BS EN 16507:2014

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Railway applications — Ground based service — Diesel refuelling equipment

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee RAE/1, Railway Applications.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Foreword

This document (EN 16507:2014) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2015 and conflicting national standards shall be withdrawn at the latest by April 2015.

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For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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Introduction

This European Standard contains requirements regarding equipment for railway vehicles and railway infrastructure for filling railway vehicles with diesel fuel. These minimum requirements for an open filling system describe the target system to be available across Europe to assist use of the railway network, supporting Directive 2008/57/EC.

1 Scope

This European Standard specifies interface requirements on vehicles and at designated fuelling points for diesel refuelling equipment for any railway vehicle fitted with a diesel power unit(s).

This European Standard is written for refuelling railway vehicles with fuels that are compliant with Directive 2009/30/EC.

This European Standard is not applicable to mobile or temporary refuelling points.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13012:2012, *Petrol filling stations - Construction and performance of automatic nozzles for use on fuel dispensers*

EN 13617-2:2012, *Petrol filling stations - Part 2: Safety requirements for construction and performance of safe breaks for use on metering pumps and dispensers*

EN 15877-2:2013, *Railway applications - Markings of railway vehicles - Part 2: External markings on coaches, motive power units, locomotives and on track machines*

EN 45545-7:2013 *Railway applications - Fire protection on railway vehicles - Part 7: Fire safety requirements for flammable liquid and flammable gas installations*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
railway infrastructure
all installations required for the running of railway vehicles including operating and support facilities

EXAMPLE Tracks, crossings, catenaries, signals, maintenance depots.

3.2
fixed installations
all installations, including buildings and services, required for the running of railway vehicles including operating and support facilities

4 Requirements

4.1 Standard refuelling connection

Railway vehicles fitted with a diesel engine capable of running with fuel compliant with Directive 2009/30/EC, Annex II shall have an opening and fuel tank on the railway vehicle compliant with 4.2. It is permitted to also fit additional alternative fuelling connections to suit local filling couplings.

NOTE A non-exhaustive list of examples of existing systems is shown in Annex C.

Designated fuelling points on railway infrastructure that store and dispense fuel compliant with Directive 2009/30/EC, Annex II shall be fitted with at least one nozzle compliant with 4.3.1. It is permitted to also fit additional alternative filling couplings to suit local conditions at the fuelling point where the vehicle is used.

Railway vehicles fitted with a diesel engine that does not run on fuel compliant with Directive 2009/30/EC, Annex II shall have a foolproof opening and fuel tank to prevent inadvertent refuelling with the wrong fuel.

Designated fuelling points on railway infrastructure that store and dispense fuel that is not compliant with Directive 2009/30/EC, Annex II shall be fitted with a foolproof end coupling compatible with the railway vehicle it is to refuel. Fixed installations for all fuels shall comply with 4.3.2, 4.3.3 and 4.3.4.

4.2 On vehicles

There shall be an opening on each side of the vehicle, at a maximum height of 1 500 mm above rail level.

The opening shall be circular with a minimum diameter of 70 mm.

The opening shall either be directly on top of the fuel tank, or lead directly to the fuel tank by pipework, in all cases the opening shall be higher than the top of the fuel tank.

NOTE Where additional closed systems are used, examples are shown in Annex C, it is possible that the coupling height for the closed system could be lower than the top of the fuel level.

There shall be a marking located beside each opening compliant with EN 15877-2:2013, 4.5.31 (Engine fuel filling point).

The opening shall have a cover which seals it against fuel spillage. The cover shall be openable by hand without any tools, to allow the unobstructed access by the nozzle. There shall be sufficient free space around the cover to permit safe operation:

— for a screw cap there shall be a minimum of 50 mm free space radially around the cap;

— for covers with clips, or press to open, there shall be direct access to the cover without obstruction.

With the tank at maximum permitted level, there shall be no leakage from the tank or opening with all covers open when the vehicle is stood on 40 ‰ gradient and 180 mm cant in the most adverse condition for leakage.

The tank shall be designed to prevent fuel surging back along the delivery pipe when the fuel delivery suddenly ceases.

