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Confidential
Communication-Matrix SAE J1939 ECAS for Bus

P4-D
C. Schrader
21.06.2005

ECAS											
Message				**Message Definition**							
Name	Identifier [Hex]	Repetition rate	ESAC/ECAS	Dashboard	Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
TCO1	0C FE 6C EE	50ms	📖					Tachograph Main frame #1	PGN 65132		
						1	8,7	Drive recognize	SPN 1611	2 bit	00b, 01b
							6..4	Driver 2 working state	SPN 1613	3 bit	000b , 001b,010b,011b
							3..1	Driver 1 working state	SPN 1612	3 bit	000b , 001b,010b,011b
						2	8, 7	Overspeed	SPN 1614	2 bit	00b, 01b
							6, 5	Driver card, driver 1	SPN 1615	2 bit	00b, 01b
							4..1	Driver 1 time related states	SPN 1617	4 bit	0000b ... 0110b
						3	8, 7	Not defined	---	2 bit	00b, 01b
							6, 5	Driver card, driver 2	SPN 1616	2 bit	00b, 01b
							4..1	Driver 2 time related states	SPN 1618	4 bit	0000b ... 0110b
						4	8, 7	Direction indicator	SPN 1619	2 bit	00b, 01b
							6, 5	Tachograph performance	SPN 1620	2 bit	00b, 01b
							4, 3	Handling information	SPN 1621	2 bit	00b, 01b
							2, 1	System event	SPN 1622	2 bit	00b, 01b
						5..6		Tachograph output shaft speed	SPN 1623	0,125 rpm	0..8031,875 rpm
				√		7..8		Tachograph vehicle speed	SPN 1624	1/256 km/h	0...251 km/h
EBC1	18 F0 01 0B	100 ms	📖					Electronic brake controller 1	PGN 61441		
						1	8, 7	EBS brake switch	SPN 1121	2 bit	00 Brake pedal is not being pressed 01 Brake pedal is being pressed
							6, 5	Anti-lock braking (ABS) active	SPN 563	2 bit	00 ABS passive but installed 01 ABS active
			√				4, 3	ASR brake control active	SPN 562	2 bit	00 - ASR brake control passive but installed 01 - ASR brake control active
			√				2, 1	ASR engine control active	SPN 561	2 bit	00 - ASR engine control passive but installed 01 - ASR engine control active
						2		Brake pedal position	SPN 521	0.4 %/bit	0...100 %
						3	8, 7	Traction control override switch	SPN 1238	2 bit	00- off 01- on 10 - Error 11 - Not available or not installed
							6, 5	ASR "Hill holder" switch	SPN 577	2 bit	00 - ASR 'hill holder' switch passive 01 - ASR 'hill holder' switch active
							4, 3	ASR off-road switch	SPN 576	2 bit	00 - ASR off-road switch passive 01 - ASR off-road switch active
							2, 1	ABS off-road switch	SPN 575	2 bit	00 - ABS off-road switch passive 01 - ABS off-road switch active
						4	8, 7	Remote accelerator enable switch	SPN 969	2 bit	00 - Off 01 - On
							6, 5	Auxiliary engine shutdown switch	SPN 970	2 bit	00 - Off 01 - On
							4, 3	Engine derate switch	SPN 971	2 bit	00 - Off 01 - On
							2, 1	Accelerator interlock switch	SPN 972	2 bit	00 - Off 01 - On
						5		Engine retarder selection	SPN 973	0.4 %/bit	0 to 100 %
						6	8, 7	ATC/ASR information signal	SPN 1793	2 bit	00 Off 01 On 10 Reserved 11 Take no action

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Name	Identifier [Hex]	Repetition rate	ESAC/ECAS	Dashboard	Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
EBC1							6, 5	ABS/EBS amber warning signal (powered vehicle)	SPN 1438	2 bit	00 Off 01 On 10 Reserved 11 Take no action
							4, 3	EBS red warning lamp	SPN 1439	2 bit	00 Off 01 On 10 Reserved 11 Take no action
							2, 1	ABS fully operational	SPN 1243	2 bit	00 - Not Fully Operational 01 - Fully Operational
						7		Source adress of controlling device for brake control	SPN 1481	1 source address/bit	0...253
						8	8, 7	Tractor-mounted trailer ABS warning signal	SPN 1792	2 bit	00 Off 01 On 10 Reserved 11 Take no action
							6, 5	Trailer ABS status	SPN 1836	2 bit	00 Trailer ABS Status Information Available But Not Active 01 Trailer ABS Active 10 Reserved 11 Trailer ABS Status Information Not Available or Parameter Not Supported
							4..1	Not defined	---		
EAC1	18 F0 06 27	500 ms	🖰					Electronic Axle Controler 1	PGN 61446		
						1		Location	SPN 927	1 byte	
						2	7, 8	Differential lock state - rear axle 2	SPN 570	2 bit	00 Differential lock disengaged 01 Differential lock engaged
							6, 5	Differential lock state - rear axle 1	SPN 569	2 bit	00 Differential lock disengaged 01 Differential lock engaged
							4, 3	Differential lock state - front axle 2	SPN 568	2 bit	00 Differential lock disengaged 01 Differential lock engaged
							2, 1	Differential lock state - front axle 1	SPN 567	2 bit	00 Differential lock disengaged 01 Differential lock engaged
						3	8, 7	Not defined	---		
			√				6, 5	Differential lock state - central rear	SPN 566	2 bit	00 Differential lock disengaged 01 Differential lock engaged
							4, 3	Differential lock state - central front	SPN 565	2 bit	00 Differential lock disengaged 01 Differential lock engaged
							2, 1	Differential lock state - central	SPN 564	2 bit	00 Differential lock disengaged 01 Differential lock engaged
						4..8		Not defined	---		
EEC1	0C F0 04 00	engine speed dependent	🖰					Electronic Engine Controller 1	PGN 61444		
						1	8..5	Not defined	---	4 bit	1111b
							4..1	Engine Torque Mode	SPN 899	4 bit	0000b...1110b
						2		Drivers demand engine - percent torque	SPN 512	0,01	0...125%
						3		Actual engine - percent torque	SPN 513	0,01	0...125%
			√			4..5		Engine Speed	SPN 190	0,125 rpm	8031,9 rpm

