TECHNICAL REPORT
No. 121369 – 21 – TAC

Test according to
Test according to Regulati on ECE No. 14.07

Uniform provisions concerning the approval of vehicles with regard to safety-belt anchorages, ISOFIX anchorages systems and ISOFIX top tether anchorages

Test method: ECE No. 14.00 – date of entry into force: 1970-04-01
including all amendments up to and including:
ECE No. 14.07, supplement 8 – date of entry into force: 2018-02-10

Objectives: Document for the manufacturer

I. Technical data

0.1.1.	Order party:	OKB z o.o. ul. Szkolna 9 95-006 Bukowiec Poland
0.1.2.	Manufacturer:	OKB z o.o. ul. Szkolna 9 95-006 Bukowiec Poland
0.2.	Product under test:	RAIL22
0.3.	Test required:	According to test procedure of checking of number, geometry and strength of safety belt anchorages according to ECE R No. 14.07, par. 5,6,7 and Annexes 3-6 and 9.

II. Test report

1. Test conditions

1.1.	Test sample:	OKB rail type RAIL22 installed to various vehicles bodies or on rigid test rig with several types of seats and legs installed on the floor. Details see below and in manufacturer's information document.
1.1.1.	Technical data from the manufacturer:	
	Make (trade name of manufacturer):	OKB
	Commercial name(s) (if available):	RAIL22
	Dedicated for vehicle(s):	See point 1.1.2.
	Category of vehicle:	M1, N1, M2, N2, M3, N3
	Type of bodywork using the codes set out in Part C of Annex II of Directive 2007/46/EC:	N/A

1.1.2. Table of vehicles types for which are test results valid:

Manufacturer	Commercial description / Type	Wheelbase
Daimler / Mercedes-Benz	Sprinter (906, 907)	3250, 3665, 4325
	Sprinter (910)	3259, 3924
	Vito/Viano/V-klasse (639, 639/2, 639/4)	3200, 3430
VW	Crafter (2E__)	3250, 3665, 4325
	Crafter (SY___ e.g. SYN1E, SYM1E, SYN2E, SYN2Z, SYM2Z)	3640, 4490
	T5 (7H_, 7E_, 7J_)	3000, 3400
	T6, T6.1 (7H_, 7E_, 7J_)	3000, 3400
Citroen	Jumper (Y)	3000, 3450, 4035
	Jumpy (X)	3000, 3122
	Jumpy (2016)	2925, 3275
	SpaceTourer	2925, 3275
Peugeot	Boxer (Y)	3000, 3450, 4035
	Expert (VF3__)	3000, 3122
	Expert (2016)	2925, 3275
	Traveller	2925, 3275

1.1.2. Table of vehicles types for which are test results valid:

Manufacturer	Commercial description / Type	Wheelbase
Fiat	Ducato (250)	3000, 3450, 4035
	Scudo (270)	3000, 3122
	Talento (FJL, FFL)	3098, 3498
Opel	Movano (MR, MS, MW)	3182, 3682, 4332
	Vivaro (F7)	3098, 3498
	Vivaro	2925, 3275
Renault	Master (FV, MA, VA)	3182, 3682, 4332
	Trafic (FL, L)	3098, 3498
	Trafic 2014 (JL, L)	3098, 3498
Renault Truck	Master (MF)	3182, 3682, 4332
Ford	Transit (FA_, FD_)	2933, 3300, 3750
	Transit (FC_)	3300, 3750, 3954
	Transit Custom (FA_, FC_)	2933, 3300
	Transit Connect (PU2)	2662, 3062
Iveco	Daily (IS_)	3000, 3300, 3520, 3595, 3950, 4100, 4175, 4750
Nissan	NV200	2725
	NV300	3098, 3498
	Primastar	3098, 3498
	NV400	3182, 3682, 4332
Toyota	Pro Ace, Pro Ace Verso (2016)	2925, 3275
MAN	TGE (SY___ e.g. SYN1E, SYM1E, SYN2E, SYN2Z, SYM2Z)	3640, 4490
LDV	V80, Maxus (SV6C)	3100, 3850
	V90, Deliver 9, E Deliver 9	3000, 3366, 3760
Hyundai	H350 (EU(V))	3435, 3670
RAM (Dodge)	ProMaster	3000, 3450, 4035

1.1.3. Table of seats tested for installation on OKB Rail22:

Dummy seat	Category M1	Category M2/M3	Category M3
Dummy Seat 2 (DS-02)	S1MED01, S1MED02, S1MED05, S1MED11, S1TAX01, S1TAX02, S1TAX03, S1TAX08, S1TAX09, S1TAX10, S1TAX11, S1TAX12, S1NOV04, S1KAP02, S1ERB08, S1KAR02, S1KAR03, S1KAR06, S1AMB01, S1AMB07	Single seats: S1NOV01, S1LID17, S1LID18, S1LID25, S1POL01, S1NOV02, S1NGP01	Single seats: S1NGR01, S1NGR02, S1NGS01
		Double seats: S2NOV01, S2LID17, S2LID18, S2LID25, S1POL01	Double seats: S2NOV01, S2LID17, S2LID18, S2LID25, S1POL01

1.1.4. Table of seats with legs and consoles tested for installation on OKB Rail22:

Seat type	Legs and consoles	Category seats	Weight of maximum mass configuration
S1MED01	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1MED02	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1MED05	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1TAX01	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1TAX02	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1TAX08	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1NOV04	S1AZM03[2], N0AZM06[2], N0BLS10, N0AZM09, N0AZM34, N0AZM36, N0AZU10-02, N0AZM38[2], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZM34, N0AZM36[1], N0AZU10-02, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg

1.1.4. Table of seats with legs and consoles tested for installation on OKB Rail22:

Seat type	Legs and consoles	Category seats	Weight of maximum mass configuration
S1KAP02	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	40 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	40 kg
S1TAX03	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	45 kg
S1TAX11	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	45 kg
S1ERB08	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	45 kg
S1KAR02 S1KAR03 S1KAR04	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1AMB01	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	45 kg
S1MED11	N0AZM33[1], Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1TAX09	N0AZM371, Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1TAX10	N0AZM371, Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1TAX12	N0AZM371, Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1AMB07	N0AZM371, Slide base	M1/N1, M2/N2, M3/N3	40 kg

1.1.4. Table of seats with legs and consoles tested for installation on OKB Rail22:

Seat type	Legs and consoles	Category seats	Weight of maximum mass configuration
S1NOV02	N0AZM13	M2/N2, M3/N3	23 kg
S1NGP01	P1NGP01	M2/N2, M3/N3	20 kg
S1NOV01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	20 kg
S1LID17	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	17 kg
S1LID18	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	17 kg
S1LID25	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	20 kg
S1POL01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	17 kg
S1NGR01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	21 kg
S1NGR02	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	20 kg
S1NGS01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	21 kg
S2NOV01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	35 kg
S2LID17	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	30 kg
S2LID18	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	30 kg
S2LID25	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	42 kg
S1POL01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	30 kg
S2NGR01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	36 kg
S2NGR02	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	36 kg
S2NGS01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	38 kg

Note: [1] – could be with fastening lockable or T-bolts

1.1.4. Table of seats with legs and consoles tested for installation on OKB Rail22:

For All possible combinations of legs with seats and design details see manufacturer's information document.

All production seats have anchorages points lower or in same height as a dummy seat.

Results of tests with dummy seats used cover installation of any production seat if such seat is separately tested and positions of seatbelt anchorage points are not higher than on these dummy seats.

1.2.	Test procedures used:	According to test procedure of checking of number, geometry and strength of safety belt anchorages according to ECE R No. 14.07, par. 5,6,7 and Annexes 3-6 and 9.
1.3.	Measuring and test equipment:	Electro-hydraulic test equipment and control unit Force measuring chain Data acquisition unit Traction devices 3D H-point measurement device Tape measure
1.5.	Test track or site:	TÜV SÜD Czech s.r.o., Mladá Boleslav, Czech Republic, TÜV SÜD Auto Service GmbH, München, Germany, PIMOT, Warszawa, Poland, IDIADA Poland, Poznań, Poland, DEKRA Automobil GmbH, Klettwitz, Germany, MIRA Ltd, Watling Street, Nuneaton, UK, OKB laboratory, Bukowiec, Poland.

2. Test results

2.1. First row of seats: N/A

2.2. Other rows of seats:

2.2.1. Safety belt anchorages strength:

Seat type (INTAP)	Mass of the heaviest configuration (protocols)	Fulfilling of requirements	Mass of the heaviest configuration (from additional tests)
Category of vehicle: M1			
S1MED01 (Medis)	20 kg -on console type P0PPK01 -on legs with UNWIN and NMI lock system - on N0AZM09 (NMI)	See Technical report No. BLB.060.10B See Technical report No. PL12120007	-
	46 kg -with slide base (P1SBE01 – P1SBE07)	See Technical report No. 120166-17-TAC	
INTAP	S1MED05	-	25 kg (max 46 kg) See point 2.3.9.
S1MED02v01 (Medis)*	22 kg	See Technical report No. BLB.034.11B	See S1MED01 *Construction S1MED02 is the same as S1MED01
S1MED11 (Medis 2)	42 kg -with sliding base 40 kg - revolving base + INTERLEG	See Technical report No. 120166-17-TAC See Technical report No. 120429-18-TAC	40 kg - on Interleg base See point 2.3.7.
S1TAX01 (Taxi)	20 kg	See Technical report No. BLB.036.12B	45 kg S1TAX01 (02) Interleg + w fitting See point 2.3.8.

2.2.1. Safety belt anchorages strength:

Seat type (INTAP)	Mass of the heaviest configuration (protocols)	Fulfilling of requirements	Mass of the heaviest configuration (from additional tests)
Category of vehicle: M1			
S1TAX01 S1TAX02	37 kg -on NMI leg	See Technical report No. 120699-15-TAC	-
S1TAX02 (Taxi)	26 kg	See Technical report No. PL13040008 See Technical report No. 120166-17-TAC	40 kg (See point 2.3.5.) - S1TAX03 on Interleg base 45 kg (See point 2.3.5.) - S1TAX01 (02) Interleg + w fitting
S1TAX03 (Taxi Tip)			
S1TAX03 (Taxi Tip)	45 kg - on wheel arch console P2NKL01-02	See Technical report No. 121878-18-TAC	
S1TAX08* (Taxi HB)	See seat S1TAX02	* S1TAX08 has the same construction of backrest and seat cushion as seat S1TAX02.	42,5 kg See point 2.3.1.
S1TAX09** (Taxi Flip up)	40 kg 3 Taxi seats: Frame representative for S1TAX03 (09) (10) seat + INTERLEG + quicklocks (fastening lockable, unwin SL/STD)	See Technical report No. 120429-18-TAC See Technical report No. PL13040008	See seat S1TAX02/03 **S1TAX09, S1TAX10 – both seats have the same construction of backrest and seat cushion as seat S1TAX02 or S1TAX03
S1TAX10** (Taxi Flip Up Adjust)			
S1TAX11**	36 kg/ 45 kg	**Construction of seats S1TAX11/S1TAX12 are practically the same as S1TAX08	See seat S1TAX08
S1TAX12**	40 kg		
S1NOV04 (Veris)	26 or 27* kg * Seat S1NOV04 with legs N0AZM06 or N0BLS10 m_s = 26 kg. Seat S1NOV04 with leg N0AZM09 m_s = 27 kg	See Technical report No. 121102-14-TAC See Technical report No. PL13040008 See Technical report No. 15-00057-CP-PRG-00	45 kg (See point 2.3.8.) - S1NOV04 Interleg + w fitting

Note: ** Construction of seats S1TAX11/S1TAX12 are practically the same as S1TAX08 (construction of backrest are the same and seat base is very similar) with the only difference – construction with seat base which is screwed to the legs:
- S1TAX08 – fixation by omega's (the same base as in case: S1TAX01, S1TAX02),
- S1TAX11 – fixation on swivel (the same base as in case: S1TAX03),
- S1TAX12 – fixation on rigid plate (the same base as in case: S1TAX09, S1TAX10).

Note: *S1TAX09, S1TAX10 – both seats have the same construction of backrest and seat cushion as seat S1TAX02 or S1TAX03

2.2.1. Safety belt anchorages strength:

Seat type (INTAP)	Mass of the heaviest configuration (protocols)	Fulfilling of requirements	Mass of the heaviest configuration (from additional tests)
Category of vehicle: M1			
S1KAP02 (Kapitan Comfort)	-	-	21 kg (max. 40 kg) See point 2.3.10.
S1ERB08 (Ergobus 450 M1 USSO)	45 kg + wheel arch bridge/ OKBeeRAIL	See Technical report No. PL13040008	-
	45 kg - on wheel arch console P2NKL01-02	See Technical report No. 121878-18-TAC	
S1KAR02* right-hand side swivel S1KAR03* left-hand side swivel S1KAR06* central swivel	35 kg -S1KAR02 on console P0PPK01	See Technical report No. BLB.163.09B	-
	40 kg - S1KAR02 mounted on wheel arch console P1NKL01-01	See Technical report No. 121878-18-TAC	-
S1AMB01 (Ambis)	26 kg	See Technical report No. BLB.060.10B	40 kg on Interleg base See point 2.3.6.
	37 kg - on console type P0PPK01-01	See Technical report No. 121878-18-TAC	
	40 kg - on Interleg	See Technical report No. 120429-18-TAC	
	46 kg - with slide base (P1SBE01-P1SBE07)	See Technical report No. 120166-17-TAC	
S1AMB07** (Ambis Flip up)	28 kg	See Technical report No. 120429-18-TAC	40 kg ** construction S1AMB07 is the same as S1AMB01

Note: * S1KAR02 – seat on right-hand side swivel,
S1KAR03 –seat on left-hand side swivel,
S1KAR06 – seat on central swivel.

Note: ** construction S1AMB07 is the same as S1AMB01

2.2.1. Safety belt anchorages strength:

Seat type (INTAP)	Mass of the heaviest configuration (protocols)	Fulfilling of requirements	Mass of the heaviest configuration (from additional tests)
Category of vehicle: M2/M3			
S1NOV01 S2NOV01 (Novis)	20 kg S1NOV01 35 kg S2NOV01	See Technical report No. BLB.056.12B	-
S1LID17 S1LID18 (Ekolider, single seat)	17 kg	See Technical report No. BLB.059.10B	-
S2LID17 S2LID18 (Ekolider, double seat)	30 kg		
S1LID25 S2LID25 (Ekolider II)	25 kg S1LID25–single seat 40 kg S2LID25–double seat	See Technical report No. 121559-20-TAC	-
	45 kg	-	See point 2.3.2. See point 2.3.3.
S1POL01/ S1POL01 (single/ double seat)	17 kg/ 30 kg	See Technical report No. BLB.006.10B/ PL12030004	-
S1NOV02 (Novis pilot)	23 kg	See Technical report No. PL13050003	-
S1NGP01 (NG110)	20 kg	See Technical report No. No. 120452–20–TAC	-

Seat type (INTAP)	Mass of the heaviest configuration (protocols)	Fulfilling of requirements	Mass of the heaviest configuration (from additional tests)
Category of vehicle: M3			
S1NGR01 S2NGR02* (NG100)	21 kg 20 kg/ 36* kg	See Technical report No. 120451-20-TAC	*Double seat floor-wall mounted without aluminium sliding mechanism. Profile 30x30x2, max configuration: 36 kg.
S1NGS01 (NG200, single seat)	19 kg	See Technical report No. 120071-21-TAC	-
S2NGS01 (NG200, double seat)	38 kg		

2.2.1. Safety belt anchorages strength:

Seat type (INTAP)	Mass of the heaviest configuration (protocols)	Fulfilling of requirements	Mass of the heaviest configuration (from additional tests)
Category of vehicle: M3			
S2LID17 S2LID18 (Ekolider, double seat)	30 kg 30 kg	See Technical report No. BLB.059.10B	-
S2LID25 (Ekolider II)	40 kg	See Technical report No. 121559-20-TAC	45 kg See point 2.3.2. See point 2.3.3.
S2NOV01 (Novis)	35 kg	See Technical report No. BLB.056.12B	-
S1POL01 (double seat)	30 kg	See Technical report No. PL12030004	-
S1POL01 (Single seat)	15 kg/ 21 kg	See Technical report No. BLB.006.10B/ PL12030004	-

Seat	Seat type	Category of vehicle	Test No.	Test results
Dummy seat (DS-02)	NMI leg with mill lock	M1	2020_04_28_01	See point 2.3.4.

Note: Verification of installation of the floor in vehicle body. For this verification were chosen worst case representatives of vehicles intended for mount of floor and seats and most unfavorable seat arrangements and seat masses.

2.2.2. ISOFIX and Top Tether anchorages strength (if provided):

Seat manufacturer	Seat type	Fulfilling of requirements
INTAP	S1MED01, S1MED02v01#, S1MED11*, S1AMB01, S1AMB07##, S1TAX01, S1TAX02, S1TAX03, S1TAX08**, S1TAX09***, S1TAX10***, S1TAX11, S1TAX12, S1NOV04, S1KAR02, S1KAR03, S1KAR06	See Technical report No. 120731-15-TAC See Technical report No. 120699-15-TAC
INTAP	S1ERB08, S1MED05, S1KAP02	N/A

Note: * construction of seat S1MED11 and position of backrest, ISOFIX and Top Tether are the same as in case of seat S1MED01

Note: ** construction of seat S1TAX08 and position of backrest, ISOFIX and Top Tether are the same as in case of seat S1TAX02

Note: *** S1TAX09, S1TAX10 – both seats have the same construction of backrest and seat cushion as seat S1TAX02 or S1TAX03

Note: # construction of seat S1MED02v01 and position of backrest, ISOFIX and Top Tether are the same as in case of seat S1MED01

Note: ## construction of seat S1AMB07 and position of backrest, ISOFIX and Top Tether are the same as in case of seat S1AMB01

Note: Construction of seats S1TAX11/S1TAX12 are practically the same as S1TAX08 (construction of backrest are the same and seat base is very similar) with the only difference – construction with seat base which is screwed to the legs:
- S1TAX08 – fixation by omega's (the same base as in case: S1TAX01, S1TAX02),
- S1TAX11 – fixation on swivel (the same base as in case: S1TAX03),
- S1TAX12 – fixation on rigid plate (the same base as in case: S1TAX09, S1TAX10).

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.

2.3. Additional tests of seat belt anchorages and seat to floor attachment.

Forward facing seat

2.3.1. Seat S1TAX08 on N0AZM06 legs mounted on rigid plate.
Mass of the heaviest possible seat configuration covered by the test m_s = 42,5 kg.
$F_z = 20 \times m_s \times g$ (N) as relevant for M1 and N1 vehicle category.
Additional force applied to the seat base.

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	6 200 N
Force in the shoulder belt	13 750 N / > 0,2 s
Force in the lap belt	15 100 N / > 0,2 s
Inertia force in the seat base	6 900 N / > 0,2 s
Remark: No ruptures occurred. Additional force is added to seat base. Displacement of upper anchorage point was 345 mm.	

2.3.2. Double Seat S1LID25 (Ekolider II adjustable) with Floor-wall on pressed legs (N0BLS15) mounted on rigid plate.
Mass of the heaviest possible seat configuration covered by the test (double seat with legs) m_s = 45 kg.
Additional force applied $F_z = 10 \times m_s \times g$ (N) as relevant for category M2/N2.
Additional force applied to the lab belt.

Seat	Left seat	Right seat
Safety belt	Ar	Ar
Upper belt anchorage	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure
Required force shoulder belt portion	6 750 ± 200 N	6 750 ± 200 N
Required force lap belt portion	8 850 ± 200 N	8 850 ± 200 N
Force in the shoulder belt	6 900 N / > 0,2 s	7 000 N / > 0,2 s
Force in the lap belt	9 600 N / > 0,2 s	9 900 N / > 0,2 s
Displacement of upper anchorage point	285 mm	263 mm
Remark: No ruptures occurred. Displacement of upper anchorage points was in tolerance. Inertia load is added to the lab belt portion.		

2.3.3. 4 seats - Ekolider II double in one row mounting on leg NOBLS17 (S1LID25 and S2LID25) in representative vehicle body.
Mass of the single seat with leg m_s = 25 kg
Additional force applied $F_z = 10 \times m_s \times g$ (N) as relevant to M2.

Seat	Forward facing			
	Right	Right centre	Left centre	Left
Safety belt	Ar	Ar	Ar	Ar
Upper belt anchorage	Seat structure	Seat structure	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure	Seat structure	Seat structure
Required force in shoulder belt portion	6 750 ±200 N	6 750 ±200 N	6 750 ±200 N	6 750 ±200 N
Required force in lap belt portion	9 250 ±200 N	9 250 ±200 N	9 250 ±200 N	9 250 ±200 N
Force in the shoulder belt measured	7 000N / > 0,2 s	7 250 N / > 0,2 s	7 000 N / > 0,2 s	6 850 N / > 0,2 s
Force in the lap belt measured	10 500 N / > 0,2 s	10 000 N / > 0,2 s	9 750 N / > 0,2 s	9 500 N / > 0,2 s
Remark: No ruptures occurred. Additional force was applied to lap belt portion.				

2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock in representative vehicle bodywork
Mass of the single seat with leg m_s = 27 kg.
Additional force applied $F_z = 20 \times m_s \times g$ (N) as relevant to M1.

Seat	Forward facing			
	Seat 1 (right)	Seat 2 (Right centre)	Seat 3 (Left centre)	Seat 4 (Left)
Safety belt	Ar	Ar	Ar	Ar
Upper belt anchorage	Seat structure	Seat structure	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure	Seat structure	Seat structure

2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock in representative vehicle bodywork.

Seat	Forward facing			
	Seat 1 (right)	Seat 2 (Right centre)	Seat 3 (Left centre)	Seat 4 (Left)
Required force in shoulder belt portion	13 500 ± 200 N	13 500 ±200 N	13 500 ±200 N	13 500 ±200 N
Required force in lap belt portion	18 900 ± 200 N	18 900 ±200 N	18 900 ±200 N	18 900 ±200 N
Force in the shoulder belt measured	13 700N / > 0,2 s	13 600N / > 0,2 s	13 800N / > 0,2 s	13 750N / > 0,2 s
Force in the lap belt measured	19 000 N / > 0,2 s	19 100 N / > 0,2 s	19 400 N / > 0,2 s	19 000 N / > 0,2 s
Displacement of upper anchorage point	123 mm	87 mm	91 mm	80 mm
Remark: No ruptures occurred. Additional force was applied to lap belt portion.				

2.3.5. Taxi seat type S1TAX03 on Interleg base with fastening lockable, M1 in representative vehicle body.
Mass of the single seat with leg m_s = 40 kg.
$F_z = 20 \times m_s \times g$ (N) as relevant for M1 and N1 vehicle category.
Additional force applied to the lab belt portion.

Seat	Seat 1	Seat 2	Seat 3
Safety belt	Ar	Ar	Ar
Upper belt anchorage	Seat structure	Seat structure	Seat structure
Lower belt anchorages	Seat structure	Seat structure	Seat structure
Required force in shoulder belt portion	13 500 ±200 N	13 500 ±200 N	13 500 ±200 N
Required force lab belt portion	21 500 ±200 N	21 500 ±200 N	21 500 ±200 N
Force in the shoulder belt	16 000 N / > 0,2 s	14 400 N / > 0,2 s	13 400 N / > 0,2 s
Force in the lap belt	21 400 N / > 0,2 s	21 500 N / > 0,2 s	21 700 N / > 0,2 s

Remark: No ruptures occurred. Upper belt anchorage displacement was in tolerance.

2.3.6. Seat type S1AMB01 (Ambis) on Interleg base, M1, mounted on rigid plate.
Mass of the heaviest possible seat configuration covered by the test m_s = 40 kg.
$F_z = 20 \times m_s \times g$ (N) as relevant for M1 and N1 vehicle category.
Additional force applied to the lab belt portion.

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 (lab belt portion)	8 000 N
Force in the shoulder belt	13 600 N / > 0,2 s
Force in the lap belt	13 600 N / > 0,2 s
Inertia force in the lap belt	8 100 N / > 0,2 s
Remark: No ruptures occurred. Additional force is added to lap belt portion. Upper anchorage point displacement was 121 mm.	

2.3.7. Seat type S1MED11 (Medis) on Interleg base, M1, mounted on rigid plate.
Mass of the heaviest possible seat configuration covered by the test m_s = 40 kg.
$F_z = 20 \times m_s \times g$ (N) as relevant for M1 and N1 vehicle category.
Additional force applied to the lab belt portion.

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 (lab belt portion)	8 000 N
Force in the shoulder belt	13 600 N / > 0,2 s
Force in the lap belt	13 700 N / > 0,2 s
Inertia force in the lap belt	8 050 N
Remark: No ruptures occurred. Additional force is added to lap belt portion. Upper anchorage point displacement was 255 mm.	

2.3.8 Interleg + w fitting, M1, mounted on rigid plate:

Dummy seat representative for S1TAX01 (02), S1NOV04 + INTERLEG + W fitting
Mass of the single seat with leg m_s = 45 kg.
$F_z = 20 \times m_s \times g$ (N) as relevant for M1 and N1 vehicle category.
Additional force applied to the lab belt portion.

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	22 500 ±200 N
Force in the shoulder belt	14 000 N / > 0,2 s
Force in the lap belt	22 500 N / > 0,2 s
Upper anchorage point displacement was 150 mm. Remark: No ruptures occurred. Upper belt anchorage displacement was in tolerance.	

2.3.9. Forward facing seat – S1MED05, Medis HB

Seat S1MED05 on the legs type N mounted on representative vehicle body structure.
Mass of the heaviest possible seat configuration covered by the test m_s = 46 kg.

Additional force applied to seat base:
$F_z = 20 \times m_s \times g$ (N) as relevant for M1 and N1 vehicle category.

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	9 100 N
Force in the shoulder belt	13 700 N / > 0,2 s
Force in the lap belt	15 200 N / > 0,2 s
Inertia force in the seat base	9 100 N / > 0,2 s
Displacement of upper anchorage point	219 mm

2.3.10. S1KAP02, Kapitan Comfort

Seat S1KAP02 on the legs type N mounted on representative vehicle body structure.
Mass of the heaviest possible seat configuration covered by the test m_s = 40 kg.

Additional force applied to seat base:
$F_z = 20 \times m_s \times g$ (N) as relevant for M1 and N1 vehicle category.

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	8 000 N
Force in the shoulder belt	13 800 N / > 0,2 s
Force in the lap belt	15 100 N / > 0,2 s
Inertia force in the seat base	8 200 N / > 0,2 s
Displacement of upper anchorage point	280 mm

2.4. Final assessment:

Above mentioned Technical reports and test results cover all possible combinations of seats, seat legs, leg to floor attachment and attachment of floor to vehicle mentioned in manufacturer's information folder.
Test results cover all variants of vehicle body and also installation of seats forward or rearward facing and use 3-point or 2-point belt.

3. Specimen submitted to test on: 2021-06-11

4. Date of test: 2021-06-11

III. Manufacturer's information folder No. RAIL22/2021/00

119 pages total of 2021-06-11

IV. Other documentation

Photos: page 21 - 26
Graphs: page 27 - 38

V. Attachments

No attachments

VI. Final assessment

The described sample:

complies

with the requirements of ECE Regulation No. 14.07
for issue the document for manufacturer

This technical report consists of pages No. 1 to 38.

TÜV SÜD Czech s.r.o.
Novodvorská 994/138
142 21 Praha 4
Czech Republic
DIČ: CZ63987121
- 38 -

Vít Bursík

Report author

Martin Hron

Business Unit Manager
Certification and Regulatory Compliance

Prague, 2021-06-23

Photos:

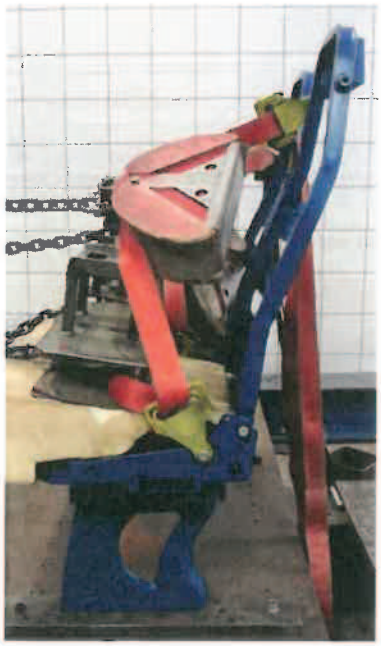
2.3.1. Seat S1TAX08 on N0AZM06 legs mounted on rigid plate.

Before test

After test

2.3.2. Double Seat S1LID25 (Ekolider II adjustable) with Floor-wall on pressed legs (N0BLS15) mounted on rigid plate

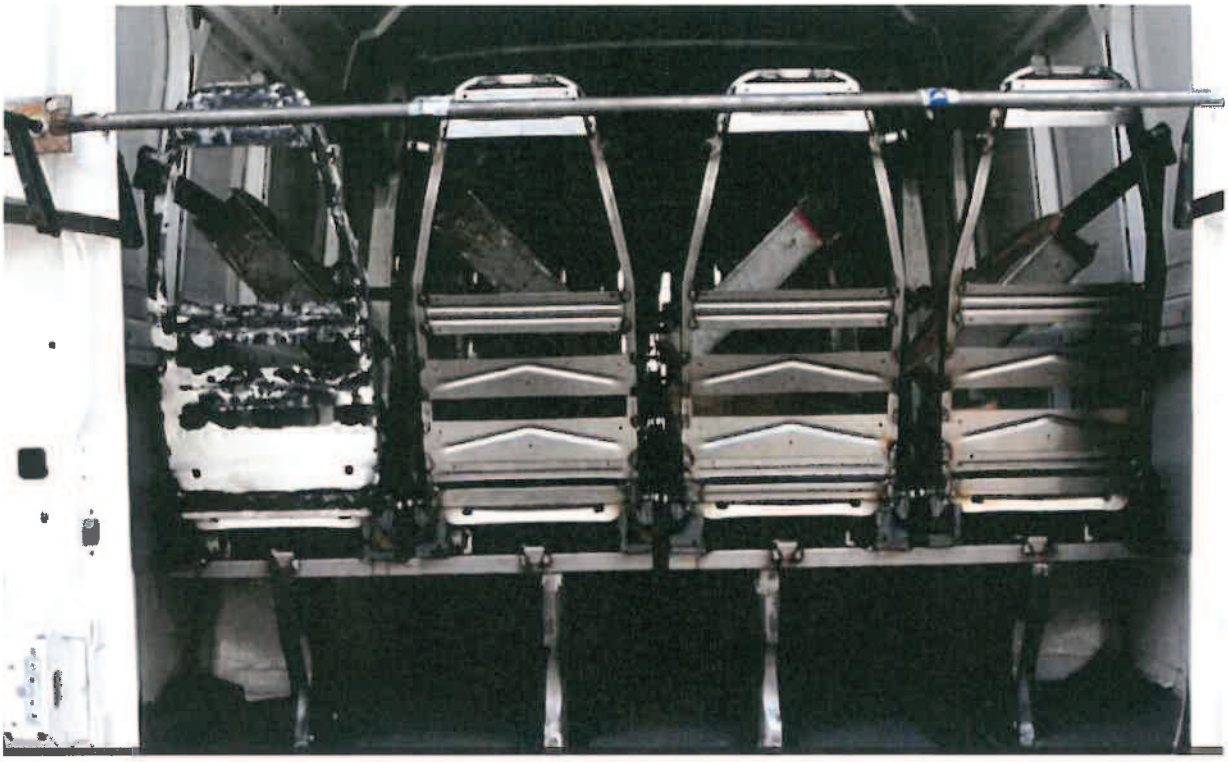
Before test



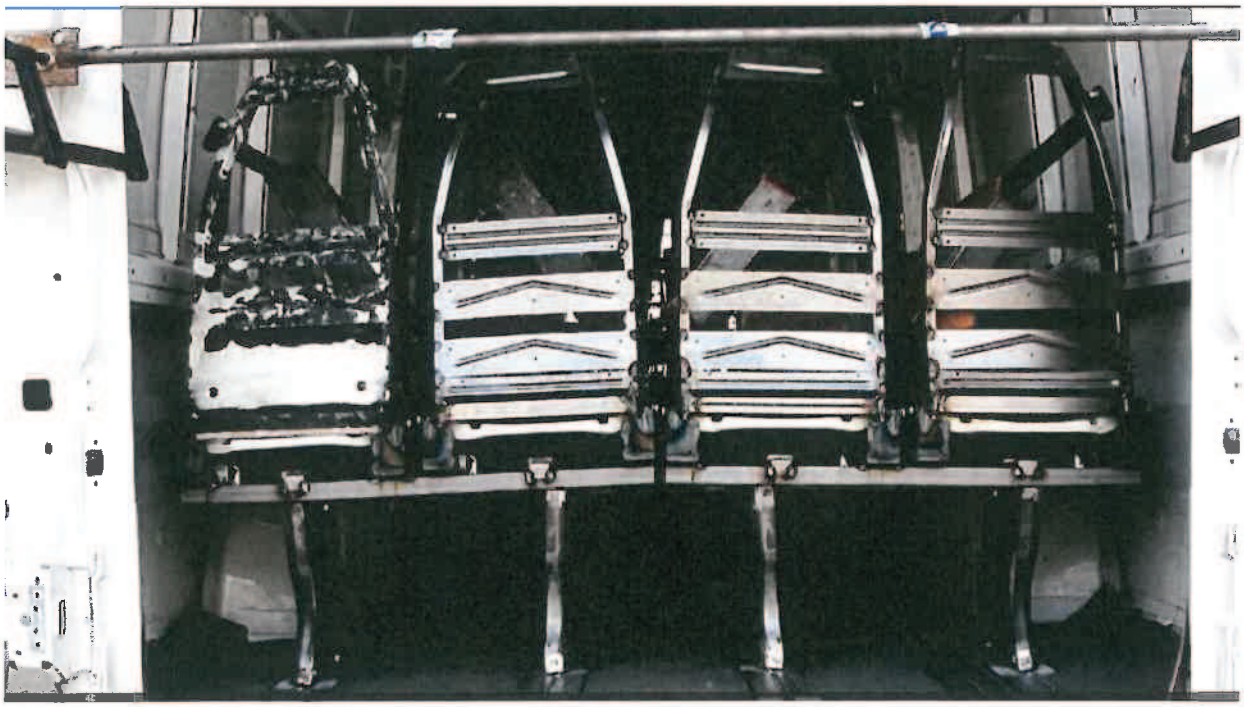
After test

2.3.3. Ekolider II double + NOBLS17 (S1LID25 and S2LID25)

Before test



After test

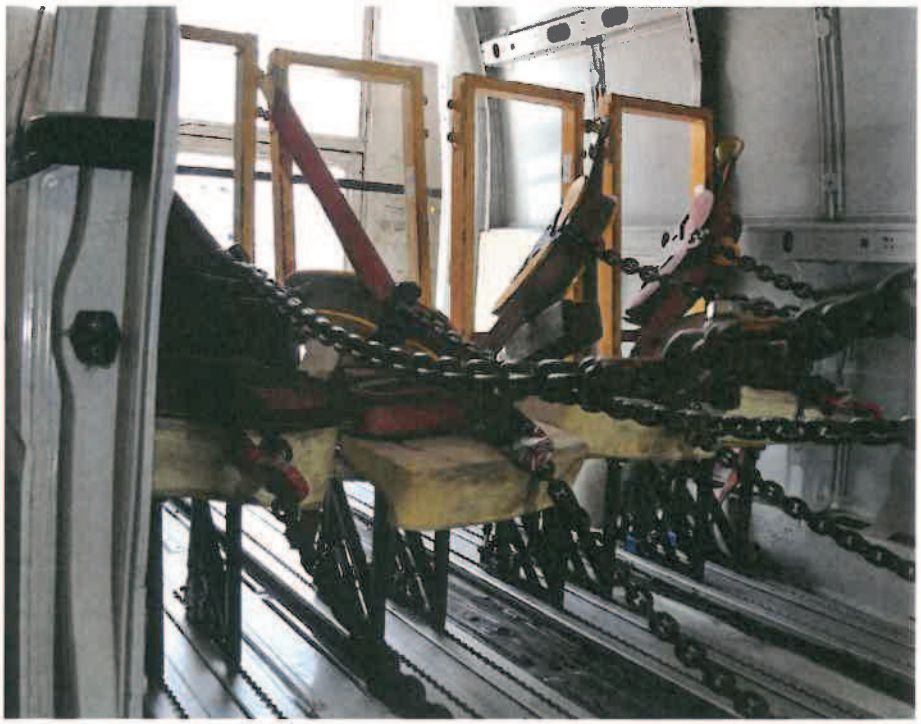


2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock in representative vehicle bodywork.

Before test

2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock in representative vehicle bodywork.

After test



2.3.5. Taxi seat type S1TAX03 on Interleg base with fastening lockable, M1

Before test

After test

2.3.6. Seat type S1AMB01 (Ambis) on Interleg base, M1, mounted on rigid plate.

Before test

After test

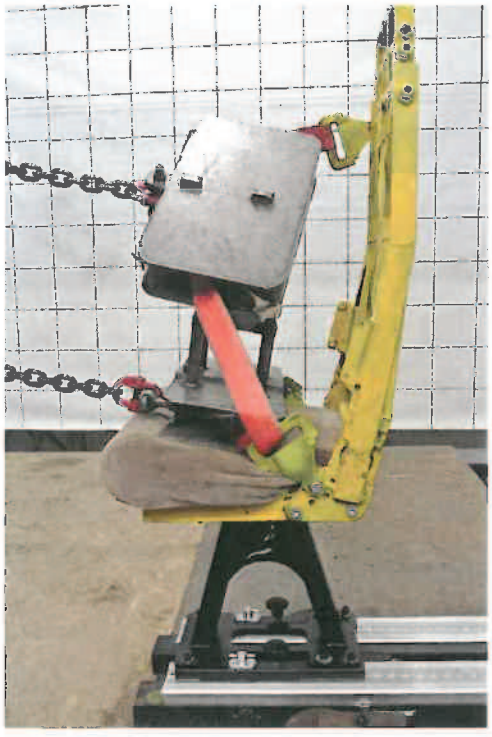
2.3.7. Seat type S1MED11 (Medis) on Interleg base, M1, mounted on rigid plate.

Before test

After test

2.3.8 Dummy seat representative for S1TAX01 (02), S1NOV04 + INTERLEG + W fitting

Before test



After test

2.3.9. Forward facing seat – S1MED05, Medis HB

Before test

After test

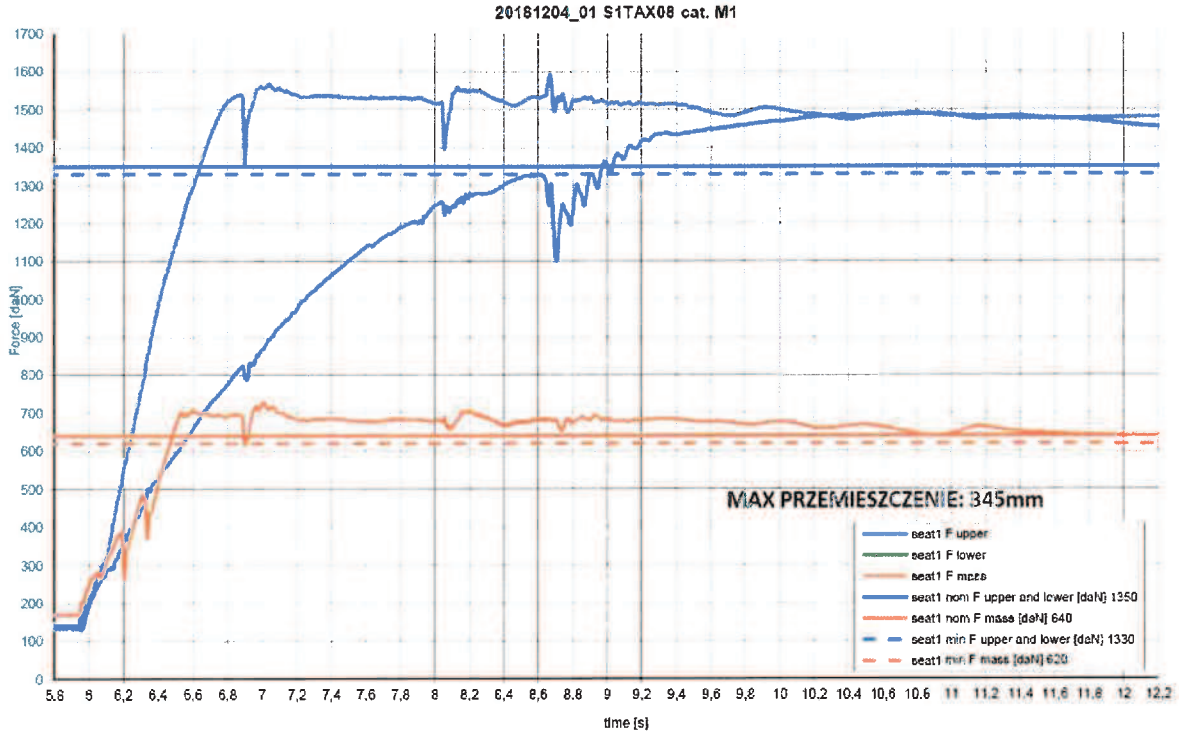
2.3.10. Forward facing seat – S1KAP02, Kapitan Comfort

Before test

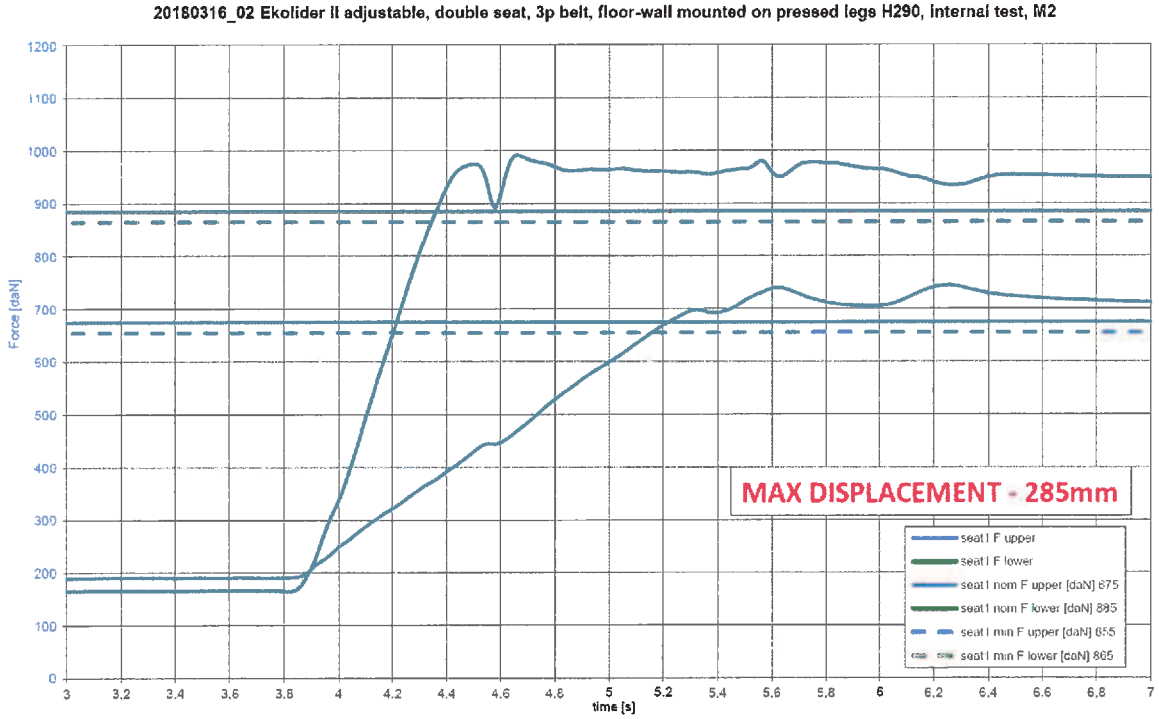
After test

Graphs:

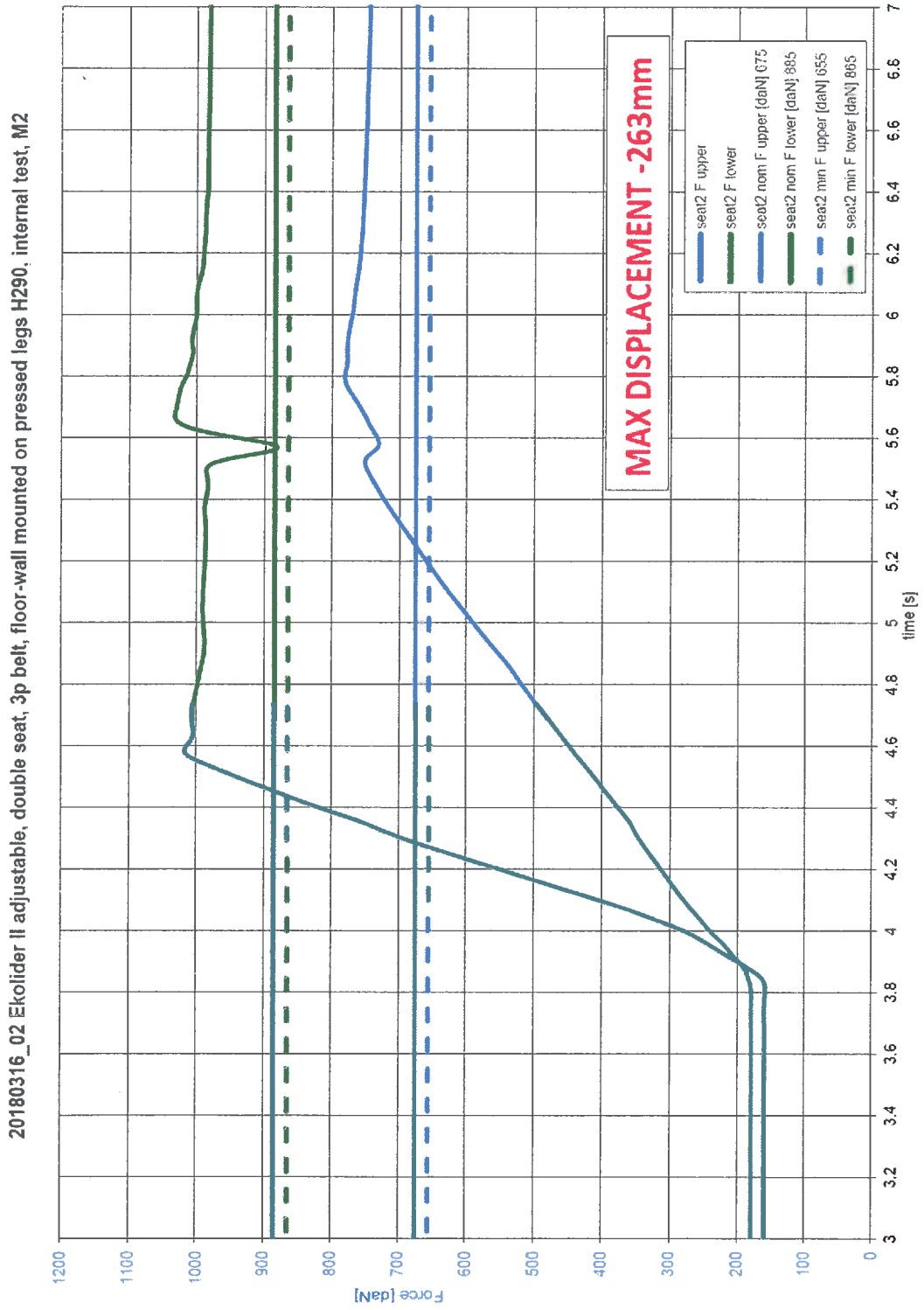
2.3.1. Seat S1TAX08 on N0AZM06 legs mounted on rigid plate.



2.3.2. Double Seat S1LID25 (Ekolider II adjustable) with Floor-wall on pressed legs (N0BLS15) mounted on rigid plate – left seat.

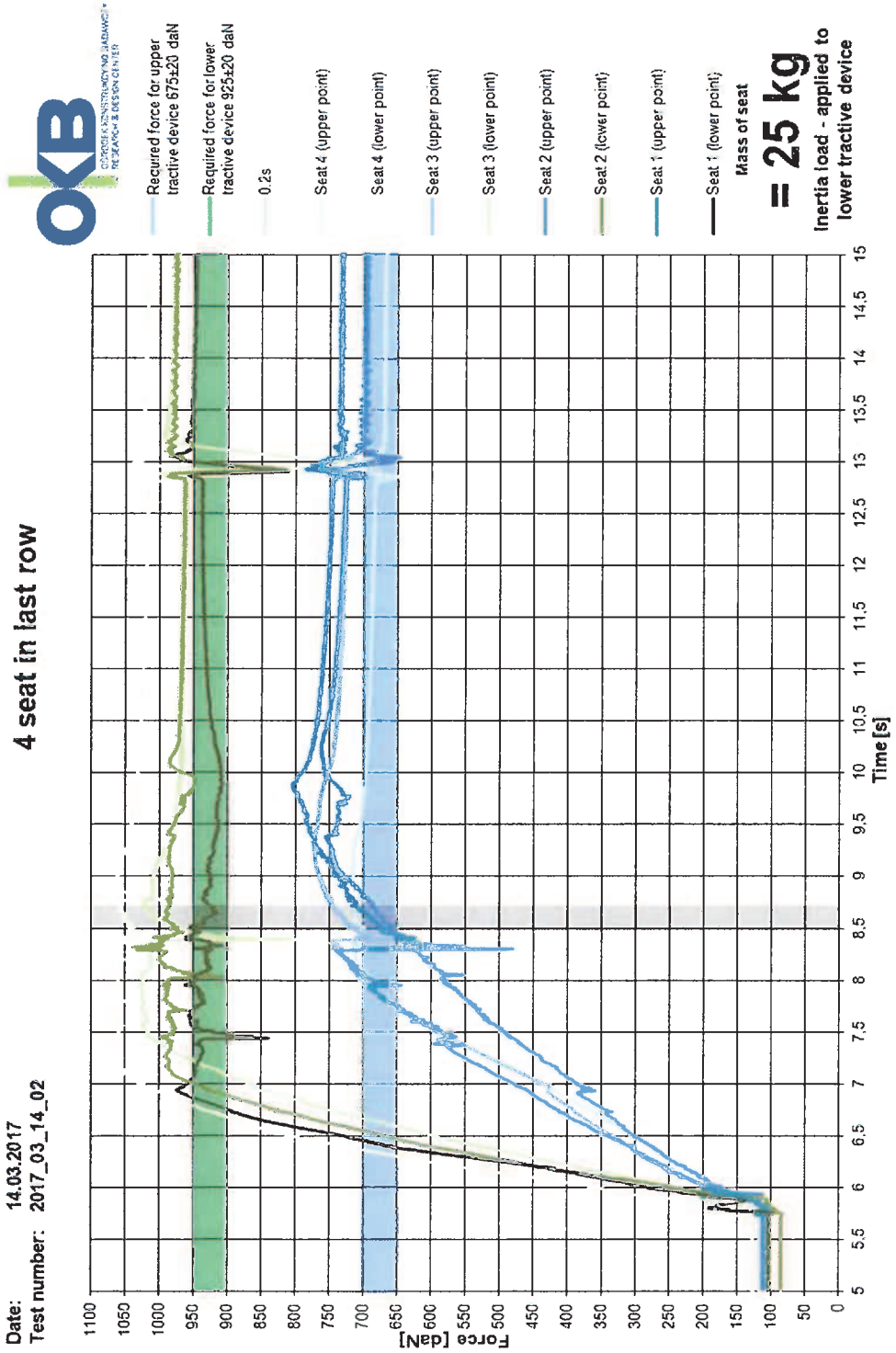


2.3.2. Double Seat S1LID25 (Ekolider II adjustable) - right seat

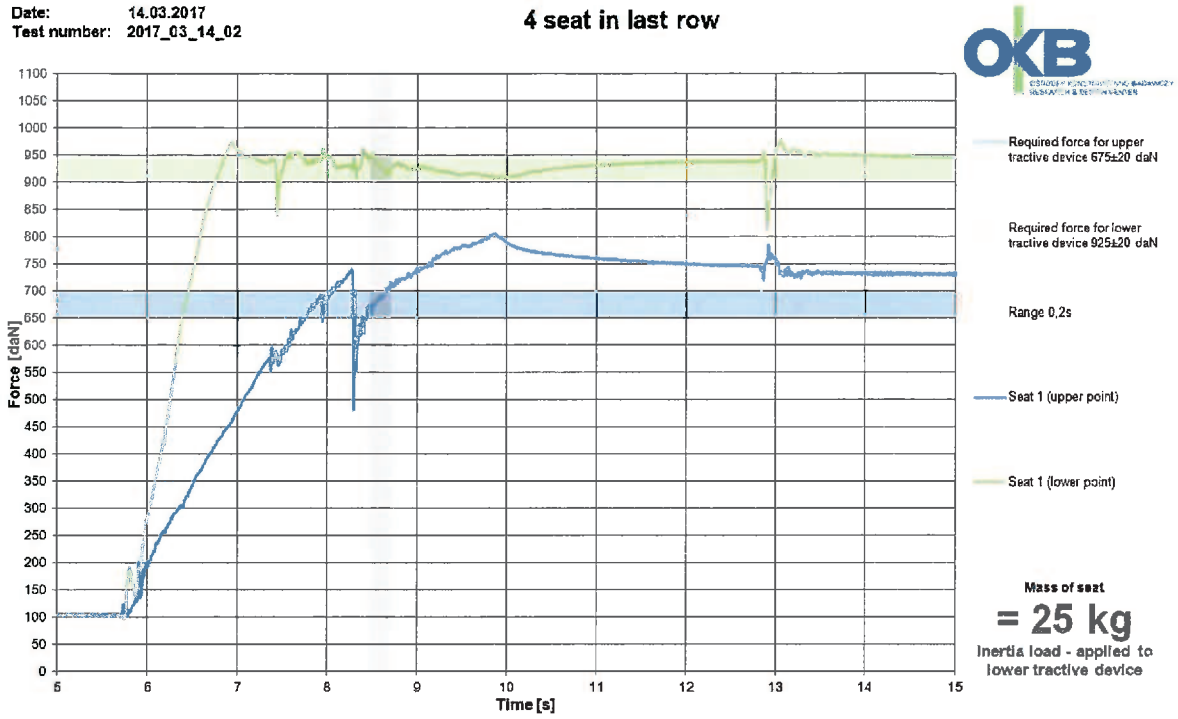


2.3.3. Ekolider II double + NOBLS17 (S1LID25 and S2LID25), representative vehicle body

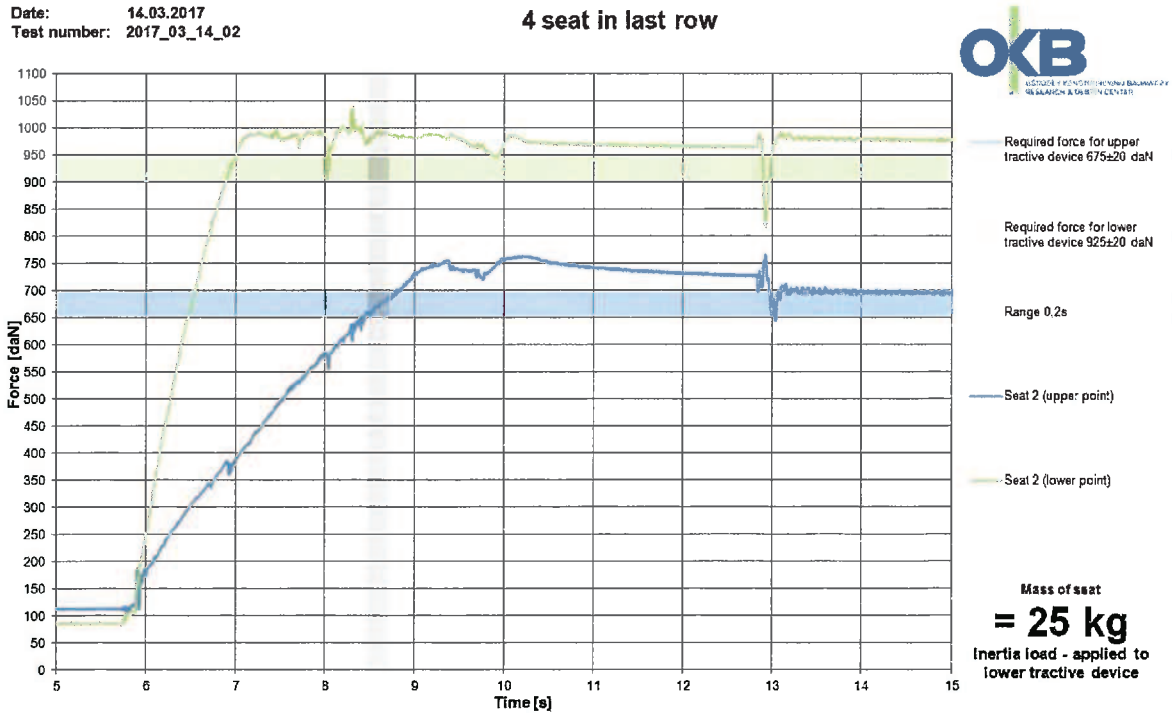
Displacement: S1: 330 mm, S2: 340 mm, S3: 320 mm, S4: 320 mm



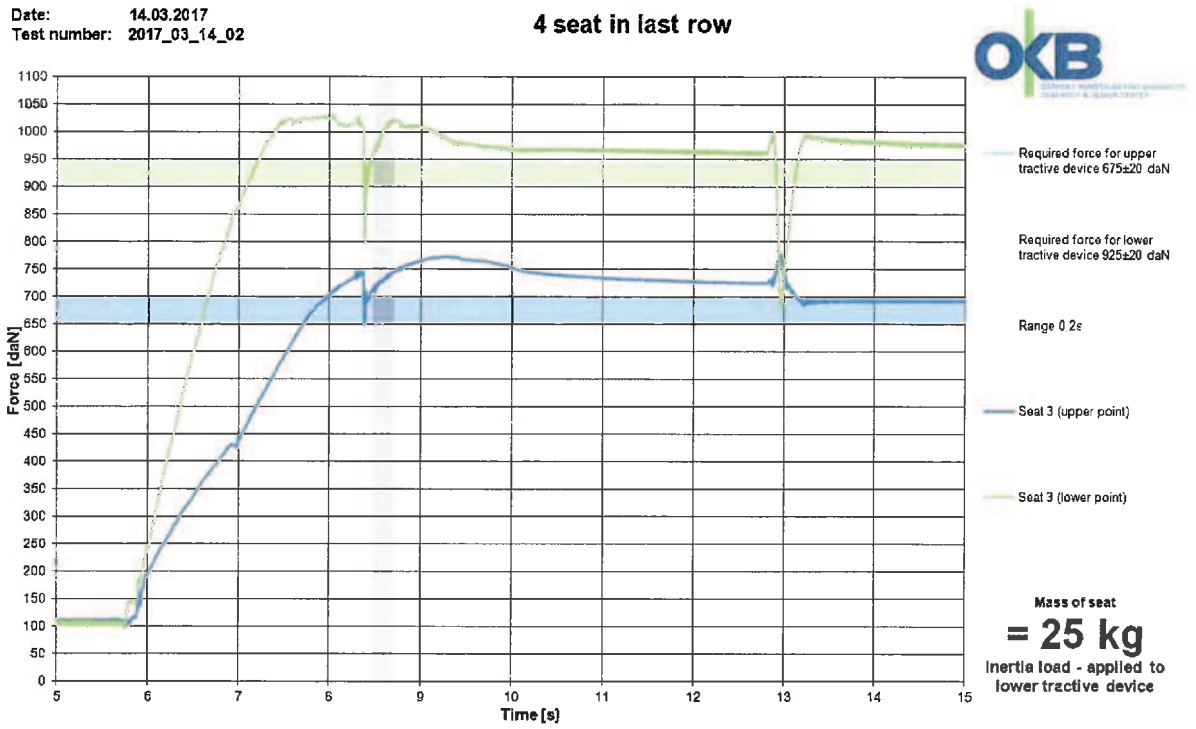
2.3.3. Ekolider II double: Seat S1, displacement = 330 mm



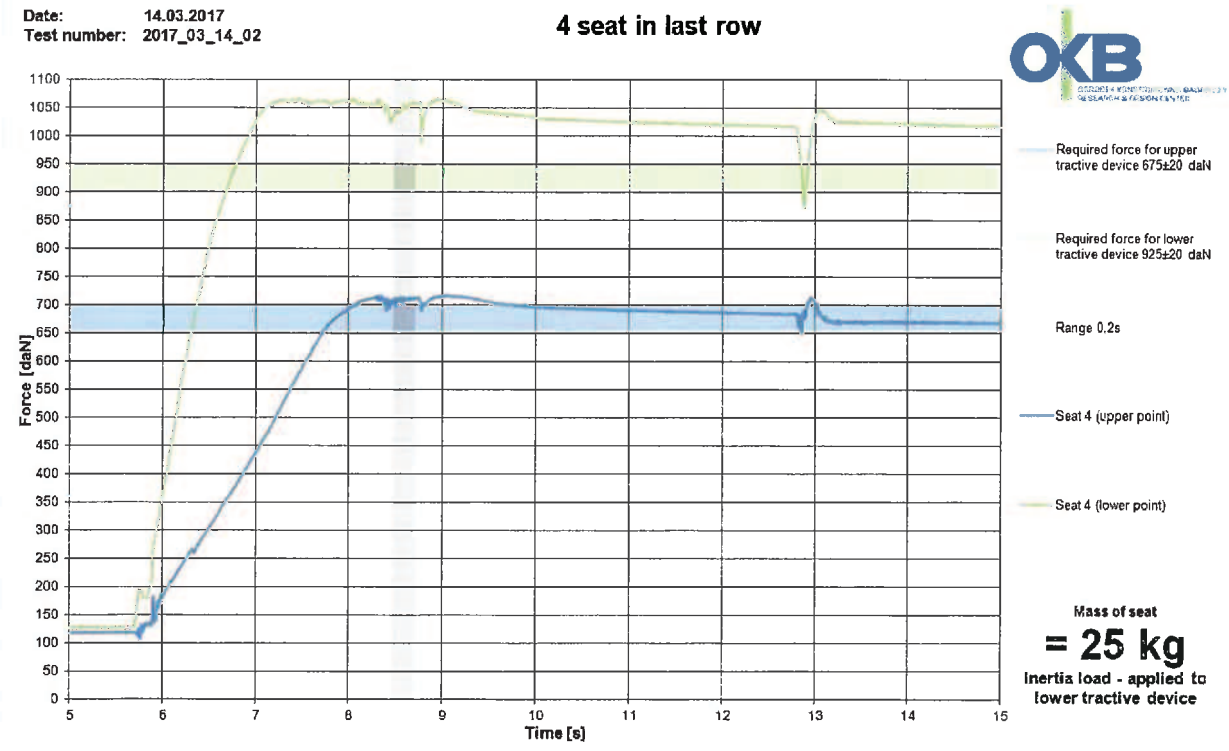
2.3.3. Ekolider II double: Seat S2, displacement 340 mm



