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<b>Quality assurance for the procurement of rail vehicles and rolling stock components (List of rolling stock products subject to quality inspection)</b>	<b>120.0381V16f Page 1</b>

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## PART A

### 1. Purpose

This document describes the minimum quality-assurance measures to be applied and substantiated to the Client throughout the supply chain during the procurement of rail vehicles and their components. The contract or order may contain supplementary requirements.

**Description**

The validity of other relevant stipulations remains unaffected by the provisions of this Contract.

**Limitations**

### 2. Principles of quality assurance

The Contractor shall perform, maintain and verify to the Client its own appropriate quality assurance measures in the entire supply chain.

**Responsibility**

Deutsche Bahn AG shall perform its own quality assurance measures, which shall include monitoring the Contractor's quality assurance measures.

The scope of quality assurance measures at Deutsche Bahn AG depends upon four factors:

**Variables**

- The product testing level (PK)
- Quality capability of the Contractor (Q status)
- Manufacturing and production processes
- Stability of the Contractor's relevant processes

Allocation to a testing level depends upon the complexity of the product and its suitability for testing. There are three testing levels, defined as follows:

**Testing levels**

Testing level (PK)	Content
1	Quality-dependent supplier monitoring (QLÜ) First article inspection, Inspection Certificate 3.1 (compliant with EN 10204)
2	First article inspections, Inspection Certificate 3.1 (compliant with EN 10204)
3	Inspection Certificate 3.1 (compliant with EN 10204)

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Further quality assurance measures may be required, regardless of the testing level (also for products without a testing level).

New products that are not listed in Part B but are comparable with the products listed shall be allocated appropriate quality assurance measures correspondingly.

Deutsche Bahn AG contractors who are to supply products with a testing level are assessed for their quality capability.

**Contractor's quality capability (Q status)**

Quality capability shall be assessed by Deutsche Bahn AG's quality assurance department on behalf of the procurement department and shall end with a classification of Q1, Q2 or Q3 status.

An assessment of quality capability is only necessary for materials with testing levels.

- Q1: Fulfils the requirements of Deutsche Bahn AG
- Q2: Fulfils the requirements of Deutsche Bahn AG; improvements required in some areas
- Q3: Does not fulfil the requirements of Deutsche Bahn AG; quality capability not sufficient

With respect to the procurement of rolling stock, the Q assessment is valid for the entire project period.

**Validity of the Q assessment**

The Q assessment is usually valid for one year for the purposes of procurement of rail vehicles.

The following criteria are used to assess quality capability:

- Results of audits
- Product trial data
- Complaints data
- Quality data
- The results of QLÜ, EMP and STBP (welded structure testing) 2

The classification can be changed at any time by the Client in the event of changes in the quality capability of Contractor or in the quality of the products and services.

The initial assessment of quality capability shall be performed in the form of audits or by a Deutsche Bahn AG auditor. The updating of the assessment of quality capability consists of the as-

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assessment of quality data such as product trial data, complaint data, data from supplier monitoring and in-process inspections, as well as an audit on the supplier's premises if necessary.

The quality assurance declaration (QSE) is a tool used by the Client to request the Contractor to initiate specific corrective and preventive measures upon agreement of the Client. The QSE applies with contractors with the status Q2.

**Quality assurance declaration (QSE)**

The corrective and preventive measures can be related to both a product and a process and are based on quality assurance standards.

It is up to the Contractor to ensure the effective implementation of the corrective and preventive measures agreed in the quality assurance declaration and to provide Deutsche Bahn AG with corresponding verification.

Deutsche Bahn AG can adjust and, if appropriate, reduce the depth and frequency of testing to fit requirements on the basis of the effective QSE.

Should no quality assurance declaration be agreed between the Client and the Contractor, suitable problem-specific product- and/or process-related measures may be introduced by the Client's quality assurance system. This may also entail an audit of each individual delivery.

**Absence of a quality assurance declaration**

### **3. Quality assurance measures for rail vehicles and their components**

The Contractor is responsible for its subcontractors.

**Contractor's responsibility  
Quality gates (QG)**

**Quality gates** (QG) constitute a standard method of project and risk management, ensuring the effective execution of projects if applied systematically. At specified times, major results are synchronised between the Contractor and the Client and are also recorded. The objective is to avoid risks, in particular those that can jeopardise quality as well as the planned schedule and costs. If risks are identified in good time by means of QGs, appropriate countermeasures shall be taken.

Quality gates are the subject of contractual agreement between the Contractor and Client.

**QG area of application**

The minimum constituent parts of the QG system are:

**Minimum constituent parts of the QG system**

- Specification and positioning of the QGs in the procurement process
- Definition of checklists
- Determination of responsibilities

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- QG monitoring
- Organisation of QG meetings
- Specification of escalation mechanisms

**Quality engineering (QE)** is the targeted and specific application of principles, methods, analyses, etc. whose aim is to identify risks and faults relating to products in the development phase and to avoid, reduce or control them by means of appropriate action.

**Quality engineering (QE)**

The fundamentals of quality engineering are described in the VDB guideline "Quality Engineering during Design Phase of Rail Vehicles and Rail Vehicle Systems."

QE shall be applied for each product according to the contractual agreements. In this case, the Contractor shall submit at least one QE method plan to the Client's quality assurance department.

**Area of application of QE**

The following, for example, shall be constituent parts of the QE method plan:

**Constituent parts of the QE method plan**

- All systems, components and parts (in each case including software) that include some development or integration work
- The planned QE methods for risk minimisation
- Their scheduling
- The planning of the required expenditure

The following shall be taken into account when applying the QE:

**Maturity level and industrial experience**

- Operational maturity level
- Integration maturity level
- Industrial experience

In the following cases, the supplier is obliged to implement a process FMEA according to DIN EN 60812 for materials with testing levels 1, 2 and 3 prior to the commencement of series production and to document this as one of the preconditions of internal production approval.

**Process FMEA**

- New design
- Change to existing design
- Change in production for existing designs
- In the event of complaints

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- Interruptions in production

Application of VDA Volume 4 or AIAG "Potential Failure Mode and Effects Analysis" is recommended for implementation of the FMEA. Upon request, the process FMEAs shall be submitted to Deutsche Bahn AG for viewing.

Requirements placed on the introduction of IT systems in rolling stock or their components are as follows:

- Documentation of the vehicle IT architecture (to be submitted by Contractor at the time of the CDR) from which the Client can recognise that system boundaries between the SILs are decoupled and free of interference
- Reviews relating to vehicle IT architecture (logical architecture, technical architecture) in the design phase
- Directory based on RAMS regarding safety-critical partial systems and subsystems (to be submitted by Contractor at the time of the CDR)
- Documentation of the safety-critical functions/processes/automatic mechanisms (to be submitted by Contractor at the time of the FDR). On the basis of the documentation submitted, the Client shall decide for which functions/processes/automatic mechanisms joint use-case meeting are to be held. The use-case meetings on the selected functions/processes/automatic mechanisms in the safety-critical partial systems and subsystems are mandatory in the design phase.

**Requirements placed on backing up IT systems**

**Manufacturer-related product qualification (HPQ)** is a verification of qualification that Deutsche Bahn AG demands from its contractors and their subcontractors for specific processes or for the manufacture of specified products. Qualification takes place on the basis of technical specifications such as EN and DIN standards, railway standards, Deutsche Bahn standards and UIC leaflets.

**Manufacturer-related product qualification (HPQ)**

HPQ is an instrument with which Deutsche Bahn AG qualifies the manufacturer to produce specified products intended for Deutsche Bahn AG. The "HPQ" column of Part B of this document contains corresponding information. In addition to this, the information sheet on HPQ (in the Deutsche Bahn AG Supplier Portal (see link)) shall also be taken into account.

**Area of application of HPQ**

<http://www.deutschebahn.com/de/geschaefte/lieferantenportal/informationsservice/dokumente.html>

Before accepting an order, contractors shall ensure that the required qualifications are in place. The Contractor shall ensure

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that its subcontractors also possess the required qualification (HPQ).

The qualification of technical capability normally included inspection of the manufacturing process and of the product. The degree of detail of the products for which HPQ is demanded results from the demands of the relevant standards (EN, DIN, railways standards, Deutsche Bahn standards and UIC leaflets), in which provisions regarding the details of the products concerned are stipulated as well as the details of the supplier's manufacturing conditions.

**Minimum constituent parts of HPQ**

The Deutsche Bahn AG quality assurance department shall perform the HPQ at the producer's site based on a request from the manufacturer. The request form is also available from the Supplier Portal.

**Performing HPQ**

An HPQ is normally valid for 3 years. A one-off extension without another audit at the supplier's site is possible under the following conditions:

- The last HPQ may not have been extended in an administrative process.
- The preconditions for qualification regarding the HPQ to be extended have not changed. Upon request, Deutsche Bahn AG shall be furnished with appropriate verification.
- During the period of validity of the HPQ which is to be extended, supplies shall be subject to quality assurance measures by Deutsche Bahn AG.
- There is confirmation by the relevant quality test engineer at Deutsche Bahn AG certifying that no quality problems occurred within the scope of quality assurance measures.

Furthermore, an HPQ must be performed again in the event of:

- Relocation of production
- Change in production processes and/or process cycles

Qualification may be withdrawn at any time if quality problems occur or if relevant conditions are not observed.

The requesting party shall bear the cost of the manufacturer-related product qualification.

**The welded structure inspection (STBP)** forms part of quality assurance at Deutsche Bahn AG. During the STBP, the Contractor shall verify compliance with welding requirements according to the provisions of the contract and taking into account the requirements of the standards. This shall be done as follows:

**Welded structure inspection (STBP)**

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- By means of STBP Part 1 regarding compliance with the design specifications in accordance with Guideline 951.0010Z03 "Deutsche Bahn AG technical specifications regarding the design of welded rail vehicles, their components and spare parts" (Technische Anforderungen der Deutschen Bahn AG für die Konstruktion geschweißter Schienenfahrzeuge, deren Komponenten und Bauteile, sowie Ersatzteile) (if within the Contractor's scope of responsibility)
- By means of STBP Part B regarding compliance with the welding specifications for production in accordance with Guideline 951.0010Z04 "Deutsche Bahn AG technical specifications regarding the production of welded rail vehicles, their components and spare parts" (Technische Anforderungen der Deutschen Bahn AG für die Fertigung geschweißter Schienenfahrzeuge, deren Komponenten und Bauteile, sowie Ersatzteile).

The STBP serves Deutsche Bahn AG as verification that the requirements placed on the procurement, design and production of welded products are met.

With respect to specified products, the Contractor shall verify vis-à-vis the Client's quality assurance department in an STBP that the Contractor satisfies the requirements demanded. With respect to subcontractors, the Contractor shall ensure that the necessary requirements are fulfilled and the corresponding verifications have been obtained.

**Area of application of STBP**

Further information on the STBP can be obtained from Part B of this document as well as from the "Work sheet on the welded structure inspection by Deutsche Bahn AG according to DB Guideline 951.0010" ("Merkblatt Schweißtechnische Bauweisenprüfung durch die DB AG nach der DB - Richtlinie 951.0010") by following this link:

<http://www.deutschebahn.com/de/geschaefte/lieferantenportal/informationsservice/dokumente.html>

**Adhesive-bonded structure testing** (KTBP) forms part of quality assurance at Deutsche Bahn AG. During KTBP, the Contractor shall verify compliance with adhesive bonding requirements according to the provisions of the contract and taking into account the requirements of the standards. This shall be done as follows:

**Adhesive-bonded structure testing (KTBP)**

- By means of the adhesive-bonded structure design test (KKP) regarding compliance with the design specifications in accordance with Guideline 951.0040Z03 "Adhe-



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sive bonding: Deutsche Bahn AG technical requirements regarding the design of adhesion-bonded rail vehicles, their components and spare parts" (Kleben: Technische Anforderungen der Deutschen Bahn AG für die Konstruktion geklebter Schienenfahrzeuge, deren Komponenten und Bauteile, sowie Ersatzteile)

- By means of the adhesive construction process test (KFP) regarding compliance with the adhesive bonding requirements for production in accordance with Guideline 951.0040Z04 "Adhesive bonding: Deutsche Bahn AG technical requirements regarding the design of adhesion-bonded rail vehicles, their components and spare parts" (Kleben: Technische Anforderungen der Deutschen Bahn AG für die Konstruktion geklebter Schienenfahrzeuge, deren Komponenten und Bauteile, sowie Ersatzteile).

The KTBP serves Deutsche Bahn AG as verification that the requirements placed on the procurement, design and production of products to be bonded or bonded products are met.

With respect to specified products, the Contractor shall verify vis-à-vis the Client's quality assurance department in KTBP that the Contractor satisfies the requirements demanded. With respect to subcontractors, the Contractor shall ensure that the necessary requirements are fulfilled and the necessary verifications have been obtained.

**Area of application of KTBP**

Further information on KTBP can be obtained from the "Work sheet on performing adhesive-bonded structure testing in the construction of new rolling stock according to the Guideline 951.0040" ("Merkblatt Durchführung der Klebtechnischen Bauweisenprüfung im Schienenfahrzeugneubau nach der Richtlinie 951.0040") by following this link:

<http://www.deutschebahn.com/de/geschaefte/lieferantenportal/informationsservice/dokumente.html>

**Type tests** (type) are defined as a test of one or more pieces of equipment, a system, or a complete rail vehicle in order to provide proof that the design conforms to the required specifications and the relevant norms.

**Type tests (type)**

The products for which type tests are necessary are not identified in Part B of this document. The necessity for type verification and the associated type tests results from the Contract as well as from standards, authorities and other demands.

**Area of application of the type test**

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The Contractor/subcontractor shall ensure that type tests are performed prior to the first article inspection or prior to commencement of series production.

A (type) test schedule shall be agreed with the Client. With respect to subcontractors, the Contractor shall ensure that the necessary type tests are included in the test schedule.

By means of type tests, the Contractor/subcontractor shall verify vis-à-vis Deutsche Bahn AG that the product produced by the Contractor/subcontractor fulfils the functions and characteristics demanded by the functional specification or other specifications. The Contractor/subcontractor shall submit a corresponding type verification or type report(s) with an evaluation by the expert(s) carrying out the tests.

Type tests shall be performed on components and systems in the configuration of the subsequent delivery condition so that, subsequently, the product's conformity with the specifications can be declared. If the configuration of the component or system changes, the Contractor shall check whether existing verifications can still be recognised or whether renewed verification is required. The test shall be documented for the Client.

**First articles** are parts, components, modules and systems that have been made completely with series operating equipment under series manufacturing conditions. **First article inspections** (EMPs) are generally carried out on the first part/component/system manufactured under series conditions. Conducted prior to the start of series production, they are designed to demonstrate that the quality requirements agreed upon in drawings and specifications have been met.

The products for which EMPs are necessary are identified in Part B of this document.

The Contractor is responsible for performing the EMP.

Even if no demand is made for an EMP in an advanced state of production in Part B of this document, the contract for rail vehicles/parts of rail vehicles or other applicable regulations, the Contractor will not be relieved of its obligation to check whether further EMPs are necessary, to perform them and to demonstrate their result to Deutsche Bahn AG in documentary form.

The Contractor shall verify vis-à-vis the Client's quality assurance department that the required EMPs were identified and performed along the supply chain to be disclosed to the Client (including manufacturing steps and critical features).

**Minimum constituent parts of the type test**

**First article inspections (EMP)**

**Area of application of EMP**

**Conducting the EMP**

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If an EMP is demanded in accordance with Part B, the Contractor shall inform the Client and, if an EMP has not yet been conducted, shall perform an EMP:

- First produced components and modules
- Modifications of products (e.g. material or design changes)
- Production relocations
- Changes to production methods or techniques
- Relevant changes in production procedures or processes
- Suspension of production (e.g. prior to options) for a period longer than 12 months
- New subcontractors
- Changes in the supplier's quality management system (with an impact on the above points) that influence product quality

The Contractor/subcontractor is obliged to obtain and document internal release of the product before the EMP.

Invitations to EMP are usually issued by the Contractor or subcontractor 20 working days before the inspection, but no later than ten working days beforehand. The documents required for the inspection must be submitted with the invitation. Should this not be possible, they must be available to the Client's specified appointed representatives at least five working days before the inspection date.

#### **Organisation of an EMP**

The Contractor must conduct the EMP with the involvement of the Client's quality assurance department (and its project manager and other representatives, if appropriate).

The EMP ends with one of the following decisions made jointly by the Client and the Contractor:

- Release for series production
- Release for series production with restrictions
- Rejected

Fulfilment of requirements must be demonstrated by the Contractor or subcontractor.

In the event of any dispute, escalation shall be initiated to the next management level. If the Client is not willing to release the EMP, there shall be no delivery approval.

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During the EMP, the Client and the Contractor shall stipulate additional specifications which the Contractor or subcontractor shall document for series delivery with inspection certificate 3.1 and which shall be included in each delivery.

**Setting quality targets**

In rail vehicle projects, products with testing levels 1 and 2 receive delivery approval intended for the recipient of the products. Delivery approval will be issued on the basis of the EMP that has been conducted and/or recognised. As a rule, delivery approval will be limited to a period of one year. Following expiry of validity, the Contractor shall apply for extension of the delivery approval from the Client (also for its subcontractors along the delivery chain).

**Delivery approvals in a rolling stock procurement project**

Within the scope of extension/renewal of the delivery approval, the relevant Deutsche Bahn AG quality test engineer shall check whether the conditions for the EMP are still in place and shall decide whether recognition or possibly repetition of the EMP or a delta EMP is necessary. The delivery approval shall be extended as a result of the decision and the resulting procedure.

**Applies to rail vehicles and their components**

The **quality-dependent supplier monitoring (QLÜ)** by the Client includes product- and process-related inspections of suppliers of rail vehicle components and requires a successful EMP. Management of inspections is quality-dependent.

**Quality-dependent supplier monitoring (QLÜ)**

QLÜ is applied to products with testing level 1 (c.f. Part B) during the procurement of rail vehicle components and must be conducted at the Contractor's site. If appropriate inspection at the Contractor's site is not possible, it must be conducted at the corresponding subcontractor's site.

**Area of application of QLÜ**

In the case of products with testing level 1, the QLÜ includes:

**Constituent parts of QLÜ**

- A product inspection to confirm compliance with the order
- A test of the effectiveness of the relevant processes for manufacturing the products

If it is not possible to conduct an appropriate test on the above points at the Contractor's site, the Contractor shall ensure that such a test shall be conducted at the subcontractor's site or at a location intended for the purpose by the Contractor. The documents supplied by the subcontractor shall be submitted by the Contractor within the scope of the QLÜ. Should this inspection fail to produce sufficiently plausible results, Deutsche Bahn AG will demand further, more extensive measures from the subcontractor.

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At testing levels 2 and 3, Deutsche Bahn AG will regard the Contractor's documented series inspections as sufficient.

The Contractor must inform the Deutsche Bahn AG quality test engineer (QPI) in good time of imminent delivery dates involving mandatory testing.

**Conditions of the QLÜ**

The Contractor must inform the Deutsche Bahn AG quality test engineer of the desired inspection date at least ten working days (20 working days in the case of delivery from abroad) in advance.

Quality-dependent supplier monitoring times must be between 7.00 and 17.00 each Monday to Friday.

The **quality-dependent in-process inspection** (QFÜ) includes fixed inspections comparable to milestones (so-called arrest and reporting points) and variable, process-oriented inspections (process monitoring) in the entire rolling stock manufacturing process. Management of inspections is quality-dependent.

**Quality-dependent in-process inspection (QFÜ)**

Quality-dependent in-process inspection is applicable to rail vehicle projects, but is also used for constituent products (at least vehicle bodies and bogies) in isolated cases. The products or the test points for which a QFÜ (A point/M point) is required are identified in Part B of this document.

