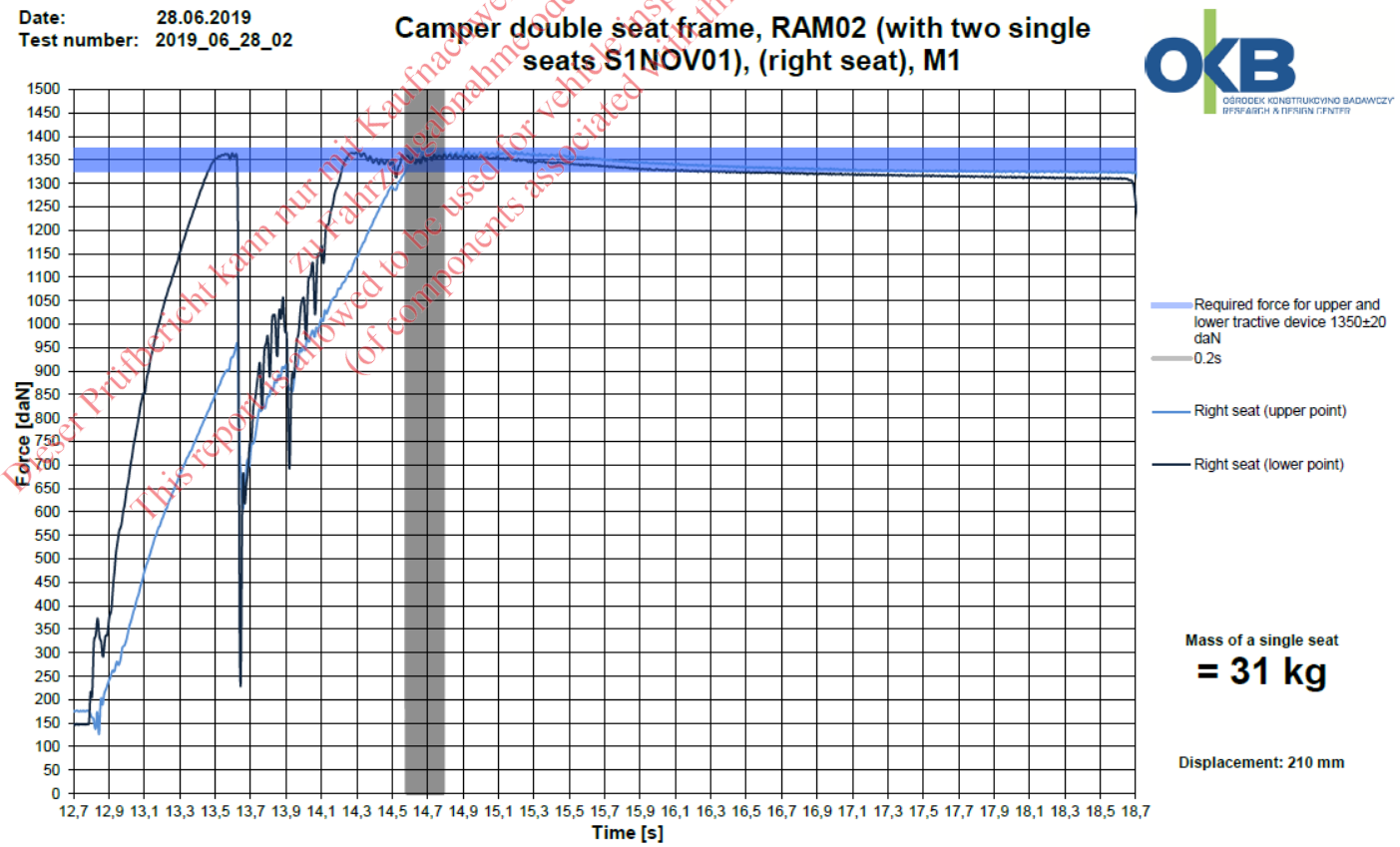
3.2.2. - 2 seats S1NOV01 on frame type RAM02 mounted on rigid test bench



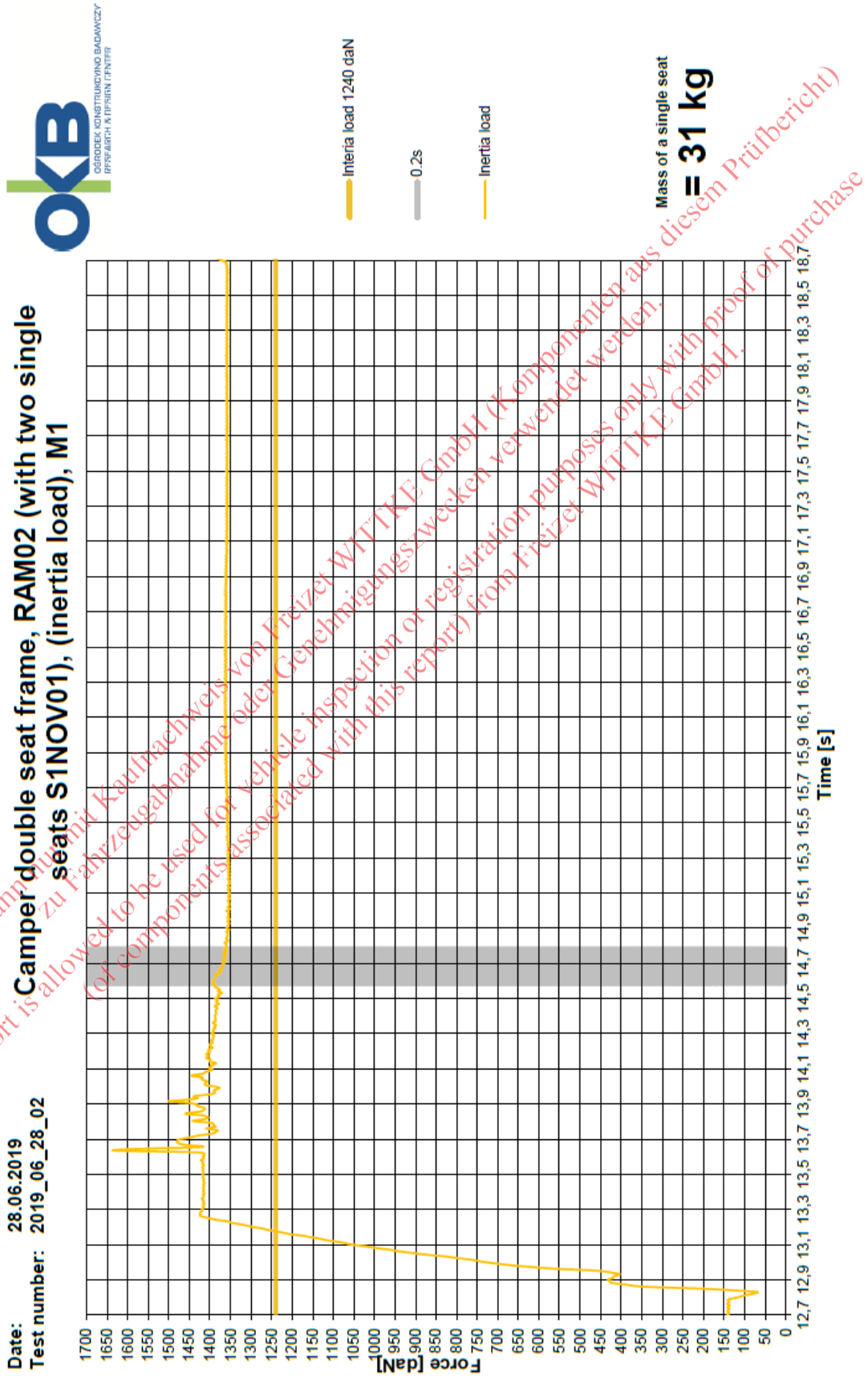
3.2.2. Left seat - type S1NOV01 mounted on frame type RAM02



