INTERNATIONAL STANDARD

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Road vehicles — Electrical connections between towing and towed vehicles — Interchange of digital information —

Part 3:
Application layer for non-braking equipment

Véhicules routiers — Connexions électriques entre véhicules tracteurs et véhicules tractés — Échange de données numériques —

Partie 3: Couche application pour l'équipement autre que de freinage

Reference number
ISO 11992-3:1998(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11992-3 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 11992 consists of the following parts, under the general title *Road vehicles — Electrical connections between towing and towed vehicles — Interchange of digital information*:

— *Part 1: Physical layer and data link layer*

— *Part 2: Application layer for braking equipment*

— *Part 3: Application layer for non-braking equipment*

Annex A of this part of ISO 11992 is for information only.

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Introduction

This part of ISO 11992 is subject to additions which will become necessary to keep pace with experience and technical advances. Care has been taken to ensure that these additions can be introduced in a compatible way, and care will have to be taken in the future that such additions remain compatible with previous versions. In particular, it may become necessary to standardize new parameters and parameter groups. ISO members may request that such new parameters and parameter groups be included in future editions of ISO 11992 by completing the "Parameter identification form" in annex A and submitting it to ISO/TC 22/SC 3.

Road vehicles — Electrical connections between towing and towed vehicles — Interchange of digital information —

Part 3:
Application layer for non-braking equipment

1 Scope

This part of ISO 11992 specifies the data content for electronically controlled systems other than braking systems to ensure the interchange of digital information between road vehicles of a maximum authorised total mass greater than 3 500 kg, and their towed vehicles, including communication between towed vehicles.

The objective of the data structure is to achieve an optimised use of the interface, whilst preserving a sufficient reserve capacity for future expansion.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 11992. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 11992 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 11898:1993, *Road vehicles — Interchange of digital information — Controller area network (CAN) for high speed communication.*

ISO 11992-1:1998, *Road vehicles — Electrical connections between towing and towed vehicles — Interchange of digital information — Part 1: Physical layer and data link layer.*

ISO 11992-2:1998, *Road vehicles — Electrical connections between towing and towed vehicles — Interchange of digital information — Part 2: Application layer for braking equipment.*

3 Definitions

For the purposes of this part of ISO 11992, the definitions given in ISO 11992-1 and ISO 11992-2 apply.

4 General specifications

The data link and the physical layer shall be in accordance with ISO 11992-1.

To minimise bus loading on the towing/towed vehicle interface appropriate messages are specified. These messages may be filtered by a device (node) on each vehicle which shall also provide address assignment and electrical isolation from the in-vehicle sub-network.

The architecture was chosen to permit a mix of new and old towing and towed vehicles in any combination. Multiple towed vehicles can be connected in any combination; the network shall be capable of addressing any towed vehicle (dolly). The truck operator can disconnect and connect towed vehicles at any time and any order and the network shall adjust and respond accordingly.

5 Application layer

5.1 Message frame format

The application layer provides a string of information that is assimilated into a protocol data unit (PDU). The PDU provides a framework for organizing the information which will be sent by the CAN data frame.

This 29 bit identifier shall be in accordance to ISO 11898.

The PDU shall consist of seven fields additional to the specific CAN fields (see figure 1).

The PDU fields are Priority (P), Reserved (R), Data Page (DP), PDU Format (PF), PDU Specific (PS), which can be a Destination Address (DA) or a Group Extension (GE), Source Address (SA) and data field.

P	R	DP	PF	PS	SA		Data field
3	1	1	8	8	8		0 to 64

Figure 1 — 29-bit CAN identifier

5.1.1 Priority

The three priority bits are used to optimise message latency for transmission onto the bus only. They should globally masked off by the receiver (ignored). The priority of any message may be set from highest, 0 (000_2), to lowest, 7 (111_2). The default for all control oriented messages is 3 (011_2). The default of all other informational messages is 6 (110_2).

5.1.2 Reserved bit (R)

This bit is reserved for future expansion. This bit should be set to zero for transmitted messages.

5.1.3 Data page (DP)

The data page bit selects an auxiliary page of parameter group descriptions.

