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ISO 13143-1

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Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to ISO 12813 —

Part 1:
Test suite structure and test purposes

Perception du télépéage — Évaluation des équipements embarqués et en bord de route quant à la conformité avec l'ISO 12813 —

Partie 1: Structure de suite d'essais et buts des essais

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International Organization for Standardization

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

This first edition of ISO 13143-1 cancels and replaces the first edition of ISO/TS 13143-1:2011, which has been technically revised and incorporates the following main modifications compared to ISO/TS 13143-1:

— conversion from a Technical Specification to an International Standard;

— amendment of terms, in order to reflect harmonization of terms across electronic fee collection (EFC) standards;

— amendments to reflect changes to the underlying requirements standards, in particular ISO 12813 and ISO 14906;

— editorial and formal corrections.

A list of all parts in the ISO 13143 series can be found on the ISO website.

Introduction

ISO 17575 is part of a set of standards that supports interoperability of autonomous EFC-systems. It defines the EFC context data, their charge reports and their use of communication infrastructure.

The set of standards also supports short-range communication links in the context of autonomous electronic fee collection (EFC) on-board equipment (OBE) to enable spot checks for the enforcement process. The application interface is defined in ISO 12813:2015.

Within the set of EFC standards, this document defines the process and tests for conformity evaluation of OBE and roadside equipment (RSE) that comply with the requirements in ISO 12813:2015.

This document is intended to

— assess OBU and RSE capabilities,

— assess OBU and RSE behaviour,

— serve as a guide for OBU and RSE conformance evaluation and type approval,

— achieve comparability between the results of the corresponding tests applied in different places at different times, and

— facilitate communication between parties.

This document is based on

— ISO 12813:2015,

— the set of dedicated short-range communication (DSRC) standards defining the communication stack, and

— ISO/IEC 9646.

This document is based on using the tree and tabular combined notation (TTCN) that is a standardized language suitable for specification of test cases and steps for assessment of protocol and application behaviour. The TTCN language is also supported by modern automated tools that accelerate software design, implementation and testing.

Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to ISO 12813 —

Part 1:
Test suite structure and test purposes

1 Scope

This document specifies the test suite structure (TSS) and test purposes (TP) to evaluate the conformity of on-board units (OBU) and roadside equipment (RSE) to ISO 12813:2015.

It provides a basis for conformance tests for dedicated short-range communication (DSRC) equipment (on-board units and roadside units) to enable interoperability between different equipment supplied by different manufacturers.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 12813:2015, *Electronic fee collection — Compliance check communication for autonomous systems*

ISO 14906:1/Amd 1:2015, *Electronic fee collection — Application interface definition for dedicated short-range communication / Amendment 1*

ISO/TS 14907-2:2016, *Electronic fee collection — Test procedures for user and fixed equipment — Part 2: Conformance test for the on-board unit application interface*

EN 15509:2014, *Electronic fee collection — Interoperability application profile for DSRC*

EN 15876-1:2016, *Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to EN 15509 — Part 1: Test suite structure and test purposes*

ETSI/TS 102 486-2-2 V1.2.1 (2008-10), *Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 2: DSRC application layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
access credentials
trusted attestation or secure module that establishes the claimed identity of an object or application

Note 1 to entry: Access credentials carry information needed to fulfil access conditions in order to perform the operation on the addressed element in the OBE. Access credentials can carry passwords, as well as cryptography-based information such as authenticators.

[SOURCE: EN 15509:2014, 3.1]

3.2
attribute
addressable package of data consisting of a single data element or structured sequences of data elements

[SOURCE: ISO 17575-1:2016, 3.2]

3.3
authentication
security mechanism allowing verification of the provided identity

[SOURCE: EN 301 175]

3.4
authenticator
data, possibly encrypted, that is used for authentication

[SOURCE: EN 15509:2014, 3.3]

3.5
cryptography
principles, means and methods for the transformation of data in order to hide its information content, prevent its undetected modification or prevent its unauthorised use

[SOURCE: EN 15509:2014, 3.6]

3.6
data group
class of closely related attributes

[SOURCE: ISO 17575-1:2016, 3.10]

3.7
Element
<DSRC> directory containing application information in the form of attributes

[SOURCE: ISO 14906:2011, 3.11 modified]

3.8
implementation conformance statement
statement of capabilities and options that have been implemented defining to what extent the implementation is compliant with a given specification

[SOURCE: ISO/TS 14907-2:2016, 3.16]

3.9
implementation extra information for testing
statement containing all of the information related to the implementation under test (IUT) and its corresponding system under test (SUT) which will enable the testing laboratory to run an appropriate test suite against that IUT

[SOURCE: ISO/TS 19015:2000, 3.20]

3.10
on-board equipment
OBE
all required equipment on-board a vehicle for performing required EFC functions and communication services

3.11
on-board unit
OBU
single electronic unit on-board a vehicle for performing specific EFC functions and for communication with external systems

3.12
roadside equipment
RSE
equipment located along the road, either fixed or mobile

[SOURCE: ISO/TS 19299:2015, 3.34]

3.13
tester
combination of equipment, humans and processes able to perform specified conformance tests

[SOURCE: EN 15876-1:2016, 3.12]

3.15
transaction
whole of the exchange of information between two physically separated communication facilities

[SOURCE: ISO 17575-1:2016, 3.21]

4   Abbreviated terms

AC_CR   Access Credentials

ADU   Application Data Unit

APDU   Application Protocol Data Unit (ISO 14906)

AP   Application Process

ASN.1   Abstract Syntax Notation One (ISO/IEC 8824-1)

ATS   Abstract Test Suite

BI   Behaviour Invalid (i.e. Invalid Behaviour tests)

B-Kernel   Broadcast Kernel

BST   Beacon Service Table (ISO 14906)

BV   Behaviour Valid (i.e. Valid Behaviour tests)

cf   Confirm

DLC   Data link Control

DSRC   Dedicated Short-Range Communication (ISO 14906)

DUT   Device Under Test (ISO/TS 14907-2)

3

EID   Element Identifier

EFC   Electronic Fee Collection (ISO 17573)

ICS   Implementation Conformance Statement

LLC   Logical Link Control (EN 12795)

MAC   Medium Access Control (EN 12795)

PCTR   Protocol Conformance Test Report

PDU   Protocol Data Unit

PIXIT   Protocol Implementation eXtra Information for Testing

TSS   Test Suite Structure

VST   Vehicle Service Table (ISO 14906)

5 Test suite structure (TSS)

5.1 Structure

Table 1 shows the Test suite structure (TSS) including its subgroups that are inherited from other specifications.

Table 1 — Test suite structure

Group	Type of DUT	Behaviour
Physical layer	On-board unit	Valid behaviour
		Invalid behaviour
	Roadside equipment	Valid behaviour
		Invalid behaviour
DLC MAC sublayer	On-board unit	Valid behaviour
		Invalid behaviour
	Roadside equipment	Valid behaviour
		Invalid behaviour
DLC LLC sublayer	On-board unit	Valid behaviour
		Invalid behaviour
	Roadside equipment	Valid behaviour
		Invalid behaviour
Application layer	On-board unit	Valid behaviour
		Invalid behaviour
	Roadside equipment	Valid behaviour
		Invalid behaviour

Physical layer tests are to be performed in a radio wave laboratory. They will not form part of the ATS.

5.2 Reference to conformance test specifications

Conformance to a profile standard implies conformance to the related base standards; hence, a number of test cases for the CCC application are exactly the same as the conformance test cases for the related base standards. Other test cases are derived from the base standards conformance test

cases, by applying some restrictions or choices in, for example, the parameters values, according to what is stated in the profile standard. Finally, specific conformance test cases for the CCC application are identified for statements contained in the CCC application, which have no equivalence in the base standards. These latter cases cover for example the application layer data test purposes. This document takes into account already defined test purposes for conformance to the base standards by referencing them, so that:

a) For test purposes that are identical to those defined in the base standards conformance test cases (see e.g. ETSI/TS 102 486-2-2 or EN 15876-1), a direct reference is reported. For reader's convenience, the title or a verbal description of the referenced test purpose is given, together with the reference.

b) For test purposes that are **derived** from those defined in the base standards conformance test cases, a direct reference is reported, plus an indication on how the referred test purpose has to be modified for the profile conformance testing.

c) For test purposes that are **specific to the standard profile**, a complete description is given.

An indication on whether a test purpose is **identical**, **derived**, or **specific** is given in each test purpose.

5.3 Test purposes (TP)

5.3.1 TP definition conventions

The TPs are defined following the rules shown in Table 2. All test purposes are defined in Annex A and Annex B.

Table 2 — TP Definition Rules

TP ID according to the TP naming conventions		Title
		Reference
		TP origin
		Initial condition
		Stimulus and expected behaviour
TP ID		The TP ID is a unique identifier. It shall be specified according to the TP naming conventions defined in the sub-clause below.
Title		Short description of test purpose objective.
Reference		The reference should contain the references of the subject to be validated by the actual TP (specification reference, clause, paragraph), or the reference to the standard document defining the TP.
TP origin		Indicates if the TP is **identical** to a TP defined in another test standard, **derived** from a TP defined in another test standard, or **specific** for this standard profile.
Initial condition		The condition defines in which initial state the DUT has to be to apply the actual TP.
Stimulus and expected behaviour		Definition of the events the tester performs, and the events that are expected from the DUT to conform to the base specification.

5.3.2 TP naming conventions

Each TP is given a unique identification. This unique identification is built up to contain the following string of information:

TP/ <group>/<dut>/<x>-<nn>

TP   : to indicate that it is a test purpose;

<group>   : which group among those defined in Table 1 does the TP apply to;

<dut>   : type of DUT (i.e. OBU or RSE);

<x>   : type of testing (i.e. Valid behaviour tests, BV, or Invalid behaviour tests, BI);

<nn>   : sequential TP number (01 to 99).

The naming conventions are as described in Table 3.

Table 3 — TP naming convention

Identifier: TP/ <group> / <dut> / <x> - <nn>		
<group>		
applicable for OBU/RSE	PHY	Physical layer
applicable for OBU/RSE	MAC/LLC	MAC/LLC sublayer
applicable for OBU/RSE	AP-BAS	Application layer – I Kernel support
applicable for OBU	AP-FUN	Application layer – T Kernel support
applicable for OBU	AP-DAT	Application layer – Data attributes support
applicable for OBU	AP-SEC	Application layer – Security Level 1 support
applicable for RSE	AP-GET	Application layer - GET-rq PDU test purposes,
applicable for RSE	AP-STA	Application layer - GET-STAMPED-rq PDU test purposes
applicable for RSE	AP-MMI	Application layer - SET-MMI-rq PDU test purposes
applicable for RSE	AP-ECH	Application layer - ECHO-rq PDU test purposes
applicable for RSE	AP-REL	Application layer - EVENT-REPORT-rq PDU test purposes
<dut> = type of DUT	OBU	On-board unit
	RSE	Roadside equipment
x = Type of testing	BV	Valid behaviour tests
	BI	Invalid behaviour tests
<nn> = sequential number	(01–99)	Test purpose number

5.4 Conformance test report

The manufacturer of the OBU and RSE, respectively, is responsible for providing a conformance test report.

The manufacturer of the OBU shall complete the protocol conformance test report (PCTR) for on-board units as defined in Annex C.

The manufacturer of the RSE shall complete the PCTR for roadside equipment as defined in Annex D.

Annex A
(normative)

Test purposes for on-board units

A.1 General

This annex contains the test purposes (TP) for the conformity evaluation of OBUs to ISO 12813.

A.1.1 Symbols in TP descriptions

For the application layer test purposes, a special notation and symbol convention is used, as defined in what follows.

Symbols are used in the description of the TPs, with meanings according to Table A.1.

Table A.1 — Description of TP Symbols

SYMBOL	DESCRIPTION
XXX.rq ⇒	The Tester sends the XXX.rq PDU to the DUT
⇐ YYY.rs	The DUT sends the YYY.rs PDU to the Tester
A ≡ B	Test purpose A "is congruent to" test purpose B. The notation Test purpose A ≡ Test purpose B means that the Test purpose A is the same as Test purpose B. If differences in parameters or parameter values have to be applied, these differences are indicated in the text immediately below.
A → B	Object A "is transformed" into Object B. So a notation like "Table X → Table Y" means that, for the scope of the Test purpose, any reference of Table X should be changed into references to Table Y.
=	Means "assignment". That is, a notation like "accessCredentials = a value" means that the field accessCredentials is given a value.
Ø	Means "empty" or "not set". So, a notation like "accessCredentials = Ø → accessCredentials = calculated value", for a given Test purpose, means "change all occurrences in which the field accessCredentials has not been assigned to calculation of the value accessCredentials to a given value.

