TECHNICAL SPECIFICATION

ISO/TS 21308-4

First edition
2007-12-01

Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP) —

Part 4: Mapping to STEP application protocol 239

Véhicules routiers — Échange de données de produit entre les fabricants de châssis et de carrosseries (BEP) —

Partie 4: Élaboration en accord avec le protocole d'application 239 de STEP

Reference number
ISO/TS 21308-4:2007(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 21308-4 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 6, *Terms and definitions of dimensions and masses*.

ISO/TS 21308 consists of the following parts, under the general title *Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP)*:

— *Part 1: General principles* [Publicly Available Specification]

— *Part 2: Dimensional bodywork exchange parameters*

— *Part 3: General, mass and administrative exchange parameters*

— *Part 4: Mapping to STEP application protocol 239* [Technical Specification]

Introduction

0.1 General

Truck chassis manufacturers deal with the configuration of chassis in infinite numbers of possible combinations, and bodywork manufacturers produce highly customized superstructures on these chassis. Bodywork manufacturers build their superstructures on chassis of several different truck brands.

The production efficiency of a specific truck chassis and its body combinations can be greatly improved by ensuring that the correct technical and commercial information about the specific chassis is communicated with the bodywork manufacturer in advance. The information needs to be reliable such that the bodywork manufacturer has sufficient confidence to prefabricate the body or the superstructure before the chassis is delivered. With uniform conditions, unambiguous dimensions and supplementary information can be established, transferred and correctly interpreted by the receiver. Increased information efficiency improves quality and reduces lead times.

The ISO 21308 series specifies a system of codes to exchange specific data between chassis and bodywork manufacturers, providing a platform for efficient communication between the parties. The process of exchanging data according to the ISO 21308 series is not dependent on the degree of IT sophistication. Any medium can be used, from fax or e-mail to a STEP (standard for the exchange of product model data) protocol.

Exchanging codes in accordance with the ISO 21308 series is useful in various situations, e.g. for design and manufacturing, technical specifications, technical drawings and leaflets.

The codes provide the basic information level, and are also the basic input parameters for a data exchange system based on the STEP protocol. This Technical Specification covers the mapping of these data to STEP application protocol 239 (STEP AP 239).

0.2 Intentions of this Technical Specification

This Technical Specification is aimed at those parties interested in using STEP for their transmission of product data. STEP can be implemented in different ways when used for the exchange of BEP (bodywork exchange parameter) data. The intention with this Technical Specification is to create a basis for compatible STEP applications when used for exchanging BEP data. In order to achieve this, it is necessary to map the BEP properties to the STEP application in a uniform way. This Technical Specification specifies the general principles of this mapping and shows examples of mapping of specific properties, as well as a complete STEP file for the transmission of data.

This Technical Specification is intended for use by implementation and software design experts with in-depth knowledge of the ISO 10303 series on STEP product data. Special knowledge of object-oriented syntaxes and the data descriptive language of STEP, EXPRESS and EXPRESS-G (the graphical notation) is necessary for the understanding and assimilation of this Technical Specification.

0.3 Relationship with STEP

The product data model schema of main interest is the ARM (application reference model) contained in STEP application protocol 239 (ISO 10303-239), published in 2005.

In addition, complementary standards and documentation are developed within OASIS (a part of W3C) to further assist in a successful usage and implementation of STEP AP 239 based solutions, referred to as data exchange sets (DEXs).

Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP) —

Part 4: Mapping to STEP application protocol 239

1 Scope

This Technical Specification describes the mapping to STEP application protocol 239 for the exchange of dimensional data between truck chassis manufacturers and bodywork manufacturers. It applies to commercial vehicles, as defined in ISO 3833, which have a maximum gross vehicle mass greater than 3 500 kg.

The process of exchanging the above information can involve

— the chassis manufacturer,

— the chassis importer,

— the chassis dealer,

— one or more bodywork manufacturers, and

— bodywork component suppliers, e.g. manufacturers of demountable bodies, cranes and loading equipment, tipping equipment.

2 Normative references

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

ISO 10303-11, *Industrial automation systems and integration — Product data representation and exchange — Part 11: Description methods: The EXPRESS language reference manual*

ISO 10303-239, *Industrial automation systems and integration — Product data representation and exchange — Part 239: Application protocol: Product life cycle support*

ISO 21308-2, *Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP) — Part 2: Dimensional bodywork exchange parameters*

ISO 21308-3, *Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP) — Part 3: General, mass and administrative exchange parameters*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10303-239, ISO 10303-11 and the following apply.

3.1
product type
type
typical (generic) description of a product

NOTE Types are usually described by part definitions.

3.2
product individual
individual
individual with given characteristics specified from the type description

NOTE Individuals are typically defined by a specific combination (configuration) of parts and components.

3.3
STEP file
data file
import file
file package containing the truck descriptive data in accordance with ISO 10303-239 and this Technical Specification

3.4
Reference Data Library
RDL
mechanism to allow dynamic semantic interpretation of data content in a STEP file at run-time

3.5
instance
individual object of a certain entity or class

4 Abbreviated terms

BEP Bodywork Exchange Parameter

DEX Data Exchange Set

OASIS Organisation for the Advancement of Structured Information Standards

PLCS Product Life Cycle Support

STEP STandard for the Exchange of Product model data

URN Uniform Resource Name

5 Overview

5.1 General

Figure 1 illustrates the information exchange model and scope of this Technical Specification.

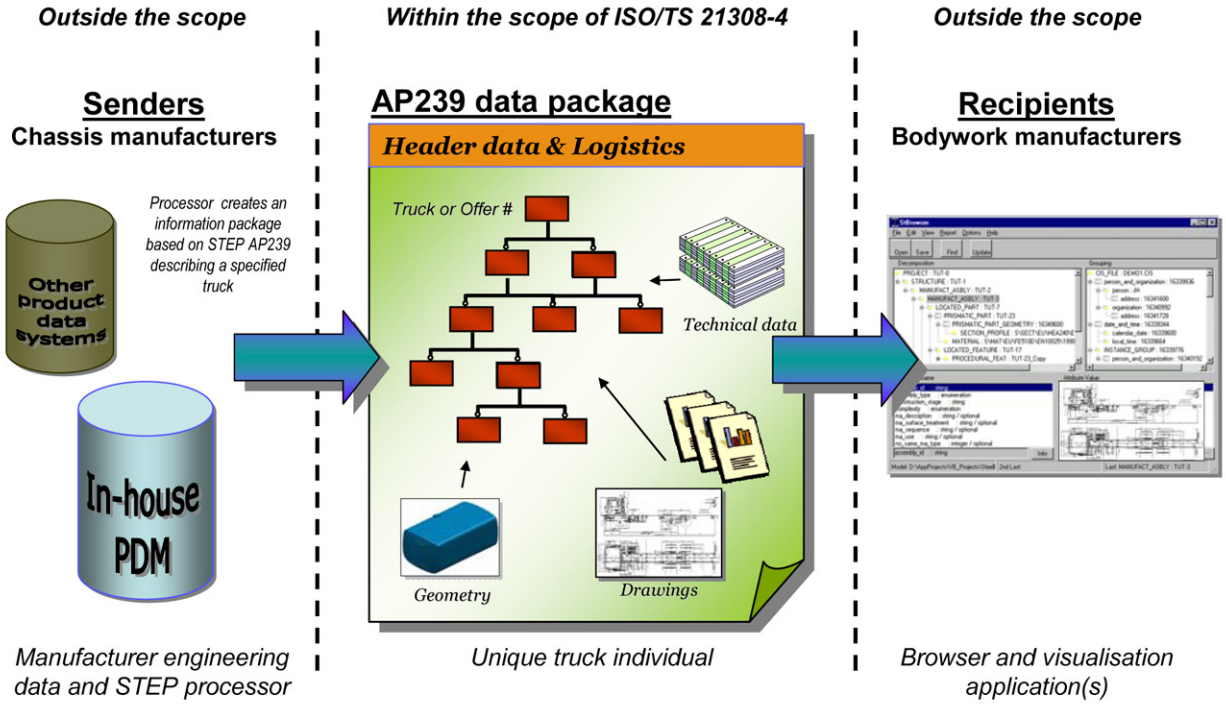

Figure 1 — Information exchange model and scope of this Technical Specification

Clauses 6 and 7 specify how exchange parameters defined in ISO 21308-2 and ISO 21308-3 should be mapped against STEP AP 239.

NOTE 1 In this Technical Specification, the term “STEP” refers to the STEP AP 239 model.

Table 2 identifies how the information entities defined in the Information Content document are generally mapped against the corresponding STEP AP 239 entity.

Subclauses 7.1 to 7.12 include an instantiation example diagram with explanatory text, where applicable.

NOTE 2 In case of doubt, it is advisable always to refer to the STEP AP 239 documentation and the corresponding DEX capabilities documentation.

The instantiation example diagrams show EXPRESS-G instantiation charts providing an overview of how a cluster of data should be instantiated and grouped.

Compulsory relationships may or may not be shown, if relevant in the context.

Optional attribute values are typically omitted, e.g. with description attributes that are usually optional and of a descriptive nature (in comparison with data that has a defined semantic meaning in the STEP standard, e.g. the name of a product class).

The STEP standard has many file representation formats (of the same data), the most common being a binding called “Part 21” (ISO 10303-21), which is a plain text file format. XML (Extensible Markup Language) is also available, referred to as "Part 28" (ISO 10303-28).

NOTE 3 Examples using Part 21 and Part 28 are used in this Technical Specification. Annex B summarizes the examples given in this Technical Specification as a complete Part 21 text file. Annex C summarizes in the same way the examples as a complete Part 28 XML file.

For complete scheme definitions and descriptions, the ISO 10303-239 documentation should be consulted.

5.2 Mapping techniques and instantiation diagrams

This Technical Specification relies heavily on instantiation diagrams to portray how the BEP data (and additional truck chassis data) is carried in the STEP file. All examples are DEX compliant as far as possible.

The model and instantiation diagrams used are in accordance with ISO 10303-11, STEP EXPRESS-G (see Figure 2).

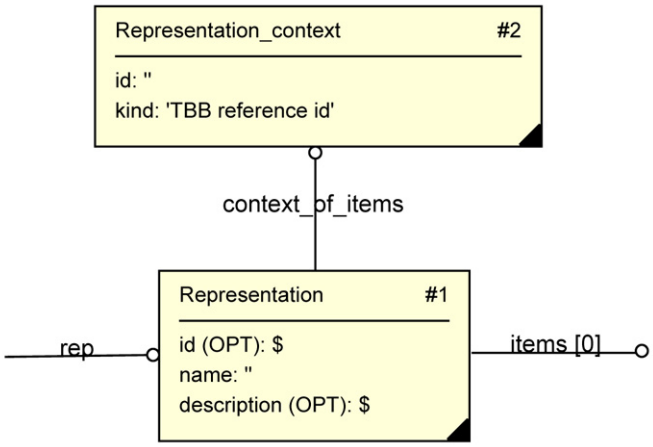

Figure 2 — Explanation of instantiation diagrams used in this Technical Specification

6 Exchange specification

6.1 General

The exchange data package consists of a core STEP file designated PRODUCT_DATA_239. All relevant information about structure, identification data and technical data information is contained here. From here, other information entities, such as external geometry documents or drawings, are referenced. See Figure 3.

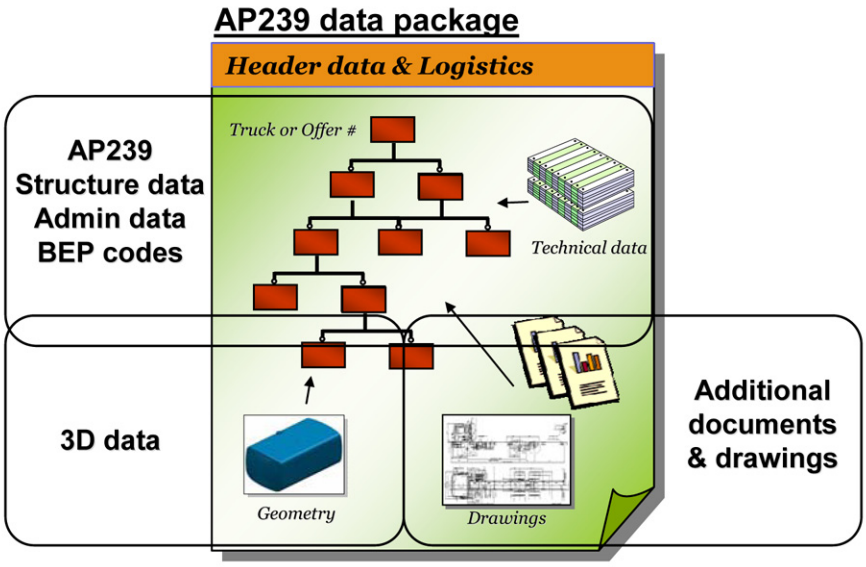

Figure 3 — Overview of STEP AP 239 data package and formats

Table 1 provides an overview of the information package physical structure and content.

Figure 4 provides an overview of the logical structure.

Table 1 — Overview of the information package physical structure

Information package envelope directory	Content overview	Format	Optional
Chassis technical data, preferably using BEP codes defined in ISO 21308-2 and ISO 21308-3	Purchase order or offer information Logistics information Chassis identity number Chassis structure (optional) Technical data References to other information items	STEP AP 239	No [a]
Chassis individual drawing	Two-dimensional drawing of chassis individual (alternatively chassis family type)	PDF, DXF [b c]	Yes
Chassis three-dimensional mock-up data	Three-dimensional geometry of the individual chassis, either complete chassis or per component	STEP AP214 cc1/2 AIM [d], STEP AP203 [e], STL [f c]	Yes
Other documentation of relevance	Document of interest to the truck body-builder, e.g. mounting instructions	MS Word, PDF [c]	Yes

[a] There are optional data entities and structures within the STEP data.

