

**Appendix A – List of the Information to be transmitted –
Specification (Version 002.03, valid from 01.03.2009)**

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
1	Doors												
1.1/1	Close all entry doors	10	MM	67 all coaches	10	R3	Operation by conductor - remote switch or Operation by driver door closing remote switch	All doors close	BITSET8	20	0	1	
		01	64 ldg. .veh				inactive			20	0	0	
1.1/2	Cancellation of the remote control command	10	MM	67 all coaches	10	R3	Operation by conductor-remote switch or Operation by driver door closing remote switch	Interrupt door closing	BITSET8	20	1	1	
		01	64 ldg. .veh				inactive			20	1	0	
1.2	All entry doors on left locked/released	01	64 ldg. .veh	67 all coaches	10	R3	Position of the door control switch of the leading vehicle or Operation of the conductor's door control switch, cancellation after 10' or at V > 5 km/h	Lock all left doors	BITSET8	20	2	1	
		10	MM				Release all left doors			20	2	0	
1.3	All entry doors on right locked/released	01	64 ldg. .veh	67 all coaches	10	R3	Position of the door control switch of the leading vehicle or Operation of the conductor's door control switch, cancellation after 10' or at V > 5 km/h	Lock all right doors	BITSET8	20	3	1	
		10	MM				Release all right doors			20	3	0	

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		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
1.7	All entry doors of the sleeping cars locked	10	MM Sleeping cars	92 all sleeping cars	10	E	Operation of the special conductor's door control switch in the sleeping car	All doors of the sleeping cars	ENUM8	7+8		0x1007	
								Locked	ENUM8	9		0	
								released		9		1	
1.7A	Information 1.7 received and processed	10	92	MM	10	E		ENUM8	7+8			0x1A07	
							Status	ENUM8	9		HH		
1.9	All left entry doors locked	10	67 all coaches	66 all vehicles	10 01	R3	Position of door control switch	All left doors locked		20	4	1	
								At least one left door is open		20	4	0	
1.10	All right entry doors locked	10	67 all coaches	66 all vehicles	10 01	R3	Position of door control switch	All right doors locked		20	5	1	
								At least one right door is open		20	5	0	
1.11	Release of the footstep extending device	01	64 ldg. veh	67 all coaches	10	R3	Process control leading vehicle (operation by driver or signalling)	Extend footstep (coupled with doors)		20	6	1	
								Not extend footstep		20	6	0	
1.12	Neighbouring interconnecting doors of two adjacent vehicles operated together	10	MM	NN	10	E	Opening of an interconnecting door in the coach NM = NN +/-1	Interconnecting door in direction of the NM coach	ENUM8	7+8		(NM) 0x1012	
								Open	ENUM8	9		1	
								Close				0	
1.12A	Information 1.12 received and processed	10	NN	MM	10	E		ENUM8	7+8			0x1A12	
							Status	ENUM8	9		HH		
1.13	Interconnecting doors to sleeping cars locked/released	10	MM Sleeping cars	92 all sleeping cars	10	E	Operation of the special conductor's-door control switch in the sleeping car	Interconnecting doors to the "sleeping car" group	ENUM8	7+8		0x1013	
								locked	ENUM8	9		0	
								released		9		1	
1.13A	Information 1.13 received and processed	10	92	MM	10	E		ENUM8	7+8			0x1A13	
							Status	ENUM8	9		HH		
1.15	WC-use prevented/released	01	64 Ldg. veh	67 all coach	10	E	Operation by driver	WC doors	ENUM8	7+8		0x1015	
								Lock	ENUM8	9		0	

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		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
				es				release		9		1	
1.15A	Information 1.15 received and processed	10	67 all coaches	MM	01	E			ENUM8	7+8		0x1A15	
							Status	ENUM8	9			HH	
1.16	Side selective door locking	0210	NN	66 all vehicles	10	R3	Door control	Side selective door blocking is in operation	BITSET8	20	7	1	
							Side selective door blocking is not in operation			20	7	0	
1.17	Central closing	10	MM	64 Ldg. veh	10	R3	doorcontrol	Central closing command to the selective door control module	BITSET8	30	0	1	
							inactive					0	
1.18	Reset central closing for the right side	10	MM	64 Ldg. veh	10	R3	doorcontrol	Reset of central closing for the right side to the selective door control module	BITSET8	30	1	1	
							inactive					0	
1.19	Reset central closing for the left side	10	MM	64 Ldg. veh	10	R3	doorcontrol	Reset of central closing for the left side to the selective door control module	BITSET8	30	2	1	
							inactive					0	
2	Lighting												
2.1	Lighting control for normal and special lighting (e.g. cleaning lights)	11	MM	67 all coaches	11	E	Operation of the train light switch	light:	ENUM8	7+8		0x2001	The train lighting is switched on on the driven tractive units (passenger room lighting)
							On !	ENUM8	9			1	
							Off !					0	
							Special light !					2	
2.1A	Information 2.1 received and processed	11	67 all coaches	MM	11	E			ENUM8	7+8		0x2A01	
							Status	ENUM8	9			HH	
2.2	Report of the passenger saloon lighting	07	NN	66 all vehicle	0207	R3	Lighting control	passenger compartment lighting is on	BITSET8	19	4	1	If this message isn't send by a vehicle which has this function, then the leading vehicle shows the

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		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
				s				passenger compartment lighting is off			4	0	message „train lighting on?“
3 Public address													
3.1	Internal loudspeaker selected reception	12	MM	67 all coaches	12	R3	Operation of corresponding switch	Switch internal loudspeaker to wires 5+6	BITSET8	21	0	1	
								inactive			0	0	
3.2	Internal loudspeaker obligatory reception	12	MM	67 all coaches	12	R3	Operation of corresponding switch	Switch internal loudspeaker to wires 7+8	BITSET8	21	1	1	
								inactive			1	0	
3.3	Speech connection to the tractive vehicle driver on leading vehicle (from any vehicle which can also be a driven tractive vehicle)	12	MM also: 65 driven tractive unit	64 ldg. veh	12	R3	Operation of corresponding switch	Switch internal loudspeaker to wires 3+4	BITSET8	21	2	1	
								inactive			2	0	
3.4	Speech connection between tractive vehicle driver on leading vehicle and driven tractive vehicle	12	64 ldg. veh	65 driven tractive unit	12	R3	Operation of corresponding switch	Switch internal loudspeaker to wires 3+4	BITSET8	21	3	1	
								inactive			3	0	
3.5	External loudspeaker left	12	64 ldg. veh	66 all vehicles	12	R3	Operation of corresponding switch	Switch external left loudspeaker to wires 7+8	BITSET8	21	4	1	
								inactive			4	0	
3.6	External loudspeaker right	12	64 ldg. veh	66 all vehicles	12	R3	Operation of corresponding switch	Switch external right loudspeaker to wires 7+8	BITSET8	21	5	1	
								inactive			5	0	
3.7	Public address of individual coaches or groups of coaches	12	MM	NN	12	R3	Operation of public address equipment	If vehicle listens to the address NNN: switch the internal loudspeaker to wires 7+8	Unsignet8 / NNN = 0..255	22		NNN	
4 Traction													
4.1	Report that remote control is ready	03 05	70 all tractive veh	64 ldg. veh.	02	R2	Process control of the tractive unit or trainset	Remote control readiness has been produced	BITSET8	47	0	1	
								Remote control readiness has not been produced			0	0	

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		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
4.2R/1e	Command: Traction release for remote control type 1e	02	64 ldg. veh.	70 if 4.1 = „1,„	03	R1	Process control of the leading vehicle	Start remote control type 1e, traction release	BITSET8	47	1	1	
								Leave status unchanged				1	
4.2R/1d	Command: Traction release for remote control type 1d	02	64 ldg. veh.	70 if 4.1 = „1,„	03	R1	Process control of the leading vehicle	Start remote control type 1d, traction release	BITSET8	47	2	1	
								Leave status unchanged				2	
4.2R/2	Command: Remote control type 2 support	02	64 ldg. veh.	70 if 4.1 = „1,„	03	R1	Process control of the leading vehicle	Start remote control type 2	BITSET8	47	3	1	
								Leave status unchanged				3	
4.2R/3	Command: Remote control type 3 support	02	64 ldg. veh.	70 if 4.1 = „1,„	03	R1	Process control of the leading vehicle	Start remote control type 3	BITSET8	47	5	1	
								Leave status unchanged				5	
4.2R/4	Command: Remote control type 4 support	02	64 ldg. veh.	70 if 4.1 = „1,„	03	R1	Process control of the leading vehicle	Start remote control type 4	BOOLEAN	64	1	1	
								Leave status unchanged				1	
4.2	Traction blocked for all tractive vehicles of the train	03	65 driven tractive unit	66 all vehicles	02 03	R2	Process control of the driven vehicle	Traction release cancelled, stop all traction activity	BITSET8	47	5	0	
								Leave status unchanged				5	
4.2E	Selective cancellation and (re)granting of the traction release	02	64 ldg. veh.	NN	03	E	Process control of the leading vehicle		ENUM8	7+8		0x4002	
								Traction release for tractive vehicle or trainset NN cancelled (has precedence over 4.2R/1e, 4.2R/1d and 4.2)	ENUM8	9	0		
								Traction release for tractive vehicle or trainset NN (re)granted (does not have precedence over 4.2R/1e, 4.2R/1d and 4.2)			1		
4.2A	Telegram 4.2E/0 received and carried out	03	NN	64 ldg. veh.	02	E	Process control of the tractive unit or trainset NN		ENUM8	7+8		0x4A02	
								Traction blocked in the tractive unit or trainset NN	ENUM8	9	0		

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		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Traction commands are (again) carried out in the tractive vehicle or trainset NN				1	
4.2M/1	Report: Remote control type 1 is switched on, commands are carried out	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Remote control type 1 is switched on, commands are carried out	BITSET8	47	1	1	
								Remote control type 1 is switched off			1	0	
4.2M/2	Report: Remote control type 2 is switched on, commands are carried out	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Remote control type 2 is switched on, commands are carried out	BITSET8	47	2	1	
								Remote control type 2 is switched off			2	0	
4.2M/3	Report: Remote control type 3 is switched on, commands are carried out	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Remote control type 3 is switched on, commands are carried out	BITSET8	47	3	1	
								Remote control type 3 is switched off			3	0	
4.2M/4	Report: Remote control type 4 is available	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Remote control type 4 available	BITSET8	71	1	1	
								Remote control type 4 not available			1	0	
4.3	Primary energy E-traction: Select current system	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the leading vehicle	All driven tractive vehicles or trainset shall be switched to the following voltage system: 1,5 kV = 3 kV = 15 kV ~ 25 kV ~ 600 V = 750 V = Reserve (value blocked) Manual adjustment No E-operation	ENUM4	54	0-3	1 2 3 4 5 6 7-13 14 15 0	

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		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
4.4	Report on current system	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Driven tractive vehicle or trainset is set to the following voltage system: 1,5 kV = 3 kV = 15 kV ~ 25 kV ~ 600 V = 750 V = Reserve selection not available Manual adjustment No E-operation	ENUM4	53	0-3	1 2 3 4 5 6 7-13 14 15 0	
4.5	Primary energy E-traction: Choice of pantograph	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	Following pantograph(s) is (are) to be selected: none the leading the trailing both automatic selection	ENUM4	54	4-7	0 1 2 3 4	
4.5/1	Collective command: UIC country code of the pantographs	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	select the pantograph(s) with the given UIC code No selection Country code	ENUM8 NNN=0...255	65		0 NNN	
4.5/2	Report: UIC country code of the pantograph	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Pantograph(s) with the given UIC code was (were) selected No selection Country code	ENUM8 NNN=1..255	65		0 NNN	
4.5/3	Collective command: Design of the pantograph	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	Select the Pantograph(s) with the given design Standard design A B C D reserve Not available	ENUM4	66	0-3	0 1 2 3 4 5...14 15	To be used if the UIC code is equal and the voltage system is equal, but there are two allowed speeds (e.g. TSI)

