

CT4045 SBS

ETCS Onboard

GAMMAMODELLE BR423

| 13.02.2023 | Elektronische Signatur | Elektronische Signatur | Elektronische Signatur | Elektronische Signatur |  • mobility by nature • ALSTOM Belgium S.A Rue Cambier Dupret 50-52 6001 CHARLEROI | | | |
|-------------------------------------|--------------------------|--------------------------|--------------------------|------------------------|---|---------------------|---------------|--------------------|
| | M. JOST | A. Lefevre | R. ERRAFI | S. DIDIER | | | | |
| DATUM | ERSTELLT | GEPRÜFT | VALIDIERT | GENEHMIGT | | | | |
| Vertraulichkeitskategorie | | | | | APC-000219 | Version A | Sprache DE | Seiten 8 |
| Öffentlich | Eingeschränkt | Vertraulich | Geheim | | | | | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |

PMT-IS-TEM-008_G_BLN_DKS_DE

Nutzungsrechte gemäß Vertrag zum Projekt: Ausrüstung der BR423 & BR430 der S-Bahn Stuttgart mit ETCS, ATO und anderen Technologien zur Zug-Strecken-Kommunikation. („Vertrag über die Entwicklung, Herstellung, Inbetriebsetzung, Lieferung, Integration und Erlangung der Typgenehmigung und Genehmigungen zum Inverkehrbringen von ETCS- und ATO-Fahrzeugausrüstungen“)

**KEINE HAFTUNG FÜR DIE VOLLSTÄNDIGKEIT UND AKTUALITÄT DER DRUCKVERSION.
Nur nach Prüfung der gültigen Dokumentenversion anzuwenden.**

ÄNDERUNGEN

| Freigabe | Verfasser | Datum | Seite / Abschnitt | Kommentare | CR/NC-ID |
|----------|-----------|------------|----------------------|---------------|----------|
| A | M. Jost | 13.02.2023 | | Neuerstellung | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

INHALT

| | | |
|----------|---|----------|
| 1 | EINLEITUNG | 5 |
| 1.1 | ZWECK | 5 |
| 1.2 | ANWENDBARKEIT | 5 |
| 1.3 | ANWENDBARE UND REFERENZDOKUMENTE | 5 |
| | 1.3.1 REFERENZDOKUMENTE | 5 |
| | 1.3.2 ANWENDBARE DOKUMENTE | 5 |
| 1.4 | ABKÜRZUNGEN UND DEFINITIONEN | 5 |
| 2 | GUTZUSTAND BR423 FAHRZEUGE | 6 |
| 2.1 | EINFACHTRAKTION | 6 |
| 2.2 | ZWEIFACHTRAKTION | 7 |
| 2.3 | DREIFACHTRAKTION | 8 |

TABELLEN

| | |
|--|---|
| <i>Tabelle 1: Referenzdokumente</i> | 5 |
| <i>Tabelle 2: Anwendbare Dokumente</i> | 5 |
| <i>Tabelle 3: Abkürzungen</i> | 5 |

1 EINLEITUNG

1.1 Zweck

Fahrzeuge vom Typ BR423 sollen mit ETCS ausgerüstet werden. Deshalb werden für die Fahrzeuge ETCS-Gamma-Bremsmodelle in Einfach-, Zweifach- und Dreifachtraktion benötigt. Auf der Basis der Ergebnisse der vorliegenden Dokumentation wurde im Auftrag der DB Regio durch die DB Systemtechnik ETCS-Bremskurvenparameter für die Baureihe BR423 definiert.

Die zusammenfassenden Ergebnisse finden sich in diesem Dokument.