5.1.4 PDU format (PF)

The PDU format is an eight-bit field that determines the PDU format and is one of the fields used to determine the parameter group number assigned to the data field. Parameter group numbers shall be used to identify or label a set of commands and data.

5.1.5 PDU specific (PS)

The PDU specific is an eight-bit field and depends on the PDU format. Depending on the PDU format it can be a destination address or a group extension. If the value of the PDU format (PF) field is below 240, the PDU specific field is a destination address. If the value of the PF field is 240 to 255, then the PDU specific field contains a group extension (GE) value (see table 1).

Table 1 — PDU specific field

	PDU format (PF) field	PDU specific (PS) field
PDU 1 field	0 to 239	Destination address
PDU 2 field	240 to 255	Group extension

5.1.5.1 Destination address (DA)

This field contains the specific address of the towing and towed vehicle to which the message is being sent. Any other device shall ignore this message. The global destination address (255) requires all devices to listen.

5.1.5.2 Group extension (GE)

The group extension field, in conjunction with the four least significant bits of the PDU format field provide for 4 096 parameter groups per data page.

When the four most significant bits of the PDU format field are set it indicates that the PS field is a group extension.

5.1.6 Source address (SA)

The source address field is eight-bits long. There shall only be one device on the network with a given source address. Therefore, the source address field assures that the CAN identifier will be unique, as required by CAN.

5.1.7 Data field

A single CAN data frame provides at maximum eight data bytes. Even if fewer than eight bytes are required for expressing a given parameter group number, all eight bytes shall be used. This provides a means to easily add parameters and not to be incompatible with previous revisions which only specified part of the data field.

5.1.8 Parameter group number (PGN)

The parameter group number is a 24-bit number which contains: Reserved bit, Data page bit, PDU Format field (eight bits), and PDU specific field (eight bits) (see table 2).

If the PF value is less than 240 (F0H; PDU 1 type message) then the lower byte of the PGN is set to zero.

Table 2 — Content of the parameter group number

Byte 1 (MSB)			Byte 2	Byte 3
Bits 8...3	Bit 2	Bit 1		
000000b	Reserved	Data Page	PDU format	PDU specific

5.1.9 PDU 1 format

The PDU format allows for applicable messages to be sent to either a specific or global destination. PDU 1 format messages are determined by the PDU format (PF) field. When the PDU format field value is 0 to 239, the message is a PDU 1 format.

5.1.10 PDU 2 format

The PDU 2 format may only be used to communicate global messages. PDU 2 format messages are those where the PDU format (PF) field value is equal to 240 to 255.

5.2 Address assignment

A road train consists of one commercial vehicle and one or more towed vehicle(s). Dolly axles within the road train are treated as towed vehicles as well (see figure 2).

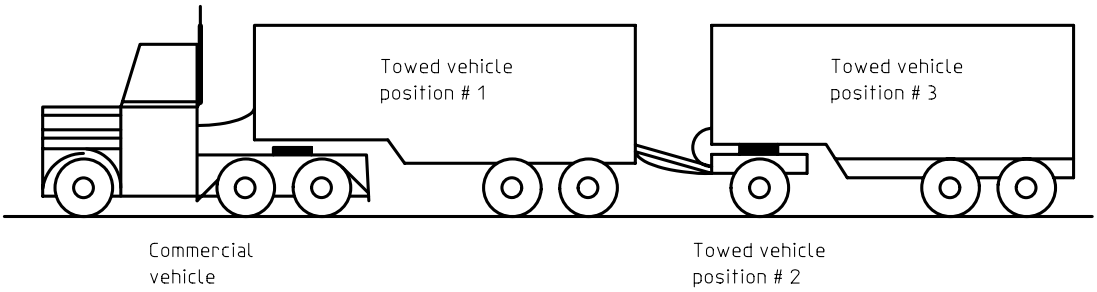

Figure 2 — Example of possible road train configuration

The address of the commercial vehicle is fixed.

The respective address of a towed vehicle corresponds to its position within the road train and has to be newly assigned each time

— communication starts,

— a towed vehicle has been connected.