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		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
4.5/4	Design of the pantograph	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Selected pantograph(s) with the given design	ENUM4	66	0-3		To be used if the UIC code is equal and the voltage system is equal, but there are two allowed speeds (e.g. TSI)
								Standard design				0	
								A				1	
								B				2	
								C				3	
								D				4	
								reserve				5...14	
								Not available				15	
4.5/5	command: disturbing current demand	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	Select net particularitiesStandard special demands	BITSET8	64	2	0 1	
4.5/6	report: disturbing current demand	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Selected net particularitiesStandard special demands	BITSET8	71	2	0 1	
4.5 E	command: detected voltage demand	02	64 ldg. veh.	NN	03	E	Process control of the driving vehicle		ENUM8	7+8		0x4005	
								Demand to report the detected voltage	ENUM8	9		1	
4.5 A	report: detected voltage	03	NN	64 ldg. veh.	02	E	Process control of the driven tractive unit or trainset		ENUM8	7+8		0x4A05	
								Report of the detected voltage	ENUM8	9			
								1,5 kV =				1	
								3 kV =				2	
								15 kV ~				3	
								25 kV ~				4	
								600 V =				5	
								750 V =				6	
								Reserve				7...13	
								Report not possible				14	
								No E-operation				0	
								free				15	
4.6	Report on pantograph choice	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Following pantograph(s) is (are) to be selected:	ENUM4	53	4-7		
								none				0	

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		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								The leading				1	
								The trailing				2	
								both				3	
4.6E	Individual command: Report available pantographs with attributes	02	64 ldg. veh.	NN	03	E	Control equip of leading vehicle		ENUM8	7+8		0x4006	
								Request for the available pantographs with their UIC country code and design	ENUM8	9		1	
4.6A	report: available pantographs with attributes	03	NN	64 ldg. veh.	02	E	Control equip of led vehicle		ENUM8	7+8		0x4A06	
								Report of the available pantographs with their UIC country code and design	ENUM8	9		1	
								Number of pantographs	ENUM4	11		0...15	
								Vehicle number inside of the trainset	ENUM4	12	0-3	0...15	
								Position of the pantograph	ENUM4		4-7		
							front	1					
							rear	2					
							middle	3					
							reserve	4...15					
							UIC country code	ENUM8 NNN=1... 255	13				
							No code					0	
							Country code					NNN	
							design	ENUM4	14	0-3			
							Standard design				0		
							A				1		
							B				2		
							C				3		
							D				4		
							Reserve				5...14		
							Not available				15		

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		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								voltage system 1,5 kV = 3 kV = 15 kV ~ 25 kV ~ 600 V = 750 V = Reserve Report not possible free No E-operation	ENUM4		4-7	1 2 3 4 5 6 7...13 14 15 0	
4.7R	Collective command: raise/lower pantograph! Permanent command/impuls command	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	Selected pantograph(s): raise ! lower ! error hold	BITSET8	57	0/1	1/0 If there is no selection of the pantograph to raise on a loco, then the pantograph above the leading drivers compartment is raised If this loco is the last driven loco, then the pantograph above the trailing drivers compartment is raised 0/1 The pantograph of the driven loco is lowered 1/1 0/0	
4.7/2	Collective command: raise/lower selected pantograph(s)! impuls command	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	Selected pantograph(s): raise ! lower ! error hold	BITSET8	64	3/4	1/0 0/1 1/1 0/0	
4.7E	Individual command: raise/lower pantograph (applies independently of	02	64 ldg. veh.	NN	03	E	Process control of the driving	Selected pantograph(s):	ENUM8	7+8		0x4007	

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		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
	4.7R)						vehicle	raise !	ENUM8	9		1	If there is no selection of the pantograph to raise on a loco, then the pantograph above the leading drivers compartment is raised If this loco is the last driven loco, then the pantograph above the trailing drivers compartment is raised
								lower !				0	The pantograph of the driven loco is lowered
4.7A	Telegram 4.7E received and carried out	03	NN	64 ldg. veh.	02	E	Process control of the driven tractive unit or trainset NN	selected pantograph(s) are	ENUM8	7+8		0x4A07	
								raised	ENUM8	9		1	
								lowered				0	
4.8/1	Report: Pantograph up/down	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	[selected] pantograph(s) is (are) up	BITSET8	54	0	1	In the leading vehicle the report „pantograph down“ is shown.
								All pantographs are down				0	
4.8/2	Report: Overhead line voltage: actual value	03	65	64	02	R2	Process control of the driven tractive unit or trainset	Overhead line voltage 100%=nominal voltage	Unsigned 8/ NNN = 0..255 100=100%	57		NNN	The driven loco report the voltage of the overhead line detected by itself to the leading vehicle
4.9R	Collective command: main switch on/off	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	All main switches:	BITSET8	57	2/3		In WTB operation the main switches of the driven locos switched on following this rule: Leading loco: the main switch of the leading loco is switched on immediately when the driver gives the demand The first driven loco: the main switch of the first driven loco is switched on one second after the demand of the driver arrived. n driven loco: as shown before, but n seconds delayed.
								On !				1/0	
								Off !				0/1	
								No action				0/0	
								Not valid				1/1	

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		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
4.9E	Individual command: main switch on/off (applies independently of 4.9R)	02	64 ldg. veh.	NN	03	E	Process control of the driving vehicle	Main switch: On Off	ENUM8 ENUM8	7+8 9		0x4009 1 0	
4.9A	Telegram 4.9E received and carried out	03	NN	64 ldg. veh.	02	E	Process control of the driven tractive unit or trainset	Main switch is switched on or switched off	ENUM8 ENUM8	7+8 9		0x4A09 1 0	
4.10	Report: main switch on/off	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Main switch: is on is off	BITSET8	54	1	1 0	
4.11R	Primary energy Diesel-traction Collective command: diesel engine start/stop	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	Diesel engine: Start Stop No action Error	BITSET8	58	0/1	1/0 0/1 0/0 1/1	
4.11E	Individual command: diesel engine start/stop	02	64 ldg. veh.	NN	03	E	Process control of the driving vehicle	Diesel engine: Start Stop	ENUM8 ENUM8	7+8 9		0x4011 1 0	The diesel engine of the driven tractive unit is started The diesel engine of the driven tractive unit is stopped
4.11A	Telegram 4.11E received and carried out	03	NN	64 ldg. veh.	02	E	Process control of the driven tractive unit or trainset NN	Diesel engine: is started is stopped	ENUM8 ENUM8	7+8 9		0x4A11 1 0	
4.12/1	Report: diesel engine	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	All diesel engines are running ≥ 1 diesel engine started or stopped All diesel engines stopped ≥1 diesel engine runs and ≥1 diesel engine stand still	2 ea BOOLEAN	58	0/1	1/0 0/0 0/1 1/1	
4.12/2	Diesel engine rotation speed	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	diesel engine rotation speed 100%=nominal rotation speed	Unsigned8 NNN=0.. 255 200=100%	59		NNN	
4.13R	Collective command: parking brake apply/release	02 06	64 ldg. veh.	66 All vehs.	06	R1	Process control of the driving vehicle	Parking brake: apply ! release !	BITSET8	59	6	1 0	This command is used only if the implementation was made without UIC leaflet 647 All driven vehicles apply the spring energy brake. All driven vehicles release the spring energy brake.
4.13E	Individual command: parking brake apply/release	02 06	64 ldg. veh.	NN	06	E	Process control of the driving vehicle	Parking brake: Apply Release	ENUM8 ENUM8	7+8 9		0x4013 1 0	

Serial No.	Purpose	Information route				Type of telegram	Display and processing											
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use					
		Fctn	Veh	Veh	Fctn													
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20					
4.13A	Telegram 4.13E received and carried out	06	NN	64 Idg. veh.	QF	E	Process control of the driven tractive unit or trainset NN	Parking brake is applied	ENUM8	7+8	9	0x4A13						
								Parking brake is released	ENUM8					1				
4.14/1	Fans and compressor remote switching	02 04	64 Idg. veh.	65 driven tractive unit	04	R1	Process control of the driving vehicle	fan:	2 ea BOOLEAN	62	0/1							
								on (maximum)!						1/0	Fans run with the maximum speed of rotation			
								Auto !						1/1	The switch for the fan of the leading vehicle is in position „A“ (auto) respectively the switch for the fan do not exist. Dependent on the temperatur control the fan of the driven tractive unit run.			
								off (minimum)!						0/1	The fan of the driven tractive unit is switched off or runs with the minimum speed of rotation. The tractive unit protect itself → “fan off” respectively reducing the fan speed only applied, if the temperature allows it.			
								No reaction						0/0				
								Compressor:						2 ea BOOLEAN	2/3			
								on !									1/0	The compressor of the driven tractive unit is switched on and will be automatically switched off if the pressure value reaches 10 bar.
								Auto (all compressors working self-supporting)!									1/1	The compressor of the driven tractive unit is released, if the compressor of the leading loco can not work.
								off !									0/1	The compressor of the driven tractive unit is switched off.
								No reaction									0/0	
4.14/2	compressor (Command comes from vehicle 01 if there is no leading vehicle in the train)	02 04	01	65 driven tractive unit	04	R2	Process control of the driven tractive unit or trainset	Compressor:	2 ea BOOLEAN	60	0/1		The vehicle 01 builds the signal „compressor on“ in the R2-telegram. (in the case of a brake test there is the possibility to process the compressors)					
								On !						1/0				
								Auto (all compressors working self-supporting)!						1/1				
								off !						0/1				
								No reaction						0/0				

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
	fan	02 04	01	65 driven tractive unit	04	R2	Process control of the driven tractive unit or trainset	Fan On ! Auto! Off ! No reaction	BITSET8	71	3/4	1/0 1/1 0/1 0/0	
4.15R	Collective command: train line switch on/switch off Permanent command/Impuls command	02	64 ldg. veh.	65 driven tractive unit	07	R1	Process control of the driving vehicle	Train line: on off Not valid hold	2 ea BOOLEAN	62	4/5	1/0 0/1 1/1 0/0	After a defined delay time the train heating line is proved to be free of voltage. If this is the case, the train heating contactor is switched on (with a delay of 2 sec. for each driven loco).
4.15/2	Collective command: train line switch on/switch off Impulsiv command	02	64 ldg. veh.	65 driven tractive unit	07	R1	Process control of the driving vehicle	OFF ON Not valid cause OFF hold	BITSET8	64	6/7	0/1 1/0 1/1 0/0	
4.15E	Individual command: train line switch on/switch off	02	64 ldg. veh.	NN	07	E	Process control of the driving vehicle	Train line : on ! off !	ENUM8	7+8		0x4015 1 0	After a defined delay time the train heating line is proved to be free of voltage. If this is the case, the train heating contactor is switched on (with a delay of 2 sec. for each driven loco). The train heating contactor of all selected tractive units is switched off.
4.15A	Telegram 4.15E received and carried out	07	NN	64 ldg. veh.	02	E	Process control of the driven tractive unit or trainset NN	Train line is switched on is switched off	ENUM8 ENUM8	7+8 9		0x4A15 1 0	
4.16	Report: Train line	07	66 all vehs	64 ldg. veh.	02 07	R3	Control of the power supply	Train line : is on is off	BITSET8	19	0	1 0	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
4.17	Report: External supply Train line	07	66 all vehs	64 ldg. veh.	07	R3	Control of the power supply	Train line is supplied externally: Yes No	BITSET8	19	1		
4.19	Report: Earthing switch (= train line is earthed)	07	66 all vehs	64 ldg. veh.	02 07	R3	Control of the power supply	Earthing switch : is closed is open	BITSET8	19	2		
4.20E	Demand to report Traction resource !	02	64 ldg. veh	65 driven tractive unit	03	E	Control equip of the leading vehicle	Traction resources report !	ENUM8 ENUM 8	7+8 9		0x4020 1	
4.20A	report traction resource	03	65 driven tractive unit	64 ldg. veh	02	E	Control equip of the hauled traction unit or trainset	Report of Traction resources Status Total number of traction converters Number of available traction converters Total number of drive axis Number of available drive axis Total number of auxiliary converters Number of available auxiliary converters Total number of battery chargers Number of available battery chargers Reserve Reserve	ENUM8 ENUM 8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8 UNSIGNE D8	7+8 9 11 12 13 14 15 16 17 18 19 20		0x4A20 1 HH HH HH HH HH HH HH HH HH HH	
4.21	Command: Intended direction of travel	02	64 ldg. veh	66 all vehs	03	R1	Process control of the driving vehicle	Intended direction of travel in direction of vehicle 01 No intended direction of travel given Intended direction of travel in opposite direction to vehicle 01	2 ea BOOLEAN	48	0/1	1/0 1/1 0/0 0/1	The intended direction of travel of the driven tractive unit is in direction of the vehicle with the UIC adress 01 For all tractive units in the train the traction is forbidden The intended direction of travel of the driven tractive unit is in opposite direction of the vehicle with the UIC adress 01.
4.22	Tractive vehicle is ready to haul, holding brake is released	03 05	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the tractive unit or trainset	Tractive vehicle is able to produce tractive effort	BITSET8	47	4	1	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Tractive vehicle is not able to produce tractive effort or/and holding brake is not released				0	
4.23/1	Traction set point (given to the leading vehicle)	02	64 ldg. veh	65 driven tractive unit	03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Traction set point	Bipolar2.16 / -100% .. +100%	49 + 50		NNN,N	In relation to the Z/B/v diagram of the tractive unit conversion of the minimum value from % to kN. Set value for the traction control.
4.23/2	Traction set point (given to the driven tractive vehicle with V-control authorisation)	02	65 with V-control authorisation	65 driven tractive unit	02 03	R2	Process control of the driven tractive unit or trainset	Traction set point of the driven tractive vehicle with V-control authorisation 100%=nominal value	Bipolar2.16 / -100% .. +100%	49 + 50		NNN,N	
4.24	Traction-actual value	03 05	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Actual traction value 100%=200kN	Bipolar2.16 / -100% .. +100%	51 + 52		NNN,N	
4.25	Report of the V-control enabling	02	MM	64 ldg. veh.	15	R3	Process control of the vehicle (tractive unit or driving trailer) or trainset	Vehicle has an operational V controller Vehicle has not an operational V controller	BITSET8	9	4	1 0	
4.26	Issue of the V-control authorisation	02	64 ldg. veh	66 all vehs	02 03	R1	Process control of the driving vehicle	Vehicle NN is authorised to control the speed No input of control authorisation	Unsigned 8/ NN = 01..63	53		NN 0	
4.27	Report of the active V regulation	02	NN	66 all vehs	02	R2	Process control of the tractive unit or trainsets	Vehicle controls the speed Vehicle do not control the speed	BITSET8	47	6	1 0	
4.28	Speed target value	02	64 ldg. veh	65 with V-control authorisation	03	R1	Process control of the driving vehicle	V-target value for vehicle NN from telegram 4.26	Unipolar 2.16/ 0 .. 400% 100 % = 256 km/h	51 + 52		NNN,N	
4.29/1	Speed actual direction of travel	16 02 03	66 all vehs	66 all vehs	02 03 06 09 10 14 15 16	R3	V-signal probe	Actual direction of travel In direction vehicle 01	BITSET8	10	7	1	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
					17 19 20			Not in direction vehicle 01 (opposite direction to vehicle 01 and stationary)				0	
4.29/2	Speed-actual					R3	V-signal transducer	V-actual value in km/h	Unipolar 2.16/ 0 .. 400% 100 % = 256 km/h	11 + 12		NNN,N	
4.30	Sand	02	64 ldg. veh.	66 all vehs.	03	R1	Process control of the driving vehicle	Command: sand Sand off!	BITSET8	47	6	1 0	It is sanded at the driven tractive unit.
4.31E	Dealing with defects	02	64 ldg. veh.	NN	03	E	Process control of the leading vehicle (loco driver)	Derive remedial measures corresponding to the definition for that specific class No remedy Remedy 1 Remedy 2 ... Remedy n	ENUM8	7+8		0x4031 0 1 2 ... n	
4.31A	Telegram 4.31E received and carried out	03	NN	64 ldg. veh.	02	E	Process control of the tractive unit or trainsets	Derive remedial measures corresponding to the definition for that specific class Status: No remedy Remedy 1 Remedy 2 ... Remedy n	ENUM8	7+8		0x4A31 0 1 2 ... n	
4.32	Produce traction readiness	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Make ready for traction Make not ready for traction	BITSET8	47	4	1 0	
4.33/1	Emergency off (triggered by the leading vehicle)	02	64 ldg. veh.	66 all vehs.	02 03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	E-loco: Main switch off and pantograph low V-loco: engine off and transmission empty E-loco: Main switch and pantograph released V-loco: engine ready to start	BITSET8	47	7	1 0	E-tractive unit: the main switch is switched off and the pantograph is lowered. V-tractive unit: the engine is switched off and the transmission is empty