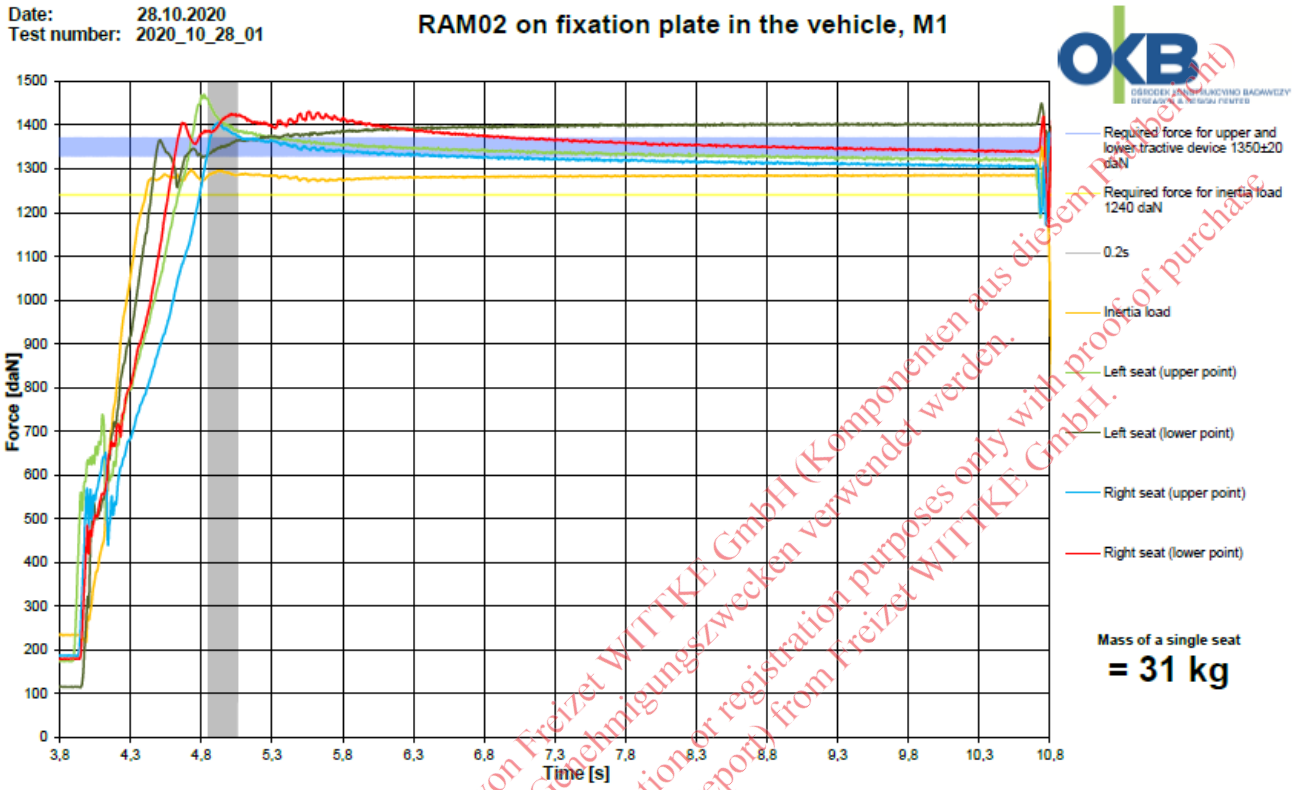
3.2.2. Right seat type S1NOV01 mounted on frame type RAM02



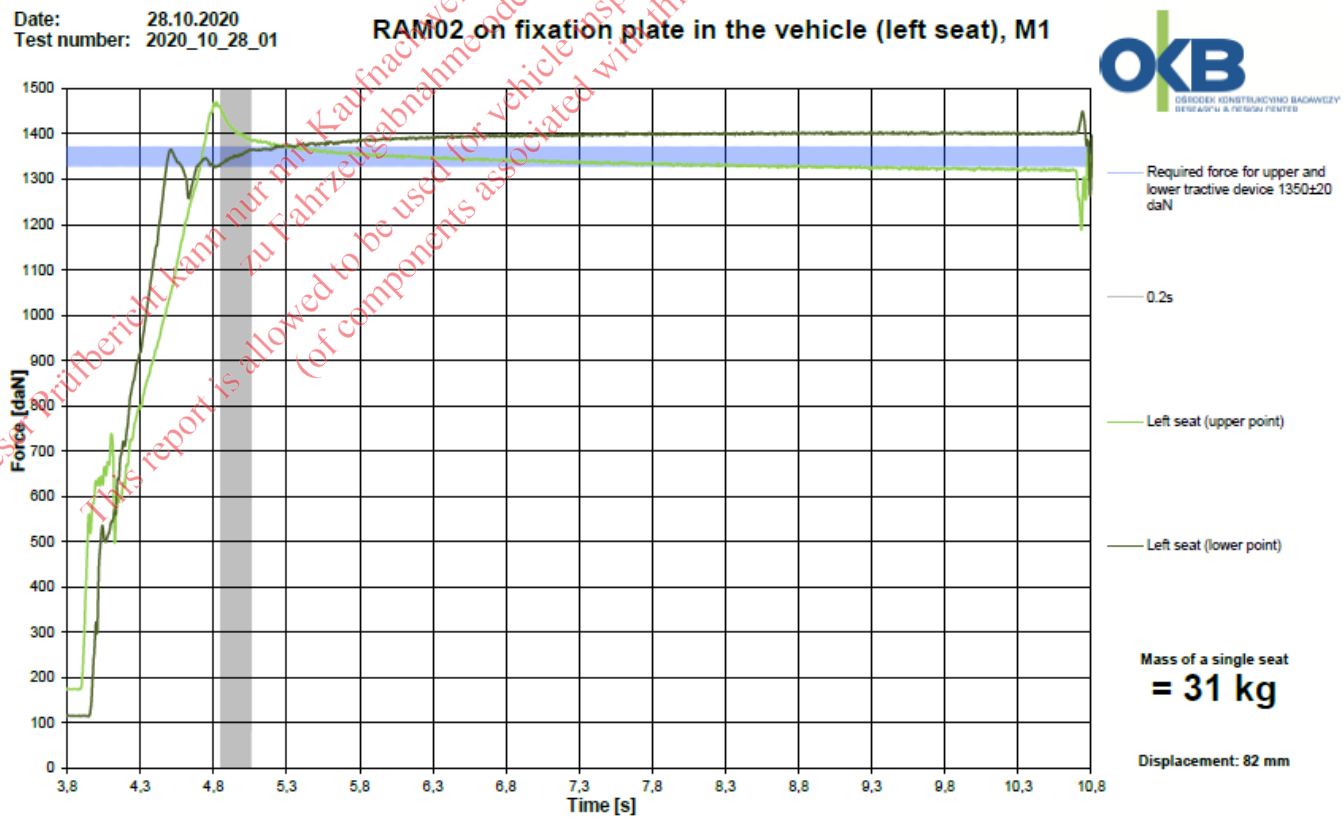
3.2.2. - Inertia load – Additional force applied to seat base (frame base)



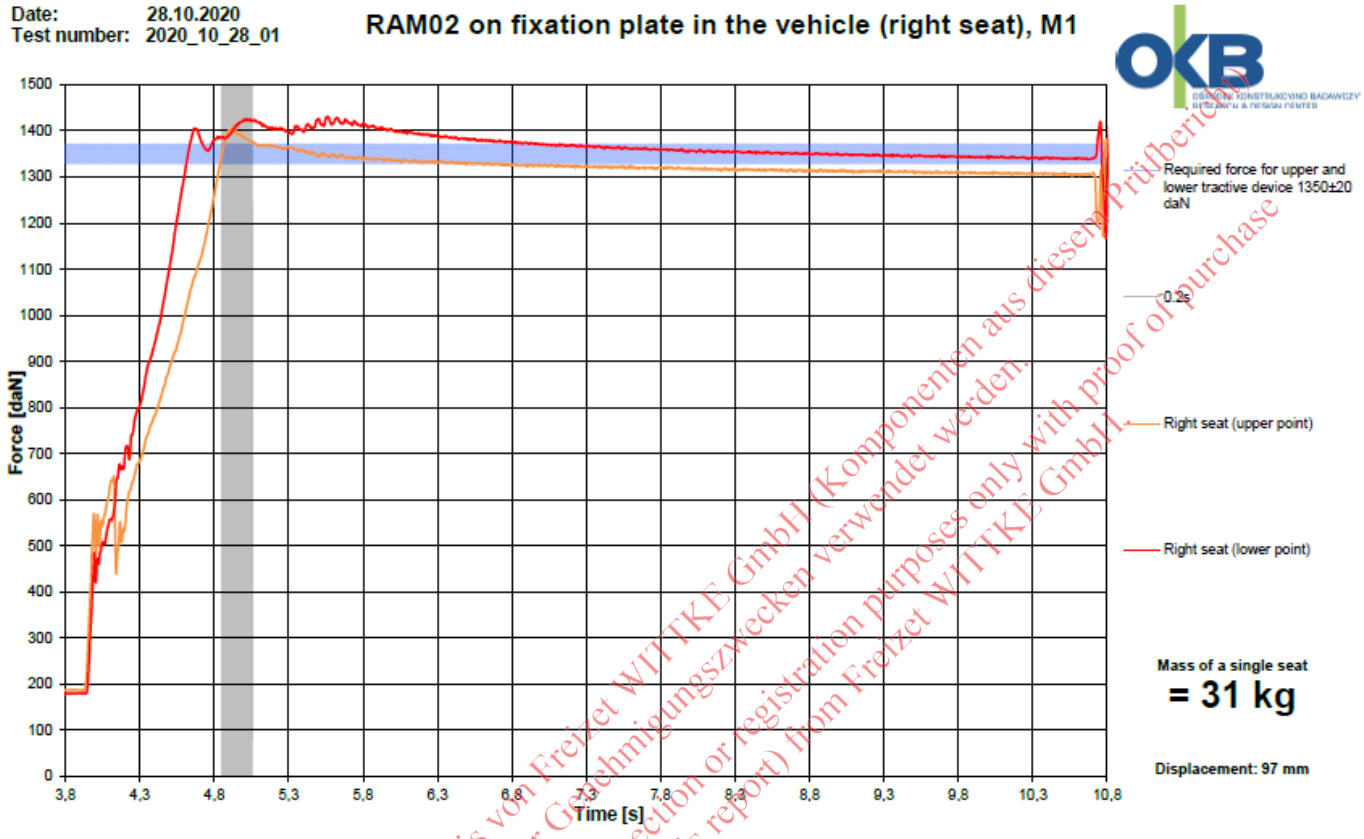
3.2.3. Frame bench type RAM02 on fixation plate in the vehicle.