[b] PDF = Portable Document Format; DXF = Data Exchange Format.

[c] Or any other format agreed on bilaterally.

[d] AIM = Application Interpreted Model; see ISO 10303-214.

[e] See ISO 10303-203.

[f] STL = Standard Template Library.

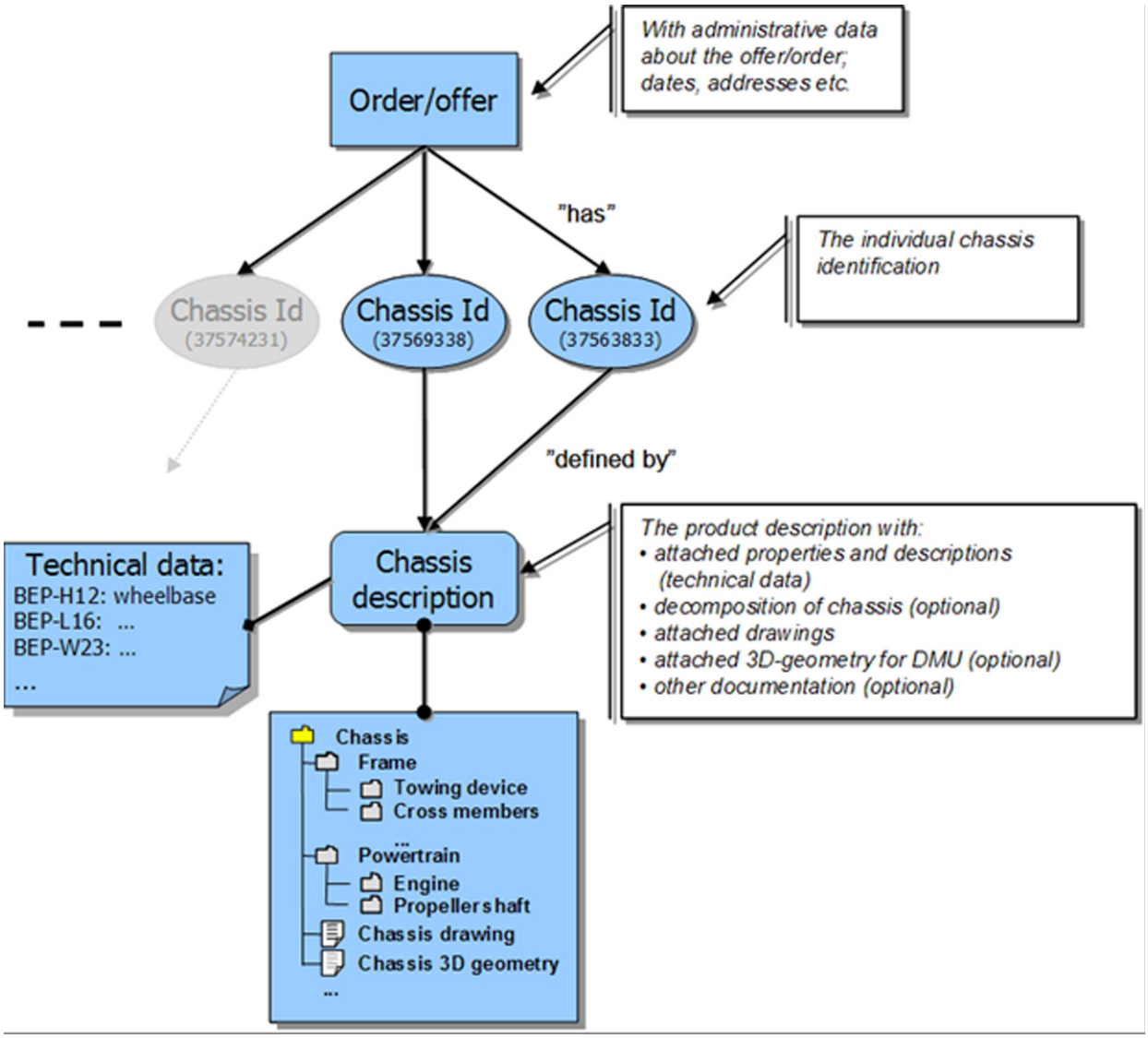

Figure 4 — Overview of logical build-up of STEP data structure

6.2 Data exchange sets and capabilities

Data exchange sets (DEXs) are OASIS standards that identify a subset of STEP AP 239 PLCS to be used to support a particular business process. Capabilities are the building blocks for DEXs. The following capabilities have been used when developing this Technical Specification:

— Capability (C001): assigning_identifiers

— Capability (C002): representing_parts

— Capability (C005): representing_documents

— Capability (C010): assigning_reference_data

— Capability (C010): assigning_reference_data

— Capability (C016): representing_person_organization

— Capability (C036): assigning_date_time

— Capability (C045): representing_product_as_individual

— Capability (C060): referencing_product_as_individual

— Capability (C079): representing_properties_numerically

— Capability (C080): representing_properties_textually

6.3 Type and individual data

In STEP AP 239, both a type of truck and a specific individual (planned or already produced) can be represented. Properties, represented by the “BEP codes” can be attached (associated) with both kinds of representation, and from the perspective of the recipients there should not be any difference.

Certain properties should however always be associated with the truck individual.

A data transfer file should always contain data for at least one individual vehicle.

6.4 External_class_library

External_class_library is a central part of STEP AP 239. It is used to reference external libraries for data definition.

This allows for dynamic configuration and a continued life-cycle for the definitions of BEP codes and other data references. External class libraries are identified by a name that uniquely specifies the library, typically a uniform resource name (URN) or similar.

NOTE In this Technical Specification, the following (fictitious) external libraries are used:

— “urn:iso:std:iso:21308” and “urn:iso:std:iso:10303-239” are used as library references;

— “urn:iso:std:iso:21308” corresponds to the URN of the BEP codes (name and description for the BEP codes);

— “urn:iso:std:iso:10303-239” corresponds to the URN of the PLCS reference data (information about classes and usage of STEP AP 239 PLCS).

6.5 Attributes

In STEP AP 239, the attributes are seldom used to represent any information. Instead, identification_assignment and classification_assignment are used in accordance with the usage guidelines developed within OASIS. To avoid data inconsistency, the rules below are used in this Technical Specification.

a) Mandatory attributes:

   — /IGNORE means value represented in another way, i.e. through identification_assignment and classification_assignment;

   — “ ”(empty string) means not used.

b) Optional attributes:

   — /IGNORE means value represented in another way, i.e. through identification_assignment and classification_assignment;

   — $ means not used.

6.6 Partitioning of mapping examples

Table 2 shows where to find the mapping of related BEP codes in this Technical Specification.

L, H, and W codes refer to ISO 21308-2. G, M, and A codes refer to ISO 21308-3.

Table 2 — Mapping of BEP codes

BEP code	STEP AP 239 PLCS entity	Subclauses in this Technical Specification
BEP-L001 - BEP-L106 BEP-H001 - BEP-H104 BEP-W001 - BEP-W102 BEP-G001 - BEP-G150 BEP-M001 - BEP-M120	Assigned_property	7.5 Type properties 7.6 Individual properties
BEP-A001 - BEP-A003	Organization	7.7 Organization information
BEP-A010, BEP-A011, BEP-A032 - BEP-A034	Project	7.8 – 7.9 Project information 1 & 2
BEP-A020, BEP-A030, BEP-A031	Contract	7.10 Purchase order information
BEP-A021, BEP-A051	Calendar_date	7.11 Delivery information
BEP-A040, BEP-A050	Identification_assignment	7.4 Individual root
BEP-A060, BEP-A070	Assigned_property	7.12 Legal reference

7 Instantiation diagrams and related part files

7.1 Part/type root

7.1.1 Part/type root instantiation diagram

The instantiation diagram in Figure 5 shows how a part, a part version and an associated view (mechanical design/design) is represented in STEP AP 239, as well as how to identify a part (identification assignment). The view mechanism allows for multiple filterable views of the product/truck information, e.g. mechanical vs. electrical configuration.

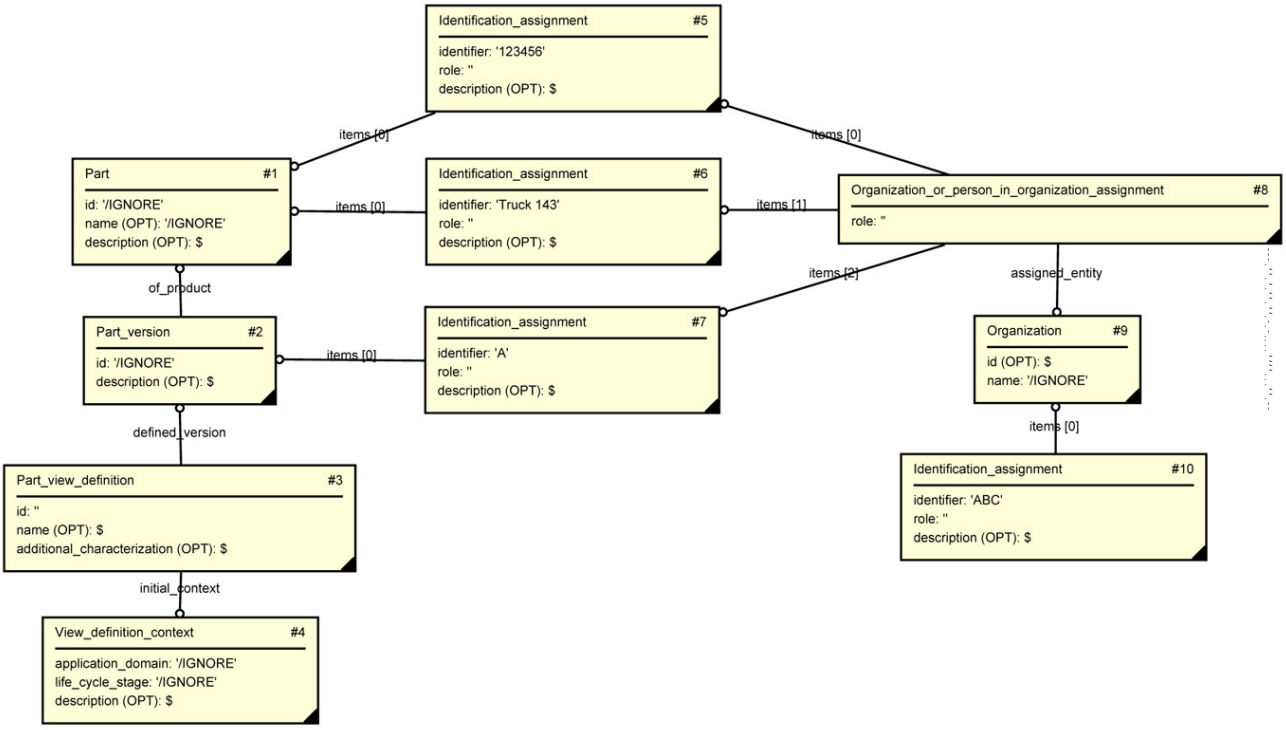

Figure 5 — Part/type root instantiation diagram

7.1.2 Corresponding part of Part 21 text file

```
#1 = PART('/IGNORE','/IGNORE',$);
#2 = PART_VERSION('/IGNORE',$,#1);
#3 = PART_VIEW_DEFINITION('',$,$,#4,(),#2);
#4 = VIEW_DEFINITION_CONTEXT('/IGNORE','/IGNORE',$);
#5 = IDENTIFICATION_ASSIGNMENT('123456','',$,(#1));
#6 = IDENTIFICATION_ASSIGNMENT('Truck 143','',$,(#1));
#7 = IDENTIFICATION_ASSIGNMENT('A','',$,(#2));
#8 = ORGANIZATION_OR_PERSON_IN_ORGANIZATION_ASSIGNMENT(#9,'',(#5,#6,#7));
#9 = ORGANIZATION($,'/IGNORE');
#10 = IDENTIFICATION_ASSIGNMENT('ABC','',$,(#9));
```

7.1.3 Corresponding part of Part 28 OSEB XML file

```
<Part x-id="ID1" Id="/IGNORE" Name="/IGNORE"/>
<Part_version x-id="ID2" Id="/IGNORE" Of_product-r="ID1"/>
<Part_view_definition x-id="ID3" Id="" Initial_context-r="ID4" Additional_contexts-r="id1" Defined_version-r="ID2"/>
<osb:ctn x-id="id1" ctype="View_definition_context[]"></osb:ctn>
<View_definition_context x-id="ID4" Application_domain="/IGNORE" Life_cycle_stage="/IGNORE"/>
<Identification_assignment x-id="ID5" Identifier="123456" Role="" Items-r="id2"/>
<osb:ctn x-id="id2" ctype="Identification_item[]"><c>ID1</c></osb:ctn>
<Identification_assignment x-id="ID6" Identifier="Truck 143" Role="" Items-r="id3"/>
<osb:ctn x-id="id3" ctype="Identification_item[]"><c>ID1</c></osb:ctn>
<Identification_assignment x-id="ID7" Identifier="A" Role="" Items-r="id4"/>
<osb:ctn x-id="id4" ctype="Identification_item[]"><c>ID2</c></osb:ctn>
<Organization_or_person_in_organization_assignment x-id="ID8" Assigned_entity-s="ID9" Role="" Items-r="id5"/>
```

<osb:ctn x-id="id5" ctype="Organization_or_person_in_organization_item[]"><c>ID5</c><c>ID6</c><c>ID7</c></osb:ctn>

<Organization x-id="ID9" Name="/IGNORE"/>

<Identification_assignment x-id="ID10" Identifier="ABC" Role="" Items-r="id6"/>

<osb:ctn x-id="id6" ctype="Identification_item[]"><c>ID9</c></osb:ctn>

7.2 Classification of part

7.2.1 Classification of part instantiation diagram

The instantiation diagram in Figure 6 shows how part name, identifiers and version identifiers are represented in STEP AP 239. By using an external class reference data library (RDL), it is possible to verify at run-time against the standard if naming and identification schemes are compliant. The RDL can be updated over time.