Serial No.	Purpose	Information route				Type of telegram	Display and processing							
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use	
		Fctn	Veh	Veh	Fctn									
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20	
4.33/2	Emergency off (triggered by the driven vehicle)	03	65 driven tractive unit	66 all vehs	02 03	R2	Process control of the driven tractive vehicle	E-loco: Main switch off and pantograph low V-loco: engine off and transmission empty	BITSET8	47	7	1		
								E-loco: Main switch and pantograph released V-loco: engine ready to start				0		
4.34/1	Prepare for running or braking	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Run or prepare to run	2 ea BOOLEAN	48	2/3	1/0	Clocking if needed.....	
								Idling				2/3		1/1
								Brake or prepare brakes				2/3		0/1
								Not valid				2/3		0/0
4.34/2	Prepare for running or braking (If the speed control lies with a driven vehicle (= NN))	03	NN	65 driven tractive unit 64 ldg. veh.	02 03	R2	Process control of the driven tractive unit or trainset	Run or prepare to run	2 ea BOOLEAN	48	2/3	1/0		
								Idling				2/3		1/1
								Brake or prepare brakes				2/3		0/1
								Not valid				2/3		0/0
4.35	Special types of operation	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Normal operation	ENUM4	48	4	0		
								Tunnel run				to		1
								blocked				7		2 - 15
								Wash run	BITSET8	64	5	1		
								inactive				0		
4.36/1	Primary energy E-traction: High current limitation	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Maximum current restricted to N, NN kA	Unipolar 2.16/ 0 .. 400% 1 % = 10A	55 + 56		NNN,N		
4.36/2	Reporting of the high current	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	High current is N,NN kA	Unipolar 2.16/ 0 .. 400% 1 % = 10A	55 + 56		NNN,N		
4.37	Neutral zone	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Train runs through neutral section	BITSET8	57	4	1		
								Not valid				0		

Serial No.	Purpose	Information route				Type of telegram	Display and processing								
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use		
		Fctn	Veh	Veh	Fctn										
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20		
4.38/1	Control of the train power supply (on tractive units driven by a diesel engine)	02	64 ldg. veh.	65 driven tractive unit	07	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Train power supply:	BITSET8	58	2/3	1/0	Synchronization of the train energy generation with supply at the same time		
								Start or switch on						2/3	0/1
								Stop or switch off							
Not valid	2/3	0/0 1/1													
4.38/2	Report of the train power supply (on tractive units driven by a diesel engine)	07	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainsets	Train power supply is running or is switched on	2 ea BOOLEAN	58	2/3	1/0			
								Train power supply starts or is switched off						2/3	0/0
								Train power supply is stopped or switched off							
								error						2/3	1/1
4.39	Preheat cooling water	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Preheat cooling water on!	BITSET8	58	4	1			
								Preheat cooling water off!						0	
4.40	Transmission high gear /low gear	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the leading vehicle (loco driver, V-controller, signal system)	Transmission high gear	BITSET8	58	5	1	On the leading vehicle the transmission switch is in the selection „high gear“		
								Transmission low gear (default)					0	On the leading vehicle the transmission switch is in the selection „low gear“	
4.41	Control of tilt equipment	02	64 ldg. veh.	66 all vehs.	20	R1	Process control of the driving vehicle	Release tilting equipment	BITSET8	63	0	1			
								Lock tilting equipment						0	
								Switch on tilting equipment						1	1
								Switch off tilting equipment						0	
4.42	Reporting of selected direction of travel switched on	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainsets	Direction of travel is set in direction of vehicle 01	2 ea BOOLEAN	48	0/1	1/0			
								No direction of travel is set						0/1	1/1
								Opposite direction of travel to vehicle 01 is set						0/1	0/1
								Not valid						0/1	0/0

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
4.43	Report: Preheat operation	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Tractive vehicle is in preheating operation preheating operation is on! preheating operation is off!	BOOLEAN	58	4	1 0	
4.44	Report of the transmission position	03	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Transmission is in fast gear position Transmission is in slow gear position	BOOLEAN	58	5	1 0	On the leading vehicle the report „fast gear“ is shown. On the leading vehicle the report „slow gear“ is shown.
4.45/1	Report of the possible traction power available	03 05	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Available traction power in X% X=100 if installed traction power is at maximum	BIPOLAR 2.16/ -100%.. +100%	61 + 62		NNN	
4.45/2	Report of the possible dynamic braking power available	03 05	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Available braking power in Y% Y=100 if installed braking power is at maximum	BIPOLAR 2.16/ -100%.. +100%	63 + 64		NNN	
4.46/1	Tractive unit is able to apply the eddy-current brake	03 05	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Tractive unit or set of wagons is able to brake with the eddy-current brake Is able to brake with the eddy-current brake Is not able to brake with the eddy-current brake	BOOLEAN	71	0	1 0	
4.46/2	Target value for the eddy-current brake (command from the leading vehicle)	02	64 ldg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	Target value for the eddy-current brake (command from the leading vehicle) in %	BIPOLAR 2.16/ -100%.. +100%	67 + 68			
4.46/3	Eddy-current brakes effective value	03 05	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	Eddy-current brakes effective value in %	BIPOLAR 2.16/ -100%.. +100%	69 + 70			
4.46/4	Report of the available possible eddy-current brake force	03 05	65 driven tractive unit	64 ldg. veh.	02	R2	Process control of the driven tractive unit or trainset	max. instantly possible eddy-current brake force	BIPOLAR 2.16/ -100%.. +100%	67 + 68			
4.47	Command: call of add on informations	02 05	64 ldg. veh.	NN driven veh.	21	E	Process control of the driving vehicle	Command: call of add on informations:	ENUM8	7+8		0x4047 1	
4.47A	Report: add on informations	21	NN	64 ldg. veh.	02 05	E	Process control of the vehicle		ENUM8	7+8		0x4A47	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Add on informations are reported:	ENUM8	9		1	
								Vmax of the vehicle	Unipolar 2.16/ 0.. 400% = 100 % = 256 km/h	11 + 12			
								Lenght of the vehicle	Unipolar 2.16 0..400% = 100% = 10 m	13 + 14			
								Reserve		15 - 64			
4.48	Parking mode request	02	64 Idg. veh.	65 driven tractive unit	03	R1	Process control of the driving vehicle	Parking Request:	BITSET8	69	0/1		
							No Parking request					0/0	
							Parking ON request					1/0	
							Parking OFF request					0/1	
							Exit Parking mode					1/1	
4.49	Parking mode status	03	65 driven tractive unit	64 Idg. veh.	02	R2	Process control of the driven tractive unit or trainset	Parking Status:	2 ea BOOLEAN	66	4/5		
							Parking ON progress					0/1	
							Parking ON					1/1	
							Parking OFF progress					1/0	
							Parking OFF					0/0	
4.50	Collective command: parking brake apply/release	02 06	64 Idg. veh.	66 All vehs.	06	R1	Process control of the driving vehicle	Parking brake:	BITSET8	69	2/3		This command must be used, if the implementation is done with UIC leaflet 647
							apply !					1/0	All driven vehicles apply the spring energy brake.
							release !					0/1	All driven vehicles release the spring energy brake.
							Hold					1/1	
							Error					0/0	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
5 Brakes													
5.1	EP-brakes apply/release	06 02	64 ldg. veh.	66 all vehs.	06	R1	Operate brake controller	EP-brakes: Apply Hold Release Not valid	2 ea BOOLEAN	59	0/1	1/0 0/0 1/1 0/1 1/1	
5.2/1	Set value for air-, friction brakes	06 02	64 ldg. veh.	66 all vehicles	06	R1	Operate brake controller	Set value in % of the full brake force	Unsigned8 NNN 0-255 100=100%	60		NNN	
5.2/2	Set value for the eddy-current brake	06 02	64 ldg. veh.	66 all vehicles	06	R1	Operate brake controller	Set value in % of the full brake force	Unsigned8 NNN 0-255 100=100%	61		NNN	
5.3	Report brake data	02	64 ldg. veh.	66 all vehicles	06	E	Operation of the corresponding switch	Report brake data	ENUM8 ENUM8	7+8 9		0x5003 1	
5.3A	Information 5.3 received and processed, brake data is reported	06	66 all vehicles	64 ldg. veh.	02	E		Vehicle NN Telegram code Type of brake in use: R + E ₁₆₀ R + E R + H R + Mg R + WB R red R white P + E P G Brake switched out Type of brake not known Total weight Braked weight R + E ₁₆₀ Braked weight R + E Braked weight R + H Braked weight R + Mg	ENUM8 ENUM8 ENUM8	5 7+8 9		NN 0x5A03 1 2 3 4 5 6 7 8 9 10 254 255 NNN,N NNN,N NNN,N NNN,N NNN,N	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Braked weight R + eddy current	Unsigned16	21+22		NNN,N	
								Braked weight R red	Unsigned16	23+24		NNN,N	
								Braked weight R white	Unsigned16	25+26		NNN,N	
								Braked weight P + E	Unsigned16	27+28		NNN,N	
								Braked weight P	Unsigned16	29+30		NNN,N	
								Braked weight G	Unsigned16	31+32		NNN,N	
								Reserve		33-36			
5.4	All compressed air brakes or friction brakes of the vehicle or trainset applied/released	06	66 all vehs.	64 ldg. veh.	01 02 06	R3	Sensor mechanism on the brakes e.g. brake cylinder pressure >0,3 bar/ < 0,1 bar	(Vehicle NN)	2 ea. BOOLEAN	23	0/1	(NN)	
								Compressed air brake or friction brake: Applied (≥ 0, 4 bar)				1/0	
								Released (≤ 0, 2 bar)				0/1	If all vehicles are sending this report, then on the leading vehicle the report „brake released“ is shown. This report is only shown if also all vehicles are sending the report „vehicle takes place on the brake test“.
								Switched off				0/0	
								Not valid				1/1	
5.5/1	All Mg brakes of the vehicle or trainset applied/released	06	66 all vehs.	64 ldg. veh.	01 02 06	R3	Sensor mechanism on the Mg brakes regarding flatness and current flow in the Mg brake	(Vehicle NN) Mg brake: Applied or lapped	2 ea. BOOLEAN	23	2/3	(NN)	
								Released or in overcharge				1/1	
								No Mg-brakes existent or all Mg-brakes shut down				0/0	
								Not valid				1/1	
5.5/2	All eddy current brakes of the vehicle or trainset applied/released	06	66 all vehs.	64 ldg. veh.	01 02 06	R3	Sensor mechanism on the eddy current brake regarding flatness as well as current flow in the eddy current brake	(Vehicle NN) Eddy current brakes: Applied	2 ea. BOOLEAN	23	6/7	(NN)	
								Released				1/0	
								No eddy current brake existent or all eddy current brakes shut down				0/0	
								Not valid				1/1	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
5.6	Report: hand, parking or holding brake	06	66 all vehs.	64 ldg. veh.	01 06	R3	Sensor mechanism of the hand, parking or holding brake	(Vehicle NN) Hand, parking or holding brake: Applied Release condition Leave released not available or shut down	2 ea. BOOLEAN			(NN)	
										23	4/5	1/0 1/1 0/1 0/0	
5.7	Determination of the pressure in the main air reservoir pipe	06	66 all vehs.	64 ldg. veh.	01 02 06	R3	Pressure in main brake pipe > 7 bar/ < 5 bar	(Vehicle NN) Pressure in main brake pipe > 7 bar < 5 bar	BITSET8	24	2	(NN)	
												1 0	
5.8	Emergency brake applied	06	MM	64 ldg. veh.	06 01	R3	Operation of the emergency brake	(Vehicle NN) Emergency brake operated Emergency brake not operated	BITSET8	24	1	(NN)	On the leading vehicle the report „emergency brake“ is shown and the emergency brake is applied.
												1 0	
5.9	Emergency brake shorted	06	64 ldg. veh.	66 all vehs.	06	R1	Operation of the emergency brake release by driver	Emergency brake shorted out Emergency brake not shorted out	BITSET8	59	7	1	On the driven vehicles an applied emergency brake is switched to an inoperative state
												0	
5.10	Emergency brake shorting is operable	06	MM each vehicle fitted with NBÜ	66 all vehs.	01 02 06	R3	Self monitoring of the NBÜ	(Vehicle NN) Emergency brake shorting is operational Emergency brake shorting is not operational or does not exist	BITSET8	24	0	(NN)	
												1 0	
5.11	NBÜ-test initiated in the last coach	01 02 06	64 ldg. veh.	84 last coach	06	E	Process control of the driving vehicle	Simulate emergency brake (=closing of the contact “emergency brake test“)	ENUM8	7+8		0x5011	
									ENUM8	9		1	
5.11A	information 5.11 received and processed	06	84 last coach	64 ldg. veh.	11	E		Red indicator light “emergency brake“ flashes and white indicator light “emergency brake function“ lights Status	ENUM8	7+8		0x5A11	
									ENUM8	9		HH	
5.12	Brake test running	06	64 ldg. veh.	66 all vehs.	01 02 06	R3	Process control of the driving vehicle	At the time an automated brake test is carried out At the time an automated brake test is not carried out	BITSET8	24	3	1	
												0	