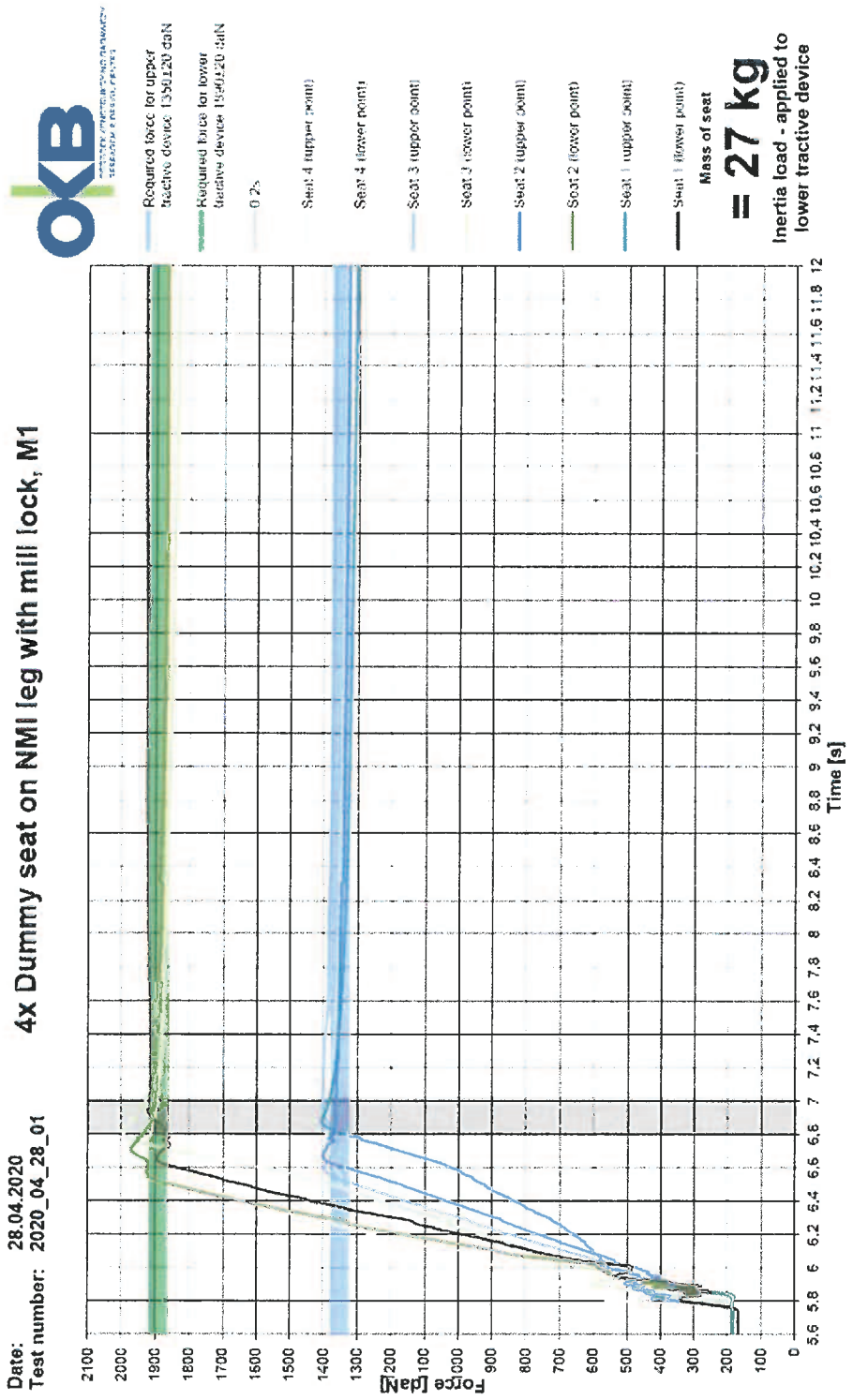
2.3.3. Ekolider II double: Seat S3, displacement 320 mm



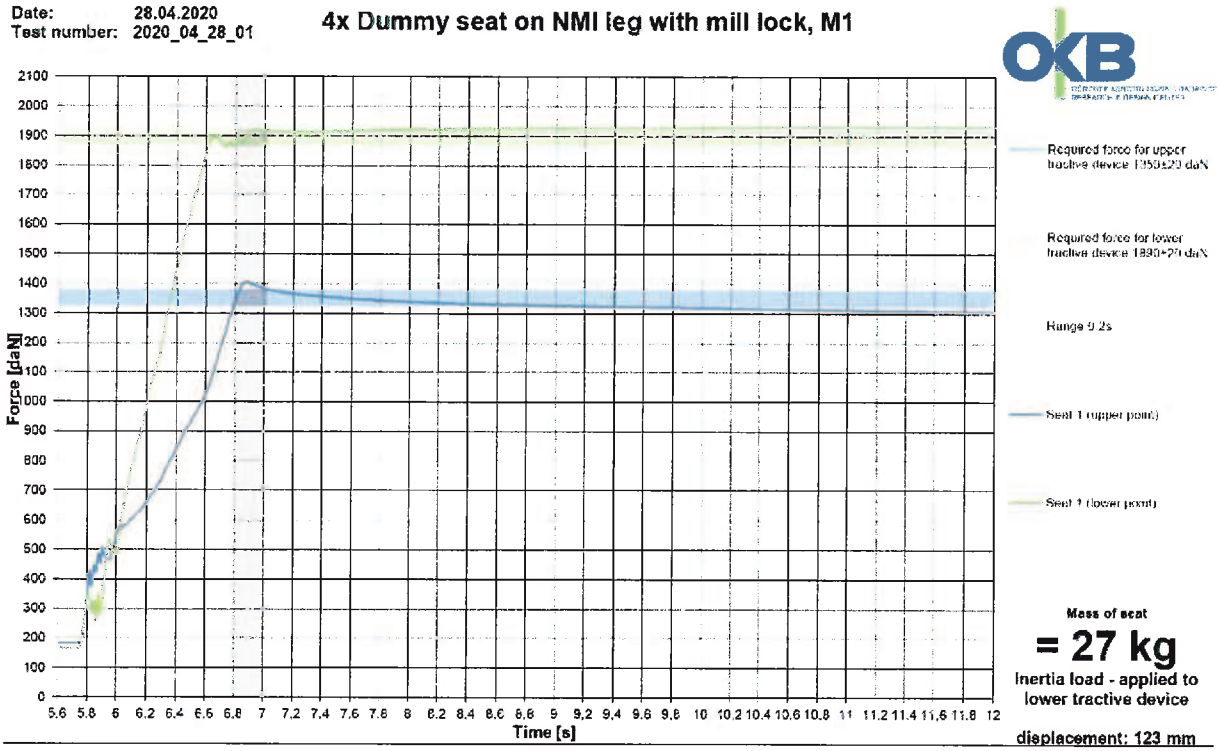
2.3.3. Ekolider II double: Seat S4, displacement 320 mm



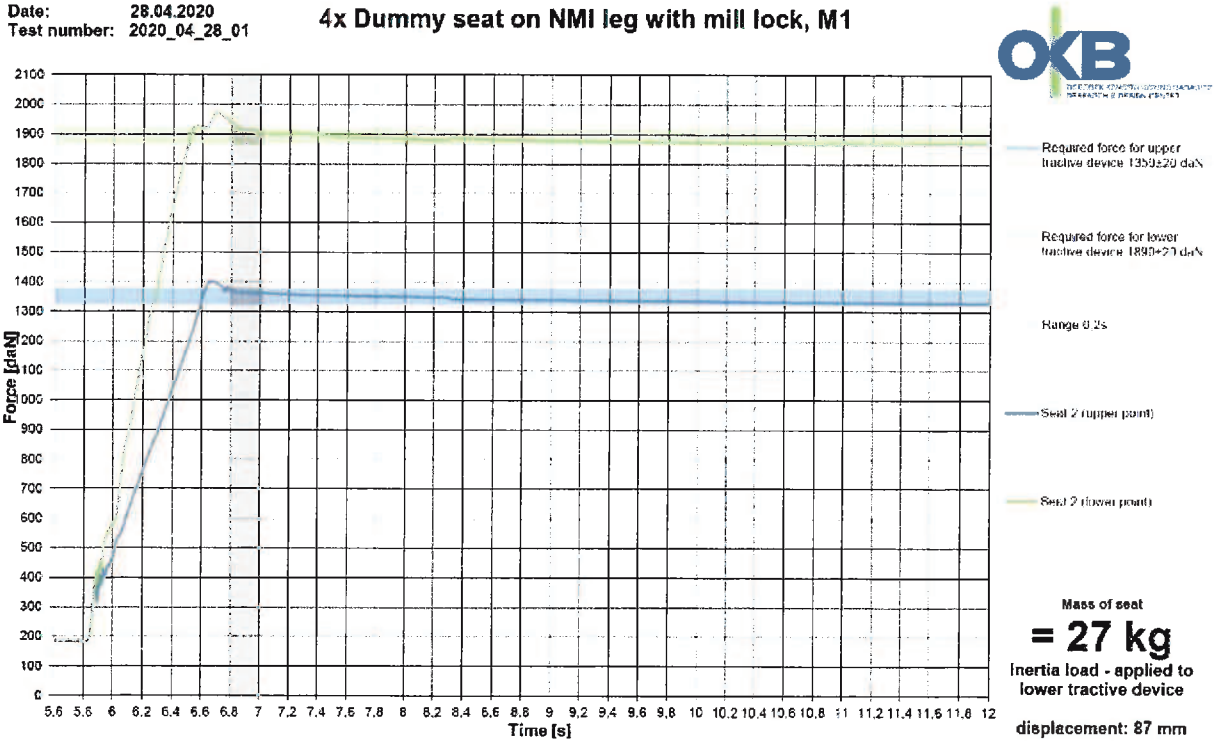
2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock in representative vehicle bodywork.



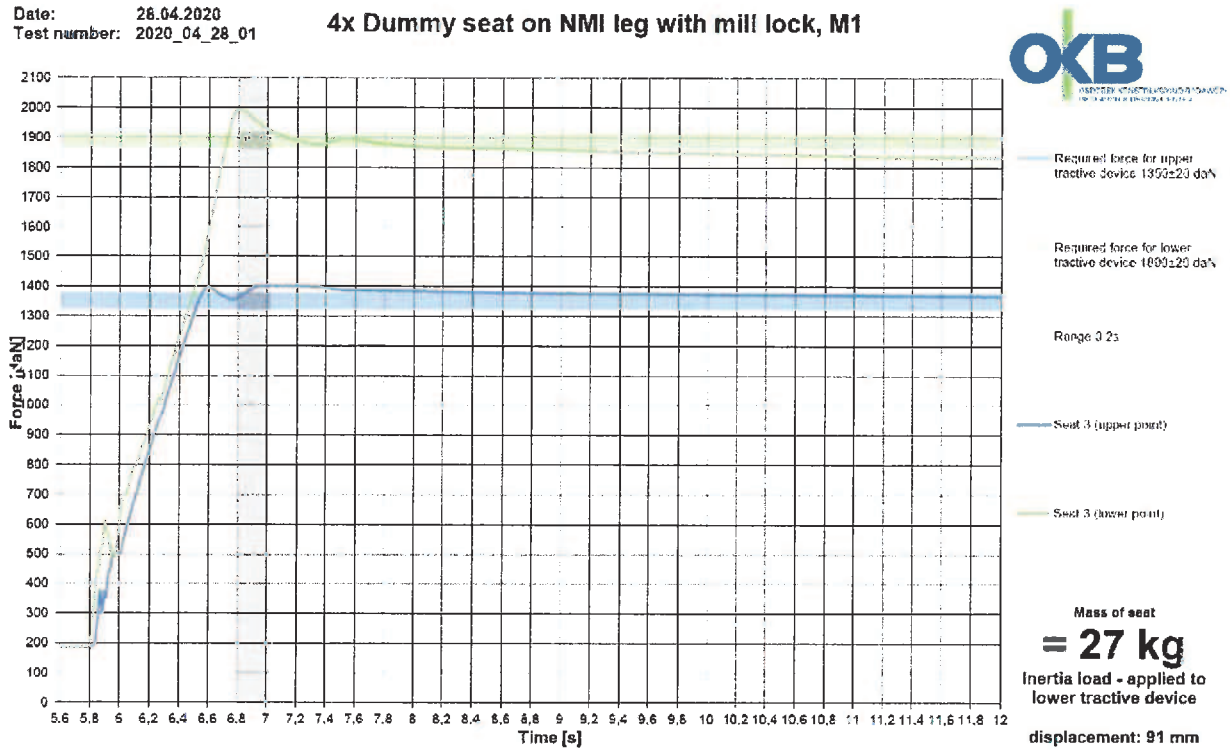
2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock – Seat 1



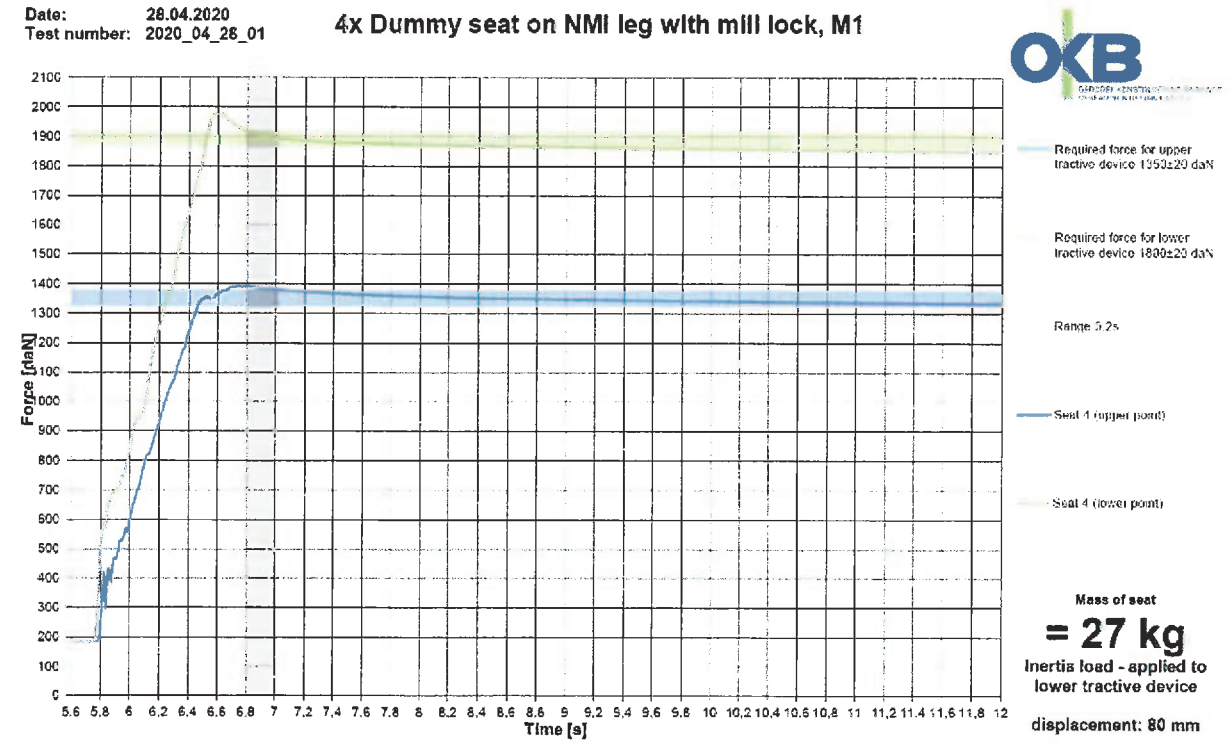
2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock – Seat 2



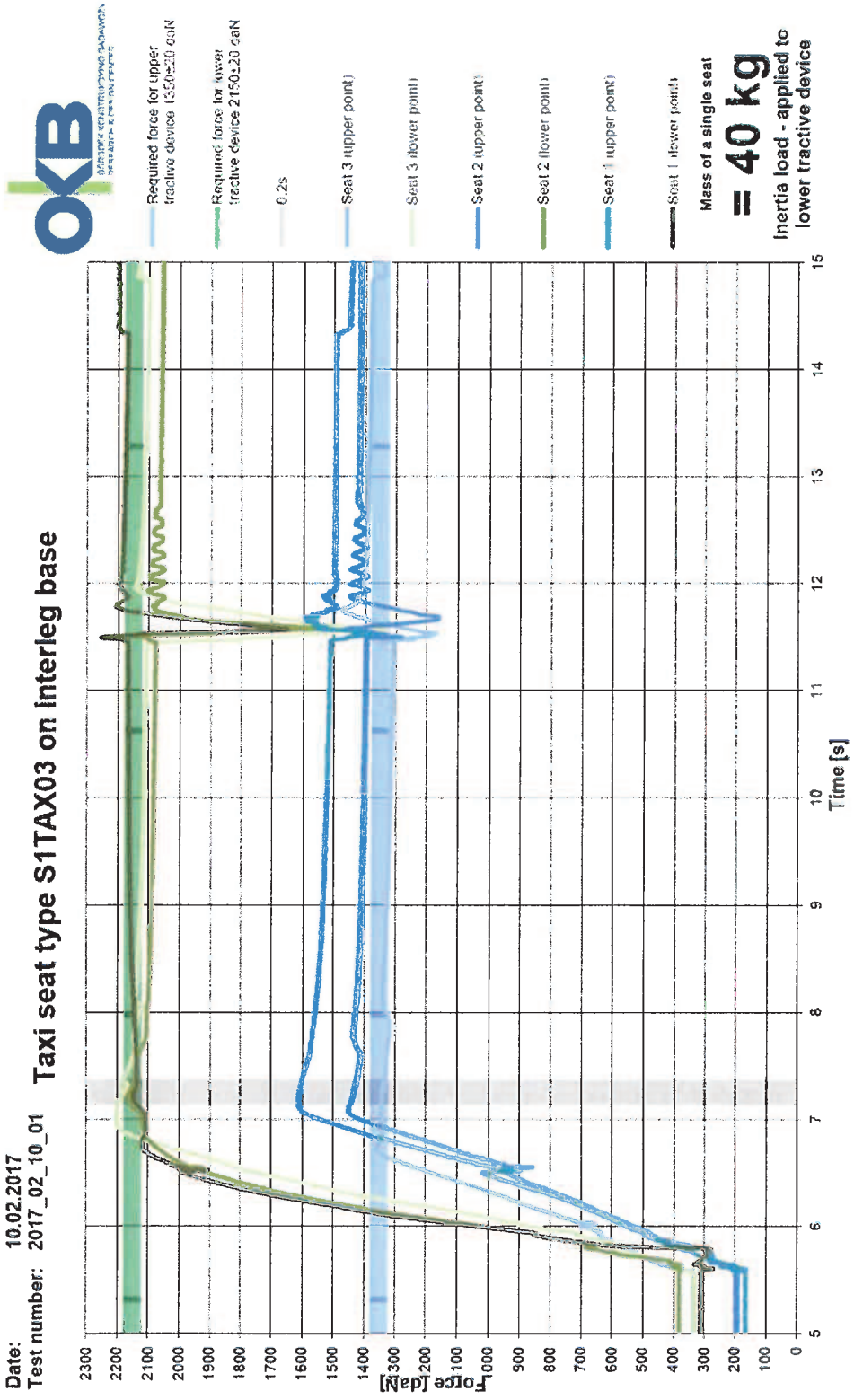
2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock – Seat 3



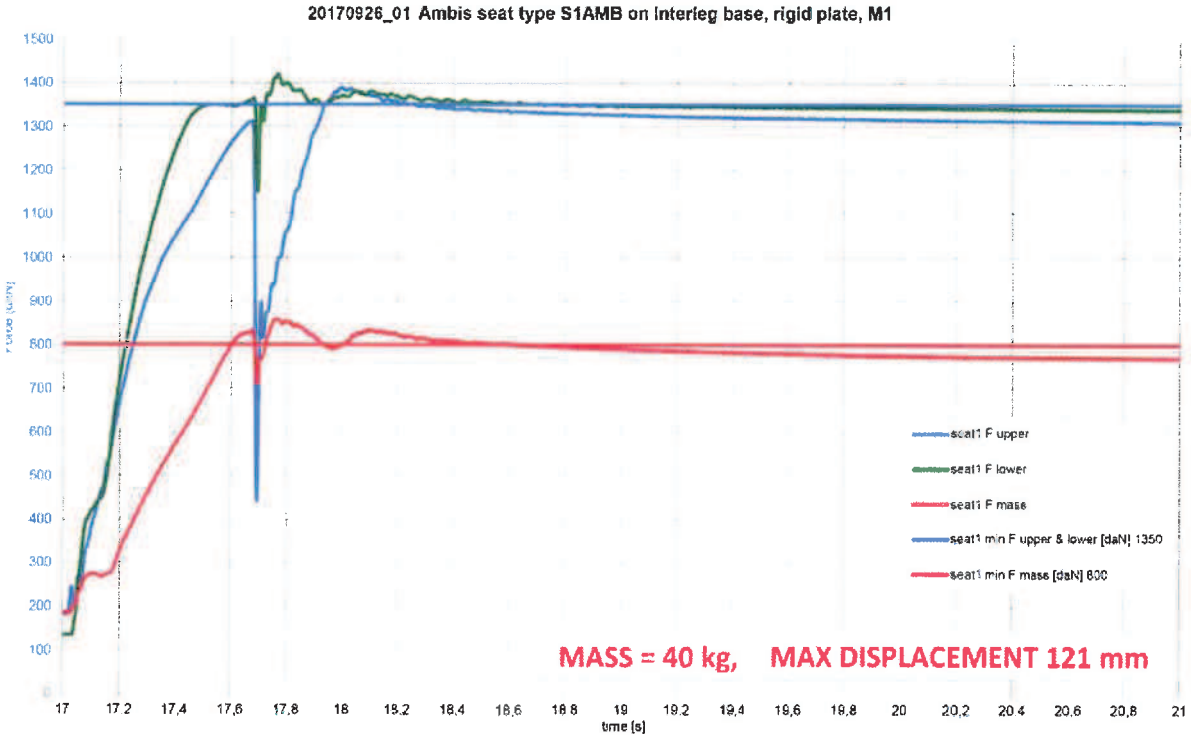
2.3.4. 4 x Dummy seat (DS-02) on NMI leg with mill lock – Seat 4



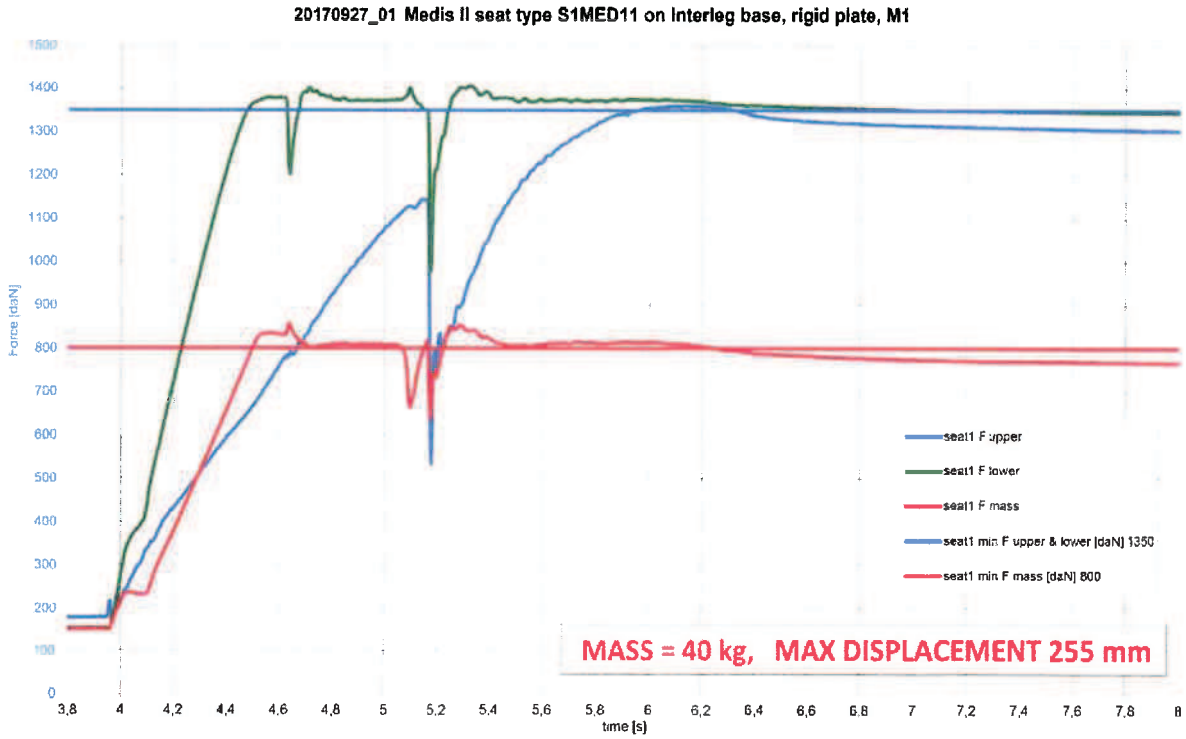
2.3.5. Taxi seat type S1TAX03 on Interleg base with fastening lockable, M1



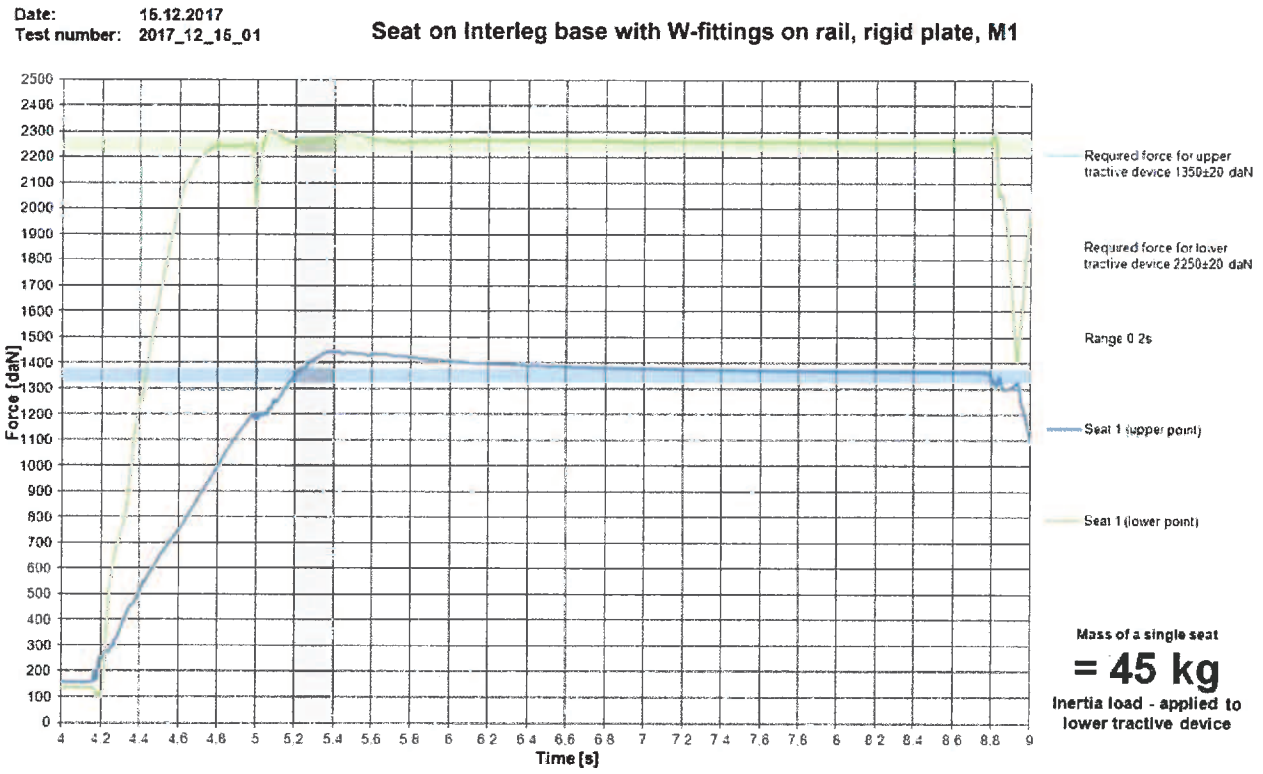
2.3.6. Seat type S1AMB01 (Ambis) on Interleg base, M1, mounted on rigid plate.



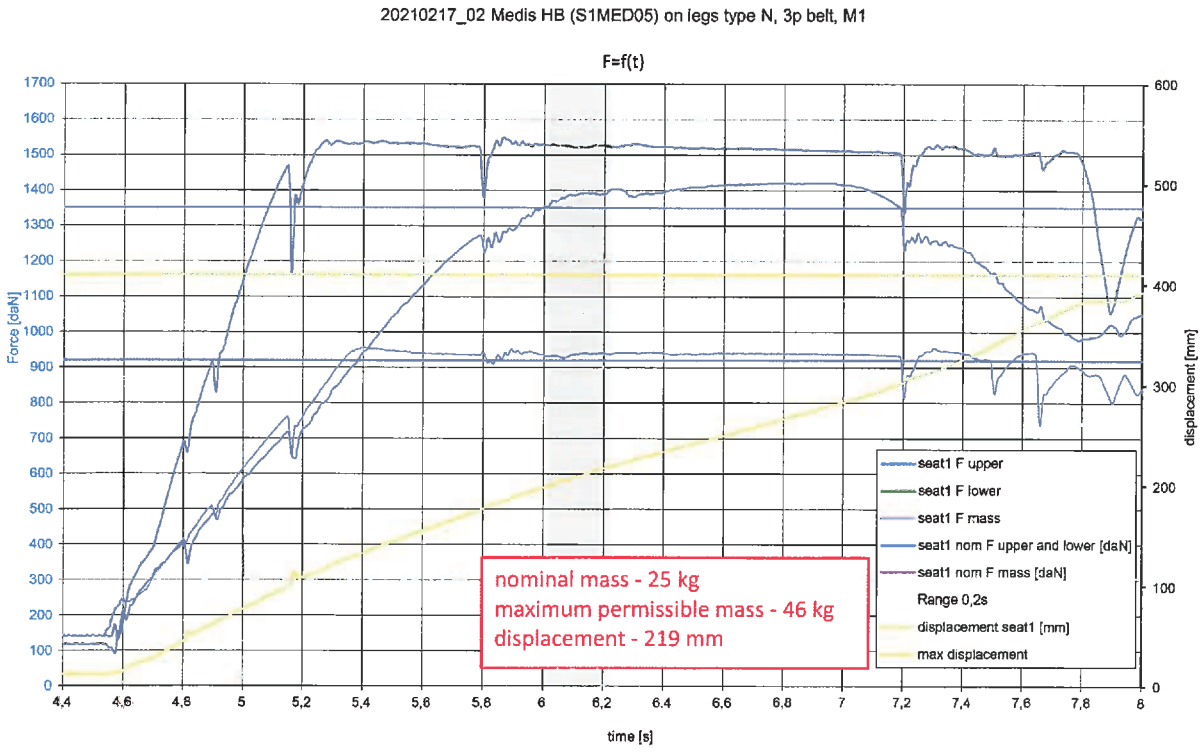
2.3.7. Seat type S1MED11 (Medis) on Interleg base, M1, mounted on rigid plate.



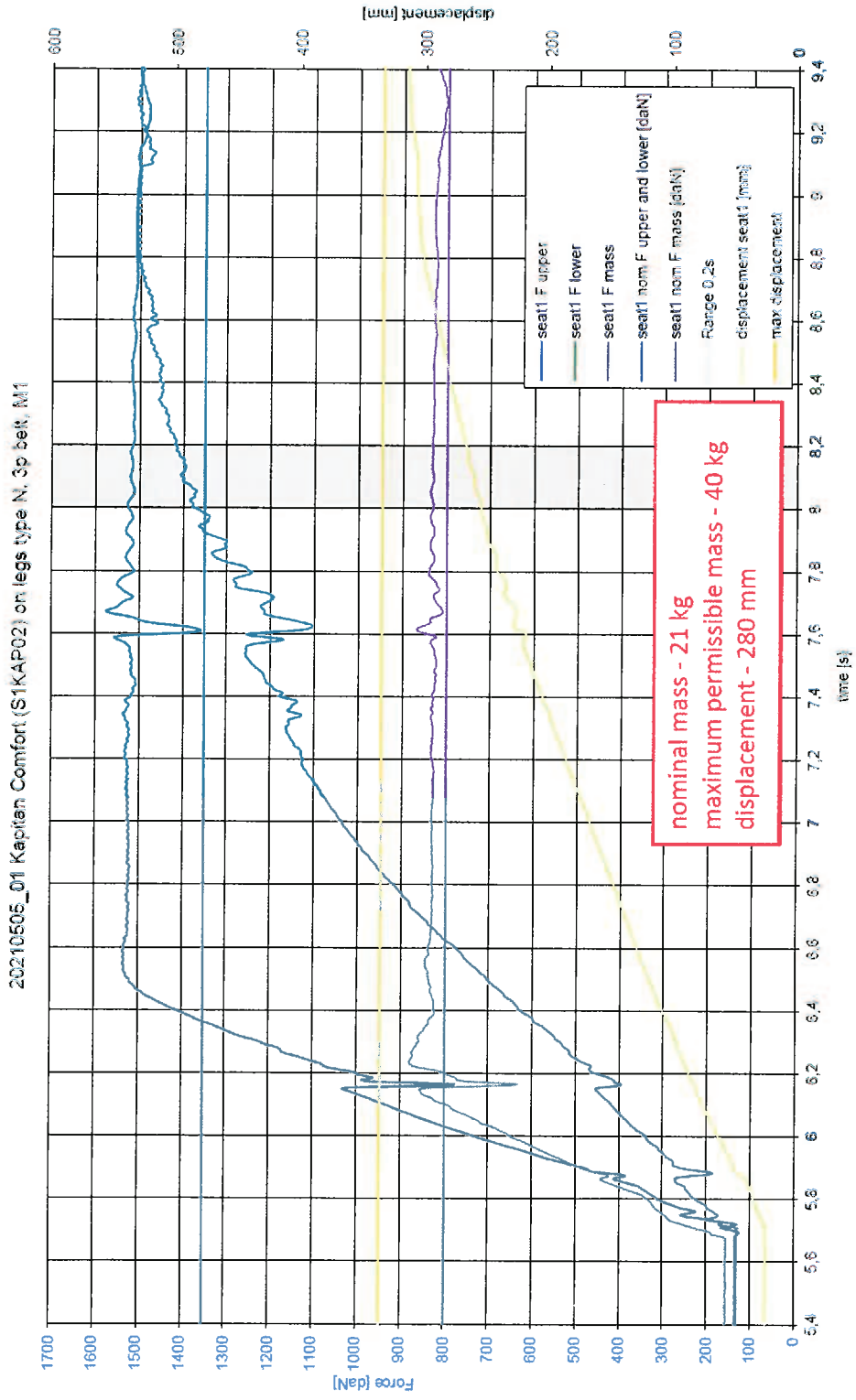
2.3.8. Dummy seat representative for S1TAX01 (02), S1NOV04 + INTERLEG + W fitting



2.3.9. Forward facing seat – S1MED05, Medis HB



2.3.10. Forward facing seat – S1KAP02, Kapitan Comfort



End of the technical report

INFORMATION FOLDER / DOCUMENT:

PURSUANT TO UN/ECE REGULATION No. 14.07 "UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO SAFETY-BELT ANCHORAGES, ISOFIX ANCHORAGES SYSTEMS AND ISOFIX TOP TETHER ANCHORAGES" (as last amended)

NAME: *OKB*
TYPE: *RAIL22*

Damian Goliński
Vice President

Total number of pages: *119*
Date of issue: *11.06.2021*

TÜV SÜD Czech s.r.o. TECHNICAL SERVICE E&IC

List of documentation and supplements

List of enclosures

Table of vehicles types	Enclosure 1
Drawings of RAIL22	Enclosure 2
Possible combinations of seats and legs	Enclosure 3
Drawings of seats	Enclosure 4
Drawings of legs and bases	Enclosure 5
Instruction of installation of RAIL22 to the vehicle's floor	Enclosure 6

Confirmation

We hereby declare that the vehicle specimens submitted for this approval test have been manufactured and assembled on conditions of ordinary mass production and that they are compatible with the enclosed documentation.

Date of issue: *11th June 2021*

Damian Goliński
Vice President

TÜV SÜD Czech s.r.o TECHNICAL SERVICE E&IC

0.	GENERAL	
0.1	Make (trade name of manufacturer):	OKB
0.2	Type:	RAIL22
0.2.1	Commercial name(s) (if available):	RAIL22
0.3	Means of identification of type:	N/A
0.3.1	Location of that marking:	N/A
0.4	Category of vehicle:	M1, N1, M2, N2, M3, N3
0.5	Name and address of manufacturer:	OKB z o.o. ul. Szkolna 9 95-006 Bukowiec Poland

1.	GENERAL CONSTRUCTION CHARACTERISTICS OF THE VEHICLE	
1.1	Photographs and/or drawings of a representative vehicle:	List of vehicles for which the presented solution is valid – see Enclosure 1: Table of vehicles types

9.	BODYWORK	
9.1	Type of bodywork using the codes set out in Part C of Annex II of Directive 2007/46/EC:	N/A
9.10	Interior arrangement	N/A
9.10.3	Seats	
9.10.3.1	Number of seating positions:	Not limited (depending of vehicle category)
9.10.3.1.1	Location and arrangement:	Seats can be mounted in any position in the vehicle, provided in one row there are not more than 4 seats
9.10.3.2	Seat(s) designated for use only when the vehicle is stationary:	N/A

9.10.3.3	Masses:	**1. Intap production seats:** **1.1. Category M1:** S1MED01, S1MED02, S1MED05, S1MED11, S1TAX01, S1TAX02, S1TAX03, S1TAX08, S1TAX09, S1TAX10, S1TAX11, S1TAX12, S1NOV04, S1KAP02, S1ERB08, S1KAR02, S1KAR03, S1KAR06, S1AMB01, S1AMB07 – see Enlcosure 4 **1.2. Category M2/M3:** Single seats: S1NOV01, S1LID17, S1LID18, S1LID25, S1POL01, S1NOV02, S1NGP01 – see Enlcosure 4 Double seats: S2NOV01, S2LID17, S2LID18, S2LID25, S1POL01 – see Enlcosure 4 **1.3. Category M3:** Single seats: S1NGR01, S1NGR02, S1NGS01 – see Enlcosure 4 Double seats: S2NOV01, S2LID17, S2LID18, S2LID25, S1POL01 – see Enlcosure 4
9.10.3.4	Characteristics: for seats not type-approved as components, description and drawings of	
9.10.3.4.1	The seats and their anchorages:	See Enclosure 3, Enclosure 4
9.10.3.4.2	The adjustment system:	See Enclosure 3, Enclosure 4
9.10.3.4.3	The displacement and locking systems:	See Enclosure 3, Enclosure 4
9.10.3.4.4	The seat-belt anchorages (if incorporated in the seat structure):	See Enclosure 3, Enclosure 4
9.10.3.4.5	The parts of the vehicle used as anchorages:	N/A
9.10.3.5	Coordinates or drawing of the R-point	
9.10.3.5.1	Driver's seat:	N/A
9.10.3.5.2	All other seating positions:	See Enclosure 4
9.10.3.6	Design torso angle	
9.10.3.6.1	Driver's seat:	N/A

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9.10.3.6.2	All other seating positions:	See Enclosure 4
9.10.3.7	Range of seat adjustment	
9.10.3.7.1	Driver's seat:	N/A
9.10.3.7.2	All other seating positions:	See Enclosure 4
9.10.4.	Head restraints	
9.10.4.1.	Type(s) of head restraints:	**Detachable:** S1MED01, S1MED02, S1MED05 S1MED11, S1AMB01, S1AMB07 **Integrated:** S1TAX01, S1TAX02, S1TAX03, S1TAX08, S1TAX09, S1TAX10, S1TAX11, S1TAX12, S1NOV04, S1KAP02, S1ERB08, S1KAR02, S1KAR03, S1KAR06 S1NOV01, S1LID17, S1LID18, S1LID25, S1POL01, S1NGR01, S1NGR02, S1NGS01, S1NOV02, S1NGP01 S2NOV01, S2LID17, S2LID18, S2LID25, S1POL01, S2NGR01, S2NGR02, S2NGS01
9.10.4.2.	Type-approval number(s), if available:	N/A
9.10.4.3.	For head restraints not yet approved:	N/A
9.10.4.3.1.	A detailed description of the head restraint:	N/A
9.10.4.3.2.	In the case of a "separate" head restraint:	N/A
9.10.4.3.2.1.	A detailed description of the structural zone to which the head restraint is intended to be fixed:	N/A
9.10.4.3.2.2.	Dimensional drawings of the characteristics parts of the structure and the head restraint:	N/A
9.13	Safety belt anchorages	
9.13.1	Photographs and/or drawings of the bodywork showing the position and dimensions of the actual and effective anchorages including the R-points:	See Enclosures
9.13.2	Drawings of the belt anchorages and parts of the vehicle structure where they are attached (with the material indication):	See Enclosure 4

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9.13.3 Designation of the types of safety belt authorised for fitting to the anchorages with which the vehicle is equipped:

	Anchorage location	
	Vehicle structure	Seat structure
First row of seats	N/A	N/A

Other rows of seats			Anchorage location	
			Vehicle structure	Seat structure
Left-hand seat *	Lower anchorages	outboard	--	Ar or Br
		inboard	--	Ar or Br
	Upper anchorages		--	Ar
Centre seat *	Lower anchorages	right	--	Ar or Br
		left	--	Ar or Br
	Upper anchorages		--	Ar
Right-hand seat *	Lower anchorages	outboard	--	Ar or Br
		inboard	--	Ar or Br
	Upper anchorages		--	Ar

Other rows of seats			Anchorage location	
			Vehicle structure	Seat structure
Left-hand seat *	Lower anchorages	outboard	--	Ar or Br
		inboard	--	Ar or Br
	Upper anchorages		--	Ar
Centre left-hand seat *	Lower anchorages	right	--	Ar or Br
		left	--	Ar or Br
	Upper anchorages		--	Ar
Centre right-hand seat *	Lower anchorages	outboard	--	Ar or Br
		inboard	--	Ar or Br
	Upper anchorages		--	Ar
Right-hand seat *	Lower anchorages	outboard	--	Ar or Br
		inboard	--	Ar or Br
	Upper anchorages		--	Ar

*- if present

9.13.4 Description of a particular type of safety belt where an anchorage is located in the seat backrest or incorporates an energy dissipating device:

Ar4m
Br4m
Br3

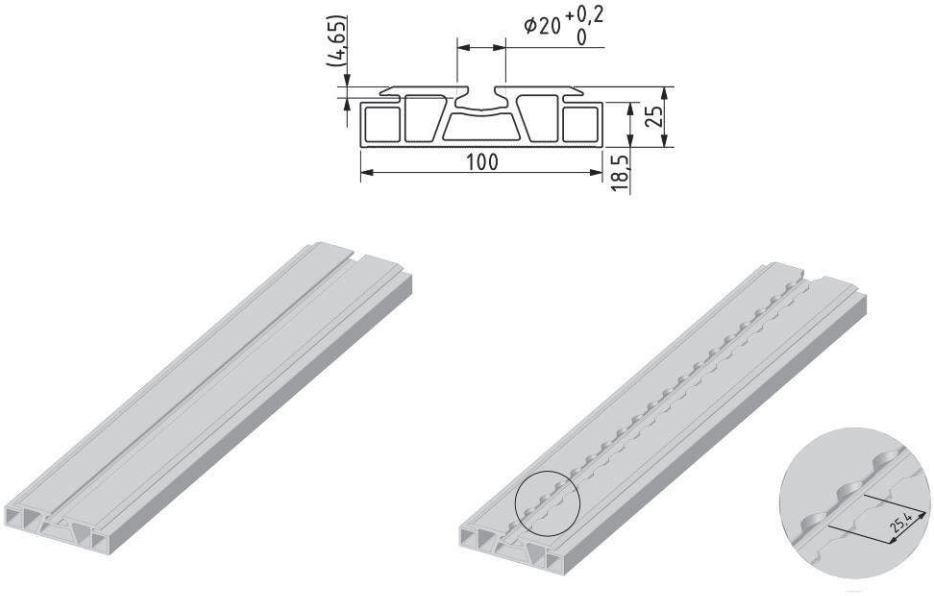
Enclosure 1: TABLE OF VEHICLES TYPES

List of vehicles for which presented solution is valid

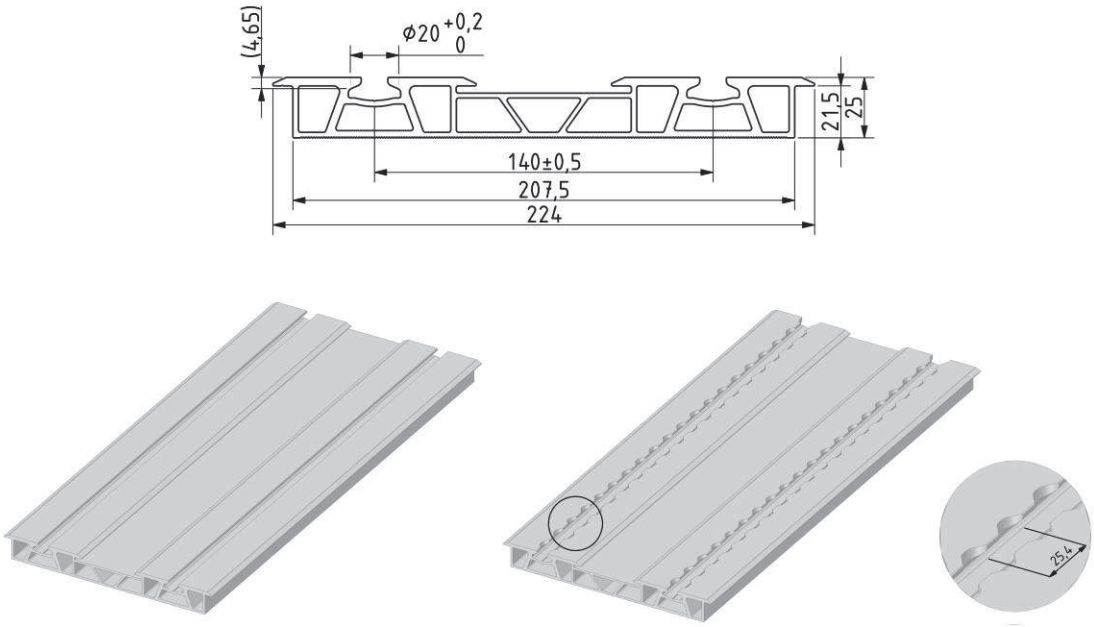
Manufacturer	Commercial description / Type	Wheelbase
Daimler / Mercedes-Benz	Sprinter (906, 907)	3250, 3665, 4325
	Sprinter (910)	3259, 3924
	Vito/Viano/V-klasse (639, 639/2, 639/4)	3200, 3430
VW	Crafter (2E__)	3250, 3665, 4325
	Crafter (SY___ e.g. SYN1E, SYM1E, SYN2E, SYN2Z, SYM2Z)	3640, 4490
	T5 (7H_, 7E_, 7J_)	3000, 3400
	T6, T6.1 (7H_, 7E_, 7J_)	3000, 3400
Citroen	Jumper (Y)	3000, 3450, 4035
	Jumpy (X)	3000, 3122
	Jumpy (2016)	2925, 3275
	SpaceTourer	2925, 3275
Peugeot	Boxer (Y)	3000, 3450, 4035
	Expert (VF3__)	3000, 3122
	Expert (2016)	2925, 3275
	Traveller	2925, 3275
Fiat	Ducato (250)	3000, 3450, 4035
	Scudo (270)	3000, 3122
	Talento (FJL, FFL)	3098, 3498
Opel	Movano (MR, MS, MW)	3182, 3682, 4332
	Vivaro (F7)	3098, 3498
	Vivaro	2925, 3275
Renault	Master (FV, MA, VA)	3182, 3682, 4332
	Trafic (FL, L)	3098, 3498
	Trafic 2014 (JL, L)	3098, 3498
Renault Truck	Master (MF)	3182, 3682, 4332
Ford	Transit (FA_, FD_)	2933, 3300, 3750
	Transit (FC_)	3300, 3750, 3954
	Transit Custom (FA_, FC_)	2933, 3300
	Transit Connect (PU2)	2662, 3062
Iveco	Daily (IS_)	3000, 3300, 3520, 3595, 3950, 4100, 4175, 4750
Nissan	NV200	2725
	NV300	3098, 3498
	Primastar	3098, 3498
	NV400	3182, 3682, 4332
Toyota	Pro Ace, Pro Ace Verso (2016)	2925, 3275
MAN	TGE (SY___ e.g. SYN1E, SYM1E, SYN2E, SYN2Z, SYM2Z)	3640, 4490
LDV	V80, Maxus (SV6C)	3100, 3850
	V90, Deliver 9, E Deliver 9	3000, 3366, 3760
Hyundai	H350 (EU(V))	3435, 3670
RAM (Dodge)	ProMaster	3000, 3450, 4035

Enclosure 2: DRAWINGS OF RAIL22

Single rail

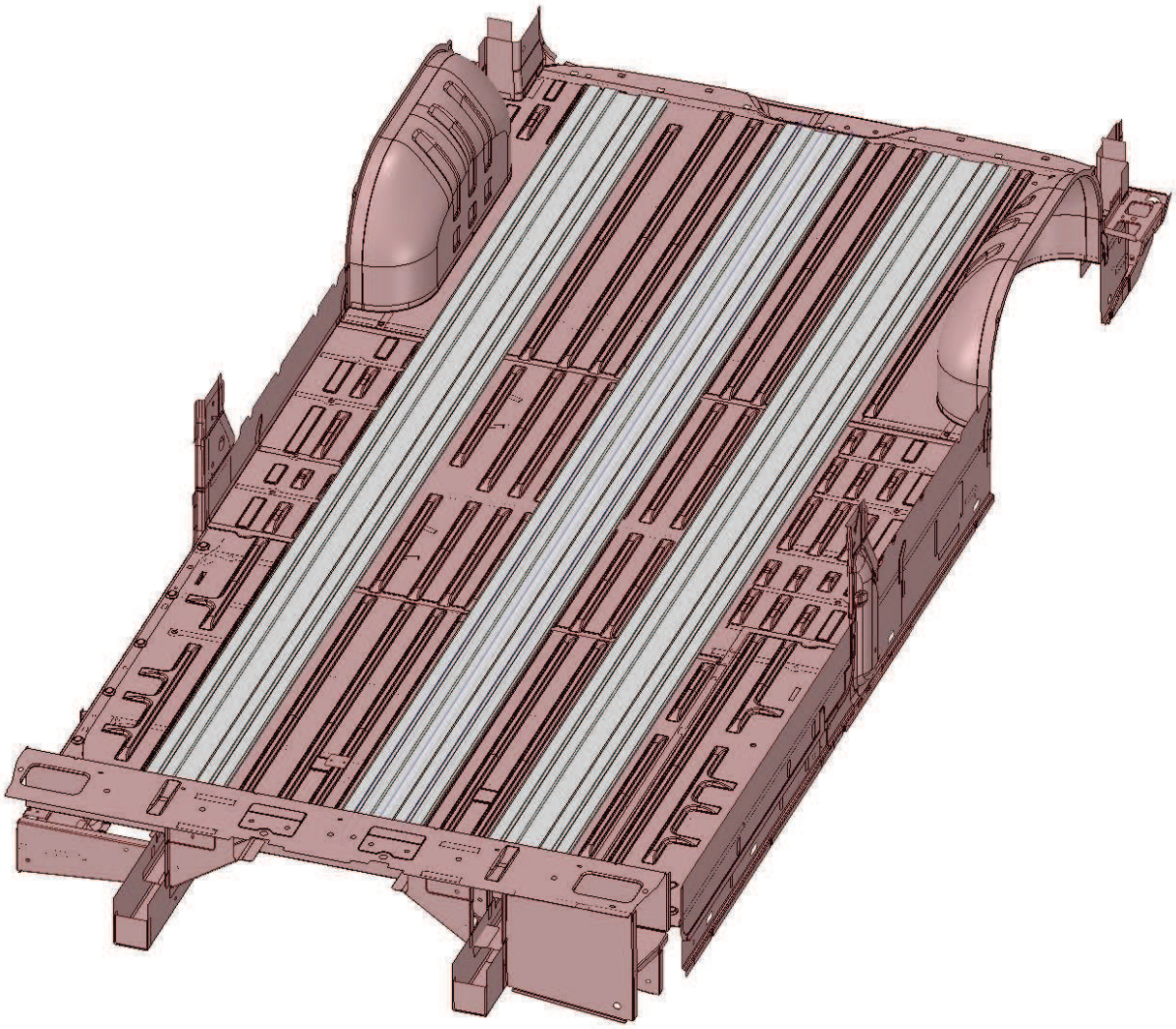


Double rail



Material: 6005T6 or 6082T6

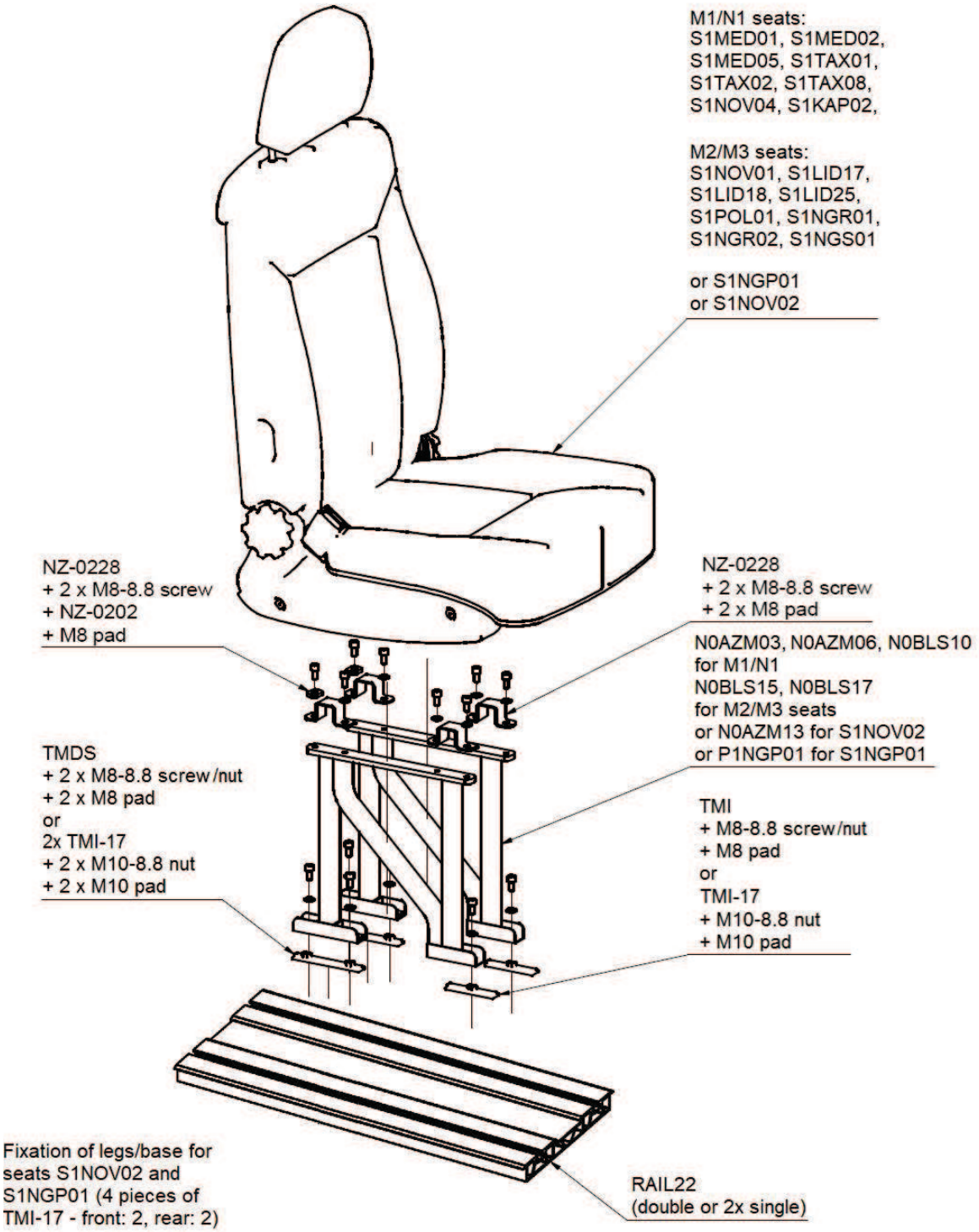
Any seats arrangement allowed but not more than 4 seat in 1 row Any position of seats on the floor allowed.



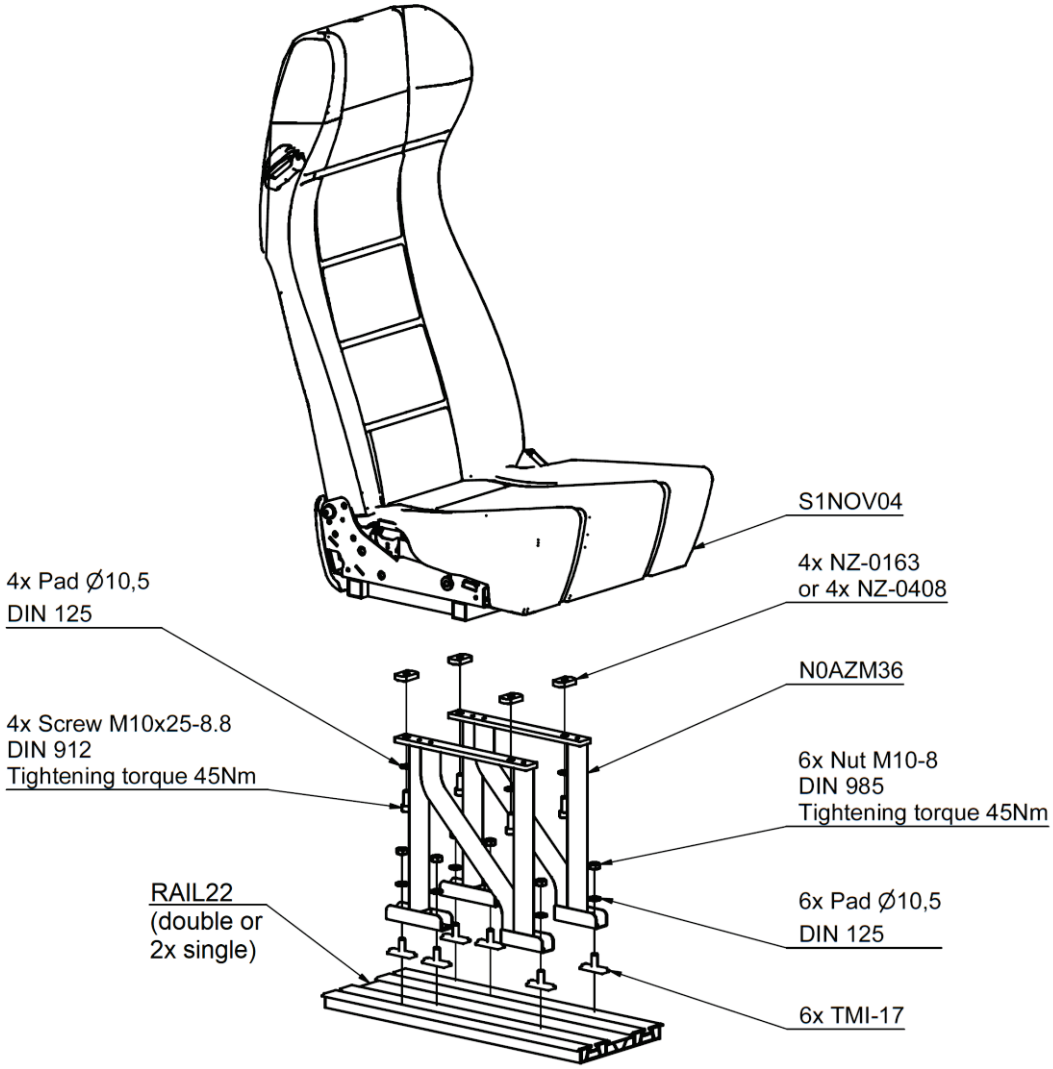
The RAIL22 are glued to the original vehicle floor.