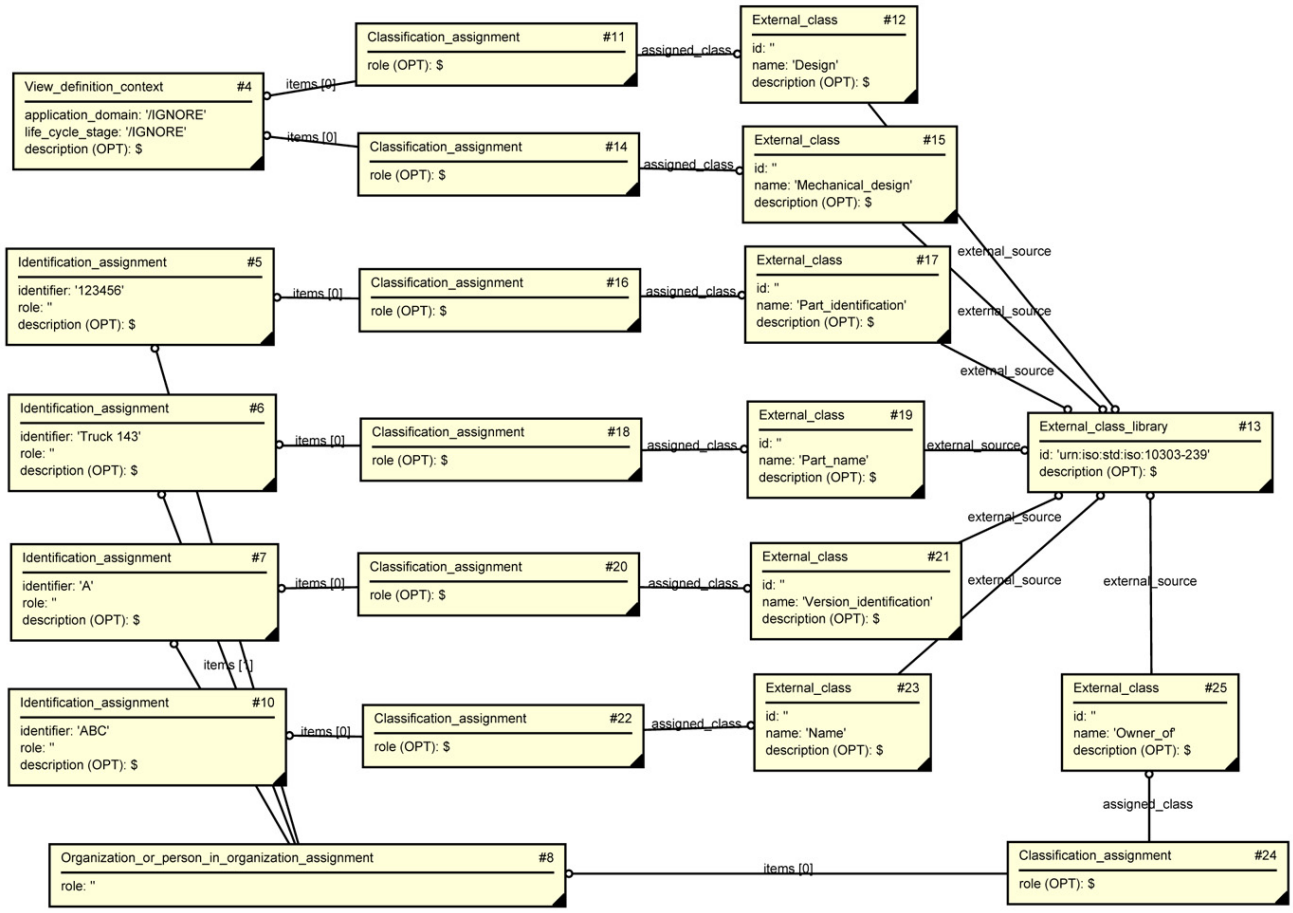

Figure 6 — Classification of part instantiation diagram

7.2.2 Corresponding part of Part 21 text file

#4 = VIEW_DEFINITION_CONTEXT('/IGNORE','/IGNORE',$);
#5 = IDENTIFICATION_ASSIGNMENT('123456','',$,(#1));
#6 = IDENTIFICATION_ASSIGNMENT('Truck 143','',$,(#1));
#7 = IDENTIFICATION_ASSIGNMENT('A','',$,(#2));
#8 = ORGANIZATION_OR_PERSON_IN_ORGANIZATION_ASSIGNMENT(#9,'',(#5,#6,#7));
#10 = IDENTIFICATION_ASSIGNMENT('ABC','',$,(#9));
#11 = CLASSIFICATION_ASSIGNMENT(#12,(#4),$);
#12 = EXTERNAL_CLASS('','Design',$,#13);
#13 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:10303-239',$);

#14 = CLASSIFICATION_ASSIGNMENT(#15,(#4),$);
#15 = EXTERNAL_CLASS('','Mechanical_design',$,#13);
#16 = CLASSIFICATION_ASSIGNMENT(#17,(#5),$);
#17 = EXTERNAL_CLASS('','Part_identification',$,#13);
#18 = CLASSIFICATION_ASSIGNMENT(#19,(#6),$);
#19 = EXTERNAL_CLASS('','Part_name',$,#13);
#20 = CLASSIFICATION_ASSIGNMENT(#21,(#7),$);
#21 = EXTERNAL_CLASS('','Version_identification',$,#13);
#22 = CLASSIFICATION_ASSIGNMENT(#23,(#10),$);
#23 = EXTERNAL_CLASS('','Name',$,#13);
#24 = CLASSIFICATION_ASSIGNMENT(#25,(#8),$);
#25 = EXTERNAL_CLASS('','Owner_of',$,#13);

7.3 Individual root

7.3.1 Individual root instantiation diagram

The individual root is the purchase order/chassis numbered individual described in the STEP file. The instantiation diagram in Figure 7 also shows how the individual is identified. By using this mapping of the data, any STEP AP 239 PLCS compliant application should be able to read the basic vehicle information.

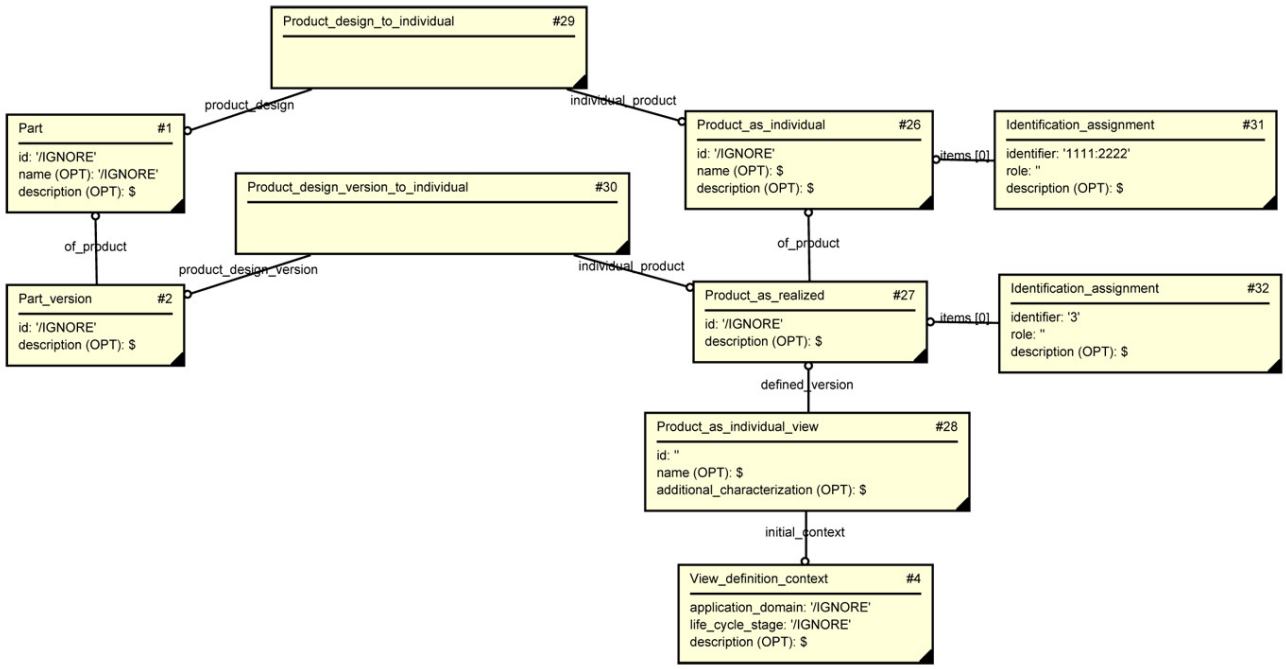

Figure 7 — Individual root instantiation diagram

7.3.2 Corresponding part of Part 21 text file

#1 = PART('/IGNORE','/IGNORE',$);
#2 = PART_VERSION('/IGNORE',$,#1);
#4 = VIEW_DEFINITION_CONTEXT('/IGNORE','/IGNORE',$);
#26 = PRODUCT_AS_INDIVIDUAL('/IGNORE',$,$);
#27 = PRODUCT_AS_REALIZED('/IGNORE',$,#26);
#28 = PRODUCT_AS_INDIVIDUAL_VIEW('',$,$,#4,(),#27);
#29 = PRODUCT_DESIGN_TO_INDIVIDUAL(#1,#26);
#30 = PRODUCT_DESIGN_VERSION_TO_INDIVIDUAL(#2,#27);
#31 = IDENTIFICATION_ASSIGNMENT('1111:2222','',$,(#26));
#32 = IDENTIFICATION_ASSIGNMENT('3','',$,(#27));

7.4 Classification of individual root

7.4.1 Classification of individual root instantiation diagram

The instantiation diagram in Figure 8 shows how the identification of the order/chassis number (the root item) is defined as also being a “BEP code”, BEP-A040.p (Serial number), referenced in the external library. In PLCS the RDL can also contain any additional explanatory information about this BEP code and its definition, and can be updated and maintained separately of any application using this construct.

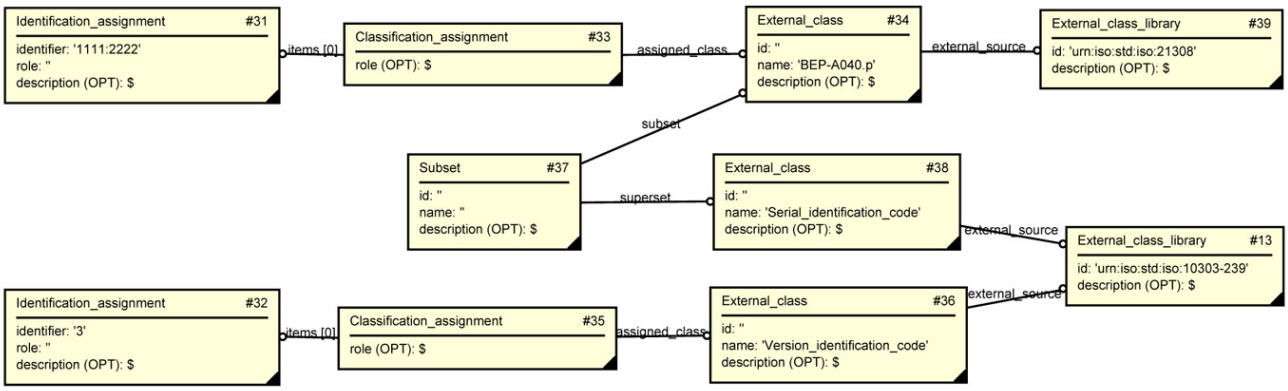

Figure 8 — Classification of individual root instantiation diagram

7.4.2 Corresponding part of Part 21 text file

```
#13 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:10303-239',$);
#31 = IDENTIFICATION_ASSIGNMENT('1111:2222','',$,(#26));
#32 = IDENTIFICATION_ASSIGNMENT('3','',$,(#27));
#33 = CLASSIFICATION_ASSIGNMENT(#34,(#31),$);
#34 = EXTERNAL_CLASS('','BEP-A040.p',$,#39);
#35 = CLASSIFICATION_ASSIGNMENT(#36,(#32),$);
#36 = EXTERNAL_CLASS('','Version_identification_code',$,#13);
#37 = SUBSET('','',$,#34,#38);
#38 = EXTERNAL_CLASS('','Serial_identification_code',$,#13);
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
```

7.5 Type properties

7.5.1 Type properties instantiation diagram

The instantiation diagram in Figure 9 shows how specific BEP codes for textual properties, such as general and administrative data, are mapped into STEP AP 239, as properties of the product/chassis definition. As an example BEP-G001 (Vehicle type) and BEP-G081.1 (Battery data) are used. Again the RDL is used to dynamically update the definition and meaning of the BEP code at run-time.

