



# DIN EN 15624:2011-01 (E)

## Railway applications - Braking - Empty-loaded changeover devices (includes Amendment A1:2010)

---

<b>Contents</b>		<b>Page</b>
Foreword.....		4
1	Scope .....	5
2	Normative references .....	5
3	Terms, definitions and symbols.....	5
3.1	Terms and definitions .....	5
4	Design and manufacture .....	6
4.1	General.....	6
4.2	Functional requirements .....	7
4.2.1	General.....	7
4.2.2	Automatic empty-loaded changeover device .....	7
4.2.3	Pneumatic device characteristics .....	8
4.2.4	Automatic hydraulic to pneumatic converter .....	9
4.2.5	Automatic elastomeric to pneumatic converter .....	9
4.2.6	Components for operation of the manual empty-loaded changeover device .....	9
4.3	Vibrations and shock .....	10
4.4	Environment .....	10
4.4.1	General.....	10
4.4.2	Temperature .....	10
4.4.3	Other environmental conditions .....	10
4.5	Compressed air quality .....	12
4.6	Service life .....	12
4.7	Fire behaviour .....	12
4.8	External appearance.....	13
4.9	Design requirements regarding pressure stress .....	13
4.10	Leakage.....	13
4.11	Interfaces .....	13
4.11.1	Mechanical.....	13
4.11.2	Pneumatic.....	13
5	Materials .....	13
6	Type tests .....	14
6.1	General.....	14
6.2	Individual automatic empty-loaded changeover device type tests .....	14
6.2.1	Test bench for individual automatic empty-loaded changeover device type tests .....	14
6.2.2	Sampling for type tests .....	15
6.2.3	Test requirements.....	15
6.2.4	Check of physical and geometrical characteristics .....	16
6.2.5	Leakage.....	16
6.2.6	Changeover operation – empty to loaded .....	17
6.2.7	Changeover operation – loaded to empty .....	17
6.2.8	Response time – empty to loaded.....	18
6.2.9	Response time – loaded to empty.....	19
6.2.10	Shock and vibration tests .....	19
6.2.11	Operation at extreme temperatures .....	20
7	Routine test and inspection.....	21
8	Type validation.....	21
9	Manual empty-loaded changeover device installation validation .....	21
9.1	Equivalent handle movement.....	21
9.2	Changeover plate alignment.....	21

10	Documentation .....	21
11	Designation .....	22
12	Identification and marking.....	22
12.1	Identification plate.....	22
12.2	Changeover plate for the manual empty-loaded changeover device .....	22
<b>Annex A</b>	<b>(informative) Assessment of an empty-loaded changeover device when fitted to a vehicle .....</b>	<b>24</b>
A.1	Vehicle assessment – Testing set up.....	24
A.2	Design acceptance testing set up .....	24
A.3	Single vehicle static testing .....	24
A.3.1	Vehicle requirements .....	24
A.3.2	Test procedures.....	24
A.4	Running tests.....	25
A.4.1	General .....	25
A.4.2	Pneumatic empty-loaded changeover device – Air consumption .....	25
A.4.3	Pneumatic empty-loaded changeover device – Output signal variation.....	26
<b>Annex B</b>	<b>(informative) Examples of manual empty-loaded changeover device handles and changeover plates .....</b>	<b>27</b>
<b>Annex C</b>	<b>(informative) Test bench diagram.....</b>	<b>29</b>
<b>Annex ZA</b>	<b>(informative)  Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (Recast)  .....</b>	<b>30</b>
	<b>Bibliography.....</b>	<b>32</b>