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Name	Identifier [Hex]	Repetition rate	ESAC/ECAS / Dashboard / Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
EEC1				6		Source Adress of controlling device for engine control	SPN 1483		
				7	5..8	Not defined			
					4..1	Engine starter mode	SPN 1675		
				8		Engine demand - percent torque	SPN 2432		
CCVS	18 FE F1 00	100ms	☞			Cruise Control / Vehicle Speed	PGN 65265		
				1	8, 7	Not defined	---		
					6, 5	Cruise control pause switch	SPN 1633		
					4, 3	Parking brake switch	SPN 70	2 bit	00b, 01b
					2, 1	Two speed axle switch	SPN 69	2 bit	00b, 01b
			√	2, 3		Wheel based vehicle speed	SPN 84	1/256 km/h	0...251 km/h
				4	8, 7	Clutch switch	SPN 598	2 bit	00b, 01b
			√		6, 5	Brake switch	SPN 597	2 bit	00b, 01b
					4, 3	Cruise Control enable switch	SPN 596	2 bit	00b, 01b
					2, 1	Cruise Control active	SPN 595	2 bit	00b, 01b
				5	8, 7	Cruise Control accelerate switch	SPN 602	2 bit	00b, 01b
					6, 5	Cruise Control resume switch	SPN 601	2 bit	00b, 01b
					4, 3	Cruise Control coast switch	SPN 600	2 bit	00b, 01b
					2, 1	Cruise Control set switch	SPN 599	2 bit	00b, 01b
				6		Cruise Control set speed	SPN 86	1 km/h	0...250 km/h
				7	8..6	Cruise Control state	SPN 527	3 bit	000b...110b
					5..1	PTO state	SPN 976	5 bit	00000b...11110b
				8	8, 7	Engine shutdown override switch	SPN 1237	2 bit	
					6, 5	Engine test mode switch	SPN 966	2 bit	00b, 01b
					4, 3	Idle decrement switch	SPN 967	2 bit	00b, 01b
					2, 1	Idle increment switch	SPN 968	2 bit	00b, 01b
AC	18 FE A8 1B	250 ms	☞			Articulation Control	PGN 65192		
			√	1		Articulation Angle	SPN 1120	1 deg/bit,	-125 to 125 deg
				2..8		Not defined	---		
AIR1 (ECAM)	18 FE AE 30	1 s	☞			Air supply pressure 1	PGN 65198		
				1		Pneumatic supply pressure	SPN 46	80mbar/Bit	0...20 bar
				2		Parking and / or trailer air pressure	SPN 1086	80mbar/Bit	0...20 bar
			√	3		Service brake air pressure, circuit #1	SPN 1087	80mbar/Bit	0...20 bar
			⊗	4		Service brake air pressure, circuit #2	SPN 1088	80mbar/Bit	0...20 bar
				5		Auxiliary equipment supply pressure	SPN 1089	80mbar/Bit	0...20 bar
			√	6		Air suspension pressure	SPN 1090	80mbar/Bit	0...20 bar
				7..8		not defined	---		
DC	18 FE 4E EC	100 ms	☞			Door Control	PGN 65102		
				1	8, 7	Not defined	---		
			√		6, 5	Ramp / wheel chair lift status	SPN 1820	2 bit	00b Inside bus; 01b Outside bus;
			√		4..1	Status of doors	SPN 1821	4 bit	0000b At least 1 door is open; 0001b Closing last door; 0010b All doors closed; 0011b ... 1101Not defined;
				2..8		Not defined	---		
TD	18 FE E6 17	1 s	☞			Time/Date	PGN 65254		
			√	1		Seconds	SPN 959	0,25 s/bit	0 ... 59,75s

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21.06.2005

Message			Message Definition						
Name	Identifier [Hex]	Repetition rate	ESAC/ECAS / Dashboard / Trailer			Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range