A.2 Physical layer

Per ISO 12813:2015, 5.5.2, all test purposes TP/PHY/OBU/Bx/yy defined in EN 15876-1 are applicable for the conformity evaluation of OBUs to CEN–DSRC based CCC as claimed in ISO/TS 12813:2015, Table B.8, Item 1.

A.3 MAC and LLC

Per ISO 12813:2015, 5.5.2, all test purposes TP/MAC/OBU/Bx/yy and TP/LLC/OBU/Bx/yy defined in EN 15876-1 are applicable for the conformity evaluation of OBUs to CEN–DSRC based CCC as claimed in ISO 12813:2015, Table B.8, Item 1.

A.4 Application Layer

A.4.1 Structure of BST and VST

A.4.1.1 BST

The BST general structure, as is transmitted to the OBU, is described in Table A.2.

Table A.2 — BST general structure

			Length	Allowed Values
T-APDUs			4 bit	'1000' indicating initialisation-request (BST)
Option indicator			1 bit (nonmandApplications opt.)	0/1
rsu	manufacturerid		16 bits	See ISO 14816
	individualid		27 bits	as specified by manufacturer
Time			32 bits	UNIX real time
profile			1 bit (Profile ext.)	0 (= no extension)
			7 bits	See Profile in EN 12834:2003, Annex A and EN 13372, 6.3.2
MandAp-plications			1 bit (mandApplications ext.)	0 (= no extension)
			7 bits (number of applications)	M
	CCC Applica-tion		1 bit (eid opt.)	0 (= eid not present)
			1 bit (parameter opt.)	0 (= parameter not present)
		aid	1 bit (aid ext.)	0 (= no extension)
			5 bits	20 (= CCC application)
	Applica-tion 2 (not CCC)		1 bit (eid opt.)	0/1
			1 bit (parameter opt.)	0/1
		aid	1 bit (aid ext.)	0 (= no extension)
			5 bits	20 (= CCC application)
		eid	1 bit (eid ext.)	0 (= no extension)
			7 bits	any
		parameter		See ApplicationContextMark in EN 12834:2003, Annex A
	...		...	...
	Application M (not CCC)		1 bit (eid opt.)	0/1
			1 bit (parameter opt.)	0/1
		aid	1 bit (aid ext.)	0 (= no extension)
			5 bits	20 (= CCC application)
		eid	1 bit (eid ext.)	0 (= no extension)
			7 bits	any
		parameter		See ApplicationContextMark in EN 12834:2003, Annex A
non-mandAp plications			1 bit (mandApplications ext.)	0 (= no extension)
			7 bits (number of applications)	N
	Application 1 (not EFC)		See "Application 2 (not EFC)" of mandApplications	
	...		...	
	Application N (not EFC)		See "Application 2 (not EFC)" of mandApplications	
profileList			1 bit (profileList ext.)	0 (= no extension)
			7 bits (number of profiles)	K
	Profile 1		1 bit (Profile ext.)	0 (= no extension)

Table A.2 *(continued)*

		Length	Allowed Values
		7 bits	See Profile in EN 12834:2003, Annex A and EN 13372, 6.3.2
	…	…	…
	Profile K	1 bit (Profile ext.)	0 (= no extension)
		7 bits	See Profile in EN 12834:2003, Annex A and EN 13372, 6.3.2

A.4.1.2   VST

The VST general structure, as is transmitted by the OBU, is described in Table A.3.

Table A.3 — VST general structure (security level 1)

					Length	Allowed value
fill					4 bits	any
profile					1 bit (Profile ext.)	0 (= no extension)
					7 bits	See Profile in EN 12834:2003, Annex A
applications					1 bit (applications ext.)	0 (= no extension)
					7 bits (number of applic.)	M
	CCC Application	parameter			1 bit (eid opt.)	1 (= eid present)
					1 bit (parameter opt.)	1 (= parameter present)
			aid		1 bit (aid ext.)	0 (= no extension)
					5 bits	20 (= CCC application)
			eid		1 bit (eid ext.)	0 (= no extension)
					7 bits	any (≠ other eid used in this VST)
					1 bit (Container ext.)	0 (= no extension)
					7 bits (Container CHOICE)	2 (= OCTET STRING)
					1 bit (octet string ext.)	0 (= no extension)
					7 bits (octet string length)	16
			CCC-ContextMark	contract Provider	10 bits (CountryCode)	See ISO 3166-1
					14 bits (IssuerIdentifier)	See ISO 14816
				typeOf Contract	16 bits	any
				context Version	1 bit (contextVersion ext.)	0 (= no extension)
					7 bits	any
					1 bit (Container ext.)	0 (= no extension)
					7 bits (Container CHOICE)	2 (= OCTET STRING)
					1 bit (octet string ext.)	0 (= no extension)
					7 bits (octet string length)	2
			AC_CR-Reference	AC_Master KeyRef	8 bits	any
				AC_CR-Diversifier	8 bits	any
					1 bit (Container ext.)	0 (= no extension)
					7 bits (Container CHOICE)	2 (= OCTET STRING)
					1 bit (octet string ext.)	0 (= no extension)
					7 bits (octet string length)	4
			RndOBE		32 bits	any

Table A.3 *(continued)*

				Length	Allowed value
	Application 2			1 bit (eid opt.)	0/1
				1 bit (parameter opt.)	0/1
		aid		1 bit (aid ext.)	0 (= no extension)
				5 bits	See DSRCApplicationEntityID, EN 12834:2003, Annex A
		eid		1 bit (eid ext.)	0 (= no extension)
				7 bits	any (≠ other eid used in this VST)
		parameter			See ApplicationContextMark, EN 12834:2003, Annex A
	...			1 bit (eid opt.)	0/1
	Application M			1 bit (parameter opt.)	0/1
		aid		1 bit (aid ext.)	0 (= no extension)
				5 bits	See DSRCApplicationEntityID, EN 12834:2003, Annex A
		eid		1 bit (eid ext.)	0 (= no extension)
				7 bits	any (≠ other eid used in this VST)
		parameter			See ApplicationContextMark, EN 12834:2003, Annex A
obe Configuration				1 bit (obeStatus opt.)	0/1
	equipmentClass			15 bits	any
	manufacturerId			16 bits	any
	obeStatus			16 bits	any

A.4.2   PDUs parameters

A.4.2.1   Parameters of request PDUs

The following tables describe the valid format of the request APDUs:

— Table A.4;

— Table A.5;

— Table A.6;

— Table A.7;

— Table A.8.

No other request commands are used by CCC application.

Fill bits shall always be set to zero.

Table A.4 — GET-Rq parameters (security level 1)

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16
GET-Rq	fill			=
	eid			=
	accessCredentials	OPTIONAL	=	mandatory
	iid	OPTIONAL		prohibited
	attributeIdList	OPTIONAL		mandatory

Table A.5 — Action-Rq parameters for GET_STAMPED action (security level 1)

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16 and ISO 12813
AC-TION-Rq	mode			TRUE
	eid			=
	actionType			0 (GET_STAMPED)
	accessCredentials	OPTIONAL	=	mandatory
	actionParameters	OPTIONAL		GetStampedRq
	iid	OPTIONAL		prohibited

Table A.6 — Action-Rq parameters for SET_MMI action

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16 and ISO 12813
AC-TION-Rq	mode			=
	eid			0
	actionType			10 (SET_MMI)
	accessCredentials	OPTIONAL	=	prohibited
	actionParameters	OPTIONAL		SetMMIRq
	iid	OPTIONAL		prohibited

Table A.7 — Action-Rq parameters for ECHO action

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16 and ISO 12813
AC-TION-Rq	mode			=
	eid			0
	actionType			15 (ECHO)
	accessCredentials	OPTIONAL	=	prohibited
	actionParameters	OPTIONAL		mandatory
	iid	OPTIONAL		prohibited

Table A.8 — EVENT-REPORT-Rq parameters

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16 and ISO 12813
EVENT-RE-PORT-Rq	mode			=
	eid			0
	eventType			0 (release)
	accessCredentials	OPTIONAL	=	prohibited
	eventParameters	OPTIONAL		prohibited
	iid	OPTIONAL		prohibited

A.4.2.2 Parameters of response PDUs

The following tables describe the valid format of the request APDUs:

— Table A.9;

— Table A.10;

— Table A.11;

— Table A.12.

No other request commands are used by CCC application.

Fill bits always shall be set to zero.

Table A.9 — GET-Rs parameters

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16
GET-Rs	fill			=
	eid			=
	iid	OPTIONAL	=	prohibited
	attributeList	OPTIONAL		mandatory
	ret	OPTIONAL		mandatory

Table A.10 — Action-Rs parameters for GET_STAMPED action

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16 and ISO 12813
AC-TION-Rs	fill			=
	eid			=
	iid	OPTIONAL	=	prohibited
	responseParameter	OPTIONAL		mandatory
	ret	OPTIONAL		mandatory

Table A.11 — Action-Rs parameters for SET_MMI action

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16 and ISO 12813
AC-TION-Rs	fill			=
	eid			0
	iid	OPTIONAL	=	prohibited
	responseParameter	OPTIONAL		prohibited
	ret	OPTIONAL		mandatory

Table A.12 — Action-Rs parameters for ECHO action

	EN 12834:2003, Annex A		ISO 14906/Amd 1:2015, Annex A	EN 15509:2014, Table C.16 and ISO 12813
AC-TION-Rs	fill			=
	eid			0
	iid	OPTIONAL	=	prohibited
	responseParameter	OPTIONAL		conditional (present when ret = 0)
	ret	OPTIONAL		mandatory

A.4.3   Application I-kernel test purposes for on-board unit, security level 1

These Test purposes apply to the security level 1 as claimed in ISO 12813:2015, Table B.6, Item 1 and to initialization and termination processes claimed in ISO/TS 12813:2015, Table B.7, Items 1 and 5.

A.4.3.1 Data structures

For the purpose of this conformance test, the following BSTs described in

— Table A.13 and

— Table A.14

are transmitted to the DUT. Invalid values are indicated in **boldface**.

Table A.13 — BST1 (actual BST used, BV) valid BST

		Length	Value
Option indicator		1 bit (nonmandApplications opt.)	0 (= nonmandApplications not present)
RSU	manufacturerid	16 bits	registered value
	individualid	27 bits	any
Time		32 bits	any
profile		1 bit (Profile ext.)	0 (= no extension)
		7 bits	0
MandApplications		1 bit (mandApplications ext.)	0 (= no extension)
		7 bits (number of applications)	1
	CCC Application	1 bit (eid opt.)	0 (= eid not present)
		1 bit (parameter opt.)	0 (= parameter not present)
	aid	1 bit (aid ext.)	0 (= no extension)
		5 bits	20 (= CCC application)
profileList		1 bit (profileList ext.)	0 (= no extension)
		7 bits (number of profiles)	0 (= list empty)

Table A.14 — BST2 (actual BST used, BI) invalid BST: extraneous parameter (CCC application inserted as non-mandatory application)

		Length	Value
Option indicator		1 bit (nonmandApplications opt.)	1 (= nonmandApplications present)
RSU	manufacturerid	16 bits	registered value
	individualid	27 bits	any
Time		32 bits	any
profile		1 bit (Profile ext.)	0 (= no extension)
		7 bits	0
MandApplications		1 bit (mandApplications ext.)	0 (= no extension)
		7 bits (number of applications)	1
	Application #1 (not CCC)	1 bit (eid opt.)	1 (= eid present)
		1 bit (parameter opt.)	0 (= parameter not present)
	aid	1 bit (aid ext.)	0 (= no extension)
		5 bits	≠ 20 (AID that is not supported by the OBU)
	eid	1 bit (eid ext.)	0 (= no extension)
		7 bits	any

Table A.14 *(continued)*

				Length	Value
Option indicator				1 bit (nonmandApplications opt.)	1 (= nonmandApplications present)
non-mandAp-plica-tions				**1 bit (nonmandApplications ext.)**	**0 (= no extension)**
				7 bits (number of applications)	**1**
	CCC Appli-cation			**1 bit (eid opt.)**	**0 (= eid not present)**
				1 bit (parameter opt.)	**0 (= parameter not present)**
		aid		**1 bit (aid ext.)**	**0 (= no extension)**
				5 bits	**20 (= CCC application)**
profileList				1 bit (profileList ext.)	0 (= no extension)
				7 bits (number of profiles)	0 (= list empty)

A.4.3.2   BV test purposes

Test subgroup objective:

— to test the behaviour of the DUT in relation to

  — valid BST, and

  — valid EVENT-REPORT-Rq (Release);

— to test the DUT support of

  — BeaconId,

  — Time,

  — Profile,

  — Applications, and

  — LID.