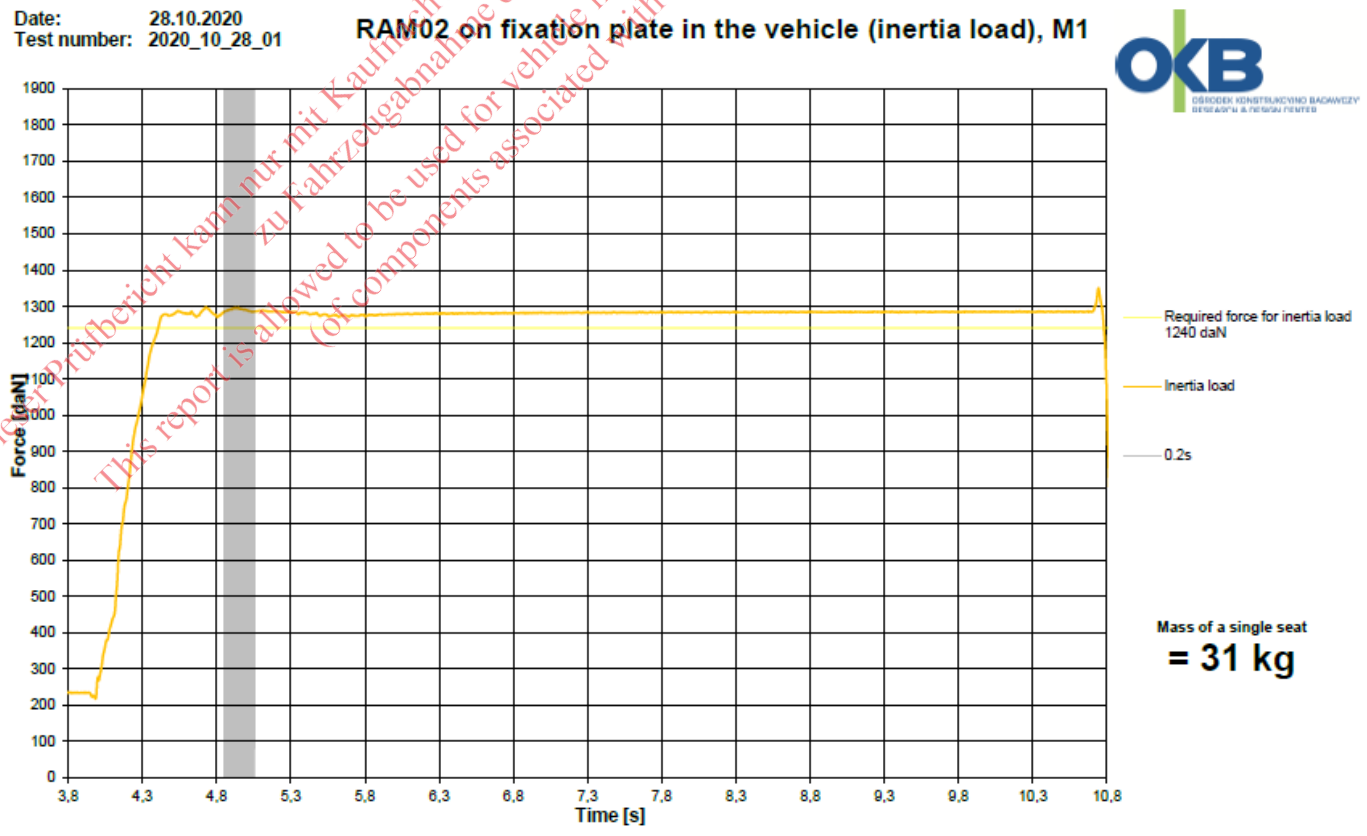
3.2.3. Frame bench type RAM02 on fixation plate in the vehicle (left seat).



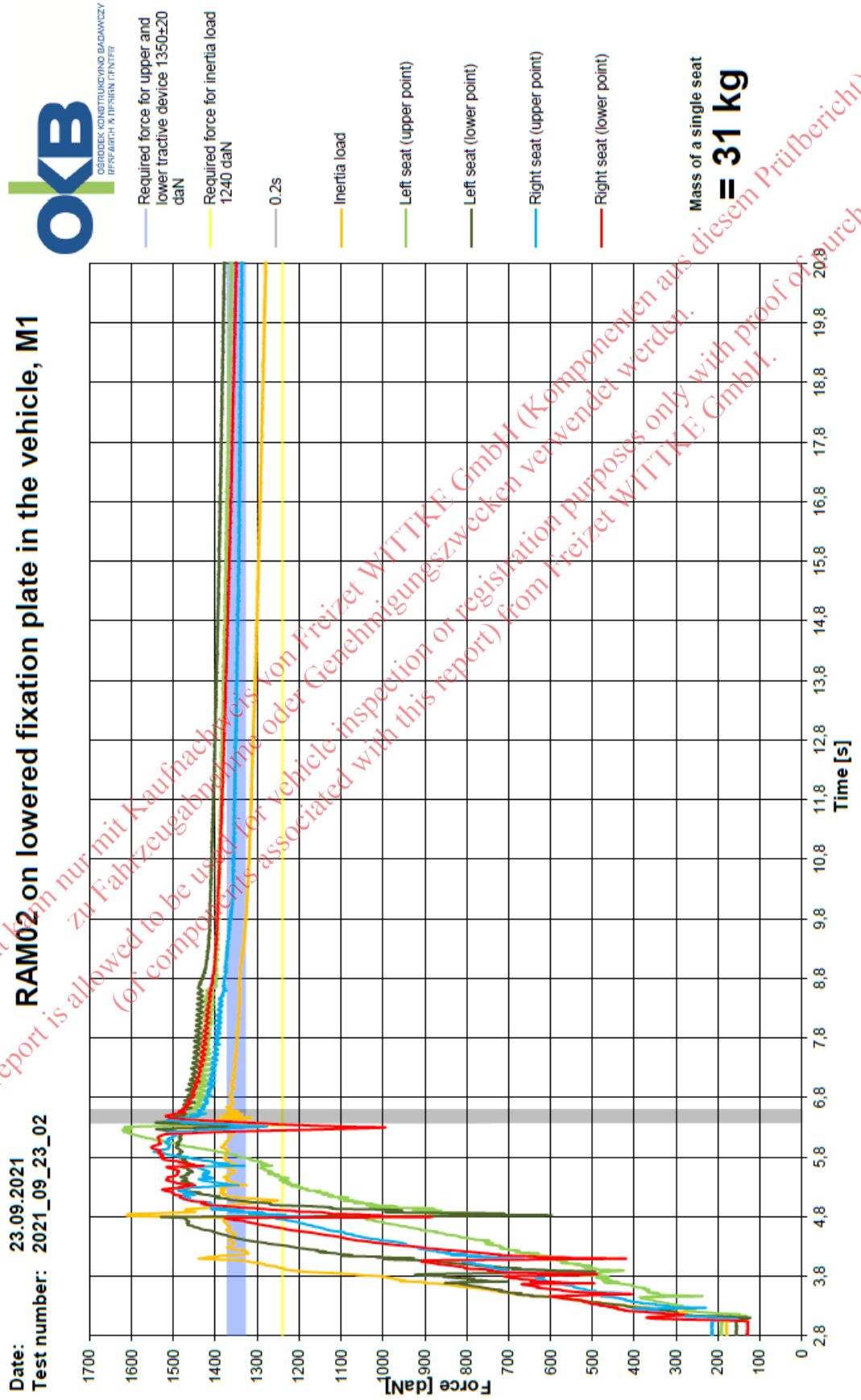
3.2.3. Frame bench type RAM02 on fixation plate in the vehicle (right seat).