Name	Identifier [Hex]	Repetition rate	ESAC/ECAS	Dashboard	Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
TD			√			2		Minutes	SPN 960	1 min/bit	0 ... 59 min
			√			3		Hours	SPN 961	1 h/bit	0 ... 23 h
			√			4		Month	SPN 963	1 Month/bit	1 ... 12 month
			√			5		Day	SPN 962	0,25 day/bit	0 ... 31,75 day
			√			6		Year	SPN 964	1 Year/bit, offset +1985 year	1985...2235
						7		Local Minute Offset	SPN 1601	1 min/bit	0 ... 59 min
						8		Local Hour Offset	SPN 1602	1 h/bit, offset -125h	-24 to +23 h
DM1 (Single DM1)	18 FE CA 2F	1s (if none or one active DTC occured)	⊠					Diagnostic Message 1 (if one active diagnostic trouble code occured)	J1939-73 5.7.1		
						1	8, 7	Malfunction indicator lamp status	J1939-73 5.7.1.1	2 bit	11b
							6, 5	Red stop lamp status	J1939-73 5.7.1.2	2 bit	11b
			√				4, 3	Amber warning lamp status	J1939-73 5.7.1.3	2 bit	00b Lamp off 01b Lamp on 10b Not defined
							2, 1	Protect lamp status	J1939-73 5.7.1.4	2 bit	11b
						2	8, 7	Flash engine malfunction indicator lamp (MIL)	SPN 3038 (J1939-73 5.7.01)	2 bit	11b
							6, 5	Flash engine red stop lamp (RSL)	SPN 3039 (J1939-73 5.7.01)	2 bit	11b
							4, 3	Flash engine amber warning lamp (AWL)	SPN 3040 (J1939-73 5.7.01)	2 bit	11b
							2, 1	Flash engine protect lamp	SPN 3041 (J1939-73 5.7.01)	2 bit	11b
			√			3		SPN, 8 least significant bits of SPN (most significant at bit 8)	J1939-73 5.7.1.5	1 byte	0...255
			√			4		SPN, second byte of SPN (most significant at bit 8)	J1939-73 5.7.1.5	1 byte	00h
			√			5	8..6	SPN, 3 most significant bits of SPN (most significant at bit 8)	J1939-73 5.7.1.5	3 bit	000b
			√				5..1	FMI (most significant at bit 5)	J1939-73 5.7.1.6	5 bit	0...31
			√			6	8	SPN conversion method	J1939-73 5.7.1.7	1 bit	0b
			√				7..1	Occurence count	J1939-73 5.7.1.8	1 occurence count/bit	0...126 (the value 127 is reserved for indicating not available)
						7, 8		Not defined	---		
BAM	1C EC FF 2F	on request	⊠					Broadcast Announce Message	J1939-21 5.10.3		
			√			1		Control byte	J1939-21 5.10.3	1 byte	20h

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Name	Identifier [Hex]	Repetition rate	ESAC/ECAS / Dashboard / Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
BAM			√	2, 3		Total message size, number of bytes	J1939-21 5.10.3	1 byte	0...65535
			√	4		Total number of packets	J1939-21 5.10.3	1 byte	0...255
				5		Reserved for SAE	J1939-21 5.10.3	1 byte	FFh
			√	8..6		PGN of Diagnostic Message	J1939-21 5.10.3	3 byte	CD FE 00h: DM1
DM1 (Multipacket)	1C EB FF 2F	1s (if more then one active DTC)	⊠			Diagnostic Message 1 (if more then one active diagnostic trouble codes occured)	J1939-73 5.7.1		
1st packet			√	1		Sequence number		1 byte	01h
				2	8, 7	Malfunction indicator lamp status	J1939-73 5.7.1.1	2 bit	11b
					6, 5	Red stop lamp status	J1939-73 5.7.1.2	2 bit	11b
			√		4, 3	Amber warning lamp status	J1939-73 5.7.1.3	2 bit	00b Lamp off 01b Lamp on 10b Not defined
					2, 1	Protect lamp status	J1939-73 5.7.1.4	2 bit	11b
				3	8, 7	Flash engine malfunction indicator lamp (MIL)	SPN 3038 (J1939-73 5.7.01)	2 bit	11b
					6, 5	Flash engine red stop lamp (RSL)	SPN 3039 (J1939-73 5.7.01)	2 bit	11b
					4, 3	Flash engine amber warning lamp (AWL)	SPN 3040 (J1939-73 5.7.01)	2 bit	11b
					2, 1	Flash engine protect lamp	SPN 3041 (J1939-73 5.7.01)	2 bit	11b
						--- DTC of the 1st failure ---			
			√	4		SPN, 8 least significant bits of SPN (most significant at bit 8)	J1939-73 5.7.1.5	1 byte	0...255
			√	5		SPN, second byte of SPN (most significant at bit 8)	J1939-73 5.7.1.5	1 byte	00h
			√	6	8..6	SPN, 3 most significant bits of SPN (most significant at bit 8)	J1939-73 5.7.1.5	3 bit	000b
			√		5..1	FMI (most significant at bit 5)	J1939-73 5.7.1.6	5 bit	0...31
			√	7	8	SPN conversion method	J1939-73 5.7.1.7	1 bit	0b
			√		7..1	Occurence count	J1939-73 5.7.1.8	1 occurence count/bit	0...126 (the value 127 is reserved for indicating not available)
						--- DTC of the 2nd failure ---			
			√	8		SPN, 8 least significant bits of SPN (most significant at bit 8)	J1939-73 5.7.1.5	1 byte	0...255
2nd packet			√	1		Sequence number		1 byte	02h