**Area of application of the QFÜ**

The Contractor shall notify the Client's quality assurance department in good time in accordance with the stipulations when its production has reached one of the test points, so that a test can take place, if appropriate.

The test points are:

- Arrest points requiring agreement (A point)
- Reporting point (M point)

**Constituent parts of the QFÜ**

Reportable test points subject to agreement in the production process must be agreed between the Client and Contractor within the scope of quality planning, in accordance with Part B of this document.

The scope of the test points to be realised shall be defined on the basis of the process capability and product quality and shall be controlled in the respective procurement process. The Q status for determining the frequency and depth of inspections shall be taken into account at the beginning of the project.

The following conditions shall apply: the A points and M points are milestones in the Contractor's testing and inspection process; they conclude a preceding production stage or sub-process. They are intended to ensure that the production stage

**Conditions concerning the QFÜ**

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was completed successfully at the Contractor's plant and that the results of the associated inspection processes fulfil the required technical specifications.

Preceding inspections (M points) can be grouped and, in consultation with the QPI (quality test engineer), they can be performed later within the respective A points. Depending on the documented process capability and product quality, the QPI can reduce the frequency and depth of inspection or not perform the inspection at all.

The QPI decides on his/her participation and performance of the inspection during the inspection appointment itself.

If the QPI decides not to perform the inspection during production and commissioning, the QPI shall perform this inspection or check the documentation at the time of the next A point in the production process that allows a corresponding delayed inspection, whereby the Contractor shall be consulted.

The Contractor shall inform the relevant QPI in writing of a forthcoming test point. The Contractor shall consult the QPI beforehand regarding the test date.

The appointments for test points requiring agreement shall be made in the time between 7.00 and 17:00 from Monday to Friday. If a number of inspections are arranged for the same time, the Contractor shall coordinate the appointments with the quality test engineer so that the inspections can be carried out.

If significant defects are detected, the test point shall be repeated (following corrective measures by the manufacturer).

**Innovative manufacturing processes** constitute new production technologies in terms of the main groups within DIN 8580 (for example primary shaping, forming, separating, joining) as well as existing manufacturing processes being used for railway applications for the first time. If a process is relatively new and therefore still subject to ongoing development, it may not be based on a standard. As such processes are being increasingly applied by manufacturers and suppliers in the rolling stock sector, they must be taken into account from a quality assurance point of view.

**QA measures for innovative production processes**

Processes to be categorised as innovative manufacturing processes include those involved in additive manufacturing (commonly known as 3D printing, e.g. powder-bed-based laser additive manufacturing) or advanced processes for the manufacture of sandwich core composite structures for the lightweight construction of rail vehicles.

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Manufacturing processes not included in the "List of rolling stock products subject to quality inspection" but which are to be used for the first time at the supplier's facility for manufacturing the listed products shall be subjected to a manufacturer-related product qualification (HPQ). This concerns both the manufacture of relevant products for new vehicles and the manufacture of spare parts for rail vehicles. Whether or not it is necessary to conduct an HPQ depends on the classification by the QA department for the procurement of rolling stock and rolling stock components according to specified rules thereby involving the relevant vehicle project manager, the person responsible for the module, the person responsible for the product line as well as the relevant functional department. A corresponding classification for new vehicles shall be performed during the design review at the latest.

**Area of application**

Regarding the procurement of spare parts for rail vehicles, coordination is required prior to commencement of the procurement process between the department issuing the purchase requisition, the person responsible for the product line and the relevant functional department (e.g. for 3D printing).

#### **4. Documentation**

The Contractor shall include documentation, a certificate or a verification in deliveries of certain products. This serves the recipient as verification that the required quality assurance measures have been performed in accordance with the specifications.

**Documentation as verification for the recipient**

**Inspection certificate 3.1** (in accordance with DIN EN 10204): The Contractor shall confirm compliance with the order vis-à-vis the Client stating the results of specific inspections as well as the modification status of the product. Any deviations or special releases as well as the contractually agreed documents shall be appended to the APZ 3.1.

**Inspection certificate 3.1 (APZ 3.1)**

**Delivery approval:** The Contractor may only send deliveries to the Client if Deutsche Bahn AG's quality assurance department has issued delivery approval (with the exception of products for which delivery approval is not required, e.g. products with testing level 3, provided that the Contractor has status Q1 and Q2).

**Delivery approval**

Delivery approval must be included with every delivery to facilitate receipt by the Client. It is used by the reception point as certification that all the necessary quality assurance measures have been taken.

The incoming goods department at the reception point checks whether the date of issue of inspection certificate 3.1 is within

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the validity period of the delivery approval. If this is correct, the goods may go through the receipt procedure.

Delivery approval is component-related and subject to a time limit, which depends upon the following factors:

**Delivery approval time limits**

- The Contractor's Q status
- Availability of an accepted quality assurance declaration (QSE)
- The testing level
- An EMP being performed
- Freedom of the product from defects
- The Contractor's process capability

The maximum time limits should be taken from the table below, depending upon the Q status, QSE and testing level:

Assessment of quality capability	Testing levels			
	1	2	3	None
Q1	12 months	24 months	No delivery approval required	No delivery approval required
Q2 with QSE	12 months	24 months	No delivery approval required	No delivery approval required
Q2 without QSE	Every delivery must be inspected	12 months	No delivery approval required	No delivery approval required
Q3/not assessed	Every delivery must be inspected			No delivery approval required

If defects in category A and/or B in the VDB fault list are detected in products or processes, the validity of delivery approval will be restricted to the date of issue (i.e. the respective delivery) after rectification of the defect.

**Product and process defects**

Any category C defects will reduce the maximum admissible time limits by 50%.



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The first delivery approval to be granted for new suppliers without prior joint experience will be reduced to 50% of the period determined hitherto.

**Delivery approval for new suppliers**

If significant defects are detected during a product inspection, no delivery approval will be issued. The delivery shall be presented for inspection once more after corrective measures have been taken. If serial defects are detected during the inspection, delivery approvals already issued by Deutsche Bahn AG will be withdrawn if necessary.

**Refusal and withdrawal of delivery approval**

If complaints are made, the delivery approval already granted will be audited and may be withdrawn.

**Complaints**

**Final inspection certificate:** Documentation of final inspection by the Deutsche Bahn AG quality assurance department to confirm that all the agreed requirements have been fulfilled and that the rail vehicle has been manufactured in accordance with the conditions and the contract. The final inspection confirms that the requirements for provision for contractual acceptance have been fulfilled.

**Final rail vehicle inspection certificate**

**In-process inspection certificate:** Should the requirements for a final inspection that is compliant with Deutsche Bahn AG quality assurance measures not yet be fulfilled or should the product be transferred to another manufacturing facility, the QPI will usually issue an in-process inspection certificate. An in-process inspection certificate will be issued in rail vehicle projects when the vehicle is to be delivered and the conditions for provision for the contractual acceptance test have not been fulfilled.

**In-process inspection certificate (FüB) for rail vehicles**

**Contractual acceptance test certificate:** Following successful conclusion of the acceptance test, the Client will usually declare contractual acceptance, if the conditions of acceptance demonstrably subsist and the Contractor acknowledges the listed objections in documentary form .

**Contractual acceptance test certificate (VA) for rail vehicles**

## 5. Inspection sub-applications

If products for which an EMP, STBP Part 2 or KFP is required are made at other manufacturing facilities by the contractor responsible for the principal delivery or if they are procured from subcontractors, inspection sub-applications shall be submitted by the Contractor.

**Inspection sub-applications**

Should it not be possible to carry out quality-dependent supplier monitoring at the Contractor's site (e.g. due to the absence of production and inspection facilities), an inspection sub-

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application must also be made by the Contractor to implement quality-dependent supplier monitoring.

## 6. Terminology and abbreviations

Summary of terms used and their meaning for the purposes of this document:

**Term and meaning**

<b>Term</b>	<b>Meaning</b>
Client	Deutsche Bahn AG or its affiliates
Client's quality assurance department	The relevant quality assurance department of Deutsche Bahn AG or of companies commissioned by Deutsche Bahn AG
Contractor	The direct contracting party of Deutsche Bahn AG
Subcontractors	The Contractor's suppliers Subcontractors may themselves have further subcontractors along the supply chain.  Pre- and auxiliary suppliers shall be treated as subcontractors for the purposes of this instruction.  N.B. A subcontractor involved in the procurement of an entire rail vehicle may be considered a contractor for the purposes of procurement of a rail vehicle component.

Summary of abbreviations used and their meaning for the purposes of Part A this document:

**Abbreviations and meaning Part A**

<b>Abbreviation</b>	<b>Meaning</b>
A point	Arrest point requiring agreement
AG	Client
AIAG	Automotive Industry Action Group
AN	Contractor
APZ 3.1	Inspection certificate 3.1
CDR	Conceptual Design Review

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DB AG	Deutsche Bahn AG
DIN	German Institute for Standardisation
EMP	First article inspection (FAI)
EN	European standard
EVB	Supplementary Contractual Conditions for Procurement
FDR	Final Design Review
FMEA	Failure Mode and Effects Analysis
FüB	In-process inspection certificate
HPQ	Manufacturer-Related Product Qualification
IT	Information technology
KFP	Adhesive-bonded production inspection
KKP	Adhesive-bonded structure design test
KTBP	Adhesive-bonded structure testing
LgP	List of products subject to quality inspection
M point	Reporting point
PK	Testing level (PK)
PK 1	Testing level 1
PK 2	Testing level 2
PK 3	Testing level 3
QE	Quality engineering
QFÜ	Quality-dependent in-process inspection
QG	Quality gates
QLÜ	Quality-dependent supplier monitoring
QPI	Quality test engineer at Deutsche Bahn AG or a commissioned testing agency
QSE	Quality assurance declaration
RAMS	Reliability, Availability, Maintainability, Safety

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Ril	Deutsche Bahn guideline
SIL	Safety integrity level
STBP	Welded structure inspection
Type	Type test
UAN	Subcontractors
UIC	(French) Union Internationale des Chemins de Fer (International Union of Railways)
VA	Contractual acceptance test certificate
VDA	German Association of the Automotive Industry
VDB	German Railway Industry Association

Summary of abbreviations used and their meaning for the purposes of Part B this document:

**Abbreviations and meaning Part B**

<b>Abbreviation</b>	<b>Meaning</b>
4 QS	4-quadrant chopper
A 1	Classification of an adhesive bond under DIN 6701-2
AFB	Automatic traction and braking control system
AQF	Active lateral suspension
AQZ	Active lateral centring and damping system
AS	Driven end
ASG (TCU)	Traction control unit
ASR	Output converter
ATB	Dutch train control system
BS	Non-driven end
CAN	Controller Area Network
CCU	Configurable Control Unit
CL 1	Certification level under EN 15085-2

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CL 2	Certification level under EN 15085-2
DBNV	Onboard three-phase AC power system
DC / DC	DC-to-DC converter
DCPU	Diagnostic Central Processing Unit
DG	Bogie
DSE	Digital logger
DSK	Data storage cassette
DÜ	Data transfer
E-Anteil	Electrical part
EBA	German Federal Railway Authority
EBICAB	Automatic train protection system
EBuLa	Electronic timetable display
EFA	Elastomer spring linkage
EFG	Elastomer spring link
ESG	Toughened safety glass
ETCS	European Train Control System
EVA	Speed measurement and logging system
EVB	Energy supply box
FIS	Passenger information system
GTO	Gate turn off
EIU	Railway infrastructure undertaking
EP	Electropneumatic
EVC	European Vital Computer
FIS	Passenger information system
FMZ	Frequency-division multiplex train control
GME	Speed measurement and logging system

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GNT	Speed monitoring for tilting technology
GMR	Speed measurement and logging system
GPRS	General Packet Radio Service
GSM-R	Global System for Mobile Communication - Rail
GTO	Gate turn off
HBU	Auxiliary system converter
HF	High frequency
HGST	Control module for tilting trains
HLK	Heating, ventilation, air conditioning
HSM	Microprocessor-controlled braking system from Knorr
HWR	Auxiliary inverter
IBIS	Integrated on-board information system
IFZ	Integrated vehicle bus
ISG	Train control device
JRU	Juridical recording system
KWS	Conventional push-pull control train system
KVB	French train control system
LAR	Location Added Routing
LTE	Long Term Evolution
LWL	Fibre optic cable
LZB	Linear train control system
M-Anteil	Mechanical part
MBS	Modular brake control
MFA	Modular cab display unit
MFD	Multifunctional display
Mg	Electromagnetic rail brake

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MMS	Man-machine interface (MMI)
MPK	Central buffer coupling
MTD	Mechanical and Technical Display
MVB	Multifunction Vehicle Bus
NBÜ	Emergency brake override
PZB	Intermittent automatic train control system
RIS	Passenger information system
SB	Quick-acting brake application
SE-Gerät	Transceiver
SIBAS	Siemens railway automation system
SDU	Speed and Distance Unit
SIFA	Automatic vigilance device
SO	Top of rail (TOR)
STM	Specific Transmission Module
TAV	Technology-based dispatch system
TCC	Train Control Computer
TEMA	Transaction energy management and charging
UG	Underframe
UMTS	Universal Mobile Telecommunication System
UV	Ultraviolet
VB	Full brake application
VSG	Laminated safety glass
VCU	Central vehicle control unit
WK	Vehicle body
WLAN	Wireless Local Area Network
WR	Inverter

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WB	Eddy-current brake
ZBF	Track-to-train radio
ZBS	Berlin rapid transit train control system
ZDS, ZWS, ZMS	Time-division multiplex double-heading, push-pull and multiple-heading control system
ZS	Train bus
ZSU	Converter for train line bus bar
ZSG, ZFG, VCU, ZWF	Central vehicle control unit (current names differ)
ZUB	Swiss and Danish train control system
Zub	Conductor
ZWG	Central distance and speed logging system



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## Part B

Part B of this document provides additional information on individual quality assurance measures described in Part A.

**Purpose**

It is divided into three categories:

- **General materials** procured for rail vehicles
- **Entire rail vehicles** procured within the scope of new acquisitions
- **Rolling stock components** procured for projects (e.g. retrofitting) or as spare parts

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## 1. List: General materials

<b>Consec. no.</b>	<b>Product group</b>	<b>Minimum Deutsche Bahn AG requirement / additional information</b>
<b>A1a</b>	<b>Bolts:</b> <ul style="list-style-type: none"> <li>From property class 8.8 from M 16; From property class 10.9 (including anti-fatigue and reamed bolts)</li> <li>From property class grade 5 from 5/8" From property class grade 8 all (including anti-fatigue and reamed bolts)</li> </ul> <b>Nuts:</b> <ul style="list-style-type: none"> <li>From property class 8 from M 16; All from property class 10</li> </ul>	<b>Testing level 3</b> <b>F[APZ 3.1 (in accordance with DIN EN 10204)]</b>
<b>A1b</b>	<b>Bolts:</b> <ul style="list-style-type: none"> <li>All those not covered by A1a</li> </ul> <b>Nuts:</b> <ul style="list-style-type: none"> <li>All those not covered by A1a</li> </ul>	<b>None</b>
<b>A2a</b>	<b>Sheet metal/semi-finished products/sections (structural steels)</b> <ul style="list-style-type: none"> <li>Steels and steel products within the scope of application of DBS 918 002-01 (DIN EN 10025)</li> </ul>	<b>Certificates compliant with DBS 918 002-1</b>
<b>A2b</b>	<b>Sheet metal/semi-finished products/sections (non-ferrous metals)</b>	<b>Certificates compliant with Guideline 951.0010Z04</b>

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<b>Consec. no.</b>	<b>Product group</b>	<b>Minimum Deutsche Bahn AG requirement / additional information</b>
<b>A3a</b>	<b>Coating materials (wet finishes)</b> <ul style="list-style-type: none"> <li>Coating materials compliant with DBS 918 300 (Terms and conditions of delivery), in accordance with project-specific supplementary sheets and supplementary sheets for mountings and parts provided under DBS 918 301 (Terms and conditions of production)</li> </ul>	<b>Certificates for product qualification and individual deliveries compliant with the demands of DBS 918 300</b>
<b>A3b</b>	<b>Coating materials (powder coating)</b> <ul style="list-style-type: none"> <li>Qualification of powder coating in accordance with BN 918 340</li> </ul>	<b>Product qualification certificates compliant with the demands of BN 918 340</b>
<b>A3c</b>	<b>Rail vehicle labelling (external)</b> <ul style="list-style-type: none"> <li>Self-adhesive transfers for external labelling and advertising in accordance with DBS 918 020</li> </ul>	<b>Certificates for product qualification and individual deliveries compliant with the demands of DBS 918 020</b>
<b>A3d</b>	<b>Rail vehicle labelling (internal)</b> <ul style="list-style-type: none"> <li>Self-adhesive transfers for internal labelling in accordance with DBS 918 021</li> </ul>	<b>Certificates for product qualification and individual deliveries compliant with the demands of DBS 918 021</b>

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<b>Consec. no.</b>	<b>Product group</b>	<b>Minimum Deutsche Bahn AG requirement / additional information</b>
<b>A3e</b>	<b>Other coating materials</b> <ul style="list-style-type: none"> <li>E.g. marker pens, temporary masking lacquer</li> </ul>	<b>None</b>
<b>A4a</b>	<b>Lubricants:</b> <ul style="list-style-type: none"> <li>Axlebox greases in accordance with DBS 918 310-01</li> </ul>	<b>Certificates compliant with DBS 918 310-01</b>
<b>A4b</b>	<b>Lubricants:</b> <ul style="list-style-type: none"> <li>All those not covered by A4a</li> </ul>	<p><b>Only greases of which the used has been legitimised by DB maintenance documents may be procured</b> (e.g. maintenance documentation from component or vehicle manufacturer, DBS, lubrication plans, etc)</p> <p>If lubricants are to be procured or used which have not yet been approved by DB maintenance documents, their procurement and use must be agreed with the lubricant purchasing department (l.eve 3, johann.schuster@deutschebahn.com) and the DB Systemtechnik GmbH tribology OU (T.TVI33(3), simon.zimmermann@deutschebahn.com).</p>
<b>A5</b>	<b>Filler metals:</b> <ul style="list-style-type: none"> <li>Welding filler materials in accordance with EN 15085-4</li> </ul>	<b>Certificates compliant with Guideline 951.0010Z04, delivery labelled with the CE mark and DB approval number (see also Online Register at <a href="http://www.en15085.net">www.en15085.net</a>).</b>
<b>A6</b>	<b>Standard and equivalent parts for unspecified use</b> <ul style="list-style-type: none"> <li>E.g. studs, bushes and sleeves</li> </ul>	<b>None</b>

## 2. List of rail vehicles

Complete vehicles, e.g. locomotives, multiple units, railcars, DVTs, passenger carriages, freight wagons and special vehicles are subject to routine testing and are not listed separately in Part B (Classification of parts, components and systems).