All fuel tanks shall be provided with independent ventilation to prevent pressurization that could lead to fuel delivery being stopped before the maximum level is reached inside the tank, when supplied at maximum flow rate per nozzle shown in 4.3.3.

The ventilation shall be designed so that it accommodates all the back pressure generated by the filling process until the tank is a maximum of 90 % full, in accordance with EN 45545-7:2013, 5.2.

This standard does not mandate how many nozzles are in use simultaneously. The specification for the vehicle could require more than one opening to be used simultaneously in which case the ventilation system should meet this back pressure requirement.

The ventilation and cover arrangements shall be designed so that there is no spillage of the fuel, or overflow, even in the event of overturning of the vehicle.

The vehicle shall be fitted on each side with an indicator showing the level of fuel. This indicator shall be easily seen (and read) from the filling point. Sight glasses are not permitted. The fuel level indicator should be identified; a suitable pictogram is shown in Annex B.

All parts of the fuel tank and pipework on the vehicle that come into contact with the fuel specified in Directive 2009/30/EC, Annex II shall be chemically and dimensionally stable under known service conditions and shall be corrosion free. Materials likely to come into contact with the fuel, both in liquid and vapour phases, shall be resistant to attack by this fuel.

4.3 On railway infrastructure

4.3.1 Fixed installation supply hose to vehicle

The flexible fuel supply hose shall be fitted with a nozzle on the end compliant with EN 13012, Type II.

The spout dimensions which are not specified in Table 1 of EN 13012 for a type II nozzle shall be between 170 mm and 280 mm length and between 30 mm and 45 mm outer diameter.

4.3.2 Breakaway coupling

A breakaway coupling compliant with the requirements of EN 13617-2 shall be fitted in the supply hose. This is so that, in the event of vehicle movement with the refuelling connection still attached, the coupling should break with no spillage of fuel or damage to the vehicle.

4.3.3 Fuel supply

Each supply device shall deliver fuel with a flow rate between a minimum of 80 l/min and maximum of 200 l/min.

All parts of the fixed installation that come into contact with the fuel specified in Directive 2009/30/EC, Annex II shall be chemically and dimensionally stable under known service conditions and shall be corrosion free. Materials likely to come into contact with the fuel, both in liquid and vapour phases, shall be resistant to attack by this fuel.

4.3.4 Refuelling apron

Except as shown in Annex A, there shall be an impermeable apron provided at the location of each refuelling point surrounded by an enclosure to contain 110 % of any potential spillage during the refuelling operation, as specified in the design for the fuelling point.

The drainage from the apron shall be through an oil interceptor before it enters the drainage system.

The oil interceptor shall be of suitable design for the intended outflow (e.g. drainage, foul drain, water course).

For more information on the design of the interceptor, it is recommended to seek guidance from the local water supply/drainage company and/or any bodies that could be advised by local requirements or laws.

4.4 Provision of information and instructions

4.4.1 For railway vehicles

Instructions shall be provided for the necessary operating and maintenance requirements to prevent the fuel system from leaking.

4.4.2 For fixed installations

Instructions shall be provided for the necessary operating and maintenance requirements to prevent the fixed fuel dispensing system from leaking.

Instructions shall be provided for the necessary cleaning requirements for the refuelling apron. As a minimum these instructions shall include:

— avoidance of cleaning chemicals which emulsify oil (this will affect the operation of the oil interceptor);

— a warning that cleaning of the apron should be with water below 60 °C and at less than 60 bar (to avoid emulsification of oil).

Annex A
(normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.

NOTE If it affects harmonization, it forms part of the European Standard or Harmonization Document.

For the countries in which the relevant national conditions apply, these provisions are normative; for other countries they are informative.

Clause	Special national condition
4.1	**Great Britain**
	The standard connection should have an opening on the railway vehicle and a coupling compliant with BS 3818. Vehicles should be fitted with connections compliant with BS 3818, but shall comply with all other requirements of 4.2. Fixed infrastructure should be compliant with BS 3818 instead of 4.3.1, but should comply with all other clauses of this standard.
4.3.4	**France**
	Aprons should be compliant with “Arrêté n°1435, du 15 avril 2010”.

Annex B
(informative)

Pictogram for fuel level indicator for vehicles

Fuel level indicators should be clearly identified. Where possible, pictograms should be used to avoid confusion. The standard symbol, as set out in ISO 7000, for fuel level is shown in Figure B.1.