Serial No.	Purpose	Information route				Type of telegram	Display and processing								
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use		
		Fctn	Veh	Veh	Fctn										
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20		
5.13	Fast brake command	06 02	64 ldg. veh.	66 all vehs.	06	R1	Operation of the brake controller or process control of the leading vehicle	Carry out fast brake application	BITSET8	59	2	1	On all vehicles the fast brake applies (the refilling is aborted).		
								Not Carry out fast brake application				0			
5.14	Control of the magnetic rail brake	06 02	64 ldg. veh.	66 all vehs.	06	R1	Operation of the brake controller or process control of the leading vehicle	Apply Mg brake			3	1			
								Release Mg brake				0			
5.15	Control of the eddy current brake	06 02	64 ldg. veh.	66 all vehs.	06	R1	Operation of the brake controller or process control of the leading vehicle	Eddy-current brake for fast brake:			4				
								unlocked				1			
								locked				0			
								Eddy-current brake for service brake:							
											5				
												1			
												0			
5.16	Report of the motor brake	03	65 driven tractive unit	64 ldg. veh.	02 06	R2	Process control of the driven tractive vehicle or trainset	Motor brake is operable	BOOLEAN	48	4	1	On the display of the leading vehicle the report „E-brake“ is shown. (only special design series).		
								Motor brake is not operable				0			
6 Completeness of the train															
6.1	Vehicle No. NN = last vehicle present	11	68 last vehicle	64 ldg. veh.	02	R3	regular sign of life	(Vehicle NN) = last vehicle	BITSET16	10	0	1			
								Vehicle NN is not the last vehicle				0			
6.2	Train tail light switch on/switch off	11	64 ldg. veh.	68 last vehicle	02	E	Operation by driver	Train tail light:	ENUM8	7+8			0x6002		
								On					9		1
								Off							0
6.2A	Information 6.2 received and processed	02	68 last vehicle	64 ldg. veh.	11	E			ENUM8	7+8		0x6A02			
								Status				9		HH	
6.4	Train tail light check	11	68 last vehicle	64 ldg. veh.	02	R3	Sensor on train tail light	(last Vehicle) Train tail light is on	BITSET16	10	1	1			
								Train tail light is off				0			

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
6.5	Check connection of automatic coupling	11	68 last coach	64 ldg. veh.	02	R3	Sensor on the automatic coupling	(last Vehicle) Automatic coupling on the side turned away from vehicle 01 occupied Regarding vehicle 01 on the side turned away from vehicle 02 Above named couplings are not occupied		10	2	1	0
7 Air conditioning equipment													
7.1	Air conditioning equipment on (also preheating, precooling)/off/ operational	13	MM	67	13	E	Operation of air conditioning equipment of the train: On	Air conditioning equipment: On Off Operational	ENUM8 ENUM8	7+8 9		0x7001 1 0 2	At the leading vehicle the normal operation is suppressed. Only frost free operation is applied
7.1A	Information 7.1 received and processed	13	67	MM	13	E	Status		ENUM8	7+8 9		0x7A01 HH	
7.2	Report air conditioning equipment data	13	MM	66/80	13	E	Preheating/precooling		ENUM8 ENUM8	7+8 9		0x7002 1	
7.2A	Information 7.2 received and processed, air conditioning equipment data is reported	13	66/80	MM	13	E	Vehicle NN		ENUM8 ENUM8	5 7+8		NN 0x7A02	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Climatic data heating Category H1 Category H2 Category H3 Category H4 Category H5 Category H6 Category H7 Category H8 Category H9 Category H10 Climatic data cooling Category K1 Category K2 Category K3 Category K4 Category K5 Category K6 Category K7 Category K8 Category K9 Category K10	ENUM8	9		1-10 21-30	
8 Diagnosis													
8.1	Flashing of the fault light indicator in all vehicles	09	MM	67 all vehs.	09	R3	Diagnostic computer reports the priority A faults	(Vehicle MM)				(MM)	
								≥1 local unacknowledged A-fault present	BITSET8	25	0	1	
								≥1 current A fault present			1	1	
								≥1 A-fault present			2	1	
								≥1 cry for help	BITSET8	29	6	1	
8.2	Remote acknowledgment of unacknowledged A defects	09	NN	MM	09	E	Operation of the I-button	i-button operated indicator for diagnostic results in order	ENUM8	7+8		0x8002	
									ENUM8	9		1	
8.2A	Information 8.2 received and processed	09	MM	NN	09	E		Code	ENUM8	7+8		0x8A02	
								Status	ENUM8	9		1	Acknowledge of unacknowledged A-faults

Serial No.	Purpose	Information route				Type of telegram	Display and processing										
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use				
		Fctn	Veh	Veh	Fctn												
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20				
8.3	Request for the transmission of diagnostic results	09	MM	NN	09	E	Use of the diagnostics in any vehicle (veh MM) as specified in UIC 557 Appendix 7	vehicle MM	ENUM8	5		MM					
									Send diagnostic results to vehicle MM	ENUM8	7+8		0x8003				
									Status	ENUM8	9		1				
									Choose the priorities to be transmitted	BITSET16	11	0					
									A comes							..0	
									no							..1	
									yes								
									A goes						1	..0	
									no							..1	
									yes								
									B comes						2	..0	
									no							..1	
									yes								
									B goes						3	..0	
								no							..1		
								yes									
								C comes			4	..0					
								no				..1					
								yes									
								C goes			5	..0					
								no				..1					
								yes									
								A1 comes			6	..0					
								no				..1					
								yes									
								A1 goes			7	..0					
								no				..1					
								yes									
								B1 comes		12	0	..0					
								no				..1					
								yes									
								B1 goes			1	..0					
								no				..1					
								yes									
								Reserve			2-7						

Serial No.	Purpose	Information route				Type of telegram	Display and processing							
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use	
		Fctn	Veh	Veh	Fctn									
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20	
								Select the history to be transmitted: Only last entry last 2 entries last n entries all	ENUM8	13			1 2 n 255	
								Select the faults to be transmitted according to the read out status: only non local acknowledged faults only faults not yet read out from the leading vehicle only non acknowledged faults only faults not yet read out all faults	ENUM8	14			1 2 129 130 255	
								Reserve		15				
								Number of the maximum diagnostic events in an 8.3A telegram to be transmitted	Unsigned8	16			HH	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Select text type	ENUM8	17			
								No text				0	
								Conductor-text				1	
								Examiner-text				2	
								Driver-text				3	
								Short text				4	
								Reserve				5-9	
								Driver remedy text when stationary (v=0) for unoccupied tractive vehicle				10	
								Driver remedy text when moving (v>0) for unoccupied tractive vehicle				11	
								Driver remedy text when stationary (v=0) for occupied				12	
								Driver remedy text when running (v>0) for unoccupied tractive vehicle				13	
								Free for national use				128-255	
								Railway administration of the stopping place	Unsigned8	18			
								UIC				0	
								e.g. DB AG				80	
								e.g. SBB				85	
								...					
								Desired language	CHAR[2]	19+20			
								Basic installation of the language on the responding vehicle otherwise two ASCII-signs as specified in ISO-2 letter-language-code e.g for German for French for Italian				„\0\0„	
								Ambient data with transmission?		21			
								No				0	
								Yes				1	
								Reserve		22			

Serial No.	Purpose	Information route				Type of telegram	Display and processing							
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use	
		Fctn	Veh	Veh	Fctn									
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20	
								Start fault code	Unsigned16	23+24		HHHH		
								Time stamp of the start fault code	Time48	25-30				
								Offset to start fault-code from start code n faults backwards	Integer8	31		- n -(1 ≤ n ≤ 127)		
								with start fault code beginning forwards				0		
								with from start fault code next entry forwards				1		
								not allowed				- n -(2 ≤ n ≤ 127)		
								Reserve		32-36				
8.3A	Transmission of diagnostic results	09	NN	MM	09	E	Arrival of the telegram 8.3	Vehicle NN	ENUM8	5		NN		
							Kopfinformation	(Owning railway)	ENUM8	1		(NN)		
								Code	ENUM8	7+8			0x8A03	
								Status	ENUM8	9			HH	
								Number of the diagnostic events transmitted in this telegram	Unsigned8	11			0 n (1 ≤ n ≤ 255)	
								Number of diagnostic events still to be transmitted	Unsigned8	12			0 n (1 ≤ n ≤ 254) 255	
								no more still n diagnostic events						
								still 255 or more diagnostic events						
								Status of the supported priorities	BITSET8	13	0			
							A is supported					..0		
							No					..1		
							yes							
							B is supported			1		..0		
							no					..1		
							yes							