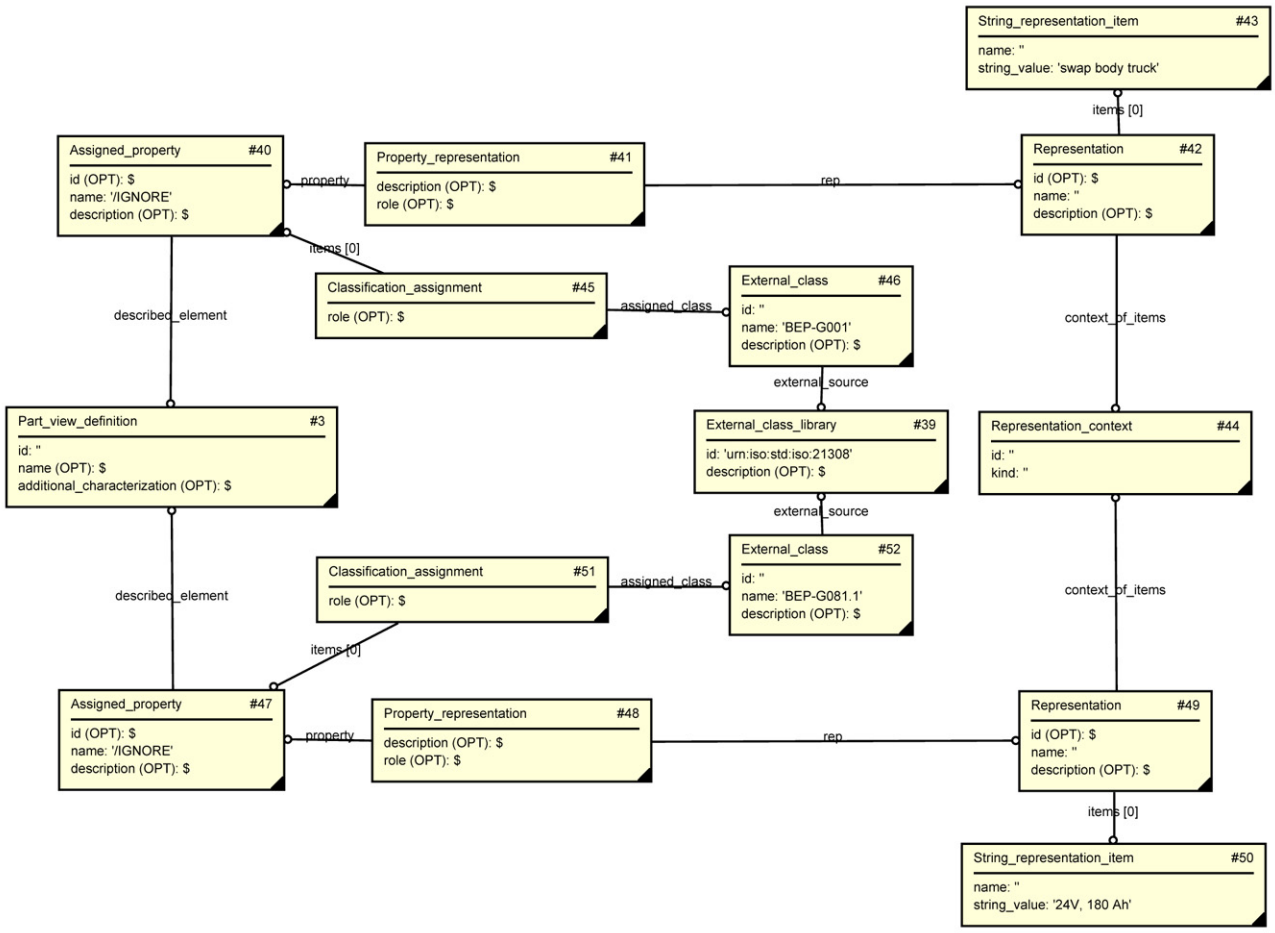

Figure 9 — Type properties instantiation diagram

7.5.2 Corresponding part of Part 21 text file

```
#3 = PART_VIEW_DEFINITION('',$,$,#4,(),#2);
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#40 = ASSIGNED_PROPERTY($,'/IGNORE',$,#3);
#41 = PROPERTY_REPRESENTATION($,#40,#42,$);
#42 = REPRESENTATION($,'',$,#44,(#43));
#43 = STRING_REPRESENTATION_ITEM('','swap body truck');
#44 = REPRESENTATION_CONTEXT('','');
#45 = CLASSIFICATION_ASSIGNMENT(#46,(#40),$);
#46 = EXTERNAL_CLASS('','BEP-G001',$,#39);
#47 = ASSIGNED_PROPERTY($,'/IGNORE',$,#3);
#48 = PROPERTY_REPRESENTATION($,#47,#49,$);
#49 = REPRESENTATION($,'',$,#44,(#50));
#50 = STRING_REPRESENTATION_ITEM('','24V, 180 Ah');
#51 = CLASSIFICATION_ASSIGNMENT(#52,(#47),$);
#52 = EXTERNAL_CLASS('','BEP-G081.1',$,#39);
```

7.6 Individual properties

7.6.1 Individual properties instantiation diagram

The instantiation diagram in Figure 10 shows how specific BEP codes for numerical properties, such as measurements and weights, are associated to the product information. The type of numerical property is defined by the PLCS RDL and should follow the standard. The specific BEP code measurement is classified as being of type BEP-L031.2 (End of chassis mounted object, length).

This mapping covers a majority of the BEP codes as specified in ISO 21308-2 and ISO 21308-3.

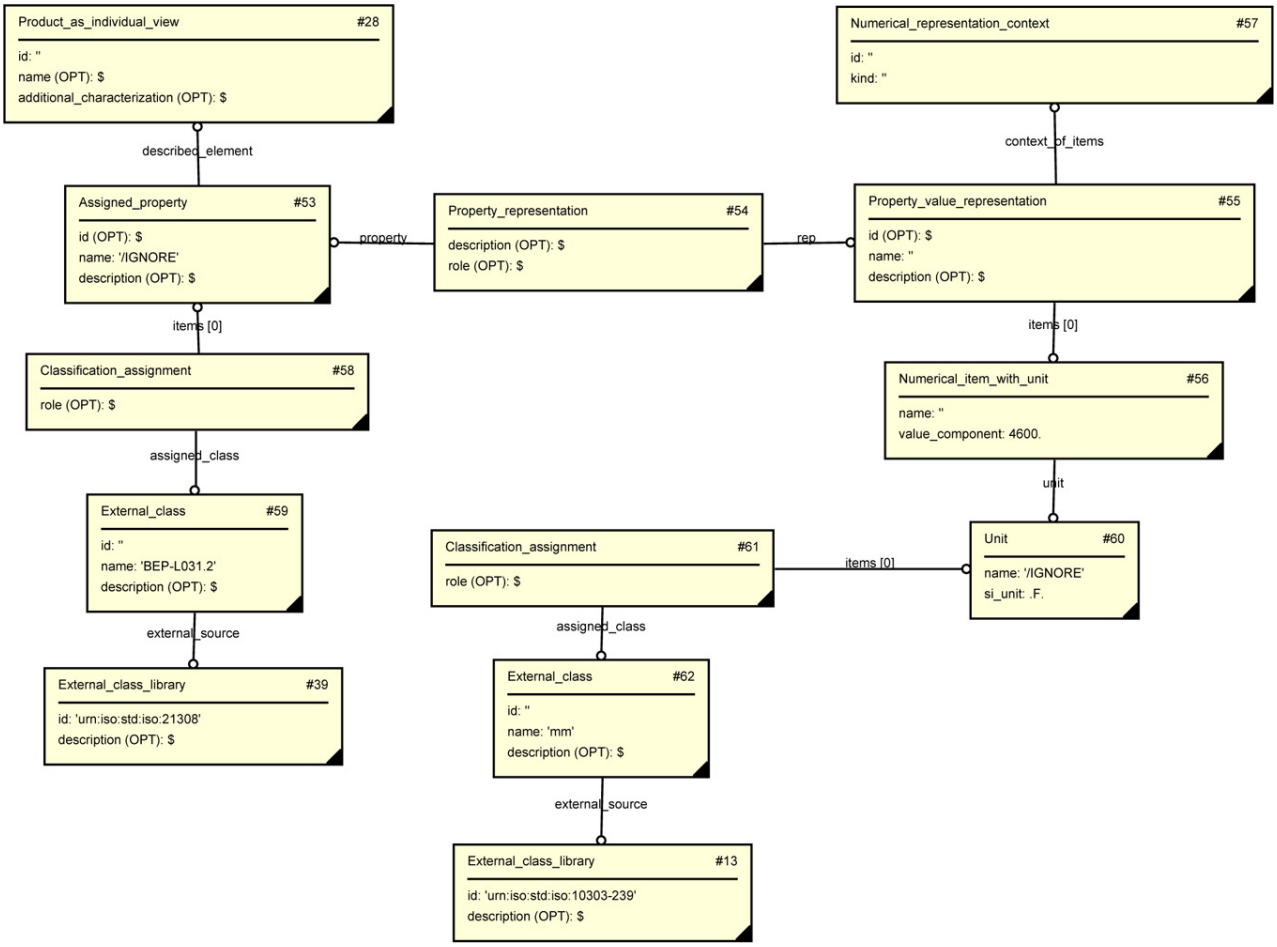

Figure 10 — Individual Properties instantiation diagram

7.6.2 Corresponding part of Part 21 text file

```
#13 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:10303-239',$);
#28 = PRODUCT_AS_INDIVIDUAL_VIEW('',$,$,#4,(),#27);
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#53 = ASSIGNED_PROPERTY($,'/IGNORE',$,#28);
#54 = PROPERTY_REPRESENTATION($,#53,#55,$);
#55 = PROPERTY_VALUE_REPRESENTATION($,'',$,#57,(#56));
#56 = NUMERICAL_ITEM_WITH_UNIT('',#60,4600.);
#57 = NUMERICAL_REPRESENTATION_CONTEXT('','',$,$);
#58 = CLASSIFICATION_ASSIGNMENT(#59,(#53),$);
#59 = EXTERNAL_CLASS('','BEP-L031.2',$,#39);
```

#60 = UNIT('/IGNORE',.T.);
#61 = CLASSIFICATION_ASSIGNMENT(#62,(#60),$);
#62 = EXTERNAL_CLASS('','mm',$,#13);

7.7 Organization information

7.7.1 Organization information instantiation diagram

The instantiation diagram in Figure 11 shows how organisational data is mapped into STEP AP 239. Identifiers and names have references to the standard STEP AP 239 library, and the example shows how BEP-A001 to BEP-A003, containing organisation names, addresses, etc. are mapped and referenced.

Figure 11 — Organization information instantiation diagram

7.7.2 Corresponding part of Part 21 text file

```
#9 = ORGANIZATION($,'/IGNORE');
#13 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:10303-239',$);
#23 = EXTERNAL_CLASS('','Name',$,#13);
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#63 = IDENTIFICATION_ASSIGNMENT('Company ID','',$,(#9));
#64 = CLASSIFICATION_ASSIGNMENT(#65,(#63),$);
#65 = EXTERNAL_CLASS('','BEP-A001.p','$',#39);
#66 = SUBSET('','',$,#65,#67);
#67 = EXTERNAL_CLASS('','Organization_identification',$,#13);
#68 = IDENTIFICATION_ASSIGNMENT('Company Name','',$,(#9));
#69 = CLASSIFICATION_ASSIGNMENT(#70,(#68),$);
#70 = EXTERNAL_CLASS('','BEP-A002.p',$,#39);
#71 = SUBSET('','',$,#70,#23);
#72 = ADDRESS_ASSIGNMENT($,#73,(#9));
#73 = ADDRESS($,$,$,'4325',$,$,'SE-11100','Sweden',$,$,$,$,$,$);
#74 = CLASSIFICATION_ASSIGNMENT(#75,(#73),$);
#75 = EXTERNAL_CLASS('','BEP-A003.p',$,#39);
```

7.8 Project information – Example 1

7.8.1 Project information – Example 1 instantiation diagram

The instantiation diagram in Figure 12 shows how the standard parameters BEP-A010.p (Reference id), BEP-A011.p (Project description), BEP-A032.p (Order version) are mapped into STEP AP 239.