1.2 Anwendbarkeit

1.3 Anwendbare und Referenzdokumente

1.3.1 Referenzdokumente

Diese Dokumente wurden zur Erstellung dieses Plans verwendet:

Tabelle 1: Referenzdokumente

| Dokumententitel | Referenz |
|------------------|----------------|
| [R1] ADM-Glossar | REF-IS-INF-005 |

1.3.2 Anwendbare Dokumente

Diese Dokumente werden bei der Durchführung von Aktivitäten verwendet:

Tabelle 2: Anwendbare Dokumente

| | |
|------|--|
| [A1] | |
| [A2] | |

1.4 Abkürzungen und Definitionen

Siehe ADM-Glossar [R1].

Darüber hinaus gelten für dieses Dokument folgende Definitionen und Abkürzungen.

Tabelle 3: Abkürzungen

| Abkürzung | Definition |
|-----------|------------|
| | |
| | |
| | |

2 GUTZUSTAND BR423 FAHRZEUGE

2.1 Einfachtraktion

| Zuglänge | 68 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|------------------------|---------|---------|---------|--------|-------|-------|-------|---------------------------------------|------------------|----------|------|------|------|------|------|---|---|----------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|----------|------|------|------|------|------|------|------|
| Bremshundertstel | 142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brake Position (Passenger train in P, freight train in P oder freight train in G) | Passenger train in P | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nominale Schnellbremsverzögerung A_brake_emergency(V) | <table border="1"> <thead> <tr> <th>Geschwindigkeit [km/h]</th> <th>140-120</th> <th>120-100</th> <th>100-80</th> <th>80-50</th> <th>50-30</th> <th>30-15</th> <th>15-0</th> </tr> </thead> <tbody> <tr> <td>A_brake_emergency [m/s²]</td> <td>1,07</td> <td>0,98</td> <td>0,94</td> <td>0,98</td> <td>1,09</td> <td>1,13</td> <td>1,05</td> </tr> </tbody> </table> | Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | A_brake_emergency [m/s ²] | 1,07 | 0,98 | 0,94 | 0,98 | 1,09 | 1,13 | 1,05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A_brake_emergency [m/s ²] | 1,07 | 0,98 | 0,94 | 0,98 | 1,09 | 1,13 | 1,05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sicherheitsfaktor auf trockener Schiene Kdry_rst(V,EBCL) | <table border="1"> <thead> <tr> <th colspan="2">Geschwindigkeit [km/h]</th> <th>140-120</th> <th>120-100</th> <th>100-80</th> <th>80-50</th> <th>50-30</th> <th>30-15</th> <th>15-0</th> </tr> </thead> <tbody> <tr> <td rowspan="9">Kdry_rst(V,EBCL)</td> <td>EBCL = 0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>EBCL = 1</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> </tr> <tr> <td>EBCL = 2</td> <td>0,92</td> <td>0,92</td> <td>0,92</td> <td>0,92</td> <td>0,92</td> <td>0,92</td> <td>0,92</td> </tr> <tr> <td>EBCL = 3</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> </tr> <tr> <td>EBCL = 4</td> <td>0,86</td> <td>0,86</td> <td>0,86</td> <td>0,86</td> <td>0,86</td> <td>0,86</td> <td>0,86</td> </tr> <tr> <td>EBCL = 5</td> <td>0,73</td> <td>0,73</td> <td>0,73</td> <td>0,73</td> <td>0,73</td> <td>0,73</td> <td>0,73</td> </tr> <tr> <td>EBCL = 6</td> <td>0,69</td> <td>0,69</td> <td>0,69</td> <td>0,69</td> <td>0,69</td> <td>0,69</td> <td>0,69</td> </tr> <tr> <td>EBCL = 7</td> <td>0,66</td> <td>0,66</td> <td>0,66</td> <td>0,66</td> <td>0,66</td> <td>0,66</td> <td>0,66</td> </tr> <tr> <td>EBCL = 8</td> <td>0,64</td> <td>0,64</td> <td>0,64</td> <td>0,64</td> <td>0,64</td> <td>0,64</td> <td>0,64</td> </tr> <tr> <td>EBCL = 9</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> <td>0,54</td> <td>0,61</td> <td>0,61</td> </tr> </tbody> </table> | Geschwindigkeit [km/h] | | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | Kdry_rst(V,EBCL) | EBCL = 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | EBCL = 1 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | EBCL = 2 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 | EBCL = 3 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | EBCL = 4 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | EBCL = 5 | 0,73 | 0,73 | 0,73 | 0,73 | 0,73 | 0,73 | 0,73 | EBCL = 6 | 0,69 | 0,69 | 0,69 | 0,69 | 0,69 | 0,69 | 0,69 | EBCL = 7 | 0,66 | 0,66 | 0,66 | 0,66 | 0,66 | 0,66 | 0,66 | EBCL = 8 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | EBCL = 9 | 0,61 | 0,61 | 0,61 | 0,61 | 0,54 | 0,61 | 0,61 |
| Geschwindigkeit [km/h] | | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kdry_rst(V,EBCL) | EBCL = 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 1 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 2 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 3 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 4 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 5 | 0,73 | 0,73 | 0,73 | 0,73 | 0,73 | 0,73 | 0,73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 6 | 0,69 | 0,69 | 0,69 | 0,69 | 0,69 | 0,69 | 0,69 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 7 | 0,66 | 0,66 | 0,66 | 0,66 | 0,66 | 0,66 | 0,66 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 8 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EBCL = 9 | 0,61 | 0,61 | 0,61 | 0,61 | 0,54 | 0,61 | 0,61 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sicherheitsfaktor auf nasser Schiene Kwet_rst(V) | 0,8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nominale Vollbremsverzögerung A_brake_service(V) | <table border="1"> <thead> <tr> <th>Geschwindigkeit [km/h]</th> <th>140-120</th> <th>120-100</th> <th>100-80</th> <th>80-50</th> <th>50-30</th> <th>30-15</th> <th>15-0</th> </tr> </thead> <tbody> <tr> <td>A_brake_service [m/s²]</td> <td>0,94</td> <td>0,90</td> <td>0,90</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> <td>0,83</td> </tr> </tbody> </table> | Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | A_brake_service [m/s ²] | 0,94 | 0,90 | 0,90 | 0,88 | 0,88 | 0,88 | 0,83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A_brake_service [m/s ²] | 0,94 | 0,90 | 0,90 | 0,88 | 0,88 | 0,88 | 0,83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Äquivalente Aufbauzeit bei Schnellbremsung T_brake_emergency | 1,9 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Äquivalente Aufbauzeit bei Vollbremsungen T_brake_service | 2,4 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nominale rotierende Masse oder Minimum- und Maximum Wert M_rotating_nom M_rotating_min M_rotating_max | 6 % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Guidance curve A_brake_nrmal_service(V) | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Service Brake Interface (ja/nein) | Ja | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Traction Cut Off Interface (ja/nein) | Nein | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Traction Cut Off Time T_traction_cut_off | 1,28 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