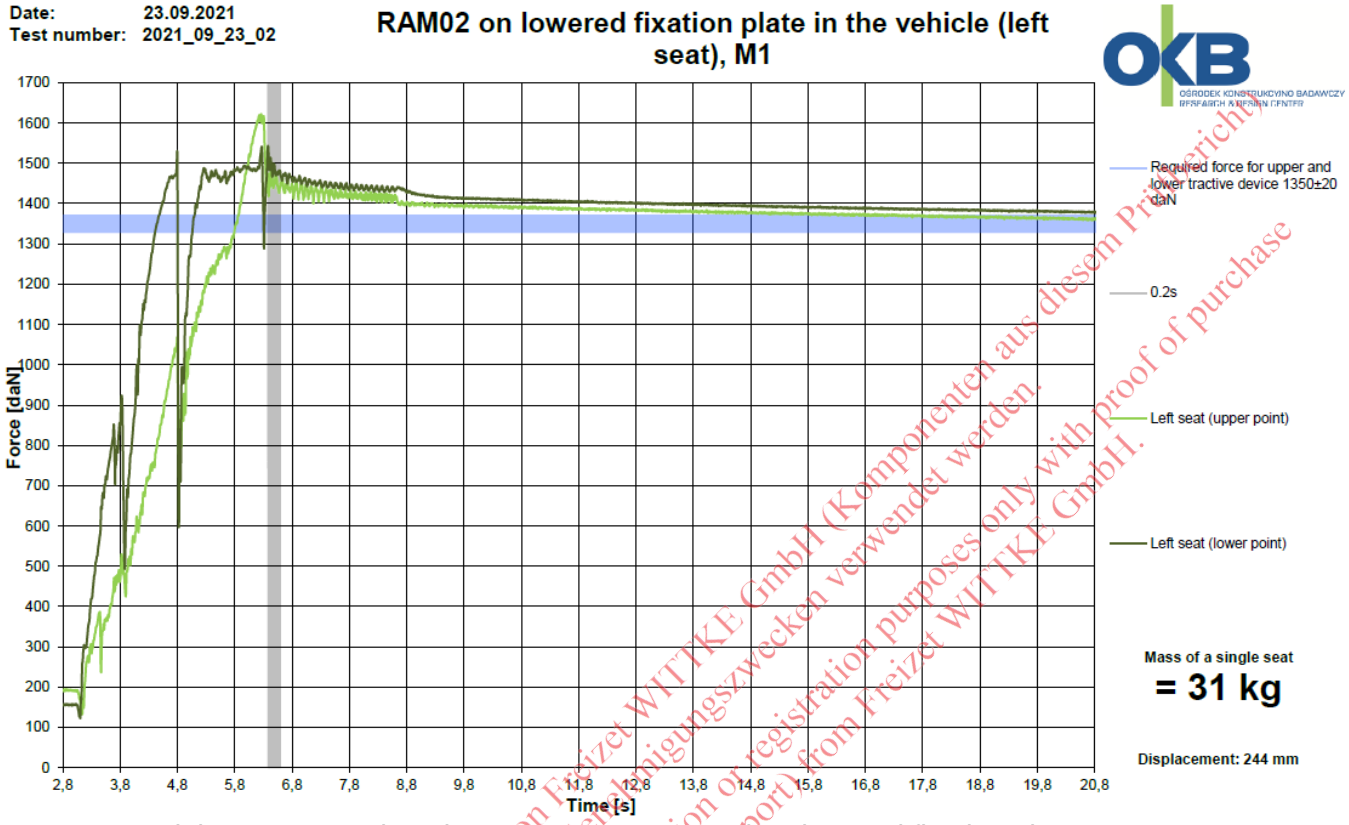
3.2.3. Frame bench type RAM02 on fixation plate in the vehicle (inertia load).



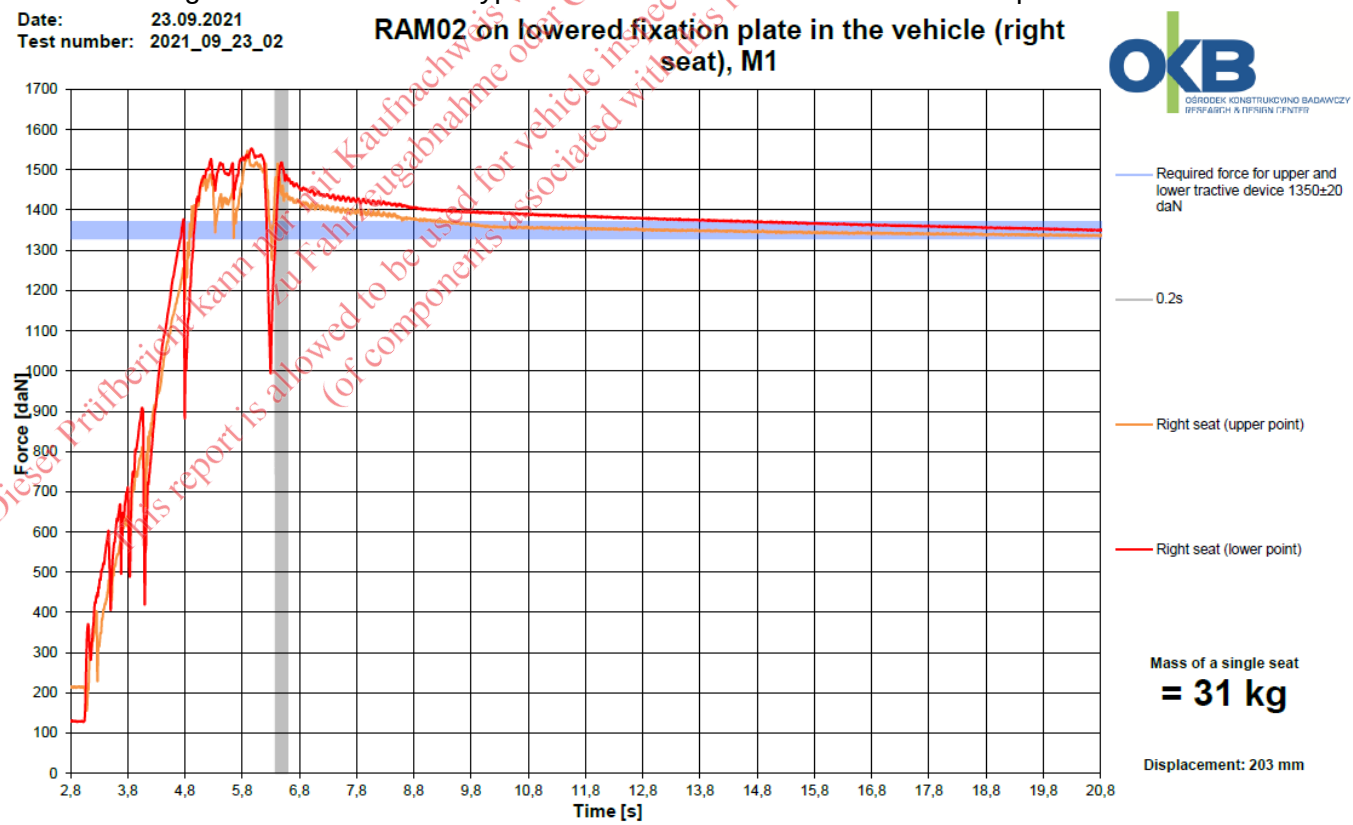
3.2.4. Seat bench type RAM02 mounted on lowered fixation plate



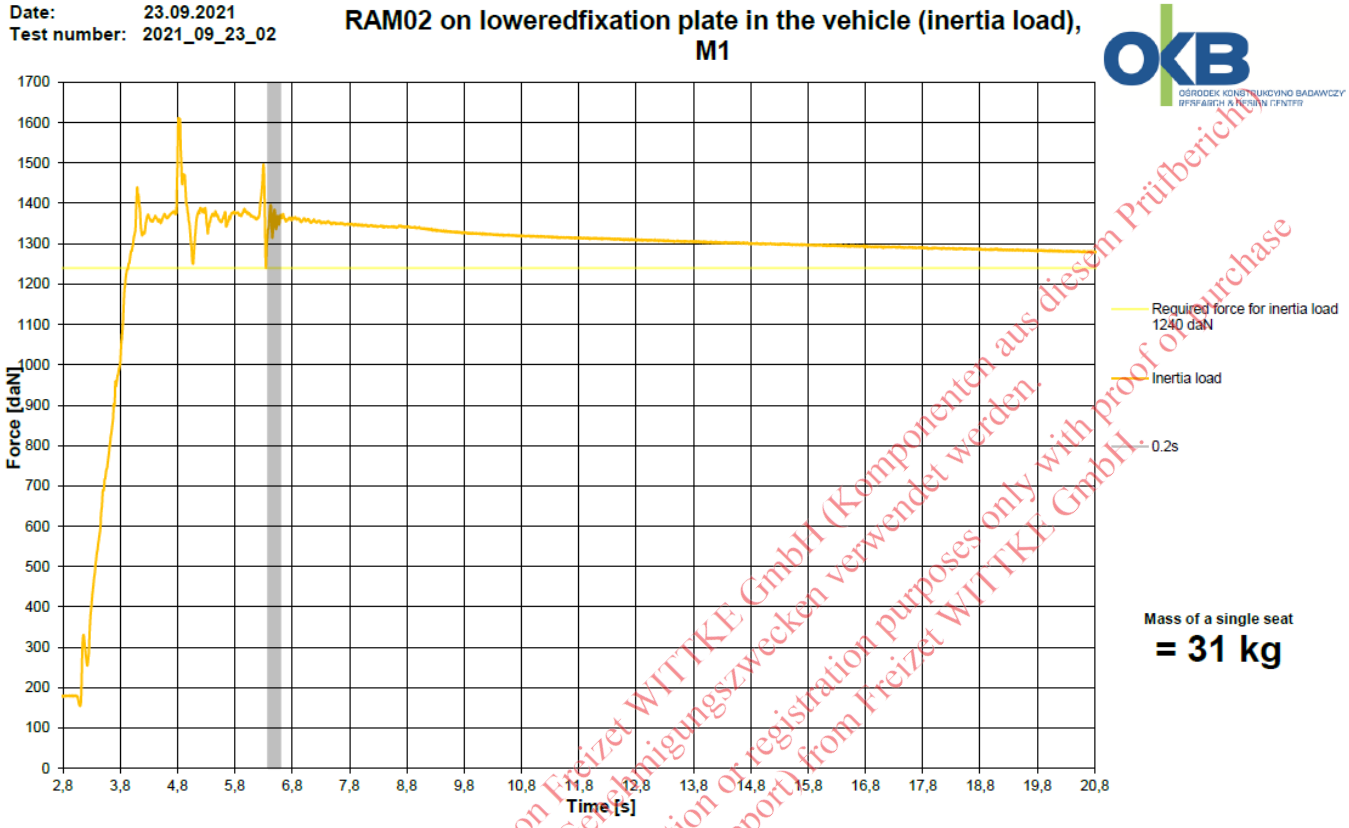
3.2.4. Left seat - Seat bench type RAM02 mounted on lowered fixation plate