TP/AP-BAS/OBU/BV/01	Receive and manage INITIALISATION.request (BST)
TP origin	Identical to TP/AL-I/OBU/BV/01 in ETSI/TS 102 486–2-2, 5.4.1
Reference	ISO 12813:2015, 6.1.2
Initial condition	See TP/AL-I/OBU/BV/01 in ETSI/TS 102 486–2-2, 5.4.1
Stimulus and Expected behaviour	
See TP/AL-I/OBU/BV/01 in ETSI/TS 102 486–2-2, 5.4.1.	

TP/AP-BAS/OBU/BV/02	Receive and manage EVENTREPORT request (RELEASE) with mode = 0
TP origin	Identical to TP/AL-I/OBU/BV/02 in ETSI/TS 102 486–2-2, 5.4.1
Reference	ISO 12813:2015, 6.1.6
Initial condition	See TP/AL-I/OBU/BV/02 in ETSI/TS 102 486–2-2, 5.4.1
Stimulus and Expected behaviour	
See TP/AL-I/OBU/BV/02 in ETSI/TS 102 486–2-2, 5.4.1.	

TP/AP-BAS/OBU/BV/03	Read and manage the BeaconID in the BST
TP origin	Identical to TP/AL-I/OBU/BV/03 in ETSI/TS 102 486–2-2, 5.4.1
Reference	ISO 12813:2015, 6.1.2
Initial condition	Identical to TP/AL-I/OBU/BV/03 in ETSI/TS 102 486–2-2, 5.4.1
Stimulus and Expected behaviour	
See TP/AL-I/OBU/BV/03 in ETSI/TS 102 486–2-2, 5.4.1.	

TP/AP-BAS/OBU/BV/04	Read and manage time of reception of BST in parameter Time in BST
TP origin	Identical to TP/AL-I/OBU/BV/04 in ETSI/TS 102 486–2-2, 5.4.1
Reference	ISO 12813:2015, 6.1.2
Initial condition	Identical to TP/AL-I/OBU/BV/04 in ETSI/TS 102 486–2-2, 5.4.1
Stimulus and Expected behaviour	
See TP/AL-I/OBU/BV/04 in ETSI/TS 102 486–2-2, 5.4.1.	

NOTE   Test purposes with ID TP/AP-BAS/OBU/BV/05 to TP/AP-BAS/OBU/BV/08 have not been used to be in line with the numbering in ETSI/TS 102 486–2-2.

TP/AP-BAS/OBU/BV/09	Manage profile selection
TP origin	Identical to TP/AL-I/OBU/BV/09 in ETSI/TS 102 486–2-2, 5.4.1
Reference	ISO 12813:2015, 6.1.2
Initial condition	See TP/AL-I/OBU/BV/09 in ETSI/TS 102 486–2-2, 5.4.1
Stimulus and Expected behaviour	
See TP/AL-I/OBU/BV/09 in ETSI/TS 102 486–2-2, 5.4.1.	

TP/AP-BAS/OBU/BV/10	Verify that the DUT replies to a BST with a VST		
TP origin	Specific		
Reference	ISO 12813:2015, 6.1.2		
Initial condition	DUT not in sleep mode and not yet initialized		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**BST1**	⇒	
2		⇐	**VST**
3	Verify length and allowed values of VST (see Table A.3)		
4	IF verification performed in step 3 was not successful THEN TP failed		

A.4.3.3   BI test purposes

Test subgroup objective:

— to check the behaviour of the DUT in response to invalid messages

TP/AP-BAS/OBU/BI/01	Manage profile selection
TP origin	Identical to TP/AL-I/OBU/BI/01 in ETSI/TS 102 486–2-2, 5.4.2
Reference	ISO 12813:2015, 6.1.2
Initial condition	See TP/AL-I/OBU/BI/01 in ETSI/TS 102 486–2-2, 5.4.2
Stimulus and Expected behaviour	
See TP/AL-I/OBU/BI/01 in ETSI/TS 102 486–2-2, 5.4.2.	

TP/AP-BAS/OBU/BI/02	Manage applications
TP Origin	Identical to TP/AL-I/OBU/BI/02 in ETSI/TS 102 486–2-2, 5.4.2
Reference	ISO 12813:2015, 6.1.2
Initial Condition	See TP/AL-I/OBU/BI/02 in ETSI/TS 102 486–2-2, 5.4.2
Stimulus and Expected behaviour	
See TP/AL-I/OBU/BI/02 in ETSI/TS 102 486–2-2, 5.4.2.	

TP/AP-BAS/OBU/BI/03	Verify that the DUT handles BST with CCC application marked as non-mandatory application
TP origin	Specific
Reference	ISO 12813:2015, 6.1.2
Initial condition	DUT not in sleep mode and not yet initialized

Stimulus and Expected behaviour			
	Tester		**DUT**
1	BST2	⇒	
2	Verify that DUT does not initialize with INITIALISATION-response (VST).		
3	IF verification performed in step 2 was not successful THEN TP failed		

A.4.4   Application T-kernel test purposes for on-board unit

These Test purposes apply to the layer 7 functions related to T-kernel as claimed in ISO 12813:2015, Table B.7, Items 2 to 6.

A.4.4.1   BV test purposes

Test subgroup objective:

— to test the behaviour of the DUT in relation to syntactically and contextual correct behaviour of the test system.

TP/AP-FUN/OBU/BV/01	Receive GET.request and manage GET.response with LID = private
TP origin	Identical to TP/AL-T/OBU/BV/01 in ETSI/TS 102 486–2-2, 5.2.1
Reference	ISO 12813:2015, 6.1.3
Initial condition	See TP/AL-T/OBU/BV/01 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BV/01 in ETSI/TS 102 486–2-2, 5.2.1.	
NOTE: Request with accessCredentials.	

TP/AP-FUN/OBU/BV/08	Receive ACTION.request with mode = 1, manage ACTION.response with LID = private
TP origin	Identical to TP/AL-T/OBU/BV/08 in ETSI/TS 102 486–2-2, 5.2.1
Reference	ISO 12813:2015, 6.1.4/6.1.5/6.1.7
Initial condition	See TP/AL-T/OBU/BV/08 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	

See TP/AL-T/OBU/BV/08 in ETSI/TS 102 486–2-2, 5.2.1

NOTE: Request with accessCredentials for GET_STAMPED and without accessCredentials for SET_MMI, ECHO.

TP/AP-FUN/OBU/BV/09	Receive ACTION.request with mode = 0 and LID = private
TP origin	Identical to TP/AL-T/OBU/BV/09 in ETSI/TS 102 486–2-2, 5.2.1
Reference	ISO 12813:2015, 6.1.5/6.1.7
Initial condition	See TP/AL-T/OBU/BV/09 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	

See TP/AL-T/OBU/BV/09 in ETSI/TS 102 486–2-2, 5.2.1.

NOTE: Request without accessCredentials.

TP/AP-FUN/OBU/BV/10	Receive ACTION.request with mode = 0 and LID = private
TP origin	Identical to TP/AL-T/OBU/BV/10 in ETSI/TS 102 486–2-2 Clause 5.2.1
Reference	ISO 12813:2015, 6.1.5/6.1.7
Initial condition	See TP/AL-T/OBU/BV/10 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	

See TP/AL-T/OBU/BV/10 in ETSI/TS 102 486–2-2, 5.2.1.

NOTE: Request without accessCredentials.

TP/AP-FUN/OBU/BV/11	Verify that the OBU can receive ACTION.request with mode = 0 with LID = broadcast after initialization
TP origin	Identical to TP/AL-T/OBU/BV/11 in ETSI/TS 102 486–2-2, 5.2.1
Reference	ISO 12813:2015, 6.1.5/6.1.7
Initial condition	See TP/AL-T/OBU/BV/11 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	

See TP/AL-T/OBU/BV/11 in ETSI/TS 102 486–2-2, 5.2.1.

NOTE: Request without accessCredentials.

TP/AP-FUN/OBU/BV/12	Verify that the OBU can receive and manage ACTION.request with mode = 0 and with LID = broadcast without initialization
TP origin	Identical to TP/AL-T/OBU/BV/12 in ETSI/TS 102 486–2-2, 5.2.1
Reference	ISO 12813:2015, 6.1.5/6.1.7
Initial condition	See TP/AL-T/OBU/BV/12 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BV/12 in ETSI/TS 102 486–2-2, 5.2.1. NOTE: Request without accessCredentials.	

TP/AP-FUN/OBU/BV/13	Verify that the OBU can receive and manage non-fragmented APDUs with random PDU number
TP Origin	Identical to TP/AL-T/OBU/BV/13 in ETSI/TS 102 486–2-2, 5.2.1
Reference	ISO 12813:2015, 6.1.3/6.1.4/6.1.5/6.1.7
Initial Condition	See TP/AL-T/OBU/BV/13 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BV/13 in ETSI/TS 102 486–2-2, 5.2.1. NOTE: Request with accessCredentials for GET, GET_STAMPED and without accessCredentials for SET_MMI, ECHO. Test purpose not applicable for SET message.	

TP/AP-FUN/OBU/BV/14	Verify that the OBU can receive and manage multiplexed APDUs from two different applications
TP origin	Identical to TP/AL-T/OBU/BV/14 in ETSI/TS 102 486–2-2, 5.2.1
Reference	ISO 12813:2015, 6.1.3/6.1.4/6.1.5/6.1.7
Initial condition	See TP/AL-T/OBU/BV/14 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BV/14 in ETSI/TS 102 486–2-2, 5.2.1. NOTE: Request with accessCredentials for GET, GET_STAMPED and without accessCredentials for SET_MMI, ECHO. Test purpose not applicable for SET message.	

TP/AP-FUN/OBU/BV/16	Verify that the OBU can receive and manage concatenated and chained APDUs from a single application
TP origin	Identical to TP/AL-T/OBU/BV/16 in ETSI/TS 102 486–2-2, 5.2.1
Reference	ISO 12813:2015, 6.1.3/6.1.4/6.1.5/6.1.6/6.1.7
Initial condition	See TP/AL-T/OBU/BV/16 in ETSI/TS 102 486–2-2, 5.2.1
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BV/16 in ETSI/TS 102 486–2-2, 5.2.1. NOTE: Request with accessCredentials for GET, GET_STAMPED and without accessCredentials for SET_MMI, ECHO. Test purpose not applicable for SET message.	

TP/AP-FUN/OBU/BV/17	Attribute encoding tests – GET
TP origin	Identical to TC03-A in ISO/TS 14907-2:2015, C.1.3
Reference	ISO 12813:2015, 6.1.3
Initial condition	See TC03-A in ISO/TS 14907-2:2015, C.1.3
Stimulus and Expected behaviour	
TC03-A in ISO/TS 14907-2:2015, C.1.3. NOTE: Request with accessCredentials.	

TP/AP-FUN/OBU/BV/19	Support of DSRC EFC GET STAMPED
TP origin	Identical to TC10-A in ISO/TS 14907-2:2015, C.2.1
Reference	ISO 12813:2015, 6.1.4
Initial condition	See TC10-A in ISO/TS 14907-2:2015, C.2.1
Stimulus and Expected behaviour	
See TC10-A in ISO/TS 14907-2:2015, C.2.1. NOTE: Request with accessCredentials.	

TP/AP-FUN/OBU/BV/20	Support of DSRC EFC SET MMI
TP Origin	Identical to TC20-A in ISO/TS 14907-2:2015, C.2.4
Reference	ISO 12813:2015, 6.1.5
Initial Condition	See TC20-A in ISO/TS 14907-2:2015, C.2.4
Stimulus and Expected behaviour	
See TC20-A in ISO/TS 14907-2:2015, C.2.4. NOTE: Request without accessCredentials.	

TP/AP-FUN/OBU/BV/21	Support of DSRC EFC ECHO
TP origin	Identical to TC25-A in ISO/TS 14907-2:2015, C.2.5
Reference	ISO 12813:2015, 6.1.7
Initial condition	See TC25-A in ISO/TS 14907-2:2015, C.2.5
Stimulus and Expected behaviour	
See TC25-A in ISO/TS 14907-2:2015, C.2.5. NOTE: Request without accessCredentials.	