2.2 Zweifachtraktion

| Zuglänge | 135 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---------|--------|-------|-------|-------|------|--|------------------------|---------|---------|--------|-------|-------|-------|------|---------------------------------------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|----------|------|------|------|------|------|------|
| Bremshundertstel | 142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brake Position (Passenger train in P, freight train in P oder freight train in G) | Passenger train in P | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nominale Schnellbremsverzögerung A_brake_emergency(V) | <table border="1"> <thead> <tr> <th>Geschwindigkeit [km/h]</th> <th>140-120</th> <th>120-100</th> <th>100-80</th> <th>80-50</th> <th>50-30</th> <th>30-15</th> <th>15-0</th> </tr> </thead> <tbody> <tr> <td>A_brake_emergency [m/s²]</td> <td>1,07</td> <td>0,98</td> <td>0,94</td> <td>0,98</td> <td>1,09</td> <td>1,13</td> <td>1,05</td> </tr> </tbody> </table> | | | | | | | | Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | A_brake_emergency [m/s ²] | 1,07 | 0,98 | 0,94 | 0,98 | 1,09 | 1,13 | 1,05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A_brake_emergency [m/s ²] | 1,07 | 0,98 | 0,94 | 0,98 | 1,09 | 1,13 | 1,05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sicherheitsfaktor auf trockener Schiene Kdry_rst(V,EBCL) | <table border="1"> <thead> <tr> <th>Geschwindigkeit [km/h]</th> <th>140-120</th> <th>120-100</th> <th>100-80</th> <th>80-50</th> <th>50-30</th> <th>30-15</th> <th>15-0</th> </tr> </thead> <tbody> <tr> <td rowspan="10">Kdry_rst(V,EBCL)</td> <td>EBCL = 0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>EBCL = 1</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> <td>0,97</td> </tr> <tr> <td>EBCL = 2</td> <td>0,94</td> <td>0,94</td> <td>0,94</td> <td>0,94</td> <td>0,94</td> <td>0,94</td> </tr> <tr> <td>EBCL = 3</td> <td>0,91</td> <td>0,91</td> <td>0,91</td> <td>0,91</td> <td>0,91</td> <td>0,91</td> </tr> <tr> <td>EBCL = 4</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> <td>0,89</td> </tr> <tr> <td>EBCL = 5</td> <td>0,85</td> <td>0,85</td> <td>0,85</td> <td>0,85</td> <td>0,85</td> <td>0,85</td> </tr> <tr> <td>EBCL = 6</td> <td>0,82</td> <td>0,82</td> <td>0,82</td> <td>0,82</td> <td>0,82</td> <td>0,82</td> </tr> <tr> <td>EBCL = 7</td> <td>0,79</td> <td>0,79</td> <td>0,79</td> <td>0,79</td> <td>0,79</td> <td>0,79</td> </tr> <tr> <td>EBCL = 8</td> <td>0,77</td> <td>0,77</td> <td>0,77</td> <td>0,77</td> <td>0,78</td> <td>0,78</td> </tr> <tr> <td>EBCL = 9</td> <td>0,74</td> <td>0,74</td> <td>0,74</td> <td>0,74</td> <td>0,74</td> <td>0,74</td> </tr> </tbody> </table> | | | | | | | | Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | Kdry_rst(V,EBCL) | EBCL = 0 | 1 | 1 | 1 | 1 | 1 | 1 | EBCL = 1 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | EBCL = 2 | 0,94 | 0,94 | 0,94 | 0,94 | 0,94 | 0,94 | EBCL = 3 | 0,91 | 0,91 | 0,91 | 0,91 | 0,91 | 0,91 | EBCL = 4 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | EBCL = 5 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | EBCL = 6 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | EBCL = 7 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | EBCL = 8 | 0,77 | 0,77 | 0,77 | 0,77 | 0,78 | 0,78 | EBCL = 9 | 0,74 | 0,74 | 0,74 | 0,74 | 0,74 | 0,74 |
| Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kdry_rst(V,EBCL) | EBCL = 0 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 1 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | 0,97 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 2 | 0,94 | 0,94 | 0,94 | 0,94 | 0,94 | 0,94 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 3 | 0,91 | 0,91 | 0,91 | 0,91 | 0,91 | 0,91 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 4 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | 0,89 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 5 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 6 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 7 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 8 | 0,77 | 0,77 | 0,77 | 0,77 | 0,78 | 0,78 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EBCL = 9 | 0,74 | 0,74 | 0,74 | 0,74 | 0,74 | 0,74 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sicherheitsfaktor auf nasser Schiene Kwet_rst(V) | 0,8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nominale Vollbremsverzögerung A_brake_service(V) | <table border="1"> <thead> <tr> <th>Geschwindigkeit [km/h]</th> <th>140-120</th> <th>120-100</th> <th>100-80</th> <th>80-50</th> <th>50-30</th> <th>30-15</th> <th>15-0</th> </tr> </thead> <tbody> <tr> <td>A_brake_service [m/s²]</td> <td>0,94</td> <td>0,90</td> <td>0,90</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> <td>0,83</td> </tr> </tbody> </table> | | | | | | | | Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | A_brake_service [m/s ²] | 0,94 | 0,90 | 0,90 | 0,88 | 0,88 | 0,88 | 0,83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A_brake_service [m/s ²] | 0,94 | 0,90 | 0,90 | 0,88 | 0,88 | 0,88 | 0,83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Äquivalente Aufbauzeit bei Schnellbremsung T_brake_emergency | 1,9 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Äquivalente Aufbauzeit bei Vollbremsungen T_brake_service | 2,4 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nominale rotierende Masse oder Minimum- und Maximum Wert M_rotating_nom M_rotating_min M_rotating_max | 6 % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Guidance curve A_brake_nrmal_service(V) | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Service Brake Interface (ja/nein) | Ja | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Traction Cut Off Interface (ja/nein) | Nein | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Traction Cut Off Time T_traction_cut_off | 1,28 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