**Testing rail vehicles**

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Conf. sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1	0	Vehicle (complete)												Heading
2	0.1	Vehicle body manufacturing process as far as blasting (shell)												Heading
3	0.1.1	Principal components of vehicle body shell		X	X (acc. to A/ M points)		3.1			EN 15085-2 - CL 1	X	X	3.1	
4	0.1.1.1	CL 1 test following welding, inc. measurement of each component			A point					EN 15085-2 - CL 1	X	X	3.1	
5	0.1.1.2	CL 2 test following welding, inc. measurement of each component			M point					EN 15085-2 - CL 2	N/A	N/A	2.2	
6	0.1.2	Vehicle body shell complete		X	X (acc. to A/ M points)		3.1			EN 15085-2 - CL 1	X	X	3.1	
7	0.1.2.1	Testing prior to welding following tacking			M point									
8	0.1.2.2	Testing after welding (after blasting), inc. measurement			A point									
9	0.2	Vehicle body manufacturing process from the shell to completion of assembly												Heading
10	0.2.1	Coating		X	X (acc. to A/ M points)		3.1							
11	0.2.1.1	Pre-coating treatment			M point									
12	0.2.1.2	Priming surfaces for safety-critical joints (e.g. bolts, adhesive bonds)			M point									
13	0.2.1.3	Priming other surfaces			M point									

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Conf. sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
14	0.2.1.4	Colouring			A point									
15	0.2.1.5	Protection against corrosion (cavity preservation)			M point									
16	0.2.1.6	Fireproof coating			M point									
17	0.2.1.7	Noise-reduction coating			M point									
18	0.2.2	Adhesive bonding		X	X (acc. to A/ M points)		3.1							
19	0.2.2.1	Cementing in windows A1			M point									
20	0.2.2.2	Adhesive bonding of principal components A1			M point									
21	0.2.3	Assembly		X	X (acc. to A/ M points)		3.1							
22	0.2.3.1	Heat insulation/insulation			M point									
23	0.2.3.2	Laying pipes (pipes for safety-critical components)			M point									
24	0.2.3.3	Assembly using screwed connections in risk class H			A point									
25	0.2.3.4	Assembly using screwed connections in risk class M			M point									
26	0.2.4	Vehicle body measurement before erection on bogies		X	X (acc. to A/ M points)									
27	0.2.4.1	Vehicle body measurement (EN 13775-x; EN 25043 inter alia)			M point									
28	0.2.4.2	Four-point measurement (passenger carriages)			M point									
29	0.2.4.3	Measurement of critical points of the loading gage calculation			M point									
30	0.2.5	Completion of assembly of all safety-critical joints, systems and plant in the traction and passenger parts of the vehicle body prior to erection on the bogies		X	A point									

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
31	0.2.6	Evidence of the certificates and test documentation of bought-in parts required			M point		3.1							
32	0.3	Bogie manufacturing process												Heading
33	0.3.1	Bogie frame		X	X (acc. to A/M points)		3.1			EN 15085-2 - CL 1	X	X	3.1	
34	0.3.1.1	Bogie frame test prior to welding after tacking			M point					EN 15085-2 - CL 1	X	X	3.1	
35	0.3.1.2	Testing after welding (after blasting)			A point					EN 15085-2 - CL 1	X	X	3.1	
36	0.3.1.3	Bogie frame measurement			M point		3.1							
37	0.3.1.4	Testing after blasting			M point									
38	0.3.1.5	Coating surfaces for safety-critical joints (e.g. bolts, adhesive bonds)			M point									
39	0.3.2	Bogie assembly		X	X (acc. to A/M points)		3.1							
40	0.3.2.1	Assembly using screwed connections in risk class H			A point									
41	0.3.2.2	Assembly using screwed connections in risk class M			M point									
42	0.3.3	Testing on the compression rig			M point									
43	0.3.4	Final bogie test		X	A point		3.1							
44	0.4	Erection and completion of vehicle or set assembly												Heading
45	0.4.1	Erection of vehicle bodies on bogies; vehicle body/bogie assembly			A point									
46	0.4.1.1	Assembly using screwed connections in risk class H			M point									
47	0.4.1.2	Assembly using screwed connections in risk class M			M point									

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
48	0.4.1.3	Vehicle body measurement after erection on bogies			M point									
49	0.4.2	Train formation			M point									
50	0.4.3	Test on completion of assembly		X	A point		3.1							
51	0.5	Commissioning												Heading
52	0.5.1	Electrical system commissioning (complete)		X	A point									
53	0.5.1.1	High-tension and insulation test			M point									
54	0.5.1.2	Electrical resistance and short-circuit tests			M point									
55	0.5.1.3	Bus systems communication test			M point									
56	0.5.1.4	Battery system/on-board grid commissioning			M point									
57	0.5.1.5	Battery system/on-board grid (short-circuit to ground) commissioning			M point									
58	0.5.1.6	Auxiliary drive commissioning			M point									
59	0.5.1.7	Main power supply commissioning (inc. pantograph, main switch and locomotive protective switch)			M point									
60	0.5.2	Brake system commissioning (complete)		X	A point									
61	0.5.2.1	Brake commissioning (inc. emergency and full brake pressures, any load dependency)			M point									
62	0.5.2.2	Brake test (user-controlled, automatic)			M point									
63	0.5.2.3	Compressed air supply inc. drying air (control system, leak-proofing)			M point									
64	0.5.2.4	Parking brake (spring loading)			M point									
65	0.5.2.5	Additional braking systems (e.g. magnetic or eddy-current brake)			M point									
66	0.5.3	Mechanical commissioning (complete)		X	X (acc. to A/M points)									
67	0.5.3.1	Refuelling, limit indicator, leak-proofing			M point									
68	0.5.3.2	Filling other consumables, leak-proofing (sand, water, oil, etc)			M point									
69	0.5.3.3	Diesel engine load settings			M point									



List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
70	0.5.3.4	Exhaust measurement (including preheating and heating systems)			M point									
71	0.5.3.5	Sanding system (including sand flow measurement)			M point									
72	0.5.3.6	Wheel flange lubricator			M point									
73	0.5.3.7	Air pressure leak-proofing			M point									
74	0.5.3.8	Pneumatic spring system setting			M point									
75	0.5.3.9	Weighing/wheel load			M point									
76	0.5.3.10	Ease of movement tests												
77	0.5.3.11	Waterproofing (sprinkling)			A point									
78	0.5.4	Functional commissioning (complete)		X	A point									
79	0.5.4.1	Setup conditions (e.g. automatic setup, stabled setup, energy-optimised stabling)			M point									
80	0.5.4.2	Safety system test sequences (fire alarm system, safety loops, SIFA, PZB, LZB, etc)			M point									
81	0.5.4.3	Cab functions (control panel, control elements, fault switch)			M point									
82	0.5.4.4	Emergency alarm and safety-critical conductor functions (public address system, driver's intercom, etc)			M point									
83	0.5.4.5	Tilting technology			M point									
84	0.5.4.6	Push-pull control system			M point									
85	0.5.4.7	Multiple traction			M point									
86	0.5.4.8	Mixed traction			M point									
87	0.5.4.9	Radio remote control			M point									
88	0.5.4.10	Train radio system			M point									
89	0.5.4.11	Main power circuit protection functions			M point									
90	0.5.4.12	Hydraulic or diesel-electric power protective functions			M point									
91	0.5.4.13	Emergency switching and control system (diesel engine, pantograph)			M point									
92	0.5.4.14	Automatic couplers, switching couplers			M point									

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
93	0.5.4.15	Air conditioning system (passenger saloon and cab)			M point									
94	0.5.4.16	Acoustic signal systems			M point									
95	0.5.4.17	Illuminated and visual signal systems			M point									
96	0.5.4.18	Windscreen wipers and washer			M point									
97	0.5.4.19	Single vehicle door control systems commissioning			M point									
98	0.5.4.20	On-train door control and monitoring system (including closing force, obstruction protection, emergency release, side selection, remote closure)			M point									
99	0.5.4.21	Remote step control (gap bridging)			M point									
100	0.5.4.22	Boarding aids for wheelchair users (ramps, elevators)			M point									
101	0.5.4.23	Self-loading and unloading systems for freight wagons			M point									
102	0.5.4.24	Diagnostic systems (which form part of the vehicle's safety concept)			M point									
103	0.5.4.25	Diagnostic systems (which do not form part of the vehicle's safety concept)			M point									
104	0.5.4.26	Response to transposition, isolation or failure of safety-critical subassemblies and systems												
105	0.5.4.27	Kitchen/galley			M point									
106	0.5.4.28	WC system			M point									
107	0.5.4.29	Passenger information system functions			M point									
108	0.5.4.30	Passenger service systems (emergency alarm, displays, service call)			M point									
109	0.5.5	Dynamic commissioning (depot trial run and/or test track)		X	A point									
110	0.5.5.1	Communication cord, emergency brake override			M point									
111	0.5.5.2	Train control systems (PZB, LZB, ETCS)			M point									
112	0.5.5.3	Automatic traction and braking control system			M point									

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Conf. sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
113	0.5.5.4	Coupling/uncoupling			M point									
114	0.5.5.5	Push-pull control system (double/multiple heading)			M point									
115	0.5.5.6	Emergency driving functions/towing circuits			M point									
116	0.5.5.7	Brake system efficiency (e.g. blended braking, special functions)			M point									
117	0.5.5.8	Traction block, system blocks, speed restrictions			M point									
118	0.5.5.9	Automatic vigilance device			M point									
119	0.5.5.10	Radio remote control			M point									
120	0.5.5.11	On-train door control and monitoring inc. dispatching system			M point									
121	0.5.5.12	Change in direction of travel			M point									
122	0.5.5.13	Vehicle function from each cab			M point									
123	0.5.5.14	Drive control, braking and automatic train control			M point									
124	0.5.5.15	Train radio system			M point									
125	0.5.5.16	Passenger doors (release of side selection)			M point									
126	0.5.5.17	Passenger information system (PIS)			M point									
127	0.5.5.18	Characteristics of tractive effort, braking and speed			M point									
128	0.5.5.19	Driving characteristics/ride behaviour			M point									
129	0.5.5.20	Tilting (DVT operation)			M point									
130	0.5.5.21	Vehicle stati (temperature, pressures, switching points, etc.)			M point									
131	0.5.5.22	Maximum speed/acceleration			M point									
132	0.5.5.23	Inspection following trial run (e.g. leak-proofing, gearboxes, plant, damage, missing parts)			A point									
133	0.6	Final inspection												Heading
134	0.6.1	Fully-completed vehicle		X	A point		3.1							
135	0.6.1.1	Equipment (integrity, inspection date)			M point									
136	0.6.1.2	Inspection of remedy of defects			M point									

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
137	0.6.1.3	Condition on delivery (modification status, configuration)			M point									
138	0.6.1.4	Inscriptions			M point									
139	0.6.1.5	Documentation (EBA approval, software loading list, operating manual, etc)			M point									

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### 3. List of rail vehicle parts

Testing rail vehicle parts includes at least the EMP, QLÜ and DOK (APZ 3.1) in accordance with the quality assurance measures specified below, in accordance with the testing level specified.

**Testing rail vehicle parts**

A QFÜ is also stored for individual items on the list and must be conducted taking the A and M points into account (see the second list of rail vehicles). The necessity of an HPQ must also be taken from the list.

The requirements stored for welding have been included for the sake of integrity. In this case the lead regulation is the Deutsche Bahn AG Guideline 951.0010 (and the respective appendices).

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
140	1	Vehicle body												Heading
141	1.1	Vehicle body shell/body shell/vehicle body/structure	1	X	X (acc. to A/ M points)	X	3.1			EN 15085-2 - CL 1	X	X	3.1	
142	1.1.1	End/side walls (complete)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
143	1.1.1.1	Window corners, window pillars, mullions								EN 15085-2 - CL 1	X	X	3.1	
144	1.1.1.2	Side panel framework, side panel upright, side panel pillar, side panel seam								EN 15085-2 - CL 1	X	X	3.1	
145	1.1.1.3	Door frame								EN 15085-2 - CL 1	X	X	3.1	
146	1.1.2	Cab/vehicle head (complete)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
147	1.1.2.1	Driver's cab frame								EN 15085-2 - CL 1	X	X	3.1	
148	1.1.2.2	Plastic head - shell												
149	1.1.3	End wall	1	X		X	3.1			EN 15085-2 -	X	X	3.1	

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
150	1.1.3.1	End wall framework, end panel upright, end panel seam								EN 15085-2 - CL 1	X	X	3.1	
151	1.1.3.2	Rear panel framework								EN 15085-2 - CL 1	X	X	3.1	
152	1.1.4	Vehicle roof (complete)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
153	1.1.4.1	Roof cowling/segment, lifting roof, sliding roof	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
154	1.1.4.2	Roof flap/skylight, ceiling flap								EN 15085-2 - CL 1	X	X	3.1	
155	1.1.4.3	Pantograph roof	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
156	1.1.4.4	Roof framework, roof arch, haunch								EN 15085-2 - CL 1	X	X	3.1	
157	1.1.4.5	Roller roof												
158	1.1.5	Frame (complete)	1	X	X (acc. to A/M points)	X	3.1			EN 15085-2 - CL 1	X	X	3.1	
159	1.1.5.1	Frame - projection/buffer beam	1	X	X (acc. to A/M points)	X	3.1			EN 15085-2 - CL 1	X	X	3.1	
160	1.1.5.1.1	Buffer beam	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
161	1.1.5.1.2	Coupling carrier	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
162	1.1.5.2	Frame - central section	1	X	X (acc. to A/M points)	X	3.1			EN 15085-2 - CL 1	X	X	3.1	
163	1.1.5.3	Main cross member	1	X	X (acc. to A/M points)	X	3.1			EN 15085-2 - CL 1	X	X	3.1	

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
164	1.1.5.4	I-beam	1	X	X (acc. to A/ M points)	X	3.1			EN 15085-2 - CL 1	X	X	3.1	
165	1.1.5.5	Sheet metal floor, corrugated metal floor, beaded floor								EN 15085-2 - CL 1	X	X	3.1	
166	1.1.5.6	Floor mounting, floor framework, floor frame, floor pan								EN 15085-2 - CL 1	X	X	3.1	
167	1.1.5.7	Welded supporting frame for large components below/on the vehicle, e.g. the power pack, electric traction motor, diesel engine, self-supporting equipment boxes, etc.; supporting frame skeleton	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
168	1.1.6	Welded-on parts, vehicle body fittings and structures								EN 15085-2 - CL 1	X	N/A	3.1	
169	1.1.6.1	Snowplough	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
170	1.1.6.2	Equipment boxes (simple type)	3				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
171	1.1.6.3	Bracket/bearer/suspension system (power transmission between the running gear/bogie and the vehicle body)	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
172	1.1.6.4	Bracket/bearer/suspension system (simple type)								EN 15085-2 - CL 1	X	X	3.1	
173	1.1.6.5	Water drain/gutter								EN 15085-2 - CL 2	N/A	N/A	2.2	
174	1.1.6.6	Limit stops								EN 15085-2 - CL 1	X	X	3.1	
175	1.1.7	Energy absorption systems	3				3.1			EN 15085-2 - CL 1	X	X	3.1	
176	1.1.7.1	Buffer stop	3				3.1			EN 15085-2 - CL 1	X	X	3.1	
177	1.1.7.2	Anti-climb protection	3				3.1			EN 15085-2 -	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
178	1.1.7.3	Underride guard	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
179	1.1.8	(Removable) fittings								EN 15085-2 - CL 1	X	N/A	3.1	
180	1.1.8.1	Side wall ventilation grille								EN 15085-2 - CL 3	N/A	N/A	2.2	
181	1.1.8.2	Roof ventilation grille								EN 15085-2 - CL 3	N/A	N/A	2.2	
182	1.1.8.3	Roof panelling (simple type)								EN 15085-2 - CL 1	X	N/A	3.1	
183	1.1.9	Insulation, acoustic deadening												
184	1.1.9.1	Sound insulation												
185	1.1.9.2	Heat insulation												
186	1.1.10	Inserted ceiling/floor (e.g. in double-deck carriages)	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
187	1.1.11	Loading platform, load bed (e.g. load deck on a car carrier)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
188	1.1.12	Base frame	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
189	1.1.13	Partition wall/permanent bulkhead	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
190	1.2	External design												Heading
191	1.2.1	Projections, front-end hood	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
193	1.2.2	Labelling, signage, pictograms for safety features/safety functions												
194	1.2.3	Handles/handrails								EN 15085-2 - CL 2	N/A	N/A	2.2	
195	1.2.4	Front flap system	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
196	1.2.4.1	Front flap (without drive)	2	X			3.1			EN 15085-2 -	X	N/A	3.1	



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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
197	1.2.4.2	Front flap drive												
198	1.2.4.3	Front flap control and operation components												
199	1.2.5	Panel components (e.g. skirts, flaps and covers)								EN 15085-2 - CL 1	X	N/A	3.1	
200	1.2.5.1	Apron								EN 15085-2 - CL 1	X	N/A	3.1	
201	1.2.5.2	Spoiler								EN 15085-2 - CL 1	X	N/A	3.1	
202	1.2.5.3	Side frame flap/cover								EN 15085-2 - CL 1	X	N/A	3.1	
203	1.2.5.4	End wall flap/cover								EN 15085-2 - CL 1	X	N/A	3.1	
204	1.2.5.5	Apron flap								EN 15085-2 - CL 1	X	N/A	3.1	
205	1.2.6	Outside mirror												
206	1.2.7	Snow protection/protective grilles								EN 15085-2 - CL 3	N/A	N/A	2.2	
207	1.2.8	Bracket for signs (e.g. end discs)								EN 15085-2 - CL 3	N/A	N/A	2.2	
208	1.2.9	Handles and levers for various uses								EN 15085-2 - CL 3	N/A	N/A	2.2	
209	1.3	Entry/loading facilities												Heading
210	1.3.1	Outside doors												Heading
211	1.3.1.1	Driver's cab entry door (complete)	2	X				3.1		EN 15085-2 - CL 1	X	N/A	3.1	
212	1.3.1.2	Passenger entry door (door system complete with drive)	2	X				3.1		EN 15085-2 - CL 1	X	N/A	3.1	
213	1.3.1.3	Entrance door leaf/wing												
214	1.3.1.4	Loading/sliding door	2	X				3.1		EN 15085-2 - CL 1	X	N/A	3.1	
215	1.3.2	Wheelchair ramp/loading ramp	2	X				3.1		ISO 3834-4	N/A	N/A	2.2	

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
216	1.3.3	Lift	2	X			3.1			ISO 3834-4	N/A	N/A	2.2	Observe Section 33 EBO
217	1.3.4	Steps												Heading
218	1.3.4.1	Fixed step, shunter's step, shunter's handle								EN 15085-2 - CL 1	X	N/A	3.1	
219	1.3.4.2	Folding step, sliding step (complete with drive)	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
220	1.3.4.3	Step cover, step grating, floor grating								EN 15085-2 - CL 3	N/A	N/A	2.2	
221	1.3.4.4	Entry ladder								EN 15085-2 - CL 2	N/A	N/A	2.2	
222	1.3.4.5	Entrance steps, access steps, other steps, handles (handrails) and external railings on the rail vehicle (excluding shunter's steps and hand-rails)								EN 15085-2 - CL 2	N/A	N/A	2.2	
223	1.3.5	Loading and unloading facilities/aids												Heading
224	1.3.5.1	Conveying equipment								EN 15085-2 - CL 1	X	N/A	3.1	
225	1.3.5.2	Tipping system								EN 15085-2 - CL 1	X	N/A	3.1	
226	1.3.5.3	Loading and unloading facility for dangerous goods	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
227	1.3.5.4	Sliding door, sliding partition, appropriate jib for freight wagons	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
228	1.3.5.5	Sliding roof, canopy, appropriate jib for freight wagons	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
229	1.3.5.6	Operating and locking facilities								EN 15085-2 - CL 3	N/A	N/A	2.2	
230	1.3.5.7	Rail for sliding partition	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
231	1.3.5.8	Trestle for semi-trailers	1	X		X	3.1			EN 15085-2 -	X	X	3.1	