For towing vehicle/towed vehicle communication the addresses shown in table 3 shall be used as source addresses (SA) and destination addresses (DA). To avoid any transmission conflict during the dynamic address assignment phase (power-up), the PDU 2 type message shall have even PS (GE) in predecessor transmission direction and odd PS (GE) in successor transmission direction. If the same message has to be sent in both transmission directions, two PS (GE) are necessary.

Table 3 — Commercial vehicle/towed vehicle addresses

Name	Address	Predecessor	Successor
Commercial vehicle (position #0)	32d = 20h	N/A	Towed vehicle position #1
Towed vehicle position #1	200d = C8h	Commercial vehicle (position #0)	Towed vehicle position #2
Towed vehicle position #2	192d = C0h	Towed vehicle position #1	Towed vehicle position #3
Towed vehicle position #3	184d = B8h	Towed vehicle position #2	Towed vehicle position #4
Towed vehicle position #4	176d = B0h	Towed vehicle position #3	Towed vehicle position #5
Towed vehicle position #5	168d = A8h	Towed vehicle position #4	undefined
Global destination address	255d = FFh	undefined	undefined

The dynamic address assignment shall be handled by the respective towing vehicle/towing vehicle node and concerns the determination of the individual position within the road train. The global destination address shall be only used by the commercial vehicle to broadcast information to all towed vehicles simultaneously.

The dynamic address assignment is based on the transmission of the standard initialization message (see 5.5) by the respective predecessor within the road train.

Within a road train, the address assignment procedure shall be initiated by the commercial vehicle, using its standard address for the standard initialization message (see table 3). A powered-up towed vehicle node shall use the towed vehicle #1 address as the default address to transmit available information, until the standard initialization has been received and a valid address can be assigned.

This allows the towed vehicle node to communicate and to identify its presence to its predecessor immediately after power-up. This could mean that several towed vehicles might use the same address, until the address assignment procedure has been completed.

An assigned address shall be valid as long as the standard initialization message is received from the predecessor with the corresponding source address and specified message timing.

To provide address assignment for itself and for possible successors, a node shall be capable of permanently sending the standard initialization message with its own source address (see figure 3).

Permanent sending of the initialization message is necessary to allow immediate towed vehicle address assignment at any time a towed vehicle might be connected.

In addition, a towed vehicle node shall be capable of

— identifying its predecessor by the source address of the standard initialization message;

— assigning its own address based on the predecessors address;

— identifying potential receiver(s) by the destination address and by the message type.

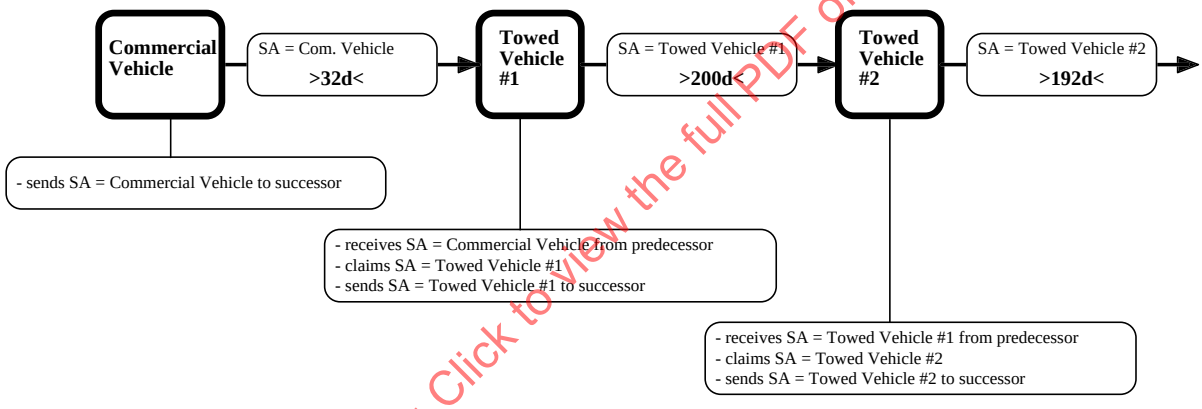

Figure 3 — Address assignment

5.3 Message routing

To allow communication between towing and towed vehicles, a node shall be capable of

— receiving messages from its predecessor and successor within the road train;

— identifying receiver(s) by the destination address (PDU 1 type messages) or the PDU format (PDU 2 type messages);

— routing all messages from its predecessor(s) to its successor(s) within the road train by sending them with the unchanged source and destination address to its successor[1)] within a maximum delay time of t_d = 13 ms;

— routing all messages from its successor(s) to its predecessor(s) within the road train by sending them with the unchanged source and destination address to its predecessor[1)] within a maximum delay time of t_d = 13 ms.