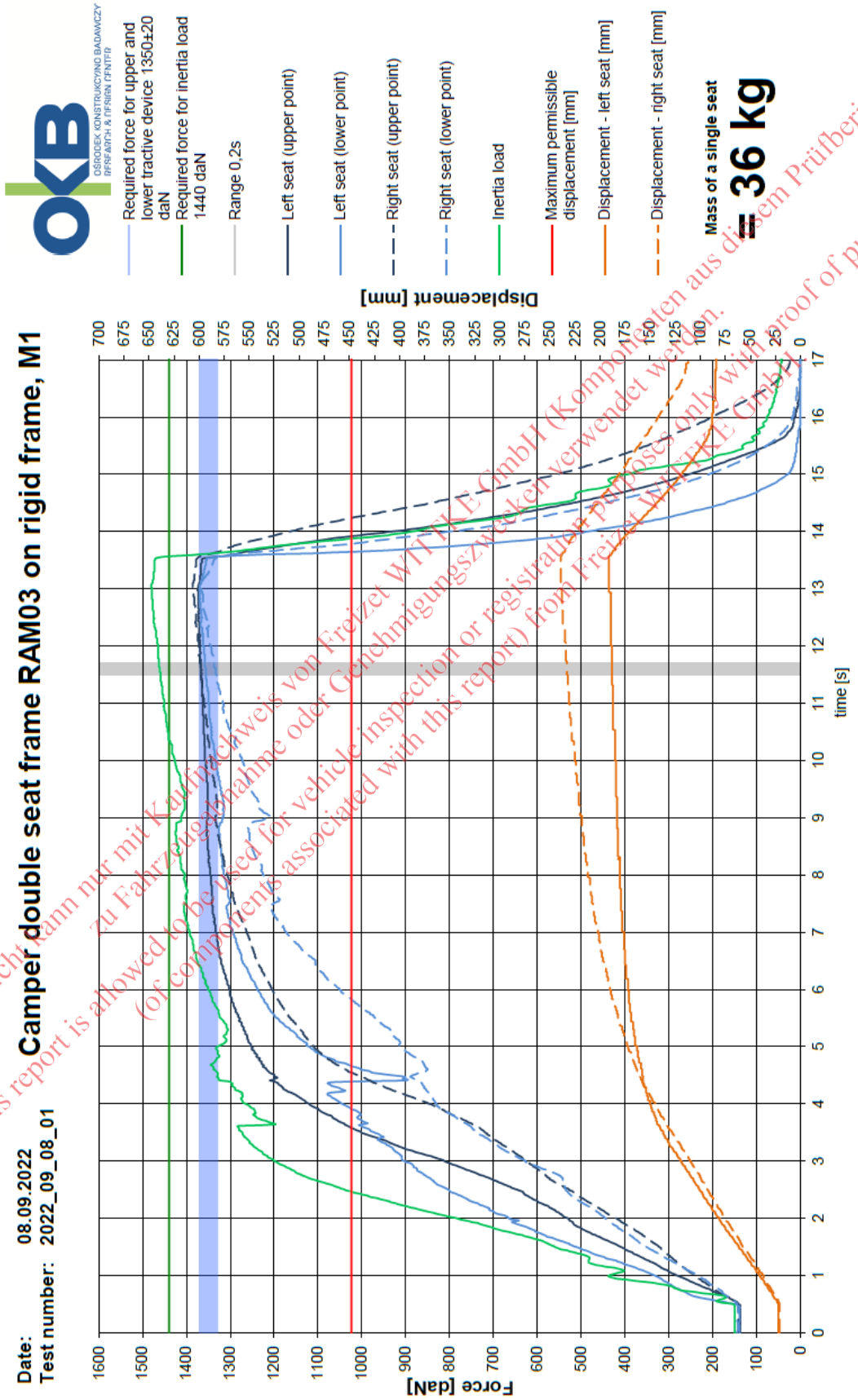
3.2.4. Right seat - Seat bench type RAM02 mounted on lowered fixation plate



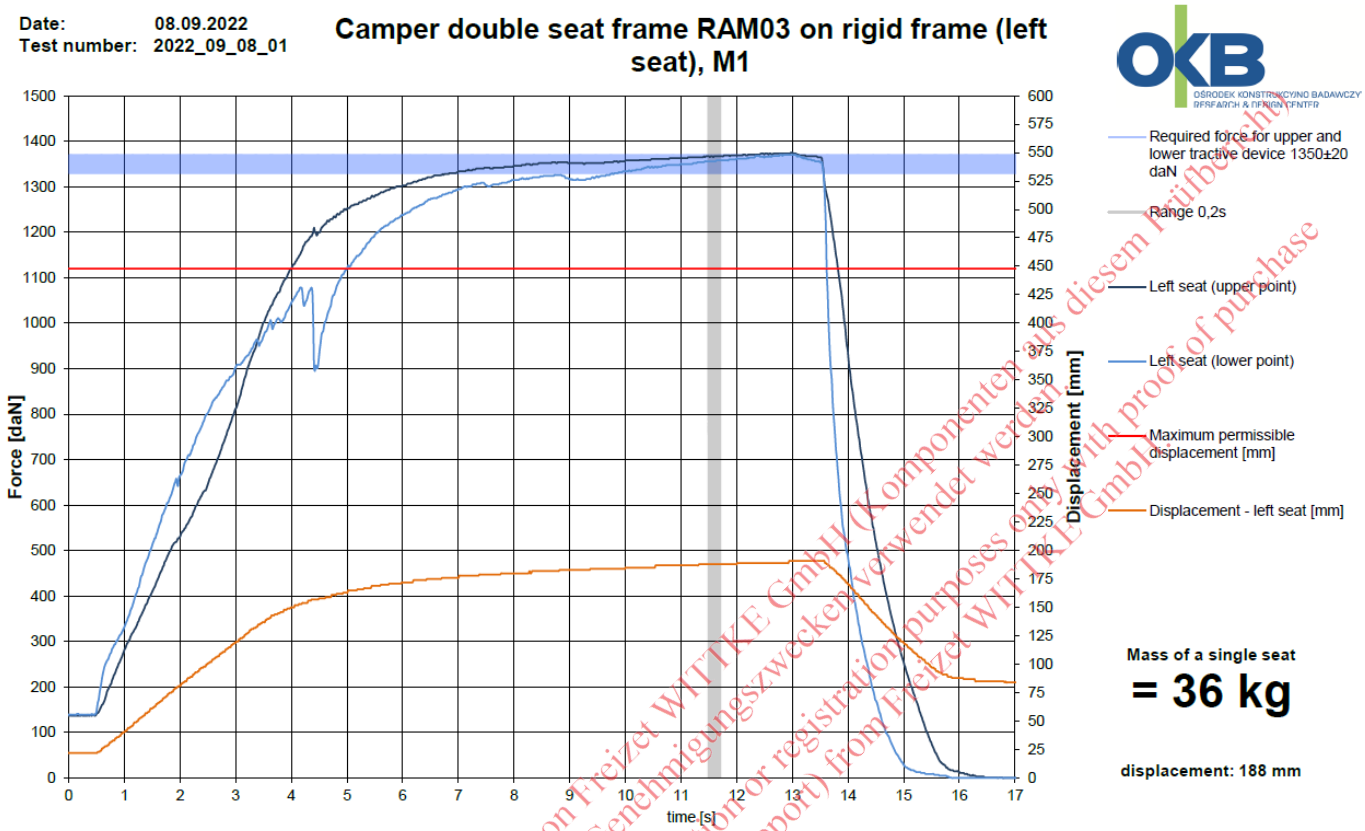
3.2.4. Inertia load - Seat bench type RAM02 mounted on lowered fixation plate