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
232	1.3.6	Freight protection												Heading
233	1.3.6.1	Tie-down facilities (lashing winches, chains, belts), retainers	2	X			3.1							
234	1.3.6.2	Lashing rings	3				3.1			EN 15085-2 - CL 1	X	N/A	3.1	
235	1.3.6.3	Coil retaining facility, retaining arm	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
236	1.3.6.4	Lockable partitions	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
237	1.3.6.5	Loading cradles, coil cradles	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
238	1.3.6.6	Side load securing facility	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
239	1.3.6.7	Stanchions	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
240	1.3.6.8	Stanchion holders								EN 15085-2 - CL 1	X	X	3.1	
241	1.3.6.9	Stanchion socket								EN 15085-2 - CL 1	X	X	3.1	
242	1.3.6.10	Stanchion foot	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
243	1.3.6.11	Stanchion skids	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
244	1.3.7	Entry lighting												
245	1.3.8	Drives												Heading
246	1.3.8.1	Passenger door												
247	1.3.8.2	Step, sliding step												
248	1.3.8.3	Wheelchair ramp, platform lift, loading ramp												
249	1.3.8.4	Loading facility												
250	1.3.8.5	Unloading device												
1587	1.3.9	Control components for operation of the en-												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		try/loading facilities												
252	1.3.9.1	Operating element, door button, opening button												
253	1.3.9.2	Conductor's switch												
254	1.3.9.3	Internal emergency unlocking device								EN 15085-2 - CL 2	N/A	N/A	2.2	
255	1.3.9.3.1	Button for emergency unlocking, emergency switch												
256	1.3.9.3.2	Emergency release operating sensor												
257	1.3.9.4	Motion detector												
258	1.3.9.5	Door obstruction system, obstruction protection system, contact strip												
259	1.3.9.5.1	Light beam, light curtain												
1561	1.3.9.5.2	Warning lights, sound generator for (passenger) doors												
261	1.3.9.6	Control/operating system for wheelchair ramp, platform lift, loading ramp												
262	1.3.9.7	Control/operating system for loading/unloading facility												
263	1.3.9.8	Door control unit, including operating software												
264	1.3.10	Protection and monitoring sensors												
265	1.3.11	Freight wagon vessel and pipe systems with compressed air discharge systems								ISO 3834-4	N/A	N/A	2.2	Observe Section 33 EBO
266	1.4	Buffing and draw gear, coupler												Heading
267	1.4.1	Mechanical coupler/central buffer coupler (automatic coupler, switching coupler, close and adapter coupler, freight traffic coupler)	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
268	1.4.1.1	Coupler head/coupling head/coupling head	1	X		X	3.1	X		EN 15085-2 -	X	X	3.1	

Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information	
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC		
		housing/catcher									CL 1				
269	1.4.1.1.1	Front plate													
270	1.4.1.1.2	Locking mechanism (components in the power train (e.g. the centrepiece, coupling link, gripper elements, dog)	2	X				3.1			EN 15085-2 - CL 1	X	X	3.1	
271	1.4.1.1.3	Locking mechanism (components in the power train (e.g. the coupling link pins, main pins)	2	X				3.1							
272	1.4.1.2	Coupling rod/energy-consuming loads													Heading
273	1.4.1.2.1	Coupling screw, telescopic device, drawbar, drawbar housing/intermediate pipe (in the power train)	1	X			X	3.1			EN 15085-2 - CL 1	X	X	3.1	
274	1.4.1.2.2	Drawbar castle nut	3					3.1			EN 15085-2 - CL 1	X	N/A	3.1	
275	1.4.1.2.3	Tapered ring, ring nut	3					3.1							
276	1.4.1.2.4	Energy-consuming loads (e.g. collapsible tube, mechanical, hydrostatic, gas-hydraulic and polymer spring elements)	1	X			X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
277	1.4.1.2.5	Bowl sleeve	2	X				3.1			EN 15085-2 - CL 1	X	N/A	3.1	
278	1.4.1.3	Linkage	1	X			X	3.1			EN 15085-2 - CL 1	X	X	3.1	
279	1.4.1.3.1	Bearing block	1	X			X	3.1			EN 15085-2 - CL 1	X	X	3.1	
280	1.4.1.3.2	Bearer pins	1	X			X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
281	1.4.1.3.3	Elastomer spring linkage (EFA)	1	X			X	3.1							
282	1.4.1.3.4	Spherical bearing, spring housing, spring housing nut, spring element	3					3.1			EN 15085-2 - CL 1	X	N/A	3.1	
283	1.4.1.3.5	Elastomer spring link (EFG, e.g. shells)	1	X			X	3.1							
284	1.4.1.3.6	Elastomer spring link (EFG, e.g. studs, centre section)	1	X			X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
285	1.4.2	Central articulated joint, vehicle body articulated	1	X			X	3.1	X		EN 15085-2 -	X	X	3.1	

Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information		
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC			
		joint									CL 1					
286	1.4.3	Electric coupling, cable coupling enclosure, self-supporting junction boxes	2	X				3.1			EN 15085-2 - CL 1	X	N/A	3.1		
287	1.4.3.1	Built-in, non-self-supporting junction boxes and cable coupling enclosures for automatic couplings									EN 15085-2 - CL 2	N/A	N/A	2.2		
288	1.4.4	Data transfer coupling														
289	1.4.5	Pneumatic /hydraulic coupling									EN 15085-2 - CL 1	X	X	3.1		
290	1.4.5.1	Uncoupling valve														
291	1.4.6	Buffing gear	1	X			X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1		
292	1.4.6.1	Side/self-contained buffers, complete, crash buffers	1	X			X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1		
293	1.4.6.1.1	Components such as sleeves, plungers and buffer heads	2	X				3.1	X		EN 15085-2 - CL 1	X	X	3.1		
294	1.4.6.2	Impact protection elements														Heading
295	1.4.6.2.1	Impact protection element (steel, reversible, e.g. annular springs, friction springs)	2	X				3.1	X		EN 15085-2 - CL 1	X	N/A	3.1		
296	1.4.6.2.2	Other impact protection elements (e.g. elastomers, hydrostatic and hydrodynamic springs)	2	X				3.1								
297	1.4.6.2.3	Impact protection element/crash element (irre-	2	X				3.1			EN 15085-2 -	X	X	3.1		

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		versible)								CL 1				
298	1.4.6.3	Long-stroke shock absorbers								EN 15085-2 - CL 1	X	N/A	3.1	
299	1.4.7	Draw gear	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
300	1.4.7.1	Draw hook	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
301	1.4.7.2	Coupling hook guide								EN 15085-2 - CL 1	X	N/A	3.1	
302	1.4.7.3	Tension springs (annular springs, helical springs, leaf springs)	3				3.1							
303	1.4.7.4	Screw coupling	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
304	1.4.7.4.1	Coupling pins, looped coupling links, coupling links, coupling nuts, coupling screws	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
305	1.4.7.4.2	Screw coupling end disc								EN 15085-2 - CL 1	X	N/A	3.1	
306	1.4.7.5	Central articulated joint, draw gear journal bearing	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
307	1.4.7.6	Coupling rod	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
308	1.4.7.7	Drawbar, forked drawbar	1	X		X	3.1	X		EN 15085-2 -	X	X	3.1	

Con-sec. no.	List structure		Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
309	1.4.7.7.1	(Castellated) drawbar nut, spacer plate, pressure plate, spring seat	3				3.1			EN 15085-2 - CL 1	X	N/A	3.1	
310	1.4.7.7.2	Bearer, journal bearing	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
311	1.4.7.7.3	Coupling bolt	1	X		X	3.1	X						
312	1.4.8	Emergency/adapter coupling												Heading
1602	1.4.8.1	Towing hitch	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
1603	1.4.8.2	Emergency coupler	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
315	1.4.9	Coupler control and operation components												
316	1.4.10	Protection and monitoring system, sensors												Heading
317	1.4.10.1	Mechanical coupling												
318	1.4.10.2	Electric coupling												
319	1.4.10.3	Pneumatic coupling												
320	1.4.11	Auxiliary device for coupling												
321	1.5	Gangway												Heading
322	1.5.1	Gangway bellows/corrugated bellows, joint bead												Heading
323	1.5.1.1	Bellows												
324	1.5.1.2	Double-articulated bellows												
325	1.5.1.3	Beading installation												
326	1.5.1.4	Pressure-proof gangway	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
327	1.5.2	Rotary elements								EN 15085-2 - CL 1	X	N/A	3.1	
328	1.5.3	Absorption elements								EN 15085-2 - CL 1	X	N/A	3.1	
329	1.5.4	Cladding								EN 15085-2 - CL 2	N/A	N/A	2.2	



List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
330	1.5.5	Operating and locking facilities								EN 15085-2 - CL 2	N/A	N/A	2.2	
331	1.5.6	Cable and hose glands												
332	1.5.7	Connecting walkway, linking walkway	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
333	1.5.8	Gangway door	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
334	1.5.8.1	Drive system												
335	1.5.8.2	Gangway door control and operating components												
336	1.5.8.3	Protection and monitoring system, sensors												
337	1.6	Window system												Heading
338	1.6.1	Window safety glass (toughened, laminated)	3				3.1							
339	1.6.2	Window frame								EN 15085-2 - CL 3	N/A	N/A	2.2	
340	1.6.3	End wall window, windscreen (inc. heating system)	1	X		X	3.1	X						Observe 1.6.2
1571	1.6.4	Other windows (e.g. fixed, panorama, top-hung, hopper, vertical sliding, balanced, drop, sliding, winding, rear, roof and door windows)	3				3.1							Observe 1.6.2
351	1.6.5	Emergency exit, emergency exit window	2	X			3.1							Observe 1.6.2
352	1.6.6	Window pane heating system												
353	1.6.7	Windscreen wipers and washer								EN 15085-2 - CL 3	N/A	N/A	2.2	
354	1.6.7.1	Wiper blade												
355	1.6.7.2	Linkage												
356	1.6.7.3	Wiper drive												
357	1.6.7.4	Water supply												
358	1.7	External lighting and indicators												Heading
1593	1.7.1	Vehicle headcode and tail lamp	3				3.1							
360	1.7.1.1	Headlamp (headcode) and tail lamp LEDs	3				3.1							

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
361	1.7.1.2	Headlamp and tail lamp frame								EN 15085-2 - CL 3	N/A	N/A	2.2	
1562	1.7.1.3	Glass cover for head and tail lamps												
363	1.7.2	Headlight system	3				3.1							
364	1.7.2.1	Headlight glass cover heating system												
365	1.7.3	Indicators, flashers	3				3.1							
366	1.7.4	Other external lighting (e.g. position lights)												
367	1.7.5	Acoustic signal system (Makrofon, horn, Tyfon)	3				3.1							
368	1.8	Transformer boiler bridge, cantilevered for transport by Schnabel car	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
369	2	Chassis/running gear/bogie (complete)	1	X	X (acc. to A/M points)	X	3.1			EN 15085-2 - CL 1	X	X	3.1	
370	2.1	Load-bearing structures												Heading
371	2.1.1	Frame/bogie frame, running gear frame	1	X	X (acc. to A/M points)	X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
372	2.1.1.1	Solebar, bogie side member	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
373	2.1.1.2	Cross member	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
374	2.1.2	Load bearing structure of the secondary suspension stage												Heading
375	2.1.2.1	Bolster, bolster system	2	X			3.1	X	HPQ only for sub-components in accord-	EN 15085-2 - CL 1	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
									ance with LgP					
376	2.1.2.1.1	Suspension rod	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
377	2.1.2.1.2	Bogie bolster/beam	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
378	2.1.2.1.3	Spring bracket, hollow shaft	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
379	2.1.3	Structural parts of running gear												Heading
380	2.1.3.1	Emergency stops, rotation limiter	3				3.1			EN 15085-2 - CL 1	X	X	3.1	
381	2.1.3.2	Sole, intermediate and fifth wheel plates								EN 15085-2 - CL 1	X	X	3.1	
382	2.1.3.3	Straps	3				3.1			EN 15085-2 - CL 1	X	X	3.1	
383	2.1.3.4	Locking pieces	3				3.1			EN 15085-2 - CL 1	X	X	3.1	
384	2.1.3.5	Clamping screws	3				3.1							
385	2.1.3.6	Collar	3				3.1							
386	2.1.3.7	Stop plates								EN 15085-2 - CL 3	N/A	N/A	2.2	
387	2.2	Suspension, damping, wheel(set) mounting												Heading
388	2.2.1	Primary suspension												Heading
389	2.2.1.1	Primary springs												Heading
390	2.2.1.1.1	Coil springs	1	X		X	3.1	X						
391	2.2.1.1.2	Rubberised metal springs	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
392	2.2.1.1.3	Rubber leaf springs	1	X		X	3.1							
393	2.2.1.1.4	Composite springs	1	X		X	3.1							
394	2.2.1.1.5	Primary leaf springs	1	X		X	3.1							
395	2.2.1.1.6	Laminated suspension spring (complete)/spring leaf (individual)	1	X		X	3.1	X	HPQ for individual	EN 15085-2 - CL 1	X	N/A	3.1	Spring leaf (individual)

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
									spring leaf only					is usually not welded
396	2.2.1.1.7	Shackles for suspension leaf springs	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
397	2.2.1.2	Spring suspension, spring bearing, spring guide	2	X			3.1	X		EN 15085-2 - CL 1	X	X	3.1	
398	2.2.1.2.1	Support shackles, spacer	2	X			3.1							
399	2.2.1.2.2	Spring balance lever	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
400	2.2.1.2.3	Suspension bracket	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
401	2.2.1.2.4	Spring bolt	1	X		X	3.1	X						
402	2.2.1.2.5	Spring shackle	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
403	2.2.1.3	Rubber bearing, Sphäribloc	2	X			3.1							
404	2.2.1.4	Spring retainer, spring seat								EN 15085-2 - CL 1	X	X	3.1	
405	2.2.1.5	Spring pin, spring seat								EN 15085-2 - CL 1	X	X	3.1	
406	2.2.2	Primary damping (vertical dampers, transverse dampers, horizontal dampers)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
407	2.2.2.1	Brackets for attaching vibration dampers/shock absorbers	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
408	2.2.3	Wheel(set) mounting and primary articulation												Heading
409	2.2.3.1	Sliding guide	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
410	2.2.3.2	Wheelset links, spring leaf, wheelset spring leaf, link	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
411	2.2.3.3	Tooth plates, bearing for wheelset link	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
412	2.2.3.4	Hinge rod	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
413	2.2.3.5	Wheelset guide bushes	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
414	2.2.3.6	Half axle guard	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
415	2.2.3.6.1	Wheelset bracket web	3				3.1							
416	2.2.3.6.2	Support bracket	3				3.1			EN 15085-2 - CL 1	X	X	3.1	
417	2.2.4	Secondary suspension												Heading
418	2.2.4.1	Secondary springs												Heading
419	2.2.4.1.1	Coil springs	1	X		X	3.1	X						
420	2.2.4.1.2	Rubberised metal springs	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
421	2.2.4.1.3	Rubber leaf springs	1	X		X	3.1							
422	2.2.4.1.4	Composite springs	1	X		X	3.1							
423	2.2.4.1.5	Laminated suspension spring (complete)/spring leaf (individual)	1	X		X	3.1	X	HPQ for individual spring leaf only					
424	2.2.4.1.6	Suspension leaf spring shackle	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
425	2.2.4.2	Pneumatic spring system (complete)	2	X			3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	N/A	3.1	
426	2.2.4.2.1	Beam, pneumatic spring bracket	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
427	2.2.4.2.2	Pneumatic spring plate, welded	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
428	2.2.4.2.3	Weld-free pneumatic spring plate												

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Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
429	2.2.4.2.4	Additional air reservoir								EN 15085-2 - CL 1	X	X	3.1	
430	2.2.4.2.5	Air suspension bellows												
431	2.2.4.2.6	Levelling valve, pneumatic spring control valve												
432	2.2.4.2.7	Clamping ring								EN 15085-2 - CL 1	X	N/A	3.1	
1584	2.2.4.2.8	Emergency spring for gas spring system	1	X		X	3.1							
433	2.2.4.3	Pneumatic suspension control system, pneumatic spring level controller												
434	2.2.4.4	Emergency spring, overload spring	1	X		X	3.1							
435	2.2.4.5	Rubber bearing, Sphäribloc	2	X			3.1							
436	2.2.5	Secondary damping												Heading
437	2.2.5.1	Vertical damper	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
438	2.2.5.2	Horizontal damper	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
439	2.2.5.3	Transverse damper	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
440	2.2.5.4	Hydraulic dampers: engine, gearbox and between vehicle bodies	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
441	2.2.5.5	Friction damper	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
442	2.2.5.6	Brackets for attaching secondary dampers	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
443	2.2.6	Rotation stabilisation system, yaw stabilisation system												Heading
444	2.2.6.1	Yaw damper bracket, rotation damper bracket	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
445	2.2.6.2	Yaw, rotation inhibition and rotation dampers	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
446	2.2.7	Friction torque inhibitor elements												Heading
447	2.2.7.1	Torsion shaft, torsion bar	1	X		X	3.1	X		EN 15085-2 -	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
448	2.2.7.2	Bearings, ball and socket joints, heel plates, sliding components	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
1591	2.3	Wheelset (complete)	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
1592	2.3.1	Disc												See con-sec. no. 1597, 5.2.2.4
451	2.3.2	Wheel												Heading
452	2.3.2.1	Monobloc wheel	1	X		X	3.1	X						
453	2.3.2.2	Tyred wheel	1	X		X	3.1	X						
454	2.3.2.2.1	Wheel centre	1	X		X	3.1	X						
455	2.3.2.2.2	Tyre	1	X		X	3.1	X						
456	2.3.2.3	Spring elements (rubber segments, rubber ring)	2	X			3.1							
1603	2.3.2.4	Connectors (bead seat ring, clamping ring), lock washer	3				3.1							
458	2.3.2.5	Wheel noise absorbers												
1560	2.3.2.6	Anti-torsional vibration wheel damper	2	X			3.1							
459	2.3.2.7	Damper ring								EN 15085-2 - CL 1	X	X	3.1	
460	2.3.3	Axle												Heading
461	2.3.3.1	Axle without central bore	1	X		X	3.1	X						
462	2.3.3.2	Axle with central bore	1	X		X	3.1	X						
463	2.3.3.3	Molybdenum-coated wheelset	1	X		X	3.1	X						
464	2.3.4	Wheel(set) bearing system												Heading
465	2.3.4.1	Axle box complete (axle roller bearing, wheelset)	1	X		X	3.1	X	HPQ only	EN 15085-2 -	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		roller bearing)							for sub-components in accordance with LgP	CL 1				
466	2.3.4.1.1	Axle box housing, axle bearing housing	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
467	2.3.4.1.2	Bearing sleeve	2	X			3.1	X						
468	2.3.4.1.3	Roller bearing for axlebox	1	X		X	3.1	X						
469	2.3.4.1.4	Roller bearing components: inner raceway, outer raceway	3				3.1	X						
470	2.3.5	Attachments												Heading
1594	2.3.5.1	Axle box housing cover, axlebox cover for locomotives, multiple units, passenger and freight vehicles	3				3.1							
473	2.3.5.2	Labyrinth rings, sealing rings												
474	2.3.5.3	Spacers												
475	2.3.5.4	Brackets	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
476	2.3.5.5	Pins and bushes, hardened							-					
477	2.3.5.6	Thrust plate	2	X			3.1							
478	2.3.5.7	Pressure cap	2	X			3.1							
479	2.3.5.8	Groove nut	2	X			3.1							
480	2.3.5.9	Earth return brush	3				3.1							
481	2.3.5.10	Axle box mountings	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
482	2.4	Running gear-vehicle body connection												Heading
483	2.4.1	Articulation, tensile force articulation, lengthwise articulation	1	X		X	3.1	X	HPQ only for sub-components in	EN 15085-2 - CL 1	X	X	3.1	



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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
									accordance with LgP					
484	2.4.1.1	Push-pull bar, link rod	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
485	2.4.1.2	Coupling element/coupling rod	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
486	2.4.1.3	Tensile force articulation system housing	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
487	2.4.1.4	Housing ring												
488	2.4.1.5	Bogie stop block	2	X			3.1	X		EN 15085-2 - CL 1	X	X	3.1	
489	2.4.1.6	Link for lengthwise articulation (e.g. housing, yoke and bracket)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
490	2.4.1.7	(Rubberised) metal elements or ball-and-socket articulated joints	2	X			3.1							
491	2.4.2	Bogie pivot, central casting, slewing rim												Heading
492	2.4.2.1	Bogie pivot, central casting pins	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
493	2.4.2.1.1	Bogie pivot ring	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
494	2.4.2.1.2	Ring element												
495	2.4.2.1.3	Pivot bearing	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
496	2.4.2.1.4	Bogie pivot - rubber spring	2	X			3.1							
497	2.4.2.2	Central casting upper/lower	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
498	2.4.2.3	Slewing rim	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
499	2.4.3	Arresting cable for emergency suspension	2	X			3.1							
500	2.4.4	Anti-roll system	2	X			3.1	X	HPQ only for sub-	EN 15085-2 - CL 1	X	X	3.1	

