

# DIN EN 14198:2017-03 (E)

## Railway applications - Braking - Requirements for the brake system of trains hauled by locomotives

---

<b>Contents</b>		<b>Page</b>
European foreword .....		4
1	Scope .....	5
2	Normative References .....	5
3	Terms and definitions .....	7
4	Symbols and abbreviations .....	9
5	Requirements .....	9
5.1	General requirements of the train braking system .....	9
5.2	General safety requirements .....	10
5.2.1	Design principles .....	10
5.2.2	Fire protection .....	11
5.2.3	Environmental condition .....	11
5.3	Requirements of the main brake system .....	12
5.3.1	General requirements .....	12
5.3.2	General functions on train level .....	13
5.3.3	Additional requirements at the vehicle level .....	18
5.4	"EN-UIC" brake system - based on air brake system .....	20
5.4.1	Foreword .....	20
5.4.2	General architecture .....	20
5.4.3	Additional brake systems .....	22
5.4.4	Functional requirements at train level .....	22
5.4.5	Design requirements .....	35
5.4.6	Brake functions at vehicle level .....	36
5.5	Direct EP brake control .....	41
5.6	Additional brake systems .....	41
5.6.1	Dynamic brakes .....	41
5.6.2	Direct brake .....	44
5.6.3	Magnetic Track brake .....	46
5.7	Brake management .....	46
5.7.1	Brake blending at vehicle level .....	46
5.7.2	Manual mode .....	46
5.7.3	Brake blending at train level .....	46
5.7.4	Jerk / ramps .....	47
5.8	Wheel slide protection .....	48
5.9	Compressed air supply .....	49
5.9.1	General requirements .....	49
5.9.2	Capacity .....	49
5.9.3	Air quality .....	49
5.10	Enhancement of wheel/rail adhesion .....	49
6	Performances .....	50
6.1	General aspects .....	50
6.2	Performance calculation .....	51
6.2.1	General .....	51
6.2.2	Calculations for nominal mode .....	52
6.2.3	Equivalent response and delay time .....	53
6.2.4	Calculations for degraded mode .....	53

6.2.5	Calculations for degraded conditions .....	53
6.3	Relevant load conditions .....	53
6.3.1	Locomotives .....	53
6.3.2	Coaches .....	53
6.3.3	Wagons .....	54
6.4	Service braking .....	54
6.5	Thermal capacity .....	55
6.6	Adhesion .....	55
6.6.1	General requirements .....	55
6.6.2	Emergency brake application .....	56
6.6.3	Service brake application .....	56
6.7	Parking brake performance .....	56
<b>Annex A (normative) Vehicle requirements .....</b>		<b>57</b>
<b>Annex B (informative) Train related brake performance categories .....</b>		<b>59</b>
<b>Annex C (informative) Explanation of "proven design" concept .....</b>		<b>63</b>
<b>Annex D (informative) Corresponding standards EN - UIC .....</b>		<b>64</b>
<b>Annex E (normative) Brake pipe pressure control system .....</b>		<b>66</b>
E.1	General requirements .....	66
E.2	Release position .....	67
E.3	Service brake application .....	68
E.4	Emergency brake application .....	68
E.5	Overcharge function .....	69
E.6	Quick release function .....	70
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC .....</b>		<b>74</b>
<b>Bibliography .....</b>		<b>78</b>