

ISO 11992-2:2023-03 (E)

Road vehicles - Interchange of digital information on electrical connections between towing and towed vehicles - Part 2: Application layer for brakes and running gear

| Contents | | Page |
|--------------------|---|-------------|
| Foreword | | vii |
| Introduction | | viii |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 1 |
| 4 | Symbols and abbreviated terms | 4 |
| 4.1 | Symbols | 4 |
| 4.2 | Abbreviated terms | 4 |
| 5 | Conventions | 5 |
| 6 | APP-Parameters specification | 5 |
| 6.1 | General definitions | 5 |
| 6.2 | APP - Identification parameter specification | 6 |
| 6.2.1 | APP - Axle/wheel identification | 6 |
| 6.2.2 | APP - Identification data index | 8 |
| 6.2.3 | APP - Identification data indexed content | 9 |
| 6.3 | APP - Braking systems parameter specification | 10 |
| 6.3.1 | APP - Park brake demand relative pressure | 10 |
| 6.3.2 | APP - Service brake demand pressure | 10 |
| 6.3.3 | APP - Vehicle service brake status | 11 |
| 6.3.4 | APP - Braking system wheel-based vehicle speed | 11 |
| 6.3.5 | APP - Vehicle retarder control status | 11 |
| 6.3.6 | APP - Retarder demand relative torque | 12 |
| 6.3.7 | APP - Retarder wheel torque reference | 13 |
| 6.3.8 | APP - Retarder relative peak torque | 14 |
| 6.3.9 | APP - Retarder actual maximum positive torque | 14 |
| 6.3.10 | APP - Retarder actual maximum negative torque | 14 |
| 6.3.11 | APP - Axle load sum | 15 |
| 6.3.12 | APP - Pneumatic supply pressure | 15 |
| 6.3.13 | APP - Brake lining | 15 |
| 6.3.14 | APP - Brake temperature | 16 |
| 6.3.15 | APP - Tyre pressure | 16 |
| 6.3.16 | APP - Automatic towed vehicle braking status | 16 |
| 6.3.17 | APP - Vehicle ABS status | 17 |
| 6.3.18 | APP - Vehicle electrical supply status | 17 |
| 6.3.19 | APP - Vehicle pneumatic supply status | 18 |
| 6.3.20 | APP - Spring brake installation status | 18 |
| 6.3.21 | APP - Electrical load proportional function installation status | 18 |
| 6.3.22 | APP - Load proportional function installation status | 19 |
| 6.3.23 | APP - ABS off-road request | 19 |
| 6.3.24 | APP - ASR brake control status | 19 |
| 6.3.25 | APP - ASR engine control status | 20 |
| 6.3.26 | APP - Pneumatic control line status | 20 |
| 6.3.27 | APP - Two electrical circuits brake demand status | 20 |
| 6.3.28 | APP - Tyre pressure status | 21 |