1) If no provisions are provided for a successor, this function is not required.

A towed vehicle node shall not route messages to its successor or predecessor within the road train, if the source address of a message received from its

— predecessor corresponds to a road train position higher or equal to its own;

— successor corresponds to a road train position lower or equal to its own.

Figures 4 to 9 illustrate the PDU type message sent in different directions.

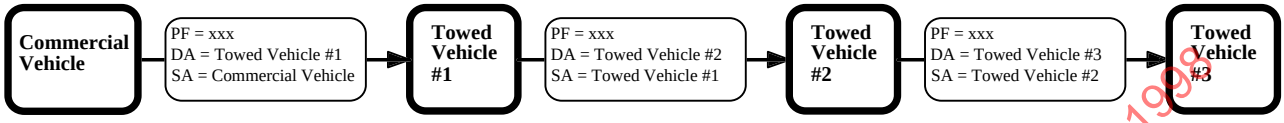

Figure 4 — Example of PDU 1 type messages from towing vehicle to succeeding towing vehicle

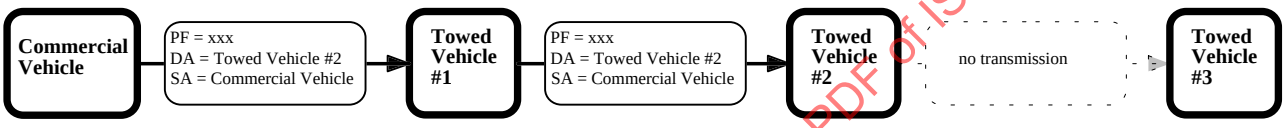

Figure 5 — Example of PDU 1 type message from towing vehicle to towed vehicle #2

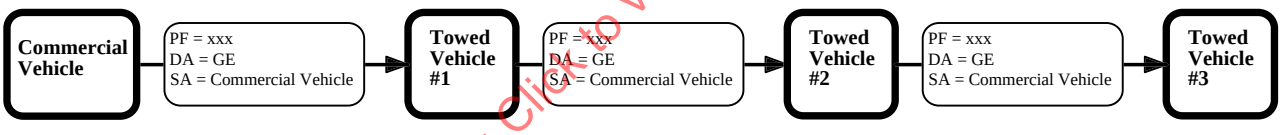

Figure 6 — Example of PDU 2 type message from commercial vehicle to all towed vehicles

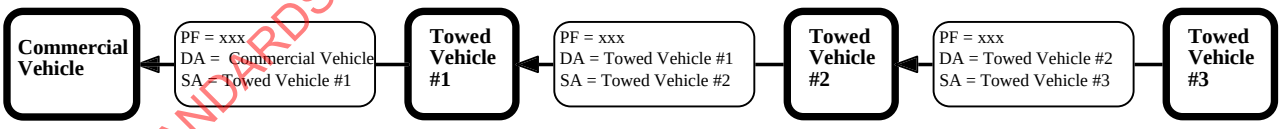

Figure 7 — Example of PDU 1 type messages from towed vehicle to preceding towing vehicle