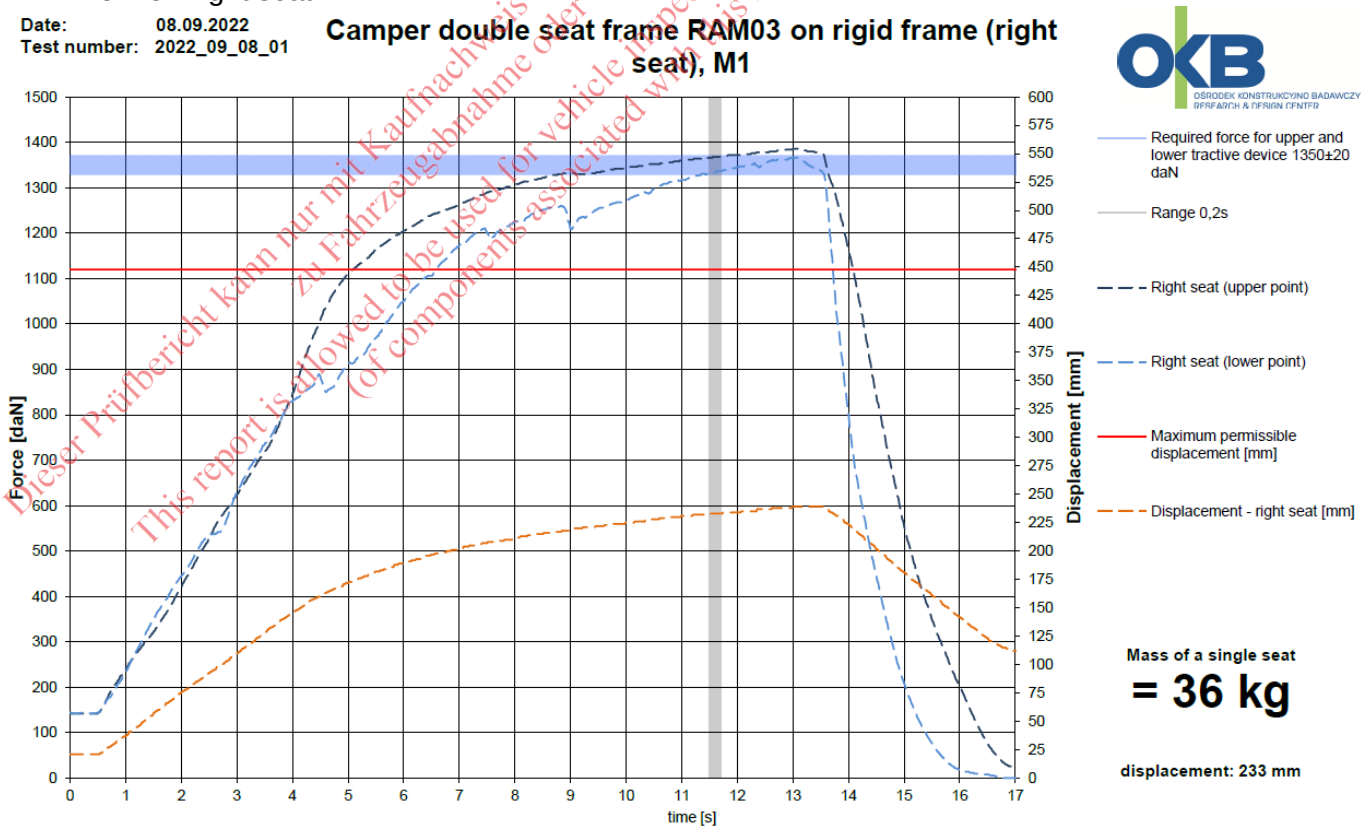
3.2.5. - 2 seats Dummy seat (S1NGR03) on frame type RAM03 mounted on rigid test bench