Enclosure 3: POSSIBLE COMBINATIONS OF SEATS AND LEGS

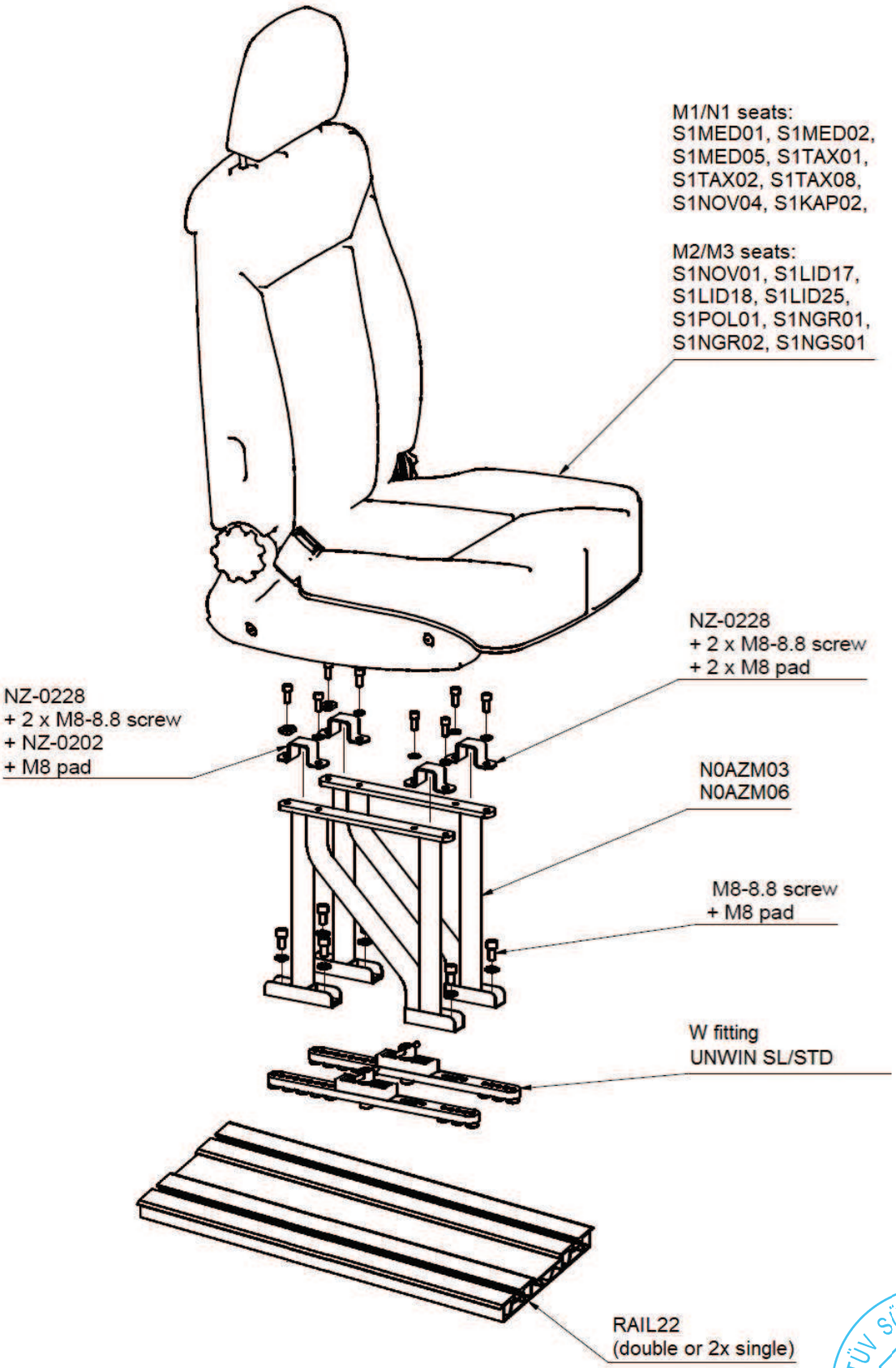
Single seats with legs and T-bolts



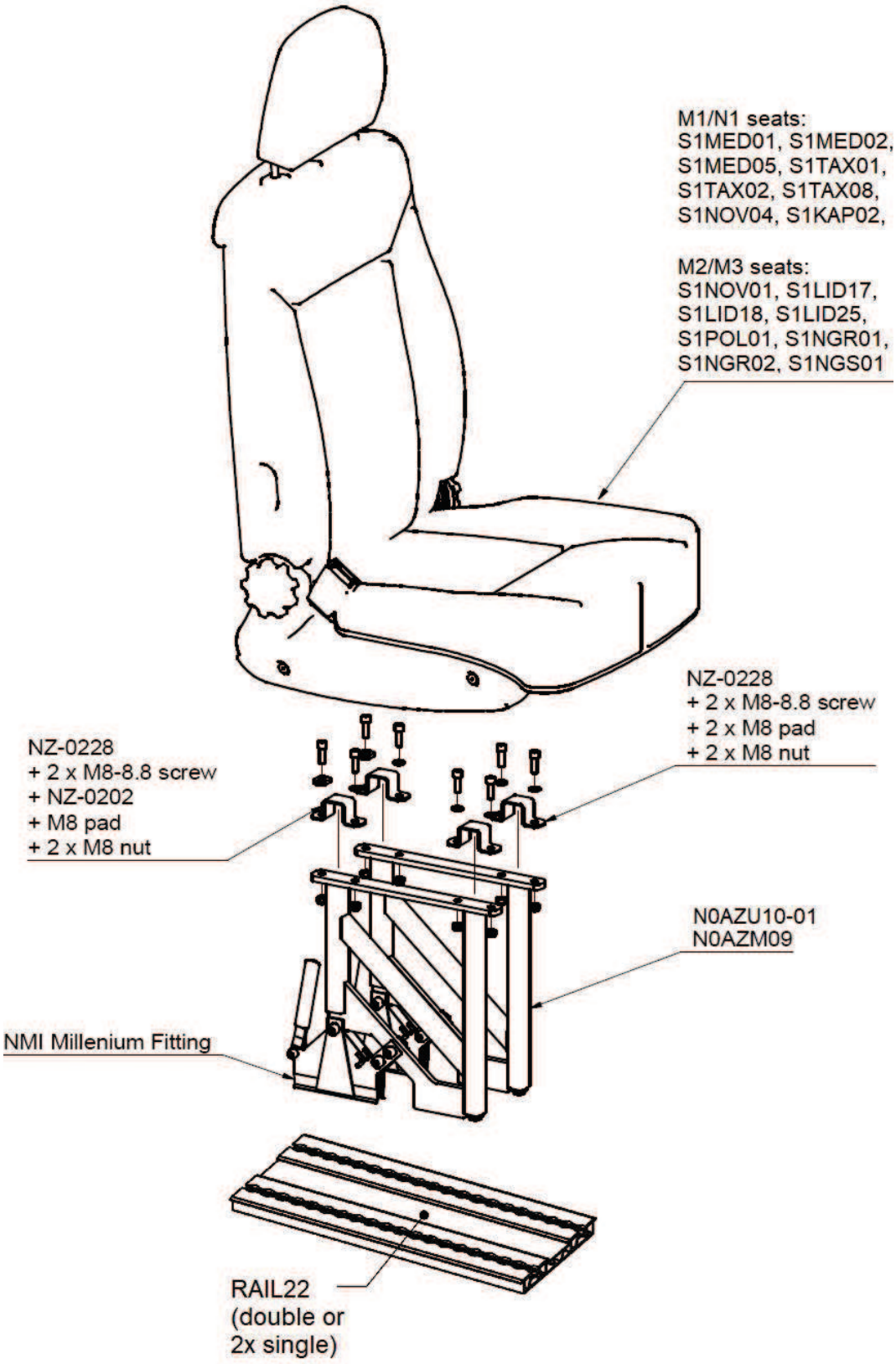
S1NOV04 seat with legs N0AZM36 and T-bolts



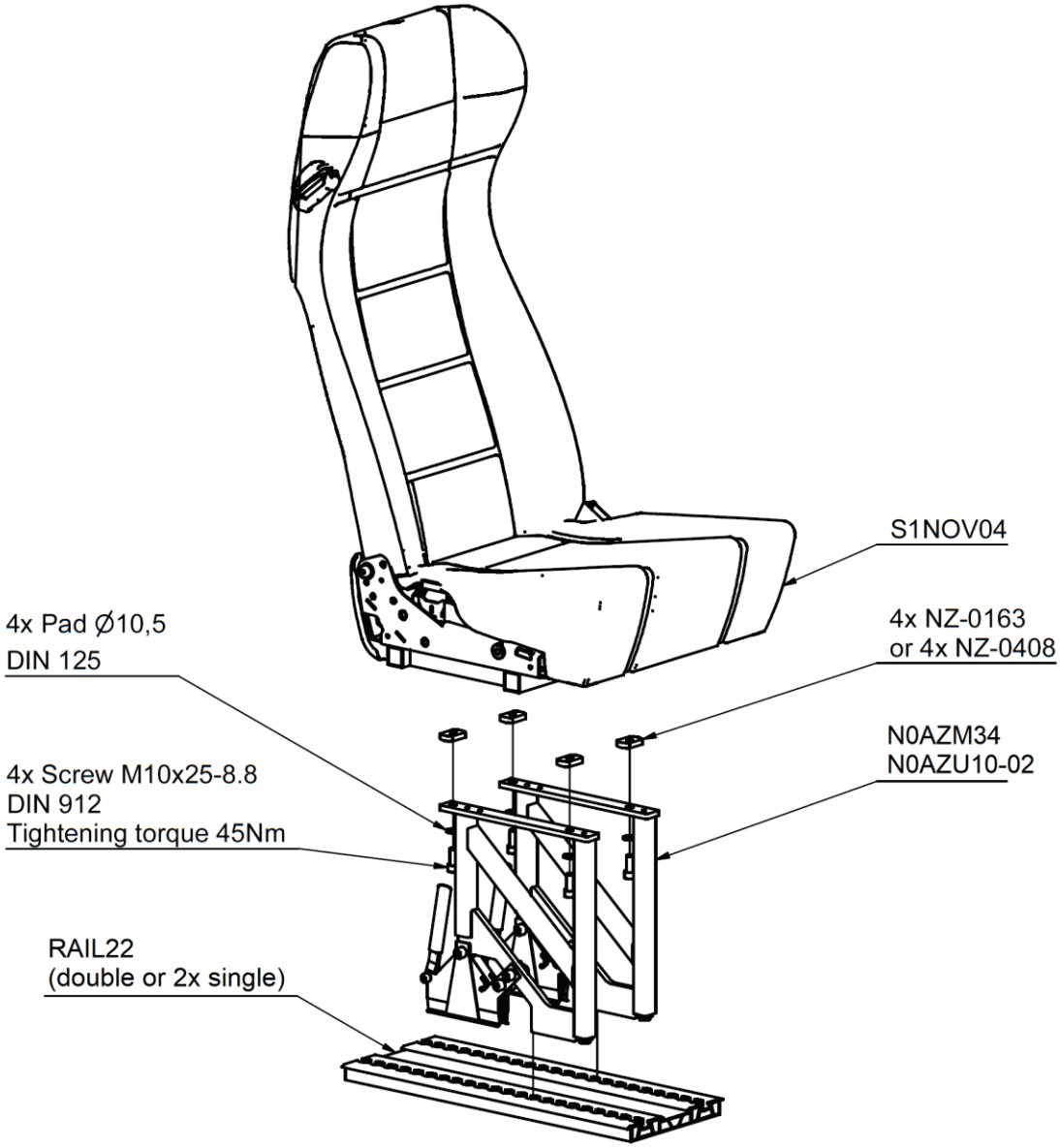
Single seat with legs and fastening lockable



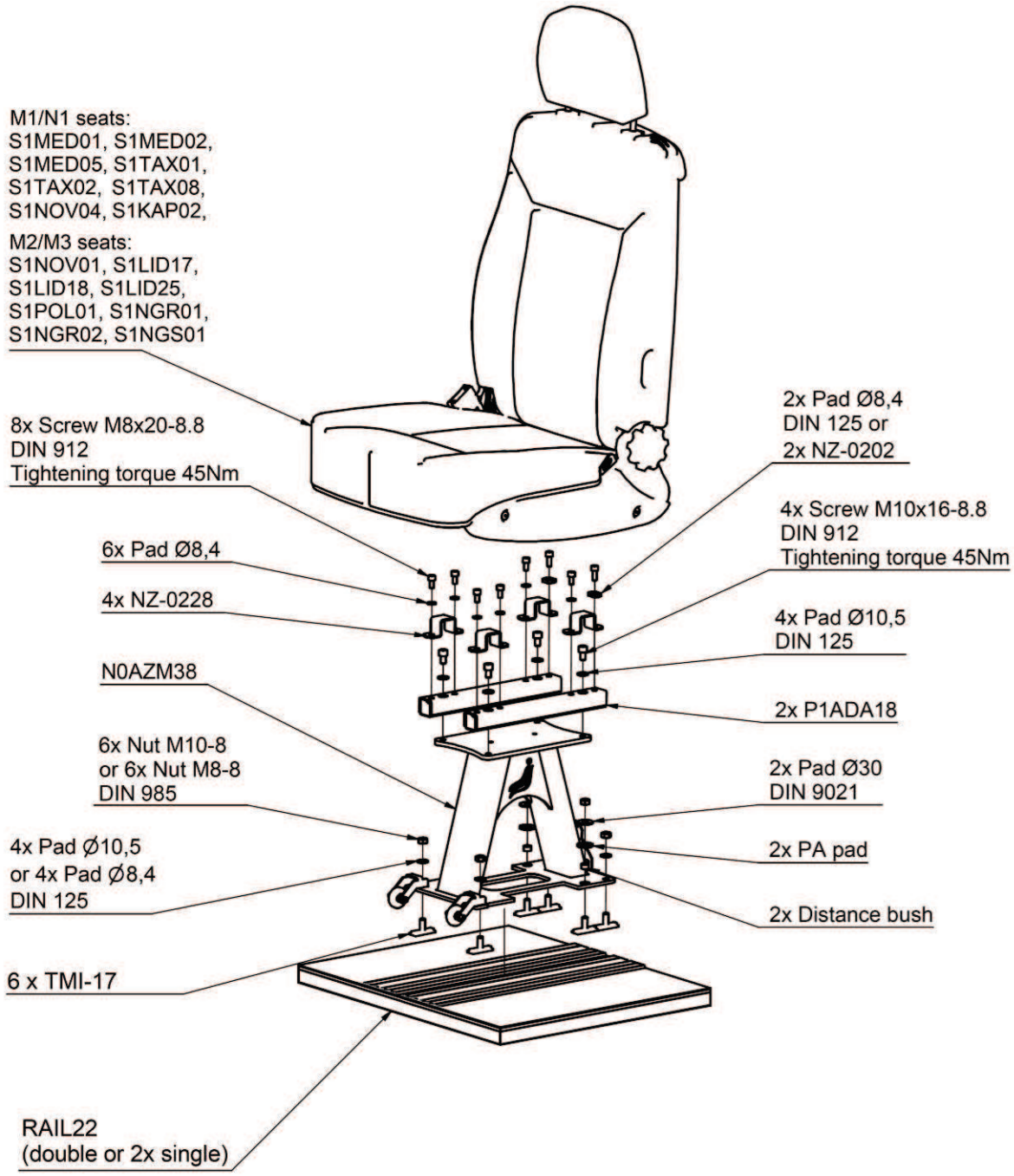
Single seat with legs with NMI Millenium Fitting

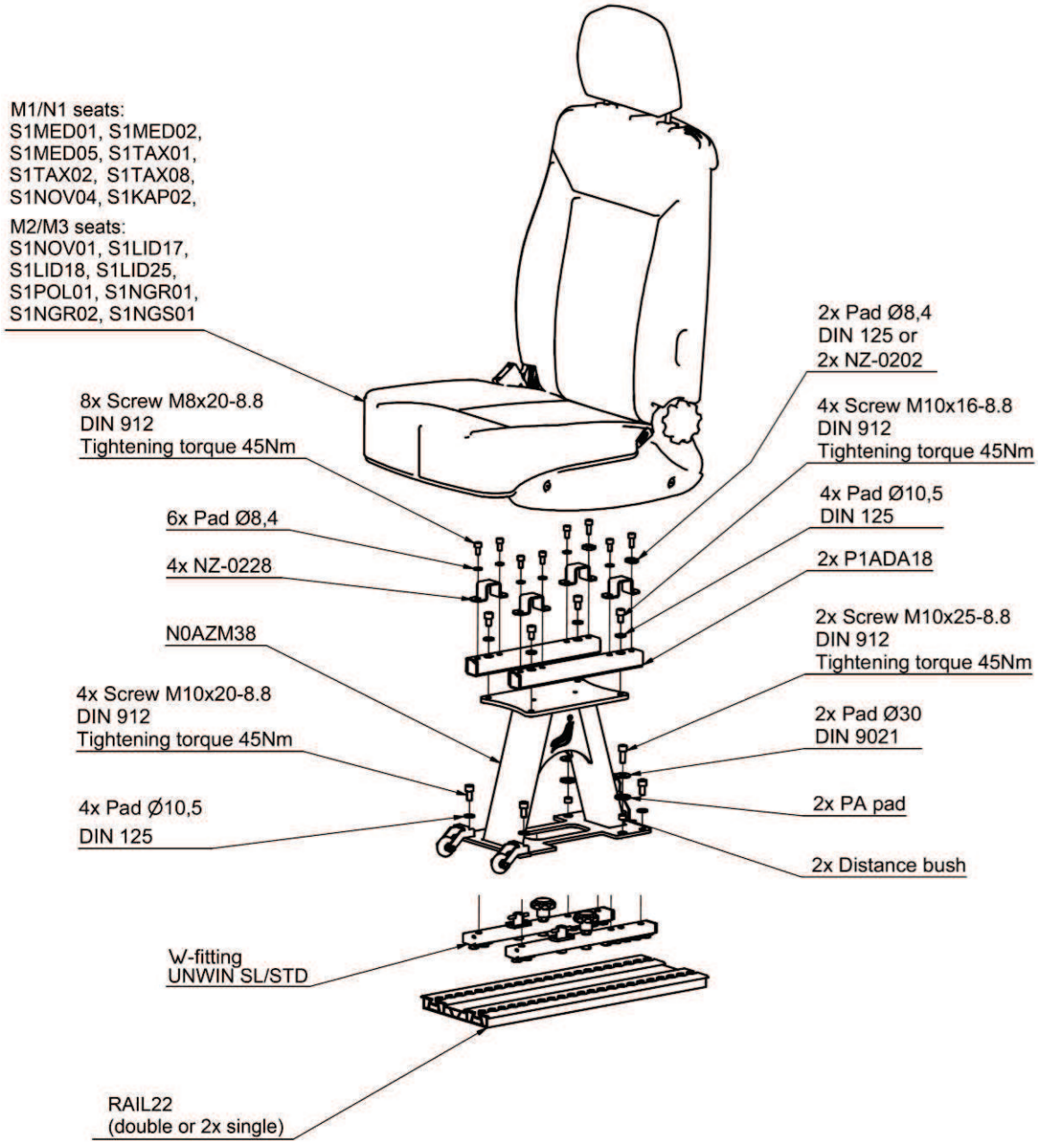


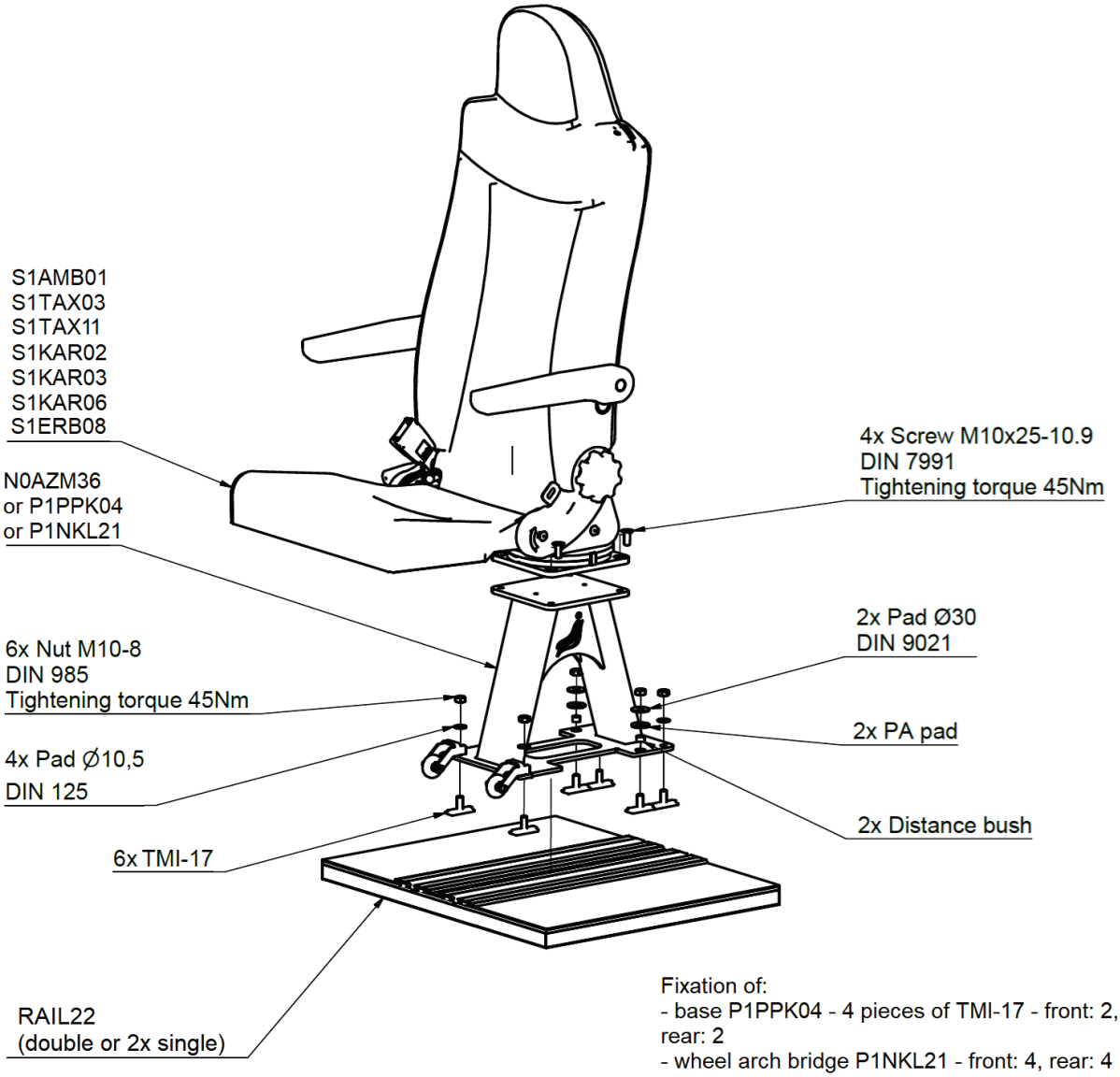
S1NOV04 seat with legs with NMI Millenium Fitting

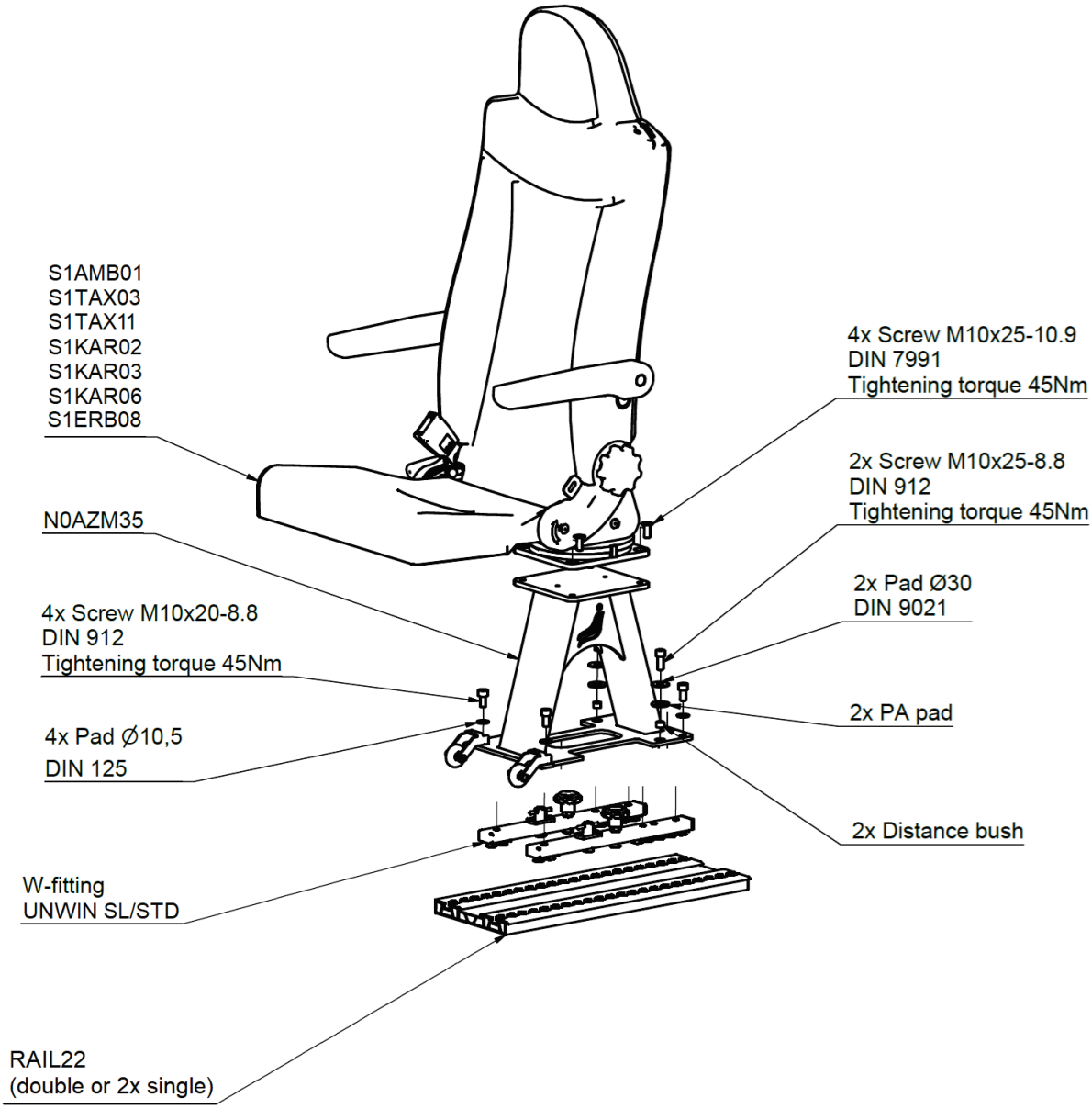


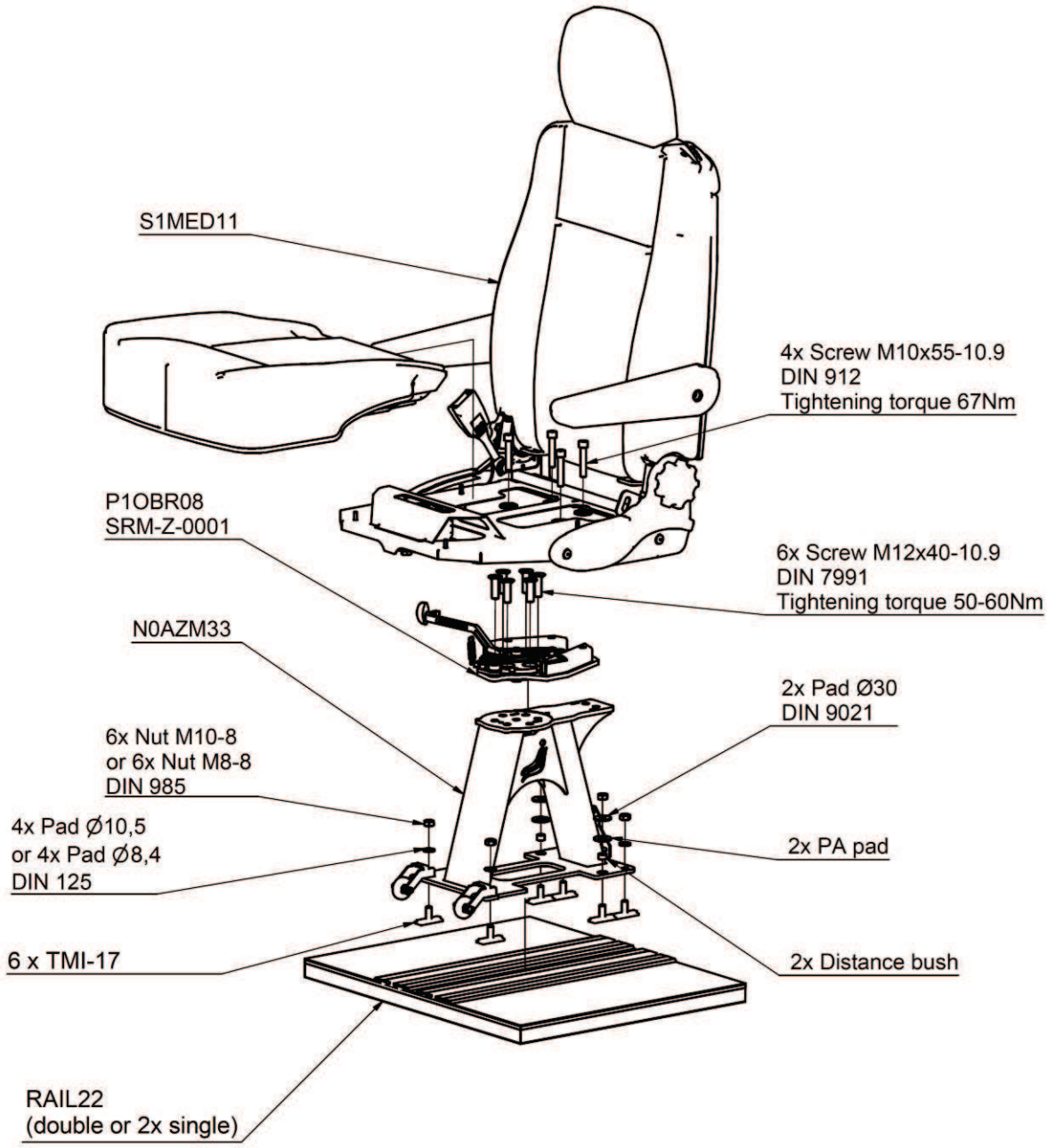
Single seats with base/wheel arch bridge

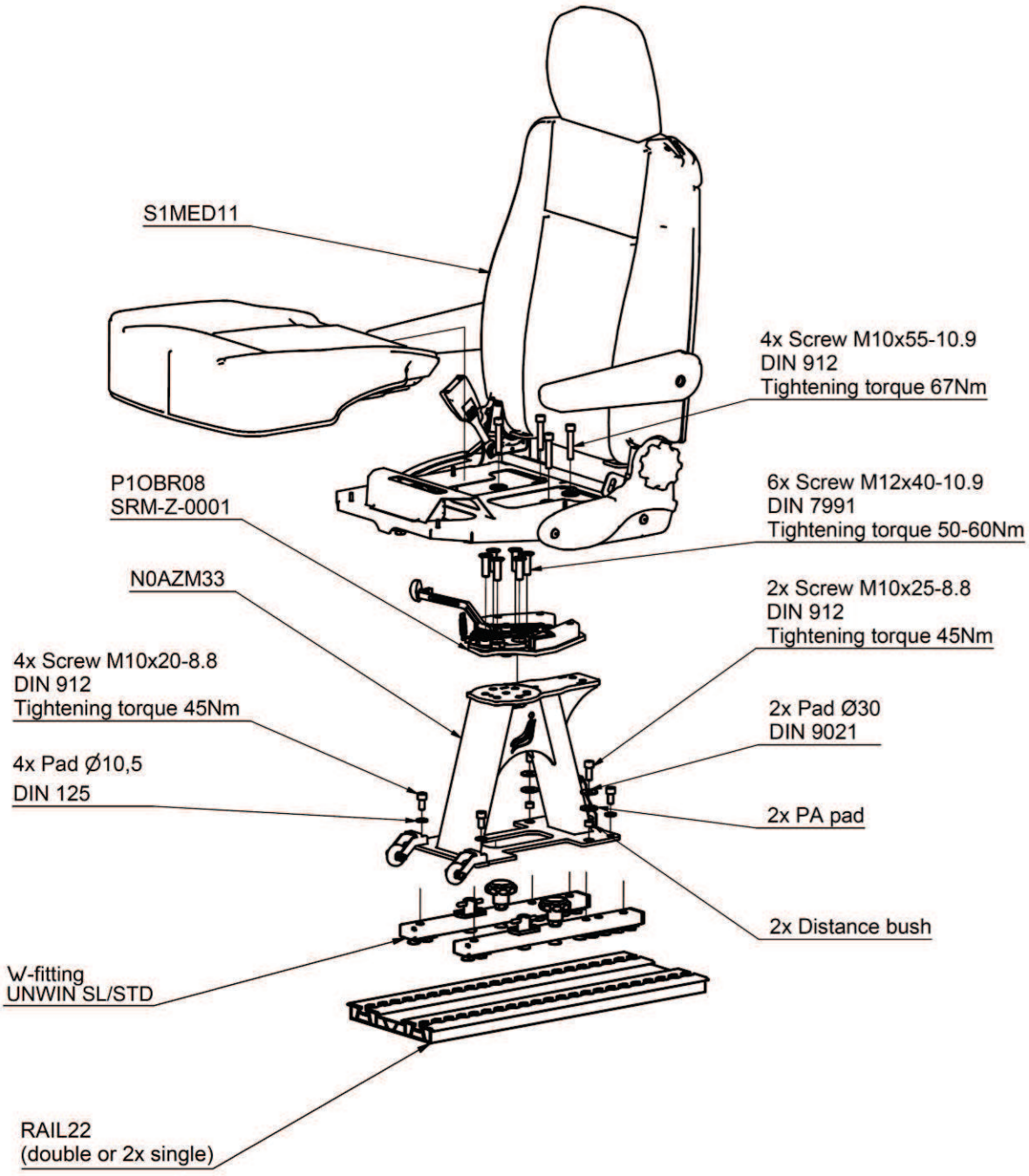


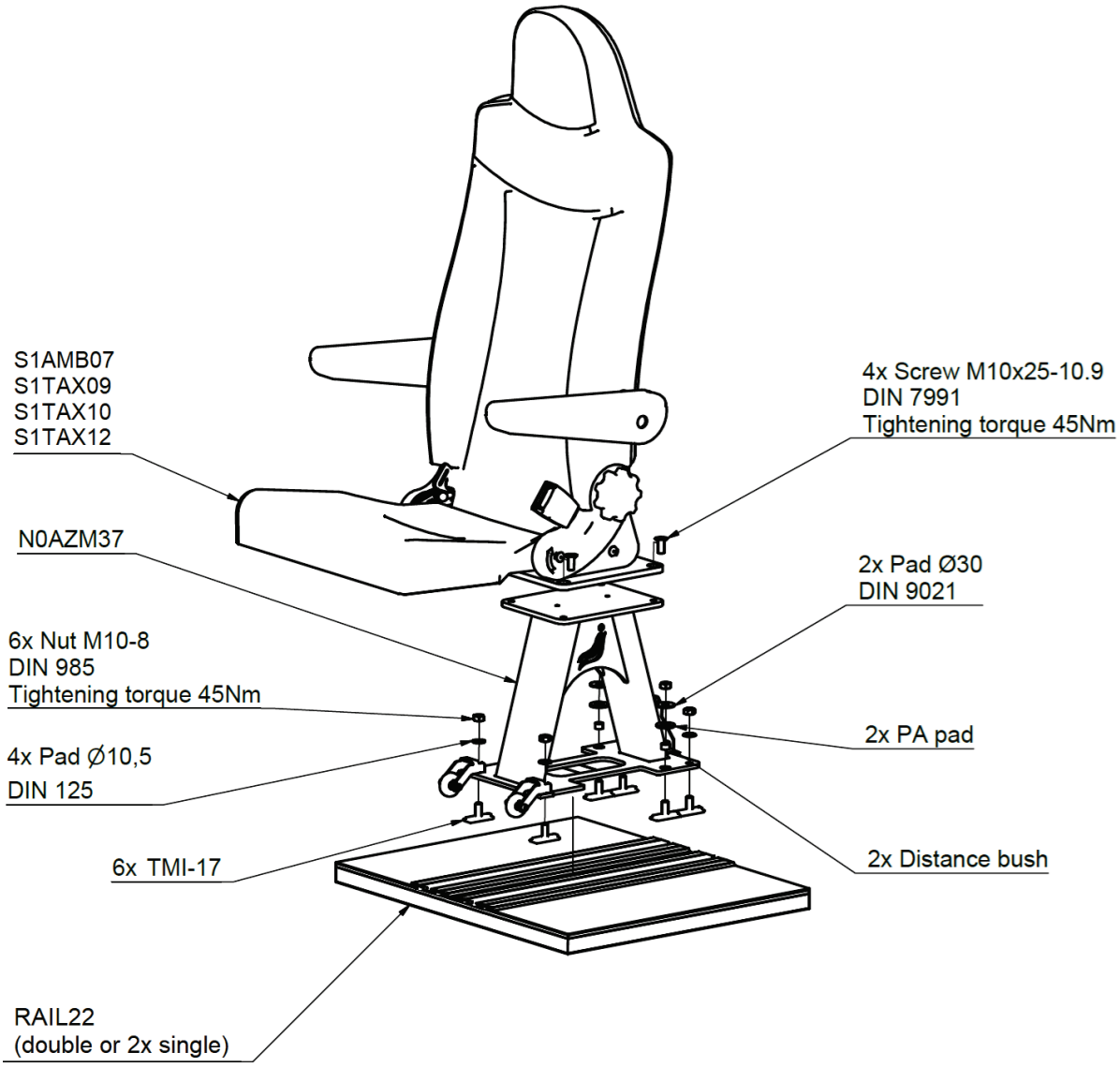


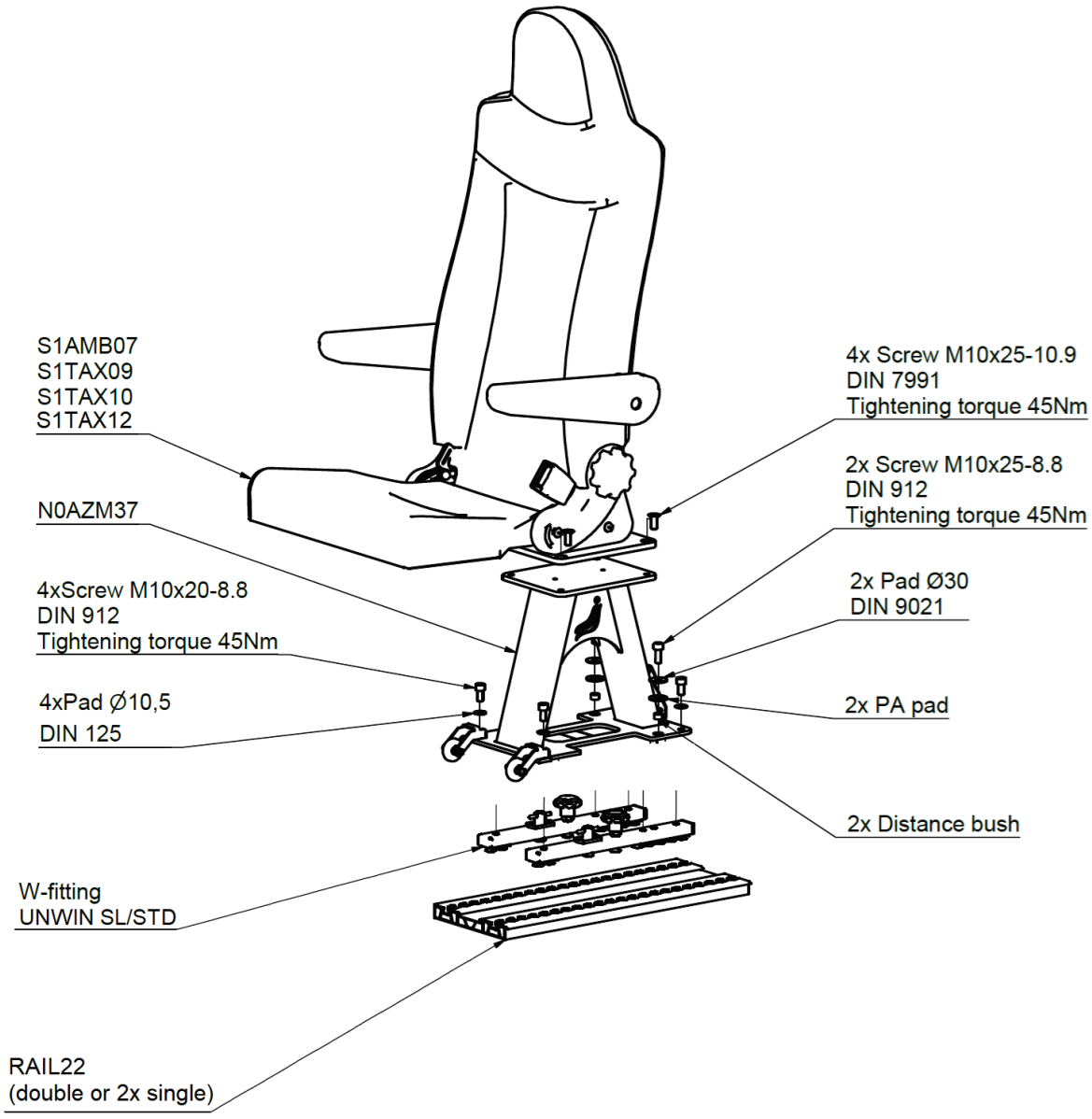


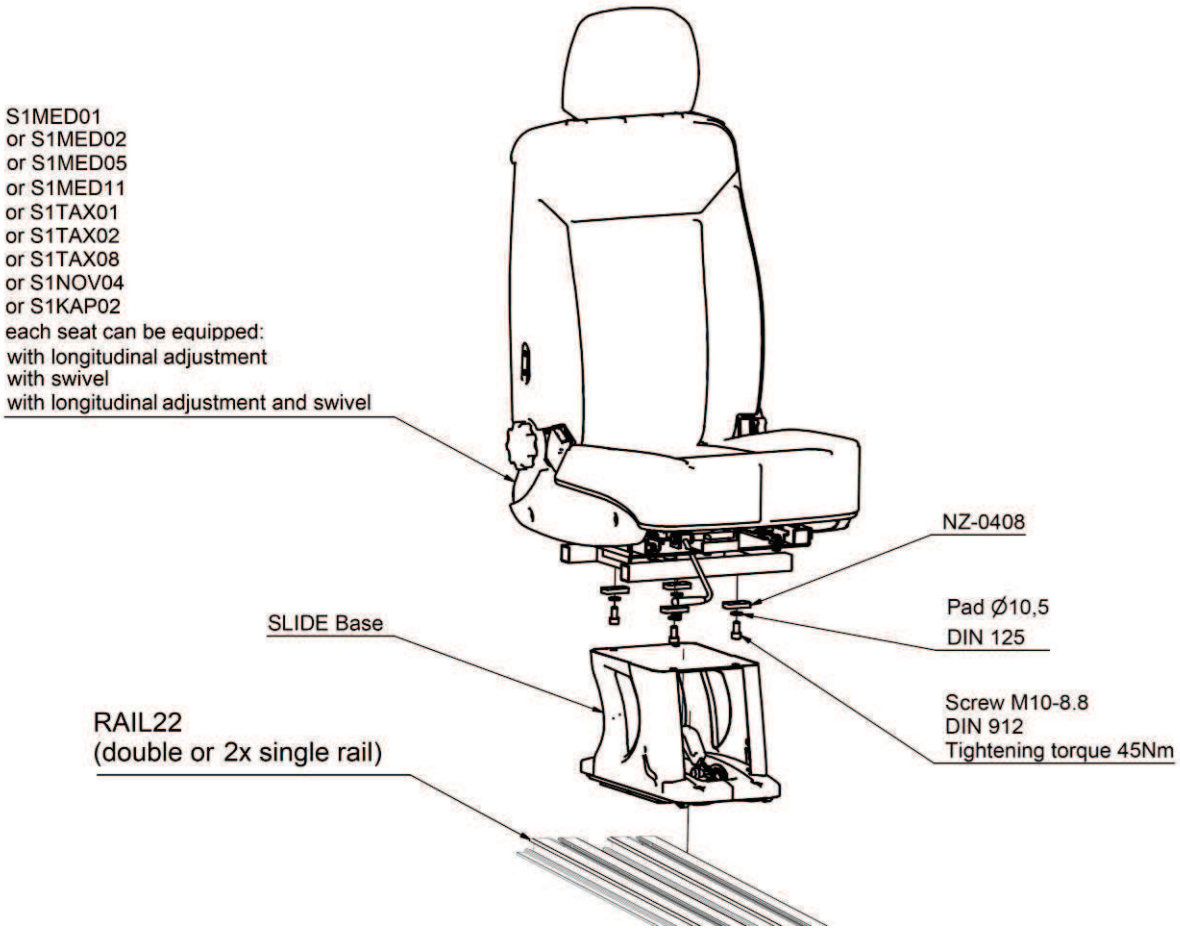


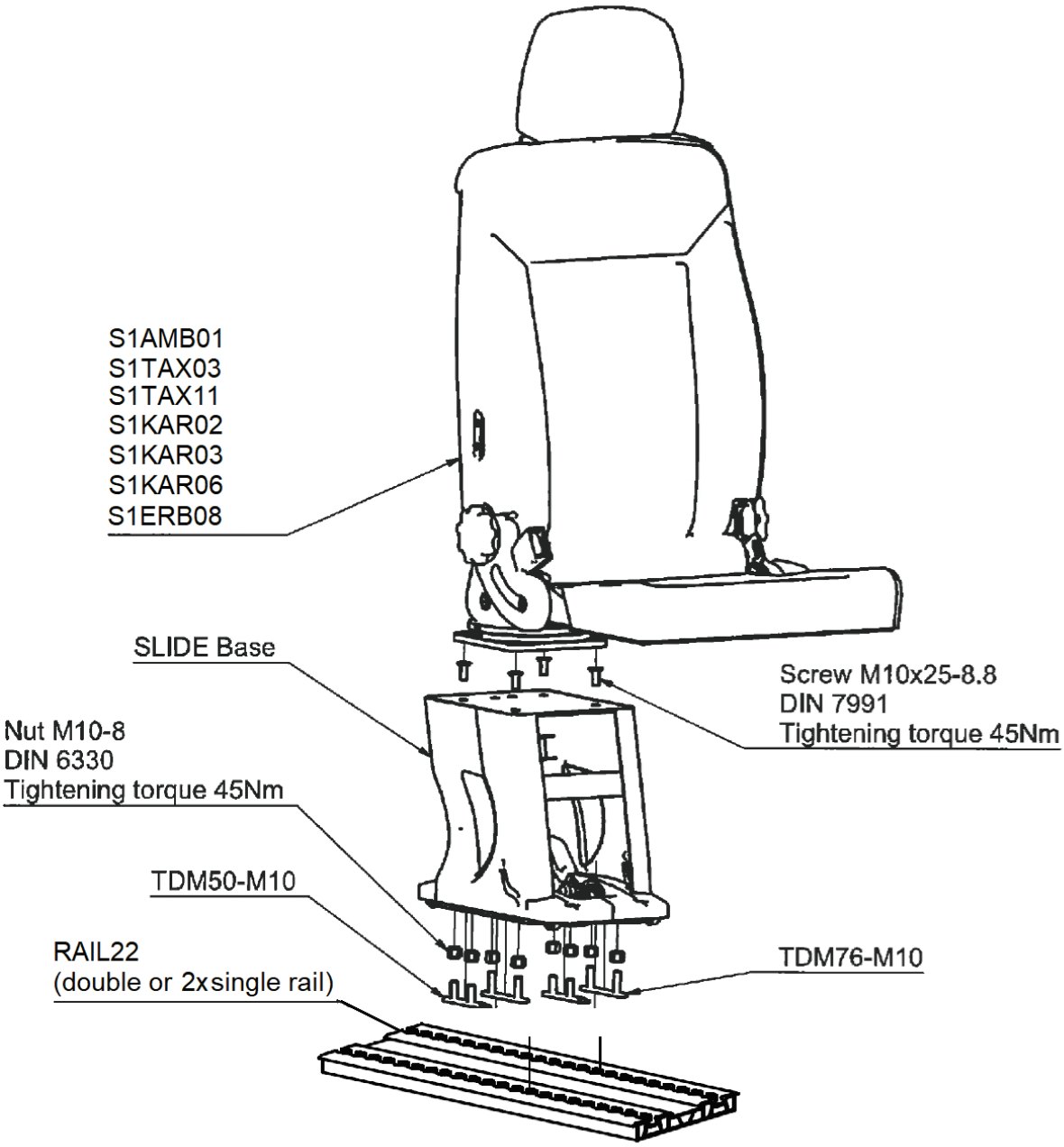












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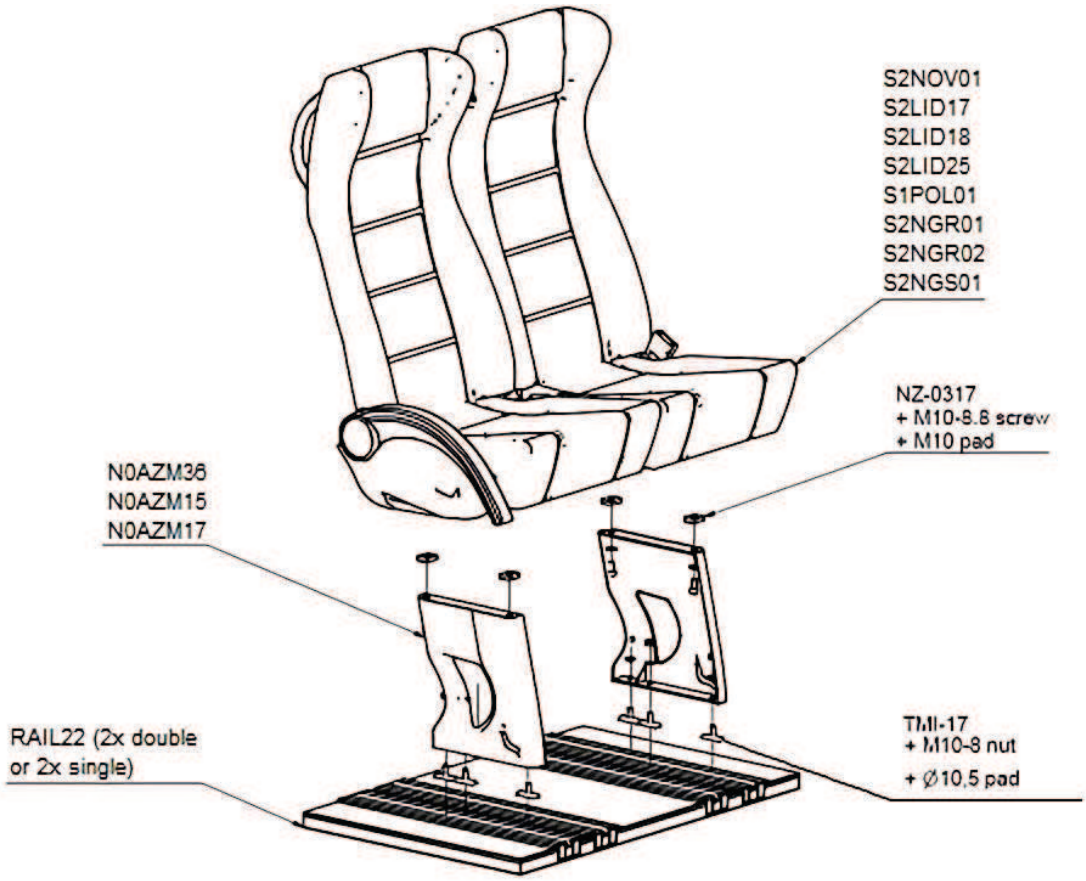
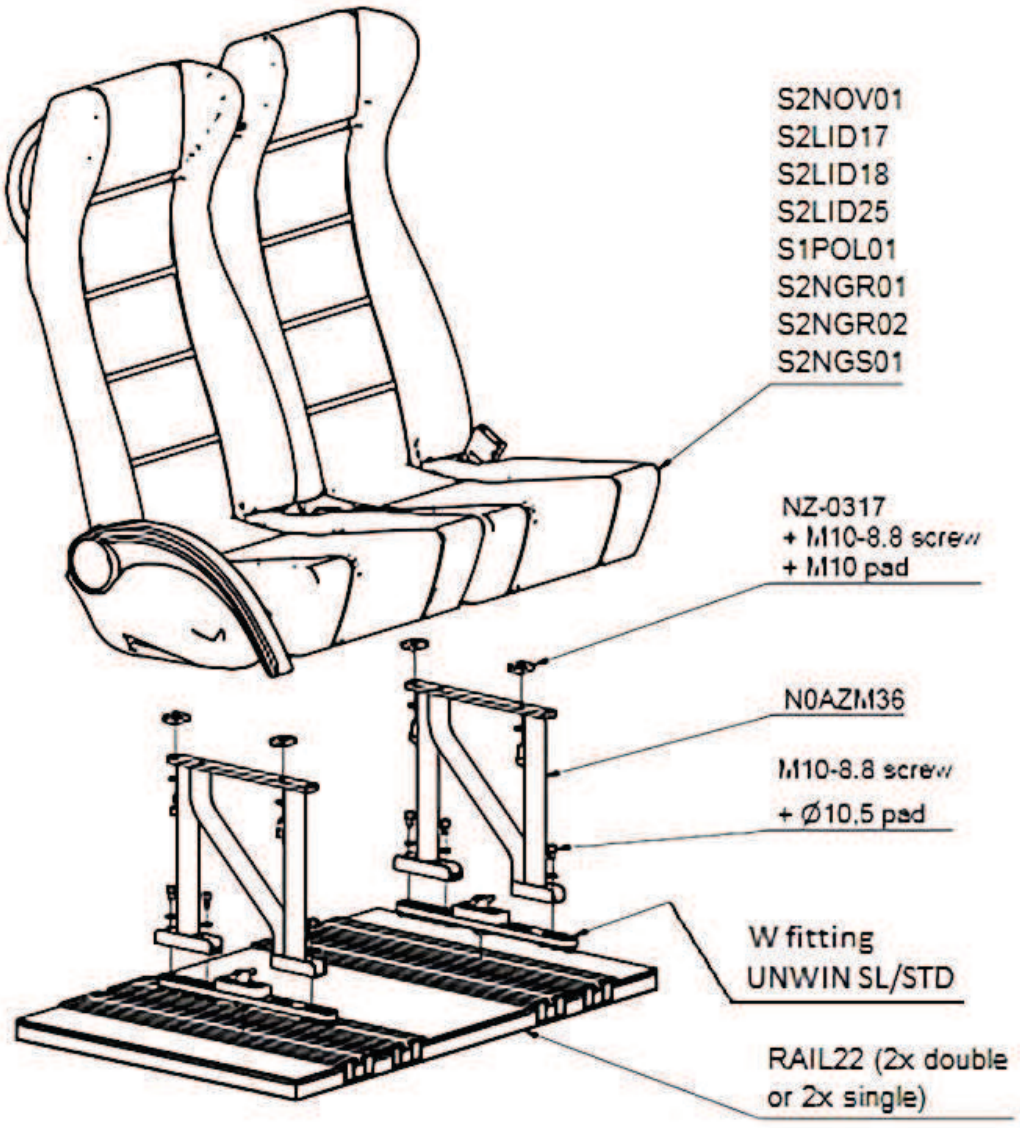
Double seats with legs and T-bolts



The same method of fixation is in case of single seats

Double seats with legs with fastening lockable



Alternatively seats can be equipped with legs N0AZM34 or N0AZU10-02 (instead of legs N0AZM36 and fastening lockable)

The same method of fixation is in case of single seats

Enclosure 4: DRAWINGS OF SEATS

Seats produced by:
INTAP Advanced Technology Sp. z o.o Sp. K., ul. Rokicińska 110/112, 95-006 Bukowiec k/Łodzi, Poland

Seat type	Legs and consoles	Category seats	Weight of maximum mass configuration
S1MED01	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1MED02	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1MED05	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1TAX01	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1TAX02	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1TAX08	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1NOV04	S1AZM03[2], N0AZM06[2], N0BLS10, N0AZM09, N0AZM34, N0AZM36, N0AZU10-02, N0AZM38[2], Slide base	M1/N1	45 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZM34, N0AZM36[1], N0AZU10-02, N0AZM38[1], Slide base	M2/N2, M3/N3	45 kg
S1KAP02	S1AZM03[1], N0AZM06[1], N0BLS10, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M1/N1	40 kg
	S1AZM03[1], N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09, N0AZU10-01, N0AZM38[1], Slide base	M2/N2, M3/N3	40 kg

S1TAX03	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	45 kg
S1TAX11	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	45 kg
S1ERB08	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	45 kg
S1KAR02 S1KAR03 S1KAR04	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1AMB01	N0AZM35[1], P1PPK04	M1/N1, M2/N2, M3/N3	36 kg
	P1NKL21, Slide base	M1/N1, M2/N2, M3/N3	45 kg
S1MED11	N0AZM33[1], Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1TAX09	N0AZM37[1], Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1TAX10	N0AZM37[1], Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1TAX12	N0AZM37[1], Slide base	M1/N1, M2/N2, M3/N3	40 kg
S1AMB07	N0AZM37[1], Slide base	M1/N1, M2/N2, M3/N3	40 kg

S1NOV02	N0AZM13	M2/N2, M3/N3	23 kg
S1NGP01	P1NGP01	M2/N2, M3/N3	20 kg
S1NOV01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	20 kg
S1LID17	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	17 kg
S1LID18	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	17 kg
S1LID25	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	20 kg
S1POL01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	17 kg
S1NGR01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	21 kg
S1NGR02	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	20 kg
S1NGS01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	21 kg
S2NOV01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	35 kg
S2LID17	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	30 kg
S2LID18	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	30 kg
S2LID25	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	42 kg
S1POL01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M2/N2, M3/N3	30 kg
S2NGR01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	36 kg
S2NGR02	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	36 kg
S2NGS01	N0AZM06[1], N0BLS10, N0BLS15, N0BLS17, N0AZM09	M3/N3	38 kg