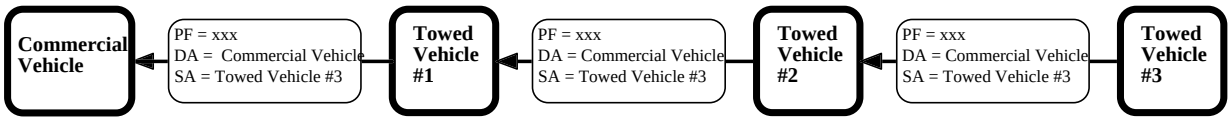

Figure 8 — Example of PDU 1 type message from towed #3 to commercial vehicle

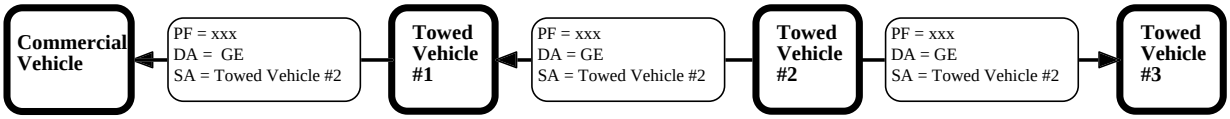

Figure 9 — Example of PDU 2 type message from towed vehicle #2

5.4 Parameters

5.4.1 Parameter ranges

Table 4 specifies the ranges used to determine the validity of transmitted signal.

Table 5 specifies the ranges used to denote the state of a discrete parameter and table 6 defines the ranges used to denote the state of a control mode command.

The values in the range "error indicator" provide a means for a module to immediately indicate that valid parameter data is not currently available due to some type of error in the sensor, sub-system, or module. Additional information about the failure may be available using diagnostic requests.

The values in the range "not available" provide a means for a module to transmit a message which contains a parameter that is not available or not supported in that module. This value does not replace the "error indicator".

The values in the range "not requested" provide a means for a device to transmit a command message and identify those parameters where no response is expected from the receiving device.

Table 4 — Transmitted signal ranges

Parameter	Unit	Value range	
		1 byte	2 bytes
Signal range	Dec	0 to 250	0 to 64255
	Hex	00 to FA	0000 to FAFF
Reserved range for future indicator bits	Dec	251 to 253	64256 to 65023
	Hex	FB to FD	FB00 to FDFF
Error indicator	Dec	254	65024 to 65279
	Hex	FE	FExx
Not available or not requested	Dec	255	65280 to 65535
	Hex	FF	FFxx

Table 5 — Transmitted values for discrete parameters

Range name	Transmitted value
Disabled (off, passive, insufficient)	00
Enabled (on, active, sufficient)	01
Error indicator	10
Not available or not installed	11

Table 6 — Transmitted values for control requests

Range name	Transmitted value
Request to disable function (turn off, etc.)	00
Request to enable function (turn on, etc.)	01
Reserved	10
Don't care/take no action (leave function as it is)	11

After power on, a node should internally set the "availability bits" of received parameters as not available and operate with default values until valid data is received. When transmitting, undefined bytes should be sent as 255Dec (FFHex) and undefined bits should be sent as "1".

If a component failure prevents the transmission of valid data for a parameter, the error indicator, as described in tables 4 and 5, shall be used in place of that parameter data. However, if the measured of calculated data has yielded a value that is valid yet exceeds the defined parameter range, the error indicator shall not be used. The data should be transmitted using the appropriate minimum or maximum parameter value.

A word (16 bit) parameter shall be sent, least significant byte first, most significant byte second.

5.4.2 Parameter specifications

5.4.2.1 General

A description of each parameter is given in 5.4.2.2 to 5.4.2.30. The description includes data length, data type, resolution and range for reference.

The type of data shall also be identified for each parameter. Data may be either status or measured. Status specifies the present state of a multi-state parameter or function as a result of action taken by the transmitting node. Note that specific confirmation of this action is not necessarily assured. For instance, the status may indicate that a solenoid has been activated, yet no measurement may have been taken to ensure the solenoid accomplished its function. An example of status-type data is "lift axle position request".

Measured data conveys the current value of a parameter as measured or observed by the transmitting node to determine the condition of the defined parameter. An example of measured-type data is "thermal body temperature".

Negative signed parameter means deceleration, positive signed ones means acceleration in accordance to the drive line of the vehicle.

5.4.2.2 Obstacle detection device (ODD)

The actual distance between back-side of towed vehicle and any obstacle when reversing.

Data length: 1 byte

Resolution: 2 cm/bit gain, 0 cm offset

Data range: 0 cm to 500 cm

Type: Measured

5.4.2.3 Thermal body temperature

The actual temperature in a thermal body on towed vehicle.