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								C is supported no yes			2	..0 ..1	
								A1 is supported no yes			3	..0 ..1	
								B1 is supported no yes			4	..0 ..1	
								Reserve			5-7		
								Reserve			14-16		
								Status text-type requested text type could not be supplied required text type was supplied	ENUM8		17	0 1	
								Status railway of the stopping place is not supported may deliver only UIC Railway is not supported	ENUM8		18	0 1	
								Language supplied: Two ASCII-signs as specified in ISO-2 Letter-Language- Code e.g. for German French Italian	CHAR[2]		19+20	„de“, „fr“, „it“,	
								Language status does not know requested language, may supply text in language of the basic installation required text was delivered	ENUM8		21	..0 ..1	
								Reserve			22		
							1. Detail-data block	Long diagnostic results	Unsigned16		23+24		
								Fault status and priority	BITSET8		25	0	
								A-fault no yes				..0 ..1	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								B-fault no yes			1	..0 ..1	Signalisation, if there are remedies existent (if yes: order by 8.8)
								C-fault no yes			2	..0 ..1	
								A1-fault no yes			3	..0 ..1	
								B1-fault no yes			4	..0 ..1	
								Fault status goes comes			5	..0 ..1	
								remedy inexistent existent			6	..0 ..1	
								Reserve			7		
								Frequency since last memory clearing	Unsigned8	26		NN	
								Conductor-Code	UNSIGNED16	27+28		HHHH	
								Examiner-Code	UNSIGNED16	29+30		HHHH	
								Driver code	UNSIGNED16	31+32		HHHH	
								Fault code	UNSIGNED16	33+34		HHHH	
								Come-time stamp	TIMEDATE48	35-40			
								Go-time stamp	TIMEDATE48	41-46			
								Reserve		47+48			
								Length of the text no text length: (even number)	UNSIGNED16	49+50		0 n (2 ≤ n ≤ 65334)	

Serial No.	Purpose	Information route				Type of telegram	Display and processing							
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use	
		Fctn	Veh	Veh	Fctn									
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20	
								Text	UNICODE 16 [length of text]	51 to (51+ text length -1)				
								Length of surrounding field data No surrounding field data Length: (even number)	UNSIGNED 16	(51+ text length) + (51+ text length +1)		0 n (2 ≤ n ≤ 65334)		
								Surrounding field data	CHAR [Length of surrounding field]	(51+ text length +2) to (51+ text length +2 +surrounding field length -1)				

Serial No.	Purpose	Information route				Type of telegram	Display and processing									
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use			
		Fctn	Veh	Veh	Fctn											
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20			
							2. Detail-data block	next diagnostic result		from (23+ length of 1. diagnostic result)						
							3. Detail-data block	Next but one diagnostic result		from (23+ length of 1. diagnostic result) + length of 2. Diagnostic result)						
														
8.4R	Status of the error report to the leading vehicle (A1-fault) as specified by UIC 557	09	66 all veh	64 ldg veh	09 02 19	R3	Diagnostic computer reports presence of fault of priority A1	(Vehicle MM)				(MM)	On the leading vehicle the display shows the distortion report: „defect running gear“			
							≥1 not interrogated A1-fault present	BITSET8	25	4	1					
						≥1 A1-fault present										
						≥1 A-fault gone										
						blocked										
							Individual fault reports as specified in UIC 557	BITSET8	26	0	1					
						Slide-/slip protection defective										
						Air brake or friction brake do not apply										
						Air brake or friction brake seized										
						Mg-brake defective										
						Eddy current brake defective										
						Emergency brake shorted										
						Brake diagnostics defective										

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								EP-brake defective	Bitset16	27	0	1	On the leading vehicle the defect report „fire“ is shown
							EP-brake switched out	1			1		
							Fire alarm	2			1		
							Hot box stage 1	3			1		
							Roll monitoring of all wheelsets	4			1		
							Running gear defect	5			1		
							≥1 drive train defective	6			1		
							≥1 drive train switched off	7		1			
							≥1 motor brake defective	28		0	1		
							≥1 motor brake switched off			1	1		
							Tilting equipment defective			2	1		
							Train power supply defective			3	1		
							Battery charger defective			4	1		
							blocked			5-7			
							Traction value over limit		Bitset8	29	0	1	
							Diesel traction fails	1			1		
							E-traction fails	2			1		
							Bord energy system defective	3			1		
							Warning critical operation status	4			1		
							Waiting to be ready to operate	5			1		
							blocked	6-7					
8.7	Request for sum of defects report	09	MM	NN	09	E	Operation of the collective interrogation in any vehicle (veh MM)	Vehicle MM	ENUM8	5		MM	All vehicles are requested to give the sum of defects report. (The sequence, in which the vehicles are requested has to be optimised with the target of the shortest situation production times)
									ENUM8	7+8		0x8007	
								Send sum of defects report to the vehicle MM	ENUM8	9		1	
8.7A	Sum of defects reporting	09	NN	MM	09	E		Code	ENUM8	7+8		0x8A07	
								Status	ENUM8	9		HH	
								Number of faults: (Value = 255 means number ≥ 255)					
								Pri A comes	Unsigned8	11		HH	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								goes	Unsigned8	12		HH	
								Pri B comes	Unsigned8	13		HH	
								goes	Unsigned8	14		HH	
								Pri C comes	Unsigned8	15		HH	
								goes	Unsigned8	16		HH	
								Pri A1 comes	Unsigned8	17		HH	
								goes	Unsigned8	18		HH	
								Pri B1 comes	Unsigned8	19		HH	
								goes	Unsigned8	20		HH	
								Reserve		21-26			
8.8	Request for the transmission of remedies for a diagnostic result or of tests	09	MM	NN	09	E	Use of the diagnostics in any vehicle (veh MM) as specified in UIC 647	Vehicle MM	ENUM8	5		MM	
								Order to send remedies of a diagnostic result or order to send tests to vehicle MM	ENUM8	7+8		0x8008	
								Status	ENUM8	9		1	
								Choice of the kind of remedy or tests	ENUM8	11			
							undefined				0		
							Remedy for train conductor				1		
							Remedy for examiner				2		
							Reserve for other remedies				3-9		
							Remedy text for the driver if the train stand still (v=0) and the tractive unit is unallocated				10	Relevant for UIC 647	
							Remedy text for the driver if the train move (v>0) and the tractive unit is unallocated				11		

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Remedy text for the driver if the train stand still (v=0) and the tractive unit is allocated				12	
								Remedy text for the driver if the train move (v>0) and the tractive unit is allocated				13	
								Tests				14	
								Free for international use				15-128	
								Free for national use				128-255	
								railway of the habitation UIC z.B. DB AG z.B. SBB ...	Unsigned8	12		0 80 85	To choose different remedies or tests dependent of the railway of the habitation
								Desired language basic setting of the language on the answering vehicle else two ASCII letters according to ISO-2 letter language code e.g. german french italian	CHAR[2]	13+ 14		„\0\0,“ „de,“ „fr,“ „it,“	
								Error code	Unsigned16	15+ 16		HHHH	Error code and time code
								Zeitstempel des Fehlercodes	Timedate48	17- 22			are together the choice of the event
								Reserve		23- 36			
8.8A	Transmission of tests or remedies of a diagnostic result	09	NN	MM	09	E	Arrival of the telegram 8.8	Vehicle NN	ENUM8	5		NN	
								(Owning railway)	ENUM8	1		(NN)	
								Code	ENUM8	7+8		0x8A08	
								Status	ENUM8	9		HH	

Serial No.	Purpose	Information route				Type of telegram	Display and processing								
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use		
		Fctn	Veh	Veh	Fctn										
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20		
								Error code	UNSIGNED16	11-12		HHHH	Values same as telegram 8.8 octet 11		
								Time code	TIMEDATE48	13-18					
								Status Test or kind of remedy	ENUM8	19					
								Unable to deliver ordered tests or kind of remedy						0	
								ordered tests or kind of remedy was delivered						n>0	
								Status railway of the habitation	ENUM8	20			Same as telegram 8.8 octet 12		
								Deliver only UIC (ordered not supported or UIC was ordered)					0		
								Ordered railway e.g. DB AG e.g. SBB ...					n		
								Delivered language: two ASCII letters according to ISO-2 Letter Language Code e.g. German French Italian	CHAR[2]	21-22		„de„ „fr„ „it„			
								Status language	ENUM8	23					
								Do not know ordered language, deliver text in default language					..0		
								Ordered language was delivered					..1		
								Number of remedies or tests (authorisation keys)	Unsigned8	24			n (1 ≤ n ≤ 8)		
								Reserve		25-30					

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
							1. Remedy or test detail data block	Length of the remedy or test	UNSIGNED D 16	31+ 32			
							Allocated key "F1" "F2" "F3" "F4" "F5" "F6" "F7" "F8"	ENUM8	33			1 2 3 4 5 6 7 8	Labeling of the allocated key
							Reserve			34			
							Text length No text length: (even number)	UNSIGNED D 16	35+ 36			0 n (2 ≤ n ≤ 255)	
							Text of the remedy or test	UNICODE 16 [length of the text]	37 to (37+ text length -1)				
							2. Remedy or test detail data block	Next remedy or test		From (31+ length of detail data block -1)			

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
							3. Remedy or test detail data block	Next but one remedy or test		From (31+ length of 1.detail data block + length of 2.detail data block)			
											
8.9	Demand of a detailed fault report of driven tractive units	09	64 ldg veh	65 driven tractive units	09	E	Operation of the enquiry on the leading vehicle (where required automatic cyclic call with an interval of ≥5 seconds)	Send detailed fault reports to the vehicle MM	ENUM8 ENUM8	7+8 9		0x8009 1	
8.9A	Detailed fault reports to the leading vehicle	09	65 driven tractive units	64 ldg veh	09	E	Report detailed faults to the leading vehicle	Code	ENUM8	7+8		0x8A09	If there are actual faults, then the fault bits of the column „use“ in telegram 8.4 must are set
								Status	ENUM8	9		HH	
							Detailed fault	Open door 1 (1L)	BITSET8	11	0	1	Door defect
							Open door 2 (1R)	1			1		
							Open door 3 (2L)	2			1		
							Open door 4 (2R)	3			1		
							Open door 5 (3L)	4			1		
							Open door 6 (3R)	5			1		
							Defect of the door control	6	1				
							slip/slide protection defective	7	1				slip/slide protection defective
							automatic train stopping valve locked	BITSET8	12	0	1		Air brake or friction brake is not applied
						Brake not applied (released)	1			1			
						Direct brake not operative	2			1			
						Brake bogie 1 locked	3			1			
							Brake bogie 2 locked	4	1				

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Brake bogie 1+2 locked			5	1	
								Drivers valve switched off			6	1	
								Pneumatic brake not released			7	1	Air brake or friction brake seized
								Direct brake driven tractive vehicle/driving trailer applied	BITSET8	13	0	1	
								High braking operative?			1	1	
								Mg-brake defective			2	1	Mg-brake defective
								WB-brake defective			3	1	WB-brake defective
								Emergency brake shorted			4	1	Emergency brake shorted
								Brake diagnosis defective			5	1	Brake diagnosis defective
								EP-brake defective			6	1	EP-brake defective
								EP-brake switched off			7	1	EP-brake switched off
								Not all axles roll	BITSET8	14	0	1	Roll monitoring of all axles
								axle 1 does not roll			1	1	
								axle 2 does not roll			2	1	
								axle 3 does not roll			3	1	
								axle 4 does not roll			4	1	
								axle 5 does not roll			5	1	
								axle 6 does not roll			6	1	
								Spring energy brake locked			7	1	
								Release spring energy brake /stop brake	BITSET8	15	0	1	
								Smoke in the machine room			1	1	Fire detector
								Axle box overheating axle 1			2	1	Hot box step 1
								Axle box overheating axle 2			3	1	
								Axle box overheating axle 3			4	1	
								Axle box overheating axle 4			5	1	
								Axle box overheating axle 5			6	1	
								Axle box overheating axle 6			7	1	

Serial No.	Purpose	Information route				Type of telegram	Display and processing							
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use	
		Fctn	Veh	Veh	Fctn									
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20	
								Respond of the running gear monitoring bogie 1	BITSET8	16	0	1	Fault of the running gear	
							Respond of the running gear monitoring bogie 12	1			1			
							Air spring bogie 1 is defective	2			1			
							Air spring bogie 2 is defective	3			1			
							Traction motor 1 (manual) switched off				4	1	≥1 drive chain switched off	
							Traction motor 2 (manual) switched off				5	1		
							Traction motor 3 (manual) switched off				6	1		
							Traction motor 4 (manual) switched off				7	1		
							Traction motor 5 (manual) switched off	BITSET8	17	0	1			
							Traction motor 6 (manual) switched off			1	1			
							CCU 1 switched off			2	1			
							CCU 2 switched off			3	1			
							CCU 1+2 switched off				4	1		
							Traction motor 1 defective				5	1		≥1 drive chain defective
							Traction motor 2 defective				6	1		
							Traction motor 3 defective				7	1		
							Traction motor 4 defective	BITSET8	18	0	1			
							Traction motor 5 defective			1	1			
							Traction motor 6 defective			2	1			
							CCU 1 defective			3	1			
							CCU 2 defective			4	1			
							CCU 1+2 defective			5	1			
							Traction system not ready			6	1			
							Too high temperature, temperature of the traction unit higher than the switch off temperature				7	1		