[1] – could be with fastening lockable or T-bolts

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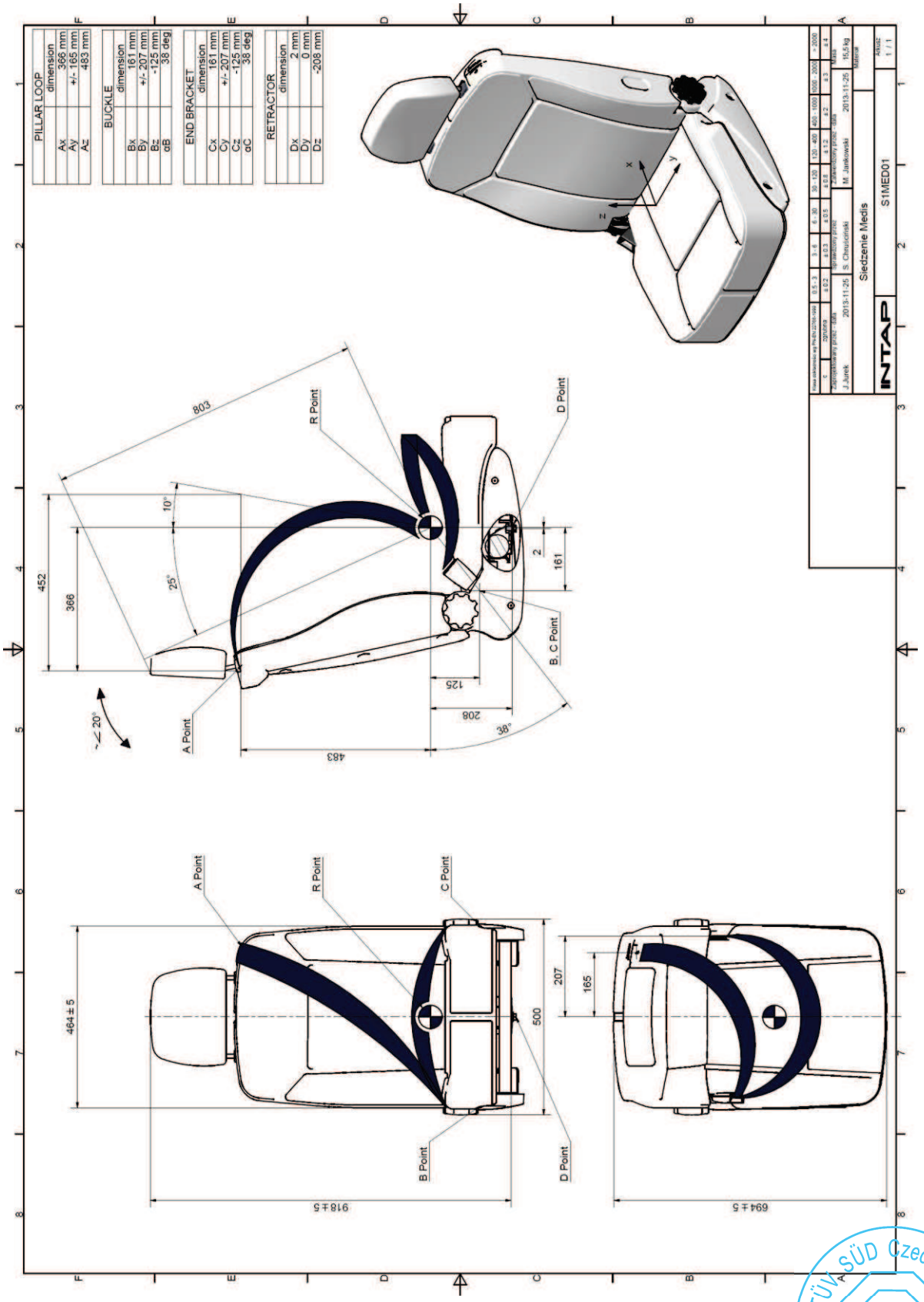
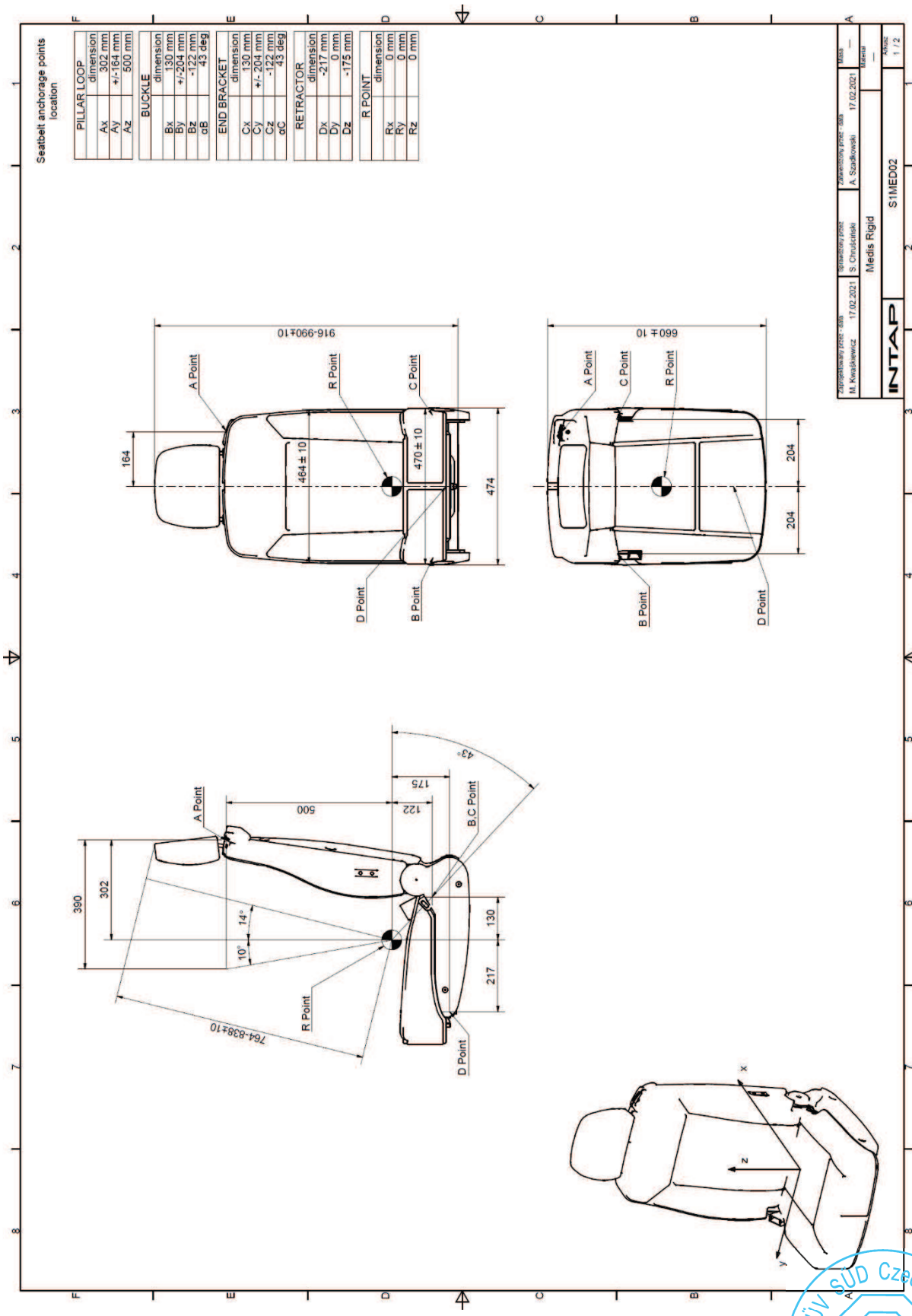
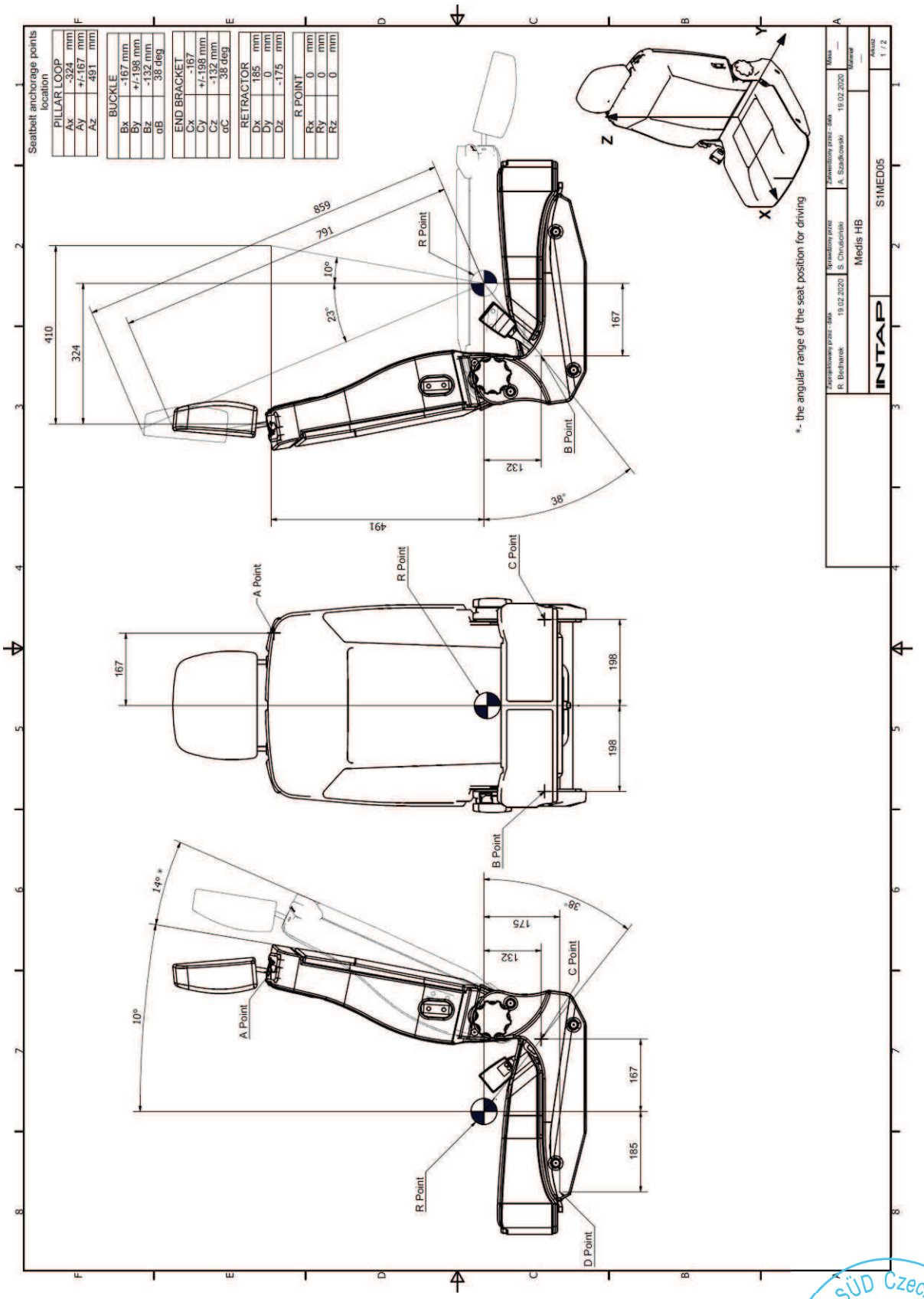
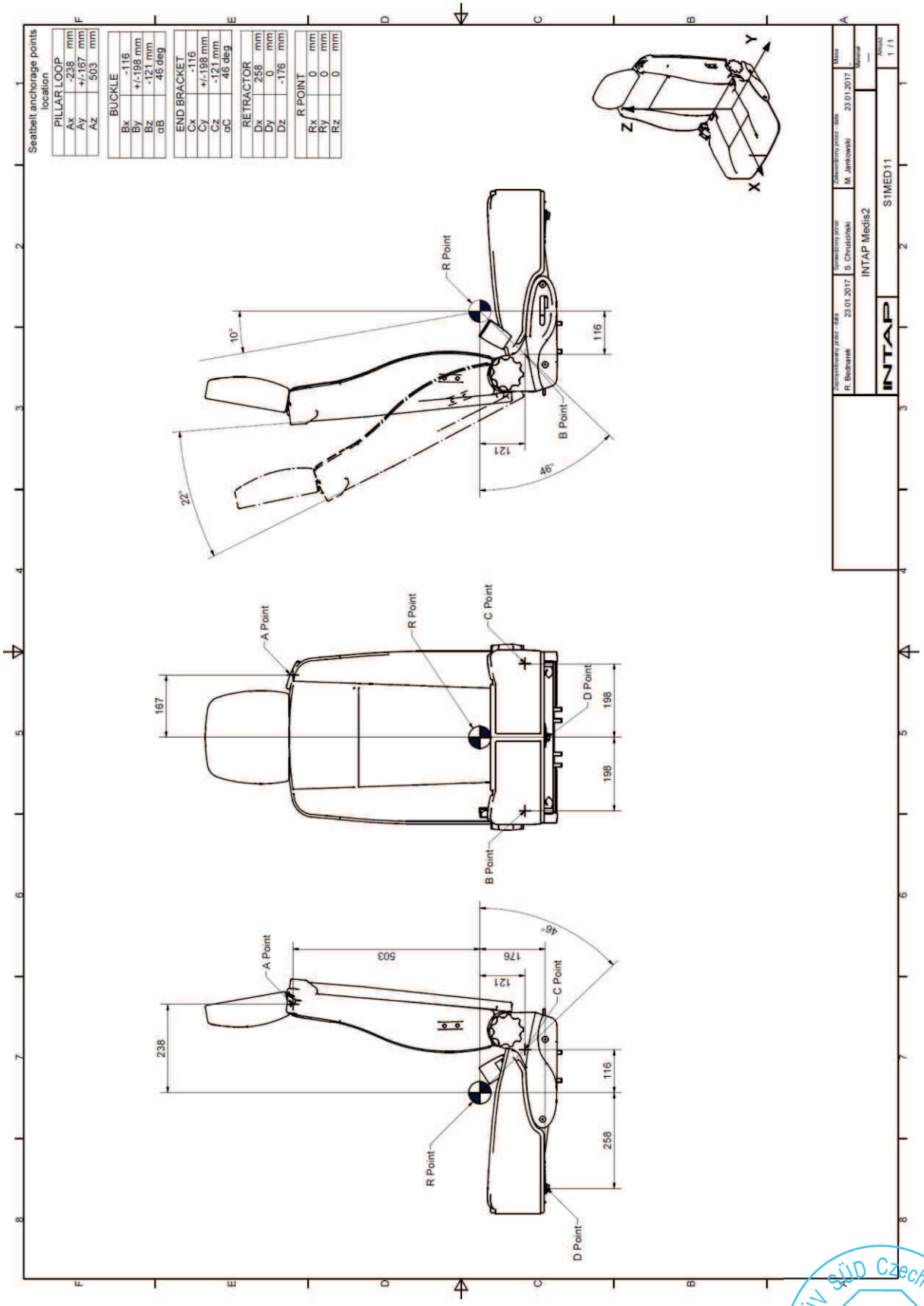
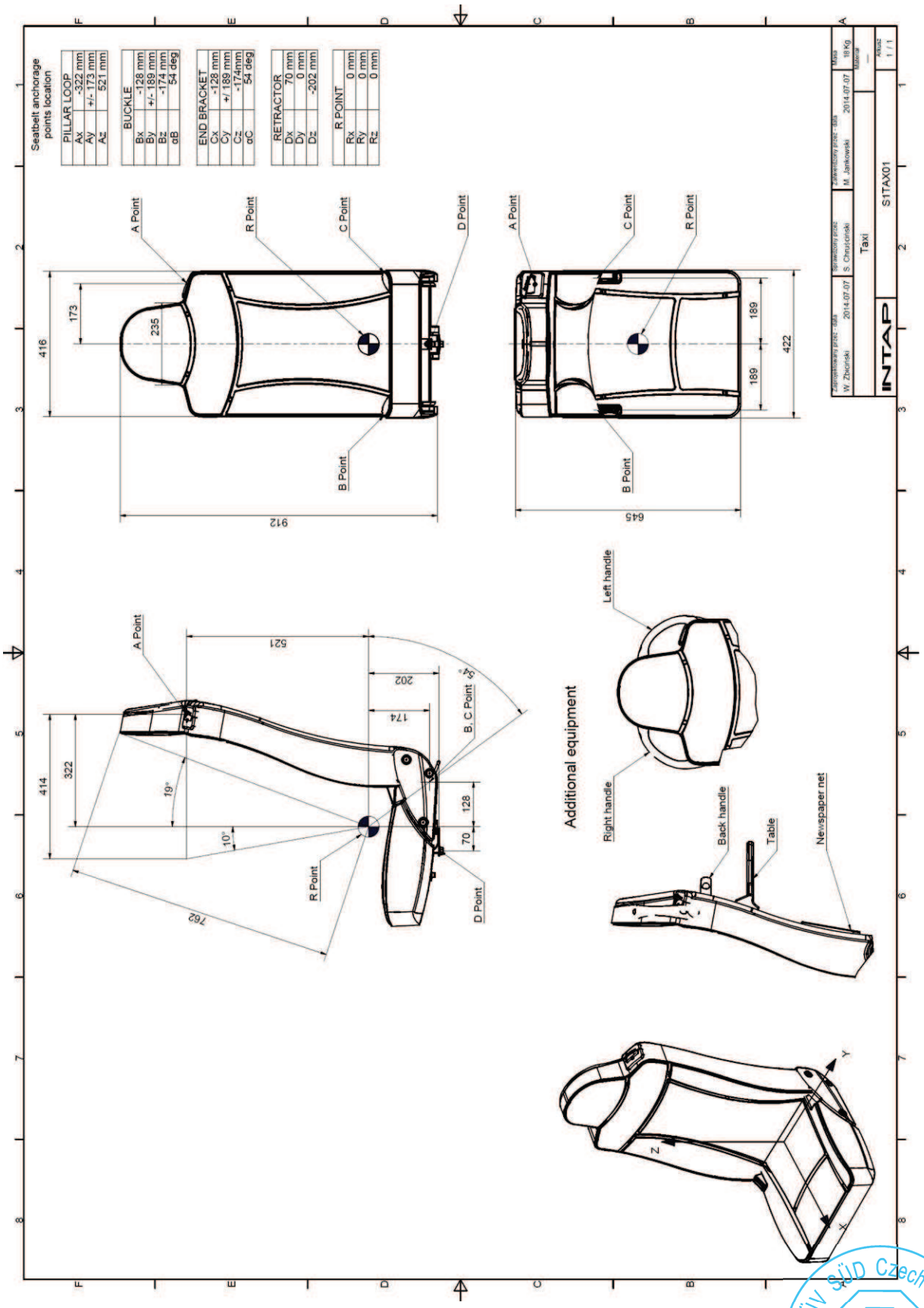
Seats for categories M1, N1

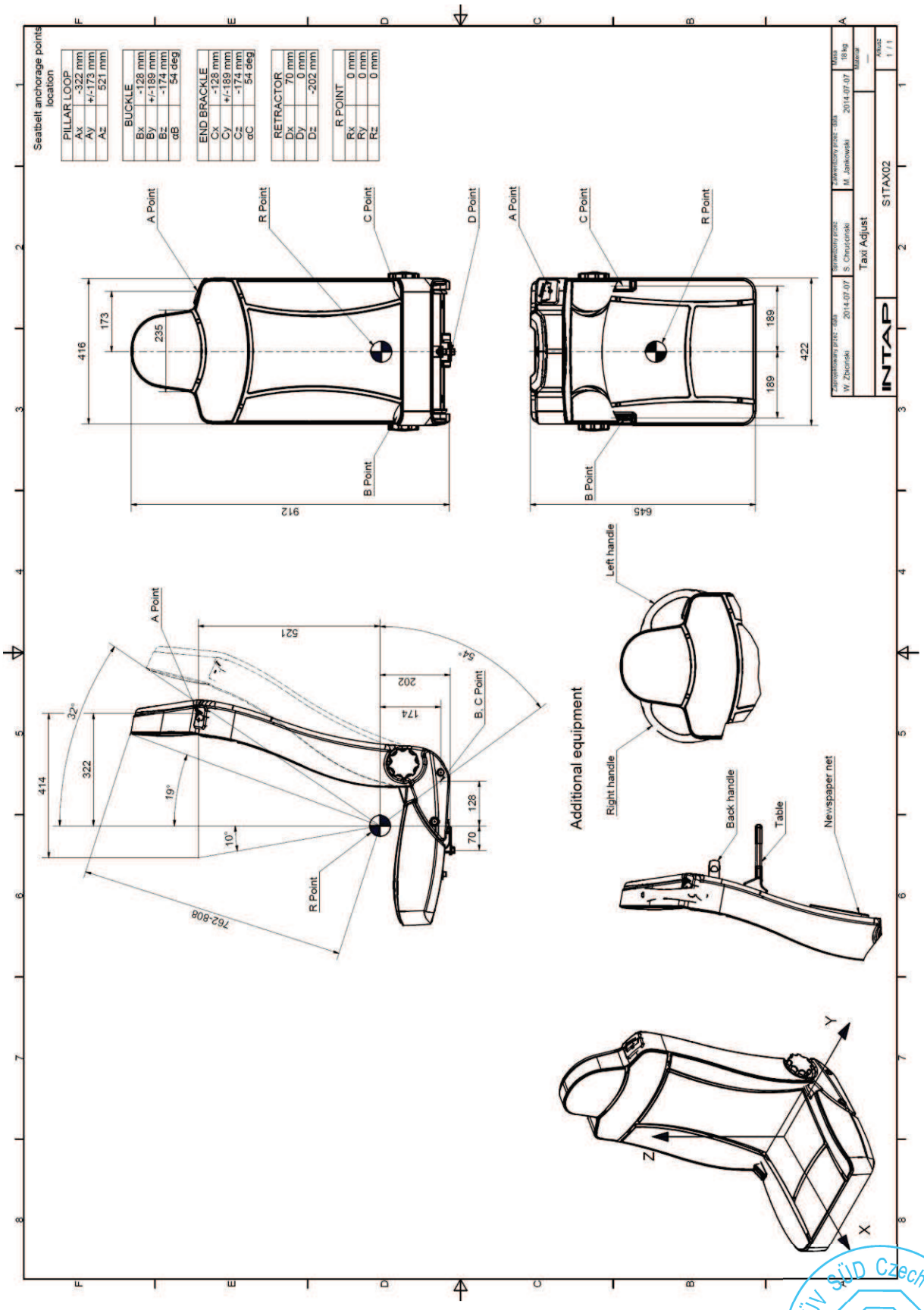


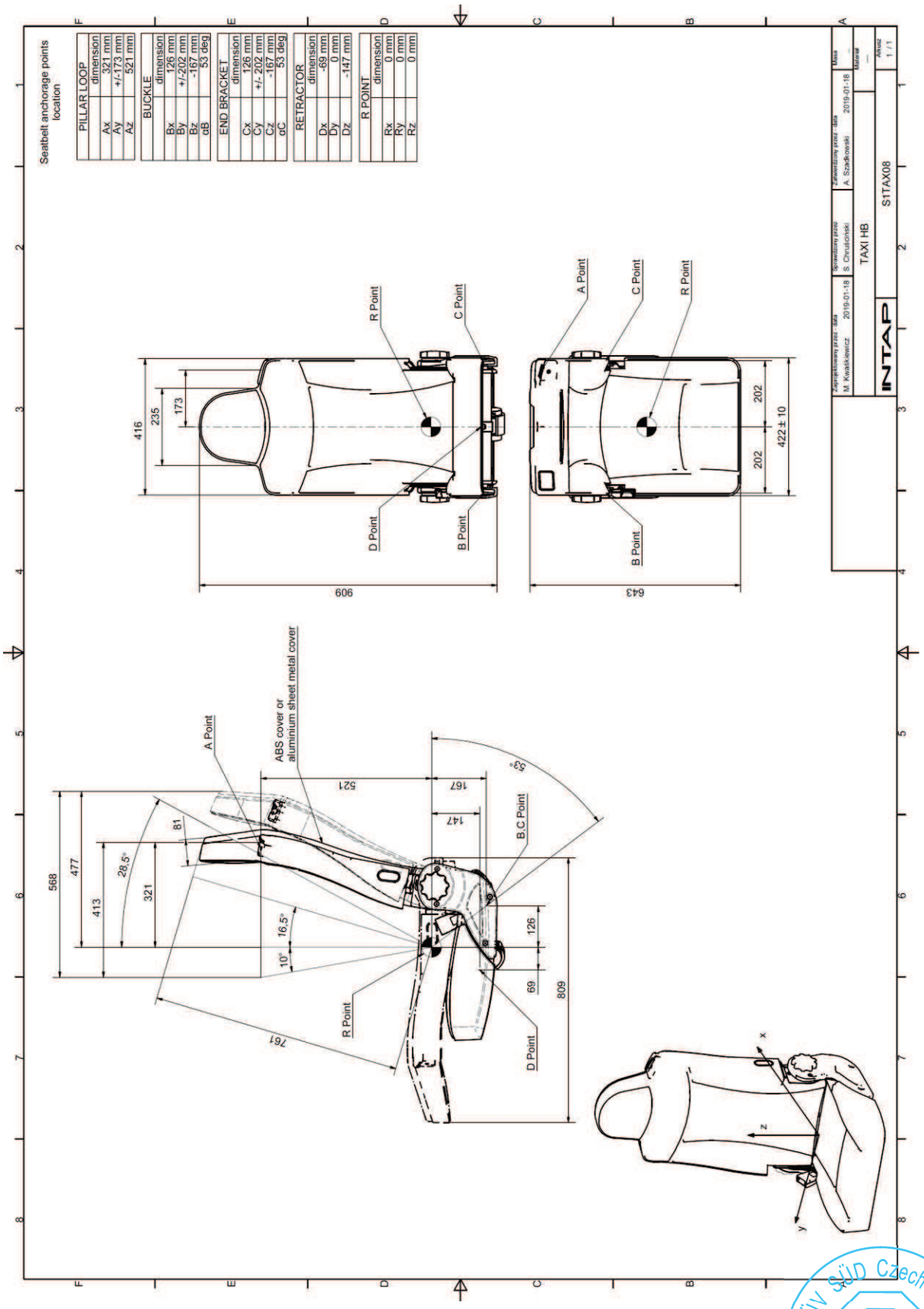


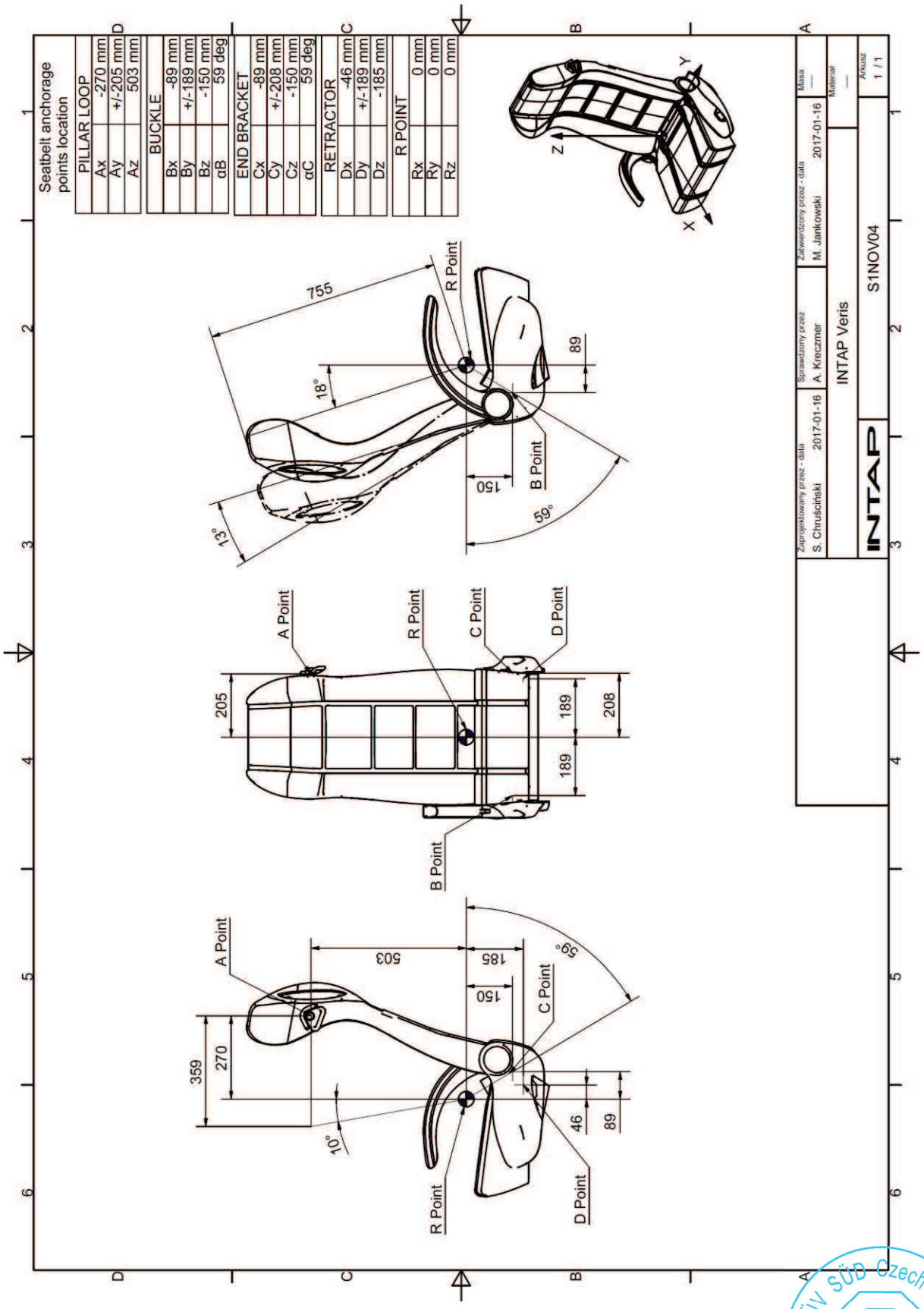


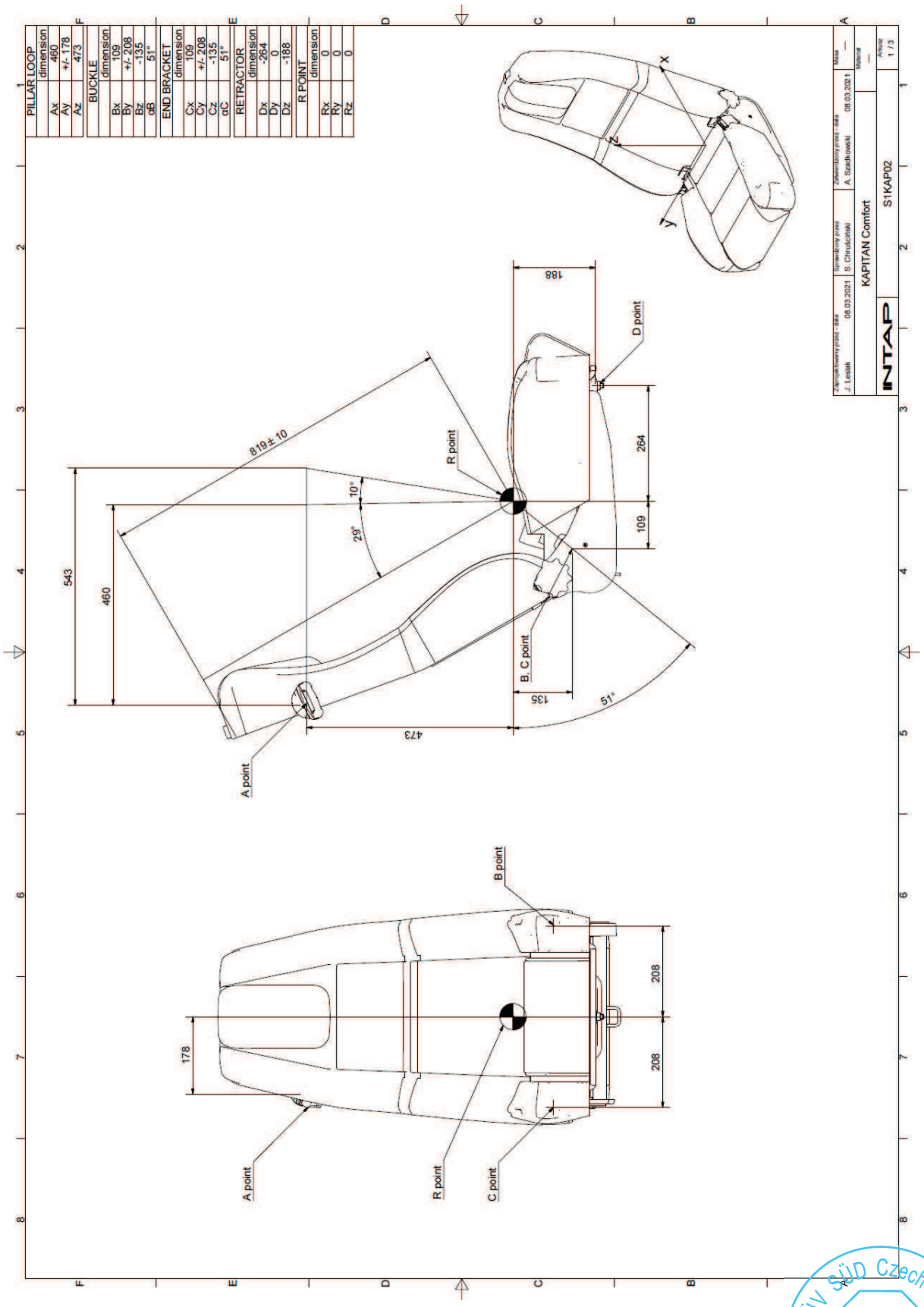


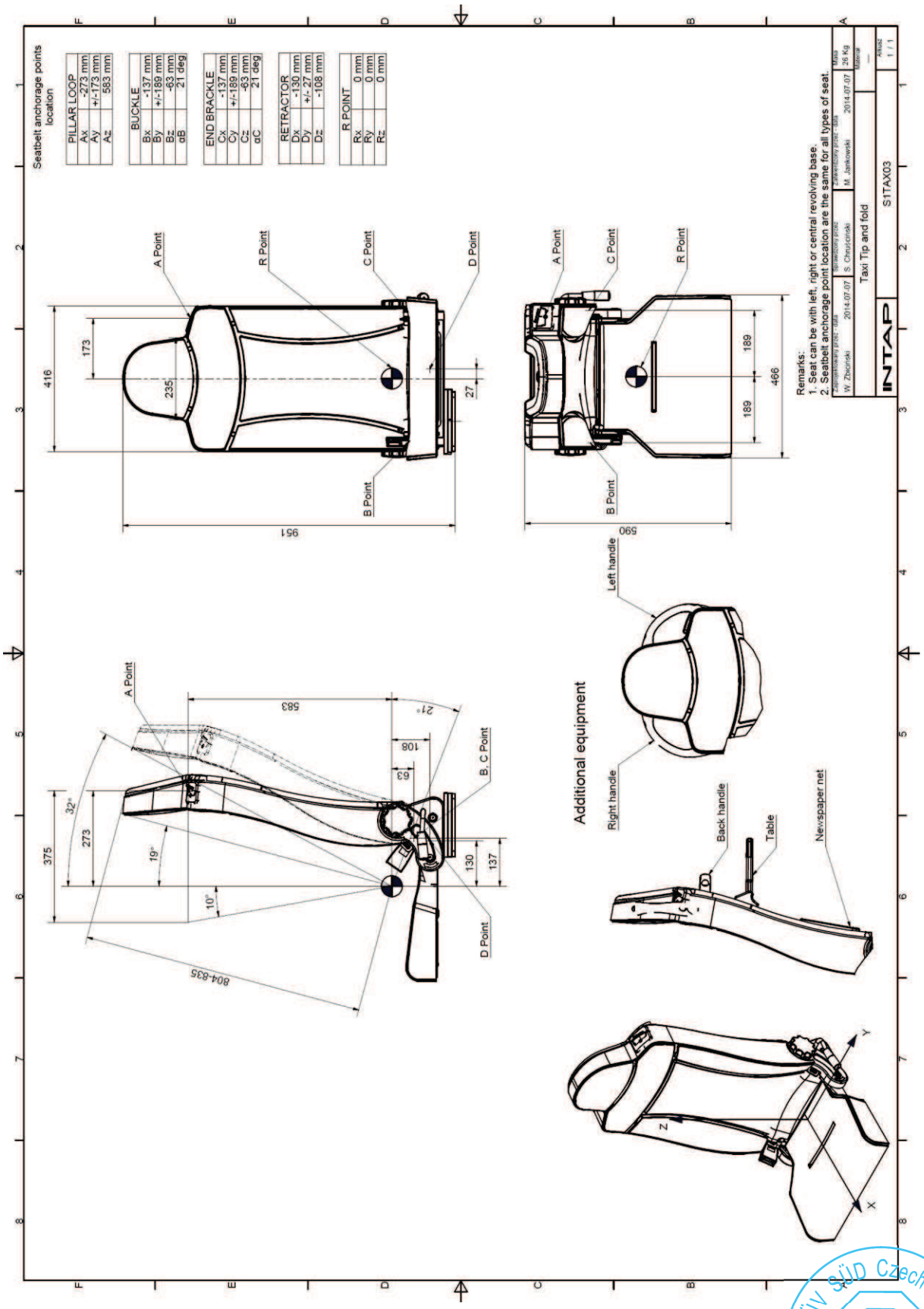


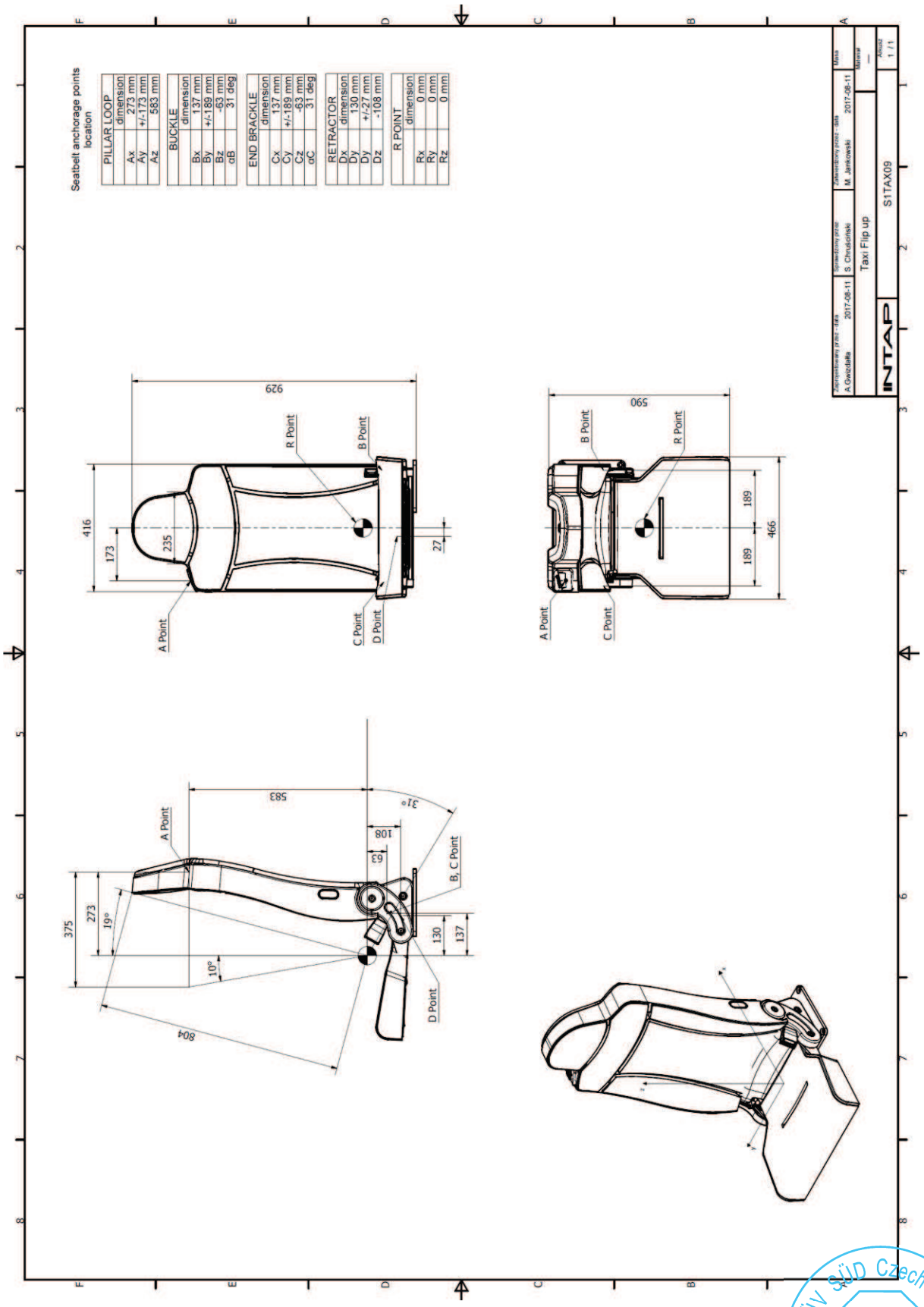


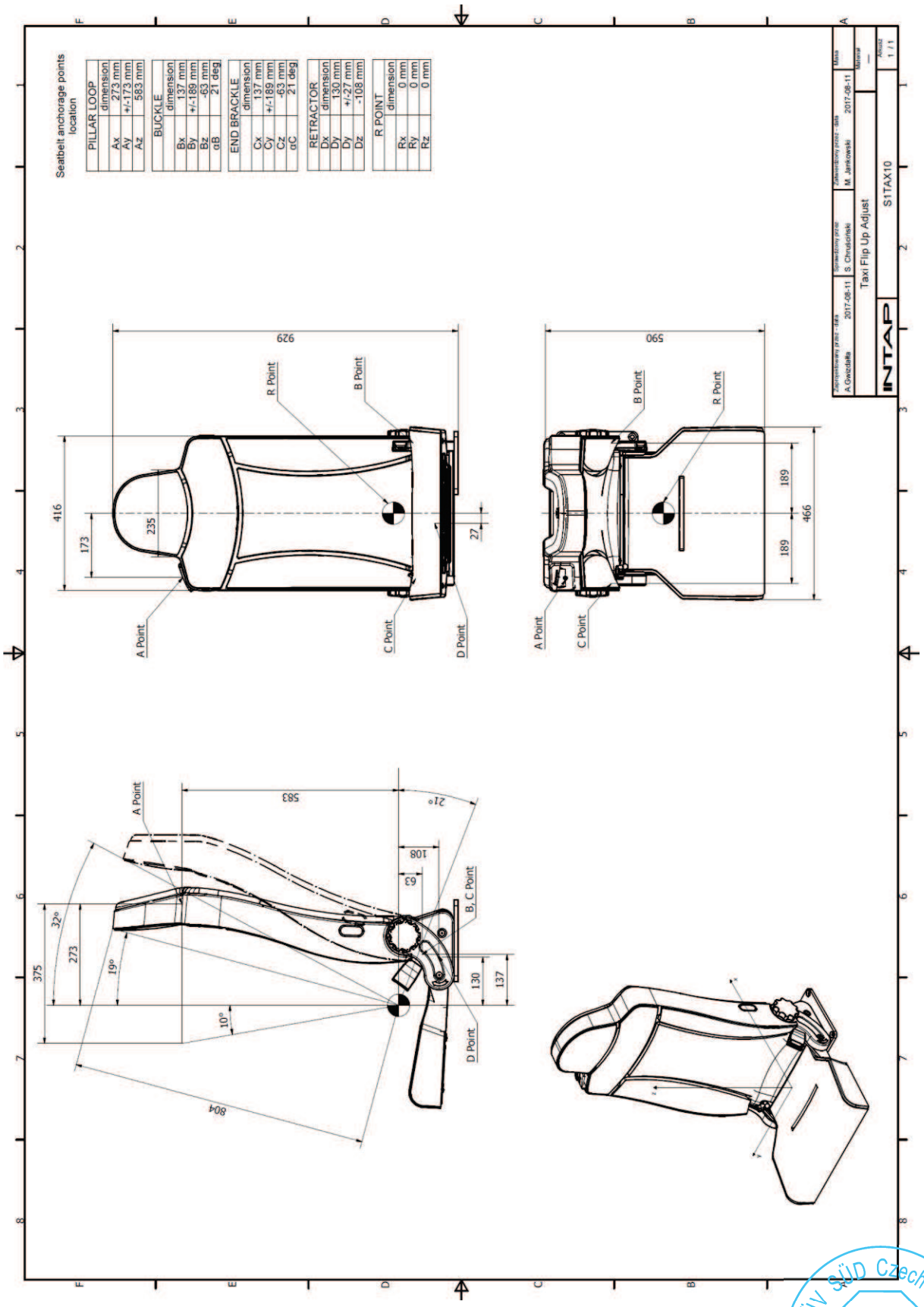


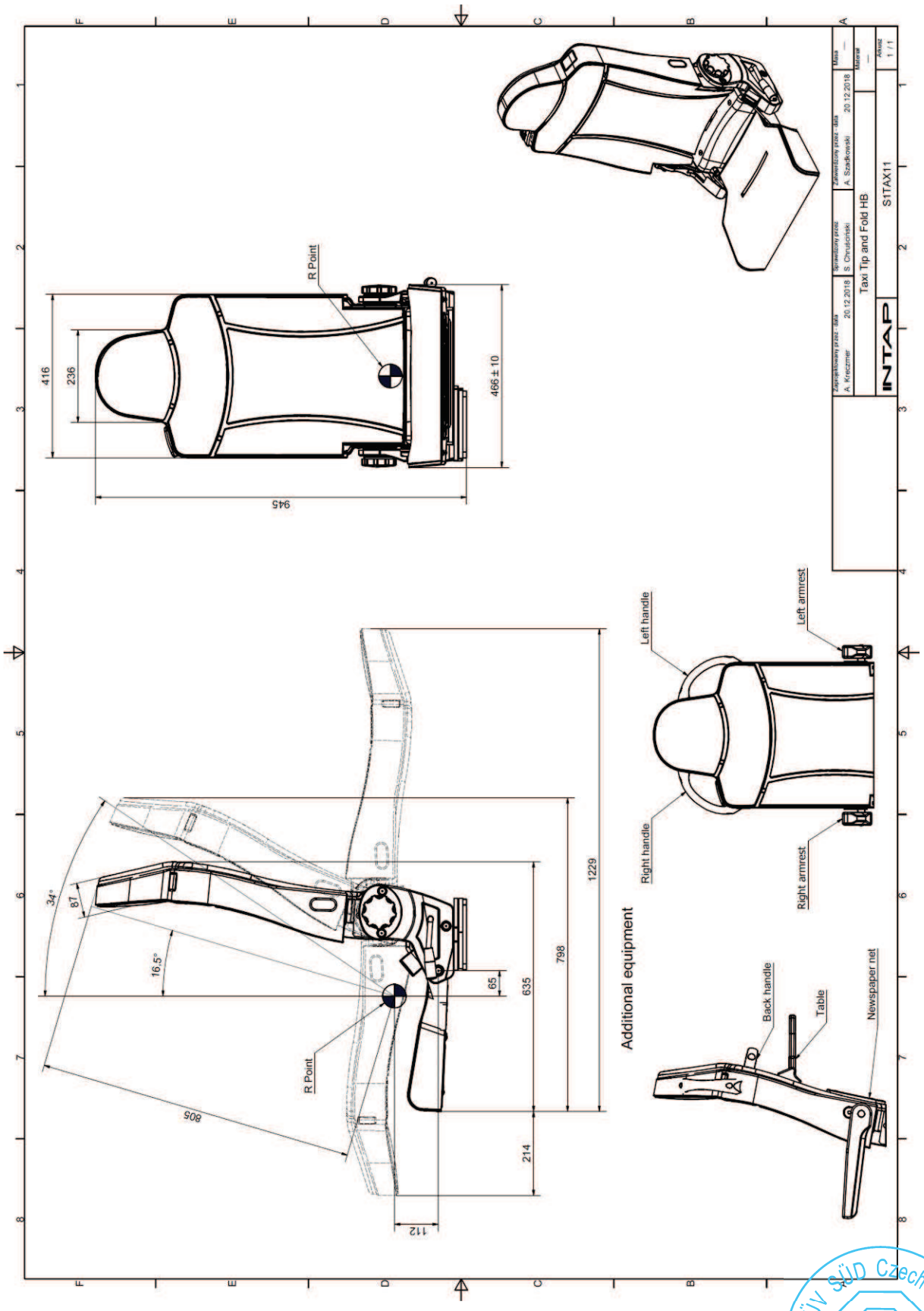


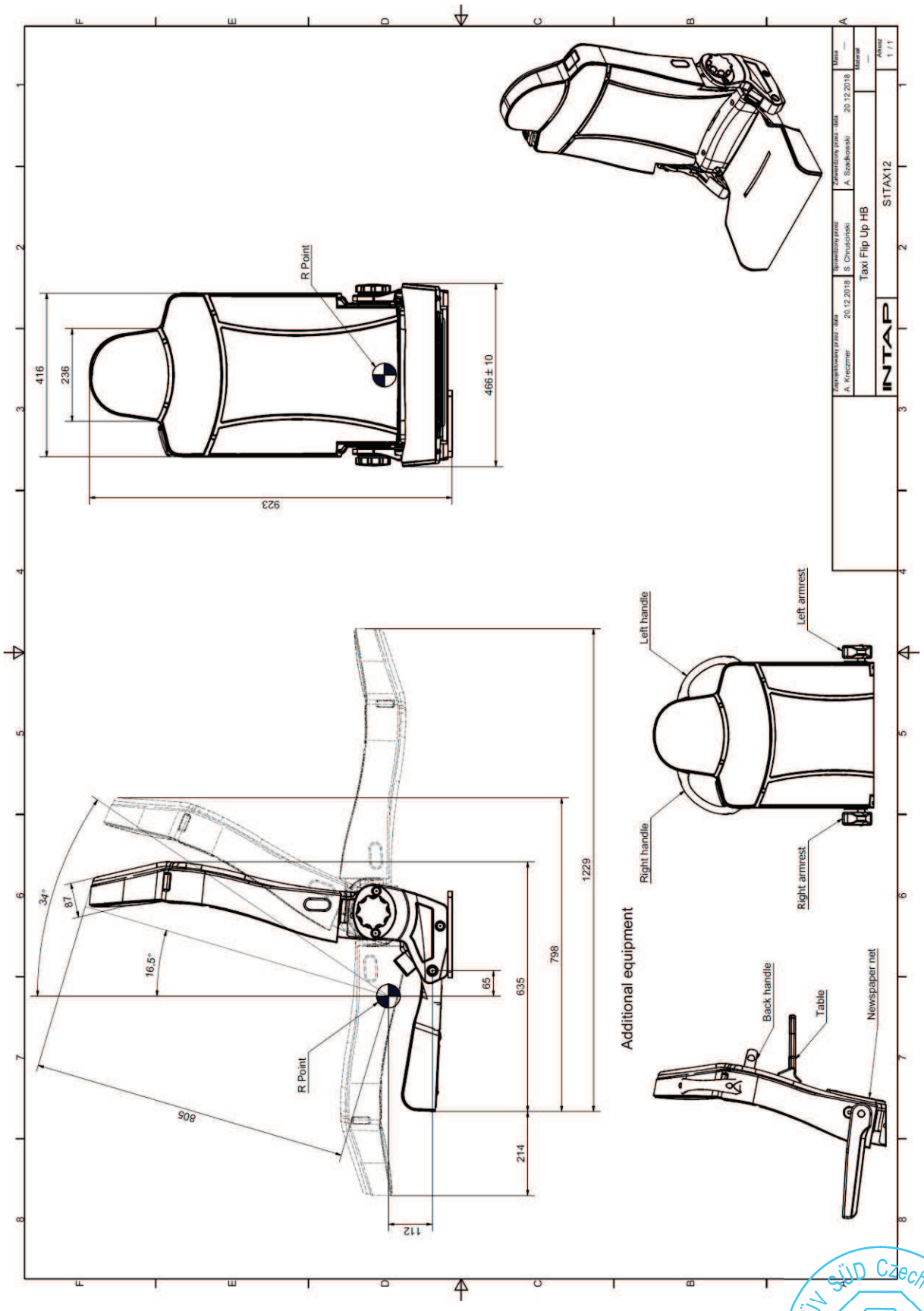


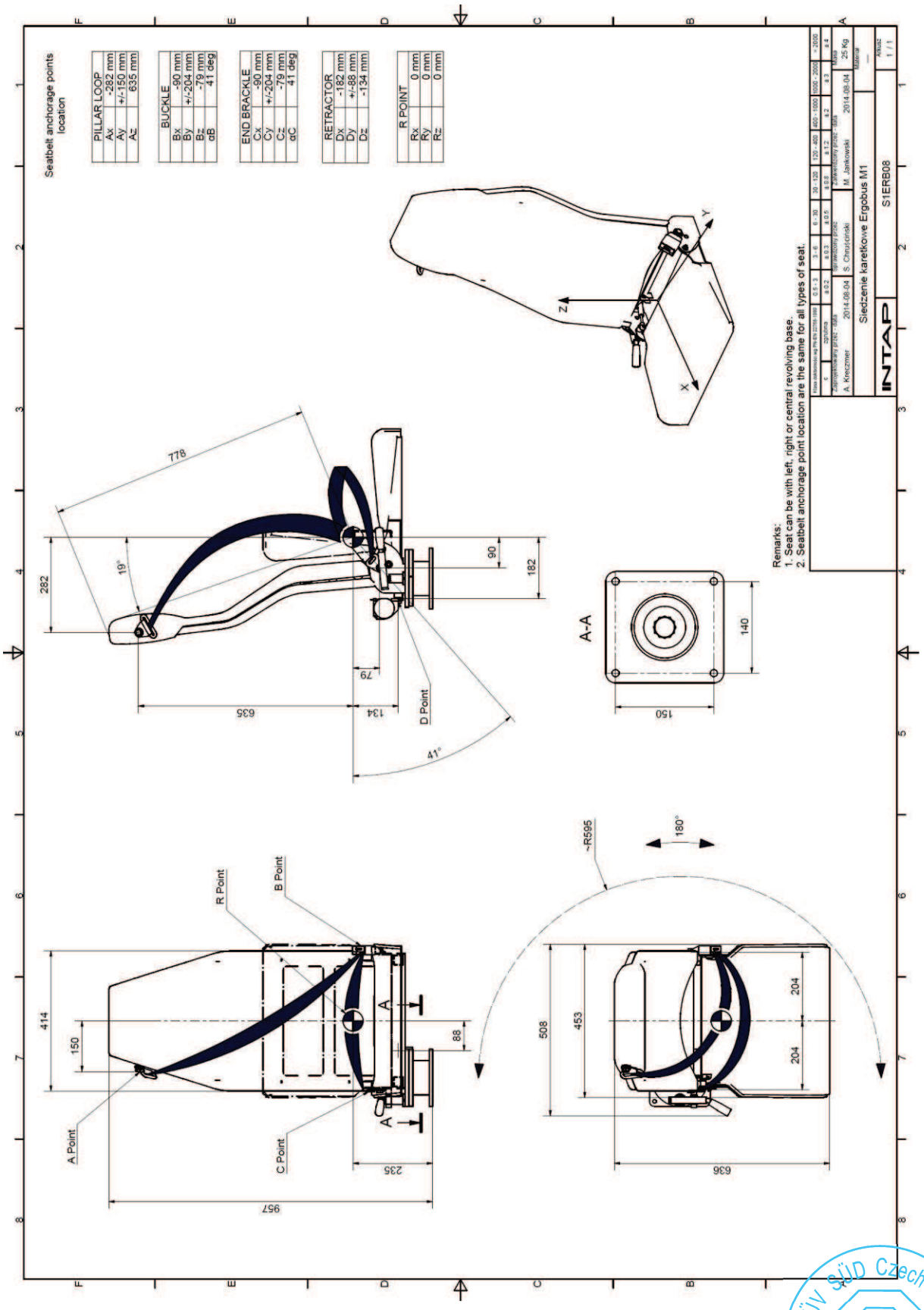


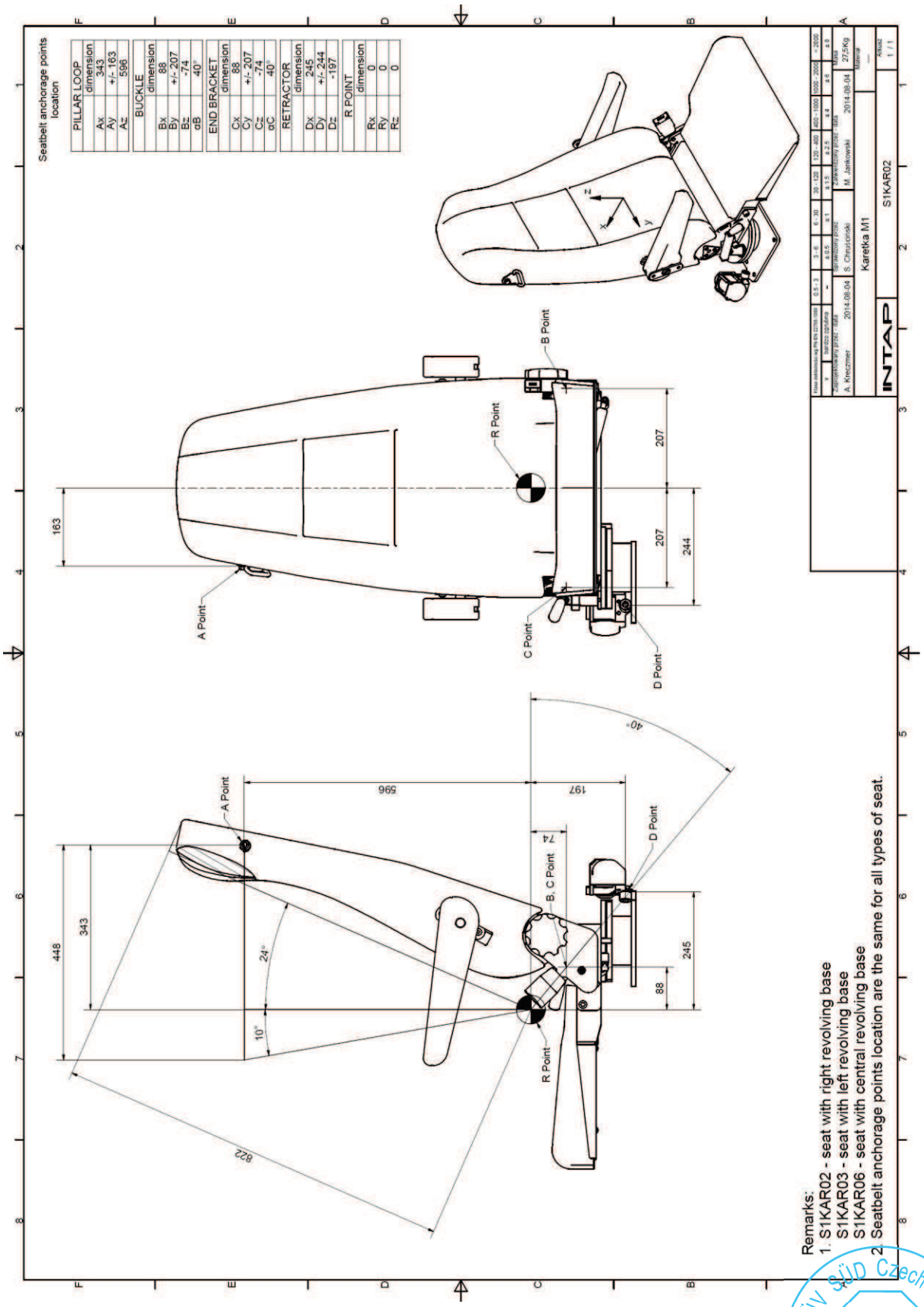


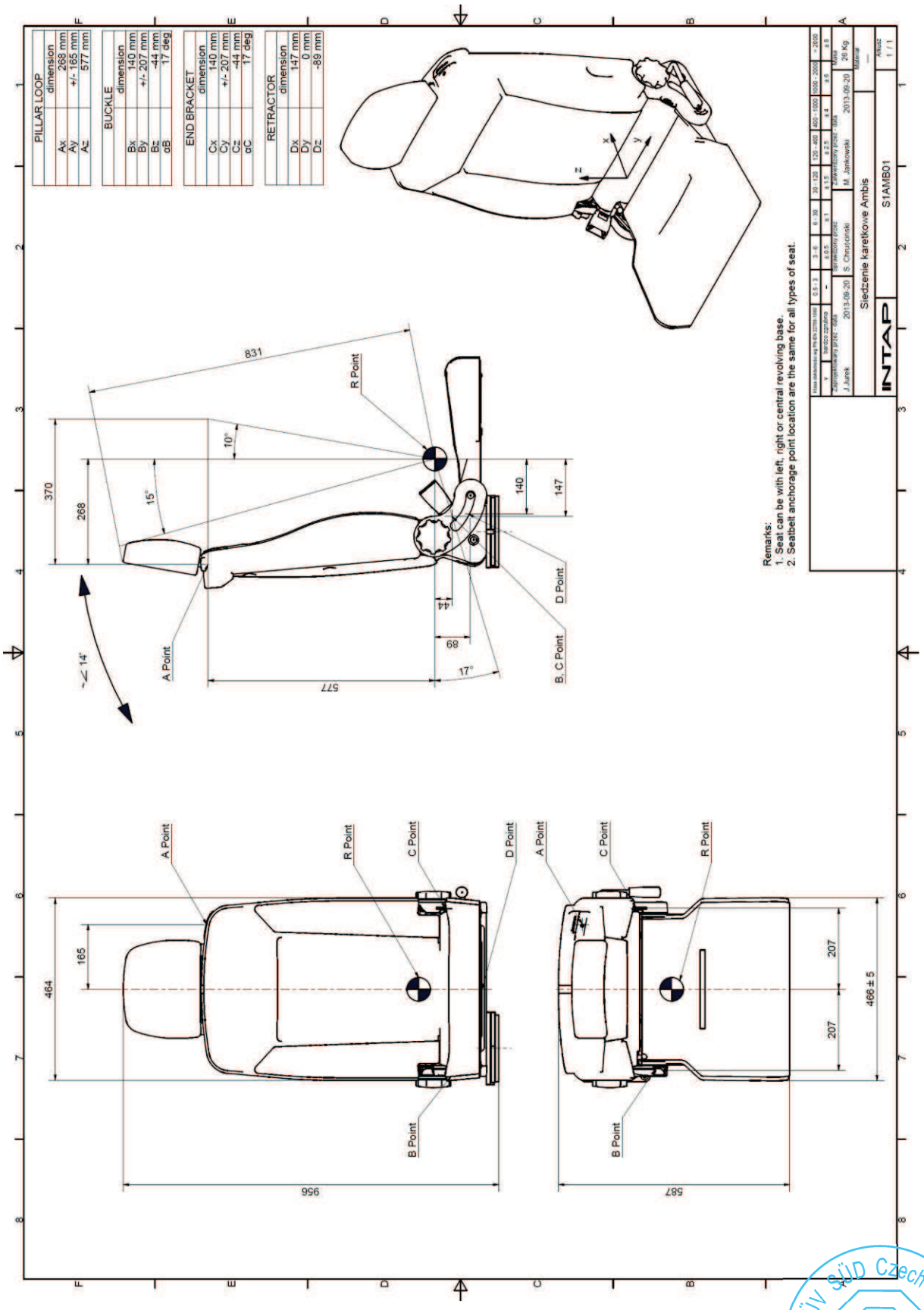


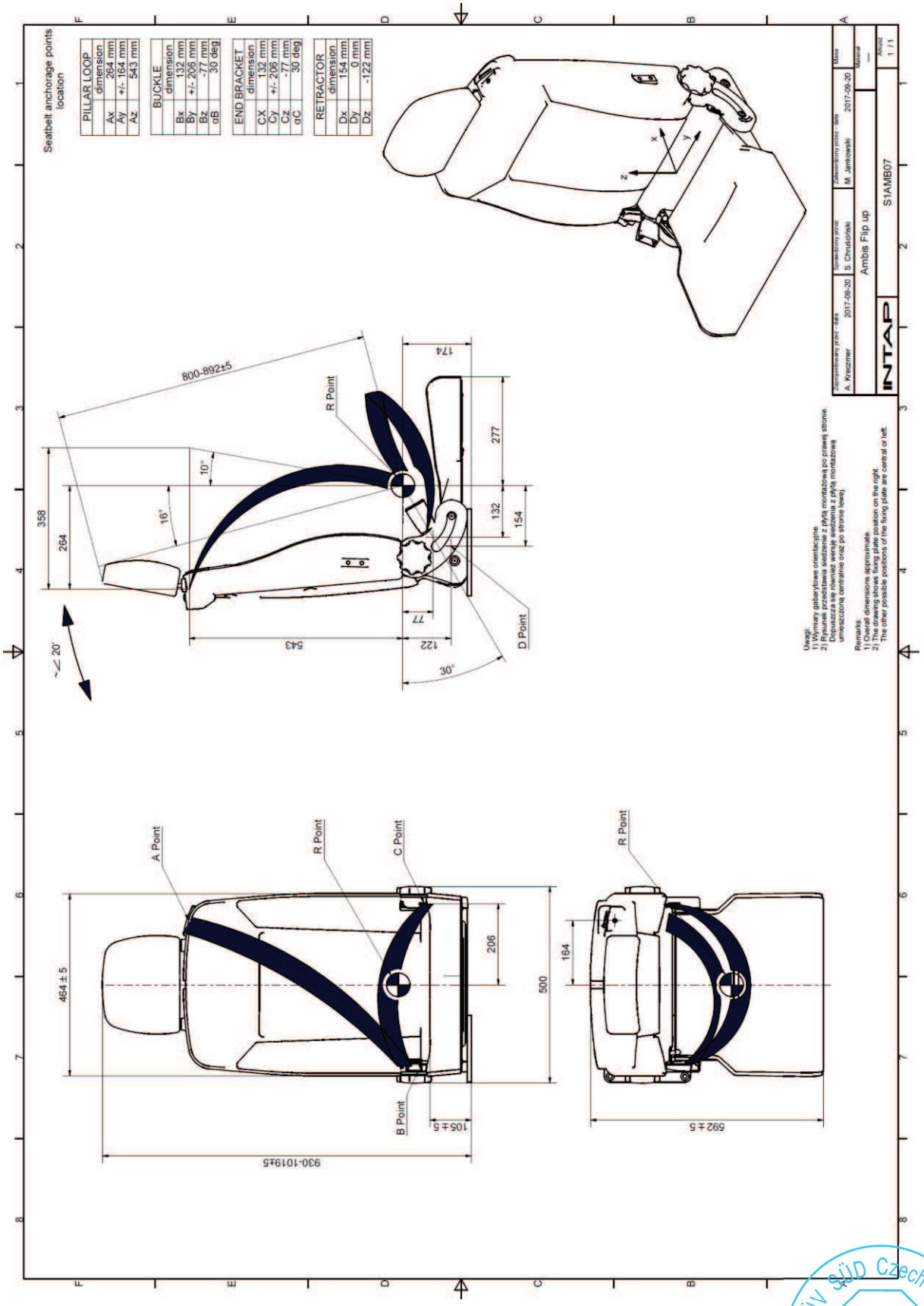




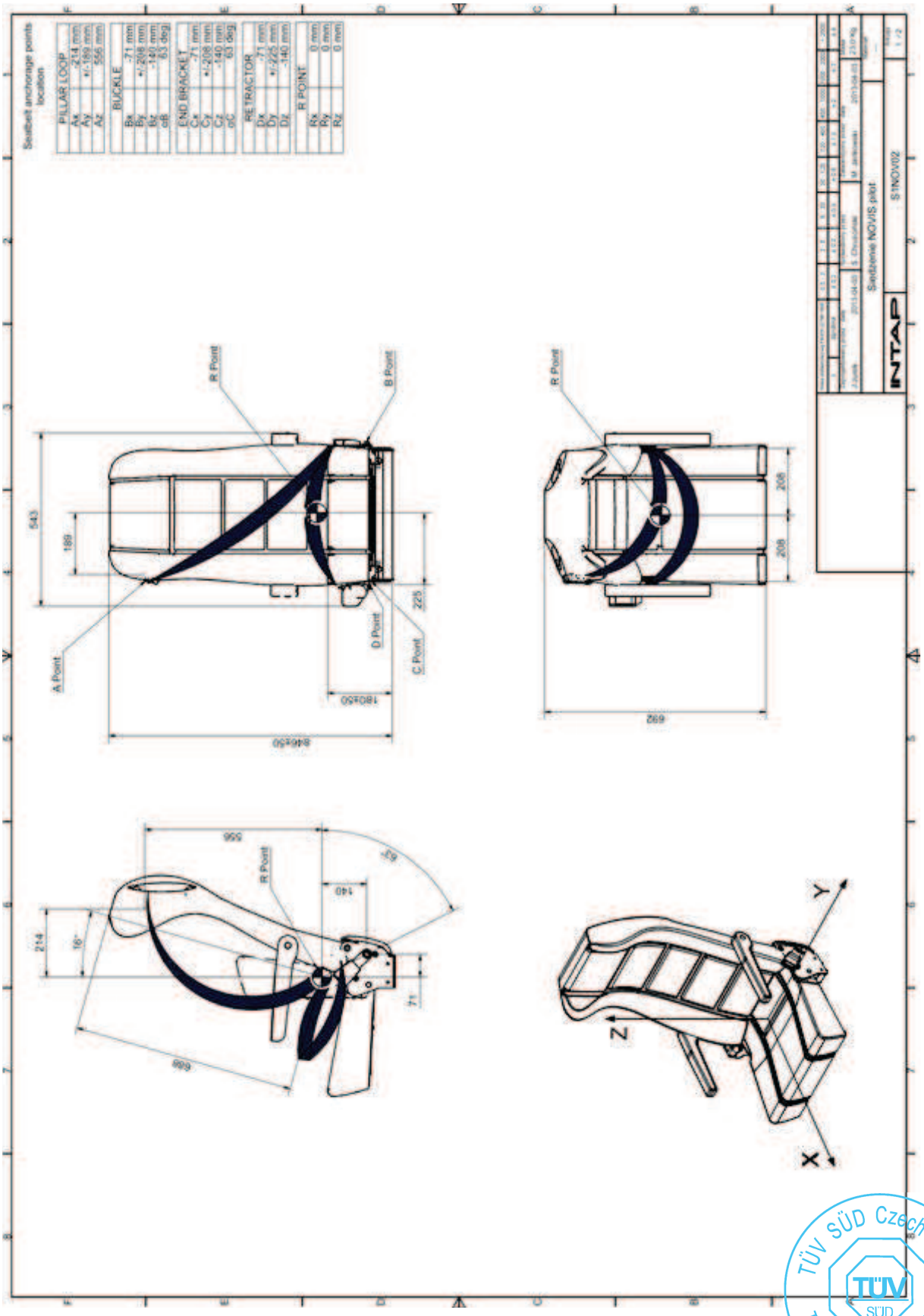








Seats for categories M2, N2, M3, N3
Guide seats:



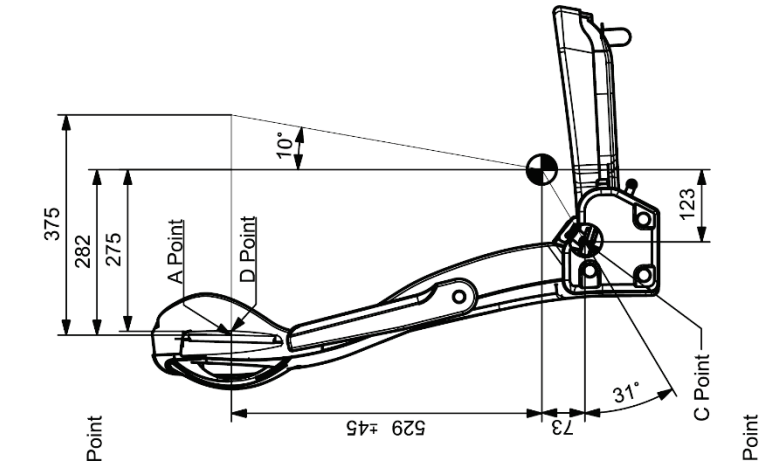
PILLAR LOOP	
Ax	-282 mm
Ay	-208 mm
Az	529 mm

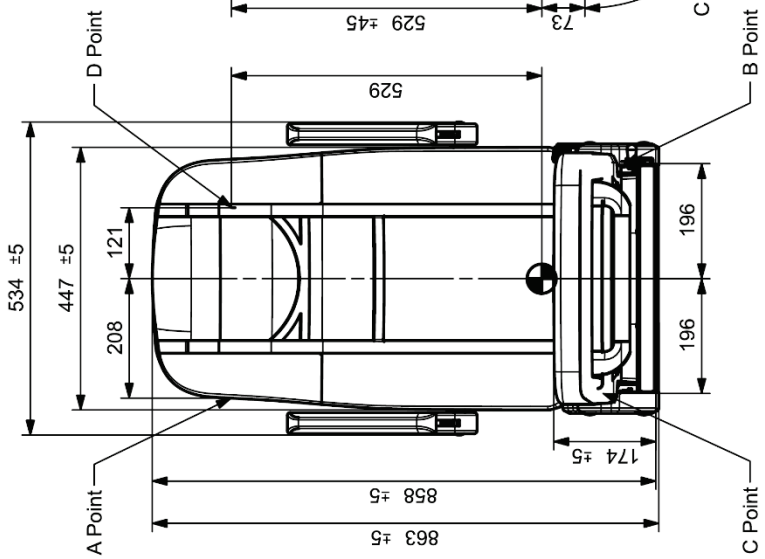
BUCKLE	
Bx	-166 mm
By	196 mm
Bz	-112 mm
αB	34°

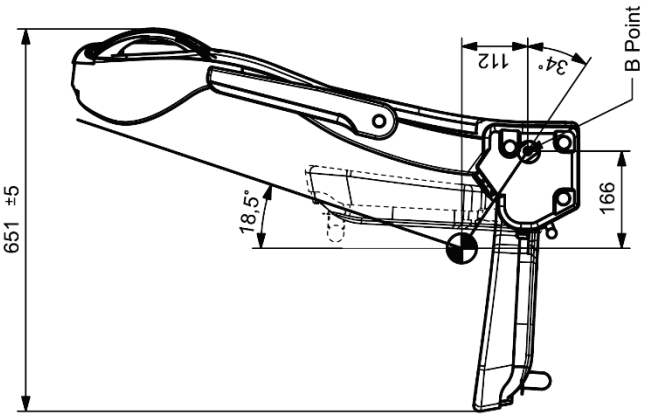
END BRACKET	
Cx	-123 mm
Cy	-196 mm
Cz	-73 mm
αC	31°

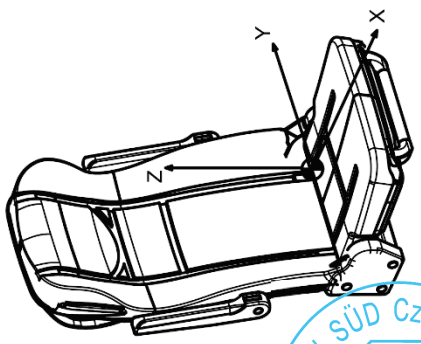
RETRACTOR	
Dx	-275 mm
Dy	121 mm
Dz	529 mm

R POINT	
Rx	0 mm
Ry	0 mm
Rz	0 mm





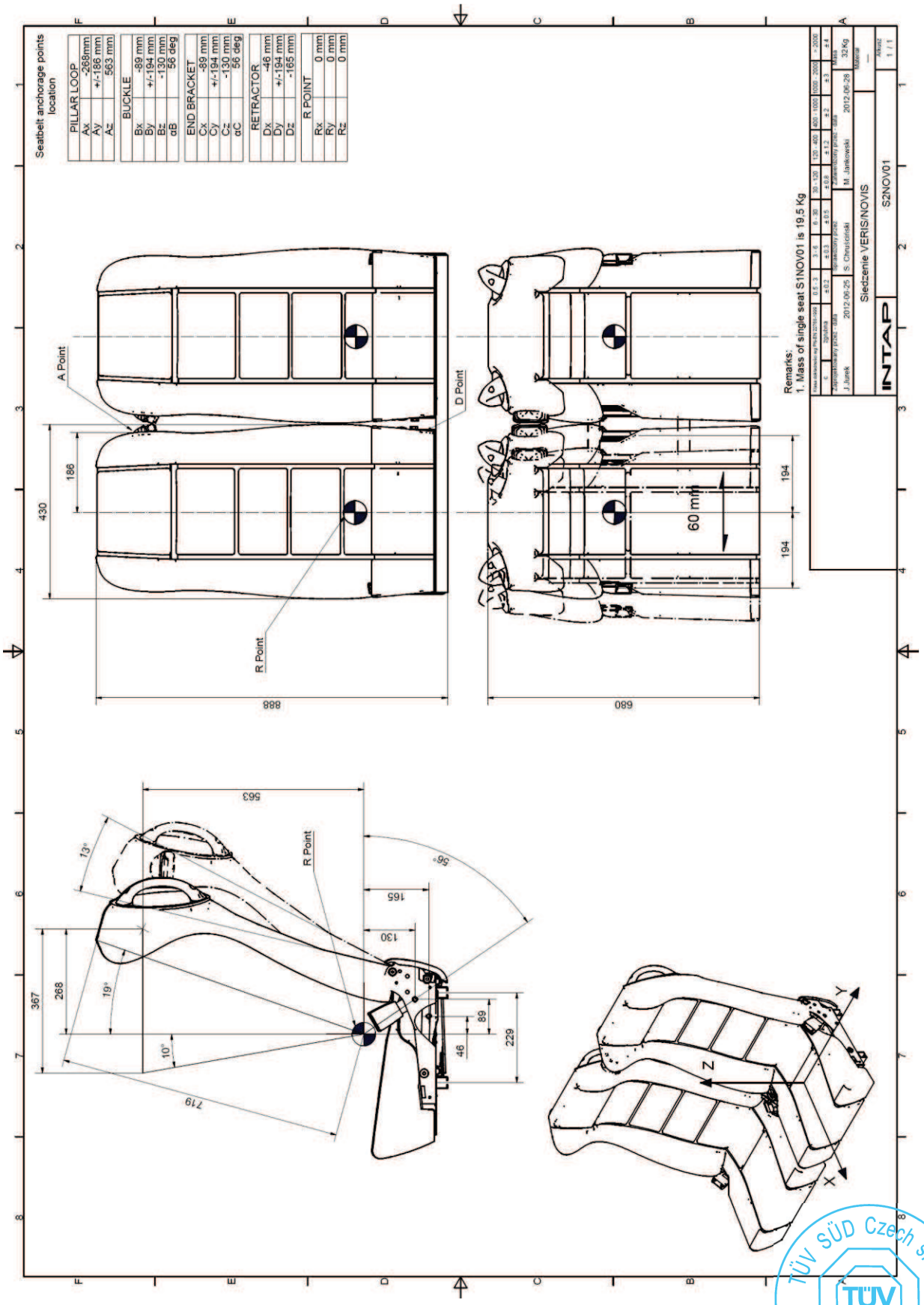


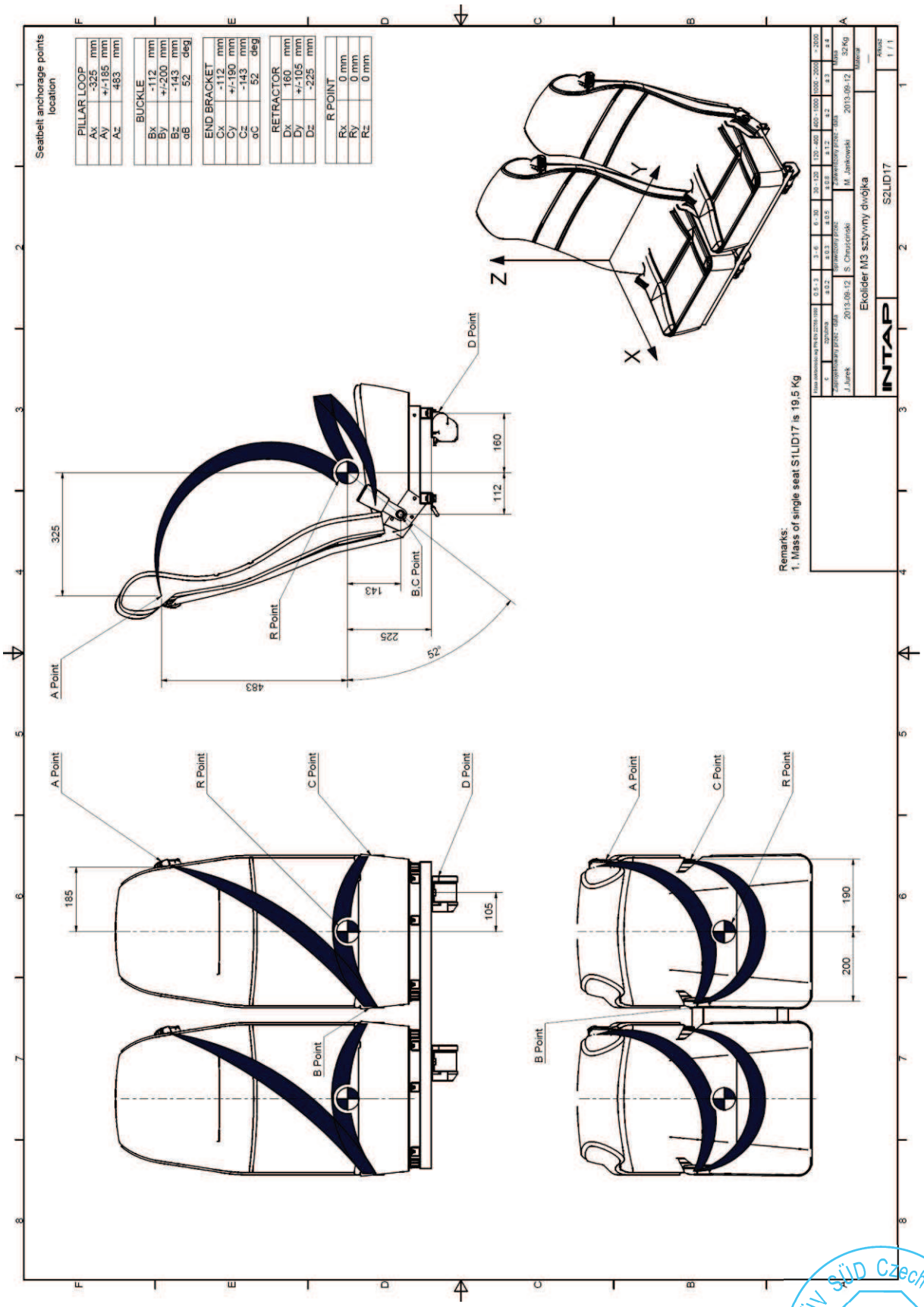


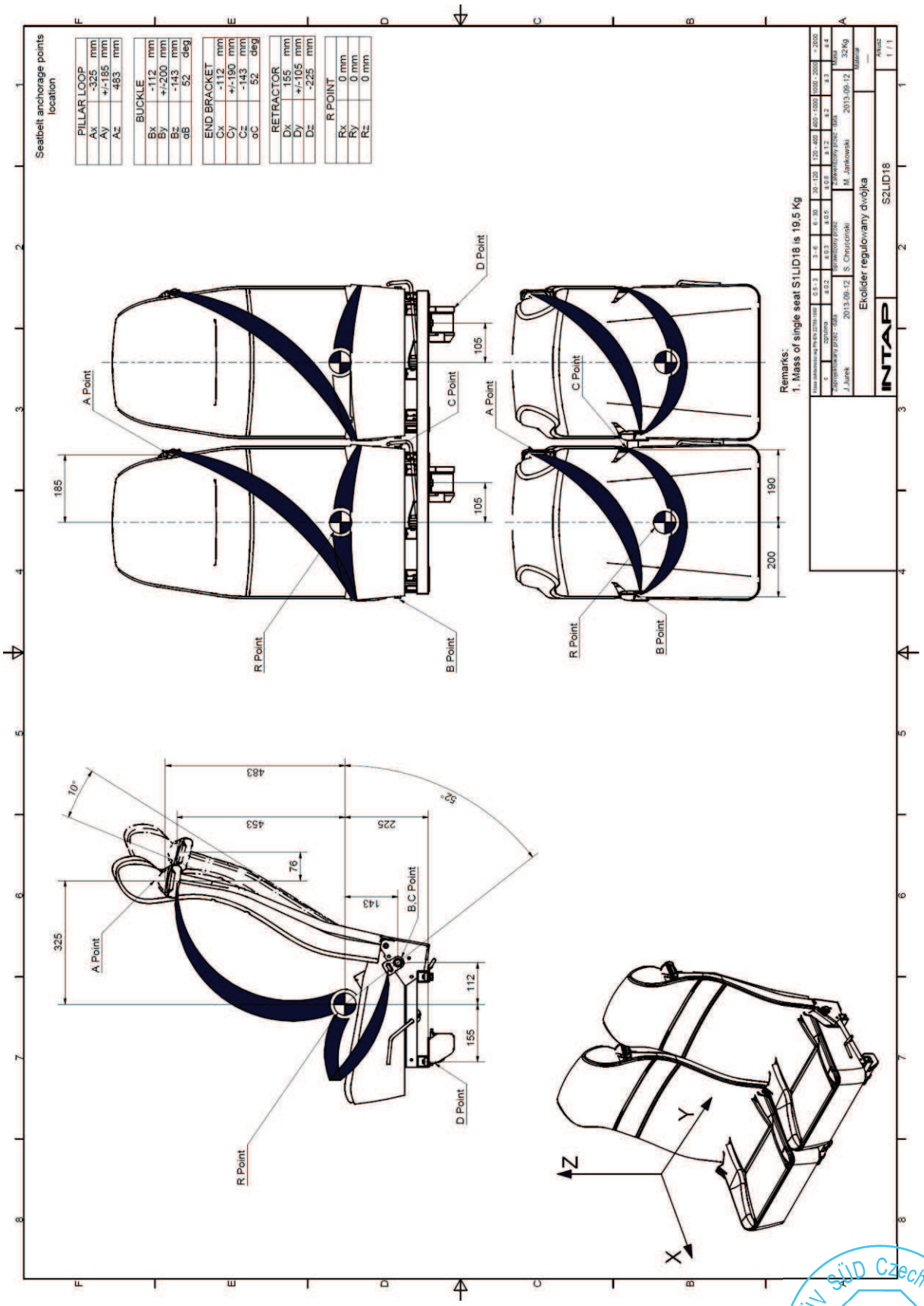
Zaprojektowany przez - data M. Opasiak - 21.01.2020	Kreślony przez M. Opasiak	Sprawdzony przez S. Chruściński
	NG110	
JINTAP	S1NGP01	

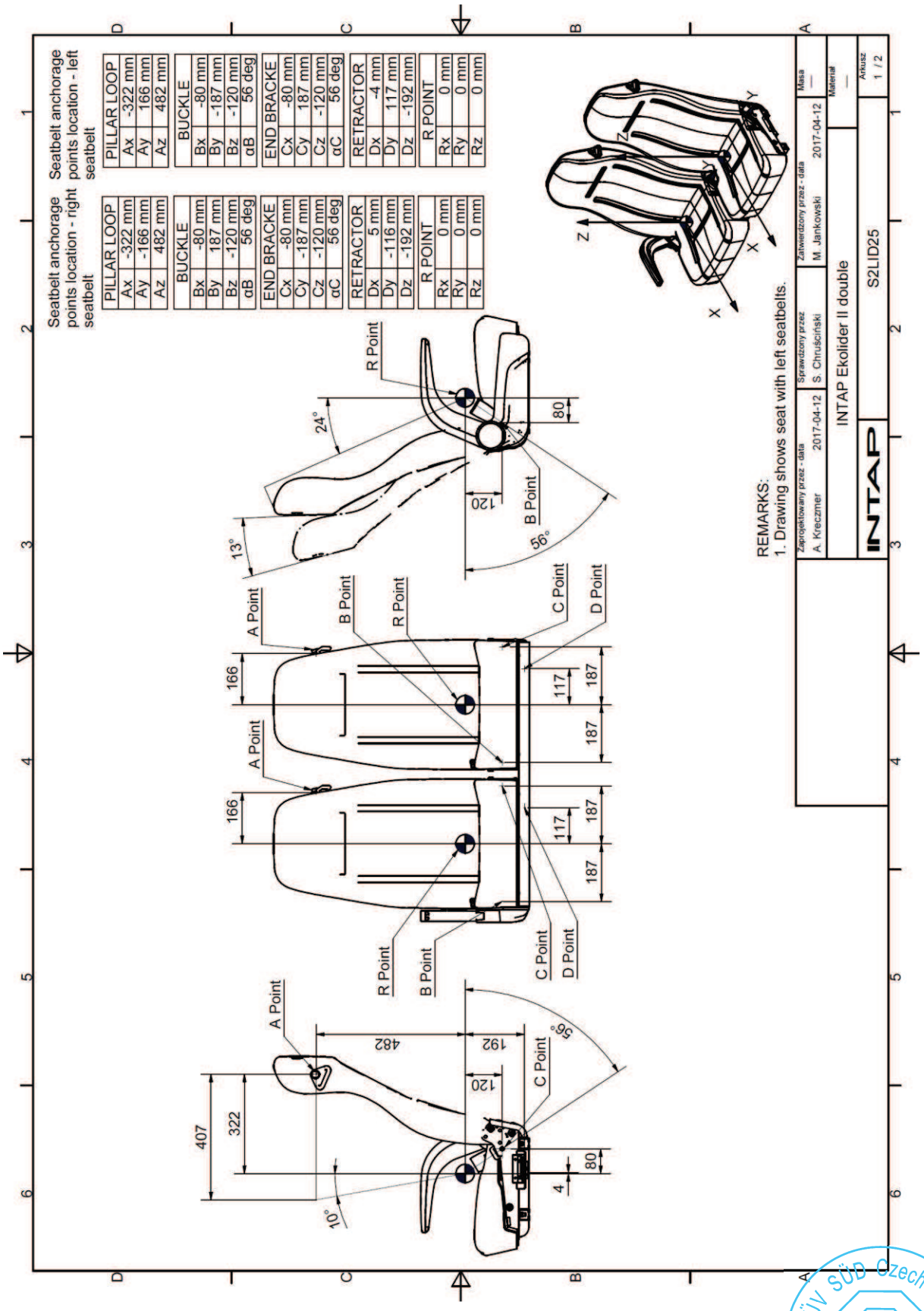
Zatwierdzony przez - data A. Szadkowski - 21.01.2020	Masa [kg] -	Arkusz 3 z 5

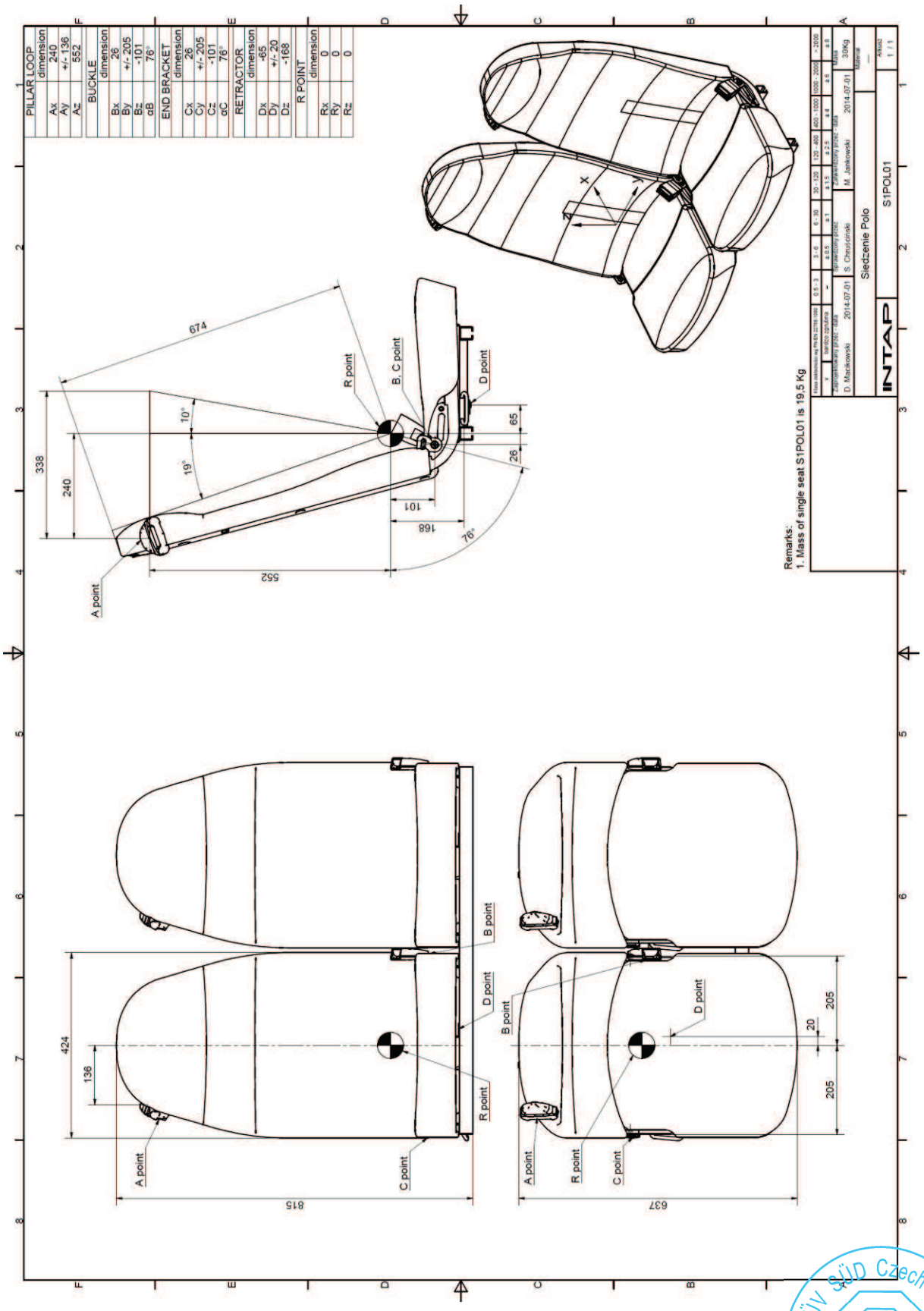
Other rows











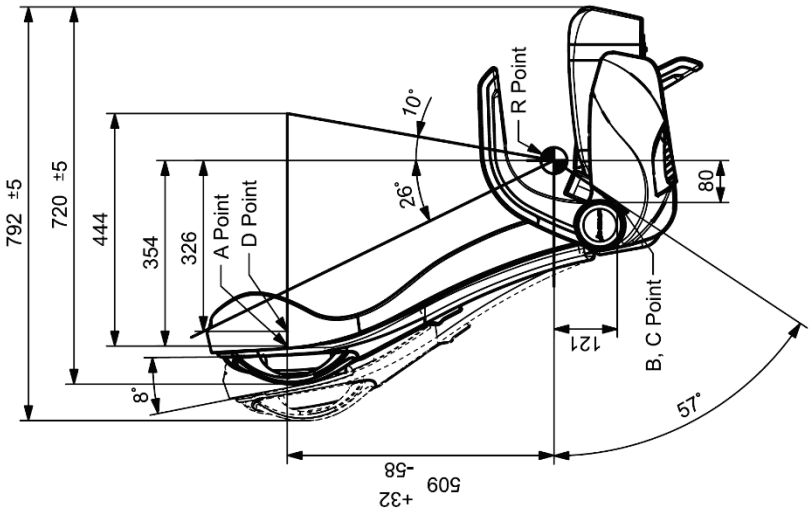
PILLAR LOOP	
Ax	354 mm
Ay	+/-208
Az	509 mm

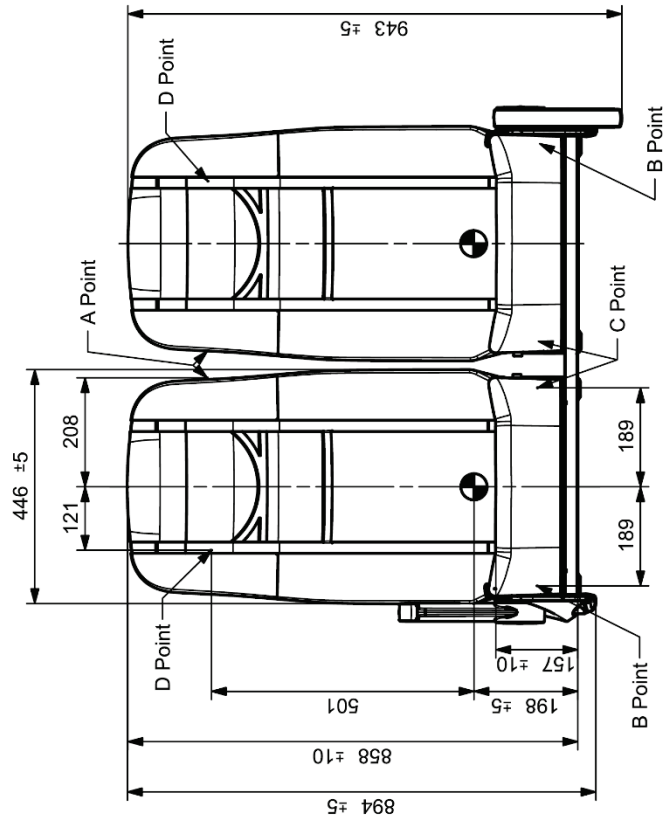
BUCKLE	
Bx	80 mm
By	+/-189 mm
Bz	-121 mm
αB	57°

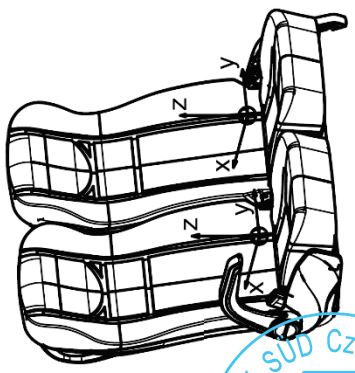
END BRACKET	
Cx	80 mm
Cy	+/-189 mm
Cz	-121 mm
αC	57°

RETRACTOR	
Dx	326 mm
Dy	+/-121 mm
Dz	501 mm

R POINT	
Rx	0 mm
Ry	0 mm
Rz	0 mm







Zaprojektowany przez - data	Kreślony przez	Sprawdzony przez	Zatwierdzony przez - data	Masa [kg]	Arkusz
Ł.Dumka - 16.01.2020	M. Opasiak	S.Chruściński	A.Szadkowski - 16.01.2020	-	1 z 4
JINTAP	NG100	S2NGR01			

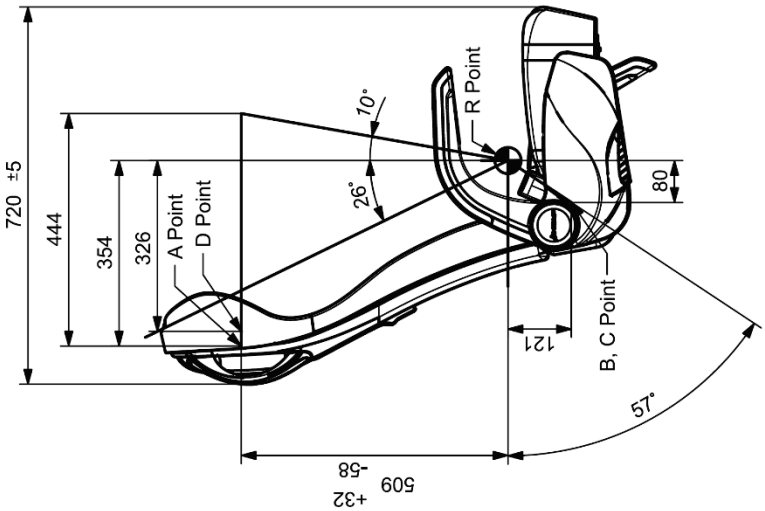
PILLAR LOOP	
Ax	354 mm
Ay	+/-208
Az	509 mm

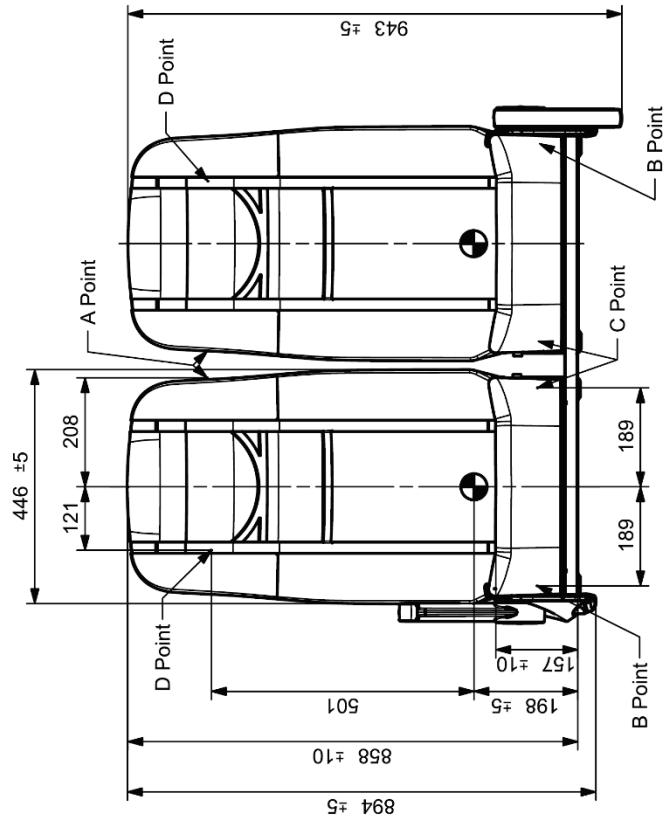
BUCKLE	
Bx	80 mm
By	+/-189 mm
Bz	-121 mm
αB	57°

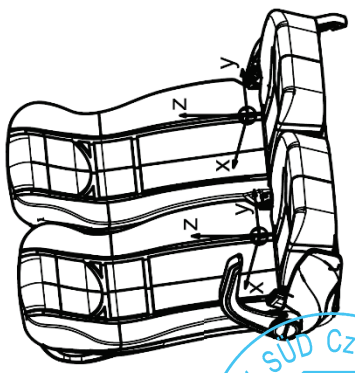
END BRACKET	
Cx	80 mm
Cy	+/-189 mm
Cz	-121 mm
αC	57°

RETRACTOR	
Dx	326 mm
Dy	+/-121 mm
Dz	501 mm

R POINT	
Rx	0 mm
Ry	0 mm
Rz	0 mm







Zaprojektowany przez - data Ł.Dumka - 16.01.2020	Kreślony przez M. Opasiak	Sprawdzony przez S.Chruściński	Zatwierdzony przez - data A.Szadkowski - 16.01.2020	Masa [kg] -	Arkusz 1 z 4
	NG100			S2NGR02	

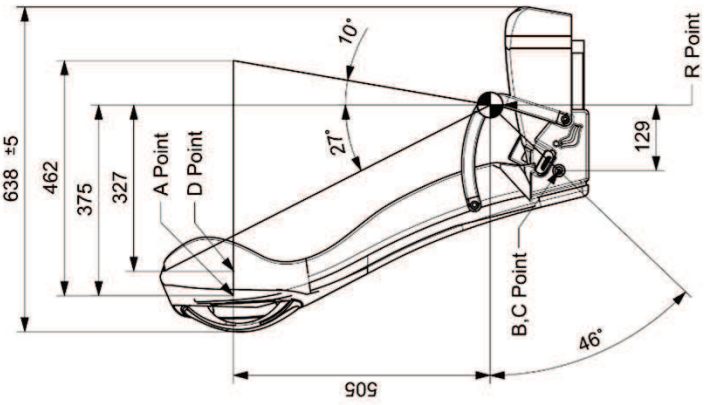
PILLAR LOOP	
Ax	375 mm
Ay	+/-151 mm
Az	505 mm

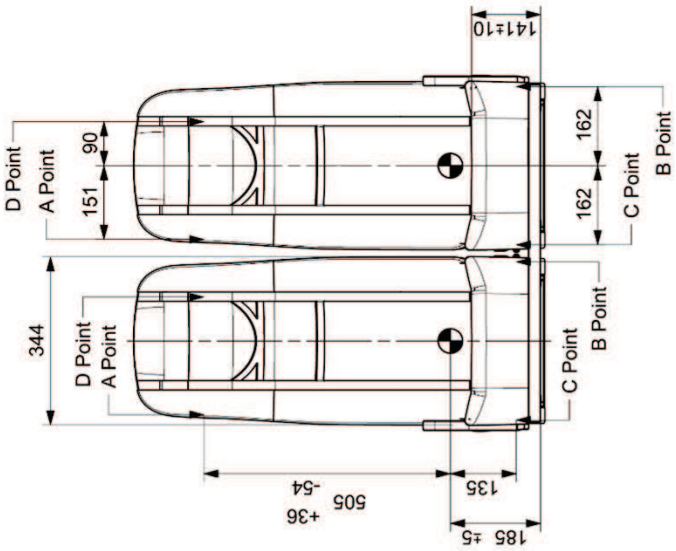
BUCKLE	
Bx	129 mm
By	+/-162 mm
Bz	-135 mm
αB	46°

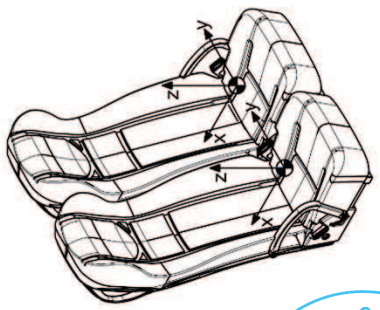
END BRACKET	
Cx	129 mm
Cy	+/-162 mm
Cz	-135 mm
αC	46°

RETRACTOR	
Dx	327 mm
Dy	+/-90 mm
Dz	505 mm

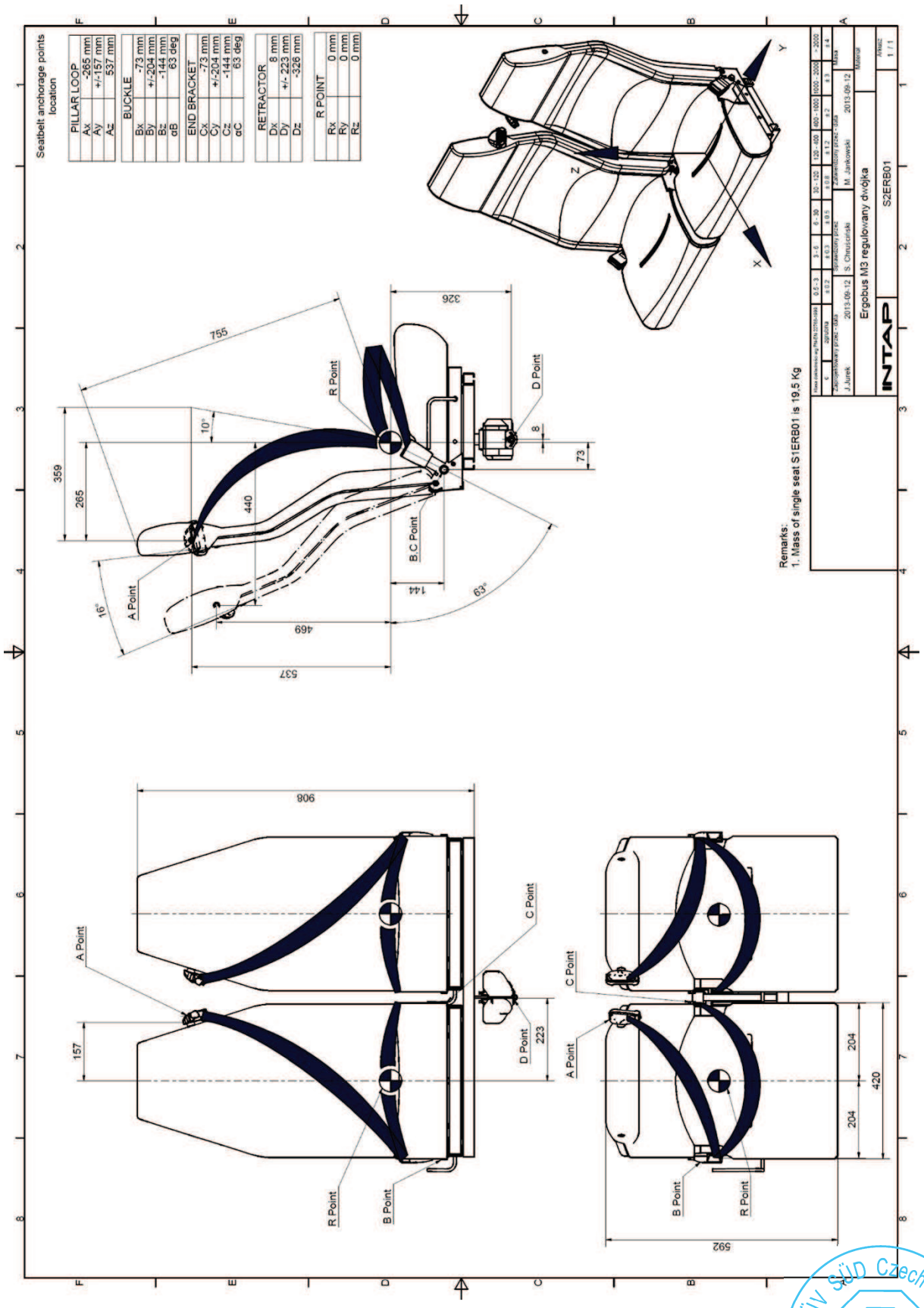
R POINT	
Rx	0 mm
Ry	0 mm
Rz	0 mm

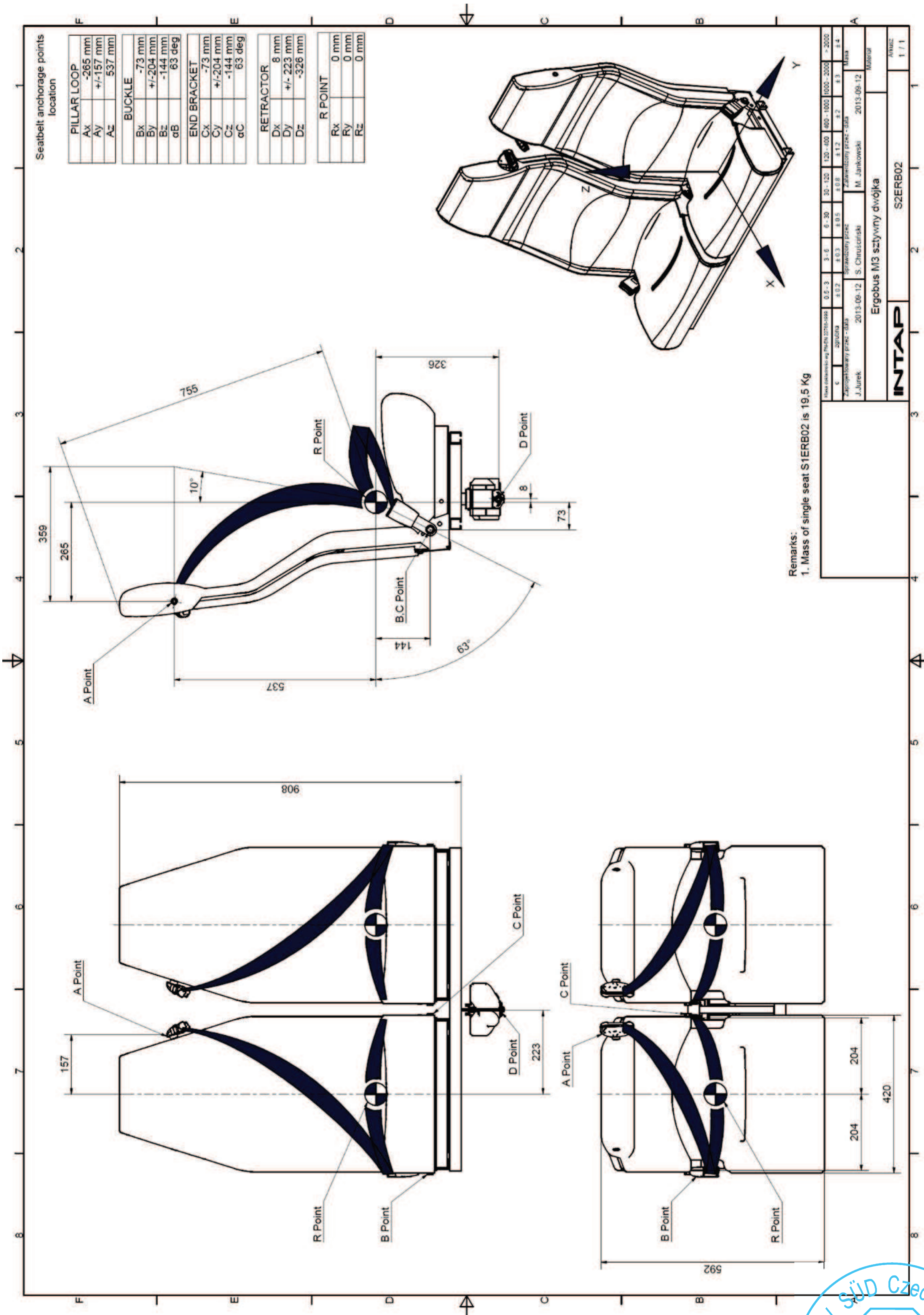






Zaprojektowany przez - data M. Makaruk - 02.06.2020	Sprawdzony przez S. Chrusciński	Zatwierdzony przez - data A. Szadkowski - 03.06.2020
JINTAP	NG200	Materiał -
	S2NGS01	Masa -
	A3	Arkusz 1 z 1

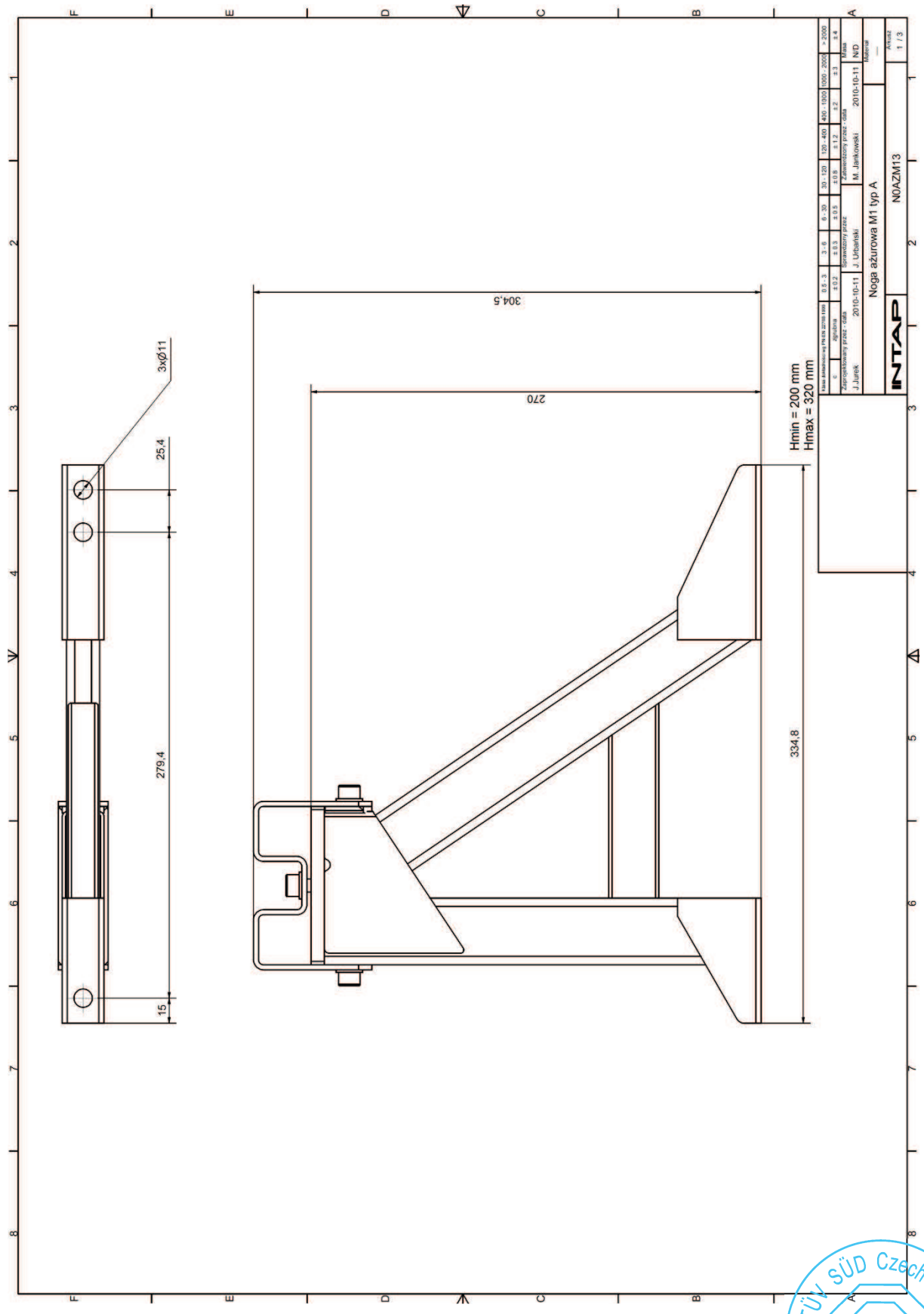


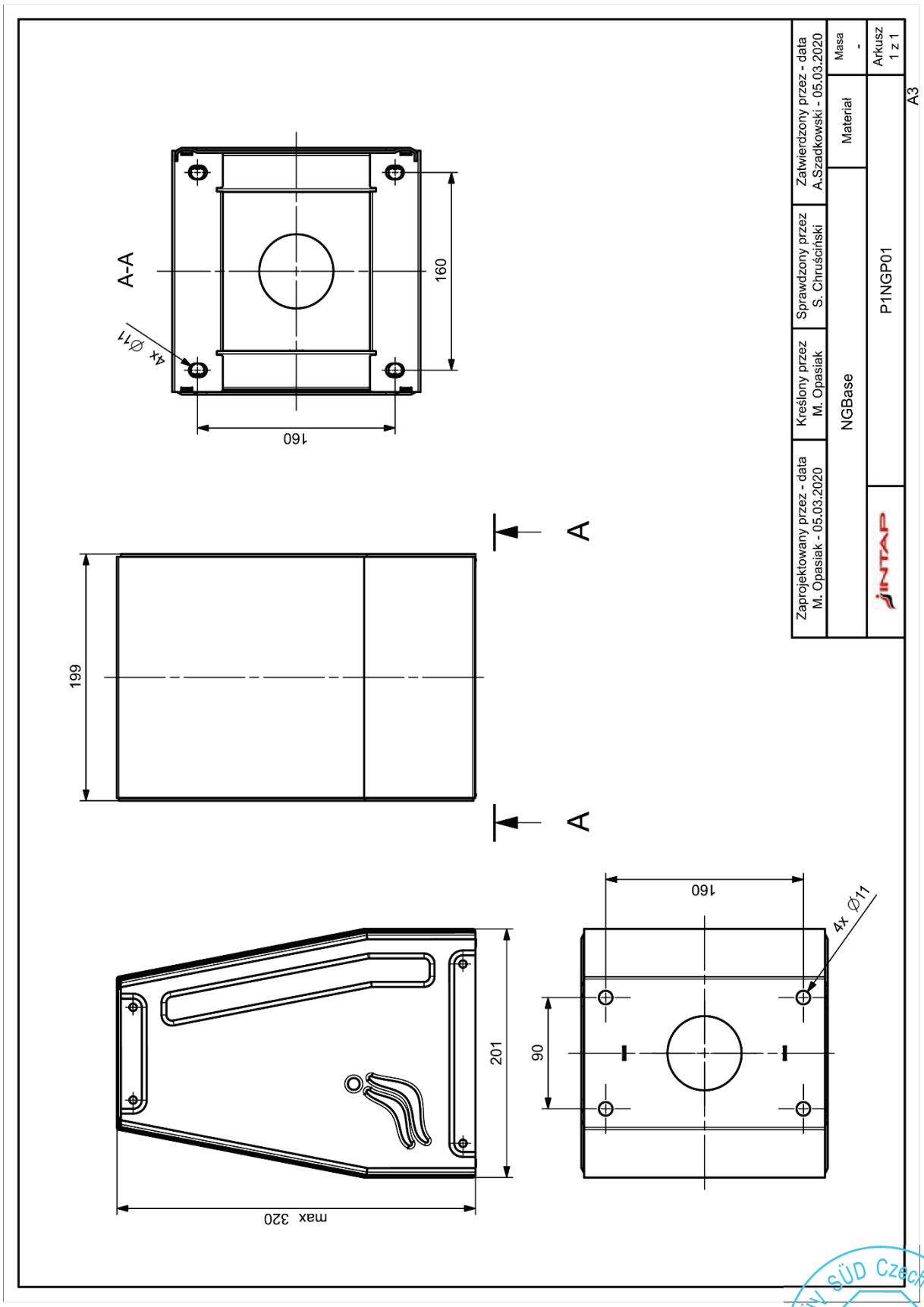

Seatbelt anchorage points location
PILLAR LOOP
Ax -265 mm
Ay +/-157 mm
Az 537 mm
BUCKLE
Bx -73 mm
By +/-204 mm
Bz -144 mm
αB 63 deg
END BRACKET
Cx -73 mm
Cy +/-204 mm
Cz -144 mm
αC 63 deg
RETRACTOR
Dx 8 mm
Dy +/- 223 mm
Dz -326 mm
R POINT
Rx 0 mm
Ry 0 mm
Rz 0 mm
755
326
R Point
D Point
10°
359
265
8
73
B,C Point
144
63°
A Point
537
806
C Point
A Point
157
D Point
223
C Point
A Point
204
420
204
R Point
B Point
B Point
R Point
592
X
Y
Z
Remarks:
1. Mass of single seat S1ERB02 is 19,5 Kg
Ergobus M3 sztywny dwójka
S2ERB02
INTAP