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
									components in accordance with LgP					
501	2.4.4.1	Torsion bar (including level), torsion shaft	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
502	2.4.4.2	Drawbar for torsion bar	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
503	2.4.4.3	Roll bar bearing	2	X			3.1	X		EN 15085-2 - CL 1	X	X	3.1	
504	2.4.5	Lift-off protection												
505	2.4.6	Supporting system, heel plate	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
506	2.4.7	Lateral bumper, lateral stop								EN 15085-2 - CL 1	X	N/A	3.1	
507	2.4.7.1	Curve-dependent transverse play control system												
508	2.4.8	Torque reaction bar	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
509	2.4.8.1	Pendulum for torque reaction bar	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
510	2.4.9	Rubberised metal element (for coupling)	2	X			3.1							
511	2.5	Running gear - fittings/auxiliary function												
512	2.5.1	Flange lubricator								EN 15085-2 - CL 1	X	N/A	3.1	
513	2.5.1.1	Lubricant reservoir								EN 15085-2 -	X	N/A	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
514	2.5.1.2	Grease pump, pipes, nozzles												
515	2.5.1.3	Flange lubricator operating valve												
516	2.5.1.4	Control unit with pickup for flange lubricator												
517	2.5.1.5	Flange lubricator isolating valve												
518	2.5.2	Sander, sanding system	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
519	2.5.2.1	Sand box	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
520	2.5.2.2	Sand box cover								EN 15085-2 - CL 1	X	N/A	3.1	
521	2.5.2.3	Sand pipe								EN 15085-2 - CL 1	X	N/A	3.1	
522	2.5.2.4	Sand pipe heating/sand box heating system												
523	2.5.2.5	Sand nozzle												
524	2.5.2.6	Control unit/automatic system for sander												
525	2.5.2.7	Sander operating valve												
526	2.5.2.8	Sander isolating valve												
527	2.5.3	Obstacle deflector, guard iron, snowplough												Heading
528	2.5.3.1	Obstacle deflector, guard iron, snowplough, self-supporting	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
529	2.5.3.2	Obstacle deflector, guard iron, snowplough, not self-supporting	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
530	2.5.4	Brackets, suspension systems												Heading
531	2.5.4.1	Brake suspension system (e.g. from brake beam inter alia)	1	X		X	3.1	X	HPQ for components with a supporting/coupler-bearing	EN 15085-2 - CL 1	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
									role					
532	2.5.4.2	Damper mounting brackets	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
533	2.5.5	Mountings/brackets for train protection system	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
534	2.5.6	Wheel arch								EN 15085-2 - CL 1	X	N/A	3.1	
535	2.5.7	Panelling, shielding								EN 15085-2 - CL 1	X	N/A	3.1	
536	2.5.8	Lift locks, primary and secondary												
537	2.6	Protection and monitoring system, sensors												Heading
538	2.6.1	Running gear monitoring system, bogie diagnosis system												
539	2.6.1.1	Acceleration sensor, acceleration pickup (high-speed vehicles)												
540	2.6.2	Bearing temperature monitoring system, temperature sensor												
541	2.7	Tilt system												Heading
542	2.7.1	Actuating elements												Heading
543	2.7.1.1	Tilting mechanism, mechanical	2	X			3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
544	2.7.1.1.1	Tilting crossbeam including suspension	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
545	2.7.1.1.2	Suspension rod, tilting pendulum	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
546	2.7.1.1.3	Ball-and-socket joint, articulated joint	1	X		X	3.1	X						
547	2.7.1.1.4	Bogie bolster	1	X		X	3.1	X		EN 15085-2 -	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
548	2.7.1.1.5	Pendulum carrier, pendulum connection	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
549	2.7.1.2	Tilting mechanism - electromechanical drive	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
550	2.7.1.3	Tilting mechanism -hydraulic drive	2	X			3.1							
551	2.7.1.4	HGST modules	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
552	2.7.2	Tilting mechanism control system												
553	2.7.2.1	Tilting mechanism computer, tilting mechanism control computer, including operating software												
554	2.7.2.2	Miscellaneous tilting mechanism control components, e.g. bus system, bus coupler												
555	2.7.2.3	Proportional valves, control valves	2	X			3.1							
556	2.7.3	Protection and monitoring system, sensors												
557	2.7.3.1	Position encoder, angle transmitter, gyroscope, lateral acceleration meter	2	X			3.1							
558	2.7.4	Pantograph tracking device												
559	2.7.5	Active lateral suspension (lateral displacement)												
560	2.7.5.1	Actuating elements (e.g. AQZ/AQF cylinders)	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
561	2.7.5.2	Control system (e.g. AQZ computer)												
562	2.7.5.3	Sensors												
563	2.7.6	Convenience control unit for tilting mechanism												
564	3	Energy supply												Heading
565	3.1	Power supply - grid power system												Heading
566	3.1.1	Overhead line pantograph	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
567	3.1.1.1	Pantograph contact strip												
568	3.1.1.2	Pantograph base frame	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
569	3.1.1.3	Pantograph: upper arm, lower arm, guiding rod	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
570	3.1.1.4	Pantograph lift drive with solenoid valve	2	X			3.1							
571	3.1.1.5	Pantograph collector head								EN 15085-2 - CL 1	X	X	3.1	
572	3.1.1.6	Pantograph horn								EN 15085-2 - CL 1	X	X	3.1	
573	3.1.1.7	Pantograph damper								EN 15085-2 - CL 1	X	X	3.1	
574	3.1.1.8	Electrical connectors/braids												
575	3.1.1.9	Post insulator 15 kV or 25 kV												
576	3.1.1.10	Pressure regulator												
577	3.1.1.11	Automatic lowering device including solenoid valve	2	X			3.1							
578	3.1.1.12	Pantograph tracking system for tilting mechanism												
579	3.1.2	Wiring system, cabling												
580	3.1.2.1	Roof cable												
581	3.1.2.2	High-tension gland												
582	3.1.2.3	Grid power cable, high-tensions cable > 1 kV												
583	3.1.2.4	Post insulators 15 kV or 25 kV												
584	3.1.3	Earthing												
585	3.1.3.1	Current bridge												
586	3.1.3.2	Earth return brush												
587	3.1.3.3	Earthing cable												
588	3.1.3.4	Grounding choke												
589	3.1.3.5	Grounding bolt												
590	3.1.3.6	Earthing switch												
591	3.1.4	Control and operation components												
592	3.1.5	Protection and monitoring, power supply sensors												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information	
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC		
593	3.1.5.1	High-voltage converter													
594	3.1.5.2	Lightning protection, surge arrester													
595	3.1.5.3	Current transformer (primary current, return current, ground current)													
596	3.1.6	Third-rail collector shoe	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1		
597	3.1.7	System switch													
598	3.2	Protective device, switchgear, logging system, grid power system													Heading
599	3.2.1	Main circuit breaker													Heading
600	3.2.1.1	Main circuit breaker (vacuum, gas-blast, expansion or compressed air fast circuit breaker)	2	X			3.1								
601	3.2.1.2	Main circuit breaker control system													
602	3.2.2	Disconnecter													Heading
603	3.2.2.1	Disconnecter and grounding switch, disconnection tab													
604	3.2.2.1.1	Knife isolator													
605	3.2.2.2	Isolating contactor													
606	3.2.2.3	Main fuse													
607	3.2.3	Protection and monitoring system, sensor elements for protective, switchgear and logging device, grid power system													
608	3.2.3.1	Protective relay													
609	3.2.3.2	Energy consumption measurement system (e.g. TEMA box)													
610	3.2.3.3	Grid protection, locomotive protection unit, including operating software (e.g. LIM - linear interface module)													
611	3.2.3.3.1	Plug-in board, sub-assembly, hardware module for locomotive protective switch													
612	3.2.3.4	Ground short-circuit detection system													
613	3.3	Grid filter (complete)													

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
614	3.3.1	Grid filter choke												
615	3.3.2	Grid filter capacitor												
616	3.3.3	Grid filter, Buchholz relay												
617	3.3.4	Grid filter container												
618	3.4	Main transformer (complete)	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
619	3.4.1	Transformer vessel	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
620	3.4.1.1	Suspension system for self-supporting transformer vessel (below/on the vehicle)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
621	3.4.1.2	Suspension system for non-self-supporting transformer vessel	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
622	3.4.1.3	Main transformer (active component)												
623	3.4.1.4	Primary connections/glands/insulators												
624	3.4.1.5	Secondary connections/glands/insulators												
625	3.4.1.6	Oil pipes, welded								EN 15085-2 - CL 2	N/A	N/A	2.2	
626	3.4.2	Transformer cooling system								EN 15085-2 - CL 1	X	N/A	3.1	
627	3.4.2.1	Cooling tower	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
628	3.4.2.2	Containerised cooling system								EN 15085-2 - CL 2	N/A	N/A	2.2	
629	3.4.2.2.1	Supporting frame for cooling system (in vehicle)								EN 15085-2 - CL 2	N/A	N/A	2.2	
630	3.4.2.2.2	Supporting frame for cooling system (below/on the vehicle)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
631	3.4.2.3	Circulation pump (oil circulation pump, transformer oil pump), with drive motor												
632	3.4.2.4	Heat exchanger								EN 15085-2 - CL 1	X	N/A	3.1	
633	3.4.2.4.1	Cooling block								EN 15085-2 -	N/A	N/A	2.2	



List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 2				
634	3.4.2.4.2	Cooler partial block								EN 15085-2 - CL 2	N/A	N/A	2.2	
635	3.4.2.5	Transformer cooling fan with drive motor								EN 15085-2 - CL 2	N/A	N/A	2.2	
636	3.4.2.6	Air drier								EN 15085-2 - CL 2	N/A	N/A	2.2	
637	3.4.2.7	Coolant pipe, welded								EN 15085-2 - CL 2	N/A	N/A	2.2	
638	3.4.2.8	Expansion joint												
639	3.4.3	Protection and monitoring system, main transformer sensors												
640	3.4.3.1	Main transformer Buchholz relay	2	X			3.1							
641	3.5	Internal combustion engine system												
642	3.5.1	Internal combustion engine/diesel engine (complete)												
643	3.5.1.1	Engine housing												
644	3.5.1.2	Crankcase												
645	3.5.1.3	Oil sump								EN 15085-2 - CL 2	N/A	N/A	2.2	
646	3.5.1.4	Cylinder head												
647	3.5.1.5	Crankshaft												
648	3.5.1.6	Cylinder liner												
649	3.5.1.7	Connecting rod												
650	3.5.1.8	Piston												
651	3.5.1.9	Camshaft												
652	3.5.1.10	Rocker arm, tappet												
653	3.5.1.11	Torsional vibration damper												
654	3.5.2	Control system and display												
655	3.5.2.1	Electronic engine control system												
656	3.5.2.2	Motor regulator												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
657	3.5.3	Auxiliary and supplementary system												
658	3.5.3.1	Venting pipe								EN 15085-2 - CL 2	N/A	N/A	2.2	
659	3.5.3.2	Venting hose												
660	3.5.4	Preheating system												
661	3.5.5	Starter												
662	3.5.5.1	Starter												
663	3.5.5.2	Starter motor controller												
664	3.5.6	Combustion air feed and conditioning								EN 15085-2 - CL 2	N/A	N/A	2.2	
665	3.5.6.1	Charging system												
666	3.5.6.2	Intake air filter												
667	3.5.6.3	Air intake pipe								EN 15085-2 - CL 2	N/A	N/A	2.2	
668	3.5.7	Fuel flow system, fuel system								EN 15085-2 - CL 1	X	N/A	3.1	Observe Section 33 EBO
669	3.5.7.1	Fuel tank	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
670	3.5.7.1.1	Supporting frame for fuel tank (below/on the vehicle)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
671	3.5.7.2	Fuel pump												
672	3.5.7.3	Injection pump												
673	3.5.7.4	Injection valve												
674	3.5.7.5	Fuel filter												
675	3.5.7.6	Fuel pipe								EN 15085-2 - CL 1	X	N/A	3.1	Observe Section 33 EBO
676	3.5.7.7	Fuel gauge												
677	3.5.8	Cooling												Heading
678	3.5.8.1	Cooling water pump/cooling water circulation pump												

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
679	3.5.8.2	Cooling element								EN 15085-2 - CL 1	X	N/A	3.1	
680	3.5.8.3	Pipe conduit								EN 15085-2 - CL 2	N/A	N/A	2.2	
681	3.5.8.4	Hose												
682	3.5.8.5	Cooling water reservoir								EN 15085-2 - CL 2	N/A	N/A	2.2	
683	3.5.8.6	Charge air cooling								EN 15085-2 - CL 1	X	N/A	3.1	
684	3.5.8.7	Cooler ventilator												
685	3.5.8.8	Heat exchanger								EN 15085-2 - CL 1	X	N/A	3.1	
686	3.5.9	Exhaust system (complete)								EN 15085-2 - CL 1	X	N/A	3.1	
687	3.5.9.1	Exhaust manifold								EN 15085-2 - CL 1	X	N/A	3.1	
688	3.5.9.2	Sound damper								EN 15085-2 - CL 1	X	N/A	3.1	
689	3.5.9.3	Exhaust outlet (cowl, pipe)								EN 15085-2 - CL 1	X	N/A	3.1	
690	3.5.9.4	Pressurised metal hoses and expansion joints								EN 15085-2 - CL 1	X	N/A	3.1	
691	3.5.9.5	Other metal hoses (unpressurised)								EN 15085-2 - CL 2	N/A	N/A	2.2	
692	3.5.9.6	Engine and gearbox pipework								EN 15085-2 - CL 1	X	N/A	3.1	
693	3.5.10	Lubrication equipment								EN 15085-2 - CL 1	X	N/A	3.1	
694	3.5.10.1	Lubrication oil pre-pump												
695	3.5.10.2	Engine oil pump												
696	3.5.10.3	Lubricating oil circulating pump												
697	3.5.10.4	Engine oil filter												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
698	3.5.10.5	Other filters												
699	3.5.10.6	Oil pipe/Valve												
700	3.5.11	Protection and monitoring, sensors for internal combustion engines												
701	3.5.11.1	Monitoring system, diesel engine												
702	3.5.11.2	Monitoring system, oil circuit												
703	3.5.11.3	Cooling system monitoring system												
704	3.6	Main generator system (traction generator)												Heading
705	3.6.1	Generator (complete) in the vehicle	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
706	3.6.2	Generator (complete) below/on the vehicle	2	X			3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	N/A	3.1	
707	3.6.2.1	Supporting frame, supporting structure for generator, stator casing	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
708	3.6.2.2	Stator compression rings												
709	3.6.2.3	Stator winding												
710	3.6.2.4	Labyrinth seals, oil seals												
711	3.6.2.5	Bearing shield: driven and non-driven end												
712	3.6.2.6	Rotor shaft												
713	3.6.2.7	Rotor pressure ring												
714	3.6.2.8	Rolling bearing												
715	3.6.3	Excitation system												
716	3.6.3.1	Diodes												
717	3.6.4	Control system/display												
718	3.6.5	Cooling												
719	3.6.6	Protection and monitoring system, sensors												

<b>Organisation and Management Systems</b>	<b>Quality</b>
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Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
720	3.7	Energy storage system (with the exception of the fuel tank)												
721	4	Traction system												Heading
722	4.1	Traction control unit												Heading
723	4.1.1	Electronic traction control system												
724	4.1.1.1	Traction control unit (ASG), including operating software												
725	4.1.1.1.1	Plug-in board, sub-assembly, hardware module for traction control unit (ASG)												
726	4.1.1.2	Anti-slip, start monitoring unit												
727	4.1.1.3	Current and voltage converter (e.g. motor current converter)												
728	4.1.1.4	Synchronisation components												
729	4.1.1.5	Auxiliary contactor												
730	4.1.1.6	Suppressor filter												
731	4.1.2	Electromechanical traction control system												
732	4.1.2.1	Change of direction control system												
733	4.1.2.2	Master controller change of direction control system												
734	4.1.2.3	Isolating contactor control system												
735	4.1.2.4	Switchgear actuation system												
736	4.1.2.5	Fluid transmission control system												
737	4.1.3	Protection and monitoring system, sensors												
738	4.1.3.1	Power transmission monitoring system												
739	4.2	Electrical power converter												Heading
740	4.2.1	Mains rectifier including actuation system (complete), traction current rectifier (complete)	2	X				3.1						
741	4.2.1.1	Supporting frame, supporting structure for containers below/on the vehicle	1	X		X		3.1		EN 15085-2 - CL 1	X	X	3.1	
742	4.2.1.1.1	Containers for converter	2	X				3.1		EN 15085-2 - CL 1	X	X	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
743	4.2.1.2	Components of a converter												Heading
1563	4.2.1.2.1	Phase modules for traction converters (e.g. thyristor, GTO, IGBT)												
1564	4.2.1.2.2	Diodes for traction power converters and traction rectifiers												
1565	4.2.1.2.3	Special control subassemblies in the traction current converter (e.g. gate units, power supply units)												
1566	4.2.1.2.4	Passive components for converters (e.g. condensers, chokes, resistors for the absorption circuit/intermediate circuit/backup circuit, charging/discharging)												
1567	4.2.1.2.5	Contactors for use in the power converter, such as charging/discharging contactors, input/output circuit breakers												
1568	4.2.1.2.6	Protective components and monitoring the power converter (e.g. current transformer, voltage transformer, AC/DC universal converter, toroidal transformer)												
768	4.2.2	Other power converters, including control system												
769	4.2.3	Switchgear, thyristor controller												Heading
770	4.2.3.1	Switchgear (tap selector)												
771	4.2.3.2	Fine-step switchgear												
772	4.2.3.3	Switchgear drive												
773	4.2.3.4	Thyristor setting device												
774	4.2.3.5	Load switch												
775	4.2.3.6	Base load choke												
776	4.2.3.7	Base load relay												
777	4.2.4	Motor switchgear												
778	4.2.4.1	Direction changer, direction switch												
779	4.2.4.2	Service brake changeover												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
780	4.2.4.3	Motor isolating contactor												
781	4.2.4.4	Choke shorting contactor												
782	4.2.4.5	Shunt contactor												
783	4.2.4.6	Shunt resistance												
784	4.2.5	Brake pad adjuster												
785	4.2.5.1	Brake circuit rectifier												
786	4.2.6	Power converter cooler (complete)	2	X			3.1							
787	4.2.6.1	Coolant pump, power converter oil pump with drive motor												
788	4.2.6.2	Coolant hose								EN 15085-2 - CL 2	N/A	N/A	2.2	
789	4.2.6.3	Grid filter cooling system												
790	4.2.6.4	Power converter fan with drive motor												
791	4.2.6.5	Heat exchanger												
792	4.3	Hydrodynamic and hydromechanical power converter system												Heading
793	4.3.1	Converter and gearbox												Heading
794	4.3.1.1	Transfer gearbox												
795	4.3.1.2	Fluid/hydraulic transmission system												
796	4.3.1.3	Electromechanical gearbox												
797	4.3.1.4	Hydromechanical gearbox												
798	4.3.1.5	Secondary gearbox (multi-step transmission and reversing gear)												
799	4.3.1.6	Wheelset gearbox with mounting (complete)	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
800	4.3.1.6.1	Gearbox	1	X		X	3.1	X						
801	4.3.1.6.2	Spur gear												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
802	4.3.1.6.3	Spur pinion shaft												
803	4.3.1.6.4	Bevel gear set	2	X			3.1							
804	4.3.1.6.5	Drive shaft/Cardan shaft	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
805	4.3.1.6.6	Other Cardan shafts	3				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
806	4.3.1.6.7	Flange shaft								EN 15085-2 - CL 2	N/A	N/A	2.2	
807	4.3.1.6.8	Connecting flange								EN 15085-2 - CL 2	N/A	N/A	2.2	
808	4.3.1.6.9	Bevel pinion shaft												
809	4.3.1.6.10	Bevel gear, ring gear												
810	4.3.1.6.11	Drive flange								EN 15085-2 - CL 2	N/A	N/A	2.2	
1595	4.3.1.6.12	Rolling bearing												
813	4.3.2	Pipe system								EN 15085-2 - CL 1	X	N/A	3.1	
814	4.3.3	Cooling												
815	4.3.4	Heat exchanger												
816	4.3.5	Protection and monitoring system, sensors												
817	4.4	Drive, traction motor, gearbox												Heading
818	4.4.1	Electric traction motor, complete	2	X			3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	N/A	3.1	
819	4.4.1.1	Traction motor stator/winding												
820	4.4.1.2	Traction motor housing	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
821	4.4.1.3	Bearing shield: driven and non-driven end	3				3.1	X						