A.4.4.2 BI test purposes

Test subgroup objective:

— to check the behaviour of the of the DUT in response to invalid stimuli and behaviour from the test tool.

TP/AP-FUN/OBU/BI/02	Receive and manage PDUs to Broadcast kernel with awake but not yet initialized OBU
TP origin	Identical to TP/AL-T/OBU/BI/02 in ETSI/TS 102 486–2-2, 5.2.2
Reference	ISO 12813:2015, 6.1.2
Initial condition	See TP/AL-T/OBU/BI/02 in ETSI/TS 102 486–2-2, 5.2.2
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BI/02 in ETSI/TS 102 486–2-2, 5.2.2.	

TP/AP-FUN/OBU/BI/03	Receive and manage non-fragmented PDUs with wrong fragment counter value with initialized OBU
TP origin	Identical to TP/AL-T/OBU/BI/03 in ETSI/TS 102 486–2-2, 5.2.2
Reference	ISO 12813:2015, 6.1.3/6.1.4/6.1.5/6.1.7
Initial condition	See TP/AL-T/OBU/BI/03 in ETSI/TS 102 486–2-2, 5.2.2
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BI/03 in ETSI/TS 102 486–2-2, 5.2.2. NOTE: Request with accessCredentials for GET, GET_STAMPED and without accessCredentials for SET_MMI, ECHO. Test purpose not applicable for SET message.	

TP/AP-FUN/OBU/BI/04	Receive and manage non-fragmented PDUs with wrong fragment counter value with awake but not yet initialized OBU
TP origin	Identical to TP/AL-T/OBU/BI/04 in ETSI/TS 102 486–2-2, 5.2.2
Reference	ISO 12813:2015, 6.1.2
Initial condition	See TP/AL-T/OBU/BI/04 in ETSI/TS 102 486–2-2, 5.2.2
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BI/04 in ETSI/TS 102 486–2-2, 5.2.2.	

NOTE   Test purposes with ID TP/AP-BAS/OBU/BI/05 has not been used to be in line with the numbering in ETSI/TS 102 486–2-2.

TP/AP-FUN/OBU/BI/06	Receive and manage concatenated and chained APDUs from a single application with chaining error
TP origin	Identical to TP/AL-T/OBU/BI/06 in ETSI/TS 102 486–2-2, 5.2.2
Reference	ISO 12813:2015, 6.1.3/6.1.4/6.1.5/6.1.7
Initial condition	See TP/AL-T/OBU/BI/06 in ETSI/TS 102 486–2-2, 5.2.2
Stimulus and Expected behaviour	
See TP/AL-T/OBU/BI/06 in ETSI/TS 102 486–2-2, 5.2.2. NOTE: Request with accessCredentials for GET, GET_STAMPED and without accessCredentials for SET_MMI, ECHO. Test purpose not applicable for SET message.	

A.4.5   Application data attributes test purposes, security level 1

These Test purposes apply to security level 1 as claimed in ISO/TS 12813:2015, Table B.6, Item 1, GET / GET_STAMPED operations as claimed in ISO/TS 12813:2015, Table B.7, Items 2 and 3, and attributes as claimed in ISO/TS 12813:2015, Tables B.9, B.10 and B.11.

A.4.5.1   Data attributes definition

Table A.15 contains the references to the standard definition of attributes length and allowed values

Table A.15 — Data group definition

Data groups	Attributes	AttrId	Definition of...	
			Length	**Allowed values**
Identification	CCC-ContextMark	0	EN 15509:2014, Table 2	ISO 14906:2011, Table 37 and Annex A
	EquipmentOBUId	24		ISO 14906:2011, Table 40 and Annex A
	PaymentMeans	32		ISO 14906:2011, Table 42 and Annex A
Vehicle	VehicleLicencePlateNumber	16		EN 15509:2014, Table A.2
	VehicleClass	17		EN 15509:2014, Table A.2
	VehicleDimensions	18		ISO 14906:2011, Table 39 and Annex A
	VehicleAxles	19		ISO 14906:2011, Table 39 and Annex A
	VehicleWeightLimits	20		ISO 14906:2011, Table 39 and Annex A
	VehicleSpecificCharacteristics	22		ISO 14906:2011, Table 39 and Annex A
	TrailerCharacteristics	46		ISO 14906:2011, Table 39 and Annex A
	VehicleAxlesHistory	48	ISO 12813:2015, Table 3	ISO 12813:2015, Table 6
	VehicleCurrentMaxTrainWeight	55		ISO 14906:2011, Table 39 and Annex A
	VehicleWeightHistory	60		ISO 12813:2015, Table 6
	ExtendedVehicleAxlesHistory	62		ISO 12813:2015, Table 6
	LocalVehicleClassId	63		ISO 12813:2015, Table 6
Status	CommunicationStatus	49		ISO 12813:2015, Table 5
	GnssStatus	50		ISO 12813:2015, Table 5
	DistanceRecordingStatus	51		ISO 12813:2015, Table 5
	ActiveContexts	52		ISO 12813:2015, Table 5
	ObeStatusHistory	53		ISO 12813:2015, Table 5
	ExtendedOBEStatusHistory	61		ISO 12813:2015, Table 5
	AttributeUpdateInterval	64		ISO 12813:2015, Table 5

A.4.5.2 BV test purposes

Test subgroup objective:

— to test the behaviour of the DUT in relation to the support of mandatory attributes (in allowed length and allowed values, see below):

— identification,

— vehicle, and

— status;

— by means of the syntactically and contextual correct PDUs:

— GET, and

— GET_STAMPED.

TP/AP-DAT/OBU/BV/01	Verify that the OBU supports the read (by means of GET) of the Identification attributes
TP origin	Specific
Reference	ISO 12813:2015, 7.2

	Initial condition		OBU initialized and can accept a GET-request
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac1, iid = Ø, attrIdList = { '24'D - - EquipmentOBUId, '32'D - - PaymentMeans} }	$\Rightarrow$	
2		$\Leftarrow$	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('24'D, v_1), ('32'D, v_2)}, returnStatus }
3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed		
4	Verify length and allowed values of $v_1 \div v_2$ Table A.15		
5	IF verification performed in step 4 was successful THEN TP passed ELSE TP failed ENDIF		

TP/AP-DAT/OBU/BV/02	Verify that the OBU supports the read (by means of GET) of the Identification attributes, one at the time		
TP origin	Specific		
Reference	ISO 12813:2015, 7.2		
Initial condition	OBU initialized and can accept a GET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '24'D - - EquipmentOBUId }}	$\Rightarrow$	
2		$\Leftarrow$	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('24'D, v_1) }, returnStatus }
3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed		
4	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '32'D - - PaymentMeans }}	$\Rightarrow$	
5		$\Leftarrow$	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('32'D, v_2) }, returnStatus }
6	See step 3		
7	Verify length and allowed values of $v_1 \div v_2$ Table A.15		
8	IF all is OK THEN TP passed ELSE TP failed ENDIF		

TP/AP-DAT/OBU/BV/03	Verify that the OBU supports the read (by means of GET) of the Vehicle data group attributes		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.4		
Initial Condition	OBU initialized and can accept a GET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, accessCredentials = ac1, iid = Ø, attrIdList = { '16'D - - LicensePlateNumber, '17'D - - VehicleClass, '18'D - - VehicleDimensions, '19'D - - VehicleAxles, '20'D - - VehicleWeightLimits, '22'D - - VehicleSpecificCharacteristics, '46'D - - TrailerCharacteristics, '48'D - - VehicleAxlesHistory, '55'D - - VehicleCurrentMaxTrainWeight, '60'D - - VehicleWeightHistory, '62'D - - ExtendedVehicleAxlesHistory, '63'D - - LocalVehicleClassId}}	$\Rightarrow$	
2		$\Leftarrow$	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('16'D, v_1), ('17'D, v_2), ('18'D, v_3), ('19'D, v_4), ('20'D, v_5), ('22'D, v_6), ('46'D, v_7), ('48'D, v_8), ('55'D, v_9), ('60'D, v_{10}), ('62'D, v_{11}), ('63'D, v_{12})}, returnStatus }
3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed		
4	Verify length and allowed values of $v_1 \div v_{12}$ Table A.15	$\Rightarrow$	
5	IF verification performed in step 4 was successful THEN TP passed ELSE TP failed ENDIF	$\Leftarrow$	

TP/AP-DAT/OBU/BV/04	Verify that the OBU supports the read (by means of GET) of the Vehicle attributes, one at the time		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.4		
Initial Condition	OBU initialized and can accept a GET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, accessCredentials = ac$_1$, iid = Ø, attrIdList = { '16'D - - LicensePlateNumber }}	$\Rightarrow$	
2		$\Leftarrow$	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('16'D, v_1) }, returnStatus }
3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed		

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4	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '17'D - - VehicleClass }}	⇒	
5		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('17'D, v_2) }, returnStatus }
6	See step 3		
7	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '18'D - - VehicleDimensions }}	⇒	
8		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('18'D, v_3) }, returnStatus }
9	See step 3		
10	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '19'D - - VehicleAxles }}	⇒	
11		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('19'D, v_4) }, returnStatus }
12	See step 3		
13	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '20'D - - VehicleWeightLimits }}	⇒	
14		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('20'D, v_5) }, returnStatus }
15	See step 3		
16	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '22'D - - VehicleSpecificCharacteristics }}	⇒	
17		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('22'D, v_6) }, returnStatus }
18	See step 3		
19	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac1, iid = Ø, attrIdList = { '46'D - - TrailerCharacteristics }}	⇒	
20		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('46'D, v_7)
21	See step 3		
22	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '48'D - - VehicleAxlesHistory }}	⇒	
23		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('48'D, v_8) }, returnStatus }
24	See step 3		
25	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '55'D - - VehicleCurrentMaxTrainWeight }}	⇒	
26		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('55'D, v_9) }, returnStatus }
27	See step 3		
28	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '60'D - - VehicleWeightHistory }}	⇒	
29		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('60'D, v_{10}) }, returnStatus }
30	See step 3		
31	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '62'D - - ExtendedVehicleAxlesHistory }}	⇒	

32		$\Leftarrow$	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('62'D, v_{11}) }, returnStatus }
33	See step 3		
34	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac$_1$, iid = Ø, attrIdList = { '63'D - - LocalVehicleClassId }}	$\Rightarrow$	
35		$\Leftarrow$	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('63'D, v_{12}) }, returnStatus }
36	See step 3		
37	IF all is OK THEN TP passed ELSE TP failed ENDIF		

TP/AP-DAT/OBU/BV/05	Verify that the OBU supports the read (by means of GET) of the Status attributes		
TP origin	Specific		
Reference	ISO 12813:2015, 7.3		
Initial condition	OBU initialized and can accept a GET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac1, iid = Ø, attrIdList = { '49'D - - CommunicationStatus, '50'D - - GnssStatus, '51'D - - DistanceRecordingStatus, '52'D - - ActiveContexts, '53'D - - ObeStatusHistory, '61'D - - ExtendedOBEStatusHistory, '64'D - - AttributeUpdateInterval } }	$\Rightarrow$	
2		$\Leftarrow$	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('49'D, v_1), ('50'D, v_2), ('51'D, v_3), ('52'D, v_4) , ('53'D, v_5), ('61'D, v_6), ('64'D, v_7) }, returnStatus }
3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed		
4	Verify length and allowed values of $v_1 \div v_7$ Table A.15		
5	IF verification performed in step 4 was successful THEN TP passed ELSE TP failed ENDIF		

TP/AP-DAT/OBU/BV/06	Verify that the OBU supports the read (by means of GET) of the Status attributes, one at the time		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.3		
Initial Condition	OBU initialized and can accept a GET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**

1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '49'D - - CommunicationStatus }}	⇒	
2		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('49'D, v_1) }, returnStatus }
3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed		
4	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '50'D - - GnssStatus }}	⇒	
5		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('50'D, v_2) }, returnStatus }
6	See step 3		
7	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '51'D - - DistanceRecordingStatus }}	⇒	
8		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('51'D, v_3) }, returnStatus }
9	See step 3		
10	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '52'D - - ActiveContexts }}	⇒	
11		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('52'D, v_4) }, returnStatus }
12	See step 3		
13	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '53'D - - ObeStatusHistory }}	⇒	
14		⇐	GET.rs = { fill, eid, iid = Ø, attrIdList = {('53'D, v_6) }, returnStatus }
15	See step 3		
16	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '61'D - - ExtendedOBEStatusHistory }}	⇒	
17		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('61'D, v_7) }, returnStatus }
18	See step 3		
19	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, access-Credentials = ac_1, iid = Ø, attrIdList = { '64'D - - AttributeUpdateInterval }}	⇒	
20		⇐	**GET.rs** = { fill, eid, iid = Ø, attrIdList = {('64'D, v_8) }, returnStatus }
21	See step 3		
22	Verify length and allowed values of $v_1 \div v_8$ Table A.15	⇒	
23	IF all is OK THEN TP passed ELSE TP failed ENDIF	⇐	

TP/AP-DAT/OBU/BV/07	Verify that the OBU supports the read (by means of GET-STAMPED.rq) of the Identification attributes
TP Origin	Specific
Reference	ISO 12813:2015, 7.2

	Initial Condition		OBU initialized and can accept a GET-STAMPED-request	
	Stimulus and Expected behaviour			
	Tester		**DUT**	
1	**ACTION.rq** = { mode = T, eid = VST. DSRC-eid, actionType = 0, accessCredentials = ac_1, **GET-STAMPED.rq** = { attrIdList = { '24'D - - EquipmentOBUId, '32'D - - PaymentMeans}, nonce = C1, keyRef = C2}, iid = Ø }	⇒		
2		⇐	**ACTION.rs** = { fill, eid, iid = Ø, **GET-STAMPED.rs** = { attrIdList = { ('24'D, v_2), ('32'D, v_3)}, authenticator}, returnStatus }	
3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed			
4	Verify length and allowed values of $v_1 \div v_3$ Table A.15 Verify authenticator			
5	IF verification performed in step 4 was successful THEN TP passed ELSE TP failed ENDIF			

NOTE   Test purposes with ID TP/AP-DAT/OBU/BV/08 has not been used to be in line with the numbering in EN 15876–1.