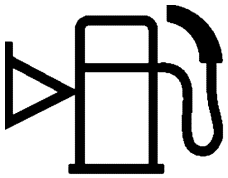

Figure B.1 — Pictogram for fuel level

Annex C
(informative)

Examples of existing closed fuelling systems

There are existing refuelling systems already in use on European railways. This standard details the target system for use according to Directive 2008/57/EC. For compatibility assessment with existing systems the following examples are used currently.

Germany

BN 411 013-01.

Netherlands

ProRail standard OVS00086 (total installation) + BEA00234 (closed system).

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC

This European Standard has been prepared under mandates given to CEN/CENELEC/ETSI by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the Directive 2008/57/EC[1)] .

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard given in Table ZA.1 for Locomotives and Passenger Rolling Stock and Table ZA.2 for Infrastructure confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard, the ERA IU LOC&PAS RST TSI final draft V 2.0 dated 11.12.2012, and Directive 2008/57/EC

Clause/ subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
The whole standard is applicable.	4 Characterization of the Rolling Stock subsystem 4.2 Functional and technical specification of the subsystem 4.2.11 Servicing §4.2.11.7 Refuelling equipment	Annex III, Essential requirements 1 General requirements 1.1 Safety Clause 1.1.5 1.2 Reliability and availability 1.5 Technical compatibility 2 Requirements specific to each subsystem 2.5 Maintenance 2.5.1 Health and safety	

1) This Directive 2008/57/EC adopted on 17th June 2008 is a recast of the previous Directives 96/48/EC ‘Interoperability of the trans-European high-speed rail system’ and 2001/16/EC ‘Interoperability of the trans-European conventional rail system’ and revisions thereof by 2004/50/EC ‘Corrigendum to Directive 2004/50/EC of the European Parliament and of the Council of 29 April 2004 amending Council Directive 96/48/EC on the interoperability of the trans-European high-speed rail system and Directive 2001/16/EC of the European Parliament and of the Council on the interoperability of the trans-European conventional rail system’.

Table ZA.2 — Correspondence between this European Standard, ERA Recommendation N. ERA/REC/10–2012INT Draft Technical Specification for Interoperability Subsystem Infrastructure version 4.0 dated 17.12.2012, and Directive 2008/57/EC

Clause/ subclauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC	Comments
Clause 1 to Clause 4 inclusive Annex A Annex C	4 Description of the Infrastructure subsystem 4.2 Functional and technical specifications of the subsystem 4.2.12 Fixed installations for servicing trains §4.2.12.5 Refuelling 6 Assessment of conformity of interoperability constituents and EC verification of the subsystems 6.2 Infrastructure subsystem 6.2.4 Particular assessment procedures for subsystem §6.2.4.14 Assessment of fixed installations for servicing trains	Annex III, Essential requirements 1 General requirements 1.1 Safety Clause 1.1.5 1.2 Reliability and Availability 1.3 Health Clause 1.3.1 1.5 Technical compatibility 2 Requirements specific to each subsystem 2.5 Maintenance 2.5.1 Health and safety	

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Bibliography

[1] UIC 563:1990, Fittings provided in coaches in the interests of hygiene and cleanliness[2)]

[2] UIC 627-2:1980, Filling devices for diesel stock[3)]

[3] BN 411-013-01:2004, Schnittstelle zw. Tankanlage u. Schienenfahrzeug — Geschlossenes Befüllsystem

[4] BN 411-013-02:2004, Schnittstelle zw. Tankanlage u. Schienenfahrzeuge — Offenes Befüllsystem

[5] ProRail standard OVS00086 (total installation) + BEA00234 (closed system)

[6] BS 3818:1964, *Self-sealing fuelling couplings for diesel locomotives and diesel railcars*

[7] Arrêté n°1435, du 15 avril 2010[4)]

[8] 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

[9] Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC (Text with EEA relevance)

2) May be purchased from: Railway Technical Publications (ETF), 16 rue Jean Rey, F-75015 Paris.

3) May be purchased from: Railway Technical Publications (ETF), 16 rue Jean Rey, F-75015 Paris.

4) Available from French government.

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