

# DIN EN 15566:2016-12 (E)

## Railway applications - Railway rolling stock - Draw gear and screw coupling

---

<b>Contents</b>	<b>Page</b>
European foreword.....	7
Introduction .....	9
1 Scope.....	10
2 Normative references.....	10
3 Terms and definitions .....	11
4 Requirements for all types of draw gear and screw coupling.....	13
4.1 Classification and designation.....	13
4.2 Interaction coupling/buffer .....	13
4.3 Interface dimension for freight wagons.....	14
4.4 Life time.....	15
5 Draw gear.....	16
5.1 Draw gear components .....	16
5.2 Draw hook and drawbar - Requirements.....	18
6 Screw coupling .....	18
6.1 General requirements .....	18
6.2 Screw coupling - Requirements.....	20
7 Elastic device .....	20
7.1 Characteristics of elastic device.....	20
7.2 Elastic device - Requirements.....	21
Annex A (normative) Dynamic test (fatigue test) procedure.....	22
A.1 Background .....	22
A.2 Performance of the test.....	22
A.2.1 Conditioning.....	22
A.2.2 Dynamic test (fatigue test).....	22
A.2.3 Non-destructive tests.....	24
A.2.4 Determination of residual strength.....	24
A.2.5 Macrographic and Micrographic tests.....	24
A.3 Criteria of acceptance .....	24
Annex B (normative) Draw hook - dimensions.....	25
Annex C (normative) Draw gear - Interface dimension .....	26
Annex D (normative) Screw coupling components - dimensions .....	27
Annex E (normative) Draw hook and drawbar - Requirements.....	29
E.1 Physical characteristics .....	29
E.1.1 Appearance.....	29
E.1.2 Integrity.....	29

E.1.3	Material examination.....	29
E.2	Geometrical characteristics.....	30
E.3	Mechanical characteristics.....	30
E.3.1	Tensile test on test piece.....	30
E.3.2	Resilience.....	30
E.3.3	Hardness .....	30
E.3.4	Tensile test on draw hook and draw bar .....	30
E.3.5	Compressive test on draw hook for locomotives .....	31
E.4	Marking .....	31
E.5	Manufacture.....	31
E.5.1	General on draw bars .....	31
E.5.2	General on draw hooks.....	31
E.5.3	Machining .....	31
E.5.4	Heat treatment .....	31
E.5.5	Rectification of defects.....	32
E.6	Acceptance .....	32
E.6.1	General .....	32
E.6.2	Inspection of the draw hooks .....	32
E.6.3	Inspection of draw bars.....	37
E.6.4	Conclusion of the inspections.....	38
E.7	Delivery .....	38
E.7.1	Protection against oxidation .....	38
E.7.2	Packaging.....	38
Annex F (normative) Screw coupling and component parts – Requirements .....		39
F.1	Material .....	39
F.2	Physical characteristics.....	39
F.2.1	Appearance .....	39
F.2.2	Soundness.....	39
F.2.3	Additional requirements for screw couplings .....	40
F.3	Geometrical characteristics.....	40
F.3.1	General .....	40
F.3.2	Dimensions limited either by two unmachined or rough-machined surfaces or by one unmachined or rough-machined surface .....	40
F.3.3	Dimensions limited by two machined surfaces .....	41
F.4	Mechanical characteristics.....	41
F.4.1	Heat treatment .....	41
F.4.2	Hardness .....	41

F.4.3	Values for predetermined breaking loads for the weakest part.....	41
F.4.4	Resilience .....	42
F.4.5	Requirements for screw coupling.....	42
F.4.6	Requirement for handle and trunnion.....	43
F.5	Marking.....	44
F.6	Manufacture .....	44
F.6.1	Preparation of the materials.....	44
F.6.2	Manufacture of the component parts .....	44
F.7	Acceptance.....	46
F.7.1	General.....	46
F.7.2	Inspection of the manufacture .....	46
F.8	Inspection of the materials, component parts and screw couplings.....	46
F.8.1	Materials submission for acceptance.....	46
F.8.2	Grouping into batches .....	47
F.8.3	Nature and proportion of the tests .....	47
F.8.4	Sampling and preparation of the samples and test pieces.....	48
F.8.5	Carrying out of the checks and tests.....	52
F.9	Completion of inspections.....	53
F.10	Delivery.....	54
F.10.1	Protection against oxidation.....	54
F.10.2	Packing.....	54
Annex G (normative)	Elastic device – Requirements .....	55
G.1	Rubber elastomer or other elastomer elastic device.....	55
G.1.1	General.....	55
G.1.2	Metal inserts requirements.....	55
G.1.3	Elastomer requirements .....	55
G.1.4	Static test.....	57
G.1.5	Endurance test .....	58
G.1.6	Bonding.....	59
G.1.7	Inspection and Tests .....	59
G.1.8	Markings.....	60
G.2	Friction spring/Ring spring.....	61
G.2.1	Manufacturer's marks .....	61
G.2.2	Flexibility test.....	61
G.2.3	Endurance test .....	62
Annex H (normative)	Marking.....	63