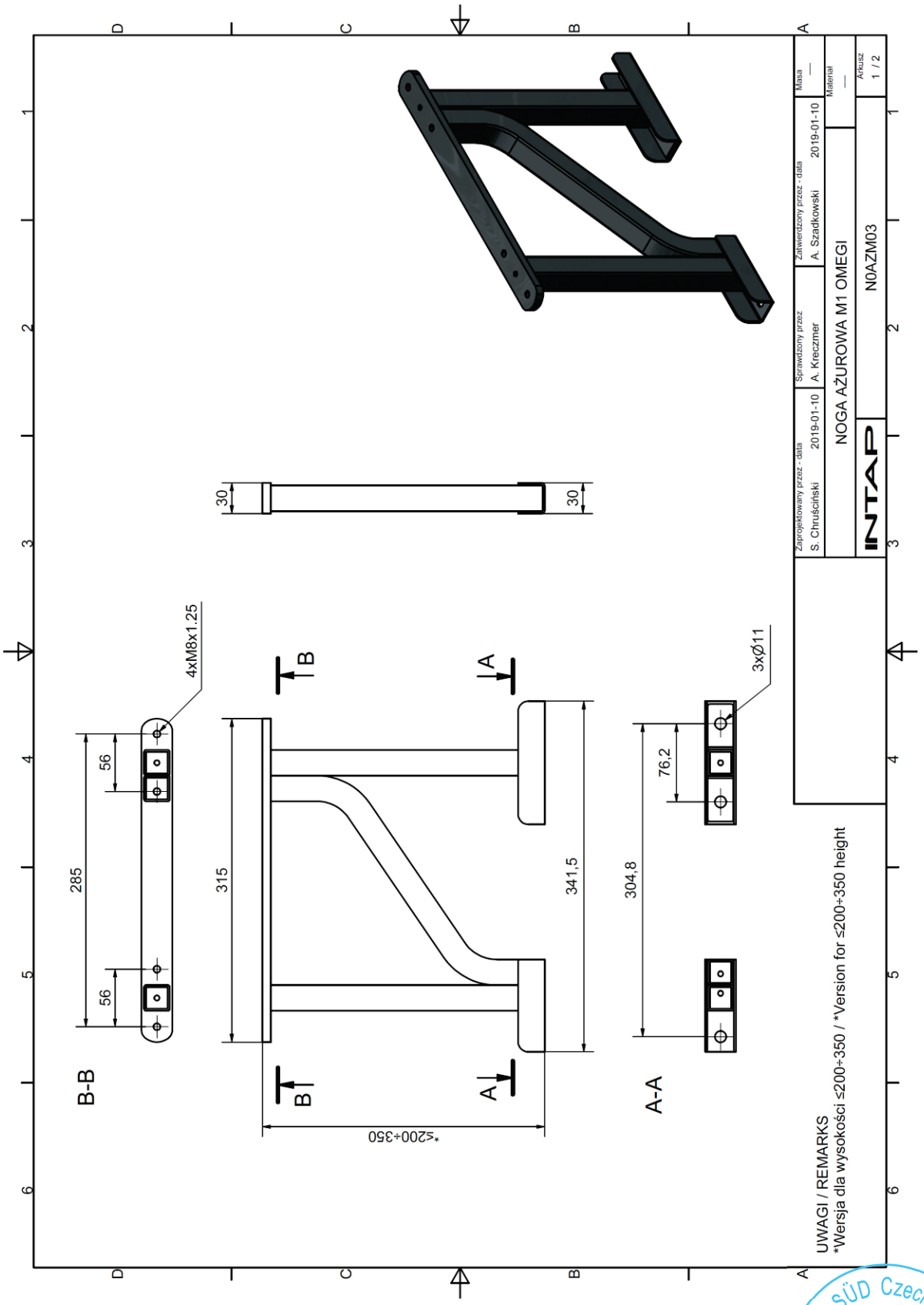
Enclosure 5: DRAWINGS OF LEGS AND BASES

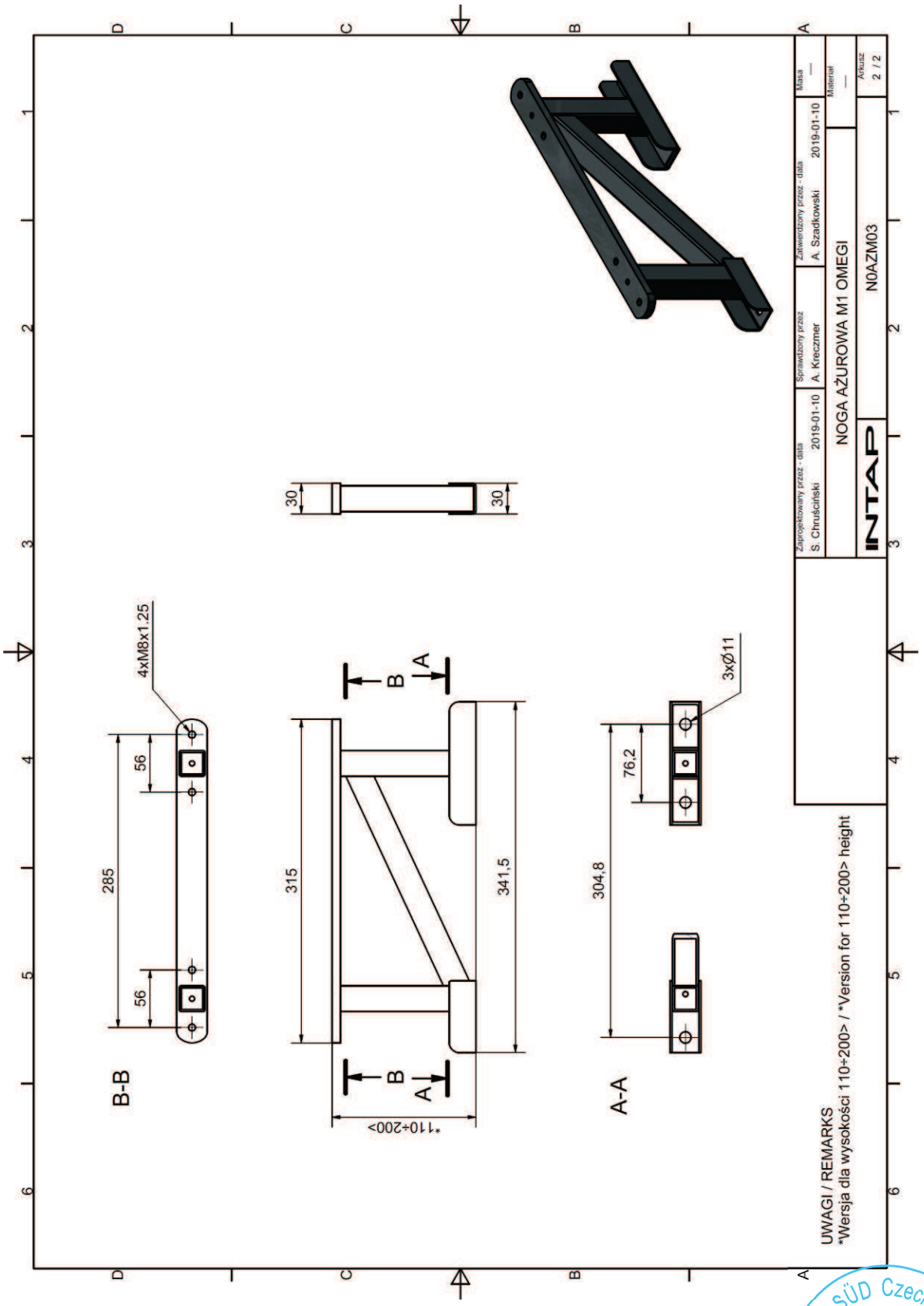
Leg/base type	Configuration	Mass of the heaviest configuration
N0AZM13	1	max 2 kg
P1NGP01	2	max 3,5 kg
N0AZM03, N0AZM06, N0AZM36	1	2,5 kg
N0AZM09, N0AZU10-01, N0AZM34, N0AZU10-02	1	4,1 kg
N0BLS10	1	3,0 kg
N0BLS15	1	2,1 kg
N0BLS17	1	2,1 kg
N0AZM33-01, N0AZM33-02 N0AZM35-01, N0AZM35-02 N0AZM37-01,N0AZM37-02 N0AZM38-01, N0AZM38-02	2	max 10,0 kg
P1PPK04	2	8 kg
P1NKL21	2	12,0 kg
Slide base (P1SBE??)	2	max 16 kg

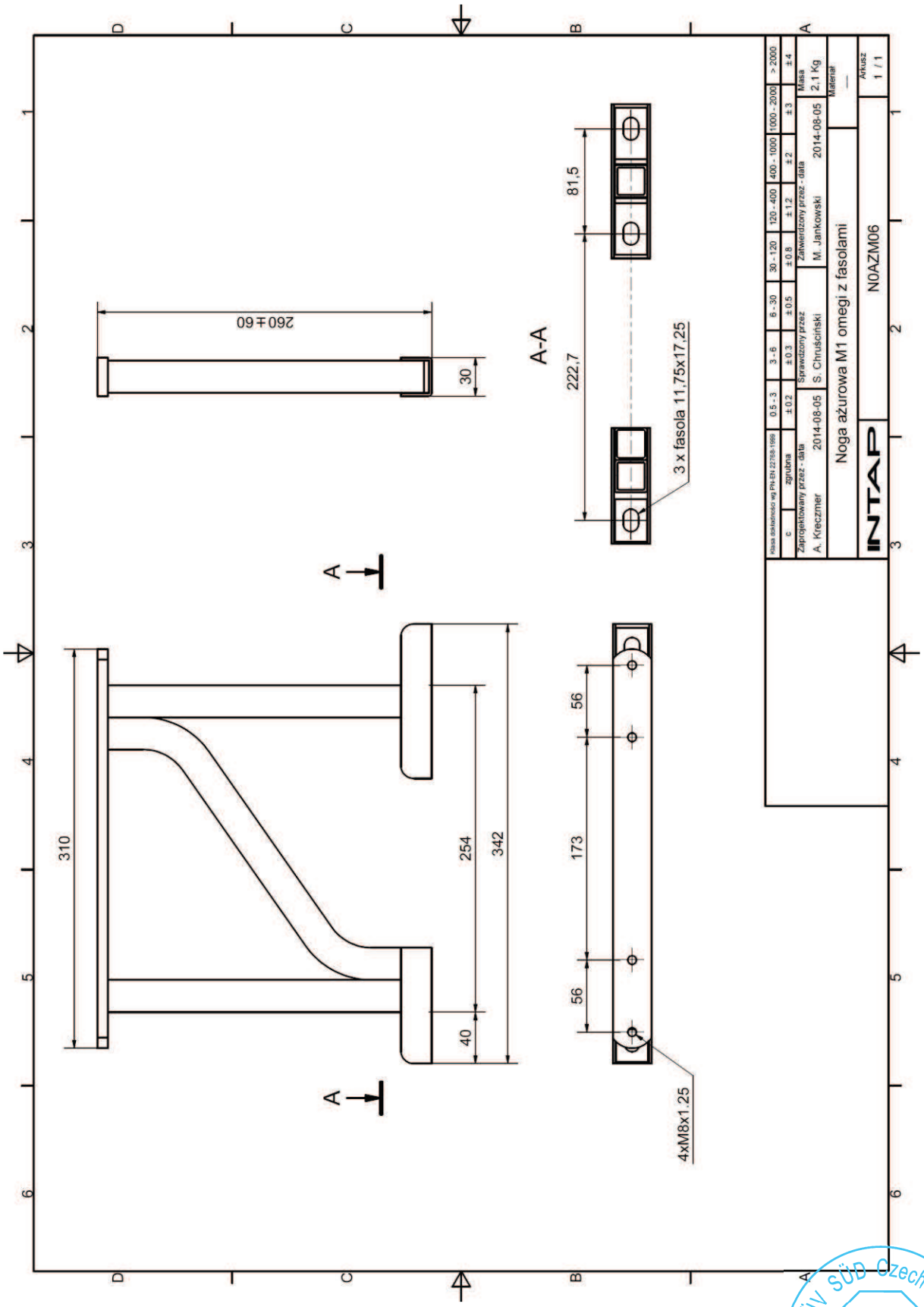
1 – single leg
2 – double leg or console

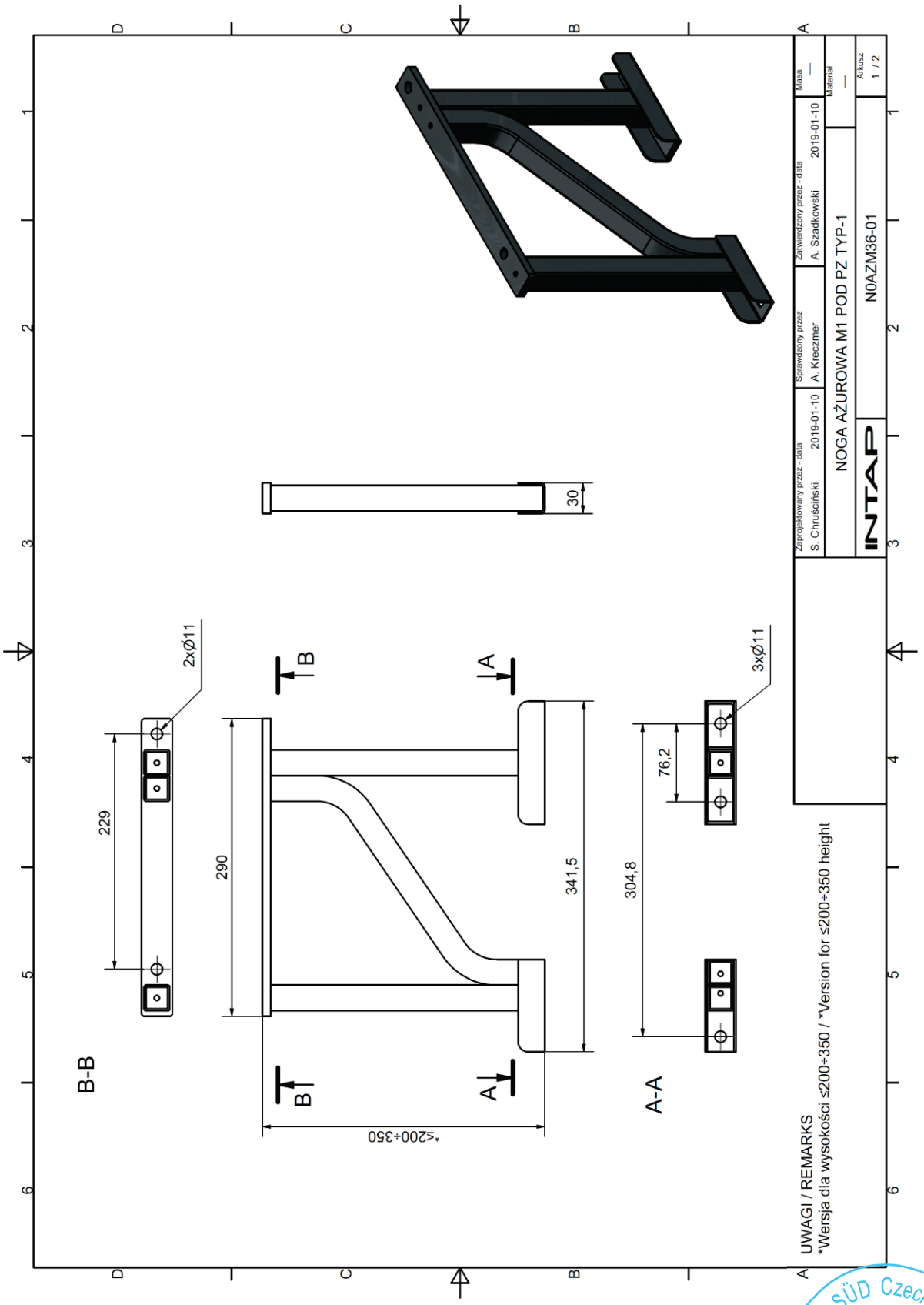


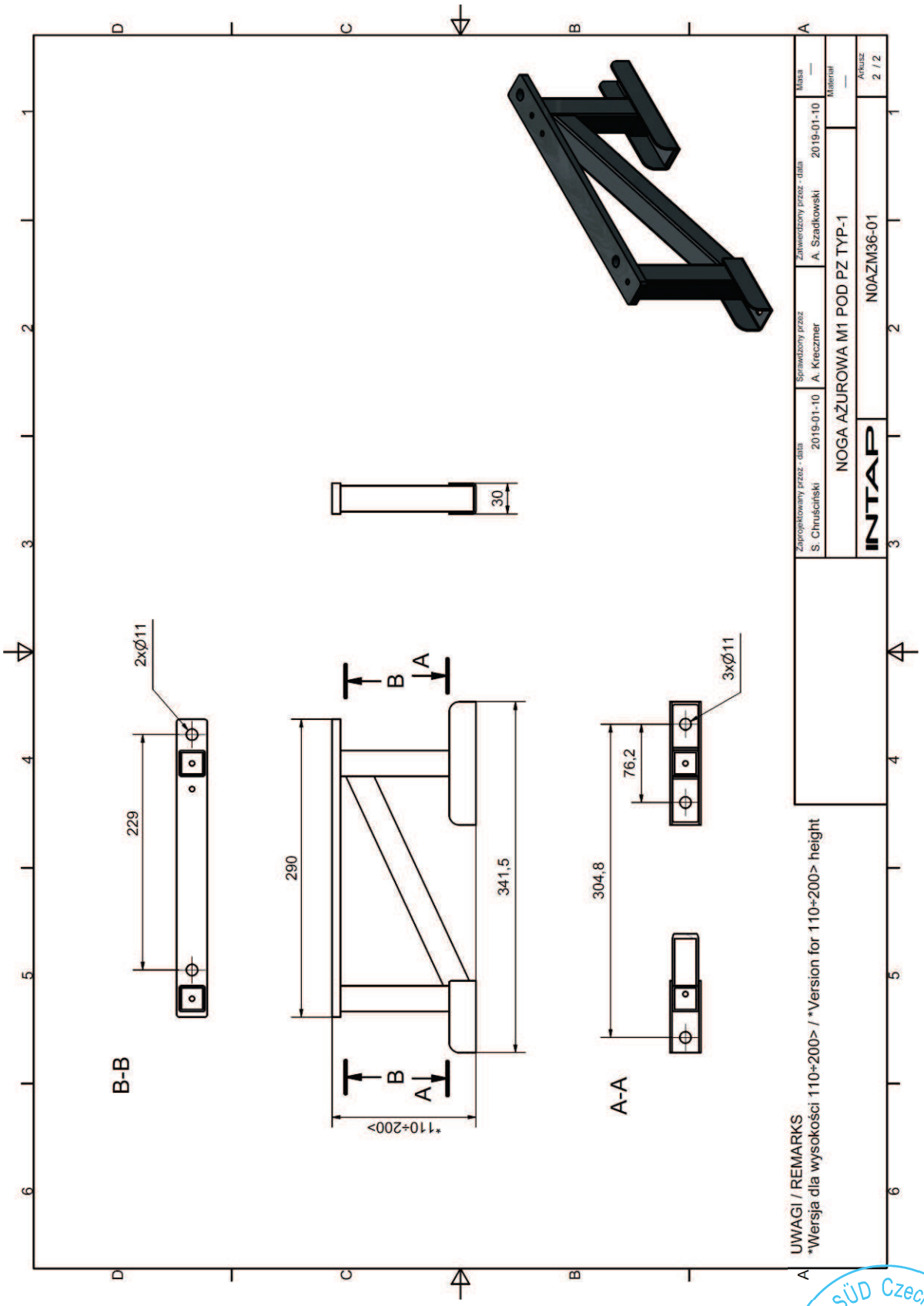


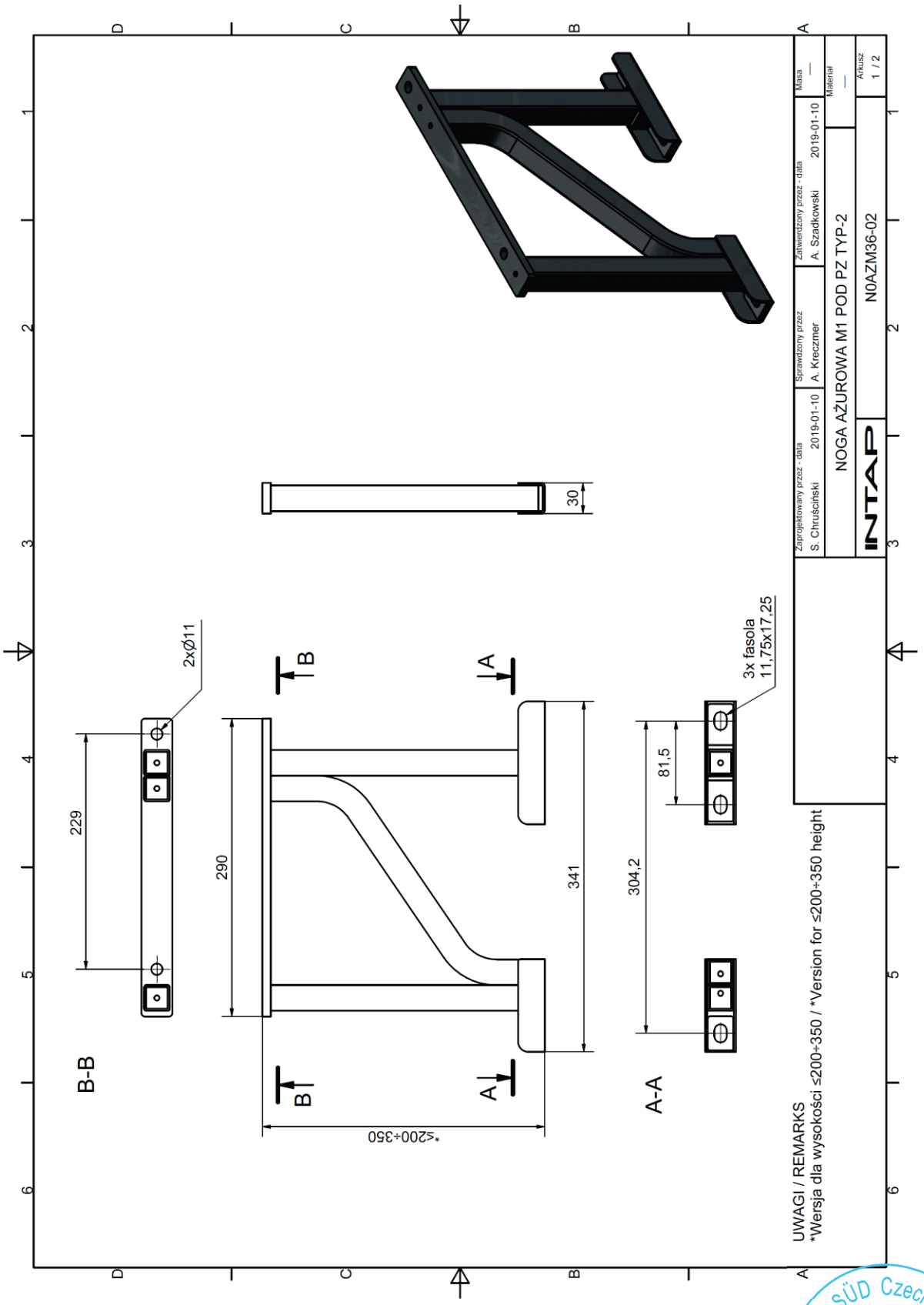


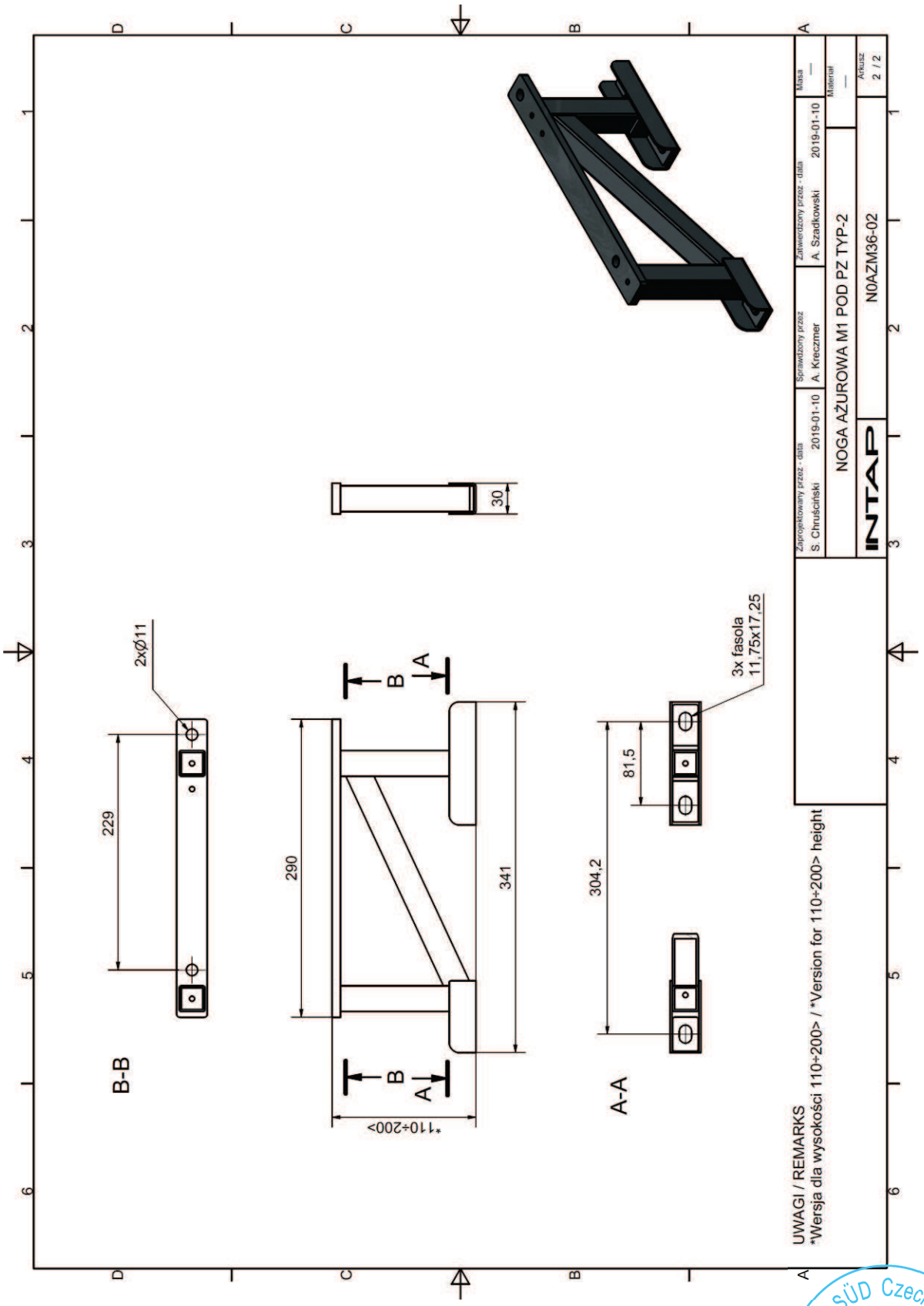


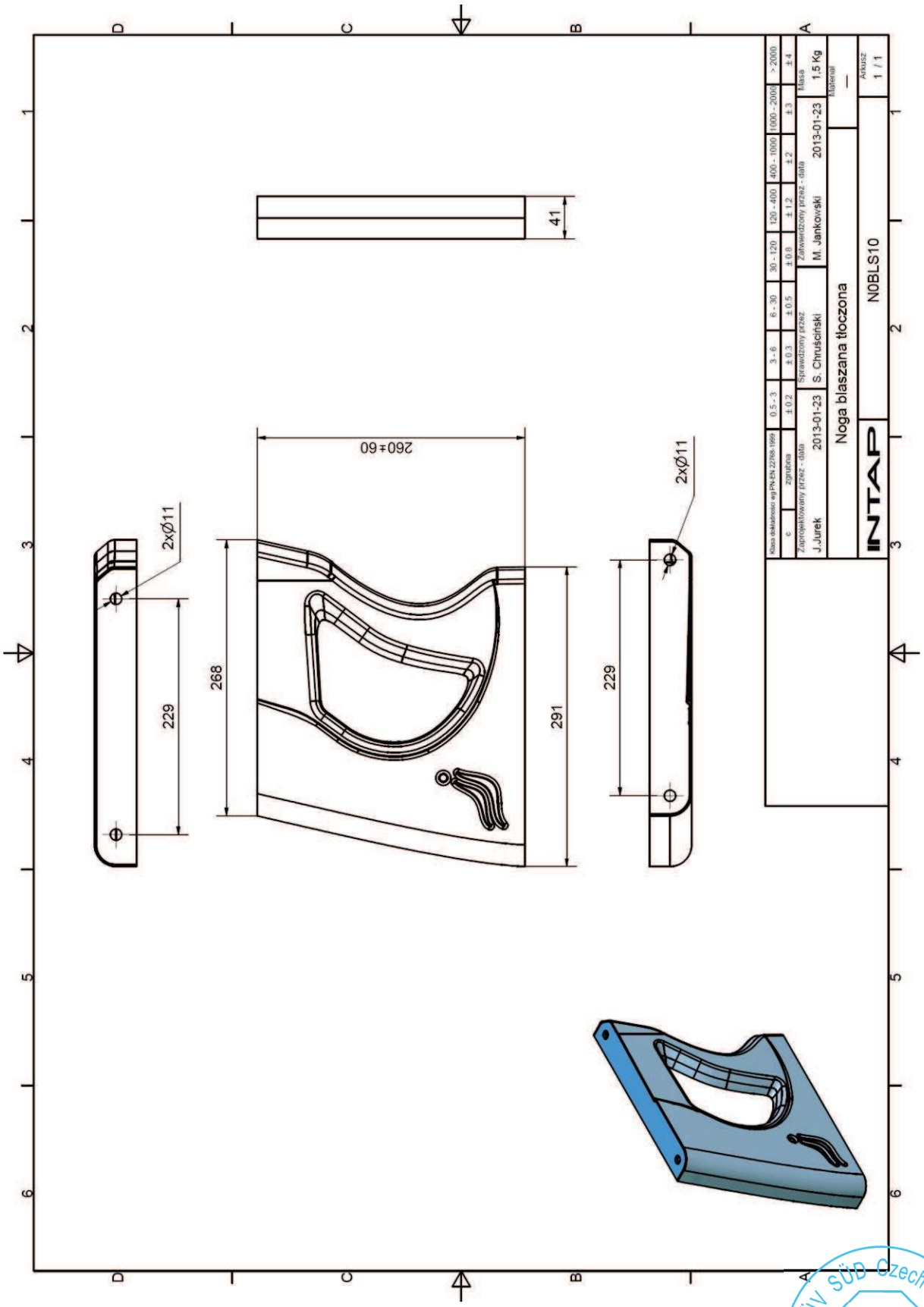


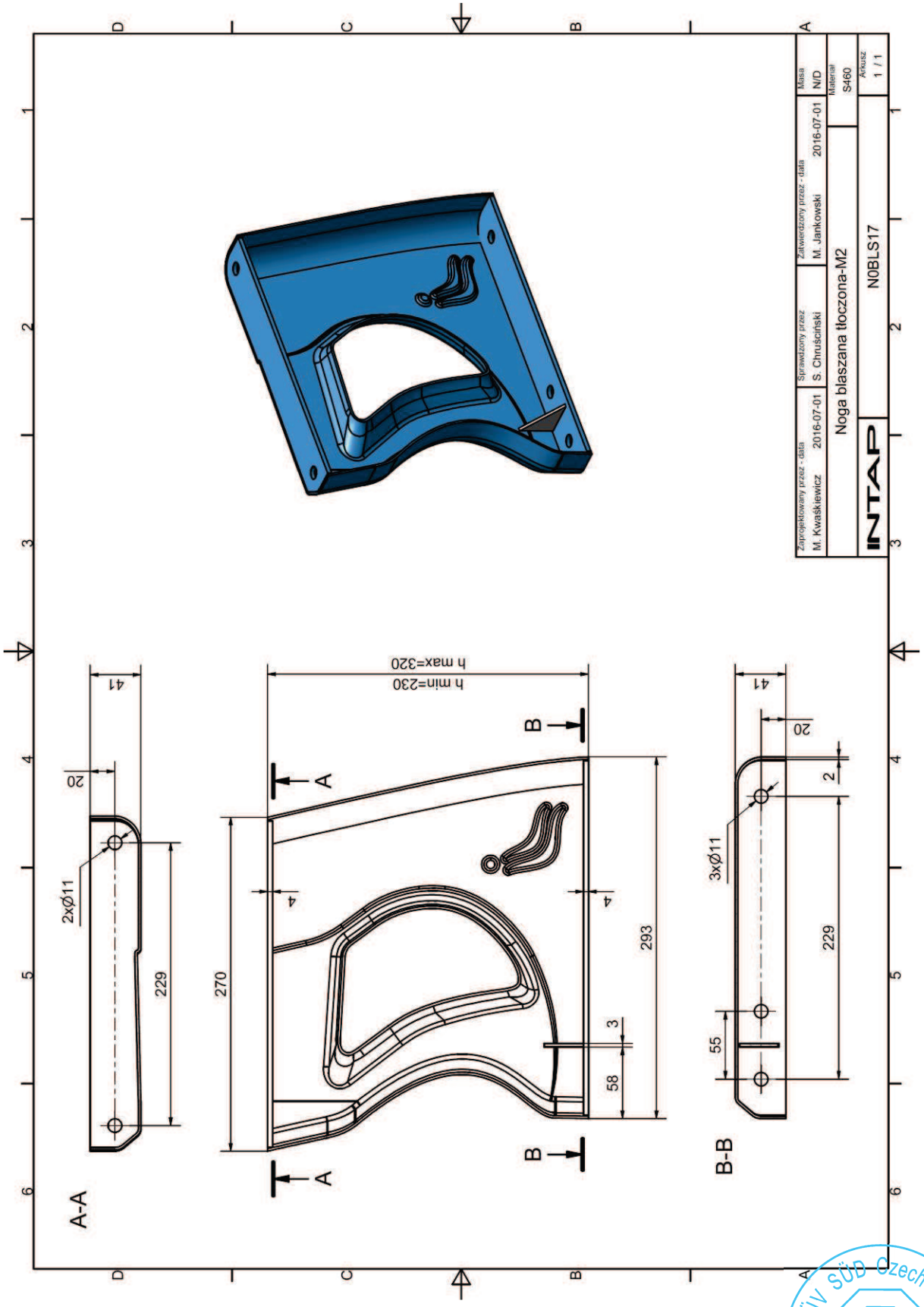


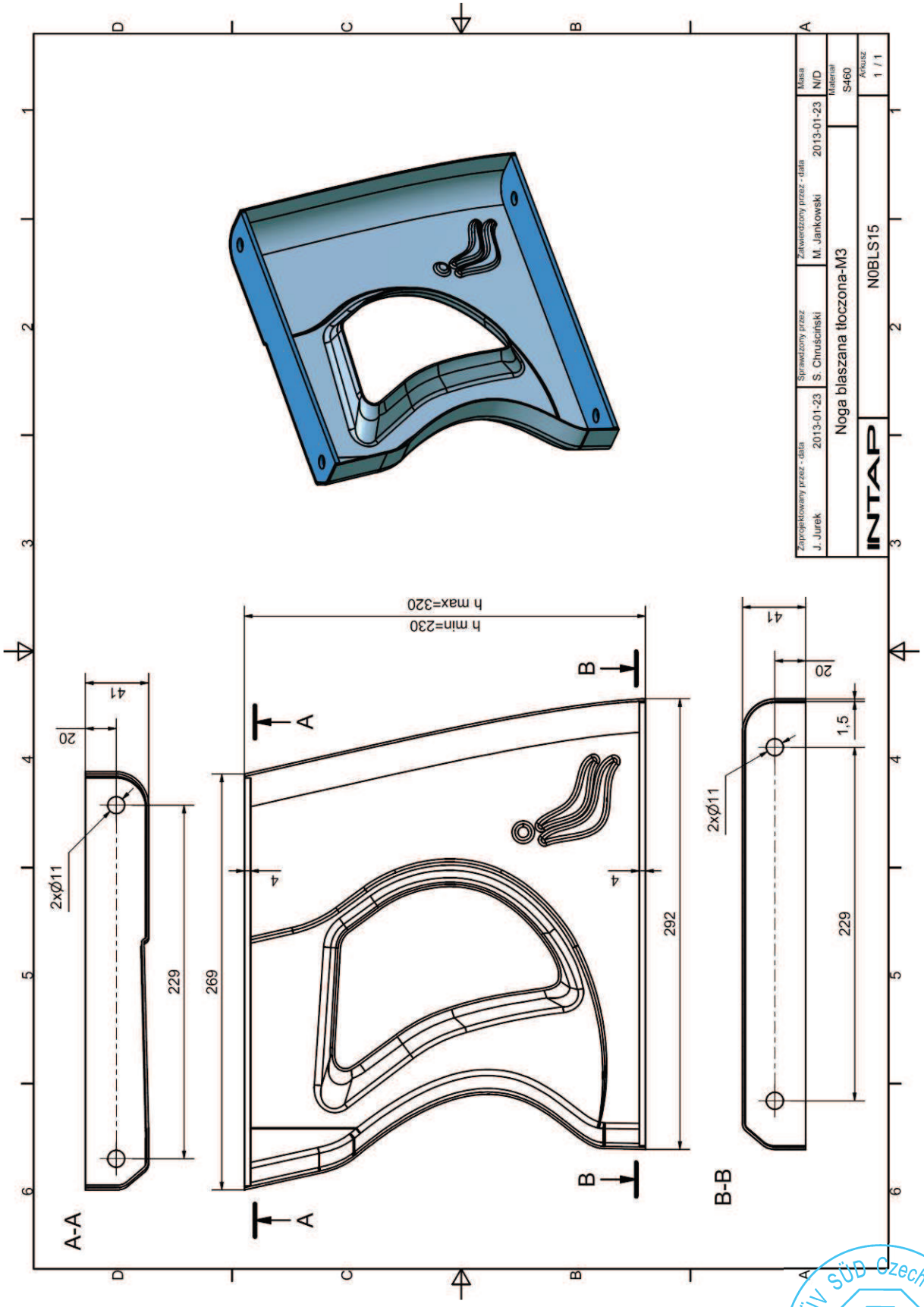


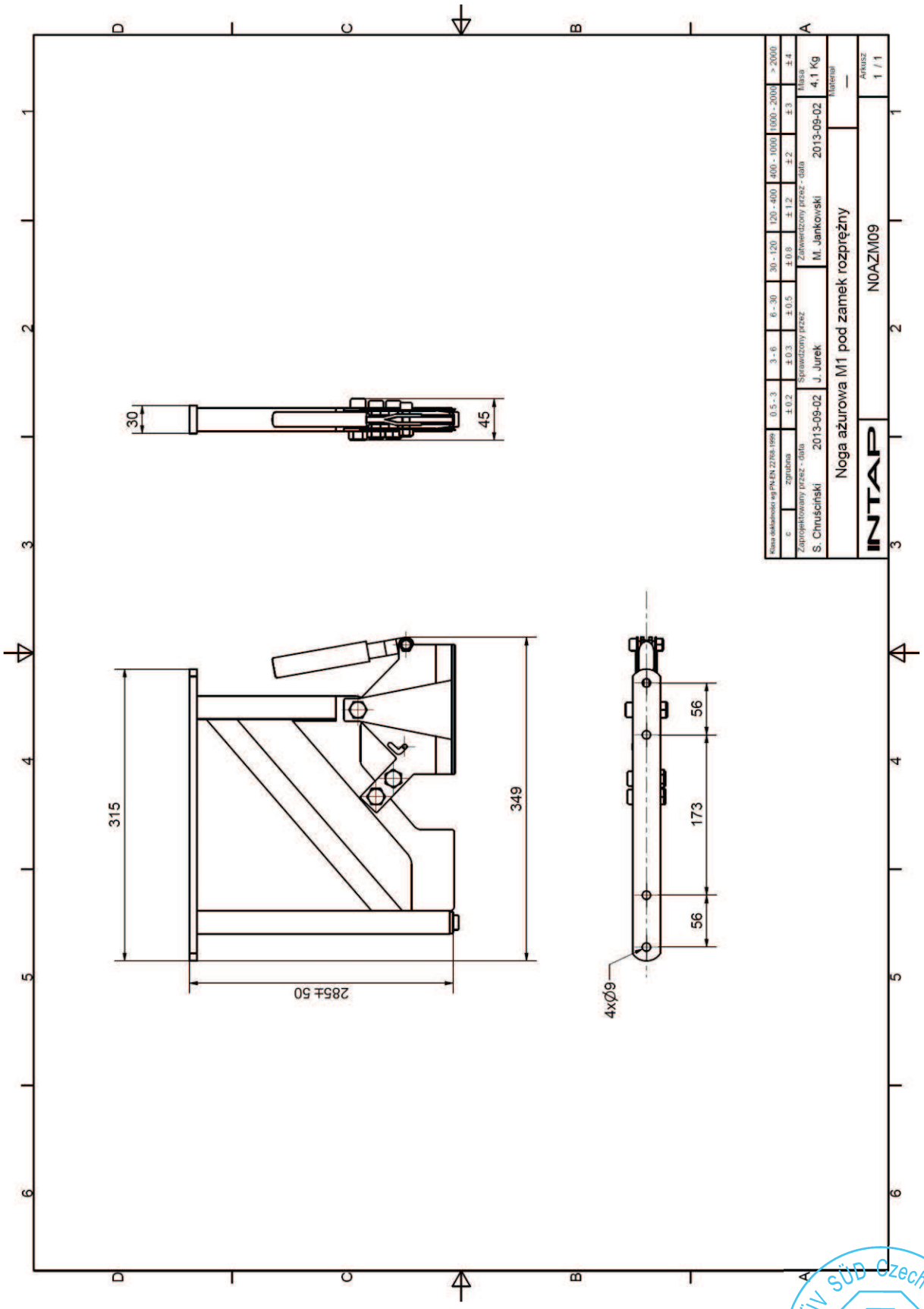


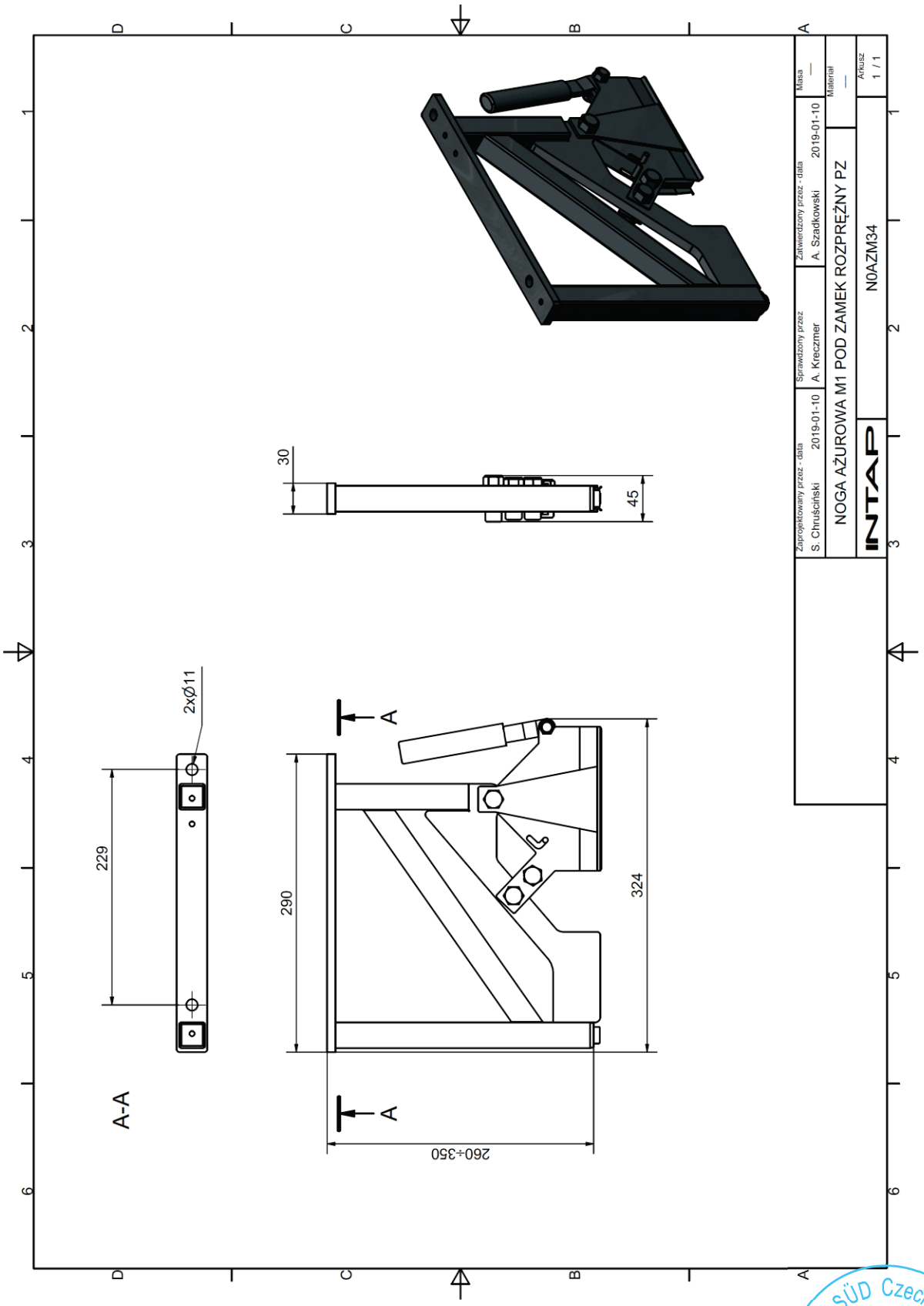


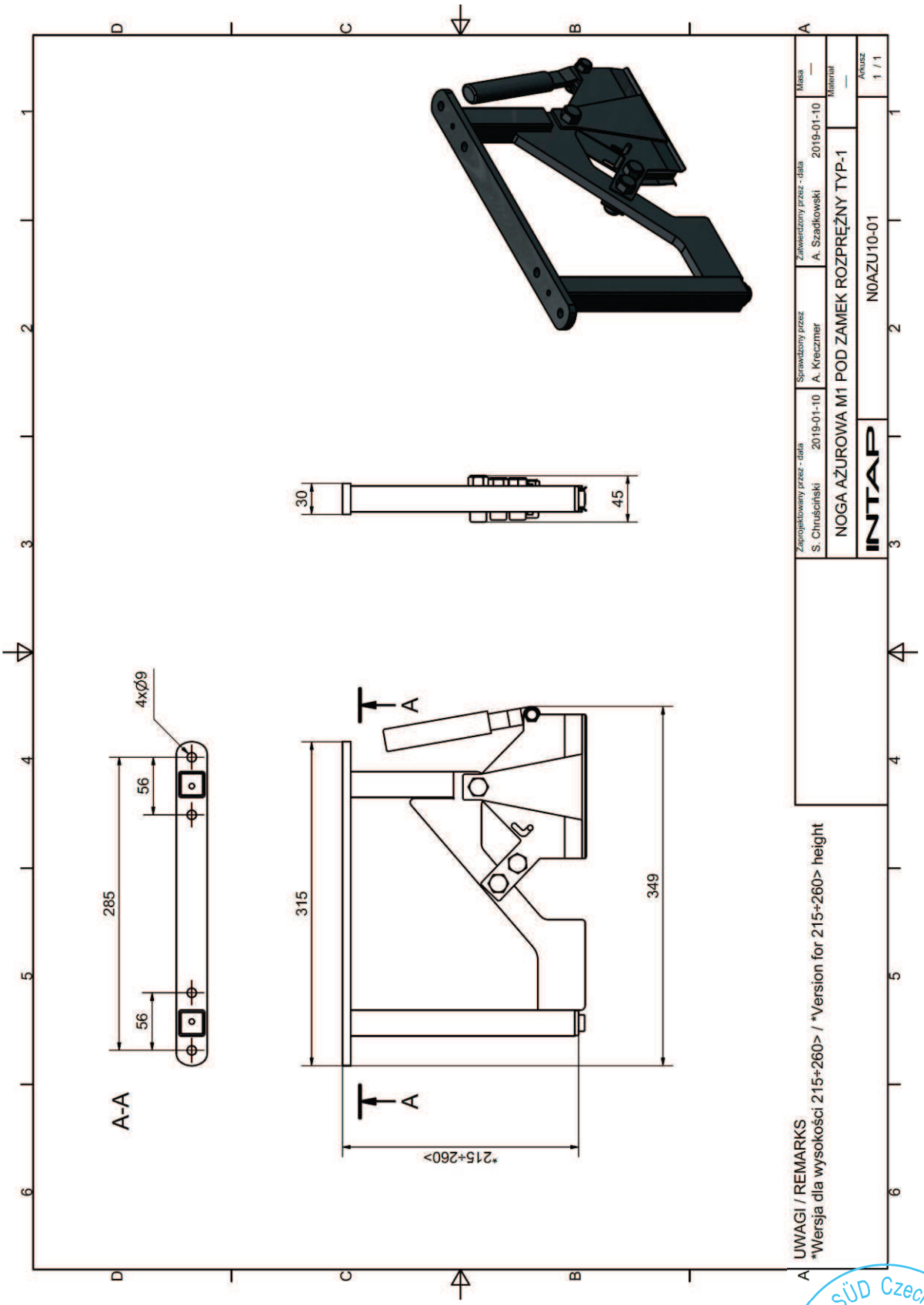

41
260±60
2xØ11
2xØ11
268
229
291
229
Noga blaszana tłoczona
INTAP
N0BLS10
J.Jurek
2013-01-23
S. Chruściński
2013-01-23
M. Jankowski
2013-01-23
1,5 Kg
1 / 1