| | | |
|--------|--|----|
| 6.3.29 | APP - Brake lining status | 21 |
| 6.3.30 | APP - Brake temperature status | 22 |
| 6.3.31 | APP - Brake light switch | 22 |
| 6.3.32 | APP - Vehicle type | 22 |
| 6.3.33 | APP - Red warning signal request | 23 |
| 6.3.34 | APP - Amber warning signal request | 23 |
| 6.3.35 | APP - Electrical supply of non-braking systems status | 23 |
| 6.3.36 | APP - Loading ramp approach assistance status | 24 |
| 6.3.37 | APP - VDC active | 24 |
| 6.3.38 | APP - Road curvature | 25 |
| 6.3.39 | APP - Wheel speed difference main axle | 25 |
| 6.3.40 | APP - Supply line braking | 25 |
| 6.3.41 | APP - Spring brake status | 26 |
| 6.3.42 | APP - Relative brake demand for front or left vehicle side | 26 |
| 6.3.43 | APP - Relative brake demand for rear or right vehicle side | 27 |
| 6.3.44 | APP - Support of side- or axle-wise brake force distribution | 27 |
| 6.3.45 | APP - Lateral acceleration | 27 |
| 6.3.46 | APP - Stop lamps request | 28 |
| 6.3.47 | APP - Braking via electric control line support | 28 |
| 6.3.48 | APP - Geometric data index | 28 |
| 6.3.49 | APP - Geometric data indexed content | 29 |
| 6.3.50 | APP - Brake cylinder pressure first axle, left wheel | 32 |
| 6.3.51 | APP - Brake cylinder pressure first axle, right wheel | 33 |
| 6.3.52 | APP - Brake cylinder pressure second axle, left wheel | 33 |
| 6.3.53 | APP - Brake cylinder pressure second axle, right wheel | 33 |
| 6.3.54 | APP - Brake cylinder pressure third axle, left wheel | 34 |
| 6.3.55 | APP - Brake cylinder pressure third axle, right wheel | 34 |
| 6.3.56 | APP - Wheel speed first axle, left wheel | 35 |
| 6.3.57 | APP - Wheel speed first axle, right wheel | 35 |
| 6.3.58 | APP - ROP system status | 35 |
| 6.3.59 | APP - YC system status | 36 |
| 6.3.60 | APP - Towed vehicle ROP system request | 36 |
| 6.3.61 | APP - Towed vehicle YC system request | 36 |
| 6.3.62 | APP - Vehicle combination ABS status | 37 |
| 6.3.63 | APP - Towed vehicle detection status | 37 |
| 6.3.64 | APP - Reverse gear status | 38 |
| 6.3.65 | APP - External brake request status | 38 |
| 6.3.66 | APP - Emergency braking status | 38 |
| 6.4 | APP - Running gear equipment parameter specification | 39 |
| 6.4.1 | APP - Driven axle load | 39 |
| 6.4.2 | APP - Nominal vehicle body level, front axle | 39 |
| 6.4.3 | APP - Nominal vehicle body level, rear axle | 40 |
| 6.4.4 | APP - Relative vehicle body level, front axle | 40 |
| 6.4.5 | APP - Relative vehicle body level, rear axle | 40 |
| 6.4.6 | APP - Level control request | 41 |
| 6.4.7 | APP - Level control status | 41 |
| 6.4.8 | APP - Level change request, front axle | 41 |
| 6.4.9 | APP - Level change request, rear axle | 42 |
| 6.4.10 | APP - Level change status, front axle | 42 |
| 6.4.11 | APP - Level change status, rear axle | 42 |
| 6.4.12 | APP - Lift axle 1 position request | 43 |
| 6.4.13 | APP - Lift axle 2 position request | 43 |
| 6.4.14 | APP - Lift axle 3 position request | 44 |
| 6.4.15 | APP - Lift axle 4 position request | 44 |
| 6.4.16 | APP - Lift axle 5 position request | 44 |
| 6.4.17 | APP - Lift axle 1 position | 45 |
| 6.4.18 | APP - Lift axle 2 position | 45 |
| 6.4.19 | APP - Lift axle 3 position | 45 |
| 6.4.20 | APP - Lift axle 4 position | 46 |
| 6.4.21 | APP - Lift axle 5 position | 46 |
| 6.4.22 | APP - Steering axle locking request | 46 |