Data length: 1 byte

Resolution: 1 °C/bit gain, 125 °C offset

Data range: –125 C to 125 °C

Type: Measured

5.4.2.4 Tyre identification

Identification number of the tyre with

— insufficient pressure, or

— brake linings, or

— specific brake temperature.

The identification number specifies the wheel position on each axle (bit 1 to 4) and the number of axles starting from the front vehicle (bit 5 to 8) (see figure 10).

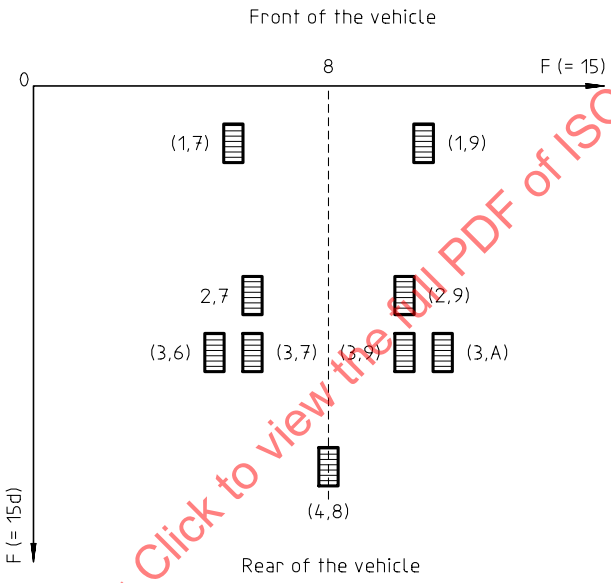

Figure 10 — Wheel and axle position

The identification number is in conjunction with the state information in the message.

Data length: 1 byte

Resolution: 1/bit gain, 0 offset

Data range: 1 - 15 wheel positions (low bits)

1 - 15 axle positions (high bits)

Type: Measured

The tyre identification is labelled sequentially from the vehicle symmetric line, starting from '9' incrementing on the right side, and from '7' decrementing on the left side. '8' is used for one wheel on the symmetric line.

5.4.2.5 Tyre pressure

Actual tyre pressure without corrections.

Data length: 1 byte

Resolution: 10 kPa/bit gain, 0 kPa offset

Data range: 0 to 2 500 kPa

Type: Measured

5.4.2.6 Brake lining

Actual relative value of brake lining of a specific brake.

Data length: 1 byte
Resolution: 0,4 %/bit gain, 0 % offset
Data range: 0 % to 100 %
Type: Measured

5.4.2.7 Brake temperature

Actual brake temperature.

Data length: 1 byte
Resolution: 10 °C/bit gain, 0 % offset
Data range: 0 °C to 2 500 °C
Type: Measured

5.4.2.8 Driven axle load (commercial vehicle)

Actual static vertical load on driven axle of the commercial vehicle.

Data length: 2 bytes
Resolution: 2 kg/bit gain, 0 kg offset
Data range: 0 kg to 128 510 kg
Type: Measured

5.4.2.9 Nominal vehicle body level[2)]

Actual nominal vehicle body height. In case of regulation by level change request (5.4.2.16) is this value the actual vehicle body height referred to ground.

Data length: 2 bytes
Resolution: 1 mm/bit gain, 0 mm offset
Data range: 0 mm to 64 225 mm
Type: Measured

5.4.2.10 Lift axle[3)] position request

Command signal to control the lift axle position (up/down).

NOTE — Vehicles with more than one lift axle are possible.

00 — Lift axle position down
01 — Lift axle position up
11 — Take no action
Type: Status

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2) Front axle or rear axle.

3) Lift axle 1 or 2, start at front axle.

5.4.2.11 Steering axle locking request

Command signal to lock the steering axle.

00 — Steering axle unlocked

01 — Steeling axle locked

11 — Take no action

Type: Status

5.4.2.12 Obstacle detection device (ODD) request

Command signal to switch on or off the obstacle detection device (ODD) during reversing.

00 — ODD off

01 — ODD on

11 — Take no action

Type: Status

5.4.2.13 Anti-theft device request

Command signal to activate the anti-theft device.