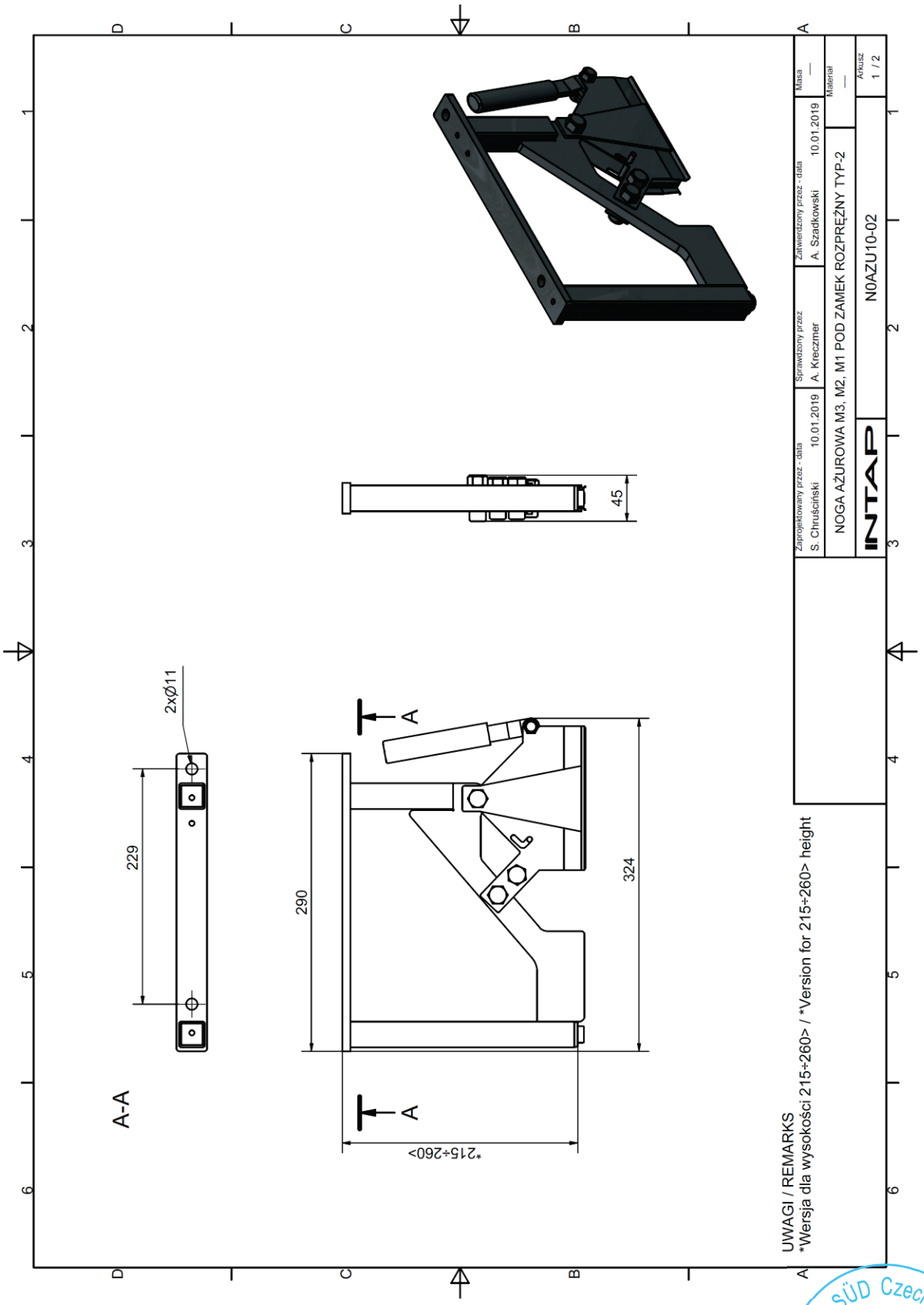


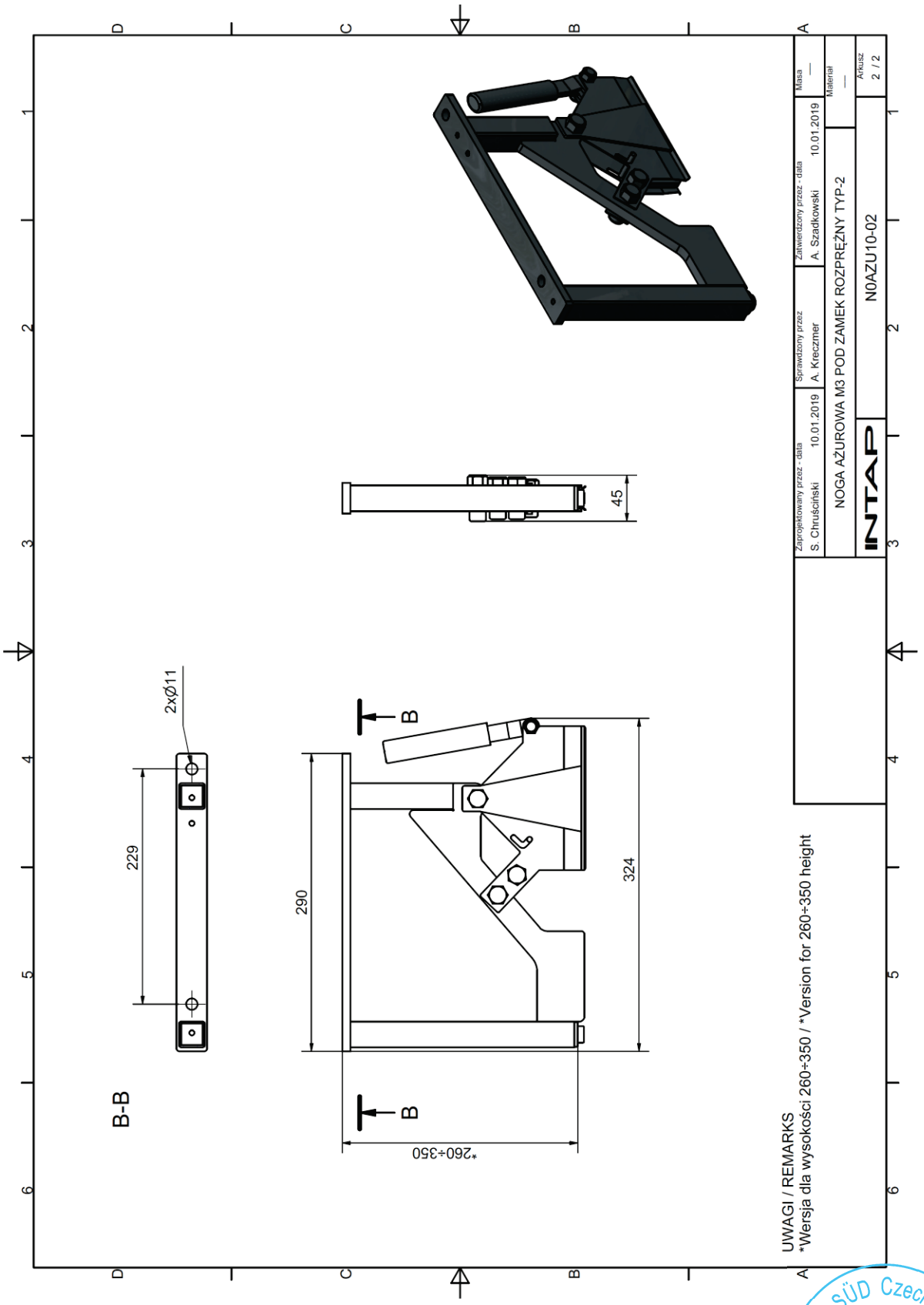


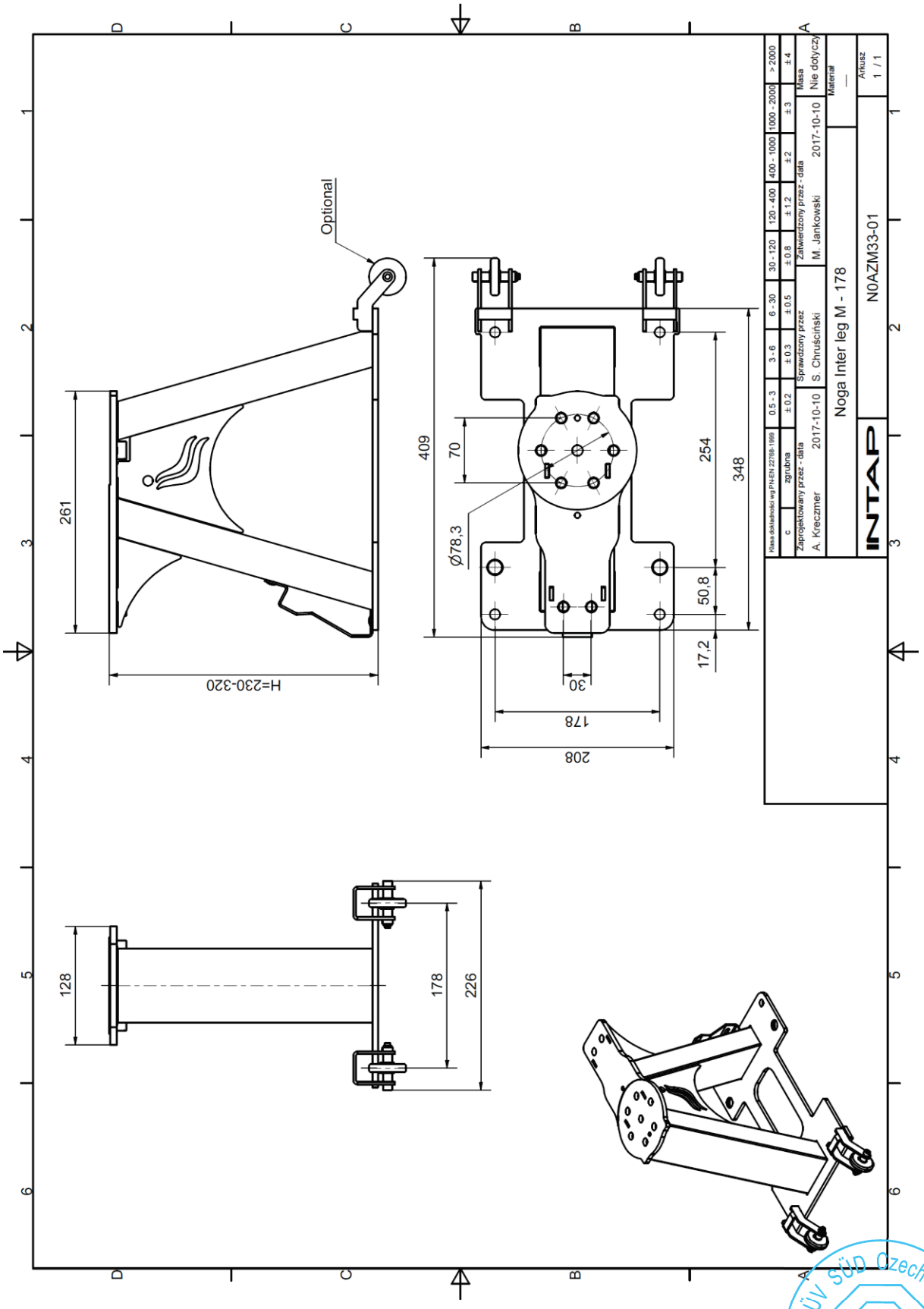


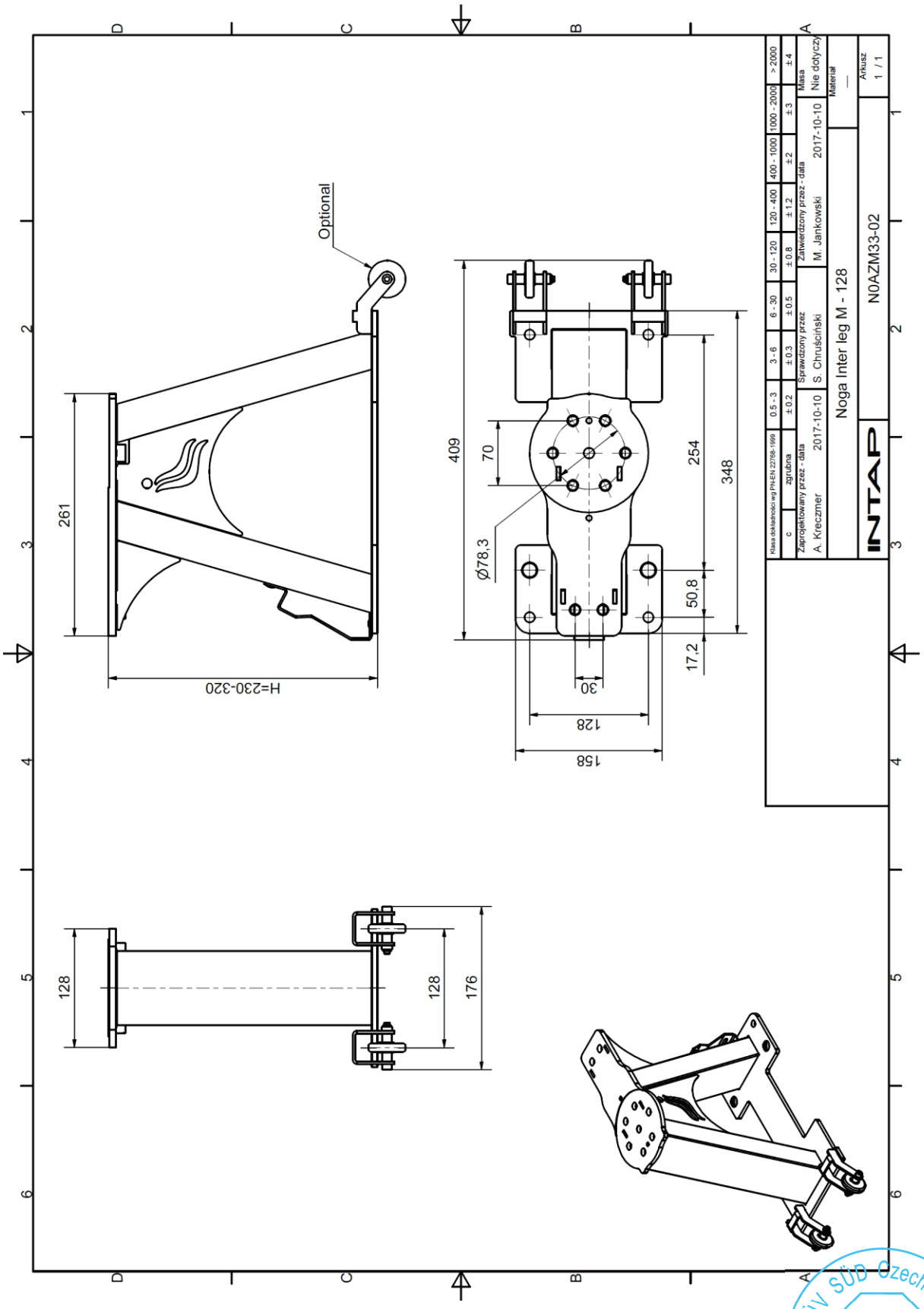


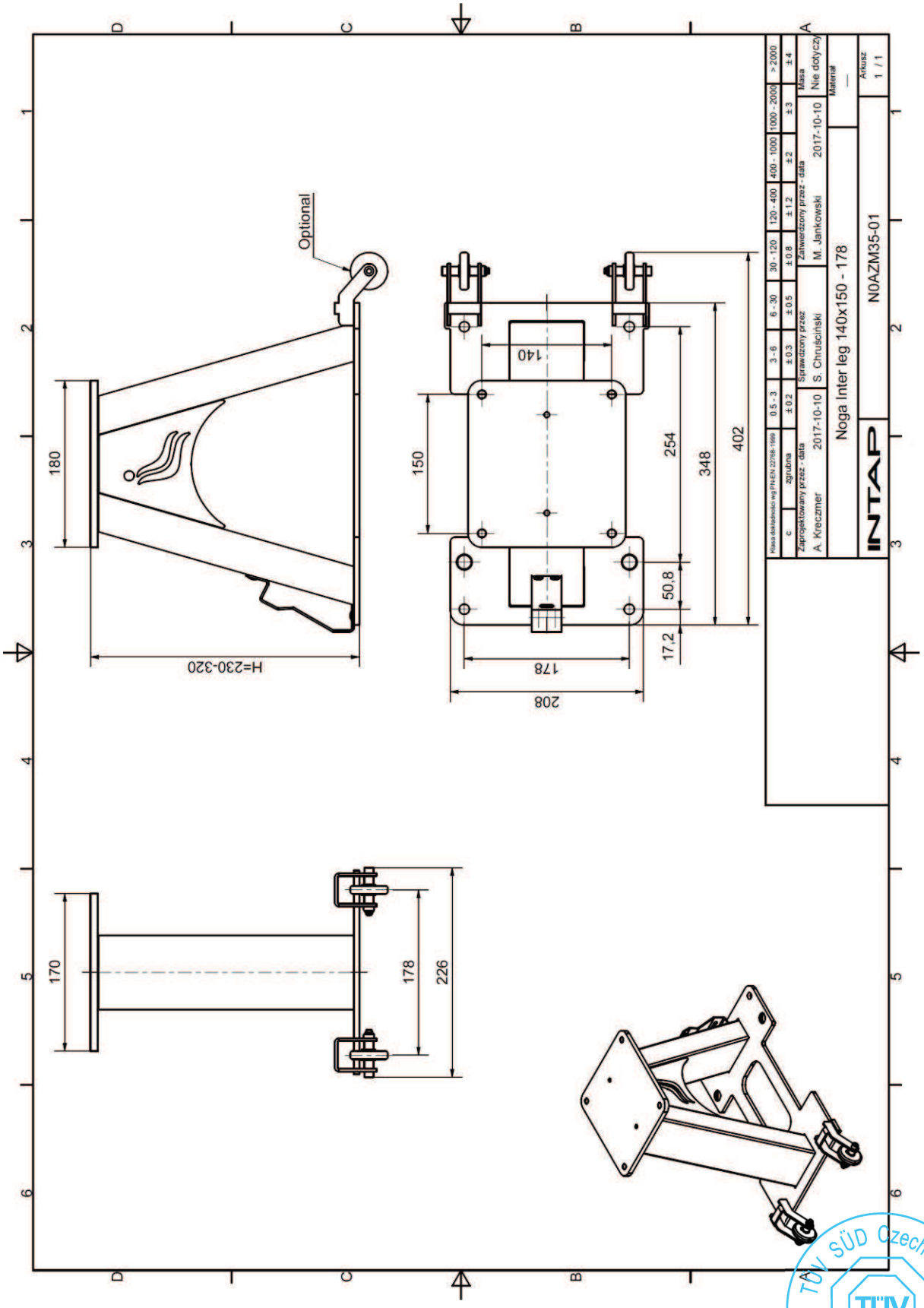


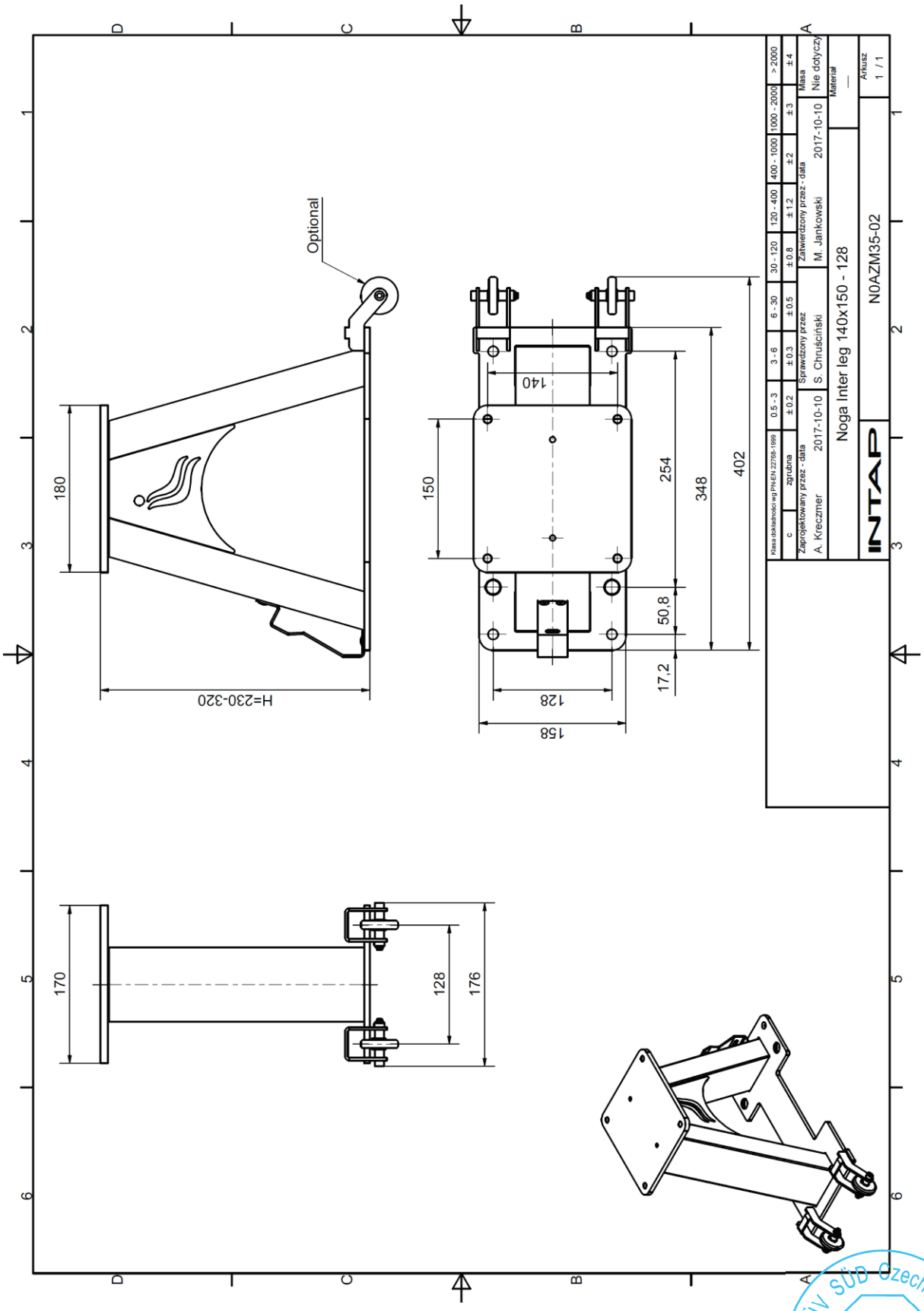


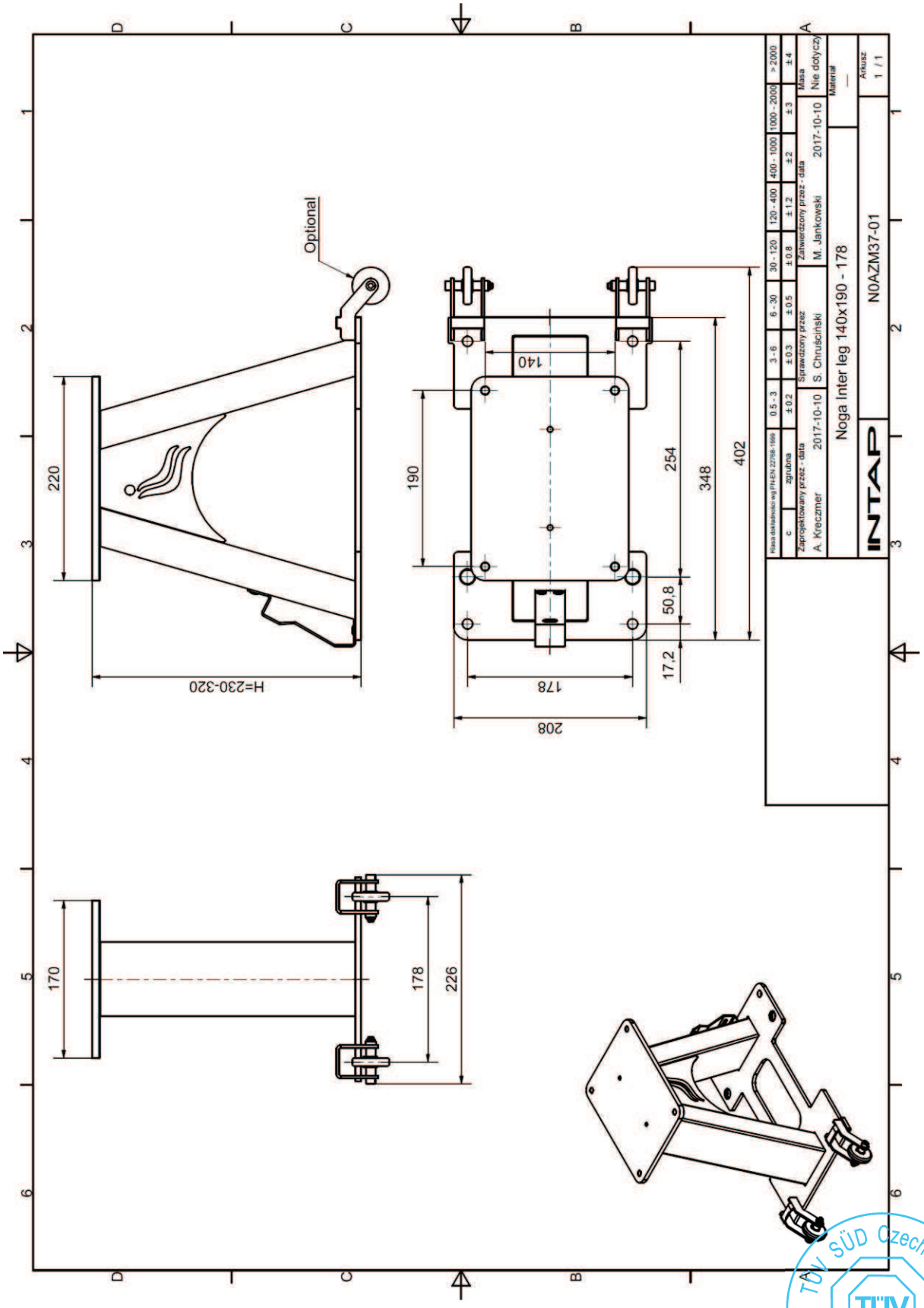


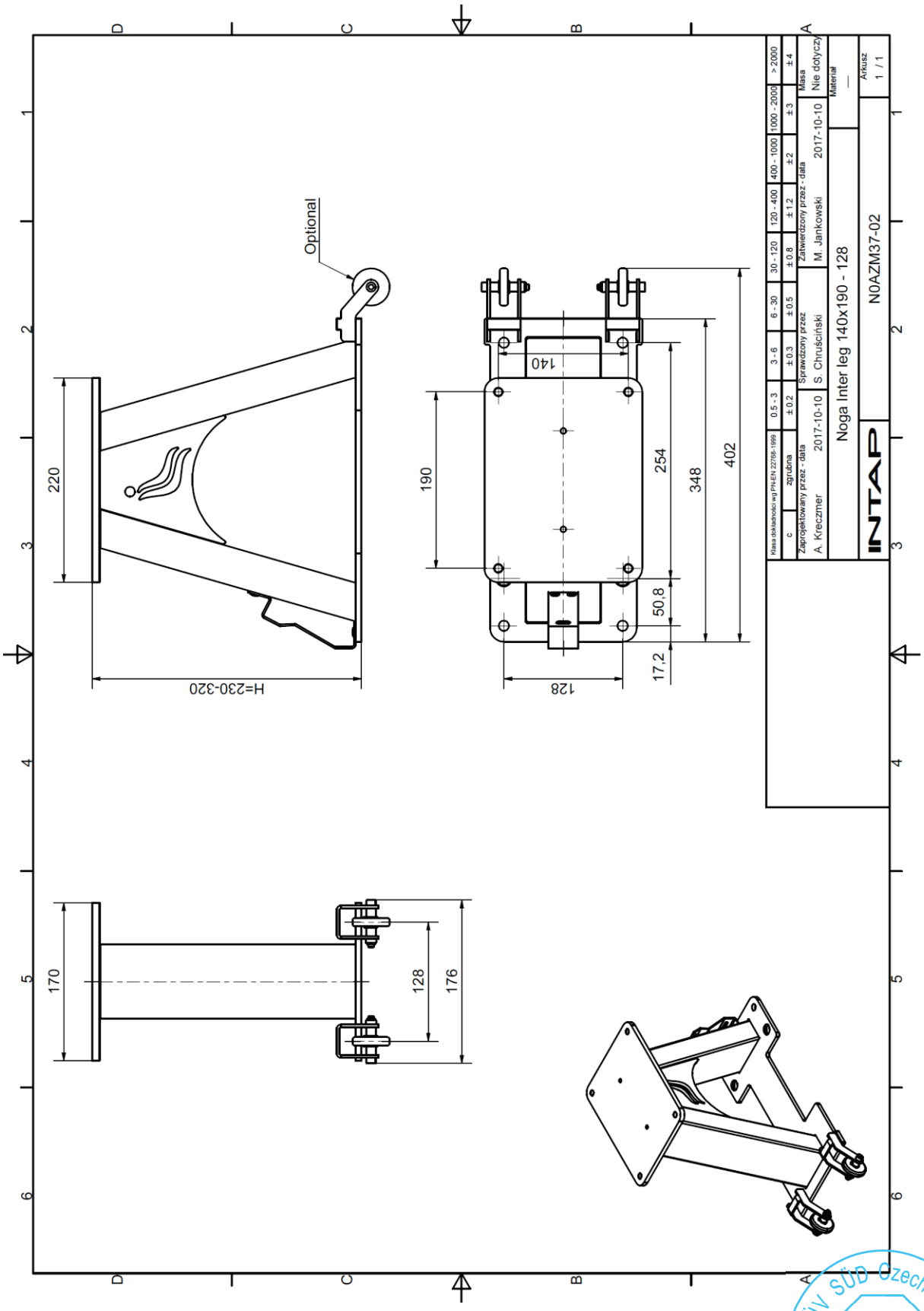


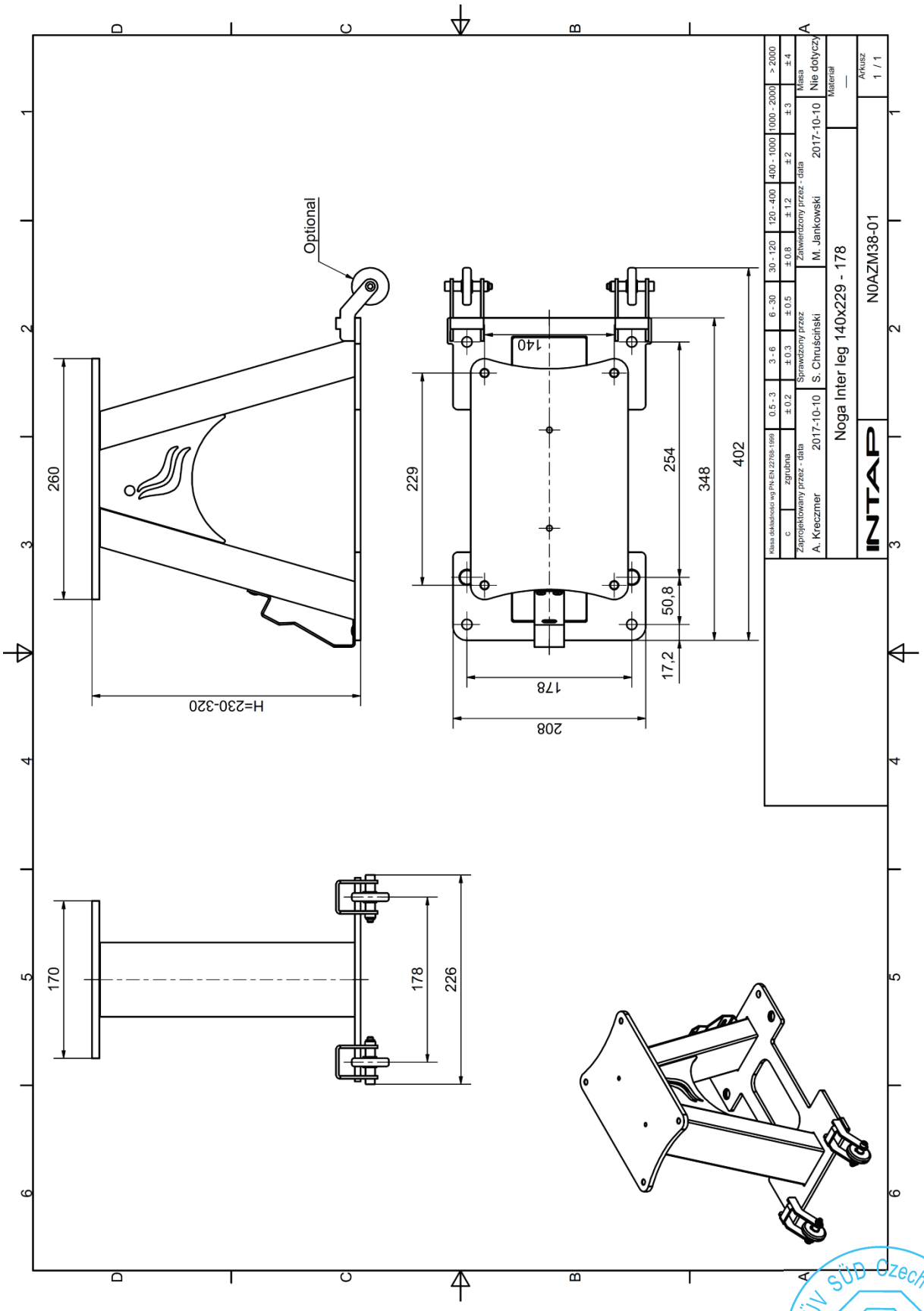


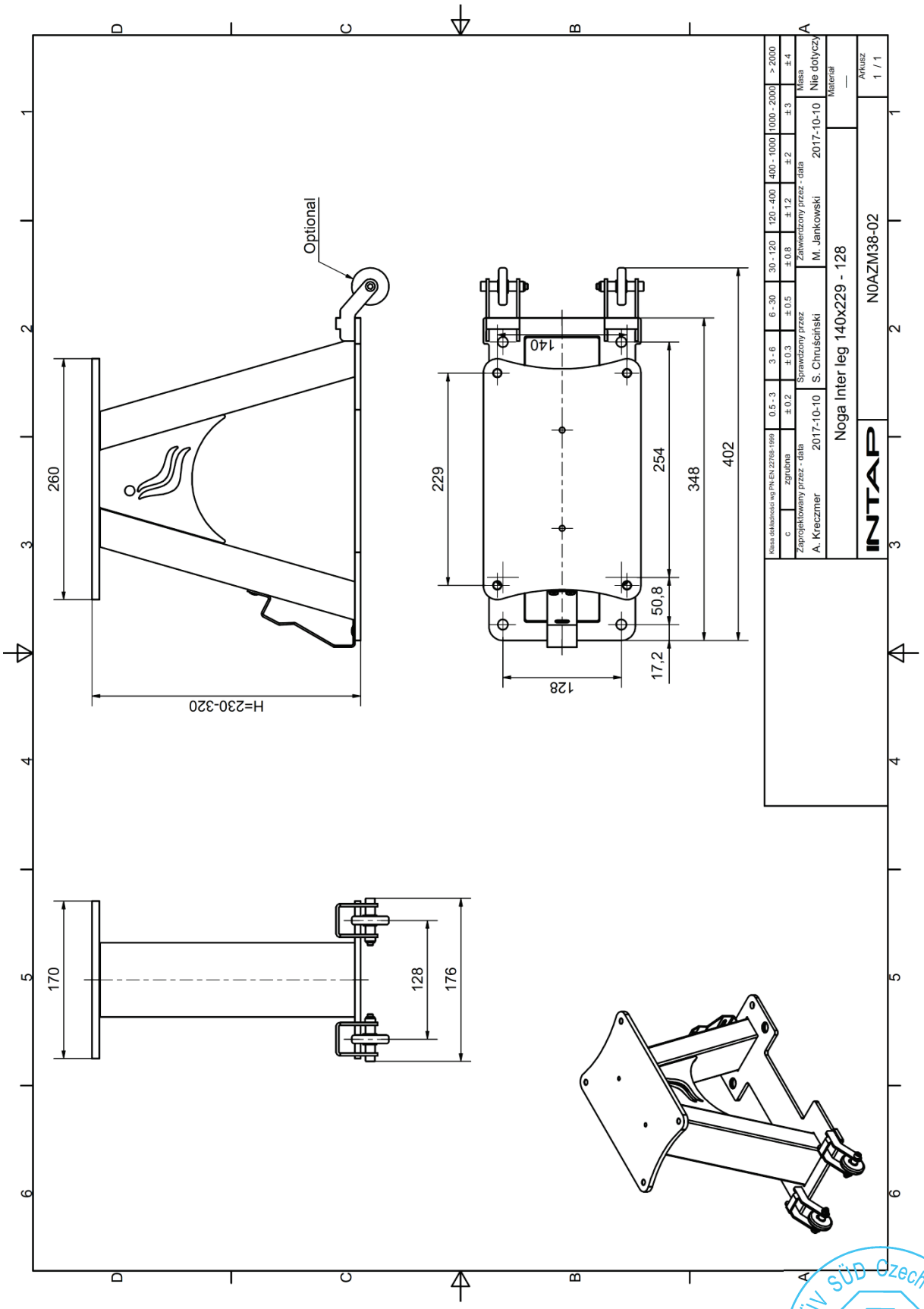


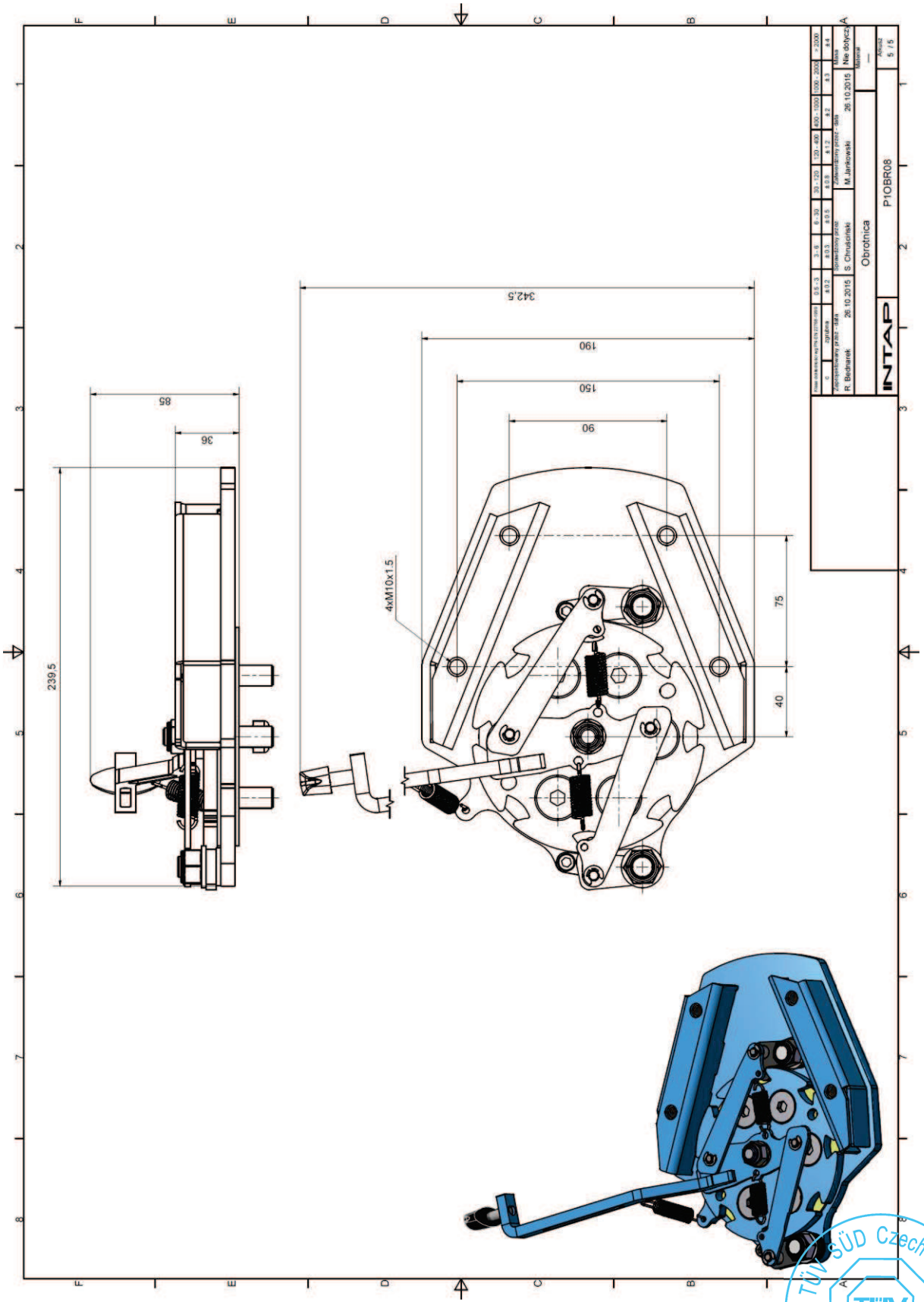


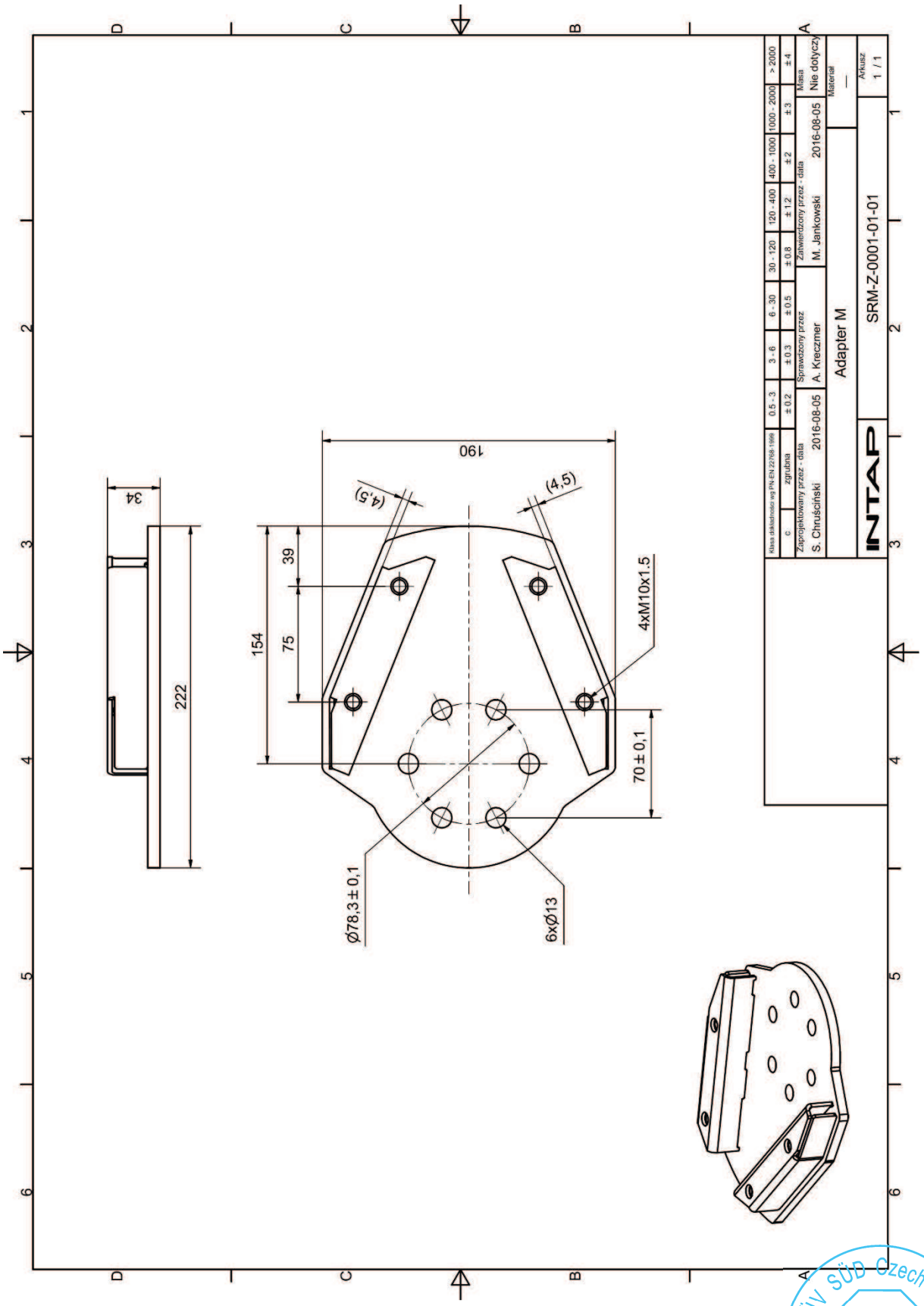


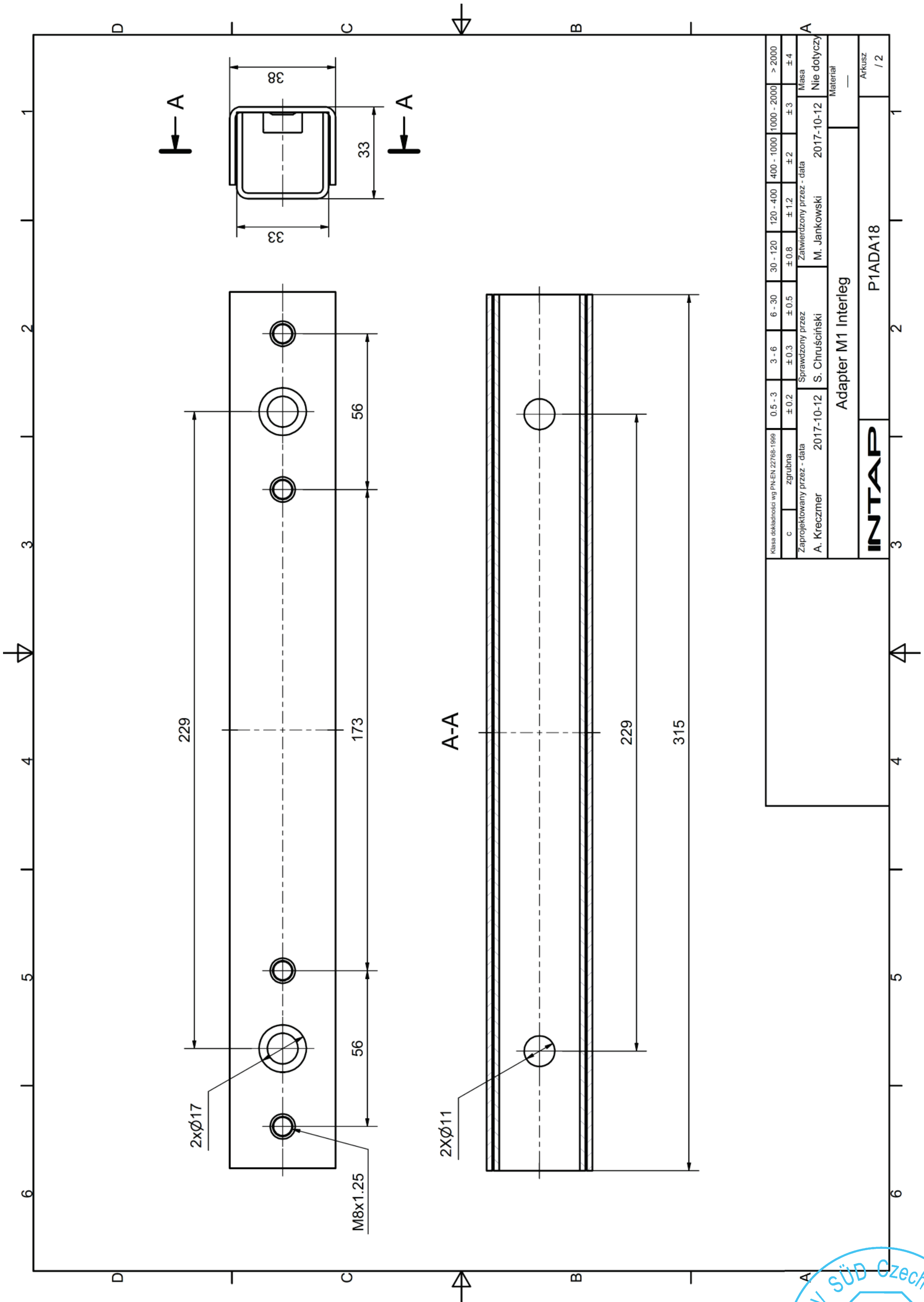








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33
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173
56
2xØ17
M8x1.25
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315
2XØ11
Klasa dokładności wg PN-EN 22768-1999
c
zgrubna
0.5 - 3
± 0.2
3 - 6
± 0.3
6 - 30
± 0.5
30 - 120
± 0.8
120 - 400
± 1.2
400 - 1000
± 2
1000 - 2000
± 3
> 2000
± 4
Zaprojektowany przez - data
A. Kreczmer
2017-10-12
Sprawdzony przez
S. Chruściński
Zatwierdzony przez - data
M. Jankowski
2017-10-12
Masa
Nie dotyczy
Materiał
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Arkusz
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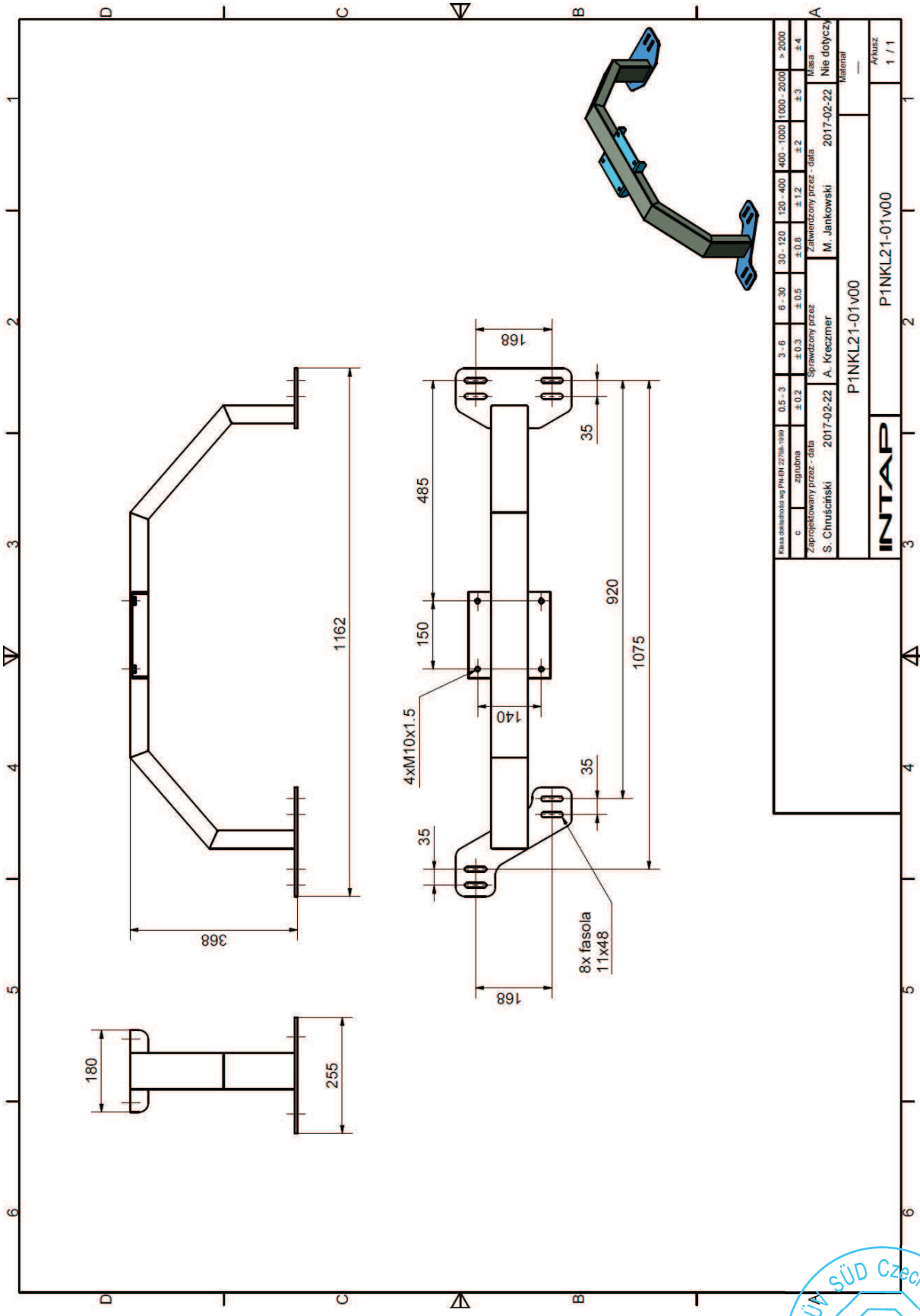
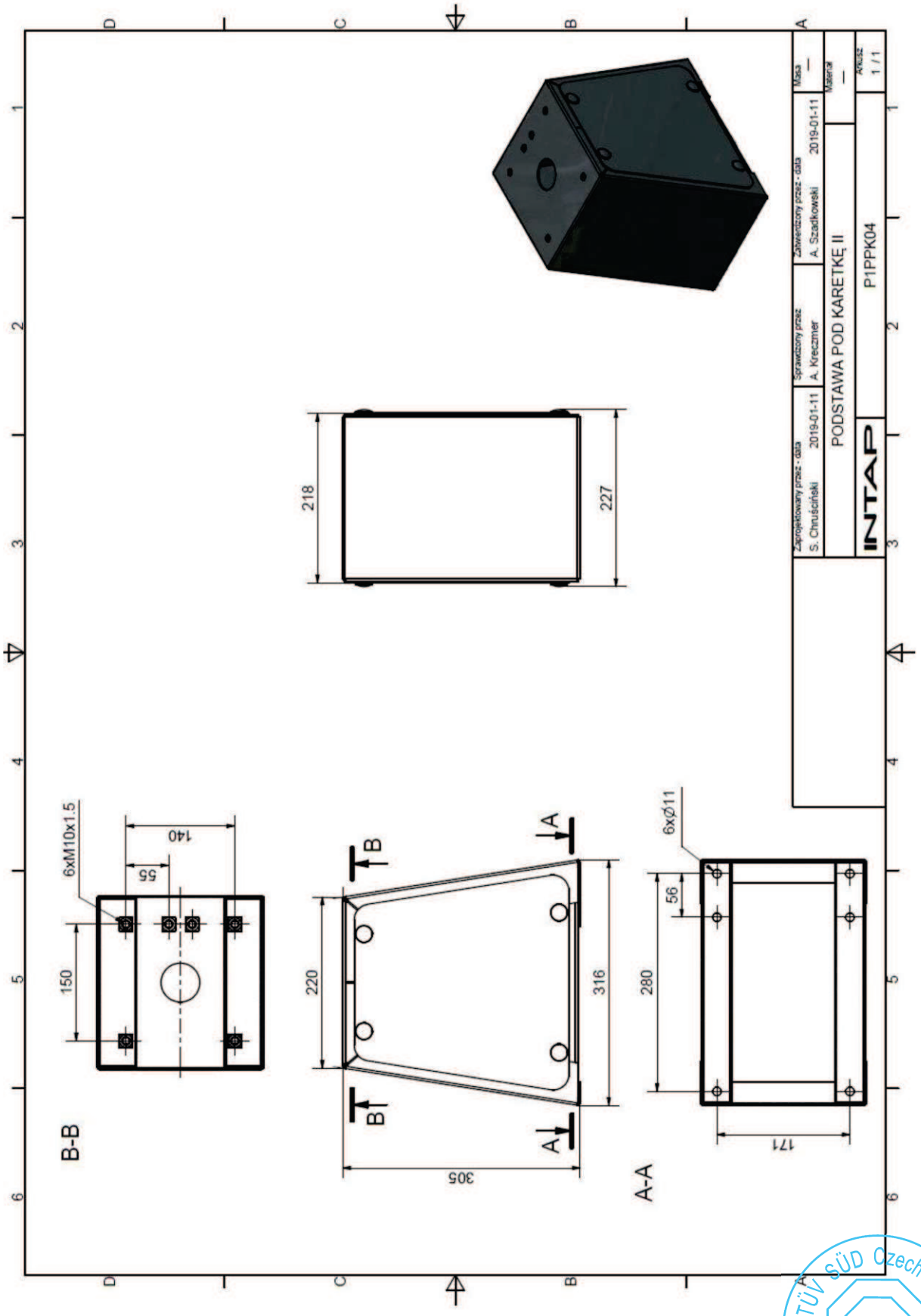
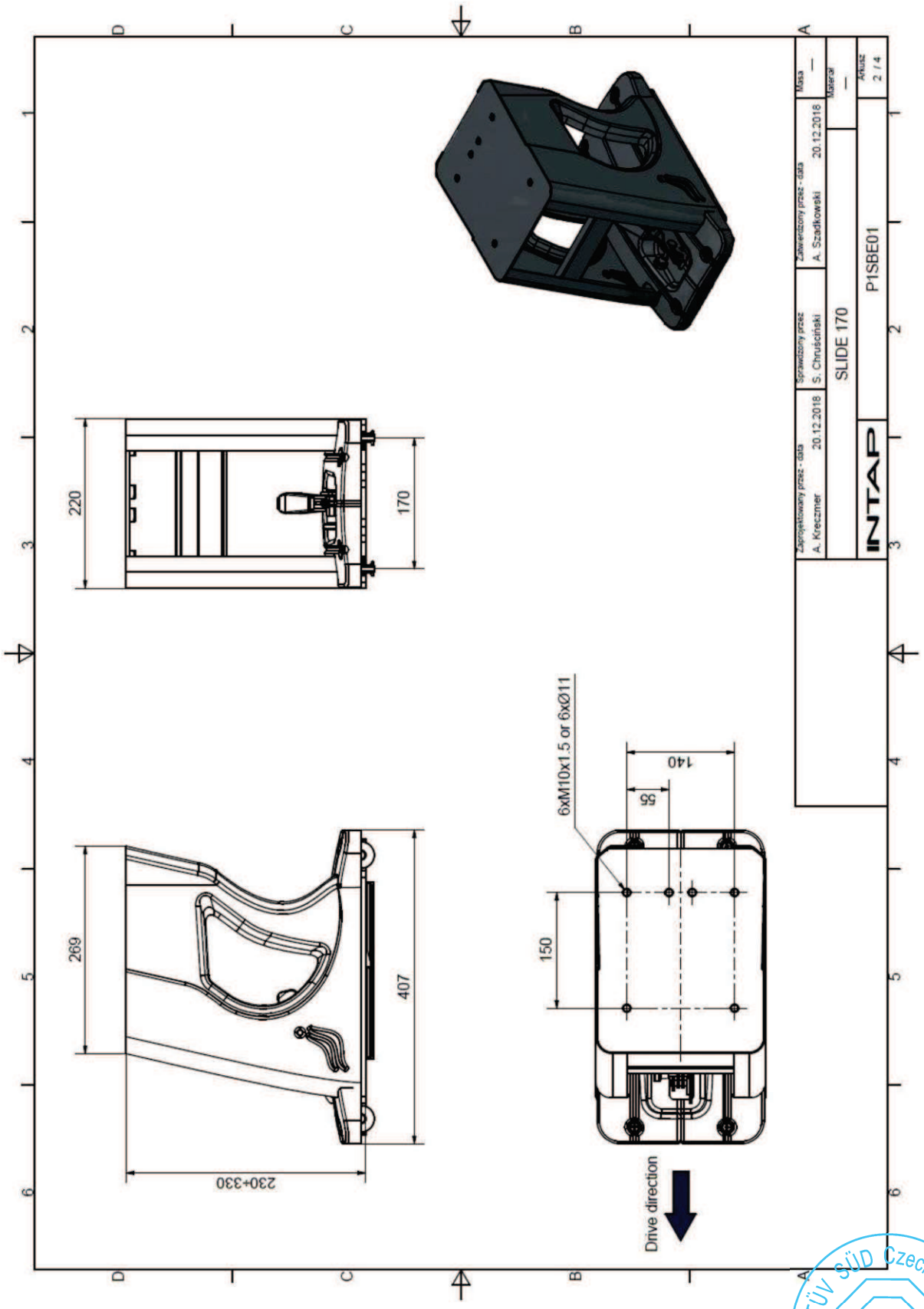
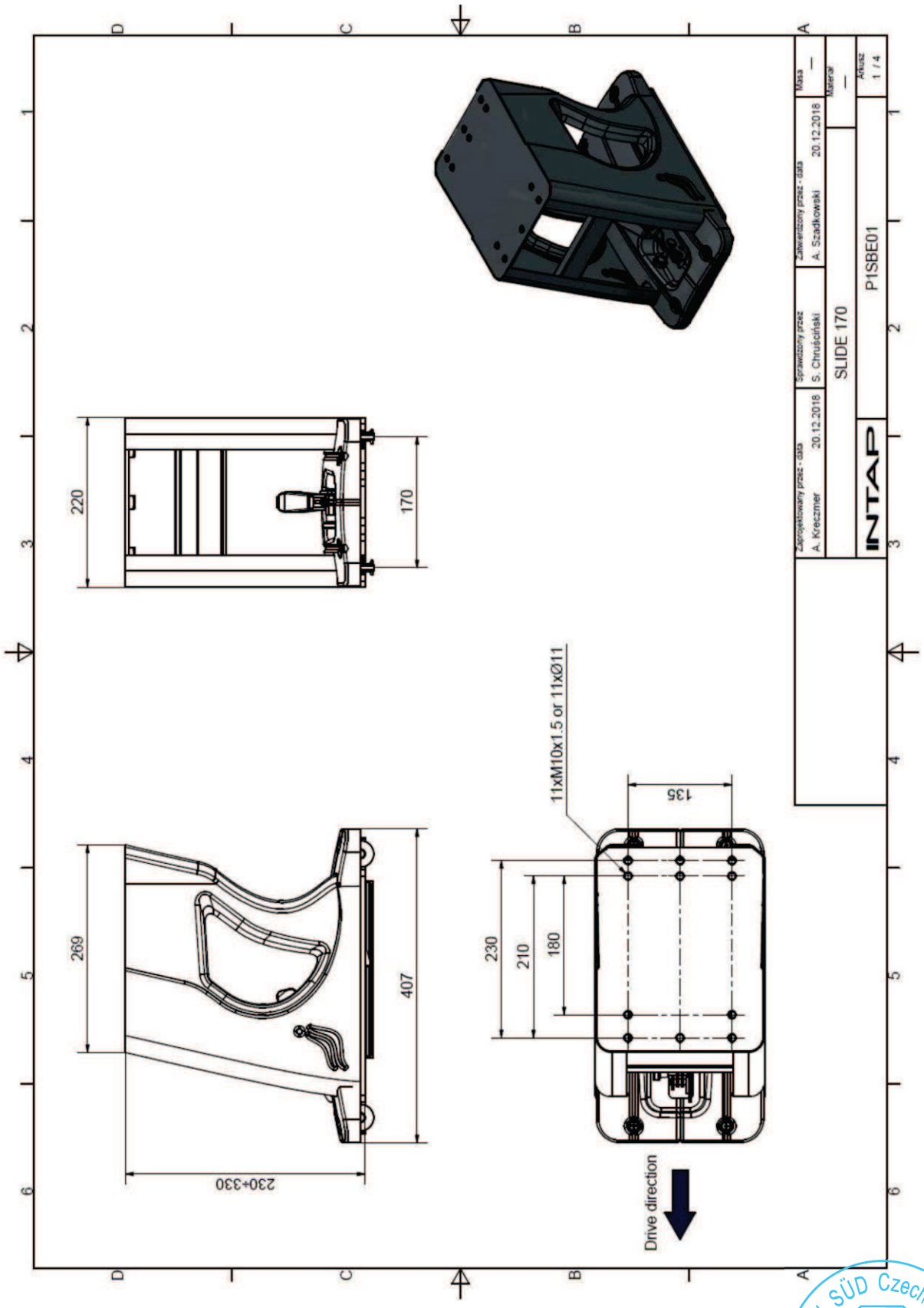
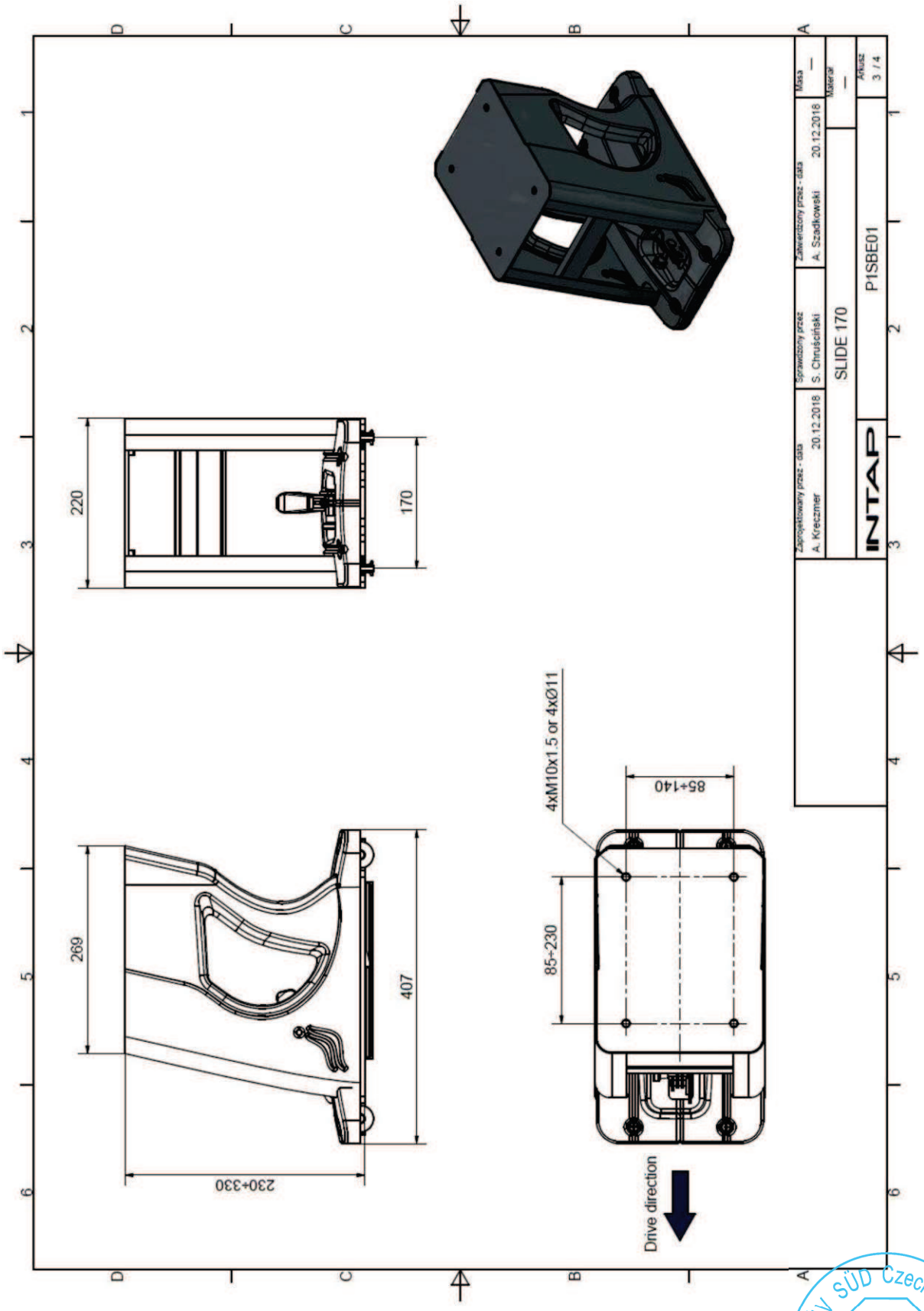
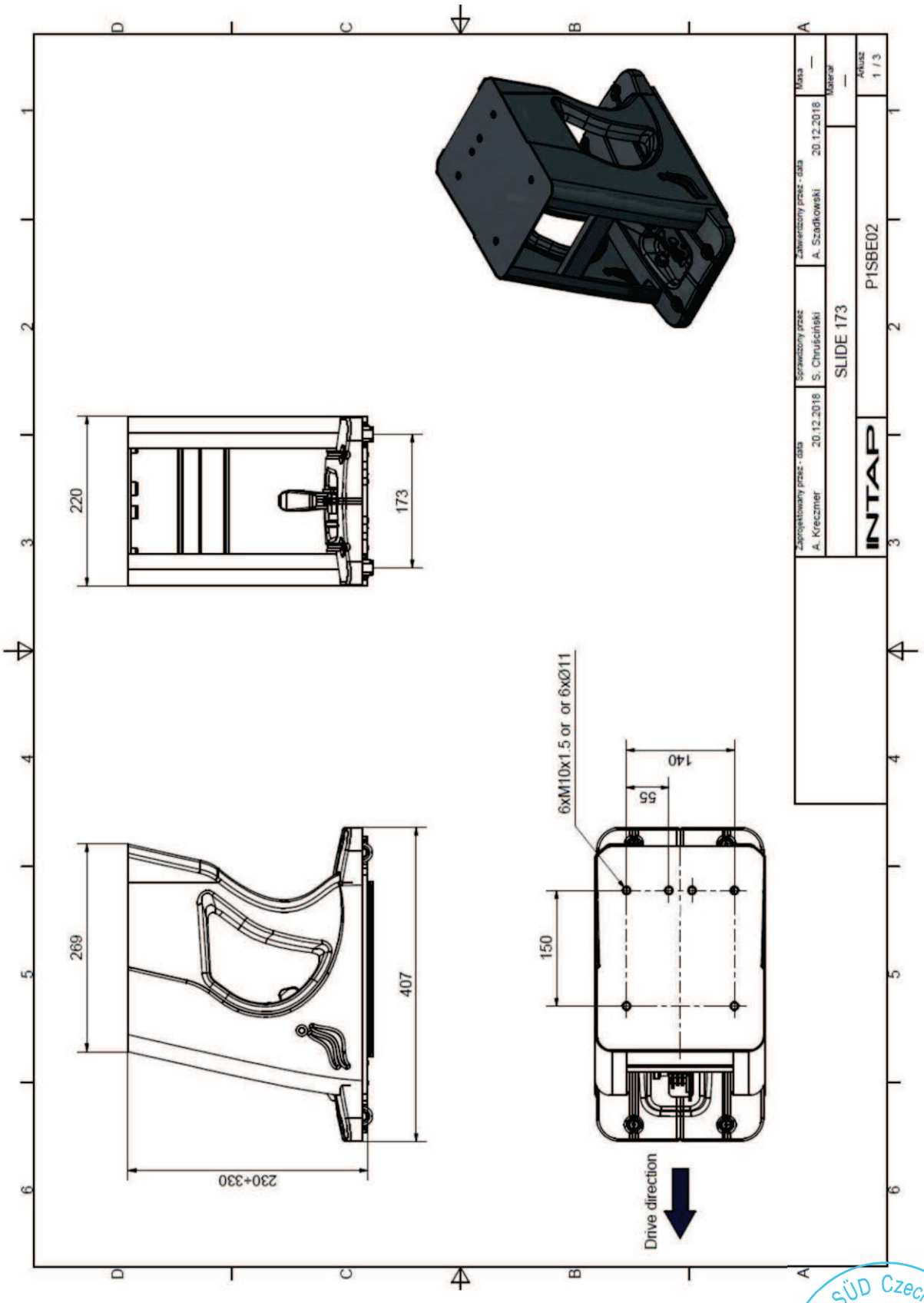