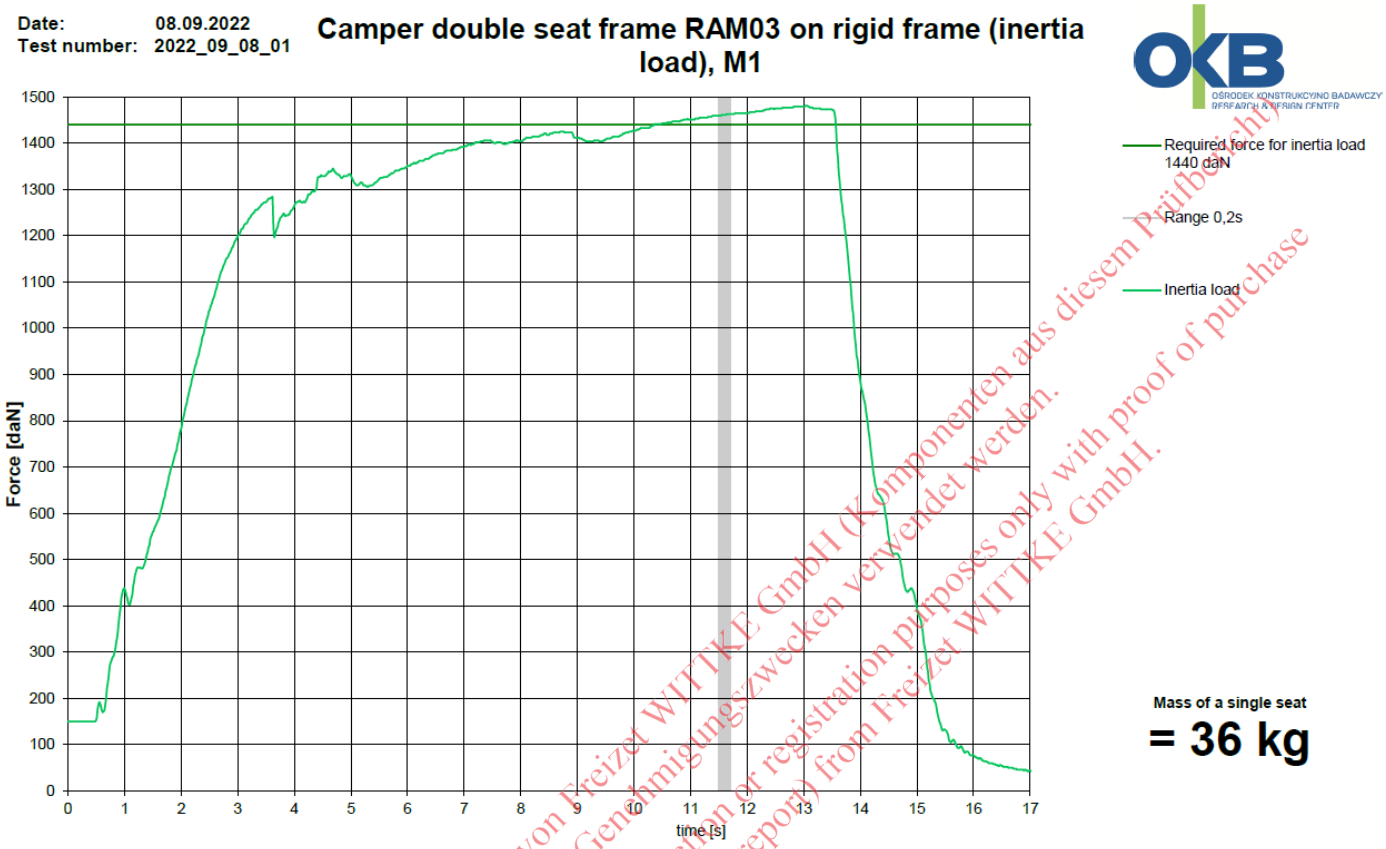
3.2.5. Left seat



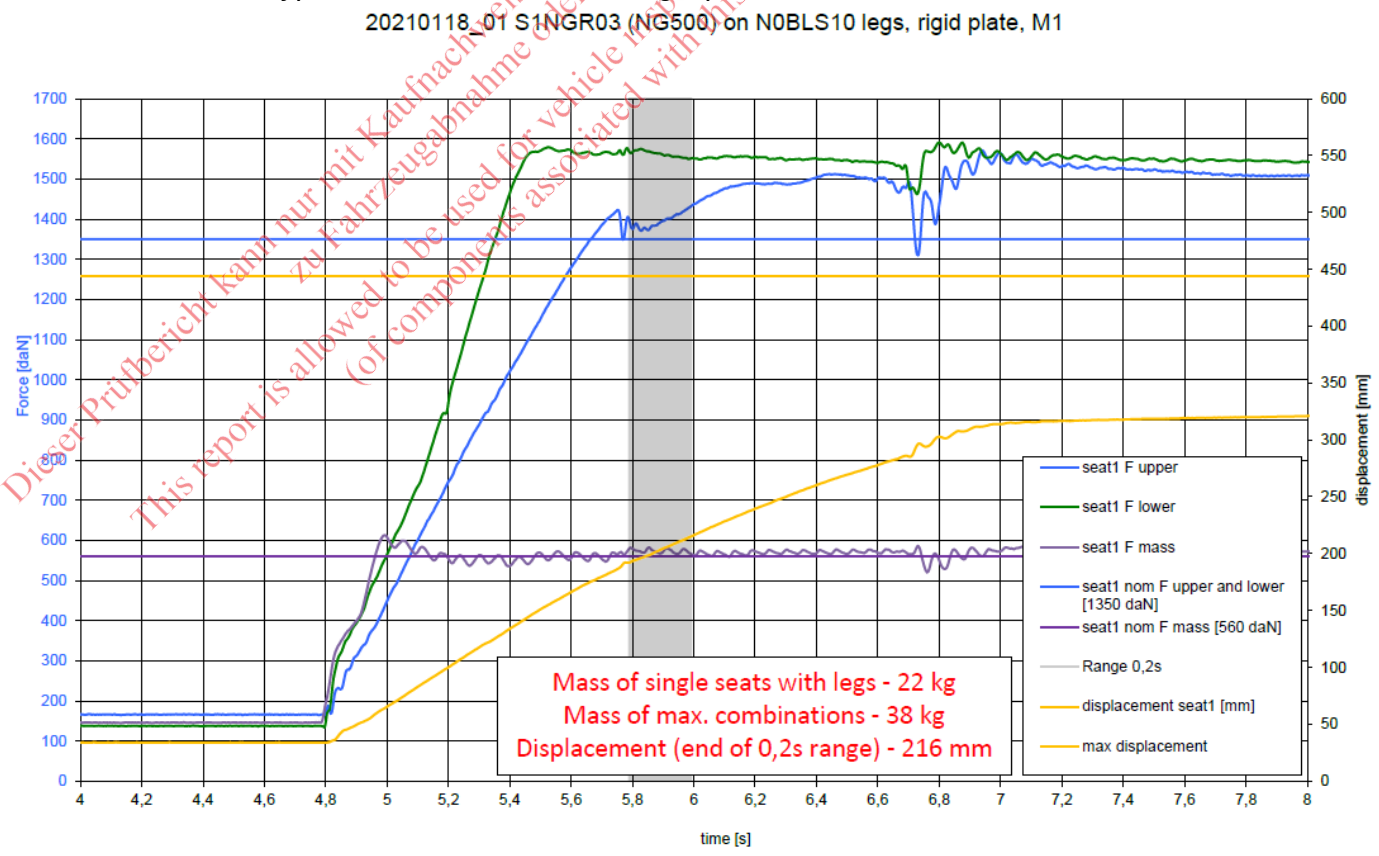
3.2.5. Right seat



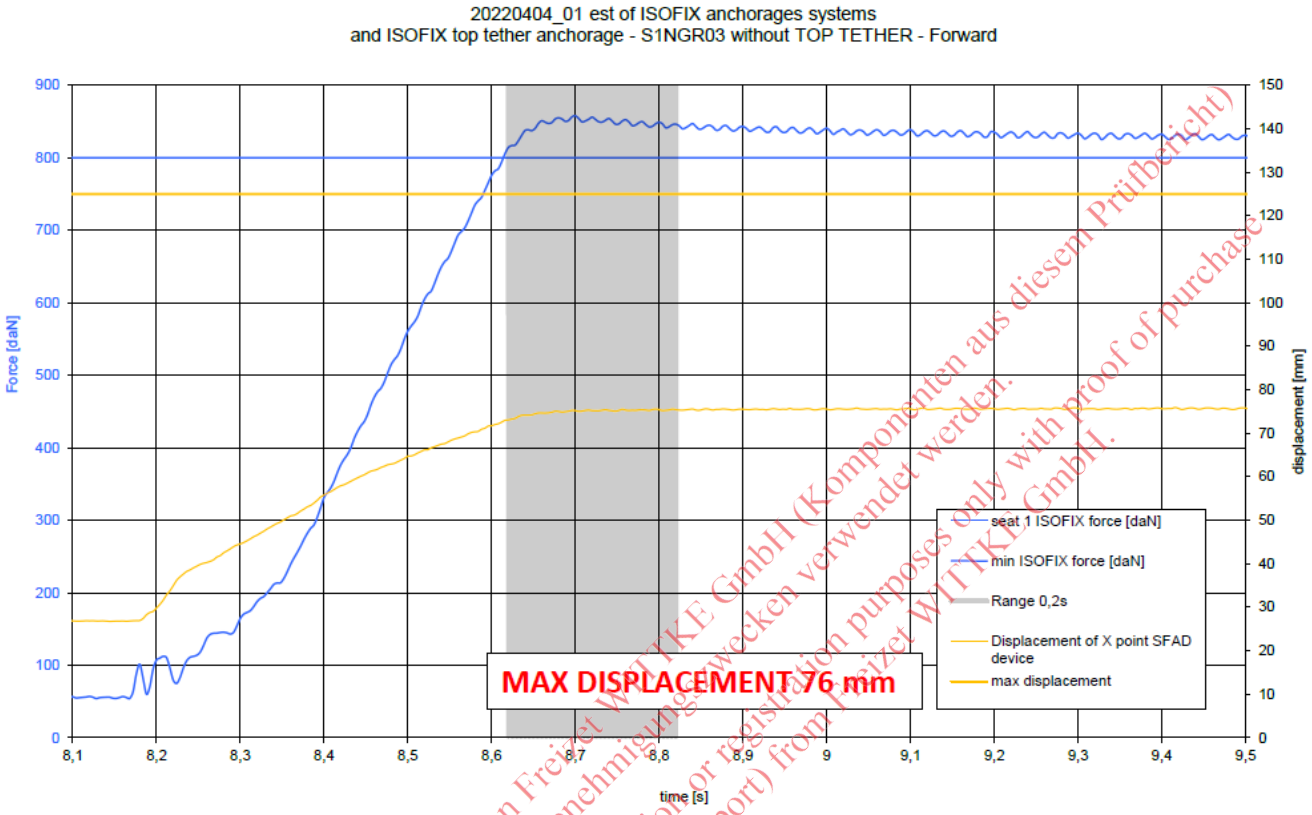
3.2.5. – Inertia load



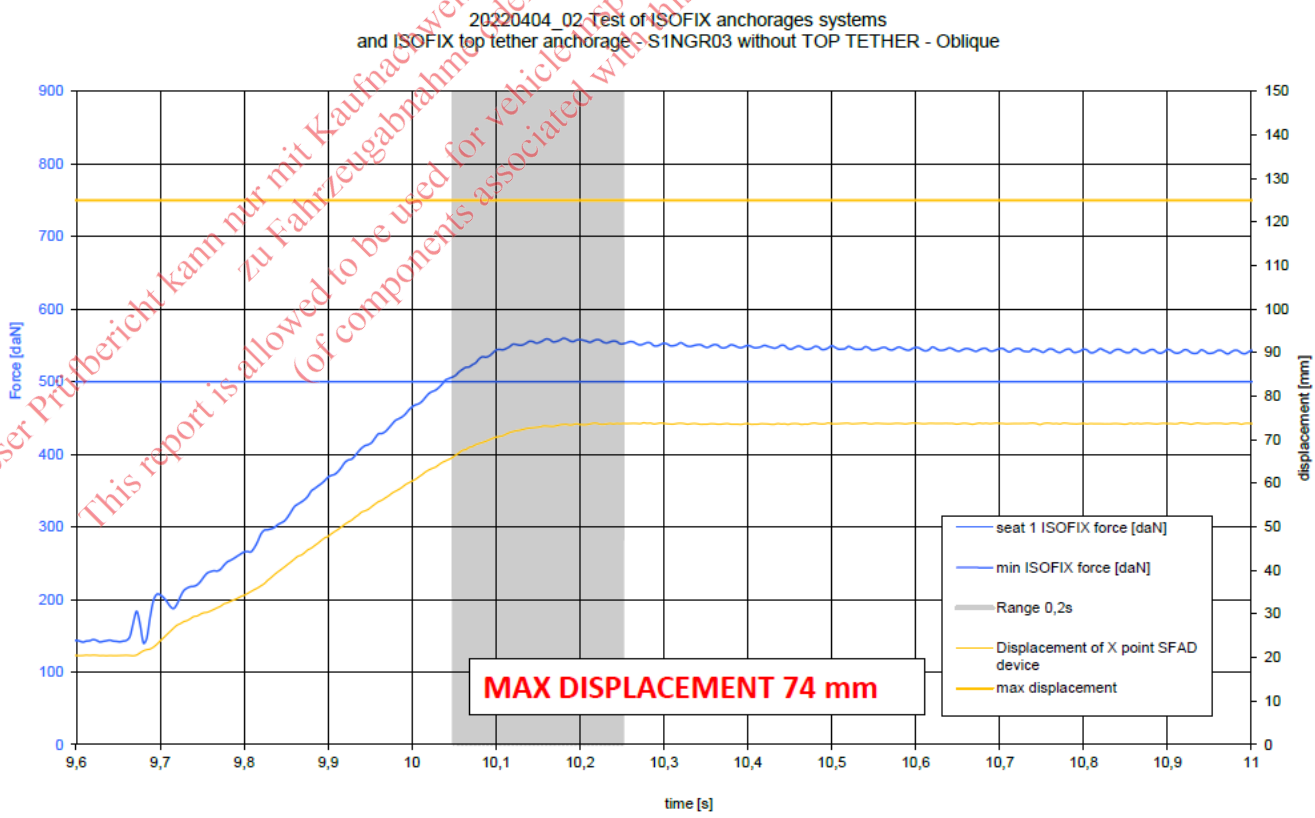
3.2.6. – Seat type S1NGR03 mounted on rigid plate