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Name	Identifier [Hex]	Repetition rate	ESAC/ECAS	Dashboard	Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
DM1 (Multipacket)			√			2		SPN, second byte of SPN (most significant at bit 8)	J1939-73 5.7.1.5	1 byte	00h
			√			3	8..6	SPN, 3 most significant bits of SPN (most significant at bit 8)	J1939-73 5.7.1.5	3 bit	000b
			√				5..1	FMI (most significant at bit 5)	J1939-73 5.7.1.6	5 bit	0...31
			√			4	8	SPN conversion method	J1939-73 5.7.1.7	1 bit	0b
			√				7..1	Occurence count	J1939-73 5.7.1.8	1 occurence count/bit	0...126 (the value 127 is reserved for indicating not available)
								--- DTC of the 3rd failure ---			
			√			5		SPN, 8 least significant bits of SPN (most significant at bit 8)	J1939-73 5.7.1.5	1 byte	0...255
			√			6		SPN, second byte of SPN (most significant at bit 8)	J1939-73 5.7.1.5	1 byte	00h
			√			7	8..6	SPN, 3 most significant bits of SPN (most significant at bit 8)	J1939-73 5.7.1.5	3 bit	000b
			√				5..1	FMI (most significant at bit 5)	J1939-73 5.7.1.6	5 bit	0...31
			√			8	8	SPN conversion method	J1939-73 5.7.1.7	1 bit	0b
			√				7..1	Occurence count	J1939-73 5.7.1.8	1 occurence count/bit	0...126 (the value 127 is reserved for indicating not available)
								... and so on up to a maximum number of <to be defined by customer> DTCs			
SPR	18 FD E2 2F	1 s	⊠					Supply pressure demand	PGN 64994		
						1		Pneumatic supply pressure request	SPN 2603	8 kPa/bit gain	0 ... +2000kPa
						2		Parking and/or trailer pressure request	SPN 2604	8 kPa/bit gain	0 ... +2000kPa
						3		Service brake air pressure request, circuit #1	SPN 2605	8 kPa/bit gain	0 ... +2000kPa
						4		Service brake air pressure request, circuit #2	SPN 2606	8 kPa/bit gain	0 ... +2000kPa
						5		Auxiliary equipment supply pressure request	SPN 2607	8 kPa/bit gain	0 ... +2000kPa
			√			6		Air suspension supply pressure request	SPN 2608	8 kPa/bit gain	0 ... +2000kPa
						7,8		Not defined	---		
VW	18 FE EA 2F	100ms	⊠					Vehicle Weight	PGN 65258		
			√			1		Axle location	SPN 928	bit-mapped	N/A
			√			2..3		Axle weight	SPN 582	0,5kg/bit	0 .. +32127,5 kg
						4,5		Trailer weight	SPN 180	2,0 kg/bit	0 .. + 128510 kg
						6,7		Cargo weight	SPN 181	2,0 kg/bit	0 .. + 128510 kg
						8		Not defined	---	1 Byte	FFh
RGE 11	18 E4 C8 20	100ms	⊠		✉			Running gear equipment #1/1 (Towing vehicle message)	ISO 11992-2 6.5.2.3		
					√	1	8, 7	Traction help request	ISO 11992-2 6.4.2.3.19	2 bit	00b No traction help request 01b Traction help request 11b take no action