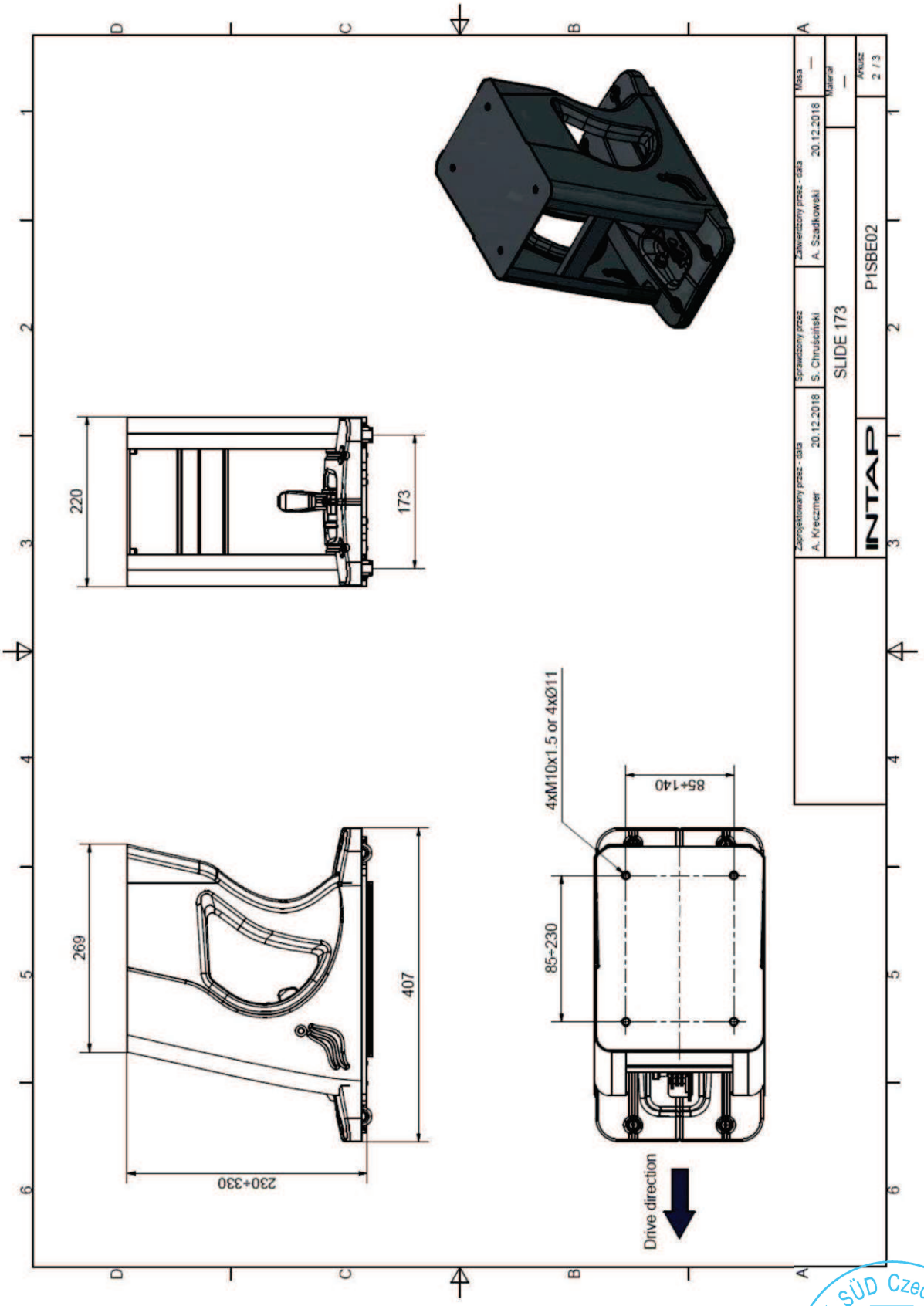


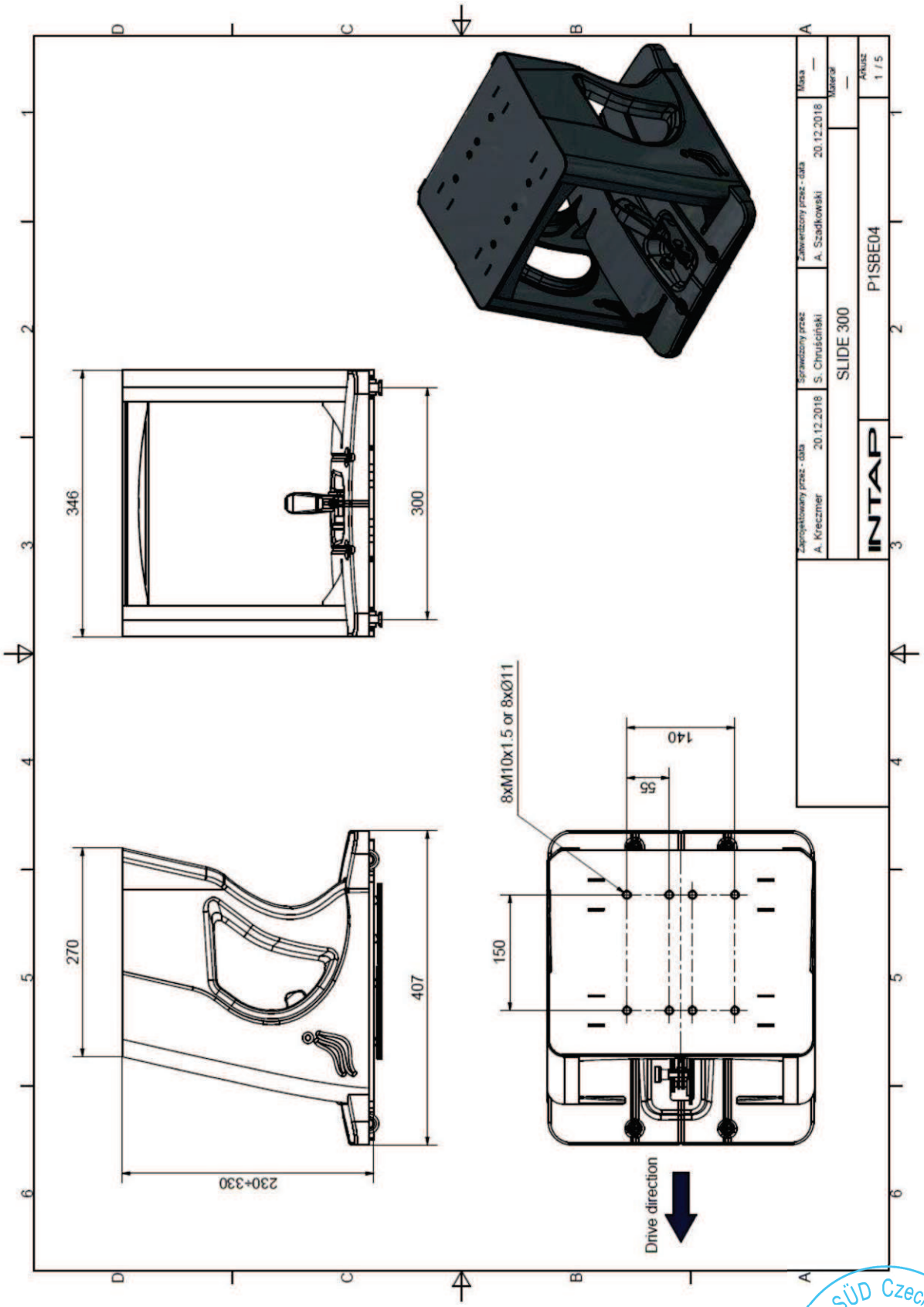


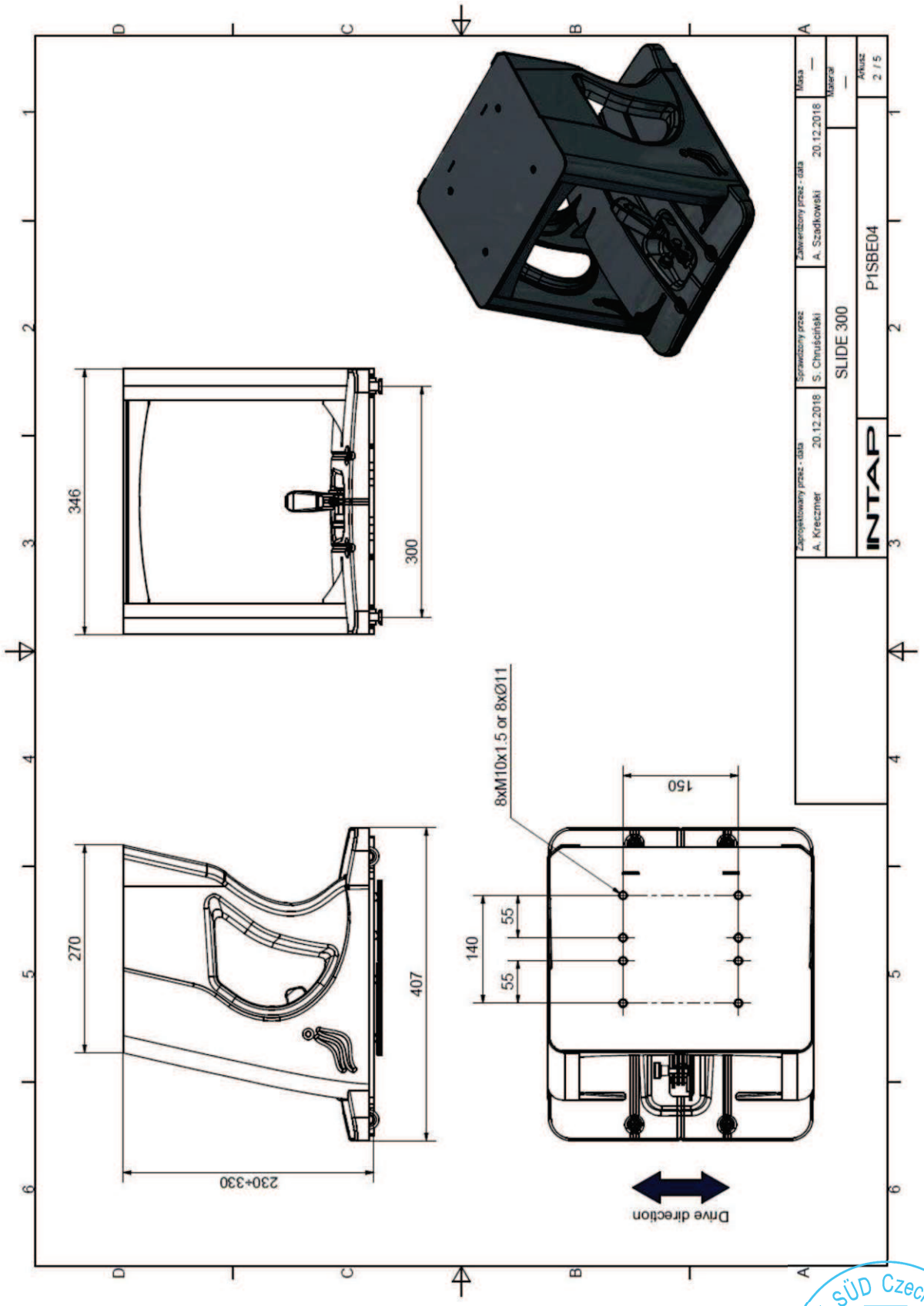


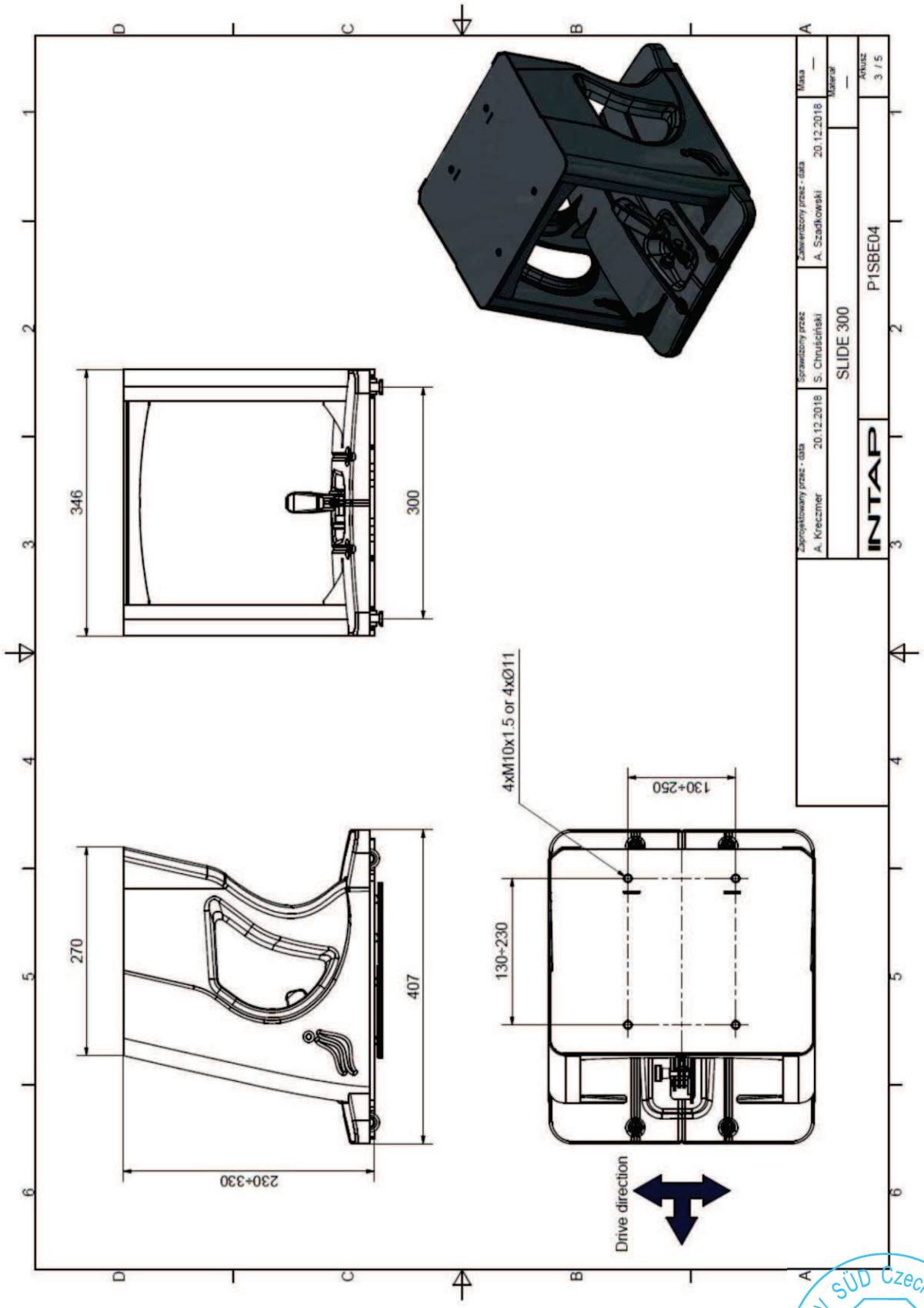


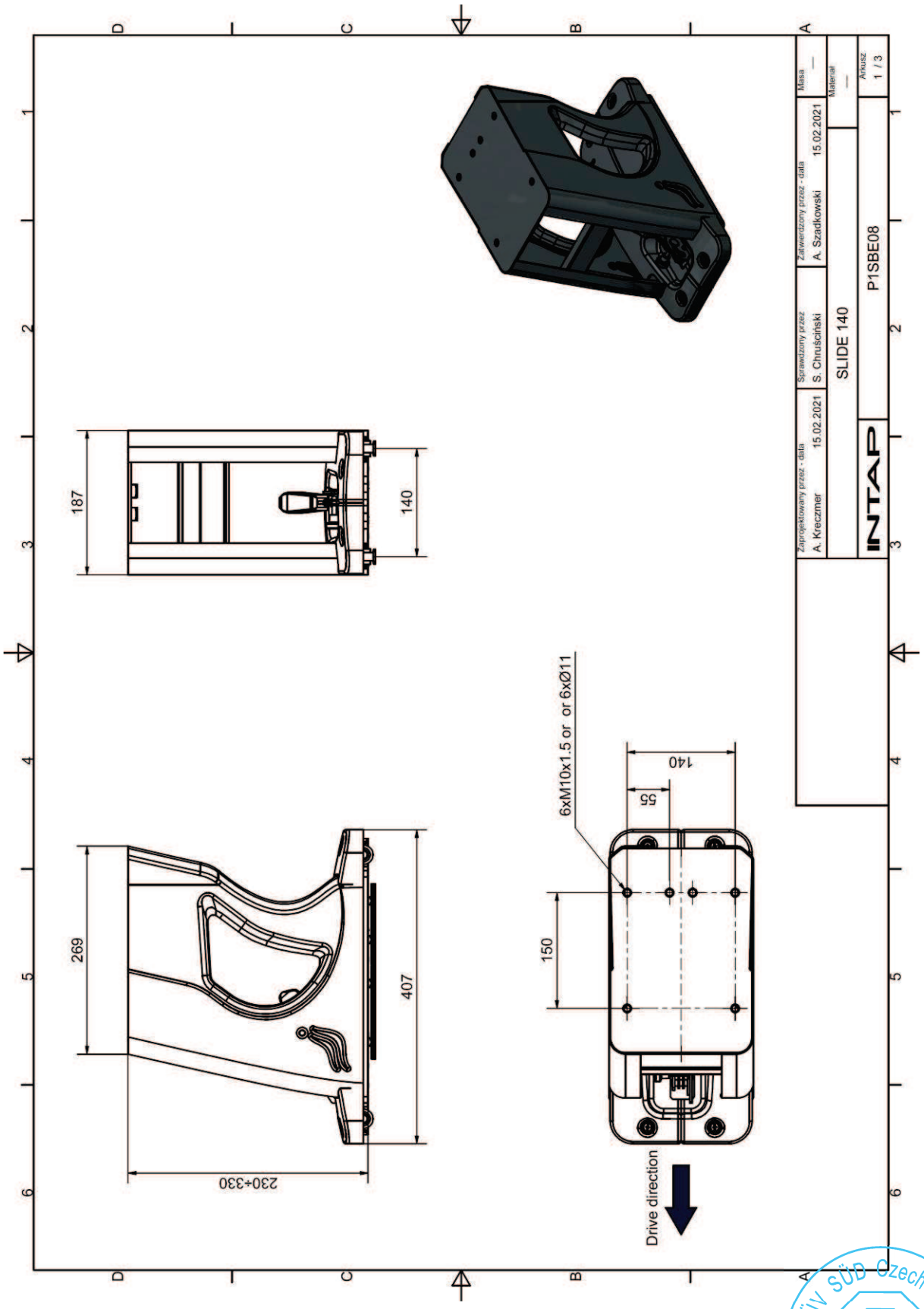


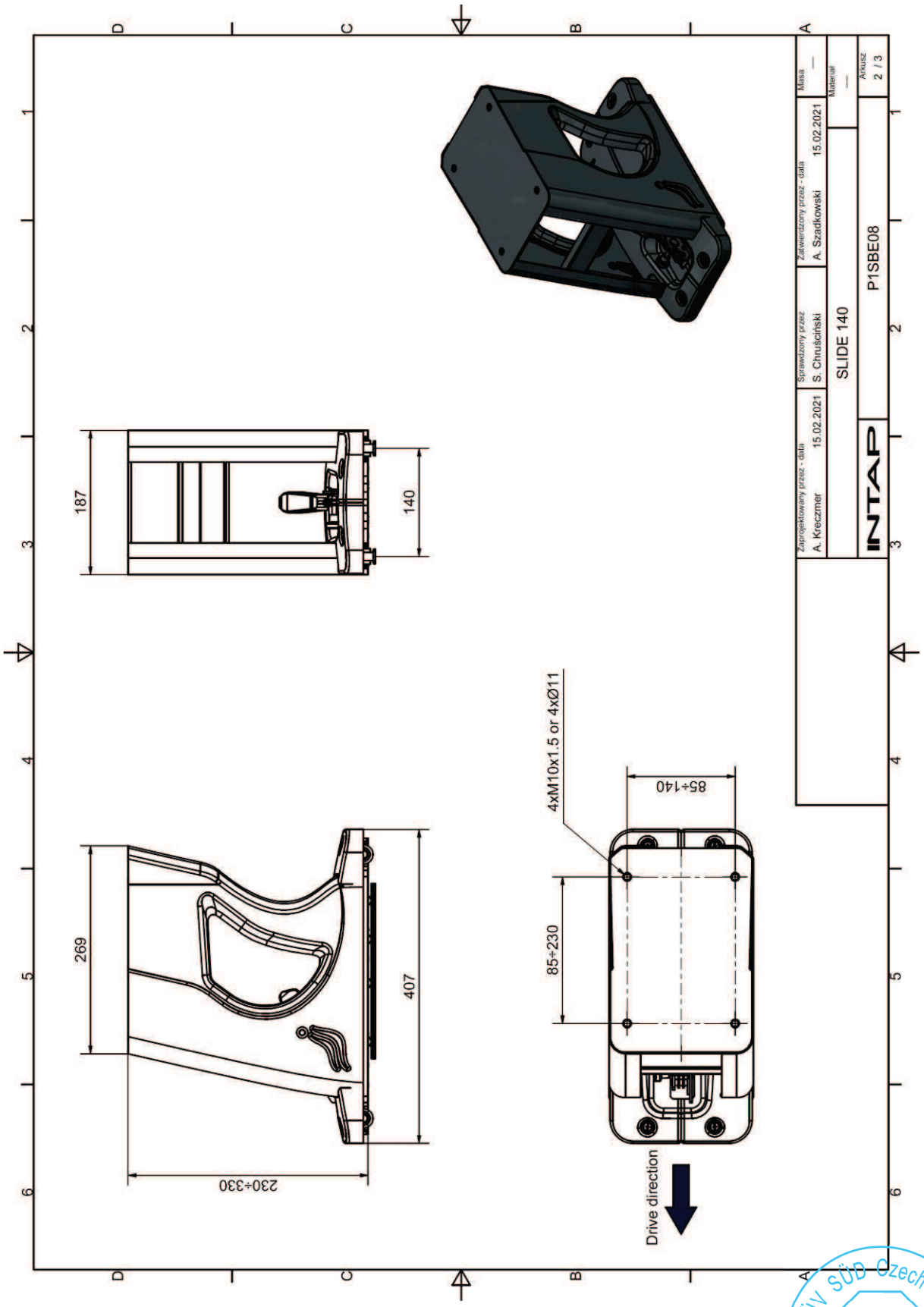


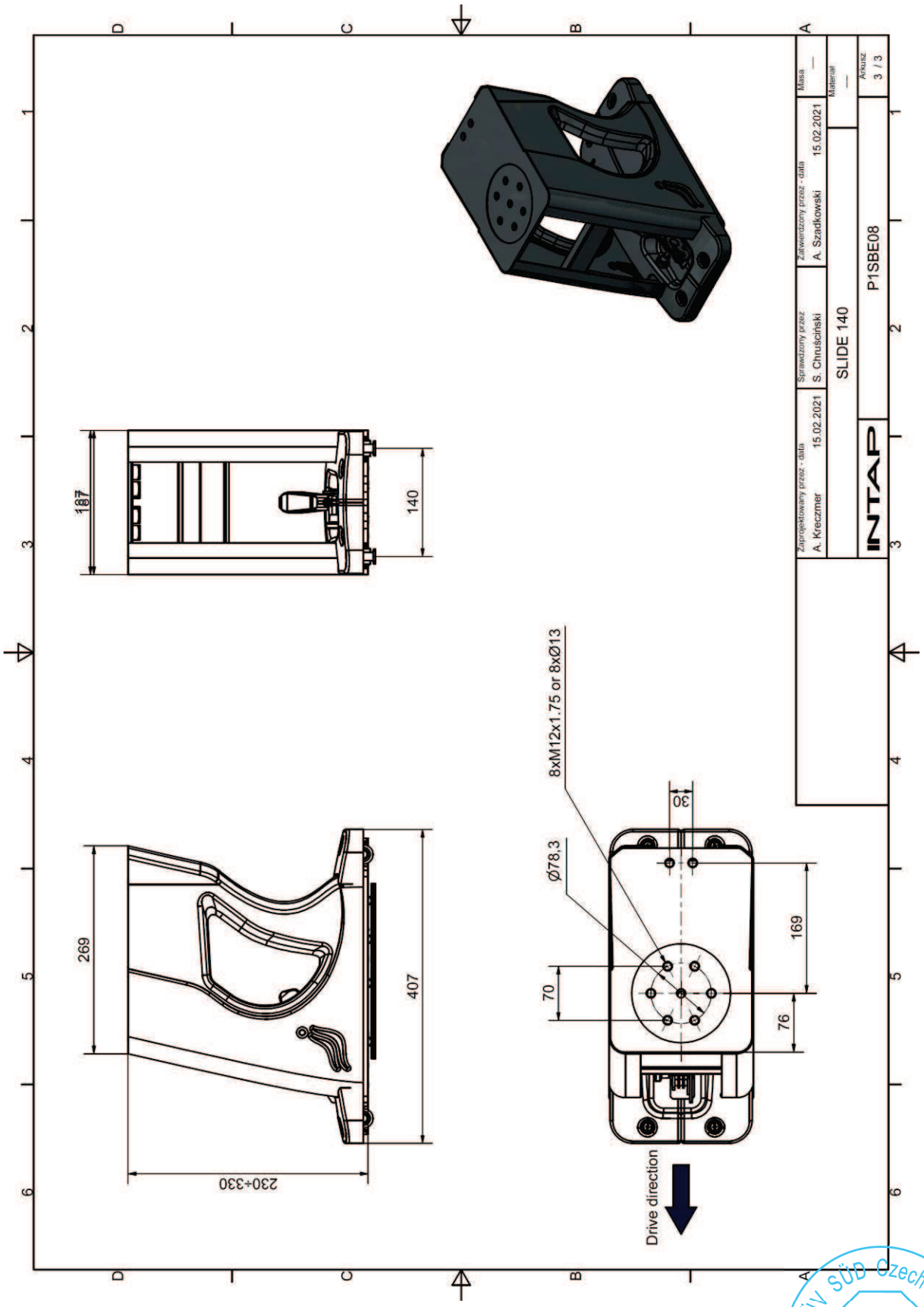




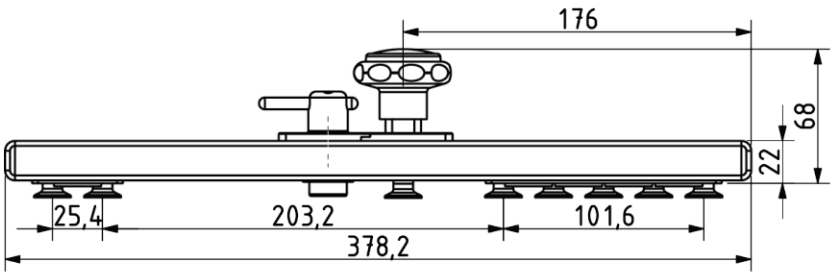


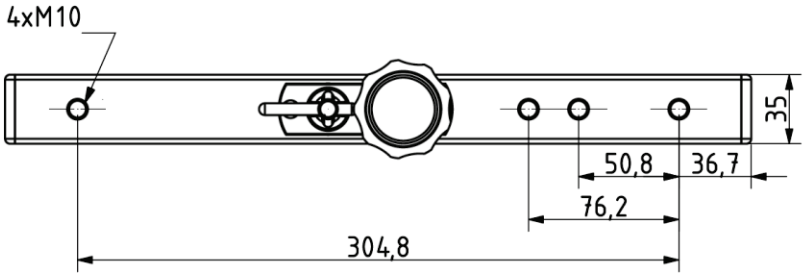


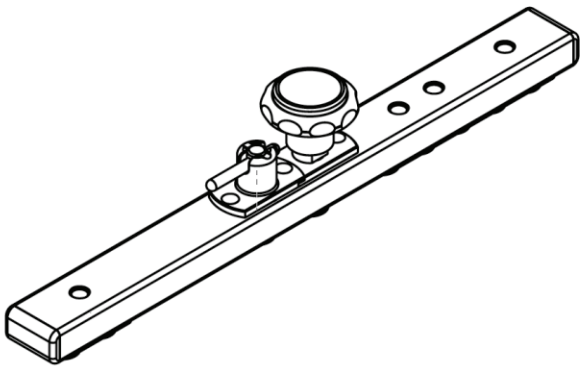




Fixation elements	Mass
W-fitting	0,5 kg
UNWIN SL/STD	0,9 kg
TMI-17	0,07 kg
TMI	0,1 kg
TMDS	0,05 kg
WZP-01	0,27 kg
WZP-20	0,27 kg
UWP-01	0,23 kg







nmi Safety Systems	W-Fitting	Date 20.05.2020
		Sheet 1/1

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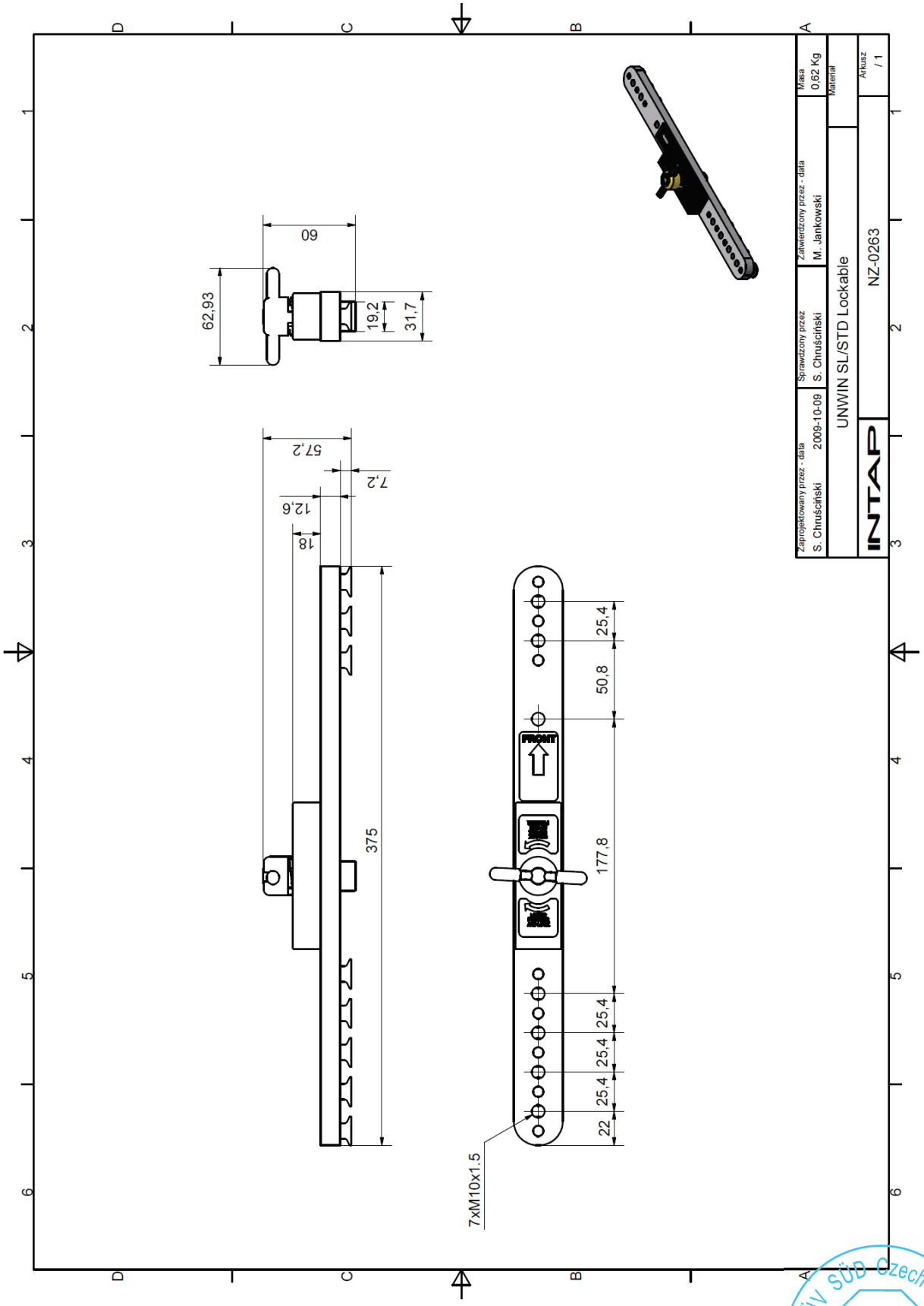
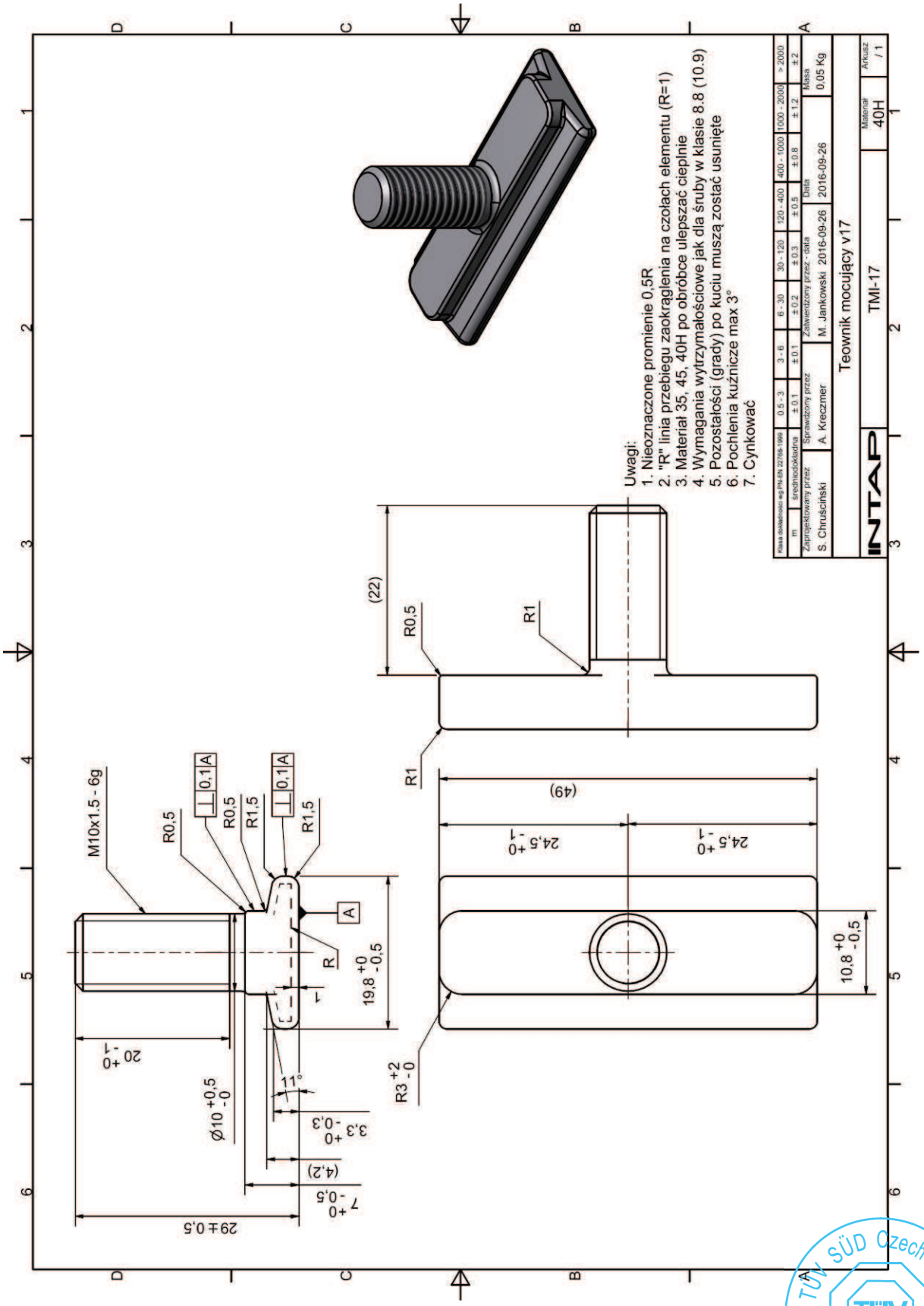
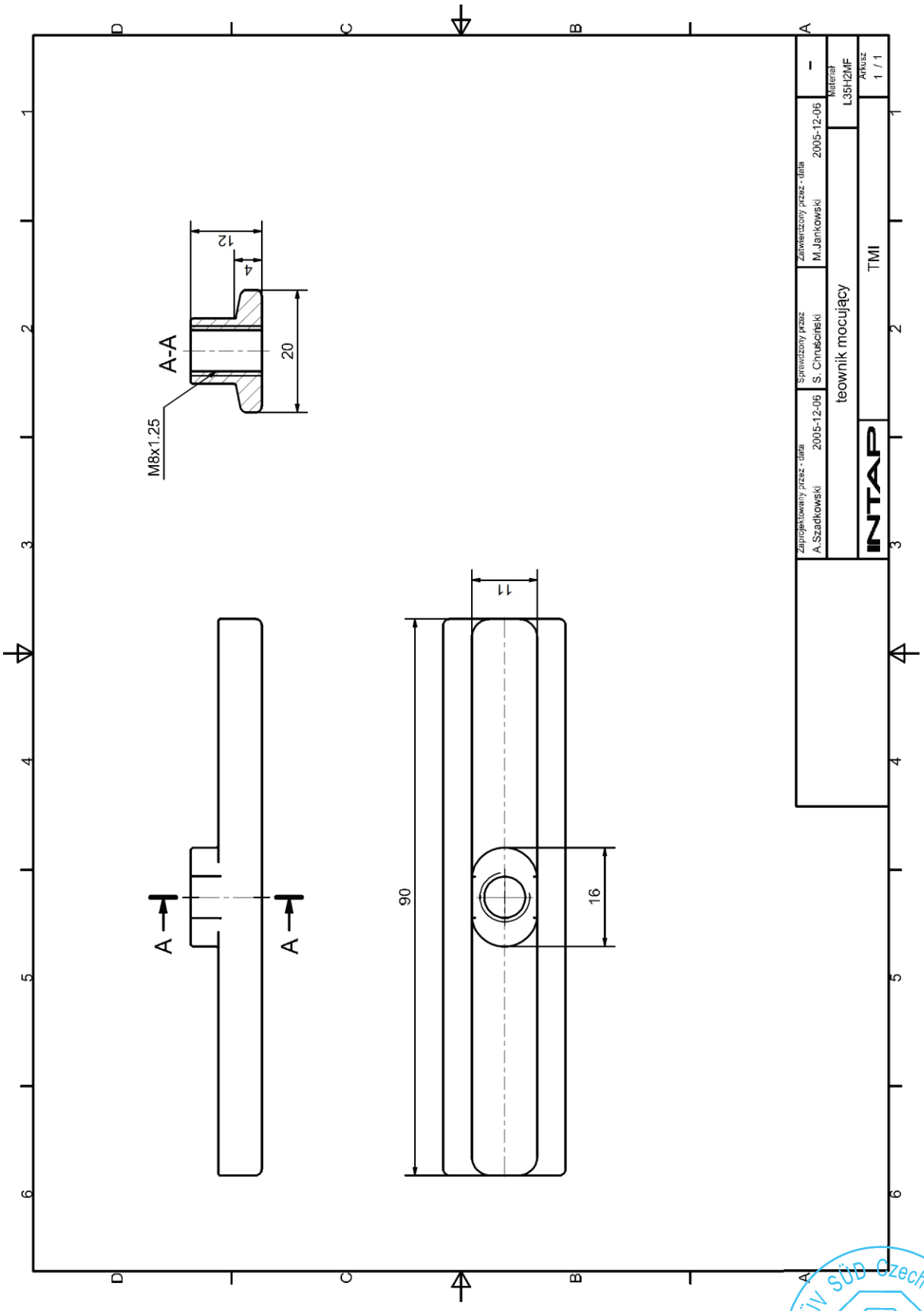
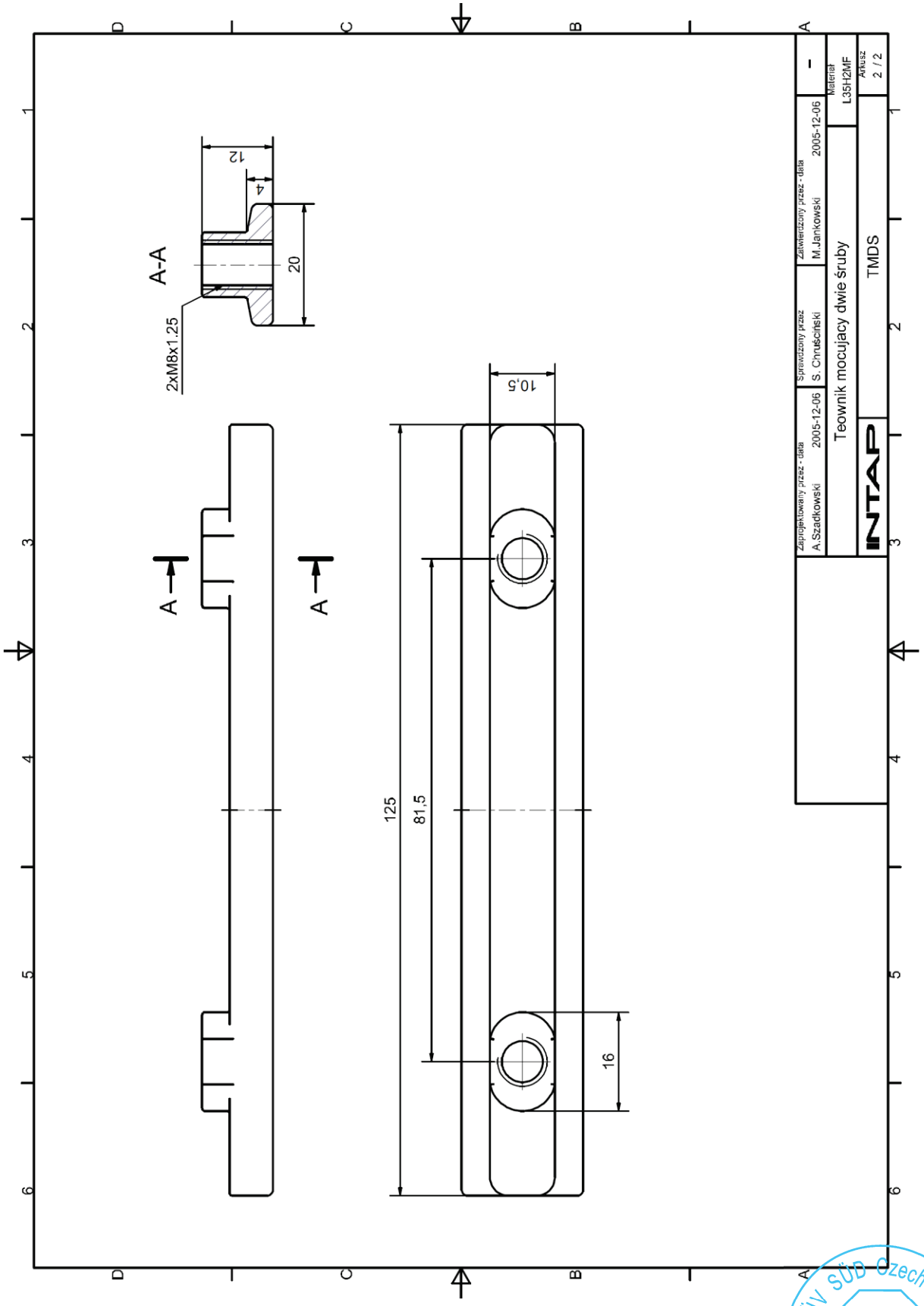
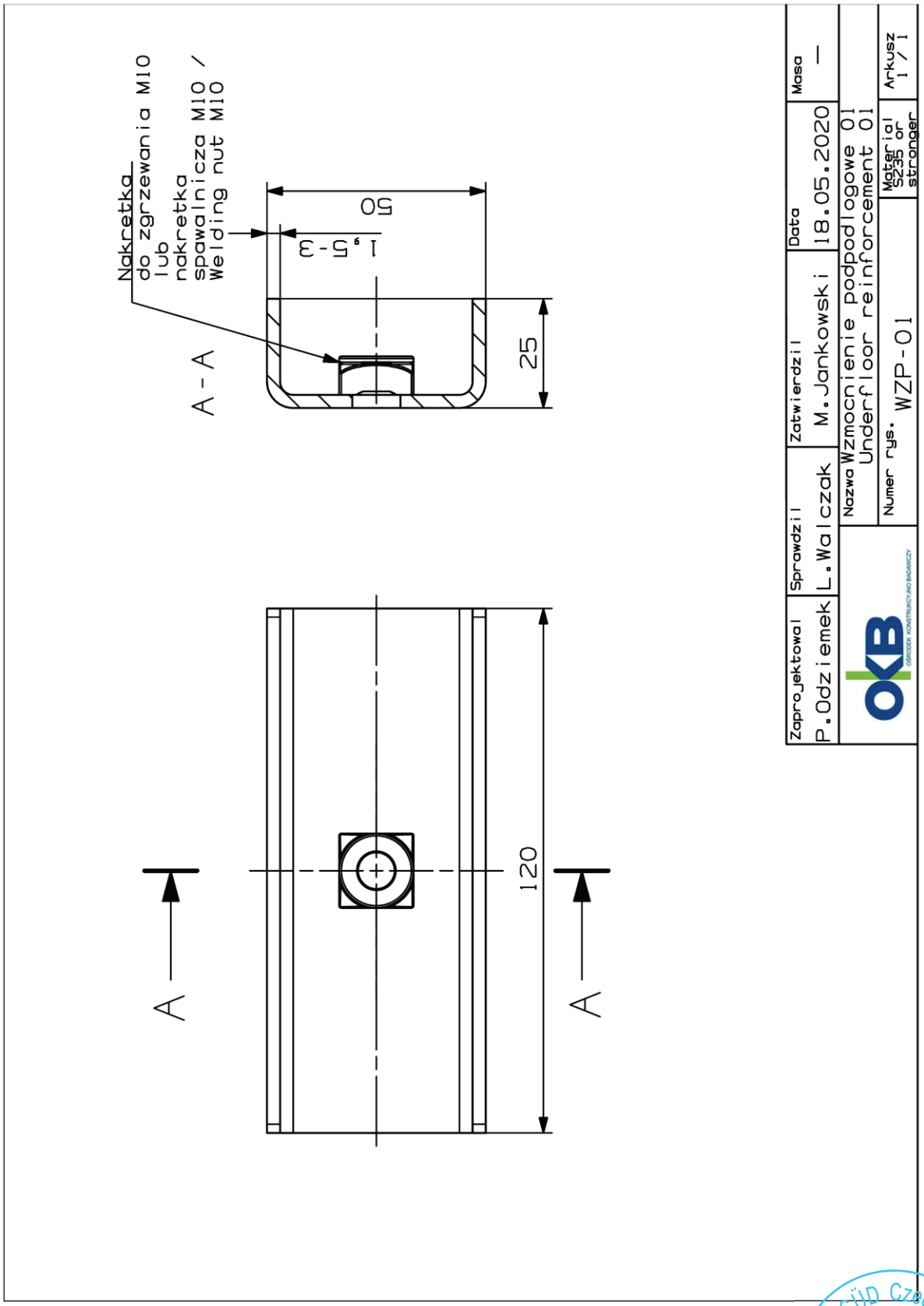


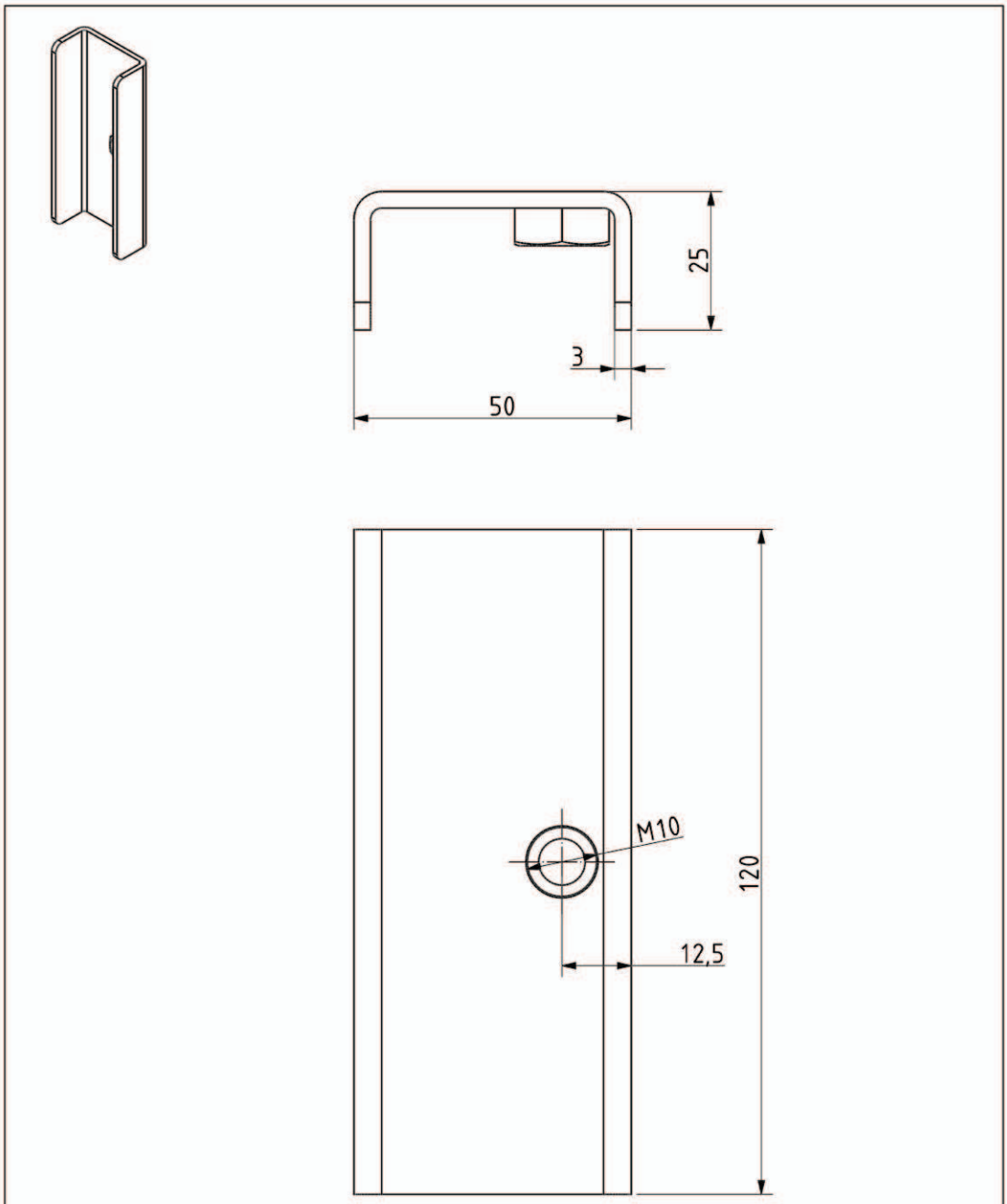








Underfloor reinforcement WZP-01 can be mounted interchangeably to UWP-01 or WZP-20

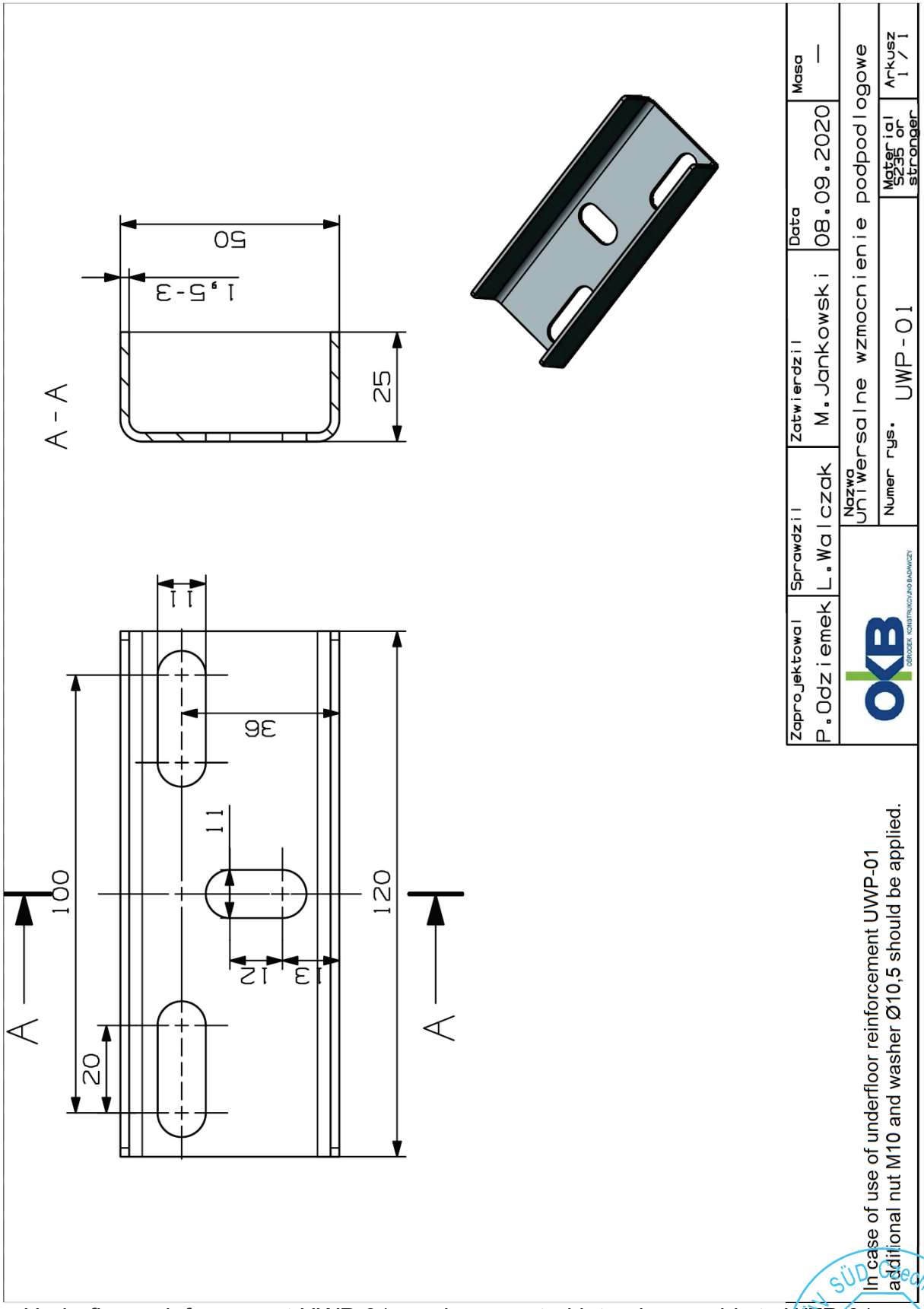


Tolerance class according to DIN 7168		0,5 - 3	3 - 6	6 - 30	30 - 120	120 - 400	400 -1000	1000 - 2000	2000 - 4000	>4000
m	Medium	±0,1	±0,1	±0,2	±0,3	±0,5	±0,8	±1,2	±2	±3

Designed by	Checked by	Approved by	Mass [kg]
P.D			0,265

nmi Safety Systems	Underfloor reinforcement	Material	
	WZP-20	Date	Sheet
		13.08.2019	1/1

Underfloor reinforcement WZP-20 can be mounted interchangeably to WZP-01 or UWP-01



In case of use of underfloor reinforcement UWP-01 additional nut M10 and washer Ø10,5 should be applied.

Underfloor reinforcement UWP-01 can be mounted interchangeably to WZP-01 or WZP-20

Enclosure 6: INSTRUCTION OF INSTALLATION OF RAIL22 TO THE VEHICLE'S FLOOR

RAIL22

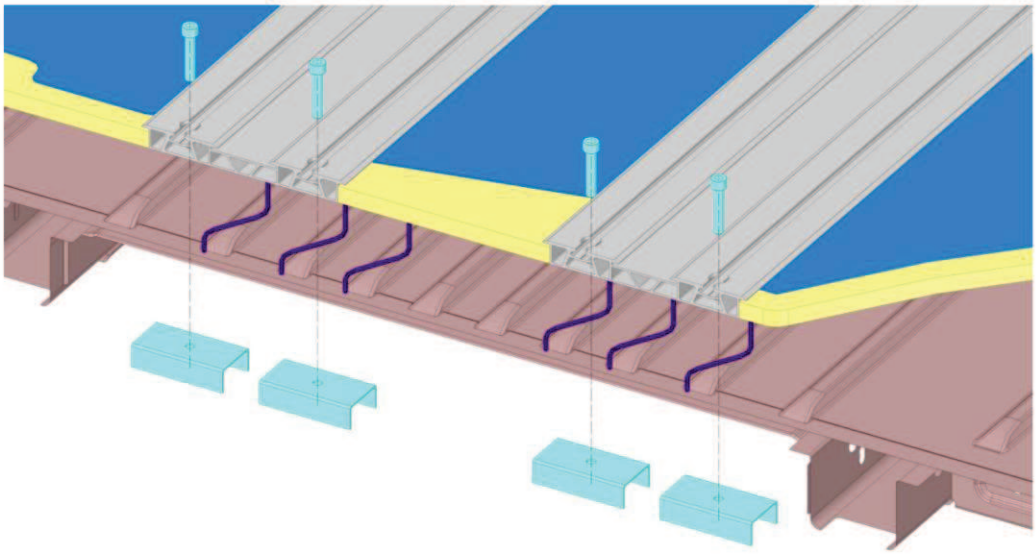
Installation:

Surface preparation:

Raw or coated aluminium. Originally painted or powder coated steel sheet:

- roughen,
- degrease,
- prime.

For surfaces prepared in that way, apply 3 paths of BETAMATE 7120 in an S patterns (or 2 straigth paths), and afterwards and press the rails.
At the end of single rail there must be one underfloor reinforcement – C-profile WZP-01 (fixed by M10 8.8 bolt). For double rail use 2 pieces WZP-01.



Underfloor reinforcement UWP-01 or WZP-20 can be mounted interchangeably to WZP-01.
In case of use of underfloor reinforcement UWP-01 additional nut M10 and washer Ø10,5 should be applied.

Dow Automotive

Technical Data Sheet

BETACLEAN 3350

Description / Application:

BETACLEAN 3350 is a cleaner for removing dirt and grease from plastics, paints and glass

All Dow Automotive products are primarily developed in co-ordination with the automobile manufacturers, according to their needs and their specifications; they are approved for the specific applications as defined by the customer.

The use of the product other than approved application have to be released in writing by the Technical Service of Dow Automotive.

Technical Data:

Basis	Heptane
Colour	Colourless, transparent
Density	0,68 g/cm³ at 23°C
Flash point	-4°C
Instructions for use	Wipe contaminated surface with BETACLEAN 3350 saturated, binder-free tissues or cloths. Preliminary trials carried out by our technical service department are recommended.
Shelf life	12 months in unopened containers
Containers	100, 250, 1000ml aluminium containers
Protection measures	See health and safety data sheet.

DOW AUTOMOTIVE Quality Management
Quality is our highest priority. Dow Automotive works with a highly modern Quality Management System which meets all international requirements of **QS 9000, VDA-6** and **ISO 9001**.

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Dow Automotive

Technical Datasheet

Aftermarket Division

BETAPRIME 5061

Description / Application:

One-Step adhesion promoter for glass, ceramic serigraphy in combination with BETASEAL and BETAMATE PUR Adhesives. A prior cleaning of the bonding surface with BETACLEAN 3300 is necessary.

All Dow Automotive products are primarily developed in co-operation with the automobile manufacturers, according to their needs and their specifications; they are approved for the specific applications as defined by the customer.

The use of the product other than approved application have to be released in written form by the Technical Service of Dow Automotive.

Technical Data:

Basis	Silane modified polymers
Colour	black
Pigments	carbon black
Density	0.91 - 0.93 g/cm³
Viscosity (DIN-cup 4)	10 - 14 s @ 23°C
Flash Point	approx. -8°C
Processing temperature	ideal 10 - 35°C
Tack free time	50 - 150 sec @ 23°C / 50 % r.h.
Evaporation time	min. 10 min @ 23°C / 50 % r.h., max. 8h Reactivation with BP 5061 or BW 4001/4002 possible.
Instruction for use	Shake container well before opening. Continue to shake for at least 60s after steel balls inside the container are released. Caution! The product is extremely hygroscopic! Close container immediately after use to preserve remaining contents. Use up remainder within a few days.
Bonding surface preparation	Clean bonding areas with the BETACLEAN 3300. Verify compatibility or consult our technical service department.
Cleaning	Clean Equipment with BETACLEAN 3000

Shelf life	9 months in unopened containers (see "use before" date printed on the container)
Storage once opened	- applicator: single use, do not store - 100 ml bottle: 5 days in original container
Storage	Temperature: 5°C to 25°C Short term up to 40°C
Containers	Single use applicator, 100 ml aluminium bottle
Protection measures	See health and safety data sheet

DOW AUTOMOTIVE Quality Management

Quality is our highest priority. Dow Automotive works with a highly modern Quality Management System which meets all international requirements of **QS 9000, VDA-6** and **ISO 9001**.

The above information implies no liability as to the usage of our products. Since the applications, utilisation and processing of our products are beyond our control, the information given is not intended to replace your own trials with the products to establish their suitability for your particular application. Our liability is limited to the value of the products supplied by us and used by you. The information on this data sheet corresponds to the latest findings and supersedes all previous versions.

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Automotive Systems

Technical Datasheet

BETAPRIME™ 5500

Short Description

Adhesion promoting primer for laminated glass with enamel layer inside and enamel substrates. To be used in combination with Dow Automotive Systems PUR-Adhesive/sealants.

Properties

One-step primer which can be used without silane wipe pretreatment. Primer with short open time.

Application

All Dow Automotive products are primarily developed in co-operation with the automobile manufacturers, according to their needs and their specifications, they are approved for the specific applications as defined by the customer. The use of the product other than approved appliction have to be released in written form by the Technical Service of Dow Automotive.

Technical Data

Unless specified otherwise test are conducted at 23°C/50% relative humidity.

Basis	Polyisocyanates
Colour	black
Pigments	Carbon black
Density	0.901 - 1.001 g/cm³
Solid contents	35 - 40%
Viscosity DIN-cup 4mm after 3d 40°C	10.5 - 13 s
Minimum open time	3 minutes / felt application
Maximum opentime	3 days / felt application
Reactivation:	One time reactivation possible with: BETAWIPE™ VP04604 (wipe-on / wipe off) maximum open time 15 minutes.
Processing temperature	10 - 40°C
Processing instructions	Primer bottle needs to be shaken for at least one minute before opening, to release the steel balls within the container. In case steel balls are not dislodged, then it is recommended to strike the top of the container against a hard surface so that the steel balls are audible within the container. This is essential in order to disperse any possible sediment within the primer.
Caution	The product is extremely sensitive to humidity. It is imperative that container should be closed immediatly after use, in order to extend durability of the remaining primer contents.
Shelf life	6 months at + 5°C - +25°C in unopened containers.
Shelf life after opening	Depending on ambient conditions and working method: Use following test method to monitor if primer can be furter used for one day or if it is non-conformous and has to be dispode of. Daily measurement of viscosity DIN 4 cup: must not exceed 17 seconds.
Bonding Surface Preparation	All bonding surfaces must be free of impurities (dirt, dust, water, oil, grease, release agent and similar contaminants). Verify compatibility before use, or consult our Technical Service for more information.
Processing equipment	Primer applicator, primer application device (flask with primer applicator head and felt) or automatic primer application system.
Cleaning	Clean equipment with BETACLEAN™ 3000
Containers	Aluminium bottles

DOW Automotive Systems

Technical Datasheet

Health and Safety

The use of bonding agent (primer) is generally harmless and as long as the basic rules for safe handling of chemicals are applied. However, the direct contact of uncured primer to food and food containers shall be avoided. Mandatory are protective measures in order to prevent direct skin contact as well as to avoid solvent inhalation. Proper ventilation should apply when using primers with high volatile content. If any primer is applied in the means of spraying technique, special care should apply in relation to respiration and personal protection in order to prevent aerosol inhalation. Suitable solvent resistant rubber gloves, conventional eye protection as well as appropriate type of respirator mask are essential. In case of direct contact with any primers the skin must be rinsed first with warm water and then cleaned thoroughly with conventional soap. Solvents shall be avoided. For detailed protective measures refer to the material safety data sheets.

Dow Automotive Systems Quality Assurance

Quality is our utmost goal. Dow Automotive works according to a modern quality management system conforming to ISO/TS 16949.
Environment: All sites of Dow Automotive are conforming to ISO 14001.
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Technical Data Sheet BTR

Dow Automotive

BETAMATE 7120

Description / Application:

Single-component, high-viscosity, atmospheric humidity-curing polyurethane bonding/sealing compound for high-strength, permanently elastic adhesive joints.
This material is used in the direct glazing process of the automotive industry in combination with glass-primer and wipe and paint primer. It is also suitable for bonding certain plastic parts in conjunction with the plastic primer BETAPRIME 5404 and/or a specific pretreatment according to prior test results.

All Dow Automotive products are primarily developed in co-ordination with the automobile manufacturers, according to their needs and their specifications; they are approved for the specific applications as defined by the customer.

The use of the product other than approved application have to be released in writing by the Technical Service of Dow Automotive.

Technical Data:

Basis	polyurethane prepolymers
Colour	black
Density	ca. 1.23 g/cm³ at 23°C
Solid contents	> 98%
Viscosity (Extrusion, Ballan 4 mm nozzle, 4 bar)	pasty, pumpable 12 - 18 g/min at 23°C
Flash point	> 100°C
Processing temperature	10 - 40°C
Open time	max. 15 min at 23°C/50% rh primerless
Sagging behavior	very good, non-sagging
Tack-free time	approx. 30 min at 23°C/50% rh
Cure rate	> 4 mm in 48 h at 23°C/50%rh
Tensile strength (DIN 53 504)	9 ± 1 MPa
Elongation at break (DIN 53 504)	> 500%
Lap shear resistance (EN 1465)	min. 5 MPa (height of adhesive layer: 2mm) 23°C/50% rh,
Resistance to tear propagation (DIN 53 515)	approx. 15 N/mm
Shore A hardness (DIN 53 505)	60 +/-5
Abrasion resistance	Extremely high

Temperature stability	-40°C to 100°C, for short periods up to 120°C
Resistance to chemicals	Highly resistant to aqueous chemicals, petrol, alcohol and mineral oils. Conditionally resistant to esters, ketones, aromatics and chlorinated hydrocarbons
Bonding surface preparation	All bonding surfaces must be free of dirt, dust, water, oil and grease. In general surfaces should be primed. Verify compatibility or consult our technical service department.
Processing equipment	Cartridges: hand-operated or pneumatic gun with mechanical piston Drums, pails: commercial pumping system with connection to automatic applicator, if required.
Cleaning	Uncured BETAMATE 7120 residues can easily be removed with BETACLEAN 3000 or BETACLEAN 3500. Hardened BETAMATE 7120 residues can only be removed mechanically. Immerse equipment in BETACLEAN 3000.
Shelf life	6 months at +5°C to +25°C in unopened containers. (See "use before" date printed on container).
Containers	300 ml cartridges, cardboard packs of 12 Pails: 22 litres Drums: 200 litres
Protection measures	See health and safety data sheet.