List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
822	4.4.1.4	Rotor (complete)												
823	4.4.1.4.1	Rotor shaft												
824	4.4.1.4.2	One-piece rotor shaft with pinion												
825	4.4.1.5	Traction motor pinion												
826	4.4.1.6	Commutators												
827	4.4.1.7	Short-circuit rings (special alloys only)												
828	4.4.1.8	Labyrinth rings, sealing rings												
829	4.4.1.9	Rotor press rigs, shrink rings												
830	4.4.1.10	Spherical bearing												
831	4.4.1.11	Traction motor bearing (roller bearing)												
832	4.4.1.12	Traction motor input reactor												
833	4.4.1.13	Bearing cap												
834	4.4.1.14	Traction motor suspension/traction suspension system (complete)	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
835	4.4.1.14.1	Rubberised metal elements of the traction motor or drive suspension unit	3				3.1							
836	4.4.1.14.2	Traction motor and drive suspension system pendulum	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
837	4.4.1.14.3	Shock absorbers and vibration dampers in the vicinity of the drive	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
838	4.4.1.15	Engine cradle	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
839	4.4.1.16	Traction motor fan (impeller) for intrinsic ventilation												
1569	4.4.1.17	Engine terminal board												
1570	4.4.1.18	Motor wiring system												
840	4.4.2	Drive and gearbox (complete)	2	X			3.1	X	HPQ only					

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
									for sub-components in accordance with LgP					
841	4.4.2.1	Drive shaft, Cardan shaft	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
842	4.4.2.2	Other Cardan shafts	3				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
843	4.4.2.3	Hollow drive shaft, hollow axle	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
845	4.4.2.4	Hollow shaft tube												
846	4.4.2.5	Hollow shaft casing	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
848	4.4.2.6	Thrust washers												
849	4.4.2.7	Star-shaped flange												
850	4.4.2.8	Gearbox	1	X		X	3.1	X						
851	4.4.2.9	Protective gearwheel casing, protective gearbox casing								EN 15085-2 - CL 2	N/A	N/A	2.2	
852	4.4.2.10	Bull gear (complete)												
853	4.4.2.10.1	Bull gear body												
854	4.4.2.10.2	Bull gear rim												
855	4.4.2.11	Small wheel												
856	4.4.2.12	Intermediate wheel												
857	4.4.2.13	Idler wheel shaft												
858	4.4.2.14	Bearing housing, roller bearing housing (gearbox)												
859	4.4.2.15	Bearing rings												
860	4.4.2.16	Labyrinth rings, sealing rings												
861	4.4.2.17	Connecting rod, lug link												
862	4.4.2.18	Pendulum driver	1	X		X	3.1							

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information	
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC		
863	4.4.2.19	Spherical bearing													
864	4.4.2.20	Spray and thrower rings													
865	4.4.2.21	Support arm	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1		
866	4.4.2.22	Driving wheel pin													
867	4.4.2.23	Rolling bearing													
868	4.4.3	Clutch													Heading
869	4.4.3.1	Curved-tooth coupling	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1		
870	4.4.3.2	Key packet coupling	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1		
871	4.4.4	Rod drive, chain drive													Heading
872	4.4.4.1	Connecting rod, coupling rod	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1		
873	4.4.4.2	Chain													
874	4.4.4.3	Torque reaction bar	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1		
875	4.4.4.3.1	(Rubberised) metal elements or ball-and-socket joints of the torque reaction bar	3				3.1								
876	4.4.4.4	Jackshaft with crank	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
877	4.4.5	Rubber ring spring drive, rubber ring Cardan drive (complete)	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1		
878	4.4.5.1	Annular ring segment (including outer and inner segments)													
879	4.4.6	Cooling													
880	4.4.6.1	Coolant radiator, cooling tower	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1		
881	4.4.6.2	Coolant pipe (welded)								EN 15085-2 - CL 2	N/A	N/A	2.2		
882	4.4.6.3	Fan/traction motor fan with drive motor													
883	4.4.6.4	Heat exchanger													

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
884	4.4.7	Protection and monitoring system, sensors												
885	4.4.7.1	Speed pickup, motor pulse generator												
886	4.4.7.2	Temperature monitoring system, temperature sensor												
887	4.5	Steam boiler system												Observe Section 33 EBO
888	5	Braking system												Heading
889	5.1	Brake control												Heading
890	5.1.1	Brake control/operation components (service brake, parking brake, emergency brake)												Heading
891	5.1.1.1	Brake control device/brake control unit	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
892	5.1.1.2	Brake housing unit	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
893	5.1.1.3	Modular brake control system (MBS), brake unit panel complete, brake module including electronic actuation system	1	X		X	3.1			EN 15085-2 - CL 1	X	N/A	3.1	
894	5.1.1.4	Electronic brake control system/brake control system/brake control computer (e.g. HSM), including operating software	1	X		X	3.1							
895	5.1.1.4.1.	Plug-in board, sub-assembly, hardware module for brake control system	3				3.1							
896	5.1.1.5	Drive/brake control system magnetic/eddy current	2	X			3.1							
897	5.1.1.6	Brake frame	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
898	5.1.1.7	Brake operating unit	1	X		X	3.1							
899	5.1.1.8	Driver's brake valve	2	X			3.1							
900	5.1.1.9	Additional brake valve	2	X			3.1							
901	5.1.1.10	Pilot valves (KE pilot valve), relay valve, weighing valve, quick-acting valve, etc.)	2	X			3.1							

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
902	5.1.1.11	Analogue converter	2	X			3.1							
903	5.1.1.12	Brake current valve	2	X			3.1							
904	5.1.1.13	Solenoid valve	2	X			3.1							
905	5.1.1.14	Driving brake changeover	3				3.1							
906	5.1.1.15	Isolating valve/straight-way valve												
907	5.1.1.16	Brake button, button for spring-loaded brake												
908	5.1.1.17	Pressure vessel system (air, nitrogen)												Observe Section 33 EBO
1596	5.1.1.17.1	Air reservoir, compressed air reservoir								EN 286-3; EN 286-4	N/A	N/A	3.1	Observe Section 33 EBO
910	5.1.1.17.2	Air reservoir retaining strap (e.g. HYDAC clamps)	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
911	5.1.1.17.3	Air pipes, compressed air pipe								EN 15085-2 - CL 1	X	N/A	3.1	
912	5.1.1.17.4	Brake pipe bracket	3				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
913	5.1.1.17.5	Compressed-air hose	3				3.1							
914	5.1.1.18	Emergency brake valve, emergency brake relay	2	X			3.1							
915	5.1.1.19	Emergency brake override, electropneumatic control system												
916	5.1.1.19.1	Electropneumatic pipe, coupling, cable												
917	5.1.1.20	Saloon operating device, emergency brake handle, emergency brake train box												
918	5.1.1.21	Emergency stop strike button, emergency strike button												
919	5.1.1.22	Control lines												
920	5.1.2	Wheel slide protection system												Heading
921	5.1.2.1	Anti-slide system (mechanical, pneumatic)	2	X			3.1							
922	5.1.2.2	Wheel slide dump valve, wheel slide solenoid dump valve	2	X			3.1							

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
923	5.1.2.3	Speed pickup, pulse generator, wheel slide pickup, speed sensor												
924	5.1.2.4	Pulse wheel												
925	5.1.2.5	Wheel slide control unit, anti-skid control unit, anti-slide controller, anti-slide computer, including operating software	2	X			3.1							
926	5.1.2.5.1	Acceleration sensor (high-speed)												
927	5.1.2.5.2	Plug-in board, sub-assembly, hardware module for anti-slide control system												
928	5.1.2.6	Housing								EN 15085-2 - CL 1	X	N/A	3.1	
929	5.1.2.7	Control lines												
930	5.1.3	Protection and monitoring components, brake control system sensors												
931	5.2	Brake actuating elements												Heading
932	5.2.1	Power generation												Heading
933	5.2.1.1	Brake cylinder	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
934	5.2.1.2	Brake cylinder with supporting frame	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
935	5.2.1.3	Spring-loaded brake cylinder	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
936	5.2.1.4	Eddy current brake/electromagnetic rail brake operating cylinder	3				3.1							
937	5.2.1.5	Pressure sensors, manometric switches for brake systems												
938	5.2.2	Power transmission												Heading
939	5.2.2.1	Brake rigging	3				3.1			EN 15085-2 - CL 1	X	X	3.1	
940	5.2.2.1.1	Slack adjusters	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
941	5.2.2.1.2	Brake pull rod, pull rod head, brake head	2	X			3.1			EN 15085-2 -	X	X	3.1	

<b>Organisation and Management Systems</b>	<b>Quality</b>
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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
										CL 1				
942	5.2.2.1.3	Polyamide sleeves and bushes for brake linkage												
1585	5.2.2.1.4	Double spring cotter pin	3				3.1							
943	5.2.2.2	Hand brake								EN 15085-2 - CL 2	N/A	N/A	2.2	
944	5.2.2.2.1	Cardan joint for handbrake or parking brake								EN 15085-2 - CL 2	N/A	N/A	2.2	
945	5.2.2.2.2	Brake screw								EN 15085-2 - CL 1	X	N/A	3.1	
946	5.2.2.2.3	Gearbox and brackets for handbrake operation	3				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
947	5.2.2.3	Brake shaft, hollow brake shaft	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
1597	5.2.2.4	Brake disc (complete), friction rings, segments of brake disc, hub	1	X		X	3.1	X						
951	5.2.2.4.3	Connecting components in the power train for separate completion and which have their own drawings (small standard parts)	3				3.1							
952	5.2.2.5	Brake calliper unit	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	N/A	3.1	
953	5.2.2.5.1	Brake callipers	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
954	5.2.2.5.2	Brake bridge	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
955	5.2.2.5.3	Brake calliper lever/brake lever	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
956	5.2.2.5.4	Bracket	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
957	5.2.2.5.5	Housing	2	X			3.1	X	HPQ for integral main suspension only					
958	5.2.2.5.6	Main suspension/mounting (pins, suspension bracket inter alia)	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
959	5.2.2.5.7	Connection components located in the power train (parts as per drawing, not standard parts)	3				3.1							
960	5.2.2.6	Brake block unit, block brake (self-contained)	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	N/A	3.1	
961	5.2.2.6.1	Main suspension/mounting (pins, suspension lug, etc.)	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
962	5.2.2.6.2	Lever	2	X			3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
963	5.2.2.6.3	Housing	2	X			3.1	X	HPQ for integral main suspension only					
964	5.2.2.7	Tie rods, crossbars (simple design), stops												
965	5.2.2.8	Spring-loading mechanism												
966	5.2.2.9	Brake hose (not brake hose coupling)	3				3.1							
967	5.2.2.10	Brake drum	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	



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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
968	5.2.2.11	Brake linings and brake shoe inserts												Heading
1598	5.2.2.11.1	Cast-iron brake blocks	2	X			3.1	X	HPQ					
1599	5.2.2.11.2	Composite brake blocks	3				3.1							
1600	5.2.2.11.3	Sintered brake blocks	3				3.1							
972	5.2.2.11.4	Brake block keys, sprung locking bars												
1588	5.2.2.11.5	Sintered brake linings	3				3.1							
1589	5.2.2.11.6	Brake pads made of composite material	3				3.1							
973	5.2.2.12	Brake lining bracket								EN 15085-2 - CL 1	X	N/A	3.1	
974	5.2.2.13	Brake block shoes								EN 15085-2 - CL 1	X	N/A	3.1	
975	5.2.2.14	Brake block unit, conditioning unit												
976	5.2.2.14.1	Main suspension/mounting (pins, suspension lug, etc.)	3				3.1			EN 15085-2 - CL 1	X	N/A	3.1	
977	5.2.2.15	Brake-block hanger								EN 15085-2 - CL 1	X	N/A	3.1	
978	5.2.2.16	Brake tie bar, brake flange, brake triangles, brake beam	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
979	5.2.2.17	Brake hose coupling, pneumatic (complete)	3				3.1							
980	5.2.2.17.1	Brake coupling hose	3				3.1							
981	5.2.2.17.2	Elastomer gaskets												
982	5.2.2.17.3	Coupling head (cast, machined)												
983	5.2.2.17.4	Air shut-off cock												
984	5.2.2.18	Brake lever, brake lever connector								EN 15085-2 - CL 1	X	N/A	3.1	
985	5.2.2.19	Pins and bushes, hardened												
986	5.2.2.20	Braking changeover box, G-P-R selector switch												
987	5.3	Regenerative brake												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
988	5.3.1	Energy conversion system, brake resistance tower								EN 15085-2 - CL 1	X	N/A	3.1	
989	5.3.1.1	Brake resistance (complete)								EN 15085-2 - CL 1	X	N/A	3.1	
990	5.3.1.1.1	Brake resistor strip												
991	5.3.1.2	Brake excitation cabinet								EN 15085-2 - CL 3	N/A	N/A	2.2	
992	5.3.2	Cooling												
993	5.3.2.1	Brake resistance fan with drive motor												
994	5.4	Hydrodynamic brake												
995	5.4.1	Energy conversion system (brake force converter, retarder)												
996	5.4.2	Cooling												
997	5.5	Linear eddy-current brake (complete)	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
998	5.5.1	Integral beam	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
999	5.5.2	Support arm	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
1000	5.5.3	Trackholder complete, retaining bracket	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
1001	5.5.4	Brake support, braking force support, complete	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
1002	5.5.4.1	Spherical bearing												
1601	5.5.5	Eddy-current magnet (complete, including field coils, end caps)	1	X		X	3.1							
1004	5.5.6	Suspension/lowering system (complete)	2	X			3.1	X	HPQ only	EN 15085-2 -	X	N/A	3.1	

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
									for sub-components in accordance with LgP	CL 1				
1005	5.5.6.1	Clamp, bracket	2	X			3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
1006	5.5.6.2	Ring bellows	2	X			3.1							
1007	5.6	Electromagnetic rail brake (complete)	1	X		X	3.1	X	HPQ only for sub-components in accordance with LgP	EN 15085-2 - CL 1	X	X	3.1	
1008	5.6.1	Supporting frame	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
1009	5.6.2	Trackholder (complete)	1	X		X	3.1	X		EN 15085-2 - CL 1	X	X	3.1	
1010	5.6.2.1	Trackholder head	1	X		X	3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
1011	5.6.2.2	Track holder rod	2	X			3.1			EN 15085-2 - CL 1	X	X	3.1	
1012	5.6.3	Pull bow, thrust bow	2	X			3.1	X		EN 15085-2 - CL 1	X	X	3.1	
1013	5.6.4	Driver, driver stem, driver stop	2	X			3.1	X		EN 15085-2 - CL 1	X	N/A	3.1	
1014	5.6.5	Suspension stand	2	X			3.1	X		EN 15085-2 - CL 1	X	X	3.1	
1015	5.6.6	Suspension system												Heading
1016	5.6.6.1	High suspension system (e.g. spring suspen-	2	X			3.1			EN 15085-2 -	X	X	3.1	

Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information	
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC		
		sion, linkage)									CL 1				
1017	5.6.6.2	Low suspension system (e.g. springs, connecting rod)	2	X				3.1			EN 15085-2 - CL 1	X	X	3.1	
1018	5.6.6.3	High/low suspension system (e.g. ring bellows)	2	X				3.1			EN 15085-2 - CL 1	X	X	3.1	
1019	5.6.7	Sectional or monobloc magnet (complete)	1	X		X		3.1							
1020	5.6.7.1	Coil (ready for installation)	2	X				3.1							
1021	5.6.7.1.1	Magnet frame/coil core (without winding)	2	X				3.1			EN 15085-2 - CL 1	X	N/A	3.1	
1022	5.6.7.2	Intermediate sections and end caps	2	X				3.1							
1023	5.6.7.3	Sintered pole shoes (intermediate and end sections)	1	X		X		3.1							
1024	5.6.7.4	Rail shoes (monobloc magnet)	2	X				3.1							
1025	5.6.7.5	Non-sintered pole shoes, steel pole shoes (intermediate and end sections)	2	X				3.1							
1026	5.6.7.6	Intermediate spacers/intermediate strips (non-magnetic)													
1027	5.6.7.7	Manometric switch for magnetic rail brake	3					3.1							
1028	6	Auxiliary and secondary mode supply													Heading
1029	6.1	Compressed air supply													Heading
1030	6.1.1	Air compression system, compressed air system													Observe Section 33 EBO
1031	6.1.1.1	Main air compressor (piston and screw compressors)													
1032	6.1.1.2	Main air compressor with integral supporting frame	1	X		X		3.1			EN 15085-2 - CL 1	X	X	3.1	
1033	6.1.1.3	Auxiliary air compressor													
1034	6.1.2	Compressed air storage													Heading
1035	6.1.2.1	Air reservoir									EN 286-3; EN 286-4	N/A	N/A	3.1	Observe Section 33 EBO

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1036	6.1.3	Compressed air distribution												Heading
1037	6.1.3.1	Main air reservoir pipe and its components								EN 15085-2 - CL 1	X	N/A	3.1	
1038	6.1.3.2	Main air pipe and its components								EN 15085-2 - CL 1	X	N/A	3.1	
1039	6.1.3.3	Isolator												
1040	6.1.4	Compressed air treatment/drying												Heading
1041	6.1.4.1	Air filter												
1042	6.1.4.2	Air cooler												
1043	6.1.4.3	Liquid separator, condensate system, water collector												
1044	6.1.4.4	Air drier												
1045	6.1.4.5	Supporting frame for condensate system or air dryer (in the vehicle)								EN 15085-2 - CL 2	N/A	N/A	2.2	
1046	6.1.4.6	Supporting frame for condensate system or air dryer (on/below the vehicle)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
1047	6.1.5	Components for controlling, protecting and monitoring, and sensors for, the compressed air supply												
1048	6.1.5.1	Safety valve												
1049	6.2	Pressure vessel system (hydraulic fluid)												Observe Section 33 EBO
1050	6.2.1	Hydraulic pressure generation system												Observe Section 33 EBO
1051	6.2.2	Hydraulic accumulator, fluid reservoir	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	Observe Section 33 EBO
1052	6.2.3	Pipe system								EN 15085-2 - CL 1	X	N/A	3.1	Observe Section 33 EBO