00 — Anti-theft device off

01 — Anti-theft device on

11 — Take no action

Type: Status

5.4.2.14 Traction help (load transfer) request

Command signal to control the lift- or tagaxle position to transfer more load on the driven axle of the towing vehicle.

00 — No traction help request

01 — Traction help request

11 — Take no action

Type: Status

5.4.2.15 Ride height request

Command signal to activate one normal ride body height specified by regulation.

NOTE — 4 m height in Europe.

00 — (Normal) Level 1

01 — (Normal) Level 2

11 — Take no action

Type: Status

5.4.2.16 Level change request[2)]

Command signal to control the body height [up (lifting)/down (lowering)] for front and rear axles.

00 — Vehicle body up (lifting)

01 — Vehicle body down (lowering)

11 — Take no action

Type: Status

5.4.2.17 Ramp level request

Command signal to control the body height to a level programmed and memorised in the ECU.

00 — Ramp level 1

01 — Ramp level 2

11 — take no action

Type: Status

5.4.2.18 Lift axle position

Signal which indicates the actual lift axle position if a lift axle is installed.

00 — Lift axle position down

01 — Lift axle in position up

Type: Measured

5.4.2.19 Steering axle locking

Signal which indicates the actual steering axle locking status if a steering axle is installed.

00 — Steering axle unlocked

01 — Steering axle locked

Type: Measured

5.4.2.20 Obstacle detection device (ODD) status

Signal which indicates that an obstacle detection device (ODD) is active/inactive during reversing, if this device is installed.

00 — ODD inactive

01 — ODD active

Type: Measured

5.4.2.21 Anti-theft device

Signal which indicates that the anti-theft device is switched on or off, if this device is installed.

00 — Anti-theft device off

01 — Anti-theft device on

Type: Measured

5.4.2.22 Vehicle pneumatic supply sufficient/insufficient

Signal which indicates that the supply pressure for braking equipment in the reservoir is sufficient/insufficient.

00 — Vehicle pneumatic supply insufficient

01 — Vehicle pneumatic supply sufficient

Type: Measured

5.4.2.23 Tyre pressure sufficient/insufficient

Status signal which indicates that the tyre pressure is out of the specific pressure range.

00 — Tyre pressure insufficient

01 — Tyre pressure sufficient

Type: Status

5.4.2.24 Brake lining sufficient/insufficient

Status signal which indicates that the brake lining is sufficient/insufficient for proper braking function.

00 — Brake linings insufficient

01 — Brake linings sufficient

Type: Status

5.4.2.25 Brake temperature status

Status signal which indicates that the brake temperature is higher than a specific level.

00 — Brake temperature out of range

01 — Brake temperature normal

Type: Status

5.4.2.26 Traction help (load transfer)

Signal which indicates that a load transfer is taken or not.

00 — Traction help (load transfer) inactive

01 — Traction help (load transfer) active

Type: Measured

5.4.2.27 Levelling control system, ride height level

Signal which indicates the body height position of the vehicle.

00 — Vehicle body not at requested level

01 — Vehicle body at requested level

Type: Measured

5.4.2.28 Level control

Status signal which indicates that the levelling system is enabled or disabled.

NOTE — For example, under braking condition, the levelling system is disabled.

00 — Level control disabled

01 — Level control enabled

Type: Status

5.4.2.29 Ramp level position

Signal which indicates the actual ramp level position of the body height.

00 — Ramp level position 1

01 — Ramp level position 2

Type: Measured

5.4.2.30 Trailer type

Status information to identify a dolly axle within a road train.

00 — Tractor or trailer

01 — Dolly axle

Type: Status

5.5 Messages

5.5.1 General

This subclause specifies the data content for use on the electrical connection between towing and towed vehicles.

All unspecified bits are to be transmitted with a value of "1". All unspecified bits should be received as "don't care" (either masked out or ignored). This permits them to be defined and used in the future without causing any incompatibilities.

The data content block is described by a short form of the function, e.g. GFM for general function message, and two numbers. The first stands for the transmission direction:

— towing to towed vehicle: 1

— towed to towing vehicle: 2

The second is the block (messages) number.