Serial No.	Purpose	Information route				Type of telegram	Display and processing								
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use		
		Fctn	Veh	Veh	Fctn										
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20		
								Cooling unit defective	BITSET8	19	0	1			
								Hydraulic transmission defective			1	1			
								One bogie fails			2	1			
								All bogies fail			3	1			
								Traction locked			4	1			
								E-brake defective			5	1		≥1 motor brake defective	
								E-brake switched off			6	1		≥1 motor brake switched off	
								Tilt equipment defective			7	1		Tilt equipment defective	
								Train power supply defective	BITSET8	20	0	1	Train power supply defective		
								Vmax exceeded			1	1	Traction value exceed the limit		
								Coupling hook load value exceed the limit or longitudinal compressive force exceeded			2	1			
								Oil pump stands still			3	1	Break down of diesel traction		
								Diesel engine defective			4	1			
								reserve			5	1			
								Overvoltage protection responds			6	1	Break down of E-traction		
								Frontier-guard of the primary current has respond			7	1			
								100 Hz – monitoring has respond			BITSET8	21	0	1	
								Pantograph locked					1	1	
								Pantograph not raised	2	1					
								Compressed air too low for the main switch	3	1					
								Main switch locked	4	1					
								train power system defective	5	1			train power system defective		
								Fuel absence (<20% of max. fuel capacity)	6	1			Warning critical operation status		
								Cable external power supply	7	1					

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Coolant too low, warm up required	BITSET8	22	0	1	
								Reserve			1	1	
								Reserve			2	1	
								Reserve			3	1	
								Reserve			4	1	
								Reserve			5	1	
								Reserve			6	1	
								Reserve			7	1	
								Reserve	BITSET8	23-31			
								wait: change of pantograph	BITSET8	32	0	1	Waiting for operational readiness
								Wait: main switch closure lock			1	1	
								wait: CCU-regrouping			2	1	
								wait: AXI-regrouping			3	1	
								wait: Test train line contactors			4	1	
								wait: warm up is running			5	1	
								Reserve			6	1	
								Reserve			7	1	
								Reserve		33-48			
8.10	Demand to run the tests or remedies of a diagnostic result	09	MM	NN	09	E	Use of the diagnostics in any vehicle (veh MM) as specified in UIC 647	vehicle MM	ENUM8	5		MM	
								Demand to run the tests or remedies of a diagnostic result	ENUM8	7+8		0x800A	
								Status	ENUM8	9		1	
								Choice of the test or Kind of remedy of the related telegram 8.8A	ENUM8	11		n	Kind and
								Railway of the habitation of the related telegram 8.8A	Unsigned8	12		n	railway and
								Error code	Unsigned16	15+16		HHHH	error code and time code are
								Time code	Timedate48	17-22			together the definite reference of the event

Serial No.	Purpose	Information route				Type of telegram	Display and processing							
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use	
		Fctn	Veh	Veh	Fctn									
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20	
								Chooesd key „F1“ „F2“ „F3“ „F4“ „F5“ „F6“ „F7“ „F8“	ENUM8	23		1 2 3 4 5 6 7 8		
								Reserve		24-36				
8.10A	Acknowledge of the execution of the remedy/tests according to telegram 8.10	09	NN	MM	09	E	Arrival of the telegram 8.10	vehicle NN	ENUM8	5		MM		
							Head information	(Owning railway)	ENUM8	1		(NN)		
								Code	ENUM8	7+8		0x8A0A		
								Status	ENUM8	9		HH		
								Other remedy/test Inexistent existent	BITSET8	10	0	..0 ..1	Signalisation, if other remedies/tests available (if yes: order by 8.8)	
								Reserve			1-7			
								Reserve		11-15				
9	Passenger information													
9.1	Visual information for passengers: Route of train journey	14	MM	Group addresses	14	E	Operation of the passenger information system	Route of train journey	ENUM8	7+8		0x9001		
								Status	ENUM8	9		1		
								Show transmitted text	Unicode16 [Length of the text]	11-14				
								(=route)	Unicode16 [Length of the text]	15 ff				
9.1A	Information 9.1 erhalten und verarbeitet	14	Gruppe	MM	14	E		Information verarbeitet	ENUM8	7+8		0x9A01		
								Status	ENUM8	9		HH		
9.2	Visual information for passengers: Seat reservation	14	MM	NN	14	E	Operation of the passenger information system	Seat reservation	ENUM8	7+8		9002		
								Status	ENUM8	9		1		

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								For each seat No. NNN		11+1 2		NNN	
								Indicate seat reservation	Unicode16 [Length of the text]	13-x			
								For each seat No. NNN		x+1		NNN	
								Indicate seat reservation	Unicode16 [Length of the text]			
								:		
								:		
9.2A	Visual information for passengers: confirmation of seat reservation	14	NN	MM	14	E	Completion of the information 9.2	All seats reserved as planned	ENUM8	7+8		0x9A02	
								Status	ENUM8	9		HH	
9.3	Visual information for passengers: Next station stop	14	MM	67 all veh	14	E	Operation of the passenger information system	Next station stop	ENUM8	7+8		0x9003	
	-							Status	ENUM8	9		1	
								Indicate text transmitted	Unicode16 [Length of the text]	11- 14			
								=next station stop	Unicode16 [Length of the text]	15 ff			
9.3A	Information 9.3 received and processed	14	67 all veh	MM	14	E		Information processed	ENUM8	7+8		0x9A03	
								Status	ENUM8	9		HH	
9.4	Visual information for passengers: Train connections in the next station	14	MM	67 all veh	14	E	Operation of the passenger information system	Train connections	ENUM8	7+8		0x9004	
	-							Status	ENUM8	9		1	
								Show transmitted text	Unicode16 [Length of the text]	11- 14			
								=Connections	Unicode16 [Length of the text]	15 ff			
9.4A	Information 9.4 received and processed	14	67 all vehs.	MM	14	E		Information processed	ENUM8	7+8		0x9A04	
								Status	ENUM8	9		HH	
9.5	Visual information for passengers: Advertising	14	MM	67 all vehs.	14	E	Operation of the passenger information system	Advertising	ENUM8	7+8		0x9005	
								Status	ENUM8	9		1	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Advertising system		11-14		CODE	
								Show transmitted text (=transmitted text and graphics)	Unicode16 [Length of the text]	15 ff			
9.5A	Information 9.5 received and processed	14	67 all vehs.	MM	14	E		Information processed	ENUM8	7+8		0x9A05	
								Status	ENUM8	9		HH	
9.6	Call conductor	14	MM	67 all vehs.	14	E	Operation of the conductor's call button	Conductor should come to calling vehicle (MM)	ENUM8	7+8		(MM) 0x9006	
								Status	ENUM8	9		1	
9.6A	Information 9.6 received and processed	14	67 all vehs.	MM	14	E		Information processed	ENUM8	7+8		0x9A06	
								Status	ENUM8	9		HH	
9.7	Request stop	14	MM	64 ldg. veh.	14	E	Operation of the stop button by passengers	Indicator: Stop at next station	ENUM8	7+8		0x9007	on the leading vehicle stop request table shine „train stops“.
								Status	ENUM8	9		1	
9.7A	Request stop requested	14	64 ldg. veh.	MM	14	E	Operation by driver	Train stops at next station	ENUM8	7+8		0x9A07	
								Status	ENUM8	9		1	
9.8	Put current data into ticket cancellor	14	MM	67 all vehs.	14	E	Operation by Conductor or data output of computer, clock, etc	Cancellation data	ENUM8	7+8		0x9008	
								Status		9		1	
								Transmitted data		11-14		ASCII	
								Read into ticket cancellor		15 ff		ASCII	
9.8A	Information 9.8 received and processed	14	67 all vehs.	MM	14	E		Information processed	ENUM8	7+8		0x9A08	
								Status	ENUM8	9		HH	
9.9	Report: Next station stop	14 02	NN	66 all vehs.	14 02	R3	Passenger information system	Train stops at next station	BITSET8	21	6	1	At the leading vehicle the report „stop request“ is shown (storage till door release). The leading vehicle sends in the R1-telegram the signal „stop request applied“.

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
10 Power supply													
10.1R	Saving of electrical energy on	07	64 ldg. veh.	67 all vehs.	07	R1	Driver operation or radio signal	Carry out load shedding as agreed	BITSET8	62	6	1	
10.1E	Saving of electrical energy on/off (coach selective)	07	64 ldg. veh.	67 all vehs.	07	E	Driver operation or radio signal		ENUM8	7+8		0xA001	
								Carry out load shedding as agreed	ENUM8	9		1	
10.1A	Information 10.1E received and processed	07	67 all veh	64 ldg. veh.	07	E		Process information	ENUM8	7+8		0xAA01	
								Status	ENUM8	9		HH	
10.2	Report of the battery charger	07	NN	66 all vehs.	02 07	R3	Energy process control	Battery is being charged	BITSET8	19	3	1	
								Battery is not being charged					0
11 Group addressing													
11.01	Request to read a group	NN	1..63	1..63	15	E	Any vehicle	Code	ENUM8	7+8		0xB001	
								Status	ENUM8	9		1	
								Group number	UNSIGNED8	11		201..254	
11.01 A	Gruppenmitglieder	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xBA01	
								Status	ENUM8	9		0: accepted >200: faults	
								Gruppennummer	Unsigned8	11		201..254	
								Number of vehicles (= n)	Unsigned8	12		1..22	
								Group description	UNICODE 16 [32]	13 - 76			
								Description of vehicle 1	UIC Id	ARRAY Unsigned8	77 - 81		0..(2 ⁴⁰ - 1)
									TCN address	Unsigned8	82		0..63
									UIC address	Unsigned8	83		1..63
									Reserve		84		
								Description of vehicle n	As first vehicle		77+8 (n-1) : 76+8n		As first vehicle
11.02	Request to read a list of all groups	NN	1..63	1..63	15	E	Any vehicle	Code	ENUM8	7+8		0xB002	
								Status	ENUM8	9		1	
11.02 A	List of all groups	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xBA02	

Serial No.	Purpose	Information route				Type of telegram	Display and processing							
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use	
		Fctn	Veh	Veh	Fctn									
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20	
								Status	ENUM8	9		0: accepted >200: faults		
								Number of groups (= k)	Unsigned8	11		0....54		
								Reserve	Unsigned8	12		0		
							Description group 1	Group number	Unsigned8	13		NN		
								Number of vehicles in this group (= n ₁)	Unsigned8	14			1....22	
								Group description	UNICODE 16	15 . . 78			32 sign user defined	
							Description vehicle 1	UIC identification number (vehicle 1)	Unsigned8 [5]	79 . . 83		0..(2 ⁴⁰ - 1)		
								Reserve	Unsigned8	84			0	
								.	.	.				
							Description vehicle n	As vehicle 1		79+6 (n ₁ -1) : 78+6n ₁				
							Description group k	As first group		s ¹				
11.03	Request to write a group	NN	1..63	1..63	15	E	Group server	Code	ENUM8	7+8		0xB003		
								Status	ENUM8	9			1	
								Group number	UN-SIGNED8	11			201..254	
								Number of vehicles (= n)	UN-SIGNED8	12			1...22	
								Group description	UNICODE 16	13 . . 76			32 Sign user defined	
								Description vehicle 1	UIC identification number	Unsigned8 [5]	77 . . 81		0..(2 ⁴⁰ - 1)	
									Reserved	Unsigned8	82			0

¹ Octets, which are allocated for the description of the group k are: $13 + 66(k - 1) + 6 \sum_{i=1}^{k-1} n_i \dots 12 + 66k + 6 \sum_{i=1}^k n_i$