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RGE 11			√		6, 5	Level change request, rear axle	ISO 11992-2 6.4.2.3.10	2 bit	00b Vehicle body up (lifting) 01b Vehicle body down (lowering) 11b take no action
			√		4, 3	Level change request front axle	ISO 11992-2 6.4.2.3.9	2 bit	00b Vehicle body up (lifting) 01b Vehicle body down (lowering) 11b Take no action
			√		2, 1	Ride hight request	ISO 11992-2 6.4.2.3.21	2 bit	00b Normal level 1 01b Normal level 2 11b take no action
			√	2	8,7	Ramp level request	ISO 11992-2 6.4.2.3.24	2 bit	00b Ramp level 1 01b Ramp level 2 11b take no action
			√		6,5	Steering axle locking request	ISO 11992-2 6.4.2.3.17	2 bit	00b Unlock steering axle 01b Lock steering axle 11b take no action
			√		4,3	Lift axle 2 position request	ISO 11992-2 6.4.2.3.14	2 bit	00b Lift axle position down/tag axle laden 01b Lift axle position up/tag axle unladen 11b take no action
			√		2,1	Lift axle 1 position request	ISO 11992-2 6.4.2.3.13	2 bit	00b Lift axle position down/tag axle laden 01b Lift axle position up/tag axle unladen 11b take no action
			√	3	8,7	Not defined		2 bit	
			√		6,5	Stop level change request	ISO 11992-2 6.4.2.3.29	2 bit	00b No stop request 01b Stop request 11b take no action
			√		4,3	Ramp level storage request	ISO 11992-2 6.4.2.3.27	2 bit	00b Store ramp level 1 01b Store ramp level 2 11b take no action
			√		2,1	Level control request	ISO 11992-2 6.4.2.3.7	2 bit	00b Disable level control 01b Enable level control 11b take no action
			√	4, 5		Driven axle load	ISO 11992-2 6.4.2.3.2	2 kg/bit	0 ... 128 510 kg
			√	6		Parking and trailer air pressure	ISO 11992-2 6.4.2.3.31	8 kPa/bit	0 kPa ... 2000 kPa
			√	7		Auxiliary equipment supply pressure	ISO 11992-2 6.4.2.3.32	8 kPa/bit	0 kPa ... 2000 kPa
				8		Not defined			
ASC1_A	0C FE 5A 2F	100ms	✉ ⬚			Air Suspension control 1	PGN 65114	ECAS / ESAC Status Information:	
			√	1	8..5	Nominal level rear axle	SPN 1733	4 bit	0000b Level not specified; 0001b Normal Level 1; 0010b Normal Level 2; 0011b Normal Level 3; 0100b Preset Level; 0101b Customer Level 0110b Upper Level; 0111b Lower Level; 1000b ... 1101 Not defined;

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Name	Identifier [Hex]	Repetition rate	ESAC/ECAS	Dashboard	Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
ASC1_A				√			4...1	Nominal level front axle	SPN 1734	4 bit	0000b Level not specified; 0001b Normal Level 1; 0010b Normal Level 2; 0011b Normal Level 3; 0100b Preset Level; 0101b Customer Level 0110b Upper Level; 0111b Lower Level; 1000b ... 1101 Not defined;
				√		2	8, 7	Above nominal level rear axle	SPN 1736	2 bit	00b not above; 01b above;
				√			6, 5	Above nominal level front axle	SPN 1737	2 bit	00b not above; 01b above;
				√			4, 3	Below nominal level rear axle	SPN 1754	2 bit	00b not below; 01b below;
				√			2, 1	Below nominal level front axle	SPN 1738	2 bit	00b not below; 01b below;
				√		3	8, 7	Lifting control mode rear axle	SPN 1756	2 bit	00b lifting not active; 01b lifting active; 10b error state lifting not possible;
				√			6, 5	Lifting control mode front axle	SPN 1739	2 bit	00b lifting not active; 01b lifting active; 10b error state lifting not possible;
				√			4, 3	Lowering control mode rear axle	SPN 1755	2 bit	00b lowering not active; 01b lowering active; 10b error state lowering not possible;
				√			2, 1	Lowering control mode front axle	SPN 1740	2 bit	00b lowering not active; 01b lowering active; 10b error state lowering not possible;
				√		4	8..5	Level control mode	SPN 1741	4 bit	0000b Normal operation; 0001b Traction help (load transfer); 0010b Load fixing; 0011b Pressure ratio 1; 0100b Pressure ratio 2; 0101b Optimum Traction 1; 0110b Optimum Traction 2; 0111b Traction help (Load reduce); 1000b Exhausting bellow function; 1001b...1101b not defined; 1110b error state, level control not possible; 1111b not available;
				√			4..1	Kneeling information	SPN 1742	4 bit	0000b Not active; 0001b Lowering active; 0010b Kneeling level reached; 0011b lifting active; 0100b Kneeling aborted; 0101b ... 1101b not defined;
				√		5	8, 7	Lift axle 1 position	SPN 1743	2 bit	00b lift axle position down / tag axle laden 01b lift axle position up / tag axle unladen
				√			6, 5	Door release	SPN 1744	2 bit	00b Doors may not be opened; 01b Doors may be opened;
				√			4, 3	Vehicle motion inhibit	SPN 1745	2 bit	00b Vehicle may be moved; 01b Vehicle motion is inhibited;

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Message			Message Definition						
Name	Identifier [Hex]	Repetition rate	ESAC/ECAS	Dashboard	Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range