H.1	General .....	63
H.2	Marking of the screw coupling.....	63
H.3	Draw gear .....	64
H.4	Draw bar .....	64
H.5	Summary of markings.....	65
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC.....		66
Bibliography .....		68
Figures		
Figure 1	— Force-stroke diagram for stored and absorbed energy.....	12
Figure 2	— Support plate – Interface dimension for freight wagons.....	15
Figure 3	— Draw gear – Assembly .....	17
Figure 4	— Standard screw coupling with non-loosening hinged ball handle .....	19
Figure 5	— Standard screw coupling with hinged handle with non-loosening upper rest.....	20
Figure A.1	— Example of Load cycles Step 1 and Step 2.....	23
Figure B.1	— Draw hook.....	25
Figure C.1	— Drawbar with “fork” and safety device.....	26
Figure C.2	— Joint pin.....	26
Figure D.1	— Coupling hook pin .....	27
Figure D.4	— Shackle .....	28
Figure E.1	— Location of the test samples .....	34
Figure E.2	— Marking of the draw hook for the tensile test.....	35
Figure E.3	— Location of the test samples .....	37
Figure F.1	— Location of the measurement of the deformation of the screw coupling.....	42
Figure F.2	— Test facility for the tensile test of the screw coupling.....	43
Figure F.3	— Measurement of the screw coupling.....	43
Figure F.4	— Permitted depth of the fold in thread profile.....	45
Figure F.5	— Screw - test sample location.....	49
Figure F.6	— Shackle - test sample location .....	50
Figure F.7	— Coupling link - test sample location .....	50
Figure F.8	— Trunnion nut (link fitting) - test sample location .....	51
Figure F.9	— Trunnion nut (shackle fitting) - test sample location.....	51
Figure F.10	— Pin - test sample location.....	52
Figure G.1	— Elastic device - load cycle for endurance test.....	58
Figure G.2	— Elastic device - Set up for endurance test .....	59
Figure H.1	— Location of mark .....	64
Figure H.2	— Mark dimension.....	64

## Tables

<b>Table 1 — Classification of coupling by designation of the minimum breaking load .....</b>	<b>13</b>
<b>Table A.1 — Pre-loading values .....</b>	<b>22</b>
<b>Table A.2 — Condition of dynamic tests for all parts except screw coupling.....</b>	<b>23</b>
<b>Table A.3 — Condition of dynamic tests for screw coupling.....</b>	<b>24</b>
<b>Table E.1 — Requirements.....</b>	<b>30</b>
<b>Table E.2 — Checks and tests .....</b>	<b>33</b>
<b>Table F.1 — Requirements.....</b>	<b>40</b>
<b>Table F.2 — load of link.....</b>	<b>41</b>
<b>Table F.3 — Breaking load screw .....</b>	<b>41</b>
<b>Table F.4 — Proportion of the tests – Finished products and component parts.....</b>	<b>48</b>
<b>Table G.1 — Characteristics of the constituents .....</b>	<b>55</b>
<b>Table G.2 — Nature of inspections and tests .....</b>	<b>60</b>
<b>Table G.3 — Number of flexibility tests per batch of springs .....</b>	<b>62</b>
<b>Table H.1 — Marking.....</b>	<b>65</b>
<b>Table ZA.1 — Correspondence between this European Standard, the Commission Regulation concerning the technical specification for interoperability relating to the subsystem ‘rolling stock – freight wagons’ of the rail system in the European Union and repealing Commission Decision 321/2013/EC, as amended by Commission Regulation (EU) 2015/924 (published in the Official Journal L 150, 17.06.2015, p.10); and Directive 2016/797/EC .....</b>	<b>66</b>
<b>Table ZA.2 — Correspondence between this European Standard, the Commission regulation (EU) No 1302/2014 of 18 November 2014 concerning the technical specification for interoperability relating to the ‘rolling stock locomotives and passenger rolling stock’ of the rail system in the European Union (published in the Official Journal L 356, 12.12.2014, p.228) and Directive 2008/57/EC .....</b>	<b>67</b>