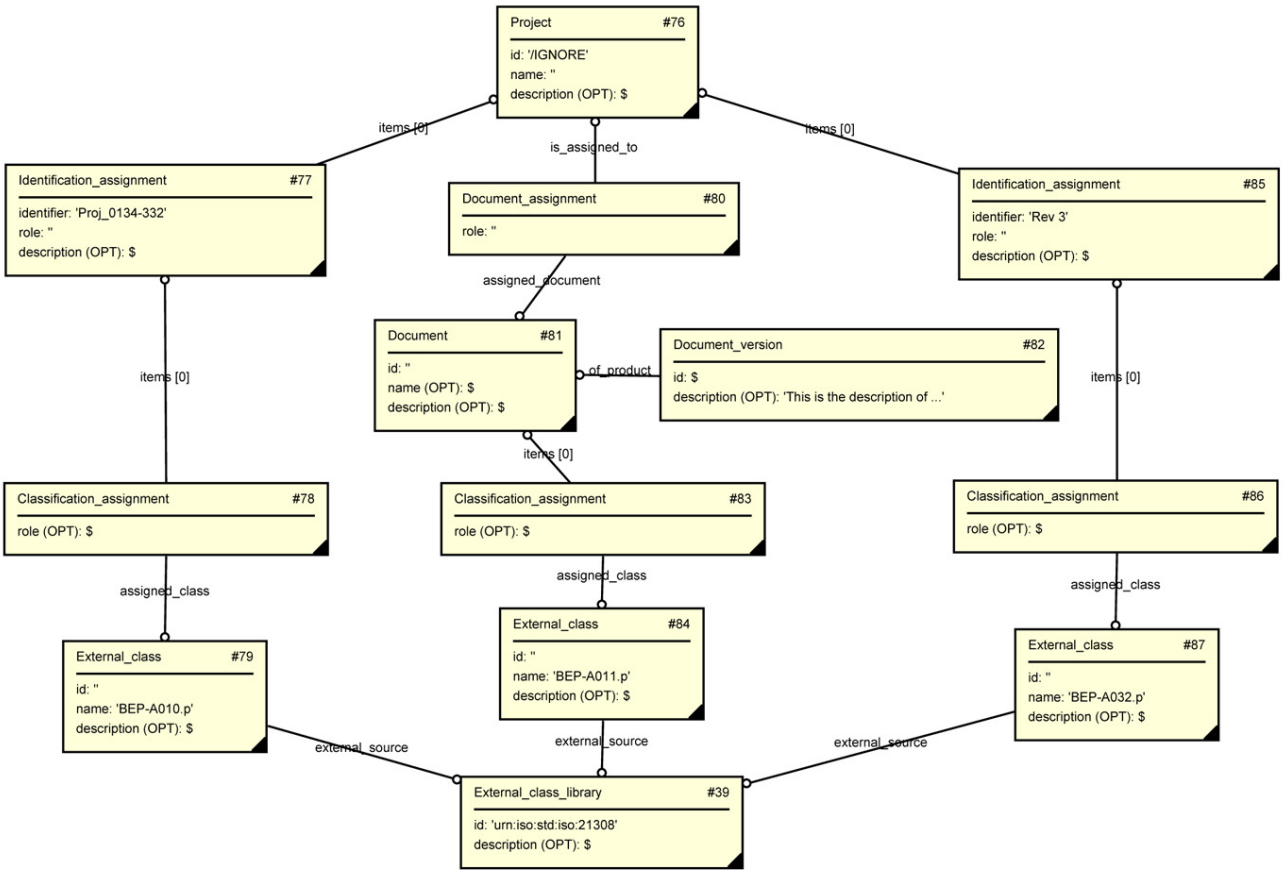

Figure 12 — Project information – Example 1 instantiation diagram

7.8.2 Corresponding part of Part 21 text file

```
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#65 = EXTERNAL_CLASS('','BEP-A001.p','$',#39);
#76 = PROJECT('/IGNORE','',$,(),$,$,$,$);
#77 = IDENTIFICATION_ASSIGNMENT('Proj_0134-332','',$,(#76));
#78 = CLASSIFICATION_ASSIGNMENT(#79,(#77),$);
#79 = EXTERNAL_CLASS('','BEP-A010.p',$,#39);
#80 = DOCUMENT_ASSIGNMENT(#81,#76,'');
#81 = DOCUMENT('',$,$);
#82 = DOCUMENT_VERSION($,'This is the description of ...',#81);
#83 = CLASSIFICATION_ASSIGNMENT(#84,(#81),$);
#84 = EXTERNAL_CLASS('','BEP-A011.p',$,#39);
#85 = IDENTIFICATION_ASSIGNMENT('Rev 3','',$,(#76));
#86 = CLASSIFICATION_ASSIGNMENT(#87,(#85),$);
#87 = EXTERNAL_CLASS('','BEP-A032.p',$,#39);
```

7.9 Project information – Example 2

7.9.1 Project information – Example 2 instantiation diagram

The instantiation diagram in Figure 13 shows the mapping of parameters BEP-A033.p (Order version date) and BEP-A034.p (Order version update information) for project.

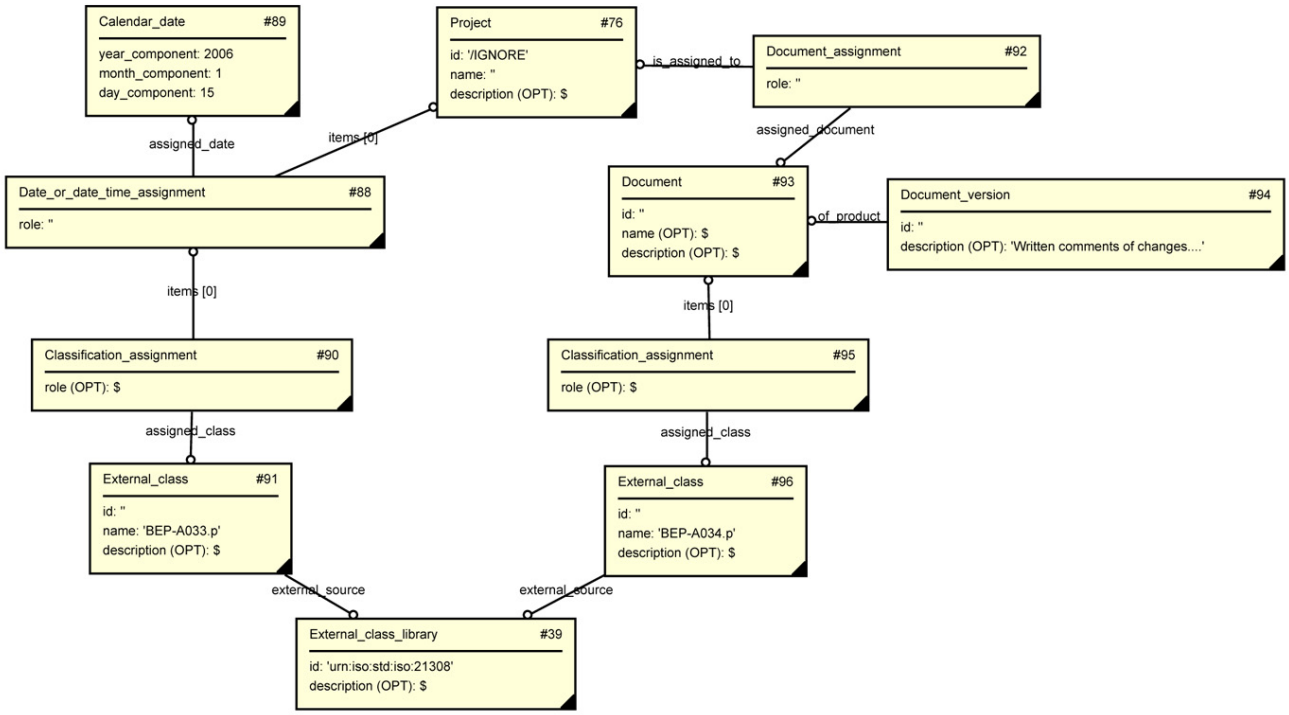

Figure 13 — Project information – Example 2 instantiation diagram

7.9.2 Corresponding part of Part 21 text file

```
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#76 = PROJECT('/IGNORE','',$,(),$,$,$,$);
#88 = DATE_OR_DATE_TIME_ASSIGNMENT(#89,'',(#76));
#89 = CALENDAR_DATE(2006,1,15);
#90 = CLASSIFICATION_ASSIGNMENT(#91,(#88),$);
#91 = EXTERNAL_CLASS('','BEP-A033.p',$,#39);
```

#92 = DOCUMENT_ASSIGNMENT(#93,#76,'');
#93 = DOCUMENT('',$,$);
#94 = DOCUMENT_VERSION('','Written comments of changes....',#93);
#95 = CLASSIFICATION_ASSIGNMENT(#96,(#93),$);
#96 = EXTERNAL_CLASS('','BEP-A034.p',$,#39);

7.10 Purchase order information

7.10.1 Purchase order information instantiation diagram

The instantiation diagram in Figure 14 shows how purchase orders are mapped to contract using specific classification. BEP-A020.p (Approval statement) is mapped to a blank document. In similar fashion BEP-A030.p (Order number) is mapped to the identification of the contract and BEP-A031.p (Order confirmation) is mapped to the calendar date entity.

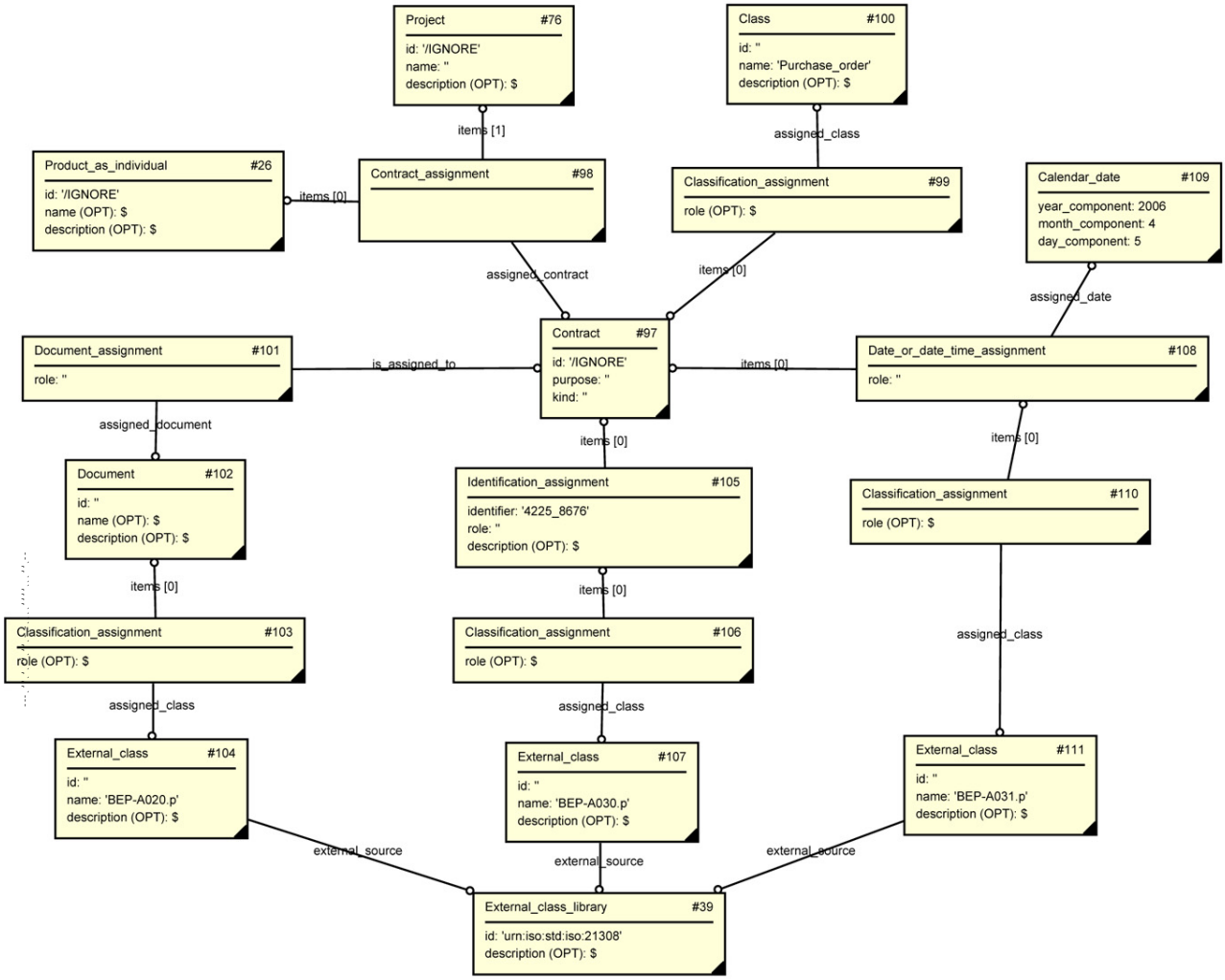

Figure 14 — Purchase order information instantiation diagram

7.10.2 Corresponding part of Part 21 text file

#26 = PRODUCT_AS_INDIVIDUAL('/IGNORE',$,$);
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#76 = PROJECT('/IGNORE','',$,(),$,$,$,$);
#98 = CONTRACT_ASSIGNMENT(#97,(#26,#76));
#99 = CLASSIFICATION_ASSIGNMENT(#100,(#97),$);

```
#100 = CLASS('','Purchase_order',$);
#101 = DOCUMENT_ASSIGNMENT(#102,#97,'');
#102 = DOCUMENT('',$,$);
#103 = CLASSIFICATION_ASSIGNMENT(#104,(#102),$);
#104 = EXTERNAL_CLASS('','BEP-A020.p',$,#39);
#105 = IDENTIFICATION_ASSIGNMENT('4225_8676','',$,(#97));
#106 = CLASSIFICATION_ASSIGNMENT(#107,(#105),$);
#107 = EXTERNAL_CLASS('','BEP-A030.p',$,#39);
#108 = DATE_OR_DATE_TIME_ASSIGNMENT(#109,'',(#97));
#109 = CALENDAR_DATE(2006,4,5);
#110 = CLASSIFICATION_ASSIGNMENT(#111,(#108),$);
#111 = EXTERNAL_CLASS('','BEP-A031.p',$,#39);
```

7.11 Delivery information

7.11.1 Approval information instantiation diagram

The instantiation diagram in Figure 15 shows BEP-A021.p (Date of final specification) and BEP-A051.p (Product delivery date) represented as two dates.