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1053	6.2.4	Fluid treatment/cooling												Observe Section 33 EBO
1054	6.2.5	Control, protection, monitoring and sensor system components												Observe Section 33 EBO
1055	6.3	Battery system												Observe Section 33 EBO
1056	6.3.1	Battery for on-board power supply	3				3.1							
1057	6.3.2	Starter battery												
1058	6.3.3	Battery charger												
1059	6.3.4	Battery box with ventilation	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1060	6.3.4.1	Battery box supporting frame below/on the vehicle	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
1061	6.3.5	Energy distribution												Heading
1062	6.3.5.1	Battery bus bar, cable												
1063	6.3.5.2	Main battery switch, main battery contactor												
1064	6.3.6	Components for controlling, protecting and monitoring, and sensors for, the battery system												
1590	6.3.7	Traction battery	2	X			3.1							
1065	6.4	Auxiliary electricity supply												Heading
1066	6.4.1	Tran bus bar (complete)												
1067	6.4.1.1	Train bus bar changeover system												
1068	6.4.1.2	Train bus bar contactor												
1069	6.4.1.3	Train bus bar leads, coupling, cable												
1070	6.4.2	Transformer for auxiliary power supply												
1071	6.4.3	Converter, rotary converter, auxiliary power supply converter (HBU), three-phase on-board power supply (DBNV), energy supply modules (EVB), train bus bar converter (ZSU)												Heading

<b>Organisation and Management Systems</b>	<b>Quality</b>
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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1072	6.4.3.1	Energy supply module, three-phase on-board power supply, auxiliary converter, including container/cabinet (in the vehicle)	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1073	6.4.3.2	Energy supply module, three-phase on-board power supply system converter, including container/cabinet (on/below the vehicle)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
1074	6.4.3.3	Inverter, secondary inverter (HWR)												
1075	6.4.3.4	Converter (rotary)												
1076	6.4.3.5	Converter (static)												
1077	6.4.3.6	Actuator, DC/DC transformer for auxiliary power supply												
1078	6.4.3.7	Input current converter, current inverter, output power converter, rectifier, link reactor for auxiliary current converter, three-phase on-board power supply, energy supply modules, etc.												
1079	6.4.4	Control system/pilot current system												Heading
1080	6.4.4.1	High-voltage relay												
1081	6.4.4.2	Energy supply module control system, three - phase on-board supply, auxiliary power supply converter, including operating software												
1082	6.4.4.2.1	Plug-in board, sub-assembly, hardware module for auxiliary power supply converter, three-phase on-board power supply and energy supply module control												
1083	6.4.4.3	Energy supply changeover contactor												
1084	6.4.4.4	Main train bus bar final control equipment												
1085	6.4.4.5	Electronic field governor												
1086	6.4.5	Earthing												
1087	6.4.6	External power supply installation												
1088	6.4.7	Energy distribution												Heading
1089	6.4.7.1	Cables, cable protectors, sockets, plugs												
1090	6.4.7.2	Circuit breakers, (air gap) contactors, relays												

Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1092	6.4.8	Filter												
1093	6.4.9	Auxiliary diesel engine												
1094	6.4.10	Generators												Heading
1095	6.4.10.1	Heating generator, on-board generator, wheel-set generator												
1096	6.4.10.2	Heating generator excitation system												
1097	6.4.10.3	Alternator, dynostarter												
1098	6.4.10.4	Axle generator												
1099	6.4.11	Auxiliary electrical load cooling system												
1100	6.4.11.1	Auxiliary load fan with drive motor												
1101	6.4.12	Protection and monitoring components, auxiliary power supply sensors												
1102	7	Interior												Heading
1103	7.1	Internal fittings												Heading
1104	7.1.1	Supporting frame, rack and brackets for internal fittings (e.g. power converters, electrical, air conditioning and compressed air system)	3					3.1			EN 15085-2 - CL 2	N/A	N/A	2.2
1586	7.1.1.1	Bracket/bearer/suspension system (simple type) for interior									EN 15085-2 - CL 2	N/A	N/A	2.2
1105	7.1.2	Floor/floorcovering												Heading
1106	7.1.2.1	Bottom plate												
1107	7.1.2.2	Insulation (insulating materials), sub-floor												
1108	7.1.2.3	Carpet, fitted carpet												
1109	7.1.2.4	Floorcovering												
1110	7.1.2.5	Staircase (internal)									EN 15085-2 - CL 1	X	N/A	3.1
1111	7.1.3	Panelling (internal panelling)												Heading
1112	7.1.3.1	Cab wall panelling	2	X				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2
1113	7.1.3.2	Saloon wall panelling	2	X				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2



List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information	
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC		
1114	7.1.3.3	WC wall panelling	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1115	7.1.3.4	Galley wall panelling	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1116	7.1.3.5	Cab ceiling lining	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1117	7.1.3.6	Saloon ceiling lining	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1118	7.1.3.7	WC ceiling lining	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1119	7.1.3.8	Galley ceiling lining	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1120	7.1.3.9	External door drive and control system paneling	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1121	7.1.4	Seats													Heading
1122	7.1.4.1	Driver's seat (complete)	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1575	7.1.4.2	Other seats (e.g. secondman, passenger, folding, child's seat, bench seats and stools)								EN 15085-2 - CL 3	N/A	N/A	2.2		
1576	7.1.4.2.1	Handles													
1577	7.1.4.2.2	Headrests, pillows													
1578	7.1.4.2.3	Seat covering, upholstery													
1579	7.1.4.2.4	Armrest								EN 15085-2 - CL 3	N/A	N/A	2.2		
1580	7.1.4.2.5	Seat shell													
1581	7.1.4.2.6	Seat frame, underseat box, supporting frame								EN 15085-2 - CL 2	N/A	N/A	2.2		
1582	7.1.4.2.7	Footrest								EN 15085-2 - CL 3	N/A	N/A	2.2		
1583	7.1.4.2.8	Seat adjustment								EN 15085-2 - CL 3	N/A	N/A	2.2		
1135	7.1.4.3	Seat-back table, side-wall table								EN 15085-2 -	N/A	N/A	2.2		

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information	
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC		
										CL 3					
1136	7.1.5	Folding table													
1137	7.1.6	Partition													Heading
1138	7.1.6.1	Non-load bearing partition													
1139	7.1.6.2	Load-bearing partition, room divider	3				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1140	7.1.6.3	Glass partition	3				3.1								
1141	7.1.7	Interior layout													Heading
1142	7.1.7.1	Driver's control panel/desk	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2		
1143	7.1.7.2	Thermo compartment													
1144	7.1.7.3	Cupboards, equipment boxes, control cabinets								EN 15085-2 - CL 3	N/A	N/A	2.2		
1145	7.1.7.4	Luggage rack													Heading
1146	7.1.7.4.1	Baggage rack (overhead)								EN 15085-2 - CL 3	N/A	N/A	2.2		
1147	7.1.7.4.2	Baggage space (floor level)								EN 15085-2 - CL 3	N/A	N/A	2.2		
1148	7.1.7.4.3	Safety glass for baggage racks (toughened, laminated)	3				3.1								
1149	7.1.7.5	Grab rails, steps, handles and railings in the rail vehicle								EN 15085-2 - CL 3	N/A	N/A	2.2		
1150	7.1.7.6	Special vehicle safe deposit box/locker													
1151	7.1.7.7	Conductor's workplace/special vehicle													
1152	7.1.8	Interior design													Heading
1153	7.1.8.1	Bed, couchette								EN 15085-2 - CL 3	N/A	N/A	2.2		
1154	7.1.8.2	Table													
1155	7.1.8.3	Glass cabinet													
1156	7.1.8.4	Wardrobe								EN 15085-2 - CL 3	N/A	N/A	2.2		

<b>Organisation and Management Systems</b>	<b>Quality</b>
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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1157	7.1.8.5	Blinds, curtains												
1158	7.1.8.6	Waste receptacle								EN 15085-2 - CL 3	N/A	N/A	2.2	
1159	7.1.8.6.1	Supporting frame for refuse bin								EN 15085-2 - CL 2	N/A	N/A	2.2	
1160	7.1.8.7	Mirror, metal frame												
1161	7.1.8.8	Advertisement holder (glazed)												
1162	7.1.8.9	Cupholder												
1163	7.1.8.10	Bicycle rack, ski rack, wheelchair fixture								EN 15085-2 - CL 2	N/A	N/A	2.2	
1164	7.1.8.11	Special features (fire extinguishers, emergency equipment)												
1165	7.1.8.12	Ladder, escape ladder, escape ramp								ISO 3834-4	N/A	N/A	2.2	
1166	7.1.8.13	Labelling, signage, pictograms for safety features/safety functions												
1167	7.2	Heating/ventilating/air conditioning (HLK)												Heading
1168	7.2.1	Saloon heating, ventilating and air conditioning system (complete)												
1169	7.2.1.1	Air treatment unit/assembly, air heating unit								EN 15085-2 - CL 1	X	N/A	3.1	
1170	7.2.1.2	High-voltage heating system												
1171	7.2.1.3	Secondary heating system												
1172	7.2.1.4	Floor heating system												
1173	7.2.1.5	Convection heating system												
1174	7.2.1.6	WC heating system												
1175	7.2.1.7	Vestibule heating system												
1176	7.2.1.8	Galley heating/ventilation system												
1177	7.2.1.9	Steam heating system												
1178	7.2.1.10	Radiators/heaters												
1179	7.2.1.11	Ventilators, fans (suitable for railway use)												
1180	7.2.1.12	Cooling unit												

<b>Organisation and Management Systems</b>	<b>Quality</b>
<b>Quality assurance for the procurement of rail vehicles and rolling stock components (List of rolling stock products subject to quality inspection)</b>	<b>120.0381V16f Page 92</b>

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1181	7.2.1.13	Valve/louvre												
1182	7.2.1.14	Air filter												
1183	7.2.1.15	Hot water pipe								EN 15085-2 - CL 2	N/A	N/A	2.2	
1184	7.2.2	Saloon heating, ventilating and air conditioning control components												
1185	7.2.2.1	Air conditioning/heating control system												
1186	7.2.2.2	Control panel												
1187	7.2.2.3	Compartment fittings												
1188	7.2.2.4	Trans. control system												
1189	7.2.3	Protection and monitoring components, saloon heating, ventilation and air conditioning sensors												
1190	7.2.3.1	Heating monitoring system												
1191	7.2.3.2	Safeguard against lack of air												
1192	7.2.3.3	Flow controller/pressure cell												
1193	7.2.4	Cab heating, ventilating and air conditioning system (complete)												
1194	7.2.4.1	Cab air conditioning system								EN 15085-2 - CL 1	X	N/A	3.1	
1195	7.2.4.2	Floor/recess heating												
1196	7.2.4.3	Driver's cab heating												
1197	7.2.4.4	Cab high-pressure fan (suitable for railway use)												
1198	7.2.5	Cab heating, ventilating and air conditioning control unit												
1199	7.2.6	Protection and monitoring, sensors for cab heating, ventilation and air conditioning												
1200	7.2.7	Heating, ventilating and air conditioning for baggage compartment												
1201	7.2.8	Baggage compartment heating, ventilating and air conditioning control system												
1202	7.2.9	Protection and monitoring, sensors for baggage compartment heating, ventilation and air condi-												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		tioning												
1203	7.2.10	Pressure protection												Heading
1204	7.2.10.1	Fan (exhaust, incoming air) with motor												
1205	7.2.10.2	Flaps												
1206	7.2.11	Oil heaters, oil burners												Observe Section 33 EBO
1207	7.2.12	Heating boiler, steam boiler												Observe Section 33 EBO
1209	7.2.13	Heating oil tank	2	X			3.1			EN 15085-2 - CL 1	X	N/A	3.1	
1208	7.2.14	Heat exchanger												
1210	7.3	Internal door system												Heading
1211	7.3.1	Internal door (e.g. machine room, cab, gangway, compartment, WC, galley, bar and partition door)												Heading
1572	7.3.1.1	Internal door without glazing								EN 15085-2 - CL 2	N/A	N/A	2.2	
1573	7.3.1.2	Internal door with glazing	3				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1574	7.3.1.3	Safety glass (toughened, laminated) for internal doors	3				3.1							
1218	7.3.1.4	Locking system												
1219	7.3.2	Fire door	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1220	7.3.3	Control and operation components for the internal door system												
1221	7.3.3.1	Door operating element												
1222	7.3.3.2	Pressure reducing device												
1223	7.3.4	Drive system												
1224	7.3.5	Control and monitoring components and sen-												

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Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		sors for the internal door system												
1225	7.3.5.1	Motion detector												
1226	7.4	Water and sanitary system												Heading
1227	7.4.1	Fresh water system (complete)	1	X		X	3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1228	7.4.1.1	Circulating pump												
1229	7.4.1.2	Water tank with overflow (fresh water tank)								EN 15085-2 - CL 2	N/A	N/A	2.2	
1230	7.4.1.3	Supporting frame for fresh water tank (below/on the vehicle)	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
1231	7.4.1.4	Filling nozzle												
1232	7.4.1.5	Water heater												
1233	7.4.2	WC installation, toilet (complete)	1	X		X	3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1234	7.4.2.1	Commode								EN 15085-2 - CL 2	N/A	N/A	2.2	
1235	7.4.2.2	WC seat set												
1236	7.4.2.3	Flushing valve												
1237	7.4.2.4	Vacuum spoon												
1238	7.4.2.5	Toilet roll holder												
1239	7.4.2.6	Vacuum system								EN 15085-2 - CL 2	N/A	N/A	2.2	
1240	7.4.2.7	Faeces tank	2	X			3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1241	7.4.2.8	Faeces tank heating system												
1242	7.4.2.9	Supporting structure for faeces tanks below/on the vehicle	1	X		X	3.1			EN 15085-2 - CL 1	X	X	3.1	
1243	7.4.3	Wastewater installation (complete)	1	X		X	3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1244	7.4.3.1	Drainage								EN 15085-2 - CL 2	N/A	N/A	2.2	
1245	7.4.3.2	Water outlet/drain								EN 15085-2 -	N/A	N/A	2.2	

Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information	
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC		
											CL 2				
1246	7.4.3.3	Wastewater level display													
1247	7.4.3.4	Wastewater changeover													
1248	7.4.3.5	Wastewater tank, grey water tank	2	X				3.1			EN 15085-2 - CL 2	N/A	N/A	2.2	
1249	7.4.3.6	Supporting structure for waste water/grey water tanks below/on the vehicle	1	X		X		3.1			EN 15085-2 - CL 1	X	X	3.1	
1250	7.4.4	Washing and showering installation, washroom													Heading
1251	7.4.4.1	Washbasin/vanity unit, nappy-changing table													
1252	7.4.4.2	Shower													
1253	7.4.4.3	Towel rail/towel dispenser													
1254	7.4.4.4	Soap dispenser													
1255	7.4.4.5	Hand dryer													
1256	7.4.5	Water and sanitary system control/operation components													
1257	7.4.5.1	WC control panel													
1258	7.4.5.2	Washing and showering installation pressure reducer													
1259	7.4.6	Protection and monitoring components, water and sanitary installation sensors													
1260	7.5	Galley fittings, catering													Heading
1261	7.5.1	Galley appliances													
1262	7.5.1.1	Coffee machine													
1263	7.5.1.2	Water heater													
1264	7.5.1.3	Microwave oven													
1265	7.5.1.4	Dishwasher													
1266	7.5.1.5	Steamer													
1267	7.5.1.6	Toaster													
1268	7.5.1.7	Hotplate													
1269	7.5.1.8	Hot cupboard													
1270	7.5.1.9	Heated cabinet													

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP 1	STBP 2	DOC	
1271	7.5.1.10	Boiler												
1272	7.5.1.11	Dispenser												
1273	7.5.1.12	Glass washer												
1274	7.5.2	Fittings, cash register, mobile vending machine												
1275	7.5.3	Ventilation and extraction												
1276	7.5.4	Drinking water installation (complete)												
1277	7.5.4.1	Pressure water pump												
1278	7.5.4.2	UV installation												
1279	7.5.4.3	Decalcifier												
1280	7.5.5	Bar installation, beverage dispensing system (complete)												Observe Section 33 EBO
1281	7.5.5.1	Bar installation cooling system												
1282	7.5.6	Standard cooling components												Heading
1283	7.5.6.1	Cooling system												
1284	7.5.6.2	Chill cabinet												
1285	7.5.6.3	Refrigerator												
1286	7.5.7	Deep-freezing components												Heading
1287	7.5.7.1	Freezer												
1288	7.5.7.2	Freezer												
1289	7.5.8	Bottled or natural gas installation (complete)												Observe Section 33 EBO
1290	7.5.8.1	Gas bottle												
1291	7.5.8.2	Gas pipes												
1292	7.5.8.3	Gas stove												
1293	7.5.9	Components for protection and monitoring, galley fitting and catering sensors												
1294	7.6	Interior lighting												Heading
1295	7.6.1	Driver's cab lighting system												
1296	7.6.2	Machine room lighting system												



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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1297	7.6.3	Corridor lighting system												
1298	7.6.4	Compartment/main lighting system, saloon lighting system												
1299	7.6.5	Galley lighting system												
1300	7.6.6	WC lighting system												
1301	7.6.7	At-seat lighting system												Heading
1302	7.6.7.1	Driver's control panel/instrument panel lighting system												
1303	7.6.7.2	Secondman side lighting system												
1304	7.6.7.3	Reading light												
1305	7.6.7.4	Cabinet lighting system												
1306	7.6.7.5	Bar lighting system												
1307	7.6.8	Emergency lighting system												
1308	7.6.9	Chokes												
1309	7.6.10	Step level lighting system												
1310	7.6.11	Lighting control												
1311	7.7	Service facility												Heading
1312	7.7.1	Vending machines												
1313	7.7.1.1	Ticket cancelling device												
1314	7.7.1.2	Ticket vending machines, ticket machines												
1315	8	Central control and communication												Heading
1316	8.1	Train and vehicle instrumentation and control systems												Heading
1317	8.1.1	Central control system components												Heading
1318	8.1.1.1	Central/integrated control units, vehicle computer, carriage computer including operating software, if appropriate (e.g.: ZSG, ISG, ZFG, VCU, ZWF)												
1319	8.1.1.1.1	Plug-in board, sub-assembly, hardware module for central control system												
1320	8.1.1.2	Control system cable (not bus cable)												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1321	8.1.1.3	Relay, contactor for control purposes												
1322	8.1.2	Internal/external vehicle identification components (e.g. transponder)												
1323	8.1.3	Components for data communication on the train												Heading
1324	8.1.3.1	Train bus (e.g. WTB, TCN, ETB), bus coupler, gateways and switches, including operating software												
1325	8.1.3.2	UIC/IS line, coupling, cable												
1326	8.1.3.3	Fibre optic cable, fibre optic cable router												
1327	8.1.4	Components for data communication on the vehicle												Heading
1328	8.1.4.1	Vehicle bus (e.g. MVB, IFZ, CAN), bus coupler, gateways including operating software												
1329	8.1.4.2	Input/output module (e.g. CAN bus modules, IFZ modules, SIBAS CLIP routers, measurement logging (MES), brake signal processing (SVB)), including operating software												
1330	8.1.5	Change of direction control system												
1331	8.1.6	Control system for double-/multiple heading, push-pull working, multiple unit control												Heading
1332	8.1.6.1	Components for conventional control, double-/multiple-heading, KWS push-pull working, multiple unit control system (complete)												
1333	8.1.6.1.1	KWS line, coupling, cable												
1334	8.1.6.2	Time-division multiplex double-/multiple heading, push-pull control ZDS/ZMS/ZWS, including operating software (complete)												
1335	8.1.6.2.1	Plug-in board, sub-assembly, hardware module for ZDS/ZMS/ZWS												
1336	8.1.6.3	Frequency-division multiplex train control FMZ (complete)												

