

## Section 1: General Information

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### 0. Identification of the type

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0.1 0.2 0.4 Type ID: 71-180-0002-0-001-001  
0.3 Date of record: 2021-12-02

### 1. General Information

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1.1 Type name: Unimat 09-4x4/4S Dynamic  
1.2 Alternative type name:

#### 1.3 Manufacturer:

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##### 1.3.1 Manufacturer identification data:

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1.3.1.1 Name of organisation: Plasser & Theurer Export von Bahnbaumaschinen Gesellschaft m.b.H  
1.3.1.2 Registered business number: ATU14654104  
1.3.1.3 Organisation code:

##### 1.3.2 Manufacturer contact data:

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1.3.2.1 Address of organisation, street and number: Johannesgasse 3  
1.3.2.2 Town: Wien  
1.3.2.3 Country code:  
1.3.2.4 Post code: 1010  
1.3.2.5 E-mail address: export@plassertheurer.com

Registration Method: New Type

Registered Vehicle Type:

1.4 Category: Special Vehicles  
1.5 Subcategory: Self-propelled special vehicle  
1.6 Platform: Unimat 08-4x4/4S

## Section 2: Conformity with TSI

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### 2.1 Conformity with TSI and Sections not complied with:

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1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function

#### **CCS TSI (Regulation (EU) N° 2016/919)**

4.2.1.2. Availability/Reliability  
4.2.4.1. Basic communication function  
4.2.4.2. Voice and operational communication applications  
4.2.5.1. Radio communications with the train  
4.2.13. GSM-R DMI (Driver-Machine Interface)  
4.2.16. Environmental conditions

#### **Noise (Regulation (EU) No 1304/2014)**

**CCS TSI (Regulation (EU) N° 2016/919)**

4.2.1.2. Availability/Reliability

4.2.4.1. Basic communication function

4.2.4.2. Voice and operational communication applications

4.2.5.1. Radio communications with the train

4.2.13. GSM-R DMI (Driver-Machine Interface)

4.2.16. Environmental conditions

**Noise (Regulation (EU) No 1304/2014)**

1435mm / None (for hauled passenger vehicles and special vehicles) / SHP

2.3 Applicable specific cases (specific cases conformity with which has been assessed)

2.2 Reference of 'EC type examination certificates'

Reference of 'EC type examination certificates' - if module SB applied - and/or 'design verification certificate' - if module SH1 applied

1940/1/SB/2021/RST/PL/17/V01 - 28/05/2021

Reference of 'EC type examination certificates' - if module SB applied - and/or 'design verification certificate' - if module SH1 applied

1940/1/SB/2021/CCO/PL/4/V01 - 28/05/2021

Section 3: Authorisations

Poland

3.0 Area Of Use:

PL(Poland)

3.1.1 Member state of authorisation:

Poland(PL)

3.1.2.1 Status:

Valid

3.1.2.2 Validity of Authorisation (until):

3.1.2.3 Coded conditions for use and other restrictions:

**1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function**

1 Technical restriction related to construction

1.1 Minimum curve radius in meters: 120

1.3 Speed restrictions in Km/h: 100

2 Geographical restriction

2.1 Kinematic gauge (coding WAG TSI): G1/G2

2.2 Wheelset gauge: 2.2.4 Gauge 1435

2.4 ERTMS on board: 2.4.2 GSM-R voice

2.5 B System on board

2.5.1 Class B signalling system: 2.5.119 SHP

2.5.2 Class B radio system: 2.5.210 PKP radio system

3 Environmental restrictions

3.1 Climatic zone: 3.1.1 T1

**1435mm / None (for hauled passenger vehicles and special vehicles) / SHP**

1 Technical restriction related to construction

1.1 Minimum curve radius in meters: 120

1.3 Speed restrictions in Km/h: 100

2 Geographical restriction

2.1 Kinematic gauge (coding WAG TSI): G1/G2

2.2 Wheelset gauge: 2.2.4 Gauge 1435

2.4 ERTMS on board: 2.4.2 GSM-R voice

2.5 B System on board

2.5.1 Class B signalling system: 2.5.119 SHP

2.5.2 Class B radio system: 2.5.210 PKP radio system

3 Environmental restrictions

3.1 Climatic zone: 3.1.1 T1

3.1.2.4 Non-coded conditions for use and other restrictions:

3.1.3.1.1 Date of the original authorisation: 2021-11-22

3.1.3.1.2 Authorisation holder:

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3.1.3.1.2.1 Authorisation holder identification data:

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3.1.3.1.2.1.1 Name of organisation: Plasser & Theurer Export von Bahnbaumaschinen Gesellschaft m.b.H

3.1.3.1.2.1.2 Registered business number: ATU14654104

3.1.3.1.2.1.3 Organisation code:

3.1.3.1.2.2 Authorisation holder contact data:

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3.1.3.1.2.2.1 Address of organisation, street and number: ohannessgasse 3

3.1.3.1.2.2.2 Town: Wien

3.1.3.1.2.2.3 Country code: 80

3.1.3.1.2.2.4 Post code: 1010

3.1.3.1.2.2.5 E-mail address: export@plassertheurer.com

3.1.3.1.3 Authorisation document reference: PL8020210210

3.1.3.1.4 Certificate of verification : Reference of type examination or design examination type:

1940/1/SB/2021/RST/PL/17/V01 - 28/05/2021

1940/1/SB/2021/CCO/PL/4/V01 - 28/05/2021

3.1.3.1.5 Parameters for which conformity to applicable national rules has been assessed:

1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function

2015/2299/EU

- 1 Documentation
- 2 Structure and mechanical parts
- 3 Track interaction and gauging
- 4 Braking
- 6 Environmental conditions and aerodynamic effects
- 7 External warning, signalling, marking functions and software integrity requirements
- 8 On-board power supply and control systems
- 9 Staff facilities, interfaces and environment
- 10 Fire safety and evacuation
- 11 Servicing
- 12 On-board control command and signalling
- 13 Specific operational requirements
- 14 Freight-related items

1435mm / None (for hauled passenger vehicles and special vehicles) / SHP

2015/2299/EU

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- 2 Structure and mechanical parts
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- 9 Staff facilities, interfaces and environment
- 10 Fire safety and evacuation
- 11 Servicing
- 12 On-board control command and signalling
- 13 Specific operational requirements
- 14 Freight-related items

3.1.3.1.6 Comments:

3.1.3.1.7 Reference to the written declaration by the proposer referred to in Article 3(11) of Regulation (EU) 402/2013:

Deklaracja wnioskodawcy z 2 czerwca 2021 r.

### 3.1.3.1 Initial Registration

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3.1.2.3 Coded conditions for use and other restrictions:

**1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function**

1 Technical restriction related to construction

1.1 Minimum curve radius in meters: 120

1.3 Speed restrictions in Km/h: 100

2 Geographical restriction

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2.2 Wheelset gauge: 2.2.4 Gauge 1435

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3 Environmental restrictions

3.1 Climatic zone: 3.1.1 T1

3.1.2.4 Non-coded conditions for use and other restrictions:

3.1.3.1.1 Date of the original authorisation: 2021-11-22

3.1.3.1.2 Authorisation holder:

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3.1.3.1.2.1 Authorisation holder identification data:

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3.1.3.1.2.1.1 Name of organisation:	Plasser & Theurer Export von Bahnbaumaschinen Gesellschaft m.b.H
3.1.3.1.2.1.2 Registered business number:	ATU14654104
3.1.3.1.2.1.3 Organisation code:	
 3.1.3.1.2.2 Authorisation holder contact data:	
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3.1.3.1.2.2.1 Address of organisation, street and number:	ohannesgasse 3
3.1.3.1.2.2.2 Town:	Wien
3.1.3.1.2.2.3 Country code:	80
3.1.3.1.2.2.4 Post code:	1010
3.1.3.1.2.2.5 E-mail address:	export@plassertheurer.com
 3.1.3.1.3 Authorisation document reference:	 PL8020210210
3.1.3.1.4 Certificate of verification : Reference of type examination or design examination type:	
	1940/1/SB/2021/RST/PL/17/V01 - 28/05/2021
	1940/1/SB/2021/CCO/PL/4/V01 - 28/05/2021
 3.1.3.1.5 Parameters for which conformity to applicable national rules has been assessed:	
	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function
	1 Documentation
	2 Structure and mechanical parts
	3 Track interaction and gauging
	4 Braking
	6 Environmental conditions and aerodynamic effects
	7 External warning, signalling, marking functions and software integrity requirements
	8 On-board power supply and control systems
	9 Staff facilities, interfaces and environment
	10 Fire safety and evacuation
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	12 On-board control command and signalling
	13 Specific operational requirements
	14 Freight-related items
	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP
	1 Documentation
	2 Structure and mechanical parts

- 3 Track interaction and gauging
- 4 Braking
- 6 Environmental conditions and aerodynamic effects
- 7 External warning, signalling, marking functions and software integrity requirements
- 8 On-board power supply and control systems
- 9 Staff facilities, interfaces and environment
- 10 Fire safety and evacuation
- 11 Servicing
- 12 On-board control command and signalling
- 13 Specific operational requirements
- 14 Freight-related items

3.1.3.1.7 Reference to the written declaration by the proposer referred to in Article 3(11) of Regulation (EU) 402/2013:

Deklaracja wnioskodawcy z 2 czerwca 2021 r.

#### Section 4: Technical Characteristics

4.1.3 Wheel set gauge RC	1435	mm
4.1.12 Number of vehicles composing the fixed formation (for fixed formation only)	1	
<b>4.13.1 Signalling</b>		
4.13.1.1 ETCS equipment on-board and the set of specifications from CCS TSI Annex A RC	None	
4.13.1.5 Class B or other train protection control and warning systems installed (system and if applicable version) RC	SHP PKP radio system with Radiostop function	
4.13.1.8 ETCS System Compatibility	Not applicable	
<b>4.13.2 Radio</b>		
4.13.2.1 GSM-R Radio voice on board and its Baseline RC	Regulation 2016/919 Set_1	
4.13.2.3 Class B or other radio systems installed (system and if applicable version) RC	PKP radio system	

4.13.2.5 Radio Voice System Compatibility	RSC-EU-0
4.13.2.6 Voice and operational communication implementation RC	Koliber GSM-R/VHF
4.13.2.7 GSM-R Radio Data communication on board and its Baseline RC	None
4.13.2.8 Radio Data System Compatibility	RSC-EU-0
4.13.2.10 Voice SIM Card GSM-R Home Network	GSM-R PL (Poland)
4.13.2.12 Voice SIM Card support of Group ID 555	False
4.10.1 Energy supply system (voltage and frequency) RC	None (for hauled passenger vehicles and special vehicles)

#### 4.1.2 Speed

4.1.2.1 Maximum design speed	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	100	km/h
	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP	100	km/h

4.2.1 Reference profile RC	G1 G2
4.3.1 Temperature range	T1 (-25 to +40)
4.3.3 Snow, ice and hail conditions	Nominal
4.4.1 Fire safety category RC	OTM

#### 4.5.2 Design mass

4.5.2.1 Design mass in working order	142550	kg
4.5.2.2 Design mass under normal payload	144707	kg



4.5.2.3 Design mass under exceptional payload RC	144707	kg
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4.5.3 Static axle load

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4.5.3.1 Static axle load in working order	19933	kg
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4.5.3.2 Static axle load under normal payload	19958	kg
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4.5.3.3 Static axle load under exceptional payload RC	19958	kg
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4.5.3.4 Position of the axles along the unit (axle spacing) : a: Distance between axles b: Distance from end axle to the end of the nearest coupling plane c: distance between two inside axles	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	a: 0001,80 m b: 0003,32 m c: 0009,45 m	
		Explanations: a: 1,8 m b: 3,32 m c: 9,45 m	