Figure 15 — Approval information instantiation diagram

7.11.2 Corresponding part of Part 21 text file

```
#27 = PRODUCT_AS_REALIZED('/IGNORE',$,#26);
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#112 = DATE_OR_DATE_TIME_ASSIGNMENT(#113,'',(#27));
#113 = CALENDAR_DATE(2006,4,6);
#114 = CLASSIFICATION_ASSIGNMENT(#115,(#112),$);
#115 = EXTERNAL_CLASS('','BEP-A021.p',$,#39);
#116 = DATE_OR_DATE_TIME_ASSIGNMENT(#117,'',(#27));
#117 = CALENDAR_DATE(2006,4,7);
#118 = CLASSIFICATION_ASSIGNMENT(#119,(#116),$);
#119 = EXTERNAL_CLASS('','BEP-A051.p',$,#39);
```

7.12 Legal reference

7.12.1 Legal reference instantiation diagram

The instantiation diagram in Figure 16 shows the STEP AP 239 representation of BEP-A060 (Country of registration) and BEP-A070.p (Legal reference) represented as text string properties.

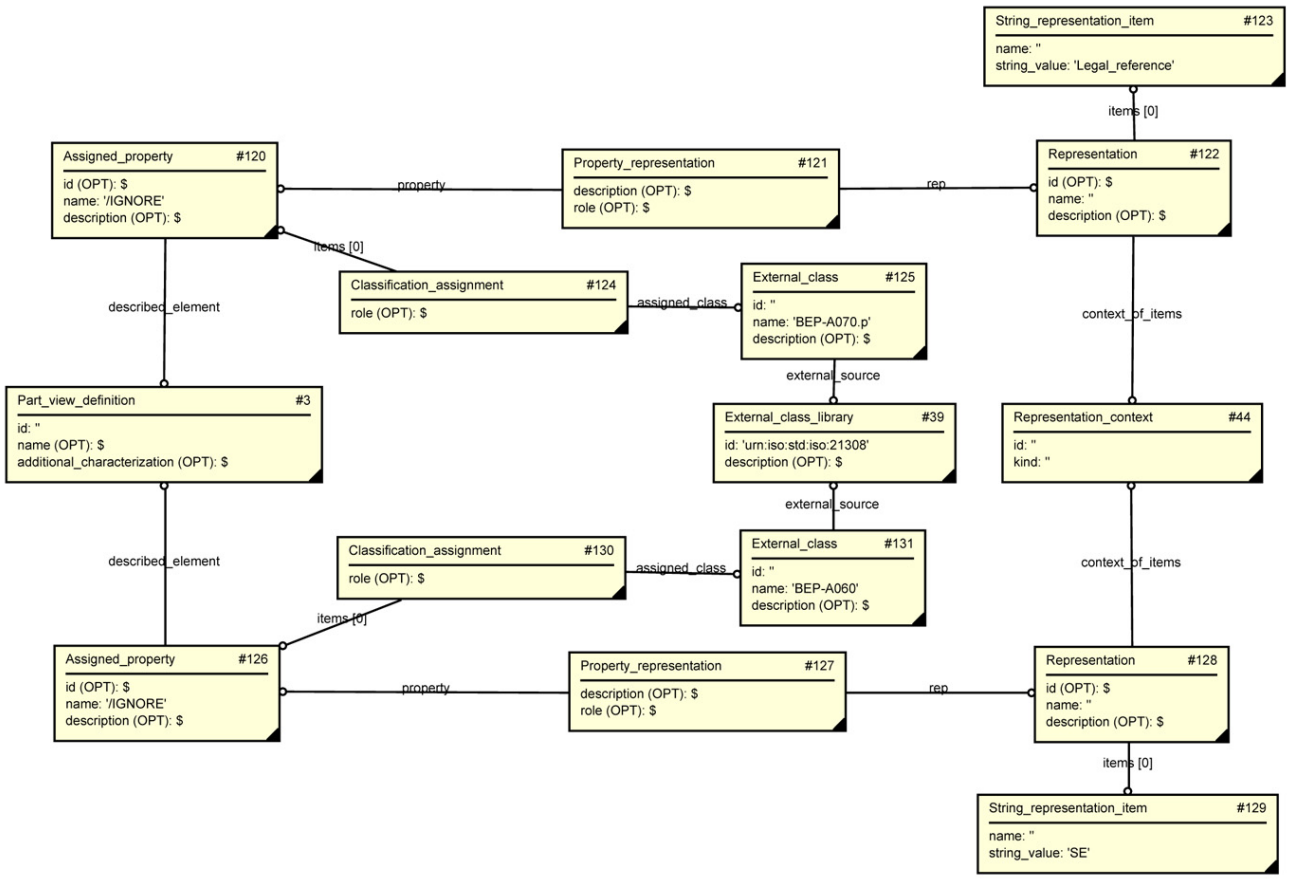

Figure 16 — Legal reference instantiation diagram

7.12.2 Corresponding part of Part 21 text file

```
#3 = PART_VIEW_DEFINITION('',$,$,#4,(),#2);
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#44 = REPRESENTATION_CONTEXT('','');
#120 = ASSIGNED_PROPERTY($,'/IGNORE',$,#3);
#121 = PROPERTY_REPRESENTATION($,#120,#122,$);
#122 = REPRESENTATION($,'',$,#44,(#123));
#123 = STRING_REPRESENTATION_ITEM('','Legal_reference');
#124 = CLASSIFICATION_ASSIGNMENT(#125,(#120),$);
#125 = EXTERNAL_CLASS('','BEP-A070.p',$,#39);
#126 = ASSIGNED_PROPERTY($,'/IGNORE',$,#3);
#127 = PROPERTY_REPRESENTATION($,#126,#128,$);
#128 = REPRESENTATION($,'',$,#44,(#129));
#129 = STRING_REPRESENTATION_ITEM('','SE');
#130 = CLASSIFICATION_ASSIGNMENT(#131,(#126),$);
#131 = EXTERNAL_CLASS('','BEP-A060',$,#39);
```

Annex A
(informative)

STEP information background

A.1 General

The “STEP” standard is a set of ISO information model standards and related tools. These standards together define “product models”, i.e. computer interpretable semantic representation of how “a product” is designed, configured and maintained.

The STEP models are independent of implementation [application (e.g. Pro/E; Windchill; Enovia, CATIA) and programming language (e.g. C++, Java, VBA)], system platform [operating system (e.g. UNIX, Windows) and CPU (Intel, IBM)], and even of persistent storage and file representation [databases (e.g. Oracle, SQL server) and file formats (e.g. XML, ASCII CSV)].[1)]

STEP AP 239 “PLCS” used in this Technical Specification represents one of the latest STEP APs which is more modularized and reusable. The scope of STEP AP 239 is the full product life-cycle, meaning that information from “cradle to grave” is covered (with some limitations). STEP AP 239 also covers the information management pertaining to the individual products, and how these products are supported and serviced “in-life”, with connections to the original design data.

A.2 Suitability of STEP for communication of BEP data

The truck body building process that the ISO 21308 series covers is about product individuals, some not yet manufactured, but still specific to a certain order or project.

For the foreseeable future, there will be a mix of measurements (BEP codes) and varying degrees of individual chassis descriptions, starting with chassis type drawings going all the way to unique product individual with three-dimensional visualization models. The STEP format can cope and grow with these expectations and demands for many years.

If the ambition is only to transport a set of simple BEP codes, then STEP is not needed. A much simpler representation using HTML (Hypertext Markup Language) or XML can be used, or even just ASCII (American Standard Code for Information Interchange) or an MS Excel sheet. It is important to understand that XML basically is an information envelope, and does not contain any semantic definitions of its contents, unless specified in a DTD (Document Type Definition) or XML schema. These semantics are what STEP standardizes.

There will always be a need for new dimensions or more detailed information about “object X and object Y”, not covered by BEP codes. Extrapolating this reasoning shows that the ultimate representation is the product definition itself, ideally represented as a product break-down complemented with technical information and three-dimensional information. The STEP protocol gives the user the ability to develop a system that can communicate the (BEP code) measurements to the model, and generate mock-up models on-screen.

1) Pro/E, Windchill, Enovia, CATIA, C++, Java, VBA, UNIX, Windows, Intel, IBM, Oracle and SQL are examples of suitable products available commercially. This information is given for the convenience of users of this Technical Specification and does not constitute an endorsement by ISO of these products.

Annex B
(informative)

Complete Part 21 text file (with data taken from earlier examples)

```
ISO-10303-21;
HEADER;
FILE_DESCRIPTION(('Description'),'2;1');
FILE_NAME('21308.stp','2006-09-27T09:18:41', ('someone'),(''),'', 'GraphicalInstance 1.0 Beta 4 [1.0.4.6]','');
FILE_SCHEMA(('AP239_PRODUCT_LIFE_CYCLE_SUPPORT_ARM_LF'));
ENDSEC;

DATA;
#1 = PART('/IGNORE','/IGNORE',$);
#2 = PART_VERSION('/IGNORE',$,#1);
#3 = PART_VIEW_DEFINITION('',$,$,#4,(),#2);
#4 = VIEW_DEFINITION_CONTEXT('/IGNORE','/IGNORE',$);
#5 = IDENTIFICATION_ASSIGNMENT('123456','',$,(#1));
#6 = IDENTIFICATION_ASSIGNMENT('Truck 143','',$,(#1));
#7 = IDENTIFICATION_ASSIGNMENT('A','',$,(#2));
#8 = ORGANIZATION_OR_PERSON_IN_ORGANIZATION_ASSIGNMENT(#9,'',(#5,#6,#7));
#9 = ORGANIZATION($,'/IGNORE');
#10 = IDENTIFICATION_ASSIGNMENT('ABC','',$,(#9));
#11 = CLASSIFICATION_ASSIGNMENT(#12,(#4),$);
#12 = EXTERNAL_CLASS('','Design',$,#13);
#13 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:10303-239',$);
#14 = CLASSIFICATION_ASSIGNMENT(#15,(#4),$);
#15 = EXTERNAL_CLASS('','Mechanical_design',$,#13);
#16 = CLASSIFICATION_ASSIGNMENT(#17,(#5),$);
#17 = EXTERNAL_CLASS('','Part_identification',$,#13);
#18 = CLASSIFICATION_ASSIGNMENT(#19,(#6),$);
#19 = EXTERNAL_CLASS('','Part_name',$,#13);
#20 = CLASSIFICATION_ASSIGNMENT(#21,(#7),$);
#21 = EXTERNAL_CLASS('','Version_identification',$,#13);
#22 = CLASSIFICATION_ASSIGNMENT(#23,(#10),$);
#23 = EXTERNAL_CLASS('','Name',$,#13);
#24 = CLASSIFICATION_ASSIGNMENT(#25,(#8),$);
#25 = EXTERNAL_CLASS('','Owner_of',$,#13);
#26 = PRODUCT_AS_INDIVIDUAL('/IGNORE',$,$);
#27 = PRODUCT_AS_REALIZED('/IGNORE',$,#26);
#28 = PRODUCT_AS_INDIVIDUAL_VIEW('',$,$,#4,(),#27);
#29 = PRODUCT_DESIGN_TO_INDIVIDUAL(#1,#26);
#30 = PRODUCT_DESIGN_VERSION_TO_INDIVIDUAL(#2,#27);
#31 = IDENTIFICATION_ASSIGNMENT('1111:2222','',$,(#26));
#32 = IDENTIFICATION_ASSIGNMENT('3','',$,(#27));
#33 = CLASSIFICATION_ASSIGNMENT(#34,(#31),$);
#34 = EXTERNAL_CLASS('','BEP-A040.p',$,#39);
#35 = CLASSIFICATION_ASSIGNMENT(#36,(#32),$);
#36 = EXTERNAL_CLASS('','Version_identification_code',$,#13);
#37 = SUBSET('','',$,#34,#38);
#38 = EXTERNAL_CLASS('','Serial_identification_code',$,#13);
#39 = EXTERNAL_CLASS_LIBRARY('urn:iso:std:iso:21308',$);
#40 = ASSIGNED_PROPERTY($,'/IGNORE',$,#3);
#41 = PROPERTY_REPRESENTATION($,#40,#42,$);
```

```
#42 = REPRESENTATION($,'',$,#44,(#43));
#43 = STRING_REPRESENTATION_ITEM('','swap body truck');
#44 = REPRESENTATION_CONTEXT('','');
#45 = CLASSIFICATION_ASSIGNMENT(#46,(#40),$);
#46 = EXTERNAL_CLASS('','BEP-G001',$,#39);
#47 = ASSIGNED_PROPERTY($,'/IGNORE',$,#3);
#48 = PROPERTY_REPRESENTATION($,#47,#49,$);
#49 = REPRESENTATION($,'',$,#44,(#50));
#50 = STRING_REPRESENTATION_ITEM('','24V, 180 Ah');
#51 = CLASSIFICATION_ASSIGNMENT(#52,(#47),$);
#52 = EXTERNAL_CLASS('','BEP-G081.1',$,#39);
#53 = ASSIGNED_PROPERTY($,'/IGNORE',$,#28);
#54 = PROPERTY_REPRESENTATION($,#53,#55,$);
#55 = PROPERTY_VALUE_REPRESENTATION($,'',$,#57,(#56));
#56 = NUMERICAL_ITEM_WITH_UNIT('',#60,4600.);
#57 = NUMERICAL_REPRESENTATION_CONTEXT('','',$,$);
#58 = CLASSIFICATION_ASSIGNMENT(#59,(#53),$);
#59 = EXTERNAL_CLASS('','BEP-L031.2',$,#39);
#60 = UNIT('/IGNORE',.T.);
#61 = CLASSIFICATION_ASSIGNMENT(#62,(#60),$);
#62 = EXTERNAL_CLASS('','mm',$,#13);
#63 = IDENTIFICATION_ASSIGNMENT('Company ID','',$,(#9));
#64 = CLASSIFICATION_ASSIGNMENT(#65,(#63),$);
#65 = EXTERNAL_CLASS('','BEP-A001.p','$',#39);
#66 = SUBSET('','',$,#65,#67);
#67 = EXTERNAL_CLASS('','Organization_identification',$,#13);
#68 = IDENTIFICATION_ASSIGNMENT('Company Name','',$,(#9));
#69 = CLASSIFICATION_ASSIGNMENT(#70,(#68),$);
#70 = EXTERNAL_CLASS('','BEP-A002.p',$,#39);
#71 = SUBSET('','',$,#70,#23);
#72 = ADDRESS_ASSIGNMENT($,#73,(#9));
#73 = ADDRESS($,$,$,'4325',$,$,'SE-11100','Sweden',$,$,$,$,$,$);
#74 = CLASSIFICATION_ASSIGNMENT(#75,(#73),$);
#75 = EXTERNAL_CLASS('','BEP-A003.p',$,#39);
#76 = PROJECT('/IGNORE','',$,(),$,$,$,$);
#77 = IDENTIFICATION_ASSIGNMENT('Proj_0134-332','',$,(#76));
#78 = CLASSIFICATION_ASSIGNMENT(#79,(#77),$);
#79 = EXTERNAL_CLASS('','BEP-A010.p',$,#39);
#80 = DOCUMENT_ASSIGNMENT(#81,#76,'');
#81 = DOCUMENT('',$,$);
#82 = DOCUMENT_VERSION($,'This is the description of ...',#81);
#83 = CLASSIFICATION_ASSIGNMENT(#84,(#81),$);
#84 = EXTERNAL_CLASS('','BEP-A011.p',$,#39);
#85 = IDENTIFICATION_ASSIGNMENT('Rev 3','',$,(#76));
#86 = CLASSIFICATION_ASSIGNMENT(#87,(#85),$);
#87 = EXTERNAL_CLASS('','BEP-A032.p',$,#39);
#88 = DATE_OR_DATE_TIME_ASSIGNMENT(#89,'',(#76));
#89 = CALENDAR_DATE(2006,1,15);
#90 = CLASSIFICATION_ASSIGNMENT(#91,(#88),$);
#91 = EXTERNAL_CLASS('','BEP-A033.p',$,#39);
#92 = DOCUMENT_ASSIGNMENT(#93,#76,'');
#93 = DOCUMENT('',$,$);
#94 = DOCUMENT_VERSION('','Written comments of changes....',#93);
#95 = CLASSIFICATION_ASSIGNMENT(#96,(#93),$);
#96 = EXTERNAL_CLASS('','BEP-A034.p',$,#39);
#97 = CONTRACT('/IGNORE','','');
#98 = CONTRACT_ASSIGNMENT(#97,(#26,#76));
```

```
#99 = CLASSIFICATION_ASSIGNMENT(#100,(#97),$);
#100 = CLASS('','Purchase_order',$);
#101 = DOCUMENT_ASSIGNMENT(#102,#97,'');
#102 = DOCUMENT('',$,$);
#103 = CLASSIFICATION_ASSIGNMENT(#104,(#102),$);
#104 = EXTERNAL_CLASS('','BEP-A020.p',$,#39);
#105 = IDENTIFICATION_ASSIGNMENT('4225_8676','',$,(#97));
#106 = CLASSIFICATION_ASSIGNMENT(#107,(#105),$);
#107 = EXTERNAL_CLASS('','BEP-A030.p',$,#39);
#108 = DATE_OR_DATE_TIME_ASSIGNMENT(#109,'',(#97));
#109 = CALENDAR_DATE(2006,4,5);
#110 = CLASSIFICATION_ASSIGNMENT(#111,(#108),$);
#111 = EXTERNAL_CLASS('','BEP-A031.p',$,#39);
#112 = DATE_OR_DATE_TIME_ASSIGNMENT(#113,'',(#27));
#113 = CALENDAR_DATE(2006,4,6);
#114 = CLASSIFICATION_ASSIGNMENT(#115,(#112),$);
#115 = EXTERNAL_CLASS('','BEP-A021.p',$,#39);
#116 = DATE_OR_DATE_TIME_ASSIGNMENT(#117,'',(#27));
#117 = CALENDAR_DATE(2006,4,7);
#118 = CLASSIFICATION_ASSIGNMENT(#119,(#116),$);
#119 = EXTERNAL_CLASS('','BEP-A051.p',$,#39);
#120 = ASSIGNED_PROPERTY($,'/IGNORE',$,#3);
#121 = PROPERTY_REPRESENTATION($,#120,#122,$);
#122 = REPRESENTATION($,'',$,#44,(#123));
#123 = STRING_REPRESENTATION_ITEM('','Legal_reference');
#124 = CLASSIFICATION_ASSIGNMENT(#125,(#120),$);
#125 = EXTERNAL_CLASS('','BEP-A070.p',$,#39);
#126 = ASSIGNED_PROPERTY($,'/IGNORE',$,#3);
#127 = PROPERTY_REPRESENTATION($,#126,#128,$);
#128 = REPRESENTATION($,'',$,#44,(#129));
#129 = STRING_REPRESENTATION_ITEM('','SE');
#130 = CLASSIFICATION_ASSIGNMENT(#131,(#126),$);
#131 = EXTERNAL_CLASS('','BEP-A060',$,#39);

ENDSEC;
END-ISO-10303-21;
```