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
							Description vehicle n	As first vehicle		77+6 (n-1) : 76+ 6n			
11.03 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xBA03	
								Status	ENUM8	9		0: accepted >200: faults	
11.04	Request to write all groups	NN	1..63	1..63	15	E	Group-server	Code	ENUM8	7+8		0xB004	
								Status	ENUM8	9		1	
								Number of groups (= k)	Unsigned8	11		0..54	
								Reserve	Unsigned8	12		0	
							Description group 1	Group number	Unsigned8	13		201..254	
								Number of vehicles (= n ₁)	Unsigned8	14		1..22	
								Group description	UNICODE 16	15 . . 78		32 Sign user defined	
							Description vehicle 1	UIC identification number vehicle 1	Unsigned8 [5]	79 . . 83		0..(2 ⁴⁰ - 1)	
								Reserve	Unsigned8	84		0	
							Description vehicle n	as vehicle 1		79+6 (n ₁ -1) : 78+ 6n ₁			
Description group k	as first group		s ²										
11.04 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xBA04	
								Status	ENUM8	9		0: accepted >200: faults	
11.05	Request to delete a group	NN	1..63	1..63	15	E	Group-server	Code	ENUM8	7+8		0xB005	
								Status	ENUM8	9		1	

² Octets, which are allocated for the description of the group k are: $13 + 66(k - 1) + 6 \sum_{i=1}^{k-1} n_i \dots 12 + 66k + 6 \sum_{i=1}^k n_i$

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Group number	ENUM8	11		201..254	
11.05 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xBA05	
								Status	ENUM8	9		0: deleted >200: faults	
11.06	Request to delete all groups	NN	1..63	1..63	15	E	Group-server	Code	ENUM8	7+8		0xB006	
								Status	ENUM8	9		1	
11.06 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		BA06	
								Status	ENUM8	9		0: deleted >200: faults	
15 UIC Mapping Server													
15.01	Delete confirmed configuration	NN	1..63	1..63	15	E	Display	Code	ENUM8	7+8		0xF001	
								Status	ENUM8	9		1	
15.01 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xFA01	
								Status	ENUM8	9		0: accepted >200: faults	
15.02	Request to write, correction information	NN	1..63	1..63	15	E	TCN Master	Code	ENUM8	7+8		0xF002	
								Status	ENUM8	9		0: Inauguration result must be corrected 1: Inauguration result is confirmed without correction	
								Number of vehicles (= n) ³	Unsigned8	11		1..63	

³ If the inauguration result is only confirmed the telegram is only 10 octets long.

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Reserve	Unsigned8	12		0	
							Description vehicle 1	UIC Id		13 . . 17		0..(2 ⁴⁰ - 1)	
								Reserve	BOOLEAN	18	0..2	0	
								Vehicle already available	BOOLEAN	18	3	1: Vehicle already available 0: or	
								Reserve	BOOLEAN	18	4..7	0	
								Coach number for seat reservation	Unsigned16	19+20		0..65535	
							Description vehicle n	as first vehicle		13+(n-1)*8 . . 13+(n*8)-1		as first vehicle	
15.02 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xFA02	
								Status	ENUM8	9		0: accepted >200: faults	
15.03	Request to write coach number for seat reservation	NN	1..63	1..63	15	E	FIS	Code	ENUM8	7+8		0xF003	
								Status	ENUM8	9		1	
								Number of vehicles (= n)	Unsigned8	11		1...22	
								Reserve	Unsigned8	12		0	
							Description vehicle 1	UIC-Id		13 . . 17		0..(2 ⁴⁰ - 1)	
								Reserve	Unsigned8	18		0	
								Coach number for seat reservation	Unsigned16	19+20		0..65535	
							Description vehicle N	As first vehicle		13+(n-1)*8 . . 13+(n*8)-1		as first vehicle	
15.03 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xFA03	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Status	ENUM8	9		0: accepted >200: faults	
15.04	Request to change to silent service/request to delete	NN	1..63	1..63	15	E	User	Code	ENUM8	7+8		0xF004	
								Status	ENUM8	9		1: Request silent operation 0: Cancel request	
15.04 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xFA04	
								Status	ENUM8	9		0: accepted >200: Faults	
15.05	Request to forbid/allow train initiation	NN	1..63	1..63	15	E	User	Code	ENUM8	7+8		0xF005	
								Status	ENUM8	9		0: allow 1: forbid	
15.05 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xFA05	
								Status	ENUM8	9		0: accepted >200: faults	
15.06	Request to carry out a UIC inauguration	NN	1..63	1..63	15	E	User	Code	ENUM8	7+8		0xF006	
								Status	ENUM8	9		1	
15.06 A	Confirmation	15	1..63	1..63	NN	E		Code	Unsigned16	7+8		0xFA06	
								Status	Unsigned8	9		0: accepted >200: faults	
15.07	Request to send a multicast telegram ⁴	NN	1..63	1..63	15	E	TCN Master	Code	ENUM8	7+8		0xF007	
								Status	ENUM8	9		1	

⁴ Implicitly triggers a UIC inauguration with the sent telegrams 15.02 and 15.03.

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								MC target address	Unsigned8	11		0: this vehicle 66: all vehicles	
								MC target function	Unsigned8	12		NN	
								MC Service	ENUM8	13		1: MCP_SI MPLE	
								MC retry number	Unsigned8	14		0..15	
								MC Code	Unsigned16	15+16		Code of the MC telegram	
								MC Status	Unsigned8	17		Status of the MC telegram	
								MC Priority	Unsigned8	18		0: First come First served	
								MC telegram with length n	Unsigned8	19 . . 19+n		Telegram to be sent in multicast e.g. telegram types 15.2 and 15.3	
15.07 A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0xFA07	
								Status	ENUM8	9		0: request from UMS accepted >200: faults	
								call_id (Call identifier)	Unsigned16	11+12		0..65 535	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
0 Test telegrams													
0.01	Request to read the current NADI	NN	1..63	1..63	15	E	User	Code	ENUM8	7+8		0x0001	
								Status	ENUM8	9		1	
0.01A	Current NADI	15	1..63	1..63	NN	E	Description of the global part	Code	ENUM8	7+8		0x0A01	
								Status	ENUM8	9		0: accepted >200: faults	
								Inauguration frame-version	ENUM8	11		0..255 0: for non UIC-vehicles.	
								R-data version	ENUM8	12		0..255	
								NADI Status	ENUM8	13		0: actual configuration 1: confirmed configuration 2: Invalid configuration	
								topo_count	Unsigned8	14		1..63	
								Number of NADI entries (= n)	Unsigned8	15		0..255	
								Confirmed position of the vehicles that cannot be reached through the train bus (only valid in the confirmed condition)	BITSET8	16 . . 23		Example : Bit 0 placed in octet (=1) a non addressable vehicle with UIC address 1	
								UIC information reference direction relative to the TCN master	BOOLEAN	24	0	0: opposite 1: same	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								At least 1 train bus node available without confirmed UIC address			1	0: feature not available 1: feature available	
								At least 1 train bus node with confirmed UIC address cancelled			2	0: feature not available 1: feature available	
								Reserve			3	0	
								Reserve			4	0	
								Reserve			5	0	
								Reserve			6	0	
								Reserve			7	0	
								Reserve	Unsigned8	25		0	
							Description of vehicle 1	TCN-address	Unsigned8	26		1..63, 127	
							(first vehicle in reference direction front)	Number of checked vehicles	Unsigned8	27		-128 .. -2, 0...+127 (negative value means vehicle with several gateway s e.g. -2 is vehicle with 2 gateway s)	
								UIC address (serial number)	Unsigned8	28		1..63	
								Operating railway	ENUM8	29		z.B. DB	
								Owning railway	ENUM8	30		z.B. UIC	
								National application answer back code	ENUM8	31		0..255	
								National telegram version	ENUM8	32		0..255	
							Description trainset properties	Vehicle has sealed toilets	BOOLEAN	33	0		
						Vehicle is pressure tight		1					

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Vehicle has side selective door locking over train bus			2		
								Vehicle has side selective door locking not over train bus			3		
								Vehicle supports "close doors"			4		
								Vehicle supports door closed check			5		
								Vehicle supports WC use stop/release			6		
								Vehicle supports lighting control over train bus			7		
								Vehicle supports internal loudspeaker (choice of receipt)	34		0		
								Vehicle supports internal loudspeaker (obligatory receipt)			1		
								Vehicle supports speech connection to leading vehicle			2		
								Vehicle supports speech connection between leading vehicle and driven tractive vehicle			3		
								Vehicle has external loudspeaker			4		
								Vehicle supports external loudspeaker control			5		
								Vehicle supports public address of individual coaches or groups of coaches			6		
								Reserve			7		
								Tractive vehicle with electric drive	35		0		
								Tractive vehicle with diesel engine drive			1		
								Vehicle has = 2 pantographs			2		
								Vehicle has > 2 pantographs independent of one another			3		

Serial No.	Purpose	Information route				Type of telegram	Display and processing							
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use	
		Fctn	Veh	Veh	Fctn									
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20	
								Vehicle can remotely control the drive of other (electric) tractive vehicles with control equipment of type 1e by the train bus				4		
								Vehicle can remotely control the drive of other (diesel) tractive vehicles with control equipment of type 1d by the train bus				5		
								Vehicle can remotely control the drive of other (electric) tractive vehicles with control equipment of type 2e by the train bus				6		
								Vehicle can remotely control the drive of other (diesel) tractive vehicles with control equipment of type 2d by the train bus				7		
								Vehicle can remotely control the drive of other tractive vehicles with control equipment of type 3 by the train bus		36	0			
								The drive of the electric tractive vehicle with control equipment of type 1e can be remotely controlled by the train bus				1		
								The drive of the diesel tractive vehicle with control equipment of type 1d can be remotely controlled by the train bus				2		
								The drive of the electric tractive unit with control equipment of type 2e can be remotely controlled by the train bus				3		

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								The drive of diesel tractive vehicle with control equipment of type 2d can be remotely controlled by the train bus			4		
								The drive of the tractive vehicle with control equipment of type 3 can be remotely controlled by the train bus			5		
								Vehicle can remotely control the drive of other (tractive) vehicles but not by the train bus			6		
								The drive of the (tractive) vehicle can be remotely controlled but not by the train bus			7		
								Vehicle has speed controller for traction	37	0			
							Vehicle has a train line	1					
							Vehicle can remotely control the train line globally over the train bus	2					
							Vehicle can selectively control the train line by the train bus	3					
							Train line can be selectively remotely controlled by the train bus	4					
							Vehicle supports report "trainline on"	5					
							Vehicle supports report "trainline earthed"	6					
							Vehicle supports report "trainline externally supplied"	7					
							Vehicle supports fan remote control by train bus	38		0			
							Vehicle supports compressor remote control by train bus			1			

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Vehicle supports preset speed control target value			2		
								Vehicle supports fault reset			3		
								Vehicle supports "produce traction readiness"			4		
								Vehicle supports "Sand"			5		
								Vehicle supports "travel or prepare to travel..."			6		
								Vehicle supports "travel through tunnel"			7		
								Vehicle supports high current limitation		39	0		
								Vehicle supports "run through a neutral overhead line zone"			1		
								Vehicle supports start train power supply or switch on/shut down or switch off			2		
								Vehicle supports cooling water preheating			3		
								Vehicle supports transmission fast gear			4		
								Vehicle supports fast brake command			5		
								Vehicle supports control of the Mg brake			6		
								Vehicle supports release of the eddy current brake			7		
								Vehicle supports control of the eddy current brake		40	0		
								Vehicle supports tilting technology			1		
								Vehicle supports report of high current			2		
								Vehicle supports report of overhead line voltage			3		
								Vehicle supports report of train power supply			4		

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Vehicle supports report of preheating operation			5		
								Vehicle supports report of transmission fast gear			6		
								Vehicle supports report of diesel engine speed			7		
								Vehicle supports auxiliary control of the compressors		41	0		
								Vehicle supports report of max. possible tractive effort value			1		
								Vehicle supports report of max. possible brake force value			2		
								Vehicle supports report of actual traction value			3		
								Vehicle supports e.p. brake by train bus with control type 1			4		
								Vehicle supports e.p. brake by train bus with control type 2			5		
								Vehicle has e.p. brake but not by train bus			6		
								Vehicle supports emergency brake shorting by train bus			7		
								Vehicle has emergency brake shorting not by train bus		42	0		
								Vehicle has magnetic rail brakes			1		
								Vehicle supports magnetic rail brakes by train bus			2		
								Vehicle has motor brakes			3		
								Vehicle supports motor brakes by train bus			4		
								Vehicle has eddy current brakes			5		