3.3.1.1. Seat bench type RAM03 – ISOFIX without TOP TETHER – forward direction



3.3.1.2. Seat bench type RAM03 - ISOFIX without TOP TETHER – oblique direction



3.6.2. Photos

Forward facing seat

3.2.1. - 2 x single seat S1NOV01 on frame type RAM02 and installed in representative vehicle body

Before test

After test

3.2.2. - 2 x single seat S1NOV01 on frame type RAM02 and installed on rigid test bench

Before test

After test

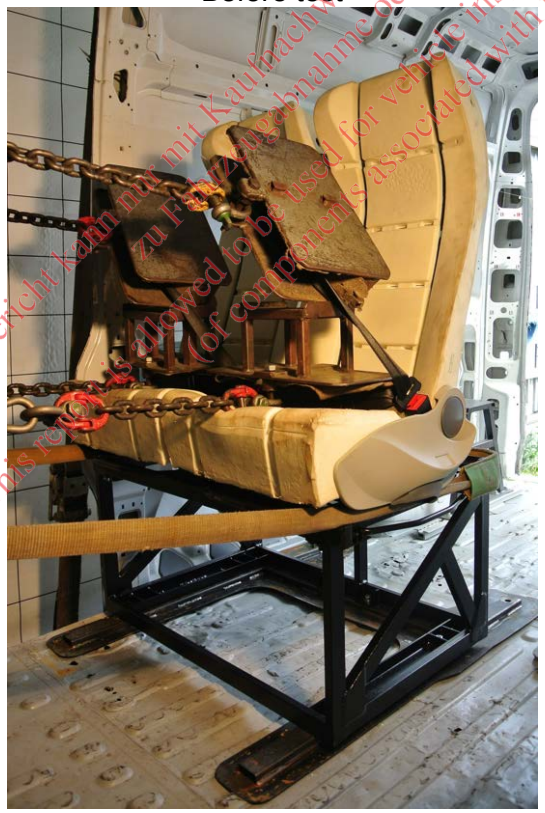
3.2.3. Frame bench type RAM02 on fixation plate in the vehicle.

Before test

After test

3.2.4. Seat bench type RAM02 mounted on lowered fixation plate

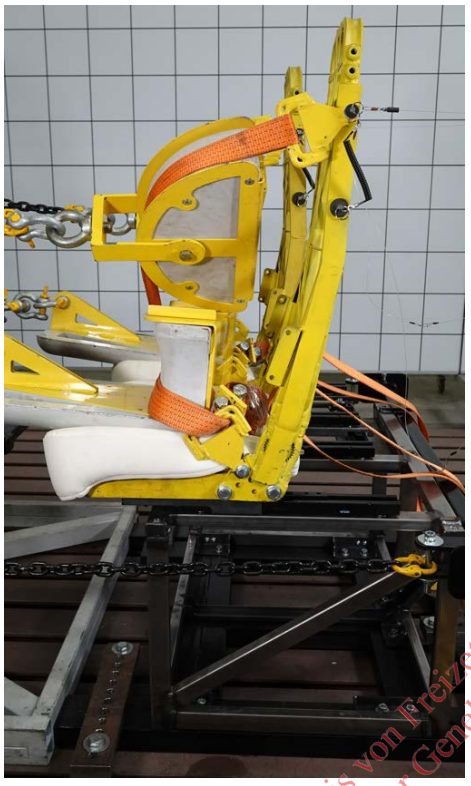
Before test



After test

3.2.5. 2 seats Dummy seat (S1NGR03) on frame type RAM03 mounted on rigid test bench

Before test



After test

3.2.6. – Seat type S1NGR03 mounted on rigid plate

Before test

After test

3.3.1.1. Seat bench type RAM03 - ISOFIX – forward direction

Before test

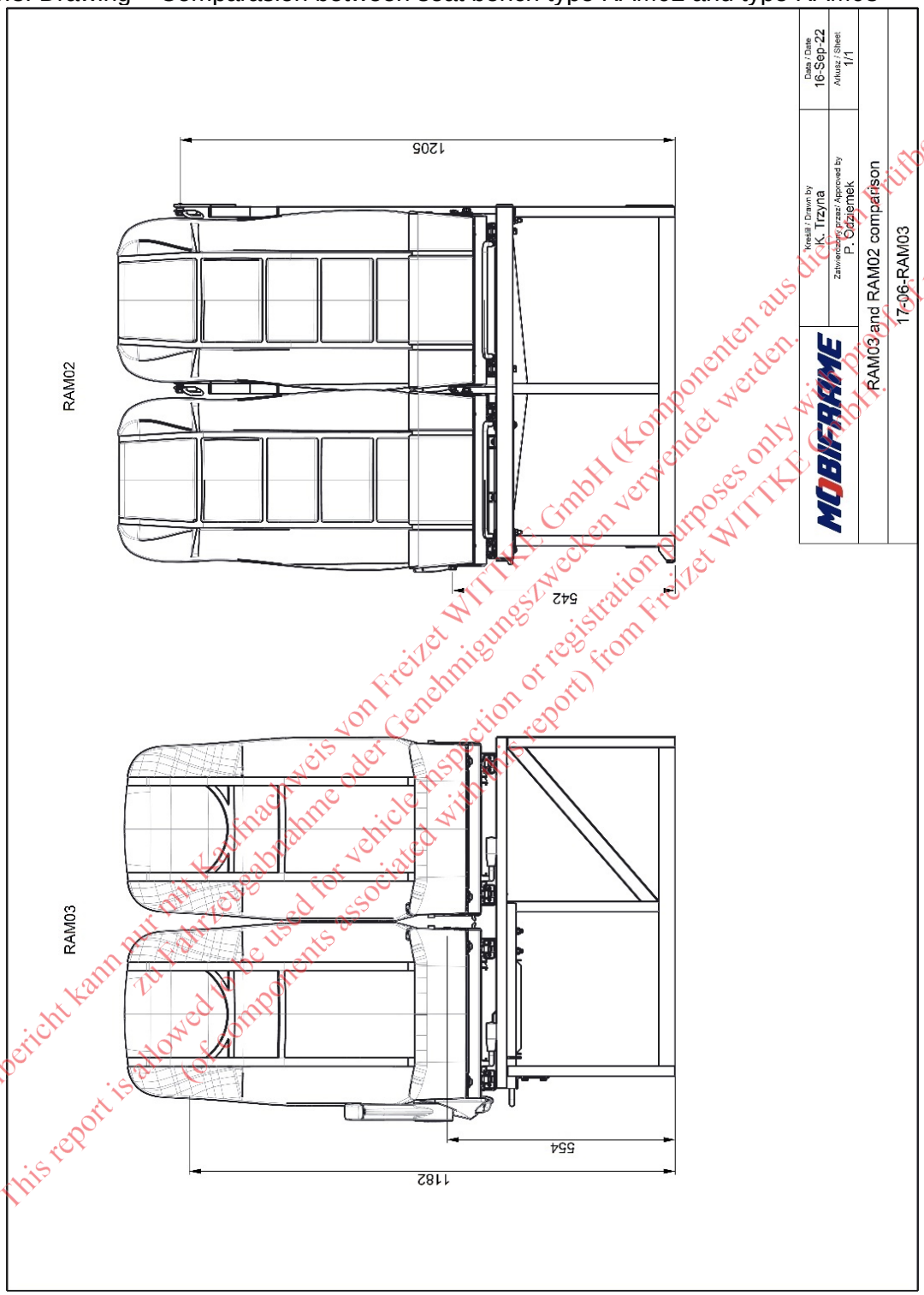
After test

3.3.1.2. Seat bench type RAM03 - ISOFIX – oblique direction

Before test

After test

3.6.3. Drawing – Comparasion between seat bench type RAM02 and type RAM03



4. Place and date of testing

As before and 08.09.2022

OKB Laboratory, Bukowiec, Poland