TP/AP-DAT/OBU/BV/09	**Verify that the OBU supports the read (by means of GET-STAMPED.rq) of the Status attributes**		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.3		
Initial Condition	OBU initialized and can accept a GET-STAMPED-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**ACTION.rq** = { mode = T, eid = VST. DSRC-eid, actionType = 0, accessCredentials = ac_1, **GET-STAMPED.rq** = { attrIdList = { '49'D - - CommunicationStatus, '50'D - - GnssStatus, '51'D - - DistanceRecordingStatus, '52'D - - ActiveContexts, '53'D - - ObeStatusHistory, '61'D - - ExtendedOBEStatusHistory, '64'D - - AttributeUpdateInterval }, nonce = C1, keyRef = C2}, iid = Ø }	⇒	
2		⇐	**ACTION.rs** = { fill, eid, iid = Ø, **GET-STAMPED.rs** = { attrIdList = { ('49'D, v_1),('50'D, v_2), ('51'D, v_3), ('52'D, v_4), ('53'D, v_5), ('61'D, v_6), ('64'D, v_7) }, authenticator}, returnStatus }

3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed		
4	Verify length and allowed values of $v_1 \div v_7$ Table A.15 Verify authenticator		
5	IF verification performed in step 4 was successful THEN TP passed ELSE TP failed ENDIF		

TP/AP-DAT/OBU/BV/10	Verify that the OBU supports the read (by means of GET-STAMPED. rq) of the Vehicle data group attributes		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.4		
Initial Condition	OBU initialized and can accept a GET-STAMPED-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**ACTION.rq** = { mode = T, eid = VST. DSRC-eid, actionType = 0, accessCredentials = ac_1, **GET-STAMPED.rq** = attrIdList = { '16'D - - LicensePlateNumber, '17'D - - VehicleClass, '18'D - - VehicleDimensions, '19'D - - VehicleAxles, '20'D - - VehicleWeightLimits, '22'D - - VehicleSpecificCharacteristics, '46'D - - TrailerCharacteristics, '48'D - - VehicleAxlesHistory, '55'D - - VehicleCurrentMaxTrainWeight, '60'D - - VehicleWeightHistory, '62'D - - ExtendedVehicleAxlesHistory, '63'D - - LocalVehicleClassId } nonce = C1, keyRef = C2 }, iid = Ø }	$\Rightarrow$	
2		$\Leftarrow$	**ACTION.rs** = { fill, eid, iid = Ø, **GET-STAMPED.rs** = { attrIdList = { ('16'D, v_1), ('17'D, v_2), ('18'D, v_3), ('19'D, v_4), ('20'D, v_5), ('22'D, v_6), ('46'D, v_7), ('48'D, v_8), ('55'D, v_9), ('60'D, v_{10}), ('62'D, v_{11}), ('63'D, v_{12}),}, authenticator}, returnStatus }
3	IF (returnStatus NOT OK) OR (response not received) THEN TP failed		
4	Verify length and allowed values of $v_1 \div v_{12}$ Table A.15 Verify authenticator		
5	IF verification performed in step 4 was successful THEN TP passed ELSE TP failed ENDIF		

A.4.5.3 BI test purposes

Test subgroup objective:

— to check the behaviour of the DUT in response to invalid stimuli and behaviour from the test tool, in case of:

    — update of the read-only attributes:

        — identification;

        — vehicle;

        — status;

— to check the behaviour of the DUT in response to request with invalid accessCredentials:

    — no access credentials (like in security level 0);

    — wrong access credentials.

TP/AP-DAT/OBU/BI/01	Verify that the OBU prevents the update of the read-only Vehicle attributes, one by one		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.4		
Initial Condition	OBU initialized and can accept a SET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('16'D, x_1) }, iid = Ø }	$\Rightarrow$	
2	IF (SET.rs received AND returnStatus=0) THEN TP failed		
3	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('17'D, x_2) }, iid = Ø }	$\Rightarrow$	
4	IF (SET.rs received AND returnStatus=0) THEN TP failed		
5	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('18'D, x_3) }, iid = Ø }	$\Rightarrow$	
6	IF (SET.rs received AND returnStatus=0) THEN TP failed		
7	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('19'D, x_4) }, iid = Ø }	$\Rightarrow$	
8	IF (SET.rs received AND returnStatus=0) THEN TP failed		
9	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, 10accessCredentials = Ø, attrIdList = { ('20'D, x_5) }, iid = Ø }	$\Rightarrow$	
10	IF (SET.rs received AND returnStatus=0) THEN TP failed		
11	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('22'D, x_6) }, iid = Ø }	$\Rightarrow$	
12	IF (SET.rs received AND returnStatus=0) THEN TP failed		

13	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('46'D, x_7) }, iid = Ø }	$\Rightarrow$	
14	IF (SET.rs received AND returnStatus=0) THEN TP failed		
15	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('48'D, x_8) }, iid = Ø }	$\Rightarrow$	
16	IF (SET.rs received AND returnStatus=0) THEN TP failed		
17	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('55'D, x_9) }, iid = Ø }	$\Rightarrow$	
18	IF (SET.rs received AND returnStatus=0) THEN TP failed		
19	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('60'D, x_{10}) }, iid = Ø }	$\Rightarrow$	
20	IF (SET.rs received AND returnStatus=0) THEN TP failed		
21	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('62'D, x_{11}) }, iid = Ø }	$\Rightarrow$	
22	IF (SET.rs received AND returnStatus=0) THEN TP failed		
23	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = Ø, attrIdList = { ('63'D, x_{12}) }, iid = Ø }	$\Rightarrow$	
24	IF (SET.rs received AND returnStatus=0) THEN TP failed		

TP/AP-DAT/OBU/BI/02	Verify that the OBU prevents the update of the read-only Vehicle attribute list		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.4		
Initial Condition	OBU initialized and can accept a SET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac1, attrIdList = { ('16'D, x_1), ('17'D, x_2), ('18'D, x_3), ('19'D, x_4), ('20'D, x_5), ('22'D, x_6), ('46'D, x_7), ('48'D, x_8), ('55'D, x_9), ('60'D, x_{10}), ('62'D, x_{11}), ('63'D, x_{12})}, iid = Ø }	$\Rightarrow$	
2	IF (SET.rs received AND returnStatus=0) THEN TP failed		

TP/AP-DAT/OBU/BI/03	Verify that the OBU prevents the update of the read-only Identification attribute list
TP Origin	Specific
Reference	ISO 12813:2015, 7.2
Initial Condition	OBU initialized and can accept a SET-request
Stimulus and Expected behaviour	

	Tester		DUT
1	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac1, attrIdList = { ('0'D, x_1), ('24'D, x_2), ('32'D, x_3)}, iid = Ø }	⇒	
2	IF (SET.rs received AND returnStatus=0) THEN TP failed		

TP/AP-DAT/OBU/BI/04	Verify that the OBU prevents the update of the read-only Identification attributes, one by one		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.2		
Initial Condition	OBU initialized and can accept a SET-request		
Stimulus and Expected behaviour			
	Tester		DUT
1	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('0'D, x_1) }, iid = Ø }	⇒	
2	IF (SET.rs received AND returnStatus=0) THEN TP failed		
3	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('24'D, x_2) }, iid = Ø }	⇒	
4	IF (SET.rs received AND returnStatus=0) THEN TP failed		
5	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('32'D, x_3) }, iid = Ø }	⇒	
6	IF (SET.rs received AND returnStatus=0) THEN TP failed	⇒	

TP/AP-DAT/OBU/BI/05	Verify that the OBU prevents the update of the read-only Status attribute list		
TP Origin	Specific		
Reference	ISO 12813:2014, 7.3		
Initial Condition	OBU initialized and can accept a SET-request		
Stimulus and Expected behaviour			
	Tester		DUT
1	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac1, attrIdList = { ('49'D, x_1), ('50'D, x_2), ('51'D, x_3), ('52'D, x_4) , ('53'D, x_5), ('61'D, x_6), ('64'D, x_7)}, iid = Ø }	⇒	
2	IF (SET.rs received AND returnStatus=0) THEN TP failed		

TP/AP-DAT/OBU/BI/06	Verify that the OBU prevents the update of the read-only Status attributes, one by one		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.3		
Initial Condition	OBU initialized and can accept a SET-request		
Stimulus and Expected behaviour			

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	Tester		DUT
1	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('49'D, x_1) }, iid = Ø }	⇒	
2	IF (SET.rs received AND returnStatus=0) THEN TP failed		
3	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('50'D, x_2) }, iid = Ø }	⇒	
4	IF (SET.rs received AND returnStatus=0) THEN TP failed		
5	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('51'D, x_3) }, iid = Ø }	⇒	
6	IF (SET.rs received AND returnStatus=0) THEN TP failed		
7	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('52'D, x_3) }, iid = Ø }	⇒	
8	IF (SET.rs received AND returnStatus=0) THEN TP failed		
9	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('53'D, x_3) }, iid = Ø }	⇒	
10	IF (SET.rs received AND returnStatus=0) THEN TP failed		
11	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('61'D, x_3) }, iid = Ø }	⇒	
12	IF (SET.rs received AND returnStatus=0) THEN TP failed		
13	**SET.rq** = { fill = 0, mode = T, eid = VST. DSRC-eid, accessCredentials = ac_1, attrIdList = { ('64'D, x_3) }, iid = Ø }	⇒	
14	IF (SET.rs received AND returnStatus=0) THEN TP failed		

TP/AP-DAT/OBU/BI/07	Verify that the OBU prevents the read (by means of GET) of the Identification attributes with invalid accessCredentials		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.2		
Initial Condition	OBU initialized and can accept a GET-request		
Stimulus and Expected behaviour			
	Tester		DUT
1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, accessCredentials = invalid_ac, iid = Ø, attrIdList = { '24'D - - EquipmentOBUId, '32'D - - PaymentMeans} }	⇒	
2	IF (GET.rs received AND returnStatus=0) THEN TP failed		
NOTE: invalid_ac is either empty or has incorrect value.			

TP/AP-DAT/OBU/BI/08	Verify that the OBU prevents the read (by means of GET) of the Vehicle attributes with invalid accessCredentials		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.4		
Initial Condition	OBU initialized and can accept a GET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, accessCredentials = invalid_ac, iid = Ø, attrIdList = { '16'D - - LicencePlateNumber, '17'D - - VehicleClass, '18'D - - VehicleDimensions, '19'D - - VehicleAxles, '20'D - - VehicleWeightLimits, '22'D - - VehicleSpecificCharacteristics '46'D - - TrailerCharacteristics, '48'D - - VehicleAxlesHistory, '55'D - - VehicleCurrentMaxTrainWeight, '60'D - - VehicleWeightHistory, '62'D - - ExtendedVehicleAxlesHistory, '63'D - - LocalVehicleClassId } }	⇒	
2	IF (GET.rs received AND returnStatus=0) THEN TP failed		
NOTE: invalid_ac is either empty or has incorrect value.			