Annex C
(informative)

Complete Part 28 OSEB XML file (with data taken from earlier examples)

```
<?xml version="1.0" encoding="utf-8"?>
<!-- ISO 10303-28 file generated by ECCO Toolkit, PDTec GmbH, Germany -->
<iso_10303_28 representation_category="OSEB" version="TS-1">
    <iso_10303_28_header>
        <document_name>21308.xml</document_name>
        <time_stamp>2006-10-09T17:52:09</time_stamp>
        <author/>
        <originating_organization/>
        <authorization/>
        <originating_system>ECCO RUNTIME SYSTEM V3.1.3</originating_system>
        <preprocessor_version>ECCO RUNTIME SYSTEM BUILT-IN PREPROCESSOR V3.1.3</preprocessor_version>
        <documentation/>
    </iso_10303_28_header>
    <express_data id="DS1">
        <osb:uos xmlns="urn:iso10303-28:oseb/Ap239_product_life_cycle_support_arm_lf" xmlns:osb="urn:iso10303-28:oseb"
schema_name="Ap239_product_life_cycle_support_arm_lf" schema_identifier="ap239_product_life_cycle_support_arm_lf" c="ID11 ID14
ID16 ID18 ID20 ID22 ID24 ID29
  ID30 ID33 ID35 ID37 ID41 ID45 ID48 ID51
  ID54 ID58 ID61 ID64 ID66 ID69 ID71 ID72
  ID74 ID78 ID80 ID82 ID83 ID86 ID90 ID92
  ID94 ID95 ID98 ID99 ID101 ID103 ID106 ID110
  ID114 ID118 ID121 ID124 ID127 ID130">
            <Part x-id="ID1" Id="/IGNORE" Name="/IGNORE"/>
            <Part_version x-id="ID2" Id="/IGNORE" Of_product-r="ID1"/>
            <Part_view_definition x-id="ID3" Id="" Initial_context-r="ID4" Additional_contexts-r="id1" Defined_version-r="ID2"/>
            <osb:ctn x-id="id1" ctype="View_definition_context[]">
            </osb:ctn>
            <View_definition_context x-id="ID4" Application_domain="/IGNORE" Life_cycle_stage="/IGNORE"/>
            <Identification_assignment x-id="ID5" Identifier="123456" Role="" Items-r="id2"/>
            <osb:ctn x-id="id2" ctype="Identification_item[]">
                <c>ID1</c>
            </osb:ctn>
            <Identification_assignment x-id="ID6" Identifier="Truck 143" Role="" Items-r="id3"/>
            <osb:ctn x-id="id3" ctype="Identification_item[]">
                <c>ID1</c>
            </osb:ctn>
            <Identification_assignment x-id="ID7" Identifier="A" Role="" Items-r="id4"/>
            <osb:ctn x-id="id4" ctype="Identification_item[]">
                <c>ID2</c>
            </osb:ctn>
            <Organization_or_person_in_organization_assignment x-id="ID8" Assigned_entity-s="ID9" Role="" Items-r="id5"/>
            <osb:ctn x-id="id5" ctype="Organization_or_person_in_organization_item[]">
                <c>ID5</c>
                <c>ID6</c>
                <c>ID7</c>
            </osb:ctn>
            <Organization x-id="ID9" Name="/IGNORE"/>
            <Identification_assignment x-id="ID10" Identifier="ABC" Role="" Items-r="id6"/>
            <osb:ctn x-id="id6" ctype="Identification_item[]">
                <c>ID9</c>
```

```
</osb:ctn>
<Classification_assignment x-id="ID11" Assigned_class-r="ID12" Items-r="id7"/>
<osb:ctn x-id="id7" ctype="Classification_item[]">
    <c>ID4</c>
</osb:ctn>
<External_class x-id="ID12" Id="" Name="Design" External_source-r="ID13"/>
<External_class_library x-id="ID13" Id="urn:iso:std:iso:10303-239"/>
<Classification_assignment x-id="ID14" Assigned_class-r="ID15" Items-r="id8"/>
<osb:ctn x-id="id8" ctype="Classification_item[]">
    <c>ID4</c>
</osb:ctn>
<External_class x-id="ID15" Id="" Name="Mechanical_design" External_source-r="ID13"/>
<Classification_assignment x-id="ID16" Assigned_class-r="ID17" Items-r="id9"/>
<osb:ctn x-id="id9" ctype="Classification_item[]">
    <c>ID5</c>
</osb:ctn>
<External_class x-id="ID17" Id="" Name="Part_identification" External_source-r="ID13"/>
<Classification_assignment x-id="ID18" Assigned_class-r="ID19" Items-r="id10"/>
<osb:ctn x-id="id10" ctype="Classification_item[]">
    <c>ID6</c>
</osb:ctn>
<External_class x-id="ID19" Id="" Name="Part_name" External_source-r="ID13"/>
<Classification_assignment x-id="ID20" Assigned_class-r="ID21" Items-r="id11"/>
<osb:ctn x-id="id11" ctype="Classification_item[]">
    <c>ID7</c>
</osb:ctn>
<External_class x-id="ID21" Id="" Name="Version_identification" External_source-r="ID13"/>
<Classification_assignment x-id="ID22" Assigned_class-r="ID23" Items-r="id12"/>
<osb:ctn x-id="id12" ctype="Classification_item[]">
    <c>ID10</c>
</osb:ctn>
<External_class x-id="ID23" Id="" Name="Name" External_source-r="ID13"/>
<Classification_assignment x-id="ID24" Assigned_class-r="ID25" Items-r="id13"/>
<osb:ctn x-id="id13" ctype="Classification_item[]">
    <c>ID8</c>
</osb:ctn>
<External_class x-id="ID25" Id="" Name="Owner_of" External_source-r="ID13"/>
<Product_as_individual x-id="ID26" Id="/IGNORE"/>
<Product_as_realized x-id="ID27" Id="/IGNORE" Of_product-r="ID26"/>
<Product_as_individual_view x-id="ID28" Id="" Initial_context-r="ID4" Additional_contexts-r="id14" Defined_version-
r="ID27"/>
<osb:ctn x-id="id14" ctype="View_definition_context[]">
</osb:ctn>
<Product_design_to_individual x-id="ID29" Product_design-r="ID1" Individual_product-r="ID26"/>
<Product_design_version_to_individual x-id="ID30" Product_design_version-r="ID2" Individual_product-r="ID27"/>
<Identification_assignment x-id="ID31" Identifier="1111:2222" Role="" Items-r="id15"/>
<osb:ctn x-id="id15" ctype="Identification_item[]">
    <c>ID26</c>
</osb:ctn>
<Identification_assignment x-id="ID32" Identifier="3" Role="" Items-r="id16"/>
<osb:ctn x-id="id16" ctype="Identification_item[]">
    <c>ID27</c>
</osb:ctn>
<Classification_assignment x-id="ID33" Assigned_class-r="ID34" Items-r="id17"/>
<osb:ctn x-id="id17" ctype="Classification_item[]">
    <c>ID31</c>
```

```
</osb:ctn>
<External_class x-id="ID34" Id="" Name="BEP-A040.p" External_source-r="ID39"/>
<Classification_assignment x-id="ID35" Assigned_class-r="ID36" Items-r="id18"/>
<osb:ctn x-id="id18" ctype="Classification_item[]">
    <c>ID32</c>
</osb:ctn>
<External_class x-id="ID36" Id="" Name="Version_identification_code" External_source-r="ID13"/>
<Subset x-id="ID37" Subset-r="ID34" Superset-r="ID38"/>
<External_class x-id="ID38" Id="" Name="Serial_identification_code" External_source-r="ID13"/>
<External_class_library x-id="ID39" Id="urn:iso:std:iso:21308"/>
<Assigned_property x-id="ID40" Name="/IGNORE" Described_element-s="ID3"/>
<Property_representation x-id="ID41" Property-r="ID40" Rep-r="ID42"/>
<Representation x-id="ID42" Name="" Context_of_items-r="ID44" Items-r="id19"/>
<osb:ctn x-id="id19" ctype="Representation_item[]">
    <c>ID43</c>
</osb:ctn>
<String_representation_item x-id="ID43" Name="" String_value="swap body truck"/>
<Representation_context x-id="ID44" Id="" Kind=""/>
<Classification_assignment x-id="ID45" Assigned_class-r="ID46" Items-r="id20"/>
<osb:ctn x-id="id20" ctype="Classification_item[]">
    <c>ID40</c>
</osb:ctn>
<External_class x-id="ID46" Id="" Name="BEP-G001" External_source-r="ID39"/>
<Assigned_property x-id="ID47" Name="/IGNORE" Described_element-s="ID3"/>
<Property_representation x-id="ID48" Property-r="ID47" Rep-r="ID49"/>
<Representation x-id="ID49" Name="" Context_of_items-r="ID44" Items-r="id21"/>
<osb:ctn x-id="id21" ctype="Representation_item[]">
    <c>ID50</c>
</osb:ctn>
<String_representation_item x-id="ID50" Name="" String_value="24V, 180 Ah"/>
<Classification_assignment x-id="ID51" Assigned_class-r="ID52" Items-r="id22"/>
<osb:ctn x-id="id22" ctype="Classification_item[]">
    <c>ID47</c>
</osb:ctn>
<External_class x-id="ID52" Id="" Name="BEP-G081.1" External_source-r="ID39"/>
<Assigned_property x-id="ID53" Name="/IGNORE" Described_element-s="ID28"/>
<Property_representation x-id="ID54" Property-r="ID53" Rep-r="ID55"/>
<Property_value_representation x-id="ID55" Name="" Context_of_items-r="ID57" Items-r="id23"/>
<osb:ctn x-id="id23" ctype="Representation_item[]">
    <c>ID56</c>
</osb:ctn>
<Numerical_item_with_unit x-id="ID56" Name="" Unit-r="ID60" Value_component-s="id24"/>
<Any_number_value x-id="id24" val="4600"/>
<Numerical_representation_context x-id="ID57" Id="" Kind=""/>
<Classification_assignment x-id="ID58" Assigned_class-r="ID59" Items-r="id25"/>
<osb:ctn x-id="id25" ctype="Classification_item[]">
    <c>ID53</c>
</osb:ctn>
<External_class x-id="ID59" Id="" Name="BEP-L031.2" External_source-r="ID39"/>
<Unit x-id="ID60" Name="/IGNORE" Si_unit="true"/>
<Classification_assignment x-id="ID61" Assigned_class-r="ID62" Items-r="id26"/>
<osb:ctn x-id="id26" ctype="Classification_item[]">
    <c>ID60</c>
</osb:ctn>
<External_class x-id="ID62" Id="" Name="mm" External_source-r="ID13"/>
<Identification_assignment x-id="ID63" Identifier="Company ID" Role="" Items-r="id27"/>
<osb:ctn x-id="id27" ctype="Identification_item[]">
    <c>ID9</c>
```

```
</osb:ctn>
<Classification_assignment x-id="ID64" Assigned_class-r="ID65" Items-r="id28"/>
<osb:ctn x-id="id28" ctype="Classification_item[]">
    <c>ID63</c>
</osb:ctn>
<External_class x-id="ID65" Id="" Name="BEP-A001.p" External_source-r="ID39"/>
<Subset x-id="ID66" Id="" Name="" Subset-r="ID65" Superset-r="ID67"/>
<External_class x-id="ID67" Id="" Name="Organization_identification" External_source-r="ID13"/>
<Identification_assignment x-id="ID68" Identifier="Company Name" Role="" Items-r="id29"/>
<osb:ctn x-id="id29" ctype="Identification_item[]">
    <c>ID9</c>
</osb:ctn>
<Classification_assignment x-id="ID69" Assigned_class-r="ID70" Items-r="id30"/>
<osb:ctn x-id="id30" ctype="Classification_item[]">
    <c>ID68</c>
</osb:ctn>
<External_class x-id="ID70" Id="" Name="BEP-A002.p" External_source-r="ID39"/>
<Subset x-id="ID71" Id="" Name="" Subset-r="ID70" Superset-r="ID23"/>
<Address_assignment x-id="ID72" Assigned_address-r="ID73" Located_person_organizations-r="id31"/>
<osb:ctn x-id="id31" ctype="Organization_or_person_in_organization_select[]">
    <c>ID9</c>
</osb:ctn>
<Address x-id="ID73" Postal_box="4325" Postal_code="SE-11100" Country="Sweden"/>
<Classification_assignment x-id="ID74" Assigned_class-r="ID75" Items-r="id32"/>
<osb:ctn x-id="id32" ctype="Classification_item[]">
    <c>ID73</c>
</osb:ctn>
<External_class x-id="ID75" Id="" Name="BEP-A003.p" External_source-r="ID39"/>
<Project x-id="ID76" Id="/IGNORE" Name="" Responsible_organizations-r="id33"/>
<osb:ctn x-id="id33" ctype="Organization[]">
</osb:ctn>
<Identification_assignment x-id="ID77" Identifier="Proj_0134-332" Role="" Items-r="id34"/>
<osb:ctn x-id="id34" ctype="Identification_item[]">
    <c>ID76</c>
</osb:ctn>
<Classification_assignment x-id="ID78" Assigned_class-r="ID79" Items-r="id35"/>
<osb:ctn x-id="id35" ctype="Classification_item[]">
    <c>ID77</c>
</osb:ctn>
<External_class x-id="ID79" Id="" Name="BEP-A010.p" External_source-r="ID39"/>
<Document_assignment x-id="ID80" Assigned_document-s="ID81" Is_assigned_to-s="ID76" Role=""/>
<Document x-id="ID81" Id=""/>
<Document_version x-id="ID82" Description="This is the description of ..." Of_product-r="ID81"/>
<Classification_assignment x-id="ID83" Assigned_class-r="ID84" Items-r="id36"/>
<osb:ctn x-id="id36" ctype="Classification_item[]">
    <c>ID81</c>
</osb:ctn>
<External_class x-id="ID84" Id="" Name="BEP-A011.p" External_source-r="ID39"/>
<Identification_assignment x-id="ID85" Identifier="Rev 3" Role="" Items-r="id37"/>
<osb:ctn x-id="id37" ctype="Identification_item[]">
    <c>ID76</c>
</osb:ctn>
<Classification_assignment x-id="ID86" Assigned_class-r="ID87" Items-r="id38"/>
<osb:ctn x-id="id38" ctype="Classification_item[]">
    <c>ID85</c>
</osb:ctn>
```