For the dynamic address assignment, one of the PDU1-type messages to be sent from the towing vehicle to the towed vehicle with the lowest transmission repetition time is specified as the standard initialization message. This message and as well one of the PDU1-type messages to be sent from a towed vehicle to its predecessor with the lowest transmission repetition time shall be sent frequently.

For PDU 1 and PDU 2 type messages, see tables 7 and 8.

The messages GFM11 and GFM21 shall be transmitted only between two coupled vehicles.

Table 7 — PDU 1 type message

Repetition rate	Data specification	P	R	DP	PF	PS	PGN	Remarks
≥ 100 ms	General function # 1/1 - GFM 11	6	0	0	226	DA	00E200h	
≥ 100 ms	General function # 2/1 - GFM 21	6	0	0	225	DA	00E100h	
≥ 100 ms	General function # 1/2 - GFM 12	6	0	0	228	DA	00E400h	
≥ 100 ms	General function # 2/2 - GFM 22	6	0	0	229	DA	00E500h	

Table 8 — PDU 2 type message

Repetition rate	Data specification	P	R	DP	PF	PS (GE)	PGN	Remarks
≥ 100 ms	General function # 2/3 - GFM 23	6	0	0	254	198	00FEC6h	
≥ 100 ms	General function # 2/4 - GFM 24	6	0	0	254	200	00FEC8h	

5.5.2 Message specifications, transmission direction towing to towed vehicle

5.5.2.1 Towing vehicle message # 1/1, GFM 11

This message is specified as the standard initialization message for address assignment of the receiving vehicle. Sending this message is required.

Transmission repetition time: 100 ms ± 10 ms

Data length: 8 bytes

Data page: 0

Parameter format: 226

PDU specific: Address of successor

Default priority: 6

Byte: 1 Towing vehicle system status — Bit: 1-2 Vehicle type; 3-8 Not defined

2 Towing vehicle general functions 1 — Bit: 1-2 Anti-theft device request; 3-4 ODD request; 5-8 Not defined

3 Towing vehicle general functions 2 — Not defined

4 Towing vehicle general functions 3 — Not defined

5 Towing vehicle general functions 4 — Not defined

6-7 Drive axle load

8 Not defined

5.5.2.2 Towing vehicle message # 1/2, GFM 12

Transmission repetition time: 100 ms ± 10 ms

Data length: 8 bytes

Data page: 0

Parameter format: 228

PDU specific: Destination address

Default priority: 6

Byte: 1 Towing vehicle general functions 5 — Bit: 1-2 Ride height request; 3-4 Level change request, front axle; 5-6 Level change request, rear axle; 7-8 Traction help request

2	Towing vehicle general functions 6	Bit:	1-2	Lift axle 1 position request
			3-4	Lift axle 2 position request
			5-6	Steering axle locking request
			7-8	Ramp level request
3	Towing vehicle general functions 7	Bit:	1-8	Not defined
4-8	Not defined			

5.5.3 Message with transmission direction from towed to towing vehicle

5.5.3.1 Towed vehicle message #2/1, GFM 21

This message is the answer of the standard initialization message from the towing vehicle. Sending this message is required.

Transmission repetition time:		100 ms ± 10 ms		
Data length:		8 bytes		
Data page:		0		
Parameter format:		225		
PDU specific:		Address of the predecessor		
Default priority:		6		
Byte: 1	Towed vehicle system status	Bit:	1-2	Vehicle type
			3-8	Not defined
2	Towed vehicle general function 1	Bit:	1-8	Not defined
3	Towed vehicle general function 2	Bit:	1-8	Not defined
4	Towed vehicle general function 3	Bit:	1-8	Not defined
5-8	Not defined			

5.5.3.2 Towed vehicle message #2/2, GFM 22

Transmission repetition time:		100 ms ± 10 ms		
Data length:		8 bytes		
Data page:		0		
Parameter format:		229		
PDU specific:		Address of the commercial vehicle		
Default priority:		6		
Byte: 1	Towed vehicle general function 4	Bit:	1-2	Levelling control system, ride height level
			3-4	Level control
			5-6	Traction help
			7-8	Ramp level position
2	Towed vehicle general function 5	Bit:	1-2	Lift axle 1 position
			3-4	Lift axle 2 position
			5-6	Steering axle locking
			7-8	ODD status