TP/AP-DAT/OBU/BI/09	Verify that the OBU prevents the read (by means of GET) of the Status attributes with invalid accessCredentials		
TP Origin	Specific		
Reference	ISO 12813:2015, 7.4		
Initial Condition	OBU initialized and can accept a GET-request		
Stimulus and Expected behaviour			
	Tester		**DUT**
1	**GET.rq** = { fill = 0, eid = VST. DSRC-eid, accessCredentials = invalid_ac, iid = Ø, attrIdList = { '49'D - - CommunicationStatus, '50'D - - GnssStatus, '51'D - - DistanceRecordingStatus, '52'D - - ActiveContexts, '53'D - - ObeStatusHistory, '61'D - - ExtendedOBEStatusHistory, '64'D - - AttributeUpdateInterval } }	⇒	
2	IF (GET.rs received AND returnStatus=0) THEN TP failed		
NOTE: invalid_ac is either empty or has incorrect value.			

TP/AP-DAT/OBU/BI/10	Verify that the OBU prevents the read (by means of GET-STAMPED) of the Identification attributes with invalid accessCredentials
TP Origin	Specific
Reference	ISO 12813:2015, 7.2
Initial Condition	OBU initialized and can accept a GET-STAMPED-request
Stimulus and Expected behaviour	
NOTE: invalid_ac is either empty or has incorrect value.	

	Tester		DUT
1	**ACTION.rq** = { mode = T, eid = VST. DSRC-eid, actionType = 0, accessCredentials = invalid_ac, **GET-STAMPED.rq** = { attrIdList = { '24'D - - EquipmentOBUId, '32'D - - PaymentMeans}, nonce = C1, keyRef = C2}, iid = Ø }	⇒	
2	IF (GET-STAMPED.rs received AND returnStatus=0) THEN TP failed		
NOTE: invalid_ac is either empty or has incorrect value.			

TP/AP-DAT/OBU/BI/11	Verify that the OBU prevents the read (by means of GET-STAMPED) of the Vehicle attributes with invalid accessCredentials
TP Origin	Specific
Reference	ISO 12813:2015, 7.4
Initial Condition	OBU initialized and can accept a GET-STAMPED-request
Stimulus and Expected behaviour	

	Tester		DUT
1	**ACTION.rq** = { mode = T, eid = VST. DSRC-eid, actionType = 0, accessCredentials = invalid_ac, **GET-STAMPED.rq** = { attrIdList = { '16'D - - LicencePlateNumber, '17'D - - VehicleClass, '18'D - - VehicleDimensions, '19'D - - VehicleAxles, '20'D - - VehicleWeightLimits, '22'D - - SpecificCharacteristics, '46'D - - TrailerCharacteristics, '48'D - - VehicleAxlesHistory, '55'D - - VehicleCurrentMaxTrainWeight, '60'D - - VehicleWeightHistory, '62'D - - ExtendedVehicleAxlesHistory, '63'D - - LocalVehicleClassId }, nonce = C1, keyRef = C2}, iid = Ø }	⇒	
2	IF (GET-STAMPED.rs received AND returnStatus=0) THEN TP failed		
NOTE: invalid_ac is either empty or has incorrect value.			

TP/AP-DAT/OBU/BI/12	Verify that the OBU prevents the read (by means of GET-STAMPED) of the Status attributes with invalid accessCredentials
TP Origin	Specific
Reference	ISO 12813:2015, 7.3
Initial Condition	OBU initialized and can accept a GET-STAMPED-request
Stimulus and Expected behaviour	
NOTE: invalid_ac is either empty or has incorrect value.	

	Tester		DUT
1	ACTION.rq = { mode = T, eid = VST. DSRC-eid, actionType = 0, accessCredentials = invalid_ac, GET-STAMPED.rq = { attrIdList = { '49'D - - CommunicationStatus, '50'D - - GnssStatus, '51'D - - DistanceRecordingStatus, '52'D - - ActiveContexts, '53'D - - ObeStatusHistory, '61'D - - ExtendedOBEStatusHistory, '64'D - - AttributeUpdateInterval }, nonce = C1, keyRef = C2}, iid = Ø }	⇒	
2	IF (GET-STAMPED.rs received AND returnStatus=0) THEN TP failed		
NOTE: invalid_ac is either empty or has incorrect value.			

A.4.6 Application security test purposes, security level 1

All test purposes TP/AP-0SEC/OBU/Bx/yy defined in EN 15876-1 are applicable for CCC application as claimed in ISO 12813:2015, Table B.6, Item 2. Note that every TP related to GET or GET_STAMPED message shall be transformed to security level 1 (i.e. with access credentials).

Annex B
(normative)

Test purposes for roadside equipment

B.1 General

This annex contains the test purposes (TP) for the conformity evaluation of RSE to ISO 12813.

B.1.1 TP symbols conventions

For the application layer test purposes, a special notation and symbol convention is used, as defined in what follows.

Symbols are used in the description of the TPs, with meanings according to the table below.

Table B.1 — Description of TP symbols

SYMBOL	DESCRIPTION
XXX.rq ⇒	The DUT sends the XXX.rq PDU to the Tester.
⇐ YYY.rs	The tester sends the YYY.rs PDU to the DUT.
A ≡ B	Test purpose A "is congruent to" Test purpose B. The notation Test purpose A ≡ Test purpose B means that the Test purpose A is the same as Test purpose B. If differences in parameters or parameter values have to be applied, these differences are indicated in the text immediately below.
A → B	Object A "is transformed" into Object B. So a notation like "Table X → Table Y" means that, for the scope of the Test purpose, any reference of Table X should be changed into references to Table Y.
=	Means "assignment". That is, a notation like "accessCredentials = a value" means that the field accessCredentials is given a value.
Ø	Means "empty" or "not set". So, a notation like "accessCredentials = Ø → accessCredentials = calculated value", for a given Test Purpose, means "change all occurrences in which the field accessCredentials has not been assigned to calculation of the value accessCredentials to a given value.

In addition, it has to be noted that the sequence of PDUs issued by an RSE is not constrained by ISO 12813. This means that PDUs cannot in general be forced to be generated by the DUT. In order for the test purposes to adequately cover all possibilities, and at the same time avoid the combinatorial explosion, an abbreviated notation has been used. According to the notation, if in a test purpose, a step is indicated as:

n	See Table B.2

This means that, according to the received PDU, a corresponding test purpose is to be executed, as indicated in Table B.2:

Table B.2 — PDU Selector

n	On ar-riving	GET.rq	Exe-cute	TP/AP-GET/RSE/...	...BI/x or ...BV/y
		ACTION.rq (GET-STAMPED.rq)		TP/AP-STA/RSE/...	
		ACTION.rq (SET-MMI.rq)		TP/AP-MMI/RSE/...	
		ACTION.rq (ECHO.rq)		TP/AP-ECH/RSE/...	
		EVENT-REPORT.rq		TP/AP-REL/RSE/...	
		Any other PDU		TP failed	

In order for the test purposes to clearly identify and specify the subject of the test, and because of the fact that most Application protocol data unit exchanges can only be tested after other exchanges had been previously successfully performed, the Tester has been modelled as controlling a variable, named **Error**, which indicates if a previously executed Test purpose had failed. This allows to properly control the sequence of events in a Test purpose. The variable Error is set by the Tester to either T (True) or F (False), to indicate whether an error occurred or not.

Additionally, as most Application protocol data unit carry the **mode** parameter, which indicates whether a response is expected or not, this mode parameter can be used in some Test purpose by the Tester in order to decide whether to issue a response or not in the case the Test purpose passes, so to enable the DUT to continue issuing requests in subsequent Test purposes.

B.2   Physical layer

Per ISO 12813:2015, 5.5.2, all test purposes TP/PHY/RSE/Bx/yy defined in EN 15876-1 are applicable for the conformity evaluation of RSE to CEN–DSRC based CCC as claimed in ISO 12813:2015, Table B.19, Item 1.

B.3   MAC and LLC

Per ISO 12813:2015, 5.5.2, all test purposes TP/MAC/RSE/Bx/yy and TP/LLC/RSE/Bx/yy defined in EN 15876-1 are applicable for the conformity evaluation of RSE to CEN–DSRC based CCC as claimed in ISO 12813:2015, Table B.19, Item 1.

B.4   Application layer test purposes

B.4.1   Application initialization phase test purposes

These test purposes apply to the INITIALISATION as claimed in ISO 12813:2014, Table B.9, Item 18.

To the purpose of this conformance test, the VST described in Table B.3 is transmitted to the DUT.

Table B.3 — VST1 (security level 1); valid VST

	Length	Allowed value
fill	4 bits	any
profile	1 bit (Profile ext.)	0 (= no extension)
	7 bits	See Profile in EN 12834:2003, Annex A

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Table B.3 *(continued)*

				Length	Allowed value
applications				1 bit (applications ext.)	0 (= no extension)
				7 bits (number of applic.)	2
	CCC Application			1 bit (eid opt.)	1 (= eid present)
				1 bit (parameter opt.)	1 (= parameter present)
		aid		1 bit (aid ext.)	0 (= no extension)
				5 bits	20 (= CCC application)
		eid		1 bit (eid ext.)	0 (= no extension)
				7 bits	any
		parameter		1 bit (Container ext.)	0 (= no extension)
				7 bits (Container CHOICE)	2 (= OCTET STRING)
				1 bit (octet string ext.)	0 (= no extension)
				7 bits (octet string length)	16
			Contract Provider	10 bits (CountryCode)	See ISO 3166-1
				14 bits (IssuerIdentifier)	See ISO 14816
			CCC-ContextMark / TypeOf Contract	16 bits	any
			Context Version	1 bit (contextVersion ext.)	0 (= no extension)
				7 bits	any
				1 bit (Container ext.)	0 (= no extension)
				7 bits (Container CHOICE)	2 (= OCTET STRING)
				1 bit (octet string ext.)	0 (= no extension)
				7 bits (octet string length)	2
			AC_CR-Reference / AC_Master KeyRef	8 bits	any
			AC_CR-Diversifier	8 bits	any
				1 bit (Container ext.)	0 (= no extension)
				7 bits (Container CHOICE)	2 (= OCTET STRING)
				1 bit (octet string ext.)	0 (= no extension)
				7 bits (octet string length)	4
		RndOBE		32 bits	any
	Application 2			1 bit (eid opt.)	1 (= eid present)
				1 bit (parameter opt.)	0 (= parameter not present)
		aid		1 bit (aid ext.)	0 (= no extension)
				5 bits	≠ 20
		eid		1 bit (eid ext.)	0 (= no extension)
				7 bits	any (≠ other eid used in this VST)
obe Configuration				1 bit (obeStatus opt.)	1 (= obeStatus present)
	equipmentClass			15 bits	any
	manufacturerId			16 bits	any
	obeStatus			16 bits	any

B.4.1.1 BV test purposes

Test subgroup objective:

— to test the behaviour of the DUT in relation to valid VST.

TP/AP-BAS/RSE/BV/01	Verify that DUT supports the BST		
TP Origin	Specific		
Reference	ISO 12813:2015, 6.1.2		
Initial Condition	DUT and Tester are not in initialization or transaction phase		
Stimulus and Expected behaviour			
	DUT		Tester
1	**BST**	⇒	
2			Verify length and allowed values of BST (see Table A.2)
3			IF verification performed in step 2 was not successful THEN TP failed
4		⇐	**VST1**
5	See Table A.2		

B.4.1.2 BI test purposes

Not applicable.

B.4.2 Application GET-rq PDU test purposes

These test purposes apply to GET as claimed in ISO/TS 12813:2015, Table B.18, Item 2.

B.4.2.1 BV test purposes

Test subgroup objective:

— to test the DUT support of GET-rq;

— to test the behaviour of DUT in relation to valid GET-rs.