<External_class x-id="ID87" Id="" Name="BEP-A032.p" External_source-r="ID39"/>
<Date_or_date_time_assignment x-id="ID88" Assigned_date-s="ID89" Role="" Items-r="id39"/>
<osb:ctn x-id="id39" ctype="Date_or_date_time_item[]">
<c>ID76</c>
</osb:ctn>
<Calendar_date x-id="ID89" Year_component="2006" Month_component="1" Day_component="15"/>
<Classification_assignment x-id="ID90" Assigned_class-r="ID91" Items-r="id40"/>
<osb:ctn x-id="id40" ctype="Classification_item[]">
<c>ID88</c>
</osb:ctn>
<External_class x-id="ID91" Id="" Name="BEP-A033.p" External_source-r="ID39"/>
<Document_assignment x-id="ID92" Assigned_document-s="ID93" Is_assigned_to-s="ID76" Role=""/>
<Document x-id="ID93" Id=""/>
<Document_version x-id="ID94" Id="" Description="Written comments of changes...." Of_product-r="ID93"/>
<Classification_assignment x-id="ID95" Assigned_class-r="ID96" Items-r="id41"/>
<osb:ctn x-id="id41" ctype="Classification_item[]">
<c>ID93</c>
</osb:ctn>
<External_class x-id="ID96" Id="" Name="BEP-A034.p" External_source-r="ID39"/>
<Contract x-id="ID97" Id="/IGNORE" Purpose="" Kind=""/>
<Contract_assignment x-id="ID98" Assigned_contract-r="ID97" Items-r="id42"/>
<osb:ctn x-id="id42" ctype="Contract_item[]">
<c>ID26</c>
<c>ID76</c>
</osb:ctn>
<Classification_assignment x-id="ID99" Assigned_class-r="ID100" Items-r="id43"/>
<osb:ctn x-id="id43" ctype="Classification_item[]">
<c>ID97</c>
</osb:ctn>
<Class x-id="ID100" Id="" Name="Purchase_order"/>
<Document_assignment x-id="ID101" Assigned_document-s="ID102" Is_assigned_to-s="ID97" Role=""/>
<Document x-id="ID102" Id=""/>
<Classification_assignment x-id="ID103" Assigned_class-r="ID104" Items-r="id44"/>
<osb:ctn x-id="id44" ctype="Classification_item[]">
<c>ID102</c>
</osb:ctn>
<External_class x-id="ID104" Id="" Name="BEP-A020.p" External_source-r="ID39"/>
<Identification_assignment x-id="ID105" Identifier="4225_8676" Role="" Items-r="id45"/>
<osb:ctn x-id="id45" ctype="Identification_item[]">
<c>ID97</c>
</osb:ctn>
<Classification_assignment x-id="ID106" Assigned_class-r="ID107" Items-r="id46"/>
<osb:ctn x-id="id46" ctype="Classification_item[]">
<c>ID105</c>
</osb:ctn>
<External_class x-id="ID107" Id="" Name="BEP-A030.p" External_source-r="ID39"/>
<Date_or_date_time_assignment x-id="ID108" Assigned_date-s="ID109" Role="" Items-r="id47"/>
<osb:ctn x-id="id47" ctype="Date_or_date_time_item[]">
<c>ID97</c>
</osb:ctn>
<Calendar_date x-id="ID109" Year_component="2006" Month_component="4" Day_component="5"/>
<Classification_assignment x-id="ID110" Assigned_class-r="ID111" Items-r="id48"/>
<osb:ctn x-id="id48" ctype="Classification_item[]">
<c>ID108</c>
</osb:ctn>
<External_class x-id="ID111" Id="" Name="BEP-A031.p" External_source-r="ID39"/>
<Date_or_date_time_assignment x-id="ID112" Assigned_date-s="ID113" Role="" Items-r="id49"/>

```
            <osb:ctn x-id="id49" ctype="Date_or_date_time_item[]">
                <c>ID27</c>
            </osb:ctn>
            <Calendar_date x-id="ID113" Year_component="2006" Month_component="4" Day_component="6"/>
            <Classification_assignment x-id="ID114" Assigned_class-r="ID115" Items-r="id50"/>
            <osb:ctn x-id="id50" ctype="Classification_item[]">
                <c>ID112</c>
            </osb:ctn>
            <External_class x-id="ID115" Id="" Name="BEP-A021.p" External_source-r="ID39"/>
            <Date_or_date_time_assignment x-id="ID116" Assigned_date-s="ID117" Role="" Items-r="id51"/>
            <osb:ctn x-id="id51" ctype="Date_or_date_time_item[]">
                <c>ID27</c>
            </osb:ctn>
            <Calendar_date x-id="ID117" Year_component="2006" Month_component="4" Day_component="7"/>
            <Classification_assignment x-id="ID118" Assigned_class-r="ID119" Items-r="id52"/>
            <osb:ctn x-id="id52" ctype="Classification_item[]">
                <c>ID116</c>
            </osb:ctn>
            <External_class x-id="ID119" Id="" Name="BEP-A051.p" External_source-r="ID39"/>
            <Assigned_property x-id="ID120" Name="/IGNORE" Described_element-s="ID3"/>
            <Property_representation x-id="ID121" Property-r="ID120" Rep-r="ID122"/>
            <Representation x-id="ID122" Name="" Context_of_items-r="ID44" Items-r="id53"/>
            <osb:ctn x-id="id53" ctype="Representation_item[]">
                <c>ID123</c>
            </osb:ctn>
            <String_representation_item x-id="ID123" Name="" String_value="Legal_reference"/>
            <Classification_assignment x-id="ID124" Assigned_class-r="ID125" Items-r="id54"/>
            <osb:ctn x-id="id54" ctype="Classification_item[]">
                <c>ID120</c>
            </osb:ctn>
            <External_class x-id="ID125" Id="" Name="BEP-A070.p" External_source-r="ID39"/>
            <Assigned_property x-id="ID126" Name="/IGNORE" Described_element-s="ID3"/>
            <Property_representation x-id="ID127" Property-r="ID126" Rep-r="ID128"/>
            <Representation x-id="ID128" Name="" Context_of_items-r="ID44" Items-r="id55"/>
            <osb:ctn x-id="id55" ctype="Representation_item[]">
                <c>ID129</c>
            </osb:ctn>
            <String_representation_item x-id="ID129" String_value="SE"/>
            <Classification_assignment x-id="ID130" Assigned_class-r="ID131" Items-r="id56"/>
            <osb:ctn x-id="id56" ctype="Classification_item[]">
                <c>ID126</c>
            </osb:ctn>
            <External_class x-id="ID131" Id="" Name="BEP-A060" External_source-r="ID39"/>
        </osb:uos>
    </express_data>
</iso_10303_28>
```

Bibliography

[1] ISO 3833, *Road vehicles — Types — Terms and definitions*

[2] ISO 10303-21:2002, *Industrial automation systems and integration — Product data representation and exchange — Part 21: Implementation methods: Clear text encoding of the exchange structure*

[3] ISO/TS 10303-28:2003, *Industrial automation systems and integration — Product data representation and exchange — Part 28: Implementation methods: XML representations of EXPRESS schemas and data*

[4] ISO 10303-203, *Industrial automation systems and integration — Product data representation and exchange — Part 203: Application protocol: Configuration controlled 3D design of mechanical parts and assemblies* (modular version)

[5] ISO 10303-214, *Industrial automation systems and integration — Product data representation and exchange — Part 214: Application protocol: Core data for automotive mechanical design processes*

ICS 43.080.01

Price based on 32 pages