Name	Identifier [Hex]	Repetition rate	ESAC/ECAS	Dashboard	Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
ASC1_A				√			2, 1	Security device	SPN 1746	2 bit	00b Not active; 01b Active;
				√		6	8, 7	Lift axle 2 position	SPN 1822	2 bit	00b lift axle position down / tag axle laden 01b lift axle position up / tag axle unladen
							6, 5	Not defined	---	2 bit	
				√			4, 3	Rear axle in bumper range	SPN 1823	2 bit	00b Actual level out of bumper range; 01b Actual level within bumper range;
				√			2, 1	Front axle in bumper range	SPN 1824	2 bit	00b Actual level out of bumper range; 01b Actual level within bumper range;
						7	8..5	Not defined	---	2 bit	
				√			4, 3	Suspension Remote control #2	SPN 1825	2 bit	00b Not active;
				√			2, 1	Suspension Remote control #1	SPN 1826	2 bit	00b Not active; 01b Active;
						8	8..5	Not defined	---		
				√			4..1	Suspension control refusal information	SPN 1827	4 bit	0000b Actual request not refused; 0001b Axle load limit reached (load transfer); 0010b Would exceed load limit (tag axle); 0011b Bogie differential not locked; 0100b Above speed limit; 0101b Below speed limit; 0110b General reject; 0111b - 1101b Not defined;
ASC2_A	0C D2 2F 27	100ms	⎘	✉				Air Suspension Control 2	PGN 53760	Dashboard Status Information to articulated bus front end / truck (see Parameter Group Label Air Suspension Control #2)	
			√			1	8..7	Kneeling control mode request	SPN 1747	2 bit	00b Automatically actuated; 01b Manually actuated
			√				6..5	Kneeling request right side	SPN 1748	2 bit	00b No Kneeling request;
			√				4..3	Kneeling request left side	SPN 1749	2 bit	00b No Kneeling request; 01b Kneeling request;
			√				2..1	Automatic traction help (load transfer)	SPN 2984	2 bit	00b Disable automatic traction help 01b Enable automatic traction help 10b reserved
			√			2	8..5	Nominal level request rear axle	SPN 1750	4 bit	0000b No level request; 0001b Normal Level 1; 0010b Normal Level 2; 0011b Normal Level 3; 0100b Preset Level; 0101b Customer Level ; 0110b Upper level; 0111b Lower level; 1000b Stop level change; 1001b ... 1101 not defined;
			√				4..1	Nominal level request front axle	SPN 1751	4 bit	0000b No level request; 0001b Normal Level 1; 0010b Normal Level 2; 0011b Normal Level 3; 0100b Preset Level; 0101b Customer Level ; 0110b Upper level; 0111b Lower level; 1000b Stop level change; 1001b ... 1101 not defined;

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Message			Message Definition						
Name	Identifier [Hex]	Repetition rate	ESAC/ECAS / Dashboard / Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
ASC2_A			√	3	8, 7	Lift axle 2 position command	SPN 1828	2 bit	00b Lift axle position down / tag axle laden; 01b Lift axle position up / tag axle unladen;
			√		6, 5	Lift axle 1 position command	SPN 1752	2 bit	00b Lift axle position down / tag axle laden; 01b Lift axle position up / tag axle unladen;
			√		4..1	Level control mode request	SPN 1753	4 bit	0000b Normal operation; 0001b Traction help (load transfer); 0010b Load fixing; 0011b Pressure ratio 1; 0100b Pressure ratio 2; 0101b Optimum Traction 1; 0110b Optimum Traction 2; 0111b Traction help (Load reduce) 1000b Exhaust bellows; 1001b...1101b not defined; 1110b reserved; 1111b don't care / take no action;
				4	8...1	Damper stiffness request front axle	SPN 1718	0,4%/bit	0...100%
				5	8...1	Damper stiffness request rear axle	SPN 1719	0,4%/bit	0...100%
				6	8...1	Damper stiffness request tag/lift axle	SPN 1720	0,4%/bit	0...100%
				7	8..5	Not defined			
			√		4..3	Kneeling request rear axle	SPN 1829	2 bit	00b No Kneeling request; 01b Kneeling request;
			√		2..1	Kneeling request front axle	SPN 1830	2 bit	00b No Kneeling request; 01b Kneeling request;
				8		Not defined	---		
ASC3_A	18 FE 59 2F	100ms	✉ 📖			Air Suspension Control 3	PGN 65113	ECAS/ESAC height information:	
			√	1,2		Relative level front axle left	SPN 1721	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
			√	3,4		Relative level front axle right	SPN 1722	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
			√	5,6		Relative level rear axle left	SPN 1724	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
			√	7,8		Relative level rear axle right	SPN 1723	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
ASC4_A	18 FE 58 2F	100ms	✉ 📖			Air Suspension Control 4	PGN 65112	ECAS / ESAC pressure information:	
			√	1,2		Bellow pressure front axle left	SPN 1725	0.1 kPa/bit	0...+6425.5 kPa
			√	3,4		Bellow pressure front axle right	SPN 1726	0.1 kPa/bit	0...+6425.5 kPa
			√	5,6		Bellow pressure rear axle left	SPN 1727	0.1 kPa/bit	0...+6425.5 kPa
			√	7,8		Bellow pressure rear axle right	SPN 1728	0.1 kPa/bit	0...+6425.5 kPa
ASC6_A	0C D1 2F 27	100ms	📖 ✉			Air Suspension Control 6	PGN 53504	Requested level preset articulated bus front end / truck (see Parameter Group Label Air Suspension Control #6)	
			√	1..2		Level preset front axle left	SPN 1732	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
			√	3..4		Level preset front axle right	SPN 1757	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm

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Message			Message Definition							
Name	Identifier [Hex]	Repetition rate	ESAC/ECAS	Dashboard	Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
ASC6_A			√			5..6		Level preset rear axle left	SPN 1758	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
			√			7..8		Level preset rear axle right	SPN 1735	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
ASC1_B	0C FE 5A 40	100ms	☒	🗇				Air Suspension control 1	PGN 65114	ECAS / ESAC Status Information: articulated bus dolly (see Parameter Group Label Air Suspension Control #1)	
				√		1	8..5	Nominal level rear axle	SPN 1733	4 bit	0000b Level not specified; 0001b Normal Level 1; 0010b Normal Level 2; 0011b Normal Level 3; 0100b Preset Level; 0101b Customer Level 0110b Upper Level; 0111b Lower Level; 1000b ... 1101 Not defined;
				√			4...1	Nominal level front axle	SPN 1734	4 bit	0000b Level not specified; 0001b Normal Level 1; 0010b Normal Level 2; 0011b Normal Level 3; 0100b Preset Level; 0101b Customer Level 0110b Upper Level; 0111b Lower Level; 1000b ... 1101 Not defined;
				√		2	8, 7	Above nominal level rear axle	SPN 1736	2 bit	00b not above; 01b above;
				√			6, 5	Above nominal level front axle	SPN 1737	2 bit	00b not above; 01b above;
				√			4, 3	Below nominal level rear axle	SPN 1754	2 bit	00b not below; 01b below;
				√			2, 1	Below nominal level front axle	SPN 1738	2 bit	00b not below; 01b below;
				√		3	8, 7	Lifting control mode rear axle	SPN 1756	2 bit	00b lifting not active; 01b lifting active; 10b error state lifting not possible;
				√			6, 5	Lifting control mode front axle	SPN 1739	2 bit	00b lifting not active; 01b lifting active; 10b error state lifting not possible;
				√			4, 3	Lowering control mode rear axle	SPN 1755	2 bit	00b lowering not active; 01b lowering active; 10b error state lowering not possible;
				√			2, 1	Lowering control mode front axle	SPN 1740	2 bit	00b lowering not active; 01b lowering active; 10b error state lowering not possible;
				√		4	8..5	Level control mode	SPN 1741	4 bit	0000b Normal operation; 0001b Traction help (load transfer); 0010b Load fixing; 0011b Pressure ratio 1; 0100b Pressure ratio 2;

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Message			Message Definition						
Name	Identifier [Hex]	Repeti tion rate	ESAC/ECAS / Dashboard / Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
ASC1_B			√		4..1	Kneeling information	SPN 1742	4 bit	0000b Not active; 0001b Lowering active; 0010b Kneeling level reached; 0011b lifting active; 0100b Kneeling aborted; 0101b ... 1101b not defined;
			√	5	8, 7	Lift axle 1 position	SPN 1743	2 bit	00b lift axle position down / tag axle laden 01b lift axle position up / tag axle unladen
			√		6, 5	Door release	SPN 1744	2 bit	00b Doors may not be opened; 01b Doors may be opened;
			√		4, 3	Vehicle motion inhibit	SPN 1745	2 bit	00b Vehicle may be moved; 01b Vehicle motion is inhibited;
			√		2, 1	Security device	SPN 1746	2 bit	00b Not active; 01b Active;
			√	6	8, 7	Lift axle 2 position	SPN 1822	2 bit	00b lift axle position down / tag axle laden 01b lift axle position up / tag axle unladen
					6, 5	Not defined	---	2 bit	
			√		4, 3	Actual level rear axle in bumper range	SPN 1823	2 bit	00b Actual level out of bumper range; 01b Actual level within bumper range;
			√		2, 1	Actual level front axle in bumper range	SPN 1824	2 bit	00b Actual level out of bumper range; 01b Actual level within bumper range;
				7	8..5	Not defined	---	2 bit	
			√		4, 3	Suspension Remote control #2	SPN 1825	2 bit	00b Not active; 01b Active;
			√		2, 1	Suspension Remote control #1	SPN 1826	2 bit	00b Not active; 01b Active;
				8	8..5	Not defined	---		
			√		4..1	Suspension control refusal information	SPN 1827	4 bit	0000b Actual request not refused; 0001b Axle load limit reached (load transfer); 0010b Would exceed load limit (tag axle); 0011b Bogie differential not locked; 0100b Above speed limit; 0101b Below speed limit; 0110b - 1101b Not defined;
ASC2_B	0C D2 40 27	100ms	⊡ ✉			Air Suspension Control 2	PGN 53760	Dashboard Status Information to articulated bus dolly (see Parameter Group Label Air Suspension Control #2)	
			√	1	8..7	Kneeling control mode request	SPN 1747	2 bit	00b Automatically actuated; 01b Manually actuated
			√		6..5	Kneeling request right side	SPN 1748	2 bit	00b No Kneeling request; 01b Kneeling request;
			√		4..3	Kneeling request left side	SPN 1749	2 bit	00b No Kneeling request; 01b Kneeling request;
			√		2..1	Automatic traction help (load transfer)	SPN 2984	2 bit	00b Disable automatic traction help 01b Enable automatic traction help 10b reserved