TP/AP-GET/RSE/BV/01	Verify that DUT supports the read (by means of GET.rq) of the data attributes		
TP Origin	Specific		
Reference	ISO 12813:2015, 6.1.3		
Initial Condition	DUT and Tester initialized		
Stimulus and Expected behaviour			
	DUT		Tester
1	**GET.rq** = { fill, eid, accessCredentials, iid, attrIdList = {a_1, a_2, ..., a_n}}	⇒	
2			1. Verify length and allowed values of request parameters (see Table A.4). 2. Verify that attrIdList contains data attributes of Table A.15. Note that at least one attribute from the above mentioned table must be present in the request.
3			IF verification performed in step 2 was not successful TP failed
4		⇐	**GET.rs** = { fill=0, eid = VST.DSRC-eid, iid = Ø, attrIdList = {('a_1'D, v_1), ('a_2'D, v_2), ..., ('a_n'D, v_n) }, returnStatus=0}
5	See Table B.2		

B.4.2.2 BI test purposes

Test subgroup objective:

— to test the behaviour of the DUT in relation to invalid GET-rs;

— to test the behaviour of the DUT in relation to invalid response to GET-rq PDU (protocol violation).

TP/AP-GET/RSE/BI/01	Verify that the DUT detects an incorrect attributeList parameter of the GET.rs		
TP Origin	Specific		
Reference	ISO 12813:2015, 6.1.3		
Initial Condition	DUT and Tester initialized		
Stimulus and Expected behaviour			
	DUT		**Tester**
1	**GET.rq** = { fill, eid, accessCredentials, iid, attrIdList = {a_1, a_2, …, a_n}}	⇒	
2			1. Verify length and allowed values of request parameters (see Table A.4). 2. Verify that attrIdList contains data attributes of Table A.15. Note that at least one attribute from the above mentioned table must be present in the request.
3			IF verification performed in step 2 was not successful TP failed
4		⇐	**GET.rs** = { fill=0, eid = VST.DSRC-eid, iid = Ø, attrIdList ≠ {('a_1'D, v_1), ('a_2'D, v_2), …, ('a_n'D, v_n) }, returnStatus=0}
5	See Table B.2		
Depending on attrIdList of the request PDU, this TP shall be repeated with different incorrect attributeList in the response.			

B.4.3 Application GET-STAMPED-rq PDU test purposes

These test purposes apply to GET-STAMPED as claimed in ISO 12813:2015, Table B.18, Item 3.

B.4.3.1 BV test purposes

Test subgroup objective:

— to test the DUT support of GET-STAMPED-rq;

— to test the behaviour of the DUT in relation to valid GET-STAMPED-rs.

TP/AP-STA/RSE/BV/01	Verify that DUT supports the read (by means of GET-STAMPED.rq) of the data attributes	
TP Origin	Specific	
Reference	ISO 12813:2015, 6.1.4	
Initial Condition	DUT and Tester initialized	
Stimulus and Expected behaviour		
	DUT	**Tester**
1	**ACTION.rq** = { mode, eid, actionType = 0, accessCredentials, **GET-STAMPED.rq** = { attrIdList = {a_1, a_2, …, a_n}, nonce, keyRef}, iid}	⇒

2			1. Verify length and allowed values of request parameters (see Table A.5). 2. Verify length and allowed values of GET-STAMPED request parameters. 3. Verify that attrIdList contains data attributes of Table A.15. Note that at least one attribute from the above mentioned table must be present in the request.
3			IF verification performed in step 2 was not successful THEN TP failed
4		$\Leftarrow$	**ACTION.rs** = { fill = 0, eid = VST.DSRC-eid, iid = $\emptyset$, **GET-STAMPED.rs** = { attrIdList = {('a$_1$'D, v$_1$), ('a$_2$'D, v$_2$), ..., ('a$_n$'D, v$_n$) }, authenticator = auth}, returnStatus = 0}
5	See Table B.2		

B.4.3.2   BI test purposes

Test subgroup objective:

— to test the behaviour of the DUT in relation to invalid GET-STAMPED-rs;

— to test the behaviour of the DUT in relation to invalid response to GET-STAMPED-rq PDU.

TP/AP-STA/RSE/BI/01	Verify that the DUT detects an incorrect attributeList parameter of the GET-STAMPED.rs		
TP Origin	Specific		
Reference	ISO 12813:2015, 6.1.4		
Initial Condition	DUT and Tester initialized		
Stimulus and Expected behaviour			
	DUT		**Tester**
1	**ACTION.rq** = { mode, eid, actionType = 0, accessCredentials, **GET-STAMPED.rq** = { attrIdList = {a$_1$, a$_2$, ..., a$_n$}, nonce, keyRef}, iid}	$\Rightarrow$	
2			1. Verify length and allowed values of request parameters (see Table A.5). 2. Verify length and allowed values of GET-STAMPED request parameters. 3. Verify that attrIdList contains data attributes of Table A.15. Note that at least one attribute from the above mentioned table must be present in the request.
3			IF verification performed in step 2 was not successful THEN TP failed
4		$\Leftarrow$	**ACTION.rs** = { fill = 0, eid = VST.DSRC-eid, iid = $\emptyset$, **GET-STAMPED.rs** = { attrIdList ≠ {('a$_1$'D, v$_1$), ('a$_2$'D, v$_2$), ..., ('a$_n$'D, v$_n$) }, authenticator = auth}, returnStatus = 0}
5	See Table B.2		
Depending on attrIdList of the request PDU, this TP shall be repeated with different incorrect attributeList in the response.			

TP/AP-STA/RSE/BI/02	Verify that the DUT detects an incorrect authenticator parameter of the GETSTAMPED.rs		
TP Origin	Specific		
Reference	ISO 12813:2015, 6.1.4		
Initial Condition	DUT and Tester initialized		
Stimulus and Expected behaviour			
	DUT		**Tester**
1	**ACTION.rq** = { mode, eid, actionType = 0, accessCredentials, **GET-STAMPED.rq** = { attrIdList = {a_1, a_2, ..., a_n}, nonce, keyRef}, iid}	$\Rightarrow$	
2			1. Verify length and allowed values of request parameters (see Table A.5).
			2. Verify length and allowed values of GET-STAMPED request parameters.
			Verify that attrIdList contains data attributes of Table A.15. Note that at least one attribute from the above mentioned table must be present in the request.
3			IF verification performed in step 2 was not successful THEN TP failed
4		$\Leftarrow$	**ACTION.rs** = { fill = 0, eid = VST.DSRC-eid, iid = Ø, **GET-STAMPED.rs** = { attrIdList = {('a_1'D, v_1), ('a_2'D, v_2), ..., ('a_n'D, v_n) }, authenticator = invalid_auth}, returnStatus = 0}
5	See Table B.2		

B.4.4   Application SET-MMI-rq PDU test purposes

These test purposes apply to the SET-MMI as claimed in ISO 12813:2015, Table B.18, Item 4.

B.4.4.1   BV test purposes

Test subgroup objective:

— to test the DUT support of SET-MMI-rq;

— to test the behaviour of the DUT in relation to valid SET-MMI-rs.

TP/AP-MMI/RSE/BV/01	Verify that DUT supports the SET-MMI-rq		
TP Origin	Specific		
Reference	ISO 12813:2015, 6.1.5		
Initial Condition	DUT and Tester initialized		
Stimulus and Expected behaviour			
	DUT		**Tester**
1	**ACTION.rq** = { mode, eid, actionType =10, accessCredentials, **SETMMIRq**, iid}	$\Rightarrow$	
2			Verify length and allowed values of request parameters (see Table A.6).
3			IF verification performed in step 2 was not successful THEN TP failed

4			IF mode = F THEN GOTO step 6
5		⇐	**ACTION.rs** = { fill = 0, eid = VST.DSRC-eid, iid = Ø, returnStatus = 0}
6	See Table B.2		

B.4.4.2   BI test purposes

Not applicable.

B.4.5   Application EVENT-REPORT-rq PDU test purposes

These test purposes apply to the EVENT-REPORT as claimed in ISO 12813:2015, Table B.18, Item 5.

B.4.5.1   BV test purposes

Test subgroup objective:

— to test the DUT support of EVENT-REPORT-rq;

— to test the behaviour of the DUT in relation to valid EVENT-REPORT-rq.

TP/AP-REL/RSE/BV/01	Verify that DUT supports the EVENT-REPORT-rq		
TP Origin	Specific		
Reference	ISO 12813:2015, 6.1.6		
Initial Condition	DUT and Tester initialized		
Stimulus and Expected behaviour			
	DUT		**Tester**
1	**EVENT-REPORT.rq** = { mode, eid, eventType, accessCredentials, eventParameter, iid}	⇒	
2			Verify length and allowed values of request parameters (see Table A.8).
3			IF verification performed in step 2 was not successful THEN TP failed

B.4.5.2   BI test purposes

Not applicable.

B.4.6   Application ECHO-rq PDU test purposes

These test purposes apply to the ECHO as claimed in ISO 12813:2015, Table B.18, Item 6.

B.4.6.1   BV test purposes

Test subgroup objective:

— to test the DUT support of ECHO-rq;

— to test the behaviour of the DUT in relation to valid ECHO-rs.

TP/AP-ECH/RSE/BV/01	Verify that DUT supports the ECHO-rq
TP Origin	Specific
Reference	ISO 12813:2015, 6.1.7

                                                                 43

Initial Condition	DUT and Tester initialized		
Stimulus and Expected behaviour			
	DUT		**Tester**
1	**ACTION.rq** = { mode, eid, actionType =15, accessCredentials, actionParameter, iid}	⇒	
2			Verify length and allowed values of request parameters (see Table A.7).
3			IF verification performed in step 2 was not successful THEN TP failed
4			IF mode = F THEN GOTO step 6
5		⇐	**ACTION.rs** = { fill = 0, eid = VST.DSRC-eid, iid = Ø, returnStatus = 0}
6	See Table B.2		

B.4.6.2   BI test purposes

Not applicable.

Annex C
(normative)

PCTR proforma for on-board units

C.1 General

The protocol conformance test report (PCTR) proforma is based on ISO/IEC 9646-6, which can be consulted for any necessary additional information.

C.2 Identification summary

C.2.1 Protocol conformance test report

Table C.1 — Protocol conformance test report

PCTR Number:	
PCTR Date:	
Corresponding SCTR Number:	
Corresponding SCTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature	

C.2.2 DUT identification

Table C.2 — DUT identification

Name:	
Version:	
Protocol specification:	
PICS:	
Previous PCTR if any:	

C.2.3 Testing environment

Table C.3 — Testing environment

PIXIT Number:	
ATS Specification:	
Abstract Test Method:	
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

C.2.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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C.2.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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C.3 DUT Conformance status

This DUT has or has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this DUT is consistent with the static conformance requirements (as specified in C.3) and there are no "FAIL" verdicts to be recorded (see C.6) strike the words "has or", otherwise strike the words "or has not".

C.4 Static conformance summary

The PICS for this DUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

C.5 Dynamic conformance summary

The test campaign did or did not reveal errors in the DUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (see C.6) strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

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C.6 Static conformance review report

If C.3 indicates non-conformance, this subclause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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C.7 Test campaign report

Table C.4 — Test campaign report

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in C.7)
TP/PHY/OBU/BV/01	Yes/No	Yes/No		
TP/PHY/OBU/BV/02	Yes/No	Yes/No		
TP/PHY/OBU/BV/03	Yes/No	Yes/No		
TP/PHY/OBU/BV/04	Yes/No	Yes/No		
TP/PHY/OBU/BV/05	Yes/No	Yes/No		
TP/PHY/OBU/BV/06	Yes/No	Yes/No		
TP/PHY/OBU/BV/07	Yes/No	Yes/No		
TP/PHY/OBU/BV/08	Yes/No	Yes/No		
TP/PHY/OBU/BV/09	Yes/No	Yes/No		
TP/MAC/OBU/BV/01	Yes/No	Yes/No		
TP/MAC/OBU/BV/02	Yes/No	Yes/No		
TP/MAC/OBU/BV/03	Yes/No	Yes/No		
TP/MAC/OBU/BV/04	Yes/No	Yes/No		
TP/MAC/OBU/BV/05	Yes/No	Yes/No		