| | | |
|--------|---|----|
| 6.4.23 | APP - Steering axle locking status | 47 |
| 6.4.24 | APP - Traction help (load transfer) request | 47 |
| 6.4.25 | APP - Traction help (load transfer) status | 48 |
| 6.4.26 | APP - Ride height request | 48 |
| 6.4.27 | APP - Ride height level | 48 |
| 6.4.28 | APP - Normal level | 49 |
| 6.4.29 | APP - Ramp level request | 49 |
| 6.4.30 | APP - Ramp level | 49 |
| 6.4.31 | APP - Ramp level position | 50 |
| 6.4.32 | APP - Ramp level storage request | 50 |
| 6.4.33 | APP - Ramp level storage status | 50 |
| 6.4.34 | APP - Stop level change request | 51 |
| 6.4.35 | APP - Stop level change request acknowledge | 51 |
| 6.4.36 | APP - Parking and towed vehicle air pressure | 51 |
| 6.4.37 | APP - Auxiliary equipment supply pressure | 52 |
| 6.4.38 | APP - Tyre pressure threshold detection | 52 |
| 6.4.39 | APP - Air leakage detection | 53 |
| 6.4.40 | APP - Tyre temperature | 53 |
| 6.4.41 | APP - Tyre module power supply status | 54 |
| 6.5 | APP - Axle load parameter specification | 54 |
| 6.5.1 | APP - Axle load | 54 |
| 6.5.2 | APP - Axle load calibration data storage request | 54 |
| 6.5.3 | APP - Axle load calibration data storage status | 55 |
| 6.5.4 | APP - Axle load measured by external scale | 55 |
| 6.5.5 | APP - Axle load measured by towed vehicle | 56 |
| 6.5.6 | APP - Axle load calibration data load level | 56 |
| 6.5.7 | APP - Axle load calibration type | 57 |
| 6.5.8 | APP - Maximum driven axle load | 57 |
| 6.6 | Ride height parameter specification | 58 |
| 6.6.1 | APP - Extended ride height and ramp level storage | 58 |
| 6.6.2 | APP - Ride height and ramp level set request | 58 |
| 6.6.3 | APP - Ride height storage request | 58 |
| 6.6.4 | APP - Ride height storage | 59 |
| 6.6.5 | APP - Neutral gear request | 59 |
| 6.6.6 | APP - Rear obstacle distance | 59 |
| 6.6.7 | APP - Immobilizer status | 60 |
| 6.6.8 | APP - Fifth wheel load | 60 |
| 6.6.9 | APP - Ambient air temperature | 61 |
| 6.6.10 | APP - Parking brake status | 61 |
| 6.6.11 | APP - Neutral gear status | 61 |
| 6.7 | APP - Software update parameter specification | 61 |
| 6.7.1 | APP - Vehicle software update request | 61 |
| 6.7.2 | APP - Vehicle software update request acknowledgement | 62 |
| 7 | APP-PGspecification | 62 |
| 7.1 | APP - Overview of PGs | 62 |
| 7.2 | APP - Message transmission in case of multiple towed vehicles | 64 |
| 7.3 | APP - Towing vehicle | 64 |
| 7.3.1 | APP - General specification | 64 |
| 7.3.2 | APP - General PGs, transmitted from the towing to the towed vehicle | 65 |
| 7.3.3 | APP - Electronic brake system PGs, transmitted from the towing to the towed vehicle | 65 |
| 7.3.4 | APP - Running gear equipment PGs, transmitted from the towing to the towed vehicle | 67 |
| 7.4 | APP - Towed vehicle | 70 |
| 7.4.1 | APP - General PGs, transmitted from the towed to the towing vehicle | 70 |
| 7.4.2 | APP - Electronic brake system PGs, transmitted from the towed to the towing vehicle | 70 |
| 7.4.3 | APP - Running gear equipment PGs, transmitted from towed to towing vehicle | 75 |
| 8 | APP - Address assignment | 78 |
| 8.1 | APP - General requirements | 78 |
| 8.2 | APP - Road train configuration | 79 |

| | | |
|--|---|-----|
| 8.3 | APP - Address assignment method of a towing and towed vehicle | 79 |
| 8.4 | APP - Vehicle node capabilities | 80 |
| 9 | SI-ServiceinterfacedefinitionbetweenapplicationandOSlayers | 82 |
| 9.1 | SI - A_Data.req, A_Data.ind, and A_Data.con service interface | 82 |
| 9.2 | SI - A_Data.req, A_Data.ind, and A_Data.con service interface parameter mapping | 82 |
| 9.3 | SIP - Service interface data type definitions | 83 |
| 10 | AL - Application layer | 83 |
| 10.1 | AL - Message PDU format | 83 |
| 10.2 | AL - A_PDU specification | 83 |
| 11 | PL - Presentation layer | 83 |
| Annex A (normative) Geometric dimensions | | 84 |
| Annex B (normative) Software update request and acknowledge interaction between towing and towed vehicles | | 90 |
| Annex C (informative)Messageflow | | 99 |
| Bibliography | | 103 |