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Message			Message Definition						
Name	Identifier [Hex]	Repetition rate	ESAC/ECAS / Dashboard / Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
ASC2_B			√	2	8..5	Nominal level request rear axle	SPN 1750	4 bit	0000b No level request; 0001b Normal Level 1; 0010b Normal Level 2; 0011b Normal Level 3; 0100b Preset Level; 0101b Customer Level ; 0110b Upper level; 0111b Lower level; 1000b Stop level change; 1001b ... 1101 not defined;
			√		4..1	Nominal level request front axle	SPN 1751	4 bit	0000b No level request; 0001b Normal Level 1; 0010b Normal Level 2; 0011b Normal Level 3; 0100b Preset Level; 0101b Customer Level ; 0110b Upper level; 0111b Lower level; 1000b Stop level change; 1001b ... 1101 not defined;
			√	3	8, 7	Lift axle 2 position request	SPN 1828	2 bit	00b Lift axle position down / tag axle laden; 01b Lift axle position up / tag axle unladen;
			√		6, 5	Lift axle 1 position request	SPN 1752	2 bit	00b Lift axle position down / tag axle laden; 01b Lift axle position up / tag axle unladen;
			√		4..1	Level control mode request	SPN 1753	4 bit	0000b Normal operation; 0001b Traction help (load transfer);
				4	8...1	Damper stiffness request front axle	SPN 1718	0,4%/bit	0...100%
				5	8...1	Damper stiffness request rear axle	SPN 1719	0,4%/bit	0...100%
				6	8...1	Damper stiffness request tag/lift axle	SPN 1720	0,4%/bit	0...100%
				7	8..5	Not defined			
			√		4..3	Kneeling request rear axle	SPN 1829	2 bit	00b No Kneeling request; 01b Kneeling request;
			√		2..1	Kneeling request front axle	SPN 1830	2 bit	00b No Kneeling request; 01b Kneeling request;
				8		Not defined	---		
ASC3_B	18 FE 59 40	100ms	✉ 📖			Air Suspension Control 3	PGN 65113	ECAS/ESAC height information: articulated bus dolly (see Parameter Group Label Air Suspension Control #3)	
			√	1,2		Relative level front axle left	SPN 1721	0.1 mm/bit, -3200 mm	-3200...3225,5 mm
			√	3,4		Relative level front axle right	SPN 1722	0.1 mm/bit, -3200 mm	-3200...3225,5 mm
			√	5,6		Relative level rear axle left	SPN 1724	0.1 mm/bit, -3200 mm	-3200...3225,5 mm
			√	7,8		Relative level rear axle right	SPN 1723	0.1 mm/bit, -3200 mm	-3200...3225,5 mm
ASC4_B	18 FE 58 40	100ms	✉ 📖			Air Suspension Control 4	PGN 65112	ECAS / ESAC pressure information: articulated bus dolly	
			√	1,2		Bellow pressure front axle left	SPN 1725	0.1 kPa/bit	0...+6425.5 kPa

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C. Schrader
21.06.2005

Message			Message Definition						
Name	Identifier [Hex]	Repetition rate	ESAC/ECAS / Dashboard / Trailer	Byte	Bit	Comment / Parameter	J1939/71	Length/ Resolution	Operating Data Range
ASC4_B			√ (Dashboard)	3,4		Bellow pressure front axle right	SPN 1726	0.1 kPa/bit	0...+6425.5 kPa
			√ (Dashboard)	5,6		Bellow pressure rear axle left	SPN 1727	0.1 kPa/bit	0...+6425.5 kPa
			√ (Dashboard)	7,8		Bellow pressure rear axle right	SPN 1728	0.1 kPa/bit	0...+6425.5 kPa
ASC6_B	0C D1 40 27	100ms	✉ (ESAC/ECAS), ⊠ (Dashboard)			Air Suspension Control 6	PGN 53504	Requested level preset articulated bus front end / truck (see Parameter Group Label Air Suspension Control #6)	
			√ (ESAC/ECAS)	1..2		Level preset front axle left	SPN 1732	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
			√ (ESAC/ECAS)	3..4		Level preset front axle right	SPN 1757	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
			√ (ESAC/ECAS)	5..6		Level preset rear axle left	SPN 1758	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm
			√ (ESAC/ECAS)	7..8		Level preset rear axle right	SPN 1735	0.1 mm/bit, -3200 mm offset	-3200...3225,5 mm

⊠	Transmitter	
✉	Receiver	
√	Data used in current application	
(√)	Data received but not used in current application	
⊗	data interests for future application	

Hints:
1) If there is no separate description for all bits, the standard definiton of SAE is used e.g. 10b = error/not available; 11b = signal not available
2) nominal value --> desired / rated value or target value
3) security device: sidewalk detector --> curbstone detector/feeler

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