1435mm / None (for hauled passenger vehicles and special vehicles) / SHP		a: 0001,80 m b: 0003,32 m c: 0009,45 m	
		Explanations: a: 1,8 m b: 3,32 m c: 9,45 m	

4.5.5 Total vehicle mass (for each vehicle of the unit)	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	144707	kg
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1435mm / None (for hauled passenger vehicles and special vehicles) / SHP		144707	kg
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4.5.6 Mass per wheel	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	9979	kg
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1435mm / None (for hauled passenger vehicles and special vehicles) / SHP		9979	kg
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4.6.4 Combination of maximum speed and maximum cant deficiency for which the vehicle was assessed RC	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	0100,00	km/h	0130,00	mm
	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP	0100,00	km/h	0130,00	mm
4.6.5 Rail inclination RC	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	1/20			
	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP	1/20			
4.7.1 Maximum average deceleration		0.69	m/s <sup>2</sup>		
<b>4.7.2.1 Brake performance on steep gradients with normal payload</b>					
4.7.2.1.2 Speed (if no reference case is indicated)		30	km/h		
4.7.2.1.3 Gradient (if no reference case is indicated)		21	‰ (mm/m)		
4.7.2.1.4 Distance (if no reference case is indicated)		46	km		
4.7.2.1.6 Maximum brake thermal energy capacity	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	107000	kJ		
	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP	107000	kJ		
<b>4.7.3 Parking brake</b>					
4.7.3.3 Maximum gradient on which the unit is kept immobilized by the parking brake alone (if the vehicle is fitted with it)		40	‰ (mm/m)		
<b>4.7.4.1 Eddy current brake</b>					

4.7.4.1.1 Eddy current track brake fitted RC		False			
<b>4.7.4.2 Magnetic brake</b>					
4.7.4.2.1 Magnetic track brake fitted RC		False			
<b>4.7.4.3 Regenerative brake (only for vehicles with electrical traction)</b>					
4.7.4.3.1 Regenerative brake fitted RC		False			
4.7.5 Emergency brake : Stopping distance and deceleration profile for each load condition per design maximum speed	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	a: 0000,00	m	0000,00	m/s <sup>2</sup>
a: Load condition: working order		b: 0602,30	m	0000,64	m/s <sup>2</sup>
b: Load condition: normal payload		c: 0000,00	m	0000,00	m/s <sup>2</sup>
c: Load condition: exceptional payload	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP	a: 0000,00	m	0000,00	m/s <sup>2</sup>
		b: 0602,30	m	0000,64	m/s <sup>2</sup>
		c: 0000,00	m	0000,00	m/s <sup>2</sup>
4.7.6 For general operation : Brake weight percentage (lambda) or Braked mass	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	076,00	(%) or	00110,00	tonnes
	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP	076,00	(%) or	00110,00	tonnes
4.7.7 Service brake: At maximum service brake:	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	0603,10	m	0000,64	m/s <sup>2</sup>
Stopping distance, Maximum deceleration, for the load condition 'design mass under normal payload' at the design maximum speed.	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP	0603,10	m	0000,64	m/s <sup>2</sup>

4.7.8 Wheel slide protection system	1435mm / None (for hauled passenger vehicles and special vehicles) / PKP radio system with Radiostop function	False	
	1435mm / None (for hauled passenger vehicles and special vehicles) / SHP	False	
4.8.1 Vehicle length		34.14	m
4.8.2 Minimum in-service wheel diameter RC		870	mm
4.8.4 Minimum horizontal curve radius capability RC		120	m
4.8.5 Minimum vertical convex curve radius capability		500	m
4.8.6 Minimum vertical concave curve radius capability		500	m
4.9.1 Type of end coupling	<b>Manual</b>		
	Tensile force	0850.0000	kN
	Compressive force	1200.0000	kN
4.9.2 Axle bearing condition monitoring (hot axles box detection) RC		Detectable by line side	
4.14.1 Type of train detection systems for which the vehicle has been designed and assessed RC		Track circuits Axle counters	