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Vehicle supports eddy current brakes by train bus			6		
								Vehicle supports automated brake test			7		
								Vehicle reports motor brake is operational		43	0		
								Vehicle supports train tail light operation			1		
								Vehicle supports train tail light check			2		
								Vehicle supports automatic coupler engagement check			3		
								Vehicle supports control of the air conditioning equipment			4		
								Vehicle supports diagnostics: flashing fault indicator light and acknowledgement			5		
								Vehicle supports diagnostics: transmission of diagnostics results			6		
								Vehicle supports diagnostics: collected fault report to the leading vehicle			7		
								Vehicle supports diagnostics: individual fault report to the leading vehicle		44	0		
								Vehicle supports diagnostics: sum of fault reports			1		
								Vehicle supports electronic train route indicator			2		
								Vehicle supports "next station stop"			3		
								Vehicle supports "train connections in the next station stop"			4		
								Vehicle supports transmission of advertising			5		
								Vehicle supports "stop requested"			6		

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Vehicle supports data updating in ticket cancelling machine			7		
								Vehicle supports "energy saving" (collective command)		45	0		
								Vehicle supports "data channel"			1		
								Vehicle supports report of date and time			2		
								Vehicle has radio clock			3		
								Vehicle supports „run through washer“			4		
								Vehicle can remotely control the drive of other tractive units with control system 4 over the train bus.			5		
								Drive of the tractive vehicle with control system type 4 can be remotely controlled over the train bus			6		
								Vehicle supports report of traction resources			7		
								Vehicle supports report of additional informations		46	0		
								Vehicle supports parking mode			1		
								Vehicle supports diagnostics: report of detailed faults to the leading vehicle			2		
								Vehicle supports diagnostics: fault correction procedure			3		
								Vehicle supports diagnostics: tests			4		
								Vehicle supports safe data transmission			5		
								Reserve			6	0	
								Reserve			7	0	
								Reserve		47	0	0	
										54			
								Reserve	Unsigned8	55		0	

Serial No.	Purpose	Information route				Type of telegram	Display and processing								
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use		
		Fctn	Veh	Veh	Fctn										
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20		
							Reserve	Unsigned8	56			0			
							Description of vehicle specific properties	UIC Identification-number	Unsigned8 [5]	57 . . 61		0..(2 ⁴⁰ - 1)			
							Vehicle has 1 st class seats	BOOLEAN	62		0				
							Vehicle has 2 nd class seats				1				
							Vehicle has seats for smokers				2				
							Vehicle has seats for non smokers				3				
							Vehicle has equipment for the disabled				4				
							Vehicle has compartment for mother and child				5				
							Vehicle has a conference compartment				6				
							Vehicle has a Conductor's compartment				7				
							Vehicle is restaurant car or has seats for passengers eating food				63	0			
							Vehicle has a support point for a minibar					1			
							Vehicle has a support point for catering					2			
							Vehicle is couchette coach or has couchette places					3			
							Vehicle is sleeping car					4			
							Vehicle is a special coach (e.g. group travel coach)					5			
							Vehicle is a luggage van or has space for carrying luggage		6						
							Vehicle is a post vehicle or has accommodation for carrying mail		7						
							Vehicle has a telephone for passenger use		64	0					

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Vehicle is a freight wagon			1		
								Vehicle has retractable footsteps			2		
								Vehicle supports the release of the footsteps			3		
								Vehicle supports locking of sleeping car doors			4		
								Vehicle supports common operation of the connecting doors to adjacent vehicles			5		
								Vehicle has a driving cab for one direction of travel			6		
								Vehicle has two driving cabs for both directions of travel			7		
								Vehicle supports completeness of the train		65	0		
								Vehicle has an automatic coupling at vehicle end 1			1		
								Vehicle has an automatic coupling at vehicle end 2			2		
								Vehicle supports electronic seat reservation			3		
								Vehicle supports call for Conductor			4		
								Vehicle has an FIS exchange			5		
								Vehicle supports "energy saving" (vehicle selective)			6		
								Vehicle supports group addressing			7		
								Vehicle supports report of actual speed		66	0		
								Vehicle is seat of the train bus node			1		
								Reserve			2		
								Reserve			3		
								Reserve			4		
								Reserve			5		
								Reserve			6		

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Reserve			7		
								Reserve		67	0		
								Reserve			1		
								Reserve			2		
								Reserve			3		
								Reserve			4		
								Reserve			5		
								Reserve			6		
								Reserve			7		
								Reserve		68		0	
								Vehicle number for seat reservation	Unsigned16	69+70		0..65535	
								Reference direction vehicle/trainset agrees with TCN reference direction	BOOLEAN	71	0	0: no 1: yes	
								Reference direction vehicle/trainset agrees with the train reference direction	BOOLEAN		1	0: no 1: yes	
								Vehicle is leading	BOOLEAN		2	0: not leading 1: leading	
								Vehicle is requesting to be leading	BOOLEAN		3	0: no 1: yes	
								Reserve	BOOLEAN		4	0	
								Reserve	BOOLEAN		5	0	
								Reserve	BOOLEAN		6	0	
								Reserve	BOOLEAN		7	0	
							Description Vehicle 2	as first vehicle			72 . . 117		
							Description Vehicle n	as first vehicle			26+ (n-1) *46 . . 26+ (n*4 6) -1		
0.02	Request to read the status of the UIC mapping server	NN	1..63	1..63	15	E	User	Code	ENUM8	7+8		0x0022	
								Status	ENUM8	9		1	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
0.02A	UIC Mapping Server Status Information	15	1..63	1..63	NN	E		Code	UN-SIGNED16	7+8		0x0A22	
								Status	UN-SIGNED8	9		0: accepted >200: faults	
								Status of the WTB manager	UN-SIGNED8	11		1: Idle 2: Regular 3: Restricted 4: Passive 5: Single	
								Strong Master conflict	UN-SIGNED8	12		0: no conflict 1: conflict	
								Redundancy status	UN-SIGNED8	13		0: OK 1: Partner gateway failed	
								Last initiation reason	ENUM8	14		0: unknown 1: shortening 2: lengthening 3: interruption 4: redundancy 5: order	
								Result of last UIC initiation	ENUM8	15		0: ok 1: defect	
								Reserved	UNSIGNED8	16		0	
								relative time	UNSIGNED32	17		0..4.29* 10 ⁹	
								Counter for number of TCN initiations	UNSIGNED32	21		0..4.29* 10 ⁹	
								Counter for number of UIC initiations	UNSIGNED32	25		0..4.29* 10 ⁹	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Oct et	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								Counter for number of defective UIC initiations	UNSIGN ED32	29		0..4.29* 10 ⁹	
								Counter for number TCN/UIC initiations caused by WTB link layer	UNSIGN ED32	33		0..4.29* 10 ⁹	
								Counter for number TCN/UIC initiations caused by order	UNSIGN ED32	37		0..4.29* 10 ⁹	
								Counter for number of E telegrams processed	UNSIGN ED32	41		0..4.29* 10 ⁹	
								Reserved	UNSIGN ED32	45		0	
								Gateway HW Identification	UNSIGN ED8	49		TCN Part 4 Section 4.8.4.16	
								Gateway SW Identification	UN-SIGNED8	50		TCN Part 4 Section 4.8.4.16	
								Gateway HW fault	UN-SIGNED8	51		TCN Part 4 Section 4.8.4.16	
								Status WTB Link Layer	UN-SIGNED8	52		TCN Part 4 Section 4.8.4.16	
								Inhibit bit	UN-SIGNED8	53		TCN Part 4 Section 4.8.4.16	
								TCN address	UN-SIGNED8	54		TCN Part 4 Section 4.8.4.16	
								Gateway information	UN-SIGNED8	55		TCN Part 4 Section 4.8.4.16	
								WTB method of operation	UN-SIGNED8	56		TCN Part 4 Section 4.8.4.16	
								Length of process data frame	UN-SIGNED8	57		TCN Part 4 Section 4.8.4.16	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
								individual period	UN-SIGNED8	58		TCN Part 4 Section 4.8.4.16	
								Gateway type	UN-SIGNED8	59		TCN Part 4 Section 4.8.4.16	
								Gateway version	UN-SIGNED8	60		TCN Part 4 Section 4.8.4.16	
								node_report	UN-SIGNED8	61		TCN Part 4 Section 4.8.4.16	
								user_report	UN-SIGNED8	62		TCN Part 4 Section 4.8.4.16	
0.03	Request to modify the type of bus operation	NN	1..63	1..63	15	E		Code	UN-SIGNED16	7+8		0x0003	
								Status	UN-SIGNED8	9		0 = SLAVE 1 = WEAK MASTER. 2 = STRONG MASTER 3 = PASSIVE	
0.03A	Confirmation	15	1..63	1..63	NN	E		Code	ENUM8	7+8		0x0A03	
								Status	ENUM8	9		0: accepted >200: faults	
0.04	Request to read the TCN topography	15	1..63	1..63	15	E		Code	ENUM8	7+8		0x0004	
								Status	ENUM8	9		1	

Serial No.	Purpose	Information route				Type of telegram	Display and processing						
		Source		Target			Origin of information	Meaning	Data type/ extent of values	Octet	Bit	Code/ Value	Use
		Fctn	Veh	Veh	Fctn								
1	2	13	3	9a	14	10	15	16	16a	17	18	19	20
0.04A	TCN topography	15	1..63	1..63	15	E		Code	ENUM8	7+8		0x0A04	
								Status	ENUM8	9		00: accepted >200: faults	
								topo_count	UNSIGNED8	11		1..63	
								Number of the WTB nodes	UNSIGNED8	12		1..63	
								TCN address "bottom node"	UNSIGNED8	13		1..63	
								TCN Address "top node"	UNSIGNED8	14		1..63	
								UIC address (trainsets: UIC address of the vehicle with the train bus nodes)	UNSIGNED8	15		1..63	
								Reserve	UNSIGNED8	16		0	

Key:

Column structure		The column numbers in previous versions were retained for continuity reasons, thus they do not correspond to the numerical sequence
Column 1	Serial No.	The serial numbers from earlier drafts were also retained for continuity reasons
Columns 13, 14		For function addresses see text part section 5.6
Columns 3, 9a	MM NN	For vehicle addresses see text part section 5.5 UIC-address of a given vehicle UIC-address of any vehicle
Column 10	E R1 R2 R3	E-Telegram as text part, section 5.7.3 R1- telegram as text part, section 5.7.2 and Appendix B.1 R2- telegram as text part, section 5.7.2 and Appendix B.2 R3- telegram as text part, section 5.7.2 and Appendix B.3
Column 16a		For types of data see Appendix F
Column 19	0, 1 0, 1..9 0, 1..9, A..F N H (NN)	Binary values Certain decimal figures Certain hexadecimal figures Any natural figures Any hexadecimal figures UIC vehicle address, the transmission of which occurs over other TCN functionalities
Column 20		Use

Change history

Version	Date	Change	Reason for the change
002.01	27.05.2004	Adaption and addition of the following telegrams and telegram contents: 1.1-1.3, 1.9-1.11, 1.16-1.19, 2.2-3.6, 4.1-4.2, 4.2M/1-4.2M/4, 4.5/1-4.5A, 4.7-4.7/2, 4.9R, 4.11R, 4.12/1, 4.14/1-4.15/2, 4.20E-4.25, 4.27, 4.30, 4.32-4.35, 4.37-4.50, 5.1, 5.4-5.5/2, 5.8-5.10, 5.12-5.13, 5.15-5.16, 6.1, 6.4-6.5, 8.1, 8.3A-8.4, 8.8-8.10A, 10.1R, 10.2, 0.01A.	Adoption of the new commands, which became necessary due to the UIC leaflet 647; error corrections; value „0“ was given a meaning
		Change of the layout according to M1	New layout concerning the UIC principle M1
		Divers changes in the format of the document	Increasing the readability
		Adoption of a change history	Increasing the usability
		Deletion of the columns „PDM“, „Time out“, „replacement value“ and addition of a new column called „Use“	The old columns weren't used
		Adoption of a revision number	enhancement and redesign of the versioning
002.02	01.08.2005	Modification of the layout	Guidelines of the UIC
		Modification of the appendix numbering	Guidelines of the UIC
		Editorial revision	
		In the E-Telegram 11.03A the code in octet 7+8 was changed from B003 to 0xBA03 and in the E-Telegram 15.02 the code in octet 7+8 was changed from A001 to 0xF002.	Error correction
002.03	01.03.2009	Check against appendices B1-3 in the columns “Purpose” and “Meaning”	Differences in the wording between appendix A and B
		Insertion of the E-telegrams 4.6E and 4.6A	Request from UIC leaflet 647
		Declaration of the octets in telegram 4.46/3 corrected	Error correction
		Check against the content of appendix A and B telegram 4.12/2 “data type/extent of values”, as well as error corrections for the source and target functions of telegrams 4.34/2 and 8.4R	Harmonisation of appendix A and B
		Insertion of telegram 4.17 (external supply of the train line), which was signed as “option” in appendix B3 before	Harmonisation of appendix A and B
		Insertion of the new vehicle property according to appendix E.1 in telegram 0.01A	New appendix L