Table C.4 *(continued)*

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in C.7)
TP/MAC/OBU/BV/06	Yes/No	Yes/No		
TP/MAC/OBU/BV/07	Yes/No	Yes/No		
TP/MAC/OBU/BV/08	Yes/No	Yes/No		
TP/MAC/OBU/BV/09	Yes/No	Yes/No		
TP/MAC/OBU/BI/01	Yes/No	Yes/No		
TP/MAC/OBU/BI/02	Yes/No	Yes/No		
TP/MAC/OBU/BI/03	Yes/No	Yes/No		
TP/MAC/OBU/BI/04	Yes/No	Yes/No		
TP/MAC/OBU/BI/05	Yes/No	Yes/No		
TP/MAC/OBU/BI/06	Yes/No	Yes/No		
TP/MAC/OBU/BI/07	Yes/No	Yes/No		
TP/MAC/OBU/BI/08	Yes/No	Yes/No		
TP/MAC/OBU/BI/09	Yes/No	Yes/No		
TP/MAC/OBU/BI/10	Yes/No	Yes/No		
TP/MAC/OBU/BI/11	Yes/No	Yes/No		
TP/MAC/OBU/BI/12	Yes/No	Yes/No		
TP/MAC/OBU/BI/13	Yes/No	Yes/No		
TP/MAC/OBU/BI/14	Yes/No	Yes/No		
TP/MAC/OBU/BI/15	Yes/No	Yes/No		
TP/MAC/OBU/BI/16	Yes/No	Yes/No		
TP/MAC/OBU/BI/17	Yes/No	Yes/No		
TP/MAC/OBU/BI/18	Yes/No	Yes/No		
TP/MAC/OBU/BI/19	Yes/No	Yes/No		
TP/MAC/OBU/BI/20	Yes/No	Yes/No		
TP/MAC/OBU/BI/21	Yes/No	Yes/No		
TP/MAC/OBU/BI/22	Yes/No	Yes/No		
TP/MAC/OBU/BI/23	Yes/No	Yes/No		
TP/MAC/OBU/BI/24	Yes/No	Yes/No		
TP/LLC/OBU/BV/01	Yes/No	Yes/No		
TP/LLC/OBU/BV/02	Yes/No	Yes/No		
TP/LLC/OBU/BV/03	Yes/No	Yes/No		
TP/LLC/OBU/BV/04	No	No	n.a.	Empty test purpose
TP/LLC/OBU/BV/05	Yes/No	Yes/No		
TP/LLC/OBU/BI/01	Yes/No	Yes/No		
TP/LLC/OBU/BI/02	Yes/No	Yes/No		
TP/LLC/OBU/BI/03	Yes/No	Yes/No		
TP/LLC/OBU/BI/04	Yes/No	Yes/No		
TP/LLC/OBU/BI/05	Yes/No	Yes/No		

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in C.7)
TP/LLC/OBU/BI/06	Yes/No	Yes/No		
TP/LLC/OBU/BI/07	Yes/No	Yes/No		
TP/AP-BAS/OBU/BV/01	Yes/No	Yes/No		
TP/AP-BAS/OBU/BV/02	Yes/No	Yes/No		
TP/AP-BAS/OBU/BV/03	Yes/No	Yes/No		
TP/AP-BAS/OBU/BV/04	Yes/No	Yes/No		
TP/AP-BAS/OBU/BV/05	No	No	n.a.	Empty test purpose
TP/AP-BAS/OBU/BV/06	No	No	n.a.	Empty test purpose
TP/AP-BAS/OBU/BV/07	No	No	n.a.	Empty test purpose
TP/AP-BAS/OBU/BV/08	No	No	n.a.	Empty test purpose
TP/AP-BAS/OBU/BV/09	Yes/No	Yes/No		
TP/AP-BAS/OBU/BV/10	Yes/No	Yes/No		
TP/AP-BAS/OBU/BI/01	Yes/No	Yes/No		
TP/AP-BAS/OBU/BI/02	Yes/No	Yes/No		
TP/AP-BAS/OBU/BI/03	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/01	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/08	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/09	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/10	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/11	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/12	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/13	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/14	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/16	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/17	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/19	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/20	Yes/No	Yes/No		
TP/AP-FUN/OBU/BV/21	Yes/No	Yes/No		
TP/AP-FUN/OBU/BI/02	Yes/No	Yes/No		
TP/AP-FUN/OBU/BI/03	Yes/No	Yes/No		
TP/AP-FUN/OBU/BI/04	Yes/No	Yes/No		
TP/AP-FUN/OBU/BI/05	No	No	n.a.	Empty test purpose
TP/AP-FUN/OBU/BI/06	Yes/No	Yes/No		
TP/AP-DAT/OBU/BV/01	Yes/No	Yes/No		
TP/AP-DAT/OBU/BV/02	Yes/No	Yes/No		
TP/AP-DAT/OBU/BV/03	Yes/No	Yes/No		
TP/AP-DAT/OBU/BV/04	Yes/No	Yes/No		
TP/AP-DAT/OBU/BV/05	Yes/No	Yes/No		
TP/AP-DAT/OBU/BV/06	Yes/No	Yes/No		
TP/AP-DAT/OBU/BV/07	Yes/No	Yes/No		
TP/AP-DAT/OBU/BV/08	No	No	n.a.	Empty test purpose
TP/AP-DAT/OBU/BV/09	Yes/No	Yes/No		

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Table C.4 *(continued)*

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in C.7)
TP/AP-DAT/OBU/BV/10	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/01	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/02	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/03	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/04	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/05	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/06	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/07	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/08	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/09	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/10	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/11	Yes/No	Yes/No		
TP/AP-DAT/OBU/BI/12	Yes/No	Yes/No		

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in C.7)
TP/AP-0SEC/OBU/BV/01	Yes/No	Yes/No		
TP/AP-0SEC/OBU/BV/02	Yes/No	Yes/No		
TP/AP-0SEC/OBU/BV/03	Yes/No	Yes/No		
TP/AP-0SEC/OBU/BV/04	Yes/No	Yes/No		
TP/AP-0SEC/OBU/BV/05	Yes/No	Yes/No		
TP/AP-0SEC/OBU/BV/06	Yes/No	Yes/No		
TP/AP-0SEC/OBU/BV/07	Yes/No	Yes/No		
TP/AP-0SEC/OBU/BV/08	Yes/No	Yes/No		

C.8   Observations

Additional information relevant to the technical content of the PCTR is given here.

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Annex D
(normative)

PCTR proforma for roadside equipment

The protocol conformance test report (PCTR) proforma is based on ISO/IEC 9646-6, which can be consulted for any necessary additional information.

D.1 Identification summary

D.1.1 Protocol conformance test report

Table D.1 — Protocol conformance test report

PCTR Number:	
PCTR Date:	
Corresponding SCTR Number:	
Corresponding SCTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature	

D.1.2 DUT identification

Table D.2 — DUT identification

Name:	
Version:	
Protocol specification:	
PICS:	
Previous PCTR if any:	

D.1.3 Testing environment

Table D.3 — Testing environment

PIXIT Number:	
ATS Specification:	
Abstract Test Method:	
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

D.1.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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D.1.5   Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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D.2   DUT Conformance status

This DUT has or has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this DUT is consistent with the static conformance requirements (as specified in D.3) and there are no "FAIL" verdicts to be recorded (see D.6) strike the words "has or", otherwise strike the words "or has not".

D.3   Static conformance summary

The PICS for this DUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

D.4   Dynamic conformance summary

The test campaign did or did not reveal errors in the DUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in D.6) strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

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D.5   Static conformance review report

If D.3 indicates non-conformance, this subclause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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D.6   Test campaign report

Table D.4 — Test campaign report

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in D.7)
TP/PHY/RSE/BV/01	Yes/No	Yes/No		
TP/PHY/RSE/BV/02	Yes/No	Yes/No		
TP/PHY/RSE/BV/03	Yes/No	Yes/No		
TP/PHY/RSE/BV/04	Yes/No	Yes/No		
TP/PHY/RSE/BV/05	Yes/No	Yes/No		
TP/PHY/RSE/BV/06	Yes/No	Yes/No		
TP/PHY/RSE/BV/07	Yes/No	Yes/No		
TP/PHY/RSE/BV/08	Yes/No	Yes/No		
TP/PHY/RSE/BV/09	Yes/No	Yes/No		
TP/PHY/RSE/BV/10	Yes/No	Yes/No		
TP/PHY/RSE/BV/11	Yes/No	Yes/No		
TP/PHY/RSE/BV/12	Yes/No	Yes/No		
TP/MAC/RSE/BV/01	Yes/No	Yes/No		
TP/MAC/RSE/BV/02	Yes/No	Yes/No		
TP/MAC/RSE/BV/03	Yes/No	Yes/No		
TP/MAC/RSE/BV/04	Yes/No	Yes/No		
TP/MAC/RSE/BV/05	Yes/No	Yes/No		
TP/MAC/RSE/BV/06	Yes/No	Yes/No		

Table D.4 *(continued)*

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in D.7)
TP/MAC/RSE/BV/07	Yes/No	Yes/No		
TP/MAC/RSE/BV/08	Yes/No	Yes/No		
TP/MAC/RSE/BI/01	Yes/No	Yes/No		
TP/MAC/RSE/BI/02	Yes/No	Yes/No		
TP/MAC/RSE/BI/03	Yes/No	Yes/No		
TP/MAC/RSE/BI/04	Yes/No	Yes/No		
TP/MAC/RSE/BI/05	Yes/No	Yes/No		
TP/MAC/RSE/BI/06	Yes/No	Yes/No		
TP/MAC/RSE/BI/07	Yes/No	Yes/No		
TP/MAC/RSE/BI/08	Yes/No	Yes/No		
TP/MAC/RSE/BI/09	Yes/No	Yes/No		
TP/MAC/RSE/BI/10	Yes/No	Yes/No		
TP/MAC/RSE/BI/11	Yes/No	Yes/No		
TP/MAC/RSE/BI/12	Yes/No	Yes/No		
TP/MAC/RSE/BI/13	Yes/No	Yes/No		
TP/MAC/RSE/BI/14	Yes/No	Yes/No		
TP/MAC/RSE/BI/15	Yes/No	Yes/No		
TP/MAC/RSE/BI/16	Yes/No	Yes/No		
TP/MAC/RSE/BI/17	Yes/No	Yes/No		
TP/MAC/RSE/BI/18	Yes/No	Yes/No		
TP/MAC/RSE/BI/19	Yes/No	Yes/No		
TP/MAC/RSE/BI/20	Yes/No	Yes/No		
TP/MAC/RSE/BI/21	Yes/No	Yes/No		
TP/LLC/RSE/BV/01	Yes/No	Yes/No		
TP/LLC/RSE/BV/02	Yes/No	Yes/No		
TP/LLC/RSE/BV/03	Yes/No	Yes/No		
TP/LLC/RSE/BV/04	Yes/No	Yes/No		
TP/LLC/RSE/BV/05	Yes/No	Yes/No		
TP/LLC/RSE/BI/01	Yes/No	Yes/No		
TP/LLC/RSE/BI/02	Yes/No	Yes/No		
TP/LLC/RSE/BI/03	Yes/No	Yes/No		
TP/LLC/RSE/BI/04	Yes/No	Yes/No		
TP/LLC/RSE/BI/05	Yes/No	Yes/No		
TP/AP-BAS/RSE/BV/01	Yes/No	Yes/No		
TP/AP-GET/RSE/BV/01	Yes/No	Yes/No		

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in D.7)
TP/AP-GET/RSE/BI/01	Yes/No	Yes/No		
TP/AP-STA/RSE/BV/01	Yes/No	Yes/No		
TP/AP-STA/RSE/BI/01	Yes/No	Yes/No		

Table D.4 *(continued)*

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in D.7)
TP/AP-STA/RSE/BI/02	Yes/No	Yes/No		
TP/AP-MMI/RSE/BV/01	Yes/No	Yes/No		
TP/AP-REL/RSE/BV/01	Yes/No	Yes/No		
TP/AP-ECH/RSE/BV/01	Yes/No	Yes/No		

D.7   Observations

Additional information relevant to the technical content of the PCTR is given here.

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Bibliography

[1]   ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

[2]   ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation*

[3]   ISO/IEC 9646-1, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 1: General concepts*

[4]   ISO/IEC 9646-2, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 2: Abstract Test Suite specification*

[5]   ISO/IEC 9646-3, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 3: The Tree and Tabular Combined Notation (TTCN)*

[6]   ISO/IEC 9646-4, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 4: Test realization*

[7]   ISO/IEC 9646-5, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 5: Requirements on test laboratories and clients for the conformance assessment process*

[8]   ISO/IEC 9646-6, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 6: Protocol profile test specification*

[9]   ISO/IEC 9646-7, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 7: Implementation Conformance Statements*

[10]   ISO 14816, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

[11]   ISO 15628, *Intelligent transport systems — Dedicated short range communication (DSRC) — DSRC application layer*

[12]   EN 300 674-1, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band; Part 1: General characteristics and test methods for Road Side Units (RSU) and On-Board Units (OBU)*

[13]   EN 12834:2003, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC application layer*

[14]   EN 13372:2004, *Road Transport and Traffic Telematics (RTTT) — Dedicated short-range communication — Profiles for RTTT applications*