List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1337	8.1.6.3.1	Plug-in board, sub-assembly, hardware module for FMZ												
1338	8.1.7	Driver's safety device/DSD (complete)	2	X			3.1							
1339	8.1.7.1	Automatic vigilance control unit												
1340	8.1.7.2	Vigilance device controls and display elements												
1341	8.1.7.3	Fault switch (automatic vigilance device)												
1342	8.1.7.4	Automatic vigilance device - brake valve	2	X			3.1							
1343	8.1.8	Train and vehicle instrumentation control and display systems												Heading
1344	8.1.8.1	Displays in the cab (e.g. MFD, MTD)												
1345	8.1.8.2	Modular cab display (MFA)												
1346	8.1.8.3	Master controller												
1347	8.1.8.4	Target speed selector												
1348	8.1.8.5	Tractive effort selector												
1349	8.1.8.6	Auxiliary master controller, switching controller, side controller												
1350	8.1.8.7	Line circuit breaker, motor circuit breaker												
1351	8.1.8.8	Starter switch												
1352	8.1.8.9	Tachometer, odometer	3				3.1							
1353	8.1.8.10	Display/automatic cutout panel, operating panels on the driver's desk												
1354	8.1.8.11	Stage display, galvanometer for motor voltage/surges ammeter for motor current/harmonic current												
1355	8.1.8.12	Direction changer, direction switch												
1356	8.1.8.13	Signal lamp (operationally necessary)												
1357	8.1.8.14	Emergency stop button												
1358	8.1.8.15	Other switches/buttons on the driver's desk												
1359	8.1.9	Automatic driving and braking control (AFB)												
1360	8.1.9.1	Plug-in board, sub-assembly, hardware module for automatic driving and braking control anti-												

<b>Organisation and Management Systems</b>	<b>Quality</b>
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Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		slide control system												
1361	8.1.10	Central distance and speed logging system (ZWG)												
1362	8.1.10.1	Wheel/distance pickup including connecting leads	3											
1363	8.1.10.2	Radar unit including connecting leads												
1364	8.1.10.3	Plug-in board, sub-assembly, hardware module for wheel/distance pickup												
1365	8.2	Diagnostic system												Heading
1366	8.2.1	Components of the central diagnostic system (e.g. DC PU, CCU diagnosis, DAVID, ZEUS)												Heading
1367	8.2.1.1	Diagnostic computer including operating software												
1368	8.2.2	Diagnostic system display elements												
1369	8.2.2.1	Diagnostic system display												
1370	8.2.2.2	Voice outputting components												
1371	8.2.2.3	Vehicle/subsystem man-machine interface												
1372	8.2.3	Service interface for maintenance												
1373	8.3	Data transfer system												Heading
1374	8.3.1	Actuation system												
1375	8.3.2	Wireless modem, wireless gateway, GPS receiver												
1376	8.3.3	Antenna, including connecting leads												
1377	8.3.4	Power supply												
1378	8.4	Information and communication systems												Heading
1379	8.4.1	Hazard alert and monitoring facilities												Heading
1380	8.4.1.1	Fire alarm system												
1381	8.4.1.1.1	Smoke detectors, fire alarms												
1382	8.4.1.1.2	Central fire alarm systems												
1383	8.4.1.2	Firefighting system, fire extinguisher system												
1384	8.4.1.3	CCTV components												Heading

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1385	8.4.1.3.1	Cameras in enclosures, including connecting leads												
1386	8.4.1.3.2	Central CCTV systems (e.g. recorders, server)												
1387	8.4.2	Passenger information, passenger information system (IBIS), complete												
1388	8.4.2.1	Passenger information system cabinet								EN 15085-2 - CL 3	N/A	N/A	2.2	
1389	8.4.2.2	Central passenger information and infotainment systems (e.g. central passenger information system computer, passenger information system computer for carriage, speech memory, reservations computer)												
1390	8.4.2.3	Bus connections for passenger information system (e.g. data bus, speech bus)												
1391	8.4.2.4	Public address system components (e.g. loudspeaker, amplifier)												
1392	8.4.2.5	Train destination, stopping pattern information displays, external								EN 15085-2 - CL 2	N/A	N/A	2.2	
1393	8.4.2.6	Train destination, stopping pattern information displays, internal												
1394	8.4.2.7	Passenger information system and infotainment displays												
1395	8.4.2.8	Reservation displays, displays on compartment doors and at seats												
1396	8.4.2.9	Control panels/terminals for passenger information in the cab, conductor's compartment or similar (e.g. driver's desk interface FT 95)												
1397	8.4.2.10	Passenger counting system												
1398	8.4.3	Communications systems												Heading
1399	8.4.3.1	Central communications system (e.g. HICOM communications hub, intercom)												
1400	8.4.3.2	Bus connections for communication (e.g.												

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		HITRAIN)												
1401	8.4.3.3	Permanent intercom terminals (e.g. for conductor, in carriages, driver's terminal)												
1402	8.4.3.4	Cordless telephone for conductor, pager, emergency alarm relay system												
1403	8.4.3.5	Passenger intercom terminals, emergency intercom terminals (e.g. disabled WC, wheelchair space, door intercom terminals)												
1404	8.4.4	Passenger communication system components												Heading
1405	8.4.4.1	Central passenger communication systems (e.g. on-train WLAN server)												
1406	8.4.4.2	Gateways, switches, routers and access points (e.g. for on-train WLAN)												
1407	8.4.4.3	Repeaters (e.g. for mobile communications using GSM, HTE, UMTS and GPRS)												
1408	8.4.4.4	Internal antenna (e.g. for WLAN access points and mobile phone repeater), including connecting leads												
1409	8.4.5	Passenger entertainment components												Heading
1410	8.4.5.1	Central passenger entertainment systems (e.g. HF train/carriage hub)												
1411	8.4.5.1.1	Players, sources of passenger entertainment (e.g. radio receivers, CD changers, video players)												
1412	8.4.5.2	Seat video and audio module												
1413	8.4.5.3	Wiring for passenger entertainment system (e.g. RF wiring)												
1414	8.4.6	Electronic timetable (complete)												
1415	8.4.6.1	Electronic timetable display												
1416	8.4.6.2	Electronic timetable computer												
1417	8.4.6.3	Electronic timetable power supply												
1418	9	Traffic management technology												Heading

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1419	9.1	Operational communications												Heading
1420	9.1.1	Analog/digital track-to-train radio, GSM-R (complete)												
1421	9.1.1.1	Track-to-train radio vehicle terminal/GSM-R, radiotelephone, including operating software												
1422	9.1.1.1.1	Plug-in board, sub-assembly for track-to-train radio/GSM-R vehicle terminal												
1423	9.1.1.2	Track-to-train radio/GSM-R operating equipment, including individual keypad/display, including connecting leads												
1424	9.1.1.3	Miscellaneous components for track-to-train/GSM-R radio, e.g. main distribution frame, including connecting leads												
1425	9.1.1.4	Handset for track-to-train/GSM-R radio, including rest and connecting leads												
1426	9.1.1.5	Power supply for track-to-train/GSM-R radio, e.g. DC-DC transformer												
1427	9.1.1.6	Track-to-train radio/GSM-R antennae, including connecting leads												
1428	9.1.2	Analogue/digital GSM-R switching radio (complete)												
1429	9.1.2.1	Switching radio vehicle terminal, radiotelephone including operating software, if applicable with special mounting												
1430	9.1.2.2	Control panels for switching radio, including special PTT buttons												
1431	9.1.2.3	Special loudspeakers for switching radio												
1432	9.1.2.4	Special swan-neck microphones for switching radio												
1433	9.1.2.5	Antennae for switching radio, including connecting leads												
1434	9.1.3	GSM-R radio data transmission system (com-												

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		plete)												
1435	9.1.3.1	GSM-R radio data system vehicle terminal, radio telephone including operating software												
1436	9.1.3.2	Power supply system for GSM-R data radio, e.g. DC/DC transformer												
1437	9.1.3.3	Data radio antennae including connecting leads												
1438	9.1.4	Portable track-to-train/switching radio set, analogue/digital (complete)	2	X			3.1							
1439	9.2	Remote control system, radio remote control system (complete)												
1440	9.2.1	Switching locomotive radio remote control system (complete)												
1441	9.2.1.1	Remote control unit, transmitter (mobile)												
1442	9.2.1.1.1	Tilt switches for remote control unit												
1443	9.2.1.1.2	Special rechargeable batteries for remote control unit												
1444	9.2.1.1.3	Special charger for remote control unit on the vehicle												
1445	9.2.1.2	Receiver/vehicle terminal, signal processing for radio remote control system, including connecting leads												
1446	9.2.1.2.1	Plug-in board, sub-assembly for radio remote control vehicle terminal												
1447	9.2.1.3	Antennae for radio remote control system, including connecting leads												
1448	9.2.2	Radio remote control system for hump switching locomotive (complete)												
1449	9.2.2.1	Receiver/vehicle terminal, signal processing system for hump switching locomotive radio remote control system, including connecting leads												
1450	9.2.2.1.1	Plug-in board, sub-assembly for radio remote												



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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		control vehicle terminal												
1451	9.2.2.2	Special operating unit for hump switching locomotive radio remote control system												
1452	9.2.2.3	Antennae for radio remote control system for hump locomotive, including connecting leads												
1453	9.3	Intermittent/linear (PZB/LZB) train control system (complete)	2	X			3.1							
1454	9.3.1	Signal logging and information transmission components for PZB/LZB												Heading
1455	9.3.1.1	PZB vehicle magnet including connecting leads	2	X			3.1							
1456	9.3.1.2	Wheel and distance pickup for PZB/LZB, including connecting leads	3				3.1							
1457	9.3.1.3	LZB transmission and reception antennae, including connecting leads	2	X			3.1							
1458	9.3.1.4	PZB/LZB radar sensor, including connecting leads	2	X			3.1							
1459	9.3.1.5	LZB acceleration sensor, including connecting leads												
1460	9.3.2	PZB/LZB data processing and analysis components												Heading
1461	9.3.2.1	PZB/LZB vehicle terminal complete (including vehicle system, switch cabinet, train protection system / cabinet), including PZ80R, I60 ER24, I60R, EBICAB 500, PZB 500, LZB 80, LZB 80E and EBICAB 2000 DES operating software	2	X			3.1			EN 15085-2 - CL 3	N/A	N/A	2.2	
1462	9.3.2.1.1	Plug-in board, sub-assembly for PZB/LZB vehicle terminal												
1463	9.3.2.1.2	Miscellaneous PZB/LZB components, e.g. connector panel, mains filter and fan module												
1464	9.3.2.1.3	PZB/LZB hardware module, including operating software, e.g. TCC, EVC, STM and SDU												
1465	9.3.2.1.4	Special PZB/LZB safety relay												

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1466	9.3.2.2	PZB/LZB data logging systems, including operating and analysis software, e.g. DSK 10/20/22												
1467	9.3.2.3	Speed measurement/logging systems for PZB/LZB, including operating and analysis software, e.g. GMR 663/663.1, GME 8, EVA 21s1, DSE 8												
1468	9.3.3	PZB/LZB control systems												Heading
1469	9.3.3.1	Braking group, electropneumatic brake module, automatic braking output for PZB/LZB, including connecting leads	2	X			3.1							
1470	9.3.3.1.1	Special valves for automatic PZB/LZB braking output, e.g. EV 80, EV 140, exhaust and emergency valve	2	X			3.1							
1471	9.3.3.1.2	Special safety relay for automatic PZB/LZB braking output, e.g. train control output relay, brake override relay	2	X			3.1							
1472	9.3.3.1.3	Air filter												
1473	9.3.3.1.4	Special isolating valves/straight-way valves												
1474	9.3.3.1.5	Pressure regulator												
1475	9.3.3.2	Automatic braking valve/trip valve for Berlin rapid transit train stop, old	2	X			3.1							
1476	9.3.3.2.1	Train stop tripping lever												
1477	9.3.4	PZB/LZB operating and display elements												Heading
1478	9.3.4.1	PZB/LZB train data parameterisation system												
1479	9.3.4.2	PZB/LZB button group												
1480	9.3.4.3	PZB/LZB disabling switch, PZB/LZB main switch												
1481	9.3.4.4	LZB emergency stop switch												
1482	9.3.4.5	PZB/LZB indicator lamp in the modular cab display unit (MFA)												
1483	9.3.4.6	Individual PZB/LZB indicator lamps												
1484	9.3.4.7	PZB/LZB display												

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			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1485	9.3.4.8	Special PZB/LZB display units, e.g. AZ 720, CPFA 10, including operating software												
1486	9.3.4.9	Acoustic alarms for PZB/LZB, e.g. PIEZO alarm, horn, buzzer, speech output												
1487	9.4	Radio train control, European Train Control System (ETCS) (complete), including Berlin rapid transit train control system (ZBS) (complete)	2	X				3.1						
1488	9.4.1	ETCS/ZBS signal logging and data transmission components												Heading
1489	9.4.1.1	ETCS/ZBS balise reader/balise antenna, including connecting leads	2	X				3.1						
1490	9.4.1.2	ETCS/ZBS radar sensors, including connecting leads	2	X				3.1						
1491	9.4.1.3	ETCS/ZBS wheel and distance pickup, including connecting lead	3					3.1						
1492	9.4.2	ETCS/ZBS data processing and analysis components												Heading
1493	9.4.2.1	ETCS/ZBS vehicle terminal/cabinet, complete, including operating software	2	X				3.1		EN 15085-2 - CL 3	N/A	N/A	2.2	
1494	9.4.2.1.1	Plug-in board, sub-assembly for ETCS/ZBS vehicle terminal												
1495	9.4.2.1.2	Miscellaneous ETCS/ZBS components, e.g. patch panel, mains filter, fan module												
1496	9.4.2.1.3	ETCS/ZBS hardware modules, e.g. TCC, EVC, BTM, STM, SDU, STU, LTM, KBS												
1497	9.4.2.1.4	Special ETCS/ZBS safety relay												
1498	9.4.2.2	ETCS/ZBS data logging unit, e.g. juridical recording unit (JRU)												
1499	9.4.2.3	GSM-R data radio for ETCS, see 9.1.3												
1500	9.4.3	ETCS/ZBS control systems												Heading
1501	9.4.3.1	Braking group, electropneumatic brake module,	2	X				3.1						

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Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		automatic braking output for ETCS/ZBS, including connecting leads												
1502	9.4.3.1.1	Special ETCS/ZBS automatic braking output valves	2	X				3.1						
1503	9.4.3.1.2	Special ETCS/ZBS automatic braking output safety relay	2	X				3.1						
1504	9.4.3.1.3	Air filter												
1505	9.4.3.1.4	Special isolating valves/straight-way valves												
1506	9.4.3.1.5	Pressure regulator												
1507	9.4.4	ETCS/ZBS operating and display elements												Heading
1508	9.4.4.1	ETCS/ZBS display, special ZBS display elements if applicable												
1509	9.4.4.2	External ETCS/ZBS controls												
1510	9.4.4.3	Acoustic alarms for ETCS/ZBS, e.g. speech output												
1511	9.5	Train control for tilted operation, speed monitoring for tilting system (GNT) (complete)	2	X				3.1						
1512	9.5.1	Signal logging and data transmission components for GNT												Heading
1513	9.5.1.1	Vehicle GNT coupling coil, automatic train control system including connecting leads	2	X				3.1						
1514	9.5.1.2	GNT balise reader/balise antenna, including connecting leads	2	X				3.1						
1515	9.5.1.3	Wheel/distance pickup for GNT, including connecting leads	3					3.1						
1516	9.5.2	GNT data processing and analysis components												Heading
1517	9.5.2.1	GNT vehicle terminal/processor/cabinet, including operating software, e.g. ZUB 262	2	X				3.1			EN 15085-2 - CL 3	N/A	N/A	2.2
1518	9.5.2.1.1	Plug-in board, sub-assembly for GNT vehicle terminal												
1519	9.5.2.1.2	Miscellaneous GNT components, e.g. connector panel, mains filter and fan module												

Con-sec. no.	Structural level	List structure Name	Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information		
			PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC			
1520	9.5.2.1.3	Special GNT safety relay														
1521	9.5.3	GNT control systems													Heading	
1522	9.5.3.1	Braking group, electropneumatic brake module, automatic braking output for GNT, including connecting leads	2	X				3.1								
1523	9.5.3.1.1	Special GNT automatic braking output valves	2	X				3.1								
1524	9.5.3.1.2	Special GNT safety relay	2	X				3.1								
1525	9.5.3.1.3	Air filter														
1526	9.5.3.1.4	Special isolating valves/straight-way valves														
1527	9.5.3.1.5	Pressure regulator														
1528	9.5.4	GNT operating controls and display elements														Heading
1529	9.5.4.1	GNT indicator lamp in the modular cab display unit (MFA)														
1530	9.5.4.2	GNT display														
1531	9.5.4.3	GNT disabling switch														
1532	9.5.4.4	GNT line circuit breaker														
1533	9.5.4.5	Acoustic alarm for GNT, e.g. warning buzzer														
1534	9.6	Train control systems for other rail infrastructure systems (complete)	2	X				3.1								
1535	9.6.1	Signal logging and data transmission components for train control systems on other rail infrastructure systems														Heading
1536	9.6.1.1	Magnets for other rail infrastructure systems, including connecting leads, e.g. INTEGRA and the CROCODILE contact brush in Switzerland	2	X				3.1								
1537	9.6.1.2	LZB transmission and reception antennae for other rail infrastructure systems, including connecting leads, e.g. Netherlands ATB	2	X				3.1								
1538	9.6.1.3	Balise reader/balise antenna for other rail infrastructure systems, e.g. KVB in France	2	X				3.1								
1539	9.6.1.4	Vehicle coupling coil for other rail infrastructure systems, e.g. ZUB in Switzerland/Denmark, in-	2	X				3.1								

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
		cluding connecting leads												
1540	9.6.1.5	Wheel/distance pickup for other rail infrastructure train control systems, including connecting leads	3				3.1							
1541	9.6.2	Data processing and analysis components for train control systems on other rail infrastructures												Heading
1542	9.6.2.1	Vehicle terminal/processor/cabinet for train control systems on other rail infrastructures, including operating software	2	X			3.1			EN 15085-2 - CL 3	N/A	N/A	2.2	
1543	9.6.2.1.1	Plug-in board for vehicle terminal for train control systems on other rail infrastructures												
1544	9.6.2.1.2	Miscellaneous components for train control systems on other rail infrastructures, e.g. patch panel, mains filter, fan module												
1545	9.6.2.1.3	Special safety relays for train control systems on other rail infrastructures												
1546	9.6.2.2	Data logging unit for train control systems on other rail infrastructures, e.g. ATESS in France												
1547	9.6.3	Train control systems for other rail infrastructures												Heading
1548	9.6.3.1	Braking group, electropneumatic brake module, automatic braking output for train control systems on other rail infrastructures, including connecting leads	2	X			3.1							
1549	9.6.3.1.1	Special valves for automatic braking output for train control systems on other rail infrastructures	2	X			3.1							
1550	9.6.3.1.2	Special safety relays for train control systems on other rail infrastructures	2	X			3.1							
1551	9.6.3.1.4	Air filter												
1552	9.6.3.1.5	Special isolating valves/straight-way valves												

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List structure			Quality assurance measures					Information on HPQ		Welding information (if a welded structure)				Additional information
Con-sec. no.	Structural level	Name	PK	EMP	QFÜ	QLÜ	DOC	HPQ	Info	Welding classification	STBP <sub>1</sub>	STBP <sub>2</sub>	DOC	
1553	9.6.3.1.6	Pressure regulator												
1554	9.6.4	Operating and display elements for train control systems on other rail infrastructures												Heading
1555	9.6.4.1	Controls and special operating units for train control systems on other rail infrastructures, e.g. in France and Italy												
1556	9.6.4.2	Operating displays in the cab, displays and special display units for train control systems on other rail infrastructures, e.g. France and Italy												
1557	9.6.4.3	Disabling/main switch for train control systems on other rail infrastructures												
1558	9.6.4.4	Train parameterisation systems for train control systems on other rail infrastructure, e.g. Denmark and Sweden												
1559	9.6.4.5	Acoustic alarm for train control systems on other rail infrastructure, e.g. Belgium												