2.3 Dreifachtraktion

| | | | | | | | | | |
|--|---------------------------------------|----------|---------|--------|-------|-------|-------|------|------|
| Zuglänge | 203 m | | | | | | | | |
| Bremshundertstel | 142 | | | | | | | | |
| Brake Position (Passenger train in P, freight train in P oder freight train in G) | Passenger train in P | | | | | | | | |
| Nominale Schnellbremsverzögerung A_brake_emergency(V) | Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | |
| | A_brake_emergency [m/s ²] | 1,07 | 0,98 | 0,94 | 0,98 | 1,09 | 1,13 | 1,05 | |
| Sicherheitsfaktor auf trockener Schiene Kdry_rst(V,EBCL) | Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | |
| | Kdry_rst(V,EBCL) | EBCL = 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | EBCL = 1 | 0,98 | 0,98 | 0,98 | 0,98 | 0,98 | 0,98 | 0,98 |
| | | EBCL = 2 | 0,94 | 0,94 | 0,94 | 0,94 | 0,94 | 0,94 | 0,94 |
| | | EBCL = 3 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 | 0,92 |
| | | EBCL = 4 | 0,91 | 0,91 | 0,91 | 0,91 | 0,91 | 0,91 | 0,91 |
| | | EBCL = 5 | 0,89 | 0,89 | 0,89 | 0,89 | 0,88 | 0,89 | 0,89 |
| | | EBCL = 6 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 |
| | | EBCL = 7 | 0,84 | 0,84 | 0,84 | 0,84 | 0,84 | 0,84 | 0,84 |
| | | EBCL = 8 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 |
| EBCL = 9 | | 0,81 | 0,81 | 0,81 | 0,81 | 0,81 | 0,81 | 0,81 | |
| Sicherheitsfaktor auf nasser Schiene Kwet_rst(V) | 0,8 | | | | | | | | |
| Nominale Vollbremsverzögerung A_brake_service(V) | Geschwindigkeit [km/h] | 140-120 | 120-100 | 100-80 | 80-50 | 50-30 | 30-15 | 15-0 | |
| | A_brake_service [m/s ²] | 0,94 | 0,90 | 0,90 | 0,88 | 0,88 | 0,88 | 0,83 | |
| Äquivalente Aufbauzeit bei Schnellbremsung T_brake_emergency | 1,9 s | | | | | | | | |
| Äquivalente Aufbauzeit bei Vollbremsungen T_brake_service | 2,4 s | | | | | | | | |
| Nominale rotierende Masse oder Minimum- und Maximum Wert M_rotating_nom M_rotating_min M_rotating_max | 6 % | | | | | | | | |
| Guidance curve A_brake_nrmal_service(V) | - | | | | | | | | |
| Service Brake Interface (ja/nein) | Ja | | | | | | | | |
| Traction Cut Off Interface (ja/nein) | Nein | | | | | | | | |
| Traction Cut Off Time T_traction_cut_off | 1,28 s | | | | | | | | |